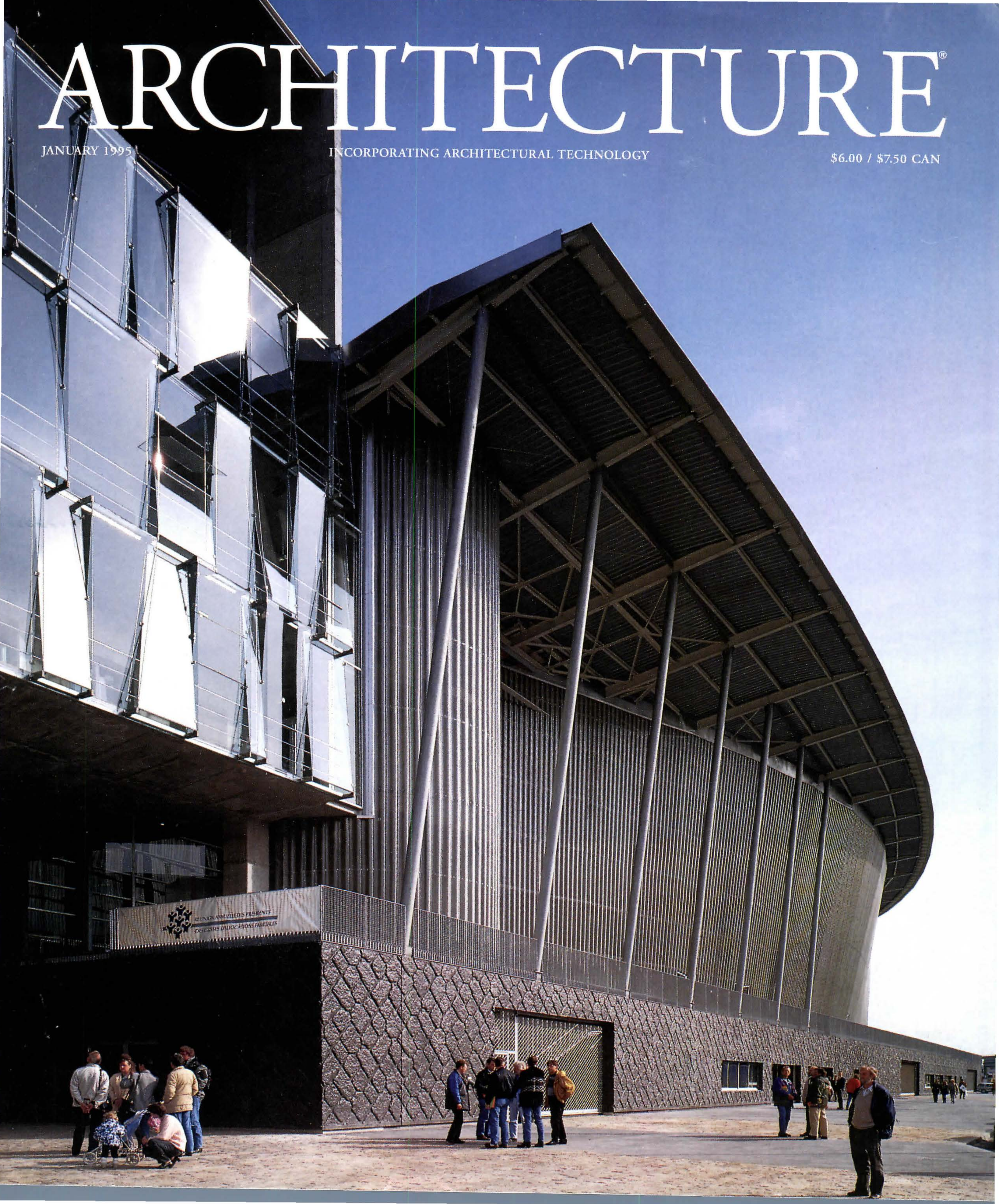
ARCHITECTURE®

JANUARY 1995

INCORPORATING ARCHITECTURAL TECHNOLOGY

$6.00 / $7.50 CAN



January 1995

ARCHITECTURE


DAVID CHURCHILL / ARCAID
page 56


CHRISTIAN RICHTERS
page 70


KAZUO NATORI
page 84

Cover
Grand Palais, Euralille; Lille, France. Rem Koolhaas/Office for Metropolitan Architecture (page 66). Photograph by Christian Richters.

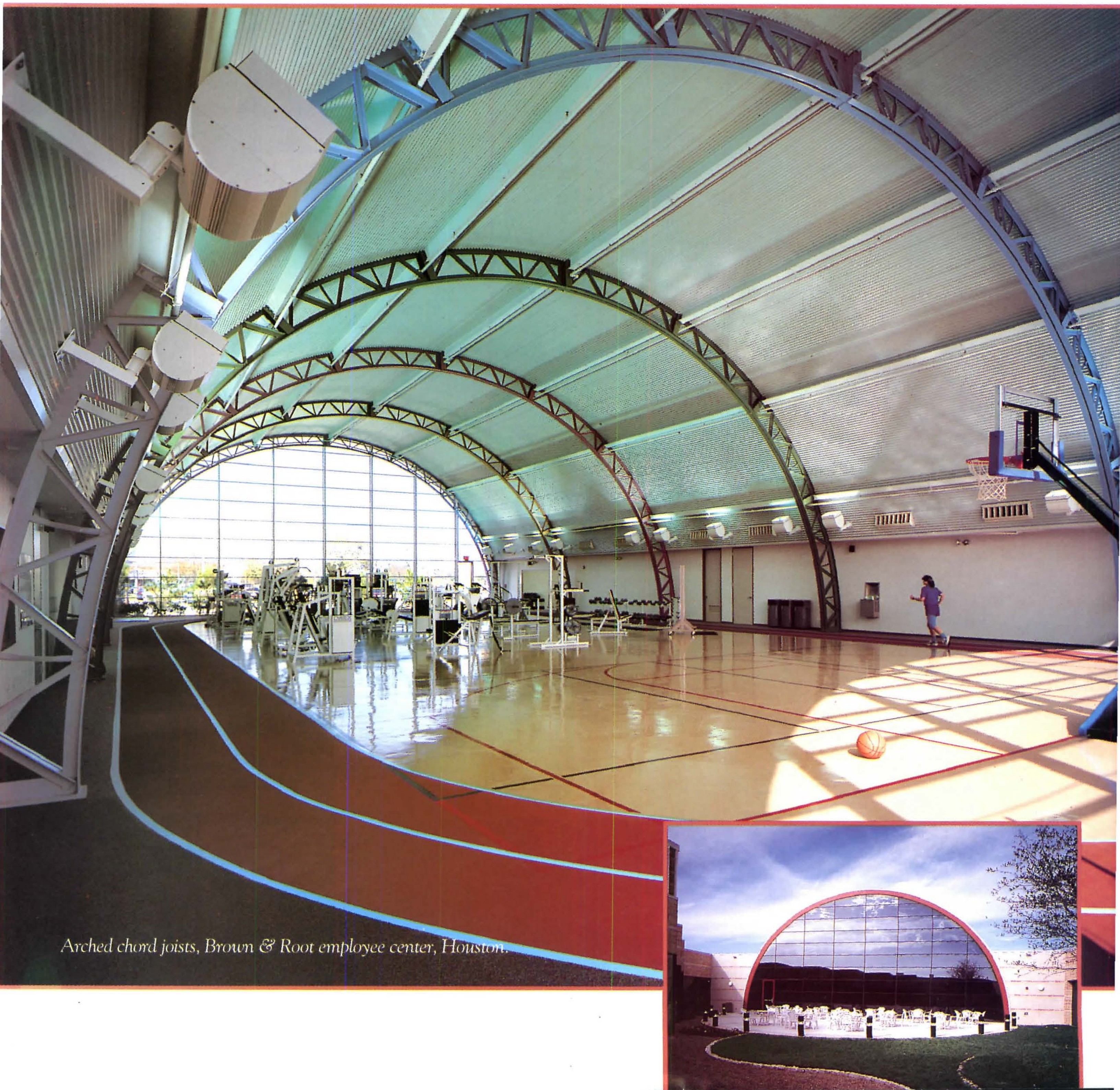
Next Month
New campus buildings
Brick details
Profile of new deans

Design

Technology & Practice

Departments

SUPPORT CAN

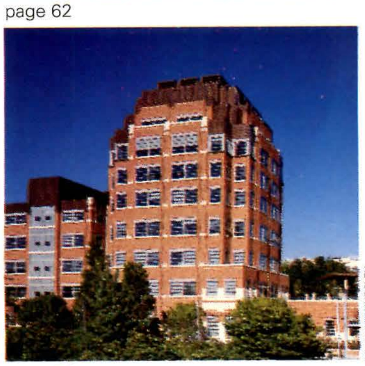


Arched chord joists, Brown & Root employee center, Houston.

ARCHITECTURE

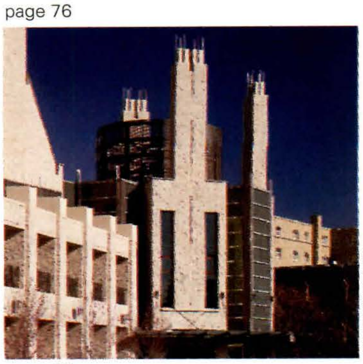
RICHARD BRYANT / ARCAID

page 62



TIMOTHY HURSLEY

page 76



JEFF GOLDBERG / ESTO

page 86

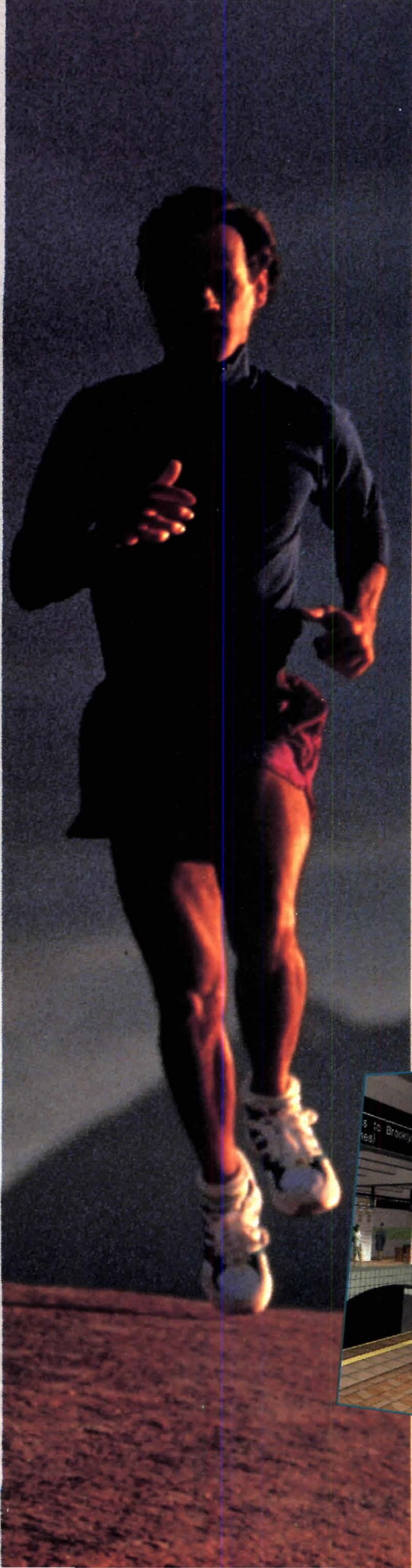
Cover
Science Library, University of California at Irvine, James Stirling Michael Wilford and Associates, Architect (page 62). Photo by Richard Bryant/Arcaid.

Next Month
New buildings by Antoine Predock
Lighting research and details

Design

Technology & Practice

Departments



For high perform
that counts.

MicroStatior

Hit the ground running *with the MicroStation family of professional CAD software. It combines high performance with superb usability through an award winning, event-driven CAD technology.*

At the heart of all MicroStation software *is a unifying architecture that lets everything run together beautifully:* MicroStation Development Language (MDL). *Discipline-specific applications cooperate* within *MicroStation V5™. Each integrates seamlessly into the MicroStation graphic user interface. Making every MicroStation application intuitive and usable.*

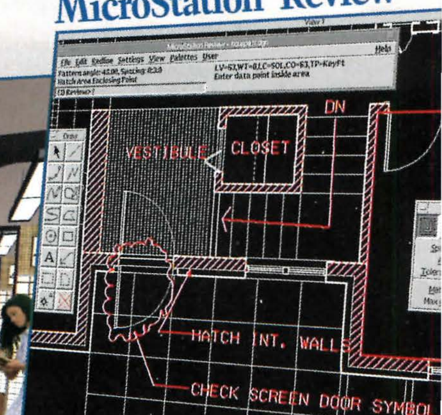
New MicroStation Modeler™ *combines with MicroStation to provide the power to draw solids, surfaces and wireframes in a single environment.*

For the drafting professional, there's ***new MicroStation PowerDraft™****. Streamlined to fit the needs of production drafting departments. Designed for dramatic improvements in efficiency and productivity.*

The energy of MicroStation software also empowers work groups and improves company-wide workflow. ***With MicroStation Review™****, employees can spot check and redline design work, and perform intelligent queries.* ***New MicroStation Field™*** *puts design*

MicroStation V5

MicroStation Review



ARCHITECTURE


page 68


page 74


TIMOTHY HURSLEY PHOTOS

page 84

Cover
Solstice Wall at Ventana Vista Elementary School, Tucson, Arizona, Antoine Predock Architect (page 58). Photograph by Timothy Hursley.

Next Month
Future of the American city
Habitat for Humanity
Building systems

Design

Technology & Practice

Departments

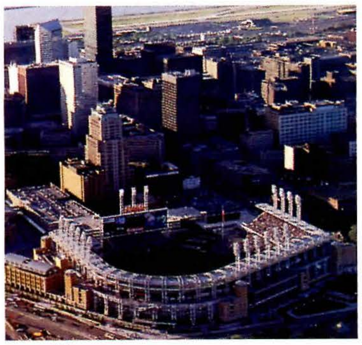
THIS BANK SELECTED US BECAUSE WE PAID HIGHER

It looks less like a bank and more like an English country manor. But the charm of the Investors Savings Bank belies the challenges its design and construction presented. Particularly to Marvin Windows and Doors.

For one thing, fast-track construction scheduling was necessary due to constantly evolving design constraints. For another, it wasn't until thermal efficiency, condensation resistance and aesthetics were factored in that wood was chosen over aluminum. Consequently, Marvin wasn't selected for the job until construction was underway, making manufacturing and delivery deadlines extremely tight.

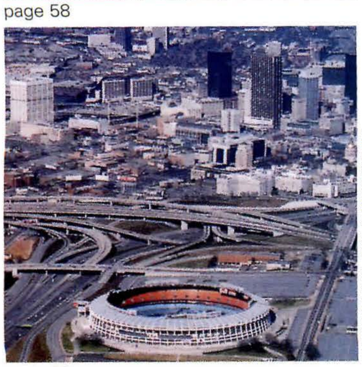
But Marvin's biggest challenge proved to be the building's three massive window and door assemblies, the largest of which measures 28 feet wide by 30 feet high. Using a combination of sturdy Magnum Double-Hungs and French Doors, Marvin not only built them on schedule, but also engineered them prior to delivery to guarantee they would withstand the strong, prevailing winds off the lake. And, like all 177 of the bank's other made-to-fit windows and doors, they were built with features designed specifically for the project. *Features such* as authentic divided lites, interior windows and doors glazed to match those on the exterior and a durable, factory applied finish in two complementary colors; Midnight Teal for the sash

ARCHITECTURE



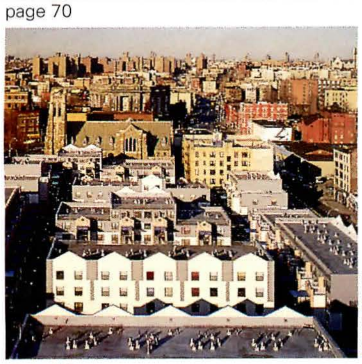
ROGER MASTROINNI

page 58



DILLON-REYNOLDS AERIAL PHOTOGRAPHY, INC.

page 70



MICHAEL MORAN

page 86

Cover
City of Phoenix (page 76). Photograph by Todd Photography Services.

Next Month
Annual Review of American Architecture
AIA Honor Awards
Strawbale construction

Design

Technology & Practice

Departments

What to Serve If the Gang's

ARCHITECTURE


SHIMER / HEDRICH-BLESSING
page 66


MICHAEL MORAN
page 76


PETER MALINOWSKI
page 86

Cover
Clockwise from top left: Evanston Public Library, Joseph Powell & Associates, photograph by Steve Hall/Hedrich-Blessing; Holt Companies Headquarters, Lake/Flato Architects, photograph by Paul Hester; Paulk House, James Cutler Architects, photograph by Art Grice; Windsor House, Merrill, Hatch and Associates, photograph by Thomas Delbeck.

Design

Technology & Practice

Departments

ARCHITECTURE


DAVID HEWITT / ANNE GARRISON

page 72


ERIK KVALSVIK

page 84


SHARON RISEDORPH PHOTOGRAPHY

page 88

Cover
Lawrenceville Senior Center, Lawrenceville, Georgia, Stanley Beaman & Sears, Architect (page 66). Photograph by Jonathan Hillyer.

Next Month
Sustainable architecture
Green practices

Design

Technology & Practice

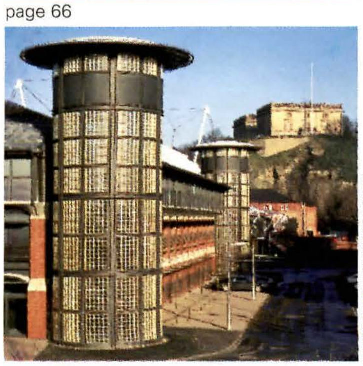
Departments


Carolyn Iu, AIA, & Neville Lewis, FIIDA, ASID, of Iu and Lewis Design LLC.
Innovators.
***Interior Design** Magazine Hall of Fame members. And specifiers of DuPont Antron carpet fiber.*

ARCHITECTURE


TIMOTHY HURSLEY

page 66


MARTINE HAMILTON KNIGHT / ARCAID

page 76


PETER COOK

page 88

Cover
National Wildflower Research Center, Austin, Texas, Overland Partners, Architect (page 66).
Photograph by Timothy Hursley.

Next Month
Public space
Metal buildings
Managing risk

Design

Technology & Practice

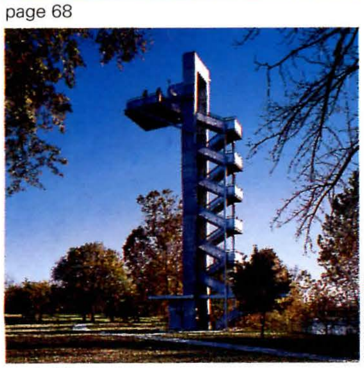
Departments

August 1995

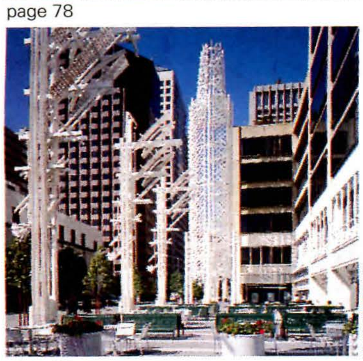
ARCHITECTURE


JEFF GOLDBERG / ESTO

page 68


RICHARD BARNES

page 78


TIMOTHY HURSLEY

page 90

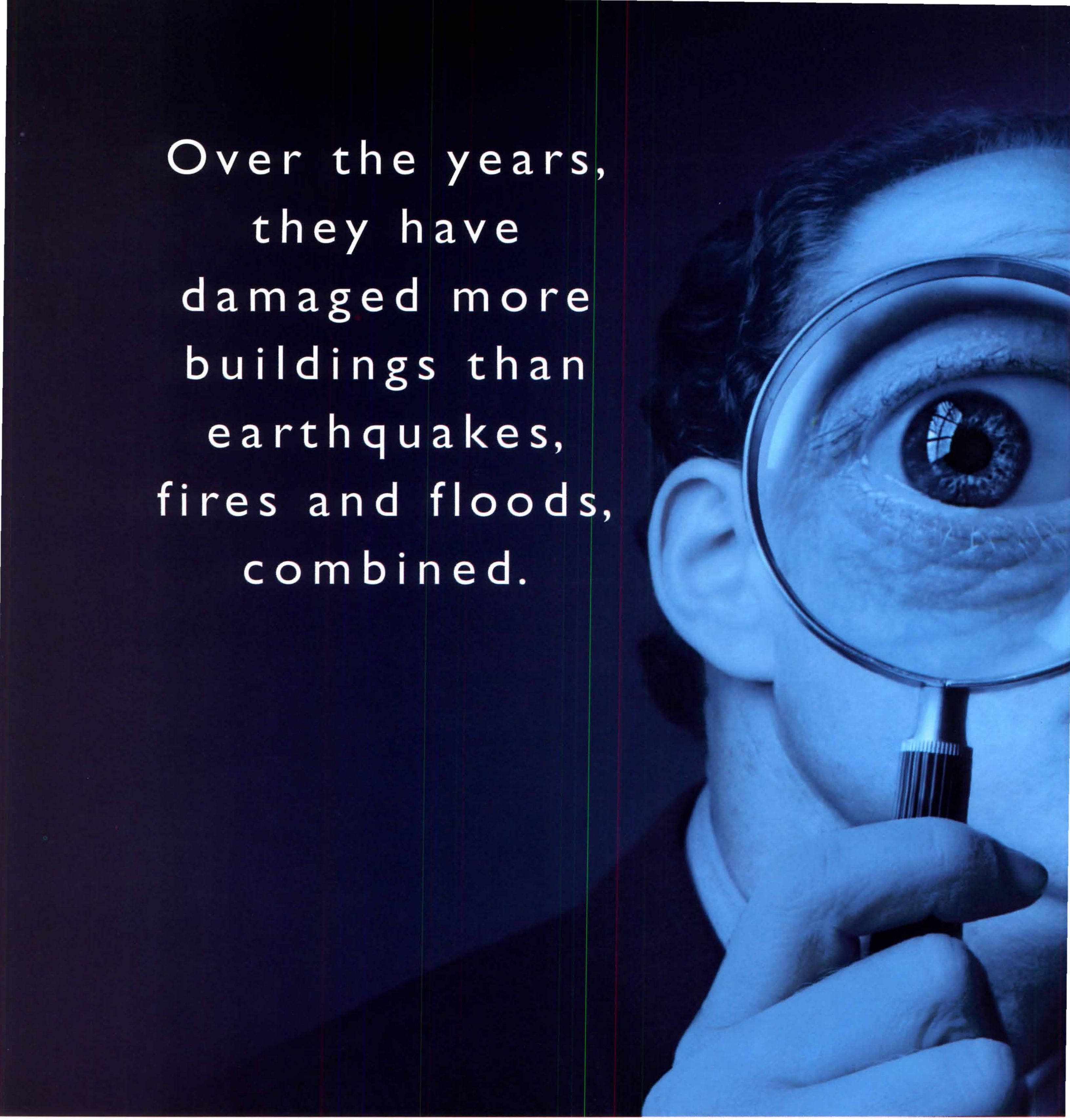
Cover
The Belvedere, New York City, Mitchell/Giurgola Architects with Child Associates (page 56). Photograph by Jeff Goldberg/Esto.

Next Month
Review of international architecture
Setting up a foreign office
Tilt-up concrete

Design

Technology & Practice

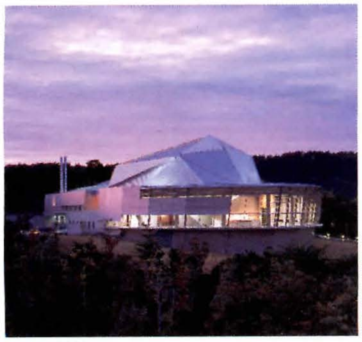
Departments


Over the years,
they have
damaged more
buildings than
earthquakes,
fires and floods,
combined.

ARCHITECTURE


page 78


page 84


page 118

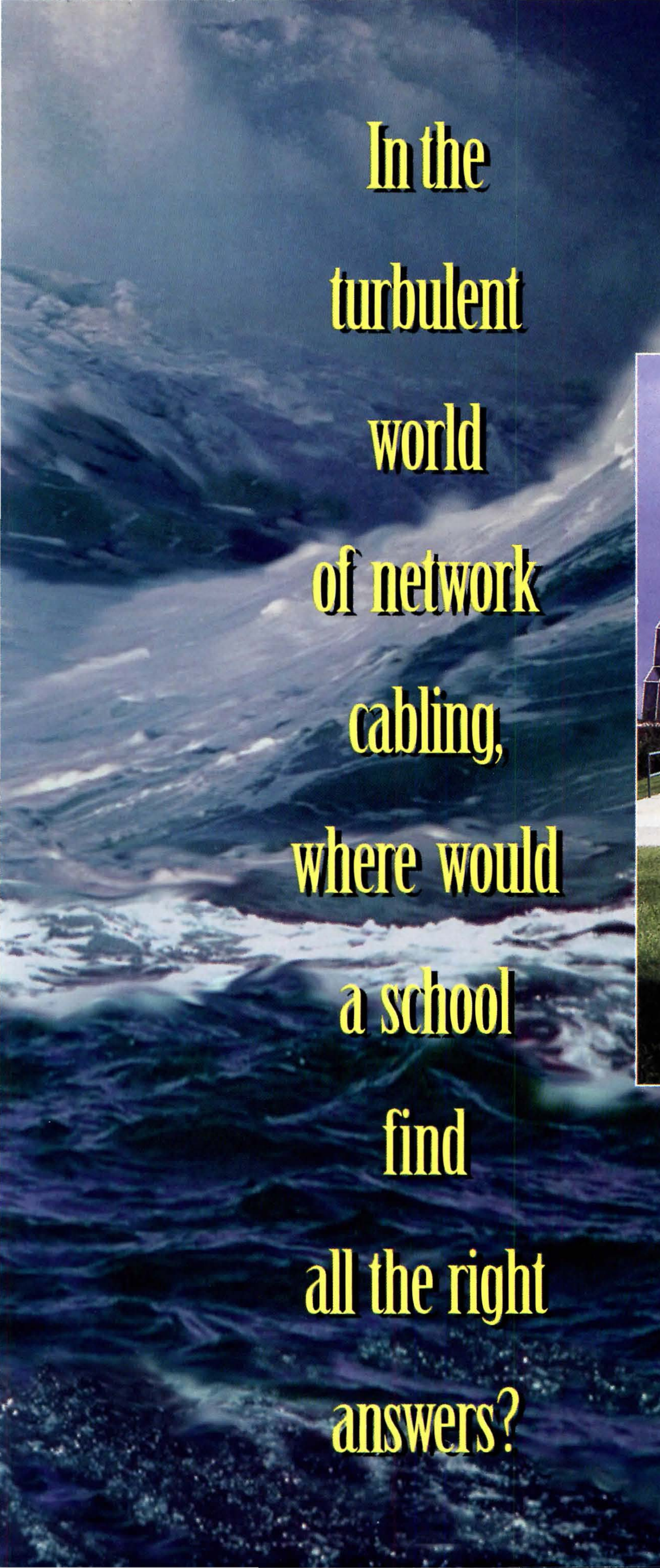
Cover
East pavilion of Groninger Museum, Groningen, Netherlands, Coop Himmelb(l)au, Architect (page 90). Photograph by Luc Boegly.

Next Month
Libraries
Computer cabling

Design

Technology & Practice

Departments



Where 386 other schools did.

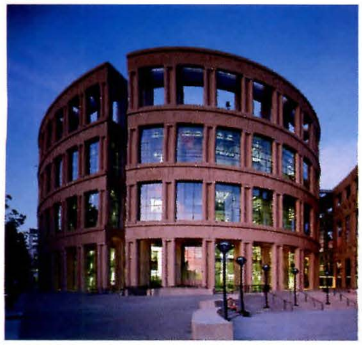
Where Networking 101 is a curriculum of constant adds, moves and changes, intensive usage and growing bandwidth, selecting a premises wiring system, and company, is a decision that will affect you for many semesters to come.

That's why AMP is chosen repeatedly by networking-dependent enterprises such as hospitals, banks, national retail chains and

ARCHITECTURE


MICHEL DENANCÉ / ARCHIPRESS

page 66


TIMOTHY HURSLEY

page 72


PAUL BARDAGJY

page 80

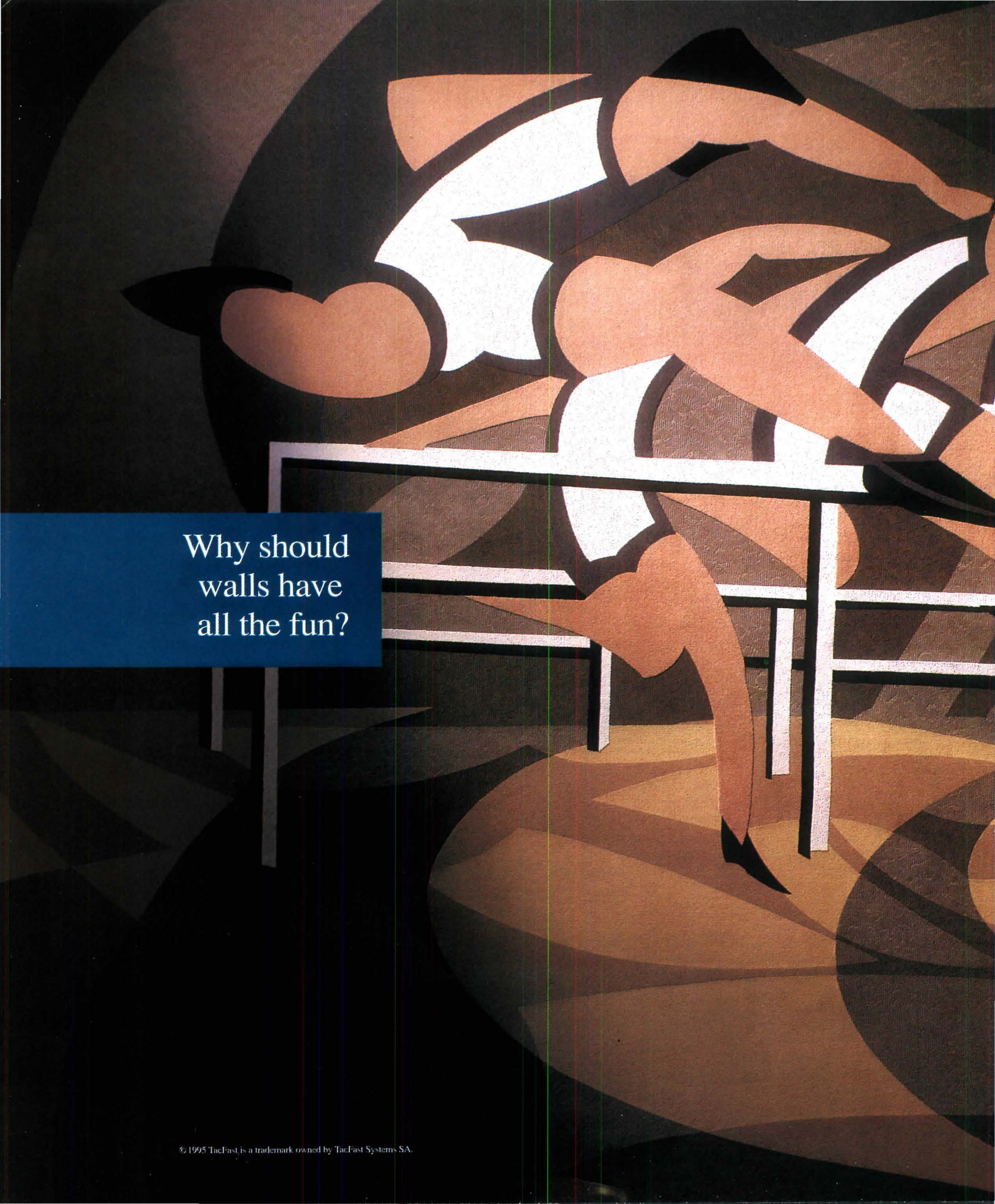
Cover
Phoenix Central Library,
Phoenix, Arizona,
bruderDWLarchitects (page 56).
Photograph by Timothy Hursley.

Next Month
Renovations and additions
Historic window repairs
Recladding office buildings

Design

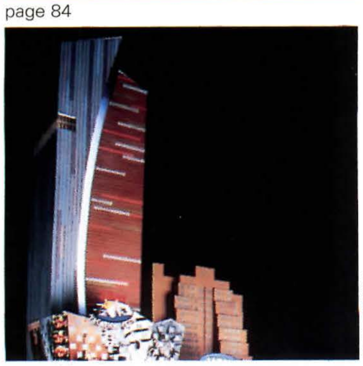
Technology & Practice

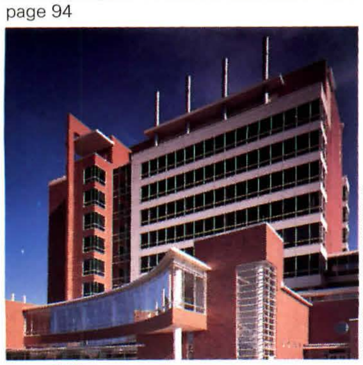
Departments


Why should walls have all the fun?
© 1995 TacFast is a trademark owned by TacFast Systems SA.

ARCHITECTURE


TIMOTHY HURSLEY
page 84


ARQUITECTONICA
page 94


NICK MERRICK / HEDRICH BLESSING
page 100

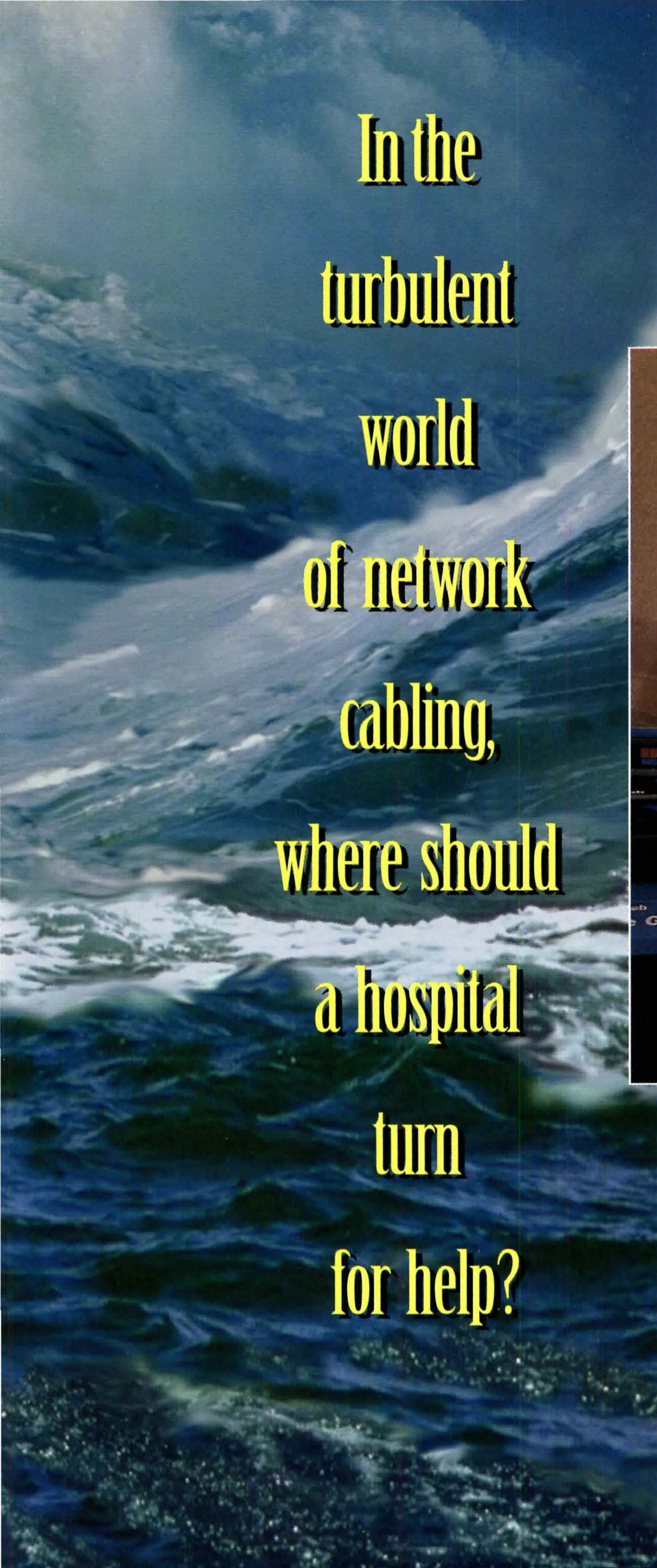
Cover
The Gatehouse, New Canaan, Connecticut, Philip Johnson, Architect (page 74).
Photographed by Michael Moran.

Next Month
Entertainment architecture
TAC's demise
Seismic upgrading

Design

Technology & Practice

Departments

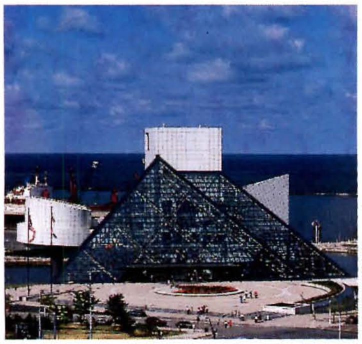


Where 124 other hospitals did.

For applications such as hospitals, where the soaring requirements of imaging systems on bandwidth, the constant growth of voice and data traffic, and the demand for unquestioned reliability all compete for immediate attention, selecting a hospital's premises cabling system, and company, is particularly critical.

That's why AMP is chosen repeatedly by networking-dependent enterprises such as

ARCHITECTURE


TIMOTHY HURSLEY
page 70


TIMOTHY HURSLEY
page 76


JEFF GOLDBERG / ESTO
page 84

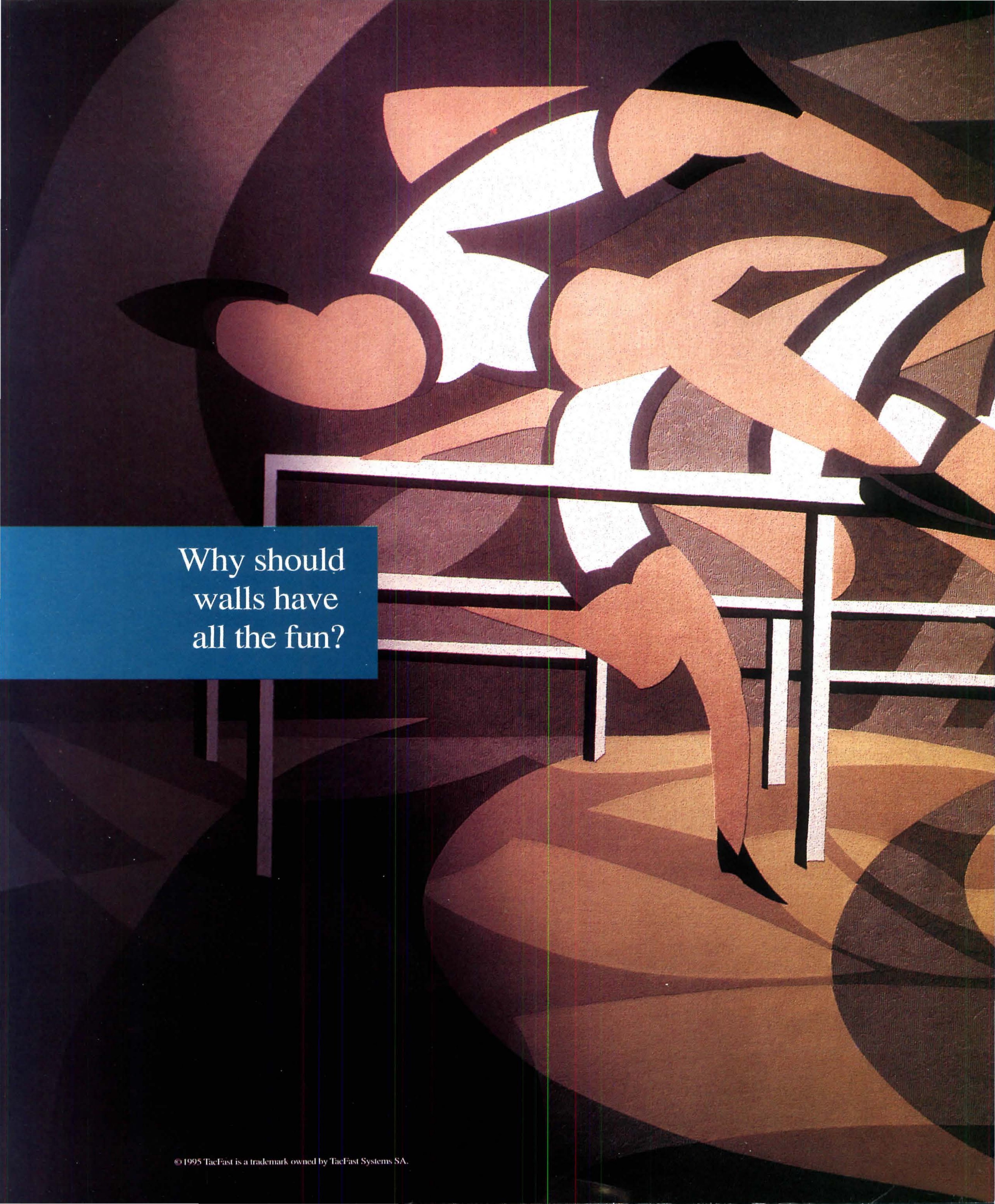
Cover
Inventure Place, Akron, Ohio,
Polshek and Partners Architects
(page 60).
Photograph by Jeff Goldberg/Esto.

Next Month
Designing and building federal projects
Security systems

Design

Technology & Practice

Departments



Why should
walls have
all the fun?
© 1995 TacFast is a trademark owned by TacFast Systems SA.

Improving Design/Build

New guidelines promote fairness in the design/build process for public projects.

Anyone familiar with the design competition for Chicago's Harold Washington Library knows that public agencies can turn design/build into a nightmare. In 1988, the city asked five shortlisted teams to develop full-blown proposals for the library building—each of which cost the teams between $350,000 and $750,000. The competition's high cost, coupled with the city's failure to streamline the process, caused many architects to resent the municipal government and the process of design/build.

Despite the Chicago controversy, public agencies nationwide are increasingly turning to design/build for new building construction. The delivery method offers government officials a single point of responsibility during a project's execution and allows them to solicit one proposal for both design and construction, rather than procuring the services of an architect and contractor separately.

Now, the design/build process for public-sector projects may become easier. This month, the AIA and the Associated General Contractors of America (AGC) are releasing a set of recommended guidelines for design/build procurement in public building projects. The guidelines not only attest to the growing acceptance of design/build, but to a newfound cooperation between AIA and AGC in advancing a mutually beneficial agenda.

The team effort began last January, when the California Department of General Services was about to embark on a $10 billion statewide building program. The agency wanted to award much of the work as design/build, but didn't know enough about the process, so it turned to the AIA and AGC for guidance. In response, the two organizations collaborated over the past year to produce brief, but comprehensive, guidelines.

The AIA maintains that all project-delivery systems are created equal, and it does not endorse design/build over conventional design/bid/build. However, if a public entity elects to employ design/build, the guidelines will prevent misunderstandings between owners and designer/builders and establish procurement methods that encourage the best-suited firms to participate.

Specifically, the AIA/AGC document urges owners to first consider whether design/build is right for a given project's time constraints, budget, and program. The public agency is then encouraged to define its space needs, design goals, site conditions, and regulatory requirements; as well as selection criteria, timetables, and budget parameters in its initial solicitation.

The design/build guidelines recommend that owners shortlist only the most promising teams through a selection jury, comprised of agency officials, users of the new building, and advisors who are likely to introduce fresh viewpoints to the judging process. State and local governments might well look to the design excellence program of the U.S. General Services Administration for a model of jury selection and peer review.

The guidelines also counsel owners on what priority project costs should receive in selecting the design/build team—should price be the absolute, competitive factor, or should selection be based on more relative calculations of value? A "modest yet fair" stipend is suggested for all competitors, and the firms that don't win the commission should receive candid feedback from the agency on the competition's results.

All architects and contractors competing for public work—winners and losers alike—stand to benefit from the new guidelines because they lay the groundwork for fair competition. It's a promising sign that AIA and AGC, organizations too often on opposite sides of professional issues, have combined their expertise to develop this design/build protocol. Such collaboration must continue, not only to help architects and contractors, but to educate clients as to more effective ways of building.

Deborah K. Dietsch

Letters

Improving gray architecture
As an AIA member for more than 35 years, I've read every version of the various magazines and newsletters the AIA has published. In my opinion ARCHITECTURE is the best yet.

Last month's Editor's Page (October 1994, page 15) was of particular interest to me... a retired architect. Housing for the elderly is a complex design and social issue that has not been fully explored. As you note in your editorial, even a Chicago architect who has solid experience in both residential and institutional design doesn't know where to start.

I have a suggestion. There must be a lot of architects who would be willing to share their expertise to develop innovative design solutions for housing the elderly, a challenge that the AIA should consider. In addition, I also believe that there already exists a wealth of talent—the AIA Emeritus members—that can speak the "language" and help sort out the design parameters.
Milan E. Srnka, AIA Emeritus
Lakewood, Colorado

I applaud your call to action to "Improve Gray Architecture." In total, I agree that this unique market is calling for good design and has for too long been lumped into the general category of healthcare architecture.

Design professionals like myself realized years ago the opportunities existing in this marketplace for making a difference in the daily lives of a generation through design. Some of the challenges that face this changing market include a lack of postoccupancy and other research to tell designers what works and what doesn't in senior care settings.
Robin H. Eggert
Milwaukee, Wisconsin

Protest over Protest
I find it necessary to write this letter in response to your Protest (October 1994, page 47). I would like to complete and correct some of the statements that were made.

There were 11 firms in the South Pointe, Miami, charette: Adbel Wahed El-Wakil; Arquitectonica/STA Architects; Bermmello Ajamil & Partners; Duany Plater-Zyberk, Architects; Michael Graves, Architect; Sandy & Babcock; The Sieger Architectural Partnership/Bosco Architects; Robert A.M. Stern, Architects; and Zyskovich, Inc.

All but one firm, Sandy & Babcock, had high-rise solutions in their "visions." Adjacent areas, as well as this site, are zoned as high-rise and are currently undergoing study by other nationally known firms for at least four taller and larger buildings.

The quote attributed to me regarding the Portofino Tower was a description of both low- and high-rise condominium buildings, not of our approach to a design solution. Our building design was chosen in a competition subsequent to the charette between five invited participants—Arquitectonica, Michael Graves, Ellerbe Becket, Sandy & Babcock, and the Sieger firm. Of the solutions, ours was one of the shortest buildings.
Charles M. Sieger, FAIA
Miami, Florida

Events

Exhibitions

BOSTON. Renaissance drawings from l'École des Beaux-Arts, February 4-April 9, Harvard University's Sackler Museum. Contact: (617) 495-2397.

MONTREAL. Photographs by Édouard Baldus, January 25-April 23, Canadian Centre for Architecture. Contact: (514) 939-7026.

NEW YORK. Zaha Hadid's recent work at Grand Central Terminal, January 17-February 15. Contact: Architectural League of NY, (212) 753-1722.

Conferences

LAS VEGAS. "Masonry Expo '95," February 6-8. Contact: National Concrete Masonry Association, (703) 713-1900.

MINNEAPOLIS. Excellence in Housing Conference, March 8-11. Contact: Energy Efficient Building Association, (612) 871-0413.

ORLANDO. PSMJ's "Design-Build America '95," international conference, March 30-31. Contact: N. Wine, (800) 537-7765.

PHILADELPHIA. University of Pennsylvania symposium on graphic visualization in architecture. Fax request for information, (215) 573-2192.

ROME. 1996 architectural conservation course. Applications due February 15. Contact: Advisory Council on Historic Preservation, (202) 606-8516.

SALT LAKE CITY. AIA juvenile detention facilities PIA, February 23-24. Contact: (202) 626-7300.

WILLIAMSBURG. RESTORE workshop on masonry conservation, March 20-24. Contact: (212) 477-0114.

Competitions

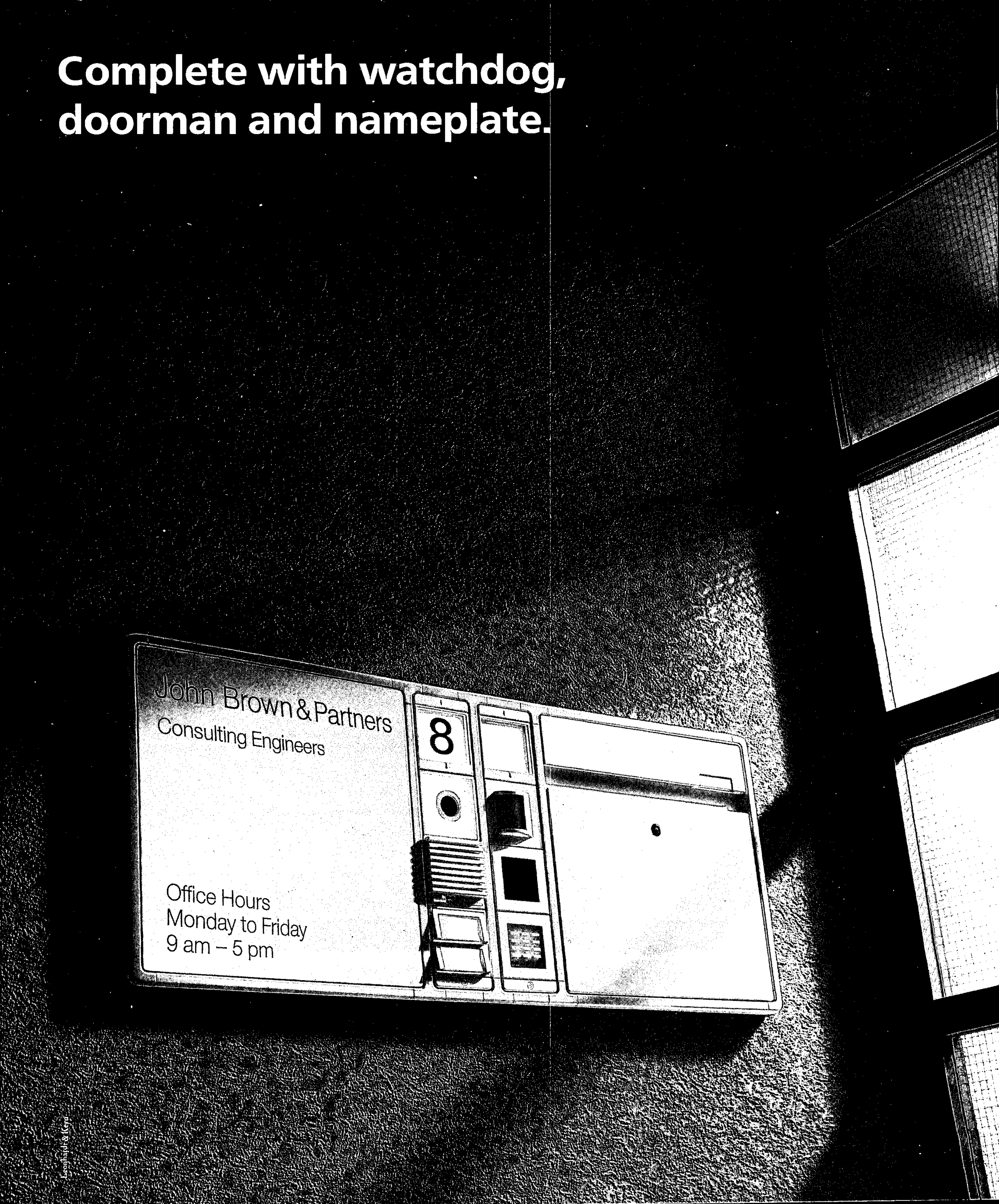
Architectural League of New York's Young Architects Competition. This year's theme: Time. Submission deadline: February 21. Contact: (212) 753-1722.

1995 Industrial Design Excellence Awards for new products. Submission deadline: February 22. Contact: Industrial Designers Society of America, (703) 759-0100.

National juried exhibit of young architects' and interns' work. Sponsor: AIA Young Architects Forum. Opens at AIA National Convention. Registration deadline: March 1. Fax request for information to R. Dionisio, (404) 998-3341.

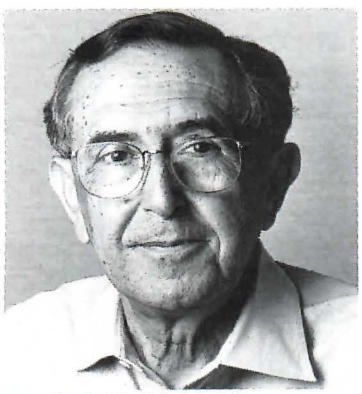
Annual Assopiastrelle design competition for innovative use of ceramic tile. Deadline for entry: March 1. Fax request for information to D. Dalla Valle, 39-536-806-828.

1995 IALD Awards for architectural lighting design. Deadline for entry: March 1. Contact: International Association of Lighting Designers, (212) 206-1281.

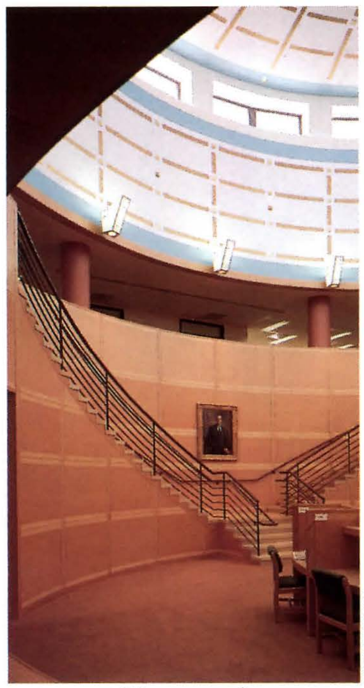


Complete with watchdog, doorman and nameplate.
John Brown & Partners
Consulting Engineers
8
Office Hours
Monday to Friday
9 am – 5 pm

News



PELLI: 53rd AIA Gold Medalist.



TIMOTHY HURSLEY

WAKE FOREST: Library rotunda.

JEFF GOLDBERG / ESTO

CARNEGIE: Brick tower over NY landmark.

TIMOTHY HURSLEY

FINANCIAL CENTER: Public winter garden.

Pelli Wins AIA Gold Medal

"The city is more important than the building; the building is more important than the architect," observes Cesar Pelli, the 53rd AIA Gold Medalist. Selected by the AIA Board of Directors last month, Pelli has demonstrated his philosophy through shaping the skylines of American cities from coast to coast.

Pelli came to the U.S. from his Argentine homeland in 1952 to pursue an M. Arch. degree at the University of Illinois. From 1954 to 1964 he worked for Eero Saarinen & Associates; over the next 12 years in Los Angeles, he rose to vice president of design of Daniel, Mann, Johnson & Mendenhall, then design partner of Gruen Associates. Pelli started his own firm in New Haven in 1977, the same year he began an 8-year term as dean of Yale's architecture school.

Pelli's expansion of MoMA in New York City (1984) is the first in a series of Manhattan high rises, including Carnegie Hall Tower, recipient of a 1994 AIA Honor Award, and the World Financial Center (1988), recognized by the AIA in 1991 as one of the 10 best works of American architecture since 1980.

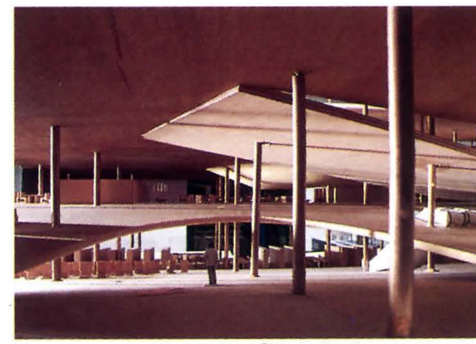
Heralded during the 1980s as master of the curtain wall, Pelli expanded into institutional commissions in association with other firms, designing hospitals, airports, museums, and campus buildings. His roster of recent academic projects includes Worrell Center at Wake Forest University (1993); a mathematics facility at Princeton University (1993); and a Humanities and Social Science building under construction the University of California, Riverside.

Teaming up with other firms also prevents Pelli's own 90-person practice from growing too large. As the 68-year-old architect explains, "It allows us to keep a studio supercharged with many very bright designers—an environment you need to do creative work." This approach earned Cesar Pelli & Associates the AIA Firm Award in 1989.

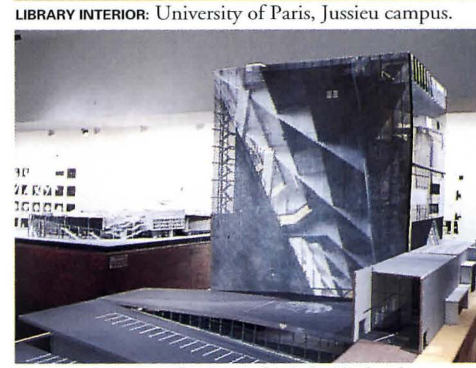
Pelli began to pursue work abroad in 1988, a move that has sustained the practice through lean years at home. Foreign work comprises 30 to 40 percent of the firm's projects today, including twin office towers and a concert hall in Kuala Lampur, and a stadium in Tokyo.

The Gold Medal will be awarded to Pelli on January 31 during Accent on Architecture in Washington, D.C. Pelli is especially proud of the award since the recognition comes from his peers. "It reassures you that what you are doing is not only right in your eyes but in others' eyes, too."—*Ann C. Sullivan*

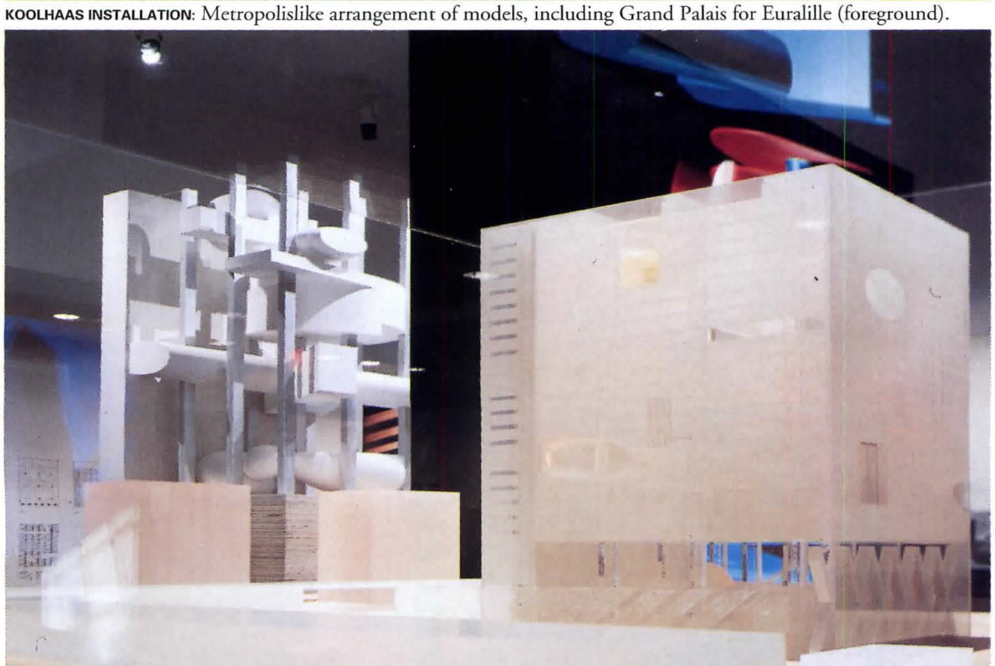
KOOLHAAS INSTALLATION: Metropolislike arrangement of models, including Grand Palais for Euralille (foreground).



LIBRARY INTERIOR: University of Paris, Jussieu campus.



KARLSRUHE: Center for Art and Media Technology.



NATIONAL LIBRARY OF FRANCE: Models show interior voids and stacks (left) and facades (right).

MICHAEL MORAN PHOTOS

MODELS: Yokohama (front), Euralille, Melun-Sénart (wall).

Koolhaas Urbanism Exhibited in New York

Dutch architect Rem Koolhaas, like turn-of-the-century Chicago architect Daniel H. Burnham, is against the making of small plans. Founder of the Office for Metropolitan Architecture (OMA) in Rotterdam, Koolhaas is the author of the famous manifesto *Delirious New York,* which celebrates the large-scale planning and urban density of Manhattan. First published in 1978 and now available in a new edition from the Monacelli Press, this 16-year-old book provides the rationale for the exhibition of the large-scale planning projects on view until 31 January at the Museum of Modern Art. Although New York has been displaced in the MoMA exhibition by the European and Japanese cities in which Koolhaas currently works, the book's central theme—that the dense, chaotic city is a survivor with its own esthetic—governs the show.

The exhibition notes, written by Koolhaas, are excerpted verbatim from a second book, *S, M, L, XL (Small, Medium, Large, Extra Large),* to be published by the Monacelli Press later this year. Unlike the earlier work, with its Manhattan focus, the principal subject of Koolhaas's second book is the work produced by OMA in the past 20 years, combined with essays, manifestos, contemporary criticism, diaries, travelogues, and a book-within-the-book on the contemporary city.

The curator of "Rem Koolhaas and the Place of Public Architecture," Terence Riley, like Koolhaas, is opposed to classicist planners imposing traditional, preindustrial city forms on contemporary cities, believing that planners must once more work at the scale that present population densities, modes of transportation, and communication require. To underscore their point, architect and curator have designed a handsome show that begins at MoMA's nearest subway stop. Quotations and photographs from *Delirious New York* and *S, M, L, XL* appear in poster form on the subway platform at Fifth Avenue and West 53rd Street, continue along the walls of escalators, turn up on the concourse level of an adjacent office building, and decorate a nearby construction fence and telephone kiosk. Inside MoMA, beautiful large-scale building models are jammed together in a tight space to make the exhibition look and feel like a very large-scale model of an urban metropolis. The show's "streets" are defined by large photographs encased in panels similar to those of a New York City bus stop, and white, papered walls are imprinted with computer-drawn plans and sections detailed to the level of working drawings. These walls release the tight space, as sky and vistas do for the city.

The exhibition includes grand schemes for two French cities. The one for Lille (pages 66-83, this issue) includes the Congrexpo exhibition and convention hall, which is also known as the Grand Palais. The other represents Melun-Sénart, the last of the new towns encircling Paris. Koolhaas's plan for Melun-Sénart encapsulates his obsession with what not to build and where not to build it. He declares that the site is "too beautiful to imagine a new city there with innocence and impunity. We asked how to abstain from architecture." Esthetic pleasure derives from the coherence of the not-to-be-built-upon voids in the plan—acres that include old villages, farmland, forests, and a beautiful landscape between the forests where French kings once chased deer. "All the rest," Koolhaas decides, "we will surrender to chaos." But not totally surrender. Chaos is contained within a system of bands and islands made attractive for what he calls average everyday ugliness—supermarkets, linear office parks, and strip malls.

This theme is carried out also in a plan for the Urban Ring, a site in Yokohama, a port city south of Tokyo, which is to serve as a future city-within-the-city that is expected in 20 years to become the most densely populated part of Japan, with more than 1 million people per square mile. Here, Koolhaas proposes to build little, but to invest the site with functions that will achieve "minimal containment, minimal cover, minimal articulation of mass, to generate the greatest possible density with the least possible permanence."

The MoMA exhibit presents elegant drawings and models for some of Koolhaas's most brilliant but unbuilt work, including individual buildings conceived for architectural competitions: a National Library of France, in Paris (1989); a Center for Art and Media Technology, in Karlsruhe, Germany (1989); and a Library for the University of Paris, Jussieu campus (1992).

The best of these, the model for the National Library, is a great vertical box, with 20 floors of stacks and a grid of nine elevators entwined by floating placentalike voids that serve as adjuncts to the stack floors. "Since they are voids," Koolhaas explains, "they do not have to be 'built'; individual libraries can be shaped strictly according to their own logic, independent of each other, of the external envelope, of the usual difficulties of architecture, even gravity."

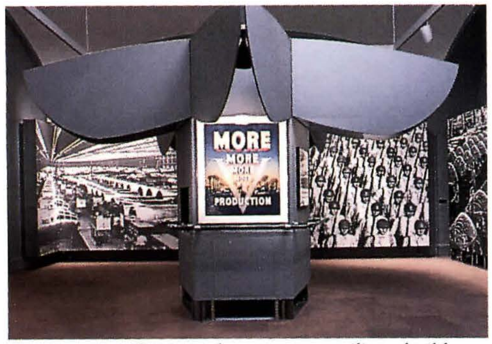
The Center for Art and Media Technology, called the Electronic Bauhaus, was designed as a futurist enclave bordering the classical city of Karlsruhe. Koolhaas intended his design to "generate density, exploit proximity, provoke tension, maximize friction, organize in betweens, promote filtering, sponsor identity, and stimulate blurring." The entire program is incorporated in a single 141-foot-square and 190-foot-high container. One of its walls is designed as an electronic billboard. Activities within the center can be projected on the wall in real time, alternating with commercials and news bulletins.

The University of Paris Library, for the windy, cold, empty campus at Jussieu, is meant to bring warmth and community life to its dreary setting. Its floors ramp and fold into each other, forming what Koolhaas conceives as a "social magic carpet" enclosed by continuous glass.

Although Koolhaas's completed works range from houses and the National Dance Theater in The Hague to housing in Amsterdam, only two major built works are included in the MoMA show—the Congrexpo (Grand Palais) at Euralille and the Kunsthal in Rotterdam (ARCHITECTURE, September 1993, pages 86-89). The Kunsthal contains three exhibition spaces, an auditorium, and an independently accessible restaurant. Koolhaas designed the museum in four parts to function as four autonomous projects, forming in his words, "a sequence of contradictory experiences that would, nevertheless, form a continuous spiral." It is fortunate that the photographs of the Euralille Congrexpo and the Kunsthal are included, if only because they approximate how Koolhaas's buildings actually look in the real world.

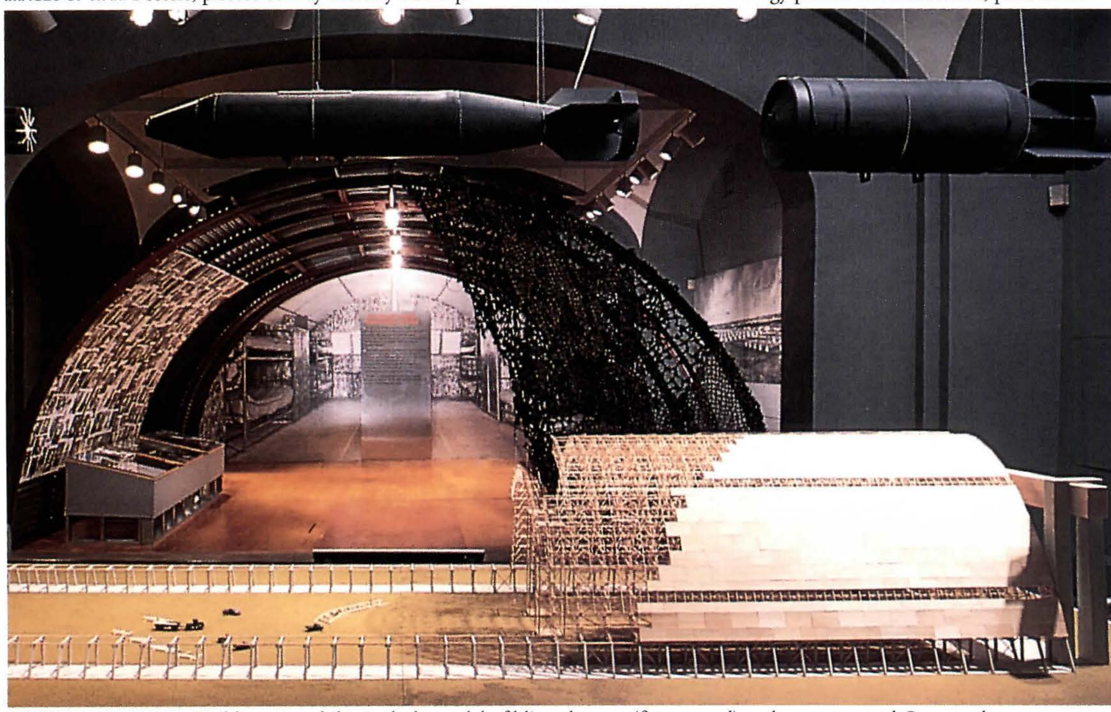
They reveal a Modernist esthetic still shaped and refined by the influence of the Russian Constructivists. They also display Koolhaas's remarkable talent as a designer of architecture as object, even though the architect's adroit, witty, literate, and often poetic argument relentlessly calls for the fragmentation, absorption, and eventual oblivion of these buildings into the esthetic of urban chaos.—*Mildred F. Schmertz*


V I S I O N A R Y



IMAGES OF WAR: Posters, photos convey military buildup.

NEW HOUSEHOLD: War technology produced frozen foods, plasticware.



MAXWELL MACKENZIE PHOTOS

INSTANT ARCHITECTURE: Buildings in exhibit include model of blimp hangar (foreground) and reconstructed Quonset hut.

Wartime Building on Display in Washington, D.C.

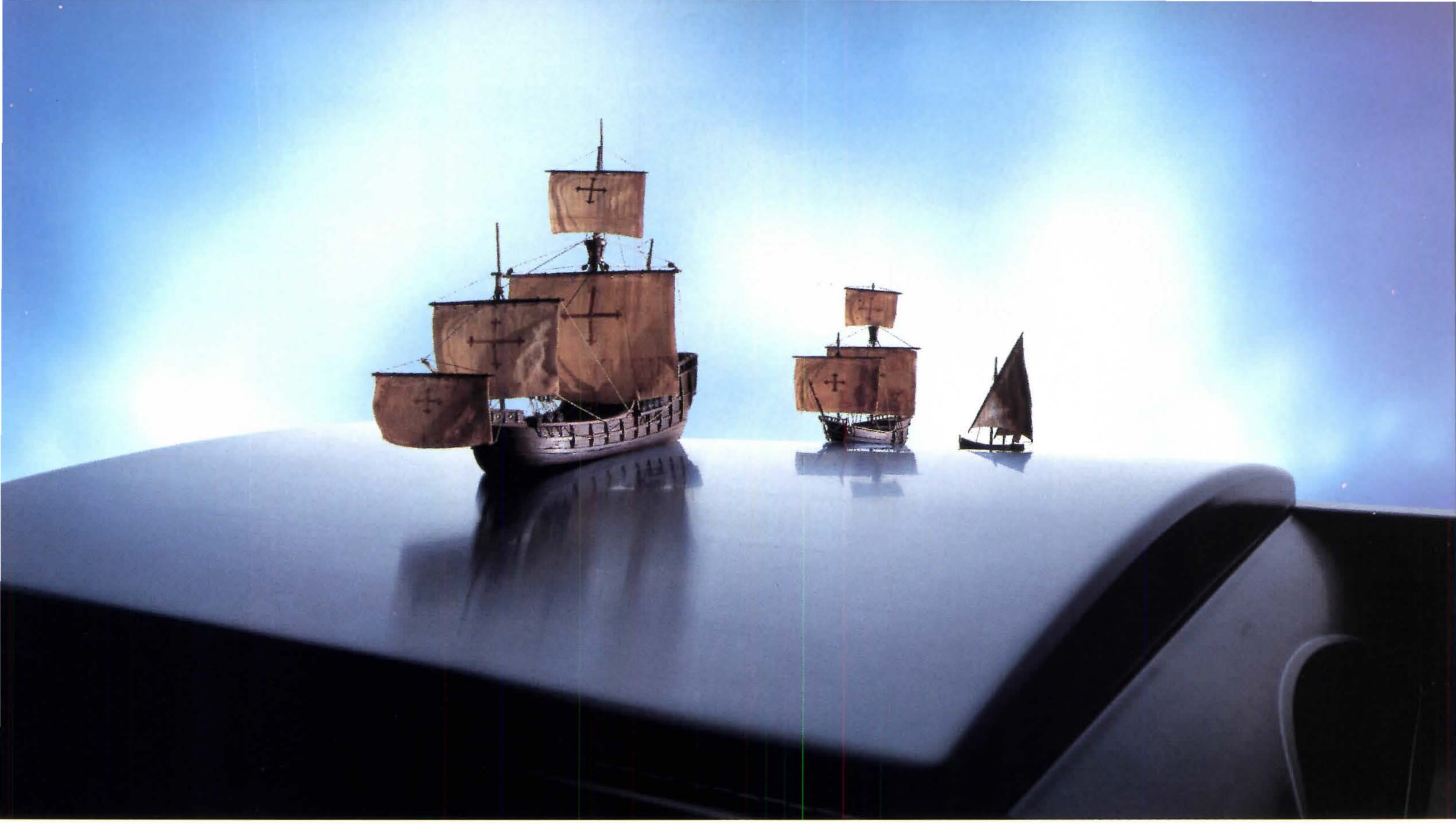
For years, scholars have treated World War II as a transition between the austerity of the Great Depression and the prosperity of the 1950s. But a provocative new exhibit at the National Building Museum in Washington, D.C., on display through December 1995, makes the point that the war years generated many modern developments that still shape American lives. Curated by Donald Albrecht and designed by Michael Sorkin Studio and Design Writing Research, "World War II and the American Dream: How Wartime Building Changed a Nation" examines the most extensive building program in U.S. history. It explores the paradoxical relationship between the destructiveness of war and the creativity of building.

Incorporating photographs, posters, vintage film, and numerous war-related artifacts—including a reconstructed Quonset hut—the exhibit chronologically traces America's emergence as the "arsenal of democracy." Our country built a wide range of structures for defense, sustained that effort by creating housing for workers who were relocated for defense jobs, and then shifted gears after the war to provide domestic products, ranging from mass-produced appliances to suburban houses for returning veterans.

The strong architectural undercurrent of the National Building Museum's exhibit focuses on the war's long-term effect on American architecture and design. Featured projects include Kahn's Dodge Chicago aircraft plant, Fuller's aluminum-and-plastic Dymaxion house, and Wright's never-built Cloverleaf housing project for Pittsfield, Massachusetts. Additional projects by Gropius, Neutra, Howe, and Breuer provide convincing evidence in the exhibit of the war's role as a catalyst for Modern architecture.

Because the museum did not want to put any sort of revisionist spin on the period, little information is presented about the negative repercussions of the war's aftermath: the environmental destruction and waste of energy caused by suburban sprawl, the esthetic poverty of the Levittowns and their progeny.

The exhibition leaves museumgoers with a 1944 quote from author Robert Nathan: "If we can so speedily ... mobilize our resources for such an immense war production ... can we not devote the same resources after the war ... to raise the standard of living of all our people?" This question is still as valid at the end of the Cold War as it was 50 years ago.—*Edward Gunts*



provements as the proposed 42nd Street trolley. "Midtown is the portal where the components of the region [New York, New Jersey, Connecticut] come together," Geddes observes. "Los Angeles and Rotterdam, for example, have really given architects a platform to help their cities emerge, and we wanted to stimulate this group to show what they could imagine for Midtown." The effort will culminate with an exhibition in 1995.

Marketing pitch

Each autumn, a group of New York City architects, engineers, and contractors meet for a rare evening of interindustry amity. This year, a crowd of 500 jammed into the New School's Tishman Auditorium to honor New York's "marketing all-stars." Large-firm honors went to Eugene Kohn of Kohn Pedersen Fox, and the small-but-swift-firm award went to architect Kevin Barnes, whose client list comprises a slew of New York developers. Margo C. Grant of Gensler and Associates captured honors for that firm's tireless marketing of interior design. Keynoter Philip Johnson rose to confess, "I don't know why I'm here... I don't even know what marketing is." Kohn, less disingenuous, insisted that a marketer's work is never done. During the ceremonies he sketched a huge commercial complex on his tablecloth, which was snapped up afterward by a client posing as a busboy.

Crosstown traffic

New York City's Regional Plan Association (RPA) has traditionally looked at Manhattan with a north-south orientation, neglecting the east-west ecology of Midtown. However, in preparation for its Third Regional Plan, the RPA recently established the Manhattan Crosstown Architects Committee to "create a crosstown cultural district within a new armature of surface transportation," maintains Robert Geddes, who heads the committee.

The RPA invited architects whose work gives them a "stake" in midtown, explains Ray Gastil, RPA's regional design director. Volunteers include Max Bond, Peter Eisenman, Steven Holl, Richard Meier, Henry Smith-Miller, Robert Stern, Marilyn Taylor, and Bernard Tschumi.

The committee is to devise ideas for Midtown's future, based upon such planned infrastructure im-

Soft on crime

Jails and prisons now rank among the most reliable, albeit depressing, building types for architects to pursue. But watch out—nonarchitects have designs on this territory too. In fact, the U.S. Patent Office has granted the first patent ever for the design of an entire prison to inventor Andrei Moskowitz of New York. Moskowitz's prison looks less like Leavenworth and more like an Adirondack camp, with clusters of 20 little cabins on 80-foot-by-40-foot plots—each surrounded by "soft" barriers of chain-link fencing and razor wire. Beyond the compound would lie towers, guards, and cameras. Inside, however, prisoners would have computers, their own kitchens, and tiny gardens.

Slave drivers

There's never enough to keep those lawyers busy....Yes, principals, it's official: You can legally treat your associates like professionals, that is, as exempt from wage-and-hour laws, even if you don't pay them accordingly. In October, the U.S. Department of Labor ruled that architectural firms don't have to pay associates overtime, provided they perform menial, unglamorous chores less than 50 percent of the workweek or more than 50 percent of the workweek for less than half the workyear.

Guide to Philadelphia

A good chunk of Philadelphia's urban core has sprung up since 1984, when the last definitive guide to the city's architecture was published. Now, the city's nonprofit Foundation for Architecture has recently published *Philadelphia Architecture: A Guide to the City*, edited by John Gallery, which provides a comprehensive look at 300 years of building in the city. The 188-page volume costs $18.95 and can be ordered by calling (215) 569-3187.

THE WHITE OF FLIGHT

Photography: Beck's Studio Photography, Jackson Heights, NY
Design Architects & Engineers: Leo A. Daly - Planning • Architecture • Engineering • Interiors; Design Consultant: Pei Cobb Freed and Partners

The Air Traffic Control Tower at J.F.K. International Airport . . . a dominating 320 foot cast-in-place concrete marvel utilizing what else? Lehigh White Cement, naturally! Another example of the innovative potential of this legendary material.

As an architectural design and structural building medium, concrete made with Lehigh White Cement offers opportunities for creativity, ingenuity and superior building engineering that are unparalleled with other construction materials.

Among its unique combination of physical properties and design benefits are virtually unlimited capabilities for the incorporation of shape, texture, color, size, pattern, moisture resistance, insulation and other attributes in building design.

The sky is the limit with Lehigh White Cement. Lehigh... The Right White for any concrete purpose!

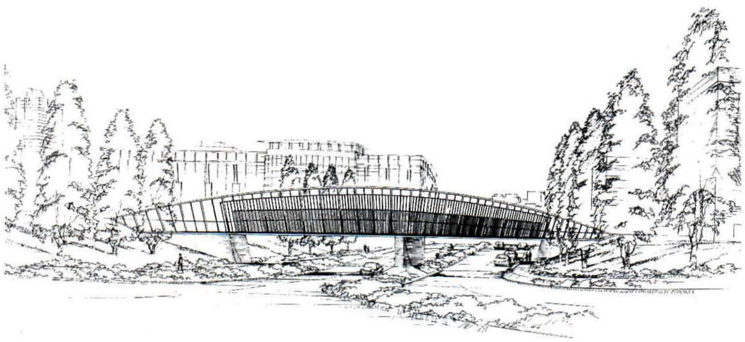
For literature or additional information call 1-800-523-5488 or write to Lehigh Portland Cement Company, 7660 Imperial Way, Allentown, PA 18195

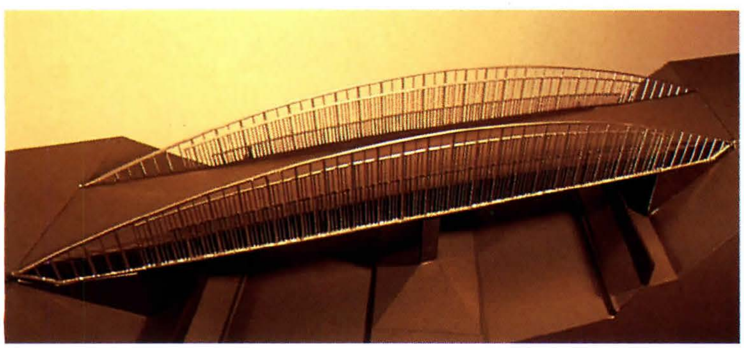
Circle 168 on information card

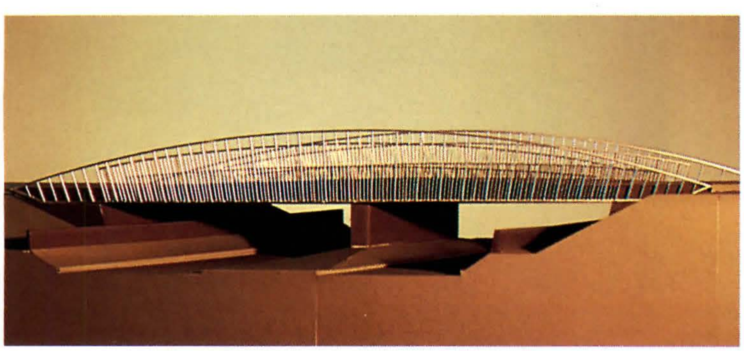
LEHIGH WHITE CEMENT

THE DESIGNERS PALETTE

On the Boards







CHAD FLOYD PHOTOS

Worcester Bridge
Worcester, Massachusetts
Centerbrook Architects
Maguire Group, Engineers

Plans for a new medical complex and convention center prompted the decision to sink a main thoroughfare and raise a new railroad bridge, creating a vehicular gateway to the city of Worcester. New Britain, Connecticut-based Maguire Group designed the steel-and-concrete bridge, and Centerbrook Architects and Planners of Essex, Connecticut, designed its arched enclosure.

The ornamental railing will be constructed of alternating polished and sandblasted stainless steel members; the bridge deck will provide lateral stability for this self-supporting structure. Worcester Bridge is scheduled for completion next fall.—*A.C.S.*

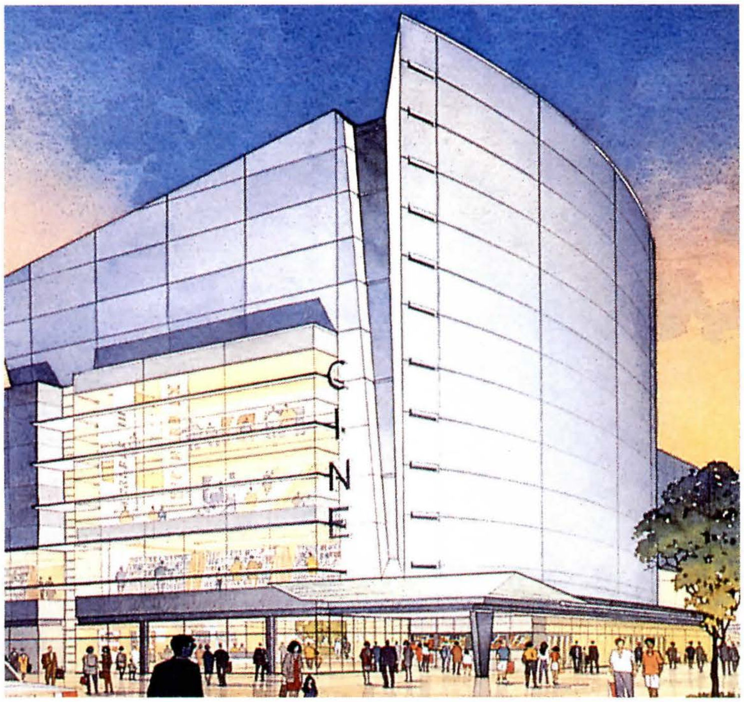
On the Boards

RICHARD MANDELKORN PHOTOS

Entertainment and Retail Center
San Francisco, California
Simon Martin-Vegue Winkelstein Moris and Gary E. Handel Associates

A $52 million entertainment and retail center by architect Simon Martin-Vegue Winkelstein Moris will complete the last phase of San Francisco's ambitious Yerba Buena Gardens cultural district, developed by the San Francisco Redevelopment Agency. Scheduled to begin construction this July, the center will be located in the center block of the 22-acre Gardens, on the western perimeter of Romaldo Giurgola's elliptical Esplanade park.

Boasting the Bay Area's first commercial IMAX theater, as well as three levels of retail, several restaurants, and 15 cinemas, the retail and entertainment center will provide a



stream of day and evening activity for the cultural district. Across the Esplanade, Polshek and Partners' Center for the Arts Theater (ARCHITECTURE, February 1994, 58-67) and Fumihiko Maki's 1993 Center for the Arts Galleries and Forum cater to the performing arts.

A palette of materials similar to Polshek's and Maki's will tie the entertainment complex to its environs. Glass curtain wall, corrugated and gridded metal panels, and transparent screens that display colored lights will clad the new steel-framed entertainment center.

An open-air arcade bisects the ground level and links the Esplanade with residential neighborhoods to the west. An exposed stair on the south face and a pedestrian bridge over Howard Street will connect the new center with the Moscone Convention Center.—*A.C.S.*

ADVANCING THE ARCHITECT'S COMPETITIVE EDGE

Design

FOR ARCHITECTS SEEKING

DESIGN PIONEERS ARE FINDING SURPRISING WAYS TO ACHIEVE BETTER BUSINESS PERFORMANCE AND PERSONAL FULFILLMENT
New knowledge, better methods, and a winning "attitude IQ" combine for real progress for the design professional. The rules in the arena of design have changed . . . and the need for up-to-the-minute information is more important than ever before.

THERE IS A REVOLUTION UNDERWAY
The decision to pursue a new strategic plan is a complex, make-or-break challenge. *Design Intelligence* is written for those who are seeking a better way. But *Design Intelligence* is not for everyone . . . it is a limited edition for those intending to "intercept the future."

Design Intelligence offers unparalleled value. It goes deep inside the critical issues you are facing today and offer new perspectives and new solutions.

Design Intelligence doesn't complain—it brings together thoughts for constructive action. You will be coached toward discovering new ideas and implementing them into action.

Design Intelligence is published from the combined resources of BPI Communications, Inc., the publishers of *Architecture* and *Interiors* magazines, and Greenway Communications International, a specialized research and information company. The Design Futures Council provides expert panels and research priorities. Each subscriber becomes an affiliate of the Design Futures Council network and its online one-on-one interactive program services.

DESIGN INTELLIGENCE WILL BE PARTNERING WITH THE WORLD'S BEST RESOURCES
Business and economic information will be reported from each of the twelve Federal Reserve Bank regions and global research will be included from our World Bank editor. Our expert analysts will be positioned in each of the regions. In addition, The Coxe Group Inc. Management Consultants will write case studies and provide information on financial management, fees, profitability, and ownership transition. Jim Cramer, Publisher of *Design Intelligence* and author of *Design + Enterprise* will write on communications, benchmarking, and competitive fitness.

In fact, you can expect to see a variety of large and small firms share their secrets. You can also expect their clients to say what they like and don't like. You can expect futurists to point toward the criteria that will determine who the successful firms of the future will be.

THE COMING INDUSTRY RESTRUCTURING
Quality and efficiency will be common. Sought after designers will offer much more. As *Design Intelligence* reports on these issues you can expect to see lists, rankings, and independent opinions on successful firms in each region and each design specialty. Also, *Design Intelligence* surveys will evaluate schools of design, architecture and engineering. Deans will rank firms as to the best internship experiences today. Leading designers will share where they would go to school if they could choose all over again. Yes, *Design Intelligence* will be independent and outspoken. It will also be real . . . and on the leading edge of change and opportunity.

OTTAWA CITY HALL: Complex includes entrance pavilion (left), 1958 building, cafeteria (foreground), tower, and council chamber.

Ottawa's latest monument is suburban, not civic, in scale and demeanor.

AERIAL VIEW: Island isolated from city.

COLLAGE: Glass cones and pyramids top entrance pavilion (left) and council chamber.

A Mall, Not a City Hall

It's amazing what they're calling a city hall nowadays. Ottawa City Hall, completed in 1993, looks more like a municipal mutt than a civic pedigree. Moshe Safdie was awarded the job just as his National Gallery of Canada was being completed down the road. The mayor of Ottawa wanted a landmark just like it. That's what he got, more or less.

Safdie's big move at the gallery was a glazed porch housing a long stone ramp that culminates in a glassy Great Hall, his "giant candelabra." The corresponding gesture at Ottawa City Hall, located on Green Island in the Rideau River and linked to the rest of Canada's capital by bridges, is a glazed porch running the full length of the riverside facade, leading to a stone-clad bulge containing the council chamber.

Since Green Island is both geographically and psychologically remote from the heart of the city, the building makes as much visible noise as possible to compensate for its exile from Main Street. It's certainly teeming with things. There are plenty of giant candelabra, this time in the form of glass chapeaux touching the sky. Of course they all light up at night. A glass witch's hat shoots through the middle of a monumental stone frame to form the entrance pavilion, and a glazed pyramid tops a café. A crystalline spire marks a reception area. The council chamber was fitted with the most elaborate of brittle millinery—a combination half-pyramid and cone. From across the way, you'd swear that you were looking at a shopping center—Ottawa City Mall. Entrance pavilion and council chamber could be anchor tenants, like Bloomingdale's and Wal-Mart.

The place is not all porch. There are two new wings joined by enclosed pedestrian bridges. They run perpendicular to the 1958 city hall, which Safdie was obliged to renovate and integrate. His precast concrete cladding was toned to match the limestone skin of the International Style neighbor. With the new so eager to upstage the not-so-old, this deference seems trite. Other echoes of a bygone era include an aluminum and glass curtain wall; but punched windows knock us into the present. A profusion of wooden screens, supposedly a Japanese motif, attempt to cut the interiors down to human size. Finding one's way around is still a problem, as several of Ottawa's elected politicians made sure I knew.

The 1958 structure, renovated as staff offices, a meeting room, and an art gallery, nonetheless remains a compelling piece of architecture. A composition of its time, it consists of a slab and boxy council chamber standing forward on columns. For refinement of detailing and spatial clarity, the new parts can't touch it. It rebukes Safdie's lumpy collage of objects, which also includes "that tower," as it's come to be called—an infamous 56-meter-high guarantee of max visibility that was eliminated from the project in 1991 to cut costs. Safdie threatened a lawsuit, claiming infringement of copyright. One editorial writer compared the "amputation" of his scheme to the defacing of a Monet. In the end, Safdie got to erect the framework of his tower, originally conceived as an observation deck. It's a big "so-what?" on a full-up site.

Strangely missing from Ottawa City Hall is any notion of public life. It doesn't help that the building is oriented toward the river and federal officialdom and doesn't address adjacent neighborhoods, as it might have. For \$52 million, citizens do get a paved and landscaped plaza between the wings, but it's not a public square, it's a courtyard. Ottawa City Hall is scenic, not civic. For all the clutter and headgear, it still has an identity problem. It doesn't have a front or back, just sides. It can't be confronted: It's just there.—*Adele Freedman*

Adele Freedman is the architecture critic of the Globe and Mail *in Toronto, Ontario.*

1995 NATIONAL AIA ARCHITECTURAL PHOTOGRAPHY COMPETITION

AIA

THIS COMPETITION IS OPEN TO ANY ARCHITECT registered in the United States. The contest is also open to Associate members of the AIA and student members of AIAS in good standing. Professional affiliate members are not eligible. All entries must be postmarked by March 1, 1995, and must include a completed entry form. Images for the 1997 Engagement Calendar will be selected from all submitted entries. Entry forms and full contest details will appear in the January and February issues of *AIArchitect* or can be obtained by sending a self-addressed stamped envelope to:

AIA ST. LOUIS

911 Washington Ave., #225

St. Louis, MO 63101

For more information, call 314-231-4252

1996 Architecture Calendar Cover—*This Is My Life*, Miami Beach, Florida; Arthur J. Marcus, AIA, Miami Beach, Florida

1994 First Place—*Reflected*, Ebeltoft, Denmark; Jens Henry Vange, AIA, St. Paul, Minnesota

1994 Second Place—*Mysterious Glow*, *Zacatecas*, Mexico; Steven House, AIA, San Francisco, California

1994 Third Place—*Collage*, Arcos, Spain; Andrew Goldman, AIA, New York, New York

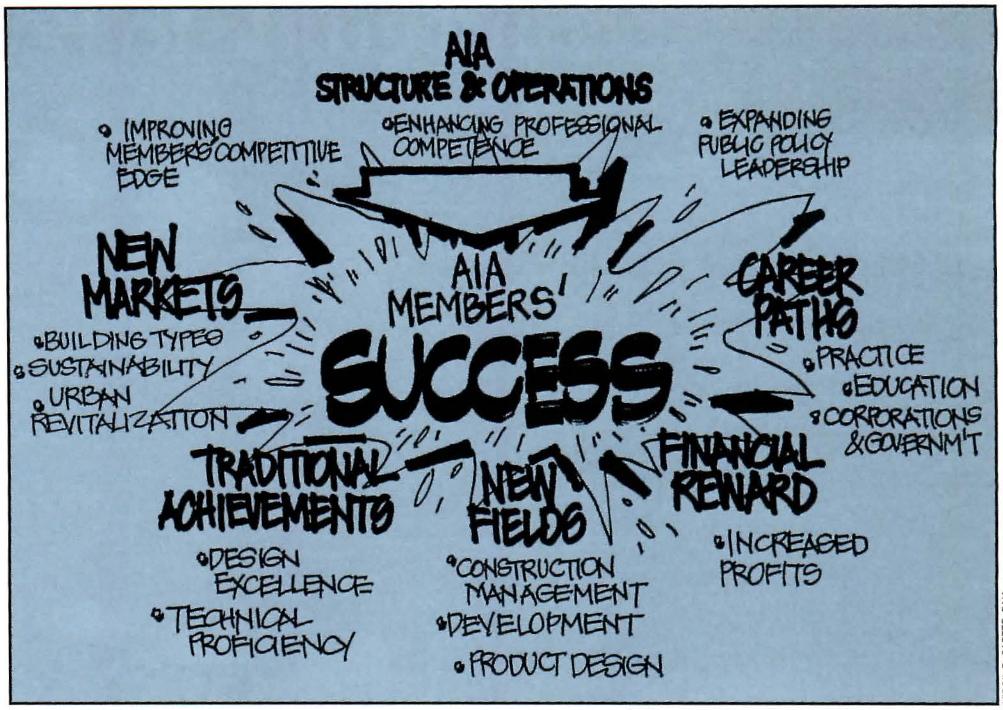
1994 Louise Bethune Award—*Long Red Barn*, Shelburne, Vermont; Thomas V. S. Cullins, AIA, Burlington, Vermont

Opinion

AIA's New Directions

President Chester Widom outlines how AIA is changing to boost members' success.

ABOVE RIGHT: Sketch summarizes diverse activities leading to architects' success.



VIRGIL R. CARTER, FAIA

Architects are obsessed with finding quick solutions to current challenges facing the profession, but we are also very quick to blame outside forces for diminishing our influence. Our current problems, however, do not lie solely with an unappreciative public nor with the clever competitiveness of contractors, developers, or others who tilt the playing field to their advantage. Our real problem is our failure to anticipate, much less design, new rules and new roles for architects in the 21st century.

It is time for the profession to redefine its position in a much-changed design and construction industry and a more diverse and sophisticated world. New approaches to "making architecture" provide us with an unprecedented opportunity to use our problem-solving expertise in new ways, provided we get our house in order.

The AIA has spent a great deal of energy searching for ways to ensure the professional success of the membership in this changing environment. Over the past decade, we have generated a variety of studies to examine the future of the AIA and determine how it can better serve the profession. Directions Eighties, Vision 2000, the Membership Futures, and Service Delivery task forces were important steps. But redesigning a professional society with more than 137 years of history and more than 56,000 architects is not easy. Although we are far from our goal of reshaping the Institute for the next century, we have made substantial progress in reworking the responsibilities, operations, and culture of the AIA's leadership and staff to address the most pressing needs of our members.

Specifically, the board has redirected our tendency to micromanage the Institute. We are now focusing on "big-picture" objectives, such as new modes of project delivery and architectural education, that have a direct effect on our membership.

Based on this approach and a 1993 study of the AIA conducted by the Summit Consulting Group, a Rhode Island-based organizational management consultant, Terry McDermott, the AIA's new executive vice president and CEO, reorganized the AIA staff to focus on government affairs, communication with the public, member communication, and the role of architects within the construction industry.

Meanwhile, we are well on our way to increasing the quality, responsiveness, and productivity of the Institute. We are moving ahead on joint ventures with private-sector companies to improve services such as Masterspec, *Profile*, and the *Environmental Resource Guide*. And by reducing the number of AIA staff positions from 220 to 150, we have gained financial resources to meet member priorities. We also intend to eliminate supplemental dues by 1997 and maintain individual dues at current levels with minimal consumer-price-index increases.

Although the changes in the structure and operation of AIA are necessary, they are important only if they can help promote the

success of architects. The definition of success might include achievement in the traditional roles of design excellence, technical proficiency, and, of course, firm profi[t] might also embrace accomplishme[nt] as lated fields such as constructio[n] ...rs have development, and product ...t architects, education, business, and ...our position AIA's officers and ...p; the en- identified several ...petencies as architects' success ...r competitive in the bu... place; the promo- hance... markets for archi- ch... ...se in awareness and ...r public policies. Our ...nclude the following:

...aborative industry: To help re- ...dership position within the con- ...uction industry, we are declaring an end to the "cold war" within the building team. We are increasing proactive collaboration with contractors, clients, and other design ...essionals, as well as with the lawyers, ...nkers, and public officials who exert such a strong impact on our projects.

For example, a liaison has been established between the AIA executive committee and its counterpart at the Associated General Contractors (AGC). Among the accomplishments to date is the completion last November of the jointly sponsored *Guidelines for Procurement of Design-Build Projects in the Public Sector*. AGC has also agreed to ally with us to press Congress to increase minimum fees on federal projects.

The AIA also recently concluded a partnering agreement with the Army Corps of Engineers, and we are approaching an agreement on compensation for project partnering on Corps-sponsored projects. Similar activities are under way with various other federal agencies, including the General Services Administration and Department of Veterans Affairs.

A stronger AIA voice in architectural licensing and reciprocity: Based upon a resolution of the 1993 AIA convention, the Institute has formed a task force to review licensing and reciprocity issues for the profession. While the responsibility of the National Council of Architectural Registration Boards (NCARB) is limited to protecting public welfare, the AIA's mandate includes protecting both public welfare and the profession. We will assist state components lobbying for changes in licensing laws that will ensure interstate reciprocity and equality for all architects and public input into the process.

A stronger market for expanded architectural services: A constant at the top of every survey of AIA membership is a request that the AIA tell the public what architects do and how we bring value to our community. The Institute is now mounting a national advertising campaign designed to reach business, institutional, government, and residential clients through national magazines.

A stronger AIA voice in public policy formation: Supporting the advertising program, the AIA will leverage the high esteem architects already enjoy with the public, allied professionals, and government by hosting

several important public policy discussions. Under consideration for this year are forums focusing on military base closures, urban development, and infrastructure. Our objective is not only to develop solutions to these issues, but to illustrate the architect's ability to collaborate and to lead.

Continued application of qualifications-based selection procedures by public clients: Because of changes in Congress—specifically, the loss of U.S. Congressmen Jack Brooks, Hon. AIA (D-Texas) and Dick Swett, AIA (D-New Hampshire)—the AIA's government affairs group is working to identify current members of Congress who are potential champions for architects and architecture. Joining with other design and construction associations, the AIA will mount a campaign to protect the qualifications-based selection procedures for government contracts prescribed by the Brooks Act.

Clearer, focused member communication: Because information is the currency of the 1990s, the AIA is streamlining communication among members. This initiative already has produced our newspaper, *AIArchitect*, which consolidates several newsletters into a more focused, accessible medium. We are also redesigning AIAOnline to be more user-friendly and useful to all AIA members.

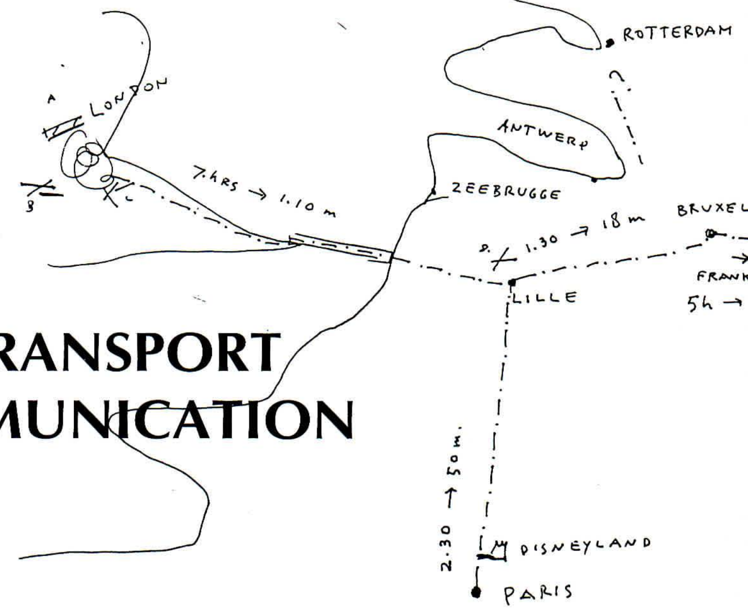
New federal legislative initiatives: The Institute is developing a proposal stimulating community investment through tax incentives. By encouraging partnerships between the public and private sectors, these tax incentives will prompt community revitalization and economic development. The tax package would include a capital gains tax reduction; a 20 percent tax credit for costs involved in rehabilitation or development of new commercial or business property; and the restoration of the historic rehabilitation tax credit to its pre-1986 viability.

At the same time, those federal programs that are already in place and work well—such as the Community Development Block Grant Program and the HOME Program—must continue to be protected. Other legislative initiatives that will be pursued include reauthorization of the Intermodal Surface Transportation Efficiency Act of 1991 and the National Endowment for the Arts.

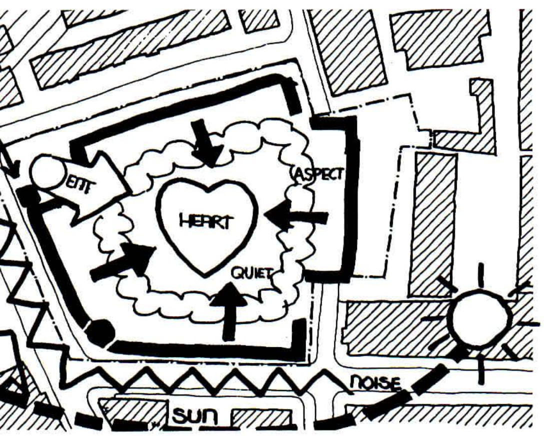
Work continues on improving military base closing procedures and defending appropriations for urban infrastructure and federal construction projects.

These initiatives represent only a part of our strategic plan for the AIA's future. They are, however, signs of a rejuvenated, refocused, and recommitted Institute. Because our world is in constant flux, the AIA's long-term strategy must remain flexible, and we must embrace the potential for continuous change. As architects, we tell our clients that there is no such thing as a perfect set of construction documents; nor is there a perfect strategic plan. There will be change orders. But the important point is that the AIA maintains its focus on our mission to help our members become more and more successful.—*Chester A. Widom*

Chester A. Widom, FAIA, is the 1995 AIA president and principal of Widom Wein Cohen in Santa Monica, California.

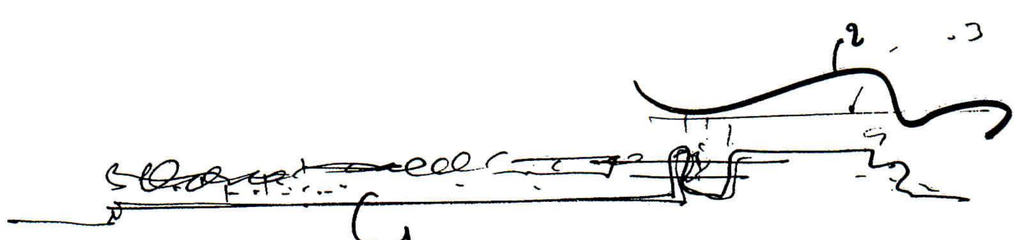


HUBS OF TRANSPORT AND COMMUNICATION



"Far can be near now," claims Dutch architect Rem Koolhaas, whose vast new city at a high-speed rail terminus in Lille, France, is nearly complete. Euralille, a major hub for the fast trains that will compress Europe's distances to mere hours, incorporates office towers, retail buildings, and a convention center by Christian de Portzamparc, Jean Nouvel, and Koolhaas's firm, Office for Metropolitan Architecture. Two hours distant from London and Paris, Euralille symbolizes the shrinking world community made possible by the new transportation and communication hubs featured in this issue.

Equally prescient is Renzo Piano's mile-long, stainless-steel-clad Kansai International Airport in Osaka, Japan. Built on an artificial island, the airport's computer-generated curves propel air and orient travelers. And in London, Piano's former collaborator Richard Rogers defines a new image for a British television company, projecting confidence and modernity with a High Tech esthetic. In this issue, far becomes very near indeed, as architecture facilitates high-speed travel and televised communication.



BROADCAST NEWS

I am searching for an architecture that will express and celebrate the ever-quickening speed of social, technical, political, and economic change.
—Richard Rogers

Britain's Channel 4 was founded in 1982 as the country was first waking up to the radical political philosophy of its new prime minister, Margaret Thatcher. To Thatcher, big multipurpose corporations like the British Broadcasting Company (BBC) and its regional commercial rivals needed the stimulus of competition to become more efficient. Channel 4, founded by an act of Parliament, was to operate more like a publisher than a traditional broadcaster: Rather than creating programs of its own, the new company would simply provide a platform for the work of various independent producers, an idea very much in tune with Britain's political and economic climate in the 1980s.

Since it had no need for studios or elaborate production facilities, Channel 4 set up its headquarters in an ordinary office block on the fringe of London's West End. It turned out to be a brilliantly successful venture, catering to specialized audiences of all kinds, from opera buffs to devotees of American football. Channel 4 grew throughout the 1980s until it employed a staff of 500 and occupied five separate buildings. By 1990, the company's expansion and switch to digital broadcasting spurred it to consolidate in a single building. Failing to find one suitable, the station's management held an architectural competition—won by Richard Rogers Partnership—for a new building to be constructed on a site in Westminster.

Richard Rogers Partnership is one of a small band of British architects who in the 1970s and 1980s developed High Tech, a style typified by the Pompidou Center in Paris (1977), designed by Rogers in partnership with Renzo Piano, and by Lloyd's insurance market in London (1984), designed by Rogers. Although the Channel 4 building is much smaller than these High Tech master-

RICHARD BRYANT/ARCAID

FACING PAGE: Entrance to Channel 4 is flanked by meeting rooms (left) and wall-climber elevator tower (right). **RIGHT:** Close-up view reveals steel frame (red) and custom-designed elevator cabs with glazed inner doors.

RICHARD BRYANT/ARCAID PHOTOS

PRECEDING PAGES: Curved staircases flanking entrance are clad in gray powder-coated aluminum. Inside lobby, curved glass wall is braced by stainless-steel cables. **FACING PAGE:** Curved glass wall is hung like a curtain from steel brackets at roof level. Hangers *(top left) are spring loaded* to accommodate movement. **BELOW:** Meeting rooms are clad in aluminum and supported by a slender, pin-jointed steel frame, painted deep red.

pieces, it displays some of the same characteristics. Shaped like an L, with two four-story office wings that meet in a main entrance on the street corner, the building is bigger than it appears when viewed from the street. Office accommodations wrap around the back of the entrance hall in a 90-degree arc, and a two-story basement contains technical equipment, a minimal television studio, and a theater under the entrance forecourt. Enclosed by the L and neighboring apartment blocks, a landscaped garden is sited on top of a three-story underground parking garage.

A requirement of the client was that the finished product be a piece of marketable real estate rather than a tailor-made company headquarters, and indeed, with minimal adaptation, the structure could serve as an ordinary office building. The concrete-framed office wings consist of cellular offices on both sides of a central area for support staff.

Because calculations revealed that cooling would consume more energy than heating, external walls are fully glazed to maximize heat loss, while solar heat gain is controlled by panels of expanded metal mesh shading the glass. These panels—which are hinged to allow the glass to be cleaned—create a beautifully simple and economical solution that eliminates all the complicated apparatus of louvered canopies and awnings. Detailing throughout is extremely refined, with every junction resolved both internally and externally. It is impressive, for example, that the wall of the quadrant facing the garden is genuinely curved and not faceted.

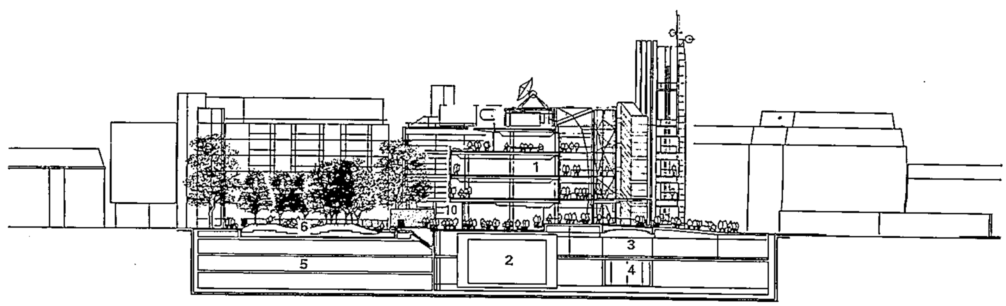
But if Channel 4 wanted a neutral, flexible building, it also wanted a building that would project an image of confident modernity. Television, after all, is a branch of show business. What is fascinating about this building is its use of High Tech language to symbolize the creative and innovative ethos of Channel 4 by dramatizing functional elements such as fire stairs, elevators, flues from basement boilers, a rooftop mechanical room, a latticed steel mast to support antennas and satellite

FACING PAGE: Cantilevered pedestrian galleries overlooking lobby form an alternative circulation route between office wings. Floors of galleries are concrete with inset glass lenses.
SECTION AND PLANS: Offices are placed over basement containing studio (box in basement plan) and theater. A three-story parking garage is located under garden.
FOLLOWING PAGES: Glass entrance canopy shelters bridge over glass rooflight. Rooflight beneath main entrance bridge lights basement theater foyer.

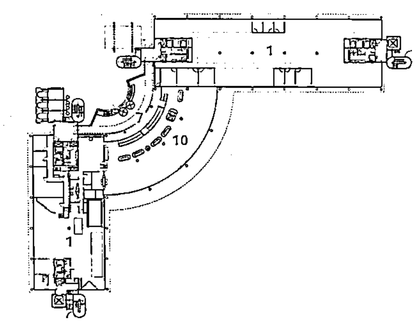
dishes, and four boxlike meeting rooms stacked in an elegant, pin-jointed, exposed steel frame. These articulated, towerlike forms flank the concave wall of the entrance hall in a Constructivist composition reminiscent of Iakov Chernikhov's visionary projects of the 1920s and 1930s. And the concave wall is perhaps the most dramatic element of all: a curtain of glass suspended from steel brackets at roof level and braced internally by a cat's cradle of stainless steel cables. Designed with the help of architects/engineers Rice Francis Ritchie, the wall was built by the same subcontractor responsible for I.M. Pei's glass pyramid at the Louvre in Paris.

Richard Rogers and his team have been developing and refining this machinelike architecture over two decades, and they do it superbly well. The obvious precedent for Channel 4 is the Lloyd's building, with its satellite towers containing vertical circulation and service elements such as elevators and toilets. But Lloyd's was a very different kind of client, a venerable City of London financial institution, and the satellite tower strategy had to be justified in functional terms. Turning the conventional office plan inside out by placing service cores outside the main envelope, argued Rogers, offered two main benefits: it freed the plan of all internal obstructions and made elements such as elevators and air-conditioning ducts more accessible for maintenance and upgrading. However, the reasons for the unusual strategies were as much architectural as functional—the dynamic expressiveness of the satellite towers really mattered.

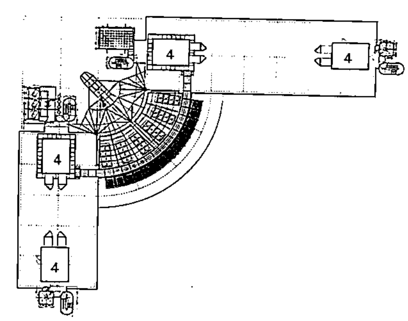
In the new Channel 4 building, this architectural agenda is explicit, and the Constructivist gestures are clearly symbolic. Less clear is why the sheer metallic physicality of High Tech was considered an appropriate symbol for a company that deals in something so fundamentally ephemeral and immaterial as television. While information technology has moved into the digital age, the architecture that houses it remains firmly fixed in the age of the machine.—*Colin Davies*



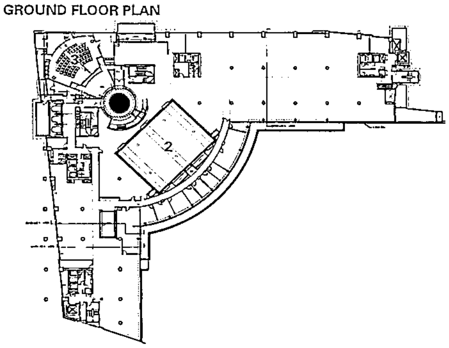
SOUTHEAST-NORTHWEST SECTION 20'/6m



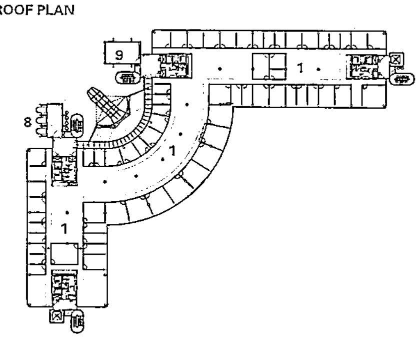
GROUND FLOOR PLAN



ROOF PLAN

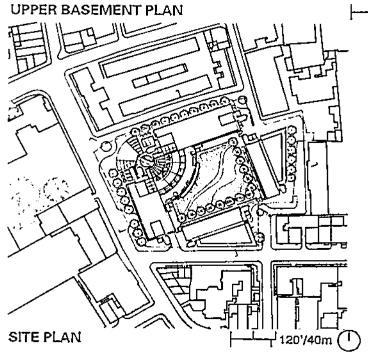


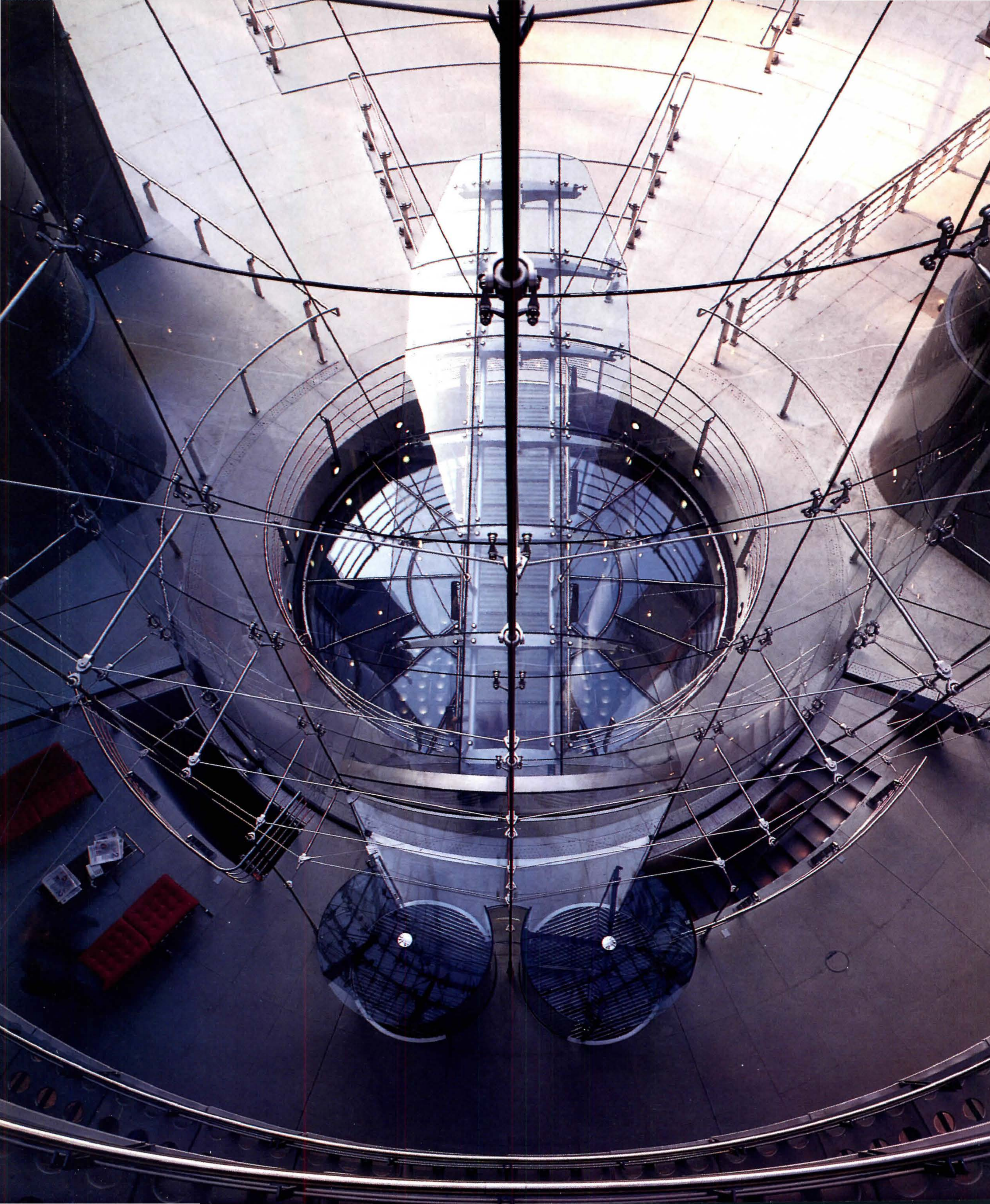
UPPER BASEMENT PLAN 40'/12m



TYPICAL OFFICE FLOOR PLAN

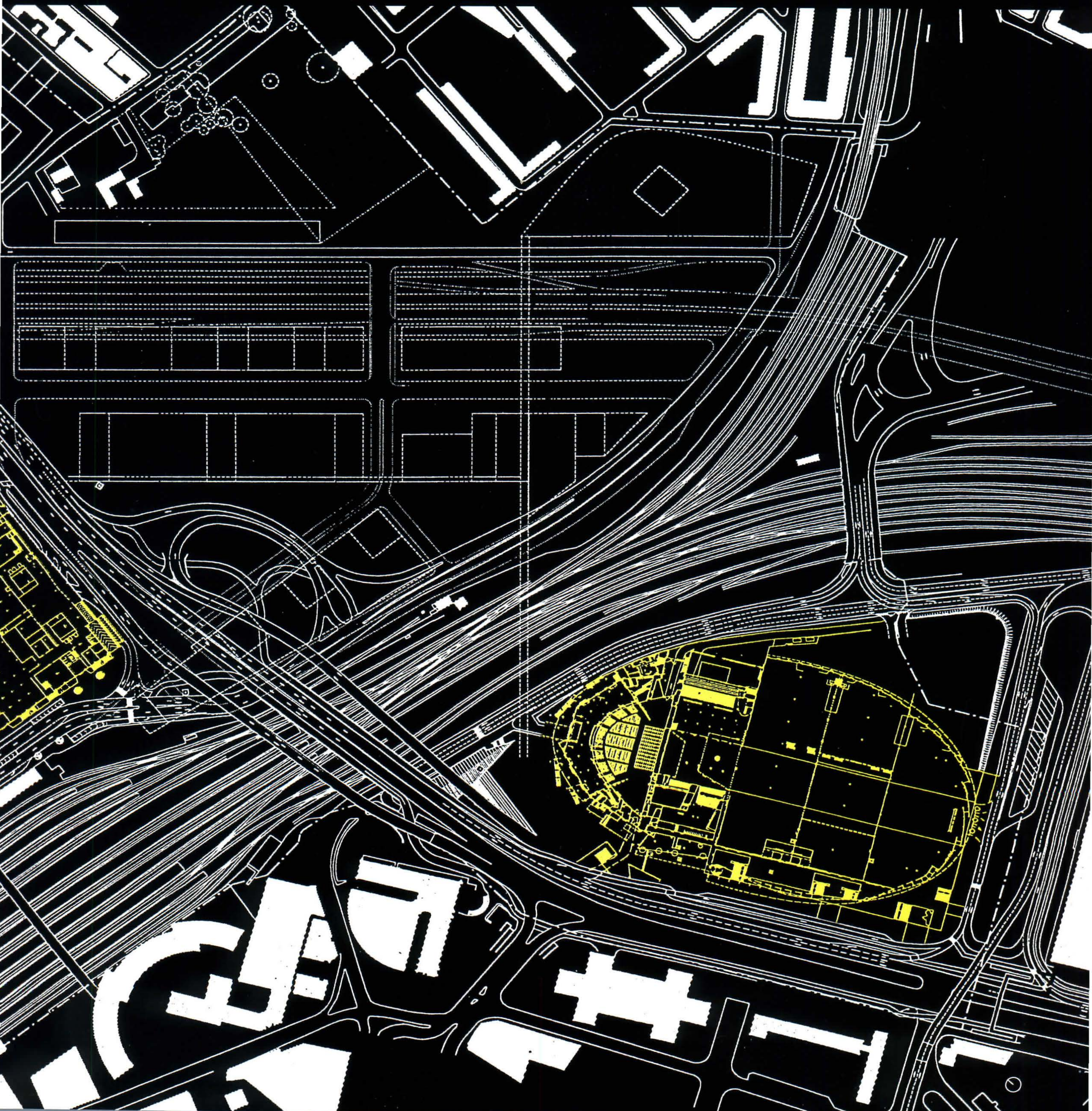
1 OFFICE
2 TV STUDIO
3 THEATER
4 MECHANICAL
5 PARKING GARAGE
6 GARDEN
7 MAIN ENTRANCE
8 ELEVATOR TOWER
9 MEETING ROOM
10 RESTAURANT


SITE PLAN 120'/40m


DAVID CHURCHILL/ARCAID PHOTOS

Euralille
Lille, France
Rem Koolhaas/Office
for Metropolitan Architecture

CROSSROADS OF EUROPE



Our strategy equips Lille for its role as headquarters of the theoretical community generated by the new infrastructure. What is important about this place is not where it is, but where it leads and how quickly.
—Rem Koolhaas

With the closure of its mines and attendant industries in the 1980s, the northern French city of Lille faced a bleak future until Mayor Pierre Mauroy saw how its location could lead to regeneration. Noting that Lille lies between Paris, London, and Brussels, Mauroy lobbied for his city to be a key juncture in the high-speed rail network now gradually linking western Europe's major cities. Moreover, he determined that the new station for the TGV (train à grande vitesse) could be located on the city's eastern edge, on a former defense site. Here, the station would spawn a major center that would not only serve and employ Lille's citizens, but also attract multinational corporations in search of a convenient European base.

The TGV now links Lille with Paris in an hour and London in two hours. In 1996, Brussels will be 25 minutes away, and eventually, Amsterdam and Cologne will be two hours distant. Lille will then be the center of what Dutch architect Rem Koolhaas calls a "virtual community," estimated at nearly 100 million people. Koolhaas's involvement began in 1988 when his firm, Office for Metropolitan Architecture (OMA) was chosen to masterplan the new development now known as Euralille. Selected from among eight firms because its ideas were the most challenging, OMA conceived the 300-acre site as a combination of functions oriented to this vast hinterland, a mix rich enough to create a distinctly urban environment that would also be an integral part of the existing city core.

Jean-Paul Baïetto, the third key figure in Lille's transformation, is Euralille's developer and OMA's client. Baïetto endorsed proposals for layered, interlocking buildings that would create the "culture of congestion" Koolhaas extolled in his 1978 book *Delirious New York*. Undismayed by the inherent difficulties of such layered architecture, Baïetto saw the mutual interdependence of the buildings' different owners as useful: They would find it more difficult to renege on commitments to build. Such synergetic cooperation is another dimension of Koolhaas's vision of a culture of congestion, generated by the ever-proliferating, unpredictable interactions that inevitably occur among the many uses jammed together in the modern metropolis.

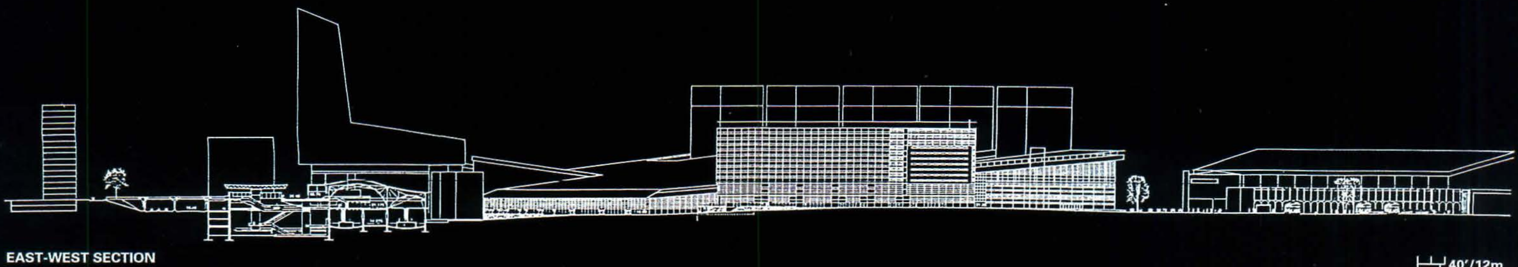
In masterplanning Euralille, OMA had to position or realign an extraordinary amount of infrastructure, including both new and existing tracks and stations, highways, and subterranean parking garages. These structures, along with a series of tall office and apartment blocks, create a new edge to the expanded city core.

The TGV track runs in a north-south trench just west of an existing highway skirting the city's edge. Straddling the station and tracks are several conspicuous towers: the Crédit-Lyonnais by Christian de Portzamparc and the World Trade Center by Claude Vasconi are under construction. A hotel by local architects will begin construction this year. Within this new edge, and therefore close to the city's core, are a number of public spaces: a park; the Euralille Center, a mixed-use complex by Jean Nouvel; and the Grand Palais, a convention center and concert hall by OMA. Koolhaas influenced the selection of all architects.

Linking the Lille-Flanders station with the TGV station is the rue Le Corbusier, under which will extend a paved station forecourt, Euralille's central piazza. A broad sidewalk leads from the piazza to the old station in Lille's original core. "This synthetic new city is and isn't part of the old town," explains Koolhaas. "It has not been spawned by Lille—it has landed there."

Critical assessment of Euralille is premature. No key urban space—station, forecourt, or park—is built or sufficiently defined to hazard a judgment, and none of the buildings is complete. Yet the Euralille Center and the TGV station already bustle with activity, and the layering of buildings and uses suggests that the complex will indeed achieve Koolhaas's visions. But to be successful, urban design must create a network of public spaces that give an area a distinct character and coherence throughout the vicissitudes of change, including constant rebuilding. Euralille's layered, interlocking buildings seem designed to defy such change, contradicting Koolhaas's claims to be more interested in urbanism than in architecture.—*Peter Buchanan*

BELOW: Aerial view of Euralille shows Koolhaas's egg-shaped Grand Palais (right), Nouvel's commercial center with projecting towers (top left), and TGV station with Portzamparc's and Vasconi's straddling tower (top center). **EAST-WEST SECTION:** TGV station (left) is linked to Crédit-Lyonnais tower and Euralille Center (center).



EAST-WEST SECTION

40'/12m

Grand Palais, Euralille
Office for Metropolitan Architecture

URBAN MONTAGE

It is not a building that defines a clear architectural identity; but a building that creates and triggers potential, almost in an urbanistic sense.—Rem Koolhaas

Combining a conference center with huge concert and exhibition halls, the Grand Palais is the only building designed by Koolhaas at Euralille. It exemplifies two of the Dutch architect's key concerns: bigness, an inevitable condition of contemporary architecture that many architects fail to address, and the "culture of congestion"—the metropolitan condition of functions interacting to spawn unpredictable new ones. Below the vast, ovoid roof of the Grand Palais, various programmatic elements are arranged to function independently or in numerous combinations, demonstrating within a single building the essence of Koolhaas's urban strategy.

The 460,000-square-foot building has a provocative insouciance of composition, its oval plan comprising three strips of completely contrasting character and cladding that house the center's three major components. The southernmost, largest strip contains an exhibition hall, clad in corrugated aluminum. The central strip houses a glazed conference center, whose auditoriums and ancillary facilities are arranged over five floors. Located above a transparent foyer within the northernmost strip is the 6,000-seat Zenith Hall, intended for rock concerts and other large-scale spectacles. Its black concrete cladding recalls Japanese stonework and echoes the exterior of the plinth of the exhibition hall.

Sliced from the western edge of the exhibition hall is its foyer, reached by steps from a broad corridor on the first floor plinth. Separated from the hall by a glazed screen, the foyer is clad in translucent, corrugated polyester impregnated with aluminum shards that afford a metallic sheen. For Koolhaas, big means neither pompous nor permanent.

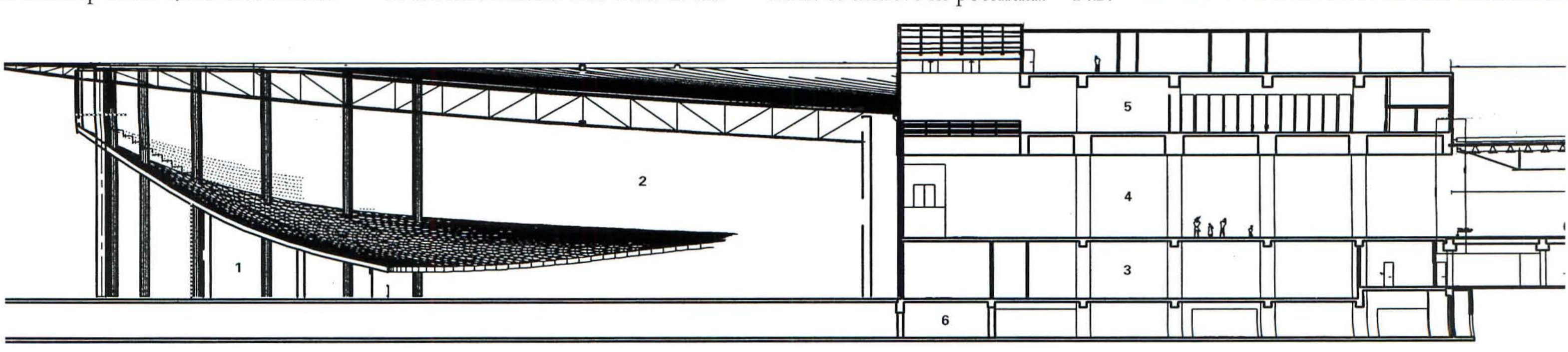
The 200,000-square-foot exhibition hall's shape eliminates corners, which, combined with its dished ceiling rising to the perimeter, emphasizes its expansiveness. The structure is all exposed, except the bottom chords of secondary trusses carrying plywood boards as partial ceiling and acoustic baffles. Air-conditioning units stand free on the roof, pumping air down cylindrical columns to grills in their bases.

The conference center is entered below three levels of frameless glazing, complexly faceted to decorative effect. The juxtapositions between this section, the exhibition hall, and a handsome tangle of steel fire stairs outside the Zenith Hall are jarringly abrupt. Inside the conference center, auditoriums are created by cutting and folding concrete floor slabs at angles: a neo-Corbusian exercise in the free section. The walls of the foyer between the Zenith and exhibition halls open up, permitting the flexibility of expansion. Koolhaas hopes this possibility of using the building as a single unit will be imaginatively exploited in spectacular promotional events.

The 1,500 seats of the largest auditorium are arranged as islands between wriggling cascades of stairs, and the ceiling is faceted in polycarbonate sheet as an acoustic reflector. The top of this hall exits into another foyer two levels up, which leads to a 500-seat auditorium. Koolhaas's nostalgic taste is revealed in the auditorium's peach-colored seats and padded blue leatherette wall. A 350-seat third auditorium is soberly finished in blond plywood.

Treating each auditorium so differently destroys the continuity of space and folding slabs, and the whole of the Grand Palais is less than the sum of its often exciting parts. Though provocative in concept, the Grand Palais is less so as a built artifact, and disappointing after Koolhaas's fresh Kunsthal (1992) in Rotterdam.

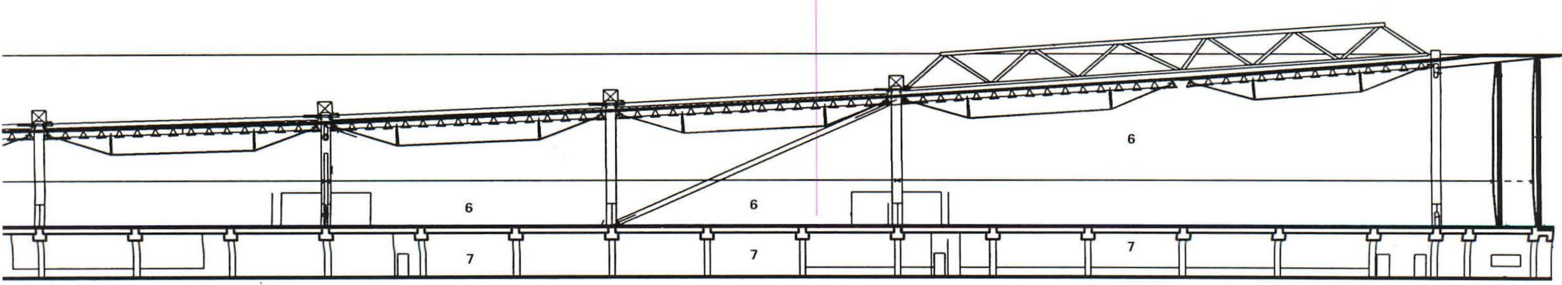
Like other designs by Koolhaas, the Grand Palais is shaped by the almost accidental abutment of disparate elements, leaving junctions and details to be resolved with minimal fuss, if at all. But just as spontaneity often requires rehearsal, so an esthetic of collision requires careful coordination for the Koolhaas esthetic to achieve its potential.—*P.B.*



NORTH-SOUTH SECTION

BELOW: West elevation shows abrupt juxtaposition of conference center faced with frameless glass (left) and corrugated-polyester-clad foyer of exhibition hall (right). **SECTION:** Grand Palais comprises a 6,000-seat auditorium at its north end, a conference center, and an exhibition hall.

CHRISTIAN RICHTERS



1 ZENITH FOYER
2 ZENITH HALL
3 ENTRANCE TO CONFERENCE CENTER AND EXHIBITION HALL
4 CONFERENCE CENTER FOYER
5 AUDITORIUM FOYER
6 EXHIBITION HALL
7 PARKING

20'/6m

CHRISTIAN RICHTERS

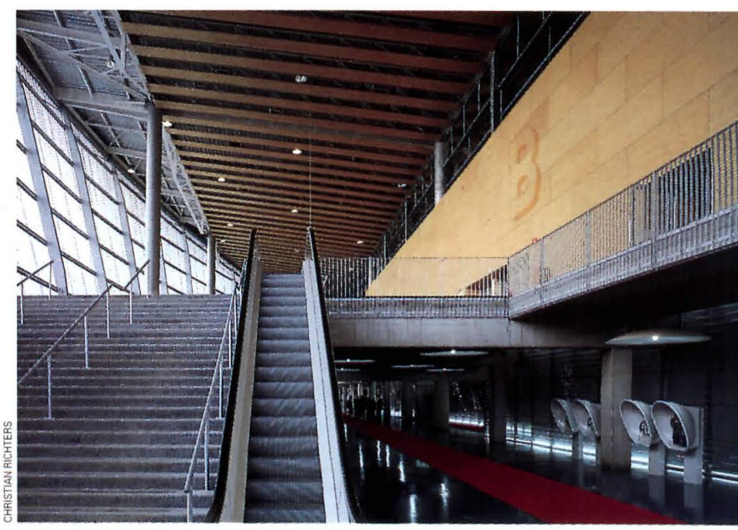
PETER COOK / ARCHIPRESS

TOP: Exhibition hall, seen from southeast, is enclosed in wavy walls of aluminum and polyester.
ABOVE: External fire stairs mark junction between Zenith Hall (left) and central conference center.
FACING PAGE: Frameless glazing of conference center (left) contrasts with curved polyester cladding of exhibition hall foyer.

PETER COOK / ARCHIPRESS

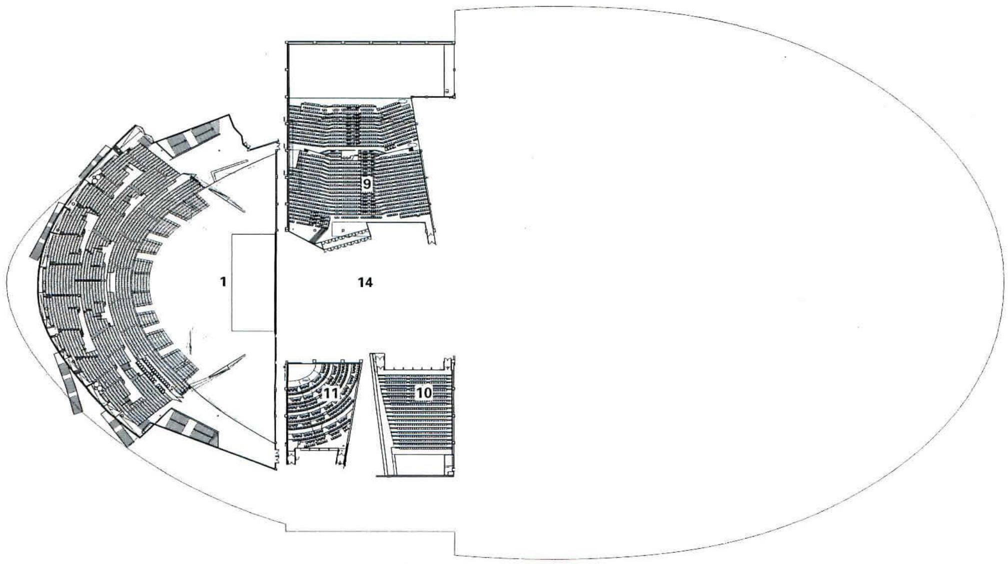

PETER COOK / ARCHIPRESS


PETER COOK / ARCHIPRESS

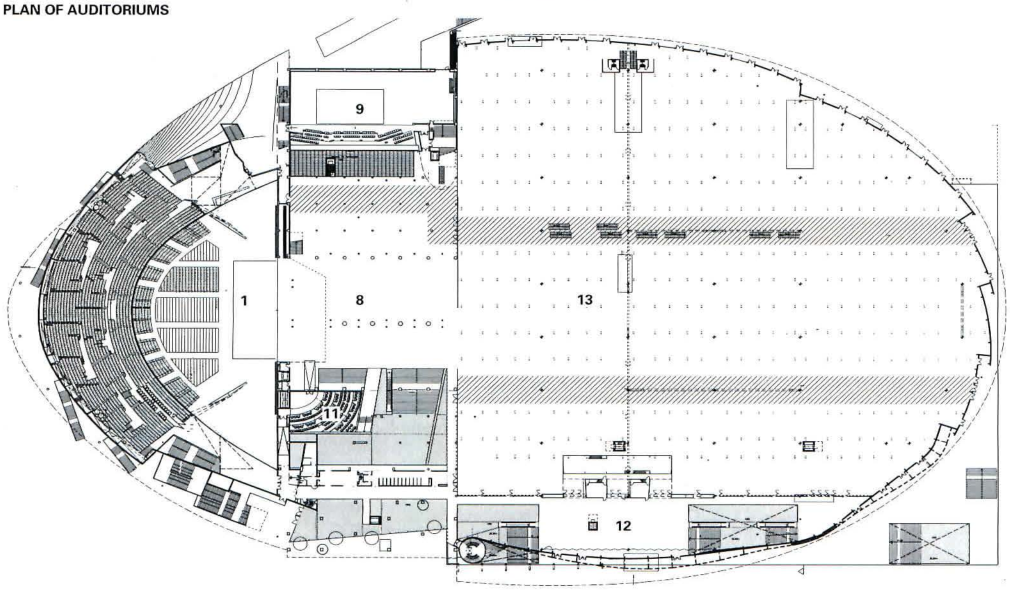

CHRISTIAN RICHTERS

FACING PAGE: Exhibition hall foyer is given character by generous space, exposed structure, and minimal detailing.
ABOVE: Columns, trusses, and cladding create formal collision.
TOP RIGHT: Exhibition hall can be divided into three smaller spaces.
ABOVE RIGHT: Staircase links internal street outside exhibition hall with foyer above.

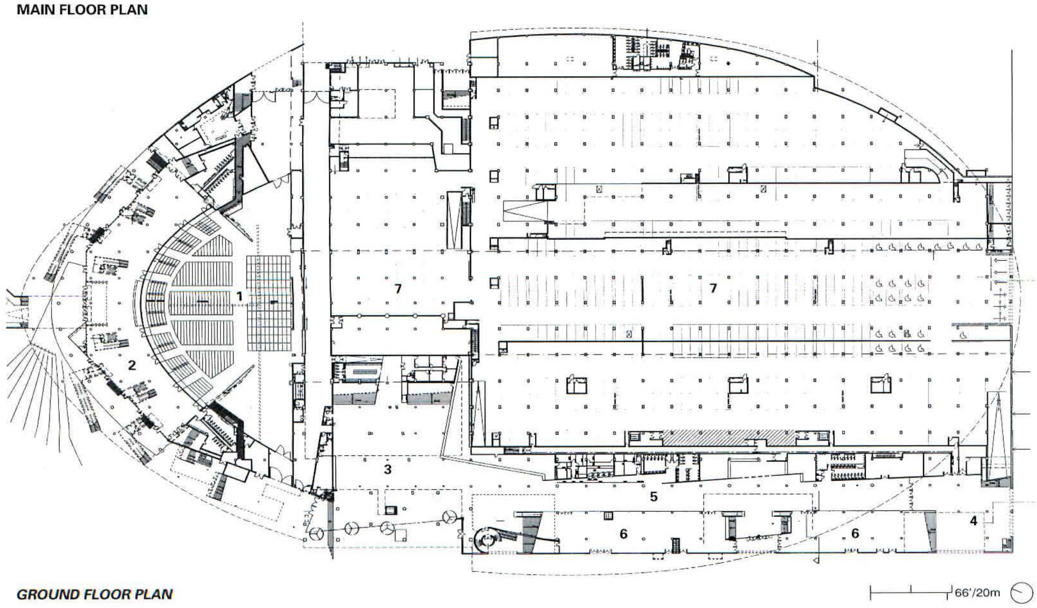
1 ZENITH HALL
2 ZENITH FOYER
3 ENTRANCE TO CONFERENCE CENTER AND EXHIBITION HALL
4 SECONDARY ENTRANCE TO EXHIBITION HALL
5 INTERNAL STREET
6 CAFETERIA
7 PARKING
8 CONFERENCE CENTER FOYER
9 1,500-SEAT AUDITORIUM
10 500-SEAT AUDITORIUM
11 350-SEAT AUDITORIUM
12 EXHIBITION HALL FOYER
13 EXHIBITION HALL
14 AUDITORIUM FOYER



PLAN OF AUDITORIUMS

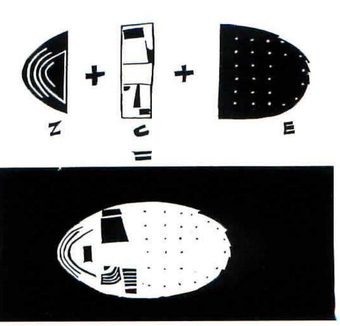


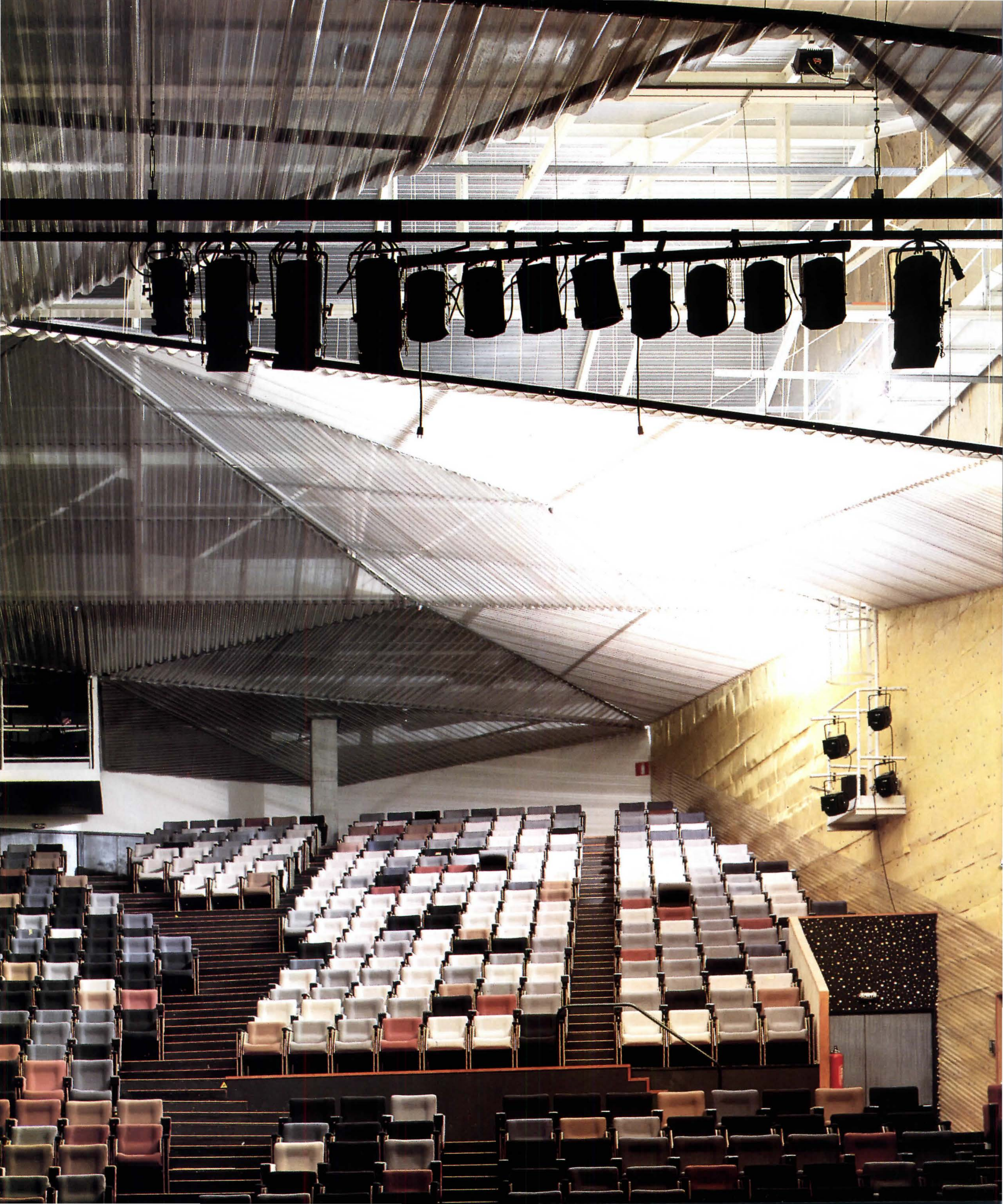
MAIN FLOOR PLAN



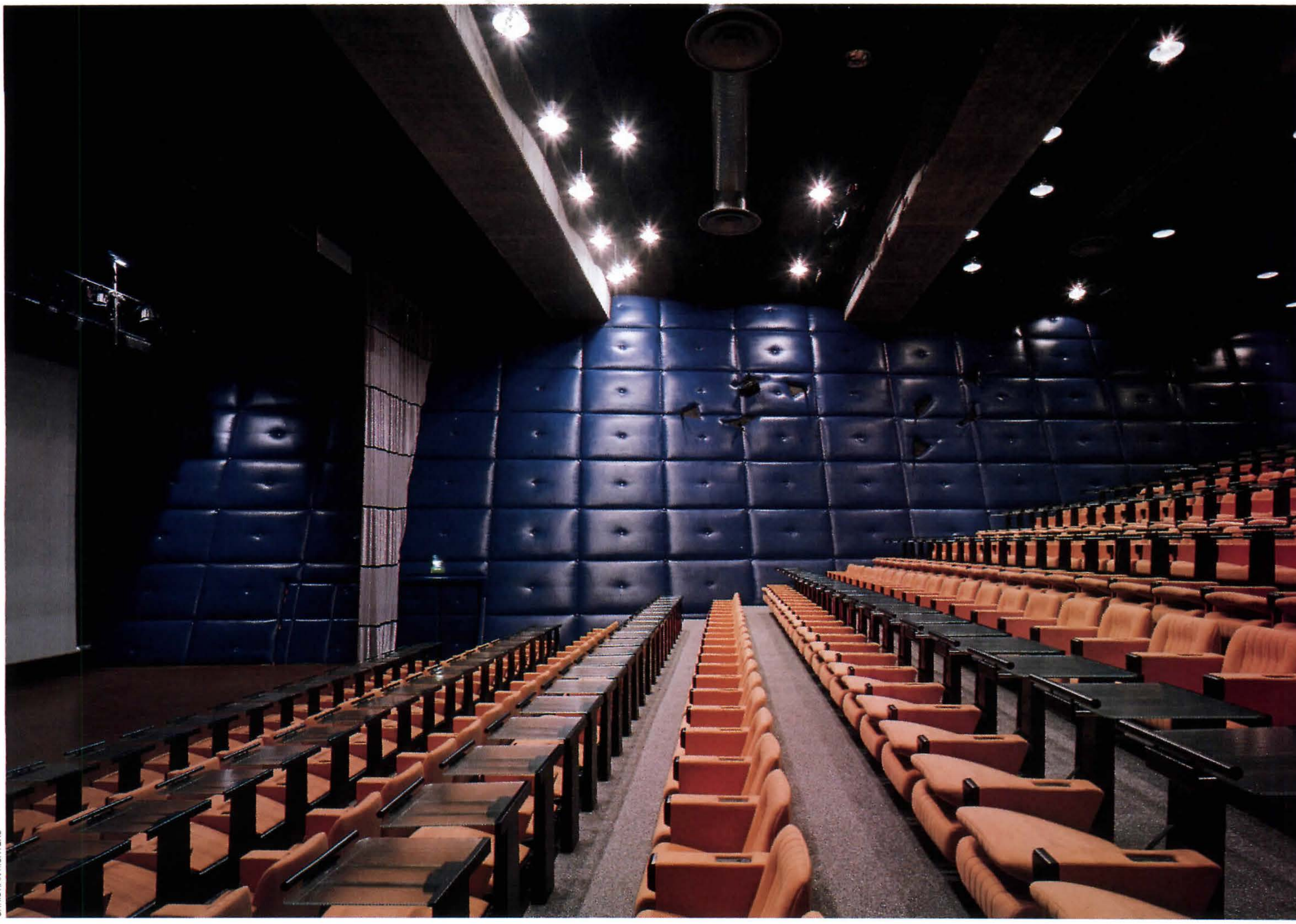
GROUND FLOOR PLAN

FACING PAGE: Stairway between auditoriums is lined with polished stainless steel. Stairs are finished in wood veneer. **PLANS AND DIAGRAMS:** Koolhaas divided egg-shaped Grand Palais into concert (left), conference (center), and exhibition (right) halls.





CHRISTIAN RICHTERS



FACING PAGE: Faceted polycarbonate ceiling of 1,500-seat auditorium serves as acoustic reflector above islands of seating and cascading steps.
ABOVE: With padded leatherette wall, 500-seat auditorium reveals Koolhaas's nostalgia for motel-moderne decor.

Euralille Center
Jean Nouvel, Architect

CITY CENTER

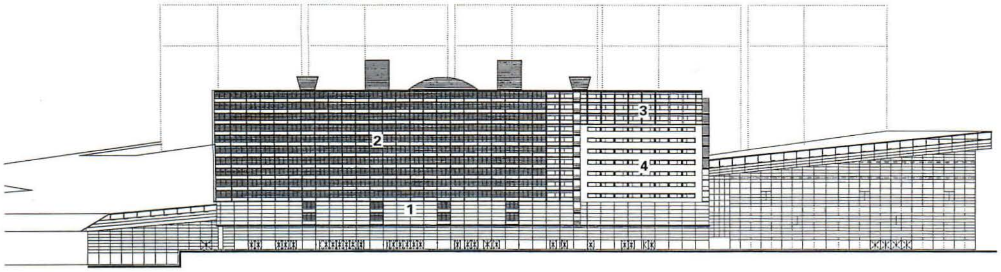
To make the center truly urban, it had to offer more than the amorphous, undifferentiated space of the typical shopping center, which is a deliberate maze. Jean Nouvel organized it through public axes that cut through the commercial substance to connect the city to the station.—Rem Koolhaas

The Euralille Center is almost a mini-city in itself: 920,000 square feet of commercial space, including a 120,000-square-foot hypermarket (a combined supermarket and department store), 11 larger stores, and 130 boutiques. Higher educational facilities, including a business school and an information center, comprise 190,000 square feet; 60,000 square feet are devoted to recreational spaces such as an indoor sports center; and 52,000 square feet of restaurants occupy an indoor court adjacent to the forecourt of the new TGV station. There are also various cultural spaces, including galleries and two theaters, and public services such as a child-care center and a post office. Beneath the complex is parking for 3,400 vehicles.

Rising from the building's primary, wedge-shaped volume are further accommodations: Slab blocks along rue Le Corbusier contain condominiums, apartments for itinerant railway workers, and a 97-room hotel. Three towers containing more apartments, a student dormitory, and offices rise another eight stories above the tall edge of the building, which faces Lille's original railway station to the southwest. One of two more towers, not yet constructed, is intended to house university faculty.

Outside, the building is monstrous. Desperately trying to animate cheaply its huge bulk are jittery, clashing grids and gaudy colors. Cantilevering out to welcome those from the old city into Euralille is the clumsiest of canopies. The most interesting external features of the vast complex are the panels between the towers facing the old station. Reflecting Nouvel's interest in exploiting contemporary forms of spectacle, these panels project holograms of supermarket carts in colors that change constantly with the sunlight.

In contrast to the outside, the interior of Euralille Center is very successful. A plastic holographic material wraps cylindrical columns to marvelously colorful effect, refracting the natural toplight that illuminates each mall. From the entrance under the canopy, one long shopping mall extends diagonally to the atrium and World Trade Center complex, and another terminates at the hypermarket. A broad cross-mall rises from the foodcourt and extends to a footbridge providing access to the old station's platforms.—*P.B.*



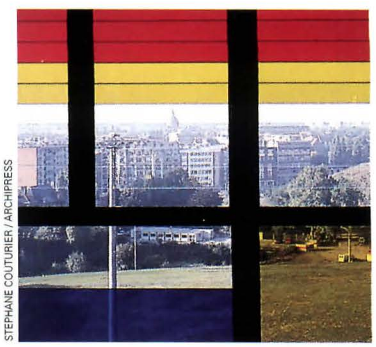
1 COMMERCIAL CENTER
2 APARTMENTS
3 RAILROAD OFFICES
4 HOTEL

NORTH ELEVATION

40'/12m

STEPHANE COUTURIER / ARCHIPRESS

CHRISTIAN RICHTERS



STEPHANE COUTURIER / ARCHIPRESS

FACING PAGE: Towers of Nouvel's center house apartments, offices, and student dormitories that overlook Lille's old train station. In distance, along rue Le Corbusier, is TGV station.
NORTH ELEVATION: Euralille Center incorporates residential and commercial uses.
ABOVE LEFT: Roof of mixed-use complex is covered by raised steel grille.
LEFT: Panels between towers and above fire escape project holographic images.
ABOVE: Nouvel incorporated colored glass into the center's windows.

Lille-Europe TGV station
Jean-Marie Duthilleul, Architect
Crédit-Lyonnais office tower
Christian de Portzamparc, Architect

CHRISTIAN RICHTERS

COMMERCE AND TRANSPORT

The station is a public arcade. The section is developed to be permeable from many points so that it performs as a connector. For the tower, Portzamparc was in a difficult situation: we had proposed a full tower; his client counter-proposed what we considered a "camel"—a kind of huge chair over the railway—as a cheaper solution. We thought of Portzamparc because he is extremely artistic, sensitive, poetic...we felt that maybe a camel designed by Portzamparc could be a really beautiful camel.—Rem Koolhaas

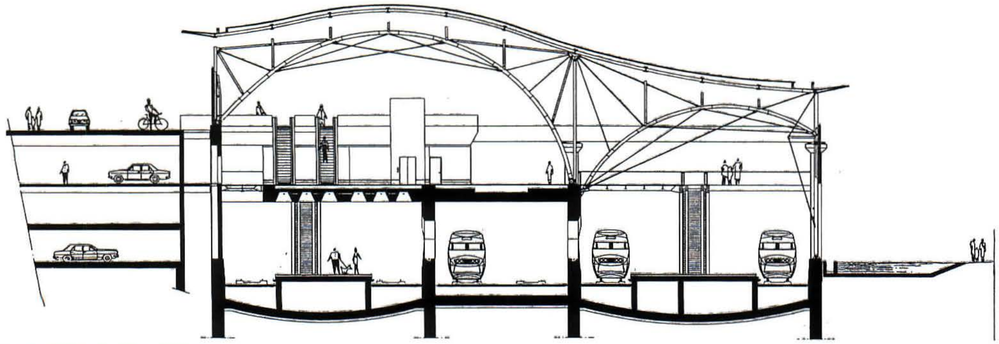
When viewed from the old city, the impact of the new Lille-Europe TGV station is subdued because of its low setting, and the fact that the station is bisected by the rue Le Corbusier. Koolhaas insisted that the trains, Euralille's *raison d'être*, be visible; the land has therefore been terraced down to what will be a paved forecourt extending under the rue Le Corbusier.

Responding to this change in level, the station is stepped in section below a curving, glazed roof. Entrances are from the sunken forecourt and along a spine road to the east, from where passengers descend to a concourse running the length of the building. Escalators and elevators also descend from this concourse to the platforms.

The design mixes curiously contrasting idioms. Concrete arches below the concourse and nonstructural steel elements, designed by Jean-Marie Duthilleul of the architecture department of SCNF (the French railways), are derived from Calatrava. The delicate roof structure of tubular steel arches and tension ties is as gracefully and delicately ethereal as the struts are earthbound. Despite these stylistic conflicts, the building has an exceedingly pleasant atmosphere, thanks to the lightness of the structure and the gently curved roof almost floating above it.

Designed by Christian de Portzamparc, winner of the 1994 Pritzker Prize, the Crédit-Lyonnais offices comprise the central tower straddling the TGV station roof. Resembling a gigantic minimalist sculpture, the building conforms to Koolhaas's stipulation that these signature buildings be "strange" and "seductive" in shape; locally, the tower is known as the ski boot.

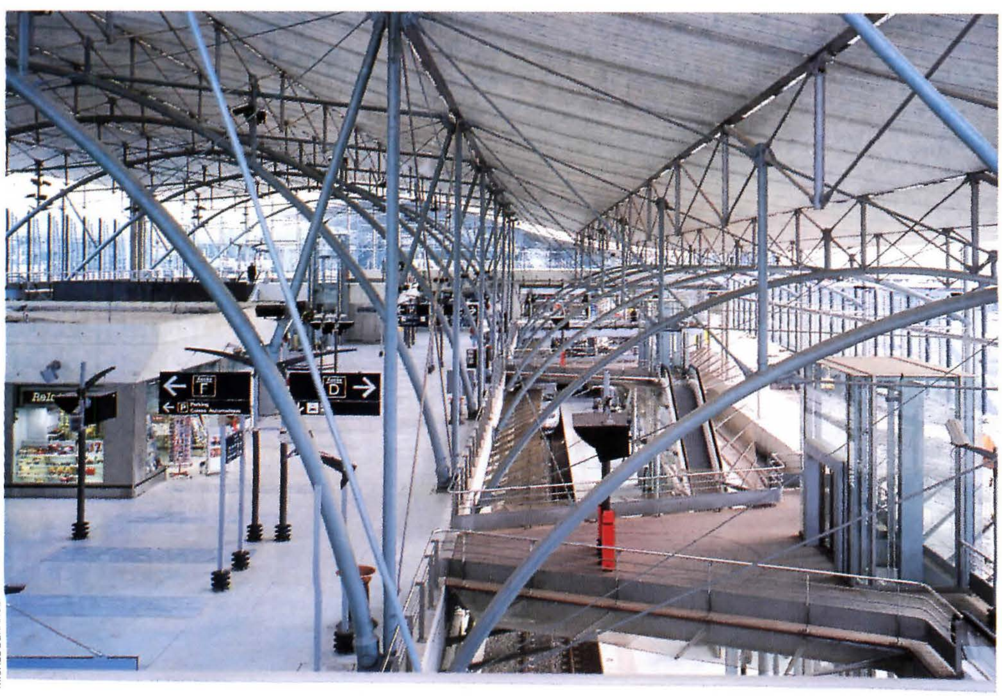
The building contains 150,000 square feet of offices. Its asymmetrical arrangement places the taller tower to one side of the station, bringing its loads directly to the ground and lessening the transfer loads carried over the station roof. Thus, like other Euralille buildings, it could be constructed on a tight budget. Although the advantages of being at the center of western Europe's "virtual community" are many, it was deemed necessary to keep rents low to compete with London, Brussels, and Paris for tenants.—*P.B.*



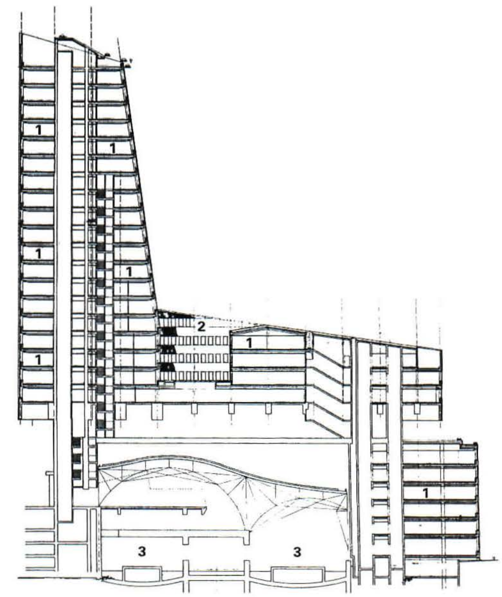
EAST-WEST STATION SECTION

20'/6m

CHRISTIAN RICHTERS PHOTOS



MICHEL DENANCE



EAST-WEST TOWER SECTION

20'/6m

1 OFFICE
2 LIGHT WELL
3 TRAIN STATION

FACING PAGE: Portzamparc's Crédit-Lyonnais tower straddles TGV station. **STATION SECTION:** TGV station steps down from road (left) to concourse, and then to train platforms (right). **ABOVE LEFT:** Terminal concourse contrasts spiky detail with delicate roof arches. **LEFT:** Tension ties keep tubular elements slender and allow roof to "float." **TOWER SECTION:** Asymmetrical design transfers loads directly to ground.

Kansai International Airport
Osaka, Japan
Renzo Piano Building Workshop

PLANE GEOMETRY

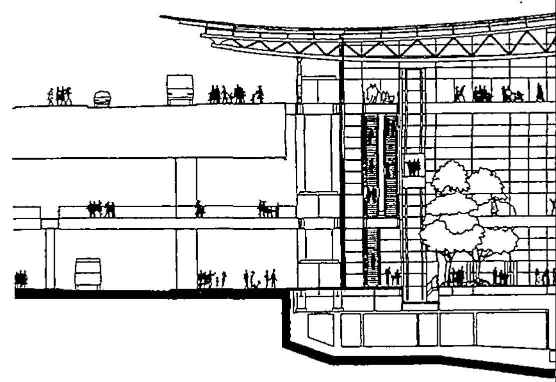
We wanted to make something very light and elegant, like an airplane.
—Renzo Piano

Extending more than a mile in length, the Kansai International Airport, located on a specially constructed island off the shore of Osaka, Japan, is the longest building ever built. With its artificial island, the terminal and its runways constitute the only human construction other than the Great Wall of China that can be seen from outer space.

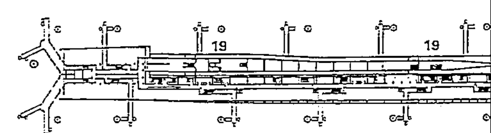
Lack of suitable land and Japan's stringent noise restrictions led the region of Kansai—which includes Osaka and Kyoto—to situate its new Asian hub 25 miles from downtown Osaka and 3 miles offshore. The huge cost of building the 3-mile-by-1-mile island in 60 feet of water will be recouped by the highest landing and concession fees in the world.

The 1988 winning competition entry for the terminal was designed by the Renzo Piano Building Workshop, with Ove Arup & Partners as engineering consultants. It is the last work of the four leading designers who first collaborated on the Pompidou Center in Paris: Piano, British engineers Peter Rice and Tom Barker, and the Japanese architect Noriaki Okabe. Rice, Ove Arup's brilliant structural engineer who died last year, had worked closely with Piano since completing the Pompidou Center as had Barker, a mechanical engineer, also of Arup & Partners. Okabe, a Japanese architect who had joined Piano and Richard Rogers to work on the Pompidou, became an associate and ran Piano's Paris office. He was in charge of the airport competition design, then set up the Osaka office to develop the design with Piano's Genoa office and to supervise construction. For the executed design, Ove Arup & Partners continued as consultants to the Building Workshop, which worked in collaboration with the Japanese architectural firm of Nikken Sekkei.

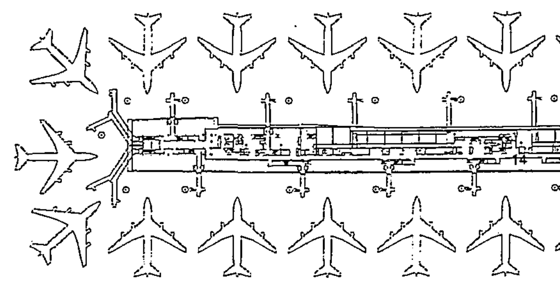
The Kansai terminal, whose strongly directional, aerodynamic shape guides more than 25 million passengers a year, will define the architecture of the 1990s just as the Pompidou defined that of the 1970s. But reflecting their very different purposes and locations, as well as changes in Piano's ideas,



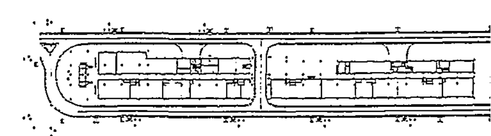
NORTHWEST-SOUTHEAST SECTION



THIRD FLOOR PLAN

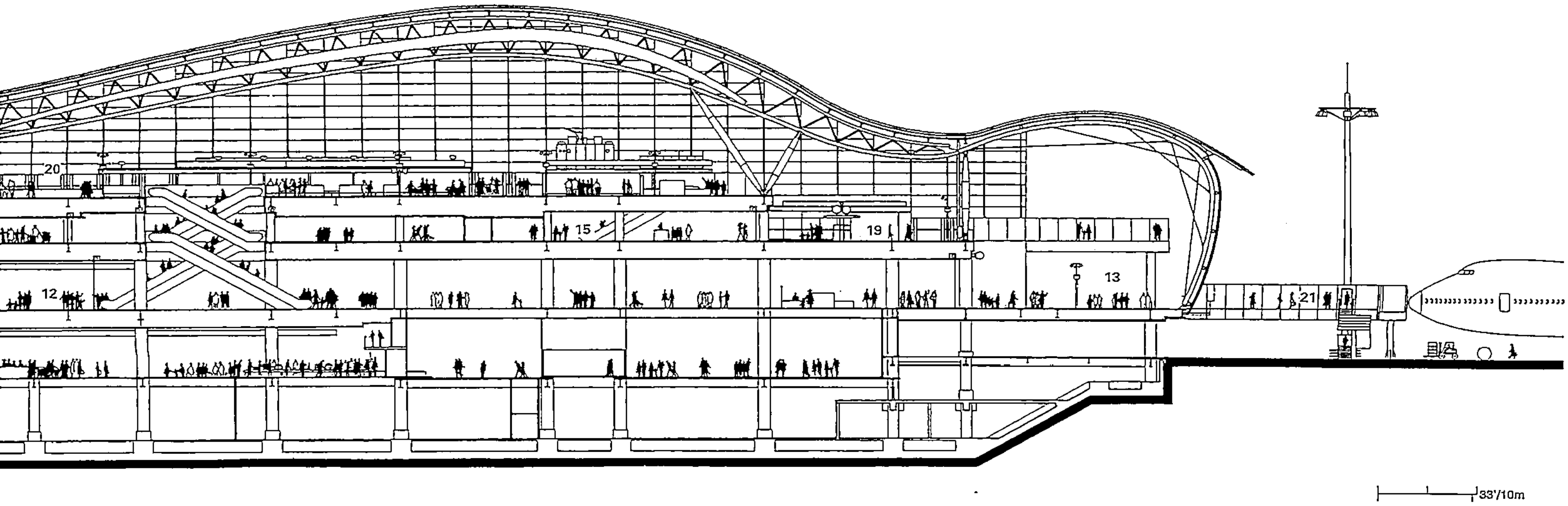


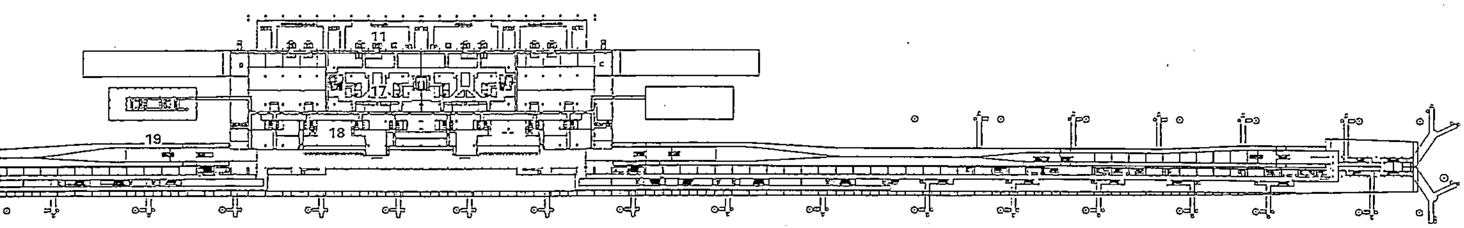
SECOND FLOOR PLAN

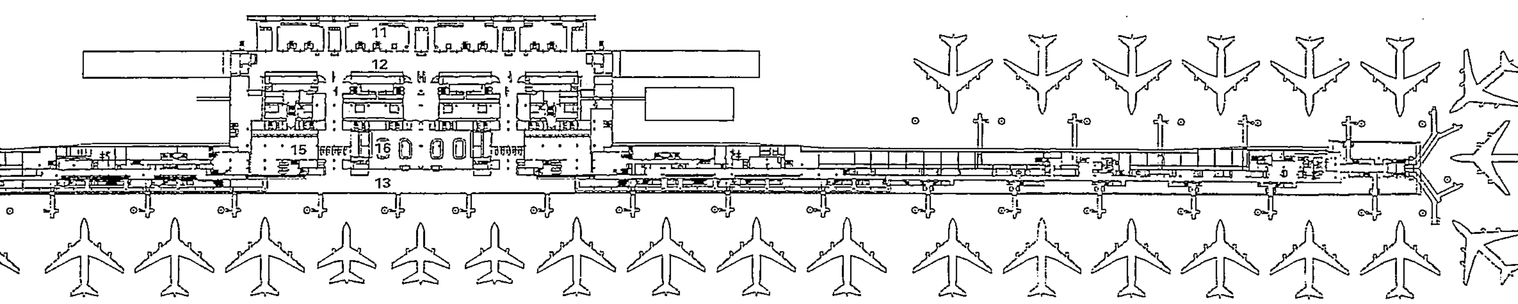


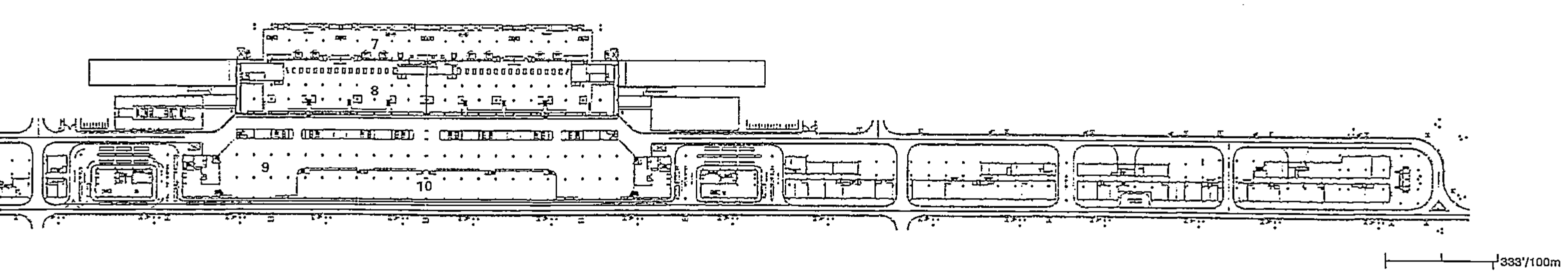
FIRST FLOOR PLAN

PREVIOUS PAGES: With its gently curved roofs, Piano's Kansai terminal assumes the appearance of a glider.
SECTION: Terminal is arranged on multiple levels with entrance hall "canyon" (left), departure and arrival halls (center), boarding wing (right).
PLANS: First floor accommodates international arrivals; second floor is devoted to domestic travelers and lounges; third floor houses concessions and shuttle.
SITE PLAN: Long, multilevel terminal is located on artificial island.

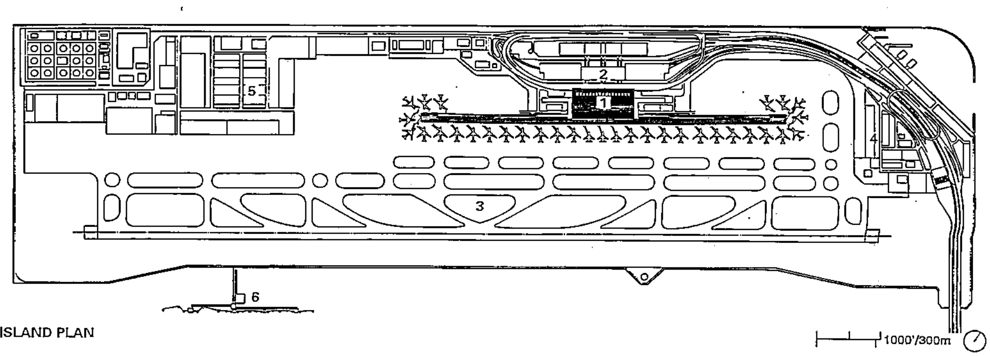








1 TERMINAL
2 STATION
3 RUNWAY
4 DOMESTIC FREIGHT TERMINAL
5 INTERNATIONAL FREIGHT TERMINAL
6 FUEL OFF-LOADING DOCK
7 ENTRANCE HALL
8 INTERNATIONAL BAGGAGE CLAIM
9 INTERNATIONAL BAGGAGE
10 DOMESTIC BAGGAGE
11 OPEN TO BELOW
12 DOMESTIC CHECK-IN
13 DOMESTIC BOARDING LOUNGE
14 INTERNATIONAL LOUNGE
15 IMMIGRATION
16 DOMESTIC BAGGAGE CLAIM
17 SHOPS
18 DUTY-FREE SHOPS
19 SHUTTLE STATION
20 INTERNATIONAL CHECK-IN LOBBY
21 PASSENGER BOARDING BRIDGE



ISLAND PLAN

the two buildings are markedly dissimilar. The Pompidou Center presents itself as a rearrangeable kit-of-parts, its structural skeleton and brightly painted technical innards all exposed to free the interior to meet unpredictable demands. In contrast, the smoothly enclosed fluid spaces of the airport lead people through it with reassuring predictability.

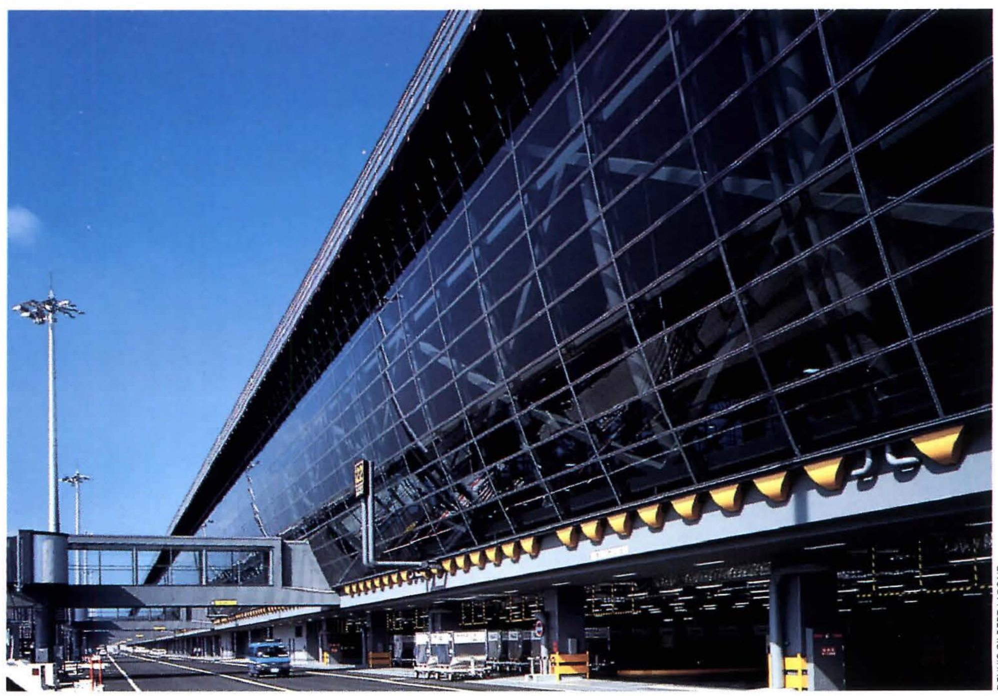
Pompidou climaxes the Modernist dream of a building as a flexible, mechanical contraption. Kansai realizes a 19th-century dream of a building that combines the functional efficiency of a machine with the graceful forms of a living organism. A major factor in the achievement of this dream is that the airport is shaped almost entirely to cope with various sorts of flow and movement. But it is the advent of the computer, which generated the geometry of the airport's complex curves, that was crucial to Piano's vision.

Piano remains as concerned with exploiting the leading edge of technology as he was at the time of building the Pompidou, but he is now equally concerned with reconciling technology and nature. For the 57-year-old architect, the challenge was to enhance the experience of flying from Kansai by affording the island a natural character. To do this, he planted the island with trees that would penetrate parts of the building.

To make the best use of the limited space, the competition program suggested a novel type of airport. Check-in and arrival facilities for domestic and international flights are sandwiched on different floors, and all airplanes are boarded from long wings that stretch out from either end of the terminal. Shuttles running outside the landside edge of each wing transport passengers to and from the planes. Piano's team introduced improvements to this approach, including a huge entrance hall extending the height and width of the terminal. It is into this hall that the trees extend, earning it the name of "canyon."

This public space helps achieve a prime objective of Piano and his team: clarity of orientation. In contrast to other airports, passen-

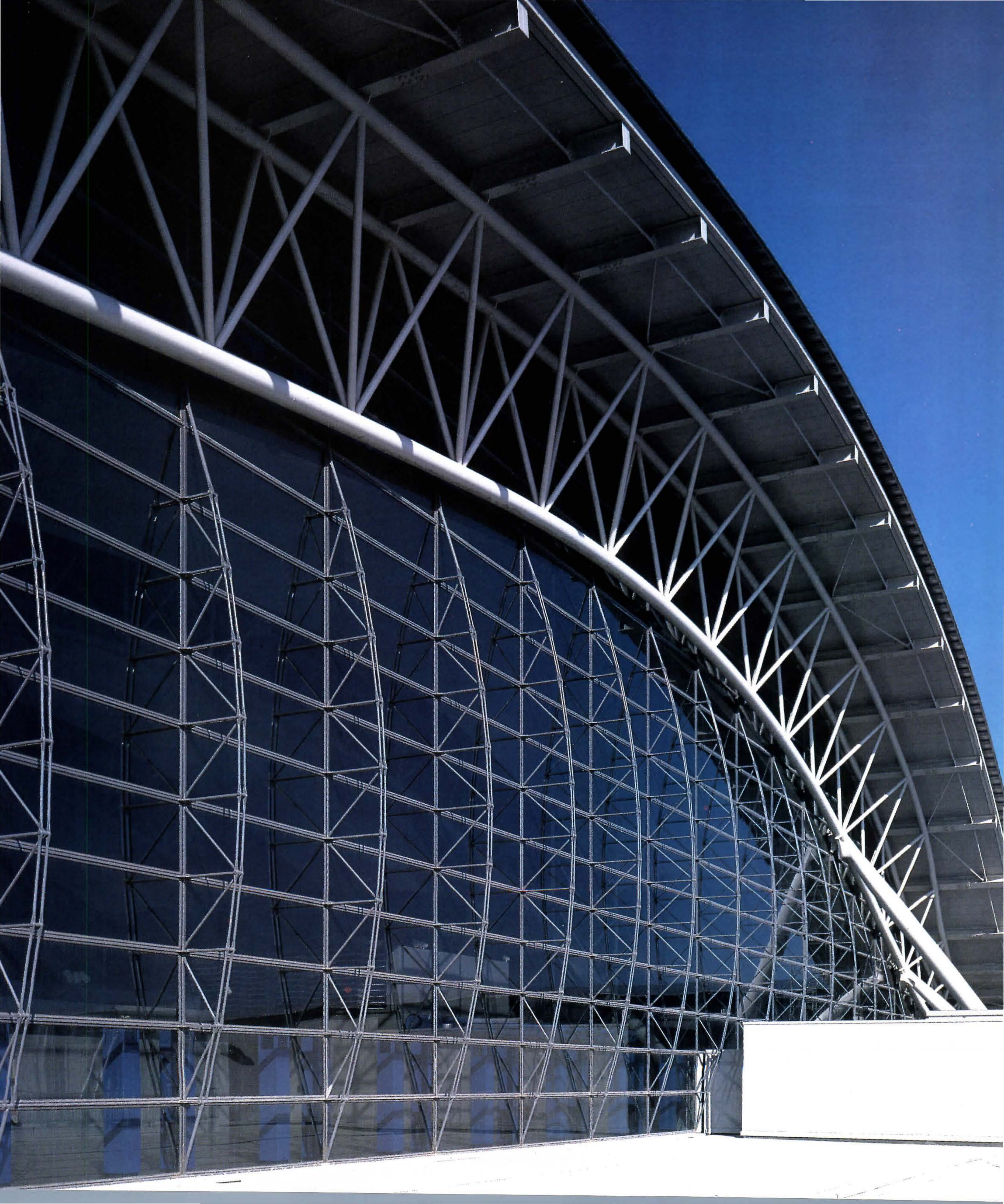
KAZUO NATORI



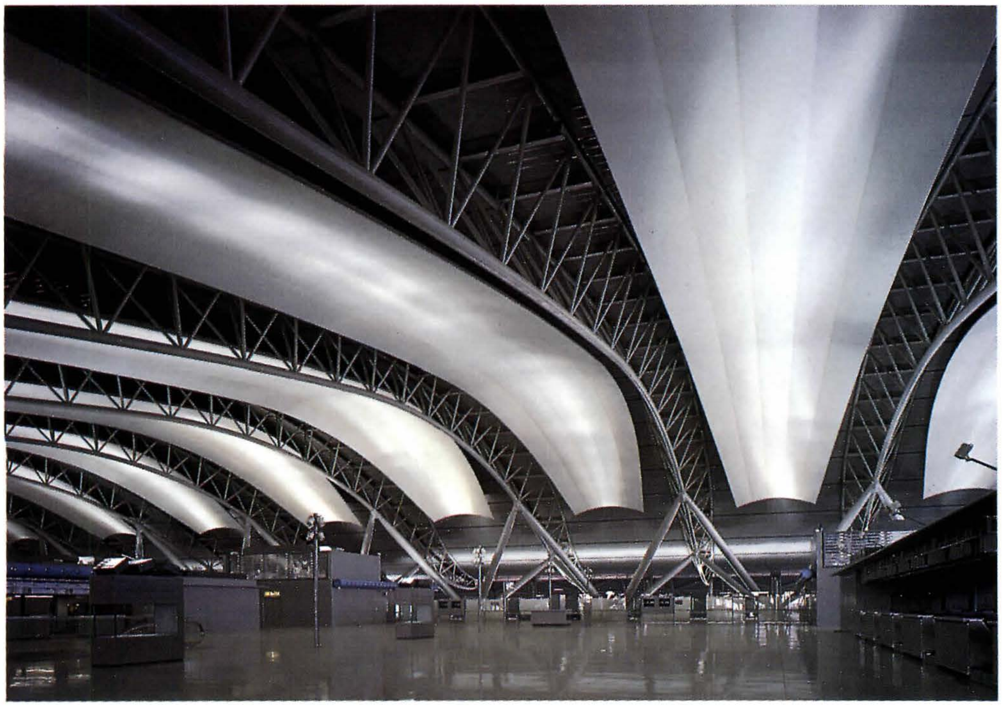
DENNIS GILBERT / ARCAID

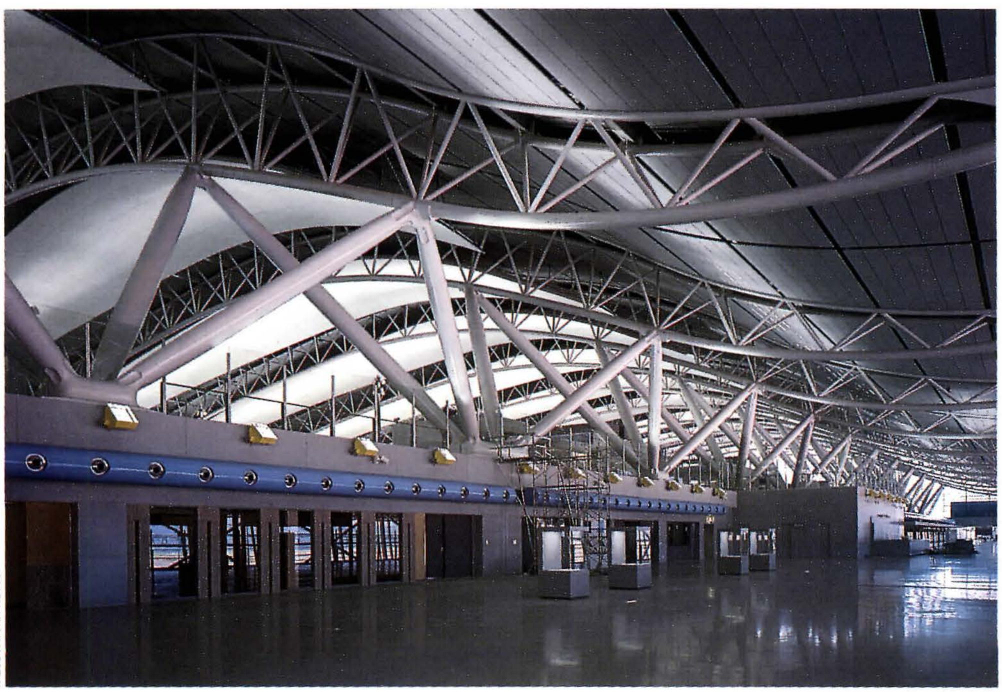
TOP: End of curving terminal roof forms canopy over sidewalk at departure level. **ABOVE:** Stainless steel roof panels project over airside glazing, which is butt-jointed, curved, and supported inside. **FACING PAGE:** Vertical double trusses absorb movement of glazed wall of terminal's international departure hall.

KAZUO NATORI




67





KAZUO NATORI PHOTOS

FACING PAGE: International departure hall overlooks domestic boarding lounge with exposed structure of curved ribs.
TOP: Suspended fabric airscoops define international departure hall; trusses emphasize spatial continuity.
ABOVE: Airside of concession level offers dramatic view of swooping trusses supporting struts and airscoops over international departure hall.

gers at Kansai can orient themselves without the aid of signs, no matter where they are in the building, as the direction of land- and airsides is immediately obvious.

At Kansai, this clarity has been achieved through transparency, a flowing sequence of spaces that open from one to the next, and the forward-flowing curves of structure and ceiling. The terminal's exposed structure also plays a crucial visual role. The trusses in the departure hall and the arched ribs in the boarding wing give definition to the curves and scale to the spaces. In the international departure hall, the prominent trusses and their asymmetrical curves seem almost to propel people forward, as if in the undertow of a wave. But the asymmetric curve was originally adopted to propel air, not people. Air from huge ducts is blown along the ceiling and guided by large fabric scoops shaped to the decelerating speed of air jets. These curves, and the more complex two-directional curves of the boarding wings, allow all aircraft to be visible from the control tower.

Asymmetrical curves are very fashionable in architecture right now. Exploiting the power of the computer to draw and calculate any shape, architects often affect only the shapes of skin and internal partitions. Because these elements are never convincingly married with the rest of the building's functional anatomy, such geometries remain superficial. Renzo Piano shows a more profound understanding of the computer's potential. The computer lets the designer enter new conceptual territories, complex mathematical topologies that open up new worlds of forms, and with them, new efficiencies, economies, and degrees of integration such as those found in nature. The triumph of Kansai is its discipline and total lack of contrivance, achieving a new type of techno-organic building—a harbinger of architecture in the 21st century.—*Peter Buchanan*

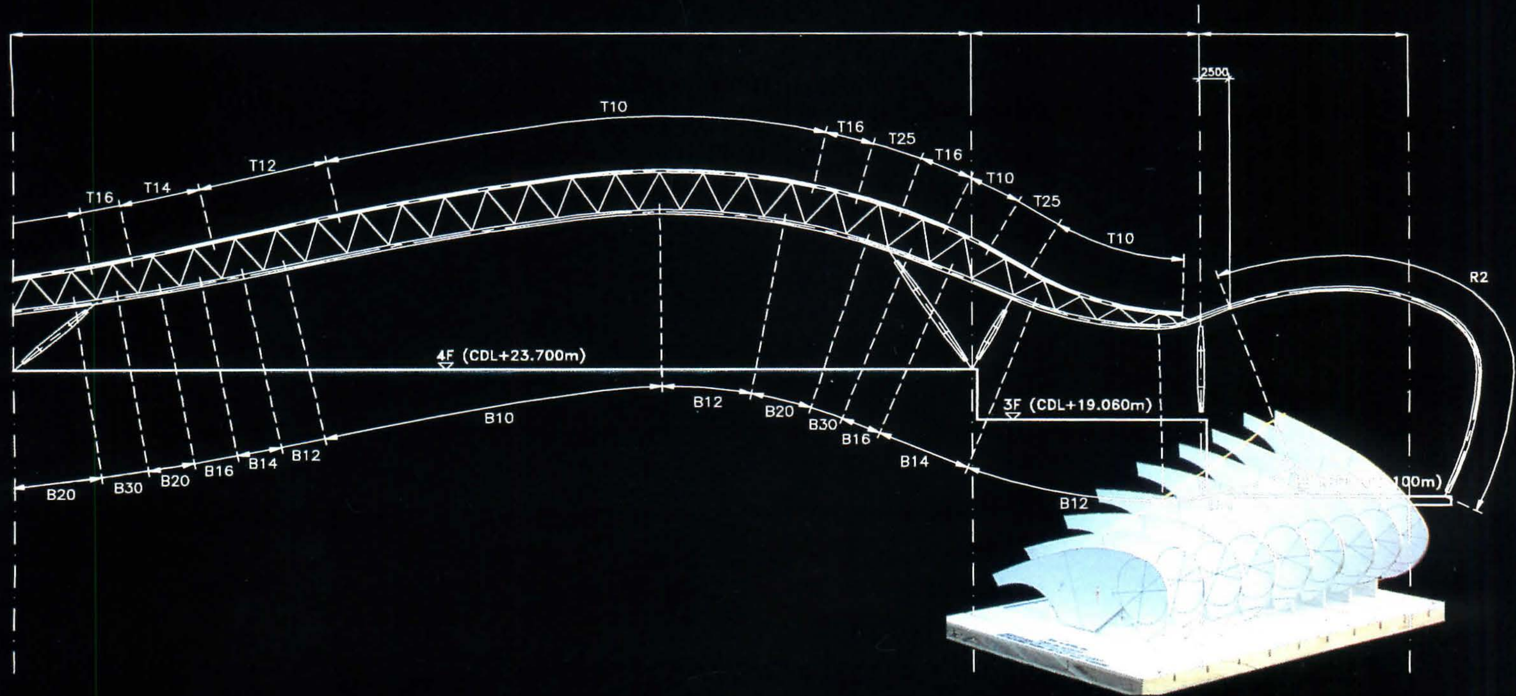
Peter Buchanan's second book on Renzo Piano will be published this year by Phaidon Press.

DENNIS GILBERT / ARCAID

ABOVE: Entrance hall immediately reveals multilevel organization of terminal.
FACING PAGE: View across top of entrance hall shows nozzle of airjet that caps vertical blue duct. Air is blown into and guided by suspended airscoop.

YUTAKA KINUMAKI

Technology & Practice



Houses offer architects some of the best opportunities for small-scale design innovation. To highlight new residential construction methods and details, ARCHITECTURE introduces a new monthly feature called House. Our debut installment reveals how a Los Angeles architect employed shoring techniques to resolve a steep, narrow site and design her own house.

Ingenious details also contribute to the epically scaled forms of Renzo Piano's Kansai International Airport. A technical article on this mile-long building shows that Piano's innovations at Kansai arise from a virtuous marriage of complex geometries and adventurous engineering (above).

We also dissect the intricate anatomy of double-wall cladding assemblies. These alternatives to conventional curtain walls combine passive-solar and mechanical components to create thermal and acoustical buffers along the building envelope. The long-term energy efficiency of these systems promises to offset their higher installation cost.

The fine print of on-line information networks is usually rather confusing—at first. Our computer feature explores this digital universe and demystifies the basic tools practitioners need to exploit the potential of computer networks such as the Internet, CompuServe, and AIAOnline.

Ahead of the Curve

Japan's new Kansai airport is designed to absorb movement, from seismic to settlement.

RIGHT: Vertical steel trusses stabilize the Kansai terminal's glazed end wall. Double trusses accommodate deflections in the primary roof structure.

More than a mile long and built on an artificial island, the Kansai International Airport is an exercise in technical virtuosity and innovation. Combining a conventional trabeated structure fabricated from 40,000 tons of steel with a lightweight roof structure of another 10,000 tons of curving tubular steel, the airport terminal was to have been built in 28 months. But because the island, designed by Japanese engineers, settled more than predicted, this schedule was expanded to 38 months—still very fast for a project of such a colossal scale.

More significant than any single technical feat is the extraordinary way in which the Renzo Piano Building Workshop and Ove Arup & Partners integrated structure, space, skin, and services. Each building system is designed to accommodate the other without compromising the integrity of its own discipline. A key to achieving this integration is the geometric discipline to which the enclosing envelope and its supporting structure conform. Piano and Arup adopted the billowing curved roof over the building's central block to achieve greater structural efficiency and entrainment of conditioned air. The curved ceiling also creates a space that feels lofty, but is low enough at its edges so that the tails of all parked aircraft can be seen from the control tower. The same constraint led to the tapering curves of the boarding wings that stretch out to the northeast and southwest of the airside terminal.

Building geometry

Architect and engineer sought a rigorously geometric form that would not protrude above a cone whose apex is the control tower, but produce a fluidly curved and forward-surging ceiling, while also allowing maximum repetition of cladding and structural components. These criteria led Piano Building Workshop and Arup to generate the international departure hall's roof as portions of cylinders of different radii that sweep

DENNIS GILBERT

smoothly into each other, and a boarding wing roof that is toroidal in geometry. (A toroid is a ring-shaped figure formed by the rotation of a constant curve, of which a circle is only a special case.) Conceptually, the boarding wing at Kansai Airport is cut from the top of a ring with a 10-mile radius and inclined at 68 degrees to the horizontal. This ring is bisected in the vertical plane and slid apart by 1,000 feet to make way for the extruded nontoroidal section in the middle of the boarding wing.

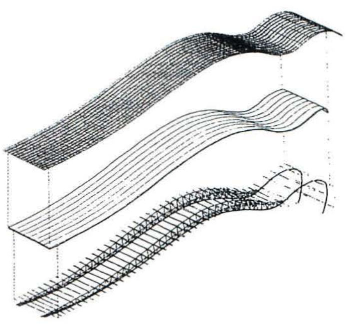
Adopting this geometry allowed an exceptional degree of repetition of components. All 90,000 steel cladding panels are identical, as are the tubular steel trusses and legs of the primary structure. The 250 bowed ribs that form the primary structure of the boarding wing are all identically curved. Such standardization resulted in multiple benefits; for example, the ribs could be made in an identical jig and trimmed as required to minimize fabrication cost and time.

Roof structure

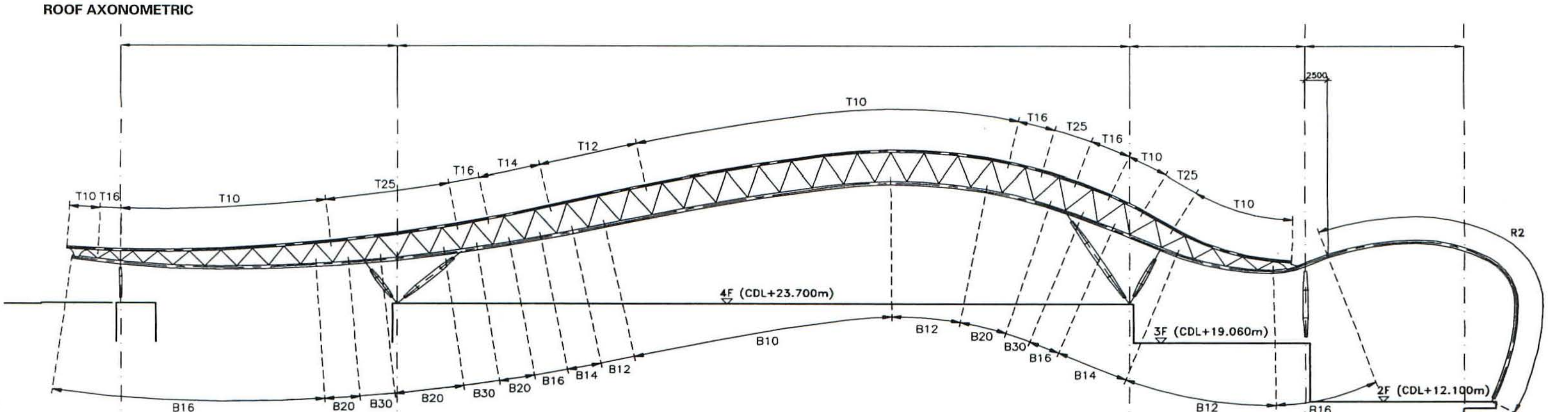
The roof itself is double layered: An inner, waterproof and insulated layer, composed of fiberglass sandwiched between ribbed galvanized steel decking, is protected by an outer layer of steel panels. Each outer panel measures 6 feet by 2 feet and is made of a very high-grade, satin-finished stainless steel to resist the corrosion of salt and pollution and the abrasion of typhoon-borne grit.

The panels do not create a weather-tight layer but allow water and grit to drop between them and then drain into huge gutters in each of the two valleys so as not to stain their shiny surfaces. This surface reflects the sun and shades an air space that is intermediate in temperature between interior and exterior, contributing both to the thermal performance of the whole roof and to the longevity of its inner layer.

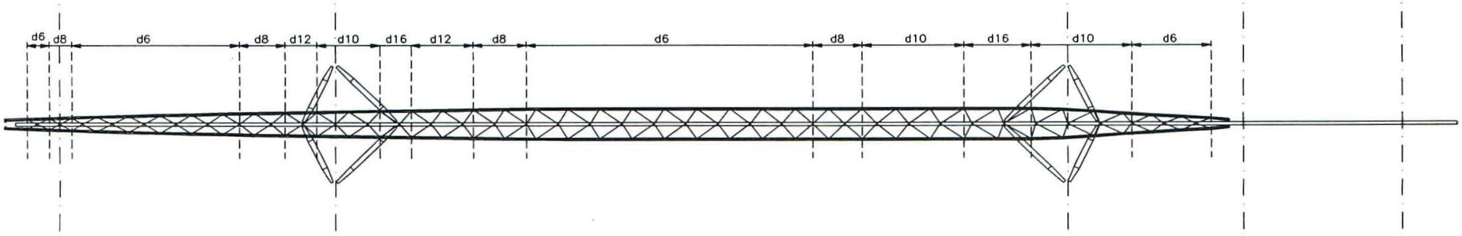
The Kansai International Airport roof is one of a series that have been built or are under design development by the Building



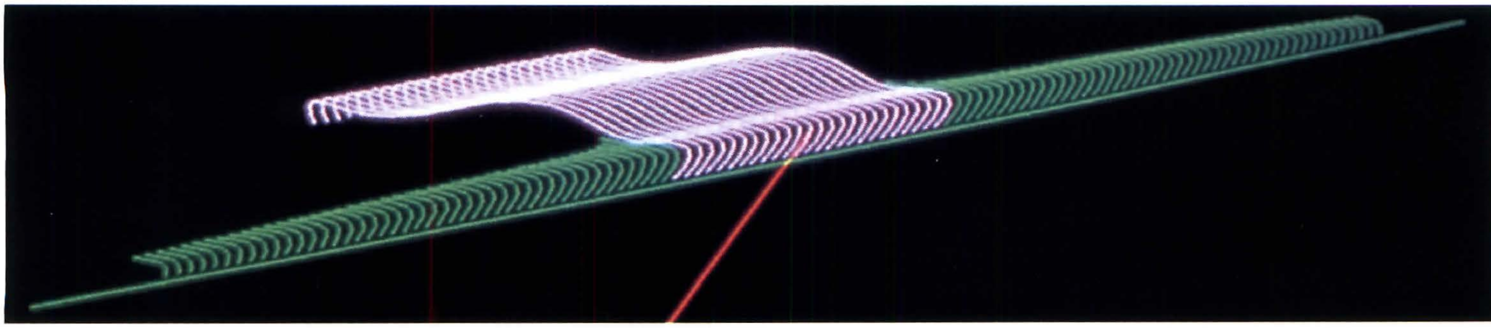
ROOF AXONOMETRIC



MAIN TRUSS ELEVATION



MAIN TRUSS PLAN



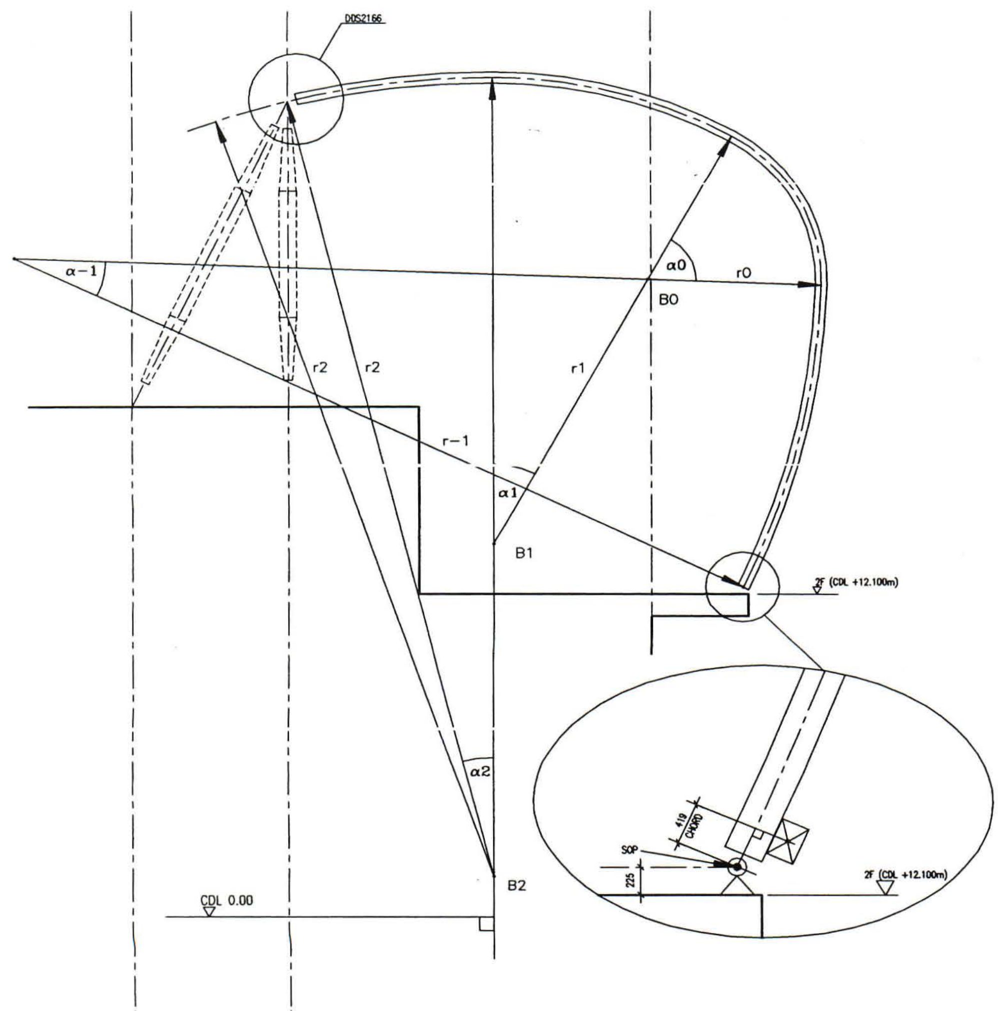
FACING PAGE, AXONOMETRIC: Roof bay of Kansai Airport is composed of an outer layer of stainless steel and an inner layer of fiberglass on steel decking.
FACING PAGE, CENTER: Elevation (top) and plan (bottom) of roof structure reveal primary geometry.
FACING PAGE, BOTTOM: Computer study shows early version of contrasting cylindrical and toroidal geometries.
BELOW: Diagram shows geometry of boarding wing rib.
BELOW RIGHT: Bowed structural steel ribs articulate boarding wing.
CENTER RIGHT: Computer model analyzes types and magnitudes of structural forces on boarding wing shell.
BOTTOM RIGHT: In an early model, Piano studied geometric transformation from boarding wing to terminal.

Workshop. These roofs exploit complex curves of sophisticated geometry with an outer cladding of repetitive rectangular metal panels, and are light in weight yet high in thermal inertia. The energy savings and increased longevity of their design more than pay for their higher initial cost. Funded by the European Union and UNESCO, Piano is currently conducting research into such roofs in his laboratory-workshop on a slope above the Gulf of Genoa; he is also examining external walls that exploit similar principles. While it immediately benefits the firm's own work, this study, which is part of a continuing series of research projects, will eventually influence the approach of other architects.

Soft geometry

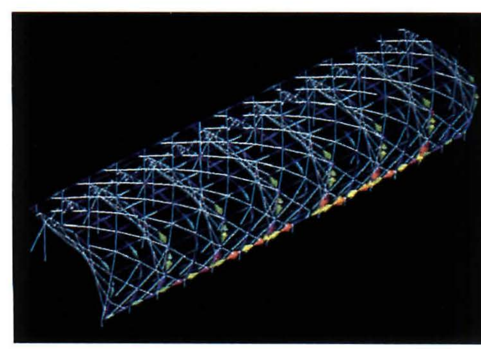
Piano's interest in cladding complex curves with repetitive rectangular units originates in the early work of the late Peter Rice of Arup & Partners, who led Kansai's structural engineering team and who devised the geometry for precasting and cladding the shells of Jørn Utzon's Sydney Opera House (1973). But the spherical geometry of the Opera House's shells resulted in an extreme mismatch between interior form and exterior volume. In contrast to this rigid geometry, the Building Workshop sought what Piano's associate Noriaki Okabe calls "soft" geometries, which dissolve the mismatch between *interior space* and exterior volume. The first building in this series was Piano's Bercy 2 shopping center (1987-90) in Paris. Because of the complex form imposed by a highway ramp that defines the edge of the site, some 30 sizes were needed for its 27,000 rectangular cladding panels. As at Kansai, these panels are designed to incrementally absorb any discrepancies in alignment.

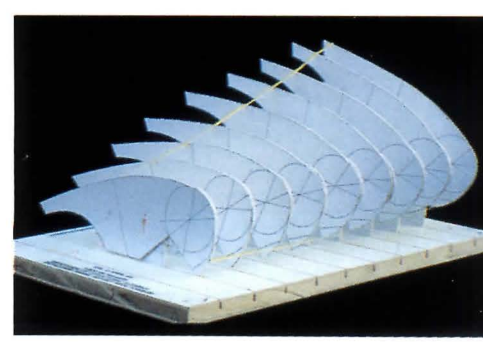
The triumph of Kansai's soft but rigorously disciplined geometry is that its complex curves are entirely clad in identical rectangular panels. The geometry results in a roof that so exactly conforms to the spaces inside



STRUCTURAL GEOMETRY OF BOARDING WING

KAZUO NATORI





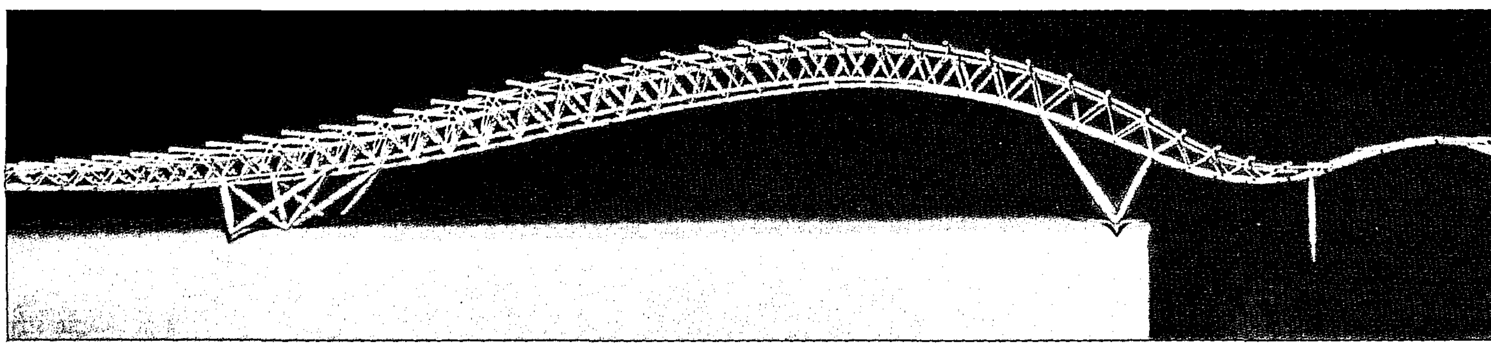
that it seems draped over them, or even pushed out like a balloon by the swelling spaces within. Moreover, this tolerant geometry was easily adjusted, with no loss of discipline, to required changes such as lowering the roof by 10 feet to improve the view of the airstrip from the control tower. It also allows the lowest rows of panels on the airside of the boarding wing to peel away from the glazing, so as to project and shade the glass.

Steel structure

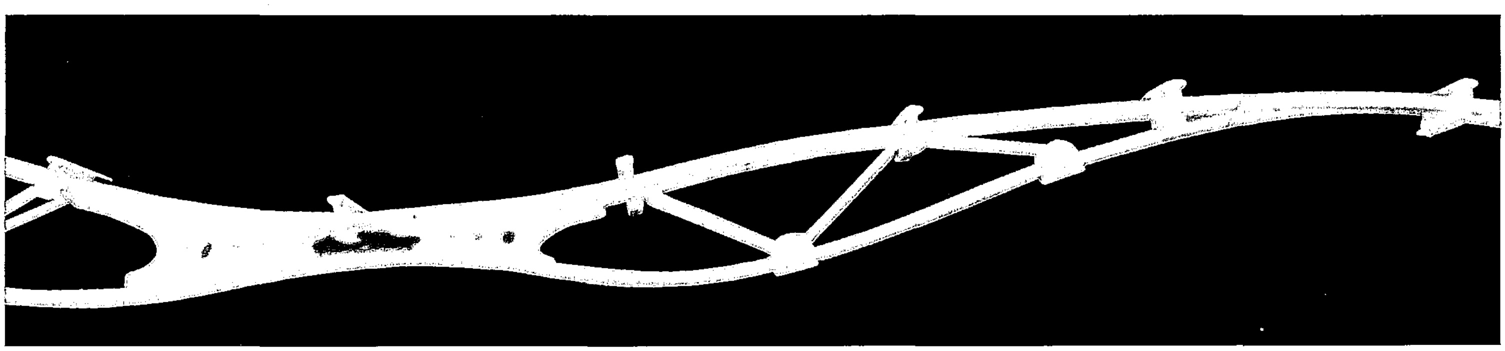
The exposed tubular steel structure of Kansai largely takes its form from that of the roof it supports. As Okabe explains: "If the geometry is soft, the structure below is melting." Despite the exotic forms of the main trusses and their props, the terminal's structure is, in engineering terms, fairly conventional, although its secondary structure must absorb huge lateral loads due to seismic action.

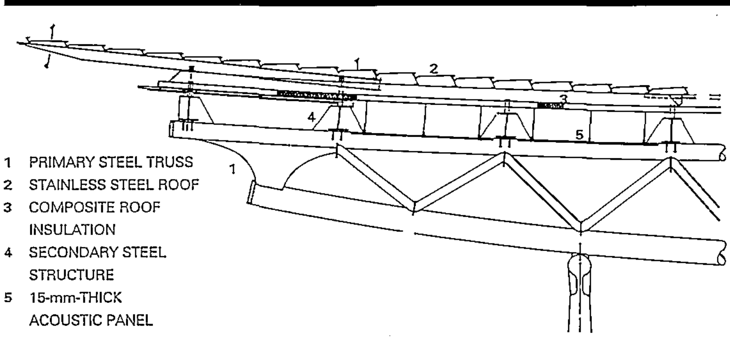
More innovative is the structure of the terminal's boarding wing, whose elements work together synergistically as a shell. Loads are distributed through all structural members and carried lengthwise along the 1/2-mile-long wings rather than by each rib placed 48 feet on center. Only alternating ribs are braced by tension ties to act as a stiffening diaphragm for the shell. The contrasting tight and slack curves of these ribs minimize bending moments so that each rib could be made in the same 16-inch tube as the chords of the trusses. To conform to the toroidal geometry of the boarding area, each of these ribs leans so as to be radially aligned with the center of the toroid 10 miles below the earth. This angle is clearly visible at the ends of the structure.

A major feature of the entire terminal's structural design is how it copes with differing sorts of movement. Besides dead-weight deflections, which are considerable given the building's spans of 275 feet, the structure must absorb live loads. Typhoons, in which horizontal and uplift wind loads are accom-



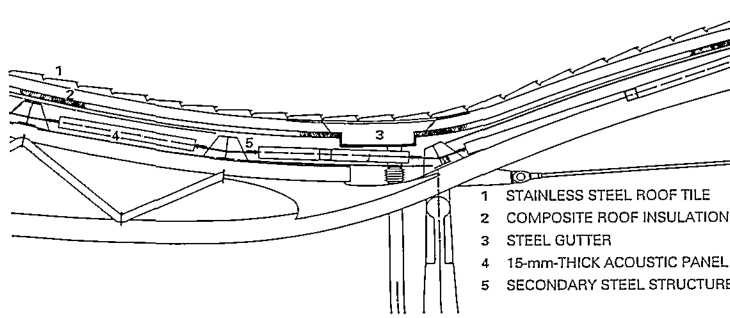
MASAHIKO TANAKA





1 PRIMARY STEEL TRUSS
2 STAINLESS STEEL ROOF
3 COMPOSITE ROOF INSULATION
4 SECONDARY STEEL STRUCTURE
5 15-mm-THICK ACOUSTIC PANEL

CURBSIDE ROOF FIN SECTION



1 STAINLESS STEEL ROOF TILE
2 COMPOSITE ROOF INSULATION
3 STEEL GUTTER
4 15-mm-THICK ACOUSTIC PANEL
5 SECONDARY STEEL STRUCTURE

ROOF SECTION THROUGH GUTTER

FACING PAGE, TOP: Structural model shows primary truss on its supporting struts.
FACING PAGE, CENTER: Early model studies junction between primary truss and boarding wing rib, which was later simplified to make bottom chord of truss contiguous with bowed rib.
FACING PAGE, BOTTOM: Sections show construction of roof and supporting structure at eaves (left) and transition between primary truss and wing rib (right).
BELOW: Section through boarding wing shows contrast between I-beams of steel structure and tension ties and curving tubular steel roof structure.
BOTTOM LEFT: Structural model of boarding wing shows expansion joint on right.
BOTTOM CENTER: Model shows junction of primary and secondary structure.
BOTTOM RIGHT: Section shows connection between glazing head and inner roof, below outer roof panels.

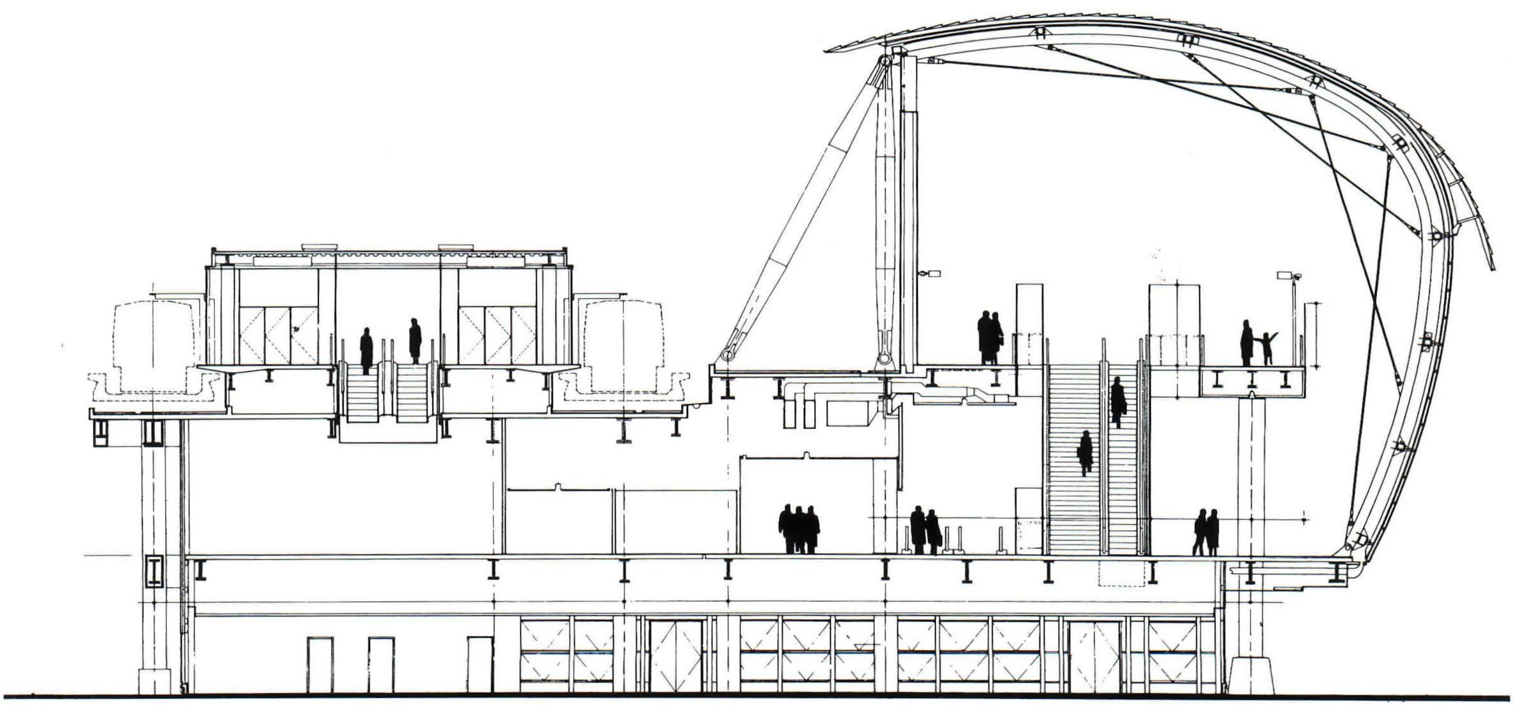
panied by huge weights of deluging rain, are frequent, as are immense, seismic stresses. The structure also has to deal with considerable differential settlements, given its construction on a newly created island setting.

Movement is absorbed in differing ways in many parts of the Kansai International Airport building. Expansion gaps sealed with flexible corrugated rubber extrusions divide the terminal into approximately 600-foot lengths. The top of the huge walls of glazing at the ends of the entrance hall, known as the "canyon," and the sides of the international departures hall slide up and down between the double trusses that edge this space. And because the supporting frames on either side of the canyon are independent of one another, the beams connecting them allow for a horizontal movement of up to 20 inches. The glazing at the top of the canyon's landside allows for some 5 feet of horizontal movement where penetrated by the bottom chord of the main trusses.

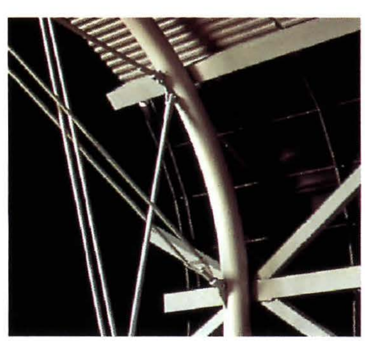
Because the terminal is lighter than the earth it displaced, it is settling more slowly on its island site than the runways. And because it floats on basements filled with mechanical equipment, the multistory central section of the terminal sinks most slowly of all, despite ballast in compartments under the basement of thousands of tons of dense iron ore. To cope with all this, all 900 columns of the terminal are monitored by computer and adjusted in height (usually lowered) through jacks and the removal of spacing shims. The terminal's settlement will continue for years to come. And heights cannot be aligned by laser, because in so long a building, the earth's curvature affects the accuracy of lasers; settlement can only be aligned by interconnected water levels.

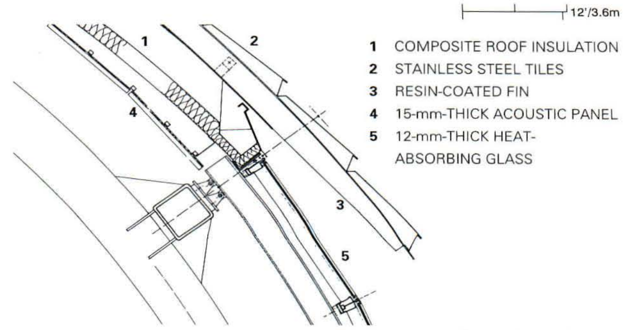
Mechanical systems

To control the environment in the huge spaces of the Kansai terminal, a combination of what Arup engineers refer to as macrosys-



BOARDING WING SECTION

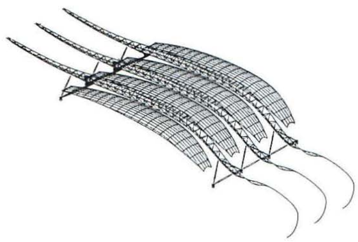




AIRSIDE FIN SECTION

tems that heat and cool the whole space and microsystems that locally fine-tune conditions has been applied throughout the building. All outside and conditioned air is introduced by the macrosystems, and the microsystems recycle air locally, simply heating or cooling it as required. The most innovative and consistent application of this solution is installed in the international departures hall. Here, microsystems draw air into a mechanical plant above one end of the check-in counters. The air is distributed via nozzles in tubular ducts that extend above these counters. And "pillars" housing fan coil units stand at the foot of the huge expanses of single glazing that enclose the sides of the hall to compensate for any heat gain or loss through the glass.

The macrosystem in the international departures hall consists of air jets blown in through ducts from its landside and entrained by scooplike shells made of Teflon-coated fabric and suspended below and between the trusses. The tightening curve of the air jet determined the asymmetric curve of the roof. The Kansai terminal is the first time such a system had been used at a vast scale and determined the form of a space. Arup & Partners tested the system at 1/10 full size, showing that the suspended shells were not strictly necessary to guide the air. But the presence of the shells and wind sculptures that spin below them make the air-handling system comprehensible to the observer. The shells also serve as reflectors for the uplights that illuminate the 50-foot high hall.

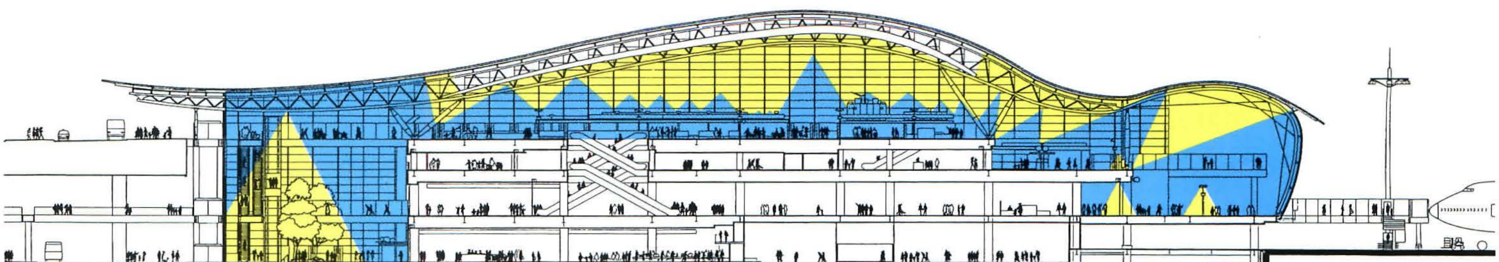


FABRIC SHELLS AND ROOF TRUSSES

Fire protection

How was the airport's single, unpartitioned volume, which includes the long boarding wings and nearly 1.5 billion cubic feet in volume, approved by local fire authorities? Again this was achieved with help from Arup—and the cooperation of enlightened Japanese authorities. Though Japan has stringent fire regulations with very specific codes,

YOSHIO HATA



SECTION SHOWING LIGHTING

FACING PAGE, TOP: Trusses support Teflon-coated fabric airscoops.
FACING PAGE, CENTER: Airscoops in the international departures hall entrain the air jets providing fresh conditioned air.
FACING PAGE, BOTTOM: Section shows light reflected on asymmetric, curved roof.
BELOW: Air blown along fabric scoops is fine-tuned with locally recycled air, which is heated or cooled and distributed via ducts atop check-in counters.
BOTTOM: Ducts over international departures hall check-in counter (left) and ducts extending from counters to concession floor (right) recycle air.

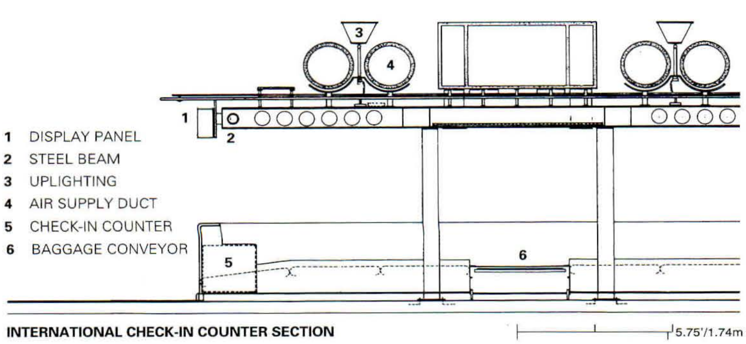
the authorities were prepared to waive them for an alternative approach to safety convincingly argued from engineering principles.

A specially convened committee of experts judged the merits of the case for a multistrategy approach argued by Arup. The engineers pointed out elements of the Kansai Airport building that make it an exceptional case: the spacious layout in which people can move freely and see where they are going; the clear definition of potential fire hazards; the lofty ceilings to which smoke can rise; and the fact that an airport is an intensively managed place where people follow public-address-system announcements.

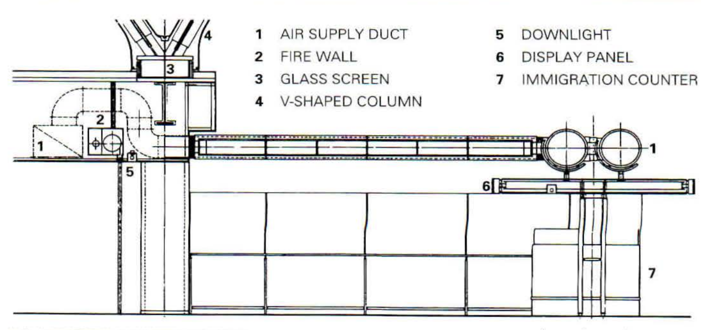
Two crucial aspects of Arup's case are what came to be known as the "cabin" and "island" concepts. With the cabin concept, major fire hazards, such as the concession floor and check-in counters, are contained separately under rapidly ventilated smoke hoods with sprinklers. With the island concept, less hazardous elements, such as groups of seats, are arranged far enough apart not to be able to induce combustion in each other.

The Kansai terminal shows what can be achieved when enlightened regulating authorities do not blindly apply standard building codes, but have the capacity to assess engineering arguments and waive regulations. Moreover, the design *shows that fast-*track, low-cost construction need no longer lead to the current norm of buildings composed of loosely married systems. Instead, with the disciplined application of the computer, these systems can come together in a satisfyingly organic synthesis. The Kansai terminal marks a turning point in architecture consistent with what is happening in other fields of human endeavor, where technology increasingly approximates biology, and nature is increasingly engineered. More prosaically, the Kansai terminal pioneers approaches to structure, cladding, and mechanical systems that are bound to be more widely applied.—*Peter Buchanan*

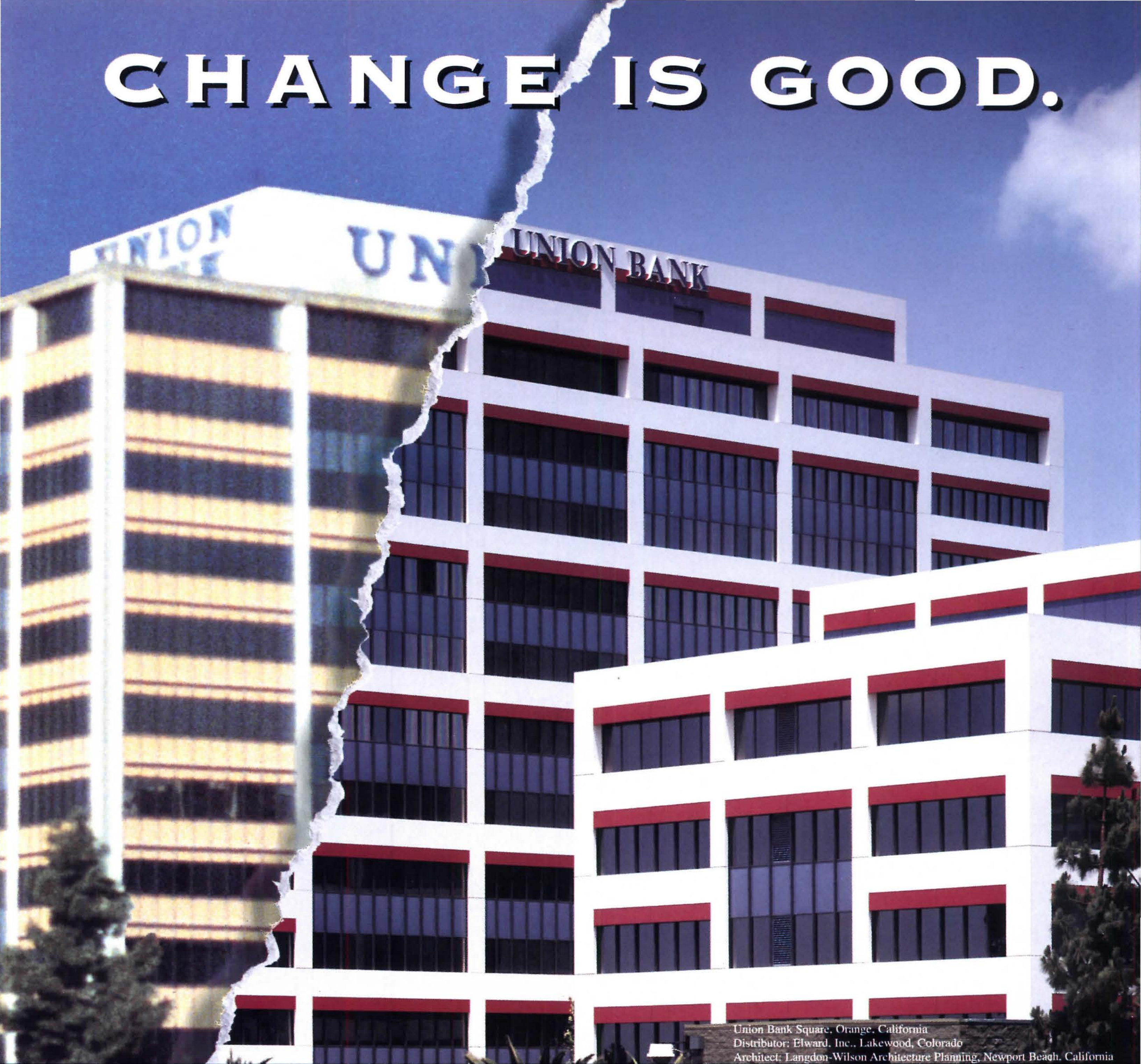
YUTAKA KINUMAKI



INTERNATIONAL CHECK-IN COUNTER SECTION



IMMIGRATION COUNTER SECTION



Make the old new again when you retrofit with Alucobond Material, the economical, flexible way to turn an outdated building into an ultramodern structure.

Installation is fast and easy. Alucobond Material goes right over the old exterior without the need to remove or pre-treat the existing building material. And with new, cost-efficient systems now available for attachment, it's even more affordable. Choose from a wide variety of standard colors and finishes. Or use our in-house, coil coating custom-color capabilities to add just the right color to restore or improve on a building's original beauty.

For more information about retrofit as well as new construction applications, call 1-800-382-6445 or 502-527-4200. Or write Alucobond Technologies, Incorporated, P.O. Box 507, Benton, KY 42025. And make a change for the better.

A-T-I®

Alucobond Technologies, Incorporated

Circle 150 on information car

Building On the Edge

A Los Angeles architect tackles steep topography in detailing a hillside house.

BOTTOM RIGHT: Large glazed expanses along the house's east elevation offer views into canyon and minimize mechanical heating in winter.
SITE PLAN: Wedge-shaped site slopes toward south at a 45-degree angle.

The steep, geologically unstable hillsides of Los Angeles have challenged architects' ingenuity for decades. The most common local solution is to cantilever a level deck from the street and build a conventional two- or three-story structure atop the platform.

Architect Aviva Carmy chose a different strategy for her house on a slope of the Santa Monica Mountains above Beverly Hills. Carmy's pie-slice-shaped, east-facing lot falls at a 45-degree angle from a narrow, twisting hillside road, and drops 12 feet south-to-north along its 140-foot street frontage.

Given the difficult site and the tendency of general contractors to bid high to cover contingencies in such tricky situations, Carmy decided to act as her own general contractor to keep costs down.

Since only two stories are permitted above street level in this district, Carmy excavated the slope along the site frontage to create a third level 14 feet below the roadway. The house encloses 6,500 square feet, plus an extra 4,000 square feet of open terraces.

In plan, the house is divided into three semi-independent zones, each with its own separate entrance: a 4,200-square-foot, family living area with a master-bedroom suite and three children's bedrooms on the second and third floors; a 1,700-square-foot architect's studio on the third floor at the north end; and a 600-square-foot, double-height guest suite on the first floor, adjacent to a lap pool, terrace, and squash/basketball court.

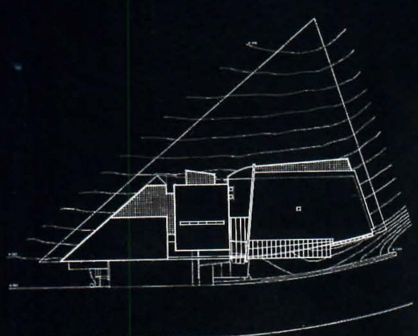
Excavating the slope presented the project's most complex and costly challenge. Shoring up the 20-foot-deep cut along the 140-foot street frontage required 37 caissons driven 60 feet down into bedrock. A 17-inch-thick reinforced-concrete wall links the piles between grade and street level.

Driving the piles was a particular headache. The only level area adjacent to the roadway was a small patch next to the main entry, and conventional piling operators refused to place their machinery in such a precarious position. Eventually, Carmy found an oilfield piler willing to risk his rig and work for a flat fee. The bill for the piling, excavation, and concrete work totalled $300,000—a third of the cost of the completed house.

At the same time, Carmy had to negotiate with a double set of codes and regulations mandated by the Los Angeles Department of Building and Safety and Department of Public Works. The permit process took a year and involved the purchase of a $1 million insurance bond against possible damage to the street structure.

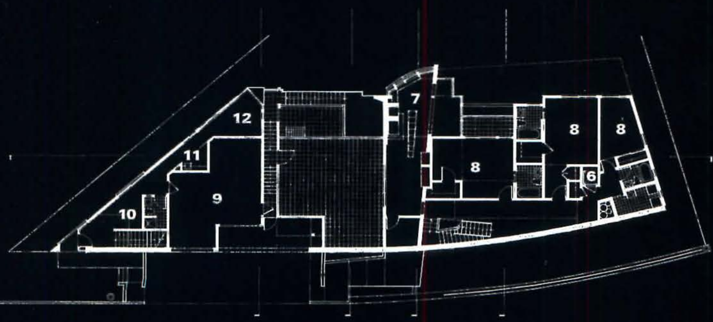
The concrete slab and beams at grade support a central spine of steel beams and columns through the first and second floors tied into flanking concrete walls at the north and south ends of the house. Wood framing extends from the concrete back and side walls and the steel spine. This framing forms the third floor and exterior walls—except where concrete is used—and interior partitions throughout the structure. The exterior and projecting fire wall that separates the studio from living area are clad in birch plywood with beaded joints.

While the house was under construction, local codes were amended to forbid building on precipitous hillside sites like Carmy's. "I understand the intention," sighs Carmy, "but I feel the new codes restrict a designer's imagination. Any site can be built on successfully with enough sweat and moxie."—*Leon Whiteson*

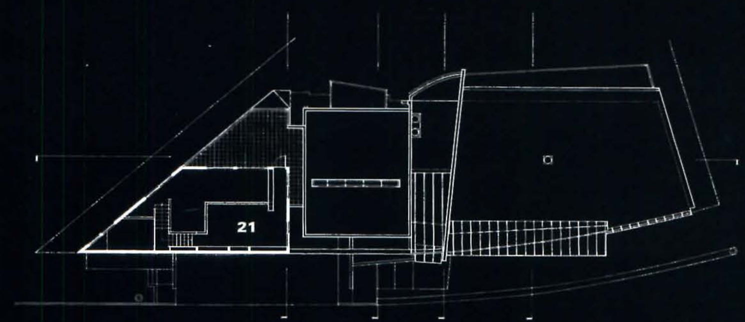


SITE PLAN 40'/12m

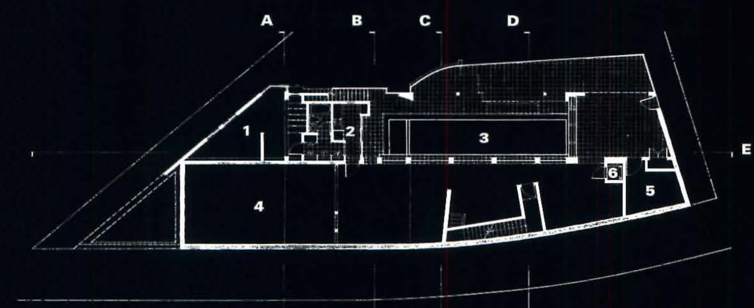
DOUGLAS HILL



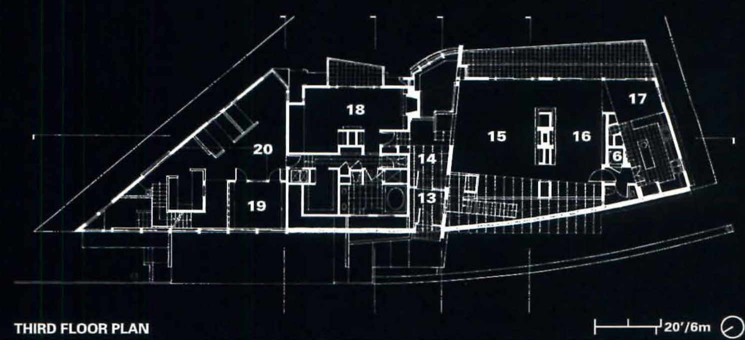
SECOND FLOOR PLAN



MEZZANINE FLOOR PLAN

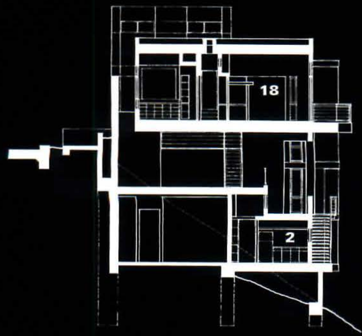


FIRST FLOOR PLAN

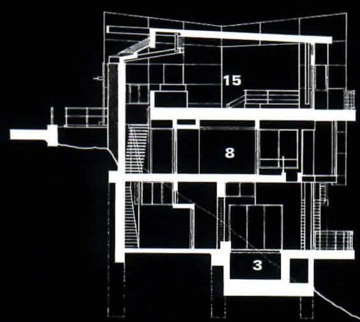


THIRD FLOOR PLAN

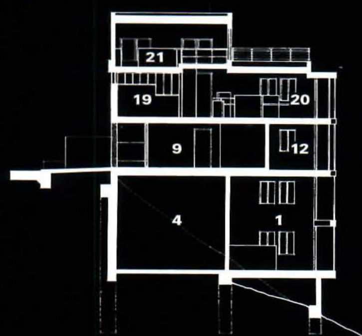
DOUGLAS HILL



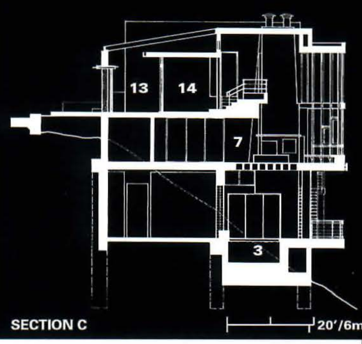
SECTION B



SECTION D



SECTION A



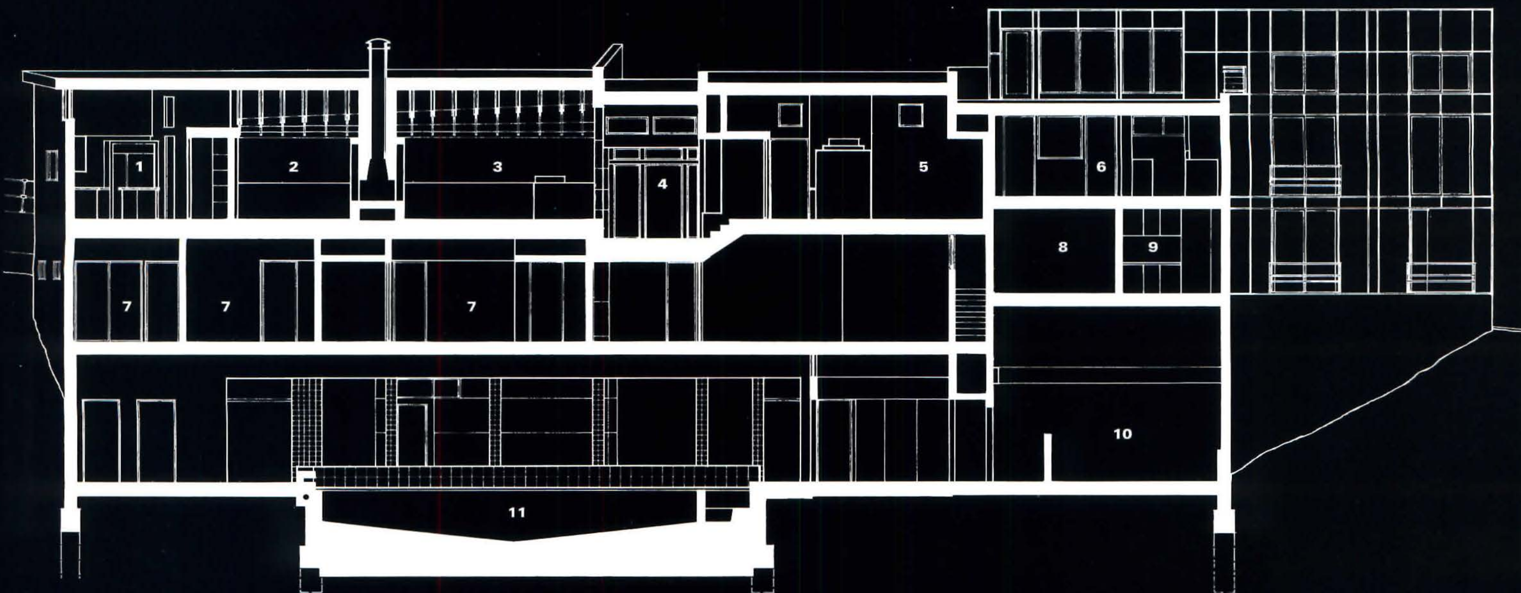
SECTION C

1 GUEST SUITE
2 KITCHEN
3 POOL
4 SQUASH COURT
5 MECHANICAL
6 ELEVATOR
7 DEN
8 BEDROOM
9 GARAGE
10 LOBBY
11 DARKROOM
12 OFFICE
13 ENTRY COURTYARD
14 ENTRY
15 LIVING ROOM
16 DINING ROOM
17 BREAKFAST ROOM
18 MASTER BEDROOM
19 CONFERENCE ROOM
20 STUDIO
21 LIBRARY

FACING PAGE, PLANS: House is divided into three semiautonomous zones, including studio, family living areas, and guest suite with pool and squash courts.
FACING PAGE, BOTTOM: Curved, redwood-framed window encloses double-height family room.
SECTIONS: Concrete foundation wall along street extends 60 feet into hillside.
BELOW LEFT: Carmy clad garage, studio, and library exteriors in birch *plywood* with beaded joints.
BELOW RIGHT: Concrete lintel in street facade supports 2-inch-thick, 500-pound steel entry door.
FOLLOWING PAGE, SECTION: Main house comprises living spaces (top floor), bedrooms (middle floor), and guest suite and pool (bottom floor).
FOLLOWING PAGE, BOTTOM: Sparse palette of interior finishes includes a maple living room floor inlaid with African purple-heart wood.

DOUGLAS HILL PHOTOS

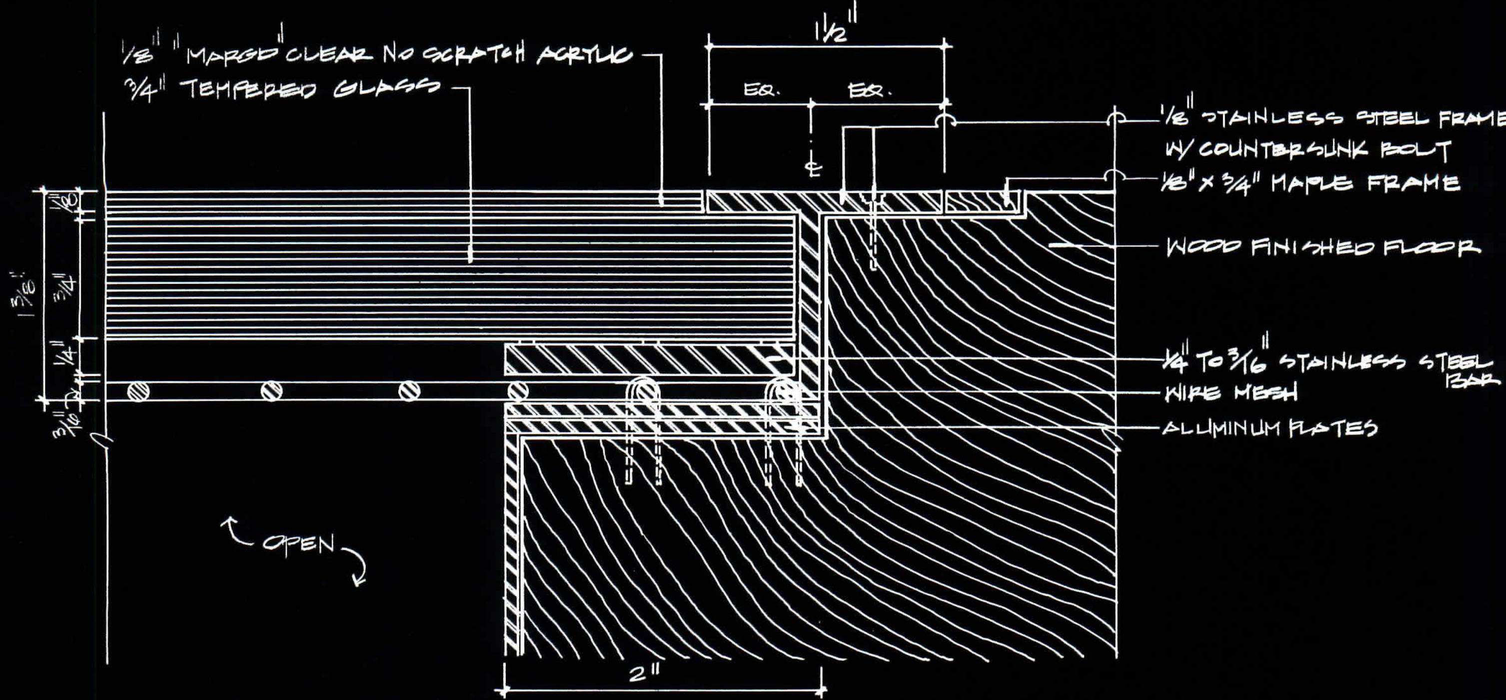
1 KITCHEN
2 DINING ROOM
3 LIVING ROOM
4 ENTRY
5 MASTER BEDROOM
6 STUDIO
7 BEDROOM
8 GARAGE
9 DARKROOM
10 GUEST SUITE
11 POOL



SECTION E

20'/6m

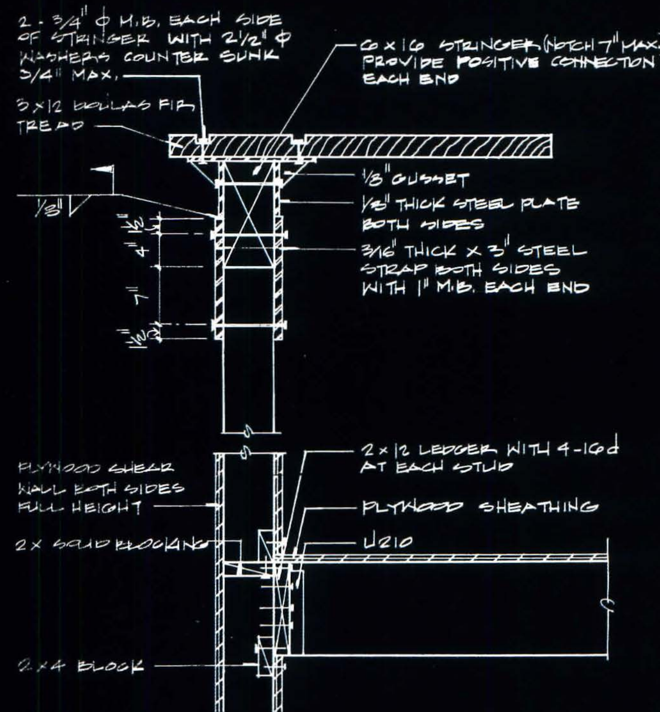
DOUGLAS HILL



DETAIL OF GLAZED FLOOR OVER POOL

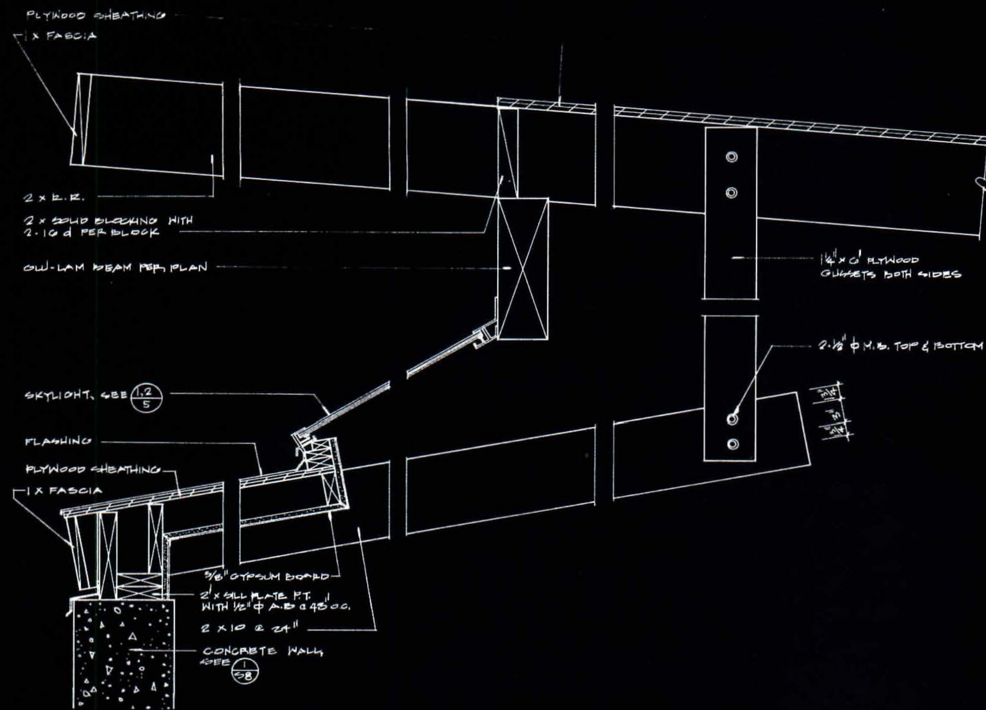
DOUGLAS HILL PHOTOS

PREVIOUS PAGE, DETAIL: Family room is punctuated by glazed slot in floor.
PREVIOUS PAGE, BOTTOM LEFT: Glazed floor opening allows views to pool.
PREVIOUS PAGE, BOTTOM RIGHT: First-floor guest suite adjoins lap pool and terrace.
DETAIL, RIGHT: Main stair is composed of 12-inch-by-3-inch treads bolted to wall.
BELOW LEFT: Skylight illuminates curved concrete foundation wall.
BELOW RIGHT: Steel-and-wood staircase overlaps skewed interior wall.
FACING PAGE, DETAIL: Plywood brackets framed into concrete wall.
FACING PAGE, BOTTOM: North-facing skylight brings diffused daylight into third-floor living room.



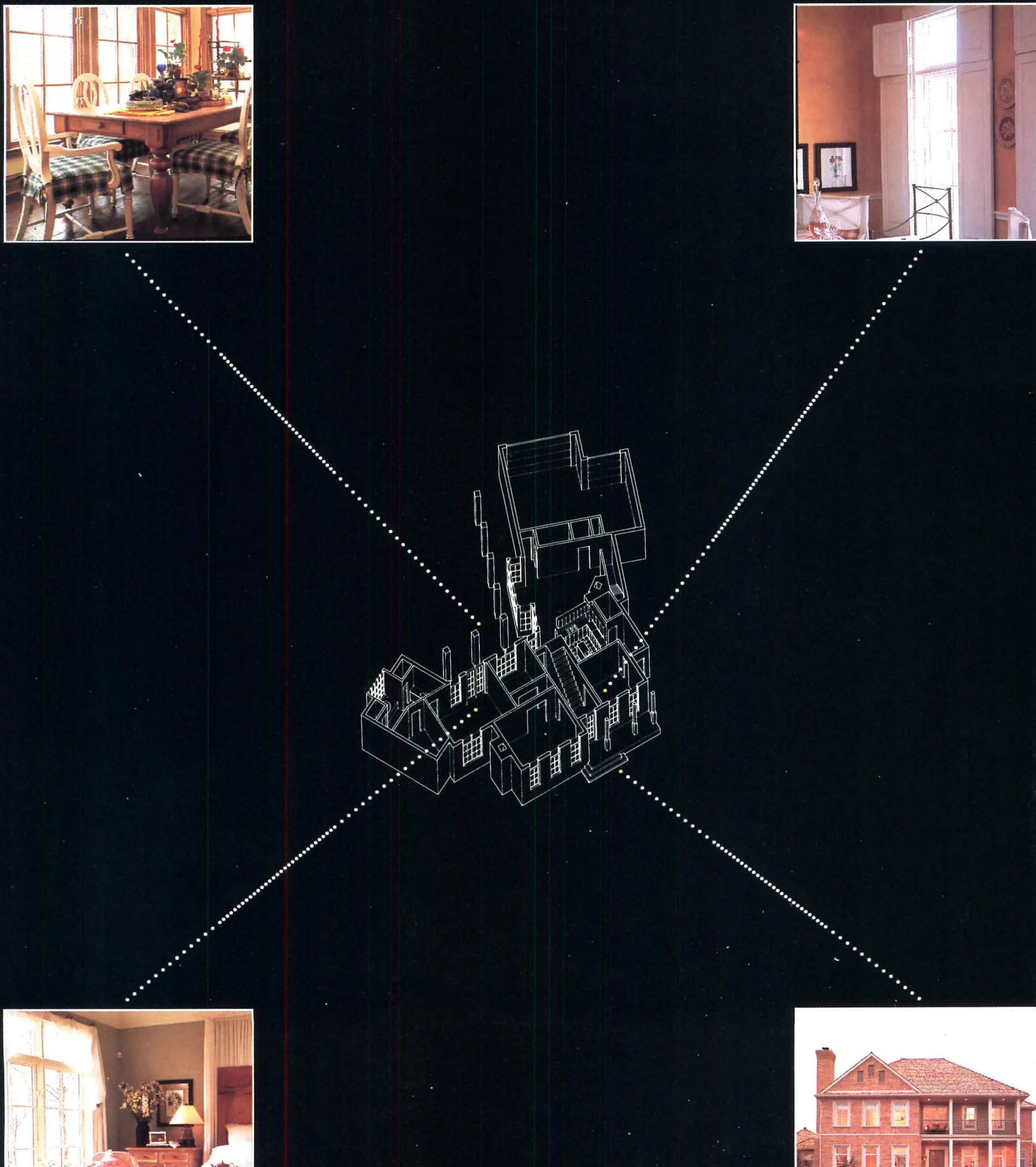
DETAIL OF STAIR TREAD

DOUGLAS HILL PHOTOS



DETAIL OF SKYLIGHT AND BRACKETS

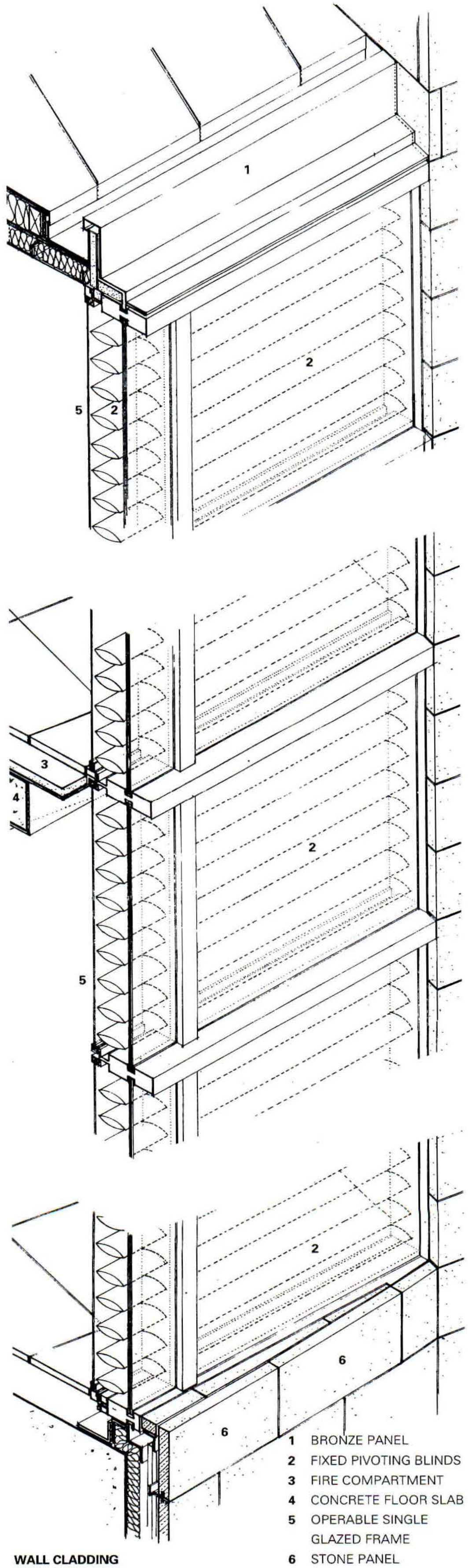
DOUGLAS HILL



High-Tech Cladding

Double-wall glazing systems improve thermal and acoustic envelope performance.

RIGHT: To insulate interiors from noise, Michael Wilford and Partners specified a double-wall cladding system for its 1 Poultry Street office building in London.



WALL CLADDING

Off-the-shelf cladding systems can sometimes be the worst solution for a building," maintains London architect Robin Partington, a principal of Norman Foster and Partners. "They're engineered to solve many problems in an average way, but don't solve any particular problem very well." A more tailored alternative to conventional curtain walls is a double-wall system, which is gaining popularity in Europe for the simple way it thermally and acoustically insulates large glazed expanses. These assemblies typically comprise a single layer of external glass and an interior layer of double-glazing—or vice-versa—separated by an air space. The cavity can be heated to create a warm buffer that protects cold facades in winter or can be configured to function as a thermal chimney that ventilates excess heat out of the building in summer. Operable louvers also can be installed in the interstitial space to minimize solar gain.

These double-wall systems cost significantly more than traditional curtain walls, discouraging many American architects from specifying them, but their potential energy benefits could end up saving owners money. "Architects in the U.S. really need to enlighten clients about the potential long-term cost benefits of these systems," explains Rayme Kuniyuki, an associate of New York City-based Heinteges Architects.

Double-wall cladding is not entirely new to American architects: the first such system in the United States was installed roughly a decade ago in the former Hooker Chemical Building in Niagara Falls, New York, designed by Cannon Architects of Grand Island, New York. Since then, only a handful of American architects have specified the system, including Alan Chimacoff of Princeton, New Jersey's Hillier Group. Collaborating with Skidmore Owings & Merrill and with mechanical engineers Flack and Kurtz, Chimacoff installed a double-wall envelope on the 1984 Innerplex offices in Princeton.

Another architect who is experimenting with a double wall is Raimund Abraham, who plans to clad the library and auditorium of his Austrian Cultural Institute in New York City in a double-wall assembly. For an 18-story office tower in Berlin, German architects Matteus Sarbrouck and Louisa Hulton, in conjunction with engineers Ove Arup & Partners, are designing the largest double-wall system to date. The successful performance of these efficient cladding systems could help make the case for increasing their use in this country.—*Raul A. Barreneche*

Milton Court
London, England
Denys Lasdun Peter Softley & Associates, Architect

To increase the thermal performance of an office building's glazed exterior and to minimize traffic noise inside, British architect Denys Lasdun Peter Softley & Associates designed a double-wall system of glass panels. Double-wall construction also maximized the flexibility of the floor plates, as it allowed the project's architects to place the perimeter columns between the layers of the exterior skin.

It also reduced the impact of the layout on the external appearance of the building. According to the architect, solid cladding panels could be introduced on the double wall's interior surface, for example, to enclose perimeter conference rooms without interrupting the exterior.

The steel-framed building's cladding comprises 6-meter-square glazed panels, which were bolted to a structural frame to facilitate their installation: During construction, the panels were fastened from inside the structure without requiring any exterior scaffolding. The architect specified 10-millimeter-thick, heat-strengthened single glass on the outer layer, which is tinted green for solar protection. Double glazing is mounted on the interior side, behind a 60-centimeter-wide ventilated air space. Catwalks extending between the enclosed columns allow maintenance of the cavity interior and also function as sunscreens.

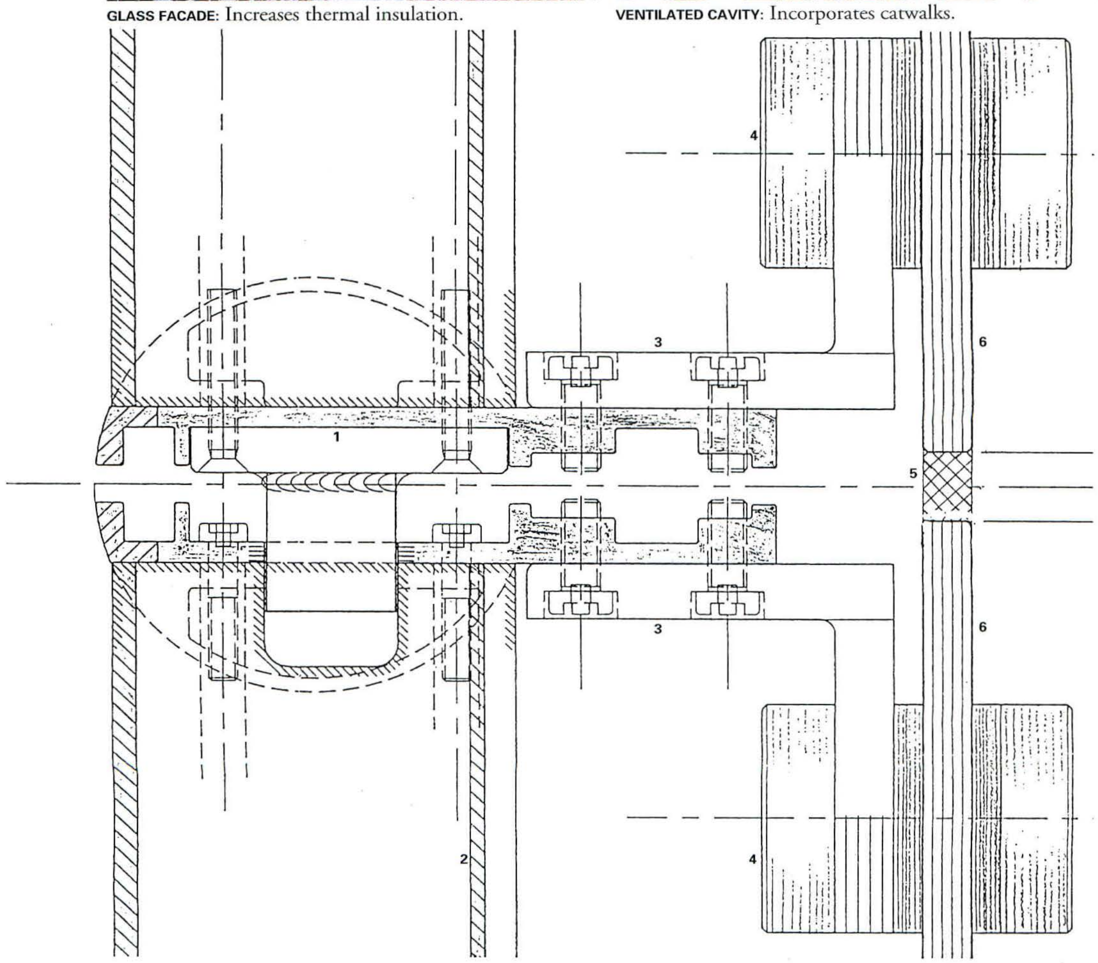
Louvers at the top of the facade automatically open when the temperature in the cavity exceeds room temperature to allow outdoor air to cool the cavity. If sensors placed inside the double wall detect that the cavity temperature is still too high, a fan at the base of the cladding forces cool ambient air into the cavity. The architect didn't include a heating system to pump warm air into the cavity during the winter, but the air space still provides more effective insulation than a typical single-layer curtain wall.


JEREMY COCKAYNE

GLASS FACADE: Increases thermal insulation.


RICHARD TURPIN

VENTILATED CAVITY: Incorporates catwalks.



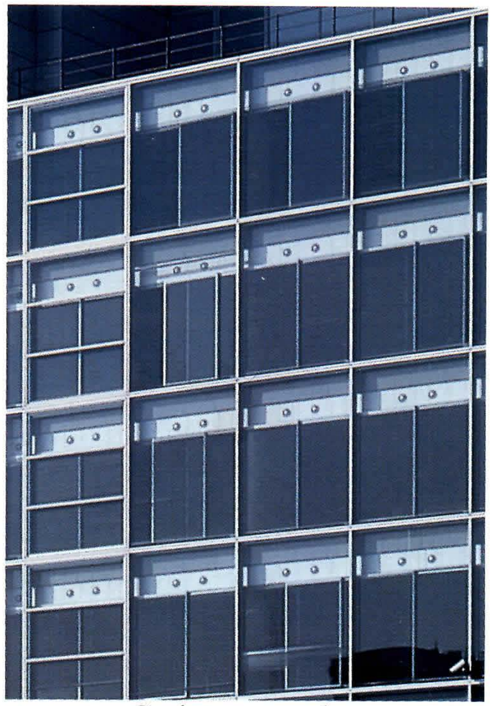
TRANSOM DETAIL

1 ALUMINUM MULLION
2 ALUMINUM TRANSOM
3 ALUMINUM SUPPORT ANGLE
4 FIXING BOLT
5 SILICONE JOINT
6 10mm TINTED EXTERIOR GLASS

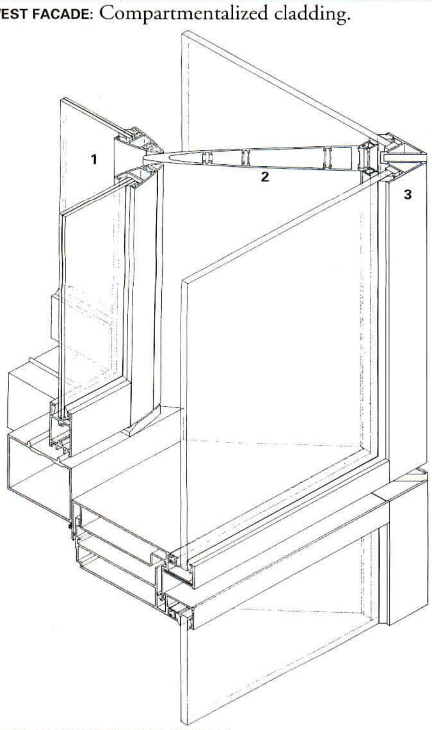
Independent Television News Headquarters Building
London, England
Norman Foster and Partners

RICHARD DAVIES PHOTOS

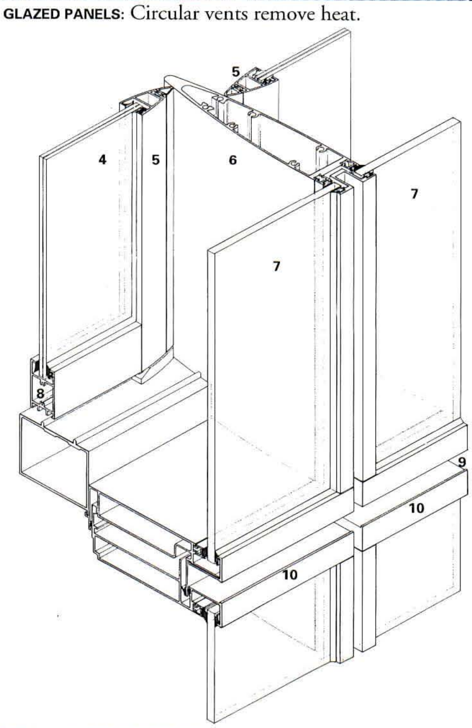
WEST FACADE: Compartmentalized cladding.



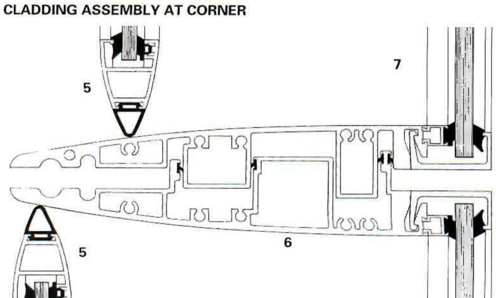
GLAZED PANELS: Circular vents remove heat.



CLADDING ASSEMBLY AT CORNER



TYPICAL CLADDING ASSEMBLY



HORIZONTAL MULLION SECTION

1 PIVOTING SINGLE GLAZED INNER WALL PANEL
2 CORNER MULLION
3 SPECIAL EXTRUDED ALUMINUM CORNER PRESSURE PLATE
4 SINGLE GLAZED LAMINATED INNER SLIDING WALL
5 EXTRUDED ALUMINUM PROFILE
6 SPLIT MULLION
7 3m x 4m SINGLE GLAZED OUTER PANEL
8 EXHAUST AIR VENTILATION GAP UNDER SLIDING DOOR
9 EXPANSION JOINT
10 ALUMINUM EXTRUSION TRANSOM

For a building housing a television channel's headquarters and speculative offices, architect Norman Foster devised an energy-efficient cladding system that made economic sense for a partially speculative project. Foster clad the first five levels of the seven-story structure in a double-wall assembly composed of 3-meter-by-4-meter bays. He placed 12-millimeter-thick single-layer float glass on the exterior and a layer of sliding, 13-millimeter-thick laminated glass panels inside. Between the glass layers, a 20-centimeter-deep cavity contains adjustable aluminum blinds anchored to individual transoms that create compartmentalized cavities with fire stops. The blinds and gray-tinted interior glass help cut solar gain.

The envelope's airfoil-shaped aluminum mullions are designed to absorb movement between glass panels caused by thermal expansion and contraction. "We wanted to make these mullions work very efficiently," explains principal Robin Partington, "to minimize the amount of aluminum used."

Another benefit of the cladding system is its function as a "thermal flue." In summer, inside air is drawn into the envelope's cavity through overhead ducts and is combined with warm air trapped in the cavity. The air is then exhausted from the building through two circular vents in the transoms. In winter, when heat is lost through the expansive glass facades, the airflow can be adjusted to blow heated air into the cavity, creating a thermal buffer between inside and out.

To prevent condensation in the cavity, Foster inserted small thermostatic heaters in each envelope module. "We initially anticipated that these heaters would be used only 5 percent of the year," explains Partington, "but in practice, the cladding works so well that the heaters are hardly ever turned on."

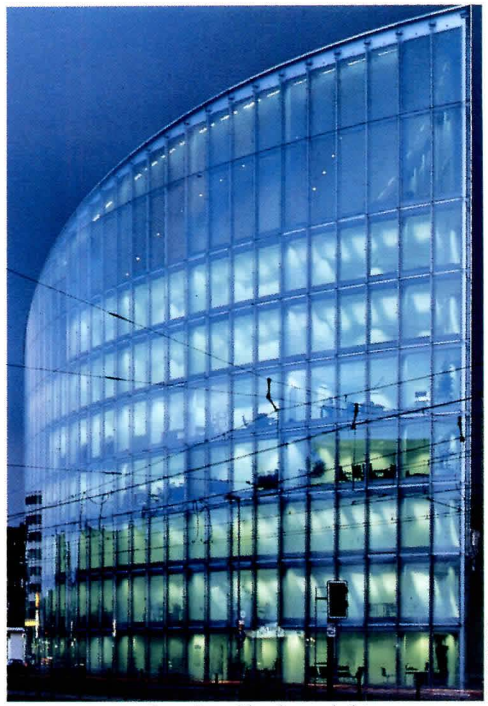
Business Promotion Center
Duisburg, Germany
Norman Foster and Partners

Foster's scheme for an office building in Germany incorporates an exterior envelope with a ventilated air space similar to that of the Independent Television News (ITN) headquarters (previous page), but with some key differences. "You can't simply photocopy the same cladding onto every building," warns principal Robin Partington. "You have to evaluate each building's particular function, client, and siting, and then develop an appropriate system." Foster's office worked with the German manufacturer Kaiserbantechnik to develop the building's cladding components.

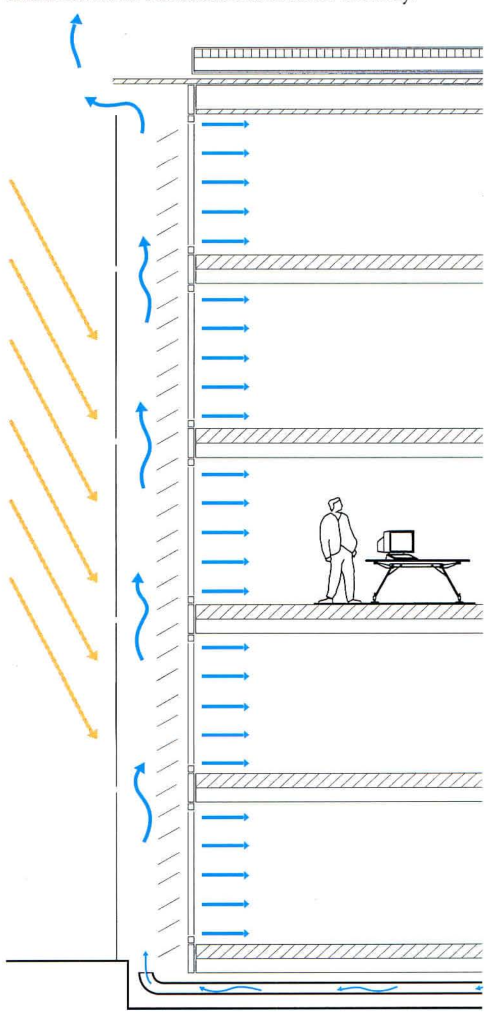
Part of the challenge for Foster was meeting strict German codes that heavily regulate the detailing of exterior cladding. "These regulations end up creating awkward, clunky facades," explains partner David Nelson. By specifying a double-wall system for the center, the architect was able to provide the necessary details, such as thermal breaks, on the inner layer and create a clean and elegant facade on the outer layer. "It's as much an esthetic solution as it is an energy or insulation solution," maintains Nelson.

The building envelope's outer layer is composed of 10-millimeter-thick, single-glazed panels fastened to aluminum tension rods with stainless steel brackets. At ground level, an aluminum channel accommodates thermal expansion of the exterior glass, up to 6 centimeters.

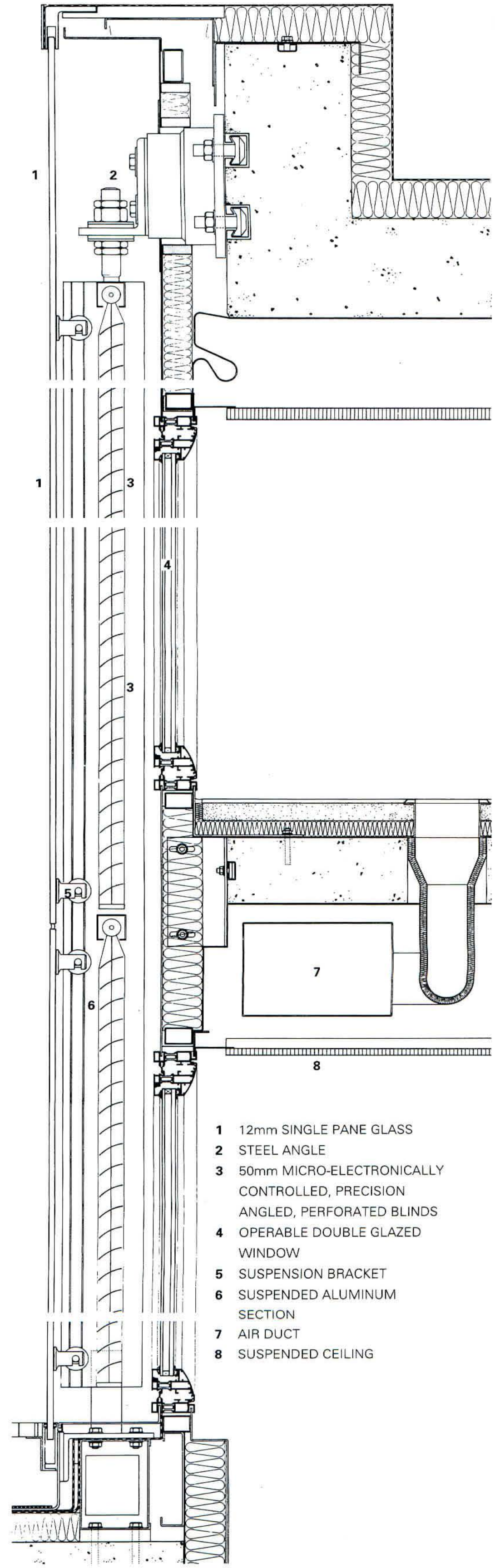
An inner layer, separated from the exterior by a 20-centimeter-wide cavity, is composed of 1.5-meter-by-2.4-meter glass panels, measuring 6 millimeters thick. These low-emissivity, double-glazed panels can be opened to ventilate the interior. Inside the cavity, perforated aluminum blinds, mounted to the underside of the top steel angles with stainless steel bolts, provide shading. The louvers respond electronically to changing sunlight, but


DENNIS GILBERT

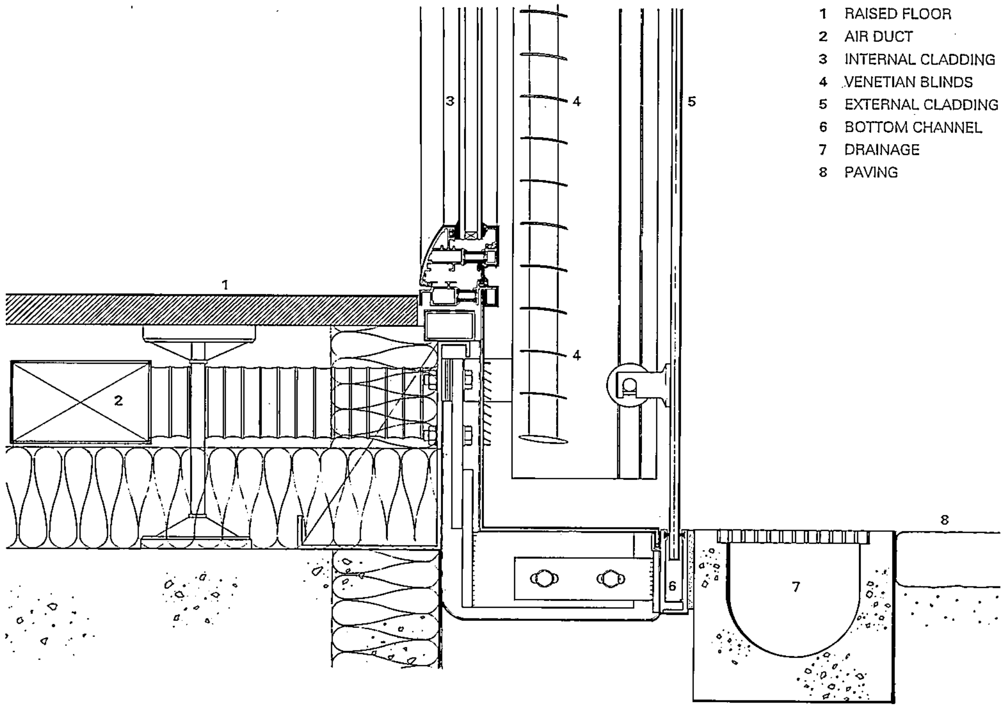
GLAZED EXTERIOR: Functions like thermal chimney.



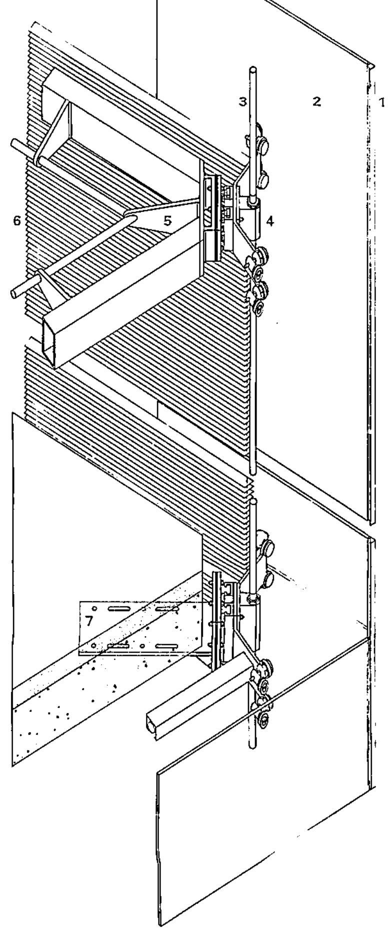
AIRFLOW SECTION



PERIMETER WALL SECTION

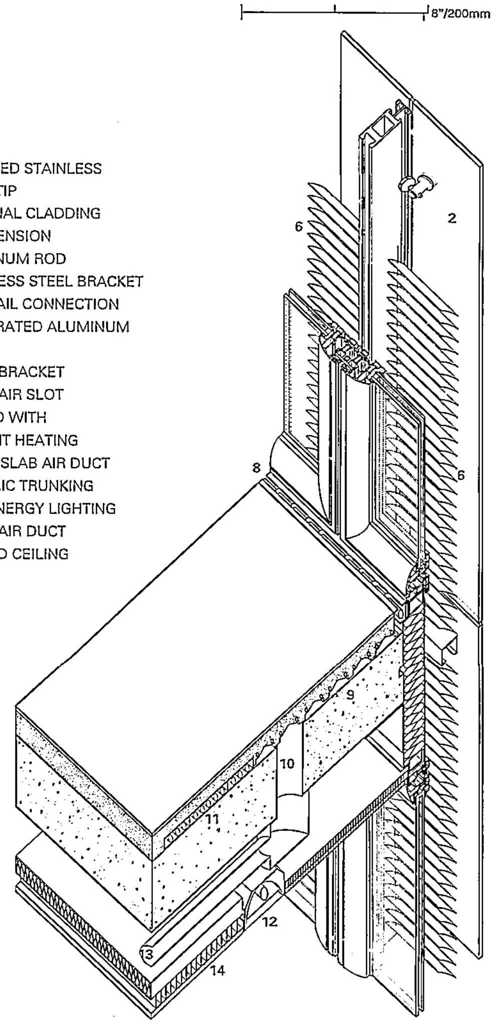


WALL SECTION AT GROUND LEVEL



EXTERIOR CLADDING ASSEMBLY

1 POLISHED STAINLESS STEEL TIP
2 EXTERNAL CLADDING
3 HIGH TENSION ALUMINUM ROD
4 STAINLESS STEEL BRACKET
5 DOVETAIL CONNECTION
6 PERFORATED ALUMINUM BLINDS
7 FIXING BRACKET
8 FRESH AIR SLOT
9 SCREED WITH RADIANT HEATING
10 FLOOR SLAB AIR DUCT
11 ELECTRIC TRUNKING
12 LOW ENERGY LIGHTING
13 FRESH AIR DUCT
14 COOLED CEILING



TYPICAL CLADDING ASSEMBLY

can also be adjusted by occupants. "Personal control over one's thermal comfort is a big concern in Germany," adds Nelson.

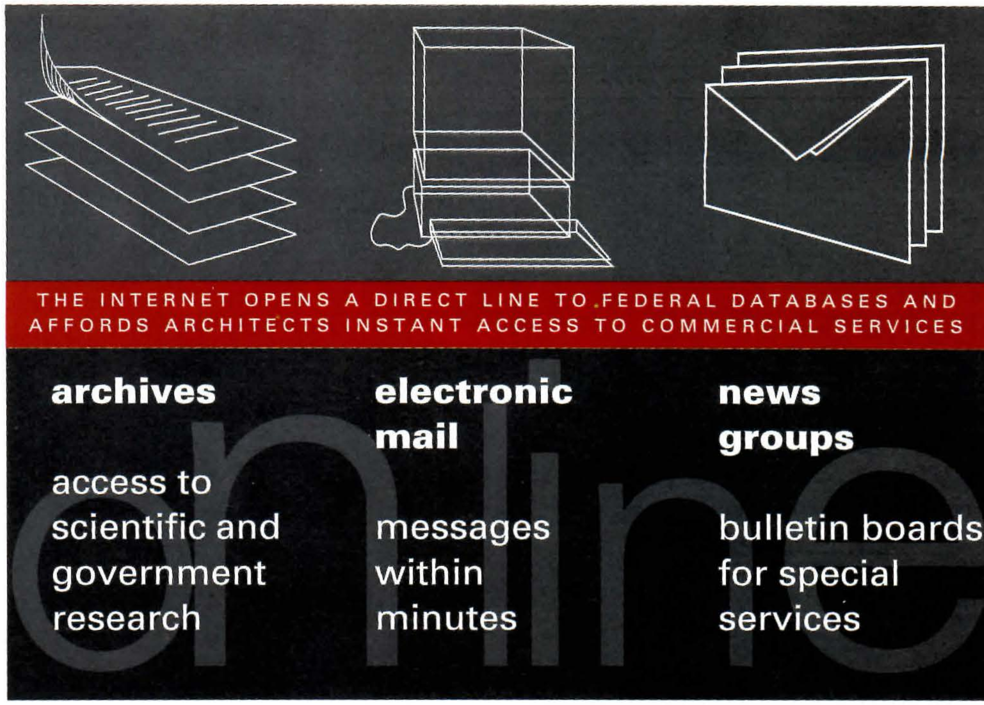
Unlike the ITN Building, the cladding for the Business Promotion Center features a continuous cavity that extends the full height of the wedge-shaped building. "One major drawback of having a continuous cavity, however, is that the air you introduce into the cavity is not as clean or as dry as air that would be ventilated from inside the building," explains Partington.

Air is heated or cooled in a below-ground plant and drawn into the bottom of the wall through ducts located beneath the raised ground-floor plenum. Because air is not pumped in directly from the outdoors, there is less risk of condensation in the cavity. Air rises through the curtain-wall cavity by chimney effect and then is exhausted through a vent located below the parapet. This continuous air flow helps reduce solar gain by trapping and removing heat before it affects the building's interiors. The air space also provides conditioned ventilation to occupants who slide open the interior glazed panels and, in winter, creates a thermal buffer as warm air is pumped into the cavity and further heated by the sun.

The energy-efficient building includes photovoltaic panels that convert solar energy into electric power. It features a radiant HVAC system, in which heat is radiated by hot-water pipes encased in floor slabs; cooling, meanwhile, is provided by chilled-water pipes inserted into the building's ceiling plenums. "Because we designed windows that open onto the air space, we were able to separate the building's ventilation system from its heating and cooling," adds Nelson. "This let us explore more energy-efficient solutions than if we had combined them in a traditional system."

Information Networks

New on-line services stretch the horizons of long-distance design and practice.



A vast new dimension of computer networks, known collectively as the information superhighway, permits the instantaneous exchange of digitized data across town and around the globe. On today's networks, architects can send messages to their consultants; grab a new piece of software from a distant electronic shelf; read tomorrow's requests for proposals from the government today; and send CAD drawings from St. Louis to Vancouver or Shanghai, and back, within hours.

The potential of on-line applications in architecture is as boundless as the networks themselves. Computer networks empower architects and planners to develop more highly defined proposals for clients when designing over long distances, contends Brian R. Sinclair, professor of architecture and director of the CADLAB at the University of Manitoba in Winnipeg, and the results are design solutions that are "better considered, communicated, and understood." Yet, today's computer networks are still suffering from growing pains, Sinclair cautions, and sometimes they seem more like an information goat-track than a superhighway.

Getting on the networks

Signing on to such networks as Internet, CompuServe, and AIAOnline requires, first of all, a computer terminal and a modem for sending digital signals over telephone lines. Most networks also require customized software, which is widely available, to make connections. Linking up, however, also takes experience in negotiating the network's commands. "The best thing to do is to have someone hold your hand to set you up, which is the difficult part," advises W. Bradley Holtz, a CAD consultant in Bethesda, Maryland. "Getting on a network is a no-brainer after that."

Choosing the right on-line service for your office is a lot like buying the right software: It depends on what you want to accomplish and how much money you want to spend. The most popular information network, with more than 25 million users this year, is the Internet, which began in the late 1960s as a military computer network, but soon was widely adopted by civilian users, particularly by educational institutions.

Addresses and protocol

Messages on the Internet are sent and received between computer addresses, which are obtained from local network service providers and look something like this: john_doe@greenthumb.edu, indicating that the addressee, John Doe, is at (@) the computer named greenthumb. The suffix .edu shows that the computer is located at an educational institution.

Originally, the Internet's main service was electronic mail, or E-mail, which is still its most popular feature because it's much faster than the postal service. Today, however, the Internet offers much more than E-mail. For instance, a function called a file-transfer protocol (ftp) allows the user to acquire software from distant computers. A software system called Telnet allows you to log on to other computers in remote locations. Architects can also join the expanding dialogue on the Internet's hundreds of special-interest "news groups," which are comparable to the electronic "bulletin boards" or forms found on commercial computer networks, such as CompuServe.

In fact, nearly 100 specialized services are directed to architects on the Internet's news groups. Robert Jacobson, president and CEO of Worldesign Incorporated, a Seattle-based developer of virtual-reality programs, plugs into the news groups called alt.architecture, and the IDFORUM, which originates at the State University of New York at Buffalo. Jacobson says he signs on to them to keep up with theoretical discussions in the design professions. Jeanne M. Brown, architectural librarian at the University of Nevada at Las Vegas, has compiled an excellent directory entitled "Internet Sources in Architecture and Building," (for ordering information, contact jeanneb@nevada.edu), which lists a variety of news groups where architects can post queries about particular materials or systems and receive replies within hours.

Around the world in 10 minutes

Beyond E-mail and news groups, the Internet leads to more sophisticated spheres of communication, where commands grow more complex. Fortunately, shortcuts are available to promote user mobility. Two information delivery services in particular that make the Internet more accessible to pedestrian users are Gopher and the World Wide Web.

Gopher is a customized access interface that organizes the random information on a network into categories, so that users can select from simplified menus. For instance, Archigopher, which originates at the University of Michigan, offers a wide range of architectural images, from Palladio to CADD. The World Wide Web is a hypertext, or interactive, repository for data, images, audio files, and animations. A Web application can take users on a zig-zagging global journey en route to architectural resources that were never before so immediately accessible.

For example, to research an urban design competition in the Netherlands recently advertised on the Web, architects would connect their computers to the Web's "home page" or point of origin, in Illinois. From there, they would move into the WWW Virtual Library, which connects to another index in Switzerland, where one finds the topic "Architecture." By choosing "Architecture," the user connects with the University of Toronto, which provides a list of design competitions, one of which is the "Inside Randstad Holland Design Contest." Within this file lies information about the competition, complete with maps and other site details. Computer interactions at this point may be slow, but the delight of connecting to architectural resources around the world is exhilarating.

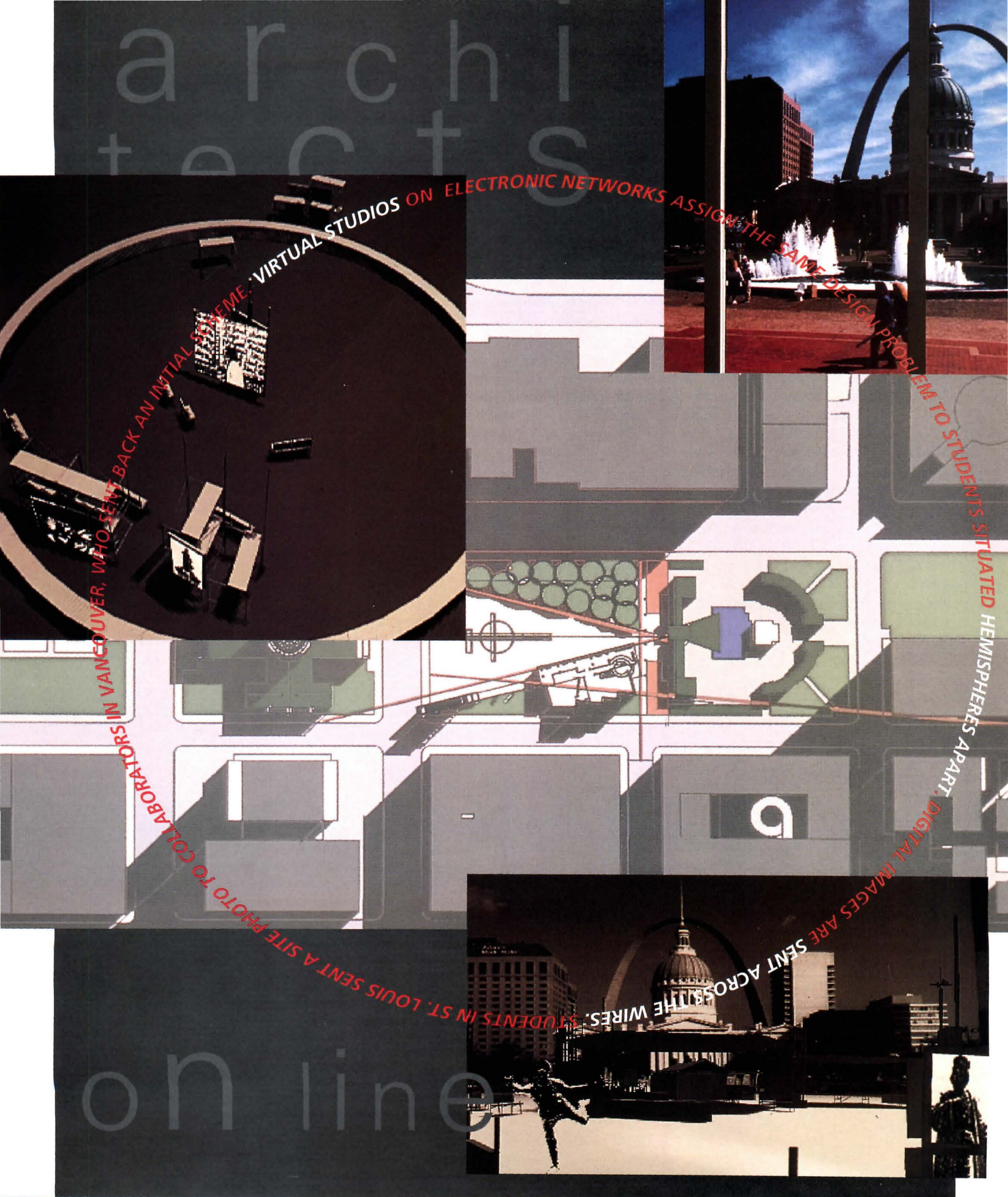
Tolls higher than a turnpike

Although the thrill of the Internet is great, so is the cost. Connecting an institution directly to the Internet may cost $10,000 a year or more, which is why it's hard for an independent architect to hook in directly. Yet, a wide variety of commercial services, such as CompuServe and America Online, provide comparable access, or "gateways," to the Internet's services, as well as considerable on-line activity of their own.

CompuServe is among the largest of these commercial computer networks, with more than 2.4 million users worldwide communicating in forums—similar to the Internet's news groups—that offer a variety of services. For example, the CAD vendors' forum, or CADDVEN, contains on-line manuals for most major hardware and software systems, along with the most current information on such topics as new versions of software, common software problems, and shorthand keystrokes for commonly used commands.

CompuServe charges $25 for the initial connection, but the real cost is for the time one spends on-line. The monthly fee for CompuServe is $8.95, but each minute online costs an additional 16 cents, or $9.60 per hour, using a typical (9600-baud) modem. Many a fascinated user has gone broke trying to read files while connected to an online service. To minimize those costs, software systems such as WINCIM and Tapcis allow users to find and copy (or download) the documents they want onto their own

archi tects on line



VIRTUAL STUDIOS ON ELECTRONIC NETWORKS ASSIGN THE SAME DESIGN PROBLEM TO STUDENTS SITUATED HEMISPHERES APART. DIGITAL IMAGES ARE SENT ACROSS THE WIRES. STUDENTS IN ST. LOUIS SENT A SITE PHOTO TO COLLABORATORS IN VANCOUVER, WHO SENT BACK AN INITIAL SCHEME.

computer files, then disconnect and read the material at their leisure.

AIAOnline's advantages

The expanding computer network of the AIA, called AIAOnline, operates much like a mainstream network, but it is tailor-made for architects. Developed in conjunction with Telebuild, a telecommunications firm in Houston, AIAOnline allows members of the Institute to receive updates from professional interest area (PIA) groups, which are analogous to Internet news groups. Users can flip through *ProFile*, the national AIA membership directory; search the Construction Market Data index; and sift through information from more than 8,500 building-product manufacturers. Most popular on AIAOnline is the electronic access to *Commerce Business Daily* (CBD), which carries the federal government's official listing of requests for proposals for new design and construction projects. AIAOnline publishes CBD listings the day before the paper version appears, giving on-line architects an advantage over their off-line competitors who receive the CBD in the mail.

The cost to members: $5 to receive an account and a software disk and 15 cents per minute, or about $9 per hour, for time spent on-line. Again, the trick to saving money is to load system files onto your own computer and read them off-line.

Architects also have developed their own in-house networks. Heinrich Kühn, the vice president of information technology at the KPS Group in Birmingham, Alabama, has connected the firm's 78 workstations to an internal network linking two separate buildings, and created a direct modem connection to a company bulletin-board service. Clients and consultants running bulletin-board software can call and upload or download computer files, Kühn explains. With network connections running through a regular modem, however, the firm hasn't sent drawing files because they take too much time.

Virtual design studio

Among the most exciting new network applications in design are the Virtual Design Studios, held by about 40 students in six schools of architecture around the world. The Virtual Design Studio was the brainchild of William Mitchell, dean of architecture at the Massachusetts Institute of Technology (MIT), and Jerzy Wojtowicz, professor at the University of British Columbia (UBC) School of Architecture in Vancouver. "The idea was to give the same design problem to students in several universities whose design studios were interconnected by Internet and other means," Wojtowicz recalls.

The first virtual studio—a collaboration between MIT, Harvard, UBC, the University of Hong Kong, and Washington University in St. Louis—focused on reconstructing an historic village outside Hong Kong. A second electronic charette was held to design a digital café (a hypothetical electronic meeting place and coffee bar) in downtown St. Louis; and a third studio investigated housing and urban design in a district of Shanghai, China.

Participants in the virtual studios posted digital images on a bulletin board and E-mail. Facilitators of the Shanghai housing charette noted the stimulating effect of instantly merging two design cultures. For example, MIT students concentrated on form and light, while Hong Kong students focused on functions and users.

In the digital café charette, the St. Louis students sent a site photograph to the students at UBC, who created a plan and sent it back. The St. Louis studio then produced a computer model from the plan and sent that back to UBC, where students modified the model and montaged it onto a site photo.

Drawings and models in the virtual studio were created on hardware by Silicon Graphics, Macintosh, IBM PCs, and even some old VAXs running software such as AutoCAD, Wavefront, 3D Studio, and StrataVision. But the importance of the virtual studios extends beyond the particular hardware and software. The program carried across the information network, participants concluded, produced a new type of design studio structure—an intensely interactive process taking place across the globe, in real time.—*Douglas MacLeod*

Architect Douglas MacLeod is director of computer applications and research at the Banff Centre for the Arts.

Research promotes progress in wind engineering, energy, and the environment.

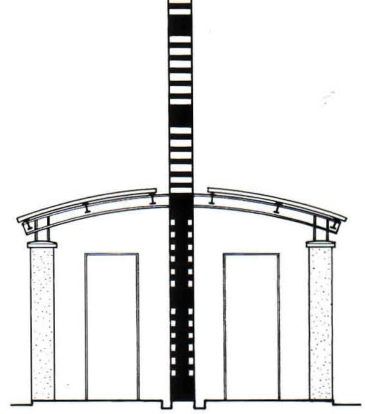
WINDSCREEN: Bridges R&D buildings.

Windscreen Shields Corporate Campus

A specially perforated, concrete screen wards off strong northwestern winds gusting across the recently opened, 57-acre campus of Sun Microsystems in Menlo Park, California, next to San Francisco Bay. The company asked San Francisco-based Backen Arrigoni & Ross (BAR), master planner and architectural designer of the campus, to create quiet courtyards on the campus's interior that would provide an informal, outdoor place for staff to congregate and work. But with a virtual tempest outside, the architects were challenged in carving an area that would be calm enough in which to work 80 percent of the time. BAR solved the problem by clustering the eight buildings in the master plan—four of which are completed—and configuring their elevations and plans so that as a group they deflect, rather than channel and amplify, wind currents buffeting the campus's courtyard.

The architects developed a precast concrete "waffle" windscreen with engineers Rowan Williams Davies & Irwin (RWDI) of Toronto to deflect residual gusts. The two firms first tested a scale model of the buildings in a wind tunnel. Sensors measured average wind speeds as well as gusts in dozens of key areas. Those test results then were overlaid with local meteorological data to figure full-scale wind speeds and their frequency. Next, the team tested solutions in RWDI's "water flume," in which water moves over and around the scale model to simulate wind flow. Colored dye is dropped into the flume to show how patterns change with various interventions.

The screens are perforated toward the top to eliminate negative pressure on the screen's leeward side,



SCREEN: Perforations balance pressure.

which would tend to draw wind back down into the courtyards. Canopies for walkways hold up the screen on either side. The windscreen's upper "cells" are open to provide necessary positive pressure, while lower cells are solid to block the wind.—*B.A.M.*

AIA Forum Urges Environmental Ethic

The AIA Committee on The Environment's (COTE) conference on sustainable design, held October 22 and 23 in New York City, urged architects to adopt an environmentally sensitive outlook as a way of surviving hard economic times.

COTE founding chair Robert J. Berkebile, principal of Berkebile Nelson Immenschuh McDowell in Kansas City, Missouri, pointed to recent environmental progress among the allied building industries and challenged the 250-person audience to work harder to counter the "inefficient, destructive community models" that still pervade the planet.

Nadav Malin of *Environmental Building News* remarked that environmentalism in the building industry is driven by a mixture of consumer awareness, government regulation, liability, and rising costs for waste disposal and energy. Malin presented examples of "green" building materials, noting that they offer architects a way to distinguish themselves in the marketplace. For architects seeking guidance on sustainable products, Harry T. Gordon, COTE's 1995 chairman, presented the AIA's *Environmental Resource Guide*, a review of sustainable materials and design techniques. Future editions, Gordon noted, will contain more comparisons of product performance and will probably soon be available in electronic form.—*Michael Wagner*

LIGHTSTRUCK STUDIO

SULFUR LAMP: No electrodes.

New Sulfur Lamp Cuts Energy Consumption

The U.S. Department of Energy (DOE) has unveiled a new light bulb that can produce four times the light of conventional incandescent or mercury-vapor systems, at one-third the cost. The new golf-ball-sized quartz lamp, invented by Fusion Lighting Incorporated of Rockville, Maryland, comprises an argon-filled bulb containing a small amount of sulfur. When excited by microwaves, the sulfur electrons give off energy with a radiance—containing all spectral colors—that approximates sunlight. Because the sulfur bulbs have no electrodes or other metal parts inside, their life is initially expected to be 10,000 to 20,000 hours, but may be "limitless," according to the DOE.

Light from the sulfur bulb is distributed by funneling it through a parabolic reflector, into an acrylic "light pipe" invented by A.L. Whitehead of Vancouver, British Columbia. The light pipe, 10 inches in diameter and fabricated in 10-foot sections, is lined inside with a prismatic film and a mirror at the end opposite the lamp. Another light-extracting film surface on one side of the pipe draws out light in a controlled manner.

DOE has installed a 240-foot light pipe inside its headquarters in Washington, D.C., replacing 240 high-intensity-discharge (HID) lamps and ballasts of 200 watts each. Light levels are four times as great, and energy use has been reduced by 72 percent. Product development was supported by federal grants through the National Aeronautics and Space Administration and the U.S. Environmental Protection Agency. Products for large indoor and outdoor commercial applications are expected to be available in 1995.—*B.A.M.*

ARCHITECTURE'S LITERATURE PORTFOLIO

The Literature offered on these pages (with rare exception) are free for the asking. Simply fill out one of the postage paid reader service cards located elsewhere in this issue, circle the appropriate numbers and drop it in the mail.

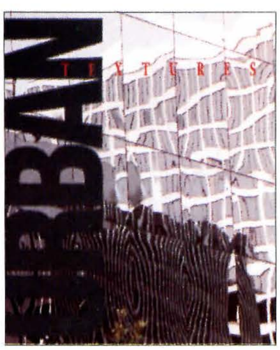
Xypex Chemical Corporation

Concrete waterproofing by crystalization. Although applied as a slurry coating, Xypex is a chemical treatment which waterproofs by penetrating the concrete with a crystalline formation which 'plugs' the pores of the structure preventing water seepage. Xypex is ideal for use on the 'inside' of wet underground structures. Xypex chemical Corporation, 604-273-5265.
Circle 14.

INTERIOR SYSTEMS–LA CROSSE

Ar*kid*tecture Funscapes is the newest addition to **Interiors Systems' Signature Series.** The Ar*kid*tecture collection uses a unique computerized cutting system to produce standard and custom acoustical ceiling tile designs for schools, children's clinics, hospitals, daycare centers, retail stores. Use single or multiple panels with any design, logo, or color. Call 1-800-782-0070.
Circle 20.

Mohawk Commercial Carpet

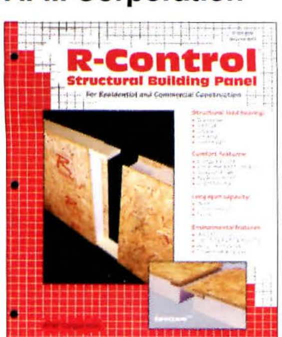


Urban Textures Brochures–A collection of coordinating patterns and solids from Mohawk Commercial Carpet and AlliedSignal Fibers. A wide variety of commercial carpets–from solid color cut piles to graphics and wovens. The brochure features photographs of the carpets paired with the Urban Textures which inspired them. MOHAWK COMMERCIAL CARPET, 800-618-1234.
Circle 22.

Transwall Corporation

Reasons Stacking System For Improved Office Spaces–REASONS by Transwall, is a new stacking system designed to provide improved office space facilities with maximum flexibility and a minimum of parts inventory. It offers quick off-module changes for work surfaces and overhead storage, which can easily be rearranged on horizontal rails without structural panel changes. Total wire management is provided in the 4" thick panels, as well as an unlimited choice of aesthetic color selections.
Circle 24.

AFM Corporation

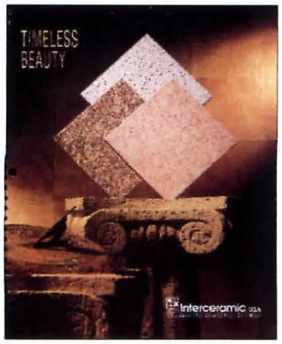


Structural Building Panels—R-Control® Panels, a strong one-piece structural system, provide superior insulation in exterior walls, roofs/ceilings, and floors. Pre-engineered lumber facings and solid EPS insulation create a monolithic structure. R-Control has passed structural and fire tests as prescribed by national building code authorities. AFM's EPS contains no CFC's, HCFC's, HFC's, or formaldehyde. R-Control is manufactured across the nation. Call 1-800-255-0176, or write AFM Corporation, P.O. Box 246, Excelsior, MN 55331.
Circle 26.

Hoover Treated Wood Products

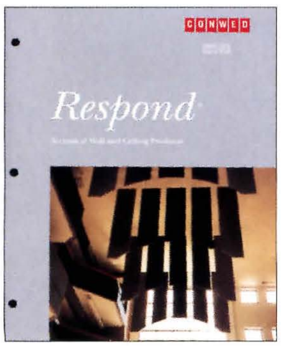
New video from Hoover Treated Wood Products Inc. shows how treated wood is produced and tested, and describes Hoover's complete line of treated wood products including **PYRO-GUARD** interior type fire retardant treated lumber and plywood, **EXTERIOR FIRE-X** exterior type fire retardant treated lumber and plywood, and **CCA KDAT** preservative treated lumber and plywood that's kiln dried after treatment.
Circle 28.

Interceramic, USA



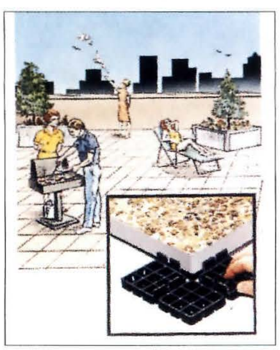
Interceramic, the largest glazed ceramic tile manufacturer in North America, offers exceptional tile in a variety of styles, colors, shapes and surface textures. We provide tile to enhance any environment–both commecial and residential. We are pleased to announce the opening of our new 4 1/4" wall tile manufacturing facility. What ever your design needs, Interceramic tile will add that distinctive touch of quality and beauty. Your complete source for ceramic floor and wall tile combinations. Call today for more information: 1-800-496-TILE.
Circle 30.

Conwed



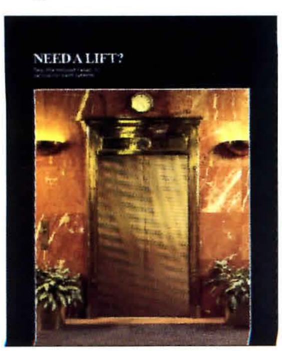
CONWED RESPOND ULTIMATE I PANEL—Conwed Respond ultimate I is an acoustical wall and ceiling panel designed for use in areas requiring abuse resistance and excellent acoustical absorption. It utilizes a glass fiber core faced with an acoustically transparent open perforated rigid vinyl sheet and wrapped with fabric or vinyl. Ideal for use in: gymnasiums, theaters, and multi-purpose rooms. Conwed, 1205 Worden Ave. E., Ladysmith, WI 54848, 800-932-2383, Fax: 800-833-4798.
Circle 34.

Envirospec, Inc.



Turn your roof tops into people places! New literature shows a better way to transform a roof into a patio, terrace, balcony, walk-way, plaze podium, promenade, or just plain roof deck, using the Pave-El Pedestal System. Designed to elevate, level, and space paver stones for drainage in any weather. Pave-El reliably **protects roof, paver-stone membrane and insulation.** ENVIROSPEC, INC., Ellicott Station Box 119, Buffalo, NY 14205, Phone (716) 689-8548, Fax (716) 689-7309.
Circle 38.

Rigidized® Metals Corp.

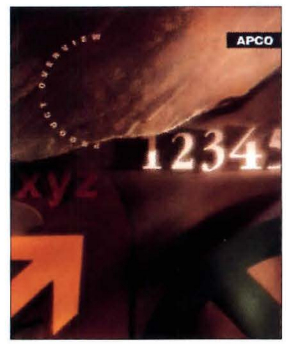


TEXTURED METAL DOORS BY RIGID-TEX®. Rigid-Tex® metals combine beauty and durability in Rigidized® and etched metals. Dozens of patterns and custom designs for interior and exterior use, new or retrofit. For elevator doors and interiors, column covers, walls, ceilings, entrances, signage and trim. Available in a wide selection of metals, gauges, sizes and colors. Rigidized® Metals Corp., 658 Ohio St., Buffalo, NY 14203-3185. (800) 836-2580, or (716) 849-4711.
Circle 42.

Virtus Corporation

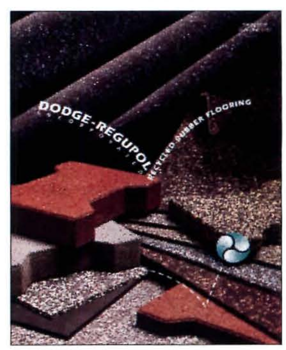
Finally, A Powerful, Easy 3-D World Builder. Create and roam through your own virtual worlds with Virtus WalkThrough Pro 3-D modeling and design software. Build homes, offices, theatre sets, and trade show booths and apply perspective correct texture maps. With Virtus WalkThrough Pro you will build, decorate and walk through three dimensional virtual models in minutes. Virtus Corporation, 1-800-847-8871, Fax 919-460-4530.
Circle 32.

APCO Graphics, Inc.



As a leader in the sign industry for over 28 years, APCO offers the expertise required to meet a broad range of wayfinding and identification needs. The award-winning product line features interior and exterior sign systems, signmaking software, displays, directories, and ADA compliant signs. Today, as always, APCO delivers the quality sign products and exceptional service that have become its trademarks throughout the years. APCO, 388 Grant St. SE, Atlanta, GA 30312; (404) 688-9000.
Circle 36.

Dodge-Regupol

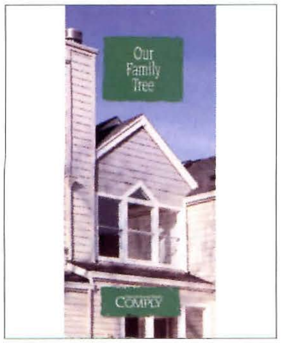


Dodge Regupol's new 8 page brochure describes and illustrates in detail the attributes of its innovative recycled rubber flooring products. Made from 100% premium quality recycled rubber, Everlast Tile™ Ever-Roll™, and Regupol™ Pavers & Tiles are suited for an infinite variety of commercial, industrial and sports applications and offer natural resiliency, unmatched durability and environmental acceptability.
Circle 40.

Openings

TOTAL DOOR®: The OPENINGS® Solution–TOTAL DOOR® is a fire rated door assembly that includes all hardware. Pairs do not require coordinators, vertical rods, astragals, flush bolts or floor strikes. Will retrofit to any fram. Meets all codes and limited warranty on locks and panics.
Circle 44.

Oregon Strand Board

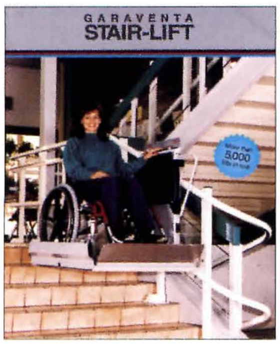


Comply Lap Siding, Flooring and Sheathing—Oregon Strand Board COMPLY is a superior alternative to conventional siding and panel products. Comply exceeds traditional products in strength, stiffness, machinability and overall quality consistency. It is moisture and insect resistant and is guaranteed not to delaminate. COMPLY is a solid core 5-ply panel that out performs waferboard, plywood and oriented strandboard in all applications. **Circle 46.**

Copper Development Association

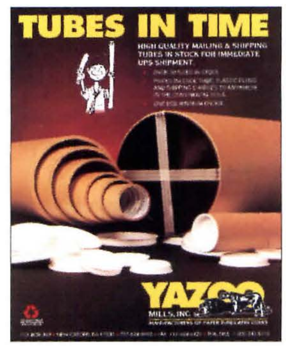
The Copper in Architecture Handbook. More information than ever assembled before on the copper metals in architecture and building construction. Contains designs, details and specifications in hard copy and on CAD diskettes. Provides abundant, practical information on physical and mechanical properties, historical applications. Includes maintenance procedures, copper product sources, fabricator and installer lists. Copper Development Association. Handbook: $85.00. Disks (4): $40.00. **Circle 48.**

Garaventa (Canada) Ltd.



New Stair-Lift Brochure–If you've been wondering why the Garaventa Stair-Lift is the first choice of building owners around the world, get a copy of our new brochure. It'll spell out the reasons why Garaventa is the world's most popular stairway access solution. It's more attractive, durable and reliable, and safer and easier to use than any other platform lift. Quite frankly, Garaventa is the best value. Call today: 800-663-6556 or 604-594-0422. **Circle 50.**

YAZOO MILLS, Inc.



TUBES IN TIME–Need a mailing tube fast for your blue prints, mylar or vellum tracings? Need storage tubes to organize your office? We have mailing and storage tubes in the length and quality you need. Factory direct and immediate shipment. Packed in cartons with end plugs in over 30 sizes. Minimum order is one carton. Call Yazoo Mills, 305 Commerce Street, New Oxford, PA 17350 (800-242-5216). **Circle 52.**

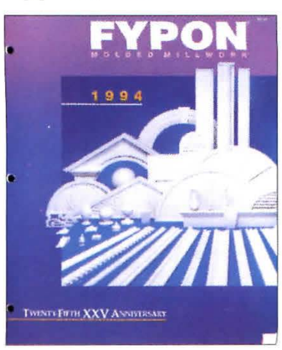
Invisible Structures, Inc.

Pave With Grasspave^2. Grasspave^2 invisible porous pavers are made entirely from recycled plastics, saving truckload volumes of plastic articles from landfills, and creating sparkling green and real grass-covered spaces where asphalt once reigned–in firelanes, overflow and event parking lots, and residential drives and parking. **Circle 54.**

Eurocobble

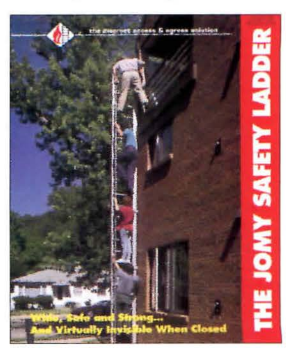
GRANITE COBBLESTONE IN MODULES. This new 12-page catalog features authentic European cobblestone that has been preassembled into modular form to facilitate transport and installation. Traditional and custom paving solutions are presented for both pedestrian and vehicular applications. EUROCOBBLE®. **Circle 56.**

Fypon, Inc



FYPON, Inc. is the manufacturer of over 3,000 millwork items made in the exclusive Molded Millwork® process. It is made from high density polymer, will not rot and is virtually maintenance free. New for 1995 are poly-steel columns. They have the strength of steel, the durability of polymer and are available in different diameters and styles. Call or write FYPON, Inc., 22 W. PA. Ave., Stewarttstown, PA 17363, 1-800-537-5349. **Circle 58.**

Jomy Safety Ladder



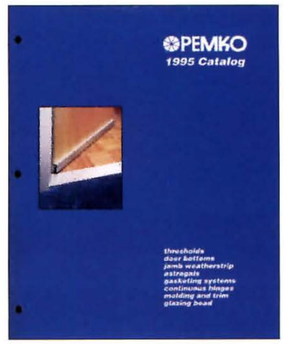
The Discreet Access & Egress Solution–Security requirements, space constraints, and aesthetic considerations are a few of the problem-solving applications for the JOMY Safety Ladder. The ladder's discrete appearance makes it an ideal solution for access and egress requirements. The JOMY Safety ladder looks like a drainpipe when closed, but opens to a heavy-duty ladder with slip-resistant rungs and **a safety rail.** JOMY Safety Ladder Co., 1728 16th St., Ste 201, Boulder, CO 80302. 800-255-2591. **Circle 60.**

Structural Board Association

STRUCTURAL BOARD ASSOCIATION

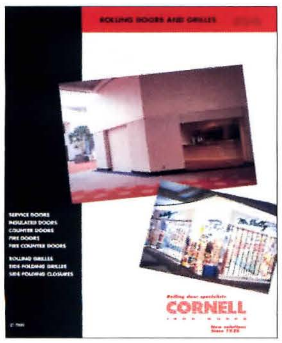
BBA member companies are expanding their supply of quality OSB wood structural panels. For more information on these popular panels, contact the SBA, Circle 62, or phone (416) 730-9090, Fax (416) 730-9013.
Circle 62.

Pemko Manufacturing Co.



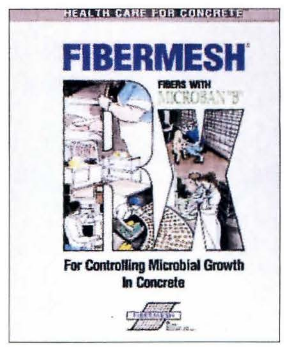
Thresholds/Weatherstripping/Continuous Hinges—Pemko's 1995 full-line catalog illustrates many fire labeled, smoke labeled, barrier-free access, sound tested, and custom fabricated threshold and weatherstripping products. New products include: patented ADA compliant ramp thresholds, PemkoHinge™-patented continous geared aluminum hinges, low-closing-force reversible automatic door bottoms, nylon brush weatherstripping, and locking astragals.
Circle 64.

Cornell Iron Works, Inc.



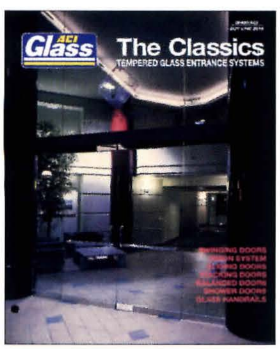
Rolling Metal Doors and Grilles. Cornell Iron Works offers a new 24-page catalog of rolling galvanized and stainless steel and aluminum service doors, fire doors, counter doors, grilles and closures. Cornell doors close openings in industrial, institutional and commercial buildings. Full specifications and detail drawings are included. For immediate response on current projects, call 800-233-8366. Cornell Iron Works, Inc., Mountaintop, PA 18707.
Circle 66.

Fibermesh



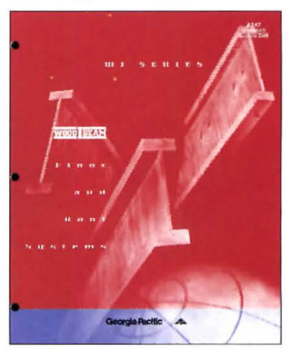
Color brochure tells how Fibermesh® fiber with Microban® "B" offers a simple but effective means of reducing microbial growth in concrete and its problems. **It is not just a surface treatment.** Tens of millions of fibers are uniformly distributed in every cubic yard of concrete, thus providing full depth microbial protection.
Circle 68.

ACI Glass



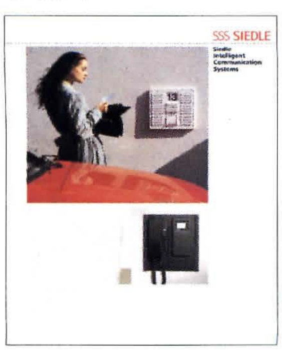
ACI Distribution's CLASSIC GLASS LINE. From glass entrances to glass handrails, there's a Classic solution for any architectural glass need. The Classic Glass product line includes glass doors of all types, glass vision systems, glass handrails and more. All high quality Classic Glass products can be tailored to meet the most demanding applications and delivery schedules.
Circle 70.

Georgia-Pacific



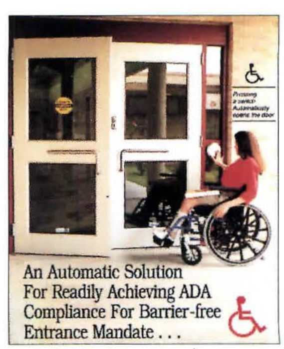
Georgia-Pacific Engineered Lumber—Georgia-Pacific offers brochures detailing three engineered lumber products. G-P Lam® LVL (laminated veneer lumber) beams and headers are specially designed and constructed for stability and high strength. WI Series and GPI Series Wood I Beam® joists, primarily used as a structural component in floor and roof systems, also may provide support as window, door and garage door headers.
Circle 72.

Siedle



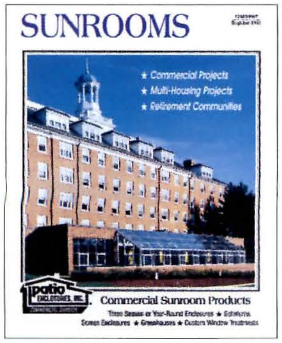
Siedle Intelligent Communication Systems—Featuring Siedle Vario® Intercom Lobby Units–Video Security for apartments, residences, and offices. . .Easikey, the Intelligent Key–Letterbox System–and the System telephone HT 611-01–the fastest way to the house door and around the house, complete with watchdog, doorman and nameplate. For full catalog, set up information and architecture specs, call toll free 800-874-3353 or 610-353-9595.
Circle 74.

Horton Automatics



Pushing a Switch Automatically Opens the Door. EasyAccess™ Series 7000 swing door operator makes complying with ADA 1990 barrier-free entrance mandate "readily achievable" and "easily accomplishable...without much difficulty or expense." EasyAccess turns most ordinary doors into affordably priced, automatic, barrier-free entrances for the physically disabled. Horton Automatics, 4242 Baldwin Blvd, Corpus Christi, TX 78405, 1-800-531-3111.
Circle 76.

Patio Enclosures, Inc.

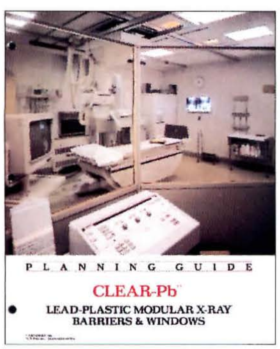


NEW BROCHURE describes many styles of custom Manufactured Sunrooms which allow the designer to fit sunrooms into many designs without expensive retrofitting. . .and custom manufacturing doesn't add to the delivery time. Also describes NEW QUICK QUOTE FAX SERVICE for professionals who need pricing or technical information, response within 2 business days. Fax 216-467-4297 or Phone 800-468-0720, Ext. 350.
Circle 78.

W&W Sales Ltd.

NT NORMBAU RAILING AND BALUSTRADES BY W&W—NT Normbau Railing Systems by W&W is the product of a revolutionary new nylon formulation that was produced to be environmentally safer by removing all cadmium from the mixture, in addition to being completely lead free. This colorful, 4-page brochure describes many additional features and technical specifications about the product that comes in several new and exciting colors.
Circle 82.

Nuclear Associates

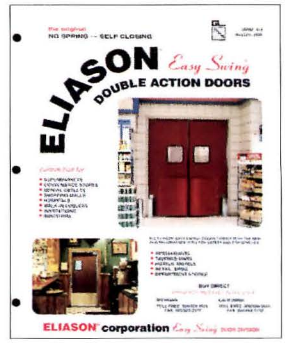


FREE X-RAY ROOM PLANNING GUIDE. Made of lead-impregnated, transparent plastic, CLEAR-Pb® X-Ray Room Shielding from Nuclear Associates provides complete radiation protection with panoramic viewing in hospital X-Ray, CT and special procedures rooms. Features include prefabrication for quick on-site assembly, shatter-resistance, 200 stock sizes, choice of lead equivalencies. Free CLEAR-Pb Planning Guide available.
Circle 86.

Kroy

KROY LABELING SYSTEMS–MORE FEATURES, MORE AFFORDABLE. Kroy's DuraType 240 labeling system boosts your efficiency with neat, professional-looking labels you create in seconds. And now that it's priced as low as $99 (SRP $169) at participating dealers you have no reason to settle for less than the finest quality labeler. Call 800-733-5769 for free literature.
Circle 90.

Eliason Corporation

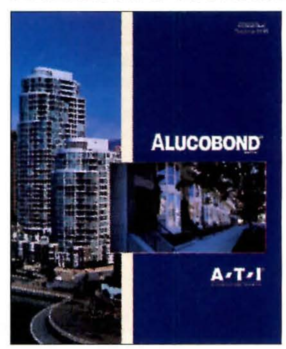


Eliason has announced the release of their new 1995 Easy Swing Door Price/Spec catalog. Doors are illustrated in full color with complete specifications, technical and application data. They are double action, open to finger touch and close with a safe gentle time delay action. Doors can be specified and purchased direct. A hard bound catalog will be sent at no charge. Eliason Corporation, P.O. Box 2128, Kalamazoo, MI 49003.
Circle 80.

EIMA

The EIFS Industry Members Association (EIMA) has published a generic EIFS Class PB Details Manual, revised guideline specifications, and quality standards brochure. These new materials represent EIMA's commitment to providing updated technical information about EIFS to building professionals. For a copy of these publications, contact EIMA at (813) 726-6477 or FAX (813) 726-8180.
Circle 84.

Alucobond Technologies, Inc.

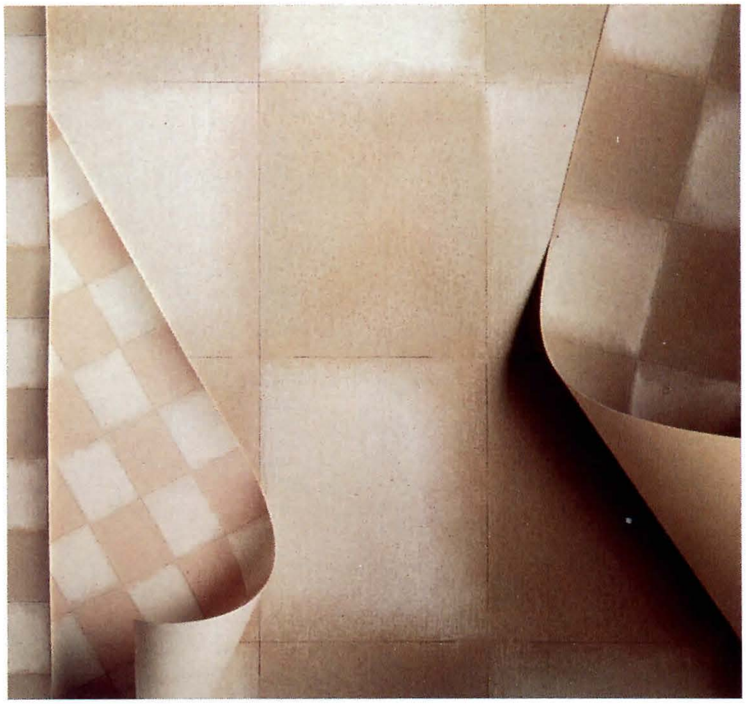


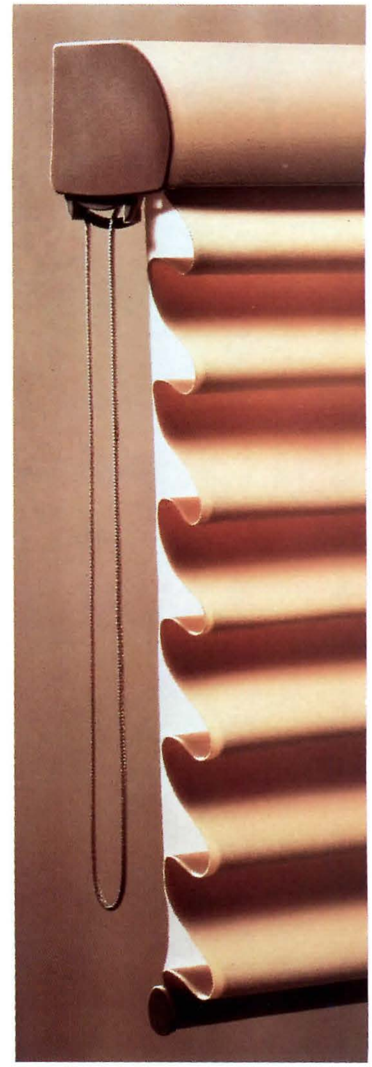
NEW ALUCOBOND® MATERIAL CATALOG AVAILABLE—This new 12-page, full-color catalog illustrates recent applications in a wide range of new and retrofit applications plus provides complete general and technical information for Alucobond® Material and Alucobond 21® Material. A current color chart is also included plus a description of attachment methods.
Circle 88.

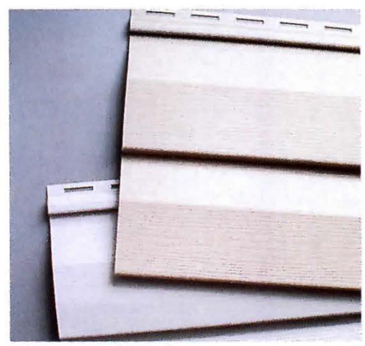
ARCHITECTURE LITERATURE PORTFOLIO UPCOMING ISSUES

ISSUE DATES	CLOSING DATES
☐ April 1995	February 24, 1995
☐ July 1995	May 25, 1995
☐ October 1995	August 25, 1995
☐ January 1996	November 27, 1995

Vinyl siding, wallcoverings, and shades offer practical residential solutions.







TOP: Neutral colors and subtle textures characterize Carolyn Ray's expanded Hover Collection of washable paper, vinyl, and foil wallcoverings. Originally conceived with a 3-inch-scale grid, the new line adds half- and double-scale versions, called Baby Grand and Hover Grand, respectively. Hover Grand measures 26 1/4 inches wide with a 23-inch repeat; Baby Grand measures 26 3/8 inches wide with a 5 3/4-inch repeat. Both patterns are available in six stock colors and 13 custom colors from the Yonkers, New York-based company.
Circle 401 on information card.

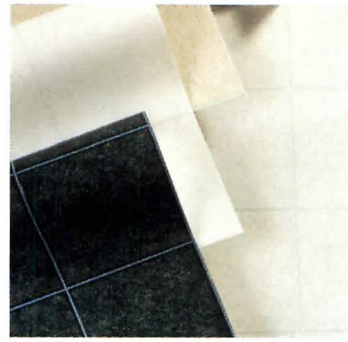
ABOVE: One-inch vertical stripes in pastels and earth tones define the new DaVinci Stripe line of vinyl wallcovering, manufactured by Columbus Coated Fabrics, a division of Borden Decorative Products Group. A component of the company's Guard contract wallcoverings, the striped designs complement 16 corresponding solid-color papers. The DaVinci collection measures 54 inches wide and weighs 20 ounces per linear yard; custom colors and weights are also available. Appropriate for corporate, healthcare, and retail environments, DaVinci wallpapers use a heavy woven backing of cotton/polyester blend and warrant a class-A fire rating.
Circle 402 on information card.

ABOVE: Headquartered in Valley Forge, Pennsylvania, CertainTeed manufactures vinyl siding and windows, asphalt roofing shingles, clay roof tiles, and ventilation and insulation products. Now CertainTeed has added the Double 5-inch Shiplap to its MainStreet line of vinyl siding. The angular profile of Shiplap distinguishes it from the company's standard clapboard siding: the base projects 1/2-inch, increasing shadow lines. The double 5-inch construction consists of two 5-inch-high courses and a single nail strip across the top. The low-gloss finish is available in nine colors, including white, blue, beige, gray, and cream.
Circle 403 on information card.

ABOVE: Vignette window shading from Hunter Douglas combines the style of draperies with the practicality of a shade. Folds of woven polyester fabric, supported by fabric backing, hang from an extruded aluminum headrail, which houses the shade when raised. Vignette mounts inside or outside a window frame, in conjunction with swags, draperies, or valances, if desired. It is available in 15 neutral colors and two fabric styles—a satin weave and a more textural basket weave, and in sizes up to six feet wide and eight feet long. Hunter Douglas, manufacturers of the first aluminum Venetian blinds in the 1940s, is headquartered in Rotterdam.
Circle 404 on information card.

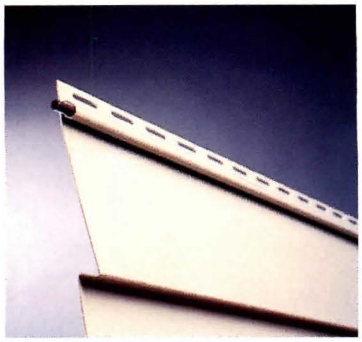
Textile wallcoverings
J.M. Lynne Company, manufacturers of commercial vinyl and textile wallcoverings, has added three new product lines to its collection, which presently comprises more than 300 vinyl patterns. Bordeaux Prints, a fabric-backed vinyl, targets corporate, hospitality, and healthcare markets and is available in 27- and 54-inch-wide sheets. Appropriate for renovations, Ensemble vinyl prints disguise imperfections in walls. Multipurpose Impressions II linen wallcoverings (above) are available in 64 colors and designs. A portion of the sales of Impressions II will be donated to the Design Industry Foundation Fighting AIDS.
Circle 405 on information card.

Sheet vinyl
Mannington Commercial, headquartered in Salem, New Jersey, manufactures residential and commercial sheet vinyl, modular carpet, ceramic tile, and wood floors. Thirty-one colors and five patterns differentiate the company's CustomSpec vinyl flooring, available in both 6- and 12-foot-wide sheets for ease of installation. Protected by a patented mold- and mildew-resistant moisture barrier and protective wear-layer, CustomSpec is appropriate for high-traffic applications, including entryways, corridors, cafeterias, and elevator lobbies. The company's Fields and Forms lines of sheet vinyl feature a flexible felt backing that allows for installation on all grade levels and helps hide minor irregularities in subflooring.
Circle 406 on information card.



Vinyl flooring
Congoleum Corporation's expanded line of residential sheet vinyl flooring products (above) enables designers to select between two installation methods: Dynaflex, a perimeter adhesive ideal for irregular wooden subfloors; or a full adhesive, appropriate for concrete surfaces. Each of the Mercerville, New Jersey-based company's existing product lines, Discover, Highlight, Prestige, and Valuflor, has been expanded to include new patterns and colors, installed with either adhesive system and equipped with wear- and mildew-resistant protective layers. Highlight and Valuflor are manufactured in 6- and 12-foot widths; Discover and Prestige are sold in 12-foot widths, which enable virtually seamless installation.
Circle 407 on information card.

Acoustical panels
Fabri-Tough acoustical wall panels from Tectum combine acoustical performance with decorative versatility. The sound-absorptive panels are appropriate for new construction and renovations, including conference rooms, classrooms, gymnasiums, and arenas. The fabric-covered panels feature a tackable surface of woven or nonwoven textiles, available in eight patterns and 48 colors. Flexible and easy to install, Fabri-Tough panels measure 1 inch thick and 2 feet wide; a variety of lengths are available. Manufacturers of acoustical wall, ceiling, and roof panels for commercial applications, Tectum is based in Newark, Ohio.
Circle 408 on information card.

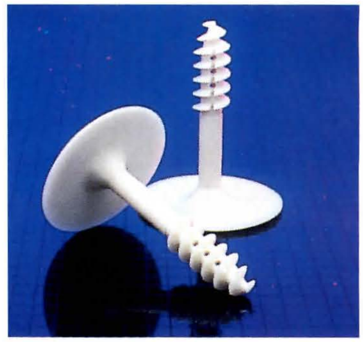


Reinforced siding

Benchmark reinforced vinyl siding (above) from Wolverine Technologies features a fiberglass tube inserted in a channel along the top edge of the panel to reduce the sagging, kinking, and flexing associated with vinyl siding installation. Compared to standard panels, Benchmark is purported to provide 50 percent more vertical stiffness and 64 percent more rigidity, resulting in easier handling and more accurate application. Three styles replicate classic clapboard profiles: double 4-inch, double 5-inch, and 4 1/2-inch dutchlap. The low-gloss surface finish, available in 12 natural colors, imitates the appearance and texture of rough-sawn cedar.
Circle 409 on information card.

Aerated soffit

Heartland Building Products has introduced a new soffit panel with center vents. For residential application under eaves and overhangs, the company's Premium Plus solid vinyl soffit features three sections in the center for controlled airflow. Angled perforations, as opposed to punched openings, allow moisture that is trapped within walls and beneath the eaves to escape, while keeping out dirt and insects. Manufactured in 12-foot lengths, the soffit panels are equipped with two V-shaped grooves that add support and prevent sagging over long spans. The Booneville, Mississippi-based manufacturer offers the Premium Plus vinyl soffit in 11 matte-finish natural colors.
Circle 410 on information card.



Roofing screws

A hollow shaft in Liquid Auger Seal Screws (above) from International EPDM Rubber Roofing Systems allows liquid sealer and epoxy to flow through the screw's stem and penetrate soft, porous roof decks. This application chemically bonds and strengthens rubber roofs. The Toledo, Ohio-based company's self-adhesive Flash Tape and Cured Seam Tape provide for easily applied roof seals. The uncured flash tape is available in 6- and 12-inch widths. Self-adhesive seam tape, available in 4-, 5-, and 7-inch widths, seals edge flashing.
Circle 411 on information card.

Erosion control

Akzo Nobel's three-dimensional Armater Geocell Containment System handles steep slopes and rugged terrain. Constructed of lightweight nonwoven polyester fabric, the semirigid, honeycomb-shaped matrix provides erosion protection, stabilizes excavation projects, and enables new vegetation to take root. Ideal for highway embankments, landfills, and earthen dams, Armater contains granular materials in areas where vegetation is scarce or undeveloped. Antoine Predock, in designing the Ventana Vista Elementary School in Tucson, Arizona, specified a 45 degree slope planted with desert marigold, grass, and brittle bushes—landscape architects Acuna Coffeen selected Armater erosion control. Akzo Nobel Geosynthetics Company is based in Asheville, North Carolina.
Circle 412 on information card.

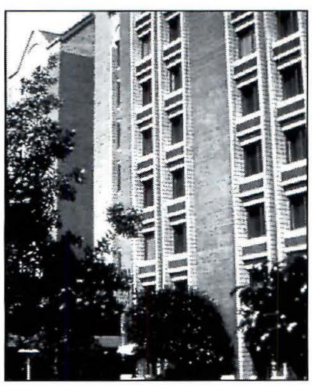
Circle 102 on information card

NCMEC III '95

Renewing the Past, Shaping the Future

The Third National Concrete and Masonry Engineering Conference June 15 to 17, 1995 in San Francisco

Practicing structural engineers interested in the latest concrete and masonry structural design technologies should not miss the Third National Concrete and Masonry Engineering Conference. A wealth of practical and state-of-the-art design information will be presented. Topics include:



- **Design of new multi-story buildings**
- **Concrete and masonry structural materials**
- **Design of low-rise buildings**
- **Design/repair of concrete parking structures**
- **Design/rehabilitation of concrete bridges**
- **Retrofit of concrete buildings**
- **Seismic retrofit of concrete bridges**
- **Retrofit of masonry buildings**

The conference is sponsored by all of the major trade and professional concrete and masonry associations. Registration is $350 for the full conference. Daily and student rates are also available.

Don't wait... sign up NOW for this important conference.

Call Debbie Terrill at:

708-966-6200

or fax: 708-966-9781

Cedar shingles
Shakertown manufactures cedar shingle panels for residential siding and roofing systems (above). The Winlock, Washington-based company has designed a new offset end joint that eliminates a visible vertical seam in two- and three-course panels. Bonded to plywood backing, the 8-foot shingle lengths are purported to install three and four times faster than individual shakes.
Circle 413 on information card.

Energy-efficient windows
Cierra windows (above) from Louisiana-Pacific combine the durability of a low-maintenance metal exterior with the insulating quality of wood. Constructed of clear-grain solid pine with extruded aluminum cladding, they are available in double hung, casement and awning, and glider styles. Custom shapes include ovals, triangles, pentagons, circle and half-circles, and trapezoids. The aluminum exterior is finished in acrylic and available in white, beige, or brown; the natural wood interior members may be painted or stained. Double-insulated glass and full weatherstripping are standard features in every Cierra window.
Circle 414 on information card.

Vinyl casement windows
Welded seams in Fiberlux's new Series 1600 vinyl casement windows ensure air- and water-tight seals. The head, sills, and jambs have multiple chambers to make them more rigid, reduce sight lines, and provide a thermal barrier between inside and outside temperatures. The reinforced frame accepts either 1- or 3/4-inch insulated glass. Optional sill-mounted rotary operators permit a 90 degree sash opening, which enables both sides of the glass to be accessed from inside the home; muntins located inside the glass facilitate cleaning.
Circle 415 on information card.

Custom-designed glazing
The Custom Arch Window (above) from Andersen Windows allows architects to transform segmented arched units into custom configurations. Equal and unequal leg arches and partial chords are available in a variety of radii. The units can be sized to 1/32-inch increments. Exterior lineal lengths are covered with reinforced plastic; arched members are constructed of aluminum.
Circle 416 on information card.

Glass cladding
Neoparies wall cladding (above) is composed of crystallized glass granules. Manufactured by Nippon Electric Glass Company, these glass panels are thinner and stronger than stone cladding. Standard Neoparies panels measure 5/8 inch thick. Flat, curved, and corner shapes are possible, allowing greater design flexibility at a lower cost than stone.
Circle 417 on information card.

Advertisers Index

EDITORIAL OFFICE
1130 Connecticut Avenue, N.W., Suite 625
Washington, D.C. 20036
(202) 828-0993

EXECUTIVE OFFICE
994 Old Eagle School Road, Suite 1010
Wayne, Pennsylvania 19087
(610) 254-9800

Robert Hoover Production Director
Barbara Falk Circulation Manager
Nancy A. Perri Assistant to the Publisher
Robert G. Kliesch Publisher

ADVERTISING SALES OFFICES
New York/Connecticut (610) 935-8522
D. Douglas Johnson
1625 Oak Hill Road
Chester Springs, Pennsylvania 19425

PA/VA/MD/New England (610) 254-9800
George T. Broskey, Eastern Sales Manager
994 Old Eagle School Road, Suite 1010
Wayne, Pennsylvania 19087

Southeast (610) 935-8522
D. Douglas Johnson
1625 Oak Hill Road
Chester Springs, Pennsylvania 19425

Midwest (312) 464-8505
Jack E. Bergren
Robert G. Hatfield, CBC
936 The Merchandise Mart
Chicago, Illinois 60654

Jack E. Bergren (414) 786-4286
2530 Coach House Drive
Brookfield (Milwaukee), Wisconsin 53005

Edward R. Novak (708) 658-7133
E.R.&J. Assoc., Inc.
P.O. Box 648
Algonquin, Illinois 60102

West/Northwest
James A. Anderson (714) 855-0808
Western Sales Manager
James D. Anderson
23591 El Toro Road, Suite 209
El Toro, California 92630

Canada (905) 833-6200
Donald C. Fenn
Tony Hyland
2130 King Road, Box 1060
King City, Ontario L7B 1B1 CANADA

Italy (02) 58.31.02.19
Cesare Fiorucci
Viale Sabotino, 9
20135 MILANO
Fax: (02) 58.31.57.10

Last Chance

Did you miss valuable information offered by advertisers in last month's issue of ARCHITECTURE?

The manufacturers listed below were advertisers in last month's issue. They are anxious to provide you with their latest product information for your planning needs. To receive this information, circle the appropriate numbers on the self-addressed, postage-paid response card. For product literature from advertisers in this issue, circle the appropriate numbers shown on the advertisements.

Acme Architectural Walls
Send for details on our customized walls. *Circle No. 67*

Alumax Extrusions
Find out about this distinctive, innovative coating option. *Circle No. 75*

Andersen Corporation
In today's designs, it's the brand that helps architects take value to new heights.

Armstrong World Industries
Our ceiling experts can give you the information and peace of mind you need. *Circle No. 3*

Bradley Corporation
Get the full story on our Express™ Lavatory System. *Circle No. 13*

Case Window & Door
Send for specs, drawings, and project assistance. *Circle No. 23*

Cold Spring Granite
Write us for the latest innovations in Granite construction technologies. *Circle No. 21*

CRSI
Find out more about creative architectural design using reinforced concrete. *Circle No. 37*

Elf Atochem
Get the details on Kynar 500-based finishes. *Circle No. 51*

Follansbee Steel
Send for samples of our TCS® finishes. *Circle No. 11*

Forbo Industries
Get details on Marmoleum—the new standard in linoleum. *Circle No. 49*

Hewlett Packard
Send for information on our new DesignJet 200 inkjet plotter. *Circle No. 9*

Homasote Company
Send for literature and samples of our products. *Circle No. 59*

Hoover Treated Wood
Send for details on PYRO-GUARD® fire-retardant-treated lumber. *Circle No. 35*

Kim Lighting
Get the facts on our new line of wall-mounted outdoor/indoor luminaires. *Circle No. 7*

LCN Closers
We provide the most reliable solutions for virtually any door-control problem. *Circle No. 25*

Mannington Commercial
Call or write to find out what your Mannington options are. *Circle No. 65*

Marvin Windows & Doors
Mail our coupon for a free catalog featuring our entire line of made-to-order windows and doors. *Circle No. 5*

NAAMM
Write or call for more details on our widely acclaimed technical publications. *Circle No. 33*

Nixalite of America
Send for information on Nixalite® superior bird control. *Circle No. 15*

Patina Finishes
Send for a free brochure on our "antique" finishes. *Circle No. 27*

Portland Cement Association
Send for a free report on masonry cement mortars. *Circle No. 39*

PPG Industries
Send for details on our Azurlite® glass. *Circle No. 55*

Schlage Lock Company
Send for more information on our D-Series Levers. *Circle No. 41*

Schuller Intl. Inc.
Find out why Schuller is synonymous with stability, strength, and experience. *Circle No. 63*

Seiho Kogyo, Inc.
Get more information on our Aluminum Vent Louvers. *Circle No. 29*

Siedle Communications
Get further details on our Siedle-Vario® System. *Circle No. 47*

Sloan Valve Company
Find out more about our Optima Plus Retrofit Kit. *Circle No. 61*

Stylemark
Call or write for our complete registered catalog. *Circle No. 71*

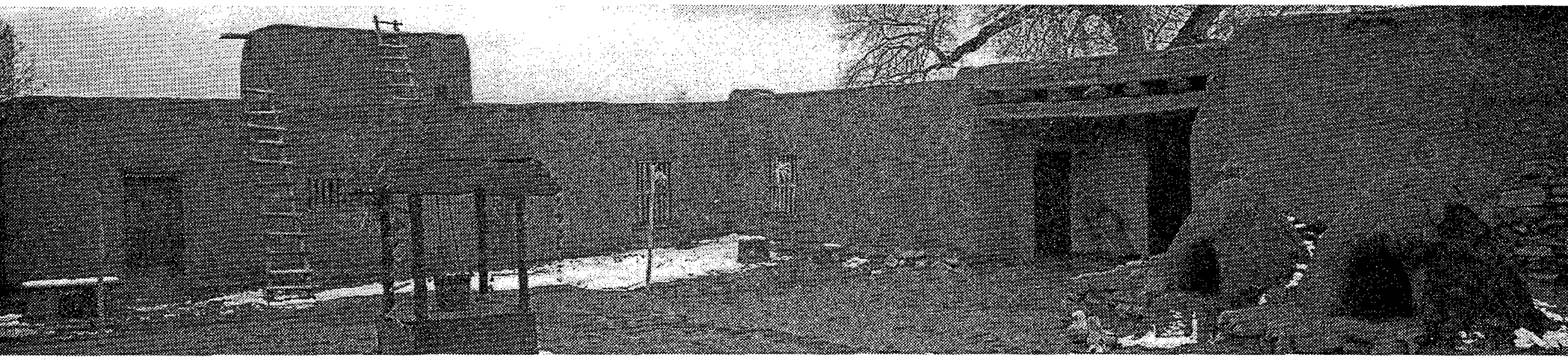
Tectum, Inc.
Find out why Tectum™ acoustical panels are the economical way to handle your tough wall and ceiling problems. *Circle No. 31*

Von Duprin, Inc.
Contact us to find out more about our vandal-resistant Breakaway™ lever. *Circle No. 69*

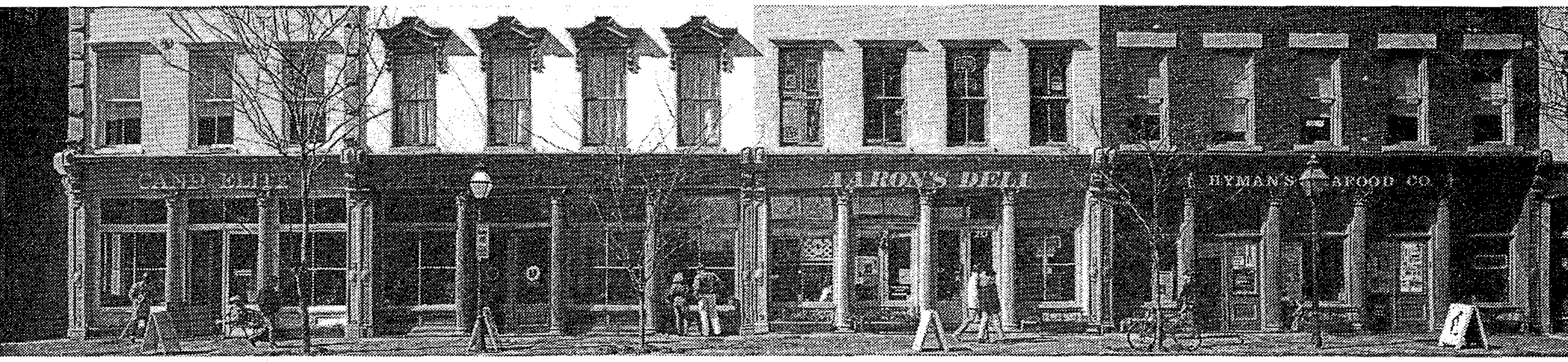
Weyerhaeuser Door Div.
Send for more information on our architectural wood doors. *Circle No. 73*

Wilkhahn, Inc.
Introducing Tubis — practical elegance for transit and waiting areas. *Circle No. 57*

IT'S DISCOVERING WHAT THIS COUNTRY WAS LIKE BEFORE IT WAS CALLED AMERICA.



IT'S BRINGING AMERICA'S MAIN STREETS BACK TO LIFE AND GETTING BACK TO BUSINESS.



IT'S JOINING NEIGHBORS AND FRIENDS TO IMPROVE THE COMMUNITY YOU CALL HOME.

What is historic preservation?

It's your memory. It's our history. It's worth saving.

NATIONAL TRUST FOR HISTORIC PRESERVATION 1 800 289 7091

1785 MASSACHUSETTS AVENUE, N.W. WASHINGTON, DC 20036

Project Credits

CHANNEL 4 HEADQUARTERS
LONDON, ENGLAND

ARCHITECT: Richard Rogers Partnership—Laurie Abbott, Helen Brunskill, Mark Darbon, Mike Davies, Jane Donnelly, Mike Fairbrass, Florian Fischotter, Marco Goldschmied, Philip Gumuchdjian, Jackie Hands, Stig Larsen, Avtar Lotay, John Lowe, Andrew Morris, Elizabeth Parr, Kim Quazi, Richard Rogers, Daniel Sibert, Stephen Spence, Graham Stirk, Yuli Toh, Martin White, Adrian Williams, John Young (project team)
LANDSCAPE ARCHITECT: Rendel + Branch
ENGINEERS: Ove Arup & Partners (structural/traffic), YRM Engineers (mechanical)
CONSULTANTS: Wheeler Group Consultancy (cost estimator); Fuller Pelser (project manager); Sandy Brown Associates (acoustics); McBains Building Surveyors (rights of light); Warrington Fire Research (fire engineering); Grey Associates (space planning)
GENERAL CONTRACTOR: Bovis Construction
COST: $60.3 million
PHOTOGRAPHERS: Richard Bryant and David Churchill/Arcaid

Richard Rogers quoted from *Architecture: A Modern View* (New York: Thames and Hudson, 1990).

GRAND PALAIS, EURALILLE
LILLE, FRANCE

ARCHITECT: Rem Koolhaas/Office for Metropolitan Architecture, Rotterdam, the Netherlands—Rem Koolhaas, Jan-Willem van Kuilenburg, Ruud Cobussen, Ray Maggiore, Marc Schendel, Diana Stiles, Luc Veeger, Ron Witte, Douglas Grieco, Edu Arroyo Munoz, Jim Njoo, Mark Schendel, Yushi Uehara, Sarah Whiting, William Wilson, Rients Dijkstra, Dirk Zuiderveld (design team)
ASSOCIATE ARCHITECT: François Delhay/F.M. Delhay-Caille, Villeneuve d'Ascq, France—François Delhay, François Brevart, Shoreh Davar, Christophe d'Hulst, James Langlin, Isabelle le Métay, Olivier Tourraine
ENGINEERS: Cecil Balmond/Ove Arup & Partners (structural); Sodeg Ingenierie, Pascal Bakaert, Gerard Catutti, Michel Desplanque, Bruno Fontana, Joel Taquet (mechanical)
CONSULTANTS: Petra Blaisse, Julie Sfez (interiors); Graphistes Associés (signage); Rens van Luxemburg, TNO (acoustics); Robert-Jan van Santen (facade); Agence Ducks, Michel Cova (scenography); Cabinet Gaillet, Bernard Gaillet (economics); Joep van Lieshout (plumbing)
GENERAL CONTRACTOR: Dumez-Quillery
COST: $66.7 million
PHOTOGRAPHERS: Christian Richters; Peter Cook/Archipress

EURALILLE CENTER
LILLE, FRANCE

ARCHITECT: Architectures Jean Nouvel, Paris—Jean Nouvel (principal); Sophie Berthelier (project manager); Isabelle Guillauic (project architect); Patrick Cosmao, Cyril Ruiz (assistant architects)
ENGINEERS: OTH NORD, PROJETUD
CONSULTANTS: Jean-Louis Besnard (facades); Cabinet Gaillet, PROJETUD (cost estimator, exterior); Agence AJN Pascal Madinier (cost estimator, interiors); Sabine Rosant (graphics)
CONSTRUCTION MANAGER: Jean Nouvel
COST: $277.9 million
PHOTOGRAPHERS: Christian Richters; Stephane Couturier/Archipress

CRÉDIT-LYONNAIS OFFICE TOWER
LILLE, FRANCE

ARCHITECT: Atelier de Portzamparc, Paris—Christian de Portzamparc (principal); Bruno Durbecq (assistant architect)
ENGINEERS: S.E.E.R. (structural); Sérété—CEEF (mechanical/electrical)
GENERAL CONTRACTOR: Groupe George V
COST: Withheld at owner's request
PHOTOGRAPHER: Christian Richters

LILLE-EUROPE TGV STATION
LILLE, FRANCE

ARCHITECT: Société Nationale des Chemins de Fer Français (SNCF) Station Design Office—Jean-Marie Duthilleul (SNCF chief architect); Etienne Tricaud (head of SNCF Station Design Office); Pierre Saboya (project architect); Bernard Haussy, Bernard Tournet, Didier Vermandel (assistant architects); Christian Descamps (design)
ENGINEERS: P. Rice and J.F. Blassel (RFR) with Ove Arup International (structural); Serete, Setec-Foulquier (mechanical/electrical); SNCF Structures Division, Serete, Setec-Foulquier (civil)
CONSULTANTS: Light Cibles (lighting), Diasonic (acoustics)
GENERAL CONTRACTOR: Buyck, Vuylstecke, Norpac-Caroni
COST: $166.8 million
PHOTOGRAPHER: Christian Richters; Michel Denancé

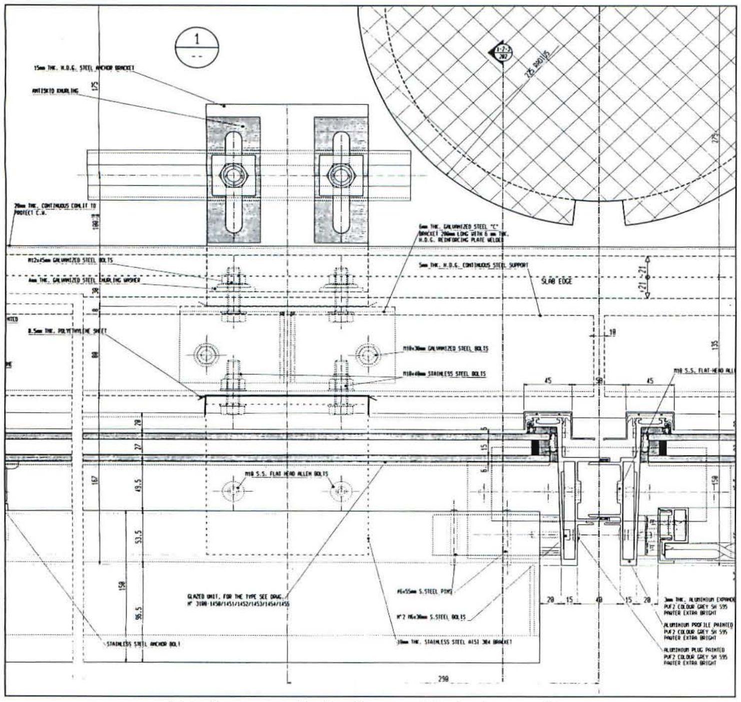
Rem Koolhaas quoted from *S, M, L, XL* by Rem Koolhaas with Bruce Mau, to be published in June 1995 by the Monacelli Press. Copyright 1995 Rem Koolhaas and the Monacelli Press.

KANSAI INTERNATIONAL AIRPORT
OSAKA, JAPAN

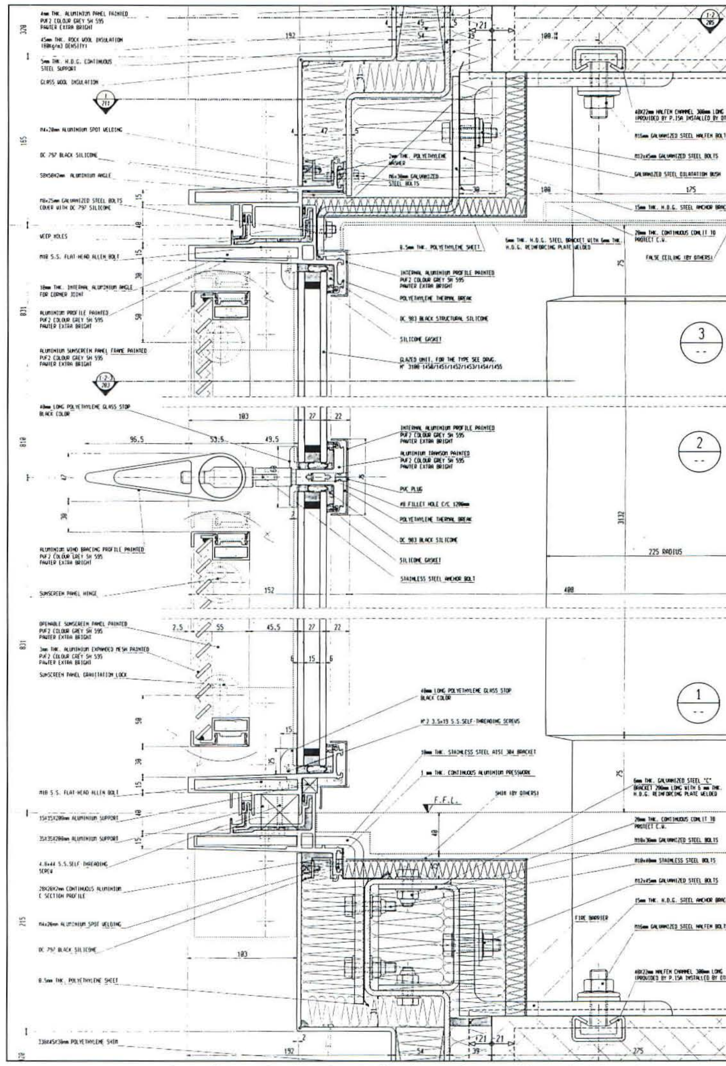
ARCHITECT: Renzo Piano Building Workshop, Osaka, Japan—Renzo Piano (principal); Noriaki Okabe (project leader); Jean-François Blassel, Ariel Chavela, Ivan Corte, Kenneth Fraser, Robert S. Garlipp, Marion Goerdt, Greg Hall, Kohji Hirano, Akira Ikegami, Shunji Ishida, Amanda Johnson, Christopher Kelly, Tetsuya Kimura, Stig Larsen, Jean Lelay, Ken McBryde, Takeshi Miyazaki, Shin'ichi Nakaya, Noriaki Okabe, Renzo Piano, Norio Takata, Taichi Tomuro, Olivier Touraine, Mark Turpin, Masami Yamada, Hiroshi Yamaguchi, Tatsuya Yamaguchi (project team)
ASSOCIATE ARCHITECT: Nikken Sekkei, Tokyo—Kimiaki Minai, Takayuki Inokura, Hiroshi Sasaki, Nobuhiro Tomatsu, Toshiaki Nakatsu, Takehide Watanabe, Yasuji Sugimoto, Kazuhiro Muramoto, Hiroshi Miyakawa, Susumu Hada, Hiromi Morimoto, Takashi Daito, Shinji Shitamukai, Kazuo Nakamoto, Kenji Kurita, Kouya Sugawara, Masato Goto, Ryohei Iwasaki, Minoru Asahi, Akira Oyama (project team)
LANDSCAPE ARCHITECT: Michel Desvigne
ENGINEER: Ove Arup & Partners (structural/mechanical)
CONSULTANTS: Aéroports de Paris; Japan Airport Consultants (airside planning); PELTZ et Associés (acoustic)
GENERAL CONTRACTOR: Obayashi Corporation
COST: $2 billion
PHOTOGRAPHERS: Kazuo Natori; Dennis Gilbert/Arcaid; Yutaka Kinumaki

Renzo Piano quoted from *The New Yorker*, August 22 & 29, 1994.

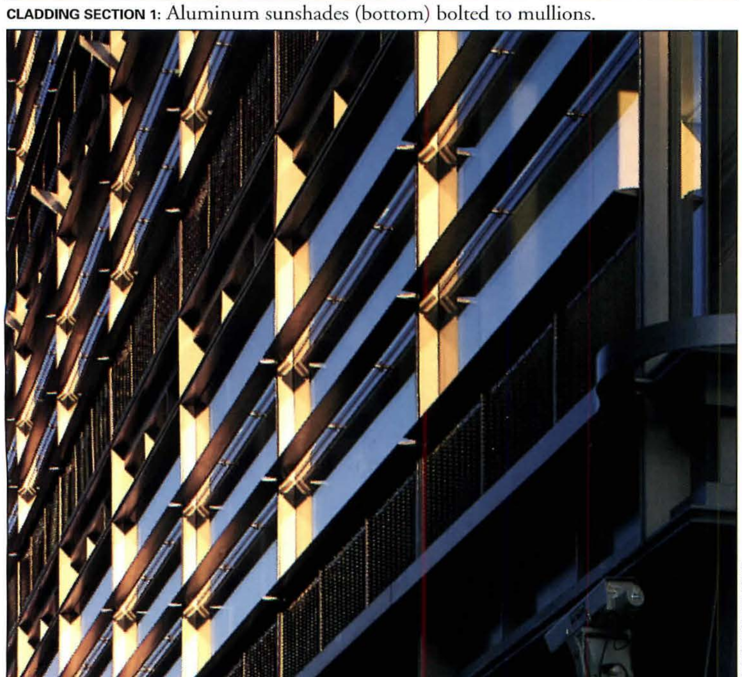
Details



CLADDING SECTION 1: Aluminum sunshades (bottom) bolted to mullions.

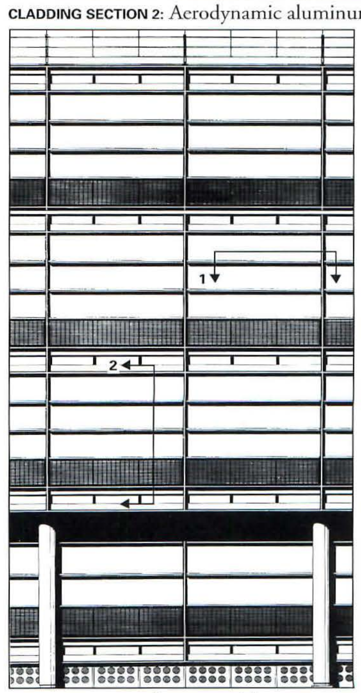


CLADDING SECTION 2: Aerodynamic aluminum fin (center) provides wind bracing.



RICHARD BRYANT/ARCAID

CHANNEL 4 OFFICES: Fins and sunscreens fastened to mullions and transoms.



NORTH ELEVATION: 3-meter grid.

Channel 4 Headquarters
London, England
Richard Rogers
Partnership, Architect

High Tech architecture depends on its details, so Richard Rogers Partnership worked closely with the Italian curtain-wall manufacturer Permasteelisa to develop the cladding for the Channel 4 Headquarters (pages 56-65). To laterally brace the aluminum-and-glass facades against the wind, the architects bolted aluminum fins to the transoms. In structural joints, they specified black silicone to avoid the yellowing that is typical of clear silicone. Hinged aluminum-mesh sunshades, adapted from highway barrier construction, are bolted to the aluminum frames. By minimizing cladding components, Rogers and his team kept the envelope's cost at $52 per square foot.—*R.A.B.*

"Your Wood I Beam™ is going to allow me unsupported spans up to how many feet?"

G-P: Wood I Beam joists have more load-bearing and spanning capabilities than dimensional lumber, so you can design with up to 48′ spans.*.

YOU: *...without cluttering up open space with support columns. It'd be ideal for a great room, a bonus room over a garage, a finished basement.*

G-P: Speaking of basements, Wood I Beams allow higher ceilings because you can pass utilities and duct work through the beams.

YOU: *What about floors? Does it help avoid squeaks?*

G-P: Absolutely. G-P Wood I Beams are built to resist the warping and twisting that create those squeaks.

YOU: *Will I be able to use Wood I Beams if I spec conventional lumber in the flooring system too?*

G-P: Yes–G-P Wood I Beams are compatible with standard dimensional lumber sizes. And you can get long lengths, even up to 60,′ for just about any design you can dream up.

YOU: *Of course, I wouldn't know how to design with it after using dimensional lumber for 15 years...*

G-P: We'll help with that, and we can do take-offs for you.

YOU: *Well, anything that expands my design options solves some big problems for me.*

G-P: So–no more questions? Come on, I'm just getting warmed up...

For more information about G-P Wood I Beam joists and headers, call 1-800-BUILD G-P (284-5347), Operator 730. (Ask about G-P Lam® laminated veneer lumber, too.) Or check Sweets Section 06190/GEO.

Solve it with G-P.℠

Georgia-Pacific

OFFICIAL SPONSOR OF THE 1992 U.S. OLYMPIC TEAM

*Depending on space, loading and beam size.

Circle 176 on information card