

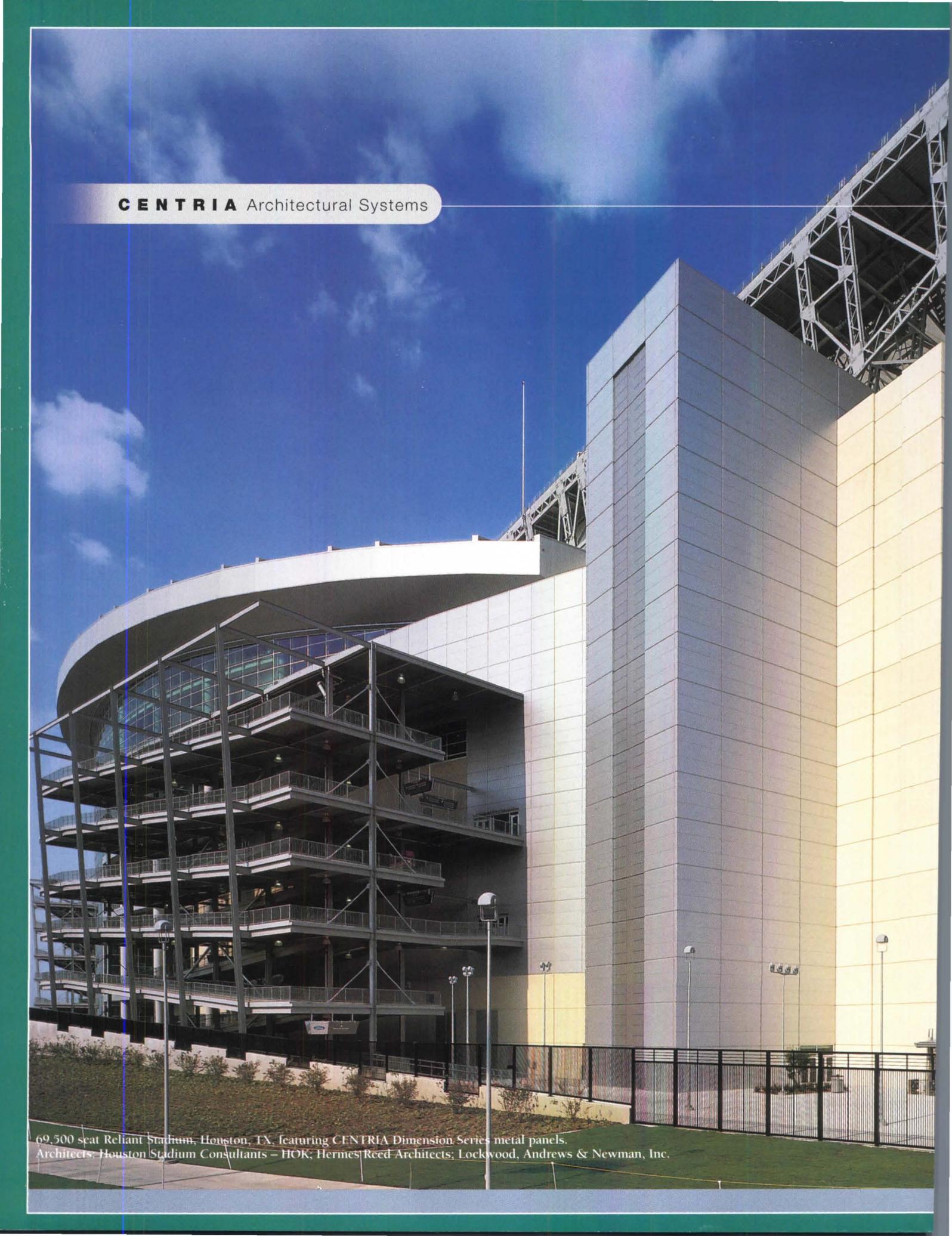
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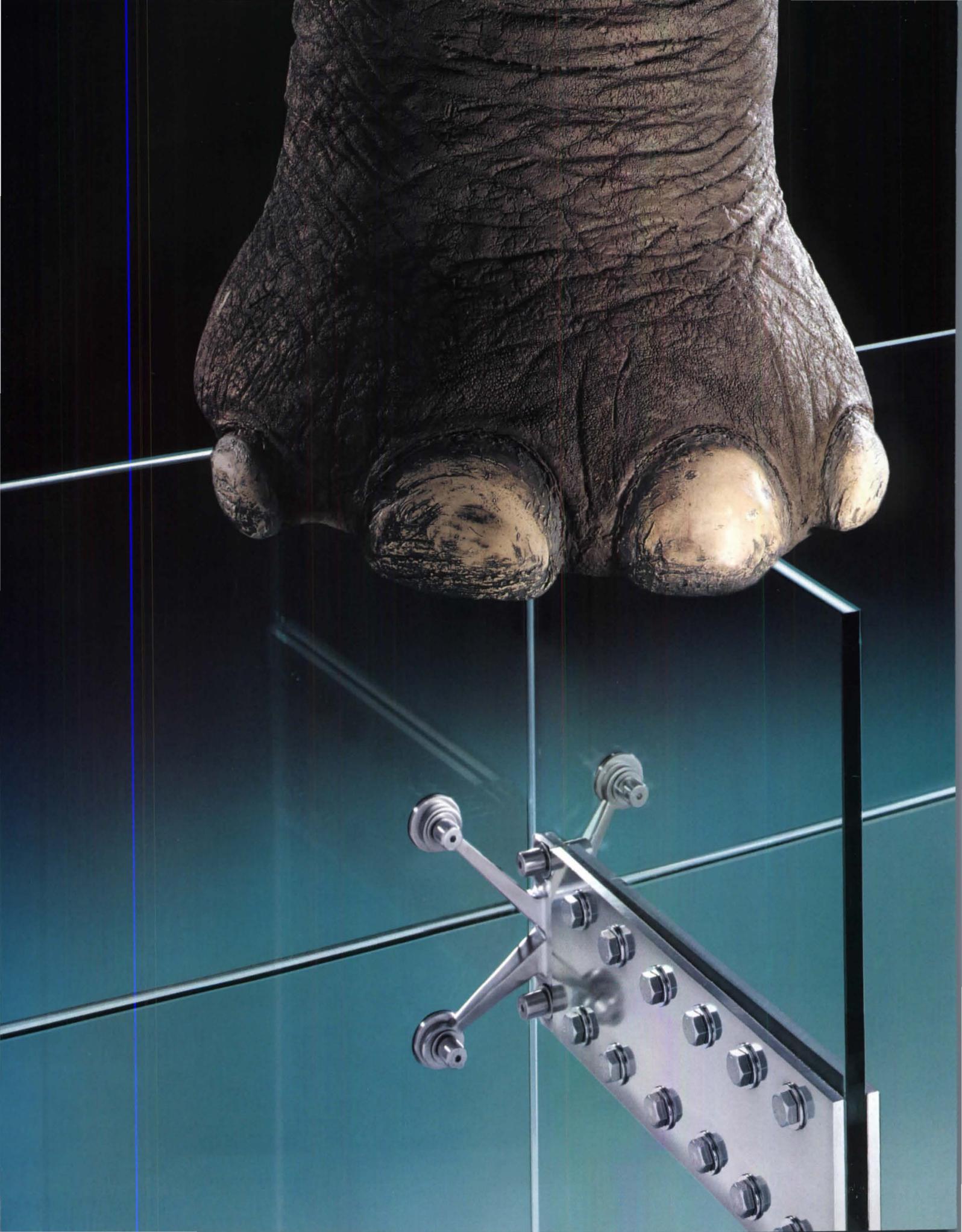
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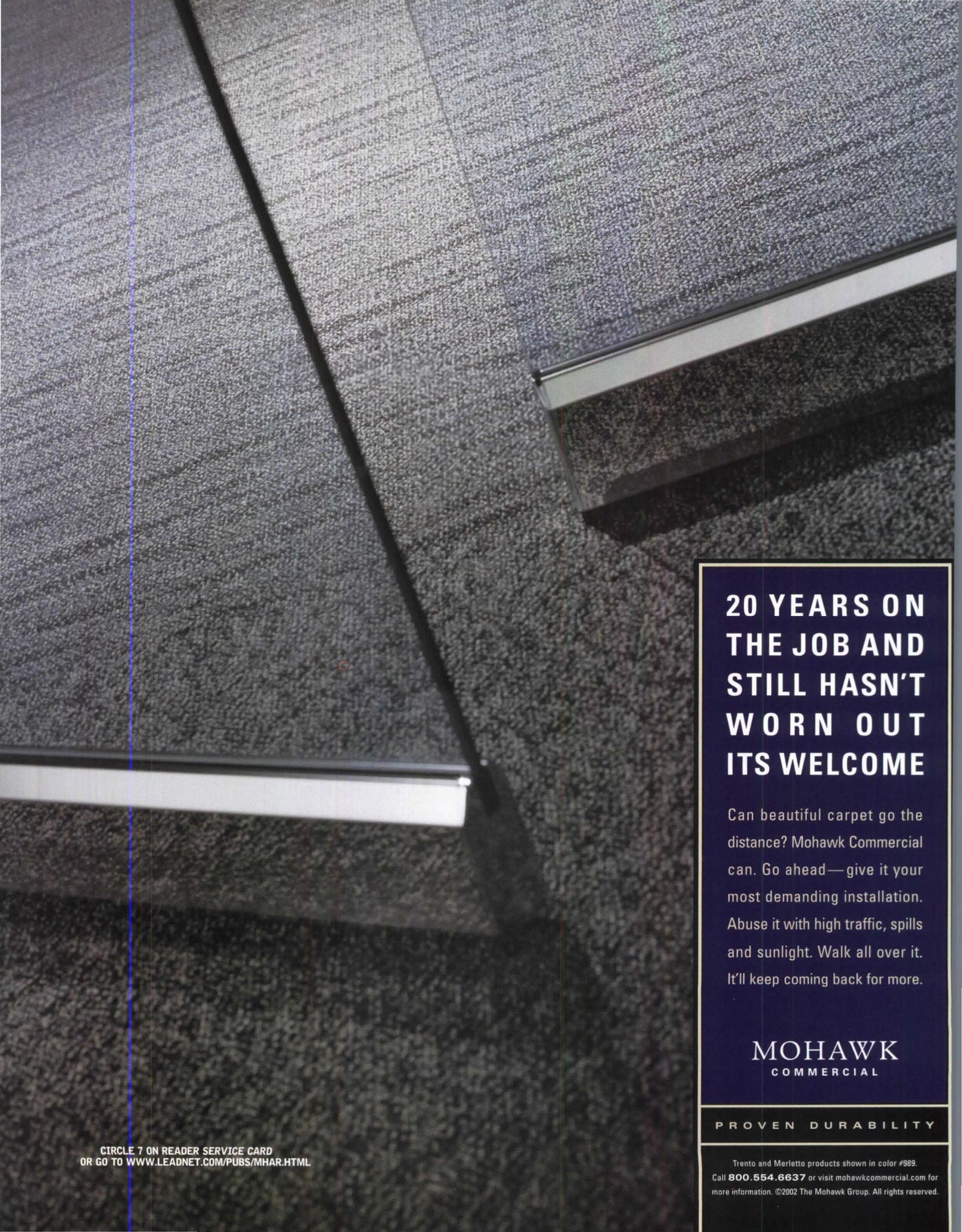


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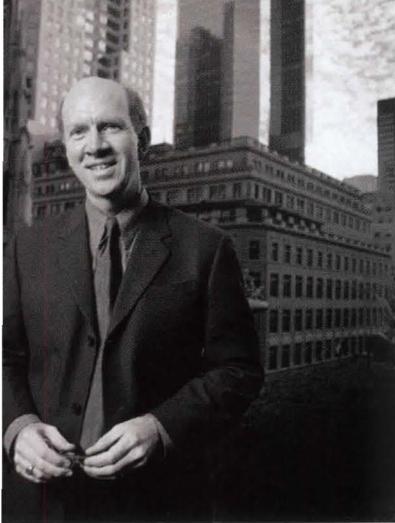
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A Public Advocate

Editorial

By Robert Ivy, FAIA

Architects and other designers deserve a public advocate. For several years, architectural critics have touted a rise in popular appreciation for good design. Perhaps as a result of the events of September 11, 2001, for the first time in many years design seems to be on everyone's lips, from professors to schoolchildren. Ordinary people as well as the erudite are looking for design to solve problems, but also for something more. Daniel Libeskind equates our search at Ground Zero with a spiritual quest.

At this critical juncture, architects need strong voices in government and in our communities. Our concerns extend beyond the immediate headlines of terrorism and war; we need leaders capable of articulating the everyday issues we face as a civilization: the spread of urban blight to the suburbs from the cities, the ennobling potential of housing, the beneficial role of design throughout the public realm, alternatives to the bunker mentality in an insecure world, the glories of open space. The need in government alone is staggering: the EPA, the GSA, HUD, and the Department of State control millions of square feet of buildings and can help determine future trends. Where can we find someone to describe the role of design in our culture, and then convince others of its worth?

For the past 35 years, the National Endowment for the Arts (NEA), and particularly its director of design, has worked to promote not only architecture, but all design, with the potential for a direct effect on what we architects do and what we care about. Ronald E. Bogle, the new executive director of the American Architectural Foundation (AAF) and a former Oklahoma City resident, witnessed firsthand the effectiveness of one program, the Mayors' Institute of City Design, following the bombing of the federal building there. He believes that the mayors' program, a partnership of the NEA, the U.S. Conference of Mayors, and the AAF, has developed "a hands-on program that brings the resources of the profession to mayors with the practical problems that they deal with." Today's climate demands increased investment in such efforts.

While its current programs remain effective and intact, the NEA faces challenges that all architects deserve to understand. First, the organi-

zation lost its director, Michael Hammond, who died shortly after taking office in January 2002. An acting chairman has filled his position awaiting the next appointment. While funding appears to be proceeding satisfactorily, the entire Department of the Interior's budget is being written, negotiated, and reviewed on Capitol Hill this fall. In tight economic times, anything might happen.

More challenging, however, may be the fate of the design director's position. Mark Robbins, the previous office holder, has stepped down as director of design after a tenure that witnessed greater visibility, an increased budget for the department, and growth in vital programs. Today, however, staffing for design seems minimized, limited to grant recipients outside the directorship. Obviously, the Graham Foundation cannot fund the U.S. government. For the coming year, replacing the directorship with a strong individual backed by adequately funded programs should be a priority for the NEA.

Now is the time to speak out for the program's growth, not retrenchment: The benefits far outweigh the minimal costs. Architects will be well served to visit the NEA Web site, www.arts.gov, to learn more about current programs, including the composition of the council and its leadership. More important, we should let our own congressional delegations—our national representatives and senators—know the importance of the director of design. Why? Because in this troubling time, as they will no doubt in the future, Americans are looking for answers that only design can provide, in a language the entire world can understand. We need, and deserve, a government advocate at the highest level.

8:10_{pm}

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Letters

A master mentor

I had the pleasure, and sometimes the burden, of working with Richard Meier [RECORD, September 2002, page 100] for over seven years on the Getty Center project. I was a senior associate in his Los Angeles office and in charge of all his on-site construction administration. I was also in charge of researching stone quarries, suppliers, and fabricators, and developing and constructing full-size design mock-ups for Richard's approval.

On that project, all of the plan and elevation elements were drawn by use of the computer. A very large portion of the project detailing, however, was drawn the old-fashioned way, by hand. One consistent message that Richard Meier had for everyone on the job—whether they were the most senior or most junior of us; whether they were someone who spent the day in front of a computer or someone who sat at a drafting table; or whether they were one of my field architects and seldom came into the office—was, “think about what you are doing, and when you are done, make it look as if an architect had made it happen.”

This simple thought caused each of us on the project to elevate our awareness of every detail. This is how Richard achieves his design success. I now use this same expression with young intern architects and with moderately experienced architects to get them to focus on the work at hand.

Thank you, Richard, for being a good teacher.

—James Mawson, AIA
Richardson, Tex.

Opportunities lost

I agree wholeheartedly with Robert Campbell's column in the August issue [Critique, page 59]. Yet I fear it's already too late. At this time when architects have had an oppor-

tunity to exhibit leadership, they have instead exhibited mankind's worst qualities.

Engineers have conducted notable forensic work, handled the clearing and stabilization of the World Trade Center site, freely expressed their grief, dismay, guilt-ridden feelings of responsibility, and have become the subject of sympathetic articles and television interviews.

By contrast, architects began making declarations about what must be done with the site before the clouds of dust had even come to earth. This has been followed by public squabbling more like gulls fighting over a crust than the noble bickering of princes that many of those involved seem to believe they are engaged in.

Unfortunately, the entire professional cadre of architects will likely suffer from the ghastly insensitivity exhibited initially by those few who lacked the strength to restrain their egos, and it will be alienated from a self-governing population that finds the whiff of sovereignty exhibited in current proceedings to be untrustworthy.

Mr. Campbell is correct in saying that the public would like to hear a common voice of wisdom and experience from architects. Yet this unity and common cause is needed even more by architects themselves. Clients work with people they like and trust, but architecture as a profession has just confirmed—on the most visible, closely watched, and emotionally charged project in the history of our country—that the public's previous inclination to dislike and lack of trust was justified.

No matter how unfair this is to the majority of you, this is what's happened. You may still have a small window of time to do something about it. But do it quickly.

—Karen L. Newcombe
San Francisco

It's better to risk

Mr. Campbell asks for us all just to get along [Critique, August 2002, page 59]. Throw away your idealism and be apart of the group. As I look around, I can't find this fraternal order of “middle-of-the-road architecture.”

Are we as architects being asked by Mr. Campbell to stop looking up and outward for new invention? I hope not. As the world looks to America to lead it through these very difficult and emotional times, we must not give in to what many feel is the “common good.” Is this a Roarkian mentality? For our profession's sake I hope so, and I hope there are many others like me.

In our office there is a quote by Teddy Roosevelt that tends to come up during trying times: “Far better it is to dare mighty things, to win glorious triumphs, even though checkered by failure, than to take rank with those poor spirits who neither enjoy much nor suffer much, because they live in the gray twilight that knows not victory nor defeat.”

I ask Mr. Campbell to dare mighty things and not ask for us as a profession to live in the gray twilight.
—J.A. Remling, AIA
TVS, Atlanta

Architect as advocate

The August article entitled “Limited Contract Agreements” [Practice Matters, page 63], by Satish Rao, looks at an area of practice from the design architect's point of view. It suggests that the design architect be an advocate for the owner. I suggest that many design architects are advocates just for themselves, which requires the owner to employ an independent advocate. (My definition of design architect is a firm that provides design and construction administration services.)

I was a project manager with a major design architect for many

years. I kept hearing from owners that design architects were not “sensitive” to their needs. Their contention was that the owner carries the burden of financial risk, not the design architect. The owner's solution was to reduce the services of the design architect during the construction administration phase.

Was it to save money, as contended by the writer? The work has to be done by someone, and the owners felt that it should be done by someone who was sympathetic to their goals. Yes, the construction management industry has flourished for these reasons. But are they filling the gap? Are they qualified to perform work truly belonging to the professional architect? In many cases, they are not.

About 10 years ago, I became an owner's advocate. I discovered that as enlightened architectural firms work in this new environment, they become secure that their designs are being protected by the owner's advocate. Their risks are also reduced. The work of the owner's advocate begins at the design phase through construction. Construction administration by the design architect continues with the knowledge that there is a “sophisticated” owner watching every phase of the development. This method of designing and building allows the design architect to focus on doing what it does best.

—Harold Radin, AIA
Commerce Township, Mich.

Vintage design

Frank Gehry's plans for a new winery [News, September 2002, page 44] are déjà vu all over again. For over 10 years, I have been waiting to experience his vision for a new architecture, like Kahn's, from project to project. But his vision, like Gaudí's, no matter how artful, appears to be a dead end. He has only taught us that serious architecture requires princely budgets

Letters

and the employment of a new technology that was actually created for mass-produced aircraft, on a one-off building. Gehry has mastered this game; he is the "old surfer dude" of architecture. Wine-filled glass columns are certainly the last straw in a litany of over-the-top work.

Ironically, seven pages later and in the same issue, you report that Steven Holl cannot build a foursquare building at Cornell for reasons that are obviously financial. This juxtaposition only dramatizes the marginalization of much of current architecture, where "art" has supplanted craft. No wonder much of our cities' buildings have become kitsch while academia and the press continue to adulate the realm of the sensuously possible while ignoring common sense. Architecture is a practical, not a fine art.

—James A. Gresham, FAIA
Tucson

The temperature of degrees

The horse really is out of the barn, and I agree with Dean Meunier ["B.Arch.? M.Arch.? What's in a name?," August 2002, page 84] when he says that an M.Arch. degree represents a lot more to the public than a B.Arch. I also agree with him that the B.Arch. already exceeds the requirements of an M.A. or M.S. When I received my B.Arch. from Arizona State University, I had nearly 190 semester hours of credit—about 65 hours more than an M.A. in Business Administration. Oh well, life is not fair.

More importantly, an M.Arch. coincides with the goals of the AIA's Continuing Education program—a demonstrated commitment to competence through the best individual efforts of professional inquiry.

The discussion has gone on for many years about how to build real working bridges between education and practice without the emergence

of any meaningful model. As an adjunct professor of architecture at Drexel University, I am somewhat biased to believe that our program may be at the forefront of achieving those bridges through its work-study programs. This is not a new idea. The Department of Architecture has a seven-year program (entirely at night—equivalent to five years full time) and a two-year, full-time day curriculum followed by a four-year evening program (two + four). Both lead to a B.Arch., and both provide a work-study advantage.

Although both programs are broad and rigorous, the Curriculum Committee is constantly seeking ways to improve the skills—and, frankly, the marketability—of the department's students. However, like other schools, there's plenty that would like to be added, but no room. This is one reason that Drexel has recently started an M.Arch. evening program.

Drexel's Department of Architecture has also successfully

experimented with case study by simulation—a course of competing mock practices. Working students have access to the resources and advice that their day jobs can provide and are always encouraged by their employers who see the direct benefit of a working relationship with a university.

It has been theorized that the architectural profession should model itself after the medical profession and include a Ph.D., internship, and a residency in its training. The majority of architects can't afford that much education, and not many employers can afford the implied commitments. Perhaps this is the next question to be debated. Meanwhile, the M. Arch. is certainly becoming more important.
—Steven C. Gatschet, AIA
Philadelphia

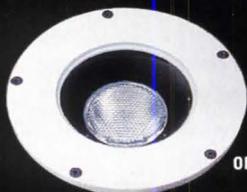
Biocentrifugal force

Regarding Nancy Solomon's article on biocentric design [Building Science, September 2002, page 173], I must congratulate you for publishing a truly exceptional, well-

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Letters

researched, and informative article—far above the level of stuff we usually get in the journals.

—Fred Stitt, director, San Francisco Institute of Architecture, San Francisco

A troubled region

Mr. Sorkin's critique [Critique, July 2002, page 61] is a plethora of misinformation. Mr. Sorkin refers to the "Haussmanization" of the IDF incursion into Jenin during Operation Defensive Shield. The lasting result of Haussman's work has not been the facilitation of tank movement but rather the Paris that we know today. The operations of the IDF were meant to expel terror cells from Jenin—not to create boulevards.

Sorkin also writes that "nowhere today is the political use of urbanism more glaring than in Jerusalem in the West Bank." When referring to the suicide bombers,

"terrorism" would be a more appropriate term than "urbanism." While the bombers have struck repeatedly in the city centers of Jerusalem, Tel Aviv, and Haifa, they have not been loath to attack more rural sites. Small towns such as Hadera and road junctions throughout the country have also been targeted.

To suggest that the Israeli settlements in the West Bank and the Gaza Strip are a way to institute "the more bureaucratic styles of apartheid" is a baseless claim. Israel is a democratic state that is committed to a peaceful political solution of the conflict. One million Israeli Arabs live within Israel as Israeli citizens. Even as the Palestinian violence continues, the Israeli government is continually trying to ease Palestinian hardship, recently issuing approximately 12,000 work permits to allow Palestinians to enter its borders. Mr. Sorkin goes on to claim that the settlements "sitting

in their arrogance on the tops of hills ... represent an almost medieval style of planning, prompted by aggression and machismo." The true reason behind the siting of Israeli homes on hilltops is to secure their safety. Their fears are not groundless: Amnesty International records 92 attacks and 72 shootings against Israeli civilians living in the West Bank or Gaza from September 2000 through May 31, 2002, and it is a number that is constantly increasing.

The claim that "Israelis pursue simultaneous policies of urban renewal and 'ghettoization'—urban renewal in the form of demolition and devaluation of the original inhabitants and 'ghettoization' not only for the Palestinians but also for the Israelis electively ensconced in the pleasant but beleaguered settlements" is simply ludicrous. Indeed, while all armies are prone to make mistakes, Israel's targeting of high-level terrorists is done in a manner that aims to preserve all innocent lives in the surrounding area.

—Jonathan Schienberg, senior

press liaison, Consulate General of Israel in New York

Corrections

In the story about Richard Meier in the September issue [page 100], Buro Happold was the engineering firm that worked on the Bethel Performing Arts Center. In September's Building Science article ["Biocentric Design", sidebar, page 174], a photograph from the Dutch Ministry of Housing and the Environment, by Behnish, Behnish & Partner, appeared incorrectly. In September, in archrecord2 [page 63], the article about Phillip Todd neglected to mention the contributions of several members of the design team. Please go to our Web site and click on archrecord2 for more information. In the August article on architectural education [page 84], former dean John McRae's name was misspelled.

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In Boston, Diller + Scofidio design waterfront jewel for ICA

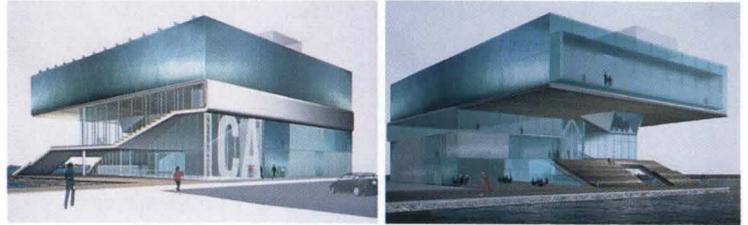
Diller + Scofidio, the architecture firm of the New York-based husband-and-wife team of Ricardo Scofidio and Elizabeth Diller, has designed a dynamic addition to the Boston waterfront. The new home for The Institute of Contemporary Art (ICA), which was unveiled in early September, was developed to embrace its urban waterfront location and include a glass-enclosed cantilevered gallery.

Construction on the 62,000-square-foot museum will likely begin by early 2004, with a projected completion date in 2006. The ICA is planned for the waterfront cove of Boston's Fan Pier development, proposed by Chicago's Nicholas J. Pritzker, which will include up to eight other buildings with a mix of

office, retail, and residential uses.

Diller + Scofidio aimed for a museum solution that was "elegant and simple in terms of design, built with an economy of means," Diller told RECORD. They intend the highly transparent four-story building to be engaging, with references to the outside on all four sides. "It's a building of many fronts," Diller says. "It's a metaphorically leaky building that is permeable in many ways."

A harbor walk will wrap the museum on two sides. An outdoor grandstand, which will appear as a continuation of a two-story-tall theater that is inside the museum, will be sheltered by the building's cantilever. The museum's 18,000 square feet of exhibition space will reside on the uppermost floor, which



The ICA will include gallery space on the top floor, which cantilevers toward the harbor (right).

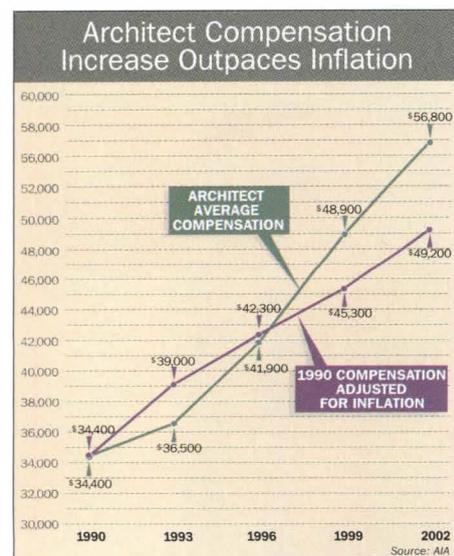
cantilevers 75 feet toward the water.

An exhibition about the ICA design process, *Building A Vision: Diller + Scofidio in Boston*, will be held at the ICA from January 22 to April 27, 2003. An exhibition of Diller + Scofidio's body of work, *Scanning: The Aberrant Architecture of Diller + Scofidio*,



will be at the Whitney Museum of American Art in New York City, March 1 to July 1, 2003. *John E. Czarnecki, Assoc. AIA*

AIA survey shows architect compensation increases continue to outpace inflation



The average compensation of registered architects, interns, and graduates of architecture programs combined has outpaced inflation.

Compensation at architecture firms has increased at a rate that has outpaced inflation in recent years, according to the American Institute of Architects (AIA), which releases its 2002 AIA Compensation Survey this month. The survey also reveals that, in general, the larger the firm is, the higher the compensation will be for all positions.

According to the survey, "The average compensation for architecture positions as of early 2002 was 15 percent above what it would be if it had merely kept

pace with inflation since 1990." In fact, architect compensation increases lagged behind inflation as late as 1996.

Architecture staff compensation increased from 1999 to 2002 on average 2.3 percent—at a pace that is only slightly less than the 3 percent increase during the previous three-year period of 1996 to 1999, when the amount of construction activity was rapidly expanding. "I think we were not expecting the percentage increase from 1999 to 2002 to be as high as it was," says Pradeep Dalal, AIA director for economics and market research.

The AIA Economics and Market Research Group administered the survey online between March 26 and May 24, 2002, to a sample of

approximately 9,000 AIA member-owned firms. Architecture positions included in the average are registered architects, nonregistered graduates of architecture programs, and graduates currently working in internship programs. Compensation is broadly defined to include salary, as well as *nonguaranteed overtime*, bonuses, profit sharing, and other incentive compensation. Principals and partners earn, on average, more than 25 percent of compensation from nonguaranteed sources, while registered and nonregistered graduate architecture staff earn 10 percent of their compensation from nonguaranteed sources.

All architecture positions averaged almost 5.5 percent compensation increases annually

OFF THE RECORD

Philippe Starck has designed a 289-unit residential tower, called ICON, for Miami Beach, Florida. Construction on Starck's first American residential project will begin in 2003, with completion expected in 2005.

A Holocaust Memorial designed by New York architect Wendy Evans Joseph opened in Salt Lake City on September 12. Joseph was one of the designers for the U.S. Holocaust Memorial Museum when she was with Pei Cobb Freed & Partners.

More than 2,500 people have registered to submit a design in the competition for a memorial to victims of the September 11, 2001, terrorist attack on the Pentagon. A winner will be selected by the end of the year.

Los Angeles-based architect Michael Maltzan Architects was chosen in a competition to design a new \$27 million Sonoma County Museum in Santa Rosa, California. The four finalists included Steven Holl Architects, Greg Lynn FORM, and Kuth/Ranieri Architects.

Renzo Piano, Hon. FAIA, has won the International Union of Architects 2002 Gold Medal. The Japan Art Association will award its 2002 Praemium Imperiale award for architecture to Norman Foster in an October 23 ceremony in Tokyo.

New Orleans-based firm Es skew+ has added five new partners and is now called Es skew+Domez+Ripple.

Six new towers are being planned for London's Canary Wharf, three each by Cesar Pelli & Associates and the Richard Rogers Partnership.

Metro, the Washington, D.C.-area transit authority, has unveiled a 10-year, \$12.2 billion plan to provide additional transportation service via light-rail trolleys and bus rapid transit.

(continued from previous page) between 1999 and 2001, while the increases for professional, specialty, and technical positions averaged 3.9 percent per year in the same period, according to U.S. Department of Labor data.

Compensation for principals and partners was about 50 percent higher at firms with 50 or more employees than at smaller firms.

Senior managers, project managers, and department heads combined had a 20.8 percent increase in compensation from 1996 to 1999 and a 14.5 percent increase from 1999 to 2002. Intern compensation increased by 12.4 percent in the past three years, while the increase was about 14 percent for other architecture positions. The survey notes: "One explanation for this widening gap

between increases for interns and that for architects is that in 1999-2002 there was a demand for architects with five to 10 years' experience, many of whom had left the profession during the early 1990s."

The compensation gap between architecture staff and other design professionals, such as engineers, interior designers, landscape architects, and urban planners, is narrowing. According to the survey, "At present, average compensation for architecture staff is just 1 to 2 percent below the average compensation for other design professionals."

Higher billings by large firms does translate into higher pay. The survey found that architecture staff compensation is about 5 percent higher at larger firms than at smaller firms, and about 5 to 10 percent higher at larger firms than at mid-size firms. Compensation at firms in metropolitan areas is about 10

percent higher than for comparable positions at firms outside metropolitan areas.

Benefits account for about 20 percent of the average compensation in a firm. Ninety-two percent of firms offer medical insurance coverage to their employees, while 47 percent offer dental insurance, and only 17 percent offer paid maternity leave (ranging from 8 percent for firms of fewer than five people to 53 percent for firms of 250 or more).

The majority of firms, 66 percent, pay full AIA member dues for their eligible employees.

The complete 2002 AIA Compensation Survey will be available for purchase, either in print or as a PDF, in late October for \$140 for AIA members and \$200 for nonmembers. Summaries of the results from each of the nine AIA regions can be bought as PDFs for \$45 per region. Purchase online at www.aia.org or call 800/242-3837 (option 4). J.E.C.

About 40% of Firms Pay Registration Exam Fee

	(NUMBER OF EMPLOYEES)							
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PAID LEAVE FOR EXAM	38%	55%	59%	65%	58%	67%	74%	56%
REGISTRATION EXAM FEE	24%	39%	50%	48%	39%	64%	63%	42%
PREPARATORY CLASSES	11%	18%	23%	21%	19%	27%	42%	19%
OTHER	6%	8%	11%	17%	21%	25%	16%	12%

Average Compensation for Architecture Firm Staff

	(NUMBER OF EMPLOYEES)							
	FEWER THAN 5	5 TO 9	10 TO 19	20 TO 49	50 TO 99	100 TO 249	250 OR MORE	ALL FIRMS
DEPARTMENT HEAD/ SENIOR MANAGER	\$72,400	\$78,000	\$83,900	\$84,300	\$96,000	\$96,100	\$101,800	\$87,600
PROJECT MANAGER	61,000	58,000	63,300	69,200	74,900	71,900	77,900	69,700
SENIOR ARCHITECT/DESIGNER	56,100	55,100	60,400	63,100	68,900	66,700	72,200	65,600
ARCHITECT/DESIGNER III	48,500	47,700	52,400	53,500	58,000	55,500	61,300	55,400
ARCHITECT/DESIGNER II	42,400	44,600	47,700	47,600	51,500	50,400	50,900	49,100
ARCHITECT/DESIGNER I	37,200	37,900	39,900	40,700	45,400	41,600	43,800	41,600
INTERN III	36,600	36,700	37,300	39,500	39,300	38,700	45,200	39,200
INTERN II	29,300	32,400	34,000	34,500	33,200	35,400	36,500	34,000
INTERN I	28,400	28,500	30,000	31,700	31,300	30,700	27,700	30,300

SPECIAL REPORT

New York architecture critics select favorite designers to develop plans for WTC site

The *New York Times* architecture critic Herbert Muschamp invited a select group of well-known architects to develop individual building plans for the World Trade Center site and surrounding areas. The designs appeared in *The New York Times Magazine* on September 8. Although created without knowing what the ultimate program will be for the site, some evocative ideas and building forms emerged from the exercise.

Muschamp's group of architects included Steven Holl, Rafael Viñoly, Richard Meier, Peter Eisenman, Zaha Hadid, Henry Cobb and Guy Nordenson, David Rockwell, Alexander Gorlin, Lindy Roy, Architecture Research Office, Frederick Schwartz/FACE, Rem Koolhaas/OMA, Charles Gwathmey/Gwathmey Siegel, TEN Arquitectos, and Koning/Eizenberg. Maya Lin also developed memorial sketches. See the proposals at www.nytimes.com/magazine.

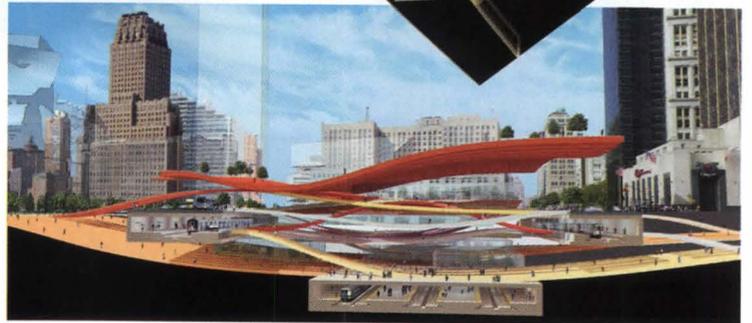
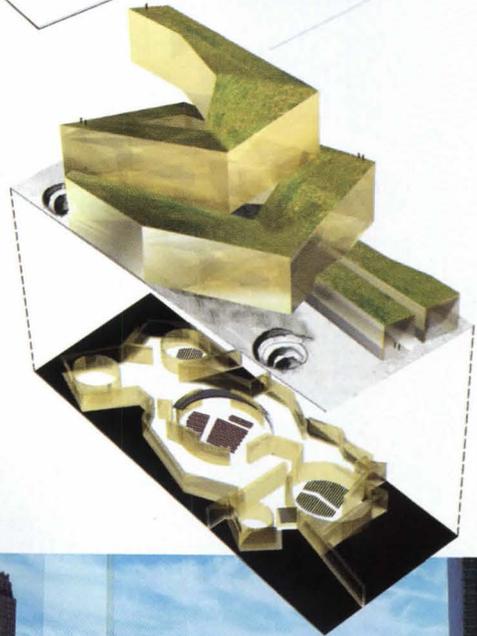
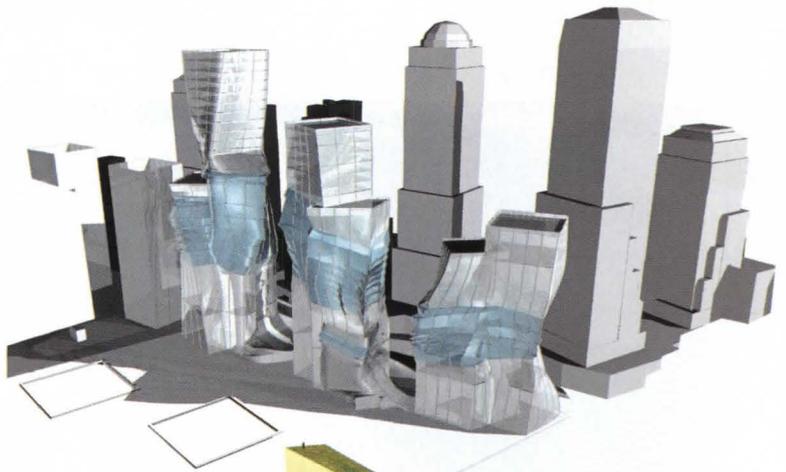
The *New York Observer*, in its September 19 issue, reported on Muschamp's efforts: "Several sources familiar with the *Times* project questioned whether Mr. Muschamp's

presence as organizer puts him in a precarious role—a critic now serving as overseer of people whose work he also covers and judges." Does this help or hurt the chances of those same architects to ultimately be selected to design a building that will be built at the WTC site?

The *Observer* also noted that "following contentious meetings with Mr. Muschamp, some members of the *Times* design panel have wanted to withdraw altogether."

Simultaneously, *New York* magazine architecture critic Joseph Giovannini also invited proposals from seven architects—Hadid, Eisenman, Thom Mayne of Morphosis, William Pedersen of Kohn Pedersen Fox Associates, Wolf Prix, Carlos Zapata, and Lebbeus Woods—that appeared in the September 16 issue of *New York*. Visit www.nymetro.com/wtcdesigns to see their schemes. J.E.C.

Proposals in *The New York Times* included offices by Peter Eisenman (top), a museum and theater by Steven Holl (middle), and a transit hub by Rafael Viñoly (bottom).



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SPECIAL REPORT

Winter Garden \$50 million reconstruction completed one year after 9/11 destruction

On September 17, one year after it sustained considerable damage from the terrorist attacks, the World Financial Center's Winter Garden atrium was officially reopened to the public. In separate ceremonies earlier in the month, invited guests visited the Winter Garden, and President Bush addressed world leaders in the space.

The reopening is remarkable considering Thornton-Tomasetti Engineers, the original structural consultant, had initially deemed the glass-and-steel structure unsalvageable due to lateral instability.

Owned and managed by Brookfield Properties, the new Winter Garden is a lesson in contrasts from Cesar Pelli's original

design, which was completed in 1988. The east facade, which had been destroyed with the collapse of the north bridge that had linked the Winter Garden to the World Trade Center, is now composed of a Pilkington Planar structural-glass system, measuring 110 feet wide by 60 feet tall. A ground-level lobby, which was not a part of the building before the attack, now faces the building's east facade. Additionally, a semicircular wall of glass ribs replaces former storefronts. Illuminated from behind, the industrial structural glass draws users into the lobby and toward the Winter Garden without deploying graphic signage.

Other components of the origi-



The reconstructed Winter Garden includes a glass wall (above) that faces the World Trade Center site, a new lobby (left), and new palm trees and marble flooring in the atrium (below).

nal design remain, including the grand stairway. Directly facing the site of the World Trade Center, visitors now use the stairway landing as a viewing platform.

The \$50 million project was completed on an exceptionally accelerated construction schedule, with Turner Construction as construction manager and general contractor. Because of the fast track, Rafael Pelli, principal with Cesar Pelli & Associates, said "very little" of the redesign was changed over the course of construction: "As soon as a concept was approved by the



owner, we'd be put in direct communication with the subcontractor."

To rebuild the roof structure, an exterior hoist-and-trolley system was implemented that allowed the work to be completed in less than five months rather than 2 years, which is how long it originally took to construct. *David Sokol*



On September 11, 2001, the WTC towers smashed into the Winter Garden's east facade.

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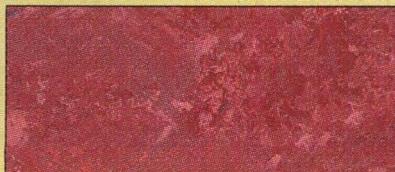
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SPECIAL REPORT



The Pentagon as seen earlier this year (below left) and after the outermost ring was reconstructed (top and below right).



Pentagon's \$501 million Phoenix Project reconstruction emerges from the 9/11 attack

A stronger and safer Pentagon has emerged lightning-fast from the cinders of the September 11, 2001, terrorist attack.

Employees moved back into the outermost E ring the week of September 11. Work on the inner D and C rings will conclude by year's end, says Rachel Decker, a spokesperson for the Pentagon's \$501 million Phoenix Project reconstruction program, named after the mythical bird that arose from ashes.

Workers sometimes toiled in dual 10-hour shifts to reconstruct the 400,000-square-foot segment that was destroyed. Another 1.6 million square feet of the Pentagon

was damaged by water, smoke, and fire, but not destroyed.

"That's an amazing pace of work," says Cris Fromboluti, project director for Hellmuth, Obata + Kassabaum (HOK). "You can't even do a house in 10 months. Normally a project of this type would take three to four years."

Construction began November 19, 2001, the same day the 24-hour-a-day demolition project ended. About 56,000 tons of debris were hauled away to a landfill.

St. Louis-based HOK and Baltimore-based RTKL Associates worked side by side to speed design and construction along. Washington,

D.C.-based KCE Structural Engineers helped coordinate Project Phoenix and provided structural engineering. London-based AMEC Construction Management was the general contractor.

"Everybody just worked together to get the work done to meet the goals," said RTKL's project manager Ridgely Dixon. "There were never any turf or scope issues."

HOK's responsibilities included design of the facade and tenant build-outs, and RTKL worked on building-core elements such as the stairwells and the roof. Security, safety, and historic preservation were the chief design concerns.

Exterior walls were rebuilt using heavily reinforced concrete. Additional interior corridors were added, with reinforced-concrete block surrounding those hallways as well as the new stairwells and elevator shafts. The same type of 1,600-pound, blast-resistant windows, which cost \$10,000 each, were installed that had been in place as part of the Pentagon's ongoing renovation program.

Some of the original Pentagon facade limestone was salvaged, and nearly 4,000 additional slabs were harvested from the same Indiana quarry that provided the original stone. *Barbara J. Saffir*

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Record News

Floods damage Czech and German structures

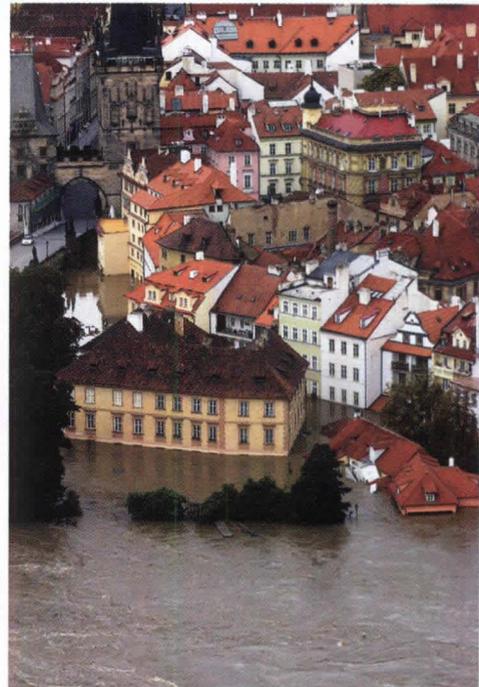
The damage to important works of architecture caused by the floods that ravaged central Europe last August, though devastating, was much less so than it might have been.

Cost estimates for the damage in Prague approach \$350 million, and \$2 to \$3 billion for the Czech Republic as a whole. The greatest architectural loss was at the National Technical Museum in Prague, where architectural archives were destroyed in flooded basement storerooms. The collection included original drawings, models, and papers of architects from Prague's "Functionalist" and "Cubist" movements in the early 20th century, including Jan Kotera, Josef Plecnik, Pavel Janák, Josef Gocár, and Josef Chochol, 90 percent of which are now considered lost.

Prague's historic Old Town was largely saved by an ingenious removable barrier that has permanent 20-foot-deep anchor slots spaced along the Vltava River. The anchor slots receive vertical H-section channels that support gasketed aluminum "stop blocks" that can rise up to 9 feet.

Backflow from old sewer systems inundated many area basements, however. Hard hit were the 13th-century Starnova Synagogue, the oldest in Europe, the 16th-century Pinka Synagogue, the National Theater, and the Rudolfinum concert hall. Areas without the barrier suffered far greater damage, including the historic Malá Strana district, Kampa Island, and the Karlín neighborhood. The Kampa Art Museum, which opened last June in a former mill, was flooded as high as its second floor. Elsewhere in the country, the 13th-century village of Cesky Krumlov, a UNESCO World Cultural Heritage site, was swept twice by floods.

In Germany, the historic center of Dresden



Prague's Malá Strana district, as photographed on August 14, flooded by the Vltava River.

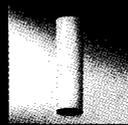
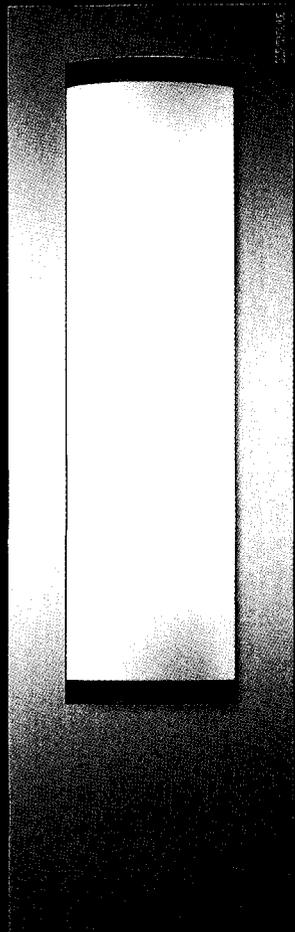
was inundated by overflow from the Elbe River, but damage was largely limited to flooded basements and mechanical systems. At the Opera, built by Gottfried Semper in 1871 and rebuilt after World War II, basements filled with 30 feet of water, destroying mechanical systems, stage machinery, costumes, sets, and musical instruments. Other major buildings affected include the Zwinger Castle and Albertinum museums, the State and Palace theaters, the royal palace, and the cathedral. The damage to these structures alone totals more than \$60 million. The central train station suffered \$42 million in damage, postponing its renovation by Norman Foster.



Dresden's Zwinger Castle, shown on August 16, had a flooded courtyard.

One of the bright points, though, was the survival of Dresden's new Jewish Synagogue [RECORD, June 2002, page 102]. As river water seeped into its basement, firefighters from Nuremberg worked around the clock for three days to pump water out. Down river, similarly heroic efforts to defend flooded dykes saved the original Bauhaus buildings in Dessau and the historic city of Wittenberg, home of Martin Luther. *David Cohn*

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Record News

Rockwell interprets 1960s Baltimore for *Hairspray* set

"Theatrical" is a word often used to describe the restaurant and hotel interiors designed by architect David Rockwell. Having recently designed the sets for his second Broadway show, the new hit *Hairspray*, Rockwell is ironically winning raves for his theater work with descriptions like "architectural."

"I've always considered the term 'theatrical' in its broadest sense," he says. "It doesn't imply two-dimensionality; rather, it creates a narrative that sparks an engaging experience."

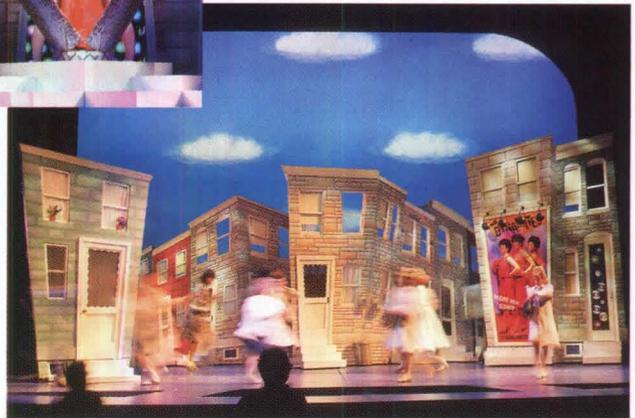
Based on the John Waters film and set in Baltimore circa 1962, *Hairspray* tells the Cinderella-like tale of teenager Tracy Turnblad and her quest to win friends and a slot on the local TV dance show, all the while improving race relations at the dawn of the swinging '60s.

After touring Baltimore with Waters, Rockwell settled on a look he calls "everyday Baroque."

With a skewed, larger-than-life perspective, the sets feature row houses with Formstone cladding, a wall inspired by a craft kit of Lite-Brite pegs, and a latticework of microphone

booms that add a canopy of angles and color above the pastel-striped TV studio.

"Theater is a great laboratory for architecture," Rockwell says. "You get to experiment with materials and space making, all the while putting on a show." *William Weathersby, Jr.*



From Lite-Brite walls (top) to Formstone row houses (above), the sets for *Hairspray* capture the look of dance-party Americana.

Report finds that school buildings are increasingly "sick"

As buildings became more energy efficient in the 1970s and 1980s, they also retained internal airborne contaminants like mold and volatile organic compounds. Cases of so-called "sick-building syndrome" have been on the rise as a result. Although children typically have a lower threshold of tolerance for such pollutants, the Falls Church, Virginia-based Center for Health, Environment and Justice reports that there are no federal health design standards that address school construction. In response, the organization, through its Child Proofing Our Communities campaign, published a report in August entitled "Creating Safe Learning Zones: The ABCs of Healthy Schools" to educate people to detect and resolve school contamination, as well as to prevent it in new construction.

Campaign coordinator Paul Ruther explains that to build healthier schools, the report proposes that "different risk assessments, with much lower levels of exposure" be applied to environmental testing and to design standards. "The ABCs of Healthy Schools" stresses that many common construction materials are toxic. It states, "While the threats from building materials such as lead and asbestos are subsiding, mold, vinyl, and toxic fumes from carpeting present a new generation of hazards." According to the document, other potential dangers include formaldehyde-treated particleboard and arsenic-treated playground structures. Recommended strategies such as installing large operable windows to improve natural ventilation and daylighting, as well as HVAC systems that quickly flush air from laboratory and art spaces and that can be maintained to prevent mold, broaches the "contractual relationship between the owner, architect, and engineer," says the report's consulting architect, Barbra Batshalom, executive director of Cambridge, Massachusetts-based The Green Roundtable. "It really requires extreme discipline and a lot of coordination up front."

Visit www.childproofing.org to read the full report. D.S.



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Record News

French government cancels Expo 2004 after Tschumi develops schematic plans

Citing budget constraints as well as a lack of interest from invited participants, French prime minister Jean-Pierre Raffarin cancelled Expo 2004 on August 8. The \$400 million international exposition was to take place in summer 2004 in Seine-Saint-Denis, just north of Paris.

The cancellation pulls the plug on Bernard Tschumi, who was hired as the exposition's chief architect in September 2001 to create its master plan as well as design guidelines for

individual national pavilions. The theme of Expo 2004 was "Images"—or, more exactly, the impact of visual imagery on culture, the economy, and society in different countries. The exhibition aimed to examine this, as well as the globalization role of media and advertising technology.

Tschumi says he regrets the missed opportunity "to discuss the multiplicity of images, and the fact that no nation can claim to own a certain type of image."



Tschumi's plan for the 60-acre Expo 2004 would have emphasized linearity.

The New York and Paris-based Swiss-French architect, who will step down as dean at Columbia University in spring 2003, had just completed the schematic design for a 60,000-person meeting hall for the exposition when he learned of the show's demise.

Tschumi explains that his design for the 60-acre site would

have emphasized linearity: "What we tried to do was to organize all the pavilions around a sequence of spaces so that, instead of having the pavilions as individual objects, they would literally define a common space—an elongated plaza."

Tschumi's design work for Expo 2004 will be in a book entitled *Virtual: Expo 2004*, to be published by Scala by the end of this year.

Raffarin's decision to abandon Expo 2004 was one of his first upon taking office. With Expo 2004 shuttered, architects and design enthusiasts must wait until 2005 for a show of similar scope, when Aichi, Japan, hosts the World Exposition. D.S.



Individual country pavilions (left) would have graphics on mesh, and an entrance scrim (right) would welcome visitors.



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Record News

After a long wait, construction to begin on Moriyama's Canadian War Museum in Ottawa

After more than two decades of often raucous debate and more than one stillborn design, construction on a new Canadian War Museum in Ottawa will begin in November. On August 7, Sheila Copps, Canada's Minister for Culture, unveiled a final design for the museum by Toronto's Moriyama & Teshima Architects in joint venture with Ottawa's Griffiths Rankin Cook Architects. The \$70 million museum will be built on Lebreton Flats, a vacant meadow between the Ottawa River and the western bluffs of Parliament Hill.

This was the second design unveiling for the museum this year. In May, Moriyama & Teshima had presented three distinct design options. When these met with studied indifference from officials, the

media, veterans, and the public, the museum diplomatically asked for "refinements."

Chief design architect Raymond Moriyama developed this version to read powerfully as a bruised, natural and urban landscape in the process of regeneration. The 52,700-square-foot building emerges from the riverside landscape as an elongated, multilevel ramp topped by a roof covered with grass mounds that are intended to recall World War I battlefields. The major exhibition spaces have a tall, glass-enclosed east facade facing Parliament Hill.

Along the south side of the building, an irregular, canted wall of poured-in-place concrete recalls World War II coastal defenses. A



The Canadian War Museum in Ottawa is designed to emerge from the landscape, recalling World War I battlefields and World War II coastal defenses.

ramping path that cleaves this wall ascends to a trenchlike cut opening out to the landscaped roof and then descending to merge with the riverbank.

A sharp, 80-foot hollow shard, clad in copper and punched with window openings that spell out *regeneration* in Morse code, marks

the museum's axis with Parliament Hill's iconic Peace Tower. It also evokes the stark, blasted landscapes and ruins seen in many of the 14,000 works in the museum's Beaverbrook Collection of War Art.

With funding in place, the museum is expected to open by fall 2005. *Rhys Phillips*



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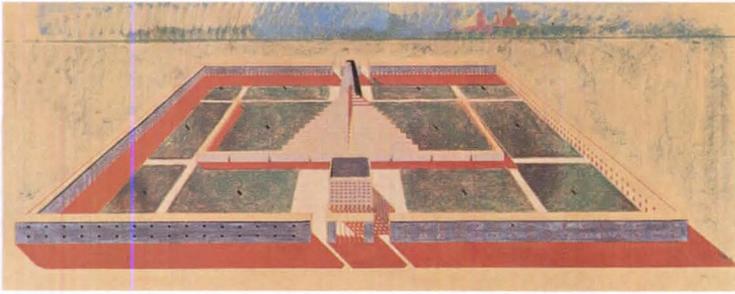


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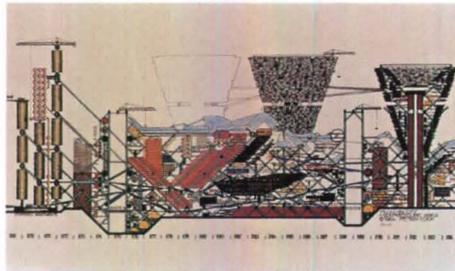


Visionary architectural drawings from the 1960s and 1970s in MoMA exhibition

The Museum of Modern Art (MoMA) will present a selection of 173 architectural drawings, mostly from the 1960s and 1970s—a portion of a gift of 205 drawings from the Howard Gilman Foundation—in the exhibition *The Changing of the Avant-Garde: Visionary Architectural Drawings from the Howard Gilman Collection*. On view at the museum's temporary home in Queens, New York, October 24, 2002, through

January 6, 2003, the show includes drawings by Peter Cook of Archigram, Raimund Abraham, Arata Isozaki, and Rem Koolhaas.

The core of the collection documents a period of architectural history that marks the beginnings of the transition from the late stages of Modernism into what would eventually be described as Postmodernism. Gilman collected these drawings from 1976 to 1980



Aldo Rossi and Gianni Braghieri's *Cemetery of San Cataldo*, 1971 (left); Rem Koolhaas's *The City of the Captive Globe*, 1972 (top); and Peter Cook's *Plug-In City*, 1964 (above).

under the guidance of Pierre Apraxine, who curates the collection for the Gilman Foundation.

While Postmodernism came to mean a revival of traditional architectural styles, as Terence Riley, MoMA's curator of architecture and

design, explains in his introduction to the exhibition's catalog, the group of architects associated with the collection responded to history in subtler ways. Gaetano Pesce's Church of Solitude "appears as a literal excavation of urban archaeology," Riley writes. Other drawings include Koolhaas's axonometric rendering of an idealized New York City, *City of the Captive Globe*, as well as Aldo Rossi's *Cemetery of San Cataldo*, Peter Cook's *Plug-In City: Maximum Pressure Area*, and Massimo Scolari's *Addio Melampo*.

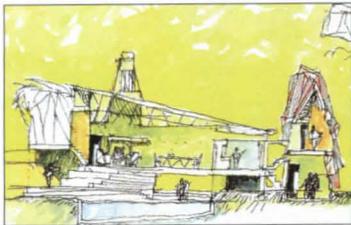
Although the early Postmodernists developed in widely divergent directions, their reactions to the ahistorical Modernist movement defined them for a time. This exhibition presents a snapshot of that moment. *Kevin Lerner*



News Briefs

Sagaponac homes go up

Construction has finally begun on nine of the houses at Sagaponac being built by developer Coco Brown, who selected different architects to design each of the nearly 40 homes [RECORD, April 2001, page 27] that are planned for the Hamptons site on Long Island, New York. The nine projects under way, which should be complete in a year, were designed by Marwan Al-Sayad, of Phoenix; Shigeru Ban, of Tokyo; Henry Cobb, Richard Gluckman, and Gisue and Mojgan Hariri, all of New



Mockbee's design for a home at Sagaponac is being built.

York; Steven Kanner, of Los Angeles; the late Samuel Mockbee, of Canton, Mississippi; Lindy Roy, and Annabelle Selldorf, both of New York. Brown says he is personally interested in the possibility of moving into the home designed by Mockbee (bottom left), who died in 2001. "I've imagined living in that house—it suits my temperament, I guess," Brown says. The first nine homes are being built before they are sold to individual homeowners, which Brown expects to occur by spring. All of the homes will be built, he says, despite the slowed economy.

Survey says security is a higher priority for many architects

According to a survey conducted by the American Institute of Architects (AIA), 55 percent of AIA architects say their clients have made building security a higher pri-



HOK Aviation has designed Delta's Terminal A at Boston's Logan Airport.

ority in the past year. Forty-six percent say at least one client has ordered implementation of security features in existing buildings or in a building design. Forty-eight percent said yes when asked, "As a result of this heightened security awareness, do you think buildings are better protected against terrorist attacks than they were a year ago?" Fifty-seven percent said no when asked, "Have

the September 11 terrorist attacks affected how you approach your work, your clients, your staff?" The survey of 400 AIA members was conducted from August 19 to September 3.

HOK completes design for Terminal A at Boston's Logan Airport

HOK Aviation, the airport design specialists at Hellmuth, Obata + Kassabaum (HOK), has completed the design for Delta Air Lines' Terminal A at Boston's Logan International Airport. Comprising two buildings, it will include 18 gates, with seven gates for regional planes, in primarily two structures: a 362,000-square-foot main terminal and a 284,000-square-foot satellite concourse. HOK expects to obtain LEED certification for the terminal, which will be the first "green" building at the airport, with recycled products specified to the extent possible. The \$395 million terminal is scheduled to open in 2005. HOK has opened an office in downtown Boston for this project.

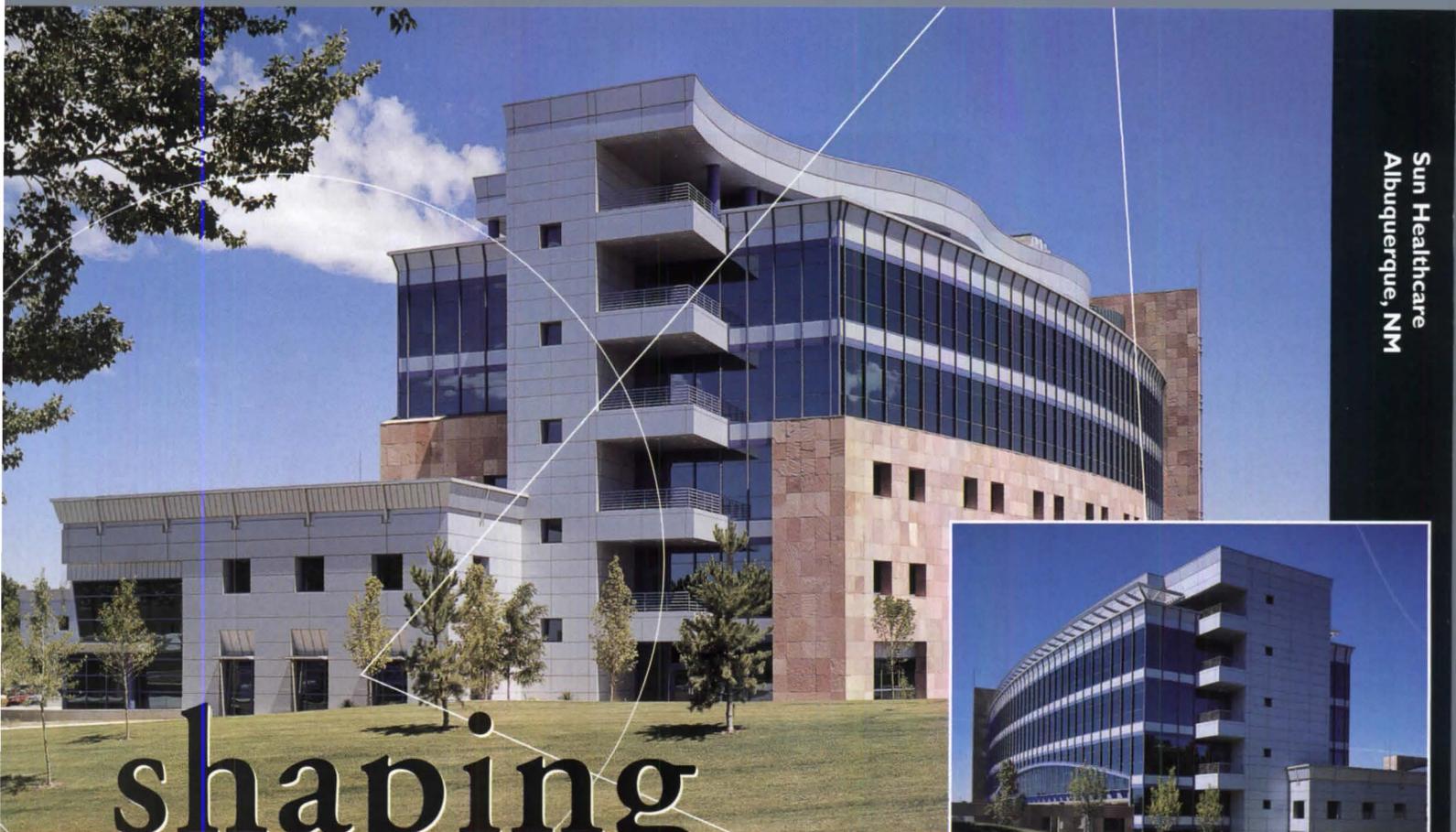
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Dates & Events

New & Upcoming Exhibitions

Herzog & de Meuron: Archaeology of the Mind Montreal, Canada

October 23, 2002–April 6, 2003

"Since architecture itself cannot be exhibited, we are forever compelled to find substitutes for it," said Jacques Herzog regarding this exhibition (which he and Pierre de Meuron curated in collaboration with Philip Ursprung). The substitutes on display are plentiful and plenty strange: an assortment of models, photographs, toys, fossils, rocks—any object that has served as a source of information for the architects. Bridging the archaeological, the psychological, and the architectural, the exhibition describes the architect's obsession with the historical object and its modern evaluation. At the Canadian Centre for Architecture. Call 514/939-7000 or visit www.cca.qc.ca for more information.

New Hotels for Global Nomads New York City

October 29, 2002–March 2, 2003

With a title that sounds like a Koolhaas co-option, the exhibition all about hotels describes them as symbols of contemporary leisure. With a focus on the opulent, Vegas-style hotels with gimmicks, attractions, and new domestic technologies, the show places these heavily designed spaces in historical context. Decadent hotel design actually dates back to 1829, in Boston. For more historical information, call the Cooper-Hewitt National Design Museum at 212/849-8400.

Out of the Ordinary: The Architecture and Design of Robert Venturi, Denise Scott Brown & Associates Pittsburgh

November 8, 2002–February 2, 2003

The first retrospective of the firm's work displays architecture, urban planning, and decorative arts from the earliest commission in the late

1950s to the recent international projects. Most architects know what they've said, or written; less than half of these could name five of their projects. At the Carnegie Museum of Art. Call 412/622-3131 or visit www.cmoa.org for more information.

Ongoing Exhibitions

Consuming Places Brooklyn, New York

August 15–October 27, 2002

Making use of a neglected public space in DUMBO (Down Under the Manhattan Bridge Overpass), this exhibition includes site-specific work that activates its waterfront setting, and it incorporates the site's historic 19th-century structures. Works are by architects and designers Asymptote, Bill Fontana, and 212box. On Water Street between Main and Dock streets. For more information, call 212/206-6674 or visit www.creativetime.org.

Helmut Jacoby: Master of Architectural Drawings Chicago

August 31–October 27, 2002

Quite possibly the best-known architectural renderer of the 20th century, Jacoby has worked for some of the brightest stars in architecture—from his earlier days in America with Philip Johnson, Eero Saarinen, I.M. Pei, Marcel Breuer, and others to his later work with international architects such as Sir Norman Foster and Helmut Jahn. His work serves to document the evolution of architecture from the 1950s through the '70s. At Kisho Kurokawa Gallery, Art Institute of Chicago. Call 312/443-3600.

Trespassing: Houses x Artists Bellevue, Washington

August 31, 2002–January 5, 2003

New York City-based architecture firm OpenOffice invited nine artists to reimagine the possibilities of the house in conceptual terms. Ideas generated were mediated through OpenOffice into architectural proposals that redefine the spatial, psychological, and technical conventions of domesticity. At the Bellevue Art Museum. Call 425/519-075 or visit www.bellevueart.org for more information.



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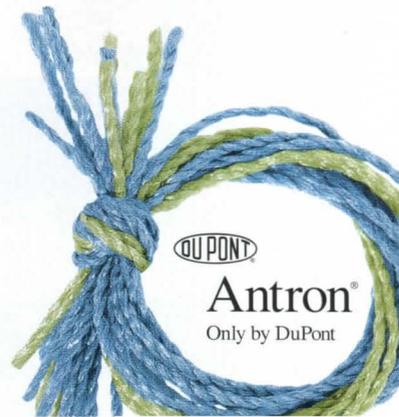


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Dates & Events

SHOPPING

Frankfurt, Germany

September 24–December 8, 2002

This exhibition analyzes the cultural phenomenon of shopping in the art of the 20th and 21st centuries. More than 70 artists are featured, all of whom, in some way or another, have dealt with consumer culture through visual art, architecture, and film. Among the artists on display are Rem Koolhaas, Marcel Duchamp, Jeff Koons, Claes Oldenburg, Gerhard Richter, and Andy Warhol. At the Schirn Kunsthalle Frankfurt. Call 069 29 98 820.

Remapping

New York City

September 14–October 14, 2002

A 10-foot-long digital photo collage of a typical Los Angeles reflective facade fills the space of the Storefront. Warren Neidich, the artist responsible for the work, explores the transformative ways that the brain records overlaps, reflections, and formal mutations in city environments. He even clads the rotating panels on the Storefront's facade with reflective stainless steel for adjustable

reflections from the gallery's site. At the Storefront for Art and Architecture. Call 212/431-5795 for more information.

Arne Jacobsen: A Centenary Exhibition New York City

September 27–November 9, 2002

Long before Scandinavian design became popular in America, Arne Jacobsen was producing the iconic architecture whose style typifies what we now know as "Scandinavian." The exhibition focuses on six of Jacobsen's major works in six different typologies—from institutional to leisure to educational—from the 1950s to the '70s. Also exhibited are pieces from his furniture and industrial designs. At the Scandinavia House. Call 212/879-9779 or visit www.amscan.org for more information.

Challenging Structure: Frank Gehry's Peter B. Lewis Building Cleveland

October 6, 2002–February 24, 2003

This exhibition illustrates the development of Gehry's School of Management building at Case

Western Reserve University, which opened in September 2002. The show is a convenient city-block away from the real building. See the work in all stages from initial conception, and then experience the built reality. At the Cleveland Museum of Art. Contact 216/707-2261 or www.clevelandart.org.

Krier/Eisenman: Two Ideologies New Haven

November 4, 2002–February 7, 2003

The debate between the opposing architectural philosophies of Krier and Eisenman is the subject of this exhibition. Work by Krier, who focuses on considerations of context, site, and function to inform his designs, will be displayed across from Eisenman's, who regards abstract form as the architect's singular consideration. The exhibition is supplemented with a symposium on November 8–9. At the Yale School of Architecture. Contact 203/432-2288 or visit www.architecture.yale.edu.

Lectures, Symposia, & Conferences

American Society of Landscape Architects Annual Meeting & Expo San Jose, California

October 18–22, 2002

This conference for designers includes education sessions that focus on specific landscape issues, such as parks and recreation planning, and general design and construction issues. The program, running for two days, includes talks on golf-course design, public spaces, desert architecture, and office-park architecture, among many others. For more information, call the ASLA in Washington, D.C., at 202/898-2444 or visit www.asla.org.

Outlook 2003 Executive Conference Washington, D.C.

October 22–23, 2002

The construction industry is directly dependent on the current economic situation; this two-day conference discusses the extent of this relationship. With panelists such as Thomas Leppert, chairman and C.E.O. of the Turner Corporation, and Kermit Baker, chief economist for the AIA, discussions will focus on specific economic influences, in addition to the political, social, and environmental trends that affect the construction industry. Robert Murray, V.P. of McGraw-Hill Construction Economic Affairs, will give a one-year industry forecast. For more information, visit www.construction.com/events.

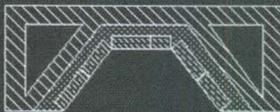
Constructing Beijing 2008

November 13–14, 2002



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Dates & Events

This conference brings together international architects and engineers to discuss the development of Beijing, with emphasis on the 2008 Olympic Games. Construction will take place over the next five years and will include sports complexes, public spaces, landscape, signage, and public transportation; the project is a microcosm of a city embedded within a city. It coincides with a design competition for design students in Hong Kong and Beijing. At the Beijing New Century Hotel. Call 852/2238-9940 for more information, or e-mail kate.newman@hongkong.messefrankfurt.com.

AIA California Council Desert Practice Conference 2002
Indian Wells, California
November 15-17, 2002

This conference attempts to clarify the business of the practice of architecture. The conversation will

cover project delivery, business and practice management, emerging practices, future trends, and expanded services. At Renaissance Esmeralda Resort. Call 916/448-9082 or visit www.aiacc.org/conferences.

35th International Making Cities Livable Conference
Monterey/Carmel, California
December 8-12, 2002

An international conference for architects, urban designers, city planners, landscape architects, transportation planners, social scientists, city managers, and public officials. A call for papers is currently under way. The deadline for submission of 200-word abstracts is October 30. For more information and to view topics for papers, see www.livablecities.org, call 831/626-9080, or e-mail suzanne.lennard@livablecities.org.

Events & Programs

ENR Construction Summit
Washington, D.C.

October 21-22, 2002

Dedicated to "The Owners"—which is also its title—the 6th Annual ENR Construction Summit will involve high-level executives from the owner community—in both the private and public sectors—in a discussion of "the perfect owner." Other discussions will highlight changing owner requirements, and partnerships between a building's owner, designer, and contractor. For more information, visit www.construction.com/events.

Good Design is Good
Business Awards Gala
Washington, D.C.

October 23, 2002

The collaboration of businessmen and architects is celebrated as *Business Week* and ARCHITECTURAL RECORD recognize 18 finalists for designs that incorporate business plans as part of the program. Winning designs in the 160-entry

juried competition exhibit measurable business and organizational goals. In other words, looking good and making money. Visit www.construction.com/events for more information.

Competitions & Awards

International Competition for the Urban Development and Planning of Sustainable Housing in Guanajuato, Mexico

Deadline: October 15, 2002

The Federation of Architects of the Mexican Republic invites architects to submit designs for a sustainable urban housing complex. The program calls for 6 housing prototypes, with emphasis on sustainable public spaces, energy management, and water and waste recycling. For more information and to submit a design, call 52 5 5550 6049.

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Dates & Events

Deadline: October 25, 2002

The FEIDAD (that's Far Eastern International Digital Architectural Design) Award is open to all, despite its exclusive-sounding title. The goal is to find the most progressive exploration of digital space in animation or graphic format. The competition welcomes (not exclusively) architects, artists, product designers, and, to quote the press release, "film designers, and sci-fi novelists." Read the whole *Dune* series for inspiration. For more information, visit www.feidad.org.

26th Annual Cooper Source Awards

Deadline: October 25, 2002

Open to any lighting designers, architects, interior designers, or other professionals who use light in an interior or exterior application. Two categories are available, one for professionals, the other for students,

who will compete for a \$1,500 cash prize. For more information, visit www.cooperlighting.com.

The Rome Prize

Deadline: November 1, 2002

The prestigious Rome Prize, whose historic winners include Louis Kahn, offers hefty stipends for advanced research and independent study in architecture, design, and other humanities-related fields. For more information, contact the American Academy in Rome at 212/751-7200 or visit www.aarome.org.

Mobile HIV/AIDS Health Clinic

Deadline: November 1, 2002

Architecture for Humanity, a nonprofit organization, announces its 2002 international design competition. Architects are invited to submit designs for a fully equipped mobile medical unit and HIV/AIDS treatment center for use specifically in Africa.

Entry fees, donations, and additional fund-raising sources will be used to build the winner's prototype. Visit www.architectureforhumanity.org for information.

International Competition for the Design of "Ephemeral Structures in the City of Athens"

Deadline for dispatch or handing in of entries: November 11, 2002

Deadline for receipt of mailed entries: November 25, 2002

The Hellenic Cultural Heritage SA, supported by the Hellenic Ministry of Culture, is organizing this competition for the 2001-2004 Cultural Olympiad and the Athens 2004 Olympic Games. The program includes event platforms for music, dance, and other events that don't require seating; for open-air theaters; and for semi-open exhibition spaces, among others. For more information, you can call 33 10 976 95 10, visit the competition's Web site at www.culturalolympiad.gr/

ephemeralcompetition, or e-mail ephemeral.competition@eeogroup.gr.

Excellence in Gypsum Board Design & Construction Awards

Deadline: December 31, 2001

Innovations in standard building materials is one of the marks of a good designer. The Gypsum Association—a 72-year-old organization—will hand out \$3,000 in prizes and plaques for residential and nonresidential design categories. Entries are accepted as project teams for three professional categories: builder or general contractor, architect or designer, and dry-wall contractor. Deadline for entries is December 31, 2002—and the first 40 qualified entries get a \$250 bonus! Contact the Gypsum Association at www.gypsm.org.

Please send event dates and other information to ingrid.whitehead@mcgraw-hill.com.



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DEPARTMENTS

Architects can't become architects without an education, and many teach to support their fledgling practices. At the same time, some tire of academic theory and ache to build something. This month, archrecord2 addresses both sides of the academic divide: in Design, a profile of an architect who combines his academic and pragmatic impulses, and in Work, a presentation of students' theoretical designs for the World Trade Center site.

DESIGN

Keith Mitnick: Theory and Practice

In a department of architecture divided between theory and construction, Keith Mitnick must have made an ideal student. Not content to focus on one or the other of academic architecture's two extremes, he feels most comfortable in a sort of middle ground he has carved out for himself, trying to reconcile the two. "In academia," he says, "things tend to be too polarized between reflection on what things mean and the production of the things themselves. I get bored or frustrated when it becomes one or the other."

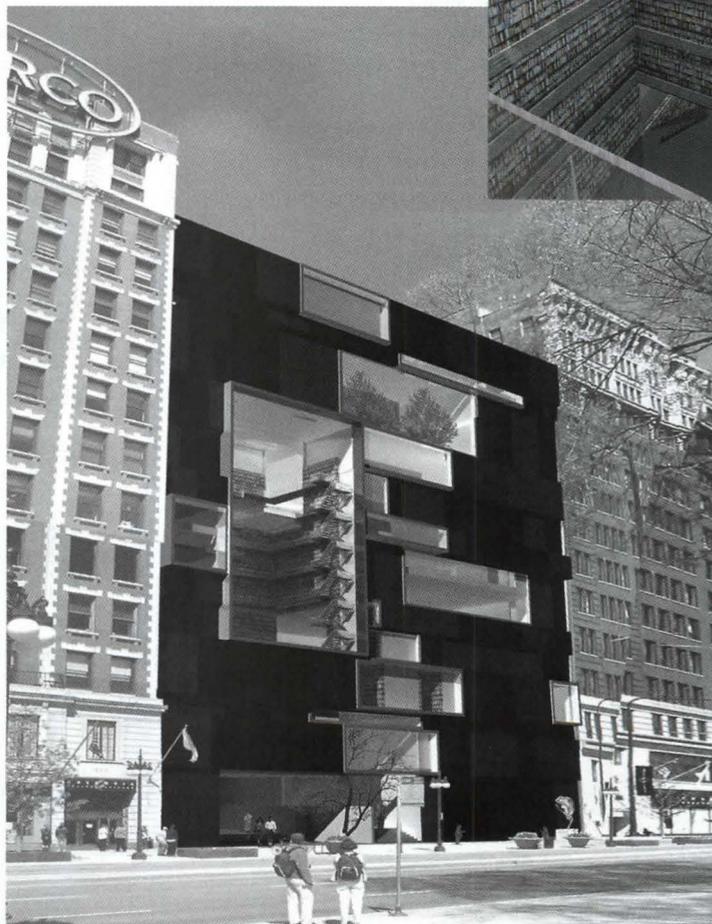
Mitnick began his intellectual life squarely on the theoretical side of things, though not in architecture. He studied art and philosophy as an undergraduate and, at first, set out to become a painter, setting up a studio in SoHo, in New York City. But he quickly became disillusioned.

"I couldn't see the social relevance of painting," he says. "It's such an elitist discourse. I even went so far as to apply and get accepted to the Art Institute of Chicago for painting, and then I bailed at the last minute. It was strange, because I was letting go of something without having something to replace it."

In the early 1990s, Mitnick dabbled in several fields: carpentry, construction, even glassblowing. None of these satisfied all of his intellectual interests. Mitnick characterizes his career path during this time as a pendulum, swinging back and forth from one extreme to another, but swinging in a narrower and narrower arc each time.

Architecture finally occurred to him as a possibility when he was doing exhibition installations for various art galleries. "My job was to arrange the work in space, as a way of embodying the meaning of the work," Mitnick says. "If you asked the curator, she'd say no, he was just the schmuck who hung the stuff up, but it was the first time there was a question about the meaning of what I was doing. It was the first time I was engaged in the process of design."

So Mitnick applied to the University of California, Berkeley for his M.Arch. "In school, the lights really came on," he says. "I didn't feel like I was swinging



**Spertus Institute, Chicago,
Burnham Prize, 2002**

Keith Mitnick. A window facing the street that reveals the building's library atrium creates a three-dimensional sign for the institute.



(continued from previous page) back and forth anymore, doing one thing while worrying about another. No one was saying 'you need to find this intersection between theory and practice,' but I felt like it was available to me. You're taking history courses, you're taking theory courses, you're taking courses in construction, heating, ventilation, cooling systems. And then you're talking about what these things mean, and what your intentions are, and what happens when



2-Way House, San Francisco, 2001–present

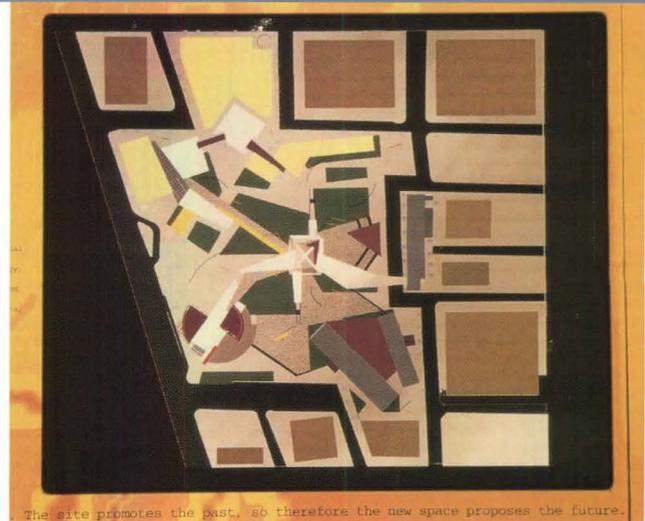
Keith Mitnick. This house mediates between views of the city and its relationship with its neighborhood.

Mitnick to pursue his academic ideas while simultaneously designing real buildings. "It's rare to be able to have a middle-ground opportunity like this," Mitnick says, and it's clear that it's the ideal sort of middle ground he has always been seeking. *Kevin Lerner*

Go to architecturalrecord.com/archrecord2 for more projects by Keith Mitnick, and for complete credits for the above projects.

your intentions are aligned or misaligned with the product. And again, this relationship between the intellectual formulation and the production asserted itself."

Mitnick and his frequent collaborator Mireille Roddier were both working day jobs in the Berkeley area when Mitnick applied for—and won—a teaching fellowship at the University of Michigan. (Roddier, coincidentally, won the same fellowship the following year). The fellowship, which gives the winner a faculty position somewhere between adjunct lecturer and full-time professor, has allowed

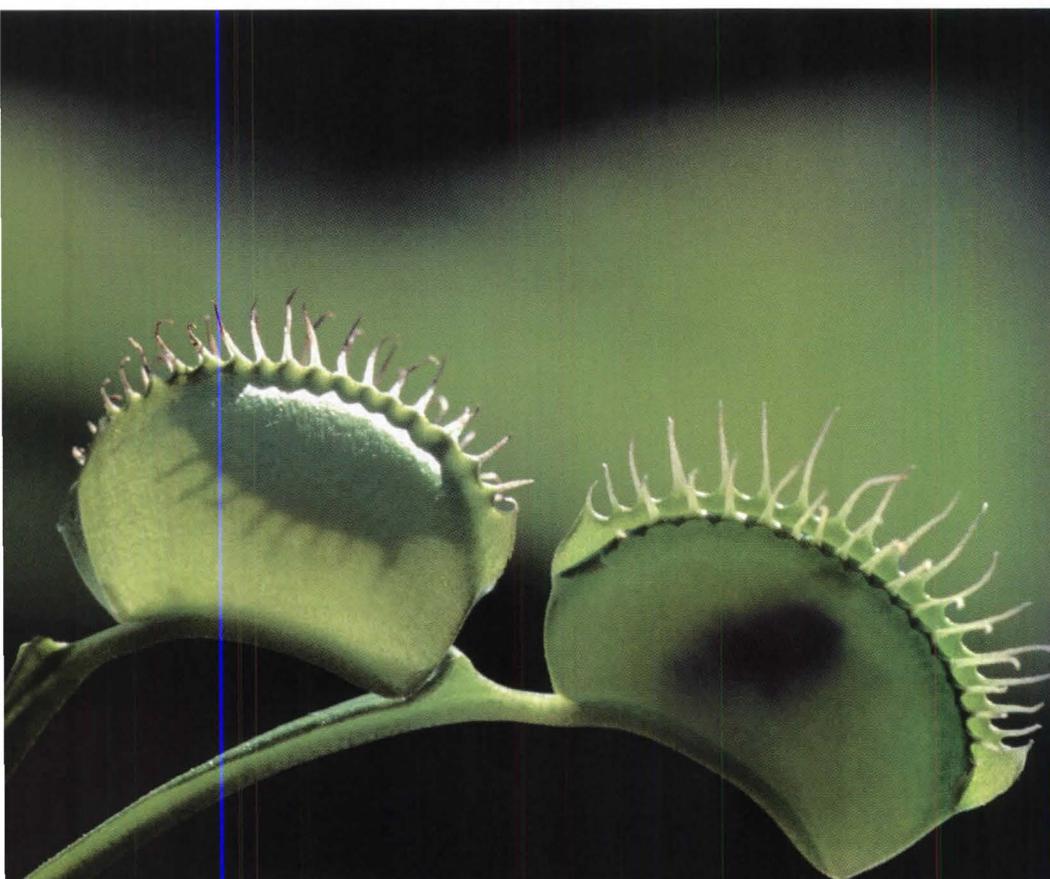


The site promotes the past, so therefore the new space proposes the future.

WORK

Student studios address WTC plans

Shortly after the events of September 2001, RECORD issued a call for the results of student design studios that addressed problems surrounding the rebuilding of the World Trade Center site and environs. Designs began arriving in the magazine's offices almost immediately. Submissions came from universities such as the Pratt Institute and the New York Institute of Technology, both practically at the World Trade Center's former doorstep. But they also came from across the country—from Lawrence Technological University, in Michigan, from California State Polytechnic, in Pomona. Some classes took field trips to New York. Others worked out the problems from a



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The University of Chicago modernizes with \$442 million in construction projects

Correspondent's File

By John E. Czarnecki, Assoc. AIA

DEPARTMENTS

The University of Chicago, with a well-known tradition of academic excellence, ranks as one of the top universities in the country in the sciences, business, and law. Its original neo-Gothic buildings, grouped around quadrangles, form the heart of the campus—a bucolic setting along Chicago's Midway Plaisance, part of the city's boulevard system planned by Frederick Law Olmsted. Over the past 40 years, many of the campus facilities had reached capacity and no longer met current academic needs, even though a number of modern structures, including a Brutalist main library by Walter Netsch, had been added to the campus. A recent University of Chicago planning document described the campus condition: "The newest student housing is 40 years old, the Research Institutes are 50 years old, and athletics and recreation are housed in buildings dating back to 1903." Now in the midst of a building boom, the university is remedying the situation with a \$442 million construction commitment for a variety of projects (funding sources vary per project) from architects including Ricardo Legorreta, Hon. FAIA, Cesar Pelli, FAIA, and Rafael Viñoly, FAIA.

History

The origins of the University of Chicago's campus date to Henry Ives Cobb's 1891 plans for a main quadrangle surrounded by six smaller quads of English Gothic buildings designed to resemble Oxford University. Completed with the help of substantial funding by

John D. Rockefeller, the neo-Gothic campus changed little until a 1955 plan by Eero Saarinen set the framework for modern buildings, new student housing, and campus growth south of the Midway, including Saarinen's law school building. The university took action on its own in an intense period of urban renewal to stabilize the surrounding South Side neighborhood from 1960 to 1985, when 29 buildings were constructed and the institution purchased some of the surrounding homes for use as student residences.

By the 1990s, the university faced capacity in a number of aging buildings, while other universities nationally were beginning major construction projects. "Most universities, certainly the University of Chicago included, had gone a very long time without really advancing the overall physical campus, and it was time for us to do that," says Geoffrey Stone, a University of Chicago law professor who was the school's provost when it undertook a master-planning process in the late 1990s. "If one university was building, then it was risky for another university not to do it. All of these institutions were driven in some way by competition."

In 1999, NBBJ Architects completed the third compre-

hensive master plan in the school's history. Curt Heuring, the university architect, is currently overseeing the plan's implementation. The plan recommends siting and development guidelines for nine new buildings, six of which are complete, as well as landscaping. "One of the subcon-

scious goals was to take advantage of the fact that the campus was not fully developed and to allow those places to be developed in a positive way," Stone says. He notes that appropriate siting "was the paramount goal."

Recognizing that the Midway

Olin Partnership developed a landscape plan to enhance the Midway Plaisance (below). Each new building is numbered in the campus map (bottom).



- | | | |
|--------------------------------------|---------------------------------|--------------------------------|
| 1. Comer Children's Hospital | 4. Parking structure | 8. Graduate School of Business |
| 2. Interdivisional Research Building | 5. Palevsky Residential Commons | 9. University Press Building |
| 3. Ratner Athletics Center | 6. Bartlett Commons | 10. Kovler Gym |
| | 7. Midway Skating Rink | |

Correspondent's File

Plaisance is city property that is actually an integral part of the University of Chicago campus and identity, the university partnered with the Chicago Park District to consider the future of this 1-mile-long green swath that connects Jackson Park and the lakefront to the east with Washington Park to the west. In 1999, the university and city hired Philadelphia-based landscape architecture firm Olin Partnership, in association with Chicago's Wolff Clements and Associates, to develop a master plan (shown on previous page) for the Midway Plaisance itself, originally planned by Olmsted as a part of the 1893 Columbian Exposition. Although only $\frac{1}{8}$ of a mile in width, the Midway divides the campus physically and psychologically. Stone says the plan was developed to "energize the Midway and make it something that people walk through and enjoy rather than

simply go across."

The Midway plan proposes a series of permanent gardens, including a pair of Winter Gardens, a Reading Garden, and a Health and Fitness Garden. Construction and plantings will be complete on two of the gardens by spring 2003. Olin Partnership has also called for traffic-calming devices along the Midway, new lighting, and enhanced landscaping. An urban horticulture center with a variety of demonstration gardens is proposed on the site of a former gas station adjacent to the Midway.

Skating rink on the Midway

Central to the reconsidered Midway Plaisance is a new \$3.9 million public skating rink and warming house designed by Chicago's Nagle Hartray Danker Kagan McKay for the University of Chicago in collaboration with the



Legorreta's dormitory building in orange brick.

Chicago Park District. Completed in 2001 and located on the site of the world's first-ever ferris wheel, which was constructed for the 1893 Columbian Exposition, the warming house has a rooftop terrace providing views of the ice rink, the Midway, and the university.

Nagle Hartray Danker Kagan McKay also designed a \$9.8 million gymnasium and reconfiguration of athletic facilities for the University of Chicago Laboratory School—a K-12 school operated by the university.

As part of its master plan, the

university sited one of its new buildings—a new home for the University of Chicago Press by Booth Hansen Associates—south of the Midway in an effort to enliven that portion of the campus. The \$11 million, four-story office building, with precast-concrete panels cast to match the Indiana Limestone on other campus buildings, opened in January 2001.

Legorreta's bold statement

Perhaps making the boldest statement on campus among the new buildings is a dormitory—the Max Palevsky Residential Commons (above)—by Legorreta. Named after the University of Chicago alum who founded both Scientific Data Systems and Intel Corporation and gave \$20 million for the project, the \$45 million facility for 734 students was completed in time for the spring 2002 semester. While Legorreta, who worked with Chicago's VOA Associates

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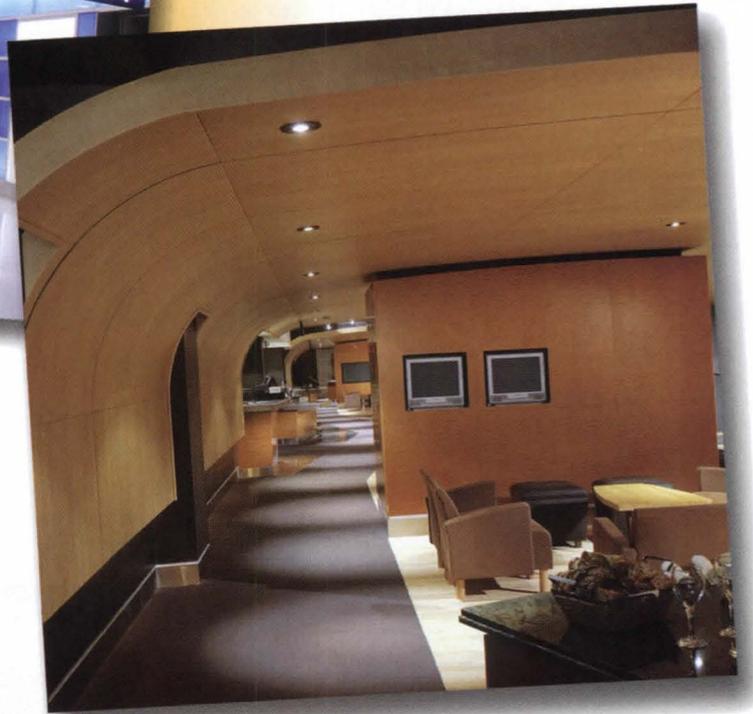
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Correspondent's File

on the dorms, has completed other projects in this country, this is one of his few buildings in the Midwest. True to his roots, he employs a bright palette of colors, including a bright orange brick. Residence hall communal spaces are each denoted with bright colors that students have already dubbed Barney purple, Barbie pink, and Big Bird yellow.

Color issues aside, the three Palevsky buildings, each configured in a traditional, linear plan, nicely form a series of outdoor courtyards by ringing the northern edge of a block occupied by the Regenstein Library. Intended for freshmen, the dorms signal a return to 24-hour student life at the campus center. "There's clearly a lot of controversy over Legorreta's design," Stone says. "From a functional standpoint, though, it's an unqualified success that accomplishes what we wanted."

Adjacent to the Palevsky build-

Bartlett Commons (right) is a dining hall in a former gymnasium. Viñoly's Graduate School of Business (below) will be across from the Robie House.

ings is the 100-year-old Bartlett Hall, a former gymnasium that has been transformed in a \$13.3 million restoration and adaptive reuse by Bruner/Cott & Associates, of Cambridge, Massachusetts, into Bartlett Commons—a dining hall and multiuse facility (top right) that opened this year. A rooftop skylight was restored and the elevated running track now serves as an observation deck and lounge.

A new home for business
Construction is about to begin on what may be the most highly anticipated new building on cam-



pus—the new home for the Graduate School of Business (above), considered by experts to be one of the best business schools in the country, by Rafael Viñoly Architects. To be located across

the street from both the Rockefeller Chapel and Frank Lloyd Wright's Robie House, the business school will be situated in an architecturally significant environment. Low, linear volumes will echo the linearity of

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Wright's Robie House, and an 83-foot-tall, glass-enclosed winter garden at the center of the building will be supported by columns that evoke the curved geometry of Gothic vaults. The 900 business students in the school currently take courses in older neo-Gothic buildings without ample room for study and debate—the hallmark of the university—outside of class. The \$90 million business school will be completed in September 2004. "The building will meet our objec-

tives to foster collaboration among students and faculty," says Ted Snyder, dean of the Graduate School of Business.

Upcoming in Chicago

The university also anticipates completion of the \$40 million Gerald Ratner Athletics Center (below center) by Pelli in late 2003. The athletics building, with an Olympic-size pool, gymnasiums, and fitness facility, will be across the street from another Pelli building, a \$20 million

parking structure with ground-floor retail completed in 2001. Together, the parking structure and the athletics building, implementing a similar vocabulary of materials and structure, will form a new northern gateway to the campus on Ellis Avenue at 55th Street.

The most expensive single building project will be a \$139 million Interdivisional Research Building (below right) by Ellenzweig Associates, of Cambridge, Massachusetts, to open in 2005. The 425,000-square-foot building, clad in limestone, metal, and glass, will combine laboratory spaces for chemistry, structural molecular

biology, and biochemistry.

Also under construction is a \$68 million hospital—Comer Children's Hospital (below left)—by HLM Design with Atlanta's Stanley Beaman & Sears. To open in 2004, the 155-bed hospital will connect with the rest of the University of Chicago Hospitals campus.

Stone succinctly explained why it is necessary for the university to build this variety of new structures at this time: "If you want to recruit first-rate scientists, you need first-rate laboratories, and if you want the best undergraduates, you have to provide them with something better than a 100-year-old swimming pool." ■

The 155-bed Comer Children's Hospital (left) by HLM Design with Stanley Beaman & Sears will open in 2004. The Gerald Ratner Athletics Center (middle) by Cesar Pelli opens in 2003. The Interdivisional Research Building by Ellenzweig Associates (right) opens in 2005.



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Users look for the name tags before buying architecture—or blue jeans—today

Critique

By Robert Campbell, FAIA

DEPARTMENTS

Princeton is building a new dormitory in the Gothic Revival style. It is being designed by Demetri Porphyrios, the brilliant traditionalist writer and designer in Britain.

Why Gothic Revival—or Collegiate Gothic, if you prefer that term—in the 21st century? It's a question worth pondering, and it probably isn't one we should leap to conclusions about.

Princeton undergrads, I'm informed, look with disdain at contemporary buildings. They all want to live in the old Gothic dorms, even when the accommodations are less practical. There's even talk of possibly demolishing some of the newer, more Modernist dorms.

For better or worse, it seems to me, we are talking here about brand image—about brandscape architecture. The students want the right architectural logo, the one that says "Ivy League" as clearly as low-rise jeans in high school say "hip." These are the kids who grew up wearing shirts that said Gap or Abercrombie & Fitch, who explain their identities to one another by listing their favorite music groups. Who you are is what you consume. And what you consume, in today's world, is brands.

It's the trustees, though, not the students, who decided what the new dorm should look like. So I checked with Lizz Plater-Zyberk, who, besides being dean of the architecture school at the University of Miami and a founder of the New

Urbanism movement, is a longtime trustee of Princeton, where she chairs the grounds and buildings committee.

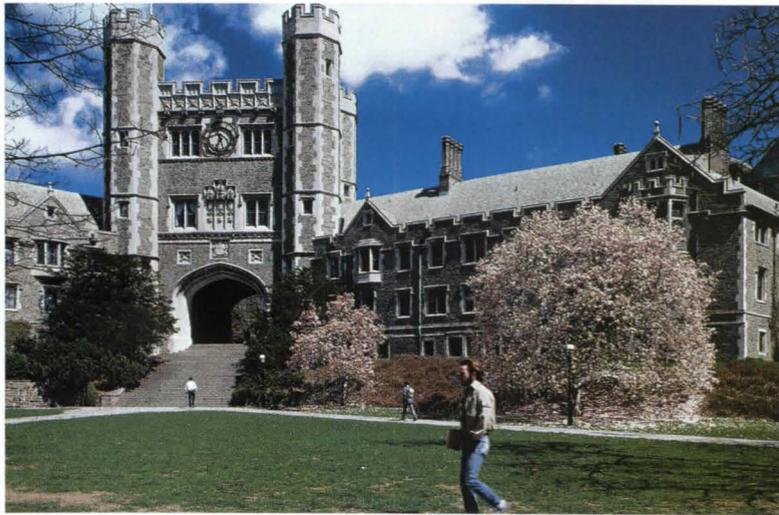
"Some of the alumni, and indeed students, have been talking about the fact that we should be able to build in Gothic again," she says. "We had a study done of the campus, which divided it into four quadrants. In the old northwest quadrant, we decided that whatever is done will retain and reinforce its historic character. Two of the other quadrants are middle ground, where architects like Michael Dennis and Rodolfo Machado are doing buildings that look to traditional form but with a new interpretation. The fourth quadrant is the area of growth where the newest things happen."

The real issue here is one that architects have been shy about mentioning ever since the dawn of the modern era. It's the issue of architectural style. All buildings have style, whether intended or not, and the language of styles speaks quite clearly to people. "That is true," says Lizz. "My bias is that style plays its strongest card when it's place-based, when it reinforces itself as a sense of place. And that's usually done by reiteration rather than great variety."

Gothic architecture, it should be noted, has been a Princeton brand for only about 100 of the university's 250 years. It was only around 1900 that Princeton adopted Gothic. Paul Venable Turner, in his book *Campus: An American Planning Tradition*,

describes the change in a chapter called "The Remaking of Princeton." Princeton hired, as master planner, architect Ralph Adams Cram, who announced that Gothic evoked "racial memories" because it was so English. Princeton's president, Woodrow Wilson, wrote: "By the simple device of building our new buildings in the Tudor Gothic Style we

"I was a Brooklyn-born-and-bred kid who, by a fluke, ended up in the Princeton class of 1964. The Gothic buildings were part of Princeton's class-and-caste system when I was there. The wealthy students lived in the Gothic dorms. The scholarship students were all segregated in the non-Gothic dorms. The symbolism was clear. Everyone



Although 250 years old, Princeton went Gothic only about 100 years ago.

seem to have added to Princeton the age of Oxford and Cambridge; we have added a thousand years to the history of Princeton." Well, they didn't really add a millennium. What they did was stamp a brand on the place. That the brand was white Anglo-Saxon (and High-Church Anglican) didn't seem to bother anyone then, and doesn't seem to do so now.

Style speaks of many things. One of them is social class. After I wrote about Princeton's tilt to Gothic in my local paper, I received a letter from a lawyer friend. I quote:

knew where he stood at Princeton by the dorm he lived in.

"The Gothic dorms were the most expensive. The non-Gothic dorms were cheaper. A scholarship student's budget had to be based upon the cheapest accommodations, which is why all the scholarship students ended up in the same few dorms, all non-Gothic.

"Architecture played an important role at Princeton in telling everyone who was where in the pecking order."

Architecture has always been

Contributing editor Robert Campbell, FAIA, is the architecture critic of The Boston Globe.

Critique

good at telling people where they stand in the social order.

There are many instances of this kind of historic brandscaping in American history. The famously lovely white village of Litchfield, Connecticut, owes its apparently historic appearance in large part to a radical reconstruction during the Colonial Revival fad of the 1920s, when many of its Victorian houses were retrofitted to look more like the 18th century. The Colonial Revival was, in large part, a move to assert the hegemony of old-family Anglophiles against the waves of immigration from southern and eastern Europe in the early 20th century. Even more inventive was the decision of Santa Fe, New Mexico, early in the 20th century, that all buildings must be built of adobe, leading eventually to the insanity of a multistory pseudo-adobe parking garage. Like the

houses of Litchfield, the Governor's Palace in Santa Fe was retro-designed to look like what somebody imagined it might have been a couple of centuries earlier. Santa Fe is an early example of a theme park. We Americans, who all came here from somewhere else, are forever seeking historic roots. We do that all the more desperately if we have to invent them.

B-School Georgian

Or take a more recent example. You'd expect a business school to be heavily into branding, and you'd be right. When the Harvard Business School built its recent student center, Spangler Hall, it was taken for granted that it must resemble the redbrick Georgian Revival architecture of that school's first buildings, which in turn were an imitation of the genuine Georgian 18th-century architecture of parts of Harvard Yard.

"We said, well, if it has to be Georgian, let's find someone who can do Georgian well," former Harvard president Neal Rudenstine once told me. Brandmeister Robert A.M. Stern handled the job—especially on the building's exterior—with genuine invention and skill.

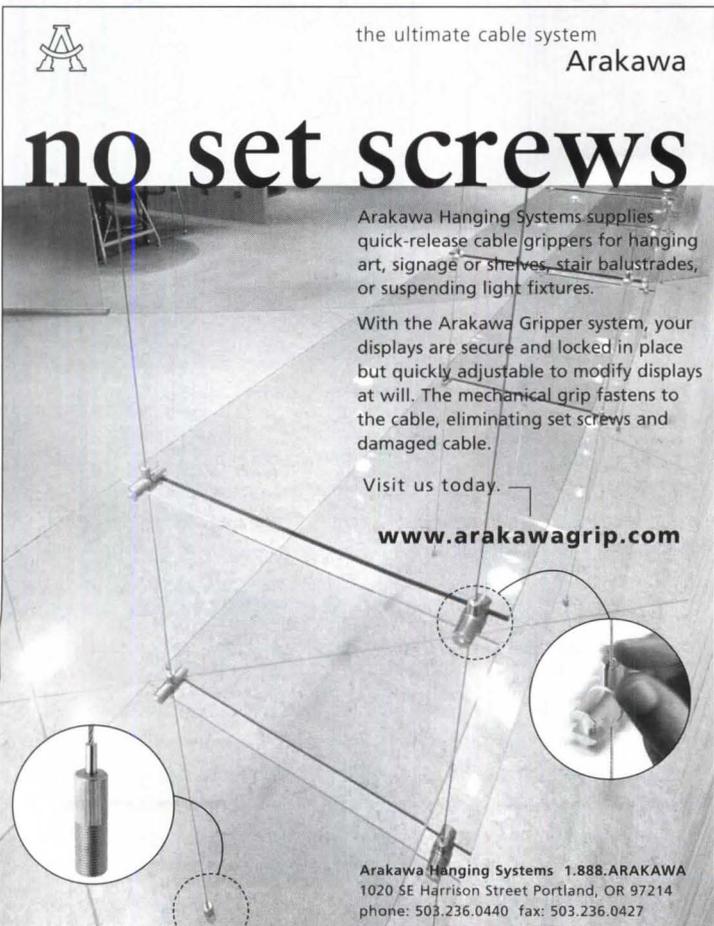
So is Princeton about to become a Gothic theme park? We'll have to see. It's fun to think of the Princeton kids in their jeans and casual shirts wandering around in Gothic halls. Surely, in such a setting, they will always look like summer tourists.

Brandscaping is neither good nor bad, but rather it is inevitable. People have always imitated the styles of other cultures in order to make statements. Just as Princeton imitated Oxbridge, the Renaissance architects imitated Rome and the English Palladians imitated the Renaissance (as does our Palladian White House). A lot of that had to do with establishing class status. Maybe that's why Texas nouveau-millionaire developers hired

Easterner Philip Johnson, in his elegant wasp-waisted suits. Johnson was a symbol of aristocracy, a brand unto himself.

Even the Socialist Modern architecture of the 1920s was, in its own way, a political kind of brandscaping, all the more class-conscious because it was so anticlassist. Brandscaping architecture can be good or bad. It can become more statement than architecture. If it's revivalist, it can be a thin stage-set version of a revered style, creating buildings that look as if they're constructed out of papier-mâché (although of course we've seen architects who enjoy that very joke). Or it can take a tradition and adapt it to changing circumstances, and do that with verve and imagination and craft while maintaining a sense of historic continuity.

My problem with Princeton isn't the brandscaping, for all the elitism it implies. My problem is a different one. I'm just afraid the university won't get Cram's quality along with his snobbery. ■



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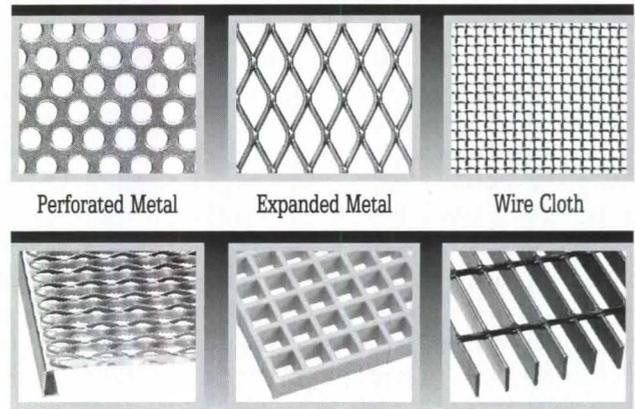
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Books

By Andrea Oppenheimer Dean

DEPARTMENTS

UN Studio: *Unfold*, edited and with texts by Ben van Berkel and Caroline Bos. Rotterdam: Nai Publishers, 2002, 150 pages, \$40.

Asymptote: *Flux*, by Lise Anne Couture and Hani Rashid. New York: Phaidon, 2002, 240 pages, \$60.

Blur: *The Making of Nothing*, by Elizabeth Diller and Ricardo Scofidio. New York: Harry N. Abrams, 2002, 384 pages, \$35.

Taken together, these books sketch out an architectural vanguard. Three husband-and-wife teams—Ben van Berkel and Caroline Bos of UN Studio, Hani Rashid and Lise Anne Couture of Asymptote, and Elizabeth Diller and Ricardo Scofidio of Diller + Scofidio—all engage the new realm of digital media. They are enthralled by flickering images, the ability of computers to shape sensuous forms, and philosophical questions posed by information technologies. These architects see a future of digital media merging with conventional architecture.

Predisposed by a fast-moving advertising-and-information age, their restless minds surf from one type of challenge to another. Their firms are interdisciplinary and collaborative. Their work, influenced by advertising's slick techniques, pushes architecture's boundaries into installation art, mixed-media environments, and beyond. They claim to have left Modernist, linear thinking behind. Too slow, too one-track, too boring. Their book titles are telling: *Flux*, *Unfold*, *Blur*. They position themselves between art and the pragmatics of economics

and commerce.

Publishing form follows 'tude: All three books share a nonlinear, magazinelike format, interweaving interviews, articles, photographs, and drawings. At a time when architecture magazines are folding and repositioning themselves, books like these might be seen as filling a gap.

UN Studio: Unfold is, perhaps, the most ambitious and most visually stunning of the three volumes. Van Berkel and Bos describe their firm as "built along the idea of a United Network," hence the UN in the name of their Dutch practice. *Unfold* presents their newest projects together with a number of older, unpublished ones, including the restructuring of the transit station area in Arnhem, and the Nuclear Magnetic Resonance Laboratory in Utrecht, in the Netherlands, a generating station in Innsbruck, Austria, and the competition-winning design for the Ponte Parodi in Genoa, Italy.

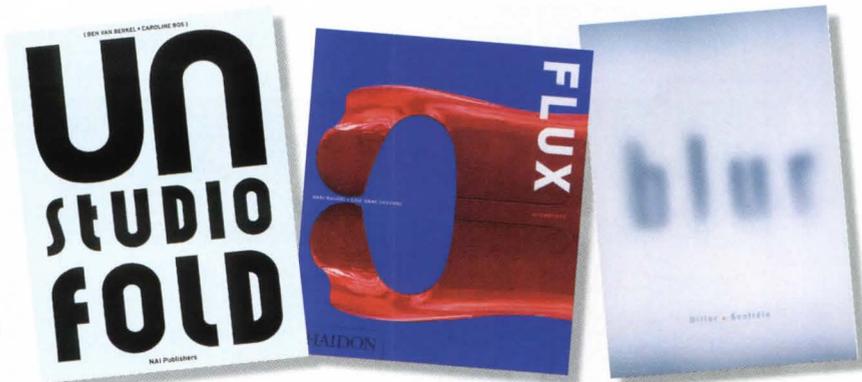
In an introductory essay, Aaron Betsky describes van Berkel and Bos's architecture as one of instability and continuously flowing shapes, their buildings as "unfolding from their constituent parts, from their infrastructure, from data, and from details." He says the partners see their work as occupying a place "between airports and art," between invisible infrastructure and stated form, between commercial concerns and the "authority of form."

Van Berkel and Bos, in turn, write that they want their architecture "to break with the narrow, self-rationalizing discourse of archi-

ture." But in the book's interview, especially, their 21st-century discourse falls back on obfuscating, 20th-century theoretical jargon. It's not their English that's at fault, as evidenced by Bos's graceful tales about building users, commissioners, and passersby. As with most jargon, theirs shrouds imprecise thinking. Another incongruity: Rather than appearing to flow, two of the book's three completed new build-

Perbellini ask Rashid what is most gratifying about the architectural profession. Rashid replies that "it is in a state of complete disrepair and open for total reconfiguration." Asked his take on form and function, he says, "Form augments function and function mutates form."

Flux's format is as fluid as the firm's experimental work. Projects—many of them virtual, executed in a variety of media, and accompanied



ings, the NMR Laboratory in Utrecht and the electricity station in Innsbruck, look lumpy.

Asymptote, the mathematical term Rashid and Couture chose as the name for their firm at its launching in 1987, describes two lines moving toward but never reaching a vanishing point. Rashid and Couture contend that an asymptote, always on the move, dynamic, and changing, describes their view of architecture. It also characterizes their practice, which, they say, operates "in a territory between theory and practice," where neither contaminates the other. (See article, page 108.)

In an interview in *Flux*, Christian Pongratz and Maria-Rita

by explanatory texts—follow upon one another as in a filmstrip that has no defined beginning or end but can be stopped and explored at any point. Four-color photographs are interspersed with collages of photographs and computer-generated diagrams. The volume includes furniture, interiors, whole buildings, urban design, installation art, and interactive digital environments, including a trading floor for the New York Stock Exchange, a multimedia research park in Kyoto, and a virtual branch for the Guggenheim Museum.

One not inconsiderable problem posed by virtual designs, such as those in *Flux*, is that it's hard to distinguish between virtual architec-

Books

ture and virtually (but not completely) finished architecture. It's all two-dimensional. That leads to a thornier question: If, as Rashid and Couture believe, actual buildings will increasingly take on characteristics of virtual architecture, how do we prevent the built environment from becoming as insubstantial and visually noisy as virtual design?

Blur: The Making of Nothing attempts to capture Diller + Scofidio's experience of creating their media pavilion for Swiss Expo 2002. The project consists of a cloud over Lake Neuchatel in Yverdon-les-Bains formed by 30,000 fog nozzles mounted on an immense structure of steel cables. *Blur* also walks the reader through Diller + Scofidio's foggy, eerily vacant maze: Visitors navigate the mist cloaked in "braincoats," technologically advanced rainwear programmed with visitors' likes and

dislikes as revealed by a questionnaire administered before they enter the cloud. The braincoat glows red when a congenial person approaches and pings when a perfect match comes near. "The project challenges our dependence on vision as the dominant sense," Diller writes in a presentation to the client.

The architects' intention in creating the *Blur* pavilion, Diller says, was "to weave together architecture and electronic technologies, yet exchange the properties of each for the other. Thus, architecture would dematerialize and electronic media, normally ephemeral, would become palpable in space."

Blur will be the enduring expression of Diller + Scofidio's Expo 2002 project after it is dismantled. It documents the pavilion from conception through completion. Made up of correspondence, discussions, construction drawings, and

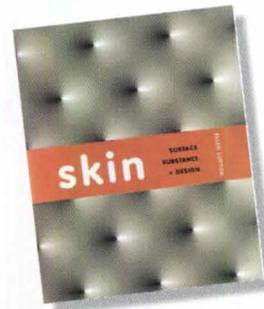
photographs, the book is part scrapbook, part anthology of stories and images. It is the least glossy and most precise of the three books. Rather than just talking about merging digital media and architecture, Diller + Scofidio has done so and created a thought-provoking, transcendent apparition that rises to the level of art.

Skin: Surface Substance + Design, by Ellen Lupton.

New York: Princeton Architectural Press, 2002, 240 pages, \$35.

Do judge this book by its cover: a dimpled, skinlike, and photographically precise pattern that looks both flat and three-dimensional, real and fake, spooky and slick. And it's padded. With the rise of digital media, Ellen Lupton writes, "the primacy of the skeleton has given way

to the primacy of skin," whose surfaces can be folded, warped, or pumped with air to become load-bearing. Like the exhibition at the Cooper-Hewitt National Design Museum on which it's based, this



book looks at products, furniture, interiors, architecture, and media and describes what Lupton calls "a new organicism" that mirrors "the convergence of natural and artificial life. It is a phenomenon of surfaces that resemble living creatures while

remaining distinctly artificial. It is a phenomenon that extends the concept of surface." While living skin has become a commercially manufactured product, industrial skins have assumed a life of their own. "It is a life whose pedigree, however, is more alien than human." Lupton regards skin as a cultural metaphor, which is what makes this beautifully produced book, with its often-disturbing images, so provocative. ■

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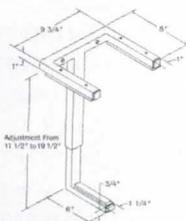
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Can a new director leave his own stamp at the CCA? Nicholas Olsberg gives it a try

Exhibitions

By Clifford A. Pearson

DEPARTMENTS

Sometimes it takes an insider to shake things up at a powerful institution. Familiar with the local terrain and missteps taken in the past, the inside guy—rather than the fresh new face—can maneuver through organizational minefields and head in a new direction without alienating the staffers whose support he'll need. That's what seems to be happening at the Canadian Centre for Architecture (CCA), as Nicholas Olsberg, a 13-year veteran of the Montreal museum and study center, takes control of the reins.

Olsberg came to the CCA from the Getty Center in 1989 as head of collections and became chief curator in 1991. In June 2001, Phyllis Lambert, the CCA's founding director and now its chairman of the board, named Olsberg interim director when Kurt W. Forster resigned. Four months later, she gave Olsberg full responsibilities as director.

Forster, who had been the founding director of the Getty Center for the History of Art and the Humanities from 1989 to 1998 and came to the CCA early in 1999 with an international reputation, was the guy who was supposed to lead the CCA into the post-Lambert era. He was the power player who was going to blaze a new path. It didn't happen. Serving as director for just two-and-a-half years, Forster was unable to shape an identity or direction for the CCA that was much different from what Lambert, the so-called "Joan of Architecture," had already established. Perhaps no one could have.

But in less than a year with Olsberg as director, the CCA has a

fresh feel to it, a new sense of energy. This summer's exhibition, entitled *Laboratories*, gave some indication of what's going on up there in Montreal. Instead of examining the work of a famous dead European architect (think Mies or Aalto or Scarpa), *Laboratories* showcased the ideas of six young Montreal firms. And instead of being the result of years of scholarly research, it was a quick, almost visceral response to the sense of uncertainty left by the terrorist attacks of September 11, 2001.

Quick on his feet

In organizing *Laboratories*, Olsberg showed a degree of improvisation unusual for any museum, let alone one known for its research as much as its public offerings. Two months after the terrorist attacks, he scrambled the CCA's exhibition schedule and issued a call for proposals for installations that would turn the CCA's galleries into "a public square: a place for reflection, response, and the exchange of ideas." His challenge to architects was to "rethink the fundamentals of their discipline" and express new approaches in a time when "even the simplest role of a building is no longer so clear."

Envisioned as a year-long initiative—not just an exhibition—*Laboratories* brought together a jury to review the 103 submissions, then involved two outside curators, Mark Wigley from Columbia University and Frédéric Migayrou from the Pompidou Centre, and a panel of critics and artists to stir the pot of creative dialogue. During the run of the show,

from April 18 to September 15, the CCA invited the public to register its opinions on paper, video, and electronic message boards. A symposium last month wrapped up the public effort, to be followed by a publication.

Although begun as a response to September 11, the six installations in *Laboratories* ended up dealing with the terrorist attacks only obliquely. No twisted or deconstructed forms, no twin towers, no evocations of violence or loss. Instead, the architects designed room-size constructions that visitors walk through, in, on, or around. Wall text at the start of the exhibition explains that the installations demonstrate "a return to basics, to

a kind of Ground Zero condition" and "scrutinize the elemental function of walls, floors, surfaces, light, and sound."

Testing strategies

The six firms—Atelier Big City, Atelier BRAQ, Atelier in situ, Bosses Design, BUILD, and Pierre Thibault, Architect—test various spatial and material strategies, hence the term "laboratories." The installations invite visitors to walk between closely placed walls, sneak inside a trailer outfitted with a wavy floor covered in Astroturf, and push metal studs that are suspended on wire rather than anchored to floor or ceiling.

Thibault's piece, entitled



Pierre Thibault's piece in *Laboratories* displays notes left by visitors.

Exhibitions

Writing Memory, makes the most direct connection with September 11, posting pages of paper with notes and graffiti left by visitors on topics such as shelter and design. The pieces of paper recall the “Missing” notices posted in New York by people searching for loved ones lost at the World Trade Center and carry emotions stirred up by the horrifying attacks. When the exhibition opened in April, reactions were quite raw, reports Olsberg. One person, for example, posted the message “There is no shelter.” By August, the latest layer of writings was more philosophical. “Shelter is a better verb than it is a noun” read one note.

In-house provocateur

That the CCA could stir things up is a remarkable turn of events. “In the past, people used terms like ‘quality,’ ‘perfection,’ and ‘sets the standard’ to describe this place,” says Olsberg. “But never ‘provocation’ or anything like that.” Now Olsberg wants the CCA to generate ideas, not just preserve, examine, and exhibit them.

When Lambert founded the CCA in 1979, it was essentially a research center for scholars and didn’t really open its doors wide until its Peter Rose–designed building debuted in 1989. Lambert purposefully eschewed the word “museum.” Over time, though, exhibitions have

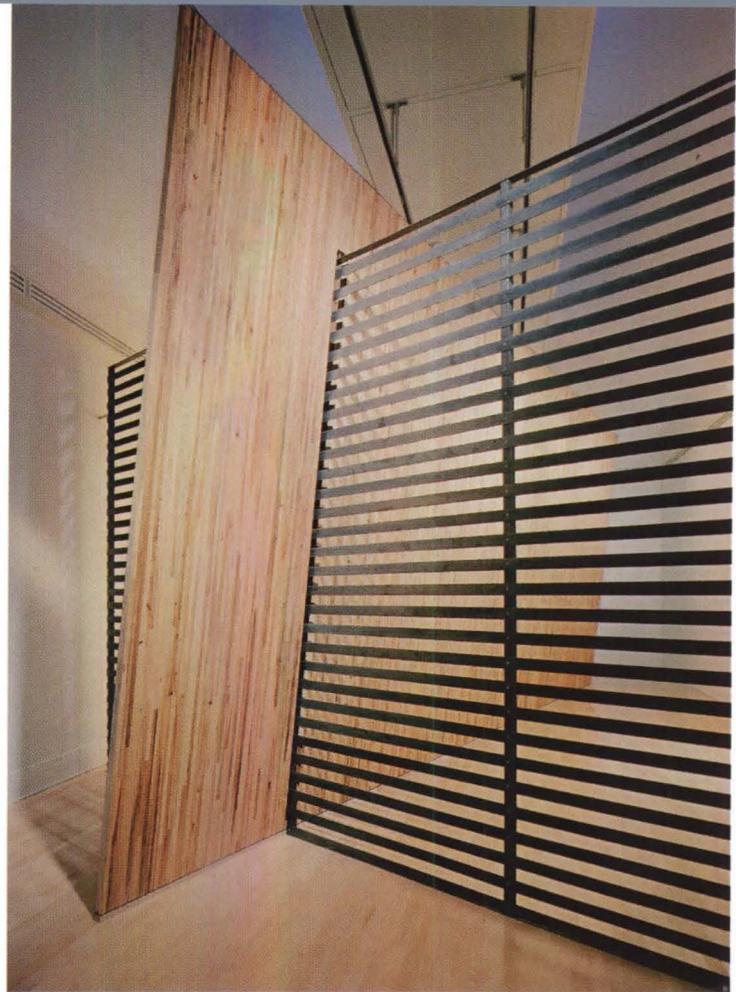
assumed a greater role in the life of the institution. Olsberg plans to emphasize the public aspects of the CCA and expand its reach to more people. He speaks of a catchment area of 100 million people stretching from Washington, D.C., and New York to Chicago and up through Ontario and Quebec. Visits to the CCA peaked at about 70,000 a year in 1999 when a popular series of exhibitions entitled *The American Century* came to an end. (The series included exhibitions on Frank Lloyd Wright, Frederick Law Olmsted, Disney’s theme parks, and the American lawn.)

Olsberg cautions about using visitation figures as benchmarks, however. “I’d rather have greater engagement by people. I want them not just to come to exhibitions but to bring their kids to educational programs, attend lectures and symposia, buy a book at the bookstore.” He also refuses to treat exhibitions as stand-alone events. Instead, he sees them as part of a continuum that includes conferences, public discussions, and publications. “I don’t think an exhibition can carry an idea all by itself.”

Dynamic balance

Olsberg hopes to keep the twin functions of research and exhibition in a kind of dynamic balance, complementing but also competing with each other. For example, he has scholars sifting through the CCA’s extensive archives on the design discourse of the 1970s and hopes this will result in an exhibition in 2007.

A less sweeping but more immediate program is something Olsberg calls “object lessons,” which would focus on particular works or collections in the CCA holdings. For example,



Atelier BRAQ’s piece, *Typical Wall*, explores a key element of architecture.

the museum is organizing a small exhibition on Peter Eisenman’s House IV, which will start at Yale in November and then travel to various architecture schools and university museums. The idea is to have each school assign the exhibition as a studio project and have students curate and design it. So the exhibition would morph and evolve from one location to another with only the original kit of parts staying the same. Olsberg hopes to do the same kind of exercise with works by Cedric Price, James Stirling, Aldo Rossi, and others in the CCA collections and to perhaps kick off the series with an exhibition at the CCA in the second half of 2003.

Olsberg is also working on a series of large exhibitions that will examine particular cities at particular times: Montreal in the 1960s, Los Angeles in the golden age of the cinema (1920–60), and Algiers during its time as a French possession (1830–1962). He plans to start with the Montreal show in 2004, then do

Los Angeles in the first half, and Algiers in the second half, of 2005.

Looking at distant corners

While the CCA has always been an international institution with international reach, it has paid scant attention to Asia, South America, and the third world in general. Olsberg wants to change that. “I’d love to see us have more impact in places like China, Indonesia, India, and Eastern Europe.” Whether it is symposia, lectures, collaborative research, or exhibitions, he is beginning to explore possibilities in new parts of the globe for the CCA.

Although Lambert is still the dominating presence at the CCA, she and Olsberg are trying to reach beyond her sphere of influence. “We’re looking for more outside support,” states Olsberg. “We need more people to see the CCA as not just Phyllis but as *them*.”

In the meanwhile, more people may see the CCA as not just Phyllis, but Nicholas, too. ■

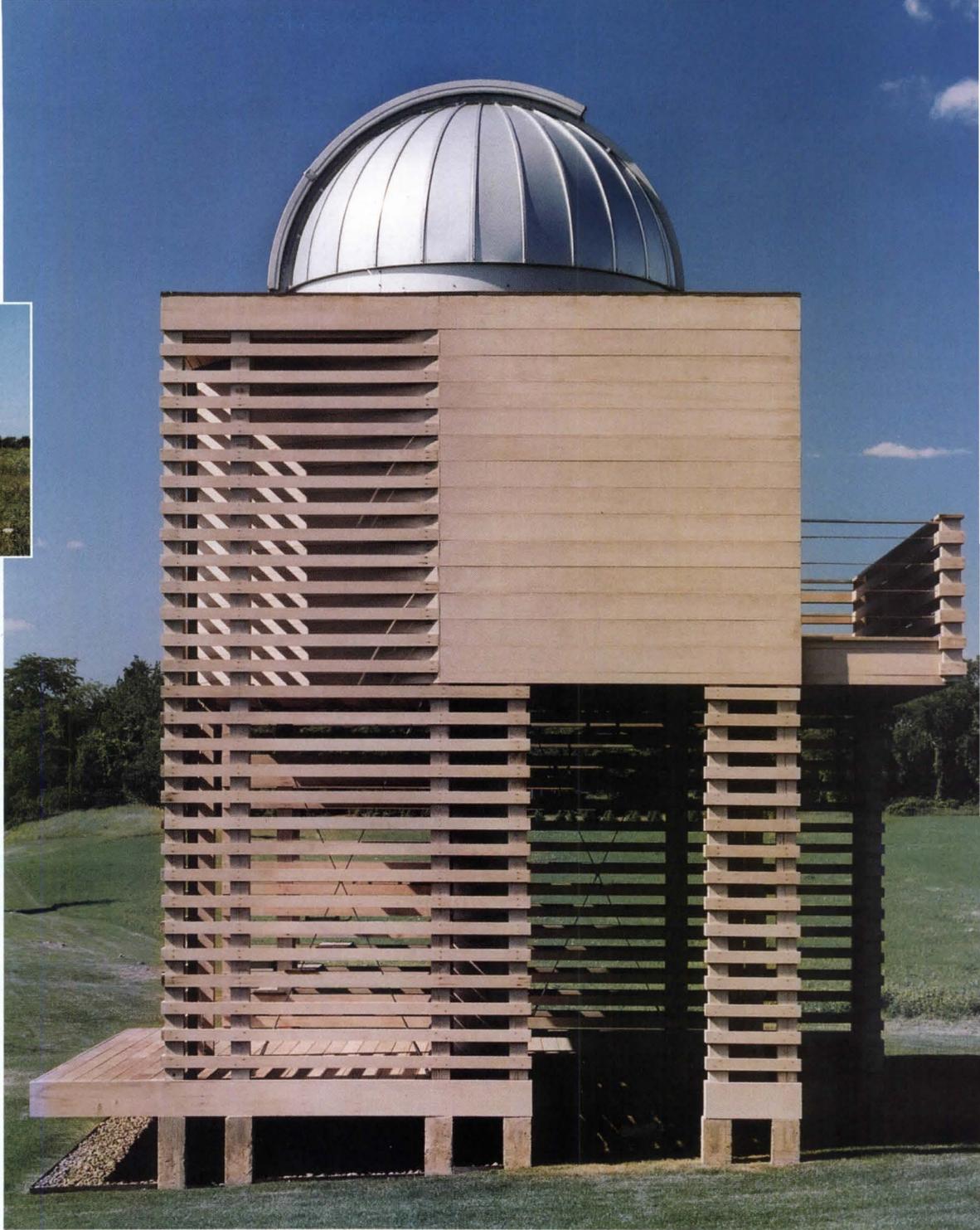


Interchange by Atelier Big City invites visitors to walk under and on top of a folded platform.

Snapshot



The slatted exterior gives the observatory structure a human scale, especially when viewed across the rolling landscape from the main house. It also gives it the feeling of a crisp, playful garden pavilion instead of a scientific structure.



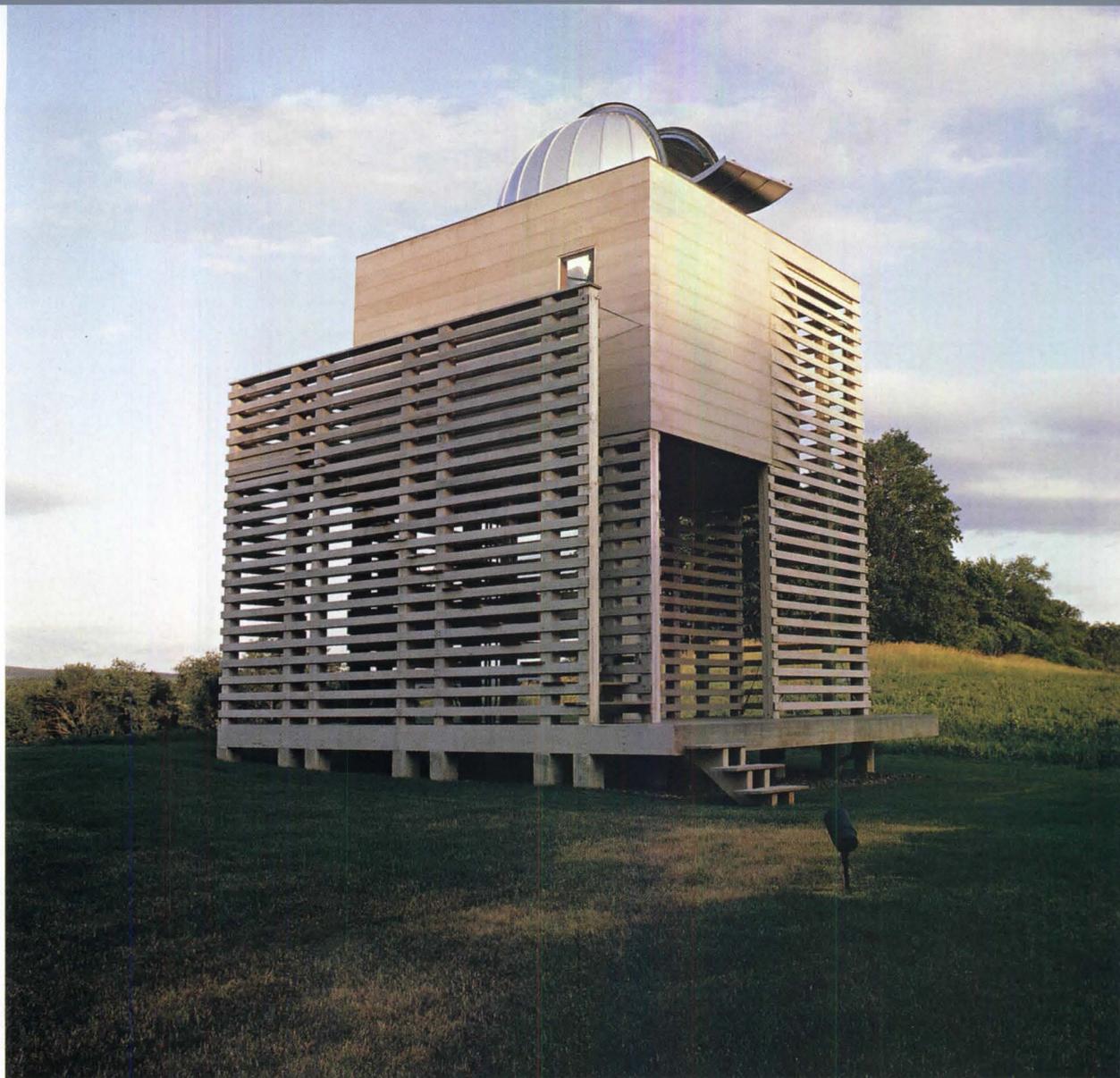
By Raul Barreneche

For most architects, the prospect of designing an observatory invariably sends their imagination back to the history books—to Boulée’s supersize Cenotaph to Isaac Newton or Mendelsohn’s Expressionistic Einstein Tower in Potsdam. Manhattan architect Wendy Evans Joseph admits she saw flashes of those icons as she began designing a small observatory for her stepson on the family retreat in Ghent, New York. But Joseph, a 12-year alumna of Pei Cobb Freed & Partners, was determined to put a Modernist spin on the observatory, which, with its requisite dome and typically solid masonry viewing room, inherently tends toward the Classical.

Making a Modern observatory wasn’t simply a matter of dressing it in more pared-down garb. “The design is really driven by pretty specific technological requirements,” explains Joseph. First and foremost among the technical mandates was establishing a structurally isolated, zero-movement support for the telescope. A 2-foot-diameter concrete pedestal anchored to bedrock creates a vibration-free base for the telescope, a computerized, 16-inch model

A solid little structure that makes architecture look easy

Snapshot

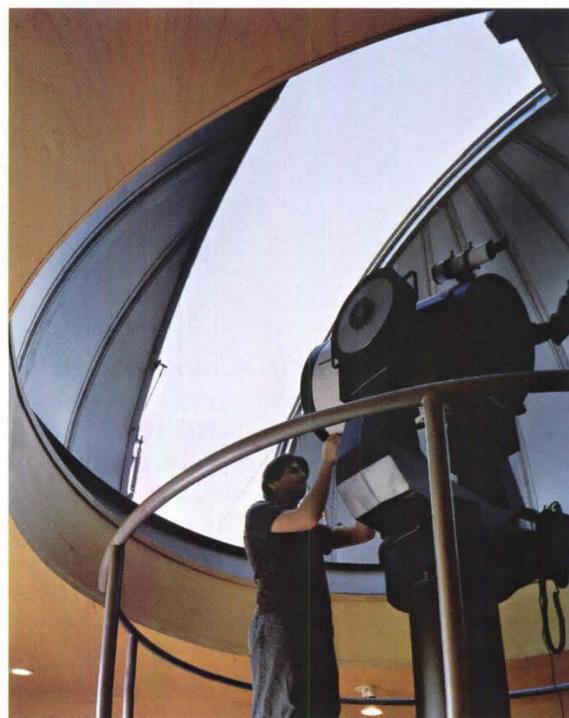


The viewing room (bottom) is sheathed in cedar siding and the tiny staircase and platform are wrapped with cedar posts and slats (right) spaced to echo the stair's riser dimensions.

that would pass muster with any university observatory. The surrounding viewing room, structurally independent of the concrete column, is enclosed by a cedar-post structure and lined inside with maple plywood walls and sustainably grown ipé floors. (Joseph likens the structural configuration to a lollipop.) A retractable, 10-foot-6-inch-diameter dome crowns the little room, which, atypically, has a small window fitted with a blackout shade to allow some air into the stargazer's perch. Mechanical heating and cooling is another no-no in observatory design: HVAC vibrations disrupt motion-free stargazing, and heat currents cloud the view through the telescope.

The dome dictated the overall proportion of the little building—"the new Modur," jokes Joseph. She thrust the solid viewing room up a full level, creating a ground-level platform around the concrete lollipop stick. The slatted skin gives the structure a human scale, especially when viewed across the rolling landscape from the main house. It also lets the observatory breathe, at least visually, and gives it the feeling of a crisp, playful garden pavilion instead of a leaden scientific structure.

Though the project was built for a high school hobbyist, Joseph's execution is anything but amateur. The architect meticulously detailed every connection and mitered all the corners. "If you don't do that, you could have tremendous amounts of vibration," explains Joseph. "It requires a lot of precision." She says local contractor Jim Romanchuk's craft was "over the top," but necessarily precise. Given Joseph's tutelage under I.M. Pei, such precision seems driven by much more than just technical mandates. ■



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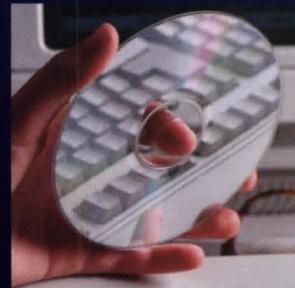
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Ethics and the Architect

By John T. Matteson and Mary Z. Donovan

A host of recent books and symposia on the relationship between ethics and architecture suggests that the profession as a whole is moving toward new and important considerations of what it means, in a moral sense, to be an architect. Architects studying ethics have been scouring the writings and teachings of theologians, critics, and philosophers, such as Thomas Aquinas, John Ruskin, and Martin Heidegger, for insight and direction.

This movement has acquired further momentum as, in recent months, Americans have become increasingly conscious of professional misconduct of all kinds. During the past year alone we have been bombarded with revelations that corporate executives and their auditors have concealed huge losses, posted illusory profits, and falsified the value of their corporations' assets while engaging in insider trading and exercising millions of dollars worth of stock options. As a result, some of yesterday's blue chips are today's cat-box liners. Billions of dollars have evaporated from 401(k) plans, retirement funds, and the pockets of investors. Those who perpetrated these crimes are intelligent professionals, well schooled in their ethical responsibilities toward others. Their recklessness betrayed millions of people.

In the wake of September 11, 2001, architects and engineers have also felt the gaze of the public settle upon them, but for different reasons. People who may not comprehend how miraculous it is that a structure could have survived the impact of a jet for any length of time are asking tough questions. Did compromises made during the design and construction of the World Trade Center towers allow them to fail too easily? Should the sprayed-on fireproofing have been more resistant to impact? Were the bolted connections that fastened the floor-framing systems to the core walls inadequate? Were exit-stair towers too close together? Sprinkler risers too easily destroyed? More broadly, has the pressure to build cheaply and quickly caused dangerous trade-offs in our building codes?

The loss of public confidence in the ethics of professionals merits our careful attention because professions that are perceived to be untrustworthy and neglectful of the public good inevitably find themselves subject to severe oversight and regulation. Accounting and

banking laws are already starting to undergo legislative reform, and no doubt some of those involved in this recent wave of white-collar crime will be going to prison. For architects, a loss of the public's trust might cause building codes to become more stringent. At its most extreme, a failure of confidence might lead the public to question whether architects are responsible or knowledgeable enough to design with the measure of freedom the profession has always enjoyed, or whether they can be trusted to use it for the public good. In an age when integrity is so quick to fall under suspicion, it is becoming more important than ever that architects think about their work in light of its ethical ramifications.

To whom shall we be true?

Of course, many of the factors that make the architect's job so ethically challenging have always been with us, and they are unlikely ever to go away. The most significant of these springs from traditional notions of what it means to be a professional. Obviously, being a professional should signify more than acquiring a body of knowledge or passing an exam. In addition, professional architects must assume the legal responsibility to protect the public's health, safety, and welfare. In the bargain, they take on an obligation to use their knowledge to serve people.

In the individual case, the architect who serves only the client appears to be doing the right thing. Yet this appearance may mask troubling ethical questions. Serving the client may well mean, for example, that a person will be asked to design 100 units of tract housing in a landslide-prone area. This creates a dilemma for the architect, because the social mathematics of self-interest seldom add up: The system in which the architect fulfills the desires of the client does not always produce the best result for everyone else.

Should an architect execute work that will be harmful to the environment and aesthetically offensive, or hand pink slips to his or her staff members? One wonders whether staying in business must come at the expense of doing what is responsible to the public in a larger sense.

Where we've come from

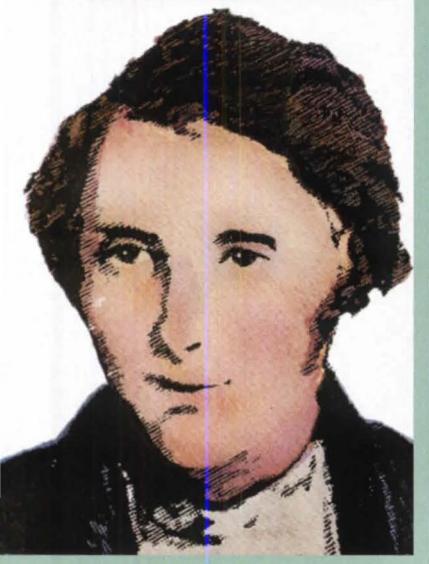
In a larger context, much of what causes this conflict arises from a dilemma with which America has been wrestling since the New Deal: Are we a nation of boisterously competitive and individualistic people, or an immense community working to achieve a generalized social will under the guidance of centralized authority? Do we depend on an authority we empower to decide what's right, and to enforce it, or do we rely on the individual to act ethically?



RESOLVING THE ARCHITECT'S DILEMMA:
HOW WE REPRESENT THE
INTERESTS OF OUR CLIENTS WITHOUT
BETRAYING OUR OWN.

1274 : Thomas Aquinas dies, leaving unfinished his *Summa Theologica*, in which he suggested that pure technical command of one's craft was not sufficient; one must also

love one's craft and the community where one works and builds. Aquinas believed that loving one's work is essential to a job well done and a life well lived.



1853: In *The Stones of Venice*, John Ruskin publishes his essay "The Nature of Gothic," denouncing division of labor and exhorting architects not to sacrifice humanity in the

name of perfection. He argued that the convenience, beauty, and economy that had been made possible by the machine had come "only by the degradation of the workman."

agreed to charge the same amount to design a building, they could decide among themselves to set that price as high as they wished. A consumer could either pay the going price, try to do business outside the organization, or do without a building.

The reasoning of the Justice Department was flawed in one respect, and that is that there are secondary "consumers" of a design project—the people who live near or work in a building and must endure its aesthetics or, in a more global sense, the environmental consequences that result from its construction. A client who is going to construct a building might get a good price because architects had cut their costs to the bone to get the job. However, the process seems self-defeating. What interest does an architect, who now stands to make little money on the job, have in designing a building that will be environmentally responsible and appealing to its neighbors? Only the interest that the architect chooses to assume.

On the other hand, the AIA's belief that it could make its members act ethically by making them conform to fee schedules was naive. The institute's rules were never enforceable and did not ensure that those who adhered to them were any better at designing buildings than the architects who didn't. Fee regulation didn't begin to address many of the ethical dilemmas the profession faced in the past, and these have only become more complex. Globalization brings up a whole new set of issues. For example, should an architect specify exotic hardwoods that can be harvested only if irreplaceable habitats are destroyed? Should an architect turn a blind eye to the importation of building materials made in countries where they can be produced cheaply because environmental standards are lax? As the AIA learned, architects will decide for themselves what their ethics will be and must impose these standards upon themselves before the public can benefit from them.

Where we go from here

What can an architect begin to do to make his own position more ethically tenable? Perhaps more than the members of any other profession, it is given to architects to take an imagined ideal and to bring it forcefully into the world. But they have the potential to change reality with more than steel, glass, and brick. Architects possess the knowledge to speak and act as leaders of communities and as shapers of artistic understanding. This authority exists, however, only insofar as architects see themselves,

THE AIA'S IDEA THAT RULES
COULD MAKE AIA MEMBERS
ACT ETHICALLY WAS NAIVE.

and are seen by the public, as belonging to a learned profession whose commitment to society extends beyond doing a job.

Many of the issues of character and social relevance that concern the modern architect were also present in the mind of a medieval churchman. Better than anyone who preceded him in the Western tradition, St. Thomas Aquinas perceived the relationship between ethical integrity and the ability to create a strong and beautiful physical artifact. Craftsmanship and citizenship were so closely allied in Aquinas's thinking that he used the

In general, Americans do not really answer this question. We tend instead to pursue one of the two positions headlong until finally, aghast at the errors of our single-mindedness, we dash back in the opposite direction.

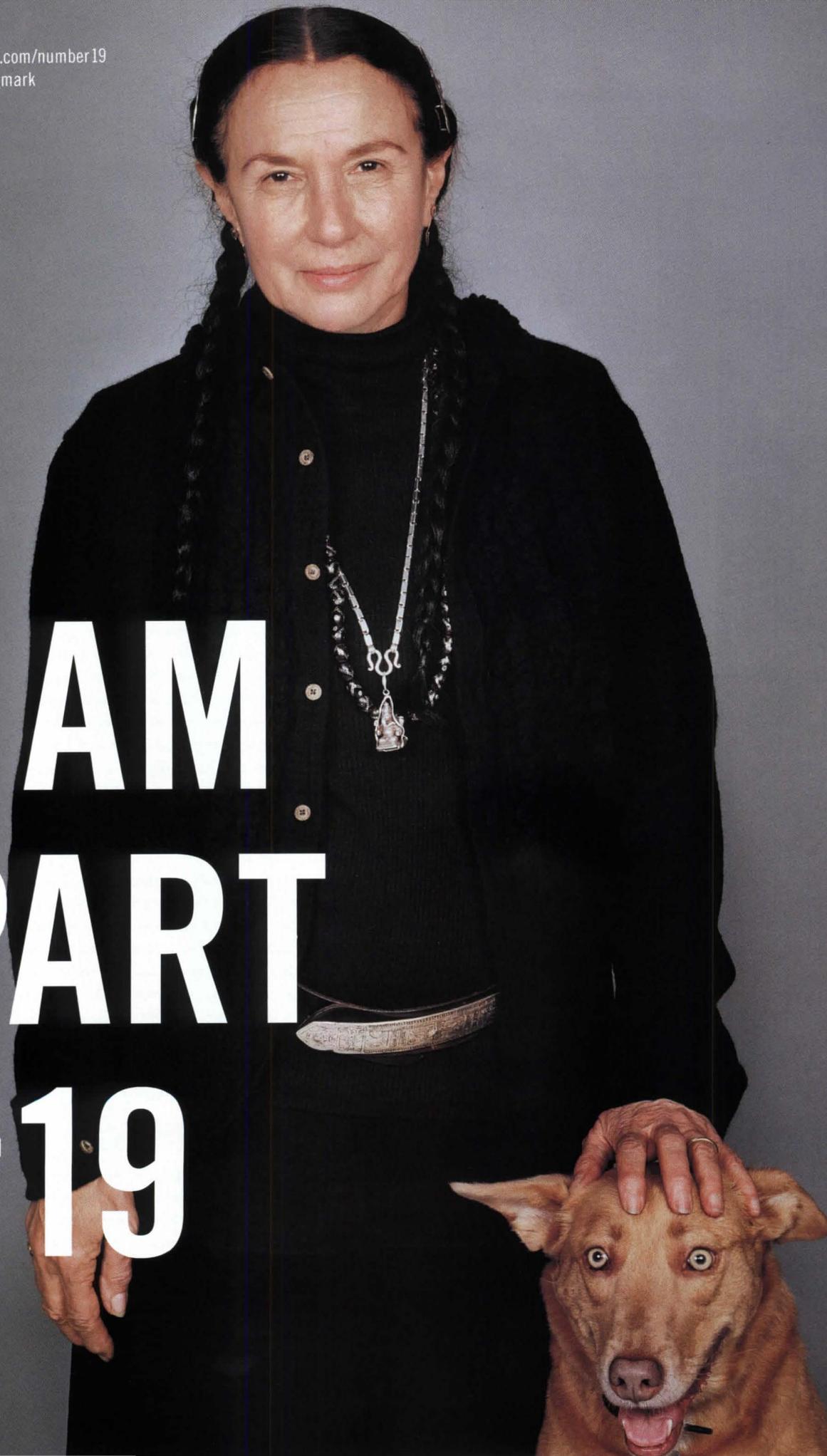
For more than three decades after World War II, our faith in higher authority held sway. We trusted government to contain Communism and end segregation. The public trusted architects to design housing for the poor and rebuild our cities. However, with the Vietnam debacle, the destruction of the Pruitt Igoe, and the failures of the welfare system, urban renewal, and many other things, people lost faith in the idea that one central authority, or profession, can always be depended upon to know and do what is best for all.

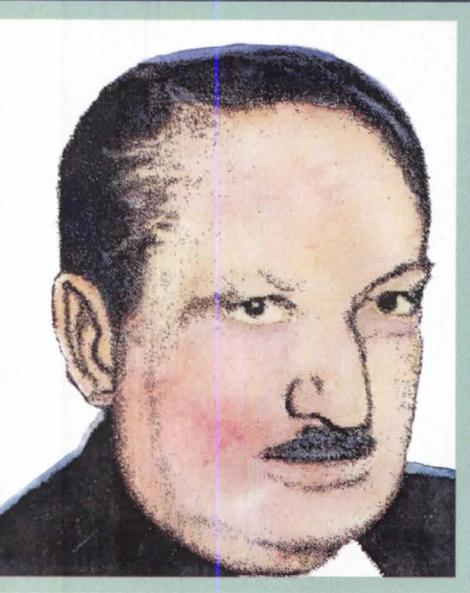
You can't legislate virtue

Until the 1970s, the AIA had tried for almost 100 years to enforce its own model of ethical behavior. The institute did this by using its code of professional conduct to keep architects from bidding against each other to get work. The thinking was that if competition among architects on the basis of fees was discouraged, competition between architects would not vanish; rather, it would be shifted away from the bottom line and into the realm of quality. Instead, the AIA found itself entangled in years of disputes over antitrust law. Starting in the early 1970s, under pressure from the United States Department of Justice, the institute entered into a series of consent decrees intended to prevent noncompetitive practices, including the setting of fee schedules. Ironically, the AIA was fighting to keep its own self-imposed regulations, in its view, to protect its ethical standards.

The Justice Department didn't see it that way. Its understanding of the case assumed that the primary arena in which architects compete is on the amount of their fees. If all of the members of an AIA chapter

I AM PART #19





1951. Martin Heidegger proclaims, "Only if we are capable of dwelling, only then can we build."

the lives and aspirations of the people. Through the hands of craftspeople, the essence of divinity became present in the world.

Ruskin and professional competence in the digital age

Recently, many experienced architects have expressed concern that crucial aspects of the competency that architects should gain during training have been degenerating. They worry that graduates of architecture schools seem to be losing their grip on how buildings are constructed. Their drawings look so good in their digitally rendered perfection that the mechanics don't seem to matter. In an interview that appeared in *RECORD* last month [September 2002, page 100] Richard Meier, FAIA, said, "... many people, especially those who come out of school today, show a lack of understanding of scale. Often someone will say, 'I'll measure it.' But, you shouldn't have to measure it. You should know what you're drawing."

Unquestionably, construction documents can be produced more efficiently and accurately using CAD, and there is no question that it has enabled architects to design things that would have been impossible using pencil and paper. But, should the public feel it can trust those who do not understand such basics as scale, how and why buildings stand, and what makes them comfortable and practical, to comprehend the intricacies of physics upon which the life-safety codes are based? In the 1850s, John Ruskin, in *The Stones of Venice*, lamented the industrial age's obsession with standardization and technical precision. He could have been talking about the effects of CAD and digital rendering on young architects today when he argued that the convenience, beauty, and economy that had been made possible by the machine had come "only by the degradation of the workman," who was no longer able to exercise judgment in the production process.

Ruskin deplored the fact that in the machine age mental work was becoming more and more distant from its physical counterpart, so that the person who produced the idea took no active part in its realization: "We are always in these days endeavoring to separate [body from intellect]; we want one man to be always thinking and another to be always working ... whereas the worker ought often to be thinking, and the thinker often to be working ... It is only by labour that thought can be made healthy, and only

ARCHITECTS CONTRIBUTE
TO THE COMMUNITY IN
WAYS NO ONE ELSE CAN.

by thought that labour can be made happy." Back then, Ruskin was concerned about the alienation of the laborer. He could not have predicted that something like a computer would one day begin to usurp the more intellectual work of design itself. But it seems to many that it can, as the gap between an idealized image and the work that makes it real widens.

Like Aquinas, Ruskin argued that a good craftsman is improved by upholding the public's trust. Just as importantly, Ruskin saw the architect as performing the essential function of reminding people of their place in relation to history. He said of architecture, "We may live without her, and worship without her, but we cannot remember without

one in an analogy to describe the other. He wrote: "A craftsman will not act well unless he acquires a love for the good pursued in the exercise of his craft; so that ... to be a good citizen, you must love the good of your city." He also observed, "Having a craftsman's skill doesn't make one good. ... Any actual doing of good depends on the doer's having a good will."

Aquinas's ideal craftsman combined a mastery of professional skill with a love of the community. The point cannot be emphasized too strongly: Architects are unique in the way they bring a knowledge of hard science, aesthetics, and psychology to their work. They have contributions to make to the spiritual and sensory wealth of the community that literally no one else can offer. Rather than allowing price to become the sole criterion of competition, the architect must educate the client and the greater public as to the value of careful, time-consuming, and sometimes more costly, design.

Although Aquinas did not refer specifically to the craft of architecture, the logical implications of his ideas speak plainly to the architect, whose design skills so directly affect people and their environment that exercising them is virtually a form of citizenship. Aquinas suggested that pure technical command of one's craft was not sufficient; one must also love one's craft and the community where one works and builds. He was not suggesting, à la John Lennon, that all you need is love. He was, however, insisting that loving one's work is essential to a job well done and a life well lived. "Truth is one," Aquinas wrote. "Hence, truth according to science and truth according to faith must coincide." While his statement may not have been literally correct, it still points toward an important precept: In the building of a good building, technical prowess and spiritual inspiration almost necessarily walk hand in hand. For Aquinas, professionalism did not isolate craftspeople from the community; rather, the best craftspeople were drawn by their work toward the very center of the community, and their work became inseparable from

number 19

**I AM
PART
HUMAN**



Allsteel

her. ... There are but two strong conquerors of the forgetfulness of men, Poetry and Architecture." More than any other kind of artist, the architect has the ability to create durable forms for preserving history and memory.

Nearer to our own time, Martin Heidegger wrote, "The nature of building is letting dwell. ... Only if we are capable of dwelling, only then can we build." A superb discussion of Heidegger's approach to architecture can be found in Karsten Harries's *The Ethical Function of Architecture* (MIT Press, 1998). What Heidegger argued was that in order to create a space that is conducive to a sense of comfort and belonging, one must first know what it is to have those feelings.

Aquinas, Ruskin, and Heidegger all advised us to create connections with community, with history, and to understand the processes of construction and science that support architecture. Architects who mediate between tradition and innovation, as well as between the client and the community, may quickly discover that mediation requires moderation. The architect who designs only for the sake of art and tradition courts financial ruin; the designer who serves the client and no other interest risks a spiritually empty career. Aristotle's idea was that the pursuit of any single virtue or value to the exclusion of all others leads directly into vice. Not surprisingly, when Horace summed up Aristotle's doctrine of moderation, he used architectural metaphors: "Whoever cultivates the Golden Mean avoids both the poverty of a hovel and the envy of a palace." The golden mean between the values of the market and the spirit will vary with the situation and personality of each designer. But an ideal balance will never be reached unless the architect confronts the moral ambiguities of the profession and strives to give each its appropriate weight. These are, of course, very personal choices.

No one can dictate to the architect what jobs to pursue or, within the limits of reason and safety, how to do them. Nonetheless, the courage and decency of an architect who works to protect the environment, who designs dignified public housing, or who contributes gratuitous beauty to the human landscape, will always deserve honor. Ernest Boyer and Lee D. Mitgang's 1996 book entitled *Building Community: A New Future for Architecture Education and Practice* is a superbly thoughtful study of education and community outreach as they relate to architectural ethics.

It's not about the money

No matter what is said or written about ethics and self-respect in the profession, the dialogue inevitably comes back to money. How can architects promote quality, creativity, and respect for the environment without placing themselves at a competitive disadvantage? Whatever course is to be followed, one point seems settled: Insofar as architects accept the assessments of the marketplace as the sole arbiter of the value of their work, they will judge themselves too harshly. First, this "secondary consumer" of design services seldom appreciates the value of the uplifting experience

BALANCE CAN ONLY BE
ACHIEVED BY CONFRONTING
THE MORAL AMBIGUITIES.

of beholding a beautiful structure. Second, and just as importantly, they will not take into account the remarkable range of expertise that architects have labored to obtain and that defy all efforts to quantify: the knowledge of science, aesthetics, sociology, and above all the human spirit that uniquely combine to make a designer of fine buildings.

Thankfully, most architects do strive always to retain their sense of social purpose and to speak with authority to the soul of the culture. In the trenches, it is often hard to remember that to serve one's public with the utmost heart and skill the architect must avoid the limitations of orthodox thinking as well as being restricted by relentlessly utilitarian economics. Both literally and figuratively, ethical architects think outside the box. Those who do not will bequeath to the future empty shells, where the dreams and aspirations of culture will be buried. ■

John Matteson is a graduate of Harvard Law School and holds a Ph.D. from Columbia University's Department of English and Comparative Literature. He is an assistant professor at John Jay College in New York City. Mary Zaboglio Donovan has an M.A. in education from the University of Wisconsin and a B.S. in architecture from The City College of New York. She organized the Ethics in Architecture conference held for the past two years by the Cathedral Congregation of St. Xavier at the cathedral of St. John the Divine in New York City.

ARCHITECTURAL RECORD

CALL FOR ENTRIES

RECORD HOUSES 2003

The editors of ARCHITECTURAL RECORD announce the 48th annual RECORD HOUSES awards program. This program is open to any registered architect. Of particular interest are projects that incorporate innovative programs, building technology, and use of materials. Submissions must be postmarked no later than *November 4, 2002*. Winning entries will be featured in the 2003 RECORD HOUSES. See submission form in this issue, page 272.

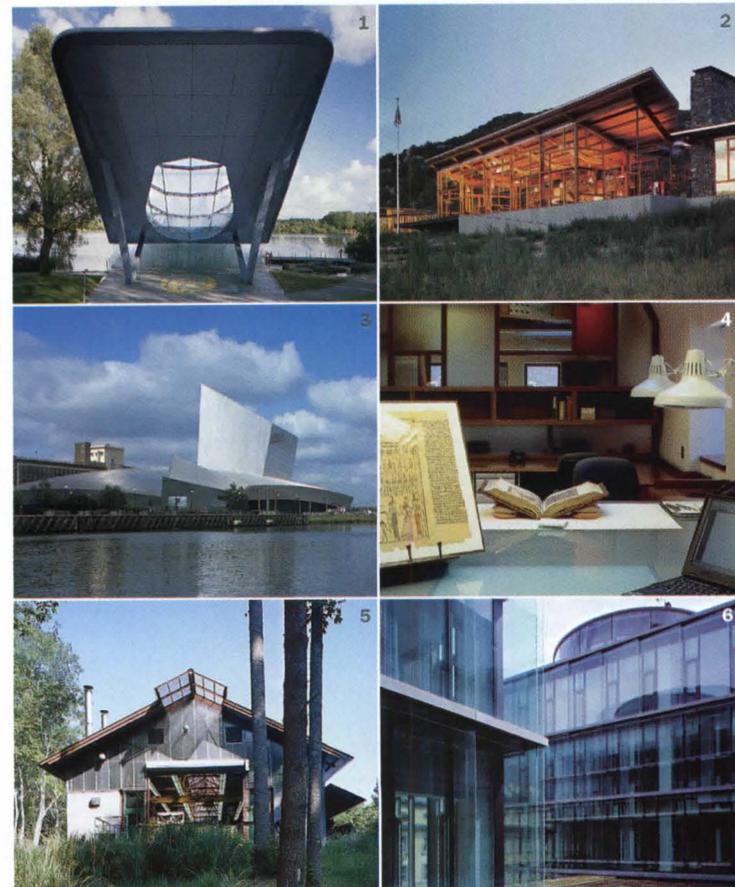


Small, medium, large

Small is beautiful. In formal polls and in informal chats, architects and other readers consistently ask us to publish little work, if judged by objective criteria—budget, square footage, or obvious scope. Consistently, small projects attract us in print. First, they fit handily within the magazine's format. In a few pages we can apprehend their context and accomplishment. They do not overly tax our understanding, as more complex programs might, allowing us to grasp their essence. In character, they recall the experimental nature of student work, associated with a period of creativity in our own professional lives.

This month, ARCHITECTURAL RECORD explores scale, from little to big. Asymptote, in its pavilion constructed for an international exposition in the Netherlands, proves that a project need not be overly large to be ambitious. Three other, distinctly American examples are featured from across this country: a camp for troubled young people set in the vast peace of the American West,

1. HydraPier (Asymptote)
2. Camp Paintrock (Charles Rose)
3. Imperial War Museum
(Daniel Libeskind)
4. Thaw Conservation Center
(Samuel Anderson)
5. Iron Studio (Frank Harmon)
6. Munich Re (Baumschlager + Eberle)

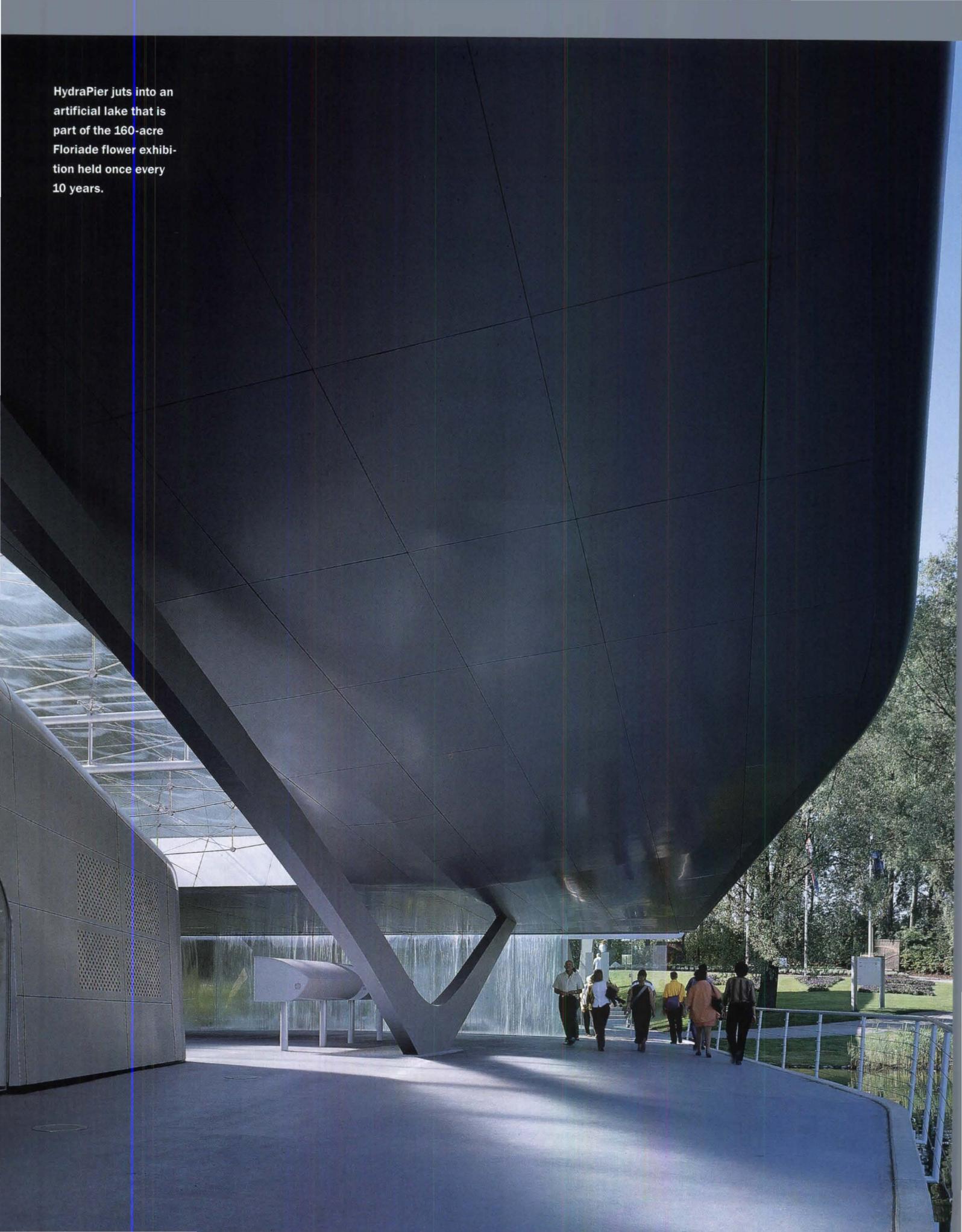


designed by Charles Rose; Samuel Anderson's laboratory for the demanding task of paper conservation placed in the attic of a New York City landmark; and a metal shop for a crafts school in rural North Carolina, designed by Frank Harmon, a native son. In all four, small equates to approachable—a personality trait that imbues both the more rustic and the futuristic architectural essays.

The real world, however, includes tonal blending. This month's issue offers an example from Manchester, a medium-size city that employs architecture as an urban magnet in its ambitious new war museum, designed by Daniel Libeskind. In Germany, the Munich Reinsurance Company, by Baumschlager + Eberle, deploys sophisticated systems and artful displays of chromatic light to enrich what could have been a mundane office building.

In October, RECORD speaks in a polyglot dialect of small, medium, and large scales—as does our professional world of clients, contracts, and buildings. Real architecture engages all three.
Robert Ivy, FAIA

HydraPier juts into an artificial lake that is part of the 160-acre Floriade flower exhibition held once every 10 years.



In an artificial landscape near Schiphol Airport, **Asymptote** helps put a place on the map with a soaring pavilion called **HYDRAPIER**

By Tracy Metz

Water and land, man and nature—these are the protagonists in Holland’s never-ending struggle and romance with its landscape. They also are the elements that shape the architecture of HydraPier, an exhibition pavilion designed by the New York firm Asymptote for Haarlemmermeer, the area south of Amsterdam that includes Schiphol Airport.

The architectural highlight of this year’s Floriade (a major horticultural event that travels to a different Dutch town once a decade), HydraPier will assume a new role as a municipal meeting hall when the flower show ends. Although its future program is not completely determined, its client is already holding meetings there between municipal officials and guests such as architects.

Like much of Holland, Haarlemmermeer was once underwater, and its hosting of this year’s Floriade coincides with the 150th anniversary of the reclamation project that created the land. Young by European standards, Haarlemmermeer lacks the grand monuments of older towns with their medieval churches and impressive palaces. So the municipality has been busy lately building new attractions, even hiring Santiago Calatrava to design three bridges. In commissioning a building for the Floriade, Haarlemmermeer was looking for more than a temporary pavilion; it wanted a modern-day landmark.

Hani Rashid and Lise Anne Couture, the husband-and-wife principals of Asymptote, took the history and character of Haarlemmermeer as the starting point for their design, drawing particular inspiration from the presence of Schiphol Airport. As a result, HydraPier perches on the edge of a man-made lake as if it were about to take flight. Essentially a hinged double roof with a pavilion tucked underneath, the building offers exhibition space both indoors and out. Rashid says the evocative shape refers obliquely to the planes flying overhead. Indeed, the architect refers to the roofs as “wings” and the pavilion as a “fuselage.” The landside roof slopes in one direction to welcome visitors and rests on a pair of triangular supports, while the lakeside roof slopes in the other direction and sits on a second



pair of supports. Where the two roofs meet, the architects inserted a walkway defined on either side by a glass wall animated by a sheet of sliding water, thereby creating a “water tunnel.”

Asymptote clad HydraPier in sleek metal panels molded in a process normally used in aeronautics, not architecture. In this fabrication process, a controlled explosion forces metal into molds with three-dimensional curvatures. Usually, a building doesn’t have enough repetitive elements to make this technique economical, Rashid explains, but he and his colleagues consciously designed this building to “fit” the technology. To maximize the interaction between sky and water, the firm painted the building’s surfaces in four different hues: white, silver, blue, and gray.

While Rashid and Couture have designed virtual environments for the Guggenheim Museum and the New York Stock Exchange, HydraPier shows they are as fascinated by elegant engineering as by bits and bytes. In fact, the pavilion offers a sensory experience, not just a built manifestation of computer dogma. “Just as Modernist architecture was

Project: *HydraPier, Haarlemmermeer, the Netherlands*

Client: *Municipality of Haarlemmermeer—Arnold Huijsmans, Rik Bolderheij*

Architect: *Asymptote—Hani Rashid, Lise Anne Couture, principals; Elaine Didyk, Birgit Schoenbrodt, Jose Salinas, John Cleater, Gemma*

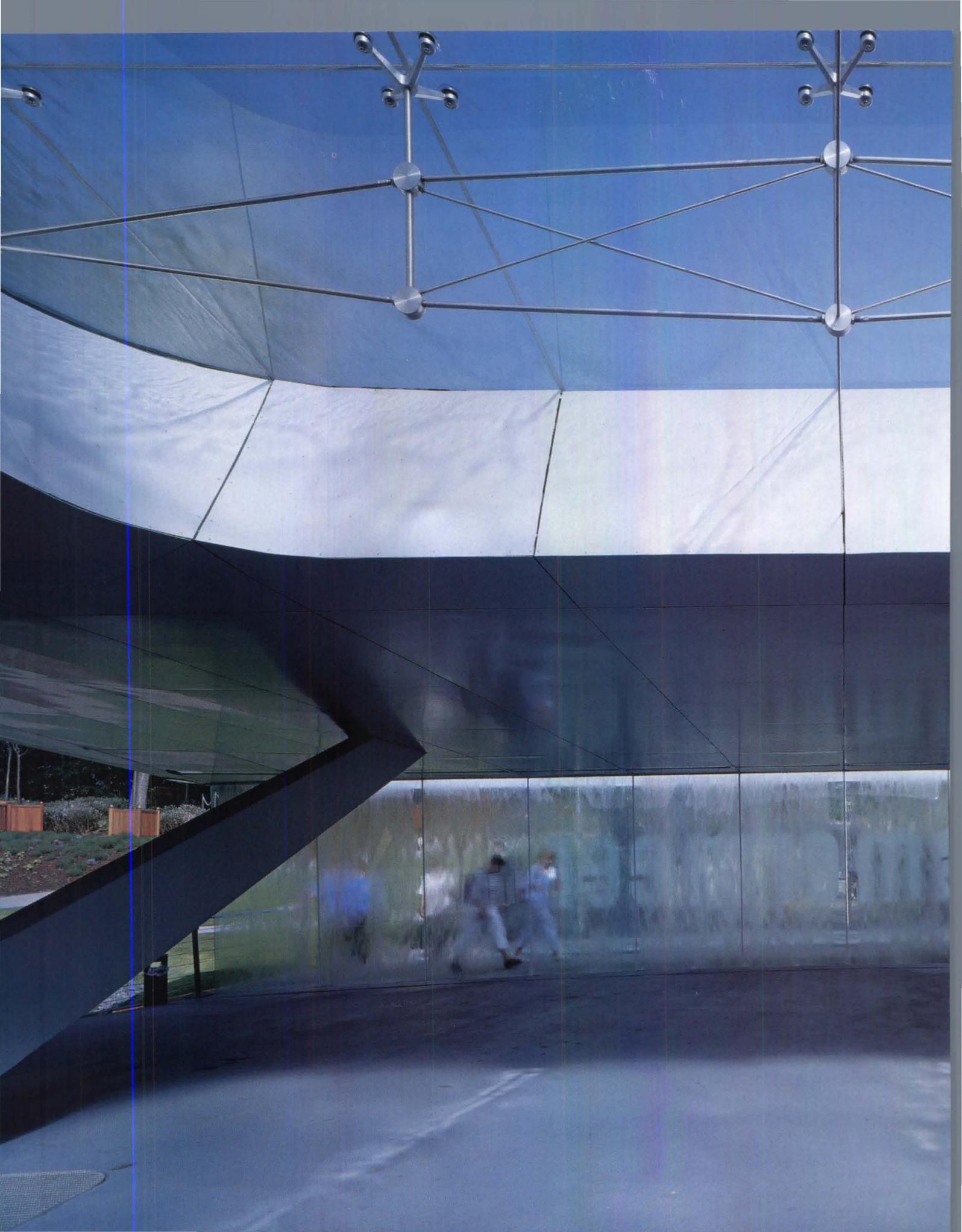
Koppen, Martin Thue Jacobsen, Alain Merkli, Moritz Schoendorf, Rafal Bajuk, project team

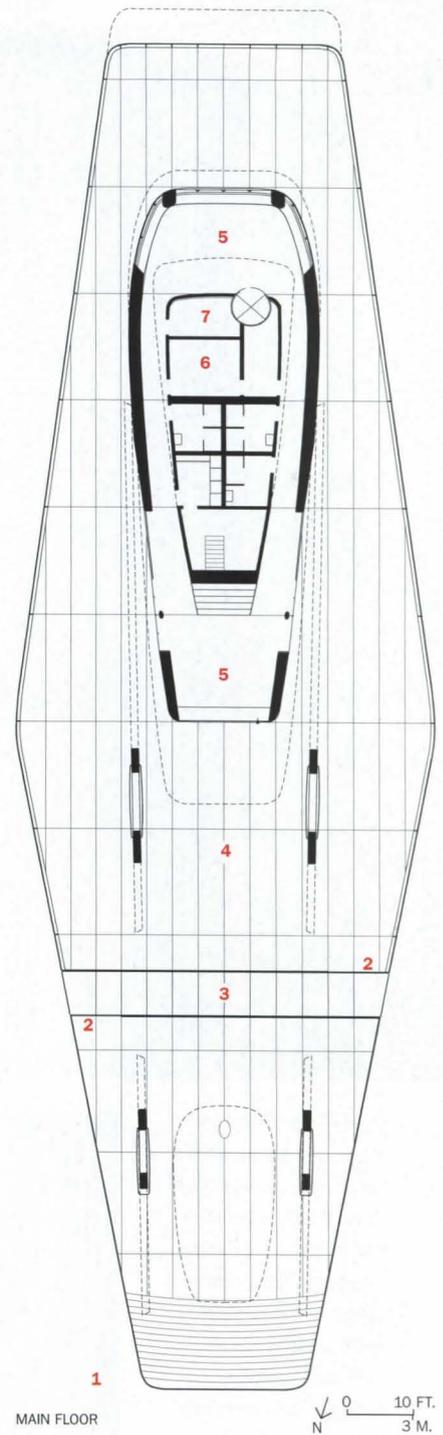
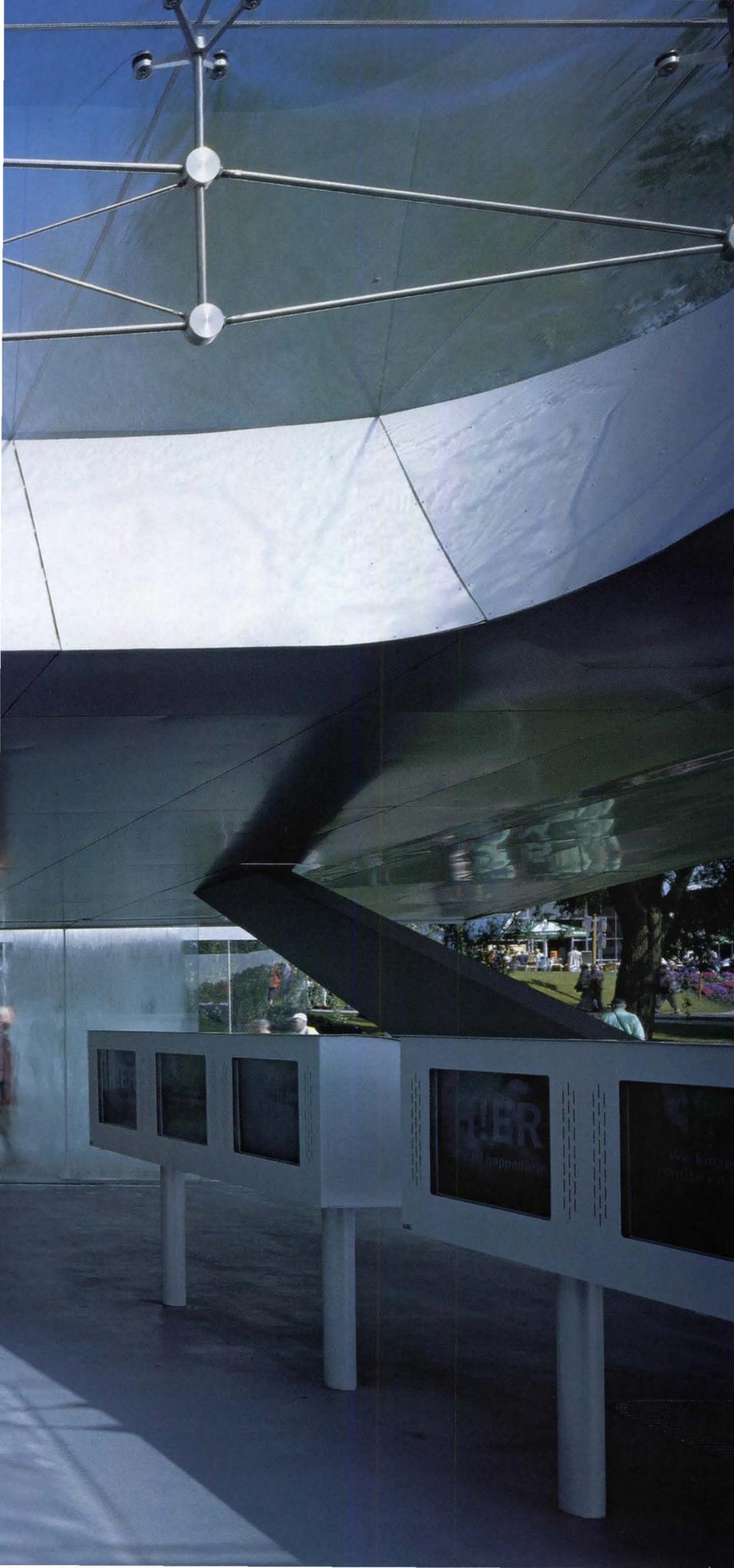
Associate architect: *Architektenburo Bronsvort*

Engineers: *Ingenieursburo, Smit Westerman (structural); Octatube (glass structure); Lotek (water)*

Contractor: *Nijhuis Bouw*

Tracy Metz is RECORD’s Amsterdam-based correspondent. Her latest book, *Fun! Leisure and Landscape*, will be published in November by NAI Publishers.





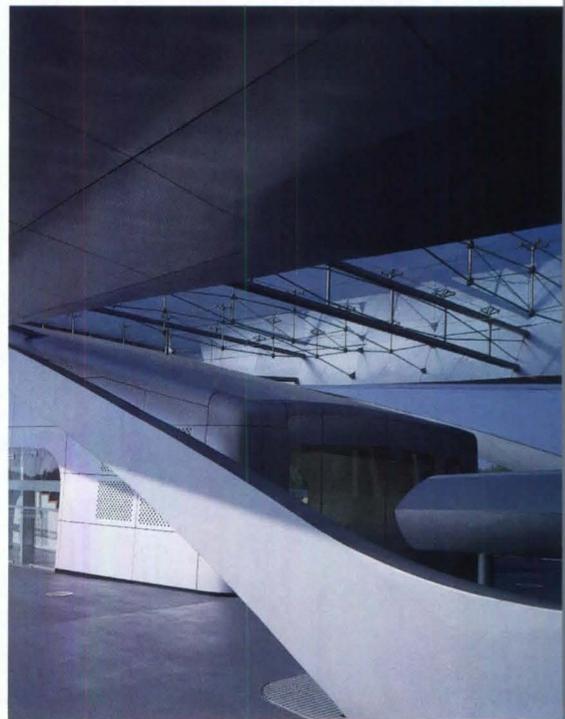
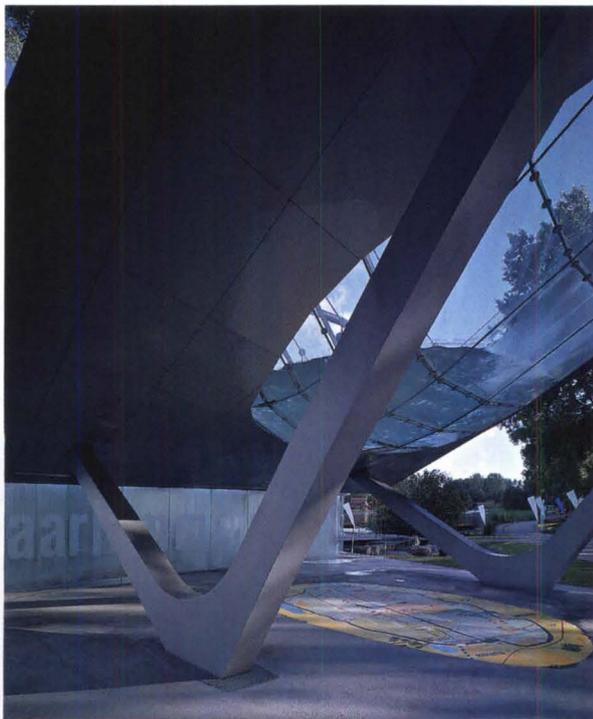
MAIN FLOOR

The main path through the project runs between two water walls (left), offering blurry views to exhibition areas and the lake beyond. Surfaces range in color from white and silver to blue and gray, so sky and water seem to merge.

1. Approach from park
2. Water wall
3. Entry path
4. Exterior exhibition
5. Exhibition
6. Kitchen
7. Office



Space is defined by glass and water at the entry path (above) but flows freely around the exhibition pavilion (opposite, top). The glass sections of the entry canopy (near right and opposite, bottom) and main roof (far right) employ cables and suction cups engineered by the firm Octatube.





inspired by advances in painting and film, we are inspired by the hybrid reality of new media and information technologies,” says Rashid. “Much of our work since we started in 1989 has been about bringing the real into the virtual; now we are bringing the virtual to the real.”

Given the municipal aspirations for HydraPier, the installation inside the pavilion is disappointing. Instead of experiencing a contemporary *gesamtkunstwerk* of cutting-edge exhibition design, visitors find uninspired videos of tulip fields and airplanes taking off and a hand-painted map of the Haarlemmermeer that looks like it came from a local grade school. But HydraPier will outlast this first temporary use and could serve as a landmark building helping Haarlemmermeer establish itself as place where innovative design matters. ■

Sources

Aluminum panels: NV Aluminum Products Benelux SA

Molds for 2D and 3D curved panels: Komplot-Plottechnik

Steel fabrication: Smulders Ducson bv.

Kitchen: Bulthaup

Paint finish: Baril Coatings; Sigma Coatings

Elevator: Axess Liften

Lighting: BEGA; Adolf Schuch KG; Philips

Resin floor coating: Sika

Furnishings: Kartell

www For more information on the people and products involved in this project, go to Projects at architecturalrecord.com.

Encouraging many different experiences of the site, the scheme includes roof decks (this page). Exploding the conventional confines of a barn, Rose literally lifted the roof of his stables (opposite).



Charles **Rose Architects** echoes the vast landscapes of north-central Wyoming in **CAMP PAINTROCK**, a life-changing program for inner-city teens at risk

By Sarah Amelar

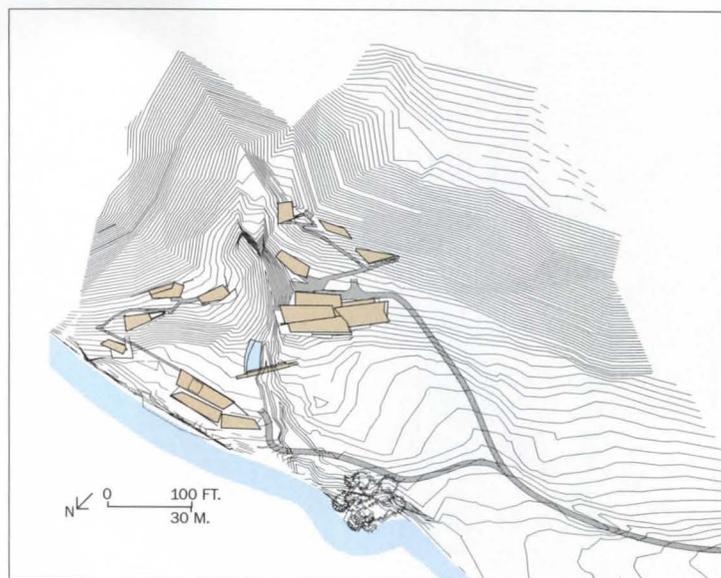
Hyattville, Wyoming: population 100. It's a place where cattle far outnumber people—a town, bordering the Big Horn Mountains, so remote you'd have to drive an hour each way just to pick up, say, a quart of milk. Yet it's where many teens from Los Angeles's inner city now vie to spend five weeks each summer.

At first glance, this scenario may seem improbable, but Hyattville has become home to Camp Paintrock, a program offering potentially life-transforming experiences to disadvantaged young Los Angelenos. Paintrock is the brainchild and philanthropic creation of John Alm, 56, president and chief operating officer of Coca-Cola Enterprises. His idea was to take motivated, high-performing minority students just as they're about to enter high school—teens from difficult family conditions and neighborhoods blighted with poverty, youth gangs, rampant crime, and soaring drop-out rates—and place them in a healthy but challenging setting, unlike anything they've ever known before.

With an intense back-to-basics program of riding and caring for horses, rappelling canyon faces, swimming, bow-and-arrow hunting, and whitewater rafting, the camp may resemble getaways for more privileged kids, except that here the activities are likely to be new, if not daunting, to the campers. A major goal is to build self-esteem, self-reliance, and positive ways of overcoming fear. But that's just the kickoff. After one five-week session, the participants can't return, except as counselors, but Paintrock stays in touch with them, providing counseling and financial aid, keeping peers in contact with one another, and helping them stay on track to later reenter society, Alm hopes, "as college-educated, make-a-difference adults."

This is the kind of dream one might plan to realize "in retirement," says Alm of Paintrock. But, after suffering a major heart attack at age 37 and later losing his first wife to cancer, he began to wonder: "Who knows how long any of us will be around? Why wait?" He'd seen how much his own two children had gained from camp—and had also witnessed tough childhood conditions firsthand. He "started from nothing," he says, weathered the "total disintegration" of his family, and then bounced from one inner city to another. A two-time college dropout, he joined the military, finally got on course, and completed his undergraduate degree at age 28. Alm emerged as a man who clearly values education.

To transform his vision into reality, this Coca-Cola C.O.O. and his second wife, Carol, joined forces with Greg Kovacs, an M.B.A. with extensive youth-development and nonprofit experience, who now directs Paintrock's program. But to give the concept physical form and character,



the team turned to the Boston firm of Charles Rose Architects. Rose had not designed a camp before, but his work had been consistently responsive to natural settings and included Thompson and Rose's award-winning artists' retreat in Florida [RECORD, June 1997, page 99].

By the time the Alms met Rose, they'd already obtained the land for Paintrock. The site, at the mouth of two small canyons, is part of a 110,000-acre ranch, where John now spends as much time as possible, and

Project: *Camp Paintrock*

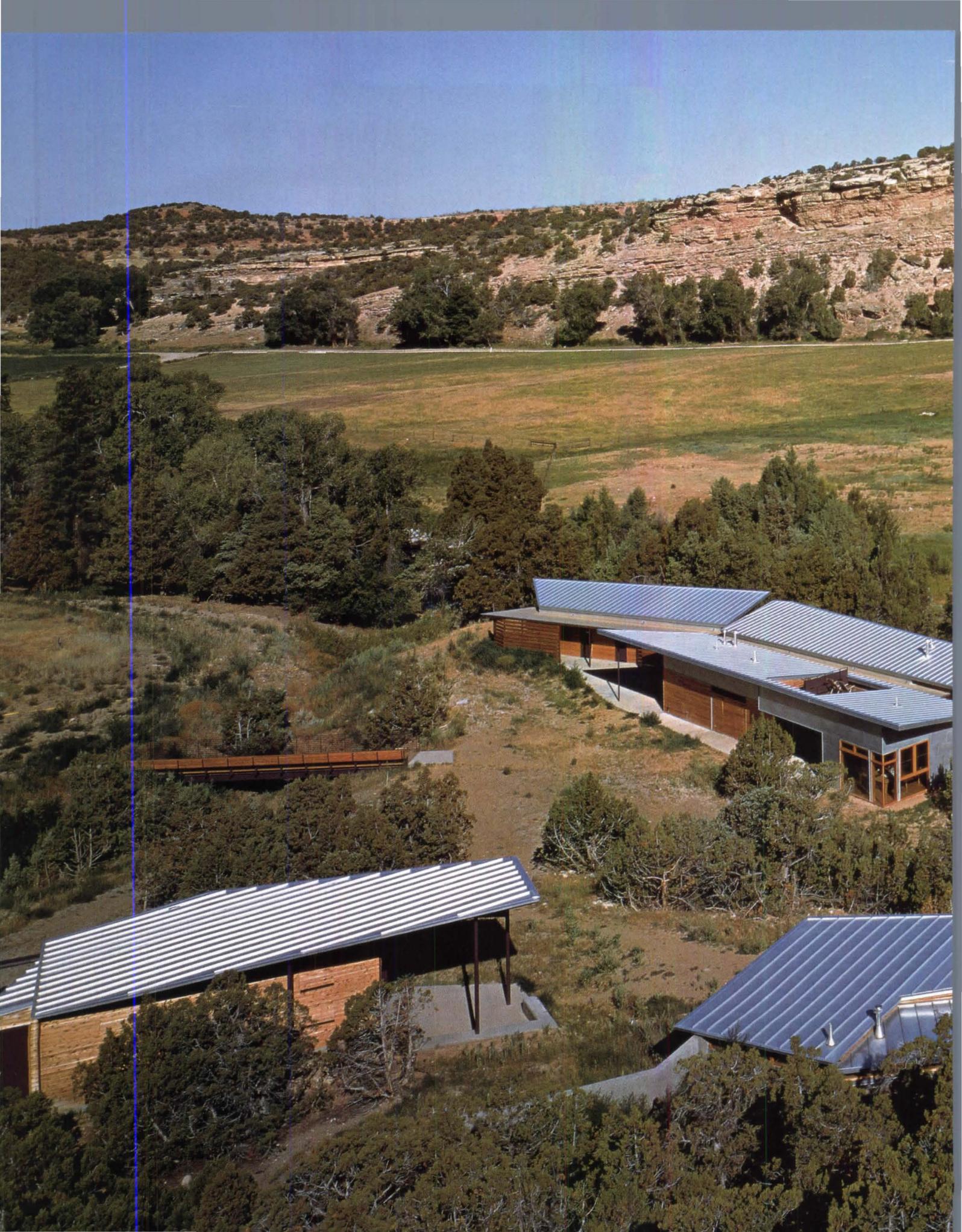
Owner: *The Alm Foundation—John and Carol Alm*

Architect: *Charles Rose Architects—Charles Rose, design principal; Eric Robinson, David Gabriel, David Martin, project architects; Franco*

Ghilardi, Lori Sang, Takashi Yanai, Maryann Thompson, Marios Christodoulides, Patricia Chen, Chris Hoxi, Heidi Beebe, project team

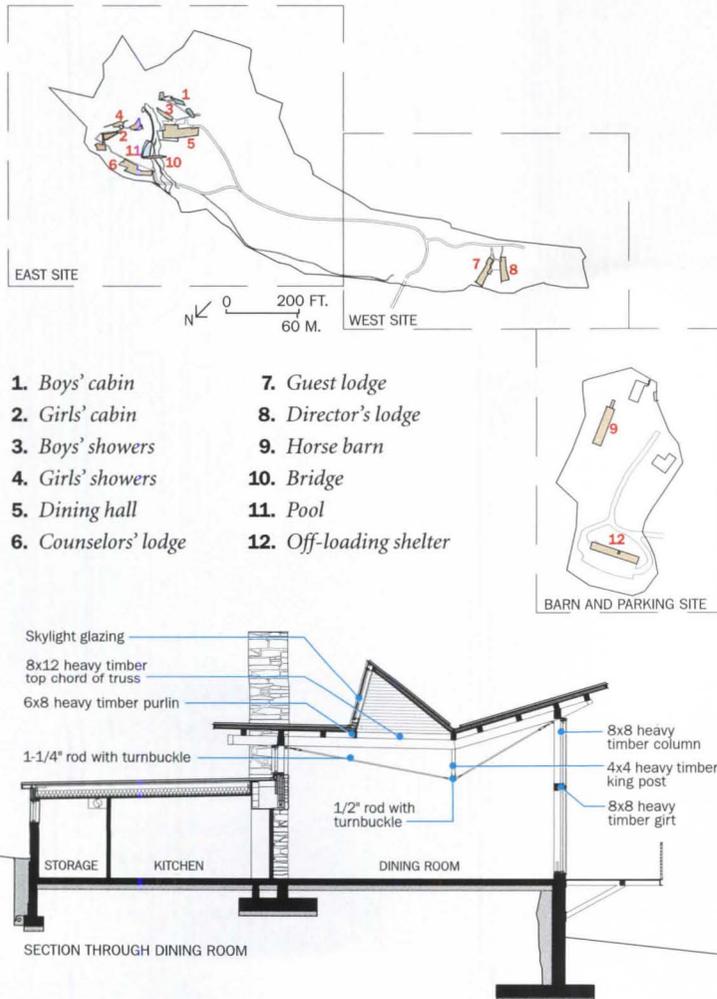
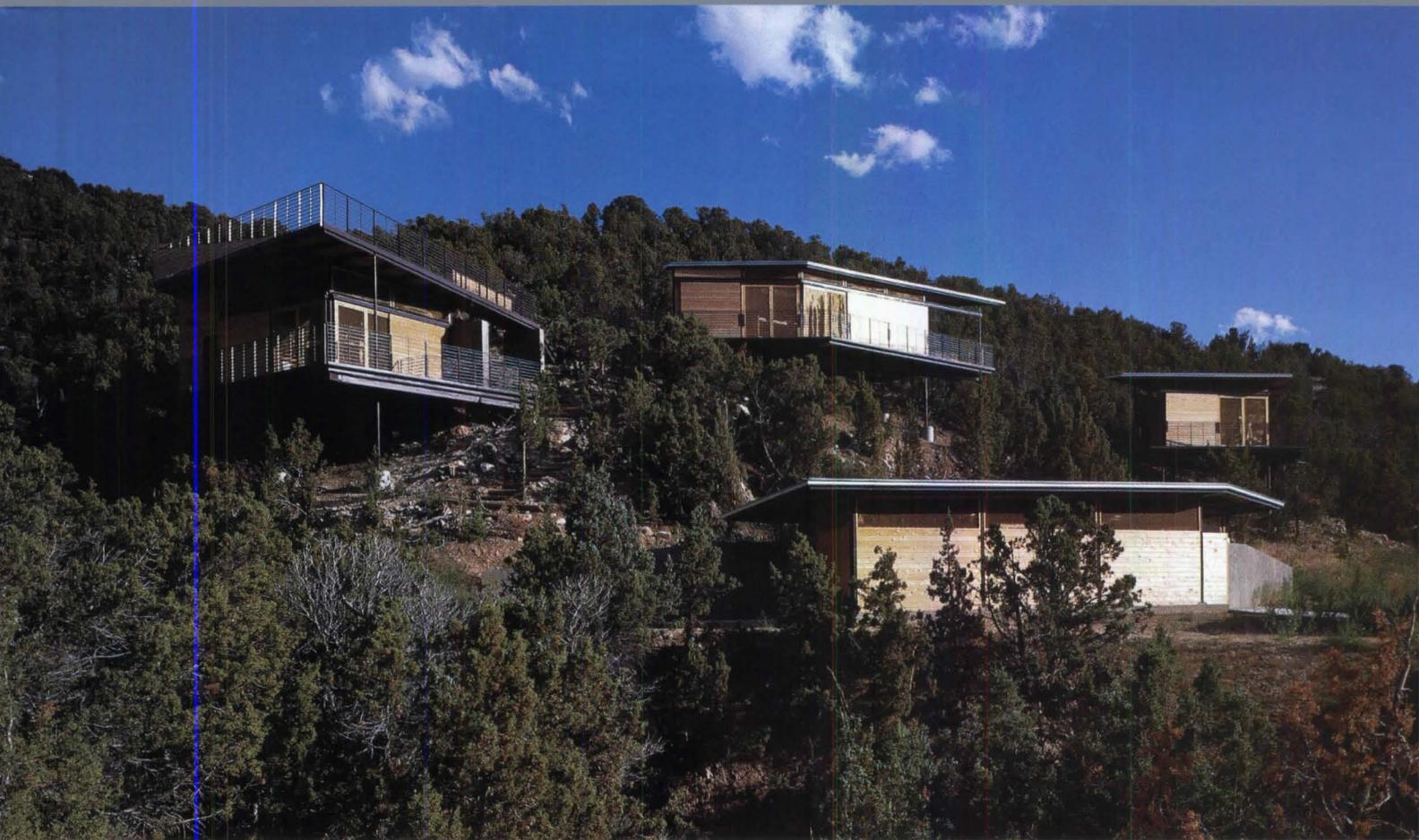
Engineers: *Arup (structural); Weber (MEP); Steedley (civil); Wolz (surveyor)*

General contractor: *Groathouse*





The low-lying, tilted, standing-seam roofs echo geologic features in the landscape—especially where rock formations resulted from sliding plates and induction processes.



Carol raises thousands of head of cattle. Like much of northern Wyoming, it is landscape with a big sky and multiple personalities—passing from mesas and rolling hills silvery with juniper and dry sage brush to vast meadows flecked with occasional wild deer or elk to billowy cottonwood trees bordering the Paintrock Creek to massive terra-cotta-colored rock formations, seemingly surging up in long horizontal striations.

The project brief included a horse barn, a dining hall, a counselors' lodge, a director's house, and cabins for the 36 campers at each summer's two sessions (a remarkably small group of students, drawn annually from a pool of 10,000 eighth graders in the Los Angeles Unified School District). Taking bold, but calculated, risks, the Almses stipulated that the camp would be co-ed "to teach boys and girls to live together"—though males are explicitly forbidden from the female cabin zone, and vice versa. To develop further responsible attitudes, the campers would sleep in bunks without a counselor present. And, according to Rose, his clients favored rugged and challenging over cushy conditions, separating bathrooms from sleeping cabins, offering no paved paths, and omitting handrails wherever possible.

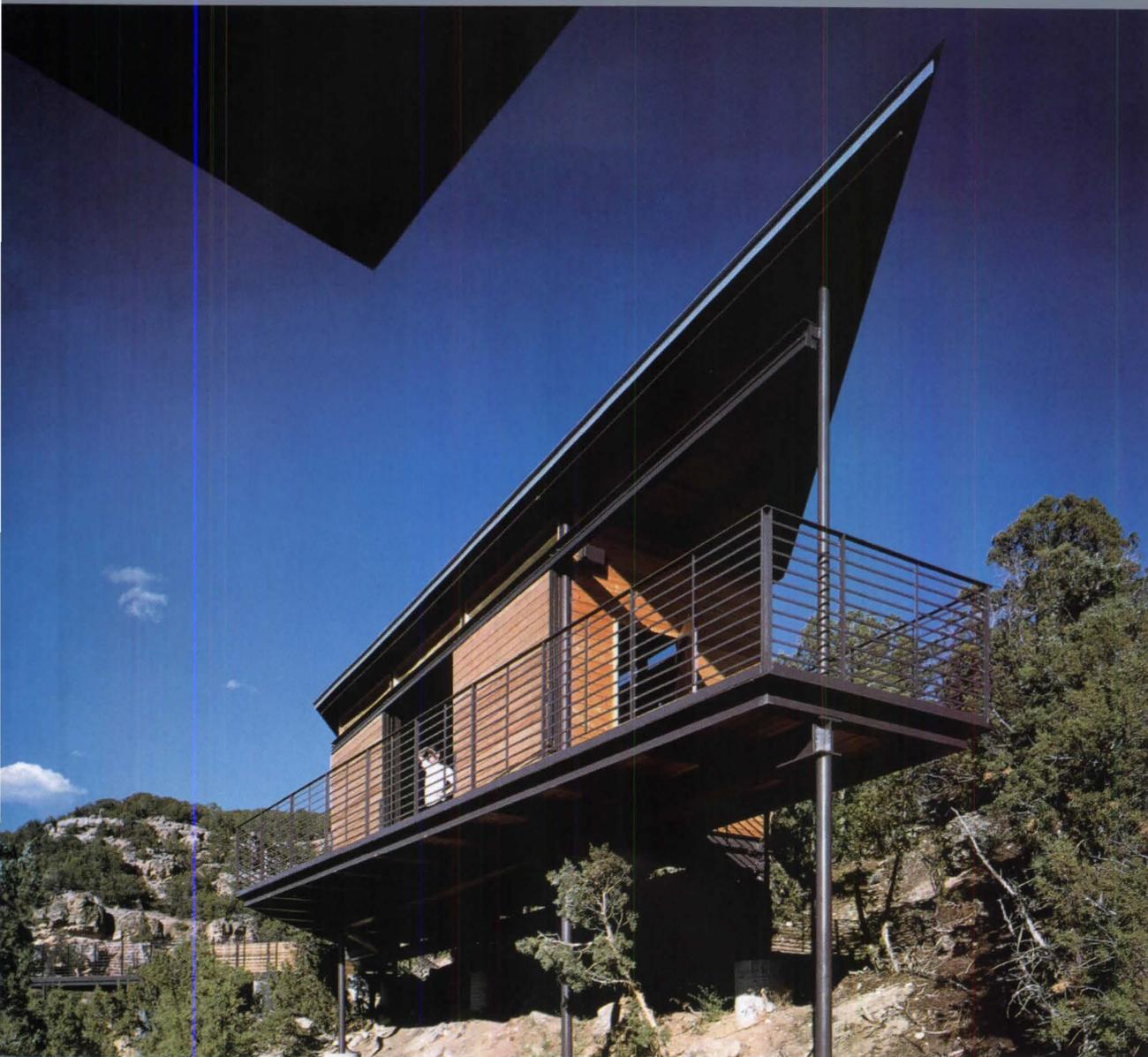
The landscape and its geologic formations provided immediate inspiration for Rose. At the same time, a tight budget, the remote location, and a mandate for a fast-track schedule (ultimately lasting 15 months from start to finish) persuaded him to enlist materials—steel, corrugated galvanized aluminum, concrete, regional river rock, and cedar siding—that matched the experience of local builders. The resulting scheme responds in scale, color, and texture to the site's existing farm structures, as it disperses 30,000 square feet of space among 16 new buildings over a 10-acre parcel. The largest of Rose's structures are a horse barn and a dining hall that doubles as a great room.

"We were trying to do something that'd be fun for the kids, but not cutesy—sophisticated instead of playing down to them," says Rose. The horse barn echoes the low-lying quality of a large lambing shed on

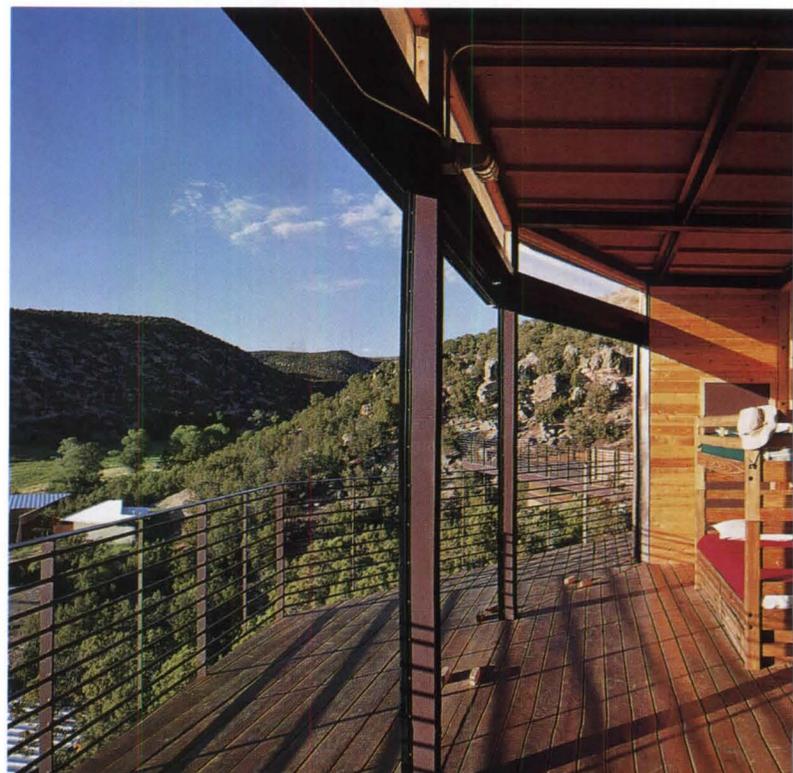


Perched on a canyon wall, the boys' cabins (opposite, top) rest on columns, allowing the structures to hover. The stable roof (above) establishes a visual dialogue with the mesa behind it. The dining hall's glazed elevations yield an exceptionally open quality (right, far right, and bottom). Apparently light wooden mullions play against the solidity of a river-stone chimney.





Instead of a conventional, dimly lit barn, the luminous stable (opposite) has skylights and clerestories. The visually floating boys' cabins, with their radically acute corners, have a subtle presence in the landscape (left and bottom left). All cabins feature rolling doors and screens that can open to the outdoors (below).





the site, while, at the same time, bursting open the traditional barn form. Hardly a conventionally boxy volume with a dark interior, Rose's stable is light and airy, clad in pale galvanized aluminum, with translucent polycarbonate-paned skylights and clerestories. The building's dogtrot, linking the stables to a storage room, frames views of Paintrock Canyon. At this juncture, the roof folds and jauntily tilts upward, following the silhouette of a mesa to the south and evoking the sliding plates and induction processes of nearby geologic formations.

Across the pastures, the dining hall, the prime indoor communal space, also rises to a playfully folding, liling, and overlapping standing-seam roof. The roof's exposed heavy-timber structure forms inverted king-post trusses with steel-rod tension chords. A glazed south-facing wall with wood Mondrianesque mullions opens the room to spectacular views (as well as extreme heat when summer temperatures soar into the 100s).

Just as the campers use the site—its rock faces, streams, meadows, and trails—in varied ways, so too has the architect shaped and sited his buildings in response to a range of landscape conditions. The three boys' cabins, hovering over a canyon wall, are raised on columns, carefully placed to minimize site disturbance. Meanwhile, the three girls' cabins, across a gully, nestle into the land, and the shower buildings, with deep-set retaining walls, are further embedded into the hillside. Large rolling screen doors and outer wooden panels open the cabins to the outside. Through roof decks, lookouts, and elevated, interconnecting walkways, the scheme

offers lots of views and overviews, encouraging different ways of seeing the landscape, as well as the complex array of roof configurations.

And the campers really seem to get it. A Paintrock teen named Michelle recently commented on "how you can see the night sky from every single bunk." Her fellow camper Betty chimed in: "And all the cabins are unique—some have roof decks, some don't but are close to the stream (which can help hot nights feel a lot cooler), some are near the bathrooms (which can be a very good thing), and one has this great boulder coming up through the floor." By design, there's no best or worst cabin: They all have carefully calculated trade-offs.

Of course, inner cities have many more deserving teens than Paintrock alone can accommodate. But its influence is spreading. Camp Coca-Cola (with a strong corporate backer, rather than the hands-on presence and personal touch of the Almses) opened this summer in St. Louis. "I may scare people," says John Alm exuberantly, "but other corporations and The Alm Foundation [which supports Paintrock] need to do a whole lot more—we should build at least 500 of these camps, all across the nation." ■

Sources

Windows : *Dynamic Windows*

Plumbing: *Basin Mechanica (toilets, sinks, faucets, showerheads)*

Kitchen appliances: *General Electric*

www For more information on the people and products involved in this project, go to Projects at architecturalrecord.com.

The Imperial War Museum is set within a district emptied of its moribund factories and warehouses (opposite, bottom). A diagonal line scribed in the patterned asphalt directs visitors to the entrance (this page), a low arch set into the iconic pylon of the Air Shard.



CRITICISM With the IMPERIAL WAR MUSEUM NORTH, Daniel Libeskind builds his case for a major museum destination on a budget

By James S. Russell, AIA

Daniel Libeskind sliced forebodingly empty spaces through the galleries in Berlin's Jewish Museum to remind visitors of the abrupt end of centuries of Jewish culture at the hands of the Nazis. He did not shrink when asked to depict in the fabric of a building the short, tragic life of Felix Nussbaum, which ended in the ever-tightening vise of the Final Solution [RECORD, January 1999, pages 76 and 90]. And in Manchester, in the haunted heartland of Britain's vanished 19th-century industrial might, he has now attempted to convey the tragic effects of war in the Imperial War Museum North (IWMN).

In Libeskind, the professional is personal. Fascism drove his family from Poland to the Bronx when he was a child. Death camps immolated relatives. "Imperial, war, and museum are the three worst words in the English language," he observes with a characteristically heavy-handed rhetorical flourish. So why did he take on this outpost of a museum whose headquarters in the former London asylum called Bedlam is festooned with the armed bellicosity of sun-never-sets empire? The professional: "The challenge is to get the public to want to come to a museum about conflict," he says. The personal: "I would not be alive had the Allies not taken up conflict with the Nazis," he said in an interview. "This museum doesn't celebrate war, it shows the difficulty of attaining peace."

His passion, tenacity, and ambition have taken him down an unusual path in this era of emotional distance. His work evokes the "speaking architecture" of the French 18th century, in which the very fabric of the structure is intended to change you, to prepare you to experience things differently. His approach appealed to the IWMN trustees because it expressed so well the intention to make more of the subject than a bombastic paean to heroism or an exploitation of the power and sex appeal of armaments. This branch's mission was, says director Jim Forrester, "to think about war's effect on people. We are interested in the toil and sacrifice of the armed forces, but also the people behind the scenes, those who stayed home and those who were caught in the middle."

But as you leave Manchester's hard-bitten—albeit in the process



of being revitalized—city center, you wonder just what Libeskind has gotten himself into. Well before you arrive, the building's silvery interlocking curves announce its presence across the considerable emptiness of what was once among the world's largest inland ports but is today a vast flat plain dotted randomly with industrial leftovers and the occasional parking-lot-fronted retail strip. The museum's shiny roof folds over dark-painted,

almost windowless walls of concrete. Surrounded by a fence (erected to foil vandals and terrorists alike), the building sits on an unarticulated expanse of asphalt. The initial effect is of Sam's Club with Style.

Is this forbidding arrival an appropriate introduction to the regimented world of the military and the unyielding realities of war? Or is it

Project: Imperial War Museum North, Manchester, United Kingdom
Architect: Studio Daniel Libeskind—Marcus Aerni, Wendy James, Martin Ostermann, Sören Bisgard, Stefan Blach, Gerhard Brun, Christopher Duisberg, Lars Fischer, Mari Fujita, Lars Gräbner, Jeanette Kuo, Susanne Milne, Daniel Richmond, Franziska

Streb, Alexis Trumpf, team
Associate architect: Leach Rhodes Walker
Engineers: Arup (structural); Mott MacDonald (mechanical)
Consultants: Real Studio (exhibition design)
Contractor: Sir Robert McAlpine

simply clumsy architecture? At the least, it represents the perils of Libeskind on a budget. The building's apparently arbitrary curves are supposed to represent shards of "the contemporary world shattered into fragments by conflict," as Libeskind describes it. Each represents a realm of conflict. The signboardlike vertical pylon called the Air Shard spears the grand horizontal vault of the Earth Shard, which contains the exhibition spaces. The Water Shard, enclosing a restaurant facing the Manchester Ship Canal, laps tentatively over Earth.

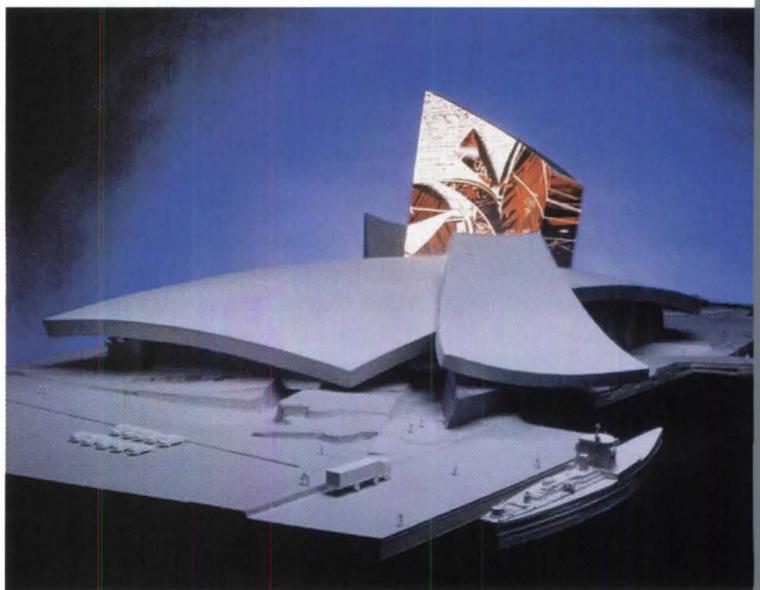
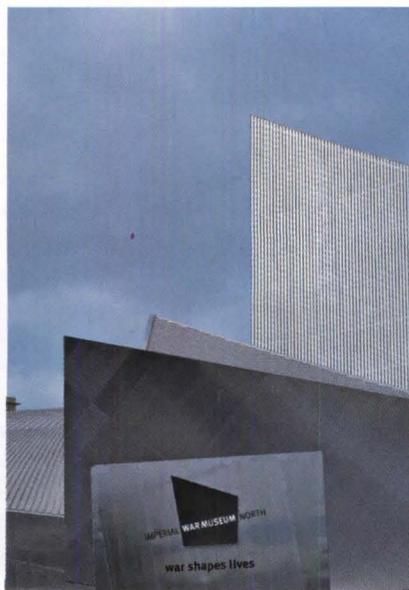
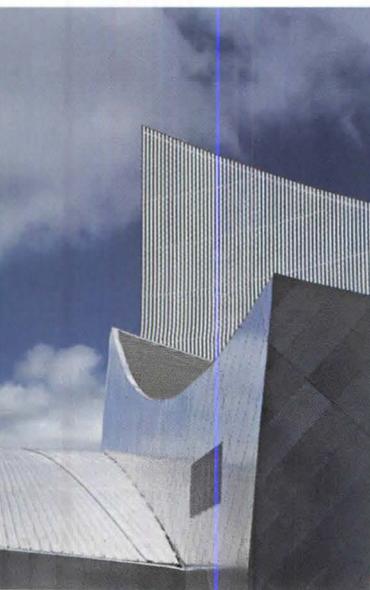
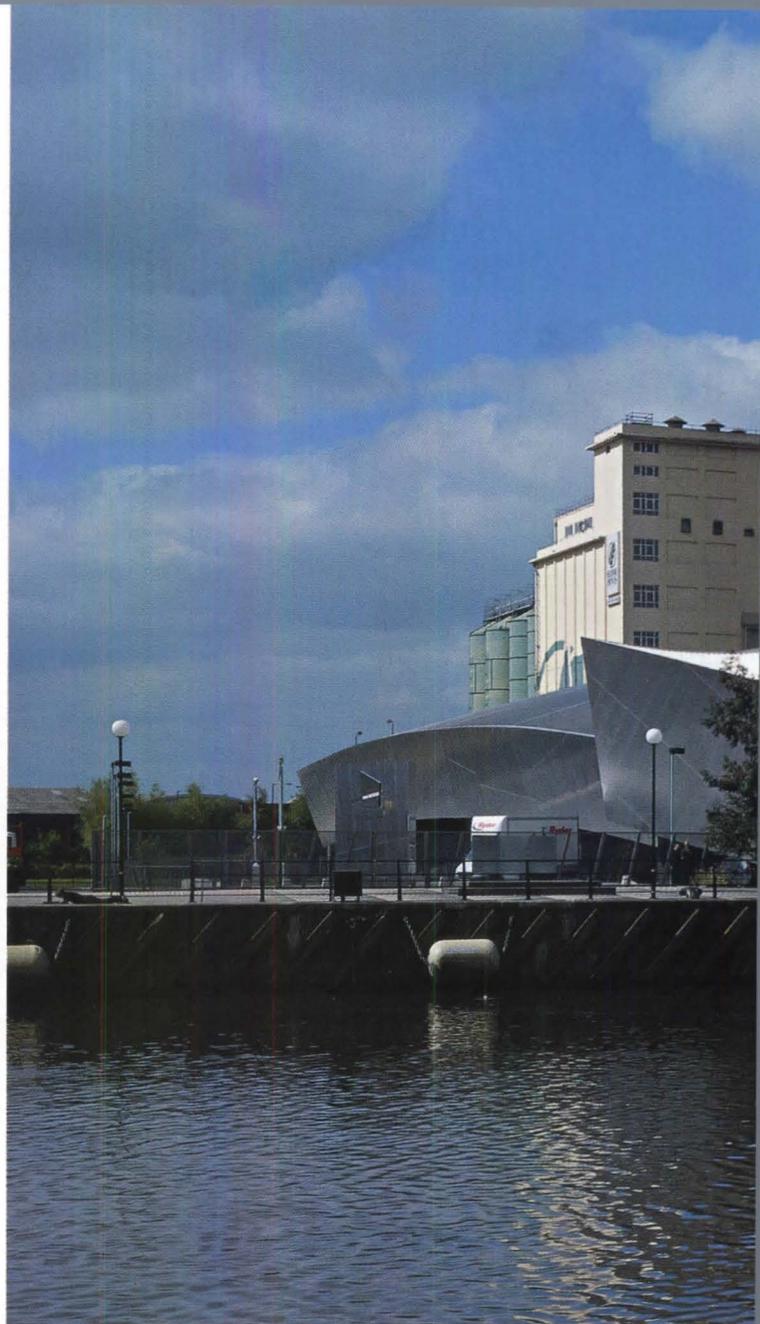
The shard idea was far more apparent in Libeskind's competition design (below). But several funding sources failed to materialize and what had been projected to be a budget of about \$62 million had to be pared back to a cost of about \$47 million. Given such a daunting constraint, Libeskind did not return to first principles, but reworked the design, attempting to retain its emblematic power. The lumpy result does not convey that power, even if you agree with Libeskind's insistence that the visitor need not "get" the shattered-globe metaphor.

Libeskind's trademark is to get to your emotions through your body, and this strategy remains largely intact once you enter the museum. The cramped entrance explodes vertically into the 95-foot height of the Air Shard. On a typically bleak day, wind whistles through gaps between

THE INITIAL IMPRESSION OF THE MUSEUM IS SAM'S CLUB WITH STYLE.

the metal-batten cladding, adding a haunted-house note to the spectacle of muscular, crisscrossed tubular-steel supports (page 130). Visitors are invited to take an elevator, which threads its way up through the 4.5-degree tilt of the shard to a viewing platform, where they are offered a vista over the old port, decimated by German bombs in World War II. The open, metal-grid flooring induces vertigo even in those who are nonagoraphobic enough to ascend in the first place.

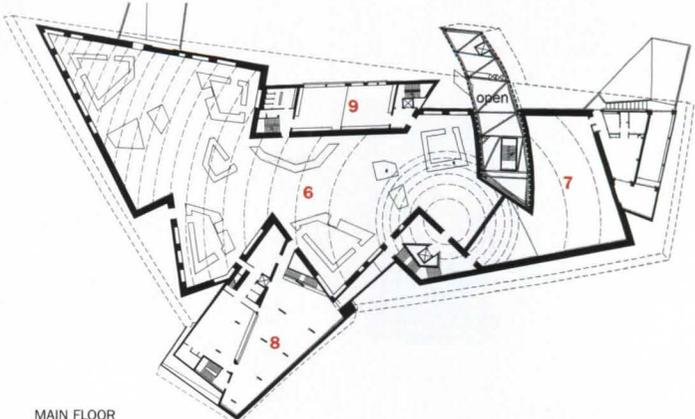
Exhibitions do not begin until after you enter the museum proper, passing through a low-ceilinged lobby and ascending the twisting stair to the upper level. The permanent exhibits occupy an enormous single space under the curved vault of the Earth Shard ceiling. With zigzagging outer walls, a U.S. Marine Corps Harrier jet apparently crashing through a wall, and jagged "silos" enclosing small, roomlike thematic presentations, the space's full extent is not immediately visible, but you are urged to explore its farthest reaches. The gently domed asphalt floor, echoing the



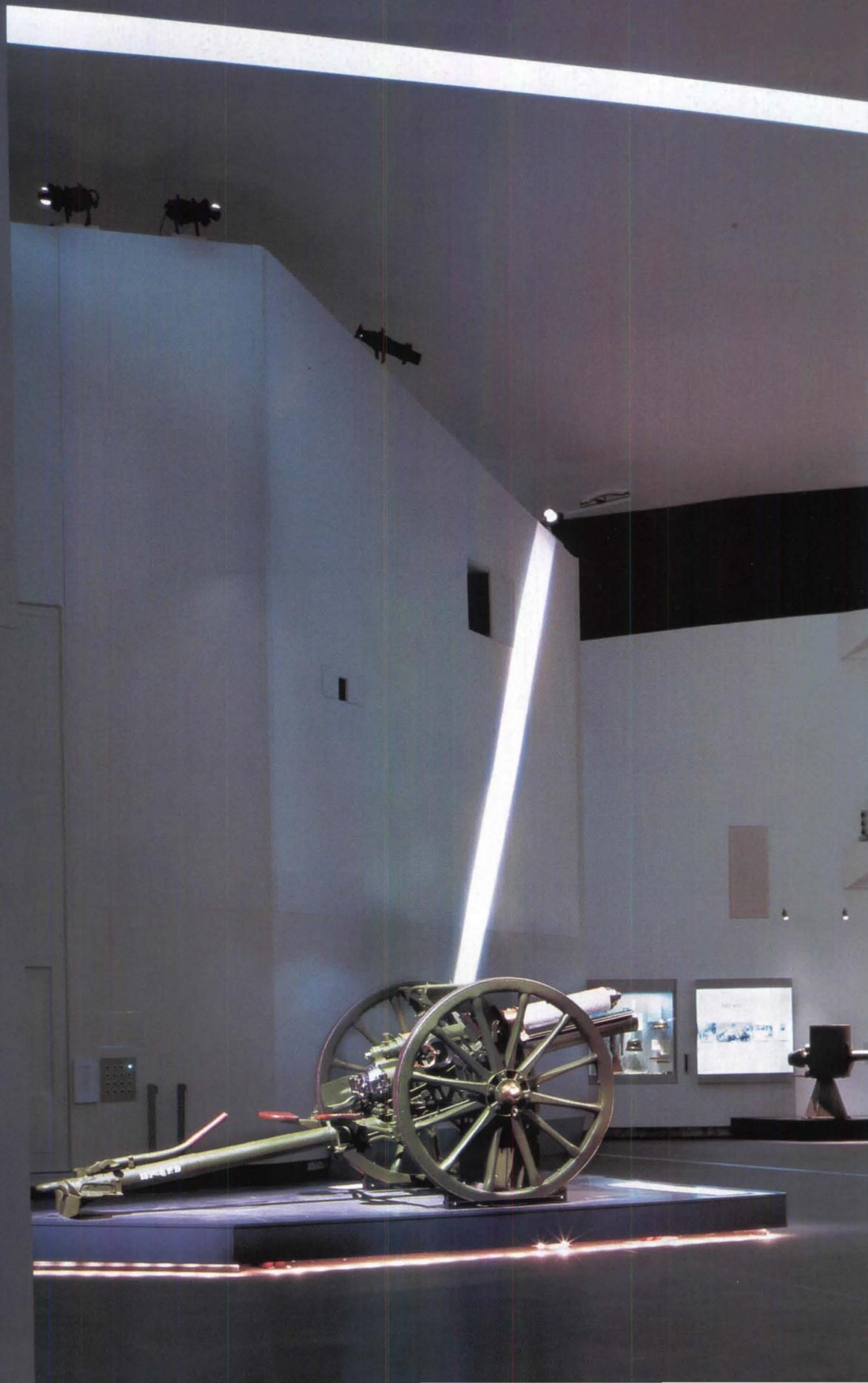


Libeskind first proposed thin-shell concrete roofs over a pancaked zigzag volume containing the exhibitions (opposite, bottom right). The shard idea was pared back (opposite, bottom left and middle, and viewed canal-side, this page), and the office later eliminated the thin curves of concrete and scrapped an ambitious program of artist-designed gardens.

- 1. Air Shard
- 2. Lobby
- 3. Gift shop
- 4. Offices/classrooms
- 5. Stair to exhibits
- 6. Permanent exhibit
- 7. Temporary exhibit
- 8. Restaurant



The museum's major drawing card is The Big Picture Show (designed by Event Communications), in which the permanent exhibition's wall surfaces become a screen for 15-minute-long thematic audio/visual presentations drawn from the museum's extraordinary image archives.

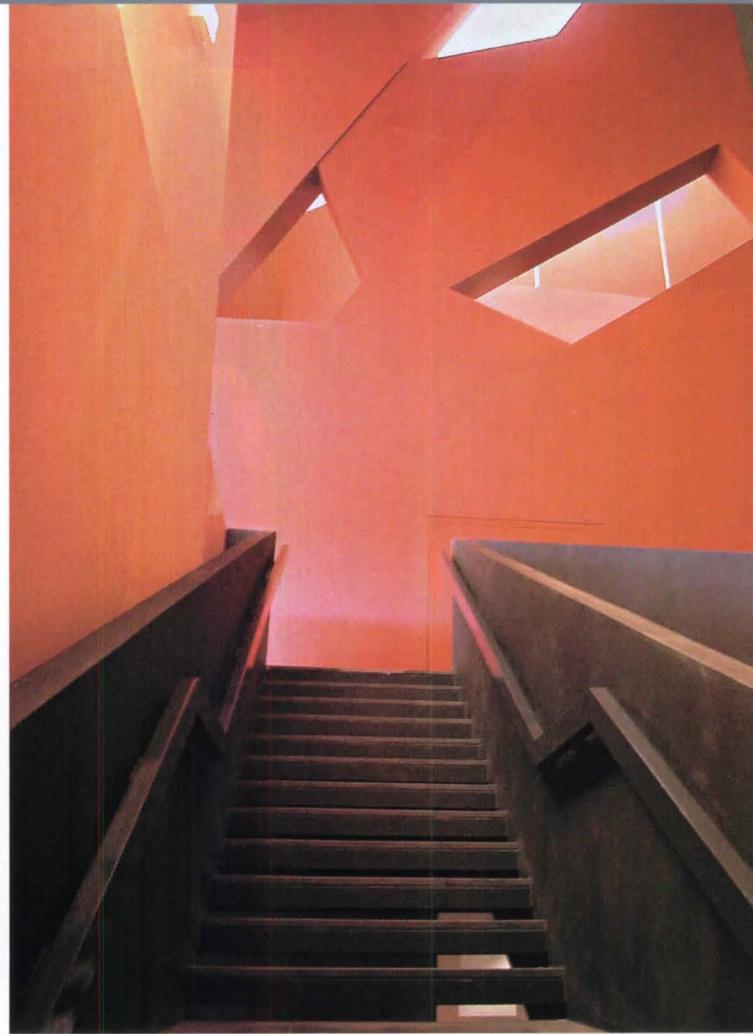


5
SCIENCE, TECHNOLOGY AND WAR

30 31

← way out





An elevator ascends through the tilted Air Shard (top left). The Water Shard houses the restaurant (bottom), near a stair to the boardroom (above). Libeskind's forbidding shapes and the menacing mounting of a Harrier Jet typify the museum's questioning stance (opposite).



roof's curve, insistently, perhaps unconsciously, tickles your nerve endings.

Libeskind's visceral approach—physically jarring you out of the confines of the everyday into the maelstrom of war—matches the museum's mission perfectly. “We made a conscious decision to allow ourselves to go into emotional territory,” says Forrester. The intention to consider the effects of conflict rather than merely to trace it historically transformed the visitor experience from a passive one of gazing onto objects into one where artifacts and interpretation are used to stimulate questions and conversation. Indeed, much of the collection housed here is stored in a computerized stack system. Docents (cloyingly called “inter-

LIBESKIND'S APPROACH—JARRING YOU INTO THE MAELSTROM OF WAR—MATCHES THE MUSEUM'S MISSION PERFECTLY.

actors”) fetch up items in response to visitor interest or to make a point: You may view a letter from a soldier that arrived on exactly the same day as a telegram informing his family that he died. “The building sets you up for something different,” says Forrester. “And it challenged us to create as bold an experience as the building offers.”

Forrester says that visitors do find this approach stimulating. “People linger and talk. We can't get them out,” he says. And visitor figures are comfortably over projections. The half-life of innovative museums can be short, however. The exhibitions at the Berlin Jewish Museum have failed to live up to the expectations created by Libeskind's building and are being revamped.

Libeskind gamely claims that revisiting every aspect of the design in a quest to reduce costs actually improved it, but the process

seems to have stripped out the multiple readings and layers of meaning his team was able to offer at the Jewish Museum. In the face of adversity, he conspicuously soldiered on, as he did in Berlin, which took 11 excruciating years. But in this case, Manchester has ended up with little more than fun-house effects, like the dizzying platform in the Air Shard.

The Imperial War Museum has been well received in most of the European press, so I had to ask myself why the finished building so deflated my expectations for it. Perhaps others chose not to see the plop urbanism this represents. Across the canal from the museum, the city parachuted into this post-industrial no-mans' land The Lowry, a bombastic big-budget performing arts center recently completed by Michael Wilford. It gestures importantly across a bleak plaza to an outlet mall. With capital-C culture and low-c commerce united, you find the stock ingredients of 21st-century urban regeneration in its most dispiriting form. It reminded me of the doomed attempts by American cities to spur regeneration by trying to take some idea that succeeded elsewhere and implant it lite. Spectacle architecture can't be expected to work any better than the favored alternative, watered-down historicism, when it lacks an adequate commitment of resources and is unmoored from any apparent vision of what this part of Manchester should be. ■

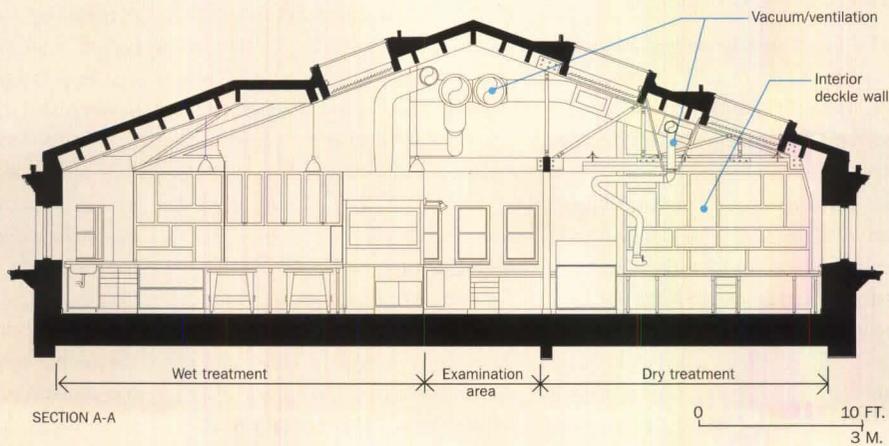
Sources

Metal roofing: Kalzip; Corus
Curtain wall: Broderick Structures
Masonry walls: Keith Walton Brickwork; Sto (synthetic stucco)
Hardware: Elite Ironmongery
Furnishings: Wilde + Speith, and

custom by architect

Lighting: Erco

www For more information on the people and products involved in this project, go to Projects at architecturalrecord.com.



Custom workstations in the dry-treatment area (above) are spacious enough to accommodate both objects being examined and modern equipment. An interior wall (opposite) is composed of rectangular elements resembling deckles (paper-making frames); some pop out to display new papers.

For paper savers, **Samuel Anderson Architect** transforms an old attic at the Pierpont Morgan Library in New York City into the modern **THAW CONSERVATION CENTER**

By Deborah Snoonian, P.E.

During a recent trip to the new Thaw Conservation Center at New York's Pierpont Morgan Library, visitors spied a sheaf of letters written by English satirist Jonathan Swift sitting on a cherry countertop. Conservator Reba Snyder, who has the cool, firm handshake of a surgeon in a hygienic smock, was inspecting the pieces for signs of wear and tear. She gladly (albeit gently) thumbed through them so the group could get a closer look.

Such is a day in the life at the Thaw Conservation Center, where the Morgan's entire world-class collection of works on paper will be safeguarded against the ravages of time. The project reaffirms designer Samuel Anderson Architects' mastery of the programmatic and aesthetic challenges of outfitting old buildings with climate-controlled environments to protect objects of cultural and historic value—a skill the firm honed at Harvard's Fogg Art Museum [RECORD, September 1997, page 102]. Meanwhile, the Morgan now enjoys a state-of-the-art paper-conservation laboratory and educational center that's as handsome as it is functional.

Building the Thaw was a strategic milestone for the Morgan, which owns more than 350,000 drawings, prints, and manuscripts, one of the largest private collections in the U.S. "If we can't preserve our collection, our raison d'être has vanished," says Charles E. Pierce, Jr., director of the library. Conservation was once done on an ad hoc basis to prepare objects for exhibitions, but with the new facility, and under director Margaret Holben Ellis, the library can now establish a systematic plan for preserving all its precious holdings.

Conservators at the Morgan, a complex of three buildings in Midtown Manhattan, were eking out an existence in the attic of the Morgan House, a brownstone built in the 1850s with an addition dating from the 1890s. The attic, dim and rabbit-warrenish, lacked climate control and other modern technology needed for the meticulous work of paper conservators. It was this attic the architect had to retrofit.

Principal Samuel Anderson sought to retain the historic flavor of the space while updating its mechanical systems, envelope, and fur-

nishings. Scrapping a dropped ceiling opened up the interior dramatically and revealed a stately old wooden roof truss. He insulated the roof, which then had to be strengthened because the thermally neutral surface would bear a snow load. Adding steel plates to the wood truss and layering plywood in a staggered pattern over the original sheathing did the trick. "This was the biggest technical challenge of the project," says Anderson.

Project: Thaw Conservation Center at the Pierpont Morgan Library, New York, New York

Designer: Samuel Anderson Architect—Samuel Anderson, design principal; Edward Gormley, project architect; Evan Ripley, staff architect; Jeff Atwood, Roger Mullin, project team

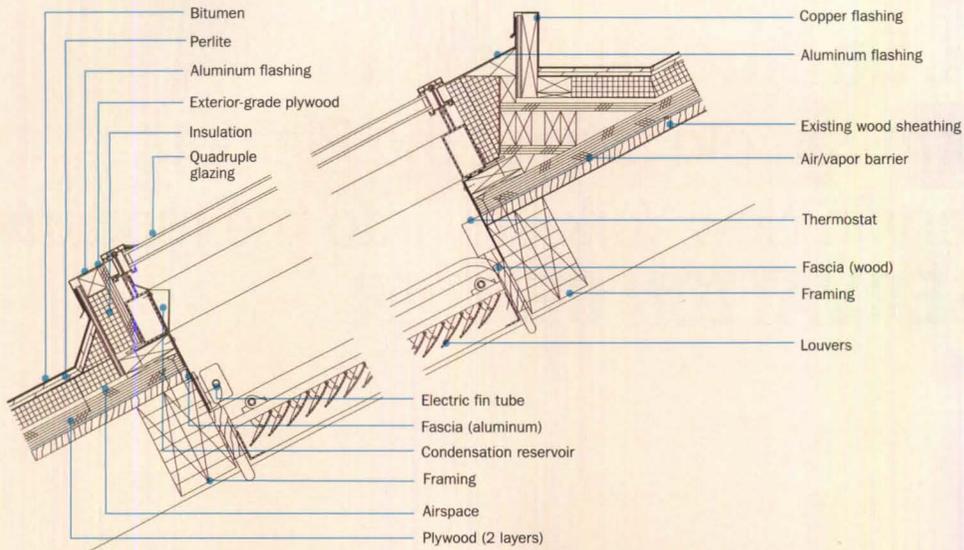
Structural engineer: LZA Technology

MEP: Landmark Facilities Group

Consultants: Kugler Tillotson Associates (lighting); Acoustic Dimensions (acoustics); Construction Specifications (specifications)

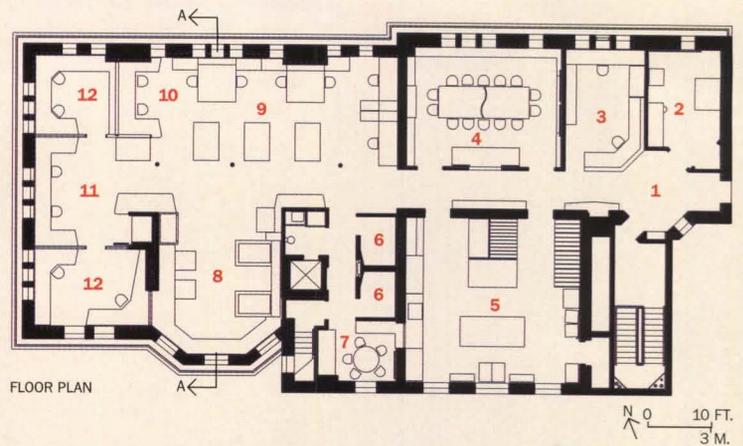
Construction manager: Barney Skanska





The Thaw's old brick and wooden roof provides a contrast to new materials and technologies (below). Custom tables and large stainless-steel sinks (opposite, top) let conservators give papers a bath in the wet-treatment area. Shelving and drawers line the matting and framing room (opposite, bottom).





Because the Thaw must be humidified to prevent paper from expanding and shrinking too rapidly, a vapor barrier was installed around the envelope so that moisture won't condense on outside walls. Likewise, perimeter spaces around windows and skylights were thermally broken. Quadruple-glazed windows and skylights also prevent condensation, and their innermost layer is laminated to screen out UV rays. The natural light that pours in helps conservators distinguish white tones from one other, says Ellis, and windows and skylights frame city vistas.

Materials for custom furnishings were selected for their low volatile organic compound (VOC) content to prevent offgassing that would degrade paper. Surface treatment areas in solid cherry lack any glues, and the marine-grade cherry-veneer plywood used in the cabinet-work has a low formaldehyde content. Furnishings with simple, clean lines provide a textural interplay with the old brick and wood. The leit-motif of old and new in the Thaw's design complements the increasingly complex and technological work performed within its walls.

Anderson divided the floor plan into two functional areas: the western portion for wet and dry conservation, the eastern portion for services like the entry and reception area, photography, matting and framing, and a seminar room/library. Because visitors enter the Thaw from the east, Ellis notes that the layout keeps them from disturbing conservators working in the treatment areas. The Thaw's services will eventually be shared by the book bindery, to be located in the east, where Renzo Piano is planning a large addition to the Morgan Library.

Anderson enjoys working with conservators, who, like architects, are immersed in the art and science of the tangible. The Thaw gives these artisans a cozy home in the heart of the city, nestled high between the jutting pinnacles of skyscrapers and the muffled hum of street life. In an age of digital everything, it's a place where one knows that pixels will never trump paper. ■

- | | |
|--------------------|------------------------|
| 1. Entry/reception | 7. Pantry |
| 2. Photography | 8. Wet-treatment area |
| 3. Administration | 9. Dry-treatment area |
| 4. Seminar room | 10. Intern/fellow desk |
| 5. Matting/framing | 11. Examination area |
| 6. Rest room | 12. Office |



Sources
Custom-fabricated structural system: *Feinstein Ironworks*
Windows: *Manning Design (custom mahogany)*
Glazing: *Southwall Technologies (exterior windows, skylights); Depp Glass (clear and patterned glass on interior walls); Bendheim Glass (colored laminated glass on*

interior walls)
Cabinetwork/custom woodwork: *Peterson Geller Spurge*
Custom sinks: *BRC Commercial Kitchens*

www For more information on the people and products involved in this project, go to Projects at architecturalrecord.com.



Frank Harmon has designed a rugged **IRON STUDIO** at the Penland School of Crafts in the Blue Ridge Mountains of North Carolina

By Sara Hart

Can a series of subtle moves, carefully considered, be as notable as the Big Move—shorthand for the architect's conspicuous signature etched in steel and concrete? The administrators at the Penland School of Crafts thought so when they began their search for someone to design a new Iron Studio for the campus. A quiet institution nestled in the stately Blue Ridge Mountains of North Carolina, Penland is not a major university or ambitious cultural institution in need of a high-profile building. Founded in 1929 for the benefit of weavers, it has evolved into a nationally recognized learning center for 10 distinct crafts, including clay, glass, metals, textiles, and wood, and occupies a 400-acre campus 50 miles northeast of Asheville.

The Iron Studio is not—as its name may imply—a vocational school for farriers, a trade with limited market value in the 21st century. Instead, students learn to hammer, forge, and weld iron and steel into sculptures and functional artifacts. Because of Penland's commitment to craft, it makes sense that the school commissioned Frank Harmon, FAIA, to design the studio. Harmon is a Raleigh-based architect recognized for his own hands-on approach to projects that he and his staff often build themselves [ARCHITECTURAL RECORD, February 2001, page 120]. He's also an associate professor of architecture at North Carolina State University (NCSU), in Raleigh. The university's College of Design follows the Bauhaus doctrine of "learning by doing," Harmon acknowledges, so it's not unusual for students to get their hands dirty in the field. In this case, Harmon invited eight graduate students to spend a weekend at Penland inhaling the mountain air as well as the smoke of a coal-burning forge and to imagine a new studio for

Project: Iron Studio, Penland School of Crafts, Penland, North Carolina

Architect: Frank Harmon, FAIA, principal in charge; Charles Holden and Vincent Petrarca, project architects

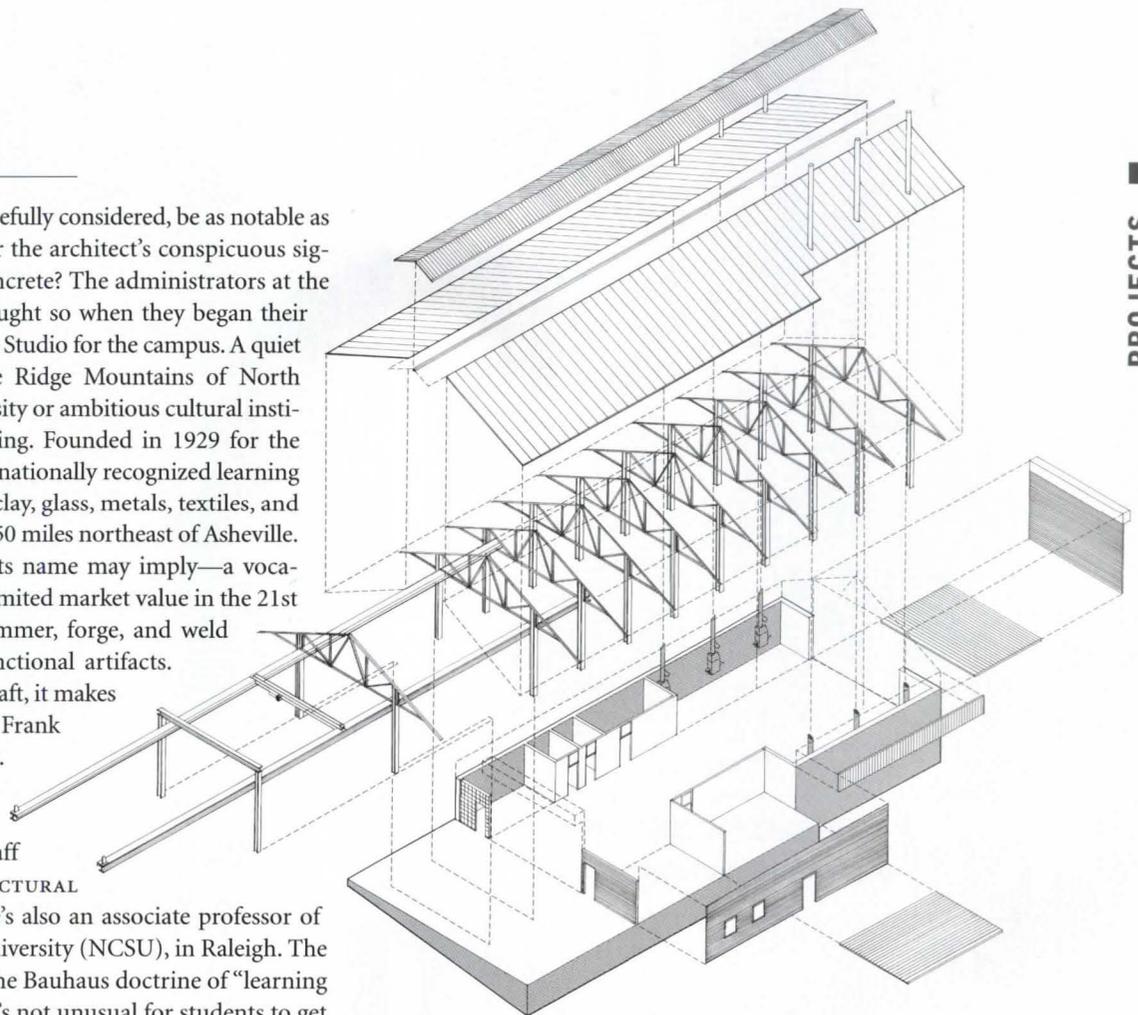
NCSU design team: George Carter, Jason Holt, Ay Chung Liu, Tim Martin, Vincent Petrarca, Chris Rae,

Rob Wagner

Engineer: T.C. Howard, Synergetics (structural); Ernest G. Myatt (mechanical)

General contractor: Appalachian Building Services—Ben Strickland, Fuzz Convery

Forge designer: Hoss Haley, Penland resident artist



The Iron Studio (opposite and above) is a deceptively simple shed, composed primarily of exposed concrete block and a steel-trussed roof clad in galvanized sheet metal.



The south portico (left and below right) provides students with a view to the mountains and a covered work area. The rear facade (below left) has a rolling door that allows cool air into the forge area.





- 1. Forging stations
- 2. Fabrication
- 3. Classroom
- 4. Deck
- 5. Tool storage
- 6. Office
- 7. Vestibule
- 8. Porch
- 9. Scrap storage
- 10. Sandblasting
- 11. Compressor
- 12. Coal storage

Students in the forge area hammer and weld red-hot metals into functional objects and works of art.

apprentice smiths. The students spent the next few weeks sketching a concept and returned to Penland for client feedback.

Harmon and two associates—Vincent Petrarca and Charles Holden, AIA—then transformed the students’ ideas, along with their own, into a buildable plan. The result is an open, steel-framed loft space with workstations around the perimeter and a high roof for exhausting smoke. The 6,312-square-foot studio is sturdy and practical, as one would expect. The Harmon Way guarantees that the design respects the program, the site, and the client and never wanders off into an exploration of architectural abstractions.

And yet, the craft is visible in his work, because Harmon has the same respect for off-the-shelf materials as he does for luxurious ones. Concrete block, corrugated metal, polycarbonate, and steel—the stuff of prefab industrial sheds—are, in Harmon’s hands, worthy materials that, given the proper expression, make inspiring architecture. The stainless-steel flues that exhaust the smoke from 12 forges rise higher than they need to, but this move creates a defining, albeit modest, skyline and there-

fore a presence that distinguishes the Iron Studio from the other Penland studios housed in generic structures.

Then Harmon gave the ironmongers the gift of light. Clerestory windows and a skylight that runs the length of the studio flood the space with daylight, proudly illuminating the butch tools of a gritty trade— anvils, chisels, hammers, and fire-breathing forges—and, of course, exposing the usually hidden scars of construction. ■

Sources

- Exterior masonry:** *Concrete Block Insulating Systems*
- Siding:** *Centria*
- Roofing:** *Centria*
- Windows:** *Binnings*
- Skylights:** *Polygal USA*
- Sliding doors:** *National Manufacturing (hardware)*

Upswinging doors: *Atlas V*

- Locksets:** *Schlage*
- Plumbing:** *Speakman*
- Forge flues:** *Selkirk Metalbestos*

www For more information on the people and products involved in this project, go to Projects at architecturalrecord.com.

The 72,000-square-foot building is rooted in a complex history—connecting underground to Munich Re's 1913 headquarters and using the bones of a 1973 office building as its own.



Baumschlager + Eberle transformed a nondescript office building from the 1970s into a sleek corporate home for **MUNICH RE** that is filled with art

By David Cohn

The seductive glass skin of a small corporate office building in Munich offers a good introduction to the holistic approach to design of its architects, the Austrian firm Baumschlager + Eberle. Like the building in general, the deceptively simple skin integrates discrete fields—art, architecture, and environmental engineering—into a pleasing and coherent work.

The glass forms the outer layer of a double curtain wall. In material terms, it is breathtakingly minimal: nothing more than laminated sheets of clear glass running between thin horizontal bands of green dolomite stone, with no mullions or framing, supported only by silicone-sealed slots in the stone. The sheets are angled slightly in plan and overlap. The open joints between them are precisely sized to allow ventilation for the operable windows on the inner wall while maintaining the skin's insulating value (and keeping out pigeons). Due to its thickness, the glass repels solar heat during the day, and its rippled surface shatters the reflections of its surroundings. At night, strips of pale white light set on the edges of each sheet, in an installation by Danish artist Olafur Eliasson, glow and fade across its length in subtle pulses and waves, "like curtains rolling in the wind," according to Bernhard Demmel, an associate with the architects.

The building behind this seductive screen is actually a luxurious makeover. Munich Re, Germany's largest reinsurance company, launched

David Cohn is RECORD's Madrid-based correspondent and the author of *Young Spanish Architects*, published by Birkhäuser in 2000.



a limited competition in 1998 to gut and rebuild the outdated speculative office building on the site, which it had erected in 1973. Known as South 1, the building is located across the street from the company's palatial headquarters of 1913, in an elegant, mostly residential neighborhood facing Munich's English Garden. Munich Re wanted to improve the image and performance of South 1 while retaining the original structure in order to maintain its underground parking, a feature no longer permitted in the area by local zoning. Competing among 10 German and Austrian firms, Baumschlager + Eberle (which is based in Liechtenstein) won the

Project: Munich Re South 1, Munich, Germany

Architect: Baumschlager + Eberle—Carlo Baumschlager, Dietmar Eberle, principals; Eckehart Loidolt, Christian Tabernigg, project architects; Marlies Sofia, Bernhard Demmel, Daniela Weber, Marc Fisler, Elmar Hasler, Alexia Monauni, team

Engineers: FSIT-Friedrich Strass (structural); OvM-Oskar von Miller (electrical); GMI-Gasser & Messner Ingenieure (HVAC)

Consultants: Vogt Landschaftsarchitekten (landscape); P.I.-Projekt Innovations (media)

Construction management: BIP Beratende Ingenieure



Curving glass penthouses on the top building (below and opposite, top) contain conference rooms and executive offices.



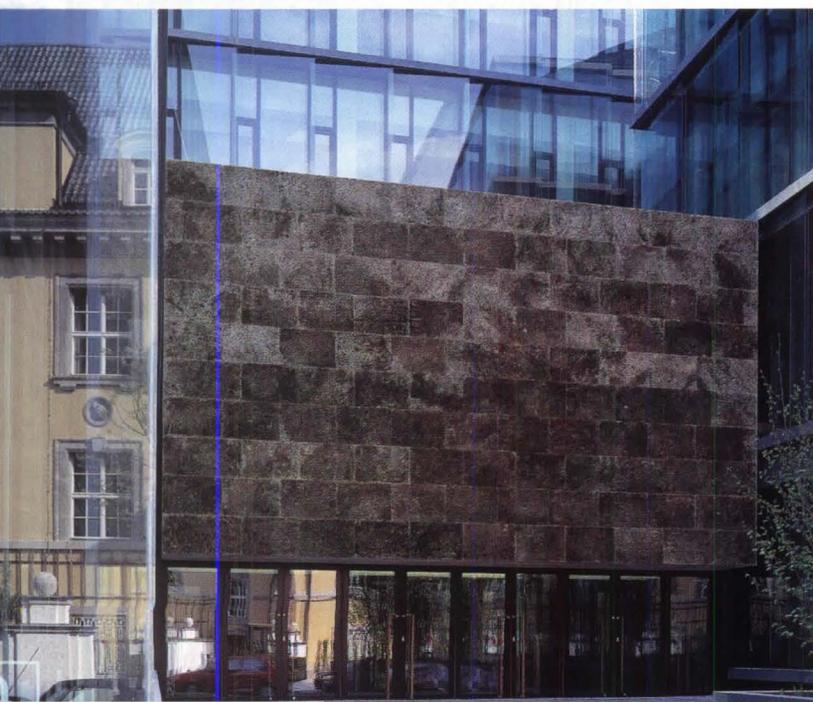
The architects and landscape designers wove a new courtyard into the office block (near left), creating a rich connection between old and new construction (far left). A double glass skin provides tempered air space between indoors and out (opposite, top).



commission by proposing radical cuts and additions to the structure, transforming the monolithic slab into an elongated S-shaped volume that brings interior offices and corridors closer to daylight.

The architects' first gesture made the building work better contextually: a deep gash that breaks the main facade on Gedon Street into smaller masses, in keeping with the street-wall rhythm of the early 20th-century apartment buildings on the rest of the block. This recess marks the entrance, which opens into a double-height hall, 180 feet long, that receives daylight from a central light court above it and a second cut in the rear of the building. The court was created by demolishing an entire section of the original structure and rebuilding it a few feet closer to the center of the block. It is largely lined with single-loaded corridors and is crossed at one point by delicate glass-walled bridges. Finally, the architects topped the structure with two curving penthouses that contain conference rooms and executive offices.

The interior finishes are as sumptuous as the exterior. For the offices and corridors, the architects developed partitions of translucent glass panels with integrated wiring and full acoustic isolation, so cunningly designed that door frames virtually disappear. They finished some

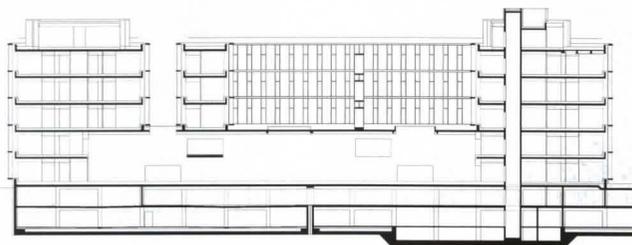


surfaces in support areas in a multitoned parquet of Canadian maple and dressed the double-story main hall entirely in this material, so it suggests a solid wood container. And thanks to audio-visual equipment integrated into the walls, the client can use one end of the hall for concerts and other events.

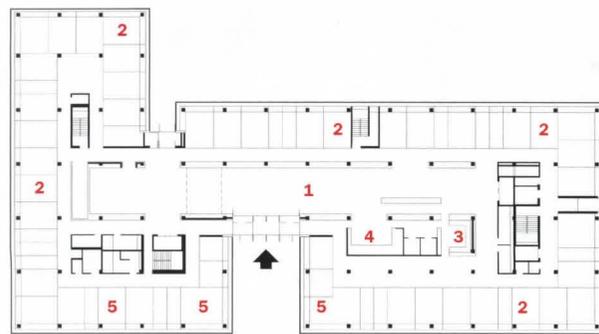
The architects' indefatigable detailing sweeps away all kinds of visual clutter. Sprinkler heads and access panels virtually recede from view. Supply and return air grilles in most rooms run along the joints where walls meet floors and ceilings, while those in corridor ceilings are integrated with continuous tube lighting. Where necessary, the parquet is perforated for better sound absorption.

Baumschlager + Eberle originally developed the building's transparent exterior to compensate for the narrowness of the offices themselves, a legacy of the existing structure and Munich Re's policy of giving employees private offices. In an ingenious detail, the architects actually set the exterior glass on the cantilevered ledge of an interior parapet wall, creating a pocket on the floor below that houses the motorized sun shades and offers protection from glare. Operable windows and shades give occupants a measure of control over their working environment. Radiant water-based heating and cooling under the floors regulates the building's indoor temperatures.

A stone wall at the main entrance to the building was injected with moss to give it a weathered look (opposite, bottom). In the main lobby, an art piece works like a cuckoo clock, opening a vertical panel once an hour to reveal a column of plasma screens (right).



EAST-WEST SECTION



GROUND FLOOR

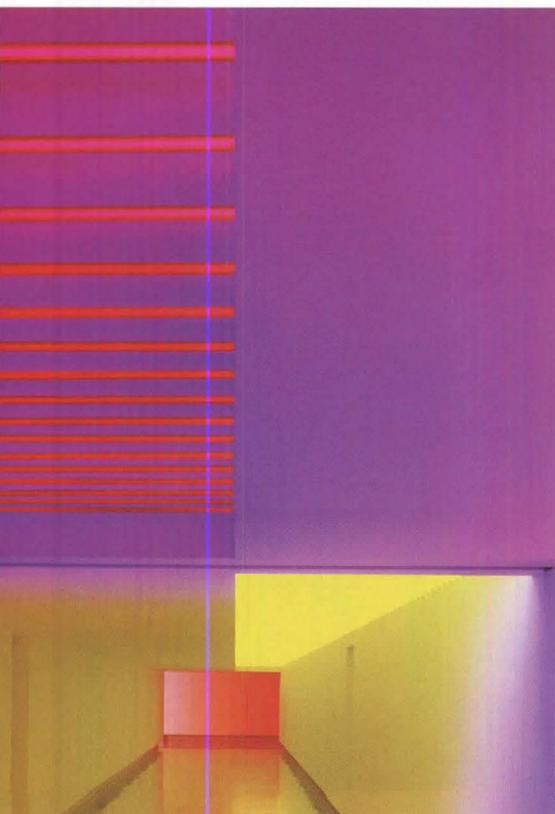
- 1. Lobby
- 2. Office
- 3. Kitchen
- 4. Café
- 5. Conference





The main hall is a two-story space wrapped in Canadian maple and detailed to suggest a solid-wood container. Due to equipment installed in the walls, the hall can be used for concerts and other events.





In office corridors, the architects integrated wiring into translucent glass panels and inserted continuous tube lighting at the ceiling (above left). A conference room in a penthouse and all offices have operable windows (right and above right). A program of artworks enlivens spaces such as fire stairs (opposite) and even a tunnel leading to the corporation's headquarters building (left).





In these discrete and disciplined architectural surroundings, artworks and landscaping provide points of color and intensity. Munich Re first turned to artists some years ago to relieve the monotony of the underground corridors that connect the buildings it occupies in the area. In this spirit, it called on New York artist Keith Sonnier to animate the underground corridors radiating from the new building. [ARCHITECTURAL RECORD, September 2002, page 110.] Working with the architects, Sonnier grouped banks of blue, yellow, and red neon tubes in the passages to create dazzling effects of light and color. For the fire stairs of the new building, artists painted walls and ceilings in strong graphic designs, including the dizzying perspectival illusions of Swiss artist Felice Varini and Peter Kogler's computer-generated organic forms. Swiss landscape architect Gunther Vogt, who often works with Baumschlager + Eberle, used chives as a decorative planting on the rooftop terrace and designed a rear garden with small pools of flowing water and maple trees.

In addition to the pulsating lights of the facade, Olafur Eliasson worked with Vogt to develop a wall of moss-covered stone that presides over the main entrance. The moss is cultivated on porous Italian tufa, creating an organic yet precise surface that softens the hard mineral texture of the building. The most elaborate of the artworks, by local artists Marc Weis and Martin De Mattia of M+M, resides in the entry hall. Once an hour, a floor-to-ceiling panel opens automatically in one of the walls, revealing a column of plasma screens that depict a computer-generated landscape under different weather conditions, a simulation developed with experts in climate and technology. The panel teasingly closes again after just one

minute, in an update of the famous performing figures in the clock tower of the Munich town hall. In each of these interventions, artists and architects worked together to integrate the artworks with the design as a whole.

With its remarkable transformation of the 72,000-square-foot South 1, Munich Re dedicated its entire investment—\$35 million, or \$485 per square foot—to improving the quality of the building. South 1's previous technical obsolescence created an opportunity to address its other deficiencies, in terms of urban responsiveness, human comfort, and the image of the company in the neighborhood, and to enhance the company's cultural prestige in the larger community. One could say that the original South 1, built according to the more limited calculus of financial gain of 25 years ago, had actually accumulated substantial debts—to the company's employees, the neighborhood, and the environment as a whole—causing real damage to Munich Re's image and good name. What Baumschlager + Eberle's project shows is that quality design is more than mere luxury; it is a necessity. ■

Sources

Curtain wall and steel: *Dobler Metallbau GmbH*

Weathered stone: *Steinwerke Rudolph GmbH*

Wooden floors, walls, entry-hall ceiling: *Stonner GmbH*

Glass office partitions: *Intek GmbH*

Office furniture: *Svoboda GmbH*

Reception furniture: *Möbel Bauer GmbH*

General lighting: *Hartmann & Unger*

www For more information on the people and products involved in this project, go to Projects at architecturalrecord.com.



PROJECT: HEADQUARTERS FOR DESIGN FIRM FOCUSED ON GREEN ARCHITECTURE.

LOCATION: APPLETON, WISCONSIN.

DESIGN BRIEF: A BUILDING THAT DRAMATIZES TO CLIENTS THE BENEFITS AND BEAUTY OF SUSTAINABLE DESIGN.

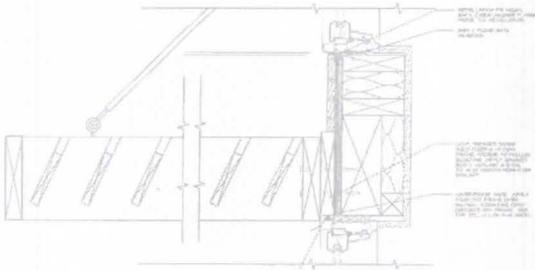
CHALLENGE: OPTIMIZE ENERGY EFFICIENCY AND USER COMFORT WITH THE USE OF COOL DAYLIGHTING, USING ENHANCED DISTRIBUTION OF DAYLIGHT THROUGHOUT WORK AREA, TO REDUCE HVAC AND ELECTRICAL REQUIREMENTS.

PELLA PROCESS: THE PELLA COMMERCIAL TEAM WORKED WITH THE ARCHITECT TO MEET ENERGY CONSERVATION AND LIGHT TRANSMISSION REQUIREMENTS WITH FEATURES LIKE TRIPLE GLAZING WITH INTEGRAL BLINDS AND LOW E GLASS. ALSO, PELLA SUPPLIED OPERABLE METAL CLAD WOOD WINDOWS THAT MET TWO IMPORTANT CRITERIA: WOOD IS ONE OF THE FEW ENTIRELY SUSTAINABLE BUILDING MATERIALS, AND THE METAL CLADDING WAS COMPATIBLE WITH THE HARD-EDGED ARTICULATION OF MUNTINS USED IN THE TREATMENT OF OTHER EXTERIOR ELEMENTS.

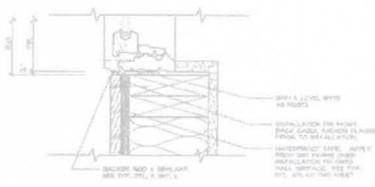
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INSTALLATION SHOP DRAWINGS



2 HORIZONTAL MULLION @ CANOPY



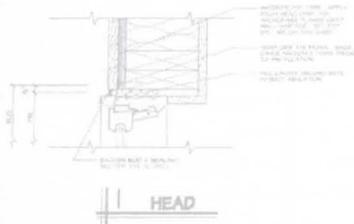
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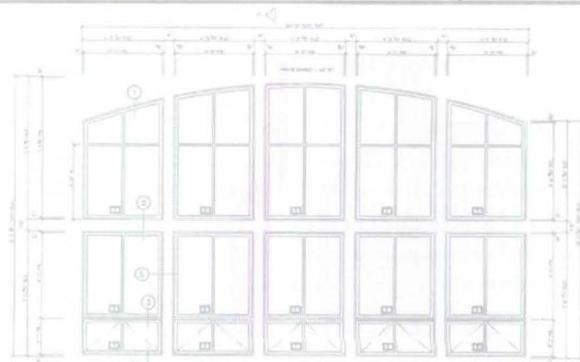
JUST BECAUSE A BUILDING DOESN'T NEGATIVELY IMPACT THE ENVIRONMENT DOESN'T MEAN IT CAN'T POSITIVELY IMPACT THOSE WHO ENCOUNTER IT.



COMMERCIAL DIVISION



HEAD



Shop (Up)Lifting

DESPITE THE PROLIFERATION OF OVERSIZE AND UNDER-DEVELOPED BIG BOXES, ARCHITECTS ARE DESIGNING STORES THAT IMPROVE THE URBAN ENVIRONMENT.

By Sara Hart

1.

New York City

Bohlin Cywinski Jackson provides Apple Computer disciples a light-filled treasure chest for everything Mac and more.

2.

New York City

Duccio Grassi takes full advantage of a rare open site and delivers a dramatic showroom for Italian designer MaxMara.

3.

Tokyo, Japan

No mere big box for merchandise, Renzo Piano Building Workshop has given Hermès an elegant headquarters and Tokyo an architectural gift.

Shopping is the only public diversion that crosses almost all socioeconomic and ethnic lines. The experiences, however, can be quite different. Ubiquitous discount retailers like Target, Wal-Mart, Kmart, and Home Depot have become one-stop destinations for suburbanites. These retailers' "superstore" versions, in which one can practically observe the curvature of the earth, make the "big box" modifier seem like a mocking understatement, code for stating the obvious—the absence of architecture. The chichi variant of the superstore can be found at tony addresses in every major city. Haute couture flagship stores continue to compete for attention everywhere, despite serious economic turbulence. Flagships have spawned countless boutique outposts in posh neighborhoods, and the high-end merchant's vision often transforms the surroundings and the experience of not only its customers, but of the local community, as well.

So apparently fraught with deep cultural meaning is the prevalence of shopping as a global pastime that it prompted students at Harvard University's Graduate School of Design (GSD) to analyze in exhaustive depth the social and cultural factors that are responsible for shopping superseding other leisure-time activities. They published their conclusions in *The Harvard Guide to Shopping* (Taschen, 2002), under the guidance of architect, polemicist, and GSD professor Rem Koolhaas.

Rem knows retail, having designed the attention-grabbing Prada "epicenter" in Manhattan's SoHo [RECORD, February 2002, page 84]. If SoHo has become a mall, then Prada is the anchor tenant. Two new merchants joined Prada in this retail ganglion. Both stores are beautifully executed in glass, steel, and wood. The Italian fashion house MaxMara got to start with a clean slate, building from the ground on a former parking lot. Around the corner, Apple Computer's new retail store is a light-filled, magically weightless volume tethered to the ground by the sturdy brick envelope of a former post office. MaxMara's spare serenity and Apple's spare effervescence give a kinetic vitality to the streets previously occupied by unanimated art galleries with far less mass appeal. Halfway around the world, Hermès has made a similar contribution, *although* at a much grander scale. The French purveyor of luxury clothes and accessories introduces some urban class into Tokyo's meretricious Ginza district with a corporate and retail center that seems to radiate optimism and taste.

These three conscientious projects may seem to be exceptions that prove the grim prognosis of Koolhaas et al., but then there are 10 others on our Web site that further suggest that where there is good design, cultural diversity will survive in spite of the shoppers. ■



For additional retail projects, and more information on the people and products involved in the following projects, go to Building Type Study at architecturalrecord.com.

Apple Store

New York City, SoHo

1 BOHLIN CYWINSKI JACKSON'S NEW RETAIL STORE FOR APPLE COMPUTERS IS AS SPARE AS THE COMPANY'S NEW AD CAMPAIGN.

By Raul A. Barreneche

Architect: Bohlin Cywinski Jackson—Peter Q. Bohlin, FAIA, design principal; Jon C. Jackson, AIA, principal in charge; Karl A. Backus, AIA, project manager; Rosa Sheng, AIA, project architect; Ben McDonald, Colleen Caulliez, Michael Waltner, design team

Associate architect: Ronnette Riley Architect—Ronnette Riley, FAIA, principal in charge; Mark Brungo, project manager; Yumi Moriwaki

Client: Apple Computer

Consultants: Dewhurst Macfarlane & Partners with Goldreich Engineering (structural); Flack & Kurtz (MEP); ISP Design (lighting); Eight (fixtures); Emmaco Prentiss (security/data/AV)

General contractor: J.T. Magen

Size: 17,000 square feet

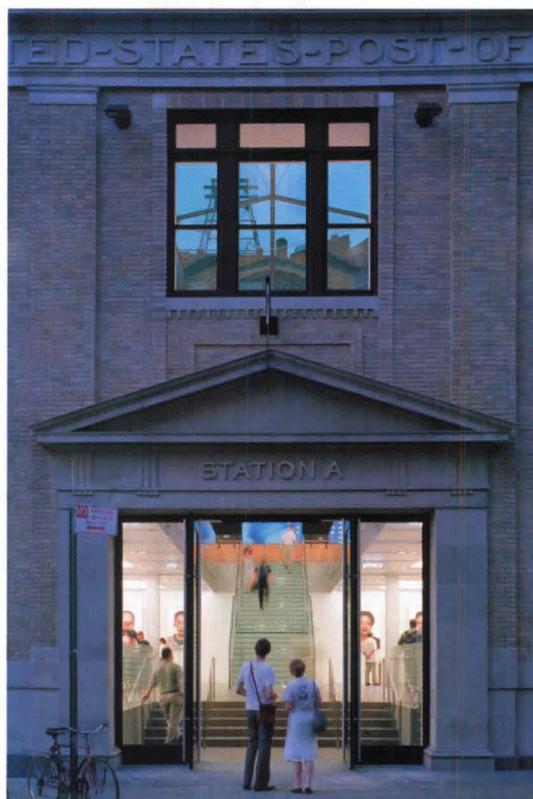
Completion date: July 2002

Sources

Structural-glass specialties:

Seele GmbH/Seele USA (glass and stainless-steel contractor); Tripyramid Structures (stainless-steel design); Depp Glass (glass treads/landing); Installite Glass (fritted-glass partition panels)

www For more information about the people and products involved in this project, go to Building Types Study at architecturalrecord.com.



Apple, the company that has been revolutionizing personal computing for three decades, just opened its first retail shop last year. But the company is quickly making up for lost time, opening 31 stores nationwide over the past 18 months. In July, Apple christened its 32nd store, its largest to date: a vast, 17,000-square-foot, two-story shop in Manhattan's SoHo, just one block west of Rem Koolhaas's much-hyped Prada "epicenter." Another flagship opened in Los Angeles a

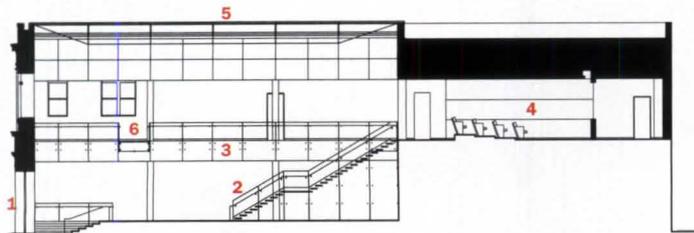
few weeks later, and a third landmark store will open on Chicago's Michigan Avenue next spring.

Apple's charismatic C.E.O. and founder, Steve Jobs, tapped architects Bohlin Cywinski Jackson (BCJ)—who designed Apple's industrial-design studios and the headquarters of Jobs's animation venture, Pixar—to transform a 1920s post office into a sleek, simple yet high-tech emporium. According to Ron Johnson, Apple's vice president of retail, he and

Jobs gravitated to the pale brick post office, which most recently housed a Restoration Hardware store, because of its rigor and simplicity—virtues shared by Apple and evident in its creative output. "It was also one of the few stand-alone places in SoHo where we could control the building's design," says Johnson. Manhattan architect Ronnette Riley, FAIA, who helped design the short-lived Restoration Hardware, served as architect of record on the store.

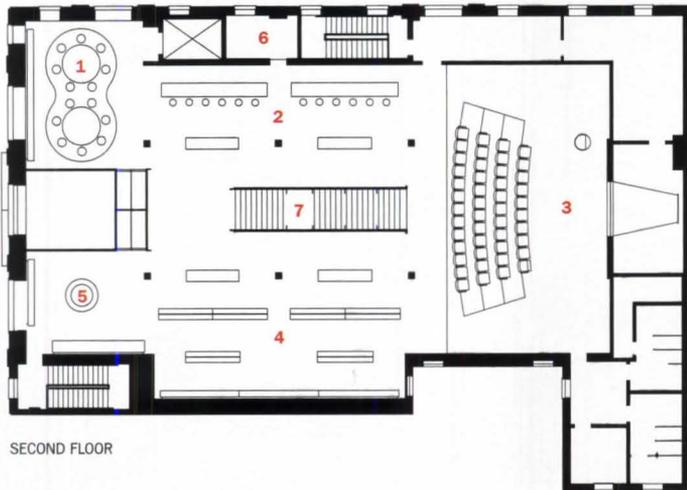
Shoppers pass through the renovated entrance of the former post office (opposite, left) and into the slick, aqueous world of Apple SoHo (opposite, right). A glazed staircase, on axis with the entry, and a delicate skylight overhead direct movement into and through the store (right).





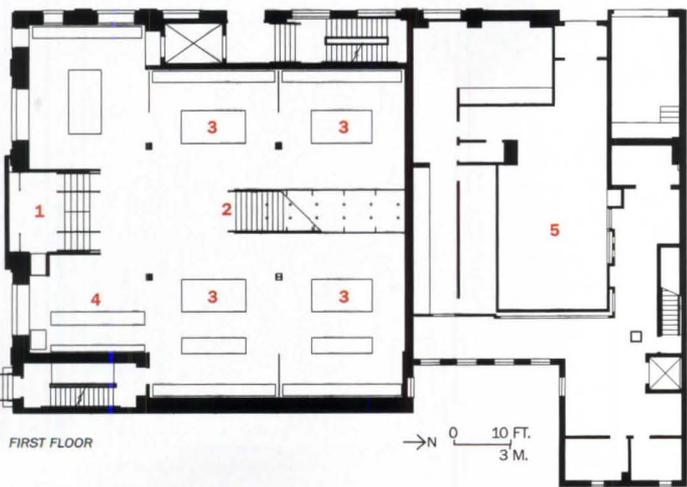
SECTION

- 1. Entrance
- 2. Glass stair
- 3. Glass panels
- 4. Auditorium
- 5. Skylight
- 6. Glass bridge



SECOND FLOOR

- 1. Kids' zone
- 2. Genius bar
- 3. Auditorium
- 4. Software
- 5. Etcetera
- 6. Apple care
- 7. Glass stair



FIRST FLOOR

- 1. Entrance
- 2. Glass stair
- 3. Product displays
- 4. Checkout
- 5. Storage

The structural-glass staircase, skylight, and bridge create material continuity and offer unobstructed views throughout the Minimalist shop (right).





Program

As realized for Apple, on the ground floor, the store contains roughly 5,200 square feet of retail space, divided into "solution zones," in Apple parlance: Photos, Movies, Music, Home, and Pro (office computers). In the solution zones, customers can test flat-screen Macs equipped with the latest animation software, try out digital cameras, or listen to the output of barely-there bubble-shaped plastic speakers. Technical service and diagnostic help are served up at two, 20-foot-long "genius bars" on the second floor, which contains another 4,300 square feet of retail. The upper level also has a kids' area with 12 computer stations; a software department; an area called "etcetera," where iPods, scanners, sub-woofers, and other peripheral devices are sold; and a 45-seat open theater where salespeople demonstrate new Apple products and visitors attend classes and "Made on a Mac" presentations.

Solution

BCJ designed the SoHo store from scratch but also drew on a kit of parts developed in an earlier prototyping exercise led by Jobs that included BCJ, Gensler, the San Francisco design firm Eight Inc., and Johnson. The prototypes established a material palette and standard details to create continuity and a recognizable image among dozens of Apple stores that includes blond maple floors, Corian counters, and modular ceilings with aluminum troughs. BCJ expanded the basic palette for the SoHo space, adding cool gray Pietra Serena stone floors, matte stainless-steel column wrappers, and oversize maple Parsons tables and benches designed by Eight Inc. The materials are all simple and familiar but are executed with a razor-sharp precision that seems appropriate for one of the world's biggest computer makers.

The shop's signature element is a structurally daring staircase of chunky laminated glass treads bolted to supporting structural-glass walls. The stair is placed on axis with the entrance and set beneath a new 70-foot-long skylight defining an





atrium within the two-story shop. In addition to creating a visual landmark, the eye-catching stair fills a functional need: "Getting people upstairs in urban retail is really hard," explains Johnson. "Here, you see the stair and all the natural light and want to walk up."

A structural etched-glass bridge connecting the two wings of the second floor—engineered, like the staircase, by the New York office of Dewhurst Macfarlane & Partners—continues the glass theme. "The stair, skylight, and bridge are all of the same family. They're rather elegant and very pure and done with a delicate, almost ethereal spirit," suggests BCJ principal Peter Q. Bohlin, FAIA.

Commentary

The store's design is as flat-footed as the new Apple ads that fill the space, in which real people who switched from PCs to Macs give testimonials about their change of heart. The ads—a far cry from earlier Apple campaigns like the Orwellian blockbuster "1984" spot—are simple and

spare, with low-glamour head shots and quotes against a white background. That same forceful, no-nonsense sensibility comes through in BCJ's design. The architecture also echoes something of Apple's sleek, understated new products, like the Titanium PowerBook G4, and the company's new collection of white laptops and desktop Macs.

It's hard not to make at least a passing comparison to Koolhaas's Prada flagship just a block away. Whereas the Prada store thrusts design front-and-center to make grand declarations about global culture and commerce, usually at the expense of the merchandise, Apple's architecture recedes, if not quite to the background, at least to the sidelines. BCJ's design lets the products stand out without clutter or pretense, while still asserting the shop's identity.

So far, Apple's design seems to be paying off. Johnson reports that more than 100,000 visitors checked in during the shop's first 30 days in business. In retail, image counts—but numbers still count for more. ■



A bridge of translucent, acid-etched structural glass connects two sides of the second level. The glass staircase leads to an open auditorium at the rear of the second floor (opposite). To the left of

the auditorium are two "genius bars," offering service and technical support. Maple benches overlooking the atrium match the genius bars and the oversize display tables downstairs.

software

photos

Max Mara

New York City, SoHo

2

DUCCIO GRASSI CREATES A DRAMATIC SETTING FOR WOMEN'S CLOTHES THROUGH THE BOLD USE OF CONCRETE, WALNUT, AND RUSTED STEEL.

By Suzanne Stephens

Architect: *Duccio Grassi Architects—Duccio Grassi, principal; Fernando Correa Granados, project architect*

Architect of record: *FZAD Architecture & Design*

Client: *Max Mara USA*

Consultants: *O'Dea & Associates (structural and MEP engineers); Isometrix Lighting + Design (lighting)*

General contractor: *American Construction/Consulting*

Size: *6,105 square feet*

Completion date: *2001*

Sources

Structural steel: *Maspeth Welding*

Concrete: *La Strada General Contracting*

Panel precasting: *Global Precast*

Skylights: *Bellapart, S.A. (engineering and fabrication)*

Glazing and aluminum framing: *Landmark Architectural Metal & Glass*

Max Mara, the fashion house based near Milan, is known for a strong geometrical cut in its women's clothes, which also feature a color palette that veers from beige to brown to black, and textures that are as sleek as steel or as nubbly as brick. In other words, the clothes seem to be inspired by architecture. Small wonder the company felt the architectural design of its shop was important to reinforce its style identity.

Program

With its new downtown store in New York's SoHo, Max Mara wanted both to grab the shopper's attention and provide a design appropriate to its clothing. Its new, one-story structure is on West Broadway, on a lot leased on a long-term basis, where the Italian office of Duccio Grassi Architects came up with a two-level scheme. In its expansive interior, walnut-laminated trusses and slatted partitions, precast and poured-in-place concrete, as well as rusted and natural steel are deployed through a trapezoidally configured volume.

Solution

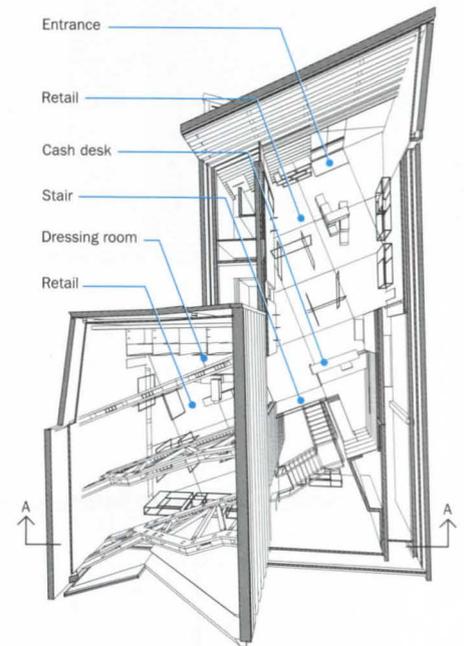
The drama begins on the sidewalk, where a slatted wall 21 feet and 7 inches high, placed on an angle with the building line, directs the visitor to the entrance. As the slanted wall suggests, Grassi organized the inte-



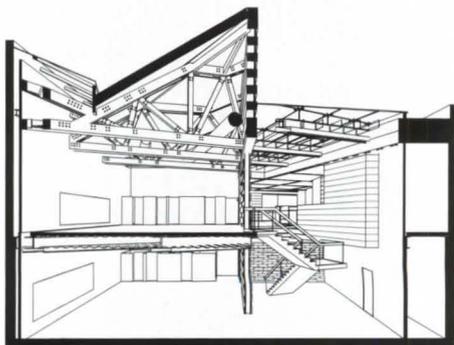
rior elements and spaces according to two overlapping grids, one of which shifts 20 degrees off the orthogonal grid established by the L-shaped structure. Meanwhile, the visitor, who may well be oblivious to such maneuvers, meanders through the first retail space, which is 10 feet high, and is gradually drawn to a light well at the rear. Here, a skylighted atrium, with an inserter stair, reveals a lower level devoted to more clothing. Architecture is deployed to heighten the experi-

ence of shopping: The only way to access the additional clothing is by detouring through a larger space purveying merchandise, here spanned by three laminated walnut trusses and punctuated by another, smaller skylight. Here, too, the building's concrete-block walls are lined with large panels of precast concrete that ripple like pieces of a quilt and seem sewn together by large stainless-steel cables. Steel channels inserted between the first and second rows of

www For more information about the people and products involved in this project, go to Building Types Study at architecturalrecord.com.



OVERHEAD AXONOMETRIC



SECTION THROUGH A-A

On West Broadway, in SoHo, the Max Mara store stops traffic with its strong wood-and-glass slatted window wall (opposite). Three laminated wood trusses span the main retail space (above) at the rear of the shop.



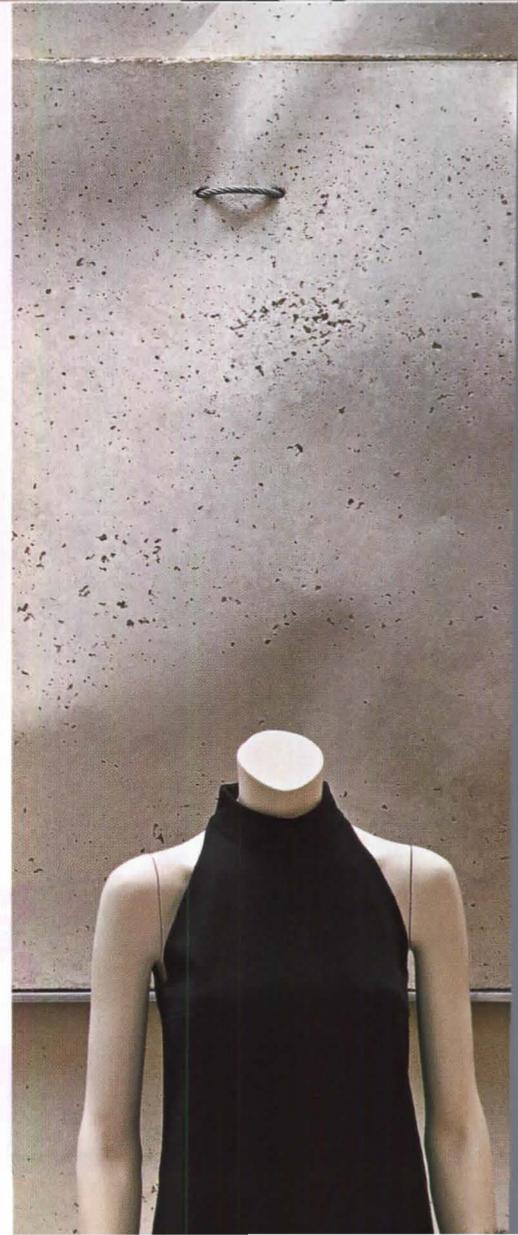
GROUND FLOOR



LOWER FLOOR

- 1. Entrance
- 2. Window display
- 3. Retail space
- 4. Sales desk
- 5. Dressing rooms
- 6. Elevator
- 7. Double-height space
- 8. Office
- 9. Accessories display wall
- 10. Stock room

At the bottom of the stair to the lower level, a walnut wall (above right) is designed with shelflike units that pull out for displaying merchandise. Dressing rooms (above left) hide behind rusted steel panels.



The walls on both levels are precast-concrete panels (opposite, bottom, and below) that have a quilted effect and seem to be sewn together with stainless-steel-cable stitches. A cantilevered, poured-in-place-concrete stair (right) sculpturally unites the two levels.

the panels can be used for hanging clothes, while other items are arranged in movable steel racks, some of which have leather and mirror panels. The modular design of these cagelike units incorporates both shelving or hanging bars used as display devices. More surfaces are provided by clustered islands of rectangular volumes formed of white solid surfacing, sheet metal, or leather cushions. Along one wall, rusted steel panels conceal dressing rooms, which are lined in white solid surfacing and mirrors.

As visitors descend the cantilevered poured-in-place-concrete stair, rotated on a 20-degree angle

aligned with the trusses and the entry plane, they arrive first at a wood display wall, in which polygonal shelves, equipped with lights on their undersides, pop out like drawers. The main retail space of this lower level retains the quilted concrete wall of the upstairs space; in this instance, the ceiling is exposed metal decking, painted white.

The artificial lighting throughout is programmed to supplement illumination from the two skylights; the skylights themselves seem weightless, for the glass is supported by stainless-steel fingers, rather than the heavier mullions usually seen elsewhere. Since the steel column-and-beam structure

of the store is painted white, it too seems to disappear.

Commentary

Many of the architectural motifs, such as the use of the diagonal, the oversize wood and glass partitions, and the large trusses with lights mounted in them, would likely dominate or fight with clothes by another designer. Here, however, fashion and architecture propitiously reinforce each other. The skylighted atrium, the slanted ceiling planes, the concrete wall, and the cantilevered stair all create a volumetric statement that keeps the shopper moving while still being able to actually see the clothes. ■



Hermès Tokyo, Japan

3

FASHION HOUSE HERMÈS' FLAGSHIP STORE BY RENZO PIANO BUILDING WORKSHOP GIVES TOKYO'S GINZA DISTRICT SOME MUCH NEEDED ELEGANCE.

By Raul A. Barreneche

Architect: *Renzo Piano Building Workshop—Renzo Piano, partner in charge; Paul Vincent, associate in charge; Loïc Couton (project manager); Giorgio Ducci, Pascal Hendier, Frank La Rivière, Christophe Kuntz, design team*

Executive architect: *Takenaka Design Department*

Client: *Hermès Japon*

Consultants: *Arup (structural, mechanical, seismic); Syllabus (cost control); Delphi (acoustics); Equipe Espace (landscaping); Philippe Almon Eclairagistes (lighting); Rena Dumas (interior design)*

General contractor: *Takenaka Corporation*

Size: *6,000 square meters*

Completion date: *2001*

Sources

Facade fabrication: *Schmidlin AG*

Glass block: *Vetroarredo*

Furniture: *SOGO (shops); Technics d'Agencement (office)*

Recession or not, the streets of Tokyo are usually full of fashionable shoppers weighed down by shopping bags sporting the most luxurious names in European fashion. Hermès, the French fashion house known for patterned silk scarves and shiny H-shaped belt buckles, recently opened a flagship in Tokyo. The company hired the Paris office of Renzo Piano Building Workshop to create an elegant building to stake out its identity among the garish neon- and billboard-covered sliver buildings of Tokyo's Ginza district.

Program

Maison Hermès, as the new store is called, consolidates the label's corporate and retail operations into a single signature building at the corner of Harumi Dori and Sony Dori in the heart of Ginza. The slender site measures just 12 meters wide by 45 meters long. Inside the 6,000-square-meter building are five levels of shopping (one below grade, four above); one floor devoted to a design atelier; two floors of offices; a mini museum on the top two levels; and a rooftop garden. The building also contains a link to the Tokyo subway.

Solution

At 12 stories, the Maison Hermès is far from a skyscraper, but it maintains a noticeable presence in Tokyo's crowded urban fabric. Piano cleft the long, narrow rectangular site with a small courtyard leading to



www For more information about the people and products involved in this project, go to Building Types Study at architecturalrecord.com.



The double-height gallery in the public museum at the top of Maison Hermès includes installations by Japanese artist Susumu Shingu. The building's short elevation along Harumi Dori (opposite, top) reveals

how the luminous glazed skin wraps in front of the concrete core. A small courtyard notched into the narrow rectangular site (opposite, bottom) leads to separate entrances to the building.



To create rounded profiles at the building's corners, Piano designed small, one-quarter variations on the square glass blocks

(above left). The exterior surfaces of the small blocks are rounded; interior surfaces are flat. Display areas on the narrow

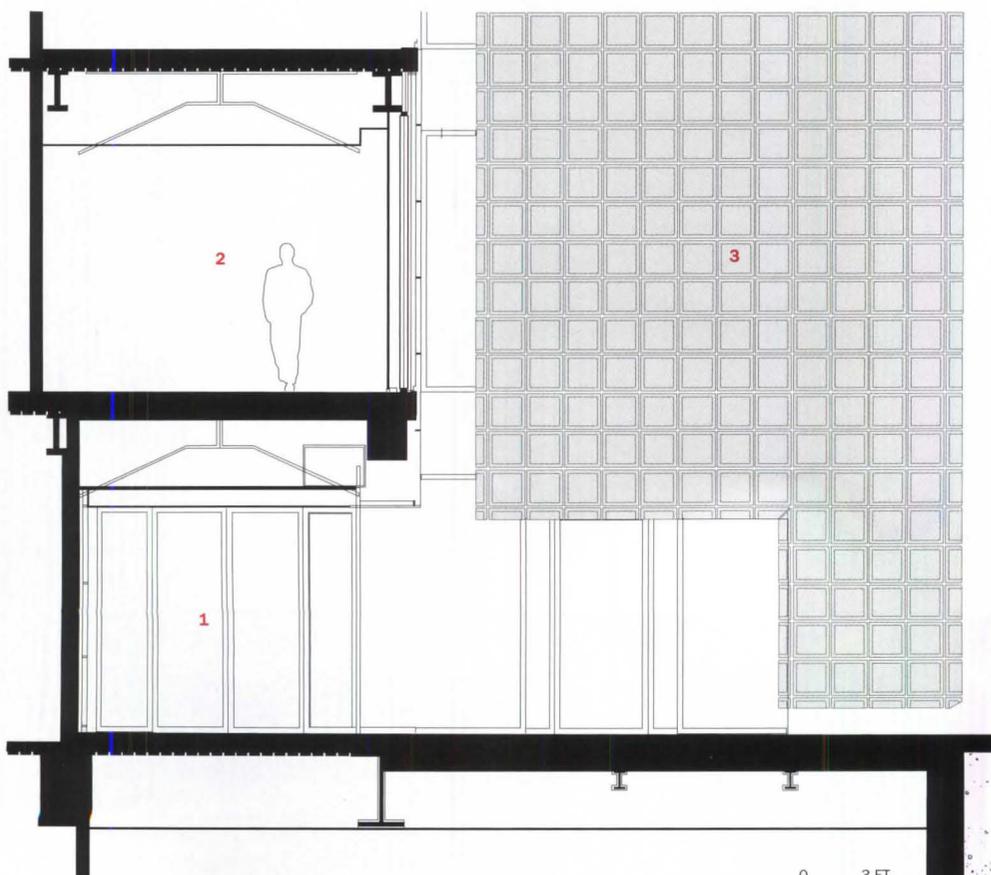
retail floors (above right and opposite) are sandwiched between public staircases along the glass-block exterior wall and the internal core.

1. Main entrance
2. Small shop
3. Glass-block curtain wall

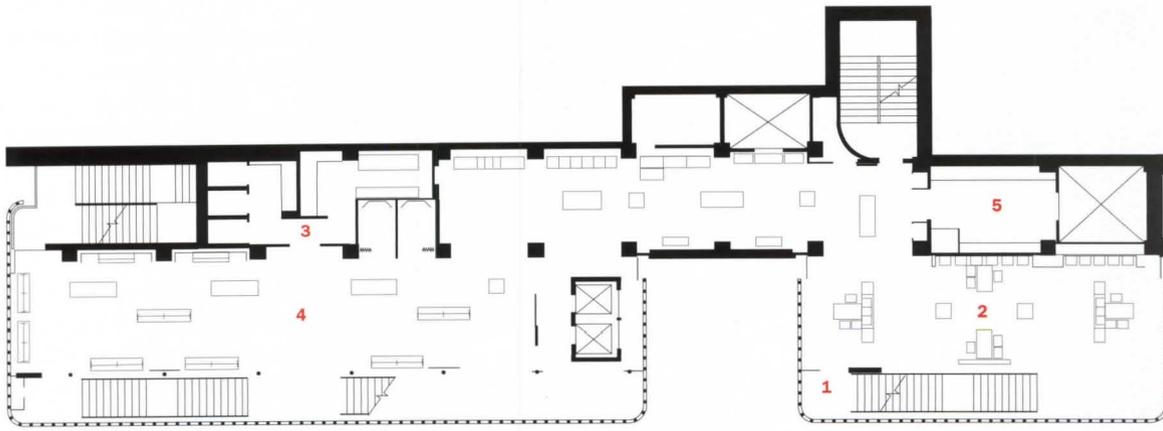
separate ground-floor entrances to the shop, the Hermès offices, the museum, and the subway station below. The courtyard void rises up the full 50-meter height of the building, creating a vertical shaft separating the structure into two distinctly proportioned volumes clad in glass block.

On the first three retail levels, Piano placed staircases up against the glass-block exterior. From the inside, daylight becomes an orientation device; from the outside, shoppers' movement up and down the staircases animates the facades with activity and differentiates between the shopping floors and the working floors above. Except for a double-height space in the top-floor museum, there is no vertical interplay among the tight, dimpled floor plates.

In typical Renzo Piano fashion, the driving force behind the building is an elegant exploration of structure and material, however subtle. The narrow floor plates are cantilevered from a concrete spine extending the full length of the building. The concrete structure defines a 3-meter-wide slot into which Piano placed most of the building's core functions, including stairs and elevators, bathrooms, and storage. The remaining 9-meter-wide cantilever



CROSS SECTION NEAR ENTRANCE



- 1. Public stair
- 2. Small shop
- 3. Service areas
- 4. Large retail
- 5. Utilities

THIRD FLOOR





Retail interiors by Parisian designer Rena Dumas (above and below) continue

the look of Hermès stores worldwide. Dumas's warm, understated interiors, filled

with boxy vitrines and furniture, create a more classical foil to Piano's cool, sleek exterior.

allows for nearly column-free floors all the way to the exterior wall. The structural core-and-cantilever concept is clearly visible in the building's Harumi Dori elevation.

The sleek cladding is composed of more than 13,000 custom glass blocks measuring 45 centimeters square, which were developed by Piano and the Vetroarredo glass factory in Florence. The exterior surfaces of the blocks were mirror-varnished by hand; the interior surfaces are textured. Despite its delicate appearance, the facade meets Japan's stringent seismic codes. The blocks are mounted in a steel grid that allows them to move up to 4 millimeters during earthquakes.

Commentary

Maison Hermès remains a relatively small, straightforward building bordering on the unremarkable. In the absence of any grand spaces or robust gestures, the glass-block wrapper is the building. It is a skin and sign that defines the both/and qualities of the building: both heavy and lightweight, transparent and solid, old-world and high-tech, background and billboard. These apparently conflicting characteristics are indeed what give the building a richness of character that transports it beyond the realm of the ordinary.

Piano executes the cladding with rigor, but it's not as structurally daring—or visually surprising—as in his previous buildings. Rather than Piano's signature forward-looking technological invention, the cladding looks like a riff on history; specifically, Pierre Chareau's 1932 Maison de Verre. There are a few moments of skillful sleight of hand, such as several spots where the glass-block wall seemingly floats above sidewalk-level display windows. On the Harumi Dori elevation, the glazed skin overlaps the edge of the concrete core like a delicate veil rather than an ordinary load-bearing, glass-block wall.

For Hermès, the success of Piano's building will be measured in register receipts. The constant crowds filling the building so far point to a resounding commercial, if not architectural, triumph. ■



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Both New and Improved Advances in Seismic Technologies Promise Safer Buildings

SINCE MOST REGIONS OF THE U.S. ARE VULNERABLE TO EARTHQUAKES, ARCHITECTS MUST RESPOND

By Michael Bordenaro

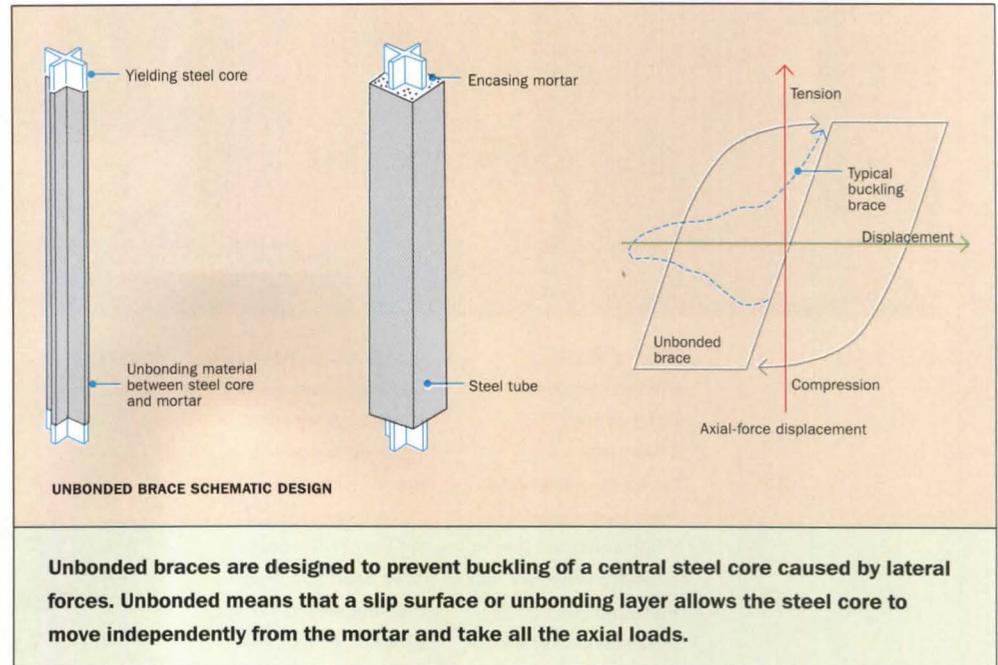
In April, New York City was rippled slightly with an earthquake that registered a mere 2.3 on the Richter scale. It was not enough of a shake to cause any damage, but it was a sound reminder that architects in many areas other than California need to give careful consideration to seismic issues.

While new seismic-reinforcing technologies continue to evolve, architects are increasingly developing innovative applications of existing design practices to cost-effectively safeguard structures. Recently introduced systems, such as unbonded braces and the promise of posttension-steel-frame research contribute to new seismic-design options. However, architects are also finding increased uses for base-isolation systems while continuing to use existing reinforcing methods in new ways. The combination of new technology and new applications of traditional methods is helping to bring existing building stock up to current seismic standards and create new structures with an increased capacity to resist seismic forces.

Unbonded braces

Braced steel frames are often used to protect buildings from damaging lateral displacements caused by severe earthquakes. Recent research and development have led to the creation of more durable bracing systems that can restrain lateral and local buckling. Unbonded braces—also

Michael Bordenaro is a Chicago-based business writer who focuses on architectural technology.



known as buckling-restrained braces—combine structural-steel-tube, girder, and cement technologies to create a member that does not buckle under compression forces. In this method, a girder—or coreplate—is given a proprietary coating to prevent it from sticking to the cement and is then inserted in the tube (see diagram above). The tube is then filled with a specially formulated cement grout that resists adhesion to the coreplate. The coreplate, typically cruciform, extends past the ends of the steel tube so it can be bolted to other structural members.

During an earthquake, if the unbonded brace is compressed, the steel tube and cement prevent the coreplate from buckling. If the member is put in tension, the nonstick coating allows the coreplate to elongate just as any brace would. “Because the unbonded brace doesn’t buckle, it provides a more predictable and reliable earthquake-resistant behavior, which is a compelling attraction for designers,” explains Ian Aiken, an engineer and principal with Seismic Isolation Engineers (SIE), in Oakland, California, and a U.S. design consultant for Japanese unbonded-brace manufacturer Nippon Steel.

The unbonded-brace system was developed in Japan, where it has been applied to more than 200 buildings in the past 10 years. Since being introduced in the United States in 2000, the technology has appeared in about 15 building projects. Zigmund Rubel, AIA, project director with Anshen+Allen, in San Francisco, says the use of unbonded braces at the Kaiser Medical Center, in Santa Clara, California, saved construction costs. “In a typical hospital there would be a moment frame with 25 pounds of steel per square foot or eccentric braces with 20 pounds per square foot,” Rubel says. “The unbonded braces required 15 psi, which represented considerable cost savings in raw steel alone.”

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 192 and follow the instructions.

LEARNING OBJECTIVES

After reading this article, you should be able to:

1. Describe recently introduced systems of reinforcing technology
2. Discuss innovative applications of existing safeguards to structures
3. Identify benefits and limitations of several seismic-design options

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**Dining Hall
University of
California,
Berkeley**
Two kinds of unbonded
braces were employed
in this structure. The
four-story office portion
of the building has 16-
foot unbonded braces in

a chevron configuration
(above). In the 40-foot-
tall dining hall (right),
exposed unbonded
braces as long as
37 feet were used. A
typical brace would
have been too large
and ungainly to serve
as a design element.



Eric Ko, principal with the project's structural engineer, Arup in San Francisco, noted that time savings are also realized, because unbonded braces can be bolted instead of welded. "Being able to bolt the connections cut 10 weeks off the steel-erection schedule and minimized the need for critical on-site welding," Ko says. Ko also noted that the unbonded braces can be made with circular tube steel that can present an attractive appearance if exposed.

Ko noted that the 1995 Kobe, Japan, earthquake, which regis-

BEING ABLE TO BOLT THE CONNECTIONS CUT 10 WEEKS OFF THE STEEL-ERECTION SCHEDULE AND MINIMIZED WELDING.

tered 7.3 on the Richter scale, occurred during the design of this project. After investigating the success rate of unbonded braces there, Ko changed the structural design of the hospital to accommodate increased building demands. "After Kobe, the seismic demand for the hospital was increased by 50 percent. The square footage of the building also increased by 50 percent, yet we were able to use the same number of unbonded braces as there were eccentric braces in our original design," Ko says.

When designing with unbonded-brace frames, Ko recommended architects consider placing the brace around the exterior of the building. He noted that while this is challenging for placement of win-

dows and other openings, it frees interior spaces to serve building functions. "Once interior plans are established, additional bracing can be placed at staircases, corridors, and other locations," Ko says.

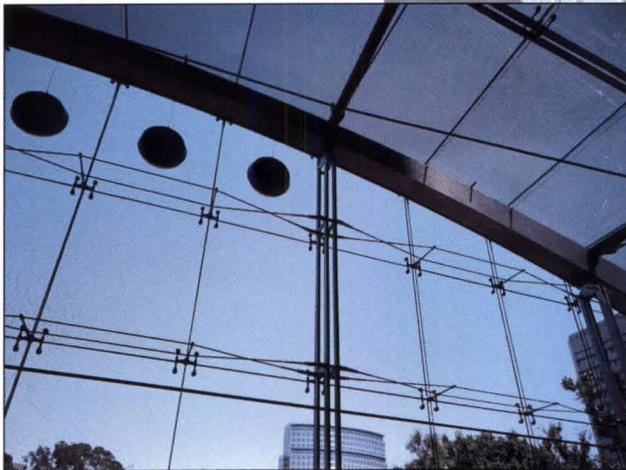
The Stanley Hall replacement building, a new center for interdisciplinary teaching and research in the biomedical and health sciences at the University of California's Berkeley campus and designed by Portland-based Zimmer Gunsul Frasca Architects, will also be supported by an unbonded-brace frame. Until the campus Seismic Review Committee recommended that physical tests be performed as part of the design process, little testing had been done using U.S. design and construction practices. San Francisco-based engineers Rutherford & Chekene designed the full-scale test specimens for braces manufactured by Nippon Steel of Japan. The field tests proved that the frames had almost identical properties in tension and compression and could sustain numerous cycles of inelastic deformations without failing or deforming. Three tests were conducted in the Structural Engineering Research Laboratory on the campus. Lateral loads exceeding 1.2 million pounds were applied to a representative one-bay-wide, two-story high segment.

For a four-story, steel-frame administration building and glass-walled dining hall also at Berkeley, two types of unbonded braces were used. Los Angeles architect Cannon Design and the Los Angeles office of Arup used 16-foot unbonded braces in a chevron configuration for the four-story office portion of the building. In the 40-foot-tall dining

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**Stanley Hall
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engineers Rutherford
& Chekene coordi-
nated a series of tests
of full-size unbonded
braces (below and

right) manufactured
by Nippon Steel of
Japan. Undertaken at
the Structural
Engineering Research
Laboratory on campus,
the braces
performed well under
1.1 million pounds of
lateral pressure.

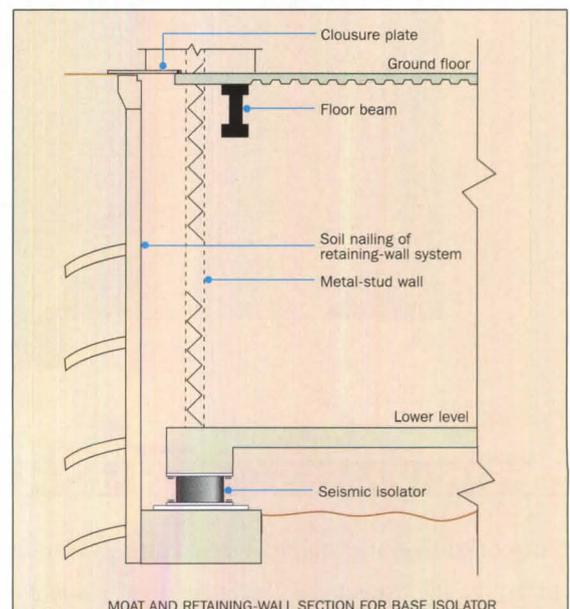


hall, exposed unbonded braces as long as 37 feet were used. A typical brace would have been too large and ungainly to be used as a design element in the tall, glass-walled dining hall, according to SIE's Aiken.

Posttensioned steel frames

The Northridge, California, earthquake in 1994 created numerous failures in the welded joints of steel-frame buildings. Many fractures extended through columns. In an attempt to stabilize the steel frames, some buildings were fitted with posttensioning rods similar to those used in posttensioned concrete, where steel rods threaded through the concrete are tightened to compress the structure and increase its strength. Expanding that concept to new buildings, research at the University of California, San Diego's (UCSD) Jacobs School of Engineering is exploring the feasibility of posttensioned-steel-frame buildings. André Filiatrault, professor of structural engineering at UCSD, indicates that under the proper conditions, posttensioned-steel-frame buildings can be built without welded joints. Filiatrault and doctoral candidate Constantin Christopoulos tested the system on the university's large-scale shaker table. Their tests demonstrated that posttensioned steel frames without any welded joints demonstrate high resistance to earthquake forces.

Arup's Ko notes that posttensioning has been a suitable retrofit solution for moment-frame structures with proper conditions for safely placing tension rods through a building at the necessary points. But in many scenarios, an application may be challenging because of construction



MOAT AND RETAINING-WALL SECTION FOR BASE ISOLATOR

Base isolation requires dynamic connections at the bottom of columns and a moat to allow free horizontal movement during an earthquake.

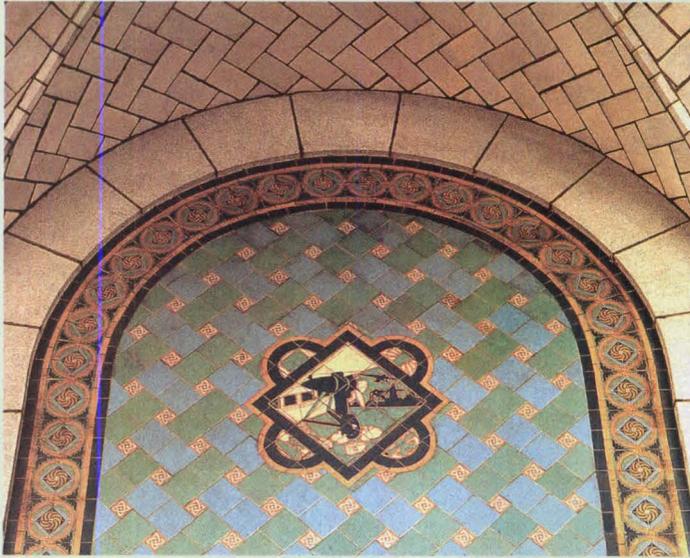


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**City Hall
Los Angeles**
Base isolators (right) combined with added shear walls and seismic dampers helped secure the building so that the renovation

program did not require that the terra-cotta details (above) be entirely reanchored. The combination of structural systems reduced the loads on the existing structure.



issues. For example, Ko noted that the rods can be an obstacle to the placement of mechanical systems. “At this point, this technology would have to be applied in very specific cases because it is in the research stage,” says Ko.

Base isolation

While base isolation is no longer a new technology, increased familiarity and reduced costs are making this highly effective seismic solution applicable to a greater range of buildings. Both small and tall buildings are being equipped with base isolators, which are dynamic connections at the

BASE ISOLATORS ARE BEING COMBINED WITH OTHER SEISMIC SYSTEMS TO REDUCE LOADS ON CURTAIN WALLS.

base of columns that are free to move independently from the ground during an earthquake [ARCHITECTURAL RECORD, February 2000, page 130].

Base isolators are known as being effective for short buildings with large footprints. The weight of such buildings and the reduced likelihood of damaging, amplifying motion—or whipping—in the upper floors makes them ideal candidates for base isolation. However, because base-isolated buildings have a high probability of remaining functional

after an earthquake, base isolators are also being used in smaller-size civic emergency facilities, such as the 53,000-square-foot Los Angeles Police Department Emergency Command Control Center, designed by Los Angeles-based DMJMH+N.

Base isolators are being combined with other seismic structural systems to reduce loads on curtain walls. In the Los Angeles City Hall renovation, led by A.C. Martin Partners, Los Angeles, base isolators combined with an increased number of shear walls and seismic dampers helped secure the tower from swaying to an extent that its 30-story terra-cotta facade did not need to be entirely reanchored.

Although base isolation still adds approximately 10 to 15 percent to the cost of a building, architects find that this premium can reduce costs in other building systems. Bruce Toman, technical director with DMJMH+N, says, “We have had cases where the engineer developed an economical structure, but the side sway was such that there was a premium on the curtain wall because it couldn’t accommodate the movement in the corners.” In some cases, Toman says, using base isolators was actually less expensive than creating a curtain-wall system that could handle the sway of a nonisolated structure.

Because base isolation is being considered for a greater range of buildings, architects can benefit from being aware of some major issues

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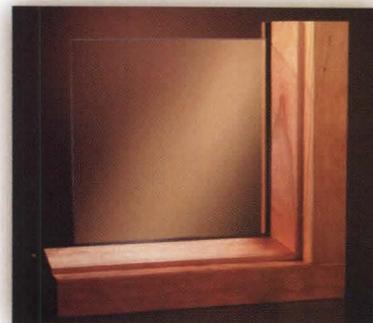
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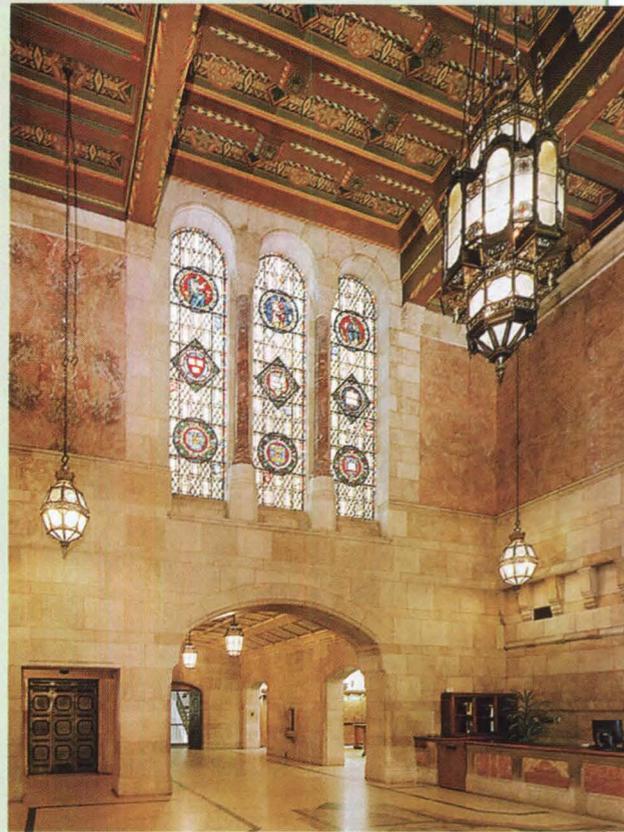


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**Edward L. Doheny, Jr., Memorial Library
University of Southern California,
Los Angeles**

Shear walls were introduced to reinforce this 1932 building (top). Panels were cut through both interior and exterior walls and up to 2 feet of shotcrete-covered shear walls were inserted throughout. Some walls (right, far right) were disassembled and reassembled to accommodate the thick shotcrete application.



when considering this structural solution. Toman notes that a key element in designing base-isolated structures is remembering all aspects of the building. “Just because you base isolate doesn’t mean motion goes away. The isolators are just limiting ground motion to a point where it won’t cause major destruction,” he says. He adds that items such as curtain walls and interior fixtures need to be thoroughly evaluated, even

BASE ISOLATION REQUIRES A MOAT AROUND THE BUILDING IN WHICH THE STRUCTURE CAN MOVE HORIZONTALLY.

though base isolation will help eliminate building failure. Base isolation requires 20 to 30 inches of free space—a moat—around the building, in which the structure can move horizontally during an earthquake. Spanning this moat with properly detailed pedestrian bridges, vehicle access, and utilities can be a challenge.

Toman notes that while there are flexible piping systems that can handle this level of movement, it is also possible to design sewer and water lines with solid pipes formed into a U shape. With flexible connections at the tops of the U and in the middle, it is possible to create a highly flexible pipe connection, according to Toman. “You don’t necessarily have

to specify special flexible rubber pipes, you just have to allow movement in the coupling,” he says.

Pedestrian bridges over the moat need to be configured in a way that does not prevent doors from opening after an earthquake, according to Toman. Telescoping floor plates and specialized seismic expansion joints are among some of the options available from manufacturers such as C/S Group and Dynamic Isolation Systems. Toman also notes that it’s important to provide headroom space around the base isolators so they can be easily inspected. Stairs that lead to the level containing the isolators are frequently suspended from the building and not attached to the floor, to allow movement.

Shear-wall solutions

Because of its scale, lessons learned from the \$180 million seismic restoration of the Los Angeles City Hall may not apply to all base-isolator projects. But there were some concepts that are applicable to other projects. For example, the installation of 526 base isolators and 64 viscous dampers did not ensure that the building’s terra-cotta facade and historic interior mosaics and details would not be rattled off during an earthquake. In order to further stiffen the building, shear walls were added.

Carey McLeod, project director for A.C. Martin & Partners,

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reports that gunite and cast-in-place concrete were added to the back of hollow clay tiles that are behind much of the city hall's historic fabric. According to McLeod, if there were only one reinforcing system, there would be enough seismic force to shake the terra-cotta tiles loose. "We would have had to reanchor the entire skin of the building," McLeod said.

Similarly, at the University of Southern California's Edward L. Doheny, Jr., Memorial Library, in Los Angeles, Fields Devereaux Architects & Engineers carefully applied shotcrete to reinforce the 1932 building. Firm principal Peter Devereaux, AIA, says that access panels

THERE ARE 45 STATES AND TERRITORIES IN THE UNITED STATES AT MODERATE TO VERY HIGH RISK FROM EARTHQUAKES.

were cut through both interior and exterior walls so that up to 2 feet of shotcrete could be applied to create shear walls throughout the 167,000-square-foot structure.

Depending on the historic nature of the wall section, either the interior or the exterior had an access panel cut into it so that reinforcing bars and shotcrete could be installed. According to Devereaux, in some cases the interior walls were disassembled and then rebuilt a short distance into the room to accommodate the required shear-wall thickness.

Tom Sabol, AIA, a principal and structural engineer with the

project engineer Englekirk & Sabol, indicated that a special code variance was required to reinforce the building in this manner. Sabol's design called for the shear-wall reinforcing bars to be larger and closer together than in typical shotcrete applications. Standard shotcrete application methods may result in air pockets if the reinforcing bars are too close together.

However, Sabol worked with local code officials and contractors to develop test panels using a more controlled application method. Coring and sample strength tests demonstrated that complete coverage and more than adequate strength was obtained. "Much structural engineering is driven by application of building code," Sabol says. "It is important to be familiar with the reasons why provisions are written so you know when it is appropriate to modify them and apply something new."

Back in New York City, where few felt the shake last April, fewer still know that the metropolitan area has a hazard rating of moderate from the U.S. Geological Survey. This means that a moderate earthquake could put buildings, infrastructure, and people at considerable risk. New York is not alone. There are 45 states and territories in the United States at moderate to very high risk from earthquakes, and they are located in every region of the country, according to the Federal Emergency Management Agency. With estimates of losses from a future earthquake in the United States approaching \$200 billion, few architectural firms will escape the need for seismic expertise. ■



AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

INSTRUCTIONS

- ◆ Read the article "Both New and Improved Advances in Seismic Technologies Promise Safer Buildings" using the learning objectives provided.
- ◆ Complete the questions below, then fill in your answers (page 272).
- ◆ Fill out and submit the AIA/CES education reporting form (page 272) or download the form at www.architecturalrecord.com to receive one AIA learning unit.

QUESTIONS

1. What happens when an unbonded brace—also known as buckling-restrained braces—is compressed?
 - a. the cement is pushed out of the steel tube
 - b. the steel tube and cement prevent the coreplate from buckling
 - c. the coreplate prevents the steel tube from buckling
 - d. the steel tube causes the coreplate to buckle
2. What happens when an unbonded brace is put in tension?
 - a. the coreplate elongates
 - b. the steel tube prevents the coreplate from elongating
 - c. the coreplate prevents the steel tube from elongating
 - d. the coreplate breaks
3. The benefits of using unbonded braces include which?
 - a. cost savings in raw steel
 - b. time saving on the steel-erection schedule
 - c. attractive appearance if exposed
 - d. all of the above
4. Where did Eric Ko, Arup structural engineer, recommend placing unbonded braces on the Kaiser Medical Center project?
 - a. away from the exterior
 - b. around the exterior
 - c. only on interior staircases and corridors
 - d. evenly spaced throughout
5. Tests of posttensioned steel frames without any welded joints demonstrated which?
 - a. some joints should be welded
 - b. damage to mechanical systems
 - c. high resistance to earthquake forces
 - d. high failure rate
6. Base isolators are normally used for what type of building?
 - a. tall with large area
 - b. tall with small area
 - c. short with small area
 - d. short with large area
7. Issues to consider when designing for base-isolation systems include all except which one?
 - a. roofing materials
 - b. interior fixtures
 - c. moat around the building
 - d. flexible piping connections
8. The benefits of base isolation in upgrades as well as new construction include which of the following?
 - a. cost savings in construction materials
 - b. elimination of horizontal sway during an earthquake
 - c. high probability of remaining functional after an earthquake
 - d. attractive appearance if exposed
9. Which standard construction methods and materials are used to reinforce shear walls?
 - a. cast-in-place concrete
 - b. shotcrete
 - c. reinforcing bars
 - d. all of the above
10. Why is it important to be familiar with the reasoning behind current building codes?
 - a. to know when to question their validity
 - b. to know that strict interpretation is necessary
 - c. to know when to apply for a variance
 - d. to know when one can ignore them

E-documents require due diligence

By Alan Joch

Gensler, an international architectural planning and design firm, recently received a wake-up call about the treacheries of working in the Electronic Age. The firm had hired a third-party service to host an extranet for sharing documents and e-mails with a client using a Web browser. The client originally asked that all communications, including requests for information (RFIs), be handled electronically, and it didn't require anyone to make backup hard copies. The project progressed as planned, a model of e-collaboration, until the extranet provider decided to upgrade its computer system one weekend.

"On the following Monday, we tried to look at some past RFIs," recalls Ben Fisher, AIA, a Gensler vice president based in San Francisco. The firm discovered it was anything but a quiet weekend for the extranet's host. The upgrade had inadvertently wiped out all past RFIs associated the project, destroying an archive of information that was essential for creating new responses. Fortunately, despite the client's "electronics only" request, Gensler had made hard copies of everything. "As a practical matter, if a question comes up, it's easier to have hard copies that you can compare to electronic files," Fisher

Alan Joch is a technology and business writer based in New England. Contact him at ajoch@monad.net.

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

explains. That nod to tradition helped the architect reconstruct the lost information.

Fisher and others now warn that lost data and a host of other electronic-document traps are more than just an inconvenience. They may open up an architectural firm to an array of potential liabilities that can cost millions in lost time and punitive damages. "We're seeing software and electronic documents

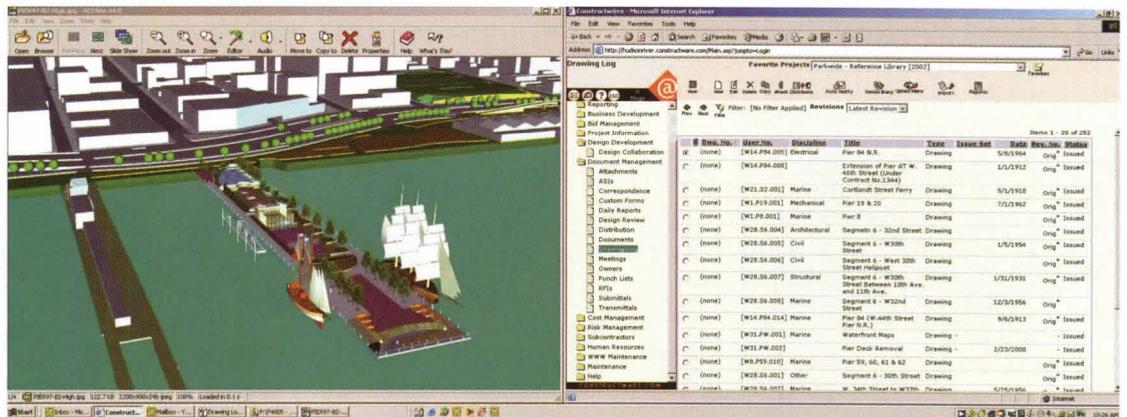
to design drawings that are easier to create and revise than hand-drawn counterparts. But experts caution that convenience shouldn't induce complacency. Electronic files and e-mail may also make it easier for firms to suffer from a host of new types of liability claims.

E-threats

According to attorneys and architects, major threats associated with

and other problems will become "more and more of an issue."

For now, the biggest headaches for his firm's clients center on discovery requests, the rights by litigants to receive copies of documents and correspondence relating to a lawsuit. In the past, complying with such requests may have involved merely pulling a few folders from a filing cabinet and making copies. Today, however, a firm may have to



Keeping track of the paper trail is critical to the Hudson River Park Trust, a group of more than 50 companies that are giving a face-lift to the Hudson River waterfront in New York City. They use Constructware to manage documents online.

creating more opportunities for architects to be found liable," says Gunther Carrle, an attorney with the Design Professional Group at the law firm Powell, Trachtman, Logan, Carrle, Bowman & Lombardo, in King of Prussia, Pennsylvania. "We see a situation where disasters are waiting in the wings," adds Bruce Lombardo, who along with Carrle co-chairs Design Professional Group, which specializes in representing A/E firms.

Few architects question the conveniences of automation, from better communications with coworkers, clients, and contractors

electronic documents include design errors introduced by glitches in CAD software; unauthorized access or modification of architectural drawings; damage claims resulting when computer crashes lead to missed deadlines; and expenses associated with gathering widely dispersed data for lawsuits. So far, threats appear to outnumber actual claims. Carrle says in the past four years he has come across "very few cases" that involve design errors linked to software problems. But he fears that as electronic communications become the norm—spurred on by Internet-based collaboration—flawed data

scour the e-mail inboxes of dozens of staff members, as well as search for files on scores of hard drives, personal electronic organizers, and backup tapes that archive records from central network servers. The hunt for all the documents relating to a case isn't only time-consuming and expensive; the size of the task could easily mean that an e-mail message left on a home-office computer or a document stored on a field rep's laptop goes undiscovered, which could make the firm vulnerable to charges of withholding information. "E-mail is the gift that keeps on giving because it's so

Digital Architect

hard to get rid of," quips Michael R. Overly, a lawyer with the e-business and IT group of Foley & Lardner, a Los Angeles law firm. "If you're sued, [a large volume of] e-mail can make it extremely expensive to respond to a discovery request."

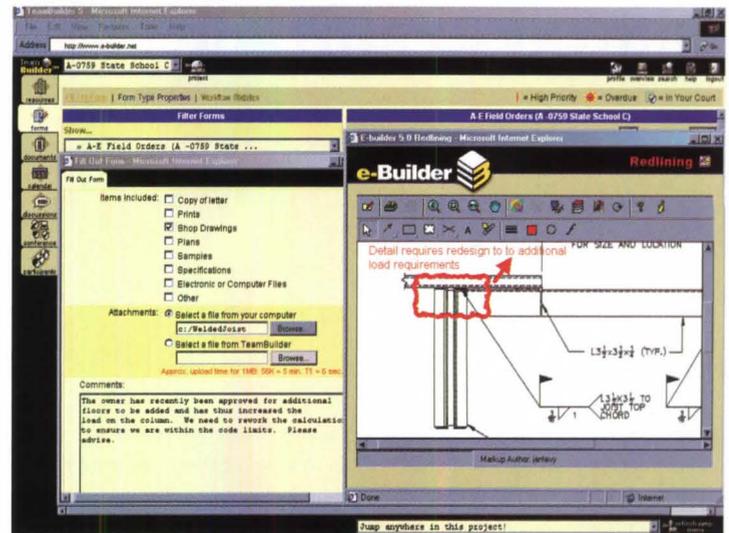
Architectural clients of Powell, Trachtman have suffered in other ways, including the failings of extranet hosts, similar to what Gensler experienced. In one case, an extranet provider didn't have sufficient computing resources to support a large design project. The massive drawing files and flood of electronic communications overloaded the extranet to the point of shutting it down. The client threatened to hold the architect responsible for lost time, but eventually relented when the extranet host upgraded its data center and the project got back on track. Lombardo says this incident illus-

trates the need for architects to write contracts that limit liabilities for technical problems over which they have no direct control.

Carrle also worries about how easy it is to use (or misuse) electronic information. "I've seen a number of situations where an electronic document was used for a purpose our client didn't intend," he says. In one instance, a client sent out preliminary CAD drawings that weren't to final scale. These shop drawings became the basis for the building's ductwork. When the error surfaced, the firm had to defend itself against an expensive change order.

Formal policies

How can firms protect themselves from these new types of liabilities? The first step, say Carrle and Lombardo, is to craft a company-wide policy that covers technology use, electronic communications,



E-Builder [note: RECORD publisher McGraw-Hill is an investor] recently upgraded its data-storage center to further safeguard client information.

and confidentiality. They encourage firms not to treat this as purely a technology concern. "This is a management issue," Carrle says. "These liabilities can have a cost and exposure impact on the entire firm, and it's essential that all executives become well-versed in the dangers and in their company's

formal procedures."

Among the components of this policy are guidelines on what type of information gets distributed electronically, and even what file format it should be in before it's sent out. In addition, management must understand what electronic files and information exist, how

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they're organized, and how to retrieve them quickly, says Lombardo. He advises firms to educate their staff about possible surprises, such as files thought to be deleted from a hard drive that in fact are retrievable to those who know how to use data-recovery software. "Develop a written policy to control the creation, mainte-

Firms also should set limits on how long to save e-mail messages. "A lot of companies are adopting policies that after 30 or 60 days, e-mail messages are destroyed," Overly says. "If the firm then gets a discovery request, at least it knows it has only 30 to 60 days of e-mail messages to go through."

In some cases, architects may

ALL FIRMS SHOULD HAVE WRITTEN POLICIES TO CONTROL THE CREATION AND MANAGEMENT OF ELECTRONIC FILES.

nance, destruction, archiving, and organization of electronic data," Lombardo says. "It's critical to have a written policy. That forces you to decide how to save information and where to store it." Architects can also contact the technology committees of their local AIA chapters to share information about sound policies and procedures.

be held responsible for errors in drawings that were introduced through glitches in their design software. Software licensing agreements typically shield software makers from such claims, which puts the burden of proof on the firm that due diligence went into the selection and use of the software it runs, including how thoroughly staff

were trained to use it. "Firms need to document why they selected the particular software," says Lombardo.

As Gensler realized, hard copies of documents still have a role to play today. "Most firms with whom I discussed this issue are asking that hard copies take precedence over electronic documents," Fisher says. "So if any questions arise over discrepancies between the two, everyone agrees to rely on the hard copy."

He says that architects often send both types of files to clients, often with the electronic versions serving as "shop drawing" iterations that lead up to the final design. "Architects need to communicate with clients about what they're getting in the electronic format. The key issue is that clients understand that electronic drawings done at the working-drawing phase may not exactly match the final product," Fisher says.

Carrle urges architects to treat Web-site collaboration with more formality than exists today. "Up to

now, we've still been in the 'gee whiz' stage," he says. Unfortunately, this attitude can result in contracts that don't clearly spell out responsibilities when a collaboration Web site crashes, or indicate how confidentiality of project information will be protected. Well-documented security procedures are necessary to prove the authenticity of documents in any subsequent litigation, he says. Contracts need to show how participants will guard the integrity of documents posted on a collaboration site, he adds.

Finally, Lombardo suggests that architects apply a higher level of formality to their e-mail messages. "People write in a conversational tone, rather than in a tone of formal business restraint," he says. Before you hit "send," ask yourself if there's anything in your message that could come back to haunt you in a lawsuit. "Don't shoot from the hip," Lombardo advises. In the Electronic Age, you could end up shooting yourself in the foot. ■

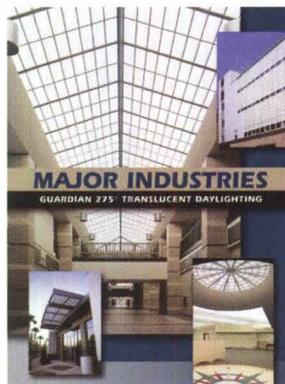


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Rockhill and Associates
Lecompton, KS



View Silo House
RoTo Architects, Inc.
Los Angeles, CA and
Livingston, MT



River Tower and Studio
Anderson, Mason,
Dale Architects
Denver, CO



Albrecht Residence
Salmela Architect
Duluth, MN

Citation Award



Goseline Residence
Bohlin Cywinski Jackson
Seattle, WA



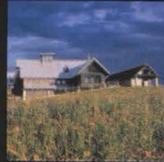
Beaverton City Library
Thomas Hacker and
Associates Architects Inc.
Portland, OR



Nicola Valley
Institute of Technology
Busby + Associates Architects Ltd.
and Equilibrium Consulting Inc.
Vancouver, BC



Sisson Cottage
Bohlin Cywinski Jackson
Wilkes-Barre, PA



The Jones Farmstead
Salmela Architect
Duluth, MN



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Impact-Resistant Systems: Security in a Tiffany Setting

A New Generation of Windows and Doors is Taking the Coast by Storm.

It has been a decade. Still, we are talking about Hurricane Andrew. Andrew, upgraded last month by federal researchers from a Class 4 to a Class 5 storm, was the costliest natural disaster in U.S. history. In the past century, only two other hurricanes of similar magnitude have struck the U.S. mainland: Camille in 1969, the unnamed storm that hit the Florida

Keys in 1935.

Andrew packed winds of 165 mph and came within 20 miles of a direct strike on downtown Miami. It was directly responsible for \$26.5 billion in damage. More than 135,000 single-family homes were destroyed or damaged; 160,000 people were left homeless.

Subsequent analysis yielded the observation that up to a quarter of the losses attributed to Andrew were attributable to construction that failed to meet codes, poor enforcement of codes, and deficiencies in the codes themselves.

In the 10 years since Andrew, building codes in Florida, Texas, the Carolinas

and other coastal states have undergone significant overhauls, many of them focused on vulnerable window openings.

Windows and doors were universally found to be the weakest building link, and their failure has been shown to lead to a domino effect that ends in catastrophic losses during major storms.

The highest priority amendment for all retrofits and new construction, according to code officials from Florida to New York, are impact-resistant windows and doors.

This continuing education section is intended to familiarize readers with the new code demands and details of a new generation of impact-resistant glass products with which to meet the new codes.

Florida Led the Change

Florida recently implemented the nation's first statewide building code. The most dramatic change: the new Florida Uniform Building Code requires approved impact-resistant glazing in windows and doors (or other protection devices).

Just a few months later, the Falls Church, Va.-based International Code Council, a body created in 1994 by officials of Building Officials and Code Officials International, Inc. (BOCA), International Conference of Building Officials (ICBO), and the Southern Building Code Congress International (SBCCI), developers of the three model codes used throughout the U.S., issued a similar mandate: windows and doors would be required to be assembled using impact-resistant glazing or shutter systems to lessen the hurricane threat.

Fourteen Texas counties also have adopted the stricter codes, and they are expected to be implemented statewide by the end of the year.

The strengthened codes are intended to improve construction techniques in order to prevent losses during natural disasters.

Use the learning objectives below to focus your study as you read **Impact-Resistant Systems: Security in a Tiffany Setting**. To earn one AIA/CES Learning Unit including one hour of health safety welfare credit, answer the questions on page 210, then follow the reporting instructions on page 274 or use the Continuing Education self report form located at architecturalrecord.com.

Learning Objectives

At the end of this article you will be able to:

- Understand the codes that apply to hurricane and other severe weather regions
- Identify the features and benefits of a window system compared to shutters
- Know how to correctly select and specify impact-resistant window & door systems

The new impact-resistant glass, developed specifically for the Southeast—the region of the U.S. most vulnerable to hurricanes—has recently become, or soon will become, a dictate of local codes in coastal regions from Texas to New York. Manufacturers are finding architects specifying it in Kansas, Iowa and other Plains states to help combat tornado disasters.

The Case for Impact-Resistant Glass

Hurricane-force winds create tremendous pressures on a building: a 140-mph wind hurricane accompanied by wind of this speed would be classified a Class 4 Saffir-Simpson hurricane, generating 80 pound per sq ft (psf) wind load on a 4-x-8-ft window, translates to a total load of 2,560 pounds of pressure on the window. No annealed glass pane can withstand that kind of pressure.

Although hurricane winds, themselves, exert tremendous damaging pressure, a large percentage of hurricane damage is not from the wind itself, but from airborne debris that, in severe cases can include entire roofs, chimneys, limbs, etc.

When windows fail, as a result of either wind pressure or breakage by flying debris, there is a near-immediate escalation of pressure within the structure as pressurized outside air rushes to find a low-pressure pocket and expand. The expansion causes tremendous lift on the roof, frequently of sufficient force to lift the roof off from the house. Once exposed, interior walls and ceilings, not designed to withstand such forces, are overturned.

Building failure during Andrew, according to a 1996 study by The Johns Hopkins University, was primarily a result of negative pressure and/or induced internal pressure overloading the building envelope. Entry doors, especially French doors (and wood and metal double doors) were prone to failure. Windows, especially sliding glass doors were susceptible to failure from wind pressure and the impact of debris. (In most cases frame systems were found intact, but only because the glazing had already failed.)



During Andrew, metal gratings and shutters were severely bent, even penetrated by wind-born debris.

The use of storm shutters to protect the windows and doors requires a homeowner to physically activate the retractable systems or to engage the non-mechanical systems. One of the benefits of using an impact-resistant glazed system vs. a shutter system is the “no-worry, always-ready-to-protect” feature. Impact-resistant windows offer other advantages:

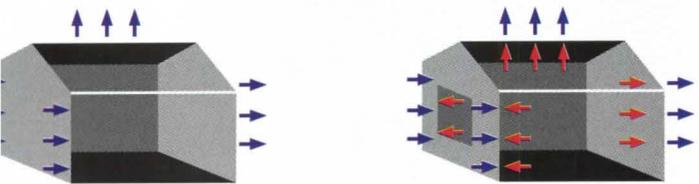
1. 24-hour protection, seven days a week. Whether home or away, the window is protecting the home. Shutters need to be closed or added before the storm.
2. If you are out of town, it may cost money for the homeowner to contract someone to put shutters up – or every single time the homeowner leaves during the storm season, the shutters will need to be put up.
3. Panel shutters or plywood take up valuable storage space when not in use.
4. Many roll-down shutters operate on electricity. If the power goes out, shutters may not be able to be put in place.
5. No unsightly shutter components are visible on the home or business.
6. If the homeowner puts up shutters or boards, when away from the home, it is evident the homeowner is absent. Security issues may arise as a result.
7. Many shutters can be labor intensive, and therefore costly, to install.
8. A family remaining in the house during a storm, is not forced to be in a dark, enclosed, shuttered environment.
9. If the window were to be broken, glass tends to adhere to the interlayer. This reduces the potential for serious injury.

Often, the effect of a hurricane is not unlike an explosion. Nearly three-quarters of the injuries from the 1995 bombing of Oklahoma City’s Alfred P. Murrah Building were caused by flying glass.

Since Oklahoma City, glass manufacturers and structural engineers have worked to develop a new generation of heat-hardened and chemically treated glass, experimenting with new interlayers and completely new impact-resistant window systems, including mullions, frames and anchors.

The new impact-resistant residential glass, similar to car windshields and aircraft windows, is now making its way to the retail marketplace. Typically, the new impact-resistant laminates contain at least a .090” gauge layer of polyvinyl butyral (PVB) or a similar type interlayer sandwiched between two sheets of at minimum 1/8-in annealed glass.

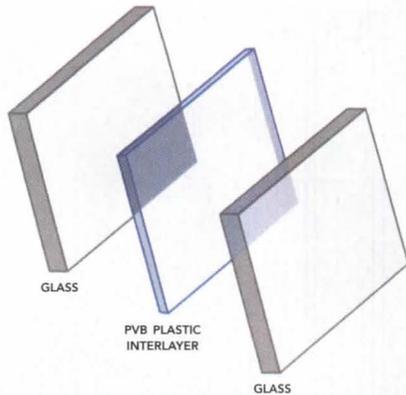
WHY IMPACT-RESISTANT GLASS IS SO IMPORTANT



ENCLOSED BUILDING
A .090” gauge and .100” gauge interlayer laminated glass windows and doors are tougher. A durable interlayer can withstand tremendous blows from flying debris, thus reducing the likelihood of an impact fracture. A reduced inward rush of air on the windward wall, the likelihood of a structure being a volatile internal pressure is reduced.

OPENING IN WINDWARD WALL
In the midst of a high-winded storm, structural openings like failed doors or windows compromise a home’s structure. When pressurized outside air rushes to find low-pressure pockets of air and expand, the force may be enough to physically blow off a roof.

When window and door loss occurred, interior damage from wind and rain intrusion was substantial. Even where structural systems were intact, many homes were uninhabitable for long periods of time because of water damage to interiors. Nearly two-thirds of all homes damaged by Andrew suffered damage to windows. The Johns Hopkins study suggests that an opening of only five percent of the windward side of a structure will allow full pressurization of the interior, creating uplift pressure on the roof and lateral pressure against interior walls. Storm shutters—from sheets of plywood to electric retractable systems, as shown to reduce the impact of the storm, by 30-to-50-percent, but shutters are not guaranteed to protect windows from hurricane-force winds.



The “glass sandwich” will break upon a severe impact, but it will not allow the flying object to enter through the glass. The interlayer can withstand tremendous blows from flying debris, and will even resist the impact of a driven golf ball (Tiger drives the ball at about 140 mph). If the glass is broken, the laminate interlayer is designed to remain intact. The adhesion between the interlayer and the lites of glass keeps the broken fragments relatively intact, thus maintaining the internal pressures.

Window manufacturers have engineered systems to meet local codes still evolving in Florida, Georgia, Texas, the Carolinas, New York and other eastern states. These new protective opening systems in many cases include not only impact-resistant glass, but also corrosion resistant hardware.

Glass Alone Does Not a Defense Make

“Many different factors influence the required design load,” says the testing and certification coordinator for a major manufacturer, including the wind zone, the mean roof height, whether units are glazed within three feet of the corners of the building, the size and quantity of doors and windows being installed, etc. Please refer to additional online material for greater detail and charts.

Architects must determine design pressure needed for each window in a building, then check sizes and configurations tested by the manufacturer to ensure that the products meet the expected design pressures.

The adequacy of the engineering design and method of attachment of windows and sliding transparent doors of all types is critical to the performance of window and door systems for applications in areas subject to wind exposure. Wind loads should be adequately transferred to the supporting structure.

Some multiple wide/high combinations will require a structural mull or can be framed into a separate opening. Designers must note differences in performance levels of various glass types and select the glass make-up that meets the required pressure.

Designers should note that heat-or-chemically strengthened glass will be required for picture units or large fixed lites in order to achieve passing performance levels.

“Do not make the mistake of believing that because you order a window or door with laminated glass, that it is necessarily impact-resistant. In order for a product to be certified as impact-resistant, it must be tested in a complete window/door system. The design of the overall sash/frame greatly affects the outcome of the testing,” says the source.

Architects should look for laminated-glass systems engineered specifically to comply with coastal building codes. New code-compliant window systems feature added mass to carry the heavier weight of a laminated glass sash. Foam-filled-center weather stripping creates airtight seals. Frame corners are reinforced with structural corner keys and injected with silicone for added durability and resistance to water infiltration.

In tests conducted in accordance with ASTM E-1886 and ASTM E-1996, Metro-Dade County Protocol PA201 and PA203, SSTD 12-97 and TDI 1-98, some new laminated window systems have been shown to withstand winds up to 205 mph winds and 65 mph driving rains. In addition, laminated glass products provide nearly 100% resistance to harmful UV rays. The added protection of the interlayer gives the homeowner peace of mind in knowing that their draperies, floor coverings, furniture, etc. will not fade.

Are My Design Options Limited?

Over the past two decades, populations along high-risk coastlines have increased significantly. The population of Florida, alone, has increased by more than 50 percent since 1988.

The Oceanic and Atmospheric Administration estimates that by the year 2010, the population of Southeastern coastal areas and other hurricane-prone areas of the country (18 states are regarded as “hurricane-prone”) will have grown to 73 million people.

At the same time, Hurricane Andrew redefined the way the public and public agencies view the risk of hurricane damage to homes. The size of losses from Andrew proved that hurricane damage estimates have, historically, been seriously underestimated.

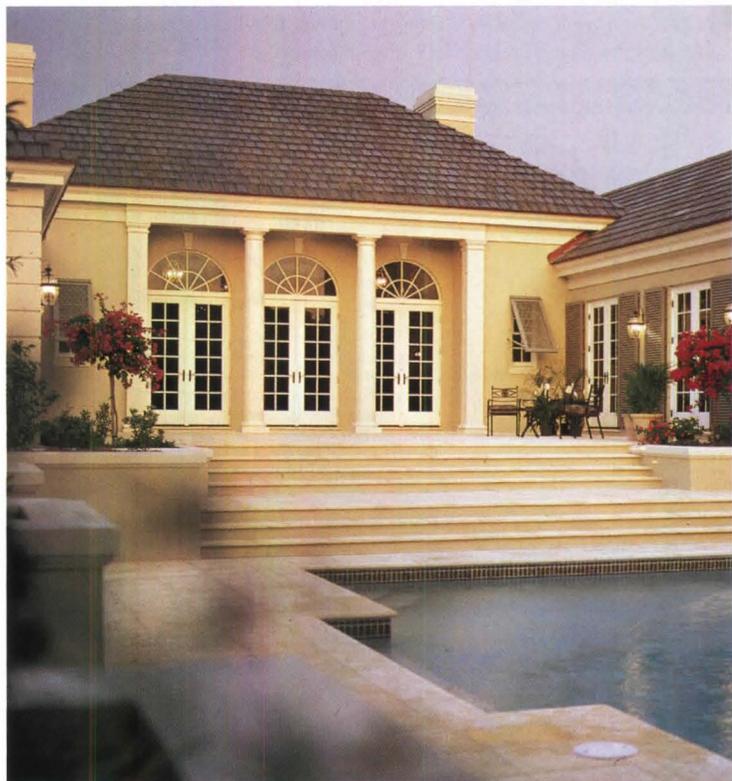
In the wake of Andrew, unprecedented code changes occurred. Those code changes, in concert with technological leaps in glass design, pushed forward-looking manufacturers to essentially recreate their entire product lines and seek certification of new hurricane-resistant systems for a residential market in which homes were growing larger and more grandiose. Some manufacturers retrofitted existing product lines and offer a limited range of certified impact-resistant products; others have created new code-compliant lines that include a full range of window types and sizes in impact-resistant glass.

The result is a new generation of window products that meet virtually all the design options available with non-laminated windows.

“There are now vast product options available in impact-resistant product lines, with a tremendous variety of custom shapes, sizes, trim and hardware options,” says a manufacturer’s representative. “The bottom line: builders will be able, in these markets, to construct virtually any look they want.”

A common characteristic to be aware of, however, is that while annealed-glass laminates are virtually distortion-free, heat-strengthened glass will exhibit some distortion due to the process of heating the glass to achieve the benefits of added strength.

It should also be noted that monolithic (non-insulated) glass, although not providing the same insulating value of a standard dual-pane insulated product, can be manufactured with a gray or bronze tint to provide added benefits for solar heat gain reduction or to meet the well-known “turtle code” now applicable in many coastal areas.





With many state and/or local codes now requiring compliance with the IECC (International Energy Code Congress) as well as the windborne debris requirements, manufacturers are scrambling to come up with a product that gives the consumer the best of both worlds.

However, this is easier said than done. In order to meet the stringent energy code requirements set forth in many coastal regions such as North and South Carolina, an insulated product is required. With the initial “push” to manufacture an impact-resistant system for the Florida market, there wasn’t a concern to provide product that met stringent insulating values. Thus, window and door manufacturers focused on the monolithic (single-pane) laminated product to meet the impact-resistant codes. This product works for Florida (where energy codes are not enforced at this time), but it does not meet the codes mandated in some other coastal areas.

The use of an approved shutter system along with an insulated window or door product meeting the design pressures required for the coastal areas does meet both the energy and windborne debris codes.

Knowing this is not always the choice of a homeowner, window and door manufacturers are working hard to develop an impact-resistant insulated glazing system to comply with both of these codes.

Because of the larger sized units requiring thicker glass to meet the impact and cyclic tests, it is a challenge to design a glazing shelf sufficient to handle a 9/16" lite of laminate, an insulated glass spacer and yet another 1/8" lite of annealed or tempered glass. There is also a minimum air space required to be able to obtain the optimal energy performance; therefore manufacturers may be required to redesign an existing impact-resistant system to be able to gain all of the benefits.

Another constraint is getting the insulated laminated product to withstand the intense pressure cycles required to meet the codes. The addition of a glass spacer and another lite of glass typically causes the glazing unit to “roll” while under heavy loads. This makes the use of a structural silicone critical in most applications.

As more and more jurisdictions mandate the energy requirements along with the windborne debris requirements, the need for low-e insulated impact-resistant glazing is becoming a key issue.

Assessing Code Compliance

The Miami-Dade protocol (PA 201, PA 203), considered the most stringent in the nation, has become the optimal standard for testing of impact-resistant glazing systems. Window systems are subjected to an impact of a nine-pound 2X4 projected at a speed of 50-ft-per-second, and are then subjected to 9,000 positive/negative pressure cycles.

This testing meets the requirements of SSTD 12-97, TDI 1-98, ASTM E1886 and ASTM E1996.

The IBC references ASTM 1886 and ASTM E 1996. BOCA and UBC fall under the IBC.

The IBC references the ASCE 7-98 standard to determine wind loads, thereby requiring a combination +/- dual-performance grade. The positive pressure required is typically lower than the negative pressure. The reason for the positive pressure being lower than the negative pressure is due mainly to the characteristics of dynamic air flow and the effect it has around a building or structure. The water performance is only required to meet the positive pressure requirement.

Certified new laminates not only meet or exceed the toughest code requirements for hurricane protection, but also offer these additional benefits:

- **Safety:** laminated glass resists penetration from accidental impact, and, if broken, glass fragments adhere to the interlayer, thereby reducing the danger of serious injury. Certified products meet CPSC, CFR 1201 and ANSI Z97.1 safety glazing standards.
- **Sound control:** the new laminates are effective in controlling sound transmission.
- **UV protection:** laminates screen out 99 percent (up to 380 nanometers) of the sun’s most damaging rays, reducing glare, fading of carpets, draperies and furnishings.
- **Security:** they protect against forced entry and resist repeated blows from hammers or thrown rocks and meet the ASTM F-1223 (Class 1) forced entry standard.

Code-approved window systems can be less expensive to install than windows protected by shutter systems—about 17 percent less expensive than windows with accordion shutters; up to 50 percent less expensive than windows with roll-up shutters.

A study conducted by Orlando, Fla.-based Associated Cost Engineers compared laminate windows with regular wood-shuttered windows. It found that a system of laminated glass (for a home in the \$100,000-\$120,000 range) cost about \$12,500 for materials and labor. Regular glass windows with roll-up shutters cost more than \$25,000, according to the study, and regular glass windows with accordion shutters cost nearly \$16,000. (The study was based on a theoretical, code-approved model home in Dade County with 1,632 sq. ft. of living area.)

The Threat Is Growing

The risk of property damage and loss in hazard-prone areas grows along with population, and as noted earlier, coastal populations are on the rise.

Florida, the state most at risk from hurricanes, accounts for the largest share of insured coastal property exposure. From 1988 to 1993, the value of insured property in Florida went from \$565.8 billion to \$871.7 billion and at the current rate of growth will soon surpass \$1 trillion, according to the 1996 John Hopkins study.

The physical properties of impact-resistant glass with a .090-in PVB interlayer are as follows:

Refractive Index:	1.48
Visible light transmittance, clear:	0.88
Shading coefficient, clear:	0.88
UV Screening, up to 380 nm:	0.99
Solar transmittance:	0.69
Solar heat gain coefficient:	0.75
Relative heat gain:	189

While one does not usually think of New York as a state exposed to hurricanes, Long Island is a highly exposed region. Coastal property exposure for New York increased from \$301.7 billion to \$595.6 billion between 1988 and 1993.

Concurrent with population increases in hazard-prone areas, there is evidence that the future will bring more intense hurricanes (Saffir-Simpson Categories 3-5) In the wake of Andrew, researcher and forecaster William Gray said in a Time magazine interview "We're going to see hurricane damage like we've never seen it before."

Indeed, there is strong evidence that intense hurricane formation is cyclic, and that we are entering a high-incidence swing of that cycle.

Climate studies, Gray says, indicate we are returning to a period of greater African rainfall, which may cause a return to the more active hurricane seasons typical of the 1940s and 1950s, when 10 major hurricanes struck the continental U.S.

Learning Objectives

At the end of this article you will be able to:

- Understand the codes that apply to hurricane and other severe weather regions
- Identify the features and benefits of a window system compared to shutters
- Know how to correctly select and specify impact-resistant window & door systems

Instructions

Refer to the learning objectives above. Complete the questions below. Go to the self report form on page 274. Follow the reporting instructions, answer the test questions and submit the form. Or use the Continuing Education self report form on *Record's* website—architecturalrecord.com—to receive one AIA/CES Learning Unit including one hour of health safety welfare credit.

Questions

- Q: 1. Analysis of Hurricane Andrew yield that up to how much of the losses were attributable to inadequate construction codes.
- A: a. 1/4
b. 1/3
c. 1/2
d. 2/3
- Q: 2. In studies, what was shown to be the weakest building link in a hurricane:
- A: a. Windows and doors
b. Roof structure
c. Interior walls
- Q: 3. A large percentage of hurricane damage is not from the wind itself, but from
- A: a. Driving rain
b. Air pressure
c. Windborne debris
- Q: 4. The action causes tremendous lift on the roof is:
- A: a. Pressurized outside air rushing in to find a low-pressure pocket and expanding
b. High winds blowing up and through building
c. Pressurized inside air rushing out to find a low-pressure pocket and accelerating

In addition to a greater number of intense Atlantic hurricanes as a result of the rainfall cycle, there is growing concern that global climate may be changing in ways that could increase hurricane frequency and intensity.

We may, however, be able to reduce the level of damage resulting from major storms. Architects now have the tools to combat hurricane-force winds, and they need not sacrifice warmth and clarity of vision to do so.

Today's wind-borne debris resistant systems offer security and attractiveness. Now, you can have both. ■

Click for Additional Required Reading

As part of this CES learning activity, you are required to read some additional material. Some of the test questions below will relate to the additional reading material. Go to www.architecturalrecord.com/CONTEDUC/ConteducC.asp to access the material online. To obtain a faxed copy, contact Corinne Liske at 800-222-2995 ext. 3716 or cliske@weathershield.com.

- Q: 5. Even an opening of only ___ percent on the windward side of a structure will allow full pressurization of the interior, exerting uplift pressure on the roof and lateral pressure against interior walls.
- A: a. 5 %
b. 10 %
c. 15 %
- Q: 6. The new impact-resistant laminates contain a .090" layer of _____ sandwiched between two sheets of at minimum 1/8 in. annealed glass.
- A: a. Polyisocyanurate
b. Polyurethane
c. Polyvinyl butyral
d. Polycarbonates
- Q: 7. The sash/frame must be included in the testing of a product to be certified as an impact-resistant window door system.
- A: a. True
b. False
- Q: 8. Code approved window systems can be about ___% less expensive than windows with accordion shutters.
- A: a. 12
b. 17
c. 27
d. 32
- Q: 9. Category 4 hurricanes can cause "extreme" damage with winds at:
- A: a. 111 – 130 mph
b. 131 – 155 mph
c. Greater than 155 mph
- Q: 10. When determining exposure categories, shorelines in hurricane prone regions are included in which category:
- A: a. Exposure A
b. Exposure B
c. Exposure C
d. Exposure D



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Understanding the UL Directory: Fire-Resistant Assemblies

Creating Code-Compliant Designs



Gypsum—hydrous calcium sulfate—is an abundant, naturally occurring mineral quarried for a variety of uses, the most common, of course, being gypsum board. Roughly 90 percent of finished interior surfaces are covered today with gypsum products.

Two molecules of water are chemically bound to the calcium crystal during the formation of gypsum. As a result, gypsum is about 21 percent chemically combined water. One of the many unique properties of gypsum is its ability to give up these water molecules as steam when heated, in a process known as calcination, making gypsum board ideally fire-resistant.

When gypsum-protected wood or steel framing members are exposed to fire, the chemically combined water being released as steam acts as a thermal barrier until the slow process of calcination is completed. The temperature directly behind the “plane of calcination” (the heated surface) is only slightly hotter than that of boiling water, significantly lower than the temperature at which steel begins losing its strength, or wood ignites.

This continuing education section will explore the fire-resistant nature of gypsum board, and more specifically, the Underwriters Laboratories (UL) requirements governing its installation.

Underwriters Laboratories Inc. (UL) is an independent, not-for-profit product-safety

testing and certification organization that has performed product safety testing on more than 17 billion products. In 2001, UL conducted 537,277 follow-up visits to audit compliance with product certification requirements, ensuring conformity in UL certified brands.

In this section, readers will learn how to navigate Volume 1 of the UL Fire Resistance Directories and create code-compliant designs using an essentially cut-and-paste procedure utilizing the UL directory.

In Volume 3, you will find hourly ratings for dampers, fire doors, glazing materials and related equipment. In Volume 2 you will find hourly ratings for joint systems, through-penetration fire-stop systems, electric circuit protective systems and duct assemblies. Our focus is on Volume 1, which includes hourly rated designs for beams, floors, roofs, columns, walls and partitions.

We will be looking at hourly fire ratings, how they are determined, and what they mean to the designer. This continuing education section will help design professionals understand hourly fire ratings, how they are determined, and how that applies to your designs. We will take readers through a few sample activities to familiarize them with the process of selecting code-appropriate drywall systems.

Richard A. Piccolo, president of a Hoffman Estates, Ill.-based code services company, and Melissa (Missy) Merfeld, product manager for a Charlotte, N.C.-based gypsum manufacturer will be our guides. Piccolo’s firm is a consulting agency specializing in building and fire protection plan reviews, inspections, training and general code consulting services. Piccolo is co-chairman of the Illinois Fire Inspectors Association Codes Standards Committee, and is a past president of the Illinois Council of Code Administrators (ICCA).

The UL Fire Resistance Directory consists of three volumes. The focus today is Vol. 1, with special emphasis on the first 10 pages of the volume—specifically the table on page 1. Understanding this table, entitled “Numbering System For Fire Rated Assemblies”, will allow you to determine which design will be best for your project.

It is important to note here that we will be talking, in all cases, about “assemblies” or “systems” because fire resistance is dependent not only on the gypsum products themselves, but also the framing, insulation and joint compounds that are part of the construction package.

AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION Series

Use the learning objectives below to focus your study as you read **Understanding the UL Directory: Fire-Resistant Assemblies**. To earn one AIA/CES Learning Unit including one hour of health safety welfare credit, answer the questions on page 217, then follow the reporting instructions on page 276 or use the Continuing Education self report form located at architecturalrecord.com.

Learning Objectives

At the end of this article you will be able to:

- Learn about the types and fire resistance properties of gypsum wallboard
- Understand how to navigate through the UL Fire Resistance Directory
- Analyze several fire-rated gypsum wallboard assembly designs

Hourly Rating

In Volume No. 1 everything is categorized by hourly rating—beam assemblies, floor assemblies, and floor-ceiling assemblies.

Building codes are based on hourly ratings.

There are two test standards that are used. One of them is ASTM E119, written by the American Society for Testing Material, and it outlines the entire test process: “What are the requirements? How big a piece of assembly? How soon before failure? What’s the temperature rise?” This is not established by Underwriters Laboratories. UL does have a similar test: UL 263.



Figure 1

“If we look at the pictures of an assembly after testing,” Piccolo says (Figure 1), “we say ‘Oh, my goodness, it must have failed. Everything fell off.’ But what we need to realize is that it is a post-test photo, and the assembly has been subjected, after the fire, to a hose-stream of certain pressure that will ensure that the structure is still viable.”

“This is a two-sided assembly. If you look, there is a second layer of drywall on the other side of the assembly, which has not failed during the course of the test. It would be acceptable for the drywall to fall off on one side, but still maintain the structural integrity on the other side. It’s very possible that this assembly did pass, even though we had some burn through the first layer. But (the fire) didn’t burn all the way through the assembly.”

Tests, by various labs, are routinely conducted to measure many of the characteristics of gypsum board, such as strength, durability, and sound resistance. But the most important tests are for fire-resistance. In a special furnace, typical wall assemblies fitted with thermocouples are exposed to varying temperatures—some in excess of 2100 degrees. Then, the reaction of the assembly is carefully observed. If the wall assembly successfully withstands the high temperatures, an appropriate hourly rating is assigned—one, two, three or four hours.

ASTM E119 follows a Standard Time Temperature Curve when conducting a fire test (see Figure 2). We see in the graph that at 5 minutes the temperature reached 1000 degrees and at 1 hour the temperature is at 1700 degrees. After one hour the temperature continues to climb but does not climb as drastically. At the end of four hours, the furnace is at approximately 2000 degrees.

This is the standard, and no matter whose product is subjected to it, it’s always the same. There are variations with the hose stream and other things, depending on the type of assembly, but in standard testing, everything should be tested the same way, so we have a basis of comparison.

It is important to keep in mind that the test results are achieved in a controlled, laboratory environment. In addition, certain UL fire ratings for many system designs are achieved as a result of engineering studies conducted by UL as opposed to actual fire tests in the laboratory. Performance of any fire-rated system in an actual field installation may vary from the published rating, due to the variability of system components, installation techniques which might be used and actual fire conditions.

In testing an assembly, one of the things we are concerned about is heat transmission through the device. When the assembly is in the test furnace, thermocouples are strategically placed over the inside of the wall. Thermocouples measure temperature of the assembly during the test. The average of all the thermocouples cannot exceed 250 degrees over ambient, or normal, room temperature. This is to prevent igniting something on the other side of the wall. In most cases, things will not spontaneously combust at 250

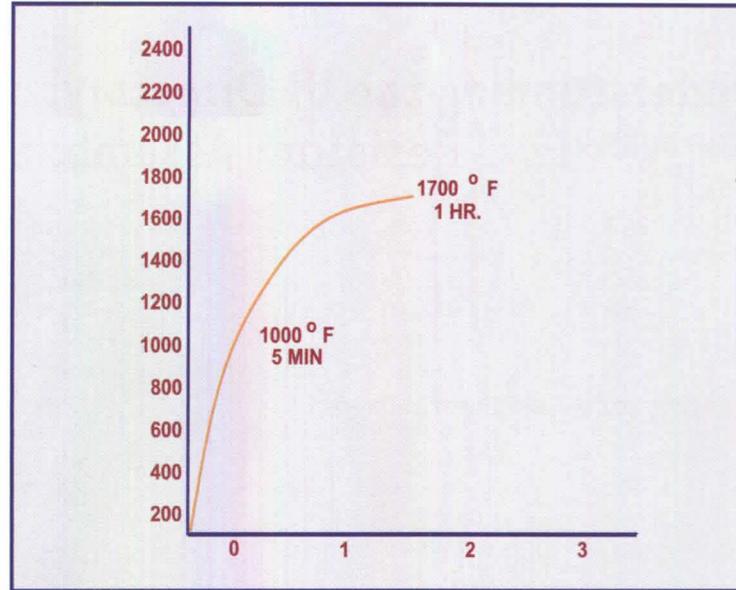


Figure 2

degrees over room temperature. That is one of the test criteria.

Another test criteria is that at any one particular point on the assembly structure, no single thermocouple can report a temperature of 325 degrees over ambient in any one spot. If a single thermocouple rises above 325 over ambient, the test is “failed.” The last point, and this is a fairly important point, is that during the course of the test we do not get a failure—the structure cannot collapse, or show any evidence of burn-through to the other side of the tested assembly. During the course of the test, the assembly has to maintain its structural integrity. If it’s a one-hour assembly, it’s a one-hour test—not 59 minutes. A variance of 30 seconds is acceptable. A two-hour assembly is tested for 120 minutes, a three-hour assembly is a three-hour test.

Which Type of Drywall Is Most Fire Resistant?

There are three essential core types. Drywall comes in regular core, Type X and Type C. All drywall affords some degree of fire protection. After all, it’s rock, it’s water, it’s difficult to burn. Regular drywall is fire resistant. It’s composed mainly of gypsum. Type X drywall contains additional ingredients that enhance its fire-resistive properties. The basic component added to Type X to give it superior resistance is fiberglass. Finally, systems tested in the laboratory utilizing Type C gypsum wallboard are the most fire resistant. The make-up of Type C drywall is, generally, proprietary, but its fire resistive properties are superior to Type X.

The most important characteristic of drywall, say fire officials, is that it will not burn. “Statistics show that in recent years, fewer people have died in fires in the U.S.,” says the Gypsum Association. “Naturally, there is no single reason for the decline. But the diminished number has a high correlation with the increased use of gypsum products and other fire-resistant building materials,” they say.

“The gypsum in the core of the board actually emits steam when exposed to fire and retards transfer through the panel. This slowdown provides extra time to evacuate a room or building.”

“Ask yourself this question, says Piccolo: ‘How do I know what type of drywall is being installed? Is it regular drywall, Type X, or Type C? The drywall will be stamped if it is Type X or Type C.’ The UL stamp on the back of the gypsum wallboard Advises you if the board is Type X or Type C in addition to letting you know that the wall board is consistent in its construction, that you have quality, and performance. Since the stamp will be on the back of the drywall, you will have to inspect it prior to completion of the assembly.”

Navigating the UL Directory

Specification of fire-resistant gypsum systems starts at the UL home page and becomes a relatively simple, essentially cut-and-paste, web-based exercise that eliminates oversight and provides the contractor with a detailed wall, ceiling or floor configuration.

On the left-hand side of the UL home page (www.UL.com):

- Click on “Certification.”
- Click on “Fire-Resistive Assemblies and Systems.”
- Click on “Numbering System for Fire Rated Assemblies.”

Up comes a chart of fire-rated assemblies that becomes your numeric guide to detailed specifications for walls, ceilings and floor systems (Figure 3).

You will learn how to select a numeric code that relates to the project detail in question by doing an exercise later in this article. When the results page comes up, click in the box under ‘Link To File’ column to view design detail.

The computer will display assembly details, including a cross-section and a narrative of assembly methods and procedures. You can then cut and paste assembly details directly into specifications. Most of the gypsum-related assemblies can be found in construction groups 500-599. It should be noted that the UL directory is not copyrighted, and that, in fact, the UL encourages direct transfer of its assembly specifications to your bid and building plans.

The UL’s Fire Resistance Directory Vol. 1, available online, provides a guide to the designs within. The first 10 pages of Vol. 1 give specifiers an explanation of terms and standards that apply to the UL assembly designs.

“I am always surprised, in my teaching, to find how few professionals have read this,” Piccolo says. “These 10 pages tell you how to use the book. The answers to many of the most frequently asked questions about drywall systems are found here.”

A few key items from the first 10 pages that we should be aware of are as follows:

- **Page 2, column 2:** “Nails and Screws.” “Screws meeting ASTM C1002 or ASTM C954 may be substituted for nails, one for one, when the head diameter, length, and spacing equal or exceed the requirements for the specified nails.” So can screws be substituted for nails? Yes! Provided the fasteners meet the above requirements.
- **Page 3, column 1:** “Gypsum Board Orientation.” Vertically applied gypsum board is applied with the long edges parallel to the framing members to which it is attached. Horizontally applied gypsum board is gypsum board applied

with the long edges perpendicular to the framing members to which it is attached. The orientation is critical to ensure that assemblies are fire-resistant.

- **Page 3, column 1:** “Gypsum Board Joint Treatment,” (Fire Taping). The key point under this heading is “Base layers in multi-layer systems are not required to have joints or fastener heads taped or covered with joint compound.”
- **Page 4, column 2:** “Steel Joists.” This section explains that the joist sizes in a design are minimums. “Joists which exceed the specified minimum size may be used provided the accessories are compatible.”
- **Page 5, column 1:** “Gypsum Board” The main point of this section is that gypsum board thicknesses specified are minimums. “Greater thickness of gypsum board is permitted as long as the fastener length is increased to provide penetration into framing that is equal or greater than that achieved with the specified gypsum board thickness and fasteners.” *Note: Additional layers of gypsum board can be added to any design.*
- **Page 8, column 1:** “Blanket Insulation.” We learn in this section that in a ceiling and floor or roof system the addition of insulation, if not specified in the design, may reduce the hourly rating of the assembly. So, in assemblies of the G500, L500 and P500 series, you may add insulation provided an additional layer of gypsum wallboard is added to the assembly. In wall assemblies, insulation is optional unless otherwise stated.
- **Page 9, column 2:** “Wall and Partition Assemblies.” “The size of studs are minimum unless otherwise stated in the design. The spacing of studs are maximum unless otherwise stated in the design.”
- **Page 10, column 1:** “Metal Thickness.” Metal thicknesses are minimums unless the design indicates a specific gauge. If metal thickness is not specified in the design, reference the table on page 10 of UL Vol. 1 for gauge and metal thicknesses.

“I can’t tell you how many jobs I’ve been on where they didn’t follow this guide and put the drywall on the wrong way. It, then, has to come down upon inspection,” Piccolo says. “You can take this information directly from the website, so that when the contractor bids the job, and when he builds it, he has no reason not to put it up the right way.”

Analyzing the Assembly

What follows is an analysis and discussion of the details of one of UL’s fire-resistant assemblies. Additional exercises, intended to familiarize the readers with the process, will be part of the additional reading material at the end of this section.

How do you find an assembly when you do not already know the design number? Start by using the chart on page 1 of the UL Fire Resistance Directory Vol. 1 (Figure 3).

Your first step will always be to determine your Group of Construction in the far left-hand column. Does your project’s floors-ceilings call for concrete and cellular steel floor? If so, your design will start with A, B or C. Are you looking for a fire rated wall or Partition assembly? Your desired design will start with a U, V or W.

	NUMBERING SYSTEM FOR FIRE RATED ASSEMBLIES								
	TYPES OF PROTECTION								
	Membrane Protection						Direct Applied Protection		Unprotected
Groups of Construction	000-099	100-199	200-299	300-399	400-499	500-599	600-699	700-899	900-999
Floors-Ceilings A,B*, or C* Concrete and Cellular Steel Floor	Concealed Grid Sys.	(Reserved)	Exposed Grid System	(Reserved)	Metal Lath	Gypsum Board	Misc.	SFRM +	Unprotected
D, E* or F* Concrete and Steel Floor Units	Concealed Grid Sys.	(Reserved)	Exposed Grid System	(Reserved)	Metal Lath	Gypsum Board	Mastic Coating	SFRM +	Unprotected
G, H*, or I* Concrete and Steel Joists	Concealed Grid Sys.	(Reserved)	Exposed Grid System	(Reserved)	Metal Lath	Gypsum Board	Misc.	SFRM +	Unprotected
J or K Concrete	Concealed Grid Sys.	(Reserved)	Exposed Grid System	(Reserved)	Metal Lath	Gypsum Board	Misc.	SFRM +	Unprotected
L or M* Wood Joist or Combination Wood and Steel Assemblies	Concealed Grid Sys.	(Reserved)	Exposed Grid System	(Reserved)	Metal Lath	Gypsum Board	Misc.	SFRM +	Unprotected
Beams: N or O* for Floor-Ceiling	Concealed Grid Sys.	(Reserved)	Exposed Grid System	Batts & Blankets or Mineral and Fiber Boards	Metal Lath	Gypsum Board	Mastic Coating	SFRM +	Unprotected
Roof-Ceiling: P, Q* or R*	Concealed Grid Sys.	(Reserved)	Exposed Grid System	(Reserved)	Metal Lath	Gypsum Board	Misc.	SFRM +	Unprotected
Beams: S or T* Roof-Ceiling	Building Units	(Reserved)	Exposed Grid System	(Reserved)	Metal Lath	Gypsum Board	Mastic Coating	SFRM +	Unprotected
Wall & Partition: U, V or W*	Bldg. or Partition Panel Units	(Reserved)	Insulating Concrete	Wood Stud Gypsum Bd. Lath and/or Plaster	Metal Stud Gypsum Bd. Lath and/or Plaster	Misc.	Metal Panels Gypsum Bd. Lath and/or Plaster	SFRM +	Masonry
Columns: X, Y or Z*	Building Units	Pre- fabricated	(Reserved)	Batts & Blankets or Mineral & Fiber Boards	Metal Lath & Plaster	Gypsum Board	Mastic Coating	SFRM +	Reserved)

The prefix numbers with an asterisk (*) and the design numbers indicated as “Reserved” in the above table are for future expansion and to cater to new types of systems

Figure 3

Next decide what type of protection your project will utilize (moving right across the chart). Your first choice is "Membrane Protection." Membrane Protection refers to the mechanical fastening of protection to the structure, as gypsum wallboard is fastened to studs. Some other building materials that are within the Membrane Protection category are concealed grid and metal lath. Our next option is "Direct Applied Protection," protective materials like mastics or spray-applied fire-resistive materials. The last column is "Unprotected." Unprotected refers, generally, to brick or block masonry.

To review, look for your Group of Construction first and then scan over to your desired type of protection. The intersection of these two items will determine the design numbers that are suitable for your project.

The chart on page 1 of the UL Directory Vol. 1 is the same as the chart online at the UL website. So if you follow the same instructions online you will find a design suitable for your project (Figure 3).

As promised, this is an exercise to assist you in getting comfortable in using the table on page one of Vol. 1. Starting with your Group of Construction...

Question: What is an assembly number for a wall & partition system with Metal Stud, Gypsum Board, Lath and/or Plaster?

Refer to the Numbering System for Fire Rated Assemblies chart. In the first column, you select the type of construction and then look across for the series with gypsum board.

You should come up with the letter designation U, V or W, and 400-499 series. An assembly that would fall under this designation is V438 (Figure 3).

UL Design No. V438 is a non-load bearing steel stud wall design with hourly ratings for 1,2,3 and 4 hours. You can see from the drawing that both a one-hour (left) and four-hour (right) wall is detailed. The call-out numbers on the drawing correspond with the numbers in the text.

Item 1 tells us that floor and ceiling runners are not shown but must be channel-shaped from a minimum 25 MSG corrosion-protected steel. Minimum sizes and screw patterns are also addressed.

Item 2 discusses steel studs as shown in the design. Steel studs need to be channel-shaped and fabricated from minimum 25 MSG corrosion-protected steel. You are referred to item four's chart (Figure 5) for minimum widths depending on the hourly rating you chose for your project. Note that the assembly calls for the studs to be cut ³/₈-to-³/₄-in. less than assembly height to allow for heat expansion.

The one-hour assembly shown in the drawing shows batt or blanket insulation. Again, item four's chart (Figure 5) will tell you if insulation is required. If insulation is not required, you may add it to your wall if desired.

Gypsum board orientation, thickness and core type is described in item 4. For instance, a double layer, two-hour wall should be constructed with the first layer vertically applied with joints centered over a stud while the outer layer can be applied vertically or horizontally (see Figure 5 for minimum stud depth and thickness of panels). Notice on Figure 5 that a one-hour wall assembled with 2-1/2" minimum stud depth and a single layer of 1/2-in. Type C wallboard requires mineral wool insulation. This is the only design option that requires insulation.

Type X or type C are also designated under item 4. The chart tells us that all the systems require either 1/2" or 5/8" type C except for two of the systems. The single and double-layer assemblies using 5/8" drywall can be type X. (Each manufacturer has its own core designations for type X and type C. Refer to the back of your Vol. 1 UL Directory for reference).

Item 5 concentrates on fasteners. Although not shown in the drawing, Type S or S-12 steel screws are required. Length and spacing of fasteners can change with each system.

Item 6 is not shown in the drawing, but describes the joint treatment necessary to complete the assembly. One point to remember: only the outside layer requires tape and joint treatment.

Finally, number 7 and 8 are optional and refer to furring channels and siding, brick or stucco applications. If the project calls for siding, brick or stucco, these products must meet the requirements of the local building code.

Try one more.

Question: What is an assembly number for a wooden floor system using drywall?

You should come up with the letter designation L or M, and 500-599series. An assembly within this designation is L558.

When you are finished, you should be comfortable finding your way around the UL Directories, and your newfound familiarity should save you considerable time and aggravation in the design of fire-rated structures. ■

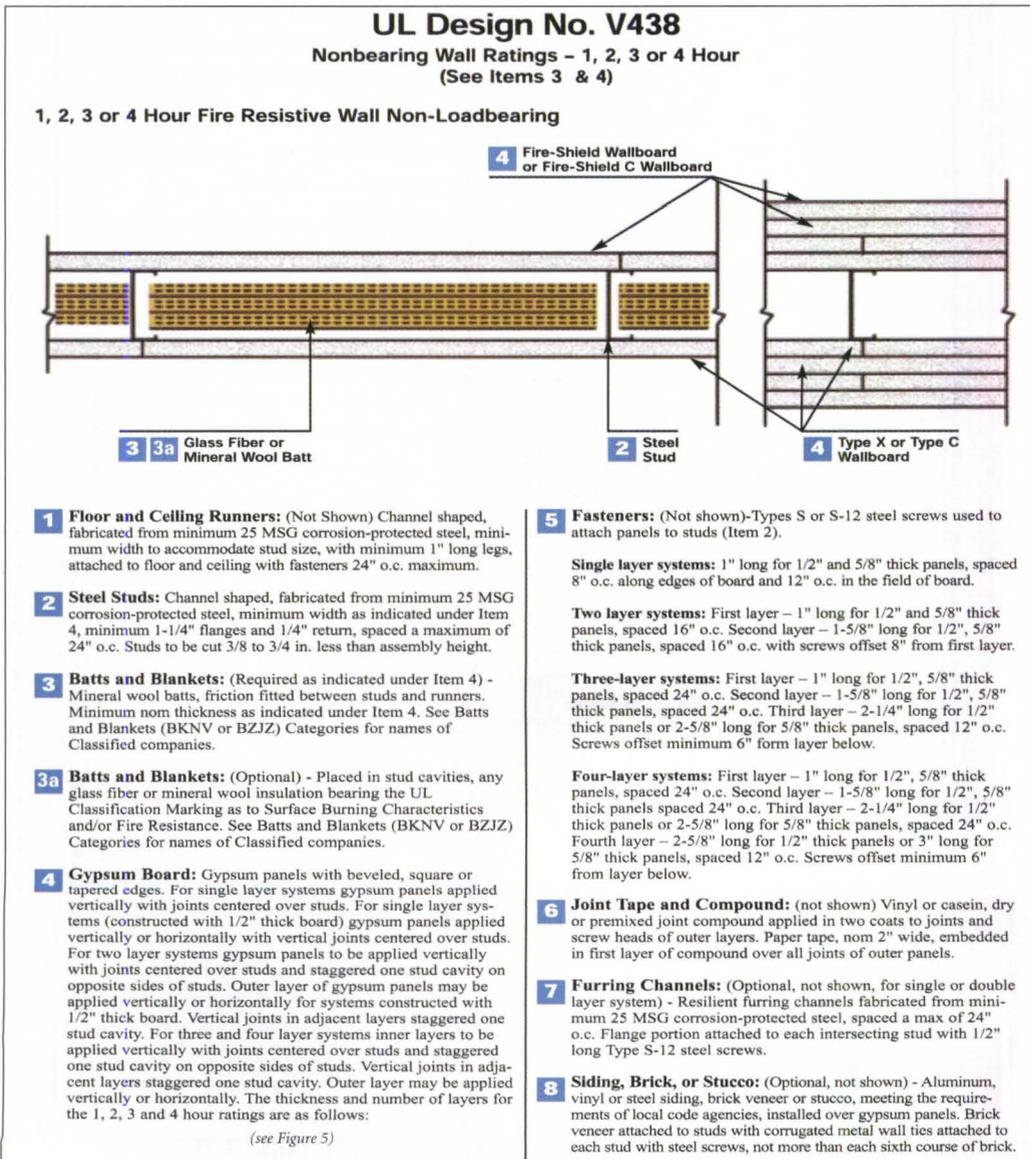
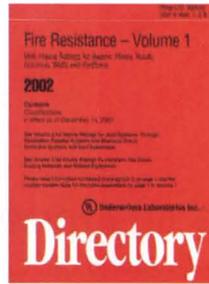


Figure 4

Rating, Hr	Min Stud Depth	No. of Layers & Thks of Panel	Min Thks of Insulation (Item 3)
1	3-5/8	1 layer, 5/8 in. thick	Optional
1	2-1/2	1 layer, 1/2 in. thick	2 in. thick
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	2-1/2	2 layers, 5/8 in. thick	Optional
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional



Click for Additional Required Reading

As part of this CES learning activity, you are required to read some additional material. Some of the test questions below will relate to the additional reading material. Go to www.architecturalrecord.com/CONTEDUC/ConteducC.asp to access the material online. To obtain a faxed copy, contact Missy Merfeld at 704-365-7494 or MSMerfeld@NationalGypsum.com.

Figure 5

Learning Objectives

- Learn about the types and fire resistance properties of gypsum wallboard
- Understand how to navigate through the UL Fire Resistance Directory
- Analyze several fire-rated gypsum wallboard assembly designs

Instructions

Refer to the learning objectives above. Complete the questions below. Go to the self report form on page 276. Follow the reporting instructions, answer the test questions and submit the form. Or use the Continuing Education self report form on *Record's* website—architecturalrecord.com—to receive one AIA/CES Learning Unit including one hour of health safety welfare credit.

Questions

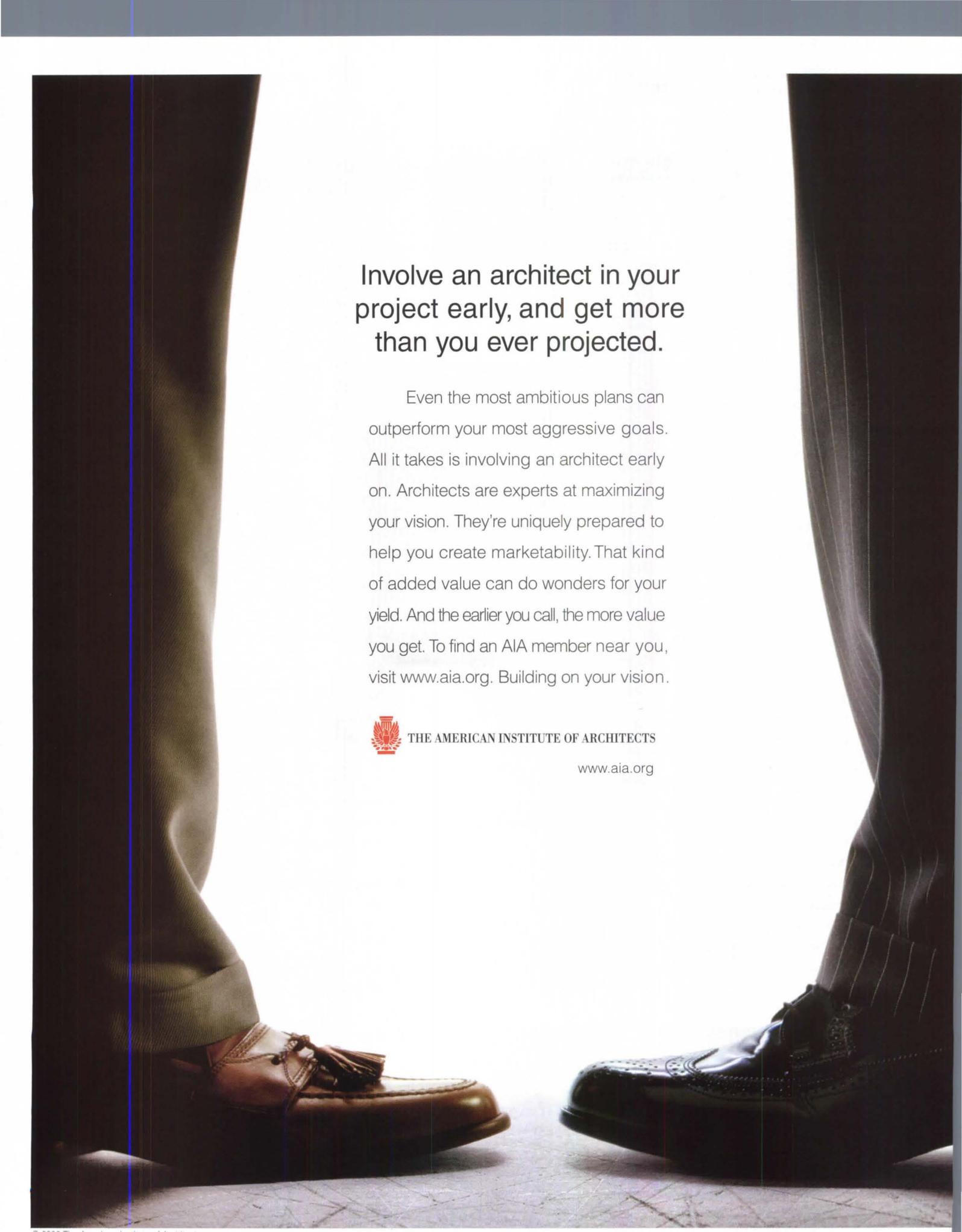
- Q: 1. Base layers in multi layer systems are not required to have joints or fastener heads taped or covered with joint compound.
- A: a. True
b. False
- Q: 2. The process of calcination makes gypsum board ideally fire-resistant because:
- A: a. The gypsum material – hydrous calcium sulfate – expands when exposed to heat and acts as a barrier.
b. The surface of the gypsum board conducts the heat to the more fire-resistant materials in an assembly.
c. When exposed to fire, water molecules in the board turn to steam and act as a thermal barrier.
- Q: 3. Fire resistance ratings apply to which:
- A: a. Assemblies or systems
b. Gypsum products themselves
- Q: 4. The standard test the UL Directory uses for fire ratings of assemblies is:
- A: a. ASTM E119
b. UL No. L558
c. ANSI/UL 1709

- Q: 5. The added component in Type X gypsum board that gives it a superior fire resistance over regular gypsum board is:
- A: a. Water
b. Calcium
c. Fiberglass
- Q: 6. What is the fire rating for 5/8" Type X Wallboard?
- A: a. 1 hour
b. 2 hour
c. No fire rating
- Q: 7. Screws can be used as an alternate to nails in wallboard designs.
- A: a. True (provided diameter, length and spacing equal or exceed nails)
b. False
- Q: 8. Gypsum is approximately ___% water:
- A: a. 11 %
b. 21 %
c. 31 %
d. 41 %
- Q: 9. Gypsum wallboard assemblies are found in:
- A: a. Volume 1
b. Volume 2
c. Volume 3
- Q: 10. When searching for a UL design using the numbering chart, the first item to consider is the Type of Protection.
- A: a. True
b. False



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Designing for Occupant Comfort

Providing true occupant comfort at reasonable cost goes far beyond maximizing R-values and controlling thermal losses. It requires careful systems planning, a thorough understanding of building envelope thermal characteristics, and methods of controlling air and moisture flow. Spray polyurethane foams can provide economical, high-performance insulation, air barriers and moisture barriers in new construction and in renovation and restoration projects.



Only by continually balancing interior temperature, air flow volume, velocity and moisture content can the designer ensure occupant comfort under all circumstances.

Naturally, while a pleasant ambience is the result, it is a pragmatic systems approach that provides the means, beginning with a careful analysis of thermal gradients, and potential air, moisture, and vapor flow paths throughout the structure.

With a detailed analysis in hand, the architect can begin to specify the structural elements, construction materials and building techniques that, together, will create total comfort and building integrity.

It is the intent of this learning module to describe how the use of spray polyurethane foam technologies help to control air, moisture and vapor flow, as well as interior temperature.

In a well-designed interior space, questions of comfort never occur to those who inhabit it. They simply *are* comfortable. For the designer, the goal is to exert such perfect control over the dynamic interior environment that those within remain totally unaware of the array of structural elements and technologies responsible for their comfort.

Why spray polyurethane foam?

Spray polyurethane foam (SPF) offers the architect tremendous versatility. It can bond disparate materials, adhere to a plethora of substrates to provide thermal insulation and sound deadening, fill cracks and voids to control air and moisture flow, even as it conforms to virtually any architectural shape or surface configuration that might be used in residential or commercial applications.

SPF products are used for insulating homes, commercial buildings, roofs, storage tanks, cold storage facilities, ducts, pipes and more. Depending on the reactivity of the polymeric mixture and the delivery mechanism, SPF may be supplied as:

- *Poured foam* — where a liquid stream reaches the substrate
- *Spray foam* — where a large quantity of small liquid droplets reach the substrate
- *Froth foam* — where the liquid stream reaching the substrate contains already-nucleated miniature gas bubbles

SPF's versatile physical properties make it useful in perhaps unexpected applications. For instance, in restoration or rehabilitation projects, instead of demolishing the outer leaf of a brick wall to install new wall-ties, rigid SPF can be injected to bond the brick veneer to the

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AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION Series

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 223 and follow the instructions.

LEARNING OBJECTIVES

When you have finished this course, you should:

- understand how thermal gradients, and the flow of air, moisture, and vapor within the structural envelope affect occupant comfort
- identify common air, moisture and vapor flow problems that exacerbate discomfort
- recognize the benefits of spray polyurethane foam (SPF) in ensuring comfort
- distinguish between one-component and two-component SPF applications

inner wall. In construction of the building envelope, SPF products are used mainly to control heat transfer and to provide air and moisture barriers. SPF can provide a complete seamless building envelope, creating a more comfortable indoor environment for the life of the structure. It seals cracks and seams, giving added protection.



SPF can form a seamless bond with building components to create a structurally sound, uniform air-infiltration-barrier system, which retains its superior thermal properties even in the most extreme climates.

All of these roles help SPF to contribute to a comfortable interior environment and extraordinary occupant comfort.

Comfort's thermal component

Economically maintaining desirable indoor temperatures requires a well-insulated building envelope. The higher the R-value of any envelope component (e.g., foundation, wall or roof), the greater the envelope's resistance to heat transfer.

Since the capacity of the heating, ventilating and air-conditioning (HVAC) system must equal the net sum of all heat losses and gains under worst-case weather and building-use conditions, the higher the envelope R-value, the smaller the HVAC system for a given design and envelope configuration.

As with any building mechanical system, the initial capital costs of insulation and other thermal efficiency measures must be balanced against the potential savings in ongoing HVAC operating costs. The final design R-value should be determined by optimizing all cost factors.

Contributions to energy efficiency and perceived occupant comfort are also made by the exterior design and materials selection, building orientation, extent of windows, use of passive solar strategies, and the selection of interior space geometries, materials, surface treatments and even colors.

Here, we will confine the discussion to the control of heat transfer, and to the use of various techniques to control air, moisture and vapor flow through the envelope.

Heat transfer refresher

Heat flows from points of higher temperature to points of lower temperature by three distinct mechanisms:

- *conduction*—heat flow through a solid
- *convection*—heat flow from a solid surface to a fluid (liquid or gas)
- *radiation*—heat flow directly from one body or surface to another via electromagnetic waves, without affecting the intervening space (e.g., from a warm person to a nearby cold window surface)

All three of these heat transfer modes occur simultaneously in any real system (though one or two often dominate), and all three can play a role in occupant comfort.

The rate of heat transfer between any two points is determined by the physical characteristics and geometries of the materials and spaces separating them, plus the temperature differential between the two points. For instance, examine the flow of heat through the exterior wall of a residential project on a cold winter day. Assume the heating system is operating properly and that the interior room air is 70°F, while the outside air is 35°F.

Heat will flow from the room air to the wall surface primarily via convection, then through the interior wall by conduction. At the studs, heat will flow from the wall to the studs, then through the exterior sheathing and exterior cladding, all by conduction. Finally, the heat will flow by convection from the exterior cladding surface to the outside air.

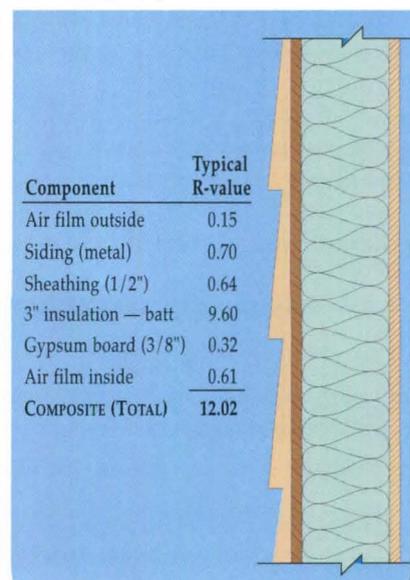
If the wall area between the studs—which represents about 90% of the total wall surface—is filled with insulation, heat will follow the same path and transfer methods as outlined above, except through the insulation instead of the studs.

If, on the other hand, the insulation does not exist in the cavity between the interior wall and the exterior sheathing, then heat will not flow through the entire envelope by conduction. Rather, an added convection circuit will carry heat from the interior wall surface into the air in the gap between the wall and the exterior sheathing, and then from the air in the gap to the sheathing itself.

R-value

Every material exhibits its own characteristic resistance to the flow of thermal energy through it. Thermal resistance, R, for a given structural component is the sum of all resistances encountered along the path of heat flow.

Insulation materials are chosen for their high resistance to thermal flow, given in English units as ft²-hr-F°/Btu at a specified thickness. In an ideal system, without air or moisture flow, the temperature profile of a wall or roof cross-section can be calculated by apportioning the total temperature change across the section to each structural member, in the same ratio as that structural member's R-value bears to the total R-value. (In real systems, R-value can degrade if construction allows air and moisture to move through the envelope.)



Moisture flow

Moisture migration in residential buildings is a particularly important, and at times complex, topic. Apart from water problems related to the plumbing system, moisture problems in residential structures are typically related to liquid water or water vapor finding its way in or out through the building envelope. There are four mechanisms of moisture migration:

- *Gravity* — Downward flow of liquid water due to gravity (e.g., roof leaks or condensation on windows collecting on the sills)
- *Capillary Action* — The movement of liquid water through very narrow spaces (e.g., up through porous masonry or tightly lapped wood siding)
- *Air Transport* — Water vapor carried by air flow (e.g., warm, humid inside air exfiltrating through unintentional gaps in the envelope)
- *Vapor Diffusion* — Transport of water vapor through permeable building envelope materials, by diffusion (from the warm, humid side to the cooler, dryer side)

While any of the four mechanisms can cause major problems in a particular structure, the majority of moisture problems in a residence with sound structure are related to interior surface condensation on windows, uninsulated walls, or cold surfaces within the building envelope.

Vapor flow

Again, it's usually the flow of water in its vapor state, rather than in its liquid state, that leads to most moisture damage in residential construction. However, it is not until this water vapor condenses that real problems develop. Such liquid moisture build-up can cause mold, mildew, rotting of wooden materials, other structural damage, and soaking of insulation materials, reducing their effectiveness.

By far the major moisture migration mechanism is air leakage through the building envelope (infiltration or exfiltration), carrying water vapor with it. The impact of vapor diffusion on moisture migration is relatively small by comparison.

The most vexing problem with moisture migration is that it is a reversible phenomenon in nearly every climate zone in the U.S. In winter, when outside air is cold and dry, moisture tends to flow outward through the envelope. In summer, interior air conditioning generally assures that interior air is both cooler and drier than outside air, so moisture tends to flow inward through the envelope. Condensation will occur under either condition, if the moisture-laden air encounters any surface within the building envelope that has a temperature below the dew point.

General building practice suggests that air/vapor retarders — like plastic film, oil-based or vapor-retarder paints and certain wall finishes — should be installed on the warm side of the insulation to prevent moisture migration through the wall. In climates where moisture migration is seasonally reversible, choice of a location for such an air/vapor retarder is a difficult decision to make.

Fortunately, SPF systems (as well as structural-insulated-panel and insulated-concrete-form systems), may allow designs where no separate vapor retarder is necessary, eliminating the concern over vapor flow direction.

Air flow

Just as heat flows through a material because of a temperature difference, air will flow into or out of a structure due to a difference in air pressure. Air flow, whether infiltration or exfiltration, can be influenced by the following factors:

- The number, size and location of holes, gaps and cracks in the envelope
- Pressure differences resulting from:

- ventilation and exhaust fans
- chimneys for fuel-fired appliances
- wind direction and velocity
- the temperature differential between indoor and outdoor air (which can produce a pressure difference called stack effect that increases with building height)

Air barrier systems

The air barrier system within the building envelope is a critically important element for economically controlling moisture and thermal transfer, and for preserving structural integrity. Inadequate air barrier systems allow leakage of air through holes, cracks and gaps in the thermal envelope.

Leaking air can carry humidity to the dew point locations in the building envelope, where resulting condensation can promote black rot and mildew, as well as the deposition of smoke, dust and dirt particles and other contaminants. These unfriendly elements are deposited in building materials through which the air passes on its way into, out of, or through the structure.

For leakage to occur, a difference in air pressure must exist between one side of the air barrier and the other. Such imbalances are common. They can be caused by wind pressure on the exterior; by stack effect, as warm air travels quickly upwards through the building; by exhaust systems purging stale air; and by the mechanical system operator trying (against the odds) to condition the indoor environment for maximum comfort.



Air barrier systems that inadequately control moisture transfer across the envelope adversely affect buildings and occupants in several ways. The most frequent and noticeable include:

- uncomfortable indoor environments
- unnecessarily high heating and air conditioning costs
- accelerated decay of building materials, particularly in walls, cladding systems, windows and roofing
- deteriorating aesthetic appearance of the building's exterior

All of these problems can in some part be attributed to faulty air barrier system design and/or installation. Performance testing of the air barrier system may be carried out using a variety of means, including blower door, large and small smoke generating devices, infrared thermography, window testers and large scale fan depressurization devices.

In most instances, geographical location and indoor environmental requirements are not the major causes of air leakage. The worst leakage areas are mechanical penthouses, soffits, parapets, windows, links connecting below-grade areas to other buildings, and joints between one system and another such as at doors or wall-to-roof joints, and rim joists at foundations and mid-floors.

What makes a good air barrier system?

An air barrier system should be continuously impermeable to air and well-supported structurally so that it remains in place and durable. The air barrier must also be coupled with insulation in such a way that temperatures below the dew point do not occur within the building envelope, under any reasonable combination of interior and exterior temperature/humidity conditions. Theoretically, the air barrier can be

located anywhere in the building envelope, providing it meets all of the above criteria.

Compartmentalization and decoupling

In renovation and restoration applications, where it is impossible to create continuity of the air barrier because not all of the structural components are accessible, the interior corners of the building should be sealed in order to “compartmentalize” each floor area. The effect would be to reduce the pressures caused by the flow of air around the building inside the wall system.

It is also advisable to “decouple” the building vertically in order to reduce stack effects. This can be achieved by a variety of measures, for instance, in hi-rise buildings, creating elevator lobbies on each floor and controlling air leakage through fire doors and all vertical penetrations. Model building codes require floor perimeters to be fire-stopped; they should be sealed, too, to create an air barrier that will also prevent smoke transfer.

Potential Air Barrier Locations

A typical residential structure contains a large number of paths by which air can leak into, out of, or through the building shell. These can be sealed and insulated with either single-component or two-component SPF.

Location	One- or Two-Component SPF
<i>In Basements and Crawl Spaces</i>	
• Headers	✓
• Sill plate and rim joists	✓
• Duct penetrations and shafts	✓
• Conduit, wire penetrations	✓
• Hose bib	✓
• Windows and surrounds	✓
• Doors—cold room and exterior	✓
• Wall cracks	✓
• Floor-wall junctions	✓
• Crawl space wall insulation	✓
<i>In Attics</i>	
• Attic access hatch	✓
• Ducting and plumbing stacks	✓
• Headers	✓
• Recessed ceilings	✓
• Behind light fixtures	✓
• Wiring and piping penetrations	✓
• Recessed lights boxed with gypsum	✓
<i>In Living Areas</i>	
• Baseboards—interior & exterior walls	✓
• Electrical receptacles and switches	✓
• Windows and trim	✓
• Doors and framing—exterior, patio, pocket	✓
• Dampers and outdoor vents	✓
• Fireplace damper seal/loose brickwork	✓
• Recessed cabinets	✓
• Plumbing penetrations	✓
• Exhaust fan and heating vent perimeters	✓
• Electrical wiring penetrations	✓
• Cold air return ducting	✓
• Range hoods	✓
• Recessed light fixtures	✓

SPF as an air barrier

Field experience shows that spray polyurethane foam can significantly improve the energy efficiency of buildings when it is used as an air leakage control and insulation material or component of an air barrier system. Moreover, recent evidence shows that a better-performing envelope contributes to the health, safety and comfort of the building occupants. Envelope performance, in large measure, depends on a well-designed air barrier, which should:

- be applied with continuity throughout the building envelope
- adhere to supporting structures (be self-adhesive)
- resist peak wind loads, sustained stack effect, and pressurization from ventilation equipment
- provide virtual air impermeability
- offer durability and long service life
- eliminate dew point conditions

Spray polyurethane foams meet all of these criteria. Add to that R-values typically in the range of 6.0 per inch or greater, and their value as a building envelope component becomes clear.

SPF selection

Spray polyurethane foams are available in several formulations, each offering advantages that make that type particularly suitable for certain applications.

One-component SPF

Single-component polyurethane foam is an insulating sealant consisting of a single mix of chemicals in one pressurized can or tank, formulated to cure when exposed to moisture in the air. Single-component SPF, which takes approximately 45 minutes to an hour to cure at 50% relative humidity, finds its primary use as an economical and practical sealant for cracks, small holes, gaps and joints.

Because it needs moisture to cure, care must be taken to avoid problem areas such as confined, nonporous cavities, which may inhibit cure. Also, if the ambient air is too dry, curing can be slowed or nullified, unless the application area can be spritzed with water to enhance cure rate.

Typically dispensed through a straw, a copper wand or a gun-type tool, one-component SPF is applied in a bead or, if filling a small hole, simply dispensed until the hole is full.

While primarily used as an air sealant, one-component SPF can also yield R-values (aged) in the 3.6 to 3.9 per inch range.

Two-component SPF

Fast-curing spray foam results in a higher expansion ratio for the two-component polyurethane foams, which makes them suitable for spray-on insulation applications, as well as for filling larger holes and cavities. They have an R-value (aged) of approximately 6.0 per inch.

Dispensing systems provide a fast and uniform flow of polyurethane foam that can be applied to flat or irregular surfaces and into cavities of all shapes and sizes. (Polyurethane foams generally set in 5 to 10 seconds and expand approximately 30 times.)

Because of SPF's superior adhesion properties, it can seal and insulate structural materials, shapes and geometries used in unconventional architectural designs, where more common batts or rigid foam panels would not install or function properly. Two-component SPF can also be effectively applied in attic spaces where

restricted movement and awkward access make sealing and insulating difficult, and it can be used to insulate cathedral ceilings while eliminating the need for venting.

Masonry block party walls, which form chimneys because of their porosity and open cores, can only be sealed effectively with two-component SPF. Two-component SPF also facilitates sealing between stud spaces at the perimeters of drop-ceilings, around plumbing stacks, and around heating and air-conditioning duct penetrations.

Polyurethane foam is combustible, and model building codes require that a thermal barrier be installed on the habitable side of any SPF used on the interior of the structure, except when specifically approved by a building code official based on fire tests specific to the application. Additional study information about thermal barriers is included in the online portion of this educational module (see box below).

SUMMARY

- Spray polyurethane foam (SPF) provides insulation plus continuity of the air barrier system.
- One-component SPF is moisture cured, while two-component SPF is chemically cured.
- One-component SPF is dispensed as a bead for gap and crack filling, while two-component SPF is used to insulate buildings and fill larger holes and voids.
- SPF insulation has become the most economical and practical way to effectively stop air infiltration and exfiltration.
- An insulating air barrier system is a crucial element in controlling moisture, minimizing energy losses and gains, and ensuring structural integrity.
- Proper use of SPF can make a crucial difference in occupant comfort, in both new construction and renovations.

INSTRUCTIONS

- Read the article, "Designing for Occupant Comfort."
- Read the additional web-based materials, which can be found at <http://www.plastics.org/ArchRecord/thermalbarrier.pdf>
- Read and answer the test questions below.
- Fill out the identification data and transfer your answers to the AIA/CES education reporting form on page 276 and submit via mail, or download the form at www.architecturalrecord.com

You will receive one (1) AIA learning unit.

TEST QUESTIONS

1. Occupant comfort is dependent on:
 - a. interior air temperature
 - b. air flow volume and velocity
 - c. moisture and vapor flow
 - d. all of the above
2. SPF applications are characterized by all but which of the following:
 - a. already-nucleated miniature gas bubbles in the liquid droplets reaching the substrate
 - b. liquid stream reaching the substrate
 - c. no liquid in any form reaching the substrate
 - d. a large quantity of small liquid droplets reaching the substrate
3. Faulty air barrier systems' adverse effects can include:
 - a. accelerated decay of building materials
 - b. uncomfortable indoor environments
 - c. both a. and b.
 - d. neither a. nor b.
4. Two-component SPF is most commonly used to:
 - a. fill tiny cracks and seal joints
 - b. fill cavities and large holes
 - c. attach drywall to studs
 - d. none of the above
5. One-component SPF has an R-value (aged) equal to:
 - a. 4.9 to 5.2 per inch
 - b. 3.6 to 3.9 per inch
 - c. 5.7 to 6.0 per inch
 - d. 3.0 to 3.4 per inch
6. Thermal barriers used in conjunction with SPF must:
 - a. provide a minimum thermal barrier index of 15
 - b. offer protection equivalent to 3/4" gypsum board
 - c. comply with time-temperature curves in ASTM B-239
 - d. limit SPF to max. 342°F after 10 min. of fire exposure
7. Two-component SPF expands approximately:
 - a. 3 to 5 times
 - b. 10 times
 - c. 30 times
 - d. 22 to 25 times
8. A person standing in a 72°F room, near a very cold window:
 - a. would radiate body heat to the cold window surface
 - b. would lose heat to the window by conduction
 - c. would absorb heat from the room air via convection
 - d. none of the above
9. One-component SPF would work well as an air barrier:
 - a. to fill cracks between baseboards and subfloor
 - b. to seal plumbing penetrations in exterior walls
 - c. to seal gaps between windows and framing
 - d. all of the above
10. Residential moisture problems occur most often when:
 - a. water vapor in the air condenses on envelope surfaces
 - b. effective air barriers and vapor retarders are in place
 - c. rain blows in open windows
 - d. vertical decoupling is used to reduce stack effect

Click for Additional Required Reading

As part of this CES Learning Activity, you are required to read additional material online. To access the material on thermal barriers, visit www.architecturalrecord.com/CONTEDUC/Conteduc.asp, or <http://www.plastics.org/ArchRecord/thermalbarrier.pdf>. To obtain a faxed copy of the supplemental material, please call the American Plastics Council at 1-800-243-5790. The test below includes questions based on the online material.

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RESIDENTIAL

Four sumptuous multifamily dwellings from around the world

Four multifamily-housing projects from across the world are presented here, with an emphasis on private dwellings designed by prominent architects. In Japan, where density and the high cost of real estate are compelling reasons for multifamily dwellings, Manabu Chiba designed Split. Based on Tokyo's unique solid-void pattern, which he discovered as a child when he leapfrogged from one vacant space to another, Split forges connections among the glitches, gaps, and cul-de-sacs of the sparsely available land. The satellite city of Almere, near Amsterdam, is host to a housing project by UN Studio. Its flexible design was motivated by the notion of consumer choice, all too common in the U.S., but radical in Holland, where highly mechanized housing production is the rule. Despite this, the Dutch have typically outpaced the U.S. in quality multifamily housing, with notable exceptions herein: Miller/Hull Partnership's imaginative solution for a small condominium complex built on a tight urban site in Seattle; and Jon Michael Schwarting's oasis of urban outdoor/indoor living spaces. He takes a Corbusian approach to revitalizing common tenement buildings on the Lower East Side of Manhattan. Altogether, these add up to a rich and varied feast. *Jane F. Kolleeny*

BRIEFS

More than one million U.S. households are unable to meet the structural needs of the disabled aging resident, according to an AARP study. Ninety percent of the elderly would prefer to age in their homes, but accessibility problems make this goal unattainable. See <http://research.aarp.org/cgi-bin/reSearch>.

Home builders are turning to solar electric power and Feng Shui to lure buyers. Solar electric power will become a standard feature in two new Clarum housing communities in northern California. Sales-training director Corinne Hoffman of K. Hovnanian Cos, the 14th-largest builder of housing in the U.S., will offer Feng Shui classes to sales staff and home buyers.

Forty houses have been built so far on a 427-lot subdivision in remote northern California. It is known as Gold Mountain and is popular among retirees. Designed by Taliesin architects and based on designs by Frank Lloyd Wright, the houses are clustered around the Nakoma Resort and Spa, also designed by Wright.

CONTENTS

- 228 1310 East Union Live/Work Lofts**
The Miller/Hull Partnership
- 234 Almere Housing**
UN Studio
- 239 Split**
Chiba Manabu Architects
- 244 Davis and Warshaw Building**
Jon Michael Schwarting Architect
- 249 Residential Products**



The architect high-lighted the exposed structure by infilling it with floor-to-ceiling glazing on the north and south elevations.



1310 East Union, Miller/Hull's striking steel-framed transparent live/work lofts, sing an ode to Modernism

By Sheri Olson, AIA

Taking a stand against suburban sprawl, environmental activist and former high-tech executive Liz Dunn asked the Miller/Hull Partnership to design a sophisticated loft-style condominium project on a small urban lot. "I wanted to give people a reason to abandon their three-car garage McMansions and live in the city," says Dunn.

These eight live/work units sit on a lot formerly occupied by a sex shop in Seattle's Pike/Pine neighborhood, a gritty-yet-hip district of low-rise concrete and brick buildings within walking distance of downtown. The site's small size—40 by 80 feet—appealed to first-time developer Dunn but put pressure on Miller/Hull to maximize the allowable areas so that the project would be profitable. Equally important to Dunn was creating a design that would distinguish itself in a lackluster local housing market. "The client wanted a unique project that was architecturally strong in a city dominated by cookie-cutter multifamily projects," says David Miller, FAIA, of Miller/Hull.

A nondescript apartment building on the west, a fashionable bakery on the east, and an auto repair garage on the north are built up to the property line on three sides. Since the site was not large enough to fit eight required parking spaces, a lobby, and retail space on the ground floor, European hydraulic parking lifts made the project feasible by stacking two cars in a single space. (Appropriately enough for the eco-sensitive design, SUVs don't fit on the lifts.) Another potential deal breaker was a five-story height limit. Since mezzanines are not considered a floor, Miller/Hull was able to achieve a seven-story building by designing double-height units with mezzanines on the upper levels.

The project's steel frame may have been born out of necessity, but for Miller/Hull it was a golden opportunity to create the project's hallmark transparency. Steel met the noncombustible construction requirements and solved staging problems on the tight site by allowing the contractor, Turner Construction, to fabricate many structural elements off-site. On the south, the exposed steel structure (fire proofed with intumescent paint) is infilled with floor-to-ceiling glass for a light and transparent front facade. By stepping the building back 10 feet from the neighboring garage, Miller/Hull was able to fully glaze the north side, too.

Seismic X-bracing—slender tube steel painted brick red—crisscrosses the central bays outside motorized glass garage doors that

Project: 1310 East Union live/work lofts

Location: Seattle

Owner: Anemone Partners, LLC

Architect: The Miller/Hull Partnership

Electrical engineer: Ed David,

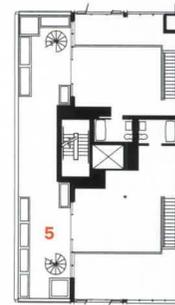
Jomega

Mechanical engineer: Sider & Byers

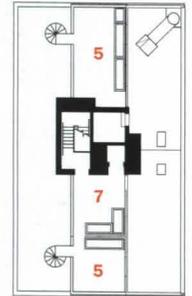
Consultants: Taylor Engineering Consultants (civil engineers); Atelier (landscape architects)

General contractor: Turner Construction

Sheri Olson, AIA, RECORD's Seattle-based contributing editor, is author of Miller/Hull (2001) and architecture columnist for the Seattle Post-Intelligencer.



FIFTH FLOOR MEZZANINE

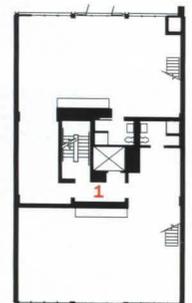


ROOF TERRACE

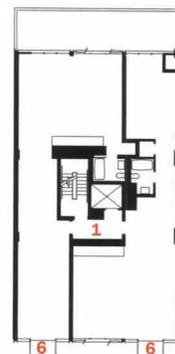
1. Lobby
2. Driveway
3. Retail space
4. Garage
5. Private terrace
6. Deck
7. Public terrace



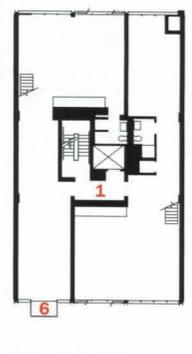
FOURTH FLOOR MEZZANINE



FIFTH FLOOR



THIRD FLOOR



FOURTH FLOOR



GROUND FLOOR



SECOND FLOOR



Seismic X-bracing—slender tube steel painted brick red—crisscrosses the central bays outside of motorized glass garage doors that slide up to open entire walls of some units to

the outdoors (top left and right). Inside, the loft-style units have a raw industrial quality, with polished concrete floors, steel-plate baseboards, and steel-deck ceilings.

slide up to open entire walls of some units to the outdoors, an appealing feature in the Pacific Northwest's moderate climate. These room-size front porches combine with a scattering of cable-railed balconies to add an extra liveliness and neighborliness to the street. To earn all that glass under the state's stringent energy code required superinsulating the solid sidewalls and the roof. Both architect and client dislike using EIFS, so the sidewalls are clad in hand-stained, ocher-colored cement-board panels. The panels have exposed metal fasteners and metal reveals modulating the large wall surface that suggest the underlying structural grid.

Details add layers of scale and texture within the bold steel frame. "We looked at the design as a kit-of-parts using off-the-shelf materials," says Miller. The cladding is a panelized system of garage doors, cement board, aluminum storefront, and metal siding at the roof. Each floor contains two units that vary in size from 700 square feet to 1,600 square feet and are designed to combine into one unit with relative ease. The fourth and fifth floor units are double height along the window wall with open mezzanines for sleeping. Most are floor-through units for fire department access from the street (there is also a central exit stair), while allowing natural light at both ends as well as cross ventilation.

The two-story penthouse units have private upper and lower outdoor terraces connected by metal spiral staircases that distinguish the project's roofline. In a city where rooftops are underutilized, these offer panoramic views of downtown, Puget Sound, and the Olympics. Inside, the loft-style units have a raw industrial quality, with polished concrete floors, steel-plate baseboards, and steel-deck ceilings. For maximum flex-





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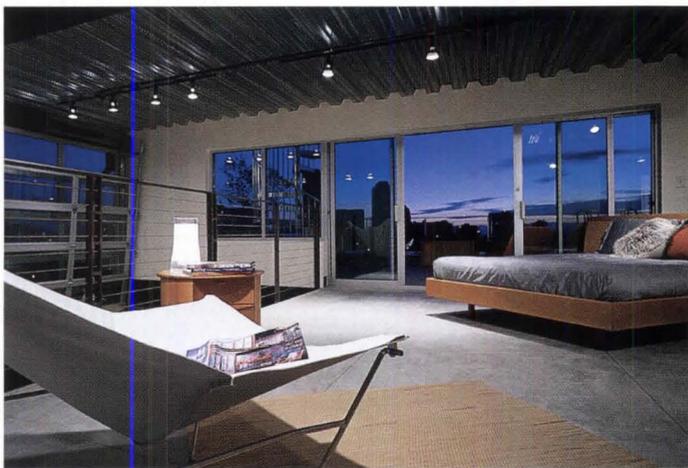
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Two-story penthouse units have private upper and lower out-door terraces that offer panoramic views (above). The fourth and

fifth floor units are double height along the window wall, with open mezzanines for sleeping (middle). For maximum flexibility,

the modular steel kitchen units can be wheeled into different configurations (bottom).

ibility, the modular steel kitchen units can be wheeled into different configurations. "As people's needs change over time, the space can be partitioned with movable freestanding furniture or fixed walls to reconfigure their work and/or living space," says Dunn.

The live/work lofts at 1310 East Union have a clarity and rigor unusual for Seattle's speculative housing market. The striking steel-framed glass box is an ode to Modernism, but, as Miller says, "It's not a Mies building; the structure has a certain muscular robustness." The detailing gives the project its fine-grained residential scale. While not intended as a prototype, it is an example of the type of urban-infill project Seattle needs to mend gaps in the urban fabric while addressing the shortage of high-quality in-city housing. ■

Sources

Exterior concrete: *Glacier Northwest*

Exterior cladding: *James Hardie Building Products*

Metal siding: *IMSA Building Products*

Roofing: *American Hydrotech*

Windows: *Pacific Aluminum*

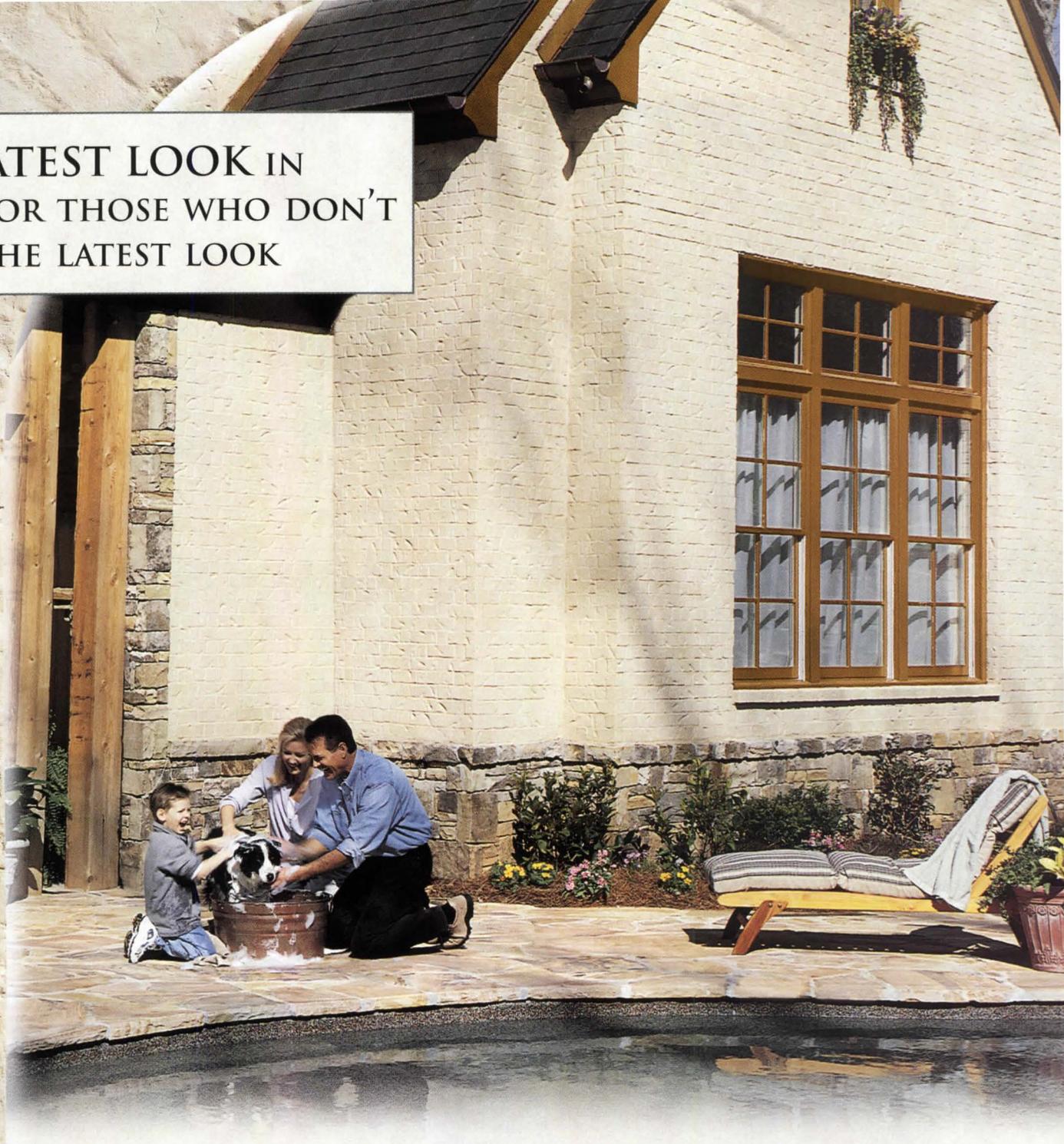
Glazing: *Hartung Glass Industries*

Doors: *Pacific Aluminum; Interstate Door Sales; VT Industries; Overhead Door Corporation*

Paints and stains: *Sherwin Industries*

www For more information on the people and products involved in this project, go to Projects at architecturalrecord.com.

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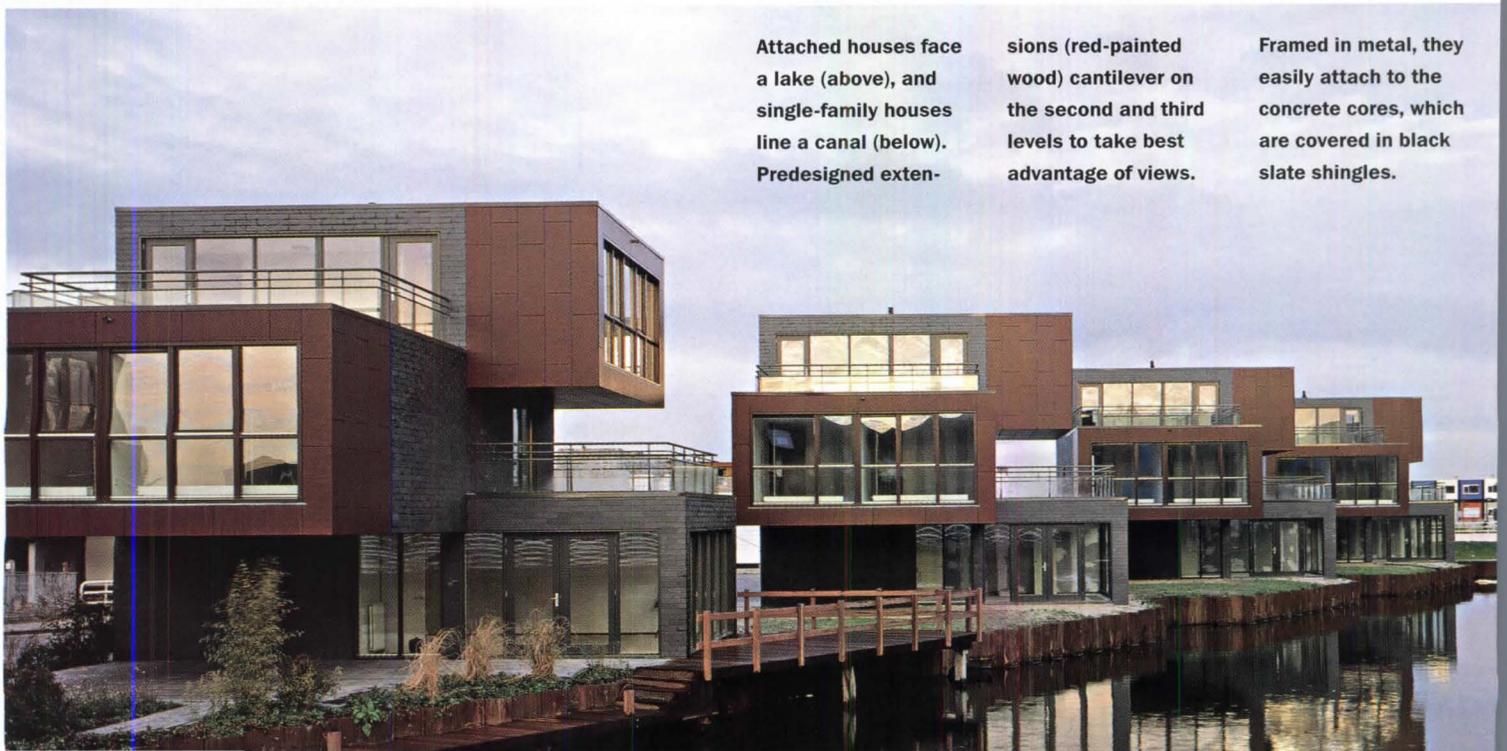


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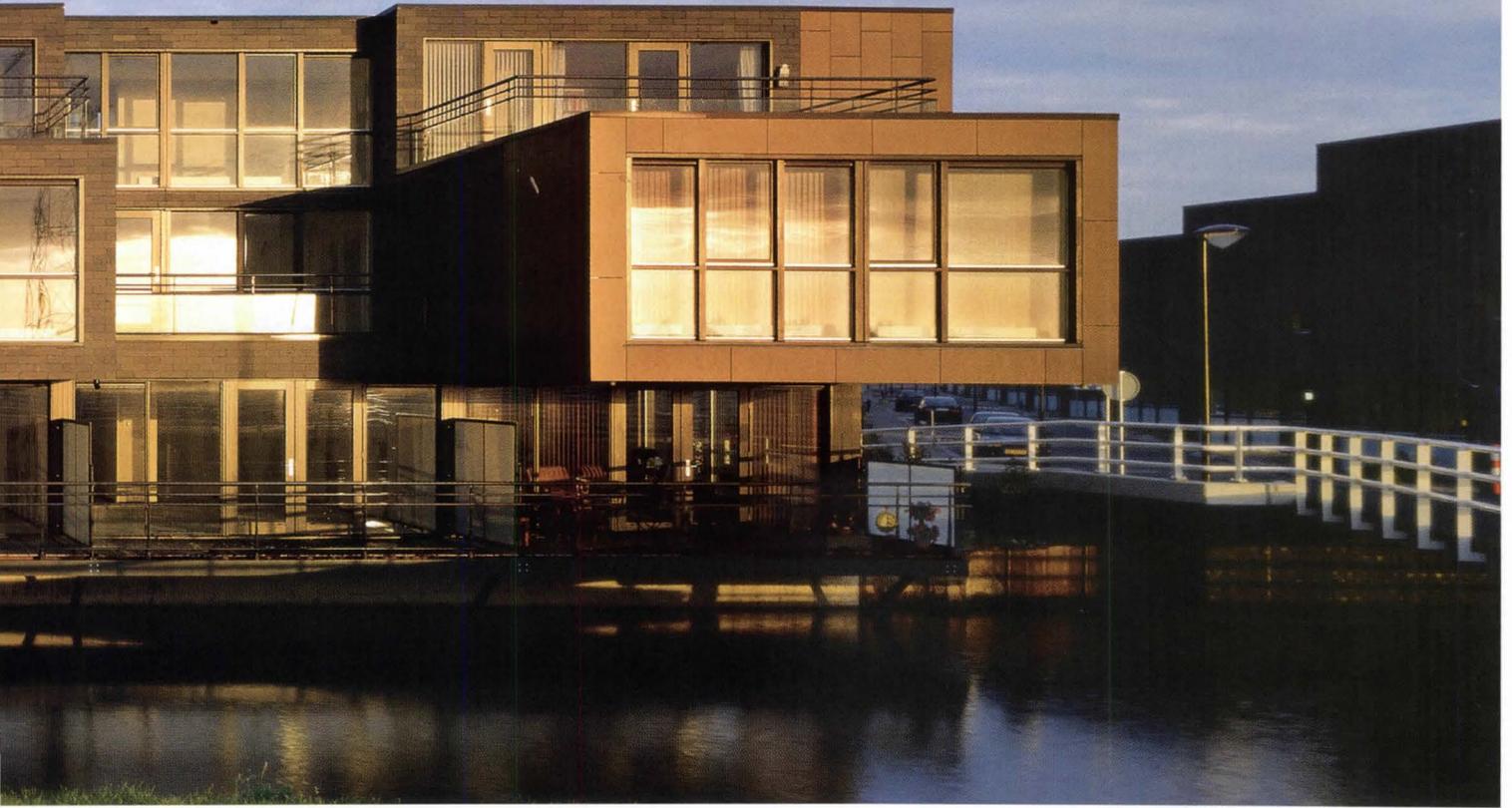


Attached houses face a lake (above), and single-family houses line a canal (below). Predesigned exten-

sions (red-painted wood) cantilever on the second and third levels to take best advantage of views.

Framed in metal, they easily attach to the concrete cores, which are covered in black slate shingles.

It may not be as “wild” as advertised, but new **Housing at Almere**, by UN Studios, makes a strong case for residential innovation

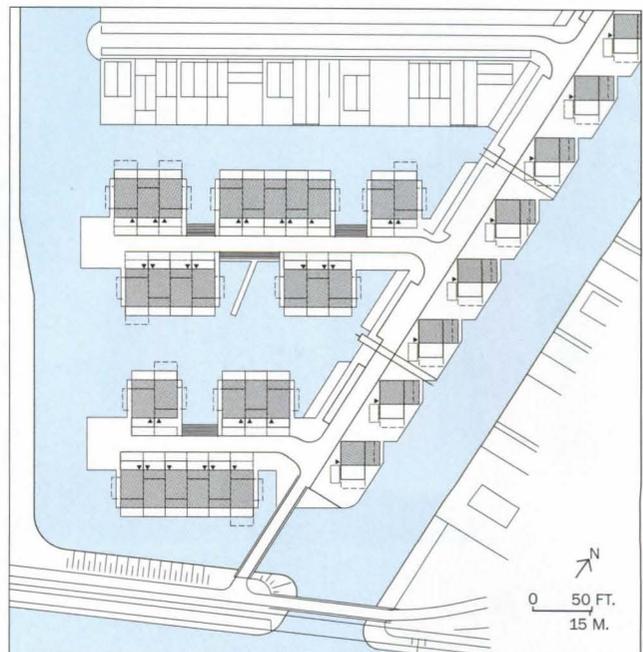


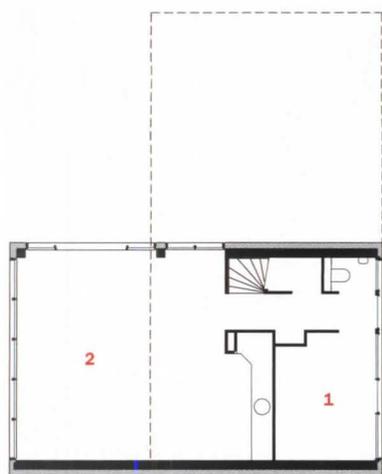
By James S. Russell, AIA

Americans offered an opportunity to “live wild” might envision a colony designed by Hells Angels or an extreme-sports subdivision. In Holland, where a new “experimental” district advertises “gewild wonen”—literally “wild living”—it means the radical notion of consumer choice.

The development is an extension of Almere, a planned satellite city about 25 miles from Amsterdam that was built from scratch in the early 1970s according to the radical urban-dispersal planning theory of the early 20th century. Almere today bespeaks conventional suburban pride, however, where, amid its vast green spaces, carefully tended small gardens line its boxy terraced housing.

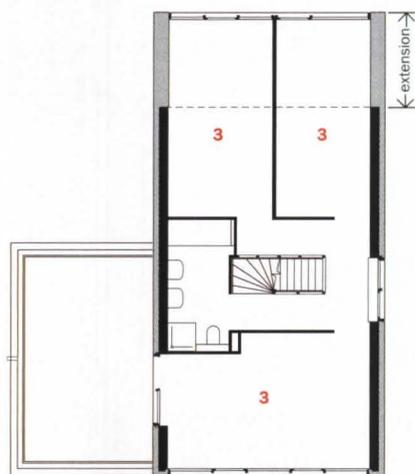
Increasing wealth and falling household size have spurred a demand for greater choice and more amenities in housing. Though the Netherlands’ highly mechanized housing-production system, based on quick erection of modular forms cast in concrete, offers relatively low-cost, durable construction, it doesn’t easily permit the variety of, say, American stud-wall construction. For this case, the district’s planners asked 15 architect and developer teams to create more flexible housing types. More radically still—in Dutch terms—they asked the teams to consider buyer desires. The experiment responds to criticisms made most prominently by architect Carel Weeber that housing production in Holland is too tied to planners’ and



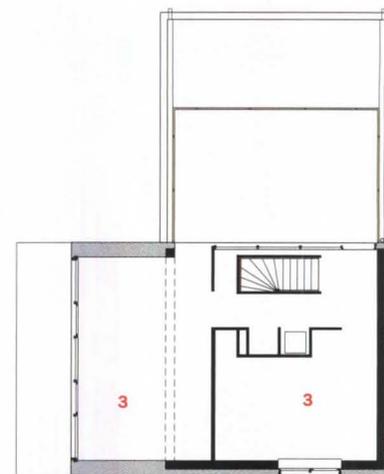


GROUND FLOOR

0 10 FT.
3 M.



SECOND FLOOR



THIRD FLOOR

- 1. Office/bedroom
- 2. Kitchen/living
- 3. Bedroom





Although all the extensions are fully enclosed, some were originally designed as covered terraces. The architect anticipated that some spaces under the cantilevers might be partly glassed in for sunrooms, but such alterations are not yet permitted.

architects' notions of what people should like, and not concerned enough with the cozy corners and woody details that people really want.

Each team was allowed to propose its own way to achieve choice and flexibility. In this quarter, one finds Weeber's shed-roofed and bay-windowed models—which would not look out of place in a standard American subdivision—and architects trying on a wide range of tastes, from houseboat lookalikes cobbled from wooden canal-barge details to a high-tech evocation of a trailer park. In this melange, UN Studio's 48-unit development looks pitched to

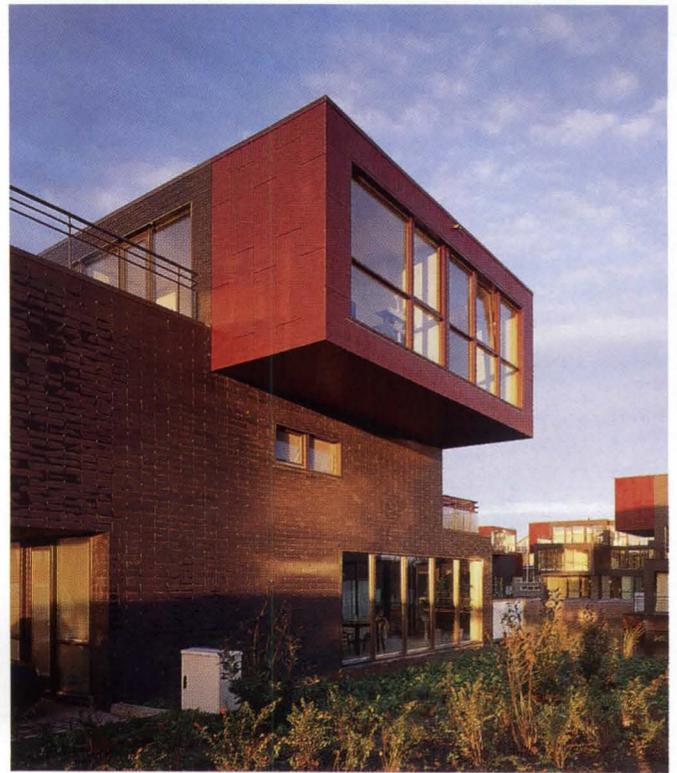
the buyer interested in platonic forms sculpturally arranged.

Although these houses have style aplenty, they intend an exploration deeper than mere appearance. Offered a line of narrow lots adjacent to a canal, UN Studio angled single-family homes of crossed-stacked pavilions (each about 20 feet by 32 feet). In attached houses, ranged along deeper sites that face a lake and inlet, the architect shifted parallel boxlike volumes for a rhythm of projections and recesses.

The notion of choice among the units is embodied (as in several of the district's other projects) in the ability to add or subtract pre-designed extensions, each of which could be "interpreted" by the buyer for different uses. This idea encountered a characteristic Dutch snag early on. "There was a little difficulty because of the regulations," explained Boudewijn Rosman, the project architect. "The building police wanted to know exactly where the extensions would be before they were built, so there was no real participation by the buyers."

As a result, the completed houses display more uniformity than intended, but the dramatic form-making offers an adaptable layout. Because they pinwheel out from a core containing stair and plumbing systems, the pavilions can be divided or undivided readily, says Rosman. Most rooms have light on at least two sides, especially appreciated in a country with a predominantly dreary climate. The roof space atop the shifted volumes becomes generous, upper-level terraces.

Visually, the interlocking volumes produce a dynamic streetscape, with views of the water framed like jigsaw-puzzle pieces for the passerby. "We didn't want to make a wall of the houses," says Rosman. Even



with the inevitable auto parked under one of the cantilevers, the design frees a fair amount of space at ground level on the tiny lots.

The single-family houses in the development have not yet sold well, which Rosman attributes to a slowing housing market and some discomfort with the assertiveness of the style. Brands Stassen, an Almere city planner, said buyers have chosen smaller houses at correspondingly lower prices in surrounding areas. Indeed, UN Studio's smaller, attached houses have done better. Rosman also wondered if the space devoted to the combination of kitchen, dining, and living area on the ground floor is too small compared to the rest of the house.

How would such a project fare in America? Even though builders tout extensive market research, the merchant-builder house of today seems more uniform than ever, down to the brick-faced entrance arch that festoons the French Provincial in Dallas or the neo-Mediterranean in New Jersey.

Although "experimental" and "housing" remain mutually exclusive terms in America, the lack of innovation is not successfully creating American models that work well at high density, built of materials more durable or environmentally sustainable than vinyl siding. The Dutch are arguably as concerned with comfort and resale value as Americans, but they're open-minded about innovation—even as it inevitably implies that mistakes will be made. There's a lesson for America at Almere. ■

Project: *Housing at Almere, 48 Family Houses*

Location: *Almere, Eilandenrijk, Holland*

Architect: *UN Studio—Ben van Berkel, principal; Boudewijn Rosman, project architect; Henri Snel, Gianni Cito, Alex Jung, Katrin Meyer, Aad Krom, Andreas Bogenschütz, Yuri Werner, KSK Tamura, Jasper Jägers, Martin Kuitert, team*

Owner: *Visser Bouwmaatschappij,*

Dhr. Drs G.J. Visser

Engineer: *Ingenieursgroep van Rossum*

General contractor: *Bouwbedrijf Visser en Bunschoten*

Consultants: *TKA, Ontwerpbureau Teun Koolhaas Associates (landscape)*

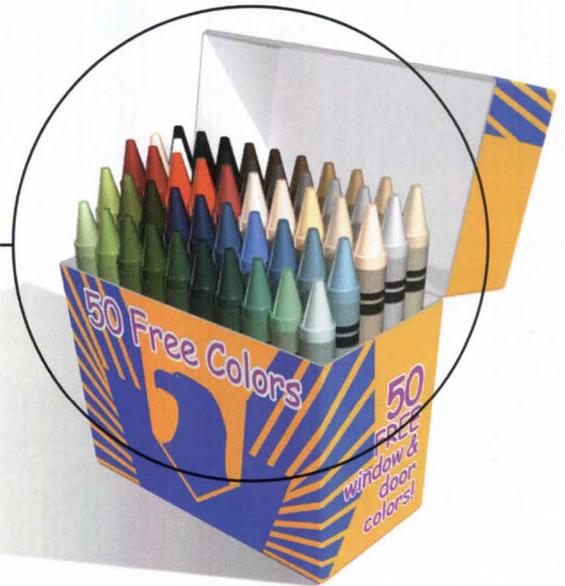
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Chiba Manabu Architects' **Split** reiterates the dialogue between built form and vacant space so unique to Tokyo

By Naomi Pollock, AIA

In Tokyo, where buildable property is scarce and expensive, most architects would happily use any available land to maximize their buildings. But to Manabu Chiba that's the tail wagging the dog. In Chiba's hands, architecture is a tool for forging connections between the glitches, gaps, and cul-de-sacs that create the network of vacant spaces responsible for Tokyo's unique urban fabric. So at the outset of designing *Split*, an eight-unit rental apartment building and landlord's house, top priority for Chiba and his firm, Chiba Manabu Architects, was not just the building itself but where to put it.

Faced with a generous site in central Tokyo previously occupied by a wooden house and garden owned by the client's family, Chiba first considered how to use his project to connect the surrounding residential neighborhood's vacant spaces. His solution was to divide the program into two blocky volumes, one for the owner and one for the tenants, and

Naomi Pollock, AIA, is RECORD's Japan-based contributing editor.

Project: *Split*

Location: Tokyo

Owner: Yasushi Okutani

Architect: Chiba Manabu Architects

Structural engineer: Umezawa

Mechanical and electrical

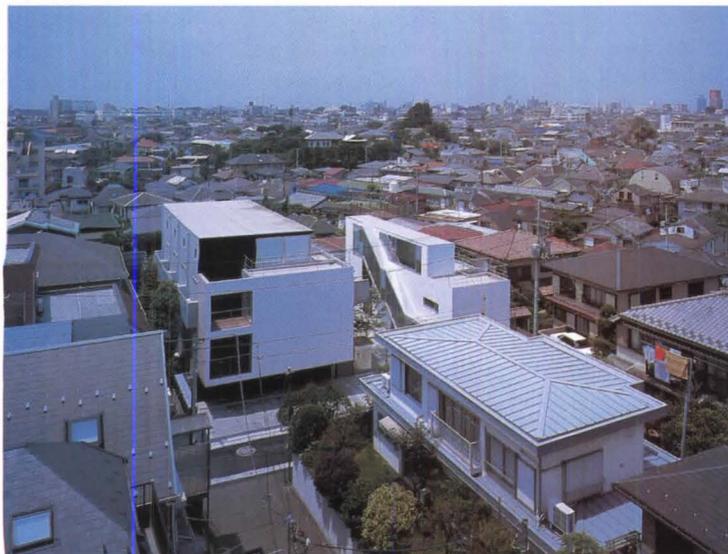
engineer: Kankyo Engineering

General contractor: Satohide Corporation



The program comprises two blocky volumes, one for the owner (above) and one for the tenants (prior page), linked together with a court-

yard (right and below). To Manabu Chiba, the dialogue between solid and void—built form and vacant space—defines Tokyo's unique character.



link them together with a 23-foot-wide courtyard that also creates a visual relationship with the dead-end street opposite, narrow slotted side yards on each end, and a garden belonging to an adjacent house at the rear.

The apartment component consists of two groups of four duplex, steel-and-reinforced-concrete apartments stacked on top of each other. The form of the apartment block was inspired by the wooden *mokuchin* apartments that proliferated in Tokyo after World War II, when there was an urgent need to throw up housing as quickly as possible. Each of the 500-square-foot apartments is entered from an exterior, single-loaded corridor on the first or third floor, the latter accessed by an exposed metal stair. "Though *mokuchin* have a bad image, I liked their casual feel," explains Chiba.

While two apartments at one end of the block each have an extra room, the other units consist of a stair and two floor plates. "I thought that each unit needed two kinds of space: one for movement and one for stationary activity," explains Chiba. Both levels consist of a single, multi-purpose space, but one also contains the kitchen and the other the bathroom. Chiba left it up to the tenants to determine how to use the space.



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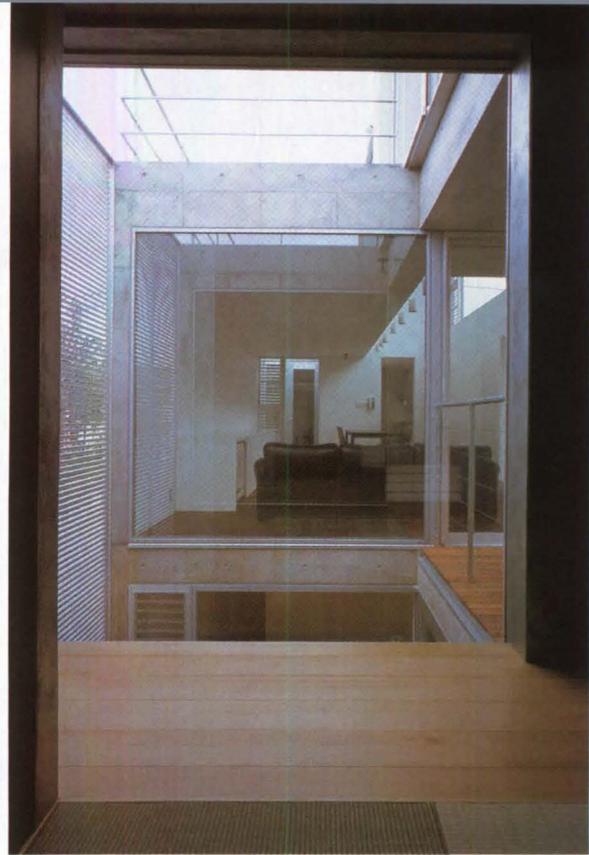
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Both levels of the apartment units (shown here) consist of a single, multipurpose space, but one level also contains the kitchen, and the other the bathroom. Chiba left it up to the tenants to determine how to use the space.



SECTION



GROUND FLOOR

0 10 FT.
3 M.

- | | |
|----------------------|--------------------------------|
| 1. Bedrooms | 6. Closet/storage |
| 2. Terrace/porch | 7. Living room/
dining room |
| 3. Courtyard | 8. Study |
| 4. Bathroom/washroom | 9. Parking |
| 5. Balcony | |

Because sleeping, living, and working all require a modicum of privacy, windows and direct outside exposure were kept to a minimum. Instead, daylight filters in through the glass walls at either end of the circulation zone, where there was no need for privacy since people go up and down stairs quickly. The ideal spot to open up to the outside world, these stairs double as a visual conduit linking the central courtyard and the side yards.

A paved area dotted with trees and bicycle parking, the courtyard separates tenants and landlord. Echoing the face of the apartment building, an enclosed stair climbs up the side of the owner's house feeding three floor plates as it ascends. As in the apartments, Chiba did not assign functions to the individual floors, yet the character of each one is slightly different. While the second floor, an expansive room with the kitchen at one end, is the most public, the other two levels are more private, especially the third floor, where a luxurious glassed-in bathroom opens onto a stunning city view. "The client likes views and baths, so I decided to put them together," says Chiba. On the ground floor, where bedrooms are concentrated, a small garden and terrace act as a buffer between the main house and a tatami-floored room in one direction, and connect the courtyard and side yards in the other.

Instead of melding into unified street walls, Tokyo's buildings are largely separated—each one a link in the visual chain of open spaces that wends its way through the metropolis. To architect Manabu Chiba, the dialogue between solid and void—built form and vacant space—has always defined the city's unique character. ■

Sources

Roofing: *Tajima*

Windows, glass, skylights, doors: *Shin Nikkei*

Chairs, tables: *Cassina Inter-Décor Japan*

Kitchen furniture: *Monte*

Lighting: *Koizumi Sangyo; Yamada Shomei Lighting Company;*

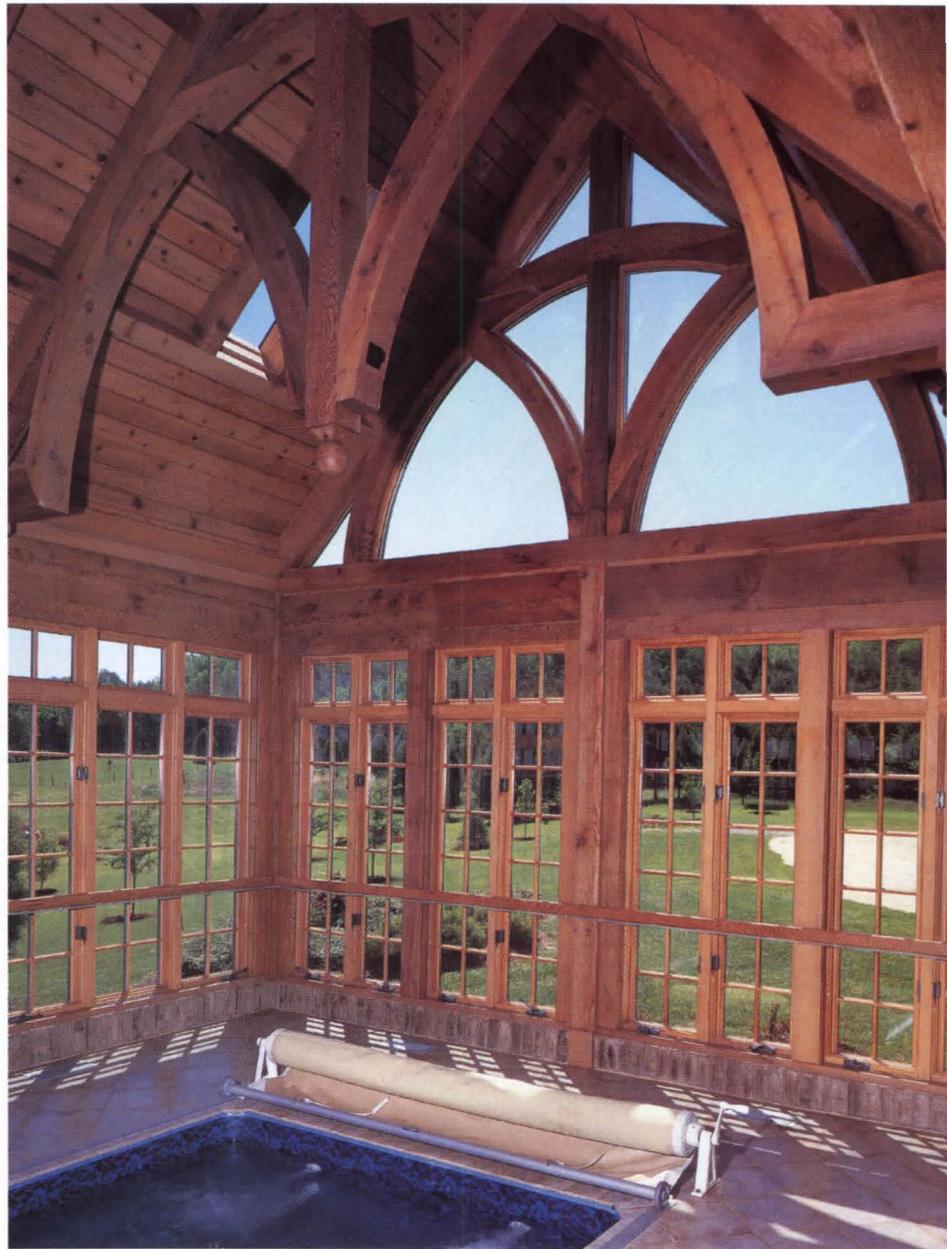
Yamagiwa; Erco Toto

Hardware: *Agaho (West Corporation); Miwa Lock Company*

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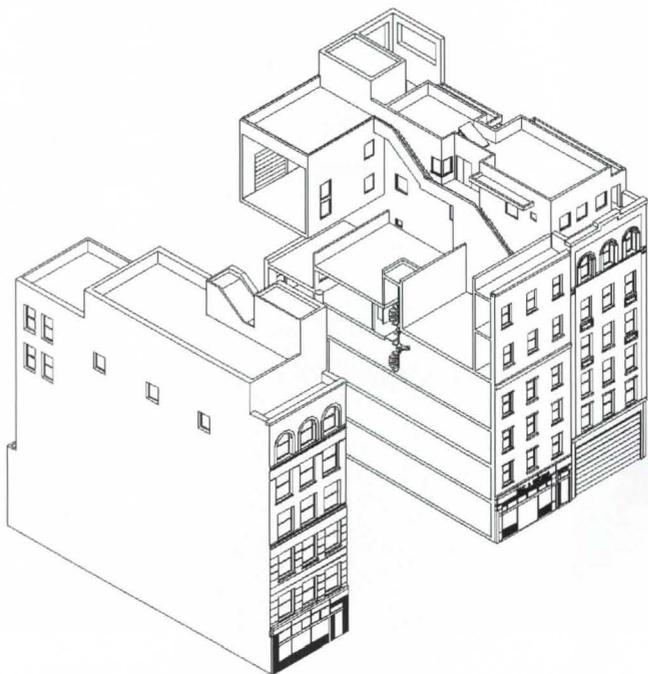


Kolbe & Kolbe
Windows & Doors

Facing west (this page), a glimpse of the surrounding city is seen beneath the artist's studio that flanks the roof courtyard (also shown opposite, facing east) of the four-story middle building.



Le Corbusier's legacy lingers in Jon Michael Schwarting's loft renovations for the Davis and Warshow Building



By Suzanne Stephens

Who would have known that Jon Michael Schwarting, an architect trained in Corbusian principles at Cornell University in the 1960s, would one day apply them to drab tenement buildings on New York City's Lower East Side? You could call it Villa Savoie crosses Delancey. After Cornell, Schwarting, who has had offices in New York and Long Island, got to know Alan Finkel, an artist whose family owned three buildings, 71–75 Ludlow Street, devoted to its plumbing-supply business, Davis Warshow. The two end buildings had been erected around 1900; the middle one, a Federal row house dating to the Civil War, had been a stable for the north one until Davis Warshow took the group over in the 1920s. In 1998, Finkel and his family decided to convert the ensemble, used primarily as a supply house where plumbing inventory was stored, into rental living lofts. Finkel was already living in one building, with his studio in another. He saw the neighborhood was heating up as a residential area, and the family concluded that storage could be pushed elsewhere. So the artist called upon Schwarting to help out with a renovation scheme, in which 13,000 square feet would remain for plumbing supplies on the street level, and 13 residential units, totaling 41,000 square feet, would be inserted into the floors above. While all the units have an open loft plan, three are duplexes, and one of these was specifically designed for the artist-client.

Since the six-story end buildings were already connected by two stacked, bridgelike corridors extending behind the street facade along the top of the middle building (see axonometric section), the ensemble could be tied into an integrated complex of indoor and outdoor living areas. In order to create the duplex at the top of the buildings, Schwarting took



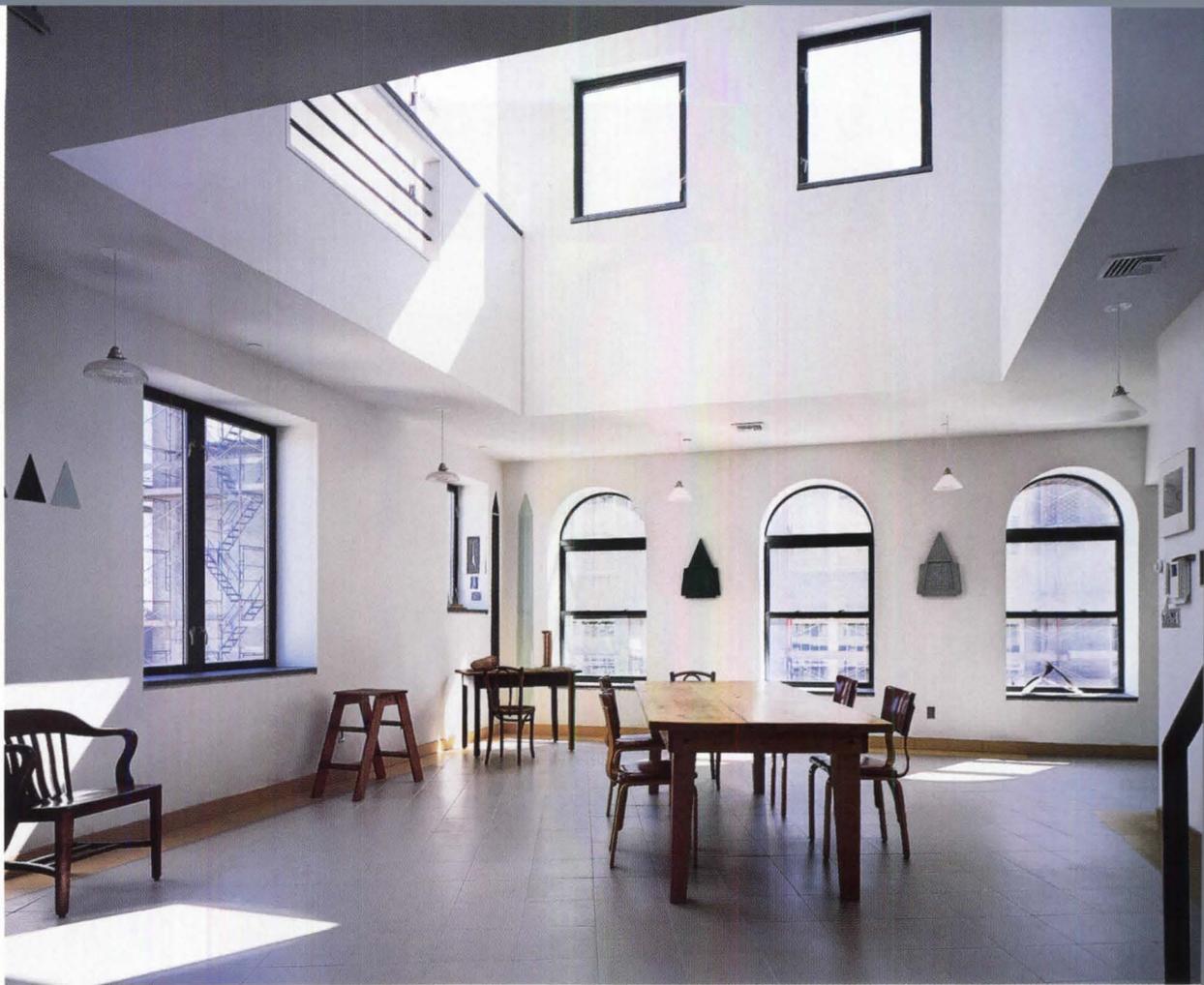
advantage of a zoning regulation that permits mezzanines to be placed in one third of an existing space, and then raised the roofs of the two end buildings by 8 feet, and the middle one by 3 feet. The living rooms of the mezzanine lofts now soar to heights of 16 to 20 feet, while the typical 1,600- to 1,800-square-foot lofts without mezzanines have ceilings that are 9 to 11 feet high.

Of the duplex units, Finkel's is the most elaborate in its disposition of spaces. In the spirit of Le Corbusier's *promenade architecturale*, Schwarting created for the artist a directed movement through a sequence of spaces that begins at the entrance elevator in the south building, then progresses across the sixth-floor bridge/corridor of the middle building, into Finkel's loft at the north end. The mezzanine level continues the

Project: Davis and Warshow Building
Location: New York City
Owner: Dorose Holding Corporation
Architect: Jon Michael Schwarting Architect (now Campani and

Schwarting Architects)—Jon Michael Schwarting, principal; Yumi Yoshino, Michael Rizzo, project team
Engineers: Severud Associates (structural); Smalley Design (mechanical and electrical)

Inside a top-floor living loft (right), a stair leads to the mezzanine (below left). Jon Michael Schwarting varied the sequence of spaces by having narrow passages edge the rooms (below right), by creating internal and external window openings that frame views, and also by making it necessary to go outside to get to various interior spaces.



sequence with a series of rooftop spaces, where rooms are both enclosed and open to the sky. Finally, one arrives at a 24-foot cube placed along the western edge of the middle building, used for Finkel's studio. The 625-square-foot space also comes with a 200-square-foot mezzanine, a volume evocative in its proportions of Le Corbusier's Esprit Nouveau Pavilion of 1925.

In addition, Schwarting turned the roof of the middle building into a courtyard, with various levels serving the fourth-floor loft and two fifth-floor units. (A communal outdoor space for the remaining loft units is placed at the front end of the south building.) The stair bulkheads, elevator housings, railings, vent and drain pipes, and metal chimneys of the main courtyard lend it the sculptural presence of Le Corbusier's famous roof garden of 1931 for Charles de Beistegui in Paris, with its carpet of green grass, outdoor fireplace, and Surrealistic air. Here, however, the functional objects and corrugated steel panels imbue the courtyard with the dramatically industrial-urban character of New York.

The renovation attests to the rich legacy of the early Modern pioneer. Schwarting's reinterpretation of Le Corbusier's sequence of spaces, proportions, volumes, and architectural elements treated as sculptural objects have brought vitality to an urban enclave and to a trio of structures otherwise lacking in architectural distinction. ■

1. Commercial space
2. Typical rental
3. Duplex, 73 Ludlow
4. Bridge connection
5. Stair to fourth-floor loft
6. Bridge connection
7. Stair to roof



Sources

Steel structural system: Marino
Finish on existing masonry: Thoro Coat and Thoro Seal
Metal curtain wall: Atlas
Aluminum windows (double-hung and casement): Universal

Corrugated-metal ceilings: Alpro

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Residential Products

Multifamily Housing

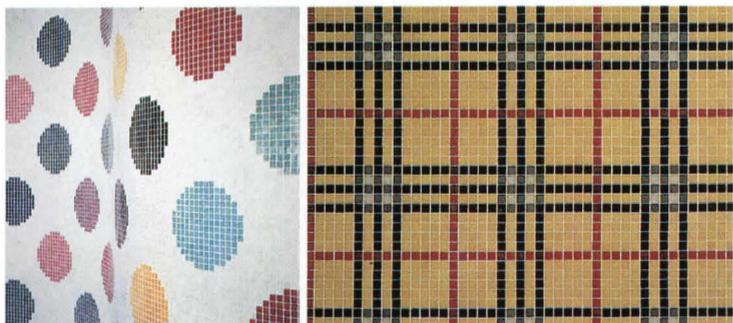
▼ Nesting, but not resting

Heltzer offers the Sedona nesting tables for indoor and outdoor use, set on locking casters for easy mobility. The collection includes a 35" high, counter-level table, a 29" high dining table, and a pair of 23" high occasional tables. Tops are of slatted teak, limestone, or granite, and frames are of stainless steel. Sizes can be customized, and casters are optional. 773/509-0005. Heltzer, Chicago. **CIRCLE 200**



▼ Mosaic couture

At this year's ICFF, Bisazza showcased several inventive compositions that illustrated the potential of mosaic. The Pois group offers a three-color polka-dot look or a confettilike, multicolored look produced from Bisazza's new Smalto tiles. Tartan Classic, inspired by Burberry plaid, includes shades of "interlaced" tan, red, black, and gray. 305/597-4099. Bisazza North America, Miami. **CIRCLE 201**



► Flooring first

Rather than bringing in rough stone slabs with the inherent waste of using only a portion of them, Ann Sacks has chosen formats that are manufactured by their quarries. The Princess Yellow slab flooring pictured here has been cut to fit the dimensions of the room shown. The slabs of approximately 3' x 5' were laid in the perimeter of the

room and the interior walls were then installed over the flooring. 503/281-7751. Ann Sacks, Portland. **CIRCLE 203**



▲ Grass cabinets

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◀ River views

Harmon worked closely with Turner Construction to achieve a 26-story solid window wall of glass for Miranova Towers, a residential tower offering one of the best views in Columbus, Ohio. Designed by Miami-based Arquitectonica International, the residential tower's northern facade reflects the river in its blue-green tinted glass, while the southern wall includes a center column of recessed windows. 763-287-4900. Harmon, Golden Valley, Minn.

CIRCLE 204

► French teak

THG USA, the American importer of luxury and high-end bath products from the House of Tetard, Haudiquez and Grisoni (THG) in France, introduces faucets, bath fixtures and accessories, and luxury bathtubs to the U.S. Inspired by the traditional Japanese bath, the Yoko tub (shown) can be equipped with an optional teak rim, an interior teak seat, and a matching teak step. The Heritage tub features soft, rounded lines, and like the Yoko tub is constructed of resin. Both tubs are available in an extensive choice of color finishes. 954/425-8225. THG USA, Coconut Creek, Fla. **CIRCLE 205**



Residential Products

Multifamily Housing

► Soapy tiles

The Finnish-based Tulikivi Group is the largest soapstone-processing company and manufacturer of soapstone fireplaces in the world. Tulikivi's soapstone tiles are also well suited for both floor and wall installation in bath and kitchen environments, and require minimum care. Other applications include exterior cladding, facades, floors, terraces and stairs, interior stairs, landscaping, and fountain structures. Tulikivi offers semifinished materials such as cut-to-size slabs and monumental masonry products. 800/843-3473. Tulikivi U.S., New York City. **CIRCLE 206**



◀ Finale touches

Finale is a new brand of decorative tile trims and accent pieces. The line includes Midori, a blend of brushed metal, slate, and colored glass; Borders medieval-look mosaics; Pulsacions hewn-stone-look accents; Metallic Dreams metallic-glazed-ceramic accents; Matterhorn travertine and marble stone accents; and Atmosphere stone medallion accents (shown). 877/356-7462. Florim USA, Clarksville, Tenn. **CIRCLE 207**

► Central vac system

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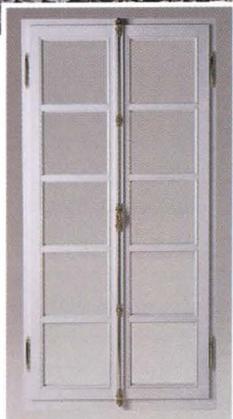
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CIRCLE 209

► Quartz surfaces

Six of the seven new colors from Silestone natural quartz surfaces will make up a new series named Tropical Forest:

Ivory Coast, Ebony Pearl, Mahogany, Rain Forest,

Brazilian Brown, and Aguazul. Kona Beige, a warm earth, tri-shade beige, is the seventh color. Cosentino, the Spanish company that produces Silestone, uses a three-color mixing process rather than the two-color mixing process used by its competitors. 281/494-7277. Cosentino U.S.A., Stafford, Texas. **CIRCLE 210**



◀ Professional-style spray

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Dornbracht USA, Duluth, Ga. **CIRCLE 211**

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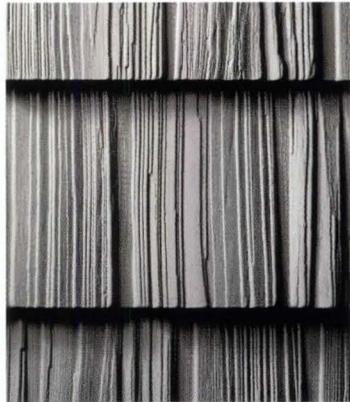
New Products

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Realistically patterned vinyl siding; architecturally inspired corner system

CertainTeed Vinyl Siding has enhanced the company's product line with several new offerings, including a new style and four new colors in the Cedar Impressions line and the new SuperCorners system.

Random Hand-Split Shakes are the newest shingle style in the Cedar Impressions family. The new style features the coarse texture and deep shadow lines found in authentic hand-split cedar shakes. The 10' panels are made with patented TrueTexture technology and designed with a random edge pattern for a realistic look for the whole house, or for accents. New colors for Cedar Impressions include Barn Red, Buckskin, Heritage Cream, and Prairie Sand, bringing the total choice to 12 col-

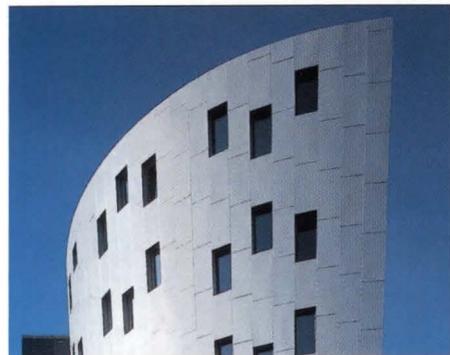
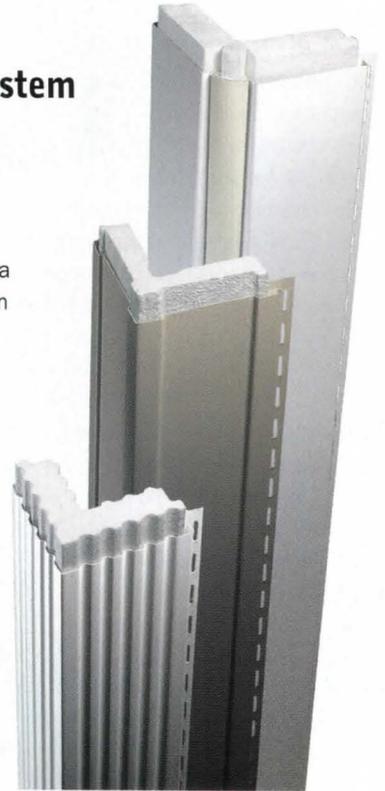


New Hand-Split Shake (above). The three styles of SuperCorners (right).

ors. The siding is available in 7" Perfection and 6½" Half-Round Shingles. In addition to the new style and colors, CertainTeed has added a new Perfection Mitered

Cornerpost for a matching look on Cedar Impressions Perfection Shingle jobs.

CertainTeed's 2002 product line also introduces SuperCorners, a new product that provides a custom look and eliminates the need for multicomponent corner systems. SuperCorners comes in three architecturally inspired styles, including Beaded (with an optional snap-on insert for color contrast), Traditional, or Fluted. SuperCorners are available in 20' lengths for quick and seamless installations and feature a rigid, solid-core foam backing for added durability and ease of handling. 800/233-8990. CertainTeed Corporation, Valley Forge, Pa. **CIRCLE 212**



Metal facade and roof component options

The Rheinzink metal facade system can be used for a variety of contemporary building envelopes. The company has utilized more than 10 different systems for modern facades and outer walls, such as corrugated and trapezoidal profiles, as well as reveal, chamfered, and horizontal panels. In addition, there are small and flat-lock tiles and designs in bat-seam, angled standing seam, and various custom-made designs.

Rheinzink also offers roof components. With the new Quick Step Stepped Roof, Rheinzink can be installed quickly by using precise plug-in components based on standard prefabricated profiles. Quick Step profiles are available in a "preweathered" surface quality and are suited to roof pitches of 10 and 75 degrees. They are manufactured for specific projects according to dimensions; standard

metal thickness is 22 gauge and standard lengths are approximately 79" or 118". For eaves, ridges, hips, and valleys, Rheinzink supplies system components, which are precisely coordinated in detail and available as standard parts. 604/291-8171. Rheinzink Canada, Burnaby, British Columbia. **CIRCLE 213**

One of Rheinzink's several metal facade systems (above left). The Quick Step Stepped Roof (above right).

Copper canopy for historic bandstand

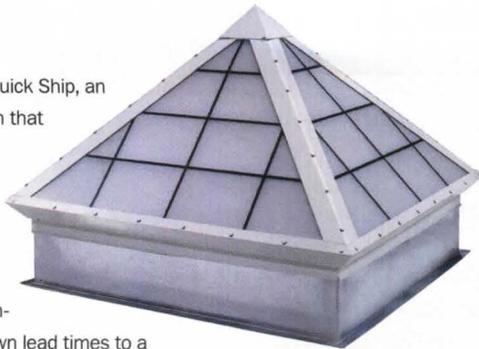
To help renovate a stone bandstand in the historic town of Hico, Texas, Custom-Bilt Metals created a metal canopy from concave copper panels. The copper panels, which were installed over a concave octagon-shaped structural-steel framework using concealed fasteners, provide shelter while also fitting around an existing street pole. An expansion cap on top of the canopy allows for deflection of the streetlight pole. 800/826-7813. Custom-Bilt Metals, El Monte, Calif. **CIRCLE 214**



New Products

► Quicker skylights

Major Industries introduces Quick Ship, an interactive Web-based system that can be used to speed up the process and lower the cost of ordering and receiving a pre-engineered skylight. All Quick Ship skylights feature Guardian 275 translucent panels, pre-engineered to cut down lead times to a maximum of six weeks for standard sizes and finishes. Architects can visit the company's Web site at www.majorskylights.com, choose the design parameters, and have a price within one business day. 888/SKYCOST. Major Industries, Wausau, Wis. **CIRCLE 215**



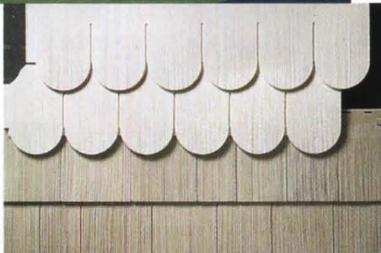
► Energy-efficient roof tiles

The Two-Piece Mission Tile from U.S. Tile is one of more than 20 of the company's roofing products that meet the stringent reflectivity requirements for participation in the EPA Energy Star partnership program. All U.S. Tile products carry a fadeproof guarantee and a class "A" fire-resistance rating. 909/737-0200. U.S. Tile, Corona, Calif. **CIRCLE 217**



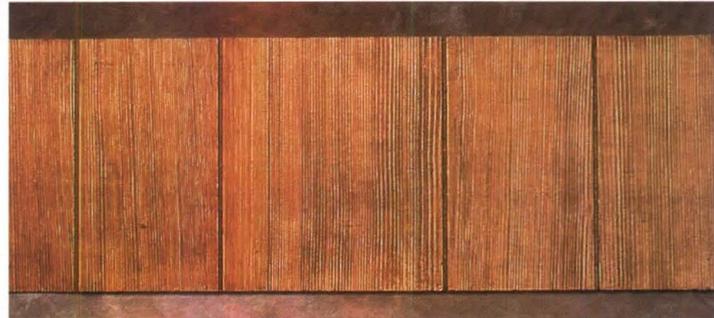
▲ Shake siding

Featuring a deep, rustic grain that was patterned directly from real split cedar, new Portsmouth Shake and Half Rounds from Crane Performance Siding are made of durable injection-molded polypropylene. Combining a .1" thickness with reinforced nail slots and perimeter locks makes Portsmouth Shake strong enough to resist wind gusts up to 160 mph, or a category 5 hurricane. The Portsmouth Shake is available in six colors and comes in 48" lengths and a double 7" profile. The Half Rounds are available in Aspen White with a 35" long, double 6 1/4" profile. 800/366-8472. Crane Performance Siding, Columbus, Ohio. **CIRCLE 219**



▲ Utility facelift

When the headquarters building of Beauregard Electric Cooperative in Deridder, Louisiana, needed a facelift, the retrofit solution was to put a pre-engineered building over the existing structure. The project utilized 28,000 square feet of Metl-Span polyurethane insulated roof panels finished in a Surrey Beige color. Leak protection was assured by the continuous panel running from ridge to eave. 972/221-6656. Metl-Span, Lewisville, Texas. **CIRCLE 216**



▲ Stained shake available

Sierra Premium Shake, a fiber-cement product manufactured by Nichiha USA, is now available both stained and primed. The new stained-shake offering includes mahogany, maple, redwood, and cedar and comes with a 12-year warranty. The 1/2" thick, 8" long shake will withstand winds exceeding 110 mph and is rot and termite resistant. 866/424-4421. Nichiha USA, Atlanta. **CIRCLE 218**

► Protecting the protection

Sealtight Vibraflex Bridge Deck Protection Course provides rugged protection for delicate deck waterproofing membranes. The multiple-ply, semirigid, asphaltic panel is designed to absorb both

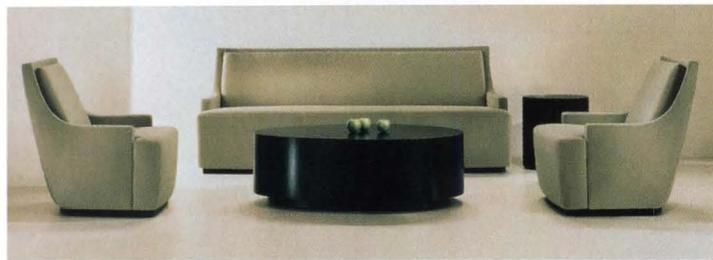


the dynamic and static loading on railway, mass-transit, airport, and other special projects. Vibraflex is ideal for both new and remedial waterproofing applications on concrete, wood, steel, and prestressed or precast-concrete structures. 847/214-2100. W.R. Meadows, Hampshire, Ill. **CIRCLE 220**

Product Briefs

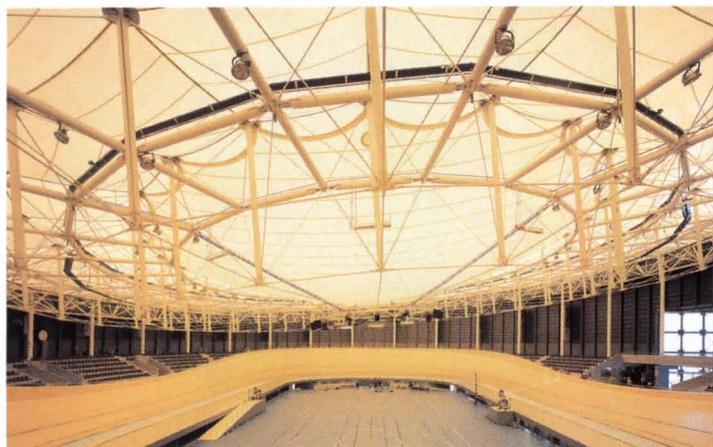
▼ Got the scoop

Barbara Barry's new Scoop Series collection for HBF consists of upholstered lounge chairs in two sizes, an ottoman, a sofa, and a love seat. Like many of Barry's designs, the Scoop Series contains references to the modern masters of the 1930s and 1940s. "These pieces are shaped like a cupped hand," says Barry, describing their streamlined form. Options for the chairs include a metal-swivel or a wooden-plinth base, with or without casters. 828/328-2064. HBF, Hickory, N.C. **CIRCLE 221**



► Healthier option

Available as a new or retrofittable option on Herman Miller's Aeron chair, PostureFit delivers support to the area of the lower back below the beltline, where the spine meets the pelvis. PostureFit was developed by a spinal-care and ergonomic-seating specialist, based on his work with the aerospace and motor-sport industries and was designed by the Aeron chair's original designers. 888/443-4357. Herman Miller, Zeeland, Mich. **CIRCLE 223**



▲ Inflatable velodrome

Created through the initiative of the International Cyclist Union, the Centre Mondial du Cyclisme in Aigle, Switzerland, opened its doors last May. Designed by Pierre et Pascal Grand and Tekhne Management, the center features a 5,000-square-meter double inflatable membrane held under tension by a pneumatic system. The interior of the velodrome is completely free of load-bearing points, optimizing the structure's use of space. 33/0474974133. Ferrari S.A., Cedex, France. **CIRCLE 224**

Product of the Month Soul

Milliken Carpet and the Omaha-based health-care firm HDR have teamed up to create a new carpet line aimed at the health-care market. The 6' loop pile collection, Soul, draws from nature and the philosophies of Zen, Feng Shui, and aromatherapy to promote a feeling of health and well-being.

The 25 designs are the first in a new series of carpets that Milliken has engineered for high-performance markets. Called Carpet for Extreme Conditions (cXc), the series features a new Antron Legacy fiber by Dupont, the new AlphaSan antimicrobial treatment from Milliken Chemical, and a new backing codeveloped with Dow Chemical.

Eastern and natural influences are prevalent throughout Soul's patterns, emerging in images of rock gardens, bamboo stalks and leaves, and lily pads. The design team also experimented with subliminal messages, incorporating the Chinese symbols for "together," "shelter," and "self" and the handwritten words "mind," "body," and "soul" into the designs. Background textures were inspired by gauze and linen, and the 10 color concepts are named for essential oils such as Eucalyptus and Ylang Ylang. 800/241-2327.

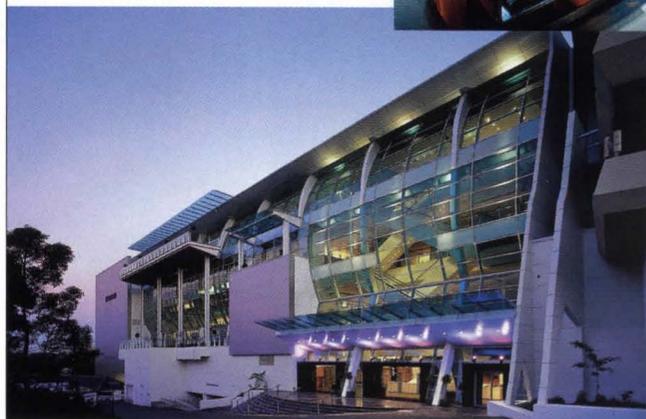
Milliken Carpet, LaGrange, Ga. **CIRCLE 222**



▼ Architectural glazing award

Five projects were recognized by this year's Solutia Design Awards, a program that pays tribute to architects and designers who have used Solutia's architectural glazing products. The winners include The Garage, São Paulo, Brazil; Milwaukee Art Museum, Milwaukee; Cauldron, Olympic Winter Games, Salt Lake City; Christian La Croix Daikanyama (right), designed by Christian La Croix and architect Christophe Carpente, Caps Architects;

and Flemington Racecourse (bottom), Melbourne, Australia, designed by The Buchan Group. 877/674-1233. Solutia, St. Louis. **CIRCLE 225**



Product Briefs



▲ Carbon art

Last May, Italian-born designer Giovanni Pagnotta unveiled his first complete collection of furniture—a line of luxury sculptural furnishings made entirely of carbon fiber. The ultra-thin pieces include two chairs, two tables, a trash bin, a light, and a chaise longue. Prices range from \$1,500–\$8,000. 914/935-1490. Giovanni Pagnotta, Port Chester, N.Y. **CIRCLE 226**

▼ Paper partitions

Allsteel has created a new collection of surfaces for its Terrace and Marbles furniture lines, including the Mulberry Paper style, shown here. Made from actual mulberry fiber, the paper is sifted through handmade screens, rinsed in natural streams, and then suspended between recyclable resin sheets. 563/262-4800. Allsteel, Muscatine, Iowa. **CIRCLE 227**



▲ Starck and square

A Minimalist square shape is the hallmark of all the furnishings and ceramic products in the Starck 3 bathroom collection. Suitable for residential, commercial, and institutional use, including hospitals, offices, railway stations, and airports, the collection includes a variety of wash-



basins, toilets, bidets, and urinals. Additionally, Duravit is producing tubs and shower trays for the collection. As the first designer collection for the contract sector, the Starck range of shower trays and baths opens up new design options for the most private areas of public buildings. 888/DURAVIT. Duravit, Duluth, Ga.

CIRCLE 228

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Blocks of ice.
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To brilliant greens.

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▼ Carpet compositions

Mannington Commercial introduces three new modular products for corporate commercial interiors: Classic Jazz, Jazz Age, and Jam Session. All of these 24 oz products manufactured of Dupont Antron Legacy contain eight colors that have an "antique tea-washed" effect. Classic Jazz features a large-scale spirograph pattern; Jazz Age has a



large-scale brushstroke pattern; and Jam Session, an enhanced-textured loop, is a coordinating textured tweed to pull the patterns together. All modular products are backed with Mannington's Infinity Modular backing that contains a minimum of 25 percent recycled content and carries a Lifetime Warranty on tuft bind, static propensity, delamination, edge ravel, and moisture penetration. 800/241-2262.

Mannington Commercial, Calhoun, Ga. **CIRCLE 229**



▲ Posh polished plaster

For RTKL's new Dallas office, around 11,000 square feet of Armourcoat polished plaster was used by the architects

on feature walls to add depth and define circulation and boundaries. For example, red Armourcoat spatulata finish incorporating the RTKL logo was used in an abstract, Cubist-style panel behind the reception desk. Armourcoat's use on the office's curved

staircase walls demonstrates its ability to be applied to curved substrates. 800/886-3626. Armourcoat Surface Finishes, North Providence, R.I. **CIRCLE 230**



▲ Aluminum shelving

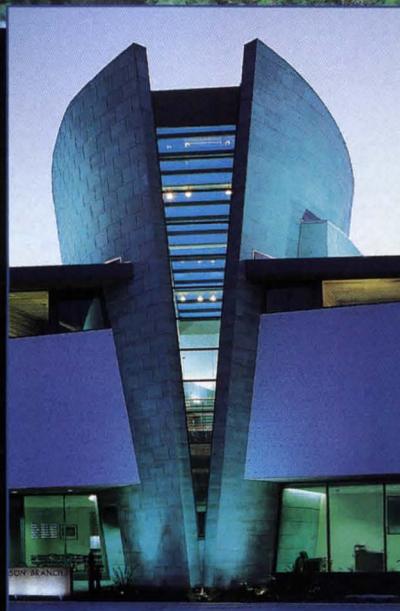
Rangine Corporation's extruded aluminum shelf features a low-profile design that exceeds the strength and stiffness of 3/4" plywood. Used in either wall-mounted or pole-supported applications, shelf depths of 4", 6", 8", 10", and 12" can be achieved by combining sections that are 4" and 6" deep. Shelving can be ordered in lengths up to 12'. 800/826-6006. Rangine Corporation, Millis, Mass. **CIRCLE 231**

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Project: Robertson Branch Library
City of Los Angeles
Architect: Steven Ehrlich Architects

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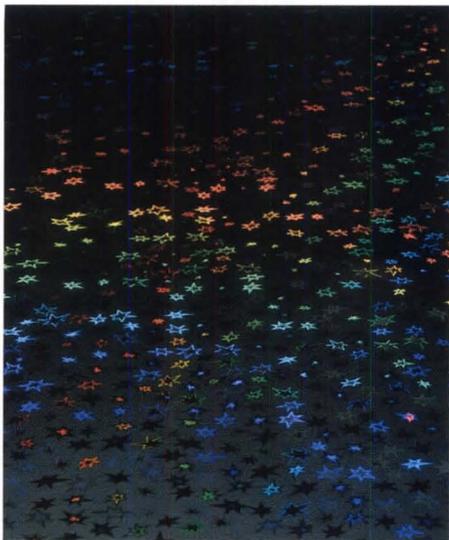
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Product Briefs

► Glitter effects

Paparazzi! holographic surfacing from Nevamar is a new decorative surface option that offers glitter effects for a wide range of vertical-use applications. The collection is made possible through the employment of the latest optical embossing technology and features four reflective effects that can be applied to any Nevamar solid color offering. The surfacing is ideal for low-abrasion vertical applications such as wall cladding, signage, soffits, and accent strips, plus a wide range of retail, gaming, and entertainment fixtures, kiosks, and exhibit booths. Because of its special material composition and construction, Paparazzi! does not offer significant abrasion resistance. It is available in 48" x 120" sheets in a .039" thickness. 800/638-4380. Decorative Products Division, Odenton, Md. **CIRCLE 232**



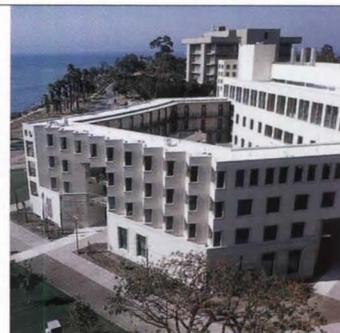
▲ Miami-grade facade

Above the entrance to Imolatile's new Miami showroom is a 42' long tile mural created on a computer by Italian artist Mauro Andrea. A gigantic ink-jet-style

printer sprayed vitreous oxide colors on Imola-made stoneware tiles, which were then fired to an impervious ceramic finish. The building's facade is finished in a structural-curtain-wall system called Imolawalls. The 36" porcelain stoneware panels are strong and lightweight, resistant to hurricane-force winds, and feature a mechanical attachment approved by Miami-Dade County for wind resistance. 800/35-IMOLA. Imolatile, Miami, Fla. **CIRCLE 233**

► Ocean air-conditioning

For the Donald Bren Hall at the University of California, Santa Barbara, Wausau manufactured the daylight-harvesting 2250 Series window system. Facing the ocean, the office wing has no air-conditioning but relies on flow-through ventilation with Wausau's operable windows and transoms. 877/678-2983. Wausau Window and Wall Systems, Wausau, Wis. **CIRCLE 234**



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ARNE JACOBSEN TODAY: PANEL DISCUSSION

The American-Scandinavian Foundation and ARCHITECTURAL RECORD present a panel discussion in which James Stewart Polshek, the architect of Scandinavia House, Robert Ivy, editor in chief of ARCHITECTURAL RECORD, and Nicholas Adams, an architectural historian, analyze the influence of Arne Jacobsen's architecture on current work. The discussion is moderated by Christopher Mount, the curatorial consultant for *Arne Jacobsen: A Centenary Exhibition* on view at the Scandinavia House, September 27–November 9, 2002.

Thursday, October 31, 2002, 6:30 p.m.

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Arne Jacobsen, Texaco petrol station in Bellevue, Denmark, photo by Strüwing, 1937.

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A reception will follow the lecture.



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Product Briefs

▼ Aerofoil fins

Levolux claims the company's aerofoil fins cut solar heat gain and offer the advantages of a conventional brise-soleil, such as good outward visibility and energy savings. Levolux aerofoil fins may be installed in vertical, horizontal, or angled

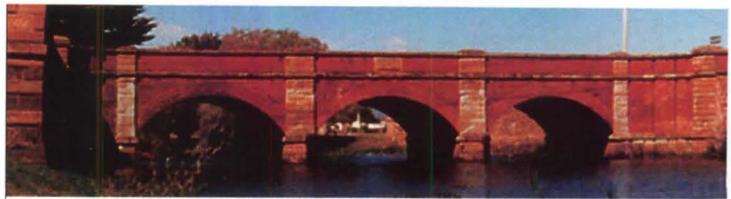


situations. They are manufactured from extruded aluminum sections and may be mounted at a fixed angle or with an adjustable manual or motorized system.

Complete assemblies that incorporate walkways and supports together with handrail and other systems may be created using aluminum and steel components. Perforated fins and timber and glass options are also available. 44 20 8863 9111.

Levolux, Middlesex, U.K.

CIRCLE 235



▲ Steady expansion

The Archtec bridge-reinforcement system utilizes technology and drilling methods designed to strengthen masonry arch bridges while maintaining their historical integrity. A computer model determines the load-carrying capacity of the bridge before the system is installed. Archtec has no impact on the environment and can be completed with little or no traffic delays. 800/363-6066. Cintec America, Washington, D.C. CIRCLE 236



▲ Healing ceiling

The ceiling design of the new Children's Renal Center at the University of California at San Francisco Medical

Center was named the winner of USG Interiors' Astro Climaplus Ceiling Panel design competition. The new facility was designed by the medical center's Office of Design and Construction. It combines vibrant color with recurring curved design elements in the

floor, ceilings, and casework finishes to create a noninstitutional look for the center's young patients. 800/USG-4YOU. USG Corporation, Chicago. CIRCLE 237

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Product Literature

Underlayment brochure

A new eight-page brochure provides information on the features and benefits of Levelrock-brand floor underlayment, a high-strength line of poured gypsum from the Industrial Products Division of USG. 800/487-4431. USG Corporation, Chicago. **CIRCLE 238**

Air-filtration magazine

Camfil Farr has launched a magazine to provide news and information on the latest developments in air filtration. Titled *Airmail*, each issue will include problem-solving case studies, air-filter-testing updates, commentary on current and proposed filtration standards around the world, and other timely information. The magazine will serve as a tool for those who buy and specify air-filtration equipment for manufacturing plants and other industrial facilities, commercial buildings, schools, hospitals, health-care facilities, and more. 973/616-7300. Camfil Farr, Riverdale, N.J. **CIRCLE 239**

Coffee-table design resource

The 2002 edition of *Kultur im Bad*, a catalog detailing Dornbracht's bath and kitchen fixtures and accessories, is available. The 256-page, soft-cover book can

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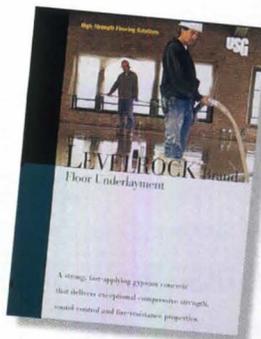


Redesigned Web site for electronic and magnetic lighting ballasts www.universalballast.com

Windows information targeted specifically for architects www.simonton.com

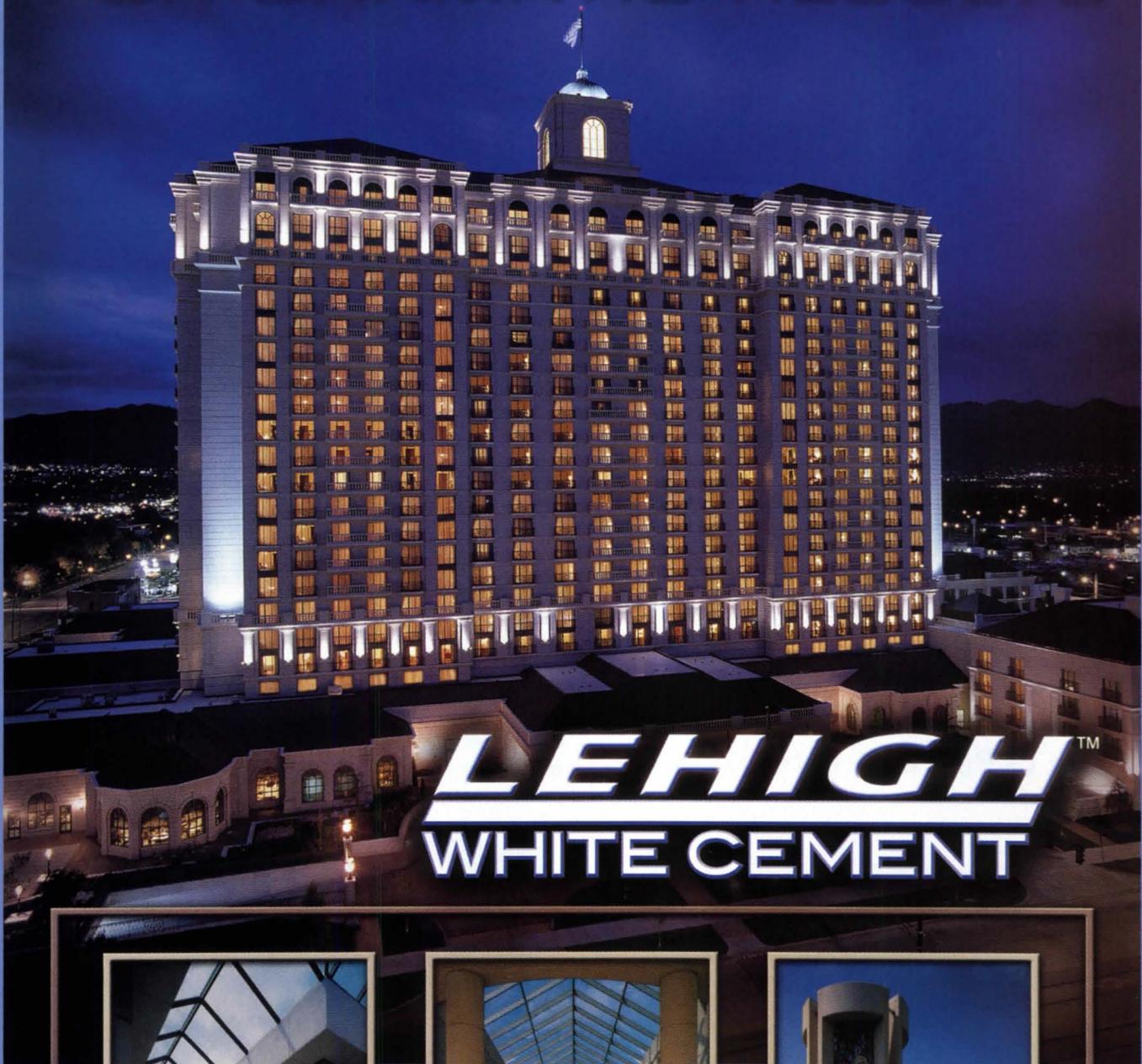
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serve equally as a coffee-table book and a design library resource. It features added photos and descriptions as well as an excerpt from "Water and Life," an essay by Simonetta Carbonaro, the Domus Academy professor/psychologist, that discusses the cultural and social aspects of the need for water. Under the subtitle of *Ideas for Living Spaces*, Dornbracht's products are classified into three themes: *Eternity*, *Imagination*, and *Transfer*. 800/774-1181. Dornbracht USA, Duluth, Ga. **CIRCLE 240**

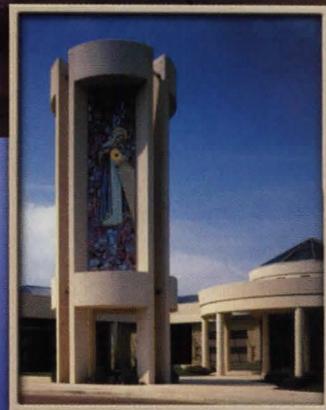
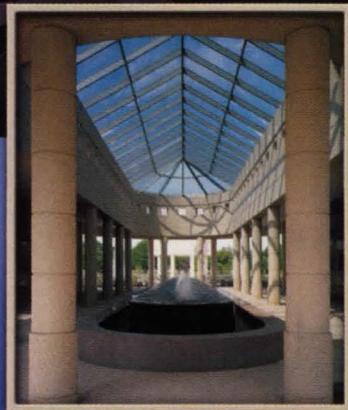
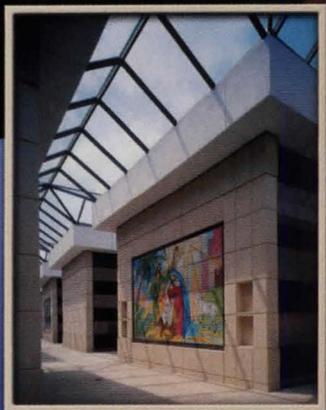


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Product Literature

Finnish fireplaces

Tulikivi, a Finnish manufacturer for soapstone fireplaces, bake ovens, and stoves, has launched a new generation of products, which are illustrated in their newest catalog. The catalog also presents ideas for using Tulikivi soapstone tiles in kitchens and baths for counters, shelving, and walls. 800/843-3473. Tulikivi U.S., New York City. **CIRCLE 241**

NCMA publications

The National Concrete Masonry Association now offers its 2002 catalog of publications, including the new *Concrete Masonry Wall Design Software CMS-10* and *Design Software for Segmental Retaining Walls*. 703/713-1900. National Concrete Masonry Association, Herndon, Va. **CIRCLE 242**

Latest lighting brochures

Lithonia Lighting has developed two new lighting brochures for specifiers. The *Rough Service Products* brochure is a 20-page, four-color resource showcasing Lithonia's entire line of lighting fixtures designed for areas where safety and security are a concern. Lithonia also offers a new brochure that illustrates the capabilities of the Synergy integrated-

lighting-control system. The Synergy brochure uses a series of vignettes to illustrate Synergy technology in action, from basic low-voltage switching and occupancy sensing to daylight harvesting, scheduling, and architectural dimming. 770/922-9000. Acuity Lighting Group, Conyers, Ga. **CIRCLE 243**

Roofing codes manual

The NRCA Building Codes Manual offers a comprehensive analysis of model building-code requirements applicable for specific roof system types in the United States. An organized list of roofing-specific reference standards required for code compliance is included. 800/323-9545. National Roofing Contractors Association, Rosemont, Ill. **CIRCLE 244**

Wood finishing CD

The Hardwood Council has just released *The Finishing Touch* CD, Version 2.0, an expanded version of the original CD. The updated CD has several new features, including a new *Lumber Grade Stain Guide* and an expanded *Finishing Tips* section that features practical advice from the American Wood Finishing Institute. 412/281-4980. The Hardwood Council, Oakmont, Pa. **CIRCLE 245**

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Program title: **"Impact-Resistant Systems: Security in a Tiffany Setting" (10/02, page 206)**

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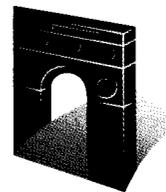
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Program title: "Understanding the UL Directory: Fire-Resistant Assemblies" (10/02, page 213)

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Program title: "Designing for Occupant Comfort" (10/02, page 219)

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187	94	W&W Glass Systems Inc <i>wglass.com</i>
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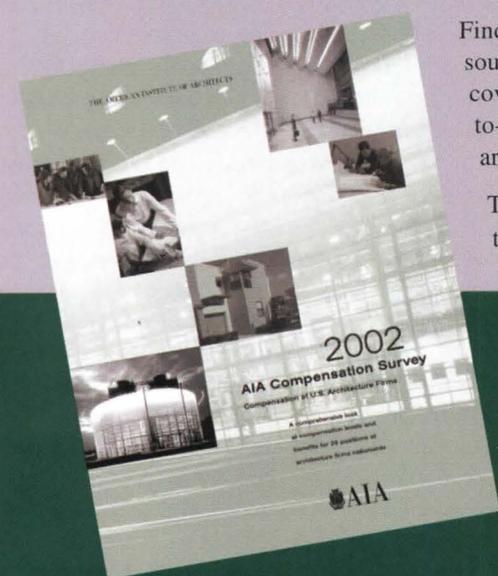
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Profile



Elizabeth Barlow Rogers: caretaker of the landscape

Interviewed by John E. Czarnecki, Assoc. AIA

Thanks to the efforts of Elizabeth Barlow Rogers, Frederick Law Olmsted's vision for New York's Central Park lives on for future generations. A resident of the city since 1964, Rogers was the first person to hold the title of Central Park Administrator, a position she assumed in 1979. The following year, she founded and served as first president of the Central Park Conservancy, created to bring citizen support to Central Park restoration and management. She stepped down from the conservancy in 1996. This fall, she developed a new curriculum as the first director of Garden History and Landscape Studies at the Bard Graduate Center for Studies in the Decorative Arts, Design, and Culture in New York City.

Q: *Tell me about the new curriculum that you have begun in your role as director of Garden History and Landscape Studies at Bard. We are breaking new ground here—it's about the future and caring about place. You cannot study landscape design without learning about literature and history and philosophy. Other schools have landscape survey courses, and we have those as well, on the English garden, Baroque garden, and others. But we also have a course just on Central Park, including its management techniques and rebuilding methodology. We have a course called "Reading the Landscape" that will be about the work of landscape architects and designers. So it's very new, and it's very exciting to be creating something from scratch.*

The Central Park Conservancy involves private funds supporting public space. It's an interesting marriage of maintenance of the public realm with fund-raising. Is there any concern that the private realm may have too much of a role in the care of what should be public space? Now there's a question that drives me crazy every time, but I'm glad you asked it! It's really based on results, and I don't think that the issue of rich people coming in and taking over Central Park has gone very far. If the city had sufficient funds to care for the park, that would be ideal, but it doesn't. The Conservancy has a track record that is admirable, and the city is very pleased that the money is being raised privately and the park looks so good.

What are your hopes for the future of the World Trade Center site? I don't think those initial designs were so great. My hope is that there will be a poetic sort of place—something very serious and beautiful. When I think of the poetics of place, I think of monuments such as the Vietnam Veteran's Memorial, places that actually move people because they've been done with great sincerity and a kind of poetry. Process and community dialogue are very important, but my hope is that somebody of great imagination and talent can do something that will not get so chewed up in the process. What is

needed is a grand vision that goes beyond commercial needs.

*Your book Landscape Design: A Cultural and Architectural History was published in 2001 (Harry N. Abrams). There have been a number of books on landscape—how does yours stand out? What I tried was to write the history of landscape from a cultural perspective—understanding the cultural dimensions of landscape is very important. There are certain broad themes that are played out in architecture, painting, music, literature, and in landscape design. None of us can inhabit the past, but we can think about the forces that made cultures do what they did, in the way they did it. **Photograph by Seth Cohen***

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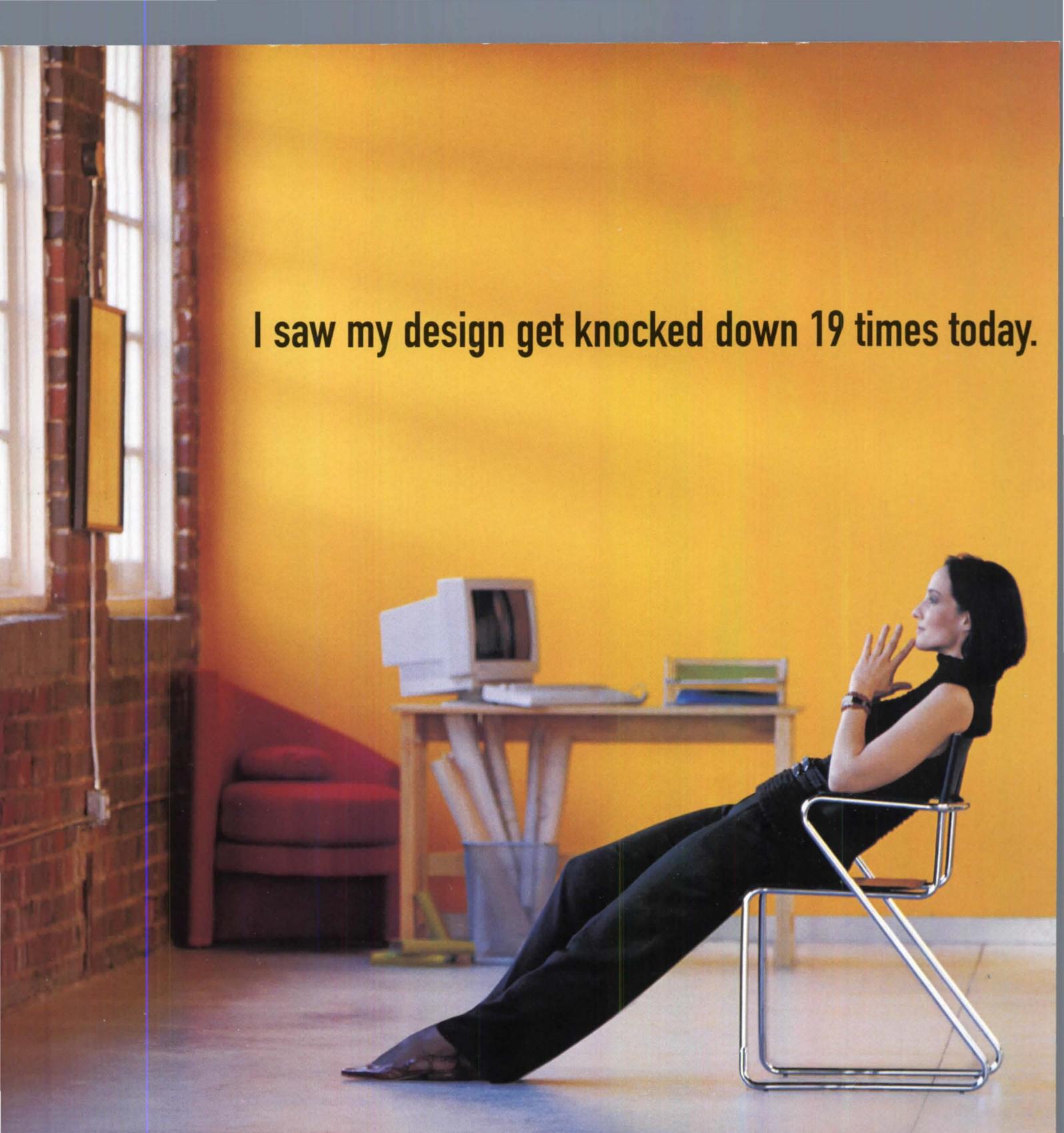
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