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EDITORIAL OFFICES: 212/904-2594 Editorial fax: 212/904-4256 E-mail: rivy@mcgraw-hill.com
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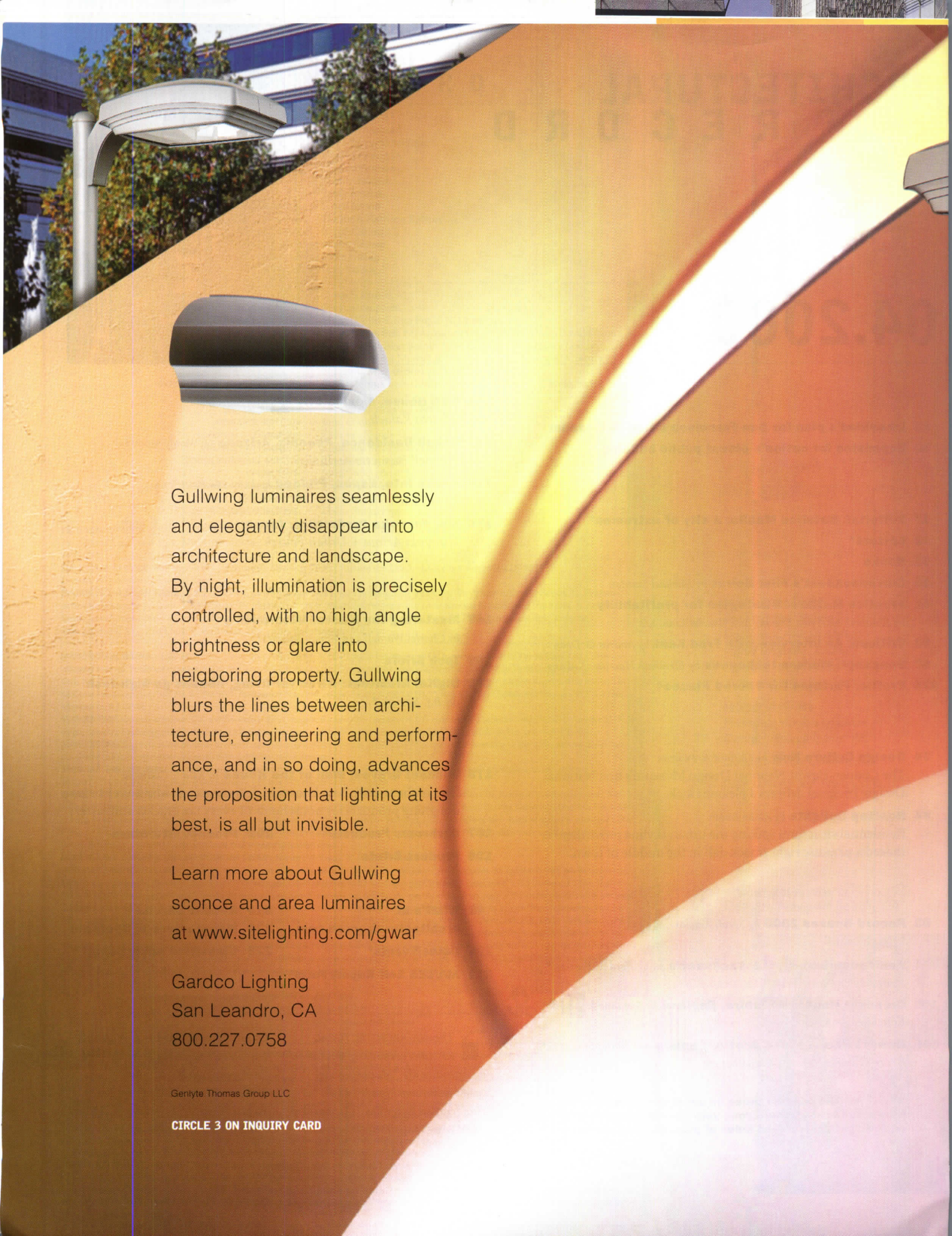
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Above: London's Tate, by Herzog & de Meuron. Photograph © Richard Bryant

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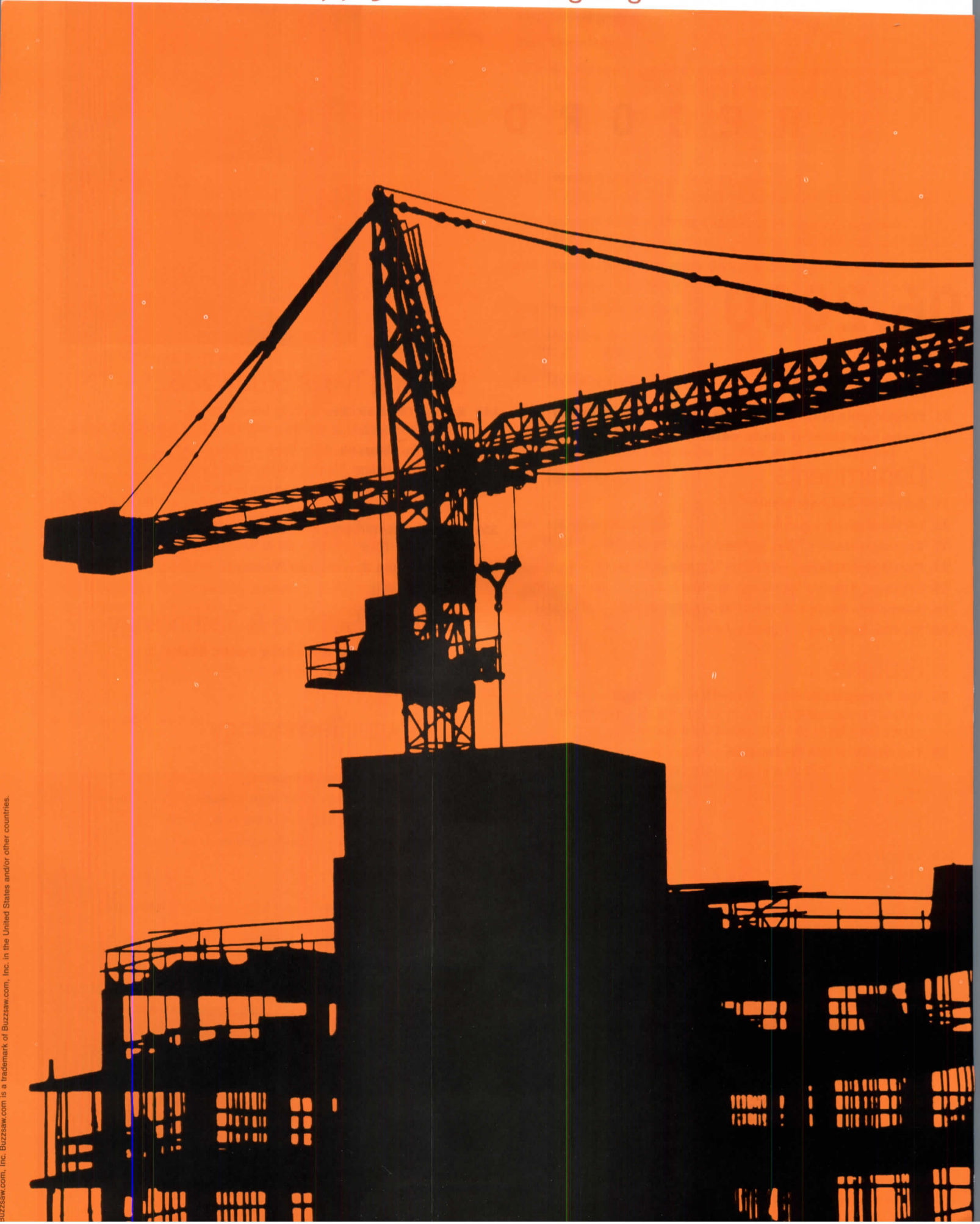


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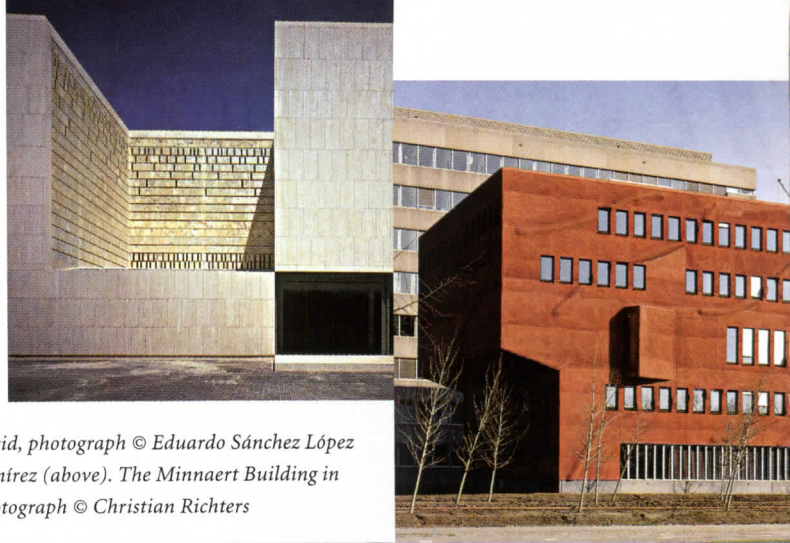
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Town Hall near Madrid, photograph © Eduardo Sánchez López + Angel Baltanós Ramírez (above). The Minnaert Building in Utrecht, Holland, photograph © Christian Richters

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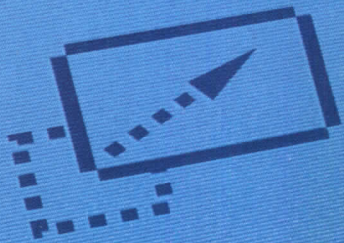
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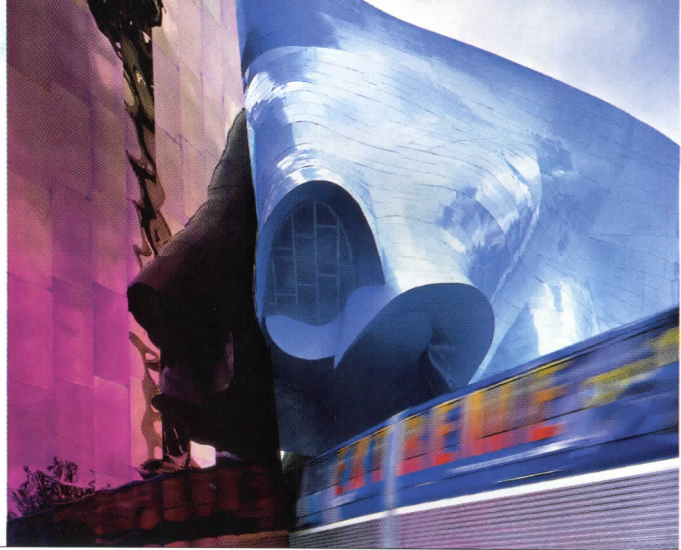
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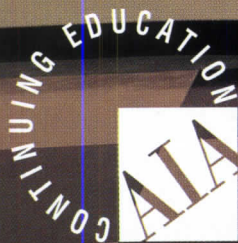
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Above: Frank Gehry's Experience Music Project. Photograph by Lara Swimmer/ESTO

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Above: Oxygen Media headquarters, New York City, designed by Fernau & Hartman Architects
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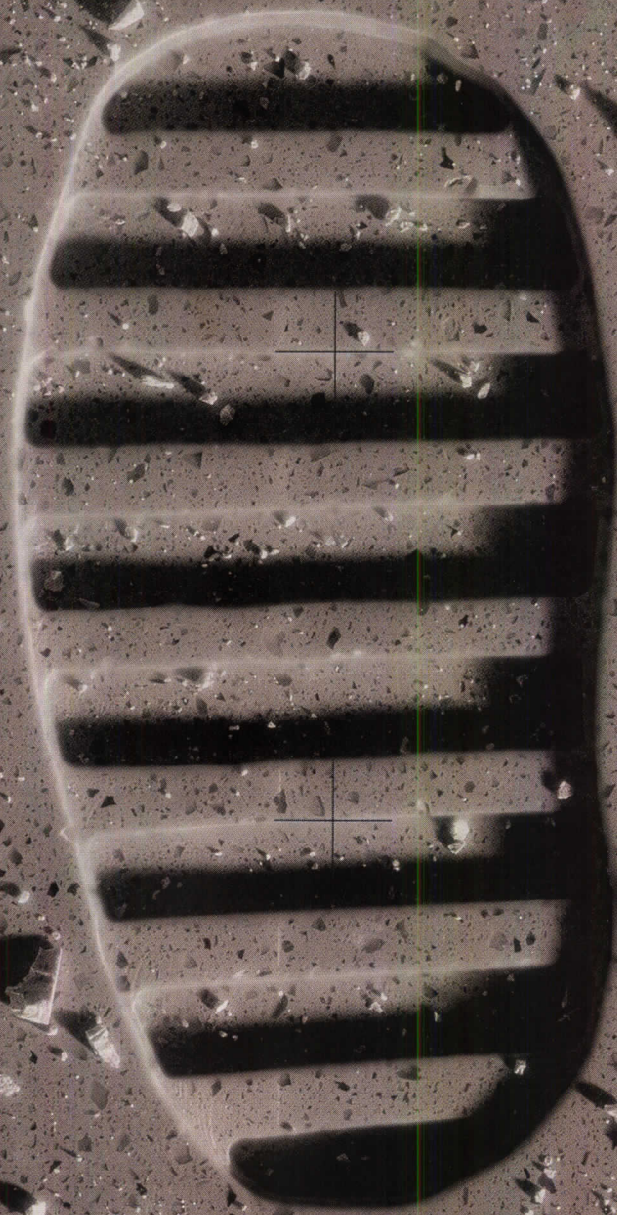


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Cover: Headquarters for Het Oosten, Amsterdam, Steven Holl Architects
Photograph by Paul Warchol
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Photograph by Paul Warchol

WWW * You can find these on our Web site at www.architecturalrecord.com, your source for more information on projects, a special Business Week/Architectural Record Awards section featuring finalists as well as winners, and more.

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Cover: Storey Hall, by Ashton Raggatt McDougall. Photograph by Tim Griffith/ESTO

Above: Italian Chancery, by Piero Sartogo. Photograph by Alan Karchmer.



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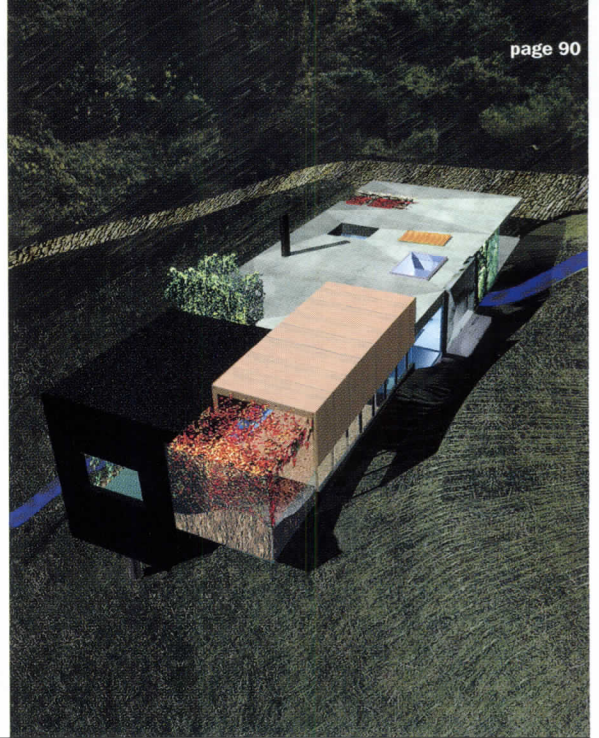
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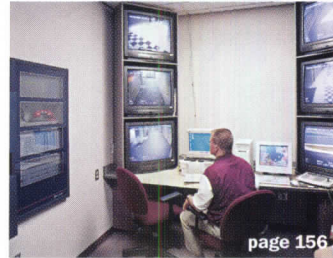
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Where do women stand?

Editorial

By Robert Ivy, FAIA

Annie Leibovitz's photographs of women, mounted large-scale at the Corcoran Gallery, stopped and shook me in a way that recent, more sensational exhibits in other media have not. Using the conventional means of the camera, Leibovitz documents women in a variety of settings and occupations—as coal miners, body-builders, and Supreme Court justices—capturing something essential, whether intelligence or strength or the power of conscious beauty, along the way. One of her subjects is Maya Lin.

Susan Sontag, who wrote an essay in the book accompanying the exhibit, *Women*, pointed out a central fact: "There have been tremendous changes in women's consciousness, transforming the inner life of everyone: the sallying forth of women from women's worlds into the world at large, the arrival of women's **ambitions**." With the number of female architects increasing, we're no longer asking, *Can they become architects? We're asking, Where are they heading? What do they want for the future?*

Today, women manage their own firms and form partnerships with male colleagues. Prominent designers and leaders, such as Billie Tsien, Merrill Elam, Julie Snow, Susan Maxman, and the reigning queen of zoom, Zaha Hadid, regularly appear in the media, while many women behind the scenes are also making architecture.

However, "Architecture has not changed as much as we would like to think," states AIA vice president Helene Dreiling, AIA. The National Architectural Accrediting Board reports that approximately 35 percent of the 21,000 students who begin professional bachelor's and master's degree programs in architecture are women and that a similar percentage complete their studies. The number of women that achieves licensure, however, appears to be significantly smaller.

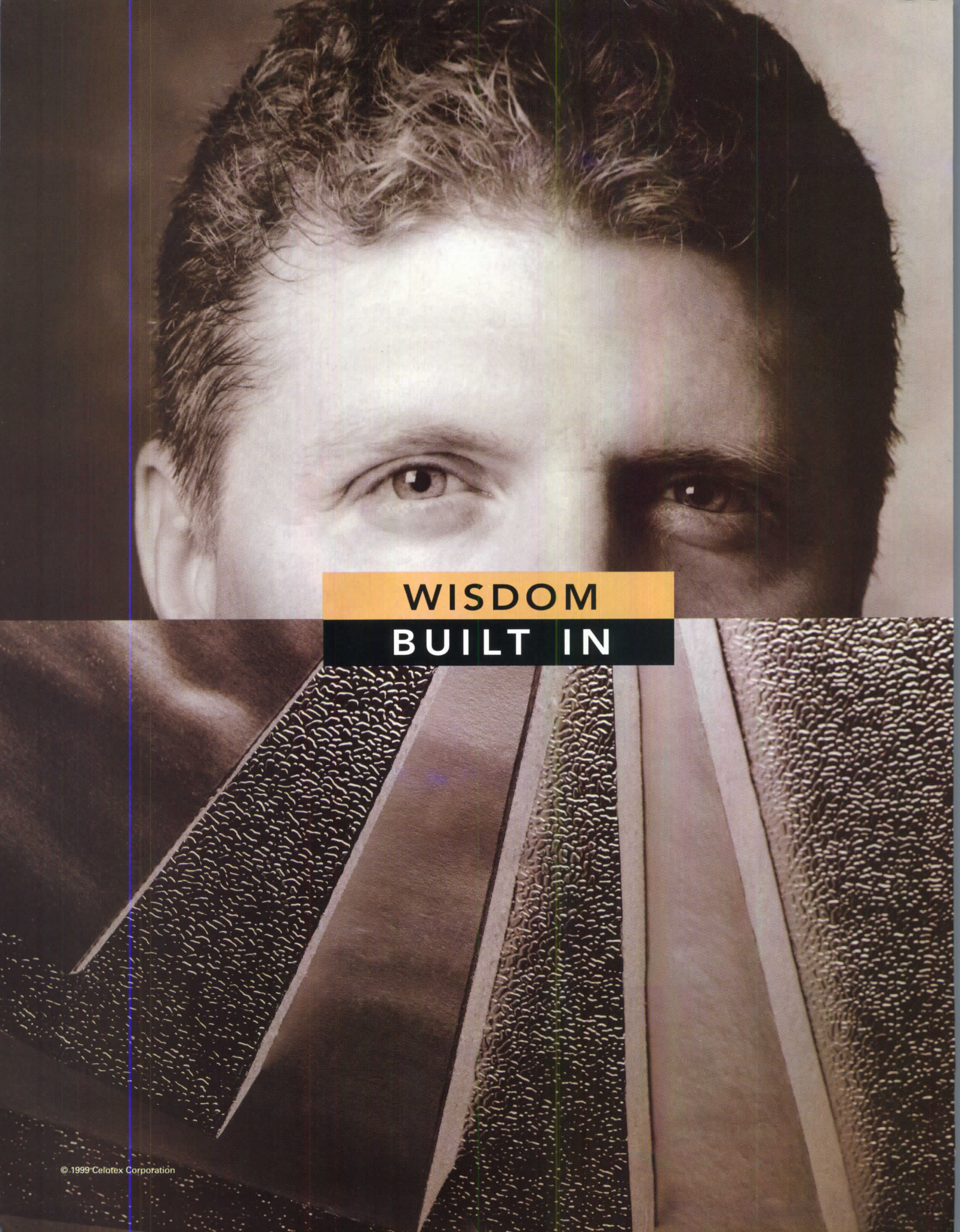
One of the few available sources for such data, the 1997 AIA Firm Survey (which is currently being updated), found that only 10 percent of licensed architects in firms were women. Including the licensed

women architects in nontraditional jobs, the proportion might swell to as much as 20 percent, but no one really knows the facts. This void in our common understanding, and the apparent gap between education and licensure, deserves our attention.

In an era focused on issues of equality, we need to assess where women stand in the year 2000. What are their needs? Is this "equality" basically lip service? Are women finding the work situations they want, or do they bump their heads against a glass ceiling at the upper echelons of management? What benefits are available to the single parent, many of whom are women? Has architecture's historically male-dominated culture adjusted its clubby work patterns to attract women, or are women choosing alternative paths—in new media or government or teaching, for example—that allow a more balanced way of life? To borrow from Sontag, *What is their ambition?*

While much has been accomplished in emancipating women's creative and intellectual powers, a long century separates Julia Morgan from Maya Lin, as portrayed by Annie Leibovitz. For our sister architects, now is the time for us to raise substantive questions about the status of women and to press for resolution. While much has improved for women in architecture, all is not yet healed.

You may notice something new in the pages of the January 2000 issue of ARCHITECTURAL RECORD. In this issue, our design snaps out with contemporary typography and coloration and the layout features a more assertive feel. New departments, including Profile, Snapshot, and Practice Matters, join the blend of regular offerings, and we present a special section devoted to residential design. Every magazine needs periodic refreshing, and we considered the turn of the century an appropriate moment. Enjoy it.



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Letters

The community connection

"Public Housing: A Hard Assessment" [November, page 76] was the most insightful and important ARCHITECTURAL RECORD article I've read in 20 years. The future impact of public housing on our nation's inner-city communities and residents is of the greatest significance, and the response by HUD and the New Urbanism movement must be fully and honestly evaluated to ultimately realize the best potential outcomes. The article and individual project summaries really get to the point.

But there is one crucial part of the successful equation missing from this article's analysis. While the author notes that "New developments that appear to be doing well [...] combine bricks and sticks with a range of social services," how that is achieved is unreported. The answer is the surrounding commu-

nity, public housing's inner-city neighborhood, and its capacity to extend both formal support services and unstructured "social capital" into the rebuilt projects.

Community-building is the hardest discipline of all to accomplish, and it will not receive the focus and resources it needs until it is at last fully valued.

—John Elberling
Executive VP, Tenants and Owners Development Corp.
San Francisco

They do it their way

Public housing here in Hong Kong doesn't suffer from the government's lack of involvement. The largest landlord in the world, Hong Kong has adopted Le Corbu's plan for the Garden City as a design standard. High-rises rife with design shortcomings have been relentlessly

planted like trees, exacerbating Hong Kong's congested living environment. All this, while New York public housing invited architects like Richard Meier to build impressive housing that fulfills the needs of humans. Enlightened governments are what will keep architects from ignoring public housing.

—John Yuan
Hong Kong, China

The client side of the street

Mr. Rybczynski's Critique [November, page 29] advocating Olmsted's nonformalist approach to landscape design was engaging, but flawed in its understanding of democratic principle. For the author, formal planning is unsuited to America because it elevates "institutions and organizations above the individual." This emphasis on the individual distorts the fact that true democracy involves balancing the rights of the individual with the collective needs of civil society. Unfortunately, such cultural narcissism has found its way into the architectural profes-

sion, where self-indulgence manifests itself in idiosyncratic designs accessible to few outside a privileged circle.

The preoccupation with self is further revealed in the arrogant attitude many architects take toward tradition. David Hill's piece on the current scene in Denver [Correspondent's File, October, page 47] is a perfect example. Mr. Hill scolds the people of Denver for their "conservative aesthetic" and "knee-jerk traditionalism," which he claims stands in the way of good architecture. The implications of this presumptuous posture—that the public has bad taste and that if they would just get out of the way of the architects they would get what's good for them—goes a long way toward explaining why our profession is in the state it is.

—Donald M. Rattner, Ferguson Shamamian & Ratner, Architects
New York City

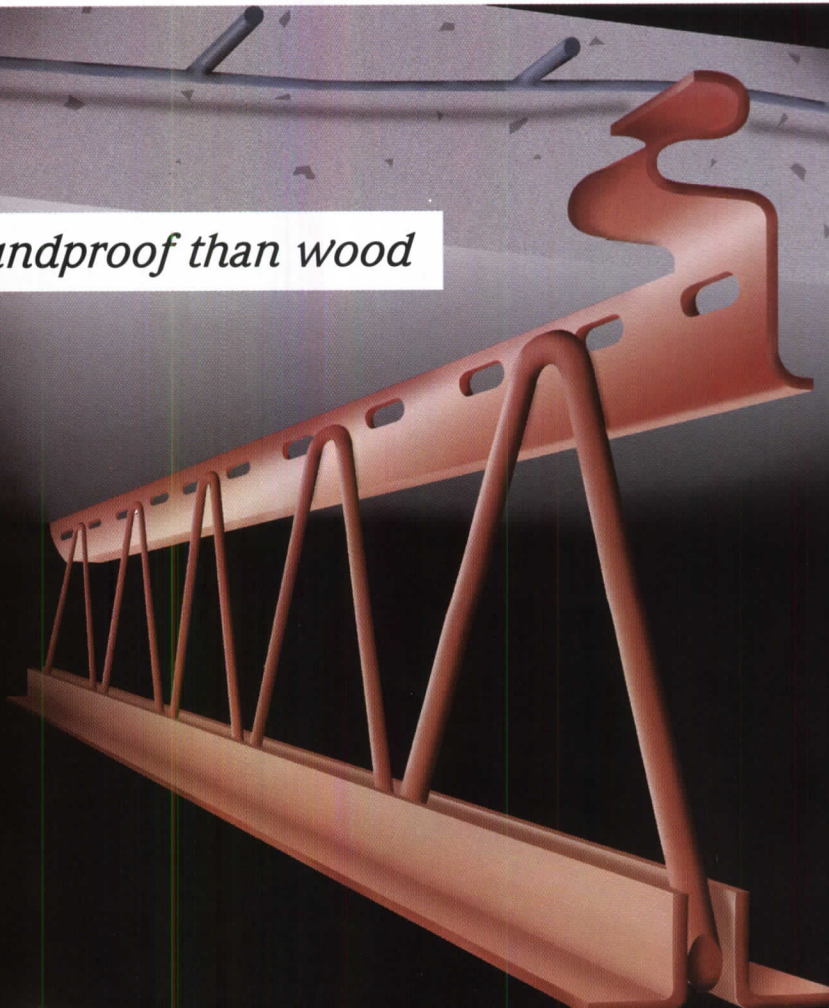
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["The Fee Dilemma Parts I and II," October, page 110 and November, page 60] were absolutely terrific. I applaud your efforts to acknowledge and emphasize this important topic. Imagine how attractive the profession would be for young people if a firm's profitability was the key to attracting graduates from the top schools.

Fortunately, some recent trophy buildings (i.e., the Bilbao Guggenheim and the Getty) have created new business climates. These buildings attract visitors and create commerce and, therefore, contribute to the local economic base. Hopefully, architects' fees will increase as a result of producing profitable design.

—Karen Thomas, AIA
New York City

School's out

As a recent architecture graduate, I feel compelled to respond to Chris Ford's comments [Letters, November, page 20] regarding the "Back to School" feature [September, page 112]. Not all critics of architectural

education are practitioners unwilling to assume the role of mentor. Some of us are fresh out of the educational environment and wondering aloud just what it was we were supposed to have learned. I agree that professional practice should be a classroom, but it is in this classroom that graduates should be able to build on a foundation of knowledge laid down at school.

If the schools are so nonessential, perhaps aspiring architects should be ushered into the professional fold directly from secondary school. At least it would lengthen our careers.

—Brian D. Beland
Architectural Intern
Lake Ronkonkoma, N.Y.

Live and Lerner

I would like to add a voice from the surrounding community to your wisely unimpressed review of Columbia University's Lerner Student Center [November, page 95].

Aesthetically speaking, the building's only redeeming characteris-

tic is its Broadway wing, rumored to have been designed under strict traditionalist orders from the Columbia Trustees. New York's Guggenheim has tempted an entire generation of architects who are not Frank Lloyd Wright to think they are fit to design context-flouting buildings.

Bernard Tschumi has delivered this monster with all kinds of intellectual bombast about "deconstruction" and the other trendy philosophical buzzwords. The attempt to substitute rationalizations for aesthetic achievements is squarely in the worst tradition of modern art, as famously pilloried in Tom Wolfe's book *The Painted Word*.

In truth, this building is unworthy to be covered in, let alone be given the cover of, a magazine of your caliber. Perhaps its mixture of pseudo intellectual bombast masking commercial banality is appropriate for contemporary Ivy League undergraduates. One would hope not.

—Ian Fletcher
Morningside Heights Residents Assoc.
New York City

Corrections

An caption in "Public Housing in 1999: A Hard Assessment" [November, page 78], incorrectly credited the design of new row-houses at the Henry Horner project. The correct architects are Johnson & Lee, Ltd., Hammond Beeby Rupert Ainge, and Brook Architecture. In December's Millennium project section [page 88], a credit for digital consultant Jose Sanchez was omitted for Kolatan/Mac Donald's Resi-rise skyscraper. In December News [page 62], a credit for HNTB, which is jointly designing the new Boston Convention Center with Rafael Viñoly Architects, was omitted from the article. A credit for construction manager Cheryl Gaston, from 3D International, was left out of the Jean Parker Elementary School project [November, page 122]. RECORD regrets the errors. ■

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The best additions embrace the present without ignoring the past

Critique

By Paul Spencer Byard, FAIA

DEPARTMENTS

For architects designing new projects involving old buildings, these are good times—but also difficult.

Additions are increasingly recognized as a building type of distinct and special interest, a thinking person's paradigm for changing distinguished existing buildings. At the same time, architects undertaking authentic work with older structures must struggle with the pervasive fear of creativity displayed by postmodern conservatism, its prejudice against change, and its preference for papering over reality with saleable fake sameness and pastiche. In addition, those architects attempting to be innovative often have to face preservation agencies—the original makers of the case for preservation as a public right—that have trouble keeping their nerve under the weight of politics.

Some of this burden may be lifting as the embarrassments of pastiche—the damage done by its pretense, the humiliating things it says about us—sink in. The loudest and most fearful opponents of change now claim to hate the hodgepodge and imitative characteristics of pastiche architecture—even as they push for it. Meanwhile, successful

Paul Spencer Byard, FAIA, is a principal in the New York City firm Platt Byard Dovell Architects and the director of the Historic Preservation Program at the Columbia University Graduate School of Architecture, Planning and Preservation. His book The Architecture of Additions was published in 1998 by W.W. Norton.

additions are continuing to create some of our most vital and instructive art.

A boon for Berlin

Take the Reichstag, Berlin's parliament. Few old buildings offer a richer opportunity to come to terms with the whole meaning of our century. It starts as a fine representative of the posturing official architecture of the century's first years. Its pomp is the relatively benign pomp of our Library of Congress, but bulked up and toughened to fit the imperial ambitions of the Kaiser, who set in motion the horrors brought us by World War I. Few buildings absorbed the pain more intensely than the Reichstag, first as the Nazis' beacon of disinformation, then as the smoldering base for the Red flag of one of its conquerors. For 50 more years, at the front line of the evolving conflict, the battered building was an emblem of a world in limbo until it could resolve the huge destructive potential of the Cold War.

Lord Norman Foster's domed addition to the Reichstag marks the startling resolution of that war—the melting away of the Soviet presence and the Berlin Wall—and what came with it, one of the century's most legitimate moments of optimism. His addition is rooted in Modernism, 20th-century architecture's great meliorative rebellion, and in the discipline by which the Modernists required us to embrace the present, to find strength and beauty in

the realities of our time, not the dead residues of bygone styles. Foster's addition wells up from the middle of the old building like optimism itself, domelike enough for comfort but mostly very strange, an immense Fresnel lens to bring in light and let the contemporary

strength and lessons to the service of contemporary government.

Reality finds a way

Just as Foster's addition emerged from the old Reichstag, Renzo Piano's beautiful Debis building emerged from nearby Potsdamer



Lord Norman Foster's domed addition to the Reichstag, the German parliament, makes a vivid new partner for a storied building.

German public literally oversee what goes on in its government.

With Foster's surehandedness in balancing old and new, the addition is just strong enough and novel enough to make a vivid partner for the old building and help it get back to work. Brought along by the addition, the old building is free to be what it is at its age, a scarred representative of old ideas about public architecture, contributing its

Platz—now being rebuilt after being demolished in the war—despite the weight of local politics favoring pastiche and rigid historicism. However valid some of its ideas about urban scale and shape might have been, the concept of Berlin of Hans Stimmann, building director after the Wall fell, was to make the city look as if it were old again, as if we could reduce the impact of what had

Critique

intervened by pretending it all hadn't really happened. But like Foster's addition and Piano's new tower, the reality of our times—abetted by the best architectural imaginations—welled up in Berlin notwithstanding.

A Penn for today

A similar breakthrough may be appearing in the proposal for a new Penn Station in New York City, though the problem involved is more mundanely difficult. The hope of the project is to make a successor to New York's lost masterwork in what is now the Farley Post Office—a minor McKim, Mead & White monument that sits above the railroad platforms across the street from the site of the original Penn Station (and its dismal replacement). We like the post office for the good building it is, and it tempts us with the apparent chance its reuse offers to atone for our sins.

The first problem for the proposal, which was created by David Childs, FAIA, of Skidmore, Owings &

rent proposal is that it addresses the problems with the site and existing structures head on, with all the architectural strength it can muster. As with Foster's addition, the design here needs to establish the scale of the enterprise to which the new and the old will hereafter contribute, the larger frame of reference in which the post office can be brought to contribute to what the proposal stakes out as the larger social good. At the same time, the architecture needs to explain the westward schlep travelers will face to get past the post office to the far end of the old train platforms, induce them to make the trip, and reward them once they get there.

The proposal takes on the job with a great glass fragment of a sphere, extending above the roofline in the middle of the building, that implies a form larger than either the post office or the new station and refers, by its focus, down to the platforms and toward the old station site. By backing up the regular, symmetrical post office facade with a contemporary enclosure just as orderly, the fragment drives the whole, by its implication of absence, back toward the lamented lost station.

ADDITIONS ARE COLLABORATIONS ACROSS TIME THAT EMBRACE CHANGE AND PUT THE OLD AND THE NEW IN SERVICE TOGETHER.

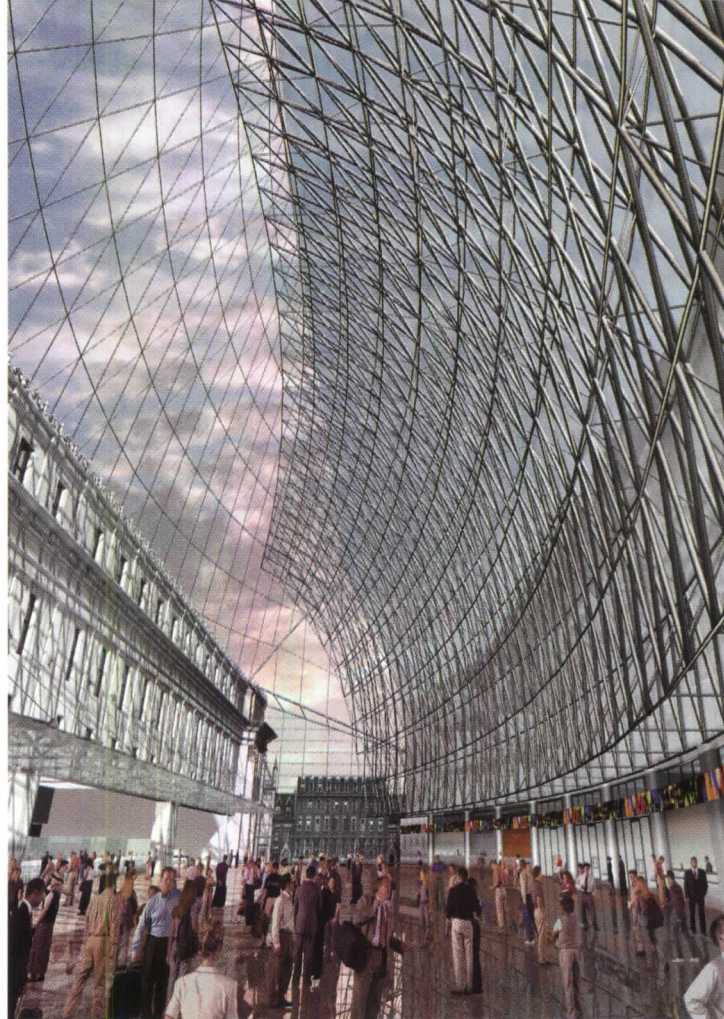
Merrill, is that the post office isn't a railroad station and doesn't really want to be one, given the physical obstacles to entry and circulation built in to sanctify the safety and security of the post—and the fact that the building's best spaces will be kept in use by the post office.

The deeper problem is that when we gave away the old station to developers (who then demolished it), we lost control of the best site on the West Side of Manhattan for a station, locked as it is between a number of subways and avenues that tap directly into the city's arteries.

The great thing about the cur-

Opposition to the proposal relied on elevating the essential fabric of the post office to sanctity. It was asserted that the removal of two panels of stone veneer would harm the old building in an unacceptable way. The appeal to sanctity had all the problems of faith, in that it was basically inexplicable and, hence, unarguable. As important, it betrayed its own misunderstanding of architecture as an art of particular pictures and, therefore, something hard to change and prone to pastiche.

Architecture, of course, is something much more robust and important, an art of buildings with logic that succeed only as they



SOM's proposal to turn Manhattan's main post office into a new Penn Station centers on a ticketing lobby topped by a soaring glass extension.

integrate what they do and what they say about their functions, their makers, and their times in ways that make sense.

The architecture of additions is a pendant art that deals directly with what happens next, the inescapable passage of time and the equally inescapable evolution of logic. Additions are collaborations across time that embrace change and put the old and the new in service together in the logic of new times, illuminating the present in the way the old and new especially can when they serve together.

Designs for realists

Therein lies a large part of the pleasures of the Reichstag and, possibly, the new Penn Station. There is a wonderful depth and realism about the Reichstag that only such a combination of old and new could have, with its dis-

play of understandings about government, Germany, our century—our burdens and our possibilities—brought together and rebalanced as a basis for a nation's new start.

Its hearty, hopeful view of architecture and what it contributes is a tonic for the struggle to design new parts for old buildings in accordance with the realities of time, change, and difference—and without hiding these realities, but instead facing them head-on. This lesson about the design of additions is finding a home, as is made plain by the new Penn Station proposal, where a vigorous view of contemporary architecture and a good existing building may together be generating a solution of stature and usefulness to a hard problem, bringing new excitement—and even a measure of redemption—to New York City. ■

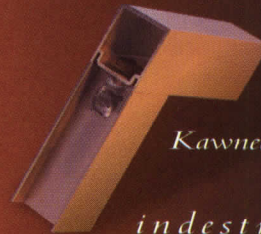
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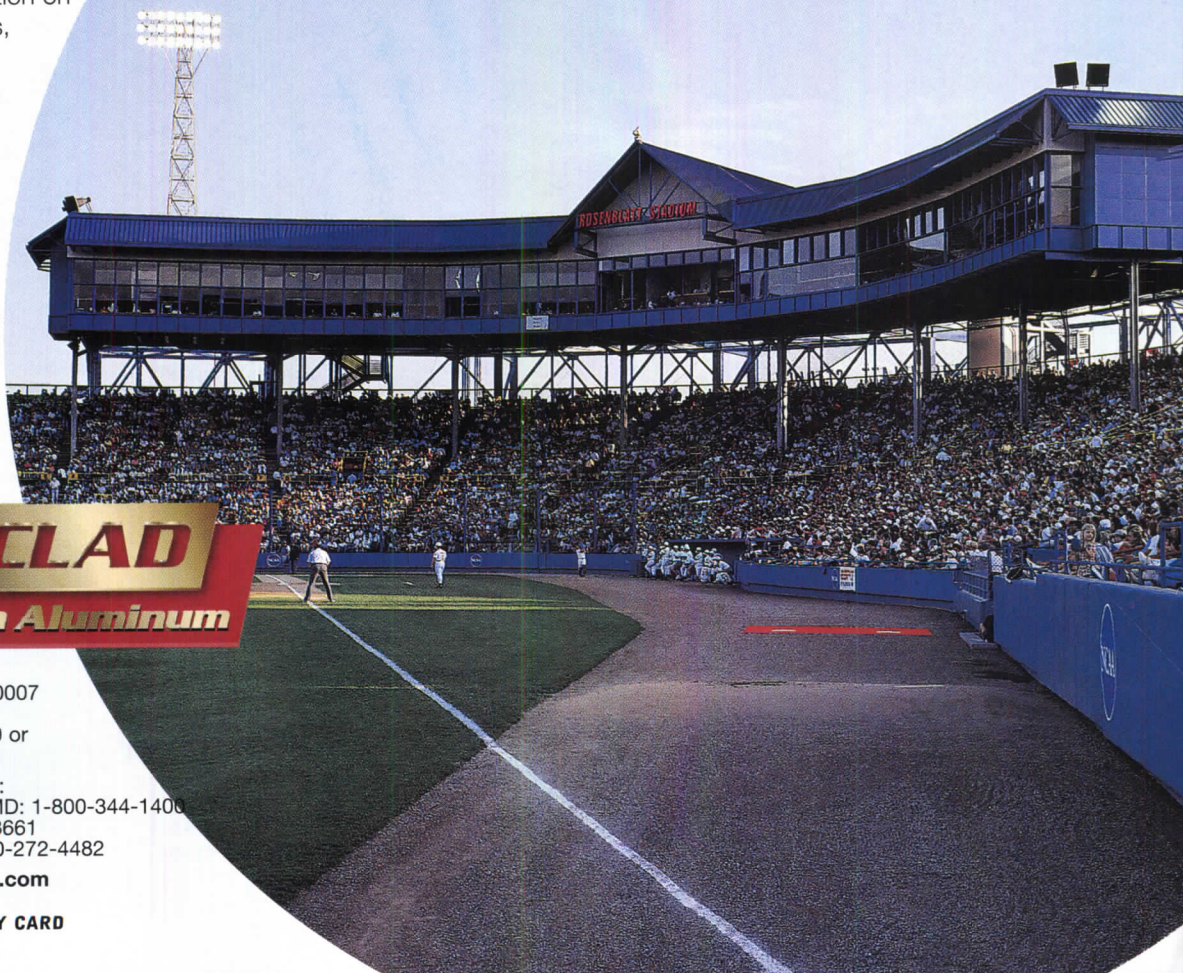
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Smart contracts give clients several ways to pay

Practice Matters

By Elizabeth Harrison Kubany

DEPARTMENTS

A little creativity can go a long way in crafting a contract. Most architects use more than one compensation method, depending on the project, to improve profitability and manage risks, such as a fixed fee for one commission and a percentage of construction cost for another. But potential risks and rewards can vary, not just from project to project, but from phase to phase within a single project. "So, architects can apply this same principle of contract negotiation to individual agreements," suggests Michael Strogoff, AIA, a Mill Valley, Calif.-based negotiations consultant.

While architects currently have at least 11 ways to determine compensation (see sidebar) at their disposal, most practitioners opt for some variation of three tried-and-true methods. The 1997 AIA Firm Survey Report found that, during 1996, most firms' contracts used some variation of either fixed-fee, hourly rate, or percentage-of-construction-cost methods.

Differing perspectives

Architects and clients often have different sets of criteria for evaluating contracts. Lump sum agreements,

for instance, are simple from an accounting standpoint (for both the owner and the architect) but can be risky for the architect if the scope of work is not well defined at the outset of a project, as is frequently the case. Some architects prefer the percentage-of-construction-cost method because the fee usually reflects the final scope of work; others, however, are leery of tying their profit to a volatile bid market.

Owners sometimes feel that it can be difficult, with the percentage-of-construction-cost method, to trust the architect's motivation for making certain decisions, such as specifying more expensive materials. Hourly fees allow for flexibility but are viewed by some clients as being too open-ended and prone to abuse. Another common complaint about hourly fees is that they don't let architects benefit from their expertise and efficiencies because the architect is not rewarded if the job is completed unusually quickly.

"Mixing compensation types can resolve these differences," says Strogoff. For phases where the scope of work is unknown or unclear—such as fund-raising presentations or the early phases of

design with a new client—architects can ask for an hourly rate with a stipulated maximum. For tasks that are more easily quantifiable, the client and architect can choose a lump sum, percentage of construction cost, or unit cost. "Converting compensation methods at a predetermined milestone can align objectives and mitigate risk for both parties," says Strogoff.

Protecting the bottom line

William S. Harris, AIA, of Signer Harris Architects in Boston gives an example: "We were once asked to do a portion of a project in a wetland. We thought we might have to jump through hoops to get the necessary approvals but weren't exactly sure what the process would involve. So we used an hourly rate with a predetermined maximum for this part of the project. If we hadn't done this, we would have lost money."

Strogoff, who was recently involved in a negotiation for a series of large school projects in northern California, cites another example. In this case, he says, "mixing compensation methods provided the client with tremendous flexibility while eliminating much of the A/E team's risk."

A sample contract

The contract was structured as follows: The programming phase, where the scope was easily defined, was based on a fixed fee with lump sum adjustments for additional presentations to the school's oversight committee. Here, the A/E team benefited from its efficiencies while the

school district was able to budget specific funds for a known scope. More open-ended predesign services, such as investigating existing conditions, were paid on an hourly basis. Design services were primarily based on a percentage of construction cost. To reduce the risk associated with a volatile bidding market for both the client and the architect, however, the percentage of construction cost was transformed to a lump sum at the end of the design development phase based on the adjusted construction budget. This predetermined fee let the client and the architect work closely during the construction documents phase to look for ways to reduce construction costs without diminishing the architect's fee. The construction administration phase, during which architects often lose money because of differences in contractors' methods and skills, was assessed based on a lump sum per site visit and on an hourly basis for other CA services.

This example may seem dauntingly complex, but according to Strogoff, it took only the time needed to go through the different tasks with the client and discuss the issues.

Choosing the correct combination of compensation methods can maximize the architect's profit and lower costs while balancing risk for both parties. It is often left to the architect to explain to the client how mixing methods can benefit the client, but the result is worth the effort. As Strogoff says, "Architects lose valuable opportunities when they base project fees on only one compensation method." ■

AN ARRAY OF CHOICES

The 11 compensation methods that architects can use today follow: predetermined measures such as lump sum, percentage of construction costs, and unit costs; time- and cost-based methods such as hourly or daily, multiple of costs, multiple of costs plus profit, multiple of subconsultants' billings, and retainer; and incentive-based methods such as royalty, equity position, and incentive bonuses and/or penalties.

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Snapshot



By Soren Larson

Seen out of its context, it might appear to be the deck of a spaceship, a giant blue-and-white alien egg, or a looming electronic eye. But this futuristic, oblong object is no creature from a science-fiction story. The reality is far more mundane: up to 250 journalists gather inside it regularly to report on the latest matches at the cricket field in London.

Still, its utilitarian function doesn't take away from the startling impact of the NatWest Media Centre, designed by Future Systems, the architectural practice run by Czech-born Jan Kaplicky and his partner, Amanda Levete. The structure, basically a press box, perches dramatically above the field, housing journalists and giving them the best sightlines possible.

The media center is Future Systems' first public commission and its most substantial completed building to date (most of the firm's executed designs have been for shops or houses, including a house built into the side

Aliens make landing atop cricket field stands

Snapshot

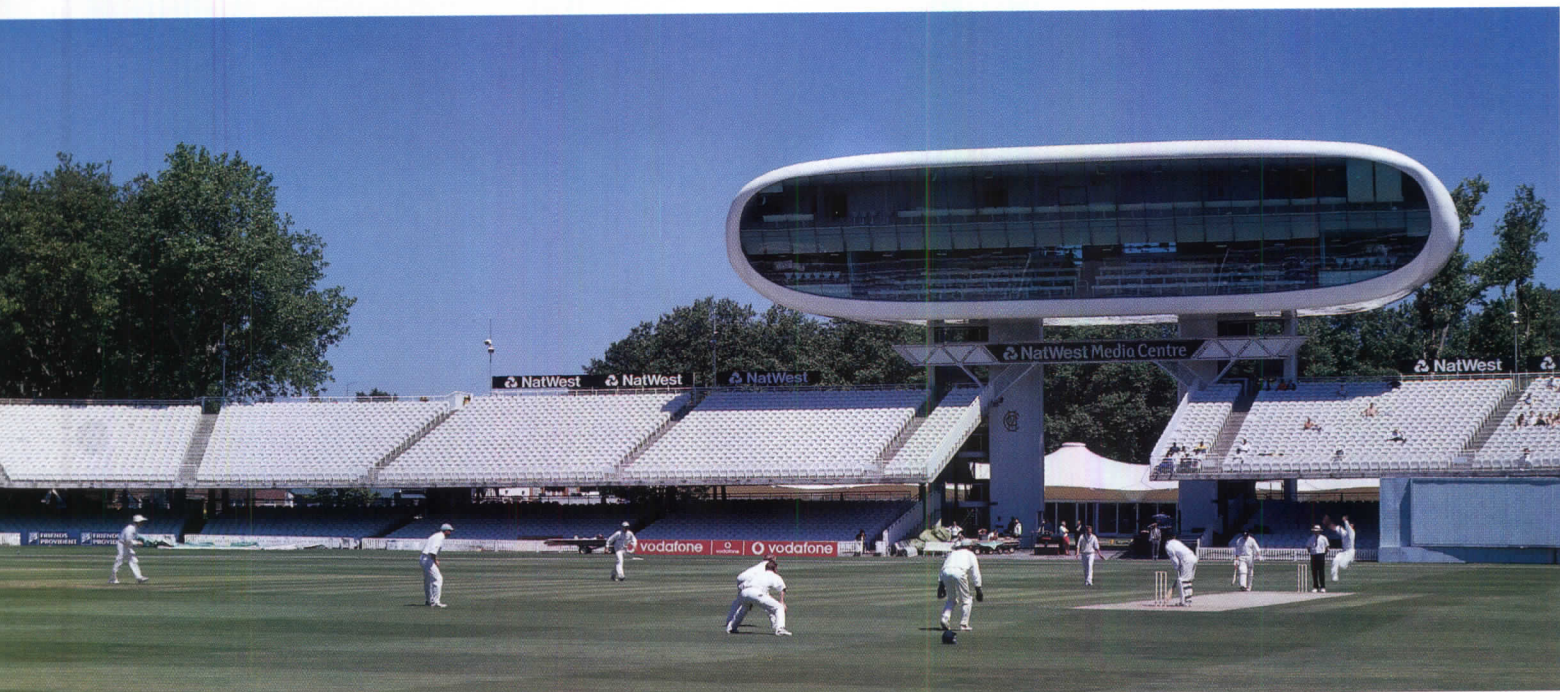
of the hill and covered with grass in Wales). The new building has already earned accolades, receiving, in November, the Stirling Prize, Britain's most prestigious architectural honor.

The media center is a semimonocoque design—its seamless, white-painted aluminum outer skin is an integral part of the structure and absorbs much of the stress on the building. The design technique lets the building be physically light and the free-flowing internal space column-free. The technology is also daring enough that most local construction companies declined to take the contract. The building was eventually made in sections in boatyards in Holland and Cornwall, as overseen by the architects and the engineers, Ove Arup, and then transported to the site at Lord's.

The prefabrication was supposed to speed up the building process, but instead caused delays when a spate of bad weather made welding the sections together difficult. The complex construction and the extended installation period almost doubled the cost, from around \$5 million to more than \$9 million. Despite the initial difficulties, the journalists who use the media center have given it favorable reports. And the structure's presence at the top of the stands adds an enigmatic counterpoint to the methodical motions of the cricket players who roam the field below. ■

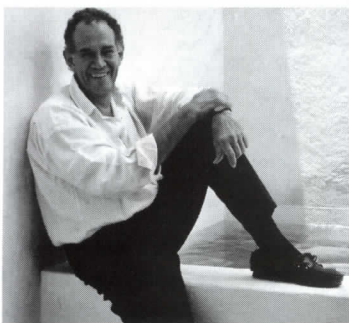


The media center had to be prefabricated in shipyards and cost over \$9 million to construct and install.



Record News

LEGORRETA TAKES AIA GOLD MEDAL TO MEXICO; GENSLER IS NAMED FIRM OF THE YEAR



The AIA said Legorreta's architecture "is attuned to the land and climate and respectful of Latin American traditions for privacy and simplicity. He has interpreted and magnified this style to earn it universal appeal. His mastery . . . has led to buildings that demonstrate an uncanny understanding of color and light." Legorreta says winning the award "is beyond my dreams. It's very important for me and also for Mexico to have that recognition."

Born in 1931 in Mexico City, he formed Legorreta Arquitectos in 1959. Early important buildings included the Camino Real Hotel in Cancun and Mexican offices for IBM. His first important commission outside of Mexico was a house for actor Ricardo Montalban. Current commissions include the Mexican Museum in San Francisco, a Hispanic center in Dallas, and the Bank of Finance in Managua, Nicaragua. Legorreta recently completed the Tech Museum of Innovation in San Jose, Calif. (top), and is excited about a hotel he is designing in Bilbao, Spain, near the Guggenheim Museum designed by Frank Gehry, FAIA, last year's Gold Medal winner. "I've tried to create an architecture that is truly human—I always think of the peo-



SAFETY AND OPENNESS: AN ONGOING BATTLE FOR BALANCE

The growing portfolio of new federal courthouses, embassies, and office buildings—designed in the post-Oklahoma City bombing era—represents the next generation of security in public architecture. But will Americans—and the design community—accept concrete bollards and metal detectors as permanent federal fixtures? That was the topic of "Building Security & Openness," a late-November symposium sponsored by the Department of State, the General Services Administration (GSA), and the AIA. Over 500 architects and high-ranking federal officials came to the Ronald Reagan International Trade Center in Washington, D.C., for the event.

"The rise of terrorism is not new but must not consume us," said keynote speaker Sen. Daniel Patrick Moynihan (D-N.Y.). "We are the arbiters of what is happening in the world." At the 1999 GSA Design Awards, Moynihan called for both security and openness in federal buildings, prompting a national conversation to explore practical design solutions for enhanced access to public buildings.

Bonnie Cohen, undersecretary of state, and Robert Peck, commissioner of public building service at the GSA, comoderated the program. "Federal buildings promote the U.S. contribution to the world and project American values and our best hopes, not our best fears," said Cohen.

Although acts of terrorism have decreased in the 1990s, the number of people killed or hurt has increased, said Jim Rice, representing the FBI's Domestic Terrorist Program. "It's difficult to protect against a lone individual," Rice noted. But Gavin de Becker, author of *The Gift of Fear*, warned against being governed by fear and suggested turning off the evening news. Architects should consider what buildings say about our times and how to achieve a balance between enhanced security and protecting buildings whose loss would be critical to society: "Timothy McVeigh should not be the designer of federal buildings for the 21st century."

Peck called for better intelligence and coordination among federal agencies, improved training for contract guards, and performance specifications in security guidelines. He also said discussion is needed on plaza design, vehicular access, and parking policies. AIA President Michael Stanton, FAIA, noted that, in addition to security criteria, federal buildings must reinforce communities and existing neighborhoods and should be energy efficient. Above all, Stanton emphasized, federal buildings should be open and inviting, symbolizing the interaction between citizens and their government and reflecting our democratic values. *Barbara A. Nadel, AIA*

ple that will be using it," Legorreta says. "The use of color and light is for that objective."

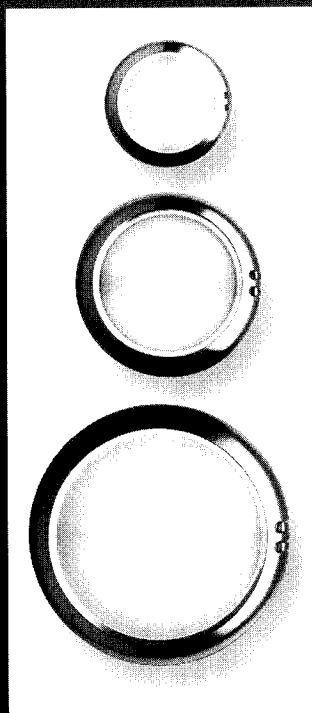
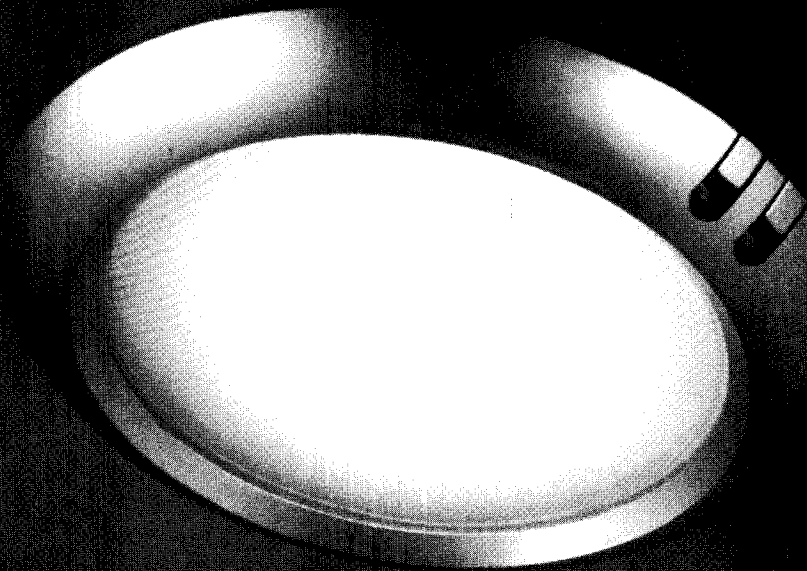
Gensler, founded by Art Gensler, FAIA, has grown from a three-person office in 1965 into the world's largest architecture firm: 16 offices, 1,700 employees, and 1,200 active clients. The firm pioneered in

integration of the design of buildings and their interiors (bottom left, Armstrong World Industries in Lancaster, Pa.).

The honorees will receive their awards at the 2000 Accent on Architecture ceremony on January 28 in Washington, D.C. *Soren Larson*

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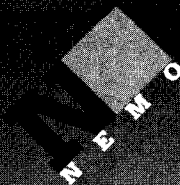
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NEMO: ENJOY THE LIGHT

Record News

PORTZAMPARC'S TOWER ADDS SPARKLE TO NYC

At long last, the LVMH Tower in Manhattan, the subject of much debate and speculation as it halt-ingly rose on 57th Street, is up and running. Bernard Arnault, chairman of the French champagne and luxury goods conglomerate, hosted a star-studded bash in December to show off the striking new headquarters, designed by French architect and 1994 Pritzker Prize winner Christian de Portzamparc, with the Hillier Group.

The building didn't arrive unscathed. Zoning rules made the design process arduous, and cost overruns and litigation caused delays. Now, however, the midtown skyline has an unusual addition.

The 24-story structure, which features a combination of curtain walls with four different types of glass, creates a prism effect with angled mirror panels that either reflect light or create shadowy facets. Topping it off is the "magic room" (below left), used for special events. S. L.



THE EDEN ROC, AN ICON OF MIAMI BEACH GLAMOUR, GOES BACK IN TIME WITH A FULL RENOVATION

When he was hired to design the Eden Roc Hotel in the mid-1950s, architect Morris Lapidus was asked by the owner to create something that looked Italian Renaissance. Lapidus complied in his own unique fashion, creating a hotel more Florida than Florence.

In the ensuing four decades, the Eden Roc Hotel became an icon of the Miami Beach of the postwar era. Lucy and Ricky and Fred and Ethel checked in (actually on a soundstage version) during a vacation episode. The hotel became a favorite haunt of the Rat Pack. Along with its next door neighbor, the Fontainebleau (also designed by Lapidus as an ode to the French Baroque), the Eden Roc epitomized Miami Beach's celebrity and lavish excess.

The years were not kind to the Eden Roc, though; each successive owner obscured more of the hotel's signature elements, and Lapidus' embellishments disappeared. Now, the Eden Roc has returned to the look of its glory days. A \$24 million renovation has brought, both literally and figuratively, Lapidus back into the lobby as a consultant to Spillis Candela DMJM, the project's renovation architects. Lapidus' memory proved invaluable, because the original drawings and plans had long since vanished. Spillis partner Julio Grabiell, AIA, says the architects ended up looking at hours of old television footage and family movies



to capture the original design, because "the Eden Roc was the place to go for Miami and Miami Beach for weddings, bar mitzvahs, baptisms."

Primarily, says Grabiell, the process was one of stripping away. The architects revealed the original mezzanine and removed a concrete baluster on Lapidus' famed floating staircase, allowing once again for grand entrances into the vast lobby. Fluted rosewood columns that dominate the lobby were stripped of layers of white paint; ornately patterned terrazzo floors were uncovered. Additions were made "to respect and recall what was there or what the intent had been," says Grabiell. In the 1950s, local laws prohibited lobby bars in plain view, so the bar was tucked away on the mezzanine; now it is where the architect originally wanted it. The verdict from Lapidus: he likes the hotel as much as ever.

Beth Dunlop

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GSA SUFFERS, PRISONS AND EMBASSIES GAIN

Congress was tough on most federal building programs when it approved fiscal 2000 spending bills late last year. Many agency budgets, including the General Services Administration's (GSA) and the Department of Veterans Affairs' (VA), were cut from fiscal 1999 levels. Only the federal Bureau of Prisons and military construction accounts won increases. Even with the cutbacks, hundreds of millions of dollars will go into buildings, but for the coming year, it looks like funds for design will be limited.

The GSA took the biggest hit, seeing its new construction account slashed 85 percent to \$75 million and its repairs-and-alterations program pared 10 percent to \$599 million. The construction account includes design funds for a new Food and Drug Administration complex in Silver Spring, Md. But the GSA has no money for new court-houses, despite a federal judge's request to include \$579 million for 17 projects.

The VA's major construction

account was chopped 54 percent to \$65 million. Robert Neary, the VA's associate facilities management officer, says the account includes \$2 million for the department's design fund, which will be used for projects that the VA hopes will win construction funding in the 2001 budget.

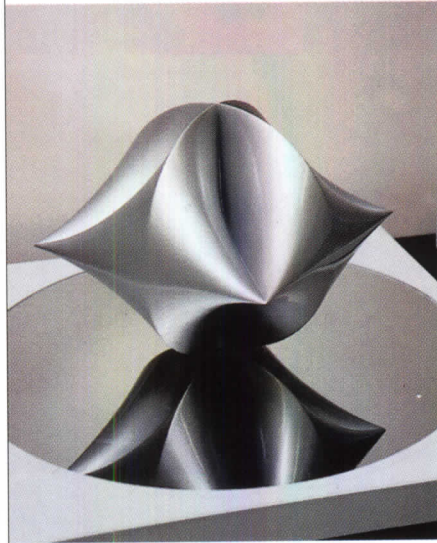
Safety first

Jim Dinegar, the AIA's chief operating officer, says construction funds "generally go to security." That includes the State Department, which will receive \$742 million in 2000 for security and maintenance of overseas posts. The figure is down from last year's \$1 billion, but the 1999 total included \$627 million in emergency supplemental spending, approved in the wake of terrorist bombings in Africa. The embassy funds will largely go to constructing projects already in design; the only new project will be an embassy in Abu Dhabi.

Meanwhile, the Bureau of Prisons will get \$557 million, up 36 percent from last year. Scott Higgins, the agency's chief of design and construction, says three prison projects—in West Virginia, South Carolina, and California—are out for design-build procurement, and planning funds are in place for three others.

Tom Ichniowski

CALATRAVA WINS TIMES CAPSULE COMPETITION WITH A STEEL DESIGN BASED ON FOLDED SPHERES



looks somewhat like a piece of origami, can be opened in segments that contain a total of 50 cubic feet of storage. The five-foot-high capsule is made of stainless steel, weighs 2 tons, and cost \$60,000 to make.

Another proposal by the Ocean Group (designers from Finland, Norway, and Germany who practice in cyberspace) was to place capsules on the Antarctic ice shelf, where they would eventually be released into the oceans

because of global warming. Architect Maya Lin suggested burying the capsule among trees planted to represent mathematical forms found in classical architecture and nature.

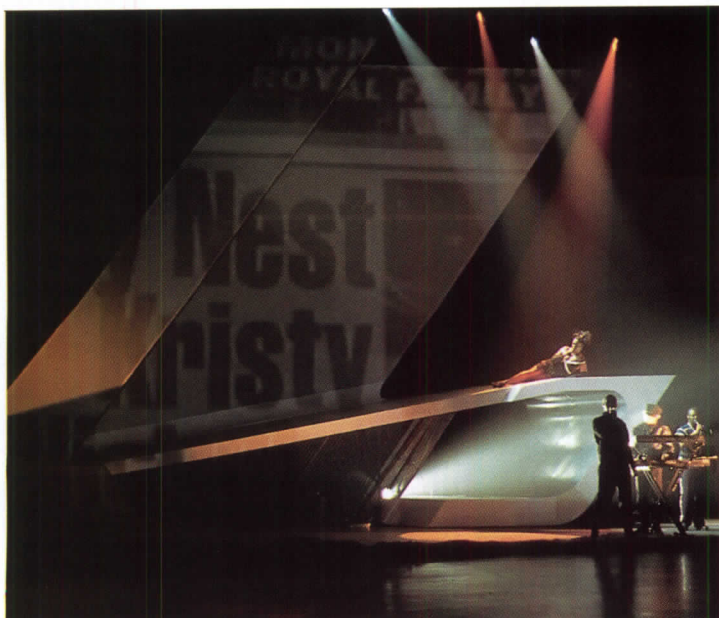
Calatrava's capsule will contain objects selected by residents of the U.S., India, France, Zimbabwe, and Brazil. The winning design and the other competitors' ideas will be displayed at the American Museum of Natural History in New York City through March 26. At the close of the exhibition, the capsule will be sealed for permanent display at the museum. S. L.

Among the many December events to commemorate the turn of the millennium, the *New York Times* might have topped the list with regard to high-design concepts. After a lengthy competition process, the newspaper chose Spanish architect Santiago Calatrava's design (above) to hold the New York Times Capsule, a collection of contemporary objects and artifacts slated to be opened in 3000.

Calatrava's design is based on a series of his sculptures that explore the formal properties of folded spheres. The module, which

because of global warming. Architect Maya Lin suggested burying the capsule among trees planted to represent mathematical forms found in classical architecture and nature.

Calatrava's capsule will contain objects selected by residents of the U.S., India, France, Zimbabwe, and Brazil. The winning design and the other competitors' ideas will be displayed at the American Museum of Natural History in New York City through March 26. At the close of the exhibition, the capsule will be sealed for permanent display at the museum. S. L.



ZAHA ROCKS Move over Robert Wilson and Philip Glass. London architect Zaha Hadid's set for the current tour of British group the Pet Shop Boys shows that architecture can work on a pop level as powerfully as it does with avant-garde opera. From the razzle-dazzle opening of Neil Tennant and Chris Lowe's "Night Life" concert—with its flashing lights, video projections, and thumping house music (English art-house, you might say)—Hadid's set is integral to the action. Electronica thrives on such "architectonica."

The set is a zig-zagged, continuous plane with a three-dimensional base and ramp structure and a two-dimensional screen jutting at an angle into the air. Looking like a fragment of one of Hadid's building designs, the evanescent, geometrical landscape becomes a spatially dynamic platform, particularly when the backup band's Sylvia Mason-James descends it like a latter-day Valkyrie. A portion of the painted base rolls away in the second half of the concert, revealing a metal mesh enclosure for the lighting and fog machine. The construction is "run of the mill," reports project architect Oliver Domeisen: an aluminum frame with plywood cladding is covered with white rubbery flooring and draped with stretched jersey. And it travels well; it can be easily flat-packed for the five-month tour, which began in October. Suzanne Stephens

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GRIFFITH OBSERVATORY PLAYS STARRING ROLE

Griffith Observatory, a landmark of the Hollywood Hills since 1935, is undergoing a \$58 million renovation and expansion that should cement its position as one of the leading cultural attractions in Los Angeles. Hardy Holzman Pfeiffer Associates, with Levin and Associates, is enlarging the Art Deco building—which houses a planetarium, science museum, and several powerful solar telescopes—by 35,000 square feet, almost doubling its size. Concurrently, conservation efforts will refurbish valuable murals depicting scenes from celestial mythology.

As host to 2 million annual visitors, including more than 50,000 schoolchildren, Griffith Observatory is a leading site for

public education and astronomical observation. Its expansion and renovation will create a world-class planetarium within the existing domed shell. New exhibit areas also will be added, along with classrooms, a multimedia auditorium, a large shop, and a public cafe.

Most of the construction, scheduled to begin in 2001, will take place beneath the existing building's front lawn. The underground area will house all the new elements except the cafe, which will hug the hillside and offer spectacular views of the Pacific Ocean and the iconic Hollywood sign. The new planetarium will be aligned with the new underground multimedia auditorium and will connect to it by a series of descending multilevel exhibit halls. The revamped observatory will contribute significantly to the ongoing cultural and constitutional growth of the City of Angels. *Alice Y. Kimm, AIA*



AFTER A RESTORATION, MUSIC IS HEARD AGAIN AT CLEVELAND'S MUCH-LAUDED SEVERANCE HALL

Severance Hall, the permanent home of the Cleveland Orchestra, has been one of that city's most treasured landmarks since it opened in 1931. The hall, designed by then-prominent Cleveland architecture firm Walker & Weeks, was named after John Long Severance, a treasurer of the Standard Oil Company, and his wife Elizabeth, who died just after her husband announced his initial gift of \$1 million. The building has neoclassical and Georgian facades and a varied (which is not to say *eclectic*) interior that embraces Art Deco, French

Nouveau, and Egyptian Revival styles, as well as classicism and modernism.

The hall, with its splendid interiors and superb, intimate acoustics, has always been regarded as an integral part in the success of what is widely thought of as one of the world's finest orchestras, led by a stream of superb conductors. Over the years, however, a back entrance to an underground garage had supplanted the more formal front arrival point, with its grand portico. Below that, a porte-cochere drop-off for chauffeured cars was filled in to



HUGE FERRIS WHEEL ON THE THAMES PROVIDES VIEWS OF LONDON AND A MILLENNIUM MARKER

London's giant new Millennium Wheel, dubbed the "London Eye" by its backer, British Airways, and its operator, Tussaud's, is battling for the spotlight with the Millennium Dome, down the river in Greenwich.

Constructed over six months in a horizontal position on a platform in the Thames, the wheel is dramatically sited almost directly opposite the Houses of Parliament, dominating London's lowrise skyline. Its supporters declare it a fitting and celebratory symbol for the millennium that offers spectacular views over the city, while its detractors say a carnival ride is inappropriate opposite Westminster. Regardless of opinion, the wheel is remarkable in many ways: it is the largest observation wheel ever built and will

carry 800 passengers at full capacity in 32 enclosed capsules. The 440-foot-high structure weighs 2,300 tons and is supported on one side only, by an A-frame structure composed of two tapered-steel columns with a maximum diameter of 10 feet. Pretensioned cables are also strategically used for support.

The wheel was the brainchild of David Marks/Julia Barfield Architects, husband and wife practitioners who won a 1993 competition for a millennium landmark. The architects not only had to help secure backing for the project, but navigate through planning permits and other procedures. Now they hope their wheel will continue to turn into the next century. *Hattie Hartman*

accommodate a variety of uses, including a restaurant, while concertgoers came in through the back, squeezing through narrow halls. In the concert halls themselves, a 1958 renovation had sealed off the 6,025-pipe E. M. Skinner organ, which has not been heard for more than 40 years; at the same time, a musically sound but architecturally compromised orchestra shell had been installed.

This month, after being closed since last March, Severance Hall reopens to unveil a \$36 million renovation designed by Washington,

D.C., architect David M. Schwarz. The restaurant was relocated and the building's two auditoriums, lobby spaces, and grand foyer have been restored, bringing new life to such remarkable architectural elements as the elaborate lace-patterned ceiling in the concert hall. Schwarz designed a 39,000-square-foot addition for the back of the building that will provide much-needed office and meeting space and better access for concertgoers. The Skinner organ also will be restored, though that will take an additional year. *Beth Dunlop*



Bronskill & Co., Rendered with RenderWorks

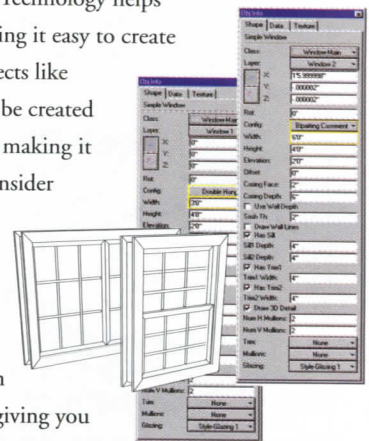
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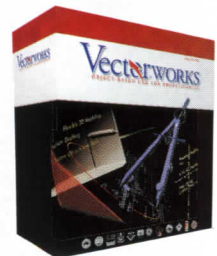
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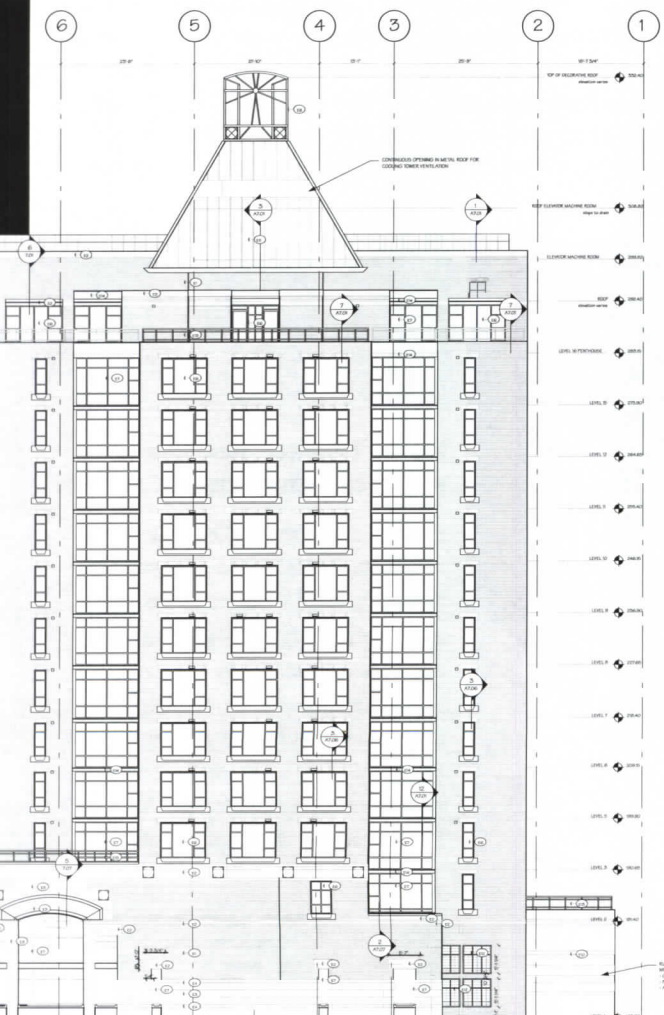
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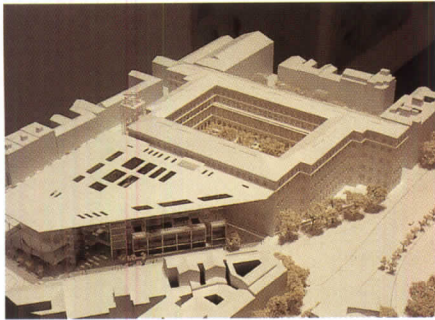
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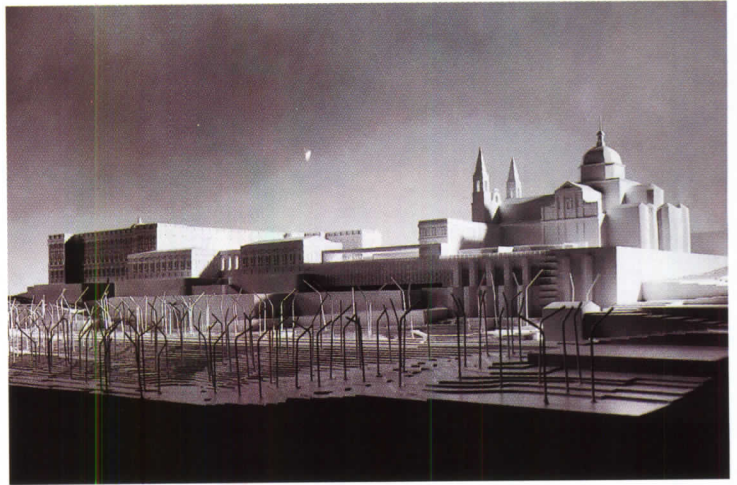
SUBTLETY REIGNS AT MADRID MUSEUMS

Sobriety and discretion won out over spectacular design statements in two recent major museum competitions in Madrid, breaking the trend set by Frank Gehry, FAIA's Guggenheim Museum in Bilbao and seconded in August by Peter Eisenman, FAIA's winning design for a "city of culture" in Santiago de Compostela.



A competition to enlarge the Reina Sofia Museum of Contemporary Art was won by Jean Nouvel with a design (below left) that neatly conforms to the streets and building heights of its surroundings. Second prize was awarded to Dominique Perrault and third prize to Madrid architect Juan Navarro.

Since 1986 the Reina Sofia Museum has been housed in a monumental hospital, designed by royal architect Francisco Sabatini in 1756. The 172,000-square-foot addition will contain temporary exhibition spaces, a library, auditorium, restaurant, offices, and technical spaces, freeing space in the original building for the permanent collections. Turning its back on Sabatini's structure, Nouvel's scheme establishes a new entrance on a busy boulevard, giving the museum a new identity. Nouvel has arranged three pavilions under a continuous floating cop-



per roof in a composition that recalls his recent performing arts complex in Lucerne, Switzerland.

The second competition, to build a museum for the Royal Collections, was awarded to the project that the jury felt best respected its sensitive site: a plaza between the 18th-century Royal Palace (also designed by Sabatini) and Madrid's eclectic 20th-century cathedral, which occupy a high escarpment with panoramic views. The Duke of

San Carlos, head of the jury, says the site did not permit "audacious solutions. Underground audaciousness was permissible, but not audaciousness in the air."

The winners were the young Madrid architects Lucia, Alfonso, Gonzalo and Diego Cano, a sister-brothers team who have taken over the architecture studio of their late father, Julio Cano Lasso. Their Museum of the Royal Collections (above) will be largely

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underground, with a facade of granite latticework at the level of the palace's foundations and a minimalist horizontal canopy on the plaza marking the entry. The 375,000-square-foot facility will display art, decorative and liturgical objects, carriages, musical instruments, and a remarkable collection of 3,000 tapestries, all former royal property now in the care of Spain's National Patrimony.

Other museum projects under way in Madrid include Rafael Moneo's plans to enlarge the Prado Museum, currently in design development, and an upcoming expansion of the nearby Thyssen Museum, which Moneo installed in a 17th-century palace in 1992. The state has acquired two adjacent historic structures and shortly will organize a competition for their rehabilitation. *David Cohn*



SEATTLE HOSTS AN ARCHITECTURE WEEK TO BOOST COMMUNITY AWARENESS AND PARTICIPATION

"Like other young cities," says Donald Carlson, FAIA, president of AIA Seattle, "we are still learning about the value of an urban environment for people. But architects can't transform cities without public participation, so once a year we bring everyone together to celebrate." In November, Seattle did just that with an Architecture Week that honored both professional accomplishments and community participation.

Highlighting the 12-day event

was the 1999 Honor Awards for Washington Architecture. Top honors went to Weinstein Copeland Architects, whose West Police Precinct and Communications Center in Seattle (above), designed in association with Roth Sheppard, merged conflicting needs for security and neighborhood accessibility in what the jury called "a humane and rich architectural statement."

Another highlight was a well-attended seminar, "How to Select

and Work with an Architect." AIA members Elizabeth Manger and Martin Moberg spoke to would-be homebuilders in an attempt to demystify design and architect/client collaboration.

Some events, including open houses for high school students at downtown firms, were directed at tomorrow's architects. Elizabeth Leroy of Bassetti Architects says that along with inspiring the students, the experience familiarized parents with architect/community collaborations, making them better potential participants. Younger kids had their say in a program directed by Dr. Sharon Sutton, FAIA, director of the University of Washington's Center for Environment, Education, and Design Studies. Elementary and middle school students presented their views on neighborhood problems to city council member Peter Steinbrueck, AIA. Notes Sutton: "Children are astute observers of their surroundings, and here they are practicing democracy through urban design." *B.J. Novitski*

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TASK FORCE MOVES ON INTERNSHIP REFORM

A task force charged with reforming internship continues to inch toward a new model of professional development. The future may bring more options for integrating practical experience during school, increased support for interns in the office, the right to take part of the registration exam immediately after graduation, and more refined, less demeaning titles to replace the word "intern."

The current drive to address the ills of internship and make a more seamless connection between education and practice began in earnest last April at an internship "summit" consisting of 66 delegates representing U.S. and Canadian architecture students, interns, recently licensed archi-

tecs, accrediting and regulatory bodies, practitioners, and educators. The summit arrived at a rough outline for a possible new model of internship, including a set of cautiously worded proposals aimed at sparking wider discussion.

The Collateral Internship Task Force, created by the Five Presidents Council to sharpen the summit's concepts, held its first meeting in October and developed seven more refined objectives for improving internship. In December, Billy Herrin, a partner in Jones & Herrin-Architecture/Interior Design in Huntsville, Ala, and chairman of the task force, presented those objectives to a meeting of the presidents council, which endorsed the task force's work-to-date.

The seven proposed objectives:

- Integrating practice into education as early as possible and recognizing multiple avenues of education and experiences.
- Requiring all candidates for architectural registration to have a

degree from an accredited school, but allowing flexibility for exceptional individuals who have gained the necessary knowledge through other, nonacademic experiences.

- Greater recognition of alternative and nontraditional means of gaining practical experience as interns.
- A more supportive environment for young architects in the practice world.

• Unbundling the Architect Registration Examination into two parts: an education-based Part A that could be taken after graduation from an accredited school and a practice-based Part B, taken after acquiring the necessary experience.

- A set of new, more descriptive titles to replace the word intern. Those in school would remain "architecture students." Graduates of an accredited program would be entitled to "graduate Architect." Those passing Part A of the registration exam would be "architects-in-training."

Those who pass Part B would

be architects, as is now the case.

- Create a culture of lifelong learning and mentorship throughout the professional development process, from school into continuing education.

"These objectives are only the first parts of a schematic design," says Herrin, adding that architects "should continue to give their comments to their representatives in the collateral groups."

Thus far, task force participants, including interns, have praised the progress in gathering feedback and developing the rough outlines of a more seamless system of professional education that bridges schools and practice. The task force could face its first test next October at the National Architectural Accrediting Board's validation conference, when the NAAB will consider whether any of the accreditation criteria for architecture schools need reconsideration in light of the proposed objectives for improving internship.

Lee D. Mitgang

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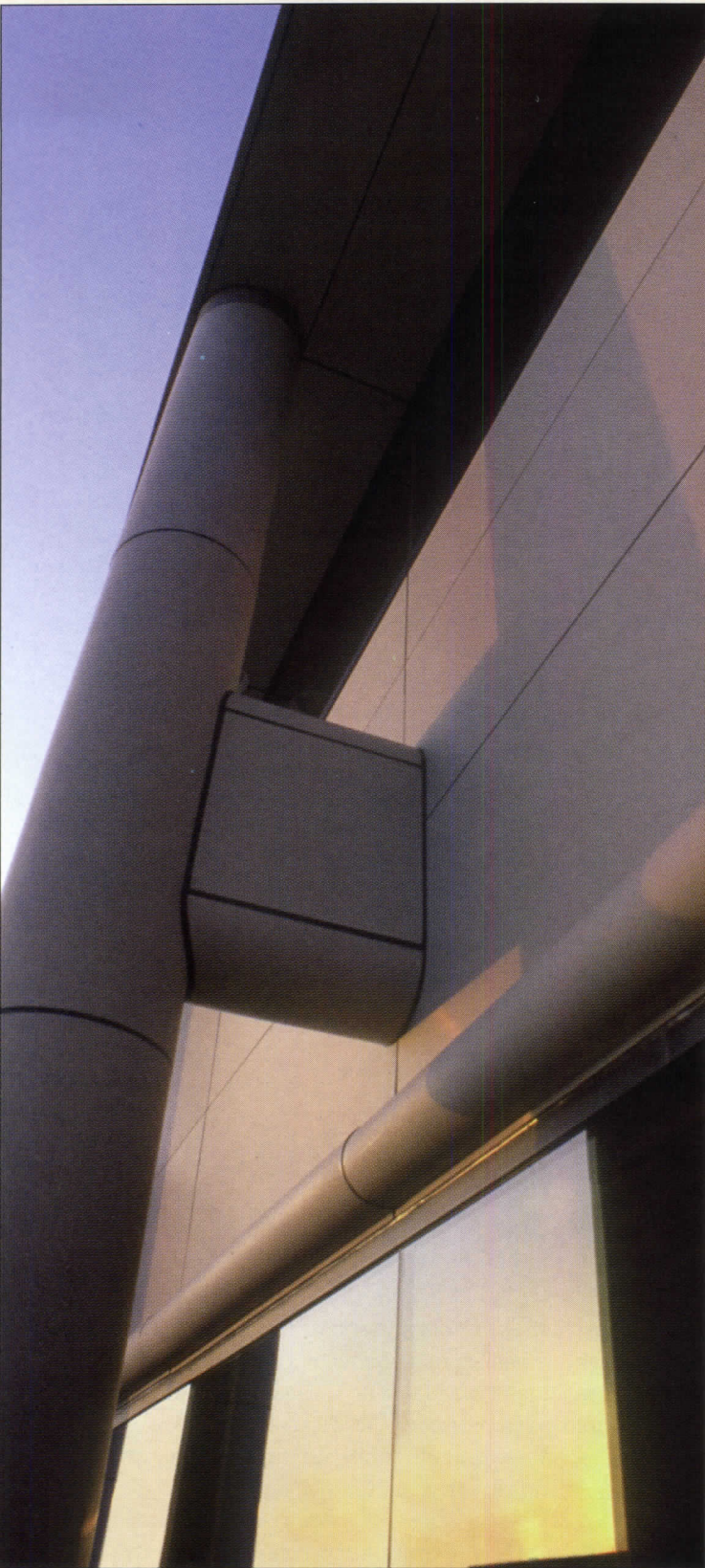


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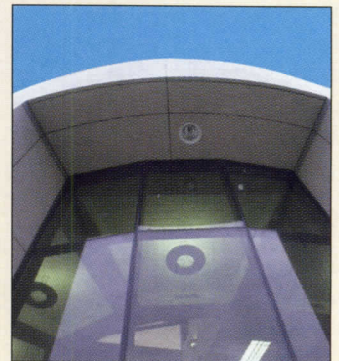


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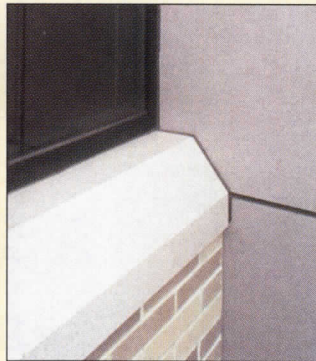
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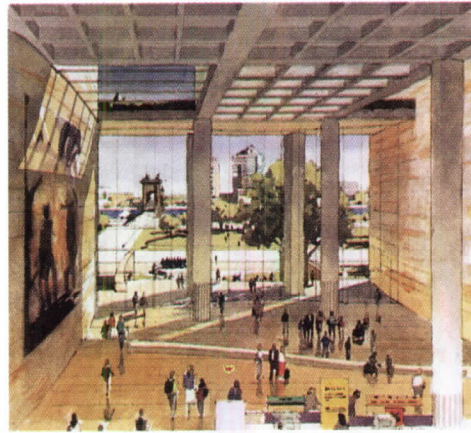
News Briefs

The saga continues In the wake of Swiss firm Herzog & De Meuron's resignation of its commission to design the new Jack S. Blanton Museum of Art at the University of Texas at Austin [December 1999, page 67] and the subsequent protest resignation of the school's dean of architecture, Lawrence Speck, FAIA, the University of Texas regents are under fire. Local critics and architects are blaming the regents for the debacle and are saying the regents overstepped their bounds in trying to dictate the museum's design (Herzog & De Meuron had to go back to the drawing board several times before giving up). But one regent, Tony Sanchez, said in the *Austin American Statesman* that the proposed designs didn't fit into the university's master plan, which was

created by Cesar Pelli, FAIA. Blanton is not withdrawing his funding of the project and the regents say they will find another architect. Meanwhile, Austin won't lack new museums: Gluckman Mayner has completed an initial design of the new Austin Museum of Art, scheduled for completion in 2002.

Happy birthday Shepley Bulfinch Richardson and Abbott of Boston celebrated its 125th year of practice in December with a forum at the JFK Library called "Envisioning Possibility." Civic leaders and academic and health care executives discussed the role of community participation in design and development. The firm, founded in 1874 by H. H. Richardson, also took the opportunity to fete itself as the oldest continuously practicing architecture firm in Boston and one of the oldest in the country.

Primitive Paris French architect Jean Nouvel has been chosen by French president Jacques Chirac to



Boora's Underground Railroad Freedom Center.

design a Museum of Primitive Arts near the Eiffel Tower in Paris. The \$190 million museum will exhibit African, Oceanian, and pre-Columbian art and is slated to open in 2004. Nouvel won out over two other finalists, Renzo Piano and the French-American team of Felice Fanuele and Peter Eisenman, FAIA. Nouvel, 54, has already made his mark in Paris with the Institut du Monde Arabe and the Cartier Foundation for Contemporary Art and

is reportedly at work on a major project in Frankfurt, Germany.

Going underground

Boora Architects of Portland, Ore., has completed a design of the new National Underground Railroad Freedom Center in Cincinnati. The 150,000-square-foot museum will house exhibits on the history of the underground rail-

road as well as other educational and research facilities. When completed in 2003, the building will be one of the showpieces of Cincinnati's redeveloped riverfront district.

Disney digs in Another groundbreaking ceremony for Disney Hall, designed by Frank Gehry, FAIA, took place in downtown Los Angeles in December. Seven years after the first such event, the ceremony was attended by a host of supporters,



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including Mayor Riordan, members of the Disney family, and the future occupants of the 2,290-seat concert hall, the Los Angeles Philharmonic. Gehry's 1988 design envisions an exterior covered with wavelike stainless steel. "I want it to be reflective enough so in our California sun, during the day, it goes almost white, like white sails," said the architect. The \$274 million project, in limbo since construction was halted in 1995, will supposedly be finished in 2003.

Recipe for Frankfurt TrizecHahn Europe, a subsidiary of the Toronto-based real estate development giant, has cleared the site of a former freight station near downtown Frankfurt to make way for a 2.9 million-square-foot mixed-used development. Construction of the \$1.2 billion urban entertainment center (\$720 million from Trizec and the rest from landowner Eisenbahnmobilien Management GmbH, a German railway company) is scheduled to be completed in 2002. While Trizec would not reveal the architects involved in the project, sources indicate that Jean Nouvel, Helmut Jahn, FAIA, Christian de Portzamparc, and Peter Pran, AIA, of NBBJ are working on designs. The development will include a hotel, a 1,800-seat theater, a multiplex cinema, restaurants, retail space, office space, apartments, and a conference center. The master plan is by ABB Architekten of Frankfurt. The local government has approved the project in principle and will have a say in the final designs.

Pelli's progress Cesar Pelli, FAIA, is designing a "music performance laboratory"—an intimate performance and practice space—for the University of Minnesota-Duluth, whose music facilities have been derided as the worst of any college in the state. The 19,000-square-foot building will feature a domed top and long, narrow skylight. Pelli is now

also participating in a new \$300 million master plan at St. John's University in New York, where he is designing an octagonal, 525-seat, limestone-clad church that will be the campus' focal point.

Canadian style Montreal's Economic and Urban Development department has been enjoying strong interest in its Commerce Design Contest, which has honored excellence in commercial design since 1995. The 1999 competition attracted 7,000 ballots, double the 1998 input. The Orbite Coupe salon, designed by Gilles Saucier, won the jury grand prize.

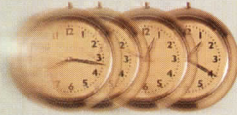
Living large UCLA held a groundbreaking last month of a new \$1.3 billion hospital and research complex that will be the largest construction project ever undertaken by the University of California. The Pei Partnership, owned by two sons of I.M. Pei, FAIA, created the design in consultation with the elder Pei and executive architects Perkins & Will. The three-year planning process involved more than 500 physicians, nurses, and patients.

Wembley woes The prospects for a design by Lord Norman Foster and HOK Lobb for the new \$750 million Wembley Stadium in London were in doubt in December after an independent report by DLA Ellerbe Becket claimed the stadium, recently redesigned with a single leaning arch instead of the original four-mast roof structure, would be too small when converted for track and field events. The report further criticized the expense and time required to transform it from a soccer stadium. While the stadium is intended to be the national venue for soccer, government funding is contingent on its supporting the U.K.'s bid for the World Athletics Championships in 2005 and an expected bid for the 2012 Olympics. As of this writing, the consortium developing the stadium was preparing a response. ■

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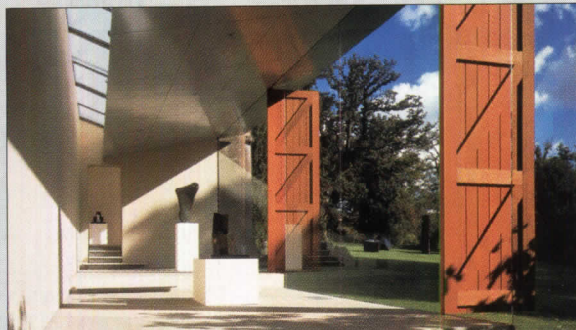
BUSINESS WEEK/ARCHITECTURAL RECORD AWARDS, sponsored by the AIA, honors the achievement of business goals through architecture and distinguished collaboration between clients and architects. To enter, access registration information in this issue or on architecturalrecord.com. Register by March 16, 2000. Submissions must be postmarked by April 18, 2000.

THE GREEN ARCHITECT

The green products guide is organized by division, with product descriptions and links to manufacturer Web sites. New "green" products are added each month. Products are evaluated for **durability, recycled content**, and other attributes—making it easier to choose products that are **resource efficient**. Find vital coverage of "green" issues, sustainable design, and newly built structures that respect the environment here.

DIGITAL ARCHITECT

Go here to find vendor guides and software reviews with links to manufacturer Web sites. **New this month:** database management system software vendors related to the January column, "Database Management Systems for Architects." You can also refer to past Digital Architect columns, digital product reviews, and related vendor guides.



PLUS...

The **people** and **products** involved in several delightful small museum projects from January's Building Types Study: The River & Rowing Museum, Chibougamau Mining Museum, North Carolina Pottery Center, and Roche Court (left).

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CIRCLE 30 ON INQUIRY CARD

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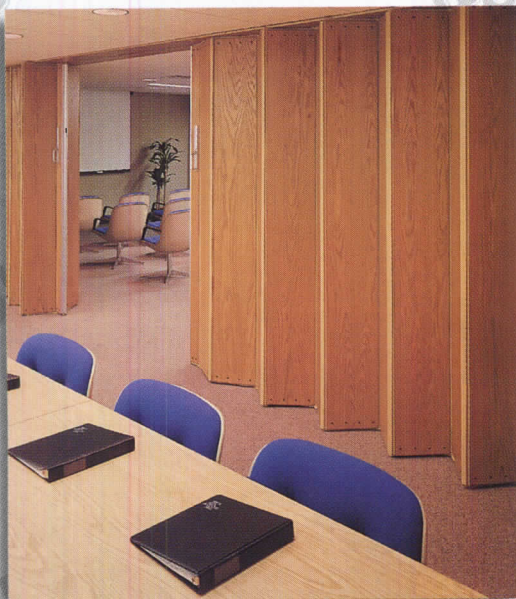
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CIRCLE 31 ON INQUIRY CARD



Dates & Events

Calendar

Landmark American Bridges of the 21st Century

Boston

Through January 28

Documentation of the design and engineering of seven major American bridges currently under construction or in their final design phases. The Architects Building/BSA. 800/662-1235.

Edge City: Work by Steven Holl

San Francisco

Through February 20

On display are the architect's models, photo collages, and drawings visualizing the imposition of form on urban sprawl. San Francisco Museum of Modern Art. 415/357-4000.

Cedric Price: Mean Time

Montreal

Through February 27

On exhibition are the often humorous unbuilt projects of English architect Cedric Price, whose work explores how architecture can adapt itself to new uses over time. Projects include an abandoned railway line converted into a roving university and a demountable house for an archaeologist. Canadian Centre for Architecture. 514/939-7000.

The Pritzker Architecture Prize 1979-1999

Pittsburgh

Through February 27

An exhibition highlighting a single, signature project for each of the 22 Pritzker laureates. Carnegie Museum of Art. 412/622-5551.

Design from the Heartland

Chicago

Through February 27

An exhibition featuring the work of three pioneering industrial designers: Henry Glass (American Way furniture), John Polivka (equipment and graphics for Control Data

Systems), and Richard Ten Eyck (Cessna aircraft and Vornado fans). The Art Institute of Chicago. 312/443-3600.

E.W. Godwin: Aesthetic Movement Architect and Designer

New York City

Through February 27

The first U.S. exhibition devoted to the work of this 19th-century British polymath; Godwin was an accomplished architect, designer, interior decorator, antiquary, theatrical producer, and critic. Bard Graduate Center for Studies in the Decorative Arts. 212/501-3072.

The Architect's Studio

Humblebæk, Denmark

Through February 27

The latest in a series of exhibitions featuring established architects focuses on the work of Danish architect Henning Larsen. Louisiana Museum of Modern Art. 011/45/49/19-07-19.

Material Evidence: Chicago Architecture at 2000

Chicago

Through March 5

Guest-curated by Cynthia Davidson, this exhibition investigates how the use of materials drives contemporary Chicago architecture. Featured architects include Ron Krueck, Obi Mwazota, Carol Ross Barney, and Joe Valerio. Also on display are commissioned installations by Sarah Dunn/Martin Felson, Studio Gang/O'Donnell, Doug Garofalo, and Helmut Jahn. Museum of Contemporary Art. 312/280-2660.

The Corner Store

Washington, D.C.

Through March 6

An exhibit tracing the history and cultural impact of a vanishing American typology: the local grocery. National Building Museum. 202/272-2448.

At the End of the Century: 100 Years of Architecture

Chicago

Through March 12

A traveling multimedia exhibition highlighting major trends in 20th-century architecture. Museum of Contemporary Art. 312/280-2660.

ModernStarts: Places

New York City

Through March 14

An exhibition demonstrating how particular spaces, real and imagined, urban and rural, were conceived and represented by artists between 1880 and 1920. Museum of Modern Art. 212/708-9750.

A Century of Design, Part I: 1900-1925

New York City

Through March 26

The first in a series of exhibitions surveying 20th-century design of furniture, metalwork, glass, ceramics, textiles, jewelry, and drawings. The Metropolitan Museum of Art. 212/535-7710.

Frank O. Gehry's Office

Bordeaux, France

Through April 2

An exhibition of Gehry projects focusing on his office's working methods. Arc en Rêve Centre d'Architecture. 011/33/5/56-52-78-36.

Triumphs of the Baroque

Montreal

Through April 9

An exhibition of European architecture from 1600-1750, highlighted by 30 large-scale architectural models. The Montreal Museum of Fine Arts. 514/285-1600.

En chantier: The Collections of the CCA, 1989-1999

Montreal

Through April 30

Celebrating its 10th anniversary, the CCA displays the best of its collection of architectural drawings,

renderings, models, and photographs. Canadian Centre for Architecture. 514/939-7000.

See the U.S.A.: Automobile Travel and the American Landscape

Washington, D.C.

Through May 7

This exhibition celebrates roadside architecture and the culture of the automobile. It features photographs by John Margolies, an expert on roadside architecture and author of 10 books on the subject. National Building Museum. 202/272-2448.

Art Deco Festival

Miami Beach

January 10-16

A festival celebrating the 75th anniversary of the 1925 Exposition Internationale des Arts Decoratifs et Industriels Modernes. There will be guided tours of Miami Beach's Art Deco district, a collectibles street fair, films and lectures, and live music. For information, call the Miami Design Preservation League at 305/672-2014.

ICON 2000

Dallas

January 14-17

More than 70,000 construction industry professionals are expected to attend this year's event, which combines the International Builders' Show and the International Commercial Construction Exposition. Register online at www.BuildersShow.com or www.ICCON.com.

Claude Parent: An Oblique Lineage Toward Hypersurfaces

Los Angeles

January 15-February 26

A exhibition of the work of French architect Claude Parent, who champions an architecture that is dynamic, flexible, and tactile. Louis Stern Gallery. 323/254-0102.



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CIRCLE 32 ON INQUIRY CARD

Dates & Events

Masonry Expo 2000

Las Vegas

January 17-18

The annual convention and tradeshow for the masonry and paver construction industry. Las Vegas Convention Center. 877/627-3976.

AGC Super Conference

Dallas

February 9-11

Associated General Contractors' annual conference covering matters related to construction project delivery. Westin Galleria. Call 703/548-3118 for information, or visit www.agc.org.

Frank Lloyd Wright: Windows of the Darwin D. Martin House

Washington, D.C.

February 18-August 20

An exhibition of art glass windows, doors, and skylights that Wright created for the house. National Building Museum. 202/272-2448.

Water Sensitive Ecological Planning and Design

Cambridge, Mass.

February 25-26

An international symposium that explores promising procedures, options, and limitations in water management. Part of Harvard's lecture and exhibition series, "100 Years of Landscape Architecture." Harvard Design School. 617/496-0436.

Restoration & Renovation

Boston

February 27-29

A tradeshow and conference dedicated to architectural rehabilitation, cultural landscape preservation, collections care, and historically inspired new construction. Hynes Convention Center. 800/982-6247.

Harvard Asia Design Conference

Cambridge, Mass.

March 9-11

This conference will explore Modernism's inroads into Asia. Call 617/621-9963 or visit gsd.harvard.edu/asiagsd for more information.

Competitions

The Rotch Traveling Scholarship

Application deadline: January 10

This \$30,000 scholarship allows a young architect to study in a foreign country for up to a year. Eligible are U.S. citizens under 35 years old with at least one year of experience at a Massachusetts firm or an architecture degree from an accredited Massachusetts architecture program plus one year of professional experience anywhere. Visit www.rotchscholarship.org.

National Endowment for the Arts competition grants

Deadline for letter of intent: January 18

The NEA is offering grants for the establishment of design competitions that involve public buildings, planning, landscape, graphic design, and industrial design. Guidelines and applications are available at arts.enow.gov. Call 202/682-5452.

The James Beard Restaurant Design & Graphics Awards

Submission deadline: January 31

For architects and interior designers who exhibit excellence in restaurant design. Call 212/627-1064 or 212/645-3654 or visit www.jamesbeard.org.

1999-2000 Young Architects Forum

Submission deadline: February 18

This annual ideas competition, sponsored by the Architectural League of New York, is open to architects who have graduated from architecture programs within the last 10 years. Winners receive a cash prize and are invited to exhibit their work and present lectures in May and June. For an entry form, call 212/753-1722.

Plan: Section

Submission deadline: March 2

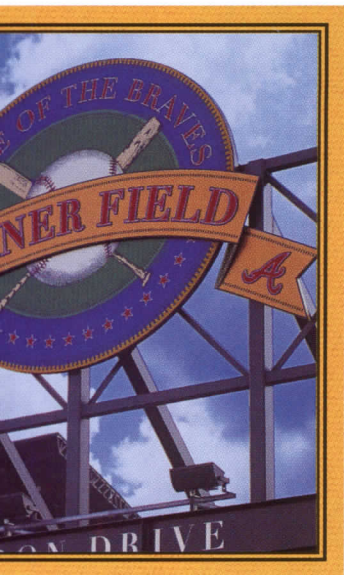
Arcade magazine is sponsoring an easy-to-enter competition: submit one plan, one section, and one sentence about a completed, in-process, or speculative building. E-mail arcade00@msn.com for a full prospectus, which will be available January 12.

Business Week/Architectural Record Awards

Registration deadline: March 16; submission deadline: April 18

This annual awards program recognizes distinguished collaboration between clients and architects to achieve strategic business goals. Entrants submit a mission statement and business plan describing how the project fits into an organization's overall goals. Also submitted are descriptions of both the process of design and how the project resulted in business success, including measurements of results where available. Eligible are public- and private-sector projects of any budget, both new construction and renovations, completed anywhere (continued on page 196)

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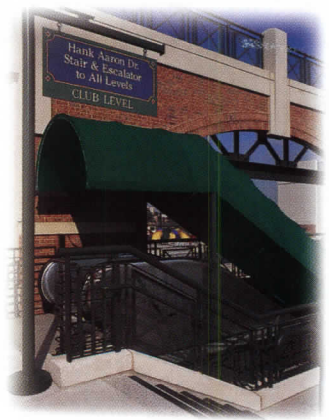
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CIRCLE 35 ON INQUIRY CARD

The Other Side of the Fence:

What Drives Landscape

By Paul Bennett

Landscape design has gained new cachet in architecture circles. Until only about five years ago, many architects saw landscape design as window dressing, a finishing touch in the design process. Now, landscape architecture is becoming a new frontier, a discipline perhaps more fertile for developing new concepts than architecture: context trumps objects. Some architects are experimenting with landscape, such as Peter Eisenman, FAIA, with his proposal for the railyards on the West Side of Manhattan, and Iowa architect Bill Conway, AIA, with his designs for Interstate 80 rest areas. Landscape architects, meanwhile, have always known the rich conceptual depth of their profession. They're a little bothered that architects think they can cross the natural boundaries between the professions with ease, boundaries that exist for pragmatic reasons. There's a lot more to landscape architecture than planting design and circulation plans. In the same way that buildings fall down, not all landscapes work.

Architects' new interest in landscape architecture, however, is more than curious experimentation. Architecture is more collaborative today than ever before, and landscape architects have become prized members of design teams. Many architects realize that landscape can work in dialogue with buildings, helping to expand a narrative beyond what any building could accomplish alone. In other instances, landscape architects bring discrete technical knowledge and close attention to such issues as grading and ecology, which architects just don't learn in school. And in some cases, architects are learning that landscape architects, because of their experience with large scales and natural systems, are well equipped for synthesizing ideas and fusing concepts: they are consummate collaborators. Still, collaboration requires a certain degree of understanding. For architects to simply work with landscape architects—never mind dabbling in their realm—they need to grasp the larger issues that have transformed landscape design in the last five years.

The greening of landscape architecture

The single most transformative issue in landscape has been the influence of ecological science. Environmental issues are now in the mainstream, which means that landscape architects need to do far more than make places pretty. Woefully slow to absorb the environ-

mental revolution of the 1970s, landscape architecture finally woke up to it in the 1980s, and by the early 1990s a handful of firms were specializing in ecological design. At the turn of the millennium, environmentalism is no longer a matter of specialization. Today, it is difficult to find a landscape architect who isn't thinking about ecology in some way.

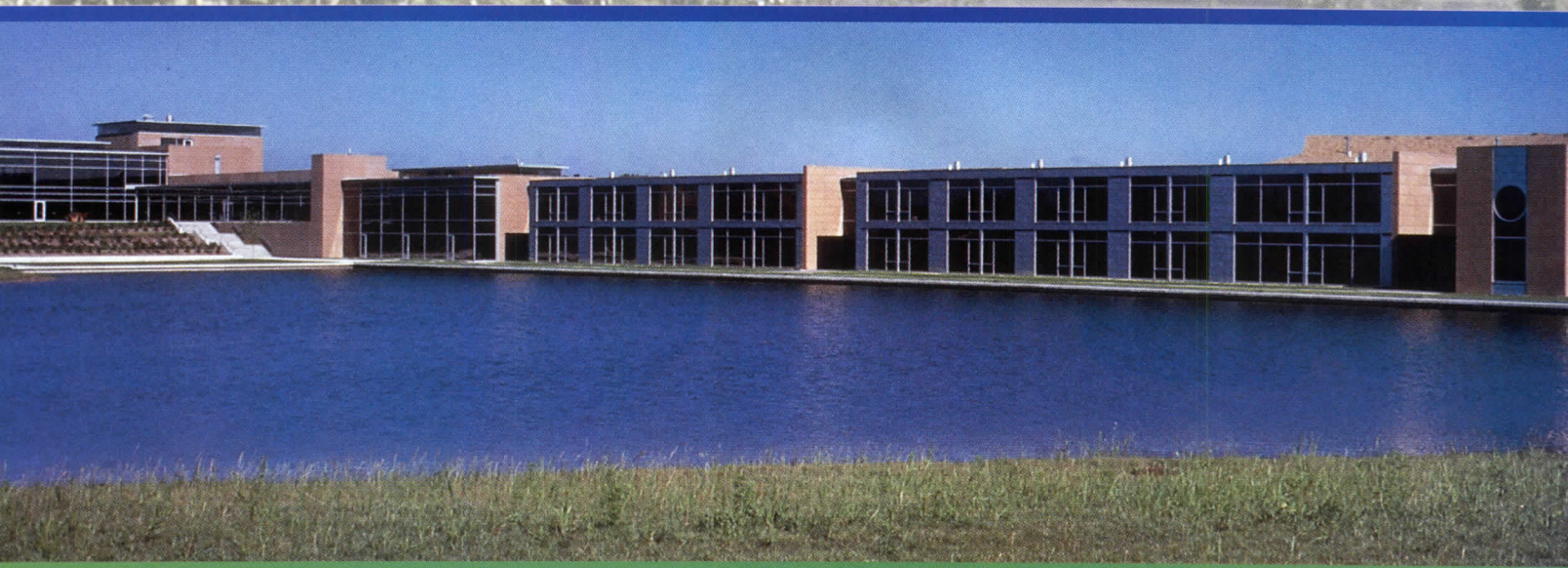
Sacred grounds

For many years the leader in ecological design has been Philadelphia-based Andropogon Associates. Although sometimes criticized for a lingering romanticism, Andropogon rose to the top of the ecological game by combining good science with strong design. It has carved a niche in the field of ecological restoration—that is, the practice of redesigning spaces so that they conform better to natural processes and systems. In this realm, the firm's redesign of Frederick Law Olmsted's tripartite Louisville park system is exemplary. Here, it recast the classic 19th-century picturesque idiom in an ecological mold. Large open spaces of grass, called *greenswards*, were redesigned as wild grassy meadows, thus reducing runoff and reliance on fertilizers and herbicides. In the woodland areas, the firm reengineered the paths to create large swales to capture water. Andropogon also instituted a reforestation program for the edges of the woodland areas to mimic natural succession, which entails open meadows giving way to small shrubs, giving way to mature canopies. Now, the park is not only a place for recreation, but it is also an ecological entity, a refuge for nature as much as for people. More than a facelift, this work was a reconception.

Ecology has even infiltrated the starkly minimalist work of Berkeley-based Peter Walker and Partners (PWP). Part of this shift is due to environmental regulations, says partner Tom Leader: "You can't do anything that doesn't help repair the environment these days." But without "knee-jerk naturalism," PWP approaches ecology as a design component rather than the sole parti. The result is an intriguing mix of natural and geometric forms. At the new Boeing commercial airline headquarters in Renton, Wash., on the site of an old racetrack, PWP confronted the discovery of a wetland after work had begun on the SOM-designed buildings. PWP accentuated the dendritic form of the wetland by extending the ribbons of wetland through the center of the site and reintroducing a natural flow of water. Over this, they laid an enormous grid of trees oriented toward Mount Rainier, views of which

Paul Bennett is editor at large at Landscape Architecture magazine and the author of several books on gardens published by Princeton Architectural Press.

Architecture Now



OSLUND.AND.ASSOC.

Landscape architects tend to mature within the shelter of a firm, emerging only in midcareer to make a name for themselves. Tom Oslund recently left the confines of HGA to start Minneapolis-based *oslund.and.assoc.*, an eight-person firm taking on commissions from planning to design, from large corporate campuses to art gallery installations.

Oslund was the master planner on new corporate campuses for the Good Samaritan organization in Sioux Falls, S.Dak., and for the Medtronic corporation in Fridley, Minn. On each project, Oslund translated the client's program into a large-scale landscape

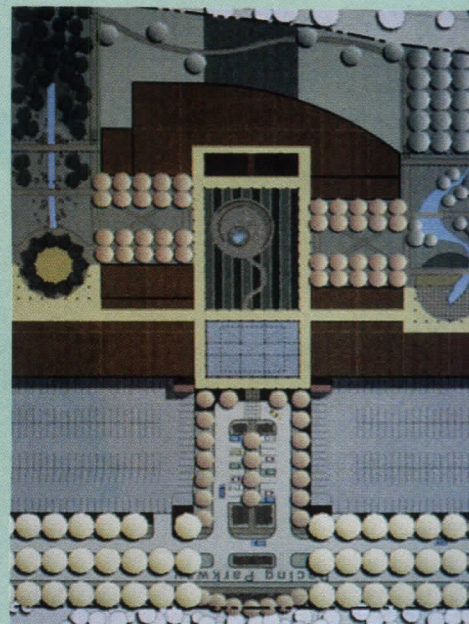
plan. For instance, at the Good Samaritan campus, Oslund sited the chapel (yet to be commissioned) as the entrance marker for the complex and then revolved the rest of the architecture around a central lake, which has a kind of equalizing effect on the overall layout. The conference center, designed by Julie Snow, FAIA, was the first completed structure.

At Medtronic Headquarters, Oslund used architecture to create a series of interlocking, interior landscapes. What might have been leftover pieces become essential corridors and visual linkages.

"We develop philosophical approaches to the structures," says

Oslund, "and look at them in terms of the way they meet the ground and the way they fit into the overall site. [In a campus context] buildings tend to be inspired or grow out of the site rather than out of a derivative style that is flashed around in the latest magazines."

The Good Samaritan Society's headquarters in South Dakota (above) and Medtronic's headquarters in Minnesota (right).



Ian McHarg rocked landscape architecture in 1969 when he published *Design with Nature*, his clarion call for ecological planning. It galvanized the profession, but perhaps none felt it so strongly as McHarg's students at the University of Pennsylvania. Among them were two couples, Rolf and Leslie Sauer and Colin and Carol Franklin, who were to found Andropogon, now a 32-person firm based in Philadelphia. The firm has carved a niche for itself in ecological restoration.

At a new spa resort in Japan, adjacent to a national park, Andropogon worked with Venturi, Scott Brown and Associates to

reduce the impact of the resort's buildings and paths on the surroundings. Andropogon did a large amount of the design work on-site, including the design of a cantilevered bridge built into the side of a densely forested mountain, a means of "immersing" visitors in the experience of nature. The firm also persuaded the local landscape architect to remove and save 3,000 trees, which took nine months. "This is an oak chestnut forest with an understory of azalea and cherry," says Carol Franklin. "It's to die for. You cannot buy this in a nursery." It was a needling point perhaps, with big ramifications. "Venturi got the bug and developed the idea of 'the village in

the forest' for the architecture. It was a real dialogue."

In another project demonstrating the widening expertise of landscape architects, Andropogon recently created a visitors' master plan for Frank Lloyd Wright's Fallingwater, where rampant tourism has seriously degraded both grounds and building. The firm will restore the pilgrimage approach to the building, accentuating the woodland context and hiding the support facilities, such as maintenance sheds and parking lots. The plan ventured so far afield from traditional landscape issues as to suggest the number of visitors that should be allowed at one time.

A romantic sensibility is mistak-

enly ascribed to Andropogon. In truth, the firm wrestles with Postmodern complexities. "We can mathematically describe a tree," says Carol Franklin, "but not with Euclidean geometry. The great tragedy is that the designers have very infrequently tapped the scientific knowledge of our age, such as the science of ecology and fractal geometry. [We are attempting] designs that are about the real geometries of nature."

The diversity of Andropogon's work at Nikko Kirifuri Resort in Japan emerges in a waterfall and pool (below), terrace steps (below left), and a bridge over restored foliage (top left), co-designed with VSBA.

ANDROPOGON ASSOCIATES





HARGREAVES ASSOCIATES

The 1990s were good to George Hargreaves. He entered the decade as the profession's enfant terrible, cranking out surprisingly original work while under the tutelage of his mentor Peter Walker, and he left it as landscape architecture's undeniable leader. Big news in the industry has been his capture of several large-scale commissions that would traditionally have gone to architects. They include the redevelopment of Louisville's waterfront and master plans for the University of Cincinnati and the Olympic Village in Sydney.

Sydney Games organizers called Hargreaves when design development for the Olympic Village hit trouble. Supposedly, so little communication existed between the architects of individual parcels that no one accounted for a five-foot grade change in the middle of the site. Hargreaves established a working design committee and produced a comprehensive plan for the site that unifies the architectural components around a central plaza. The plan also introduces ecological interventions to the site, including green corridors and a series of foun-

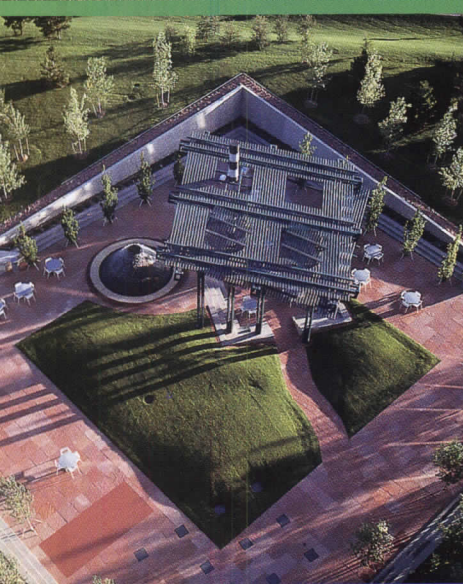
tains that purify water from a nearby polluted stream.

In recent years, the San Francisco- and Cambridge, Mass.-based firm has focused on making natural processes accessible. Along the Guadalupe River in San Jose, Calif., Hargreaves combined an engineered channel bed with a wetland to create a natural, ecologically inspired design. The firm developed the underlay with the Army Corps of Engineers and consulting biologists, ecologists, and engineers, replacing the traditional U-shaped concrete riverbed with a system of stone terraces,

gabions, and vegetated slopes. The design introduces biological diversity into the river system to help slow flows and clean water. It also creates an infrastructure of interlocking stairways that provide unfettered access to the river.

The grounds of the Aronoff Center for Design and Art (top left) and Sigma Sigma Commons (top right) at the University of Cincinnati. Guadalupe River Park in San Jose, Calif. (bottom left), and Sydney's Olympic Village (bottom right).





CIVITAS

“Our society presumes that knowledge is power. I don’t believe that’s true. I believe judgment is power,” says Mark Johnson, principal of Denver-based Civitas and a long-time agitator for the landscape architecture profession. According to Johnson, landscape architects are schooled in the art of making judgments.

This credo drives Civitas’ versatility. The landscaped plazas the firm designed for Great-West Life’s U.S. headquarters in suburban Denver reflect the angular geometry of the company’s building and the buildings of the surrounding office park. For the *University of Colorado’s*

Laboratory for Space Physics in Boulder, the firm chose nearly the opposite approach, restoring native grasses that grew up right next to the buildings. For MCI’s western headquarters in the foothills of Colorado Springs, Civitas took the middle road, weaving grass between sandstone pavers at the site’s edges to create a transition zone between buildings and their natural surroundings.

Civitas works primarily in landscape design, about half for public agencies and half for the private sector. With the help of architects and planners on staff, the firm has also made extensive forays into the realms

of master planning, urban design, and architecture, including the recent commission to replan the National Renewable Energy Laboratory. The laboratory, which is the federal government’s largest alternative energy test site, has expanded haphazardly over the years without regard to site characteristics, most notably the problem of extreme runoff velocity from a nearby mesa. Civitas, inspired by an unrealized 1970s design by architecture firm CRS, manages the water flow by siting long, linear buildings parallel to runoff patterns. Civitas didn’t design the buildings, but did determine their footprints.

This page: The Laboratory for Space Physics at the University of Boulder (top left); Great-West Life U.S. headquarters in suburban Denver (bottom left); and MCI western headquarters in Colorado Springs (above).

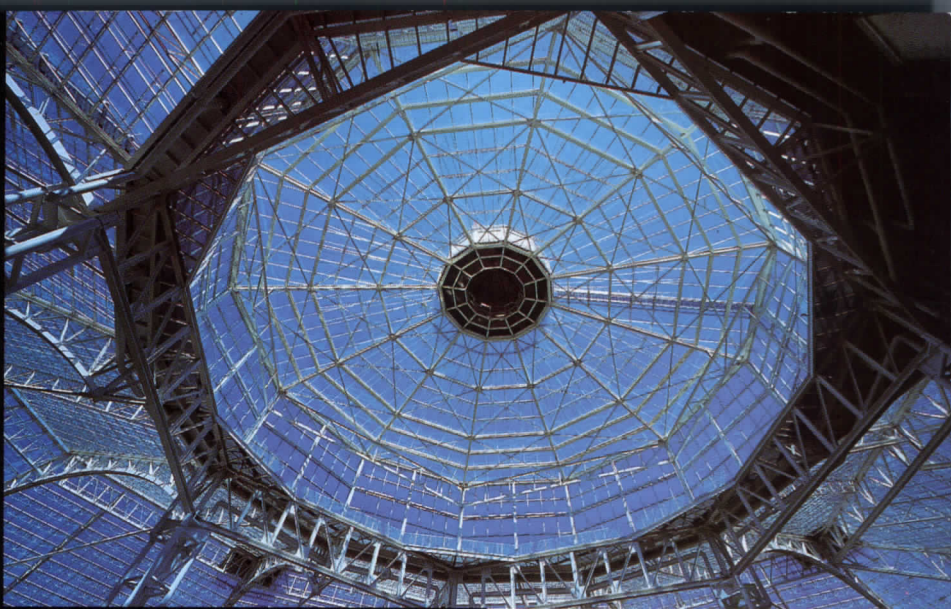
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Laboratory in Portland,
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dominate the site. The contrast between the strikingly man-made and the seemingly natural stirred some controversy, but also heightened awareness of previously hidden ecology.

If society has become estranged from nature, landscape architecture is responding by revealing underlying processes. Robert Murase Associates in Portland, Ore., has taken this practice of “day-lighting” to new levels of artistry. At the Water Quality Laboratory in Portland, Murase captured storm runoff in an intricately designed “bioswale.” The water passes through a steel trough planted with wetland species that clarify and clean the water of pollutants. The system successfully recaptures and purifies runoff, usually trundled off-site by a mundane network of underground pipes.

The influence of ecology in the profession has prompted most larger landscape firms to hire ecologists, which in turn readies firms for different types of commissions. In the ecological realm, San Francisco-based EDAW, the country’s largest landscape architecture firm, and JJR, based in Ann Arbor, Mich., are leading the way with large-scale environmental planning and remediation projects. JJR’s design for Crosswinds Marsh, a constructed 1,000-acre wetland that mitigates the impact of an expansion at Detroit Metropolitan Airport, was awarded the profession’s highest award this year.

From the particular to the general

Another big idea currently afoot is of landscape architecture as a very general design discipline. Many landscape architects think that instead of focusing on specific technical problems (like ecology), their profession should consider the interrelationships of every element in a system. For instance, they should not only relate buildings to each other, but they should also stimulate interaction among the people using a site. This kind of thinking has prepared landscape architects to meet the newest expectations for academic environments and workplaces: progressive administrators and managers of college and corporate campuses strive for “total environments” where learning and productivity can be heightened through the manipulation of the user’s experience.

Carol Mayer Reed’s design for the new Nike headquarters in Portland, Ore., represents a new breed of corporate campuses. In addition to pleasant courtyards for sitting, employees can now enjoy an extensive running track, soccer fields, and nature walks along a stream.

At university campuses, the changes have been more complex. One major challenge today is to knit together campuses that have been fragmented by haphazard building. The University of Cincinnati commissioned San Francisco- and Cambridge, Mass.-based Hargreaves Associates to create a campus master plan in 1991. The initial work evolved into extensive urban design, until ultimately, the firm reviewed architectural proposals, giving advice on the best architects to hire for each project.


The problem with the University of Cincinnati campus, says George Hargreaves, was that piecemeal planning had destroyed the sense of place. What the landscape architect provided was an overarching strategy for the entire campus, connecting fragmented zones by rethinking the space between them—the landscape. As a result, the new buildings at Cincinnati, currently being designed by a “who’s who” of architecture, including Frank Gehry, Morphosis, Pei Cobb Freed, Peter Eisenman, and Gwathmey Siegel, respond first to the spatial fabric of the campus and second to their own programmatic or technical needs.

The idea of the landscape architect as a consummate generalist can be dangerous, potentially weakening the public perception of landscape architecture. Danger aside, on the ground we’re seeing the idea take hold and redefine the profession in entirely new ways. Denver-based Civitas has used landscape architecture to infuse solid design ideas into planning. The firm was brought on early to work on the reuse plan for Denver’s abandoned Stapleton International Airport. Civitas’ ideas were so well thought out that it has stayed on to shepherd the project through the next phase: negotiating with the developer on behalf of the city.

Collaboration: More strain than synthesis

Another major theme in landscape architecture today is collaboration. In some ways, the ecological revolution and broader conceptual horizons have driven the profession in this direction—some would say it is impossible to create a landscape without working with a host of other professionals, including ecologists, engineers, artists, and architects. Collaboration requires more, however, than just working together. It requires breaking down the hierarchy of prime- and sub-consultants and creating an equitable team to which each professional contributes.

(continued on page 194)



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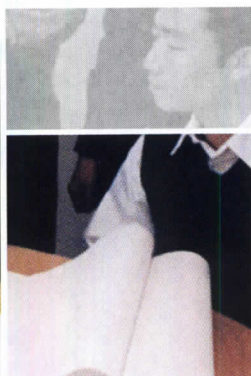
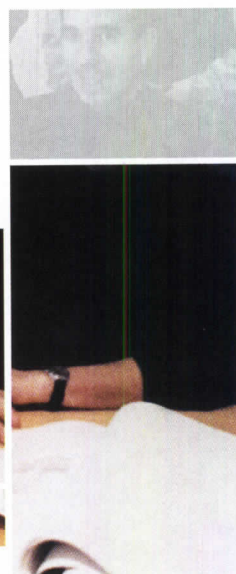
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THE STRONG ECONOMY HAS MADE KEEPING THE BEST ARCHITECTS HARDER THAN EVER.

By Kira L. Gould

Architecture firms all across the country are looking for good young architects—and they are probably calling yours. Gordon Godat, an architect for seven years with RTKL in Baltimore, says he is approached on a regular basis, through friends, by firms, or by headhunters. Recruiters are offering better job titles, larger salaries, and sometimes summer hours, flex-time, telecommuting arrangements, or family-leave incentives. So far, he's not been tempted, but the calls keep coming.

According to U.S. Department of Labor statistics, during the past three years available positions at architecture firms increased from 112,000 to 141,000—about 8 percent per year. The construction industry is humming, and the pressure to attract and retain talented architects is raising the bar on employment practices. The market for those with three to seven years of experience is particularly tight. It's not exactly a "generation" that's missing, but there's a significant gap in the labor market. Few

firms were hiring in the early 1990s, and the folks who couldn't get jobs then aren't lining up for the midlevel jobs now.

Architecture offices are not alone in their struggle to keep positions filled. The strong economy is putting the squeeze on many industries. Other Department of Labor statistics show a continuing decline in the median tenure of all workers. These numbers show men aged 35 to 44 had been at their jobs for 7.3 years in 1983; by last year, the same age group had remained at their jobs just 5.5 years. Some analysts believe that the hundreds of career sites on the Web are actually transforming the employment marketplace by spurring a culture of job-hopping. And tales of ordinary folks whose stock options made them millionaires overnight when their privately held companies went public are now so commonplace that it is hard for those who have traditionally been reluctant to change jobs to resist jumping ship.

Po-Sun Chen, principal with Zweig White & Associates Inc., a management consulting and publishing firm that serves the architecture and engineering fields says that when discussing turnover, it's important to distinguish between large and small firms. "We've found that it's harder to measure at small firms for a range of reasons. Even in hard times, many

Kira L. Gould is a writer living in New York City. She telecommutes to work at Gould Evans Goodman Associates in Kansas City, Mo., where a creative office environment and child-, pet-, and nap-friendly policies help keep people on board.

people tend to remain at small firms—loyalty is a bit stronger,” Chen says. At large firms, turnover rates hovered around 15 percent per year five years ago, and they are up to about 25 percent now. “It’s important to remember that turnover should not be zero—not all turnover is a bad thing for an organization. But there are many costs associated with turnover, and firms are trying to become more proactive to keep the people they need.”

Bucks, benefits, and ownership

Architects’ salaries (including all monetary incentives) have risen 25 percent since 1996, a 10 percent rise when adjusted for inflation, according to the *Compensation at U.S. Architecture Firms 1999 AIA Report*. Ronnette Riley, FAIA, runs a 13-person office in New York City and welcomes the salary increase. “As an industry, I think that we are significantly underpaid,” she says. “Yet it’s still a struggle. Although fees have also risen a bit, they have not caught up with salaries [see “The Fee Dilemma,” parts 1 and 2, October 1999, page 111, and November 1999, page 60].”

To better control the disparity between fees and salaries, firms are using bonuses, profit sharing, and other compensation tactics to keep base salaries from inflating too greatly. Perhaps principals know that when the feverish pace of the economy does slack off, they will be unable to support large, highly paid staffs. Instead of offering large starting salaries, firms are using signing bonuses more frequently. These can help a firm hire new people without upsetting the salary structure. Some firms are experimenting with bonuses that reward longevity, factoring in the years an employee has been with the firm. Fifteen years ago, firms didn’t need to offer the benefits and perks common to other industries because there were more architects than jobs. Many people felt lucky to be working at all. In 1990, only 64 percent of firms offered medical insurance. Today, 95 percent do, according to the recent AIA compensation report.

Traditionally, firms also offered stock only to partners. In recent years, the opportunity for rank-and-file employees to own a piece of the firm has become more widespread. The founding partners of Looney Ricks Kiss Architects in Memphis began a shared-ownership strategy when the firm opened its doors in 1983; stock is offered to employees throughout the company. “It just seemed like the fair thing to do to show our commitment to sharing the wealth,” says Frank Ricks, FAIA. “And people appreciate the sharing mentality. Ultimately, it helps build loyalty and commitment.” R. Nicholas Loope, AIA, CEO of the Durrant Group based in Phoenix, says that when employees have an ownership stake, they know that looking out for themselves also means looking out for the best interests of the firm. “Members who choose to take an equity position in the firm participate in strategic planning. It’s a ‘bottom-up’ style of communication that we think increases the degree of interest and commitment of employees.”

Environment and culture

Healthy profits have provided many firms with the resources to fund initiatives designed to strengthen the organization—including those to help keep people on board. Many firms have adopted practices common in other businesses accustomed to competing for the best help, as the compensation and ownership strategies illustrate. No matter how many of these more conventional strategies architecture firms adopt to keep employees, however, they will continue to court a somewhat idiosyncratic workforce that has never counted salary and benefits as top priorities for employment. According to Ed Friedrichs, FAIA, president of Gensler, “People tell us over and over that they stay with us because of our culture. They say that they get a kind of family ‘support’ here.”

Management consultant Donna Gaines, AIA, of Gaines International in Chicago, compares architects to workers in the information technology business. “The aesthetics and location of the office are impor-



Capping Growth to Focus on Quality.

Mackey Mitchell Architects is a 44-person firm in St. Louis, Mo.

At the offices of Mackey Mitchell Architects, managing partners Gene Mackey, FAIA, and Dan Mitchell, FAIA, share an office and an open-door policy that is noticed—and appreciated—by the people they work with every day. “People feel the firm really cares about the individual,” says Mackey. “Time-off policies are flexible, mentoring is a priority, and we believe that lifelong learning is important. We encourage people to pursue what interests them as individuals—because the firm benefits from such study. The whole group goes on an architectural ‘tour’ each year. A few months ago, we were in Columbus, Ind., and last year, we visited the Cranbrook Academy of Art. It’s a way we get to know each other, away from the office, but that still relates to architecture. That investment pays back again and again. As leaders of the firm who want this to be a great place to work, we have to extend ourselves in creative ways.”

For the Mackey Mitchell leadership, this has also meant deliberately limiting the size of the staff. “We are very successful, and we do not want to grow,” Mackey says. “We turn work away. We feel that we could risk the commitment to excellence if we allowed ourselves to balloon up—it’s a risk we are not willing to take.” The firm may not be growing in number, but it is by no means static. Office leaders encourage the staff to make decisions on their own and strive to banish office politics. In fact, studio members recently redesigned the office space to foster more interaction.

In the spirit of delegating responsibilities to staff members, the agendas for weekly meetings are set by the staff, not the partners. That respect for people at all levels of the firm is one of the things that has kept Paul Wuennenberg, AIA, on board. “Money alone has not been a lure for me. It’s the work, the people, and the culture of excellence. The complexion of the work in the office—small jobs as well as large ones—is such that people of all ages get significant design, project architect, and project management responsibilities. And, we have developed a culture within the office of pushing technology and looking for new ways to study architecture,” Wuennenberg says. “These are passionate people, and they all really believe in what they do. There’s no underestimating what that means in terms of day-to-day environment.”



Big Firm Resources and Opportunities

RTKL is a firm of 750 individuals operating in Los Angeles; Baltimore; Dallas; Chicago; Washington, D.C.; Tokyo; and London. David Brotman, FAIA, vice chairman of RTKL Los Angeles, believes that his firm offers the closeness and the collegiality of a small firm and the work opportunities of a large firm. "Young people will not get lost here. But they will benefit from the fact that the firm is large—the work is exciting, and often international."

Brotman also cites the firm's annual design conference, which brings together the top young designers from all the RTKL offices, as another thing that keeps the culture stimulating. "We are not afraid to spend money on experimenting. We do a lot of research and development in terms of how we deliver design. But we socialize like a small firm with monthly office parties so people can get to know one another."

After leaving MIT nearly six years ago, architect Helen Jeffrey started her career at RTKL Baltimore. She says she stays because she gets a chance to vary her role in the firm. "I have written marketing proposals, checked shop drawings, worked on models, and taught CAD; I like working on large, multiphase projects, but I enjoy the chance to do different things." The people and the learn-while-you-earn environment has also impressed Jeffrey. "I'm learning from gifted people that I really respect. The investments that the company is making in its people and in their tools, such as technology, are important. I also appreciate the teaching culture."

Gordon Godat, AIA, joined RTKL Baltimore after graduation in 1992. He acknowledges that "it's a great time to be a young architect," but disdains those who fail to see the big picture in the midst of a strong market. "Many people are simply attracted by the money and fail to realize the overall opportunity and potential of being a part of a diverse firm," he says. Godat was hired during the recession, which he felt made a strong statement about how successful the firm was. He also noticed that there was a five-year difference between himself and the next youngest architect, and he recognized that this age difference might mean there would one day be an opportunity for him to move into management. "RTKL promised a primary design role from the start, which they've held to, and I've been in that role ever since," Godat says. Project typology was critical, too. "I'm interested in projects on the macro scale that affect the way cities look and operate."

He has not been disappointed. "The design opportunity is overwhelming. The projects offer challenging programs, exciting clients, and international travel. And the sense of openness here has been terrific. I feel I can talk candidly with people at all levels and that I can explore new ideas. RTKL has never said 'no' to any idea I've put forward."

tant. Architects want to work in a cool place, with good lighting, where there's a sense of fun." A dynamic space and lighthearted environment can also go a long way toward relieving the stress and increased deadlines that the fast-paced construction market has brought into many firms. At the Denver office of Fentress Bradburn Architects, showers have been provided for employees who like to jog midday and plans for a small fitness area are under way. According to founding principal Curtis W. Fentress, FAIA, this change emanated from a detailed employee survey.

Employee amenities can take many forms. Shortened workweeks are not widespread, but in regions where there's an emphasis on outdoor activity, flex-time is gaining popularity. The Steinberg Group, a 100-person firm in San Jose, Calif., closes at noon on Fridays and makes up the time Monday through Thursday. Frank Ricks, of Looney Ricks Kiss, believes that his company's project-team structure helps ensure that employees can get time off for family events. "We have offered the opportunity to telecommute in certain situations, and we try to remain as flexible as possible to meet a person's needs—adjusting to the person is almost never as expensive as trying to replace them."

Empowering the Individual

Learning on the job has always been important, but, increasingly, firms are codifying how they address this issue. Gensler is an industry model often recognized for its approach to continuous learning. In addition to providing some tuition reimbursement for approved classes, the firm offers a deep and diverse set of in-house educational programs as a part of what the firm calls "Gensler University."

Even smaller firms can conduct such programs. Lucinda Ludwig, AIA, vice president of architecture at Design Forum Architects in Centerville, Ohio, was impressed by the emphasis on staff training at Kaplan McLaughlin Diaz in San Francisco. She has modeled Design Forum similarly, as a teaching office. "I enjoy teaching, and so do others on staff. We think it's important to start the mentor process on the new hire's first day. That, plus a strong orientation program, makes them feel valued."

Education and development sometimes means going outside the office walls. At NBBJ Seattle, a yearly trip for staff costs the firm some \$40,000. The group has traveled as far as Brazil and China to gain perspective and new insight. EDAA, a 1,500-person, San Francisco-based landscape and planning firm, runs a summer student program each year (costing close to \$100,000). For employees, the chance to travel and work with interns—a summer camp-style week—is seen as a perk.

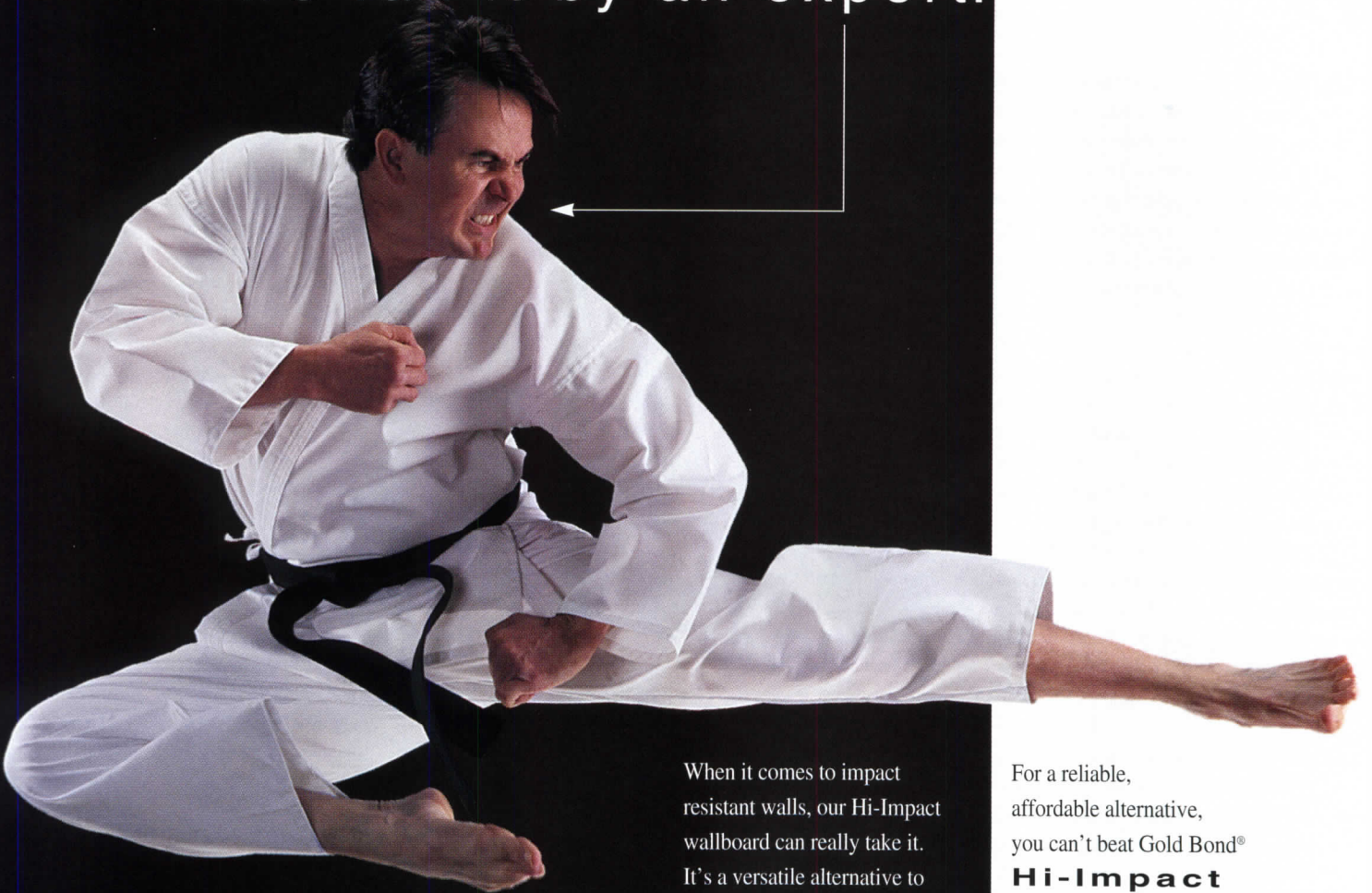
How an office is structured to handle work is also important: people at all levels want to get involved in the work in a meaningful way. John Kudrycki, associate principal at Fentress Bradburn Architects, notes that, "Job candidates care most about what their role will be and how good the work is." Kris Strain has been an intern architect at Fentress Bradburn for two years and says, "The firm does a mix of small and large work as well as national and international competitions. I have many opportunities to influence the design process. People aren't pigeonholed here, and the mentor program helps ensure that we move around the office for a varied experience."

Erin Olson Douglas, an intern architect for three years at Herbert Lewis Kruse Blunck in Des Moines, Iowa, says, "The difference here is the quality of the work that we do, the opportunities to contribute to that work, and the people. People are very receptive to ad hoc mentoring. I have more responsibility than any of my former classmates—it's valuable and exciting."

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Opportunity to Become a “Complete” Architect

Garrison Siegel Architects is a 12-person firm in New York City.

Jim Garrison, AIA, and Rob Siegel, AIA, founded their firm in 1991.

“Keeping employees is basic, but not easy,” says Siegel. “Architects must feel that they are part of great work, that their personal growth is tangible and appreciated, and that they are intellectually and technically challenged. Getting and doing great work is critical to recruiting and keeping great talent.”

The work varies widely. Last year, Garrison Siegel completed the Swiss Center in New York, and before that, they won a competition and completed a design for the Korean embassy in Beijing (which awaits funding). The firm has worked to keep salaries and benefits up to speed with industry shifts. While the firm doesn't offer profit sharing, they do give bonuses each year. These are calculated on several factors, including the length of time that employees have been on board.

Still, these efforts are not why people come—or stay, Siegel insists. Employees find an intellectual and professional comfort zone here, he says, pointing out that, after a couple of years, with his firm an employee can “become a ‘complete’ architect. They are all exposed to marketing, site visits, client and contractor meetings, and working out details on every aspect of the project. Jim and I work that way, too. We also push ourselves to invent or research new technology, and people get excited about that.”

James Puckhaber, an intern architect with Garrison Siegel for more than two years, says he likes the “direct access to the principals and the fact that we all do everything—the exposure to all aspects of the work is important.” He admits that he would like to work on larger projects, but says that the variety of work the office pursues keeps him interested. Puckhaber has noticed that many architects his age have been switching jobs every six months or so—far too soon, he says, to be tuned in with a firm's idiosyncracies and find one's niche in the organization's way of doing things.

The social side of Garrison Siegel is something that partners emphasize, too. Friday “happy hours” are typical, and social gatherings outside the office are organized on a regular basis. Last summer, a group of nearly 30—current employees and “alumni”—took a sail around Manhattan. “We work hard, but we also want to get out of the office and enjoy the city and each other,” Siegel says.

eight years will slow. Kermit Baker, the AIA's chief economist, says that architects have positioned themselves to better weather the coming change. “We are seeing less of the exaggerated growth rates than we did in the 1980s. Most of us remember the recovery from that phase—it was a difficult time for the profession and we learned a lot.” Still, the boom has permanently changed what architecture-school grads expect from employers: they may not enter the field for the money, but at least they can count on benefits from most firms. And firms of all sizes will likely continue to assume responsibility for educating and challenging young and rising practitioners. This market will leave its mark on the expectations of architects across the country. ■

Points of Enlightenment

What goes around comes around. Although everyone wants to be paid a fair wage for what he or she does, a good salary alone isn't the bottom line for most people. Workers say:

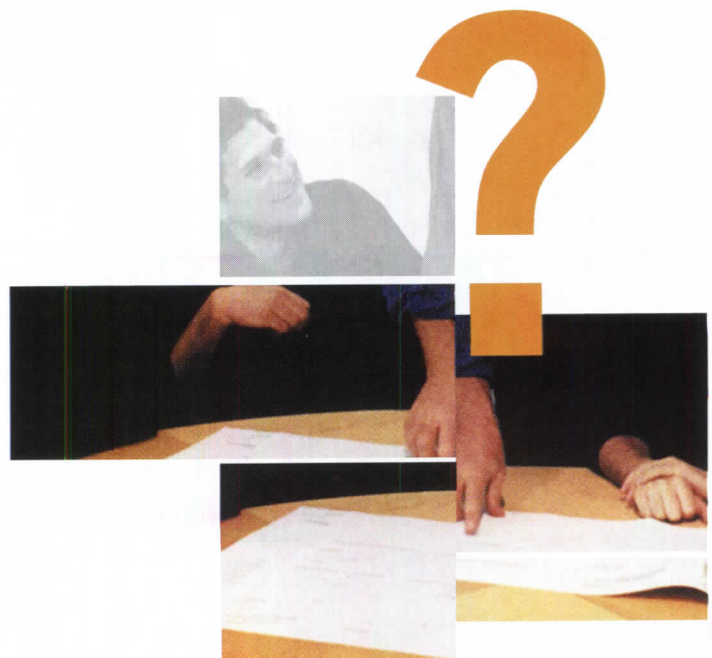
Don't pigeonhole me. Employees want interesting and varied work so their jobs don't become moribund. A former employee of one major firm says, “I got locked into writing specs because I was good at it. Pretty soon it seemed like the project managers had forgotten I was capable of doing other things, even though I kept reminding them I wanted to take on other assignments. I felt the firm had no long-term plans for me except more spec writing, so when I got another job offer, I bolted.”

Mentor me. Whether learning opportunities are as sophisticated as the trips overseas offered by some architects' offices, as costly as tuition reimbursement, or as simple as monthly lunchroom seminars, the willingness to invest in education should be seen by workers and managers as a commitment to a lasting partnership made by both parties.

Recognize me for a job well done. Sometimes, rewarding an act of exceptional effort by an employee at a company party can be a more important and memorable moment in that individual's career than a pay raise or a cash bonus, which are normally kept confidential.

Work with me. The development of a “growth plan” for each employee helps keep the expectations and career goals of the employee in synch with the needs of the firm. This growth plan can become the basis for an annual or semiannual salary review. Such scheduled reviews are advantageous because they help establish a cause-and-effect relationship between a worker's accomplishments and progress and his or her salary.

Charles Linn, AIA



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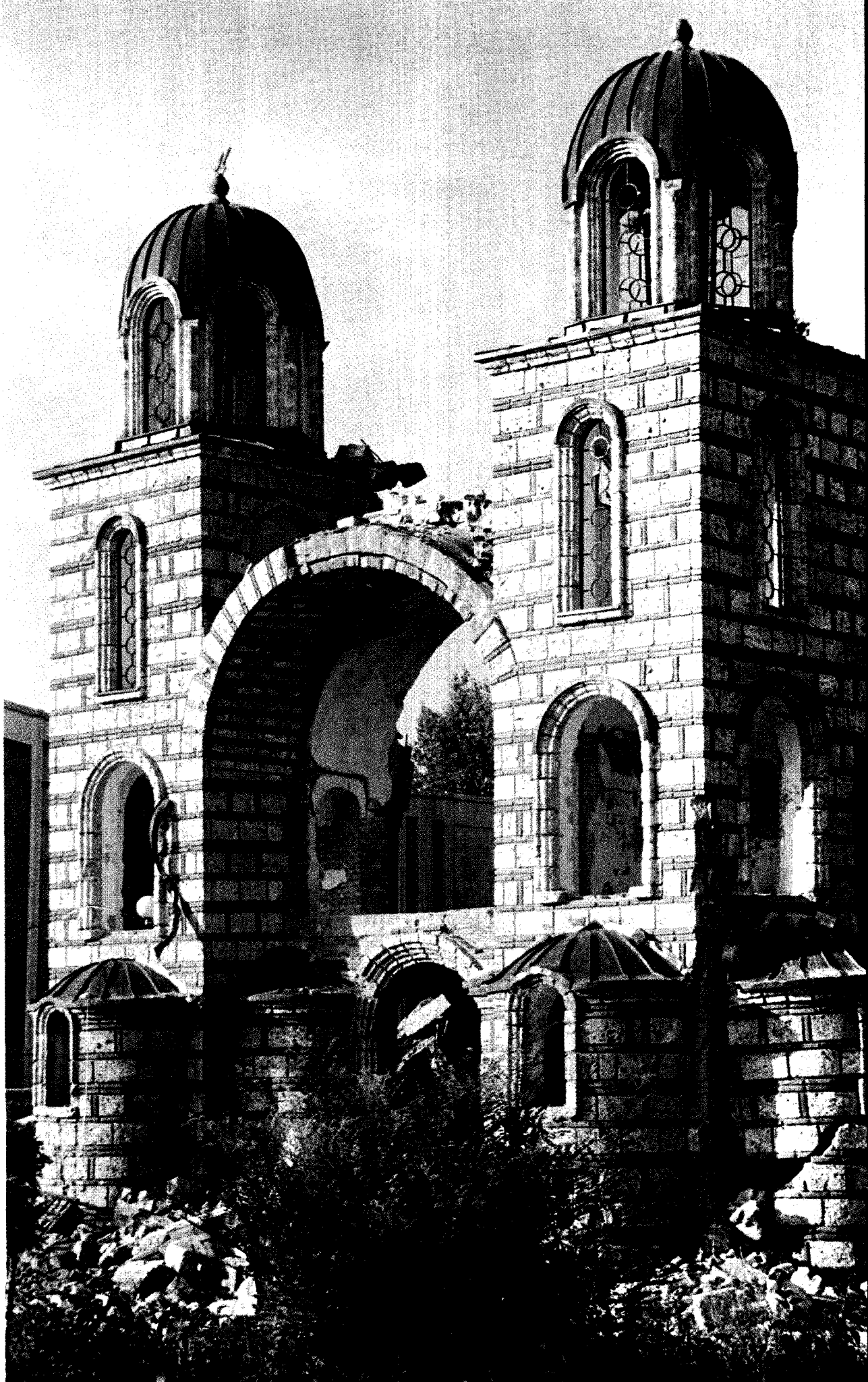
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This page: Church of the Holy Trinity, Djakovica/Gjakova, completed and destroyed in 1999.



KOSOVO: Walls but No Shelter

Photos by Ted Phillips

Last spring, while NATO planes carried out a bombing campaign against military targets throughout Yugoslavia, Serb forces—the Yugoslav army, paramilitaries, and civilians—used the cover of war to step up efforts to systematically remove Kosovo's Albanian majority. Approximately 100,000 Albanian homes were severely damaged or destroyed by Serbs, as were many mosques, some brand new and others dating from as early as the 15th century. Since June, and with the return to Kosovo of most of the 800,000 Albanian refugees, vengeance-seekers have targeted Serb homes and cultural monuments, like medieval Serbian Orthodox monasteries, as well as the homes of Roma (gypsies), who are viewed by many Albanians as Serb collaborators. This is happening even as Kosovo is under NATO occupation.

New York City-based photographer Ted Phillips documented the destruction. Unless both Serbs and Albanians use the same name for a town, the towns pictured are identified in Serbian and Albanian, respectively. *David S. Morton*

Below, background: Hadum Mosque in Djakovica/Gjakova, built in the 16th century.

PHOTO ESSAY





Above: Red Mosque in Peć/Peja, built in the 17th century.

Below: Home belonging to a Muslim Slav family in Kosovska Mitrovica/Mitrovice.





Above: Cafe formerly patronized by Serbs in Kosovska Mitrovica/Mitrovice, reopened by Albanians.

Below: Home belonging to an Albanian family in Kosovska Mitrovica/Mitrovice.





Above: Albanian neighborhood in Peç/Peja.

Below: Mosque near Prizren, destroyed before it was completed.





Above: Jewelers' row in Djakovica/Gjakova.



Above: Homes belonging to Roma families in a village near Prizren.



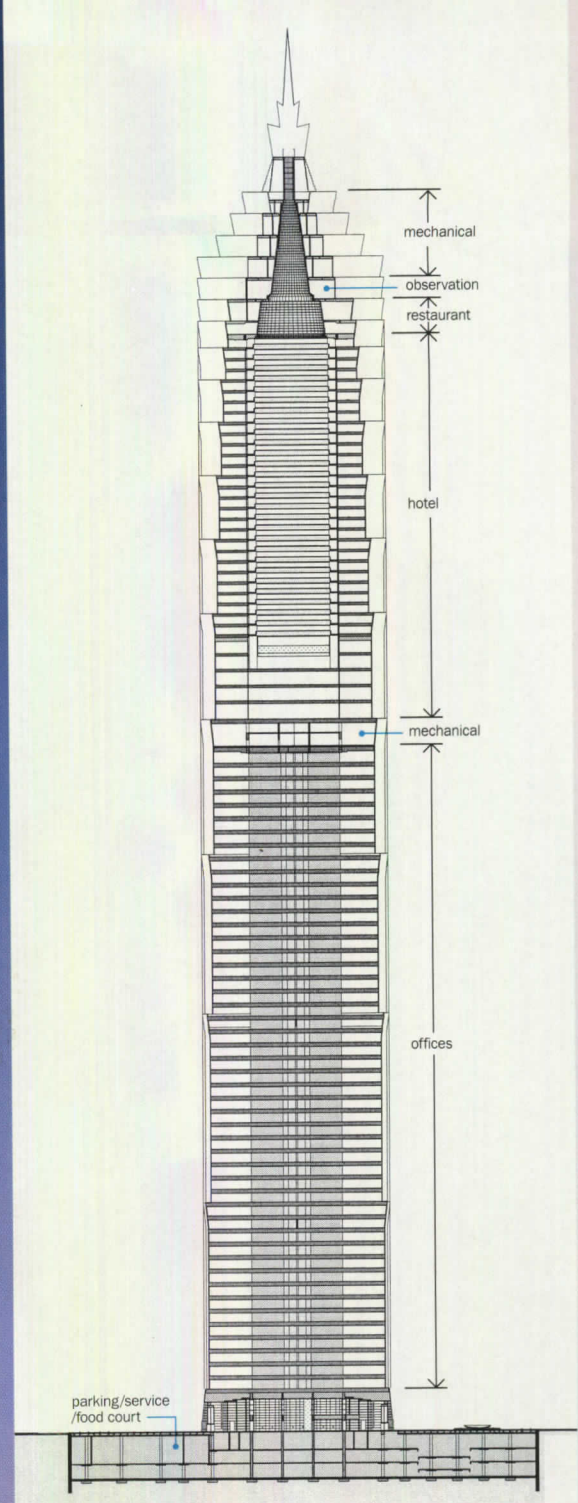
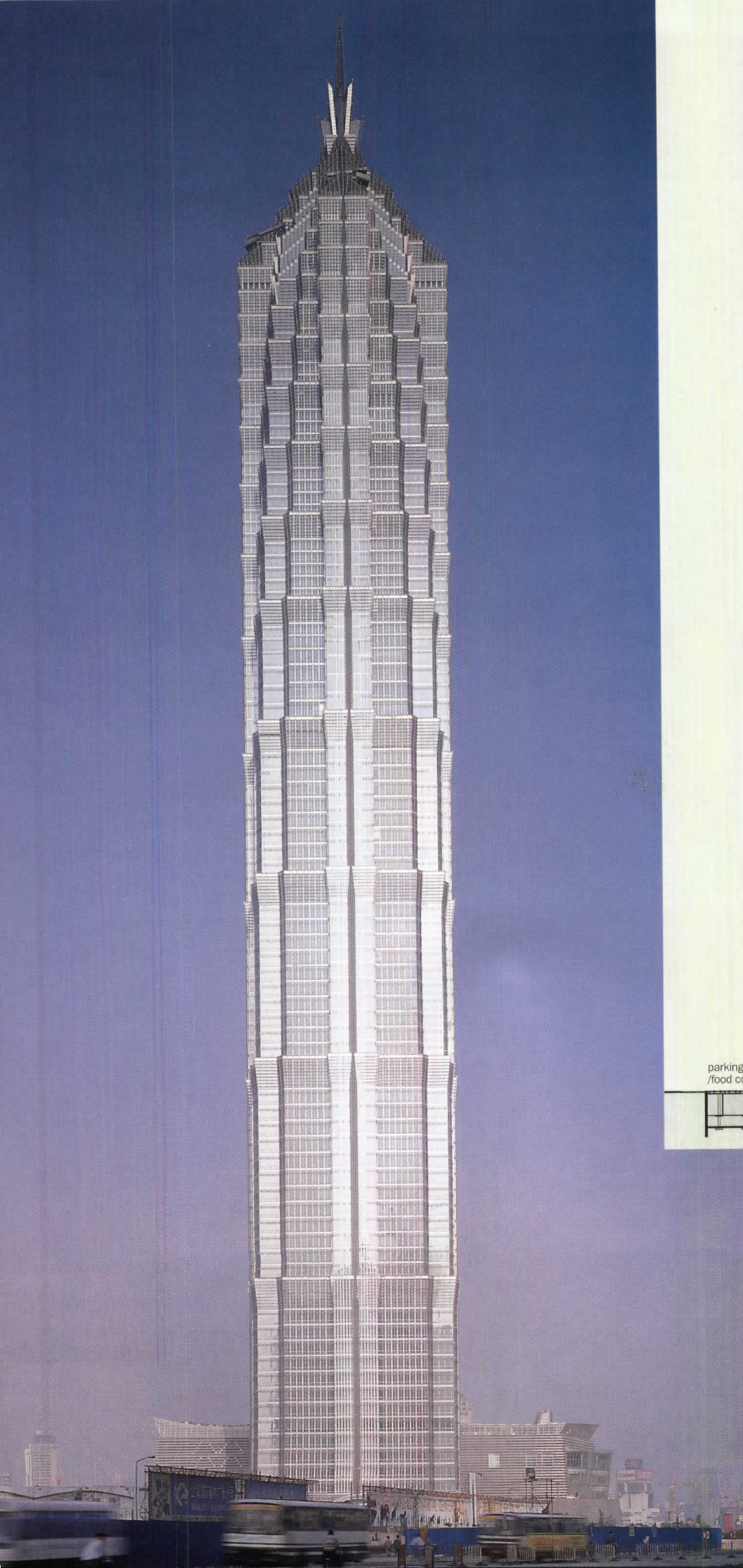
ordinary or extraordinary

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CIRCLE 41 ON INQUIRY CARD





Located across the Huangpu River from the old part of Shanghai, Jin Mao anchors the new Lujiazui Finance and Trade Development Zone (opposite). The project includes a podium building with retail and banquet facilities (bottom in photo left), 52 floors of office space, and 31 floors of hotel rooms on top.

Rising at the heart of Shanghai's new business district, the **JIN MAO TOWER** designed by **SOM** reflects the new face of China.

By Thomas J. Campanella

Shanghai is not for the humble or the meek. It is a soul-rattling place where adrenaline runs from the taps and women dress to kill. Carl Sandburg would have loved it, and the muse of Louis Sullivan seems to have taken up permanent residence here. Shanghai has been called everything from “the Whore of Asia” to “the Paris of the East,” but these days, the metropolis on the Huangpu River is most evocative of Chicago, its American sister city. And crowning Shanghai's skyline now is a monument straight from the shores of Lake Michigan.

Created by the Chicago office of Skidmore, Owings & Merrill, the Jin Mao building is China's locomotive ego in built form. Forget about human scale and the sustainable city; this one is for the romantics and the record books. Rising 1,380 feet above Shanghai's Pudong New Area, Jin Mao is the loftiest skyscraper in a nation that has erected more tall buildings recently than any on earth. The building's 70,000 tons of steel support the highest hotel in the world—the Grand Hyatt Shanghai, which boasts the tallest atrium ever built and the longest laundry chute.

Built for \$540 million, Jin Mao is a self-contained city whose construction was an odyssey in itself. Never before in China had concrete been pumped so high; never had pilings been driven so deep. It is China's most intelligent building, with the equivalent processing power of a spaceship and wire enough to span the Pacific. It is also an icon, already known on the street as *dong fang ming zhu*—“shining pearl of the east.”

Fueled by the boom economy of the 1980s, the Chinese landscape has undergone a cataclysmic transformation in recent years. Mountains have literally been moved for expressways and suburban tracts, and old urban districts have been blotted out overnight for shopping malls and office towers. It is at Pudong, across the Huangpu River from Shanghai, that a quasi-capitalistic “New China” is taking its most breathtaking form. A whole new city has erupted from the rice fields and village lanes, even as the remains of the past squat all around.

What Jin Mao's developers—the China Shanghai Foreign Trade Centre Company—wished to build at Pudong was nothing less than its

Thomas J. Campanella is a Fulbright fellow in Hong Kong, where he is working on the forthcoming book Eighteen Holes in the Good Earth: Dispatches from the New Chinese Landscape.



crown jewel, the alpha skyscraper in China's most celebrated experiment in urbanism. A Sino-American team of architects and engineers led by SOM has delivered just that. Jin Mao rises like a clean silver bolt above Pudong. The building's curtain wall—a bristling hide of steel mullions, aluminum fins, and reflective glass—not only reduces solar gain but also gleams in the sun, making the tower conversant with the sky.

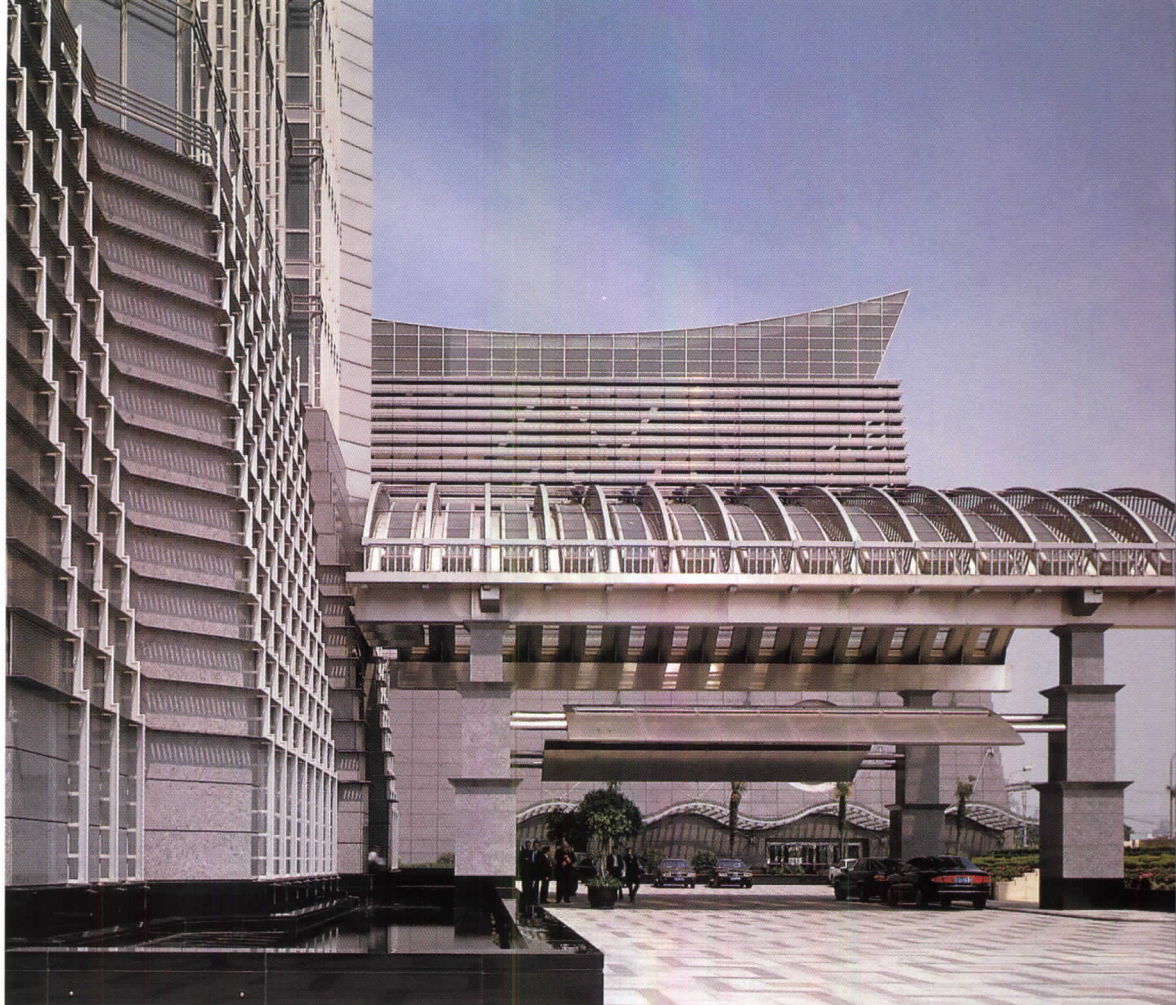
The tower is lithe and slender, with a biaxially symmetrical shaft and an aspect ratio of 8-to-1. A series of setbacks taper the tower into 13 segments, each diminishing in height by a factor of eight until the top floor is reached, 88 stories above the street. The preponderance of eights is no accident. The number is auspicious in Chinese culture and commonplace in building design throughout Asia (the Petronas Towers in Kuala Lumpur are also 88 stories tall). When spoken in Chinese, “eight”—or *ba*—sounds like *fa*, a character that signifies wealth or fortune. “Eight-eight” thus resembles *fa fa*, an emphatic expression of prosperity.

Project: Jin Mao Tower, Shanghai, China

Architect: Skidmore, Owings & Merrill LLP—Adrian Smith, AIA, design partner; Thomas Fridstein, FAIA, project partner; Raymond Clark, MEP partner; D. Stanton Korista, Paul DeVlyder, Thomas Scheckelhoff, Steve Hubbard, AIA,

Peter Weismantle, AIA, Lou Oswald, AIA, Mark Sarkisian, Paul Kwong, Sherman Leong, Bob Blohm, Brian Schirmer, Al Khoshaba, project team
Associate architects: East China Architectural Design and Research Institute (construction); Shanghai Institute of Architectural Design and Research (preconstruction)

The building's curtain wall is an assertive combination of steel mullions, aluminum fins, and reflective glass. The building's skin changes character with varying atmospheric conditions and the time of day (opposite). A porte cochere in front of the office tower provides protection from the sun and rain (right).



HISTORY

The significance of the Jin Mao building is bound to Shanghai's past. In spite of being China's largest city, metropolitan Shanghai is neither very old nor particularly Chinese. A feudal walled city founded in the 13th century, Shanghai was one of several "treaty ports" opened after the Opium War as a "concession" to the victorious European forces.

Western architecture soon dominated the city, and the Bund—Shanghai's famous waterfront avenue along the Huangpu River—became a rampart of Neoclassicism.

The metropolis that evolved after 1850 was for the most part an alien import, however grand. For years, planners dreamed of a new, Chinese metropolis. Today, that city is ascending at Pudong, an urbanistic riposte to the humiliations of the colonial past. If Shanghai is to be China's flagship metropolis for the next century, Pudong is its prow, or, as Deng Xiaoping, China's late paramount leader described it in a celebrated "inspection tour" in 1992, the "head of the dragon." Its centerpiece is the Lujiazui Finance and Trade Development Zone—Pudong's "Golden District." Based

on a loose combination of schemes submitted in an international urban design competition (which included star architects such as Richard Rogers, Dominique Perrault, Massimiliano Fuksas, and Toyo Ito), a master plan for the area was prepared by the Chinese authorities in the early 1990s. A large Technicolor crystal model was unveiled, promising an urban future straight out of the 1926 Fritz Lang motion picture *Metropolis*. Few urbanists took it seriously.

Still, the Lucite confection is fast becoming reality. Several years ago, the "Oriental Pearl" television tower alone dominated the horizon; today, more than 100 new skyscrapers jostle for the sky. For the most part, these are a derivative lot, a carnival of monuments imported from around the globe.

To Jin Mao architect Adrian Smith, AIA, these buildings are suffering an identity complex. "They are kind of bizarre," he says. "The Chinese architectural community has, by and large, turned its back on its own past. Architects in China are striving to create a 21st-century metropolis, and there seems to be this feeling that to do so, history must be discarded."

The people of Shanghai themselves pull no punches when it comes to critiquing bad architecture. Pudong's new convention center, opened in time for last year's Fortune Global Forum, features a high-tech facade on the Pudong side, a Neoclassical elevation facing the Bund, and two massive globes in between. Locals have labeled it "Shanghai's ugliest building." *T.J.C.*

While Jin Mao's segmented articulation employs Chinese numerology to good effect, its real purpose is to evoke the form of a Chinese pagoda. Adrian Smith, AIA, the SOM design partner in charge of the project, sought a building "that in some way evoked the culture and memory of China, that was unmistakably Chinese." He was most impressed by China's ancient pagodas and the way these often served as "a center of gravity" in villages. "The pagoda struck me as a fitting reference point from which to begin thinking about the design of a Chinese skyscraper." Visually, the pagodic form lends momentum to Jin Mao's shaft, thrusting its mass skyward and creating an impression of lightness.

Formally, the pagoda is a legitimate model for a tall building. But how defensible is it on a philosophical plane? Is a Buddhist religious icon appropriate for a mammon temple in an officially godless land? For that matter, is it really necessary that a modern skyscraper, wired to the global bitstream, genuflect to the past to gain cultural legitimacy? In Asia today, history is often invoked to temper or validate the drive toward modernization—a particular irony in the People's Republic, where the past was once vilified as decadent and bourgeois.

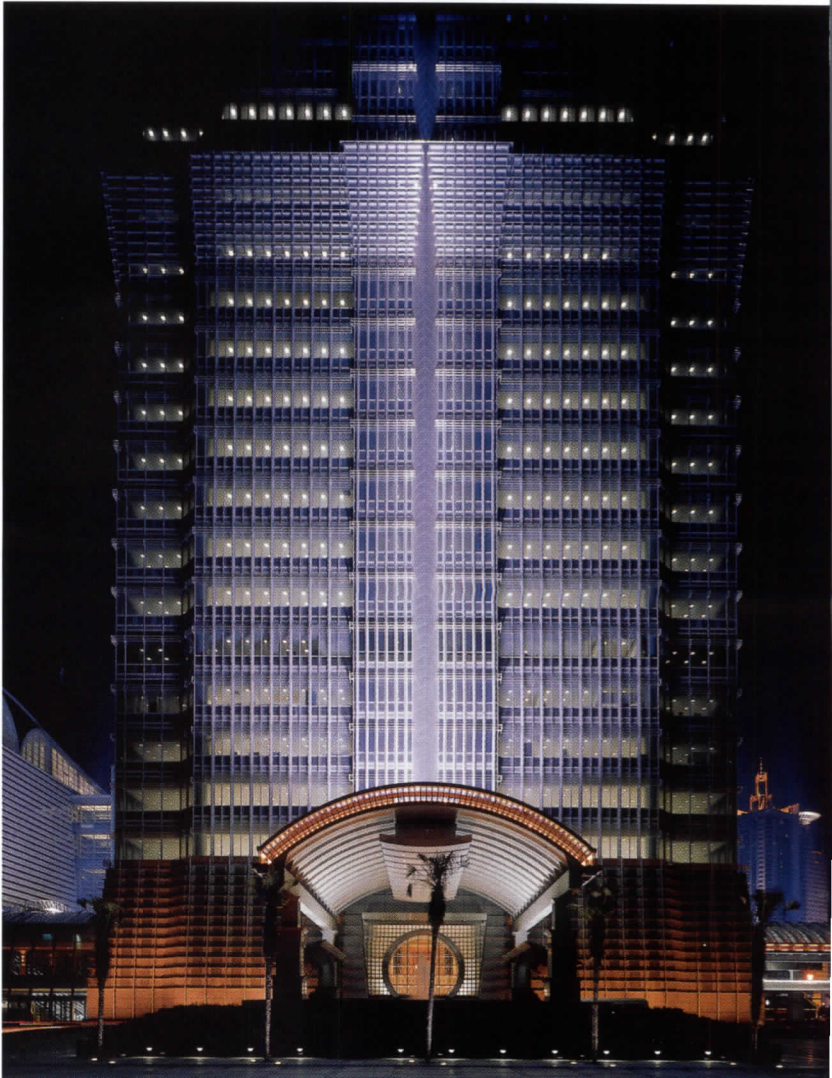
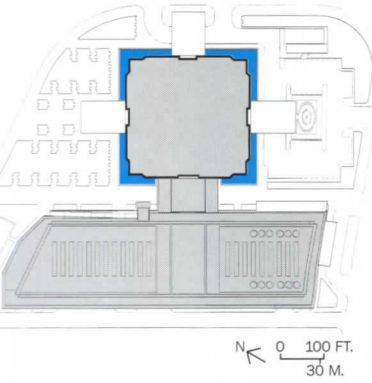
Dr. Ho Puay-peng, an architectural historian at the Chinese University of Hong Kong, has no problem with Smith's use of the past. Though the function of early pagodas was indeed religious, they were later used for secular purposes. "By the Ming dynasty, pagodas were often built for *feng shui* reasons," he says, "to block an evil force or to create, in effect, a hill where geomancers determined one was needed." Pagodas were also associated with success on the imperial examinations, because they were thought to "draw into alignment the literary constellations."

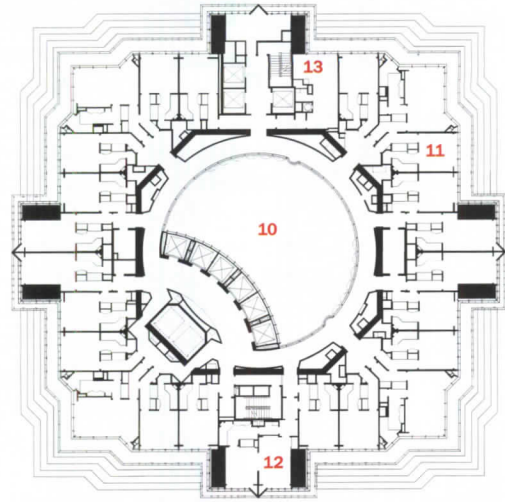
The infusion of historical reference in the design of a skyscraper is among architecture's most perilous endeavors. Hungry to pay homage to a culture they barely understand, designers often rummage through the past like blind men in an attic. The results are sometimes laughable: In Beijing, countless office towers wear neotraditional Chinese rooftops meant to "sinofy" otherwise Modernist boxes. Jin Mao, though, successfully fuses past and present, melding the two with subtlety and restraint. To Dr. Ho, the pagoda reference is "a clever use of imagery for a high-rise building; there is a certain logic to it." The building is certainly popular with the people, and this is, after all, the People's Republic of China. Nearly every individual interviewed on the street said Jin Mao *da xia* ("big tower") is a symbol of the city and a point of pride for the Chinese.

Jin Mao is composed of two buildings: the 88-story tower and a squat 6-story podium building hunkered beneath it. The tower contains 52 floors of commercial office space, with a total gross floor area of 1.33 million square feet. Office floor-plate areas range from 25,466 to 30,110 square feet, and the floor-to-ceiling height is 8.9 feet. The floors are column-free and use the international standard 1.5-meter (4.9-foot)

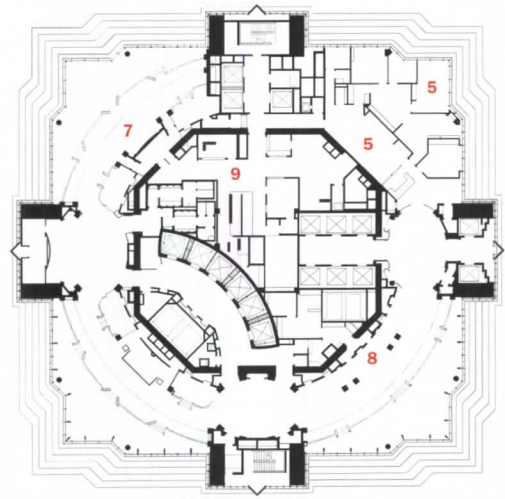
planning module (as does the exterior facade, to facilitate partitioning along the perimeter). Among the first commercial tenants are Dow Jones and Dresdner Bank.

Above the office zone is the Grand Hyatt Shanghai, which begins on the 54th floor and features a spectacular 31-story Guggenheim-on-steroids atrium. The hotel is easily one of Asia's finest, with 555 well-

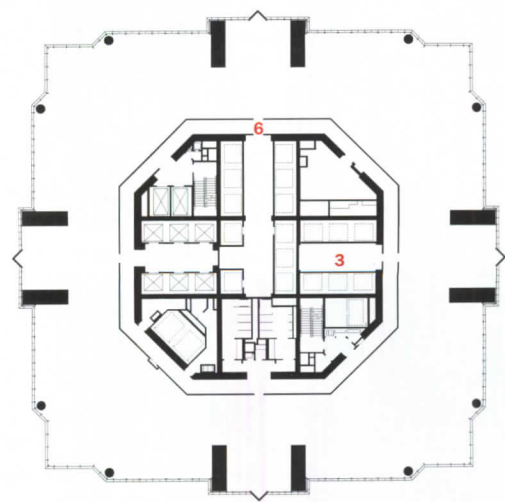




TYPICAL HOTEL FLOOR (LEVELS 60-64)



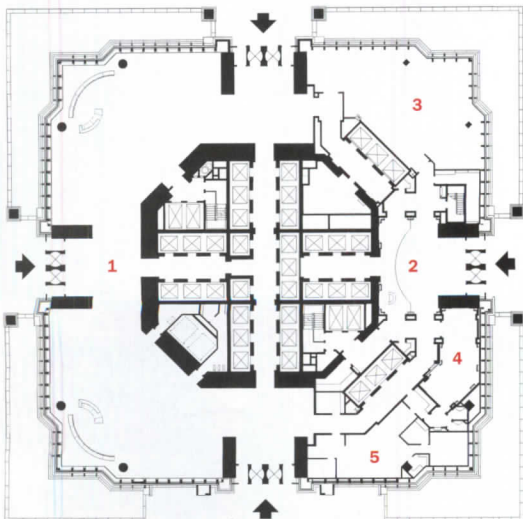
54TH FLOOR (SKY LOBBY)



TYPICAL OFFICE FLOOR (LEVELS 18-23, 26-29)

The six-story podium building (above and opposite) contains a shopping mall, cinema, food court, and conference facilities for the Grand Hyatt. The 52 office floors range in size from 25,000 to 30,000 square feet. The hotel starts on the 54th floor and rises 31 stories.

1. Office lobby
2. Hotel lobby
3. Tenant
4. VIP lounge
5. Hotel offices
6. Multitenant corridor
7. Restaurant
8. Hotel reception
9. Kitchen
10. Atrium
11. Guest
12. Suite
13. Housekeeping



GROUND FLOOR







The angled geometry of the office-tower lobby (above) contrasts with the great curves of the 31-story hotel atrium (opposite). The building's structural heart is a great concrete core surrounded by an array of eight composite megacolumns. One of the hotel's restaurants (right) offers a partial view of the structural system and a sweeping view of Shanghai.



appointed rooms, nine restaurants, a swimming pool on the 57th floor, and breathtaking vistas of metropolitan Shanghai.

The podium building, with its roofline reminiscent of an open book, contains a shopping mall and cinema, food court, and the Grand Hyatt's conference facilities and ballrooms. The building is an effective counterweight to the tower, giving the ensemble a satisfying equilibrium. Though the designers didn't intend for it to happen, people have begun referring to the two as a "pencil and open book"—a reference amplified by the literary association of pagodas.

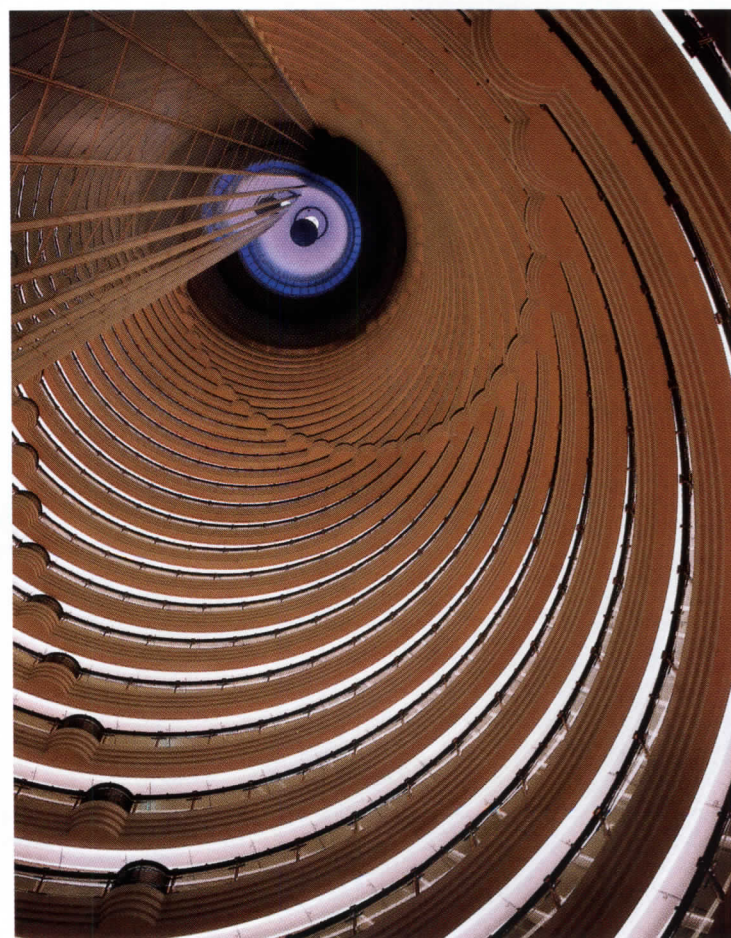
If there is a weak link here, it is the connection between the podium and the tower. While the tower has its own lobby, the main entrance to the complex—and the most heavily used—is between the two. The expectation here is for an arrival experience equal in majesty to that of the tower's entry. Sadly, there is no such grandness. Rather, visitors are delivered into a low-ceiling lobby where a Pepsi sign, set above the escalators to the food court, is the most memorable feature. What makes this so frustrating is that the podium's lofty atrium lies to the left, just out of sight behind a low-slung bridge—the result of a last-minute design change to meet code requirements. "The two sides of the atrium

FROM THE TOP OF JIN MAO, THE GRAND SCALE OF CHINA'S AMBITION IS EVIDENT, AS IS THE SPEED OF CHANGE.

had to be linked," explains Smith; "I had a circulation ring on every floor but that one, because I wanted to keep the view to the atrium open." He says further, "I was disappointed by the change, but on the other hand it adds an element of surprise."

The structural heart of Jin Mao is a great core of concrete surrounded by an array of eight composite megacolumns with smaller steel columns between them. The core, hexagonal in shape, contains a cruciform diaphragm wall, within which are the elevator shafts and mechanical equipment. Two sets of massive outrigger trusses, each 26 feet across and occupying two floors, secure the megacolumns to the central core, providing lateral rigidity.

It is from the top of Jin Mao that the grand scale of China's ambition becomes evident and that one begins to comprehend the speed at which the nation is hurtling out of its past. At the building's base, old villages lay in tatters, in the process of being cleared for the next cluster of skyscrapers. Great piles of wrecked matter burn all night, besotting Jin Mao's high-performance windows with the soot of centuries-old wood. When the first sunbeams of the new century greet Shanghai, it will be through Jin Mao's soaring glass, and its veil of ashes. ■



Credits (continued)

Interior designer (hotel): *Bilkey
Llinas Design*

Consultants: *Shen, Milsom & Wilke
(acoustical); Fisher Marantz Renfro
Stone (lighting); Rolf Jensen &
Associates (fire/life safety/codes);
Woodward-Clyde, Inc. (geotechnical)*

General contractor: *Shanghai Jin
Mao Contractor*

Sources

Anodized aluminum curtain wall:
Josef Gartner & Co

Glazing: *Guardian*

Fluorescent fixtures on office levels:
Thorn

Maple paneling in office-tower lobby:
Imperial Woodworking

Acoustical ceiling tiles: *Armstrong
and USG*

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The hotel lobby features a quirky melange of hand-carved wooden stools from the Philippines, steel benches upholstered in tufted silk, gilt molar teeth, plus an overscaled vase. The exterior of the former office building (opposite) comes alive with interior lighting at night.



Philippe Starck once again unbottles his joie de vivre to a bracing effect in **ST MARTINS LANE HOTEL** near Covent Garden.

By Suzanne Stephens

All glamorous capital cities get stuck with architectural losers, and London has more than its fair share of dreary modern postwar architecture. The situation is salvageable, however. As the irrepressible French designer, Philippe Starck, along with savvy American hotelier Ian Schrager and his in-house architect, Anda Andrei (originally from Romania), demonstrate, it's possible to transform a dowdy office building into a smart international caravansary. From the moment the seven-story, late-1960s building opened last fall as a 204-room hotel in the Covent Garden area, it was a smash. Dressed-in-black arty types fill its restaurants and bars, mill around the lobby, and retire to rooms that begin at a relatively affordable \$200 a night. Black, or gunmetal gray (the shade of dress for the hotel staff), goes particularly well in the spare white environment, drenched here and there with brilliant splashes of color. Indeed, color and light are crucial design motifs. They deftly and quickly transform a simple, neutral interior into a vibrantly hot mise-en-scene for people who are beyond cool.

"This is the first modern hotel," Starck hyperbolically asserts about his design concept. "Modernity is transparency and energy and dematerialization," he adds. "We played with light and color to give it life. We wanted a boiling pot with all the energy of the city." For those who only feel at home in staid, posh old-world surroundings with burnished oak paneling, this may not be the venue of choice. The Connaught it's not. But to the design team's credit, there is more to the place than color and light. The hotel ambience succeeds as a knowing mix of whimsy, energy, and serenity, especially in the bedrooms.

It used to be so blah

The original office building, a concrete column-and-slab frame with pre-cast-concrete-and-glass exterior walls could not have been more conventional. Andrei kept the basic columnar grid and gutted the rest, using drywall construction for rooms, and adding baths, new mechanical



systems, and new elevators to the 180,000-square-foot hotel. She also replaced the glass-and-spandrel panels in the exterior wall with 9-by-9-foot double layers of glass.

In the lobby Starck and Andrei beefed up six interior columns to 5-foot, 3-inch diameters to subdivide this open space into seating and reception areas. The fat columns are plain, most walls are white, and the Portuguese-limestone floor is off-white. Starck gave the spaces in and around the columns distinct personalities, however, using color, light, and idiosyncratic furniture of varying scales. The lemon-yellow hue and theatrically placed lights, along with the quixotic assortment of furniture, offer cheeky ebullience to the potentially severe setting. While the surreal ensemble (which includes molar teeth stools and kitschy gnomes) could border on cute, the effect is actually not overdone, partly because the giant columns prevent you from taking in all the objects in one glance. Instead, you come upon these set pieces episodically.

An axial route through the lobby leads from the front entrance to the Light Bar at the rear. Here, four 25-foot-high openings punched between the ceiling beams borrow space from an unused portion of the

Project: *St Martins Lane Hotel, London*

Client: *Ian Schrager London Limited*

Designer: *Philippe Starck, overall design; Bruno Borriane, design team*

In-house architect: *Anda Andrei, president of design, Ian Schrager Hotels; Helka Puc, Kirstin Bailey, Anne Ondrovic, Kim Walker, Natasha Ziff, Hilary Gilford, Leila Fazel,*

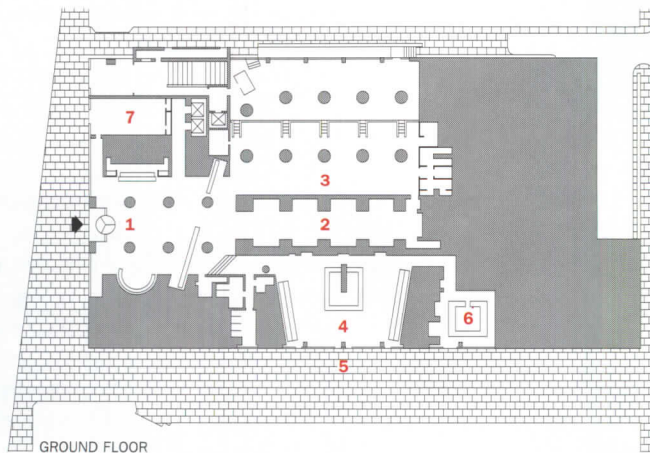
Courtney Friedlander, Sara Adams, design team

Production architect: *Harper Mackay Ltd.—David Harper, director; Peter Korkolls, Peter Gilbertson, Jef Smith, team*

Consultants: *Ove Arup & Partners, mechanical; Isometrix (Arnold Chan and Gary Campbell), lighting*



1. Lobby
2. Light Bar
3. Asia de Cuba
4. St M Brasserie
5. Outdoor cafe
6. Sea Bar
7. Shop



Lemon-yellow glass encloses the limestone reception desk; a Louis XV-style concierge desk is tulipwood, while the Salvador Dali "Leda" chair is cast bronze. As the plan (left) indicates, the public spaces are carved out of the building's footprint; the remainder provides for

back-of-the-house operations. The Light Bar's black slate floors and gray walls (opposite top) are dramatized by double-height voids, lighted and painted different colors. St M Brasserie (opposite bottom) features cumaru wood and tan leather banquettes.



second floor. Dramatically punctuating the long rectangular room, these light wells are painted and illuminated in coruscatingly intense colors, casting a phosphorescent glow over the white bar furniture.

To one side of the Light Bar is the Asia de Cuba restaurant, which Starck designed to be festive, idiosyncratic, and elegant. Its hefty columns are girded with decorative objects or shelves with books and photographs, or just plumped up with tufted silk. Their rounded forms, echoed by semi-circular banquettes at the rear of the restaurant, create eddies of space for tables, edged at the front by a standing bar.

On the other side of the lobby, a wide, shallow stair leads up to the “modern” bistro, St M, and beyond that, the small white marble Sea Bar. St M’s clean lines are warmed by expanses of African cumaru wood and simple tan leather banquettes. As Andrei explains, “It is supposed to have a computer-generated look.” The effect succeeds, without draining the place of detail, largely because of the rich, natural grain of the wood and leather.

The bedrooms are simple and spare, in part because of the all-

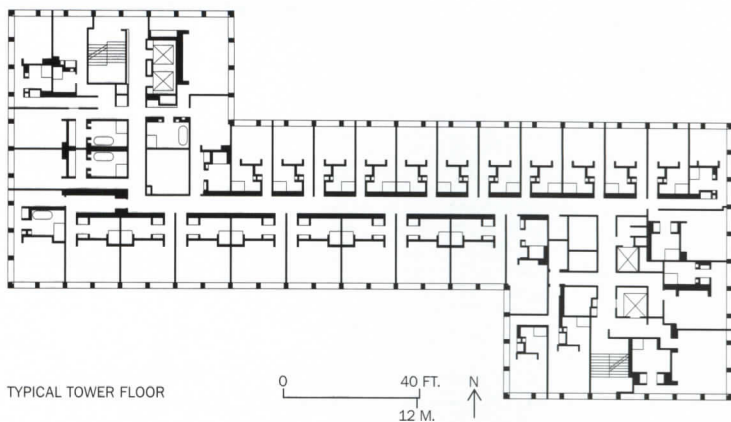


A forest of tall tables in the Rum Bar at the front of the Asia de Cuba restaurant (above) creates a permeable boundary to the dining room. Here the fat

columns are laden with shelves of photos, books and other artifacts. Floors are bleached maple, with Scandinavian-style wood-laminate chairs.

In the bedrooms (opposite), headboard lights shift colors from warm yellow to deep purple. The views out serve as the "art," emphasized by the

white furnishings, including a Starck-designed cross-shaped armoire for the TV, a bottom-lit onyx table, and a lucite chair.



white color scheme and the simple lines of the Starck-designed furniture. New floor-to-ceiling glazing gives each bedroom light and panoramic views: Two bays of glass amplify the sense of space for the typical 350-square-foot room. Corner rooms benefit from glass walls on two sides, particularly where three and a half bays of glass stretch along one side. Because the hotel tower, five stories in all, sits on a two-story base, the architects could create rooms with small walled-in gardens on the second floor.

Enhancing the mood

The spartan rooms are quickly “decorated” with a flick of the headboard light switch, which offers each guest a range of colors from soft sunrise yellow to deep purple. Candles, lit at night by the staff, enhance the mood. Clearly, much of the hotel is about ambience. In the bedroom, guests modify the environment according to personal disposition. “The style of tomorrow is freedom of choice,” Starck pronounces. “You are no longer a consumer but an actor.” (In case you prefer to act out your fantasies by reading or working, the proper lamp light is also available.)

Starck, Schrager, and Andrei work together well. With the Royalton, the Paramount in New York, the Delano in Miami Beach, and the Mondrian in L.A., the team’s modus operandi has emerged: buy an existing building, not in its prime, work with its architecture, add Starck’s design panache, hire an attentive hotel staff, and voila! Although St Martins Lane is the group’s first overseas hotel, the trio is already at work on Sanderson’s, another hotel renovation of a 1950s building in London, scheduled to open this spring. They also have designs on the larger Miramar in Santa Monica, Calif., and the Henry Hudson in New York City. Such rapid growth may create pressures, particularly because they rely on surprise rather than a formulaic theme. So far, they haven’t run out of ideas. ■

Sources

Exterior cladding: *TW Ide LTD glass (ground floor); Robertson & Vogue Ltd, metal (ground floor); Parry Bowen Ltd, metal and glass panels (upper floors)*

Interior glass (yellow): *Concepta*

Ceiling: *Burgess Ceiling Ltd.*

Cabinetwork: *Ruddy Joinery (lobby), Sherlocks Interior Contracting Ltd, (rooms).*

Floor and wall tile: *Portuguese moleanos limestone*

Furniture: *Cassina; Philippe Starck (custom)*

Bar: *Corian surfacing for counter and stools*

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



South elevation (above) shows one of the building's glass-enclosed gardens. Colorful awnings pull down to shade the west-facing library (below).



Behnisch, Behnisch & Partner let the environmentalists at the **IBN-DLO** institute in Holland practice what they preach.

By Tracy Metz

Stress and anxiety evaporate the moment you enter the building that the German firm Behnisch, Behnisch & Partner designed for the Dutch Institute for Forestry and Nature Research (IBN-DLO) at an agricultural university in Wageningen. As a pilot project in sustainable and user-friendly architecture for the Dutch Ministry of Housing and the Environment, it is—literally and figuratively—as green as they come. Form and function, inside and outside flow together in this delightful building, where earth scientists conduct their research in appropriately Eden-like surroundings.

Built on a former cornfield, the IBN-DLO building is shaped like an E, with two glazed gardens between the offices in the three “fingers.” The north-facing spine of the E houses the laboratories, the only mechanically ventilated spaces. The south-facing fingertips house a library, where on bright days a warm light falls through pink and orange sunscreens, a meeting room, and a small restaurant. A patterned concrete path, part of American artist Michael Singer’s contribution to the project, leads from the entrance past the reception area, across the office wings, and through the green oases, weaving indoors and outdoors together.

Stefan Behnisch, the partner-in-charge of the project, describes the design as a low-tech building with a high-tech result. He has given workers much more control over their surroundings—a great leap further than standard, operable windows. Each office has a door with a glass fanlight looking onto the hallway and a sliding glass door revealing one of the garden atria. Because there is no mechanical ventilation, the workers air their offices themselves by opening doors and windows when they leave. The workplaces are cooler in the morning than in an office building with traditional HVAC, but as the computers are switched on, the temperature rises. Most of the year, there is a heat surplus, and efficient cooling saves more energy than efficient heating.

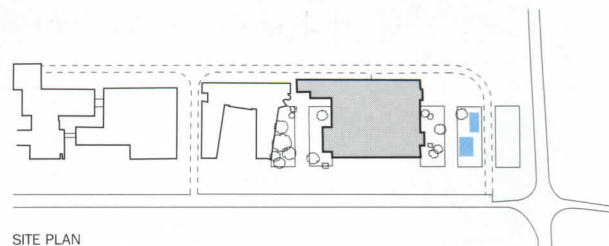
In summer, users help cool the building by opening doors in the glass-garden facades. The gardens provide so much thermal insulation that it was possible to make 65 percent of the office’s outer walls out of clear (rather than tinted) glass. Consequently, the offices are largely lit by daylight. Sensors monitor light intensity, and, above a certain level, cause aluminum-laminated roof sunscreens to unfold to prevent overheating.

Tracy Metz, RECORD’s Amsterdam-based correspondent, is a journalist at the newspaper NRC Handelsblad and writes about architecture and landscape.

Practicality prevailed in the architect’s choice of sunscreens and glass roofs: they are off-the-shelf components of modern greenhouses. Other parts of the building, however, demanded fundamental research into materials and the effect of their production and recycling on the environment. “Our office is known for green design,” says Stefan Behnisch, “but this went further than anything we had done before.” All the wooden interior surfaces were made of short pieces rather than long planks so that as little of the tree as possible was wasted; wherever possible, local woods, such as European larch, were used to reduce transport costs. And moss-covered roofs help reduce solar gain.

Each garden has its own ambience, based on a concept devised by Vermont-based artist Michael Singer. “My goal was to unify the outdoor and indoor architecture by means of the pathway and gardens,” says Singer. “I wanted to create something that would give this new building a sense of time, an older texture, as if it were built around something that had always been there.” To that end, he used wood that had been stressed and coated with dirt for the trellises in the garden atria and the structure in the meeting garden. Concrete pavers are rough, as if found on-site and reused, and come in 12 different patterns. Some of these patterns are what he calls “a reflection on gridlike notions of space and structure,” others are fragments of the building’s architectural drawings.

The gardens are not just to be admired, but to be treated as an extension of the workplace: for lunch, for meetings, or simply for reading.



Project: Institute for Forestry and Nature Research (IBN) Wageningen, The Netherlands
Owner: Department for Agricultural Research (DLO)
Architect: Behnisch, Behnisch &

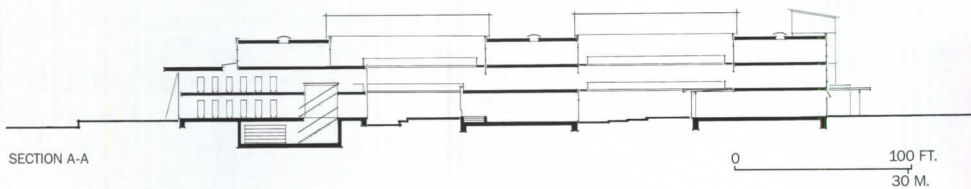
Partner—Stefan Behnisch, partner-in-charge; Ton Gilissen, project leader; Ken Radtkey, Martin Werminghaussen, Brook Muller, Andreas Ditschuneit, Yianni Doulis, Martin Schodder, project team





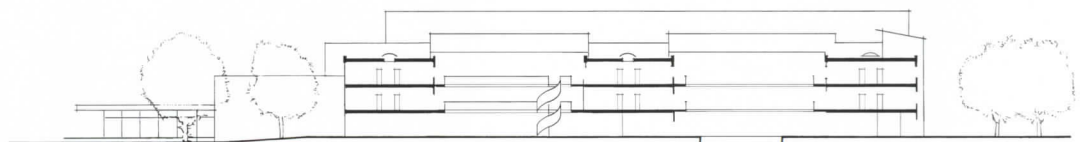
Each of the two internal gardens acts as a thermal buffer between offices and the outside environment. This allows 65 percent of the offices' walls to be clear glass and lets workers rely on day-

light for most internal illumination. The western garden (these pages) has a lush planting scheme. Horizontal sunblinds with heat-reflecting foil can be unrolled below the glass roof.



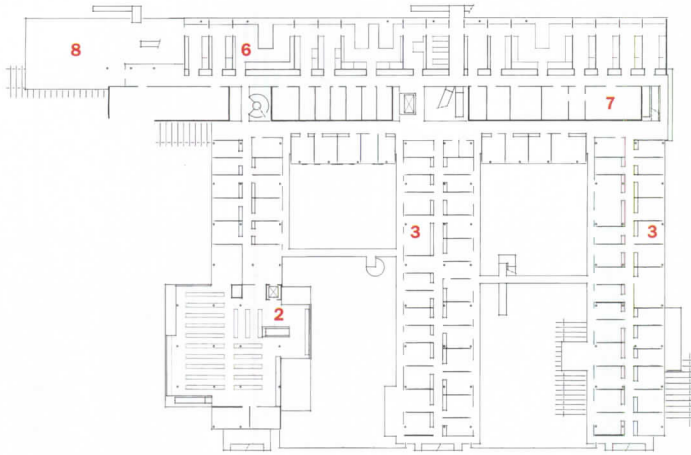
Artist Michael Singer designed a wood-and-concrete arbor for the west garden (above) and a water sculpture for the east garden (right). The Dutch landscape-design firm Copijn devised a plan

for the complex that contrasts a lushly planted garden with a more spare and formal one. A small terrace off the library provides a tranquil spot to read, meet with colleagues, or relax.

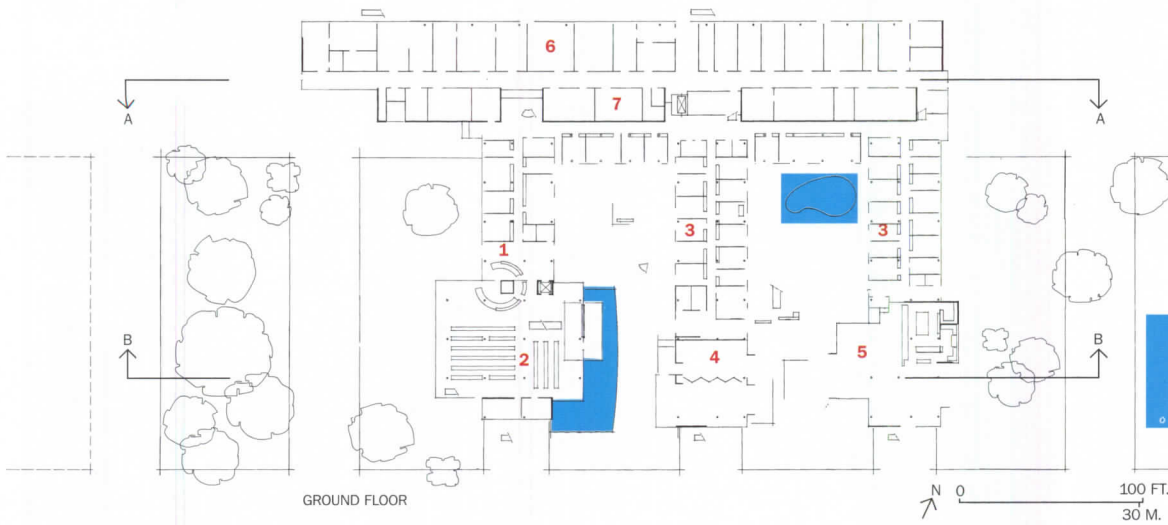


SECTION B-B

0 100 FT.
30 M.



SECOND FLOOR



GROUND FLOOR

- 1. Reception
- 2. Library
- 3. Office
- 4. Conference center
- 5. Restaurant
- 6. Standard laboratory
- 7. Climatized laboratory
- 8. Roof terrace

Although the restaurant is small, it has a seating area in one of the internal gardens (below). The library is a two-story space, which also has direct access to a garden (opposite top). Workers can control the temperature of their offices by opening or closing windows and sliding glass doors onto the internal gardens (opposite bottom).



The first, westernmost garden is luxuriant, “almost a rainforest,” says Singer, where water flows inaudibly. The second garden, the more public of the two, is sparer, with a lighter palette and more succulent plants, and the added luxury of an audible flow and drip from a large flat surface into the dark recesses of the pool below.

As the designer of the plantings, together with the Dutch firm Copijn, Singer was gratified that the client was amenable to experimentation. “We were researching conditions, seeing what would grow. That, after all, is what the IBN-DLO does: study the effects of human intervention on nature.” In summer, about 1,500 gallons of water a day evaporate into the atria, helping to cool the building. Part of the runoff water from the roof is used for a gray water circuit for the toilets, but most of it is held in a basin north of the building and piped into the pools.

Creeper vines are gradually taking over the plywood wall of the library’s poolside terrace, and the delicate but persistent tendrils of a passion flower vine are making their way along the aerial walkway tra-

“I AM CONVINCED THAT WE CAN ATTAIN AN ACCEPTABLE DEGREE OF COMFORT BY FOLLOWING THE RULES OF NATURE.”

versing the western garden. Nature is never far away here. The walkways along the offices have handrails, of course, but metal mesh has been replaced with knotted nets hanging from mountaineering clips—a small but telling detail enhancing the building’s laid-back nondesign quality. Is this atmosphere of semipermanence typically green? Behnisch distinguishes two main schools of thought in green design. “There is the Norman Foster view, which says you can solve ecological problems with more technology, or the Soleri view that says: no technology. We’re in the middle, but my sympathy is with Soleri. I don’t want to change our lives or go back to the Stone Age, but if we are prepared to accept that it’s warmer in summer and cooler in winter, I am convinced that we can attain an acceptable degree of comfort by following the rules of nature.”

Ultimately, the most sustainable thing about the IBN-DLO building may be the example it sets. “The technology is very old and very new at the same time,” says Behnisch. “The concepts—local materials, natural ventilation—have been around for centuries, we merely adapted them to modern times. But the execution was like building the Eiffel Tower, or the first skyscraper: we figured everything out from scratch.” ■

Credits (continued)

Engineers: Arohson Consulting Engineers V.O.F. (structural); Deerns Consulting Engineers B.V. (mechanical, electrical); Fraunhofer Institute for Building Physics (energy); DGMR Consulting Engineers B.V. (acoustical)
Consultants: Copijn Tuin en Landschaps Architecten (interior garden planning)
Artists: Michael Singer, Krijn Giezen
Contractor: Dura-Bouw B.V.

Sources

Curtain wall: Custom by Nelissen Metaalindustrie B.V.

Wood facades: DeGroot Vroomshoop B.V.

High-efficiency glazing: Al van Veen Glasspecialist B.V.

Single-glazed skylights: Pilkington

Greenhouse roofing: Prins Bleyswijk B.V.

Gypsum acoustical ceilings: Nolteg

Gypsum walls: Calmont B.V.

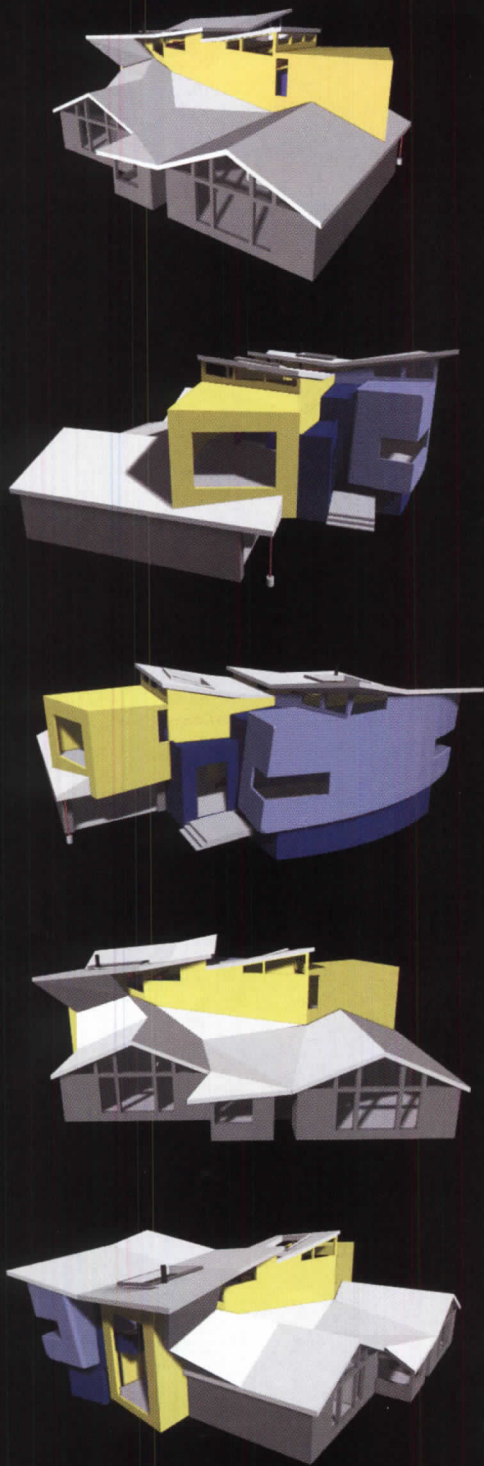
Paints: Lansink Schilderwerken B.V.

Railings and stairs: Geert

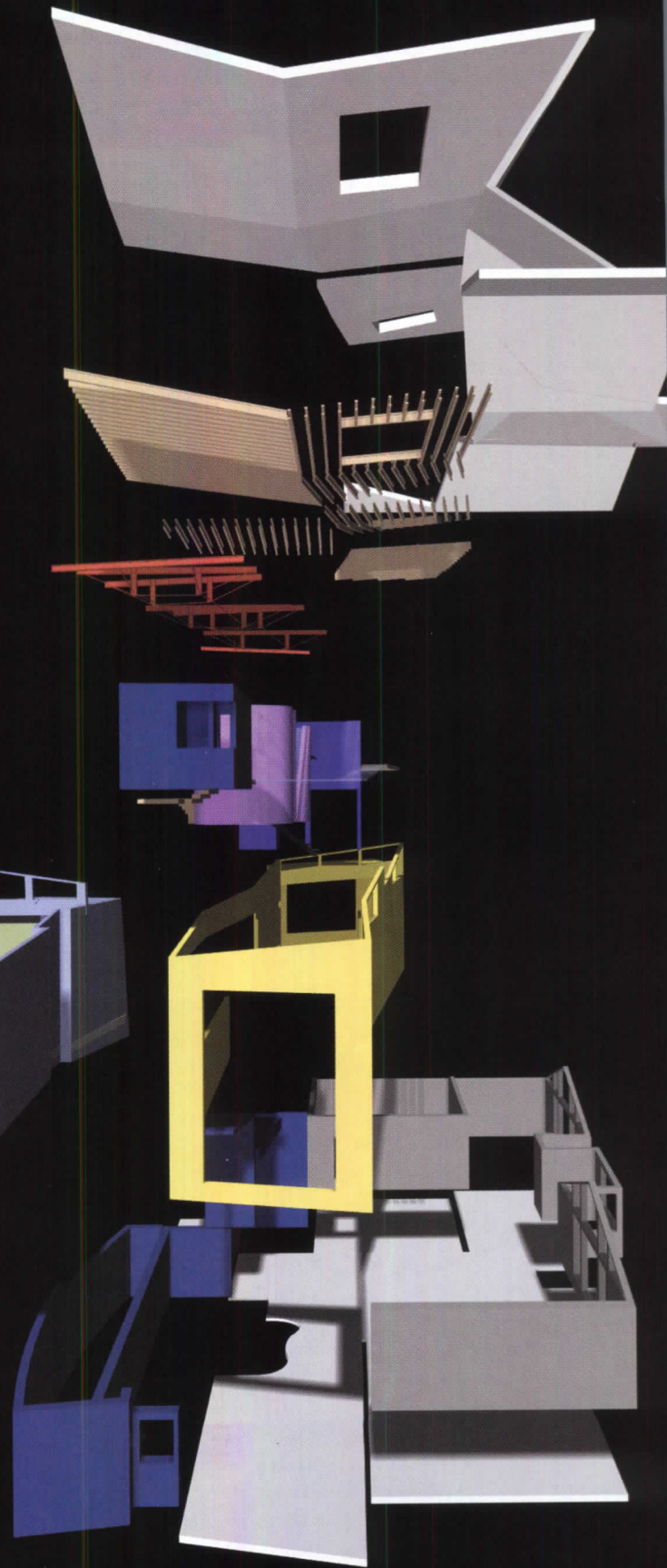
Matthijssen B.V.

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The house's geometry—particularly the complex roof topography—reflects the computer modeling that produced it (this page). The glazed front doors (opposite top) and clerestory windows, as in the rear elevation (opposite bottom), contribute to a luminous interior.



Garofalo Architects blows the roof off a standard suburban ranch house with the **MARKOW RESIDENCE**

By Sarah Amelar

In a neighborhood of discreet neo-Tudor houses with tidy frontyards and symmetrically pitched roofs, Garofalo Architects' Markow Residence rises as a dynamic presence. Its skewed, tilted, hovering, and bowed volumes—quietly composed in the front and more eruptive toward the back—seem to swell beneath the undulant folds of a blanketing metal roof. “What *are* we doing in the suburbs?” wondered Doug Garofalo, AIA, seven years ago, when he first ventured into the Windy City's outskirts to reincarnate a ranch-style house.

Since then, his small Chicago firm has revisited this question repeatedly while transforming seven homes, most recently the Markows' in Prospect Heights, Ill. “The notion that the suburbs are bad,” says Garofalo, “often comes with architectural training.” Yet unexpectedly, he's discovered formal and intellectual fodder in the hinterlands of Middle America, making architectural interventions that prod the clichés of domestic conformity.

Garofalo, who designed the Korean New York Presbyterian



RESIDENTIAL PROJECT

Project: Markow Residence

Architect: Garofalo Architects—

Douglas Garofalo, AIA, principal; Ellen Grimes, Minkyu Whang, Randall Kober, and Christopher Goode, design team.

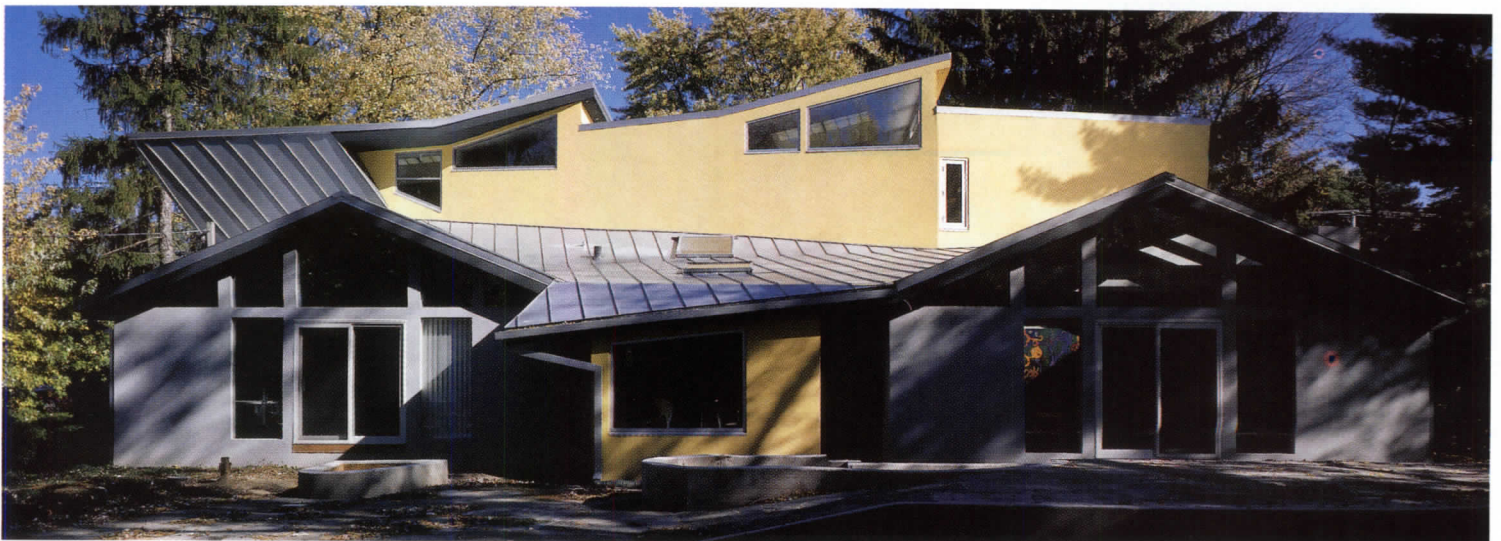
Engineer: Thornton Tomasetti

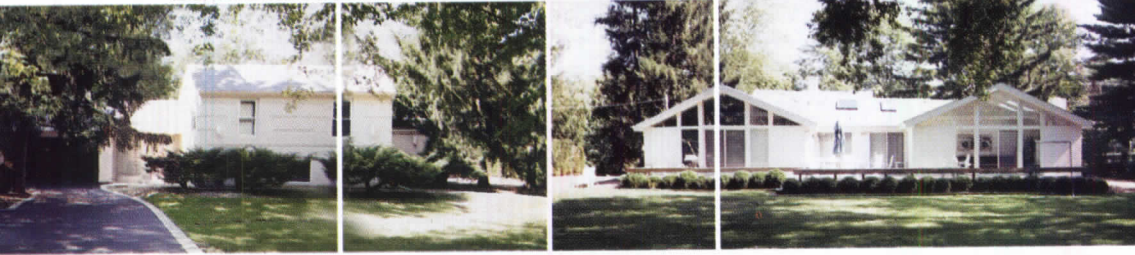
Steel fabrication and consultation:

Anton Metalworks

General contractor: Juniper Construction

Computer imaging: Robert Brobson





Church with Michael McInturf and Greg Lynn, is not the first architect to graft onto the iconic suburban home, to blast out the walls and blow off the tops of vinyl-sided colonials, low-slung ranches, and prefab saltboxes. One of the best-known suburban reinventors, Frank Gehry, FAIA, began shaping his own unconventionally collaged house—spliced with chainlink and corrugated steel—in Santa Monica, Calif., in 1977. And a new wave of architects with an alternative vision has been transforming traditional houses across the country. In New Jersey, David Hotson, for example, is extending a gambrel-roofed house with a cubist riff on the original barn-like forms, while in Connecticut, Kolatan/Mac Donald Studio is morphing a globular outgrowth for a standard colonial cottage (below).

Because such transformations often entail lower budgets and speedier construction schedules than houses built from scratch, this work frequently falls into the hands of young practitioners. And ideally, with youth comes a spirit of invention—if not an outright rebellious streak.

their architect tremendous aesthetic freedom. “We saw this as an adventure,” Mr. Markow says. “It was not just about building a house.”

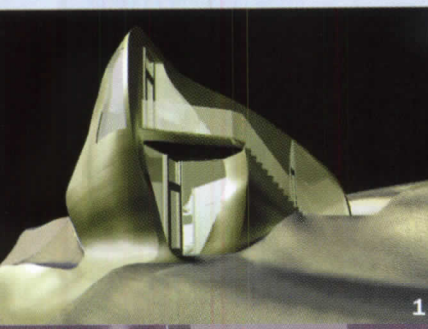
Indeed, Garofalo’s clients have defied classic suburban stereotypes with forward-looking attitudes toward architecture. Having left the city in search of good schools and backyards for their kids, they are settled in and not fixated on resale values. Therefore, the architect discovered, they tend to be less architecturally conservative than city dwellers. Also, reflecting the growing ethnic diversity of suburbia, his clients have been mostly foreign-born (the Markows are from Poland). These young immigrants, says Garofalo, are not trying to blend in; instead, they eschew the local vernacular—identifying it with Old World traditions—in favor of newer forms.

The Markow house is striking for its formal mutations, drawn from the “genetics” of the surrounding architecture. While the continuous folded roof is a distant relative of the conventional neighboring roofs, it plays off them: its quasi-dormer, for example, pops out opposite a real

While Garofalo, 41, isn’t out to dynamite the suburbs, or obliterate all recognizable features of the buildings he expands, his projects involve radical reconfigurations. “We scrutinize the houses we’re given,” he says, “and look for eccentricities to exploit, often taking cues from the original structural and plumbing systems.”

The Markows wanted to keep the twin gables they’d added a decade before to the back of their split-level 1962 house. Budgetary constraints convinced them to add on to the existing 2,000 square feet, rather than erect a new home. (Typically costing less than \$100 per square foot, Garofalo’s renovations tend to be more economical than ground-up construction of comparable quality). Otherwise, Andrew Markow and his wife, Aleksandra, gave

HYBRID SUBURBAN HOUSES BY GEHRY, KOLATAN/MAC DONALD, AND DAVID HOTSON



1



3



2

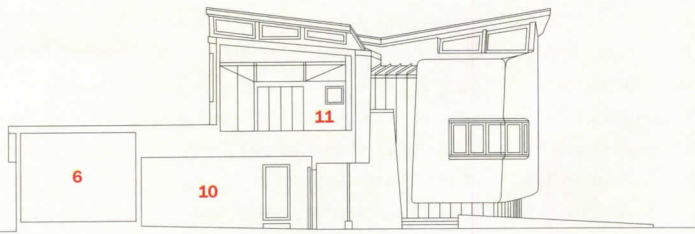


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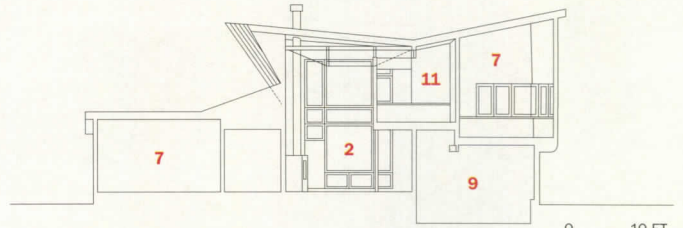
1 and 2. Kolatan/Mac Donald Studio, *Raybould House*, Fairfield County, Conn. (construction anticipated in 2000)

3. David Hotson, Architect, *Athanassiades Residence*, Princeton, N.J. (currently nearing completion)

4. Frank O. Gehry, *Gehry Residence*, Santa Monica, Calif. (1977-78; 1991-94)

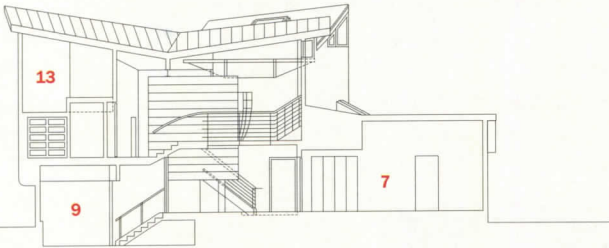


SECTION A-A

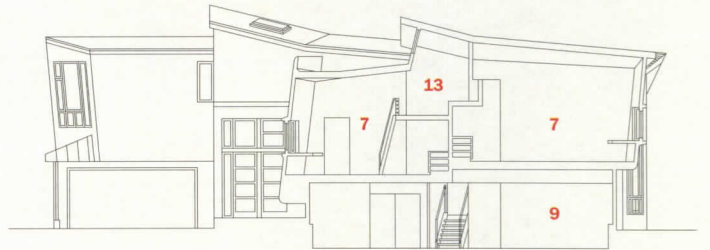


SECTION B-B

0 10 FT.
3 M.



SECTION C-C

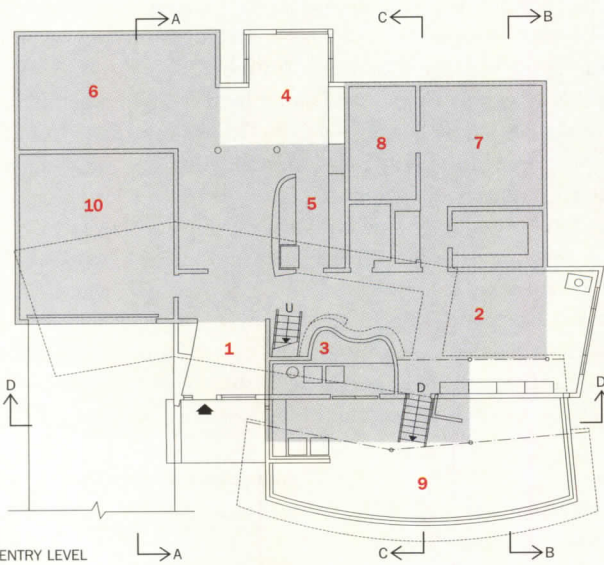


SECTION D-D

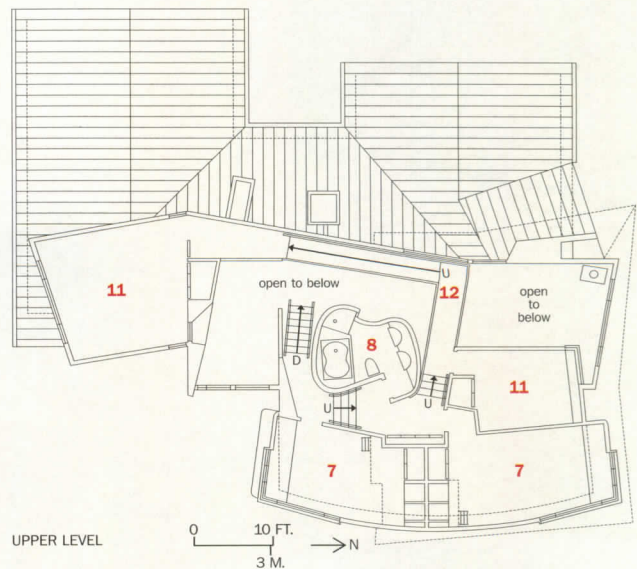
The relatively quiet street facade (opposite top) begins to suggest the more dynamic eruption of form toward the building's back. Grayish purple, blue, and yellow hues depart radically

from the original front elevation (opposite bottom, left). Garofalo retained the twin gables that the client had added earlier to the rear elevation (opposite bottom, left).

- | | |
|--------------|---------------|
| 1. Foyer | 8. Bath |
| 2. Living | 9. Recreation |
| 3. Utility | 10. Garage |
| 4. Breakfast | 11. Study |
| 5. Kitchen | 12. Catwalk |
| 6. Dining | 13. Loft |
| 7. Bedroom | |



ENTRY LEVEL



UPPER LEVEL

0 10 FT.
3 M.



dormer next door. And the roof's elongated double-V profile in back provides an inverted counterpoint to the preexisting twin gables beneath it.

To create spacious communal areas, a study, a breakfast room, and more generous bedrooms, Garofalo added 1,000 square feet and demolished an existing glass-block entry piece. A new, cantilevered, curved volume in front holds upstairs bedrooms, while a rectilinear tubular element, forming a central spine, contains a two-story foyer and living room, and upstairs study. Clusters of new programmatic elements occupy distinct idiosyncratic volumes, further differentiated by exteriors stuccoed in deep contrasting colors: yellow for communal spaces and purple for bedrooms.

With this massing, Garofalo comments on the nature of suburbia. Rejecting the common view of such neighborhoods as banal and homogeneous, he has come to appreciate their visual and demographic diversity, seeing suburbia as simultaneously cohesive and rife with contrasts. He intended the Markow Residence—with its multiplicity of forms and all-embracing roof—to echo abstractly this duality.

Responsive to its setting yet distinct from it, the house gently touches the front of its zoning envelope, but breaks with the familiar front-back orientation of the suburban streetscape. Its exterior angles are dictated not by neighborly alignments, but by small shifts that open the inside to views and oblique rays of light.



The roof's underside is as geometrically complex as its exterior. The two-story communal areas rise to a multifaceted ceiling, supported by steel trusses, all at slightly different orientations. "I think of it," says Garofalo, "as a tent held by guy wires." At the entry level, the traditional suburban compartmentalization of spaces is gone: the light-filled foyer, kitchen, living, breakfast, and dining rooms flow into one another, winding around a sculptural split core, which conceals a utility room below and a bathroom above. Diagonal vistas penetrate interior zones, slipping

between stair rails and fragmental partitions, to the outside.

A partially ramped, glass-floored catwalk, crossing above the foyer, links the upstairs bedrooms to a study. Playing off the house's original split-level design, the second-floor steps and ramp spiral around the core, prolonging the four-foot ascent from bedrooms to study. The elevated walkway's transparency and slope have a slight edge of danger, gently threatening to set one off-balance. This isn't the path of staid suburbia—we're not in the home of Ozzie and Harriet. This midwestern ranch house has been jolted and split at its seams.

But the building somehow fits its setting. Among its tawny stone and brick neighbors, this purple, blue, gray, and yellow presence is not jarring. The saturated colors are muted. The house's scale, siting, and proportions reflect a close reading of context and, thus, allow for many things simultaneously. Full of contrast, the architecture remains a balanced whole. Even the basketball hoop beside the curving purple facade and the barbecue grill out back hardly seem out of place. ■

Sources

Curtain wall: Kawaneer

Synthetic stucco: Dryvit Stucco

Roofing: GS Roofing Systems, Peterson Aluminum

Paint: Benjamin Moore

Sliding doors: Pella

Fiberglass panels: Kalwal

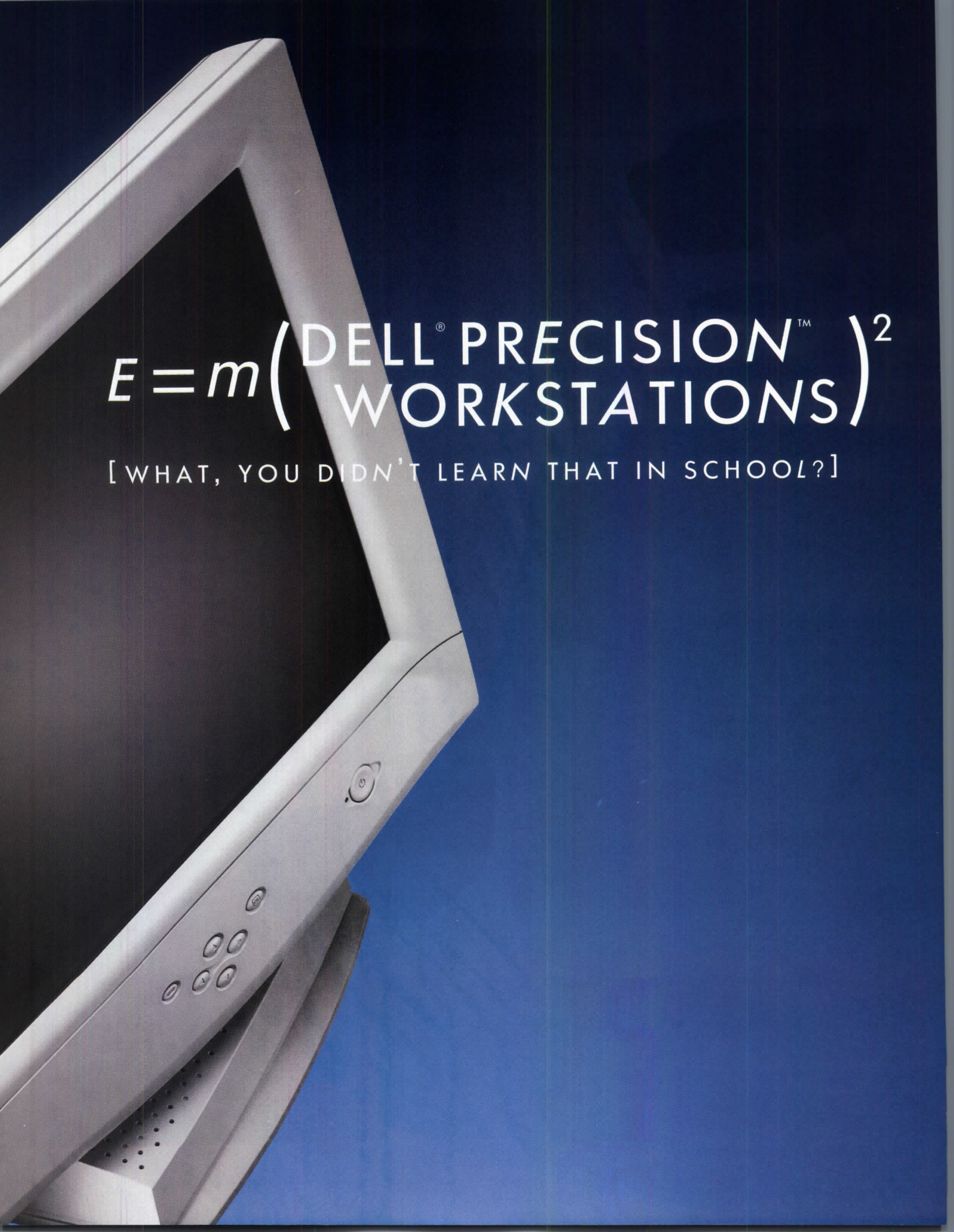
Wall sconces: Zelco

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A wall crossing diagonally beneath the glass catwalk marks the house's original perimeter, while the core's blue panes bring light into the shower stall (opposite top). Skewed trusses, fragmented partitions, and tilted ceiling

planes animate the interior (opposite top and bottom). Skylights, clerestories, and large windows illuminate the living room (this page). Within the sculptural core (this page) the second-floor bathroom has curving walls (opposite center).



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SMALL MUSEUMS

The Anti-Bilbao

WHILE THE LARGE MUSEUMS GET ALL THE PRESS, SMALL MUSEUMS OFFER AN INTIMACY AND ACCESSIBILITY THAT THE BIG GUYS CAN'T MATCH.

By Elizabeth Harrison Kubany and Suzanne Stephens

1.

Henley-on-Thames, England

With the craft of a boatmaker, David Chipperfield Architects creates an homage to rowing, Britain's oldest team sport, in a lovely, riverside setting.



2.

Seagrove, N.C.

Frank Harmon Architects designs a museum that honors vernacular architecture and reflects the importance of pottery to the local economy.



3.

East Winterset, England

A modernist intervention on a pastoral Georgian country estate by Munkenbeck + Marshall is the backdrop for a stunning private collection.



4.

Chibougamau, Canada

Using an existing mine as the architectural form, Julien Architectes allows its audience to experience what it was like to work as a miner.



At this moment, in the aftermath of openings of the Guggenheim Bilbao and the Getty Center in Los Angeles, the word museum conjures up an architectural extravaganza. Like the Metropolitan Museum of Art, the Louvre, or the British Museum, these monumental urban destinations, housing international art collections, have, more than any other type of museum, taken over the public consciousness. And this is where the money is. Billions of dollars are currently being spent on the expansion or creation of art museums. According to a list recently published by the *Los Angeles Times*, the 10 largest museum projects currently under way in the United States—all devoted to art—total more than \$1.5 billion in construction. These mega projects include the renovation and expansion of New York City's Museum of Modern Art, the Museum of Fine Arts in Houston, and the Asian Art Museum in San Francisco.

In addition to size and cost, the most striking similarity they share is their universality. The buildings are often designed by international architects for collections that may also have global appeal.

Diminutive in scale

While these large projects capture most of the attention, a parallel trend is the proliferation of small museums. According to Edward Able, president and CEO of the American Association of Museums (AAM), the vast majority of museums in this country are not large; more than half have annual operating budgets under \$100,000. (An operating budget of \$1 million or more qualifies an art museum as a large museum, according to the AAM.)

The construction of small museums accelerated greatly during the 1950s, '60s, and '70s, as people began to see them as a way to celebrate publicly what was special about their communities and regions. This grassroots expression of local culture may explain their continued popularity for they help provide citizens with a sense of identity and place. "Small museums draw strength from the communities in which they are built and give richness back to those communities," says Richard Koshalek, president of the Art Center College of Design in Pasadena, Calif. The communal link explains in part why more people have been visiting museums in recent years: The December 1998 issue of *Museum News* estimated that the visits to U.S. museums during that year were 865 million, the highest ever.

Whereas large museums may be devoted to a broad range of subjects within specific categories (such as art or science), small muse-

ums can concentrate on a single subject, and even an unusual one at that. In the preface to her book *Towards a New Museum*, Victoria Newhouse writes that “one intriguing aspect of the current proliferation of museums is the ‘museumification’ of seemingly every phenomenon known to humanity, from Sverre Fehn’s Glacier Museum in Norway, to Hans Hollein’s Vulcania, the project for a museum about volcanoes in France’s Auvergne region.” Today, you can visit museums as esoteric as the Shin-Yokohama Ramen Museum (devoted to the Japanese noodle) or the Philadelphia Insectarium (founded by a former exterminator and featuring insects and rodents from around the world).

Strange but true

Even if museums devoted to idiosyncratic subject matter strike us as unusual (or crazy), they do have a history. Small museums displaying objects, oddities, or art have direct roots to the collections pertaining to

EVEN IF MUSEUMS DEVOTED TO IDIOSYNCRATIC SUBJECT MATTER STRIKE US AS UNUSUAL, THEY DO HAVE A HISTORY.

antiquities and natural science that were stored in cabinets in the homes of the affluent merchants, bankers, and, of course, royalty, during the Renaissance. By the end of the 15th century, the interest in antiquities and the rise of humanism had prompted scholars, merchants, and businessmen in Italy to begin systematically to accumulate

numerous objects, including small relics, cameos, and coins. Special cabinets were set aside in closetlike rooms where the owner could study them, or show them off to interested colleagues. In 1521 Paolo Giovio, a historian in Como, was already opening up his collection of portraits to fellow humanists.

By the 16th century, the number of cabinets displaying porcelains and pictures, as well as shells, fossils, stones, and other scientific oddities had proliferated. The humanist scholars, in turn, influenced the formation of similar collections in royal and papal courts. Soon, kings and emperors, who often had piled up troves of art in their castle strong rooms, became enthralled with the idea of displaying the work. In the late 16th century, Holy Roman Emperor Rudolf II was known for his *Kunstkammern* (cabinets of art) as well as *Wunderkammern* (cabinets of curiosities). By the late 17th century, August the Strong, the Elector of Saxony and King of Poland, amassed enough to fill cabinets in seven rooms in his palace in Dresden.

Eventually these ever burgeoning collections would form the first museums. Indeed, in the 1630s, John Tradescant’s collections of beasts, outlandish fruit, insects, minerals, and other objects in his house in England became a small museum where anyone could go for a small price. Its 4,000 items were catalogued, and in 1686, through a change of hands, became the beginnings of the Ashmolean Museum at Oxford.

A grassroots phenomenon

It is not surprising that small museums today have developed around



Frederick Fisher & Partners designed this 9,000-square-foot addition to the Colby College Museum of Art in Waterville, Maine (above and right). Reflective of the modest local vernacular architecture, the wing showcases 150 pieces of American art.



specialized collections. The desire for an immediate connection with the work on display requires a scale available only in an intimate space. No wonder, then, that Edward Able has observed: “These small museums tend to have a more active relationship with their communities than the traditional static museum designed for passive viewing.”

As is evident in the four examples on the following pages, the sense of place is so powerful that the projects—both from an architectural and a content point of view—would seem out of place anywhere else. David Chipperfield’s River and Rowing Museum in

IN THE ELECTRONIC AGE, BUILDINGS HAVE THE POWER TO BECOME THE LOCI FOR FRAGMENTED COMMUNITIES.

Henley-on-Thames, with its exterior clad in horizontally laid oak panels, emerges out of its Oxfordshire context. Its purpose—to tell the history of Britain’s oldest team sport—is special to this town renowned for its regatta.

The North Carolina Pottery Center, designed by Frank Harmon, FAIA, similarly reflects its locale in its architecture and display. The barnlike shapes of the two buildings—one for exhibitions and one for education—with its monitor roof and large porch, respectively, echo the vernacular architecture of local family. The indigenous materials used throughout the project—Atlantic white cedar and recycled heart pine—reinforce this tie to the region. Moreover, pottery has been

an economic cornerstone since the discovery of the clay-rich soil’s unsuitability for agriculture.

Munkenbeck + Marshall’s modern, glass-and-concrete design for Roche Court seems, on its face, less tied to the surroundings. The tiny gallery is nestled between the house and orangery of a landmarked late-Georgian country estate. As a public gallery for the viewing of a private collection, the museum is closely linked to the rather simple beginnings of the museum as we know it today. In the 16th century, Newhouse notes, painting collections were shown in long corridors of English country houses and French chateaux. (An explicit forerunner of Roche Court could be the cast iron and glass picture gallery that Lord Berwick had John Nash add to his house in Attingham in 1805.)

Of all the projects discussed below, the Chibougamau Mining Interpretation Center by Julien Architectes is the most firmly rooted (literally) in its location. By building a mining interpretation center inside a defunct mine in the Canadian wilderness, the architects mimicked the experience of a miner, allowing visitors to understand a lonely and dangerous activity that has been this region’s primary sustenance.

While the Bilbaos and Gettys have their place, small museums present the opportunity to embody a particular sense of place and affect us profoundly. Their mission may be more modest, but their accessibility, special programs, and often regional subject matter can touch us and instill a sense of local pride. In the electronic age, these buildings have the power to become the loci for fragmented communities otherwise lacking a physical public space for cultural expression. ■



Located in a remote area of the Yukon, the Tr’ondek Hwech’in Cultural Centre by Maurer Kobayashi Architects (opposite top right and above) is a tribute to the Han people. Because the structure itself incorporates references to various built forms the Han used, such as their fish-drying frames, skin-and-stick tents, and basket traps, the building itself is a museum to the people.

Housed in several new and historic buildings, including a converted church, the Farnsworth Art Museum by Schwartz/Silver Architects in Rockland, Maine (right and below), shows the work of three generations of the Wyeth family: N.C. Wyeth, his son Andrew Wyeth and his grandson Jamie Wyeth. A landscaped area provides views that recall favorite subjects of the Wyeths.



River & Rowing Museum

Henley-on-Thames, England

1

IN A PICTURESQUE RIVER TOWN, DAVID CHIPPERFIELD CRAFTS AN HOMAGE TO BRITAIN'S OLDEST TEAM SPORT.

By Robert A. Ivy, FAIA

Architect: David Chipperfield
Architects—David Chipperfield, principal; Renato Benedetti, Alec Gillies, Genevieve Lilley, project architects
Client: River & Rowing Museum Foundation

Consultants: Whitby, Bird & Partners (structural); Furness Green Partners (services); Whitelaw Turkington (landscape); Land Design Studio Ltd. (exhibitions); Applied Acoustic Design (acoustical); Eric Maddock (lighting); Atelier (graphics); Davis Langdon Management (project management); Norwest Holst Construction Ltd. (contractor)

Construction cost: \$5.1 million (phase 1); \$3 million (phase 2)
Size: 7,340 square feet (phase 1); 2,712 square feet (phase 2)
Completion date: 1998

Sources:

Windows: Jandor Hansen

Doors: Jandor Hansen

Curtain wall: Jandor Hansen

Exterior cladding: Henry Venables Hardwoods Ltd.

Hardware: Allgood Architectural Hardware

Flooring: Henry Venables Hardwoods

Lighting: Erco

Lighting controls: Trilectric Ltd.

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

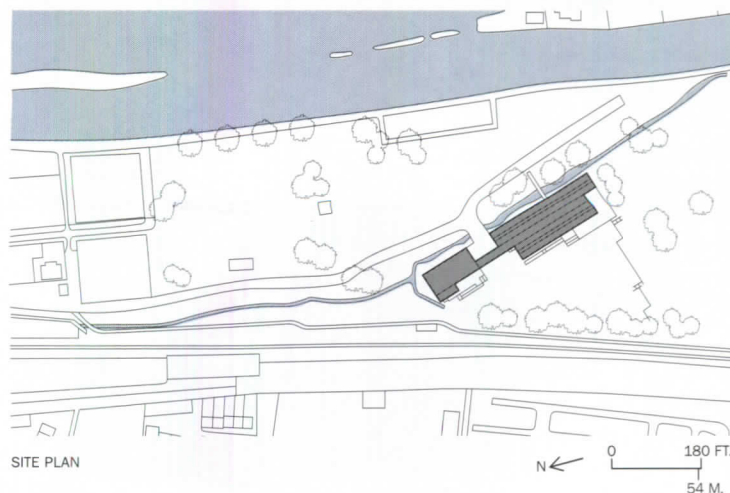
Program

Henley-on-Thames, a picturesque town whose world-famous regatta looms large in Britain's history, received an unanticipated gift. Unsolicited, a private donor chose to fund the construction of a museum that would include a collection of historic work boats and tell the history of Britain's oldest competitive team sport. The stories of rowing and of the town itself are inextricably linked and share a narrative thread throughout the galleries and exhibits.

Solution

London-based architect David Chipperfield placed the museum just down the road from the city on a riverside site surrounded by willows and green fields. Raised above floodstage on concrete pilings, the modest structure recalls the hulls of sculling boats. From the exterior, the strong parallel forms of the two-story building lie hidden by vegetation, that exposes only the pitched roofs at each end. Defining the boundary between the natural and the man-made, a watery rill runs by the front entry like a moat, alongside a straight row of trees.

The horizontal structure combines Modernist ribbon windows and a strong plinth with familiar, vernacular elements, such as wood siding and metal roofs. Ramps connect the gravel-strewn parking lot to the first level, which seems to float

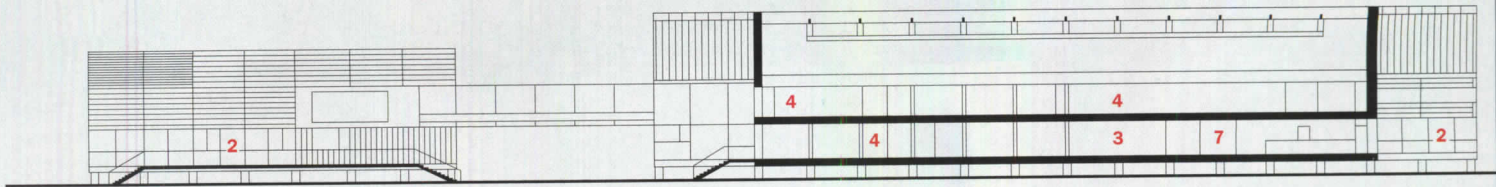




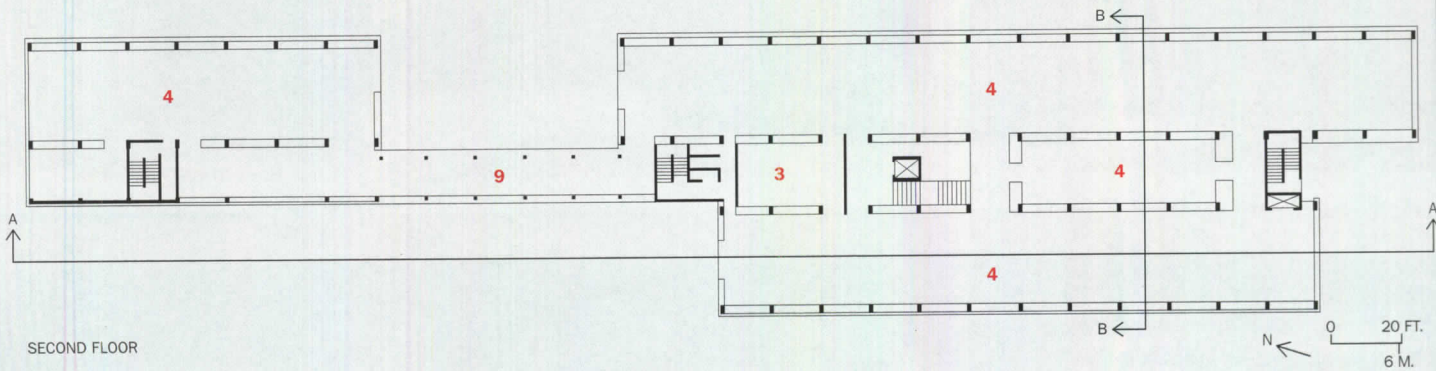
The horizontal structure combines Modernist ribbon windows and a strong plinth with vernacular elements, such as wood siding and metal roofs (above). Strong

detailing outlines the intersections of windows and doors with the wall plane (opposite). A horizontal bridge connects a later addition to the main structure (below).

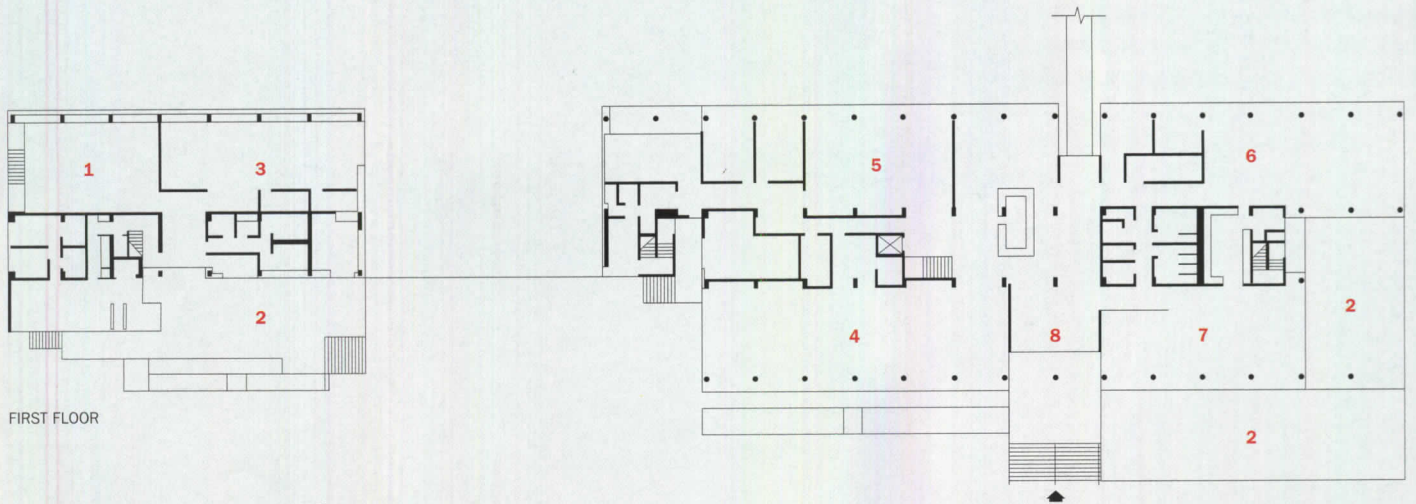




ELEVATION / SECTION A-A



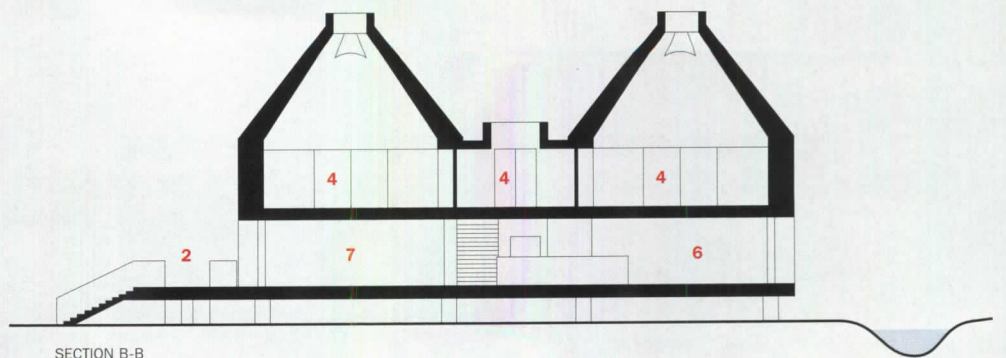
SECOND FLOOR



FIRST FLOOR

- | | |
|----------------------|---------------|
| 1. Multipurpose room | 5. Library |
| 2. Terrace | 6. Classroom |
| 3. Storage | 7. Restaurant |
| 4. Gallery | 8. Foyer |
| | 9. Bridge |

The strong roof forms resemble the hulls of sculling boats (opposite top). Ramps, which run from the parking lot through rows of trees and above a watery rill, bring the visitor to the entrance (opposite bottom).



SECTION B-B





above grade. Transparency characterizes the first level, a gesture to the open, public character of the main entry, cafe, foyer, meeting rooms, and initial exhibit spaces. By contrast, the second level, which houses the primary galleries, presents a more closed appearance.

Inside, light shoots through the spaces unexpectedly. Rays from above naturally illuminate the elevator shaft to glowing, mysterious effect. Upstairs, the galleries are surmounted by louvered skylights that enhance the pitched space, a condition somewhat marred by the crowded installation of boats and oars (Chipperfield did not design the exhibits). The overhead glazing provides the primary light source, which is moderated by curved metal screens that disperse light to the side walls.

A horizontal bridge connects a later addition to the main structure and provides an airy view of the river. The gallery interiors from the project's second phase seem dark and enclosed compared to those in the original building.

The architects focused their attention on the details. Stairways feature glass-sided metal rails, inset in gaskets, with knife-sharp edges to treads and risers. Handrails seamlessly combine stainless steel and wood. Clean edges define borders throughout the structure, outlining where a window slides into a wall or a light



fixture cuts into the ceiling plane. The building seems as well crafted as a boat.

Structure/Materials

Chipperfield has designed an exquisite but humble building that defers to its surroundings. His choice of materials—primarily wood and glass—help complete this disappearing act. He clad the building's exterior with oak panels in horizontal strips, a natural material that calms the forms and sets the building firmly in its Oxfordshire context. Inside, strip oak flooring continues the motif. Chipperfield

plays the textured siding against an asymmetrical Modernist composition characterized by a concrete structural base and simple forms. Black metal railings and operable windows outline finish details.

Commentary

Beautifully sited in a pastoral setting, this small building captures the historic spirit of the place through its materials and forms while speaking eloquently in contemporary architectural language. And while the museum announces Henley-on-Thames' most famous achievement to the world, it has

Simple forms and attention to detail characterize the River and Rowing Museum, inside and out. Transparency sets the tone for the public, open nature of the first level (above), while the upstairs presents a more closed, boxlike appearance (opposite).

simultaneously become part of the cultural identity of the town. Townspeople—including senior citizens, young mothers, and small children who frequent the cafe and enjoy the riverside setting—have adopted the museum as part of their local world. ■



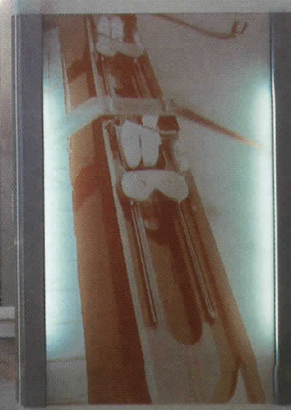
OARS, OARLOCKS AND OUTRIGGERS

Two wings beat together, a whorl through the water. As they emerge for another immense stroke, it becomes clear: these are no wings. They are oars.
Craig Lambert, *Wind Out*, 1992

Oars and oarlocks that move a boat past water faster than pushing water past the boat. All boats have three parts: effort, load and a fulcrum.

- The effort on an oar is the pull given by the rower.
- The load is the boat and crew.
- The fulcrum is the blade in the water.

The blade is attached to the oar by the oarlock. The catch or hook of the blade in the water at the start of a stroke is what transfers it from the rower's whole body to work the lever.



North Carolina Pottery Center

Seagrove, North Carolina

2

FRANK HARMON ARCHITECT CREATES A POTTERY SHOWPLACE AND ARTISTS' GATHERING PLACE WHERE DAYLIGHT AND RURAL CHARM ABOUND.

By Jessica Dheere

Architect: Frank Harmon Architect—Frank Harmon, FAIA, principal in charge; Vincent Petrarca, project manager; Quan Banh, Charles Holden, Jeff Schroeder, design team
Client: North Carolina Pottery Center
Consultants: Morrison Sullivan Engineers (structural), Stanford White Engineers (MEP), Swanson and Associates (landscape), Dan Gottlieb (exhibit design), Design Dimensions (exhibit fabrication), John William Brown Company (general contractor)

Size: 7,500 gross square feet (main building), 1,500 gross square feet (education building)

Cost: \$1.25 million

Completion date: November 1998

Sources

Roofing: Northstate Roofing

Windows: Hopes Steel Windows

Paint: Cabot

Sliding exterior doors: Plywood on metal frame

Exhibit lighting: JUNO Lighting

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

Program

Like tobacco, Tarheels, and Christmas trees, pottery in North Carolina is a way of life. Though, until November 1998, when the North Carolina Pottery Center (NCPC) opened in Seagrove (pop. 300), daytrippers and tourists might never have known to what extent.

In 1988, a group of potters and other ceramophiles began raising money for a facility whose exhibit and educational functions would expose visitors to local styles and direct them to the potters' studios. In 1993, Frank Harmon Architect of Raleigh won the commission to design the center.

As realized, the center consists of three buildings on a nine-acre site. Harmon designed two buildings among a grove of oak trees on a knoll: a 7,500-square-foot minibasilia for exhibits, lectures, meetings, offices, and archival storage and a 1,500-square-foot education building for pottery workshops. An existing house will serve as a visiting artist's residence. Exhibits chronicle the evolution of pottery in North Carolina from prehistory to present day and display the work of more than 100 local potteries.

Solution

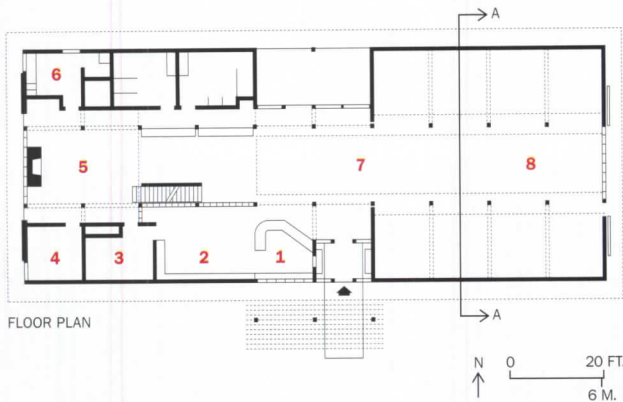
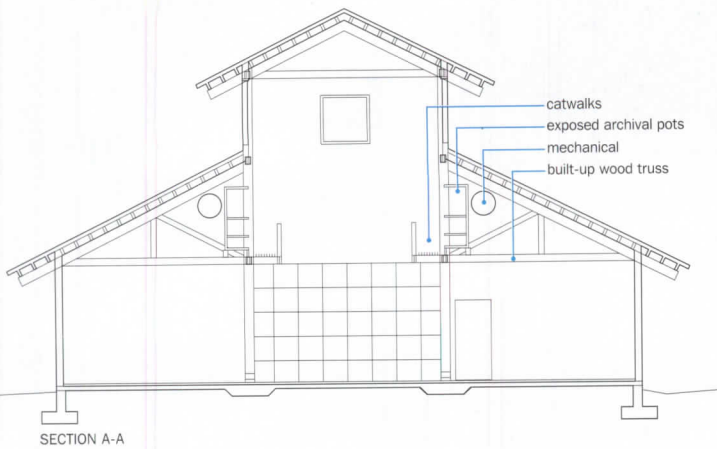
Harmon held a workshop to gather input from potters, professors, the mayor of Seagrove, representatives from the state's department of cultural resources, and exhibit designer Dan Gottlieb. Most local potteries are



The differing size and scale of the buildings and their placement among the mature oaks make the center feel like an enclave that has developed over time (this page and opposite).

1. Pottery museum
2. Education building
3. Administration building
4. Parking
5. Oak grove
6. Pond
7. Festival meadow





- 1. Reception
- 2. Gift shop
- 3. Storage
- 4. Office
- 5. Multipurpose
- 6. Lounge
- 7. Lobby
- 8. Exhibit

By lowering light levels, an entrance pergola and handmade door with tiny windows help visitors adjust to the bright interior (below).



in artists' homes or in studios attached to the home, says Harmon, so they wanted it "to be friendly and open . . . to feel like you were visiting someone's house and studio."

This sentiment called for natural materials and simple barnlike forms and colors to give the buildings a rural look. Daylight admitted through clerestories in the monitor roof and wall windows imbued the main building with an "openness [that] knocks people out," says Terry Zug, a former NCPD board member and professor at UNC-Chapel Hill. Unlike most museum or gallery architects, Harmon didn't have to worry about maintaining low light levels because sunlight doesn't damage ceramics the way it does paper or canvas.

Despite the abundance of light in the gallery, Harmon was concerned that if visitors entered the gallery from the full Southern daylight, with their pupils contracted, they would feel as if they had walked into the dark. This sensation would have detracted from the openness he had tried to create.

To cheat the eyes, Harmon designed an entrance pergola that reduces daylight by about half. Here, visitors walk through the first of two 300-pound maple doors, handmade (and donated) by the architect, into a vestibule. Four-inch-square Plexiglas windows in the doors admit even less light than the pergola. As a result, when visitors finally step through the second door into the gallery, brightness not darkness greets them.

A mezzanine—visible from below and accessible via catwalks—provides storage for hundreds of pots, a nod to the greenware (unfired pots) that occupies every flat surface in most potters' studios. Finally, the education building's wide, shaded porch reproduces another common feature of home studios, which allows artists to work outdoors.

Structure/Materials

Both inside and outside the center, Harmon, working with contractor Paul Turbeville, left the wood structure exposed so that the building would "show its own sense of craft." On the exterior walls, the vertical support members are visible, and roof trusses, lookouts, and outriggers reveal themselves. Inside, columns built-up from pieces of southern yellow pine seem "almost woven together," Harmon says. Heart pine recycled from century-old textile mills gives the center's floor "a rich quality," says Zug, "particularly when lit at night." Finally, the corrugated galvalume roof is more elegant than the metal roofs of neighboring buildings.

Commentary

Renowned North Carolina potter and former NCPD board member Mark Hewitt praises the flexible exhibit spaces and educational mission that are drawing potters from all over. "With time and leadership," he predicts, "it will be a leading center of ceramic exchange." ■





Wall windows, unusual in settings for displaying art, let visitors see finished pots and the clay-bearing soil from which they came all in a glance.

The New Art Centre at Roche Court

East Winterslow, England

3

MUNKENBECK + MARSHALL DESIGN A THOROUGHLY MODERN INTERVENTION WHERE THE PUBLIC CAN VIEW ART ON A PRIVATE COUNTRY ESTATE.

By Elizabeth Harrison Kubany

Architect: Munkenbeck + Marshall—Stephen Marshall, partner in charge; Stuart Cameron, job architect
Client: Countess Bessborough
Consultants: Barton Engineers (structural); Fulcrum (M & E); Martin Price (general contractor)

Size: 1,000 square feet (new); 350 square feet (renovated)

Cost: \$160,000

Completion date: September 1998

Sources

Glass curtain wall: Cantifix of London

Skylights: Cantifix of London

Sliding doors: Cantifix of London

Masonry paint: Kimes

Downlights: SKK Lighting

Exterior lights: Louis Poulson

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

Program

When the lease on her prominent London sculpture gallery ended in 1993, Madeleine Ponsonby, the Countess of Bessborough, relocated her business to Roche Court, her family home. Located 5 miles east of Salisbury and about 60 miles south of London, Roche Court was built in the early 19th century, during the Napoleonic Wars, as a retirement home for Lord Nelson. The late-Georgian-style country estate is now a national landmark.

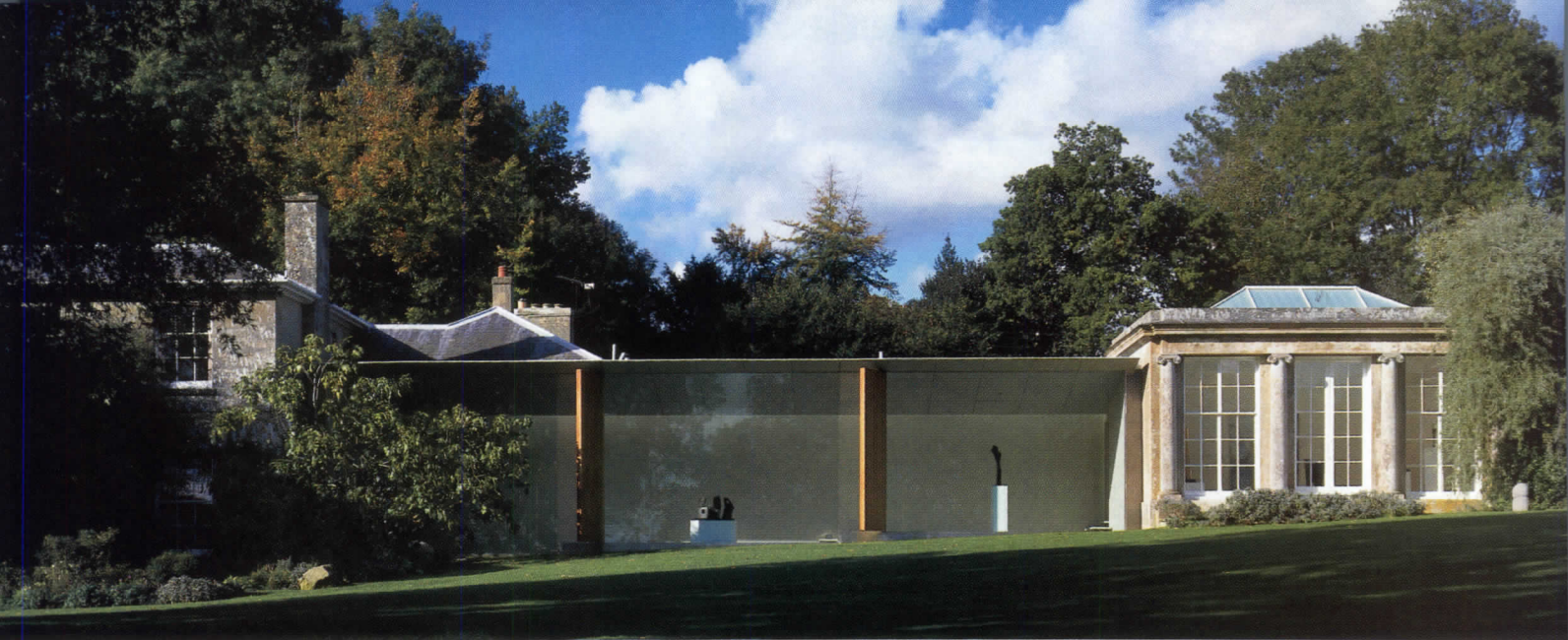
In addition to the main house and the orangery, where small sculptures and paintings are exhibited, Roche Court provides 120 acres of lawns, woods, and fields in which Lady Bessborough shows outdoor sculpture. Her gardens now contain one of the largest collections of outdoor sculpture in the country, including works by such renown sculptors as Allen Jones, Anthony Gormley, and Barbara Hepworth.

The New Art Centre, as the gallery and gardens are called, is open to the public all year and attracts between 5,000 and 10,000 visitors. When the owners decided they needed more indoor gallery space, they hired London firm Munkenbeck + Marshall.

Solution

The design solution is remarkably simple. Located along the south





The contemporary glass and concrete gallery for viewing small sculptures is nestled between the late-Georgian house

and orangery (this page). The gardens contain one of the largest outdoor sculpture collections in the country (opposite).





edge of the walled gardens, the new gallery uses an existing garden wall as its backbone. The architects conceived a skeletal-steel-framed, glass-enclosed bar building nestled between the house and the orangery. The expanse of glass that forms the south elevation of the new gallery establishes its connection to the open sculpture gardens in true Modernist tradition. Because of the gallery's integral connection to nature, the paintings and sculpture are sheltered, yet part of a gardenlike setting.

Structure/Materials

The existing wall supports the roof on the north side of the gallery. Two steel columns, only two inches in diameter, provide additional support at the opposite elevation. These structural elements are encased in the two 13-foot, 6-inch cedar doors that divide the glass elevation into three bays. These hidden door columns make the aluminum-clad roof seem to float without any support above the gallery. This effect is most powerful when the doors, which pivot on concealed ball races, are open. The doors can be closed in inclement weather.

The cedar doors punctuate the south elevation, which is formed by three laminated glass panels. The architects designed a frameless wall system—the glass

slips into slots in the ceiling and is fixed back to the edge of the slab with stainless-steel plates at ground level—the startling result is that there is nothing solid to separate indoors from out.

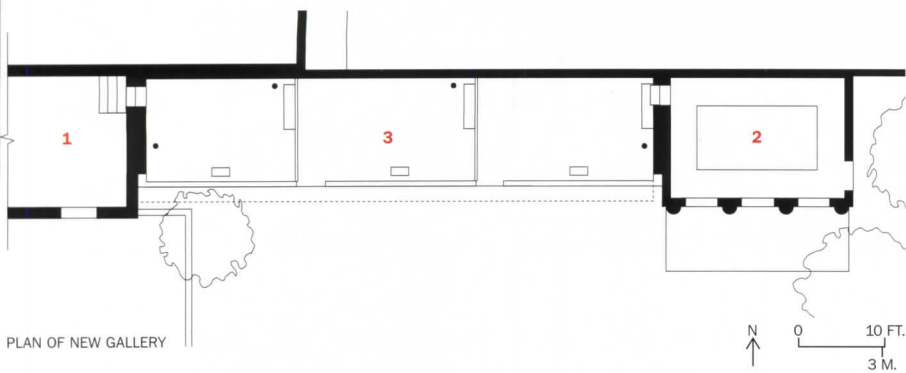
The roof is angled to give more expansive views out to the garden. Above the glazed elevation, it is beveled to further diminish its visual weight. The roof slopes back from this point to the existing wall in the rear, but is separated from it by a row of translucent-glass skylights that filter in natural light and add to the detached effect. Light reflects off the silvery tone of the ceiling and bounces back onto the exhibits.

An unreinforced, unsealed concrete slab, made without aggregate, forms the gallery floor and adds to the sense of lightness because of its color. The risers of the steps are local limestone.

Commentary

The result is a delicate enclosure that provides seamless connection between indoors and out, sculpture garden and sculpture gallery, historic and new, man-made and natural.

Munkenbeck + Marshall has created a space of remarkable clarity and serenity. Sited in this genteel, bucolic setting, the New Art Centre provides visitors the opportunity to forge a special, intimate relationship with the works on display. ■



The architects conceived the gallery as a seamless connection between indoors and out, historic and new (below). At night, the architecture seems to disappear (opposite top). The gallery has been treated as a classically Modernist link between the late-Georgian structures (opposite middle and bottom).



Chibougamau Mining Interpretation Center

Chibougamau, Quebec, Canada

4

BY BUILDING A MUSEUM IN A DEFUNCT COPPER MINE, JULIEN ARCHITECTES HAS SHED SOME LIGHT ON A LIFE UNDERGROUND.

By Elizabeth Harrison Kubany

Architect: Julien Architectes—Marc Julien, partner in charge;

Stéphane Carrière, architect;
Michael Boxer, architect-intern

Client: Economic and Tourism Commission of Chibougamau—M. Ronald Blackburn, mayor of Chibougamau

Consultants: Idéation Communications (exhibit designer); Gérin-Lajoie Experts-conseils Inc. (structural, mechanical, electrical); Roche Ltée Groupe-conseil (mining engineering); Larouche Construction (general contractor)

Size: 2,400 square feet (interpretation center only); 12,000 square feet (center and all tunnels)

Cost: \$408,000

Completion date: May 1997

Sources

Sealants: Ferlac Inc.

Copper cladding: Russell Steel

Insulation: Rocksul

Doors and door hardware: Von Duprin, Schlage, Sargent, Richard Wilcox, Mont Hard

Wood paneling: Goodfellow

Lighting: Peerless, RAB

HVAC systems: Dry-o-Trom, Westinghouse, TECK

HVAC controls: Edwards

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

Program

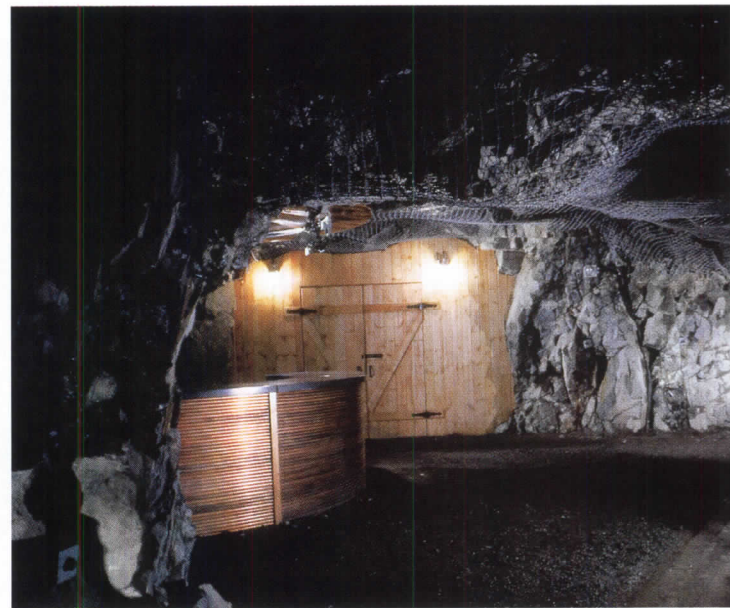
Mining is the bedrock of the economic and cultural identity of Chibougamau, a remote area located 1,000 kilometers north of Montreal in Quebec. "There are two large mines in Chibougamau now," says Marc Julien of Julien Architectes in Montreal. "If the mines close, the town will close."

The local Bruneau Copper Mine was operational for only two years during the 1960s before its seam of copper was exhausted. But, in 1992, when two local geologists and a retired miner suggested building a mining museum adjacent to an old mine, Bruneau was recommended because it was the only mine in the area bored horizontally into a mountain.

Solution

Julien Architectes was hired to build an interpretive center outside the mine. Instead, Marc Julien proposed bringing visitors inside the shaft to let them experience what it is like to be a miner. Rather than design an artificial enclosure, Julien has made the mine itself the architectural form.

The primary program elements—the reception room, the washrooms, the permanent exhibit room, and the cloakroom—are housed in a series of found and newly created spaces. Almost 60 percent of the modest budget for the project was used to excavate more space from the rock with dynamite.

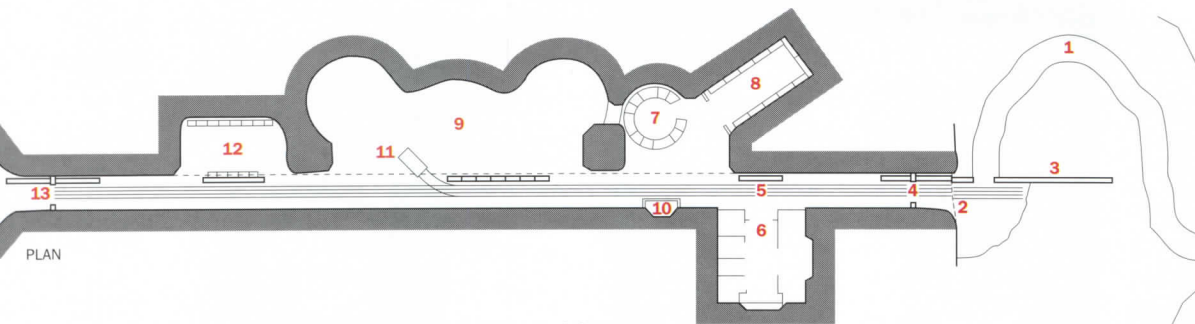


From a distance, all that is visible of the museum is a shining, linear copper wall jutting out from a mound of rock debris. The only element visible from the exterior of the mine, the wall both recalls the mine's former use and helps unify the design. While not continuous, the copper wall appears throughout the project to signal the primary program elements. It also doubles as a technical service wall, concealing electrical controls and light fixtures.

Visitors enter the center between the old rails for the carts that carried the metals out of the mines. Once inside, they encounter the entrance gallery first. Because of the minimal budget, Julien had to design a space that could be

run by only two people—one to supervise the main program areas from the centrally located reception desk, the other to take visitors on tours.

The large exhibition space, just beyond the reception desk, contains simplistic historical panels and displays and cartoonlike figures. After passing through the reception area, visitors—like the miner going to work—put on a hardhat and headlamp, boots and a belt. Beyond the heavy steel door, at the end of the wall, they are greeted by total darkness, hearing only the sound of water dripping. Life-size images of miners at work appear, illustrating mining techniques through history; they are shown emerging from a



- | | | |
|----------------------|-------------------|----------------------------|
| 1. Path | 5. Main tunnel | 9. Exhibit room |
| 2. Entrance terrasse | 6. Bathrooms | 10. Vertical shaft exhibit |
| 3. Copper wall | 7. Reception desk | 11. Existing rails |
| 4. Entrance door | 8. Boutique | 12. Cloakroom |
| | | 13. Gate to mining complex |

A modular copper wall announces the entrance to the interpretation center (below). The entire museum is built into an existing mine (see plan left). The reception area, with its circular reception desk, is the first space visitors encounter (opposite).



Before entering the tunnels, visitors stop at a cloakroom to garb themselves in authentic miners' gear (right). One of the exhibitions tells the story of mining through history by showing miners at work, doing a variety of tasks (right bottom).



chute, shoveling debris, discussing technical problems, and drilling. The last space in the center before the entrance to the tunnels contains a sound and light show.

After passing through all the program elements, visitors can explore 1.2 kilometers of tunnels. Their headlamps are the only source of light, making the experience even more authentic.

Structure/Materials

All materials are indigenous to mines. Finely crushed gravel, a remnant of the excavations and of Bruneau's days as a working mine, carpets the floor. Pine planks create pathways that lead the visitor through the center. The doors are galvanized steel, just like the doors in a working mine. Rough spruce, a local wood, was used for all the millwork. Frost fencing has been bolted to the rock ceiling, preventing debris from falling while still allowing rainwater to seep in, as it does naturally, through fissures in the rock.

All elements of the interior, from the mechanical and electrical equipment to the displays, had to be waterproof, and the washrooms and mechanical room have protective roofs like those found in other mines. In the shop, shelves and lighting fixtures are protected by copper awnings. The reception desk has a stone countertop, its drawers are watertight, and the



cash register can be stored in a waterproof locker.

Commentary

The idea of placing the museum within the mine itself has such power that the exhibits seem weak and extraneous by comparison.

Unlike more traditional museums where visitors are passive observers of exhibits, the Chibougamau Mining Interpretation Center promotes the knowledge and understanding of an activity that has been vital to this region by emphasizing the experiential qual-

ity of an actual space. The architectural interventions reinforce the quality of the original interior while still accommodating the museological needs. As Marc Julien says, "This project was designed to evoke emotions. It is not only about learning; it is also about feeling." ■

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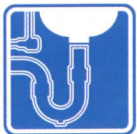
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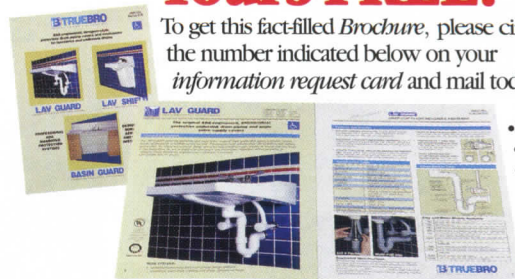
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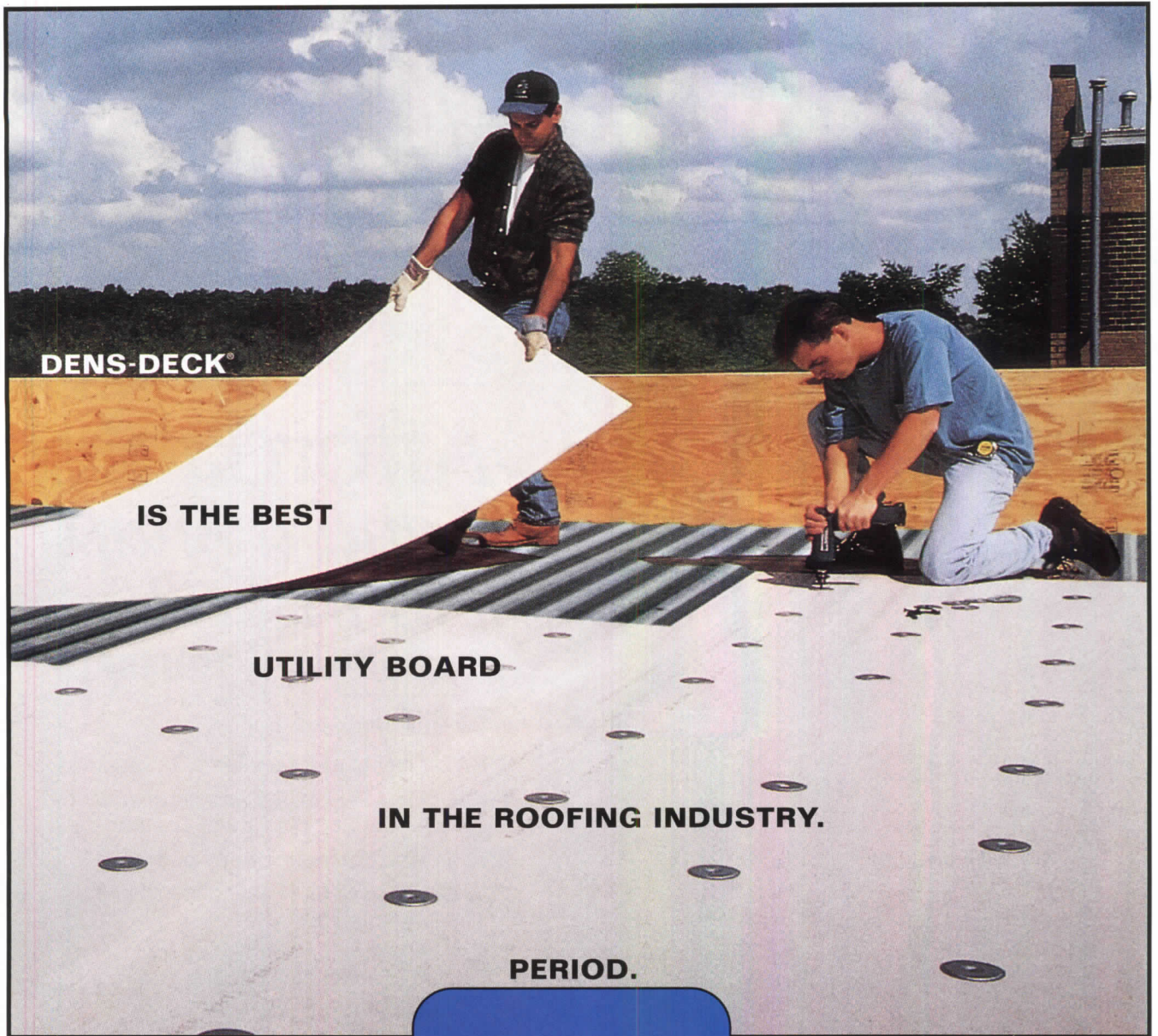
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CIRCLE 46 ON INQUIRY CARD

Making Sense of Single-Ply Roofing

WHAT PERFORMS BEST AND LASTS LONGEST DEPENDS ON THE TYPE AND QUALITY OF THE MEMBRANE AND THE INSTALLATION SYSTEM.

By Steve Hardy and Mark Boulay

Most architects, unless they're extraordinarily dedicated to roofing systems, can't remember all the names, initials, and chemical compositions of single-ply roof membranes, let alone digest the performance characteristics of each type. "Every so often I have to go look them all up and make sure I understand how each of the materials is performing lately," says Vaughn Wagoner, an architect at Lockwood Greene in Atlanta.

Part of the industry's confusion comes from the idea that new single plies come along frequently. But the fact is that most "new" membranes are simply reformulations of existing products. According to the National Roofing Contractors Association (NRCA), there are eight manufacturers offering 30 variations of polyvinyl chloride (PVC) single plies and 14 manufacturers offering 44 other types of single plies. For example, the names of membranes within the PVC family may be changed to enhance marketing efforts as much as to portray performance characteristics. Butadiene acrylonitrile polymers (NBP), for example, contains as little as 6 percent of the NBP, with the balance of the formulation made up of PVC and fillers. But by calling the membrane NBP, the manufacturers offer a unique product.

The latest membrane, and one that is genuinely new to the industry, is thermoplastic polyolefin (TPO). It's been on the market for about six years, but widely available for less than three. Among its attributes, TPO is reportedly resistant to UV degradation and premature aging from exposure to the high temperatures often present on the rooftop.

Steve Hardy is principal of Moisture-Tech., NW, a roofing consulting firm. He is the author of Time Saver Details for Roof Design [McGraw-Hill, 356 pages]. Mark Boulay is chief engineer for Engineering Services Group, civil engineers specializing in commercial roofing, in Centerville, Mass.



TECHNOLOGY

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 144 and follow the instructions

LEARNING OBJECTIVES

After reading this article, you should be able to:

1. Describe the components of single-ply roofs.
2. Explain the difference between thermoset and thermoplastic membranes and understand the performance properties of each.
3. Discuss the newest single-ply membrane, thermoplastic polyolefin, and its characteristics.
4. Identify various roof membrane attachment methods.

NBBJ chose PVC roofing for Safeco Field because of its ease of installation.

According to SPRI, a trade organization for manufacturers of single plies, it is also flexible in cold temperatures and more resistant to punctures and tears than other types of membranes.

New products bring excitement, as well as exaggerated claims, and TPO is no exception. There's often confusion about how to specify and detail the newcomers, and questions about how well the membranes will perform. It's difficult for architects to choose a membrane wisely.

Wagoner has a two-step solution—a belt-and-suspenders approach—to the marketing hype. He focuses on the quality of the roof system as a whole, making sure the underlayment, deck, and attachment system are carefully thought out and detailed. And he checks out the reputation and reliability of the manufacturer because the company's



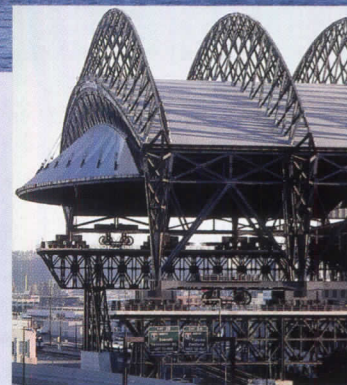
CASE STUDY

Safeco Field, Seattle

PVC's trim appearance and clean, easy installation were the two main reasons NBBJ's Hansen specified it for the Safeco Field. "With no buckets or torches perched 200 feet in the air, the PVC seemed safer to

install than any type of built-up roof," he says. Applying a built-up roof is a craft, one that requires years of training. But putting on a single ply is a quick, easy, and "foolproof" process, he says. "That means a decent-quality job, even when you can't control who will be applying the roof." Appearance was

also important on a roof that is such a predominant architectural element. The smooth, "Mariner's gray" custom-colored cap blends with the rest of the structure. The flexibility of the membrane also made it easier to cover the curved surfaces of the dome without special, costly detailing.



formulation of a particular roofing product determines its performance as much as the type of membrane. He judges manufacturers on past experience, how they answer his questions, the consistency of the information they provide, and personal contact. "If I don't hear from somebody at the company regularly, I start to worry," he says. "Unless they keep me informed, I'm not likely to work with them."

What are single plies?

Before exploring the performance of new materials, a basic understanding of single-ply roofing membranes, which account for more than 55 percent of the roofs on commercial buildings; is needed. Single plies are polymeric sheets, meaning they are made with flexible synthetic polymers. This flexibility lets them accommodate building movement and makes them easy to install. Unlike built-up roofs, which are applied in the field, single plies are made in a factory where quality is closely controlled, meaning a more consistent product. Another advantage is the variety of ways in which single plies are installed. The system that's used depends on the roof, the membrane that is selected, costs, aesthetic considerations, and the experience of the installers. Once installed, repairs are easier to make than on built-up roofs since tears and other problems are cut out and a patch is heat-welded or glued in place.

Single-ply sheets are thermoset or thermoplastic. Thermoset materials are set, or cured, by heat during manufacture. This is significant because it dictates how the membranes are installed: thermosets must be lapped to like materials using either liquid-applied, butyl-based splice adhesives or seam tape. The system is, in essence, only as good as the strength and quality of the seam adhesive or tape. Ethylene propylene diene monomer (EPDM), the most common thermoset membrane, is also the most widely used of all the single plies. That's because of its comparatively low cost. It's also been around longer than PVCs—since the early 1960s.

Many architects, however, avoid EPDM because of the reputed weakness of its seams. "I'm not convinced that glue keeps water out," says Kenneth L. English, AIA, of Houston-based Hermes Reed Architects. Also,

application is tricky. The seams must be carefully cleaned and primed before applying the adhesives. A number of firms compensate by over-designing the seams, increasing the width of the lap from the manufacturer-recommended 3 inches to 6 inches or more. Specifying wider sheets for ballasted and fully adhered applications—20 feet is most common—means fewer seams, reducing costs and opportunities for failure.

Thermoplastic membranes cure in the field with exposure to the elements. Seams are heat-welded with 1,700-degree-F air from a hot-air gun. The result is a fused seam that's stronger than the field of the membrane. TPO and PVC are common thermoplastics. Some of the lesser-known varieties are formulated for laboratories, manufacturing facilities, or other corrosive environments.

DuPont's Hypalon, or chlorosulfonated polyethylene (CSPE), bounces between the two categories. Hypalon is a self-curing, nonvulcanized elastomer. After manufacture, it is thermoplastic in nature but, with heat and light exposure, it becomes thermoset. Use of CSPE is



Narrow rolls of TPO are labor intensive to install, but are more stable.

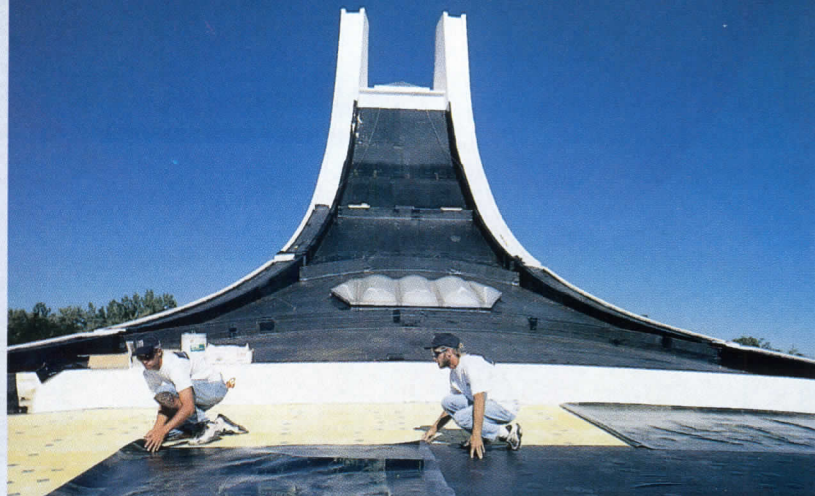


CASE STUDY

Church of the Risen Christ, Denver

Architects, building owners, and roofers all seem to have different opinions about which membrane type is best. Dick Ducey, who specified EPDM to reroof the Church of

the Risen Christ in Denver, says that membrane “lasts longer and has a better track record” than any of the thermoplastic sheets. The church’s 110-square roof swoops from a height of 118 feet in the front to 12 feet in the back—not an easy roof to work on and another reason for selecting EPDM. “PVCs



are unbelievably slippery when they’re wet,” Ducey says. The seams were taped, rather than cemented, because Ducey says that tapes provide better holding power. The gray 60-mil EPDM was coated with two coats of hypalon paint to make it snowy white—the color of most PVCs.



declining because of its cost, typically higher than other commonly used single plies. Also algae can grow on the wet membrane, sinking its roots into the material. To combat the algae, manufacturers introduced a chemical that causes chalking. But this, in turn, can cause the membrane to dissolve, like chalk in a glass of water. The result is a sheet that is too thin to perform properly. A recent generation of reformulations has purportedly solved this problem.

Other types of single plies also have checked pasts. EPDM had trouble with seaming tapes and cements that gave way, though new adhesives have helped. In the 1980s, many PVC roofs failed when the plasticizers, added to the formula to keep the sheets from becoming rigid, like PVC pipes, migrated from the material upon exposure to UV. The result was roofs that shrank, crazed, and shattered. Reformulations in the mid-1980s improved the durability of the membrane, while reinforcing the sheet with an inner scrim helps control shrinkage.

The newest membrane

“You’d think it was the second coming, the way people are carrying on,” says Michael Johannes, director of sales and marketing for Johns Manville’s single-ply roofing division, of TPO. The company is one of many, including Firestone, GAF, and Carlisle, that offer TPO membranes. The material combines the ethylene propylene (EP) synthetic rubber in EPDM with polymers such as polyethylene or polypropylene (olefins). The synthetic rubber eliminates the need for plasticizers, making a more stable polymer.

This significant advantage, combined with the cost of TPO, which is somewhere between PVCs and EPDM (the least expensive of the single plies), makes it attractive. The material is highly resistant to chemical degradation from many sources, including aged asphalt and polystyrene, often present on the roof. Originally used as a geomembrane and a component in many products, such as golf cart bodies and inline roller skates, TPO has been around since the 1970s, though it was first used as a roofing material about six years ago.

Most major roofing producers began offering TPO within the

past three years. “They see a good business opportunity,” says Sam Everett, director of corporate communications for Stevens Roofing Systems, which, he is quick to point out, began selling TPO about six years ago. “TPO doesn’t have the baggage of other single plies.”

Despite the confidence of some manufacturers, the limited amount of TPO installed for any extensive period of time leaves its long-term performance open to speculation. And with the absence of ASTM testing criteria for the early TPO sheets, the “recipes” for the material varied greatly. That makes it difficult to accurately assess the performance of the membranes. “This is a product that’s still evolving,” Johannes says.

More significant, some TPO membranes shift in weather extremes. This lack of dimensional stability, particularly in black TPO sheets, which absorb more heat and, therefore, have a greater coefficient of expansion, is resulting in membranes that are baggy in the summer and taut to the point of straining the fastening system in the winter.

The solution, manufacturers say, is a conservative fastening schedule—more fasteners per square means less stress on each one, improving holding power. And, once again, an individual company’s product performance is based on how their TPO is formulated. The differences in the membrane formulations are readily apparent based on their appearance and flexibility. Some sheets are stiff; the manufacturers of these say the rigidity makes installation easier. Regardless, Everett

THE SINGLE-PLY ALPHABET

THERMOSETS

- CR CHLOROPRENE, ALSO KNOWN AS NEOPRENE (A SPECIALTY MEMBRANE)
- CSPE* CHLOROSULFONATED POLYETHYLENE, ALSO KNOWN AS HYPALON
- EPDM ETHYLENE PROPYLENE DIENE MONOMER OR TERPOLYMER

THERMOPLASTICS

- CPA** COPOLYMER ALLOYS
- CPE** CHLORINATED POLYETHYLENE
- EIP** ETHYLENE INTERPOLYMERS
- NBP** BUTADIENE ACRYLONITRILE POLYMERS
- TPA** THERMOPLASTIC ALLOY
- PIB POLYISOBUTYLENE ALLOY
- PVC POLYVINYL CHLORIDE
- EP*** ETHYLENE PROPYLENE
- TPO THERMOPLASTIC POLYOLEFIN

* TECHNICALLY A THERMOSET, BUT HAS THERMOPLASTIC PROPERTIES
 ** CLASSIFIED AS PVCs
 *** REFERRED TO AS A TPO BUT MAY ALSO BE CONSIDERED A PVC

CASE STUDY

Garden Ridge, Atlanta

Hermes Reed Architects is increasingly specifying TPO roof membranes paired with a cementitious underlayment, which gives a sturdy, smooth surface that stands up to traffic. The firm has designed more than 25 Garden Ridge stores, a home decor and crafts retailer. The first few buildings had an EPDM roof, but

punctures were a continual problem. "Installing the cross-shaped, high-bay, metal roof left screws littered across the roof surface. These were popping the EPDM laid over them and the roofs were leaking," says Robert Kane, AIA, project architect. He switched to a mechanically attached TPO, which is not only more puncture-resistant, but also faster to apply. "It doesn't have the prep time that EPDM requires," he says.



recommends evaluating a company's track record before specifying their product. "Not all TPOs are alike. Many companies buy the raw material in batches from wholesalers, which means they have little control over the consistency of the ingredients," he says.

The nitty gritty

Membrane thicknesses for all single plies range from .033 to .060 mils, though thicker roofs are available for special uses. The 8.9-acre retractable PVC roof over Safeco Field in Seattle, designed by NBBJ, is a weighty .080 mils, .096 mils in the gutters. "We knew people would be up there walking around so we needed something to stand up to traffic," says Knut Hansen, the architect who specified the roofing. "The thickness made it difficult to seal the seams—something specifiers should know before they pick something this hefty."

In general, however, a thick membrane will not always outperform a thin one. TPO may be an exception here since heavier sheets—.040 mils or more—offer greater dimensional stability. But, in general, the quality of the formulation, the characteristics of the inner reinforcing scrim, the abilities of the installer, and the compatibility of the single-ply membrane with the rooftop environment all factor into the roof's performance.

Most single-ply membranes have a scrim reinforcement layer,

usually polyester, sandwiched within the membrane to give the sheet puncture and wind-load resistance, and to increase dimensional stability. Reinforced sheets are required when a system is mechanically attached to give the fasteners better holding power. Unreinforced sheets are less expensive, however, and may be used when a membrane, usually EPDM, is loose-laid and ballasted. The ballast protects the sheet and enhances wind resistance.

Warranties among the varieties are similar: 10 to 20 years, depending on the installation. An improperly applied flashing or edge detail will quickly void a warranty, so understanding the terms is important. English recommends working closely with the manufacturer, especially when installing TPO—because of its newness—or if some type of special modification to the roof is required. "We recently put an addition onto an existing building and seamed the older PVC to the newer membrane [from the same manufacturer]. I had the reps come right up on the roof and watch it being done to make sure no warranty conditions were violated," he says.

Attaching the membrane

The attachment method that's used, whether fully adhered, mechanically fastened, or ballasted, depends on type of membrane, height and size of the building, fire rating, deck material, building use, and wind

TELLING THEM APART: SINGLE-PLY CHARACTERISTICS

EPDM

- **ETHYLENE PROPYLENE DIENE MONOMER** (SOMETIMES TERPOLYMER IS USED) MOST POPULAR SINGLE PLY, COMMONLY KNOWN AS A RUBBER ROOF BECAUSE IT IS MADE OF THE SAME MATERIAL AS TIRE INNER TUBES.
- **INSTALLATION:** MECHANICALLY FASTENED, FULLY ADHERED, BALLASTED (USED MOST OFTEN)
- **SEAMS:** CHEMICALLY FUSED (WITH ADHESIVES OR TAPE)
- **INTRODUCED:** EARLY 1960s
- **COLOR:** GRAY
- **NOTES:** DURABILITY FOR NEW AND REROOFING APPLICATIONS IS PROVEN OVER MANY YEARS OF USE, BUT MANY ARCHITECTS DISTRUST THE SEAMING MATERIALS.

CSPE

- **CHLOROSULFONATED POLYETHYLENE** (COMMONLY KNOWN AS HYPALON) A THERMOPLASTIC THAT THERMOSETS IN THE FIELD.
- **INSTALLATION:** MECHANICALLY FASTENED (USED MOST OFTEN), FULLY ADHERED, BALLASTED
- **SEAMS:** HEAT WELDED
- **INTRODUCED:** 1950s
- **COLOR:** WHITE, LIMITED CUSTOM COLORS
- **NOTES:** USE IS DECLINING DUE TO COSTS, WHICH ARE OFTEN HIGHER THAN OTHER MEMBRANES, AND REPAIR PROBLEMS. RECENT REFORMULATIONS ATTEMPT TO ELIMINATE PROBLEMS WITH RED ALGAE (A RESULT OF PONDING), AND CHALKING.

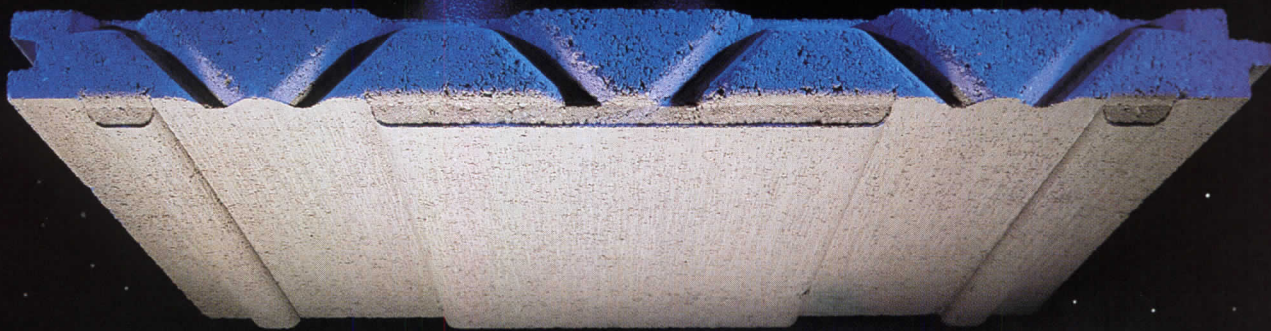
PVC

- **POLYVINYL CHLORIDE** VARIATIONS SUCH AS NBP, EIP, CPA, AND CPE, ARE USUALLY SPECIAL-PURPOSE MEMBRANES CONTAINING PVC, FILLER MATERIAL, AND A PERCENTAGE OF PROPRIETARY MATERIAL.
- **INSTALLATION:** MECHANICALLY FASTENED, FULLY ADHERED (USING A SMOOTH OR FLEECE-BACKED SHEET BONDED WITH ADHESIVES OR HOT ASPHALT), BALLASTED (NOT TYPICALLY COST EFFECTIVE)
- **SEAMS:** HEAT WELDED
- **INTRODUCED:** LATE 1960s
- **COLOR:** WHITE, CUSTOM COLORS
- **NOTES:** AVAILABLE ONLY AS A REINFORCED SHEET AFTER NUMEROUS SYSTEMS FAILED IN THE EARLY 1980s. PRODUCT REFORMULATED OVER THE YEARS TO IMPROVE ITS DURABILITY AND CONTROL SHRINKAGE. SUITABLE FOR NEW AND REROOFING APPLICATIONS.

TPO

- **THERMOPLASTIC POLYOLEFIN** (TECHNICALLY THERMOPLASTIC ELASTOMER OLEFIN, A TYPE OF PVC) COMBINES THE RUBBER (ETHYLENE PROPYLENE) IN EPDM WITH POLYMERS (OLEFINS) TO PRODUCE A THERMOPLASTIC MATERIAL WITH HEAT-WELDED SEAMS.
- **INSTALLATION:** MECHANICALLY FASTENED, FULLY ADHERED
- **SEAMS:** HEAT WELDED
- **INTRODUCED:** 6 YEARS AGO
- **COLOR:** BLACK, WHITE, GRAY, LIMITED CUSTOM COLORS
- **NOTES:** THE LATEST SINGLE PLY TO ENTER THE MARKET, TPO LACKS A PROVEN TRACK RECORD. DIMENSIONAL MOVEMENT IS A POTENTIAL PROBLEM, BUT COMPARATIVELY INEXPENSIVE.

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SURFACE WIND

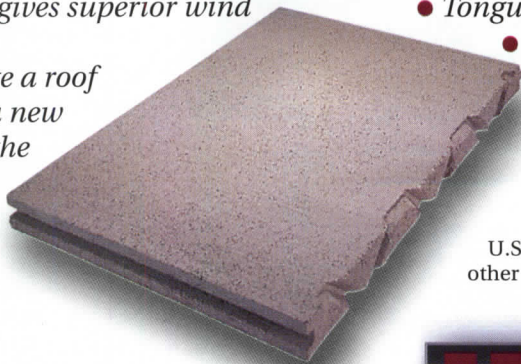
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CIRCLE 47 ON INQUIRY CARD



Recycling used single-ply roof membranes

With something like 1,400 square miles of low-slope roofing in place in the U.S., an area slightly larger than the state of Rhode Island, and close to \$13 billion spent annually on reroofing, disposal of the old

membrane is a big issue.

Thermoplastics, such as PVC and TPO, are recyclable, while thermoset membranes, such as EPDM, are not. Here's why: thermoplastics can be melted, purified, and reextruded; thermoset plastics have been changed during the polymerizing process and cannot be changed

back. When EPDM is recycled, it is chopped up and added to another material, such as rubber flooring.

One of the few companies actively recycling commercial roofing is Conigliaro Industries in Framingham, Mass. Gregory Conigliaro, president, says his company recycles about one million square feet of PVC membrane per year, or 20,000 pounds per month (left), plus several million board feet of expanded polystyrene insulation, and a small amount of EPDM. For large reroofing jobs, the company charges a flat price that is usually no more expensive than landfilling the waste. With foam insulation, where there is more of a market for the waste, the cost of recycling is about 40 percent lower than landfilling.

Conigliaro sells recycled PVC to compounders for use in manufacturing a wide range of consumer goods and as a compo-

nent in cold-patch paving materials. Recycled foam is used as beanbag stuffing, plant hangers, and flower pots.

Unfortunately, few roofing manufacturers actively promote recycling. An exception is Sarnafil, producers of PVC roofing. Through Conigliaro Industries, Sarnafil is promoting recycling of PVC membrane on reroofing jobs in New England. The company is producing a video on roof membrane recycling for sales reps. "To date we're not seeing a lot of requests for recycling," says Brian Whelan, Sarnafil's vice president of sales. He is hoping that the new video will help to turn that around. Sarnafil also recycles post-industrial scrap from both their PVC and TPO production lines to produce walkway layers for roof surfaces.

—Alex Wilson, executive editor and publisher of Environmental Building News

loads expected for the life of the roof system.

Mechanically fastened: There is an assortment of methods, including nonpenetrating clips and metal plates, batten strips, or bars. The type of fastener is dictated by the single-ply manufacturer, but the number of fasteners as well as the size and position of each is based on the design of the building and the architect's specifications. "That's where the architect has an opportunity to improve the performance of the roof," English says. Making sure the fasteners are close enough to pre-

vent the deleterious effects of wind uplift, expansion and contraction, and other stresses adds time to the life of the assembly.

Fasteners secure the sheets at the seam edges, which leaves the loose area between the seams free to flutter in the breeze. If there are not enough closely spaced fasteners, this consistent fluttering will cause the fastener shanks to eventually wiggle out of the deck. This means that adjacent fasteners must absorb the load, causing them, in turn, to fail. This failure cycle leads to the demise of the roof.

Steel batten bars are susceptible to movement due to temperature changes. This movement stresses the fasteners that hold the bars in place. Again, an insufficient fastening schedule will lead to the roof's failure. Plastic bars may be a good alternative.

The cost-effectiveness of a mechanically attached assembly drops as the number of narrow profiled areas, penetrations, or wall openings increases. Or if a building is long and narrow, edge and corner attachments are so frequent, it may be less expensive to use a fully adhered membrane.

Fully adhered: Membranes are attached to the roof substrate with manufacturer-supplied adhesives, often latex based, compatible with the substrate and the sheet. The roof substrate is normally roof insulation, cementitious board, or low-moisture concrete.

The cost of the adhesives and the labor and time required to apply it and smooth the sheet in place makes a fully adhered single ply more expensive than mechanical attachment or ballasting. But the uniform bond of membrane to substrate achieves a roof that's highly resistant to wind, water, and dimensional changes.

Ballasted: Large sheets of material are rolled into place



Heat-welded PVC seams are stronger than the membrane in the roof field.

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and ballast, in the form of washed river gravel, crushed stone, or concrete pavers is layered over the top. As simple as this system is, there can be problems. The wind scours the roof perimeter and corner areas, eroding the gravel. This leaves these areas unprotected and vulnerable to wind uplift. Ballasted roofs are banned in many cities due to ballast blowing off the roof in high winds and causing damage to adjacent buildings. And fines, small, sand-sized particles from the aggregate ballast, act as abrasives that deteriorate the roof.

Ballast atop a roof prevents sunlight from reaching the membrane surface. This prevents UV degradation, but the membrane can stay wet and moist—ideal for vegetation growth. These problems aside, a ballasted system, paired with an EPDM membrane, is probably the most economical means of attachment.

Looks matter

Performance characteristics aside, aesthetics often drive the decision to specify single plies. “We used PVC on a vaulted roof and the seams are almost invisible,” English says. “The overall impression is of a smooth white cap that enhances the look of the building, Most roofs look like necessary evils.”

Color is also important, both to the look of the project and its performance—reflective light-colored roofing is more energy-efficient than black roofing in warm climates. The overall trend in the U.S., the NRCA reports, is toward a white or light-colored membrane. Custom



Working 200 feet in the air, roofers applied PVC to Safeco Field's roof.

colors, like the “Seattle Mariners’ gray” used on the Safeco Field roof, cost more but are worthwhile if there is enough material specified. “You could have a lot of fun with all the different colors,” NBBJ’s Hansen says. “I can imagine a roof that becomes the most important feature, with the rest of the building serving as a backdrop.” ■



AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

INSTRUCTIONS

- ◆ Read the article “Making Sense of Single-Ply Roofing” using the learning objectives provided.
- ◆ Complete the questions below, then check your answers (page 198).
- ◆ Fill out and submit the AIA/CES education reporting form (page 198) or file the form on ARCHITECTURAL RECORD’s Web site at www.architecturalrecord.com to receive one AIA learning unit.

QUESTIONS

1. What are the advantages of thermoplastic membranes over thermoset?

2. What are the components of single-ply roofs?

3. What are the advantages of the newest single-ply membrane, TPO?

4. What are the differences between membrane attachment methods?

5. What are single-ply roof membranes made of?

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CIRCLE 50 ON INQUIRY CARD

Tech Briefs

KEEPING THE LOW-SLOPE ROOF ON THE BUILDING WHEN THE HARSH WINDS BLOW



Wind is a roof's worst enemy. When it slams into a building, the pressure against the building face is directly proportional to the wind velocity. But as wind pushes over the top of the building, it accelerates. Thanks to Bernoulli, architects know this high-velocity wind causes negative pressure, or a lifting effect, on the roof. The negative pressure is directly proportional to the wind velocity, but the magnitude of the force is higher at roof perimeters and corners. As a result, this is where close to 80 percent of all wind-related roof failures occur, according to Factory Mutual Research, a nonprofit division of FM Global, an insurance company.

To prevent these problems, all roof elements, including the membrane, insulation, deck, edge metal, perimeter wood-blocking, and walls, must perform in concert to resist wind uplift. The successful performance of perimeters and corners on low-slope roofs cannot be attained by citing one standard. ANSI and the Single Ply Roofing Institute (SPRI) have some standards (ANSI/SPRI ES-1-98), as do the American Society of Civil Engineers (standard ASCE 7-95) and FM Global in its Property Loss Prevention Data Sheets. The following are some common details and recommendations drawn from these sources. Abiding by these guidelines will not only mitigate wind uplift damage, they will also help architects avoid liability issues if problems do occur.

Membrane: Adhered membranes don't require additional attachment, but mechanically attached single plies do. Fastener rows along the perimeter should not exceed 60 percent of the width of the fastener rows in the field of the roof. At the corners, fastener rows should not exceed 40 percent.

Insulation: The number of mechanically attached insulation fasteners needed increases by 50 percent at the perimeter and 75 percent at corners relative to the field. Adhesive-applied insulation "spots" must increase by 70 percent along perimeter and 160 percent at corners.

Deck: Reinforced-concrete decks don't need more reinforcing, but steel decks require doubled fasteners at the perimeter and corners. Cementitious wood-fiber decks should have their attachment density increased by 70 percent at the perimeter and 160 percent at the corners.

Edge metal: The success of this troublesome detail depends on the integrity of the substrate, the wind resistance of the edge detail, and the quality of the materials. For the latter, the ANSI/SPRI ES-1-98 worksheet provides guidance.

Perimeter wood blocking: This should be pressure-treated wood, at least 2-by-6 inches, secured to a masonry wall by corrosion-resistant anchor bolts. Vertical-design load resistance should be a minimum of 200 pounds of force per foot. Wood blocking should never be attached to lightweight concrete or gypsum decks.

Perimeter walls: Anchor bolts should be bent by 90 degrees at the base to prevent rotation and slippage, and should not exceed a spacing of 4 feet on center—2 feet on center within 8 feet of an outside corner.

William J. Hope



FEDERAL PROGRAM IMPROVES THE QUALITY OF NATIVE AMERICAN VILLAGE IN THE GRAND CANYON

There is a village at the bottom of the Grand Canyon in Arizona. Its 600 or so residents, the Havasupai Indians, have lived there since the 1300s, getting in and out of the canyon by hiking, riding burros and horses, or, these days, getting a lift in a helicopter in an emergency.

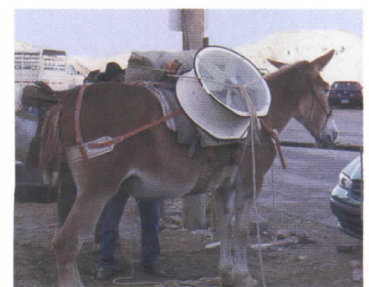
Housing conditions are poor. Of the approximately 130 houses in the village, 30 have no running water or electricity. Utility service is intermittent anyway; electricity is supplied by a single wire snaking down the canyon wall. Roofs are leaky, windows are broken, and air-conditioning—despite the summer's extreme heat—is rare.

This fall, two representatives of the U.S. Department of Energy's Rebuild America program, Jim Cavallo, with Argonne National Laboratory in Argonne, Ill., and architect Paul Knight of Domus Plus, in Oak Park, Ill., rode on horseback, toting supplies on burros (right), down to the village to see how they could help. Rebuild America helps community organizations form partnerships with local governments,

utilities, corporations, schools, and building owners to make buildings more livable and energy efficient. Many of the program's 160 community partnerships have involved Native American reservations.

Cavallo and Knight looked for ways to make the buildings energy efficient and, more important, tried to find opportunities for installing photovoltaic (PV) systems, thereby decreasing the area's dependency on electrical utilities.

This spring, the pair plans to return to the canyon to teach members of the tribe to install the PV systems and to weatherize the buildings, making life more comfortable and efficient for those at the bottom of the canyon. *Wendy Talarico*



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CIRCLE 51 ON INQUIRY CARD

Database management systems for architects

Digital Architect

By Jerry Laiserin, AIA

DEPARTMENTS

What's in a database?

Informally, any computer-based collection of data constitutes a database. Rows of information in a database table are called records. Each record, like each listing in a telephone directory, contains one or more fields of information, such as last name, first name, street address, and so on.

Once data is collected and formatted into records, the information can be shuffled and analyzed in many ways. In a telephone directory, for example, database records are sorted by alphabetizing the last-

name field. In an architectural practice, a marketing coordinator might organize a database of projects by geographic area; project managers might sort the same database by number of staff hours remaining in the budgeted fee for active projects; and principals might sort projects by their profitability.

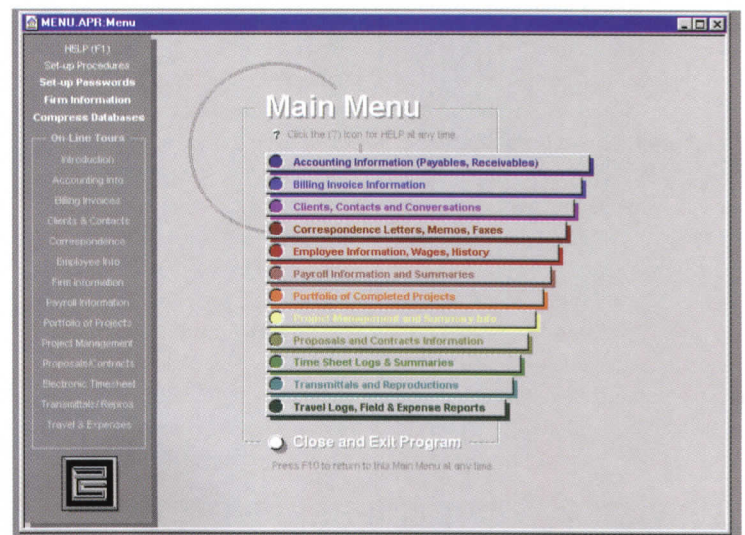
Management systems

DBMSs are the software tools that collect, format, store, and retrieve the desired bits of information. Most DBMSs include a system that generates the forms and reports for entering and retrieving data; a programming language to define the possible operations on that data; and an engine that processes the data according to these defined operations.

There are several types of DBMSs. At one end of the spectrum

are flat-file systems, such as Filemaker Pro. These are the easiest to program because they operate on only one level of data at a time. At the other end are relational databases (RDBMS), such as Oracle (from the company of the same name) and Microsoft's SQL Server. These are powerful DBMSs, capable

programs or specification packages. The actual software purchased by the customer, however, typically contains only the database engine and a set of predefined forms and reports. Thus, a commercially produced marketing program may include forms for making appointments, reminders, and notes about phone calls, and be



Arch Administrator's menu allows access to client and billing information.

of operating on multiple tables simultaneously and manipulating relationships among the tables. In between these two extremes are systems such as Approach by IBM/Lotus and Access by Microsoft. These are easy to program but less powerful than RDBMSs.

Incompatible data

Commercial software developers rely on DBMSs (typically RDBMSs), in conjunction with other programming tools, when building application products such as financial management

able to generate reports such as address books, to-do lists, and calendars, but may not include access to the database engine or the ability to create new forms and reports.

Custom-designed programs are tailored to individual firm's needs, but are limited by the software developer's understanding of the underlying data and its potential uses. With packaged or custom applications, such limitations become painfully obvious when a firm tries to share data among applications. For example, the name of a client may

Even before computers came along, architectural practice revolved around information management. Throughout their history, from codes and costs to soil borings and schedules, architects have had to marshal all the possibly relevant data and then sort, filter, and massage it into useful project information. In the past, this was accomplished with laborious notes, books, Rolodexes, and perhaps stacks of index cards. Today, many design firms rely on specialized computer software called database management systems (DBMSs) to make this culling and

DBMSs ARE SOFTWARE TOOLS THAT STORE, COLLECT, AND FORMAT INFORMATION.

winning process as efficient and productive as possible.

Few architects ever interact directly with a DBMS because users are insulated by application programs—layers of forms, queries, and reports specifically designed to shield them from the complexity of data manipulation. While detailed knowledge of DBMS software is unnecessary, it's worthwhile to understand key terms and concepts. With such a background, architects can make better decisions when buying software that depends on database management. And they can be more effective when coordinating and centralizing a firm's business and design information.

Contributing editor Jerry Laiserin, AIA, consults, writes, and lectures about the impact of information technology on the practice of architecture.

updated every time any of the programs are upgraded.

Designer databases

be coded as "client_name" for use in title blocks on drawings in a CAD program, as "client" for use on timesheets and invoices by an accounting program, and as "last_name," "lname," and "recipient" for communications via the firm's word-processing, E-mail, and fax software, respectively.

Because of inconsistencies among programs, the staff-members end up inputting the same information over and over—a time-consuming and error-prone practice, especially considering that a fully computerized firm uses a dozen or more different applications, from electronic timesheets to digital image libraries, each with its own database.

Coordinating databases

It's logical to assume that the path to eliminating this redundancy is to select one DBMS as a standard and then buy or build only applications that use that system as the data engine. In fact, some software is sold in multiple DBMS versions, though these may not be commercially available for every application. Moreover, it rarely makes economic sense to custom-develop software when a commercial alternative is available, even if that alternative does not use the firm's preferred

As a result of these limitations, many large, multi-disciplinary A/E practices with sufficient in-house programming staffs, select a powerful RDBMS as their standard and then buy, modify, or develop a fully coordinated suite of applications. Firms that can't afford this kind of investment deploy architecture-specific application packages developed (often in Filemaker Pro) for smaller firms by fellow architects-turned-software-entrepreneurs.

One such package, by Nina Kim McKenzie, AIA, from Oakland, is Arch-Street Portfolio. A series of software modules or components crafted in Filemaker Pro, Portfolio provides a form or report for almost every imaginable nondrawing function in a design firm. Finith Jernigan, AIA, principal of five-person Design Atlantic in Baltimore, finds Portfolio's selection of forms and reports—from proposals and budgets to field reports and invoices—comprehensive enough that he seldom uses other software, such as Microsoft Word or Excel.

Other examples of these software packages created by fellow architects are Arch Administrator by Paul Smialowicz, AIA, of Bloomfield, N.J., and ArchitectData by Dennis Hughes, AIA, of Tampa. Not only are these packages more attuned to the needs of architects in specific, but

THE WEB MAY BRING A HAPPY ENDING TO THE TANGLED EPIC OF DESIGN-FIRM DBMSs.

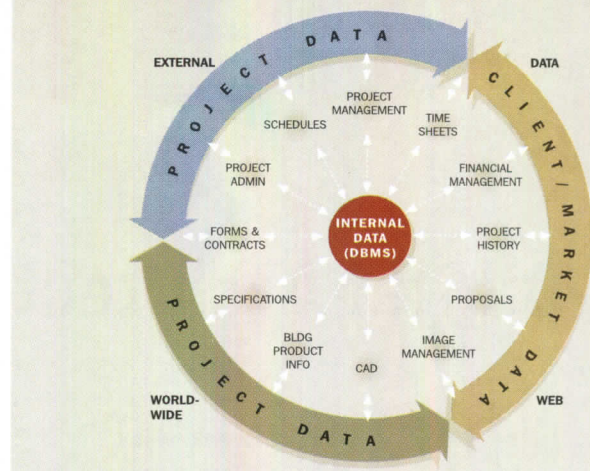
DBMS engine. Thus, most firms are faced with coordinating data derived from different DBMSs.

Most current DBMSs comply with a standard called open database connectivity (ODBC)—a set of rules that enables one database to connect with another. Most commercial software is built on these ODBC-compliant data engines; in theory, therefore, one could centralize databases by linking these data engines according to the ODBC rules. In reality, this approach is rarely chosen because the link has to be

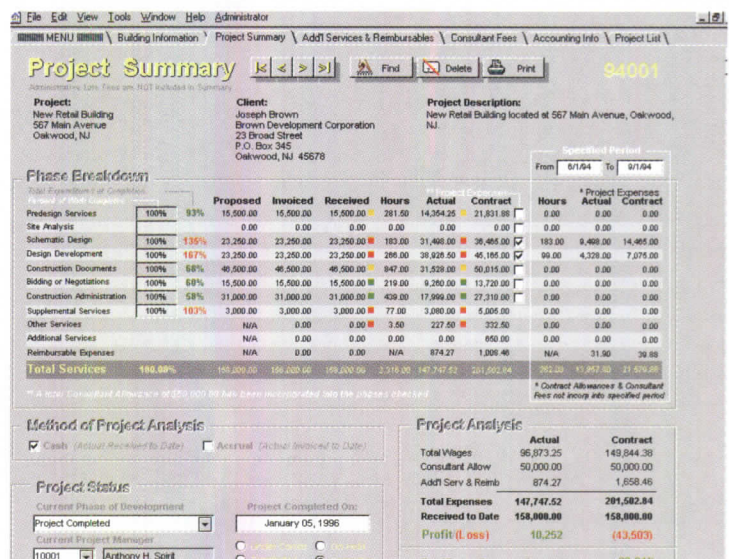
they are also less expensive than custom-developed applications.

Maurice Wasserman, AIA, a partner at Kappell & Kostow, a 40-person firm in New York City, evaluated some of these tools and found them "well done, but more comprehensive" than what most of his project architects want. For example, on projects requiring a quick turnaround, such as corporate interiors, the set-up time and daily data chores may not justify the rewards. Instead, Kappell & Kostow is exploring Details 2.01, from

DATABASE MANAGEMENT SOFTWARE SYSTEMS



SOURCE: © PROJECTWEB.ORG™



An information flow chart illustrates database management patterns in an architecture office (top); Arch Administrator's sample project summary (bottom).

AECSoftware, a data-management program well-suited to making and storing ad hoc lists—things like submittal logs and punchlists.

Web-based databases

The technology of the World Wide Web may bring a happy ending to the tangled epic of design-firm DBMSs and their complications. Firm-wide intranets—portals for selecting and viewing in-house data through Web browsers [March 1999, pages 39-40]—create a universal front end for firm data, regardless of its residing place or its original DBMS format. Middleware, the Web software that enables browser front-ends to connect to disparate DBMS back-ends,

is much easier to program than most individual DBMSs.

While databases and the applications developed with them remain an unavoidable part of a computerized practice, Web middleware makes it easy to extract and combine data from more than one database in a single on-screen browser view. With the additional potential to link data inside and outside the firm with a single mouse-click, Web technology may soon fulfill the dream of "information at your fingertips." ■

WWW For a list of DBMS vendors and other information-management resources, go to **Digital Architect** at: www.architecturalrecord.com

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CIRCLE 52 ON INQUIRY CARD



WIRE AND CABLE MANAGEMENT SYSTEMS



MEETING SPACE AND TECHNOLOGY REQUIREMENTS WITHOUT COMPROMISING AESTHETICS

The increased reliance on computer networks and telecommunications systems, as well as the transformation of office space into workstations, have fundamentally changed the relationship between

information technology and building design. Today, clients require buildings that take full advantage of high-performance data/communications systems. Because rapid change is an economic fact of life, clients also need flexible space so that workstations can be quickly and cost effectively reconfigured. And they are increasingly demanding

that aesthetics not be sacrificed for the sake of technology or flexibility.

The challenge is to maximize building function by meeting current and future space and technology requirements without compromising aesthetics. Central to meeting this challenge is the infrastructure that distributes data/communications cabling from communications closets to individual workstations. These wire and cable management systems are integral components of design that have the potential to greatly enhance a building's function.

Today, premises wiring is more than cable in the wall and jacks in permanent outlets. New wire and cable management systems have been engineered for greater workstation flexibility and high-performance cabling. In addition, these new systems have been designed to be as physically and visually unobtrusive as possible.

The growing importance of the cabling infrastructure means that architects have an opportunity to add value to client relationships by taking an active role in incorporating wire and cable management systems into building design. The technology infrastructure should be considered early in the design process, when there is the greatest opportunity to fully meet clients' requirements.



AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

Use the learning objectives below to focus your study as you read **Wire and Cable Management Systems**. To earn two AIA/CES Learning Units including one hour of health safety welfare credit, answer the questions on page 156 and follow the reporting instructions on page 198. Or use the Continuing Education self report form on *Record's* web site – www.architecturalrecord.com.

Learning Objectives:

After reading **Wire and Cable Management Systems** you will be able to:

- ◆ Describe the workplace needs for wire and cable management.
- ◆ Explain how wire management can maximize function in the workplace without being visually obtrusive.
- ◆ List the benefits of including wire and cable management early in the design process.

TRENDS AND DESIGN RESPONSES

Three primary trends are driving the development of new wire and cable management systems and enhancements to existing products. These are workstation flexibility, high-performance cabling, and aesthetics.

Flexibility: People are working in ways – and spaces – that were unimaginable just a few years ago. As a result, a building’s wire and cable infrastructure must be able to be easily upgraded, reconfigured, and relocated. Wire and cable management systems provide both operational and systems flexibility. Operation flexibility encompasses day-to-day issues such as changing employee teams and the growing use of integrated, multifunctional spaces. Systems flexibility, on the other hand, enables a building to accommodate new or expanded technologies over its lifetime.

Recent innovations that enhance flexibility include:

- ◆ Modular connectivity inserts with common interfaces that simplify installation and alteration of high-performance data/communications systems.
- ◆ Systems that feed cable directly into modular office furniture.
- ◆ Infloor system components – ducts, junctions, presets, and activations – that have been redesigned to increase cable capacity.
- ◆ Poke-thru devices that have been engineered to provide improved data/communications capability.
- ◆ Integrated multimedia boxes that combine multiple services at a single point of use.
- ◆ High-capacity, multichannel perimeter systems that accommodate the larger number of cables required for modern workstations.

High-performance cable: While copper cabling (e.g. Category 5, 5e, 6) continues to be a popular data/communications medium, optical fiber cable has also become a major influence. In fact, many surveys indicate that optical fiber will soon overtake copper cable in horizontal applications – frequently called fiber-to-the-desk.

The data transmission capability of high-performance copper and fiber optic cabling can be compromised by excessive bending. Recent research demonstrates that a 2.0-inch bend radius affords ample protection for the vast majority of copper and fiber cable used in horizontal applications. An infrastructure with 2.0-inch bend radius being installed for a copper system

WIRE AND CABLE MANAGEMENT OPTIONS

Wire and cable management systems can be grouped into five primary categories.

Infloor systems include underfloor duct and raised floors. Underfloor duct systems provide support and security for cabling in reinforced concrete and steel constructions. Raised floor boxes offer convenient access to data/communications cabling.



Open space systems, such as floor boxes and poke-thru devices, serve areas that are not adjacent to partitions. These systems provide direct access to cabling or they can feed into modular office furniture. Installed in core-drilled holes, poke-thru fittings maintain the fire rating of floors. Service poles are another option for open space applications.

Perimeter systems route wiring and cabling securely along walls. These systems are often specified for conference rooms, offices, classrooms, and training centers. Unlike with conventional conduit, cabling that is laid into a perimeter system remains easily accessible at all times. These systems are also easy to expand or reconfigure.

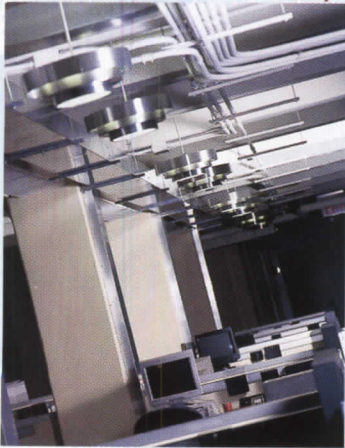


Overhead systems offer a high degree of flexibility, both in terms of locating the components and accessing the cabling contained within them. Cable trays are available in a variety of styles, including center spine, solid bottom, and ladder. Although cable tray was historically installed above drop ceilings, it is increasingly showing up in open ceiling applications.

Point-of-use solutions focus on the workstation. Here, the objective is to provide communications connectivity that is compatible with all cabling pathways. Modular systems enable a diverse array of connecting components to be installed in standard faceplates or mounting bezels.



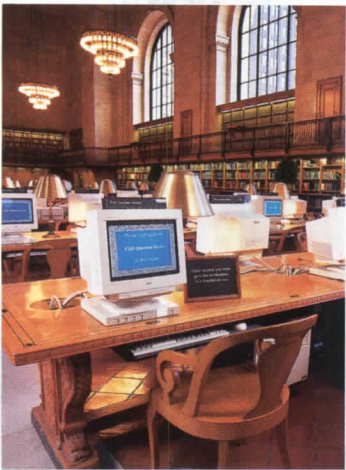
Maximum flexibility for CNN Facility.



New space at the CNN New York bureau accommodates up to 90 people who work for CNNfn, the network's full-service financial news and Internet directory, search, and navigation service. A major concern was for maximum flexibility in the cabling infrastructure. The solution was solid-bottom cable trays suspended from the open ceiling and containing an array of data/communications cable. Vertical raceways with customized perforated metal covers

bring wires and cables from the overhead space down to the news desks.

Maintaining the ambience of the New York Public Library's main reading room.



The challenge was to provide easily available database and Internet access for the library's computers and individuals' laptops right at the reading tables. Steel raceway under the tables feeds custom-made flush bronze enclosures that complement the rich finish of the massive oak tables. In a new self-service copy facility and a multimedia center, Wiremold Access® 5000 raceway helps to maintain the room's decor while providing convenient access to power and data/communications services. The cover features a white oak veneer that was stained to match the existing woodwork.

The cover features a white oak veneer that was stained to match the existing woodwork.

Feeding high-performance cable to multiple workstations.



When Briggs Corporation relocated its headquarters to an early-1980s building in Des Moines, Iowa, the building was gutted and the existing cabling was removed. The renovated structure, including open office space, a training facility, and computer and communications centers, needed flexible and aesthetically pleasing wire and cable management systems. One challenge was bringing high-performance voice and data cabling to open spaces on the second and

third floors. Installed in core-drilled holes, Walker® poke-thru devices provide direct links to modular office furniture.

will also meet the bend radius standards for optical fiber media in the event that the facility ultimately switches to fiber-to-the-desk. In other words, wire and cable management systems can be designed independent of the hardware and system protocol that will eventually be used. New designs ensure that wire and cable management systems will accommodate all high-performance cable:

- ◆ Systems that maintain the cable bend radius around corners and junctions.
- ◆ Integral storage loops for optical fiber cable.
- ◆ Service activations with adequate space for high-performance cable.
- ◆ Angled connectivity device brackets.

Aesthetics: In the early days of the data/communications revolution, many building owners and facility managers were willing to sacrifice aesthetics because the benefits of local area networks and other communications systems outweighed the sight of tangled cables snaking around desks. More recently, however, an aesthetically pleasing work environment has become a high priority and wire and cable management systems have been redesigned. Examples of this trend include:

- ◆ A variety of attractive metal and nonmetallic service fittings and covers for in-floor systems.
- ◆ Flush and recessed activations that are very nearly invisible.
- ◆ System components that are commonly used together, such as service activations, faceplates, and connectivity devices, are color matched for a seamless look.
- ◆ Cable tray that can be custom colored for open-ceiling installations.
- ◆ New generation perimeter systems that feature eye-pleasing profiles, specialized materials such as stainless steel, and extensive color options.

EARLY INVOLVEMENT MAXIMIZES BENEFITS

Unfortunately there is still a tendency to think of data/communications installations as unrelated systems that can somehow be slipped into a building moments before the tenants or users arrive. According to some estimates, 75 percent of workstation wiring and cabling is installed after a new or renovated building is occupied. Achieving the optimal wire and cable system infrastructure requires the active involvement of the design team and building owners throughout the design process. Members of the design team

who do not consider wire and cable management until late in the design run some risks, including:

- ◆ Eliminating certain highly effective cabling pathway solutions. Cellular deck and infloor duct systems, for example, must be considered early in the process. Optimal placement of other infrastructure components, such as cable trays, may be impossible if the design does not provide for them.
- ◆ Reducing building flexibility. Effective utilization of open space depends on the availability of communications technology and ability to reconfigure the space with minimal down time.
- ◆ Failing to consider the impact of future technology. While no one can predict the future with complete certainty, providing a robust, accessible, adaptable cabling infrastructure is an effective strategy for maintaining a building's long-term function.
- ◆ Increasing the costs and difficulty associated with installing and changing the cabling system.
- ◆ Encouraging a patchwork of unattractive stopgap wiring methods.

In the absence of a well-planned technology infrastructure a typical response is to specify a high-capacity distribution system. This may not be the most cost-effective long-range solution, and it certainly adds up-front costs. Excessive capacity can also compound design and aesthetic problems. If the solution is not merely adding capacity, then what is it? There are several points to consider before answering this question:

How many services are needed at each point of use?

Typical workstations require five services: filtered, surge protected, isolated ground AC power; unfiltered AC power; LAN connection; modem line; and telephone line. A growing number of workstations also need specialized services, such as desktop video.

Is the cabling system going to need to be upgraded to meet future technology?

The answer is almost certainly "yes." This means accessibility for change-out is essential. The cabling infrastructure must also accommodate the required bend radius of fiber optic and high-performance copper cable. Make sure the system will have the expected bandwidth and technical performance when needed.

How frequently will it be necessary to move people or add workstations?

The cabling infrastructure must be flexible for moves, adds, and changes with minimal down time.

How much do you want to see?

Aesthetic requirements vary from workspace to workspace. What is effective in a back-office space might not be appropriate for a conference room. Investigate which cabling infrastructure components best suit the surrounding space.

CONCLUSIONS

Communications cabling is an integral, building-wide infrastructure. It is a component of design that is of growing importance to owners and building managers. Manufacturers have responded with wire and cable management solutions that:

- ◆ Ensure maximum operational and systems flexibility.
- ◆ Accommodate any and all data/communications cabling that would normally be installed from a telecommunications closet to a workstation.
- ◆ Enhance workplace aesthetics.

Going forward, much of the impetus for new wire and cable management products and system enhancements will be driven by the need to effectively manage increasingly complex data/communications requirements in business and institutional environments where flexibility is a paramount concern.

The Wiremold Company, headquartered in West Hartford, Conn., is a leading manufacturer of wire and cable management systems, power and data quality products, and data/communications connectivity systems.

Rapidly evolving data/communications technology and the need for flexible workstations have increased the amount and complexity of wiring and cabling. At the same time, building owners demand improved aesthetics and lower life cycle costs. The Wiremold Company anticipated these changes and introduced the concept of integrated wire and cable management systems. Leading product lines include Walker® infloor systems, SpecMare™ cable tray, the Interlink Cabling System, the Activate™ Connectivity System, Wiremold® perimeter raceway systems, and Sentrex® power and data quality products.

The Wiremold Company has embarked upon an aggressive program of product development that focuses on customer needs. A top priority is to extend future-ready enhancements, such as bend radius support, across a broad range of wire and cable management systems.

The Wiremold Company has expanded its global sales, support, and manufacturing capabilities. Its strategically located staff is "on the ground" with a thorough understanding of construction techniques and local codes. Value-added services include product testing and securing appropriate country approvals, design engineering support, and on-site project coordination.



LEARNING OBJECTIVES:

After reading *Wire and Cable Management Systems* you will be able to:

- ◆ Describe the workplace needs for wire and cable management.
- ◆ Explain how wire management can maximize function in the workplace without being visually obtrusive.
- ◆ List the benefits of including wire and cable management early in the design process.

INSTRUCTIONS

Refer to the Learning Objectives above.

Complete the questions below. Then turn the page upside down and check your answers. Fill out the reporting form on page 198 and submit it or use the Continuing Education reporting form on *Record's* web site www.architecturalrecord.com to receive two AIA/CES Learning Units including one hour of health safety welfare credit.

QUESTIONS:

1. What are recent innovations that enhance flexibility in cable management system design?

2. What are the requirements for high performance cable design?

3. How are wire and cable management systems achieving improved aesthetics?

4. What are the risks of not considering wire and cable management early in the building design process?

5. What are the five primary categories of wire and cable management systems?

1. Recent innovations that enhance flexibility include modular connectivity inserts, systems that feed cable directly into modular office furniture, in-floor system components that have been redesigned to increase cable capacity, poke-thru devices that have been engineered to provide improved capability, integral, integrated multimedia boxes, and high-capacity multichannel perimeter cable systems.

2. High-performance cable requires a 2.0 inch bend radius in systems, integral storage loops for optical fiber cable, service variations with adequate space for high-performance cable, and angled connectivity device brackets.

3. The trend toward aesthetically pleasing wire and cable management systems includes: a variety of attractive metal and non-metallic service fittings and covers for in-floor systems, flush and recessed activations that are very nearly invisible, system components color matched for a seamless look, custom colored cable tray for open-ceiling, and perimeter systems with new profiles and specialized materials such as stainless steel, and color options.

4. Risks from not including wire and cable management early in the design process include: eliminating certain highly effective cabling pathway solutions, reducing flexibility in reconfiguring the space in a building, maintaining a building's long-term function, increasing the costs and difficulty associated with installing and changing the cabling system, and encouraging a patchwork of stopgap, uncoordinated wiring.

5. The five primary categories of wire and cable management systems are: in-floor systems including underfloor duct and raised floors, open space systems serving areas that are not adjacent to partitions, perimeter systems routing wiring and cabling securely along walls, overhead systems, and point-of-use solutions.

ANSWERS:

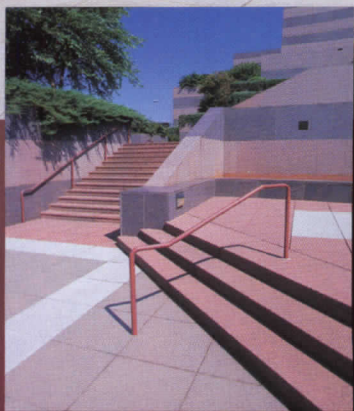
FOR MORE INFORMATION CONTACT:

THE WIREMOLD COMPANY
60 WOODLAWN STREET
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Maple Flooring Manufacturers Association Presents

WOOD SPORTS FLOORS: *Minimizing Damaging Effects*



Photo: Courtesy of Sannmar, Inc.

Naturally beautiful. Shock absorbing. Incredibly durable. Many hardwood floors outlive the buildings in which they are installed. In a floor, northern hardwood maple exhibits flexibility, resilience, durability, finishability and low-demand maintenance.

This section is intended to help architects understand the nature of maple hardwood flooring, now in use on nearly 60 percent of all U.S. sports floors, the effects of moisture on sports floors, proper installation procedures and how to spot – and avoid – potential problems.

schools. There is a growing market in health care institutions which more and more are devoted to preventive medicine, and which more and more frequently include workout facilities.

"These, more and more, are environments in which you may be conducting an aerobics class in the afternoon and a Lamaze class in the evening. Hardwood flooring functions extremely well in that kind of multi-purpose environment," says Kevin Hacke, executive director of the Northbrook, Ill.-based MFMA.

Northern hard maple is dense, strong, remarkably hard and supremely durable. Maple, perhaps surprisingly, is also among the hardest of the hardwoods, 12% harder than red oak, 7% harder than white oak. It offers a wide range of uses and color possibilities. It is close-grained, hard-fibered, free from slivering and splintering, and polishes well under friction.

For these reasons, hard maple is the near universal choice for sports floors. It has a natural beauty when given a transparent finish and is suited for a variety of uses. Northern hard maple has an unusual ability to resist pointed pressure without abrasion. It is easily covered with high polishes and attractive finishes.

The quality of this maple hardwood begins in the northern forests above the 35th parallel where shorter growing seasons and longer winters produce a densely grained maple with rich, consistent color and fewer imperfections. However, because wood is a natural product, it is subject to color variations resulting from differing growing conditions. The color of the heartwood is brownish; the sapwood is much lighter. Consistency of color cannot be controlled in the manufacturing process, and color variation is not a grading defect. If consistency of color in your installation is an important consideration indicate that in any specifications.

It is an appropriate time for this particular lesson: the U.S. sports floor market growing at a rate of between 10% and 20% annually. There will be nearly 5,000 sports floors installed in the U.S. next year. Perhaps surprisingly, the most highly visible market for hardwood sports floors – colleges and universities and the expansionist National Basketball Association – accounts for a miniscule proportion of newly installed sports floors. About two-thirds of all U.S. sports floors today are installed in primary and secondary



AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

Use the learning objectives below to focus your study as you read **Wood Sports Floors: Minimizing Damaging Effects**. To earn two AIA/CES Learning Units including one hour of health safety welfare credit, answer the questions on page 164 and follow the reporting instructions on page 198. Or use the Continuing Education self report form on Record's web site, www.architecturalrecord.com.

LEARNING OBJECTIVES:

After reading **Wood Sports Floors: Minimizing Damaging Effects** and answering the self-test questions at the end, you will be able to:

- ❖ Describe the impact of excessive moisture or the absence of sufficient moisture on hardwood sports flooring materials.
- ❖ Explain types of moisture problems with wood floors.
- ❖ Identify items to look for in wood flooring specifications in order to avoid problems related to moisture.

In 1997, the most recent year of record, 44.5 million square feet of sports flooring of all types was installed in the U.S. MFMA-graded maple flooring accounted for nearly 23 million square feet, a little more than half of all installed flooring of all types. Nearly 30 million square feet of sports flooring went into primary and secondary schools, either as new or retrofit projects.

Health clubs and wellness centers account for another 10 percent of the overall sports floor market.

"Maple works well in the healthcare environment," says Hacke. "It is sanitary, lasts a long time and is easy to maintain."

Robert Riddlemoser, a principal at RDS Architects, San Francisco, says elementary and secondary schools are being built at a surprising rate, that nearly all include at least one sports-or-general-activity gym floor – maybe more – and that when the discussion over flooring types gets to the basketball coach, he wants hardwood.

"It's a high-quality product with a high-quality finish," he says. "We always discuss other options, but we rarely sell them."

Because wood, in its natural state, is porous and water-laden, as a finished product it becomes a unique and valuable flooring material.

It is user-friendly to a degree that few other traditional court surfaces can match. When an athlete impacts a hardwood sports surface, the impacting force is translated into two resulting forces, one absorbed by the floor; the other returned to the athlete. While hard surfaces like concrete and asphalt provide little or no force reduction for the athlete upon impact, MFMA sports floor systems absorb these impact forces and are rated by the percentage of force reduction they provide compared to hard surfaces.

For example, a sports floor with a force reduction value of 60 percent will absorb 60 percent of the impact force and return 40 percent of that force to the athlete. Since different sports make differing demands on athletes, various force reduction characteristics may be prescribed for various sports.

Eight MFMA mills nationwide engineer performance characteristics into flooring systems. Standards of performance may be specified to provide particular characteristics. Much can be accomplished through the flooring itself. You can make a wood floor surprisingly soft. That may not be appropriate for basketball floors, but it might be for aerobic centers. You can also "stiffen" a hardwood floor.

"It is incumbent on the architect to look at his facility, understand what it will be used for and bring those factors into play in specifying the performance characteristics and floor type most appropriate for those uses," says Hacke.

After extensive consultations with clients, Riddlemoser finds it relatively simple to specify flooring systems himself. "We are doing primarily schools," he says. "Our clients don't need professional basketball floors, but they don't need injuries either. I believe hardwood courts are a factor in reducing injuries, and I know the product has been tested for performance."

Maple flooring is nearly exclusively the material of choice, not only for exacting college and university basketball courts, but also for, say, the continuous grinding of wheels in a public roller skating rink. Maple floors are the most highly demanded surface for volleyball, aerobic and dance floors, racquetball and handball courts and dozens of other uses.

THE CHARACTERISTICS OF MAPLE FLOORING

The issue of life cycle costing is a critical evaluation criterion for facility owners and managers. A study conducted between 1993 and 1994 by Birmingham, Michigan-based Ducker Research Co., Inc. for the Maple Flooring Manufacturers Association compared the cost of maple flooring to PVC and poured urethane floors. Ducker interviewed 145 building owners, maintenance heads at primary and secondary schools, colleges and universities and building contractors. The study concluded that the life-cycle cost of maple flooring, based on a 38-year life span, is, on average 42 percent lower than the cost of PVC floors and 40 percent lower than poured urethane floors.

"Schools frequently demand maple because of tradition and because of longevity," says Riddlemoser.

The MFMA-graded maple is produced from trees grown north of the 35th parallel, a line running roughly from Cape Hatteras through Memphis and Albuquerque to San Luis Obispo, CA., where shorter growing seasons and longer winters produce maple with closer, more uniform grain, consistent color and fewer imperfections.

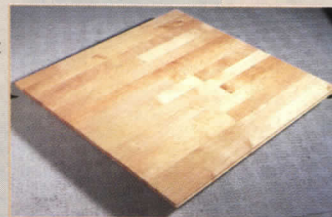
Several grades of maple flooring are available: First Grade hard maple is the ideal solution for gymnasiums, dance floors, churches, hospitals, offices, homes and other applications where fine appearance and long wear are sought. First Grade maple is characterized by a practically defect-free face. Second and Better Grade flooring provides the same long life, but admits tight knots and slight imperfections in the face. Third Grade hard maple offers the same good-wearing qualities of higher grade flooring, but is a medium-cost material characterized by wider variations in color and texture caused by wider variations of grains and growth marks.

Colleges and professional sports franchises rely almost exclusively on top-grade maple flooring "because variations in lower grades show up so strikingly in the eye of television cameras," says Roch Manley, an architect and flooring specialist for LSW Architects, Vancouver, WA. But LSW uses Third Grade maple for primary and secondary schools projects not only for its lower cost, but also because "its appearance is more varied, striking and interesting to me than clear maple," says Manley.

Because Third Grade maple typically comes in shorter lengths than higher grades, says Manley, LSW recently amended in-house flooring specifications to insist

THINGS TO LOOK FOR WHEN SPECIFYING HARDWOOD FLOORS

1. Specify a reputable hardwood sports flooring contractor with significant experience in projects of the size and scope of yours.
2. Specify a subfloor system that matches the primary activity on the floor.
3. Specify pre-installation concrete slab tolerances.
4. Specify pre-installation moisture content of wood flooring.
5. Specify pre-installation conditions of the room, including fully functioning HVAC, constant temperature and humidity, weather tightness.
6. Specify industry-recognized installation guidelines throughout process.
7. Specify following the same post installation procedures.



FIRST GRADE



SECOND & BETTER GRADE



THIRD GRADE

on 8-in.-on-center sleepers both for performance and ease of installation. Even with the additional sleepers, says Manley, a Third Grade floor can be installed less expensively than with either of the higher grades of flooring. "Installers still want to bid projects based on a 12-in. standard," he says. "It's something we have learned to watch for."

WATER AND WOOD: MOISTURE AND YOUR FLOORING

MFMA manufacturing specifications require that maple flooring be milled from kiln-dried lumber, which typically has a moisture content of between 6% and 9%, but "proper" moisture content at installation can range from 4% to 13% depending upon the geographic location of the job and the time of year.

Flooring installed along the Gulf Coast, for instance, can be expected to acclimate to a moisture content of between 11-13%, while the same flooring installed west of the Rocky Mountains, would acclimate to between 4-8%.

Even after finishing and sealing, wood retains its "hygroscopic" character, which means that it will gain or lose moisture until it is in equilibrium with the temperature and humidity of the surrounding air. When wood is neither gaining, nor losing, moisture it is said to have reached its "equilibrium moisture content" (EMC). As a rule of thumb, relative humidity of 25% produces an EMC of 5%; relative humidity of 75% yields an EMC of 14%. As a practical matter, a 50% change in humidity can result in expansion or contraction of a 2-inch board of about 1/16-inch – a full inch over 16 boards. Over the width of a 10-ft-wide floor three inches of expansion or contraction can occur.

Intermediate expansion spaces ("washer rows") are left between flooring strips to allow for calculated expansion of the wood flooring material when humidity rises. Depending upon the annual extremes in relative humidity that are typical for the region, the interval required between intermediate expansion spaces in the floor can vary greatly from one installation to another. Your flooring manufacturer will provide you with the reference materials and instructions you need in order to correctly determine the intermediate expansion space interval for each installation.

Protective coatings slow the process of moisture absorption and release, but they cannot prevent it. Thus, it is critical, for your sports floor to perform best, to maintain humidity of between 35% and 50% and temperatures of between 55 and 75 degrees Fahrenheit year round to maintain the wood's original moisture content.

Before installation, maple flooring must be "acclimated."

Wood flooring should not be delivered to the jobsite until plastering and painting are completed and dry because moisture evaporates from damp walls and will be absorbed by the flooring.

It should be delivered to the building site at least 72 hours prior to installation and stored indoors under the conditions above. The building should be weather-tight and HVAC should be functioning throughout the process. Flooring should not be unloaded in the rain and should be safe from condensation. Continual dry heat during its acclimatization will reduce its moisture content and may result in buckling of the installed floor if moisture is later regained. If flooring is subject to dampness, it will absorb unwanted moisture, expand and later contract as it dries, leaving spaces or cracks in the floor.

It also is critical that cement slabs be fully cured (this can take 60 days or longer) and tested for moisture before delivery and installation of flooring.

Moisture content in concrete is measured in terms of pounds of water vapor emission per thousand square feet per 24 hours. There are several accepted methods for measuring the moisture content of concrete, including the Polyfilm test and the Calcium Chloride test.

The Polyfilm test is widely accepted, and uses inexpensive materials commonly found on the job site. If the slab is too wet, the Polyfilm test will show the presence of excessive moisture and, thereby, indicate the need for additional curing time and/or testing by another method. If a quantified reading of the slab's moisture content is required, a calcium chloride test will provide measurable results.

Always check with the maple flooring manufacturer, but three pounds of water vapor emitted per thousand square feet of on-grade concrete slab per 24 hours is generally recognized as an acceptable moisture content level for beginning the installation of a wood floor.

Begin the installation process by loosely laying sheets of six-mil polyethylene over the concrete slab, allowing sufficient plastic for a four-to-six-inch rise on walls and joints. Seal the seams with tape or with mastic.

Because moisture can rise through concrete by capillary action, it is essential

that moisture-vapor barriers are properly installed between the slab and the flooring, most typically PVC vinyl, polyethylene film or roofing felt over asphalt mastic. It is important to remember that concrete, like wood, expands when it absorbs moisture and contracts when it loses moisture.

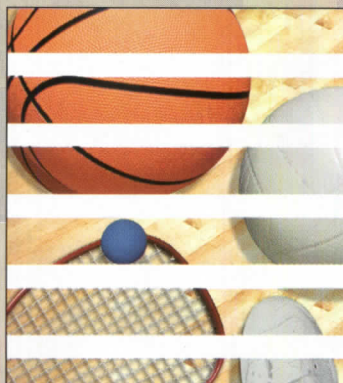
Wood does not shrink or swell equally in all directions. It changes about 0.1% along the grain, but up to 15% across the grain.

HOW TO SPOT AND AVOID TROUBLE IN HARDWOOD FLOORS

Some movement is to be expected in all maple floors, and room for expansion is allowed around perimeters and interior

columns and flooring obstructions (electrical outlets, posts, etc.) during proper installation of most systems. Occasionally, but not in all installations, expansion spaces will be required within the floor itself. In the absence of a humidifier, it is not unusual for maple floors to contract slightly during winter months when heating systems are turned on. Slight spaces that appear in winter most likely will disappear in spring. There are conditions that can occur, however, that are abnormal and most often are repairable if dealt with when first noticed.

Cupping of wood floorboards, a condition that appears as a concavity, occurs when the bottom of the flooring is wet. Cupping occurs because the top surface of a board dries faster than the bottom. The first step in repairing a cupped floor is to identify and eliminate the source of moisture. Once moisture is controlled, cupping usually can be cured, and most hardwood floors will repair themselves over time. Fans can speed the process.

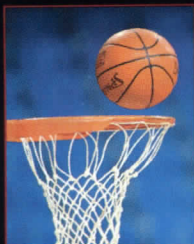


MOISTURE PROBLEMS INHERENT IN WOOD

- ❖ Absorption of moisture causes wood to swell
- ❖ Loss of moisture causes wood to shrink
- ❖ Shrinkage begins at 25-30% moisture content, the fiber saturation point.
- ❖ Swelling occurs as wood gains moisture at between 0-25% moisture content.

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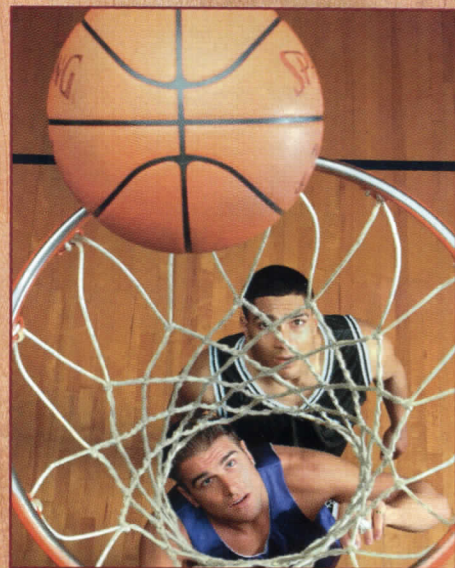
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CIRCLE 54 ON INQUIRY CARD

Crowning is the opposite of cupping and can be caused by moisture on the floor's upper surface. A more common cause, however, is the contraction of a previously cupped floor that has been sanded before the floor has had a chance to dry thoroughly.

Wood lignin is the material between individual cells in a living tree. It is the glue that holds the plant cells together. Lignin is weakened by significant moisture changes that cause wood to expand and contract. Significant or repeated moisture changes can cause flooring to split in the direction of the grain.

When flooring expands but has no release point for the pressure, some floors will buckle. Others will cup. If, however, they are held so tightly in compression, individual wood cells are crushed in expansion, a condition known as "compression set" can develop. Once compression set takes place it is as if the flooring had been through a trash compactor, even after drying. It will retain the shape it assumed under compression. Most often, a rapid change in moisture, a flood for instance, will cause compression set.

Float a stick of wood in a bathtub. It eventually will disintegrate. Wood fibers can absorb only so much moisture. Beyond its saturation point, decomposition begins, a condition known as fiber saturation. Unattended moisture problems can lead to fiber saturation.

Panelization, or side-bonding, is a condition that occurs more frequently with the widened use of water-based finishes. Some water-based products have a tendency to act as a welding agent in gluing floorboards together. If a facility experiences a very dry season, the resulting chemical bond caused by water-based finishes sometimes is stronger than the lignin bond of wood itself, and a resultant longitudinal splitting of the floorboards that appear as racing stripes can occur. In parts of the country that experience distinct seasonal changes, panelization occurs more frequently. In Denver and Miami, say, it is a relatively rare occurrence, because Miami is generally always humid, Denver always dry. Panelization occurs most frequently during the first winter of a floor installed in spring or summer. When the floor shrinks for the first time, shrinkage collects at the weakest points, often splitting a board into "panels" that can run the length of the floor. Maintaining the facility within a 15% humidity range will mitigate the problem.

SEALING AND FINISHING YOUR WOOD FLOOR

There are two basic methods for application of seal and finish for wood athletic floors. Both are four-coat specifications. The first uses one coat of seal and three coats of finish; the second, two coats of seal and two coats of finish. Polyurethanes, and oil-based urethanes are traditional finish products, however there is growing concern that oil-based finishes release volatile organic compounds (VOCs) that may degrade indoor air quality.

Water-based finishes may require more than the two or three coats that have become the standard application procedure with traditional oil-based products. It also is critical that sealants, paints and final finish materials be carefully coordinated to insure proper adhesion. The MFMA publishes a list of finishes that have been performance-tested by independent laboratories.

"My advice? Make sure each of the components of the floor finishing system meets the requirements of local air quality regulators and that the products are compatible," says LSW's Manley. Failure to coordinate finish materials can result in bubbling, or peeling, of one or more of the finish layers, any of which can ruin the appearance of a hardwood athletic floor.

"Traditional oil-based sealers we've used in the industry for years may exceed air quality regulations by several hundred grams per liter," says Manley. "There are, as an alternative, a lot of good products out there that are water-based. But you must be careful with them or you will create problems."

PROPER MAINTENANCE PREVENTS PROBLEMS

Daily maintenance of a hardwood floor does more than keep up the appearance of the floor: it ensures that moisture-related problems are avoided whenever possible. Making certain that heat, air conditioning and humidity are set properly and that windows and doors are sealed against weather can reduce the impact of moisture on your floor. The use of appropriate equipment and cleaning agents also are essential to proper maintenance. The Maple Flooring Manufacturers Association has produced a bilingual (English and Spanish) video with instructions for proper maintenance.

WORK WITH SPORTS FLOORING EXPERTS

Hardwood sports floors differ greatly from common hardwood floors, both in design and installation. To ensure a long-lasting, trouble-free playing surface, it is important to seek the advice of experienced contractors. ■

INSTALLATION CHECKLIST & MOISTURE TROUBLESHOOTER

1. Is the building enclosed and airtight?
2. Is all block, brick or masonry work complete?
3. Is all painting finished and fully dry?
4. Is permanent light, heat and ventilation operating?
5. Is all overhead work complete?
6. Is the floor free of obstructions?
7. Indoor temperature, humidity?
8. When was concrete poured; is it dry?
9. What method was used to test concrete dryness?
10. Is concrete level to specifications?

Established in 1897, the *Maple Flooring Manufacturers Association* is a trade organization representing the maple flooring industry. The MFMA is the authoritative source of technical and general information about maple flooring and related sports flooring systems. Its membership consists of manufacturers, installation contractors, distributors and allied product manufacturers who subscribe to established quality guidelines. Through cooperative member programs, MFMA establishes product quality, performance and installation guidelines; educates end users about safety, performance and maintenance issues; and promotes the use of maple flooring products worldwide. Please call 847/480-9138, or write: MFMA, 60 Revere Drive, Suite 500, Northbrook, IL 60062. www.maplefloor.org. E-mail: mfma@maplefloor.org.

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The Scissor-Loc Air Flow
System handled it beautifully.
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using the facility without
a major interruption.
The floor still looks and
feels just great."*

*Denise Day,
Executive Director*

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CIRCLE 55 ON INQUIRY CARD

LEARNING OBJECTIVES:

After reading *Wood Sports Floors: Minimizing Damaging Effects* and answering the self-test questions, you will be able to:

- ❖ Describe the impact of excessive moisture or the absence of sufficient moisture on hardwood sports flooring materials.
- ❖ Explain types of moisture problems with wood floors.
- ❖ Identify items to look for in wood flooring specifications in order to avoid problems related to moisture.

INSTRUCTIONS:

Refer to the learning objectives above.

Complete the questions below. Then turn the page upside down and check your answers. Fill out the self report form (page 198) and submit it or use the Continuing Education self report form on Record's web site, www.architecturalrecord.com to receive two AIA/CES Learning Units including one hour of health safety welfare credit.

QUESTIONS:

1. What are the characteristics of maple flooring that contribute to it being the most used flooring material for sports flooring?

2. In what applications would you specify a Third Grade maple floor?

3. What characteristics of northern grown maple woods make it desirable for flooring?

4. How should maple flooring be acclimated before installation?

5. What causes the difference between cupping and crowning in wood floors?

1. The characteristics of maple flooring that make it desirable for use in sports flooring are that it is naturally beautiful, easy to maintain, shock absorbing, and durable. Based on a 38 year life span, the cost of maple flooring is 42 percent lower than PVC floors and 40 percent lower than poured urethane floors.
2. Third Grade hard maple offers the same long wear as higher grade maple, but is a medium-cost material characterized by wider variations in color and texture caused by wider variations of grains and growth marks. It is typically not used on sports floors of colleges and professional sports because variations in lower grades show up strikingly through television cameras. Third Grade maple is used for primary and secondary school projects because of its lower cost and there is no objection to its varied appearance.
3. The most desirable maple is produced from trees grown north of the 35th parallel where shorter growing seasons and longer winters produce maple with closer, more uniform grain, consistent color and fewer imperfections.
4. Maple flooring should be delivered to the building site at least 72 hours prior to installation and stored indoors. The storing conditions should be temperatures between 55 and 80 degrees Fahrenheit and humidity between 30 and 50 percent. Wood flooring should not be delivered to the jobsite until painting and painting are completed and dry and concrete is cured because moisture evaporates from damp materials and will be absorbed by the flooring.
5. Cupping and crowning both result from moisture, but on different surfaces. Cupping of wood floorboards occurs when the bottom of the flooring is wet. The boards cup because the top surface of the board dries faster than the bottom. When the moisture is eliminated, the boards will usually repair themselves over time. Crowning is the opposite of cupping and can be caused by moisture on the floor's upper surface. A more common cause, however, is the contraction of a previously cupped floor, which was sanded before the floor has had a chance to dry thoroughly.

ANSWERS:

FOR MORE INFORMATION:



Please call 847/480-9138, or write:
MFMA, 60 REVERE DRIVE, SUITE 500,
NORTHBROOK, IL. 60062 U.S.A.
E-mail: mfma@maplefloor.org
www.maplefloor.org

CIRCLE 181 ON INQUIRY CARD

RESIDENTIAL

More houses! It's clear that architects can't get enough information on residential design that is specifically geared to them. While RECORD Houses, presented annually in our April issue, displays a wealth of domestic design, ranging from the spectacular to the experimental, architects need both practical advice or wonderful inspiration, whether for an apartment, a condo, a simple suburban house, or that expansive mansion on 22 acres.

Here's one of the more typical problems architects face: how do you get carpenters to build certain details the way you design them—especially when they know “a better way”? It's a challenge Jim Cutler, FAIA, confronts every time he draws one of his wonderfully inventive wood details. “I try to work with carpenters who I've worked with before and who know the way I think,” Cutler says. But that, of course, is not always possible.

Other quandaries: How do you choose sustainable materials and products? What's the best way to get materials in and out of a cramped apartment building? Who do you turn to when housing inspectors are arbitrary and capricious? How do you track down funds for low-cost housing projects?

Knowing the answers to these questions not only makes the architect's job easier, it ultimately contributes to the quality of people's lives and of housing overall—every architect's ultimate goal. And, of course, the goal of this new quarterly section. *Wendy Talarico*

169 Residential News

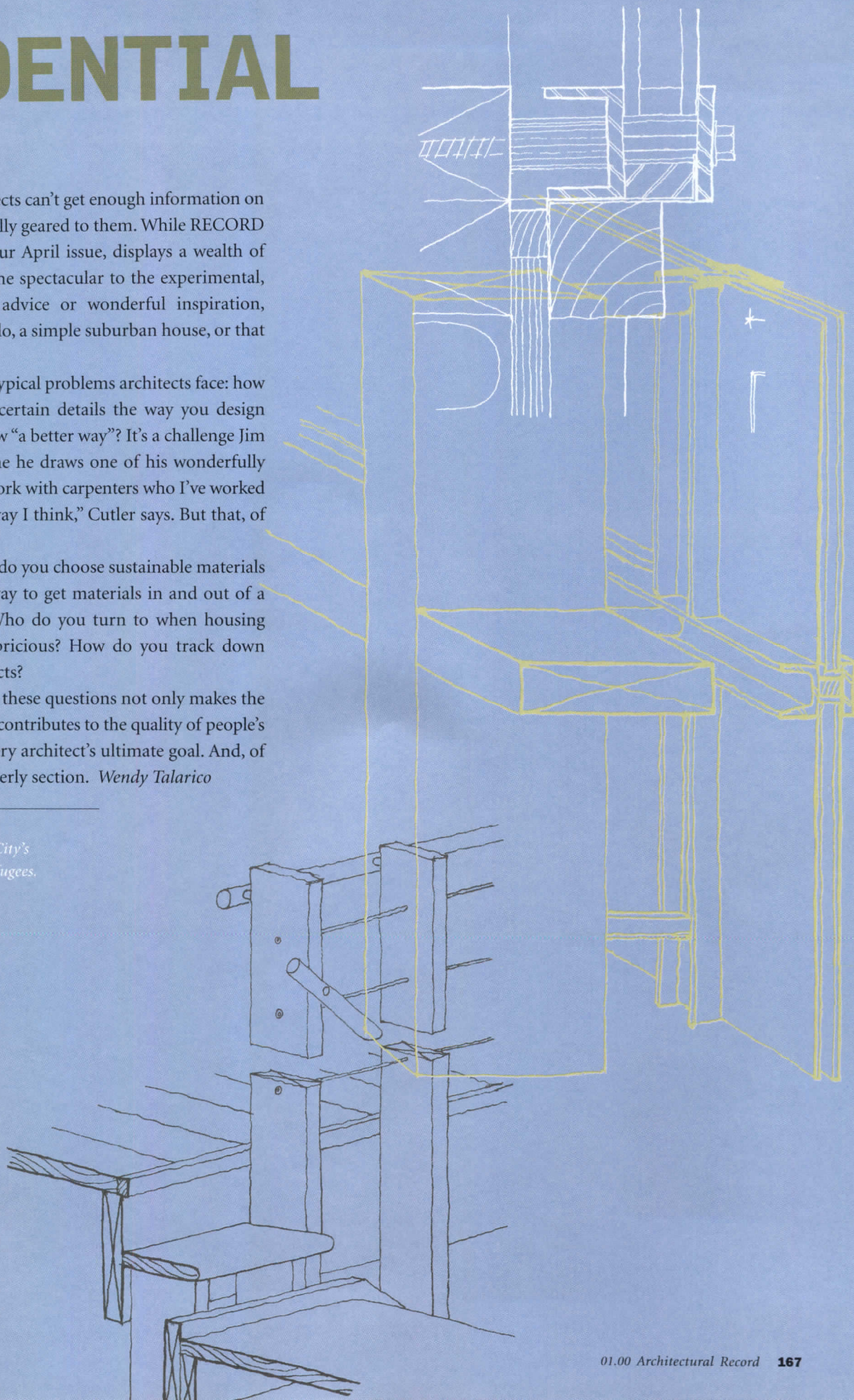
New development in New York City's West Village; housing Kosovo refugees.

170 Wood Detailing

Jim Cutler, FAIA, uses wood in unusual ways in three houses in the Northwest.

179 Residential Products

Kitchens from the bottom up, including flooring, appliances, and fixtures.





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CIRCLE 58 ON INQUIRY CARD

Residential News



KEEPING IT RAW: A NEW NYC BUILDING CAPITALIZES ON ITS INDUSTRIAL ROOTS

New York City is full of living spaces converted from factories, warehouses, and other buildings past their prime. In fact, dwelling in a converted loft is a badge of a true New Yorker. It's all the rage in stylishly hip neighborhoods such as Soho and Tribeca and continues to be a primary housing vehicle for artists.

Tamarkin Architecture & Development, a New York City firm, has taken the loft concept a step further with a new 11-story residential building in Manhattan's West Village. The structure and its units have the raw feel and openness of a factory conversion, as well as other characteristics of converted apartments, but the structure is entirely new.

The \$13.5 million project includes seven floor-through apartments and two penthouse duplexes. Purchasers acquire open, minimalist spaces they can rework as they see fit. Concrete floors and columns add to the industrial feel. An unadorned lobby will double as workspace for a



part-time doorman. The concept seems to be working: the apartments started selling immediately early last year, with a top price of more than \$4 million.

The far West Village is seeing a flurry of such development. Several new apartment buildings are on the rise, as is the Greenwich Village Hotel. Among the architects participating in the development is Richard Meier, FAIA, who is designing a 2-story restaurant, a 15-story condominium building, and a 6-story hotel in one corner of the neighborhood. *Soren Larson*

WINNERS CHOSEN IN KOSOVO HOUSING IDEAS COMPETITION; EXHIBITION GOES ON TOUR TO SEVERAL MUSEUMS

After an open call in which 205 proposals were submitted from more than 30 countries, Architecture for Humanity has selected 10 finalists and 20 honorable mentions in its competition to design transitional housing for refugees of the war in Kosovo. The organization's stated goal was to foster the development of housing that can relieve suffering and speed the transition to a normal way of life. [For more on Kosovo, see page 74.]

An exhibit of the entries, displayed last month at New York City's Van Alen Institute, will be at the RIBA Gallery in London through January and then will travel to Paris, Bucharest, Florence, and Washington, D.C.

Cameron Sinclair, the New York City architect who organized the competition, said some entries looked at very inexpensive solutions for short-term shelter, while others explored temporary urban housing schemes, studied the potential for housing-unit aggregations, or proposed low-tech building systems or alternative construction materials. Proceeds from the competition will go to War Child USA and its relief work in Kosovo, Albania, Macedonia and Bosnia.

Turkey is also the object of relief-housing efforts. After the earthquake there last year, Simple Building Products of San Diego assembled architects and engineers to provide temporary housing. The teams used ArchiCAD-based modular building systems to construct, in two weeks, relief coordination centers and housing for as many people as possible. *S. L.*

In Brief

HUD helps The Department of Housing and Urban Development is providing \$792 million in assistance to nonprofit groups around the country to create 8,943 subsidized apartments for poor senior citizens and people with disabilities. Most of the apartments funded by the grants will be newly constructed units, but some will be existing units, purchased and rehabilitated as necessary. The apartments will provide housing for more than 11,000 people.

Space case A proposed design for a residence in outer space is now viewable on the Web. An online home decor site, Myhome.com, has teamed with the Space Island Group (www2.dowco.com/spaceisland), a private consortium, to design the interiors of what is planned to be the first space resort. Space Island's strategy is to join about 12 huge shuttle tanks, left in orbit by NASA, into a large ring, creating space for hotels, entertainment, and living quarters. No specific timetable has been set for the destination's opening.

Mad as hell A new homeowners' group called the National Alliance Against Construction Defects (www.jps.net/hollister1) is attempting to stop builders from profiting from structurally unsound and badly built homes. The group contends that with rampant code violations and head-turning by inspectors, something needs to be done to allow more governmental control during new-home construction.

Jim Cutler's penchant for trees and fine detailing drives his designs for three new houses

By Sheri Olson, AIA

Every time a tree is milled into lumber and then hidden in a wall, it is treated with disrespect," says Jim Cutler, FAIA. The Bainbridge Island, Wash., architect has a deep respect for building materials, particularly wood. His recent designs reflect his emphasis on the moral and physical dimensions of building.

It was in Louis Kahn's design studio that Cutler discovered the implications of architectural anthropomorphism—the practice of giving lifelike attributes to building materials. "That's what Kahn was doing when he asked the brick what it wanted to be," he says.

Cutler began his own practice in 1977, hanging around the Bainbridge Island ferry terminal and introducing himself to potential clients. His first house won local honor awards, but he struggled for 10 years before his practice took off. Now, he juggles 14 employees with projects around the world.

A few key projects proved instrumental in shaping Cutler's approach to wood detailing and design. The first was a totem-pole carving center he designed in Alaska. There, he learned about the Native American remorse ritual, in which homage is paid to the animals killed for survival. "I decided to find ways to honor the trees that were cut," Cutler says. He gave form to this idea at the Bloedel Education Center on Bainbridge Island [February 1993, pages 92-97] by designing a project without any wood studs. Taking their place is a wood curtain wall in which every wood component is visible.

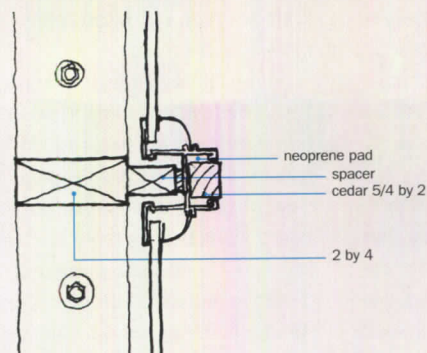
Microsoft billionaire Bill Gates' house, designed with Peter Bohlin, FAIA, of Bohlin Cywinski Jackson's Pittsburgh office, gave Cutler name recognition beyond the Northwest. Gates' private Xanadu on the suburban shores of Lake Washington includes a reception pavilion that seats 120, a trampoline room, and 20-car garage. The wood curtain-wall system developed at the Bloedel Center is used throughout the house. There is no drywall; every piece of wood and joinery is visible. During construction, the general contractor suggested that he and Cutler go into an old-growth forest to select trees for lumber. "It hit me that while I was fighting to save every tree on the property, I was chewing up more wood in my designs than most architects," Cutler says. The dilemma was solved by using 2.8 million board feet of lumber.

Post-Gates, Cutler looks for ways to achieve the thoughtful and expressive design of that spectacular house, but on a more modest budget, always conservative and respectful of the resources used. He moved from heavy-timber construction to light-wood framing with beams made from layers of wood. "The quality of larger sections of wood is suspect anyway," he says, "remilling salvage lumber is expensive, often 20 to 30 percent more than new wood." Also, instead of exposing every wood framing member, his new approach to detailing provides glimpses of the framing in key places. "Every wood stud gets its own little peep show," he says.

Cutler is no slave to sustainability, but he believes strongly in his intuitiveness. Architecture's strength and, Cutler says, his own lie in the ability to intimately connect people to a place. Detailing plays an essential role by heightening an awareness of materials and, by extension, the natural world. Three new houses demonstrate Cutler's evolving vocabulary. ■



Cutler begins the design process by learning the topography of the site. The Wood Residence reacts to the gently undulating land with a series of rectangular spaces that back up to the woods and face the meadow (top). The wood construction is revealed, often cleverly. The exterior cladding stops short of the sill, revealing the joint between frame and foundation (left), while rafters swoop straight into the eaves (right).



Detail 1: window frame

Left: The frames of the exterior single-glazed aluminum windows are separated from the studs with cedar spacers and neoprene pads.



WOOD RESIDENCE, VASHON ISLAND, WASH.

"I don't use the word 'site.' It turns land into an abstraction making it easier to devastate," Cutler says, striding through the gray-green grasses in this meadow near the sea, the setting for the 2,330-square-foot Wood Residence [January 1999, page 149]. Vashon is a rural island, though it is just a short ferry ride from Seattle. He begins each project this way, getting acquainted with the land and personally recording the location of every tree and change in grade.

The house is a series of rectangles dancing along the edge of the meadow. To address the clients' conflicting requirements—the wife is an avid horsewoman and her husband is allergic to horses—Cutler developed a separate shower and laundry block that she passes through from the barn to the house.

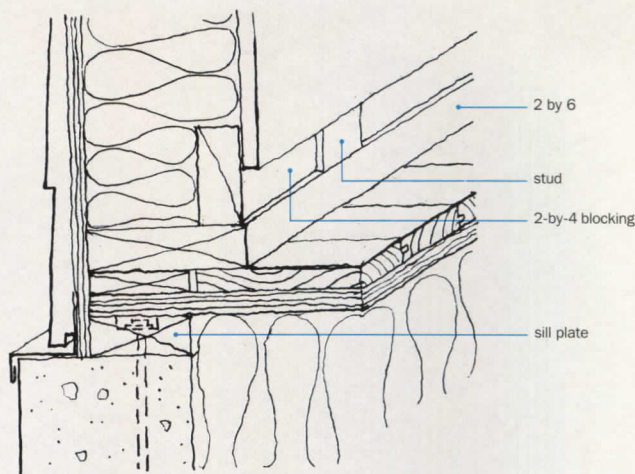
Completed in 1997, the house is one of the first where Cutler modified the details of the Gates house for a relatively modest budget—\$160 per square foot. Instead of exposing the wood framing, the wall-finish material stops 3 ½ inches above the floor revealing the bottom of the studs (detail 2). The juncture between ceiling and wall is also visible. This approach reduces the finish materials—whether dry-wall or tongue-and-groove pine—to skins that stretch sparsely over the wood skeleton beneath.

In place of heavy-timber post-and-beam construction, flitch

beams—triple-decker sandwiches made by alternating 2-by-8s with ½-inch wood spacers—span the living and dining area (detail 3). A T-shaped steel knife plate slipped into the ½-inch space and bolted into the columns. It might have been easier to use engineered wood or trusses, but these materials lack the expressiveness Cutler strives to achieve.

Another detail, now standard in Cutler's vocabulary, developed during the design of the attached greenhouse. Concerned that condensation from the windows would harm the adjacent exposed wood framing, Cutler mounted standard aluminum window frames on the exterior face of the framing. Cedar spacers and neoprene pads hold the frames off the 2-by-4s so that condensation can drip away from the wood (detail 1). Cedar trim covers the joints between the jambs and at the edges of the windows.

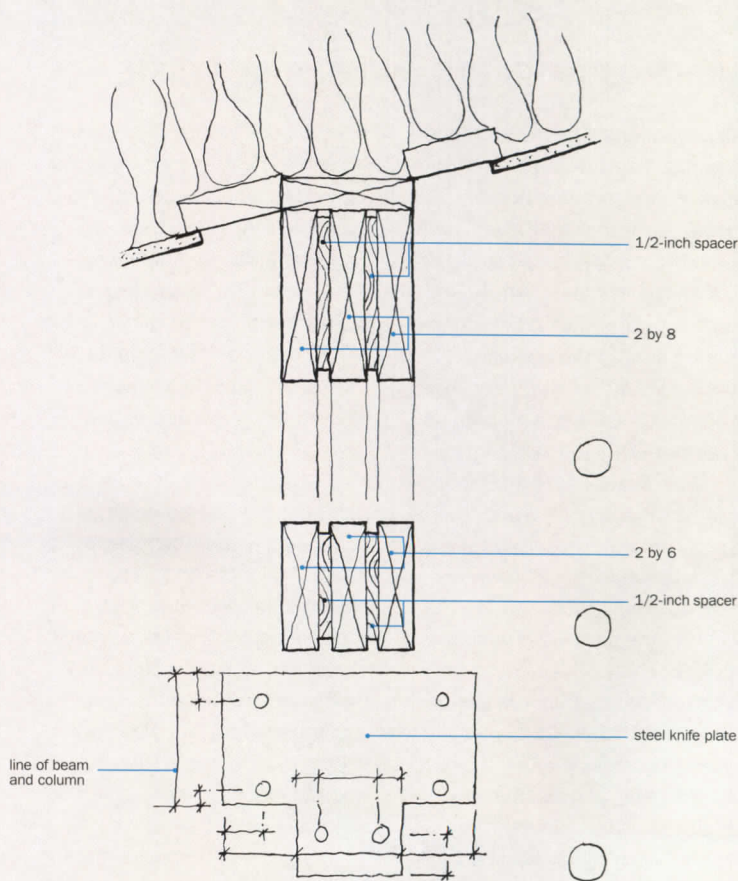
Cutler draws many details free-hand on gridded vellum sheets. These are bound with the specifications to make hefty project manuals. Contractors see the phonebook-thick manuals and react "with fear," Cutler says. Not surprisingly, the architect prefers working with contractors who are indoctrinated into his routine; the general contractor on the Wood Residence, Pete Crocker, is now in Australia building his third Cutler house. S. O.



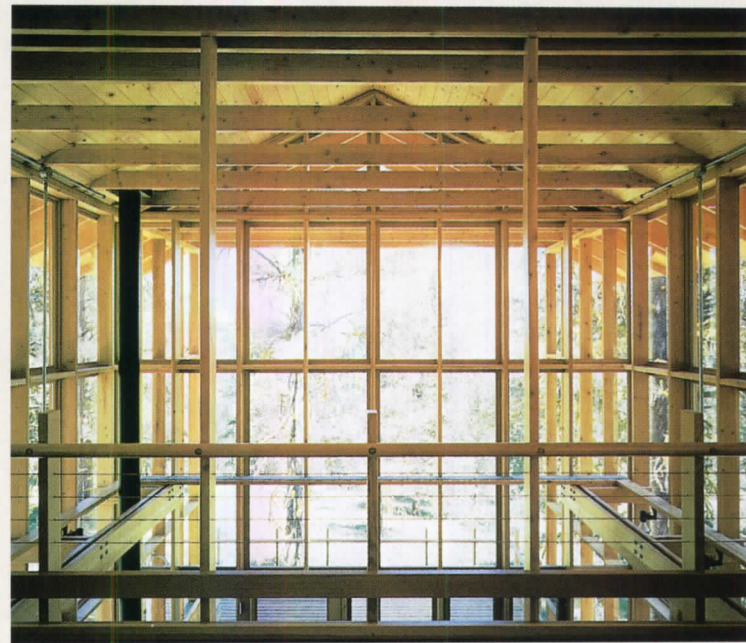
Detail 2: wall and foundation joint

Top: To highlight the wood structure, the wall-finish material stops 3 ½ inches shy of the finish flooring. Blocking hides the insulation behind.

Bottom: Flitch beams are made of 2-by-8s that alternate with ½-inch spacers. Steel knife plates (below) join the beam to the column.



Detail 3: flitch beam section and knife plate



Tall and slender like the surrounding pines, the cabin (left) features a window wall that showcases the studs (below). The exposed structure of the staircase helps form the guardrail (bottom right). Battens whimsically extend beyond the board siding (top right).

ARROWLEAF CABIN, WINTHROP, WASH.

Tall and laconic like the surrounding pines, this 1,350-square-foot cabin, completed last autumn, has a large gable roof that gives it an iconic form. A weekend retreat on a steep five-acre site, Arrowleaf Cabin is part of a vacation-home development in the bucolic Methow Valley, located near the snow-tipped Cascade mountains in north-central Washington.

The roof shelters a 16-foot-wide by 65-foot-long wood platform that hovers above the steeply sloped land. Balloon-framed walls, 18 feet high, run the length of the platform. These are clad, if scantily, with wood siding and fixed glazing punctuated with operable windows. Otherwise, the framing is visible, making it seem as if the trees got together and decided to make a house.

The design of the support structure beneath the platform, perhaps the most visible exterior detail,

went through several iterations. "At one point, the whole thing looked like a centipede walking down the site," Cutler says.

Budget concerns reduced the supports to seven pairs of board-formed concrete piers. The narrow piers are battered on their short sides and braced back to the underside of the house with steel struts.

On top of each pier rests a pair of built-up wood columns connected by a ¼-inch galvanized-steel plate for lateral stability. The double-prongs of the column's welded-steel plate connector meshes with triple 2-by-8s (detail 4). Eight ½-inch galvanized through-bolts, penetrating the plate, the sill plate, and the footing, tie the assembly together.

Like the greenhouse glazing at the Wood Residence, the cabin's prefabricated wood win-

dows are applied to the exterior face of the framing. Where the windows are operable, the jambs fall along the 24-inches-on-center dimension of the framing. Horizontal mullions on top of the blocking are required to prevent the continuously framed studs from buckling.

To enclose the short north and south ends of the cabin, the window wall turns the corner between the studs (detail 5), a construction technique that underscores the continuity of the exposed framing that runs the length of the platform. Cedar trim is used along the outside corner to finish the vertical seam between windows. On the inside, the seam is trimmed out with fir.

The staircase features an exposed 2-by-8 stud wall that serves multiple purposes on its way from the first floor to the second (detail 6). Along the main run of the stair and the second-floor landing, the exposed studs support the stair

stringers and the round maple handrail. At the second floor, the studs continue above a maple handrail, while steel cable, threaded through the 2-by-8s, forms the guardrail.

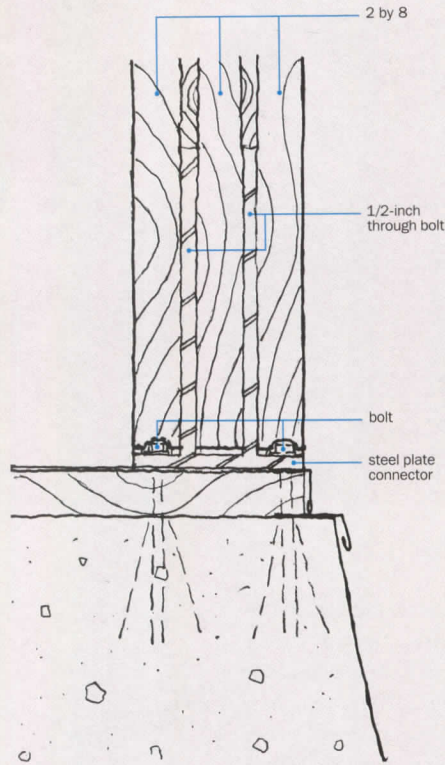
On the exterior, the battens extend several inches below the bottom edge of the rough-sawn board-and-batten cedar siding, preventing the clad portion of the cabin from feeling like a solid box. This light touch continues overhead where the rafters stop two feet short of the edge of the corrugated metal roof. Smaller 2-by-4 extensions nailed to one side of each rafter continue outward to support the roof while, at the same time, expressing the lightened load.

The cabin is small but, at \$200 per square foot, not inexpensive. "It still requires the same level of detail as the other houses," Cutler says. S. O.

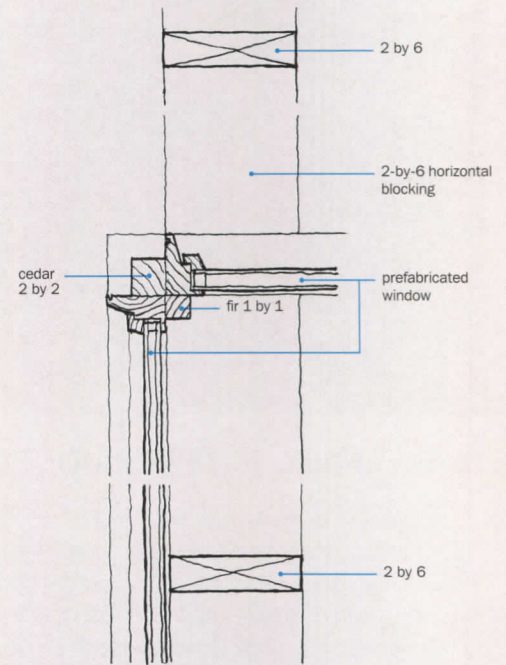
Top left: The cabin's triple 2-by-12 columns are tied to the foundation with a steel plate connector and eight through-bolts.

Top right: The window wall turns the corner between studs. Joints are trimmed with cedar on the exterior and with fir inside.

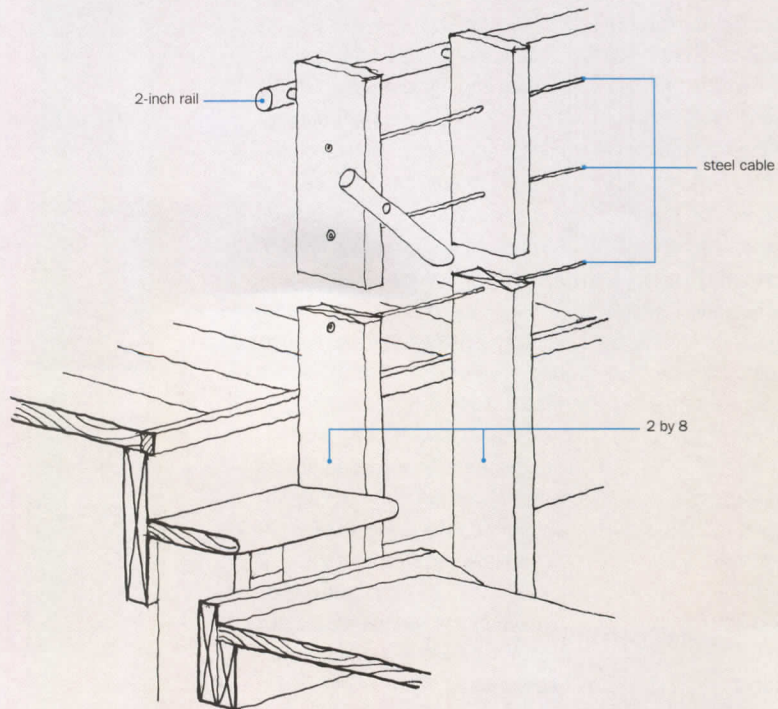
Bottom: Steel cable, threaded through 2-by-8 studs is used for the guardrails. The studs also support the stringers.



Detail 4: foundation section



Detail 5: window wall corner



Detail 6: stair



The exterior of Tanglefoot peeks out from behind the pines (far left). Drywall is, for the most part, nonexistent in the house, so the wood framing was sanded and lacquered to highlight its color and grain (left).

TANGLEFOOT, PRIEST LAKE, IDAHO

The owners rely on their small fleet of amphibious planes to get to this remote, 6,000-square-foot house-on-a-lake. Built for an inventor (who developed the birthing beds now used in most maternity wards), his wife, and their four young children, the house also serves as a small conference facility for their business.

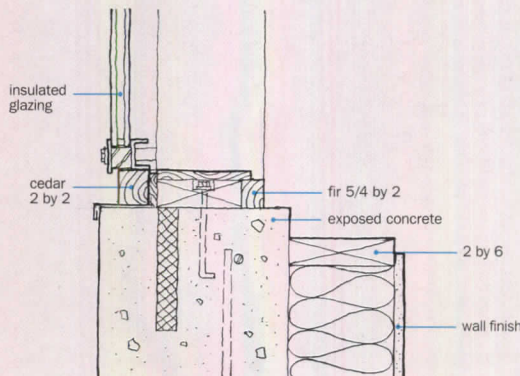
Cutler attributes the expressiveness of the project to his highly collaborative and creative relationship with the clients. "They listened to my ideas, then pushed me further," he says. As has become his practice, Cutler turned the standard design-then-details method inside out by determining seminal details early on before the scale of the plans and elevations increased from $\frac{1}{8}$ inch to $\frac{1}{4}$ inch. This set the relative position of building elements and helped define the overall concept.

"The house is supposed to look as if it were built on an abandoned concrete building," says general contractor Randy Humble of Humble Homes Construction, Moscow, Idaho. To make the new poured-in-place concrete walls appear *weathered*, the formwork was lined with salvaged boards.

The concrete walls were poured a $\frac{1}{2}$ inch higher than needed and ground down to form a clean edge for the sill plate (detail 7). Cutler exposed the concrete ledge inside the house by stopping the walls $1\frac{1}{2}$ inches short of the top of the foundation wall.

To slip the house in among the trees, it was broken into separate summer and winter blocks connected by a double-height 750-square-foot greenhouse, which becomes a living space during mosquito season. During cold months, the summer block—with a master suite above and a conference room below—is closed, reducing the area needing heat. The balance of the living space, including the living room, kitchen, and children's bedrooms, is in the winter block.

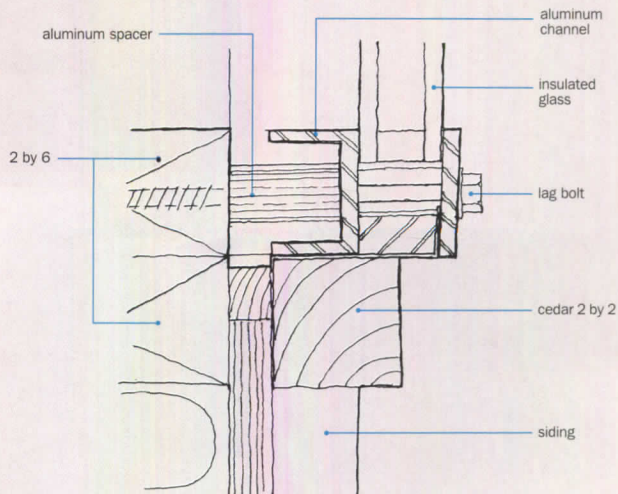
Again, Cutler used fitch beams, alternating wood studs with galvanized-steel plates. To accommodate Idaho's 100-pounds-per-square-foot snow loads, the plates dip below the bottom of the beams (detail 10). Cutler, who worked as an auto mechanic while in college, galvanized freeze plugs found on engine blocks and used them as



Detail 7: wall section

Left: To reinforce the impression that the house sits atop an abandoned building, the concrete is exposed at the base of the walls inside the house.

Bottom: Where the glass is inoperable, aluminum bars clamp the panels against the metal channels with lag bolts.



Detail 8: window section



Make outside

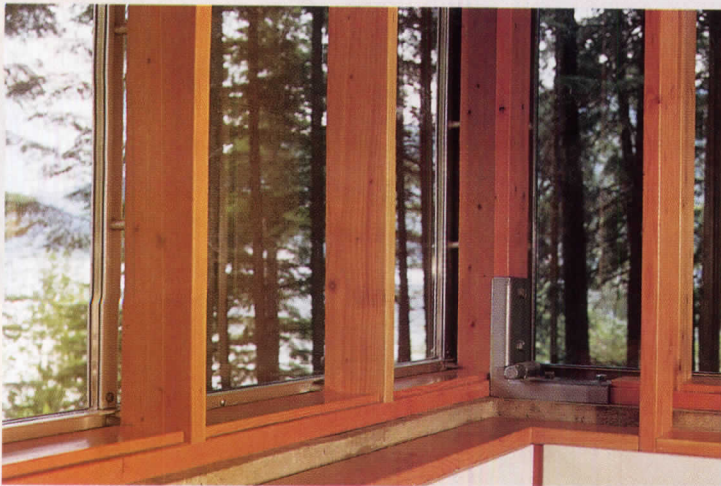
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covers for the bolt ends.

The window detailing is more refined than that of the other two houses. Aluminum spacers float a frame of aluminum channels off the face of the wood studs (detail 9). Where the windows are inoperable, an aluminum bar clamps the insulated glass panels against the aluminum channels with stainless-steel lag bolts (detail 8).

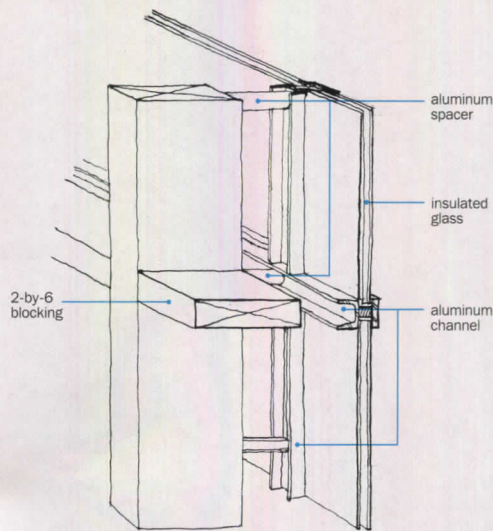
At operable sections, prefabricated aluminum windows sit within the aluminum channel frame. The tight tolerances and unusual configurations made flashing difficult until rolls of flexible, thin, and durable aluminum tape, used in the aerospace industry, were hunted down by the client. A cedar 2-by-2, set back from the face of the aluminum, finishes the outside edge of the frame.

Drywall serves many purposes in standard construction, so when it is eliminated, the elements it disguises must be rethought. "Rarely was anything commercially available that was in harmony with the design," the client says.

For example, industrial explosion-proof switches replace standard electrical switches, while cast-aluminum junction boxes and galvanized-steel conduit are substituted for standard electrical outlets.

Because much of it is visible, the framing is select structural lumber to cut down on the amount of chipped edges. The client began working with a local mill to pull and stockpile the best pieces a year before construction started. "I've never sanded and lacquered wall studs before," remarks Humble. Three 40-by-60-foot tarps protected the framing from the elements until the roof was in place.

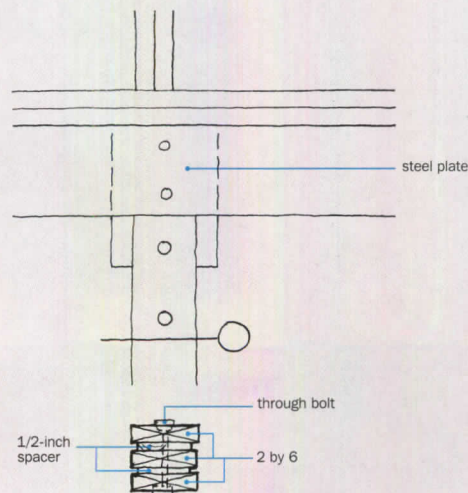
Achieving this level and consistency of design required a 2-inch stack of Cutler's hand-drawn details. It also required a shift in thinking on the part of both the contractor and the architect. The house, the architect says, "raises construction, particularly framing, from a trade to a craft." This is a house that tells the story of how it was made and celebrates not only the occupants, but also the people who made it. S. O.



Detail 9: window

The unusual window details, which include aluminum channels and bars that hold the glass away from the wood (far left), are one of the architect's hallmarks. Cutler used galvanized automotive parts to cover the bolt ends on his fitch beams (above).

Left: Aluminum channels and spacers hold the insulated glass away from the frame.



Detail 10: fitch beam

Bottom: A built-up beam made of alternating layers of wood and steel supports snow loads. For greater strength, the steel runs beyond the ends of the beams to the framing.

Credits

Project: Wood Residence, Vashon Island, Wash.

Project team: Jim Cutler, FAIA, David Cinamon, AIA, Mark Wettstone, George Houdek

Consultants: Verdigris Landscape Architects

Project: Arrowleaf Cabin, Winthrop, Wash.

Project team: Jim Cutler, FAIA, Russell Hamlett, David Cinamon, AIA, Joe Hurley, Bruce Anderson, AIA

Engineers: Monte Clarke Engineering
Contractor: Bjornsen Construction

Project: Tanglefoot, Priest Lake, Idaho
Project team: Jim Cutler, FAIA, David Wagner

Engineers: Coffman Engineers (structural)

Steinberg Pavilion
Steamboat Springs, Colorado

Dare To Dream...

For 85 years, children with dreams of performing have attended the renowned Perry-Mansfield Performing Arts School and Camp. Now the oldest, continually-operated dance and theatre camp in the country, its distinguished alumni include; Doris Humphrey, Merce Cunningham, Agnes de Mille and Dustin Hoffman.



"The Pavilion", a focus of great pride for the school, was designed with wide, open-air spaces and symbolizes life's essentials: a person, the land, and the sky. Expansive walls of hinged patio and sliding doors frame the structure,

and windows with small, divided-lite patterns represent trees and leaves.

EAGLE® windows and doors were chosen to showcase the project having intricate, hand-crafted patterns of Modern Divided Lights® and natural, warm wood interiors. EAGLE's willingness to customize products to exact design specifications contributed to making "The Pavilion" a success.

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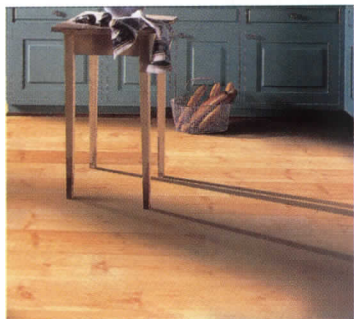
let your imagination surface

CIRCLE 60 ON INQUIRY CARD

Residential Products

► Home on the range

Frigidaire has expanded its lineup of cooking products with both gas and electric models of the Millennia series of ranges. Consisting of eight different gas ranges, the line features a power burner with 11,000 BTU output and heavy cast-iron grates with an easily cleaned porcelain coating. 800/FRIGIDAIRE. Frigidaire Home Products, Augusta, Ga. **CIRCLE 200**



◀ Laminate by nature

Armstrong introduces a residential laminate-flooring line, which debuts with two new collections of authentic wood designs. The designs blend plank styles, natural colors and lusters, and grain varieties to look realistic. 888/ARMSTRONG. Armstrong World Industries Inc., Lancaster, Pa. **CIRCLE 202**

▼ The heart of the home

Kitchens of today are the single most visited room in a house. With the addition of a see-through fireplace, the kitchen can connect to another room in the home, such as a living or dining room. The multiview B-vent gas fireplace series (shown) vents vertically through the roof and fea-

tures a new log configuration and burner system. The logs are carefully crafted to look like natural logs. The series is available in peninsula, see-through, and corner styles to suit any decorative taste. 800/731-8101. Superior Fireplace Company, Fullerton, Calif.

CIRCLE 201



▼ European panorama

The new Gaggenau series of 27-inch stainless-steel-behind-glass built-in ovens feature a panoramic front, no dirt traps, and a door handle that can be hinged on the left or right to swing open 180 degrees. Surrounding cabinets are protected against overheating by the low-noise cooling system. 800/828-9165. Gaggenau, Huntington Beach, Calif. **CIRCLE 203**



◀ ADA-compliant faucet

Designed primarily for commercial retrofit applications, the wall-mount, two handle kitchen faucet is poised to meet the resurgence of large kitchen sinks in new residential applications. Both handle styles are ADA compliant. 847/675-6570, ext. 359. Gerber Plumbing Fixtures Corp., Lincolnwood, Ill. **CIRCLE 204**

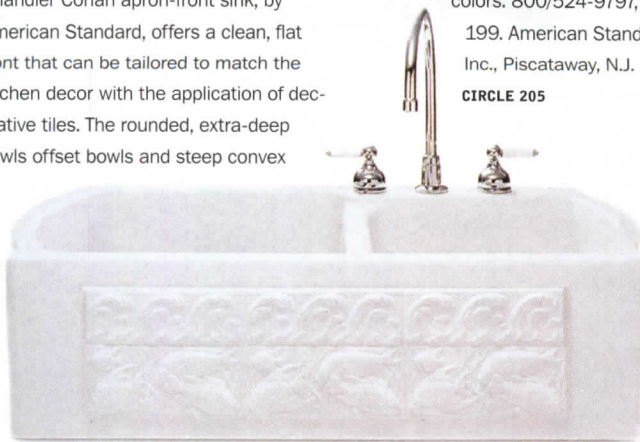


▼ Don't cut those apron strings

The front apron panel of the new Chandler Corian apron-front sink, by American Standard, offers a clean, flat front that can be tailored to match the kitchen decor with the application of decorative tiles. The rounded, extra-deep bowls offset bowls and steep convex

sides make room for large pots and pans. It is offered in a range of Corian colors. 800/524-9797, ext. 199. American Standard Inc., Piscataway, N.J.

CIRCLE 205



▲ Metal detailing

Questech metal tiles can turn backsplashes or fireplace surrounds into focal points or highlight a wall or floor border. Installed just like ceramic tile, the tiles are manufactured using a blend of premium metals, such as copper, nickel-silver, brass, and bronze, but weigh only 20 percent as much. They can be used as an alternative to many decorative materials, including marble, granite, plaster, ceramic tile, and wood paneling. The metals have a protective clear coat. 931/484-2110. Crossville Ceramics Company, Crossville, Tenn. **CIRCLE 206**

Residential Products

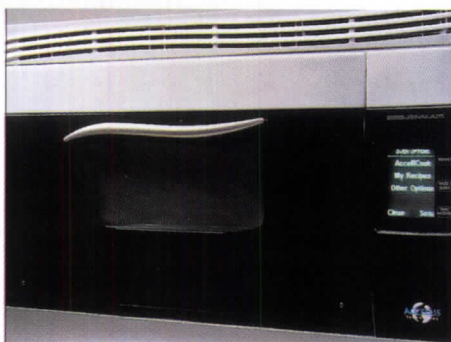
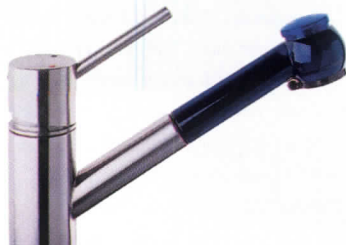
▼ Pot fills and nothing spills

Inspired by professional kitchens, the pot-filler faucet complements the commercial-styled appliances popular in many of today's domestic kitchens. The pot-filler extends to reach front burners, bends to reach back burners, and folds against the wall when not in use. It is available in chrome (shown) or satin nickel. 215/822-6590. Franke Consumer Products Inc., Kitchen Systems Division, Hatfield, Pa. **CIRCLE 207**



▼ Clear-headed faucet

The Supremo kitchen faucet collection features a stainless-steel body and translucent sprayheads in three colors: green, blue, and gray. The sprayheads' Turn and Lock technology allows spray settings to be locked in place and easily changed with the push of a button. Supremo also features an aerator screen for easy cleaning and maintenance. 770/248-1600. KWC Faucets Inc., Norcross, Ga. **CIRCLE 211**



▼ Short-order cook

The Jenn-Air Accellis 5XP wall oven has a compact configuration that provides a number of installation options. It can be installed above the counter or below, paired with a cooktop or another wall oven, or even installed in nontraditional locations like a dining room. The oven's rapid-cook technology lets the user cook up to five times faster than a conventional oven. 800/499-0116. Jenn-Air, Newton, Iowa.

CIRCLE 208



▲ New finish and door styles

KraftMaid offers four new cabinetry finishes and seven new cabinetry door styles. KraftMaid's buttercream finish features a pale-yellow semitransparent stain with deep-toned "fly spec" highlights. This creamy yellow finish combines with KraftMaid's new decorative grape onlays and ornaments in an indigo finish (shown). Buttercream is available on KraftMaid's maple and birch cabinetry. 440/632-5333. KraftMaid Cabinetry Inc., Middlefield, Ohio.

CIRCLE 210



► Exhausting results

Depending on the model in the Allure Series of range hoods, Broan-NuTone uses either a patented axial blade or specially designed centrifugal wheel for exhausting air. Both are designed to be more efficient than other hoods, resulting in reduced revolutions and quieter operation. 800/558-1711. Broan-NuTone, Hartford, Wis. **CIRCLE 209**



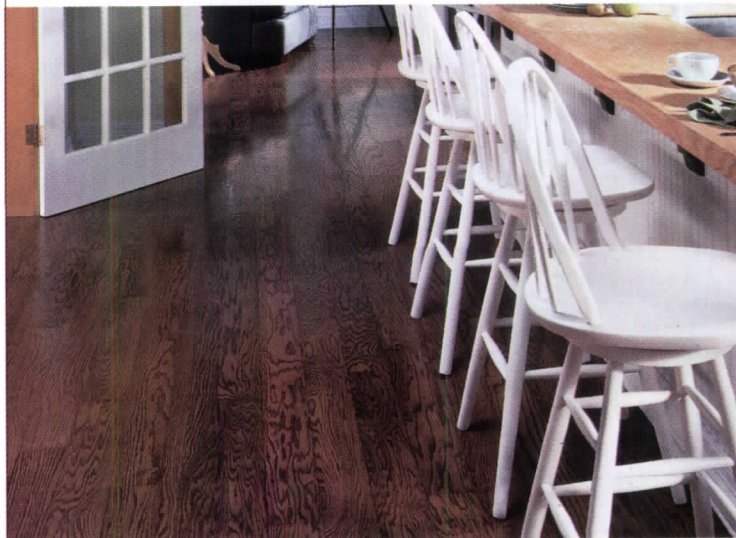
▲ The butler did it, again

The Hudson Valley Collection was inspired by the craftsmanship of butler's pantries found in the great homes of the late 19th and early 20th centuries. The collection features beaded inset doors, beveled or fluted glass, and historically accurate reproduction hardware in stainless steel or chrome. It comes in 10 finishes. 800/765-5266. SieMatic Corporation, Bensalem, Pa. **CIRCLE 212**

▼ Finish for high-traffic areas

Bruce Hardwood Floors introduces Dura-Luster Plus urethane finish, an aluminum-oxide finish that provides up to 10 times more abrasion resistance than traditional urethane finishes, according to company plant tests. Previously offered only on the Natural Reflections,

Harborlight Plank, and Northshore Plank, Dura-Luster Plus will now be available on all Bruce plank and strip floors. The aluminum-oxide wear-layer forms a crystal-clear, consistent finish that never needs waxing and requires only minimal care. 800/722-4647. Bruce Hardwood Floors, Mount Olive, N.J. **CIRCLE 213**



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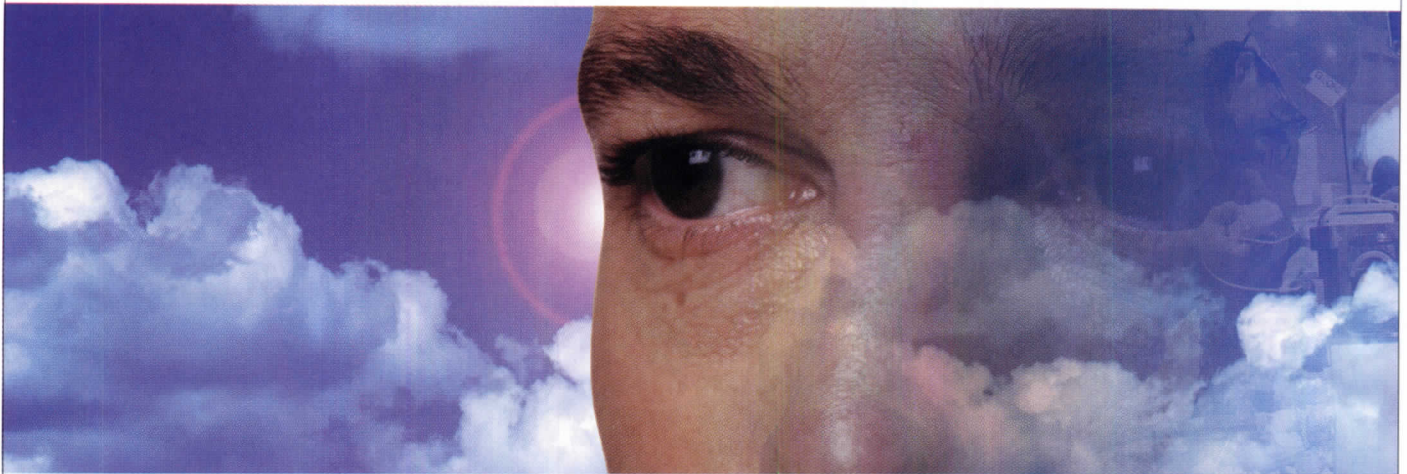


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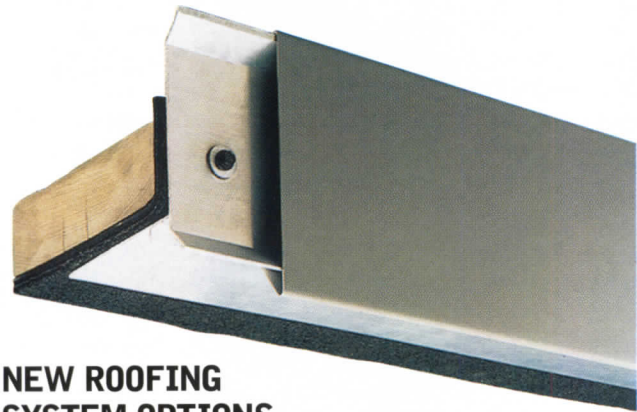
National Electrical Contractors Association
International Brotherhood of Electrical Workers



CIRCLE 62 ON INQUIRY CARD

New Products

Picking the right roofing system is about using common sense, explains James R. Kirby, AIA, director, technical services, National Roofing Contractors Association. He suggests that architects stick with companies with a proven track record. Local knowledge provided by roofing contractors can also give architects an advantage, he adds. *Rita F. Catinella*



NEW ROOFING SYSTEM OPTIONS

The Johns Manville Roofing Systems Group has introduced the Presto-Tite Fascia System to provide maximum protection against wind-uplift damage (top right). Presto-Tite is a two-part fascia system with an extruded aluminum anchor bar and a snap-on fascia cover.

Presto-Tite is available in three versions: a built-up and modified version, single-ply adhered and mechanically fastened version, and single-ply stone ballasted version. The system is included in all JM Roofing System guarantees, is FM

heat weldable for SBS and APP membranes. DuraBoard is less expensive and easier to install in these applications because of its ability to be directly heat welded without an additional base sheet. With its weight-bearing strength and rigidity, the 1-inch DuraBoard can span the wider rib openings of metal roof decks. It also has the advantage of a minimum recycled content of 25 percent.

In addition, the company has recently introduced the OmniDiamond standard precut

crickets and the DynaWeld Base. The crickets are designed to enhance drainage on a tapered roof system, to allow for on-site adjustments for drain locations, and to be helpful on new construction projects when actual drain location can change. The DynaWeld Base was

designed for use as a premium, modified bitumen ply or base sheet. It can be heat welded as is particularly suitable for tight or awkward roof areas. DynaWeld's elastomeric asphalt blend is formulated to provide the physical properties for ease of installation and long-term roof performance. 800/654-3103. Johns Manville Roofing Systems, Denver.

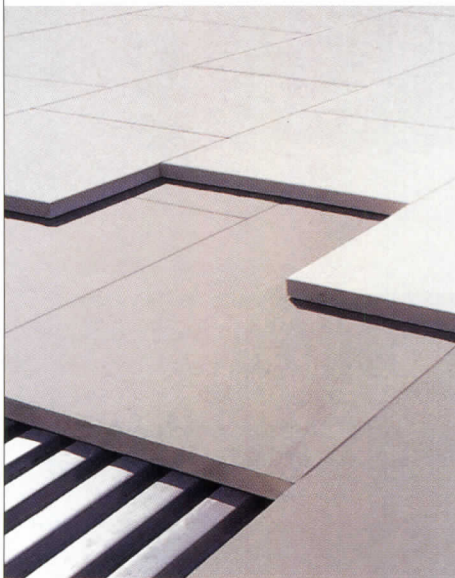
CIRCLE 215



1-90 approved, and meets ANSI/SPRI-1-98 wind standards. It has a 20-year warranty, and no stripping in is required.

DuraBoard (bottom left), which is available in 1/2-inch, 3/4-inch, and 1-inch thicknesses, is one of the newest additions to the JM line of insulations for built-up and modified bitumen roofs. It is impact resistant, has high wind-uplift ratings, and is

POLYISO INSULATION WELL AHEAD OF EPA REQUIREMENTS



PIMA was awarded the 1999 U.S. EPA's Climate Protection Award last August. The organization was one of 10 individuals and organizations internationally to receive the honor in recognition of "exemplary efforts and achievements in protecting the global climate." In addition, Atlas was awarded the EPA's coveted 1998 Stratospheric Ozone Protection Award. Other initiatives by Atlas include the R-value warranty on polyiso products for roof insulation and the

first 20-year warranty on R-value retention. The primary facers for many Atlas roof insulation products are made from predominately recycled materials. "We strive at once to be the low-cost and high-quality manufacturer of products that are as energy-efficient as they are environmentally responsible," says Atlas president Ron Fredin. ACUltra Technology is available in all Atlas polyiso foam insulation roofing and sheathing products, including tapered ACFoam and ACFoam composite products, Nail Base and Vented-R insulation for roof decks, and Atlas' exclusive Gemini precut roofing crickets. The technology offers improved dimensional stability, improved facer adhesion, and continued R-Values and code compliances for flame spread/smoke development. 770/952-1442. Atlas Roofing Corporation, Atlanta.

Atlas Roofing is the first company to develop and introduce a new generation of environmentally friendly HCFC-free polyiso insulation products, known as ACUltra Technology. The company is working ahead of the EPA requirement to end the use of HCFCs by the year 2003 through the development of proprietary and patented hydrocarbon blowing formulation for foam insulation. Back in 1992, Atlas was the first manufacturer to convert from CFCs to less-harmful HCFCs.

The polyiso industry as a whole has been making efforts to develop products that are as harmless to the environment as possible. "I'm sure every other [polyiso] company is doing work that will allow them to make a similar announcement within the next few years," says Jared O. Blum, president of the Polyisocyanurate Insulation Manufacturers Association (PIMA), of which Atlas is a member.

first 20-year warranty on R-value retention. The primary facers for many Atlas roof insulation products are made from predominately recycled materials.

"We strive at once to be the low-cost and high-quality manufacturer of products that are as energy-efficient as they are environmentally responsible," says Atlas president Ron Fredin.

ACUltra Technology is available in all Atlas polyiso foam insulation roofing and sheathing products, including tapered ACFoam and ACFoam composite products, Nail Base and Vented-R insulation for roof decks, and Atlas' exclusive Gemini precut roofing crickets. The technology offers improved dimensional stability, improved facer adhesion, and continued R-Values and code compliances for flame spread/smoke development. 770/952-1442. Atlas Roofing Corporation, Atlanta.

CIRCLE 214

New Products



◀ Chrome dome

Owens Corning introduces two additions to its MiraVista specialty roofing family, MiraVista Copper and MiraVista Designer Metal. Fashioned from 16-ounce solid copper, MiraVista Copper is less costly than traditional copper roofing, maintenance free, and backed by a 50-year warranty. MiraVista Designer Metal roofing offers metal panels in 30 colors and is backed by a 30-year warranty. 800/GET-PINK. Owens Corning, Toledo. **CIRCLE 216**



▲ All-weather flashing sealant

One of the additions to the line of Polyseamseal products is a new all-weather roof and flashing sealant that can be applied at temperatures ranging from 20 to 90 degrees Fahrenheit without difficulty in extrusion. 800/321-3578. OSI Sealants Inc., Mentor, Ohio. **CIRCLE 217**



◀ Fully adhered system

FleeceBACK membrane consists of a nonwoven fleece backing laminated to Carlisle SynTec's patented EPDM membrane and provides 100 to 115 mils of consistent thickness for various roofing substrates, resulting in flexibility, durability, and weatherability. The membrane is adhered with VOC-free adhesive. 800/4-SYNTEC. Carlisle SynTec Inc., Carlisle, Pa. **CIRCLE 218**



◀ Southern exposure

Savannah is a heavy-weight strip residential shingle with the look of an architectural laminated shingle. The Speed Lap alignment system features a notched side lap that makes it simple for roofing installers to determine where the shingles should be aligned, both horizontally and vertically. 800/839-2588. Georgia Pacific Corp., Atlanta. **CIRCLE 219**

▼ Hitting the slopes

The designers of the Squaw Valley Ski Resort needed compatible solutions capable of both low-slope and high-slope curved metal panel applications to withstand severe weather conditions. Garland

suggested they seal the low-slope area with the R-Mer Lite insulated steel roofing system and use the R-Mer Span standing-seam system for the curved terminal. 800/321-9336. The Garland Co. Inc., Cleveland. **CIRCLE 220**



▲ Polymers keep roofs cool

New Kraton polymers help extend the life expectancy of roofs exposed to high temperatures and improve their overall performance, without sacrificing the low-temperature performance associ-

ated with SBS polymers. The flexibility of the SBS-modified roofing membranes are highlighted in this new building at Sheffield University in the U.K. 800/457-2866. Shell Chemical Co., P.O. Box 2463, Houston. **CIRCLE 221**

Product Briefs

► No smoking, please

The Helva Collection, designed by Italian architect Paola Navone, is composed of woven Manila hemp, a natural vegetable fiber prevalent in the Far East and commonly used in rope. Although it's not a familiar medium for furniture construction in the West, its durability makes it appropriate for this use. The hemp, handwoven to create an intricate pattern, is crafted around a wooden and rattan frame on chrome-plated glazed steel legs. 415/626-6730. The Wicker Works, San Francisco. **CIRCLE 222**



▼ Sculptured grille blocks

Depending on how it is assembled, a new sculptured glass-fiber-reinforced concrete block (GFRB) grille can create a circular or herringbone pattern. Although visibility is limited to 5 percent through the grille, 22 percent of air can pass through. 941/925-3331. The Grille Block LLC, Sarasota, Fla. **CIRCLE 223**



▲ Signs of expansion

The expanded ASI Infinity Series adds an assortment of new standard components to the signage system, including precision-crafted aluminum text, graphic- and ADA-ready panels, ASI updatable modules, and a choice of new mounting fixtures. In addition to the current wall-mounting options, ASI Infinity now offers suspended, projecting, freestanding, and tabletop options among the standard available fixtures. 214/352-9140. ASI Sign Systems Inc., Dallas. **CIRCLE 225**



▲ Colorful cowhide

Twenty years ago, Edelman Leather started making leather specifically for architects and interior designers of aircraft, contract, and residential

interiors. The line consists of 450 colorways and 25 different types of leather. The leather ranges from aniline-dyed cowhides to vegetable-tanned artisan leather. The Fur Fun

collection of cowhide with fur (shown) is available in 11 bright, solid colors for use on walls, chairs, or pillows. 203/426-3611. Teddy & Arthur Edelman, Hawleyville, Conn. **CIRCLE 224**



◀ The road to Kathmandu

As part of her exploration into the art of rug making, Melisca Klisanin has traveled to Kathmandu to work with rug weavers, to Egypt to create hand-knotted silk pieces for private collectors, and to Amish country to work on natural and dyed raw-silk rugs. Shown here are Rings in a Pond and Spinning Daisy, hand-tufted silk and wool blends in 6-foot diameters. 212/358-8720.

Klisanin Ross Gallery, New York City. **CIRCLE 226**

▼ Substrate for nontiled areas

Dens-Shield Tile Backer is an ideal substrate when interior walls and ceilings of swimming pools, natatoriums, laboratories, and other areas need protection from high moisture. The same properties that have made it a substrate for interior tile installations are equally appropriate for nontiled areas. 800/BUILD-GP. Georgia-Pacific, Atlanta. **CIRCLE 227**



Product Briefs

◀ Bridging steel and glass

Kipp Stewart has designed a series of steel and glass indoor tables for residential or commercial applications. The Golden Gate Collection includes console, cocktail, and side tables that feature long sweeping arcs contained in simple rectangular structures. The Column Series includes round and rectangular dining tables, as well as cocktail tables with dense vertical columns bound together with weightless horizontal elements. 510/835-1365. Bradford Stewart Furniture, Oakland.

CIRCLE 228



▲ Tough tapestry

The Tapis Collection, designed by Sally Sirkin Lewis, consists of seven tapestries translated through 37 new textiles in colorways that include lemon peel, solid ebony, persimmon, and a warm neutral flax. Three of the new Tapis patterns are made with a looped weave that conveys a feeling of a subtly tex-

ured antique document with a modern-day pattern and color. The other four designs use variations of an Ottoman weave that creates a background-ribbed effect. Tapis meets heavy-duty upholstery standards, thanks to its detailed weaving process. 310/680-4300. J. Robert Scott Inc., Inglewood, Calif. CIRCLE 230

▶ Cedar home construction

International Homes of Cedar (IHC) manufactures pre-cut homes on a custom basis. IHC uses the massive strength of solid horizontal log structures with kiln-dried laminated-cedar timbers and modern precision-machined interlocking joints. 800/767-7674. International Homes of Cedar Inc. Woodinville, Wash.

CIRCLE 229



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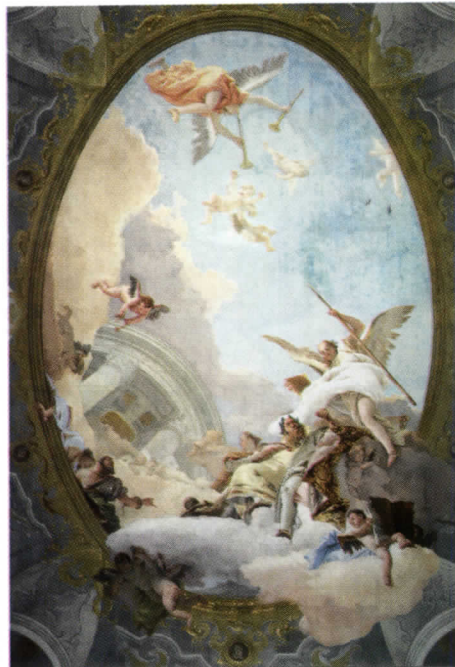
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CIRCLE 66 ON INQUIRY CARD

Product Briefs

Another renaissance

Philippe de Saga (PDS) has acquired exclusive rights to Europe's largest digital private art archive, Scala, which



contains more than 100,000 images primarily from Italian art history (including the Vatican Museum's collection). PDS technology allows any digitized image to be transferred to almost any material, including fabric, metal, glass, and marble. Images or portions of images can be manipulated by size and

scale, and after transfer, a variety of techniques can be applied such as surfacing, etching, and sculpting to accurately recreate originals. Despite the attention to detail required, this process costs substantially less and takes far less time than hiring painters, fabric artists, and the like. PDS helped recreate masters like Titian, Veronese, and Tiepolo on the walls and ceilings of The Venetian casino in Las Vegas. 416/964-7105. Philippe de Saga, Toronto, Ontario.

CIRCLE 231



Classic tile shape

The Fifth Avenue Collection of glazed 3-by-6-inch ceramic wall tiles comes in 5 stocked colors and 17 custom colors. The collection's design is inspired by 3-by-six wall tiles that date back to the late 1800s and early 1900s. 330/866-5531. United States Ceramic Tile Company, East Sparta, Ohio.

CIRCLE 233

Aerated concrete under fire

ACCO autoclaved aerated concrete is noncombustible, emits no toxic fumes when exposed to fire, and has a fire-resistance rating of 1 inch per hour. ACCO AAC can be used as a cladding to protect other materials, such as steel, or to increase the fire rating of concrete walls.

888/901-ACCO. ACCO Aerated Concrete Systems Inc., Apopka, Fla. CIRCLE 232



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Product Briefs

▼ Allegory of nature

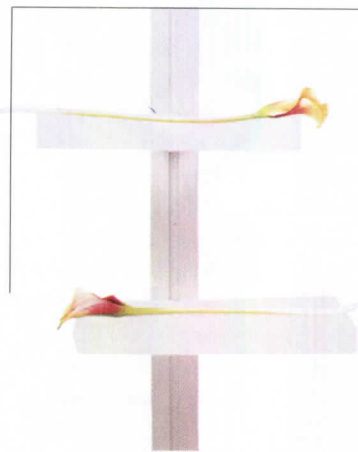
Allegory is a new eco-sensitive, Type II wallcovering composed of 50 percent wood pulp and water-soluble inks. It contains no heavy metals, like chromium, cadmium, lead, and mercury, nor does it contain measurable amounts of formaldehyde. Its other component, recycled spun-woven fibers,

enhances the sparkling finish. Allegory is available in two coordinating patterns, Allegory Rush and Allegory Fern, and comes in a palette with names such as Bayou, Sunshine, and Glacier. 212/807-6300. Innovations In Wallcoverings Inc., New York City. **CIRCLE 234**



▼ Cladding for a rainy day

Rheinzink has expanded its product line to include a building-envelope system. Rheinzink System-A panels provide the first layer of defense against precipitation by blocking rain and snow with a metal cladding screen. The entire exterior skin of Vancouver's Coal Harbour Towers uses the rain-screen principle. 604/291-8171. Rheinzink Canada Ltd., Burnaby, British Columbia. **CIRCLE 236**

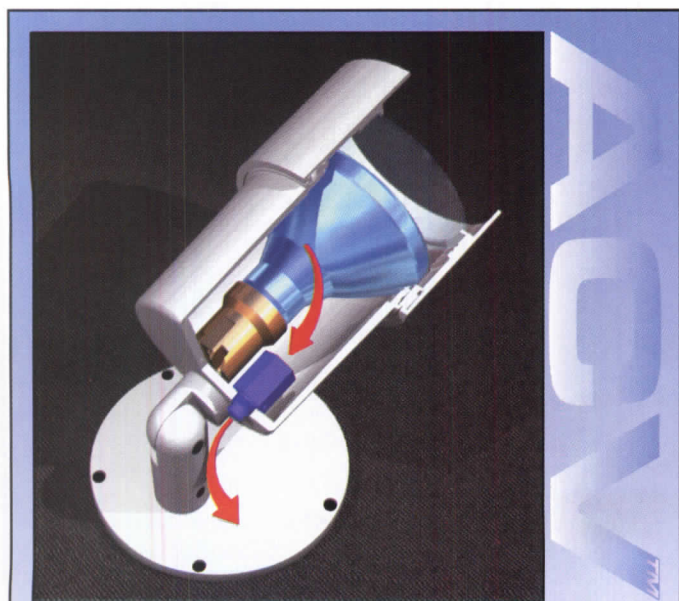


▲ Show off your stuff

The Reed display system, whose anodized-aluminum, tension-based verticals are even slimmer than those of the ALU Autopole system that inspired it, has a diverse range of attachable accessories in sandblasted and white acrylic. Reed is an appropriate choice for merchandising apparel, footwear, jewelry, eyewear, fragrances, and cosmetics. 212/924-8713. ALU, New York City. **CIRCLE 235**



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Product Briefs

◀ Ringing in the new

Nevamar's Year 2000 high-pressure laminate collection features 33 items, including a variety of new solids, patterns, and woodgrains. Two new patterns are reminiscent of metal, yet offer the functionality of high-pressure laminates. MetalX (shown) conveys the image of finely brushed metal and is offered in three colorways: copperwire, stainless, and bronzed. 800/526-9469. International Paper, Decorative Products Division, Odenton, Md.

CIRCLE 237



▲ Urethane millwork additions

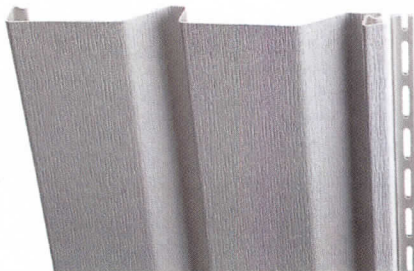
Two new styles, a triangle louver (stretching 10 feet long) and an eyebrow louver in three sizes, have been added to the company's urethane louver product line. Existing louver products in round, cathedral, peaked, and other styles are now offered in 14 new sizes. Available in both a stainable

version with a natural redwood texture and color (in a limited number of styles) and in a smooth, white finish with a UV-protective topcoat finish. Architectural Accents louvers also come with optional siding rout. 800/446-3040. Style-Mark Inc., Archbold, Ohio.

CIRCLE 239

► Embossed vinyl siding

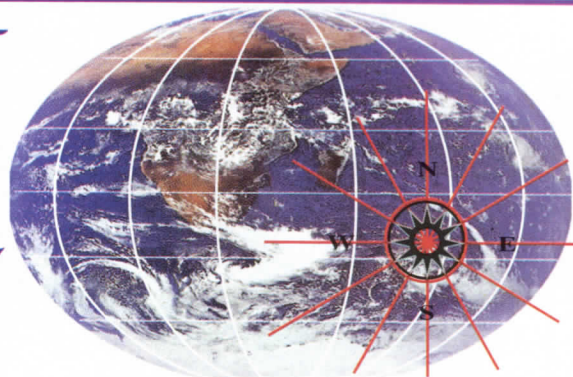
Sovereign Select vinyl siding features a .046-inch wall thickness with a full-roll nailing hem and patented Advantage Lock system. Embossed with a rich, cedar-grain texture, the panel is available in 11 core colors and 4 designer shades. 216/514-3500. Revere Building Products, Cleveland.



CIRCLE 238

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Product Literature

1,000 pages of design and construction information, including the building-code-recognized National Design Specification for Wood Construction. 504/443-4464. Southern Forest Products Association, Kenner, La. **CIRCLE 241**

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Vetter's online launch www.vetterwindows.com

Clipay Building Products' new application and design manual www.clipaycommercial.com

NetCompliance launches a new MSDS site www.msdscompliance.com

Cypress construction guide

Versatile, Distinctive Cypress is a free, 12-page technical guide for building and design professionals working with cypress. 412/829-0770. Southern Cypress Manufacturers Association, Pittsburgh. **CIRCLE 240**

Wood structure design manual

The new *ASD Manual* brings together all required elements for allowable stress design of wood structures in one comprehensive package. It features over

Educational lighting CD-ROM

Retail Lighting is the second CD-ROM produced in conjunction with Lightpoint, Osram Sylvania's lighting education center. 800/LIGHTBULB. Osram Sylvania, Danvers, Mass. **CIRCLE 242**

Stone solutions

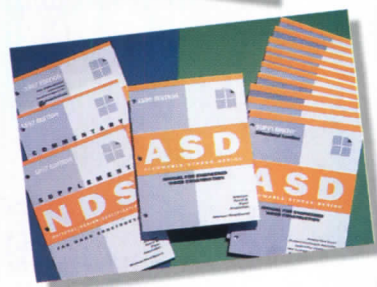
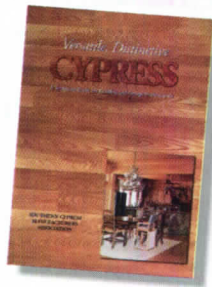
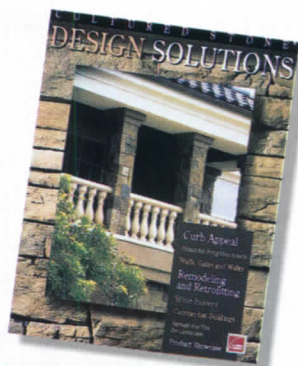
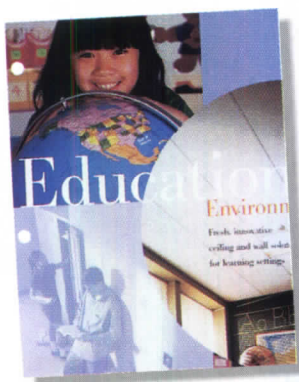
The 84-page *Cultured Stone Design Solutions* addresses a range of building needs and solutions with cultured stone products. 800/255-1727. Cultured Stone Corporation, Napa, Calif. **CIRCLE 243**

School construction brochure

The *Education Environments* brochure provides designers detailed information on a range of wall and ceiling products and systems suited for educational construction. 800/950-3839. USG Corporation, Chicago. **CIRCLE 244**

Laminate catalogue

The *Year 2000 Catalog* features Nevamar's largest-ever collection of newly introduced high-pressure laminates. 800/526-9469. International Paper, Decorative Products Division, Odenton, Md. **CIRCLE 245**



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Product Literature

Cedar shingle site/CD-ROM

Cedar Valley's *Design File* is now available on CD-ROM and on the Web at www.cedar-valley.com. *File* includes application photos, shingle panel options, corner systems, and custom products. 800/521-9523. Cedar Valley Shingle Systems Inc., Hollister, Calif.

CIRCLE 246

Window/door selection guide

EFCO's 480-page *Architectural Guide* binder contains information on how to make preliminary window, door, curtain-wall, and storefront selections. 800/221-4169. EFCO Corporation, Monett, Mo. CIRCLE 247

Testing directory

A new directory from ITS contains a listing of fire doors, frames, and hardware that have been tested, certified, and issued the industry-recognized Warnock Hersey Mark for positive pressure standards compliance. 800/967-5352. Intertek Testing Services NA Inc., Boxborough, Mass. CIRCLE 248

Window case study

A new brochure from Weather Shield showcases the use of the company's windows in the newly opened Ten Mile Station restaurant in Colorado. 715/748-2100. Weather Shield Windows & Doors, Medford, Wis. CIRCLE 249

Book of TPO knowledge

The TPO Book of Knowledge includes information about the manufacture, history, and benefits of TPO roofing products. 877/TPO-ROOF. Stevens Roofing Systems, a division of JPS Elastomerics Corp, Holyoke, Mass. CIRCLE 250

Resilient flooring guide

The *Interlock Tile Color Selection Guide* was designed to aid architects, designers, and facility owners in selecting the proper resilient flooring for commercial, institutional, and industrial applications. 800/431-3456. Pawling Corporation, Wassaic, N.Y. CIRCLE 251

Fire testing brochure

A new *Fire Facts* brochure from Trus Joist MacMillan discusses the thorough fire testing of their products. 800/628-3997. Trus Joist MacMillan, Boise. CIRCLE 252



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continued from page 64

Not everyone, however, thinks this partnering can happen smoothly. According to Bill Callaway, president of SWA, a Sausalito, Calif.-based landscape architecture firm, the state of collaboration between architecture and landscape architecture is worse than it has ever been. He gives a couple of reasons, including the development of a hero-architect paradigm that encourages big-name architects to believe they can complete a project entirely on their own. But the main reason for poor collaboration, says Callaway, is a lack of cross education between disciplines. Landscape architects learn nothing in school about architecture, and architects learn nothing about landscape. The problem has obvious technical ramifications. Architects have few skills in grading and topography; landscape architects fail to grasp aesthetics or philosophies of building types. An even bigger problem is how this lack of intellectual reciprocity affects the relationship between the two professions: they look down on one another.

Callaway would like to see both professions more broadly educated in each other's disciplines with a real effort to bridge the divide. Some academics have proposed the idea that, in the future, there will be no division; architecture will absorb landscape, or vice versa, and we'll be left with a profession of "placemakers." It's a fabulous, if seemingly unrealistic notion, but we can get an idea of how collaborations with architects might come about by looking at the collaborative work of landscape architects and artists.

With the old mindset, artists produced objects that landscape architects then "sited" in their designs. The new mindset has artists and landscape architects creating places that are at once designed landscapes and pieces of art. Some examples include Michael van Valkenburgh's collaboration with Ann Hamilton on a new riverfront park in Pittsburgh; the work of Ignacio Bunster-Ossa, principal of the multidisciplinary firm Wallace Roberts and Todd, with artist Jodi Pinto; and Paul Friedberg's work with Jackie Ferrara. Pinto describes her work with Bunster-Ossa, on a redesign of the coastal frontage of Santa Monica, Calif., as a tempering dance, a "kind of weave, in which you can't pull the thread from any part of the design without destroying it." Paul Friedberg says the artist acts as a foil to the designer. "Artists deal with ambiguity and paradox," says Friedberg, "whereas landscape architects and architects deal with

total resolution. We had two views: one that said things are complete, and one that said they're not."

The issue that concerns Friedberg most is whether landscape architects—and any architects for that matter—have the right value system for collaborating. For these professions to evolve, they need to shed some of the Modernist baggage that holds them back, including the idea of designer as sole genius, in favor of the broader concept of generalist, cross-disciplinary explorer.

Indeed, a casual survey of young talent in the profession seems to indicate a trend toward crossing previously impenetrable boundaries. A good example is Cliff Garten, a potter, whose work gradually became larger and more spatially oriented until the next logical step was landscape. He received his MLA from Harvard and is now working in SWA's Laguna Beach, Calif., office. Garten designed a well-regarded art park in St. Paul, as well as the interior landscape of the new Memorial Sloan-Kettering Medical Center in New York City. Another artist-turned-landscape-architect to watch is Mikyoung Kim. Like Garten, she was educated as a sculptor and brings that sensibility to landscape. Among her first commissions are two courtyard gardens in Seoul that transform the minimalist idiom with an eye toward landscape's experiential quality.

To each his own

While many landscape architects welcome increased interest in their profession, some observers warn against excessive emphasis on cross-disciplinary projects. The evolutionary pressures on landscape architecture in the last five years have made it an extremely complex profession, one that is not easily understood from the outside. Hargreaves, for one, recognizes that while there are times for true collaboration, the more appropriate model is cooperation, in which architects do their thing and landscape architects do theirs. And from this division, he says, a "natural gravity" will determine who leads and who follows.

"Clearly, architects look over the fence, see a rebirth in our profession, and see larger processes in what is called placemaking," says Hargreaves. "But they will never be able to come to grips with that because architecture is always formal. Landscape architecture resists a formal solution."

Whether in cooperation or complete collaboration, it's time to introduce more flexibility to the dialogue between the professions. ■

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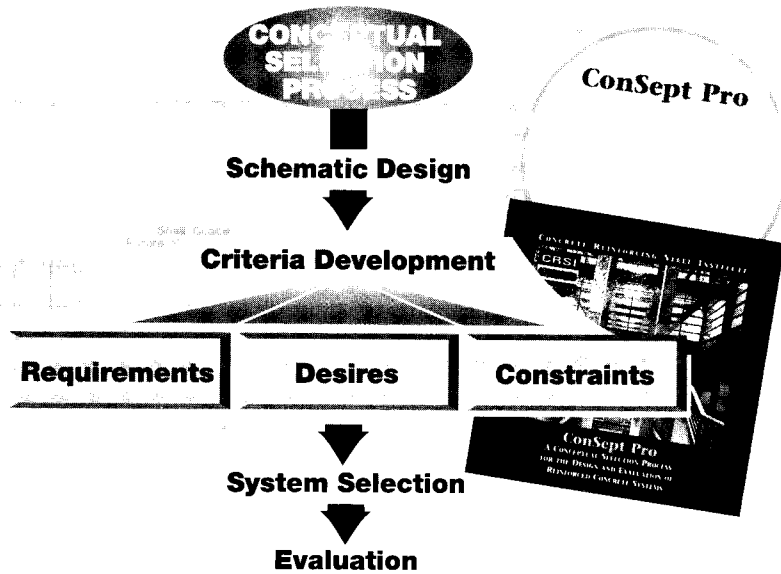
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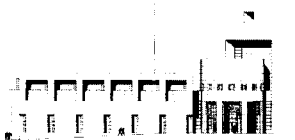
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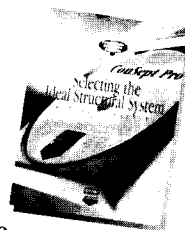


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CIRCLE 76 ON INQUIRY CARD

Dates & Events

continued from page 52

in the world since Jan. 1, 1997. Winners will be featured in fall issues of *Business Week* and *RECORD*. To register, call 888/242-4240, or visit www.architecturalrecord.com.

DuPont Benedictus Awards

Submission deadlines: March 6 (professional architects); March 24 (students)

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AIA Young Architects Forum/Germantown, Pa., Habitat Competition

Submission deadline: April 1

This design competition coincides with the 2000 AIA national convention in Philadelphia. "Building Livable Communities" asks entrants to design an urban rowhouse prototype for Germantown, Pa. The competition is open to young architects (those licensed 10 years or fewer), architectural interns, and students. For details, E-mail mottc@aiaemail.aia.org.

Martin Luther King, Jr. National Memorial

Registration deadline: April 1; submission deadline: May 1

Entrants in this international competition to design the King memorial for its site on Washington's Tidal Basin, are asked to embody "the man, the movement, and the message." Anyone can enter; interdisciplinary teams are encouraged. To register, send a check for \$75 accompanied by a letter listing the entrant's address, phone number, and E-mail address. Checks should be made out to "M.L. King Jr. National Memorial" and sent to Dr. E. Jackson Jr., Design Committee, Martin Luther King Memorial Project Foundation, Dept. 211, Washington, D.C., 20055. Visit cluser1.bell-southonline.com/mlk for more information. ■

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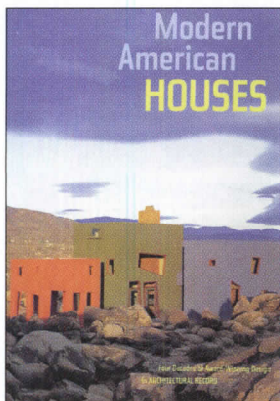
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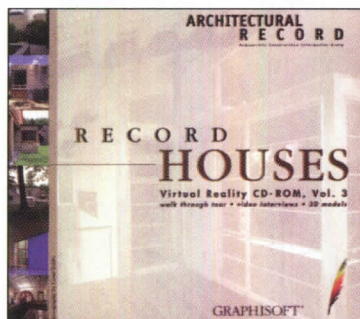
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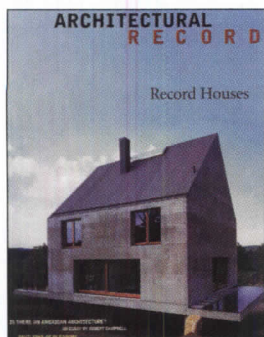
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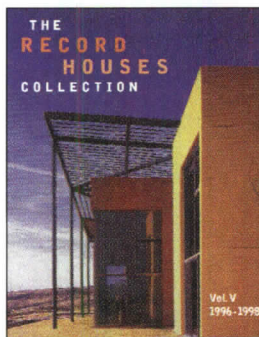
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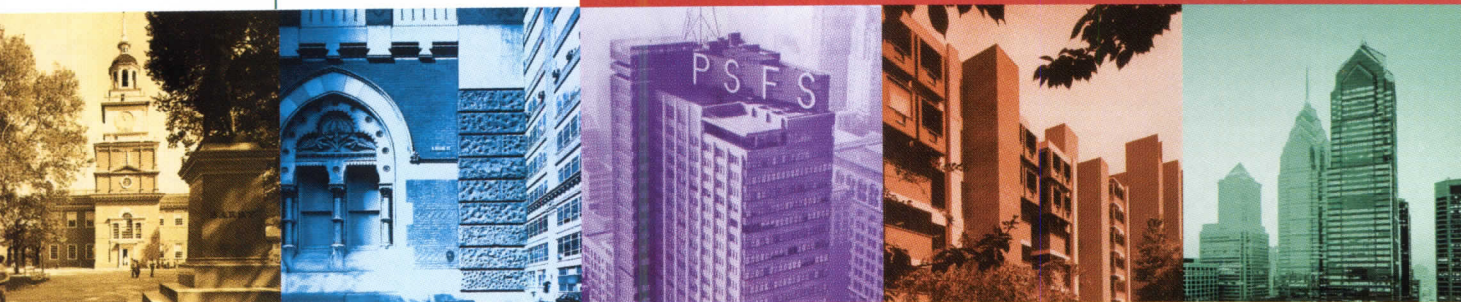
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3. Sheets of membrane are mechanically anchored, chemically adhered, or ballasted. With mechanical attachment methods, clips and metal plates,

batten strips, or bars, are used. Fasteners secure the sheets at the seam edges. If there are not enough fasteners, the wind uplift can cause the fasteners to eventually work loose. A conservative fastening schedule is normally advised. Chemically adhered membranes use adhesives to hold the membranes to the roof substrate. The time and labor to apply the adhesive and smooth the sheets in place adds to the cost of the job, but the bond achieves a roof that is highly resistant to wind, water, and dimensional changes. Ballasted roofs weight the membrane with gravel or pavers. This is the least expensive application, but there are drawbacks. Wind can blow the ballast off causing damage to the membrane or other surfaces.

4. TPO combines synthetic rubber with polymers, such as olefins, making a more stable formulation. This advantage, combined with the membrane's low cost, makes it attractive. Disadvantages include a lack of testing and a limited number of installations, making it difficult to accurately assess the performance of the membranes.
5. Roof membranes are made of several different chemical compounds. The oldest is chlorosulfonated polyethylene (CSPE), commonly known as Hypalon. The most widely used is ethylene propylene diene monomer (EPDM), commonly known as a rubber roof. Polyvinyl chloride (PVC) has been reformulated over the years to improve its durability and is available only as a reinforced sheet. The newest is thermoplastic polyolefin (TPO).



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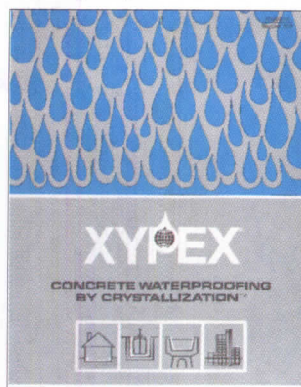


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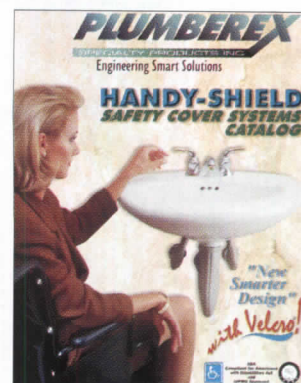


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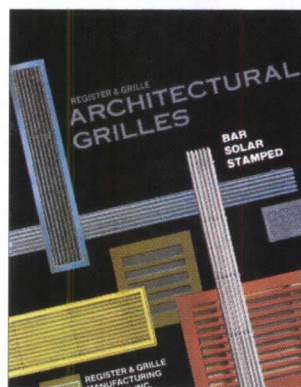


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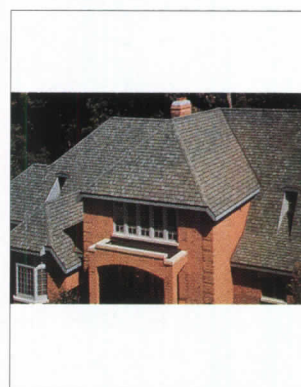


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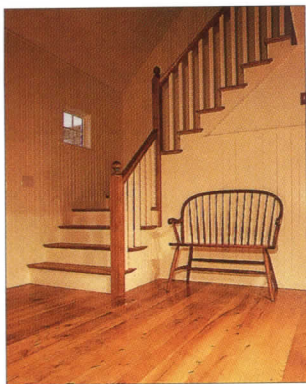


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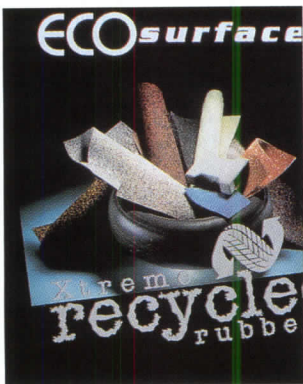


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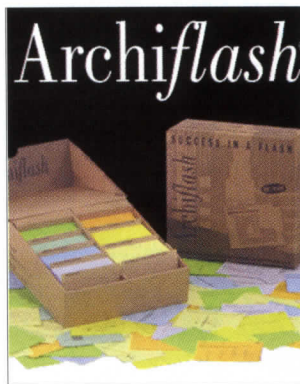


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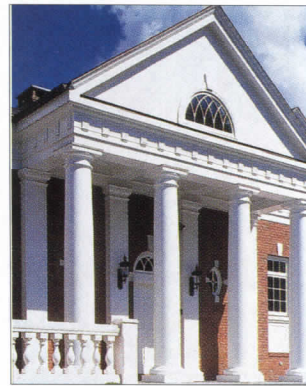


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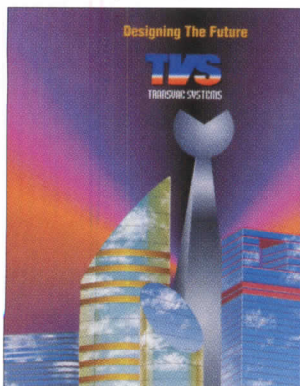


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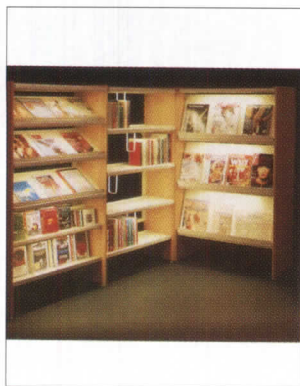


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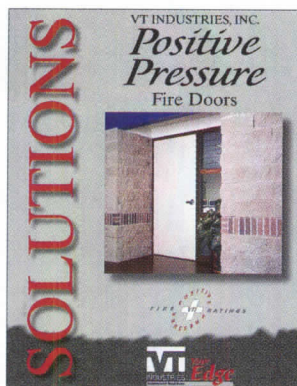


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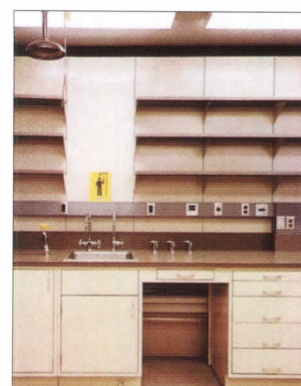


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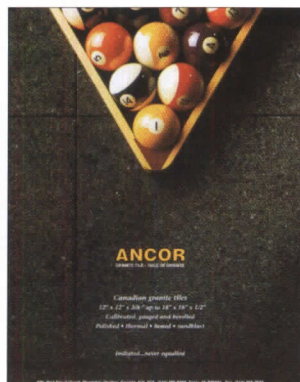


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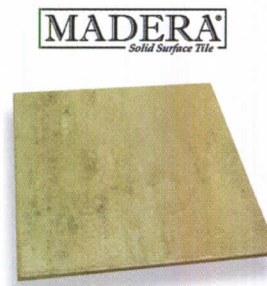


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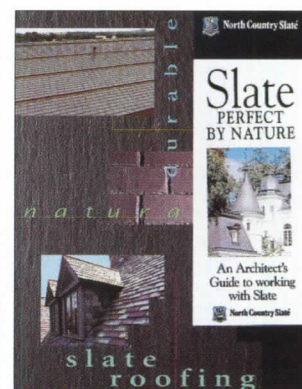


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Keystone Ridge Designs

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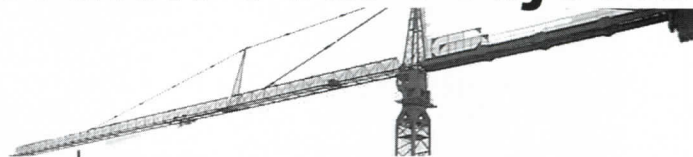
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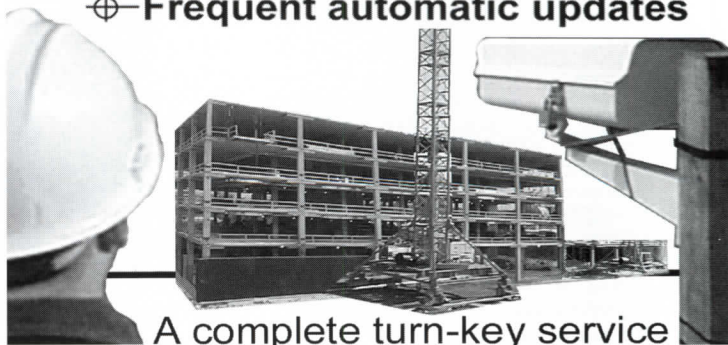
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ARCHITECT

Sought by a Chicago firm, must have a BA in Architecture 2 yrs. of practical exp. in Airfield & Airport Facility design, Site Planning, knowledge of Std. Bldg. Codes, use & applications of DOT/FAA Project Requirements, fluent in French & Arabic. Duties: consulting clients in regard to needs, structure, renovation, cost estimates, prepare schematic & working drawings, construct models, communication skills w/clients, agencies & professional assoc. in USA, France & Morocco. 40 Hr/wk/9 to 5, 25k/yr must have proof of legal authority to work permanently in the USA. Respond to IL Dept. of Employment Security, 401 S. State St., 7 North, Chicago, IL 60605. Attn: Len Boksa, Ref. V-IL 15966-B, employer paid ad, no calls, send 2 cpy's of resume & cover letter.

PROJECT MANAGERS

Project Managers for commercial design/build firm with offices in Tampa, Miami, Jacksonville and Orlando, FL. College graduate with 2-5 years of construction experience. Design and AutoCAD experience a plus. Fax resume and salary requirements to 813-387-6001.

INTERIOR DESIGNER

Sought by Connecticut based kitchen design firm. Must have Bach in interior design and AutoCAD knowledge. Respond to: *Personnel*, Kitchens by Deane, 1267 East Main St., Stamford, CT 06902.



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Senior Level Architects, are you interested in a career change or are you searching for better opportunities? Executive search and recruiting firm with 25+ years of experience in the architectural and engineering industry serving the nation's leading A/E firms. Please submit your resume to: CSS Search and Recruiting, c/o Duane McClain, 115 5th Ave. S., Suite 501, La Crosse, WI 54601. Fax: 608-784-4904. Telephone: 608-784-4711. E-mail: css@csssearch.com. For a current list of our job openings, log on to our web site at <http://www.csssearch.com>.

ARCHITECTS

We are an architectural firm specializing in large industrial/commercial properties and biomedical/high-tech structures in Southern California. Currently seeking a project architect with credible experience in these areas. Graduate degree from a reputable university program required. Work location: Southern California (Orange County). Please fax cover letter and detailed resume to (949) 863-0851 for consideration. Attn: Yong Nam, Hiring Manager HPA, Inc.

PROJECT DESIGNER

Small Manhattan based architectural design & interiors firm, specializing in complex biomedical research, healthcare and academic projects seeks project designer, with master's degree in architecture and planning with 3 years working experience on similar project types. Candidates must have strong design and technical skills with proven analytical problem solving and graphic presentation skills. Proficiency in Mac based programs such as MiniCad, Photoshop, QuarkXpress, MS Word, and MS Excel is required. Job responsibilities include planning and all phases from schematic design, design development, construction documents, and construction administration. Must work closely with partner and project architect. Send resume to Tapert Architecture PC., 1133 Broadway, Suite 611, New York, NY 10010. Fax: 212-727-1969. No telephone calls, please.

ARCHITECTS

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SENIOR ARCHITECT

Assists the Principal with design presentation and development expertise and assists at client meetings; prepares working drawings to code requirements and prepares specifications to be used as contract tender documents; professionally seals documents as required; follows the construction process to ensure conformity with tender documents and records the progress of the work; verifies/approves draw requests submitted by the builder and verifies costs for extras/change orders; keeps working drawings up-to-date with approved construction modifications and prepares additional detailing as required; supervise office staff; and assist the clients during all phases of the projects. Requires Bachelor's degree in Architecture and min. eight years of experience in job offered or in architecture related to high-end residential programming, design, and working drawing production, including construction and finish detailing, site inspections, and meetings with contractors and clients. Also requires: 1) Eligible for architectural registration in South Carolina. 2) Exp. in supervision of architectural and secretarial staff. 3) Exp. in client development and relations. 4) Exp. in project management relating to design/build. 40 hrs/week, 8 am – 5 pm, Monday-Friday. Job site: Bluffton, SC. Salary: \$50,000/year. Each applicant must submit two resumes to: Ms. Regina D. Ratterree, E&T Technical Services, SCESC-SC 2000984, PO Box 1406, Columbia, SC 29202. All applicants must have the legal right to work in the US.

ARCHITECTS & INTERN ARCHITECTS

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ARCHITECTS

Wallace Roberts & Todd seeks talented architects at all levels of experience. Projects include libraries, gymnasiums, community centers, corporate office buildings, private schools, college dormitories and senior and affordable housing, all with an approach based on strategic planning, environmental sensitivity, and sustainable design. E-mail resumes to: Grosenthal@ph.WRTdesign.com.

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ARCHITECTS

Architects for Miami based international firm with exciting projects. 2-10 yrs. exp. in design or production in hotel, airport, retail or highrise residential, AutoCADD 14 skills. Fax resume to Arquintonica 305-373-2178. Visit our website at www.arquintl.com

INTERN ARCHITECTS II

A med.-size multi-family firm in Dallas seeks interns w/ 2-5 yrs. exp. & Bachelor's in Architecture/professional degree. Requires portfolio w/ strong design, presentation & production skills, CAD experience & proficiency (pref. Microstation SE), and project coordinator exp. Send resume to J Mark Wolf, AIA, James, Harwick + Partners, 8340 Meadow Rd., Ste. 248, Dallas, TX 75231.

**INTERIOR DESIGNERS/ARCHITECTURE/
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American Personnel specializes in corporate designers and furniture specialists, established since 1969, are in constant search for prospective employees, to fill our various job opportunities with our national clients. Project Managers/asst. Project Mgrs./Sales associates/Sales assts./AutoCADD operators/Administrative support/Entry level designers. Clients are based out of New York City, New Jersey, and other locations. For more details on our services, please feel free to call Frank Cassisa - Executive V.P., Ph: 212-233-2900, Fax: 212-233-3043 or after 7pm at 732-360-0655.

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To design commercial, educational, and residential facilities per clients requirements. To prepare design development packages, construction documents and specifications for review by government or local authorities. To design floor plans, site plans, building elevations, applying knowledge of construction materials, building codes, zoning, environmental control system, and complying with budget constraints. To consult with structural, electrical, mechanical and plumbing engineers to develop the design. To monitor construction for compliance with design, and prepare construction document drawings, renderings and animated 3D models of projects utilizing AutoCAD R14, 3D Studio VIZ, Adobe PhotoShop, Adobe PageMaker and Adobe Illustrator software. 40 hrs/wk; Mon. thru Fri. 8 am to 5 pm. Salary \$22.70/hr. Must have Bachelor's Degree in Architecture and 3 yrs. exp. as Graduate Architect. Send your resume to: Cody, 1026 Blackburn Ave, Suite 1, Cody, WY 82414-8464, Job Order Number: WY0022368.

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Leading manufacturer of aluminum and glass curtainwall systems is seeking experienced personnel with architectural and/or engineering background to work in major high rise building projects. Knowledge of CAD required. Full benefit package. Send resume to: Glassalum International Corporation, 7933 N.W. 71 Street, Miami, FL 33166.EOF.

DESIGNER/ARCHITECT

Established Denver architectural firm is seeking a talented Designer, experienced in all phases of architecture, with a marketing background and proven client skills. A minimum of ten years of experience is desired. If you match this description and are interested in future ownership of a mid-sized firm, please respond to P.O. Box 480192, Denver, CO 80248-0192.

ARCHITECT

The Sear-Brown Group is an employee owned full service national firm with offices in key locations throughout the U.S. We offer an extraordinary compensation package, challenging work, career advancement and participation in annual profit sharing and 401(k) plan with a 25% match that is immediately vested. Our corporate headquarters in culturally rich Rochester, New York has an exciting opportunity for an Architect with 5 - 10 years experience designing hospitals and nursing facilities. Candidate must be registered, preferably in New York. If you are interested in living in an area offering excellent schools, model health care, water and mountain sports, along with theater, music and arts galore, join a growing, reputable, national firm. Please send a resume to the Sear-Brown Group, 2250 Brighton-Henrietta Townline Road, Rochester, NY 14623 or fax: 716-427-9124. EOF.

INTERN ARCHITECT

Under supervision of licensed architect, perform preliminary architectural design, computer-aided drafting using AutoCAD and Microstation, architectural detailing, free-hand sketching, color rendering and computer generated 3-dimensional conceptual models and animation, prepare schematics and design development drawings; perform code research and coordinate with civil, structural, mechanical and electrical drawings; prepare construction documents. Required: M. Arch. in Architecture and demonstrated ability to perform stated duties by portfolio. Salary: \$37,000 per year, 8:30 am to 5:30 pm, M-F. Apply with resume to: Ruth Hanna, Human Resources, Cooper Carry, Inc., 3520 Piedmont Road, Suite 200, Atlanta, GA 30305

INTERIOR DESIGNER

Project Manager sought by NYC arch. & design firm. Responsible for overseeing hi-end retail & office interior projects. Must have Master's degree in interior design & 2 years min. exp. as project manager/job captain with interiors-oriented firm. 2 yrs. min. exp. CAD req'd. Fax cover letter & resume to Lalire March Architects (212) 366-9595.



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FACULTY POSITIONS AVAILABLE**TWO ARCHITECTURE FACULTY
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Are sought for Fall 2000, teaching: Architectural Design and one of the following: Arch. Structures, Construction, Urban Design, Urban History, Arch. Theory, Arch. Visualization, or Basic Design. Judson College is a Christian college of the liberal arts and professions committed to an evangelical expression of the Christian faith, seeking candidates desiring to teach in such a setting. Applications due Feb. 15, 2000. Send resume, brief portfolio, and a short statement of your Christian liberal arts/professional teaching philosophy to: Arch. Search Committee, Dept. of Architecture, Division of Art, Design & Architecture, 1151 N. State St., Elgin, IL 60123. Phone: 1(847) 695-2500 ext. 3350, Fax: 1(847) 695-8014. email: jhopkins@judson-il.edu

**SCHOOL OF
ARCHITECTURE
FACULTY POSITION**

The School of Architecture at Rensselaer Polytechnic Institution invites applications for a tenured/tenure track position beginning Fall 2000. Candidates must have earned a master or doctorate in architecture or related field. Architectural Technology and Design: Candidates should have demonstrated strength in construction technologies and computer assisted design integration. Technology and design faculty are expected to lead in teaching the technology and design studio sequence within the architecture and building science degree programs. Also the chosen candidate will be expected to undertake significant research and scholarship. Candidates interested should submit a resume, statement of professional interests, as well as names/addresses of at least three references to: Chair, Faculty Search Committee, School of Architecture, Rensselaer Polytechnic Institute, 110 8th Street, Troy, NY 12180-3590. Review of applications has begun and will continue until the position is filled. Rensselaer is an equal opportunity/ affirmative action employer. Applications from women and minorities are particularly encouraged.

FACULTY POSITIONS AVAILABLE

THE AMERICAN UNIVERSITY OF SHARJAH
UNITED ARAB EMIRATES
SCHOOL OF ARCHITECTURE AND DESIGN
Faculty Openings for Fall 2000

The American University of Sharjah (AUS) is a non-profit, coeducational institution of higher education formed on the American model. Student applicants are considered on the basis of their qualifications regardless of race, color, gender, religion, disabilities, age or national origin. The medium of instruction is English. Baccalaureate degrees are offered in twenty majors by the faculty of four schools: Arts and Sciences, Business and Management, Architecture and Design, and Engineering. The curricula of the programs are based on the American model of liberal education and include a strong general education requirement.

The 375 acre University City campus is located ten miles from the center of Sharjah and is situated between the shores of the Arabian Gulf and the Gulf of Oman. The Emirate of Sharjah has beautiful beaches and lovely varied countryside.

Architecturally distinguished facilities have been constructed to accommodate 4,000 students, including eight academic buildings as well as administrative, library, residential and athletic structures. All academic buildings are equipped with state-of-the-art language, science, and engineering laboratories and computer facilities. The projected student enrollment in the 2000 fall semester is 2,000.

The School of Architecture and Design has the potential and is committing the resources to exert regional leadership in design education in the Middle East. The School offers first professional degrees in architecture, interior design, heritage management, visual communication, and multimedia. The School is committed to digital media as tools integral to design and pedagogy and expects Macintosh OS proficiency from its faculty. Faculty must be capable of offering diversified contributions to a curriculum that is taught on all levels as a collaborative exploration of ideas. The successful candidate must demonstrate a strong teaching record in studio courses and in the specialty, an established research interest and record of scholarship within the discipline, and/or an established record of professional practice centered on the specialty, and the ability to teach the specialty to all levels, particularly at the formative, foundation level of a design program that serves a mix of graphic, visual design, multimedia, and architecture students.

The Common Foundation Year Program seeks applicants to formulate and teach effective studio courses in descriptive and analytical drawing, graphics and 3-dimensional design, and/or digital media as tools for design.

The Architecture Program seeks applicants (1) to teach intermediate and advanced studio, with specialties in environmentally responsive architectural form, urban design, and urban history. Expected to integrate digital media/technologies with studio teaching at both levels; and (2) to assist in foundation courses in digital media and first professional studio. Primary responsibility to teach digital media as tools for architectural design within the context of on-going studio problems. Requires knowledge and ability to teach Macintosh OS, PowerCADD, formZ, PhotoShop, Word, Excel.

The Interior Design Program seeks applicants to teach intermediate and advanced studio, with specialties in space planning, interior construction technology, interior design history, exhibition design, and/or lighting technology. Expected to integrate digital media/technologies with studio teaching at both studio levels.

The Heritage Management Program seeks applicants to develop the new program and to teach courses in the histories of art, architecture, design, and interior design, and in documentation, research, project planning, and conservation and presentation of movable and immovable cultural property. Special interest in Islamic culture is an advantage.

The Multimedia Program seeks applicants to teach courses in sound, video, editing, and production, interactive authoring, and/or interface design, in building a rapidly growing media lab and curriculum. Professional and/or teaching experience with digital linear and non-linear systems is preferred.

The Visual Communications Program seeks applicants to teach foundation and intermediate graphic design and/or illustration courses. Ability to integrate digital and traditional media, including photography is required.

Applicants for all positions should show evidence of a commitment to excellence in teaching. As appropriate, faculty will be expected to employ methods that utilize new instructional technologies. Experience with project based instruction and/or interdisciplinary instruction is welcomed. Faculty must be committed to the vision of this institution as an independent university thoroughly grounded in Arab culture while serving the diverse populations of the region.

Compensation is competitive. There is no income tax in the UAE. Initial contracts are normally for a period of two years and are renewable. Rank will be determined by previous employment history. Benefits include: home leave for faculty and their resident dependents between academic years; new on-campus housing for all members of the faculty without charge including utilities; education allowances for tuition for up to two children from grade one through four years of higher education; medical insurance and dental plan.

Interviews will be held at various sites. Positions are open until filled with preference to early applicants. Faculty who are appointed must be in Sharjah by August 23, 2000.

Applicants should send cover letter and CV (including the names and addresses of three references) to:

Sharjah Liaison Office
American University
4400 Massachusetts Avenue N.W.
Washington, DC 20016-8173
Email: sharjah@american.edu

ASST/ASSOC./FULL PROFESSOR IN
ENVIRONMENT AND DESIGN TECHNOLOGY

The Department of Architecture and Urban Design at UCLA invites applicants for a tenure-track position beginning academic year 2000-2001. The Department seeks candidates with expertise in environmentally responsive technology, lighting, sustainable design of products, systems, buildings, or communities, or green building technology, with implications for architecture, urbanism, or regionalism. The successful candidate will be able to work across disciplinary boundaries as well as in the design studio context, and will be expected to conduct advanced research or practice related to her/his expertise. Academic training and experience are appropriate from architecture, landscape architecture, urban design, or urban planning. The Department has demonstrated a long-standing interest in environmental issues related to architecture and urban design, and seeks to extend this tradition in new directions into the coming millennium. Architecture and Urban Design at UCLA is structured around three primary content areas: design, cultural studies, and technology. Candidates for this new faculty position should be able to integrate their particular expertise with other aspects of the curriculum. It is possible but not necessary for the candidate to share an appointment with the Institute of the Environment, a cross-disciplinary program on campus. The Institute of the Environment brings together research, teaching, and community outreach from UCLA's diverse environment-related programs, with the objective of addressing the full breadth of environmental issues facing today's society. The appointment can be made at any level, with special attention given to junior level candidates. Candidates are requested to furnish a letter of intent with a curriculum vitae and the names, phone numbers, mail and e-mail addresses of three references able to provide knowledgeable evaluation of the applicant's qualifications. Please do not send additional supporting materials until they are requested. Applications deadline: February 15, 2000, or until filled. Address letters of application to Dana Cuff, Acting Chair, Department of Architecture and Urban Design, UCLA, 1317 Perloff Hall, Los Angeles, California 90095-1467. The University of California, Los Angeles is an Equal Opportunity/Affirmative Action Employer.

ASSISTANT/ASSOCIATE PROFESSOR

The School of Architecture invites nominations/ applications for a tenure-track position to engage the depth and breadth of the discipline to teach in a five-year accredited professional degree program. The position is to teach one collaborative design studio and practice related course (such as, seminar, programming or CAD) per semester. Studio teaching should be directed towards integrating contemporary theories, technologies, and issues of practice. Candidates must actively engage scholarship and research, university committees, and community service responsibilities. We are seeking individuals who will work with faculty and students to foster diversity and address a variety of professional and design issues through dialogue, teaching, and research. Requirements: Professional terminal architecture degree, registration, minimum of five years professional experience, and CAD literacy. Preference will be given to the candidate who is practicing with recognized professional work in the field. Rank and salary commensurate with experience. The University of Louisiana at Lafayette (formerly University of Southwestern Louisiana) is an equal opportunity employer. Applications/nominations will begin on January 1, 2000 and will be accepted until position is filled. Please submit a letter of interest, resume, and portfolio, references to: Hector Lasala & Robert McKinney, Co-Chairs Faculty Search, School of Architecture, University of Louisiana at Lafayette, PO Box 43850, Lafayette, LA 70504-3850. For more information call 337-482-6225, e-mail: mckinney@louisiana.edu, or www.louisiana.edu.

**ASSISTANT OR ASSOCIATE PROFESSOR
THE UNIVERSITY OF TENNESSEE
TENURE TRACK FACULTY POSITIONS
IN ARCHITECTURAL TECHNOLOGY**

The University of Tennessee, Knoxville-The School of Architecture seeks candidates for one or more, full-time, tenure track position in architectural technology, either at the Assistant or Associate Professor rank, commencing Fall 2000. Candidates should be qualified to teach required and elective courses at all levels of both the undergraduate and graduate programs with their primary area of expertise being either structures or environmental control systems. An additional area of specialization in computer applications, lighting, materials and/or building construction technology is preferred. An interest and aptitude in the integration of design and technology through studio instruction will be a major consideration. Prior to appointment, applicants should possess a graduate, post-professional degree in engineering or architecture. Special consideration will be given to candidates who demonstrate multi-disciplinary interests and those possessing both engineering and architectural degrees will be given preference. A background in architectural education, including experience in teaching, is valued. Preference will be given to those candidates who possess professional registration and/or experience in distinguished practice. All applicants must have the potential and capability to pursue self-defined intellectual objectives through research, scholarship, creative work and/or practice. Candidates should submit a letter of interest and objectives, a curriculum vitae, photocopied select examples of personal, professional, and/or academic work (non-returnable), and the names of three references to: Chair, Technology Faculty Search Committee, School of Architecture, The University of Tennessee, 1715 Volunteer Boulevard, Knoxville, TN 37996-2400. Deliberations will start February 15, 2000 and will continue until the position is filled. UT Knoxville is an EEO/AA/Title IX/ Section 504/ADA/ADEA institution in the provision of its education and employment programs and services.

**ASSISTANT OR ASSOCIATE PROFESSOR
THE UNIVERSITY OF TENNESSEE
TENURE-TRACK FACULTY POSITIONS**

The University of Tennessee, Knoxville- The College of Architecture and Design seeks candidates for one or more full-time tenure track positions in architectural design, at either the Assistant or Associate Professor rank, commencing Fall 2000. Candidates should be qualified to teach architectural design at all levels in both the undergraduate and graduate programs, as well as a second elective course in an area of related specialization, such as computer-aided design, drawing, interior design, landscape architecture, structures, technology, or theory. Prior to appointment, applicants should possess a professional degree in architecture, including a graduate degree in either architecture or another related field (i.e., art, landscape architecture, urban design, planning, etc.). Secondary interest in the integration of design and construction technology is one of our priorities. Experience in teaching is valued. Experience in distinguished practice and professional registration is desirable. All candidates must have the interest and potential to pursue self-defined intellectual objectives through research, scholarship, creative work, and/or practice. Candidates should submit a letter of interest and objectives, a curriculum vitae, photocopied select examples of design work (non-returnable), and the names of three references by February 15, 2000 to: Chair, Design Faculty Search Committees, School of Architecture, The University of Tennessee, 1715 Volunteer Boulevard, Knoxville, TN 37996-2400. UT Knoxville is an EEO/AA/Title IX/Section 504/ADA/ADEA institution in the provision of its education and employment programs and services.

**DEPARTMENT OF
ARCHITECTURE
BALL STATE UNIVERSITY
BALL STATE UNIVERSITY
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The Department of Architecture is rostered in the College of Architecture and Planning along with the Departments of Urban Planning and Landscape Architecture. Also residing there are the Housing Futures Institute and Community Based Projects. Along with the professional degree in architecture, a master's in historical preservation is offered as well as a post-professional degree in architecture. The nationally recognized Center for Energy Research, Education, and Service is co-located in the CAP building. Ball State University and the Department of Architecture includes internationalization and information technology in its hallmarks of excellence and stresses both teaching and research in its mission.

Two full-time, tenure-track positions will be available August 18, 2000.

Position 1. Responsibilities: teaching design studios and courses in computers in design; providing leadership in developing the curriculum in the area of computational tools for designing.

Position 2. Responsibilities: teaching design studio and courses in one or more areas such as architectural theory, environment-behavior studies, or urban design.

Minimum qualifications: master of architecture degree or equivalent. Preferred qualifications: registration (license to practice architecture), quality of design work and/or evidence of contributions to the profession through practice and service; record of teaching experience and commitment to work in a collaborative environment; publications and or appropriate research work as evidence of scholarly contributions. Rank depends on qualifications. Send letter of application identifying the position sought, curriculum vitae, three letters of reference, official transcripts of highest degree earned, samples of student and professional work, and evidence of teaching and research ability to: Chair, Search Committee (1 or 2), Department of Architecture, Ball State University, Muncie, IN 47306. (Tel: 765-285-1900; Fax: 765-285-1765) Review of applications will begin March 1, 2000, and will continue until the positions are filled. (www.bsu.edu)

Ball State University is an equal opportunity, affirmative action employer and is strongly and actively committed to diversity within its community.

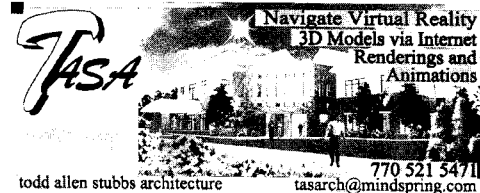
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(Architect) interviewer Charlie Rose takes questions

Interviewed by Robert Ivy

Q: *Why do you interview architects?* Because they're interesting, first. If Philip Johnson is not interesting, I don't know who's interesting. They have vision. They have egos. Most of them have personalities. They range all over the landscape in terms of how they see what's good and bad and right and wrong. And there is finally this wonderful competition, jealousy, ego among them. More so than most professions I know.

Does anybody care? They care that it's part of the mosaic I present to them. My audience likes that on this program there is politics, entertainment, books,

minutes at this table with slides and pictures . . . on the screen. Doesn't do justice to any building I've ever seen.

Do you, then, have an agenda that you want to achieve with architecture? No. Do I hope people will appreciate architecture more? Yes. Do I hope it will be a stimulus for people to take note? Yes. Do I want them to like or not like post-modernism? No. Do I want them to like or not like a particular architect? No. I want them to say, because I watch *Charlie Rose*, I've developed an interest. ■

Photograph by Jordan Hollender

architecture, painting, science, and a sense of what's new, who's doing something interesting. And people can [relate to architecture]; everybody lives in a building, works in a space. As far as I know . . . the number of people watching doesn't drop when we have an architect. Maybe I do too much.

Who picks who's on the show? I do. I'm always asking who's new? Who's happening? Why haven't we had any young architects? Any old architects? Any women?

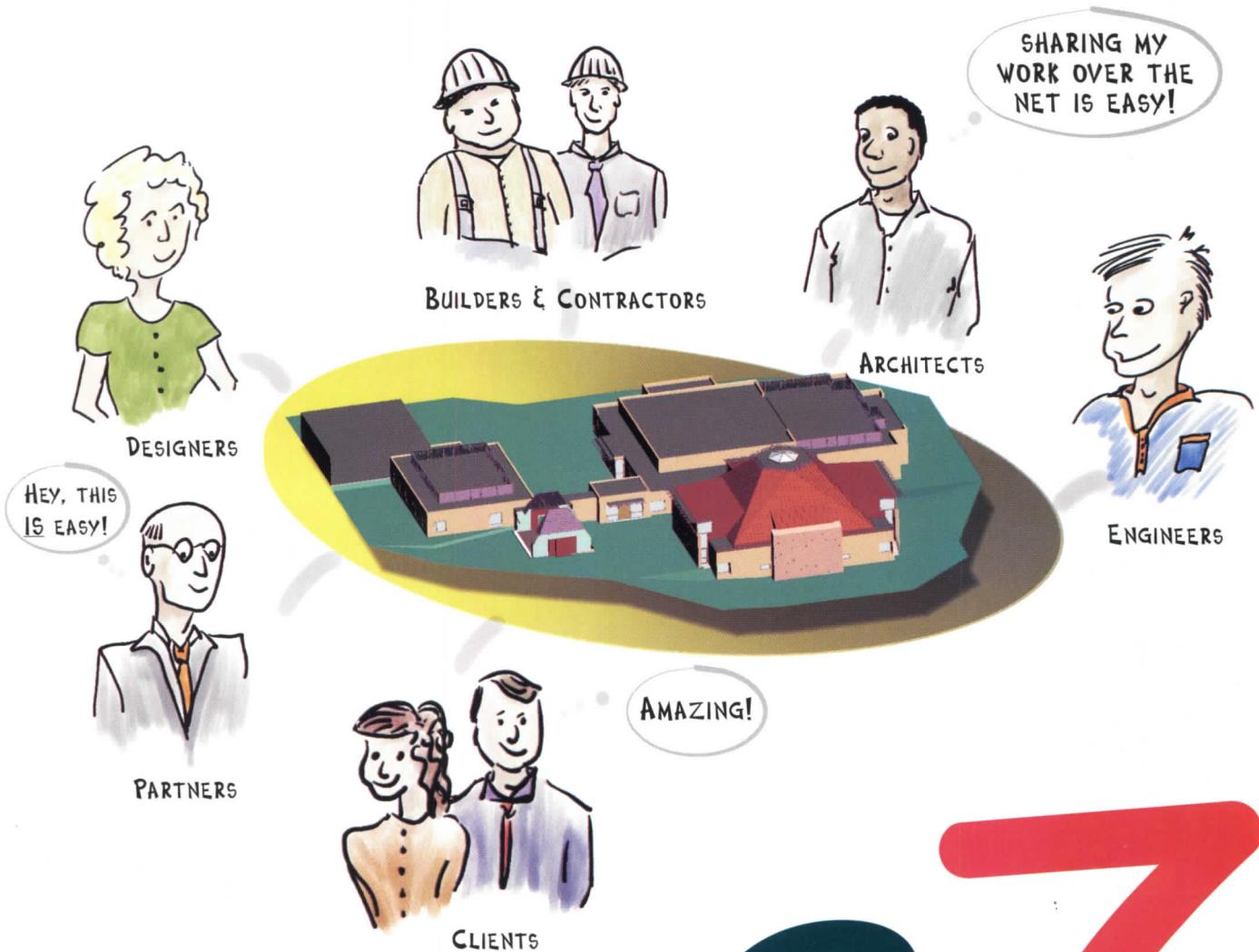
Out of these architects you've talked to, are there any particular experiences that stand out? They're different. Bob Stern is as different from Michael Graves as Michael Graves is different from Rem Koolhaas. Yet I don't have any negative reaction to any of them.

You've had Frank Gehry on several times. More than that. I like Frank a lot. But I also like Richard Meier a

lot. I like [Charles] Gwathmey. I like Peter Eisenman.

But these are architects and they're dealing with a topic that can be rather abstract. If you ask me what's least satisfying about my presentation of architects, I've never felt like we were able to do justice to it. The best way to do it is go to a building and walk around [with] two or three cameras [for] two or three days. I don't have that. I have 20

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