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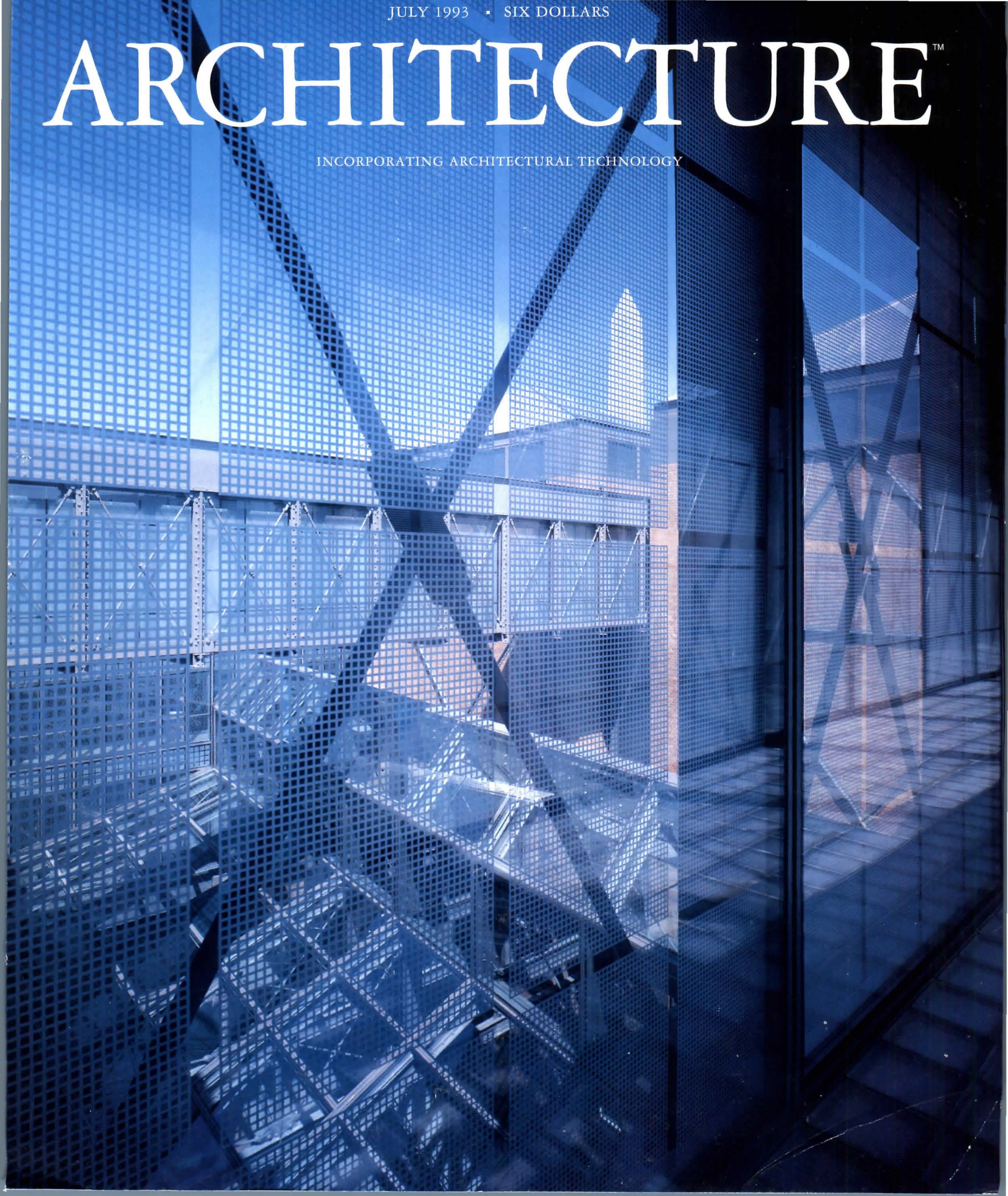


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Design Backlash

Neighborhood groups are overregulating environments and stifling urban vitality.

ABOVE: Model of Dan Rockhill's monument for a Lawrence, Kansas, park.

A backlash against design is heating up across the country as community groups and homeowners organize to keep public art and controversial architecture out of their own backyards.

In Lawrence, Kansas, for example, battle lines were drawn between local citizens and city commissioners over a sculpture proposed for a city park last year. To honor the city's history, the Lawrence Arts Commission held a competition for a civic monument in Buford M. Watson, Jr., Park and selected "Confluence," a 10-foot-high gateway designed by local architect Dan Rockhill, as the winner. Rockhill's design, a concrete and steel interpretation of Lawrence's urban growth, quickly became the subject of public outcry. A letter-writing campaign waged in the local newspaper argued that the $9,200 city-financed monument was "ugly," "a piece of junk," and a waste of taxpayers' money.

In an eastern suburb of Seattle, a similar war erupted between a homeowners association and a neighborhood couple who refused to change the color of their house from purple to white. Four years ago, Lee and Barbara Jones painted their house mauve with purple trim, without consulting the English Hill Homeowners Association, whose architectural control committee regulates such changes. After the Joneses refused to repaint the house, the local association filed a lawsuit, resulting in a lien on the property. Seattle's King County Superior Court recently ruled against the couple, forcing them to submit a new color scheme to the committee.

Even in culture-conscious New York City, a community group has organized to block the installation of 14 bronzes by Colombian sculptor Fernando Botero on a Park Avenue median. Hoping to generate the same kind of public enthusiasm that greeted the large sculptures when they were displayed in Paris, the nonprofit Public Art Fund organized the outdoor exhibition, but was met with opposition by members of the Park Avenue Malls Planting Project. The neighborhood coalition argues that the Botero bronzes would attract large crowds, increasing the risk of traffic accidents as well as the disruption of their carefully planted gardens.

The message of such backlash against art and design is clear. The public is fed up with government agencies, community associations, and art experts telling them what belongs in the public spaces of their cities and neighborhoods. Citizens are entitled to shape the policies that affect their environments, but the number of restrictions governing communities is growing out of control. Nearly one in eight Americans now lives in an area regulated by a community association, according to the Alexandria, Virginia-based Community Associations Institute.

For architects, this esthetic conservatism has led to more restrictive design guidelines and zoning. San Francisco, for example, recently enacted new residential zoning controls that regulate building envelopes, materials, window placement, and scale (page 25, this issue). Such restrictions are aimed at preserving the architectural character of neighborhoods, but too often, they result in new buildings that are retrogressive, sanitized, and mediocre. Frank Lloyd Wright's spiraling design for the Guggenheim Museum, for example, now a cherished landmark, would never pass muster today under New York's strict guidelines for new construction in historic districts. But without such nonconforming, inventive, even "ugly" designs, our cities and neighborhoods will suffer from homogeneity and blandness.

The backlash against design is aimed at maintaining traditional values, limiting innovation, and undermining the enrichment and diversity of our environments. We must reinvigorate the process of selecting public art and legislate more liberal design guidelines so that artists and architects are empowered with creative opportunities to benefit us all.

Deborah K. Dietsch

Letters

***Fountainhead* furor**

"*The Fountainhead* at 50" (May 1993, pages 35-37) was excellent. At the time of its publication, many thought Frank Lloyd Wright and Louis Sullivan were the true-life models for Howard Roark. In fact, Wright and Rand did know each other. In the late '40s, Wright was commissioned by Rand and her husband to design a house for them. As it turned out, the relationship quickly cooled: The house was never built, and Wright made it crystal clear that Roark's International Style was diametrically opposed to his own Usonian, Organic style. Rand, of course, insisted that no strict resemblance between Wright and Roark was intended. Rather, her thesis was about the creative spirit reacting against a hostile society.

It is a fascinating paradox that in the year of *The Fountianhead*'s 50th anniversary, Modern architecture is dying. The idea of Roark as fountainhead has passed the test, but his architectural ideas have not.
Samuel M. Thomas
Tacoma, Washington

My compliments to Edward Gunts. A less accomplished writer could not have imitated Ellsworth Toohey so perfectly. It was a fine tongue-in-cheek piece of writing—or was it?
Jack Craycroft, AIA
Dallas, Texas

Edward Gunts misses the point when he writes: "There is no room in the profession for Howard Roark today." There has never been room for Roark in the "profession" of architecture. Individualists, like Roark and Wright, have never sought approval or acceptance from a profession—but, rather, rallied against the mediocrity entrenched in that profession.
Winn W. Winer
Austin, Texas

Lost in Columbus

Most people attending a convention are first-time users of the facility housing it. Wayfinding is obviously a problem for them. Large-scale spaces, long halls, sleeve-tugging exhibits, and the diversity of attendees all work to disorient the convention's participants. Well, they will be well-prepared for disorientation when they arrive at the entrance of Peter Eisenman's Columbus Convention Center (May 1993, pages 52-63). Giovannini describes Eisenman as "the most cerebral of architects"; were that he a pedestrian one.
Andrew Ruppel
Charlottesville, Virginia

Dues and don'ts

When I joined the AIA, I was under the impression that the purpose of the organization was to further the profession of architecture. Your editorial, "The Task of Diversity" (May 1993, page 15), makes me wonder whether I have been mistaken. The article describes an activist AIA that claims an architect's relevance is contingent upon adoption of the agenda of the political left. Perhaps I am the only member who feels this way, but this is not what I pay my dues for. I pay dues in the expectation that the AIA's goals are to support my professional development and to advocate the "art of building."
Paul Ashley, AIA
Madison, Wisconsin

Events

July 9
Submission deadline for Excellence in Design, a competition cosponsored by the American Institute of Architects and the Cedar Shake and Shingle Bureau. Contact: (206) 453-1323.

July 12-16
Guidelines for Laboratory Design, offered by Harvard School of Public Health. Contact: (617) 432-1171.

July 15
Registration deadline for The Architect's Dream: Houses for the Next Millennium, a competition sponsored by the Contemporary Arts Center and the Cincinnati chapter of the AIA. Contact: (513) 421-4661.

July 16
Binder deadline for the 1994 AIA Gold Medal Award. Contact: Dennis R. Smith, (202) 626-7464.

July 22
From ADA to Universal Design, a one-day seminar on design sponsored by the AIA. Contact: Lynne Lewicki, (202) 626-7467.

July 26-29
ADA Expo '93 conference in Washington. Contact (301) 445-4400.

July 30-August 8
A program of courses in historic preservation at the University of Southern California. Contact: (213) 740-2723.

August 2
Entries due for the 1994 AIA Honor Awards. Contact: (202) 626-7464.

August 5-September 6
Table, Lamp + Chair, an exhibition in Portland, Oregon. Contact: Reid Martin, (503) 226-3556.

August 12
Submissions due for the Maryland Society/AIA Design Award Program. Contact: (301) 588-7095.

August 30
Binders due for the 1994 AIA Honor Awards. Contact: (202) 626-7464.

August 30
Submissions due for the AIA 25-Year Award. Contact: (202) 626-7464.

August 31
Entry deadline for the first edition of the international festival for Film + Architecture to be held in Graz, Austria. Contact: EBS Productions, (415) 495-2327.

September 29-30
Washington Design Center's 10th anniversary celebration. Contact: (202) 554-5053.

September 30-October 2
Urban Design: Reshaping Our Cities, a conference sponsored by the Institute of Urban Design and the University of Washington's College of Architecture and Urban Planning. Contact: (206) 543-4190.

October 11-15
Autodesk University, a conference for Autodesk users in San Francisco. Contact: (415) 905-2354.

October 14-19
Crossing Boundaries in Practice, a six-day forum on architecture and culture at the University of Cincinnati. Contact: (513) 556-3413.

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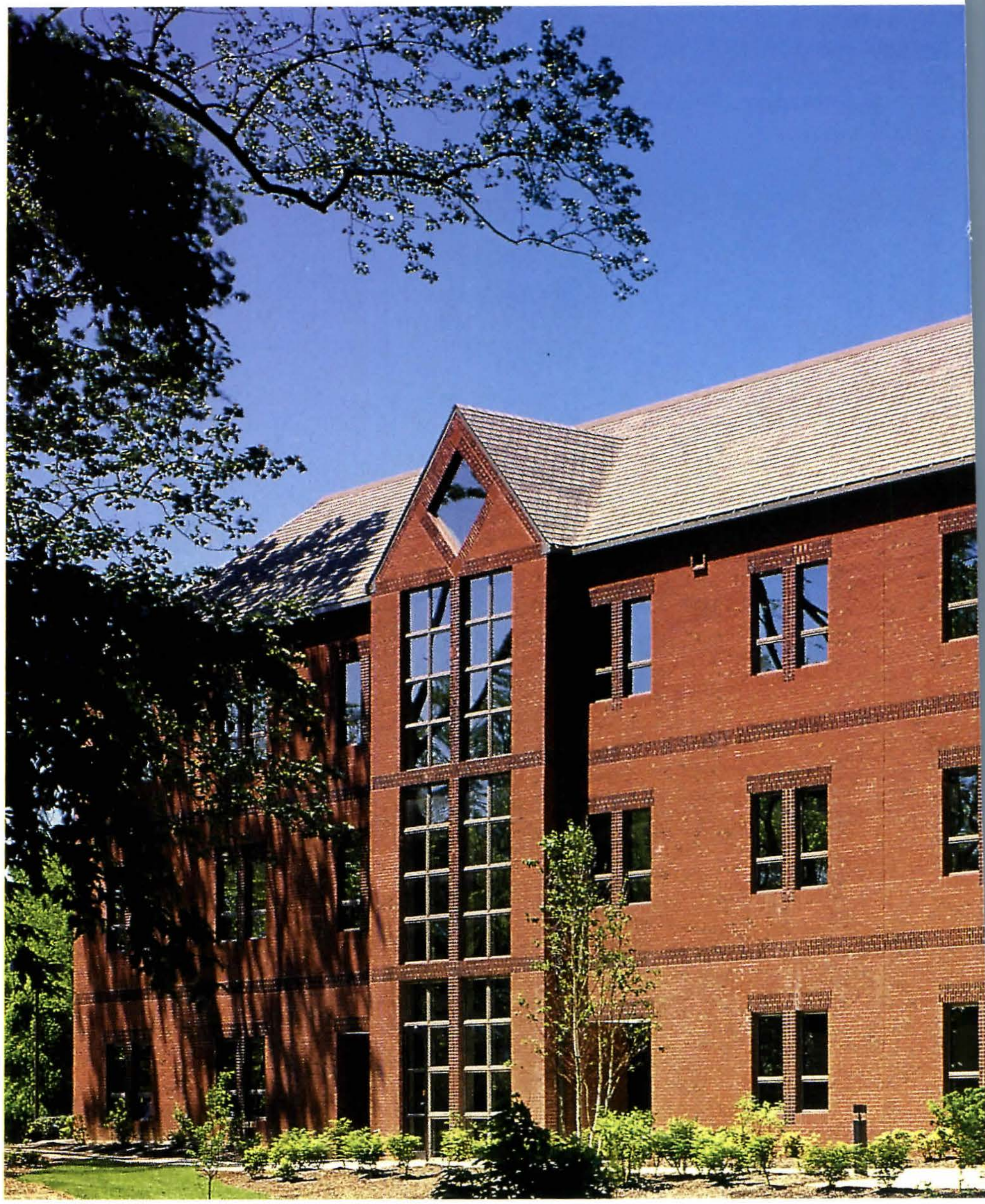

A corporate office building on a 12-acre nature preserve seems to call for a lot of windows. So architect Frank Tomaino called on Andersen.

Fenestration was handled with curtain walls that overlooked the preserve. Said Tomaino: "The Andersen distributor was there for us from the shop drawings to the field installation."

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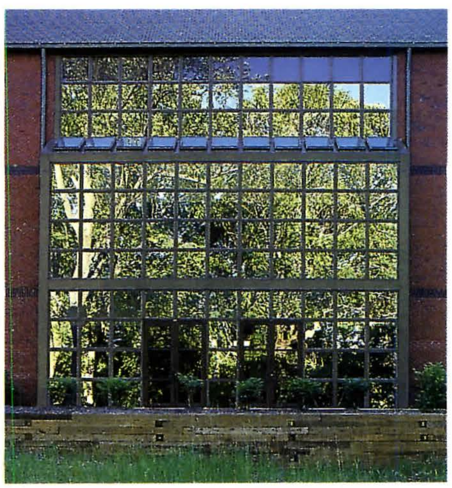

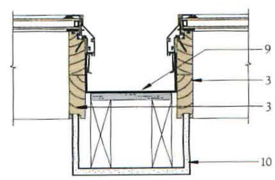

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News

Piano Designs New Menil Gallery in Houston

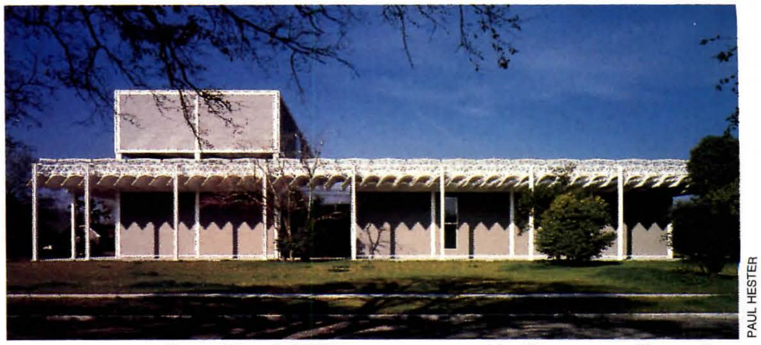
For an architect who designs airports and stadiums and shopping centers, a freestanding gallery for an artist sounds like a trivial pursuit. But when the gallery is owned by the Menil Collection in Houston, and the artist is American painter Cy Twombly, such a commission could hardly be refused. Italian architect Renzo Piano, who made his American debut with the Menil Collection in 1987, has completed the design of the 9,000-square-foot Cy Twombly Gallery, to be built across the street from his 1987 museum and a block from the Rothko Chapel. It will combine elements from both the Menil and the chapel and will house a collection solely devoted to Twombly's work.

Piano's low rectangular pavilion is designed to respect the scale and character of the adjacent neighborhood. A wall of cast concrete block will surround the gallery, providing a solid enclosure for the fragile art within. Above this permanent base will float a multilayered roof that cantilevers slightly over the edge of the walls. Piano has compared it to a "butterfly coming to rest."

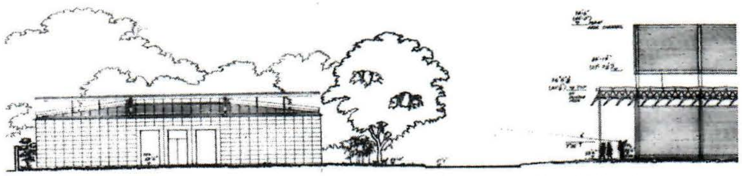
The roof will consist of a structural steel frame containing a solar grille, glass panels with movable louvers, and a membrane of seamless stretched fabric intended to replicate the luminous ceilings of Beaux-Arts galleries. While not as technically innovative as the trussed and louvered roof of the Menil, it displays Piano's extraordinary attention to proportion and crisp detailing, as well as his ongoing quest for lightness.

Twombly asked only for good light and clean spaces, and Piano's design promises both. The interior consists of nine cubes; two are combined to exhibit large paintings. The walls will be finished in white plaster over a floor of 9-inch oak planks. Visitors will enter the gallery by passing through an outdoor sculpture garden, then a foyer containing an archive and small exhibit space.

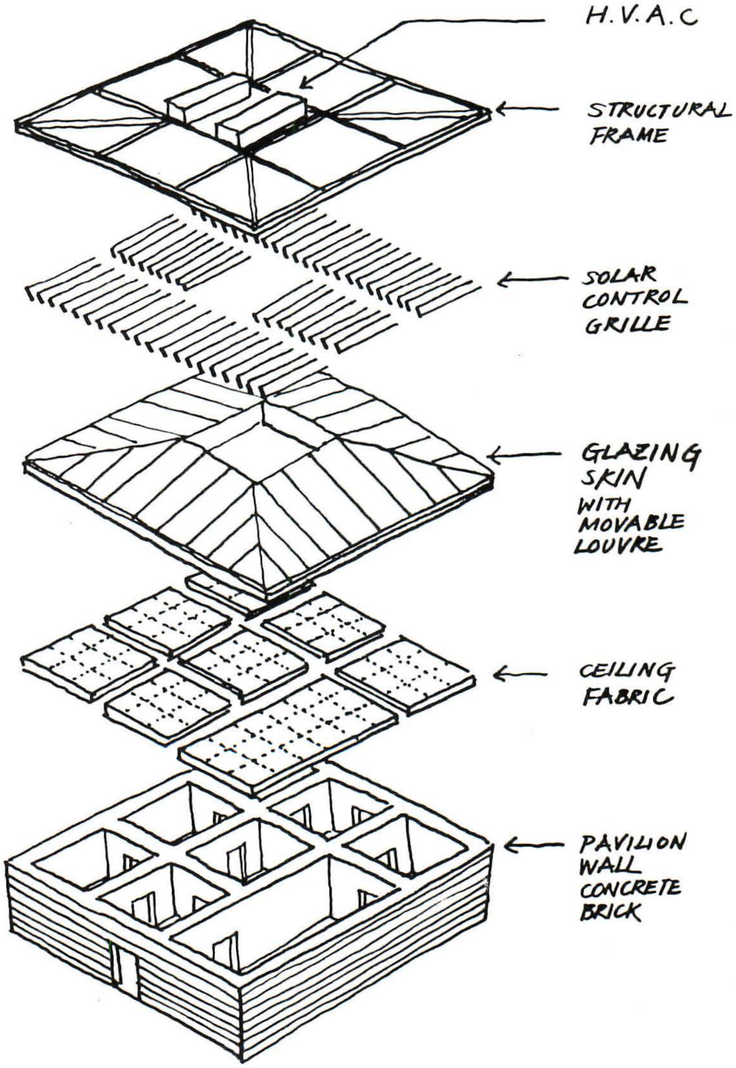
The Twombly Gallery will house approximately 50 paintings, sculpture, and works on paper produced since the early 1950s. The collection has been assembled jointly by the Menil; the artist; and the Dia Center for the Arts in New York City, founded by relatives of matriarch Dominique De Menil. The gallery will cost \$3.5 million and will open in early 1995. —*David Dillon*



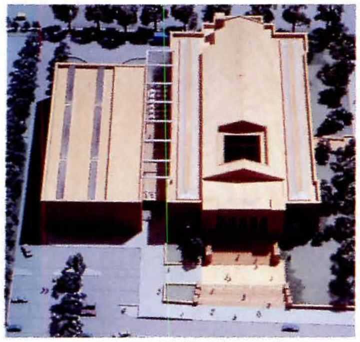
MENIL COLLECTION: Renzo Piano's 1987 museum, topped by ferrocement "leaves."



EAST ELEVATION: Piano's pavilion (left) respects predecessor and neighborhood scale.



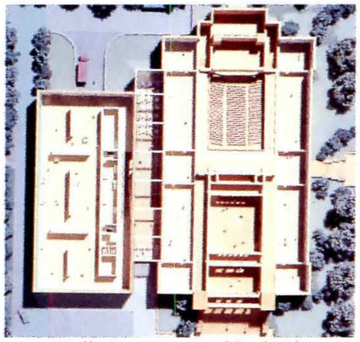
TWOMBLY GALLERY: Nine-square plan of galleries for painting and sculpture.



FOSTER ADDITION: Linked by atrium.

PUBLIC PROMENADE: Visitors will enter through original building's portico.

JOSLYN ART MUSEUM: 1931 facade.



PLAN: Galleries connected by bridge.

EAST ELEVATION: Addition (left) will be clad in same marble as 1931 structure.

Foster Addition to Nebraska Museum Breaks Ground

The design for an addition to the Joslyn Art Museum in downtown Omaha, Nebraska, by British architect Norman Foster was unveiled by the museum in May, and groundbreaking took place June 7. Foster's reticent design will be situated directly north of the existing Neoclassical museum and will add 52,000 square feet on two levels to accommodate galleries, offices, art storage, shipping and receiving areas, and a kitchen for the museum's food service operations. Foster was selected last June from a group of finalists that included James Freed of Pei Cobb Freed & Partners, French architect Christian dePortzamparc, Antoine Predock, and Renzo Piano.

The new gallery space will allow Joslyn's permanent collection to be exhibited in the original museum, according to museum director Graham W.J. Beal. Built over an existing parking lot, Foster's clean, Modernist addition sensitively complements the stripped-down Neoclassicism of the original museum, designed in 1928 by John and Alan McDonald of Omaha and completed in 1931. A 210-foot glass atrium will link the two structures, allowing the north wall of the original museum to remain intact and visible to visitors. To maintain visual consistency, Foster will clad his addition to the Joslyn in the same Georgia pink marble as the existing structure.

Foster intrudes upon the 1931 building in only one place: A glass bridge will penetrate the north wall of the existing museum and connect the second floor galleries in the older structure to galleries in the addition. On the ground level, the glass atrium, which will house a new restaurant, will be entered from secondary galleries through an existing side entrance. "The link is the only place where the new design impinges on the integrity of the existing structure," assures museum director Beal. "But we think the trade-off in geographic clarity and visitor orientation is worth it."

The placement of the glass atrium over a former side entrance will also force visitors to return to the practice of entering the museum through its original grand lobby. "We've brought the main entrances back to where they belong, which is at the front," notes Foster. "This is helped by a reorganization of the site so that there are improved facilities for parking and truck docks."

Foster Associates will work with the Omaha-based architectural and engineering firm Henningson Durham & Richardson. The project will be completed late next year.

—Philip Porado

AIA Announces Young Architects Citation

Two women architects from Minneapolis are among the first four recipients of the AIA's newest award, the Young Architects Citations. This year's citations were awarded at the AIA convention in Chicago to architects who have been AIA members fewer than 10 years and who have given outstanding service both to the public and to the profession.

The winners from Minneapolis are Vicki L. Hooper and Joan M. Soranno. Hooper is a senior project architect with Minneapolis-based RSP Architects. She is also chair of Minnesota Design Team, a Minnesota AIA-affiliated program to help small communities manage growth and planning. Additionally, Hooper is involved with a corporate partnership program in the Minnesota public schools that matches businesses with students and school programs for extension teaching.

Joan M. Soranno, a project designer with James/Snow Architects, has worked on numerous municipal as well as academic projects in and around Minneapolis.

The other award winners include Brett Keath Laurila, a young practitioner based in Venice Beach, California. Laurila has undertaken extensive pro bono work, including the remodeling of a shelter for Children of the Night, a nonprofit organization that helps runaway children.

The final recipient is Thomas Sumerville Howorth, the sole proprietor of Jackson-Mississippi-based Howorth & Associates, who has worked to enhance the membership services of the Mississippi AIA chapter and has helped to launch the journal *ArchitectureSOUTH*.

Despite members' interest in the citation (the jury considered 25 nominees), the AIA Board expressed some initial resistance to the inauguration of the award, according to William J. Carpenter, chair of the AIA's National Young Architects Forum.

"There was a sense that the AIA was already giving out enough awards as it was, so we had some friction at first to get it through the bureaucracy," says Carpenter. "But we felt strongly about this award because it recognizes talent at the beginning of an architect's career: It's an important way to bring young architects into the forefront and recognize these new spirits."

The AIA's 1993 Young Architects Citation jury was chaired by Harry Robinson, dean of the Howard University School of Architecture in Washington, D.C. Other jurors included former AIA President Sylvester Damianos and AIA Board member Douglas Austin of the San Diego, California-based Austin Hansen Fehlman Group. *—P.P.*


CAROL SIMOWITZ

LANDMARKS: Precedent for zoning.

CITY INFILL: Zoning would prohibit new rowhouse by Kotas/Pantaleoni Architects.

BUILDING ENVELOPE: Regulation would restrict facades such as Kotas/Pantaleoni design.

New Residential Zoning for San Francisco

San Francisco's new "Residential Conservation Controls," zoning guidelines for residential buildings, have sparked heated debate. The controls, more than 200 pages worth, were issued by the city in April. City planners expect them to be approved by the Planning Commission and Board of Supervisors on an interim basis this summer, with modifications and permanent adoption expected during the year ahead.

Planners hope the new controls will conserve neighborhood character, allow reasonable expansion of existing buildings, and streamline the permit review process. But builders would like them to include more liberal height and setback standards. Conservative neighborhood groups are afraid the controls will allow new development that could damage the character of their neighborhoods. And some architects feel creativity will be severely hampered.

"The gods being served here are called neighborhood preservation and neighborhood values, but in my opinion, it's really not preservation— it's stagnation," claims local architect Jeremy Kotas, a former city planner known for his wild and colorful designs. "The neighborhood busybodies are trying to preserve a vision of San Francisco as a quaint and beautiful place, but the art of architecture is the first thing that gets kicked out the door."

The new controls are generally more restrictive than the previous code, adopted in 1978. Allowable height drops from 35 or 40 feet to 32 feet, with variations for slope and the height of adjacent buildings. Front and rear setbacks are greater. The new controls make it more difficult to raze existing structures, but simplify the process for notifying neighbors of pending new projects.

The zoning controls regulate the building envelope, but not architectural style. Issues of style and context are addressed by a new version of the city's 1989 residential design guidelines, expected to be adopted on an interim basis alongside the zoning controls. These don't demand period revivals in new buildings, but they strongly encourage keeping materials, window placement, and scale in context.

The most significant feature of the new zoning controls is a two-level process intended to streamline the issuance of building permits, which took up to eight months under earlier interim controls. Projects that meet new, stricter height and setback standards will be designated Level 1 by city planners. More extensive Level 2 review is reserved for projects expected to be controversial, primarily due to height and setbacks.

"The new zoning controls are an improvement, but there are still problems," says San Francisco architect John Schlesinger, chair of the local AIA's Advocacy Commission, which has worked closely with the city. Schlesinger, while pleased to finally have a concrete document that could smooth the permit process, worries that the controls still are not concise enough to prevent lengthy discretionary reviews drawn out by the varied tastes of planners, planning commissioners, and supervisors.

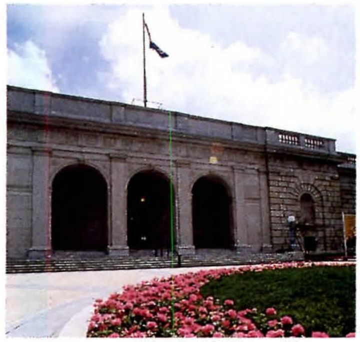
The new zoning document is the latest to come out of a 15-year controversy that began with the adoption of the last set of residential controls in 1978 and continued through several interim measures. The city has been enforcing a hodgepodge of 1978 and more recent controls.

While some architects feel restricted by the new controls and accompanying design guidelines, Schlesinger thinks good architects will find ways to be inventive, and he believes the controls will improve the quality of buildings not designed by architects—a majority of the city's new residential buildings.

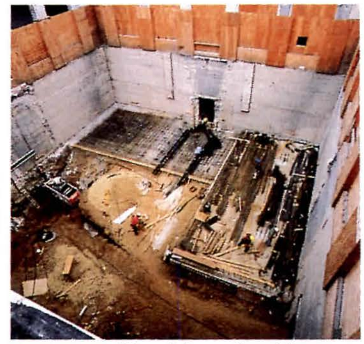
According to Schlesinger, "Bay windows are still encouraged, but if you are creative enough, you can demonstrate to the Planning Department that your building is perfectly contextual even though it might be avant garde." —*Dirk Sutro*

Details

GHA Architects has been selected to design the first phase of Lewis & Clark Colleges' Signature Project, which comprises additions and renovations to its library, as well as the design of a humanities center, and a visual arts center. Finalists for the commission include **Carlson/Ferrin Architects**, ***Moore Ruble Yudell Architects***, **Stanley Saitowitz**, and **Zimmer Gunsul Frasca Partnership**. The American Society of Arts and Letters has announced the winners of its annual awards in architecture. **José Rafael Moneo** of Madrid was named winner of the Arnold W. Brunner Memorial Prize, and **Franklin D. Israel**, principal of Los Angeles-based **Franklin D. Israel Associates**, was named winner of the Academy Award in Architecture. The Women's National Democratic Club honored AIA President **Susan Maxman** with its Shattering the Glass Ceiling award, which recognizes contributions to the advancement of women in business and politics. **Maxman** also received an honorary doctor of humanities from Ball State University in Muncie, Indiana. **HNTB** has been commissioned to design a replacement for Terminal A at Logan Airport in Boston. HNTB will work with **Leers Weinzapfel Associates Architects** on the $209 million first phase of the project. **Payette Associates Architects and Planners** is developing a master plan for the Physical Sciences Division of the University of Chicago. **Kohn Pedersen Fox Associates** is designing a 600-room hotel with an adjacent condominium in Djakarta, Indonesia, and a 46-story hotel tower in Taichung, Taiwan. **Beyer Blinder Belle** has been commissioned to restore Paul Rudolph's architecture building at Yale. **Hammel Green and Abramson** has won a $3 million commission to design the Plains Art Museum in Fargo, North Dakota. **TAMS Consultants**, in collaboration with **Skidmore Owings and Merrill** and **Ove Arup and Partners**, is studying redevelopment alternatives for terminals at Kennedy Airport in New York. **James Walsh** and **Paul Ladensack** of **Mackey Mitchell Associates** won the St. Louis Development Corporation's Gates and Markers competition. **I.M. Pei**-designed Rock and Roll Hall of Fame broke ground in Cleveland. **Venturi, Scott Brown and Associates** has completed a design for an emergency service workers' headquarters at Walt Disney World in Orlando.



FREER GALLERY: Platt's 1923 pavilion.



JOHN TSANTES/FREER GALLERY OF ART

EXCAVATION: New labs and archives.

SITEWORK: Sasaki refines plaza.

Freer Gallery Reopens in Washington, D.C.

After a $26 million renovation and expansion that took four and a half years, Charles Lang Freer's eponymous collection of Asian art on the National Mall in Washington, D.C., reopened May 9. That date marked the Freer's 70th anniversary in its small, Italianate temple designed by New York Classicist Charles Platt.

The Freer's remodeling upgrades the original 1923 building with fresher galleries, more room for its large collection, and new spaces for study and conservation. Shepley Bulfinch Richardson and Abbott of Boston designed 13,000 square feet of new research and storage space, excavated below the Freer's central courtyard. Three new sublevels house a commodious laboratory and archival complex; at last, scholars may examine most of the 27,000-object art collection privately, as if it were on display, in generous windowed cabinets and vertical drawers. Directly below the storage area lies a new exhibition gallery connecting the Freer with the adjacent Arthur M. Sackler Gallery, the Smithsonian's sister museum of Asian art, which also was designed by Shepley Bulfinch and opened in 1987.

At the gallery level, architects Cole & Denny/BVH of Alexandria, Virginia, overhauled the 302-seat Eugene and Agnes E. Meyer Auditorium, replaced the roof, and inserted new skylights and laylights. Limestone walls in foyers and corridors were cleaned and repointed; marble floors have been realigned. Architects eliminated most structural barriers to people with disabilities: An elevator was carved into the south end; and designers improved lighting, signs, and exhibits. A second public entrance has opened, facing Independence Avenue to the south. The gift shop has been moved from the north lobby to a handsome den near the corridor to the Sackler.

New skylights in the galleries hold specially fitted glass to modulate seasonal light changes within. Both skylights and laylights reduce ultraviolet light shed on photosensitive artwork. Track lighting now vivifies delicate sculptures, ceramics, and metal objects that once stood obscured in incidental shadows. The lighting mixture harmonizes with

JOHN TSANTES AND JEFFREY CRESPI

PEACOCK ROOM: Whistler revived.

DENISE HOWELL/FREER GALLERY OF ART

NEW SKYLIGHTS: Daylight modulated.

ROBB HARRELL/SMITHSONIAN INSTITUTE

AMERICAN GALLERIES: Walls are painted in bolder shades to showcase artwork.

the newly colored gallery walls: forest green, sand, fair yellows, and milk-chocolate brown.

Such alterations to the Freer, while outwardly calm, deviate substantially from the founder's intentions, which scarcely foresaw his collection tripling in size. Freer, a Detroit railroad magnate who taught himself about art, "had a vision of his collection—a wholeness," says gallery spokeswoman Mary Patton of the collector's singular focus on Asian art and select American paintings.

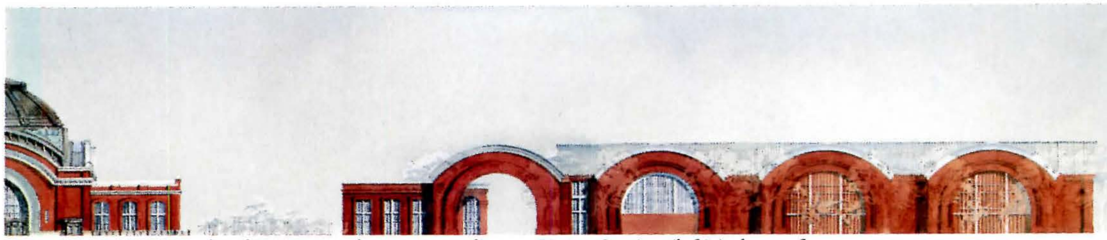
Freer's confidant, Agnes Meyer, finally persuaded him to allow additions to his Asian collection. However, Freer would never add to his American collection, which encompasses a total of 58 paintings by James McNeill Whistler, John Singer Sargent, and a few others.

Whistler's extravagance and influence on his reserved friend Freer appears with peculiar force in the restored installation of the gallery's Peacock Room, which Whistler painted in 1876-1877. This rich space, itself a work of art, was originally designed by English architect Thomas Jeckyll as the dining room of wealthy London shipowner Frederick Leyland. Freer bought the room and had it dismantled and shipped to his Detroit home in 1904; it was installed in the Freer Gallery after his death in 1919.

Lined with Chinese porcelain vessels, the Peacock Room portrays an artistic tale of the time Whistler came to near-fisticuffs with his client Leyland during the original installation. In reaction, Whistler covered the room's leather walls with Prussian blue and painted a symbolic pair of fighting peacocks in gold—with Leyland as aggressor—titled ironically: "Harmony in Blue and Gold."

Today, two live peacocks, James and Sylvia, parade about the Freer Gallery's interior courtyard. Ceremonious patterns of this inner garden echo in the new sitework designed for the outer plaza by Sasaki Associates of Washington, D.C. The central circle of the plaza is the "interior courtyard being brought to the outside," says architect Tony D'Agostino, of Sasaki. In addition, shrubs that once covered much of the Freer Gallery's facade have been removed and replaced by smaller garden details that allow the one-story limestone building to breathe. —*Bradford McKee*

News



WEST ELEVATION: Moore/Andersson pays homage to adjacent Union Station (left) in bays of new museum.

Washington Builds New History Museum

Washington's first museum to relate its whole state history will begin construction in Tacoma this October. Scheduled to open in 1996, the Washington State History Museum will be the only new building constructed in an historic, formerly industrial neighborhood along the Thea Foss Waterway. According to David Nicandri, director of the Washington State Historical Society, "It is a model infill project, but a modern museum nonetheless."

The 104,000-square-foot museum, designed by Moore/Andersson Architects of Austin, Texas, with the aid of Olson/Sundberg Architects of Seattle, will comprise a monumental vaulted shed divided into three vaulted bays, arranged along a north-south axis parallel to the waterway. At its northern end, the building will be entered through a west-facing arch—a variation on the bays—to a plaza and an amphitheater. Inside, the museum's northernmost bay will house the historical society's offices, a bookstore, and spaces for topical and temporary exhibits. The southern two-thirds will showcase the museum's permanent collection. A cafe and auditorium will be housed in a separate structure on the northern edge of the history museum's site.

In scale and style, the new museum takes its cues from Union Station to the north. The 1911 railroad station, closed in the mid-1980s, was restored in 1992, and now houses a federal court complex. While the station's Neo-Romanesque spirit resounds in Moore/Andersson's museum design, the museum will not imitate the older structure. For example, the arches of the new building will be framed in brick, rather than the stone of its elder neighbor. The museum design "articulates the vernacular of the neighborhood," explains Susan Benz, project manager for Moore/Andersson. Its environs also include historic warehouse buildings that will be transformed by Moore Ruble Yudell, with Loschky Marquardt & Nesholm of Seattle, into a branch campus of the University of Washington. Seniority counts: The museum's design, its architects maintain, will not upstage Union

NORTH-SOUTH SECTION: Permanent exhibits in south end will comprise dioramas and displays along a central circulation spine.

Station and its grand dome. "We have paid our respects to the building next door," notes Benz.

In that regard, the new museum's concave courtyard, which will serve as a small but dramatic amphitheater, is designed as an inverse counterpart to Union Station's dome. Two classic, Roman-style city gates will usher pedestrians into the courtyard area from the northern and eastern sides.

Visitors to the museum's main building will enter a large, daylit lobby on axis with the dome of Union Station. The lobby will rise 52 feet to its vaulted roof. A long curve of stairs will dominate the lobby, continuing toward the space for short-term exhibits.

The museum's permanent exhibition gallery will hold four large bays and several smaller alcoves situated along a main aisle. The central circulation spine will function as a metaphorical time line and index to the displays surrounding it and will climax at its southern end with a gigantic, lighted map of Washington. The side galleries will include dioramas, portraying an Indian lodge, for example, and pioneer settlements. This story line—from aboriginal life, to Manifest Destiny, to the present—will cross a set of perpendicular railroad tracks at a point representing the end of the 19th century, distinguishing the great turn of Northwest civilization at the advent of the Industrial Age.

Nicandri of the historical society says he looks forward to the museum's "nontraditional, new ways of looking at history." The displays will incorporate modern, multicultural Washington in all its idioms, such as the winter festivals of the Chinook tribe on the Pacific Coast and the history of the first nonnative colonies, settled by the Mexican Spanish. The director also says the exhibits will explain the "subtle" ways Washington's landscape has shaped its history. Nicandri points out that William Boeing, who founded the aircraft company that is the state's crown employer, was a timber man, and that early airplanes relied upon the wood of Washington's forests. As Tacoma's newest landmark takes a place beside its grandparents, it promises faithfully to synthesize the rugged state's manifold character. —*Bradford McKee*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San Francisco Architect Named Palladio Award Finalist

San Francisco architect Richard Stacy, of Tanner Leddy Maytum Stacy Architects, has been named a finalist in this year's Andrea Palladio International Architectural Award exhibit to be mounted in the Hall of the Basilica Palladiana in Vicenza, Italy, from September 3 to October 17. Stacy's submission is one of 20 finalists—from 333 entries from around the world—and the only submission by an American architect to reach the Palladio Award finals.

The award, held every two years, is sponsored by Italian lighting products manufacturer Caoduro Rooflights under the patronage of the Italian government and the city of Vicenza. Stacy's scheme for a live/work studio on a 20-by-75-foot infill site in the South of Market district in San Francisco responds to the clients' tight budget and incorporates maintenance-free industrial materials that are carefully detailed and deliberately revealed to enclose the high-volume spaces.

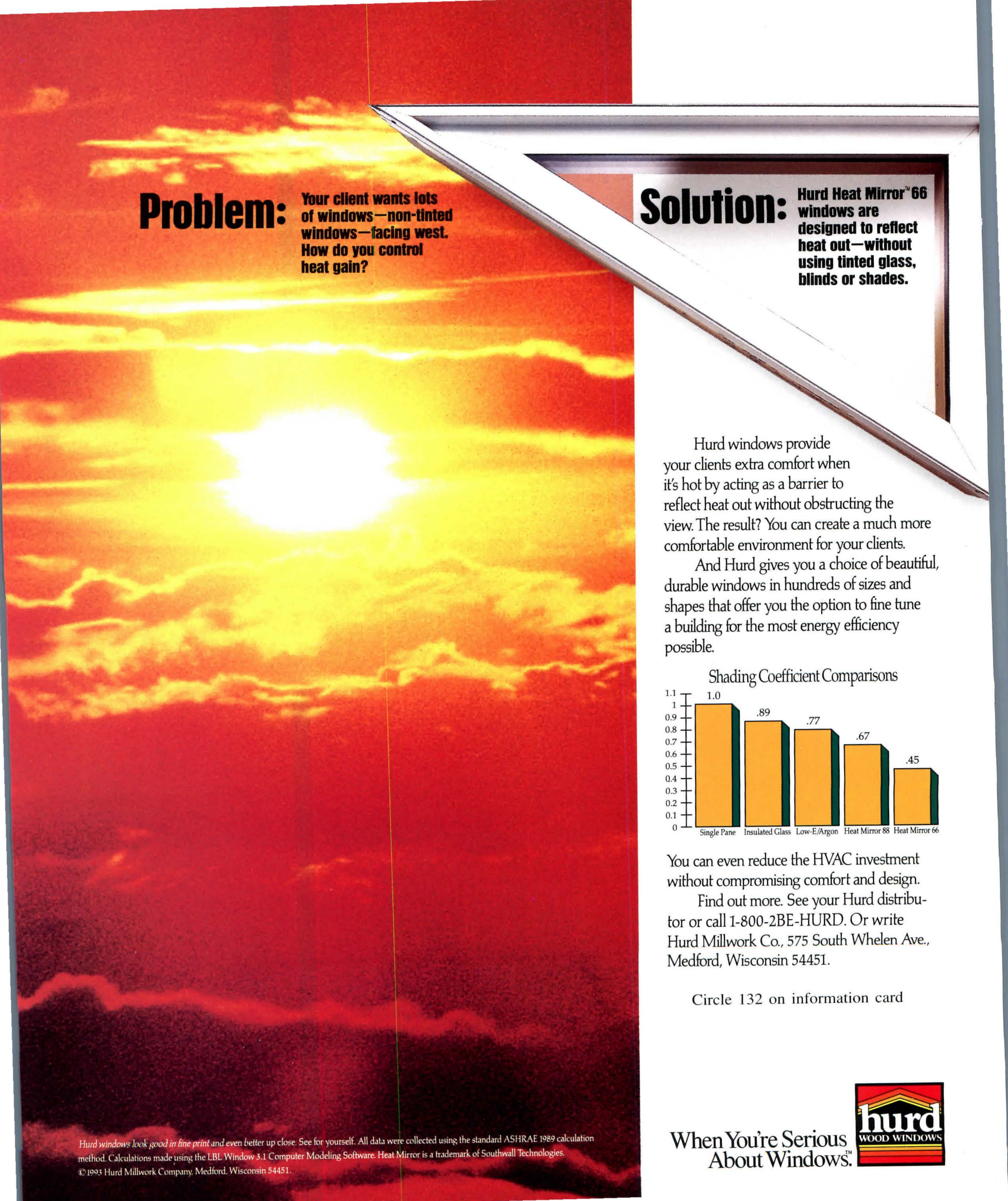
The building plan concentrates stairs and ancillary spaces on the southeast side, leaving the northeast portion open for loft spaces with large windows that provide the occupants—a fashion photographer and a graphic designer—with maximum daylighting benefits. Open metal riser stairs and interior translucent panels allow light to penetrate deep inside the structure.

The winning project will be selected by the Palladio Award jury during the course of the exhibition and formally announced at a ceremony in the Teatro Olimpico in Vicenza on October 1. —*P.P.*

WINDOW WALL: Maximizes light in loft.

OPEN PLAN: Accommodates live/work.

INDUSTRIAL MATERIALS: Exposed steel.



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WOOD WINDOWS

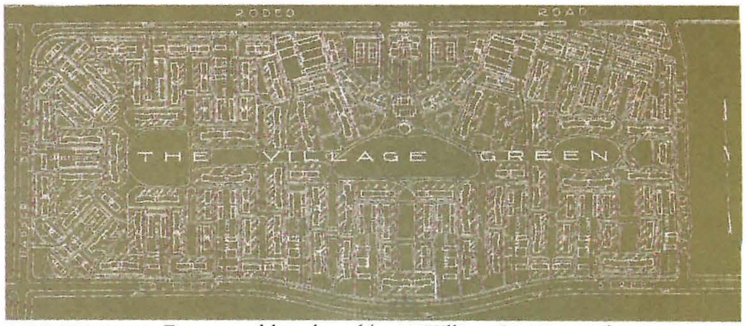
Fence Competition Provokes Controversy

Fences build bad faith. So say some residents of Village Green, a 64-acre garden apartment complex designed by Reginald Johnson, Robert Alexander, and Clarence Stein in 1940 for the Baldwin Hills section of Los Angeles. Last year, they learned that a fellow resident and architect, Wesley van Kirk Robbins, was staging a design competition for a fence around their 600-household community.

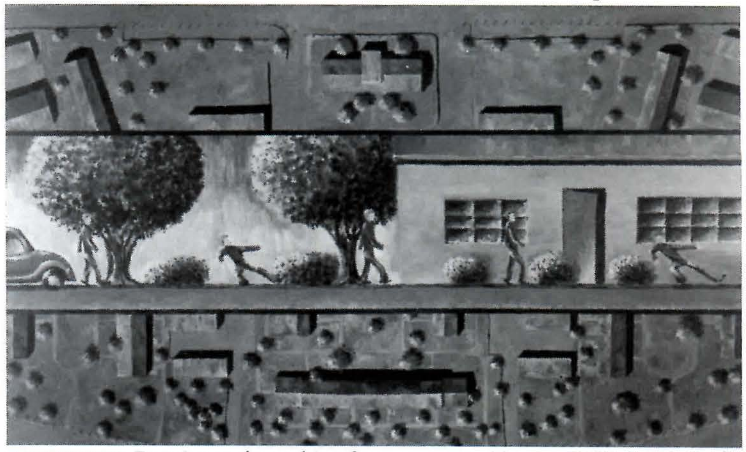
Ann Moore, a writer for Gensler Associates, headed the Village Green homeowners' board when word emerged of the maverick contest. Moore says that philosophically, she had "grave misgivings" about the fence idea. Some of her neighbors say they felt similarly vexed, maintaining that a fence is a poor way to solve urban problems. To his credit, says Moore, Robbins never claimed the contest was official.

Despite the provincial outrage over his competition, the 36-year-old architect proceeded on course, calling for entries worldwide. About 128 entries arrived from the United States, Japan, Belgium, Spain, and Singapore. Robbins paid seven local architecture luminaries $1,000 apiece to judge the entries in mid-May. The jury comprised Hank Koning, Eric Owen Moss, Dion Neutra, Crombie Taylor, Susan Whitin, Barbara Stauffacher Solomon, and David Gebhard.

Prize money totaled $12,000, split among six entries. Winners included a "human fence," which Georgia architect James Scott O'Brien scripted as a row of figures dressed in 1970s clothing, with every third person dancing the "Hustle." A California winner, Udo



COMPETITION SITE: Fence would enclose 64-acre Village Green complex.



FENCE WINNER: Dancing and marching figures proposed by James Scott O'Brien.

THE RIGHT WHITE

Photography: Peter Leach, Denver, PA   Artist: Toshio Sasaki   Owner: New York Aquarium

Artist Toshio Sasaki's choice of material for his award winning 340 foot long Sea Cliffs Exhibit art sculpture wall at the New York Aquarium? White cement concrete, Naturally! Another example of the inovative potential of this legendary material.

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THE DESIGNERS PALETTE

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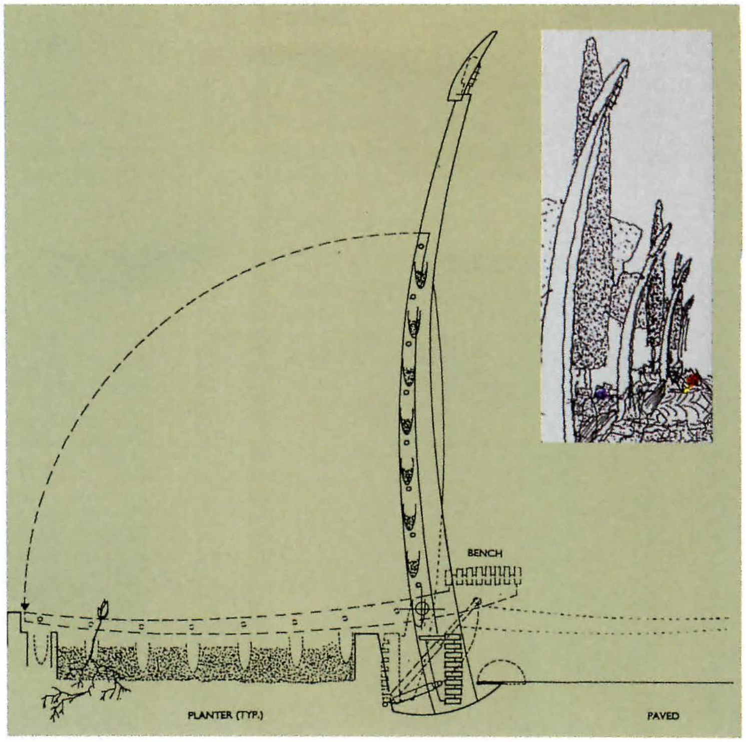
Greinacher, who teaches at the University of California at Berkeley, proposed the installation of thousands of water jets to create an apparition of mist and lights. New York architects Irvin Glassman and Plato A. Marinakos, Jr., won for their conception of a cantilevered fence bearing rows of planted flowers, which would unfold over time with its own increasing weight. The other competition winners were two teams of Canadians: Kerry Nagata and Robert Pashuk of Calgary, Alberta; and Paul Backewich and Kevin Sugden with Ken Coit and Neil Campbell of Waterloo, Ontario. Aaron Paul Davis, who teaches at the University of East London, was also awarded a prize.

"There was not one project that stood out," insists juror Hank Koning of Koning Eizenberg Architecture. "They are conceptual; they aren't necessarily buildable." Notes Eric Owen Moss, who admits he would not want a fence built around Village Green, "We wanted to know how somebody could think of the problem in various ways, including very extreme ways." Winning entries, along with some 40 others, were displayed in a Los Angeles warehouse until June 13—the date of Robbins's awards ceremony.

Robbins says he conceived the competition before the Los Angeles riots in April 1992, which erupted close to Village Green. So while the fence idea was not reactionary, he says, the tensions of post-riot Los Angeles have added emotional freight to his enterprise. The motivation was "dialogue," Robbins insists dryly: "I wanted to ask an impertinent question." —*Bradford McKee*



FENCE WINNER: Entry by Irvin Glassman and Plato A. Marinakos, Jr., depicts a cantilevered fence of hanging flowers, which unfolds under its own weight.

Castro-Blanco Awarded Whitney Young Citation

Affordable housing advocate David Castro-Blanco, FAIA, a New York City-based architect, was honored with the 1993 Whitney M. Young, Jr., Citation at the AIA convention last month in Chicago.

The annual AIA award, named for the late civil rights leader who challenged architects to assume responsibility for issues, is presented to practitioners who make significant contributions to society and the task of cultural diversity.

Colombian-born Castro-Blanco is this year's President of the AIA's New York City chapter and founder and CEO of New York's largest Hispanic firm, Castro-Blanco, Piscioneri & Associates, Architects. Castro-Blanco was recognized for his efforts on behalf of minority architects and his participation in numerous civic activities. Each year, his firm sponsors and funds a yearly design competition to encourage young Hispanic students to enter the profession. Castro Blanco also founded the Institute of Puerto Rican Urban Studies in 1967.

YOUNG CITATION: David Castro-Blanco.

Mariani Wins AIA's Kemper Award

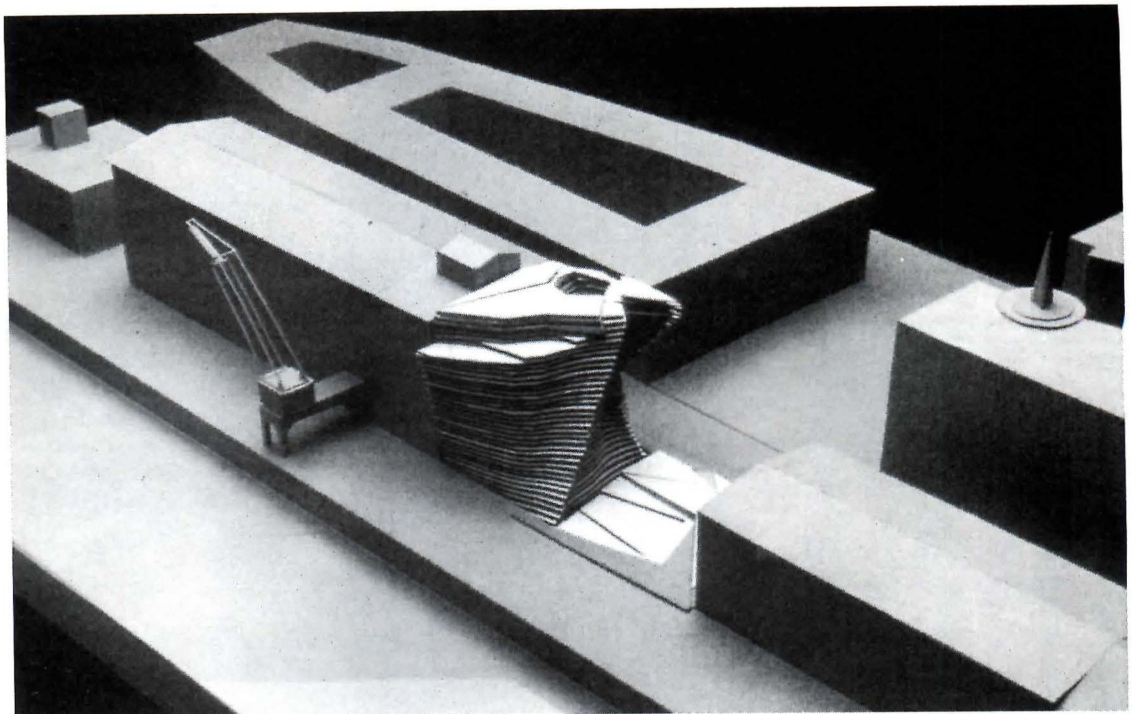
Former national AIA Vice President Theodore F. Mariani has been honored with the 1993 Edward C. Kemper Award—named for the national AIA's first executive director—for his contributions to the Institute and the profession.

When he was chair of the AIA Legal Oversite Committee, from 1984 to 1990, Mariani helped resolve an alleged antitrust violation of the U.S. Justice Department's 1972 consent decree and a dispute concerning the AIA Benefit Insurance Trust's administrator.

As AIA Vice President in 1984, Mariani led an effort for the creation of a new AIA region for the Virginias from the Middle Atlantic region. AIA's Middle Atlantic region now comprises Washington, D.C.; Delaware; and Maryland.

Mariani—who has practiced architecture in Washington, D.C., since 1957—was also the first architect to serve on the Washington Metro Council of Governments. He twice chaired the Washington, D.C., Zoning Commission. Mariani also served on the Mayor's Downtown Design Committee from 1981 to 1985 and chaired Maryland's Howard County Rural Residential Land Use Commission in 1991.

KEMPER WINNER: Theodore F. Mariani.



SITE MODEL: Eisenman's swirling design for Haus Immendorf will overlook the Dusseldorf Harbor.

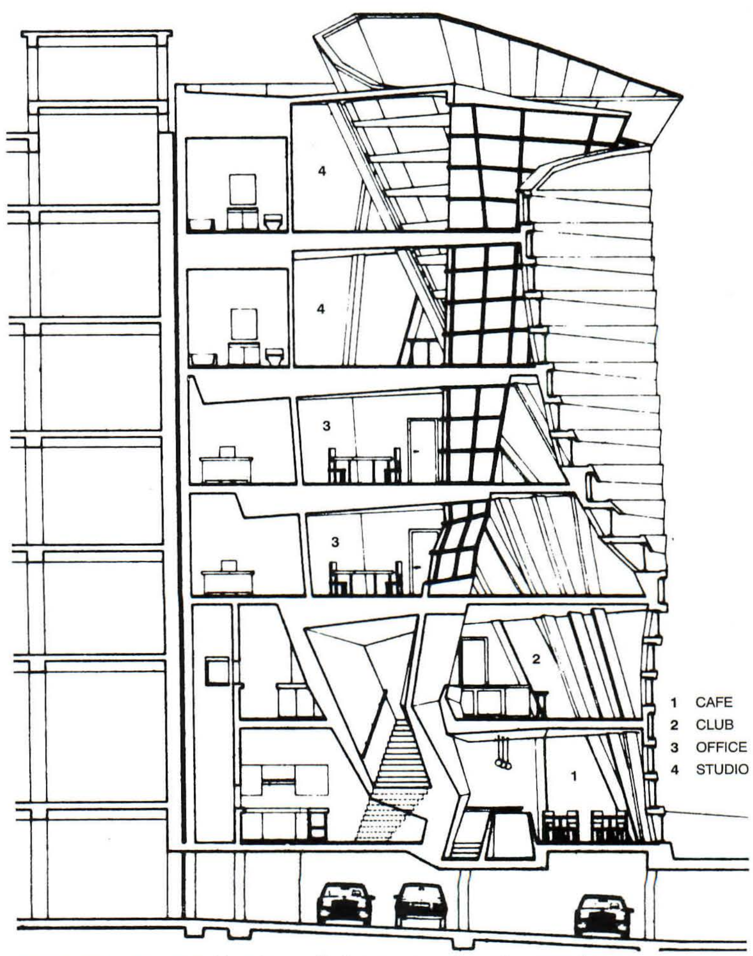
Haus Immendorf
Dusseldorf, Germany
Eisenman Architects

Peter Eisenman has recently designed two projects in Germany, both derived from the unsettled precincts of nature. His plan for Max Reinhardt Haus, a 34-story multiuse building in Berlin, envisions a fantastic expression based on the Mobius strip—a twisting surface with no definite sides. The design currently awaits municipal review.

Meanwhile, Eisenman is developing his latest iconoclastic creation, Haus Immendorf in Dusseldorf. Its swirling, six-story volume summons the nonlinear play of solitons—solitary waves that retain their shape after colliding with each other.

Haus Immendorf and its plaza will be sited on the Dusseldorf Harbor. The ground floor of the 1,235-square-meter, mixed-use building will hold a cafe/bar and an outdoor terrace. A private club will occupy the first floor; rental offices will fill the second and third floors; and studio space for artists will take up the fourth and fifth levels.

Slanting surfaces of Haus Immendorf's inner and outer concrete volumes intersect as they rise in a vortex. The exterior will be clad in a stepped glass skin of 1-meter-high windows, alternating with louvers set back at varying depths. *—B.M.*



NORTH-SOUTH SECTION: Slanting walls intersect as they rise, creating a vortex.

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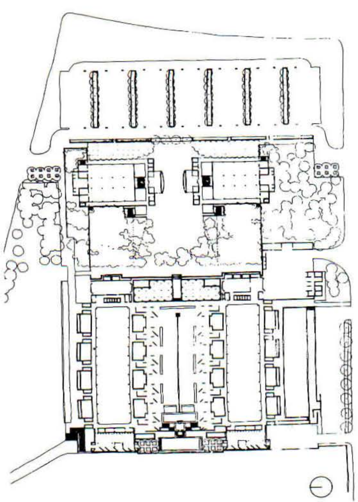
Salk Addition: Pro and Con

Will Kahn's vision be preserved or destroyed as Salk expansion plans progress?

EZRA STOLLER

SALK INSTITUTE: Kahn's courtyard.



NEW ADDITION: Anshen + Allen's structure is sited to east of Kahn's complex.

As the traveling retrospective of the work of Louis I. Kahn opened in Los Angeles this spring, bulldozers were uprooting the eucalyptus grove in front of the Salk Institute in La Jolla, paving the way for construction of the controversial addition by Anshen + Allen to Kahn's masterpiece by the sea. By mid-June, the site had been cleared for former Kahn associate David Rinehart's bilevel, 113,000-square-foot addition to the 1966 complex, a winner of the AIA's 25-Year Award.

Although most architects across the country oppose the addition, their hue and cry did not make itself felt at the Salk until the building process was practically irreversible. According to project architect Tom Chessum of Anshen + Allen, the first letters against the project, from Sue Ann Kahn and Anne Tyng, among others, weren't received until the design was being reviewed by the San Diego City Planning Commission in the spring of 1991. For six months, Tyng and Kahn fruitlessly appealed each approval by a city or state commission.

In November 1992, as a building permit was issued, founding director Jonas Salk defended the plans at the Architectural League in New York. The packed house was respectfully antagonistic; Vincent Scully, Kenneth Frampton, Steven Holl, Anne Tyng, Esther Kahn, and others rose to explain their opposition and to propose alternatives. Salk, however, seemed satisfied to claim that he had listened to these viewpoints. Frampton subsequently spent a day in La Jolla with Salk and convinced him to move the building site 10 feet to the east, ameliorating the damage to the vista of the Pacific Ocean between Kahn's two-sided institute. Also, a 45-foot-wide central rotunda linking the two new wings was removed from the design. However, according to Frampton, "The building itself is weak. On the surface it's very respectful of Kahn in a sentimental way, but it is not intelligent in itself."

Jonas Salk instead sees the new addition as a natural evolution of the complex and necessary for the future success of the institute. The addition contains offices, communal spaces for the scientists, and a below-grade auditorium, allowing the 1966 structure to house laboratories and research spaces, as Kahn intended.

In April, an ad hoc committee of architects, among them Frank Gehry, Richard Meier, Philip Johnson, and Robert Venturi, sought an audience with the institute's new president, Dr. Brian Henderson, who joined the institute only this February. Henderson, however, declined the invitation and recently explained that "it seemed inappropriate. There has already been a lot of review, and I didn't see the point." A stirring response to the course of events by Venturi and partner Denise Scott Brown is printed on the following pages. Henderson, whose view of the Salk expansion also follows, explains, "We have other realities. We really do need the space." The foundation for the new structure has been dug, and the addition should be completed in two years.

Genius Betrayed

We protest the addition to the Salk Institute not as Kahn groupies. We are part of a normally dispassionate group of people—critics, architects, and academics—whose sensibilities are outraged not by the decision to grow, but by the location and arrangement of the addition to the architectural masterwork that is the Salk.

Background

Le Notre, in his French garden, evolves beyond the finitely ordered Italian Renaissance garden whose central axis is terminated by the sculptured slopes of a terraced hill; the central axes of the Baroque gardens at Vaux-le-Vicomte and Versailles remain open at the end, extending, within their Cartesian order, toward a horizon symbolizing infinity.

Lewis Mumford discussed the significance of Thomas Jefferson's original intention of maintaining open views at both ends of the lawn at the University of Virginia. Jefferson was evidently persuaded by Benjamin Latrobe to insert the Pantheon-library at the northeast end of the central axis and thereby reproduce an essentially traditional-hierarchical order; alas, McKim, Mead and White plugged up the other end less than a century later. Much of the power of Jefferson's second design derived from its spatial and symbolic gesture toward the Shenandoah Valley, from its framed view of the imminent frontier extending to the southwest. But his original design—open at each end—was more significant.

The grid-iron plan of the American town is significant, too. Streets are typically open-ended—there is no ducal palace at the end of an axis—and relationships between streets and buildings are nonhierarchical, conforming to a democratic ideal. A building in this kind of plan derives its importance not from its relative position but from its inherent quality. American cities do not conform to the European ideal, where a whole is defined within borders and axial terminations, but acknowledge an order that is incomplete as it accommodates expansion toward eternal frontiers.

Kahn's conception

Louis Kahn designed the Salk Institute not as a naive or pompous whole, but as an eloquent composition that is spatially and symbolically incomplete—its two richly rhythmical buildings, in themselves incomplete, suggest at once a divine duality with significant implications and an evocative inflection toward a significant American landscape.

EZRA STOLLER

SALK: Common space defined by an infinite horizon.

This eloquent, nonhierarchical complex, with nothing in its central axis, suggests, in its sophistication, the American democratic ideal. Its common space poised between a vast continent—symbolized by the bosque of trees—and a vast ocean—defined by an infinite horizon—is perceptually, physically, poignantly American. In framing the sea and the land in its composition, it marks the end of the Western frontier and the beginning of a new frontier. The Pacific Ocean and the American continent, a nation and the world, are poised at the Pacific rim in a global culture whose science, practiced within the architecture, becomes complex and universal, as it heads over toward its own new frontiers.

This Salk Institute complex completes the evolution within the space and meaning of American architecture described above. Up to this point, it remains the most significant architectural composition of our century and, arguably, of all American architecture. It is an American architectural masterpiece by an American genius—and it is a tragedy it is being whimsically and imperiously transformed into an ordinary, Baroque bore.

Recommendation

Don't speculate on what Kahn intended, when, and where. Just relate to what's there—an expression of the American view of space. We don't care what the new building looks like. Just don't locate it as an axial ducal palace that subordinates Kahn's original buildings—locate it where it doesn't demolish the genius of the place. Site it nearby if need be, but place it off axis and cant it. Learn from Kahn's exquisite, groping sketches of axially planned buildings related nonaxially, as the Greeks did. Shun the symmetry and completeness; honor Lou's abstractions of the infinite sea and the stylized woods representing land, continent, and the human landscape.

Robert Venturi and Denise Scott Brown, principals, Venturi, Scott Brown and Associates.

A Delicate Balance

We at the Salk Institute share the concern expressed by many architects to preserve the architectural integrity of the structures in which we are privileged to work. We, too, have been sensitive to such concerns throughout the two years of planning; consultation; and local, national, and international fund-raising that have brought about the much-needed change.

Thriving institutions have a need to grow, and the Salk Institute is at just such a point in its 31-year history. To make scientific progress toward the conquest of human disease through fundamental biological understanding, we must have laboratory facilities. The new East Building will not only house administrative offices, an auditorium, and seminar rooms, but will also provide space for research on human genetics. The East Building will enable us to free all of the South Building of the Kahn complex to serve the purpose for which it was intended: housing scientific laboratories.

Placement and design

We are well aware that a crucial element in any change is the relationship between the placement and design of the new structure in relation to that which exists. The site selected for the administrative/meeting structure is the one that Dr. Jonas Salk and Louis Kahn envisioned together back in the 1960s. The question has been raised by some as to why other locations to the west of the site that were also marked in the Kahn/Salk master plan were not chosen. Those western areas were reserved for buildings designed for nonlaboratory functions, such as housing visitors and programs related to activities of a more general nature. The laboratories were always meant to be placed on the site to the east now being developed for that purpose. The western sites are being respected for future development when funding becomes a reality.

The site for the Anshen + Allen-designed expansion is historically based and the most functionally appropriate solution. The architects were intentionally chosen because they were part of the original Lou Kahn design and project team and will maintain the same delicate balance between scientific needs and esthetic considerations that the original complex so remarkably achieved. The institute sought and heard opinions and suggestions from individuals, the general public, and special interest groups for more than two years and in at least 12 forums, including the San

SALK: Laboratories will be reinstated as intended.

Diego Chapter of the AIA, the New School of Architecture in San Diego, the University of California at San Diego's Campus Planning Committee, the University Community Planning Group, and the La Jolla Community Planning Association. Dr. Jonas Salk presented the plans to the New York Architectural League last November. Public organizations involved in the process included the American Planning Association; the San Diego Historical Society; Save Our Heritage; and the University of California, San Diego, School of Architecture.

Among the changes that resulted from these encounters were an increased distance between the new and existing buildings to 150 feet; deletion of a cylindrical structure and a bridge between the wings of the East Building; the deletion of trees in the entry court to open the view to the Kahn complex; the addition of jacaranda and eucalyptus trees in the area between present and new structures to re-create the eucalyptus grove that was planted for the purpose of filling the space east of the Kahn structures until other structures were built.

Commitment to humankind

We are firmly committed to complete the laboratory aspect of the master plan on a site determined by Louis Kahn and Jonas Salk. It is one more step toward completion of the original vision for this unique institution. As the East Building's structure and landscaping are completed, we hope you will judge for yourself how well we have succeeded.

Not only are we obligated to the public who have supported our research efforts and to the world-class scientists who advance their work here, but also to the citizens of San Diego who donated the land for the institute. We have an obligation to them to put their gift to beneficial use for humankind.

Dr. Brian Henderson, president, The Salk Institute, San Diego, California.

ARCHITECTURE

CULTURAL SENSIBILITIES

New museums and art centers express the cultural messages of their exhibits and settings.

Museums and art centers that immerse visitors in didactic, often visceral, experiences are the subject of this month's issue. These new arts facilities shun the Bauhaus box, drawing instead from the character of their settings and the sensibility of the culture showcased within their walls.

Our cover story on the United States Holocaust Memorial Museum in Washington, D.C., reveals how architect James Freed drew from the tectonics of Nazi death camps to create powerful architecture that prepares visitors for the horrors displayed in the exhibits. In New York City, Maya Lin transformed a SoHo storefront into darkened galleries and illuminated staircases to underscore the non-Western aspects of African art. In Portland, Oregon, the Zimmer Gunsul Frasca Partnership renovated a power-generating station along the Willamette River as an appropriate anchor for a hands-on museum of science and industry. In designing two different arts centers, Hardy Holzman Pfeiffer Associates drew upon the idiosyncrasies of masonry: brick manufactured in beehive kilns for the Fine Arts Building at the University of Nebraska at Omaha and granite blocks for the Middlebury College Center for the Arts in Vermont. For a new Visual Arts Facility at the University of California at San Diego, architect Rebecca Binder bent the rules of the campus master plan by separating art studios, classrooms, and workshops into five distinctly different buildings, united by courtyards, that support the informality of the artistic process.

RIGHT: The United States Holocaust Memorial Museum designed by Pei Cobb Freed and Partners mediates between the Auditor's Building to the north (foreground) and the Bureau of Engraving and Printing to the south.

U.S. Holocaust Memorial Museum
Washington, D.C.
Pei Cobb Freed & Partners, Architect

IN REMEMBRANCE

TOP: The 14th Street facade marks main entrance on a pedestrian path from the Mall to the national mint. Curving limestone screen shields entrance plaza. **ABOVE:** The 15th Street facade steps back from the street to create 18,000-square-foot ceremonial courtyard known as Raoul Wallenberg Place. Hexagonal limestone volume contains Hall of Remembrance. Towers to north recall death camp sentry stations. **FACING PAGE, TOP LEFT:** Limestone screen of principal facade obeys Classical context, but is curved to stand out. **FACING PAGE, TOP NEAR LEFT:** Entrance plaza leads to prisonlike facade. **FACING PAGE, TOP NEAR RIGHT:** Loading dock recalls incinerator. **FACING PAGE, TOP RIGHT:** Narrow slots in Hall of Remembrance offer glimpses of Tidal Basin memorials. **FACING PAGE, BOTTOM:** Glass bridges spanning Hall of Witness connect library and archives on fifth floor.

The Nazi concentration-death camps in Germany, Austria, and Poland were the first Holocaust memorials. Anchored on the very ground where millions were murdered, the buildings that remain in Auschwitz, Buchenwald, Dachau, Bergen-Belsen, Majdanek, and Treblinka bear powerful witness to 20th-century civilization's deadliest fall from grace.

Forty-eight years after Europe's camps were freed, the United States Holocaust Memorial Museum opened in Washington, D.C., on a 1.7-acre parcel of federal land in the heart of America's civic culture. Around the corner from the National Mall, and a short walk from the Smithsonian, the new museum is located near the Washington Monument and overlooks the Lincoln and Jefferson memorials. In the company of a democratic nation's noblest monuments to freedom, and some of its greatest repositories of art and learning, the new memorial could not be other than an American presence. It embodies this country's own particular version of the Holocaust—a story that honors those who made new lives here as survivors of a political system unsurpassed in evil. Like its neighbors, the Holocaust Museum defines and celebrates the meaning and importance of democracy, but it does so by demonstrating the worst that can happen through the absence of liberty and law.

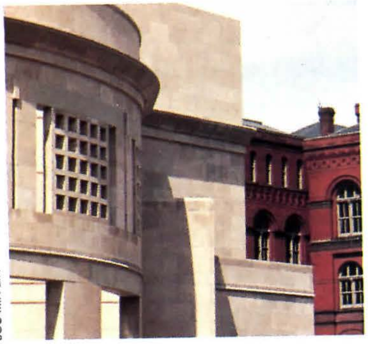
Could the art of architecture be made to bear witness to this worst? The task of the museum's architect, James Ingo Freed of Pei Cobb Freed & Partners, would have been a lot simpler had he decided not to try. He might have satisfied his client, the United States Holocaust Memorial Council, established by Congress in 1980 to create the memorial, as well as Washington's Federal Fine Arts Commission, had he designed a symbolically neutral, Modernist shell, contextually wedded to the Neoclassical monuments nearby, its public spaces unburdened by metaphors of murder, and its exhibits buried within a multistoried black box. Such a scheme, through architectural default, would have left the telling of the Holocaust narrative solely to the exhibition designers.

Architect Freed decided instead to make his building speak of the Holocaust's horrors, by means of allusion and metaphor. The architecture was to be in part a distillation of Holocaust death camp construction, intended to disturb, upset, and forewarn its visitors, a prelude to the more focused sorrow the exhibits would engender. Freed knew that he was taking a great risk. If the building were to become a hyperreal death camp reconstruction, his museum would surpass Disney in the perpetuation of theme park kitsch.

Freed was not the first architect to undertake the design of the Holocaust Museum. After several leading architects failed to satisfy the Holocaust Memorial Council, the council engaged architect Arthur Rosenblatt as museum director to find the right designer and act as liaison between the council and the chosen firm. It was Rosenblatt who, having failed to persuade I.M. Pei to accept the Holocaust commission, prevailed upon Pei partner Freed to take the job.

Freed had a hard time getting started. "When we got the project, frankly, we were not able to cope with the material because we didn't know enough," the 62-year-old architect explains. "Then, of course, we began to think about the images and conditions of the Holocaust." This investigation led Freed, in the company of Rosenblatt, to visit a number of concentration-death camps, including Auschwitz-Birkenau in Silesia, Poland. The camp consisted of two separate centers, Auschwitz for slave labor and Birkenau for extermination, the latter served by its own railroad spur. As the two architects toured this terrible place, they noted the evidence of its efficiency and accessibility.

The architecture of this immense death camp consists of simple industrial construction, a system of steel plates and double angles riveted together, infilled with loadbearing brick, not unlike the tectonics of turn-of-the-century factories, train sheds, and market




JOU MIN LIN

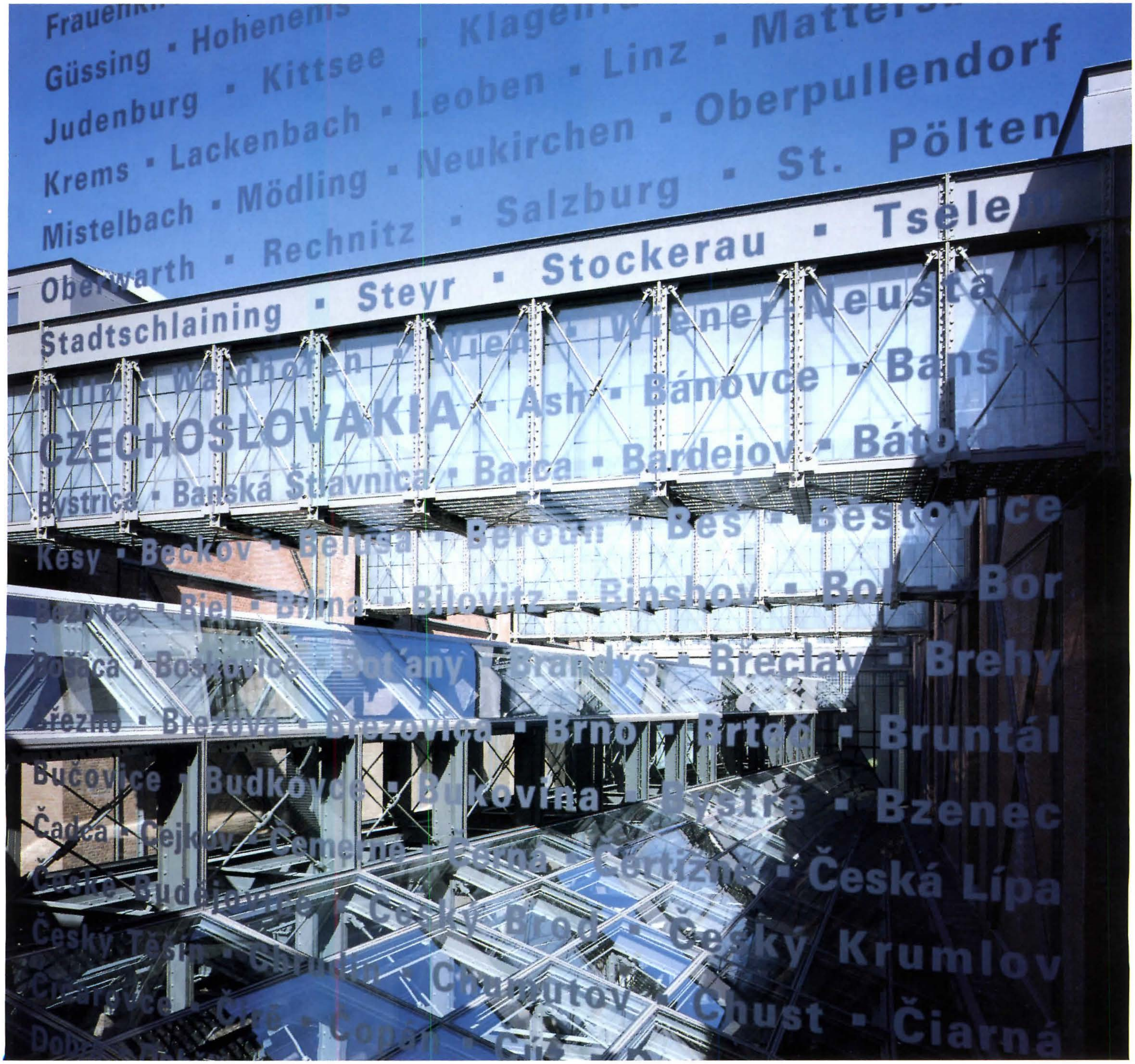

YOU ARE MY WITNESSES
ISAIAH 43:10

JOU MIN LIN

JOU MIN LIN

FACING PAGE PHOTO: ALAN GILBERT

FACING PAGE: Staircase from Hall of Witness to second floor narrows as it reaches a solitary brick arch, reminiscent of the one-way rail spur leading to the gates of Birkenau. Stair, skylight monitor, and glass block incision in floor bisect the hall along a 13-degree diagonal, a metaphor for disjunction.
TOP LEFT: View of eastern end of Hall of Witness reveals metal stage where tour groups gather, designed to recall train platforms where families were separated at concentration camps.
TOP CENTER: According to Freed, diagonal steel braces refer to the brick-filled iron frame of the 1872 Menier chocolate factory near Paris, designed by architect Jules Saulnier. They also recall the iron straps the Nazi engineers used to reinforce the brick crematoriums to prevent them from exploding through uninterrupted use.
TOP RIGHT: Bracing of roof trusses evokes turn-of-the-century factory technology.
LEFT: Warped, eccentrically pitched skylight was designed on a computer; it begins with an uneven slope (16 degrees on one side and 60 degrees on the other) and twists its way to the far end of the hall, so that the gentle and steep slopes end up on opposite sides.


Güssing • Hohenems
Judenburg • Kittsee • Leoben • Linz
Krems • Lackenbach • Neukirchen • Oberpullendorf
Mistelbach • Mödling • Salzburg • St. Pölten
Rechnitz • Stockerau
Stadtschlaining • Steyr
CZECHOSLOVAKIA • Bánovce
Banská Štiavnica • Barca • Bardejov
Beckov • Beroun • Beštovice
Bor
Breclav • Brehy
Brezová • Brezovica • Brno • Bruntál
Bučovice • Bukovina • Bystré • Bzenec
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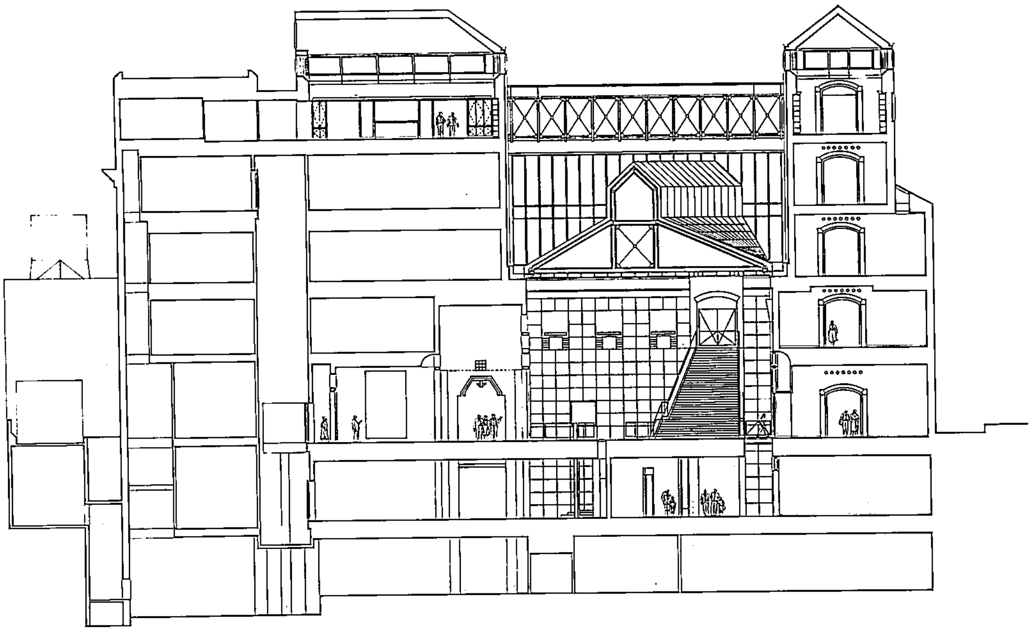
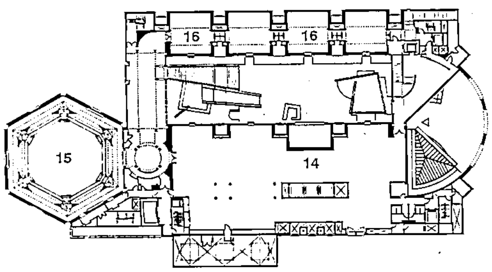
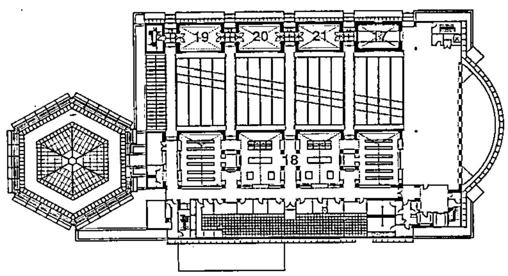
Český Brod • Český Krumlov
Chomutov • Chust • Čiarná



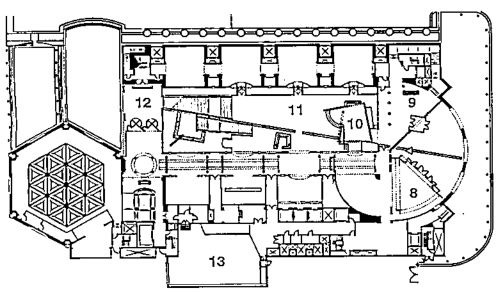
NORTH-SOUTH SECTION



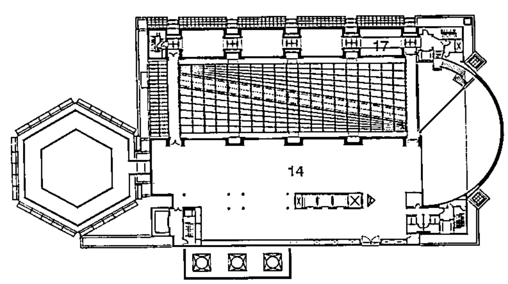
SECOND FLOOR



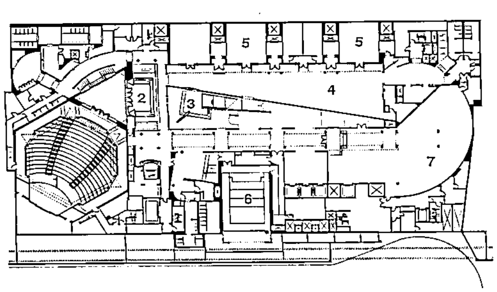
FIFTH FLOOR



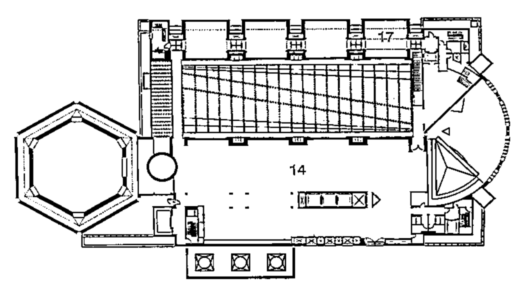
MAIN FLOOR



FOURTH FLOOR



CONCOURSE LEVEL



THIRD FLOOR

FACING PAGE, TOP LEFT AND RIGHT: Glazed bridges with glass-block floors offer views of skylight over Hall of Witness. Glass walls are etched with the names of more than 5,000 obliterated communities in Eastern Europe. **FACING PAGE, BOTTOM:** Close-up of names on etched-glass wall of bridge spanning the Hall of Witness. **PLANS:** Exhibition spaces form enfilade around Hall of Witness, beginning on fourth floor and ending on the second, where visitors enter the hexagonal Hall of Remembrance. Theater, cinema, and classrooms are located on concourse level. Library and archives occupy top of towers on fifth floor. **SECTION:** Hall of Witness features angled geometries expressed in skylight and stair. Galleries in towers (right) are entered through arched doorways.

1 MEYERHOFF THEATER
2 AMPHITHEATER
3 STAIRS TO HALL OF WITNESS
4 EDUCATIONAL/ CONFERENCE CENTER
5 CLASSROOM
6 CINEMA
7 TEMPORARY EXHIBIT
8 EAST ENTRY
9 GROUP ENTRY
10 STAGE
11 HALL OF WITNESS
12 WEST ENTRY
13 LOADING DOCK
14 PERMANENT EXHIBITION
15 HALL OF REMEMBRANCE
16 HALL OF LEARNING
17 TOWER OF VICTIMS
18 LIBRARY/ ARCHIVES
19 CONFERENCE ROOM
20 PHOTO ARCHIVES
21 SURVIVOR REGISTRY




halls. The early Modernist effort to perfect systems of structure had been carried forward with high technical ambition by the Nazis. Freed and Rosenblatt were astounded that such effort would be lavished upon the construction of a killing complex. Even the camp's well-crafted barracks, gas chambers, and crematoriums bore the proud emblems of the firms that made them. "It was always incomprehensible to me," remembers Freed, "why the places where the most atrocious things happened were so often the most beautiful. The Germans had a sort of purist esthetic sensibility." For him, the most powerful memory of the death camps, apart from their significance as the locus of mass annihilation, derived from the methodologies and tectonics of their construction. "The addition of heavy steel to a raw wall became for me very important," he notes.

In rationalizing his design, Freed recounts that the proponents of early Modernist architecture believed that emerging industrialized building technology could bring about an ideal built world. Their buildings were charged with optimism and hope. In the death camps, by contrast, the Germans demonstrated the demonic side of technology. Therefore, in deciding to base the design of the memorial on Holocaust architecture, Freed intended the museum to become a metaphor of destruction, to signify the moral and ethical collapse of German civilization under the Nazis. As such, his building is warped, fractured, twisted, dislocated, and ominous.

Freed's intention is first disclosed by the 14th Street entrance facade. A curved, Classicized, roofless limestone screen—deliberately heavy, overbearing, and almost ugly—makes the obligatory contextual reference to its Neoclassical neighbor to the south, the limestone-clad Bureau of Engraving and Printing, built in 1914. The clumsy, squared arches and overscaled funereal lanterns of Freed's entrance signal that beyond lies not just another federal bureau. To the north, four five-story brick towers, evoking death camps' sentry stations, send a more direct message. Deftly, the brick helps to perform the building's contextual obligation to its other neighbor, the Auditor's Building, a splendid deep red brick Victorian pile built in 1879.

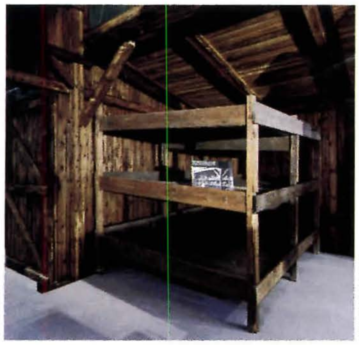
Inside the Holocaust Museum's three-story atrium, the Hall of Witness, architectural form once again becomes broadly allusive, ambiguous rather than literal. Freed explains that this space, covered by a great eccentrically pitched, trussed skylight spanning brick walls braced by diagonal steel, has been designed as a "resonator of memory, a stage for introspection, rather than as a series of specific architectural metaphors."

From the Hall of Witness, the visitor makes a disquieting journey through three floors of impassioned, powerfully didactic exhibitions brilliantly programmed and designed (following pages). This experience ends at the 6,000-square-foot, hexagonal Hall of Remembrance, a beautiful, somber space built of limestone. More mausoleum than synagogue, it is a place for prayer and contemplation.

Freed's building has been widely acclaimed in the media, and attendance has been high, but visitor reactions have yet to be surveyed. How are the Holocaust survivors themselves, now in their 70s and 80s, responding to the architecture? What do ordinary tourists, out to see the sights, make of Freed's design? Those few who were interviewed do not necessarily read or respond to the museum's Holocaust forms as Freed does. His architecture resonates with memories of evil, horror, and loss, but not exclusively. The Hall of Witness and the Hall of Remembrance are so superbly crafted, that they are as beautiful as they are ominous.

Now that the museum is complete, Freed appears to have been right to put his feelings at the center of the design process. If his masterful, message-laden design helps to keep the memory of the Holocaust alive, even after all the survivors are dead, Freed will have accomplished one of the most challenging tasks undertaken by an architect. —*Mildred F. Schmertz*

FACING PAGE, TOP LEFT: View into Hall of Witness reveals brick walls braced by diagonal steel designed to recall concentration-camp architecture.
FACING PAGE, TOP CENTER: Slotted limestone screens light at top of monumental stair from Hall of Witness.
FACING PAGE, TOP RIGHT: Five-story towers are linked by brick arched passageways. On the second floor, they are lined with carrels where museum-goers can select audiovisual displays on subjects related to the Holocaust.
FACING PAGE, BOTTOM: Conveying a sense of foreboding, steel-clad elevator doors part to take visitors to fourth floor where Holocaust narrative begins.



ALAN GILBERT

ALAN GILBERT

ALAN GILBERT

ALAN GILBERT

TOP LEFT: Reconstructed Auschwitz barracks where prisoners slept six or more to a bunk.
TOP CENTER: Boxcar donated by Polish national railway of the type used for transporting victims to death camps. Rails supporting car led to Treblinka.
TOP RIGHT: Exhibits evoke great sadness, but none more so than this pile of shoes from Majdanek, a Polish concentration camp.
RIGHT: Photographs, film clips, and artifacts are presented behind 8-foot-high glass partitions.
FACING PAGE: More than 1,000 photos of Jewish villagers, most of whom perished in a single day in the *shtetl* of Ejszyszki in what is now Lithuania, are exhibited on canted walls in northeast tower. Bridge with glass block floor leads to adjacent galleries.

The story of the Holocaust as told in the museum's exhibitions is horrifying, presented with authenticity, austerity, and brilliance by Holocaust Museum exhibition directors Martin Smith and Ray Farr, and by New York-based exhibition designer Ralph Appelbaum Associates.

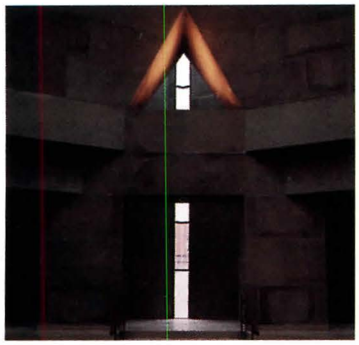
So harrowing are the exhibits that they are not recommended for children under the age of 11; the most gruesome images are semiconcealed by a 4-foot-high wall. Their narrative, explains Appelbaum, was not conceived as a conventional chronological display of artifacts, but rather as a time line of events, a three-dimensional historiography. Visitors don't move through galleries but through literal concrete evidence.

"Jim Freed's idiosyncratic, storytelling architecture was our natural ally," maintains Appelbaum. "Jim's metaphorical devices allow our work which, in contrast to his, is direct and explicit, to come through strongly."

The installation, including the ceiling and lighting systems, is the work of the exhibition designers, who constructed an almost invisible display system of metal and glass. Beautifully devised and crafted, it partakes of and complements the building's technological sophistication.

The collection of artifacts starts with the contents of prisoners' pockets—Stars of David, ID cards, small mementos—and grows to include a boxcar from Poland and part of barracks from Auschwitz. Researchers sifted through the vast photo and film archives from the national museums of Poland and Germany, turning up thousands of rarely seen images. The Nazis were never without their Leicas and Rolleis, seldom missing the chance to record for posterity their most unspeakable acts. AGFA was producing color film as early as 1939, some of which was used to film Hitler playing the gracious host at Nazi galas. The films are edited as pieces of evidence, not meant to be complete narrations of a particular event.

The exhibition is staged as a play in three acts. It begins on the fourth floor with the Nazi climb to power; descends to the third to display the Final Solution; and on the second, presents the aftermath of the Holocaust. In sequence, the visitor shares the experiences of American GIs discovering the horror of the camps; moves on to learn how the Jews were systematically excluded from society in Nazi Germany, and the nations into which the Nazis expanded; and comes face to face with the grim reality of the Jewish ghettos, the mass murder by mobile killing units, and the systematic deportation of millions to the killing centers. Finally, the Holocaust history flows into the present. Visitors learn of the brave efforts of those who risked their lives to rescue the Jews, and of the efforts of those who survived to make new lives in the U.S., Israel, and other countries.



JOU MIN LIN

TOP LEFT: Hall of Remembrance is notched with slotted windows that look out to the memorials on surrounding Tidal Basin, integrating Holocaust Museum with existing monuments.
TOP CENTER: Stairwell lounge between third and fourth floors includes paintings by Ellsworth Kelly.
TOP RIGHT: Hall of Remembrance is surrounded by skylit ambulatory with niches for memorial candles.
RIGHT: Meyerhoff Theater on the concourse level beneath the hexagonal Hall of Remembrance seats 400.
FACING PAGE: Hall of Remembrance's walls are clad in limestone cut and laid in a manner that suggests an ancient tomb. Translucent skylight filters, softens, and diffuses light. Central oculus casts an illuminated disk that moves across dome as the sun moves across sky, complementing bands of light cast across granite floor from window slots.

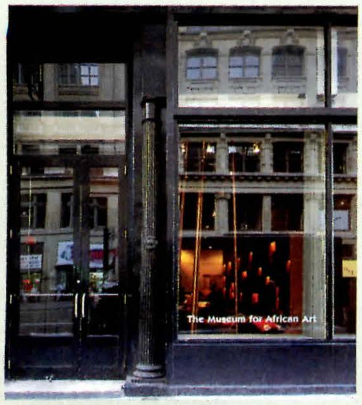
U.S. HOLOCAUST MEMORIAL MUSEUM
WASHINGTON, D.C.

ARCHITECT: Pei Cobb Freed & Partners—James Ingo Freed (partner-in-charge/design); Werner Wandelmaier (partner/administration); Michael D. Flynn (partner/technology); Craig Dumas (associate partner/administration); Beatrice Lehman (associate partner/production); Michael Vissichelli (senior associate/production); Harry Barone (senior associate/site architect); Wendy Evans Joseph (senior associate/design); Marek Zamdmer (senior associate/design); Jean-Pierre Mutin (associate/design); Stephen Ohnemus (associate/administration); Jou Min Lin (building envelope); Alissa Bucher (associate); Abby Suckle (associate/interiors); Deborah Campbell (associate/theaters); Anne Lewison, Jeff Stumacher, Steven Valentine, Jeffrey Rosenberg, Quin Chen, John Coburn, Monica Coe, Karen Cox, Steven Derasmo, Paul Drago, Richard Dunham, Richard Gorman, Rossana Gutierrez, David Harmon, Reginald Hough, Kevin Johns, Jennifer Nadler, Michael Ngu, Camillo Rosales, Amiel Savaldi, Emily Sidorsky, Mercedes Stadthagen, Deborah Taylor, Hieu Vuong (design team)
ASSOCIATE ARCHITECT: Notter Feingold & Alexander; George Notter (partner-in-charge); Manuel Almagro (project manager)
LANDSCAPE ARCHITECT: Hanna/Olin
ENGINEERS: Weiskopf & Pickworth (structural); Consentini Associates (mechanical/electrical)
CONSULTANTS: Rolf Jensen & Associates (fire & life safety); Jules Fisher/Paul Marantz (lighting); Jules Fisher Associates (theater design); Jaffe Acoustics (acoustical); Boyce Nemec Designs (audiovisual); Calvin Kort (elevators); Woodward-Clyde Consultants (soils engineering); Issco Corporation. (security); Taylor & Nakagawa (planning); Scharf-Godfrey (cost consulting); Nancy Rosen (art)
GENERAL CONTRACTOR: Blake Construction Company
COST: $90 million, construction; $78 million, permanent exhibits
PHOTOGRAPHER: Timothy Hursley, except as noted

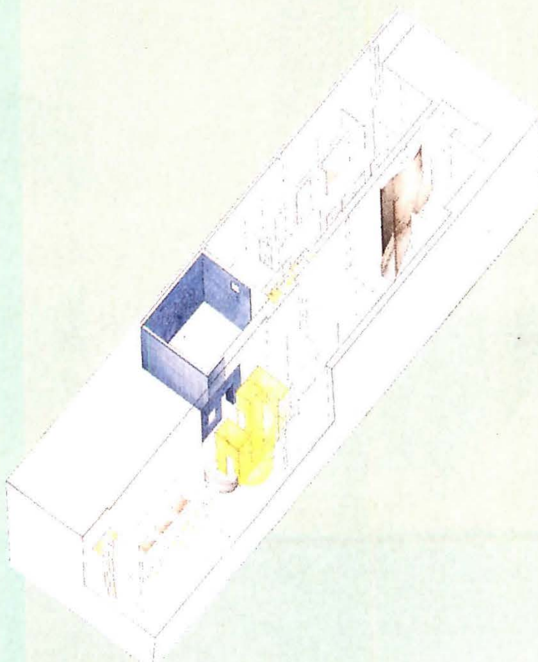

WHAT HAVE YOU DONE
BROTHER'S BLOOD CRIES OUT TO ME FROM THE GROUND
I CALL HEAVEN AND EARTH TO WITNESS THIS DAY:
I HAVE PUT BEFORE YOU LIFE AND DEATH, BLESSING AND
CHOOSE LIFE—THAT YOU AND YOUR OFFSPRING SHALL

The Museum for African Art
New York City
Maya Lin, Designer

CROSS-CULTURAL JOURNEY



ABOVE: The Museum for African Art is located in the renovated ground floor and basement of an 1859 storefront in the SoHo District of Manhattan.
AXONOMETRIC: Maya Lin modulated the 200-foot length of the storefront to create a museum shop at the street, a multipurpose events room, and galleries on two levels. Staff offices are located behind the events room.



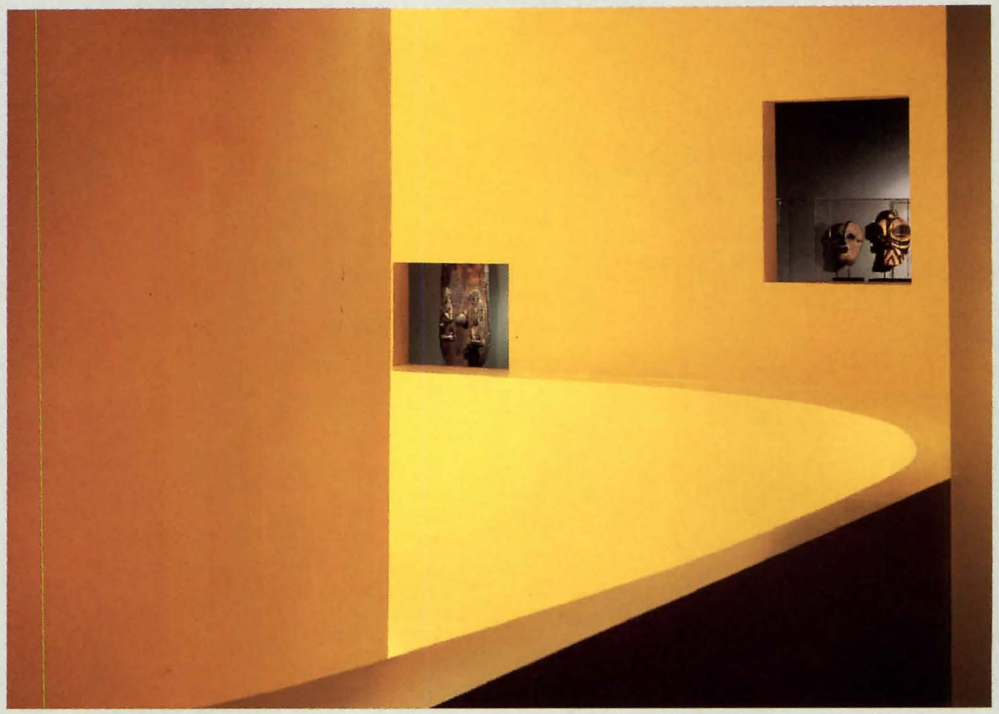
"You move into the darkness," Maya Lin explains of her design for The Museum for African Art, "and emerge into the light." For visitors, this journey within the new museum is not only spatial, but cultural and historical. Within Lin's fluid space, most museum-goers will have their first encounter with non-Western art. The 12,500-square-foot renovation of a storefront in Manhattan's Soho District includes galleries for exhibitions on historic and contemporary themes; an events room for film, video, music, dance, and workshops; a store for African wares and books; and offices for a full-time staff of 16. Lin developed the design with museum director Susan Vogel and her curatorial staff. New York City architect David Hotson collaborated on the renovation.

"Nothing here is an imitation of Africa," Lin explains. "There are no specific references to African architecture or symbol systems." Nor does the museum comprise stark, all-white galleries where the subtly modeled surfaces of African art fade before brightly lit walls. In Lin's design, no artificial opposition emerges between "sophisticated" West and "primitive" Africa.

Instead, Lin deftly integrates open spaces and modern forms with traditional African materials and colors. She defines an architectural promenade that meanders its way through ground-floor galleries; descends to lower galleries via an undulating stairway; and winds its way to a staircase that is asymmetrical and spiraling in its ascent.

This journey functions as a metaphor for the museum-goer's educational passage through an inaugural exhibition on the provocative subject of secrecy in African art. The passage sets the show's masks, figures, textiles, and sculptures within a flowing continuum that suggests the role of art in daily African life. "We can only attempt to create exhibition spaces in which objects have some of the animate presence they have in Africa," remarks museum director Vogel, "where objects were intended to be seen in perfor-

LEFT: Visitors enter through forest of tubular copper "trees." Museum shop displays African artifacts on waxed masonite paneled shelving.
ABOVE: Free-form reception desk of maple plywood and steel plate follows contours Lin drew by hand.
BELOW: Galleries are lit to highlight sculptural qualities of African art, including wooden dance platform from Zaire (foreground). Wood floors are stained deep blue to suggest water.



mance, surrounded by dense crowds, singing, dancing, or feasting." Lin's spiraling forms demonstrate the asymmetrical balance that typifies art in the non-Western world.

The path for the museum began in 1984, when Vogel and a group of collectors founded the Center for African Art. Housed for eight years in a pair of 19th-century townhouses on Manhattan's Upper East Side, the center was rechristened The Museum for African Art in 1992 to accurately reflect its scholarly exhibitions, publications, and education programs. At the same time, the museum wanted to reach a younger, more diverse audience, which propelled its move to SoHo, the hub of New York City's downtown art community. The plan worked: After the museum opened last February, more people attended in eight weeks than in the most popular year uptown.

Museum visitors will inevitably seek comparisons to Lin's most celebrated commission, the Vietnam Veterans Memorial in Washington, D.C. Both works reveal Lin's parallel career as a sculptor. She earned a master's degree in architecture from Yale, but has decided to practice in a nontraditional manner, preferring to work in the spaces between art and architecture. Lin is now completing her first private residences in Williamstown, Massachusetts, and Santa Monica, California. In addition, two new artistic endeavors will soon be unveiled: a sculpture of granite and flowing water commemorating women at Yale; and an installation of broken, tempered glass at the Wexner Center for the Arts in Columbus, Ohio, that blends the shape of American Indian burial mounds with forms reminiscent of Japanese Zen gardens.

Like these works, the new Museum for African Art is more experiential than cerebral, more about movement than stasis. Underscoring the need to recognize and understand America's changing demographics, Lin's museum design eases the way for a cross-cultural journey from the darkness of narrow-minded prejudice to the light of global diversity. —*Donald Albrecht*

FACING PAGE, TOP: Irregular openings in staircase frame views of ground-floor gallery. Lin situated the lower opening for children, the upper for adults.
FACING PAGE, BOTTOM: Benches are hewn from floor joists of original structure. Walls of events room are covered in tie-dyed damask from the Ivory Coast.
LEFT: Staircase is painted five progressive shades of yellow, from lemon to mustard. The effect subtly emphasizes the stair's outwardly spiraling form.

THE MUSEUM FOR AFRICAN ART
NEW YORK CITY

DESIGNER: Maya Lin Studio, New York City—Maya Lin (designer); Clay Miller, Alan Bruton (design assistants)
ARCHITECT: David Hotson, New York
CONSULTANTS: Maureen Healy (exhibitions); Jerry Kugler and Associates (lighting)
CONTRACTORS: Herbert Construction (general); Scott Horst (specialty millwork)
COST: $575,000
PHOTOGRAPHER: Paul Warchol

Oregon Museum of Science and Industry
Portland, Oregon
Zimmer Gunsul Frasca Partnership, Architect

Poised amid a tangle of freeway bridges, derelict warehouses, and railroad rights-of-way, the new Oregon Museum of Science and Industry courageously stakes its claim in a most unlikely quarter of Portland. Separated from the city's glimmering downtown skyline by the Willamette River and bounded on three sides by neglected industrial buildings, the crisp Modern forms of the museum immediately stand apart as symbols of the city's confidence in its own future.

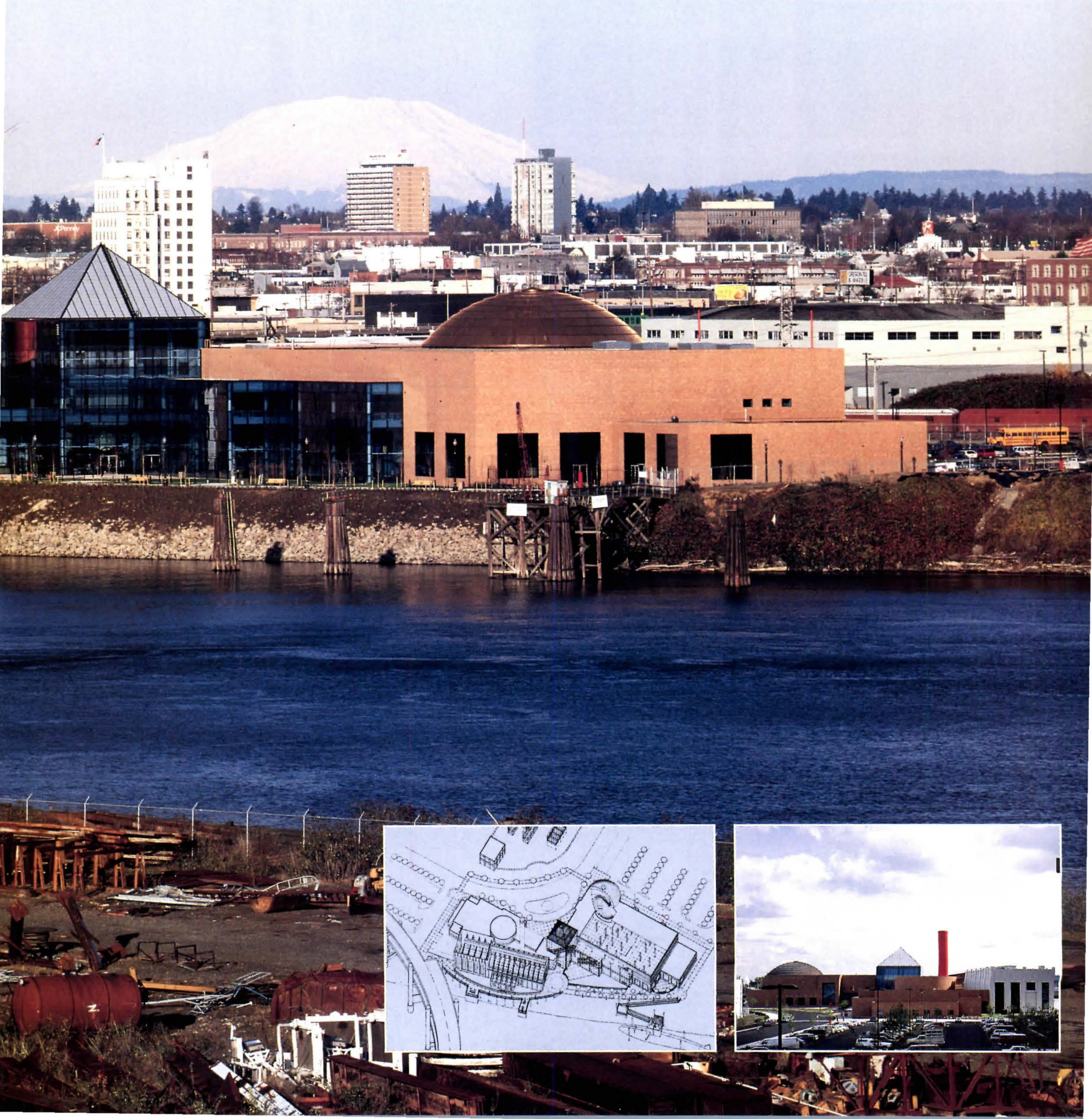
Location was a much-debated issue in the project's evolution. OMSI, as the museum is known locally, had operated since 1958 on a site in Portland's Washington Park, surrounded by fashionable residences. But the extreme popularity of the institution and its ambitious expansion program—which called for six large exhibit halls, 330-seat Omnimax theater, planetarium, classrooms, laboratories, and restaurant—prompted discussions of relocating. An urban site was sought in part because of the broadly supported museum's decision to project a popular image.

The deal was sealed when Portland General Electric Company offered to donate an 18-acre site on the river's edge, complete with the hulk of an 80-year-old steam-driven power plant. Explains Principal Robert Frasca of the Zimmer Gunsul Frasca Partnership (ZGF), "It was an incredible opportunity to deal with the issue of cleaning up a wasted site and making it usable again. That's the kind of issue that many cities are facing." Reclaiming the blighted site was especially important to the future of the river's east bank, now under redevelopment. Just a short distance away is the ZGF-designed Oregon Convention Center, which will be linked to the museum by a new public promenade.

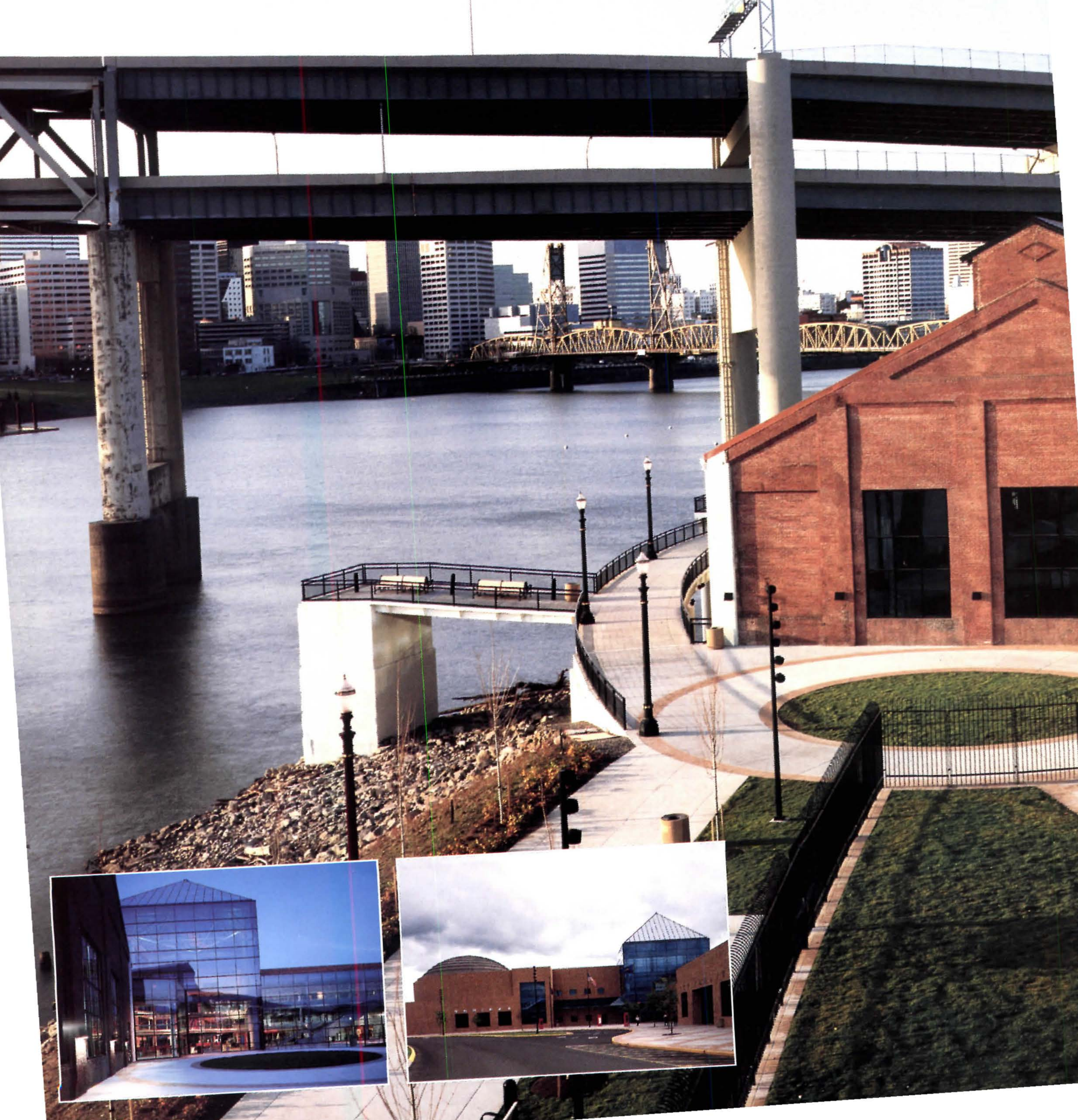
Frasca took advantage of OMSI's river frontage by assembling a composition of pieces that are easily recognized from Portland's urban core across the river. The museum's heroic glass tower, copper-domed theater, and bright red smokestack present a compelling, dramatic image from other van-

SCIENCE PROJECT

THESE PAGES: The Oregon Museum of Science and Industry in Portland is located on an 18-acre industrial site along the Willamette River.
BOTTOM LEFT: Axonometric reveals how the Zimmer Gunsul Frasca Partnership aligned museum's volumes with geometries of street grid and river bank.
BOTTOM RIGHT: North elevation reveals theater (left), planetarium (center), and turbine building (right).



THESE PAGES: Paved plaza and grass courtyard anticipate shift of activity as riverfront promenade develops and outdoor exhibits are installed.
BOTTOM LEFT: Glass-enclosed lobby provides access from riverfront on west side and courtyard on east.
BOTTOM RIGHT: Large brick volumes are downscaled by banded brick patterns and rhythmic openings.



tage points as well, even as one approaches through the nearby warehouse district.

Cues for the site planning came from two sources: the geometry of the river and the city streets. While the existing powerhouse maintains its parallel relationship to the water's edge, the new portions of the museum stay true to the orthogonal street grid. All the parts converge on a towering glass lobby that Frasca likens to the knot of a bow tie. "Where functions crash together, that's where the most interesting spaces occur," he notes.

Indeed, the lobby is framed by muscular structural members and metal-framed windows that amplify the industrial esthetic of the surrounding landscape. Overhead, a glass-enclosed pedestrian bridge shoots through the space, connecting staff workrooms at the mezzanine level. After purchasing tickets, visitors can choose a number of directions to explore, all of which lead back to the lobby or the glass circulation spine that links the new exhibit halls. One route leads to the old turbine building, a lofty industrial hall containing hands-on demonstrations such as an earthquake simulator, holography lab, and cargo crane. Memories of the building's former life remain intact through a jet-black generator left in the center of the room and a bright yellow crane on heavy casters overhead. Wedged into one side of the space behind a sweeping wall of glass is a playroom for young children, dominated by the base of the crimson smokestack.

On the east side of the turbine building, Frasca crafted a new classroom, auditorium, and planetarium, which forms a large cylinder on the building's facade. The cylinder and the prominent copper dome sheltering the museum's Omnimax theater balance nicely on opposite wings of the complex. Frasca unified the varied geometries of the volumes by wrapping the building in a brick envelope, laid in subtle bands to yield a more human scale.

OMSI was founded on the principle of participatory science education, and with the new facility, the museum has sought to push its hands-on exhibits to new levels. Specialized interactive laboratories adjoining the exhibit halls on the first and second floors provide opportunities for visitors to explore such science topics as the physics of holography or the principles of electronics. The architects located staff offices adjacent to the labs at the urging of OMSI Director Marilynne Eichinger. "Our goal was to see that people were connected," she says, noting that museum staffers too often have limited contact with visitors.

Eichinger pressed for an overall feeling of brightness in the new exhibit halls, without

THESE PAGES: City skyline view from circulation spine. Concrete structure fits into industrial surroundings.
BOTTOM LEFT: Lobby leads to theater, gift shop, and exhibits. Bridge connects offices and workrooms.
BOTTOM RIGHT: Atrium walls are banded in low-E glass; translucent fiberglass roof glows at night. Spotlights on spandrels adjust to changing exhibits.

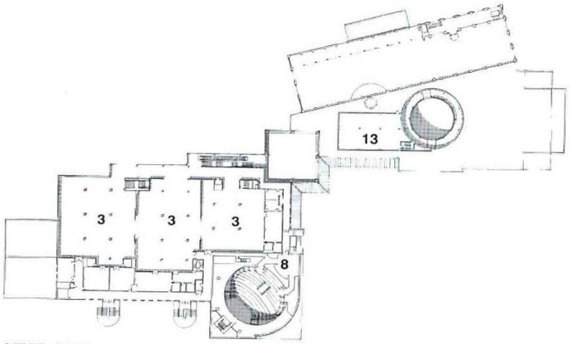
compromising the ability to control lighting in them. Frasca met that requirement by organizing dark exhibit halls along a sunlit circulation spine, which offers the only connection between exhibits. For a building that receives young visitors by the thousands, the transparent spine is a welcome orienting feature. Its simple connection to the lobby and powerful views of downtown Portland generate an understanding of the physical setting.

ZGF designed the exterior space between the Willamette River and the museum to allow for later installation of outdoor exhibits. A circular plaza outside the atrium will become the focal point for people who approach from the river, especially those museum-goers who arrive by the planned river shuttle bringing passengers to OMSI from downtown.

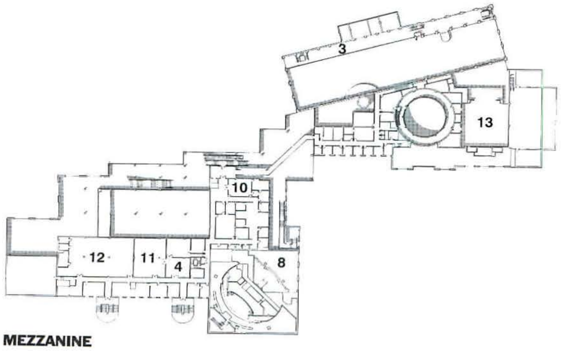
Location on the river also allowed installation of an innovative energy-efficient heating/cooling system that exploits the river water's ambient temperature. Water drawn through two intake towers is fed into a giant heat exchanger in the turbine building's basement, where the cooling effect of the river in summer or the heating effect in winter is borrowed by the museum. While the water-based heat pump system cost $4.5 million to install, OMSI estimates energy savings of approximately $20,000 to $40,000 per year over more conventional HVAC systems.

A $2.5 million Department of Energy grant also supported the installation of the building's computerized operating system for lighting, exhibit power, and climate control. Lighting and exhibits are turned on and off to coincide with the museum's operating hours, and adjustments can be made to compensate for longer or shorter periods of daylight. And a unique "biofiltration" drainage field is incorporated into the museum's parking lot landscaping and storm sewer system. Selected grasses and plants are arranged in "wetland cells" through which rainwater flows and slowly percolates, removing pollutants such as road debris and asbestos from automobile brakes before the water flows into a conventional drain.

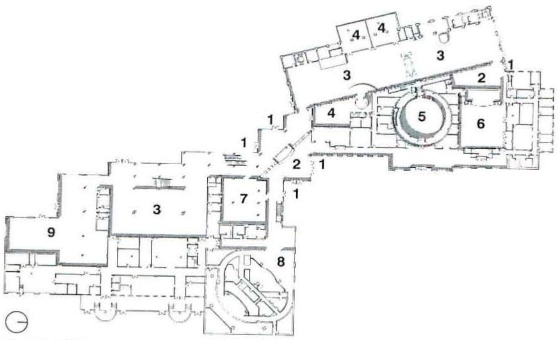
Response to the Museum of Science and Industry's new home has been overwhelming since it opened last fall. And the hope that the museum might serve as a catalyst for further development already is borne out by the news that a local community college will build a branch facility on adjacent land. "This building is a cheerful place," says Eichinger. "It sets a good mood when you walk in." If that's not a good beginning to successful city-building, what is? —*Vernon Mays*



LEVEL TWO



MEZZANINE



LEVEL ONE

1 ENTRANCE
2 LOBBY
3 EXHIBIT AREA
4 LABORATORY
5 PLANETARIUM
6 AUDITORIUM
7 STORE
8 OMNIMAX THEATER
9 DINING AREA
10 BOARDROOM
11 COLLECTIONS
12 STORAGE
13 MECHANICAL

OREGON MUSEUM OF SCIENCE AND INDUSTRY
PORTLAND, OREGON

ARCHITECT: Zimmer Gunsul Frasca Partnership, Portland, Oregon—Robert J. Frasca (partner-in-charge, design partner); Larry S. Bruton (technical design partner); John Thompson (senior designer); Brainard Joy Gannet, Milstead & Associates (project managers); Erkki Ojala (project architect); Brooks Gunsul, Steve Adams, Rob Bernard, Cindy Cox, Sharron Duggan, Ron Gronowski, Bill Hutchinson, Joan Jasper, Lee Kilbourn, Kathryn Krygier, Stacie Frey (design team)

LANDSCAPE ARCHITECT: Murase Associates

ENGINEERS: KPFF Consulting Engineers (structural/civil); Carson, Bekooy, Gulick & Associates (mechanical); PAE Consulting Engineers (electrical)

CONSULTANTS: Hammel, Green & Abrahamson (theater architects); Percell, Noppe (acoustical); Chase Jones (survey); Geotechnical Resource (geotechnical)

GENERAL CONTRACTOR: Koll Construction

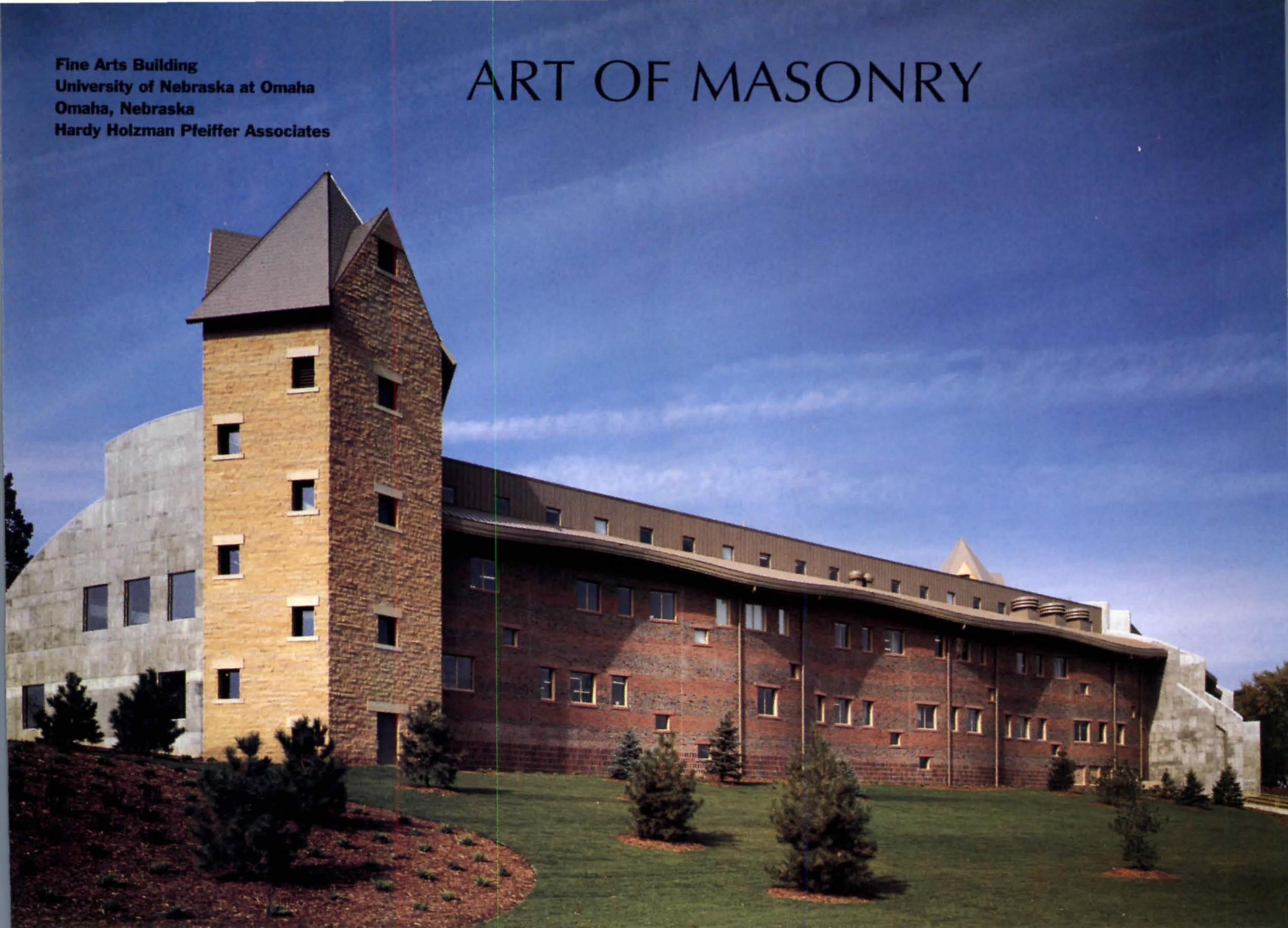
COST: Withheld at owner's request

PHOTOGRAPHER: Strode Eckert Photographic

THESE PAGES: Turbine building exhibit hall is illuminated from above by clerestory windows and translucent monitor roof. Curved glass wall separates the children's center from the hall.
BOTTOM LEFT: Playroom focuses on base of crimson smokestack, a remnant of building's previous life.
BOTTOM RIGHT: Staff-designed exhibits in new wing are housed in simple, dark spaces with computer-controlled lighting that varies with exhibits.
PLANS: Principal exhibit areas and theater are organized for direct access from central lobby.

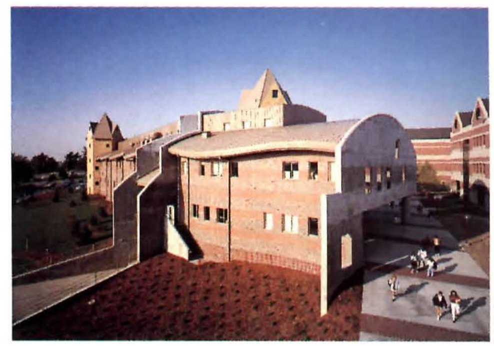
Fine Arts Building
University of Nebraska at Omaha
Omaha, Nebraska
Hardy Holzman Pfeiffer Associates

ART OF MASONRY



Malcolm Holzman, who has been designing stone buildings for two decades, believes the public responds differently to masonry than to manufactured materials. The sense of human involvement in stacking stones and bricks, and the earthiness of the materials, convey to the public an aura of history and familiarity. "We are trying to exploit some of that feeling of continuity," Holzman explains.

This masonry-induced continuity characterizes a pair of academic fine arts buildings, one at Vermont's Middlebury College, the other at the University of Nebraska at Omaha, recently completed by Hardy Holzman Pfeiffer Associates (HHPA). Gray granite and clapboard were obvious choices for a new building at Middlebury, a 19th-century campus of limestone and marble buildings, set in an Early American village. In Omaha, where brick is the dominant material both on campus and off, the architects incorporated a local discovery: brick manufactured in beehive kilns, replete with odd angles and blackened clinkers. Both buildings reveal these architects' penchant for variety: in Vermont, clapboard and stone are solemnly juxtaposed; in Nebraska, brick, limestone, granite, and concrete are combined to dramatic effect. Like antiques incorporated into a Modern building, these traditional materials seem all the more intriguing when cladding or supporting HHPA's contemporary forms: Asserting newness and invention, they also tug at memory.



Recalling a Gothic cathedral with buttresses of concrete, the Fine Arts Building is immediately recognizable from anywhere on the 88-acre campus of the University of Nebraska at Omaha (UNO), projecting above the university's 1976 library and 1987 science building. Its Neo-Expressionist limestone towers, Malcolm Holzman explains, help the public recognize and find the building, which not only adds classrooms but offers theatrical productions and art shows.

Hardy Holzman Pfeiffer's work often reveals the architects' delight in crafting a variety of materials, and this building is no exception. Brick, Minnesota limestone, concrete, metal, and South Dakota granite have been fearlessly combined and juxtaposed. "In Nebraska, masonry is the standard form of construction," claims Holzman. "You can find incredibly good stone and brick masons, so we obviously wanted to exploit that. Our tendency is not to make buildings out of one material. We believe in variety." The fact that the Fine Arts Building comprises different departments undertaking a variety of activities—staging theatrical productions, printmaking, painting, crafting poetry volumes on a fine arts press—corresponded philosophically to constructing the building out of more than one material, revealing the different programmatic elements inside.

The new four-story, 79,000-square-foot building looms above a campus of brick boxes, housing classrooms and studios for the 17,000 students enrolled at this commuter school. The linear building forms a 300-foot-long spine along which a theater, art gallery, and two medievalesque towers are arranged. A trapezoidal black-box theater and a rectangular art gallery—both composed of South Dakota granite—jut off the west side of the spine. The northern tower houses faculty and student lounges on the top two floors, a gallery lobby at street level, and a drawing studio in the basement; the southern tower encloses an elevator and staircase.

FACING PAGE: Undulated east wall of the Fine Arts Building is composed of brick fabricated in a local beehive kiln. South tower, clad in Minnesota limestone, houses elevator and stairwell.
LEFT: Public entrance within concrete flanges faces away from campus center toward parking area. Vestibule opens to experimental theater.
TOP: From the south, the building's entrance, circulation tower, and gable-roofed theater are visible, with north tower projecting behind theater. To the east stands UNO's campanile, which inspired tower forms.
ABOVE: North entrance reaches out to embrace a campus walkway. Barrel-vaulted, standing-seam metal roof curves over 300-foot-long building.

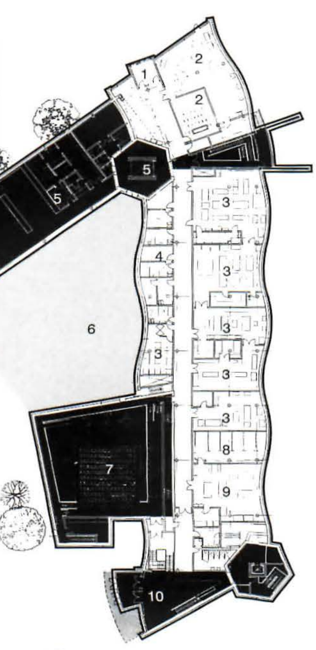
ABOVE: First-floor corridor reveals HHPA's signature juxtaposition of materials: concrete columns; granite walls; and ceiling panels of painted rib lath, typically a stucco substrate.
RIGHT: Experimental theater incorporates flexible seating and a state-of-the-art tension-mounted wire mesh ceiling for access to lighting.
FACING PAGE, LEFT: Painting studio exposes ductwork and concrete. Windows admit light from three directions.
FACING PAGE, RIGHT: Gallery rooms are arranged in an enfilade. Glass laylight admits daylight from fiberglass skylight in gabled roof.
PLANS: Concrete wedges embrace entrances to the building. On the first floor, northern tower forms gallery entrance. Trapezoidal theater juts off western side of linear building.

Holzman, a pioneer of combining off-the-shelf materials in unusual ways, discovered an Omaha company that manufactures brick in turn-of-the-century beehive kilns. He selected the granite from remnant material purchased inexpensively from a South Dakota stone quarry. The granite-enclosed theater and gallery wings are loadbearing, with a steel frame that supports the roof. The stone towers, however, are actually constructed of poured-in-place concrete with a 4-inch cladding of Minnesota limestone.

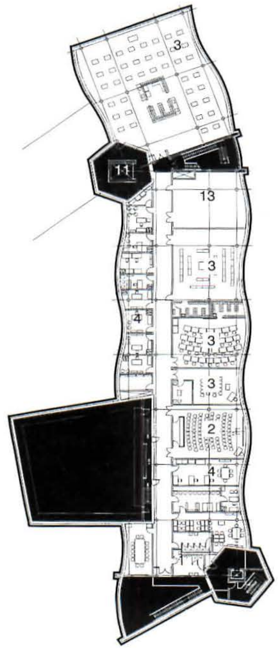
The UNO arts community wanted a building that in some way set itself apart from the rest of the campus. "They didn't want to appear like they were wrapped up in yet another brick box," explains Holzman. "They wanted a building that announced itself as being different from the buildings around it." HHPA's response was to design serpentine walls that undulate on a shallow curve, foreshortening the long building and softening the impact of its 60-foot-high east facade, which slices the campus. Dubbed the "new wave" by chemists in a nearby building, the walls recall Bruce Goff's Bavinger House and even Thomas Jefferson's serpentine garden wall at the University of Virginia. With its curvaceous roof and many-windowed towers, the building is also reminiscent of Antoni Gaudí's Casa Milá in Barcelona.

So conscientious was Holzman about honoring the arts community's request for a distinct identity that the UNO Fine Arts Building not only differs from those around it, but from most other architecture by Hardy Holzman Pfeiffer. If these architects have a signature, it is the freshness with which they approach each project, from their performing arts centers to remodeling Classical buildings, to schools and company headquarters. Buildings by HHPA are never neutral, and whether a community likes them or not, they make people aware that they are more than simply tasteful containers; they are architecture.

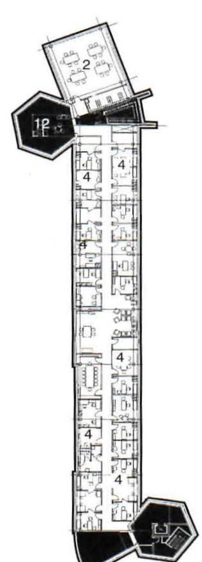
—Heidi Landecker



FIRST FLOOR



SECOND FLOOR



THIRD FLOOR

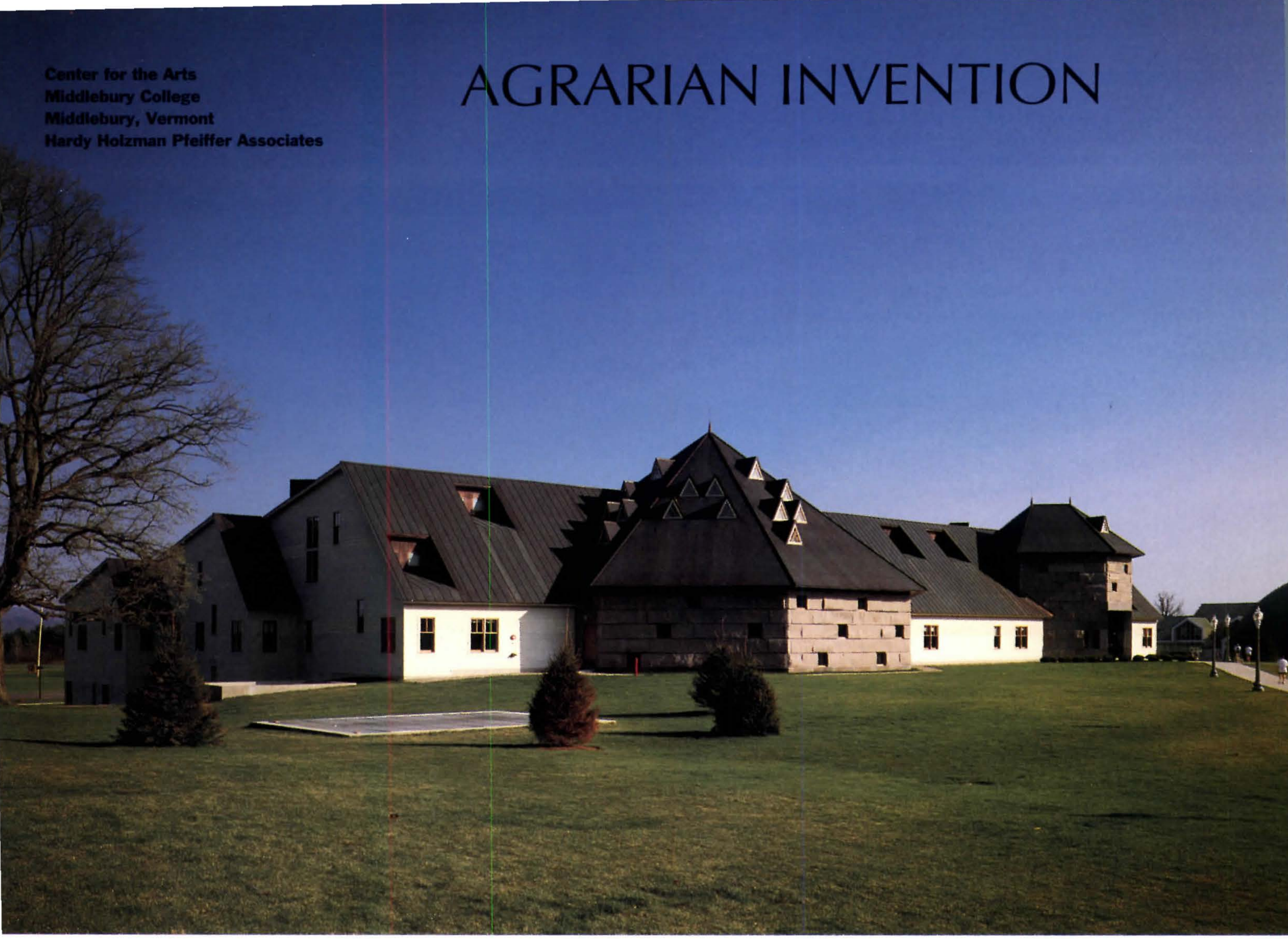
1 CAMPUS ENTRANCE
2 CLASSROOM
3 STUDIO
4 OFFICE
5 ART GALLERY
6 SCULPTURE COURT
7 EXPERIMENTAL THEATER
8 STORAGE
9 COSTUME SHOP
10 PUBLIC ENTRANCE
11 STUDENT LOUNGE
12 FACULTY LOUNGE
13 MECHANICAL

FINE ARTS BUILDING
UNIVERSITY OF NEBRASKA, OMAHA

ARCHITECT: Hardy Holzman Pfeiffer Associates, New York City—Malcolm Holzman (principal-in-charge); Victor H. Gong (administrative partner); Robert T. Almodovar (project architect); Robin Kunz (interiors); Ron Albinson, Nestor Bottino, Jonathan Cohn, Tony LaFazia, John Mariani, Todd Martin, Victor Rodriguez, Gilbert Sanchez, Bruce Spenadel, Matt Tendler, Dale Turner (design team)
ARCHITECT OF RECORD: The Schemmer Associates, Omaha, Nebraska—Roger Wozny (principal-in-charge); W. Larry Jacobsen (project coordinator)
ENGINEERS: Donald Anderson (structural); R. Scott Wells (mechanical); Brad Farmer (electrical); Gary Tinkham (civil)
CONSULTANTS: Peter George Associates (acoustics/theater); Fisher Marantz Renfro Stone (lighting); CPMI (cost)
GENERAL CONTRACTOR: Hawkins Construction
COST: $11.4 million; $117 per square foot
PHOTOGRAPHER: Thomas Kessler

Center for the Arts
Middlebury College
Middlebury, Vermont
Hardy Holzman Pfeiffer Associates

AGRARIAN INVENTION



In keeping with its central Vermont setting, where preservationists will go to the mat to save the tiniest historic landmarks, Middlebury College Center for the Arts was conceived by HHPA as an assemblage of traditional agrarian forms. Silo- and barnlike volumes are clad in stone and clapboard. Double-hung, wood-framed windows recall farmhouses; and massive blocks of granite—which match the color of the 19th-century limestone and marble buildings on campus—clad the most important volumes. The granite stones measure as much as 3 feet high, assembled, according to Malcolm Holzman, "in the spirit with which people have made buildings in Vermont for many years."

The arts center is prominently sited along Vermont Route 30, which traverses the Middlebury College campus, and its most talked-about feature is a series of inventive isosceles-triangle-shaped dormers atop its granite "silos." These unconventional dormers hint at what's inside the unassuming street frontage: a handsomely executed and richly detailed building arranged in a complex formal plan. Like Omaha's Fine Arts Building, Middlebury's 90,000-square-foot Center for the Arts consolidates an art gallery and dramatic arts department and includes dance studios, a music library, and a concert hall.

Embracing a southeast-facing courtyard, the building comprises a massive shed punctured by a series of skewed volumes: octagonal vestibule and concert hall, rectangular experimental theater, several small square entrances. The complex is unusual for Middlebury College in that music, theater, dance, and an art gallery are all housed in one structure. The architects retained individuality among the disciplines with what they call the "chocolate-chip-cookie" theory of architecture: a unifying clapboard shed, or "cookie," studded with autonomous "chips"—the inserted granite components. These "chips"—a concert hall, dance studios, art gallery, and vestibules—are sweeter in their resolution on

FACING PAGE: Street-facing, public side of Middlebury College's Center for the Arts resembles an assemblage of farm buildings. Large granite volume houses concert hall; small stone volume encloses a vestibule and a stairwell.
TOP LEFT: Octagonal entrance, which is composed of granite curbstone remnants, faces campus proper.
ABOVE: Southeastern elevation reveals massive clapboard shed punctured by stone volumes, which designate dance studios, art gallery, and entrances.
LEFT: Gallery entrance addresses circular courtyard. Stucco clads east side of gallery, where whimsical parapet wall recalls Hardy Holzman Pfeiffer's Best Products headquarters.

ABOVE AND RIGHT: Multilevel central gathering area is marked by pedestrian bridges and balconies and reveals the architects' rich blend of stone, steel, wood, and clapboard. Granite wall clads rehearsal room.
FACING PAGE, LEFT: *In concert hall, light fixtures double as acoustic baffles. Massive cherry railing embraces the audience, conveying the curves of a violin.*
FACING PAGE, RIGHT: Gallery's curved wall defines circular terrace on exterior.

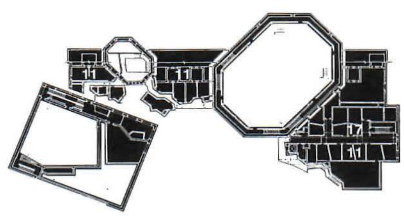
the exterior than the interior, where finding different departments may be difficult.

However, the clustered plan allowed the architects to compact all the circulation within the center of the building, where it serves as an internal reception area. This three-level core, with its massive granite block walls, exposed ductwork, skylit ceiling, painted steel columns, and industrial end-grain fir floor, is a real Hardy Holzman Pfeiffer showstopper, as unlike the modest vestibules of the University of Nebraska at Omaha building as it could be. The lobby is already in constant demand as a reception area for plays, concerts, and private events.

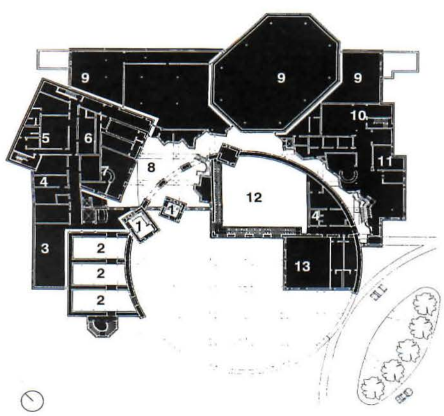
For a building designed primarily for education, the Center for the Arts' one oddity is the way it turns its back on the campus. A welcoming circular courtyard, embraced by a crenelated parapet wall, addresses not the college's stone-visaged buildings, but its athletic fields. The arts building in Nebraska, on the other hand, occupies a site in the heart of the campus—its entrance sits squarely atop a main pedestrian walkway. Middlebury's arts center is a 7-minute walk for students, "only a half-mile," notes Richard Saunders, director of the art gallery, "but if it's not in your natural path, it might as well be on the other side of the state." Saunders has addressed the problem by creating exhibits that complement the academic program.

Chalk up the arts center's farmlike side as contextualism, but by turning its whimsical courtyard away from Middlebury's sterner existing architecture, HHPA has imbued the building with a split personality. Unlike Nebraska's new Fine Arts Building, which, with its playful curves, central location, and audacious architecture, pokes fun at its surroundings, a new building in tradition-oriented Vermont had to show respect for campus history. The Center for the Arts' farm esthetic may be only a front for the caprice at its rear, where HHPA's happier forms reveal the architects' true colors. *—Heidi Landecker*

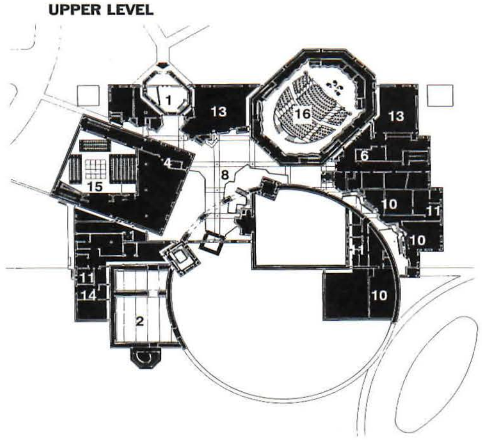
1 ENTRANCE
2 ART GALLERY
3 STORAGE
4 WORKSHOP
5 DRESSING ROOM
6 GREEN ROOM
7 CAFE
8 INTERNAL LOBBY
9 MECHANICAL
10 MUSIC LIBRARY
11 OFFICE
12 DANCE THEATER
13 REHEARSAL ROOM
14 CLASSROOM
15 EXPERIMENTAL THEATER
16 CONCERT HALL
17 PRACTICE ROOM



UPPER LEVEL



LOWER LEVEL



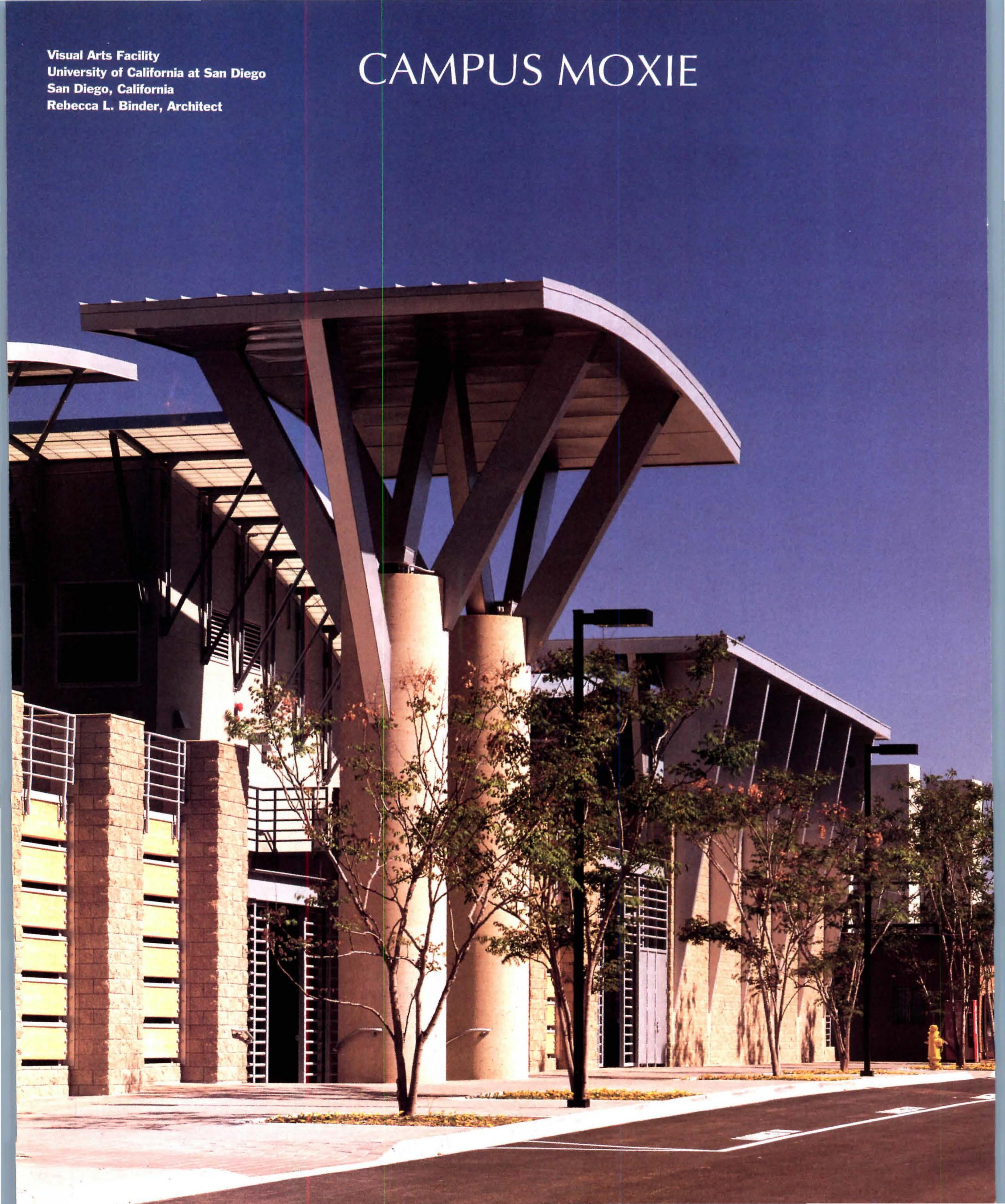
MAIN LEVEL

MIDDLEBURY COLLEGE CENTER FOR THE ARTS
MIDDLEBURY, VERMONT

ARCHITECT: Hardy Holzman Pfeiffer Associates, New York City—Malcolm Holzman (principal-in-charge); Victor H. Gong (administrative partner); Robert T. Almodovar (project architect); Robin Kunz (interiors); R. Cleveland Adams, Jr., Tracy Aronoff, William Billing, Ben Caldwell, Mark DeMarta, Harris Feinn, Sandy Ford, Lee Harris, Diane Lam, Hilda Lowenberg, Raoul Lowenberg, John Maddox, Manuel Mergal, Gilbert Sanchez, Douglas Stebbins, Amy Wagenbach, Kristina Walker, Thomas Young (design team)
LANDSCAPE ARCHITECT: Sasaki Associates
ENGINEERS: Knight Engineering (geotechnical); Thornton Tomasetti (structural); Hallam Associates (mechanical/electrical/plumbing); Phelps Engineering (civil)
CONSULTANTS: Fisher Marantz Renfro Stone (lighting); Jaffe Holden Scarborough Acoustics (acoustics); Jules Fisher Associates (theater); Boyce Nemec (audiovisual)
GENERAL CONTRACTOR: *Pizzagalli Construction*
COST: $16 million; $165 per square foot
PHOTOGRAPHER: Steve Rosenthal

Visual Arts Facility
University of California at San Diego
San Diego, California
Rebecca L. Binder, Architect

CAMPUS MOXIE



Universities that spring up out of the ground and quickly grow into major campuses tend toward architectural confusion. Their buildings, erected in a hurry to accommodate a rapidly expanding student body, come in a jumble of styles and a wide range of esthetic accomplishment, from the downright clumsy through bland mediocrity to a few that stand out as superb.

The University of California at San Diego (UCSD) is a prime example of this phenomenon. In a quarter of a century since the site of the original Scripps Institute of Oceanography was upgraded into a full-fledged campus, UCSD has exploded to serve 17,500 students. Campus planners, beginning with Robert Alexander and Quincy Jones in the 1960s, on to Skidmore Owings and Merrill (SOM) in the early 1990s, have struggled with mixed success to impose a sense of coherence on the sprawling hilltop site on the northwest edge of San Diego. The result is wryly summed up by David Gebhard and Robert Winter in their standard guide to Southern California architecture: "The thick planting of eucalyptus helps, for it hides most of the buildings."

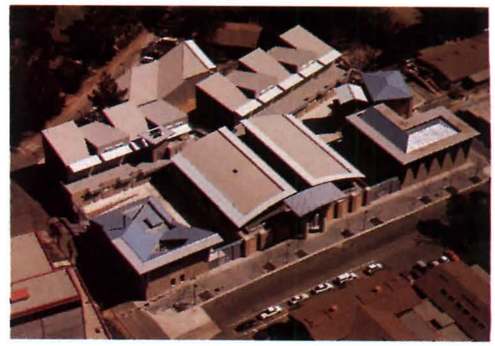
UCSD buildings range from the original World War II vintage, prefabricated, barrack-type sheds to more institutional complexes recently designed by firms such as Arthur Erickson Associates and Moore Ruble Yudell. Among the buildings erected in the 1970s, the most impressive is William Pereira's Central University Library: a bravura concrete Modernist structure with cantilevered floor planes.

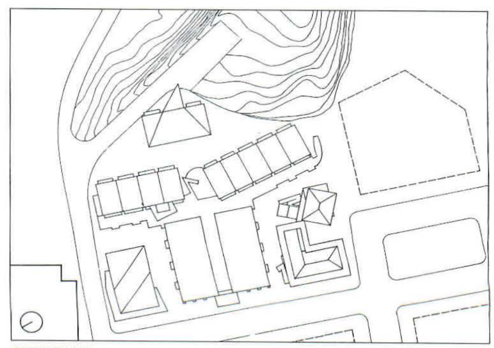
Within this mixed visual context, the new Visual Arts Facility by Rebecca L. Binder, Architecture & Planning, is a surprise and a delight. It makes a feisty statement while respecting the underlying principles of the current campus master plan developed by SOM in collaboration with Daniel Solomon.

However, Binder was not the art faculty's first selection to design the facility; in early 1989, when the project was first proposed, Frank Gehry was the architect of choice. But, after it became clear that Gehry's fees were beyond the scope of the project's $9 million budget, the UCSD selection committee let Gehry go and chose Binder in a limited competition. According to campus architect Boone Hellmann, Binder impressed the committee with her vigor and intelligence. And, at the time, Binder was gaining repute for her design of the Engineering Research Facility at University of California at Irvine, proposed to complete a computer sciences/engineering quadrangle designed in two earlier phases by Gehry.

At UCSD, Binder and her partner Kim A. Walsh began by questioning the basic diagram for the Visual Arts Facility mandated by the campus master plan: a long, rectangular, three-story building lining Russel Drive, the main roadway bordering the western edge of the 4-acre site. The intention was to center the block to close a visual axis running through a proposed campus green to the west. Upon examining the site, Binder concluded that a monolithic, linear block would neither serve the program nor fit the site's character.

FACING PAGE: Viewed from Russel Drive, the Visual Arts Facility presents a bold frontage to the evolving campus of the University of California at San Diego.
BOTTOM LEFT: Assertive, two-column portal that defines art facility's front entrance supports an aluminum canopy. Enclosed block under curved roof houses graduate student studios.
BELOW: Aerial view reveals facility's crisp, articulated organization, with student studios, performance space, and art galleries along the front, and faculty studios at the rear.
SITE PLAN: The Visual Arts complex lies between the main USCD campus to the north and proposed undergraduate campus to the south and east.





SITE PLAN

RIGHT: Boat-hull-shaped cedar screen flanks entry off Fifth College Court and encloses staircase. Door in metal screen leads to performance space and gallery. **BELOW:** Steel doors to performance space lobby open onto an intimate piazetta for informal outdoor gatherings. **BOTTOM:** Airy lobby interior creates open-air transition between the piazetta and the windowless theater. **FACING PAGE:** Binder's simple palette of finishes includes split-face concrete block and Alaskan cedar dramatically counterpoised, set off by canted timber struts supporting roof canopies.

The site of the Visual Arts building lies on a pivotal corner between the main campus to the north and west and the proposed undergraduate Fifth College campus to the south and east. Also, it occupies a boundary zone between the built-up environment of the campus to the west and a wild canyon to the east. Along Russel Drive, the ground falls away sharply to the canyon along a north-south ridge bisecting the center of the site.

In terms of the program, the master plan's rigid rectangular block was too inflexible to accommodate the studios and outdoor work spaces for such activities as welding and fiberglass fabrication. In addition, the proposed main entry on Russel Drive conflicted with the natural flow of the main public access around the southwest corner on Fifth College Court. Working with an advisory committee of artists and faculty, Binder rethought the layout and came up with a simple solution: break up the 71,500-square-foot complex into five buildings with a continuous screen facade along Russel Drive. The formal western entry remains on Russel Drive, while the actual public access opens to the south.

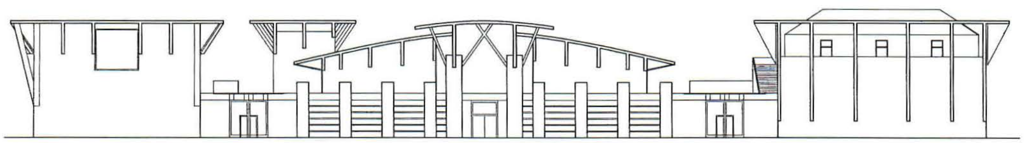
"Our main concern was to create a supportive environment for artists to work in," campus architect Hellmann emphasizes, "and Rebecca's conception provided the cloistered, flexible layout that best served that end." The advisory committee, led by artist David Anton, chairman of the visual arts department, also supported Binder's plan. "We wanted an efficient, light-industrial building type with lots of raw working space," Anton says, "and the architect's revised layout suited us very well." After some hesitation, the UCSD Design Review Board accepted Binder's site plan. In a final twist, however, campus planners increased some surrounding roadway widths and, consequently, shrunk the area of the site by about 10 percent.

Binder describes the layout of the Visual Arts complex as a "mannered tartan grid": The facility's disparate, asymmetrical structures and outdoor spaces are organized by a coherent modular design in the Modernist tradition. Each building assumes its own shape and character according to function, but all owe allegiance to an underlying formal structure. This skillful interplay between a kind of roughhouse informality and an intellectual coherence gives the Visual Arts Facility its esthetic verve and crisp presence.

On Russel Drive, three separate buildings linked by screens line the frontage. A central, two-story building houses 42 graduate student studios along with laboratories for computer arts, photography, and electronics, plus editing rooms and media viewing rooms. To the north, Binder designed a shed containing metal, wood, and framing workshops; to the south, a two-story block houses a windowless, "black-box" performance space, a public gallery, and art history faculty offices and seminar rooms. Between the three blocks, open courtyards provide outdoor work spaces.

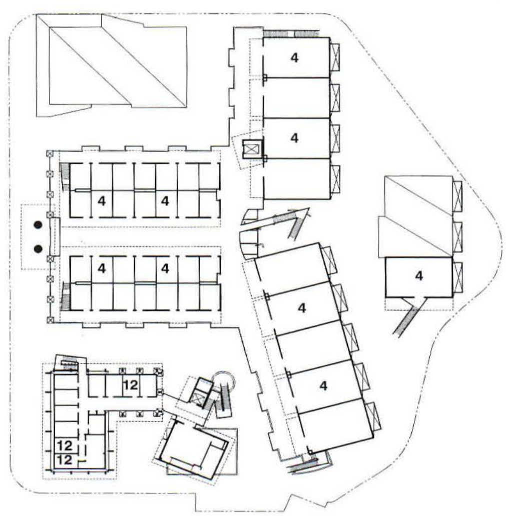
Behind these three buildings, the cranked faculty studio sits on the line of the sharp

FACING PAGE: Graduate student studio block features painted steel pipe balconies projecting from walls of split and smooth concrete block.
LEFT: Viewed from the balcony fronting faculty studios, second-floor arts history faculty offices are linked by a bridge to the seminar room.
BELOW: Elevator tower to seminar room is capped by fiberglass roof that matches overhangs screening balconies.
BOTTOM: Faculty studios are finished in painted drywall over plywood with service ducts and conduits exposed.



WEST ELEVATION

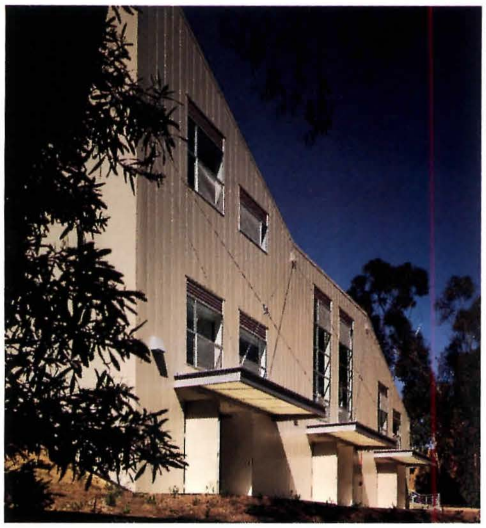
FIRST FLOOR



SECOND FLOOR

1 METAL SHOP
2 WOOD SHOP
3 PHOTO LAB
4 STUDIO
5 DARKROOM
6 COMPUTER LAB
7 ELECTRONICS LAB
8 EDITING LAB
9 COMMONS
10 EXHIBIT GALLERY
11 ASSEMBLY/ PERFORMANCE AREA
12 OFFICE

BELOW: Cranked faculty student block at the rear of the site, clad in painted aluminum, conveys an industrial air. **BOTTOM RIGHT:** Projecting steel-framed canopies, roofed in translucent fiberglass, shade doors to studios. **FACING PAGE:** Second-floor promenade between blocks of student studios frames a vista of eucalyptus-shaded canyon flanking north side of the site.



drop in the site's contours toward the canyon. At the point where the axis cranks, the faculty building is articulated by a dog-leg painted metal staircase linking its upper and lower floors. The drop in the site allowed Binder to vary the section of these large studios with 14-, 18-, and 23-foot ceiling heights, without towering over the rest of the complex. The fifth building at the foot of the eastern slope also houses faculty studios and offices, as well as student work areas.

Simple materials serve bold massing. In the more publicly visible buildings along Russel Drive and Fifth College Court, panels of stucco and Alaskan cedar complement split-face and smooth concrete blocks. The faculty studios at the rear are clad in aluminum, giving them the look of upscale industrial warehouses. Standing-seam sheet metal roofing; painted steel canopies suspended on cables; steel security screens; and floors finished in cement, synthetic cement, or concrete add to the industrial ambience.

Set off against these no-nonsense materials is a more playful palette of translucent fiberglass sunscreens and floating roof planes. A bold bowed roof caps the graduate students' studio building, above the tall concrete columns of the formal gateway, which anchors the east-west campus axis. The gateway, with its own floating roof, is a deliberate fake; behind it lies a modest painted door leading into a narrow corridor. The main public entry on Fifth College Court is far more welcoming and intimate. Split-face block walls line a small plaza that leads into an open-air lobby to the north and the flanking performance space and gallery.

In several places, the complex assumes the air of an Italian piazzetta. Elevator towers, capped by floating roofs, look like miniature campaniles; and steel stairways assume the grandeur of piazza steps. However, this Italianate air of the Visual Arts Facility has an ironic undertone. The campus master plan for the Fifth College calls for loggias capping all buildings, partly to establish a common cornice line throughout the campus, partly as a Postmodernist fancy. The fiberglass sunshades and floating roofs are Binder's nod to this official loggia-ism.

The Visual Arts Facility marks a maturing in Binder's architectural evolution. Compared to her Irvine Engineering Research Facility, completed in 1991, the UCSD complex is more assured. Within the Irvine engineering complex, many of the external features seem stuck onto the basic box like afterthoughts; in UCSD's Visual Arts Facility, every feature fits its context and springs from the character of the building it elaborates.

Former University of California at Irvine campus architect David Neuman once praised Binder for her mixture of modesty and moxie. At Irvine, the modesty, in Gehry's shadow, might have seemed the right way to go. The Visual Arts Facility, however, is in no way modest. On the contrary, it is assertive in just the right way, and to just the right degree—moxie with maturity. —*Leon Whiteson*

VISUAL ARTS FACILITY
UNIVERSITY OF CALIFORNIA AT SAN DIEGO
SAN DIEGO, CALIFORNIA

ARCHITECTS: R.L. Binder Architecture & Planning, Playa del Ray, California—Rebecca L. Binder (principal-in-charge); Kim A. Walsh (project designer); Neptune Thomas Davis, San Diego—Grover L. Starr (principal-in-charge); Kevin A. Spady (project architect); Mark D. Thomas (construction administrator)
LANDSCAPE ARCHITECT: Kawasaki/Theilacker/Ueno & Associates
ENGINEERS: Burkett & Wong (structural); Merle Strum & Associates (mechanical); Randall-Lamb Associates (electrical); Bement Dainwood & Sturgeon (civil)
GENERAL CONTRACTOR: Ninteman Construction
COST: Withheld at owner's request
PHOTOGRAPHER: Jeff Goldberg/Esto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Technology & Practice

Info

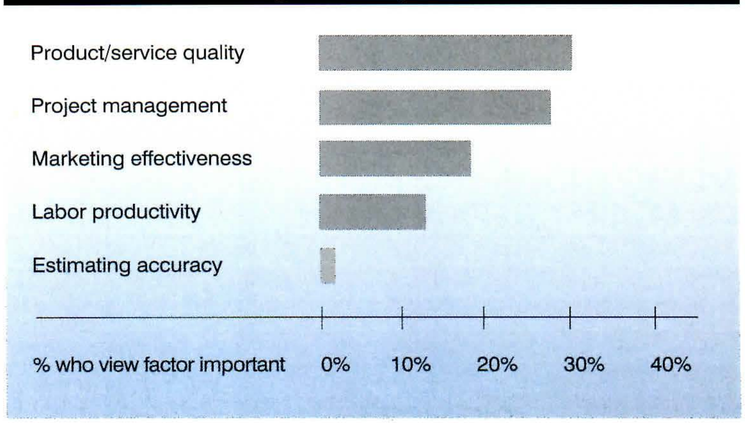
AIA Surveys Outside Private Practice

Recognizing the growing diversity of its membership, the AIA conducted its first comprehensive survey of licensed architects in roles outside private practice and issued the results in May. Eighteen percent of AIA members currently hold positions in corporate, government, and academic settings, up 2 percent from five years ago, with the highest concentration working for corporations—23 percent—and local, state, and federal governments, a combined 24 percent. Of the 3,167 responses to the national questionnaire, 39 percent reported practicing architecture or performing additional consulting services beyond their full-time employment. Nearly two-thirds of all those questioned answered they would not return to private practice if given the same compensation and benefits as their current jobs.

Where Architects Work Outside Private Practice

Corporate architectural, engineering, or facilities management division	23%
Public college or university	14%
Local government	11%
Other	10%
Federal government	8%
Developer	7%
Contractor or builder	7%
Self-employed	6%
Private college or university	5%
State government	5%
Engineering firm	2%
Building product manufacturer	1%
Design firm (nonarchitectural)	1%

Architect/Engineers' Top Factors of Success



Contractors Poll Construction Industry

Another recent poll, this one conducted by the Associated General Contractors of America in association with the management consulting firm of Deloitte & Touche, reveals that architects, engineers, and contractors are hungry for ways to improve their management strategies. Respondents to the poll, titled "Insights in Construction: Survey Report on the Nation's Leading Construction Companies and Design Firms," provided views on various business strategies.

Only 13 percent of architecture, engineering, and contracting firms responding to the poll indicated they do not plan to employ Total Quality Management techniques. Of those surveyed, 75 percent are considering employing the concept of partnering to improve productivity and reduce litigation. In response to increasing legal concerns, 77 percent of all firms that have used alternative dispute resolution techniques (ARCHITECTURE, June 1992, 99-101) in lieu of litigation view the outcome of their efforts in these circumstances as favorable. However, the majority of those polled responded that they had not tried such mediation tactics.

According to the poll, computer automation and software will likely become more prominent in architecture and engineering practices. More than 70 percent of such firms polled plan to invest over $100,000 in information technology during the next two years. Approximately 15 percent of the surveyed respondents plan to spend in excess of $1 million during the same time period.

In ranking the "top five factors of business success," architects and engineers responded by listing product/service quality as the most important, followed closely by project management and marketing effectiveness. The factors of productivity and accuracy were a distant fourth and fifth.—*Marc S. Harriman*

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Brick Institute Awards

Winners of the 1993 Brick in Architecture Awards, cosponsored by the AIA and Brick Institute of America, were announced at the AIA convention in Chicago last month. The three-member jury— architects Larry Lord of Lord, Aeck & Sargent; Laurence Booth of Booth/Hansen & Associates; and Jean Parker of Butrick, White & Burtis— selected 11 projects from 250 entries. The jurors commended a diversity of building types in the competition, which highlights new construction and renovations designed in brick.

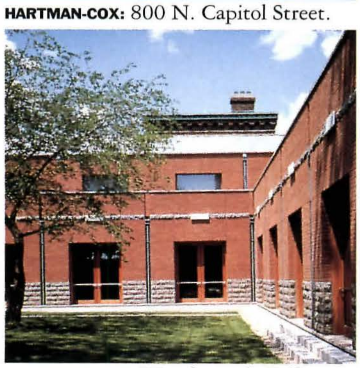
Commercial projects honored were: a 22-story tower for ABC by Kohn Pedersen Fox; 800 North Capitol in Washington, D.C., by Hartman-Cox Architects; and 518 C St., also in D.C., by Weinstein Associates.

Two preservation projects were recognized: the Franklin School restoration in Washington, D.C., by Oehrlein & Associates, Architects, and Boston's Old State House by Goody, Clancy & Associates.

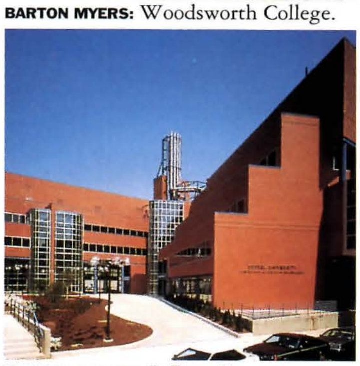
Two new residential projects received awards: the Charlestown Navy Yard Rowhouses in Boston by William Rawn Associates and La Estrella Ranch House in Roma, Texas, by San Antonio-based Lake/Flato Architects.

The jury also commended three university projects: LeBow Engineering Building Center for Automation Technology at Drexel University by the Kling-Lindquist Partnership; an addition to the Suzallo Library at the University of Washington by Edward Larrabee Barnes/ John M.Y. Lee & Partners and associate architect TRA of Seattle; and Woodsworth College, University of Toronto, by Barton Myers and associate architect Kuwabara Payne McKenna Blumberg. The Illinois Bell Telephone Company Remote Switching Unit by Ross Barney + Jankowski also received an award.

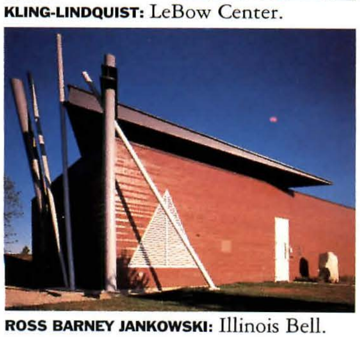
HARTMAN-COX: 800 N. Capitol Street.



BARTON MYERS: Woodsworth College.



KLING-LINDQUIST: LeBow Center.



ROSS BARNEY JANKOWSKI: Illinois Bell.

INTERNATIONAL DARK-SKY ASSOCIATION & ASTRONOMICAL SOCIETY OF THE PACIFIC (IDA)

Illuminating Regulations

Architects can minimize light pollution by specifying suitable fixtures and lamps.

ABOVE RIGHT: Satellite view of the United States at night reveals concentrations of light. Much of the visible light is wasted, causing urban sky glow and other forms of light pollution.

A billion dollars worth of light is wasted through light pollution every year in the United States, according to some estimates. Defined as unwanted atmospheric ambient light, such pollution causes urban sky glow, a phenomenon created by lights of sprawling cities. Light spilling or glaring on adjacent property, called light trespass, is another form of light pollution, stemming from security-obsessed society, which is convinced that brighter means safer.

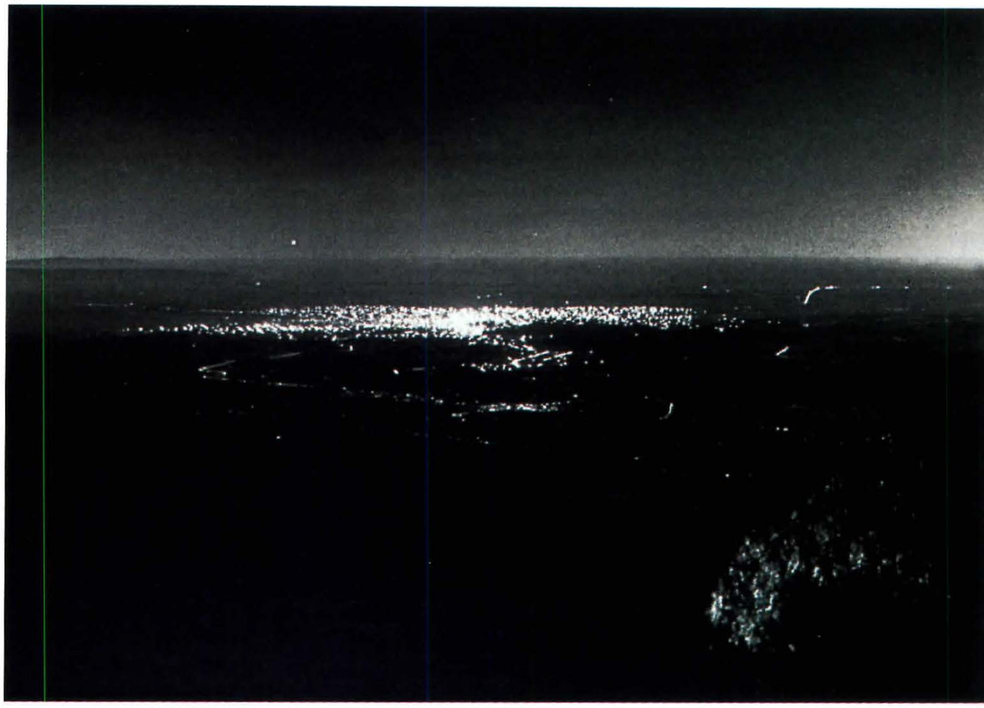
Pouring out of millions of poorly designed fixtures and inefficient lamps, lost illumination floods the sky with urban sky glow. This form of light pollution can obscure astronomers' views of the stars. In fact, Mt. Wilson Observatory, near Los Angeles, was the first world-class observatory to have been temporarily shut down by urban sky glow. In the late 1970s, the same fate imperiled Mt. Palomar, also in Southern California, when urban sky glow from the city of San Diego increased background light levels to twice their normal intensity.

On a more down-to-earth level, light pollution also results from glare from a single dusk-to-dawn mercury vapor security light in a neighbor's yard, intruding into living rooms to create the ambience of a prison cell.

Public and governmental awareness of light pollution is growing. Increasing attention is being paid to energy efficiency and light trespass by public lighting, such as streetlights; parking lot lights; billboard lights; and sports facilities, which increasingly operate after dark. As a result, more than 50 municipalities, counties, and states have enacted light control ordinances designed to minimize light pollution. The first of such laws was passed in Tucson and Pima County in Arizona in 1972. When light pollution from Tucson began to affect visibility and readings at Kitt Peak Observatory, some 40 miles away, astronomers lobbied and a strict light control law was passed, resulting in the absence of light pollution at the observatory. As the light pollution threats to numerous observatories have increased in recent years, astronomers and their supporters organized the International Dark-Sky Association (IDA) in 1989, which today numbers more than 1,300 members from 49 states and 52 countries. The IDA researches and produces newsletters and information sheets relating to light control and lobbies for stricter laws to limit the various types of light pollution.

Lighting laws

One person's trespass, however, is another's security. Light pollution is subjective, and in the absence of a quantifiable method of defining and measuring light trespass, local and statewide laws set different standards for almost every aspect of the problem. How does one decide what level of glare constitutes light trespass? How close to or beyond the edge of a parcel of property should light be allowed to spill? Some laws, such as those legislated in San Diego, Tucson, and in the state of Hawaii, have been passed in response



IDA PHOTOS

ABOVE AND FACING PAGE, TOP LEFT: Taken from the Mt. Wilson Observatory, matching photos of Los Angeles in 1920 and 1990 illustrate the growing problem of urban sky glow.
FACING PAGE, TOP RIGHT: Spill light emanates from poorly designed fixtures.
FACING PAGE, BOTTOM RIGHT: Well-designed fixtures boost efficiency, cut glare, and eliminate spill light.

to the IDA's lobbying efforts to restrict lighting in proximity to observatories; other laws reflect the concerns of citizens and urban planners. Several cities have undertaken efforts to limit light trespass from spill or glare through strict fixture guidelines.

Los Angeles is 3 years into an estimated 11-year program to replace all of its cobra-headed street lamps with flat-lensed units incorporating specially designed optics to increase efficiency and cut glare. In Milwaukee, Wisconsin, light levels beyond property lines can not exceed 0.2 footcandles 4 feet above the ground, and no glare source or reflected glare source can be visible higher than 5 feet above the ground at a level of intensity to cause discomfort or annoyance. In Brookfield, Wisconsin, fixtures are limited to a maximum of 1,000 watts. In Greenwich, Connecticut, all exterior lights must be shielded. Those adjacent to businesses must not be visible above a height of 5 feet, and those adjacent to residences must not be visible at all, unless they are unobjectionable due to photometric design. Also in Greenwich, spill light levels are limited to 0.1 footcandles on residential property lines and are limited to 0.5 footcandles on business property lines. In San Diego, California, spill light is limited to a maximum of 0.02 footcandles 5 feet inside the property line.

The jumble of laws reflects citizen concern over invasive glare and spill light from retail, commercial, and recreational sources—not diminished star-gazing. These laws also reflect the lack of national standards and the absence of lighting engineers in the planning stage. One engineer, for example, notes that wattage levels are irrelevant to issues of light trespass if fixtures are properly shielded.

Levels of visibility

Given the absence of national standards for measuring light trespass, part of the responsibility for creatively minimizing or eliminating light pollution lies with architects and their lighting consultants. In some situations, light pollution can be reduced through very simple measures. The most obvious is turning off the lights. Inarguably, night lighting has made parks, playgrounds, shopping centers, streets, and other public gathering places usable after dark; but poorly designed, inappropriate night lighting can have the opposite effect. By creating the impression of a high-crime area, or by lighting a public area with inappropriate levels or unflattering types of illumination, glaring illumination can drive people away.

Additionally, anecdotal evidence suggests that in some cases, bright lights actually attract and inspire vandals, who prefer to scrawl graffiti on a wall or smash a store, school, or office building window in light bright enough to illuminate their handiwork. Similarly, exterior security systems in residential communities don't necessarily require banks of high-intensity lamps beaming across the front and back yards. The job can be done as well by a minimal number of

well-placed floodlights with infrared motion sensors, which turn on only if there is movement in the range "seen" by the sensor.

Appropriate lamps, appropriate fixtures

For architects, light pollution can best be controlled by specifying appropriate lamps and, more importantly, appropriate fixtures. The wrong kind of outdoor light is the most commonly specified: a 175-watt mercury vapor lamp fixture that emits glare in all directions. It's popular because it's cheap, but the fundamental inefficiency of the fixture negates any up-front savings. Other inappropriate outdoor fixtures include globes or other fixtures that are poorly shielded or use inefficient lamps requiring high levels of wattage to produce low lumen levels. It is better to employ low-wattage (18-, 35-, or 55-watt), low- or high-pressure sodium lamps, which are less expensive to operate. On the one hand, low-pressure sodium light has no blue in its spectrum, so it tends to make people look rather ghoulish. On the other hand, because virtually all low-pressure sodium light is emitted on the yellow-orange wavelength, which can easily be filtered out, such lamps are recommended by astronomers because the monochromatic color doesn't interfere with spectroscopy. High-pressure sodium is full spectrum, so it makes people look better; but unfortunately, it blocks out starlight at many wavelengths.

Recently, this low- versus high-pressure sodium controversy has put astronomers and urban planners at odds in San Diego. The city's efforts at preserving the viability of the Mt. Palomar Observatory led to the installation of all low-pressure sodium street lighting in the early 1980s. Now, as the city is faced with increasing blight and crime, and decreasing commercial activity after dark, city officials have decided that the low-pressure sodium light actually enhances the chances of criminal activity by driving people away. The astronomers are not pleased, as the high-pressure sodium light may interfere with their observations of distant galaxies and quasars. They argue that there is no statistical evidence that high-pressure sodium lighting lessens crime. But perception is critical, and if people feel safer in high-pressure sodium light, commercial interests will see that it is provided.

Astronomer David Crawford of the IDA suggests that one way around this problem is to provide roughly 90 percent of the ambient illumination with low-pressure sodium and then utilize metal halide or fluorescent light for the final 10 percent, which will whiten the overall appearance of the light and render it more visually pleasing. However, lighting designers James Benya of the San Francisco firm Luminae Souter and Stephen Lees of New York's Horton-Lees Lighting Design both maintain that this lighting mix, while slightly improving the visual field, will not work. The lighting designers point out that recent research has confirmed that for good vision, the human eye requires light with a blue component. There is no blue in monochromatic sodium light and not enough blue in Craw-

IDA PHOTOS

JEFFREY JACOBS/MIMSTUDIOS

ford's 10 percent solution to make a real difference. Clearly, solutions to the problem of light rendition are not yet defined, and at present, the conflict of interest between astronomers and lighting designers continues.

The IDA recommends low-pressure sodium for roadways, walkways, and parking lots; outdoor and residential security lighting; and any other area where color rendering is not critical. Other types of lighting that may be appropriate include metal halide for display lighting and sports lighting where color rendering is critical. Incandescent, including quartz, is inefficient but may be appropriate, if well shielded, in low-wattage applications such as porch lighting.

Uplights and custom designs

Regardless of the type of lamp, properly designed fixtures will eliminate light pollution in its most common form, uplight. Uplight is almost always wasted and/or invasive light; ordinances passed in Tucson and Pima County, Arizona, ban uplighting on advertising billboards, for example. Well-designed exterior fixtures are called full-cutoff fixtures, because they allow no light to be emitted above a horizontal plane running through the lowest part of the fixture. Full-cutoff fixtures originated by Gardco and other manufacturers have been on the market for about 20 years, according to lighting designer Jim Benya.

Benya collaborated with architect Gregory Hnedak of the Hnedak-Bobo Group on the lighting design along the new Memphis, Tennessee, trolley promenades, a recently completed project that demonstrates an astute approach to the control of light trespass. Utilizing pole-mounted luminaires at two different heights, the architect and lighting designers created a bright, cheerful atmosphere below, with selective floodlights above. At 30 feet above ground, custom-designed luminaires mounted on the trolley line power poles cast light overall and cut off at a point halfway up the second story so that light does not trespass into the windows of the upper level residential sections of the buildings along the promenade. Pole-mounted luminaires 15 feet above ground illuminate pedestrian walkways, and floodlights atop poles at both heights provide focus illumination on selected commercial building facades.

Recent research has shown that the public believes the appearance of brightness warms the atmosphere in a given environment. Manufacturers have responded with full-cutoff fixtures—which, in their original form, were seen as creating a somewhat gloomy ambience—enhanced with visibly glowing tops. However, the contemporary look of these off-the-shelf luminaires was inappropriate for the historical setting of the Memphis project, so Benya developed a custom fixture with modern optics—full cutoff underneath, but incorporating a chimneylike glow on top created by acrylic rods inside the fixtures. Only 3 percent to 5 percent of the light output actually goes into the glow, minimizing the wasted uplight, but creating a more at-


JEFFREY JACOBS/MIMSTUDIOS

tractive luminaire. The designers chose to exceed minimum lighting levels recommended by the Illuminating Engineering Society to make the promenade more appealing. At the same time, the careful fixture design has enhanced that appeal with visible light, yet eliminated light trespass, an important consideration for residents of apartments above ground-floor commercial spaces.

At the Ameritech Center, a 230-acre corporate campus in the rural village of Hoffman Estates, Illinois, Basil Souder, an architect with Dirk Lohan Associates, worked with Stephen Lees, from Horton-Lees Lighting Design, on a lighting program that would not trespass on the residential neighborhood to the north. Along the main U-shaped approach to the corporate campus, the designers installed bollards containing 13-watt compact fluorescents located 36 inches above ground. Four intersections within the campus were signalled with globe lamps placed on 12-foot poles, again with minimal wattage levels. Selected groupings of trees close to the buildings—and far from the borders of the property—were modestly uplit for dramatic effect.

Rather than lighting the exterior of the buildings, which might have produced unwanted glare, the architects and lighting consultants chose to create a lamplike effect by illuminating glass-enclosed atria, stairwells, and other internal architectural components that are visible from the exterior. The ultimate combination of low-wattage lamps, close-to-the-ground fixture placement, and internal architectural lighting directs visitors to the Ameritech Center and appropriately illuminates the buildings, while establishing a completely noninvasive after-hours presence. In general, Souder prefers to specify metal halide or compact fluorescent lamps for their whiter colors. He believes that fixtures should be designed with cutoff shields to prevent glare—a point too many architects overlook in their pursuit of dramatically spotlighting buildings and landscapes.

Exterior lighting alternatives

In recent years, other options and approaches to exterior lighting have emerged. Small, well-shielded quartz security lights with motion sensors are a viable replacement for mercury vapor lamps. For uplighting building facades, wide, flat beamspreads are most suitable, as the building itself will shield the light from the sky. Graphics, signage, and significant architectural elements can be illuminated with projectors such as the new Phoenix 100 line developed by Phoenix Products Company of Milwaukee, Wisconsin. These fixtures focus light in a narrow beam through custom templates, color filters, and other options.

Although fixture design is critical, the responsibility for minimizing light pollution lies with architects and lighting designers. For the sake of star-gazers, and others affected by light trespass, it is imperative that architects learn more about the nature of lighting and how it can be designed to prevent light pollution. —*Justin Henderson*

FACING PAGE, TOP LEFT: Projector-type fixtures such as the Phoenix 100 line control light trespass by focusing light on a building facade through internal shutters and custom templates.
FACING PAGE, BOTTOM LEFT: Full-cutoff fixtures prevent light from escaping upward, reducing urban sky glow.
FACING PAGE, RIGHT: High-pressure sodium lamps provide soft, amber-colored light from fixtures integrated into the Civic Center Plaza on the Memphis trolley line. Metal halide and fluorescent lamps uplight the structure, and boarding areas at center are brightly illuminated with shielded downlights.
ABOVE LEFT: Custom fixtures cut off light halfway up the second stories of building facades along the pedestrian promenade in downtown Memphis, preventing light trespass into residential buildings. Commercial building facades are illuminated with carefully focused floodlights. The pole-mounted fixtures are designed to glow, but only 3 percent to 5 percent of the light is "wasted" on street appeal.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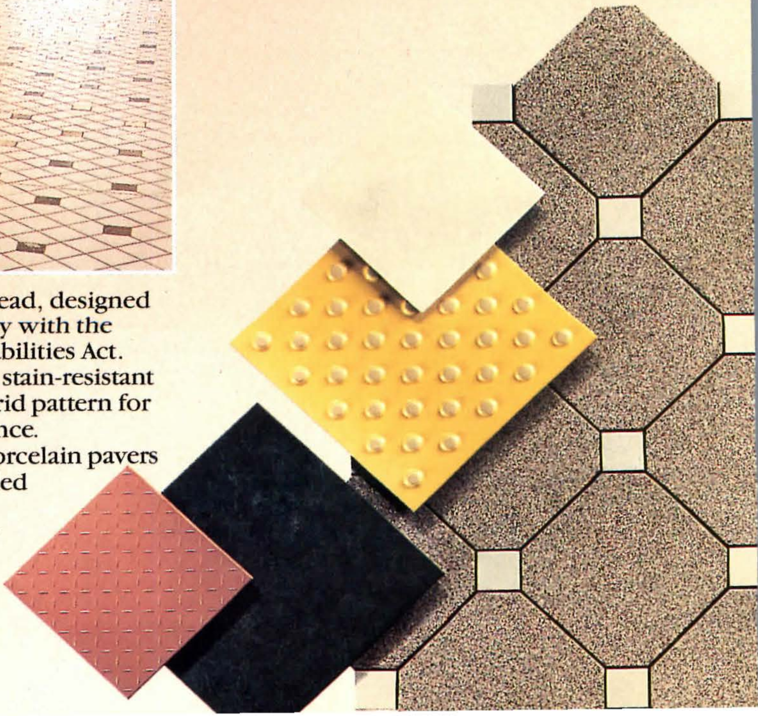
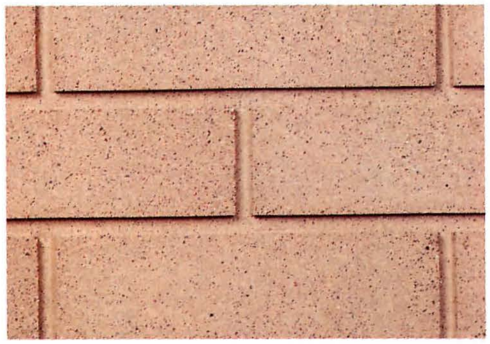


Concrete Into Stone

Precast concrete is finished to simulate marble, granite, and several other masonry types.



TOP LEFT: Simulated stucco finish, comprising white cement, reddish-brown concrete sand, reddish-brown river gravel, and brown pigment.
TOP RIGHT: Simulated keystone, with a light sandblasted finish, is composed of white cement, white concrete sand, coquina shell, plus gray limestone, and dark buff pigment.
ABOVE LEFT: Simulated brick with light acid etch, composed of white cement, reddish-brown concrete sand, reddish-brown river gravel, and buff pigment.
ABOVE RIGHT: Simulated split-face concrete block, comprising gray cement, crushed gray and red granite, and yellow pigment.

With the rise of Postmodern architecture in the 1980s, an interest in replicating traditional load-bearing stonework led to the development of precast concrete finished to simulate stone. Once relegated to occasional limestone details, stone-simulating precast is increasingly cladding entire buildings. "Architects are more familiar with the material and more adventurous," maintains Sidney Freedman, director of architectural precast concrete services at the Precast/Prestressed Concrete Institute. Today, Freedman explains, precast simulates limestone, granite, marble, travertine, quartz, dolomite, and split-face rock.

More architects also design with precast, since it is less expensive to purchase and erect than stone. Concrete can be especially economical for intricate sculptural elements such as finials and cornices that must be carved from solid blocks. Precast is also gaining advocates among architects and owners concerned about liability connected with falling stone.

Concrete must be very high quality—and careful attention must be given to designing and detailing the precast molds—to create an esthetically plausible replication of stone. The precaster has to ensure that the stones from which the molds are created do not have any recognizable patterns or fossils that will identify the building as precast when the form is repeated. Joints between precast panels must be detailed so they avoid exposing vertical masonry joints, explains Bill Avard of the Pre-Con Company in Brampton, Ontario.

Precast concrete that simulates stone is created in much the same manner as conventional precast, from large aggregate, sand, cement, water, and pigments. Typically, the architect provides the precaster with stone samples to be copied, and the precaster mixes two types of concrete for each panel: a more expensive colored mix for the face and a standard gray back-up mix behind.

Surface textures can be created from rubber, polyurethane, or fiberglass molds generated from stone or wood positives. Color is varied by adding manufactured pigments and aggregates to the mix. White cement, which is more expensive than gray cement, helps to create colors. Limestone is replicated by matching the sand color to the stone sample and adding a light-colored pigment to the concrete matrix. Granite is simulated by adding a dark pigment and incorporating various aggregates to simulate speckling.

Finishing techniques determine both the color and the texture of the precast. Most precast meant to simulate stone is sprayed with a solution of water and acid to remove a fine layer of surface cement residue. The acid wash maintains both the sharp colors of the concrete mix and the crisp details and sharp edges created by the molds. Sandblasting mutes and lightens concrete's colors and softens sharp edges and corners. Standard color and texture options are available in the *Architectural Precast Concrete Color and Texture Selection Guide*, published by the Precast/Prestressed Concrete Institute. —*Virginia Kent Dorris*

Alii Place
Honolulu, Hawaii
DMJM, Architect

DMJM Architects went to great lengths to simulate natural stone in the facade of Alii Place, a 333,700-square-foot office building in Honolulu, Hawaii: More than 3,000 pieces of precast concrete weighing 6,000 tons were shipped 3,400 miles by boat, train, and truck from Denver to Honolulu and erected to simulate limestone and granite.

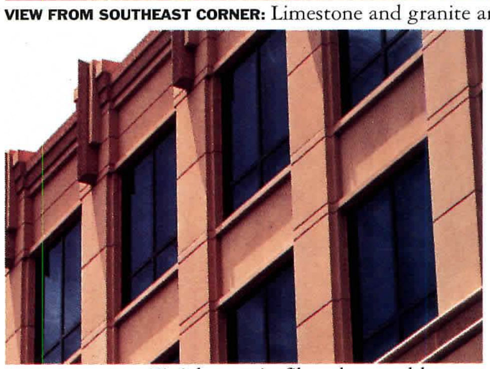
Dissuaded by cost from incorporating real stone into the facade—the $60 million building would have cost at least $70 million if clad in granite—DMJM and project developer Beta-West considered poured-in-place concrete or local precast but rejected both due to quality concerns. The precast contract was awarded to Rocky Mountain Prestress after the company demonstrated the ability to simulate natural stone and deliver the material to Honolulu on time.

The cladding panels were cast from two concrete face mixes, and textures and colors were achieved through casting and finishing methods. The simulated limestone arches at the base were created from rubber formliners cast from limestone blocks. Creating the finials was challenging because of the precision required to form sharp angles and points. Fiberglass molds were built from a wood model that was adjusted so that surfaces would meet the slope needed to pull the concrete from the form.

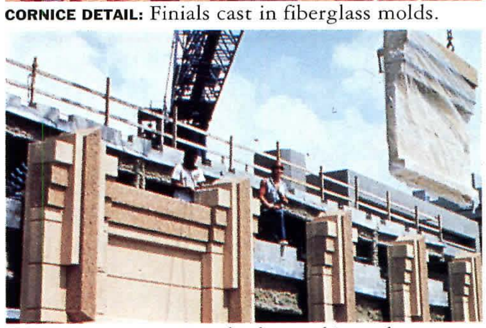
The panels; arches; and the flat, simulated limestone surfaces at the base were acid-etched to create a smooth finish that conceals the darker river-rock aggregate within.

For the upper stories, a dark pigment was added to simulate honed granite. While most of this portion is acid-etched for a smooth finish, a darker, rougher finish was desired for some details, including the sculptural finials at the roof line. For these areas, Rocky Mountain painted a chemical retarder onto the concrete forms to keep the mix from hardening at the surface. When the concrete was removed from the forms, workers were able to wash or brush away the surface matrix of sand and cement to a depth of 3/16 inch, leaving the darker large aggregate exposed. From a distance, the concrete gives the impression of *flame-cut granite*.

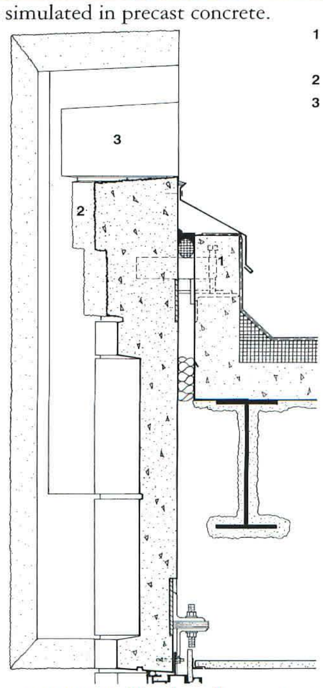
VIEW FROM SOUTHEAST CORNER: Limestone and granite are simulated in precast concrete.



CORNICE DETAIL: Finials cast in fiberglass molds.



WALL CONSTRUCTION: Panel is lowered into place.



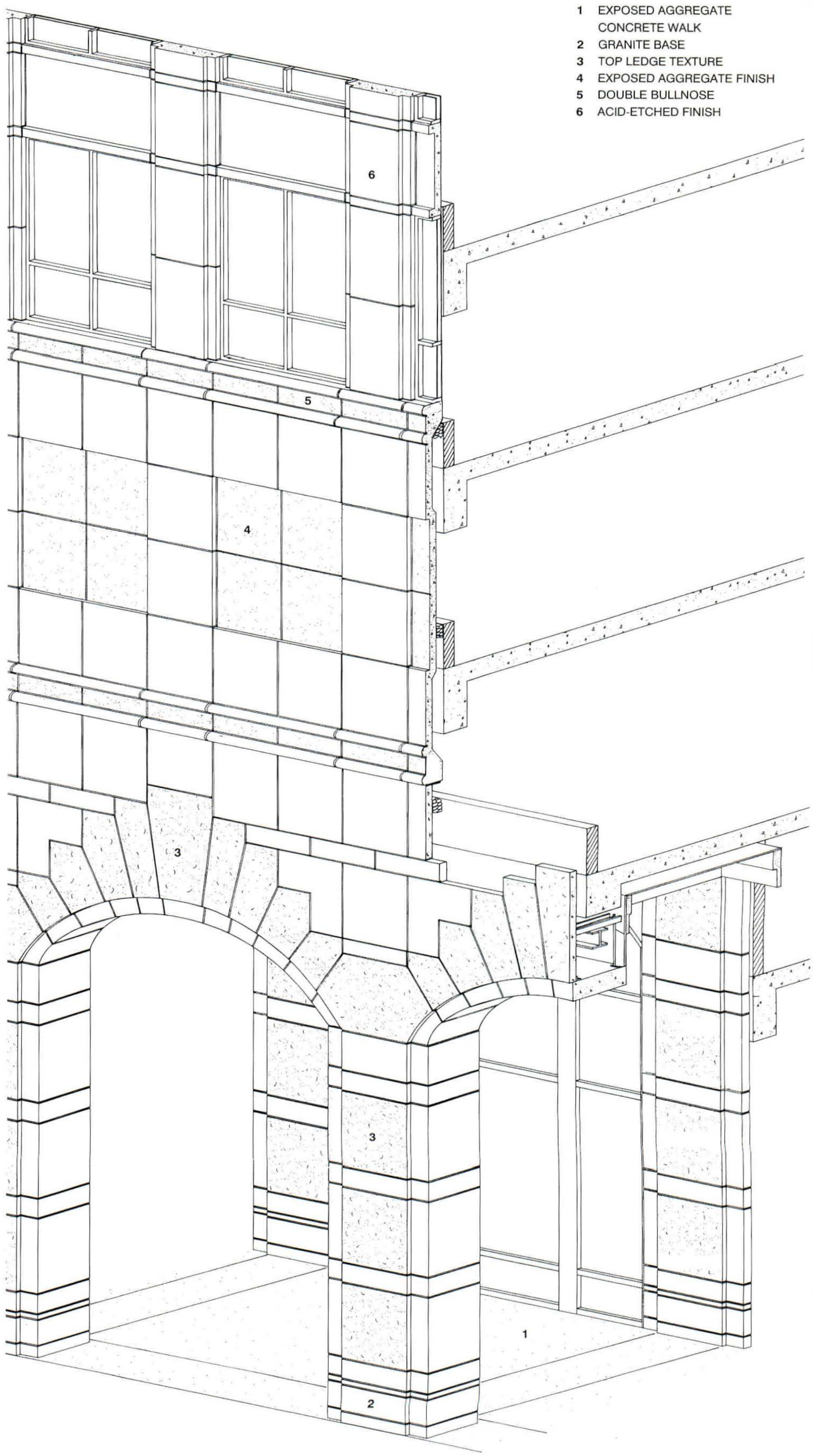
1 SPANDREL SUPPORT BRACKET
2 ACID-ETCHED FINISH
3 EXPOSED AGGREGATE FINISH

FINIAL DETAIL: Metal angles secure precast.

ARCH: Precast panel erected over formwork.

COLUMN: Precast panels enclose concrete structure.

ARCADE: Fiberglass beams create coffered ceiling.



AXONOMETRIC: Precast imitates limestone at ground floor and simulates granite above.

Synergen LakeCentre
Manufacturing Facility
Boulder, Colorado
Davis Partnership, Architect

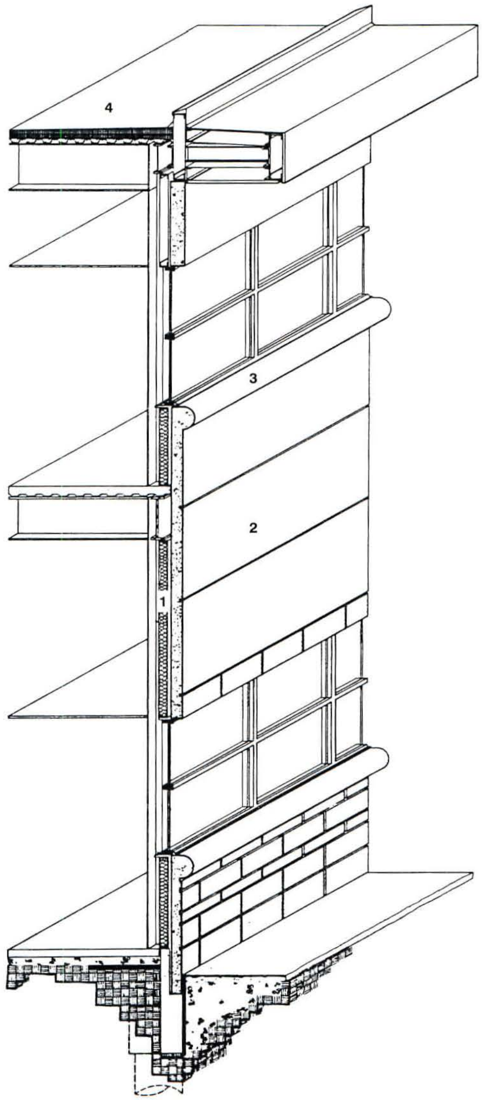
Rather than developing a high-tech, industrial appearance for a new pharmaceutical manufacturing facility in Boulder, Colorado, the Denver-based Davis Partnership took its cues from the environment, mimicking the earth tones and natural materials of the West in precast concrete. In particular, the architects sought to recognize the red sandstone rock formations in the foothills of Boulder. At the base of the building, they designed the precast to simulate the rose-hued sandstone of buildings at the nearby University of Colorado campus, satisfying client concerns about context at an economical price.

The precaster, Rocky Mountain Prestress, was brought on early in the design/development stage. Project designer Curtis Cox visited the local quarry to select several rough-textured sandstone blocks. A urethane mold was created from these blocks, and the precast color was also matched to the blocks.

Each of the typical 10-foot-wide by 30-foot-high concrete panels that clad the 75,000-square-foot, steel-frame building was cast of two concrete colors and textures. The bottom half consists of the rougher, rose-colored precast while the top half consists of a lighter, buff-colored concrete. The multicolored panel was created by inserting a temporary divider into the mold at the division between the colors and pouring a layer of face mix of one color. Next, the divider was removed and the second color was poured while the first color was still wet. Afterward, the gray back-up concrete was poured throughout the mold. The entire panel was acid-etched to provide a fine texture.

The Davis Partnership designed projecting precast bullnose window sills and an overhanging roof line to emphasize the building's strong horizontal lines and visually reduce its height: At 55 feet, the Synergen building is 20 feet taller than is usually permitted by view-conscious Boulder. "Designing a humanistic building was our focus," explains partner David Rhyne. "A high-tech building would have been outside of the value system of the community."

SOUTHEAST ELEVATION: Rose- and buff-colored precast concrete recall Western earth tones.



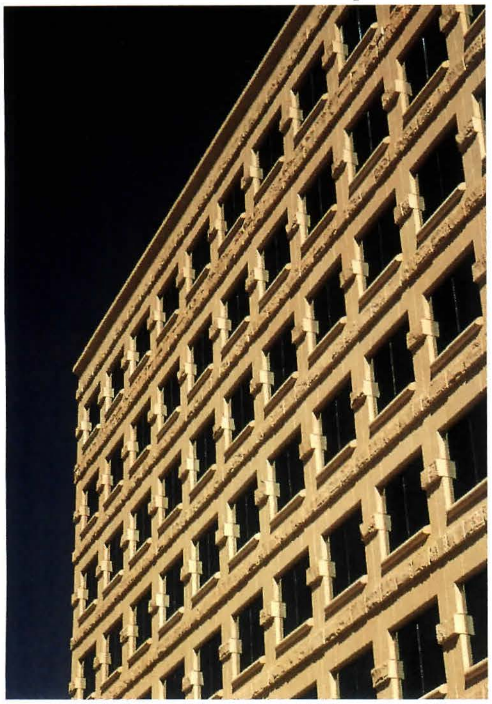
WALL SECTION

1 4" LIGHT GAUGE STEEL STUDS
2 PANEL WITH INTEGRAL COLOR AND ACID-ETCHED FINISH
3 PRECAST CONCRETE BULLNOSE
4 TOP OF ROOF

STAIR TOWER: 10-by-30-foot precast panels.

WEST ELEVATION: Bullnose sills visually reduce height.

WEST ELEVATION: Travertine marble is replicated in textured precast concrete.

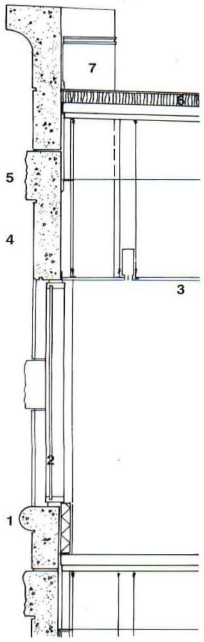


WINDOWS: Bullnose sills are cast within wall panels.

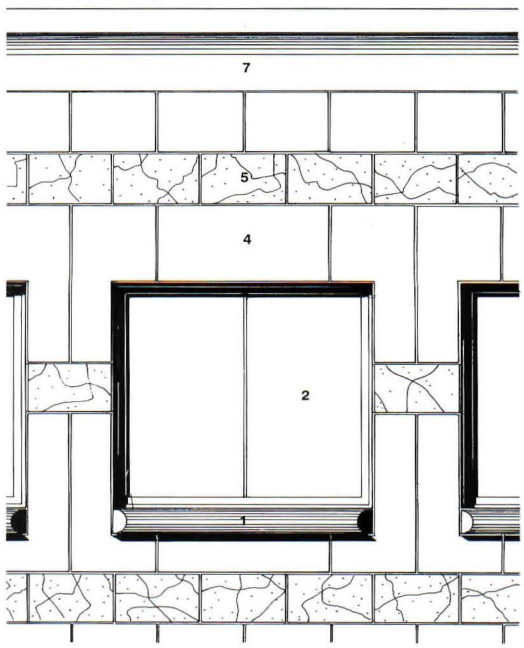
FORMWORK: Urethane forms vary within panel molds.

WALL DETAIL: Irregularly cleaved simulated stone.

1 PRECAST BULLNOSE SILL
2 ALUMINUM WINDOW SYSTEM
3 SUSPENDED CEILING
4 ACID-ETCHED FINISH
5 SIMULATED-STONE FACE
6 ROOF MEMBRANE
7 PRECAST CONCRETE PARAPET



WALL SECTION



TYPICAL PRECAST ELEVATION

198 Inverness Drive
Englewood, Colorado
Pouw & Associates, Architect

To convey the feeling of a monolithic loadbearing structure from a "nonliability" building system, Denver-based Pouw & Associates specified precast concrete for an 8-story office building in Englewood, Colorado. According to Joseph J. Poli, principal designer, the architects initially hoped to construct the project from pieces of irregularly cleaved travertine marble, but balked when the firm's engineer, concerned about the liability associated with recent high-profile stone cladding failures, insisted that the stone be secured with visible "button" connections to the structure behind. "The degree of mechanical attachments needed was not something we wanted to live with," Poli explains.

Two major concrete forms, each 13 feet high and 30 feet wide, one flat and one curved, were created from wood to produce the building's loadbearing wall panels. All of the facade's stonelike details were created with formliners within these major forms. Individual, non-repetitive stone textures comprise the horizontal moldings that encircle the building at every level. To produce these textures, the architects chose stone from a local quarry and worked with stone cutters to develop 70 different profiles. Precast contractor Rocky Mountain Prestress then fabricated a urethane mold of each stone. Those individual forms were then placed within the larger panel molds in a variety of patterns. The approach saved money because it allowed the major precast forms to be reused. Pouw & Associates used CAD to juggle the placement of the textured blocks within the larger molds and ensure that they did not look artificially repetitive.

Poli is comfortable with the compromise he made in selecting precast concrete over travertine marble, explaining that the material was selected primarily to convey the image of a massive, self-shadowing, masonry wall rather than to fool observers into thinking the concrete is actually stone. As he points out, "Precast can be very rich if one sits and thinks about how to craft it.

1501 M Street
Washington, D.C.
Hartman-Cox, Architect

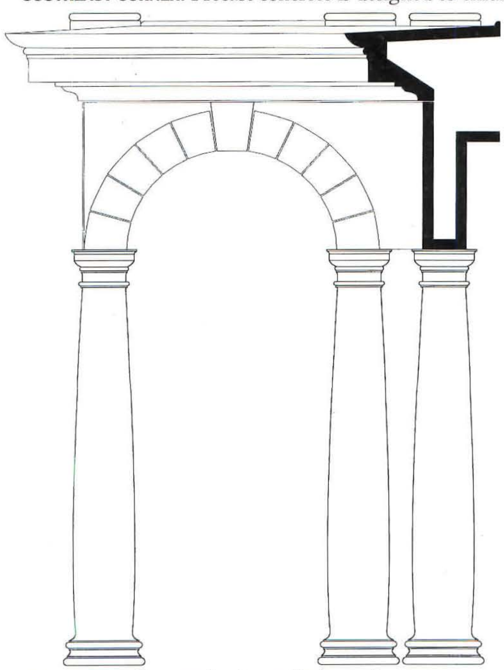
When Hartman-Cox first began developing the design for an 11-story office building in downtown Washington, D.C., the firm envisioned a Classically inspired facade constructed of buff-colored Indiana limestone. Discussions with stone vendors indicated that limestone would cost between $5 million and $10 million for materials and erection, so the architects turned to precast concrete, which ended up costing about $2.5 million, according to John Dale, project architect.

Hartman-Cox's design was inspired by early 20th-century Neoclassical commercial buildings as well as mass-produced cast-iron office buildings. The facade consists of two layers: a freestanding screen of two-story-high Doric columns, and cornices placed in front of a painted metal curtain wall. The column wall is self-supporting and is tied back to the building's concrete structure with lateral ties.

Hartman-Cox initially designed the facade's 18-foot-10-inch-high columns in drumlike sections. Brampton, Ontario-based Pre-Con Company was awarded the precast contract after demonstrating that it could cast each column as one piece without visible seams. From a wood form, Pre-Con created a two-piece fiberglass mold for the column. Before each pour, workers bolted the pieces together and then caulked and sanded the seams inside the mold to ensure an unblemished finish. The mold was then slipped over reinforcing steel, and the pour was made *vertically* to ensure the uniform quality of the circular surface.

The 10,000 pound-per-square-inch concrete mix for all of the precast elements was developed to match limestone samples supplied by the architect. Because of the shapes that were cast, a face mix customarily applied to just the visible surface of the concrete had to be poured throughout the thickness of each precast form. Hartman-Cox opted to have Pre-Con finish the pieces with a light acid wash rather than sandblasting because it provided a more stonelike texture and a warmer color. When completed, the 175 columns, 1,400 feet of cornice, and 24 precast arches were shipped to Washington by truck and erected on site at night.

SOUTHEAST CORNER: Precast concrete is designed to emulate Indiana buff limestone and cast iron.



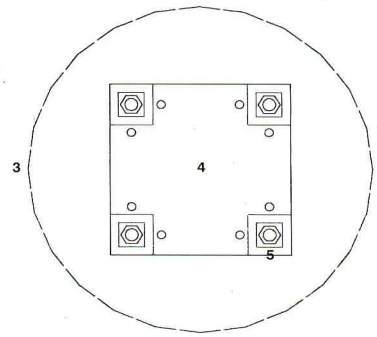
ARCH DETAIL: Precast fascia applied to columns.

COLUMNS: Each poured as a single piece.

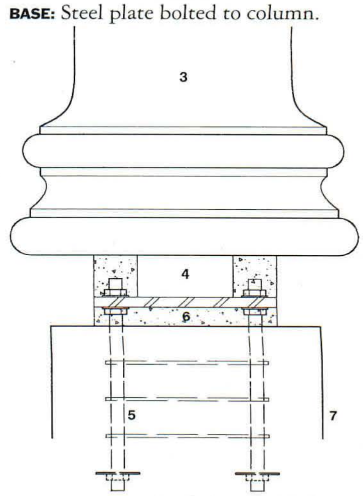
ELEVATION AND WALL SECTION


CORNICE MOLD: Built of wood.


COLUMN MOLD: Formed from fiberglass.



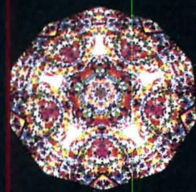
BASE: Steel plate bolted to column.

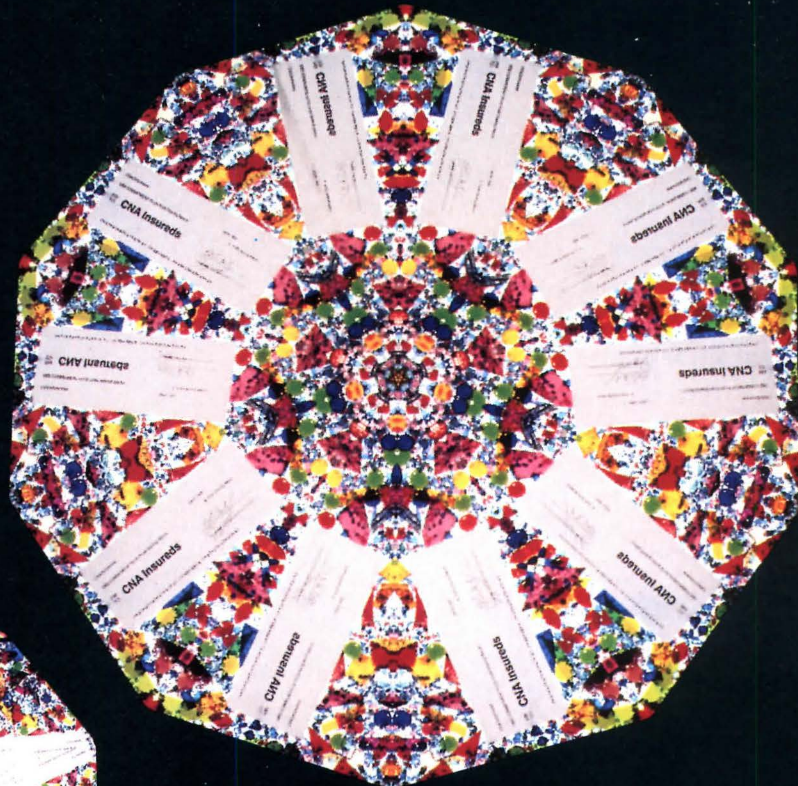


COLUMN DETAIL: Steel plate and bolts.

1 PRECAST CONCRETE CORNICE
2 METAL SPANDREL PANEL
3 PRECAST CONCRETE COLUMN
4 STEEL PLATE
5 ANCHOR BOLT
6 NONSHRINK GROUT
7 CAST-IN-PLACE CONCRETE PIER

YOUR NEEDS EVOLVE.





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PHOTOS: KAREN HOLZBERG/HATS: HATS IN THE BELFRY

Roles of a Project Manager

A project manager wears many hats in orchestrating the firm/client partnership.

ABOVE: A project manager acts as diplomat, detective, leader, and team captain and puts out fires that arise during various phases of construction.

To achieve a successful design and construction project, architects, consultants, contractors, and clients must develop a positive working relationship. This partnership is orchestrated by project managers (PMs); they are the primary point of contact in the design firm for every member of the building team. They have responsibility and authority for staying within the project budget, meeting the schedule, and fulfilling the client's contractual scope of services. Regardless of practice size, there is a need to fill the project manager role. Often the overburdened principal undertakes this task.

Few architects have both the skills to fulfill the role effectively and an interest in the business side of architecture. Few university curriculums provide even basic management training. Those who seek the necessary skills typically learn them either on the job or through seminars or self-initiative.

Project manager skills

In some firms, the best technicians are appointed to be project managers on the basis of their proven ability in a chosen area of technical expertise. But often, the best technicians make the poorest project managers. Most individuals with a proven technical ability tend to focus on one detailed aspect of a project, to the detriment of the broader needs that must be addressed. The best all-around architect makes the ideal project manager, whose capabilities can be categorized according to a number of skills.

- **Strong organizational ability:** The successful project manager must be able to organize a project and the team and address the many details that arise. The PM must excel at organizing personnel schedules and be able to handle multiple projects if necessary.
- **Broad scope:** While managers may be interested in a particular area of architecture, they must be familiar with all aspects of a project. However, project managers do not need to know all of the technical details. Successful project managers must have broad experience in a variety of building types. They must possess strong skills and experience in project budgeting, negotiating, marketing, and estimating. They should also have their own database of previous project experiences.
- **Communication:** A project manager must be able to monitor project status and display a willingness to ask for assistance as needed. Effective communications among all members of the project team is vital. Project managers must have good verbal and written communication skills—and be good listeners. As marketers and managers, they must establish a rapport with both individuals and groups.
- **Professionalism:** Professional appearance must be maintained, since the project manager is the firm's primary representative to the client. Furthermore, the manager must demonstrate a high regard for the firm's image.
- ***Leadership and decision making:*** *The* project manager must be a leader who can direct and motivate the team. The PM should have previous leadership responsibilities.

A project manager is a decision maker. The ability to make decisions and carry them through is vital. In addition, the manager must be able to admit a mistake and to say no to a client or staff member when necessary.

In general, most of the characteristics of a successful project manager entail the ability to work well with people, rather than technical skills. Certainly, a project manager must have basic technical abilities, but overemphasis on these by senior management will not necessarily result in a good manager. All project managers require regular training to improve skills and learn new ones; this training must become part of a firm's culture.

Finding capable project managers

Many architectural firms find it difficult to recruit capable project managers. As Houston architect Steve Wintner noted at the First Annual Symposium of the Association for Project Managers held recently in Chicago: "A project manager is a businessman, a psychologist, an accountant, a technician; part designer, part nuts-and-bolts. A truly rare combination of skills." As more architectural firms recognize the value of these skills, the shortage of qualified project managers becomes clearer. Competition for available talent is nearing crisis proportions.

In large cities, high job mobility creates the opportunity to recruit project managers from other firms. In many smaller cities, however, experienced managers may be unavailable or cannot be recruited. To obtain project management talent, firms should keep the following criteria in mind.

▪ **Recruit from outside your firm:** This method is often the fastest way to build your management staff. However, recruiting from other local firms (particularly in smaller communities) may create animosity among your peers, and it may also encourage other firms to raid your staff. In addition, the local design community may simply be exchanging each other's weaknesses.

If the local pool of talent is thin, recruiting from other, often larger, cities, may be the solution. A variation of this process may occur when an architectural firm establishes a branch office. For example, in 1990, Holabird & Root relocated project manager Greg Cook from Chicago to lead their new Rochester, Minnesota, office. Cook's understanding of existing firm operations and his project management ability far outweighed the local knowledge and contacts the firm might have gained by hiring or acquiring a local architect. Unfortunately, for many firms, transferring staff to smaller communities may be difficult when highly paid, experienced project managers are sought. Offering competitive salaries, fringe benefits, and firm ownership has been tried with varying success.

▪ **Train your own project manager:** In some communities, the only significant source of project managers lies within a firm's own staff. Many firms are reluctant to invest in staff training, however, for fear of losing the newly trained managers to competing firms. Clearly, a certain percentage of your staff will leave the firm for various reasons. With sufficient incentive—for instance, salary, bonus, ownership, or profit-sharing—many capable staff members will remain to help the firm prosper, justifying the cost of training.

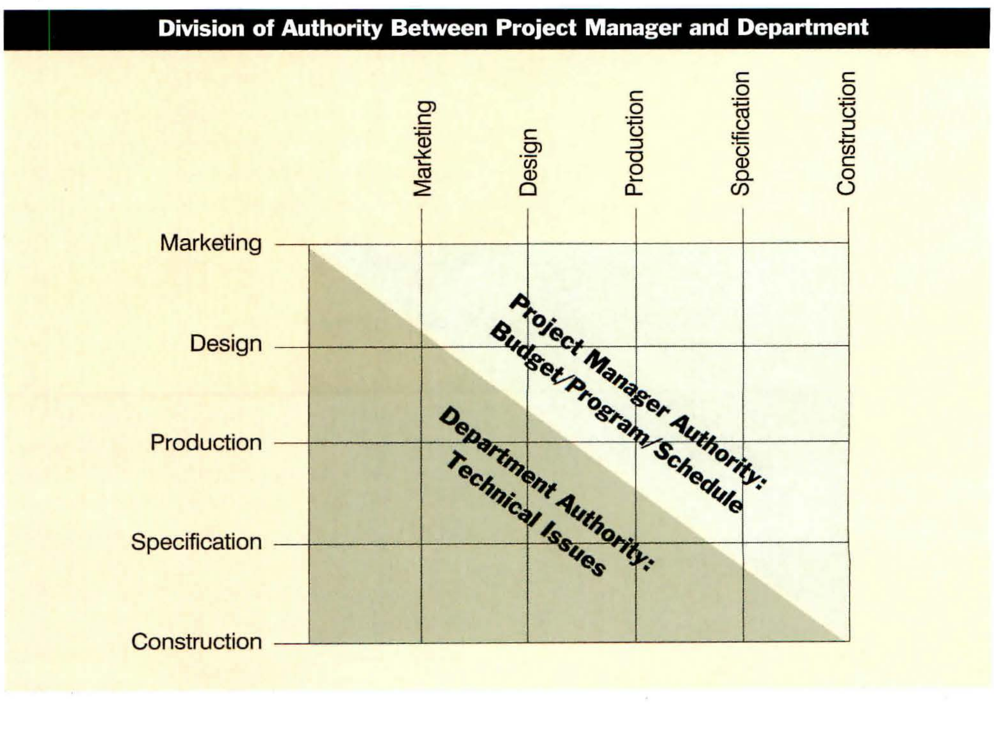
Many architects believe that designers are born, not made. They should also recognize that project managers can be cultivated. Effective management is as important as creative design, and it makes sense to focus a limited training budget on staff management and communications skills.

This training process requires constant monitoring of time and resources for seminars, courses, and publications. Some firms recruit prospects directly from colleges and universities to obtain the most capable talent. Then they educate these individuals to become project managers whose beliefs are compatible with their firm's philosophy.

In large cities, successful firms with experienced teams of project managers also should nurture younger talent and bring them along, as it is not unusual to find a large percentage of architects who—at one time or another—have worked for one or two of the local firms. Many of these firms are noted for their training programs.

▪ **Recruit an experienced PM:** For many architectural practices inexperienced in effective project management, it is often wise to recruit one knowledgeable manager as the center of your system. This individual should help to establish the project management

RIGHT: The project manager is in full charge of the project from the beginning (marketing) to end (construction). For functions related to successful design and construction, the project manager has authority over budget, program, and schedule; while departments have authority over technical issues. **FACING PAGE:** Survey of architecture firms conducted by the Association for Project Managers reveals focus of project manager's time and effort.



program, recruit and train younger staff, and serve as a technical and managerial resource. In many architectural firms, it is not necessary to recruit an experienced project manager, since a principal of the firm may wish to begin an intensive self-education program to acquire the necessary skills.

Training project managers

In many architectural firms, the project manager learns on the job. However, the benefits of a formal training program to the individual and to the firm are great. A project manager training program includes the following:

- **Communication skills:** As stated earlier, project managers need to possess a wide range of communication skills. Their importance to the marketing effort is well documented. Well-managed firms seek to involve project managers at an early stage in contacting a potential client. As a result, their experience and skill at marketing and selling are essential. Some firms encourage their project managers to take courses in these topics at local colleges and even cover the cost of the classes and materials.

Other communication skills are also important to project managers. In particular, negotiating, effective writing, and public speaking are vital. Negotiating contracts and communicating with other members of the project team such as consultants makes this an obvious focus of training. Firms should encourage staff to attend a number of commercially available courses on negotiating.

- **Interpersonal skills:** Project managers are people managers. They must know how to direct, motivate, and manage their project team, contractors, clients, suppliers, and many other individuals with whom they interact. For some, it requires extensive training in human psychology.

A skill that is very difficult to teach is leadership. Some individuals exhibit natural leadership skills; others can learn techniques to improve their leadership ability.

Perhaps the most difficult skill to learn is that of delegation. Many architects tend to be poor delegators; ego-driven, they often lack trust in their subordinates' skills. As a result, these individuals feel the need to be involved in all aspects of the project at all times. Not only does this overburden them, but it hinders the performance of project team members. Learning how to delegate is a painstaking process that must be reinforced by top management in setting an example and providing the tools and systems to permit adequate supervision of subordinates.

- **Technical management skills:** Project managers must have a complete understanding of technical management skills, including budgeting, scope determination, personnel planning, and quality assurance/control.

A number of outside sources can assist in developing or enhancing these abilities. The AIA offers a self-assessment program in project administration (for information, contact 202-626-7348). An annual, week-long course is offered by the University of Wisconsin Department of Engineering Professional Development (608-263-4705), and programs are held periodically by the Association for Project Managers (312-472-1777).

Successful project management

Ensuring the success of a project management system requires continual effort. In many architectural firms, a principal's meddling in the process is the biggest obstacle to successful project management. A project manager's responsibilities must be on a level with his or her authority to do the job.

An effective project management system is not only for large firms. Small architectural practices may not have dedicated project managers, but they can use the management, budgeting, monitoring, and other skills required of effective project management. Capable project designers, for example, understand that adherence to budgets and schedules is an integral part of their responsibility. Every member of the project team—designers, consultants, contractors, suppliers—must become a partner in the process that is led by the project manager.

Architecture must a collaborative effort. A design is successful by effective management of the creative process. Achieving a balance among all of the parties to this process is essential. It is the project manager who guides and molds this partnership.—*Howard Birnberg*

Howard Birnberg is Executive Director of the Association for Project Managers.

Range of Project Manager (PM) Responsibilities

Responsibility	Percentage of PMs with these responsibilities
Client meetings/contact	92.9
Quality assurance/control	86.9
Change order management	85.7
Project budget preparation	84.5
Specification preparation/review	83.3
Project team meetings	83.3
Consultant meetings/contact	82.1
Preparation of project status reports	80.0
Scope determination	77.4
On-site observation	77.4
Project close-out/evaluation	77.4
Review of consultants' expenses	71.4

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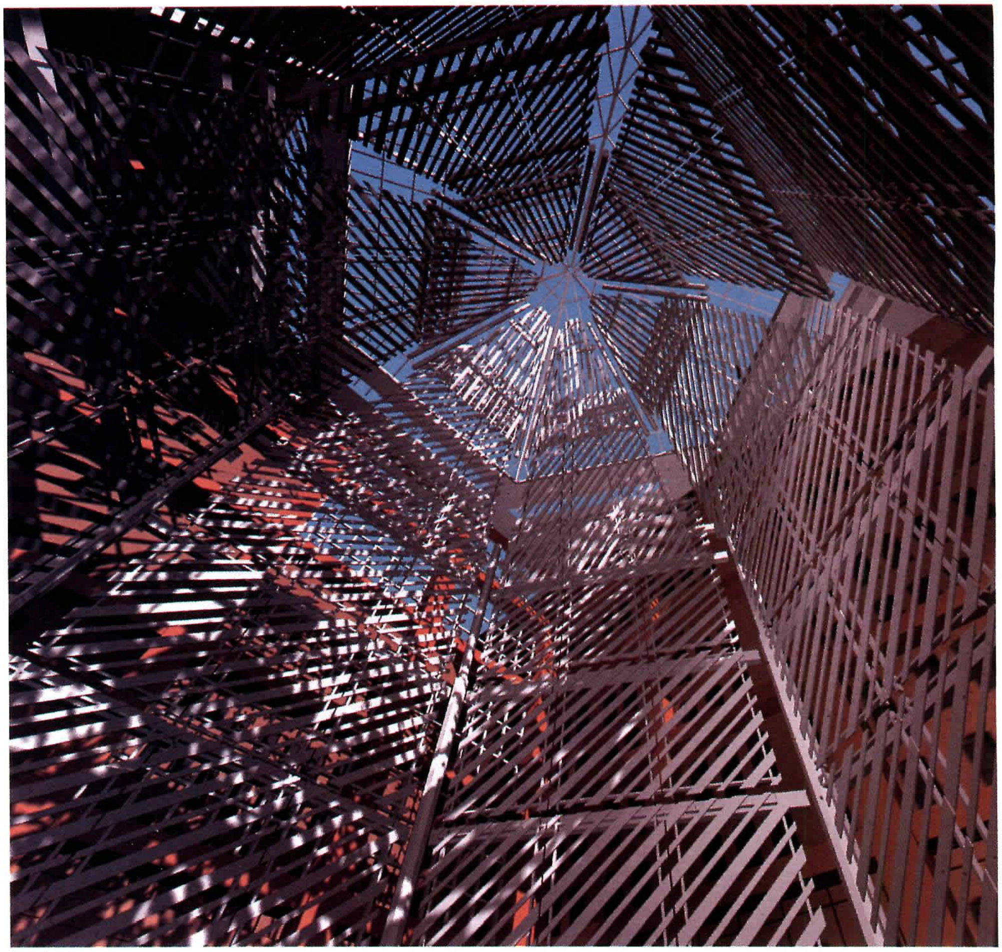
Software for Rendering

New programs allow architects to create photorealistic images with freehand characteristics.



RIGHT: Trellised pavilion of One Market in San Francisco was modeled by Cesar Pelli & Associates and rendered by Oakland-based Michael Sechman with HiRes QFX software.

If you ever have trouble distinguishing between photographs of buildings and computer-generated images, then welcome to the world of "photorealism." Sophisticated rendering software, now available for relatively modest computer systems, can project a world inhabited by buildings, people, and plants; enhanced by colors, textures, light, and shadows. Although many architects have embraced the technology, others approach it more cautiously. They warn of the glitz obscuring the architecture. While the process of translating a 3D concept to a 2D image is new, the principles of composition are not. There must be a balance between high-tech capabilities and old-fashioned image-making.

Rendering options

The rendering process parallels the traditional steps of building a physical model, photographing it, then retouching the photograph. First, the architect creates the building's form as an electronic 3D model and assigns colors and other attributes to its surfaces. The range of features depends on the sophistication of the software and the host hardware. A variety of techniques are available, for example, to create the illusion of texture. "Texture maps," scanned photographs of real materials such as brick and wood, can be applied like decals to the model's surfaces. Another alternative is a "bump map," a texture map that simulates rough surfaces such as stucco or rippling water. "Procedural textures" are computed rather than scanned and can represent regular patterns, such as tile, or random patterns, like natural landforms. These textures conform to the shape to which they are "mapped" and follow the same rules of perspective. Surfaces may also be given characteristics of specularity and transparency.

However, a problem common to texture maps occurs when a small patch of texture is applied repeatedly to a large surface. The "seams" become visible and can make the material look artificial and contrived. Creating small areas of texture maps that can be "tiled" seamlessly requires patient retouching. In lieu of preparing their own textures, architects can purchase collections, such as the Material Library from Modern Medium, which contains patterns for marble, stone, fabrics, wallpaper, and other finishes.

TOP: Rendering of lighting fixture with illuminated glass in One Market by Michael Sechman reveals sophisticated treatment of glass in HiRes QFX. **ABOVE:** Sechman focuses on pedestrian view by manipulating lighting, viewpoint, and detail. Scanned photographs of people add to realism of image.

After a model's surfaces are described, the next step is to set up a scene, as in a photographer's studio: specifying the location and direction of light sources and viewpoint. Additional objects may be added to represent people, plants, or automobiles. For even more realism, the architect can add a scanned photograph of a cloudy sky to the background, an urban context to the foreground, or an ocean view as seen through the windows from an interior. Some software can simulate fog and other atmospheric effects.

Taking the photo

When these scene features have been specified, it's time for the computer to take over and "take the photograph." The software calculates the shape and location of every object in the perspective and computes the color of every point according to the selected shading. Very sophisticated procedures produce more realistic images but require extra time. They also result in larger image files requiring higher capacity storage devices.

The most complex procedure generally available in commercial packages is "ray-tracing," in which every beam of light is traced as it bounces off and is reflected in specular surfaces; refracts through water and glass; illuminates opaque objects; and casts shadows. In most cases, this photorealistic effect is convincing but not scientifically precise. Programs that compute footcandle levels for the renderings include Lumen-Micro and Radiance (see June 1992, pages 114-117). Depending on the image resolution and the speed of the hardware, this computation could take hours, even days. The result is a raster-based 2D image that can be output to paper or film.

Analogous to photographic retouching, the image can be further processed in "paint" programs. Scanned photographs of people and other objects can be pasted in, and any number of special effects can be applied to the digital image to soften its sharp, clean, computed look. "Filters" can create impressions of textured paper, watercolor, or pencil marks. Finally, all the steps that create a still image can be repeated along a path through the building to create an animation.

Rendering can be an arduous, unfriendly, time-consuming process. Many architects have difficulty justifying the time and cost to their clients. As a result, software developers are trying to make the procedures easy and as integrated as possible with 3D modeling processes. For example, Ketiv Technologies has recently released Advanced Rendering Extension (ARE-24), which renders within Auto-

CAD, eliminating the need to export a model to a separate rendering package. William Holt, applications consultant at Ketiv, explains, "Rendering has traditionally been done at a point where you stop production, think about the message you're trying to communicate, go through some studies, hire a renderer, then present what you have to your client. We're trying to let that happen on-line. In five minutes, you get a different way to look at your design in progress."

Attention to composition

With increased accessibility, rendering software is no longer limited to technical experts and is being adopted by experienced illustrators. In the past, designers comfortable with computer techniques but less experienced in artistic expression produced images that called attention to special effects rather than to the architectural subject. Now, more experienced renderers are incorporating traditional principles of composition. One such renderer is Michael Sechman, based in Oakland, California. His realistic images of One Market in San Francisco, designed by Cesar Pelli, focus the viewer's interest at the pedestrian level by manipulating lighting, viewpoint, and detail. Although Sechman still finds software difficult to work with, he credits past experience for his ability to visualize a space before beginning a rendering. "Most architectural renderers," he claims, "can choreograph the viewpoint and the placement of lights and not have to spend all their time determining where to view the scene from." Still, computer rendering requires an ongoing commitment of time and effort; those who only dabble in it, Sechman warns, will produce amateurish results.

Another architect who brings experience in traditional media to computer rendering is Larry Hatfield, with Baxter Hodell Donnelly Preston in Cincinnati. One of the most common errors he finds is the reliance on saturated colors that make the image cartoonish. "When I pick a color for a material on my monitor," Hatfield explains, "my choice may look okay until I start composing it with other colors. Together, they look far too bright, so I intentionally make the colors more gray." Hatfield believes that computer renderers often overdo the shadows and reflections. "If you provide too much information for the eye," he cautions, "it detracts from the architecture." He also warns against the overuse of texture maps to compensate for the absence of detail, because they can look like appliqué. Instead, he models selected detail to enhance the impression of depth in the image. In his design for the Shawnee State University Performing Arts Center, Hatfield experimented with floor treatments. Tiles detailed in the geometric model allowed him to control angles and colors. By contrast, the bump-mapped terrazzo appeared rocky and surreal. As a teacher of rendering in traditional media at the School of Interior Design at the University of Cincinnati, Hatfield stresses training "an eye for composition and a sense for detail. Having a computerized tool won't substitute for talent."

Composition is also important to David Johnson, of Arcathexis, in New York, who has created a model of the Fondation Le Corbusier in Paris with software from Byte by Byte. He compares his work to that of a traditional renderer trying to represent the feeling the architect wants to express through his building. "The way the diagonals of the building elements and their shadows work together has been carefully composed. I set up the lights in the right place to get a particular sense of the light in the space." The difference between working with light and ignoring it, Johnson asserts, is like the difference between a photograph and a snapshot.

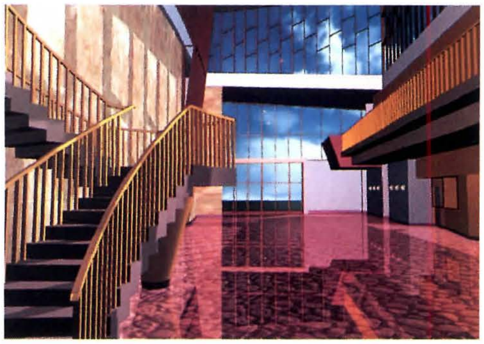
Sometimes the persistent "truthfulness" of the computer's calculated perspective detracts from the composition. Bruce MacDonald, a Seattle-based freelance illustrator, may soon adopt computer media but has been reluctant to embrace the technology wholeheartedly. "Even in elaborate drawings," he explains, "accuracy is only the first layer in communicating the ideas behind the physical materials. A computer only sees what the camera sees, while hand drawing can be true perceptually without being true factually."

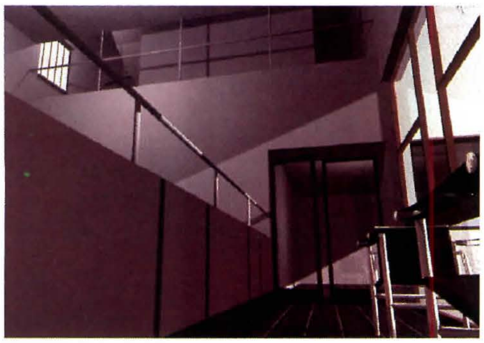
MacDonald continues, "To capture the quality of the space on a drawing surface may entail subtle tweaking of perspective angles. That seems difficult in affordable systems today." When the illustrator begins with the computer, he plans to rely heavily on Macintosh software to allow for freehand manipulations after the rendering is computed.

Matching phases of design

Many architects and clients are put off by the polished appearance of computer images that make a proposed design look complete and unalterable. Hans-Christian Lischewski, an architect with Perkins & Will and the director of architectural computing at Pratt's School of Architecture, has been studying ways to make computer-generated design drawings fit better with particular design phases. He prefers a simple drawing, limited

TOP: The San Francisco-based firm of Backen Arrigoni & Ross modeled and rendered a new campus for Sun Microsystems with AutoCad and 3D Studio. **CENTER:** Computer rendering was modified with Altamira Composer, which placed people and plants and computed their perspective and shadows. **ABOVE:** Final image was touched up with Painter freehand computer sketching, giving it a "paper" texture and the quality of a study drawing.





TOP AND SECOND FROM TOP: Design development studies by Baxter Hodell Donnelly Preston in Cincinnati were rendered to help with decisions about floor covering and stair structure. Studying the floors demonstrates the relative success of CAD detailing (top) compared to texture mapping (second from top). **THIRD FROM TOP AND ABOVE:** Renderer David Johnson of Arcathexis in New York applied Macintosh software from Byte by Byte to a model of the Fondation Le Corbusier in Paris. He located the light sources so the building elements and their shadows would be faithful to the architect's expression.

to essential information, to "an overloaded visual that distracts from the important design issues." Lischewski applies filters to make clean, crisp CAD images appear abstract and "fuzzy." After experimenting with combinations of filters to create various effects, the architect sets up macros, or command sequences, to apply the same combination to any 2D image. He explains that this is the reverse of the architect's normal progression from sketchy to precise: "To take advantage of the CAD software's copying functions in composing the facade, for example, you have to start with precision. But then, to present it at a resolution appropriate to schematic design, you have to 'fuzzy' it up."

Communicating with clients during design development poses somewhat different imaging needs. Like architects, clients may interpret an unfinished appearance in the drawing as an invitation for a critique. Unlike architects, however, they may not care for an impressionistic, sketchy image; they want to know precisely what they're paying for. An example of presentations that maintain this balance comes from Patrick Mays, an architect with Backen Arrigoni & Ross (BAR) in San Francisco. His associate Jackson Ng modeled a new campus for Sun Microsystems in AutoCAD. BAR's computer artist, Karl Marmaduke, rendered the model in 3D Studio and, with Altamira Composer, placed images of people and plants while the software computed their perspective and shadows. Finally, Mays simulated manual techniques with Painter and a Wacom pressure-sensitive digitizing tablet. At this point in design development, the clients were most interested in evaluating alternatives for building colors and seeing the effects of different light sources. "The clients liked the fact that the model was accurately developed on a computer," Mays recalls. "However, the sketchy quality of the image suggested that this was a tool to study alternatives with."

When design is substantially complete, clients may request highly detailed, photorealistic images tailored for persuasive purposes, such as public review or marketing to potential tenants. However, even highly developed images may benefit from softening. An example is the theater modeled by Eric Hanson, the computer visualization supervisor at Gensler & Associates Architects in Los Angeles. In ModelView, he created high-quality renderings with about 50 light sources throughout the space that created a subtle wash of ambient light and soft shadows. Then he exported the rendered image to Photoshop and, with Gallery Effects, applied a filter that resembles pencil sketching. "Combining the power of Intergraph with special effects on the Macintosh," Hanson says, "enabled us to rely more on the 3D model for communication and less on rendered boards than in the past."

Expression and impression

David Conant, an architect with Ellenzweig Associates in Cambridge, Massachusetts, experimented with unusual effects for his thesis while at Harvard's Graduate School of Design. After overlaying rendered images and scanned photographs, he created surreal effects by requesting a deliberately coarse resolution and by experimenting with random colorations. Conant recalls: "I wanted to explore the disorientation of looking at a screen and not knowing whether you're viewing something next door or across the world." Such images, he believes, would be appropriate for idiosyncratic structures and for clients who are more interested in expression and artistry than in simulating reality.

Conant's former architecture professor at Harvard, Malcolm McCullough, has also been exploring ways to manipulate texture and light in computer-generated renderings, expressing greater artistic license through less literal detail. "Art always leaves something to the imagination," McCullough asserts, "and the obsession with photorealism precludes communicating the quality of intangibles." As a cautionary note, he adds, "Requiring architects to show people only what they are really getting, allowing visual accuracy to become the sole reality, will threaten the artistic spirit of their designs." If we are to learn from conventional media, McCullough advises, we will develop means of indirect representation. "Early endeavors may seem banal," he admits, "but in time, expressive conventions will emerge, and masterpieces will become possible."

Technology has already extended the capacity for accuracy. It is now beginning to facilitate an expression of artistic spirit. But architects cannot rely exclusively on traditional visions as they adopt digital tools for architectural expression. As Conant explains, "We're entering a field without an established code of representation. It's like the first 50 years of photography when people tried to imitate painting. When they finally liberated themselves from that imitation, photography found its own niche. We in computer graphics are trying to liberate ourselves from being digital photographers." —*B.J. Novitski*

Rendering Software Sources

Advanced Rendering Extension
Ketiv Technologies
(503) 252-3230

Advanced Visualizer
Personal Visualizer
Wavefront Technologies
(805) 962-8117

Alias Sketch
Alias Research
(800) 447-2542

ArchiCAD
Graphisoft
(800) 344-3468

Arris Modeling & Rendering
Sigma Design
(617) 270-1000

AutoShade
3D Studio
Autodesk
(800) 525-2763

Big D
Graphics Software
(609) 427-0584

DynaPerspective
Dynaware
(415) 349-5700

Electric Image Animation
Electric Image
(818) 577-1627

form-Z
autodessys
(614) 488-9777

Infini-D
Specular International
(413) 549-7600

Macromedia Three-D
Macromedia
(415) 252-2000

ModelView
Micro Station
Intergraph
(800) 826-3515

Model Vision
ASG
(415) 332-2123

Point Line RenderMan
Point Line USA
(213) 353-1480

Presenter Professional
VIDI
(818) 918-8834

Ray Dream Designer
Ray Dream
(415) 960-0765

Rendering Module, Architecture & Engineering Series
IBM
(800) 426-4237

Renderize
Visual Software
(800) 669-7318

Renderman
Pixar
(510) 236-4000

RenderStar
Material Library
Modern Medium
(503) 255-8401

Sculpt 3D
Byte by Byte
(512) 795-0150

SilverScreen
Schroff Development Co.
(913) 262-2664

StrataVision 3d
Strata Inc.
(800) 869-6855, ext. 400

Topas
AT&T Graphics Software Labs
(317) 844-4364

Image Processing Software Sources

Adobe Photoshop
Adobe Systems
(800) 833-6687

Altamira Composer
Altamira Software Corp.
(415) 332-5801

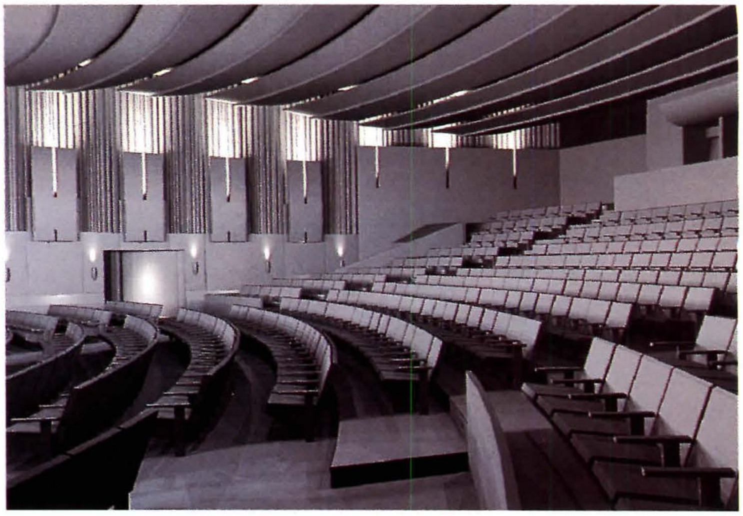
Gallery Effects
Aldus Corp.
(800) 888-6293

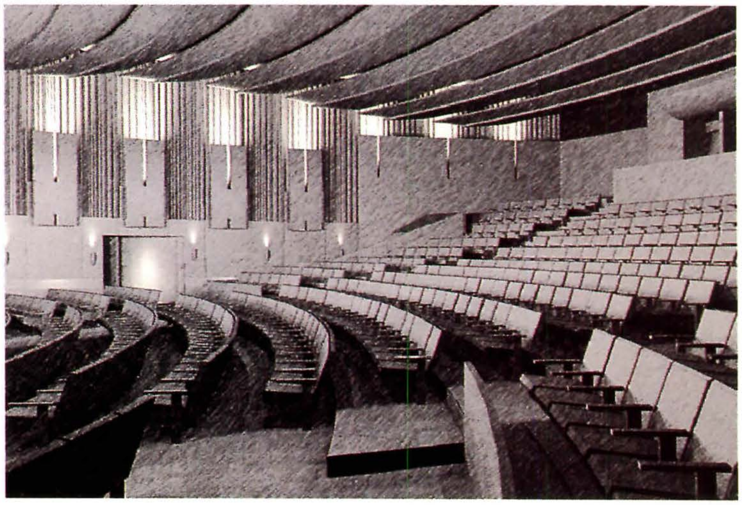
HiRes QFX
Ron Scott Inc.
(713) 529-5868

Painter
Fractal Design Corp.
(408) 688-8800

Picture Publisher
Micrographics
(800) 733-3729

Visualizer Paint
Wavefront Technologies
(805) 962-8117





TOP: In a theater modeled by Gensler & Associates, ambient light comes from 50 hidden sources, creating subtle nuances of light and shadow.
ABOVE: After rendering with Intergraph software, the model was exported to the Macintosh to create special pencil effects with Adobe Photoshop.

Each year, thousands of apprentices and journeymen receive training from IMI. Training in brick and block laying, tile setting, stone and marble masonry, cement masonry, maintenance and restoration, terrazzo and mosaic work and plastering. Our courses conform to the everchanging demands of the marketplace while maintaining craft standards. Through their work with union contractors, our apprentices and trainees gain valuable experience. The kind of experience that allows them to offer the ultimate craftsmanship in masonry.

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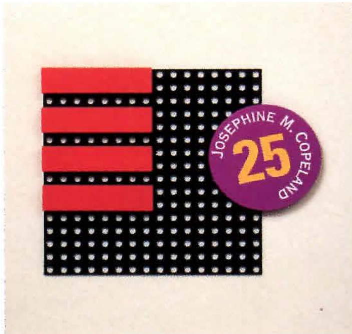
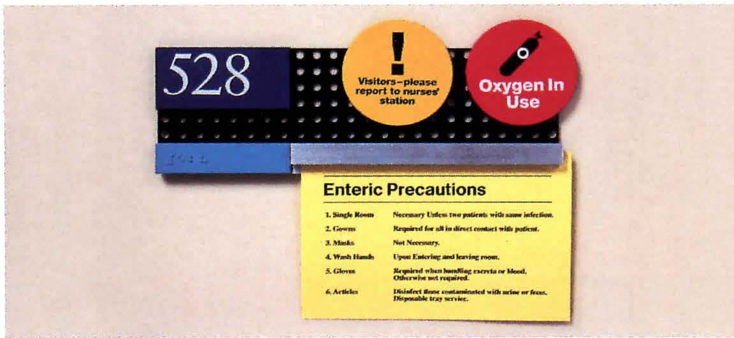
Products

New signage upgrades buildings with accessible, interactive information.





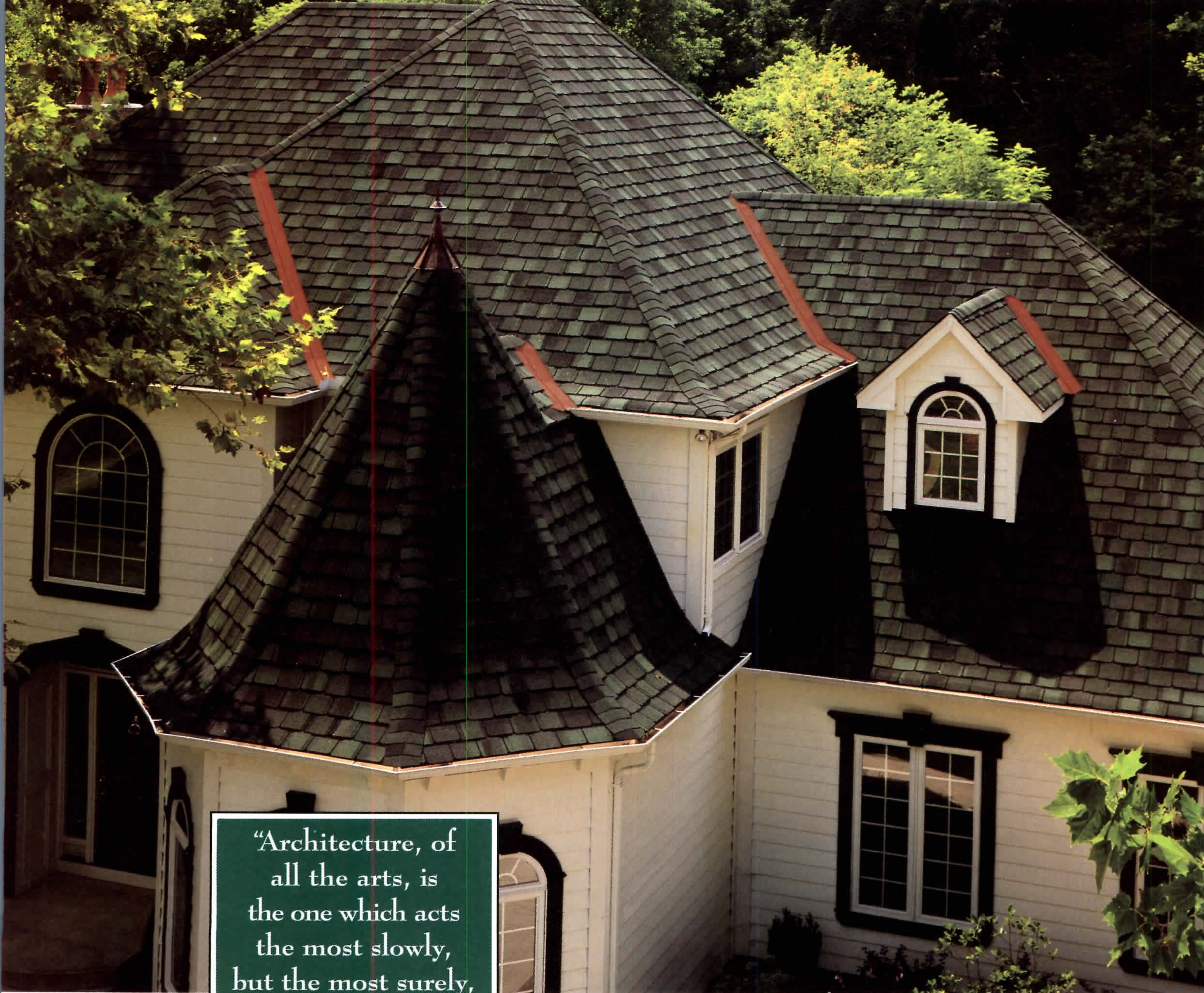
TOP: Luminique offers irradiated directories, directionals and retail signage, wall units, dividers, and complete enclosures. To illuminate the signage, the manufacturer incorporates an edge-lighting technique that employs low-cost fluorescent lamps. Engraving for directories is digitized and etched in clear acrylic. Housing units are designed for recessed and flush ceiling or wall mounting. Units can be clad in bronze, brass, aluminum, and marble.
Circle 401 on information card.

CENTER: ASI Sign Systems manufactures ASInfinity, a modular interior sign system that incorporates ASIntouch signage to adhere to ADA requirements. ASInfinity can be constructed from virtually any material, shape, or size and is precision-registered to a perforated metal chassis. Decorative trims and accessories are interchangeable.
Circle 402 on information card.

ABOVE: ASI Sign Systems has also developed a computer program called ASInvision that combines a database management system and drawing program for designers to visually assemble the company's sign systems on screen. The software package includes color printout capabilities with price quotes based on the number and variety of components selected. Graphics are accomplished through surface or subsurface screening, with laser-photopolymer imaging for tactile characters and Grade 2 Braille lettering.
Circle 403 on information card.

TOP: Oklahoma City-based ARK Ramos manufacturing company complements its line of architectural graphics with a new line of ADA-related signage. Available casts and finishes include aluminum, magnesium, stainless steel, brass, bronze, and polyurethane colors. With one-piece construction, lettering and Braille characters are formed as part of the original cast and are not removable. The magnesium and stainless steel signs are 1/8-inch-thick, while the aluminum, brass, and bronze signs are 1/4-inch-thick, unless otherwise requested.
Circle 404 on information card.

ABOVE: Mohawk Sign Systems provides a new manufacturing process to meet special ADA-compliant sign requirements. The company sandblasts 1/8-inch-thick phenolic ES plastic laminate to raise the carved characters 1/32 inch. The characters that are formed are an integral part of the sign and cannot be removed or broken off. Colors are permanent, scratch-resistant, and tamper proof. Verbal messages can be transferred into Grade 2 Braille.
Circle 405 on information card.



> "Architecture, of all the arts, is the one which acts the most slowly, but the most surely, on the soul."
> —Ernest Dimnet

And of all architecture, a home evokes the very deepest emotion—we live not aside it, nor near it, but inside it. A home contains and shelters those people and objects that define our lives and bring us meaning. It becomes part of us. For the architect who designs each house with heart and soul, there is Grand Manor Shangle® from CertainTeed.

A Grand Manor roof creates instant intrigue and makes a classic, elegant statement on virtually any upscale home. The natural appearance of slate and wood is created from triple-stepped laminations and an exclusive *Super* Shangle® design* using two full-size, one-piece base shingles over an 8-inch weather tab. Once applied, Grand Manor becomes a breathtaking five-layer roof.

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Circle 166 on information card

Snow guard for roofs

Real-Tool offers Snow Guard (above), a metal roofing unit that prevents the collection of ice and snow. The guard is secured to standing seams on metal roofs with stainless steel set screws. The fastening procedure for the snow guard does not require glue, sealants, or soldering. The snow guard is available in either cast aluminum alloy or bronze.
Circle 406 on information card.

Brass-clad directory

The HeartPlace directory, by Chicago-based Spanjer Brothers, is manufactured as the company's improved version of its ISD 200 illuminated strip directory. Partially recessed and framed with a brass molding, the recently remodeled directory is encased with prefinished metal laminates of brass, bronze, or stainless steel. Custom logos and copy strips are positioned behind a smoked gray glass facade.
Circle 407 on information card.

Electronic information

Toronto-based King Products enhances the company's electronic information system with King Link (above), a compact version of the system, measuring 2 inches deep by 17 inches long by 8 1/2 inches high. This directory system comprises a computer with an interactive screen that can be programmed to provide elevator cab displays, office directories, meeting and conference room management systems, donor boards, and gallery and exhibit information. King Link can interconnect several units and is available for half the cost of traditional computerized directories.
Circle 408 on information card.

Color matching

Pantone and 3M, a manufacturer of pressure-sensitive translucent films, have agreed to assign simulated Pantone color numbers to 3M Scotchcal translucent films and Panaflex paint-on-paper products. Color number association allows 3M to readily communicate its color selection of more than 50 standard colors for signs, fascia bands, and awnings.
Circle 409 on information card.

Signage specification literature

Charleston Industries, a wholly owned subsidiary of Petersen Aluminum Corporation, has developed a reference guide for specifying typical architectural signage requirements. Specifications, colors and finishes, graphics options, and ADA compliance applications are all covered within sections of the specification binder.
Circle 410 on information card

Flexible substrate

Alucobond Technologies manufactures Sintra, a rigid foamed sheet of polyvinyl chloride (PVC). The closed-cell substrate is flexible and resists water absorption. Sintra material responds to thermoforming and heat molding and varies in thickness from 1 millimeter to 19 millimeters. This material is available in a variety of colors which can be screen-printed or painted. Color and cell density are evenly distributed and consistent throughout the flexible substrate.
Circle 411 on information card.

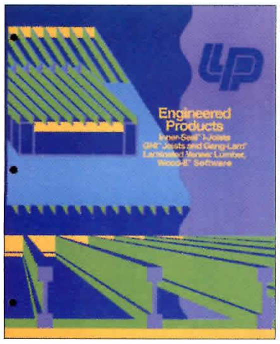
Donor displays

Ontario-based Embree Industries offers custom-designed donor recognition displays. The displays are manufactured and installed to recognize financial donors for the development and construction of healthcare facilities, educational institutions, theaters, and associations. The units are designed to incorporate models, drawings, or sample materials that associate donors with the project. Materials utilized for the company's donor display construction are marble, wood, various metals, and plastics.
Circle 412 on information card.

ARCHITECTURE'S LITERATURE PORTFOLIO

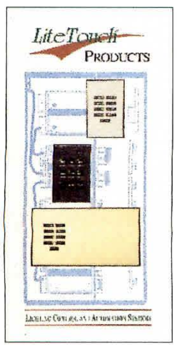
The Literature offered on these pages (with rare exception) are free for the asking. Simply fill out one of the postage paid reader service cards located elsewhere in this issue, circle the appropriate numbers and drop it in the mail.

Louisiana-Pacific



Engineered wood products are designed to eliminate the common problems of solid sawn lumber. Gang-Lam LVL, Inner-Seal I-Joists and GNI Joists are stronger, more stable and easier to handle than solid sawn lumber. Catalog includes span and uniform load charts, and information on new Wood-E® Cut and Wood-E® CAD engineering software also available.
Circle 2.

Lite Touch, Inc.

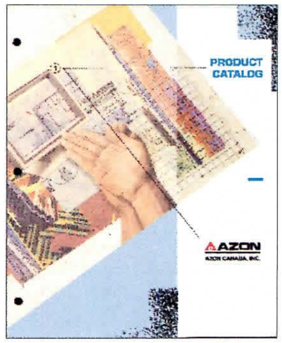


Elegant Lighting Control System. The LiteTouch 2000 is a mid-range architectural or custom residential lighting control system elegantly designed to meet stringent demands of both architects and homeowners. The LiteTouch 2000 includes advanced features such as master controls, scene presets, wireless RFI and IR control. This master dimming system can be interfaced with telephones, audio/video and security systems.
Circle 6.

Transwall Corporation

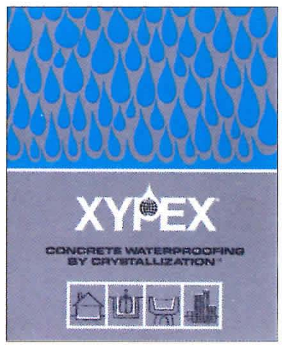
TRANSWALL'S PRIVATE & OPEN PLAN PARTITIONS ENHANCE OFFICE SPACE. Transwall offers a full line of private and open plan office partitions. All systems include a wide choice of fabrics, baked enamel finishes and trim. Work surfaces, storage units and accessories readily interchange between lo and hi-wall. Freestanding computer support furniture blends with panel-mounted work surfaces. Electrical and electronic support is system integrated. For more information call 1-800-HI-1-WALL
Circle 10.

Azon Corporation



The Standard in reprographic media. Azon's 52 page product catalog lists their entire line of reprographic papers. The catalog features diazo papers and films, xerographic copy products, plotter media, manual drafting media, and a complete line of drafting equipment & supplies. For the best in line quality, density, production consistency and overall performance in reprographic media, call 1-800-847-9374 for more information.
Circle 4.

Xypex Chemical Corporation



Concrete waterproofing by crystallization. Although applied as a slurry coating, Xypex is a chemical treatment which waterproofs by penetrating the concrete with a crystalline formation which 'plugs' the pores of the structure preventing water seepage. Xypex is ideal for use on the 'inside' of wet underground structures. Xypex Chemical Corp. 604-273-5265.
Circle 8.

Envirospec, Inc.

A PRACTICAL SOLUTION TO ROOF PAVER STONE APPLICATIONS. New bulletin shows a better way to transform a roof into a patio, terrace, balcony, walk-way, plaza podium, promenade, or just plain roof deck, using the Pave-El Pedestal System. Designed to elevate, level, and space paver stones for drainage in any weather, Pave-El reliably protects roof, paver stone, membrane and insulation. Envirospec, Inc., Ellicott Station Box 119, Buffalo, NY 14205 (716) 689-8548.
Circle 12.

Freestanding signs

Modulex Signs offers Modulex Pacific (above) wall or single post, freestanding exterior sign systems. The modular sign systems vary from 10 inches by 10 inches to 41 inches by 81 inches and incorporate flexible curved panels and text surfaces. The complete system is constructed of aluminum alloys for strength and low maintenance. The panels are chemically cleaned and chromatized prior to receiving a polyester finish. Text and graphics are applied in adhesive vinyl or by screen printing. Pacific systems are recyclable if damaged and require replacement.
Circle 413 on information card.

Cast aluminum signage

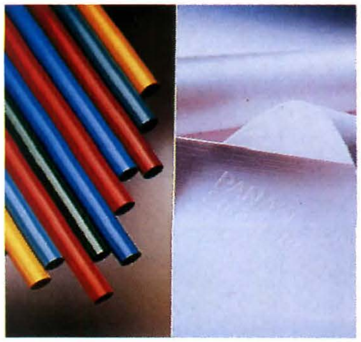
Lake Shore Industries (LSI) provides cast aluminum logos and seals incorporating sculpted reliefs (above). Custom designs are first molded in clay and then cast in sand molds prior to finishing. LSI can create logos as large as 14 feet and can represent financial, healthcare, and educational information. Building identification, plaques, lawn directionals, and interior illuminated signs are available.
Circle 414 on information card.

ADA signage literature

Panduit Corporation produces a bulletin describing its ADA-compliant signage. The signs comply with text, pictogram, Braille, and contrast/finish requirements under the ADA and are purported to eliminate informational and directional barriers. The bulletin reports that Panduit's new ADA signage contains international symbols, legends, and the Grade 2 Braille inscription. ADA signs are available in three sizes with white on black, white on blue, and white on brown. Constructed of polycarbonate laminate, the ADA-compliant signage resists damage due to repeated rubbing.
Circle 415 on information card.

Bronze finishes

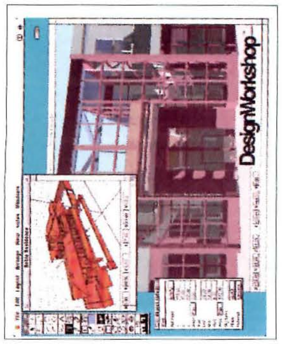
Matthews Bronze, a division of the Matthews International Corporation, offers six patina colors as a finish for the company's contemporary bronze cast lettering and plaques. Patina variations of greens and blues are created when heat and chemicals are applied to prematurely "age" the bronze surfaces. Once the desired color is created, a clear lacquer is administered to prevent continued oxidation of the bronze. The six bronze finishes are available in sea green, moss green, teal blue, turquoise, amber, and burnt sienna.
Circle 416 on information card.



Signage substrate

3M Commercial Graphics Division offers Panaflex 945 Graphic Protection System (GPS) flexible surface substrate, a material that produces a dirt-resistant substrate for signage when combined with Panaflex 830 GPS paint-on-paper. Panaflex 945 GPS consists of a translucent polyester scrim embedded between two layers of white pigmented film formulated to accept selected 3M Scotchcal opaque and translucent films plus the 3M 830 GPS Panaflex paint-on-paper. Panaflex's surface material is vacuum-formed to the 830 GPS paint-on-paper and is available in 34 colors.
Circle 417 on information card.

Artifice, Inc.



DesignWorkshop™ is an intuitive 3D modeler for architects. Sketch in live 3D perspective, developing your design seamlessly from massing to spatial and detailed models. Graphically create, move, and reshape objects. Quickly produce plan, elevation, pochéd section, and perspective drawings, and hidden-line, shaded, and shadow-cast renderings. Save animated walkthroughs, sun studies as QuickTime movies. For Macintosh.
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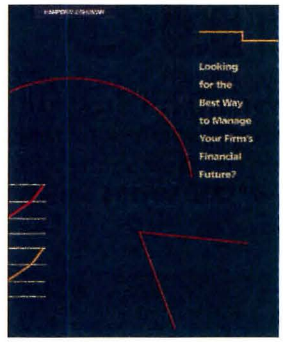
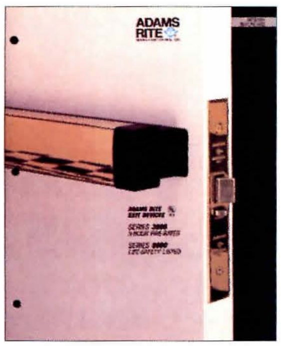
Harper and Shuman, Inc.



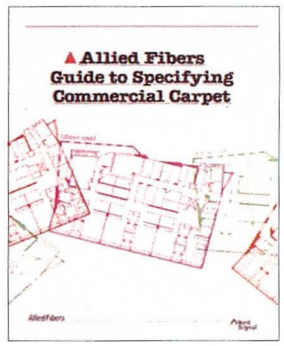
Financial Management Systems. The only systems sponsored by the AIA. Harper and Shuman develops, sells and supports financial management software specifically for architectural and engineering firms. CFMS (Computer-based Financial Management System) runs on the DEC VAX and MICRO/CFMS runs on PCs and networks. A modular approach lets you buy only what you need. **Call today 1-800-872-4050. Harper and Shuman, Inc.**
Circle 16.

Adams Rite Manufacturing Co.



Exit devices — 32-page catalog shows Adams Rite Mfg. Co. touchbar exit devices Series 8000 (listed for life safety) and Series 3000 (listed for fire doors rated up to 3 hours). Ten finishes of aluminum, brass, bronze and stainless materials are shown along with various matching entry trim, electric operation, monitoring and other options. Contact: Adams Rite Mfg. Co., 4040 S. Capitol Ave., P.O. Box 1301, Industry, CA 91749; 213-699-0511, Fax 213-699-5094.
Circle 18.

AlliedSignal Fibers

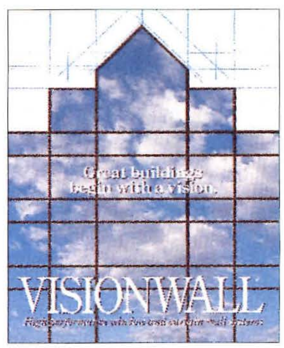


Allied Fibers Guide to Specifying Commercial Carpet is one of the industry's most valuable working tools. It covers everything from choosing an installation contractor to subfloor preparation and post-installation clean-up. It also includes the advantages of Allied Fibers' 100% nylon Anso HTX — High Technology Cross-X-Bonding — commercial fiber system. For a free brochure, call 1-800-545-ANSO.
Circle 20.

TimberForm® Site Furnishings

Over 350 different site products are presented in an 88 page technical catalog. Choose from cast iron, perforated metal, steel, welded wire and wood products offered in a dozen design series ranging from traditional to contemporary. Seating, litter containers, ash receptacles, picnic and game tables, bollards and bike racks are offered in 170 designer colors. Marine Teak, Alaska yellow cedar and Douglas fir slats are available. Call 1-800/547-1940 (ext. 777) or
Circle 22.

Visionwall Technologies, Inc.



High Performance Window and Curtain Wall System. Create comfortable, energy-efficient indoor environments with the VISIONWALL® high performance window and curtain wall system. Features R-8 glazing, structural aluminum frame with 3 inch deep thermal break, great resistance to condensation, and excellent acoustical attentuation properties. Custom designed and precision manufactured for commercial, institutional and industrial applications.
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Real-Tool Inc.

Real-Tool is proud to present a non-penetrating, non-marring Snow Guard which will not compromise integrity or finish of metal roofs. It securely clamps to standing seams without restricting thermal movement, and is available in cast aluminum and bronze. Aluminum model is pretreated and finished with electrostatically applied baked-on epoxy; custom colors possible to match prefinished metal. Real-Tool, Inc, P.O. Box 370, Purcellville, Virginia 22132, Phone (703) 338-4544, Fax (703) 338-4654.
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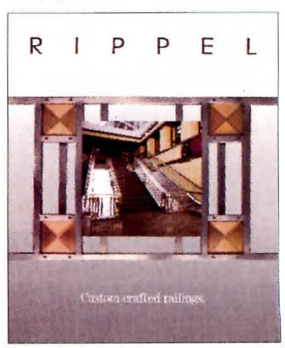
Rippel Architectural Metals, Inc.



Custom Crafted Railings of stainless steel, aluminum and bronze are a specialty at Rippel Architectural Metals. We are committed to quality craftsmanship in the fabrication of custom railing systems and ornamental components for a variety of architectural applications. Rippel has over 45 years of experience and professional competence to create your vision. Call (312) 772-0600.
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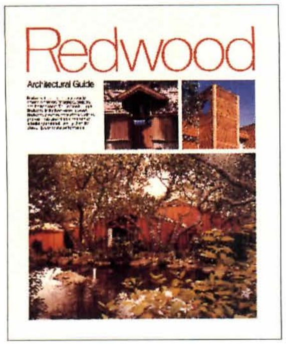
California Redwood Association



REDWOOD ARCHITECTURAL GUIDE — Free 8-page booklet. Color photographs show a variety of redwood design ideas. Provides technical information for specifiers. A useful guide to properties, grades, sizes and patterns of redwood lumber. Easy-to-use drawings of siding and paneling profiles and charts of sizes and textures. Recommends finishes and hardware. California Redwood Association, 405 Enfrente Drive, Suite 200, Novato, CA 94949 415/382-0662.
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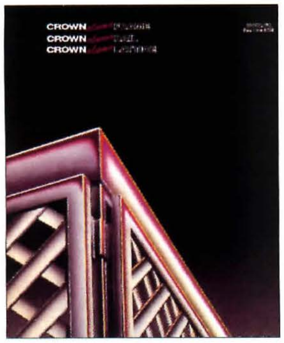
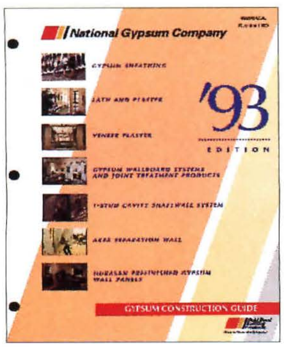
CROWNaluma CORP.



Maintenance-Free Lattice System. Aluminum frames/rails designed for use with CROSS VINYLattice provide a complete, easily installed, durable lattice system. Ideal for balcony and utility enclosures, building facades, fences and trellises. Entire installations can be shipped in pre-assembled sections thus reducing labor costs and waste. CROWNalumaCORP will custom fabricate to meet special design or code requirements. For quotation send drawings to 3174 Marjan Dr., Atlanta, GA 30340. Phone: 800-521-9878. Fax: 404-457-5125.
Circle 34.

National Gypsum Company



New Gypsum Wallboard Construction Guide. National Gypsum's 140-page Gypsum Wallboard Construction Guide is a complete reference library designed to meet the needs of architects, specifiers and contractors. Written in the CSI/Master Format System, each section is color coded and contains technical data, detailed drawings, specifications and recommendations for installation. For technical information call 1-800-National.
Circle 38.

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Enjoy over 15 sports and games with family and friends in the convenience of your own backyard with the SPORT COURT® game court—a suspended, live surface that's safer and more comfortable than concrete. Basic package includes an array of games and activities, adjustable net system, basketball hoop, lighting system, and rebounder net. For Distributors and Dealers nationwide, call 1-800-421-8112.
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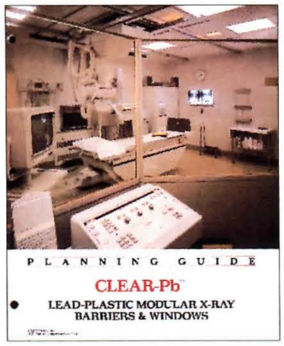
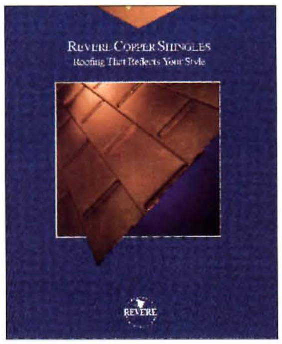
Nuclear Associates



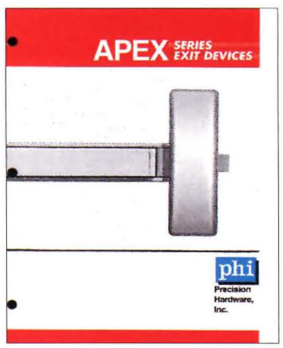
FREE X-RAY ROOM PLANNING GUIDE. Made of lead-impregnated, transparent plastic, CLEAR-Pb® X-Ray Room Shielding from Nuclear Associates provides complete radiation protection with panoramic viewing in hospital x-ray, CT and special procedures rooms. Features include prefabrication for quick on-site assembly, shatter-resistance, 200 stock sizes, choice of lead equivalencies. Free CLEAR-Pb Planning Guide available.
Circle 32.

Revere Copper Products



Revere Copper Shingles are quicker and easier to install than ordinary asphalt shingles. There are no special skills required and no special tools. Because Revere shingles are manufactured from solid copper, not a foil laminate, they will likely last as long as the building they protect. To learn more about our copper shingles, or any of our other copper products, call us toll-free at 800-448-1776.
Circle 36.

Precision Hardware, Inc.



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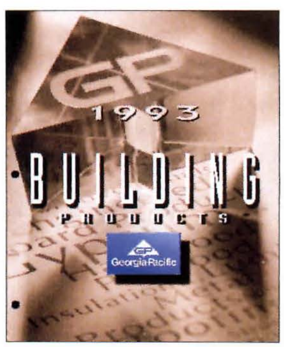
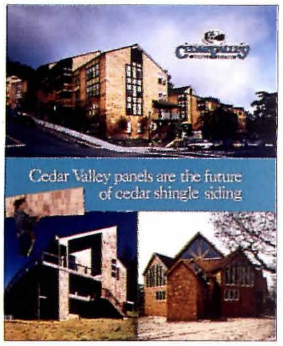


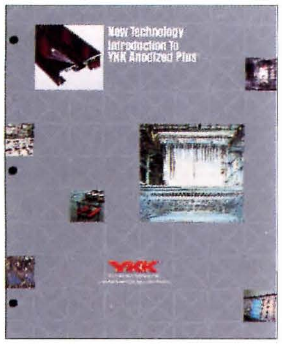
Divided into eleven product categories, the **1993 Georgia-Pacific Building Products Catalog** features information on decorative panels, engineered board products, gypsum, hardwood plywood, insulation, lumber, metal products, millwork, roofing, siding and structural panels. Call 1-800-BUILD-GP *for your free copy.*
Circle 44.

Cedar Valley Shingle Systems



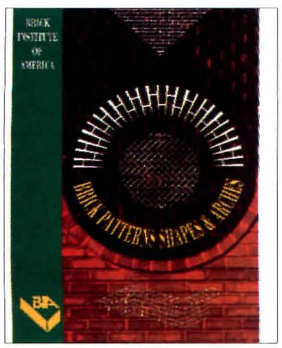
The future of cedar shingle siding is the theme of Cedar Valley's new 8-page 4-color brochure detailing the panelized exterior siding system. Included are specifications, product descriptions and illustrations, finishing and application information, and nearly four pages of color photos of significant projects by leading architects throughout the U.S. who used conventional and Decorator shingle panels. Cedar Valley Shingle Systems. Phone 800-521-9523, FAX 408-636-9035 or **Circle 46.**

YKK AP America, Inc.



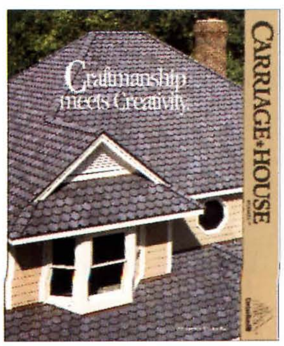
YKK AP now offers a brochure revealing important new test results gauging the performance of Anodized Plus versus other surface treatments. As the literature illustrates, Anodized Plus provides a unique protective coating on anodized finishes that present four major benefits: finish consistency, enhanced protection of aluminum substrate, superior color and gloss retention, and resistance to chemical corrosion. To obtain this brochure, or information on other YKK AP products, call YKK in Atlanta at 404-344-2981.
Circle 50.

Brick Institute of America



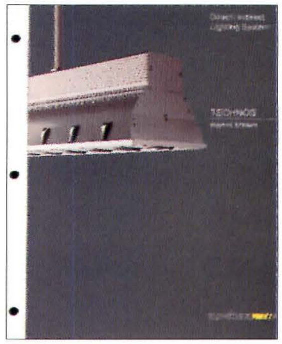
Brick Patterns, Shapes and Arches Computer Program for AutoCad. Brick detailing has never been easier. Brick Patterns, Shapes and Arches provides Arches, hundreds of Hatch Patterns of brick bonding patterns for walls and paving and common Special Shapes for use in plan, elevation or detail drawings. All with just a few keyboard inputs. The program runs from within AutoCAD® and is available from BIA for $99.00.
Circle 54.

CertainTeed Corporation



Carriage House Shangle™ Product Brochure. This 8-page product brochure features CertainTeed's Carriage House Shangle™, its newest designer asphalt shingle with a unique chamfered cut to provide the look of hand-crafted slate roofs. This free brochure includes color photos of Carriage House along with product specifications and warranty information.
Circle 58.

Zumtobel Lighting, Inc.



TECHNOS. Simply Efficient. Direct/Indirect Lighting System by Zumtobel Lighting, Inc. The TECHNOS luminaire by Zumtobel Lighting, Inc. was designed to complement contemporary interiors. TECHNOS is constructed of high quality anodized aluminum with a natural finish which supports the statement conveyed in many modern spaces. Due to precise light distribution, the matte silver BIVERGENCE louver provides glare free light and thus fulfills the ergonomic mandate of the modern retail or office space.
Circle 48.

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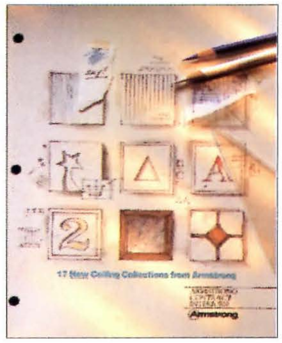

New for 1993! Over 17 new contract ceiling collections are illustrated in this 44-page, full-color catalog. Choose from revolutionary new acoustical metal and wood systems, intricately carved panel designs as well as a special new family of Cirrus ceilings for kids called Cirrus Themes. This catalog contains all the information you need to specify these exciting new systems.
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Pushing a Switch Automatically Opens the Door. EasyAccess™ Series 7000 swing door operator makes complying with ADA 1990 barrier-free entrance mandate "readily achievable" and "easily accomplishable....without much difficulty or expense." EasyAccess turns most ordinary doors into affordably priced, automatic, barrier-free entrances for the physically disabled. Horton Automatics, 4242 Baldwin Blvd, Corpus Christi, TX 78405, 1-800-531-3111.
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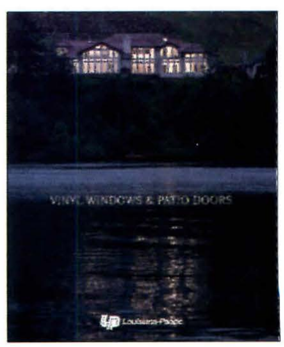
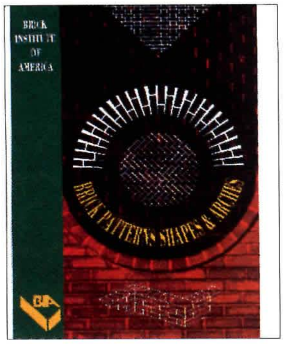
Louisiana-Pacific



Louisiana-Pacific's vinyl windows and patio doors meet the most demanding new energy codes and are a perfect fit for new construction as well as replacement. Made with a new generation of stronger, modified uPVC, they resist rust, rot, scratches and dents. And they're available in a wide range of sizes and styles, including a large variety of custom shapes.
Circle 60.

Pemko Manufacturing Co.



Weatherstrip/Thresholds/Continuous Hinges. Pemko's full-line catalog illustrates a broad line of weatherstripping and threshold products. Pemko offers many fire labeled, smoke labeled, barrier-free access, sound tested, and custom fabricated products. New products include: ADA compliant ramp threshold assemblies, PemkoHinge™ continuous geared aluminum hinges, non-handed reversible automatic door bottoms, a series of locking astragals, and smoke-labeled gasketing. Call (805) 642-2600; toll-free (800) 283-9988.
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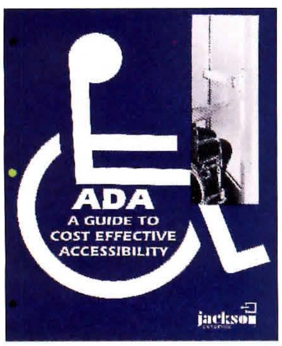
Circle 66.

Jackson Exit Device



ADA CLEAR WIDTH PROBLEM SOLVED. You don't have to make costly door changes to meet ADA standards. The narrow profile, Jackson 2100 series exit devices are the only panic bars now available that meet the 32 inch ADA requirement in existing 36 inch doorways. Send for this free brochure today. Call 800-533-6229. CA only 800-585-6533.
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Circle 74.

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NAPOLEON WEATHER-PROTECTED ASH URN is the solution for outdoor smoking areas. The tapered top keeps rain out and the depth of the ash pan protects contents from the wind. Attached litter receptacle may be specified. Napoleon is constructed of recycled aluminum, finished with polyester powdercoat; is 41" tall, 11-1/2" wide, 4-1/4" deep. Call 800-521-2546 for a free brochure.
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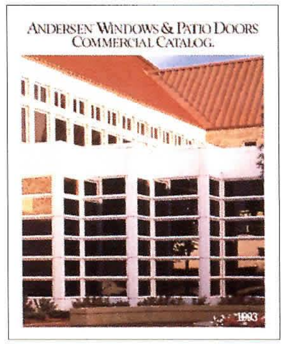
Andersen Commercial Group



1993 Andersen Commercial Product Catalog. This 92-page catalog comes complete with detail drawings, color photographs and descriptions of all Andersen windows and patio doors for non-residential applications. Added to this are detailed specifications, product size tables and technical data. The catalog also offers comprehensive information on Andersen Reinforced Joining Material for proper reinforcement when combining Andersen windows and patio doors to create larger Andersen Feature Windows for non-residential applications.
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Louisiana-Pacific

FiberBond Sheathing is designed for use on outside or sidewall framing. It provides a water-resistant backing for various exterior siding materials. They are exceptionally strong and fire-resistant with superior fastener-holding ability. Sheathing can be used in E.I.F.S. construction and meets or exceeds ASTM C79 requirements. Underlayment and wallboard also available.
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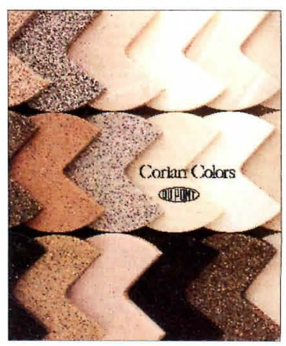

The Living Colors of Corian — Corian is an extraordinary surfacing material—and Corian colors are no less extraordinary. Inspired by the timeless artistry of nature, honest and pure hues, patterns and textures created to respond well to trends and time. Colors that will retain their original beauty for a lifetime—and are open to your imagination. Call 1-800-4 CORIAN for information.
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WRCLA

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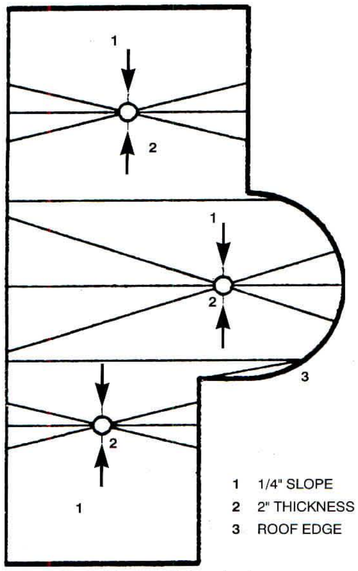
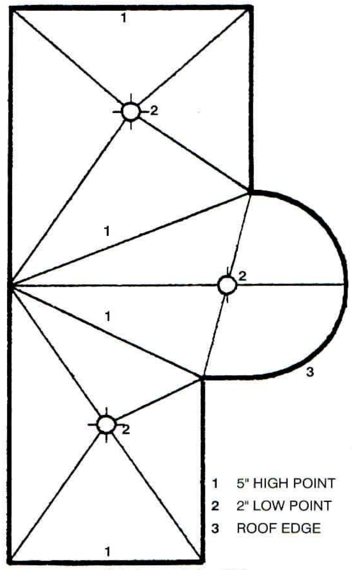


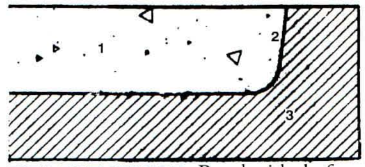
1 1/4" SLOPE
2 2" THICKNESS
3 ROOF EDGE

ROOF PLAN: Tapered insulation.



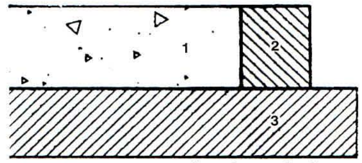
1 5" HIGH POINT
2 2" LOW POINT
3 ROOF EDGE

ROOF PLAN: Lightweight fill.



TOTAL ENVELOPE MOLD: Panel with draft.

1 PRECAST CONCRETE PANEL
2 PANEL DRAFT
3 MOLD



STANDARD MOLD: Panel without draft.

1 PRECAST CONCRETE PANEL
2 SIDE RAIL
3 MOLD

Thermal and Moisture Protection

CSI Section 07000

Tapered Insulation Systems

Some codes require a positive slope to drain a roof, and most roofing manufacturers will not issue a guarantee without good drainage. When the structural deck cannot be sloped, a tapered insulation system must be considered. Such systems are categorized into two types; the geometry of the roof plan is an important consideration when choosing between them. Factory fabricated tapered rigid insulation is the most cost-effective, but must follow a regular geometric pattern and incorporate aligned drains plus a perimeter that can accommodate uneven elevations. For plans with a variety of slopes, irregular geometric shapes, or considerable deflection, field fabricated and poured-in-place insulating lightweight fill are more suitable.

Documentation of the two systems should reflect their installation differences, and the designer should know the requirements for each. Insulating lightweight fill should be documented by indicating the low and high points in inches. Tapered rigid insulation should be recorded by identifying the insulation's thickness at its lowest point and by providing the rate of slope (for example, 1/4-inch or 1/8-inch per foot).

John J. Serke, AIA
JDS Design Associates
Ardmore, Pennsylvania

Architectural Precast Concrete

CSI Section 03450

Panel Design

Architectural precast concrete is most economically applied by repeating components and maximizing the size of individual panels. The key to gaining efficiency with repetitive components is to allow the formwork to be reused for fabricating multiple pieces. This requires the precast panel to be removed from the mold without disassembling or destroying the formwork. To accomplish this, each component must be designed with a sloped edge, called draft. A minimum draft of 1:12 is required, with 1:8 preferred, for all panel openings and sides. For narrow or complex pieces, the draft should be increased to 1:6. Without the draft, either slip blocks at the side rails of the formwork or disassembly of the mold would be required to remove the panel.

The architect must also incorporate draft into the design of the other cladding elements. Windows and other components must be dimensioned to correspond with the panel size, considering clearances to accommodate the draft. Draft should be considered for construction tolerances and maintaining proper joint sizes between adjacent panels.

Maximizing the size of a precast panel will result in fabrication, erection, and handling savings. Large panels also provide better dimensional control and reduced caulking. Variation in finishes, textures, and color can be incorporated into a single panel to add detail and reduce its scale. Rustication with false joints will also reduce the scale of large panels. These false joints can serve to separate concrete mix colors or multiple textures within the mold.

Panel anchorage details should be considered to ensure a common plane between the false joints and the "true" panel joints. Anchors should be set far enough back from the face of the panel to allow installation of both sealant and backer rod. This arrangement will allow the surface of the sealant to align with the back face of the false reveal, thereby providing a uniform appearance between both false and real joints.

James F. Zemski
Daniel Mann Johnson & Mendenhall
Honolulu, Hawaii

Architects are encouraged to contribute their practical suggestions about specifications and detailing, including drawings, for publication. Send submissions to:
ARCHITECTURE
1130 Connecticut Avenue, N.W.
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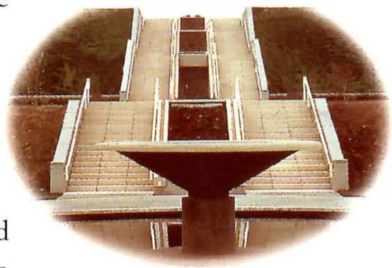
Open Spaces Come Alive With Terra-Pavers

Turn those ho-hum roof and plaza decks into more usable contemporary spaces.



Precast concrete pavers from Wausau Tile can transform those outdoor areas and provide protection for roof and deck structures, too. Use Terra-Pavers for new construction or easy renovation of failing roof decks. Pavers install on-grade or with the patented Terra-System One® elevated system for sloped and level surfaces.

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

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

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

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

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