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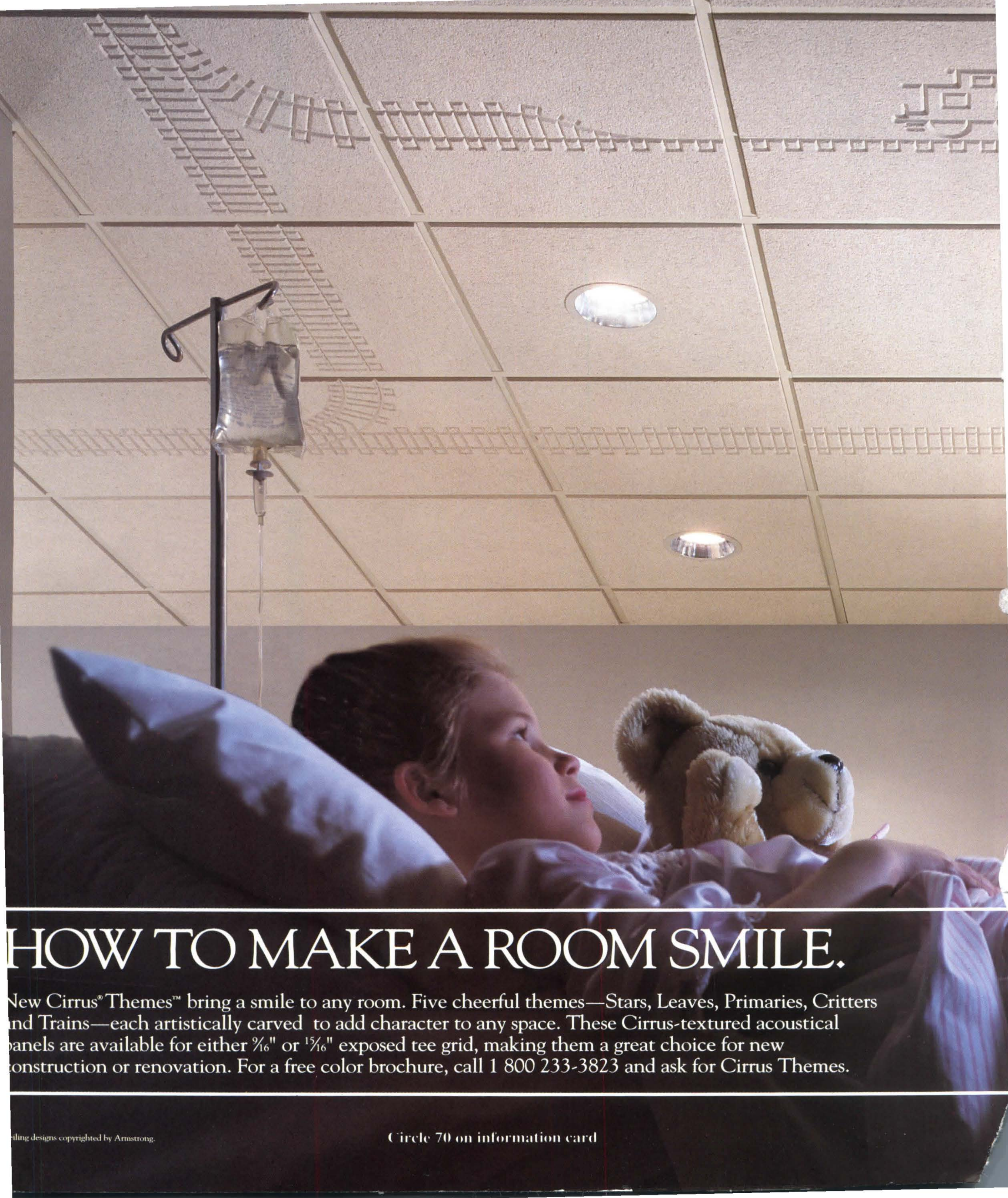
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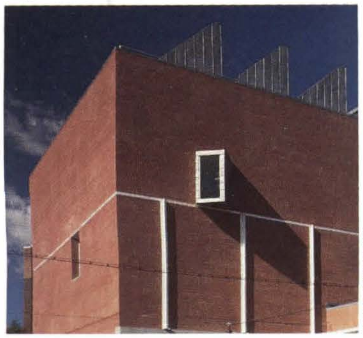

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Cover
Pilar and Joan Miró Foundation, Palma de Mallorca, Spain, by José Rafael Moneo (page 52). Photograph by Lluis Casals.

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Context and responsibility
Fire protection
Teleconferencing

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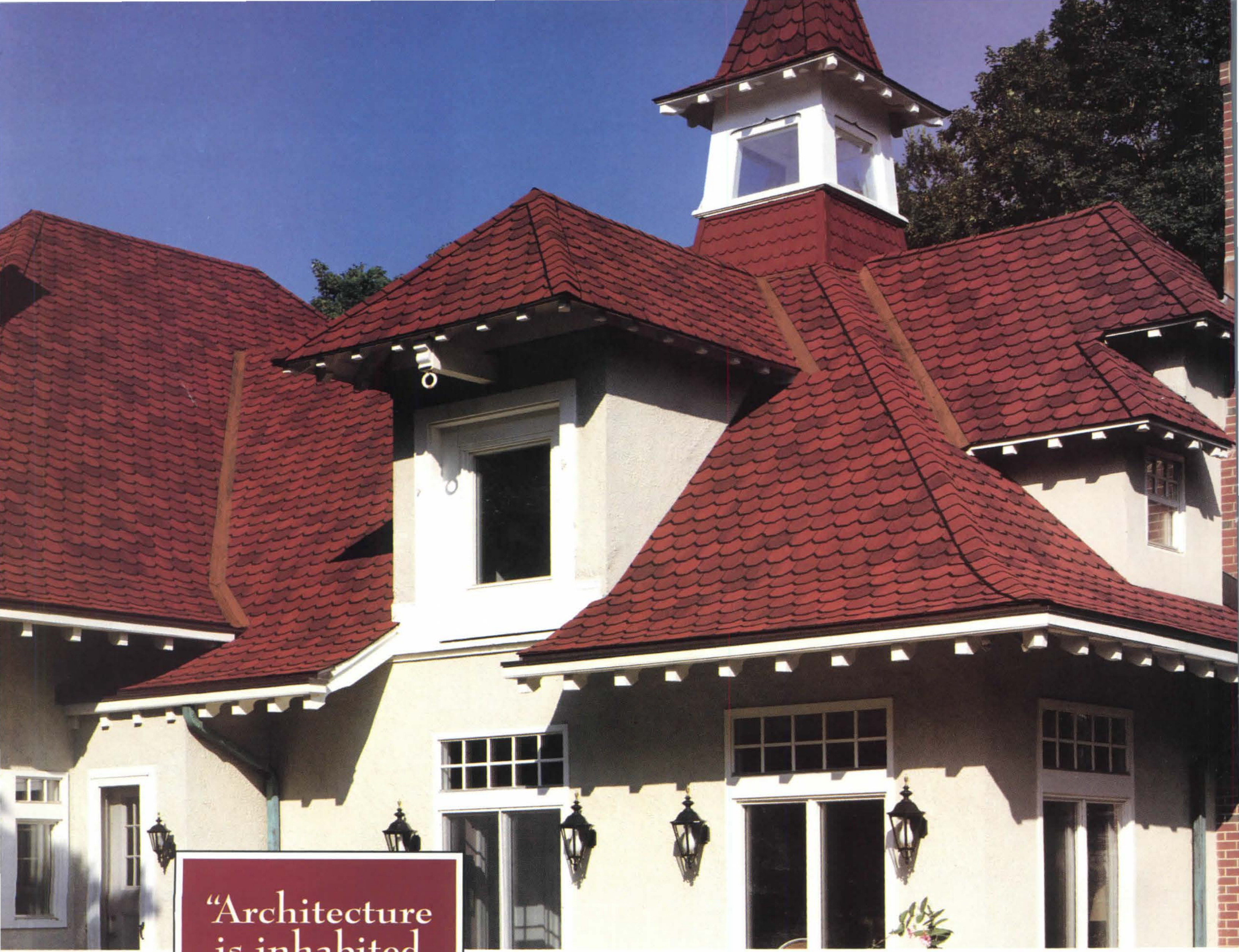

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—Constantin Brancusi

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MBTA Operations Control Center, Boston, Massachusetts, by Leers, Weinzapfel Associates (page 48). Photograph by Steve Rosenthal.

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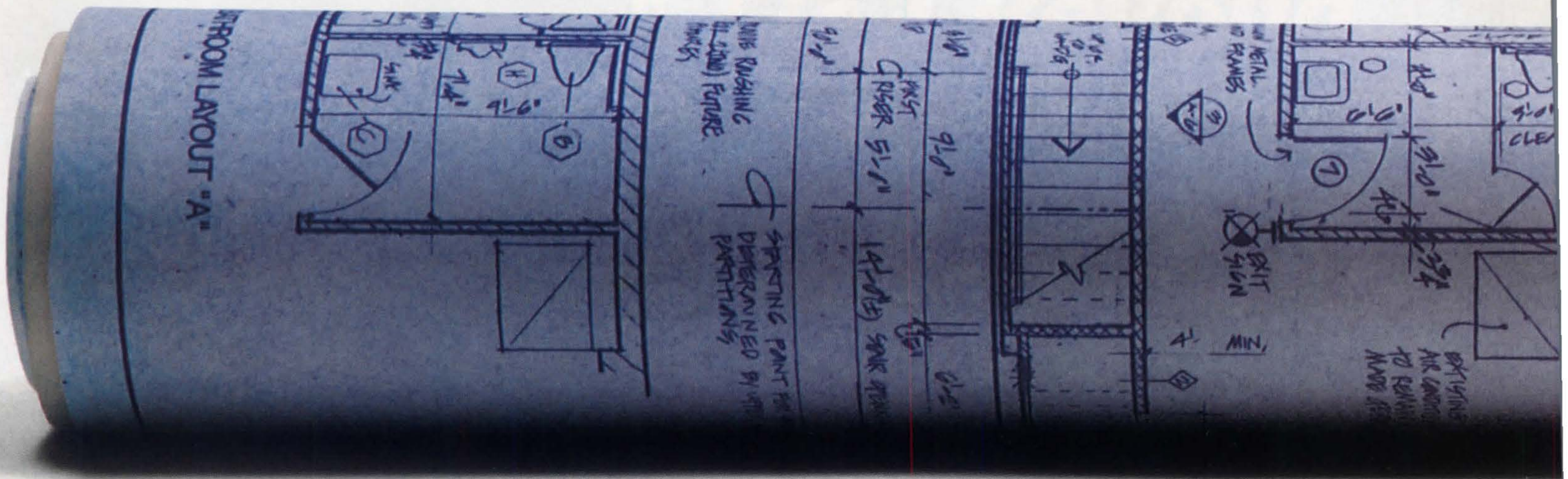

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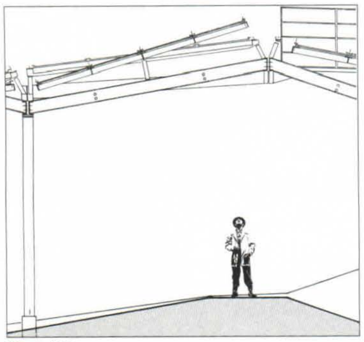

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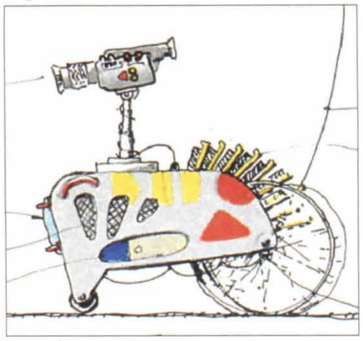

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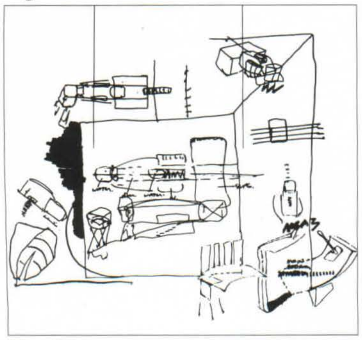

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Harvard Apartments, Los Angeles, by Kanner Architects (page 86). Illustration by Georganne Deen.

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Annual review of American architecture
AIA Honor Awards

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TIMOTHY HURSLEY

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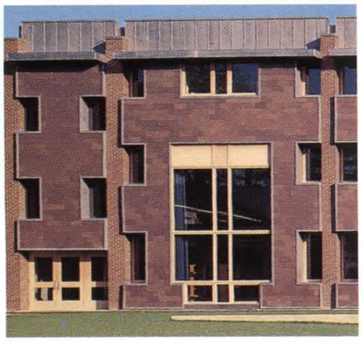
BARRY HALKIN

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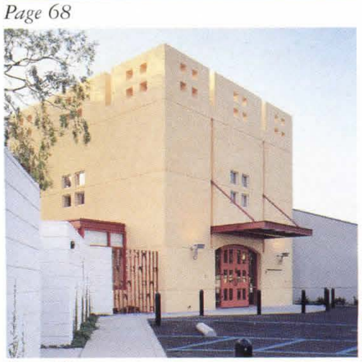
TIM GRIFFITH

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Corning Child Development Center, Corning, New York, Scogin Elam and Bray Architects (page 58). Photo by Timothy Hursley.

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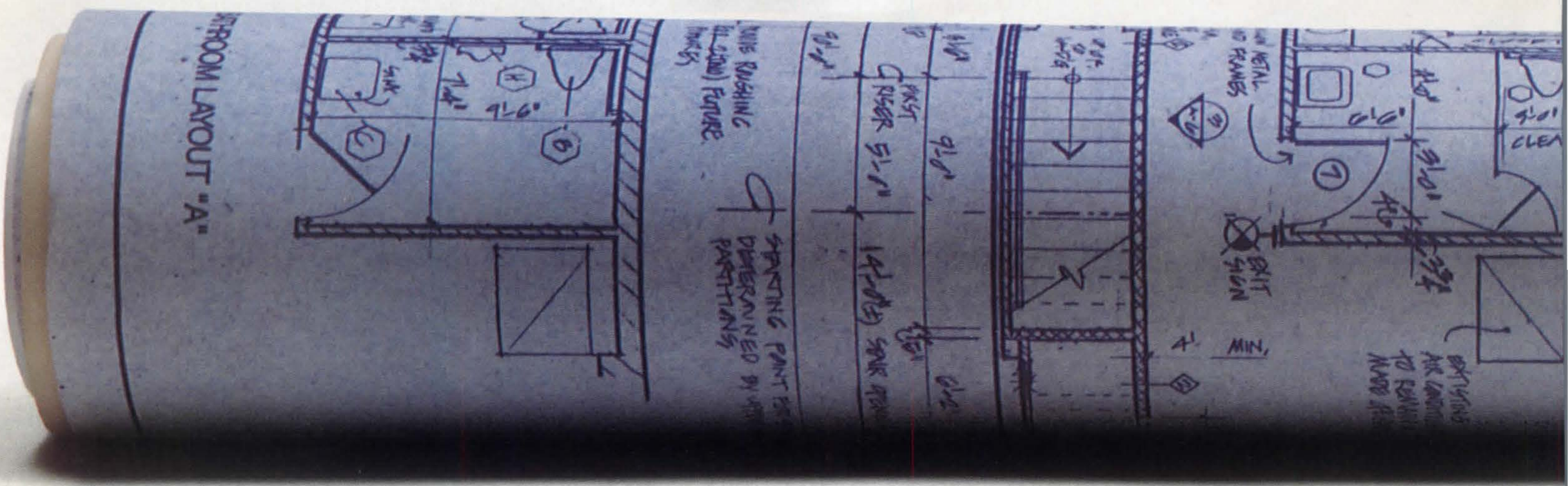

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LUC BOEGLY
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JANE LIDZ
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Elrey Jeppesen Terminal, Denver Airport, C.W. Fentress J.H. Bradburn and Associates (page 44). Photo by Nick Merrick, Hedrich-Blessing.

Next Month
New buildings in Europe, Australia, and Asia

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DUCCIO MALAGAMBA

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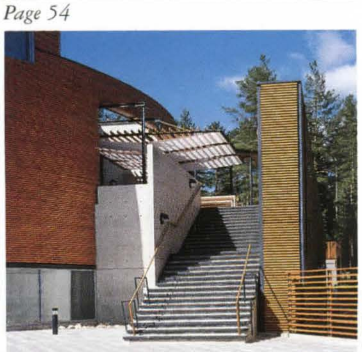

JUSSI TIAINEN

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Center for Contemporary Galician Art, Santiago de Compostela, Spain, Alvaro Siza, Architect (page 54). Photo by Duccio Malagamba.

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Housing innovations
Design for the elderly
Virtual reality

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DAVID HEWITT / ANNE GARRISON

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MEHRDAD YAZDANI

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Retirement Cohousing, Mendocino County, California, Fernau & Hartman Architects (page 76). Photograph by Richard Barnes.

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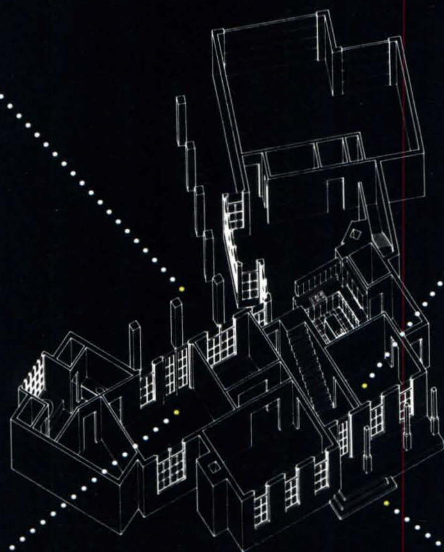
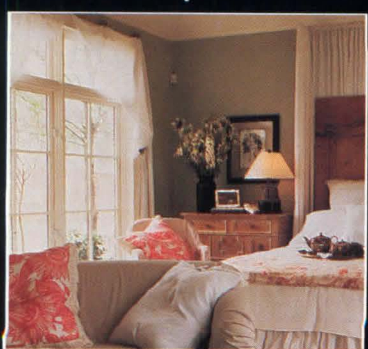


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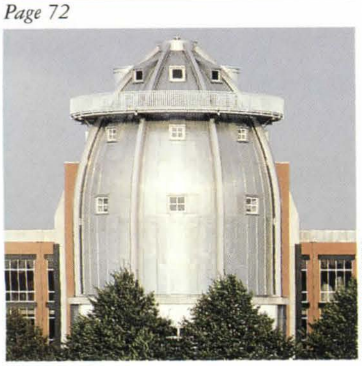

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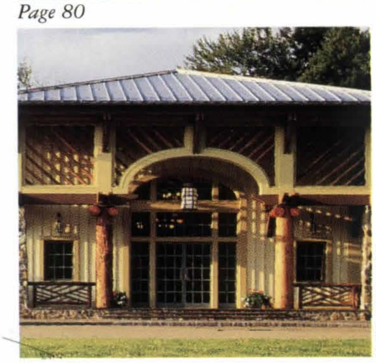

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The News Building, Athens, Georgia, Allan Greenberg, Architect (page 72). Photograph by Tim Buchman.

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Buildings for the arts
Acoustics
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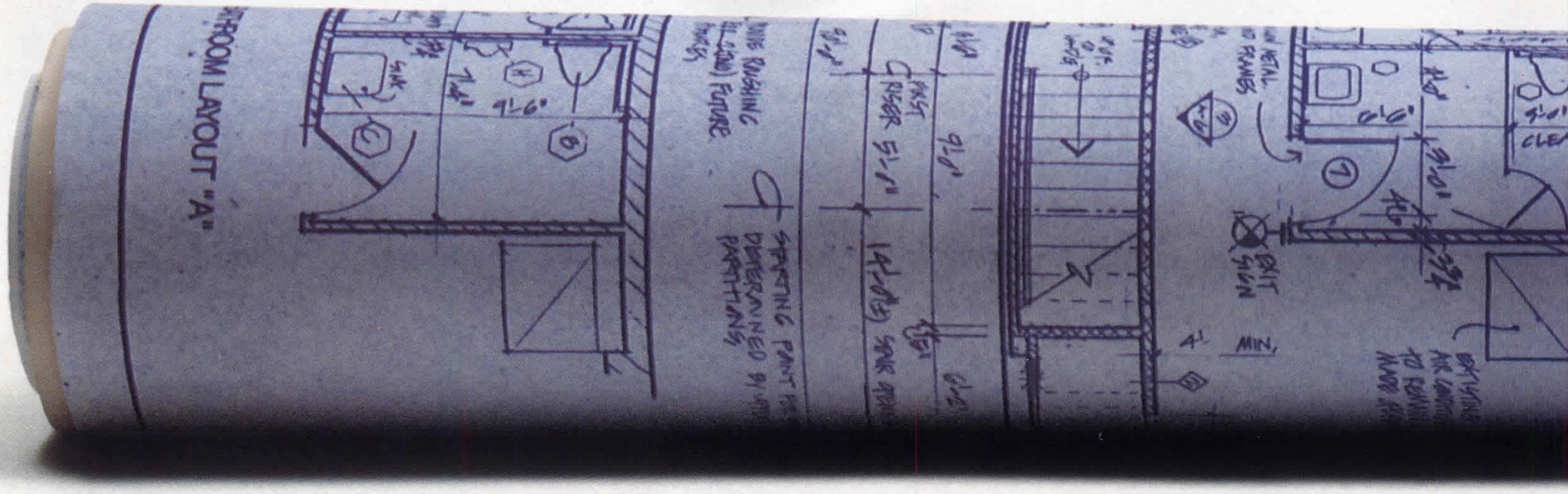

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Cover
Seiji Ozawa Hall, Tanglewood Music Center, Lenox, Massachusetts. William Rawn Associates, Architect (page 58). Photograph by Steve Rosenthal.

Next Month
Hubs of transportation and communication
New cladding systems
Information networks

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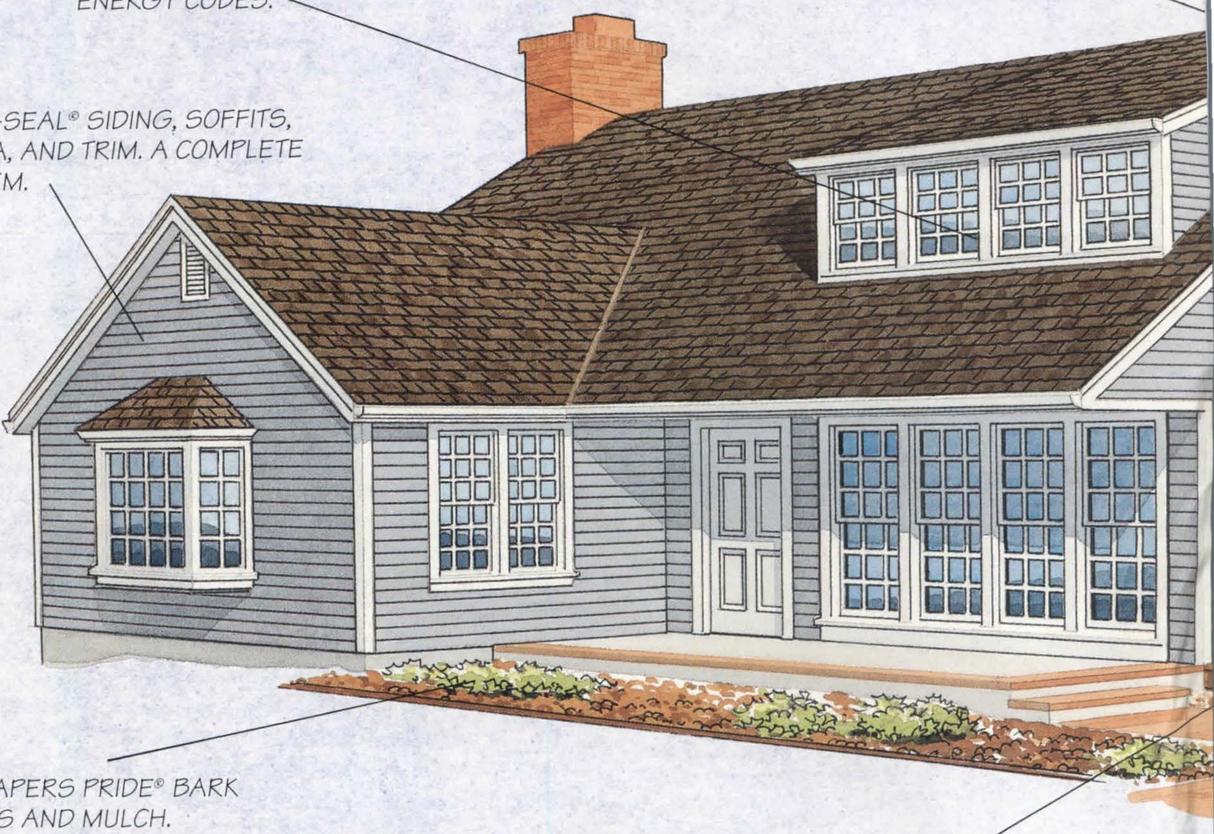
The Cost of Building A House Is Ridiculous.



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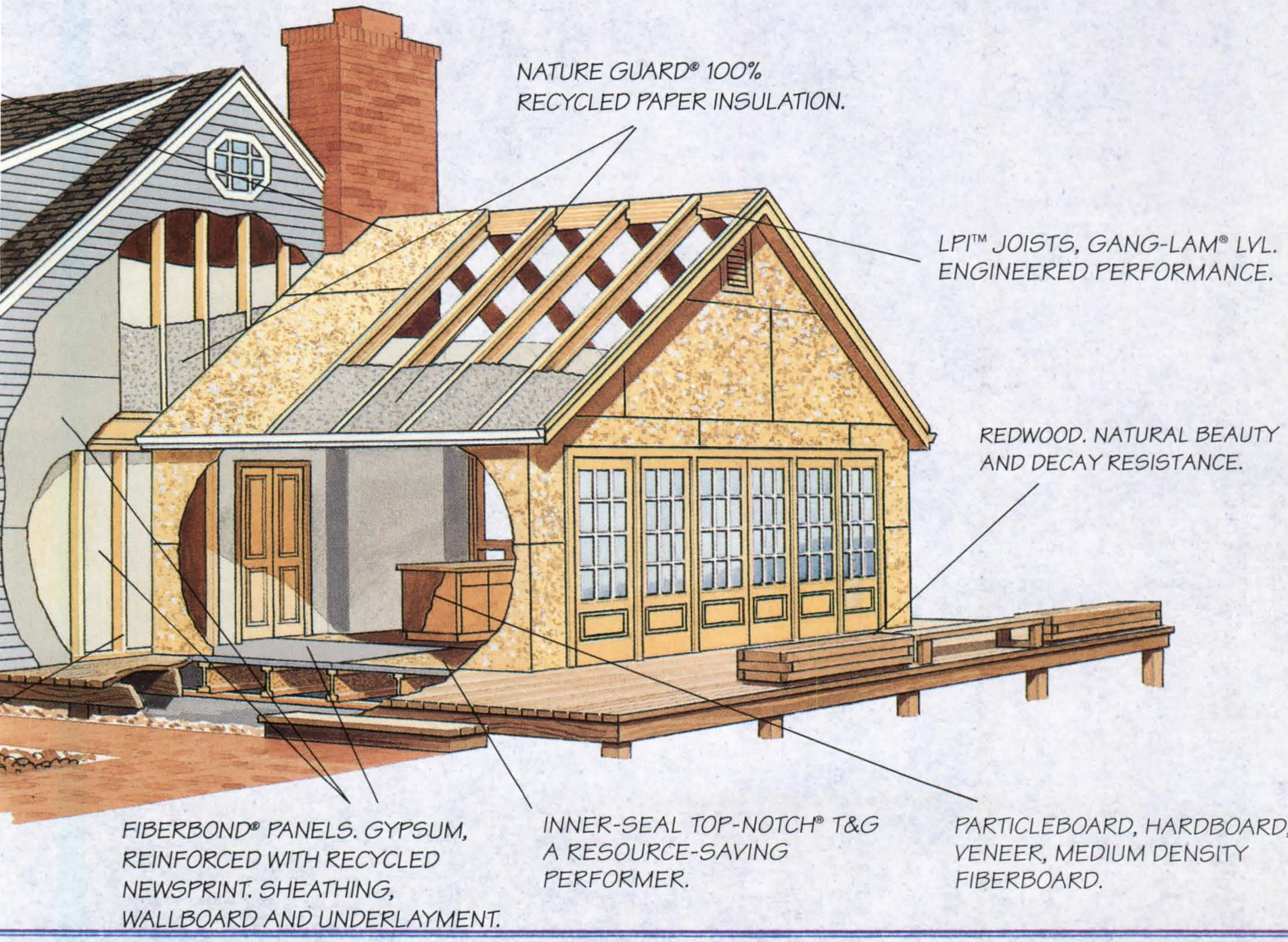

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Letters

Mix masters

In your article "Octagon's Progress" (November 1993, pages 107-113) you state that previous repair work had been done with a mortar that was hard, gray, and Portland-cement based. You add that this hard mortar was being replaced with a more compatible mortar. It would be helpful to know the exact ingredients.
Norbert Schaaf
Norbert Schaaf Architect
Michigan City, Indiana

Editor's reply: The Octagon's original mortar comprised lime and white sand, while mortars in 20th-century restorations all contained gray Portland cement. The mortar applied in the latest restoration is made of white Portland cement, hydrated calcium lime, and white sand.

Partnering guidance

While the professional liability insurance carrier's attorney quoted in your article "Project Partnering" (October 1993, pages 111-113) was critical of the concept, this view is not held throughout our industry. In fact, DPIC recently introduced Partnered/TeamCover, a new program that pays for most if not all of the cost of a partnering facilitator on projects insured under our project policies.

Like the AIA, ACEC, AGC, and the design professionals quoted in your article, we feel that partnering will go a long way toward ending project disputes. And we plan to promote *A Design Professional Partnering Guide*, co-authored by the AIA and ACEC, to our 7,000 policy holders.
Peter Hawes
DPIC Companies
Monterey, California

Liability unleashed

Your article "Liability on a Leash" (October 1993, pages 99-101) did an excellent job of capturing the issues relative to professional liability insurance for architects. I must point out, however, that the insurance market sampler included with your article did not properly reflect the coverage available through Lloyd's of London. First of all, AVRECO is only one, relatively small player in the Lloyd's market. Our London affiliate—Johnson & Higgins Limited—is the largest single producer of A/E insurance in the Lloyd's market. This is especially important as, unlike the AVRECO program, J&H has been able to secure coverage in excess of $15 million from Lloyd's.
Dan Knise
Johnson & Higgins
Washington, D.C.

In "Liability on a Leash," you state that "selecting a policy begins with choosing a broker. The best references come from colleagues, or the local or state AIA chapter. Another option is to call A/E ProNet, a network of independent underwriters." I question whether simply reiterating the AIA's endorsement of A/E ProNet is in the best interest of architects. Such endorsements limit your readers' access to competitive resources that are available.
Luciano M. Elias, Jr.
Building Industry Insurance Services
Newport Beach, California

Events

January 15-20
1994 Roof Coatings Manufacturers Association convention in San Diego. Contact: (301) 230-2501.

January 21-24
National Association of Home Builders annual convention at the Las Vegas Convention Center. Contact: (202) 822-0200.

January 28
Registration deadline for A Youth Center for Your Community, a design competition sponsored by the New Jersey Institute of Technology. Contact: (201) 596-3080.

February 1
AIA's Accent on Architecture at the National Building Museum in Washington, D.C. Contact: Melissa Houghton, (202) 626-7514.

February 2
Registration deadline for Urban Infill Housing, a competition sponsored by the Columbus Ohio Neighborhood Committee. Contact: (614) 274-4141.

February 10-12
Conference on Therapeutic Environments sponsored by AIA Academy of Architecture for Health/Healthcare Facilities and the AIA Task Force on Therapeutic Environments. Contact: (202) 626-7429.

February 12-16
National Wood Window and Door Association's annual meeting in Palm Beach. Contact: (708) 299-5200.

February 15
Deadline for American Society of Architectural Perspectivists' drawing competition. Contact (617) 846-4766.

February 15-18
A conference on Total Quality Management hosted by the Design and Construction Quality Institute in Tampa. Contact: (301) 588-0967.

February 20-May 10
Frank Lloyd Wright—Architect, an exhibit at the Museum of Modern Art in New York City. Contact: (212) 708-9500.

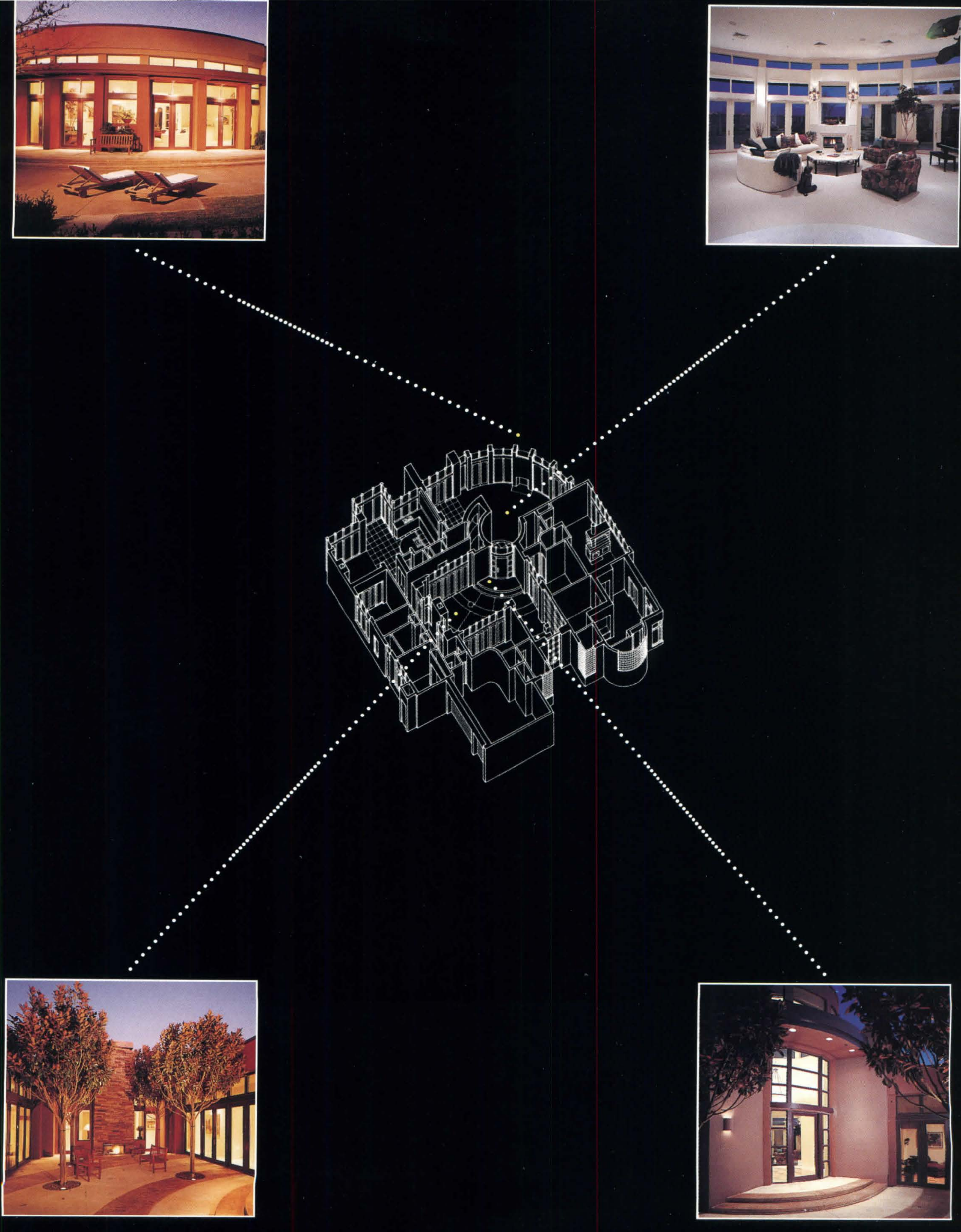
February 22
Registration deadline for Public Space in the New American City, a competition sponsored by the Architecture Society of Atlanta. Contact: (404) 872-0330.

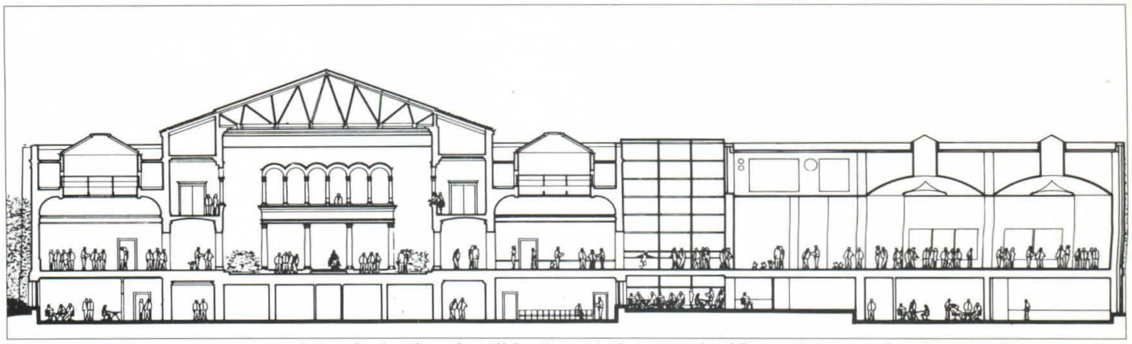
February 22-26
Making Cities Livable, a conference sponsored by the Urban Initiatives and the Istituto Nazionale de Urbanistica. Contact: (408) 626-9080.

February 23
Entry deadline for the New England Healthcare Facilities 1994 Design Awards. Contact: (800) 662-1235.

February 25-26
ADA and Courthouse Design, a conference sponsored by the AIA Justice Facilities Committee in Washington, D.C. Contact: (202) 626-7437.

March 1
Deadline for The Paris Prize, a competition sponsored by the National Institute for Architectural Education. Contact: (212) 924-7000.





JOSLYN ART MUSEUM: Expansion of Omaha landmark will be Foster's first U.S. building when completed in October.

LYCÉE DE FRÉJUS: Foster's recently completed school in southern France.

LYCÉE DE FRÉJUS: Represents a new environmental concern in Foster's work.

COMMERZBANK: Foster in Frankfurt.

Norman Foster Wins AIA Gold Medal

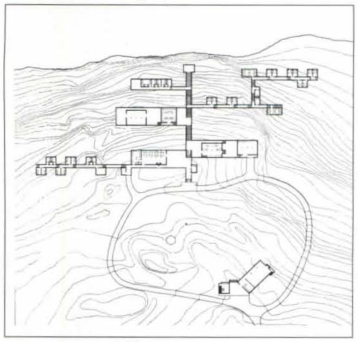
British architect Norman Foster was awarded this year's AIA Gold Medal by the Institute's board last month. Foster first came to prominence in the late 1960s as one of the pioneers of the architectural style known as British High Tech. In the late 1970s and early '80s, Foster demonstrated that his distinctive style could be successfully applied to a wide range different building types and locations. And in 1983, the Royal Institute of British Architects recognized Foster's achievements by awarding him its Gold Medal.

The completion of the Hong Kong Bank headquarters in 1986 established Foster's international reputation. Since then, Foster's architecture has become more sober and less expressive, but without any loss of formal, spatial, and structural inventiveness. The Century Tower in Tokyo (1991) is a more austere and economical version of the Hong Kong Bank. The Stansted Airport in Essex (1991) has an extremely refined, minimalist structure of shallow square domes supported on slender, tree-like steel frames. In the Carrée d'Art, a library and art gallery in Nimes, France (ARCHITECTURE, September 1993, pages 108-109), Foster's architecture takes on an almost monumental character.

In Foster's most recent buildings, such as the Microtechnology Park at Duisburg in Germany (ARCHITECTURE, September 1993, pages 112-113) and the Lycée Polyvalent Régional in Fréjus, France, a new environmental concern is evident. These buildings are exercises in the rational application of modern building technology to the problem of low-energy architecture. Currently, Norman Foster's office is working on commissions throughout Europe and the Far East, including the remodeling of the Reichstag Parliament Building in Berlin and the new Hong Kong Airport. Curiously, there are as yet no completed Foster buildings in the U.S., though an extension to the Joslyn Arts Museum in Omaha, Nebraska, is due to be finished this October.

Commenting on the AIA Gold Medal, Foster recalls the two years he spent as a graduate student at Yale: "It was a liberating experience for someone trained in a very traditional British university. I studied under teachers like Paul Rudolph, Serge Chermayeff, and Vincent Scully and really felt at home almost for the first time in my life. That is one reason why this award means so much to me."—*Colin Davies*

HAYSTACK: Shingle-clad cabin.



SITE PLAN: Walkways connect cabins.

HAYSTACK SCHOOL: Barnes' 1961 complex integrates wood structures into landscape, offering coastal vistas.

Maine School Receives 25-Year Award

Edward Larrabee Barnes' Haystack Mountain School of Crafts in Deer Isle, Maine, is being honored with this year's AIA 25-Year Award. The prize is given each year to a building between 25 and 35 years old that "exemplifies design of enduring significance," according to the AIA.

Sited on a dramatic rocky slope in coastal Maine, Barnes' 1961 arts and crafts school was planned as a village of simple frame structures clad in wood shingles. The scheme's central feature is a grand wooden stair that leads from the main entrance of the complex to an overlook 90 feet below. Individual workshops, studios, and dormitories—connected to the stair by a series of elevated decks and walkways—are constructed on piers.

Donlyn Lyndon of Lyndon/Buchanan Associates served as jury chair. "For architects who have studied the complex," explains Lyndon, "it has provided a profound example of the liberating fusion of vernacular building traditions with the rationality and discipline of Modern architecture."—*Raul A. Barreneche*

AIA's CEO Resigns

James P. Cramer has announced that he will leave his position as the Executive Vice President and CEO of the American Institute of Architects later this year. "I believe that there should be renewal in an organization that brings in fresh leadership," explains Cramer. "For me, it's time to go back to the private sector. But it is my hope to continue to do something for the profession." Cramer was named President of the AIA Service Corporation in 1982. He was later appointed President of the American Architectural Foundation and Deputy CEO of the AIA, before assuming his current position in 1988. During Cramer's six-year tenure, the AIA has successfully lobbied for federal legislation to improve the environment, public transit, historic preservation, and universal access; introduced professional development and continuing education programs; and boosted its financial base by over $5 million.

A search committee, including current AIA President L. William Chapin II, past President Susan A. Maxman, and 1995 President Chester Widom, has been formed to appoint Cramer's successor. Cramer will act as an advisor to the committee and will continue to serve in his current position until a replacement is named later this year.—*R.A.B.*

PAUL WARCHOL PHOTOS

STOREFRONT FOR ART AND ARCHITECTURE: Holl and Acconci's pivoting panels create changing composition.

GALLERY INTERIOR: Scheme blurs distinctions between inside and out.

SITE: Storefront distinguishes locale.

Holl and Acconci Reface Storefront

Across from a barren park in a no-man's-land between Manhattan's SoHo and Little Italy, the Storefront for Art and Architecture is presenting a new face over the next two years. New York architect Steven Holl and artist Vito Acconci, a Bronx native known for his aggressive public art, have revamped the public image of this not-for-profit gallery devoted to showing art and architecture outside the mainstream, with an elegantly austere facade that changes throughout the day.

Before noon, the 90-foot storefront gallery resembles a bunker faced in battleship-gray concrete boards that appear to be riveted shut against the winds on this corner site. Later in the day, the severe walls seem to dissolve, as four large, well-spaced panels swing out over the sidewalk while reaching back into the gallery. Interspersed among these solid panels, smaller pieces of the wall fold out and down into lively, abstracted bench-and-table configurations that could well attract a regular summer lunchtime crowd.

When all the panels are fully opened and set at various angles, the space shifts dramatically with the viewer, whether seen while walking past the white-walled gallery or from inside where the entire wall can appear as little more than a skeletal structure for viewing the street scene. From other points, the larger masses become intrusive—blunt, out-of-scale protrusions that create a claustrophobic interior. This menacing quality, aided by the military-industrial colors and materials that flow seamlessly into one another and blend with the ragged surroundings, keeps the piece off balance. The project was designed following a series of meetings between Holl and Acconci, Storefront Directors Kyong Park and Shirin Neshat, and curator Claudia Gould. New York-based Face Fabrications served as the project's contractor.

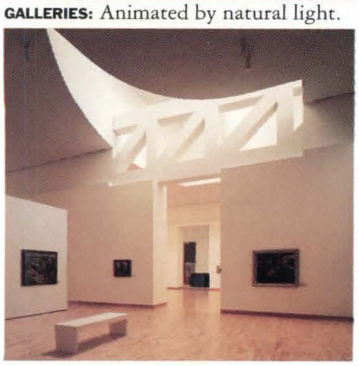
Storefront's only rule, says Park, was that the collaborative commission be integral with the gallery. By using the space as material, it would serve to "alleviate the problem of making a distinction between art and architecture."

Although Park admits the collaboration was not a blissful enterprise, the rough-edged Holl-Acconci facade eloquently expresses the uneasy codependence between architecture and art, a relationship in which each party often tries to assume the other's role before settling into its own.—*Peter Slatin*

Details

Architect **L. William Chapin II** of the Rochester, New York, firm **Chapin & Tomaselli** was inaugurated last month as the AIA's 70th President. **Kohn Pedersen Fox Associates** has been commissioned to design the new $176 million Internal Revenue Service headquarters in New Carrollton, Maryland. New York architects **Thomas Hanrahan** and **Victoria Meyers** have been named winners of the 1993 Eugene McDermott Award by the Council for the Arts at MIT. **Charles Gwathmey** has set up the Robert Gwathmey Chair at Cooper Union, a rotating professorship in art and architecture in honor of his father. Santa Monica-based **Moore Ruble Yudell Architects** has been commissioned to design a new facility for the School of Business Administration at the University of Southern California. **Schwartz/Silver Architects** has been selected to design the expansion of Boston's New England Aquarium, originally designed by **Cambridge Seven Associates**. **Bentel and Bentel Architects** of Locust Valley, New York, will design the National Purple Heart Museum in Enfield, Connecticut. The Center for American Architecture and Design at the University of Texas at Austin has named **Michael Benedikt** its new director. **Centerbrook Architects** has been selected to renovate five historic buildings and design a new science building at Western Maryland College in Westminster, Maryland. **Siegel Diamond Architects** of Los Angeles is designing the new $55 million central utility plant at the University of California, Davis, Medical Center. The project was selected over schemes by **Antoine Predock Architect**, **James Stewart Polshek and Partners**, **Austin Hansen**, and **Michael Willis & Associates**. Babson College has commissioned **Goody, Clancy & Associates** to design a new graduate school building for its campus. **Edward Larrabee Barnes/John M.Y. Lee Architects** will design the new $60 million Brooklyn Sportsplex on Coney Island. **Susan Henshaw Jones**, former president of the New York Landmarks Conservancy, will succeed **Robert W. Duemling** as Director and President of the National Building Museum in Washington, D.C. In her ABC television special last month, Barbara Walters cited architect **James Ingo Freed** as one of the "12 Most Fascinating People of 1993."

GALLERIES: Animated by natural light.



GALLERIES: Trusses punctuate space.

DON F. WONG PHOTOS

WEISMAN MUSEUM: Gehry's stainless steel forms over brick base change in color according to sunlight and weather.

Weisman Art Museum Opens in Minneapolis

Already nicknamed the "tin can castle" and the "stainless steel artichoke," the Frederick R. Weisman Art Museum, which is located on the University of Minnesota's Twin Cities campus, is Frank Gehry's latest cacophonous assembly of fractured forms. Developed with local architects Meyer, Scherer & Rockcastle, the free-form, stainless steel segments seem to boil over the plain brick base that sits four-square to the campus, spilling over the bluff toward the Mississippi River below.

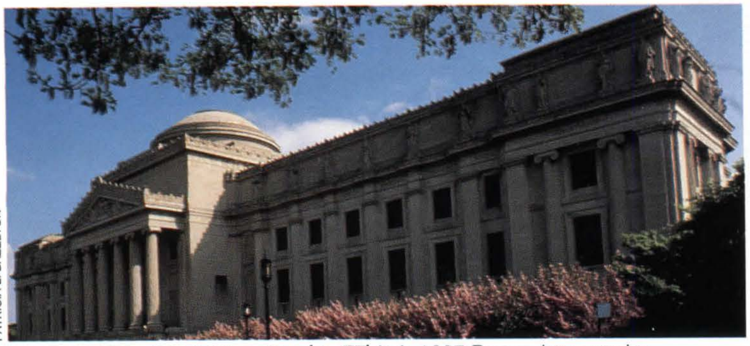
The Weisman Museum is Gehry's third major building to be completed in the Midwest. Like the Iowa Advanced Technology Laboratories in Iowa City (ARCHITECTURE, March 1993, pages 58-67), the building juxtaposes an explosion of metal-clad forms to a simple masonry box, and like the recently opened Center for the Visual Arts in Toledo, it explores a quirky vocabulary of curvilinear forms. The Weisman's forms are even wilder and more curvaceous than these Gehry projects. Due to site constrictions, the museum's sculptural energy is concentrated into a single masklike facade, which seems to come alive in the evening as stray rays from the setting sun bounce pink and gold off the cladding of stainless steel plates. Although the exterior is bold and brash, the interior defers subtly to the art. Cool and quiet galleries—all white except for their serene maple floors—are animated by the natural light that pours in through sculptured skylights, which are controlled by electronically operated louvers.

This spacious, attention-grabbing new building focuses the spotlight on the university's art museum, which has languished in a cramped attic gallery for the past 60 years, with its collection of works by such noted American painters as Marsden Hartley, Alfred Maurer, and Georgia O'Keeffe packed away in storage. The museum's director, Lyndel King, raised the $14 million to cover the cost of constructing the new facility through contributions from over 400 donors, including a $3.5 million gift from Minneapolis native and University of Minnesota graduate Frederick R. Weisman, a philanthropist and art collector who now makes his home in Los Angeles.

Gehry curated one of the museum's opening shows: "The Architect's Eye," which highlights works by numerous artists that have influenced his design. The exhibition's works range from the whimsical "Shoestring Potatoes Spilling From a Bag" by Claes Oldenburg (1966) to a minimalist steel box construction by Donald Judd (1991).

Local acceptance of Gehry's controversial design was helped by a $100,000 advertising campaign donated by the Minneapolis newspaper, the *Star Tribune*, which positioned the Weisman Museum as playful rather than pompous, populist rather than pretentious, and diffused criticism of the design with humor. In response to complaints that glare from the stainless steel facade was blinding passing motorists, opening-day visitors to the museum were handed futuristic wraparound sunglasses. Gehry, however, seems to shrug off the controversy, claiming, "They told me not to build another brick lump."—*Robert Gerloff*

Robert Gerloff is an associate of Mulfinger, Susanka & Mahady Architects.



PATRICIA L. BAZELTON

BROOKLYN MUSEUM: McKim, Mead & White's 1897 Beaux-Arts exterior.

EGYPTIAN GALLERY: Renowned collection displayed in minimalist rooms.

RENOVATED GALLERY: Limestone-trimmed portal conceals mechanical system.

Brooklyn Museum Renovation Unveiled

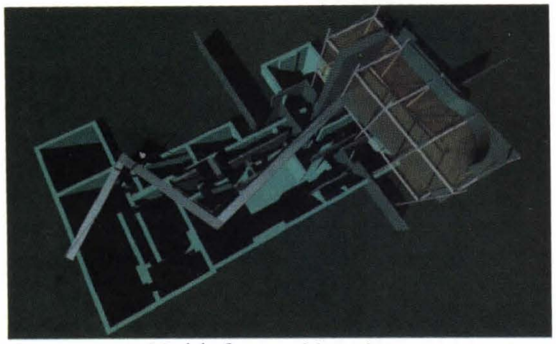
America's art, the French artist Marcel Duchamp once quipped, is in her plumbing. As the newly renovated galleries of the Brooklyn Museum attest, it's also in her ductwork, lighting, and fireproofing. The remodeled spaces, officially unveiled last month, complete the first phase of the master plan for the museum, developed in 1986 by architects Arata Isozaki and James Stewart Polshek. Comprising three floors of art galleries, including handsome quarters for the museum's celebrated Egyptian collection, as well as one level of staff offices, the project restores almost half the museum's west wing, the oldest section of its 1897 structure designed by McKim, Mead & White. An earlier stage of the $31 million renovation yielded 10,000 square feet of new art storage and the beautiful Cantor Auditorium, which opened in 1991.

The Isozaki/Polshek scheme succeeds best by balancing the contemporary demands of museum-quality climate control, fire safety, and lighting flexibility with the historic imperatives of the building's Beaux-Arts architecture. Working with mechanical engineers Goldman Copeland Associates and lighting designers Jules Fisher & Paul Marantz, the architects created elegant galleries with plaster surfaces free of outlets, switches, and other mechanical controls. Only a linear air-supply diffuser disguised as a picture rail interrupts the walls' purity. All other mechanical components have been concealed within deep, limestone-trimmed portals between the individual galleries. The most complex lighting occurs on the skylit fifth floor, where motorized, sun-controlled louvers allow for a variety of adjustable lighting conditions. Arranged as an enfilade along an axis established by Charles McKim, the galleries are loftily proportioned, superbly detailed, and finished in time-honored materials.

Unfortunately, Isozaki and Polshek overstate their penchant for abstract reductionism, and the galleries convey an antiseptic chill that makes them seem vacant. The root of this problem, however, may lie less with the architecture than with the tepid installation design. The worst gallery is the fifth floor of the west wing, which houses selections from the museum's contemporary art collection. The gallery's sparse and haphazard arrangement of walls and artwork neither engages nor challenges the room's classic severity.

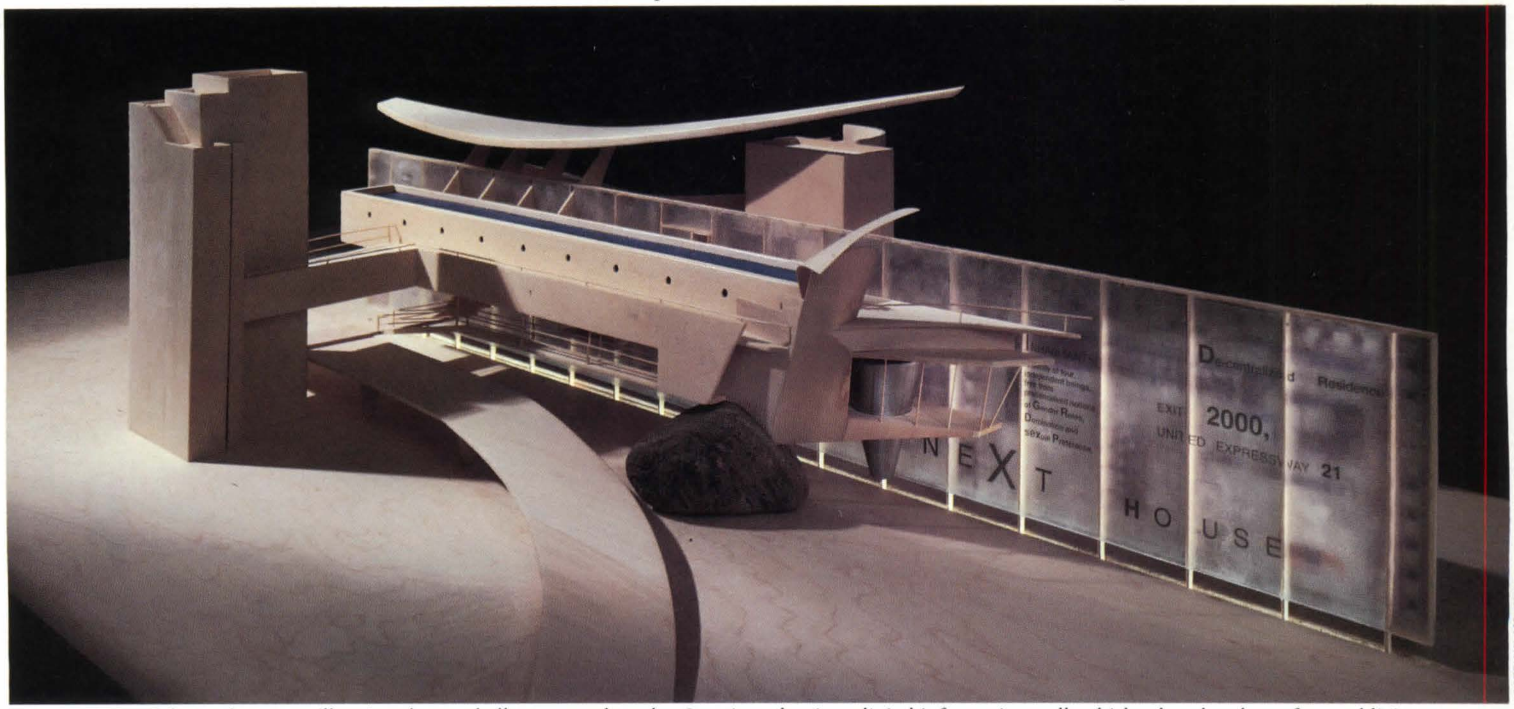
More successful are the galleries that currently display a retrospective of Isozaki's work. "Arata Isozaki: Works in Architecture" remains on view until February 27 and has been designed by the 62-year-old Japanese architect in a manner suited to his cool, monumental minimalism.

Included in the exhibition is Isozaki's and Polshek's master plan for the Brooklyn Museum. Like the original 1.5 million-square-foot structure proposed by McKim, Mead & White, the new design extends a pair of symmetrical structures into the adjacent botanical garden. Also, like the original museum design, the new master plan promises to remain unfinished. Nevertheless, as their 19th-century counterparts set a Beaux-Arts precedent for our century, Isozaki and Polshek have set new standards for the Brooklyn Museum to follow into the 21st century.—*Donald Albrecht*



MOORE/KENNON: Model of competition winner.

MOORE/KENNON: Spirits of Mies and Le Corbusier evoked.



JOSEPH W. MOLITOR

HARIRI & HARIRI: Scheme for new millennium house challenges gender roles. Interiors plug into digital information wall, which takes the place of central living room.

Cincinnati Exhibit of Dream Houses

Radical questions about the form of the house helped inaugurate 20th century architecture: Le Corbusier's "machine for living," Adolf Loos's *Raumplan*, and Frank Lloyd Wright's "broken box." For a new exhibition titled "The Architect's Dream: Houses for the Next Millennium," which opened November 19 and runs until January 23, The Contemporary Arts Center (CAC) in Cincinnati commissioned 16 architects to take up this question once again by designing the house of their dreams on the site of their dreams. Guest curator Daniel Friedman, assistant professor of architecture at the University of Cincinnati, invited participants to reconsider the house in response to our increasingly complex domestic experience. The program encouraged speculation on the changing constitution of marriage, family, place, and community according to five themes: body, health, and hygiene; new technology; public and private spaces; production and consumption; work and leisure life.

The new exhibition displays projects by New York architects Karen Bausman and Leslie Gill of Bausman-Gill Associates; and Gisue Hariri and Mojgan Hariri of Hariri & Hariri; California architects Pam Kinzie of Kinzie & Associates Architects and Les Taylor; Hank Koning and Julie Eizenberg of Koning Eizenberg Architecture; Eric Owen Moss of Eric Owen Moss Architects; Atlanta architects Merrill Elam of Scogin Elam Bray Architects; and Frederick Pearsall and Stuart Romm of Romm + Pearsall Architects; Philadelphia architects Marco Frascari and Claudio Sgarbi; Cincinnati-based John C. Senhauser; and Chicago architect Joseph M. Valerio of Valerio-Associates.

The curators originally invited 30 architects. They chose them to represent a range of established practitioners and emerging designers, educators, and specialists in innovative affordable housing. Friedman and former CAC chief curator Cynthia Goodman selected the final 12 schemes based on the portfolios submitted by all the participants.

The winner of a national design competition cosponsored by AIA Cincinnati joined the selected schemes developed by the invited exhibitors. Jurors Deborah K. Dietsch, Michael Rotondi, and Charles Gwathmey selected a design by Peter Moore and Kevin Kennon of New York-based Moore/Kennon from among 65 schemes.

The exhibition's 13 projects in-

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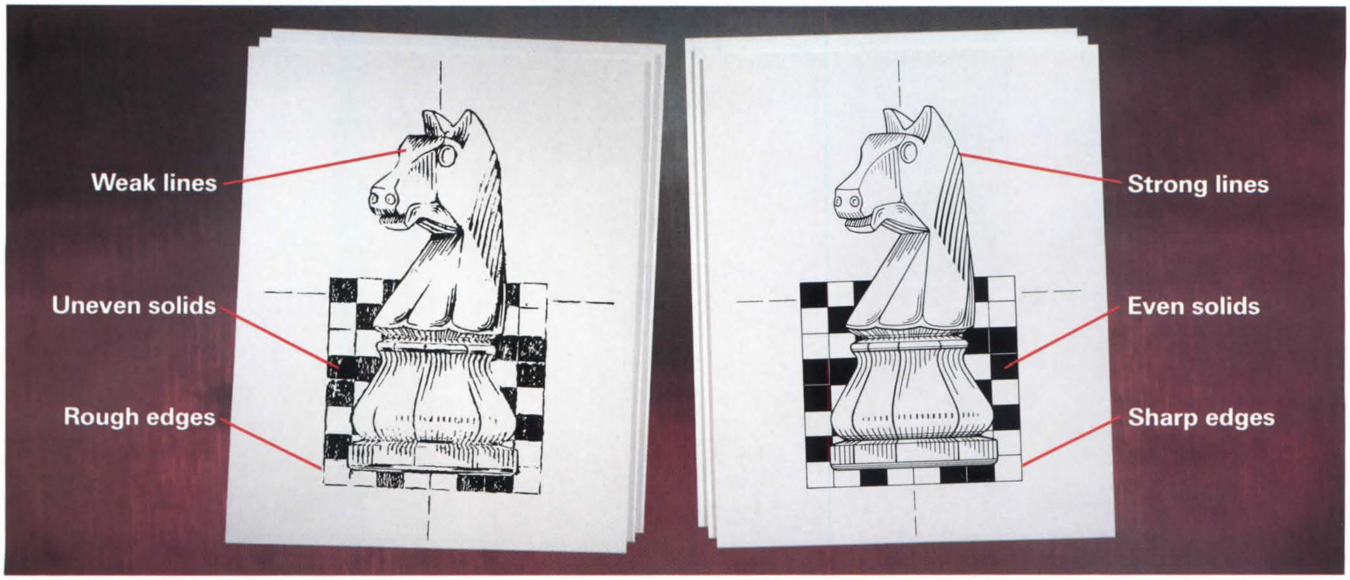
Surfaces '94 *Please Visit Us At Booth #4064 February 10 - 12, 1994* clude aerodynamic forms and poetic constructions that examine the ethereal properties of shelter and time. Some of the schemes prophesize an ecologically sound technology, while others renounce the centrality of the house and the sanctity of the ground. Most of the schemes, however, explore a dream's abstract and hallucinatory qualities, not the commercial dream of suburbia.

According to the exhibition's organizers, most competition entries did not seem to question the changing constitution of the family, but several winners did. Hariri & Hariri's house, for example, is occupied by a family of "four independent beings free from preconceived notions of gender roles, domination, and sexual orientation." The architects propose three interior "habitats" that can be plugged into a huge digital information wall, which obviates the centralized living room. Joseph Valerio's scheme translates the numbing

MERRILL ELAM: Aerial house proposed for posttechnology age.

FRASCARI AND SGARBI: Tower house recalls Scarpa project.

The decisive move to copy quality.



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repetitiveness of the suburbs into a "city without community," creating austere rooms arranged in an endless, nonhierarchical grid.

But such references to the loss of community and the implications of the collective house are, for the most part, embodied in individual, abstract projects that only point to social context indirectly.

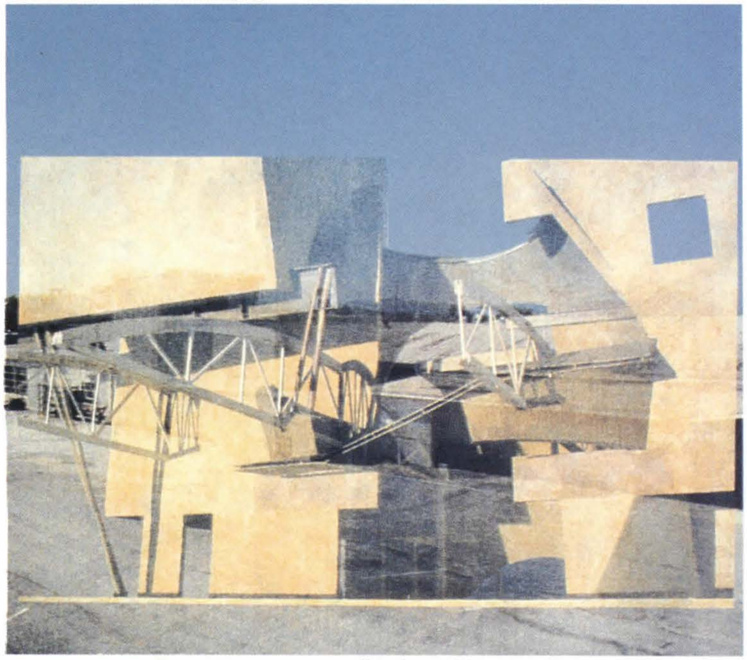
Save the hauntingly apocalyptic vision of Leslie Gill and Adi Shamir Zion, who embedded their house in the contaminated earth of Chernobyl, the exhibition is silent on complex problems related to basic human needs, economic disenfranchisement, and urban decay.

Accompanying the exhibition is a chronology of houses designed by architects—from Hadrian to Malcolm Holzman—for themselves and their families. Researched and compiled by assistant guest curator Merrie Stillpass, the house design timeline underscores the premise that architects often use their own houses as laboratories for generating and testing key ideas later applied to larger scale public works.

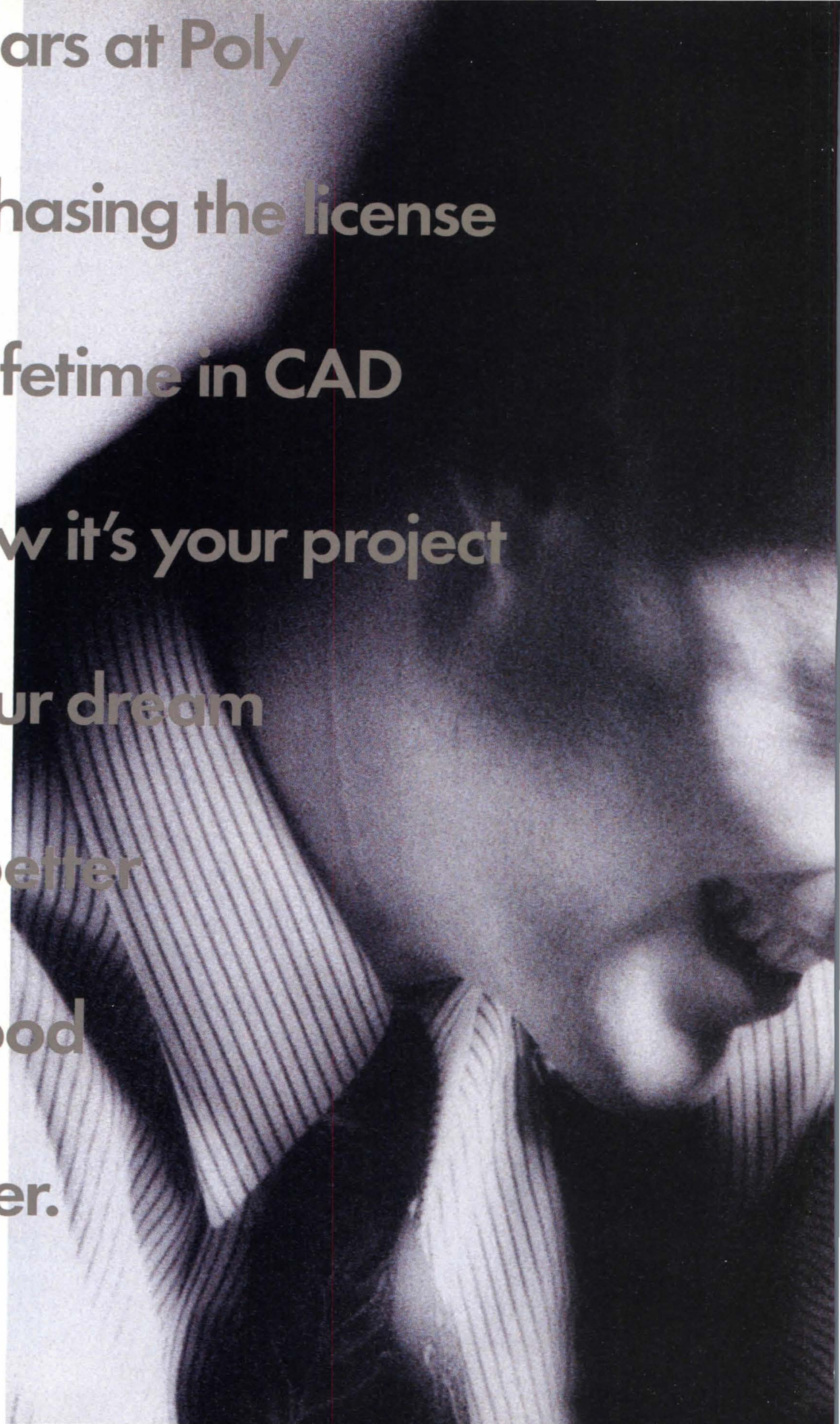
To know something of the next house is to know something of the next city. The Cincinnati show avoids both a Jules Verne-style evocation of the future and the thornier problem of the architect's responsibilities in a society unable to ensure its citizens safe, affordable housing. It concentrates instead on the personal dreams and the theoretical excavations of a strikingly diverse gathering of practitioners. In their varying contemplations, these architects offer rich, ironic, and disturbing images of the antemillennial house, notable not only for what they proclaim as for what they leave to doubt.—*Ann Marie Borys*

Ann Marie Borys is a Cincinnati-based architect and educator.

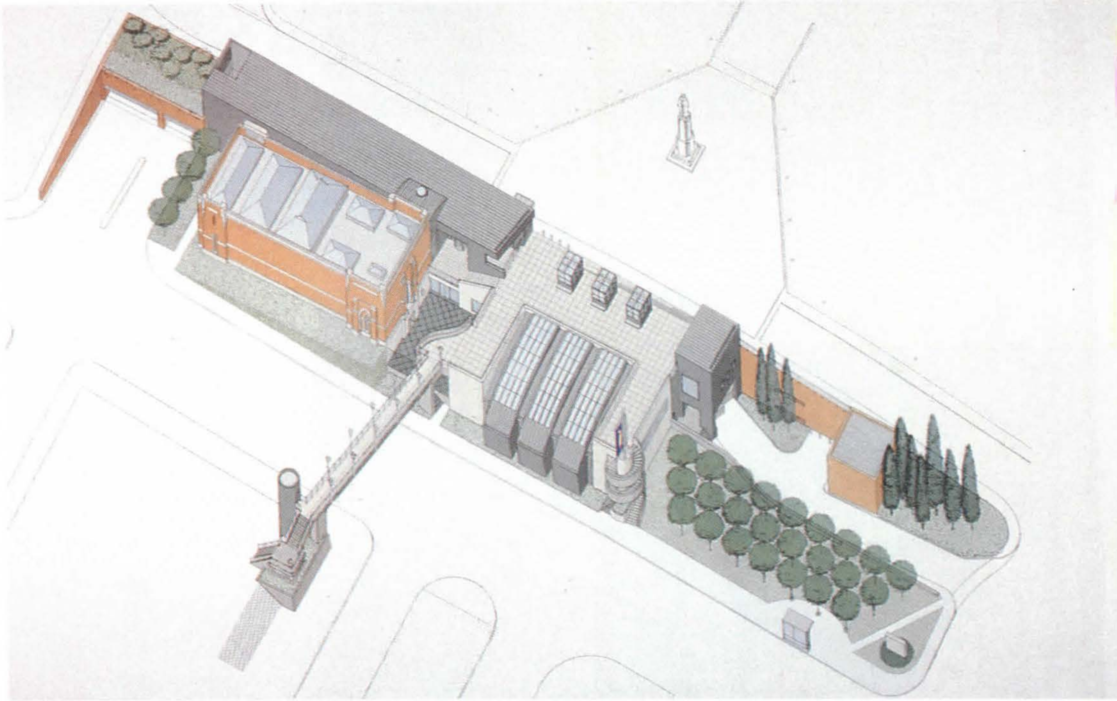
ERIC OWEN MOSS: Rhino 2 project excavates Southern California location.



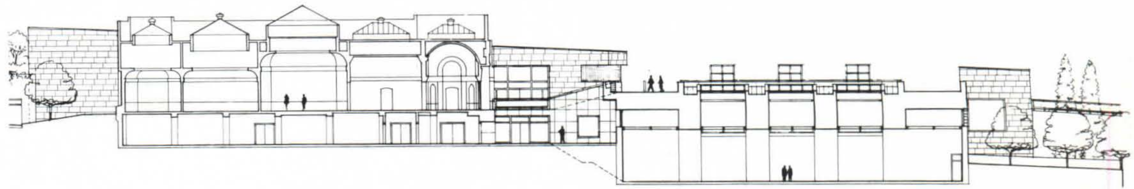
ERIC OWEN MOSS: Bowstring trusses recall industrial history of building site.



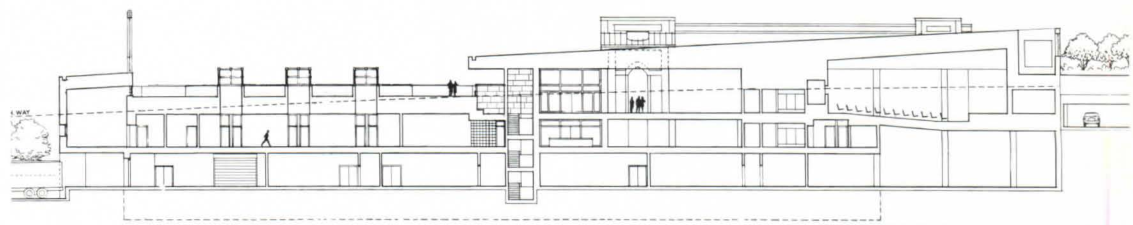
A gallery addition at the University of Washington forms a new campus gateway.



AXONOMETRIC: Stainless steel- and concrete-clad museum addition wraps 1927 Beaux-Arts original (left).



NORTH-SOUTH SECTION: Outdoor sculpture court (center) connects existing Beaux-Arts museum (left) and new galleries (right).



SOUTH-NORTH SECTION: Bermed addition comprises galleries (left), bookstore (center), and auditorium (right).

Henry Art Gallery
University of Washington, Seattle
Gwathmey Siegel & Associates

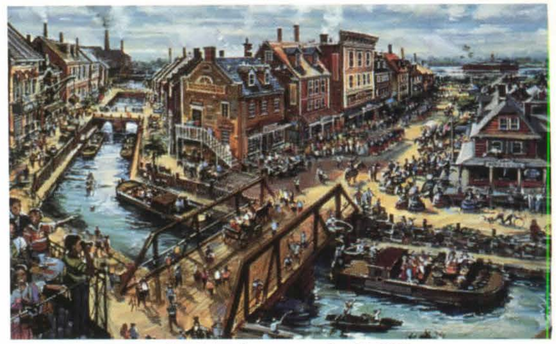
In 1992, the New York firm Gwathmey Siegel & Associates won a design competition to renovate and expand the University of Washington's Henry Art Gallery in Seattle. The state will provide $8.3 million in funding, with the remainder of the $15 million budget raised through private contributions.

Gwathmey Siegel's 45,000-square-foot addition will house flexible galleries illuminated by skylights; conservation and administrative spaces; a new lobby and 150-seat auditorium; below-grade visitor parking; and improved loading dock and storage facilities. The existing 1927 building—a Beaux-Arts structure designed by Carl F. Gould—will be converted into exhibition space for the museum's permanent collection, as well as photographic archives and curatorial offices. The expansion will allow the museum to display objects currently in storage, including paintings by Winslow Homer and Mark Tobey.

The architects will berm the addition—which wraps the south and east sides of the existing museum—into an adjoining hillside. A new pedestrian bridge will connect a roof terrace atop the Gwathmey Siegel-designed galleries to the adjoining campus library. The bridge will provide a major gateway to the west side of the campus. To highlight the original museum's brick and stone exteriors, Gwathmey Siegel will clad the addition in lead-coated stainless steel panels and precast concrete. Skylights above the new galleries will be fitted with frosted glass and automated louvers, which will respond to variations in natural light.

Seattle-based Loschky Marquardt & Nesholm will serve as associate architect. Construction is slated to begin in summer 1995 and should be completed by late 1996.—*R.A.B.*

DISNEY'S AMERICA: New settlement threatens Old Dominion.



CROSSROADS USA: Sanitized portrayal of 1800s commerce.

A proposed theme park near a Civil War battlefield sanitizes history and threatens the environment.

MINIATURE ELLIS ISLAND: Immigrant struggle reduced to multimedia entertainment.

Disney's America

Despite EuroDisney's net loss of $898 million in only one year, the Walt Disney Company has announced plans to develop a 3,000-acre theme park in rural Haymarket, Virginia, 25 miles from Washington, D.C. "Disney's America" will be the company's third U.S. entertainment venue, and its theme will focus on important events in U.S. history.

Curiously, the park will be built just 4 miles away from the historic Manassas National Battlefield Park, where 4,200 soldiers lost their lives in 1861-62. Given the proximity to this historic site and the monuments of Washington, D.C., why would visitors travel to Disney's re-creation of history when the real events took place a stone's throw away?

Disney bets that visitors will enjoy such attractions as Enterprise, a ride devoted to the Industrial Revolution; We the People, a miniaturized version of Ellis Island; and Victory Field, which "lets guests experience what America's soldiers faced in the defense of freedom," albeit without getting shot. In other words, this country's labor movement, immigrant struggles, and bloody wars will be reduced to cheap thrills, trivializing our history in the process.

Thematic content aside, the new Disney theme park presents dire environmental consequences for the surrounding countryside and nearby historic sites, most of all the solemn Manassas Battlefield. Hotels and fast-food joints will inevitably spread toward the Blue Ridge Mountains, transforming a rural area into a strip development as tawdry as nearby Tyson's Corner. To support a drastically increased density, the Disney development will cost taxpayers as much as $2 billion to build the necessary infrastructure.

While supporters of the theme park applaud its potential to attract jobs and boost the local economy, they should take another look at Disney's record. EuroDisney's promised economic boom, for example, proved to be a pipe dream: Three of the five hotels are now up for sale—and French citizens paid for the highway to get there.

Environmentalists, preservationists, and residents opposed to the theme park face a tough challenge in convincing Disney to relocate its proposed development. Robert Dennis, President of the Piedmont Environmental Council, sums up the protest: "Does it make sense to transfer responsibility for significant restructuring of the National Capital Region to a huge, private firm located a continent away?"—*D.K.D.*

Educating Bureaucracy

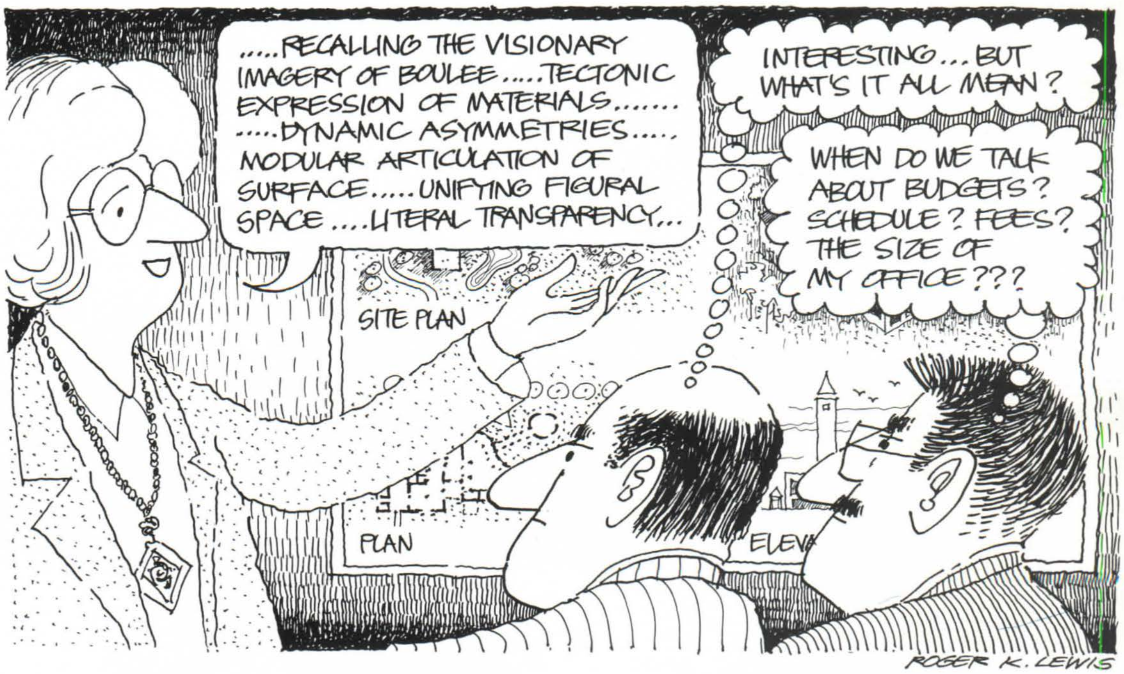
Architects must help transform institutional administrators into advocates for good design.

The scene is familiar to every practicing architect who has worked for institutional bureaucracies or sought design approvals from government agencies. You're presenting your scheme, lyrically explaining its compelling attributes of commodity, firmness, and delight. Certain concepts, more esthetic than functional or technical, hang critically in balance. Money, as always, is an issue. You focus on several of the people listening, noticing facial expressions and body language.

The glazed looks tell the story—skepticism, disbelief, bewilderment. "What's this architect talking about? Why is this design appropriate? Do we really need this?" You imagine these questions lurking in the minds of your audience as you continue your efforts to persuade. Chances are, many listening can't be persuaded. They are preoccupied with their own views of reality: budgets, schedules, procedures, and institutional politics. Their interests are limited to getting the job done with minimum hassle; complying with rules and regulations; and, above all, making no mistakes for which they might be criticized or held accountable.

Such scenes are repeated daily somewhere in the United States. They characterize countless bureaucracies staffed by officials who, in one way or another, exercise enormous control over the design quality of much of what is built in America. These organizations can be of any size and can serve any purpose. But most ubiquitous are the thousands of municipal, county, state, and federal government agencies that have authority over project design, or actually build projects themselves.

For architects who continually interact with such bureaucracies, the frustrations that arise are not due to organizational charts or rules and regulations. Rather, the primary obstacles to achieving exemplary design are the attitudes and values of specific individuals within these organizations. Organization officials typically have little or no awareness of architectural history, design principles and methodologies, urban design theory, or contemporary norms of architectural practice. Few officials within bureaucracies are visionaries. Few comprehend or appreciate the holistic nature of architecture or the aspirations of its best practitioners.

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Institutional bureaucracies governing much of what is constructed in America tend to be staffed and led by engineers, not architects. Indeed, many of these engineers are retired military officers. Not surprisingly, this situation has produced a value system shared by many organizations—procedure intensive, risk averse, anti-experimental—in which linear, not lateral, thinking pervades. Often, the most important organizational goal, other than meeting budgetary and scheduling targets and obeying regulations, is avoiding controversy. Creating architecture that transcends functional, technical, and economic exigencies normally is not on the institutional or governmental agenda.

If they are not engineers, design and construction decision-makers tend to be business administrators, lawyers, accountants, or financial managers who, with few exceptions, have had limited exposure to the realm of architecture. Yet many architects are both accomplished technologists and business managers. Architects study engineering, but engineers do not study architecture. Architects must learn about marketing, accounting, finance, organizational management, and law to be successful practitioners, but their professional counterparts learn little about architecture. So why are the positions of power and authority within institutions not pursued and held more often by individuals with an architectural education?

Nontraditional roles

Not surprisingly, we have ourselves to blame. Architects—and those who educate future professionals—have failed to recognize adequately the vital importance of proactively fostering an enlightened, institutional clientele. We all begin our careers in architecture aspiring to be design practitioners, owners of successful firms, recipients of awards and respectable compensation, admired by both clients and the public. But rarely are we told that the odds of fulfilling these aspirations are relatively low, or that an individual architect might influence design outcomes more significantly if he or she were in a position of leadership within a regulatory agency or real estate development organization. Although the profession periodically credits the design contributions of architects who fulfill nontraditional roles, much more attention is paid to architectural designers.

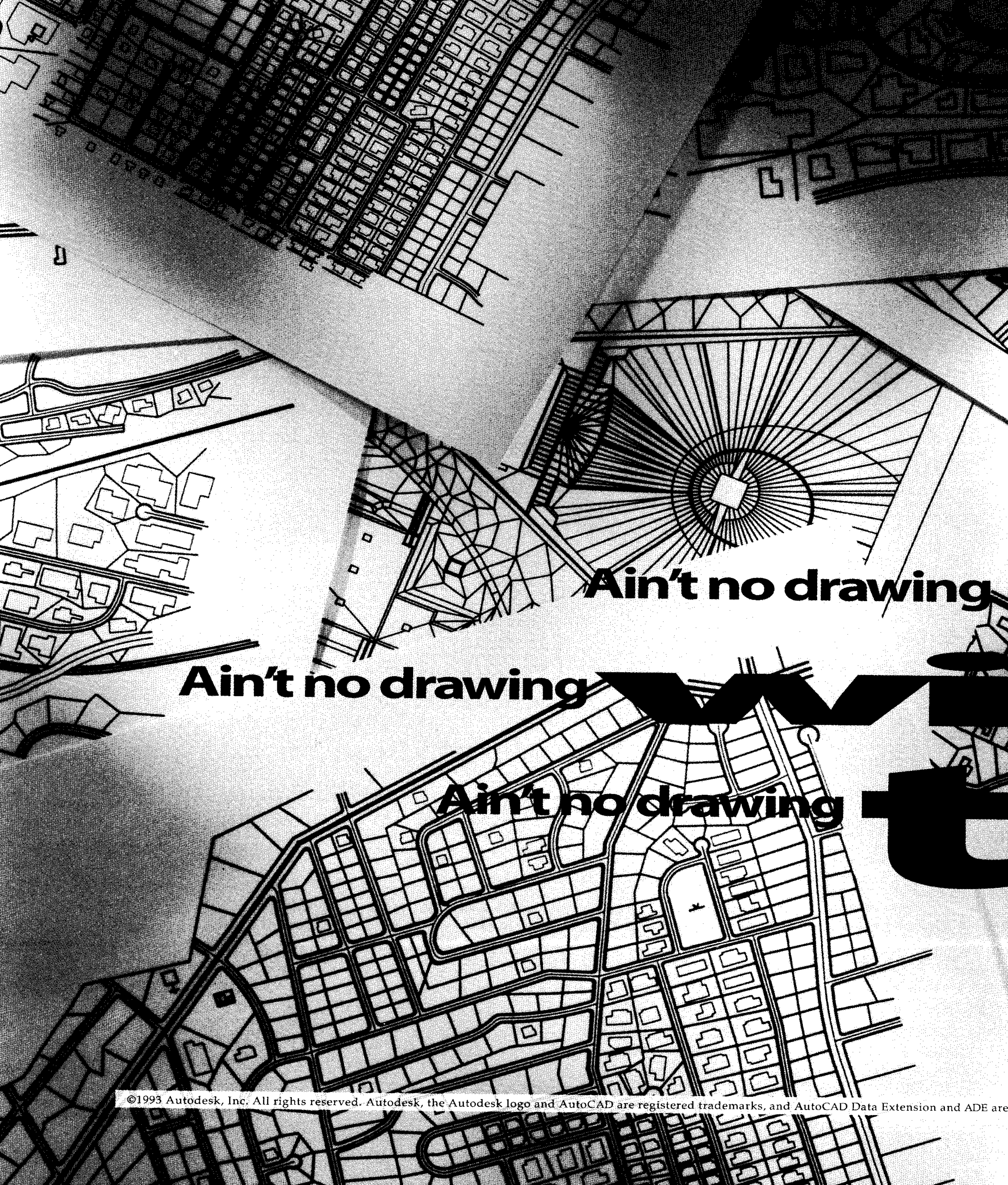
This oversight is even more evident in our architectural schools. The culture of academic architecture is still dominated by the worshipful nurturing of design egos. The contributions to design by others are routinely overlooked. Ironically, at a time when the highly competitive marketplace suggests that we have a surplus of architectural practitioners and architectural students, we continue to resist even slight modifications to the culture of architectural education. Why not inform students about the opportunities potentially awaiting them as design advocates within governmental and corporate institutions? Why not more energetically encourage some of these students to pursue further specialized education and careers in management, leading to positions of control in government and corporate America? Tell these architectural students the truth: They may earn more money and realize more professional satisfaction by procuring and guiding design than by actually carrying it out.

Architectural advocates

How can we transform administrators and executives who are not architects into knowledgeable architectural advocates? This task is much more difficult, but one that should be undertaken more rigorously, not just by periodically issuing AIA brochures about the value and scope of architectural services, but rather by direct and continuing education. Better communication must be established with managers and executives—and their numerous associations focused on various aspects of building and real estate—who think of architecture only as a commodity.

We, as industry professionals, need to generate and promote more interesting courses on architecture and urban design tailored specifically for the overseers of design and construction. Such continuing education should focus on the fundamentals of architecture: its historical and intellectual roots; its cultural and artistic significance; its effect on individuals and society; and the process by which it is accomplished. These courses should not only convey information, but also impart values and develop critical thinking. Regulators, administrators, and procurers of design need to care more about our built environment and its consequences, about more than simply negotiating bargain-basement fees or keeping change orders to a minimum. If we can get architects interested in management, surely we can get managers interested in architecture.—*Roger K. Lewis*

Roger K. Lewis, FAIA, is a practicing architect and a professor of architecture at the University of Maryland. He writes a weekly column, "Shaping the City," for The Washington Post.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ARCHITECTURE

RAFAEL MONEO

This issue profiles works by an architect who deftly links tradition with innovation.

BELOW: Moneo's sketch of entrance drum to Atocha Railway Station in Madrid, completed in 1992.

Architect José Rafael Moneo is recognized on both sides of the Atlantic as a master of his profession, largely because he has not only performed as an extremely gifted designer, but also because he has been a committed teacher and a very erudite critic of the culture at large. Like José Lluis Sert, who preceded him as Chairman of the Graduate School of Design (GSD) at Harvard, Moneo has emerged as the most representative Spanish architect of his generation. For Moneo, as with most of his Spanish colleagues, tectonic authenticity remains the essential catalyst of architectural quality, in that it guarantees the physical and cultural durability of the work. "Architecture in principle should be durable," explains the 56-year-old architect. "Materials should provide for the building's long life."

Moneo was trained at what is still one of the finest schools in Europe, the architectural department of the Technical University of Madrid. The tectonic rigor of his work derives in considerable measure from the exceptional calibre of his teachers, Xavier Saenz de Oiza and Alejandro de la Sota. From them, Moneo inherited a respect for the expressive potential of construction, assuring his work its particular distinction. Equally significant for Moneo's development is his subsequent work for the Danish architect Jørn Utzon, at the time when Utzon was beginning to refine his design for the Sydney Opera House.

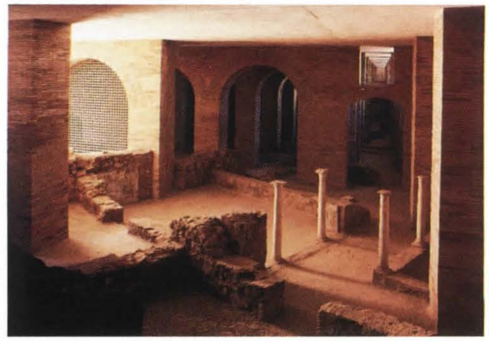
Moneo's first independent work after returning to Madrid in 1990 was a factory that he built at Zaragoza. With its giant, reinforced concrete roof frames and blank rhythmical masses set against the sky, this factory testifies not only to the influence of Utzon, but also to a propensity that would remain with Moneo throughout his career: his ability to treat each commission as an integrated structure and mass-form. This quality is very evident in a building that is Moneo's most distinguished work to date, the Museum of Roman Art at Mérida, which is effectively a large brick warehouse dedicated to the conservation of Roman antiquities.

Mérida is a subtle building that demands to be read at many levels, and in this conceptual layering resides its cultural significance. The design is predicated on an act of audacity toward the excavation upon which the building rests, namely, the architect's decision to allow its loadbearing piers to take new meaning in the midst of the Roman foundations. One may readily imagine how such an irreverence was greeted by the archaeological establishment, although this intervention has enlivened the entire site through an interplay between the Roman proportioned brick cladding of the new concrete piers and the presence of the actual Roman ruins. This purpose-made cladding not only functions as a finish over the structural frames of the warehouse, but also serves as a loadbearing enclosure for the repository, enabling the overall volume to be read as a 19th-century brick warehouse, comparable in terms of the early Modern movement to such works as Hans

STEVE ROSENTHAL

RIGHT: Museum of Roman Art (1986) at Mérida is faced in thin Roman bricks.
FAR RIGHT: New brick-clad arches complement Roman archaeological excavation within Mérida museum.
BOTTOM: Moneo's sketch of Wellesley's Davis Museum and Cultural Center (1993) portrays top-lit gallery block (left) and central staircase.

AKE E:SON LINDMAN



DIDA BIGGI

Poelzig's chemical factory in Luban (1912). Such a reference, however slight, is hardly an accident, since Moneo has kept his distance from the legacy of the avant-garde, favoring instead the Modern Northern European brick tradition in all its expressive power.

Inasmuch as he interprets every commission according to its topographic situation, Moneo has been faithful to the Tendenza precept of "building the site." At the same time, he remains committed to the evolution of a particular building type as an institution, to be developed in detail for a given location at a particular time. In this regard, both his Atocha Railway Station, Madrid (1992) and his Seville Airport (1992) make categoric statements not only about their respective sites and programs, but also about their operational character at this moment of history.

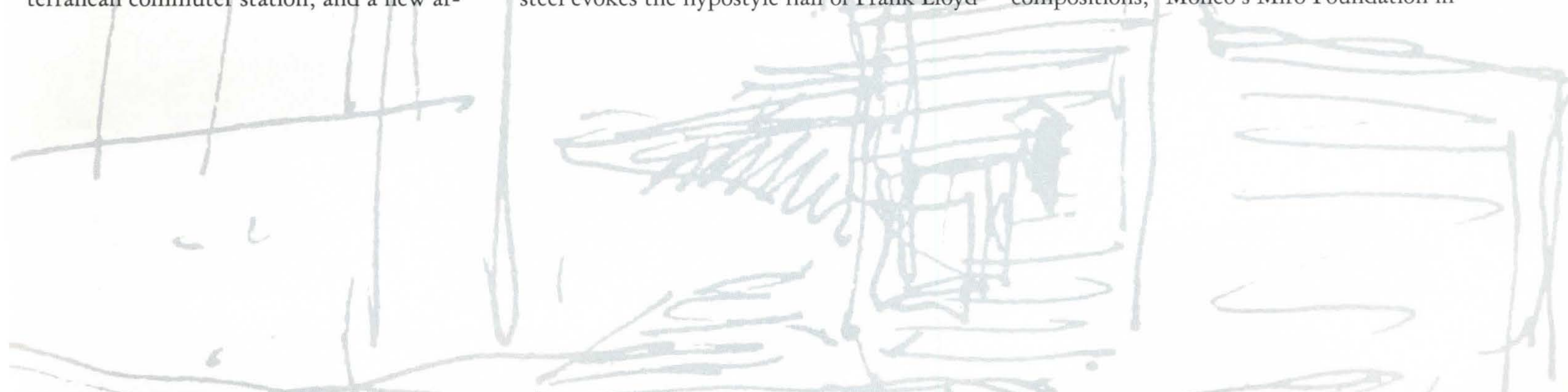
Of the two, Atocha proved to be the more difficult proposition, programmatically and topographically (pages 62-69, this issue). Among the difficulties facing the development of the new terminal were the existing tracks and station, both situated well below the level of the surrounding streets. Moneo's reinterpretation of this unsatisfactory condition was to conceive of the new terminus as a clustering of megaforms converging about the nexus of the old station. Atocha can thus be seen as a kind of inverted Acropolis comprising a vast hypostyle hall, receiving long-distance trains; a parking level roofed with rather awkward, Soanesque canopies; a subterranean commuter station; and a new arrival and departure threshold, crowned by a cylindrical entry hall leading to the commuter terminal below.

Moneo opted for an opposite strategy in the Seville Airport. Within a single structure, he unified diverse functions that are normally kept apart, namely, the parking and the concourse. Moreover, where Moneo treated the train station as a semisubterranean structure, he handled the airport as if it were a freestanding public building in the traditional civic manner. In this sense, the Seville Airport is the more critical work of the two. "Experience has taught us that an airport cannot be compared to an airplane, whether in terms of materials or form," Moneo asserts. "The perfection and lightness of flying machines have very little in common with the complex functional mechanisms behind airports."

Inspired by Le Corbusier's computer center project for Olivetti at Rho-Milan (1963), Moneo's airport incorporates the auto route into its distribution system, while presenting an all but Classical front to the runway itself. Syntactically, this design turns on a number of historical references, including a peristyle and a double-vaulted internal arcade. This Andalusian conjunction of Oriental and Occidental tropes—a vault within and a peristyle without—is faced externally in concrete block and capped by hipped roofs that seem to imply that the terminal is some kind of an agrarian factory. In contrast to the Atocha, where a mushroom-columned roof in welded steel evokes the hypostyle hall of Frank Lloyd Wright's Johnson Administration Building (1939), the point of departure for the airport eschews any overt reference to modernity. This distancing, bordering at times on historicism, has given Moneo the reputation of being a late Modern eclectic, as willing to build in one manner as another. And while Moneo has often varied the appearance of his work according to its context, as in the case of the Previsión Española Building in Seville (1987), such a judgment overlooks the latent critical character of his work, even when it drifts toward pastiche, as in his Collegio de Arquitectos in Tarragona (1992).

Moneo is at his best where the site presents itself as particularly propitious, or where it has been possible to build up the earthwork in such a way as to make it into the parti for the building as a whole, as in his proposal for the Kursaal Cultural Center (pages 48-51, this issue), a work that promises to be the most minimalist monument of his career. Inspired once again by the Scandinavian topographic tradition, Moneo renders the two main auditoriums as twin crystalline prisms, subtly inclined at different angles toward the sea. As in the Sydney Opera House, the Kursaal's ancillary volumes, parking, entry lobbies, and exhibition spaces are all housed beneath a shallow civic podium, upon which the auditoria "rocks" stand dramatically poised.

Equally Nordic in inspiration, but taking its cue from Alvar Aalto's late "geological compositions," Moneo's Miró Foundation in



LEFT: Sketch of Miró Foundation shows development of linear administration block and crystalline gallery wing.
BOTTOM LEFT: Pyramidal roofs of Seville Airport (1992) recall agrarian factory.
BOTTOM RIGHT: Airport's concourse is divided by a double-vaulted arcade.

Palma de Mallorca (pages 52-61) is a tour de force in crystalline, organic form. Consisting of an orthogonal administration block and a gallery wing with canted walls, gathered before a garden court facing the sea, the building is unified by a single repetitive element. Where the unity of Mérida is guaranteed by the endless repetition of the same, narrow hipped roof, the integrity of the Miró Foundation derives from the horizontal brise soleil that is applied with equal thoroughness to both the gallery and the office building. This all-encompassing screen compensates for the exfoliated character of the gallery wing and effectively layers the structure into the site as a series of horizontal profiles.

Over the past 20 years, starting with his Bankinter Building in Madrid (1976), Moneo has designed one urban set-piece after another—works that have tended to display an ever-increasing scale and complexity, culminating in an extremely long, mixed-use block built along the Diagonal in Barcelona, a concert hall for Lucerne, an art museum for Stockholm, and a cinema complex for Venice (pages 48-51). The majority of these works date from the last decade, during Moneo's Chairmanship at Harvard. When one remembers that they were all worked on at the same time as the Seville Airport, Atocha Railway Station, and Thyssen-Bornemisza Museum (pages 70-77), not to mention the Davis Museum and Cultural Center at Wellesley (pages 78-85), it is nothing short of miraculous that one relatively small studio with a peripatetic principal was able to generate and control so much production. That the architect's control has fallen short at times should come as no surprise to anyone, least of all to Moneo himself. In fact, what is more remarkable is that so much was put in place exactly as it was intended to be.

However, such a precarious balance can only be maintained with a good deal of tolerance and mutual understanding, as much from the architect as for all the others involved. Thus, from time to time, lacunae arise not so much in the actual construction, which is usually impeccable, but at a conceptual level, particularly where one spatial sequence leads to the next.

This is especially noticeable in Atocha, where there is a lack of adequate facilities for passengers of long-distance trains, or in the Seville Airport, where there is a formal and ideological disjunction between the self-conscious peristyle of the building, presenting a monumental front to the apron, and the machinism of the standard lightweight gangways, affording access to the planes. The otherwise deftly handled Davis Museum also presents a certain number of hiati. The main staircase, beautifully paneled in wood and subtly illuminated, leaves one uncomfortable about the amount of floor area it consumes at the expense of gallery space. The center is otherwise extremely successful in responding to the presence of Paul Rudolph's Jewett Arts Center, not to mention the Gothic Revival "acropolis" at Wellesley.

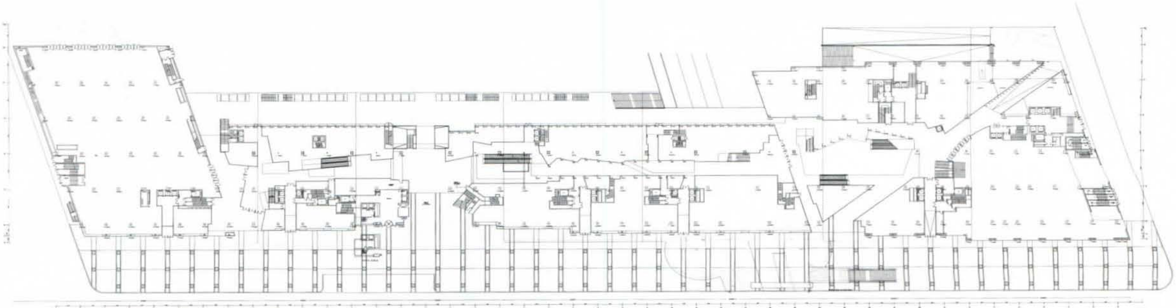
More than any other architect practicing today, Moneo remains all too painfully aware of the way in which architecture has been transformed by the phenomenon of speed and by what one might call our consumeristic amortization of the built environment. "A building used to be built to last forever, or at least, we certainly did not expect it to disappear. But today things have changed," Moneo wrote in an address to Harvard's GSD in 1985. "Architecture has lost contact with its genuine supports, and immediateness is the natural consequence of this critical change suffered by the role of architecture in the world." By "immediateness," Moneo refers to fashionable media effects, the rule and role of the decorated shed in our late Modern age.

Moneo belongs to a discernable culture of modernity in which tradition and innovation are reciprocally linked to each other, with all innovation stemming from tradition and all tradition depending upon radical reinterpretation. It is on such grounds that Moneo has assumed his particular stand. Blown ever backward by the storm of progress, he focuses nonetheless on a critical reinterpretation of type and on the rendering of such fabric as well-constructed form. Where else, one may ask, should the architect-poet place himself in our destitute time?—*Kenneth Frampton*

Kenneth Frampton is Ware Professor of Architecture at Columbia University and author of Modern Architecture: A Critical History *and* Modern Architecture 1851 to 1945.

DIDA BIGGI PHOTOS

WORKS IN PROGRESS



DIAGONAL BLOCK — FIRST FLOOR PLAN

FACING PAGE: Moneo's Diagonal Block, in Barcelona, is a design collaboration with Manuel de Solà-Morales.
PLAN: Small shops are located between stores at both ends of building.
BELOW: Model of Kursaal Cultural Center reveals ice-cube-like auditoria.
CENTER: Twin auditoria lean away from one another, toward mountain peaks.
BOTTOM: Kursaal Cultural Center project includes three auditoria.
SECTION: Longitudinal view reveals auditoria and pedestrian ramp.

Rafael Moneo's designs are concerned with physical presence achieved by playing up mass and materiality and by articulating a studied response to site and surroundings. Hence, they command their sites in a way very different from the timid contextualism many other architects pursue. Instead of forming an extension of and transition between the buildings around them, in a way analogous to the dissolves in movies, Moneo's buildings make their own strong statements so as to enter into dialogue with, rather than be dominated by, their particular settings. They thus intensify the sense of what is special about a site, while also cementing it firmly into place, often by suggesting connections with buildings and other features some distance away.

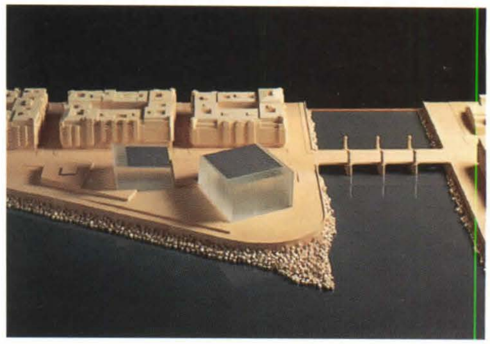
These themes in Moneo's work are displayed in a series of recent competition-winning designs. In 1986, Moneo won the commission for the Diagonal Block, now nearing completion on Barcelona's Avenida Diagonal, the thoroughfare that slices at an angle across the city's 19th-century grid designed by Ildefonso Cerdá. Designed by Moneo in collaboration with Manuel de Solà-Morales, the complex, which houses offices, a shopping center, and a hotel, is outside the western limit of the famous grid. It addresses the important avenue with an understated, stepped facade clad in thin travertine, which creates an illusion of mass, as if the building were carved from solid stone, a still island in the babble of its surroundings.

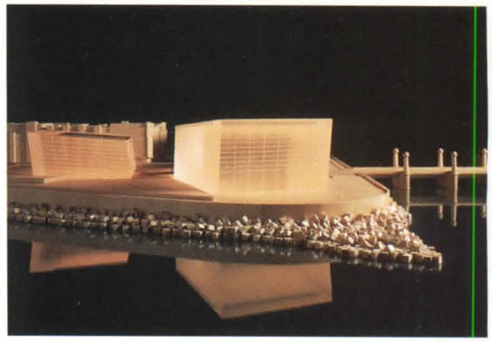
LLUIS CASALS

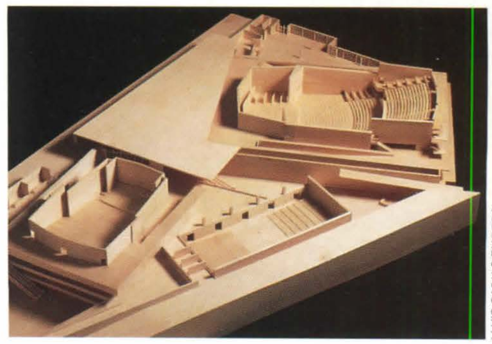
On Spain's northern coast, Moneo's Kursaal Cultural Center for San Sebastián shows how even glass boxes can be given great physical presence and make suggestive connections with their settings. The Kursaal's glass boxes, which enclose a concert and conference hall, are to be constructed of double skins of glass block and so will seem as solid and substantial as vast blocks of ice. The blocks lean toward two mountain peaks, making an explicit connection with the surrounding terrain and imbuing the whole composition with a dynamism.

But the design achieves more than a connection with these two mountains. Set in front of the tightly packed blocks of the city just where the Urumea River disgorges into La Concha Bay, the building articulates the junction between river and bay, city and sea, and creates a connection with the mountains that enfold all of these. Rising from a podium that offers a panoramic view of sea and mountains, the huge glass volumes appear as rocks or ice blocks deposited by the river, their glacial solidity relating them to both the sea in front and urban blocks behind.

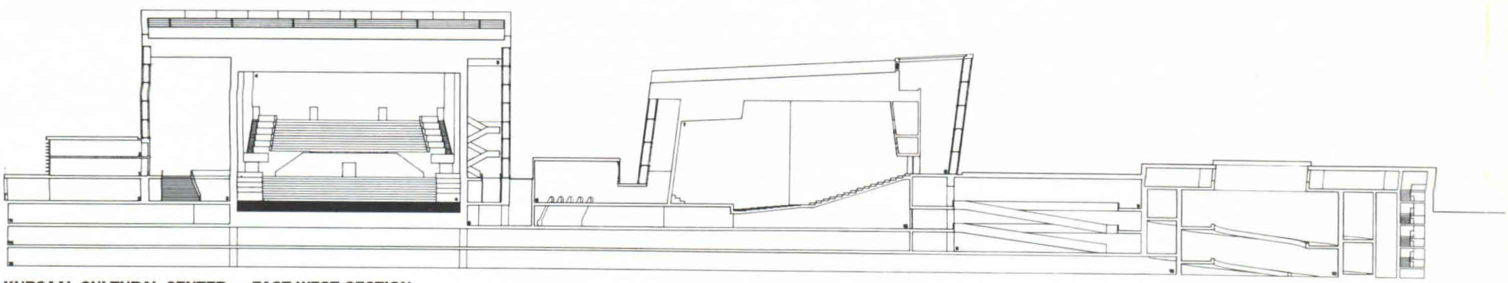
Moneo's Palazzo del Cinema in Venice is designed to signal very similar messages and, again, to cement a connection between city and sea. A market for selling films as well as a multicinema complex for viewing them, the Palazzo del Cinema is proposed for construction on the Lido, a sandbar of beaches and hotels that separates the Adriatic from the Venetian lagoon: A major element of the





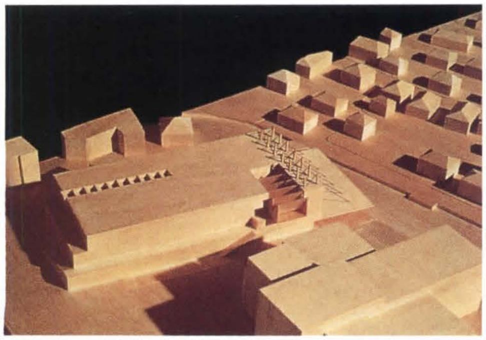


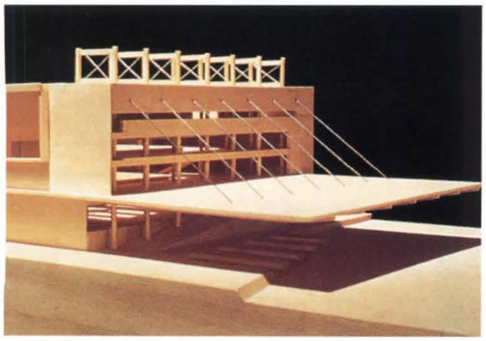
LLUIS CASALS PHOTOS

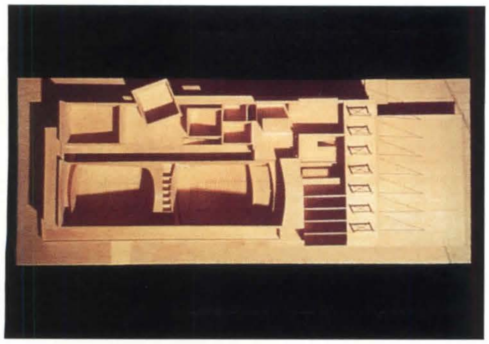


KURSAAL CULTURAL CENTER — EAST-WEST SECTION

BELOW: Venice will be visible across the canal from the balcony-canopy of Moneo's Palazzo del Cinema.
CENTER: Balcony-canopy is suspended from structural frames projecting above Palazzo's main roof.
BOTTOM: Palazzo will contain seven cinemas of differing sizes. The two largest are placed back to back, and the three smallest form a cluster.
SITE PLAN: Palazzo will be located between beaches of the Lido (left) and canals leading to lagoon (center).







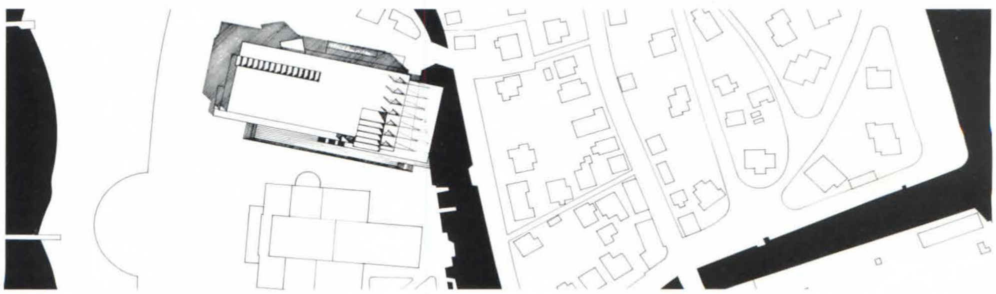
building will be a huge canopy that reaches toward the lagoon and Venice itself. Beneath it, *vaporetti* will drop off visitors, who will climb a broad ramp to an indoor piazza. Above this space, the canopy extends as an enormous balcony, a stage for film stars and fans against the cinematic backdrop of this magical city. An efficient machine for viewing and selling films, the building provides varied, yet fluidly connected, social spaces. Suited to spectacle, they acquire sense of occasion from the civic backdrop that is intrinsic to the architectural experience.

Much less monumental, and suitably tactful in their dialogue with a more low-key setting, are Moneo's Museums of Modern Art and Architecture, on the island of Skeppsholmen in the Stockholm harbor. Tucked into a sloping site behind a long terrace building and an historic, T-shaped gymnasium, the museums comprise a series of compact, pyramidal-roofed galleries. The architectural museum occupies the old gymnasium, and the museum of modern art is accommodated within the clusters of galleries. The museums share a common entrance between gymnasium and terrace, and a foyer that extends between them to a restaurant and terrace with views over city and sea.

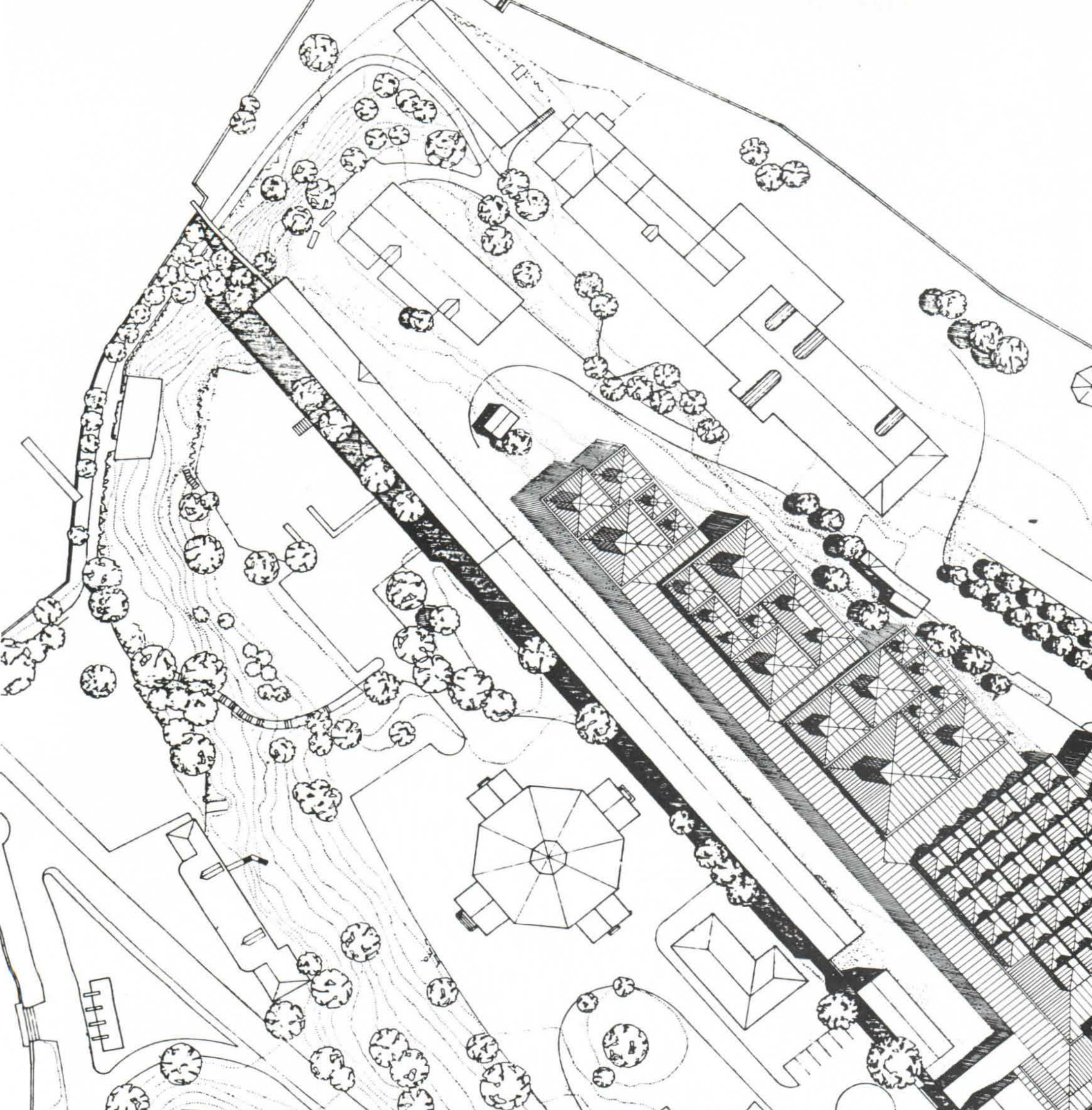
As is typical of Moneo, each of these new designs is quite different from one another. Unlike some architects whose schemes display a consistent signature style, Moneo lets each project be shaped by the particularities of place, program, and propriety. Yet because these responses are mediated through one of the most cultivated sensibilities on the current architectural scene, they are also overlaid with allusions that give these works their characteristic depth and resonance. So if each of these new designs seems an unpredictable new beginning, it is also entirely consistent with the architect's past work.

If these projects are different from those that came before, it is because the more obvious allusions are not to historic architecture, but to that of this century. The Kursaal Cultural Center, for example, calls to mind the glass architecture of the Taut brothers and the Sydney Opera House by Jørn Utzon, for whom Moneo once worked. Just as the Miró Foundation projects a rooftop pond to make a connection to the now largely obscured sea, so the Palazzo del Cinema extends forward its balcony-canopy to make the backdrop of Venice an integral part of its architecture. The independent, gallery roof monitors of Moneo's Stockholm museums update those of his Mérida museum and recall those designed by Arata Isozaki at the Museum of Contemporary Art in Los Angeles and by Louis Kahn at the Trenton Bath Houses. What is significant in each case is that these references are not made with tacked-on symbolism, but are an essential part of the fabric of the building. —*Peter Buchanan*

Peter Buchanan is a free-lance writer based in London. His most recent book is Renzo Piano Building Workshop: Complete Works.



PALAZZO DEL CINEMA — SITE PLAN

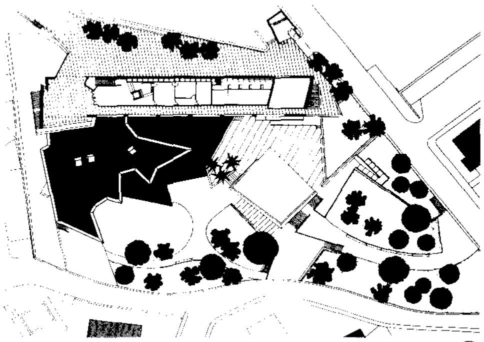


JUAN DE DIOS

PLAN: Museums of Modern Art and Architecture in Stockholm occupy lantern-topped galleries behind existing long terrace building and existing T-shaped gymnasium.
BOTTOM: Model integrated with site photo shows how building will be tucked against existing structures and articulated as smaller units to diminish its effect on the surroundings.

Pilar and Joan Miró Foundation
Palma de Mallorca, Spain
José Rafael Moneo, Architect

GARDEN FORTRESS



SITE PLAN

SITE PLAN: Foundation occupies former almond orchard adjacent to Miró's studio.
FACING PAGE: Foundation consists of linear block housing administrative, meeting, and support functions; star-shaped volume with rooftop pool containing main gallery space; and Miró's studio from the 1950s by José Lluis Sert (far right).
FOLLOWING PAGES: Complex embraces a terraced sculpture garden where Miró's three-dimensional works are exhibited. Concrete louvers screen penetrating Mediterranean sun, which is filtered through thin sheets of alabaster before entering main gallery. Stone wall (right) forms facade of cafe/bar.

Rafael Moneo seems to have sketched his first ideas for the Pilar and Joan Miró Foundation with a touch of rage. The building parti is the first clue: the architect envisaged a long shaft attached to a jagged, fortresslike volume that withdraws behind a shallow moat. Any doubt of Moneo's anger is erased by the architect himself. "The gallery's volume ignores its surroundings, or better, responds angrily to the neglect and disregard implicit in the constructions on the once-attractive hillside," he asserts.

Unquestionably, the new Miró museum and study center on a hillside above Palma de Mallorca is as much a pointed commentary on profit-driven decimation of the landscape as it is a loving tribute to the artist whose work it celebrates. In the process, the emotions sparked in Moneo by the commission have generated what seems, by far, to be the most expressive of this architect's works. Though characteristically restrained in construction and detail, its dynamic planning and site design concepts produce a structure of enormous vitality.

Construction of the Miró Foundation was fueled by Pilar Juncosa, the artist's widow, who wanted to fulfill Joan Miró's desire for a gallery to protect and preserve his work, while establishing a center where scholars and artists might pursue their work in the same cross-disciplinary manner as the late painter. The foundation's location—overlooking the Bay of Palma and the Mediterranean—was a natural choice, for the center rests just a few steps away from the house where Pilar and Joan Miró lived for more than 25 years until the artist's death in 1983.

Occupying a portion of the site is Miró's studio, designed by fellow Spaniard José Lluis Sert and completed in 1956. Moneo's intent was to incorporate the artist's studio into the site plan, while attempting to recover the lost presence of the sea—views now blocked by the area's overdevelopment. Moneo's strategy included transforming the roof of the art gallery into a suspended lake that returns to the site some sense of its former tranquility. He also placed a garden rich with native plants adjacent to the building. In time, the architect reasoned, the thriving garden will create a dense buffer against the site, establishing an isolated environment that separates the Miró Foundation complex from its surroundings and allows visitors to focus on the sculptures exhibited there.

The complexity of the building unfolds slowly to the visitor, who approaches on the street alongside a stone wall that largely obscures the Miró Foundation complex. A simple concrete threshold frames a view of the austere north facade and a linear plaza that funnels visitors the breadth of the site. A turn through the portal leading to the museum's entrance elicits the first surprise: a view across the glimmering rooftop pool, which Moneo calls "a small and broken hanging lake." Prismatic concrete skylights emerging from the sheet of water magnify the lyricism of this pool that meets the sky.

AKE E:SON LINDMAN

FACING PAGE, TOP LEFT: Simple opening in severe facade along entry plaza leads to building entrance.
FACING PAGE, TOP RIGHT: Projecting monitor filters daylight through alabaster screen into main gallery.
FACING PAGE, BOTTOM LEFT: Sheltered entrance is contained within steel-framed curtain wall. Rust-colored stucco accentuates location of entrance.
FACING PAGE, BOTTOM RIGHT: Pools separate gallery from garden in moatlike fashion, adding force to the fortress imagery of the building. Painted-tile mural was inspired by Miró sketch.

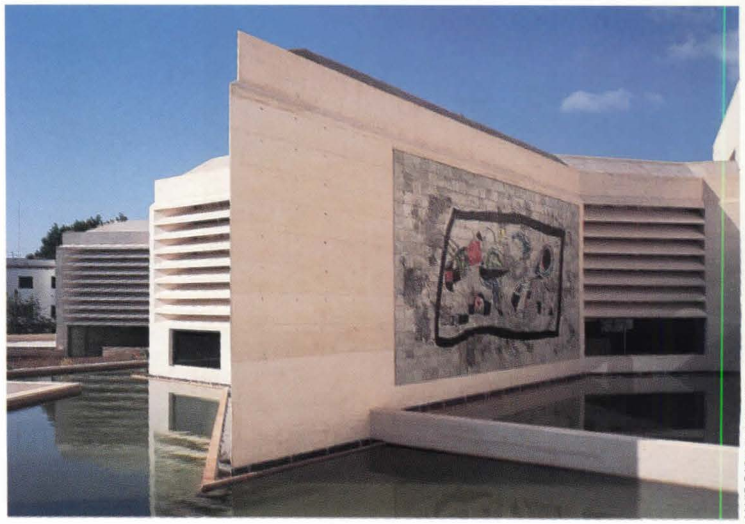
From this portal, one enters the small lobby and descends a concrete staircase, whose landing contains a bookshop. The route continues either to a temporary exhibits gallery or through a turnstile that guards the star-shaped main gallery. The first glimpse of the primary space is from a high vantage point—a moment of disorientation, rather than understanding, due to the gallery's fluid space and ambiguous floor plan. Moneo planned it that way, presenting a fragmented and inapprehensible spatial atmosphere true to the spirit of Miró's painting. The building is a composite of separate chambers that flow into each other, separated into discrete levels along connecting ramps and stairs, and broken into sections by freestanding walls.

Curiously, the fortresslike shape of the exterior visits no oppressiveness on the interior—only idiosyncrasy. Glowing translucent walls of alabaster humanize the space with a warm light. The texture of stone floors is reassuringly genuine; concrete walls are warm in tone; and the patterned alabaster adds a sensuality that overrides the regularized strata of the poured concrete walls.

As a place for displaying art, the gallery maintains a proper neutrality in spite of its sculptural expressiveness. Focused display lighting makes up the difference where natural light is lacking. Moneo's idea of pushing clear windows down to floor level, allowing only glimpses of the garden outside but not the surrounding townscape, is a stroke of divine inspiration, if not mortal genius.

Offices and other primary spaces critical to the functioning of the complex as a resource for scholars are placed in the linear portion of the building. Outside the boxlike building, a covered porch made habitable in the Spanish summer by a brise soleil allows commanding views of the garden, the landscape, and the sea beyond. From this vantage point, one also enjoys a private view of the painted-tile mural by Maria Antonia Carrio, which fills one of the exterior walls—another tribute to the lively curiosity that led Joan Miró into experiments with many media.

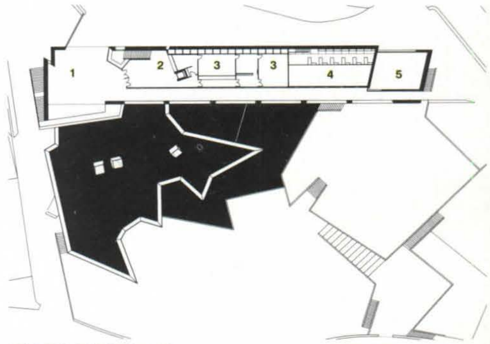
From the sculpture garden, the visitor is confronted with a series of dynamic facades that project and recede, more embracing and quieting than they are repelling with their sharp points—and all in great contrast to the stark facade that the visitor first encounters. By fleeing from repetition and parallelism, Moneo has created a figurative masterpiece in the Miró Foundation complex that befits its namesake. "In the painter's *oeuvre*," remarks the architect, "each painting is different, unique—as if each sought to capture an instant in time, one that would never be repeated. The discontinuous, fragmented, and broken aspect of the foundation's edifice responds to such a way of understanding Miró's work." Such characteristics spring forth in this remarkable building in a way that challenges the sensibilities. As with the artist's work, the Miró Foundation engenders a response that is, at its least, enlightened and, at its best, epiphanical. —*Vernon Mays*



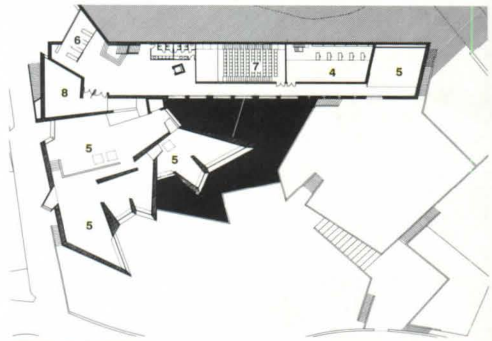
LLUIS CASALS PHOTOS

LLUIS CASALS PHOTOS

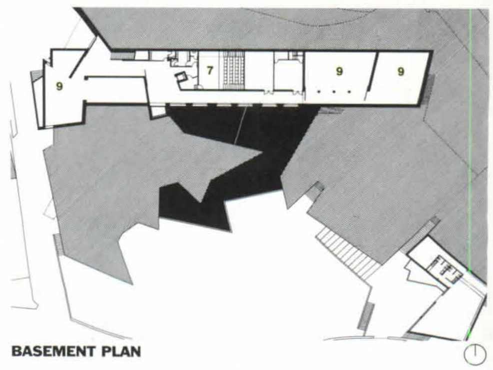
FACING PAGE: Concrete walls and stone floors give gallery a monastic quality, warmed by the glow of natural light through alabaster windows. Glass at floor level allows restricted views of outside.
TOP AND ABOVE: Concrete partitions subdivide gallery into a fluid sequence of spaces.
PLANS: Visitors enter top level of building and descend from reception area to galleries.
FOLLOWING PAGES: Star-shaped envelope and interior partitions result in a dynamic interior of converging planes for exhibiting art. Skylight penetrates rooftop pool; subdued light allows artwork to predominate.



SECOND FLOOR PLAN



FIRST FLOOR PLAN



BASEMENT PLAN

1 ENTRANCE
2 RECEPTION
3 OFFICE
4 LIBRARY
5 GALLERY
6 BOOKSTORE
7 LECTURE HALL
8 AUDIOVISUAL ROOM
9 MECHANICAL/STORAGE

Atocha Railway Station
Madrid, Spain
José Rafael Moneo, Architect

GRAND TERMINUS

The Atocha Railway Station is not one transportation center but four. The urbanistically most prominent is a late-19th-century train shed. This unified, single-span steel structure now plays only a minor part in the Rafael Moneo-designed expansion. Nevertheless, the presence of this arched shed, now an indoor tropical garden, exerts a profound effect on the architecture of the rest of the complex. Behind it, the new commuter terminus is practically invisible, buried under a large parking lot shaded by a tartan grid of shallow aluminum pendentive domes. Beyond this structure to the east, under the main road and directly accessible from the commuter station, is a subway station. Finally, directly behind the old train shed is the terminus for long-distance trains and supertrains. Architecturally, this station is the main event, though it serves far fewer passengers than its more modest neighbor. Two smaller structures complete the ensemble: a supremely elegant, rectangular brick clock tower, which dominates the main pedestrian plaza, and a colonnaded lantern, which marks the new center of the complex.

The four stations are located at different levels, and all of them are sunken below the surrounding roads. One of the many beauties of Moneo's design is the way that it manages to impose a powerful, formal simplicity on such a complicated section. The architect's basic strategy is to gather overlapping planes together in a compact, multistory concourse linking all the tracks. His master stroke, however, was to deny this concourse any external architectural expression apart from the simple form of a drum, which rises out of the rooftop access road like a guiding beacon. Each of Moneo's new spatial elements is free to assume a simple, even monumental, form.

The first of these elements is the vast sunken plaza that has been cleared beside the old train shed. Honoring the old station, now beautifully restored like some ancient temple dug out of the ground, the new plaza is a deliberately carved-out space, quite different in character from the leftover areas commonly found near large transport interchanges.

The second new spatial component is the commuter platform hall, covered by a roof that cleverly combines several functions. The shallow domes that shade the rooftop parking garage are supported on squat brick piers that consist of hollow shafts admitting light and air to the tracks below. They pierce a concrete slab supported by massive transverse beams, spanning the five platforms and 10 tracks in two steps via a central row of round columns. A formal, symmetrical system of raised walkways, pedestrian bridges, staircases, and escalators efficiently conveys arriving passengers to the concourse at the upper level. The whole sandwich of domes, parking spaces, ventilation shafts, beams, bridges, platforms, and tracks expresses a satisfying spatial and functional congruence.

Atocha Station's real architectural excitement is contained in the long-distance platform hall. Here, Moneo was faced with an awkward architectural problem: how to design a new roof that would not compete visually with the arch of the old train shed. Many of the entrants to the design competition simply proposed a bigger arched hall so that the new would dominate the old. Moneo's answer is much more subtle. Rejecting the obvious solution of a single span across all the tracks, he opted instead for a hypostyle hall, with a grid of slender concrete columns, rising from the center lines of the platforms, that supports a lighted, flat canopy.

Critics have noted the resemblance between the nonhierarchical, uniformly repetitive elements in Moneo's architecture and ancient Islamic buildings—the great mosque at Cordoba, for example. Here the comparison seems especially apt. But there is another subtlety. The new railway tracks are slightly angled in relation to the old train shed. It would have been easy to have resolved this geometrical clash by inserting a tapering bay between the two buildings. Instead, the architect has racked the whole column grid so that it is rhomboidal, rather than rectilinear. Surprisingly, this slight distortion is clearly visible in the finished structure and imparts it with a special dynamic quality.

Curiously, the lantern drum that is such a prominent feature of the exterior does not have the same effect inside. One is led to expect a circular well penetrating the floors beneath the drum and providing a focus for the space at every level. In fact, the internal view of this cylinder, and the delicate radial structure of its shallow dome, are obscured by a T-shaped arrangement of ramps and escalators, plus a ticket office.

Despite these few reservations, Madrid's Atocha Railway Station complex is an excellent example of the way a major transport interchange—which is basically an engineering installation—can, by formal and spatial dexterity and sheer organizational skill, be elevated to fine architecture. —*Colin Davies*

Colin Davies is a senior lecturer in architectural history at the University of North London.

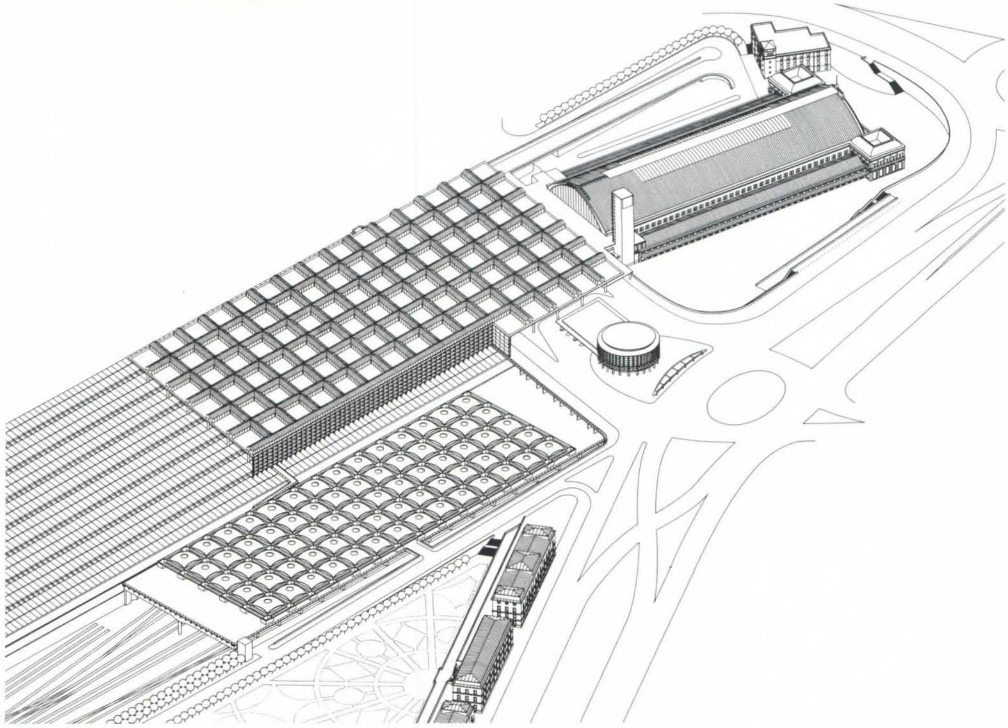
JAVIER AZURMENDI PHOTOS

DIDA BIGGI

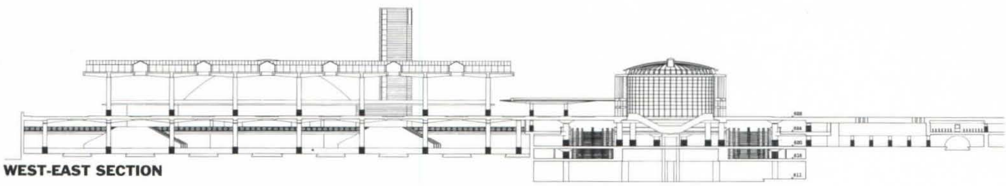
FACING PAGE, TOP: Heart of Atocha complex is a multilevel concourse, marked by a cylindrical, drumlike brick-faced lantern.
FACING PAGE, BOTTOM: Vast sunken plaza is dominated by elegant clock tower. Long volume at far end of plaza houses commuter station and restaurants. Restored 1888 station (right) abuts new long-distance terminal (center), defined by slender columns and steel-framed umbrella roof.
ABOVE: Simple geometric forms of entrance cylinder and clock tower convert a modern transport interchange into an urban monument.

LLUIS CASALS

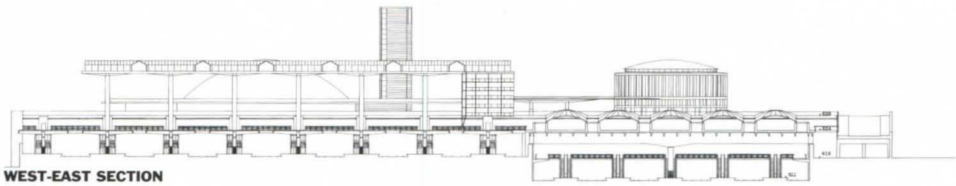
ABOVE: Massive brick-clad piers form an open colonnade around Atocha Station's entrance cylinder. **DRAWINGS:** Isometric, sections, and plan show the main elements of Moneo's site composition: The commuter station (left center), the long-distance station (top center), and the restored 19th-century station (top right). Subway station is located below ground, accessible from the commuter station. **FACING PAGE:** Entrance cylinder is topped by an elegant radial copper roof structure, partially concealed from the lower levels of the concourse by staircases and escalators. The steel ribs are supported on a concrete structure.



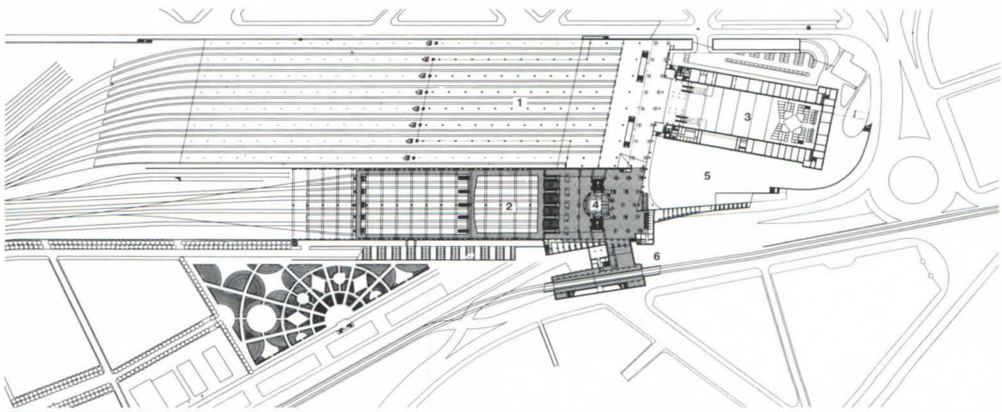
SITE ISOMETRIC



WEST-EAST SECTION



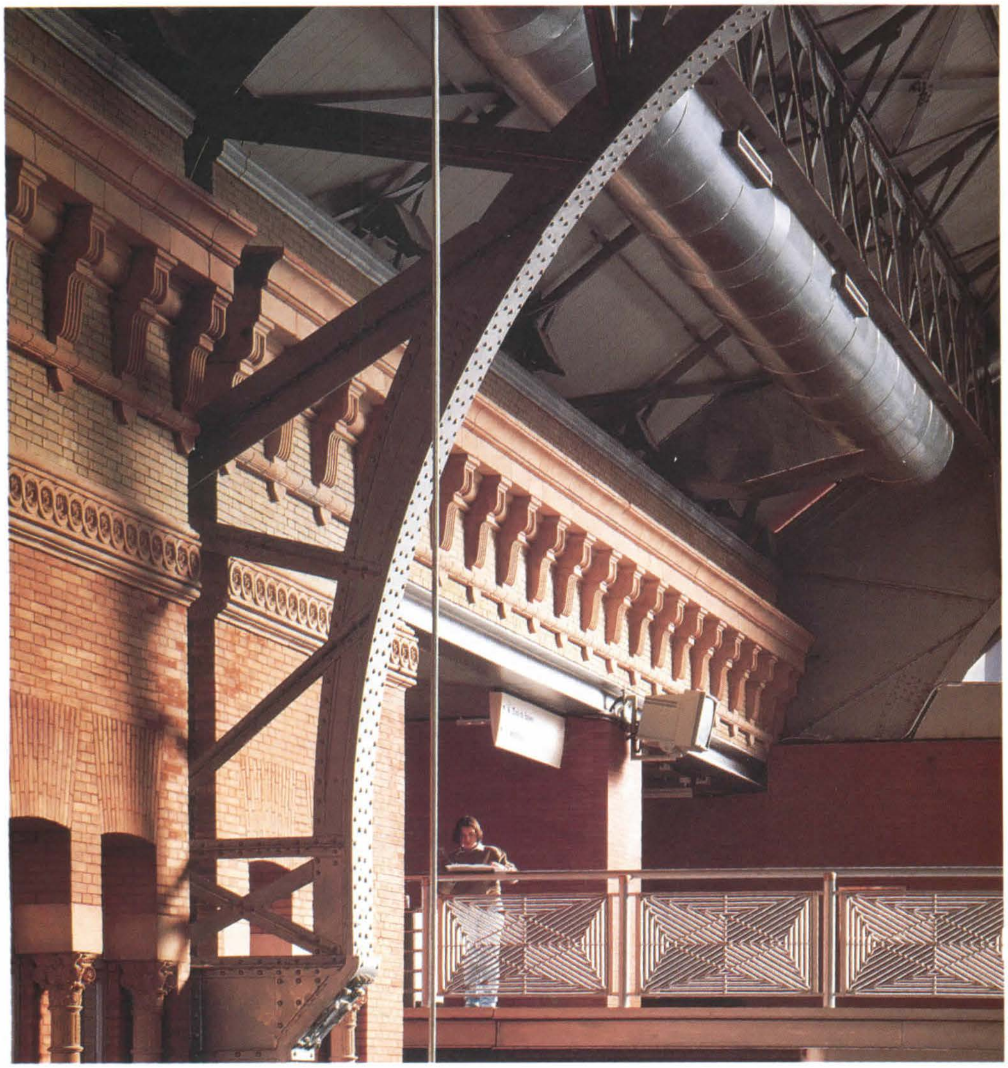
WEST-EAST SECTION



CONCOURSE LEVEL PLAN

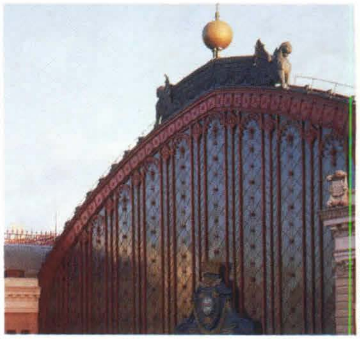
1 LONG-DISTANCE TERMINAL
2 COMMUTER TERMINAL
3 EXISTING TRAIN SHED
4 ROTUNDA
5 SUNKEN PLAZA
6 SUBWAY TERMINAL

LLUIS CASALS



DUCCIO MALAGAMBA

DUCCIO MALAGAMBA

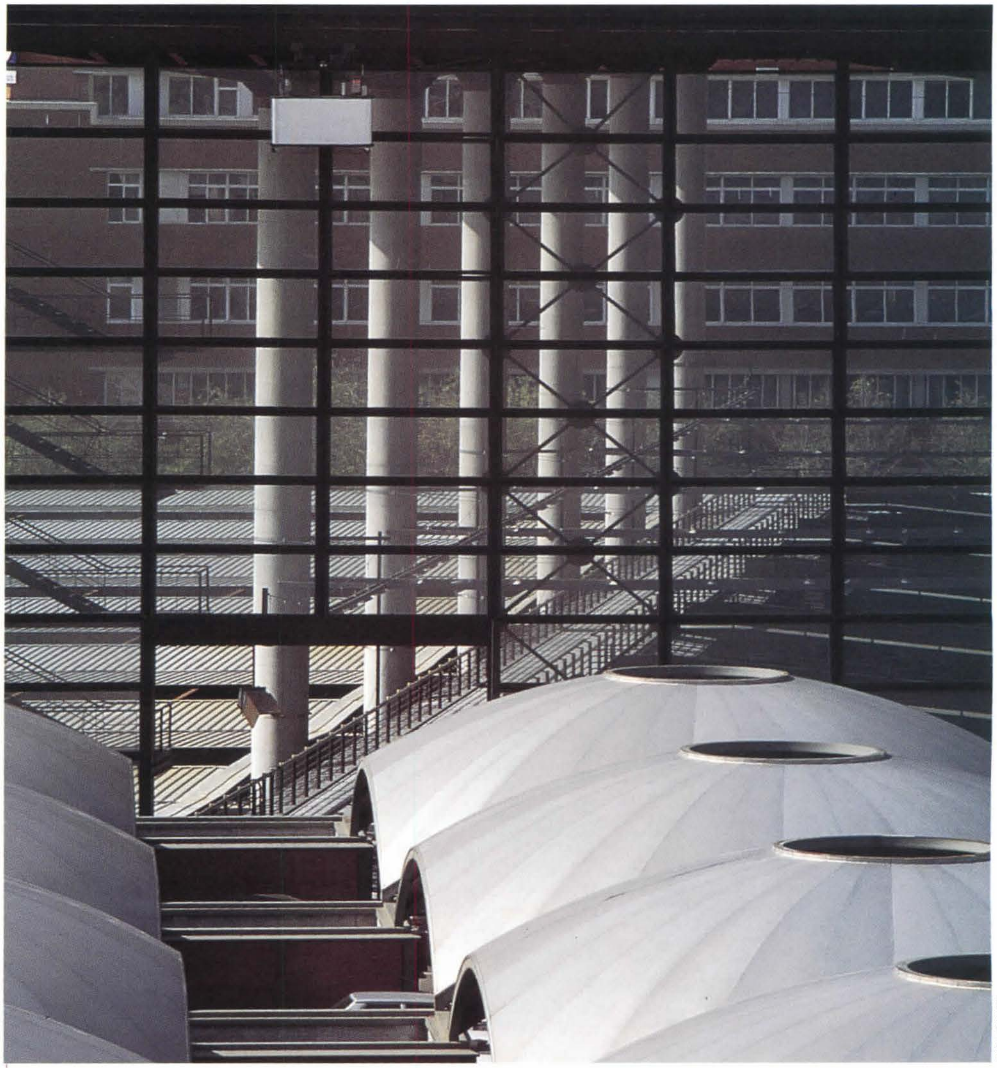


DUCCIO MALAGAMBA

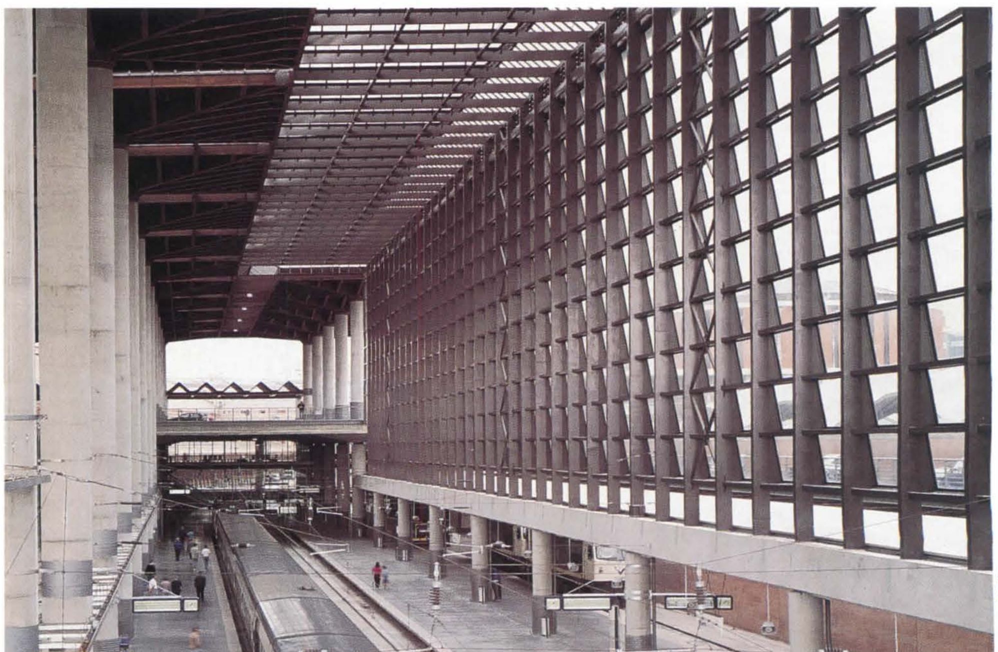
AKE E:SON LINDMAN

FACING PAGE: Interior of 19th-century station has been converted into a tropical garden and restaurant court.
ABOVE LEFT: Moneo's painted steel balustrade sympathizes with steel roof structure of old station.
LEFT: Long escalator ramps connect various levels of the concourse within the hall of the restored station.
ABOVE: Original station, by Alberto de Palacio, is a portal frame structure with ornately framed glass walls.

DUCCIO MALAGAMBA



DIDA BIGGI



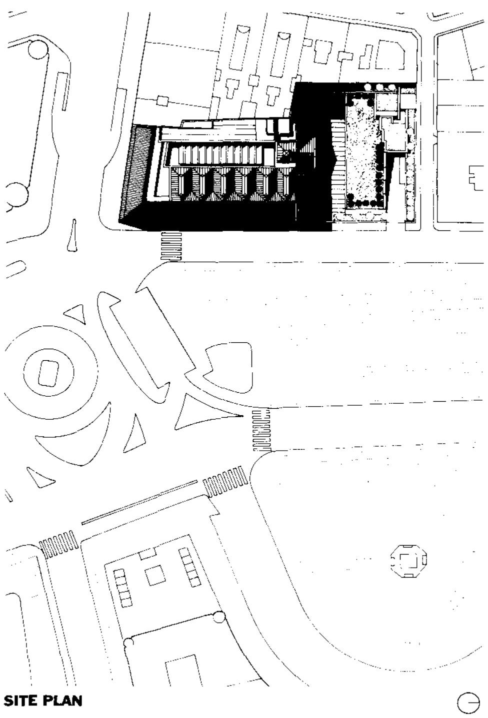
JAVIER AZURMENDI

DUCCIO MALAGAMBA

ABOVE: On north wall of long-distance station, Moneo eschewed a traditional glass curtain wall in favor of angled glass panels in a light steel frame.
ABOVE RIGHT: North wall of long-distance station reveals walkway across platforms. Domes cover parking area on top of commuter station.
RIGHT: Wind loading on columns is reduced by louvered glass wall. Angled glass panels, open at the bottom, protect the platform from wind and rain, while allowing air to circulate.
FACING PAGE: Dense grid of slender columns rises from the center of each long-distance platform to support a steel-framed umbrella roof.

Thyssen-Bornemisza Museum
Madrid, Spain
José Rafael Moneo, Architect

PALACE TREASURES



SITE PLAN

SITE PLAN: Thyssen-Bornemisza Museum faces busy Paseo del Prado, but main entrance is sheltered by quiet garden to the north (right).
FACING PAGE, TOP: Moneo rebuilt tiled roof of palace above retained facades to form a frame around new rooflights.
FACING PAGE, BOTTOM: Early 19th-century entrance facade was designed by Antonio López Aguado.

The Villahermosa Palace in Madrid is a plain but beautiful three-story building facing the broad promenade of the Paseo del Prado. Its main facade features no formal accents whatsoever, simply a wall of smooth, red brickwork punctured by a regular grid of finely proportioned windows with simple granite surrounds. Solid, austere, and abstract, it might have been designed by an 18th-century Rafael Moneo. In fact, the history of the palace is rather obscure. The form of the original plan is unknown. The present facades date from the early 19th century, when the Spanish Neoclassical architect Antonio López Aguado extended the building and reorganized its interior about an east-west axis, with a pair of courtyards and a central grand staircase. Aguado's intention must have been to place the entrance in the middle of the main facade, but it was later moved to the north facade, facing a garden. By the time Moneo was commissioned to convert the palace into a gallery to house the art collection of the German industrialist Baron Heinrich Hans August von Thyssen-Bornemisza, who now lives in Madrid, the relationship between the building's facades and interior had been destroyed completely by its remodeling into a bank.

Moneo's instinct was to restore the relationship between the outside and inside of the building, and the architect set up a new longitudinal axis to make sense of the existing north entrance. The garden, Moneo reasoned, would provide a perfect transitional space between the busy street and the quiet, contemplative spaces of the new gallery. His basic compositional method, therefore, was to work inward from the facades, placing the main galleries around the perimeter, with room divisions corresponding to the rhythm of the windows. But what, then, would occupy the center of the building?

Many architects would have opted for the obvious solution and created a full-height, top-lit atrium, which would unify all the spaces and contain the main staircase. Moneo did, in fact, insert a top-lit space at the heart of the building, but the architect insists that it is not an atrium, nor even a covered courtyard, and certainly not a patio, despite the tropical plants that have been placed in it against his will. This space is not surrounded by open galleries (in either sense); it is two, not three, stories high; and it does not contain the main staircase. Rather, it is a long and relatively narrow room or hall, with its own identity and integrity—a place of stillness, rather than movement, that the Spanish call a *zaguán*. Views in the *zaguán* from the first floor are restricted to two locations. Even the small, windowless galleries against the party wall on the building's west side are only allowed to borrow a little light at high level. Otherwise, the walls of the *zaguán* are finished in vast plain areas of pink plaster, without any embellishment.

Visitors pass straight into this high room, which has a perfectly square section, from the low entrance lobby, which has a perfectly square plan. The experience (despite the tropical plants) is like the cleansing of the visual palette in preparation for the richness of the museum's collection. Visitors are encouraged to enter a plain rectangular opening in the thick, right-hand wall of the *zaguán* by the simple device of an angled slice taken off the far jamb. On the other side of the wall, they find the main staircase and elevators, which take them to the top floor to begin a spiral descent around the perimeter of the building. The collection of paintings, ranging from Italian primitive to Modern masters, is arranged chronologically.

The circuit of the top floor leads to a long, broad promenade extending along almost the whole length of the main facade. The east-facing windows are screened by louvered shutters to keep out the sunlight that might damage the paintings, but here and there a half-shutter is left ajar to permit a glimpse of the outside world. This hallway is a circulation route, but definitely not a corridor. Like almost all the other spaces in the building, Moneo has designed this promenade as a room, with a regular, symmetrical rhythm of windows on one side and plain, full-height openings to the main galleries on the other.

The main galleries located to the west of the promenade are top-lit by lanterns above pyramidal ceilings. Their form could hardly be more traditional. Moneo acknowledges that they are simply a reinterpretation of the lighting in the first public art gallery, John Soane's Dulwich Gallery (1814). And yet, in their details, these skylights are modern.

One reason for the existence of the promenade on the museum's top floor is the decision to rebuild the tiled roof above the existing facades, forming a kind of picture frame for the banks of lantern lights over the third-floor galleries. On the second floor, where there is no opportunity for top lighting, the plan reverts to a simpler, enfilade arrangement so that each gallery has the benefit of a pair of existing side windows. On this level, at roughly the halfway point in the tour of the building, a generous seating area is provided, directly over the entrance lobby and open to the long, narrow *zaguán*.

Having completed the museum tour, one emerges from the first-floor galleries into the entrance lobby, where the usual ancillary facilities are available, including a bookshop and, in the basement (accessible by a separate staircase), a cafe. At this level, a long corridor leads to a small lecture theater with a raked floor at the south end of the building, and the place of the *zaguán* is taken by a gallery for temporary exhibitions.

Looking back from the peaceful garden to the main entrance, framed by plain granite pilasters and crowned by a modest pediment, it is clear that, far from constraining Moneo's design, the remains of the old palace have provided both the inspiration and the necessary controlling discipline. But then Moneo's architecture is, in any case, rooted in tradition. If the architect had been offered a cleared site, the resulting building would not have been very different. —*Colin Davies*

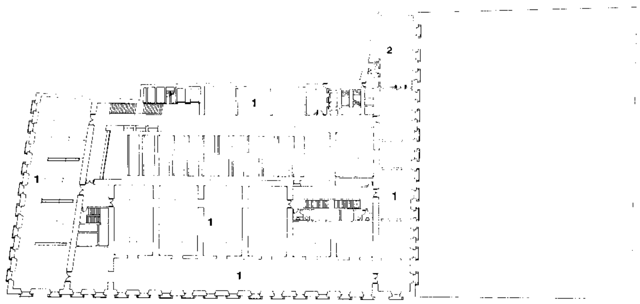
ENTRECANALES

JAVIER AZURMENDI

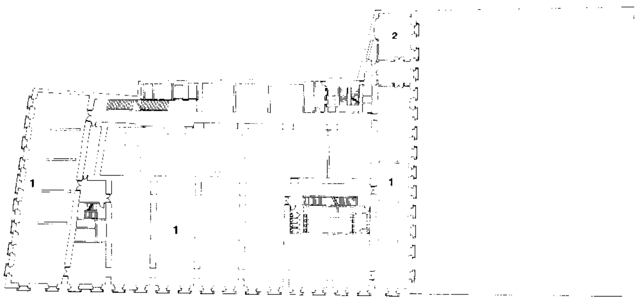
TOP: Marble floor of lobby is simply patterned in squares and triangles. **ABOVE:** Second-floor gallery, with resting area on left, overlooks central hall. **THESE PAGES:** Top-lit central space is a place of stillness, rather than movement. Entrance to main staircase is at far end of right-hand wall.

JOSE LATOVA PHOTOS

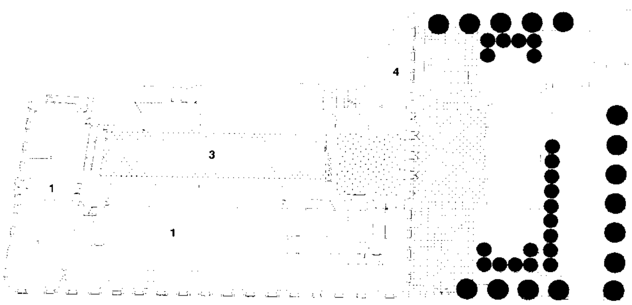
PLANS: Moneo reorganized interior according to rhythmic discipline of retained facades and north-south axis set up by the existing main entrance.
RIGHT: Worm's-eye section/isometric reveals contrasting forms of the rooflights over top-floor galleries (left) and *zaguán* (right). Seemingly solid and massive, the internal walls and floors are steel-framed.



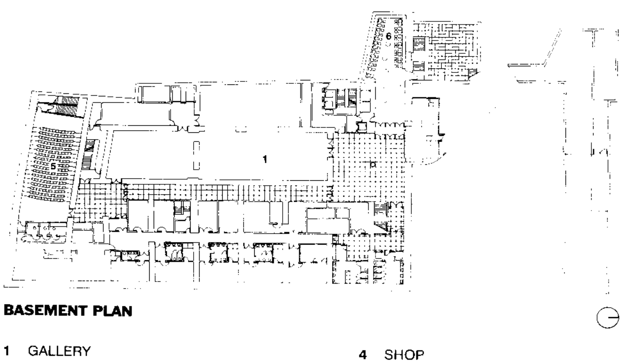
THIRD FLOOR PLAN



SECOND FLOOR PLAN

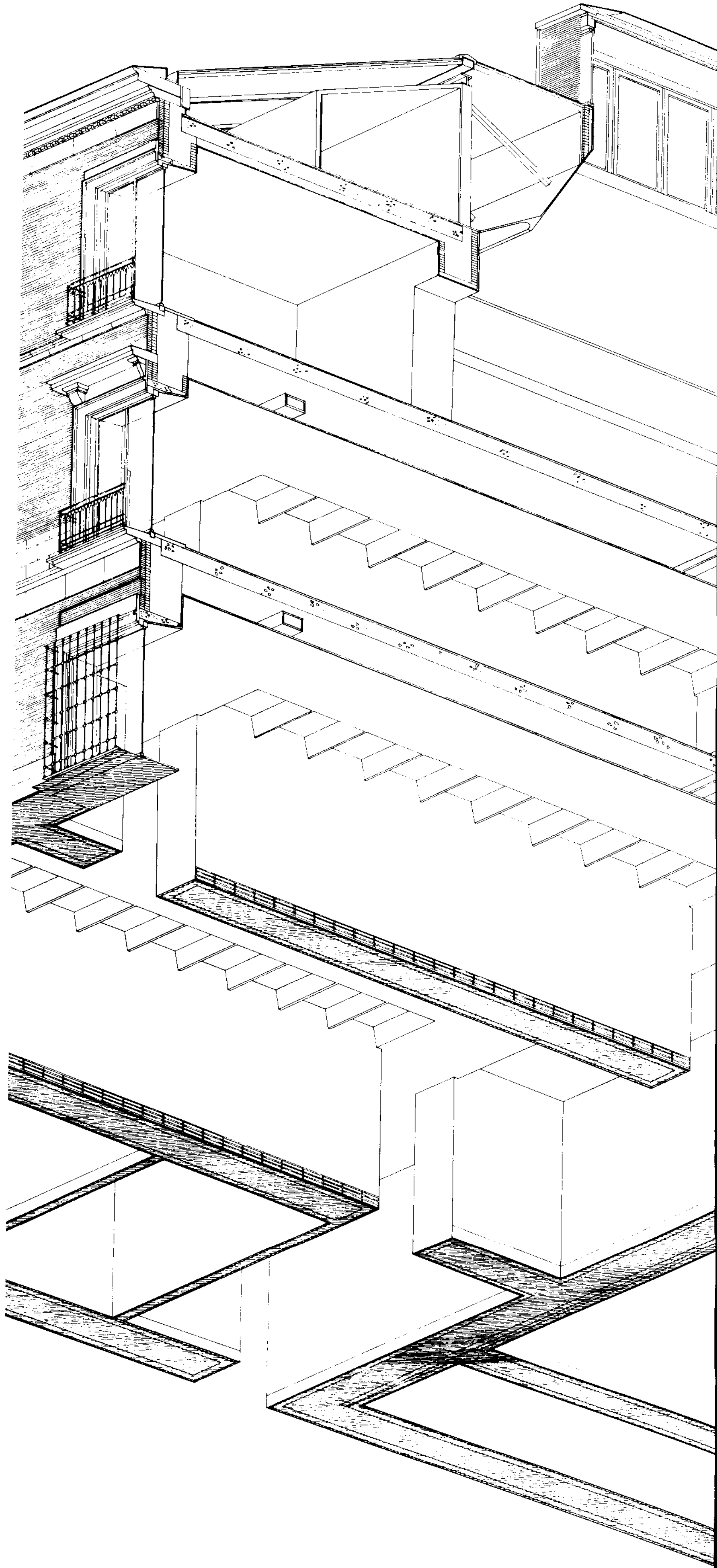


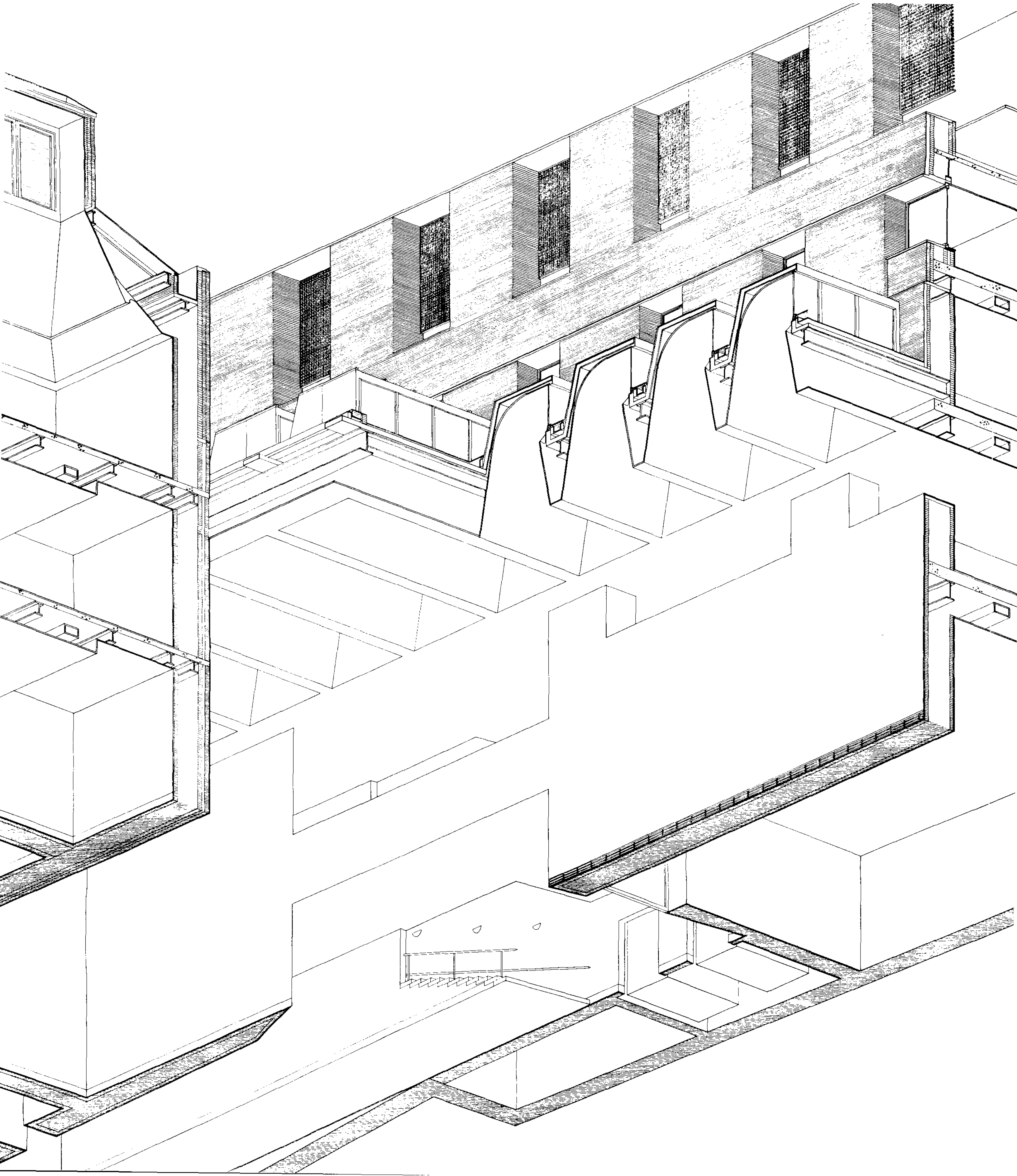
FIRST FLOOR PLAN



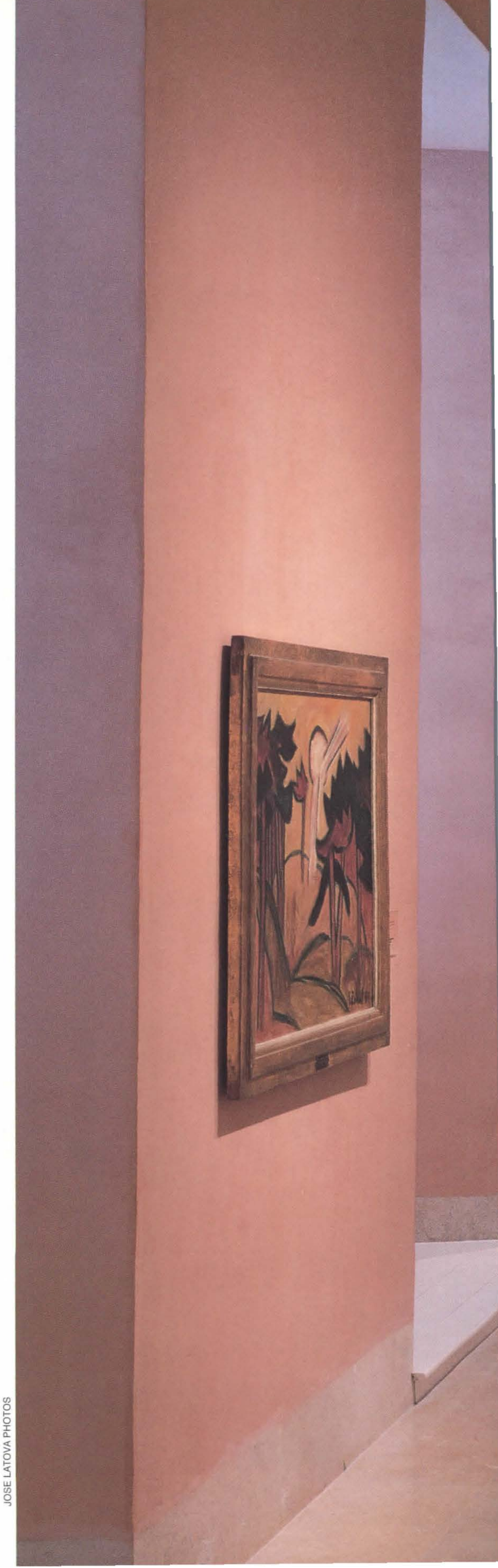
BASEMENT PLAN

1 GALLERY
2 OFFICE
3 ENTRANCE LOBBY
4 SHOP
5 LECTURE THEATER
6 CAFE





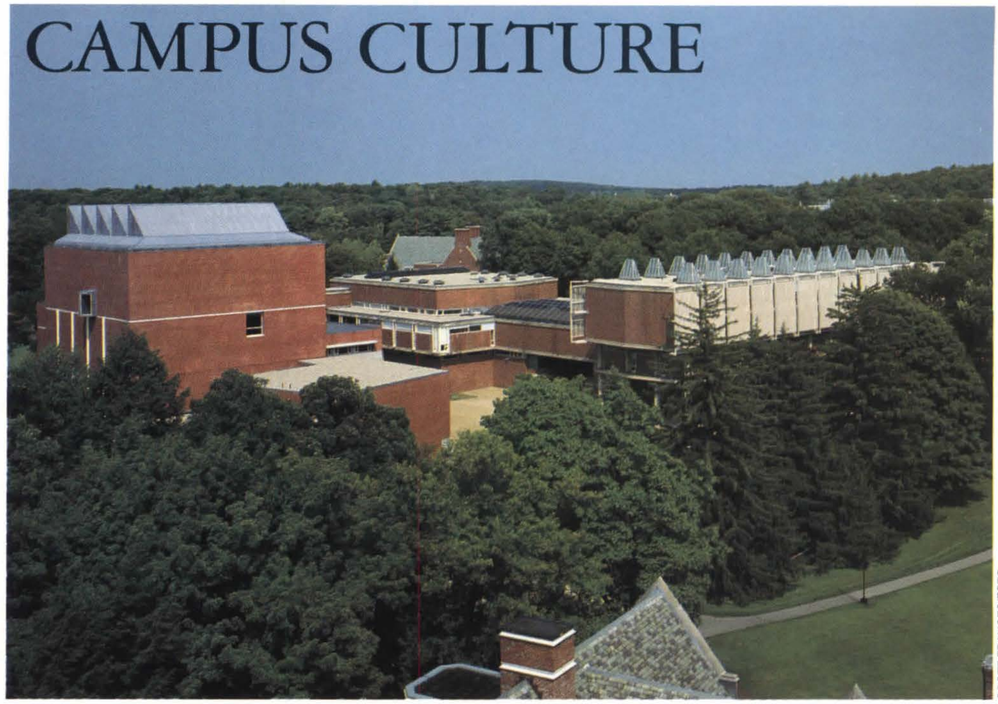
TOP: Gallery at south end of top floor features clerestory incorporated into reconstructed, tiled roof.
ABOVE: Second-floor gallery is terminated by a pair of existing windows.
THESE PAGES: Top-floor gallery at north end of the building integrates windows from retained facade (left), to establish a regular rhythm for the interior.



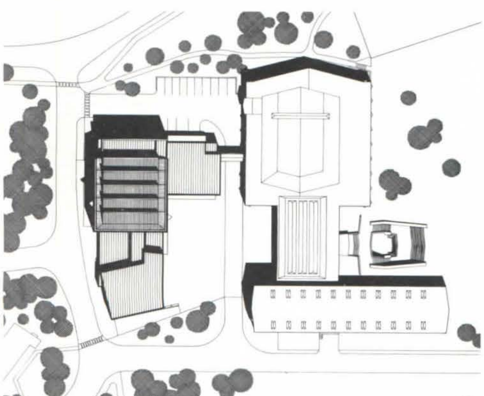
JOSE LATOVA PHOTOS

Davis Museum and Cultural Center
Wellesley College
Wellesley, Massachusetts
José Rafael Moneo, Architect

CAMPUS CULTURE



SCOTT FRANCES/ESTO



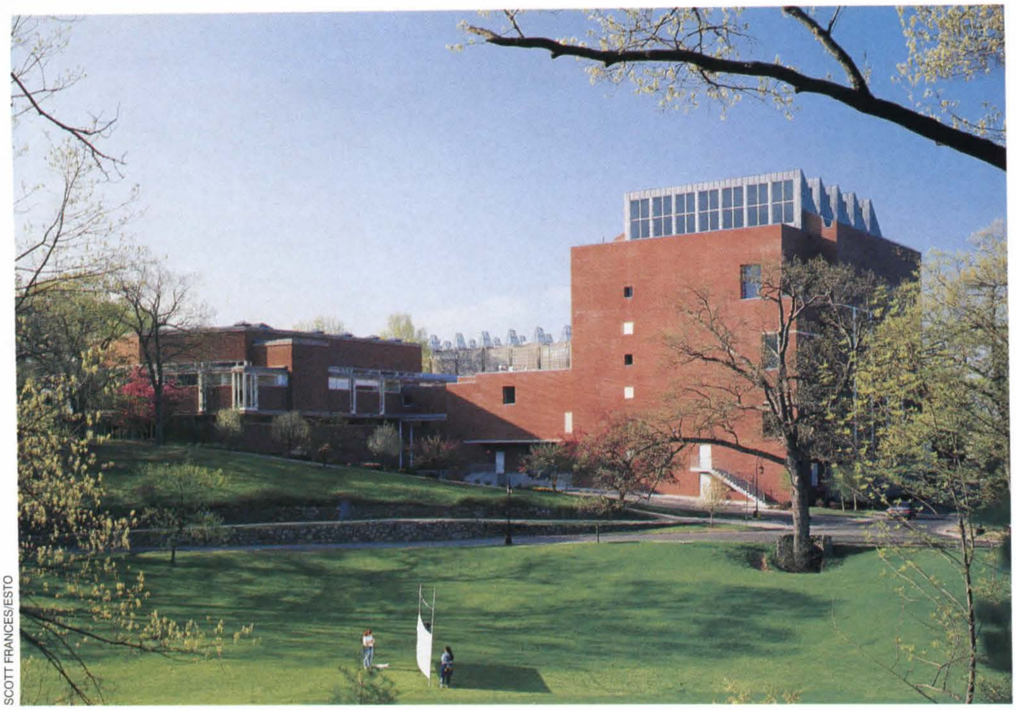
SITE PLAN

The recently completed $11.7 million Davis Museum and Cultural Center at Wellesley College marks Rafael Moneo's American debut. Moneo was selected from a field of 183 applicants for the commission, which called for designing new quarters for the college's distinguished art collection of more than 5,000 objects. The search committee was most impressed with Moneo's high regard for the structure that the new facility was to join, Paul Rudolph's Jewett Arts Center. "It was one of the buildings I admired early in my career, one of the first Modern buildings to strike my eye," Moneo recalls. "My goal was to enhance the Rudolph building." Completed in 1958, the Jewett, while Modern in structure and functional arrangement, possesses a genuine sense of place. Through Rudolph's manipulation of scale, massing, and materials, it belongs to the Collegiate Gothic quadrangle it faces.

Wellesley's art collection, spanning Western art from ancient Greece to the present, and including Oriental works as well as African art, had long outgrown its space in the Jewett, leading the college to construct a separate museum. Because the artworks are continually under study by the art historians and artists, whose offices and studios are located in the older facility, the college wanted the new structure to be closely integrated with the 1958 center. Unfortunately for Rudolph's building and for Moneo's, the only available site, an area used for parking, was too small to allow the new museum's extensive spatial requirements (approximately 61,000 gross square feet) to be assembled into a scale respecting the Jewett.

Little could be done to enhance the Jewett under these constraints, so Moneo positioned and designed the new structure in a way that minimizes its interruption of the Jewett's western facade. He completed what he perceived as Rudolph's unfulfilled intentions with regard to the art center's magnificent outdoor stair, leading upward and eastward to Wellesley's quadrangle. The foot of the stair was intended to open upon a terraced landscape that instead became a parking lot. By creating a concrete plaza in the foreground of his museum, Moneo has given Rudolph's stair a new, if rather plain and Spartan, destination and made the new plaza as large as practical to amplify the distance between the museum and the Jewett.

In response to the tightness of the site, Moneo assembled his new galleries in a rectangular, skylit, brick box extending five stories above the plaza. Because of its height and bulk, it has been placed at the northwest corner of the site so as not to crowd the Jewett's library wing to the southeast, a segment of Rudolph's building that Moneo calls "gorgeous." The gallery block is flanked to the east by a three-story administration wing with a bridge to the Jewett; to the south lies another small wing containing a special exhibition gallery, an auditorium, and a cafe that opens upon the new plaza. Passing under this wing is a meager stair, placed on axis with



SCOTT FRANCES/ESTO

Rudolph's counterpart, that leads to the lower campus. Both new wings are kept low, thereby reducing interruption of the view of the Jewett Arts Center.

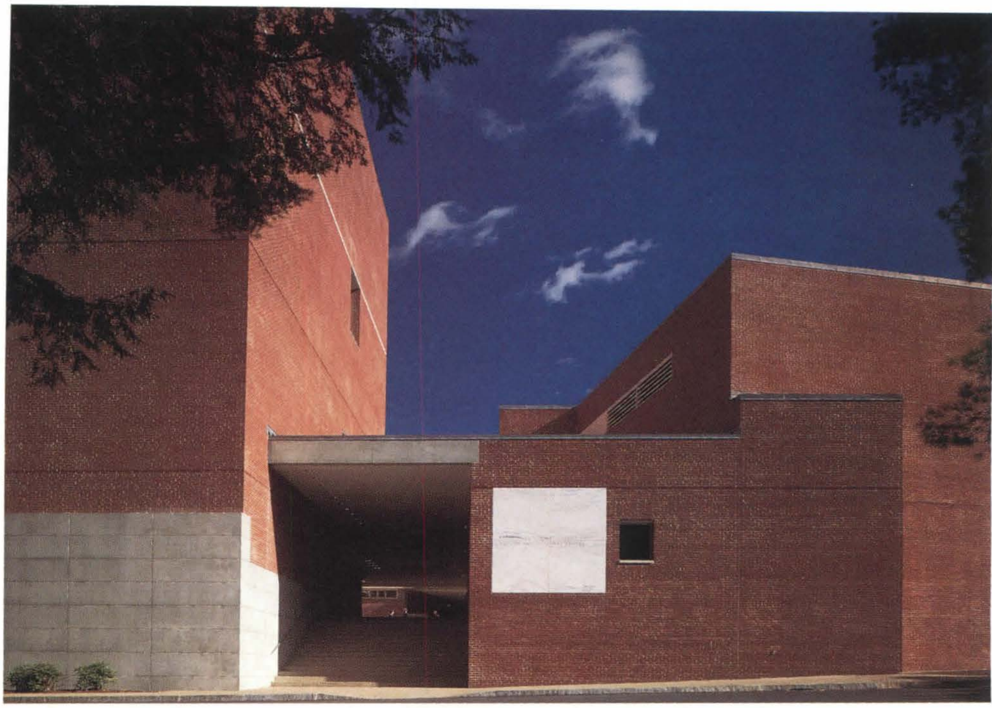
Moneo has not enhanced Rudolph's masterpiece; instead, by the very nature of his assignment, he has diminished it. But through his effort, important segments of Rudolph's western facade are left to be enjoyed from the new plaza, and this paved open space is a needed urban amenity in a predominantly parklike campus. The Jewett's beauty of proportion, detail, and material is so singular that it makes the new museum, and particularly the plaza itself, appear unstudied and commonplace. On the one hand, the handsome, varicolored, waterstruck brick walls of the Jewett are laid in Flemish bond. The wall's of Moneo's museum, on the other hand, are veneered in ordinary brick, uniform in color, and laid in common bond. Since brickwork of the quality of the Jewett is no longer possible within today's construction budgets, invidious comparison could have been avoided if Moneo had selected a material other than brick for the museum.

The interior of the building, in contrast to the exterior, is a complete success. Moneo has designed the gallery wing as a skylit cube in which the viewer is to feel surrounded completely by the art. The museum's generously proportioned gallery spaces, uniformly 17 feet high, are simply finished in drywall painted white and modestly enhanced by maple casework and stair paneling.

Moneo asymmetrically placed a scissor staircase within the cube, creating on each floor a larger space to the west and a smaller space to the east. Framed openings on each landing offer ample views of the collections at each level, simplifying the choices of which art to choose to see. Because it is narrow and, except at the landings, enclosed, the staircase forms a volume that tightly confines the visitor, thereby increasing by contrast the sense of amplitude within the gallery space. The collection's curators reversed the chronological sequence of the installation beginning with Modern art at the first level and going backward in time to ancient art at the top. This curatorial *tour de théatre* is all the more effective given the visibility from the stair of several chronological periods at once.

"For anyone who enters the building," Moneo believes, "the act of going to the top is like a process of almost continuous purification. The light comes down from the skylight, almost from heaven you could say. The building becomes progressively more open. At the top, an epiphanic moment, your contact with the art should at last become clear." The Davis Museum's interior may not offer the visitor an epiphany every time. Nevertheless, because of the mastery with which the architect has arranged and scaled the interpenetrating spaces, the effect is uplifting, inspiring, even joyous. Even though Moneo failed to enhance the Jewett, no one can say that he failed to enhance the Wellesley College art collection. —*Mildred F. Schmertz*

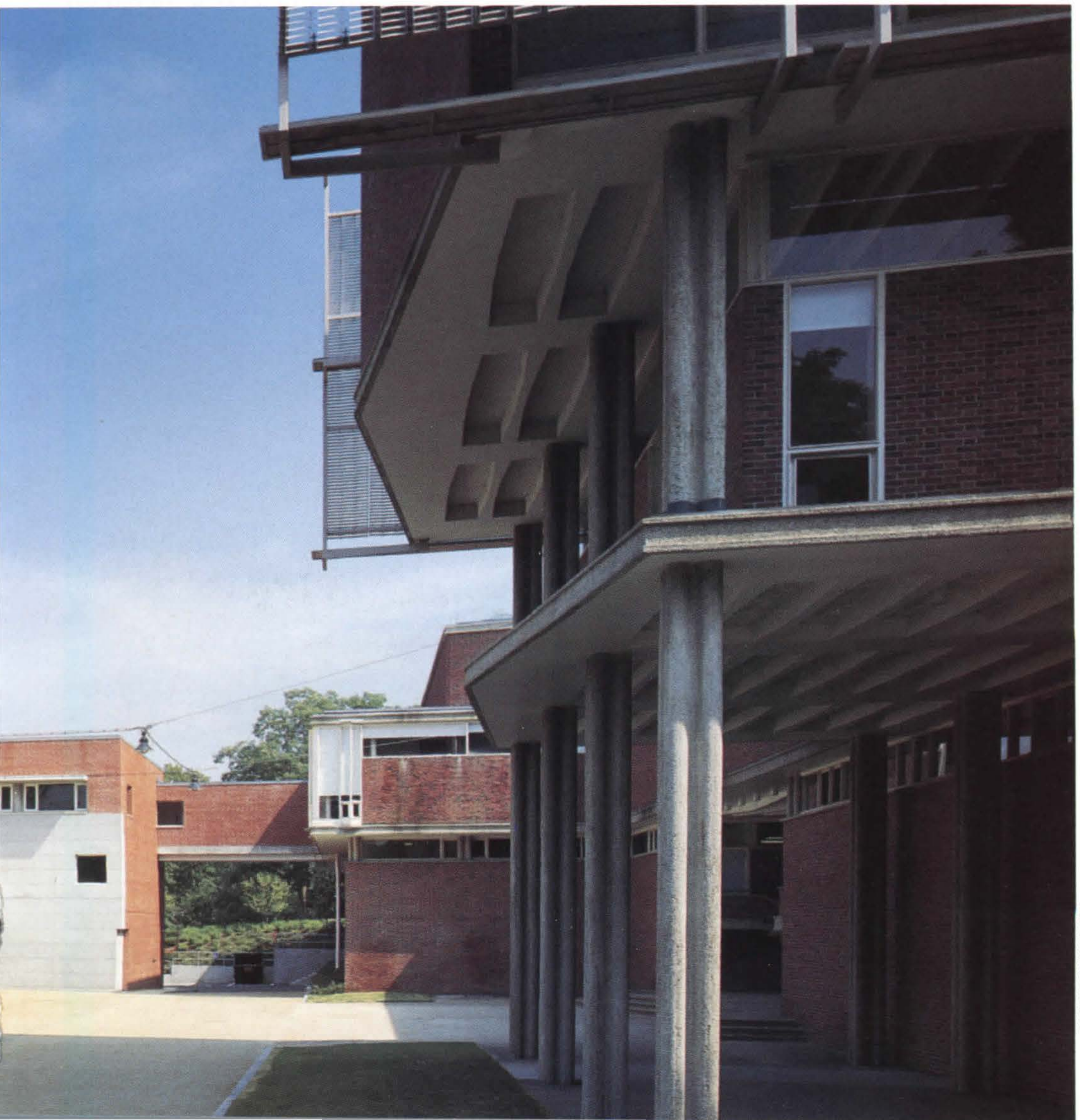
SITE PLAN: The Davis Museum and Cultural Center is located to the northwest of the Paul Rudolph-designed Jewett Arts Center.
FACING PAGE, TOP: The Davis Museum (left) partially conceals western elevation of the Jewett (center), a Modernist building successful in its contextual relationship to the Collegiate Gothic quadrangle beyond (right).
ABOVE LEFT: Northern facade of the Davis gallery (right) overwhelms the more modulated proportions of the Jewett Arts Center (left).



STEVE ROSENTHAL

ABOVE RIGHT: The stair between the museum's five-story brick gallery and its southern wing connects the new plaza with the lower campus.
FACING PAGE, TOP: The five-story gallery block, flanked by two lower wings, surrounds a new plaza.
THESE PAGES, BOTTOM: In contrast to the Jewett's Flemish bond brickwork and richly textured concrete, the museum's brickwork and concrete facing are low cost. The administration wing of the museum is connected to the Jewett by an ungainly bridge.

STEVE ROSENTHAL



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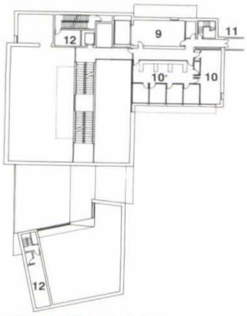
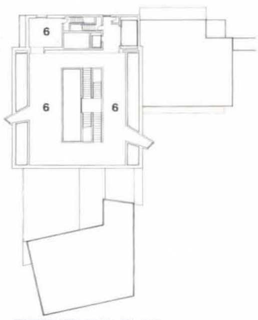
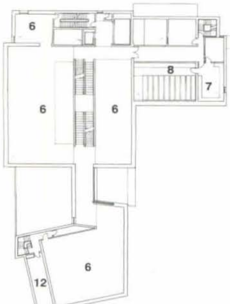


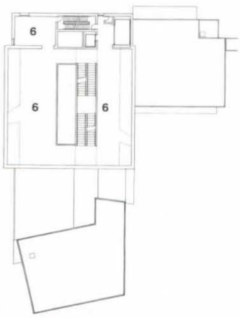
THIRD FLOOR PLAN



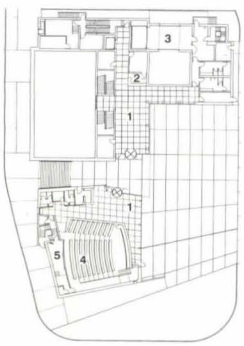
FIFTH FLOOR PLAN



SECOND FLOOR PLAN



FOURTH FLOOR PLAN



FIRST FLOOR PLAN

1 LOBBY
2 INFORMATION
3 STAFF ENTRANCE
4 AUDITORIUM
5 PROJECTION ROOM
6 GALLERY
7 STUDIO
8 ARCHIVES
9 CLASSROOM
10 OFFICE
11 BRIDGE
12 MECHANICAL/STORAGE

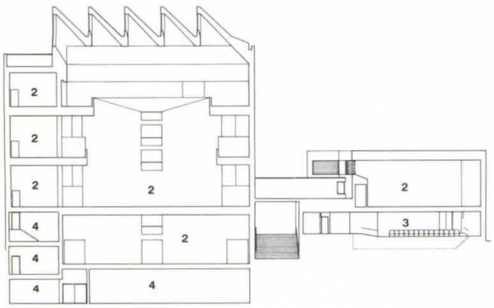
STEVE ROSENTHAL PHOTOS

PLANS: Gallery block is flanked by administration wing and volume housing special exhibition gallery, theater, and cafe. Collection begins with Modern art on the first floor and ascends to ancient art at the top.

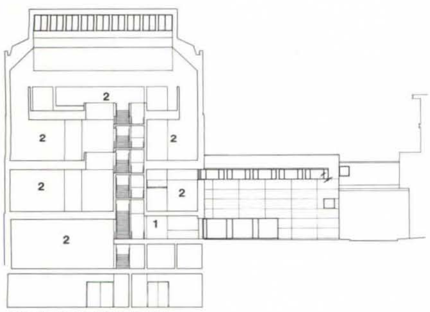
FACING PAGE, TOP AND BOTTOM: The principal sources of daylight are skylights that crown the museum's top story. Light washes through open parapet-rimmed bays on the top two floors, illuminating three levels. Daylight is supplemented with fluorescent lighting and incandescent spots.

ABOVE LEFT: The 5-foot-wide stair is paneled in maple. Shallow risers and broad treads ease passage upward. Landings offer views of collections.

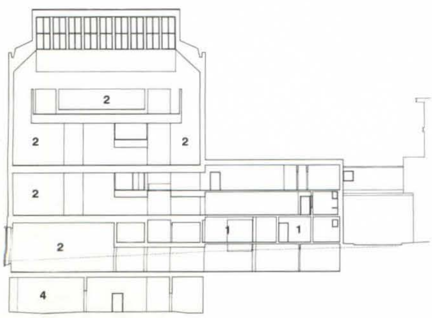
LEFT AND FOLLOWING PAGES: The skylights consist of north-facing double-paned clerestory windows. Tinted coatings allow the transmission of 60 percent of visible light and screen out ultraviolet and other harmful rays.



NORTH-SOUTH SECTION



EAST-WEST SECTION



EAST-WEST SECTION

1 LOBBY
2 GALLERY
3 AUDITORIUM
4 MECHANICAL/STORAGE

STEVE ROSENTHAL

Technology & Practice

This month's Technology & Practice section highlights the innovative ways in which architects are streamlining construction techniques, revamping documentation and presentation methods, and restructuring business strategies to boost their bottom line.

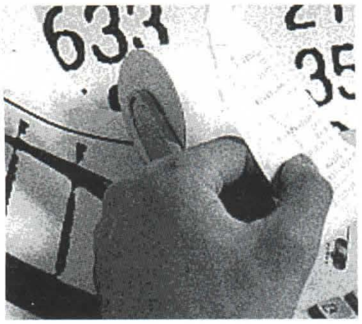
Formwork, a wasteful by-product of poured-in-place concrete, is now becoming a permanent part of new construction. New systems that incorporate stay-in-place, polystyrene blocks provide built-in thermal and acoustical insulation, while eliminating the costly disposal of formwork.

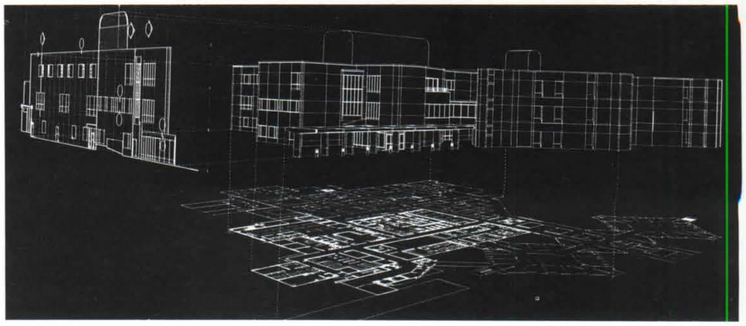
Innovative computer software now allows architects to generate 3D models from which 2D projections can be extracted. These complex models contain more comprehensive building data than the simple details and elevations of 2D drawings. They may one day replace conventional documents with isometric working drawings for more accurately constructed buildings.

Architects are also revamping their delivery of projects and in-house practices to increase profits. A practice article outlines how firms of all sizes can sharpen their pencils, reconfigure their fee structures, and employ the latest computer software packages to achieve profitability.

Face-to-face presentations to potential clients obviously play a key role in securing commissions. Winning the job requires thorough research of a client's project, staff, and organizational goals before rehearsing for the interview.

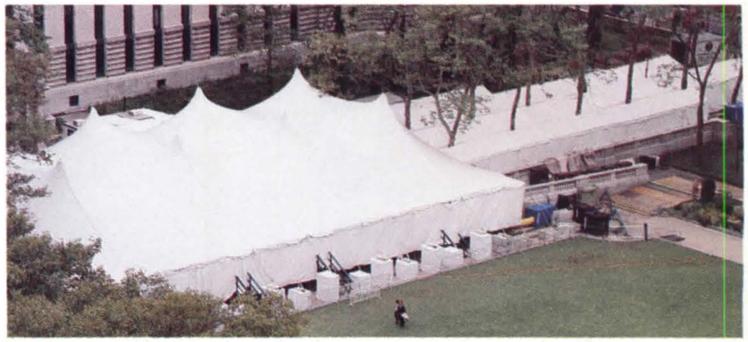
As articles on these topics point out, some of the most basic aspects of building technology and professional practice are being thoroughly revised. These far-reaching changes underscore architects' ability to successfully transform time-honored methods into more efficient tools for meeting new challenges.





A temporary installation of tensile technology reveals low-cost versatility.

FABRIC BEACON: Echoes tents.



BRYANT PARK: Vinyl-laminated polyester tents and covered walkways.

MICHEAL LENT PHOTOS

TENT INTERIOR: Spotlighting is diffused through polyester membrane to project softer light on runway models.

Tents Showcase New York Fashion Shows

Transient architecture played a defining role in the New York fashion industry's spring fashion shows held last October beneath two huge fabric tents, designed by FTL Architects and erected in Bryant Park, adjacent to the New York Public Library in midtown Manhattan.

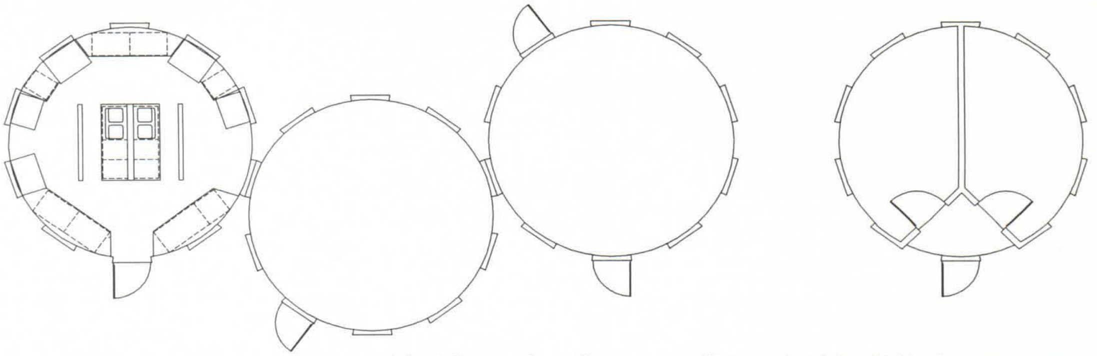
The larger of the two 30-foot-high tents, the Gertrude Pavilion, seated 1,000 people, measured 100 feet across, and cost $24,000 to erect. The smaller Josephine Pavilion across the lawn seated 600 people, was 80 feet wide, and cost $13,500. FTL Principal Todd Dalland, who designed the tents, estimates the cost per square foot at about $5, or about 15 percent more than the older tent varieties. "These new tents take tensile-structure technology down to the application of a rental structure," Dalland asserts.

Dalland describes the vinyl-laminated polyester structures as an advanced version of traditional red-and-white carnival tents. The newer structures are approximately of the same weight and mass as their nomadic forerunners, but now require 60 percent fewer supporting poles, because the tents' double-curvature forms are engineered to serve as loadbearing members.

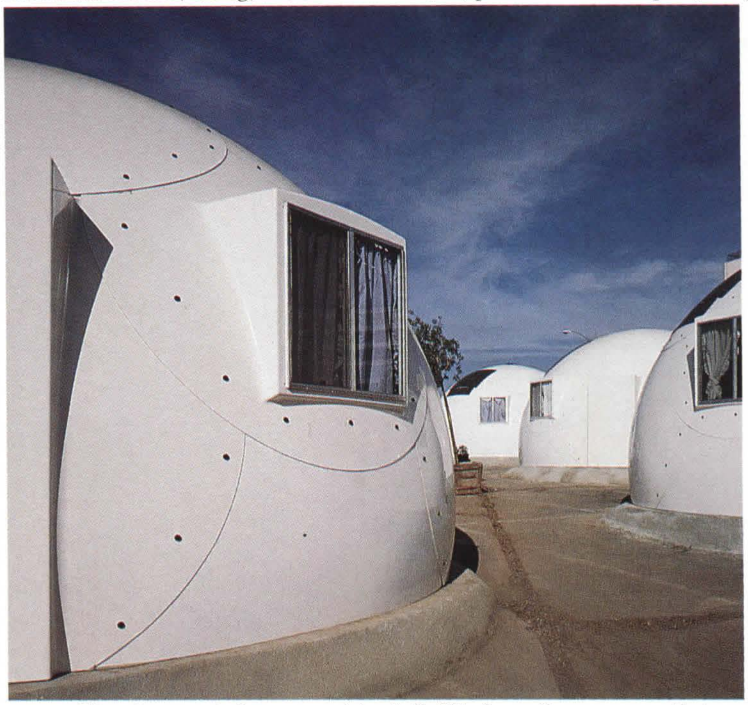
Their peaked roofs are designed to counter wind uplift and suction with the aid of Tensyl, an analytical, form-finding software created by the engineering firm Buro Happold, which is engaged in a joint venture with FTL. The computer software first accepts the determined coordinates of anchorages and enclosures and then optimizes the three-dimensional form according to probable wind and snow loads. Heavy rain caused the Gertrude Pavilion to leak the first day of the fashion shows, but otherwise the interior was kept agreeable. Generators along 40th Street pumped heat through fabric ducts to 18-inch-diameter vents attached to the tent walls. Circulation routes between the tents and the New York Public Library building were kept dry beneath walkways covered with fabric identical to the tent membrane.

The event's organizers remain enthusiastic about bringing back the tents for the fall preview fashion shows this spring. "We're trying to stretch the concept and work on fine-tuning for the coming year," notes Fern Mallis, executive director of the Council of Fashion Designers of America. Dalland attributes the structures' success to their utter simplicity, utility, and lightweight construction.—*B.M.*

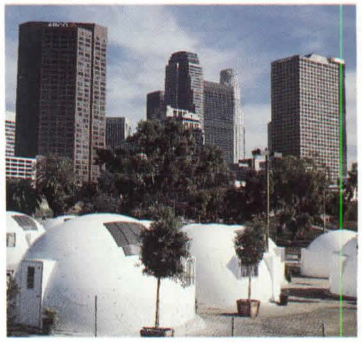
Geodesic principles are translated into flexible, temporary housing.



DOME PLAN: Kitchen, dining, and office module (left) provides collective space; living unit (right) divides into two rooms.



DOMES: Fiberglass panels form watertight shell. Windows allow cross-ventilation.



JUSTICEVILLE: 18 units at $6,500 each.

DOME INTERIOR: Subdivided living unit.

Domes House LA's Homeless

Buckminster Fuller's utilitarian vision for his geodesic dome is being exploited anew near downtown Los Angeles, where 24 homeless men and women recently moved into temporary structures inspired by Fuller's famous model. The tiny community of 18 domes is called Justiceville and was established by local activist Ted Hayes—not to provide permanent housing to the streetbound, but rather, Hayes contends, to offer them a means toward self-sufficiency. The domes, called Omnispheres, were designed by architect Craig Chamberlain, president of American Temporary Housing Corporation in Salt Lake City. Chamberlain developed Omnisphere prototypes in the late 1970s, while working with Fuller.

The Omnisphere's geometry is a disguised derivative of Fuller's geodesic domes. "The panels are still basically pentagons and hexagons," Chamberlain explains. "You can't see them, but they're there." But where Fuller's domes relied on orthogonal frames for support, Chamberlain's model employs a spherical geometry. The precise shape of the domes emulates a bubble or an eggshell, producing uniform tension when unstressed, and uniform compression when loaded.

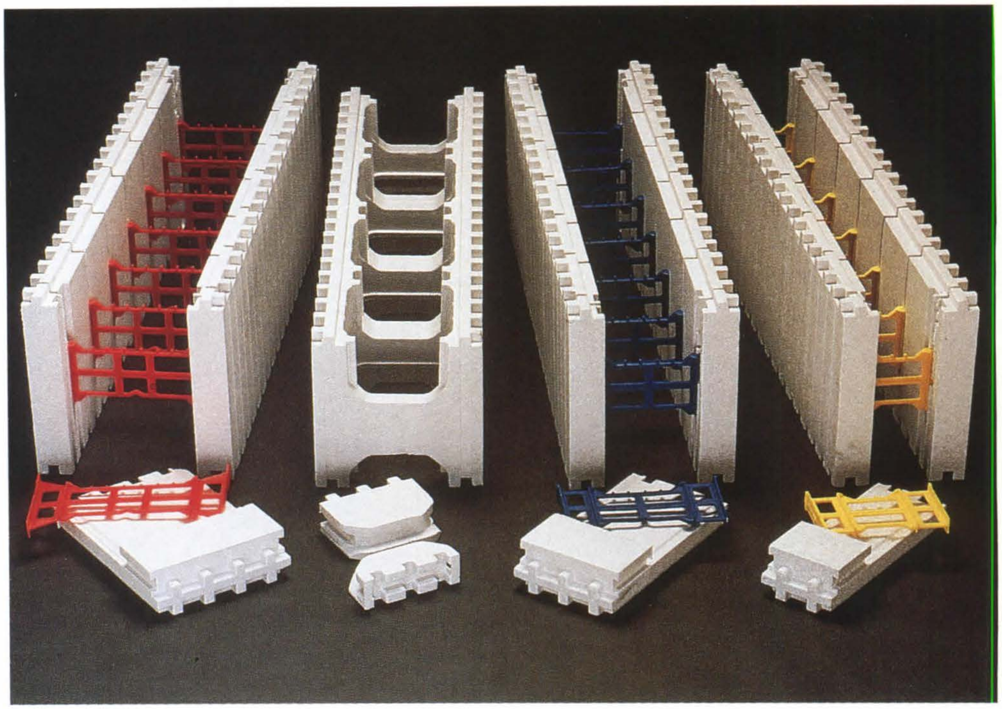
The structures measure either 14 feet in diameter and 8 feet high, or 20 feet across and 12 feet high. Their armor is constructed of 1/8-inch-thick molded fiberglass that achieves an R 2 insulation factor. The domes' outer surface is coated with a thin layer of polyester gel to resist ultraviolet radiation. Each closure comprises 21 panels, which are concave except for the placement of windows and doors.

Five flat-edged sections form the circular base atop a concrete platform. The remaining members are held together with rustproof nylon nuts, bolts, and gaskets to overlap the base in a downward direction: Water runs off; the interior stays dry; and the structure breathes through the shell's interstitial spaces. Modest amounts of electricity are generated by uncommonly flexible solar panels affixed with silicone to the domes' outer surface.

In the laboratory, the dome withstands dynamic wind loads of 80 miles per hour and static loads of 20 pounds per square foot (psf). Chamberlain claims that prototypes constructed in Alaska survive winds up to 160 miles per hour and bear 16 feet of snow at a combined pressure of 200 psf.—*B.M.*

Permanent Formwork

A new system for erecting concrete stays in place and incorporates insulation.



ABOVE RIGHT: Steel ties bridge interstitial space of permanent polystyrene formwork, which is joined and aligned by interlocking teeth.

Formwork is a necessary but wasteful aspect of concrete construction. At the end of a project, it is discarded, leaving the concrete to remain as a permanent structure. However, concrete and formwork no longer need be separate entities, as stay-in-place, insulated formwork is erected on increasing numbers of building sites. With this newly imported technology, formwork becomes part of a permanent structure.

Structural considerations

Stay-in-place formwalls were first developed in Europe, where some systems have been in use for 20 years. The various systems in the United States are conceptually similar: An assemblage of interlocking, lightweight, polystyrene panels or blocks is arranged on site in two parallel running bonds. These blocks, the most common of which measure 10 by 10 by 40 inches, offer great insulation value but little strength; however, the polystyrene wall created from stacking the blocks assumes structural strength once concrete and steel are placed within it. Steel ties bridge the interstitial space, and interlocking teeth keep the formwork in line and plumb.

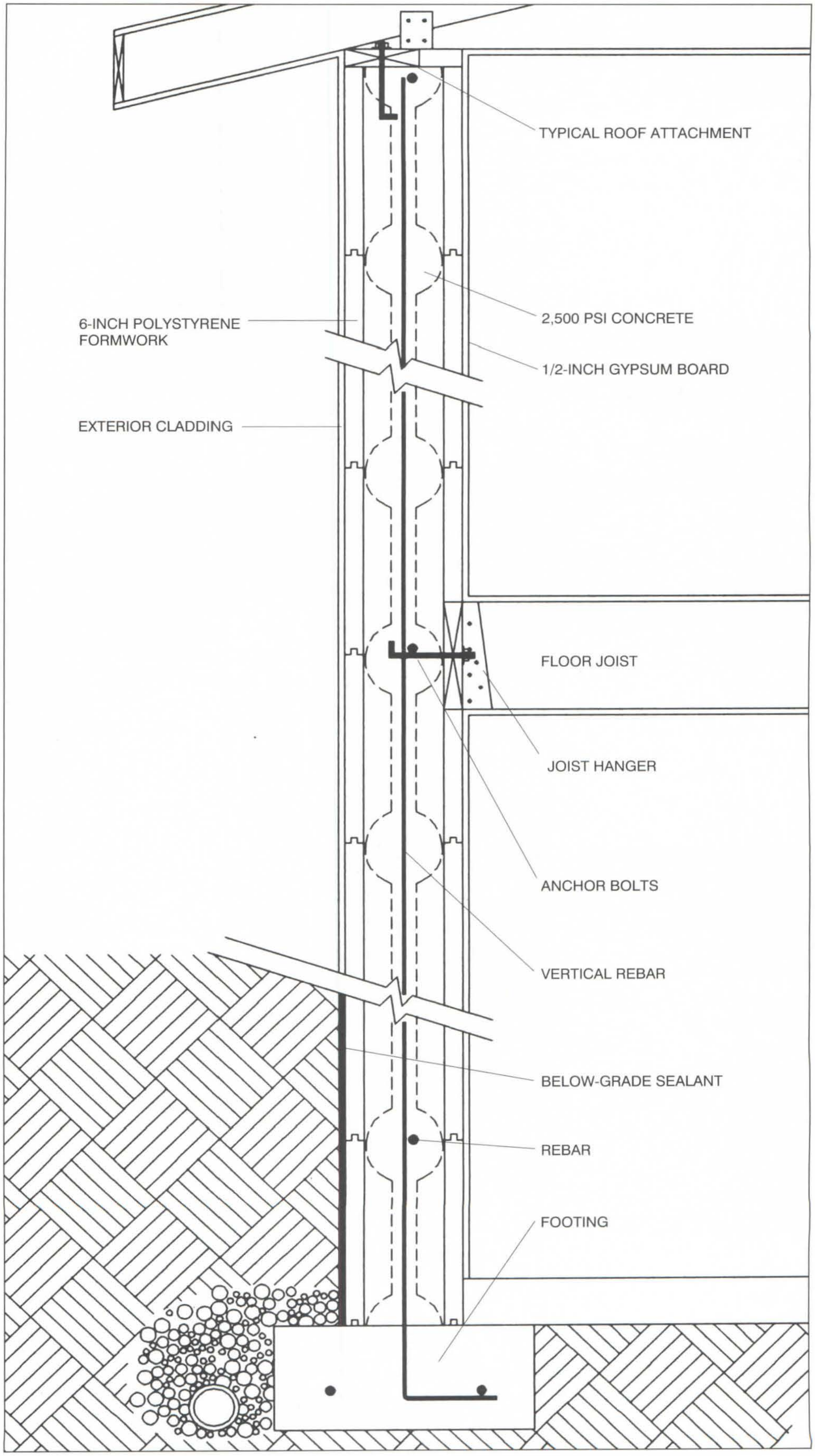
Stay-in-place forms still employ a traditional system of reinforcing, specified by the architect and engineer. A section through a stay-in-place poured wall and floor slab reveals the basic elements: A key and steel rebars tie wall and slab together. The result is a wall constructed of a polystyrene surface and a loadbearing concrete core. The two systems are linked by the thinnest measure of concrete (about 1/64 of an inch), which permeates the surface of the polystyrene. The stay-in-place wall has a greater compressive strength than conventionally formed walls, is thermally and acoustically insulated, and achieves a four-hour fire rating. Most stay-in-place systems are erected in nonresidential buildings as foundations, where they save time and labor over conventionally poured walls. The blocks are lightweight and can be cut with a handsaw. The forms require only a minimal level of skill to assemble and, once a crew is trained, are erected quickly. In some systems, if the formwall breaks or is improperly cut, it can be glued or taped back together before the pour.

Rick Emsiek, a principal of McLarand, Vasquez & Partners in Costa Mesa, California, incorporated a stay-in-place system for the firm's 1994 New American Home, which will be spotlighted during the National Association of Home Builders' show this month in Las Vegas. The system selected by Emsiek is fabricated in part from recycled polystyrene —old hamburger containers, coffee cups, and even discarded concrete forms.

System advantages

The great advantage of stay-in-place poured walls is their compressive strength, which manufacturers claim is 50 percent greater than traditionally poured walls of equal thickness. Because the insulated wall cavity controls hydration, water leaves the concrete

TOP: Insulated wall cavity modulates concrete's dehydration and thermal changes, diminishing risk of ruptures. **ABOVE:** Formwalls require minimal skill to assemble. Damaged portions can be repaired before concrete pour. **RIGHT:** Section through a typical wall constructed of stay-in-place formwork reveals steel ties and attachments.



at a slower rate, diminishing the risk of serious cracks developing. Moreover, the insulation inhibits both thermal expansion and contraction, further reducing fracturing.

When timber was plentiful and inexpensive, frame construction was the traditional choice of most builders for above-grade walls of residential buildings. Today, stay-in-place formwalls may prove to be a more cost-effective alternative. According to Tacoma architect William Parretta of the firm Austin/Cina Architects, the rising cost of lumber was enough to convince him to try the stay-in-place forms for above-grade walls. Parretta estimates the forms saved between $6,000 and $8,000 on an addition to the First Lutheran Church in Port Orchard, Washington. The permanent form saved more than lumber costs alone. "The walls gave us thermal and acoustic insulation," Parretta explains, "cutting the noise from a nearby road considerably." Parretta also credits the thermal insulation with reducing the size of his rooftop mechanical system, because "the walls gave us an R 22." The thicker stay-in-place forms were selected for all the perimeter walls except a small, cantilevered alcove.

Openings and curves

In most permanent form systems, openings in the building envelope are simply cut out of the blocks before the pour. The openings are then framed in lumber for a door or window.

Emsiek chose concrete after schematics were completed, determining where stay-in-place formwalls would make sense by examining the plan. "The product did not limit the design in any way," he contends. The architect did not limit the stay-in-place forms to foundation walls, but incorporated them into curved walls in the bedrooms, living room, and bathroom. The blocks are bendable, making curved walls easy to construct.

Most manufacturers of formwalls recommend that below-grade walls be finished with an exterior moisture barrier, since water degrades the insulating property of the polystyrene. If water penetrates the concrete, it can cause corrosion. Exterior walls must be finished, or water will degrade the polystyrene and, ultimately, the concrete. Both Emsiek and Parretta finished their buildings in stucco. Wood shingles or brick also make excellent exterior cladding. Brick can be applied to the surface of the formwall using a thinset mortar. Shingles and tongue-and-groove board are applied to the furring strips provided by the manufacturer. Interior walls are finished in gypsum board or stucco, and most stay-in-place manufacturers provide metal furring strips for sheetrock. Channels for plumbing and electrical wiring can be routed into the polystyrene, and conduit and electrical boxes are easily recessed.

Potential complications

There is no effective way to check for errors in a stay-in-place wall, because removing pieces of the formwall is impractical. While the concrete may only barely permeate the polystyrene form, separating the two materials often requires the help of a sandblaster. Any mistakes of the pour are usually revealed when the formwork is removed.

The chief disadvantages of stay-in-place formwork are misalignment and problems resulting from the consistency of the concrete mixture. "If you don't have the forms properly braced when you put the concrete in, you're going to have difficulty getting a straight, true wall," explains Alan Sparkman, president of DoubleStar Incorporated, a manufacturer of stay-in-place formwork.

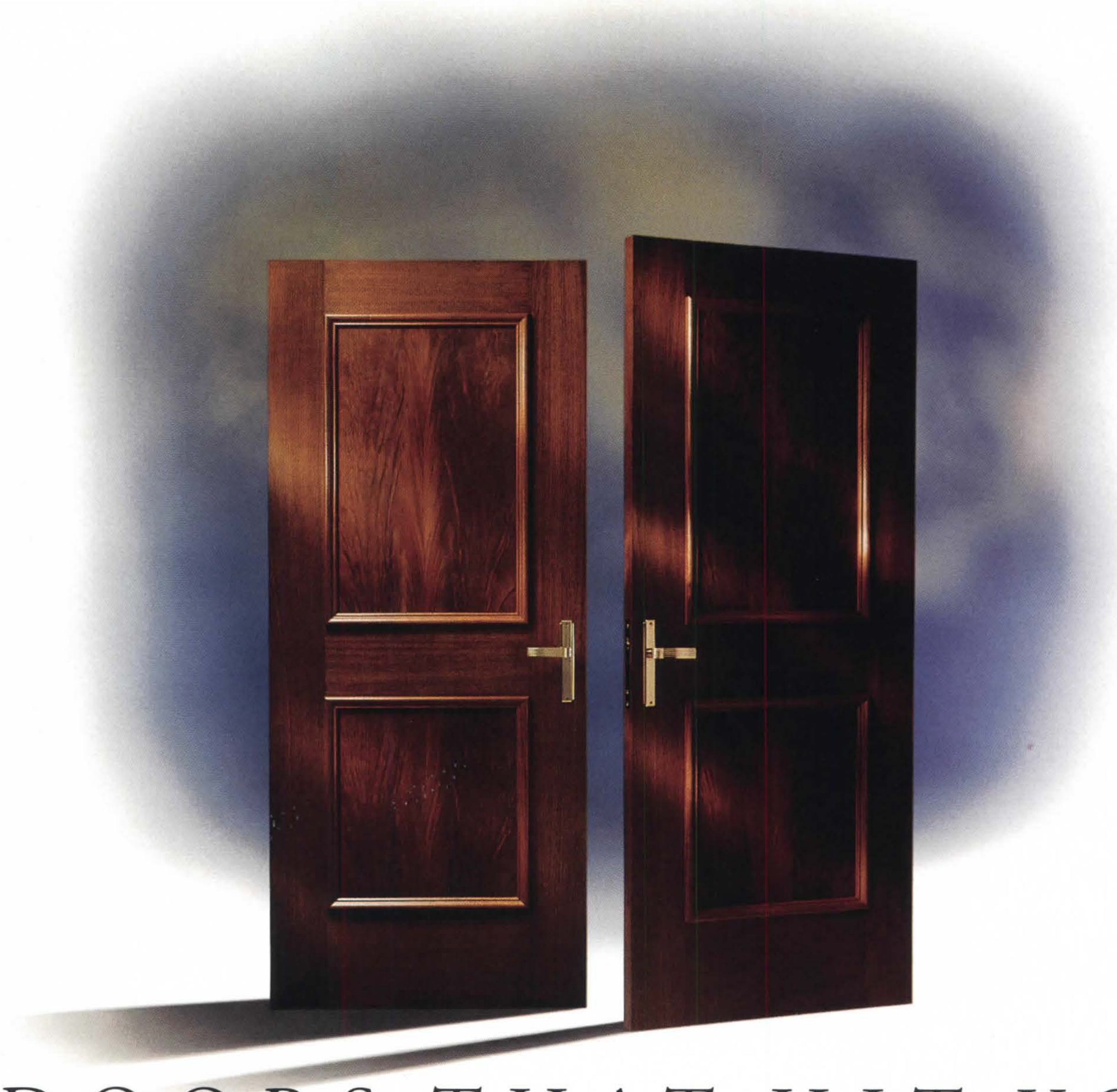
The other potential problem is under- or overshooting the slump of the concrete mixture. Sparkman places the ideal slump for stay-in-place formwork at about 4 or 5 inches. Ruptures or blowouts can occur as the concrete cures, but such problems usually stem from mixtures that are too dry or too wet. The foam will pop out from between two metal fasteners. "You will lose concrete, but you won't lose nearly as much as in conventional pours," asserts Sparkman.

While timber frame construction remains a strong tradition in the United States, Dan Mistick, residential program manager of the Portland Cement Association, is heartened by his experience with builders who are trying stay-in-place formwork for the first time. "Once contractors discover it really is easier to use, they are converted, along with electricians and plumbers, too."

Ultimately, the acceptance of stay-in-place formwork will be hastened by the price of lumber, which rose 37 percent last year. As traditional timber frame construction becomes less economical, builders and architects will likely switch to stay-in-place forms. And as there is no shortage of used polystyrene, the cost of stay-in-place formwork should remain stable. As more architects learn about the material, manufacturers expect its application in commercial and residential projects to grow.—*Barry Abrams*

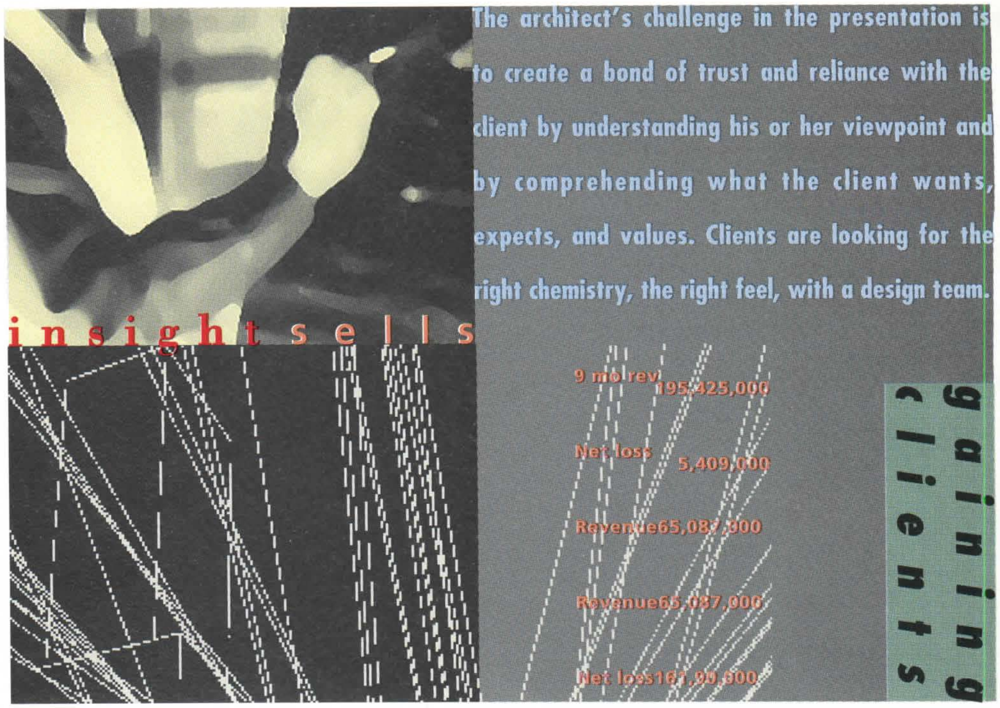
Barry Abrams is a landscape architect and writer based in New York City.

TOP: Openings in formwall are cut before concrete pour and are then framed to create doors and windows.
ABOVE: Interior formwalls can be finished in gypsum board, stucco, or sheetrock fastened to furring.



Preparing a Presentation

To win a client, architects must practice the three Rs: research, rehearse, and relax.



The client made the decision as soon as the design team entered the conference room. The sight of each team member wearing identical blue blazers, blue shirts, and gray pants immediately convinced the selection panel that this wasn't the team for their project—even before the members of the team introduced themselves.

Such a reaction is natural, as presentations are an intuitive process: The client's selection is ultimately based on subjective factors. When hearing presentations, clients look for the right chemistry with a particular design team. The issue of qualifications has already been settled; those who make the short list are presumed capable of doing a good job. At the interview stage, the client's main question is: Which team feels best for us? This is the client's chance to get to know each of the teams, see how they could work together, and then decide with which one he or she feels most comfortable.

Building a relationship

For the architect, the ultimate purpose of the presentation should be to show the humanity of the project team, says Adam Gross, design principal of Ayers Saint Gross of Baltimore. "We want to show the panel what our values are, how we work and communicate, and what it will be like to work with us."

The architect's challenge is to create a bond of trust and reliance with the client by showing an understanding of his or her point of view. This ability is demonstrated by thoroughly comprehending what the client wants, expects, and values. Then the architect can communicate clearly how to satisfy those demands and desires.

The first step in building a client relationship is learning about the client's project, people, and organization. Clients look for signs of effective research; the teams that do the best homework usually are the ones who win the job, asserts Jeff Gingold, president of PMLA, an architectural project management consultant in Los Angeles.

First, learn about the project. Nothing reassures a client more than the feeling that an architect knows more about the project than he or she does; and nothing turns off a client more than the sense that the designer is speaking from less-than-complete knowledge. Learn what's being built, why, and where—and what it says about the organization.

Next, learn about the client's selection panel and process: Who is on the panel? What are their responsibilities? What type of people are they? What is likely to interest and concern them? Who will make the final decision, and how will it be made? Finally, learn about the organization's vision, plans, expectations, and values. Study the challenges of its industry or specialization.

Such intelligence comes from many sources, for instance, consultants who have worked with this client, suppliers, bankers, real estate developers and brokers, and even competitors. Talk to accountants and attorneys who have done business with the client.

A Self-Evaluation for the Presentation Team

Research

Is this client and its project appropriate for our firm? Why?

What do we know about the project: the site, the program, the budget, the schedule?

What do we know about the people involved in the selection process, the selection criteria, and the process itself?

What is the client's perception of us? What do they want to see, feel, and hear in the presentation? Who is our competition?

Delivery

Does our presentation team include key project people?

What key points do we want to make? Do we know what we will say, how, and when each of us on the team will say it?

What is the best way to communicate our key points? What supportive material, including visual aids, can we provide to reinforce these points?

Are we adequately addressing their needs and concerns in their language? Are we properly translating our own?

Have we rehearsed enough that members of the presentation team can comfortably play their respective parts spontaneously and enthusiastically?

An obvious but often overlooked source of knowledge are people inside the prospect's organization. Also, trade associations and journals should be checked to learn about major issues facing the industry. Annual reports and newspaper and magazine articles can supply the talk of the client's trade. Show clients that you know their vocabulary.

Information on the competition also is helpful, suggests Jay Sleiter, principal of BWBR Architects in St. Paul, Minnesota. Sleiter uses his knowledge of competitors to determine how best to portray his firm in light of the competition's perceived strengths and weaknesses. Use this information carefully, he cautions, as you don't want to be seen only as reacting to the competition.

Treat the homework on the client like detective work, recommends Michael Welch, a trained architect who is president of Hardball Marketing in Los Angeles. Before a presentation for an interior architecture project involving complex computer installations, Welch first talked with the prospect's marketing director and data processing manager to learn about their growth plans and equipment requirements. In a phone conversation with the supplier of the firm's computers, he discovered that the additional volume of data could be handled by upgrading the prospect's existing system rather than purchasing new equipment. Welch used this information in his presentation to show how the prospect could both save money and get a better design. Welch's two hours of research time paid off. His firm got the job.

Chemistry and charisma

Welch's strategy helped spark favorable feelings between him and the client during the presentation—that chemistry plays a key role. Because the presentation is the primary way to assess the strengths of the team, the client wants to see and hear from those who will be doing the work, especially the project manager. This aspect of the interview is so important, asserts Bill Simms, senior vice president of Walt Disney Imagineering in Florida, that members of Disney's selection panels often interview design team members one-on-one to gain a better sense of a firm's individual strengths and capabilities.

Also important is the way the design team members interrelate in the presentation. Richard Benedict, manager of architectural services for Corning Incorporated of Corning, New York, describes two project presentations. The first team was led by a principal who clearly was a strong, charismatic leader;

the second was led by a senior partner acting as team leader who was co-equal with his team members. Team two was selected because the panel felt the team concept resonated more closely with Corning's values.

Develop strategies to connect the firm's ideas to those of the client, who wants to know what's in it for them, maintains presentation consultant Susan Thompson of SpeechPower in Seattle. The presentation team should ask itself that question from the client's viewpoint to understand what value and benefits the client can expect from the firm. This exercise also focuses your message on points of greatest interest to the client.

Commonality between architect and the client is an asset. For example, Neil Frankel, senior vice president of Perkins & Will in New York City, will underscore similarities between his firm and the client: whether they have offices in the same city, whether they both started in the Midwest, and so on.

Capitalize, too, on the appeal of your firm. David Hoffman of Law Kingdon, an architectural firm in Wichita, Kansas, reinforces positive perceptions that the client may carry toward his firm. For example, if Law Kingdon is perceived as the local firm, he emphasizes the advantages of architects who are familiar with and committed to the community; if the firm is seen as an outsider, he focuses on the value of its expertise.

Tailor your material

This advance scoping strategy calls for a play-by-play plan by which you'll run the presentation. This script should identify the key messages the firm will deliver and should define the part that each member of the presentation team plays. It also should indicate what each person says and when, while leaving enough room for spontaneity.

In developing the presentation and script, consider the audience's capacity to absorb information. According to Frankel, the attention span for a presentation solely of slides is 15-20 minutes; using a variety of media such as slides, charts, and models can hold people's attention for about an hour.

The presentation should be appropriate to the circumstances of the decision, adds Frankel. For urgent decisions that will be made within a day or two, the presentation should focus only on a few key issues, be more direct and less subtle, and use visual material that requires the audience to do less work. If the decision will be made over a longer time, the presenter should expand on background and supportive information.

Rehearsing the presentation is important. At least three practice sessions should be conducted. During the first session, the design team reviews information on the client, sets presentation goals, and determines the approach. Then the group defines each presenter's role. In the second session, the strategy is tested, and people assume their roles. The third session is a full dress rehearsal. This session is videotaped, and everyone has a chance to review and critique performances.

Practice will reinforce a good attitude and allow the team to relax, which will help create the chemistry to woo the client. An imperious attitude is a sure road to rejection, and you'll likely lose the job if you act overconfident. Respect the client's time and attention. Treat every interview as an opportunity to develop your relationship. Listen with the intent of understanding when interacting with the client. Don't dismiss the client's ideas; address them thoughtfully before offering alternatives. Don't talk about problems and constraints; speak of opportunities, solutions, and possibilities. Convey knowledge and experience in a way that signals interest and enthusiasm toward the client's needs.

Be courteous

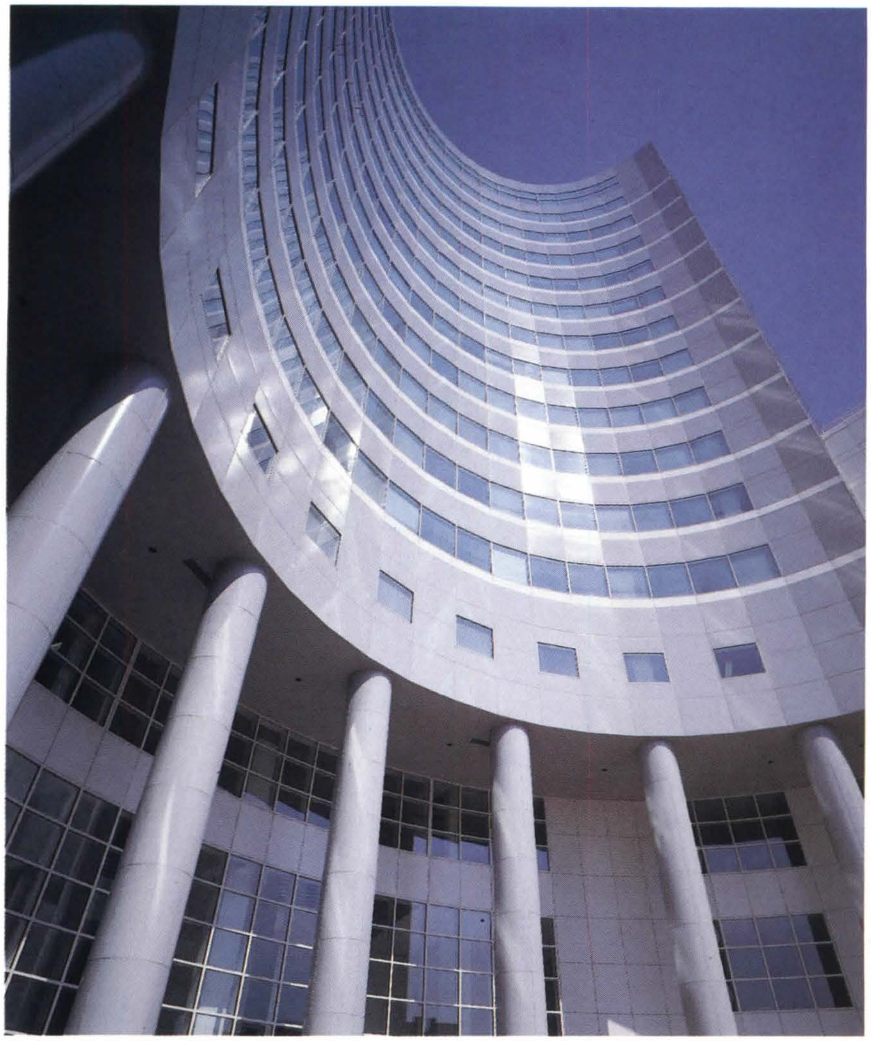
Most of all, successful presentations depend on common sense and courtesy. Sometimes these valuable qualities are lacking. For the presentation by a well-known design firm for a $92 million data center being built by Southern California Edison Company, the CEO sat in on the selection process. It was bad enough that the lead partner's presentation was monotonous and boring, but when the architect fell asleep right after he was finished, the firm's fate was sealed.

Preparing an outstanding presentation requires time, effort, and energy. Successful firms are selective and search out the opportunities that are best matched to their strengths and interests and then take the time to do them properly. This approach pays off: Frankel of Perkins & Will reports a 62 percent success rate from presentations last year due to the firm's selection strategy.

Even when a firm is choosy about competing for work, one variable remains that cannot be controlled: the client's personality. But if presentations are understood as an interpersonal communications process, steps can be taken that will improve the chances of winning the commission.—*Norman Kaderlan*

Norman Kaderlan is a management consultant and free-lance writer based in Los Angeles.

Develop strategies to connect your ideas to the client's. Formulate a play-by-play plan for the presentation; keep in mind the audience's capacity to absorb information. Match the material to the circumstances of the decision: If urgent, go for impact; if longer, expand information.



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Circle 126 on information card

Increasing Profits

Making money requires the right fee, internal controls, and thinking like a client.

Many architects are neither trained nor experienced in business practices and passively accept that unprofitability is the nature of the profession. Increased competition among the growing number of architects—and among related professionals such as engineers, design/build outfits, and contractors—has led some architects to slash their fees, absorb the cost of quality design, and allow internal controls on projects to deteriorate.

Such a lack of business savvy has led clients to regard architectural services as a commodity for which it is easy to find substitutes. "Architecture isn't regarded as being as critical as law or medicine," observes Robert Gutman, visiting professor of architecture at Princeton University and author of *Architectural Practice: A Critical View*. "Unless you're doing a monumental building where design considerations are important," Gutman adds, "a lot of the work architects do can be done by other professions."

Profits on the rise

The blurred boundaries between architecture and related disciplines have kept profits teetering in many firms because the value of architectural expertise has become unclear. But smart firms have grasped that their profitability is tied directly to the value of their service and that the ability to provide top-flight service relies on practice advantages made possible by healthy profits. This realization has prompted some firms that have been experiencing unsatisfactory earnings to reclaim lost ground with their clients while strengthening their bottom lines. For many of these newly profit-conscious firms, profit margins are on the rise.

A recent profitability survey of 141 architecture and engineering firms by Chicago-based Birnberg & Associates/The Profit Center suggests a slight rebound in profits for the fiscal year that ended in late 1992. Additionally, an economic survey conducted by the AIA last November found that 48 percent of the 300 architecture firms polled nationwide reported that their gross revenues had increased. Revenues held steady in 26 percent of firms surveyed and declined in another 26 percent of firms.

According to the AIA, most firms reporting increased revenues were firms with 50 or more architects; however, the percentage of firms of four or fewer architects reporting increased billings was above the national average. Midsized firms indicated increases below that average. AIA's findings discourage parallels between firm size and profitability while reinforcing the idea that performance is connected to a firm's critical mass of employees.

The Birnberg study reports an increase in profits of 1.1 percent on gross revenues, to 6.7 percent. Average profits on net receipts increased to 8.5 percent, from 7.0 percent reported the previous year. Related vital signs improved as well in the Birnberg survey. Overhead rates dropped, and indirect costs such as rent and utilities dropped from 153 percent of direct labor dollars to 149 percent. Firms' average net multiplier rose to 2.79, from 2.70 the year before, meaning that for each dollar of direct labor, the average firm earned $2.79. The average collection period for fees dropped by 1 day—to 68 days. In 1988, the typical collection period lasted 77 days. It took longer to collect the money, but architects made more: Profits on gross revenues in 1988 were 8.1 percent; profits on net receipts totaled 9.0 percent.

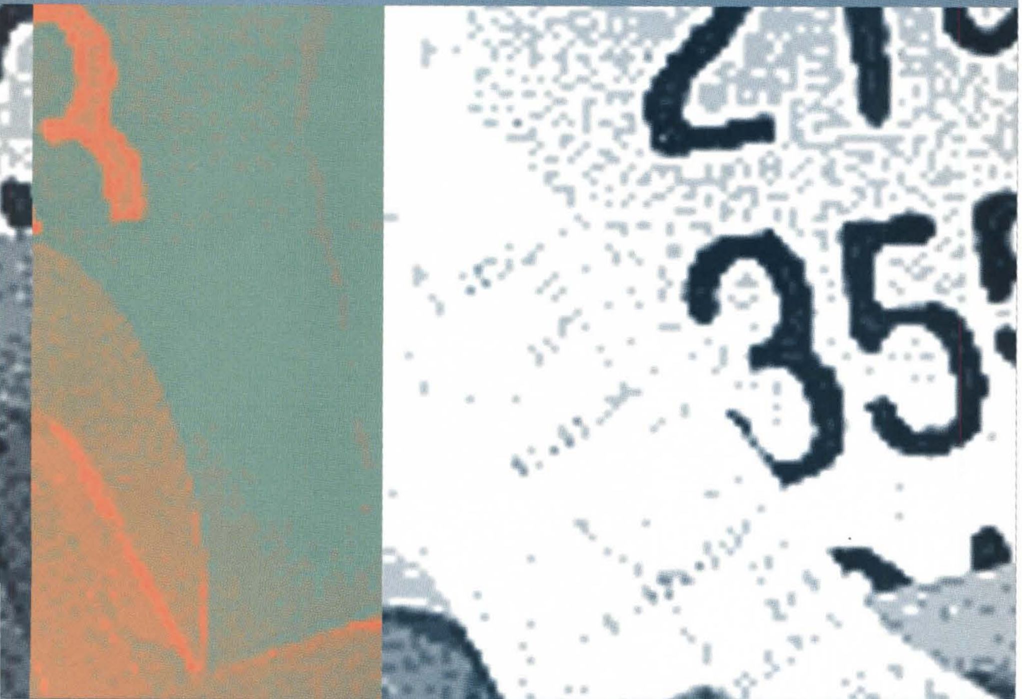
If revenues and profits really are improving after a five-year slump, it is because principals have grown weary of running on slim margins or, provisionally, on losses. When profits are low, a firm cannot reinvest in its practice—in new equipment; larger space; and competitive salaries, bonuses, and benefits for talented staff. The firm can't afford to take educated risks, such as entering design competitions or accepting a lower fee to gain experience in a new building type. And without a profit, a firm can't control its direction; it can't consider strategic acquisitions, take equity in a venture project, or finance its own transition. Without profit, an architecture firm remains stuck in a holding pattern.

Recognizing these problems, principals of some architecture firms have aggressively reconstructed their means of practice and service to put profitability back at the center of their goals. They have reasserted control over project scope, overhauled project tracking methods, and adapted fee structures to maximize potential earnings. Some principals have learned to create their own revenue opportunities rather than react to what the market offers. Most importantly, architects are taking control of project negotiations with clients by focusing on value rather than cost.

Value-based budgets

"If the client really understood what the value of the service is, the cost would come along as easily as anything else," contends Scott Simpson, president of Flad & Associates, based in Madison, Wisconsin. What clients dislike most, Simpson points out, is overpaying for service. Thus, after listening carefully to the requirements of a proposed project, Simpson asks the client one question: How much money do we need in this contract for us to do a good job for you? The answer indicates the client's level of expectation for the job. Once Simpson knows what calibre of project the client demands, he maintains, completing the math is easy.

The resulting project budget always allots a profit for Flad. If, for example, the client



Survey of Financial Indicators

Profit on revenues before reimbursing consultants

Year	Percent
1993	6.7
1992	5.6
1991	7.1
1990	7.0
1989	8.1
1988	8.1

Profit on revenues after reimbursing consultants

Year	Percent
1993	8.5
1992	7.0
1991	8.6
1990	8.7
1989	9.3
1988	9.0

Overhead rates

Year	Percent of direct labor
1993	8.5
1992	7.0
1991	8.6
1990	8.7
1989	9.3
1988	9.0

Net multiplier

Year	Times direct labor
1993	2.79
1992	2.70
1991	2.80
1990	2.75
1989	2.80
1988	2.71

Statistics based on 141 firms surveyed in 1993 financial performance report by Birnberg & Associates/The Profit Center.

envisions a $10,000 job, but only offers $8,000 for the work, Simpson chooses from three options: "Number one is to say, 'Thank you very much. I'd love to work for you, but I can't.' Number two is to take the project and absorb the $2,000 difference and call it a marketing cost. Number three—and this is the really interesting choice—is that I reinvent my methods of service or delivery to bring in the job for $7,000, get $8,000, and that's where my profit comes from."

To ensure a profit, architects should always negotiate from the client's point of view, contends Simpson. "That gives you the power to say to your client, 'I don't care what you pay me. I only care that I have enough money in the budget to do a good job for you,'" he says. This appeal keeps the client focused on ordering high-quality architecture, and "this adversarial question about the fee goes entirely out the window."

Practitioners anxious about securing work may think project negotiations are too fragile to withstand their own commitment to making a profit. They fear that clients will think it ignoble to insist on a margin for themselves. But Simpson argues that clients prefer profit-minded professionals because clients themselves are business-oriented. "Clients have to make money. They've got staff; they've got overhead; and they want to deal with somebody who can speak with them in their own language," he declares. "By coming across as not profit-motivated or financially unsophisticated, architects are giving exactly the wrong message to their clients."

Hourly fees

Many architects dissatisfied with their earnings also find they must configure their fees to reflect the complexity of projects they're designing. Many architects have begun to steer away from fixed fees toward more commensurate hourly contracts.

"We got caught on fixed fees for residential work," recalls Julie Eizenberg, principal of Koning Eizenberg Architecture in Santa Monica, California, "so we never made money on a residential project." Now the firm charges hourly fees for residential projects, with a fixed price for working drawings. That open-ended hourly fee structure helps the firm continue to make money even as the client changes its mind, which is not possible under a fixed fee. "It also allows a client who's clear about what they want to save some money," adds Eizenberg.

Hourly fees should be constructed to guarantee that the architect reaps a profit from the project. Amy Weinstein, principal of Weinstein Associates Architects in Washington, D.C., charges an hourly rate to about half of her clients, that is, whenever possible. Weinstein's profit margin is built into the hourly rate. "If you're able to bill every single hour that you worked on the project—because it's not a set fee, and you don't go over budget—then you really don't have to worry about making a profit, because at the end of the year, what's left over *is* profit," Weinstein explains. "If you can get contracts on an hourly basis, as opposed to lump sum," she adds, "then you don't have to do all that year-end planning," or attempt impossible stretches with precious cash.

Splitting the fee

James Franklin, professional development specialist with the AIA in Washington, D.C., urges architects to issue a "memorandum of scope" when settling a contract with a client. The memorandum should furnish a comprehensive list of what the client may wind up paying for, noting which work will be billed by the hour, as well as those parts of a project that will apply to any lump-sum payment. Commonly, Franklin notes, an hourly fee will be charged through a project's schematic phase—often including construction administration—with a lump sum for the remainder of the work involved in the project.

Hourly fees generally are the privilege of smaller firms. Some clients, such as government agencies, won't consider them at all, preferring a predetermined percentage of the construction costs as the fee. Charles Redmon, managing principal of Cambridge Seven Associates in Cambridge, Massachusetts, notes that his firm began an innovative approach to fees when designing the National Aquarium in Baltimore. "Baltimore had a very narrow view of what fees would cover and what they should be," explains Redmon. "They had fees for buildings and then fees for parking garages."

Cambridge Seven's solution was to split the aquarium fee into three parts. After explaining the complexity of the building, Cambridge Seven charged a basic fee for designing the aquarium shell. Then the firm charged a second fee for outfitting the building with an aquarium infrastructure. The third fee was based on a contract for specialty items on the interior: exhibits, furnishings, and equipment. "Our approach to fees was to package them in a way that the client could understand—but also to justify a vote in city council," Redmon recollects. "When you

Architects are taking control of project negotiations with clients by focusing on value rather than on cost.

added all the numbers, the fee was about five times what it would have been for the full building at one fee. We didn't make five times as much money, but we did make enough so we could do the job and earn a fair profit, rather than lose our shirts."

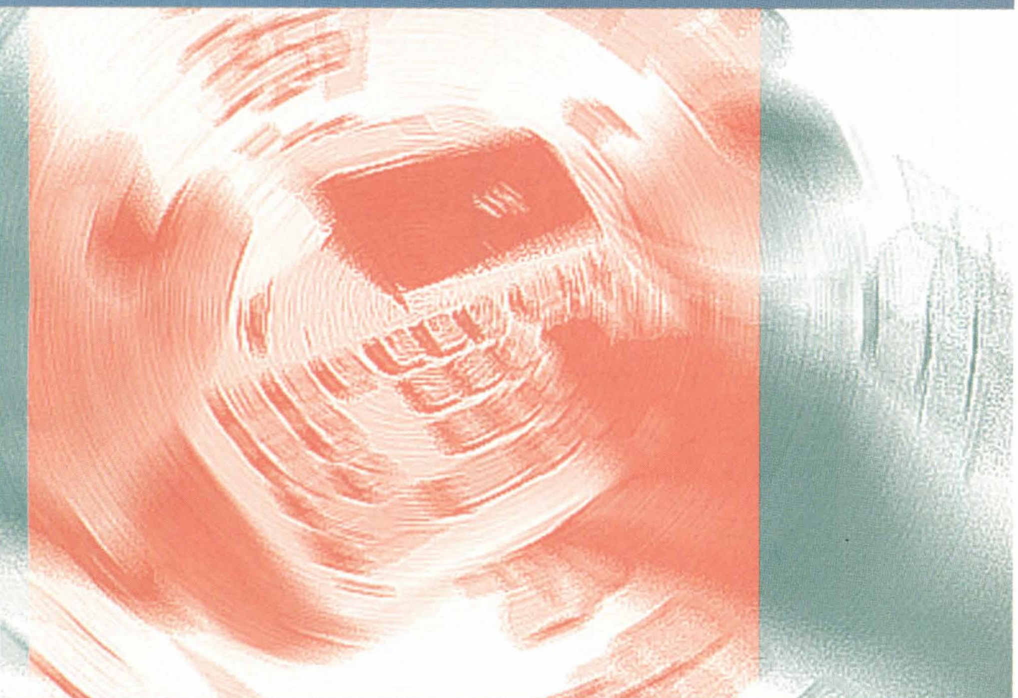
Creating opportunity

In designing its signature aquariums, Cambridge Seven also spotted an opportunity for ancillary revenue. After its Baltimore project, the firm found itself providing a substantial amount of start-up consulting to other aquarium clients. "With an attraction being created out of thin air, there's no organization to manage it," notes Redmon. "We did a couple of jobs where we gave advice and did a lot of coordination work, such as finding specialty exhibition materials and hiring management staff for the new facility. And then we said, 'Why don't we get paid for it?'"

In 1990, Cambridge Seven founded an affiliate company called International Design Associates for the Environment to provide the extramural aquarium work. "It's created a new kind of profit center for us," Redmon adds. "Aquariums make sense for us in terms of profitability because we're able to deliver a wider range of services than a traditional architect would." This strategy pushed Cambridge Seven's profitability close to 20 percent of net earnings for two years in a row in the late 1980s, according to Redmon.

Another firm that creates opportunities for work rather than wait for them is Thomas Harley Architects, in Indiana, Pennsylvania. Tom Harley, the firm's sole proprietor, keeps his firm profitable by "finding out about projects before they happen." Harley spots industrial buildings that are ready for rehabilitation, approaches the property owner, and asks whether he may buy an option on the property. He funds the front-end costs of prospecting himself, such as feasibility studies that may be required to build on the site. Harley also researches grant opportunities or enterprise-zone incentives to develop the parcel. While many architects in his region are worried about a lack of work, Harley counts 195 projects in progress at his firm. He eschews the conventional request-for-proposal (RFP) system, on which many of his colleagues depend for new jobs. "It costs \$2,000 to answer an RFP," Harley points out. "If I took that and advanced it to a developer, I get a \$1.5 million job, and we can keep our front-end costs down to \$500."

Harley shepherds a lot of small projects through his firm, but meets a multiplier



Survey of Financial Indicators

Changeable ratio or utilization rate

Year	% hrs charged
1993	63
1992	62
1991	65
1990	62
1989	63
1988	66

Average accounts-receivable collection period

Year	Number of days
1993	68
1992	69
1991	69
1990	67
1989	69
1988	77

Where the overhead dollar goes

Payroll	27%	Legal accounting	2%
Indirect labor	25%	General insurance	1%
Cost of space	10%	Debt charge-offs	1%
Marketing	9%	Training/education	1%
Supplies	4%	Telephone	1%
Liability insurance	4%	Interest	1%
Computer costs	2%	All other	10%

Statistics based on 141 firms surveyed in 1993 financial performance report by Birnberg & Associates/The Profit Center.

between 2.5 and 3.0, which results in a profit margin of about 25 percent. This high profitability is due not only to Harley's initiative in finding work, but also to the precision he demands in his financial dealings with clients. While some architecture firms gamble on sending incomplete or incorrect bills to clients just to ship them out, Harley will tolerate only 100 percent accuracy in billing. "I will not issue a bill unless it's right," he asserts. "If it's right, I get a check. If it's wrong, I get a phone call"—followed by the client's delay in sending payment. Yet the architect still insists that bills go out quickly. It formerly took two weeks to bill a client for work. Now, equipped with a software system called MacArchitect, he has the project accounting and billing cycle down to two days. "We give clients the wrong impression when we don't get the bills out there for two or three weeks," Harley observes.

Internal controls

Siegel Diamond Architects, a small firm in Los Angeles, also has turned more serious about patrolling its ledger and hewing to time budgets, having recognized that project fees were evaporating during the design process. After seven years as a partnership, "we only recently got our books to where we know how we're doing on a project," admits Katherine Diamond, design principal. "We got tired of losing money."

Now, at the outset of a project, Siegel Diamond budgets the hours available to complete each phase of the job, which depends on the fee and the project's complexity. Once the work begins, the principals compare the time sheets against the time budgeted for each job. The system helps especially on smaller projects, Diamond maintains. "When you're working on a $1 million or $2 million project and you have too many people on it for two weeks and they're not working productively, you can eat up a quarter of your schematic design fee."

The improved tracking format prevents such crises, Diamond adds: "I'm very aware of who's turning out work in the allocated time frame. We are also terribly open with all our staff about the nature of the contract, the fee, and the number of hours we have to do a job. The senior people help put together those time budgets, so they have to buy into them as their responsibility." Such tighter controls have helped Siegel Diamond survive the currently depressed California market.

Harry Weese Associates, a Chicago-based firm, also tracks the status of project budgets with a mind toward profitability, but it uses a sophisticated computer system. The tracking allows architects to keep tabs on their progress by referring to a project multiplier, a number that shows the amount of money generated by each hour of direct labor registered on their time cards.

"We're trying to show people that their individual job affects the total profit result," Principal George Vrechek explains, "and the multiples of time-card [hours] are the fewest numbers we can give architects to keep them focused on how we're doing." To figure the firmwide multiplier, which has a target of 2.7 (meaning that $2.70 is generated from each dollar's worth of work), Vrechek computes the average of all the projects in the firm in descending order, as well as all projects under the supervision of respective principals.

Each month, Vrechek analyzes those same numbers to create a monthly profit-and-loss statement, which supplies enough intelligence in ample time to head off any fiscal emergency. "The multiplier you use and all the rest is not as important as getting timely, accurate information," Vrecheck advises. Sixty percent to 70 percent of Harry Weese Associates' work is based on a limited fee, either a lump sum or a finite hourly rate. "So we've got to be comparing the budget versus the marked-up actual [fee] all the time to stay within the limits," Vrechek remarks.

Planning for profit

Flad & Associates, while working to bolster the architecture firm's value in the minds of clients, also has revamped its practice to tie the performance of project teams to the firm's profitability. Staff architects cannot bill their time without pinning the hours to a project number. Project numbers are issued by a dedicated computer, which also submits a draft budget with the project code.

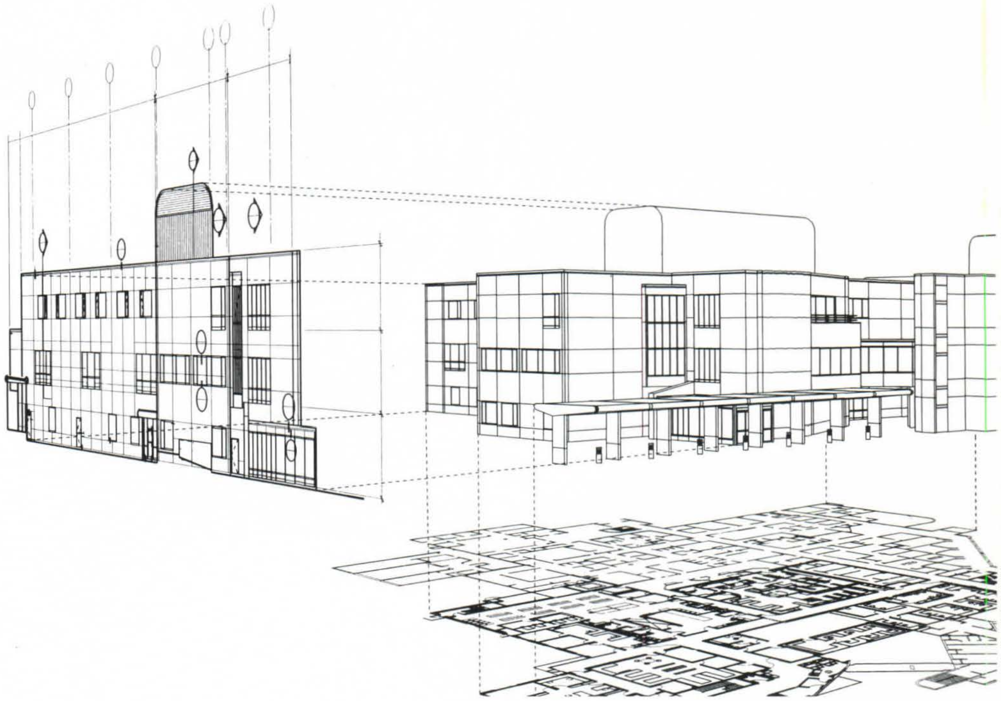
"We've made it very simple to understand how much money's available to do a job," says Scott Simpson, and the effort has proved successful. In 1992, Flad & Associates' profits stood at 6 percent of gross revenues and were projected at 8 percent for 1993. Simpson's goal for the architecture firm is 10 percent profitability by 1995.

"Making a profit in this business is really pretty simple," Simpson declares. "Spend less than your fee." Architects, Simpson advises, have to plan for profit the way they plan for employee salaries, overhead, or any other expense. "Profit is not what's left over at the end of a job," Simpson avers. "Profit is a cost of doing business."—*Bradford McKee*

Principals of a number of architecture firms are now reasserting control over project scope, overhauling their tracking methods, and adapting flexible fee structures to maximize potential earning power.

Extracting 2D From 3D

Architects are developing working drawings from electronic 3D models.



ABOVE: Meridian Hospital by Yost Grube Hall was studied thoroughly in 3D before construction.
ABOVE RIGHT: Working drawings of Meridian Hospital were developed from plan and elevation projections extracted from the 3D model.

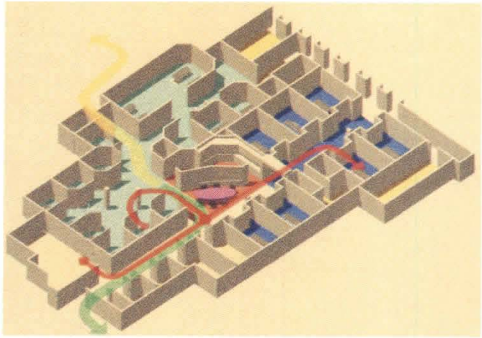
The future of building technology may lie not in the automation of traditional practices, but in the reinvention of design communications. In contrast to drafting systems, which document a building as a disjointed series of 2D drawings, newer CAD systems make the 3D model central, and 2D drawings of different views are simply projected from this single model. Ideally, the model is part of a complex database containing everything known about the building, such as specifications and construction scheduling. Although most popular software falls short of this ideal, architects are already taking advantage of existing technology to design in 3D and extract 2D drawings from 3D models. This process improves coordination between drawings and reduces time required for drafting. Some architects are also replacing traditional plans and elevations with isometric working drawings to improve construction communications.

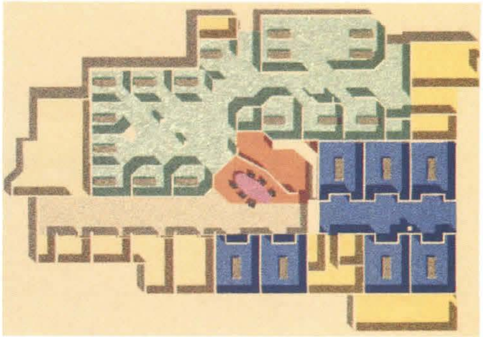
In the 1970s and '80s, John McIntosh, now a professor of architecture at Arizona State University, developed his doctoral dissertation at the University of Michigan on the idea of an integrated building database that would contain a geometric representation plus the basis for quantitative analysis. "In an architectural office," he observes, "the automated drafting system is a metaphor that explains a new process in terms of an old one and eases the transition. Ultimately, the old metaphor must be discarded, as was the 'horseless carriage,' if the impact of the new technology is to be fully understood. Inevitably, something completely different begins to happen when a new medium is introduced into an institutionalized process, like the practice of architecture."

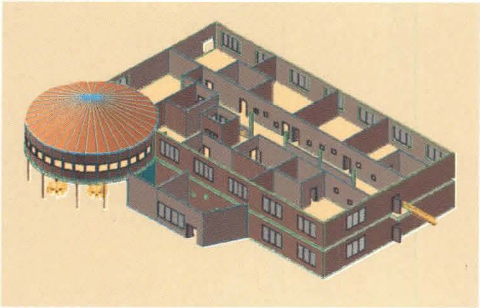
Model as database

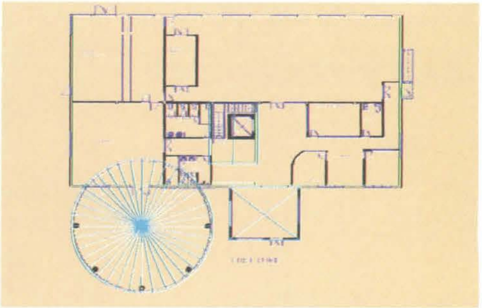
One future scenario, according to McIntosh, might include an electronic model that evolves continuously throughout its life. It begins as a compilation of statistical data and spatial requirements and acquires geometric and building-product data during design. This information is transformed into a timetable for construction, then an as-built document for facility management, and finally an archive for historians. Prototypical software created by McIntosh and his colleagues at Michigan demonstrated the ideas, but hardware and time limitations prevailed. Only now, 15 years later, such integrated database features are beginning to appear in commercial software in the United States.

When a 3D model forms the core of a building database, 2D drawings can theoretically be extracted by the computer rather than drawn by a person. But this process is difficult unless the 2D and 3D software are specifically designed to mesh interchangeably. For one thing, a real building is geometrically more complex than an extruded floor plan. Also, drawings are heavily laden with ambiguous graphic conventions that architects learn to understand from their context. Many such conventions were invented









TOP LEFT AND RIGHT: Architect James Lennon developed presentation drawings for a hospital in form-Z. Even Lennon's floor plans are bird's-eye view renderings of a 3D model, showing shadows cast by the walls.
BOTTOM LEFT AND RIGHT: Julie Marquez developed a school in ArchiCAD, working between plan and axonometric. The school's floor plan is only one of many available predefined views onto Marquez's 3D model.

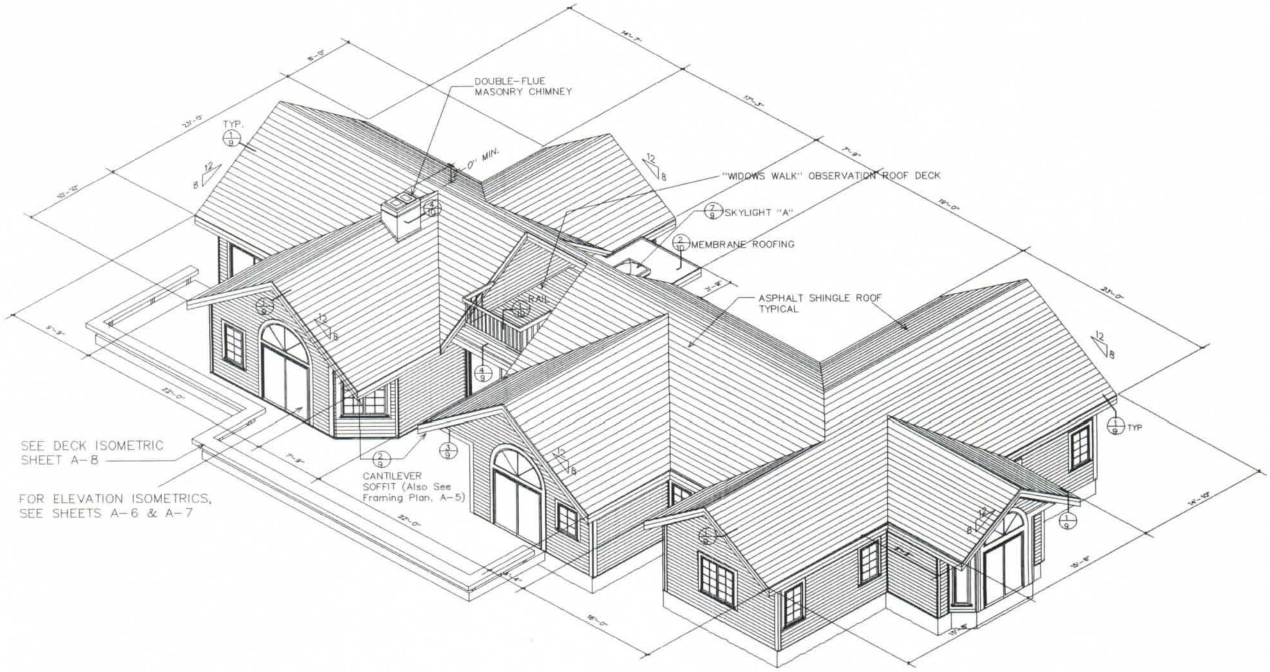
to show complex geometries on paper, so lines in one view may have no significance in another. For example, the hinge location of a door might be indicated in elevation by dashed diagonal lines but in plan, by an arc. Only in so-called "intelligent" software, which stores a variety of qualitative, quantitative, and graphical information, will the door's appearance change for each view.

The AutoCAD-based application ArchT from Ketiv allows the architect to construct models by assembling components such as walls, roofs, or windows, instead of composing AutoCAD's lines, polygons, and arcs. According to Ketiv's William Holt, "The CAD software must distinguish when to apply 3D or 2D symbology to the same object. There isn't always a one-to-one correspondence, so extruding conventional 2D drawings doesn't always produce good 3D models." Similarly, orthographic views of a model do not necessarily create satisfactory 2D drawings. With ArchT, architects are able to draw a component once, then rely on the computer to store that information, organize it in relation to other data, and retrieve it for later modification and for representation.

One Macintosh program that supports this approach is ArchiCAD from Graphisoft, now also available for Windows platforms. Although the ArchiCAD user designs in plan view, the lines being drawn are really three-dimensionally defined objects, like walls and slabs. The architect can easily flip between plan and perspectives and other preset views. Longtime ArchiCAD user Julie Marquez, director of interior design with Los Angeles-based Marquez Architecture, exploits the system's ability to move quickly between views to work interactively with clients on commercial space planning. Once the space has been planned in three dimensions, the model's 2D views form the basis of subsequent construction documents.

Working drawings in 3D

Evan H. Shu, a Boston-based architect, has been taking advantage of this ability to work in both 3D and 2D to experiment with isometric and axonometric working drawings. He believes these can offer as much information as, if not more than, conventional drawings. "They don't replace the plan," he notes, "which may always be the core of working drawings, but they can replace some elevations and details. They are especially good for showing how a corner fits together." Shu concedes that this approach requires the contractor's cooperation and belief that dimensions can be taken off the drawings. "And it takes a commitment from the architect to work this way from the beginning," he adds. Shu works with DataCAD from Cadkey, but believes that a similar approach could be taken with any CAD software that supports simultaneous design in 2D and 3D. "Perhaps the best thing about working in a 3D mode from start to finish," Shu concludes, "is that it totally integrates the design process with the working drawing process."



ABOVE LEFT: Evan H. Shu, a Boston-based architect, works in both 3D and 2D with DataCAD from Cadkey. His scaled isometric working drawing replaces a roof plan and two elevations.

University of Cincinnati professor Anton Harfmann has also been experimenting with 3D working drawings. Although he finds this successful in communicating construction processes to students, drawbacks include the extra labor required to produce the drawings with software not specifically designed for that task. Ideally, he says, the model and each component should be linked to a database that could be queried for dimensions and product information, so that changes to the model or database would result in automatic changes to the working drawings.

Looking overseas for leadership

In Japan, Europe, and Australia, where design and construction are commonly executed by the same firm, software developers have been working on CAD integration. Their systems offer 3D modelers linked to nongraphic databases, with 2D drawings extracted as a by-product. Some also include "expert" systems, embodying sophisticated engineering calculations and evaluations.

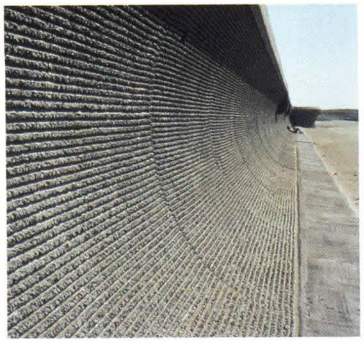
Perhaps the best known import is Sonata, now owned by Alias. Project Architect/Model, to be released by Intergraph in March, will combine the power of its model-based European parent with the "designer-friendly" MicroStation user interface. In competing with American CAD software, these Unix-based systems may enjoy greater favor in the future, when competition forces the U.S. construction industry to look abroad for methods for integrating design and construction.

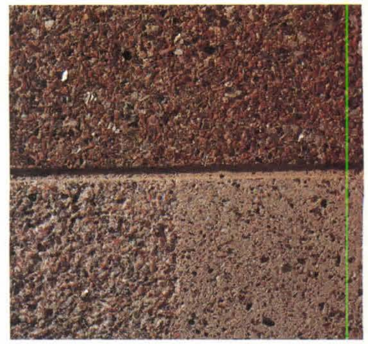
An early Sonata adopter was the architectural firm of Yost Grube Hall (YGH) in Portland, Oregon. Now the firm relies more on IBM's Architecture & Engineering System (AES) for its modeling. The architects typically build 3D models in AES; then, during or after design development, depending on the size and complexity of the project, they export 2D projections to AutoCAD for further work. The Meridian Hospital campus is one recent YGH project that involved many user groups, each interested in visualizing different aspects of the model. With AES, the architects created a variety of fly-throughs to explain the design. Information from the geometric model was projected to plan and elevation for the working drawings.

YGH Principal Roger Yost predicts the entire profession will move toward modelers like Alias over the next decade. "These modelers have more intelligence than drafting systems," Yost explains. "They can even notify you of code violations and interferences between mechanical and structural systems. This capability to count the pieces and coordinate the documents explains why modeling will eventually prevail."

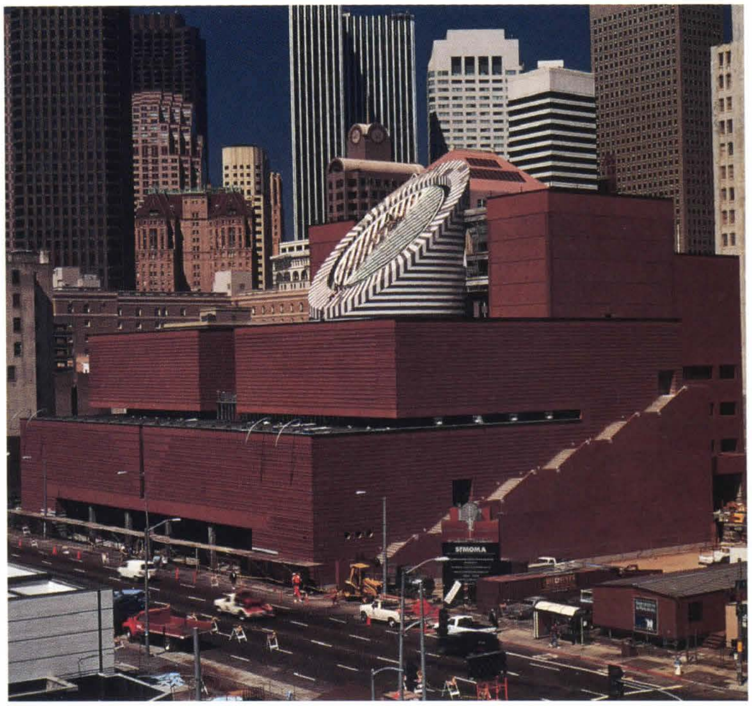
Ultimately, like the construction robots now under development in Japan, future construction techniques will be linked directly to the building's electronic database. And even the question of how 2D drawings are produced may eventually be forgotten, along with quaint debates about the horseless carriage.—*B.J. Novitski*

Products





Architectural precast concrete offers varied surface textures.



TOP LEFT: San Francisco's Department of Public Works and Bureau of Engineering designed a barrier wall to harness the power of the Pacific Ocean and to protect the city's sewer system beneath it. The bold design features a radial vaulted seawall resembling an ocean wave. With the aid of L.M. Scofield Company, the desired gray color was achieved using a color-conditioning admixture called Chromix, a water-reducing, set-controlling agent that offers pigments in earth tones. The horizontal ribbing is accomplished by applying L.M. Scofield's Lithotex Elastoliners to the pour. The formliners mold the concrete surfaces for desired texture or sculpted effects.
Circle 401 on information card.

TOP CENTER: Molded Fiber Glass Company (MFG) specializes in replicating terra-cotta, cladding, and structural applications. The single-seam fiberglass form is set in place, the cement is poured, and the mold is stripped once the mixture has cured. The Belvedere tower on the Niagara Mohawk building in Buffalo, New York, was restored in 1992 with MFG's urethane liquid molds. Fiberglass was chosen to simulate the original terra-cotta because of its ability to replicate the cladding and lower labor costs and maintenance requirements.
Circle 402 on information card.

TOP RIGHT: Architectural precast concrete has many faces. The Precast/Prestressed Cement Institute helps architects to specify surfacing techniques, including retardation (top half) and light or deep sandblasting (bottom half). Retardation will delay hardening time and increase the surface depth by increasing the concentration of the texturizing agent. Chemical retarders are available for face-up or face-down casting methods, as well as vertical and horizontal surfaces. Surface retarders may be applied by roller, brush, or spray. Sandblasting or abrasive blasting is primarily applied to expose shallow aggregate in the mix. Sandblasting produces a frosted effect, lightens the color, and subdues the luster of the aggregate. The depth achieved during sandblasting is affected by the softness of the mix.
Circle 403 on information card.

ABOVE LEFT AND RIGHT: The San Francisco Museum of Modern Art, designed by Mario Botta and expected to open to the public in January 1995, is clad in precast concrete with thin brick integrally cast into the concrete. The texture was achieved by applying elastomeric formliners from Denver-based Scott System. The company manufactures a brick gasket liner that consists of a urethane mat, allowing brick pockets to hold thin brick or tiles in place. The liner is attached to a precast form; then the bricks are placed into the pockets and wet-casted into the face of the concrete panel. After curing, the liner is peeled from the surface to reveal the completed precast panel with brick facing.
Circle 404 on informational card.

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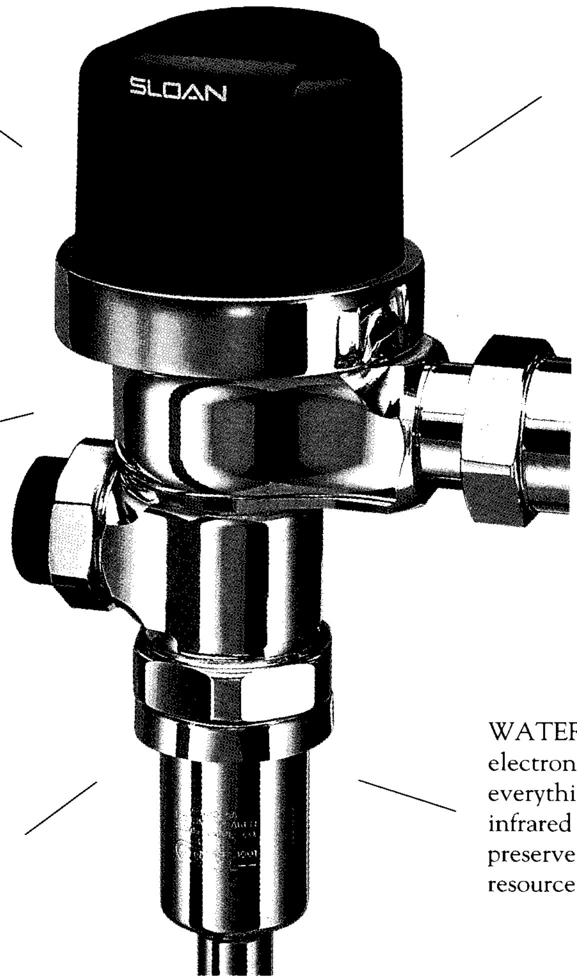

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Concrete stains

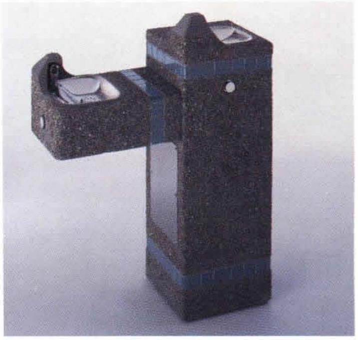
Bomanite Corporation offers chemical stains in eight standard colors (above) for concrete paving. The stains are produced by combining metallic salts with water and acid solutions. The combined chemicals etch new or existing concrete surfaces with color. Bomanite stains are permanent and can be applied on interior and exterior concrete surfaces. They can be administered to porous tile, stucco, and marble, plus other concrete and masonry surfaces.
Circle 405 on information card.

Cement mixtures

Cement distributor Holnam manufactures five types of cement approved by the American Society for Testing and Materials (ASTM) and the Canadian Standards Association (CSA). Varied applications for Holnam's products include cast-in-place, precast, and prestressed concrete members, as well as masonry mortars and grouts. Holnam cement can also be mixed with aggregates to form concrete that resists harsh environmental elements such as frost, water, oil, and de-icing chemicals.
Circle 406 on information card.

Crack calculator

Construction Technology Laboratories (CTL) offers a transparent and flexible plastic card for measuring the stress and decay of cladding, paving, and structural materials. The wallet-sized crack comparator can measure a crack width in both millimeters and inches. CTL is a structural/architectural engineering and materials technology firm.
Circle 407 on information card.



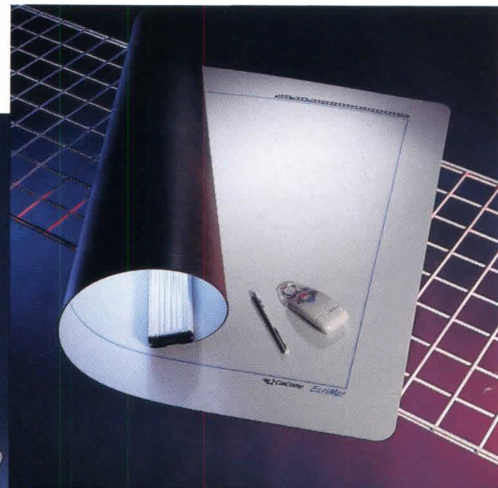
Drinking fountains

Haws Company, an international manufacturer of drinking fountains and electric water coolers, is keeping up with ADA regulations with its model 3150 pedestal-mounted drinking fountain (above). The fountain is constructed of reinforced concrete and finished with an exposed aggregate. Haws' pedestal fountain features a dual-height water dispenser to accommodate wheelchair access. It also includes recessed, push-button valves with automatic stream regulation; concrete guards over polished, chrome-plated water dispensers; and waste strainers. The vandal-resistant fountain is available with optional tile insets.
Circle 408 on information card.

Precast flooring

Wausau Tile specializes in precast concrete and terrazzo products and has manufactured precast flooring for four decades. The company's terrazzo flooring is available in three styles. Micro style features aggregate chips measuring 3/16 inch and is available in 10 stock colors; Neptune style flooring incorporates mother-of-pearl and is available in five stock colors; Wausau's new Rustic flooring incorporates a polished, 3/4-inch accent border with a light-abrasive surface for slip resistance. An optional, raised circular design on the Micro style paving meets ADA requirements. Wausau also manufactures site furnishings; recreational equipment; and such precast architectural specialties as column covers and interior curbings.
Circle 409 on information card.

Big. Deals.



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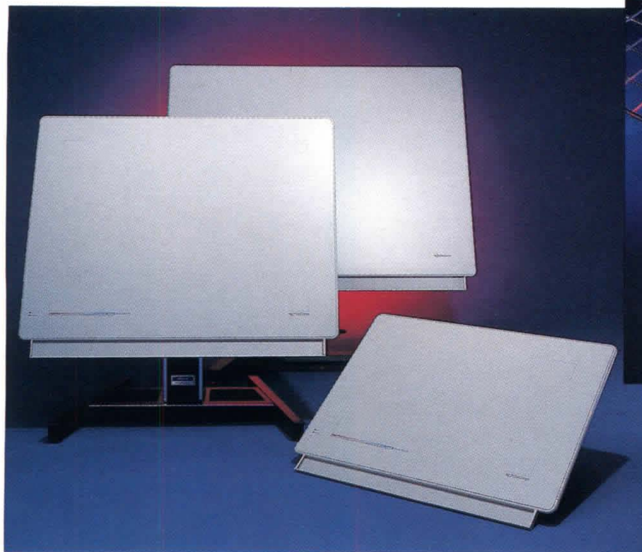

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Circle 132 on information card

Concrete insulation system

Thermomass concrete sandwich wall building system (above) is manufactured by Composite Technologies Corporation for constructing insulated concrete sandwich walls. This system is constructed and insulated in one application, retaining 99.7 percent of the R-value of the insulation. It is secured in place with low-conductive and chemically resistant fiber-composite connector rods.
Circle 410 on information card.

Ground face masonry

Trenwyth Industries based in York, Pennsylvania, manufactures specialty masonry units. Trenwyth's Trendstone Apollo units (above) feature a ground face masonry that exposes the variegated colors of the natural aggregates within the blocks. The units are purported to be of high quality and low cost.
Circle 411 on information card.

Structural connectors

A 28-page guide to structural connectors and accessories for tilt-up and precast panels is being offered through The Burke Group based in Converse, Texas. The connectors attach tilt-up and precast concrete wall panels to building foundations or roofs, and from panel to panel. Burke's connectors are rated for tension, shearing in hurricanes, and seismic conditions, as well as for dead and live loads.
Circle 412 on information card.

Concrete forming system

Lite-Form, a manufacturer of concrete forming systems, offers Quick Strip, a lightweight and more cost-effective forming system than wood or metal forms. Quick Strip is supplied as 4-foot-by-8-foot panels with 2-inch-thick rigid insulation. Panel widths can be adjusted with nylon snap ties to accommodate measurements from 4 inches to 24 inches thick. The panels can be removed or left in place to insulate the form.
Circle 413 on information card.

Acid etching

Kem-O-Kleen, a division of Unique Industries, manufactures a pressurized acid-injection machine for precast and prestressed concrete. Like sandblasting or chemical retardants, an acid wash exposes the concrete aggregate, removes dirt and stains, and blends finishes. Acid etching can duplicate the look of granite or limestone or have its own distinctive appearance. The variety of finishes is achieved through the colors of the concrete, the composition of the aggregates and sand, and the degrees of exposure of the aggregates. Kem-O-Kleen reports that the cost of acid etching is one-fourth the cost of sandblasting and that its machines provide exacting control of the acid concentration, while using less acid in the process than conventional washes. The acid is applied at the same pressure of 2,500 to 3,000 psi as the water and is controlled by a regulating device for detailing.
Circle 414 on information card.

Autoclaved cellular concrete

North American Cellular Concrete offers concrete masonry blocks and precast panels of reinforced or prestressed autoclaved cellular (AC) concrete. The concrete is a lightweight, environmentally sensitive, and fire resistant structural building material constructed from 75 percent recycled fly ash, cement, lime, aluminum powder, and water. To create AC, first the mix is poured into molds; then an aluminum powder generates microscopic hydrogen bubbles within the mix, which causes the mixture to expand. The expansion forms cakelike materials that can be cut into blocks, slabs, panels, or other desired shapes. A strengthening chemical reaction occurs when the pieces are pressurized with steam in an airtight chamber for 10 to 12 hours.
Circle 415 on information card.

Project Credits

**PILAR AND JOAN MIRÓ FOUNDATION
PALMA DE MALLORCA, SPAIN**

ARCHITECT: José Rafael Moneo, Architect, Madrid, Spain—Rafael Moneo (principal-in-charge); Luis Moreno Mansilla, Luis Rojo, Emilio Tuñón (design collaborators); Rafael Balaguer, Antonio Esteva (site supervision)
ENGINEERS: Mariano Moneo (structural); Gustavo Alvarez (mechanical/electrical)
CONSULTANTS: J&G Asociados (technical)
GENERAL CONTRACTOR: Agromán
COST: $3 million
PHOTOGRAPHER: Lluis Casals, except as noted

**ATOCHA RAILWAY STATION
MADRID, SPAIN**

ARCHITECT: José Rafael Moneo, Architect—Rafael Moneo (principal-in-charge); José Miguel León (design collaborator/commuter station); Emilio Tuñón (design collaborator/commuter station, long-distance station, canopy restoration, old station rehabilitation); Javier Revillo (design collaborator/long-distance station, canopy restoration, old station rehabilitation); Gabriel Ruz Cabero (design collaborator/canopy restoration); Eduardo Belzunce (design collaborator/old station rehabilitation)
ENGINEERS: INESCO (mechanical/commuter station); Euroestudios (structural /commuter station); Javier Manterola (structural/long-distance station); ESTEYCO (structural/long-distance station, old station rehabilitation); OTEP, Jesús Jiménez (structural/canopy restoration); TYPSA (mechanical/canopy restoration)
CONSULTANTS: Addison (signage and furnishing/commuter and long-distance stations); Arturo Gómez (technical drawings/canopy restoration); Eupalinos (tropical garden)
GENERAL CONTRACTORS: Fomento de Obras y Construcciones (commuter station, old station rehabilitation); Lara UTE (long-distance station); Huarte, AZVISA (canopy restoration)
COST: $47 million (commuter station); $65 million (long-distance station); $18 million (canopy restoration); $11 million (old station rehabilitation)

**THYSSEN-BORNEMISZA MUSEUM
MADRID, SPAIN**

ARCHITECT: José Rafael Moneo, Architect—Rafael Moneo (principal-in-charge); Luis Moreno Mansilla, Emilio Tuñón, Belém Hermida (design collaborators); Vidal Gutiérrez de Sande (technical architect/site supervision)
ENGINEERS: Ove Arup & Partners, ESTEYCO (structural); J.G. Asociados, Ove Arup & Partners (mechanical/ lighting/security)
GENERAL CONTRACTOR: Entrecanales y Tavora
COST: $130.3 million
PHOTOGRAPHER: Jose Latova, except as noted

**DAVIS MUSEUM AND CULTURAL CENTER
WELLESLEY, MASSACHUSETTS**

ARCHITECT: José Rafael Moneo, Architect—Rafael Moneo (principal-in-charge); Victoria Kiechel (design collaborator)
ASSOCIATE ARCHITECT: Payette Associates —Scott Payette (principal-in-charge)
ENGINEERS: LeMessurier (structural); J. Altieri (mechanical/electrical)
GENERAL CONTRACTOR: Richard White and Sons
COST: $11.7 million
PHOTOGRAPHER: Steve Rosenthal, except as noted

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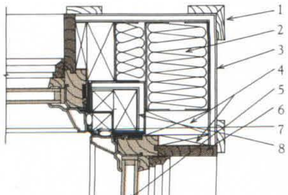
PROJECT ARCHITECT: JON THORSTENSON. HICKEY, THORSTENSON, GROVER, LTD. EDINA, MN.



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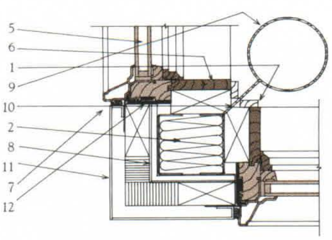
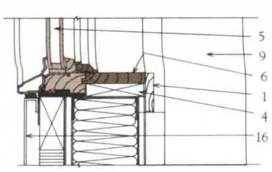
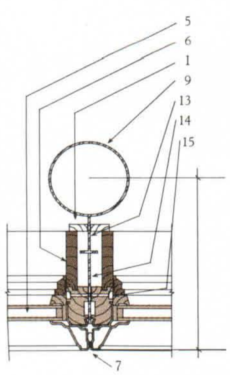


OUTSIDE CORNER DETAIL



SILL DETAIL



TYPICAL MULLION DETAIL

1. Wood trim
2. Metal studs/blanket insulation
3. Gyp board
4. Wood blocking
5. Andersen® Flexiframe® unit
6. Andersen® extension jambs
7. Sealant/joint backing
8. Sheathing
9. 5" PNTD steel column
10. Steel plate welded to metal studs
11. Metal panel
12. Insulation typical
13. Steel plate w/'T' welded to column
14. Steel plate w/slotted holes welded to 'T'
15. Through bolt
16. Metal panel/metal stud wall

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Andersen Windows Patio Doors

Circle 148 on information card

No excuses after this information exchange

Sheet Metal Flashing

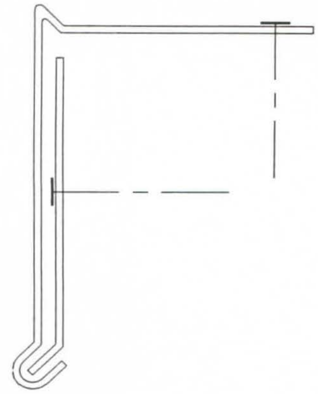
CSI Section 07620

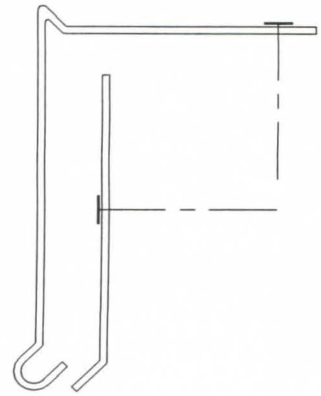
Low-slope roofing

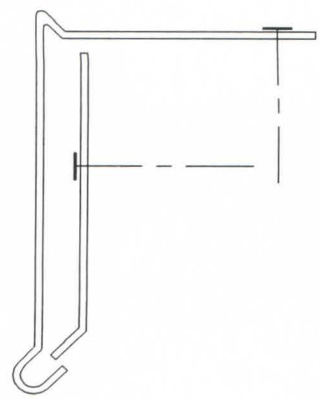
In observing edge details in low-slope roofs, I too often find inconsistencies between the architect's intent and the built results. Much effort is given to assuring that the gravel stop and the continuous cleat are compatible and that the weight or gauge of the sheet metal is sufficient for the height of the fascia. However, if the gravel stop is not hooked securely over the cleat, the roof could easily blow off under high wind conditions in a storm. Standard procedure for roofers is to snap a chalk line along which the conventional cleat (without a horizontal flange) is fastened. If the blocking on top of the wall is not perfectly level, as can easily occur in the field, then the gravel stop and cleat will not align (illustrations at right).

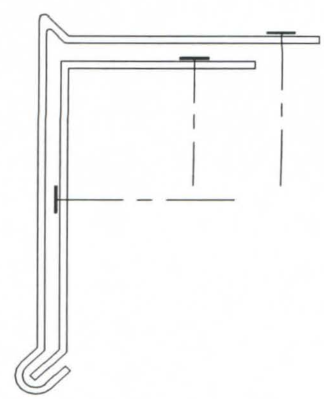
To remedy this alignment problem, we detail a continuous edge cleat for a sheet metal gravel stop/fascia to incorporate a horizontal flange that extends over the blocking at the roof's edge, which is also the top of the exterior wall. This flange ensures that the continuous edge cleat is always at the correct height for the fascia to lock properly over the cleat's drip edge, even if the top of the wall is uneven.

John J. Hoffman, FAIA
Hoffman Architects
North Haven, Connecticut


FLASHING: Traditional detail.


GRAVEL STOP: Cleat too low.


GRAVEL STOP: Cleat too high.


NEW METHOD: Continuous cleat.

Stairs

CSI Section 09004

ADA compliance

A Neat File published on exterior stairs (ARCHITECTURE, December 1992, page 112) should be clarified for projects that fall within the guidelines of the complex Americans With Disabilities Act (ADA). Foremost, projects that are required to comply with the ADA must provide at least one accessible route within the boundary of the site from public transportation stops, accessible parking spaces, and so forth to an accessible building entrance, and then from that entrance to all accessible spaces and elements within the building. Since neither accessible routes nor accessible means of egress include stairs, steps, or escalators, this is an important design consideration that affects ingress and egress routing in the overall design. The technical requirements regarding stairs, ADAAG Section 4.9, only apply to those stairs required to be "accessible" by ADAAG Section 4.1, and not necessarily to all stairs, interior or exterior. A thorough understanding of the scoping provisions is required to properly address varying stair types on most projects.

Much confusion has also arisen regarding acceptable stair nosing conditions on stairs requiring ADA compliance, particularly over the potential tripping hazard created by the horizontal projection of the tread. In consideration of persons climbing the stair—especially individuals with limited or restricted gaits—the nosing dimension must be limited to a maximum of $1^1/_2$ inches. The angle at the underside of the nosing was established at 60 degrees minimum in the ADA guideline to alleviate the nosing projection from catching on a person's foot.

This ADA guideline was not intended to address the angle of a sloping riser. ADA does not address riser heights *per se*. But, by using a maximum allowable riser height of 7 inches (in accordance with most model codes), the angle of any sloping riser is dictated solely by the allowable nosing projection and allowable riser height dimensions.

Furthermore, performing a simple calculation reveals that the angle of the sloping risers may decrease to less than 78 degrees only when the riser height decreases to less than 7 inches. In no case will the angle approach 60 degrees unless the riser height becomes approximately $2^1/_2$ inches, which is unlikely. For typical riser heights of 7 inches, the sloping riser angle may range from 78 degrees to the 90 degree vertical, to comply with the $1^1/_2$-inch specified maximum nosing projection.

I have absolute confidence in the accuracy of this interpretation of riser heights, having reviewed and confirmed the information through the Architectural Transportation Barriers and Compliance Board.

Richard E. Campbell, Jr.
CRS Sirrine Engineers
Greenville, South Carolina

Architects are encouraged to contribute their practical suggestions about specifications and detailing, including drawings, for publication. Send submissions to:
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