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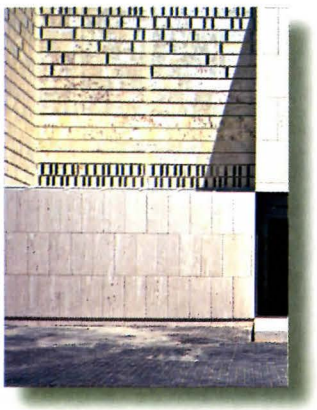
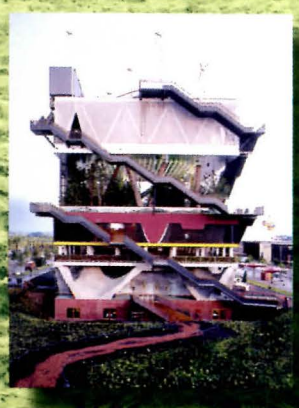


Cool in Spain

Hot in Holland



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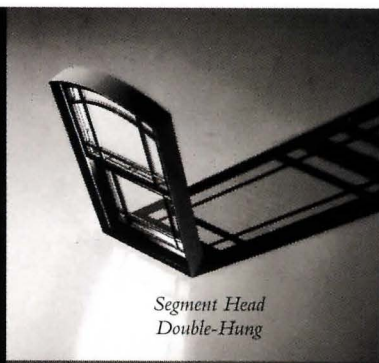
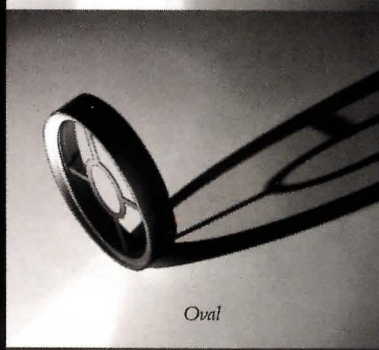
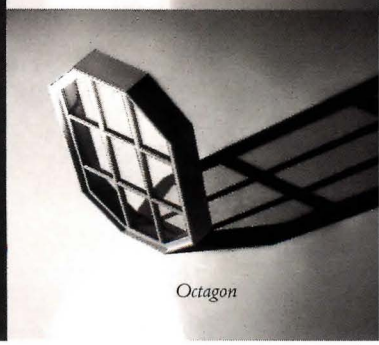


Segment Head Double-Hung



Oval

Standing Arch



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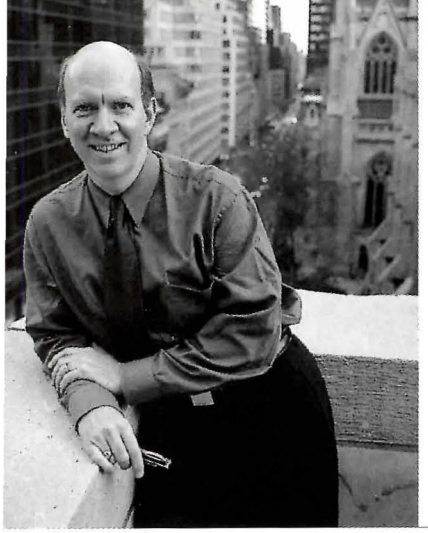
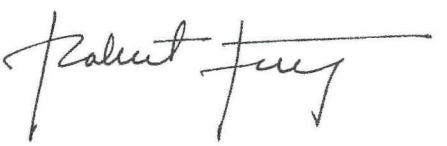


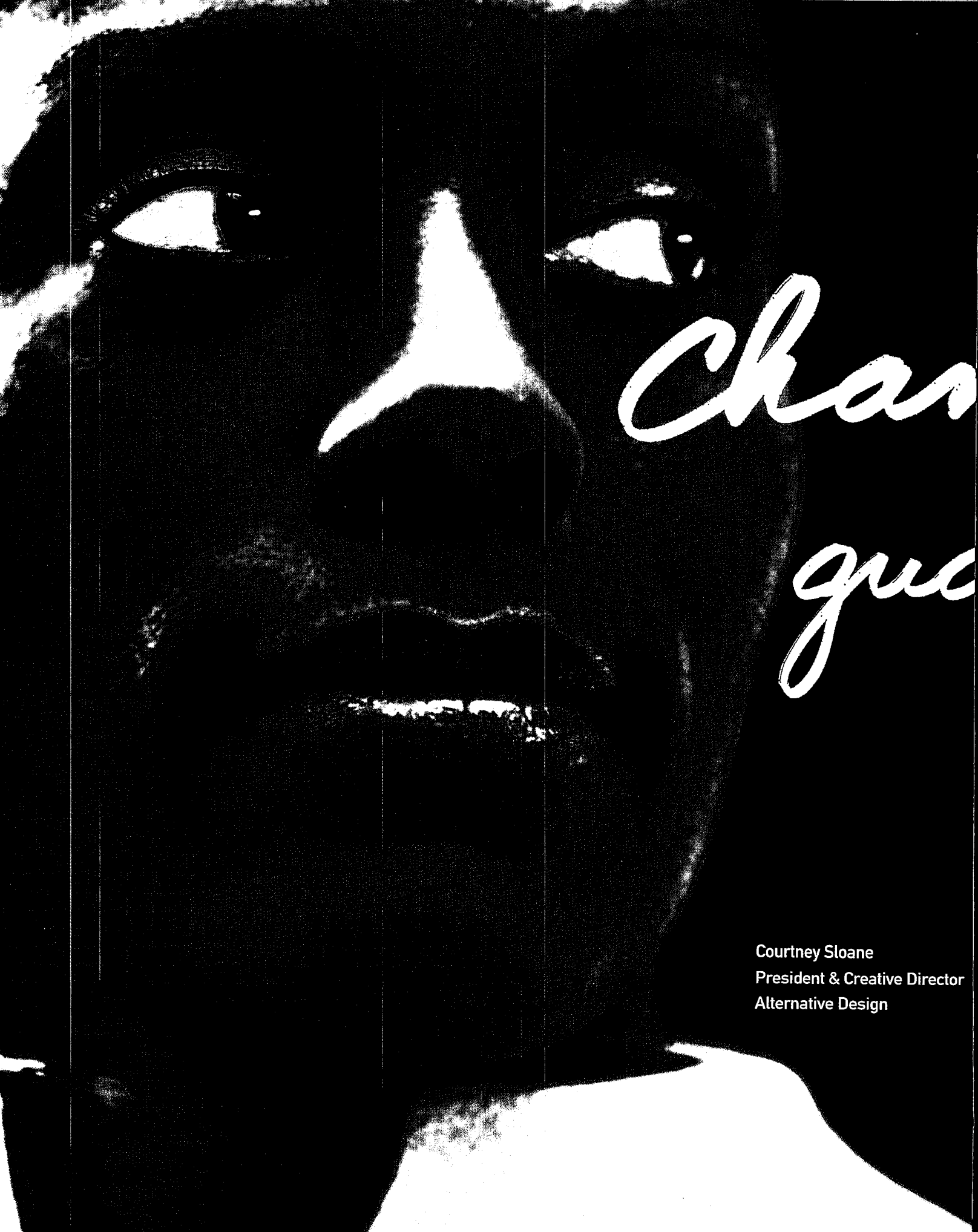
Gone digital

Editorial

By Robert Ivy, FAIA

To read Robert Ivy's July editorial, visit our newly redesigned website at www.architecturalrecord.com. Next month it will be back in print, as well as on the Web.





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Letters

Restoring viability

Kudos to the magazine for running such a grand article on the World Monuments Fund [May 2000, page 182], and congratulations to Mildred Schmertz on such a scholarly review of the manifold activities of this remarkable organization. As I've come to know the people who run this show, I'm amazed at the leverage they've managed to exert on those closest to these various monuments the world over. They and their sponsors are a beacon of light in the murky atmosphere of world monument preservation.

The article states: "Restoration must be technologically, financially, and politically feasible. . . . The basic criterion is viability."

I sponsored and organized an open house for the community on April 16, the 30th anniversary of the death of my father [Richard Neutra]. Laurie Beckelman, of WMF, made a special effort to come out to be our honored guest. I gave a commemorative talk, paying homage to my father and partner. About 400 people showed up, which was overwhelming.

What this illustrated is that there *is* great interest in the house and Cal Poly's plans for its future. In any case, it's time for others to step up to the plate and deliver in a meaningful way to optimize the real honor WMF has bestowed on this western outpost of modernism in the U.S.

The crux of the matter in the case of the Neutra House/studio comes down to "viability," as stated in the article. Will the community of Los Angeles—and indeed the world at large—be able to convince the university to support and implement an outreach program to identify the major funding needed for a $2 million endowment and for a $400,000 fund to do the immediate restoration needed?

—Dion Neutra
Los Angeles

Foreign competition, part II

"Competitions produce the highest quality design." This generalized statement in Mr. Karn's letter [April 2000, page 22] is, I fear, far from true. It does not correctly reflect the European experience.

The rather dull level of open design competitions here has been notorious, and it has, to a great extent, been responsible for Germany's lagging far behind the U.K. and France in design excellence. While there's no reason to condemn competitions out of hand, a critical appraisal shows that the best designs in Europe have not been obtained from open competitions. These have an overwhelming tendency to favor mediocre compromise. The outstanding work of Rogers, Foster, SOM, KPF, Meier, or Jahn (just to name a few) in Europe has in most cases resulted from direct commissions or from a choice among a few top-level offices.

Limited competitions or competitions with a second stage among acknowledged firms have proven to render superior results over general open competitions. The vast field of entrants in general competitions does not allow for a qualified selection process by the jury, and the best firms most often don't bother to participate.

Young architects have better chances to participate in the competition system by joining top-level firms and working their way up to leading positions there.

—Oswald W. Grube
Herrsching, Germany

Irrational architecture

In the May issue ["Separated at birth?" Letters, page 32], Leon Rosenthal expressed his dislike of Frank Gehry's method of expression, and he questioned whether Gehry's work would come to be classified as "great architecture." Mr. Rosenthal, if the world shared the your opinion concerning architecture, we would now and forever be drowning in a sea of marginal and aesthetically dull building types (look at the suburban quarters of Soviet cities or American suburbia).

Our duty as a profession is to break the barriers of prevalent public and private thought in order to make room for new ideas and physical examples in the field of architecture. It is a responsibility for the growth and prosperity of the human species that leads us to rationalize the irrational. It is what we, as a species, have been doing since discovering fire, the wheel, etc. What, then, of Gaudi and his then considered irrational use of the parabolic arc and structurally organic design in major buildings? What of Picasso's then-irrational use of color and the broken line? What of Goreki's interpretation of musical chords, considered irrational by most, even today? They, along with scores of others, were harbingers of new ways in which to view, interpret, and live in our environment.

In my opinion, building is the highest form of art. Like all art, it is a gift with a dual purpose: it serves to satisfy the conceiver and the recipient. In Frank Gehry's case, it seems as if both purposes have been fulfilled. Mr. Rosenthal, irrationality is soon overcome by precedent and example.

—Gregory Joseph Singletary
Via E-mail

Unwitty parody party

Your favorable review of Columbia's new Warren Hall [Lighting, May 2000, page 345] is very wide of the mark. This building in fact shows clearly the way NOT to go when building new buildings in a historic neighborhood with well-established style traditions. By trying to copy local colors and materials while adding what seem to be deliberately strange postmodern gestures, it ends up reading like a parody of Columbia's traditional architecture, and an unwitty parody at that. Its vast sloping light wall and weird bulbous roofline merely manage to be unsettling while serving no purpose that more traditional shapes would not have served equally well.

All in all, this building is a catalog of meaningless stylistic tics that fail to gel into anything resembling a coherent aesthetic, though the aspiration seems to be there. The building also fails to have any retail on the ground floor, further deadening the life of a street locally notorious for this problem. This is despite community protests to the contrary and the fact that if it had been an apartment building, zoning codes would have required it. All community reaction I have heard has been negative.

—Ian Fletcher
New York City

Viva Mexico

As a mexican architect I was pleased to see Ricardo Legorreta on the cover of the May edition—it is not easy to be recognized outside of your country. The article was a good tribute to his ideology. I would like to invite people interested in new ways to design buildings in Mexico to follow the work of such architects as Enrique Norten and Isaac Broid.

—Katia Rubio
Mountain View, Calif.

Off to camp

We were thrilled to see your call for hands-on architecture in the May 2000 editorial [page 23] . There is another program that exemplifies this effort to "satisfy that craving" for actualization: Masonry Camp. http://www.imiweb.org/imitoday/97_08/7pg3-1.htm. The "interdisciplinary collabo-

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Letters

ration in design and construction" you wrote so well about is the essence of Masonry Camp.
—*Hazel Bradford*
International Masonry Institute
Director of Communications

Shaken frames don't slide
Skimming backward through your February 2000 issue, I stopped at the arresting photo of an earthquake-stricken building on page 127.

Continuing back to pages 80–87, I saw more apparently earthquake-stricken structures, which on closer inspection turned out to be a university building by one of the current whiz kids.

As long as you give credence to these arbitrary, willfully nonconformist architectural giggles, you will continue to perpetuate the myth that architecture is just another "fine art" where a concoction of glue, string, newspaper headlines and pigeon droppings based upon a series of dreary platitudes is the flavor of the month.

I know that you are essentially running a newspaper, and that "man bites dog" always makes good copy.

But if you ever want to regain your now-sadly-lost reputation as a forum for serious consideration of buildings that recognize the planet's need for judicious use of materials and harmonious environments, rather than lauding cacophonous displays of personal whims, then you should stop praising naked emperors.
—*Leslie Rebanks*
Toronto

It's hip to be square
Whatever happened to the box? The Egyptians and Greeks thought it was okay. Even the Romans could not discard it, for all their pushing upward and outward with curved forms. The Goths kept pushing skyward, opening up the walls to let in more light. Renaissance Italians followed the Romans but decorated the box while pushing the boundaries. The Victorians tried everything that went before but still ended up with it. Moderns liked the box, but F.L.W. claimed that breaking out of it was one of his greatest achievements. Like the Goths, Mies wanted the walls of the box to disappear but he genuinely liked it. Postmoderns made it a goal to eliminate the box by first changing the skin; decorated, twisted, curved, angled, complex, contorted—anything *but* the box. But I miss the box. Think of how beautifully it fits into the grid city. Think of how it blends and harmonizes with its neighbors without shouting or screaming. Think of its economy. Think of how easy it is to find your way around it. Think of how only brilliance can change the box into art. Contemplate the deep aesthetic experience of simplicity, no gymnastics, no circus acts. Oh, how I miss the box!
—*Gerald R.McSheffrey* AIA
Glendale, Calif.

Troubled bridge over water
Reading the review of the proposed waterfront development adjacent to New York's Brooklyn Bridge in the June 2000 issue [page 32] made me wonder if the reviewer and I were *examining the same* master plan. The errors in fact and judgment begin with the statement that the park allows countless entry and exit points with spectacular Manhattan views. In fact, along the greatest length of the park, which abuts the landmark neighborhood of Brooklyn Heights, there is exactly one intermediate access point, and that has been bizarrely routed through a narrow residential side street unequipped to handle the increased traffic. The bio-wall described as "beautiful" is in actuality an out-of-scale, 45-foot-high looming mass that consumes valuable parkland, interrupts views, and turns a local street into a dangerous tunnel that no pedestrian would want to walk through. Nor has the process been as consistently "democratic" as you

Letters

describe. Once the public-comment phase was over and a "final draft" master B2 published, the planners became remarkably intransigent, ignoring several very valid criticisms put forth by local design professionals and citizens who were responding to the published proposal. Far from being universally admired, this plan faces serious opposition and may go unrealized if citizens' concerns are not addressed.

—Donald M. Rattner
New York City

Falling down stairs

The diagram "elements of a safe stairway" on page 172 of your June issue shows a very large radius on the nosing of the stairs and notes its "gradually radiused nosing" but gives no explanation as to why this is desirable.

A number of years ago, I spent a few months on crutches, and on one occasion had to go down a set of monumental steps with just such a large-radius nosing. Because of the large radius on the nosing, I could not put the crutch tips out at the edge of the tread. When I went to step forward, my center of gravity got too far in front of the crutch tips and I went sprawling down the stairs. Fortunately, I was next to a railing and was able to catch myself and avoid serious harm. A smaller radius on the nosings would have prevented this accident.

—Eugene A. Groshong, Jr.
Alexandria, Va.

Corrections

The Correspondent's File in May 2000 [page 69] noted the Eric Owen Moss Stealth Office Complex will be the "home to Ogilvy & Mather." Actually, iShubin + Donaldson Architects is designing the space for Ogilvy & Mather. The photographer's credit was omitted on the photo published for the new Italian Chancery [April 2000, page 36]; the photographer was Daniel Mansfield for the Embassy of Italy.

The following credits did not appear in May 2000's piece on Ricardo Legorreta, FAIA, [page 149] College of Santa Fe Visual Arts Center/Architect: Legorreta Arquitectos—Ricardo Legorreta, Victor Legorreta, Noe Castro, Miguel Almaraz, Adriana Ciklik, Benjamín González, Javier Ten. Executive Architect: Lloyd & Tryk. On page 152: Seaside house in Japan/Architecture: Legorreta Arquitectos—Ricardo Legorreta, Victor Legorreta, Noe Castro, Adriana Ciklik, Miguel Almaraz, Jorge Covarrubias. Associate Architect: Kajima Design—Yukishige Miyamae, Atsu Wada. Consulting Architect: Crayon & Associates. Page 154: Los Patios Townhouses/ Architecture: Legorreta Arquitectos—Ricardo Legorreta, Victor Legorreta, Noe Castro, Miguel Almaraz, Adriana Ciklik, Gerado Alonso, Carlos Gerhard. Also in that article on page 156, the Hotel Camino Real in Ixtapa was mistakenly labeled as being on the Yucatán Peninsula. The hotel is actually in Ixtapa, Zihuatanejo, State of Guerrero, on the southwestern coast of Mexico. Also on page 158, the credit should have indicated that both photos are from Televisa Corporate Offices in Mexico City.

In the story about the Conde Nast Cafeteria [June 2000, page 116], project director Peter Black, from associate architect Mancini Duffy, was identified incorrectly, and Anthony Schirripa, a principal at Mancini Duffy, was left out as architect of record. Also, the article should have indicated that the glass used in the project was molded, then laminated.

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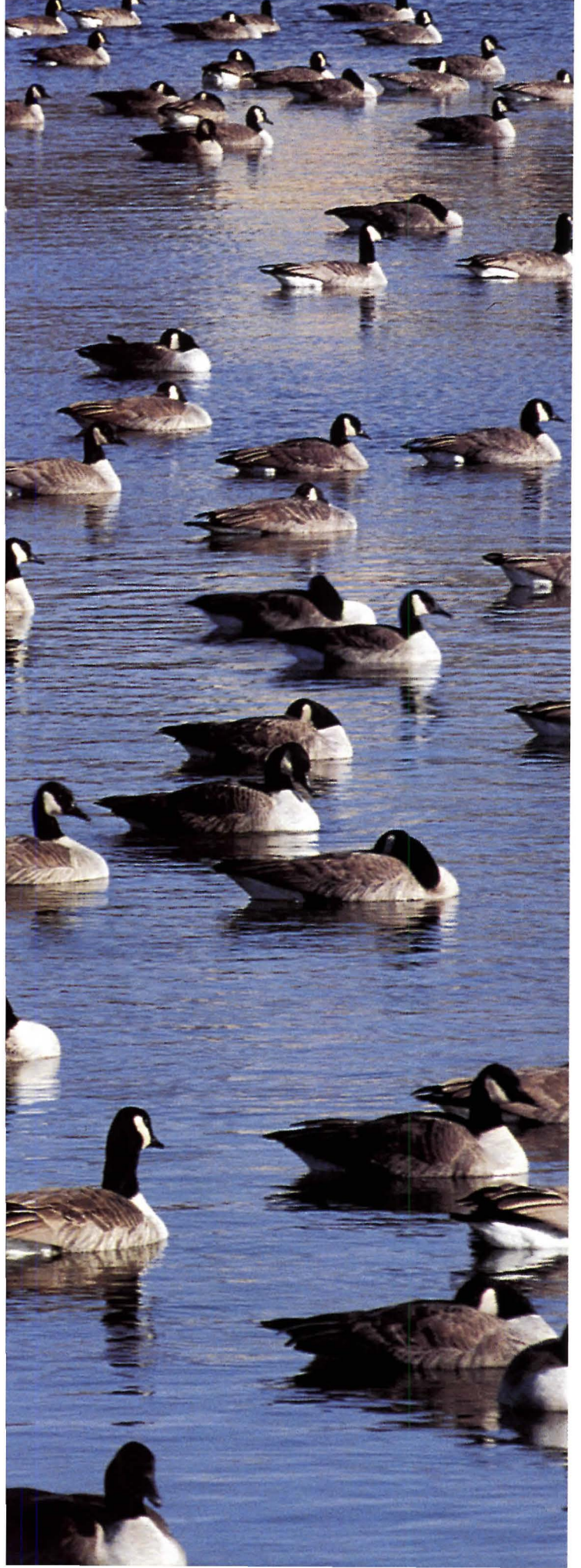

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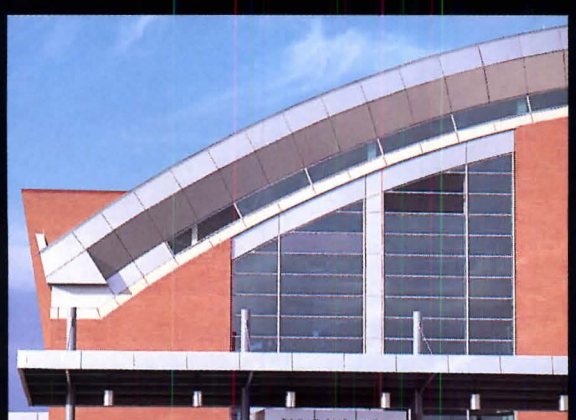

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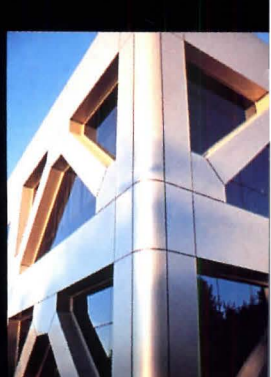

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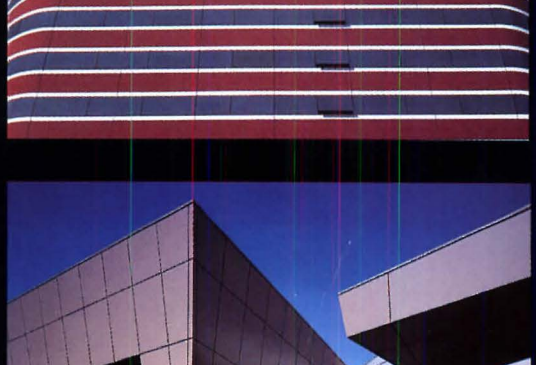

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Record News

GREAT CAESAR'S GHOST . . . WHOSE VERSION OF HISTORY IS GLADIATOR?

With great flair, Hollywood rebuilds, reconceives, and envisions cities past, present and future.

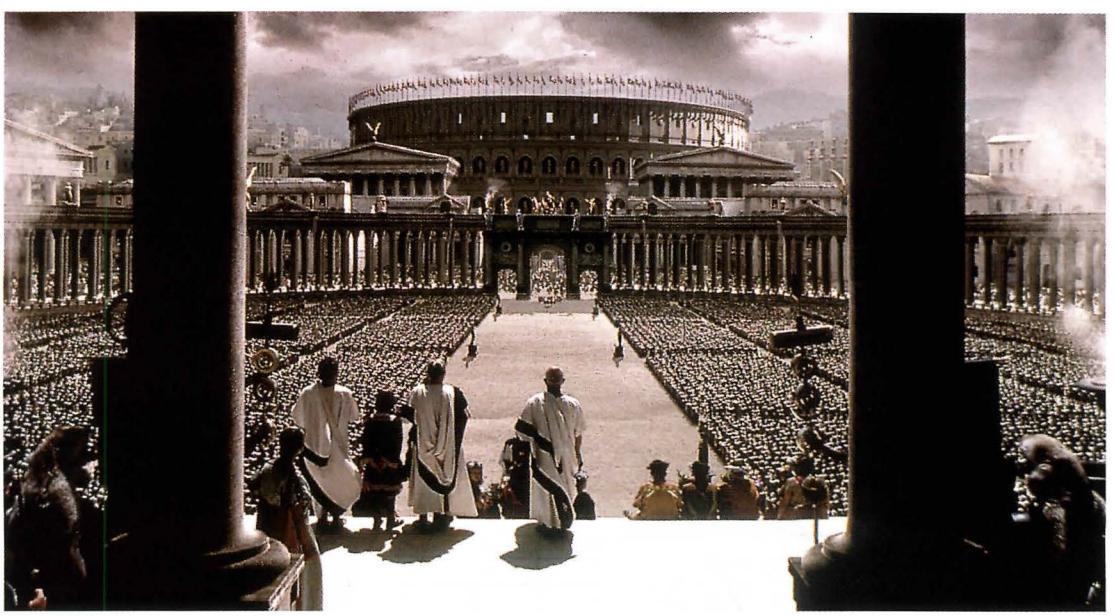
Shakespeare in Love used traditional shop-built sets to revel in the realistic grime and chaos of olde London; each *Star Wars* episode further evolves computer graphic imaging (CGI) in matching unique extraterrestrials with specific galactic architectures; and *Ghostbusters* bridged the generation gap, taking advantage of emerging technologies to animate urban spooks while relying on old-fashioned aerial shots to cleverly shuffle Manhattan landmarks. This summer, with tens of millions of special effects dollars at his disposal, Ridley Scott conjures the Roman Empire in *Gladiator*, an action tale of the heroic general Maximus who is stripped of his name, rank, and family by the late Caesar's son and spurned heir, Commodus, and then sold into slavery where he seeks revenge as an arena gladiator.

Shooting in Malta, the filmmakers built a full-scale quarter-section replica of the great Colosseum's first tier for the primary sequences. Visual effects supervisor John Nelson and London's Mill Film Ltd. then "filled in" the remaining circumference, height, statuary, and audience of 40,000 via computer. The canvas sunshade—its engineering often debated by historians—is included, complete with CGI sailors manning the ropes used to retract this massive velarium. It is a spectacle, yet there is never a moment to pause and digest this visual awe. Scott's camera hurtles and spins through his wide shots, almost as if the puppet master fears his strings will be revealed should he slow to a less frantic pace.

Much of *Gladiator*'s stylized shell of a story (think *Braveheart* in tunics) plays out in the streets and structures of A.D. 180 Rome. But this is a far cry from the cypress-and villa-dotted Palatine and elegant white Forum familiar to natives, students and visitors. A gray gloom clouds out the city's mystical Mediterranean light. CGI aerial shots pan over a treeless, brooding Rome whose scale is an awkward marriage of the director's futuristic *Bladerunner* sets (after a Michael Graves classical makeover) with the high nationalist imperialism of Albert Speer.

Production designer Arthur Max manipulates the proportions of the base, column, and pediment orders and sporadically repeats them vertically throughout the city; skyscraper-like classical follies tower over a Rome that appears to sprawl well beyond the San Fernando Valley. Bolder yet is his invention of the Gate of Rome: an appropriation of Bernini's 17th Century colonnaded Piazza San Pietro. Commodus' epic procession through it dwarfs the next millennium's more modest military parades in Tianamen and Red Squares.

They say Rome wasn't built in a day. Were it, however, constructed by an army of Los Angeles developers charged with a Hollywood-sized budget, it might look like a smoggy day in the *Gladiator* version of Rome.
Nicholas S.G. Stern



The Colosseum (above) and other scenes in *Gladiator* are stylized versions of Rome A.D. 180. Although a visual delight, the scenes portray a sprawling, out of scale Rome.

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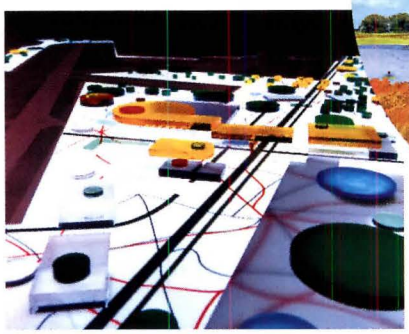
KOOLHAAS HEADS TEAM TO DESIGN TORONTO PARK WITH THE UNKNOWN BUILT INTO IT



An interdisciplinary design team headed by Rem Koolhaas and his Office for Metropolitan Architecture, Rotterdam, was recently selected to create a $77-million ($112 million Canadian) urban park on half of a sprawling 644-acre decommissioned military base in the center of greater Toronto.

The international design competition attracted 176 submissions from 22 countries. The Koolhaas team includes graphic designer Bruce Mau Design Inc. of Toronto, Amsterdam-based landscape architect Inside/Outside, and engineers Ove Arup & Partners International, New York/London. The winning team was awarded $178,500 ($260,000 Canadian).

Parc Downsview Park Inc., a federal agency developing the former World War II-vintage base, quoted Koolhaas as saying: "The park's mass will be built up over time into a flexible patchwork of planted clusters separated by undesignated meadowlands." The Dutch architect wasn't able to attend the selection ceremony—he was in Jerusalem accepting the Pritzker Architecture Prize for 2000.

The agency describes the opportunity to reclaim a land block of that scale and importance in the middle of a city as "unprecedented worldwide." It is certainly one of the more interesting of Toronto's many fallow waterfront and brownfield sites, with its 1930s and '40s-era aircraft plants, hangars, a film studio complex, butterfly garden, wildlife center, active rail line, and former military buildings, most of which will remain on the site.

Detlef Mertins, a University of Toronto professor and the competition's advisor, notes: "The jury has selected a design that takes into account the incredible pace of change taking place around us and the need for flexibility. In this it was unique among the submissions. This is not a fixed plan, but rather one that has the unknown built into it."

He was referring to the evolution of the design over the next 15 years, with the creation of more than 1,000 walking and bicycling pathways, water features, playing fields, and gardens. Preparation of the urban park site, dubbed Tree City by the winners, is already under way. *Albert Warson*

OKLAHOMA CITY MEMORIAL RECOGNIZES INDIVIDUALS, MOMENT

The Oklahoma City National Memorial, dedicated April 19 on the fifth anniversary of the bombing, makes no grand pronouncements on terrorism or violence. Instead, it offers trees, water, and grass as a setting for 168 empty chairs, one for each victim. The effect is more churchlike than conventionally civic, especially at night when the bases of the chairs glow serenely.

The architects, Hans and Torrey Butzer and Sven Berg, were in their early thirties and working in Berlin when they entered the international competition for a memorial. They designed a space rather than an object, covering 3.3 acres between the surviving walls of the Murrah Federal Building and the shell of the Journal Record Building to the north. At opposite ends of Fifth Street, which bisects the site, stand bronze gates inscribed 9:01 and 9:03, the times between which the blast occurred. In the middle sits a shallow reflecting pool, 330 feet long, with terraces, an orchard, and a solitary "survivor tree" on one side and the field of empty chairs on the other.

The chairs are the memorial's centerpiece: tall ones for adults, shorter ones for children, each bearing a name. With bronze backs and cast glass bases, they are small monuments, arranged according to where individuals died. Seats are arranged in nine rows, representing each of the nine floors of the building, with a clustering at the epicenter of deadliest impact and a few more off to the sides. What seems at first like a random pattern is a deeply emotional geometry.

On the gates of time are the words, "May this memorial offer comfort, strength, peace, hope, and serenity." These words come from the mission statement and express the desire of families, rescue workers, and the entire community for healing and closure. By not overloading the memorial with fountains and commemorative sculpture, by allowing the voids to speak for themselves, the architects have contributed to that process. *David Dillon*

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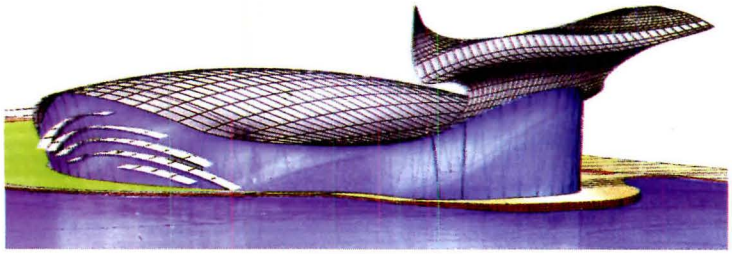
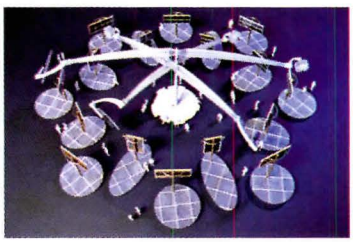
EXPO 2000 EMBRACES GLOBALIZATION, BUT WHO'S ATTENDING?





"Pavilion of Hope" (top) and "Tree of Knowledge" (middle and bottom) are located in the German Pavilion.

The first world exhibition ever held in Germany, Expo 2000, opened in Hannover June 1. Guided by the theme "Humankind—Nature—Technology," the Expo, costing a record $1.6 billion, is intended to improve Germany's image abroad, to encourage Germans to be more tolerant of foreigners, and to prepare Germans to face challenges posed by globalization.

Organizers have labeled the Expo, which largely occupies an existing venue, "a new type of World Exhibition." To house the mega-event, a trade fair grounds on Hannover's southern periphery was refurbished and expanded according to plans developed by Arnaboldi/Cavadini of Locarno, Switzerland, and Albert Speer, Jr., of Frankfurt-am-Main, Germany.

For the five-month-long Expo, 15 trade fair halls (each roughly 212,000 square feet) have been outfitted to accommodate exhibitions. Five halls comprising a theme park contain lavish electronic media displays created by designers, including Toyo Ito and Jean Nouvel, that explore how life will change during the 21st century.

The Expo's major new architecture, including a 20,000-seat concert arena and 40 pavilions representing corporate sponsors and nations from Europe, North Africa, and the Near East, is located at a 148-acre, eastern extension to the existing fair grounds.

Hannover's biggest disappointment has been the absence of a U.S. Pavilion, which would have occupied a dominant, 130,000-square-foot parcel at the Expo's eastern extension. After poor American showings at recent World Exhibitions, Congress passed a law in 1994 prohibiting public support for future U.S. pavilions at such venues. Initially, the Expo's U.S. Commissioner, William D. Rollnick, hoped to build a pavilion by James Wines / S.I.T.E. of New York. When this project proved difficult to realize, a simpler pavilion, by the Berlin based, German-American architects Barkow/Leibinger was subsequently developed. Rollnick failed to raise the $45 million required for the second project with its accompanying exhibitions and cultural events.

According to Frank Barkow of Barkow/Leibinger, the project died a slow death for several reasons: "Companies such as Coca Cola and McDonalds saw themselves as global, not American, companies, and contributed millions of dollars to become official Expo sponsors instead." American organizers also lacked an overriding idea to orient the U.S. presentation. Although Germans failed to publicize the Expo sufficiently in the U.S., observes Barlow, the "choice of a provincial city for a world exhibition did not help."

As of early June, crowds had not flocked to the Expo, due in part to the high admission fee. Does Hannover's example suggest that world exhibitions are no longer viable? Despite the Expo's numerous attractions, the answer remains to be seen. *Mary Pepchinski*

AMERICANS ON THE EDGE OF PARIS **When Tour EDF, or PB6, opens in early 2001, the 40-story office tower (pictured right) will be adding another U.S. imprint to the Parisian skyline—not in the heart of the capital, but in La Défense, the high-rise business district on the Paris periphery.**

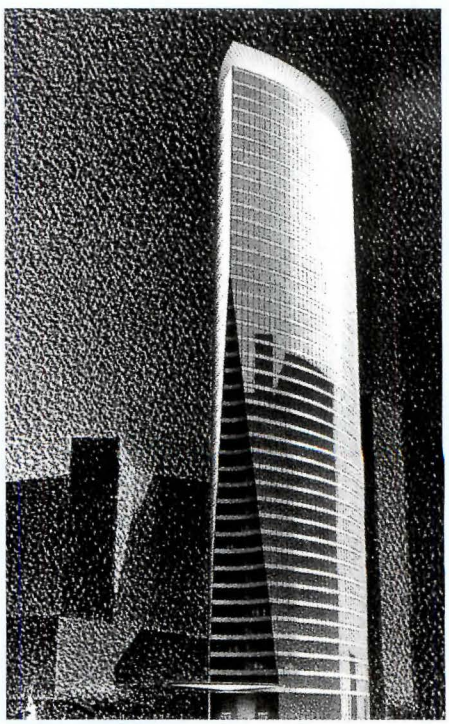
The estimated $93-million PB6 has already achieved half its height, rising upon an extensive, paved plinth that is true to Le Corbusier's functionalist principles: to separate towers from pedestrians from transport. In 1995, Pei Cobb Freed and Partners, in association with Roger Saubot and Jean Rouit of the French practice SRA Architectes, won the commission over six other finalists that included Foster and Partners and SOM.

EDF (the French electricity company) and the Caisse des Dépôts et Consignations (a state-run organization that invests in social, economic and cultural enterprises) will occupy the tower. Henry N. Cobb, FAIA, in his description of the building, says it has a "carved prow" that "creates a memorable gathering place where passersby will be invited to pause and enjoy the view from a sheltered vantage point beneath a generous canopy of metal and glass."

PB6 is just one of a clutch of La Défense projects generated by a lack of office space, coupled with a rise in property prices since the late 1990s.

Jean-Paul Viguier's twin towers Coeur Défense, (heart of (La) Défense) have a 40-meter-high atrium that connects three smaller, eight-story structures. The neighborhood's first church, Notre-Dame-de-la-Pentecôte by Franck Hammoutène, also will be completed this year.

Major long-term construction projects totaling about $571 million are also under way behind La Défense Arch. A 74-acre, mixed-use site is being developed with accommodation for students at the Léonardo de Vinci University, with residential blocks, hotels, offices, shops, and parks. The 34-story CBX tower by Kohn Pedersen Fox and Rouit will be complete in 2003. The low-rise Bâtiment Guynemer, also by Rouit, will be complete in 2001. **[*For information* about other recent French projects, see page 53.]** ***Robert Such***



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UNIQUE RAIL STATIONS TO DOT TWIN CITIES NEIGHBORHOODS

Minneapolis and St. Paul evolved around the mighty Mississippi River. Despite this vital connection—and an interdependence reflected in their nickname, Twin Cities—the pair still lacks a comprehensive public transit system to unite them.

A new light rail transit system, whose construction starts this fall, should change that. Station designs were recently unveiled for the 11.4-mile, $548-million Hiawatha Line—linking Minneapolis-St. Paul International Airport and Mall of America with downtown Minneapolis—the first of many proposed routes.

The Hiawatha Line design process was unique, if not unprecedented, for light rail transit design. While ticket machines, light fixtures, and other elements are consistent among stops, each station has a unique character with canopies and windscreens appropriate to their neighborhood surroundings. For example, pitched roofs and dormers of the bungalow houses near one station in a residential neighborhood are echoed in the station design. At a station in downtown, colored light illuminates a translucent canopy, creating a dynamic image for those in the skyscrapers above and on the street below.

Stations for the Hiawatha LRT include designs by Cuningham Group Architects (top and middle) and Meyer Scherer & Rockcastle Architects (bottom).

Five Minneapolis-based architecture firms designed 13 stations: Barbour La Douceur Architects, Cuningham Group, Elness Swenson Graham, Julie Snow Architects, and Meyer, Scherer & Rockcastle. Each firm worked separately with team artists on particular stations. The Minneapolis planning and urban design firm BRW coordinated the project, and designed areas between stations. Hammel, Green and Abrahamson, Inc. and Craig Lau will be responsible for two additional stations, controlled by the Metropolitan Airport Commission.

The design process was also unusual with intense community involvement. Originally, the contract called for three station types—downtown, neighborhood, and suburban. Community groups expressed a strong desire that stations better reflect the character of their neighborhoods. BRW proposed a consortium of multiple firms and artists, each charged with tackling this issue. The approach was vital to quelling community concerns and generating support.

Unlike a typical approach to transit-stop design, with uniform stations distinguished solely by signage, the Hiawatha Line is distinct. Residents' long wait for mass transit—the Twin Cities remain one of the last major metropolitan areas without such a system—is rewarded with stations of distinctive design. *Todd Willmert*

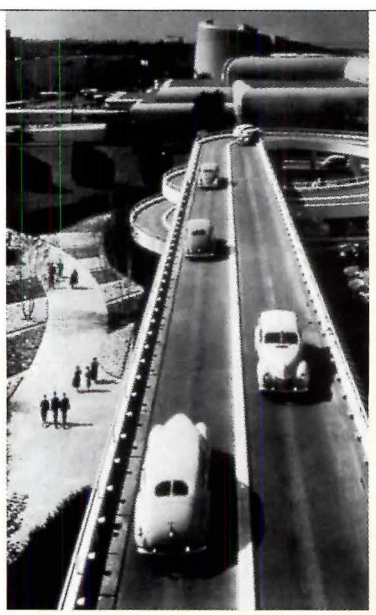
100 YEARS OF ARCHITECTURE EXHIBIT REACHES FINALE IN L.A.

Five years ago, when Richard Koshalek and Elizabeth Smith began curating the exhibition, "At the End of the Century—100 Years of Architecture," they agonized over the task. "We could have gone for a pure chronological ordering, simply chosen the popular masterworks or merely concentrated on innovation," recalls Smith, the Chief Curator at the Museum of Contemporary Art in Chicago. "But architecture over the last hundred years has had a decidedly more complex history."

Ultimately, the curators devised a series of 21 smaller exhibitions, each with a different theme. Subjects range from "The Skyscraper" to "World of Tomorrow: The Future of Transportation" and "The Rational Kitchen."

***The exhibition,* with more than 1,000 pieces including original models, rare architectural plans, stellar photographs and furniture is at the Museum of Contemporary Art in Los Angeles through September 24. The show originated in Chicago, then went to Japan and Koln, Germany. The Los Angeles showing is the exhibit's last.**

A few of the exhibit's more contemporary projects include Frank Gehry's Guggenheim Museum Bilboa, Morphosis' MTA Pedestrian Bridge in Los Angeles, *Zaha Hadid's Vitra Fire Station*, and Daniel Libeskind's Jewish Museum in Berlin. *David Hay*



Images of the 1939 World's Fair in New York (left) and Canal City Hakata (right), Fukuoka, Japan, by Jerde Partnership are in the exhibit.

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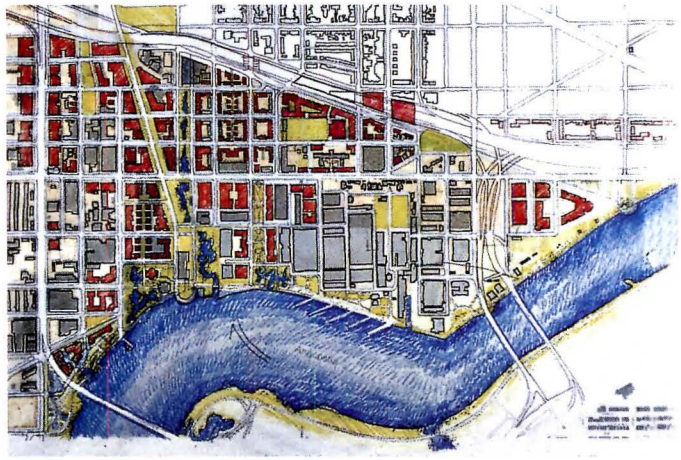
NATION'S CAPITAL LAUNCHES INVIGORATING INNER CITY PROGRAM



This spring District of Columbia officials announced plans to revitalize two city neighborhoods flanking both sides of the National Mall in Washington. Both efforts are intended to shore up areas outside the traditional, better-known tourist attractions of the city, and would boost the tax base, and provide housing, an important aspect of D.C. Mayor Anthony William's success strategy for the nation's capital.

Targeted areas for development include the neighborhood directly north of the mall, in the old downtown core, and the area southeast of the Capitol, along the Anacostia River waterfront. The hope is to provide a more stable infrastructure in both areas that will benefit the entire downtown and make use of the long-neglected river resource.

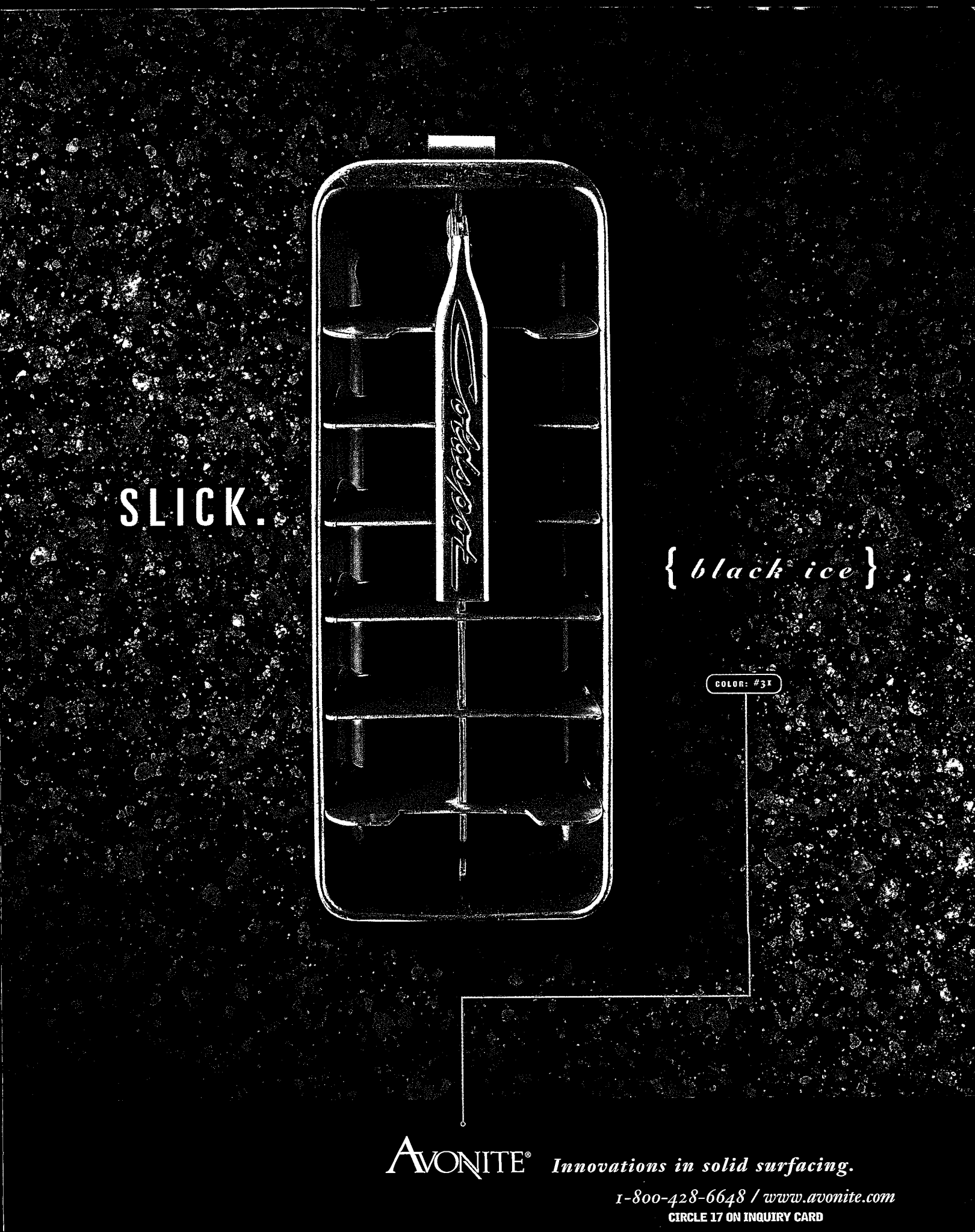
The downtown has struggled to maintain its vitality since the 1960s, when federal building projects and rising crime drained the availability and desirability of housing. Planners hope their efforts, along with the generally favorable economy, will bolster the revitalization already started by projects such as the three-year-old MCI arena. That venue, which provides homes for major league hockey and basketball teams, as well as college teams, restaurants, and sports-related retail outlets, has pumped new vigor into city nightlife. On the cultural front, the ongoing renovation of the National Museum of American Art and the National Portrait Gallery has brought tourists and locals venturing into what was previously a quiet quarter of the city.

In April Mayor Williams announced a development plan that included 3,000 units of housing as well as shops, theaters, and museums. The targeted area is bounded on the south by the Mall and Massachusetts Avenue to the north, and extends westward to the White House and to the Capitol building on the east. A National Music Museum, sponsored in part by the Smithsonian Institution and spurred by a large Frank Sinatra collection donated by the singer's widow, is part of the proposal. Housing is a focal point, however, according to Eric Price, deputy mayor for economic development in the District of Columbia. "We believe the success of the new downtown will not be assured until we create a 'living downtown' that is active 18 hours of the day."

Meanwhile, down on the southeastern end of the Mall, city officials and business leaders teamed up with the Federal Government Services Administration, the Congress for the New Urbanism and a group of architects to generate proposals for reintegrating that area with the rest of the city. Locked in a weekend-long charette-style design session, the group examined ways to pump up the overlooked Anacostia River waterfront. Their goals were to provide a significant civic space along the waterfront, create pedestrian access to the river, create mixed-use development in the area, particularly housing, and encourage new technology-based industries to locate there.

The area, which includes the Navy Yard and an undeveloped parcel known as the Southeast Federal Center, includes many acres of federally owned flood plains. Its unsuitability for large-scale development makes it an asset for those looking for outdoor civic space. "The vision identifies a way to parcel off what's least valuable about the land on the site and use it to enhance the value of everything else," said Tony Costa, head of public buildings for the GSA in the National Capital Region.

Mayor Williams, noting the success of cities such as Providence, Cleveland, and Oakland in developing their own waterfronts, stated that Washington should be able to match those efforts. Remarking on the alliance that convened to initiate the project, he proclaimed, "The vision marks a true coming together of our community, and unprecedented partnerships among residents, local stakeholders, the city, the Housing Authority, and the Federal government to reclaim our nation's waterfront and revitalize this under-utilized part of our city." *Ellen D. Sands*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Record News

THE LOWRY ARTS CENTER REJUVENATES MANCHESTER DOCKS

In the rundown Salford Docks area outside of Manchester, England, the London-based architects Michael Wilford and Partners have designed the Lowry Arts Centre. The $155 million theatre and gallery complex was largely funded by the National Lottery.

Like a significant number of recent projects of its kind—London's Tate Modern, for example—the Lowry is not only about creating a new cultural facility but the regeneration of a waterfront area. The Bilbao effect of creating distinctive buildings that majestically rise from indiscriminate townscapes has clearly been sought at Salford.

The Arts Centre is named after a locally celebrated 20th century Salford painter LS Lowry. In addition to galleries dedicated to his works, the Lowry also houses temporary exhibition spaces and two theatres. The larger theatre seats 1,730 and has the biggest stage in England, excluding London. As a facility, the Centre thus has real potential to attract high-quality exhibitions and performances.

The building stands on 803 concrete piles sunk into the bedrock at the end of Pier 8. In plan, it fits in with the shape of the pier. In section, its complex roof-scape with a 160-foot-high tower provides the Lowry with a skyline effect befitting a landmark.

The various elements of the building are composed as distinct entities that can be read externally. The most prominent features are the exaggerated double-height entrance canopy, the tower, and the rotunda at the back. Viewed from across the canal, the three can be interpreted as the prow, the mast, and the stern of a ship. Such a nautical analogy is appropriate for a building in the docks. In fact, there may be a regatta on its way to Salford Quays, with the completion of Daniel Liebeskind's Imperial War Museum on the other side of the canal.

Laura Iloniemi

SCULPTURE GARDEN BY PIANO, WALKER TO ENLIVEN DALLAS ARTS DISTRICT **After four years of planning, the final design for the $32 million Nasher Sculpture Garden was unveiled June 5 in Dallas. Designed by Renzo Piano and landscape architect Peter Walker, the 2.4-acre garden will enclose the finest private collection of modern sculpture in the world.**

Assembled over 30 years by Dallas developer Raymond Nasher and wife Patsy, the collection contains over 150 works by Brancusi, Calder, Moore, Picasso and other modern masters. The garden will be the new centerpiece of Dallas' downtown Arts District, between the Museum of Art by Edward Larrabee Barnes and I.M. Pei's Morton H. Meyerson Symphony Center.

Visitors will enter the Nasher Garden through a series of five slender pavilions with travertine walls and intricately faceted glass roofs. The three center pavilions will serve as galleries for small or fragile works, while those at the ends will house a cafe, bookstore, and offices for the Nasher Institute of Modern Sculpture.

From the pavilions, visitors will walk onto a flat, grassy terrace populated by large, ingratiating sculptures. A gently sloping lawn past groves of native trees will lead to a reflecting pool and a grassy berm that will screen noise from a nearby freeway. The garden contains at least 60 locations for sculpture, ranging from shady groves to knolls and open lawns. Garden installations will change seasonally.

City officials are counting on the Nasher Garden to be an international cultural attraction comparable to the Kimbell Art Museum in Fort Worth, and to energize its presently moribund Arts District. "If there is any chance of creating a real urban space in Dallas, this is it," said Piano. "We have stolen a piece of land from downtown and created a place of discovery. People will be drawn to it. You will see them walking."

Groundbreaking is scheduled for August, with an opening in spring 2002. ***David Dillon***

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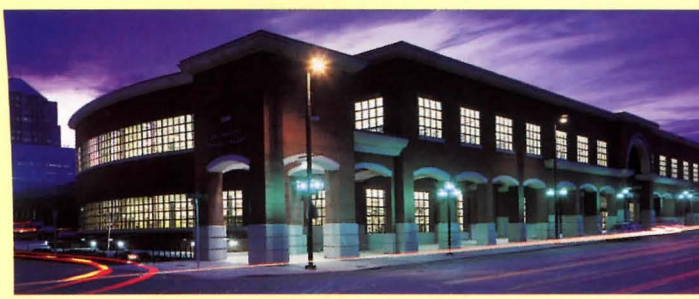

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Record News

HILLSIDE CAMPUS EMERGES LIKE TUSCAN VILLAGE

The same Travertine stone used to build the Coliseum in Rome serves as the prominent material at Soka University, a private liberal arts college in Aliso Viejo, Calif. Attention to craftsmanship is evident everywhere on the construction site, where buildings are being created with hand-troweled plaster, cherry wood detailing, and terra-cotta roofs. With a price tag of $220 million for phase one, Soka is currently the eighth largest construction project in California and the only private campus built from the ground up in the United States in the last 25 years.

Set to open to students in the fall of 2001, the campus is perched atop a hill overlooking a 4,000-acre wilderness park. "The architectural metaphor for Soka is a European hillside village," says Norman Pfeiffer, FAIA, founding partner of Hardy Holzman Pfeiffer Associates, LLP, planner and architect of record for a majority of Soka's new campus. Summit Architects, Inc., in Santa Monica, Calif., is project manager and architect of record of several campus buildings.

Phase one includes 18 Tuscan-style buildings layered up the hillside on a series of bending axes. The signature piece of the campus is the Student and Community Services Building, which includes an 8,000-square-foot art gallery and a copper-clad dome that rises 100 feet above ground. The 124,000 square-foot library is the largest building on campus. Plans for future phases include a 2,000-seat performing arts

center and additional academic buildings.

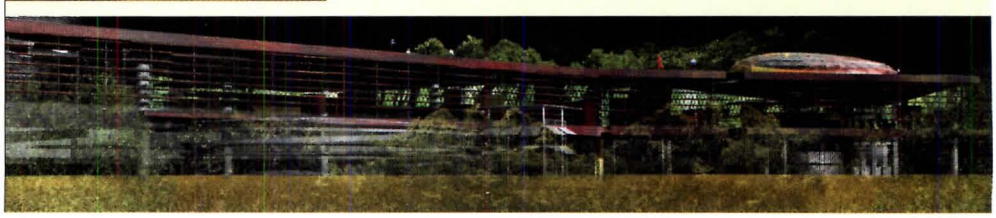
"Attention to energy conservation has been paramount," says Steve Davis, AIA, of Summit Architects. The student services building features natural ventilation controlled by weather instruments in the dome and special precautions were taken to protect the campus from fire, which can wreak havoc in this southern California locale.

The Japanese word "soka" means "to create value." The college's mission is to encourage students to create value in their lives and in the world. The founder of Soka is Daisaku Ikeda, a noted educator who is president of a lay Buddhist organization. The college is non-sectarian and open to students of all nationalities and beliefs. *Susan R. Bleznick*

NOUVEL AWARDED LE MAC **Paris, a city already spoiled with excellent museums, is about to build another. The $82 million project for a Museum of Arts and Civilizations (Musée des Arts et des Civilisations), baptized "le MAC," was awarded to French architect Jean Nouvel in December. Other architects in the competition included Peter Eisenman, Renzo Piano Building Workshop, Patrick Berger, Jakob & MacFarland, Foster and Partners, Tadao Ando/Jean-Michel Wilmotte, and Christian de Portzamparc. Nouvel's second building along the Seine River will occupy a site at the scenic Quai Branly, a stretch of riverfront east of the Eiffel Tower. The first, the Institut du Monde Arabe, opened in 1987.**

The new museum is dedicated to primitive art from Asia, Australia, the Americas and Africa. The architecture is meant to dissolve into the landscape while also creating an asylum for rare objects. The exposition floors are raised off the ground on large columns, which, according to Nouvel, are like tree trunks in the midst of a "sacred forest."

The forest is part of a garden landscape covering almost the entire 214,000-square-foot site. Designed by Gilles Clément, it is a zone of tranquility. A 56-foot high glass wall along the Seine provides a second barrier from the hubbub of the city. A mystical glow will be emitted at night as thousands of tiny lights set within the ground plantings change color with the weather. ***Claire Downey***



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CIRCLE 21 ON INQUIRY CARD

News Briefs

Venice Biennale opens Focusing on how a sense of disorder affects society, The Seventh Venice Architecture Biennale, an international architecture exhibition, takes place at the Giardini di Castello and Venice Arsenale through October 29. With a theme "Cittá: Less Aesthetics, More Ethics," events are planned to broaden dialogue between architects and those in related disciplines. The conference will explore how a sense of disorder impacts architecture, the visual arts, cinema, theater, music, and dance. Those unable to get to Venice can visit at www.labiennale.org.

Computer rendering of U.S. Pavilion

The U.S. Pavilion will feature two working studios led by Greg Lynn and Hani Rashid, instructors at UCLA and Columbia University, respectively, with architecture students from both schools. Students will investigate the application of technology as a defining factor in design, altering perceptions of time and space.

Mockbee wins MacArthur Fellowship Samuel Mockbee, FAIA, co-founder of Auburn University's Rural Studio, is one of 25 persons to receive a 2000 MacArthur Foundation Fellowship, known as the "genius award." In the Rural Studio, architecture students build homes and other structures in one of Alabama's poorest counties using recycled materials. Mockbee will receive $500,000, which can be used at his discretion. The John D. and Catherine T. MacArthur Foundation awards fellowships annually to persons in a variety of fields, and there is no application process. "MacArthur Fellows are chosen for their exceptional creativity, record of significant accomplishment, and potential for still-greater achievement," says Daniel J. Socolow, director of the Fellows program.

World's first performing arts facility built for jazz Jazz at Lincoln Center, the largest and most comprehensive not-for-profit jazz organization in the world, unveiled plans for its new home, perched above Columbus Circle in New York City. The $103 million, 100,000-square-foot facility for education, performance and broadcast, named Frederick P. Rose Hall, is designed by Rafael Viñoly Architects and will be completed in fall 2003. The jazz hall is the entertainment centerpiece of Columbus Centre, a twin-tower complex by SOM that will include headquarters for Time Warner and studios for CNN.

Jazz at Lincoln Center includes a 1,200-seat concert theater for jazz, but it will be flexible to allow for opera, dance, or orchestra. A 600-seat performance atrium, with soaring walls of glass overlooking Central Park, features a dance floor, tiered tables, and a bandstand.

Section of Jazz at Lincoln Center

"The whole space is going to be dedicated to the feeling of swing, which is a feeling of extreme coordination," says Wynton Marsalis, artistic director of Jazz at Lincoln Center. "Everything will be acoustically sound and everything will be wired, so we can send out the material all over the world. It's all resonant, and it's all swinging."

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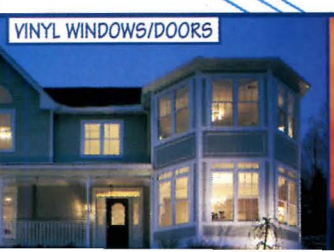
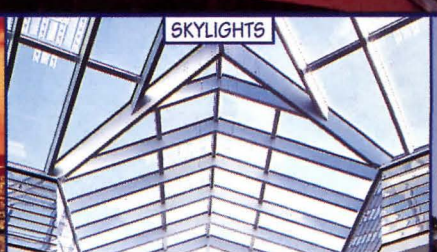




News Briefs

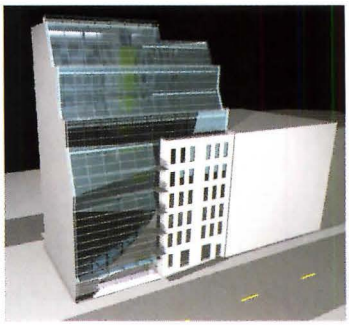
Muller's transformer plant

Vitra museum branches out
The Vitra Design Museum opened its Berlin branch this month with a retrospective of the designer Verner Paton. The museum occupies an industrial transformer plant constructed by Hans Heinrich Muller in 1925. The large converted transformer halls have become exhibition spaces for design and architecture from around the world. This is Vitra's second location in Europe following Frank O. Gehry's Weil am Rhein building, an expansion. The museum's expansions will eventually include sites in Italy, France, Spain, and the United States. Vitra's important collection on the history of industrial furniture design will serve as a centerpiece, supplemented by the museum exhibition program, publications, workshops, and products. Retrospectives on Luis Barragan, Isamu Noguchi, Charles and Ray Eames, Ludwig Mies van der Rohe, and Frank Lloyd Wright will follow the Paton exhibition in Berlin.

CANstruct a World without hunger
Students from Jefferson High School in Tampa Bay, Florida, led by architects Gould Evans Associates, won the Fourth Annual National *CAN*STRUCTION Competition with their entry, "Wurlitzer Jukebox." As a result of this year's competitions, 775,000 pounds of food were donated and distributed nationwide to help feed people in need. The national winners were announced this spring in Philadelphia at the SDA's and AIA's national conventions.

Million Can March

Residences by Archi-Tectonics On a pier jutting out in Rotterdam's River Maas is a remarkable 1930s grain silo that Archi-Tectonics of New York proposes to restore and convert to live-work units. Their design will add three 30-story residential towers (top right), a sports facility, and a park to revitalize this section of Rotterdam. Living units will be constructed with a modular steel panel wall system positioned on the silo's concrete base. The three towers will be cantilevered from the pier's edge, allowing for greater sunlight exposure and spectacular views. The developer is awaiting rezoning approval for construction to begin.



Also by Archi-Tectonics, a six-story abandoned warehouse on Greenwich Street (above) in lower Manhattan will be gutted, renovated, and topped with a three-story penthouse. The open loft plan of the

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News Briefs

building will feature set-back intervals allowing for terraces with views of the Hudson River. The ground floor will host retail and art gallery spaces. For an adjacent lot, the architects have designed a new 11-story residential building, composed of steel and glass, to be integrated with the former warehouse. Archi-Tectonics' Winka Dubbeldam is principal architect on both projects.

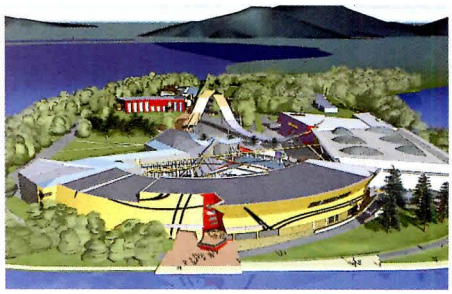
NCARB opposes interior designer licensing At their annual meeting in Chicago, June 14-16, the National Council of Architectural Registration Boards' (NCARB) delegates voted to oppose the enactment of interior designer licensing laws. In a statement on the vote, NCARB says proposals for interior designers to stamp, seal, and submit drawings would "seriously impact public safety. [To enact licensing laws] there must be a demonstrable need to protect the public from unqualified practitioners."

Only your architect knows for sure Movie studio designers Bastien & Associates of Irvine, Calif., have turned their office into a showpiece. They purchased a set they had designed for the 1999 movie *The Haunting* that mimicked a 500-year-old European castle, complete with high gothic ceilings, huge columns, and large wooden doors. The set became the backdrop for their office. "I'm attracted to high ceilings, and Gothic detail is timeless," says Gary Bastien. "We've gotten a number of commissions as a result of the creative sense [clients] get from our office." He says DreamWorks, the film studio that sold Bastien *The Haunting* set, is considering selling other used film sets to boost income.

Bastien office in Irvine

War memorial Columbia University has chosen a design by Architecture Research Office (ARO) as the winning scheme in a competition to design a war memorial honoring undergraduate students who served in combat. The memorial, centered on a mature tree, has a hedge cut away at five points. Discrete spaces for remembrance, the points each commemorate a war. ARO won the competition against Cliff Garten of SWA Group, Louise Bourgeois, and Diller + Scofidio.

Controversy down under Construction of the Australian National Museum is under way in Canberra, but not without controversy. The $91.2 million project, scheduled to open in March 2001, was designed by Ashton Raggatt McDougall in association with Robert Peck von Hartel Trethowan. The footprint of the Gallery of Aboriginal Australians, one of the museum's multiple buildings, bears a striking resemblance to the plan of the Jewish Museum in Berlin by Daniel Libeskind. Some Australian architects are dismayed by the similarity, citing copyright, ethical, and moral issues. Others find the reference appropriate, if it is meant to link the tragic history of Aborigines and Jews. Libeskind told the Australian magazine *The Bulletin*, "It seems there is a very shocking similarity and we'll investigate further."



Australian National Museum

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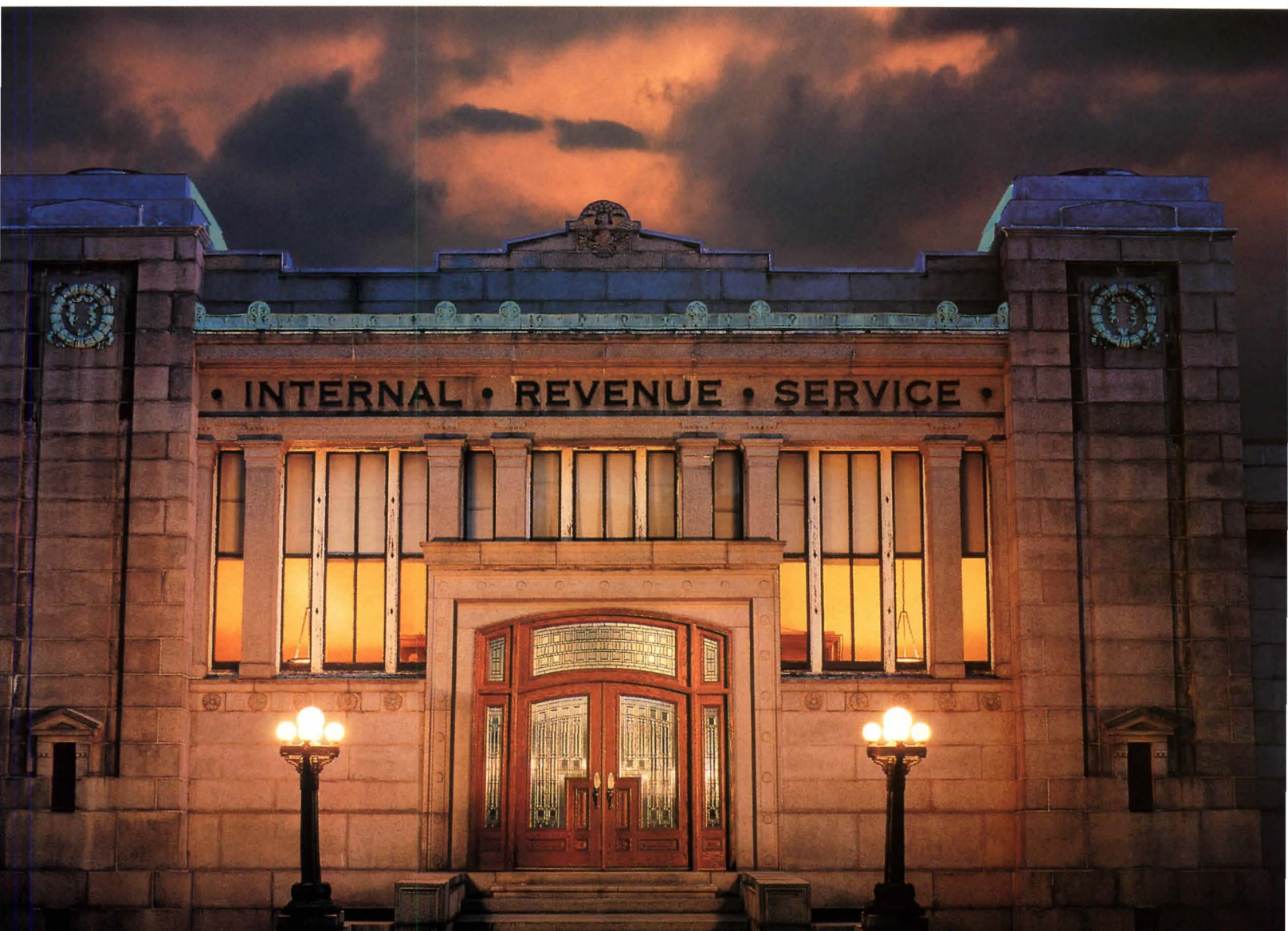

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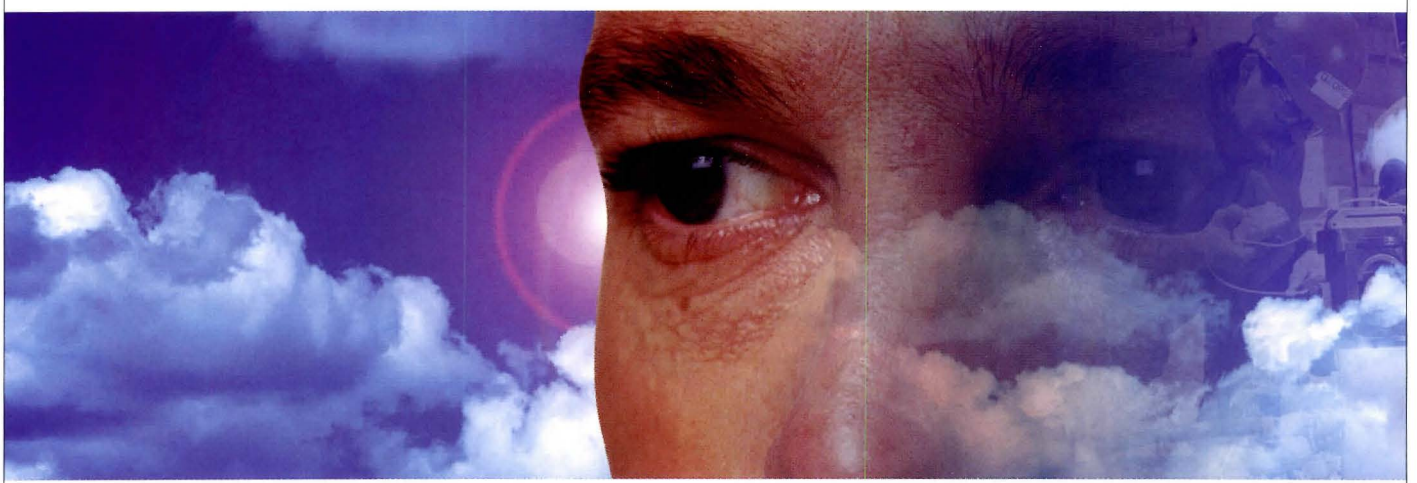

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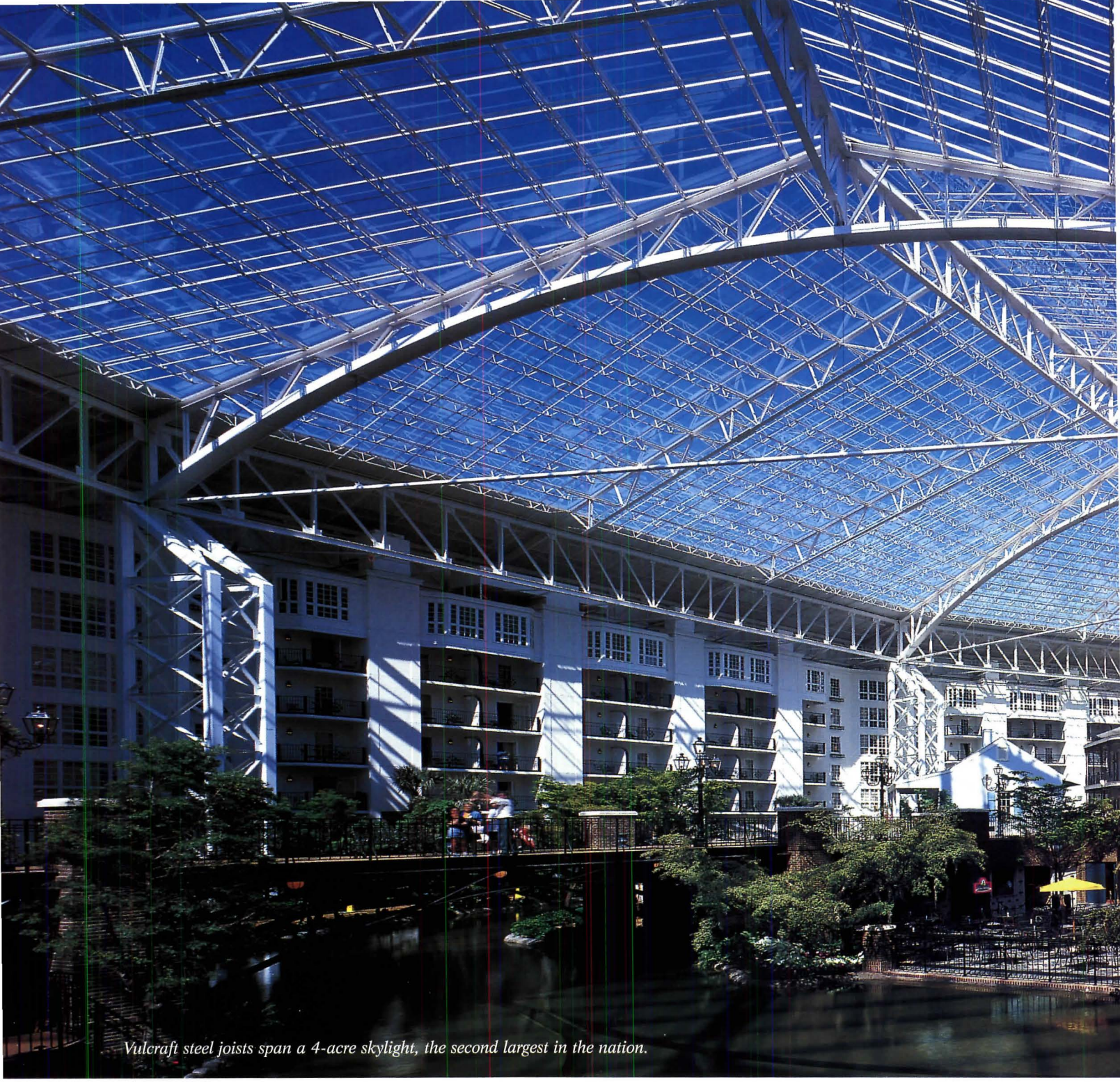

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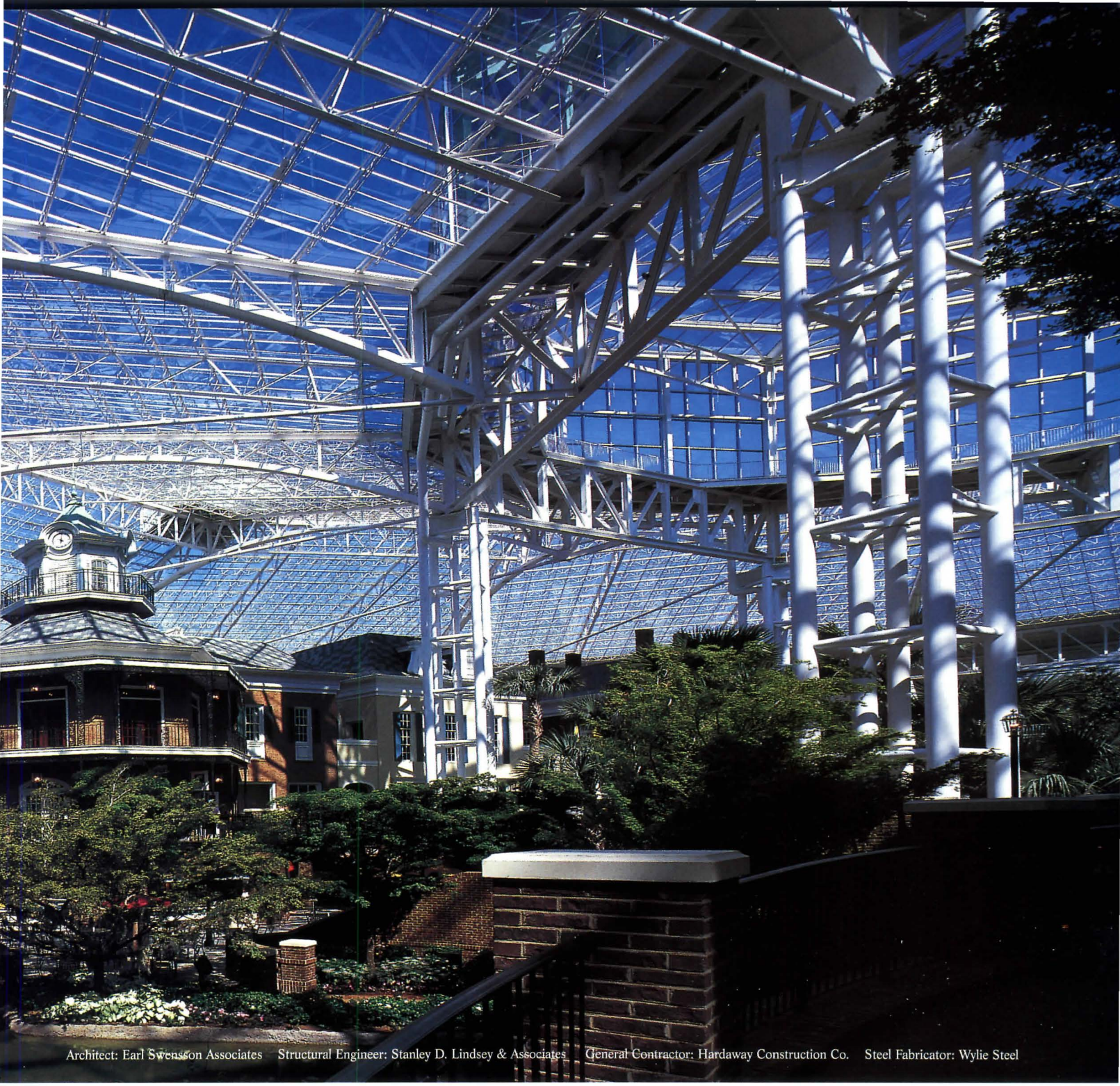

Architect: Earl Swensson Associates Structural Engineer: Stanley D. Lindsey & Associates General Contractor: Hardaway Construction Co. Steel Fabricator: Wylie Steel

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Paris: The world's most beautiful city gives itself a face-lift

Correspondent's File

By Claire Downey

Being one of the most popular tourist destinations in the world comes with certain responsibilities. For Paris, the price for being the City of Light, is the constant upkeep of an exceptional architectural heritage, a heritage accessed by over 20 million tourists a year. In the past decade, an unprecedented number of landmark buildings have been shut down for important renovations, including structural reinforcement. Several reopened this year with spectacular results, including the Opéra Garnier, the Théâtre du Châtelet, and the Musée des Arts et Métiers. Still others are due to close at the end of the year. Why so many buildings at the same time?

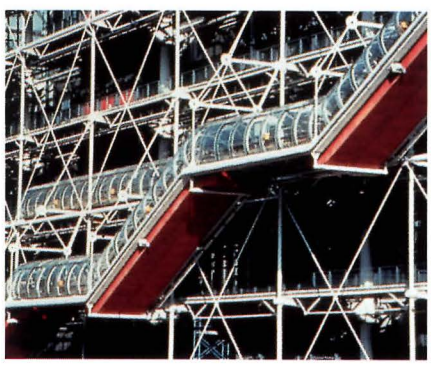
While the budgets for the *grands travaux*, or public works, of the 1980s and early '90s were in theory supposed to cover historic buildings, in reality almost all the money was spent on the late president François Mitterand's *grands projets*. Convinced that Paris should not become a museum, Mitterand initiated a building program that included I. M. Pei's pyramid at the Louvre, the Opéra Bastille, and the Library of France—all monuments to a modern, forward-looking France. Most were awarded through international competitions. These competitions created exhibitions and articles, and the architectural life of the city was buzzing, even if the economy was slowing down.

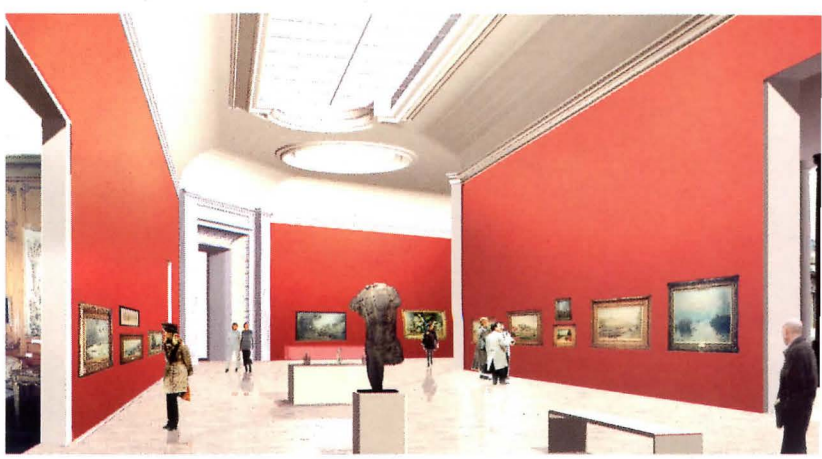
In June 1992, the tone changed. Like a wake-up call, a large piece of the Grand Palais' great glass roof came hurtling down, landing—ironically enough—in the middle of an important design exhibition. Soon after, stone from the Pantheon dome came crashing down. No one was hurt, but the two incidents set off a heated public debate on the state of Paris' historic architecture. After all the money spent on the *grands projets*, Paris' patrimony was crumbling.

Experts had known since the 1970s that, due to soil erosion, the Beaux Arts–style Grand Palais was slowly sliding toward the Seine. Closing the doors to the Grand Hall in 1993, the Minister of Culture set aside $2 billion for the renovation of the 666,000-square-foot space. Yet, while the exhibit space in the northern wing has remained open, the Grand Hall is still closed today, owing to administrative tie-ups, and is presumably still slipping southward.

The Opéra Garnier and the Pompidou Center were also in need of major renovation work. One journalist went so far to write, in a 1994 article in *Le Monde*, of the risk of a "murderous cave-in that menaces the overcrowded Pompidou Center." Fortunately, before that happened, the 20-year-old museum closed for renovation. It reopened in January 2000 with a greatly reinforced structure and more organized interior.

Unveiled on June 20, the completely restored entry facade of Charles Garnier's famous Opéra is a dramatic example of how efficient laser-cleaning techniques have become. What had long been a dull gray, pollution-stained facade has found its original 1875 splendor, revealing limestone from six different quarries, a polychrome of 10 brilliantly polished marbles from Europe and North Africa, mosaic panels edged in gold leaf, and, topping the roofline, brightly gilded sculptures. After being closed for several decades, the loggia above the entry is at last open to the public, offering a commanding view of the Avenue de l'Opéra.





The renovation and modernization of Paris' museums is a priority; the Pompidou Center (top) and the Petit Palais (bottom) are among the newly refurbished sites.

The $6 million facade restoration is the second stage in a multiphase project scheduled to be completed in 2007. Already finished is the restoration of the theater and modernization of the stage and back-of-house facilities. Coming soon, the restoration of the lobby spaces and the side facades.

With all the restoration frenzy going on in Paris, the French have not lost their taste for the modern. For museums in particular, the prevailing philosophy is to save the shell and any protected interior pieces, but not to hesitate to insert a contemporary architecture. According to Jean-Jacques Aillagon, president of the Pompidou

Claire Downey is a writer in Paris, and an international correspondent for RECORD.

Correspondent's File

Center, "Today's museum-goer has traveled extensively and has high expectations for the presentation of the art within the museum. This includes the lighting and even the furniture design."

The Musée Guimet will reopen this fall after five years of work by the architect Henri Gaudin, who completely reorganized the circulation and gallery spaces, then added a rooftop Japanese garden. The renovation of the Petit Palais was recently awarded in a competition to Paris-based architects Chaix and Morel. Like its big brother across the street, the Petit Palais was built for the Universal Exposition of 1900. Since then, it has seen its interior broken into boxy spaces with false ceilings and dim corridors. The new design reopens boarded-up windows to views of the city and creates an entirely new museum experience.

Urbanism in Paris has also taken a turn toward showing off its best assets, including the Seine, the grand boulevards, and even the Place de la Concorde. In May, the mayor's office announced a project to improve the quality of parks, architecture, and industrial fringes along the Seine and the Canal Saint Martin. This is in addition to an ongoing project to open 7.5 miles of pedestrian walks along the river's quays and to light Paris' 36 bridges. The newest bridge, the Pont de Solférino, designed by Marc Mimram, was awarded one of France's highest architecture awards in May, but it is not yet open to the public. The arched pedestrian bridge linking the Tuileries gardens with the Musée d'Orsay was deemed dangerous by safety officials and will require

Charles Garnier's famous Opéra is a dramatic example of how techniques such as laser cleaning are being used.

the application of an antislip finish to the supposedly treacherous wooden surface.

Facing the Seine, at the eastern edge of the city, are two of Paris' most important urban-housing developments. Bercy, on the Right Bank, is nearing completion, and across the river, the Seine Rive Gauche development that surrounds Dominique Perrault's controversial library is not far behind. Both are linked by a newly automated metro line named Météor.

The grand boulevards leading to the old department stores and the Opéra Garnier are being spruced up under a general plan to control signage and parking, harmonize street furniture, and regulate intrusions on the wide sidewalks by cafes and newsstands. The city has even unveiled plans for an almost car-free Place de la Concorde. Hard to imagine how they would reroute the traffic, but this is one of several published plans being considered.

There may be many fewer flashy projects being built in Paris these days, except Jean Nouvel's Museum of Art and Civilization [see News, page 38], but as the churches, theaters, and museums slowly reopen, one thing is sure—visitors will continue to call Paris "the most beautiful city in the world," for a long time to come. ■

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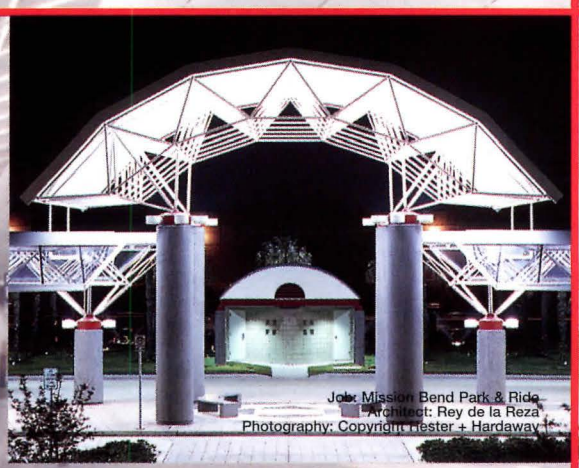

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Caveat Emptor: Insurance rates are on the rise

Practice Matters

By Charles Linn, AIA

For over a decade, the cost of professional liability insurance has been dropping. From a historic high of 10 percent of revenue for high-risk firms during the 1984 to 1986 policy-renewal years, prices have fallen since 1987 to rock-bottom lows—one-half of one percent for some large practices.

In the early years of this lower-price trend, architects took an active role in reducing their premiums by taking advantage of risk-management programs offered by the AIA and the insurance industry. At the same time, the construction industry slowed significantly, lowering claims. During the current economic recovery, premiums stayed low for two reasons: the insurer's risk was spread over a larger pool of work, and more carriers entered the liability insurance market, further depressing prices.

Observers of the insurance industry now caution that prices will soon begin to rise again. "What has happened," says Dick Crowell, a senior vice president at the DPIC Companies, the Monterey, Calif.-based professional liability insurer, "is that the total cost of payouts, settlements, and defense costs for claims has recovered from the lows we experienced in the late 1980s and early '90s, and has been climbing for the last six to eight years. These costs have crossed over the insurance companies' income line, which has been coming down for 13 years."

Donna Parsons, construction industry group manager at CNI/Victor O. Schinnerer & Company, of Chevy Chase, Md., agrees. "Some firms have been seeing prices even lower than one-half of one percent. These price levels are not sustainable for the insurance companies. None of them can do it." Parsons says that claims losses on firms with annual revenues of $5 to $10 million "have caught up with all of the insurers, and everyone is talking about raising rates for these firms."

Crowell says, however, that firms will not see the drastic cost increases that occurred in the mid-1980s. "And I would call this an adjustment, rather than an across-the-board increase," says Crowell. "We're still trying to figure out which specific types of firms need to be paying a little more."

OWNERS, AND ESPECIALLY DEVELOPERS, BECOME MORE LITIGIOUS WHEN MONEY GETS TIGHT.

Claims climb with the prime

But architects should also pay attention to the economy, keeping in mind that increases in interest rates and a slowing of the economy have historically meant an increase in claims and premium prices. Both Parsons and Crowell say that owners, and especially developers, become more litigious when money gets tight. "There have been times when litigation was actually a profit center for developers," says Crowell. "That isn't true now, but when the economy begins to tighten up, litigation increases in every profession."

Parsons adds, "In the past we typically didn't see claims until the boom slacked off because the clients had money to throw at problems and they would. As interest rates go up, clients don't have the extra money it takes to solve their problems." This means that most claims typically occur when work slacks off, the worst time in the economic cycle for the architect.

Architects should also be aware that current activity in the design and construction industries is propelling liability insurers into new territory. "The problem for architects now isn't claims, it's staffing. Architects are either having junior staff run projects, or they've hired new people who are making mistakes because they are unfamiliar with their new employer's procedures," says Parsons, who speculates that, "we're potentially building a problem here that could hit us in a year to two years as we see the results of work done by inexperienced people." Architects who are using temporary employees should also double-check to make sure those workers are covered by their insurance. Not all carriers' policies do this.

Parsons is also concerned that owners who want design-build delivery are hiring contractors as their sole supplier. The contractors, in turn, hire architects and engineers to do design and construction documents, then dismiss them once the drawings are done. "We've always been an advocate for construction-phase services because the architects have a chance to catch problems before the building is finished. If you don't have that chance, you are potentially at risk."

Proceed with caution

Everyone is at risk. The only architects who are "suitproof" are those who have no more assets "than a laptop and their imaginations," Dick Crowell says. Michael Tardiff, Assoc. AIA, the AIA's director of professional practice, recently issued a statement cautioning architects to continue to be diligent in their risk management practices even though times are good, to continue to educate staff members, and to be cautious about selecting an insurance carrier strictly on the basis of price. Many carriers dropped out of the market during the 1984 through 86 period, when claims numbers were spiraling out of control, leaving design professionals to seek new policies at a time when getting insurance was costly.

Insurance companies that have the longest track record in the business offer discounts for architects who try to minimize claims. This can be accomplished, for example, by participating in risk-management seminars and continuing-education programs, or putting the firm's procedures and practices through peer review.

Today it is still a buyers' market for professional liability insurance, and carriers are very willing to customize an insurance policy that will meet a firm's individual needs. Architects should definitely take advantage of this while it lasts. ■

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The architectural media: Fashion runway or teaching tool?

Critique

By Neil Denari

Not long ago, I ran into an acquaintance in an architectural bookstore in Los Angeles. He rushed over to me and said, "Great to see you, but what are you doing here?" When I asked what he meant, he said that he was surprised to see me as a consumer of architecture books instead of just a producer of them. He mentioned a book I had recently published, the first substantial one on my work and ideas, and said it was clear to him that I didn't need to borrow (or worse, steal) from others to develop my work. He was sure that I had no reason to purchase or even look at books since, for him, my work must come from my soul, not from the pages of recent architectural publications.

Well, it was reassuring to know that someone could see how much effort went into my work and could detect palpable evidence of soul in it. However, to me, this incident was also an indication that architects often have difficulty with the idea that media influences them; they think it impedes originality.

Everyone today inhabits an exhilarating Technicolor world of film, television, graphic design, and informational images of all kinds. We all have our fetishes, addictions, and hidden and expressed forms of censoring this visual and textual overload. As architects, we employ ideas and influences from a variety of fields as a way to make our work reflect our contemporary environment. In filtering the excessive and the trivial, we search for the images, ideas, and conditions that will help us develop new and, it is hoped, personal works of architecture.

For many, film is an inspiring and useful medium. While I am fixated on the graphic aspects of Michelangelo Antonioni and Jean-Luc Godard, other architects look to Peter Greenaway, Wim Wenders, or Alfred Hitchcock for ideas and images that might be translated to space. Still others choose to explore and acknowledge the influence of video, photography, new developments in software, and current critical theory on their work. Yet the one area of research that seems to be the most quickly dismissed by architects is architecture itself.

ARCHITECTS OFTEN HAVE DIFFICULTY WITH THE IDEA THAT MEDIA INFLUENCES THEM; THEY THINK IT IMPEDES ORIGINALITY.

Some architects believe that media such as monographs and journals that publish the work of contemporary architects, including *El Croquis* and even the magazine you are reading at this moment, are nothing but a kind of empty fashion world, a world violently at odds with the heavy timelessness of authenticity, a world where images of buildings are indistinguishable from the ads seen in *Vogue* or *Elle* magazines. Other architects have an opposite view. They see the architectural media as providing a set of templates to work with in the search for a critically acceptable architecture. While, as its detractors claim, the media will always appeal to many as a field of vacuous images deployed by the dangerous forces of seduction (building image equals fashion ad), it can conversely work as a didactic tool for those architects who are curious witnesses to the often-brilliant work produced by many of their contemporaries.

By consciously resisting the influence of the media, one embraces the long-standing idea that it is not possible to create truly compelling and personal work by researching the work of others. Indeed, it is common for architects to take pride in saying that they do not look at the work of other architects because they are engaged in a dramatic and at times emotional struggle to reveal the self. It is an approach I respect but would never adhere to. Certainly no one would want to be accused of unconsciously (or otherwise) repeating the work of other architects, but the drive to produce personal work should not obscure the necessity of making that work a part of the contemporary discourse of architecture, nor should it gloss over the learning opportunities inherent in the media.

Across the architectural landscape, movements arise through the forces of debate and critical

Fashion or substance? Architects debate the media's role.

Neil Denari is the director of SCI-Arc and the author of Gyroscopic Horizons.

confrontation. But they also develop through osmosis: In Holland, many architects share a hyper-Cartesian planning process; throughout France and Switzerland, experimentation with glass has become a focus; an axis running from Los Angeles through Vienna has maintained an obsession with the concept of experimental form. In all cases, it becomes clear that architects are learning from one another, if only by real or spiritual proximity. But how often does an architect acknowledge the influence of a contemporary?

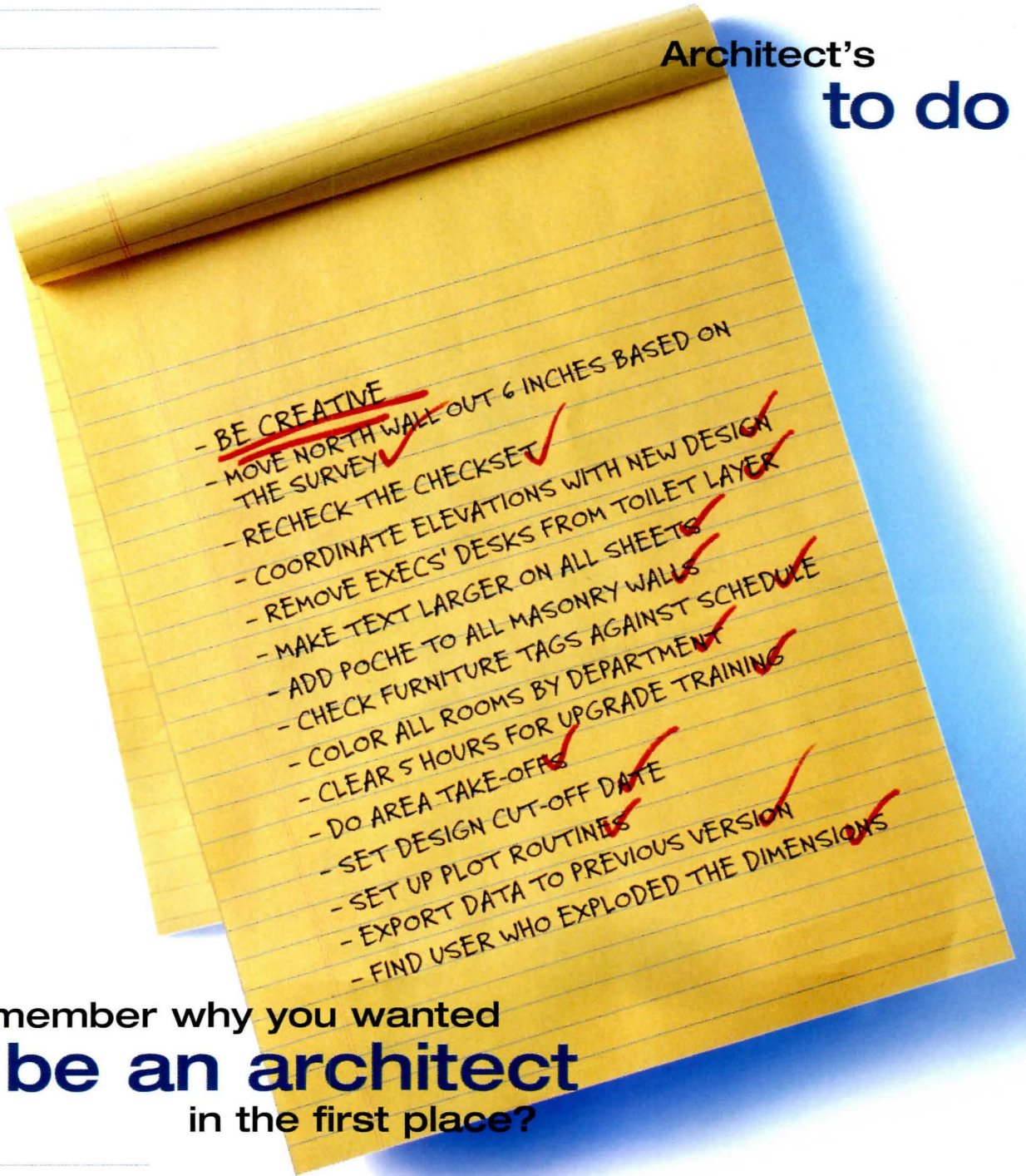
IT BECOMES CLEAR THAT ARCHITECTS ARE LEARNING FROM ONE ANOTHER, IF ONLY BY REAL OR SPIRITUAL PROXIMITY.

The desperate search for originality is a powerful and at times inhibiting phenomenon; it is an area where the narcotic of the media, the rhetoric of resistance, and the ego create conflicted desires. Whether as an expression of disinterest (real or feigned) or as a method of resisting the temptation to mimic the work we like the most, the act of rejecting the media is more than anything a way to protect the integrity of one's ideas. But I believe that using the media to help place our own design issues and solutions within the larger discourse on architecture can make our ideas more relevant and improve their execution. Although conventional wisdom suggests that, as an architect moves forward in his or her career, ideas and areas of research become more and more focused and less prone to submit to fashion, I cannot imagine being a self-imposed media exile. I continue to believe that media research is an important factor in extending the field of collective architectural progress. For me, looking closely at the work of contemporary architects as a series of case studies continues the tradition of learning that begins in school.

There is quite a big gap between the unapologetic copyist and the private poet in terms of how each uses the media. Indeed, one must use the media for expressed purposes, for strategic ends. For instance, an architect interested in formal complexity might find the work of Herzog & de Mueron unappealing and the work of Coop Himmelblau quite fascinating. What might compel an architect to buy a monograph on both, despite the preference for one, is that both offices use glass envelopes in particularly interesting ways. Whether through extreme flatness, graphic pattern-making, or unthinkable acute angles, both are extending the possibilities of the architectural skin. If Toyo Ito splits the difference between these two offices, then one might study his work as a hybridization of subtle geometric impulses within a smooth, technically expressive skin. Accompanying the analysis of contemporary buildings are project descriptions, position articles, and critical interviews that make it possible to compare stated ideas to project performance. When I read such material I am inclined not only to ask myself if I am convinced by the arguments, but also to wonder where I see my own work in relation to these propositions. I cannot imagine challenging my own thinking without studying the architecture of others.

After all, even if one has a vision no one else can produce, why should others automatically care that it exists? Newness, for all its power to captivate, must come from intense forms of research and development within the field of global architectural activity if it is to be significant. ■

Architect's to do list:



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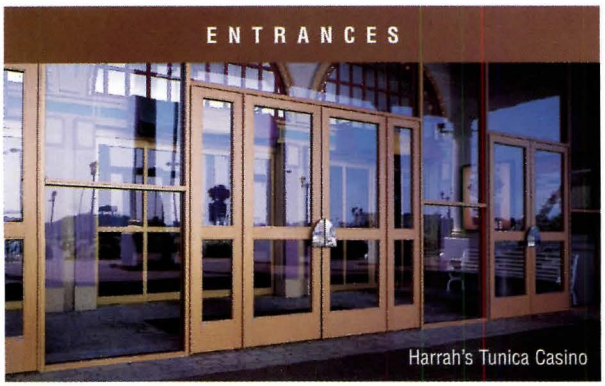

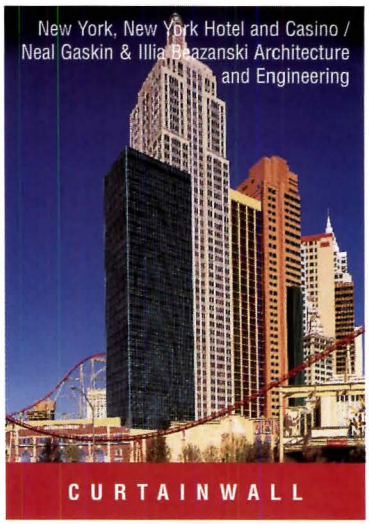

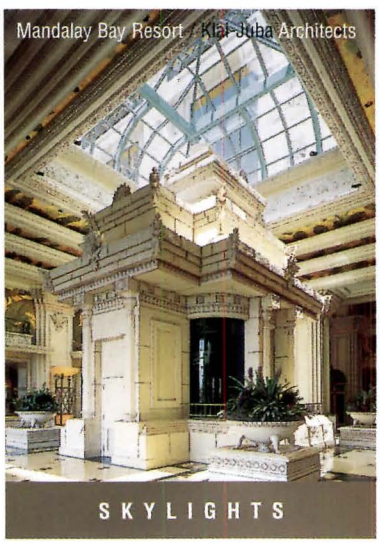

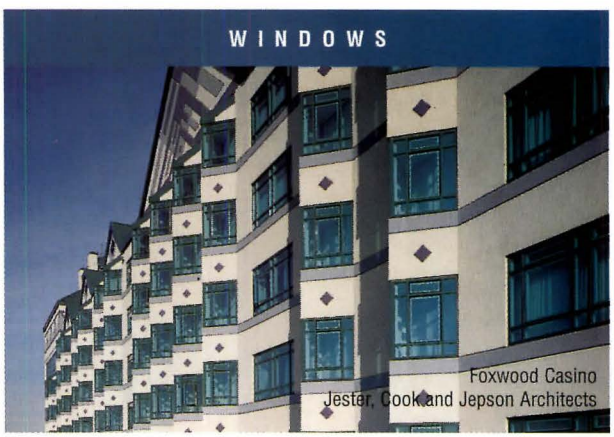

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CIRCLE 34 ON INQUIRY CARD

Snapshot

By David Cohn

A bathhouse turns swimming into a fine art

With its softly burnished volumes of sandblasted stainless and corten steel spaced between horizontal planes of roof and floor, this diminutive bathhouse in the woods looks more like an elegant sculpture or large piece of furniture than a building. Its luminous, almost seamless volumes provide changing rooms, showers, toilets, and a refreshments kiosk for an old river swimming hole at the edge of the Spanish town of Olot, in the Catalan province of Gerona, 50 miles north of Barcelona. Designed by the young Olot-based architects Rafael Aranda, Carme Pigem, and Ramón Vilalta of RCR Arquitectes, the pavilion is one of several elements in the Tussols-Basil Fluvial Park, which also includes an athletic field and a meandering, floating promenade among the trees.

The pavilion was carefully sited as a point of transition between the town and the river. Its closed volumes are spaced and shaped to best reveal the trees and landscape between them. The pavilion is gently curved in plan, following the curving bank of the river, and is raised slightly above the ground against possible flooding. An adjacent

platform on the river side serves as a gathering space for bathers. The detailing and materials have been designed in part to resist vandalism. Interior spaces are finished in stainless steel, and daylight filters through panels of glass sandwiched between perforated steel sheets.

Trained eyes will note the architects' nod to Mies van der Rohe's Farnsworth House in Illinois, the tightly packed, nature-friendly Usonian houses of Frank Lloyd Wright, and the finely crafted minimalist boxes of Donald Judd's sculptures. So it is not surprising to learn that the architects have backgrounds in fine arts and spent time studying the traditional architecture and culture of Japan, which they first visited in 1989.

With its spare lines and fine detailing, the pavilion serves as elegant transition between land and water (above and left). Daylight enters interior spaces through glass sandwiched between sheets of perforated steel (below).

RCR's principals intentionally established their practice far from the dynamic but overcrowded architectural scene of Barcelona, where they were trained. But their focus on the building as an exquisite object is close in spirit to Barcelona's rich tradition in furniture, interior, and retail design, a reflection of the mercantile and manufacturing basis of the city's prosperity since the 19th century. This sophisticated, cosmopolitan sensibility treats buildings with the same upclose intensity as household objects or graphic designs. Everything from jewelry to entire buildings is judged by the same criteria of craft, elegant efficiency, style, originality, and fashionable aloofness.

In the Olot bathhouse, a slight curve in plan, along with angled entry faces of the changing rooms and soft metallic surfaces give the project a slightly off-balance, quirky character, endowing the object in the woods with ambiguous expressivity. ■

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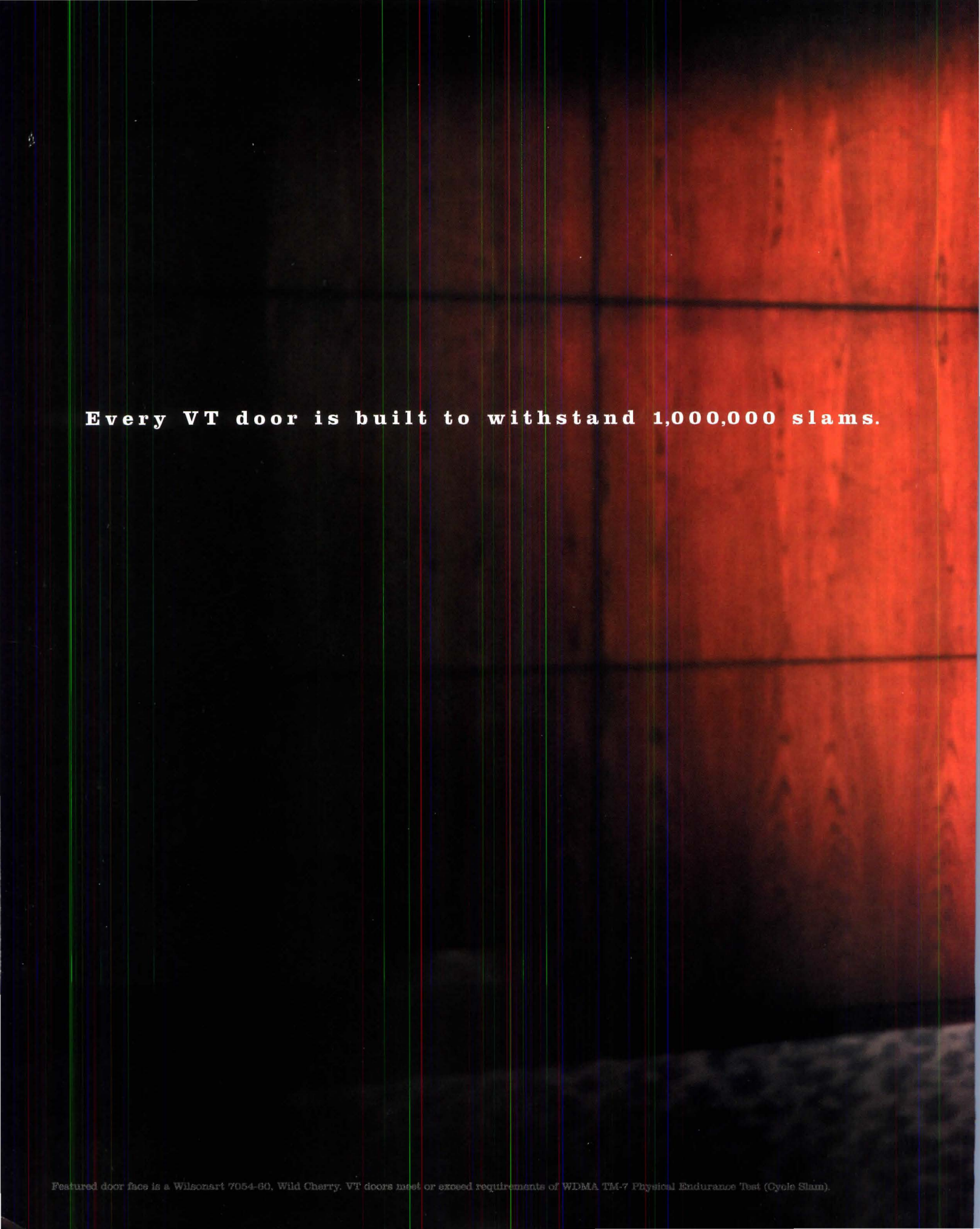

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CIRCLE 38 ON INQUIRY CARD

Calatrava speaks...

about the genesis of his work and the influences that shape his singular vision

Santiago Calatrava plays an astonishing variety of roles in a specialized age: engineer, architect, sculptor, artist, builder, husband, father. The Spanish-born architect and his wife, Robertina, live and work in an elegant white villa beside Zurich's Lake Zurichsee. On a spring day, he and editor-in-chief Robert Ivy met in a museumlike space on the residence's piano nobile, amid Calatrava's models and works in progress. Yellow light and Bach pierced the quietude, and when he spoke, Calatrava talked like an animated philosopher. The two then strolled to lunch beside the lake, a daily ritual.

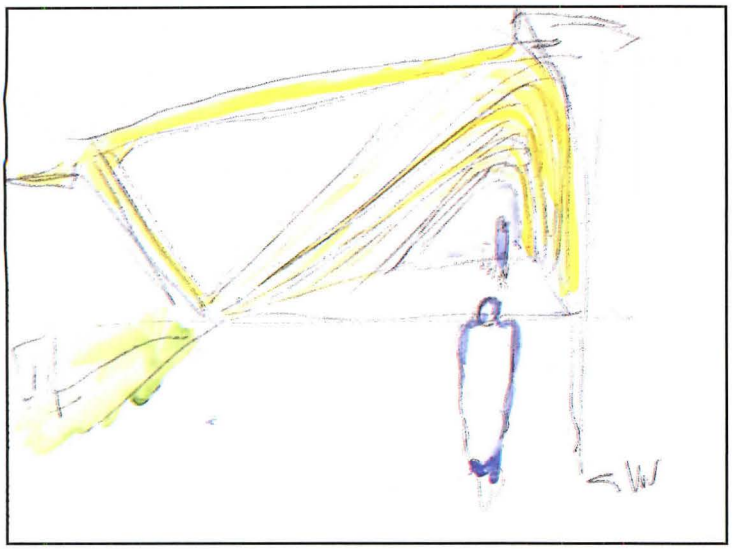
ARCHITECTURAL RECORD: *How do you formulate and develop your ideas?*
SANTIAGO CALATRAVA: I think I have tried to emphasize the importance of place. The very first impression will come from the place. And I think it is fundamental to feel connected to this place.

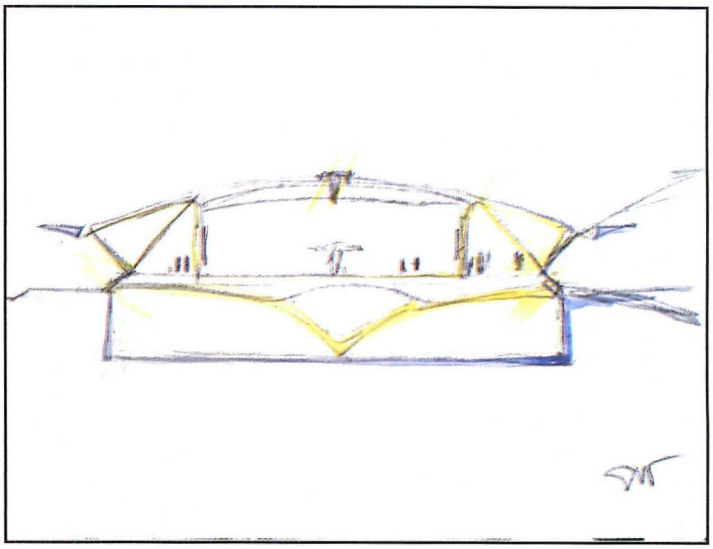
Then I think another relevant element that I would like to emphasize is that the human context is involved, I mean not only the topographical landscape or the climatic or cultural landscape as a natural event but also the human climate.

And with those [elements] I start a work of synthesis. I try to represent ideas as I can, maybe sketching them on paper. And at this point, what I sketch is not only the result of a mental image. At this moment, the sketch is the first manifestation of the idea. In terms of a graphic language, it is just the result of an idea that comes out from these other factors.

I explained that in a very rational way. Probably things don't happen so rationally. Sometimes you think, this is the real shape for this place. But when you say the real shape, you mean also that this is the shape that solves the problems, or some of them, because you also are able through your experience or your capacity for synthesis to understand that things can happen in this shape or in this volume. Understand? This is probably to be done in structures that don't have a very complex function—for example, a bridge, which is a simple link, or a station. When I have to work on projects that have more complex structure, I subdivide the objects in two parts. One we could call a container, in which many things can happen, and the other will be the single part. I employed this approach at the station in Lyon and also at the station in Lisbon.

PHOTOGRAPHY: © PAOLO ROSSELLI



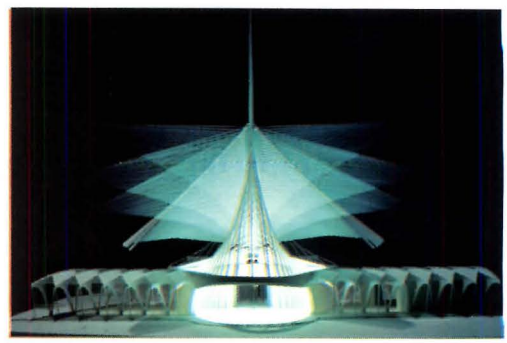


AR: *In Lisbon?*
SC: And in Milwaukee also. You do a part of the building that is much more the essence than the rest of the building, because the rest of the building in all its complexity needs a certain . . . operational understanding of the development of the architecture, in terms of economics, in terms of structure, in terms of modulation and division.

AR: *Your research involves what we call art. You use sketching as a method of seeing.*
SC: The sketch is the instrument that helps me to materialize the ideas, looking for forms at another level, making studies of morphology in a very abstract way. And probably the most abstract way to do studies of morphology is sculpture. Or drawing the human body—to get the movement, to get the gesture.

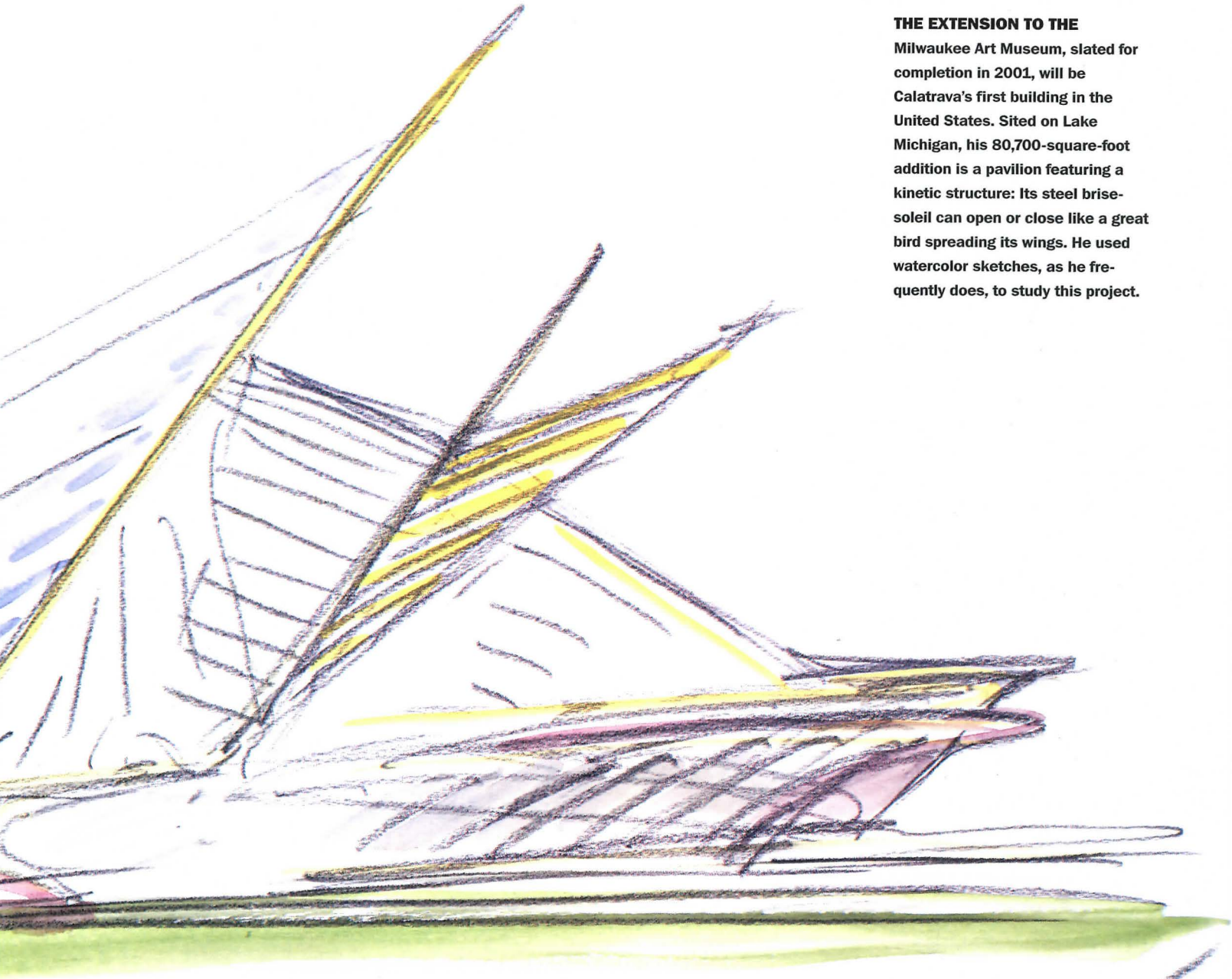
What is important for me is the place and the landscape, the human landscape, the topography. This will inspire or will bring the essence [to a project]. Also important is the analysis of the functional program because this will bring an understanding of the project. On the other hand, the need for the accidental . . . to recreate the research work in which you can channel all the impulses of free thinking, free feeling, shape, or forms or the natural—watching the natural—and this goes from the sketches and the human body into the sculptures. So those are the sources.

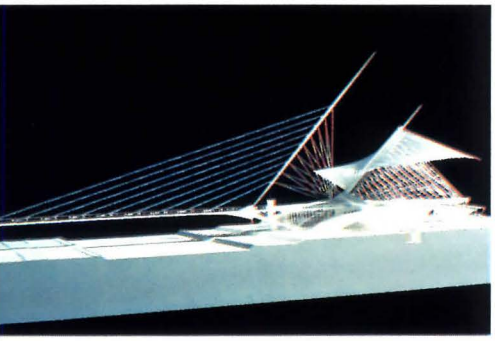
"THE SKETCH IS THE INSTRUMENT THAT HELPS ME TO MATERIALIZE THE IDEAS."



AR: *Contemporary architecture often lacks your level of synthesis. You're bringing another very human gift to design that isn't often done. Do you understand yourself as unusual in that sense?*
SC: I think the problem of architecture has been [related to] a model of linguistics, or model vocabularies. How to overcome the dryness of the pure analysis? Let's say, for example, my approach to the material part of the architecture may be to remember the works of engineers of the 20th century, or my approach of certain formal aspects may even recall my icons of architecture, [such as] Gaudi . . . projecting myself, I mean projecting my dreams, my knowledge, projecting my personal research. *(continued on page 87)*

THE EXTENSION TO THE Milwaukee Art Museum, slated for completion in 2001, will be Calatrava's first building in the United States. Sited on Lake Michigan, his 80,700-square-foot addition is a pavilion featuring a kinetic structure: Its steel brise-soleil can open or close like a great bird spreading its wings. He used watercolor sketches, as he frequently does, to study this project.





Spanning the divide between pure Structure & Art

In the architecture of Santiago Calatrava, two vital forces converge: the influence of art and an enlightened, often poetic, attitude toward structural engineering. In his extensive academic background, Calatrava studied art in Valencia before receiving an architectural degree there. He then went on to earn a doctorate in civil engineering in Zurich with a thesis on the "Foldability of Spaceframes." His work follows in the tradition of such visionary engineers as Pier Luigi Nervi, Robert Maillart, and Felix Candela. Unlike most architects, Calatrava has designed numerous bridges—elements often sequestered to the realm of structural engineering—as well as such monumental buildings as museums, airports, and opera houses. Still in his 40s, he has produced a prodigious body of work.

Among Calatrava's projects, certain images or obsessions recur: analogies with biological structures—rib cages, vertebrae, and branching trees—as well as such kinetic forms as the human eye, birds' wings, and figures in motion. Given these repeated sources of inspiration and the forceful role of structural engineering in his architecture, Calatrava tends to favor more symmetry than many architects of his generation, while often exploring the possibilities of buildings with moving parts. His kinetic designs have ranged from the winglike forms of the Milwaukee Art Museum (currently under construction) to the opening and closing "eyelids" of an emergency services center in St. Gallen, Switzerland; the Valencia Planetarium; and the unfolding "petals" of his Reichstag dome (unbuilt).

In his bridges—perhaps the most purely distilled of his forms—standard structural conditions are frequently reconsidered and given an unexpected grace, fluidity, dynamism, and balance. Though the bare bones and the sinuous tendons and ligaments of structure are essential to Calatrava's work, he researches them, in part, through such "softer" disciplines as sculpture making (many of his pieces reside in the front yard of his lakeside villa—his home and office—in Zurich) and watercolor sketching.

Accompanying our exclusive interview with the architect [page 70], we offer the following sampler of his work: a portfolio of projects new, old, and forthcoming.

THE VALENCIA CITY OF SCIENCE & Planetarium traces its roots back a decade to an initiative by the government of Valencia, Spain, to boost the city's cultural prominence with a new science museum complex. In 1991, Calatrava won a competition for a communications tower on the site, and was later awarded the commission to develop the entire complex, including a planetarium and science

museum, and eventually the Palacio de las Artes, a performing arts center with an opera house. In the form of an eye, the planetarium (preceding two pages) features a globe cradled in an elliptical pod with a kinetic slatted brise-soleil. Recalling the river that once flowed on its site, the science museum (this page and opposite) is a longitudinal building—790-foot-long—in the tradition of great 19th-century exhibition pavilions. A glass-infilled concrete framework on the south face evokes branching trees. The future Palacio de las Artes and opera house will anchor one end of the complex's long axis.

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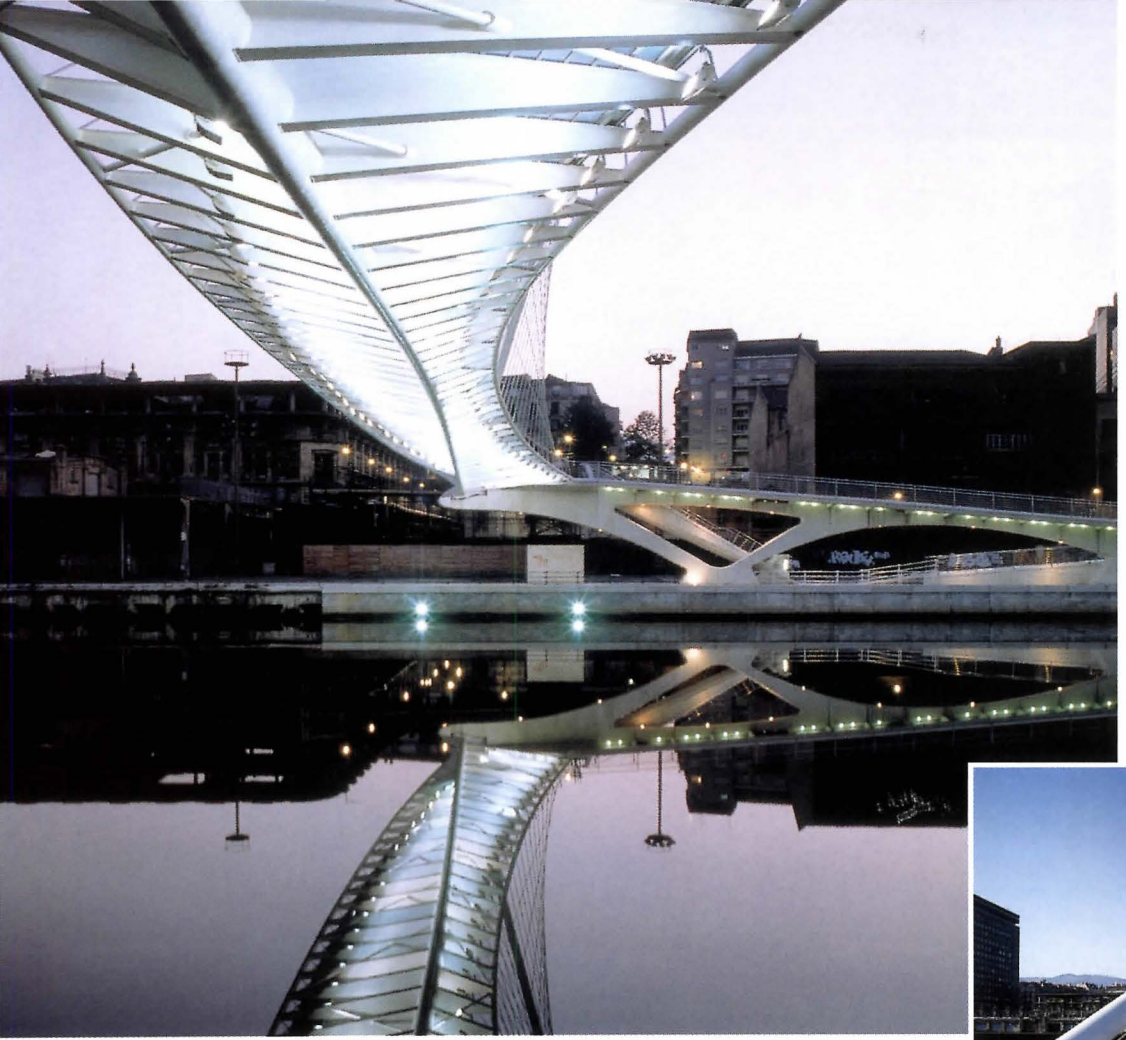
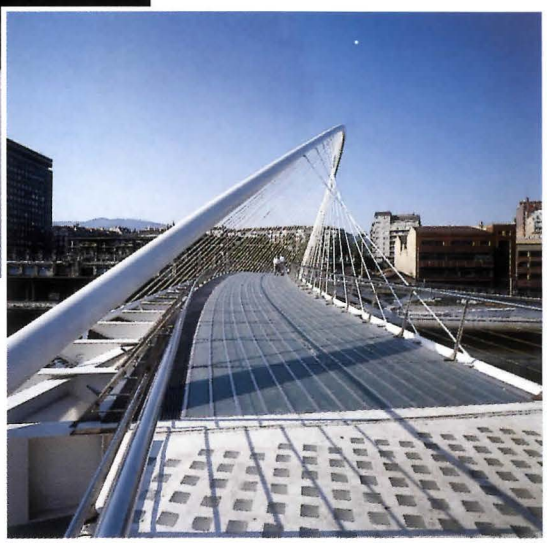


THE CAMPO-VOLANTIN BRIDGE, in Bilbao, Spain (1990–97), spanning 232 feet, acquires a visual dynamism from its inclined parabolic arch structure. Its curving path and translucent paving become especially dramatic when illuminated from below at night.



"WITH A BRIDGE," SAYS CALATRAVA, "A SINGLE GESTURE CAN TRANSFORM AND ORDER NATURE."

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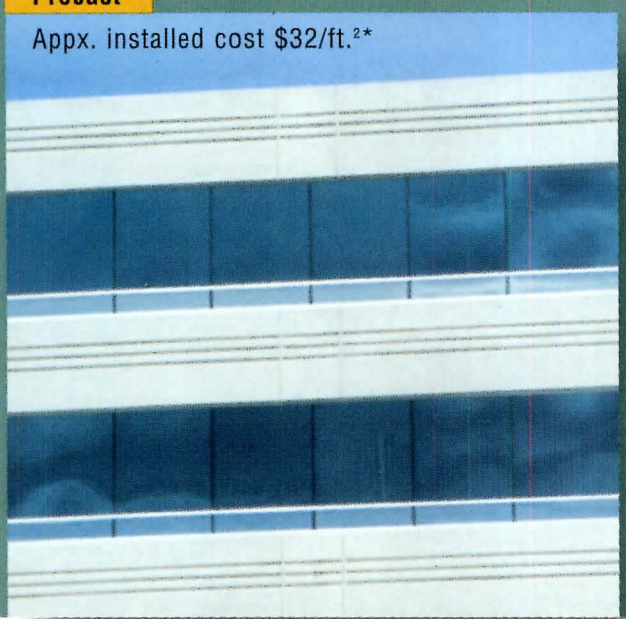

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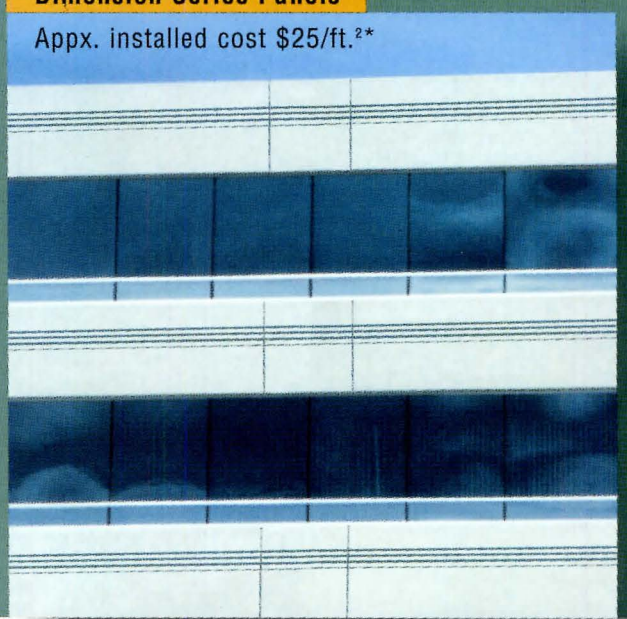

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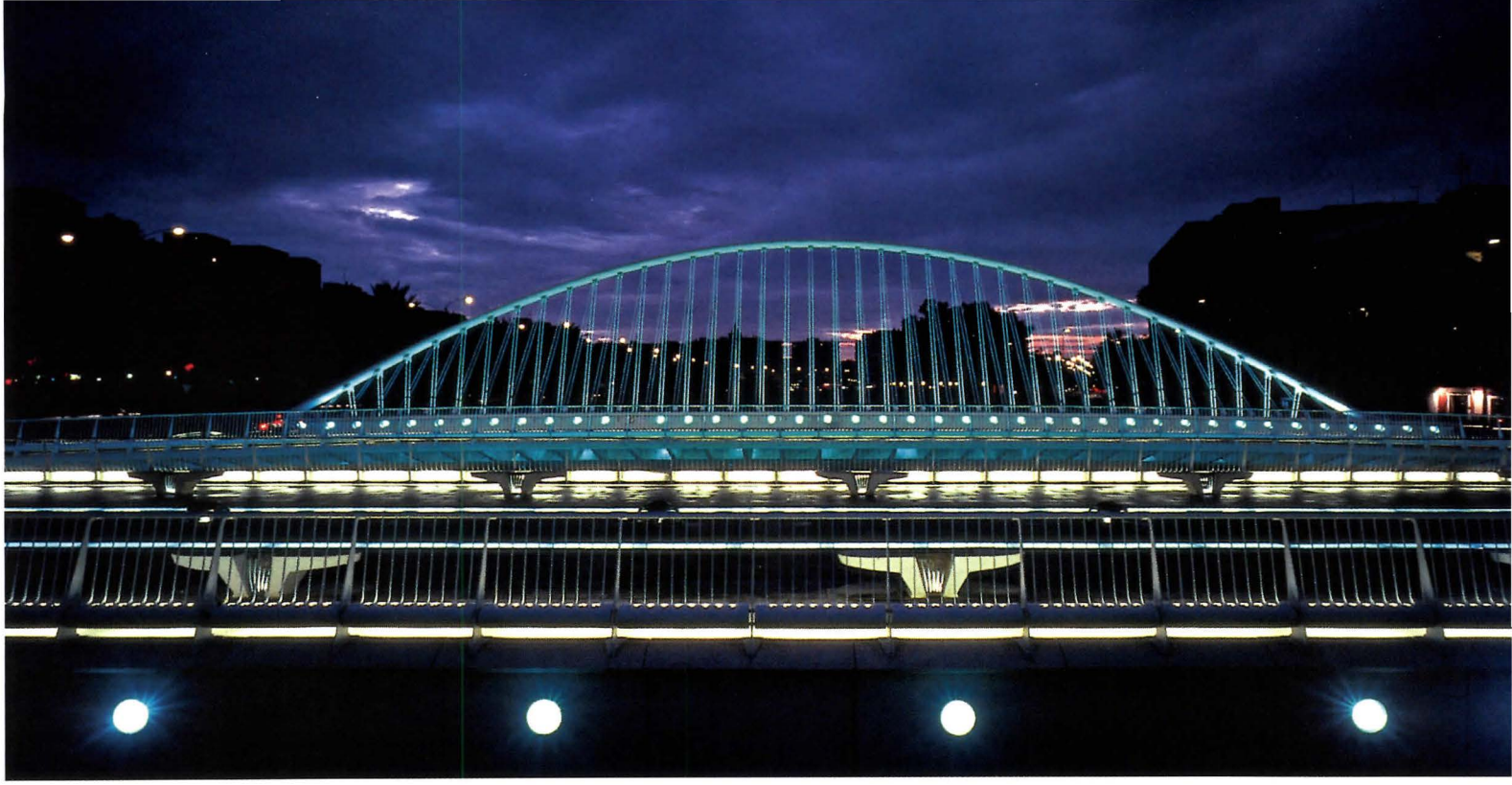

"WE MUST REDISCOVER THE BRIDGE," SAYS CALATRAVA OF A FORM THAT DISTILLS THE ESSENCE OF HIS STRUCTURAL INVESTIGATIONS.

THE HOSPITAL BRIDGES (above) and Manrique Footbridge (below) of Murcia, Spain, (1993-99) span 177 feet across the Segura River. In the Hospital Bridges, a central pedestrian deck, is flanked by twin vehicular decks with an inclined-arch suspension system, powerfully strung like a pair of great harps.

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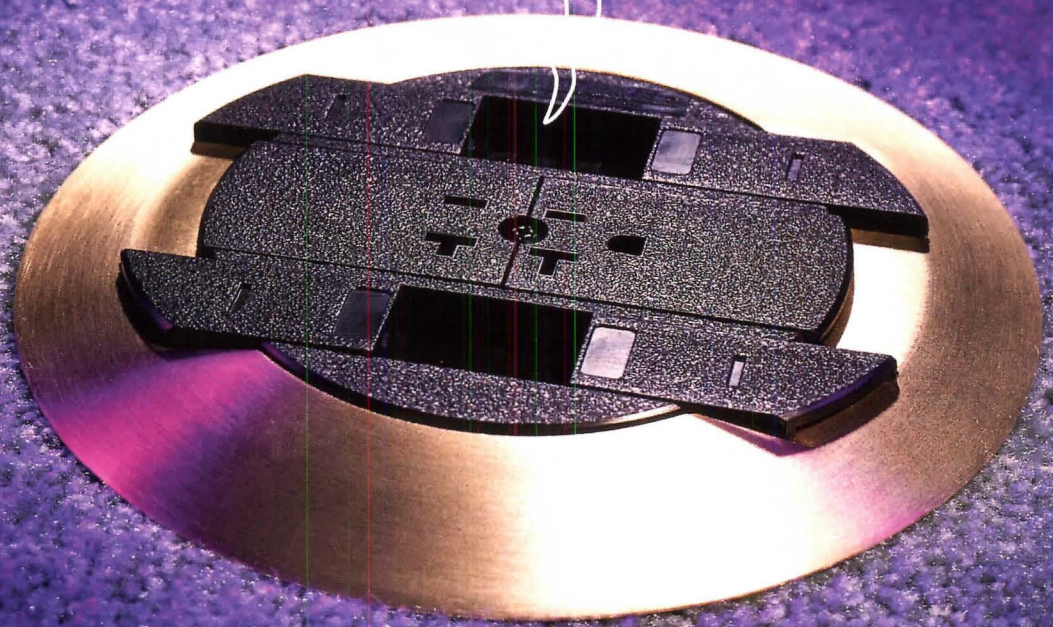

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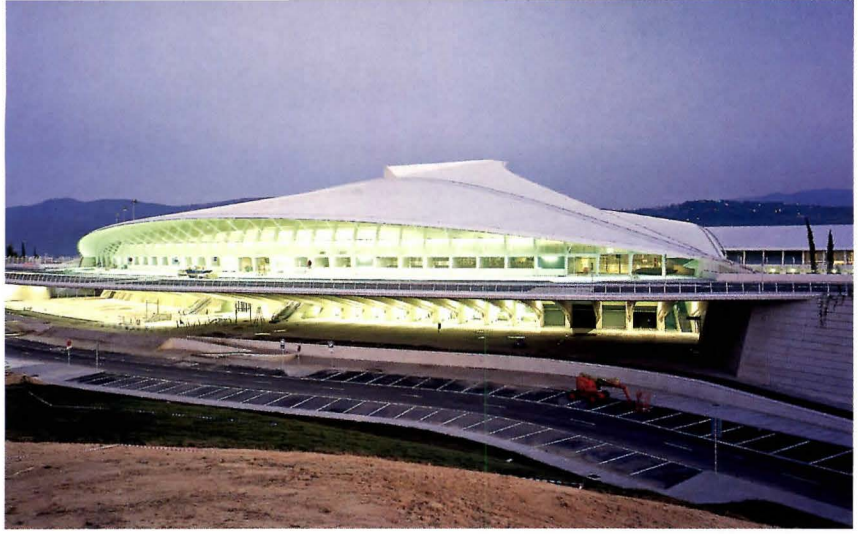

THE SONDICA AIRPORT in Bilbao, Spain (1990–2000), draws on aerodynamic birdlike forms—as does Calatrava's Airport Station in Lyon, France, his Bajaras Airport in Madrid, and the late Eero Saarinen's TWA airline terminal in New York.

CALATRAVA'S PUBLIC WORKS CONSISTENTLY ASPIRE TO MAKE IMPACT AS CIVIC SYMBOLS.

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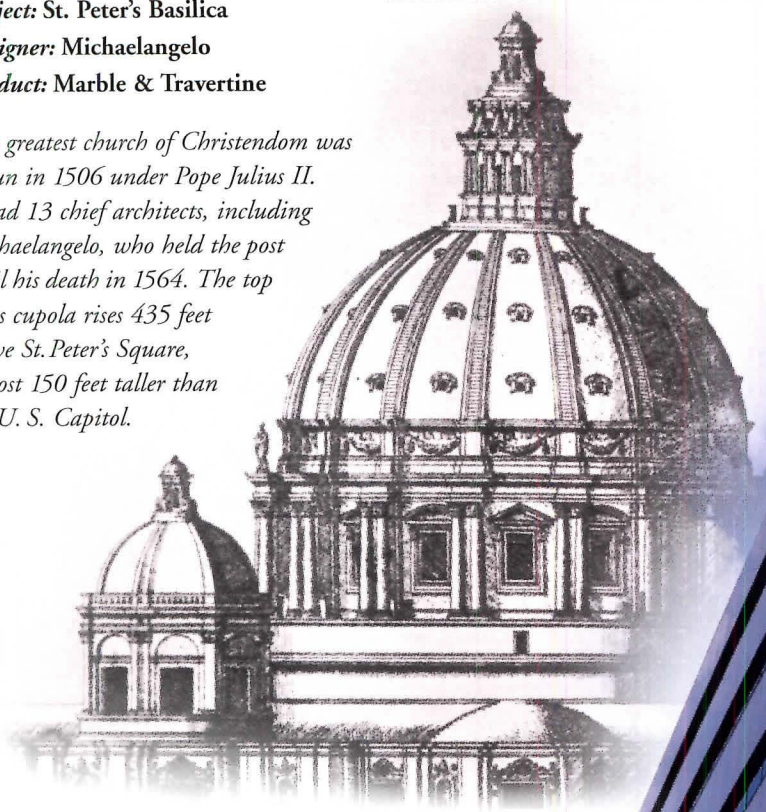

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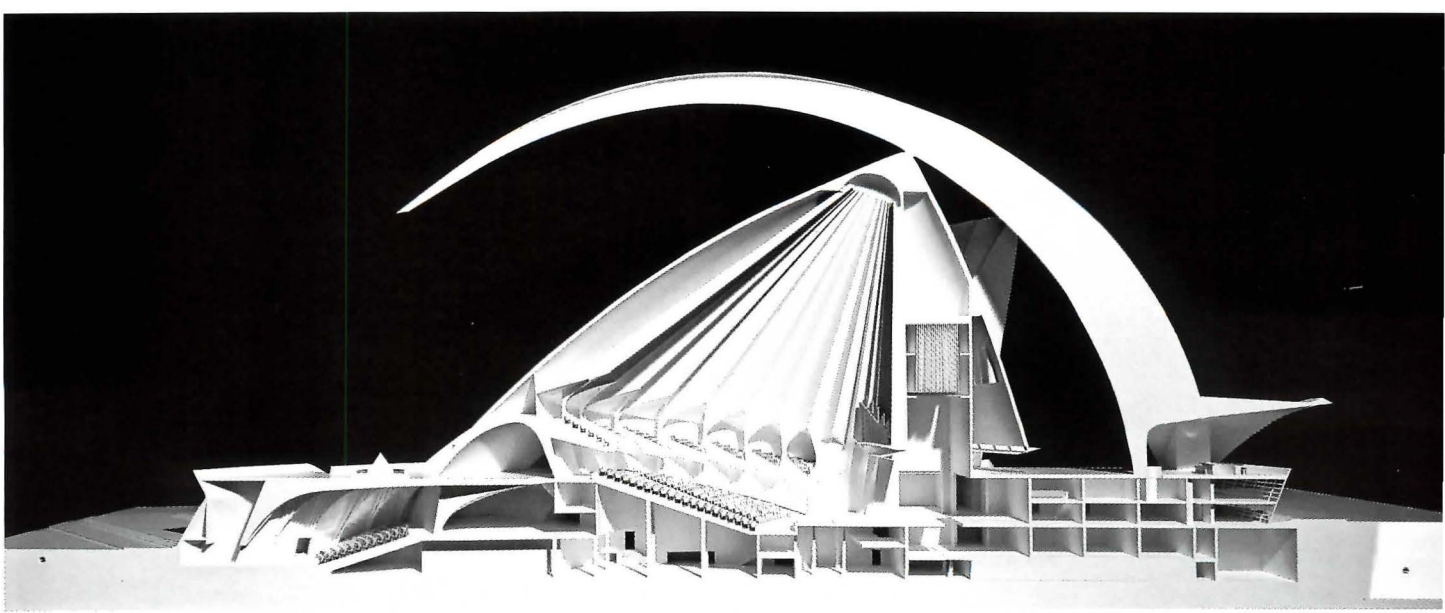
THE LYON-SATOLAS AIRPORT Station (1984–94)—abstractly like a bird poised for flight—is 60,000-square-foot competition-winning design that links France's high-speed train network with the Lyon Airport. The gracefully arcing roof (which actually weighs 1,300 tons) provides a symbolic gateway to the region.

CALATRAVA'S GRACEFULLY BALANCED FORMS OFTEN EVOKE SUCH BIOLOGICAL STRUCTURES AS RIBCAGES, VERTEBRAE, OR EYES AND FIGURES IN MOTION.

THE TENERIFE OPERA HOUSE, in the Canary Islands, is one of two Calatrava opera houses currently in the works. (The other, in the Palacio de las Artes, will anchor the long axis of Valencia's City of Science.)



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CALATRAVA INTERVIEW *continued from page 72*

I have more than the paradigm of an architect; I have the paradigm of a painter, an example of a painter—Cézanne, who spent all his life just trying, he said, to make some little progress. I am doing little progressions. You understand what I mean. I like his personality very much. At the end of his life, he almost always painted outdoors, taking nature as the real model. And I apologize, not taking the example of an architect. Many architects have built like that, but I think Cézanne is so splendid. And so uncomprehended in his stance, just a few people understood his work, but [it was] so important for the next generation.

"IF WE CONSIDER ARCHITECTURE AN ART, THEN ENGINEERING IS ALSO ART."

AR: *You are both an architect and an engineer; it is surprising that you've been talking about your "research" when, in a sense, you mean your art. Art seems to be where these strands come together. How do you describe yourself?*
SC: I would like to emphasize that if you step back in history, you will see that architecture has been considered an art. If you study the history of art, [you will find] this pure understanding that architecture is an art. This is something that, for me, needs to be strongly emphasized.

Engineers and architects belong to the same [profession], but there is not a clear independence between the two.

So if we consider architecture an art, and engineering as part of, or a branch of, architecture, then engineering could ultimately be considered an art. But the most interesting thing is, I want to go even further.

AR: *You've discussed intuition. Here's a very rational question. Do you use the computer?*
SC: Myself, I don't use the computer. I draw everything by hand or I sketch.

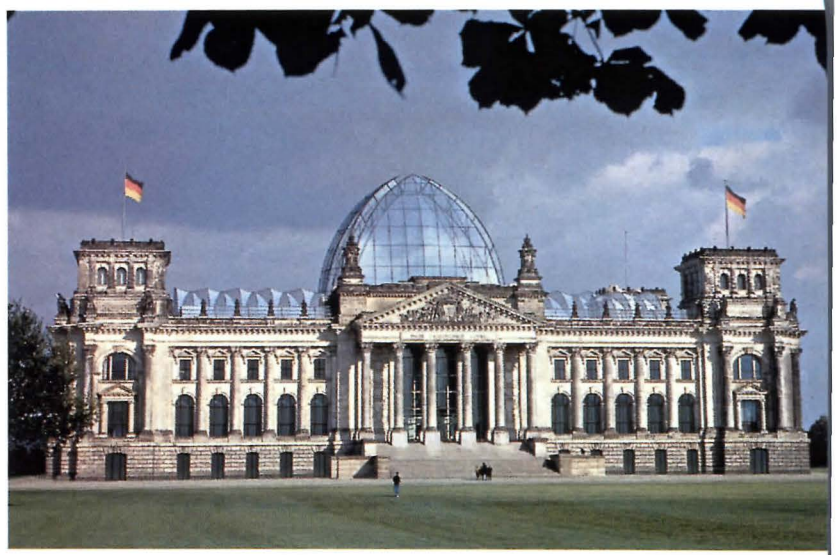
AR: *You do use your hand to sketch and to draw. What's the relationship between your mental process and the physical act of drawing?*
SC: Ultimately, the problem of an idea is not only having the idea but finding the clarity to express this idea. . . .Even a poem needs to be written in simple words. So the sketch as the translation of the idea has, in my eyes, by itself a very high value.

When Matisse speaks about his drawing, sketches appear very intimate because sketches are usually done only between you and yourself. A sketch can clarify what has happened in your mind. So it is like a letter to yourself.

And I think this— the intimacy is very important. Sketches can become bigger or the sketches can become more detailed until you solve a joint, or you solve a connection, or you describe this or that.

I want to give you a more contemporary example on sketching: there are two filmmakers, one is Fellini and the other Akido Kurasawa, and both used to do sketches of their shots—very beautiful drawings by Fellini or sketches for very particular scenes by Kurasawa, who was master of the camera, the movies.

I think they were trying, through the sketches, not only to show what they wanted, but also to show people working with them what they were envisioning. And on the other hand, [to] get an aesthetic feeling that goes beyond the power of the words. Because certain ideas are internal. His ideas and my ideas are internal, but at least looking at a common object, we both are getting an aesthetic vibration that is also not only a pure design, but more than that—also a message of emotion. *(continued on page 89)*



AFTER THE FALL OF THE BERLIN WALL and the decision to relocate the German government to Berlin, a 1992 competition was held for the Reichstag building's conversion. Three first prizes were awarded—including one to Calatrava. Unique aspects of his scheme, such as a filigreelike transparent dome, were adopted by other entrants in the second phase of the competition. (Only Calatrava's proposal had a clear dome with petal-like openable segments.) Ultimately, the commission was awarded to Sir Norman Foster.

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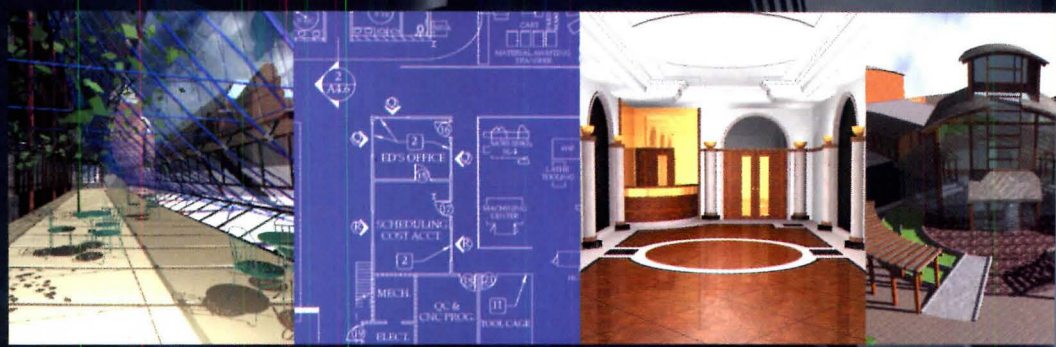

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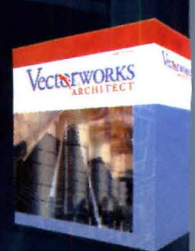

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CALATRAVA INTERVIEW *continued from page 87*

AR: *What about your own work in relationship to this moment? How do you think it relates to the late 20th century?*

SC: We should look at [the question] not from my point of view versus the object, but [from the point of view of] those who have generated the object. I know, for example, the major part of my career is [dedicated to] public buildings.

Most of them are here in Europe. This shows you that, at the end of the 20th century, the public authority took a lot of responsibility as a promoter of architecture. Most of the work emerged from competitions. We have done 120 competitions, something like that. So it also shows how important the system of competitions is for this public authority promoting arts, and also for someone like me. So the fact of competing with other architects immediately contextualizes the architecture, because you are competing with other people who are offering things that are contemporary.

People who chose those projects very often look for the new idea. I am obsessed with the idea of getting just one or two steps forward, but, it doesn't [always] matter. Sometimes other people, when they judge, are looking for something completely new, you understand.

The fact that the buildings are public represents very much an ideological moment in which the public authorities take part in the consciousness, and the fact that [the projects] are chosen by competition shows you another particular [point of view]. Many of them are bridges—or they are stations. Or they are museums and music buildings. All of them are related to the city.

For example, I try very hard, to bring dignity . . . [to] forgotten buildings like bridges. I try very hard to do that. I think the 1950s and the '60s and the '70s have been very bad years for bridges, because they were all purely controlled by economics. And no major technical achievements, like the Golden Gate, and also no major formal achievements. They were just economics, economics, and economics. Giving 20th-century bridges a little bit of the dignity that existed before, this was an important goal.

You can say the same thing about a railway station. This coincides also with the moment in which high-speed [technology] changes the utility of the station.

[As for museums] . . . another word that was very common in the 20th century, especially at the end, is culture. The word *culture* comes from the Latin *cultus,* and *cultus* is a cult to the gods, in this case, a cult to the muses. But also the understanding of culture as more accessible part, so [we have] public museums.

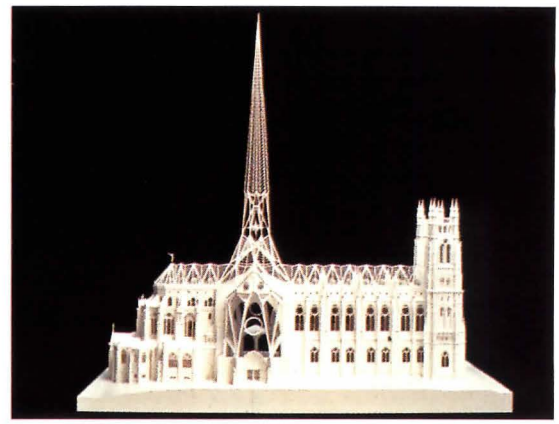
Another aspect of the city in the 20th century is the [urban] periphera. I'm not speaking of the suburban area where the wealthy people live in villas. Very often the peripheral areas can be terrible, very ugly. Bridges, concert halls, museums—those things deserve [good design] because they help to restructure these areas and to create new experiences.

I am very proud of this city-related aspect of my projects. Also that many of those projects have been related to mobility and transportation—airports, railway stations, bus stations, or bus shelters.

AR: *Your buildings are bold. Most of the buildings that we make lack this boldness—you make a statement when you make a building.*

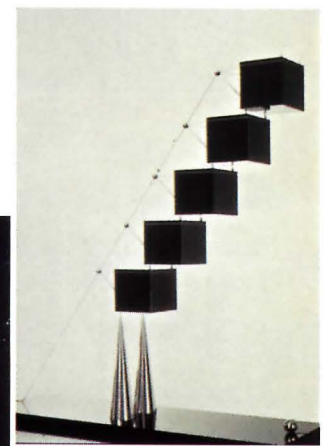
SC: Many of those [bold] buildings are in the [urban] periphera, in very poor neighborhoods. When we built a bridge in Barcelona, it was one of the first commissions I had—the first one for a bridge—and it was in really a very poor neighborhood. The object, which is strong, helped to regenerate the area in a way.

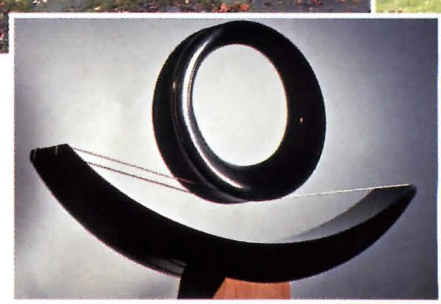
Why the strength of the elements in *(continued on page 258)*



The Cathedral of St. John the Divine in New York City originally began in 1892, but remains unfinished. In a 1991 invited competition, Calatrava proposed opening the roof toward the sky with a new glass-and-steel structure, housing a bio-shelter.

CALATRAVA DRAWS INSPIRATION from sculpture for the creation of many architectural ideas. Some consider structural conditions, while others examine folding surfaces and forms.





REM KOOLHAAS and OMA lead the Dutch onto new turf

By Michael Speaks

Now that he has been named 23rd recipient of the prestigious Pritzker Architecture Prize, it will be even easier to misunderstand the genius of Rem Koolhaas and his Office for Metropolitan Architecture (OMA). Koolhaas is undeniably one the most important architectural figures in the world today. Anyone familiar with his Nexus Housing in Fukuoka, Japan (1991), the Kunsthal in Rotterdam (1992), the Educatorium in Utrecht (1997), or the houses in Holland and in France (such as the 1991 Villa Dall'Ava in Paris or the 1998 Maison à Bordeaux), cannot fail to recognize them as exceptional architecture. The Pritzker, however, is not bestowed on merely good or even great architects, but on those architects who display a kind of singular (primarily formal) artistic genius. It is somewhat ironic, then, that Koolhaas and his Office for Metropolitan Architecture have been recognized with the Pritzker at the very moment when he himself has drawn an even greater distinction between the practice of the "art of architecture" and another species of architecture pioneered by his office over the last 25 years.

PHOTOGRAPHY: © COURTESY OMA

In response to globalization, Koolhaas graphically exclaims "YES" with signs for the yen, the Euro, and the U.S. dollar (above). OMA proposes that Amsterdam's Schiphol airport be built on an island (with a shopping mall) in the North Sea (left).

Koolhaas straddles a line drawn by his own hand between Pritzker-type architects of the recent past and a future generation of young Dutch architects whose ambitions have been defined largely by his buildings and ideas. Koolhaas and OMA have not only generated worldwide interest in architecture and urbanism in the Netherlands, they have provided the entire Dutch architectural world with a kind of intellectual and design endowment equal to the generous financial subsidies provided by the government and distributed through institutions like the Netherlands Architecture Institute. Aspiring architects in Holland are influenced by OMA's irreverent ideas, designs, and presentation style, even to the point of adopting Koolhaas' speech mannerisms and word choices. "Astonishing," "condition," and "ambition" find their way into practically every conversation about architecture and urbanism. It is fair to say that Koolhaas and OMA have given to contemporary architecture in the Netherlands an entirely new model for a

Michael Speaks is head of the Graduate Program and director of the Post-Graduate Metropolitan Research and Design Program at the Southern California Institute of Architecture (SCI-Arc), in Los Angeles.

Rem Koolhaas, the 2000 Pritzker Architecture Prize Laureate, accepting the prize at this year's ceremony, held *May 29 in Jerusalem.*

practice uniquely suited to respond to the social, political, economic and technological disruptions wrought by globalization.

Quantity over quality

In many ways, Koolhaas' first publication, *Delirious New York* (1978), presciently defined the agenda for this new practice. There, Koolhaas focused on an architecture less concerned with form and ideology than with the shaping forces, logic, and technologies of the metropolitan condition; an architecture of quantity, not quality, where density and scale provide opportunities that outstrip the enfeebled art of architecture; and on an architecture that exploits opportunities presented under conditions of constraint.

In an essay entitled "Bigness," from *S, M, L, XL* (1995) Koolhaas was even more explicit, arguing that the art of architecture is useless in a world more and more dominated by quantity. "Issues of composition, scale, proportion, detail," he wrote, "are now moot. The 'art' of architecture is useless in Bigness." Furthermore, architecture would remain important in this world scraped of conventional architecture, only by acknowledging its limitations and dependence on forces beyond its control.

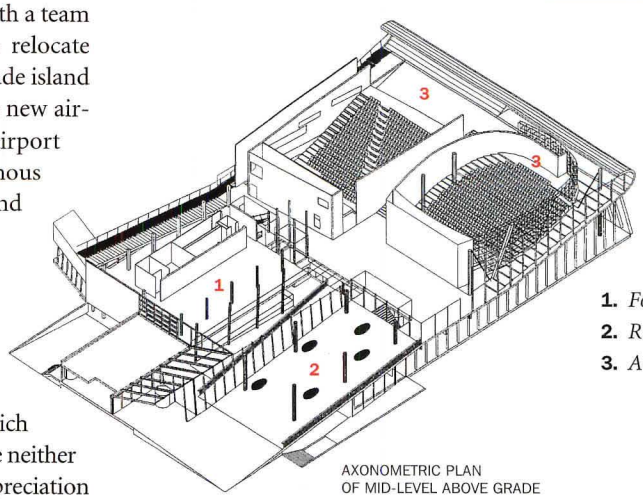
Now there is AMO

More recently, Koolhaas has distanced himself even further from the art of architecture with the startup of his new virtual office, AMO (OMA reversed) that defines itself as a new-economy architectural consultancy focusing on the potential of the unbuilt. So now there are two offices: OMA, which will continue to make buildings; and AMO, which will focus on projects like the one Koolhaas worked on in collaboration with a team of marketing, banking, transport, and other consultants to relocate Schiphol airport from the heart of the Netherlands to a man-made island in the North Sea. Their only design product was a logo for the new airport. As he remarked recently about the collaboration on this airport project, "Architecture is important, but no longer as an autonomous discipline, but as a way of thinking very much connected and aligned with other ways of thinking."

Junkspace as muse

Consistent with his dismissal of the art of architecture, Koolhaas has always expressed an interest in what he today calls "junkspace," the built detritus of contemporary life that makes up 99 percent of the metropolitan condition within which most of us reside. The term, like his use of "generic," is meant to be neither pejorative nor celebratory, but opportunistic; this amateurish appreciation

The Educatorium for Uithof University in Utrecht (1997), is a concrete-and-glass structure with two 400- and 500-seat auditoria. Executed as part of OMA's master plan for the campus, its ground floor accommodates a 900-seat cafeteria with a sloped ceiling and randomly placed columns, (right). The 35,000-square-foot building also contains three examination rooms and a roof garden.



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2. *Ramp*
3. *Auditorium*

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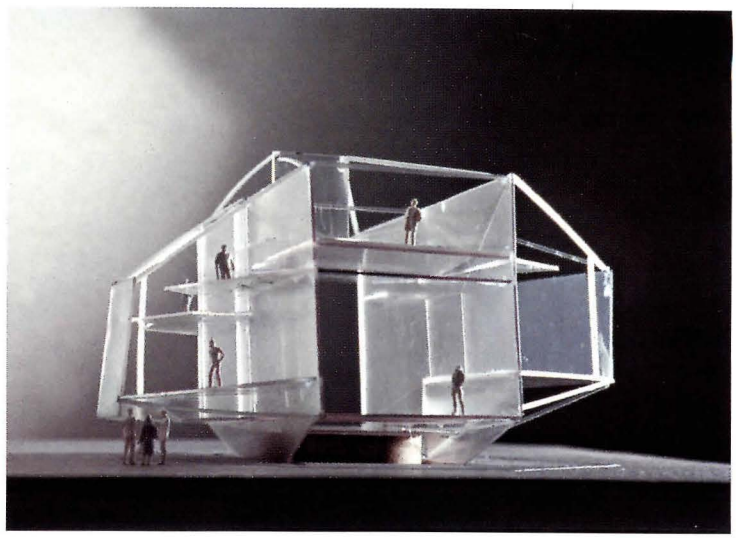
distinguishes Koolhaas' interest in the everyday from the late 1960s valorization of Vegas pop and Jane Jacobs–style urbanism.

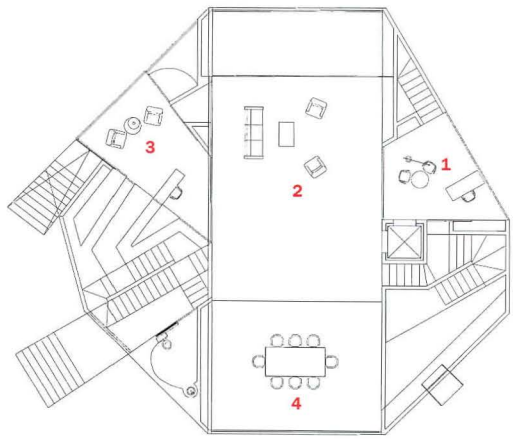
Koolhaas has an affinity for the most brutal and coarse materials and forms, from the orange safety netting of the villa in Paris, to the garish plastic toilet and bar facilities in the Congrexpo, (1994) in Lille, France, which OMA commissioned from the Dutch industrial designer Joep Van Lieshout. This fascination extends to the research Koolhaas is now conducting through his "Project for the City" studio at Harvard, where he has been teaching since 1995. Research areas have included the gargantuan urban development occurring in China's Pearl River Delta, the history and ideology of shopping, and currently, the organized chaos that forms the infrastructure of Lagos, Nigeria. For Koolhaas, these areas are the future, not the past, of global modernization, and as such, should be studied to formulate design interventions dealing with Lagos-like conditions unfolding on the edges and the inner cores of Paris, Los Angeles, Phoenix, and Rotterdam.

Koolhaas has employed not only the materials of junkspace, but he has artfully adopted its banal sensibility in OMA designs and buildings. He dared, in his Bordeaux house, to make a piston/elevator and its disabled owner/occupant the centerpiece of an elegant dissertation on "living"; he proposed, in a competition entry for MoMA's expansion in New York, to make shopping and its attendant means of conveyance, escalators, the raison d'être of the venerable art museum. Furthermore, he audaciously shoved the program of an enormous concert hall in Porto, Portugal, with all its acoustical demands, into a house form previously designed for an OMA client obsessed with Y2K; and he made ramping the design focus of the Kunsthal in Rotterdam, as well as two libraries proposed for a university campus in Paris. He also proposed a town plan for Melun-Senart, France, in which he suggested that the most significant intervention architecture could make was not to make one. All this has still resulted is some of the most breathtaking architecture of the last 20 years.

In OMA's Y2K house (1999) for a Rotterdam client, spaces on two levels are carved out of the overall volume, with parking underneath. The form led to Casa di Musica, a competition-winning concert hall in Porta, Portugal, with a "shoebox" hall embedded in its mass.

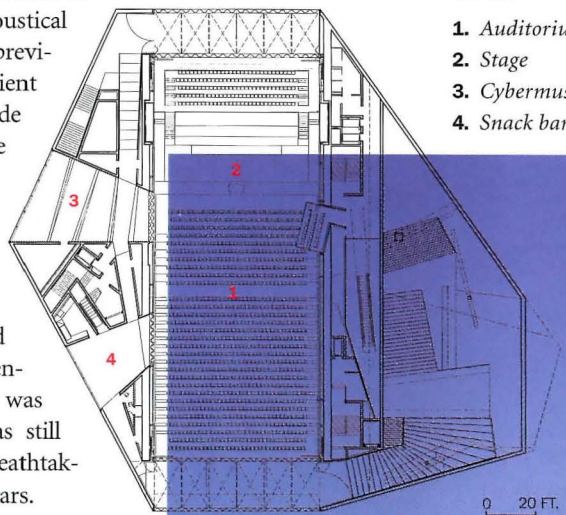


1. *Studio*
2. *Living room*
3. *Library/office*
4. *Dining room*



LEVEL+4

1. *Auditorium*
2. *Stage*
3. *Cybermusic facility*
4. *Snack bar*



Innovation as a form of practice

But the real significance of the new practice of architecture developed by OMA is perhaps best illustrated by a distinction drawn by management thinker Peter Drucker between problem solving and innovation. Problem solving simply accepts the parameters of a problem given by society or, in the case of architecture, by the client. The object of design is then to work within those parameters until a solution to the problem is reached, a final design. This is how "the art of architecture," traditionally represented by

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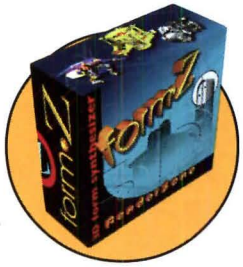

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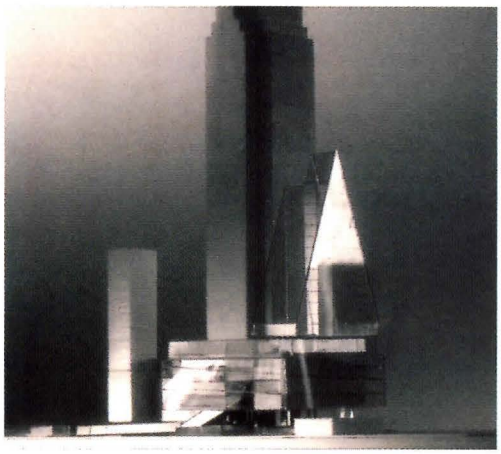
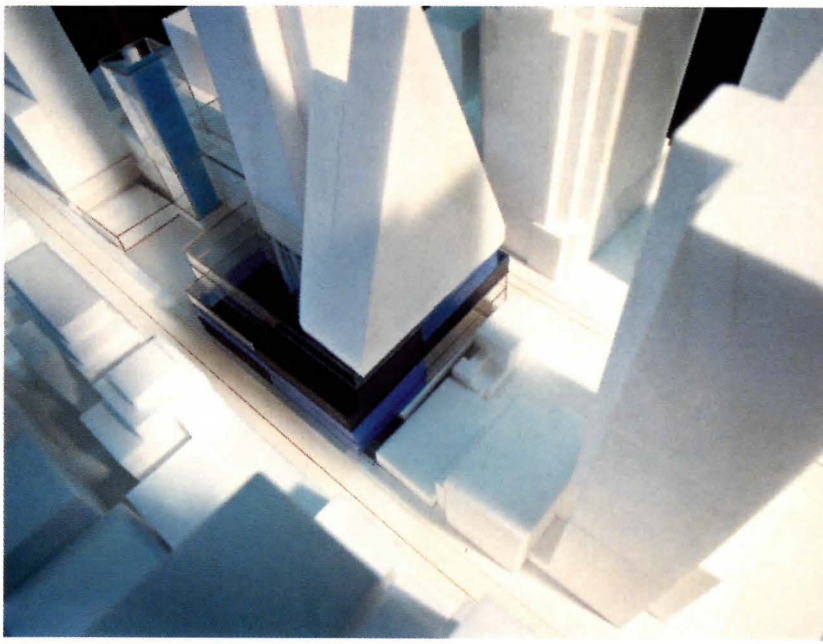
CIRCLE 47 ON INQUIRY CARD

cultural institutions such as the Pritzker Prize, and indeed by much of the architectural establishment, approaches the dramatic changes thrown up by the forces of globalization. Innovation, Drucker tells us, works by a different, more entrepreneurial logic where, by rigorous analysis, opportunities are discovered that can be exploited and transformed into innovations. While problem solving works within a given paradigm to create new solutions to known problems, innovation risks grappling with the existent but unknown in order to discover opportunities for design solutions that could not have been predicted in advance.

This innovative approach is seen in many of OMA's recent designs, such as their Prada stores in New York, San Francisco, and Los Angeles. OMA has discovered "branding" opportunities in the Prada design campaign, for example, that only architects are able to exploit. In a world saturated by brands and logos, Koolhaas/OMA proposed to solidify Prada's identity not by creating a unique, signature design that would represent Prada, but instead by designing an exciting urban environment that creates a unique Prada experience. Today, we live in a new "experience economy" where products are no longer differentiated by the quality of their design, nor by the level of service, but rather by the creation of unique experiences that surround the product. Rather than abandon this new territory to marketing or branding agencies, OMA has exploited the emergence of this new economy to discover architectural opportunities.



OMA's submission for the Museum of Modern Art expansion in New York (1997) projected a triangular tower with the Sculpture Garden (right) depressed a level below grade. One of the few proposals that relocated the venerated garden, Koolhaas' scheme didn't win.



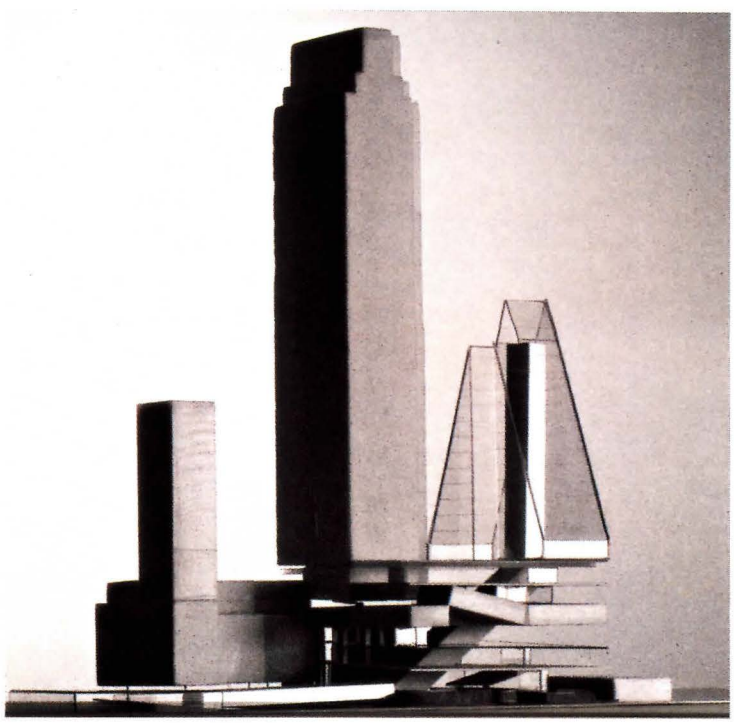
Young Dutch

It is clear that Koolhaas/OMA remains one of the most innovative offices in the world today. OMA innovates in order to innovate. Now a host of intrepid young Dutch architects, many of whom once worked at OMA, has begun to dominate public lecture series, symposia, and magazine and newspaper discussions of contemporary architecture and urbanism. The familiar jumble of letters and numbers that name their offices and publications (MVRDV, UN Studio, West 8) has joined Koolhaas' own to become the lingua franca of design change among students in almost every school of architecture in the world. What is more, French, German, Japanese, and American varieties of "Dutch" architecture are beginning to emerge around the world—some franchised versions of OMA, some, like the young French office Périphérique, seemingly genetically predisposed to the new Dutch approach.

TODAY, THE CREATION OF UNIQUE EXPERIENCES DIFFERENTIATE THE PRODUCT.

What is not clear is whether these "Dutch" architects, Netherlandish or otherwise, will transform OMA's innovative practice, or whether they simply will use this practice as just a way to solve problems. Given the new standard that Koolhaas' selection has set for the Pritzker Prize awards, it is sure that if they choose the path of mere problem solving, no "Dutch" architect will ever again be considered for this prestigious award.

On the other hand, perhaps the selection of Koolhaas was itself not as innovative as one might hope; perhaps it was not meant to award creativity or redefine the art of architecture, but to solve a problem: that the world's most important architectural thinker and one of its most important builders had yet to receive their approval. Maybe, though, it was a decision driven by the need to re-brand the Pritzker Prize itself, to make it the marker of architectural innovation and not a reward for a job well done. We will only have a short wait to find out. ■



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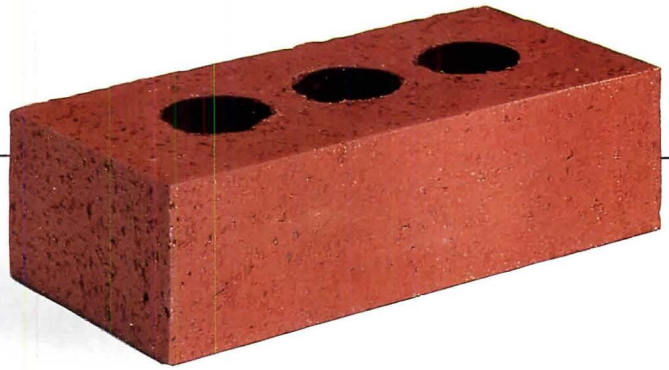

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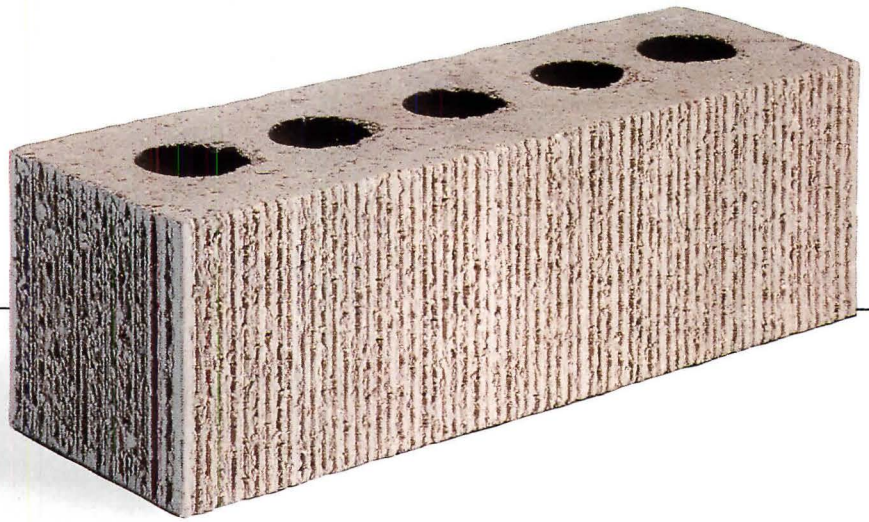

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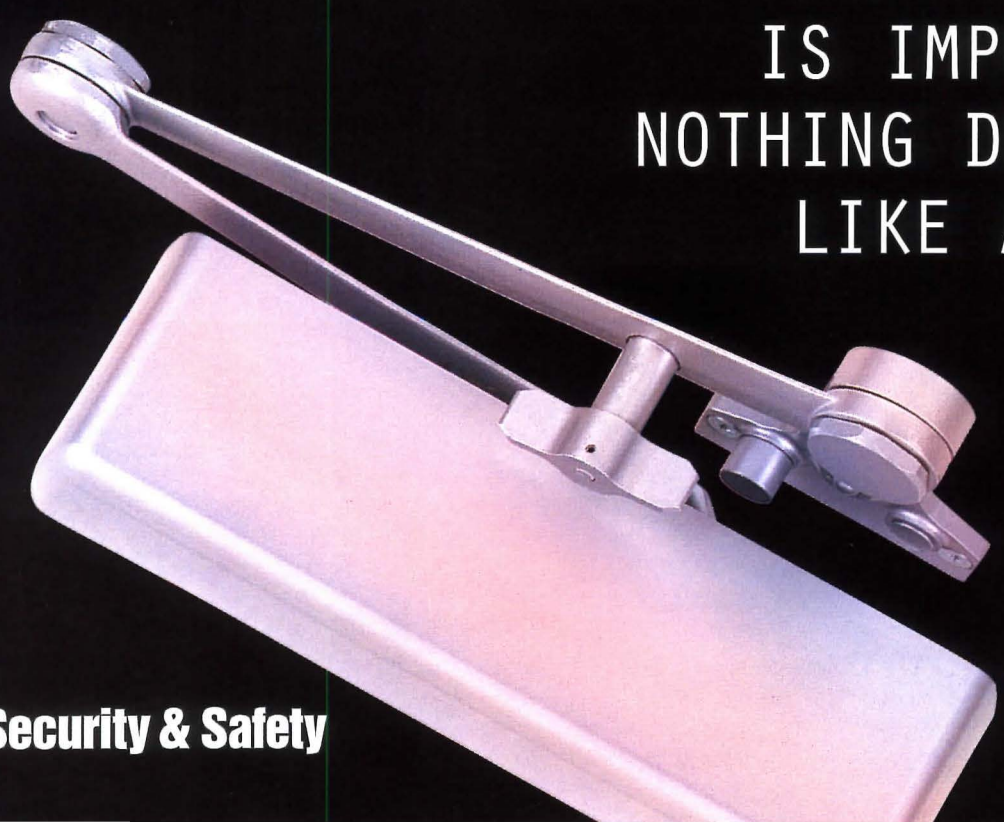

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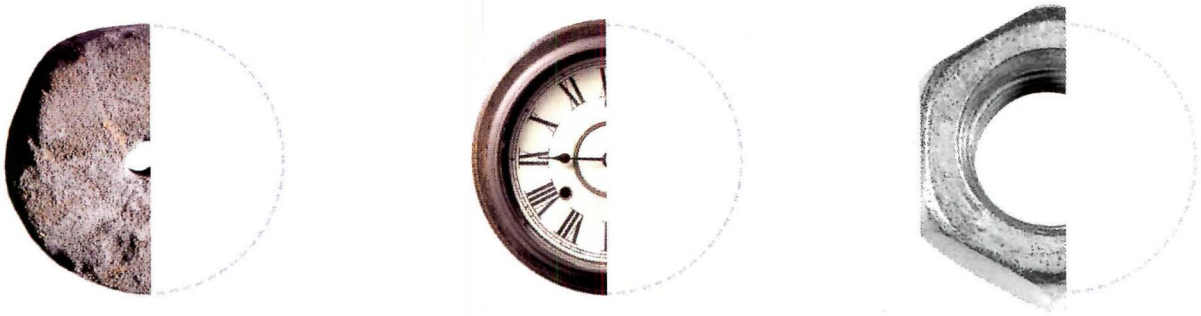

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CIRCLE 50 ON INQUIRY CARD

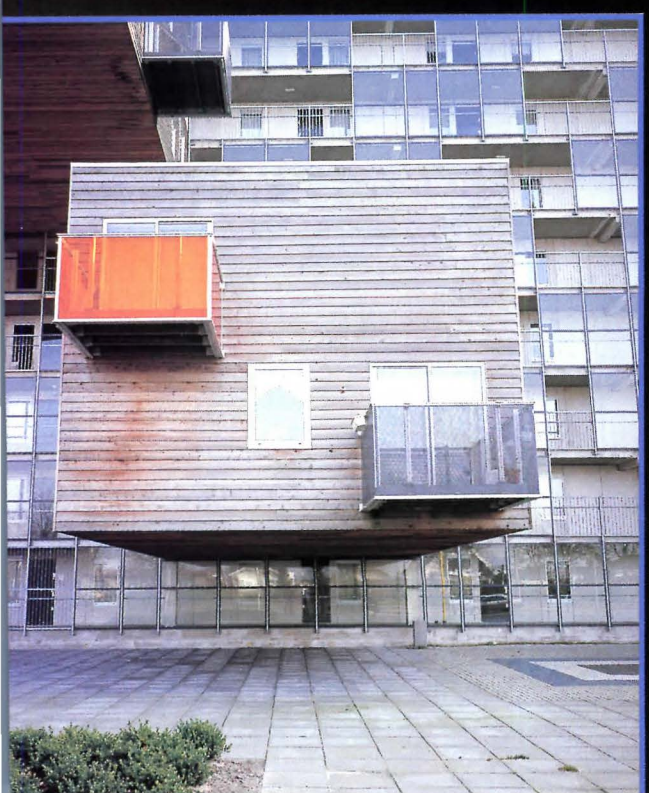
New architecture of extraordinary creativity is bursting forth in Spain and Holland

Why did we choose these two countries to showcase in July, and why do we apply such seemingly arbitrary adjectives as "hot" and "cool" to the architecture of two disparate European nations? Spain tends to be the hotter, climatically; Holland, cool, yet the architecture of each country could be described by both familiar adjectives—depending on how you couch the phrase. Whose architecture is hotter than that of the Netherlands in AD 2000, the year of Rem? Contemporary Spanish architecture, for all the Spanish brio, seems to revel in a certain Modernist formalism.

Spain and Holland show us that Modernism with a capital "M" is alive and well in Europe. Though their approaches vary, both nations employ contemporary architecture as signals of cultural and economic health. In addition to the masters, such as Moneo, Calatrava, and Koolhaas, a new generation of architects in each country is bending, even changing the rules of the game. Both groups are represented here and deserve attention.

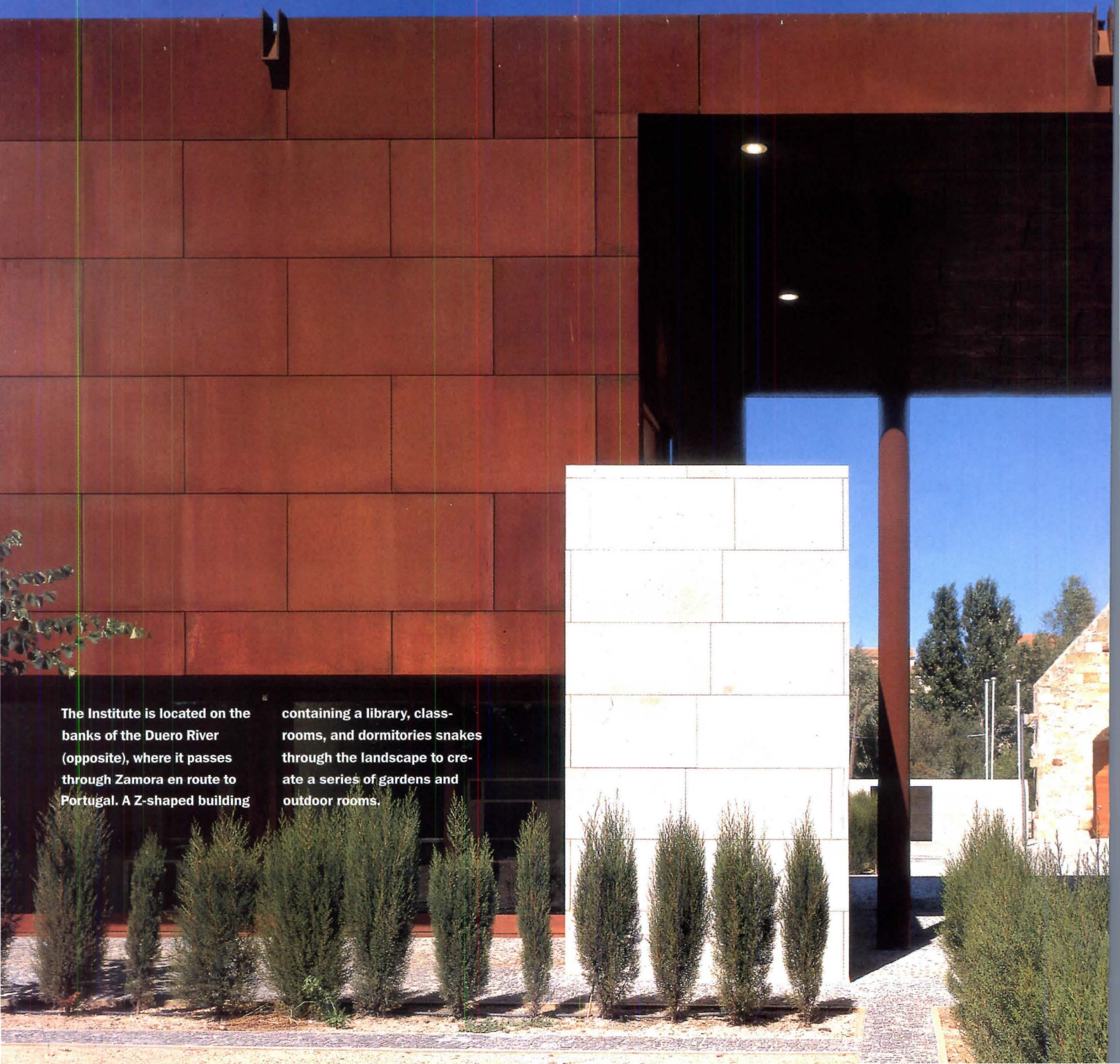
How do they differ? To oversimplify, Dutch architecture is more concerned with urban planning, ecological matters, and mutability. A fierce intellectualism, the school of Kool, is being plugged into the Web. In Spain, architecture tends to be more concerned with the plastic, formal, and the material. Light reigns. The architecture can be gloriously tactile, even sensuous.

Unlike the bulk of current work in the U.S., where, with certain spectacular exceptions, client expectations and market forces often compromise for the mundane, European architecture is riding high. Spain and Holland are not alone in producing architecture of quality and creativity—visit Germany, Switzerland, or Britain and find imagination channeled into buildings. We celebrate the continent's architectural achievements at a fertile moment by presenting two exemplars, both hot and cool. *Robert Ivy, FAIA*

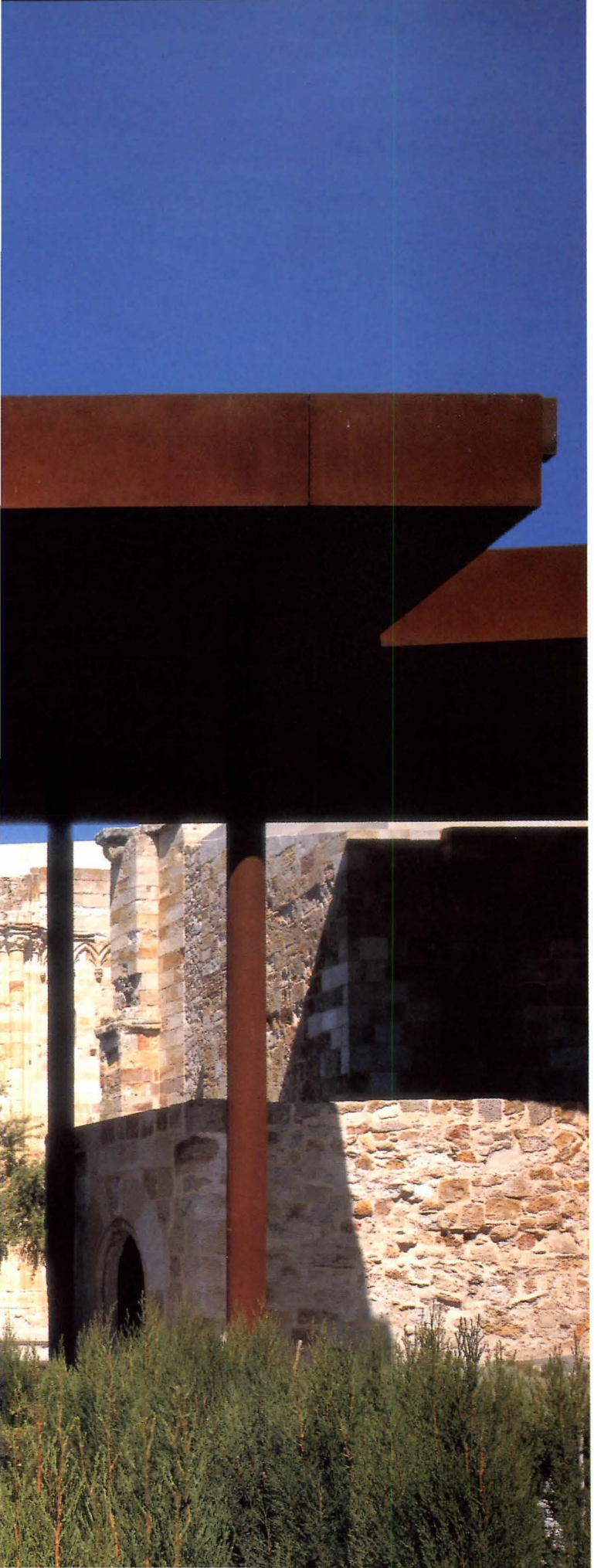


PHOTOGRAPHY: © EDUARDO SÁNCHEZ & ÁNGEL LUIS BALTANÁS (INSTITUTO HISPANO-LUSO, TOP); GERARD HADDERS (WOZOCO HOUSING PROJECT, BOTTOM)

Manuel de las **Casas** marries a Gothic convent with modern structures to create the **KING ALFONSO HENRIQUES INSTITUTE** in Zamora



The Institute is located on the banks of the Duero River (opposite), where it passes through Zamora en route to Portugal. A Z-shaped building containing a library, classrooms, and dormitories snakes through the landscape to create a series of gardens and outdoor rooms.



By David Cohn

Manuel de las Casas, who turns 60 this year, belongs to the generation of Madrid architects who helped forge the architectural image of a modern, democratic Spain in the decades following the death of Franco in 1975. A contemporary of Madrid colleagues Rafael Moneo and Juan Navarro Baldeweg, though perhaps less well known abroad, he first won wide recognition for innovative public housing, such as the Palomeras blocks, the sculpturally modeled redbrick towers built in the Vallecas district of Madrid in 1979–86. In his 1992 Department of Agriculture for the regional government of Castilla-La Mancha, he inserted a contemporary office building in the heart of old Toledo, arranging the new construction around a series of narrow patios in harmony with the character of the historic setting. Like Oriol Bohigas in Barcelona, De las Casas also played a key role in promoting quality architecture at a national level during the 1980s. As a top administrator in the Ministries of Culture and Public Works, he commissioned many of Spain's best architects for important public buildings and spearheaded restoration programs for endangered historic monuments. He currently holds a Chair in Design at the Madrid School of Architecture, and received Spain's National Architecture Prize in 1999.

De las Casas drew on his experience in both historic preservation and contemporary design in his competition-winning project of 1992 for the King Alfonso Henriques Institute of Spanish-Portuguese Studies. The institute is situated amid the ruins of a 16th-century Gothic monastery on the banks of the Duero River in Zamora, an ancient provincial capital not far from the Portuguese border. It is jointly sponsored by the Spanish and Portuguese governments as a scholarly retreat and conference center for cultural interchange. A sister institution, housed in a building designed by Álvaro Siza, will soon open downriver from Zamora in the Portuguese city of Porto.

With its dormitories, refectory, and spaces for quiet study and meetings, the program for the institute had much in common with that of a medieval monastery, although little remained of the original Franciscan monastery on the site except the imposing roofless ruin of its apse. De las Casas proposed a building that would maintain this relationship, preserving the suggestive beauty of the ruins and drawing out the fragile but evocative memories of monastic life they retained.

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

Project: *Instituto Hispano-Luso "Rei Alfonso Henriques" rehabilitation of the Convent of San Francisco, Zamora, Spain*
Architect: *Manuel de las Casas, principal; Blanca Lleó, Leandro Iglesias, Antonio de las Casas (structure); Juan Carpio (installations); Felicidad Rodríguez (plastics); M. Alberola, J. Blanco, I. de las Casas, R.S. de las Casas, F. Garcia, J. Garcia, J. Gonzalez, Ricardo Tendero, Alfredo Blanco, project team*
Contractor: *Rearasa*

The remains of three chapels (left and opposite) have been transformed for new uses. One is a meeting room, another is an exhibition and lecture room, and the third houses the reception and management areas.

His design follows the traces of the monastery's layout, leaving as outdoor gardens the spaces of the original cloister and church. De las Casas explains that "the new buildings are very simple, a background to the open spaces, which are the fundamental elements." The different functions and buildings are thus fragmented across the site, as in a ruin, connected only by the gardens. As a result, landscaping and planting have received as much care as the details of the construction.

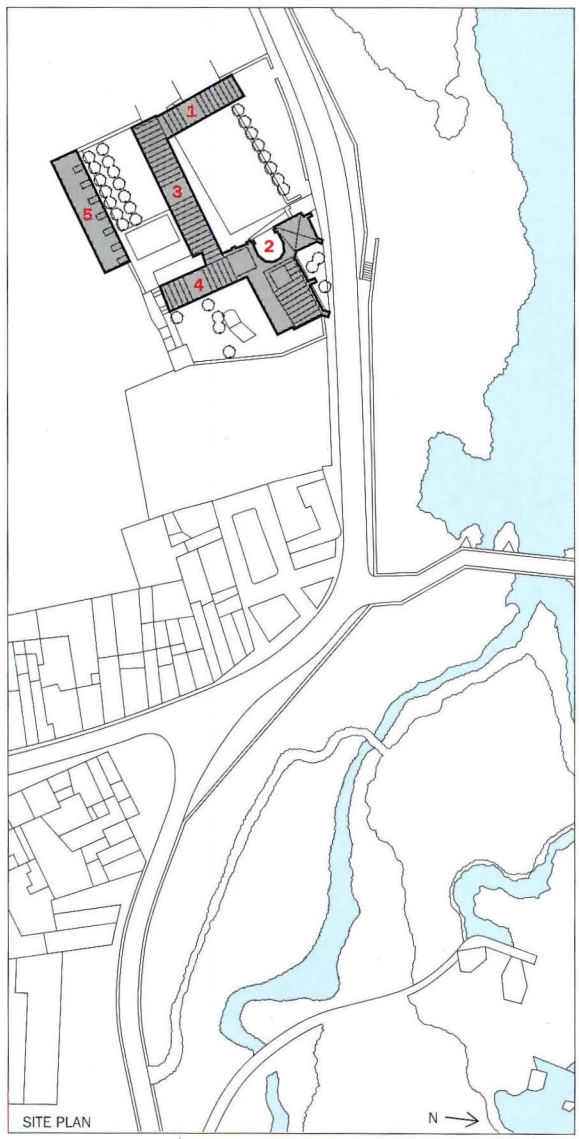
De las Casas maintained what he calls a "Ruskinian" approach to the ruins, in that he sought to preserve their "patina," the scars and stains of time and deterioration, which Ruskin felt to be essential to the

DE LAS CASAS PROPOSED A BUILDING THAT WOULD PRESERVE THE SUGGESTIVE BEAUTY OF THE RUINS.

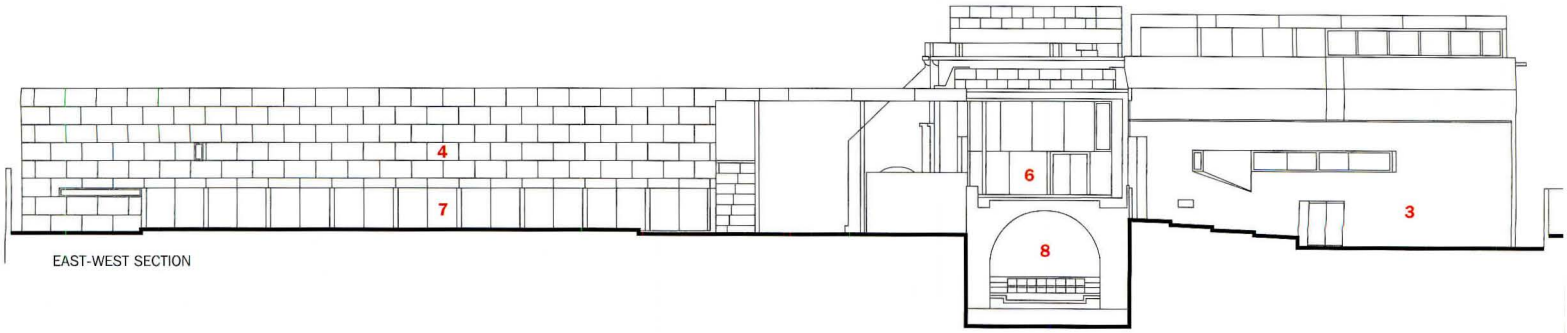
character and aesthetic impact of works from the past. Working with master stonemasons, he sought only to "stabilize the ruins so they wouldn't fall down." In the same spirit, the new structure was clad in self-oxidizing corten steel, chosen as a contemporary complement to the weathered sandstone of the ruins.

The main entry to the institute from the street and screened parking area opens directly to the garden of the former nave, which De las Casas compares to a public plaza. The garden is framed by the curving apse and an L-shaped new building containing seminar rooms and a library on its second floor. These public spaces are raised on a windowless base, almost like a classical podium, which lifts them up to views over the monastery's original boundary wall to the spires of Zamora across the river.

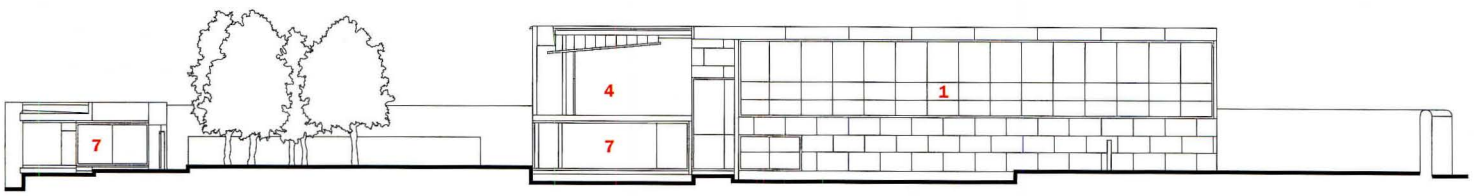
Beyond the paved section of the former transepts and crossing, De las Casas planted the nave area with rows of miniature cypress, interrupted by clearings containing an almond tree, an *alméz* or hackberry, a pomegranate, and a *azufaifo* or jujube—fruit-bearing trees that were introduced by Islamic invaders in the eighth century and often are found in old gardens of the Castilian plateau.



1. *Library*
2. *Old church apse*
3. *Dormitories/classrooms*
4. *Assembly/cafeteria*
5. *Dormitories*

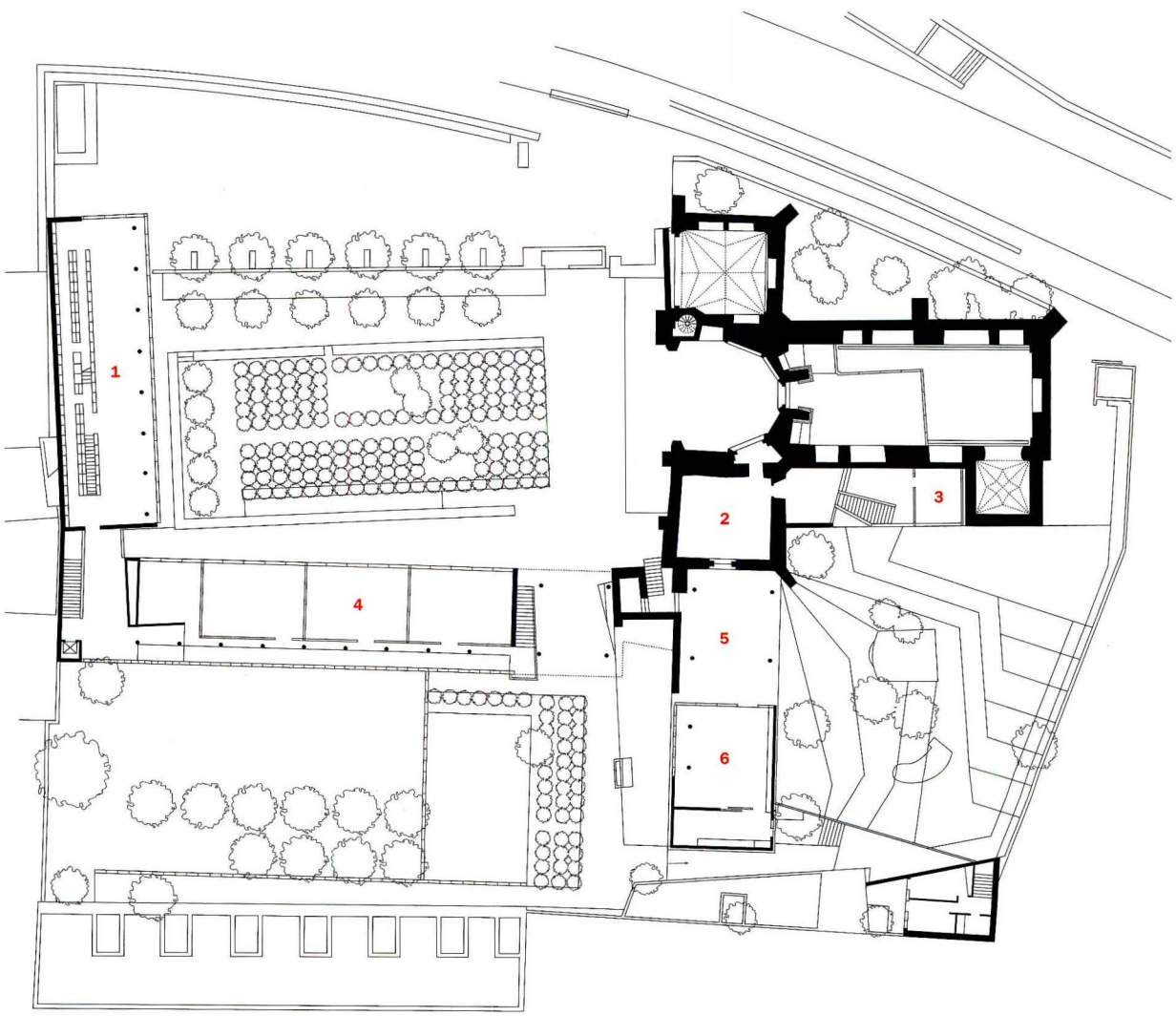


EAST-WEST SECTION



NORTH-SOUTH SECTION

1. *Library*
2. *Boardroom*
3. *Administration*
4. *Classroom*
5. *Dining terrace*
6. *Cafeteria*
7. *Dormitories*
8. *Assembly*



MAIN LEVEL

The roof of the classroom building extends to the cafeteria, and creates a union between the new and existing construction (left). This union also establishes a connection between the north and south patios (below).

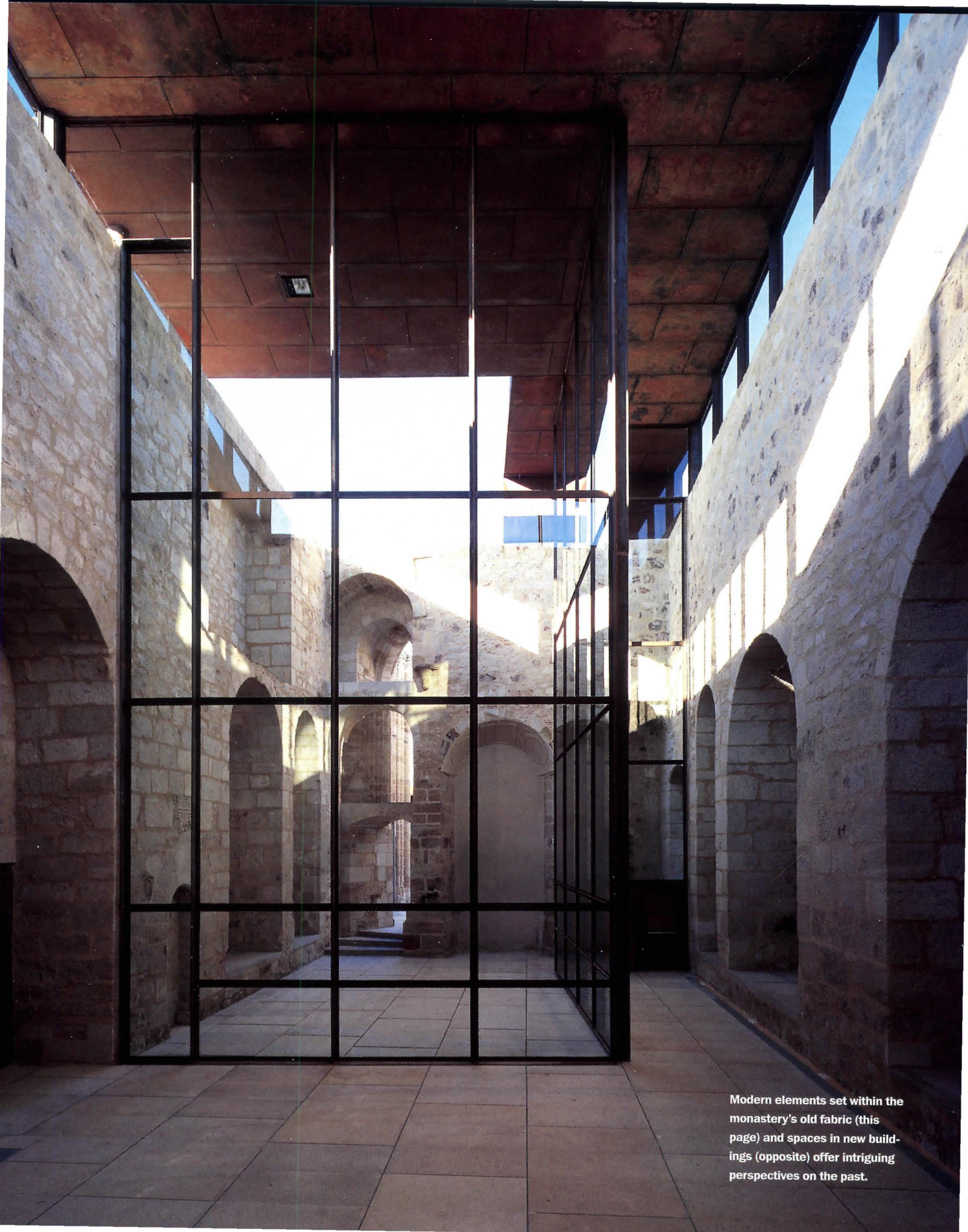
A monumental open-air portico leads from this space to the more private and informal garden of the former cloister, which is lined on one side with dormitories for students, located under the seminar rooms, and on the other with larger quarters for professors. The seven professorial suites are located behind the seven original openings of an existing wall. Each suite is arranged around a small private patio, like the cells in a Cistercian monastery. The roof above them is planted with wild herbs native to the region, whose aroma perfumes the air, while linden trees shade the garden's center. A raked sand garden outlines the foundations of the old refectory, evoking both the meditative sand gardens of Japanese monasteries and the furrowed fields of Castile.

IT WOULD BE AN UNDERSTATEMENT TO DESCRIBE DE LAS CASAS' WORK AS AN ARCHITECTURE OF PLACE.

The high portico leading to this garden also unifies scattered entries to other elements. In the new wing, a granite stair rises to access the classrooms and library. Behind the apse, narrow flights of old stone stairs lead down to a semi-buried cellar, reconstructed as a public auditorium, and up to the newly built cafeteria on its roof, with a raised and covered terrace that captures evening breezes in the summer and offers spectacular views of the city.

In the adjacent ruins, two intact side chapels were minimally restored for use as an administrative center and boardroom. Their original Gothic vaulting was protected on the exterior by simple stone enclosures. A larger roofless chapel, used as an exhibition hall, was enclosed only partially by a new roof that hovers above it, maintaining the powerful impression created by its exposure to the elements. A deteriorated fresco in one of the chapels was left as it was found, and two windows were filled with stained glass designed by the architect's wife, the artist Felicidad Rodríguez, who also designed the deep green tones of the library's walls. Other new windows and doors are of cedar or corten steel framing, and floors are of local granite.

It would be an understatement to describe De las Casas' work as an architecture of place. In its immersion in the forces gathered on the site, the interwoven themes of history, nature, time, death, and the persistence of life and culture, the institute invokes a romantic 19th-century tradition. De las Casas is able to achieve this depth of expression using simple and abstract forms. In the institute, he has enlarged the expressive range of architecture not through a dense formal development, but rather through a sensitive orchestration of environmental relations and poetic associations. ■

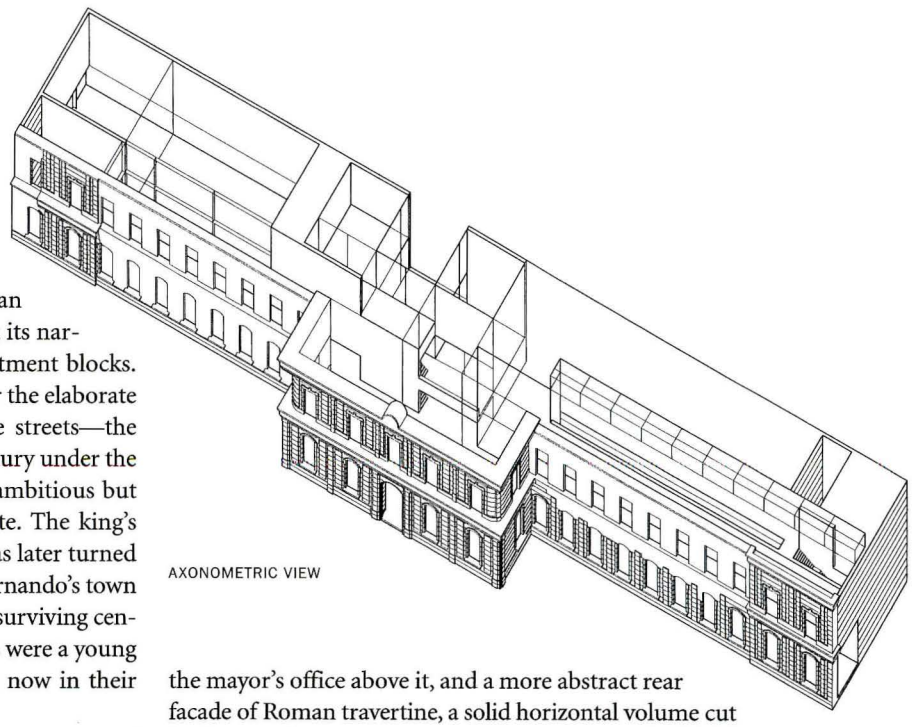


Modern elements set within the monastery's old fabric (this page) and spaces in new buildings (opposite) offer intriguing perspectives on the past.

On both the front (right) and rear (above) facades, the architects combined the axes, rhythms, and grids of the Baroque with their own modern approach of hollowing out solid blocks from different directions.

In an industrial village near Madrid, **Madridejos and Sancho** sculpt a **TOWN HALL AND CIVIC CENTER** using a series of intersecting blocks and voids

By David Cohn



AXONOMETRIC VIEW

San Fernando de Henares is a small industrial town of 28,000 inhabitants situated 10 miles east of Madrid. Like most of the working-class communities that ring the Spanish capital, San Fernando shows little evidence of its historic fabric except its narrow streets, which are now crowded by modest, low apartment blocks. San Fernando stands apart from its neighbors, however, for the elaborate design of circles, radial axes, and plazas traced by these streets—the remains of a model town plan laid out in the mid-18th century under the direction of King Fernando VI. The plan was part of an ambitious but failed scheme to establish a royal cloth factory on the site. The king's palacelike factory, built in sumptuous Baroque fashion, was later turned into a hospital and eventually fell into ruin. In 1994, San Fernando's town council organized a design competition to incorporate the surviving central facade in a new town hall and civic center. The winners were a young Madrid couple, Sol Madridejos and Juan Carlos Sancho, now in their early 40s, who at the time had yet to complete a building.

Madridejos and Sancho belong to a rising new generation of Spanish architects who have come to prominence entirely through such competitions. Their projects have won the attention of juries for their formal rigor, derived in part from the study of spatial concepts found in contemporary sculpture.

According to the architects, the design for San Fernando was developed using a method of "spatial projection" employed by the well-known contemporary Basque sculptor Eduardo Chillida. A solid block is hollowed out from different directions by spatial voids, which are projected in depth over one another to create what Chillida calls different "densities of space." The architects contrast this method of "constructing space" with what they term the "vectorial" approach of the existing Baroque facade and its urban setting, in which space is defined through the use of axes, grids, rhythms, repetitions, and the like.

In this sense, their new town hall has two faces, like the Roman deity Janus: a centralized Baroque front incorporating the main entry and the mayor's office above it, and a more abstract rear facade of Roman travertine, a solid horizontal volume cut by deep voids, whose projections and reflections are played out in the interior composition.

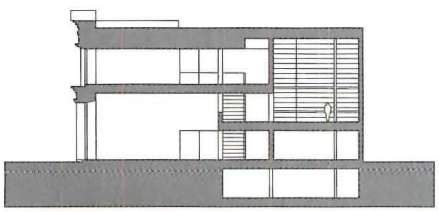
This ambitious formal apparatus is smoothly integrated into an efficient functional layout, with civic and administrative wings dividing the building. The civic wing includes a ground-floor social center for senior citizens, and a council chamber and a hall for civil weddings on the second floor. In the administrative wing, ground-floor offices for public consultation are succeeded by second-floor technical departments and third-floor political offices. The new spaces are separated from the Baroque facade by a continuous, covered light court, which serves as a multipurpose hall on the civic side and a circulation gallery for the administrative wing.

The highlight of the design is a cubic void cut out of the rear facade and lined with a curtain of translucent onyx backed by glass. This 25-foot cube picks up an almost metaphysical theme that appears in all the architects' work, that of a "light and luminous void, subtracted from and set in contrast to a heavy, solid volume," in the words of Madridejos. Scattered openings between the leaves of onyx, based on mathematical series, admit dappled patterns of light to the 25-foot cube of the adjacent wedding hall, and offer fragmented exterior views from other spaces.

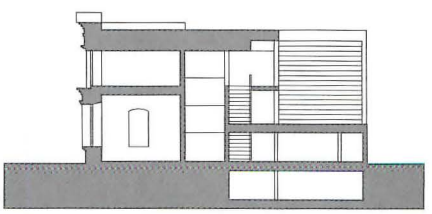
The cubic void is part of an elaborate three-dimensional puzzle of intersecting and interlocking spatial volumes, a formal composition

Project: *San Fernando de Henares Town Hall and Civic Center, Madrid, Spain*
Architect: *Juan Carlos Sancho Osinaga and Sol Madridejos Fernández*
Engineer: *F.C.C. Construcción S.A.*
Consultants: *F.C.C. Construcción S.A. (lighting, acoustical, general contractor)*

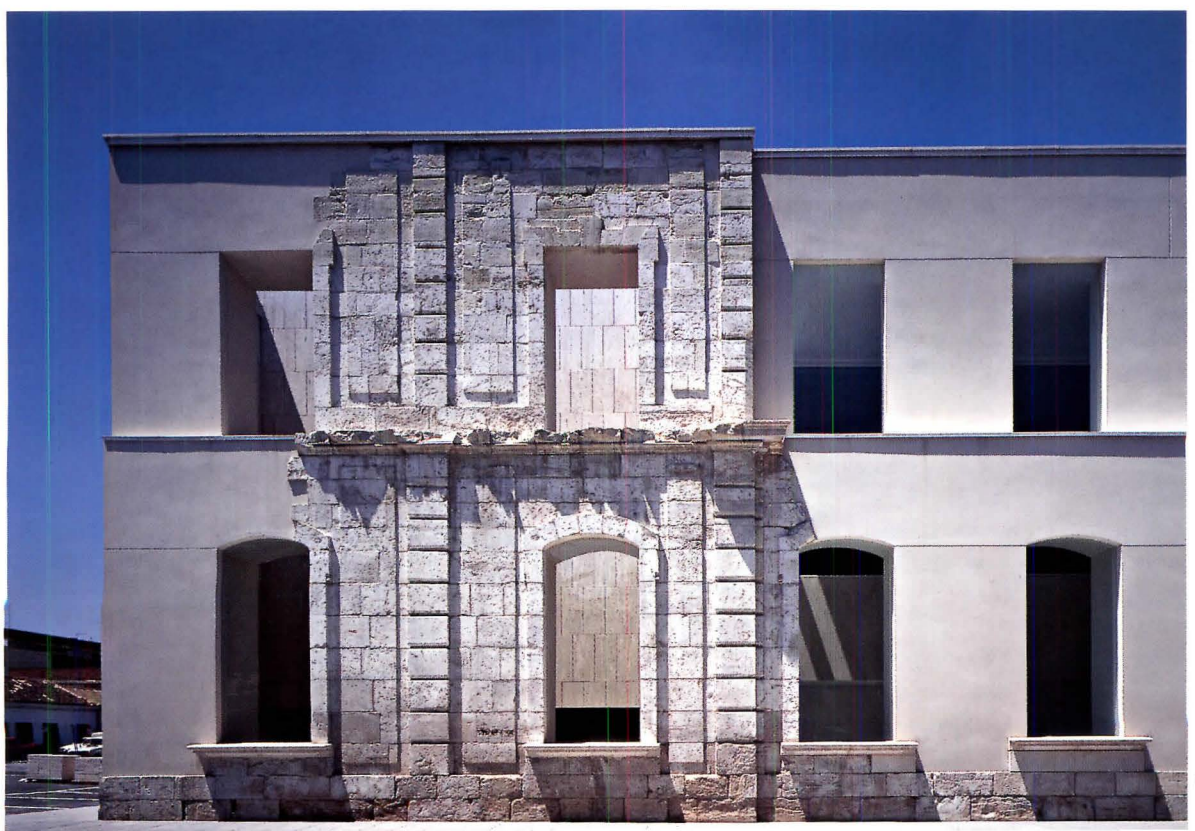
SECTION A-A



SECTION B-B



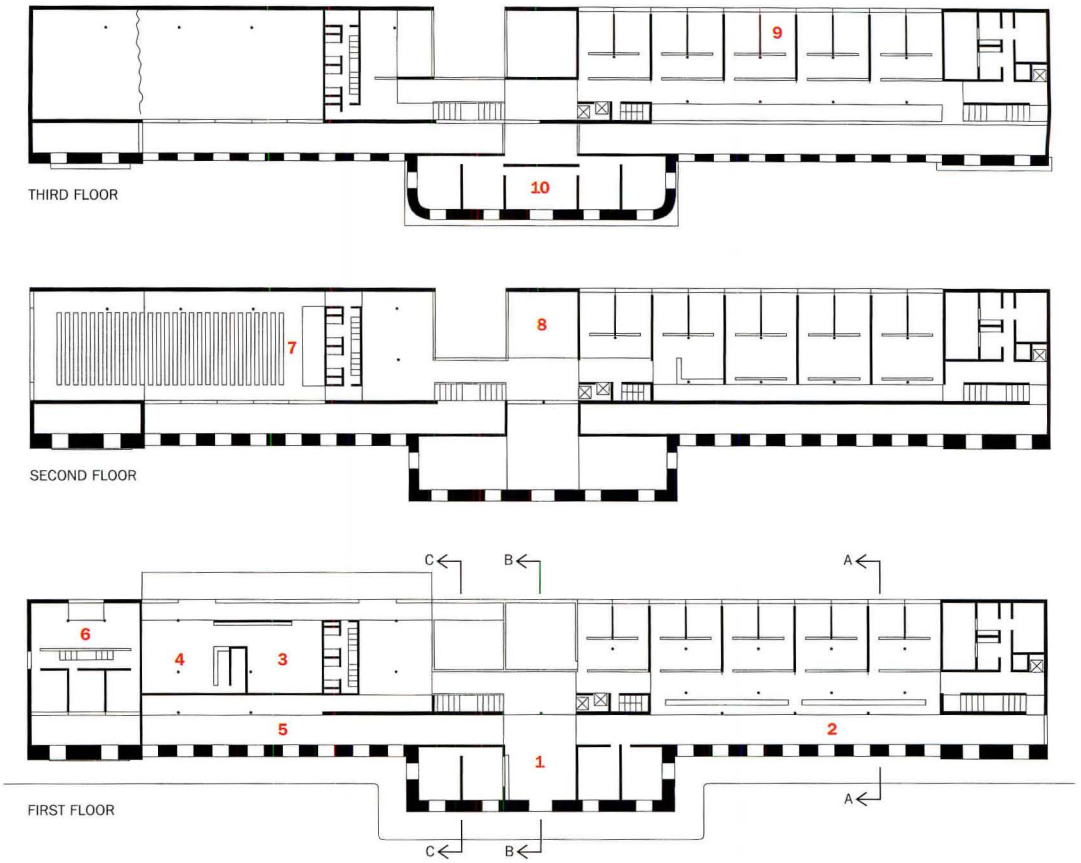
SECTION C-C



Madridejos and Sancho restored the badly deteriorated Baroque remnants and designed new portions of the facade that maintained the old rhythm of openings and thick masonry construction without the original detailing.

The building is a three-dimensional puzzle of intersecting and interlocking spatial volumes. The two-story main lobby (this page) leads onto a three-story-high exhibition hall (left in photo).

1. *Entry*
2. *Administration*
3. *Civic center*
4. *Cafe*
5. *Exhibition hall*
6. *Police*
7. *City council meeting room*
8. *Reception*
9. *Political area*
10. *City council offices*



Offices in the political area (left) overlook a skylit two-story atrium. An auditorium space (below) is used for city council meetings and other civic gatherings. A wall of translucent onyx stands behind a glass curtain wall near the entrance to the city council meeting room and expresses the architects' ongoing fascination with contrasts between luminous elements and those that are heavy and solid.

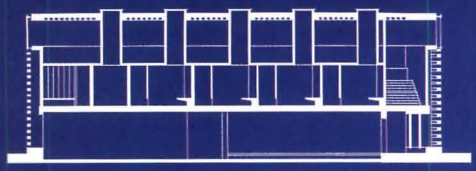
based on multiples and divisions of cubes, squares, and the golden section. On the rear facade, the void is counterpoised, in what the architects call "tangential tension," to the horizontal void of the ground-floor entry to the social center, a spatial cut that projects into the multipurpose hall beyond. The wedding hall can in turn be read in plan as a spatial projection of the main entry hall on the opposite side of the building, and as a reflection of this projection 90 degrees into the exterior void. As the visitor explores the interior, the design begins to hum with similar spatial correspondences, reflections, and transpositions.

In restoring the badly deteriorated Baroque facade, the architects jacked up the sagging lintels and fixed them in place by injecting adhesive resins in the original limestone. They also re-created missing sections of wall, maintaining the rhythm of openings and the thick masonry construction, but without the original detailing. Inside, finishes offer tactile variations on an abstract Modernist white, including polished limestone floors, bleached wood cabinetry, white metal columns, and walls of stucco with panels of travertine that underline the spatial and harmonic play.

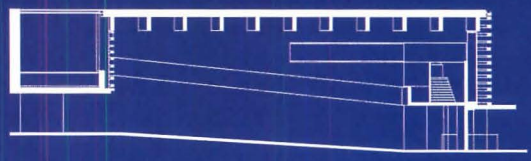
This abstract architecture of white forms recalls in some ways the neo-Corbusian rigor and formal complexity of Richard Meier's work. The obvious difference is that Meier's spaces owe much to Colin Rowe's analytic interpretation of the Corbusian vocabulary, as developed in celebrated essays such as "Transparency: Literal and Phenomenal" (written with Robert Slutzky, 1955–56). By using Chillida's spatial projections, Madridejos and Sancho introduce a welcome formal variation to the Modernist vocabulary. Their vibrant play of solid masses and deeply shadowed or luminous voids adds weight and expressive intensity to the phenomenal planes and spatial layering of American Neo-Modernism. The San Fernando City Hall assumes the modern tradition as a living, contemporary language, restoring the town's fragile civic dignity and projecting it toward the future. ■

Sources
Windows: *Perfrisa*
Floors: *Travertine Stone*
Aluminum square lights: *Vanlux S.A.*
Downlights: *Philips*
Task lighting: *Liderlux, S.L.*

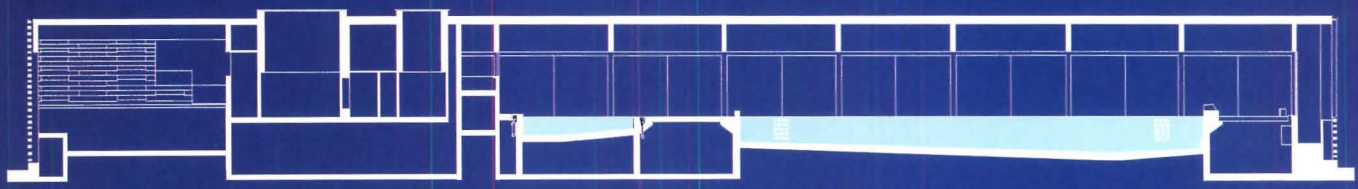
WWW *For more information on the people and products involved in this project, go to* ***Projects*** *at:* ***www.architecturalrecord.com***



SECTION THROUGH LOCKER ROOM



SECTION THROUGH VESTIBULE



LONGITUDINAL SECTION

Luis Mansilla and Emilio Tuñon wrap an indoor SWIMMING POOL in a concrete lattice where light dances on water

Latticed walls shield the swimming pool from its inhospitable surroundings—the structure is wedged between a nondescript sports facility and high exterior fencing.

By David Cohn

The main feature of the San Fernando Swimming Pool, a competition-winning project designed by Madrid architects Luis Mansilla and Emilio Tuñon, is a latticed exterior composed of custom prefabricated concrete elements modeled on railroad ties. During the day, they scatter dappled patterns of light across the pool, which mix with dancing reflections from the broken surface of the water.

Luis Mansilla explains that the combination of the tough materiality of the concrete and the abstract visual patterns they create is a recurring theme in their work: "All our projects are related, at bottom, by a very precise definition of the exterior and the entry of natural light."

The concrete lattice is part of a complex wall system backed by concrete piers, whose interior bays facing the pool are filled in with glass. The piers are topped by a continuous concrete lintel that supports the deep roof beams. The open ends of these beams are in turn enclosed in a continuous strip of glass above the latticed walls, admitting a more direct light that visual lightens the weight of the roof.

The deck is raised several feet above the ground due to the high water table at the riverside site, with the mechanical equipment area located below it. The entry and skylit locker rooms are situated at one of the structure's narrow ends, while the other overlooks playing fields and distant treetops through clear glass walls.

Now in their early 40s, Mansilla and Tuñon form part of a close circle of contemporaries who are active teachers, critics, theorists, and designers; their projects and critical writings can often be found in the pages of the Madrid journal *El Croquis*. Other members of the group include Juan Herreros and Iñaki Ábalos, whose work was featured in the 1995 *Light Constructions* exhibit at the Museum of Modern Art in New York; Federico Soriano and Dolores Palacios, designers of the recently completed Bilbao Opera; and Alejandro Zaera, professor at London's Architectural Association and winner with Farshid Moussavi of a 1995 competition for a cruise ship terminal in Yokohama, Japan.

After graduating from Madrid's School of Architecture in 1982, Mansilla and Tuñon began as project architects for Rafael Moneo from 1983 to 1993, working on projects such as the Atocha Railroad Station in Madrid and the Seville Airport. They opened their own studio with the commission for the Provincial Museum of Zamora, which won the European Union's Mies Van der Rohe Prize in 1997, and have gone on to win a series of national competitions, for a central library in Madrid (1995), a concert hall and arts center in León (1995 and 1997), and a museum in Castellón (1997), all currently in development.

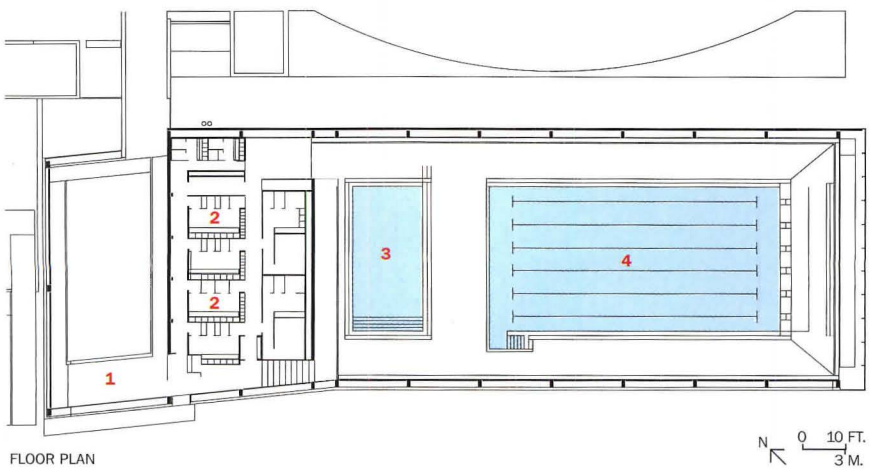
The San Fernando Swimming Pool is a good introduction to the architects' design concerns. Its apparent simplicity can easily lead one to overlook its sophistication—the multiple sensory contrasts offered by the muscular power of the structural concrete, the playful lighting effects, and the serene, floating space of the pool, with its neutral gray-tile deck and focused view. This quiet sophistication is at the heart of Mansilla and Tuñon's design philosophy, which they summarized in a 1999 essay in their small-circulation journal *Circo*: "Architecture isn't exactly silent. It is more like a conversation in lowered voices. Ideas are present, but the true effort lies in making them invisible." ■

Project: *Indoor swimming pool, Madrid*
Architect: *Luis Moreno Mansilla & Emilio Tuñon—Santiago Hernán, Juan Carlos Corona, Altonsi G. Gaite, David Nadal, Fernando Garcia, Robert Reninger, Andres Regueiro, Maria Linares, project team*
Consultants: *JG & Asociados S.A.*

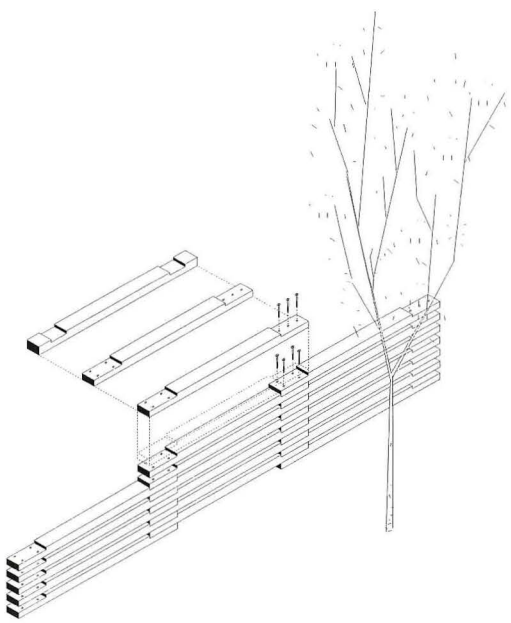
Sources
Glass: *Chrisaleria Española*
Paint and stain: *Kein Cocretal*
Plastic laminate: *Trexpa*

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

1. *Entry*
2. *Locker room*
3. *Small pool*
4. *Large pool*



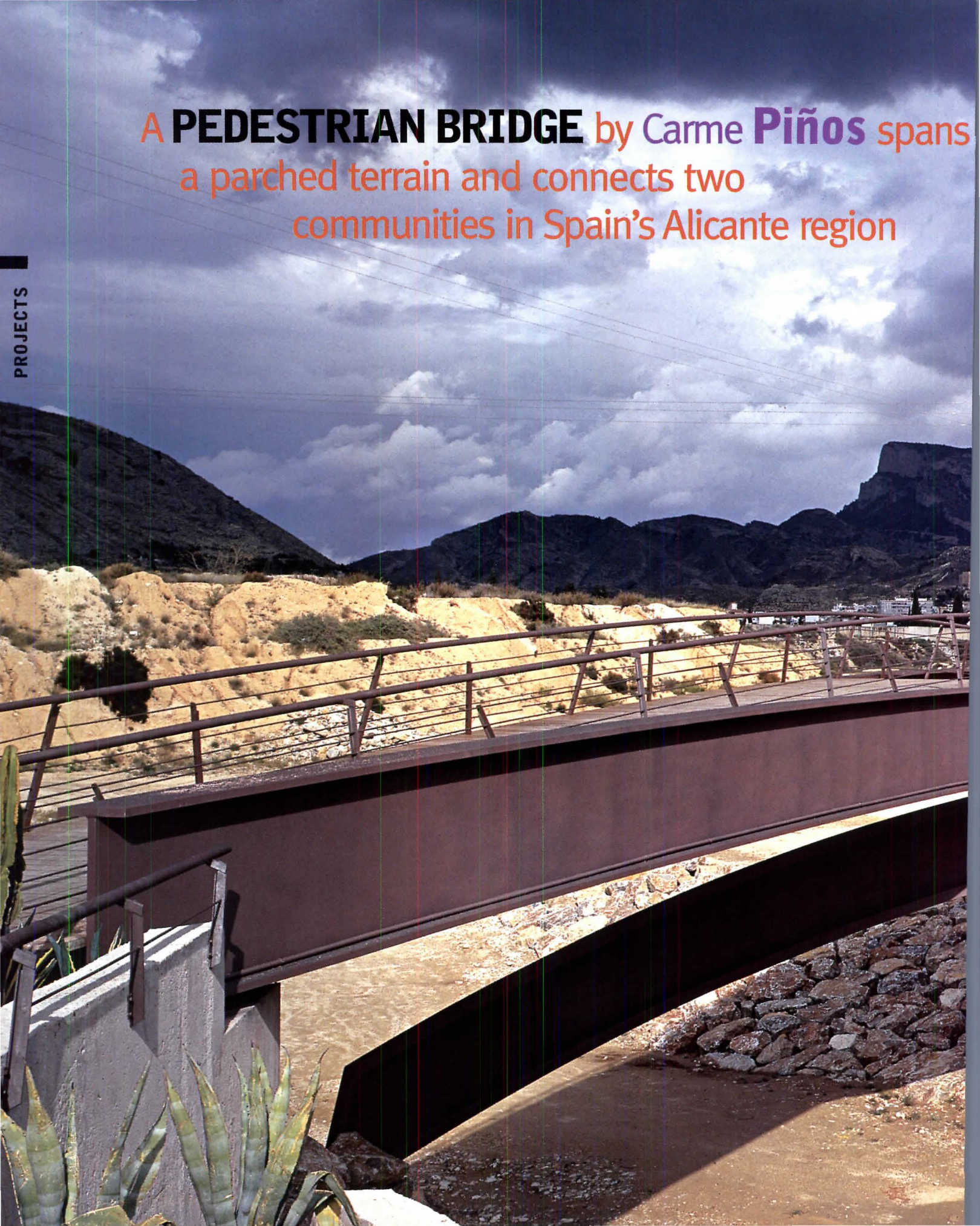
FLOOR PLAN



WALL AXONOMETRIC

Like the traditional shuttered windows of Spanish houses, the latticed exterior permits contact with the outdoors while protecting the interior from inquisitive eyes (this page and opposite). At night, the building glows like the cut-out face of an illuminated jack-o'- lantern.

A **PEDESTRIAN BRIDGE** by Carme **Piños** spans a parched terrain and connects two communities in Spain's Alicante region



The footbridge stretches over a dried-up riverbed and connects the town of Petrer with an isolated suburb.

By Dominique Tomasov, AIA

"More than drawing plans, we illustrate experiences," says architect Carme Piños, whose work reveals the underlying sensuality of the terrain of Spain. "Anything that speaks to us of life, that helps us understand human behavior, its needs, the everyday; anything that helps us define the corporeal nature of these concerns incites our utmost attention," adds Piños. Building and landscape appear to overlap, all of a piece. Petrer's Bridge, the first solo project by Piños after her long collaboration with Enric Miralles, is a good example of this synthesis of land and man-made structure. The commission called for a foot bridge to connect the town of Petrer, in Alicante, with an isolated suburb lacking its own public square. The site's principal features were the dried-up riverbed in the middle of a rural no-man's land, stone ruins of a Gothic aqueduct, and the view of mountains in the distance.

"ON THIS BRIDGE THE TOWNSPEOPLE ENCOUNTER THE PUBLIC SPACE THE TOWN WAS LACKING."

"I wanted the bridge to be static rather than dynamic so that pedestrians would take a long time to cross it and perhaps even take a moment to stop," Piños says. "On the bridge the townspeople encounter the public space the town was lacking." As the architect anticipated, the main users of the bridge are children, who play year-round upon and below it.

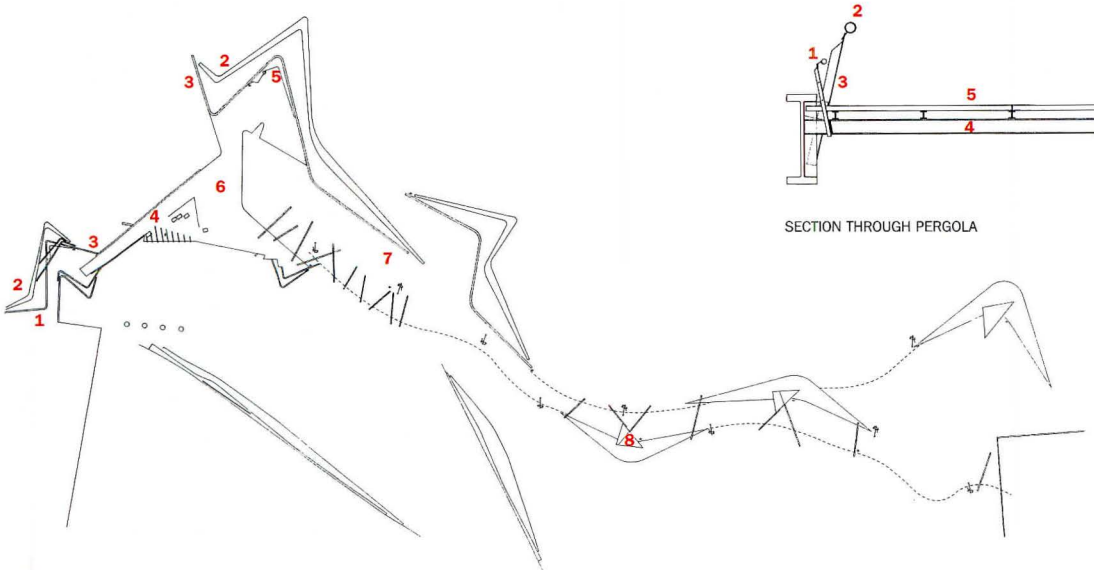
Three intersecting steel arches and joists form the main structure. On the side of the old aqueduct, the joists rise above the platform like ribs forming a balustrade and canopy to contain the observer. The wood-slat paving gently slopes, leading pedestrians to face the mountains. The wood members rise up in spots to create benches or part to make room for trees. Additional seating is built along the stone and concrete walls. Piños says her intent was to design a controlled environment, halfway between an urban and a landscaped space. Therefore the bridge has low lighting levels at night, with only a few spotlights along the road leading to the town, one fixture mounted in the middle of the plaza, and another at one corner.

Piños chose iroko—a tropical wood popular in Spain for exterior applications—and steel coated with a special earth-toned, metallic-looking paint (corten steel was discarded for budgetary reasons, and because of its tendency to stain when washed out). The concrete forming pedestals and walls matches the color of local soil. Sharp shapes were avoided, in favor of sloping planes and undulating lines. Even marks produced by the formwork were disguised, while anchor holes were patched and the concrete's aggregate was exposed with high-pressure water. The raised roofline helps mask an adjacent warehouse while enhancing the sense of enclosure for pedestrians, who turn toward the view of the mountains on the other side. "It is very pleasing to be in this place," says Piños, "It offers a slowness within an unfriendly context. I am not interested in virtual effects, but in buildings that are comprehended from experience." ■

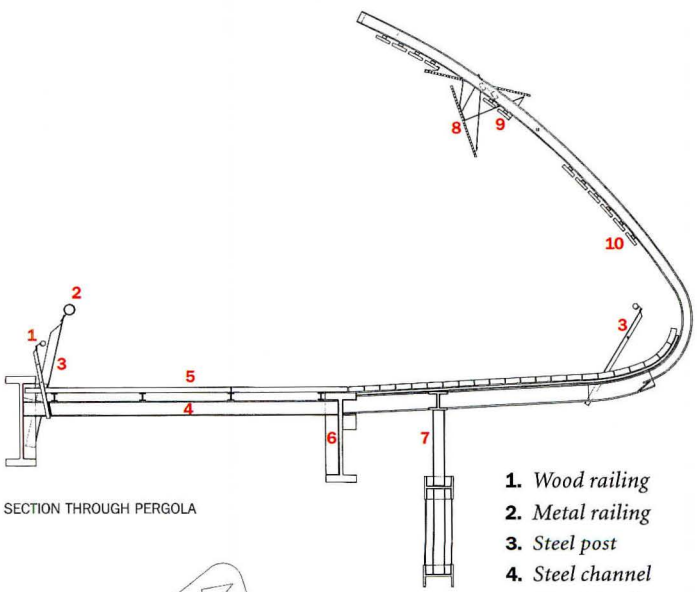
Dominique Tomasov, AIA, is an American architect who works as an independent consultant in Barcelona.

Project: *Pedestrian bridge in Petrer, Alicante, Spain*
Architect: *Carme Piños Studio—Carme Piños, partner-in-charge; Juan Antonio Andreu Rocamora, Miguel Lluch, Carlos Pascual, Miguel Llorens, Jochem Schneider, design team*
General contractor: *Necso Entrecanales Cubiertas*
Landscape consultant: *Teresa Galí*

1. *Entry*
2. *Packed-earth wall*
3. *Concrete wall*
4. *Bridge*
5. *Bench*
6. *Plaza*
7. *Lamp*
8. *Concrete platform*

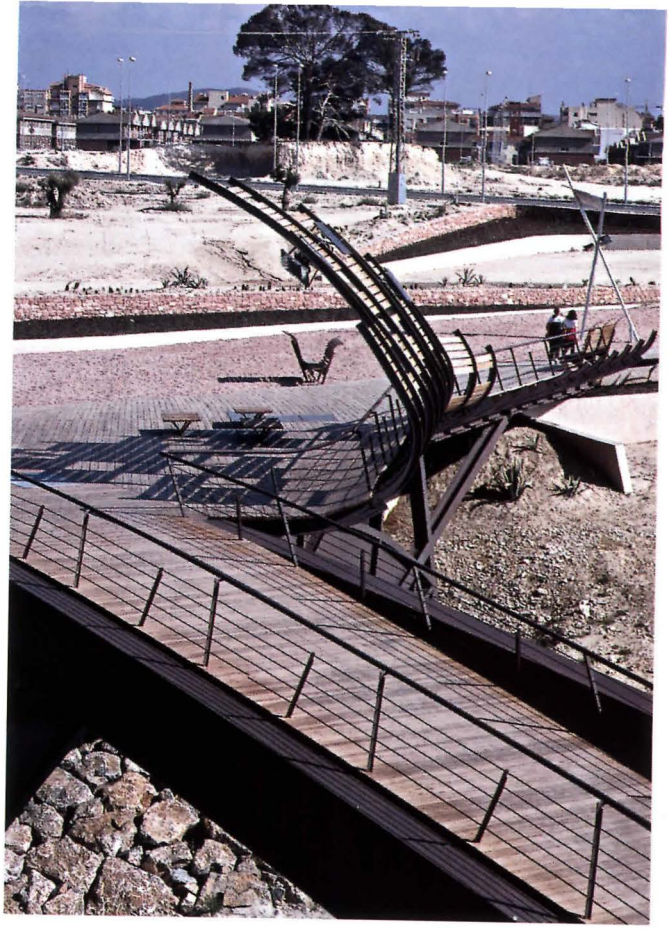


SITEPLAN



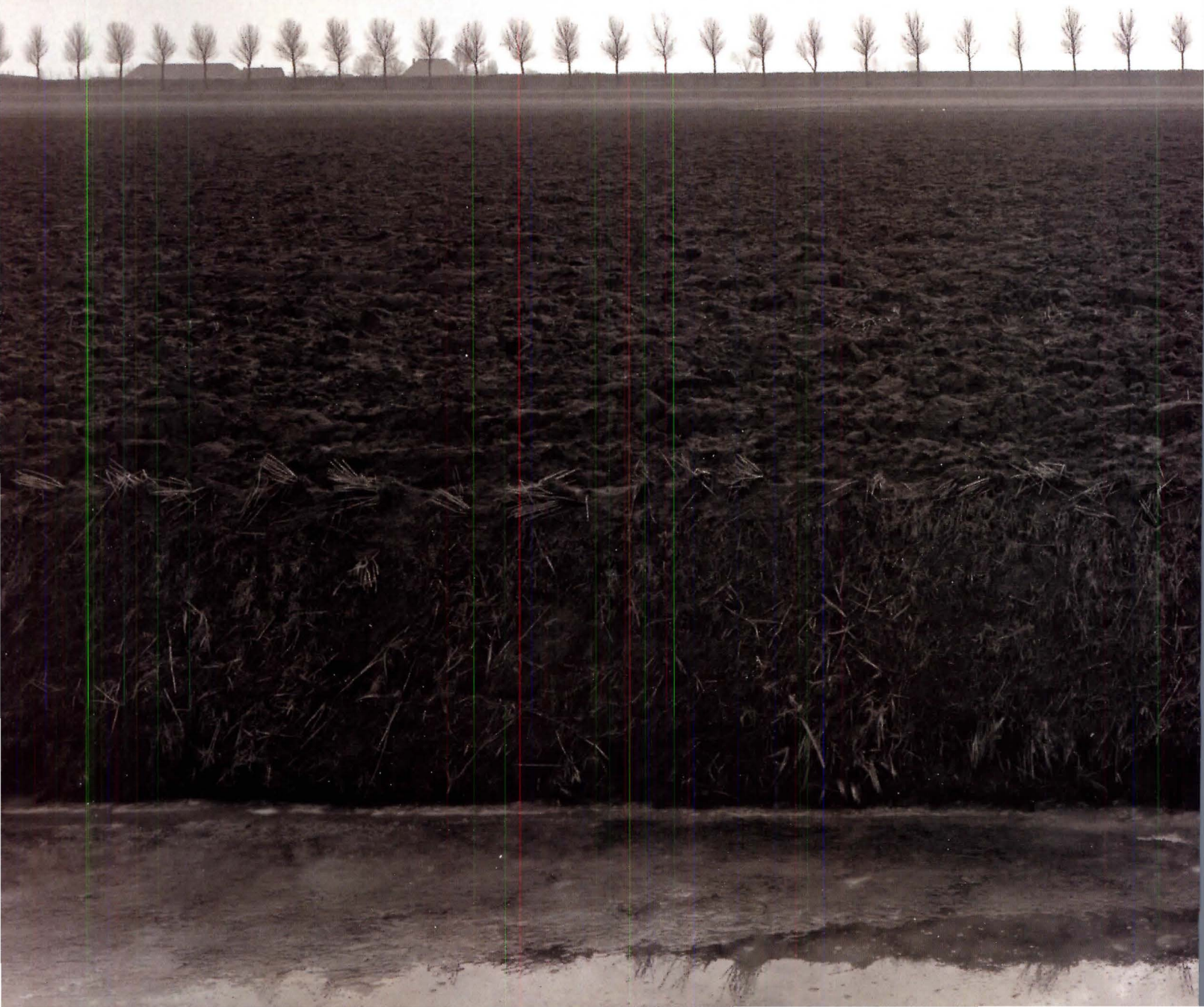
SECTION THROUGH PERGOLA

1. *Wood railing*
2. *Metal railing*
3. *Steel post*
4. *Steel channel*
5. *Wood plank*
6. *Steel beam*
7. *Steel truss*
8. *Light diffuser*
9. *Luminaire*
10. *Wood board*



The main structure, on the side of an old aqueduct (above), rises up above the platform like giant steel ribs, forming a balustrade and canopy (right and below). Benches sit along the stone and concrete walls, providing a place to rest in the arid landscape.

In HOLLAND the



shock of the **new**

Can a new architecture of aggressive individualism take root in a famously consensus-driven culture?

By James S. Russell, AIA

Although greenery is ubiquitous in the Netherlands, Dutch people readily admit that theirs is an entirely man-made landscape. Every square inch of land has been obsessively demarcated, planned, and designed. Such rigor is perhaps inevitable in a country that is largely made from reclaimed land and would slip underwater were it not for a gigantic, relentlessly maintained infrastructure.

It takes a lot of organization, planning, and consensus to keep such an unlikely nation viable, and these qualities the Dutch have in abundance. A rational, consensus-driven planning-and-design process that dates from the 1920s relies primarily on the public sector to determine what land is developed and how cities grow. It has helped make Holland among the world's best-housed nations while maintaining a high percentage of land in agricultural use. One can get out of even the largest cities in a few minutes by bicycle, car, or train. While in America, "social" planning became associated with massive, sterile housing blocks derived from the Corbusian vision and built for the purpose of warehousing poor people, in Holland social principles were devoted to minimizing class differences. Although the planning regime permits few Dutch people to live in big houses on large lots—something regarded virtually as a birthright in America—almost everyone lives in well-designed dwellings with good

1

light and access to at least a patch of garden. Americans may have more choice, but Dutch people value the knowledge that "you know what goes up next to you," says architect Jeroen van Schooten of Meyer & Van Schooten.

Architects and architecture are deeply embedded in the planning and construction process in the Netherlands [see also March 2000, page 206]. Architects have also maintained their status by surrendering their proclivity to individualized expression. There have always been exceptions, such as when Piet Blom turned cubes diagonally and mounted them on columns as housing. Until recently, though, a soft-edged neo-Modernism has prevailed. The following pages offer a sampling of the much gutsier, more individualistic strain of architecture that has recently emerged in Holland. It's easy to conclude that such psychologically complicated—even self-indulgent—buildings are the progeny of Rem Koolhaas, the Netherland's most prolific theorist of architecture. Stop living in "a straitjacket of self-effacement," Koolhaas urged in an influential lecture he gave at a 1990 symposium.

IN A NATION WITH A GOVERNMENT BOARD TO ASSURE "VISUAL DECENCY," THE UMBILICAL OF STATE SUPPORT HAS YET TO BE SEVERED.

Tiptoeing into the global-market maelstrom

A younger generation does acknowledge a debt to Koolhaas [see page 60], but the expressionistic architectural scene in Holland today appears to spring from a number of sources. As privatization and the winds of globalization buffet the Dutch economy, the nation has unwound many of the comforting strictures of the social-welfare state, in the process altering the state-centered planning process and a design process so reliant on social tolerance that the Rotterdam Planning Department could without fear of retribution deploy in 1993 a Miesian column-and-"privacy"-panel system for its carefully mapped Municipal Heroin Prostitution Toleration Zone.

Not long ago, 70 percent of Dutch housing was built by heavily subsidized social-housing societies. In the mid-1980s, they were told to privatize, and now only 30 percent of production is "social" housing. The government has lavishly funded the rebuilding and expansion of Schipol airport, one of Europe's major hubs, while permitting private, American-style office parks to proliferate along suburban freeways. Holland is fledging architecture, once a heavily protected *(continued on page 143)*

3

PHOTOGRAPHY: LUUK KRAMER (1); THEO BAART (2, 3, AND PREVIOUS PAGE)

2

Nothing is overlooked in the placement or design of the buildings, landscape, structures, and street furniture in Haarlemmermeerpolder district (2), near Schipol Airport outside Amsterdam. For all the planning and attention these places receive, argues a new generation of designers, they look like they could be anywhere. Dutch designers are also taking a more critical look at housing, where multiple layers of design and planning too often result in well-made but slightly antiseptic neighborhoods (Toolenburg 2). Still, the Netherlands is a land of opportunity for architects, including Snelder Architects, which stacked an office on columns above a warehouse/distribution facility for **KINZO TOOLS** (1). The office block is intended as an iconic image visible from the nearby A 30 freeway.

Designed by the Rotterdam office of Neutelings Riedijk for Holland's largest university in Utrecht, the **Minnaert Building** is an exercise in controlled anarchy. In a powerful architectural statement, the architects thumb their noses at many of Holland's multifarious rules and codes.

For example, the Minnaert Building has no real ground floor; it seems to float. It has no columns; the rainwater drips in from the roof, adding auditory sensation to visual. And, contrary to traditional educational facilities, all the corridors and circulation spaces are bundled into one big hall of 150 by 60 feet, with a pool stretching the entire length. And in spite of (or is it thanks to?) all this bad-boy stuff, it is environmentally conscious architecture.

Minnaert is the newest building in the Uithof, a campuslike satellite location on the periphery of Utrecht which opened in 1974 (the university itself dates from 1636). That era's slab-in-the-park approach didn't work well, however, and in 1986 the university adopted a master plan by Rem Koolhaas' OMA aimed at densifying the existing clusters. Since then, the university's director of housing has been working hard to transform the Uithof into a focal point of modern-day Dutch architecture, bringing in Van Berkel

Project: *The Minnaert Building*
Location: *Utrecht, the Netherlands*
Owner: *University of Utrecht*
Architect: *Neutelings Riedijk—Willem Jan Neutelings, Michiel Riedijk, Johnathan Woodroffe, Evert Crols, Jago van Bergen, Gerrit Schilder, Ruton Hamfelt, Chidi Onwuka, Joost Mulders*
Engineer: *ABT (structural)*
Consultants: *Adviesbureau Peutz & Associes (building physics); N. R. A. and F. B. U. (interiors)*
General contractor: *Aanneming Maatschappij J. P. van Eesteren*


N A E R T

and Bos, Mecanoo, Wiel Arets, West 8, Rem Koolhaas, and Neutelings Riedijk.

Interior pond as a focus

Minnaert was commissioned as the central building of the earth-sciences cluster; the goal was to stimulate interaction within the department. The program includes labs, classrooms, a study hall, a restaurant seating 500, and staff offices. The ground floor is given over to labs and generous parking space for bicycles; most people enter the building at the level of the *piano nobile*, i.e., via the elevated walkways connecting all the earth-sciences buildings.

The building's most striking feature is also on the second floor: the central hall, with a stone water basin along the entire length of one wall and, in stark contrast, keyhole-shaped niches in red and purple along the other. Long troughs slant down from the ceiling and spill rainwater collected on the roof into the basin. (Whether dripping or pouring, the rainwater poetically reminds students of the forces of nature operating outside.) Spouts mounted on the wall return water to the basin. Steel bowls floating on tires are filled with seashells to neutralize the water's acidity.

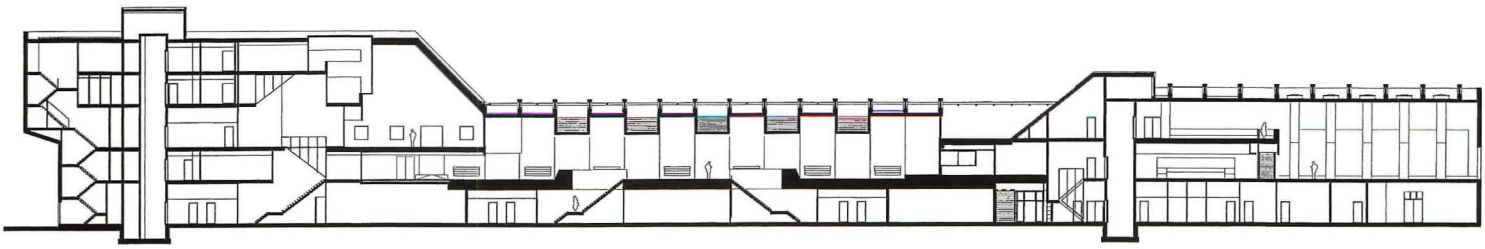
The basin offers a solution to the "cooling paradox," according to partner Willem Jan Neutelings. "Buildings are so well insulated nowadays that cooling is a bigger problem than heating," he adds. "Cooling machinery can easily eat up a third of your budget, and we thought that was a waste. Here, the water basin is the cooling machine. The water can cool the entire building in a day. And the only expense is an electric pump that moves the cool water through the building, up to the roof at night and then back to the basin." With a wry smile he adds: "We're not green out of ideology, but out of pragmatism."

A "veined" exterior

The floor plan is a simple rectangle, but the building's skin is unusual in

The higher ends of the building, containing a variety of study areas, laboratories, and lecture *rooms, spill into* the central meeting space (section opposite), which has as its focal point a *recycled-water* pond.

THE 254 WINDOWS OF ONE ELEVATION HOLD UP THE EXTERIOR WALL, AS DO THE MONUMENTAL "LETTER COLUMNS." HERE, THE BUILDING NOT ONLY BEARS ITS NAME, THE NAME BEARS THE BUILDING.



both color and texture. The earthy rust-brown exterior—sprayed concrete to which an iron pigment was added—is covered with a curious pattern of sinuous welts that writhe their way across the surface, even across the windows, like determined earthworms. The shapes were formed over metal armatures applied to the building's concrete frame.

"TO MY MIND, THAT CALVINIST IDEA OF HONESTY IN PLAN IS A FAKE," SAYS NEUTELINGS. "IT IS MORE IMPORTANT TO IMBUE THE FACADE WITH MEANING THAN TO SHOW WHAT'S INSIDE."

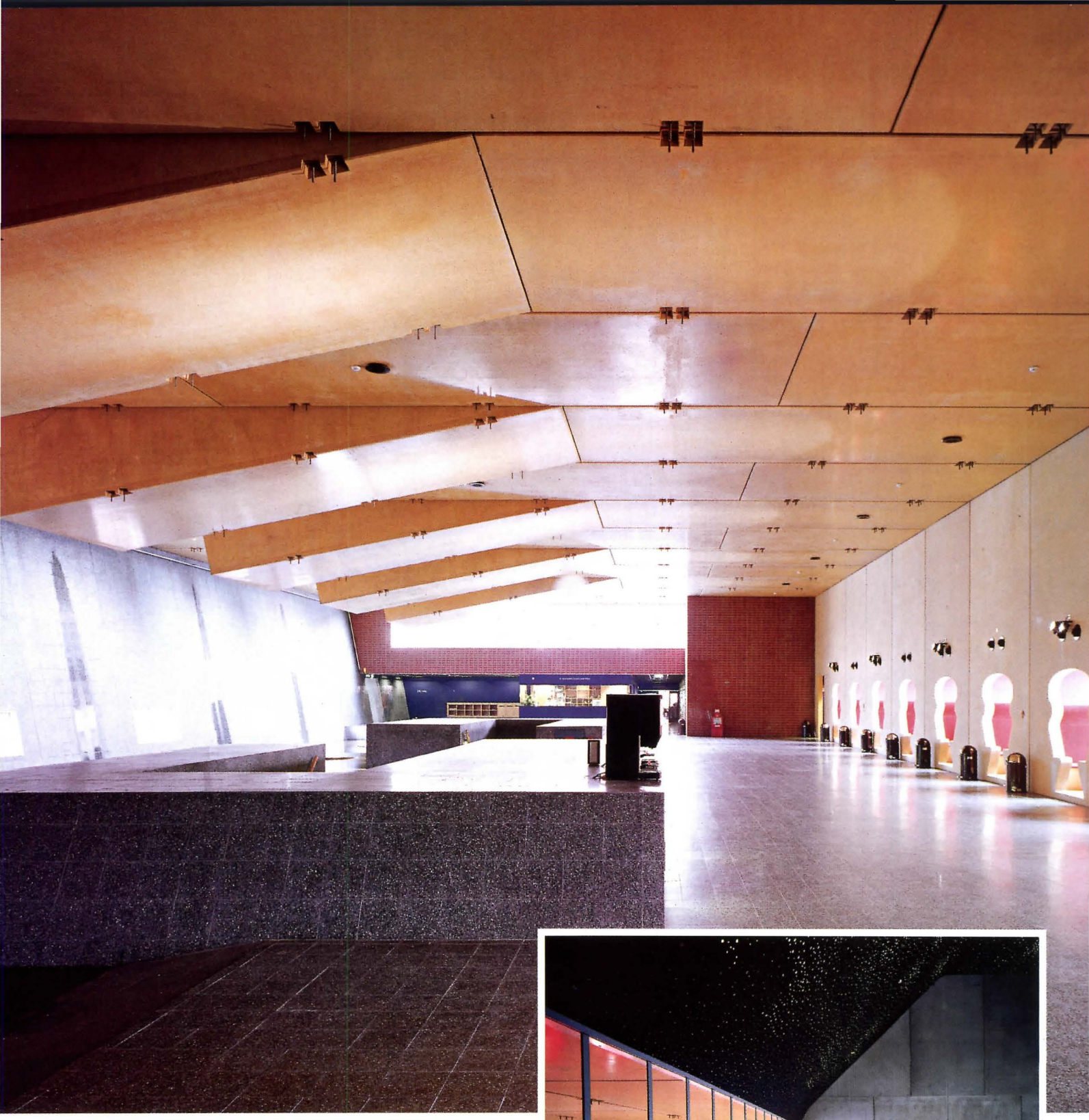
The facade is supported by two structures that don't look the part: the 254 steel window frames on the one side and the steel "letter columns" forming the name of the Utrecht University's Belgian-Dutch astronomer (1893–1970) on the other. Here, it is not the building that bears the name, but the name that bears the building.

Sense and sensuality

According to Neutelings, the design for Minnaert gets teachers and students to interact by prickling the senses. "Most buildings are aimed at one kind of person and are the same throughout. Near the stone basin it is cool, even cold, but the keyhole-like niches along the other wall are warm, in color and in temperature. All the rooms are different, too: one has a blue wall and even a blue (black) board. The study hall has a ceiling full of stars; the doors of the offices all bear their own distinctive pattern of white, black, and gray rectangles. We wanted to create a building that changes as you move through it."

Neutelings, who is 41 and recently returned to Rotterdam from a guest professorship at Harvard, has emphatically broken with the Modernist tradition that requires "legibility" of a building's interior organization based on its exterior. From the outside of the Minnaert, there is not even a hint of the large hall with the water basin. "To my mind, that Calvinist idea of honesty in plan and construction is a fake," he states. "A facade is by definition the wall demarcating public space. It is more important to imbue that with meaning than to show what is inside. All you get otherwise are boring, predictable facades. In a lot of our buildings there is a big contrast between inside and outside. I am not interested in rows of windows, but in the larger scale, in the iconographic character of the building." ■

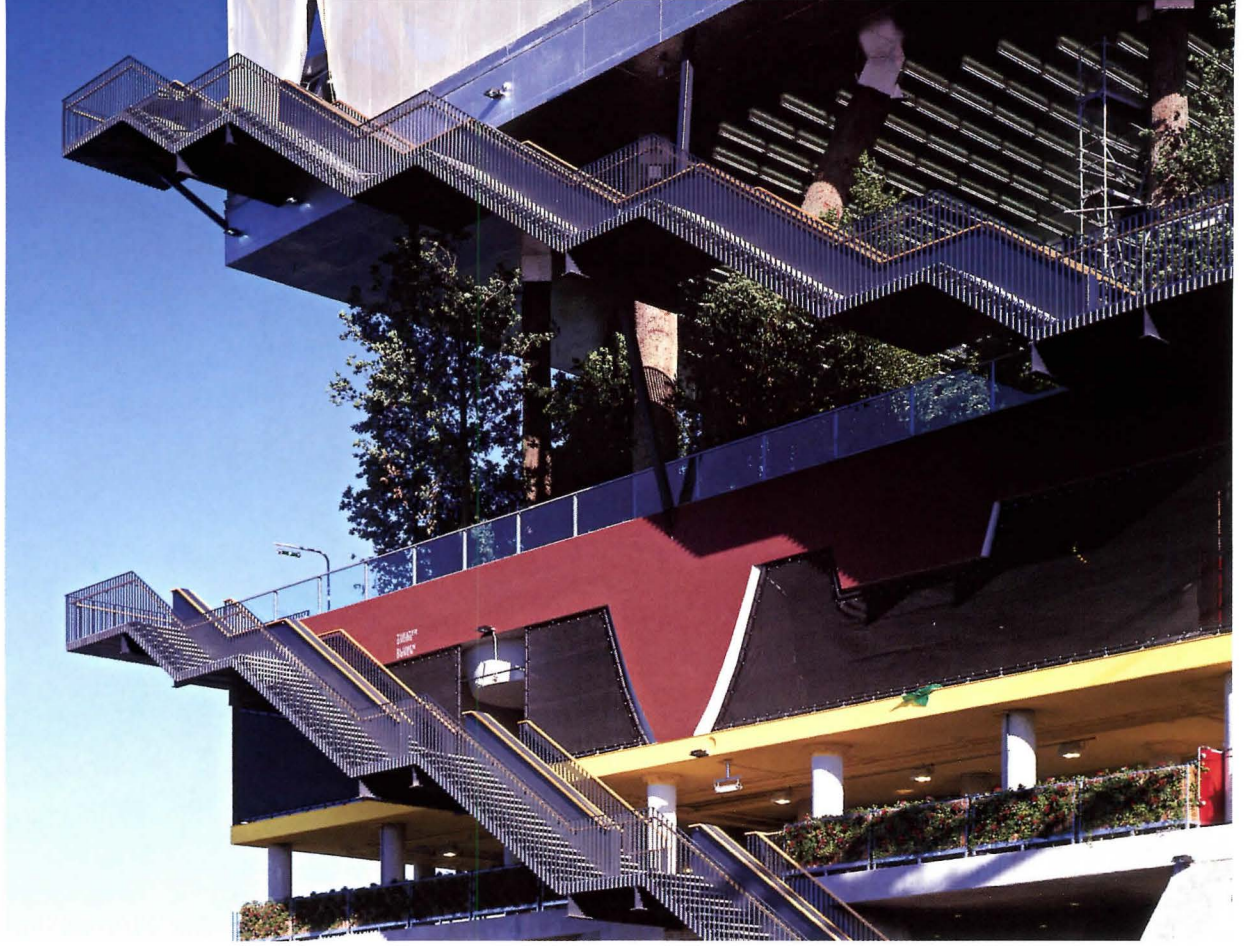
Author Tracy Metz is RECORD's correspondent in Holland.



The water level in the basin that runs through the central gathering space of the Minnaert Building (left in photo above) rises and falls depending on the flow of rainwater. A study space overlooks the central hall (right). Skylights bathe columns in daylight within the cafeteria (opposite bottom), among the many elements designed to awaken the senses.

1

"THIS MONUMENTAL, MULTILEVEL PARK IS A SYMBOL OF THE ARTIFICIALITY OF NATURE ALTERED BY MAN." —*MVRDV*



2

Heat emitted by spectators in an auditorium warms a "forest" above it (4). Visitors take refreshment within lower-level "dunes" (3).

4

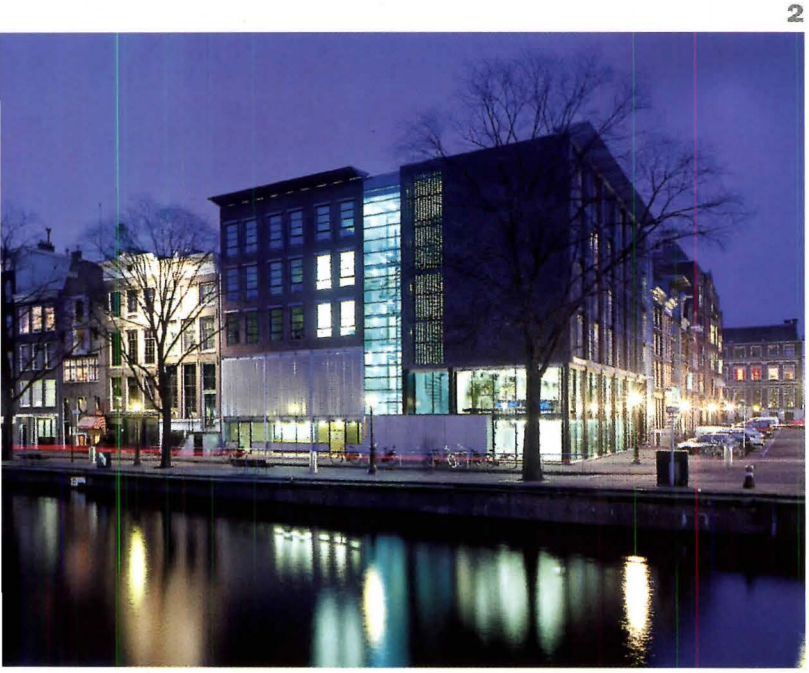
3

Like a parade float on steroids that was abandoned by its tenders, the **Dutch Pavilion at Expo 2000** seems to have run aground a couple of hundred miles from home on the plains of Hanover, Germany (1, 2). Architect MVRDV built a lighthearted construction that recognizes the unadmitted kitsch nature of these affairs without ignoring the nation's desire to parade its technological prowess.

Titled *Holland Creates Space*, it takes the historical idea of the Netherlands as a landscape recovered from the sea and stacks it in a 130-foot-high multilevel sandwich set in a field of flowers. Windmills on the roof propel cooling breezes over a basin of rainwater while generating power. *Water from the roof* is used to flush toilets and to irrigate the cooling forest one level down. Wastewater, passed through a biomass filter, is returned to the roof.
James S. Russell, AIA

1

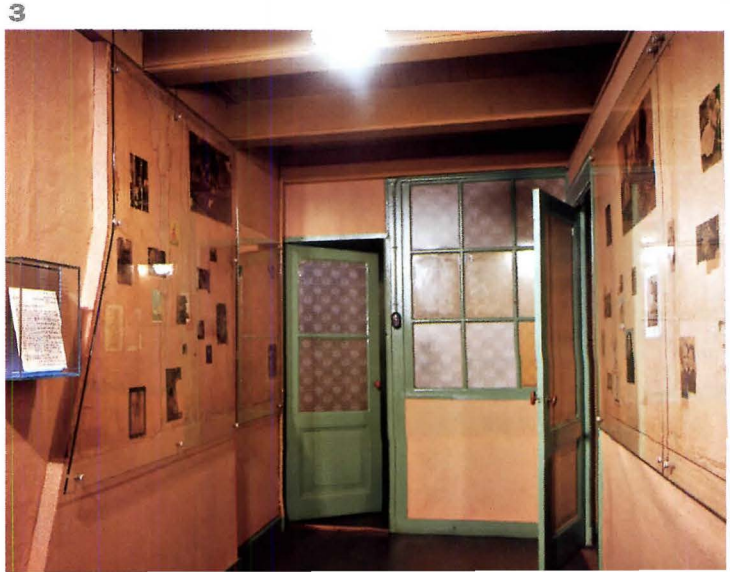
2



THE NATION HAS UNWOUND MANY OF THE COMFORTING STRICTURES OF THE WELFARE STATE, ALTERING THE CONSENSUS MODEL OF PLANNING.

Dutch work today is steadily more attuned to changes in its society and economy. Smaller households and a desire to live in the city spurred the redevelopment of **Java Island** (foreground in 1) and **KNSM Island** (background)—once devoted to shipping—as high-density housing. The earlier Java project, by Jo Coenen, offers larger, more forceful architectural gestures, while KNSM, a design by S. Soeters just reaching completion, opts for a smaller-scale streetscape laced by bits of canal. Tourism is also important to the Dutch economy. A careful Modernist solution would likely seem radical in American preservationist circles. But the actual house in which **Anne Frank** wrote her famous diaries (canal house at far left in 2 and interior, 3), among the Netherland's most popular destinations, is far too small to accommodate the crush of visitors. Architect Bentham Crouwel decided not to try to emulate the existing house in adding myriad visitor services, but to quietly evoke the institutional quality of a museum. *J. S. R.*

3



4

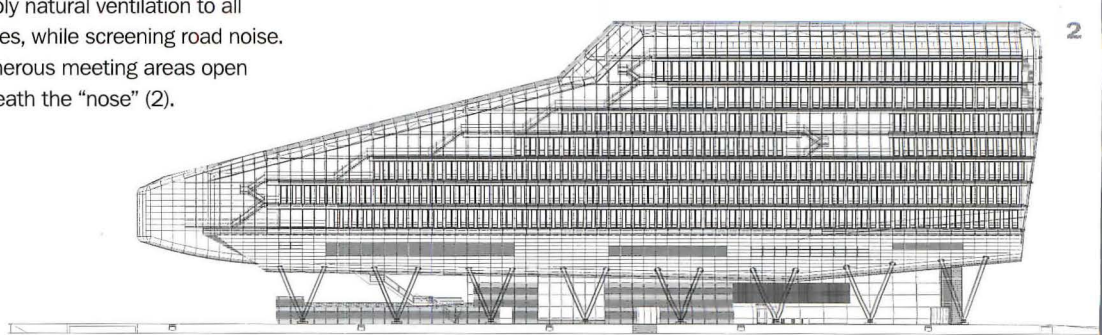
TODAY'S DUTCH ARCHITECT MAY COMBINE A PRAGMATISM TOWARD COMMERCIAL CULTURE WITH AN IRONIC, BUT NOT CYCLICAL, DISTANCE.

5

6

Over the last decade a much gutsier, more expressionistic strain of architecture has rapidly emerged in Holland. Much of the work looks askance at the contradictions of the safe "moral" state that survives in the amoral, cutthroat, media-saturated world economy. These photos, taken for the book *Mart Stam's Trousers*, look ironically at today's pretensions. The **de Kolk Shopping center** (4), by Ben van Berkel, is shown somewhat desperately clad in commercial messages. It has since closed. Urban space has been rethought along science-fiction lines by West 8, a young landscape architect. Red-painted light masts bend and hover over the **Schouwburgplein**, a public square in downtown Rotterdam, like hydraulic brontosaurus heads at feeding time (5). Lights, sounds, and vapors rise from an underground parking garage through openings in the metal-plate surface, titillating visitors. Architect MVRDV's housing units stand like drawers of a filing cabinet left open, cantilevered 40 feet out of the typically prim social-housing slab in the **WOZOCO housing project** in Amsterdam (6).

You've got to strive to make an impression in an information-saturated economy, suggest Meyers & Van Schooten, architects for the **headquarters for ING bank,** which now appears in advertisements. Located at the very edge of one of Holland's major highways, not far from Schipol Airport, the bank marries ecological technology and workplace amenity. Fresh air from the side of the building that faces away from the highway (1) is drawn up into a void between two glass walls to supply natural ventilation to all offices, while screening road noise. Numerous meeting areas open beneath the "nose" (2).



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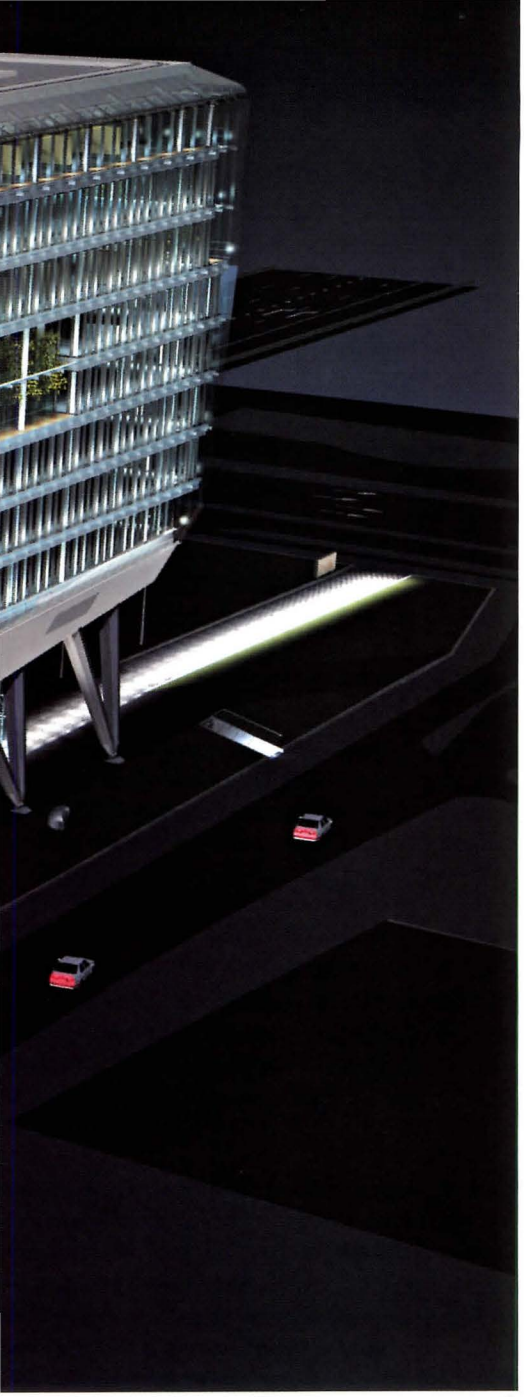

1

ward of the state, which became an export-oriented, private-sector business on the wings of subsidies for design competitions, conferences, publications, and the Dutch Architectural Institute. (Notable overviews are *20th-Century Architecture in the Netherlands* by Hans van Dijk and *20th-Century Urban Design in the Netherlands* by Hans Ibeling, both published by NAI).

But in a nation that has had a government board to assure the "visual decency" of buildings for almost a century, the umbilical of state involvement has yet to be severed. The Netherlands is in the midst of an enormous government-sponsored, rigorously planned effort to build a million new units of housing by 2010, impressive for a nation with about the same population as Florida. Because much of the new housing is intended to offer greater amenity to the nation's rising number of smaller households, there is an ongoing debate about whether state-sponsored neo-Modernism should give way to greater individual expression. Why should architects employed by the government preside over the architectural appearance of the Netherlands, asks Carel Weeber, a dissident in Holland's emerging taste debate. Housing production should reflect consumer desire to a greater extent, say theorists Alexander Tzonis and Liane Lefivre. They recognize that doing so would inevitably lead down the Garden City path to the romantic imagery of homebuilders in America, who prefer to derive their designs from marketers and focus groups rather than from architects.

FOR NOW, THE DUTCH SEEM LITTLE INCLINED TO ADOPT THE INDIVIDUALISTIC, SELF-AGGRANDIZING CULTURE OF AMERICA—HOWEVER SUCCESSFUL IT HAS BEEN.

And yet, for now, the Dutch seem little inclined to adopt the individualistic, self-aggrandizing, and privatized culture of America, however well aligned it may be with the ever-changing currents of global capital. The Netherlands recognizes that cities with amenity and well-coordinated infrastructure will successfully compete in less protectionist European and world markets.

Aesthetic pioneers or pop-culture poseurs?

Dutch architects seem more attuned than ever to the contradictions of their own situation: they now tinge their socially responsible work with influences derived from world flows of multimedia. *Mart Stam's Trousers: Stories from behind the Scenes of Dutch Moral Modernism,* a book by Crimson, an architectural firm that practices largely in a theoretical mode, posits Winy Maas, of MVRDV, as standing "for the typical Dutch architect, with a certain pragmatism regarding . . . suburbanization, automobility, pop culture; and a certain coquettishness about his Dutchness," a pose that is "slightly ironic," but never "cynical."

The embattled American designer might well envy the enormous artistic freedom and public respect Dutch architects enjoy. But Dutch architects today may be playing with fire. In the 1990 lecture, Koolhaas noted with approval, "There is a major stream in modernity that has no concern for people, that isn't humanistic, seeing itself as a part of a whirlwind that spares nothing." In admiring that free but nihilistic universe, the Dutch architect is like the adolescent confronting drugs for the first time: Can I get the thrill without the consequences? If the consequences include depriving Dutch architects of the public respect that has come from subsuming the self-expressionistic urge to the larger good, then they'll suffer consequences the American architect—much lower on the cultural totem pole—knows well. There's no heavy planner's hand in the U.S., but architects spend their days trying to get the client, perpetually driven by "shareholder value," to approve a material slightly more inspired than drywall or synthetic stucco. ■

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EVERYTHING ABOUT AIRPORTS IS GETTING BIGGER: SIZE, PROGRAM, AND FUNDING. CAN ARCHITECTS COPE WITH BALLOONING DEMANDS AND STILL MAKE THESE PLACES MEMORABLE?

1.

Kuala Lumpur, Malaysia

At nearly 4.4 million square feet, this giant new airport by Kisho Kurokawa is a major piece in Malaysia's plan to modernize. And this is just Phase I.

2.

San Diego

A new terminal designed by Gensler and SGPA finds inspiration in the city's industrial heritage and its balmy clime.

3.

Shanghai, China

Paul Andreu and Aéroports de Paris bring their design expertise to a new airport serving the rapidly emerging Pudong business district.

By Thomas Mellins

Often difficult to reach in a timely fashion and hard to leave fast enough, the contemporary airport reflects conflicting currents in our culture. Like the state-of-the-art planes they accommodate, airports are machines for transporting people and goods; efficiency constitutes the primary measurement of their success. At the same time, airports, like the grand 19th- and early-20th-century railroad stations they have in large part replaced, are symbolically rich gateways that reveal our need to create lasting expressions of civic pride.

"Few building types so profoundly fascinate and frustrate people," says Steven M. Reiss, AIA, chairman of architectural services at HNTB Architecture, a firm based in Kansas City, Missouri, that has been responsible for more than 100 airport projects over the past 50 years. "Despite their importance in our lives, however, airports remain fundamentally overlooked and undervalued in aesthetic terms," notes Reiss. Particularly for smaller cities, an airport can be, as John Zukowsky, curator of architecture at the Art Institute of Chicago, puts it, "their temple, their most important public building."

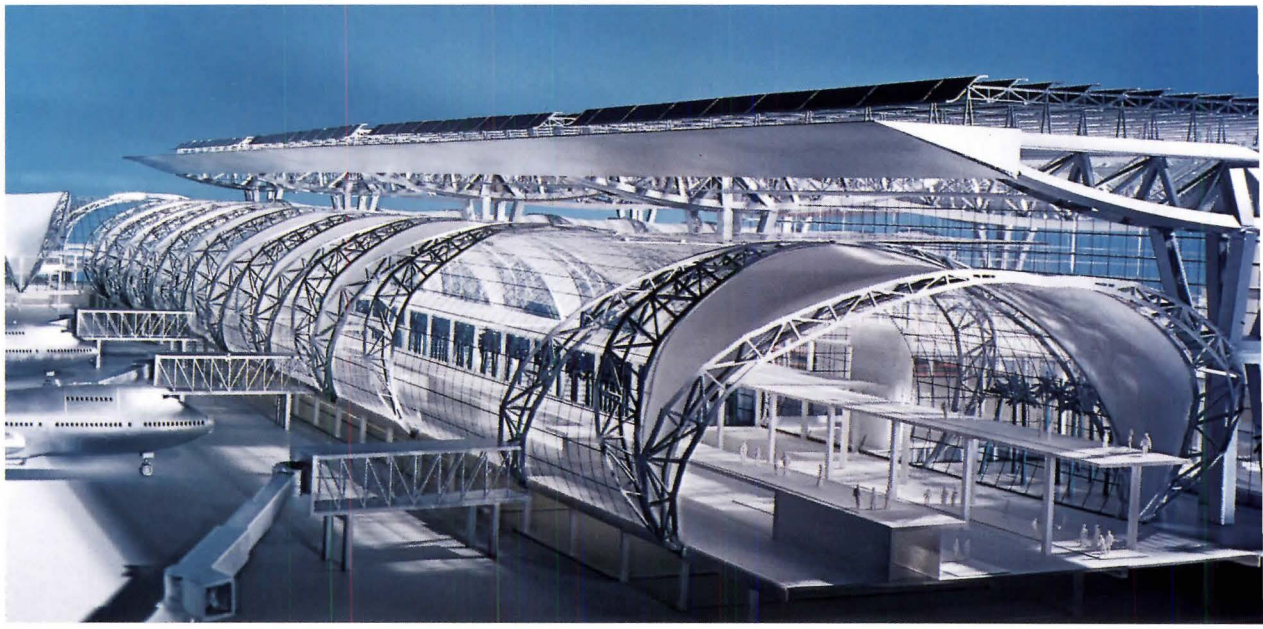
Today, airports are burgeoning in both number and size. They handle more people than ever before. According to the U.S. Department of Commerce, in 1990, there were about 465 million airplane passengers in this country; by the end of the 1990s the number had grown to nearly 600 million. Despite often constricted building sites and relatively limited amounts of available funding, every one of the 25 busiest airports in the United States has recently undergone, or is currently undergoing, a major expansion or renovation. The Airports Council International of North America, a trade group based in Washington, D.C., estimates that an average of $7 billion was spent annually on airport construction in the late 1990s, up from $4 billion in the 1980s. The group says the figure may exceed $10 billion a year in the coming decade. And the explosive growth of airport construction is by no means an exclusively American phenomenon, with facilities being built and expanded throughout Europe and Asia. China alone is currently renovating or planning to renovate 40 airports, and 20 new ones are either in design or under construction.

The World Bank asserts that roughly $350 billion would be required to handle the increased airport demand projected through the year 2010. Though per-square-foot costs for airline terminal buildings are low relative to other building types (about $85–$90 for a regional airport

Thomas Mellins, an architectural historian, is the coauthor of New York 1880, New York 1930, *and* New York 1960.

WWW *For information on the overburdened air transportation system, see "Welcome to Gridlock, All Flights Delayed" in the October 25, 1999, issue of* Aviation Week and Space Technology *or visit the publication's Web site at:* **www.aviationnow.com**

The $1.1 billion Inchon International Airport (left) in Seoul was designed by Fentress Bradburn Architects and will open early next year.



A roof trellis with louvers protects tubular concourses and a rectangular terminal building at the new Bangkok International Airport (right), designed by Murphy/Jahn and set to open in 2003.

and twice that for a major facility in the U.S., compared with $250–$300 for museums), the immense scale of the projects nonetheless sends budgets into the stratosphere. To cover these costs, private developers and public-private partnerships are playing an increasingly important role in the construction of airports and in their operation, both formerly the near-exclusive domain of government. Privatization, widespread in Europe, is becoming more common in the U.S., although it is controversial and can lead to significant battles for control.

New money for projects around the country

U.S. government funding will soon become more plentiful. In April 2000, President Clinton signed the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (commonly called AIR 21), which allocates $40 billion over the next three years for airport construction and airspace infrastructure improvement. Additionally, the bill allows airports to raise the ceiling on the passenger facility charge on every airline ticket by $1.50. It allows for an increase of up to 60 percent in available funds, beginning in 2001. AIR 21 promises to have a profound impact not only on large cities such as New York, Chicago, Boston, and Washington, D.C., but also on smaller ones like Buffalo, Palm Springs, Calif., and Austin, Tex., where recent airport projects, by Kohn Pedersen Fox Associates, Gensler, and PageSoutherlandPage with Lawrence W. Speck Design, are also critical to growth.

For an architect, designing an airport presents particular challenges. While airport commissions are considered plum jobs—in large part because, as Zukowsky succinctly states, their long duration—sometimes up to two decades—renders them "recession busters," time is not always on the architect's side. Architects designing airports are perpetually planning on the basis of soon-to-be-outdated realities. According to Charles Dalluge, vice president and managing principal of the Washington, D.C., office of Leo A Daly, an architecture and engineering firm that has designed more than $1 billion in airport facilities throughout the world since 1994: "When it comes to airport design, the only thing you can absolutely count on is change." Helmut Jahn, FAIA, chief executive officer of Murphy/Jahn in Chicago, who has been designing airports since he began work on Chicago's O'Hare International Airport in 1982, notes, "It is easy to design for what you know; it's very much more difficult to design for what you don't know." Jahn, whose expansion of the FKB Airport serving the Cologne/Bonn area in Germany is scheduled to begin operation in September and whose new Bangkok International Airport is scheduled for completion in 2003, states, "The amazing thing is how well some of the comparatively old airports still work. Building at a scale that exceeded then-current need has helped. The key is a good building diagram and sufficient space for expansion." O'Hare, originally intended to serve 20 million passengers, has been extensively expanded, including the completion of Jahn's United Airlines Terminal One Complex in 1988, and now accommodates 80 million passengers a year.

In addition to an ever-growing number of passengers, another factor dramatically affecting the design of airports is the increasingly large size of aircraft. As planes get bigger, it is more difficult to pack them in at the gates. This results in a call for detached passenger holding facilities, which in turn require intra-airport transportation systems. And airlines want to use a gate as many times per day as possible. As connecting times between flights shorten, efficiency of passenger movement throughout an airport becomes critical.

Still another change affecting the planning and design of air-

ports is an intensified search for sources of revenue. One highly visible result of this trend is the growing number of on-site retail and entertainment concerns. Indeed, today some airports incorporate what amount to suburban-scale shopping malls. Modest food concessions and newsstands have given way to restaurants operated by celebrity chefs such as Wolfgang Puck, branches of high-end stores previously located in the central city or upscale suburb, and fully equipped health clubs.

Bulging programs pose design challenges

To the architect, the integration of large amounts of retail space and facilities such as high-end hotels and business meeting centers can be problematic. Increasing the size of an airport makes efficient pedestrian movement more difficult. Furthermore, what Jahn calls the "proliferation of commercial paraphernalia" can dilute the architect's scheme. Whatever the aesthetic challenges, however, extensive airport-based retail seems here to stay, not only because it makes money, but because it responds to consumer demand that an airport be a place of entertainment. Due to new ticketing and security procedures, the time spent in airports is, despite improved aircraft technology, increasing. In some airports, it is not unusual to have up to four hours of what people in aviation call "dwell time." Travelers require activities that are fun and memorable—picking up a newspaper and running for a flight no longer suffice.

As people spend more time in airports, terminal buildings, once powerful reflections of our collective mobility, must serve as antidotes to the deracination blues. The selection of building material, appropriate art and signage, themed retail, and the inclusion of views outdoors can help root a traveler in a particular location. Additionally, references to local architectural vocabularies can help establish a sense of place. Inchon International Airport, built on a man-made island in the Yellow Sea to serve Seoul, incorporates traditional Korean elements within a modernist scheme; it was designed by Fentress Bradburn Architects, which is also working on the Doha International Airport under construction in Qatar.

With flying now an accepted element not only of long trips, but also weekend getaways—and even some people's weekly commutes—it inevitably risks seeming commonplace. And this, in turn, places a greater burden on the architect. As Curt Fentress, AIA, a principal at Fentress Bradburn Architects, puts it: "It's key to put the excitement of air travel, today so often taken for granted, back into the architecture of airports. Whether it be with a memorable rooftop silhouette or a large room flooded with light, an airport's design, if it is to successfully communicate to the public, must connect to the thrill of taking to the skies." ■

Gensler, Lawrence W. Speck Design, and PageSoutherlandPage built the Austin-Bergstrom International Airport on the site of an old air force base in Texas.

Teflon-coated fiberglass canopies help create shaded outdoor rooms at the new 11-gate concourse and terminal expansion at Palm Springs Airport, designed by Gensler.

A 285,000-square-foot facility designed by KPF, Cannon, and William Nicholas Budouva and Associates replaced two old terminal buildings at Buffalo Niagara International Airport.

Kuala Lumpur International Airport
Malaysia

1

KISHO KUROKAWA WEAVES TOGETHER NATURE AND TECHNOLOGY BY DESIGNING A FOREST OF COLUMNS AND WRAPPING BUILDINGS AROUND TREES.

By Thomas J. Campanella

Project: *Kuala Lumpur International Airport, Kuala Lumpur, Malaysia*
Architects: *Kisho Kurokawa Architect & Associates and Akitek Jururancang*
Engineers: *Ranhill Bersekutu (mechanical); Sepakat Setia Perunding (civil and reinforced-concrete structural design); Pacific Consultants International (steel structure)*
Consultants: *Arklandskap (landscape); GK Sekkei and Urn Kok Wing Integrated (signage)*
Project manager: *Pacific Consultants International*

Size: *4,382,000 sq. ft. (total). 1,842,000 sq. ft. (terminal); 997,000 sq. ft. (contact pier); 1,543,000 sq. ft. (satellite building)*
Completion date: *March 1998 (phase 1)*

Sources
Curtain wall: *Pilkington, MSG Glazing*
Steel windows : *YKK Architectural Products*
Interior ambient lighting: *Matsushita Electric*
Elevators: *Schindler*

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

Program

More than an enormous construction effort, the Kuala Lumpur International Airport (KLIA) was conceived in 1992 by Prime Minister Mahathir Mohamad as a national showpiece—a symbol of Malaysia's rising power in Southeast Asia. The new airport would anchor the southern end of an ambitious 30-mile-long "Multimedia Super Corridor" to include a high-tech development zone known as Cyberjaya, a new governmental complex at Putrajaya, and the Petronas Towers, the world's tallest buildings. Despite recent economic troubles in Asia, much of this Super Corridor is under way or completed.

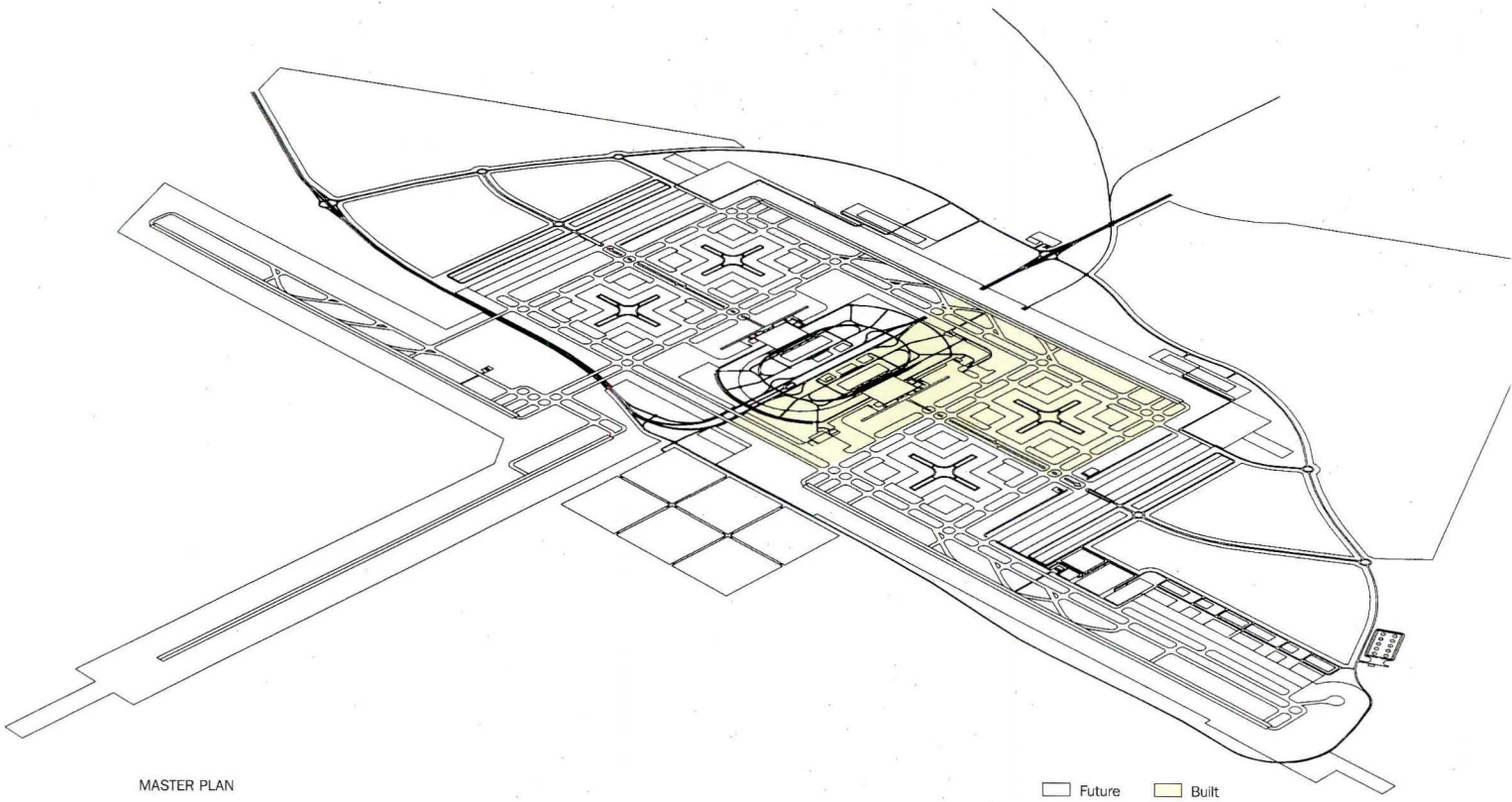
To be built in phases, KLIA was designed to compete with Singapore's Changi Airport as a regional hub and to handle 120 million passengers a year by 2020. After an international design competition, the Japanese architect Kisho Kurokawa won the job.

Design Solution

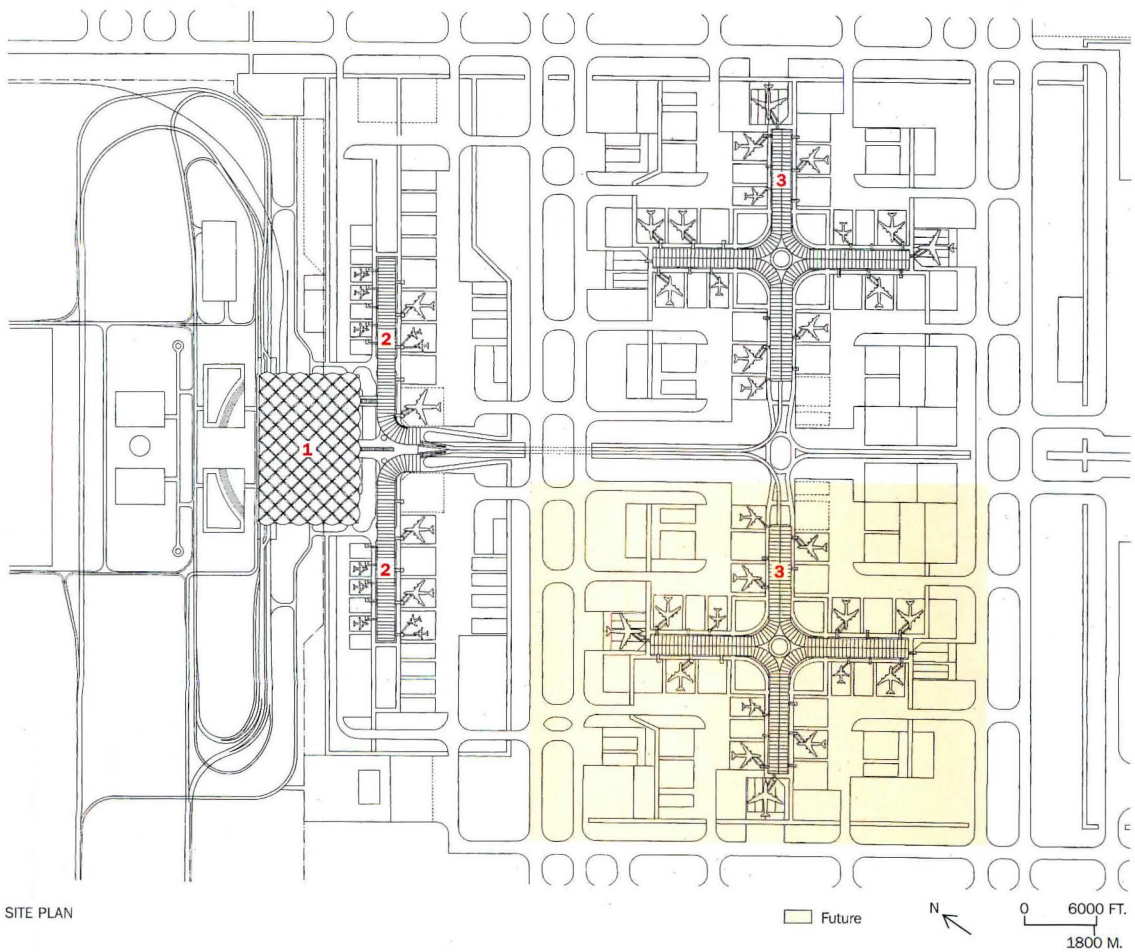
As built, KLIA features three main structures: a 1,842,000-square-foot main terminal, an adjacent 997,000-square-foot contact pier (or passenger concourse) for domestic and short-haul international flights, and a 1,543,000-square-foot satel-

Thomas J. Campanella is a Fulbright fellow at the Chinese University of Hong Kong.

A long contact pier or gate concourse runs behind the main terminal (opposite top). The terminal's roof is a grid of hyperbolic-paraboloid shells that rest on conical columns and incorporate glazed trusses (right and opposite left).

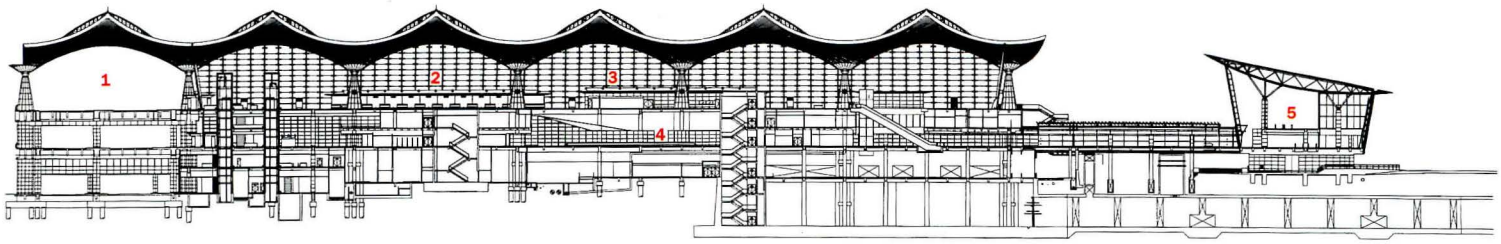


MASTER PLAN



SITE PLAN

1. *Main terminal*
2. *Contact pier*
3. *Satellite building*



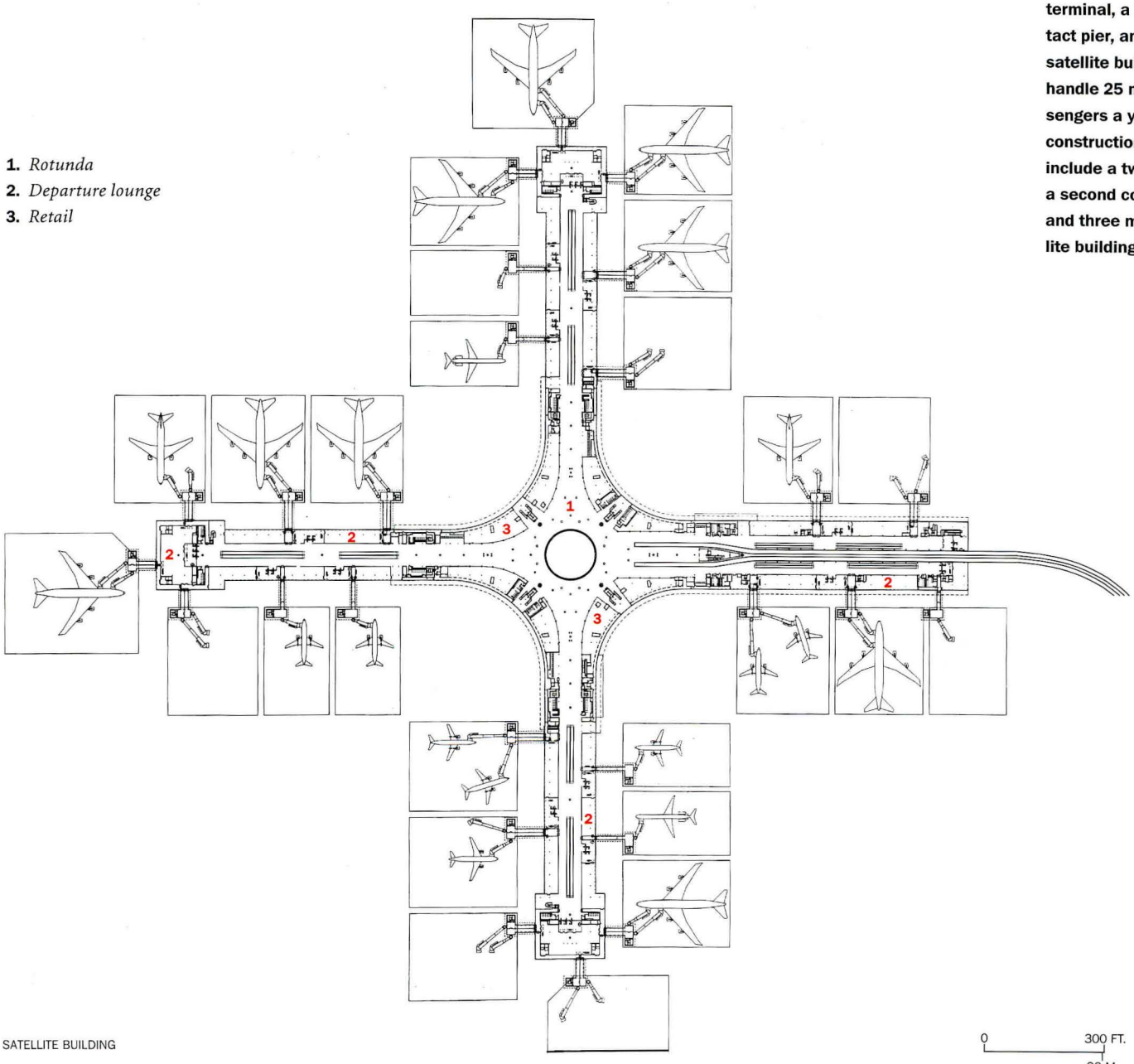
SECTION THROUGH TERMINAL AND CONTACT PIER

0 100 FT.
30 M.

1. *Ground transportation*
2. *Ticketing*
3. *Retail*
4. *Baggage claim*
5. *Contact pier*

Phase I of the project has been completed and includes a main terminal, a long contact pier, and one satellite building. It can handle 25 million passengers a year. Future construction may include a twin terminal, a second contact pier, and three more satellite buildings.

1. *Rotunda*
2. *Departure lounge*
3. *Retail*



SATELLITE BUILDING

0 300 FT.
90 M.


LL
M

lite building to accommodate long-distance international flights. This satellite building is connected to the main terminal by underground high-speed conveyor belts and elevated people-mover trains. Plans call for eventually adding a twin terminal building, a second contact pier, and three more satellite structures, as well as three more runways to go with the existing two.

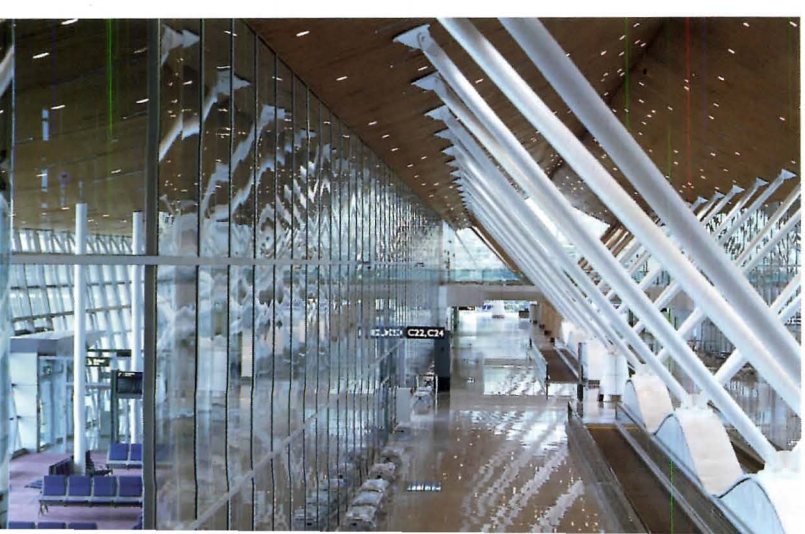
A leading Japanese architect since the 1960s, Kurokawa has written about the symbiosis of the natural and artifactual worlds. At KLIA he sought to fuse his architecture with the lush tropical landscape. Because the site itself was once a plantation, Kurokawa chose as a governing metaphor an "airport in the forest" and a "forest in the airport." The terminal building incorporates the woodland theme with a grid of trunklike columns that evokes a Malaysian oil palm plantation. An undulating ceiling adds to the impression of palm fronds overhead, while glazed connecting trusses resemble uplifted branches.

The open-plan terminal has six levels. Check-in islands, six in all, have louvered canopies that reduce the scale of the departure hall. Beyond the check-in counters are a variety of facilities including stores and prayer rooms (know as *suraus*) for the devout population of this mostly Muslim nation. The nontraveling public may continue to an observation deck, while travelers move through security checkpoints down to a mezzanine-level passport control area. The arrivals hall, with baggage claim and access to ground transportation, lies one floor below this.

The contact pier, which is attached to the terminal building by a bridge, houses passenger gate lounges and a people-mover station. Between the main terminal and the contact pier are two landscaped areas planted with a mixture of native trees and shrubs—a literal manifestation of Kurokawa's forest metaphor. (Species unappealing to birds were selected to reduce the risk of collisions with aircraft.)

The satellite building wraps around a landscaped "forest" (above). The main terminal's departure level (opposite top and bottom) features a different kind of forest made of fat columns supporting roof modules that are 125 feet square in plan.

The passenger areas in the long arms of the satellite building (above and below), as well as the concourse area of the contact pier (opposite), are essays in transparency.



Structure/materials

The roof of the main terminal is a hyperbolic-paraboloid shell supported by a lattice of keel trusses mounted on a grid of reinforced-concrete columns. Conical steel capitals fitted with gusset-fin plates attach trusses to columns. The 100-foot-long trusses, which resemble great insect wings from the air, are glazed and serve as skylights for the departure hall. Columns are clad in polished granite and contain plenums for chilled air, jet-nozzle diffusers, and drainwater pipes.

Both the contact pier and satellite building use bow-truss roof structures supported in cross section by multipoint, column-mounted raking struts. The courtyard of the satellite building is enclosed by an inclined curtain wall supported by a ring truss. Throughout these buildings, the structural glazing system offers maximum transparency.

Commentary

The satellite building is the airport's most arresting element and also the least visible—situated more than two-thirds of a mile from the main terminal. Cruciform in plan, it is a study in glass and light, with four great arms pinwheeling about a landscaped courtyard. The lushly planted, visually compelling space is enclosed by an inverted conical curtain wall.

In spite of their size, all three of Kurokawa's buildings possess a lightness made possible by an abundant use of glass. Glazed curtain walls offer generous views outside and help travelers orient themselves. By connecting people to daylight and plantings, the complex helps relieve the anxiety of modern air travel. ■


A1-A11

San Diego International Airport
San Diego, California

2 **GENSLER AND SGPA ARCHITECTURE BRING AN AERODYNAMIC SLANT TO A NEW TERMINAL, WHILE CATCHING SOME OF THE VIEWS OF ITS CALIFORNIA CONTEXT.**

by Alice Y. Kimm

Project: *Terminal 2, San Diego International Airport*
Architect: *Gensler—Andrew Cohen, AIA, project director; Kap Malik, AIA, project designer; Ronald Steinert, AIA, terminal planner; Gerhard Pichel, AIA, project manager; John Circenis, AIA, Imre Takacs, project architects; Son Do, Lorraine Francis, Tim Sullivan, Claud Kamar, Craig McMahon, AIA, Bill Lim, Thomas Rosbach, Huston Eubank, Michael Collins, design team*
Architect of record: *SGPA Architecture & Planning—Dave Reinker, AIA, Bill Headley, AIA, Maria Koter, Chuck Snyder, Patrick Carr*
Engineers: *Cottrell, Valdos and Associates in association with Libby Engineers (structural); LSW Engineers (mechanical/electrical/plumbing); P & D Consultants (civil)*
General contractor: *Douglas E. Barnhart, Inc.*

Size: *320,000 gross square feet*
Completion date: *January 1998*

Sources
Exterior cladding: *Alucobond*
Sloped curtain wall: *Don Reynolds wall system, manufactured by EFCO*
Built-up roofing: *Johns Manville*
Lighting: *Bega, Orgatech, Zumtobel Staff*

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

Program

Constrained by a tight 470-acre site and growing passenger traffic, the San Diego International Airport needed a second terminal that would provide nine new arrival gates and be expandable when adjacent land becomes available in the future. The San Diego Unified Port District, which operates the airport, also wanted the new terminal to act as a gateway to the city and recall San Diego's history as an aircraft-manufacturing hub. Other aspects of the job would include reworking roadways to reduce congestion and building a new parking structure and ground transportation plaza.

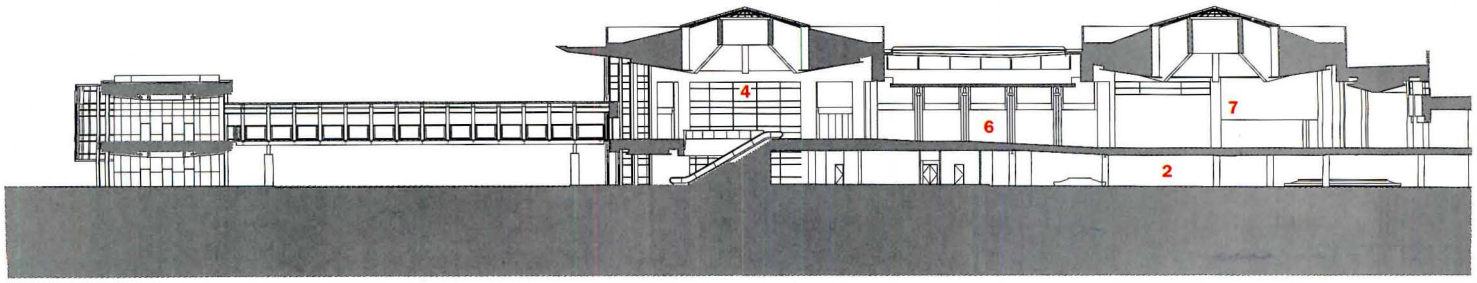
Design solution

The new 320,000-square-foot, L-shaped terminal locates services and arrival gates to one side of a large linear concourse, which in turn is anchored by two large rotundas. The rotundas work as transition nodes and decision-making points. The landside rotunda, the terminal's main entrance, connects to a large new landscaped parking and transportation plaza via a circular pavilion and a sky bridge. The entry rotunda provides easy orientation and access to ticketing and the main concourse. The second—airside—rotunda contains concessions and other amenities. While many airports feature dramatic departure halls, arrivals halls are often less memorable. But in San Diego, a large, double-height baggage-claim wing delivers an architectural punch.

According to Kap Malik, project designer for Gensler, the project's organization works because "wherever you stand in the new terminal, you can see all other major program elements." The plan's simplicity will allow for future expansion to occur easily. When land directly to the

Alice Y. Kimm is a partner in the Los Angeles firm John Friedman Alice Kimm Architects.

With only 470 acres for the entire airport, the new terminal needed a compact plan (opposite top). The south facade (this page) recalls Saarinen's design for Dulles Airport.



NORTH-SOUTH SECTION

→N 0 50 FT. 15 M.

1. *Transportation plaza*
2. *Baggage claim*
3. *Ticketing*
4. *Entry rotunda*
5. *Airline operations*
6. *Security corridor*
7. *Marketplace rotunda*
8. *Holdroom*
9. *North rotunda*

west becomes available, additional arrival gates will simply be added to the opposite side of the present concourse, and the two rotundas will remain the nuclei of the expanded facility.

Structure/materials

If the clarity of the building's plan gives rise to its efficiency, its envelop refers to the aeronautical age with sleek, winglike forms. The building is framed in steel, with concrete elements providing lateral stability. Moment frames eliminate the need for cross-braces.

The structure is tied to form: for instance, the baggage-claim area is a double-height hall framed on the south by a 700-foot-long glass curtain wall punctuated by poured-in-place concrete piers. Clearly inspired by Eero Saarinen's Dulles Airport in Washington, D.C., this wall tilts forward and faces the ocean. While the practicality of a tilted wall lies in the creation of a sunshade that blocks southern glare, metaphorically it refers to the angle of an airplane wing.

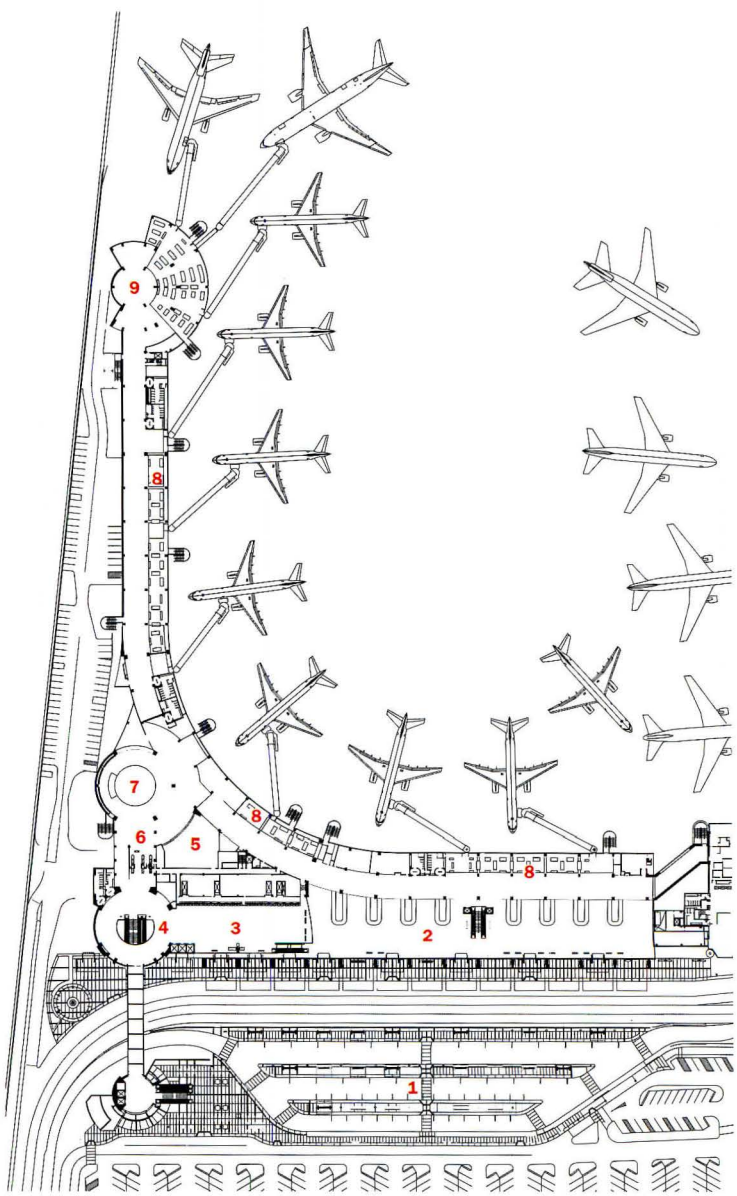
At San Diego the profiles of the tilted wall, sloped steel-framed ceiling, and overhead eaves, along with the sheer scale of the hall, draw the visitor toward views of the sea. Standing on the upper concourse and looking out through the south-facing glass, "you can see not just the water, but sailboats," says project designer Malik. Three immense skylights also bring the outdoors inside, as do ceiling panels corrugated like rolling ocean waves.

While the architects used stainless steel, concrete, and glass to define or dissolve spatial boundaries, they specified warmer materials for floors and solid walls. Introducing color without resorting to paint, Gensler used materials such as slate and limestone in their natural states. And in a subtle homage to a local masterpiece, concrete for the piers along the arrival hall's south wall was mixed to match the concrete at Louis Kahn's Salk Institute.

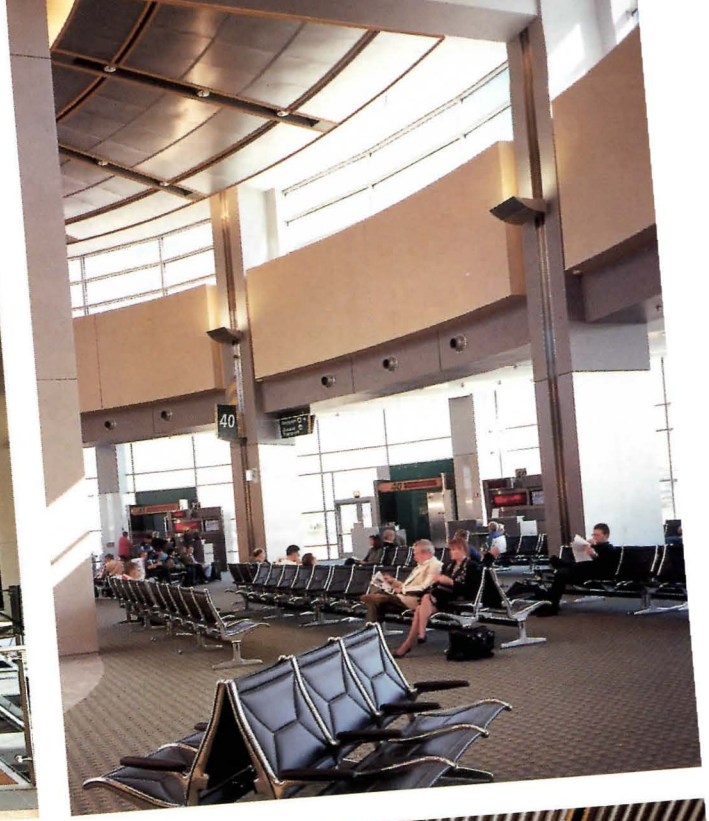
To maximize energy-efficiency, Gensler used low-e glazing at curtain walls, advanced variable volume air-handling systems, and air-economizer cycles (which turn off cooling systems whenever the outside temperature drops below interior temperature). In addition, an automatic control system turns off interior fixtures when there is sufficient ambient light.

Commentary

While the two rotundas that anchor Terminal 2 may fall short of formal or visual innovation, they serve to anchor a building that functions simply and elegantly. And elsewhere, such as at the arrivals hall, the project's more skillful spatial and formal articulation alludes to both the local context and an aeronautical spirit that recalls San Diego's industrial heritage. ■



N 0 200 FT. 60 M.



Rotundas act as nodes between different parts of the terminal and help orient travelers. Both the entry rotunda (right) and the north rotunda (far right) also bring daylight in from above. The arrivals hall (below) features a 700-foot-long canted glass curtain wall.

Shanghai-Pudong International Airport
Shanghai, China

3

AÉROPORTS DE PARIS DESIGNS A SLEEK NEW AIRPORT FOR SHANGHAI'S 21ST-CENTURY DEVELOPMENT AREA. BUT IS IT REALLY NEEDED?

By Thomas Campanella

Project: *Shanghai-Pudong International Airport Shanghai, China*
Architect: *Aéroports de Paris Architectes et Ingénieurs—Paul Andreu, principal; François Tamisier, Gérard Andreu, Pascale Gonon, Hélène Boitard, design team*
Engineer: *Coyne et Bellier (structural)*
Consultants: *Michel Desvigne (landscape); Yan Kersale (lighting)*

Size: *2.27 million square feet*
Completion date: *October 1999*

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

Program

In the early 1990s the Chinese authorities decided to turn the Pudong district of Shanghai into a model metropolis for the 21st century. Lying across the Huangpu River from old Shanghai, Pudong has morphed during the past decade from an area of farms and villages into an explosion of skyscrapers, convention centers, shopping and entertainment districts, and one of the widest boulevards in the world.

To serve the new Pudong, the government decided to give it an international airport all its own, the second in the Shanghai area. After a design competition in 1996, Paul Andreu of Aéroports de Paris (ADP) was awarded the commission.

Due to the pace of development in China, the Shanghai-Pudong airport had to be built in record time, moving from initial design in the fall of 1996 to opening at the end of 1999. The first phase required 28 gates in the terminal and 11 remote gates and needed to handle 20 million passengers a year.

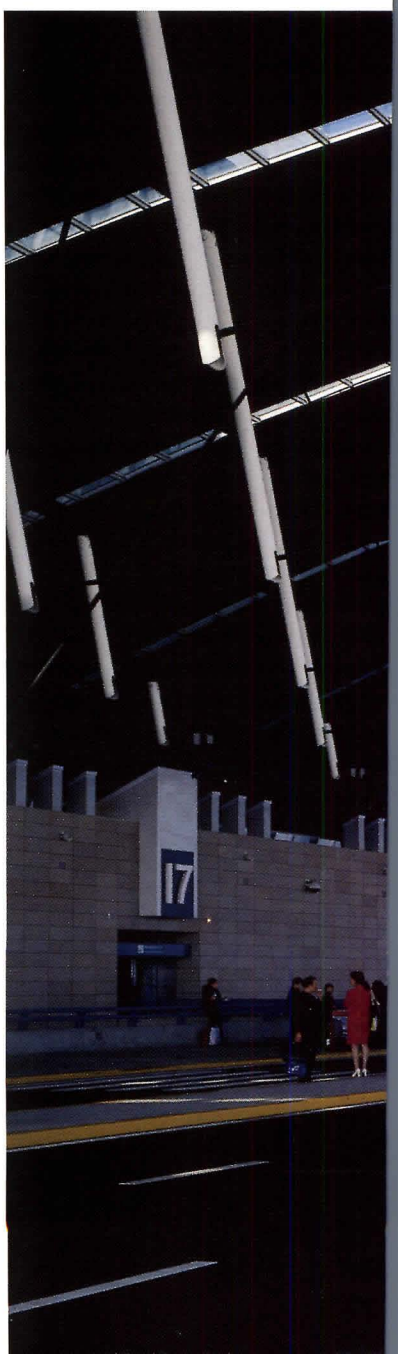
Design solution

To speed the building process, ADP used a simple structural system for the project's signature roofs and began foundation work even as the superstructure was in the final design stages. Andreu approached the huge site by abstracting it into a geometric arrangement of water and landscape. Curving access roads and a right-of-way for a future rail line cut across a broad, rectilinear reflecting pond, while the terminal building sits within a great square of trees and gardens.

Andreu broke down the 2.27 million-square-foot terminal into four components—a drop-off platform, a departure hall, a retail area, and a gate concourse—and gave each its own curving roof. Angled curtain walls and radiating vertical mullions give the building a sense of upward thrust, but a heavy concrete plinth keeps it earthbound.

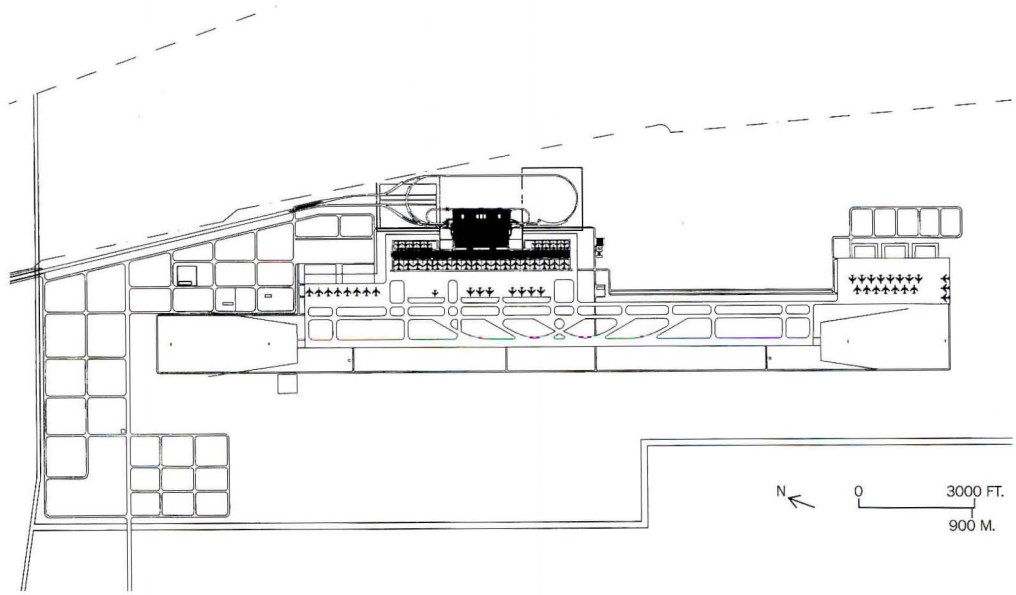
Inside the terminal, skylights illuminate hundreds of vertical roof-support members; when illuminated at night, these verticals resemble "a shower of comets falling from the sky," says the architect.

As is typical of airports today, arriving and departing passengers are segregated vertically and move

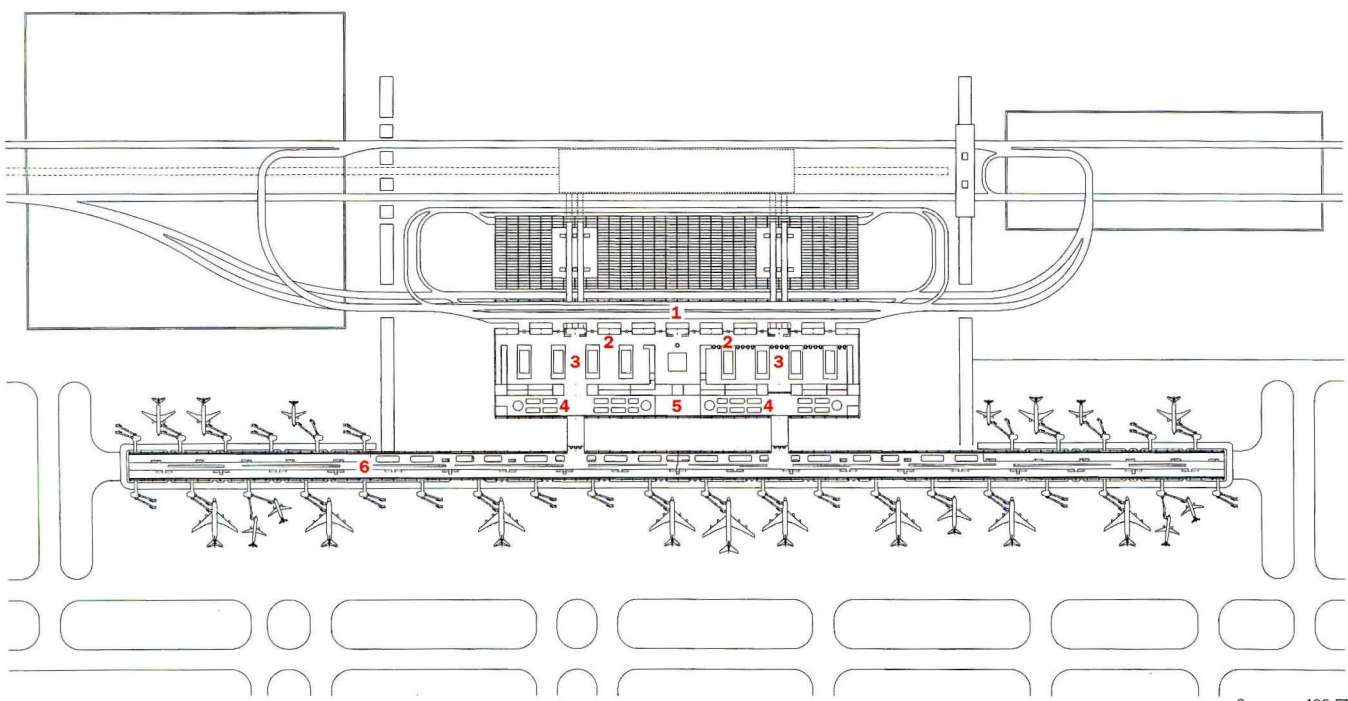


An access road cuts across a large rectangular pool (left) in front of the terminal. A curving roof covers each of the building's four main components: a drop-off area (below), the departure hall (middle section in photo left), a retail area (right in photo left), and a 4,600-foot-long gate concourse.

A glazed bridge (opposite top) leads from the main portion of the terminal (opposite bottom) to the departure concourse (opposite middle). There are 28 gates in the concourse and 11 remote gates beyond the building.

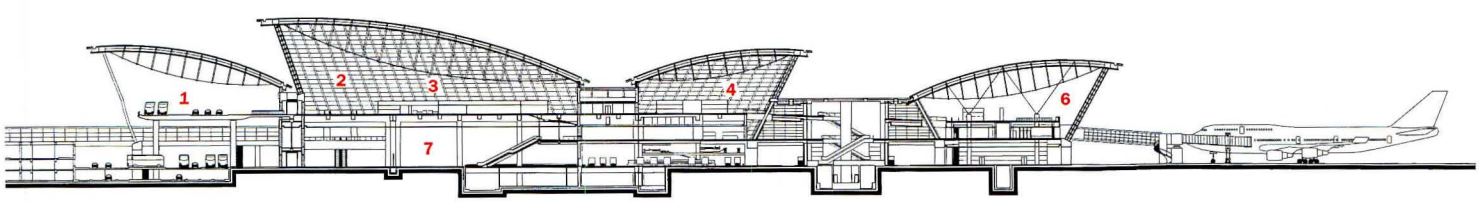


SITE PLAN

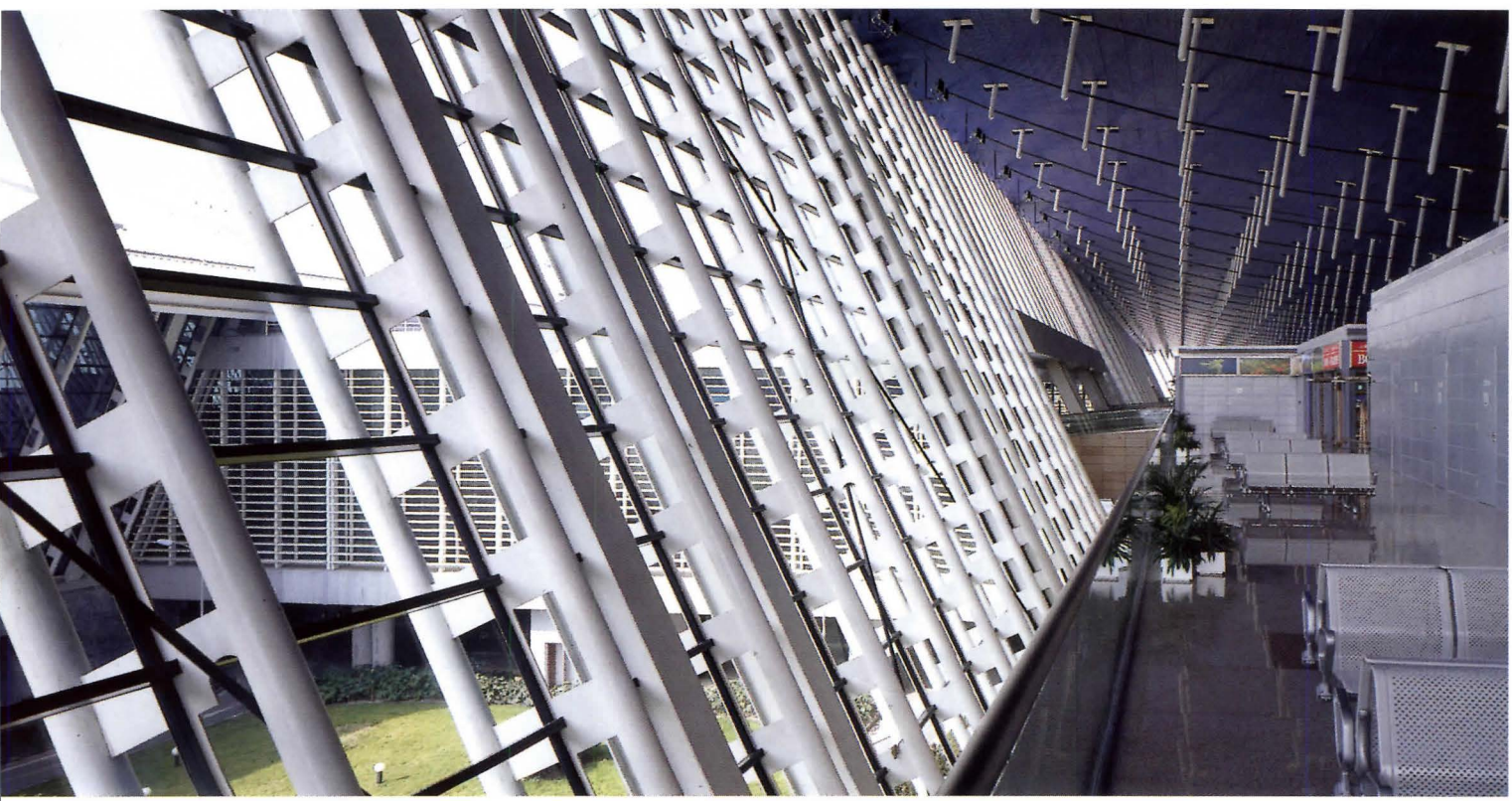


UPPER LEVEL

1. *Drop-off*
2. *Departure hall*
3. *Ticketing*
4. *Retail*
5. *Restaurant*
6. *Concourse*
7. *Arrival hall*

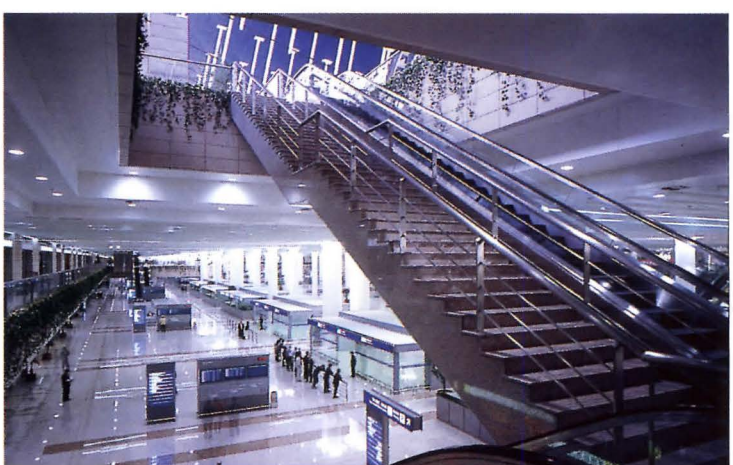


TRANSVERSE SECTION



from one curved-roof zone to another. Located on the upper level are the departure hall and check-in counters, shops and restaurants, security checkpoint, and boarding lounges. Arrival areas, immigration and customs checkpoints, and baggage-claim facilities are located below. Glazed bridges connect the main portion of the terminal with the 4,600-foot-long concourse.

The present terminal is the first of four such complexes planned for the airport, each "module" designed to accommodate an additional 15 to 20 million passengers annually. The next phase will involve construction of a "mirror" complex opposite the present terminal; future plans call for a second pair of complexes further along the airport's central axis. When all construction is completed, the airport will be able to handle more than 70 million passengers a year.



Throughout the project, roofs are prestressed parabolic trusses with lower chords that are cables.

Structure/materials

Andreu used "contrasting but complementary elements"—light steel roofs and a heavy concrete base—to allude to the earth and the sky. The project's most identifying elements are its roofs, which employ a series of prestressed parabolic trusses free of diagonal members and supported at each end by columns. The upper chord of the trusses is in compression, while the lower chord—a cable—is in tension. Where the roof is exposed to wind (as in the vehicle drop-off area) a series of uplift stays have been added for additional rigidity.

Commentary

Shanghai-Pudong International Airport was one of a number of major capital projects that opened on October 1, 1999, marking the 50th anniversary of the People's Republic of China. It is the largest and most technologically advanced airport on the Chinese mainland, and proof that architectural design and construction there has come a long way in the past decade.

The terminal's clean and simple logic makes getting about effortless, something jet-lagged globe-trotters will particularly appreciate. Because the terminal is spacious and flushed with natural light, even a long layover here can be a positive experience.

Architectural quality aside, it is not yet clear how successful Shanghai-Pudong Airport will be. Competition with Hongqiao Airport, on the city's west side, is inevitable. Air-passenger traffic in Shanghai has been growing at more than 20 percent a year, but whether this will be enough to support two major hubs remains to be seen. The Pudong airport is fairly remote, even from Pudong's center (which, ironically, is more quickly reached from the old airport). The new airport's planners have had a difficult time convincing investors that Shanghai's center of gravity has shifted to the east side of the Huangpu River. For most people, Shanghai remains a city with a split personality, each with its own ambitions and now its own airport as well. ■

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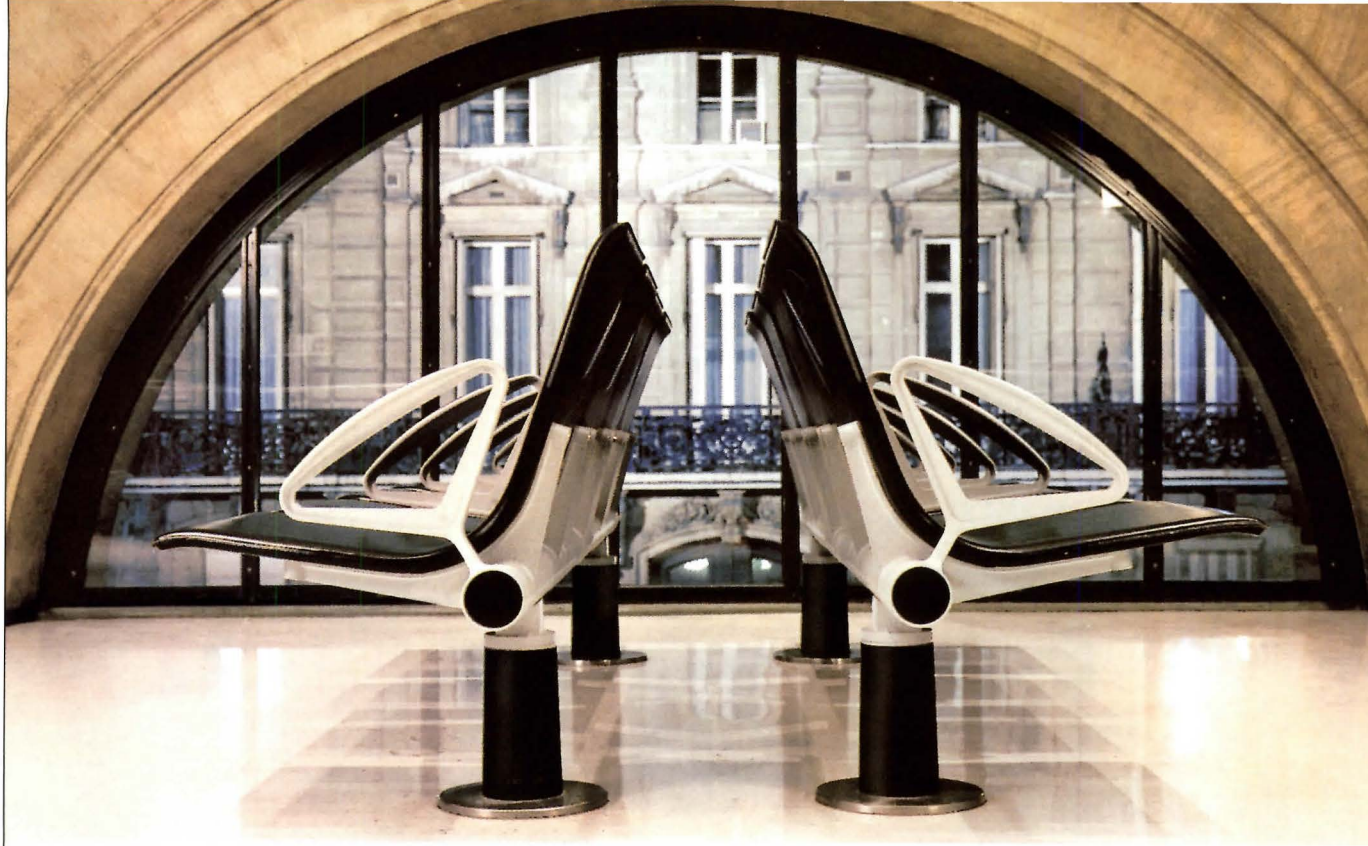

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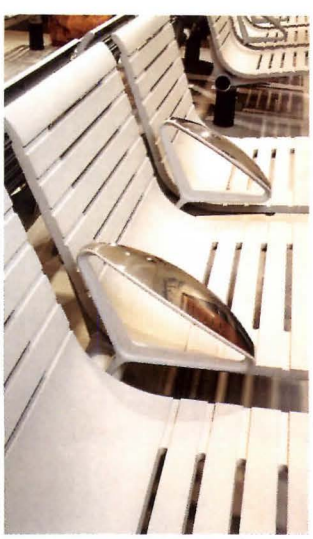

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Using multiple glass skins to clad buildings

THEY'RE SOPHISTICATED, ENERGY-EFFICIENT, AND OFTEN SPARKLINGLY BEAUTIFUL, BUT WIDELY USED ONLY IN EUROPE—AT LEAST FOR NOW.

By Werner Lang and Thomas Herzog

Although a dual-layered glass facade may be configured in many ways, it is essentially a pair of glass skins separated by an air corridor ranging in width from a few inches to several feet. The glass skins may stretch over an entire structure or a portion of it, or a single layer of glass may arch, tentlike, over several buildings with conventional or glass facades. The main layer of glass, usually insulating, serves as part of a conventional structural wall or a curtain wall, while the additional layer, usually single glazing, is placed either in front of or behind the main glazing. But no matter how the layers are arranged, they make the air space between the layers work to the building's advantage—primarily as insulation against temperature extremes and sound.

Dual-layered glass facades offer many indirect advantages as well, particularly the twin-face facade, which allows natural ventilation in an environment with high winds, such as high-rise buildings. This type, the most popular in Europe, enables users to control their working environment while helping to eliminate "sick-building syndrome," which can result from an over-reliance on air-conditioning.

Werner Lang is a Ph.D candidate in the building technology department at the Technical University of Munich; he specializes in innovative sun-shading and heat-protection devices for dual-glass facades. Thomas Herzog, Ph.D., is chairman of the building technology department at the Technical University of Munich.

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 182 and follow the instructions.*

LEARNING OBJECTIVES

After reading this article, you should be able to:

1. Describe dual-layered glass facades and how they function with the building's climatic system.

2. Compare the different classifications and characteristics of glass facades.

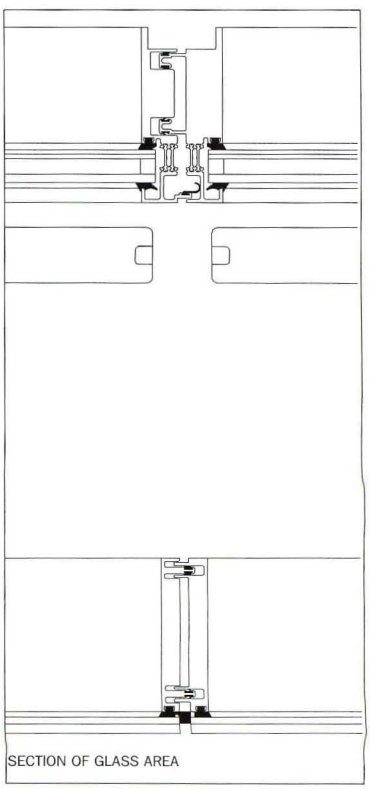
3. List the advantages of dual-layered glass facades for building occupants and owners.

4. Discuss why these are not widely used in the United States.

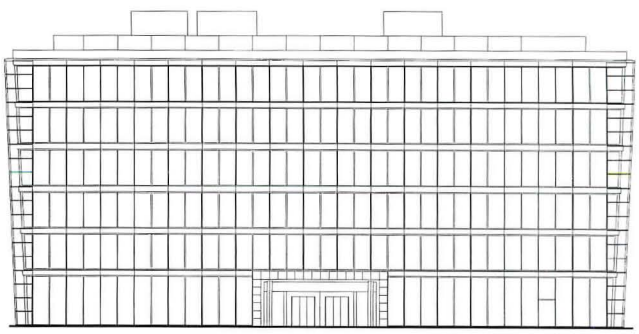
WWW *For this and more continuing education go to:* **www.architecturalrecord.com**

The Halenseestrasse "Lemon" is a 10-story office building in Berlin-Wilmersdorf. Designed by Hilde Leon and Konrad Wohlhage of Berlin, the Lemon's facade has a 28-inch-wide corridor between glazing layers (above) that contains sunshades. The corridors are mechanically ventilated; fresh air is drawn in at roof level and pumped to the floors via vertical shafts. The dual-glass skin also reduces noise and pollution from heavy traffic outside.

Van den Valentyn & Tillman's office complex for the Victoria Insurance Company in Cologne, Germany, consists of twin towers and a conical building. The dual glazing on the towers is coated to limit solar gain. The inner skin is sealed; the building is fully air-conditioned. But natural ventilation improves comfort by conditioning the air in the 31-inch-wide corridors. Fresh air enters the bottom of the air gap, moves upward through the grilles at each floor, and is exhausted out the top. Large expanses of glass limit the need for electric light.



SECTION OF GLASS AREA



ELEVATION

CURTAIN WALL SECTION

In winter, the glass layers enhance the heat-insulating functions of the facade owing to the comparatively higher surface temperatures of the inner surface of the facade. Moreover, according to studies by Drees & Sommer, environmental engineers in Stuttgart, two-layer facades improve sound insulation properties by 5 to 30 decibels, depending on the layout of the floors.

THE AIR SPACE BETWEEN THE LAYERS OF GLASS IMPROVES INSULATING QUALITIES.

All types of dual-layered glass facades offer a protected place—within the air gap—to mount shading and daylight-enhancing devices such as venetian blinds and louvers. Sheltered from wind, rain, and snow, these shading devices are less expensive than systems mounted on the exterior. The protecting layer of glass makes it possible to operate the devices year-round and in any weather. Maintenance and replacement are also simplified by the gap. In addition, advanced daylighting systems, such as reflective blinds, prismatic components, and light grids, which are used to control daylight and heat gain, also are better installed in the gap.

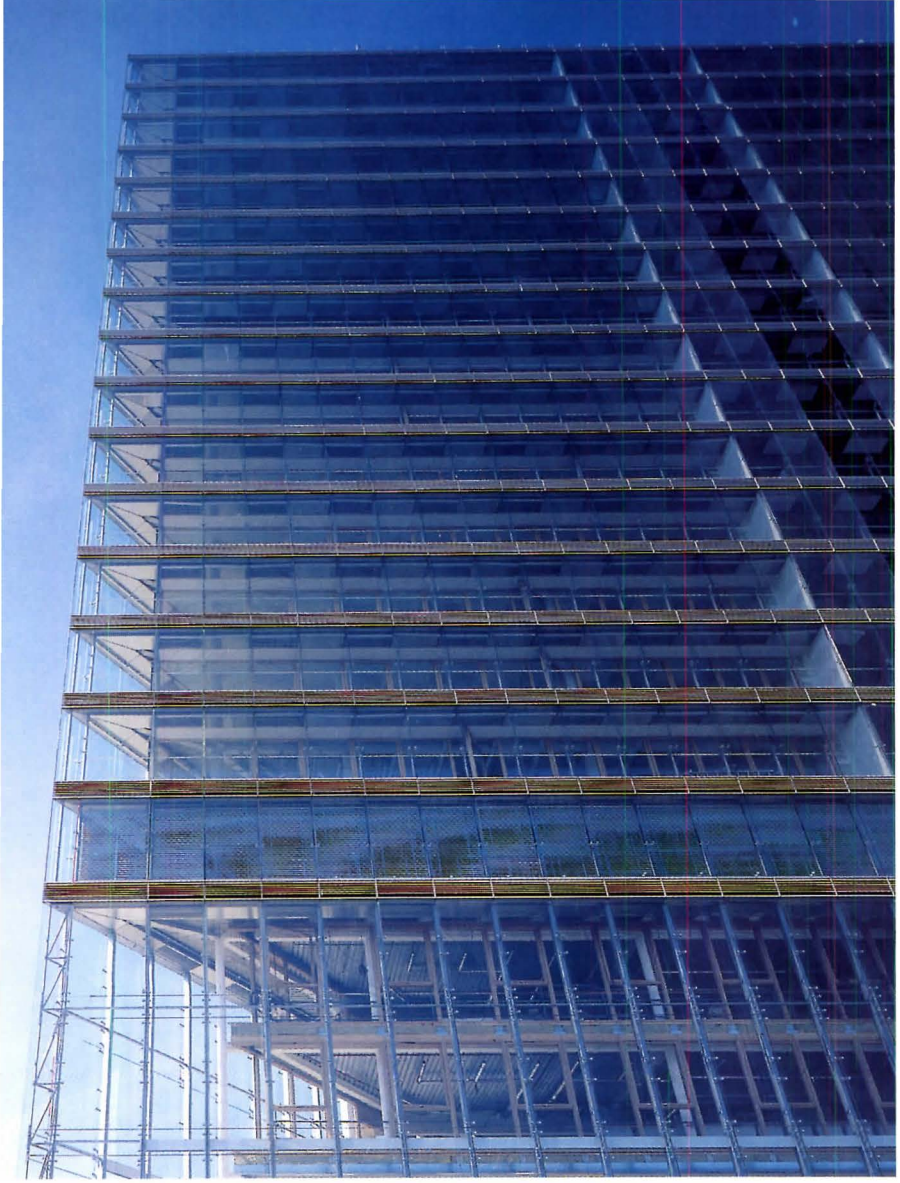
Beyond the practical considerations, these crystalline facades often possess a fragility and weightlessness that make more conventional wall systems seem oppressively solid. The glass admits copious quantities of light, so that the interior appears barely enclosed.

Architects in central Europe are increasingly using dual-glass facades to create these often-ethereal spaces while reducing energy consumption. According to some estimates by environmental engineers, certain types of ventilated facades show energy savings of 30 to 50 percent. But much confusion exists in the U.S. and other countries about the function, construction, costs, and appearance of these facades. A successful application addresses this type of facade not as an isolated subsystem of a building, but as an integral part of the whole building—its construction, its technical equipment, and the overall energy balance.

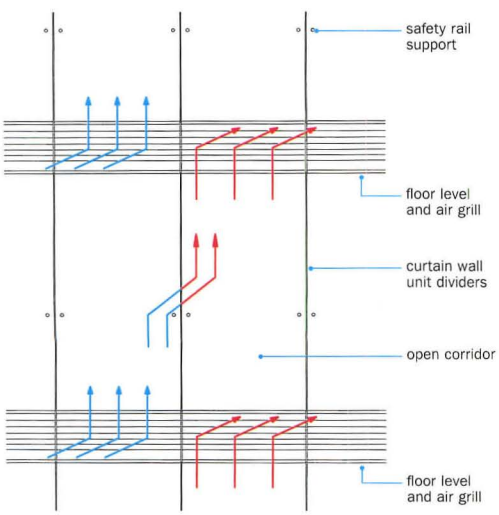
Twin face is best

A typology based on the function and construction of the dual-glass facades classifies the various systems and clarifies the different terms used in the design of the multilayered glass skins. There are three principal types of dual-layered glass facades: *buffer*, *extract air*, and twin face, which differ significantly with regard to ventilation and potential reduction of a building's energy demand.

Buffer facades have been around for almost 100 years and are still in use. They were developed before insulating glazing was invented to



Designed by Petzinka, Pink and Partner in Düsseldorf, the Düsseldorfer Stadttor has a glass skin placed over a conventional wall with doors that open to the corridors. Fresh air enters the skin at each floor via mechanically controlled grilles (drawing, right). Exhaust air is drawn diagonally through vertical glass panels and expelled through grilles at the top of each floor.



increase the heat- and sound-insulation properties of facades without reducing the use of daylight. They consist of two layers of single glazing mounted 10 to 30 inches apart. As with insulating glass, the gap between the two layers of glazing is sealed. Fresh air gets into the building through separate box windows, cut into the two layers of glazing. An early example of this type is the curtain wall of the 1903 Steiff factory in Giengen/Brenz, Germany. A modern example is the 1983 Hooker office

EXTRACT-AIR FACADES WORK WELL FOR BUILDINGS IN WINDY AND NOISY LOCALES.

building in Niagara Falls, N.Y., by Cannon Design in Grand Island, N.Y. This recent building improves on the model: warm air is exhausted through openings at the top of the facade, while cool air is drawn into a gap at the bottom.

Extract-air facades, popular in the 1970s and 1980s, consist of a second single-glazed skin placed inside a main facade of insulating glass. This type of facade is useful for buildings in windy and noisy locations or in places with fumes, where fresh air is supplied by the HVAC system because natural ventilation via operable windows is not possible.

The gap between the two layers of glazing becomes part of the

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At Düsseldorfer Stadttor, a 184-foot-tall glazed atrium (left) shields open space between two 16-story towers. A somewhat different atrium was used at the Museum of the History of Hamburg, by Gerkan, Marg + Partner in Hamburg. Such atria reduce the thermal demand on the inward-facing walls and moderate temperatures within the adjacent buildings. They also serve as pleasant spaces.

air-conditioning system, since the "used," warm air is mechanically exhausted through openings in the inner skin and pulled into the gap of the facade. The warm air from the room heats the inner layer of glass, improving comfort and reducing heat lost through the facade during cold weather. From there, the extract air is led to heat exchangers (within the HVAC system) so the warm air tempers incoming fresh air and saves energy.

Shading devices may be mounted within the gap, keeping solar gains outside the occupied areas of the building in the summer, where they may be exhausted immediately. In this way, the extract-air facade lightens the cooling load. To supply the necessary air changes mechanically, however, demands energy and prevents occupants from adjusting the temperature of their individual spaces.

A better choice, and the most innovative and commonly used system today, is the twin-face facade. Developed in the late 1980s, this facade consists of a conventional curtain or massive wall system within an outer skin of single glazing. In most cases, the secondary glass skin is a non-load-bearing curtain wall made of a single layer of safety or laminated glass. It can also be made of insulating glass to enhance the thermal properties of the twin-face facade.

The width of the gap between inner and outer skins varies from 6 to 30 inches, depending on the space needed to maintain the facade and on the type and size of the shading system within the gap. Twin-face facades are primarily distinguished by openings in the skins that allow for natural ventilation. The outer glass skin blocks the wind, permitting high-rises or buildings in exposed settings to have access to fresh air. As a result, windows on the interior glass layer can be opened without gales sweeping through the space. Where external noise is a problem, remote openings allow fresh air to enter while minimizing sound.

The role of glazing

Combining a variety of glazing types with very different functional characteristics enhances the function of dual-skin glass facades. Early versions, such as buffer facades, used single glazing for the outer and inner skins.

Extract-air facades employ insulated glazing for the outer skin and single glazing for the inner skin. That's because this type was developed so that the warm "used" air passes through the gap in the facade, tempering the inner layer of single glazing, while the outer layer of insulating glazing minimizes heat-transmission losses.

Twin-face facades combine a single-glazed outer skin with an insulating-glass inner skin. While the function of the outer skin is primarily to protect the contents of the gap and the inner layer from rain and wind, the insulating glass on the inner layer prevents heat-transmission losses during cold weather. It also offers a range of construction variations for the outer skin, leading to easier architectural expression. For example, the substructure of the outer layer of glass is normally composed of aluminum or steel cantilevers. The glazing is then fastened with a point-fixed system or top and bottom rails.

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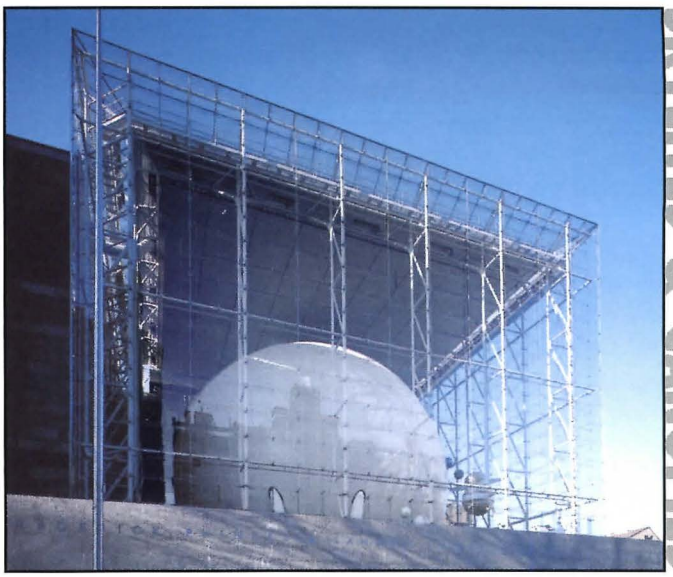

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Mind the gap

An important criteria for the classification of glass facades is the way in which they divide the gap between outer and inner layers. The gap may be undivided, or it may be partitioned by walls, glazing, wings, or other design techniques. This determines the functional characteristics of the facade, such as its heat and sound insulation, as well as the means of fire protection used within the structure.

Undivided facades are simple systems without structural elements between the inner and outer skins. This type poses some problems: Noise flows throughout the air space so that any rooms with open windows are invaded by sounds from the rooms above, below, or on either side. Fire and smoke can also spread freely through the gap.

In addition, air that accumulates at the top of the air space between the two layers is likely to get hot on sunny days. Openings in the outer skin at the top of the structure siphon out the warm air, while cooler replacement air is drawn from near the base of the building.

THE WAY THE GLASS LAYERS ARE CONFIGURED DETERMINES HEAT AND SOUND INSULATION AND FIRE PROTECTION.

Undivided facades include the following:

- Atria made by placing an additional layer of glass in front of or atop various wings of a building, creating a large, sheltered space. Atria are used for various purposes, such as meeting areas or cafeterias. Offices may open onto the atria, creating a more inviting and temperate work space. As in a conservatory or covered courtyard, the air temperature of these spaces is influenced by heat lost from the main building and by the weather conditions outside.

Atria reduce the thermal-performance demands on the walls that face inward. They can also collect solar radiation and lose heat from the surrounding building or buildings, keeping the temperatures within the space warmer, even on cold winter nights. Plants used in this space filter and moisten the air.

- In the house-within-a-house, a secondary skin completely encloses a building or several buildings [see RECORD, December 1999, page 78]. The solar radiation heats the air between the outer glazing and the facade of the building, thus reducing heat transmission and ventilation losses. Air can circulate in the whole space between the glazing and the original outer skin of the building, so parts of the interior not hit by the sun are heated. Summertime overheating is prevented by ventilation openings at the upper and lower extremes of the facade. The gap

The 27-story circular tower, part of a complex of office and residential buildings in Essen, Germany, has a conventional curtain wall with a layer of glazing outside it (top and left). Designed by the Düsseldorf firm of Ingenhoven, Overdiek and Partner, the tower has an inner skin with operable windows that bring in fresh air from the air gap. The Steiff factory in Giengen/Brenz, Germany (bottom), built in 1903, is an early example of dual-skin glazing.

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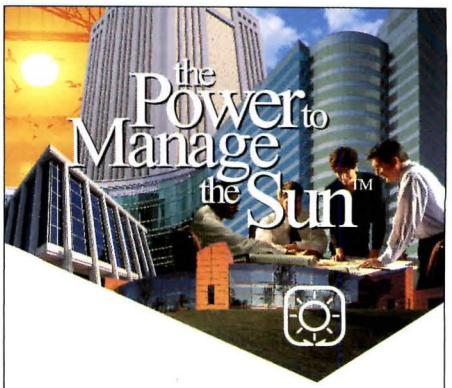

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CIRCLE 58 ON INQUIRY CARD

Project: *Yazaki North American Office Building, AY-21, Canton, Mich.*

Architect: *Plantec Architects, Tokyo, design architects; Stevens & Wilkinson Inc., Atlanta, architects of record*

Design/builder: *Shimizu America Corp., New York City*

Despite their beauty and apparent energy savings, true dual-glass skins are seldom used in the U.S. In fact, the system used on the Yazaki North American Office Building may be the largest example.

Yazaki is a supplier of electronic and electrical technology primarily to the automotive industry. The facility is composed of mostly research and development laboratories, though it also contains offices and a technical library. It was completed about one year ago.

The approximately 420,000-square-foot, four-story structure has a conventional curtain wall with a layer of glazing surrounding the exterior. This external layer creates an air gap, or corridor, that's about 10 feet wide. The glass panels are supported by a system of vertical steel masts and cables.

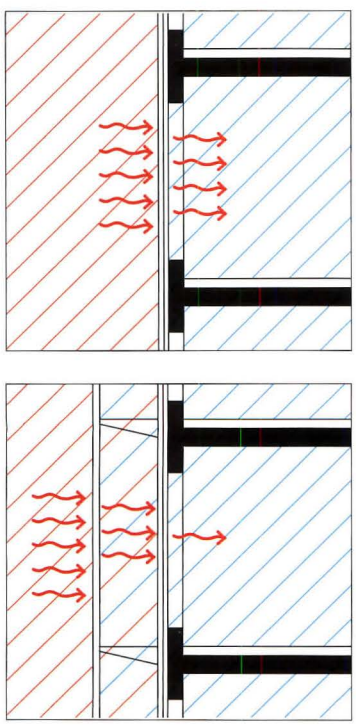
Motorized louvers at the base and top of the outer layer of glass allow fresh air to enter at the bottom and exhaust air to exit at the top. To limit heat loss on very cold winter days, the louvers are closed. The stationary air is warmed by the sun and by heat escaping from the building. In the summer, the facility is fully air-conditioned, though the air circulating through the corridor lessens solar gain.

It's a system that significantly boosts comfort levels, according to representatives of Shimizu America who, along with other members of the design team, traveled to Germany to see dual-glazed buildings. The team was impressed with the airflow dynamics of the German structures, as well as their beauty.

They were also astonished by the cost of the dual-glazed walls. In Germany, such a system is about twice the cost of a conventional curtain wall. In the U.S., however, a comparable system costs four to five times as much—a cost that may, perhaps, be justified for a structure that is architecturally progressive.

The building also features a dramatic canopy made by a boat builder of Philippine mahogany. A similarly boatlike structure houses the library, while highly reflective terrazzo floors simulate water.

Wendy Talarico



The insulating properties of the glass, as well as the layer of air in dual-glass facades, helps decrease the amount of heat that enters the building during hot weather (top). Conventional facades must either decrease the amount of glazing or simply rely on more air-conditioning to offset thermal gains (bottom).

between the building and the glazing creates bonus space, which can be used for meeting areas, gardens, or other purposes.

Partitioned gaps

Horizontal and vertical partitions divide the gap between the glazing layers in the partitioned-gap facade. This division influences fire protection, sound insulation, and natural ventilation, depending on which partition-gap system is used. Types include the following:

- Corridor facades, one of the most commonly used twin-face types, are divided with horizontal partitions at each floor. Fresh-air intakes and exhaust areas are located on each floor; the openings for each level are often placed above one another, alternating in a horizontal direction with the openings for the exhaust air. The construction of corridor facades demands more than an undivided twin-face facade due to the additional elements for the partitions and the number of ventilation openings necessary for each floor. The functioning of the facade improves, however. Overheating in the upper reaches of the building is reduced, as is noise transmission and smoke and fire spread.
- Shaft-type facades have vertical divisions in the gap between the glass layers, which create shafts for moving the extract air out of the building. Ventilated sections between the shafts draw fresh air into the building through double windows.
- Natural ventilation is better with shaft-type facades than corridor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facades; fresh air enters the building via openings in the outer skin in the lower part of the double window. The exhaust air leaves the room in the upper part of the double window and enters the shaft through openings in the upper part of the partition between the shaft and the double window. As in a solar chimney, buoyancy forces due to temperature differences induce an upward flow of air in the shaft, thus improving air movement within the building by creating lower air pressure in the double window. Compared to other types of twin-face facades, shaft-type facades present problems with fire protection, noise, and the mixing of fresh and foul air.

TWIN-FACED FACADES CAN COST TWICE AS MUCH AS STANDARD CURTAIN WALLS, BUT ARE OFTEN WORTH THE EXPENSE.

• Double-window facades are more complex to build than other types of twin-face facades, because the gap between the inner and outer glass layers is divided vertically and horizontally. The facade consists of separate window units that have no immediate interaction with adjacent units. Separate ventilation openings are positioned with an offset in order to prevent the mixing of fresh and foul air.

Commonly used in office buildings, double-window facades reduce smoke and noise transmission within the air space due to the vertical and horizontal partitions. On hot, sunny days, temperature extremes within the facade are minimized by frequent ventilation openings in the outer skin. As in other twin-face facades, natural ventilation is possible much of the year. Other advantages of twin-face facades, such as nighttime cooling of the interior, mean considerable savings on cooling loads.

At what cost?

The various types of multiple-glass facades offer architects ways to enhance occupant comfort, reduce energy demand, and provide natural light and natural ventilation. But despite these advantages, they are seldom used outside central Europe. Experience and extensive testing by the designers of these structures prove that the facades can be easily adapted to other regions besides central Europe; indeed, they are occasionally used in parts of Japan and China.

The principal drawback in Europe and elsewhere is cost. In central Europe, twin-face facades are about twice the price of conventional curtain walls. In the U.S., they are likely to be four to five times more expensive. The extra costs are racked up by the expense of engineering these systems, the amount of special glass required, and an unfamiliarity with these systems among the trades, which leads to higher installation costs. In addition, mechanical engineers must think creatively (which often leads to more time and higher costs) about the heating and cooling loads and the type of hvac system used.

Despite the higher investment, twin-face facades are common among high-rises in central Europe, principally because energy prices are significantly higher in Europe than in the U.S., resulting in a faster return on investment.

But there is more to evaluate when considering a dual-glazed system than the hard costs. In central Europe, studies conducted by employers as well as engineers show that the satisfaction and productivity of those who work in buildings with these facades is higher, thanks to the many benefits that twin-face facades can offer, including natural ventilation, daylighting, and greater control over the workplace atmosphere. Depending on labor costs, the higher investment might be worthwhile. ■

AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

INSTRUCTIONS

◆ Read the article "Cladding Buildings with Multiple Glass Skins" using the learning objectives provided.

◆ Complete the questions below, then check your answers [page 256].

◆ Fill out and submit the AIA/CES education reporting form [page 256] or file the form on ARCHITECTURAL RECORD's Web site at www.architecturalrecord.com to receive one AIA learning unit.

QUESTIONS

1. What is a dual-layered glass building facade and why is it used?

2. What problems are associated with undivided facades?

3. Which type of divided gap gives the best natural ventilation?

4. What are the differences between each of the principal types of dual-layered glass facades?

5. What are the advantages of using dual-layered glass facades?

Tech Briefs

Students commit to sustainable housing • Software marketers forge new alliances • Wearable computers may alter building design

NEW "ECODORM" HELPS STUDENTS LIVE IN COMFORT WHILE LEARNING ABOUT THE ENVIRONMENT

With some projects, client desires and demands leap ahead of standard design-and-build practices, challenging architects to think in new ways. This was the case with a new residential hall at Northland College, a small, innovative school in Ashland, Wis., on the wooded shores of Lake Superior.

The 40,000-square-foot, 114-bed Wendy & Malcolm McLean Environmental Living and Learning Center is not the average dorm. It is designed to enable students to trace the often-frightening environmental footprints they leave in the course of their own daily activities. The center's green technologies came in response to students who wanted the college to make an ecological commitment; the school offers one of the leading liberal arts environmental programs in the nation. Not only did the design of the dorm enhance the college's reputation, but it also became part of Northland's curriculum. There is even a seminar room within the dorm where classes can be held to teach students about the technologies used in the hall.

The two architects involved with this project, Hammel Green and Abramson Architecture in Minneapolis and associate architects LHB Engineers & Architects in Duluth, Minn., are committed to sustainability issues. But working with a band of zealous and idealistic students made this project unique.

Student input was solicited by the architects at several work sessions, each of which drew 50 to 70 young participants. From these "envisioning sessions" emerged the ideas for various products and technologies that were not typically associated with a residence hall. Priorities included selecting products and materials valued for their recycled content; wood harvested from forests that are certified sustainable; alternative energy sources, such as wind and solar power; a strong emphasis on indoor air quality, including natural ventilation and inert products; and composting toilets, located in two of the building's six-person apartments. Careful management of construction waste was important while the dorm was built.

"Students were adamant about integrating their concepts," says

Students had plenty to say about their new dorm at Northland College, designed by Hammel Green and Abramson and associate architects LHB. The building includes photovoltaic and wind-driven energy sources, composting toilets, and a computer to monitor energy use.

Dave Bercher, AIA, of Hammel Green and Abramson. "We tried to achieve as many as possible. It was as if we had made a promise to them."

In fact, the envisioning sessions resulted in "a memorandum of understanding" that set the environmental goals. All parties, including staff, students, administration, trustees, designers, engineers, and contractors, signed it. The memorandum "proved we all bought into the desired project outcomes," says James Brew, AIA, with LHB. The architects had the memorandum bound into the front of the project manual.

When budget issues arose, this document was critical in keeping the project's priorities straight. For instance, the renewable-energy systems, which include a wind-driven power generator, pole-mounted photovoltaic panels on the south side of the building that track the sun, and a solar hot-water heating system, would have been "easy to cut," Bercher says. "But the strong commitment to them as presented in the memorandum of understanding meant these items had to stay."

Alternative materials used include locally grown white cedar shakes, instead of western red cedar, which would have required transportation to the site. Biocomposite countertop materials use agricultural waste as an aggregate. Room furnishings—beds, desks, and shelves—are made of recycled plastic. Linoleum was selected for the floors instead of

vinyl, which is energy-intensive to make and gives off dangerous chemicals in case of fire. Air-conditioning was exchanged for large operable windows, and cellulose insulation was beefed up to exceed the state energy code.

Nevertheless, these materials, as well as the innovative energy and plumbing systems, created code and construction problems. For example, the composting toilets, which were estimated to save 10,000 gallons of water per user per year, are widely used where sewer lines are unavailable or in areas not suited for septic systems. The center's two composting toilets, however, could not be included in the number of plumbing fixtures required by the Wisconsin state building code. "In short, they wouldn't allow us to substitute a composting toilet for a flush toilet," Bercher says. Additionally, the builder and subcontractor required more instruction and supervision to make sure they used the right products and installed them correctly.

To evaluate the facility's performance, the wind-generation and photovoltaic systems were hooked to a computer in a student lounge. That way, students can see the effects of their stereos and other appliances on power-consumption patterns.

As the dorm nears its first full year of occupancy, a year's worth of data is being tallied. Wind- and solar-power sources accounted for a small percentage of the energy needs but demonstrate to the students how well these systems can function. Air-quality ratings are on par with that of a quiet, uninhabited island in the middle of Lake Superior. Most important, the students recognized that they can have some impact on the quality of the buildings in which they live. *Todd Wilmert*

DIGITAL BRIEFS

WEARABLE, WIRELESS COMPUTERS LOOK TECHNO-CHIC AND BLEND CYBERSPACE WITH REAL SPACE Imagine navigating a complex building, such as an international airport terminal, without stopping to decipher signs, symbols, or other way-finding devices. Or traversing a college campus without the aid of maps or directories. These are just a few of the mind-bending possibilities of the emerging technology of mobile augmented reality.

What is mobile augmented reality? Says Steven Feiner, a professor at Columbia University's computer science department, "Augmented reality refers to the combination of real and virtual that assist the user in his environment." Typically, this involves a head-mounted display or eyepiece through which the wearer sees a computer projection of a virtual image superimposed on the real-world view.

Medical applications of such devices include displaying in a surgeon's eyeglasses a diagnostic CT scan image superimposed on the view of the patient on the operating table. Craftspersons could view computer-generated installation and service manuals while investigating the physical components they're assembling or fixing.

The computer that runs the display goggles or glasses to synchronize the virtual view with the real one must know where the user is and what that person is looking at. The location component relies on the well-established, satellite-linked GLOBAL positioning system (GPS) to pinpoint outdoor locations. Indoors, infrared transmitters at key points in a building, such as doorways or corridor corners, could provide location references. Motion tracking of the entire head, or just the user's eyes, allows the system to "know" where the user is looking. The selection of the computer image that corresponds to the user's location and point of view is downloaded via a wireless connection to the Internet, over the new Wireless Access Protocol (WAP), a communication process that connects Web sites to cell phones and similar devices.

A prototype of this entire system—including the display, the computer, GPS, motion tracking, and WAP components—is being tested by students at Columbia. The experimental mobile augmented reality system (MARS) allows users to "see" the classroom directory and class schedules within each building while walking around the campus. Another application allows users to request historic views of buildings on the university's site, superimposed on the current terrain.

Related work under way at the Media Lab, affiliated with MIT's School of Architecture and Planning, extends the wearable-computer concept to smart clothes, in which the wearer can interact with appropriately wired smart rooms, smart cars, and so on. Under the direction of Alex Pentland of the Media Lab, these initiatives make it possible for hybrids of real and virtual environments to recognize occupants and adapt to their expectations and behavior. Pentland suggests that architects will be freed from many design constraints based on circulation and adjacency because a building's computers will communicate with the occupants' wearable computers and tell them where to go and how to get there.

While few people could imagine walking around wearing the cumbersome MARS prototype, it may be techno-chic to don the next-generation augmented reality system prototypes from Charmed Technology, a Sherman Oaks, Calif., company to which Pentland is an adviser. These prototypes look like wired jewelry. Once such technology becomes affordable, it may spawn a transformation in building design. Construction processes will change as paper-based documentation yields to augmented reality projections. *Jerry Laiserin, FAIA*

MARKETING SOFTWARE FOR ARCHITECTS REVISITED Two new alliances between organizations involved in marketing tools for architects [June 2000, page 190] were recently announced. Both indicate that the strong demand for new construction and design services fuels new investment in computer products and capabilities for the profession.

First, Deltek Systems of McLean, Va., makers of Electronic Timesheet and Advantage financial management software, acquired the RFP proposal-generating software product line from A/E Management Services of St. Petersburg, Fla. Deltek, well established in the "back office" functions of project management, financial management, and human resources management for architectural and engineering firms, plans to use the RFP acquisition as a step toward integrating front-office functions, such as business development and presentations, into a comprehensive suite of professional service applications. Linking business software applications allows the diverse software to share common databases for greater efficiency.

Separately, the Society for Marketing Professional Services (SMPS), in Alexandria, Va., and Web-based service provider DesignArchitecture, of Wilton, Conn., announced that SMPS endorses DesignArchitecture's online Marketing Department Module as a preferred solution for SMPS members. Marketing directors and coordinators at many of the largest A/E firms make up the bulk of SMPS' membership. The Marketing Department Module provides easily updatable templates for simplified and inexpensive Web site development and maintenance. Also included in the Marketing Department is an online "lightbox" function for creating instant brochures that are customized to the information needs of a specific project or client prospect. *J. L.*

Digital Architect

New Technologies for Old Buildings

By Jerry Laiserin, FAIA

Most discussions of computers, CAD, and other high-tech tools for design practice focus on how these technologies are applied to new buildings, materials, and methods of construction. Yet digital technologies are also important for projects that involve historic buildings, traditional materials, and old methods of construction. Designers have at their disposal an arsenal of analytic and descriptive tools that can enhance their understanding and stewardship of historic resources.

Such tools can be grouped into three broad categories based on their function and the project phases in which they're used: documentation, investigation, and presentation. Documentation includes tools for measuring, drawing, and modeling existing buildings. Investigation covers a slew of noninvasive and nondestructive testing techniques borrowed from fields such as manufacturing and civil engineering. Presentation includes innovative techniques for organizing and integrating old and new information in a single project.

Documentation

Any structure old enough to be considered historic—even those built as recently as the 1960s—was not designed with computers. Paper drawings, if they exist, may be in poor condition or unreliable. Old drawings can be scanned as raster image underlays (or backgrounds), to be used as a reference for new, measured, CAD-based drawings.

"Having access to the original drawings speeds up the redrawing in CAD from field measurements," says Michael J. Mills, FAIA, a partner and preservationist with Ford Farewell Mills and Gatsch Architects (FFMG) in Princeton, N.J. Mills recently used this process of scanning old images to create CAD-based drawings during the restoration of the 1905 Essex County Courthouse located in Newark, N.J., and originally designed by Cass Gilbert.

New drawings of historic buildings are often created so that they can be integrated into three-dimensional CAD models. Such models reveal aspects of the work that paper drawings cannot convey. When FFMG documented existing conditions for a building systems retrofit of Princeton University's neo-Gothic Graduate College, the toughest system to integrate was the bus ducts, risers, and cable distribution infrastructure for the university's telecommunications network. "The quality of the model-based documentation helped us detect conflicts and resolve placement of new piping and conduits with minimal intrusion on the existing building fabric," Mills says.

CAD also is indispensable in documenting buildings for which no reliable drawings exist. For example, during a seismic retrofit of the 1888 Hotel Del Coronado near San Diego, Architectural Resource Group (ARG) of San Francisco was called in to measure the building and trace its structure. The hotel, one of the largest wood-frame buildings in the world, does not necessarily conform to the original drawings and has been modified many times over the years. "Without the speed and accuracy of CAD, we could never have documented all of the structure," says Eric Rekdahl, AIA, with ARG. By carefully aligning drawing layers and superimposing the building's framing on different levels in the computer model, ARG was able to trace all load-bearing components from roof to foundation.

An "interactive report" on the 1860s Gilbertsville First Presbyterian Church.

Because of a building's size, height, or other access limitations, direct measurement for CAD input is not always convenient or feasible. In such circumstances, several alternatives are available. One is photogrammetry, whereby accurate dimensions and 3-D CAD-compatible models can be extrapolated from stereoscopic photographs. One popular photogrammetry system is Photomodeler from Eos Systems.

A similar, but more direct, measurement technique is 3-D laser scanning, in which a tripod-mounted, computer-driven laser device scans a building interior or exterior in sequential "slices," much like medical magnetic resonance imaging devices scan the human body. The scanned spatial data measured by the laser device, such as the Cyrax from Cyra Technologies, produces a digital collection, or "cloud," of points in three dimensions that can then be reassembled via a CAD system into an accurate, highly detailed 3-D model of the space or building that was measured.

Detective Work

Building measurement in high or difficult-to-reach places can also be performed by trained specialists who combine the skills of steeplejacks or rock climbers with a knowledge of architecture. This specialized access method often is used in conjunction with direct physical inspection of the building fabric. Kent Diebolt, founder of Vertical Access in Ithaca, N.Y., offers such a service. "Before architects, engineers, and building conservators can decide what course to take

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

with a historic structure, they need to know more than just dimensions," Diebolt says. "They need to see what's underneath, behind, and inside the surface materials."

Diebolt, who has a background in construction, employs a range of nondestructive and noninvasive tools. And he uses them while dangling hundreds of feet off the ground, inspecting the sides of buildings.

Borescopes, or rigid bundles of fiber optics, can be inserted through small holes drilled in mortar joints to inspect conditions inside a cavity wall. Ultrasound devices can detect the thickness of homogeneous materials, such as metals, especially in roofing applications. And electromagnetic metal detecting equipment can locate both ferrous and nonferrous metals, such as steel reinforcing rods, wall ties, or cramps embedded in concrete or masonry.

According to Diebolt, high-tech testing, inspection, and measurement tools were initially developed in other fields, such as bridge and highway engineering or manufacturing-plant maintenance, where the cost and complexity of development could be economically justified (or, in the case of bridge inspection, mandated by law). As the technologies matured, they became available for other uses, such as building diagnosis. Although still too costly and complex to be used directly by average architects in general practice, such nondestructive testing can be used by specialists to "avoid destroying buildings in order to save them," Diebolt concludes.

James W. Rhodes, FAIA, a partner and director of historic preservation at the New York City firm of Beyer Blinder Belle (BBB), also suggests techniques such as infrared thermography to identify hidden moisture conditions, and impulse radar to distinguish multiple layers of differing materials and the voids between them within wall, floor, or roof construction. Extensive information about all documentation and investigation techniques for historic buildings is available through the Association for Preservation Technology International and the National Center for Preservation Technology and Training.

On the Chrysler Building, a Vertical Access rappeller uses high-tech investigation tools.

Presenting results

Coordinating unwieldy collections of rolled drawings, bound reports, photographs, CAD files, and text can be a challenge, whether in the office or in the field. The information from documentation and inspection processes must be merged into report formats that are useful to designers, contractors, and craftsmen on a particular project, and to building conservators throughout the ongoing life cycle of a historic structure.

Using Macromedia Director software, Diebolt developed an innovative system for creating interactive, multimedia reports on CD-ROM disks. Says Diebolt: "We import AutoCAD documentation files into Director and, at each point of interest, we embed coded symbols and links to inspection results that may include text reports, digital photos or even streaming video captured from videotapes in high-elevation locations that the architect and engineer are unlikely to see firsthand. Then we burn the whole presentation onto a CD-ROM that anyone can play in any PC."

Ford Farewell Mills and Gatsch Architects scanned old drawings to create new digital images of the 1905 Essex County Courthouse in Newark, N.J.

One of the first of these interactive CD-ROM reports was prepared by Diebolt for a project by Crawford and Stearns Architects of Syracuse for the nearby Gilbertsville First Presbyterian Church, an 1860s stone structure.

As technology advances, presentations are no longer static, one-time documents. Rhodes of BBB says, "Architects must recognize that we are intervening in the midlife of a building. It often is necessary to set up testing procedures for ongoing monitoring of a building's condition and the durability of current repairs."

FFMG's Michael Mills sees a role for the Internet in such monitoring and reporting. "The Web is becoming the preferred channel for disseminating professional information within the preservation community." For example, strain gauges or other monitoring devices can beam their output directly to a project's Web site, enabling continuous observation from remote locations. Webcams, digital video cameras directly linked to the Internet, can allow visual inspections by architects and conservators unable to visit a structure or gain physical access to portions of it. And interactive reports, such as Vertical Access' CD-ROMs, can be published on the Web, so that the entire historic project team can engage in a collaborative review at any time and from any location.

Over time, it is likely that "historic structure-specific Web sites" will emerge, serving as both repositories and clearinghouses for all documentation, investigation, and presentation information about a building. Architects and conservators, equipped with high-speed Internet connections and simple browser software, will be able to review scanned original drawings, photographs, measured CAD drawings and models, and every manner of inspection and test report.

Linked to the history of prior repairs and interventions as well as to real-time instrument readouts from ongoing monitoring efforts, such building-specific sites will prove invaluable in managing and conserving our historic resources. In a sense, the most advanced technologies are making all that was once old new again. ■

WWW *For more information about digital technology vendors that deal with historic buildings, go to* ***Digital Architect*** *at:* ***www.architecturalrecord.com***

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Courtesy of Wolverine Vinyl Siding, Valley Forge, Pa.

The Vinyl Institute

Vinyl By Design:
A Proven Material in the Built Environment

In selecting building materials, architects know from education and experience what characteristics make a material appropriate for a given design application. Steel, concrete, wood, glass, textiles, stone, brick and plastics all make up a palette of building material choices having inherent advantages and disadvantages depending on the application.

The plastic used most in building applications is vinyl, or polyvinyl chloride (PVC). Vinyl is a versatile, durable material that can be made rigid or flexible, textured or smooth, and in nearly any color or shape. Blending many attributes of traditional materials with advanced technologies, vinyl is a proven material in the built environment. In the United States, two-thirds of all vinyl manufactured is used in building and construction applications, including flooring; wallcovering; piping; siding; roofing; electrical materials; fencing, decking and railing; and windows.

This continuing education section will explore vinyl's inherent characteristics as a building material, its invention and development, the manufacturing process for vinyl and vinyl building products, and what the future holds for vinyl in the built environment.

INVENTION AND DEVELOPMENT

Vinyl's Beginning. Although scientists first synthesized vinyl in 1872, no scientist had done anything more than study and record its properties until 1926, when Dr. Waldo Semon, a researcher with The BFGoodrich Company in Akron, Ohio, began to experiment with it.

Searching for materials that could replace rubber in tires at a time when the supply of natural rubber was dwindling, Dr. Semon mixed certain additives into the compound, producing a flexible substance that was waterproof and versatile. The revolutionary new material was put to use in coated fabrics, rainwear, shower curtains and shoes. Vinyl provided water-resistant qualities that no other material could provide.

One of the first commercial uses for vinyl in the built environment was as wire and cable insulation, replacing the heavy rubber insulation and textile jacketing so prone to damage and dampness. Vinyl's use in electrical applications represented a major advancement in fire safety, since vinyl has inherent fire-resistant characteristics. The U.S. Armed Forces were among the first to adopt vinyl-jacketed wiring during World War II, after a fatal submarine fire involving rubber and textile cables.

AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

Use the learning objectives below to focus your study as you read **Vinyl By Design: A Proven Material in the Built Environment.** To earn one AIA/CES Learning Unit including one hour of health safety welfare credit, answer the questions on page 196 and follow the reporting instructions on page 256. Or use the Continuing Education self-report form on *Record's* Web site—www.architecturalrecord.com.

LEARNING OBJECTIVES:

- Describe the inherent characteristics of vinyl.
- Explain the development of vinyl as a building material.
- Discuss vinyl's impact on the future of building materials.

Decades of Vinyl Growth and Expansion. In the post-war years, vinyl's use in buildings grew rapidly. Facing a major rebuilding challenge and a shortage of traditional materials, German manufacturers developed window frames from this new material. These windows had a bulky, heavy-duty appearance that German consumers wanted, but which was not well accepted by Americans who were accustomed to larger viewing areas and narrower frames. Vinyl windows were later reintroduced to the U.S. marketplace in styles similar to wood and aluminum, and grew quickly in popularity.

Building upon its success as a waterproof material, companies began to use vinyl to coat wallpaper, making it more durable, washable and stain-resistant. Vinyl composition tile also emerged, challenging cork, rubber and linoleum flooring with superior durability and a wider range of styles.

In the 1950s, PVC pipe from Europe was introduced to U.S. municipalities, farmers, and home and building owners as an inert, durable and low-cost alternative for potable water delivery, sewage collection and industrial/agricultural applications.

The 1960s saw the first use of vinyl in exterior siding, although it was more expensive than wood and aluminum and slow to catch on. More efficient manufacturing techniques, lower prices and improved quality – and the rising costs of aluminum – eventually spurred vinyl siding's growth, taking it to its place today as the dominant material for this application.

In the 1970s, vinyl single-ply roofing systems came to the U.S. and were embraced as a clean, quick, safe and less costly alternative to asphalt built-up roofs. Some of those early vinyl roofs are still in use and performing well today. Vinyl roofing is now one of the fastest growing segments in the low-slope commercial roofing marketplace.

Vinyl entered the 1980s as a well-accepted building material, and new applications continued to evolve, including fencing, decking, railing and other exterior accessory products. Fencing was the first of these to gain market acceptance, especially by horse farm owners weary of painting miles of wood fencing. An added plus: horses didn't chew on vinyl fences as they did on wood.

In the 1990s and today, vinyl is playing a role in many of the most advanced technologies found in the built environment while helping make today's homes and buildings easier to maintain, more durable and more affordable.

THE MANUFACTURING PROCESS

Vinyl is derived from petroleum (or natural gas) and salt. Petroleum/natural gas is heated to create ethylene; salt is subjected to electrolysis to separate out the natural element chlorine. Ethylene and chlorine are then combined under heat to make vinyl chloride monomer gas, which is converted into a fine, white powder – vinyl resin.

Compounding and Processing. One more important step – compounding – remains before the resin becomes a usable material. Combining resin with selected liquid and powder additives and modifiers, followed by re-heating and cooling, produces small, hard pellets the size of BBs. In this form vinyl can be re-melted at any time and made into final products. Depending on the additives "package" selected, vinyl can be made flexible enough for wallcovering or rigid enough for pipe, can have nearly any texture or pattern, and can be made clear or in virtually any color. Its durability, resistance to the elements and fire performance are all characteristics affected by the compounding process.

PROCESSING TECHNIQUE		SELECTED APPLICATIONS
Extrusion **see photo below*	Compound is heated and forced through a die to form long lengths of product.	Pipe, siding, windows, fencing, decking
Injection molding	Heated compound is injected into a hollow, three-dimensional mold.	Electrical outlet boxes, exit signs, smoke detectors, pipe fittings
Calendering	Compound is compressed through a set of rollers to form film and sheet of various widths and thicknesses.	Flooring, wallcovering, roofing
Thermoforming	Three-dimensional forms are made using heat and pressure to shape rigid vinyl sheet.	Drain pans, water collection basins, shower surrounds
Coating	Products are dipped or spread with vinyl resin dispersed in a solution.	Carpet backing, closet shelving, single-ply roofing

Courtesy of Royal Crown Technologies Limited Woodbridge, Ontario, Canada

The small pellets of vinyl compound are melted and shaped into the desired end product. The various processing and fabrication techniques used to make vinyl building products provide added versatility. The table above describes the major processing techniques and the common building products which result from them.

Environmental Impact. The vinyl resin manufacturing process is closed, automated and high tech, and nearly all waste is recycled back into the process. The little waste that remains is treated and disposed of according to strict regulations.

A lifecycle assessment (LCA) conducted by Franklin Associates, which specializes in LCA research, determined that vinyl production accounts for a fraction of one percent of all U.S. oil and gas consumption. The same study compared the manufacturing processes for vinyl and aluminum windows and determined that vinyl used about three times less energy.

Nearly all manufacturers of vinyl products recycle their production scrap back into the manufacturing process, meaning that nearly all vinyl products contain some post-industrial recycled content. This waste source-reduction was confirmed by Principia Partners, who recently found that more than 99 percent of all vinyl manufactured ends up in a finished product.

THE MATERIAL AND ITS ATTRIBUTES

Durability. Vinyl exhibits exceptional durability compared to alternatives in most building applications. A prime example is vinyl single-ply roofing. Vinyl membranes manufactured using a unique spread coating process have withstood the elements for more than 30 years. And vinyl is the material of choice for flooring and wallcovering, particularly in areas prone to heavy traffic and abuse such as healthcare environments.

Buried PVC pipe can be conservatively expected to serve for many decades, with no build-up, scaling, pitting or rusting. The National Research Council of Canada found the break rates of PVC pipe to be a fraction of those for metallic pipe.

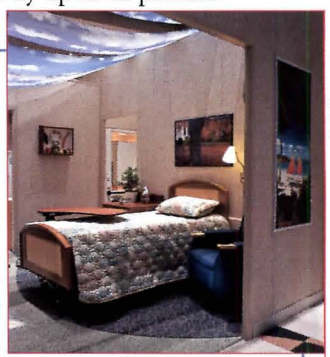
Energy Efficiency. Many vinyl building products save additional energy in use. In residential windows in particular, vinyl transfers heat more slowly than aluminum and some clad styles of window frames. With a U-value range of 0.3-0.5 vs. 1.0-2.2 for aluminum, utility costs are kept low.

Vinyl Institute photo by Doug Walker

IN THE HEART OF LUMBER COUNTRY, CUSTOM HOME OWNER INSISTS ON VINYL

When former professional wrestler Bill Savage and his wife Betty retired to a quiet spot by the Willamette River outside of Portland, Ore., they built their dream house – a 6,000-square foot custom home with a price tag of more than a million dollars. Aesthetics were important to them, but so was low maintenance, so they insisted on vinyl siding. When they approached Portland-area builder Rick Lesniak of Blazer Development, he had to be convinced. "I have completely changed my mind about vinyl siding," said Lesniak; the Savages say neighbors insist on touching the house before they'll believe it's vinyl.

Single-ply vinyl roofs, which are typically reflective white or gray, also make a positive contribution to energy efficiency. Research from the U.S. Environmental Protection Agency, the National Aeronautics and Space Administration and the federal Department of Energy has shown that reflective roofs may lower a building's air conditioning costs by up to 40 percent.



Courtesy of Mannington Commercial, Calhoun, Ga.

AWARD-WINNING HEALTHCARE SETTING REALIZED USING BROAD ARRAY OF VINYL PRODUCTS

Evolving a prototype of a long-term care facility room for a cognitively aware, physically frail resident encompassing both quality of life for the resident and superior functionality for staff was the objective of JSR Associates, Inc. (Ellicott City, Md.) and Mannington Commercial (Calhoun, Ga. and Salem, N.J.). Vinyl proved to be the winning ingredient in the ultimate result: the Mannington Commercial LifeCare™ Experience, which received an honorable mention in the Nightingale Product Design Competition at the 1999 Symposium on HealthCare Design. The resident room and adjacent spaces vignettes included vinyl wallcovering, flooring, handrails, bumper guards, transition strips and vinyl-backed carpeting. "Vinyl interior products are often utilized within long-term care settings due to their cleanability, durability, vast color selection and cost effectiveness," said Jane Rohde, AIA, IIDA, Principal of JSR Associates. "Demonstrating the complete environment by integrating 20 cooperating manufacturers' products was the innovative aspect of the exhibit design."

Fire Performance. Vinyl building products are based on a naturally fire retardant polymer, meaning that generally they are slow to catch fire, their flame spread is slow and they cease to burn after the flame source is removed.

Firefighters recognize that a fire's most toxic by-product is carbon monoxide. When burning, all organic materials produce carbon monoxide to varying degrees. Vinyl produces less than most, which is why vinyl is often specified for use in buildings. Third-party organizations such as the National Fire Protection Association (NFPA) have concluded that fires involving vinyl – and the associated smoke – are no more toxic than any other fires. Indeed, vinyl is one of the few materials meeting the stringent NFPA requirements for insulating electrical and data transmission cables, including in plenum applications.

Generally, vinyl building products are associated with low fire hazard and risk. The precise fire performance characteristics of any building product, including vinyl products, vary; specifiers should check with manufacturers to determine whether a given product can meet applicable codes and standards.

Vinyl Institute photo by Eric Hanson

VINYL DECKING IS THE RIGHT CHOICE FOR CEDAR POINT AMUSEMENT PARK

When Terry Ross, AIA, corporate architect for Cedar Point amusement park and resort, needed to replace a section of its 660-boat marina, he surprised himself by choosing a vinyl decking product made by Thermal Industries (Pittsburgh, Pa.). "I had to be convinced that vinyl was the way to go," Ross said. Cedar Point, the second oldest amusement park in the country, is in Sandusky, Ohio, right along Lake Erie. Not only does the area experience temperature extremes, ranging from below freezing to the high nineties, but everything at the park is exposed to high foot traffic and abuse by nearly 3.5 million visitors a year. Before choosing vinyl Ross conducted half a dozen tests including one in which he delivered a direct blow to the material with a hammer. He even went as far as to freeze the product to see if it would crack or split. "Northern Ohio weather is brutal on any decking product," Ross added. "We've been through a full season with the vinyl deck and we like it so much that we are going to replace more of the marina's docks with the product," Ross said. He also discovered that vinyl wasn't as hot on boaters' feet, and it was easy to clean with just a garden hose. "There are a lot of seagulls at the marina, and it is easy to hose down; not only that, I don't have to worry about splinters and wood pops."

Low Maintenance. Because colors are compounded into vinyl products early in the manufacturing process, they do not need paint, stain or other surface treatments to maintain their original appearance. Vinyl siding certified through a program sponsored by the Vinyl Siding Institute to meet or exceed the ASTM D3679 standard ensures that vinyl siding retains a uniform color over time without chipping, cracking, peeling or flaking, like paint would.

Vinyl products are known for being easy to keep clean. A hard rain or occasional pressure washing is typically sufficient for exterior products such as siding or fencing. Inside, vinyl minimizes hiding places for dust, dirt and allergens. Employees of hospitals, schools, assisted living facilities and other institutions generally find vinyl wallcovering and flooring easy to keep clean and sanitary.

Recyclability. Vinyl is unique among all plastics because about 70 percent of it is used in products expected to last 10 years or more. This durability (and the relative youth of most vinyl markets) means that most products are still in service. Nevertheless, many companies actively promote recycled content in and recycling of vinyl building products.

Notable examples include Collins & Aikman Floorcoverings, Inc. (Dalton, Ga.), which markets commercial carpets with 100 percent recycled-content vinyl backing, and Re-New Wood, Inc. (Wagoner, Okla.), which manufactures roofing shingles made from recycled vinyl and waste sawdust.

LOOKING TO THE FUTURE

The future of vinyl building products is bright. New additives and innovative manufacturing techniques are creating entirely new applications for vinyl, including:

- **Durable Semi-Structural Applications.** A new composite material made of vinyl and reinforced by fiberglass enables manufacturers to produce building systems that could replace wood and metal for many uses. The company that developed the technology, Decillion LLC (Toledo, Ohio), a joint venture of Owens Corning and The Geon Company, has produced a material system that has three times more structural stiffness and dimensional stability than typical vinyl building materials. Of particular importance is the material's much higher heat distortion temperature, allowing it to be utilized in situations previously beyond vinyl's reach.
- **Innovative Building Systems.** Royal Building Systems (Cdn) Limited (Woodbridge, Ontario, Canada) has developed interlocking hollow vinyl extrusions known as The Royal Building System™ (RBS). The RBS is filled with concrete and serves as the finished walls of a structure, which can receive any number of common surface treatments. This system has been used around the world for single-family and multi-family homes, office buildings, factories, car washes and other commercial construction. It fills a particular need for affordable yet durable housing in developing nations, where homes constructed using the system have withstood weather extremes such as hurricanes, earthquakes and flooding that other construction methods could not. The RBS vinyl walls are also termite-resistant.
- **Composite Materials.** CertainTeed Corporation (Valley Forge, Pa.) has developed a line of windows made from an innovative vinyl composite containing wood fibers. The wood fiber material is molecularly bonded to the frame and sash, and does not peel, crack, warp or rot. The window has the same energy efficiency of a vinyl window but can be painted or stained.

Today, vinyl is being used in new and exciting ways, giving architects and designers more options on their palette of materials. For more information about vinyl, or to find out about other continuing education opportunities offered by the Vinyl Institute, visit www.vinylbydesign.com.

vinyl by design™

LEARNING OBJECTIVES:

- Describe the inherent characteristics of vinyl.
- Explain the development of vinyl as a building material.
- Discuss vinyl's impact on the future of building materials.

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 256 and submit it or use the Continuing Education reporting form on *Record's* web site www.architecturalrecord.com to receive one AIA/CES Learning Unit including one hour of health safety welfare credit.

QUESTIONS:

1. How and why did vinyl become a standard building material?

2. What inherent characteristics of vinyl make it a good building material?

3. What impact has vinyl had on selection of building materials?

4. How does vinyl behave in a fire?

5. Why is vinyl often used in healthcare and other institutional environments?

ANSWERS:

1. Vinyl's longevity and acceptance in the built environment stems from the fact that it has consistently offered better performance than many traditional materials in certain applications. It came into use as a building material prior to World War II, when it was introduced as wire and cable insulation, replacing heavy rubber insulation and textile jacketing. After the war, vinyl's use in buildings grew rapidly. It was used in window frames, to coat wallpaper, and then introduced as a flooring material with superior durability to cork, rubber and linoleum. In the 1950s vinyl was introduced for water and sewage pipe. In the 1960s it was introduced for exterior siding, and in the 1970s for flat roofing. It was continually improved and by the 1980s vinyl was an accepted building material. New applications in both exterior and interior building products have evolved over the past 20 years and continue to evolve.

2. The characteristics are durability; energy efficiency; fire performance; low maintenance, and recyclability. In addition, vinyl resin's ability to combine with additives and modifiers in the compounding process means that vinyl is versatile – it can be made flexible enough for wallcovering or rigid enough for pipe, can have nearly any texture or pattern, and can be made clear or in virtually any color. Its durability, resistance to the elements and fire performance are all characteristics affected by the compounding process.

3. Vinyl blends many of the attributes of traditional materials with advanced technologies to produce a material with nearly unlimited possibilities for use in the built environment. The continuous evolution of vinyl's performance capabilities virtually ensures the material we know today as vinyl will be capable in the future of use in applications not previously thought possible. Further, vinyl's inherent recyclability means that we are likely to see more and more building products containing recycled post-industrial and/or post-consumer content. The result is the creation of entirely new building products.

4. Building codes govern the performance of building materials in a fire. Vinyl building products are generally slow to catch fire, their flame spread is slow and they cease to burn after the flame source is removed, because they are based on a naturally fire retardant polymer. Vinyl produces less carbon monoxide than most other organic materials, which is why it is often specified for use in buildings. Third-party organizations such as the National Fire Protection Association have concluded that fires involving vinyl – and the associated smoke – are no more toxic than any other fires.

5. Employees of hospitals, schools, assisted living facilities and other institutions generally find vinyl wallcovering and flooring easy to keep clean and sanitary. In addition, vinyl can enhance the hygiene of buildings and indoor air quality by minimizing hiding places for dust, dirt and allergens.

Jeff Terry, Director of Industry Affairs - Rigid
(vinyl windows, siding, fencing, decking & railing, pipe)
703-253-0669
jeff_terry@plastics.org

Mark Sofman, Director of Industry Affairs - Flexible
(vinyl roofing, wallcovering, flooring, wiring)
703-253-0667
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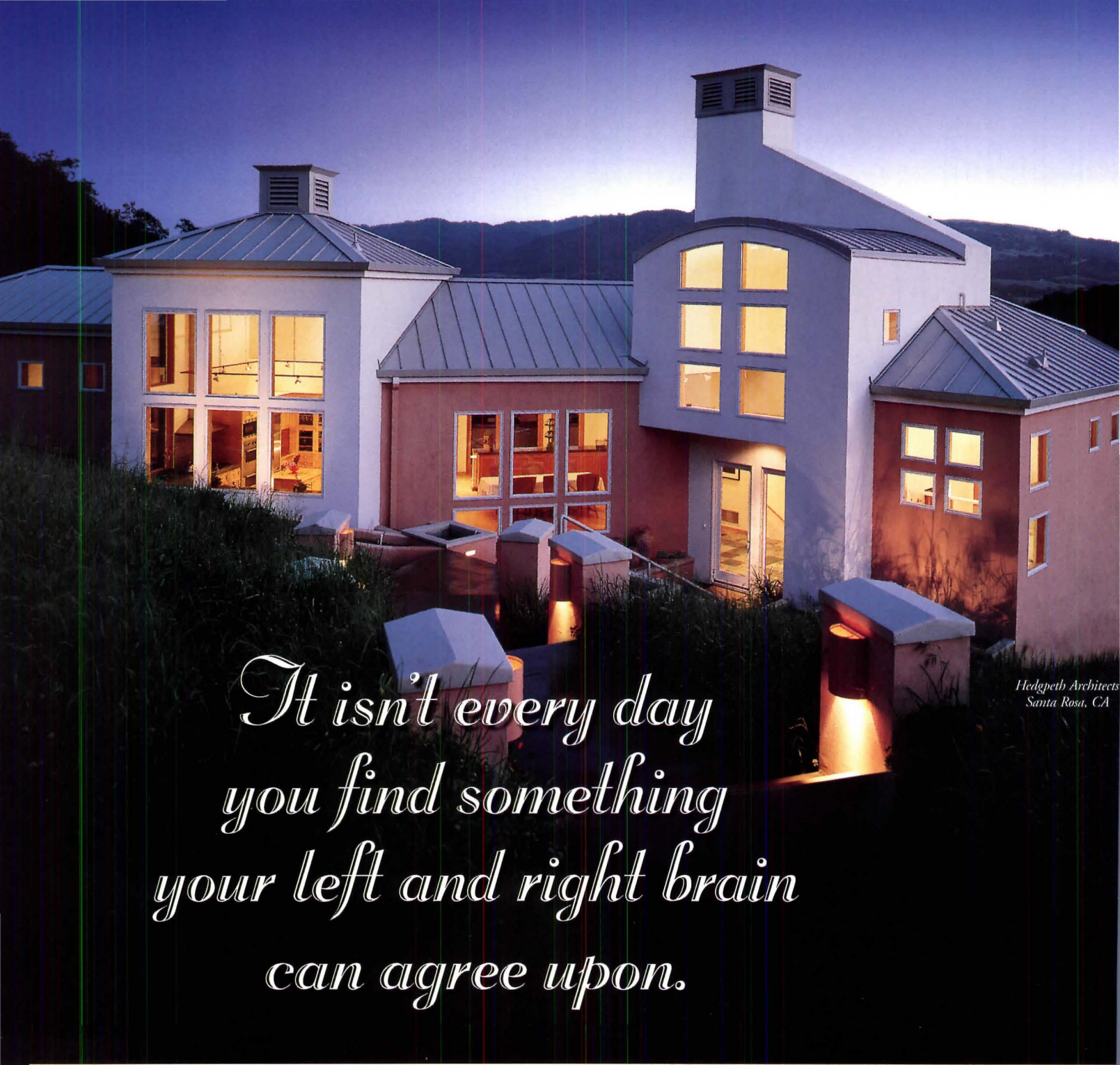
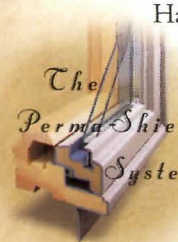


It isn't every day you find something your left and right brain can agree upon.

Hedgpeth Architects
Santa Rosa, CA



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RESIDENTIAL

Sometimes a 28-square foot addition does the trick. Other times a whole new house is required.

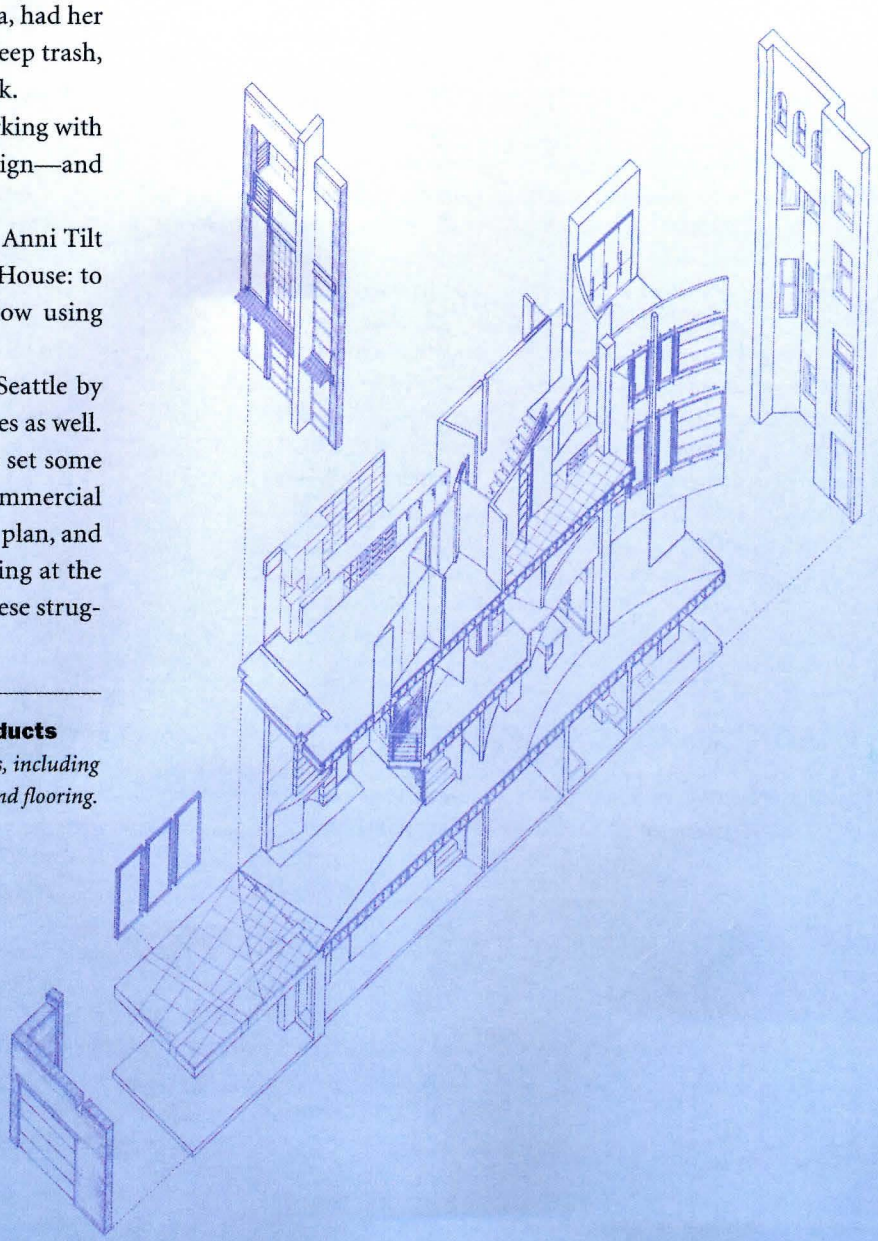
In some languages, the word crisis is synonymous with opportunity. In renovating a house or building something new, the owners and architect have an opportunity to reinvent the domain—and to some degree themselves. It's a process that's often accompanied by at least a few crises.

Architect and owner Martha Finney, who built an addition to and renovated a crumbling stone house in Philadelphia, had her share of crises between coping with dead animals, knee-deep trash, and walls that yielded to the anchor bolts she tried to sink.

The Fitch/O'Rourke's had their troubles too. Working with Robert Gurney, AIA, the couple took a year to design—and redesign—their Washington, D.C., townhouse.

Berkeley, Calif. architects David Arkin, AIA, and Anni Tilt had a different kind of challenge in the Hester/McNally House: to inexpensively improve a funky 700-square-foot bungalow using sustainable materials and a 28-square-foot addition.

The metal-sided house in the suburbs outside Seattle by Miller/Hull Partnership included a few crises/opportunities as well. Here's a house that defies convention just as it strives to set some new standards. Its hybrid metal and wood frame, the commercial components paired with residential ones, its unique floor plan, and that metal skin all break from the traditional while lunging at the innovative. We invite you to see the inventive results of these struggles in the pages that follow. *Wendy Talarico*



Residential News

A NEW ADOBE URBANISM SPRINGS UP IN SANTA FE

Santa Fe's style stems from its jumble of adobe buildings and narrow roads that make it a pleasant place to live and walk. But thousands of recent arrivals have SUV lifestyles miles away in sprawls of houses on big lots.

A "New Urban" development called Aldea de Santa Fe will offer an alternative where one can live, work, shop, go to school and play without a car. It mixes sizes of residences with shops and offices around a plaza, town hall and school, with generous amounts of open space, pedestrian trails, narrow roads, and small blocks. The design is by architects Andres Duany and Elizabeth Plater-Zyberk, known for Seaside, Fla., as seen in the film, "The Truman Show." The architects' Miami firm, DPZ, has 30 similar developments to its credit, but this is the first in a Santa Fe style. "Not only will Aldea continue the Santa Fe architectural style, but it will reintroduce Santa Fe style urbanism that has been lost," said DPZ project manager Jeff Speck.

Aldea, Spanish for village, is four miles west of downtown. A partnership of 14 families plan 433 units on 344 acres, with buildings clustered on 139 acres so 205 acres remain undeveloped. Lots will go for $69,000 to $120,000 each, for homes estimated at $180,000 to $600,000. "It's not because we're nostalgic," said partner Alan Hoffman who has worked on the project since 1994. "It's because we've looked at everything else that's been built in the last 50 years and it didn't work. It lowered people's quality of life." *Thomas H. Sharpe*

In Brief

I've Only Got Eyes for You A residential laboratory at Georgia Tech that is connected via broadband communications opened recently to study how technology interacts with and affects domestic lifestyle. One experiment under way at the three-story, 5,040-square-foot residence is the "Aware Home," an environment where computers are constantly present, seamlessly integrated into the domestic environment, assisting with everyday activities. The home senses inhabitants by seeing, hearing and measuring contact through a variety of technologies, including video, audio, motion, and load. According to Dr. Nikil Jayant, Broadband Institute Director, "One of the goals is to discover technology combinations that can obtrusively enhance lifestyle in the home of the future—both for special classes of inhabitants such as older citizens and infants and for families in general." Researchers expect such aware technology to work its way into the mainstream within a decade. *Jane F. Kolleeny*

NextGen Housing Factory-built economy housing has been brought to a new level of quality, durability, energy efficiency, and visual appeal. Known as the "NextGen" house, this innovative "green" residence was recently unveiled as a rental property for the Danbury, Conn., Housing Authority. Energy performance is one of the projects biggest achievements—exceeding performance requirements by nearly 20 percent, representing a $180 reduction in annual energy costs to the homeowner. The three-bedroom, two-bath house is composed of two factory-built sections, quickly and efficiently manufactured, so that the finished 1,200-square-foot house costs $90,000 including land, whereas a comparable new house would sell for $200,000. Designed by Steven Winter Associates of Norwalk, Conn., NextGen is a demonstration project for the Partnership for Advanced Technology in Housing (PATH), a voluntary public/private sector initiative, administered by HUD, that seeks to improve the nation's housing stock. *JFK*

A TOWN CALLED "WATERCOLOR"

Seaside, the 80-acre town that launched New Urbanism, turns 20 this year. If imitation is the sincerest form of flattery, then one need only step beyond Seaside's borders to the adjacent new town of WaterColor to prove that aphorism. WaterColor received final approval last winter, and its developer, the St. Joe Co., launched an ambitious construction schedule in time for the summer tourist season. WaterColor is a far bigger and more ambitious project than Seaside, however. WaterColor will eventually have 1,140 dwelling units (cottages, townhouses, apartments), beach and tennis clubs, an inn, and commercial development.

With a plan by the New York architect Jacquelin Robertson, WaterColor is a hybrid of Seaside and the Walt Disney Co.'s new town of Celebration near Orlando, Fla. Robertson and Robert A.M. Stern were master planners for the Disney town. Like Celebration, the design guidelines for WaterColor are contained in a pattern book put together by the architect Ray Gindroz of the Pittsburgh-based firm, Urban Design Associates. The pattern book outlines the allowable architectural building types drawn from historic architecture, most of it with regional vernacular precedents, and specific elements—windows, doors, trim, detailed for the builder.

A hotel, designed by David Rockwell of New York is under way. Robertson designed the other buildings now under construction, which include a beach club and "downtown," with three-story buildings with shops below and offices and condos above. *Beth Dunlop*

"Can this be legal?" he queried.

Interior Design Firm - *Alan J.E. Deal & Associates, Inc.*
Location - *Wulfmeier & Ottenwess / shown above - partner's executive office*

Products - *Sherwin-Williams ProMar®*
Project Paint Colors - *Sherwin-Williams ColorAnswers®: Hematite SW1014 | Ermine SW1023 | Landmark Gray SW1036 | Leatherleaf SW1167 | Artful Auburn SW1308 | Luminary Gold SW1362 | Gem Turquoise SW1474 | Melbourne Coast SW1475 | Truly Teal SW1476 | Crowning Glory SW1532 | Grapevine SW1546 | Cabaret Purple SW1553 | Renoir Red SW1609*

An appeal to design.

It was a most successful case: Alan J.E. Deal & Associates deftly negotiated a merger of individual tastes when the design firm recently created a new suite of offices for Detroit's Wulfmeier & Ottenwess law practice. Though prudence mandated that the unique styles of the firm's two partners be duly represented in the 5,000 square foot repurposed space, in reality, their design perspectives were dramatically diverse.

To visually unite one partner's preference for conservative traditional finishes and furnishings with the other's wish for fresh and contemporary, Deal specified Sherwin-Williams paints in deep, woodsy tones of *Cabaret Purple*, *Leatherleaf* and *Hematite*, interspersing the rich shades with clean but complementing neutrals like *Ermine* and *Landmark Gray*. Through this judicious use of color and design principles, consolidation was completed. And the verdict? A unanimous win.

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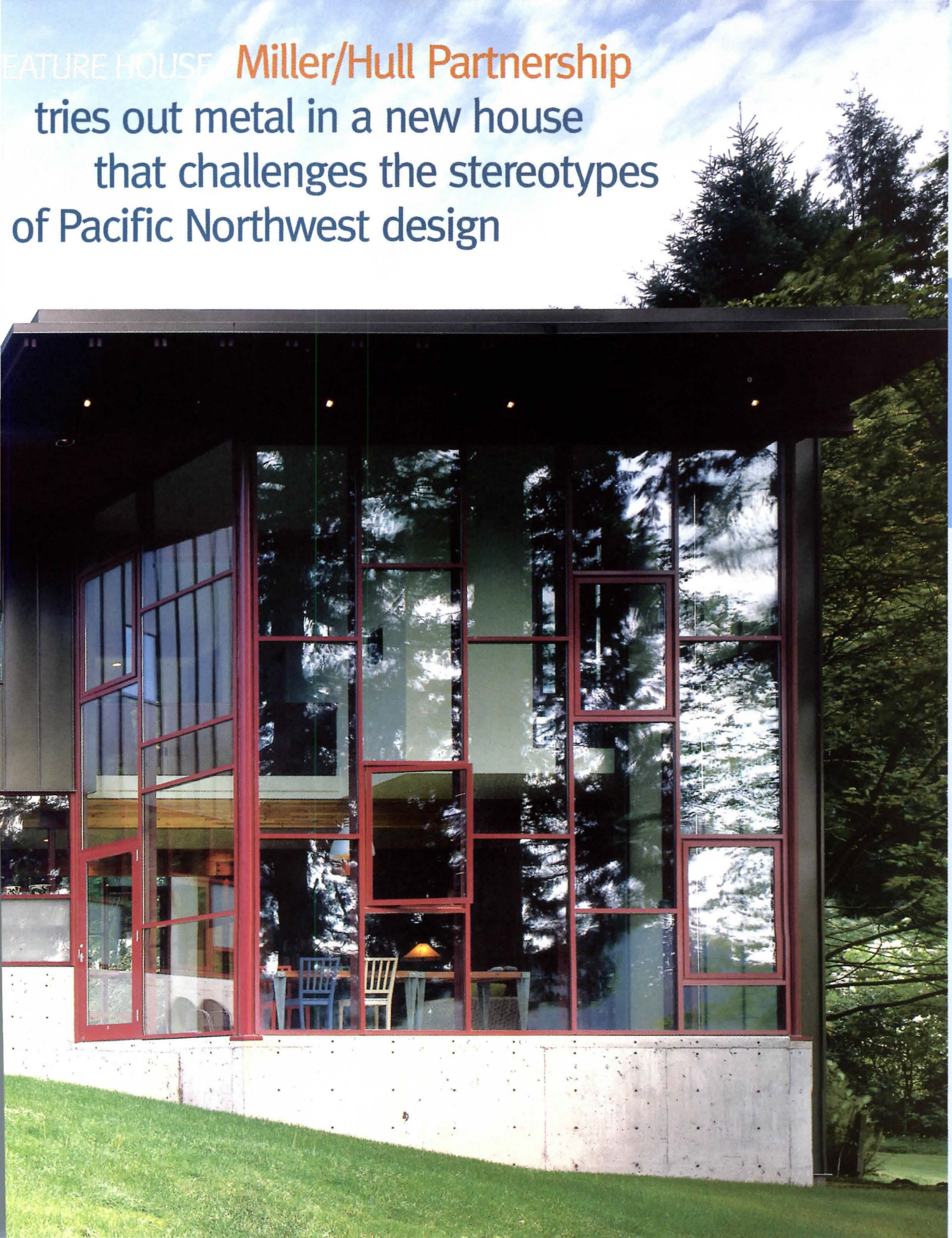
CIRCLE 69 ON INQUIRY CARD

A 1950s ranch was demolished by the owners to make room for this metal-and-glass house in a Seattle suburb. The window wall in the back (inset) faces lawns and a small fishing lake.

EATURE HOUSE

Miller/Hull Partnership tries out metal in a new house that challenges the stereotypes of Pacific Northwest design



By Sheri Olson, AIA

The Miller/Hull Partnership in Seattle makes an art of playing against the stereotypical images of woodsy Pacific Northwest architecture. In the sprawling and very suburban town of Bellevue, there's nothing that even comes close to resembling this metal-and-glass structure, designed for owners Jan Roddy and Marc Bale. Says Roddy: "We weren't afraid of doing something interesting." Miller/Hull was the couple's choice because they knew they wanted a metal house and they knew the architects could pull it off.

Situated within casting distance (the couple owns a fly-fishing-rod company) of the small, bass-filled Phantom Lake, the house is on a spot previously occupied by a mundane 1950s ranch-style house. Roddy and Bale purchased the property some time ago for its location and for a rustic two-room cabin right at water's edge. But when their daughter came along, the ranch had to go; it was time to create larger and more endearing quarters. The cottage remains for use as a guest house.

The slender 2,800-square-foot house divides its long, narrow acre of property into two distinct yards, front and back. Entering from the street side, visitors progress through tranquil woods and across a wide lawn to the house. A walkway in the backyard leads to the cabin and the lake. Two paths through the house, one visual and one spatial, link these yards. "The client wanted a house that is both transparent and substantial," says Robert Hull, FAIA, partner in charge. The transparency is achieved with a tall window on the front facade, which is aligned with an oversized double-height bay window on the back, creating a view corridor. The second path allows visitors to stroll from a patio opposite the front entry, through an outdoor room to the back patio. The second floor projects over the outdoor room, providing proof of the house's substance.

Sheri Olson, AIA, is a contributing editor and author of a forthcoming monograph on Miller/Hull (Princeton Architectural Press, Spring 2001).

Testing the metal

The standing-seam steel cladding is installed over felt and plywood, similar to systems typically used on roofs. It has a vaguely industrial look, which the owners wanted. But it's also low maintenance; thanks to a metallic polyvinyl coating, it will never have to be painted. The coating also shifts in color from olive green to rose, depending on the light. "It changes subtly, like the color of someone's eyes, with the brightness of the sky," says project architect Amy Lelyveld, AIA. "It looks good even on a rainy February day."

Installing the steel was demanding for the architect and the builders, says contractor Mike Surver of Jerry Fulks & Co. For example, during design, the house had to be dimensioned and detailed to fit the product's standard 16-inch width. Particular attention was paid to details

Project: *Roddy Bale Residence on Phantom Lake, Bellevue, Wash.*
Owner: *Jan Roddy and Marc Bale*
Architect: *The Miller/Hull Partnership—Robert Hull, FAIA, partner in charge; Amy Lelyveld, AIA, project manager*
Engineers: *CT Engineering (structural); SVR Design Company (civil)*
General contractor: *Jerry Fulks & Co.*
Square footage: *2,800*
Construction cost: *$400,000*
CAD system: *Autodesk's AutoCad Release 14*

such as the corners and doors, where it was necessary to make sure the battens fell at equal distances. The 28-gauge metal required care during installation to keep it from folding over and creasing. To allow for expansion along the sometimes 30-foot-long extrusions, the siding was pinned

The spare, orderly exterior is made buoyant by a bubbly sweep of miniature windows.

at the top of the wall and turned under into a concealed cleat at the bottom, allowing the metal to move.

Typical construction sequencing was also changed. Surver waited until the metal cladding was in place to get an exact fit between the standing seams for the miniature windows. He carved holes in the siding and built interior wooden frames for the glass, which was applied from the inside. If this glass ever breaks, the walls will have to be opened to replace it.

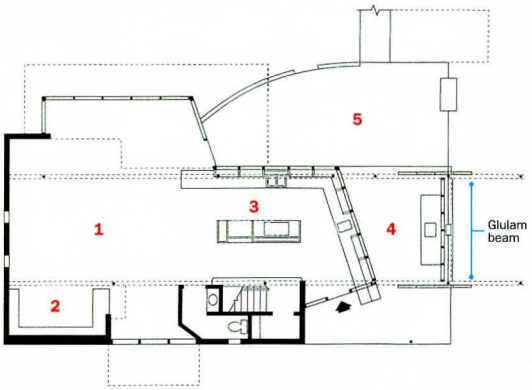
Innovative inside

The house's spare, orderly exterior is made buoyant by a narrow window irreverently poking up above the roofline and by the bubbly sweep of small windows. "A few of these little windows go a long way," says Hull, who places them carefully to fit specific tasks and views.

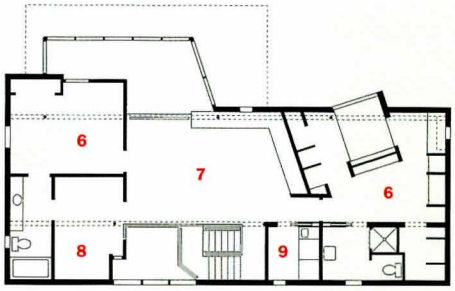
The structure was originally intended to be exposed steel but became a hybrid of wood framing, glulams, and steel columns when cost studies showed the steel would add $80,000 to the cost. Two 15-inch-deep glulams run parallel through the house, starting outside, above the

Glulam beams, visible throughout the first floor (far left), are supported by steel posts, creating a hybrid framing system. Most of the balance of the framing is wood. One of the steel posts becomes the newel post for the staircase (left). Fir-veneer cabinets delineate the kitchen from the other living spaces (top) and are inset into the window wall elsewhere (below).

The window wall in the living/dining area (top) is made of standard storefront windows. Steel cables add rigidity to the outdoor room structure (below and right). The walls in this room are industrial garage doors mounted sideways on overhead barn-door track.

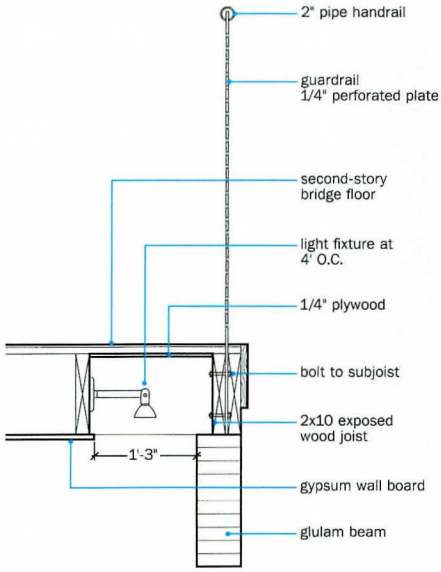


GROUND LEVEL

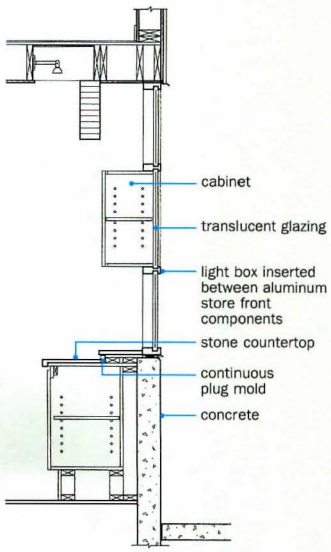


UPPER LEVEL

1. *Living/dining*
2. *Library*
3. *Kitchen*
4. *Outdoor room*
5. *Patio*
6. *Bedroom*
7. *Family*
8. *Den/guest*
9. *Laundry*



DETAIL OF CEILING LIGHT



KITCHEN WALL SECTION

entry, and terminating at the outdoor room. Both are supported by pipe columns that jab through the living space in unlikely places—into a kitchen countertop or in place of a traditional newel post at the bottom of the staircase. The ceiling drywall flanking these beams stops a foot shy of the wall junction, exposing the tails of the second-floor wood joists. This makes the ceiling appear to float while providing space in the bays between the joists for off-the-shelf galvanized-steel spotlights.

Northwest architecture is about framing views of cedars and a rain-streaked sky.

Standard metal-framed storefront windows create window walls in the living room and kitchen. In the living room, the two stories of glass are stiffened with vertical mullions fastened to a welded T-shaped steel plate that runs continuously behind them. This steel fin is bolted to the concrete foundation and to an exposed steel beam overhead. This arrangement keeps the frame profile narrow.

Budget was an important consideration here. The interior is open and simple both to make the space seem larger and to keep costs low. For example, a seven-foot-high fir cabinet screens the kitchen from the entry while housing the stove and the refrigerator.

The upper kitchen cabinets are fir-veneer boxes set at varying heights. The stains used on each cabinet door and drawer front vary slightly, from soft greens to almost clear hues in a subtle pattern recalling Mondrian's color blocking. The doors have small glass panels that allow vignette-like views of the dishes inside. Sandblasted glass on the back of each cabinet is set into the window wall.

The second floor bridges a portion of the living area, creating double-height spaces on either side that open to the family room, located on the second floor for more privacy.

The bed in the master bedroom sits snugly in a bay window angled toward a view of the lake framed by two evergreen trees. The window that pops up above the roofline on the front facade becomes a skylight that opens the master bathroom to the 100-year-old cedars and the rain-streaked sky. And that is what Northwest architecture is all about: framing the beauty outside. ■

Sources

Exterior metal wall panels: *BHP Steel*
Built-up roof: *GAF*
Roof drains: *Jay R. Smith Manufacturing Co.*
Steel windows: *Goldfinch Brothers*
Aluminum windows: *EFCO*
Glass in kitchen: *Asahi*
Entry doors: *EFCO*
Sliding doors: *Overhead Door Co.*
Track: *Richards-Wilcox "Trolley Track"*
Floor and wall tile: *American Olean*
Resilient flooring: *Forbo Marmoleum*
Carpet: *Merida*

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A derelict turn-of-the-century townhouse is reborn as the dynamic Fitch/O'Rourke residence

By David Dillon

In a city of crown moldings and pedimented doorways, the Fitch/O'Rourke residence in the Adams-Morgan section of Washington, D.C., is a stunning anomaly—open, edgy, and bright, with exposed concrete, acid-rusted steel walls, and dynamic spaces tucked behind a conventional rowhouse facade.

When Mary Fitch and Ronald O'Rourke first saw the house, it was a rotting shell without a rear wall, and its turn-of-the-century details had been destroyed. The previous owner had abandoned it to pigeons and vagrants after losing a zoning battle with the city. While neighbors were delighted to see this eyesore go, they were initially startled by what the new owners chose to put in its place.

"I work in a government building where all the walls are straight and rooms square," says O'Rourke, a naval analyst with the Library of Congress. "I didn't want to come home to that every night. I wanted to push limits."

O'Rourke, the son of an architect, and Fitch, now executive director of AIA/Washington, D.C., weren't interested in faux Georgian or rancho deluxe. They wanted clean lines and warm spaces with daring forms and materials. They bought their "wreck" in the summer of 1997. Earlier, they had seen the work of Robert Gurney, AIA, at a local exhibit and knew he'd be the right architect for them. A New Yorker with a degree from Catholic University, Gurney was as excited as his clients about designing a modern house. "To get a commission like that in a city like Washington was exhilarating," he recalls. "Here were people who actually wanted to do an interesting building."

Within two weeks, Fitch and O'Rourke had written a remarkably clear and thorough program. "The interior should be modern," one section begins, "not the safe, boring, architecturally sterile interiors of new homes in northern Virginia . . . or the modernism of extreme Minimalism and endless white walls. We don't want a temple to Sheetrock."

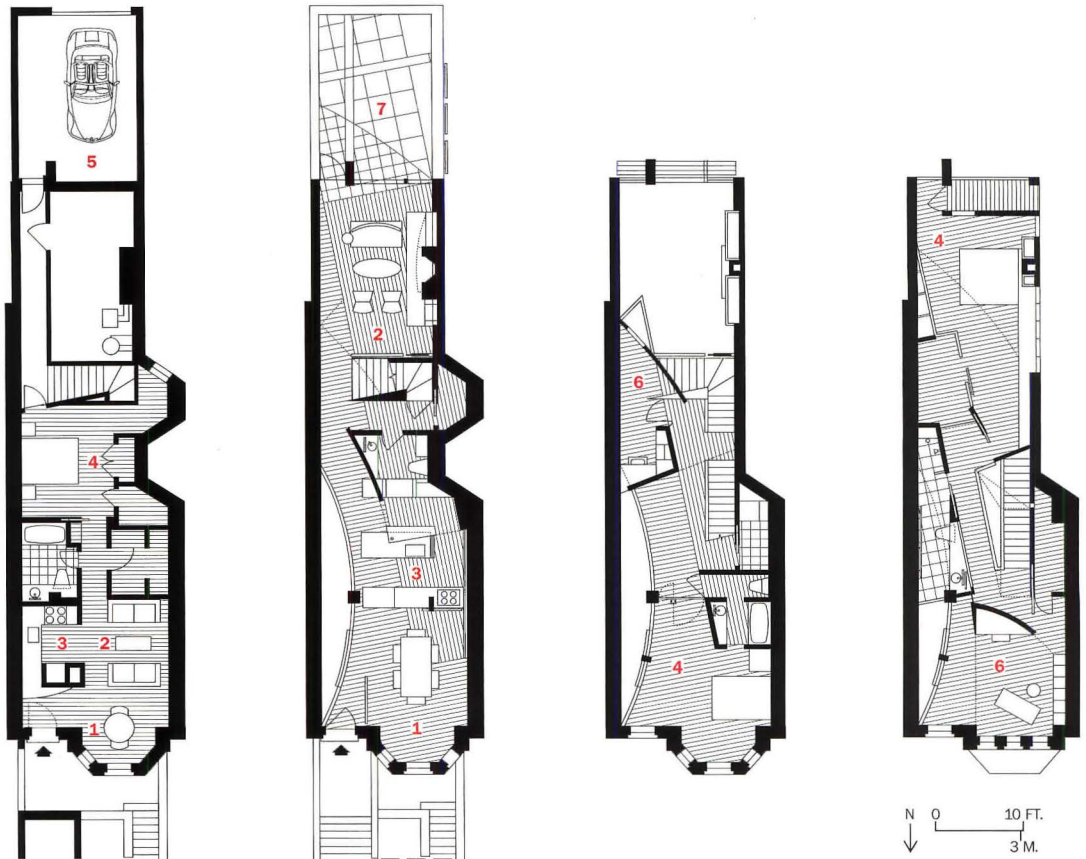
David Dillon is the architecture critic of the Dallas Morning News *and the author of* The Architecture of O'Neil Ford: Celebrating Place, *published by the University of Texas Press in 1999.*

The renovation's dynamism (above) was generated by a strong new curve and diagonal—both of which penetrate the house vertically to bring in light and allow for unexpected views.

Project: *Fitch/O'Rourke residence*
Architect: *Robert M. Gurney, AIA; Robert M. Gurney, Hito Martinez—project architects; renderers—Emily Barnett, Hito Martinez*
Engineers: *Advance Engineers, Ltd. (structural); Brian Ford (mechanical)*

The architect enclosed the wall-less south-facing end of the house (opposite bottom), with a balanced Modernist composition (this page) that combines solids and voids with a shoji-like translucency.

1. *Dining*
2. *Living*
3. *Kitchen*
4. *Bedroom*
5. *Garage*
6. *Study*
7. *Terrace*



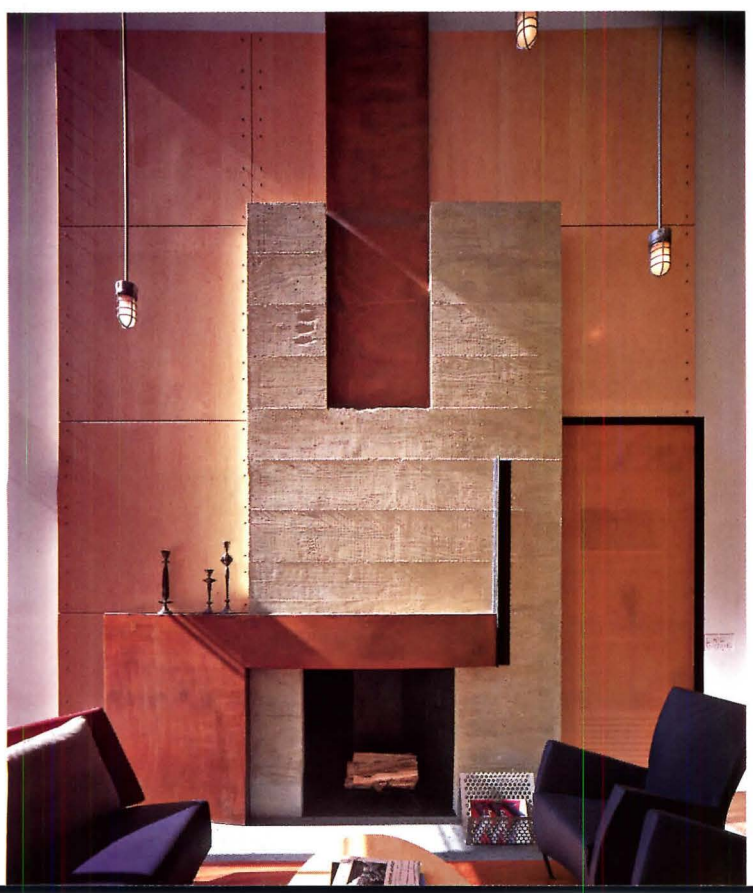
BASEMENT RENTAL UNIT FLOOR

FIRST FLOOR

SECOND FLOOR

THIRD FLOOR

In the two-story living room (below and opposite), a board-formed fireplace surround is juxtaposed with maple paneling and an acid-rusted steel mantel. Immediately to the mantel's right, a copper-wire screen masks stereo equipment. Low-cost industrial light fixtures were converted into simple pendants. The main stair (below right) is skylit.



THE CLIENT SPEAKS

My wife, Mary, and I lived down the street from a gutted townhouse and wondered what would become of it. The rear wall was missing and the interior rotted out. Someone would have to be brave to take on that wreck, we imagined, and that someone wasn't us. But we were wrong.

When the house came on the market in 1997, we realized it presented a rare opportunity to build a modern home in a historic neighborhood. We'd dreamed of doing this.

My experience with architecture goes back to my father, architect Jack O'Rourke, who designed houses in the San Francisco Bay area in the 1950s and '60s. After buying the house, we quickly brought in an architect, Robert Gurney, whose project we'd seen in a local AIA exhibition. We knew he was the architect for us—passionate about modern design and willing to work closely with clients.

When we told friends we had hired an architect, they assumed we had money to burn. On the contrary, we hired Bob because we didn't have a lot of money and believed he'd earn his fee many times over by developing a good design and controlling costs and risks by seeing it through approvals and construction. That proved even truer than we thought.

Design took 12 months, longer than expected, but the results were better than we could have hoped for. Construction, on the other hand, was a nightmare. We faced reluctant lenders, a supportive but dysfunctional building department, a historic review board eager to freeze-dry the neighborhood and maddeningly unreliable contractors. In the end, Mary became construction manager and finished the job within budget. At $140 per square foot, our renovation was roughly the cost of a new tract house in suburban Washington, D.C. The house achieves everything we wanted in terms of surprising materials and dynamic spaces that are both warm and functional.

My father thought it the highest compliment to him that we had hired an architect. Failing health prevented his visiting, but we showed him pictures. We were pleased that we could build our dream house and honor him as well. Ronald O'Rourke

They suggested layouts, identified needs, and specified the character of individual rooms. "The kitchen should be a place to show off modern design," another section reads, "but we don't want it to be one of those huge suburban soccer-mom command posts that looks like the bridge of the starship *Enterprise*. A moderate-size facility will do."

At $140 per sq. ft., this materially rich renovation cost the same as new tract houses in the area.

Gurney and his clients then spent 12 months designing and redesigning the 4,000-square-foot home. Describing the design process, O'Rourke says, "I was in favor of wild, and Bob was in favor of restraint." The gutted interior allowed Gurney to create a new house within an old shell. His challenge was to avoid the typical stacked boxcar arrangement of rectangular rooms placed end to end; his solution was to introduce a geometry of curves and diagonals that set the interior in motion. The primary curve defines a 30-foot-long stainless-steel plate set in the kitchen floor and the convex arcs of two balconies above it. Carving a vertical shaft through the interior, this curve opens part of the first-floor kitchen all the way up to the third story. Meanwhile, a diagonal gesture in plan penetrates the house from front to back and upward from the first floor, skewing floor patterns and partitions, 10

The arc of a 30 foot long stainless-steel plate in the kitchen floor (below) is echoed in the concave curve of balconies above it—defining an open well (left) that allows oblique rays from upper-story windows and a skylight to filter down to the first floor.

degrees from the sidewalls. Much of the design works off the curve or the diagonal. Spaces intersect and overlap, producing exciting cross views that bring daylight deep into the house. "There's a lot happening,

"There's a lot happening," says Gurney, but the geometry is purposeful.

but it all responds to that basic geometry I set up," says Gurney. "There are few happy accidents."

Recognizing that a spacious volume is a valuable commodity in a small house, Gurney created a two-story living room at the rear, or south end, of the building, with a patio over the garage and a tall Mondrian-esque window where the original end wall once stood. A concrete fireplace with copper-mesh panels anchors one side wall, while a skewed balcony from Fitch's office pops out of the other. The master bedroom and study, on the third level, are connected by a steel-and-block-aluminum staircase to a guest room on the second level and the

In the master bedroom (above), the rich and elegant material palette includes lead-coated copper cladding the south wall, smooth mahogany and maple cabinets, and a pietra verde limestone countertop.

kitchen and dining room on the first. A rental apartment with a separate entrance occupies the basement, previously a seven-foot-high, dirt-floored crawl space.

Besides dynamism, the owners insisted on a sense of warmth with an element of surprise. So Gurney gave them maple, mahogany, and cherry floors, walls, and cabinets; acid-rusted and sealed steel- and lead-coated copper doors; sliding copper screens; and pivoting glass doors like ones he'd previously used in a Capitol Hill hair salon. Despite this eclecticism, the interiors don't have that guess-what-we-found-at-Home-Depot look. They are calculated rather than capricious. Materials come together effortlessly and elegantly.

The completed house, including the rental apartment, cost $140 per square foot. The owners feel they got not only their money's worth, but also a paradigm that others might follow.

"We didn't want to live in the past," O'Rourke says evangelically. "We wanted to do something different, within a budget, and show Washington what modern residential architecture could be about."

Whether Washington gets the message or not, the owners and their architect have created something fresh and provocative under unlikely circumstances. ■

Sources
Curtain wall: *Kalwall*
Windows: *Weathershield (wooden); A&S Window Associates (steel)*
Glazing: *Maryland International Glass (custom)*
Doors: *A&S Window Associates (metal); Northeast Iron Works (custom sliding)*
Locksets: *Modric*
Cabinetry: *Burger's Cabinet Shop (custom); Hafele (hardware)*
Paints and stains: *Duron*
Lighting: *Lightolier (downlights); Estiluz (task); Stonco (exterior); Lutron (controls)*

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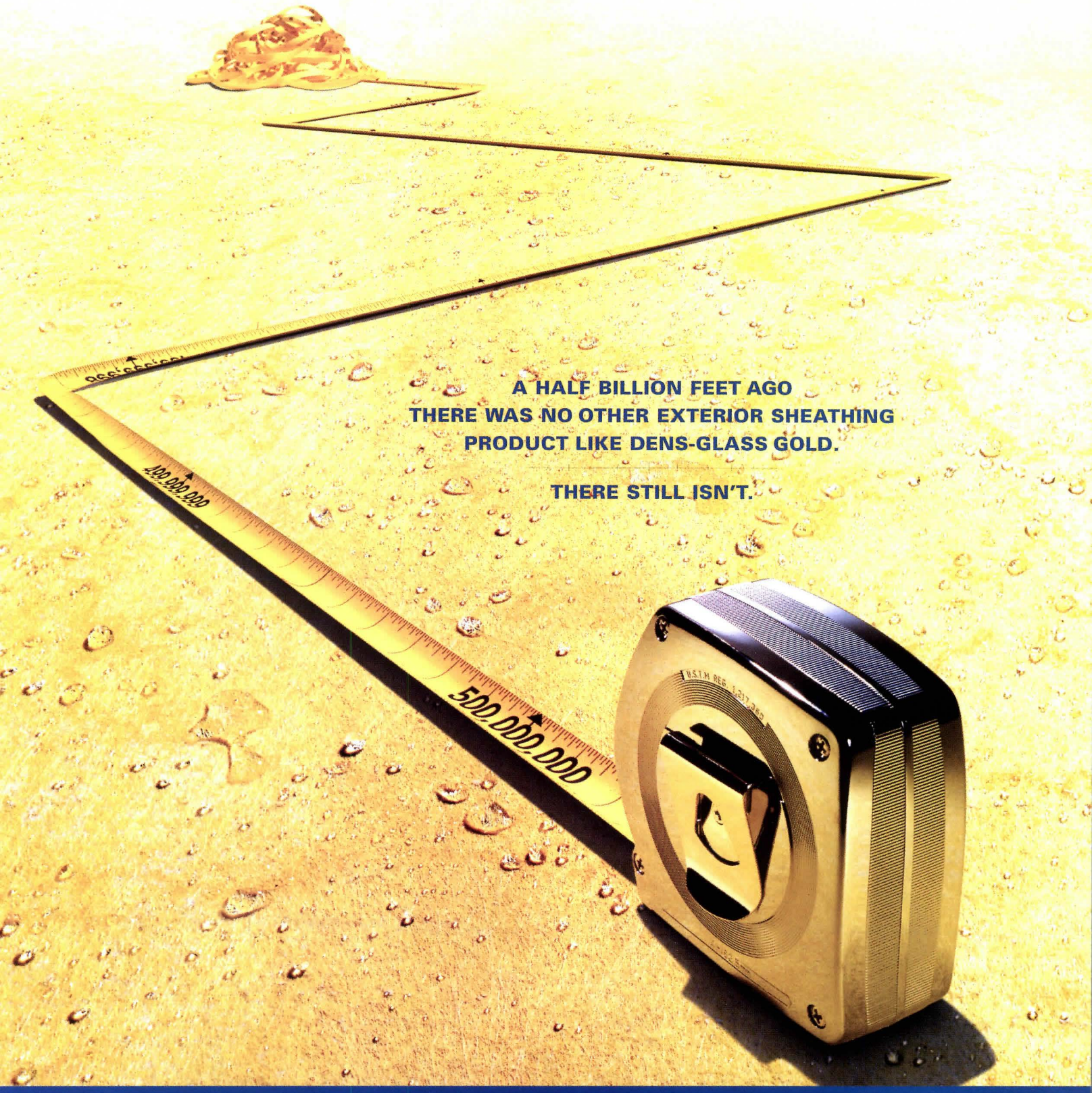

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CIRCLE 71 ON INQUIRY CARD

In the wilderness of Philadelphia, M. Finney Design transforms an 1809 house and barn

"A simple house of solid construction and pleasing proportion" is how architect/owner Martha Finney describes this patched-up stone and stucco structure (above) in Philadelphia. She restored the original 1,260-square-foot house, built in 1809, and attached a 444-square-foot wood-frame addition (right).

By Thomas Hine

Architect Martha Finney's house and barn stand on a narrow country road, flanked by farmhouses, barns, and former pastures that have turned to thicket and copse. The setting could be Vermont, but, as it happens, it's within the city limits of Philadelphia. Though the area seems remote and rural, the land just across the road was considered for digital television transmission towers that would have served the country's fourth largest media market.

It is fitting, therefore, that the 1809 house Finney renovated and modestly expanded for her own use is neither a slavishly restored historic building nor a suburban farmhouse fantasy. Rather, reflecting a contemporary pastoral vision, it is a megalopolitan country cottage. The original two-and-a-half-story rubble-stone-and-stucco structure, with generations of patches, is a true vernacular building. It's about as cute as a Roman ruin, but it has undeniable strength and integrity. "I didn't want it to look as if it had been hit by an architect," Finney says. By using a standing-seam metal roof and standard windows, the architect signals that her project is not a restoration but a contemporary renovation, done in a spirit as pragmatic as the one that produced the original house.

Finney also reveals a sensibility that is more personal than the generic simplicity of the old building. That's clear from the way her dark-stained wooden 444-square-foot addition meets the piebald stucco house with a new angular entrance canopy at one end and jutting porch at the other. "It has always seemed to me," Finney says, "that the joining of old and new can actually strengthen the peculiarities of each."

As it turns out, connecting an old masonry building with a new wood-frame structure proved to be a construction challenge. Finney, acting as general contractor, first decided to drill 12-inch-long anchors into the stone walls to tie the two structures together, but these didn't always hold. Some stones, she discovered, were so hard that the bolts didn't penetrate at all, while others were too soft. The mortar was so powdery that Finney realized the walls, though plumb, were held up more by inertia than adhesion. Only after drilling many holes did she find stones to secure the addition.

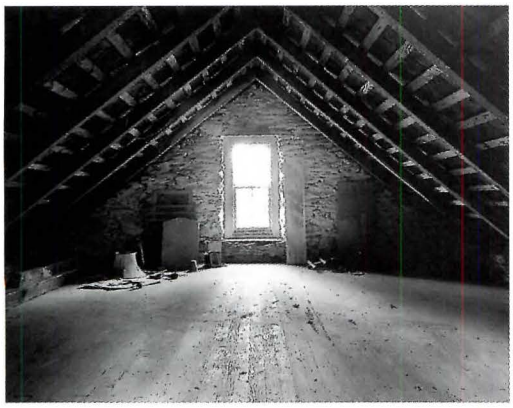
Finney is also renovating the far larger and spatially dramatic stone barn as her office. From the exterior, the barn looks essentially unaltered, except for a new roof. Inside, she has added a wood stove and a checkerboard painted floor, but its original roof trusses remain the chief architectural feature.

Thomas Hine, former architecture and design critic of the Philadelphia Inquirer, *is author of* The Rise and Fall of the American Teenager *(Bard/Avon) and* Populuxe *(MJF Books).*

Project: *Schuylkill House, Philadelphia*
Architect: *M. Finney Design*
Engineer: *Kachele Group—Tom Langan*
Carpentry: *John Weckerly*

Finney obtained the house on a 50-year lease after proposing to renovate it. The building is owned by a nature preserve. Standing-seam metal roofs and new standard windows on both the addition and the original house unify the structures and signal that this is not a literal restoration (above). The addition, with its odd angles and tall, skinny center, provides necessary living space.

The small attic—the third floor of the old house (left)—has barely enough room for standing. It is, nonetheless, a dramatic space and Finney's favorite room in the house. The large windows (right) allow views of the surrounding woods. She currently uses it for her office.



Renovation contest

The house is owned by a nature preserve, the Schuylkill Center for Environmental Education, which considered tearing it down. Instead, in May 1998, the center asked the community for proposals for renovating the property. Most schemes focused on a residential conversion of the barn, but Finney's concentrated on the house. Four months later, she was granted a 50-year lease with a 30-year option for renewal.

After five years of abandonment, the house had fallen into terrible shape, recalls Finney. The roof remained intact, but none of the windows was in one piece and everything was overgrown with vegetation.

"I didn't want it to look as if it had been hit by an architect," says Finney.

"The floors were knee-deep in trash," she says, "and other horrors, included a long-dead cat and a recently dead raccoon. I had to crawl in the window to explore the basement, which was overpoweringly creepy."

Because the joists had rotted in their masonry pockets, she added two wooden beams beneath the first story. These members are supported by steel columns set in concrete footings. She also replaced and reinforced some of the beams that support the first story. Little was done to the floors, apart from removing the old linoleum and uncovering the wide-planked wood that she painted pale gray to reflect and intensify the light from the outdoors. She tore down partitions, making each of the floors into a single room.

Finney kept all the existing masonry openings, converting one ground-floor door into a window, and using a second-floor window as the door to a bathroom which, along with a sleeping loft for guests, the kitchen, and the porch, occupies the addition. The third floor is really an attic, with only a bit of standing space. Yet it is clearly one of Finney's favorite places, with a view of a grassy field and distant woods that convinced her this was the house she was looking for. This room is her office until the barn renovation is complete.

The narrow stairway was rotted, but to save every square foot, Finney replaced it exactly as it had been. Then, because it was impossible to get anything large up the stairs, she placed a huge window in the new bathroom, through which she hoisted the bed and bathtub.

Though the original stone structure is only 1,260 square feet and the ceiling height seven feet, these rooms seem spacious. This quality owes much to Finney's choice of colors and furnishings, as well as the thick walls that create deep-set windows, the austerity of detail, and the expansive wilderness out the window. "No matter where you are," Finney says of her house, "you always have a sense of another place just beyond. You are drawn to it either by a view or a play of light."

She has lived in the house for a year and is still making discoveries and getting acquainted with the creatures that have lived so long in the walls. "Enormous spiders and centipedes keep emerging," Finney says. Fauna aside, she is delighted with her near ruin: "To start from such squalor and make it into what it could be—that was invigorating." ■

Sources

Wood cladding: *Delaware Cedar Co.*
Windows: *Kolbe &Kolbe*
Entry doors: *Fiorella Woodworking*
Locksets: *Schlage*
Pulls: *IKEA*
Paints and stains: *Benjamin Moore, Martin Seynour*
Kitchen counters/hearth: *Fireslate*
Sink and fittings: *Elkay*

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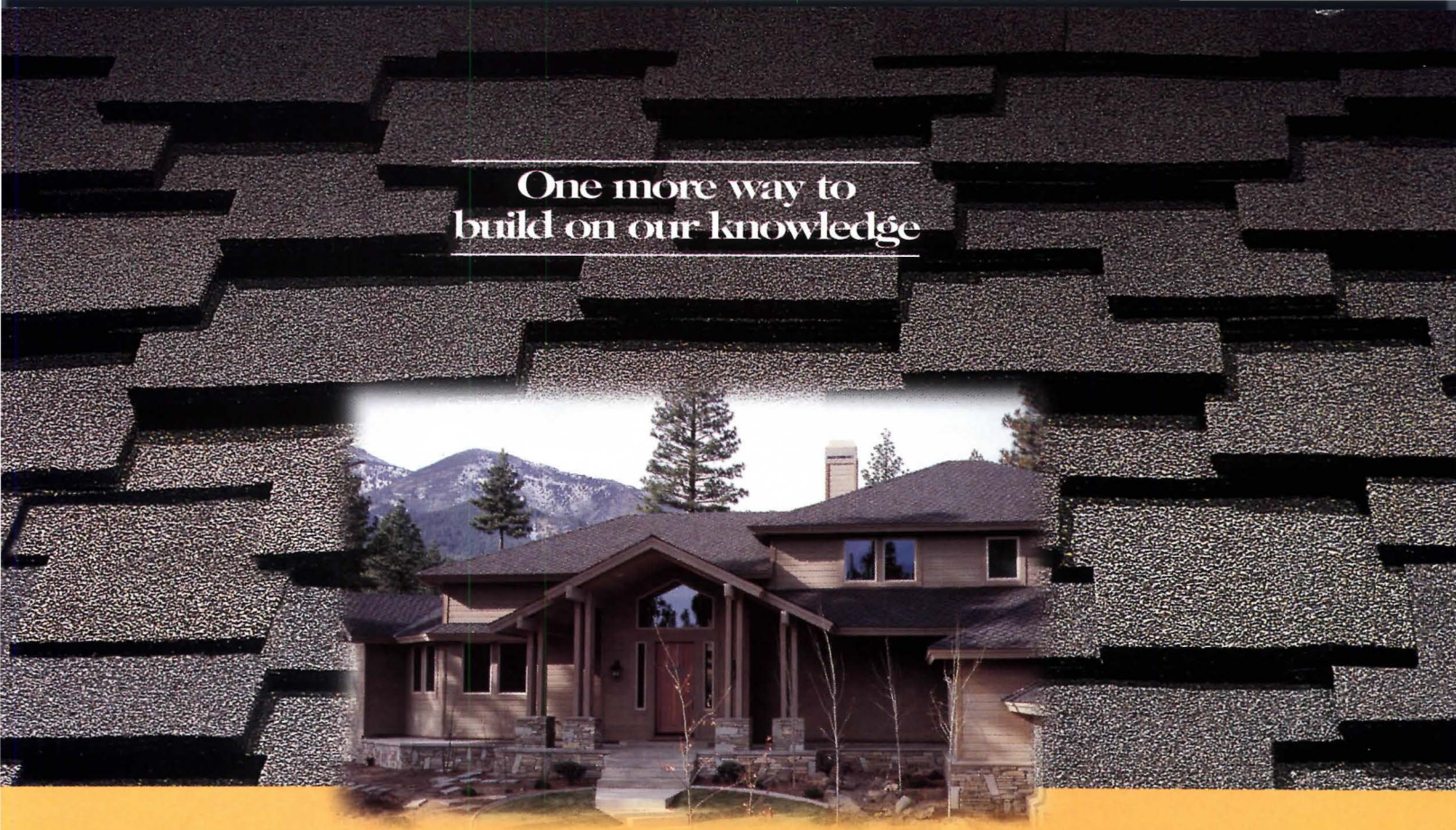

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CIRCLE 72 ON INQUIRY CARD

Colorful license plates join wood shingles and recycled goods in the Hester/McNally House

By Lisa Findley

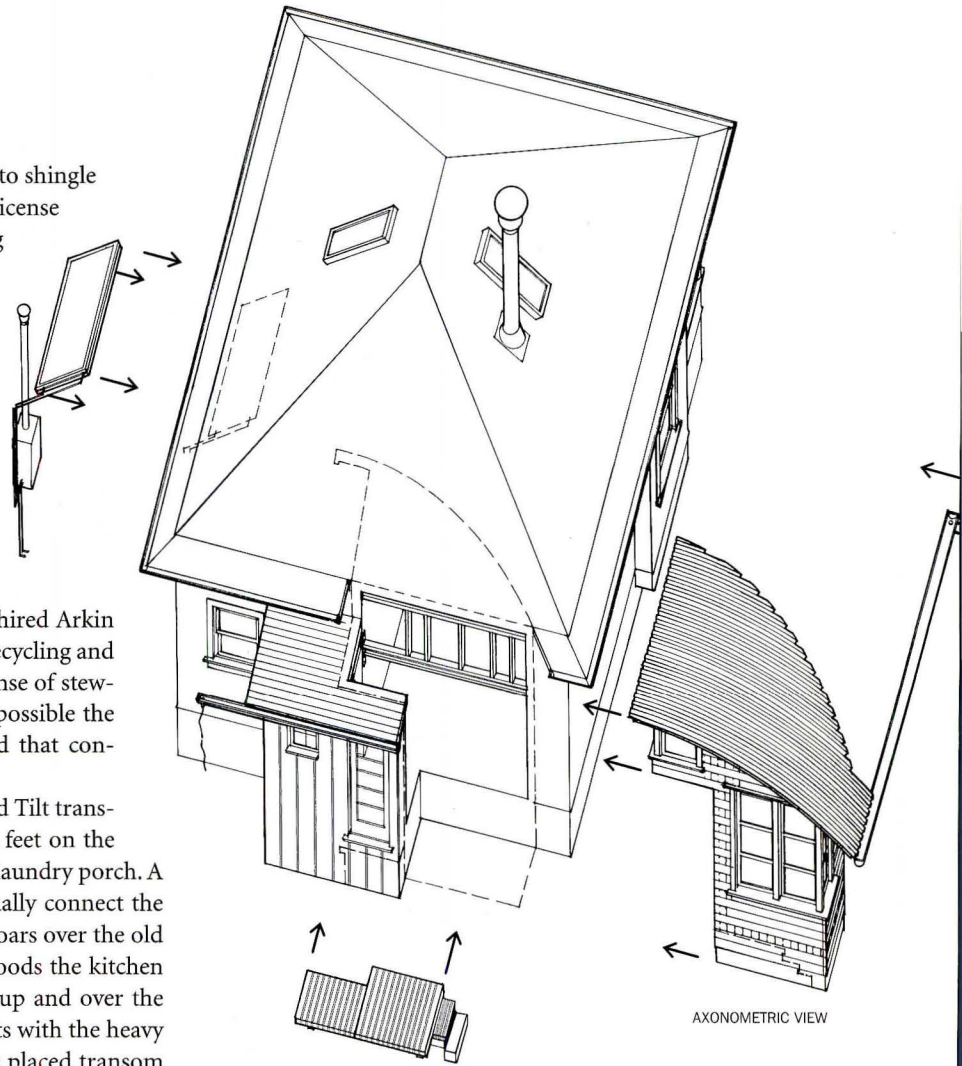
During hard times, rural do-it-yourselfers used to shingle small buildings in colorful and durable old license plates, picked up at the junkyard. Young Berkeley-based architects David Arkin, AIA, and Anni Tilt unwittingly rediscovered this delightful tradition in their $55,000 addition/remodel for two professors of ecology and community design.

The house, in Berkeley, California, began as a 700-square-foot 1920s bungalow, whose back garden has evolved into a composition of found objects and plantings with a flock of live chickens and ducks. But the north-facing eat-in kitchen was dark, too small, and without a connection to the garden beside it.

To enlarge and open the kitchen, the owners hired Arkin Tilt Architects, who shared their explicit dedication to recycling and zero-waste specifications. This approach, driven by a sense of stewardship about limited resources, meant that wherever possible the building integrated reprocessed or used materials, and that construction waste was kept to a minimum.

With straightforward, clean gestures, Arkin and Tilt transformed the kitchen. They added an efficient 28 square feet on the garden side and extended the space by enclosing an old laundry porch. A glazed door and large windows bring in light and visually connect the garden and kitchen. Above the new spaces, the ceiling soars over the old roof to create a south-facing clerestory window that floods the kitchen with sun. The resulting corrugated metal roof curves up and over the back door, and is detailed with a thin edge that contrasts with the heavy craftsman eaves of the rest of the house. The architects placed transom windows in the wall between the kitchen and living room to bring daylight into both spaces. In the living room, below the transoms, new niches hold books and objects. And Arkin and Tilt's integral-color concrete fireplace surround is textured with impressions of leaves.

The project's recycled elements include a locally produced terrazzo-like countertop of fragmented automotive glass and an 1882 railroad tie used as a header over the eight-foot-tall opening between the old and new. A salvaged window, installed low in the wall of the old laundry room (now dubbed the "Frog Viewing Room" for its views of a tiny pond) has a planed recycled lumber sill. Recycled redwood forms a deck with steps leading down to the garden. An old limestone fence post on its side provides the bottom stair. "Plyboo," laminated bamboo, covers the 28 square feet of added floor space. Thin strips of hardwood set the bamboo apart from the adjacent flooring—exposed, refinished fir subfloor—in the original space.



AXONOMETRIC VIEW

Perhaps most telling of the passion invested in the project is the story of the license plates. While seeking a way to sheathe the addition in a durable, recycled material, the architects happened upon a shed covered in old rusted tin cans in California's Sierra Nevada range. It inspired them to ponder other metal coverings and eventually led to the idea of license-plate shingles. When the architects suggested this sheathing for the addition, the clients began gathering plates. Their collecting, however, was not random. Friends, relatives, and the Internet were enlisted to find a

Lisa Findley, an architect, is RECORD's California correspondent. She is currently an adjunct professor at the School of Architecture of the California College of Arts and Crafts.

Project: *Hester/McNally residence remodel*
Owners: *Randy Hester and Marcia McNally*
Architects: *Arkin Tilt Architects; David Arkin, AIA; Anni Tilt—partner in charge.*
General contractor: *Chris Polk*
Landscape: *Randy Hester*

License-plate cladding on a new addition whimsically plays off the bungalow's original wood shakes, as seen before the renovation (below). The rear facade now opens the kitchen to light and views (right), raising the ceiling to create a clerestory beneath a new curving corrugated metal roof.

THE CONTRACTOR played a key role in this group project.
Like the architects and their clients, contractor Chris Polk was dedicated to zero-waste construction and reclaimed materials. As with any addition, many details had to be worked out on-site, and Polk worked closely with the architects and clients, modifying the old building to accommodate the extension. He describes the process as follows:

We were all deeply committed to low-impact ecological concerns, which gave this teeny exercise huge symbolism. Underlying its whimsical nature is a serious dedication to principles. An unusual confluence of people, with like values, cared about every aspect of this small project, paying it an almost-inordinate amount of attention. But everyone tolerated the situation because we all loved the project. If we'd been working with more formality, I can't even begin to count the number of change orders we would have had in the seven months it took to complete the work.

The clients were tuned in to the process and have very sharp eyes. Nothing escaped their attention. This could have been a recipe for on-the-job tension, but, in this case, the input was generous and positive. I have never dealt with a project where the clients were so involved. They were interested in every nook and cranny.

Overall, we tried to create continuity between the old and the new. Instead of hiding connections, we wanted to articulate them carefully and consistently to give a sense of wholeness in the way the pieces relate to one another.

With large, salvaged windows, a glazed door, and new clerestory lights, the formerly dark laundry room is now animated by daylight (left). Beneath transom windows, a new integral-color fireplace surround is textured with impressions of leaves (below).

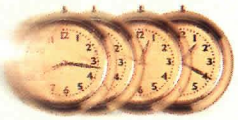
license plate from every state, including special ones from the clients' years and states of birth, and personalized plates from relatives across the country. After more than 670 plates were assembled, one of the clients made a detailed map of a Mondrian-inspired pattern for the specific placements. He then worked hand in hand with the contractor to put each item in its proper place. The result, a playful pattern in a range of colors, invites close inspection, revealing the names of far-flung states and humorous vanity plates.

A deep commitment to zero-waste construction and reclaimed materials guided the renovation.

Arkin says the modest remodel/addition has prompted "more debate per square foot" than any project they have ever done. With two architects, two community-designer clients, and a creative contractor who was fully committed to the project [see sidebar], every small detail, corner, and connection was consciously designed. One of the project's great challenges was to define a clear approach for integrating the new and the old. The architects devised a set of rules

Picasso had paints and canvas.

Einstein had time and motion.



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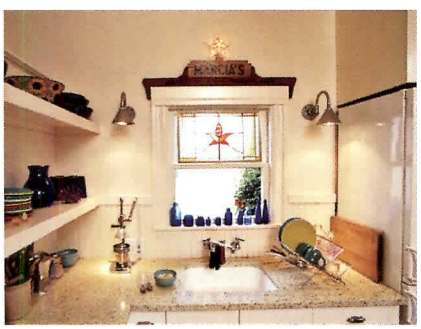

The kitchen (this page) has a salvaged stained-glass window, a countertop of recycled automotive glass, and a railroad tie used as a steel beam (top).

for their broad palette of materials. They often broke or revised their own rules, however, at corners.

The attention lavished on this project yielded uneven results. In some places, this intense focus produced beautiful effects, while elsewhere the outcome is more self-conscious and overworked, such as the area where the new floor is set off from the old. Overall, the project succeeds in opening the calm, dark interiors of the existing craftsman bungalow through a sunny, collaged-on addition. On the exterior, the license-plate cladding and exuberant new roof curve create a facade in harmony with the garden, where collected rocks and scavenged objects are carefully placed. The project's vernacular quality, however, sometimes seems at odds with details that are almost too refined. Yet like any lovingly crafted object, this idiosyncratic and deeply personal place exudes life. ■

1. *Living*
2. *Kitchen*
3. *Addition*
4. *Bedroom*
5. *Study*
6. *New deck*
7. *Solar water heater*

Sources

Roofing: *BHP (curved corrugated Zincalume panels)*
Paint: *Benjamin Moore*
Lockset and hinges: *Schlage*
Cabinets: *Ikea; Phoenix Biocomposites (composite panels of soy with sunflower-seed hulls)*
Countertop: *Counter/Production (custom, precast recycled glass)*
Fireplace surround: *Sonoma Cast Stone (custom concrete)*
Flooring: *Smith & Fong (bamboo strip)*

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▲ Return of porch pride

In response to the growing number of homeowners eager to add porches to their home designs, Style Mark Inc. has created a balustrade system they claim is virtually maintenance-free. The porch system is made from high-density urethane that resists insect infestations and ultraviolet rays. The porch posts are made from steel rods and contain fiberglass throughout the rails to ensure sturdiness. Nine styles of balustrade systems in a wide variety of sizes are offered. 800/446-3040. Style Mark Inc., Archbold, Ohio. **CIRCLE 200**

▲ Block options

A durable wall system is available from Anchor Wall Systems' Vertica and Diamond series. With geosynthetic reinforcement, the wall systems can be built anywhere from 3 to 30 feet. Options of straight or beveled faces are available on both the Vertica and Diamond blocks. The Vertica series uses built-in locators to assure proper alignment and a four-degree batter. The near-vertical rise means less excavation and land loss. 800/473-4452. Anchor Wall Systems, Minnetonka, Minn. **CIRCLE 201**

► Remodeling with personality

Remodeling the outside of a home is just as important as remodeling the inside. The Exterior Design Collection, a new program from Owens Corning, takes the age out of a home's architecture. Owens Corning does this by adding contemporary siding options and refined architectural accents. The Exterior Design Collection extends the personality of a home all the way to the curb. The collection features five thematic categories that match products and colors with a customer's style. 419/248-8000. Owens Corning, Toledo. **CIRCLE 202**

▼ Headers above the rest

Builders Edge shutters and window headers were developed for easy installation to any siding material and are available in a variety of sizes. The product is made from a durable copolymer material and never needs repainting due to UV stabilization. The fasteners on a window header are covered, providing a finished look, and distinctive keystones are available. Each window header and shutter is backed by a 40-year warranty. 800/350-1706. Builders Edge, Pittsburgh. **CIRCLE 203**

▲ Polyurethane holds up

Therma-Tru Doors has added raised panel designs to its line of Smooth-Star fiberglass doors. The new three-dimensional detailed panels create shadow lines and offer the strength of steel doors without dents and rust. Also, the doors have the smooth look of painted wood without warping or splintering. According to Therma-Tru, their solid polyurethane foam core insulates five times greater than wood. 800/843-7628. Therma-Tru Doors, Maumee, Ohio. **CIRCLE 204**

▲ Radius patio doors

New technology, applied by Pozzi Wood Windows, has resulted in the Pozzi clad radius patio door. The new door exterior is available primed for painting or with Pozzi exterior cladding. Pozzi offers the exterior aluminum cladding in six standard colors, 25 Designer Choice colors, and custom color matches to complement nearly any exterior. Pozzi windows and doors retain their color after many years of exposure to the elements. 800/257-9663. Pozzi Wood Windows, Bend, Ore. **CIRCLE 205**

▲ Old designs, new touch

The archival flooring designs in Armstrong's new collection, New Generations/Classics Contemporized, focus on updated versions of vintage designs. The collection features vinyl flooring in four patterns in a variety of colors. The floors also have a patented CleanSweep wear layer. 717/396-4197. Armstrong World Industries, Lancaster, Pa. **CIRCLE 206**

▼ Stones with culture

Cultured Stone Used Brick veneer looks like full-thickness brick, but it is only half an inch thick. It can be installed anywhere without the expense of additional foundation support. With a large variety of stones, brick, and architectural trim products, the line is durable and colorfast indoors or out. 800/255-1727. Cultured Stone, Napa, Calif. **CIRCLE 207**

▲ Bringing products from the outside, in

By borrowing from the decorative products used on the outside of a home, Style Mark and Architectural Accents have created interior-window surrounds. The low-maintenance urethane millwork pieces install quickly and can be marbleized, faux, or texture-painted. The millwork can be added on any or all of the four window sides. Panels below the windowsill add depth and overall style to the window unit. 800/446-3040. Style Mark, Archbold, Ohio. **CIRCLE 208**

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▼ Replacement windows to the soul

Featuring a contoured lift rail and triple-stepped sloped sill, the Simonton Impressions 7500 replacement window promotes faster water runoff. Insulation is provided by multiple-chambered profiles that create dead air chambers inside the frame and by ¾-inch glass penetration into the sash. The replacement windows are available in many styles, such as double-hung, patio door, picture, bay, and bow. Many grid and color options are also included. 800/542-9118. Simonton Windows, Parkersburg, W. Va. **CIRCLE 211**

◄ Living in a vacuum

Due in part to bigger homes with more square footage, central vacuums are making a comeback. The new Dimension 2000 central vacuum from Hoover is simple to install whether in an existing home or in a new construction. The vacuum has a three-stage motor, a 8.4-gallon capacity, and 530 maximum air watts. The power unit has a 5-year warranty while the suction motor comes with a 10-year warranty. 330/499-9200. Hoover, North Canton, Ohio.

CIRCLE 210

► Precision fit windows

The new Pella Precision Fit replacement window system provides homeowners who need to replace their windows with a simple and economical solution. The windows arrive fully assembled and factory-tested. Customers can choose from three exclusive Pella double-hung sash options. The windows also feature an accessory groove on the exterior that can be used as an exterior trim. Pella has a 20/10 Limited Warranty (20 years on glass, 10 on other components). 880/84-PELLA. Pella Corporation, Pella, Iowa. **CIRCLE 209**

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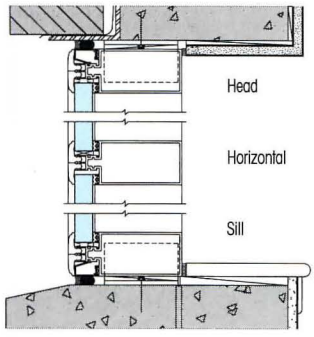

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New Products

When specifying glass, architects will notice a new class of low-emissivity products, a wider choice of coatings, and the increased popularity of double-glass wall structures [see page 171]. This month we feature several products and fabrications that push the material to new limits. *Rita F. Catinella*

FABRICATORS HELP GEHRY BEND THE RULES OF DESIGNING WITH GLASS

It's not surprising that Frank O. Gehry's name appears more than once on a list of new projects designed with unique glass fabrications. His firm has recently worked with fabricators who are able to manipulate glass in ways that emulate everything from, in Gehry's words, "reeds swaying in the breeze" to less organic objects.

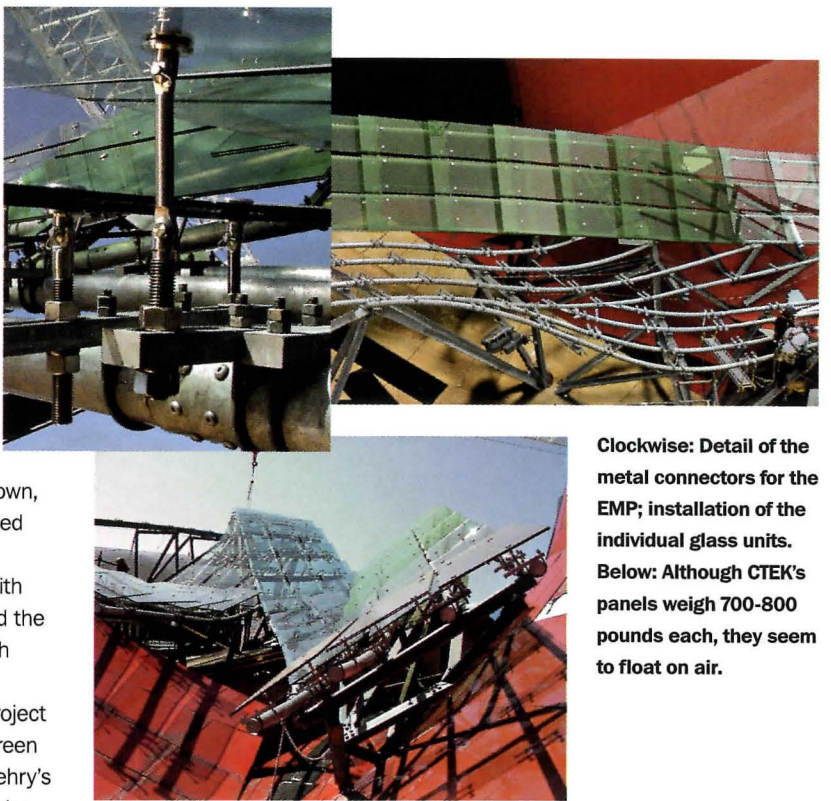
Gehry's first commercial project in the Pacific Northwest, the Experience Music Project (EMP), is an interactive music museum conceived by Paul G. Allen and Jody Patton. The EMP collection includes more than 80,000 artifacts that helped shape music history, including Allen's collection of Jimi Hendrix memorabilia, the largest in the world. A grand opening of EMP is scheduled for June 23, when visitors will explore the 140,000-square-foot space, which has been anticipated (with mixed emotions) since the groundbreaking in June 1997.

Cricursa Cristales Curvados, a Spanish fabricator, helped bring the architect's design to life by producing 7-by-2.8-foot laminated glass "guitar strings" for the project. The guitar strings were designed with 621 units of color-tempered laminated glass (top right and bottom right). These units are fabricated from two plies of 10-millimeter clear-tempered float glass laminated with polyvinyl butyral (PVB) and a chromafusion film. The lamination process was performed at Cricursa's facilities in Barcelona. Each glass unit is supported with iron steel connectors, manufactured by Trypiramid, which go through glass holes (detail shown, right). Cricursa also collaborated with glazing contractor Permasteelisa (who worked with Gehry on the Guggenheim and the Condé Nast cafeteria) and with glass installer Crown Corr.

"The challenges of the project were to match the blue and green colors exactly as desired at Gehry's office [achieved with Cesar Color technology] and the tolerances requested to fit the glass in the complex metal structure," says Cricursa, marketing director Jordi Camps Arbestain. The company also fabricated the striking curved glass for architect Rafael Moneo's Centro Kursaal project in San Sebastián [May 2000, page 212], and the Skywalk for Expo 2000 in Hanover, for Schulitz+Partners.

Check out those curves

For another Gehry project, the Condé Nast cafeteria at 4 Times Square in New York [June 2000, page 116], the Santa Ana–based company CTEK created a new medium of complex curved architectural safety glass. Seventy-six giant panels, resembling molten glass shaped by the wind, were used to partition the space. Clear glass is used in the corporate cafeteria, while frosted glass was used to create private dining rooms. Each of the ⅞-inch-thick, approximately 12-by-4-foot panels is one-of-a-kind; the panels are made from two pieces of glass that are slumped in computer-controlled ovens over a mold that reproduces Gehry's specific shape for each panel. They are then taken out, cooled, and laminated using a cold cure liquid resin; a process that allows the size of the panels to be much larger. The design process was aided by the fact that CTEK, a company originally established to do modeling and prototypes for the West Coast's automobile industry, employs the same CATIA software for computer-aided design used by the architect. CTEK has the five-axis Computer Numerical Control (CNC) equipment that allows the architect's data to be directly translated into the ultimate shape envisioned by Gehry.



Clockwise: Detail of the metal connectors for the EMP; installation of the individual glass units. Below: Although CTEK's panels weigh 700-800 pounds each, they seem to float on air.

"This is the glass as it never has been done before," explains Fred Adickes, who founded CTEK along with his son Eric. "With our software and CNC technology, we can take an architect's design data in digital form or as two-dimensional drawings, and model or prototype the design in three dimensions to precise specifications."

The fantastic possibilities of this process do not stop here. CTEK has recently installed a 30-foot, five-axis CNC mill that makes even larger panel sizes possible.

34/93 840-4470. Cricursa Cristales Curvados, Barcelona. CIRCLE 212

714/431-1190. CTEK, Santa Ana, Calif. CIRCLE 213

DUPONT BENEDICTUS AWARD HONORS INNOVATIVE USES OF LAMINATED GLASS WORLDWIDE

The DuPont Benedictus Awards program is an annual international competition to recognize significant and enterprising uses of laminated glass by both professional and student architects. This year's winners were announced on May 5, at a ceremony held during the AIA convention in Philadelphia.

The Germany-based firm of Fink+Jocher Architects won the award in the commercial division for the AUDI Development Center in Ingolstadt, Germany, and Fougeron Architecture of San Francisco won the residential award for the design of a private house in Palo Alto, Calif. Eric Owen Moss, of Culver City, Calif., was honored with a special recognition award for the Umbrella, an outdoor amphitheater space located at the roof level of two contiguous warehouse structures in Culver City. These structures were remodeled and converted to production and post-production uses.

The judges designated the following firms for special recognition: Rafael Viñoly Architects PC, for the Samsung Jong-Ro Building, Seoul, Korea (below); Arup Facade Engineering, for the Corporation Street Bridge, Manchester, England; Jutta Schürmann und Peter Schürmann, for the Pavilon Domshof in Bremen, Germany; Ingenhoven Overdiek und Partner for the AUDI AG Messestand, first seen in Frankfurt and later in Tokyo, Detroit, Geneva, and Paris; Ray King Studio Ltd., for *Light Wave,* a sculpture in the Library Reading Room of Rowan College in Glassboro, N.J.; Hugh Newell Jacobsen, FAIA, for the Scheer House in Vero Beach, Fla.; and Marks Barfield Architects, for the Millennium Wheel in London.

The London Eye capsules, one of the more unusual award winners, (above) are made entirely with laminated glass, except for the floor. The tough (PVB) plastic interlayer in laminated glass gives the glass panels the strength to withstand the weight of six people per square yard. In addition to ensuring safety for the passengers, laminated glass also reduces outside noise.

The awards program is a collaborative effort of Dupont and the AIA, with worldwide support of the Union Internationale des Architectes (UIA). The two winners received a new original sculpture, a crystal parallelogram constructed to catch and split light beams, designed by James Carpenter, a New York artist working in architectural laminated glass. 202/393-5247. The Dupont Benedictus Awards, Washington, D.C. CIRCLE 214

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– Graham Davidson, architect

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Terminal A parking garage at National Airport in Washington, D.C.
Architect of record: HNTB Corporation
Design architects: Hartman-Cox Architects
Graham Davidson, FAIA

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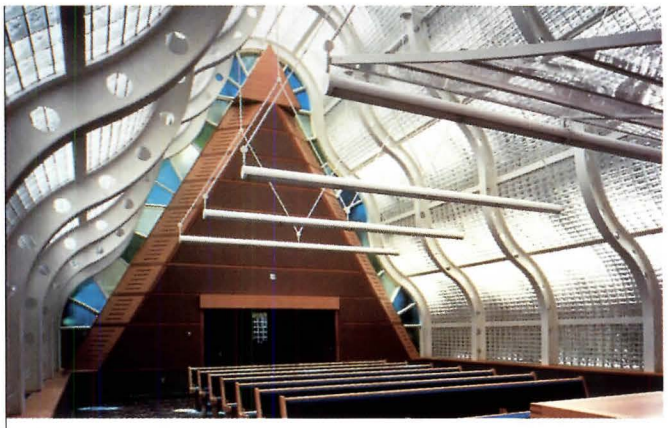


▲ Rays of light from above

With its trademark undulations, the Decora Pattern, part of the Premiere series for Pittsburgh Corning Glass Block, provides maximum light transmission with subtle visual distortion. The nondirectional faces of the 3⅛-inch-thick glass block make for quick installation. The blocks range in size from 6 by 6 inches to 12 by 12 inches. Decora was used to brighten the Veteran's Administration Hospital Chapel in Detroit (above), in a design by Smith, Hinchman & Grylls. 724/327-6100. Pittsburgh Corning, Pittsburgh. **CIRCLE 216**

► Replicating historic glass

Joel Berman Glass Studios is one of only a few studios in North America that can cast glass in a way that meets the requirements of the Chrysler Building's restoration architects, Beyer Blinder Belle, and the scrutiny of the New York City Historical Board. To replicate the remaining glass panels, the studio made a mold of a sample of the original glass (which features a pyramid-shaped bump texture) that surrounds the building's entrances on 42nd Street and Lexington Avenue. 888/505-GLASS. Joel Berman Glass Studios Ltd., Vancouver. **CIRCLE 217**

▲ To see and be seen

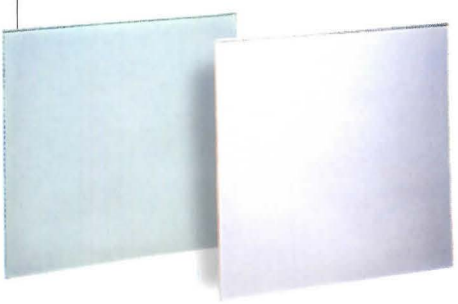
ABC's Time Square Studios (home of *Good Morning America*) features Amiran anti-reflective glass in the ground floor and in the Marquee Studio, allowing passersby a voyeuristic view into the studio. From within the studio, the glass provides a view up Broadway for television viewers. Amiran reduces reflected light to as little as 1 percent, far below the 8 percent reflection of normal window glass (16 percent when double-glazed). 914/968-8900. Schott Corporation, Yonkers, N.Y. **CIRCLE 218**

◄ Contemporary classics

Over the past 19 years, Joseph K. Beyer has been offering design solutions for worship environments and the adaptive reuse of historic windows in new religious settings. His studio, Beyer Stained Glass, consults on the framing as well as the design, fabrication, and installation of stained glass. The detail shown here is of one of 17 installations in the Holy Martyr's Church in Orland, Pa. The figures take on an Egyptian, rather than a traditional Gothic, form. 215/848-3502. Beyer Stained Glass, Philadelphia. **CIRCLE 219**

▼ Clearly not green

Ultra-clear Starphire glass was reintroduced by PPG Industries earlier this year. Starphire Glass (below right) has a formulation enhancement compared with traditional float glass (below left) that results in higher visual clarity. In standard six-millimeter thickness, Starphire glass achieves 91 percent light transmittance. It is available in thicknesses from 2.5 to 12 millimeters. Visibly clearer than ordinary glass and without any greenish cast, Starphire glass has also been used in photovoltaics, mirrors, and furniture. 800/377-5267. PPG Industries, Pittsburgh. **CIRCLE 220**



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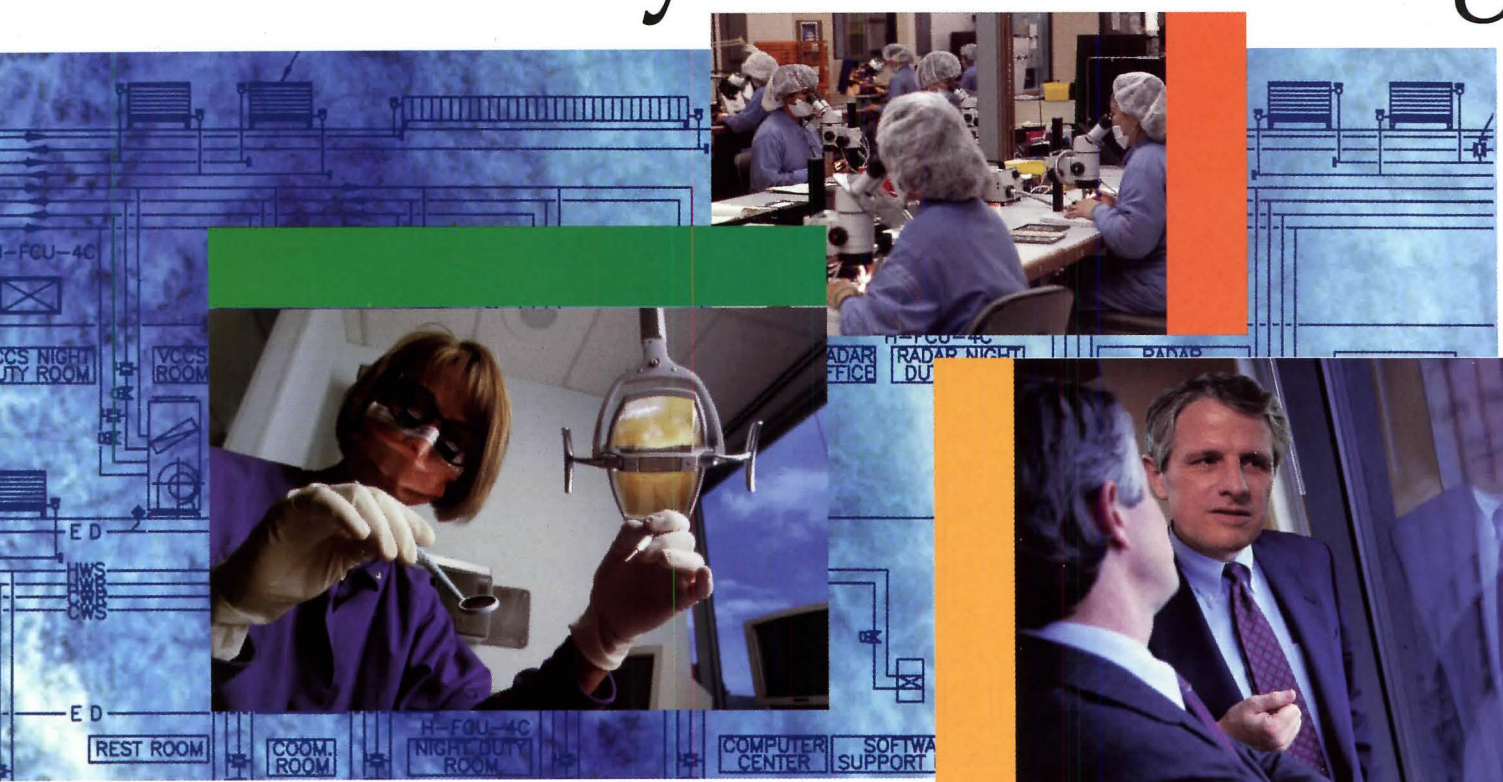

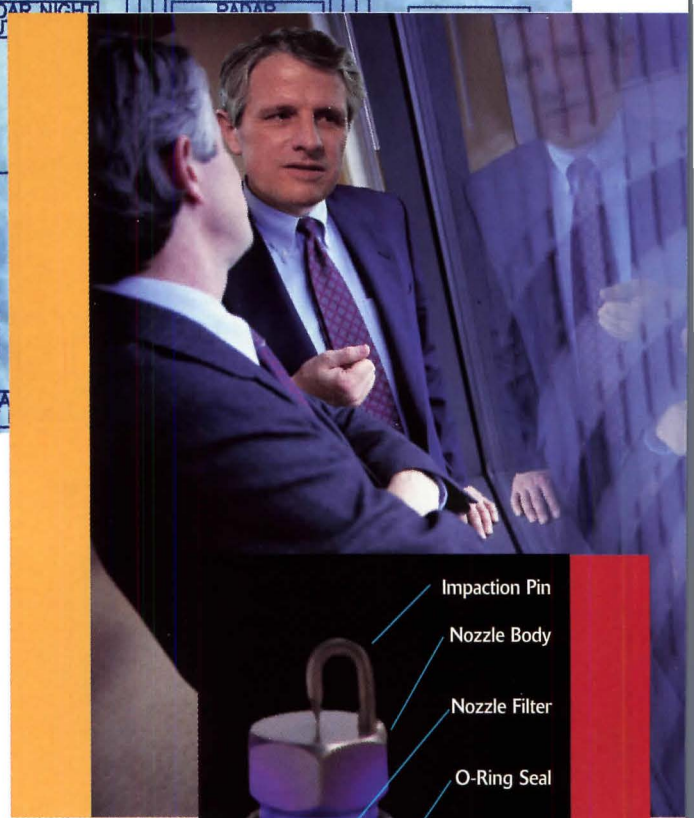

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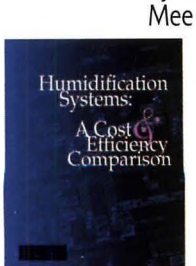

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CIRCLE 82 ON INQUIRY CARD

Products Briefs

Highlights from the International Contemporary Furniture Fair (ICFF) held in New York from May 20 to 23 *Rita F. Catinella*

▲ Give us our daily bath

The new Giorno bathroom collection is an homage to nature. With fittings from Dornbracht, furniture and ceramic articles from Duravit, and a bath from Hoesch, the bathroom series is unified by the design of a leaf and a water droplet. Furniture and accessories feature a combination of aluminum, glass, and wood. Fittings are available in a chrome or platinum finish. 888/DURAVIT. Duravit USA, Duluth, Ga. **CIRCLE 221**

► Making grandpa's trailer hip again

Christopher Deam, a San Francisco–based architect, redesigned the interior of a vintage 1948 trailer to appeal to a younger crowd. The kitchen cabinets, countertops, benches, table, floor, and additional detailing all feature Wilsonart laminate. The surface was chosen because it is lightweight, durable, and consistent with the aesthetic of the trailer. The laminates are layered to create fluid, multi-dimensional patterns, reflecting the growing interest in abstract designs and a departure from solid colors. 800/433-3222. Wilsonart International, Temple, Tex. **CIRCLE 222**

▼ Media units with style

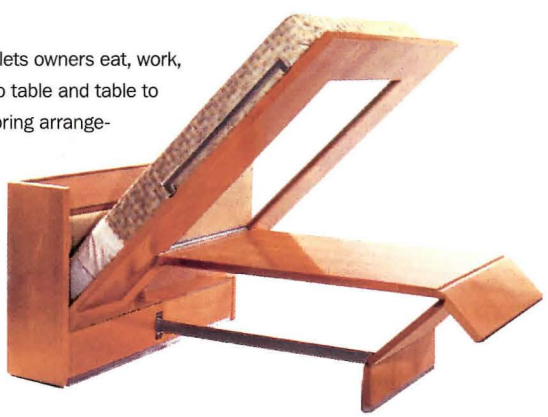
With a design based on a formal architectural grid, the Mainframe Media Unit from Dakota Jackson is the centerpiece of the Mainframe Collection. The grid appears as a basic white box, with sides of white lacquered wood, shelves of natural anigre, and a back of translucent white acrylic. Tension cables also offer additional support to the back of the media unit. The translucent panels change into clear glass six inches from the top and bottom to reveal shelves. An elongated light fixture attached to the back of the unit reflects light off the wall to illuminate the cabinet. 212/838-9444. Dakota Jackson, New York City. **CIRCLE 223**

▲ Going retro in the home and office

The new Malibu collection from SKYPAD is a complete collection of 1950s retro industrial-style furniture for the home and office. The collection currently consists of 30 items divided into four categories: office, dining, bathroom, and occasional. Offered in five vibrant finishes of silver, orange, blue, white, and neon green, the collection was designed by Rutger Anderson, a industrial designer based in Sweden. 416/762-2929. SKYPAD, Toronto. **CIRCLE 224**

► Small space, double the furniture

Making double use of limited space, the Inova TableBed lets owners eat, work, and sleep all in one area. The transformation from bed to table and table to bed is accomplished with one fast, easy movement. A spring arrangement hidden inside the frame makes raising and lowering easy because no locking or latching is required. The TableBed is offered in a twin-, full-, or queen-size bed with a range of table sizes. A recessed area above the table may hold frosted glass, a mirror, or artwork. Solidly self-supporting and movable, the unit does not need to be bolted or attached in any way to the floor. 212/932-1447. Inova Furniture, New York City. **CIRCLE 225**



Products Briefs

▼ Kitchen computing

Thanks to a kitchen island developed by Nova Solutions, computers can now become a seamless part of the kitchen without compromising workspace. The station includes anti-reflective tempered glass with a spill-resistant trim, a concealed CPU shelf, and power cord. With a removable back panel, the computer island is convenient to access and can be moved easily on heavy-duty wood casters. The island also features a John Boos & Co. butcher-block top. 800/730-6682. Nova Solutions Inc., Effingham, Ill. **CIRCLE 226**

▼ Cooking up options

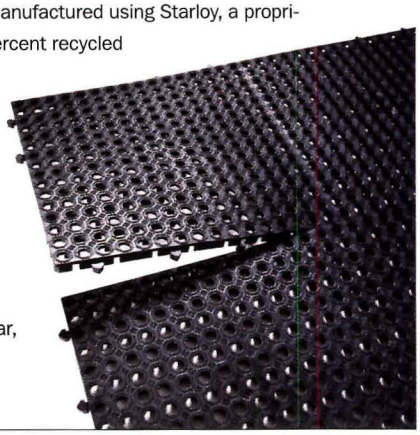
The Gaggenau VK230 Steamer is part of the Vario System, a modular surface cooking concept. The system has unlimited configurations for gas, electric, and steam cooking. A full range of options for the built-in cooktop includes a deep fryer, an electric barbecue grill, and a gas wok. 800/828-9125. Gaggenau, Huntington Beach, Calif. **CIRCLE 229**

▲ Cutting corners

Installing finish materials and wall applications is faster with new products from Blue Maxx. The new four-inch form unit has eliminated the need to miter-cut non-90-degree corners. Also, finish materials can be fastened to the new corner furring tab. Above, a worker cuts a six-inch standard Blue Maxx form unit. 905/373-8301. Blue Maxx, Cobourg, Ont. **CIRCLE 230**

► Safely walking on the roof

Nova Walkway Pads, introduced by EcoStar, are an interlocking, safe roofing walkway system. The pads are manufactured using Starloy, a proprietary polymer made from 100 percent recycled post-industrial waste rubber and plastic. The Starloy compound provides a nonabsorbent, impact-resistant, nonslip, interlocking walkway system. The walkway's open octagon-grid design allows for the free flow of liquids below the pads. 503/525-9544. EcoStar, Vernon Hills, Ill. **CIRCLE 227**



▼ Private communications

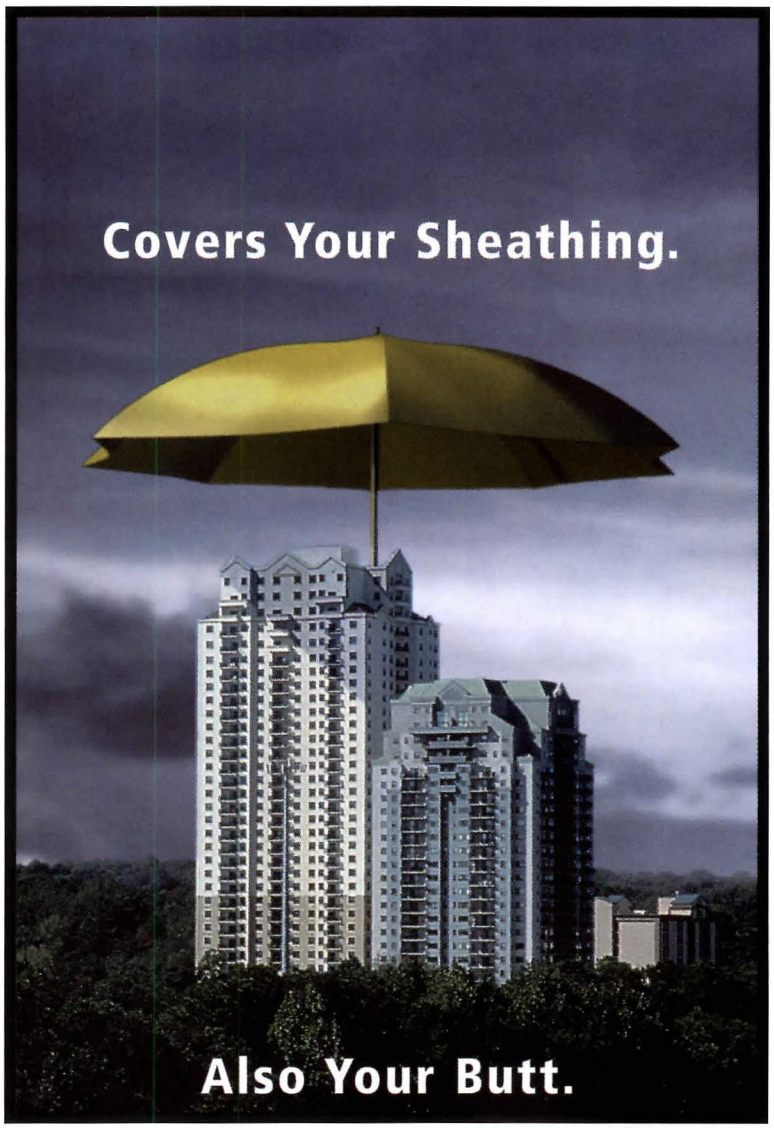
The low-profile Platform Beam from Inscape can carry power and data cables from walls and columns or off-module from a central spine of Platform panels. It can also be freestanding, with end-of-runs supported by leg assemblies in L, T, and new Y configurations. Tables can nest or cluster around the communication beams. Lightweight screens may also be attached to the top of the beam for increased visual and acoustical privacy. 905/836-7676. Inscape, Holland Landing, Ont. **CIRCLE 231**

► Self-regulating machine

Introduced at Neocon last month, Raptor seating from Allsteel features a patented inverse synchro-tilt movement. As the back of the chair tilts to the rear, the Raptor chair articulates forward. This motion causes the weight of the user's body to serve as a self-regulating tension mechanism. Ensuring that the seating shell distributes weight evenly, Allsteel engineers employed computer-assisted pressure mapping. The fiber-reinforced shell is supported by aluminum castings. 888/ALL-STEEL. Allsteel, Muscatine, Iowa. **CIRCLE 228**

◄ Stay secure inside

In response to the increasing reliance on key-card locks in hotels, Doorcraft's Wide Stile door has been created to allow these systems to be installed easily. Specifically designed for commercial applications, the door has a solid-core internal construction. This accommodates door-closer installation on the top rail and kick-plate installation on the bottom rail. 800/877-9482. Doorcraft, Klamath Falls, Ore. **CIRCLE 232**



Introducing Gold Guard. A barrier against moisture, not design.

Despite misconceptions, EIFS provides a better moisture barrier than other claddings. Now we've taken it even further. Introducing Sto Gold Guard — a moisture protection system that resists water penetration more than 5 times longer than leading brand house wraps and 28 times longer than conventional building paper. Gold Guard has two easily-applied steps (all you need is a trowel and a roller). And when combined with EIFS, you get seamless moisture protection for years. Now you can create memorable, lasting designs with EIFS without having to watch your...um...back. Start today by visiting our Web site at **www.stocorp.com** or calling **1-800-221-2397**.

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CIRCLE 83 ON INQUIRY CARD

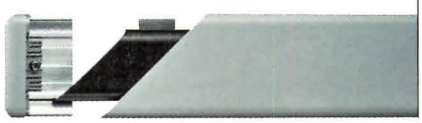
Product Briefs

► Simple storage

Kanso, a Japanese word meaning simple, is the title of a collection by Yves-Claude Arbour. The Kanso pullout pantry is a mobile, multipurpose pantry with a sliding shelved interior. The unit can be used in the kitchen as a cupboard, storage unit, or utility closet. Custom outfitting for entertainment or for the office is also available. 212/625-9612. Yves-Claude Design, New York City. **CIRCLE 233**

▼ Protective guard

Many products are available to protect walls from damage, but most are heavy and difficult to install. The 1600I Wall Guard is strong enough to resist impact of more than 88 pounds, yet light enough to ship and install easily. The wall guard can be used in numerous buildings where damage occurs frequently, such as hotels, schools, hospitals, airports, and restaurants. 800/222-5556. InPro Corporation, Muskego, Wis. **CIRCLE 234**



▼ Marbleized rubber

With the Prima marbleized rubber flooring system (shown below), customers can choose from one of 16 base colors, along with three colors that will be used as veining in each tile. Other offerings from Johnsonite include wheeled-traffic transitional moldings, Sport-Ability sports and multifunctional flooring, and ComforTech Anthem cushioned flooring. 800/899-8916. Johnsonite, Chagrin Falls, Ohio. **CIRCLE 235**

▲ Metal grid system

A new family of ceiling systems and suspension products is on its way from Celotex. The system will be manufactured in imperial as well as metric measurements, with a variety of configuration options. The grid system also comes with three T connection options: stab, hook, and quick release, as well as a tight connection tolerance. 800/CELOTEX. Celotex, Tampa. **CIRCLE 236**

For more information, circle item numbers on Reader Service Card or go to www.architecturalrecord.com Advertiser & Product Info

COOL AND CLEAR.

V-KOOL® Finally a clear window coating that blocks up to 60% of total heat.

Until recently, there were just two ways to protect interiors from solar heat gain. You could either block the heat with a reflective window coating, or you could try a less effective tint.

Now, there's a better alternative—V-KOOL (formerly known as Solis). V-KOOL uses a patented, high tech process to embed tiny particles of exotic metals in optically clear and durable polyester film. When applied to your windows, this high tech product screens out an amazing 90% of the infrared rays responsible for heat build-up while letting in over 70% of visible light. That is almost as much heat reduction as heavy silver window films and significantly more than conventional tints. And unlike those products, V-KOOL is virtually transparent, so you are never forced to sacrifice appearance, light or clarity. By comparison heavy silver window films allow just 15 to 20% of the light to enter.

V-KOOL also blocks 99% of harmful ultraviolet rays that can damage skin and eyes and cause materials to fade. It is ideal for new construction, or it can be retrofitted right over existing glass for dramatically improved heat protection.

V-KOOL has been chosen one of the top 100 inventions of the past millennium by Popular Science *magazine.*

V-KOOL. So cool, so clear. For more information about how it can reduce solar heat while giving you a clear glass appearance, call 1-800-SUN-2-HOT.

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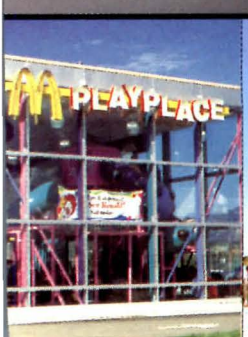
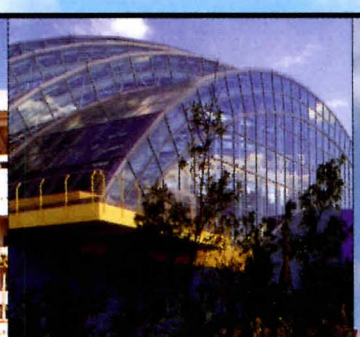
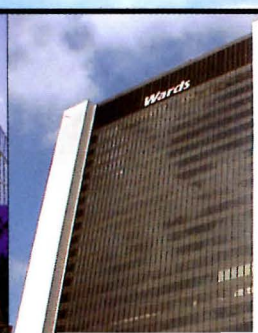


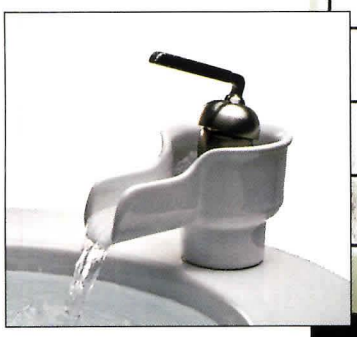




Product Briefs

▼ New bathroom toys

Kohler presents new products for 2000, including new faucets and console tables. Inspired by an antique apothecary mortar and pestle, the Bol Faucet works as water fills the upper ceramic bowl and slowly *pours out* the spout into the basin. The faucet is made of durable vitreous china and complements a wide range of Kohler fixtures. The cast-iron Cattails console table is another item in the collection. A pattern of cattails and waves adorns the apron of the table and creates the look of a vintage iron gate. Also featured in the collection are sinks, shower screens, baths, and toilets. 800/4-KOHLER. Kohler Company, Kohler, Wis. **CIRCLE 237**



▼ Wings, with or without arms

The new line of chairs from Segis uses molded plywood for the seat and back panels. The chair frame is made of chromed or powder-coated steel tube. Three main styles of chairs are available, each with different colors and options. The wing chair is stackable and available with beech wood or cherry wood veneer as well as a matte lacquer finish in dark blue, tangerine, apple green, white, and black. The chair is available with or without armrests. 954/960-1100. Segis, Pompano Beach, Fla. **CIRCLE 238**

► Foam fillings

International Homes of Cedar has developed an energy-guard wall system, Thermo-Lam, which helps maintain a constant indoor temperature, no matter what the weather is like outside. The system uses patented interlocking, laminated timbers with an added foam core. The thickness of a solid wall of Thermo-Lam also reduces outside noise. 800/767-7674. International Homes of Cedar, Woodinville, Wash. **CIRCLE 239**

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The National Building Museum, a private, nonprofit educational institution, was created by Congress in 1980 to celebrate American achievements in architecture, construction, engineering, urban planning, and design. We invite yout to join us! Members receive discounts on all education programs, subscriptions to the Museum's quarterly journal and the calendar of events, invitations to exhibition openings, and discounts on Museum Shop purchases. For more information, please call the Membership Office at 202 272-2448, or visit us online at **www.nbm.org**

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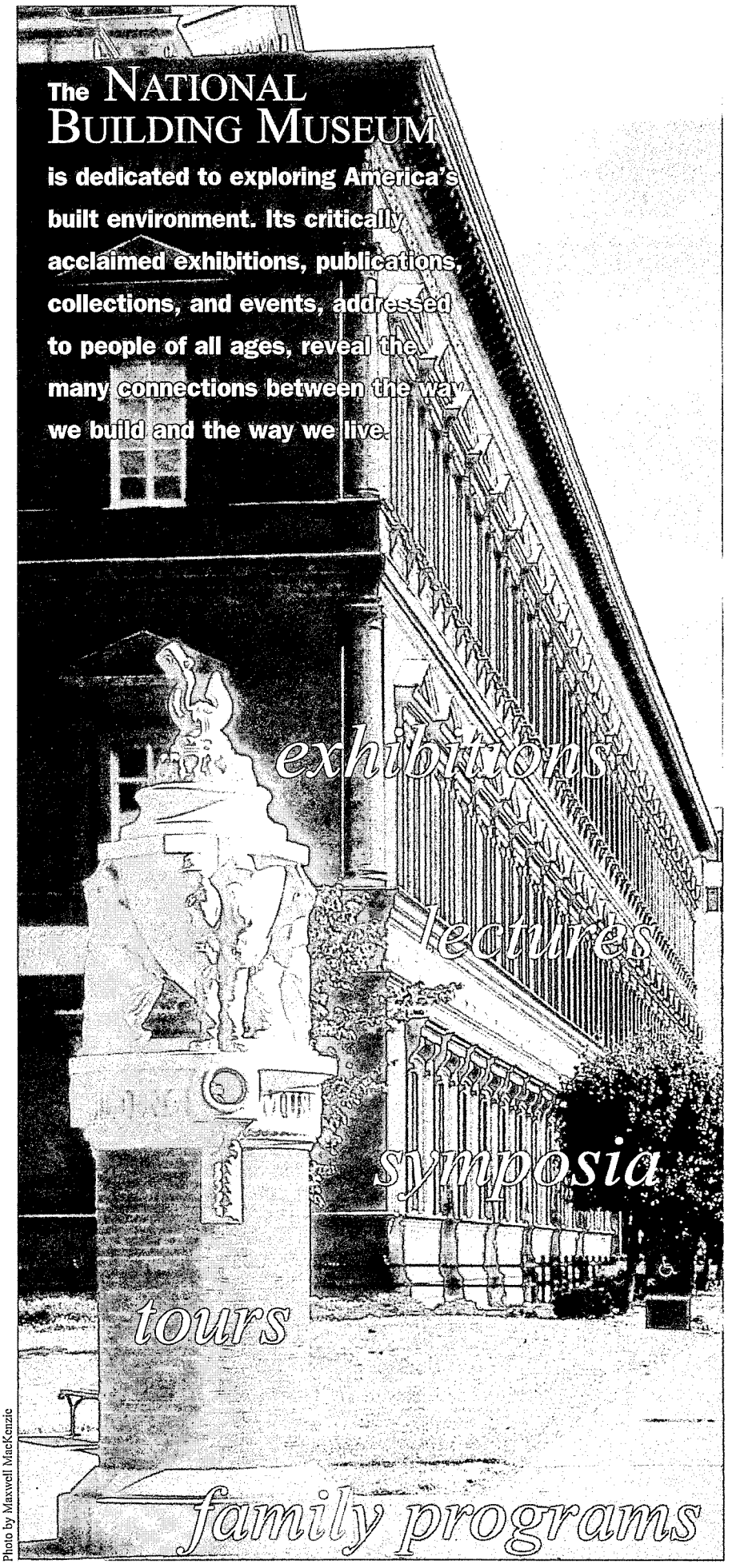


Photo by Maxwell MacKenzie

Product Literature

Color selection aid

The KohlerWindows kit is a hands-on interactive tool designed to help consumers incorporate color into the kitchen and bath. The kit consists of a series of 16 templates or window frames that create a natural color environment with photographs of architecture, wallpapers, textures, fabrics, and other design elements. 920/457-4441, ext. 74507. Kohler Co., Kohler, Wis. **CIRCLE 240**

Specialty wall brochure

Marlite has published a 12-page brochure for the commercial building industry detailing the company's specialty wall and related interior building products. 330/343-6621. Marlite, Dover, Ohio. **CIRCLE 241**

Lighting handbook

Lightolier has issued "Red Book", the latest version of the Lightolier *Comprehensive Lighting Handbook*, a presentation of the company's family of interior lighting fixtures. 800/215-1068. Lightolier, Fall River, Mass. **CIRCLE 242**

Flooring options

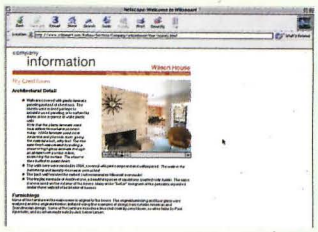
Two new brochures for Bonar Floors' flagship product lines are available. *Flooring Collection* shows the entire collection of Flotex flocked flooring patterns and colors, in both rolled goods and tile. *Entrance Flooring Systems* is a complete description of the Coral and Nuway clean-off systems. 800/852-8292. Bonar Floors, Newnan, Ga. **CIRCLE 243**

Ballast slide chart

Lutron has revised and expanded its ballast slide chart, a tool that allows users to select the correct electronic fluorescent dimming ballast and compatible dimming controls. 800/523-9466. Lutron Electronics Co. Coopersburg, Pa. **CIRCLE 244**

NEW SITES FOR CYBERSURFING

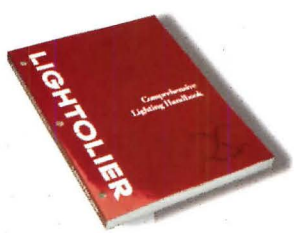
Take a virtual tour of the all-laminate Wilson House **www.wilsonart.com**

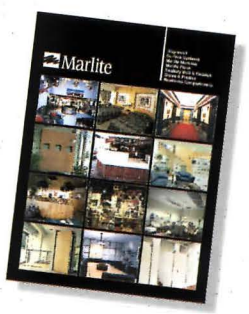


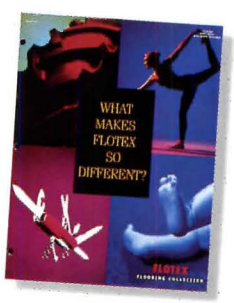
Paint spec tool from Devoe Paint and Fuller O'Brien **www.paintspec.com**

Online auction service for lighting industry **www.LightingBuyer.com**

Information source for residential window and door systems made with KeepSafe glass **www.keepsafe.com**







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Product Literature

Roofing systems brochure

The *Firestone Building Products 2000* Sweet's brochure is a resource for building owners, roofing contractors, architects, and other specifiers of commercial roofing systems. 800/428-4442. Firestone Building Products Company, Carmel, Ind. **CIRCLE 245**

Skylight showcase

A new brochure from Velux-America helps designers and contractors upsell to homeowners by showcasing the benefits of adding skylights and roof windows to their projects. The brochure contains "before and after" photography, as well as information and statistics about the quality, energy-efficiency, and performance of Velux products. 800/283-2831. Velux-America, Greenwood, S.C. **CIRCLE 246**

Third boxed collection

Invision introduces its third boxed collection of patterns and textures designed with coordinating colorways. Each portfolio has a large sample of carpet, smaller samples in nine colorways, and a photo to help define scale. 800/241-2586. Invision Carpet Systems, Dalton, Ga. **CIRCLE 247**

Ceiling system overview

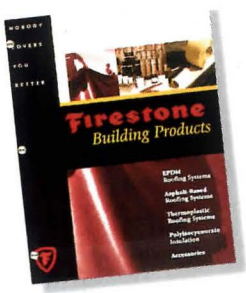
A new brochure provides a summary of Chicago Metallic's standard ceiling grid systems, including specialty products such as perimeter curved/straight trim, fiberglass and vinyl-gyp panels, fiberglass reinforced panels, and the new drywall grid system. In addition, the brochure reviews the company's complete line of metal ceilings, which includes linear, open cell, decorator metal pan, and security ceiling systems. 800/323-7164. Chicago Metallic, Chicago. **CIRCLE 248**

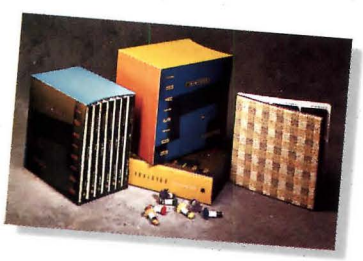
Southern Pine information

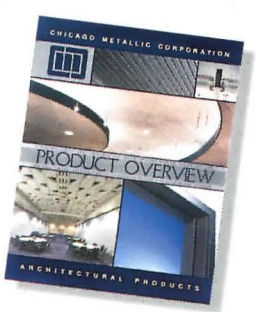
The new Southern Forest Products Association catalog contains over 100 publications organized in sections such as reference manuals, technical literature, pressure-treated Southern Pine literature, case studies, and project plans. Also included is a section on international literature available in seven languages. 504/443-4464. Southern Pine Council, Kenner, La. **CIRCLE 249**

Fiber-optic lighting reference

Fiber-Optic Lighting: A Guide for Specifiers, 2nd ed., is written to serve the needs of professional lighting designers, engineers, facility managers, architects, and interior designers. 770/925-9388. The Fairmont Press, Lilburn, Ga. **CIRCLE 250**







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Dates & Events

Calendar

Chicago Architects
Chicago
June 3–March 2001
Selected architectural drawings on display from the permanent collection linked with the Art Institute's oral histories of 50 Chicago designers, including Mies van der Rohe, Harry Weese, and Myron Goldsmith. The Art Institute of Chicago. 312/443-3600.

Exhibition and Lecture Series: Young Architects Forum 2000
New York City
Through July 12
A lecture series and exhibition by winners of the competition, a public forum for discussion of their work and ideas. The Urban Center. 212/753-1722.

"Second Nature": Young Architects Forum
New York City
Through July 12
The Architectural League reveals six winners in its 18th annual competition for young architects and designers. This is an exhibition of work and a lecture by the winners. The Urban Center. 212/753-1722.

Oswald Häerdtl: Architect and Designer 1899-1959
Vienna
Through July 14
This exhibit of Häerdtl's Austrian career, spans from early Modernism through World War II and into the 1950s. Architecture Centre Vienna (Architektur Zentrum Wien). 43-1/522-3115.

Experiments: Recent Accessions in Architecture and Design (A/G/D)
San Francisco
July 15–October 17
This exhibition presents approximately 150 pieces of furniture, design objects, and graphic design whose form, material, or content extends the experiments of contemporary art to the objects and images of daily life. San Francisco Museum of Art. 415/357-4177.

Bilbao: The Transformation of a City
Chicago
Through July 16
Models, plans, photographs, and drawings illuminate a dozen architectural projects—Frank Gehry's Guggenheim, Santiago Calatrava's observation tower/airport—that have energized the ancient city in northern Spain. The Art Institute of Chicago. 312/443-3600.

E-Construction & Contracting
Chicago
August 1–2
The conference will highlight tools and techniques needed to succeed in the new e-Construction marketplace. Leading construction, hardware, software, design, and supply firms will be presenting on practice studies and initiatives. 312/980-3410. www.iqpc.com/e-construct

Planning Successful Schools
Madison, Wis.
August 2–4
This seminar will address educa-

tional restructuring, community involvement in schools, school security, design-effective facilities, and project-delivery methods. University of Wisconsin-Madison. 800/462-0876.

National Design Triennial: Design Culture Now
New York City
Through August 6
The museum looks at architecture and the built environment, product design, graphic design, and new media across the country to discover the impulses, issues, and ideas that are driving design practice in America. Cooper-Hewitt National Design Museum. 212/849-8400.

The Corner Store
Washington, D.C.
Through August 6
Examine the familiar yet overlooked building form, drawing on examples from across the country, with an emphasis on Galveston, Tex. National Building Museum. 202/272-2448.

Architecture in the Year Zero
Jyväskylä, Finland
August 11–13
Emphasis will be on Alvar Aalto's works in Seinäjoki, Noormarkku, Paimio, and Turku. Alvar Aalto Museum. +358/14-624811.

James Welling: Photographs 1974–1999
Columbus, Ohio
Through August 13
Prominent in this expo of 129 images by Welling are prints from the artist's small-scale *L.A. Architecture* series and detail photographs of massive buildings by H. H. Richardson. Wexner Center for the Arts, The Ohio State University. 614/292-0330.

Gwathmey Siegel & Associates Exhibition
New York City
Through August 14
A display of 14 institutional projects, with a 50-foot wall that features a survey of the firm's entire practice. The Graduate Center, The City University of New York. 212/947-1240 x117.

Frank Lloyd Wright: Windows of the Darwin D. Martin House
Washington, D.C.
Through August 20
An exhibition of some 70 art-glass windows, doors, and skylights (both originals and reproductions) created by Wright. National Building Museum. 202/272-2448.

Skyscrapers: The New Millennium
Chicago
August 19–January 15
Architectural models and drawings show some 50 high-rises currently under construction or recently completed. The Art Institute of Chicago. 312/443-3600.

Kahn's Modern Monuments
New York City
Through August 22
Drawings and models explore the mid-century architect Louis I. Kahn's favored themes: abstracted ancient monumentalism and massive layered enclosure. The Museum of Modern Art. 212/708-9400.

Modern Living 1
New York City
Through August 22
Design objects, architectural drawings, and models explore the clarity, efficiency, and hygiene advocated by designers Gerrit Reitveld, Eileen Gray, and others who inspired the course for Modernism. The Museum of Modern Art. 212/708-9400.

Before and after the End of Time: Architecture and the Year 1000
Cambridge, Mass.
August 26-December 31
This exhibition looks at the beginning of Romanesque architecture in Western Europe shortly after the year 1000 A.D. Fogg Art Museum, Harvard University. 617/495-9400

Dates & Events

Smart Growth and Choices for Change
New York City
Through September 6
A new exhibition presenting 12 case studies organized around the themes of "reinvigorating urban cities" and "repairing urban fabric." National Building Museum. 202/272-2448.

Design Diplomacy: Public Policy and the Practice of Architecture
Copenhagen
September 6–9
A panel of architects offers an indepth look at how architects can shape sound public policy as community leaders. Cosponsored by the McGraw-Hill Construction Information Group; a division of the McGraw-Hill Companies, New York. 888/273-8017.

Restoration & Renovation
San Antonio
September 7–9
Trade show and conference dedicated to architectural rehabilitation, cultural landscape preservation, and historically inspired construction. Architects earn Quality Level 2 Credits including Health, Safety, & Welfare. 800/982-6247

Promosedia—24th International Chair Exhibition
Udine, Italy
September 9–12
This is the only exhibition in the world dedicated wholly to seating. It is a meeting place for designers and the specialized trade as well as a source of cultural, industrial, and artistic renewal focused on this basic item of furnishing. +39/0432-745611

Aging and Health Symposium
Cambridge, Massachusetts
September 14–15
Among the issues to be discussed is the role of buildings in healthy aging: barrier-free housing, elderly housing opportunities and challenges, design issues of safety, comfort and air quality. Harvard School of Public Health. 617/432-3483

Public Jurying and Reception to End International Architectural Design Contest
Rancho Palos Verdes, Calif.
Through September 17
This event was designed to garner ideas for the renovation and expansion of the Art Center facilities. Seven jurors—Todd Bennitt, Philippa Blair, Phillip Max Cheshire, Mark Mack, Scott Ward, Michael Webb, and Eric Lloyd Wright—will vote and comment on their final selections. The Art Center. 310/541-2479.

The White House in Miniature
Washington, D.C.
Through September 17
This exhibit explores how the President's house has been redecorated, renovated, and rebuilt in response to 200 years of changing tastes in interior design. National Building Museum. 202/272-2448.

At the End of the Century: 100 Years of Architecture
Los Angeles
Through September 24
In 21 parts, this massive international exhibition organized by MOCA surveys countless architectural photographs, scale models, drawings, furnishings, clips, and artifacts. The Museum of Contemporary Art at the Geffen Contemporary. 213/621-2766.

Modern Living 2
New York City
Through September 26
After WWII, figures such as Eames, Nelson, Saarinen, and Aalto adapted industrial technology for the manufacture of rational, functional, and affordable domestic objects on display. The Museum of Modern Art. 212/708-9400.

Lynn/Rashid: Architectural Laboratories with Columbia University and UCLA
New York City
Through October 29
With the help of students, Lynn and Rashid will transform the U.S. Pavilion into a research lab designed to investigate, produce, and present a broad scope of new architectural schemes. U.S. Pavilion. 212/423-3840.

Lyons "City of Fiction" 7th International Exhibition of Architecture
Venice
Through October 29
The installation explores the architectural firm's current thinking about architectural practice—in particular, an increasing tendency for architecture to embody an image, as opposed to being purely abstract or functional in design. Australian Pavilion. +61/3-9754-4868.

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Competitions

Ar+d Award

Deadline for receipt of entries: September 12

This award is for completed work by architects under the age of 45 and aims to recognize new talent worldwide. Submissions are encouraged in respect of all building types, interiors, manufactured products, urban design, landscape, bridges, and temporary structures. There will be a first prize of £5000. Go to www.arplus.com for more information.

New School of Business Design Competition

First-stage entry deadline: August 31

The University of South Dakota is sponsoring a two-stage design competition for a new School of Business. Open to registered architects with experience in design and project management at the scale required. The first stage of competition (portfolios/credentials) will be reviewed by a professional jury and selected entrants will be invited to enter the second-stage. The selected entrants will submit their requisite proposals for final review by a state building committee and will receive a cash award for their work and travel expenses. The winning entrant will be awarded the commission. Info: 605/677-6101. or www.usd.edu/finadmin/competition/index.htm

Before + After: The Intentions and Processes of Transformation

Deadline for receipt of entries: October 16

A juried exhibition will present a critical inquiry into architectural interventions and the trends effecting change in the built environment. Two images and supporting process documentation will compare the state of an original condition and the effect of a practical and transformative intervention. $15 entry fee. For submission requirements: 303/443-1945.

Please submit information for the calendar to ingrid_whitehead@mcgraw-hill.com.

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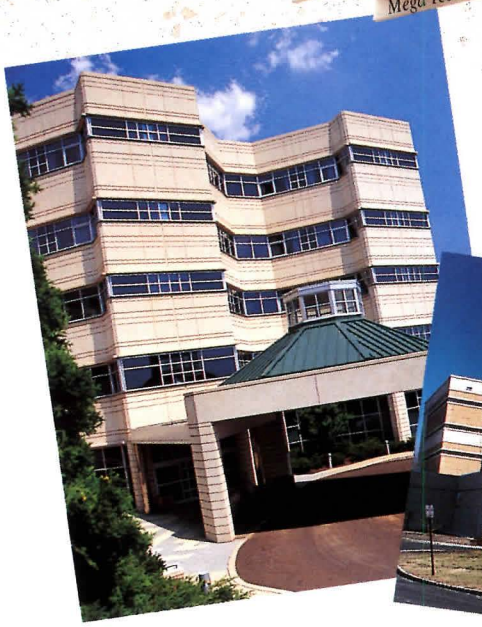

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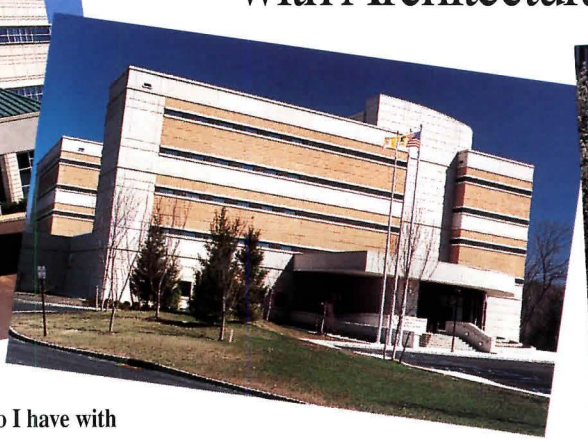

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ANSWERS

Questions appear on page 182. To receive CES credits, fill in the education reporting form below or on our Web site (www.architecturalrecord.com).

1. Dual-layered glass facades are a pairing of glass skins with an air space in between that ranges from a few inches to several feet in width. The glass skins may cover the entire structure or a portion of it, or they may span several structures. The purpose of dual glass layers is to create an air space that works as insulation against temperature extremes as well as noise, while allowing maximum daylight.

2. Undivided facades allow air to flow freely within the space between the inner and outer skins. They are simple and inexpensive to build. This type presents several problems, but most importantly, noise, smoke, fire, and odors can move, unimpeded, from one space into another. Also, warm air accumulates at the top of the air space, while cool air pools at the bottom. Unless there are openings at the top of the facade to vent that hot air, the upper floors of the building will be hot on sunny days.

3. Natural ventilation is best in shaft-type facades. These work by allowing fresh air to enter the building through openings in the outer skin between the shafts. A double-window effect, similar to solar chimneys, allows cooler air to enter at the lower portion of the shaft while warmer exhaust air leaves through the upper part of the window. In other words, the temperature differences induce an upward flow of air in the shaft, improving air movement within the building.

4. Buffer facades use two layers of single glazing that are sealed; fresh air enters the building though separate box windows. Extract-air facades have an insulating glass facade on the exterior and a second single-glazed skin inside. Air is supplied by an HVAC system and natural ventilation is not possible. Warm air exhausted from the building as well as solar gain warm the air in the gap, or corridor, reducing the amount of heat lost through the facade during cold weather and improving comfort. Twin-face facades consist of a curtain wall system with a second skin of single glazing outside made of safety glass or insulating glass. Openings in the skins allow for natural ventilation. The outer skin acts as a windbreak, and permits sunshades in the interstices. It also allows fresh air to enter without blowing papers and other lose materials around the interior.

5. Dual-layered glass facades offer architects ways to enhance comfort and reduce energy demand. They have a higher construction cost, but they provide a much lower operating cost during the life of the building. These facades are ideal for maximizing daylight. Shading devices or daylight-enhancing devices can be mounted in the gap where they are protected from the weather. Twin-face facades offer wind control with natural ventilation and sound control, which satisfies occupants need for privacy, fresh air, and daylight.

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CALATRAVA INTERVIEW *continued from page 89*

formal terms? Many of those buildings were done for very low cost. I had to rely on several factors. One is a material factor and the other could be [called] an idea factor. The material factor was that I had to use very bold and simple materials, for example, steel; for example, concrete. And [sometimes] a little bit glass, sometimes a little bit stone.

So always what I did was exposed. . . . I could never imagine

"SO YOU INVENT THINGS, LIKE RHYTHM: YOU CREATE A BRIDGE, THEN YOU REPEAT IT."

making a pillar in steel and cladding it in something else, in stone, because it was unaffordable. Material resources and economical resources. You have to work very hard with and insist very much on the formal quality of the objects that you are producing. And also the constructive efficiency.

So you invent things, like rhythm: I repeated the same pillar, as we have done in Lyon many times. You create a bridge, you know, and then you repeat it. And so I am [bringing] a certain daringness [to the designs] . . . trying to do spans that are unusual, because the other resource that is also nonmaterial is the human resource.

I want very much to stress that we have been confronted with buildings that had to be built in very low cost profiles.

AR: *And yet you now have projects—high-profile projects—throughout the world, including a high-visibility project in the United States. Can you tell us about the new museum in Milwaukee?*

SC: [After describing his approach to siting and to the overall organization, Calatrava then speaks about technology.]

I was also extremely surprised to see how much support I got from the technical point of view. I have today the conviction that the real country of high-tech is the United States because high-tech is part of everyday life. I am thinking of NASA or the beautiful airplanes or things like that; high-tech is very much understood. We decided to do a brise-soleil in carbon fiber, according to proposal from the local engineer, which is, I think, one of the most revolutionary achievements in the building from the material point of view.

Not only are we building a very daring construction, but we are also overcoming technical problems. You know that I am accustomed to solve [problems] with steel or aluminum—not using such a beautiful material as carbon fiber, a modern material.

I tried very much to influence the building with a certain sensibility for the culture of the lake, for the boats, the sails, the sea boats, the always-changing landscape, because the lake has a very changing physiognomy. In hours it can metamorphose. You go from a blue sky into very, very dramatic gray-silver light. You really feel you are in the presence almost of an interior ocean. So I would very much like the building to respond to those things. ■

For several hours, Calatrava opened his thoughts about technology, cosmology, his favorite artists, and the architects who have influenced his work. In addition, he talked explicitly about work under way, including much more extensive commentary on the Milwaukee Art Museum. For the complete text of this extraordinary interview, please visit our Web site at www.architecturalrecord.com.

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*Source: Public Agenda (1999)

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Bold: *indicates page number.*
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PAGE NUMBER	READER SERVICE NUMBER	
44	24	A/D Fire Protection Systems Inc
250		AIA Call for Entries
246		AIA Conference
261		AIA Online
257		ALLBusiness.com
26	13	Alusuisse Composites Inc
200	68	Andersen Commercial Group
215	70	Ann Sacks Tile & Stone
46		Architecturalrecord.com
2cov-1	1	Armstrong (Optima Vector™)
16	8	Armstrong (Arch Specialties Grp)
29		Autodesk (iDesign)
42		Autodesk (piracy)
98	47	Autodessys
35	17	Avonite
102	48	Belden Brick Company, The
33	15	Bentley Systems Inc
34	16	Bergerson
58		Bidcom Inc
251	89	BOCA/Bldg Offcls & Code Admins Intl
191	64	Bricsnet US
2		Buzzsaw.com
181	59	C/S Group (Acrovyn)
183	60	C/S Group (Expansion Joints)
236	78	Canterbury International
14-15	7	Caradco
31	14	Ceco Door Products
223	72	Celotex (Presidential TL)
12-13	6	Celotex (Tuff-R® "C")
80	40	CENTRIA Architectural Systems
146	53	CENTRIA International
78		Cephren Inc
56	31	CNA/Victor O Schinnerer & Co Inc
168	54	Construction.com
22-23	11	Copper Development Association
68	37	Copper Sales Inc
100-101		Dell
251	90	Doug Mockett & Company Inc
52	28	Dryvit Systems Inc
18-19	9	DuPont Antron
21	10	DuPont Antron (Atlas Carpet Mills)
90-91	45	DuPont Zodiaq
234	77	EFCO Corporation
69	38	Follansbee Steel
167		Forms + Surfaces (Tecno)
169		Forms + Surfaces (Cabforms®)
217	71	Georgia-Pacific
258	94	Glass Studios Ltd
50-51	27	Glen Raven Mills Inc
184	61	Graham Architectural Products
188	63	Graphisoft
54	29	Hansgrohe Inc
255E	93	High Concrete Structures Inc
103	86	Ingersoll-Rand (LCN Division)
45	25	IWP
187	62	Kawneer Company Inc
43	97	Kim Lighting
4-5	2	Kinko's
232-233	76	KitchenAid
4cov	100	Kroin Incorporated
38	20	LeFevre Studio
248	87	LightingUniverse.com
259		Making Academics Count
6-7	3	Marlite
24-25	12	Marvin Windows & Doors
255W		McGraw-Hill Companies, The
240B	82	Mee Industries Inc
104	50	Meridian Project Systems Inc
3cov	49	Metal Construction Association
84	42	Mitsubishi Chemical America Inc
40	22	Mortar Net
258	95	Musson Rubber Co
197	66	Nathan Allan Glass Studios Inc
247		National Building Museum
230	75	National Gypsum Company
47	96	NECA/IBEW NLMCC
88	44	Nemetschek North America
240A	81	Northwest Energy Efficiency Alliance
86	43	Pacific Lumber Company, The
37	19	Pella Windows & Doors
244	84	Pemko
179	58	Pilkington Libbey-Owens-Ford
237	79	Pittsburgh Corning
10-11	5	PPG
249	88	Research Engineers
61	33	Revit Technology Corporation
229	74	ROHL
36	18	ROMTEC Inc
203	69	Sherwin-Williams
39	21	Sloan Valve Company
145	52	SMI/Spider Manufacturing Inc
252	91	Speakman
55	30	SPI Lighting Inc
243	83	Sto Corp
262-263	98	Sweet's, Div of The McGraw-Hill Cos
254	92	T Rowe Price
175	56	Technical Glass Products
65	35	Timely
41	23	Traco Skytech Systems
198-199	67	Trex
96	46	USG Corporation
245	85	V-KOOL
227	73	Vetter
192-196	65	Vinyl Institute, The
60	32	Viracon
62	34	Vistawall Architectural Products
170	55	Visteon
66-67	36	VT Industries
48-49	26	Vulcraft, A Division of Nucor Corp
177	57	W&W Glass Systems Inc
144	51	Wausau Tile
239	80	Wausau Window and Wall Systems
8-9	4	Weather Shield Windows & Doors
144A-B	102	Wilsonart International
253		Wingate Inn
82	41	Wiremold

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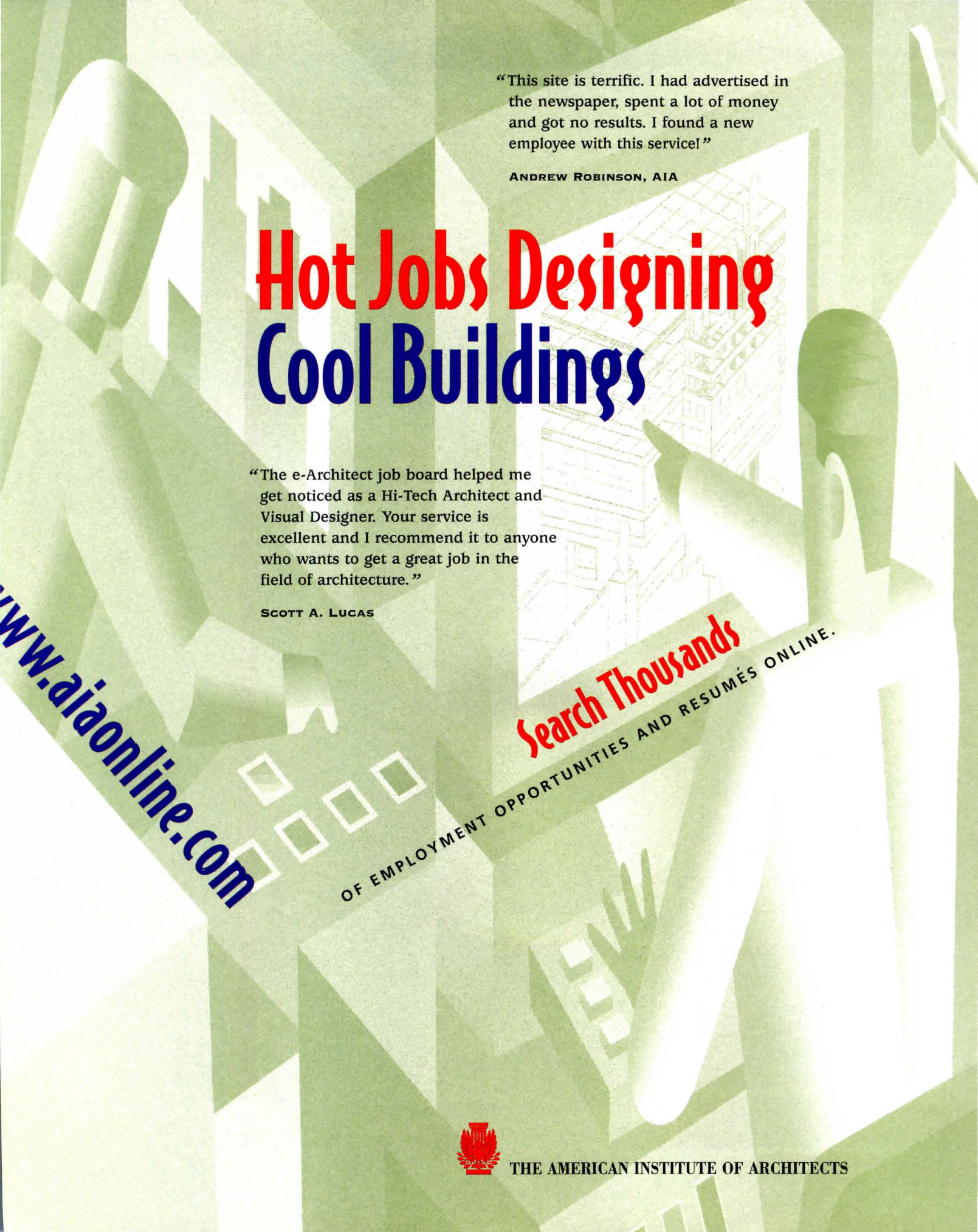
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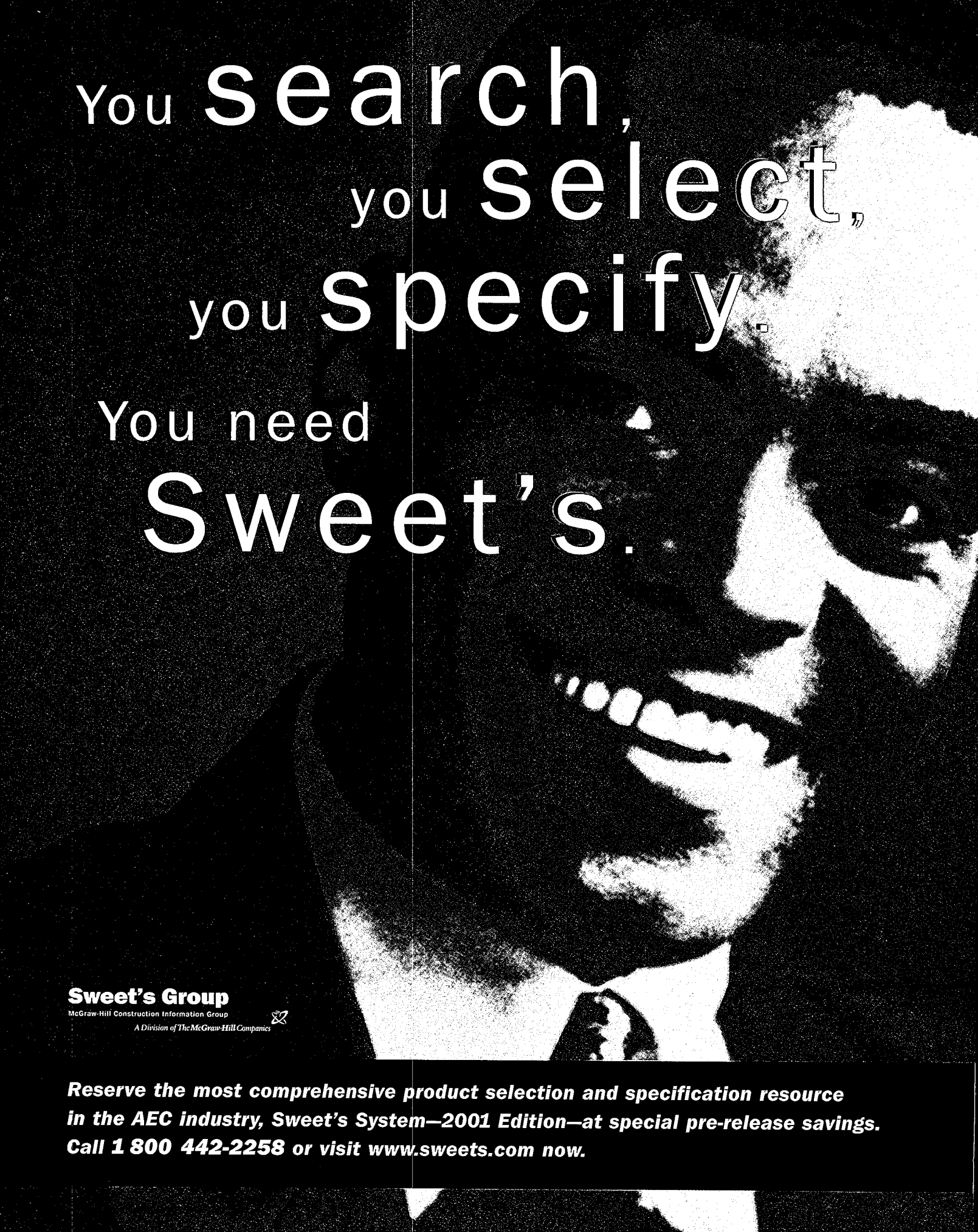
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Reserve Sweet's now and you'll get the 2001 Edition at a special pre-release discount. Plus you'll also begin receiving all the current 2000 editions of *Sweet's CD* and *Sweet's Product News*. **Call 1 800 442-2258** or visit **www.sweets.com** now to secure your *Sweet's System—2001 Edition*. *(Please refer to 5JLA1 when you call.)*

When you need product information, the *Sweet's System* is all you need.

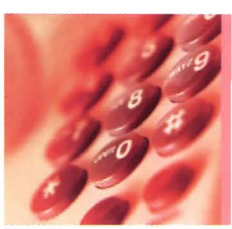
Sweet's Catalog Files

Sweet's CD

sweets.com

Sweet's Directory

Sweet's Product News


Sweet's BuyLine® Service

*Independent Market Survey: Hase/Schannen 1999.

CIRCLE 98 ON INQUIRY CARD

Sweet's
Construction's Product Marketplace

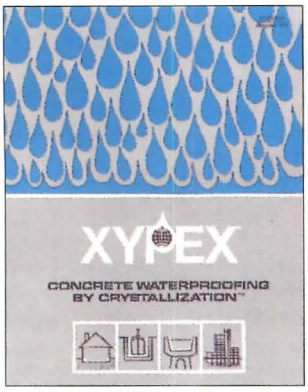
Applications

The new flush exit device is designed for use on TOTAL DOORS in single, pairs & double egress pairs. Ideal for corridor & elevator lobby applications in all commercial facilities. The exit device allows continuous, uninterrupted sight-lines in corridors when doors are pocketed in the open position. Its quiet operation is ideal anywhere noisy hardware is a problem. TOTAL DOORS can be retrofitted into existing door frames, saving time & expense.

Openings

CIRCLE 150 ON INQUIRY CARD

Concrete Waterproofing by Crystallization

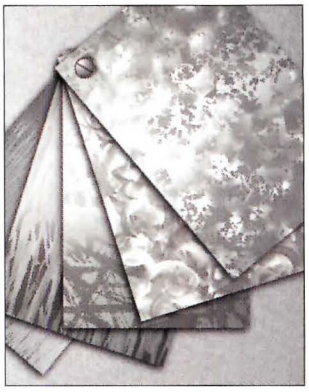


Applied as a slurry coating Xypex is a chemical treatment that waterproofs by penetrating the concrete with a crystalline formation that "plugs" the pores of the structure preventing water seepage. Xypex is ideal for use on the "inside" of wet underground structures.

Xypex Chemical Co.

CIRCLE 151 ON INQUIRY CARD

Alpha Collection 2000 Aluminum-Stainless Steel

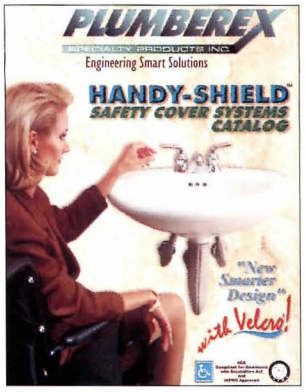


New and innovative design patterns and textures. Ideal for most vertical surfaces. Border to border standard sizes. Thickness from 0.025" to 0.064". Quantity discounts and free design consulting. Ask us about our custom capability. SD+T Marketing INC., Phone: 305-856-3825 TollFree: 877-626-2595 Fax: 305-856-1287 Email: sales@sdtmarketing.com Web: www.sdtmarketing.com

SD+T Marketing Inc.

CIRCLE 152 ON INQUIRY CARD

ADA Insulation Safety Covers



Plumberex Specialty Products, Inc. is the only company that manufactures a complete line of ADA safety covers for commercial & residential applications, meeting all building & fire codes with a -0- smoke rating. The Handy-Shield™ Safety Cover is the one and only ADA safety cover on the market with a "Dual" fastening system to help deter theft! For more information call 800-475-8629, Website: www.plumberex.com or email: plumberex@earthlink.net

Plumberex Products, Inc.

CIRCLE 153 ON INQUIRY CARD

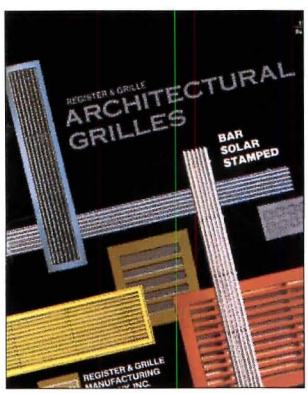
Three-Sided Fireplace for Unlimited Installations

Heat-N-Glo introduces model PIER-TRC, a three-sided direct vent fireplace that can be terminated vertically or horizontally to accommodate nearly any application. The PIER-TRC is perfect as a room divider, bar, end of counter or a wide variety of creative installation possibilities. As with all Heat-N-Glo fireplaces, the PIER-TRC can be operated by remote control for the ultimate in convenience. Call 888-427-3973.

Heat-N-Glo

CIRCLE 154 ON INQUIRY CARD

Decorative Grilles



Unusual visual effects emerge when our grilles are designed for area effects. Versatility is the theme. R&G offers architects and interior designers many ways to express the changing forms of metal with the integrity of R&G's architectural grilles. Custom or standard finishes are available plus any grille can be made in matching color to blend with your decor. 202 Norman Ave., Bklyn, NY 11222. 800-521-4895, Fax: 718-349-2611.

Register & Grille Mfg Co.

CIRCLE 155 ON INQUIRY CARD

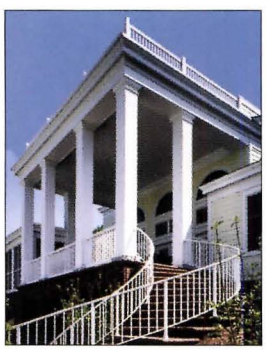
Ornamental Picket Fence with a Purpose

We have given special attention to each & every component of our fence. Every item is designed for strength, durability and low maintenance. No other company builds a complete fence - rail, rivets, brackets, pickets and posts, that are stronger, more durable, have more security or lower maintenance costs than our fences. Monumental Iron Works, 6500 Eastern Ave., Baltimore, MD 21224. Tel: 410-633-6500, Fax: 800-239-2963.

Monumental Iron Works

CIRCLE 156 ON INQUIRY CARD

Chadsworth's 1.800.Columns® www.columns.com

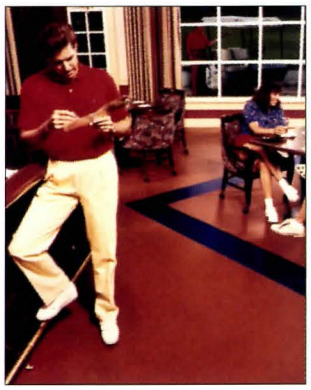


Voted No. 1 Preferred Brand in U.S. Columns, pillars, pilasters and posts available in wood, PolyStone™ and fiberglass. Interior, exterior. Variety of sizes and styles. Competitive prices. Job-site delivery. Worldwide shipping. Our award-winning Idea Book features an exciting collection of column projects. Includes Columns Product Portfolio, $20 soft cover, $30 hard cover. Columns Product Portfolio $5 (credited to first order). Free flier, 800.486.2118 • Fax 910.763.3191

Chadsworth's 1.800.Columns®

CIRCLE 157 ON INQUIRY CARD

Save $$$ on New Flooring



Visit the new Tuflex Rubber Flooring website at www.tuflex.com to see the complete color line including Spartus, Titan (an economically-priced line), feature strips for borders and accents, customized logos, reducer strips for wheel chair accessibility and the new 4'x6' ColorMat. Architectural specifications, installation and maintenance information is included as well as a company profile and Tuflex flooring's place in history as an early recycled product. Call 1-800-543-0390.

Tuflex Rubber Flooring

CIRCLE 158 ON INQUIRY CARD

CLEAR-Pb® Lead-Plastic Radiation Shield

Discover the advantage of incorporating Nuclear Associates' CLEAR-Pb® Lead-Plastic Radiation Shielding into your next project! Lead-impregnated plastic won't shatter; space saving; cost-effective; more versatile than old-fashioned lead-glass; quick, mess-free, hassle-free installation; ideal for medical and non-medical facilities; available in more than 100 standard sizes, seven lead equivalencies and now 16 colors. Floor-plan ideas available.

Nuclear Associates

CIRCLE 159 ON INQUIRY CARD

Panelfold's Walls So Tall! www.panelfold.com

Moduflex® Series 800 steel operable walls as high as 44' (4925mm) are made with rugged one-piece 14 gauge (1.99mm) steel frames permanently and invisibly welded to one-piece seamless steel faces surfaced with a wide variety of materials including COM. Panelfold Electronic Library Version 3 on CD ROM available upon request by FAX: 305-688-0185 or E-mail: sales@panelfold.com. Please visit our website: www.panelfold.com

Panelfold

CIRCLE 160 ON INQUIRY CARD

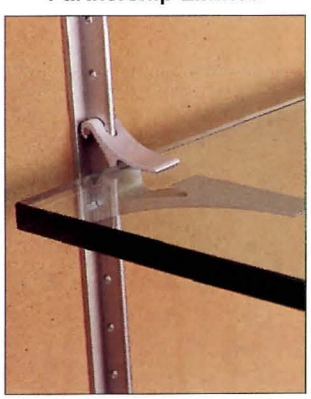
NANZ®

The No. 2006 is a Bauhaus handle based on a Walter Gropius design. Nanz manufactures this and a wide range of other levers, knobs, locks, hinges and cabinetry hardware. Fax a request for our free Product Selection Guide or our $20 catalogue featuring this and over seventy other handles. phone 212-367-7000, fax 212-367-7375. www.nanz.com

Nanz Custom Hardware Inc.

CIRCLE 161 ON INQUIRY CARD

Parallel Design Partnership Limited



"ellen's brackets", an anodized-aluminum shelving system designed by M Ali Tayar, provides an elegant alternative to existing bracket-and-track systems. Cantilevered brackets come in two sizes, for shelves 3/4 or 3/8-in. thick and 10-in. deep. Wall-mounted tracks permit 1 1/2-in. adjustment of wood, glass or plexiglass shelves. For more info phone Parallel Design Tel: 212-989-4959 Fax: 212-989-4977.

Parallel Design

CIRCLE 162 ON INQUIRY CARD

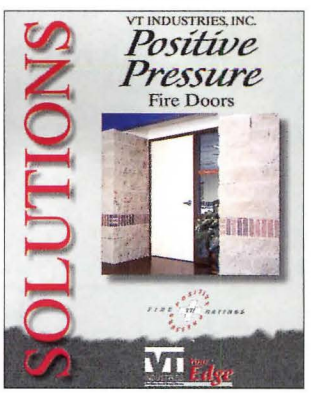
Ventilate All Baths With One Quiet Fan

ALDES' MPV fan is designed for multiple and extensive duct runs. Remote mounting of fan assures almost silent operation. Up to 6 exhaust points at 50 cfm each. Equipped with a continuous duty motor, the MPV may be used also to provide IAQ Ventilation. Super Quiet, Powerful & Versatile. 3 year warranty. Cost Effective. American ALDES Ventilation Corp. 4537 Northgate Court, Sarasota, FL 34234, Call 1-800-255-7749, http//www.americanaldes.com

American ALDES

CIRCLE 163 ON INQUIRY CARD

Positive Pressure Fire Doors

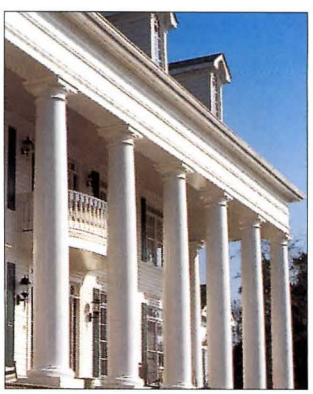


Meet UBC 7-2-97 requirements with positive pressure fire doors from VT Industries, Inc. Our commitment to innovation manufacturing technology means you receive doors that deliver top performance plus added aesthetic appeal. VTI is Your Edge for outstanding quality and value. To learn more, ask for our free brochure at 800-827-1615, ext. 304.

VT Industries

CIRCLE 164 ON INQUIRY CARD

Melton Classics



Melton Classics architecturally correct columns, balustrades, and architectural details, are the industry standard for quality, yet are affordably priced. Columns are available in fiberglass, resin composite, and wood. MarbleTex™ Balustrades and Columns are integrally colored and require no painting. Ask us about our complete line of architectural elements in MeltonStone™ cast stone. 800-963-3060, web site www.meltonclassicis.com

Melton Classics

CIRCLE 165 ON INQUIRY CARD

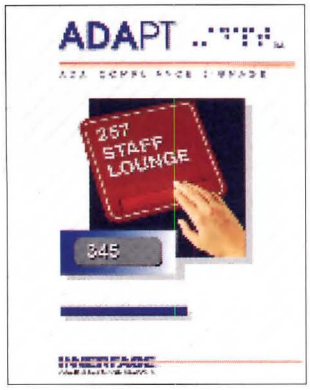
Unique Early *Childhood Furniture*

GRESSCO, Ltd introduces HABA® a new line of children's modular Loft furniture, shelving, platforms and room partitions in addition to our existing array of KinderSystem™ reading furniture. Now you can create a truly unique children's area in your hospital waiting room, day-care center, church or library. Call GRESSCO today for a FREE catalog at 800-345-3480, www.gresscoltd.com

GRESSCO Ltd.

CIRCLE 166 ON INQUIRY CARD

ADA Compliance Signage



Innerface makes it easier for you to meet the Americans With Disabilities Act (ADA) signage standards. Innerface offers (1) A variety of compliance signage, (2) National distribution (3) Solid 27 year history and (4) Economical, attractive, & highly functional interior and exterior signage. Innerface also offers signage planning and wayfinding services. For free literature, please call 800 445-4796.

Innerface

CIRCLE 167 ON INQUIRY CARD

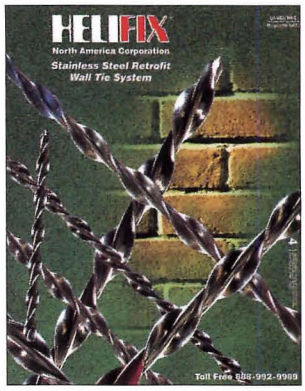
Sculptured Concrete Masonry Unit

Winner of the "Award for Design Excellence", the 8"x16" Grille Blocks are made of 7,000 psi white Glass-Fiber-Reinforced Concrete and are sculptured on both sides. Visibility is limited to 5%, while allowing 22% free air to pass through, providing privacy and security. Contact us at 941-925-3331, Fax 941-925-5841, Grillblock@aol.com

Grille Block, LLC

CIRCLE 168 ON INQUIRY CARD

Stainless Steel Retrofit Wall Tie System

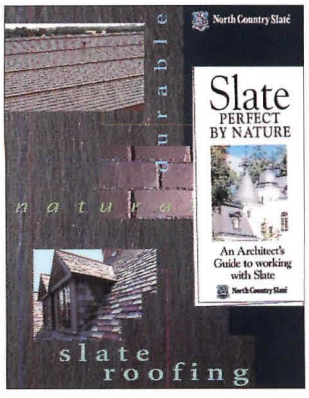


The unique Helifix 'DryFix' stainless steel remedial wall tie system is used to stabilize and strengthen masonry walls in both high rise and domestic buildings. The 'DryFix' system involves no toxic chemicals or complex expander devices while providing a fast, cost effective, stress free result in most common building materials. Helifix ties may also be used in new construction and masonry refacing. Call 888-992-9989 for further information. Booth #1860 at CSI Show.

Helifix

CIRCLE 169 ON INQUIRY CARD

Slate Roofing



Natural North Country slate. For enduring character, nothing else compares. No wonder—it's perfected by nature! Free product brochure showcases the wide variety of sizes and colors, and comes with our Architect's Guide to working with this remarkable roofing material.

North Country Slate

CIRCLE 170 ON INQUIRY CARD

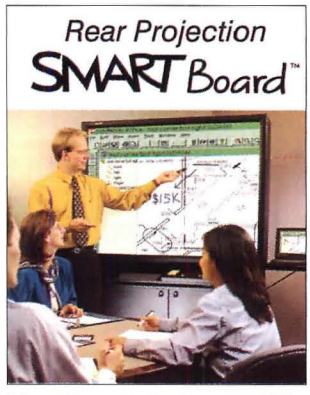
Matrix Composites Inc.

Chosen by a distinguished panel of Architects for Architectural Record as one of the best new finishes for 1999, Madera Tile is made from an exciting new material known as Lignasil®. Using 100% post-use hardwood in a patented process, Madera forges new ground in "green" building material technology. Several textures are available in an exciting range of solid colors and unique color blends for your sustainable design solutions. Call 800-767-4495 www.maderatile.com

Matrix Composites Inc.

CIRCLE 171 ON INQUIRY CARD

Interactive Whiteboard



The Rear Projection SMART Board™ is an interactive whiteboard that allows you to control projected Windows® or Macintosh® applications and other multimedia by pressing on the Board's large, touch-sensitive surface. Write over top of applications and your notes are saved for future reference and distribution. Architects and facility designers can request the SMART Product Kit by calling 888-427-6278 or by visiting www.smarttech.com/productkit

SMART Technologies Inc.

CIRCLE 172 ON INQUIRY CARD

Xenon Luminaries

Space Cannon Illumination Inc. introduces the Litehose, the latest in linear lighting technology made of extruded, durable optical-grade acrylic. Available in different diameters and sizes, reflective paints and films are not required. The Focus is an architectural coloured luminarie utilizing a 1200w lamp source designed to work with the Litehose or separately. 888-705-1028.

Space Cannon

CIRCLE 173 ON INQUIRY CARD

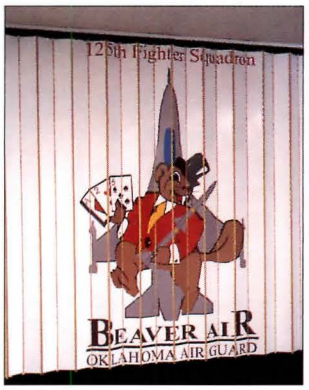
Vision Control®: No Strings Attached!

No more curtains, shades or Venetian blinds constantly flapping in the wind and damaged by the opening and closing of the door. Custom-made hermetically sealed glass unit consists of rigid pivoting aluminum blinds, manually operated or motorized, no cords or strings attached! Dust-free & MAINTENANCE-FREE. Offers privacy, hygiene, control of light, heat, sound. For interior & exterior doors, windows, skylight, curtain walls. Call 800-668-1580. www.visioncontrol.qc.ca

Unicel Inc.

CIRCLE 174 ON INQUIRY CARD

Your Name Here!!



Digital graphic imaging, just one of Woodfold's unique ways to put your client's signature on our custom made folding doors. Since 1957 Woodfold has provided a full range of accordion and roll-up doors to the building products industry. Each door is custom made to order. Our folding doors are offered in models suitable for sight, sound, or installations calling for security.

Woodfold-Marco Mfg.,

CIRCLE 175 ON INQUIRY CARD

Genuine Cedar Shakes

Cedar shakes have been a premium roofing material for centuries, & their combination of beauty & performance is unbeatable in terms of value for the dollar. As the most tested of all roofing materials, cedar shakes have proven durability, even under extreme conditions. For fire hazardous regions, such as California, Meeker offers factory treated shakes with FTX® fire retardant. These shakes can be applied using various systems to achieve a Class A, B, or C fire rating. Call 800-663-8761 or www.meekercedar.com

Meeker Cedar Products

CIRCLE 176 ON INQUIRY CARD

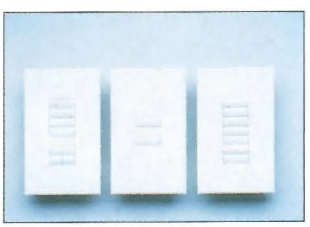
Site Furniture of Distinction

Keystone Ridge Designs, Inc. is the architect's choice for premier site amenities. Offering a full line of steel furnishings, we pride ourselves on exclusive designs and our patented powder coat finish, KEYSHIELD™, that is unparalleled in the industry. Quality, craftsmanship, and dedication to your creative vision are the hallmarks of Keystone Ridge Designs. For more information please call 800.284.8208 or e-mail KeystonRdg@aol.com. www.keystoneridgedesigns.com

Keystone Ridge Designs

CIRCLE 177 ON INQUIRY CARD

Lutron's new SeeTouch™



Lutron's new SeeTouch™ blends lighting control fashion with convenience. It is compatible with Lutron's GRAFIK Eye® Series for commercial application and HomeWorks Interactive™ Series for residential installations. Its large-style buttons are set at an upward angle, so it can be installed at and operated from standard switch height, instead of eye level.

Lutron

CIRCLE 178 ON INQUIRY CARD

Luxalon Wide Panel Systems

The revolutionary ceiling system offers nominal 12" (300mm) wide panels in lengths up to 19'0" creating a clean sophisticated, monolithic ceiling plane. Long spans are available with a soft beveled edge or a reveal edge. The system provides both acoustics and aesthetics with easily installed panels. Available in 8 finishes and 2 perforation patterns. For further information call 800-366-4327.

Hunter Douglas

CIRCLE 179 ON INQUIRY CARD

Scala-3

Scala-3, a fashionable new design by Charles Loomis, Inc., radiates sophistication and simplicity with just a touch of whimsy. Available with etched opal acrylic, off-white linen and Aramid diffusers. Fluorescent and incandescent lamping options are available. Scala-3 is U.L. listed and ADA compliant. Contact Charles Loomis, Inc., at 800-755-0471 for more information.

Charles Loomis, Inc.

CIRCLE 180 ON INQUIRY CARD

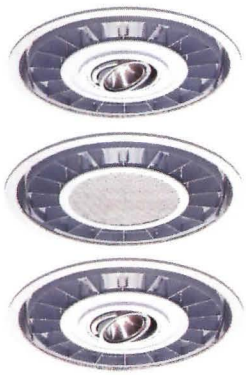
Boa Two-Circuit Track System

Bruck Lighting, the international leader in innovative low-voltage cable and track systems, introduces Boa, a low-voltage two-circuit track system with dual switching ability. Boa may be suspended or flush mounted, installed vertically or horizontally and is available in chrome or matte chrome. All Bruck Uni-lights fixtures can be utilized with Boa as well as all seven other Bruck track systems. www.brucklighting.com

Bruck Lighting Systems

CIRCLE 181 ON INQUIRY CARD

CircLet

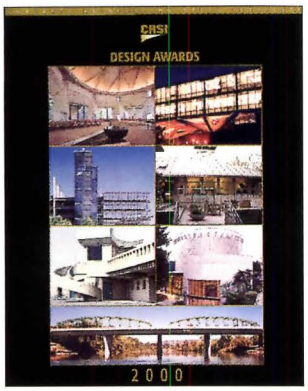


Wila Lighting introduces CircLet, a revolutionary multifunctional downlight utilizing the circular T5 lamp. CircLet's modular construction allows integration of speakers, video cameras, accent lights, smoke detectors, and fire sprinklers in the center "free space" of the fixture, which eliminates ceiling congestion. www.wila.com

Wila Lighting, LLC

CIRCLE 182 ON INQUIRY CARD

New CRSI 2000 Design Award Brochure Available

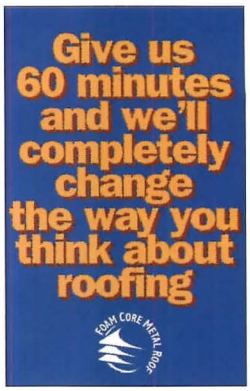


Seven winning structures from the Concrete Reinforcing Steel Institute (CRI) 15th biennial design competition featured in this 4-color brochure. All site-cast reinforced concrete, chosen from entries throughout North America. Project overview, photos, winning firms included for each project. Judging criteria included design aesthetics, engineering achievement and economy of construction. Web: www.crsi.org

CRSI

CIRCLE 183 ON INQUIRY CARD

Seminar Highlights Benefits of Foam Core Metal Roofs



The Metal Construction Association is offering a seminar that showcases the many advantages of foam core metal roofs, compared with competitive materials. It's enjoyable, interesting and informative – and you can earn AIA continuing education credits just for attending. Contact Centria at 800-759-7474 or Foam Core Metal Roof at 877-902-ROOF for complete details.

Centria

CIRCLE 184 ON INQUIRY CARD

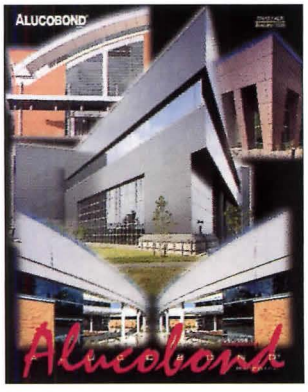
Make a Great Impression

New from Wausau Tile, Inc., our new "Impression" pavers and tree surrounds. A wide variety of precast patterned manufactured to match most Wausau Tile pavers colors and finishes. Pavers available in 18" and 24" square, tree surrounds in 24" square with 12" square tree opening and 30" square with 18" tree opening. Contact Wausau Tile for more information. Call 800-388-8728.

Wausau Tile

CIRCLE 185 ON INQUIRY CARD

New Alucobond® Materials Brochure

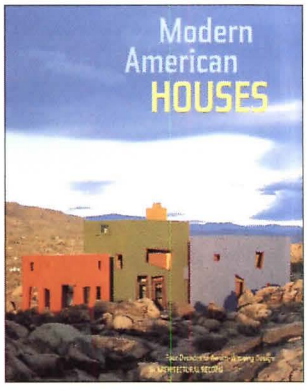


Totally new Alucobond® Material brochure in dramatic new format illustrates the use of Alucobond Material a variety of innovative applications and colors. Alucobond® Material is the original ACM (aluminum composite material) and has been used on more than 50,000 buildings worldwide. Alucobond Material is always the affordable solution. For more information, call 800-382-6445 or visit www.alusuisse-comp.com

Alusuisse Composites, Inc.

CIRCLE 186 *ON INQUIRY CARD*

Modern American Houses

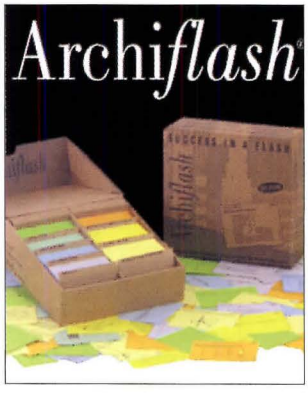


This 230-page book is packed with color photographs of more than 75 houses featured in Record Houses since 1956. New essays explore the evolution of home design decade by decade–Thomas Hines on the '50s, Robert Campbell on the '60s, Suzanne Stephens on the '70s, Charles Gandee on the '80s and '90s. $49.50. To order please call 212-904-4635.

Record Houses

CIRCLE 187 ON INQUIRY CARD

Pass the A.R.E. Study with Archiflash®

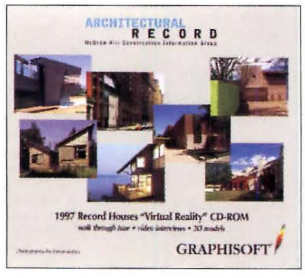


Prepare for the computerized Architect Registration Exam with Archiflash®. Each set contains over 1,100 expertly written flashcards covering all six multiple choice tests, plus a review section on Site Planning. Learning is easy with timesaving charts, essential definitions, concise diagrams, true/false and multiple choice Q & A. More information than you ever thought possible in an easy-to-use Flashcard format. Order by phone: 800-411-7314. Order online: www.archiflash.com

Nalsa, Inc.

CIRCLE 188 ON INQUIRY CARD

Record Houses "Virtual Reality" CD-ROM



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Iole Allessandrini: An architect turned artist lights up our lives

Interviewed by Elizabeth H. Kubany

"Space reveals light, light reveals space," says Iole Allessandrini. And few people are as well qualified as she to make such a statement. Trained as an artist and an architect in her native Italy, Allessandrini has worked for architectural firms in Rome, Milan, London, and Seattle—the city she currently calls home. Several years ago she received her Lighting Certificate, which she puts to use as a site-specific artist who blends natural light, artificial light, video, sound, and architectural landmarks—from a 1906 water tower in Seattle to wall fragments from demolished buildings in Tacoma. The Seattle Art Commission and the Paul Allan Foundation for the Arts have acknowledged Allessandrini's work with generous grants.

Q: *You are an architect, an artist, and a lighting designer. How does your knowledge of all these disciplines affect your art?* My art deals with the ephemeral. It appears, disappears, and changes depending on the sun. In that sense, it is the opposite of architecture. But architecture is both the inspiration and the shelter for my light transformations. My work is revealed by the architectural elements with which it is composed.

You seem to love architecture. Why did you stop practicing? As a young girl, I was always interested in fine art. I decided to study architecture because it is a much more complete discipline than any other profession. It combines a humanistic, artistic, and scientific approach. Although I no longer build buildings, I still think of myself as an architect. I try to put my knowledge of buildings to inventive and evocative use.

What made you decide to pursue these explorations of light? My perception of the world is that it is already too crowded. We have no need for additional objects. Light is a minimalist medium because it simply intervenes and interacts with something that already exists.

Your work has evolved quite a bit, from explorations of natural light to interventions with existing structures. How has this happened? Yes, my first work was a video installation installed in a park—an attempt to integrate natural light and elements of nature with technology. In essence, it was a study of human visual perception. I was interested in how the video was perceived by the viewer at different times of day. I am still interested in exploring perception, and my work today always incorporates natural light. But today there is an added element, which is architecture. My recent projects have been about beautifying and enhancing existing built structures.

What has been the response to your work? Are people appreciative? One of my recent projects, *Winter, Season of Light,* was installed in two demolished city blocks in Tacoma. This is a neglected area of the city; before I started working, the site looked like a bomb had dropped there. I am not exaggerating when I say people used to cover their eyes when they walked by this sad area. I used these urban remains as my inspiration and added a reflecting pool, light-reflecting panels, and light that changed from light pink to deep red depending on the time of day. When everything was lit, the whole block started to glow. The mayor and the city council of Tacoma proclaimed January 2000 as Season of Light Month and encouraged all citizens of Tacoma to visit the exhibit. I guess the built environment really can affect people's lives.

Photograph by Richard Nicol

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