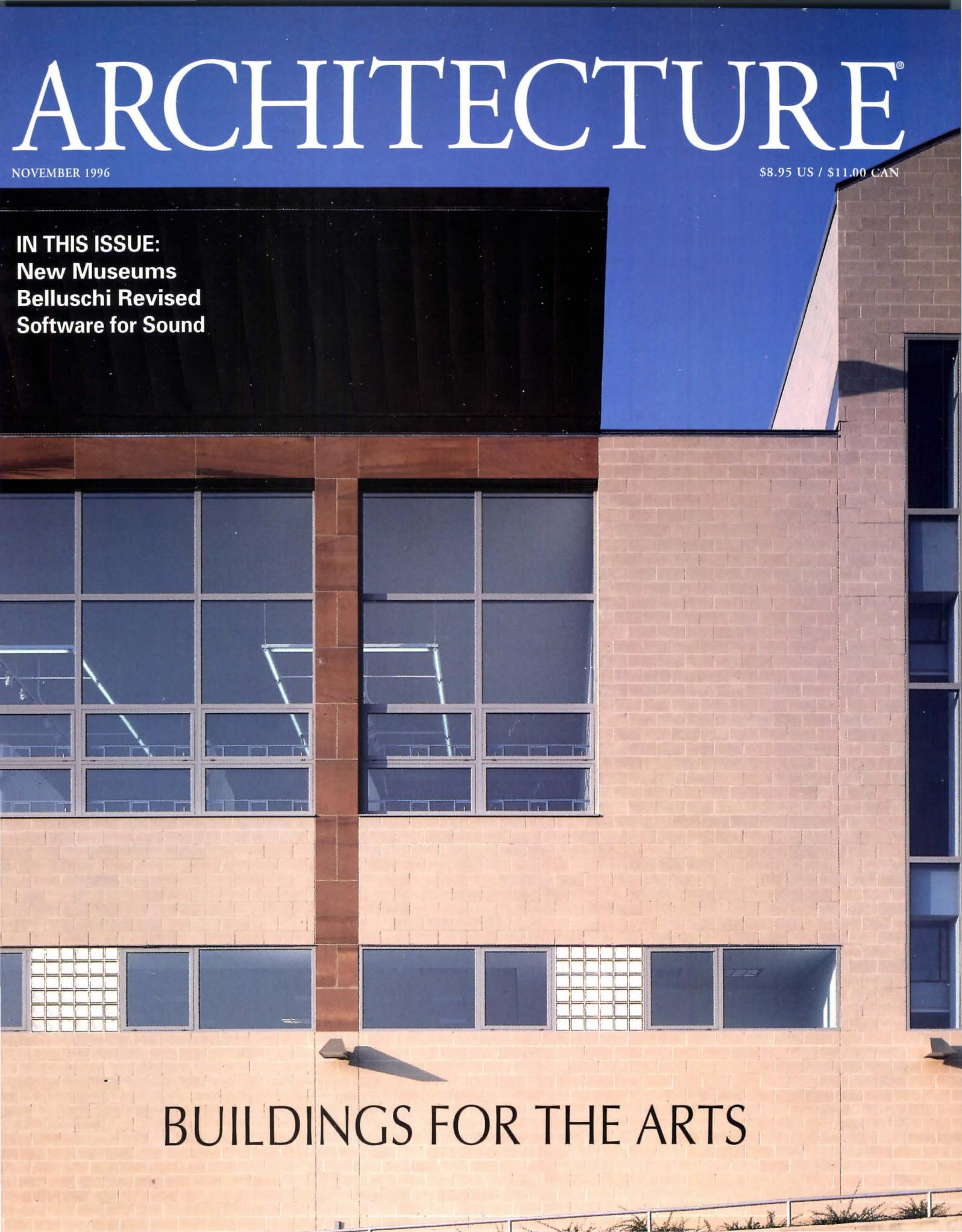


# ARCHITECTURE®

NOVEMBER 1996

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**IN THIS ISSUE:**  
**New Museums**  
**Belluschi Revised**  
**Software for Sound**

A photograph of a modern building facade. The building features a light-colored, textured brick or stone wall. There are several large, multi-paned windows with dark frames. A prominent vertical element is a dark, possibly copper or wood-clad, column that runs through the center of the facade. The sky is a clear, bright blue. The overall aesthetic is clean and architectural.

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## Repair Our Nation's Schools

*Crumbling buildings and overcrowded classrooms threaten the education of children across the country.*

America's schools are in crisis. A record 51 million children entered our nation's schools this fall, but many face the worst learning conditions in recent history. In New York City, for example, students are forced to sit on stairs, floors, and radiators because the city's public schools now have 91,000 more students than they are designed to handle. The city is considering holding classes year-round, but only 60 of New York's 1,100 schools are air-conditioned. In Los Angeles, students in 180 of 650 public schools already go to school all year, primarily in poorer areas where overcrowding is the norm. And in cities from Washington, D.C., to Little Rock's historic Central High, public schools do not meet basic fire codes; several remained closed weeks after opening day.

The current educational crisis stems largely from the fact that most school buildings are out of date and woefully inadequate for today's teaching. Nearly a third of the nation's 80,000 public schools are more than 50 years old. Roofs, plumbing, lighting, and other systems need to be extensively repaired to bring these schools up to "good" condition, according to a General Accounting Office report released in June. Just these basic improvements will cost \$112 billion.

And more than half of U.S. schools lack sufficient cabling and equipment for installing computers. In October, the Clinton administration proposed giving every school and library free access to the Internet. Cost estimates for providing this access run to \$109 billion over 10 years.

Congress has recognized the dire need for repairs and renovations by passing the Education Infrastructure Act of 1994, which appropriated \$100 million for grants to schools. However, these funds were eliminated last year by legislation aimed at balancing the federal budget.

Given that the number of school-age children will continue to increase through the first decade of the next century, the in-

coming Congress should work quickly to restore school funds.

Architects can help institute changes at the local level, proposing new ways of dealing with overcrowded classrooms and outdated buildings. Many have already started.

In Los Angeles, where students are bused far from their own neighborhoods to relieve overburdened classrooms, Gensler and Associates has suggested converting empty stores in strip malls into classrooms. In Pennsylvania, former AIA President Susan Maxman is pushing state legislators to invest in energy-efficient building systems for older schools, pointing out that the initial investment in these systems is recovered within six or seven years of a renovation meant to last 50 years.

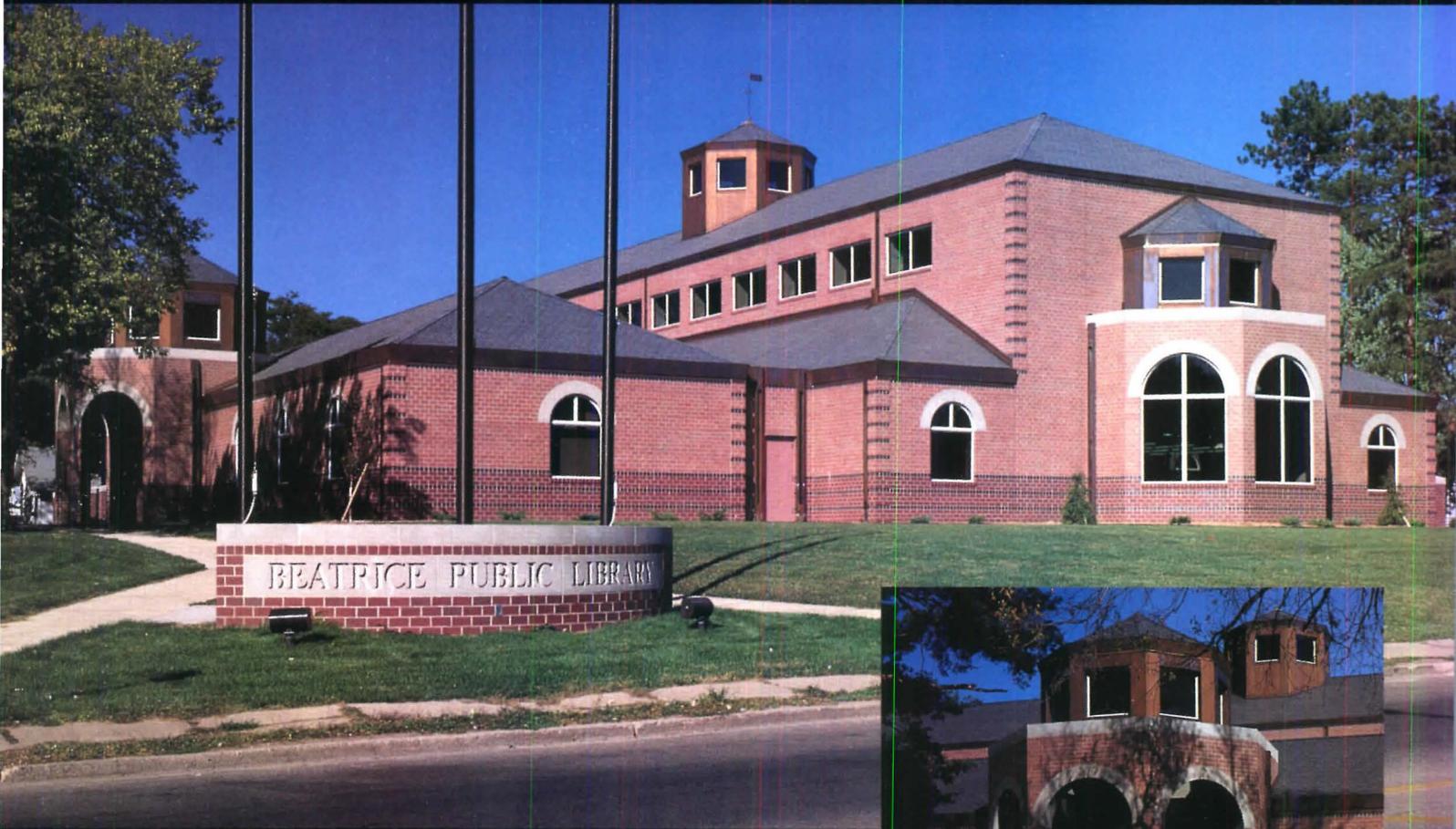
New York City architects are taking this lobbying a step further. New York AIA is advocating that an architect be appointed to head the city's School Construction Authority, which oversees renovation and new building from the Bronx to Staten Island.

More architects should exert political pressure to improve school design and construction. This month, the AIA is sending that message by sponsoring a national conference on school renovations that will discuss funding mechanisms, technological upgrades, and bricks-and-mortar improvements. But it will take more than talk to improve the current crisis.

Today, an estimated 2 million students must attend class in portable trailers; unless more schools are opened, this situation will worsen. Four million more children are expected to enter our schools before the ongoing baby boom peaks in 2006. Architects must remind administrators and politicians that the quality of school buildings is crucial to the quality of education.

*Deborah K. Diekmann*

# REFINEMENT



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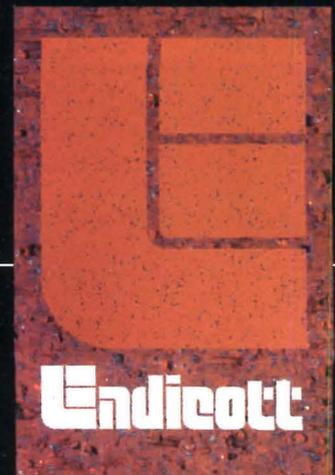
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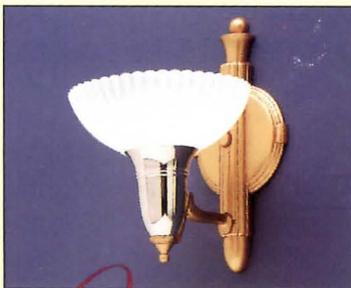
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## Letters

### Educating architects

In response to your editorial on the failure of firms in educating interns (ARCHITECTURE, August 1996, page 15), the high failure rate of first-time Architectural Record Exam (ARE) candidates should indicate that three years of work experience may be insufficient in most cases. Ironically, you insinuate that we should lower Intern Development Program standards instead of solving the problem. Why not enforce the established rules instead of lessening the requirements? Meaningful internship is the last best hope for the profession to ensure that those who pass the ARE are qualified, not just lucky.

*Douglas W. Gibson, AIA  
Clermont, Florida*

I want to commend Reed Kroloff for his excellent commentary, "How the Profession Is Failing the Schools" (ARCHITECTURE, August 1996, pages 92-93). Education needs the profession's moral, practical, and financial support—now more than ever. We [academics] are responsible for producing graduates who understand and honor the art of the nobler profession of architecture, who can think critically and problem solve. Schools that do not provide a theoretical/practical balance are not doing their jobs, and the professionals who do not value the academic mission are not honoring their responsibility to education and, in most cases, the excellent education that got them where they are.

*John C. Gaunt, FAIA  
Dean, School of Architecture  
University of Kansas  
Lawrence, Kansas*

I was flummoxed by Reed Kroloff's essay. Kroloff takes the profession to task for reducing the salary of graduate architects and wasting continuing education hours "listening to a manufacturer's sales talk."

Any practitioner not intimately acquainted with every new product,

its relative cost, and reliability will quickly lose their place in the market. Rather than conducting an internecine sniping campaign between the ivory tower and the ground, educators and practitioners should jointly endeavor to raise public appreciation of the poetry of building. Kroloff has an exaggerated sense of his (and our) influence.

*Paul Matthews, AIA  
Rathdrum, Idaho*

I want to congratulate you on the excellent August issue, particularly its coverage of the crisis in architectural education. However, I disagree with Reed Kroloff's assumption that "architecture graduates who go on to other careers are just as important as those who stay with the field."

My experience has been that such unlucky, expensively trained, high-hoped individuals end up bitter and frustrated—often getting back at the profession as know-it-all renegades.

*Robert F. Gatje, FAIA  
New York City*

In Italy, and elsewhere, architecture is taught typically as an academic discipline, like literature or history. The University of Rome alone teaches and graduates nearly as many students of architecture as the entire American system. A minuscule number of these graduates become career architects.

As long as architectural education serves only to produce practitioners, the profession will further alienate itself as a detached elite.

*Jeff Joslin  
City of Portland Bureau of Planning  
Portland, Oregon*

### All philosophies welcome

I take exception to the implication that the San Francisco Institute of Architecture (ARCHITECTURE, August 1996, pages 164-165) imposes organic, ecological, and visionary architecture in the doctrinaire way that other schools impose their de-

sign fashions and dogmas. We encourage students to pursue any direction they choose and support them 100 percent. To assure this, grading is objective—based solely on doing assignments as specified, not whether instructors like the results or not. You would be hard-pressed to find similar openness in other schools.

*Fred A. Stitt*  
Director, San Francisco  
Institute of Architecture  
San Francisco, California

#### ADA compliance

Thank you for your excellent editorial in the September issue. As an architect who does significant work in accessibility, I must, however, take exception to the phrase “designing for the disabled.” The phrase implies that accessible design is “for” people with disabilities. Although people with disabilities benefit, accessible design is for the protection of the public’s health, safety, and welfare. The Americans with Disabilities Act (ADA) establishes that inaccessible design is inherently discriminatory and a detriment to our society’s well being.

The phrase “the disabled” inappropriately homogenizes and categorizes a group of widely divergent people. When speaking of people with disabilities, put the emphasis on their humanity, not on their difference from some presumed norm.

We must keep the ADA “in the face” of the profession so they accept their responsibility for its execution. However, we must also be careful of our language so that we don’t subliminally dilute the message.

*Harold Dean Kiewel, AIA*  
White Bear Lake, Minnesota

I read with interest your editorial regarding ADA compliance and building codes (ARCHITECTURE, September 1996, page 15). You stated that only the code in the state of Washington officially complies with ADA. In 1994, however, Flor-

ida adopted the Florida Accessibility Code for Building Construction.

*David Porter, AIA*  
Palm Beach Gardens, Florida

*Editor’s reply:* Since the editorial was published, the U.S. Department of Justice certified Texas’s code as complying with ADA. According to a spokesperson at Justice, Florida’s new building code has yet to comply fully with ADA standards.

#### Detailed omission

I am concerned with a serious omission in the detail for the Team Disneyland building (ARCHITECTURE, July 1996, page 164). The drawing does not show any method to drain any moisture that may sheet down the membrane surface and work its way through any joint in the flashing assembly to the stud space or building interior. Overlooking this drainage has bitten many an architect.

*Jim Mann*  
Yost Grube Hall Architecture  
Portland, Oregon

#### Kiesler’s plagiarism

I do not argue in my book *Machinations* (ARCHITECTURE, September 1996, pages 42-43) that Frederick Kiesler copied the plans for the Endless Theater from drawings by Marcel Duchamp. It is my opinion that this plan and section for an unbuilt optical device are works by Duchamp that Kiesler presented as his own, possibly with Duchamp’s permission.

*Marc Dessauce*  
New York City

#### Correction

The cornerstone of Temple Hoyne Buell Hall (ARCHITECTURE, August 1996, pages 96-103), designed by Charles Platt and James McLaren White, was laid November 16, 1926—not 1936. The official name of the building designed by Helmut Jahn is the Agricultural Engineering Sciences Building.

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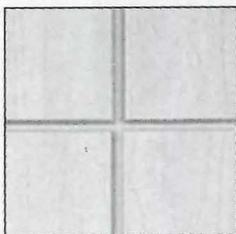
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## Events

### Exhibitions

**ATLANTA.** Architectural photography exhibition, "Steven Brooke: Views of Rome," through January 20 at the Michael C. Carlos Museum, Emory University. Contact: (404) 727-4282.

**CHICAGO.** "Building for Air Travel," through January 5 at the Art Institute of Chicago. Contact: (312) 443-3600.

"Good Design 1996," through January 12 at the Chicago Athenaeum. Contact: (312) 251-0175.

**LOS ANGELES.** "Paradise Cage: Kiki Smith and Coop Himmelblau," November 24 through February 2 at the Museum of Contemporary Art. Contact: (213) 626-6222.

**MINNEAPOLIS.** "Wild Design: Designs for the Wild," through January 5 at the Walker Art Center. Contact: (612) 375-7600.

**MONTREAL.** "Luigi Ghirri/Aldo Rossi: Things Which Are Only Themselves," through November 24, and "Viewing Olmsted: Photographs by Robert Burley, Lee Friedlander, and Geoffrey James," through February 2 at the Canadian Centre for Architecture. Contact: (514) 939-7000.

**NEW YORK.** "A House for an Art Lover: Charles Rennie Mackintosh's Masterpiece," November 20 through February 8 at the New York School of Interior Design. Contact: (212) 472-1500.

"Mixing Messages: Graphic Design in Contemporary Culture," through February 16 at the Cooper-Hewitt. Contact: (212) 860-6868.

"Portugal: Of Sea, Stone, and Cities," through December 7 at the Architectural League. Contact: (212) 753-1722.

### Conferences

**ATLANTA.** "Security in the Built Environment," February 27-March 1, sponsored by AIA Justice. Contact: (202) 626-7482.

**BOSTON.** Center for Health Design annual symposium, November 14-17. Contact: (510) 370-0345.

Build Boston, November 19-21. Contact: (800) 544-1898.

**HOUSTON.** "The Builder's Show," January 24-27, sponsored by the National Association of Home Builders. Contact: (202) 861-2191.

**WASHINGTON, DC.** The American Institute of Architecture Students convention, November 26-December 1. Contact: (202) 626-7472.

### Competitions

The Philip N. Winslow Landscape Design Award, sponsored by the Parks Council. **Entries must be postmarked by November 18.** Contact: (212) 838-9410, ext. 233.

Paris Prize, "Real Downtown/Virtual Downtown," sponsored by the Van Alen Institute. **Submissions due January 1.** Contact: (212) 924-7000.

Collaborative art and design competition for a public square in Vail, Colorado. **Submissions due January 6.** Contact: (970) 479-2344.

Society for Environmental Graphic Design-sponsored design awards. **Entries due January 17. Student grant entries due December 31.** Contact: (202) 638-0891.

Student design competition sponsored by the Association of Collegiate Schools of Architecture and Otis Elevator. **Registration due March 7.** Contact: (202) 785-2324.

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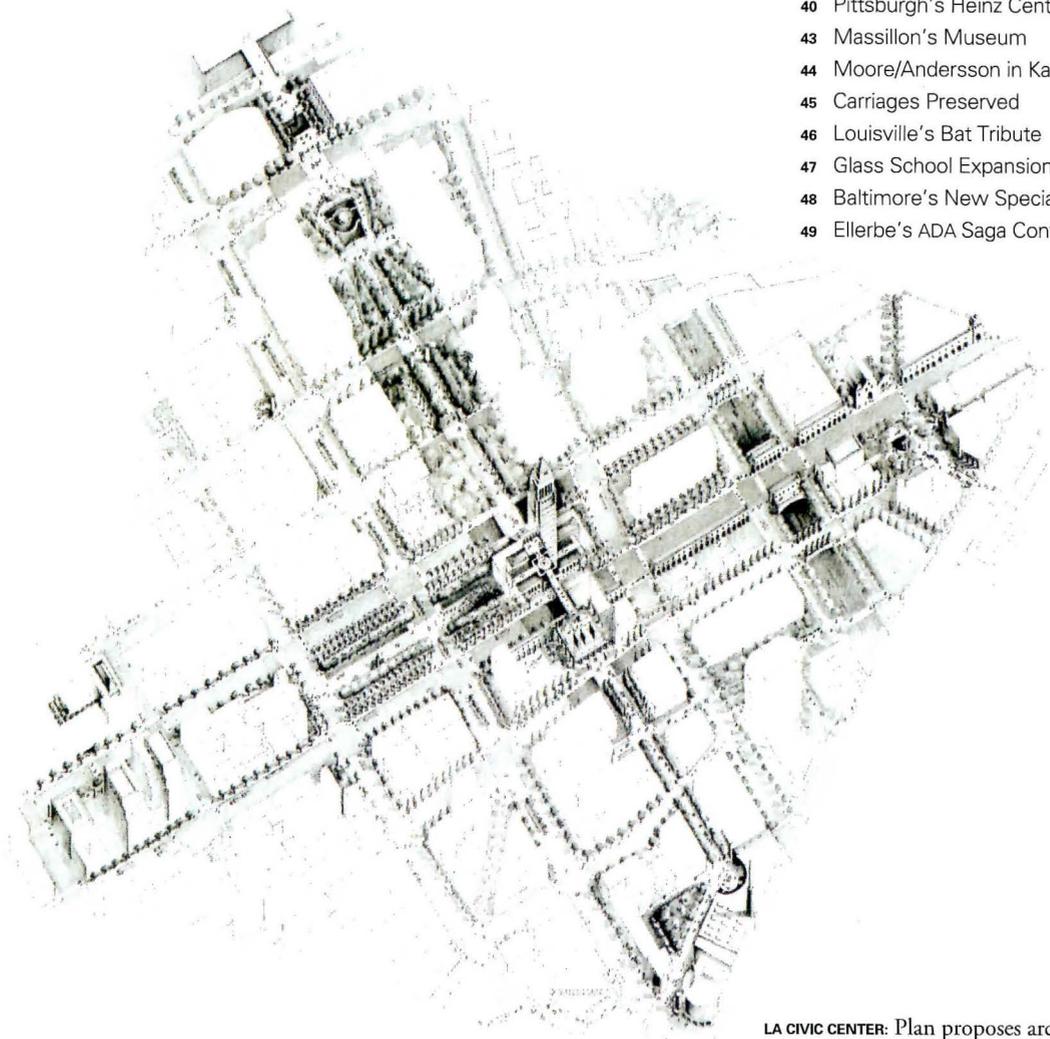
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**LA CIVIC CENTER:** Plan proposes arcades on Main Street from City Hall.

### New Master Plan for L.A.'s Civic Center

At the behest of the city and county of Los Angeles, a group of local urban designers announced a new master plan for the civic center in September that may make the barren area more accessible. Led by Meléndrez Associates, the design team includes Johnson Fain and Pereira, Public Works Design, RAW Architecture, and Landmark Partners. The plan redefines the civic center as a diamond shape surrounding city hall. To connect city hall with historic Olvera Street to the north, the plan proposes arcades down a portion of Main Street, currently a barren bridge over the Santa Ana Freeway; the bridge itself would be widened to allow retail on both sides of the street. The plan calls for more planting in an over-

scaled, under-used plaza between two Los Angeles county buildings, a new street between city hall and Frank Gehry's Geffen Contemporary Museum, and demolishing an undistinguished police headquarters building. Planners hope to receive approval for the scheme from both county supervisors and Los Angeles city council members by the end of the year.—*Morris Newman*

### California Architects Fight State for Public Projects

California architects are fighting a statewide ballot measure that would amend the state's constitution by ending qualifications-based selection of architects on projects worth more than \$50,000. The measure, scheduled for a June 1998 referendum, might steer a significant por-

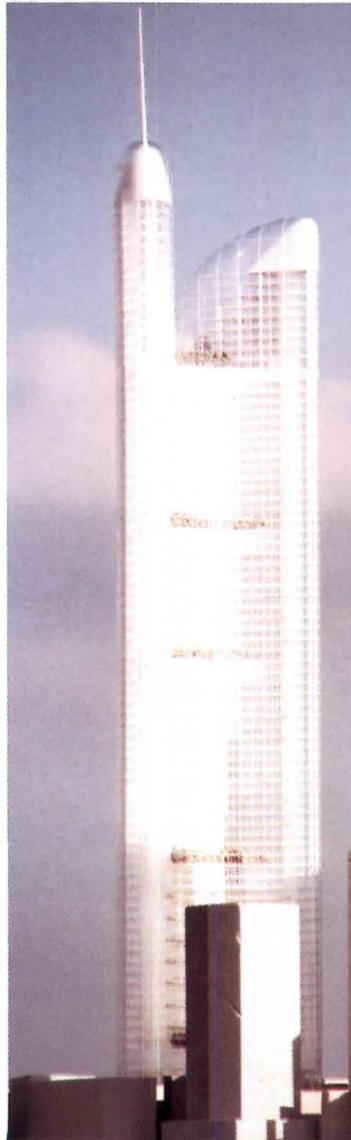
tion of public design work to state-employed architects and engineers. The measure is sponsored by the Professional Engineers of California Government, a union representing public-sector architects and engineers. If passed, the amendment would ensure competitive bidding of most major projects and require the state controller's office to review all state-funded projects to determine if they could be completed more cheaply by public-sector designers.

Private architects would have to submit "all anticipated contract costs," including overhead. Yet government professionals' estimates "shall include only the additional direct costs to the state" to provide the same services. "The state's engineers basically want the right of first refusal on all new projects," warns Philip Bujakowski of AIA California Council.—*Bradford A. McKee*



ROGERS: Revitalizes moribund Modernist South Bank Center with glass canopy covering existing buildings and plaza.

HAYES DAVIDSON



FOSTER: Europe's tallest tower.

RICHARD DAVIES

## High-Tech Gains New Ground in London

London boasts some of the world's most daring designers, but few avant-garde buildings ever materialize in this city, where Prince Charles's sentimental Classicist longings dominate architectural discourse. New commissions by architects Zaha Hadid, Richard Rogers, and Norman Foster, however, promise to put a contemporary spin on three prominent sites in London's staid cityscape.

The most visible of these on-the-boards projects is Foster's London Millennium Tower. At 1,265 feet in height, the 92-story office tower in the City of London's cramped quarters will be Europe's tallest, more than twice the height of the neighboring NatWest building, and more than 400 feet higher than the KPF-designed tower at Canary Wharf, currently Britain's tallest building. The Millennium Tower will be located on the former site of the Baltic Exchange building, badly damaged by an IRA bomb in 1992, just two blocks north of Richard Rogers' Lloyd's of London headquarters (1986). Foster's curved, crystalline tower for the Norwegian construction and engineering giant Kvaerner will comprise offices, restaurants, and seven trading floors, with 12 levels of residential units atop the building's 73rd floor. The architect expected little opposition from planning officials when he presented his design in October:

The usual height restrictions were moot since the site is not designated a conservation area and the proposed tower would not block views of St. Paul's Cathedral.

To the west of Foster's behemoth, a proposed habitable bridge designed by Zaha Hadid could span the Thames from Temple Gardens to the London Television Center on the south bank of the river. Hadid's design—a futuristic version of Old London Bridge or Florence's Ponte Vecchio—was chosen along with a scheme by French architect Antoine Grumbach & Associates as winners of an invited competition jointly sponsored by the Royal Academy and the Georges Pompidou Center in Paris. Other entries included schemes by Daniel Libeskind, Future Systems, and Nigel Coates, who designed an exhibition of the competition schemes, on view at the Royal Academy through December 18. The competition's sponsors are now looking for developers to take on the construction of the bridge, but given Hadid's track record of doomed competition-winning designs, the project may never be built.

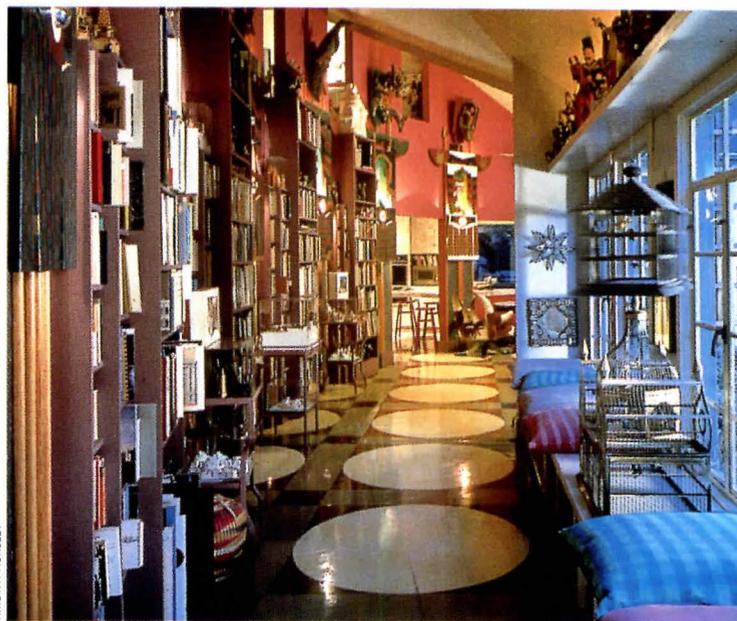
Near the southern terminus of Hadid's proposed bridge, Richard Rogers has unveiled a scheme to revamp South Bank Center, a riverside site housing the 1951 Royal Festival Hall (page 179, this issue) and a trio of other performance and exhibition halls. The centerpiece of the rejuvenated arts complex will be a "crystal palace," a High-Tech, undulated glass canopy blanketing ex-



**NEXT HOME:** Three single-floor units.



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TIMOTHY HURBLEY

**LESS IS NOT MOORE:** Entry hallway of house displays architect's trademark whimsy.

isting Queen Elizabeth Hall, Hayward Gallery, and an adjoining outdoor plaza will feature new shops and restaurants.

The majority of the \$160 million South Bank project is financed by the Arts Council of England Lottery Fund, one of five agencies that distributes profits from Britain's national lottery. (Another agency, the Millennium Commission, hopes to revamp Britain's cultural infrastructure with *grands projets* comparable to those of Paris.) When completed in 2001, Rogers' addition to the center will be one of the first major projects built with lottery funding, as the program to date has funded only renovations and expansions to the Tate Gallery and Royal Opera House. South Bank Center could be proof that Britain's multi-billion-dollar lottery gamble will indeed pay off.—*Raul A. Barreneche*

## HUD Awards Funds for New Public Housing

The U.S. Department of Housing and Urban Development (HUD) is expanding its "HOPE VI" plan to demolish the nation's worst public housing. In October, HUD awarded another \$716 million to 74 cities, from Ozark, Alabama, to Tacoma, Washington. Under the expanded program, localities will tear down 17,000 substandard units, build 4,000 new townhouses, and give rent vouchers to the 15,000 families about to be displaced. The plan also

calls for greater accountability among local housing authorities and stringent screening of tenants with histories of crime and drug dealing.

Congress did not approve the funds before adjourning for election season. Instead, HUD drew the money to continue its demolition and replacement program from past appropriations. The strategy, contends HUD Secretary Henry G. Cisneros, gives public housing tenants a "real chance to improve their lives." In Chicago, for example, HUD is demolishing 11 high-rise projects at the Henry Horner Homes and building two- and three-family townhouses on the very same site. New Orleans' 660 units in the 97-acre Desire development are giving way to 124 garden apartments.

Critics point out that HUD's plan displaces more than three times as many families as its shelters—just as the Clinton Administration's welfare reforms take effect.—*B.A.M.*

## New Housing Prototype Built in Montreal

A single mother of two, an unemployed widower, and a young couple with no children are the hypothetical residents of model housing constructed on the McGill University campus in Montreal this August. Architecture professor Avi Friedman designed the Next Home to reflect changing demographics based on research by McGill's Affordable Homes Program. This think tank

was founded by Friedman in 1989 as North America's first graduate school program to focus on affordable housing.

The Next Home was sponsored by Canadian manufacturer Matériaux Cascades, IKEA Canada, the Canada Mortgage and Housing Corporation, and the Housing Society of Québec. The Grow Home, a previous housing model Friedman designed with architect and Affordable Homes Program cofounder Witold Rybczynski, has been wildly successful: More than 5,000 units have been built across North America.

Friedman's latest prototype emphasizes affordability and flexibility. "The Next Home offers a glimpse of what homes will be like in the new millennium: streamlined, personalized, designed for change, and priced for our challenging economic times," the designer explains.

Each housing block comprises three 750-square-foot floors. Buyers can purchase one or two floors, or the entire house. As their needs change, they can upgrade or downgrade by buying or selling floors.

Building products and layouts are standardized, reducing costs and facilitating changes, yet buyers can still choose from a range of designs. For example, the Next Home can be built as a rowhouse or a free-standing unit, with various exterior arrangements. Friedman has already been approached by Canadian developers; the architect hopes to have Next Home under construction by next spring.—*Ned Cramer*

## Charles Moore House and Studio Saved

The fate of the Austin, Texas, house and compound designed by AIA Gold Medalist Charles Moore and his partner Arthur Andersson has finally been decided. At the time of Moore's death in 1993, a \$350,000 mortgage threatened to force the sale of the landmark and the breakup of its collections.

Now, with the aid of Moore's heirs, Andersson, and the Charles Moore Foundation, the debt has been fulfilled and the property secured. Major funding came from Foundation President Willard Hanzlik, whose early association with former Moore partner Donlyn Lyndon led to an appreciation of Moore's work, and a "desire to see this important legacy preserved." The foundation will now focus on raising a \$2 million endowment.

Moore's compound will become a study center. His archives, slides, and library will go to the School of Architecture at the University of Texas at Austin, which has promised to leave all books at the house "since they are integral components of Moore's design," according to Dean Lawrence Speck. Moore/Andersson Architects will move out of the studio, which will become the foundation office. Andersson's house has already been converted to a visiting scholar's residence. And Moore's house will host tours, seminars, and gatherings—much as if Moore were still alive.—*Reed Kroloff*



DISNEY WORLD: Castle turned into cake.



NEW SPORTS COMPLEX: Will open next year with baseball stadium by David Schwarz.

### Disney World Turns 25, Builds New Town

Disney World celebrated its 25th anniversary last month with events staged for the media and fans. The occasion was billed as a tribute to Walt Disney's vision (the founder died in 1966, before the Orlando, Florida, development was completed), though the ever-expanding theme park might well be renamed Eisner's Empire.

Since Michael Eisner was ap-

pointed CEO of Disney in 1984, the company's stock has risen 22 times. Eisner has expanded Disney World with new theme parks, hotels, commercial buildings, golf courses, and campgrounds. He has expanded Disney's operations in Burbank; opened EuroDisney in France; bought Capital Cities/ABC; and helped revive 42nd Street in New York.

In building Disney's empire, Eisner, to his credit, has hired the most respected architects in the country. The CEO publicized his design

FLEET CENTER, Boston, Massachusetts

**12,553**

*pieces of structural steel*





CELEBRATION TOWN HALL: Philip Johnson.



BANK: Venturi and Scott-Brown.



REAL ESTATE TOWER: Charles Moore.



INSTITUTE: Hammond Beeby Babka.

patronage during Disney World's celebration by taking part in architectural tours and a symposium, which included fellow patrons William Miller of Columbus, Indiana, David Neuman of Stanford University, and Milwaukee Mayor John Norquist. The event was held at the Disney Institute, a new learning and fitness campus, designed by Hammond Beeby Babka.

A few miles away from Disney World, Eisner is experimenting with a vision Walt Disney imagined but

never got to pursue. This summer, the first residents moved into Celebration, a new community that Disney hopes will attract a population of 20,000. Master-planned as a neo-traditionalist mecca by Robert A.M. Stern and Jaquelin Robertson, Celebration is being built on 4,900 acres with 8,000 houses, a school, a hospital, and a commercial district. So far, only the "downtown" is substantially finished, with buildings by Stern, Robertson, Michael Graves, Philip Johnson, Charles Moore, Ce-

sar Pelli, and Robert Venturi and Denise Scott-Brown. An office building by Aldo Rossi and a teachers' training center by William Rawn have also been completed.

Meanwhile, Disney World continues to grow with new attractions. Its retail district is being renovated as Downtown Disney, including a tent structure for the Cirque du Soleil designed by David Rockwell. A new 200-acre sports complex with a 7,500-seat baseball stadium, designed by David Schwarz, and a

Southwestern-style resort with hotels by Graham Gund, will be completed in 1997. In 1998, a new theme park, Animal Kingdom, and Disney's first cruise ships will be launched. Successful or not, all will aim for architectural quality under Eisner's watchful eye. "Our Aldo Rossi building is our own La Defense," the 54-year-old CEO quipped at a luncheon, revealing his design savvy and ambition to build Disney's version of France's *grands projets*.—Deborah K. Dietsch

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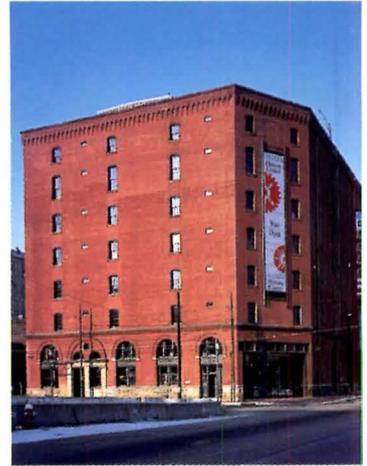
HEINZ HISTORY CENTER: Ice storage warehouse is located in Pittsburgh's Strip District.

### Pittsburgh Museum Enlivens Warehouse District

On the edge of Pittsburgh's compact downtown lies the gritty, riverside Strip District, where a growing number of produce warehouses, wholesale food shops, and small factories are being transformed into trendy bars and restaurants. In

April, the new \$16 million Senator John Heinz Pittsburgh Regional History Center, designed by architect Bohlin Cywinski Jackson (BCJ) with Washington, D.C.-based Notter Architects opened. This renovation introduces a new civic function to the area's commercially oriented gentrification process.

BCJ transformed an abandoned



CONVERSION: New canopy and banners.

1890s ice storage warehouse into 160,000 square feet of exhibition galleries, archives, a library, and educational and administrative facilities for the Historical Society of Western Pennsylvania.

Colorful banners and a new steel and glass canopy mark the museum's public entrance; a new copper-clad stair and elevator tower at the west-



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**TIMBER FRAME:** Opened to create seven-story atrium.



**LOBBY:** Exposed steel structure evokes local industry.



**ATRIUM:** Stair connects exhibition levels.

ern end of the building defers to the existing structure. Inside, original exposed steel girders, vaulted brick ceilings, and a heavy timber structural frame complement BCJ's signature addition of elegantly detailed assemblies.

The second floor of the building houses the museum's permanent collection as well as an orientation the-

ater that is contained within a steel-sheathed drum reminiscent of old water towers and factory drums. The third floor contains a classroom and educational exhibit areas for children, while the fourth floor houses changing exhibits. The museum's top three floors are given over to a reading room, archives, and offices.

To break up the museum's boxy

interiors and provide daylight to the generally windowless interior, the architect removed parts of the existing timber frame, creating a seven-story atrium. The structure's salvaged timbers were recycled into the lobby's flooring. Clerestories and a large west-facing window with a view of Pittsburgh's skyline illuminate the space.—*R.A.B.*

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GALLERY: Converted from loft.



FLOATING WALL: Runs length of gallery.



SHELVES: Exhibits in wall's thickness.

### Perimeter Gallery Opens in Chicago Loft

Chicago's Perimeter Gallery, opened in May, is the latest addition to the city's River North district. Architect Brininstool Lynch maintained the exposed wood floors and ceilings of the old loft building and carefully inserted a sparse series of walls for

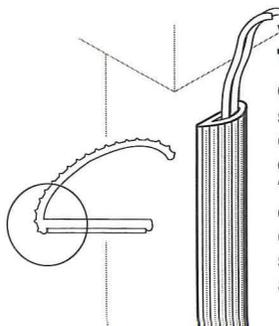
displaying contemporary art.

Spanning the full length of the gallery, the east wall is the dominant element, cantilevered off an existing masonry wall. It "floats" 7 inches above the floor, an effect reinforced by concealed lighting at the base. The surface of the wall is broken at regular intervals by vertical reveals that sprout wooden fins to support

perpendicular partitions, dividing the gallery into more intimate zones. From the front of the gallery to the rear, the wall very subtly shifts outward from the masonry wall behind, creating a thick layer of poché. This gesture allows the insertion of deep shelves within the partition to showcase ceramics, weavings, and sculpture.—*Edward Keegan*

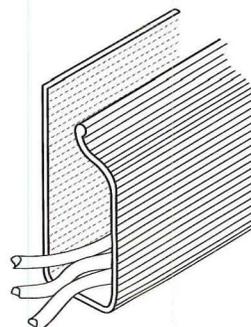
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**MASSILLON MUSEUM:** Former Art Deco store.



**INSTALLATION:** Vitrine displays regional pottery.



**LOBBY:** Steel wall and copper desk recall local industry.

## Ohio Museum Houses Community Artifacts

In May, Massillon, Ohio, a town of 32,000 people located 50 miles south of Cleveland, opened its first permanent museum in a 1930s department store. Paintings, photographs, pottery, furniture, and sports memorabilia collected over

the last 63 years by residents of this industrial city make up the Massillon Museum's 50,000-item collection, which now fills the high-ceilinged, open spaces of a three-story, 28,000-square-foot Art Deco building in the center of town.

Cleveland architect Van Dijk, Pace, Westlake & Partners renovated the building. Fritted glass panels, de-

signed to recall the building's original leaded-glass transoms, adorn the new entrance facade. In addition to a large, flexible space for temporary shows, smaller rooms divided by colorful partitions display the permanent collection.

A steel-clad wall in the café—acid-washed by architect Peter Van Dijk and museum director John Klas-

sen—pays tribute to the local steel industry, which brought financial success to many early donors.

The museum depends on Massillon's residents for funding. Voters have approved and renewed a property tax levy earmarked for operating costs—proof of the institution's value to locals and the success of the new museum building.—A.C.S.



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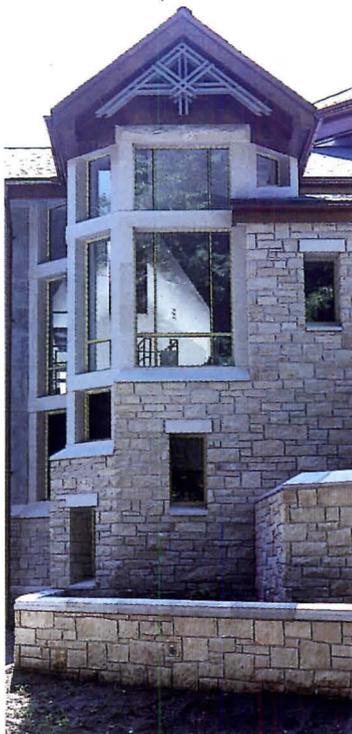
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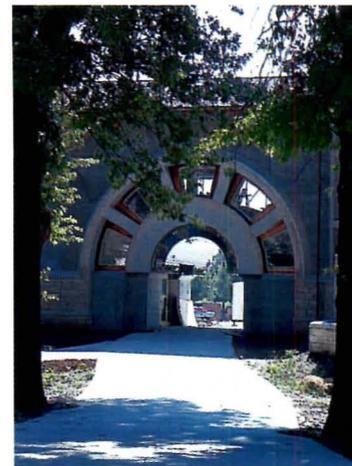
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LIMESTONE FACADE: Matches context.



GALLERY WINDOW: Overlooks terraces.



CAMPUS GATE: Arch opens to town.

PHOTOS COURTESY OF MOORE/ANDERSSON

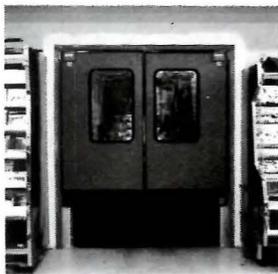
### Kansas State Opens New Campus Museum

Austin-based Moore/Andersson Architects, with Kansas City-based Wiedeman Architects, has completed a new art museum for Kansas State University in Manhattan, Kansas. The 25,000-square-foot Beach Art Museum opened October 12, and

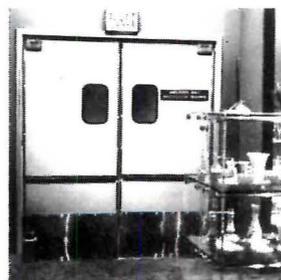
comprises five galleries, a 150-person lecture hall, and offices. Its collections focus on regional American art. The limestone building "serves as a gate for the campus," says design architect Arthur Andersson of the first major project completed by Moore/Andersson without significant contributions from its late founder, Charles Moore.—R.K.

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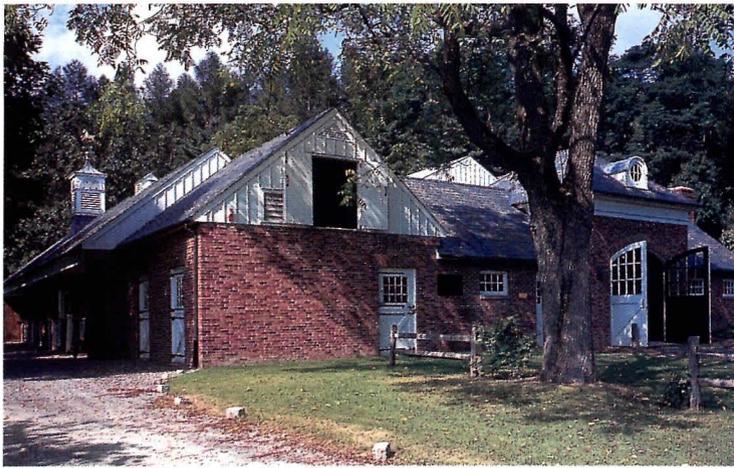
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CARRIAGE MUSEUM: Exhibit hall is tucked behind 1930s stable.

## Carriage Collection Preserved in New York

Citibank heir Chauncey Stillman had an abiding interest in European and American horse-drawn carriages, and collected them at the 1,200-acre Amenia, New York, estate he built during the 1930s. The estate is now managed by the Homeland

Foundation, which funds preservation projects around the world, including the renovation of the Sistine Chapel in Rome. In 1994, Homeland commissioned New York City architect Bartholomew Voorsanger to create a museum for Stillman's extensive collection of 19th-century carriages.

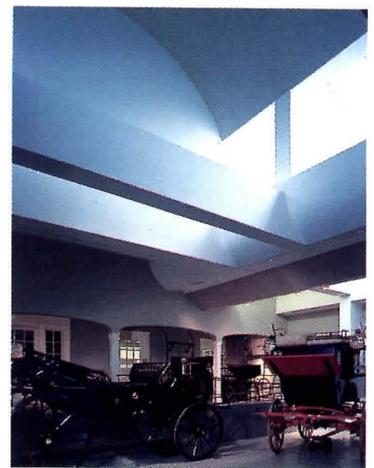
Voorsanger's design, completed



CARRIAGE EXHIBIT: Main space is skylit.

in August, comprises a 3,600-square-foot, skylit central exhibit hall; two auxiliary galleries; and support areas. The museum adjoins a working stable, where eight horses are boarded, primarily to facilitate demonstration of the carriages.

The airy central gallery was created in what had been a covered storage area surrounded by stables. The new



VAULTED CEILING: Rises to 26 feet.

room is topped by stuccoed vaults formed over open web steel joists resting atop steel columns. Voorsanger's white- and gray-painted gypsum board interiors provide an effectively neutral backdrop for the sculptural and brightly colored carriages. The stable's brick exteriors were preserved in as close to original condition as possible.—R.K.

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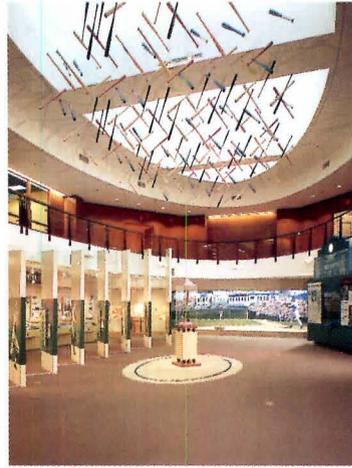
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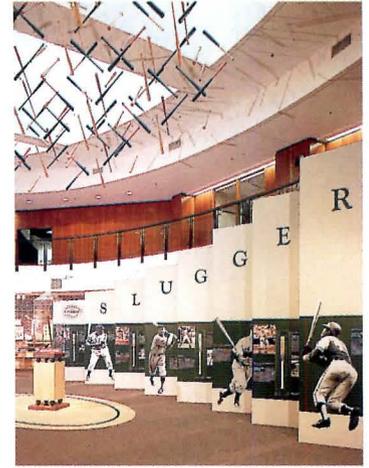
**BIG BAT:** Sterling Little's entrance.

### Baseball Bat Museum Opens in Louisville

Hillerich & Bradsby manufactured its first Louisville Slugger baseball bat in 1884. Today, a new museum on the site of the original factory in downtown Louisville celebrates bat-making and the history of the great baseball sluggers. The new two-



**BAT MOBILE:** Bats hang over gallery.

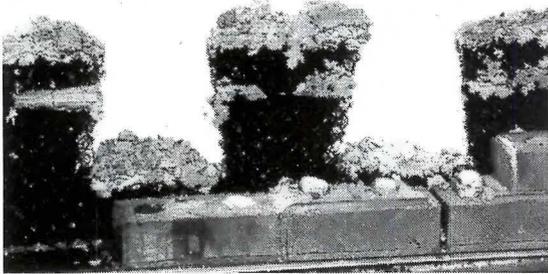


**EXHIBIT HALL:** History of hits.

story building is linked by a four-story atrium to an existing turn-of-the-century office building. Exhibits, designed by Philadelphia-based Ueland, Junker, McCauley Architects and Exhibit Designers, include a tunnel that evokes the route players take from the locker room to the dugout and emerges into a mockup of Camden Yard. A

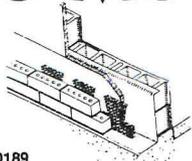
sportscaster's booth allows visitors to tune in to legendary baseball announcers. Visitors tour the working plant as part of their museum experience. The 100,000-square-foot building was designed by the Weyland Partnership of Louisville; a 120-foot high bat at the entrance was conceived by local architect Sterling Little.—*Heidi Landecker*

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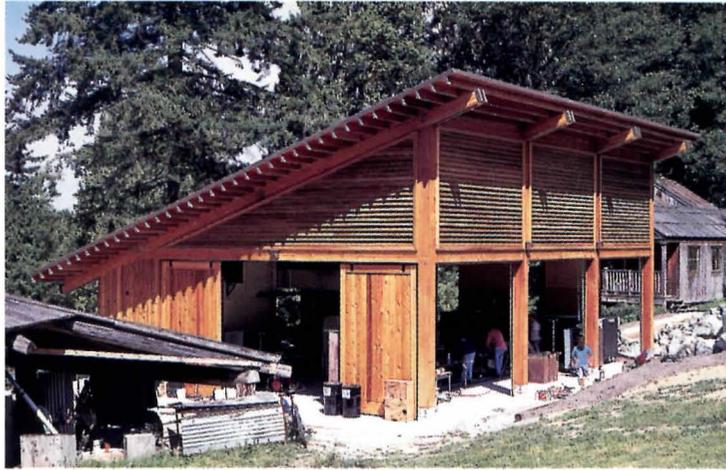
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NEW STUDIO: Located in Cascades.



HOT SHOP ANNEX: Cedar louvers and rolling doors ventilate casting studio.



INTERIOR: Glass-casting area.

## Glass Studio Opens at Pilchuck School

Pilchuck Glass School, a 50-acre campus in the Cascade foothills about an hour north of Seattle, was designed in the 1970s as a collection of post-and-beam structures by Seattle architect Thomas Bosworth. The school's newest building, de-

signed by Weinstein Copeland Architects, is an annex to Bosworth's original glass-blowing studio, the first building at the school. Known as the "hot shop annex," it houses a studio for casting glass sculpture. The 2,100-square-foot shed is arranged around a central furnace that reaches 2,600 degrees Fahrenheit. Rolling garage doors and cedar

louvers ventilate the building.

Weinstein Copeland designed faculty and staff housing at Pilchuck in 1988 and 1992. The hot shop annex is the first classroom the firm has completed; additions to the lodge and other classrooms are in schematic design. Staff cabins and a bath house by the Seattle firm will be constructed this fall.—H.L.

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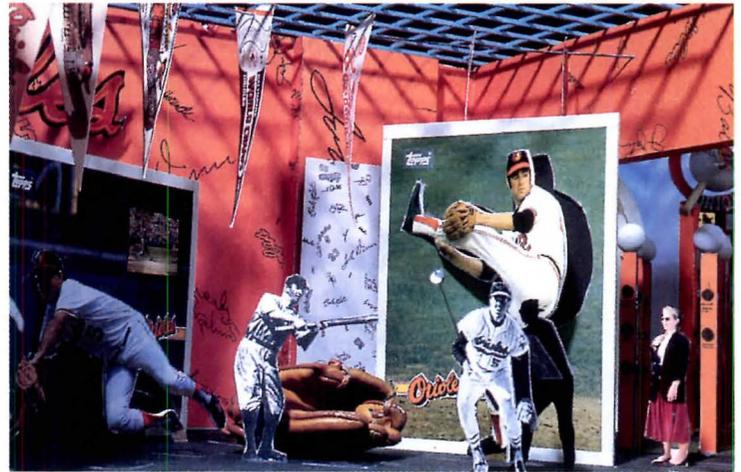


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MUSEUM OF DENTISTRY: Dental tool display.



BABE RUTH CENTER: Exhibits by Cambridge Seven.

### Baltimore Builds New Specialty Museums

In the 1970s and 1980s, Baltimore became a leader among cities rejuvenating their downtowns. Now, no fewer than 12 specialty museums have either just opened or are in the planning and construction stages, extending the city's Inner Harbor

tourist district, which already draws 8 million visitors a year.

One of the newest is the \$7 million American Visionary Art Museum, occupying a trolley barn renovated by Baltimore designers Rebecca Swanston and Alex Castro with architects Davis, Bowen & Friedel of Salisbury, Maryland. Another is the \$8.4 million Morton K.

Blaustein City Life Exhibition Center designed by Peterson and Brickbauer Architects as part of a downtown history campus; the Blaustein Center's restored cast-iron entry facade was salvaged from an 1869 fruit warehouse. In 1996, the Dr. Samuel D. Harris National Museum of Dentistry, featuring George Washington's false teeth

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Circle 38 on information card

and Queen Victoria's scalers, will open. Designed by Grieves Worrall Wright and O'Hatnick with Miles, Fridberg and Molinaroli, it occupies a 1904 building that once served as home to the University of Maryland's dental department.

More attractions are in the planning stages. Camden Station, an 1857 railroad terminal next to Oriole Park at Camden Yards, will be transformed by Cho Wilks & Benn and Cambridge Seven Associates into the \$10 million Babe Ruth Baseball Center. A Willy Wonka-style candy factory and museum is planned by Design Collective for construction inside a half-vacant market shed near the harbor.

The Center for Maryland History, by Grieves Worrall Wright and O'Hatnick, is under construction inside a former Greyhound bus garage. Local architects Ziger/Snead have designed a maritime museum for Baltimore's Fells Point area, housing nautical artifacts in a 19th-century horse barn.

Other proposed museums include

a medical museum, a \$1 million Civil War museum, an African-American museum near the Inner Harbor, the expansion of the Baltimore & Ohio Railroad Museum, and a \$12 million renovation of the Walters Art Gallery's 1974 wing. Cho Wilks & Benn has designed the Eubie Blake National Museum and Cultural Center, a shrine to Baltimore native Eubie Blake and other jazz greats.

Too many specialty museums in one city will have to compete for funding and patrons. Port Discovery, a \$30 million children's museum by Schwartz/Silver Architects of Boston with Walt Disney Imagineering, was supposed to begin construction in 1996. But the timetable has been pushed back because the museum is still raising funds.

Although some observers have questioned whether Baltimore's museum boom will become a bust, such doubts haven't dissuaded city planners and others from moving ahead with their individual projects.—*Edward Guntz*

## Ellerbe Becket's ADA Saga Continues

Ellerbe Becket is back in hot water over the Americans with Disabilities Act (ADA). The U.S. Department of Justice filed suit last month against the Minneapolis-based architect for allegedly designing six sports arenas that do not comply with the ADA. The suit, filed in U.S. District Court in Minneapolis, contends that Ellerbe's new arenas in Boston; Philadelphia; Portland, Oregon; Cleveland; Buffalo; and Washington, D.C., all violate the ADA by failing to provide disabled spectators with lines of sight comparable to those for other patrons. The suit seeks to bar Ellerbe from designing more stadiums with poor sight lines and also requests an unspecified civil penalty for any violations.

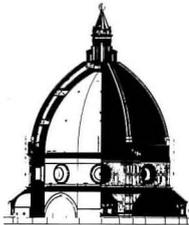
The Justice Department's suit, which follows eight months of failed settlement negotiations with Ellerbe, follows another suit brought against the firm earlier this year. In that case, the Paralyzed Veterans of

America (PVA) tried to block construction of Washington's MCI Center until seating plans were changed to accommodate people with disabilities (ARCHITECTURE, August 1996, page 41). The judge dismissed Ellerbe from the suit, maintaining that the ADA holds owners and operators of public facilities liable for violations. The AIA supported Ellerbe with a friend-of-the-court brief. The Justice Department filed a brief in support of PVA, whose claim against the MCI Center's owner is pending even though its case against the architect was thrown out.

Justice Department officials, however, stand firm in their quest to hold architects responsible for accessible design. "Architects are as well positioned as anyone to ensure that new facilities are designed [correctly] from the start," argues Assistant Attorney General for Civil Rights Deval L. Patrick. In a statement, Ellerbe contends that its goals were in line with those of the Justice Department, but "we will not stop any work in progress."—*B.A.M.*

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When architect Bill Becker redesigned this summer retreat in the Berkshire Mountains, the home's setting provided all the inspiration he needed. He used native wood and stone extensively. Fashioned the front porch supports from 8" logs. And for the north end of the home, which looks out over a lake to the mountains beyond, he created a wall of glass using windows and doors with custom-designed

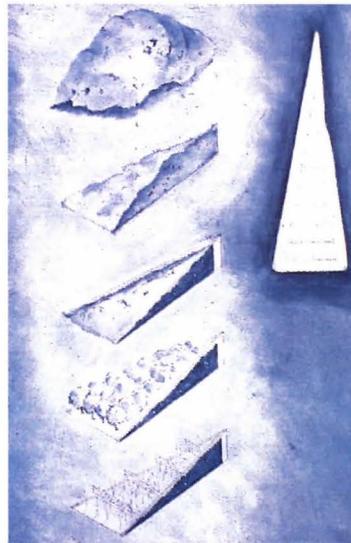
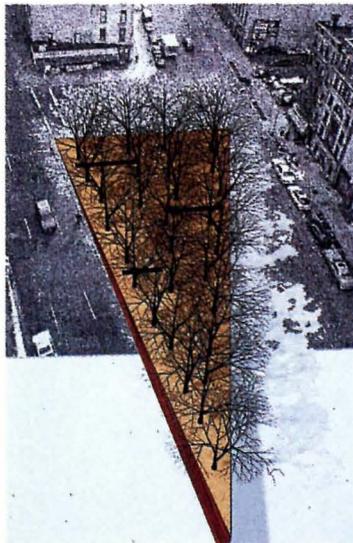
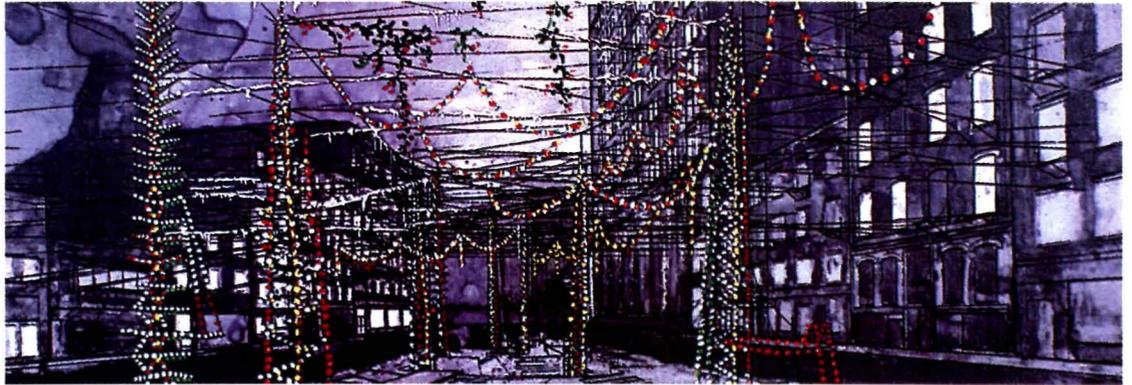
mullions that echo the shape of the surrounding pines. Who did he contact to supply these unique products? Bill Becker's search began and ended with one phone call. To Marvin Windows & Doors.

From Bill's drawings, the company produced three large fixed windows and eight doors, three of which open onto the deck. Marvin's ability to create these custom products inspired similar design elements in the home's interior, including a rustic stairway made from pine logs and branches. Still, as unique as they are, these aren't the only Marvin windows that figured prominently in the design.

To double the home's square footage without violating local zoning codes or overwhelming the surrounding cottages, Bill skewed the second level off the long axis of the first floor by seven degrees to create the illusion of a dormer. Marvin windows which step down in height help further the illusion. And to optimize their energy efficiency, these



*The Storefront for Art & Architecture holds a contest to revive a Manhattan park.*

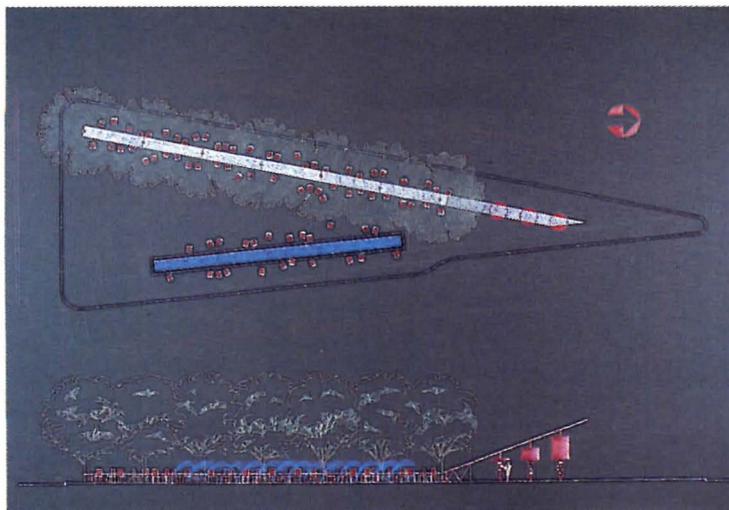


## Winners of New York Park Competition

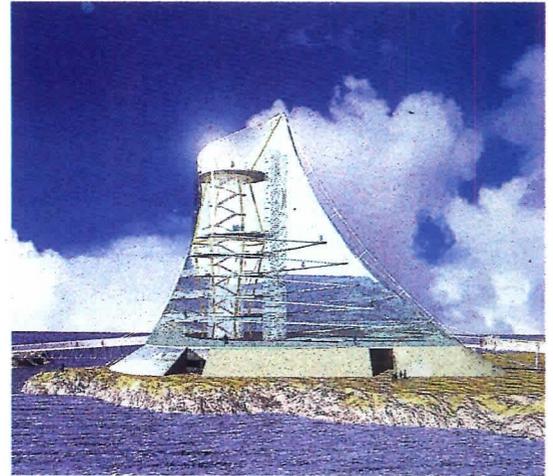
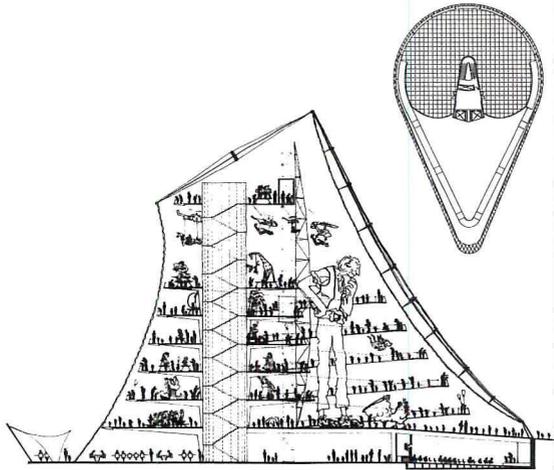
New York City's Storefront for Art & Architecture, an experimental nonprofit gallery and advocacy group, sponsored a design competition this summer with the Lower Manhattan Cultural Council to rehabilitate nearby Lieutenant Joseph L. Petrosino Park.

The jury, including architects Michael Sorkin and Billie Tsien, and designer Krzysztof Wodiczko, split three prizes of \$3,000 each between four entries. The scheme by Susan Wines and Azin Valy (top) creates a canopy of cables that stretch from building to building across the park. New Yorker Craig Abel's entry (bottom) incorporates a fountain, glass table, movable seating, and a kiosk. Projects submitted by Alberto Kalach, Ricardo Regazzoni, and Julio Gonzalez of Mexico City (center left), as well as by Patricia Owen of Studio E in Santa Monica, California (center right), propose tilting, landscaped planes. The jury decided to split a prize between the two, merging them into a single proposal for subsequent consideration.

A single project will be selected by City Council member Kathryn Freed, and then reviewed by city departments. Storefront hopes construction will begin next summer. Entries are on view at Storefront through November 15.—N.C.



## On the Boards



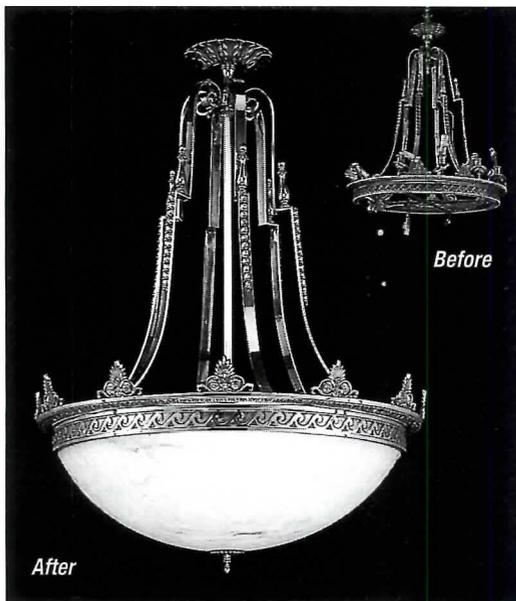
**Roald Dahl Arts Center  
Cardiff Bay, Wales  
Nicholas Grimshaw and Partners**

Roald Dahl, author of such children's books as *Charlie and the Chocolate Factory* and *James and the Giant Peach*, will be the subject of a museum designed by Nicholas Grimshaw and Partners in Dahl's birthplace.

The museum is the latest waterfront development on burgeoning Cardiff Bay and is sited in a waterside park on a peninsula of reclaimed land. The \$23.5 million museum will house interactive exhibits and virtual reality programs including a narrative of Dahl's life and displays on storytelling and illustration.

Tear-shaped in plan, the glass-clad

structure rises to form a curved, truncated cone approximately 175 feet above the water. Five exhibit floors cantilever from a service stair and elevator core, and are connected by ramps. Lobbies, ticketing, and retail are located on the ground floor, with an auditorium and café below. The project is scheduled for completion in 1999.—*N.C.*



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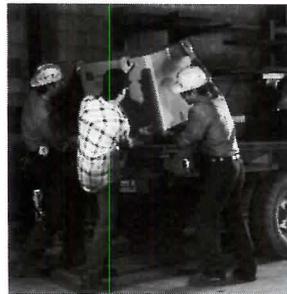
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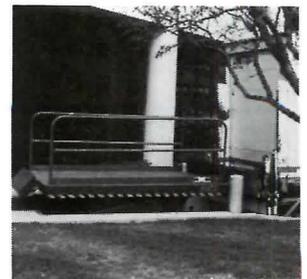
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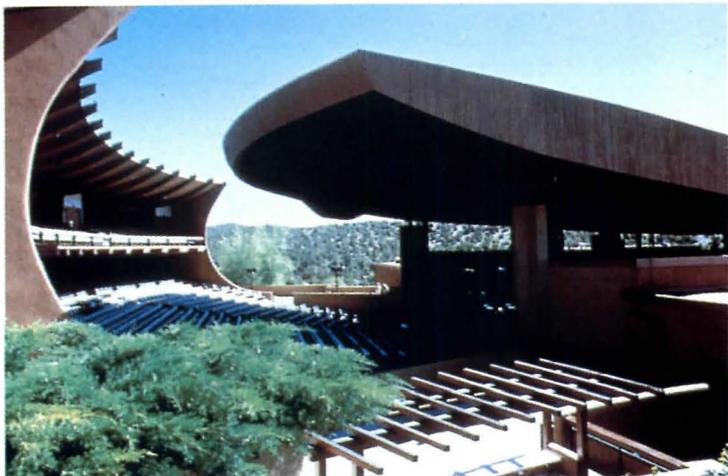
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**Santa Fe Opera**  
**Santa Fe, New Mexico**  
**Polshek and Partners**

Audiences of the renowned Santa Fe Opera have long been at the mercy of the elements, thanks to McHugh-Kidder's open-air design. Now Polshek and Partners is designing a long-overdo retrofit of the

28-year-old opera house, located in the foothills of the Sangre de Cristo mountains of New Mexico.

Polshek's scheme respects the original 1968 structure, where two curving roofs over the stage and auditorium are separated by a large gap. Two new roofs will replace the current stage and auditorium canopies, and will incorporate the existing



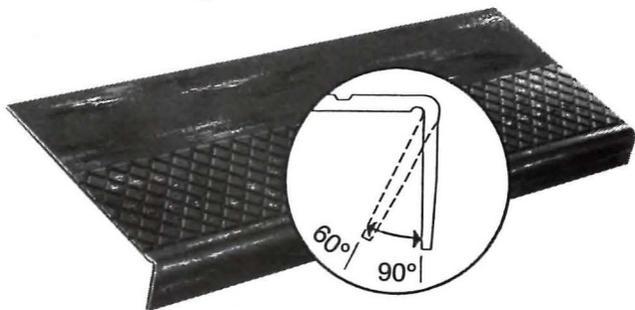
columns into a steel-ribbed, cable-stayed structure. The wooden forms will overlap, providing total cover for performers and audience alike. Their curving profiles were determined by acoustics—to deflect sound from the stage to the audience.

The renovation will boost the seating capacity from 1,880 to 2,166 by expanding the orchestra seating level

toward the back of the house. Terraces flanking the auditorium to the north and south will be enlarged to accommodate larger crowds before performances and during intermissions. A new entrance promenade sequence will incorporate a porte cochère, pergola, gift shop, and box office. Construction is scheduled to begin next August.—N.C.

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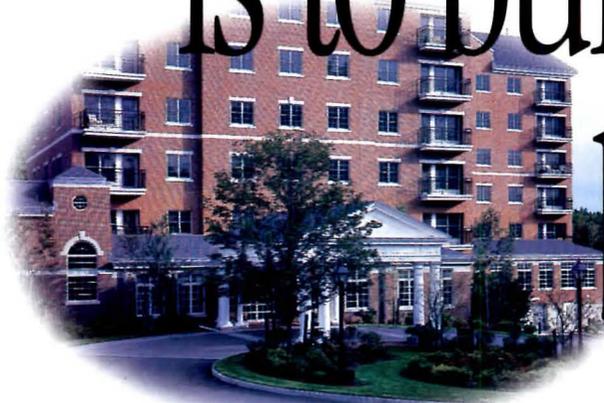
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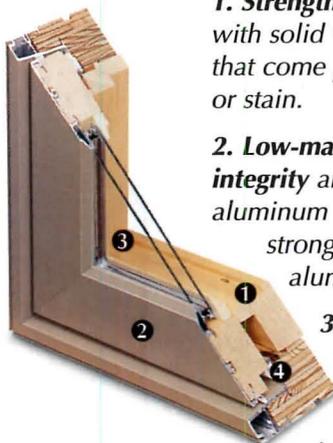
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*A bland, boxy superstore turns out to be a super failure.*



STYLELESS IN SEATTLE: Bland facades and strip mall detailing squander important urban site.

## Retail Rudeness Offends Downtown Seattle

A few paces from Nordstrom in downtown Seattle, the new Meridian West building, home to Nike-town and Planet Hollywood, insults the streetscape with an enormous box that rudely squats on its corner. This site, at Sixth Avenue and Pike Street, is surrounded by fine examples of retail architecture that the new center might have emulated. Across the street is the 1920s Beaux-Arts-style Decatur Building with buttery terra-cotta trim and delicately detailed storefronts. Across the intersection is F.A.O. Schwarz, designed by the Callison Partnership with an urbane rotunda.

Instead of picking up these obvious cues, the Meridian West building seems to have been inspired by a parking garage. Four stories of

blandly sculpted precast panels extend from a ground-level row of equally banal, off-the-shelf storefronts. Only the knife-edge entrance into Niketown breaks from this otherwise featureless facade.

The new building is loaded with awkward details. The joints of the panels on the upper stories do not align with the storefront modules below. The canopy slopes disconcertingly downward, ensuring that pedestrians will be splashed with rainwater. They won't fare any better if they stay close to the building; there is a two-foot gap between the canopy and the building face.

Meridian West practically invites disrespect. Planet Hollywood's huge sign is not centered within any module of the new building's facade. The restaurant's retail store has covered its portion of the canopy with a pink and green zebra-striped

awning. Nike, a company with a reputation for good design, should be embarrassed to be occupying this sad example of urbanism.

It is unclear just who is responsible for this disastrous result. BOORA of Portland, Oregon, which has designed fine schools and community centers throughout the Pacific Northwest, is the architect for Nike-town, and Curtis Beattie and Associates of Seattle is in charge of the box behind it. According to some local architects, the developer, Minneapolis-based TOLD Company, sought a design team that would not question the company's approach or press for too much architecture. And TOLD had its way. The result is a missed opportunity for a prime downtown site.—Mark L. Hinshaw

*Mark Hinshaw, an urban design consultant, writes for The Seattle Times.*



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## But What Does It Mean?

*Turgid, arcane writing is the most vulnerable chink in an architect's professional armor.*

Eleanor Roosevelt once said, "You always admire what you really don't understand." Here, as in other matters, the former First Lady attracted controversy, but the germ of truth her words contained should not encourage those in our profession who believe that the more impenetrable the prose, the more important the message.

There's little in the architect's long, costly education to prepare him or her to deal adeptly with the host of written products required in everyday practice. The list includes proposals, program statements, client correspondence, internal project and staff memos, promotional material, project-related reports, correspondence with code and zoning groups, written contacts with community groups, and articles for the media. In each case, clarity or confusion can spell the difference between retaining or losing a client.

Poor writing is widespread, serious, persistent, damaging, and not on any visible road toward improvement. The architect's education tends to reward design proficiency at the expense of the written word. An admittedly unscientific survey of U.S. architectural school curricula revealed, in their statements of philosophy, a mere handful—16 out of 100—with even a glancing reference to the value of verbal literacy as a tool of practice. The only cogent statement came from the University of Tennessee at Knoxville. There, the school of architecture requires projects in its graduate programs to be "clearly articulated in verbal and graphic form, reflecting intellectual depth and rigor consistent with [graduates'] future professional responsibilities." Amen! More often, when the bright light of practice shines on the professional, he or she often lacks the tools to speak or write clearly. Most critical is the damage caused by turgid architectural prose or oral presentations aimed at those whom architects should make an extra effort to cultivate—namely, the client and the public.

The architect's language consists of technical vocabulary and jargon. Do not confuse

the two. Every profession has the right to its technical vocabulary. But there's a difference between using "decibel," "emissivity," "floor plate," and "flashing" and such jargon clunkers as "activating axiomatic topologies of non-nomadic tribal elements" and "elevated paradigms for action." (The wording has been altered slightly to protect the guilty.)

Some of our schools need to set a better example, too, and avoid such chestnuts as: "The themes...include...the role of contextualism versus disruption or critique; the relation between architecture and 'event'; the notion of environmental determinism with regard to social practices; the possibility of oppositional urban space; and the emancipatory potential of architecture." Very often, the message is obscured not because the authors fail to write clearly, but because they seem not to know what message they are trying to impart.

There's a direct link between clear written language and clear speech: a lucid written proposal makes for a more lucid presentation. Here, too, it's time to raise the clarity level. Yet, presenters have been known to deliberately pepper their pounds of message with a few ounces of mystery, figuring that such posturing will impress the selection committee. The technique has been known to work, but it's risky. I recall speaking with the principal of a small southern firm, who complained of out-of-town architects who throw out esoteric jargon at job interviews to impress clients. (He cited the case of such a firm that used liberally the term "colliding volumes" in trying—unsuccessfully, it turned out—to dazzle a committee.) The reality is that selection committees and citizen review boards, especially for local projects, are often made up of store owners, homemakers, service station managers, and other local citizens who have a lot of common sense but little exposure to architectural jargon. Wrapping a clear message in a blanket of obscurity hurts not only the architect, but also the whole profession.

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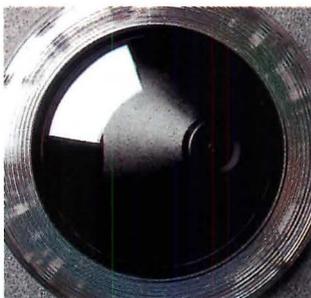
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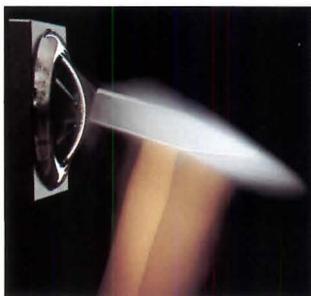
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## Opinion

In the end, architectural prose either sings to you, or it's gobbledygook. Over the years, experts have sought to apply measuring sticks to written language. The late Robert Gunning's Fog Index, for example, rewards short words and short sentences. His formula calls for computing the number of words with three or more syllables per randomly chosen 100-word passages of text, determining the average number of words per sentence, adding the two, and multiplying by 0.4. This formula yields an index that supposedly measures the number of years of education a reader requires to understand the text.

At last count, *People* magazine's index hovered around age 12, and a random sampling of recent issues of the two U.S. national architectural journals revealed a Fog Index range of 15 to 20, with *Metropolis* magazine a couple of points lower. A score of 20 is pushing the limits—it presumes 12 years of precollege and eight years of college education—a rare event.

Architectural journalists are paid to communicate. The best of them produce clear prose and carefully considered opinions. Others are often tempted by prolix phraseology from architects, or they invent their own. As an editor, I recall heading off at the pass the delicious allusion in a manuscript to "iconographic roots," a term that, I pointed out to its writer, seemed to connote a new species of radish.

Writing by academics, too, contains its share of turgid prose. Academics serve as highly visible role models for the practitioner and student. Writing with clarity is not always easy for them, since architectural theory tends not to lend itself to simple thoughts and well-oiled phrases. (Although scholars such as Reyner Banham, Vincent Scully, and Geoffrey Scott have nevertheless succeeded in demystifying theory.) On occasion, clarity is muddled by the invasion in architectural lingo of jargon from other disciplines, such as the literary criticism-studded language of Jacques Derrida and the Deconstructionists.

In the era of the Information Highway,

communicating on-line is a routine phenomenon. E-mail demands a special style—spartan, but without reading like Western Union telegraphese; closer, perhaps, to the style of the great Roman historian Tacitus, a favorite with generations of high school students for his tightly organized, pithy, and information-packed prose. Composing a web site likewise calls for a special approach, in which methods of linking text can count for as much as the texts themselves.

The battle for clarity is not helped by the current fad of co-opting the term "architect" to apply to any creative function, from "architect of the universe" (God), to "architects of détente" (politicians), to "architects of XYZ Company's revival" (entrepreneurs). Pervasive use of the term "architecture" when referring to the configuration of computer hardware also tends to confuse readers.

The purpose of this article is not to give a lesson in clear writing, but to point out that the challenge is critical. In the final count, architects can achieve clarity by listing the points they want to make, arranging them in the right order, using short words and short sentences, and making paragraphs that aren't so long that the reader has to come up for air. Avoid stylistic acrobatics. It's better to be clunky and clear than elegant and murky.

Architects need verbal literacy to win clients and commissions in a competitive national and global marketplace. The schools, the critics, the journals, and the professional societies all have a responsibility to teach architects this skill. Not for nothing did a certain Texas senatorial candidate, in a campaign famous for its confusion of issues, print and distribute bumper stickers bearing the message, "Eschew Obfuscation." I'm not sure whether the slogan raised the level of the political campaign, but it surely captured the message. —*Stephen A. Kliment*

*Stephen A. Kliment, FAIA, the former editor of Architectural Record, writes, teaches, and consults on architecture.*



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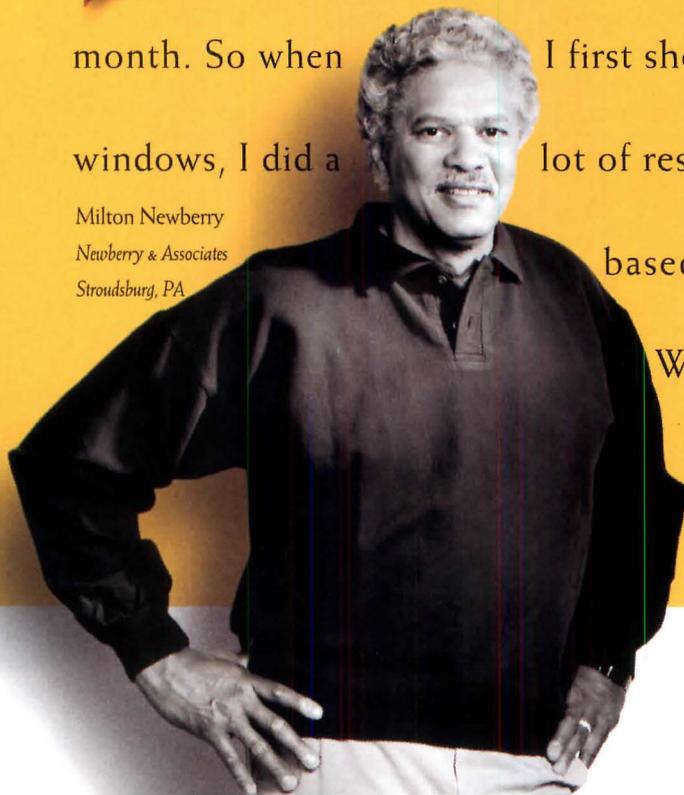
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## BUILDINGS FOR THE ARTS

The crown jewels of civic infrastructure—museums, performing arts centers, and other arts-related buildings—are symbols of cultural achievement intended to galvanize community pride and identity. Increasingly, cities view such arts institutions as engines of economic growth, magnets for tourism, and even agents of urban renewal. In Saint Paul, for example, the Minnesota Children's Museum, designed by James/Snow Architects, is a lively, family-oriented educational center that is helping a tattered section of downtown to mend. Cesar Pelli's new Aronoff Center for the Arts similarly strengthens downtown Cincinnati with an urbane, contextual facade, and three theaters dramatic enough to rival the productions held within them. At Two Rivers Landing, in Easton, Pennsylvania, the success of Schwartz/Silver Architects' museum and discovery center owes as much to the positive effect of the building on the life of its community as it does to the design. Thanks to its enormously popular Crayola Factory, the project is luring more than 250,000 visitors each year to the city of 25,000, and almost single-handedly sparking renewal in an all-but-abandoned downtown. Several of the other buildings presented in this issue, including Richard Meier's Museum of Television and Radio in Beverly Hills, and Houston's new Holocaust museum, by exhibit designer Ralph Appelbaum and architect Mark Mucasey, breathe new life into buildings that outlived their usefulness. Finally, at Williams College in Williamstown, Massachusetts, the next generation of visual artists is developing in a new facility designed by Houston-based Carlos Jimenez. This elegant, understated building should teach students not only about the importance of the arts, but also about the importance of good architecture.



**Minnesota Children's Museum**  
St. Paul, Minnesota  
James/Snow Architects with  
Architectural Alliance, Architects

**THESE PAGES:** Red brick along main facade of children's museum evokes warehouses along the Mississippi. Ocher and purple were chosen to avoid primary colors, a cliché in children's design. Glazed towers on either end mark galleries.

## KID CITY

It's tough being a kid these days. Fewer children grow up in two-parent households; more kids are poor. Even if they are lucky enough to be middle class, American kids—like their parents—are experiencing more stress, with less time and fewer safe places for what they need to do most—play.

As a result, family-style amusement parks, pay-for-play venues like Discovery Zone, and child-oriented museums have burgeoned over the last five years. Among museums, children's and science museums are growing the fastest, with 36 new children's museums opening across the United States since 1990. Although these institutions generally inhabit renovated warehouses, new buildings are currently on the boards for Bettendorf, Iowa;

Muncie, Indiana; and Richmond, Virginia.

One of the newest and most innovative, both in its exhibits and its architecture, is the Minnesota Children's Museum in the urban heart of St. Paul, Minnesota. Designed by an architect team headed by Vincent James of James/Snow Architects (now Vincent James Associates), in collaboration with Thomas J. DeAngelo of the Architectural Alliance, the building is located just a few blocks from Cass Gilbert's state capitol and the expanded Minnesota Judicial Center (ARCHITECTURE, November 1991, pages 80-87) in a gritty urban core along West Seventh and Wabasha streets. This marginal site, across from a bus station, soup kitchen, and juvenile detention center, has seen its share of drug traffic—



hardly the neighborhood to host a giant civic playground. But the city of St. Paul offered a \$3 million incentive package to the museum, originally housed in a downtown warehouse, to stay in the city. It also proffered the tax-free million-dollar site and built a skyway to an existing parking garage. "Our urban location is part of our persona," explains Museum Director Ann L. Bitter. "We serve all children, but especially urban children."

Inserting a pavilion for children into this seedy area presented the architects with a major challenge. Their response was to avoid the introverted "black box" strategy of museum design in favor of revealing the building's contents to the street. A museum store, administrative offices, and an auditorium on

the ground level—and galleries on two stories above—are arranged in a C-shaped plan embracing three stories of glazed lobbies. These open, light-filled lobbies, connected by a dramatic, treehouse-like stair, face northwest along West Seventh Street, a major St. Paul thoroughfare.

The lobbies serve as a gathering place for ticketing on the first floor and a vortex where museum staff, jugglers, and performers entertain kids on the floors above. The galleries, too, are partly glazed on the museum's east and west ends—as much as the museum's exhibit designers would allow. The windows reveal eager children and colorful exhibits to passersby. Explains Vincent James, whose firm recently won the commission for the



**ABOVE:** Glazed core of museum's three lobbies overlook West Seventh Street in urban St. Paul. Round cut-out windows symbolize thematic galleries, referred to as "worlds."

**FACING PAGE, LEFT:** Aluminum "magnifying glass" is designed to be motorized and rotate over opening, creating crescent-moon window. Steel pinnacle (left) is designed as tower's focal point, with motorized spinning "top" at apex.

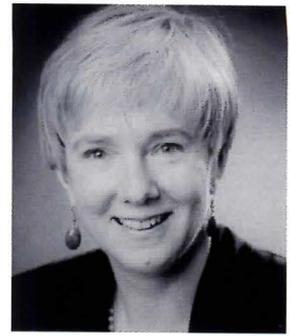
new children's museum in Richmond, "Our metaphor for the museum's design was an open toy box, its contents spilling over."

Since the museum's six galleries open onto these bright lobbies, they provide a convenient meeting place, easy to find because of the light. Galleries have only one door for both entrance and egress. Parents and teachers can allow children to explore the galleries without fear of losing them.

Inside, the museum tailored its imaginative, low-tech, hands-on exhibits (pages 92-93) to specific age groups, from 6-month-old infants to 10-year-old grade-schoolers. To develop the content of these exhibits, the museum solicited ideas from focus groups, which were held to determine what kids and their parents wanted to see. Then the museum staff assembled four teams comprising an eclectic mix of educators, set designers, carpenters, artists, and mechanical engineers to interpret what they learned from parents

and children. For example, many adults thought the museum should include an environment "where they could be with their kids and learn how to love the earth," recalls Bitter. The result is the Earth World gallery, which includes a balcony where children "create" a thunderstorm. A 6-year-old was recently heard shouting, "People! Look! I'm moving the clouds!"

James and DeAngelo wanted to keep the museum equally lively at street level, while still providing skyway access from nearby parking garages. (Although the Twin Cities' skyways protect urban visitors from Minnesota's frigid winters, they have a way of creating second-story lobbies that suck the life off the streets.) The architects solved the problem by pulling the entrance back from the street to accommodate a drop-off plaza for school groups, thereby ensuring that the front door will be busy throughout the school year. While smaller groups may enter



#### DIRECTOR'S REPORT

Director Ann L. Bitter, a driving force behind the success of the museum, explains the institution's mandate: "making kids feel happy, and giving them power."

Bitter strives for kids' empowerment through exhibits that place them in charge: a city bus, which they "drive"; a grocery store, where they operate the cash register; a thunderstorm, where they control the clouds. There are no elaborate instructions or signage, just lots of cranks, magnets, wheels to turn, inviting exploration, discovery, and a sense of accomplishment. The exhibits have a homemade, low-tech quality: Instead of audiovisual displays with push-button screens, there are cranes and locks to operate, paper to recycle, and a giant ant hill to navigate. All were designed by the Minnesota Children's Museum staff, with help from set designers, giving the four main galleries a theatrical yet playful quality. "When you turn over exhibit design to a museum exhibition company, you lose a certain amount of control," explains Bitter. "We were trying to invent something that no one had ever done before." (Where, indeed, do you find an ant hill designer?) "If you have a clear idea of the kind of experience you are trying to create," the director continues, "you're best off trying to execute it yourself."

The big challenge for architects designing children's museums is to stay away from generic, clichéd experiences—little doors, primary colors, playgroundlike equipment. Bitter, whose résumé includes fundraising for the Minneapolis Sculpture Garden at the Walker Art Center and a vice presidency at the nearby Science Museum of Minnesota, credits architect Vincent James with designing an inventive building that not only encourages such originality, but is also welcoming, sophisticated, and doesn't talk down to kids.

from a skyway at the northeast end of the building, a glazed stair brings them down to the first floor lobby level.

A few design elements remain unresolved. Several galleries are two stories high—too tall for the child-oriented exhibits they contain. However, they are intended to allow the institution to add fourth-level floors in these spaces, creating more galleries as soon as it can afford them. And a courtyard at the building's west end is accessible through a locked gate off the sidewalk, rather than from the plaza or lobby. This awkward connection makes it less likely that the pleasant, grassy courtyard, visible through a high fence topped with sculptures of animals, will be used. The building also backs onto a 1970s-style pedestrian mall that has seen better days; a boarded-up 1920s theater affords the block behind the museum a feeling of disuse and decay. If the city could have found a way to connect the Children's Museum to this mall,

it might have revived this sad passageway.

There are plans for reviving the Wabasha Street corridor, including reopening the pedestrian mall to through traffic. More importantly, Minnesotans have responded well to the colorful, friendly museum, whose glass facade recalls another St. Paul favorite, the Ordway Theater, located a few blocks away. Although the Children's Museum competes with the Mall of America in the nearby suburb of Bloomington (an indoor amusement park, wildlife shows, and a recently opened underground aquarium are big draws for kids), visitation is expected to double what it was when the old museum closed, reaching 400,000 by the end of 1996. These visitors shop and lunch at downtown establishments, transforming a marginal intersection into a vital commercial zone. The museum's animated interface with its city is responsible for this vitality, and is just what the city of St. Paul bargained for.—Heidi Landecker



**MINNESOTA CHILDREN'S MUSEUM**  
ST. PAUL, MINNESOTA

**ARCHITECTS:** James/Snow Architects with Architectural Alliance—Vincent James (design principal, James/Snow) Thomas DeAngelo (principal-in-charge, Architectural Alliance); Jerry Hagen (project architect); Joan Soranno (project designer); Yinsze Lam (design team); Doug Coffler, Maria Hanft, Yinsze Lam, Michael Sheridan, Krista Scheib, Julie Snow, Joan Soranno (project team)

**LANDSCAPE ARCHITECT:** Damon Farber Associates

**ENGINEERS:** Meyer Borgman & Johnson (structural); Michaud Cooley Erickson (mechanical, electrical)

**CONSULTANTS:** Schuler and Shook (lighting design); Jaffe Holden Scarbrough (acoustics); CBA (owner's representative); Pentagram (graphic design)

**GENERAL CONTRACTOR:** Knutson Construction

**COST:** \$6.5 million

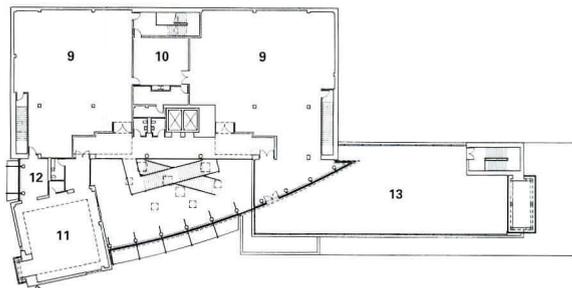
**PHOTOGRAPHER:** Don Wong

**ABOVE:** Vincent James designed lobby's colorful mural and "lollipop" light fixtures. Stair incorporates two railings to accommodate small and smaller people.

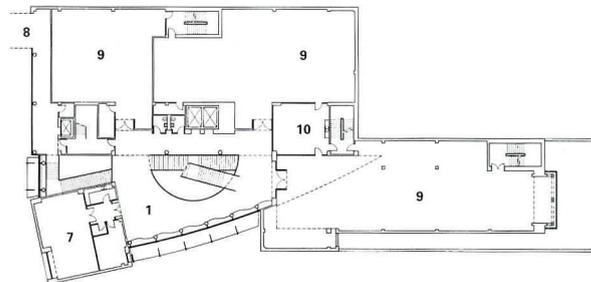
**PLANS:** Galleries on levels two and three embrace central open space, where performers and museum staff entertain kids. On level one, lobby is bracketed by museum store, auditorium, and administrative wing.

**SECTION:** Double-height galleries (right) allow for insertion of future levels.

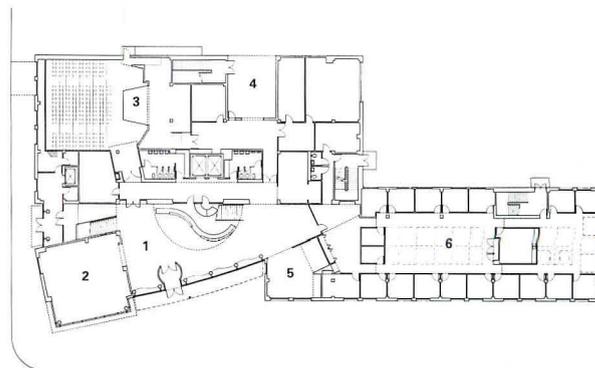
**FACING PAGE:** Curved reception desk leads visitors to dynamic birch stair. Museum graphics are by Pentagram.



**THIRD FLOOR PLAN**

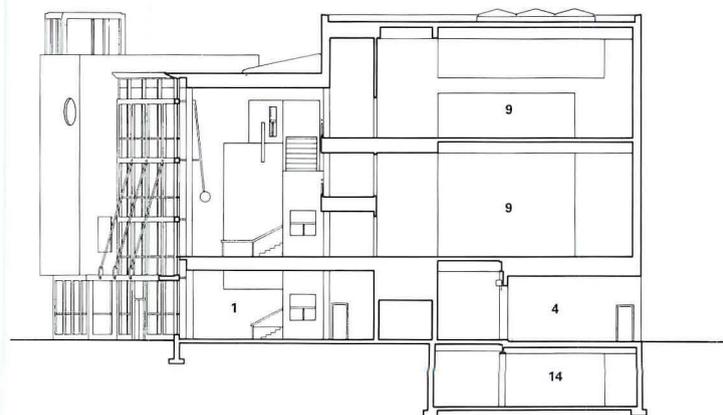


**SECOND FLOOR PLAN**



**GROUND FLOOR PLAN**

26/7.7m



**NORTH-SOUTH SECTION**

13/3.7m

- |                |                             |
|----------------|-----------------------------|
| 1 LOBBY        | 8 SKYWAY                    |
| 2 MUSEUM STORE | 9 EXHIBIT SPACE             |
| 3 AUDITORIUM   | 10 CLASSROOM                |
| 4 SERVICE BAY  | 11 EARLY CHILDHOOD EXHIBITS |
| 5 LUNCH ROOM   | 12 PARENTING SUPPORT        |
| 6 OFFICES      | 13 ROOF GARDEN              |
| 7 BOARD ROOM   | 14 EXHIBIT FABRICATION      |



The Minnesota Children's Museum exists to provide fun, interactive learning experiences for children and families who come together to discover and explore the world around them through exhibits and programs in the arts, sciences and humanities.

Tickets

Minnesota Children's Museum  
5  
4  
3  
1

Minnesota Children's Museum

Minnesota Children's Museum

CREATIVE KIDSTUFF



**ABOVE: WATERFALL AND WATERWORKS**

In World Works gallery, children can operate locks and direct water through channels along varying levels, ultimately turning water wheel. The gears of the waterwheel also operate fans that move metal screen, creating “thunder.” Raincoats offer protection but are rarely worn.

**BELOW: MAKE A THUNDERSTORM**

Children steer clouds across upper realm of Earth World Gallery. When clouds unite, giant fabric “thundercloud” emerges and “lightning” is activated. Exhibits such as this one shy away from instructions, allowing children to achieve results through collaboration and exploration.

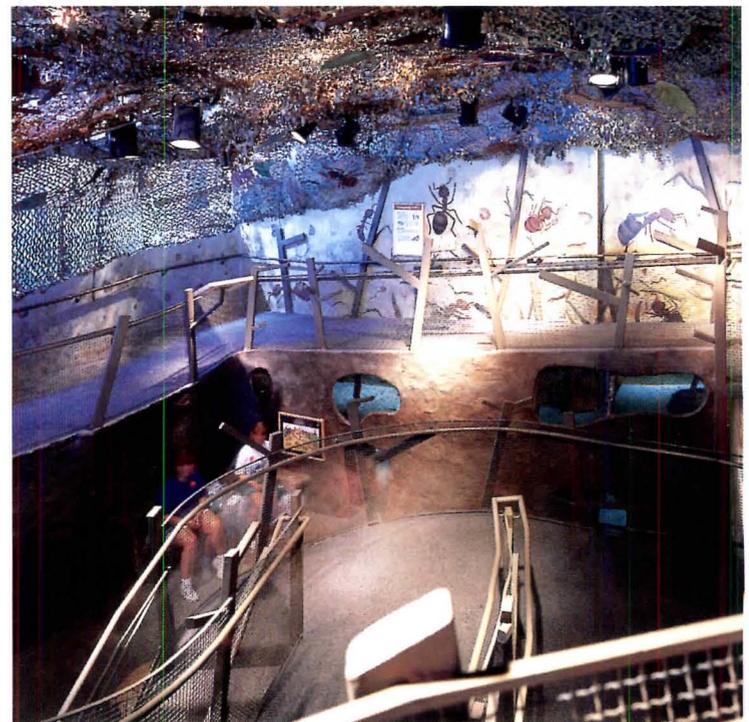
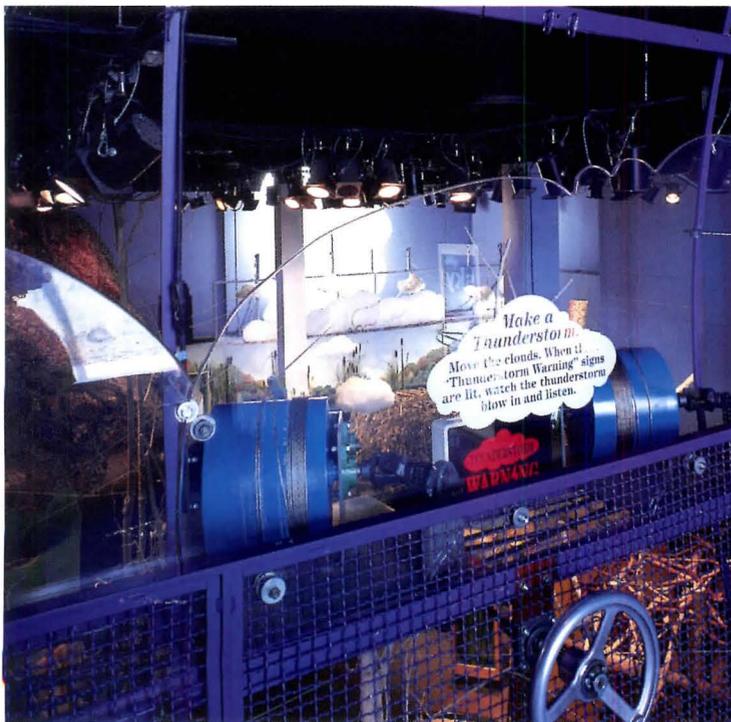


**ABOVE: RAMPS AND RACEWAYS**

In one of two temporary galleries, exhibit designed by Minnesota Children’s Museum staff allows children to explore gravity and physics using golf balls and ramps. Two-story-high room dwarfs exhibit area but permits installation of another gallery above, the museum’s eventual goal.

**BELOW: ANT HILL MAZE**

All children’s museums have labyrinths, which are designed to teach way-finding and independence. Minnesota Children’s Museum staff designed its labyrinth as a giant ant hill, where children can don ant costumes and crawl through convoluted burlap-clad corridors and tunnels.





**ABOVE: HABITOT**

Minnesota Children's Museum incorporates unique gallery for children ages 6 months to 2 years. Exhibit is partitioned into different "natural areas" designed for skills of different age groups. Screen on outside of round window moves gradually over glass, creating a thumbnail slice of light.

**BELOW: PLAYING TOGETHER**

Travelling exhibit designed by the Memphis Children's Museum comprises board and card games from all over the world. Parents and children are encouraged to play the games to learn about other cultures. Round windows at rear of gallery accentuate global theme.



**ABOVE: ONE WORLD GALLERY**

Intended to emphasize multiculturalism, One World includes a *mercado* where children act as grocery cashiers or shoppers. Although museum visitation is currently 86 percent Caucasian, museum staff have a mandate to attract diverse audience through multicultural exhibitions and sliding fees.

**BELOW: WORLD WORKS GALLERY**

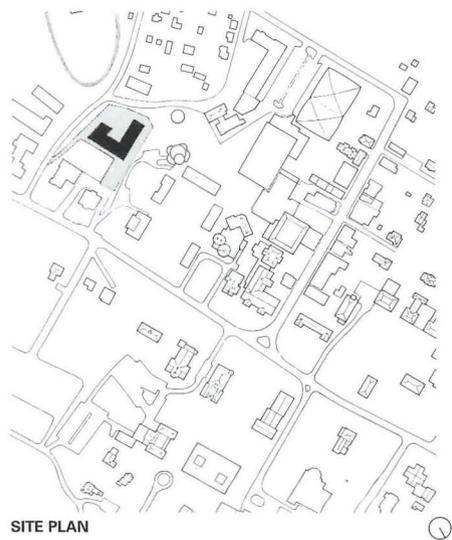
Popular pin screen (right) allows visitors to make temporary impressions of hands, faces, and sometimes, whole bodies. Mural depicts all people who had a hand in building the exhibits in World Works Gallery, which includes woodworking, waterwheels, and a paper recycling "plant."





**W.L.S. Spencer Studio Art Building**  
 Williams College  
 Williamstown, Massachusetts  
 Carlos Jimenez Studio, Architect

# FINE ARTS FACTORY



SITE PLAN

The best art studios combine the freedom of exploration with the discipline of production. Houston architect Carlos Jimenez has captured both qualities in his design of the W.L.S. Spencer Studio Art Building at Williams College. With its large industrial windows and simple detailing, the Spencer is unmistakably a place for making art. Into its 40,000 square feet, Jimenez has incorporated studios, labs, classrooms, a gallery, and a handful of faculty offices. Instead of being scattered across town in garages, lofts, and dank basements, Williams art students finally have a place to call their own.

Art is no peripheral pursuit at Williams. In addition to painters, sculptors, and filmmakers, the school has produced its own

mafia of museum directors that includes the current heads of the National Gallery of Art, the Museum of Modern Art, the Brooklyn Museum, the San Francisco Museum of Modern Art, and the Guggenheim Museum.

A studio art building had been discussed for 20 years before the college finally found a donor and, through a rigorous competition, an architect. The selection committee had been particularly impressed by Jimenez's Fine Art Press in Houston (1987), another art factory of simple forms, inexpensive industrial materials, and the rich, balanced light that studios require. They wanted the spirit of that building transferred to an academic setting.

Jimenez's preliminary design for Williams's \$5.4 million studio building was a sweeping



semicircle with a discrete entrance tower and a line of trees screening out the main street. While the form expressed the irregular curving site, it confused the building's relationship to the rest of the campus. The courtyard, a faculty requirement, ended up on the frigid north side of the building.

Over the next several months, Jimenez revised his initial scheme into an L, and then into a compact J, with a series of vaulted and sloping copper roofs. The entrance, framed in a painterly red sandstone and tucked into the base of the long west wing, now marks the intersection of several key campus paths, including one leading up the hill to Charles Moore's Williams College Museum of Art. The wing helps enclose an interior courtyard

where students can draw and schmooze. On the north, where the building faces a drive-in bank and a row of nondescript commercial structures, Jimenez inserted clerestories to give students views of sky and mountains instead of windshields and ATMs.

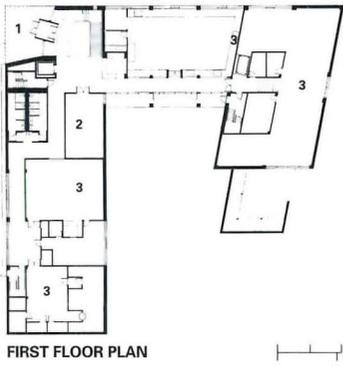
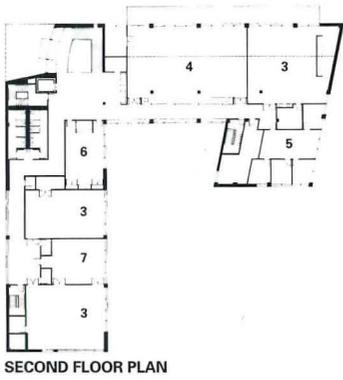
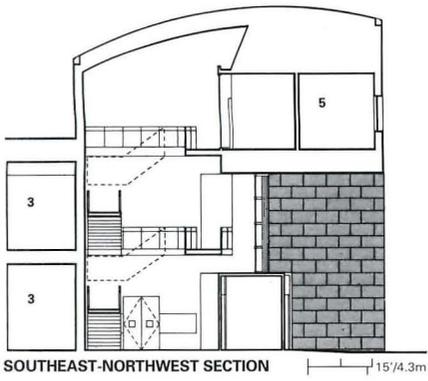
Like most of Jimenez's work, the Spencer emphasizes details over formal invention. The concrete block exterior may be a bit too tanned for the Berkshires, but the combination of copper sunscreens and textured sandstone trim around the windows and doors gives the facade scale and a touch of luxury.

Inside, the building is open and fluid. The tall, airy painting and drawing studios would make anyone want to pick up a brush or pen. Interior windows allow visitors to observe the

**FACING PAGE, TOP:** Spencer art building responds to a tight sloping site, bordered by fringe of parking lots and commercial buildings.

**FACING PAGE, SITE PLAN:** Jimenez configured art studio as a J, to create more space on the west plus an interior courtyard. New building is located to east of Williams's main campus.

**ABOVE:** Copper visor shields north-facing studios from direct sun, and frames views of the nearby Berkshire hills.



- 1 ENTRANCE
- 2 GALLERY
- 3 STUDIO
- 4 MULTIPURPOSE STUDIO
- 5 OFFICE
- 6 SEMINAR ROOM
- 7 CRITIQUE ROOM





studios without disturbing the artists. Jimenez also overscaled the corridors so that they can serve as galleries and pin-up spaces.

Surfaces throughout are industrial-strength steel, concrete, and wood that should withstand saws, solvents, forklifts and other routine physical abuse. The one oddity, given the school's concern for flexibility and the architect's roots in Houston, is the omission of air-conditioning. Is this some new manifestation of Yankee self-denial, or merely an oversight?

The most exhilarating feature of the Spencer Studio Art Building, and the clearest connection to Jimenez's other work, is its daylighting. Jimenez speaks of light as one of his most essential architectural tools, "the one that offers the most potential for exploring architectural space." He compares making space to getting inside a camera and creating apertures to balance north light and south light, morning and evening.

In the Fine Art Press, the 37-year-old ar-

chitect modulated the intense Houston light so skillfully that artificial illumination is often unnecessary. In the Spencer art building, he handled the subtler New England version, with its delicate grays, blues, and purples even better. The light is soft and even, without glare or distracting shadows. It makes the building feel open and transparent, as though only the thinnest membrane separated inside from outside.

Open only a few months, the Spencer Studio Art Building has already received rave reviews from students and faculty, who feel that at last Williams has recognized the community of artists within its community of scholars. "They consider the building a validation of what they do," explains Ed Epping, a professor of art and head of the building committee. "The building has exploded with art; every wall is covered. And you see the students feeding off one another in ways that never happened before." —*David Dillon*

**FACING PAGE, TOP:** Main entrance combines crisp industrial details with textured red sandstone.

**FACING PAGE, BOTTOM:** Large operable studio windows and spare details, including sandstone trim, emphasize building's functional qualities.

**FACING PAGE, SECTION:** Northwest corner contains main circulation. Key campus paths converge at entrance.

**FACING PAGE, PLANS:** Large studios are clustered in east wing, offices and classrooms in the west. Overscaled corridors double as galleries.

**ABOVE:** Wings frame outdoor courtyard for drawing and reflection. Corridor leads from lobby to studios and faculty offices.

**W.L.S. SPENCER STUDIO ART BUILDING  
WILLIAMS COLLEGE  
WILLIAMSTOWN, MASSACHUSETTS**

**ARCHITECT:** Carlos Jimenez Studio, Houston—Carlos Jimenez (designer); John H. Bowley (project architect); Robert Fowler; Eric Batte; Mason Wickham; Joaquin Diz (project team)  
**ASSOCIATE ARCHITECT:** Cambridge Seven Associates, Cambridge—Dick Tuve, Bob Galloway (project architects); Melissa Douglas (project team)  
**LANDSCAPE ARCHITECT:** Carol R. Johnson & Associates  
**ENGINEERS:** John Born Associates (structural); Luchini Milfort Goodell & Associates (mechanical, electrical, plumbing); Vincent P. Guntlow (civil)  
**CONSULTANTS:** Daedalus Projects (cost); Michael McCann (industrial hygienist)  
**GENERAL CONTRACTOR:** Aquadro & Cerruti  
**COST:** \$5.6 million  
**PHOTOGRAPHER:** Timothy Hursley



**ABOVE RIGHT:** Main staircase, connecting all three floors, has become a popular place for student installations.  
**RIGHT:** Tall, spacious drawing studios look out on trees and hills instead of parking lots.  
**FACING PAGE:** Sculpture studio on first floor has the look and feel of a garage, with rollup doors and exposed grids and ducts.







**Museum of Television  
and Radio**  
Beverly Hills, California  
Richard Meier and Partners

**THESE PAGES:** Museum presents its travertine-clad public face to east, with entrance rotunda and staircase promenade (right) behind sunscreen.

## BROADCAST NEWS

Rational and sumptuous, the Museum of Television and Radio in Beverly Hills is classic Richard Meier. The architect's signature white metal panels, gridded sunscreens, and glassy expanses are all in evidence here, as is travertine, a material that distinguishes his sprawling Getty Center to the northwest, and Pei Cobb Freed & Partners's sleek headquarters for the Creative Artists Agency a few blocks away from the museum.

Like its neighbor, Meier's museum injects a note of high culture into the tony commercial center of Beverly Hills. His refined architecture declares that the popular world of television and radio is a serious art form worthy of its own pantheon. It's a statement consistent with the Museum of Television

and Radio's 16-story Philip Johnson-designed tower in New York, completed in 1991. The museum's Los Angeles branch expands its public outreach, allowing access to the same storehouse of radio and television programs in East and West Coast locations.

Meier's design, undertaken in his Los Angeles office with Partner Michael Palladino, reflects the urbanity of the architect's recent buildings in Europe (ARCHITECTURE, February 1996, pages 65-107). Fine-tuned to the low-rise scale of Beverly Hills, where the height limit stands at 45 feet, it establishes a dignified, institutional presence that clearly stands apart from the mundane commercial buildings of this district.

The three-story structure, located at the

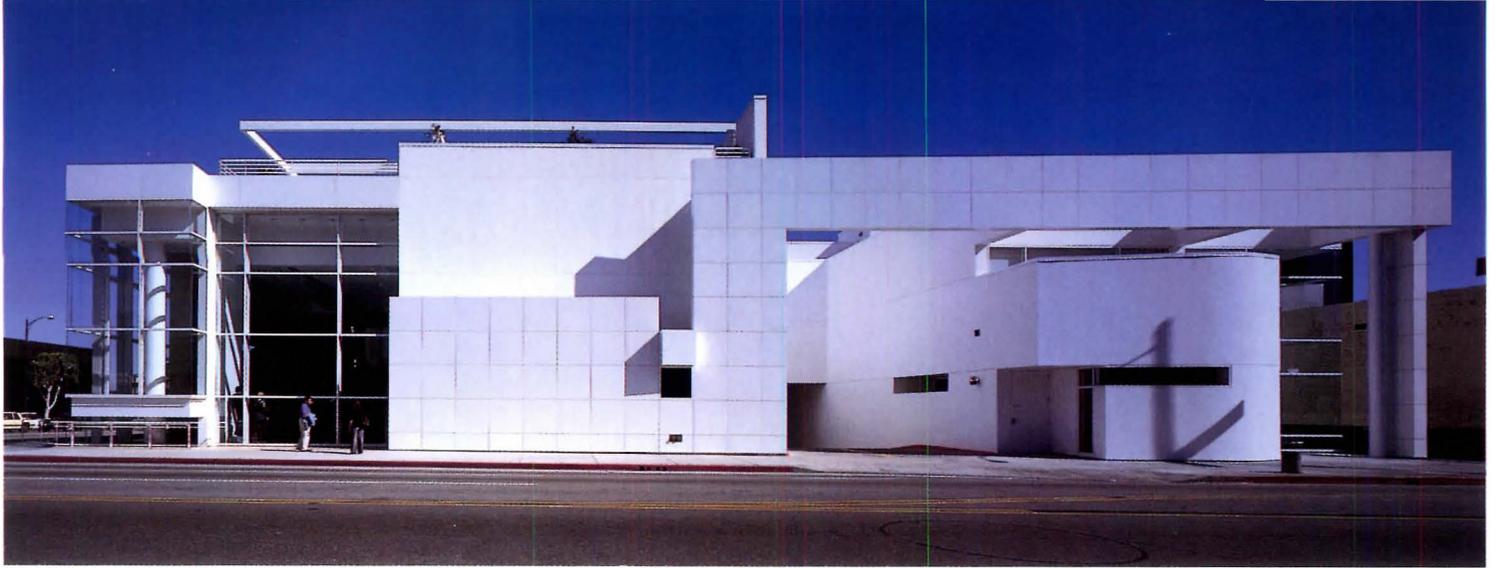


corner of Little Santa Monica Boulevard and Beverly Drive, is actually the renovation and expansion of a two-story bank, most recently occupied by Security Pacific National, whose concrete shell remains visible from an alley at the rear. Meier's new cylindrical rotunda and layered facades fit neatly into their surroundings, with expanses of glass that offer interior views to passersby, in the manner of nearby shops and restaurants. The building is highly formal, yet friendly to pedestrians.

Meier breaks no new ground with the museum, but reinforces his reputation for superb compositional technique. For example, rather than placing the rotunda at the corner, a clichéd gesture, the architect pushes it to the south as a punctuation point within the

building's orthogonal framework. He expresses the staircase that leads to the cylindrical lobby as a diagonal counterpart to the horizontal lines of the front facade's steel and glass screen, and extends the travertine as a rich plane behind the glass. On the building's north side, the architect differentiates the auditorium and administrative offices from the open public spaces with metal-paneled planes and curves. Inside, he softens the rotunda with a cantilevered staircase and sinuously curved balconies. Light and shadow accentuate every surface.

The openness and formality of Meier's design, however, are at odds with the museum's collections and operations. For the Museum of Television and Radio isn't a museum in



**TOP:** Theater (center) and offices (right) are concealed by Meier's signature metal panels.

**ABOVE:** Travertine panel at south end (left) shields museum shop and screening room from public view. North wing (right) is topped by spacious roof garden with bougainvillea-planted trellis.

**FACING PAGE:** Sunscreen of aluminum extrusions is flanked by reflecting pool at sidewalk level.

the conventional sense. It is an archive of more than 75,000 television and radio programs covering more than 75 years, including news, documentaries, sports, sitcoms, educational and variety shows, and advertisements.

The collection is publicly accessible from an interactive, computerized catalog, and is experienced in the 150-seat theater, radio listening room, and "library" on the second floor. Here, visitors and scholars are encouraged to research, analyze, and evaluate media as varied as the unaired pilot program of the 1960s family adventure series "Lost in Space" to vintage footage from the 1956 game show "Queen for a Day." The museum's message is that television and radio are as important to our culture as other art forms and as deserving of serious study.

But the archival activities so essential to the museum's public life are buried in the building. Study spaces are treated as secondary interiors to the first-floor gallery,

third-floor board room, and commodious circulation areas that occupy so much of the building and are Meier's stock-in-trade. (Even the inaugural exhibition of "Star Trek" costumes plays second fiddle to the architecture; the mannequins are pushed to the periphery of the gallery so they can't be viewed in the round.)

Most of the listening and watching of programs takes place in carrels and on consoles that are housed in bland, open office-type areas with few windows. In contrast, Meier's 42-foot-high, 42-foot-diameter rotunda and travertine-clad, streetside staircase leading to these second-floor study areas are light-filled and serene. They provide a grand frontispiece and welcome antidote to the generic interiors upstairs, but mislead the visitor in establishing expectations that aren't delivered in the building's inner reaches.

More importantly, the museum sorely lacks the visual and aural excitement of tele-



#### PRESIDENT'S REPORT

Robert M. Batscha, president of the Museum of Television and Radio since 1981, has devoted much of his career to studying the broadcast media. While teaching in the late 1960s and early 1970s at Queens College at City University of New York, Batscha studied the relationship between television and politics, which he discussed in his book, *Foreign Affairs and Broadcast Journalism*, published in 1975.

Today, he regards broadcast media both as an art form as well as a political force. "Some of the work that has been done in TV and radio has been among the most creative of our time," Batscha claims. Yet, critical appreciation of television and radio media is in its infancy, much like cinema was a generation ago.

The desire to treat broadcasting seriously may account for the Museum of Television and Radio's conservative architecture in New York, designed by Philip Johnson, and its sibling institution in Beverly Hills by Richard Meier. "We did not want a 'radical' art museum, and the architects understood that very well," Batscha explains.

The challenge of both buildings is to communicate the purpose of the museum, which is to make archived television and radio programs available to the public. Exhibits of artifacts related to broadcasting are confined to a ground-floor gallery.

"Our design attempts to create a vibrant and open environment for the museum's collections," explains Meier. Batscha is particularly pleased with the transparency and sense of access that the architect provided for the Beverly Hills museum, which announces the institution's purpose to visitors. As he points out, "Almost everywhere you look, you see glass walls and doorways that let you see in. That's very important when you have an audience that doesn't exactly know what to expect." —*Morris Newman*

vision and radio. Neither Meier nor his client capitalize on the media as a recognizable symbol for the building. The only overt reference to TV is a multimonitored screen discreetly installed behind the reception desk in the lobby and framed in maple. Why didn't the museum, at the very least, commission site-specific artworks in the spirit of Nam June Paik's stacked TVs or Jenny Holzer's electronic signs? Such kinetic art juxtaposed against Meier's coolly elegant interiors would enliven the building and underscore its media-oriented message.

Without such celebratory symbols of broadcast technology, Meier's generous, almost empty spaces seem more appropriate for viewing sculpture than studying stars from the silent screen. There's no evidence of media's pervasive effect on contemporary culture, no interaction between video or sound and three-dimensional space.

In fairness to Meier, the architect has de-

livered the type of highly articulate, if conventional, museum that his clients expected. Maintains Robert A. Batscha, president of the Museum of Television and Radio, "We wanted a building that would capture the light and feel of Los Angeles, but with a sense of permanence and stature. We feel that is what Richard Meier gave us."

Hollywood luminaries, too, seem delighted with the result. Donations have poured in, as indicated by the many signs posted around the museum, which name each space after television stars and producers (the Danny Thomas lobby and the Steve and Barbara Bochco scholars' room, for example).

Moreover, Beverly Hills is better off for having this handsome, urbane new building in its shopping district. But it's disappointing that Richard Meier's new Museum of Television and Radio doesn't broadcast its programs and popular purpose in a more obvious and challenging way. —*Deborah K. Dietsch*



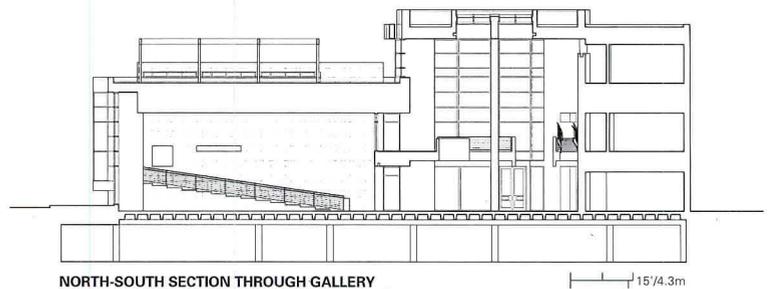
**ABOVE LEFT:** Ground-floor gallery (right) is flanked by skylit stepped ramp leading to ramp at perimeter.

**ABOVE RIGHT:** Stepped ramps are formed by 6-inch risers and 3-foot, 6-inch treads and clad in travertine. Perimeter ramp flanks sunscreen and offers views of street and gallery.

**SECTIONS:** Museum is organized with celebratory public circulation spaces typical of Meier designs, including rotunda and perimeter staircases.

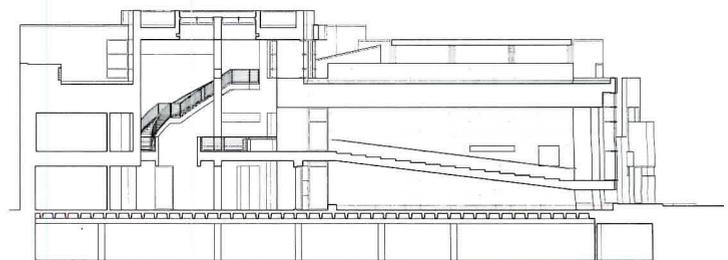
**FACING PAGE:** Visitors enter lobby rotunda and climb gently inclined staircase (left) to second-floor viewing and listening areas.

**PLANS:** Viewing and listening areas are relegated to south (top). Exhibit gallery and auditorium occupy north half of building.



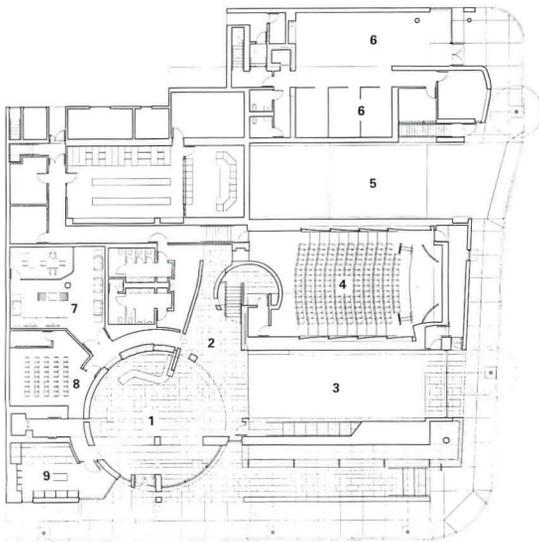
NORTH-SOUTH SECTION THROUGH GALLERY

15/4.3m



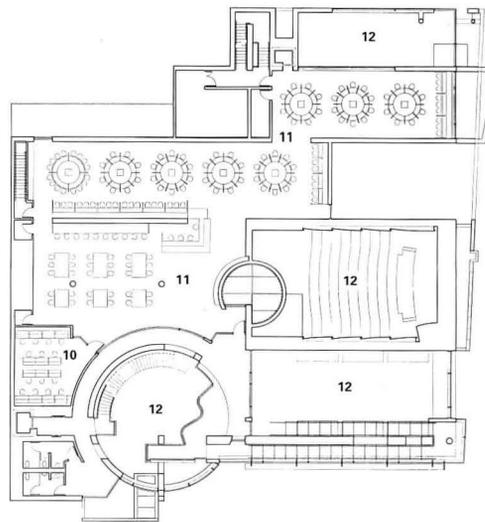
SOUTH-NORTH SECTION THROUGH RAMP

15/4.3m



GROUND FLOOR PLAN

19/5.5m



SECOND FLOOR PLAN

- 1 LOBBY
- 2 VESTIBULE
- 3 GALLERY
- 4 THEATER
- 5 RAMP TO GARAGE
- 6 OFFICE
- 7 RADIO LISTENING ROOM
- 8 EDUCATION ROOM
- 9 MUSEUM STORE
- 10 SCHOLARS' ROOM
- 11 LIBRARY
- 12 OPEN TO BELOW



**MUSEUM OF TELEVISION & RADIO  
BEVERLY HILLS, CALIFORNIA**

**ARCHITECT:** Richard Meier & Partners, Los Angeles—Richard Meier, Michael Palladino (design team); John Eisler (project architect); Peter Burns (project architect, construction); Amy Donohue, Jeff Greene, Stephen Harris, John Locke, Jun-ya Nakatsugawa, Greg Reaves, Jennifer Stevenson, Bruce Stewart, David Swartz, Carlos Tan, Thomas Vitous (project team)

**ENGINEERS:** Robert Engelkirk (structural); Altieri Sebor Wieber (mechanical)

**CONSULTANTS:** Fisher Marantz Renfro Stone (lighting)

**GENERAL CONTRACTOR:** Peck/Jones Construction

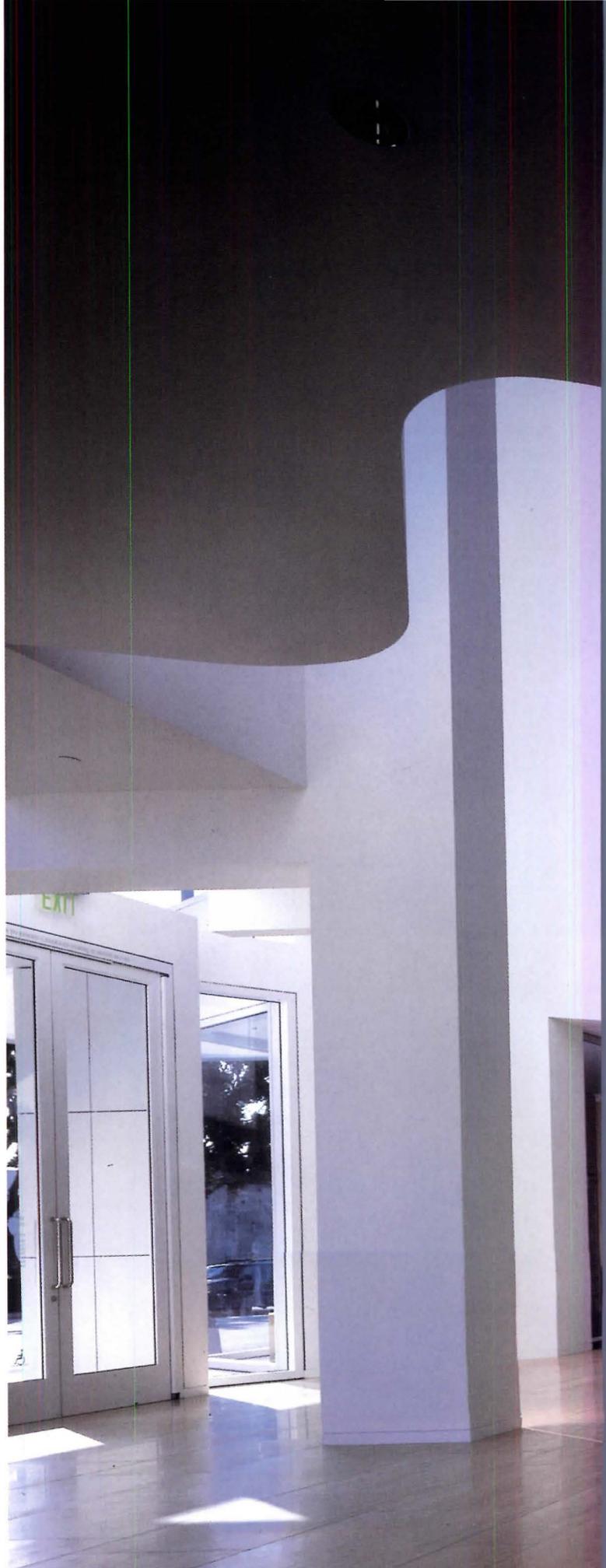
**COST:** Withheld at owner's request

**PHOTOGRAPHER:** Scott Frances/Esto

**TOP:** Rotunda, measuring 42 feet high and 42 feet across, is punctuated by skylights, second-floor balcony, and cantilevered stair to third floor.

**ABOVE:** View across rotunda reveals daylight from skylights and glazing above entrance, as well as city vistas.

**FACING PAGE:** Meier's compositional mastery is evident in sculptural stair, sinuous balcony soffit, and wall openings in rotunda.







Two Rivers Landing  
 Easton, Pennsylvania  
 Schwartz/Silver Architects  
 Wallace & Watson Associates, Architects

## COLORS OF HOPE



On July 16, Two Rivers Landing, a new downtown cultural center designed by Schwartz/Silver Architects, opened to crowds that Easton, Pennsylvania, hadn't seen in over a century. Like many Rust Belt cities, Easton spent the latter half of the 20th century in a precipitous economic decline. Yet, through it all, the town retained one important asset: Crayola crayons—the wax pencils in the trademark yellow and green box.

Since 1903, the crayons have been manufactured in Easton, and for almost as long, people from around the world have come to visit Easton to witness the process. By the early 1990s, Crayola was ushering more than 20,000 visitors a year through its antiquated

factory, which was scheduled for replacement.

Alarmed by the decline of Easton's once bustling town center and intrigued by the commercial and cultural potential inherent in its factory tours, Binney & Smith—Crayola's makers—decided to commit significant resources to the construction of a Crayola museum downtown. A subsequent city-sponsored downtown redevelopment study suggested possible locations, a broadening of the museum program, and the renovation of several city buildings into office and hotel space.

Two Rivers Landing is the realization of that vision. It includes the new Crayola Factory museum; the National Canal Museum, which depicts the history of the system of waterways that once connected commercial



centers throughout the Northeast, including Easton; a National Park Service visitors center, which details the landscape of the region; a 120-seat auditorium; offices; a gift shop; and a restaurant. All are housed in a collection of five downtown brick warehouses built between 1850 and 1929.

Schwartz/Silver's task was to knit the warehouses (which did not share common floor levels in several instances) into a coherent, 65,000-square-foot whole that would no longer appear as separate buildings. The architect was also charged with renovating the historic architecture, shoring up the most prominent corner of the town square, and developing a cultural destination for a flow of visitors that ultimately would outnumber

the town's resident population by a factor of 12 to one—all for less than \$10 million. Under the direction of design principal Robert Miklos, all these goals were met with sensitivity and gentle humor.

Although the National Canal Museum and the National Park Service exhibit are featured prominently in the building, Crayola dominates the project: it draws the crowds—more than 65,000 since July, far exceeding projections; it occupies almost a third of the building, including the prominently located northeast corner; its child-oriented exhibits visually outshine the more staid offerings of the building's other residents. At Crayola, visitors watch crayons and markers being made, and get sample packs that they are

**FACING PAGE, TOP:** Crayola Factory (above) and museum shop (below) occupy former department store (center), union office (left), and three warehouses attached at rear.

**FACING PAGE, BOTTOM:** Schwartz/Silver renovated existing department store (right) and office (left) obscured by 1950s metal cladding and stucco.

**ABOVE:** Two Rivers Landing entrance forms edge of town square. Brick facades removed in the 1950s were replaced. Ground floor houses gift shop, with studio workshop above.



TWO RIVERS LANDING





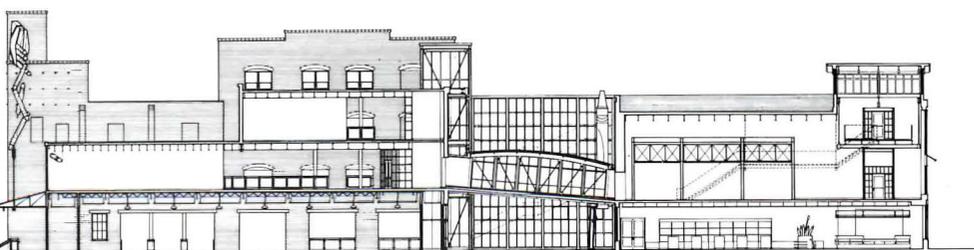
#### DIRECTOR'S REPORT

Easton was a city sliding from grace," recalls Mitch Weissbein, executive director of the Crayola Factory, "and we were a corporation with a problem. Sometimes, that makes for a beautiful marriage." Crayola's specific problem was factory tours. Theirs had grown so popular that the manufacturer of the world's most famous crayons had a two-year waiting list and was forced to turn away more than 40,000 visitors per year.

The solution was the new Crayola Factory, a museum and educational center "which gives us more space and much more public access," reports Weissbein, "and allows us to be active in community development." Binney & Smith, Crayola's maker, anticipates that more than 300,000 guests will tour the factory annually, a number current attendance suggests may be attained within two operating years. "We're already running at twice our projections," Weissbein reports.

For Easton, a town of 25,000 residents, the numbers represent a windfall. Since Two Rivers Landing opened, at least three gift shops, two restaurants and two coffee houses have moved into the downtown area, according to Chamber of Commerce President Mike Dowd.

Crayola is also happy with the building. "Our exhibits are self-guided," Weissbein explains. "This is part of our philosophy of creativity—it can't be rushed or pushed. Having a space that is open and inviting enhances that," he adds. Schwartz/Silver's casual plan organization affords easy and (in the case of the tilting bridge) dynamic movement throughout the space. Exhibits are also open-ended and range from observational to participatory. Further, Weissbein continues, "the factory esthetic gives people permission to play and be messy, which is also part of the creative process—and we love that."



NORTH-SOUTH SECTION

17/5m

**FACING PAGE:** Rear entrance of Crayola museum, marked by tumbling metal crayons, is formed from space between existing warehouses.

**TOP:** Glazed, steel-framed bridge between Crayola exhibits and elevator tower marks front entrance.

**SECTION:** Bridge connects uneven floor levels between Crayola manufacturing exhibit (left) and visitor's studio workshop (right).



**TWO RIVERS LANDING  
EASTON, PENNSYLVANIA**

**DESIGN ARCHITECT:** Schwartz/Silver Architects, Boston—Robert Silver (managing principal); Robert Miklos (design principal); David Stern (project architect); Nelson Liu, Steven Gerrard, Jon Traficonte (design team)

**ARCHITECT OF RECORD:** Wallace & Watson Associates, Allentown, Pennsylvania—William Watson (principal-in-charge); David Landis (project manager)

**EXHIBIT DESIGNER:** Krent/Paffett Associates

**ENGINEERS:** Pany and Lentz Engineering (structural); Wallace & Watson (electrical)

**GENERAL CONTRACTOR:** Alvin H. Butz

**COST:** \$6 million

**PHOTOGRAPHER:** Matt Wargo

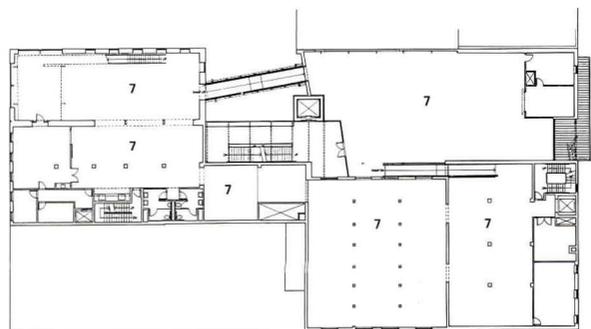
then invited to try out in a variety of environments intended to foster creative thought. In one exhibit, children (and parents) are even permitted to draw on the walls. Boston's Krent/Paffett Associates's exhibits are playful, if not architectural.

As in many historic renovations, much of the design team's work is invisible—essentially uncovering what was already there. Schwartz/Silver carefully exposed and restored the brick walls and steel and wood structural systems of all the warehouse interiors. Where necessary, layers of external cladding were also removed to uncover original brick siding. Due to its badly deteriorated condition, the northeast corner of the complex was all but rebuilt, with only the structural steel remaining.

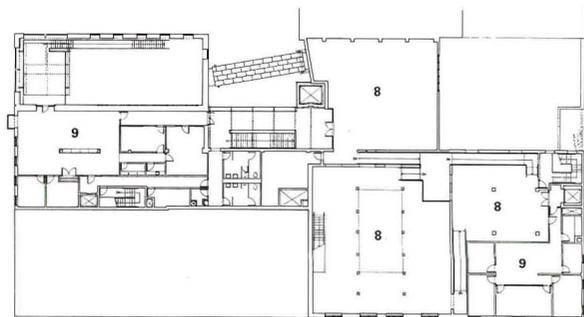
This restorative effort is complemented by new architectural elements that appear mostly in the lobby and along circulation corridors, including a suspended bridge (that

connects two uneven floor levels of the Crayola museum) and a glass elevator that together mark the complex's town square entrance. These newer articulated steel are unified by a coat of blue paint and refer to a neighboring building's prominent fire escape; doors and windows recall industrial sash. These additions restore the character of the old warehouses while coating them in user-friendly, Crayola-inspired colors.

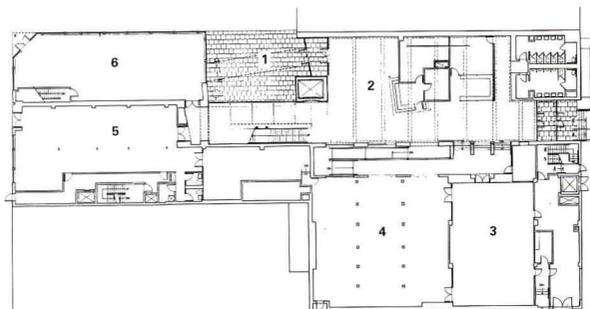
Appropriately for a children's museum, the new architectural language is outscaled and lively: bolts are big, colors are bright. Yet the new architecture never overshadows the existing warehouse esthetic; if anything, it is somewhat too demure. For instance, Krent/Paffett has inexplicably obscured much of the restored brickwork with several coats of paint. Nevertheless, the new cultural complex reclaims a once derelict corner of downtown Easton, offering the color of hope to the rest of the city as well.—*Reed Kroloff*



SECOND FLOOR PLAN



THIRD FLOOR PLAN



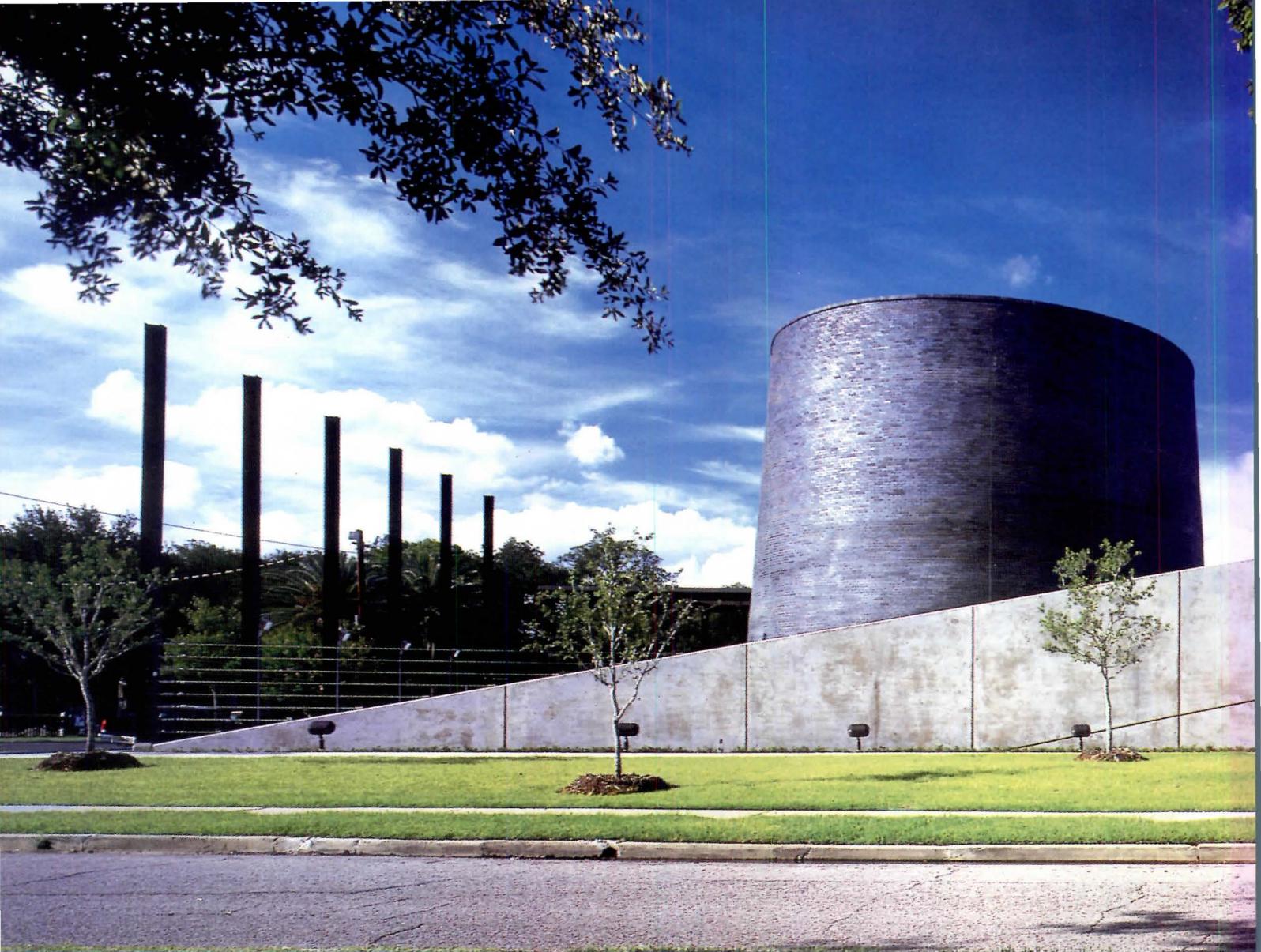
GROUND FLOOR PLAN

- 1 ENTRANCE COURT
- 2 LOBBY
- 3 AUDITORIUM
- 4 NATIONAL HERITAGE CORRIDOR EXHIBIT
- 5 CAFÉ
- 6 MUSEUM SHOP
- 7 CRAYOLA FACTORY EXHIBIT
- 8 NATIONAL CANAL MUSEUM EXHIBIT
- 9 OFFICE

**FACING PAGE:** Crayon manufacturing, educational exhibits by Krent/Paffett, and new architectural metalwork are rendered in bright Crayola colors.

**ABOVE:** Visitors create three-dimensional sculptures in studio located in northeast corner of building. Stairs lead to mezzanine offices and observation landing.

**PLANS:** Museum connects five warehouses, each with a different structural module.



**Holocaust Museum Houston**  
Houston, Texas  
Ralph Appelbaum & Associates, with  
Mark Mucasey, Architect

**THESE PAGES:** Museum's smokestack-like cylinder contains theater. Concrete wedge houses historical exhibits.

## DARK REMEMBRANCE

Holocaust memorials and museums have become something of an eerie cottage industry in this country (ARCHITECTURE, December 1995, page 23), with more than 100 organizations dedicated to translating their “never forget” message into solid form. A forceful, yet austere new building in the midst of Houston’s patchwork museum district brings the city face-to-face with this bleak history.

The 18,000-square-foot, \$3 million museum was designed by New York exhibit designer Ralph Appelbaum, who created the installations at the National Holocaust Museum in Washington, D.C. (ARCHITECTURE, July 1993, pages 54-65), and Houston architect Mark Mucasey. The collaborative com-

mission grew from the Houston museum’s request for an exhibit design in a remodeled medical office. “We suggested a simple remodeling wouldn’t do the exhibit justice,” explains project architect Jack Pascarosa, “and the museum agreed that an addition was the way to go.”

Holocaust memorials are somber affairs, generally relying on symbolism to deliver their contradictory messages of slaughter and survival, temporality and transcendence. Houston’s museum is no exception, with its striking collage of simple forms, dominated by a dark brick cylinder that clearly alludes to extermination camp incinerator smokestacks. The cylinder contains a theater, and towers over a wedge-shaped structure that



houses the building's main educational exhibits. The canted top surface of the wedge is treated as a concrete field of names that commemorates entire communities of European Jews eliminated by the Nazis—a human carapace that points skyward as it shrouds the story of its own annihilation.

Contrasts continue inside the building, but are more pedantic. Below the tilted memorial plane is a dark 3,500-square-foot hall filled with the chilling images and sounds of Hitler's propaganda and racial policies. The wedge starts high and open above the story of European Jewish culture and reaches its lowest, most compressive point over documentation of the extermination camps. This literal descent is accompanied by a narrowing of the

exhibit structures as the Holocaust becomes inescapable. It's an appropriately claustrophobic device, but also predictable.

And despite elegant interior design by Murphy Mears Architects of Houston, an attached 1,000-square-foot memorial room also employs obvious symbolism: it is a high space flooded with natural light. The library, located in the renovated section of the building, is daylit too. In these rooms and elsewhere, Appelbaum's symbols are simple and familiar: knowledge and redemption are light; evil is dark.

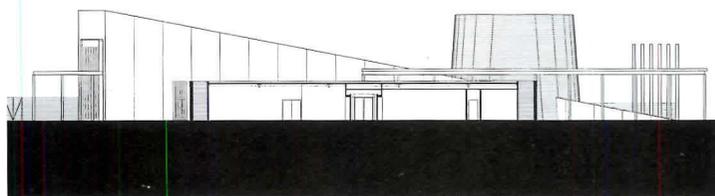
Appelbaum resorts to more direct representation as well. Circulation is defined by a system of black steel trestles that clearly refer to the railroad cars onto which the Jews were



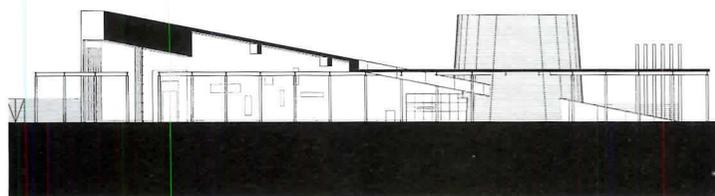
**TOP:** Exposed steel frame of original Miesian medical building (left) inspired entry canopy and circulation spine (center) of addition.

**ABOVE:** Circulation spine punches through rear lobby to children's memorial garden.

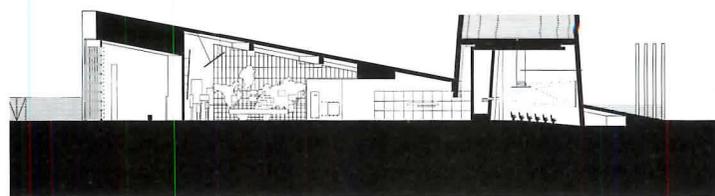
**SECTIONS:** Original one-story rectangular office building now houses library and offices (top). Circulation spine through lobby (center) resembles railroad trestles. Daylit memorial room occupies highest point of wedge (above).



WEST-EAST SECTION THROUGH CLASSROOMS AND EXHIBIT AREA



WEST-EAST SECTION THROUGH MAIN HALLWAY



WEST-EAST SECTION THROUGH CORE EXHIBIT SPACE

1/21/6m

herded; at the opposite end of the lobby, these “tracks” pass through a glass wall, ultimately converging in the grass beyond—the same terminal perspective faced by the Jews as they entered the death trains. Finishes replicate the materials of the camps: surfeits of concrete, brick, and steel are bolted together with the purposefully crude, outsized connections of railyards, warehouses, and other buildings of the Nazi extermination machine.

It is at the detail level, interestingly, that the designers make one of their more subtle and effective connections with the past. The former medical building, in which the offices, library, and changing exhibitions are now housed, was a handsome Miesian volume of tan brick and exposed steel. Appelbaum's railroad trestles are the wide flange sections of the original building. Where the old and new structures meet in the lobby, his addition of a few well-placed bolts to a set of exposed steel headers over the reception desk

transforms the aloof elegance of Mies into the faceless industrial architecture of the camps. Such gestures recast these simple fasteners into architectural allegories for German indifference toward the plight of the Jews.

Appelbaum's exhibits at the National Holocaust Museum are so powerful they make visitors physically uncomfortable. Houston's museum, which opened in March, is only slightly less troubling, particularly because of its emphasis on the Holocaust's effects on the local community: the ancestors of Houston residents are depicted in exhibits, and their fate at the hands of the Nazis is movingly detailed. Explains Interim Executive Director Glenda Regenbaum, “We wanted people to know it was their neighbors who were victims—and that next time it might be them.” The ease with which Appelbaum exposes the fine line between beastly and banal gives Regenbaum's prediction all too much plausibility.—*Reed Kroloff*



**ABOVE:** Appelbaum's exhibits show the plight of Houston's Jewish families (right) as well as European Jews (left) through photographs, film, artifacts, and testimonials.

**LEFT:** Miesian vocabulary of exposed steel in original building, as shown in lobby, is transformed into metal details reminiscent of concentration camps through newly applied steel bolts and plates.



**HOLOCAUST MUSEUM HOUSTON  
HOUSTON, TEXAS**

**DESIGNER:** Ralph Appelbaum Associates, New York—Ralph Appelbaum (principal-in-charge); Jack Pascaros (project architect); Kai Tom Chiu (job captain); Shari Berman (art director/interpretive designer); Sylvia Juran (writer/editor); Rick Sobel (exhibit designer); Vicci Ward (content/graphics)  
**ARCHITECT OF RECORD:** Mark S. Mucasey, Houston

**ENGINEERS:** SCA Engineering (structural); Holste and Associates (mechanical, electrical); Dannenbaum Engineering (civil); C-AIRS Mechanical (mechanical)

**CONSULTANTS:** Murphy Mears Architects; Patricia and Robert Moss-Vreeland (Memorial Room/Wall of Tears installation); John Roth (scriptwriter); Jody Small (audiovisual producer); Electrosonic (audiovisual systems)

**COST:** \$2.3 million

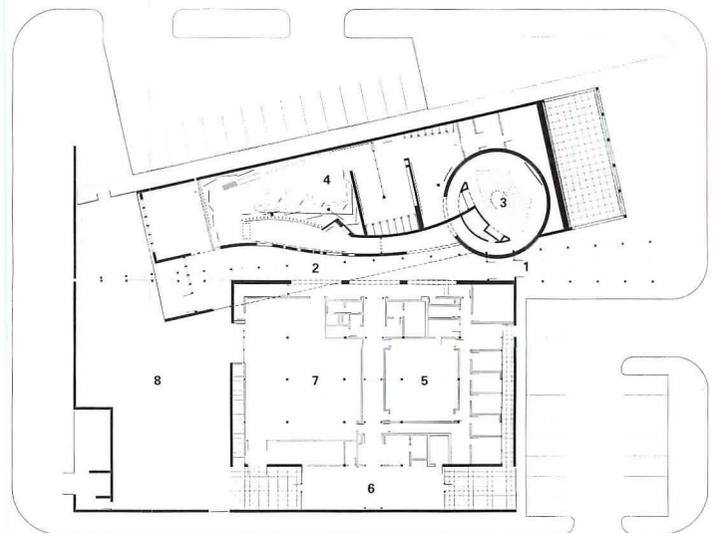
**GENERAL CONTRACTORS:** Higbie Roth (building); Maltbie Associates (exhibits)

**PHOTOGRAPHER:** Scott Frances/Esto

**ABOVE:** Houston-based Murphy Mears Architects and Philadelphia artists Patricia and Robert Moss-Vreeland designed commemorative room at east end of museum.

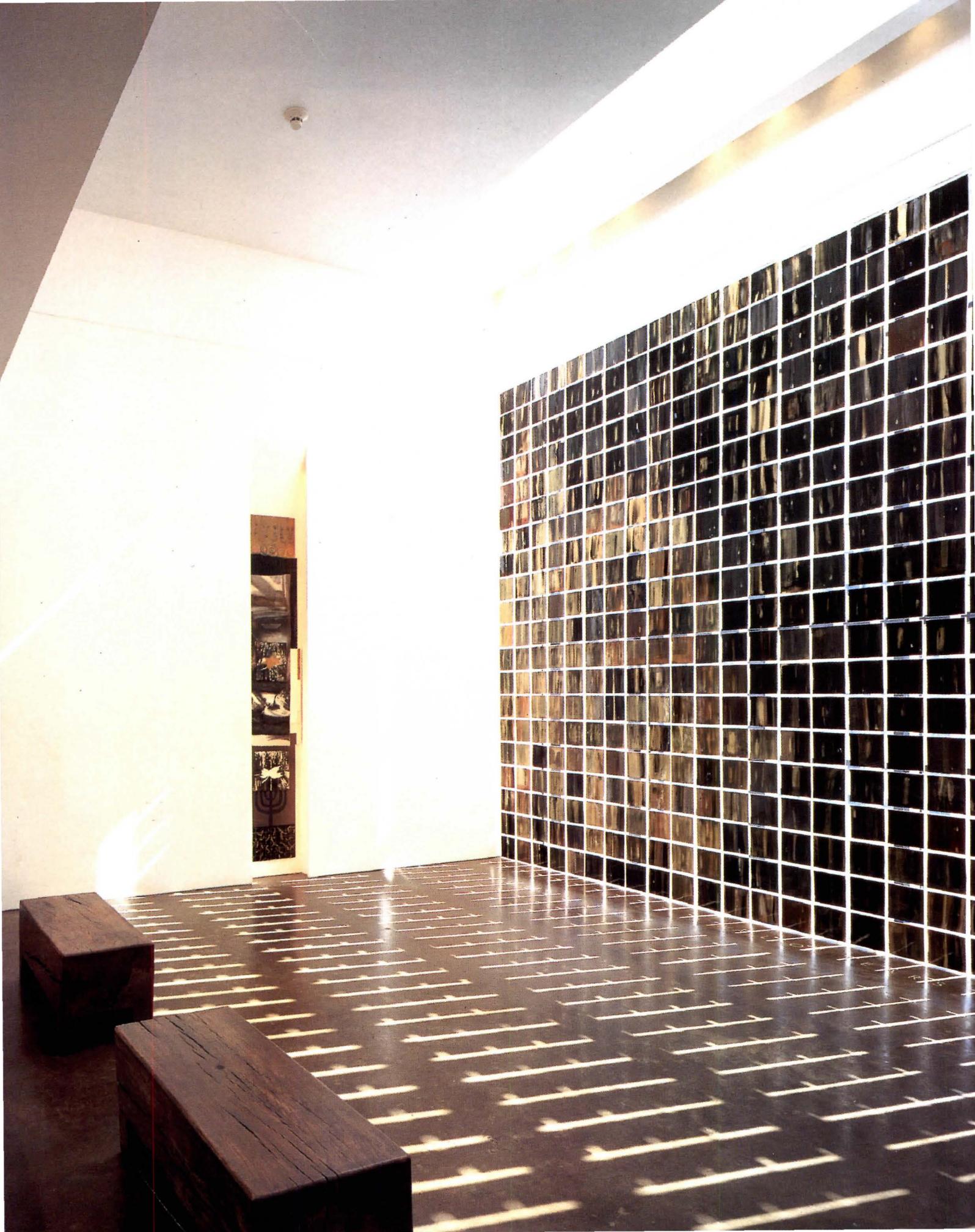
**PLAN:** Lobby occupies truncated space between canted rectangular addition and existing building, which formerly housed medical offices.

**FACING PAGE:** Light streams around “Wall of Tears” installation of glazed ceramic tiles hung from a ceiling-mounted steel structure, placed 18 inches in front of window.



**GROUND FLOOR PLAN**

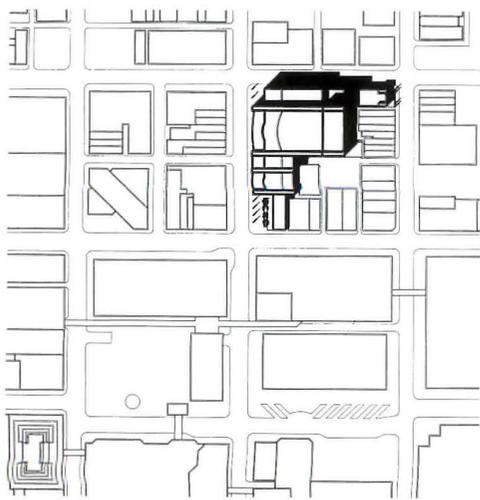
- |                     |                         |
|---------------------|-------------------------|
| 1 ENTRY             | 5 CLASSROOM             |
| 2 MAIN HALLWAY      | 6 LIBRARY               |
| 3 THEATER           | 7 CHANGING EXHIBIT AREA |
| 4 CORE EXHIBIT AREA | 8 SCULPTURE GARDEN      |





**Aronoff Center for the Arts**  
Cincinnati, Ohio  
Cesar Pelli & Associates, Architect

## STREET PERFORMANCE



SITE PLAN

At first glance, Cesar Pelli & Associates's new Aronoff Center for the Arts might seem the product of a highly conflicted sensibility. The exterior is crisp and clean, a composition of frankly Modernist boxes that clearly express the different functions contained within. But inside, Pelli has no qualms about employing artifice in the service of theatricality: a touch of Deco here, a splash of La Scala there. Upon closer inspection, however, the differences between the inside and the outside aren't so extreme. "Architecture needs to operate at so many different levels," claims Pelli. "I like to design buildings that are very contextual, but very contemporary." Pelli's sophisticated architectural ability allows him to develop the Modernist box with

an uncanny sense for texture and material while simultaneously recalling historical forms without pastiche or nostalgia.

The Aronoff Center fills an L-shaped site in the heart of downtown Cincinnati, addressing all four streets that border the block. Procter & Gamble Hall, the complex's Broadway-style playhouse, shares an address on heavily trafficked Walnut Street with the smaller, community-oriented Jarson-Kaplan Theater. The Fifth Third Bank Theater is home to more experimental productions and faces less prominent Main Street.

Opening onto a plaza at the intersection of Walnut and Seventh streets, the Weston Art Gallery gives way to a four-story framed office and retail structure that defines the



Center's presence on Seventh Street. A two-story restaurant creates a plaza at the corner of Walnut and Sixth streets. The entire complex is neatly divided into brick and limestone masses that frame the monumentally scaled volumes of the theaters and infill frame structures that contain the more modestly scaled offices, shops, and restaurants. This decrease in scale directs pedestrian traffic through the complex. "We found it necessary to develop a compressed procession," Pelli explains in describing the site's tight boundaries. "You should have space in the front of a theater—patrons need to be able to walk a little [before entering]. That is why the sidewalk carries into the lobby."

The public lobbies of each of the perfor-

mance halls share a vocabulary of forms that mediate between the building's spartan exterior and sensuous interiors. A public passageway that parallels the sidewalk along Walnut Street allows passersby to sample the interiors. These spaces are grandly proportioned and elegantly appointed in an assortment of rich, imported stones.

At the heart of the Center, Procter & Gamble Hall is an exuberant room in the grand tradition of Radio City Music Hall and Louis Sullivan's Auditorium Theater. It will be used principally for Broadway touring productions, but it can also accommodate dance, opera, symphony, and choral performances. The arch of the proscenium is echoed by four distinct vaulted ceilings of perforated

**FACING PAGE, TOP:** Aluminum-framed office-retail structure steps back from corner to create plaza and expose side of masonry tower.

**FACING PAGE, SITE PLAN:** Aronoff Center wraps northern and western sides of downtown Cincinnati block.

**ABOVE:** Stainless steel curtain walls expose lobbies of Procter & Gamble Hall and Jarson-Kaplan Theater to Walnut Street. Brick-clad towers housing circulation and services echo masonry of surrounding buildings.

**RIGHT:** Fifth Third Bank Theater faces Main Street and mimics compositional strategies of larger theaters at more pedestrian scale. Stone pylons support banners promoting current productions.

**BELOW RIGHT:** Entrance to Jarson-Kaplan Theater is flanked by striated towers of granite, limestone, brick, and slate.

**FACING PAGE:** In Procter & Gamble Hall lobby, exterior stainless steel is replaced by painted aluminum columns; Burlington stone on sides of stairs is used in lieu of granite; Minnesota limestone and Vermont slate on walls is rendered with less texture than exteriors. Punched square openings express depth of masonry wall.



metal that connect the boxes on either side of the auditorium. The vaults are compound curves formed from an intricate pattern of triangular perforated aluminum panels suspended from the structure above. "Our goal was to create the most intimate 2,700-seat theater possible," explains Cincinnati Arts Association General Manager Steven Loftin. The parallel arches compress the perspective of the audience and create the illusion of a much smaller house. "The theater needs to be a world of social imagination—a shared experience where everybody becomes a bit of an actor," adds Pelli. This sense of imagination infuses each of the performance spaces to varying degrees.

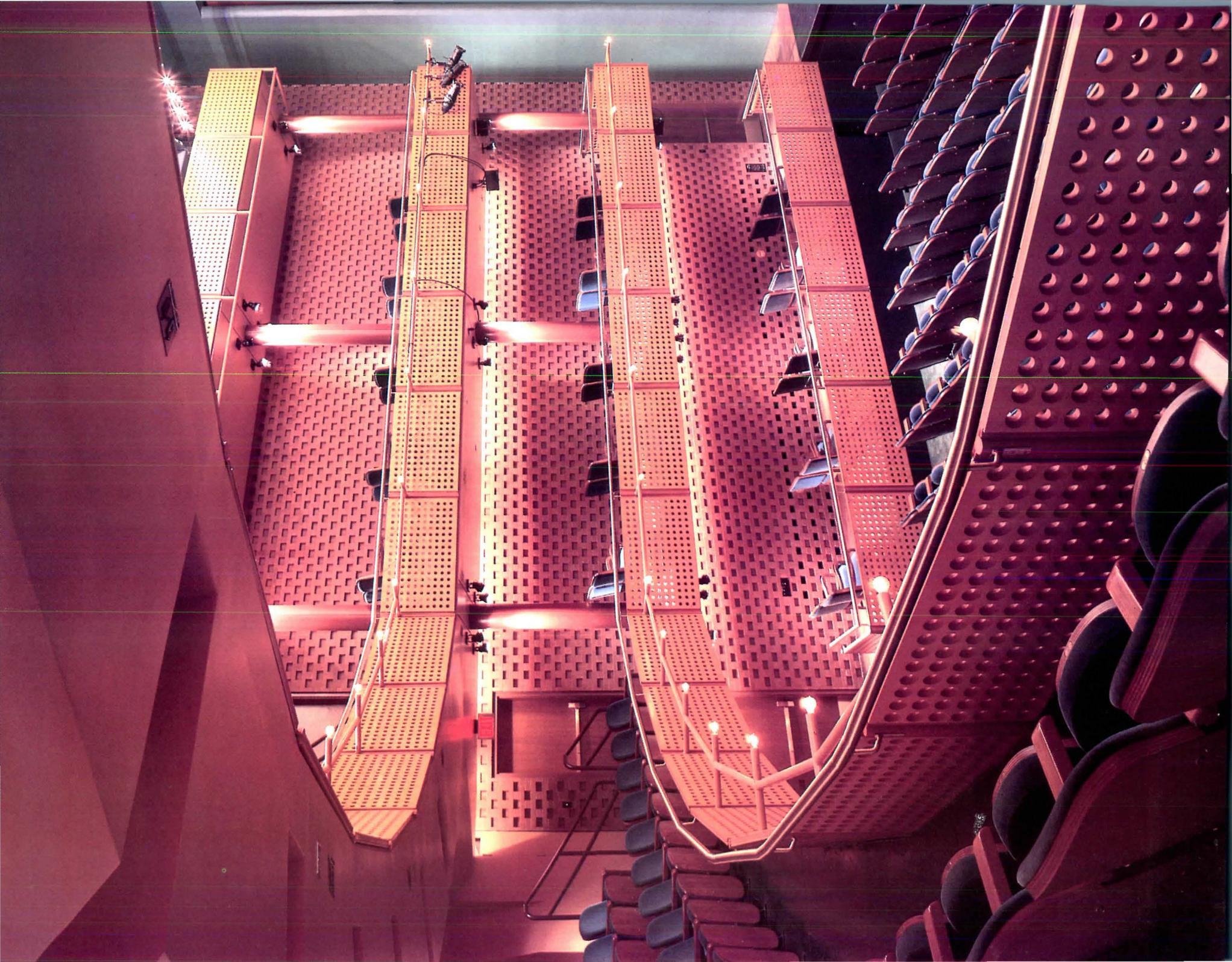
An intimate 440-seat hall to the south of Procter & Gamble Hall, the Jarson-Kaplan Theater is a tall, narrow space where the orchestra-level audience is surrounded by three tiers of seating articulated by perforated wood panels. While the immense size of Procter &

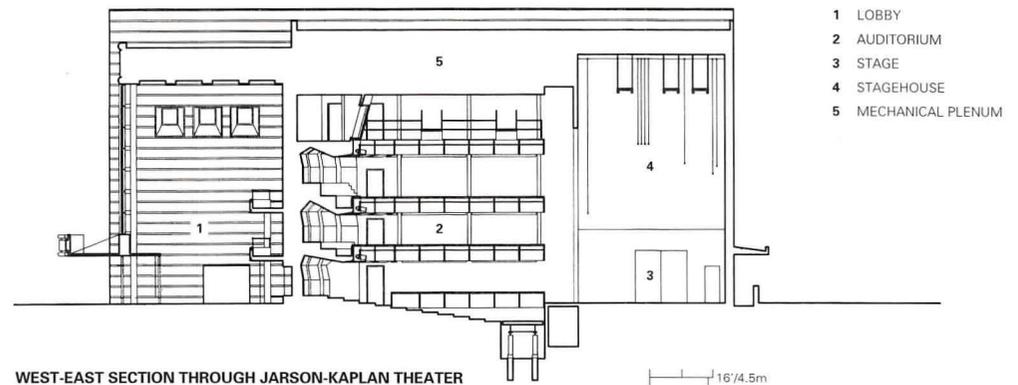
Gamble Hall is purposefully diminished, the Jarson-Kaplan's scale is willfully enlarged through a fourth ring of fascias that make the hall seem considerably taller than its 50 feet.

The Fifth Third Bank Theater is the only performance space that faces away from Walnut Street. Configured as a black box theater with a maximum seating of 150 persons, its innovative productions are visible to pedestrians through three large windows facing the sidewalk on Seventh Street.

The more undistinguished frame and infill structure at the north edge of the site along Seventh Street appears a rather ordinary office building from a distance. But up close, the combination of round gray aluminum columns and beams plays against rectangular curtain wall sections, sharply cleft green slate infill panels, and a lively metal sign band that displays electronic messages about coming attractions. Pelli's deft hand creates a compelling composition that







demonstrates that the formal potential of the frame building has not yet been exhausted.

A very limited palette of colors is employed throughout—terra-cotta, ocher, gray, and green. These hues are subtly varied between exterior and interior through natural and manmade materials. This level of textural development is critical to the complex's success. In exploring the nuances found in the very few inches of depth that can be developed in a contemporary curtain wall, Pelli took his inspiration for the limestone base, brick-clad towers, and slate banding from local examples. "I'm impressed with the clarity of form in Cincinnati's brick buildings," he says. "They are very sharp and unambiguous."

While architecture is not a performing art, it still has the ability to tell tales. In his sophisticated interweaving of carefully wrought details, Pelli shows that the diagrammatic simplicity of Modernism need not be mute.—Edward Keegan

**FACING PAGE:** Jarson-Kaplan Theater is wrapped by two balconies. Perforated wood panels aid room acoustics and create a rich visual texture against patterned brick walls. Auditorium is made to appear higher than its 50 feet by wrapping these back-of-house functions with fascia similar to balconies below.

**ABOVE:** View from stage recalls shoe box configuration typical of Italian opera houses.

**SECTION:** Upper level houses control room and technical catwalks.

**ARONOFF CENTER FOR THE ARTS  
CINCINNATI, OHIO**

**ARCHITECT:** Cesar Pelli & Associates—  
Cesar Pelli (design principal); Fred W.  
Clarke (project principal); Mitchell A.  
Hirsch (design team leader); J. Bunton  
(senior designer); Keith Krolak,  
Patricia F. MacDougall, Lazaros  
Papanikolaou, Kiyohiko Ozawa, Jane  
L. Twombly (design team)

**ASSOCIATE ARCHITECT:** GBBN Architects,  
Cincinnati—Robert E. Gramann  
(partner-in-charge); Christopher N.  
Beghtel (project manager); Joseph T.  
Schwab (project architect)

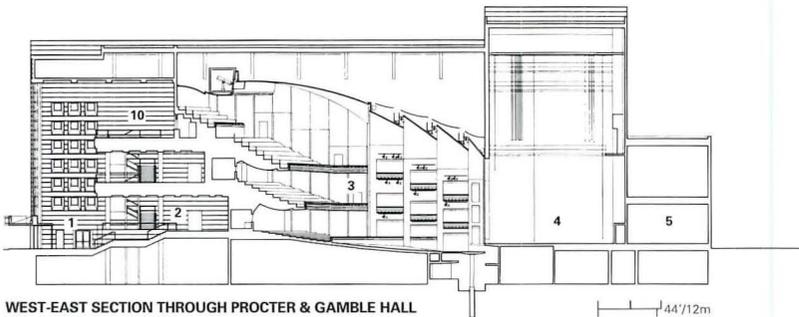
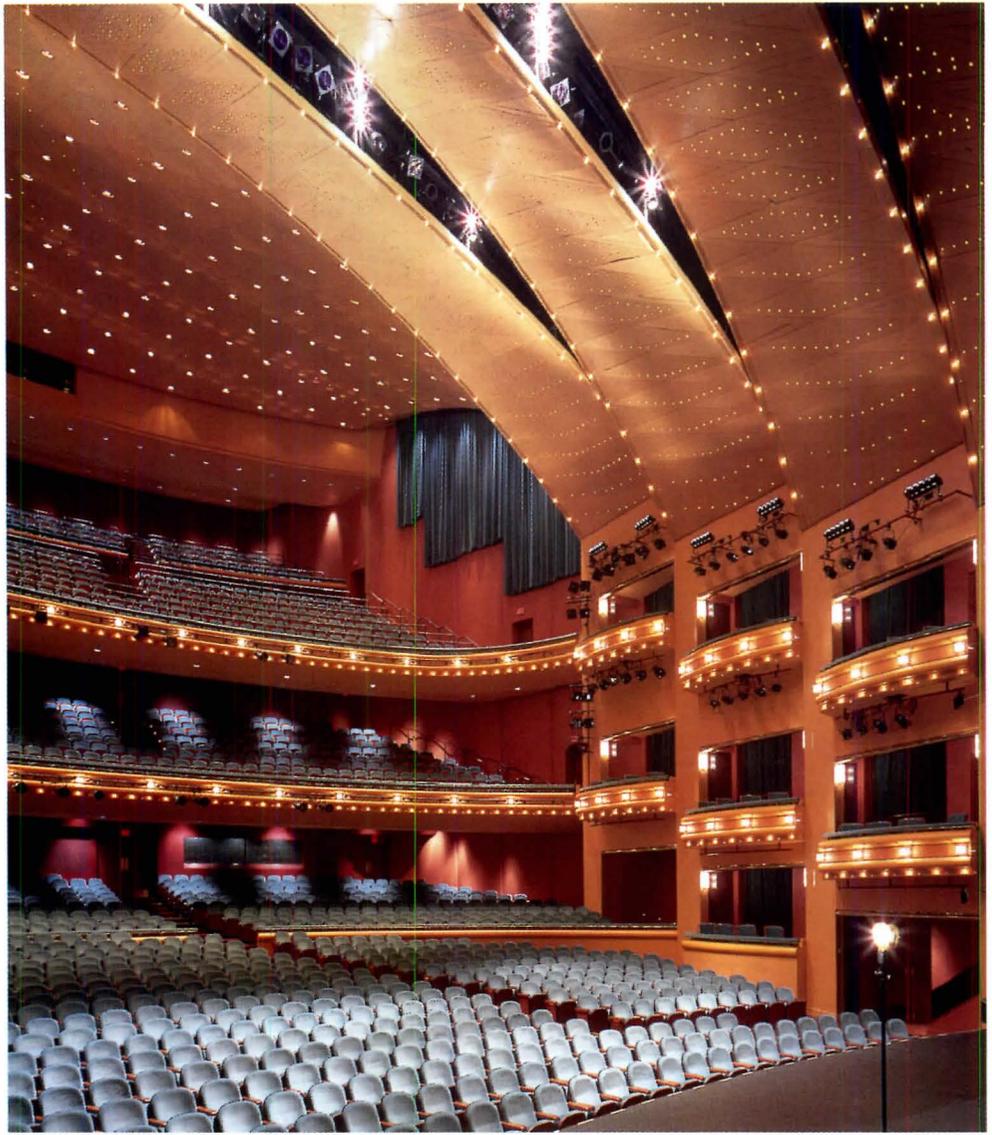
**LANDSCAPE ARCHITECT:** Balmori  
Associates

**ENGINEERS:** THP Limited (structural);  
Byers Engineering Company  
(mechanical, electrical); Balke  
Engineers (civil)

**CONSULTANTS:** Theatre Projects  
Consultants (theater planning,  
lighting design); Kirkegaard Associates  
(acoustics); FRCH Design Worldwide  
(signage); Donnell Consultants (cost  
estimating); Rolf Jensen & Associates  
(life safety)

**GENERAL CONTRACTOR:** Messer/Cargile  
**COST:** \$43 million

**PHOTOGRAPHER:** Jeff Goldberg/Esto



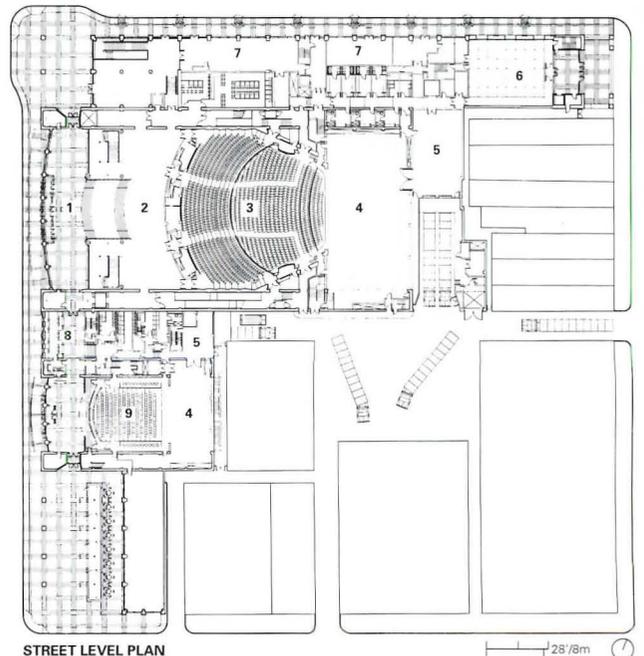
**ABOVE RIGHT:** Curves of arches in Procter & Gamble Hall allow for lighting positions visible only from stage.

**SECTION:** Sixty-five-foot height and 125-foot depth of room is more apparent in two dimensions, unfettered by Pelli's three-dimensional optical effects.

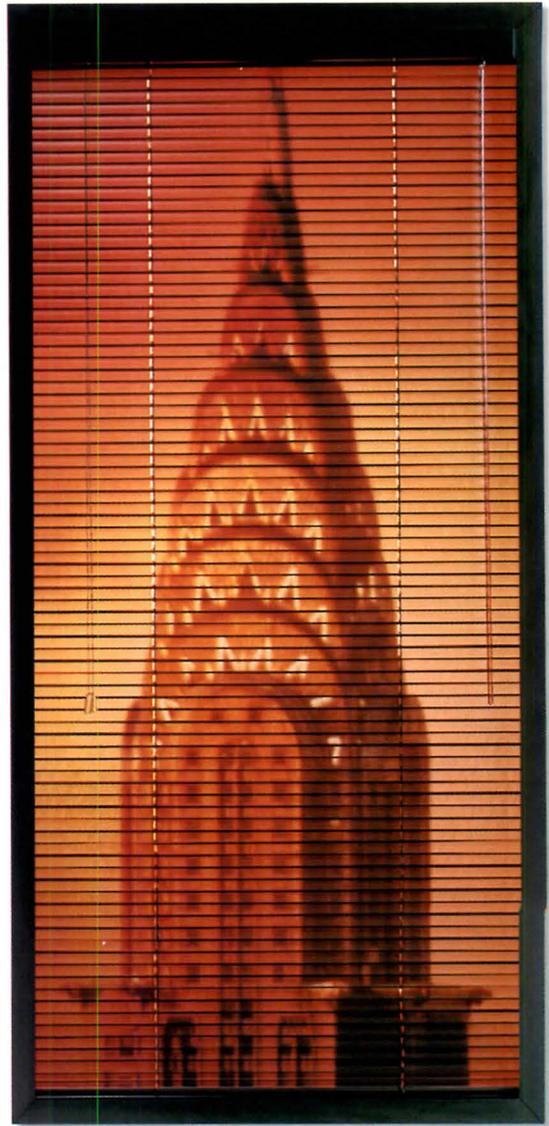
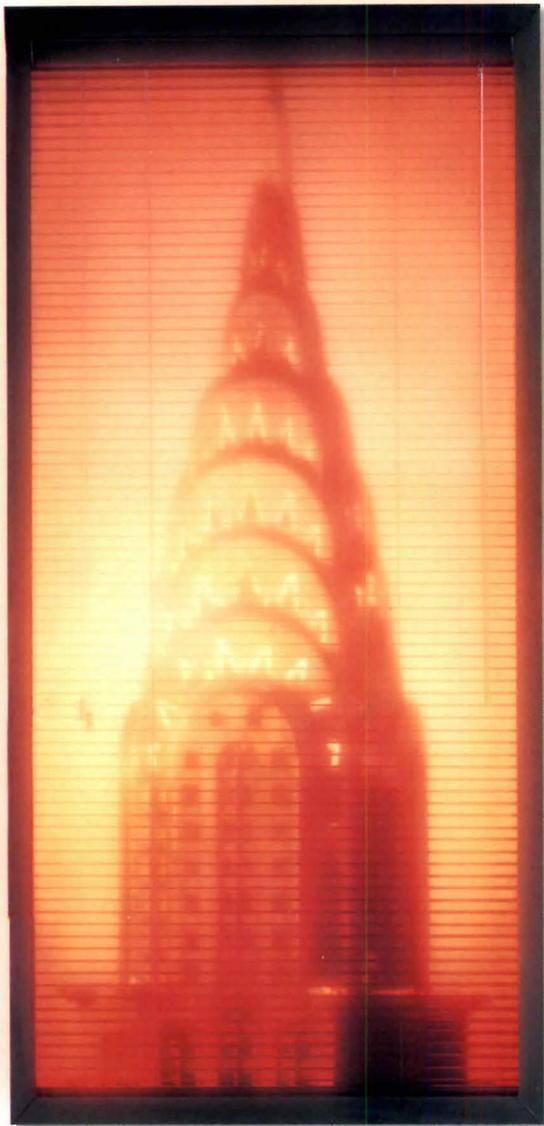
**PLAN:** Building's L-shaped configuration allows for servicing of all spaces to north from central loading dock.

**FACING PAGE:** Fiber optic lights richly texture brightly saturated other arches.

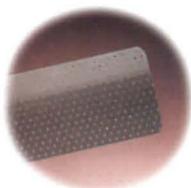
- 1 ENTRY LOBBY
- 2 ORCHESTRA LEVEL LOBBY
- 3 PROCTER & GAMBLE THEATER
- 4 STAGE
- 5 SCENE DOCK
- 6 FIFTH THIRD BANK THEATER
- 7 RETAIL
- 8 TICKET LOBBY
- 9 JARSON-KAPLAN THEATER
- 10 BALCONY LOBBY







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## Fine-Tuning Galleries, Museums, and Theaters

*Architects apply creative cultural restraint in designing spaces for discriminating eyes and ears.*



**A**rchitecture for the arts demands subtlety, according to the architects profiled in this month's Technology & Practice section. Designing and renovating museums and galleries usually calls for supreme restraint, as most clients don't want the architecture to upstage the art. But it's still possible to design intriguing spaces, as have Frederick Fisher, Annabelle Selldorf, and Richard Gluckman, three architects who specialize in gallery design. Proportion and detailing are key to creating exhibition halls that resonate with a variety of art. And though the 1980s art boom is over, gallery and museum commissions are again on the rise, according to the Art Dealers Association of America.

Renovations of two museums originally designed by the late Modernist Pietro Belluschi straddle the line between design and deference, as our technology feature reveals. Ann Beha Associates of Boston reconfigured both the Portland Art Museum in Oregon and the Clark Art Institute in Williamstown, Massachusetts, for the next century, controlling climate in one and adding galleries to the other, while carefully maintaining the character of both Belluschi originals. Beha's changes to the Portland's building and mechanical systems—the ultimate museum guards—are largely invisible, but are critical for the museum's expanding mission. The Clark additions similarly recede into the new whole to support the growth of the institution's programs.

Our computer article reveals acoustic advances in auditoriums made possible by sophisticated computer-simulation techniques. New software imports anechoic sound—sound from a reflection-free room—into a computer model so that architects and acousticians can judge how music or speech will sound in their spaces. This predictability minimizes errors, cutting the risk of designing innovative configurations in performing arts halls. The new software can predict the strength, timing, timbre, and path of direct and reflected sound by electronically simulating variables such as the quality and shape of surfaces and volumes.

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## Building a Specialty in Art



*Museums and galleries are a growing market for architects, as three designers demonstrate.*

The art boom of the 1980s spelled success for art dealers as well as for the architects they commissioned to design their galleries. But the recession of the early 1990s forced many upstart galleries to close.

These days, museum and gallery commissions are once again strong: According to the Washington, D.C.-based American Association of Museums, 44 new museums opened across the country in 1996. Commercial galleries are on the rebound, too, though not at the same intensity with which they peaked in the late 1980s. Established owners such as Larry Gagosian, Mary Boone, Barbara Gladstone, and Paula Cooper are moving into new, larger spaces or expanding their galleries, while younger dealers are eagerly opening new venues. Gilbert Edelson, vice president of the Art Dealers Association of America in New York City, reports that “there’s a good, solid recovery” in the art market. “I’ve sensed optimism among owners and dealers not just in New York, but also in cities like San Francisco and Chicago,” maintains Edelson.

Los Angeles-area art dealer and gallery owner Wayne Blank, who also developed the new Bergamot Station art center in Santa Monica, sees a definite upturn in the gallery scene. “There is no question the art market is coming back,” asserts Berg. “As the economy has stabilized, so has the art market. Curators and collectors are coming back to the galleries.” Gordon VeneKlasen, director of the Michael Werner Gallery in New York, agrees: “There seems to be more money in the art world lately. People are more willing to take chances.”

Such an upswing in the art world is good news for architects. Maintains New York practitioner Daniel Rowan, architect of the Gagosian Gallery, “The commitment to architecture still exists in the gallery world, though there may be more concern about budgets. But good galleries are still committed to designing good spaces.”

The recent art boom is especially good news for New York designers Annabelle Sell-

dorf and Richard Gluckman and Los Angeles-based architect Frederick Fisher. The three have successfully carved out specialty practices focusing on the design of commercial galleries, museums, and artists’ studios.

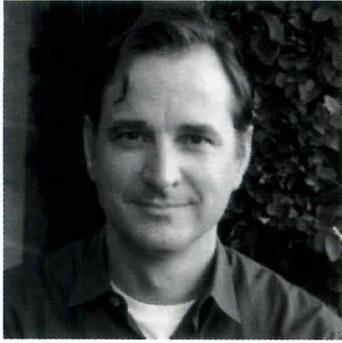
Art galleries are not the most lucrative commissions for architects, despite their glamorous reputation. As Fisher notes, “Budgets in the art world are always tight.” These smaller budgets don’t allow designers the freedom to create the highly idiosyncratic designs that distinguish many museums. Grand design statements, however, aren’t always welcome by artists and curators. As Fisher points out, “Artists hate architects because they make too much architecture and it overwhelms the artwork.” Moreover, gallery commissions demand quick turnaround times from architects—sometimes as short as four months for design and construction.

What do gallery owners want from their architects? These strong-minded clients can be “very controlling,” maintains Fisher. “They are very visually oriented people who want to be very involved in the design.” VeneKlasen affirms Fisher’s point: “The art business is very much about presentation.”

Owners and curators also demand that architects be technically proficient in properly displaying and illuminating art with an eye to flexibility—designers must keep in mind that different curators have different preferences for display and lighting techniques.

Selldorf, Gluckman, and Fisher succeed in gallery and museum design because each takes a subdued, minimalist approach to environments for exhibiting art, crafting simple, well-proportioned spaces that reverently defer to the art displayed within them. But these architects create more than just neutral containers in which to showcase art. “I don’t believe that neutral space exists,” maintains Selldorf. Fisher agrees: “It’s impossible to create a vacuum, and there are spaces that are so perfect you’re only aware of their perfection,” he maintains. “Then the art looks like an intrusion.” —*Raul A. Barreneche*

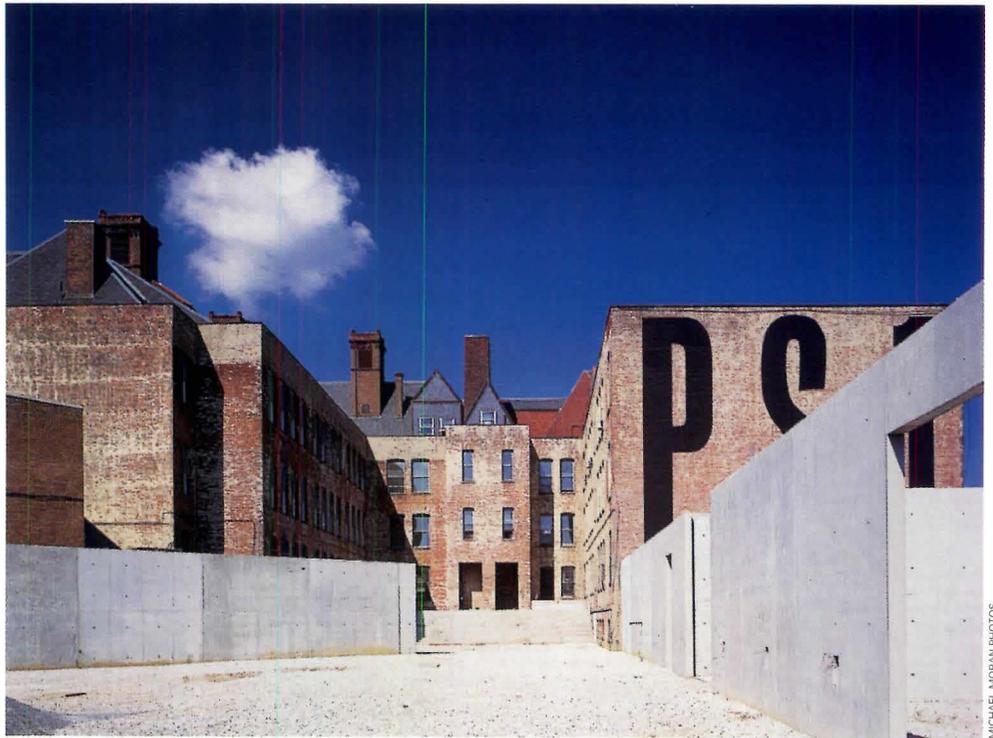
**FREDERICK FISHER & PARTNERS**  
Los Angeles, California



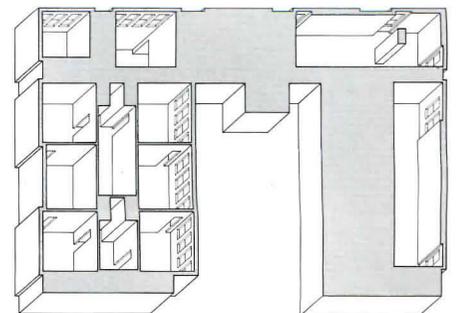
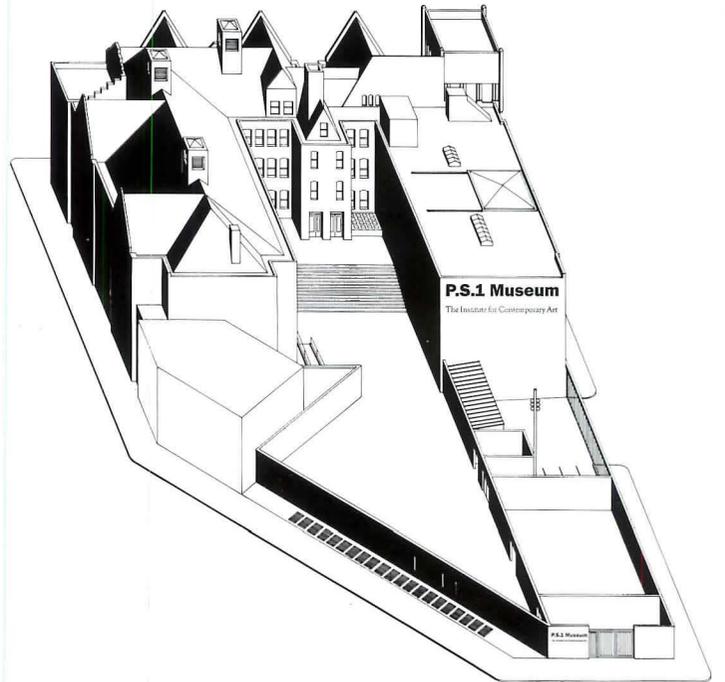
Los Angeles architect Frederick Fisher has been designing galleries and studios since he renovated a studio for his friend and ceramic artist Elsa Rady in 1981. Unlike his colleagues (following pages), Fisher studied art history at Oberlin College in Ohio before earning his master's in architecture from the University of California, Los Angeles (UCLA) in 1975. "I came out of an era when minimal art was one of the strongest esthetic and intellectual propositions in art, and I think that has really affected my view toward making art spaces," he admits. Fisher's minimalist sensibilities were also shaped by a 1970 Robert Irwin installation at the Museum of Modern Art (MoMA), where he was a summer intern. The painted white scrim and wires constituting the piece "influenced my way of looking at architecture, seeing how little you could act on a space and still change it," Fisher recalls.

After graduating from UCLA, Fisher went to work for Frank Gehry, an experience he says reinforced his interest in the connection between art and architecture. Afternoons at the studio, for example, were filled with informal discussions with artists such as Michael Heizer and Elyn Zimmerman. Fisher left Gehry's office in 1980 to launch his own firm and began designing small studios and live/work spaces for his artist friends from Venice.

As his reputation among the art community grew, Fisher expanded his practice by designing commercial galleries and larger exhibition spaces such as the Bergamot Station arts center in Santa Monica and the renovation of the P.S. 1 Museum in Queens, New York, Fisher's largest and most ambitious project to date. In his 16 years of private practice,

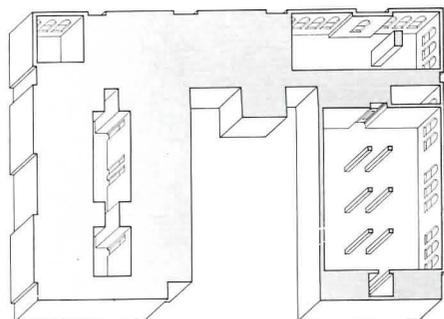


MICHAEL MORAN PHOTOS

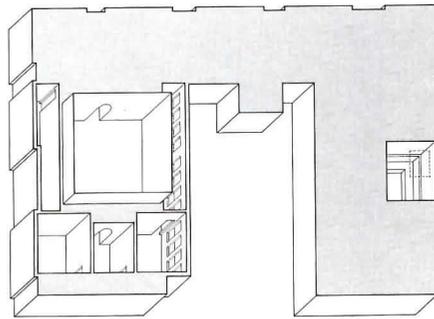


FIRST FLOOR

**TOP:** School renovated into museum.  
**AXONOMETRIC, ABOVE:** Concrete enclosure creates outdoor sculpture gallery.  
**AXONOMETRICS, RIGHT AND FACING PAGE:** Figure-ground diagrams of galleries reveal variety of scales of exhibit spaces.  
**FACING PAGE, TOP:** Gallery exposes steel and terra-cotta structure.  
**FACING PAGE, CENTER LEFT:** New concrete wall encloses outdoor sculpture court.  
**FACING PAGE, CENTER RIGHT:** Exposed brick walls of double-height exhibition space provide textured backdrop to art.



SECOND FLOOR



THIRD FLOOR

Fisher's portfolio has grown to include more than two dozen artists' studios, galleries, institutions, exhibit installations, and proposals for museums throughout the U.S., and in Germany and Scotland.

Fisher approaches all these projects with an eye toward designing quiet spaces that defer to the work exhibited within. "My work is about not competing with the art; it's about creating visual silence," the architect asserts. "I don't make my art spaces hermetically sealed and perfect. I try to create a certain naturalness of the space, so you're not overly aware of its composition."

For the L.A. Louver Gallery (1994) in Venice, for example, Fisher created a volumetric collage rendered on the exterior in a simple palette of split-face concrete block, stucco, steel, and glass (following page). Inside, whitewashed galleries with sealed concrete floors provide a flexible setting for large sculptures or small paintings. A second-floor viewing area for potential buyers allows art to be shown in a domestic-scale setting, under a combination of natural and artificial light. Throughout the interior, framed views and natural light animate Fisher's assemblage of spaces.

The gallery's director, Peter Goulds, admittedly chose Fisher not only for his formal sensibility, but for his knowledge of how to work with city officials, the coastal commission, and neighbors. Collaborating with Fisher turned out to be the ideal situation for Goulds. "Fred had a unique way of considering space relative to light and volume, yet his philosophy was not authoritarian," explains Goulds. "He listened to his client and accurately mirrored our way of working."

For the Eli Broad Family Foundation (1989) in Santa Monica, Fisher renovated an old concrete-and-steel-framed office building into a showcase for the foundation's extensive collection of contemporary art. The building neatly sums up the 47-year-old architect's attitudes toward renovating existing spaces: "The textures, proportions, and even imperfections of a space should remain in dialog with the art," he asserts.

Throughout the galleries, the original building's exposed concrete beams, columns, and floors create a quiet but varied backdrop to large paintings and sculptures by Anselm Kiefer, Jean-Michel Basquiat, and Jeff Koons. Fisher whitewashed cer-

tain portions of the existing structure, and left some unfinished. He also provided abundant daylighting throughout the building; newly inserted windows frame ocean views that become displays in their own right. Despite such irregularities of space and texture, “all you see is the art,” Fisher pronounces.

Another renovation of an existing building, Bergamot Station arts center (1994), converts a gritty industrial facility into a complex of studios, galleries, and offices (facing page). The project’s developer, who happens also to be a gallery owner in the complex as well as the project’s contractor, leased the 5.8-acre site from the City of Santa Monica and hired Fisher to transform the former industrial sheds into flexible spaces that could be converted into galleries, offices, or studios. Given the project’s incredibly tight budget of just \$9 per square foot, and a fast-track, six-month construction schedule, Fisher was able to make only the most minimal of interventions. He painted the existing metal roof and installed new corrugated steel siding on the exteriors of the sheds. As a result, the project feels undesignated and somewhat unfinished.

Within the Bergamot complex, Fisher designed seven of the individual galleries. Inside these spaces, suspended light tracks are hung from the peaked roofs, some of them up to 35 feet high, to illuminate the art, as well as introduce a more intimate scale to the lofty interiors.

The project has been warmly received by both gallery owners and the public. As gallery owner and project developer Wayne Blank asserts, “It has basically rejuvenated the art scene in Los Angeles after it had been at an all-time low following the recession. Collectors are back, and there’s a waiting list for new galleries and virtually no turnover of existing gallery tenants.”

Fisher reports that film studios are considering moving into Bergamot Station’s rugged sheds. And construction begins this month on architect Narduli/Grinstein’s design for the Santa Monica Museum, scheduled to open in one of the station’s vacant buildings in March. Bergamot’s success charts a definite move away from formal, high-end settings such as L.A. Louver Gallery. Bergamot, claims Fisher, represents a new trend in art towards “lean-and-mean, almost ad-hoc” spaces.

Fisher’s newest and most ambi-

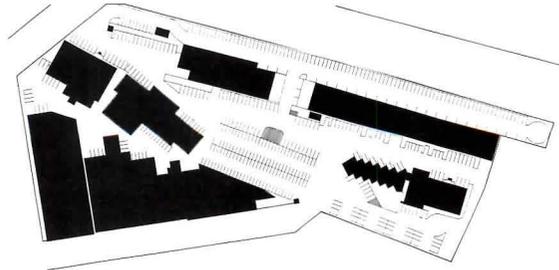


**TOP:** Fisher articulated main south-facing elevation of L.A. Louver Gallery with palette of stucco, rough concrete block, steel, and glass.

**ABOVE:** Main ground-floor exhibition space of L.A. Louver Gallery allows display of large sculptures or smaller paintings. Behind partition wall at south end of gallery (rear), intimate exhibit space shows small-scale art.

**RIGHT:** Atop main gallery, partially enclosed outdoor room displays sculpture such as Peter Shelton’s *mere ubu*.





**SITE PLAN**

**TOP:** Fisher transformed industrial sheds of Bergamot Station into galleries clad in corrugated steel.

**ABOVE AND SITE PLAN:** Bergamot Station comprises former industrial site along old rail line in Santa Monica.

**LEFT:** In typical gallery, lighting is suspended from pitched roof.

tious art project is the renovation of the P.S. 1 Museum (1995), the brainchild of the Institute for Contemporary Art in New York. Fisher was first hired in 1988 to renovate the existing museum, which is housed in a neo-Gothic former schoolhouse across the East River from Manhattan. Given the massive building's 84,000 square feet of space, Fisher and architect of record David Prendergast approached the renovation with an eye toward creating a range of different interiors. "I sacrificed order for variety. I could have done a more orderly, regimented series of spaces, but I chose to create different types of spaces instead," explains Fisher. "You're always discovering different textures, wall surfaces, and types of lighting."

In the north wing of the U-shaped building, a steel and terra-cotta framed school dating from 1900, Fisher removed many of the interior walls to create open, whitewashed galleries enlivened by the exposed terra-cotta arches and natural light. The rest of the building is constructed of loadbearing brick; here, Fisher respected the proportions, materials, and spatial arrangements of existing classrooms—whether soaring double-height or tiny enfilade rooms.

For the viewer, Fisher's constantly changing interiors provide a muted background to the art. The varied interiors also complement the museum's history as an in-situ art space, where artists create site-specific works that respond to the character of the galleries. "Our design is an invitation for artists to do something with the building. We created a varied set of backdrops that will stimulate artists and curators to do something unique in these spaces," adds Fisher. As in the Broad Foundation building, the variegated textures and surfaces of the P.S. 1 Museum's interiors don't detract from the art; instead they create a lively yet restrained backdrop.

No matter what the project, Fisher says he benefits from working with dealers, curators, and artists and their particular sensibilities. "I enjoy collaborating with them because it continues my visual education," he admits. And his work will continue to reap the benefits of his collaboration with the art world. "I plan to continue designing art spaces because I've invested my whole career in it—and I like doing it."

**SELLDORF ARCHITECTS**  
New York City

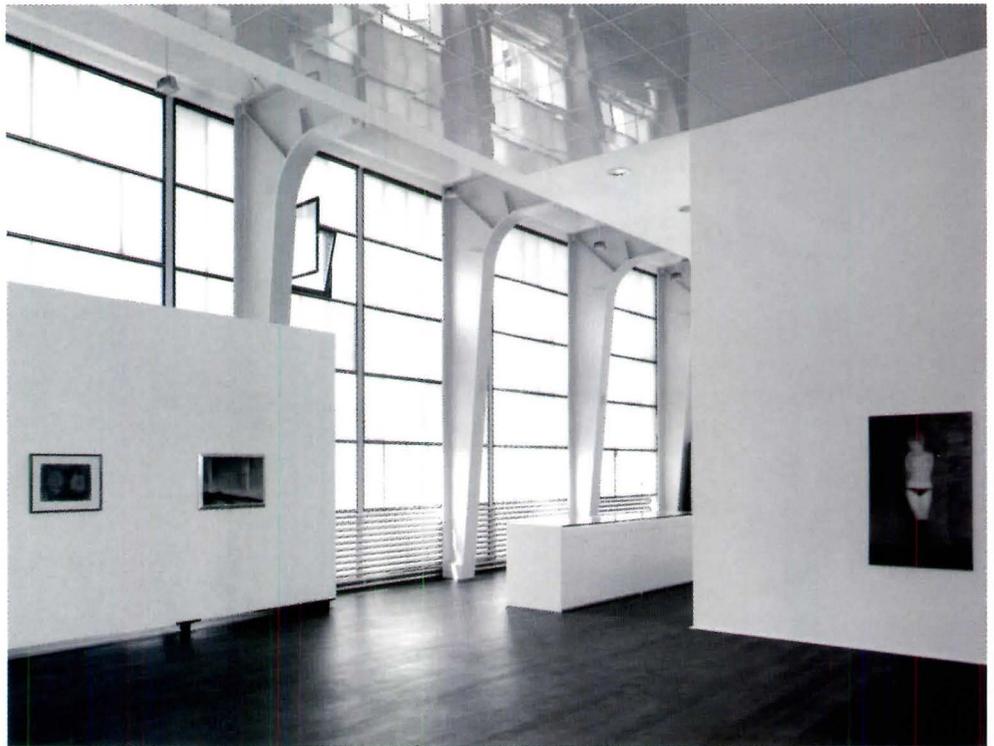


**A**nnabelle Selldorf's gallery designs display a quiet elegance achieved through simplicity and restraint. But the German-born architect is wary of those who label her cool, discreet interiors as minimalist. "I don't think of my work as minimal per se," counters Selldorf, "I just think it's careful."

Selldorf began her career working in the offices of Richard Gluckman in 1979, when the firm was known as Stelle/Gluckman Architects, before pursuing an undergraduate architecture degree at Pratt Institute and later a master's from Syracuse University. But it wasn't Gluckman's expertise in gallery and museum design (following pages) that piqued Selldorf's interest in such work. Rather, it was her involvement in the contemporary art scene in Cologne, Germany, where she grew up, the daughter of an architect and an interior and furniture designer. Selldorf's contacts with artists and dealers in Cologne led her first to Gluckman's office and eventually to gallery commissions when she launched her own firm, Selldorf Architects, in 1990.

Initially, Selldorf took on small-scale renovations and interiors, the typical bread-and-butter work of young firms. In 1990, she landed her first commission to design a commercial gallery for German art dealer Michael Werner. Now, more than a dozen galleries and exhibition spaces later, much of Selldorf's 12-person practice focuses on the design of art spaces, in addition to high-end residential renovations and retail installations.

The 36-year-old architect's knowledge and affinity for art not only has helped her find new clients, but has also enabled her to fine-tune exhibition spaces to spe-



**TOP:** Selldorf designed new partitions in renovated brewery at Galerie Hauser + Wirth (1996) in Zurich. New translucent glass panels are inserted in gallery behind original windows.

**ABOVE:** Combination of daylight and exposed incandescent bulbs illuminate restrained exhibit space at Koury Gallery (1991) in New York City.

**RIGHT:** David Zwirner Gallery (1992) in New York exhibits small sculptures or large paintings.





**TOP:** At Michael Werner Gallery (1990) in New York, Selldorf designed walnut plank floors and custom finishes in her first solo gallery project.

**ABOVE:** In exhibit space of McEnroe Gallery (1993) in New York, Selldorf exposed existing cast-iron columns and inserted new glass doors separating gallery from kitchen and office at rear of thin, rectangular floor plate.

cific types of painting and sculpture. “I often know the artists that galleries show, and I can imagine what those shows will look like, and that’s really helpful,” she asserts.

For Selldorf, a successful art space is one that allows owners or curators to exhibit any size or style of work, whether tiny ink-wash sketches or large-scale video installations. “It’s very tricky,” Selldorf explains, “because you have to be able to hang small pictures and not have them dwarfed by the room, or to exhibit large paintings and be able to step back and view them.”

Selldorf applies a similar strategy to each of her projects, creating well-proportioned, daylit spaces through minimal means. Details and material expression are spare; her interiors sometimes feel untouched by the architect’s hand. There is no signature style or look to Selldorf’s galleries, although she admits her bias is Modernist. No matter what the setting, maintains Selldorf, the question is still the same: “How do you make a flexible space that uses daylight where possible, with clarity and restraint in the details, that makes people feel like they’re in a generous space?”

Selldorf’s work varies greatly, depending on the particulars of client and budget and the art being exhibited. In the Koury and McEnroe galleries in New York (left and facing page, center), for example, she keeps details to a bare minimum, so exposed light bulbs and painted cast-iron columns comprise the only obvious architectural elements. Their open spaces are suited for displaying large contemporary paintings.

Selldorf’s design for the blue-chip Werner Gallery (top left) achieves a more polished look with walnut floors, recessed lighting, and vitrines for small objects. “It’s an extremely clean but elegant space that steps out of the way of the art,” explains the Werner Gallery’s director, Gordon VeneKlasen. “It functions very well, no matter what kind of exhibition we do.”

As a result of her gallery work, artists such as Jeff Koons, Eric Fischl, April Gornik, and the Swiss artist Not Vital have called on Selldorf to design their studios or live/work spaces. “Sometimes I trade my architectural services for art pieces,” Selldorf notes. The architect is now completing a new gallery for New York dealer Barbara Gladstone, which opens this month.

**RICHARD GLUCKMAN ARCHITECTS**  
New York City



BRIGITTE LACOMBE

**R**ichard Gluckman has won several of the most important architectural commissions in the art world over the past 20 years: The Dia Center for the Arts in New York City; The Andy Warhol Foundation for the Visual Arts' New York headquarters and the Andy Warhol Museum in Pittsburgh; the Georgia O'Keeffe Museum in Santa Fe, New Mexico; and more than 30 commercial galleries around the country and abroad, including spaces for noted New York art dealers Larry Gagosian, Paula Cooper, and Mary Boone.

Gluckman "never knew or expected" he'd eventually specialize in designing art spaces and wound up in the art world through a circuitous route. The architect moved to New York from Boston in 1976, and set up his first firm, Stelle/Gluckman Architects, with partner Fred Stelle.

Gluckman's first commission was to renovate a townhouse for German-born art dealer Heiner Friedrich and his wife, Philippa de Menil, who founded the Dia Center for the Arts in 1974. Throughout the late 1970s and early 1980s, Gluckman worked on a variety of exhibition spaces for Dia-supported artists, including Dan Flavin, Donald Judd, and Walter De Maria. "Working with these artists gave me my design approach," the 49-year-old architect explains.

Friedrich and de Menil again called on Gluckman's talents to design a new permanent headquarters for Dia, which opened in 1987. He reconfigured an old brick warehouse on the western edge of New York's Chelsea district into lofty exhibition spaces. This cool, stark setting for art became a paradigm for the gallery-as-neutral-container of the late 1980s and early 1990s. The proj-

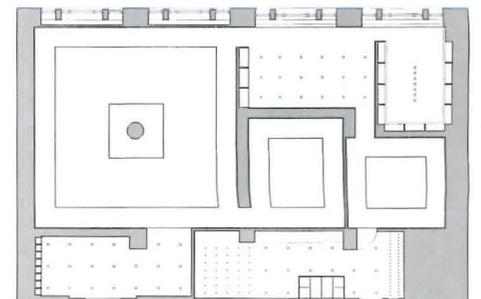


ANDRUAN/FREEMONT

**TOP:** Tinted plaster walls and ceiling and concealed low-voltage halogen lighting distinguish the exhibition space of Gluckman's Mary Boone Gallery (1996) in New York.

**ABOVE AND RIGHT:** Boone Gallery incorporates library (left) and art storage and preparation (right).

**PLAN:** Large and small galleries (top left and center) and showroom (center right) dominate Boone Gallery.



**PLAN**



**TOP:** For Site Santa Fe (1995), Gluckman converted 18,000-square-foot warehouse into exhibit space for site-specific installations.

**ABOVE:** Gluckman designed displays and partition walls topped by translucent plastic panels for Brancusi sculpture retrospective at Philadelphia Museum of Art (1995).

ect also put Gluckman on the map as the preferred architect of the art world, as gallery owners called on him in increasing numbers. Gluckman estimates his firm has designed almost 800,000 square feet of commercial and institutional exhibition space, not including studios or houses for artists.

Despite the minimalism of his interiors, Gluckman doesn't abstract space and materials into totally neutral, hermetic environments. Rather, he lets the textures of concrete, brick, drywall, and plaster become backgrounds to both the viewer and the work exhibited—because for Gluckman, these are integral parts of an exhibit space. "Ours is a reductive approach," he maintains. "We don't leave a certain amount of the space incomplete or unfinished, but we leave the viewer and the object to complete the space. It allows us not to overarticulate the architecture."

Many of Gluckman's commissions come from repeat clients. His experience with Dia, for example, led to his selection as architect of the Andy Warhol Museum (1994), established by a collaborative effort among the Dia Center, the Andy Warhol Foundation for the Visual Arts, and Pittsburgh's Carnegie Museum of Art. One of only a handful of monographic museums in the United States, the Warhol museum is housed in a renovated commercial and industrial building in Pittsburgh's North Side. Throughout the museum, Gluckman manipulates the building's exposed concrete structural frame to create sober, restrained galleries of varying scales, each of them deferential to Warhol's exuberant images. The museum, in turn, led Gluckman to design the Warhol Foundation's New York City headquarters. Building on his experience designing spaces for Dia, the architect currently has on the boards two new expansions for the organization (following page): A proposed new structure and a renovation of an existing warehouse will provide much-needed space for Dia's permanent collection, plus changing exhibition and performance spaces.

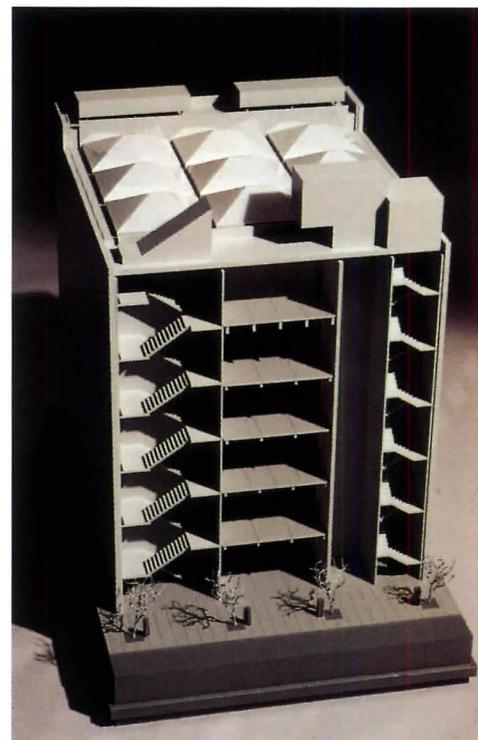
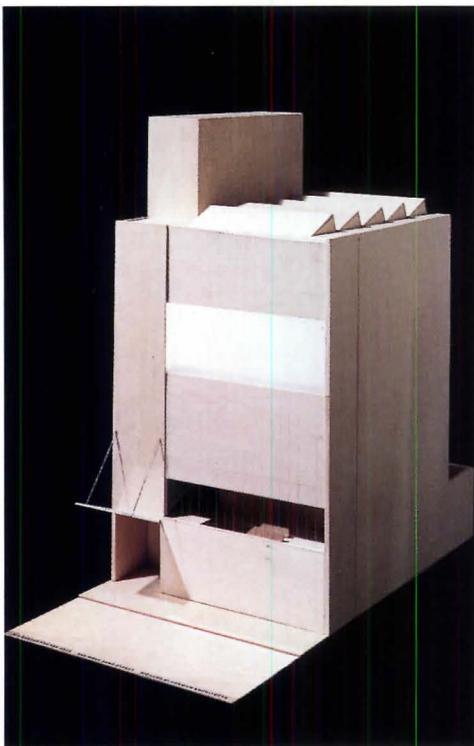
Fabled New York art dealer Mary Boone is another of Gluckman's repeat clients. Boone first hired the architect in 1990 to renovate her downtown Manhattan gallery. When the dealer moved to a new space on Fifth Avenue last year (facing page), she again hired Gluck-

man as much for the successful rapport they established during the design of her previous gallery as for his material and spatial sensibilities. "I think we bring out the best in each other," Boone says. "In fact, I'd build another gallery just to be able to work with Richard again."

Many of his commissions, however, have been from clients that have seen built projects. For example, in 1995, Gluckman completed a warehouse renovation in New Mexico for the biennial exhibition, Site Santa Fe (previous page), to house site-specific installations by artists such as Barbara Bloom, Anne Hamilton, and Felix González-Torres. This design led to the Georgia O'Keeffe Museum in Santa Fe, New Mexico, scheduled to open next July. The museum's exhibition spaces, according to Gluckman, will lean toward the decorative—a departure from his typical spare, whitewashed finishes. Tinted plaster or hand-troweled mud-finished interiors will allude to the artist's studio in Abiquiu, and custom skylights will try to recreate the daylight of studio as well as the light inherent in O'Keeffe's paintings.

Through designing both small commercial galleries and large private museums, Gluckman has learned the key differences between these two types of art institutions. Obviously, there are programmatic distinctions between the two: Galleries exist primarily to sell art, while museums have a more curatorial and didactic role. In their design, galleries present a double challenge: to reflect the character of the work shown, as well as convey the personality of the dealer. "Galleries can really become manifestations of strong-willed, dominant dealers," explains Gluckman. "Museums and other institutions don't have the idiosyncratic characteristics that sometimes become evident in galleries." As fundamentally commercial ventures, galleries lack the permanence and stability of big museums and are more susceptible to the economic pressures of the marketplace. Gluckman estimates that of the more than 30 commercial galleries he designed in the 1980s, only 10 are still in existence.

Galleries can also make for difficult working relationships between client and architect. "A gallery owner is a more intense involvement with the client," Gluckman explains. "Some individuals are dif-

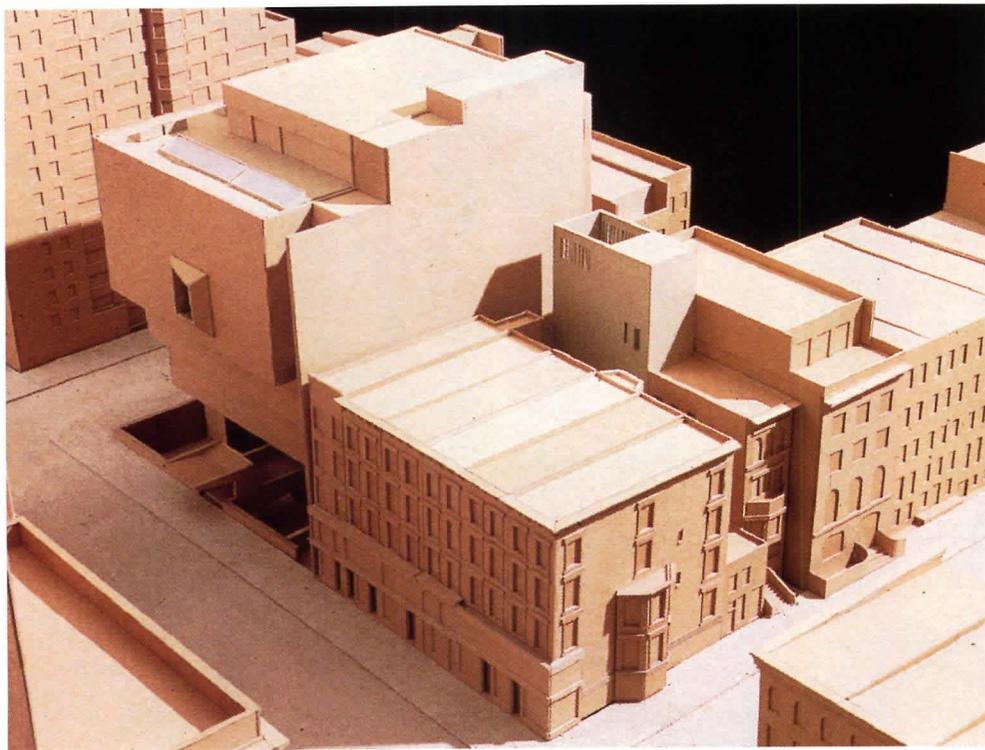


**TOP LEFT:** Proposed new building for Dia Center for the Arts in New York City augments 1987 facility.

**TOP RIGHT:** Dia expansion will house portions of permanent collection and changing exhibition space.

**ABOVE:** Renovated industrial building will house 42,000-square-foot expansion of Dia Center for the Arts.

**ABOVE RIGHT:** New staircases flanking galleries (left and right) create 9-square plan organization for Dia expansion.



**TOP:** At Whitney Museum of American Art in New York, Gluckman is converting top-floor offices of Breuer's original landmark (1966) into galleries for permanent collection, and renovating adjoining townhouses into offices and expanded library.

**ABOVE AND LEFT:** Wood-framed artist's studio at Acadia Summer Arts Program in Mount Desert, Maine, will be clad in cement board panels, sheet metal, and plastic.

difficult, but that doesn't make them bad clients; in fact, some of the most demanding owners make the best clients."

These days, Gluckman's firm is tackling larger, more high-profile institutional work. In addition to the O'Keeffe museum, the architect is expanding the Whitney Museum of American Art, by renovating a pair of townhouses and connecting them to Marcel Breuer's landmark 1966 building (left).

In Malaga, Spain, Gluckman has signed on to design a new Picasso museum. The architect had also proposed inserting an art museum into a renovated 13th-century ship-building structure in Seville, until the project was put on hold last year. Other projects on the boards in Gluckman's office include an artists' cottage in Maine for the Acadia Summer Arts Program (below left).

Gluckman has been working with large museums since 1989, when he renovated the contemporary art galleries in the I.M. Pei-designed wing of Boston's Museum of Fine Arts. In 1995, he renovated the galleries at the Carnegie Museum of Art's contemporary wing, designed by Edward Larrabee Barnes. And this year, the architect was commissioned to renovate the contemporary galleries of the Philadelphia Museum of Art's permanent collection.

Gluckman is also tackling exhibit design: He created the displays for the 1995 Brancusi retrospective at the Philadelphia Museum of Art, as well as for the museum's blockbuster Cézanne exhibition, which closed in September. "The Brancusi show was the first time we worked on a monographic exhibition," explains the architect.

Gluckman has indeed amassed an impressive oeuvre of museums and galleries, and continues to build his portfolio. Almost all of the work currently in construction and on the boards in the architect's TriBeCa studio is art-related. Yet for all of Gluckman's success in the glamorous world of art, the architect feels somewhat pigeonholed into a niche by his concentration in exhibition spaces, most of which have been renovations of existing interiors. "It creates a problem when we want to be considered for new construction," Gluckman admits. "I'm happy we've developed this expertise, because it makes each subsequent job a little easier. But I'd love to do a school or a library."



# V I S I O N A R Y

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## Revising Belluschi



*Ann Beha Associates renovates two museums by the prolific late Modernist Pietro Belluschi.*

It was purely by coincidence that the firm Ann Beha Associates of Boston recently found itself renovating two museums designed by Modern master Pietro Belluschi, who died in 1994 at age 94. The commissions to upgrade the Portland (Oregon) Art Museum (1932) and to expand the Clark Art Institute (1973) at Williams College in Williamstown, Massachusetts, marked Beha's first major foray into revising Modernist structures. For nearly 20 years, the Boston firm has preserved historic cultural facilities from earlier eras, such as the buildings on Harvard Yard, Harvard's Fogg Museum, and Boston's Gardner Museum.

Unlike those previous projects, "these Modern buildings have their own technologies and design attitudes," Beha remarks. "And if you're used to working on 19th-century buildings—get ready."

Belluschi's Portland and Clark museums stand a continent and a career apart. Yet each is carried by a loadbearing structure of reinforced concrete; both display the architect's fluid organization of spaces in simple, subdued galleries off generous corridors suffused with natural light. And each rehab involved a client with a strict budget adapting an outdated facility from this century to the next.

At the Portland museum, both design and technology are "transitional," Beha observes—more sophisticated than early 20th-century structures, but not as advanced as postwar buildings. The museum's stripped Classical mass is wrapped by a skin of red brick trimmed in travertine. Its mechanical systems were idiosyncratic to the time and place: Interior air was heated and humidified by a deep-well water system passing water through sumps in the mechanical closet before distribution to the ducts, and the museum had no air-conditioning.

In addition, the Portland museum's bay windows and rooflight monitors, Beha contends, "were beautiful, but total heat sinks," and admitted too much ultraviolet light. The roof had leaks, and the open foyer and first-

floor galleries proved a major source of air exchange where the winter climate is clammy and the heat spikes sharply in summer.

The museum's mechanical health would not support the long-range plans of new Executive Director John Buchanan to show more of Portland's permanent collection, increase donations of artworks, and attract more traveling shows.

Yet, in deference to Belluschi's landmark and the museum's budget, structural changes had to be minimal. Beha's team installed new mechanical systems (though original ductwork remains beneath an asbestos layer in the walls); refined the envelope with new glazing, solar shades, and a membrane roof; and most noticeably, erected a transparent interior wall in the main foyer to serve as a moisture barrier. "We could put in new systems," Beha says, "but we couldn't bunker the building."

The Clark project presented a similar challenge, as it called for finding new floor area within Belluschi's stoic, granite-clad building, completed with The Architects Collaborative in 1973. Museum Director Michael Conforti sought more space for compact storage and exhibitions, a new café, as well as offices to house the Getty-sponsored Bibliography of the History of Art. The chief expansion strategy was to introduce a steel structure designed by LeMessurier Associates of Cambridge. "With anything heavier [such as more loadbearing concrete]," reports Beha Associates's Design Principal Thomas M. Hotaling, "we would need new support walls that would eat up a lot of floor area."

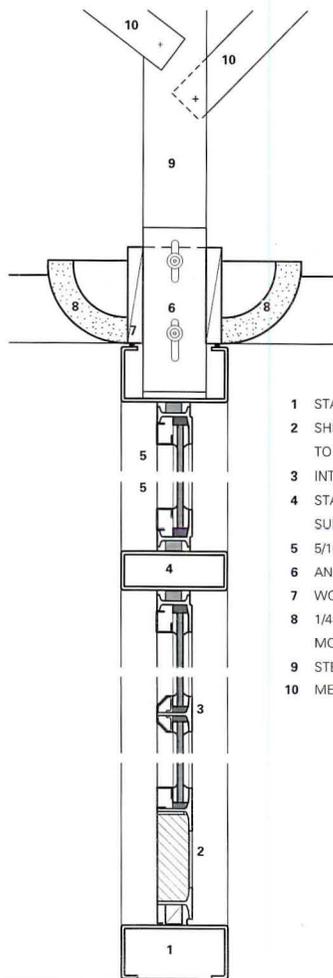
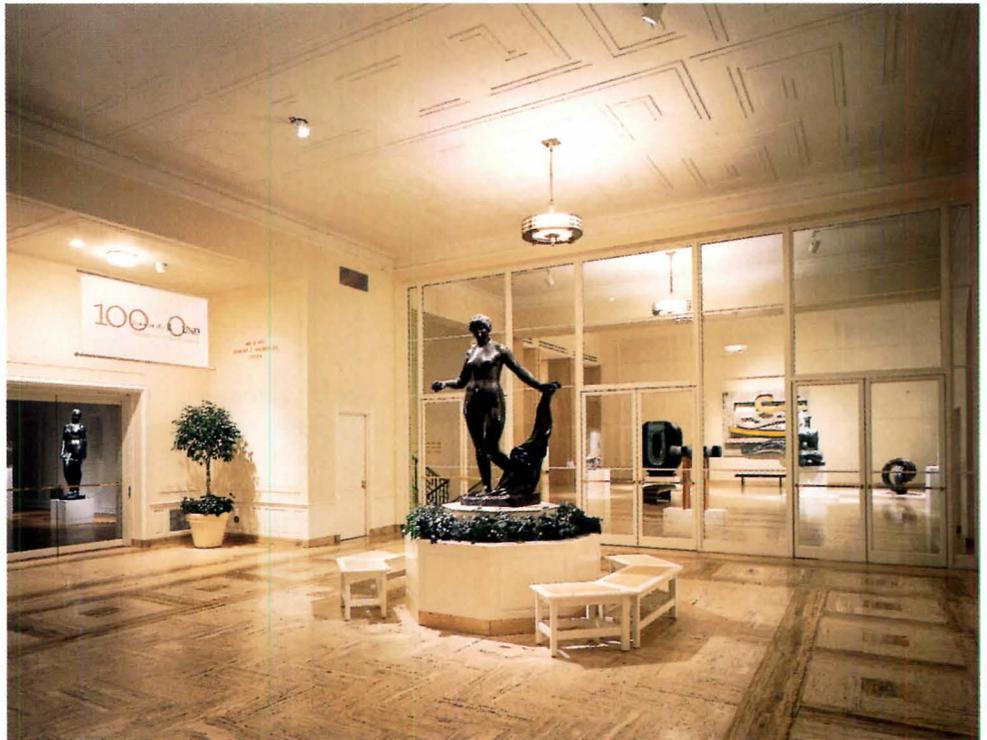
Working under Belluschi's hand in both museums, Beha mitigated between esthetics, technology, and the interests of museum boards and patrons to foster stewardship of the art collections. The high point of the Portland project, Beha recalls, was meeting Marjorie Belluschi, the architect's widow, who surveyed the building's transformation and concluded that "Pietro would be smiling." —Bradford McKee

Climate control was the main objective in renovating Pietro Belluschi's Portland Art Museum, so Ann Beha Associates stealthily upgraded the building envelope and interiors. In the foyer, Beha Associates created new coat rooms, and ticketing and security areas, sealed by a 15-foot-high stainless-steel vestibule wall, with 8-foot-high doors, bolted to the existing structure above new molding. The wall was custom-designed by Hopes Architectural Products of Jamestown, New York, to match Belluschi's original 14-foot-high bay windows, built 64 years earlier.

Climate-control issues centered on light, temperature, and moisture. Beha specified tightly caulked, aluminum-framed, interior storm windows to reduce condensation on the bay windows, which are fitted with framed solar-veil shades. Skylights in 17-foot-high roof monitors gained tighter aluminum framing to improve thermal performance and reduce air infiltration, and double panes of 1 1/16-inch-thick laminated glass separated by 1/2-inch air spaces to cut ultraviolet light. Light transmissibility stands at 53 percent, with a shading coefficient of 0.60 and a U-value on summer days of 0.38.

New HVAC units allow separate humidification for each gallery, all controlled by a central computer. Indoor climate targets called for 50 percent relative humidity, plus or minus 3 percent; and temperature that doesn't vary by more than 1 degree Fahrenheit.

All new mechanical systems and materials were scrutinized by museum conservators Murray Frost and Sonia Sopher for their environmental impact on artworks. In addition to controlling temperature and moisture in each space, Frost suggested placing carbon dioxide sensors in each gallery, which bring in outside air on busy days when crowds make galleries stuffy, to prevent "museum fatigue."



- 1 STAINLESS SASH
- 2 SHEET METAL TACKED TO FRAME
- 3 INTERMEDIATE MUNTIN
- 4 STAINLESS STEEL SUBFRAME
- 5 5/16" LAMINATED GLASS
- 6 ANGLE SUPPORT
- 7 WOOD BLOCKING
- 8 1/4" ROUND PLASTER MOLDING
- 9 STEEL ANCHOR
- 10 METAL BRACING

SECTION THROUGH LOBBY PARTITION



**FACING PAGE, TOP:** Entry foyer is sealed from sculpture court and galleries by 15-foot-high vestibule wall, which acts as barrier to moisture.

**FACING PAGE, CENTER:** Portland Art Museum is clad in brick and travertine.

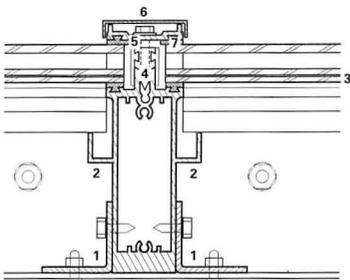
**FACING PAGE, WALL SECTION:** Vestibule wall frame is anchored by bolts to concrete beneath travertine floor and bolted to metal bracing above ceiling.

**LEFT:** New skylights in roof monitors above sculpture court shield artwork from ultraviolet rays and summer heat.

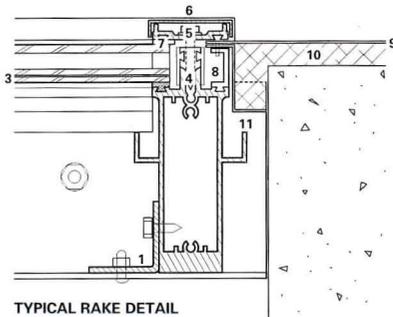
**RAFTER DETAIL:** Aluminum rafter is bolted to concrete by angle clips.

**RAKE DETAIL:** Rigid insulation abuts aluminum housing.

**ROOFLIGHT DETAIL:** Double layers of 1 1/16-inch-thick laminated glass are framed in aluminum. Inner layer comprises two panes of 1/8-inch-thick heat-strengthened glass.

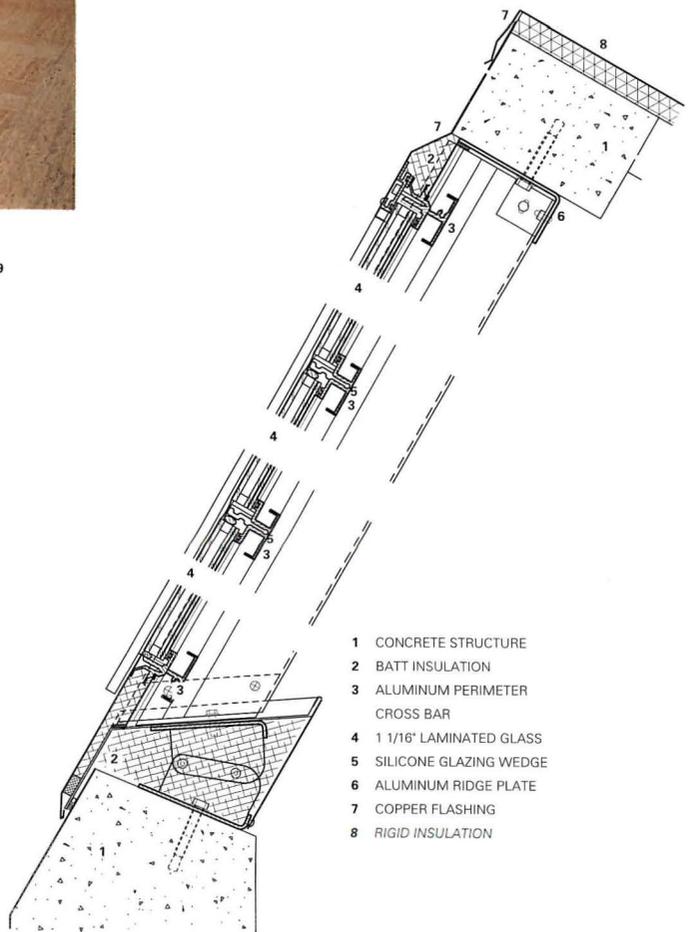


**TYPICAL RAFTER DETAIL**



**TYPICAL RAKE DETAIL**

- 1 ANGLE CLIP
- 2 5" ALUMINUM RAFTER
- 3 1 1/16" LAMINATED GLASS
- 4 GLAZING WEDGE
- 5 NYLON SHOULDER WASHER
- 6 ALUMINUM SNAP CAP
- 7 ALUMINUM PRESSURE PLATE
- 8 1" SLIDE-IN SPACER
- 9 COPPER FLASHING
- 10 RIGID INSULATION
- 11 4" INSULATION CLOSURE



**ROOFLIGHT DETAIL**

- 1 CONCRETE STRUCTURE
- 2 BATT INSULATION
- 3 ALUMINUM PERIMETER CROSS BAR
- 4 1 1/16" LAMINATED GLASS
- 5 SILICONE GLAZING WEDGE
- 6 ALUMINUM RIDGE PLATE
- 7 COPPER FLASHING
- 8 RIGID INSULATION

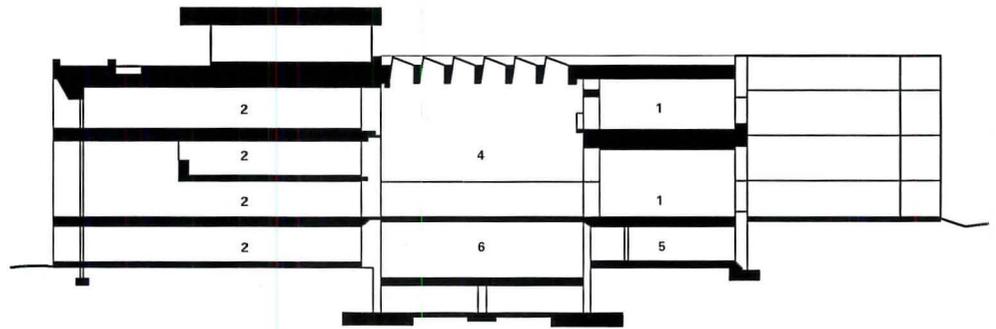
3/7.5cm

Within the Clark Art Institute's existing footprint, Ann Beha Associates created 15,000 square feet of new additions. They comprise compact storage excavated below the main entry plaza, a new 6,200-square-foot volume built onto the museum's northeast corner containing offices and storage on the ground floor, a café on the first floor, an extended gallery on the second floor, and new space over the entry on the second and penthouse levels.

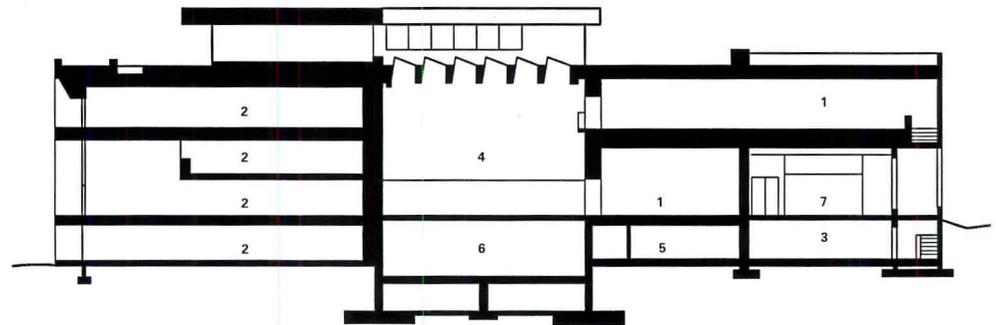
The new storage area was being dug deeper than the existing footings, which were partly excavated and underpinned with additional concrete. When paved over with granite, the compact stacks would lie below the entry court and had to be strong enough to hold a fire truck; the solution of structural engineer William Thoen of LeMessurier Associates was to place three compact concrete beams within the storage area's roof slab below grade.

On the upper levels, LeMessurier reduced the weight of the additions, by inserting structural steel framing that bears directly on existing walls. Demolishing concrete and erecting steel in stages, steel detailers joined the frame to the 12- to 18-inch-thick concrete walls with welded connections, and inserted steel beams into beam pockets carved out of the bearing wall.

Among the more complex problems was extending a second-floor gallery into the added northeast volume. The gallery design called for a clear span of 43 feet with seamless ceilings. The gallery roof was shored and the exterior wall removed below the parapet as two parallel, 33-inch steel beams were placed across the gallery's full length above the roofline. Just beneath the roof, a secondary 10-inch beam was suspended from 1 $\frac{1}{4}$ -inch hanger rods to support the roof's load from below when the shores were removed.



NORTH-SOUTH SECTION (BEFORE)

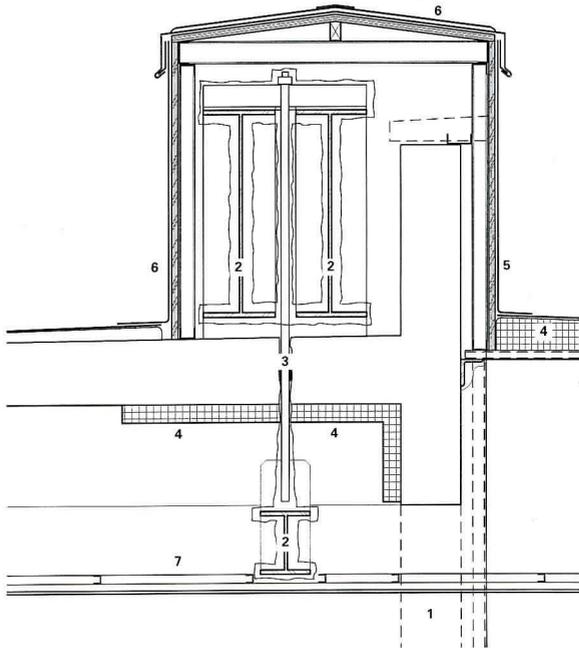


NORTH-SOUTH SECTION (AFTER)

- 1 GALLERY
- 2 LIBRARY STACKS
- 3 OFFICE
- 4 SCULPTURE COURT
- 5 STORAGE
- 6 MECHANICAL
- 7 CAFÉ

16/4.5m

TOP: Additions to Clark Art Institute include new second-floor and penthouse offices inserted above entrance. SECTIONS: Original exterior wall (top) was removed to expand second-floor gallery (bottom).



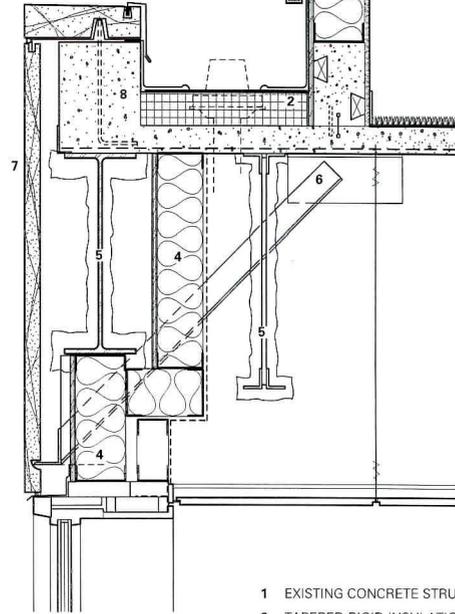
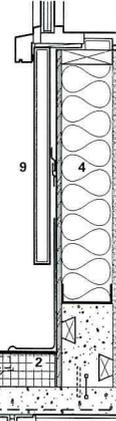
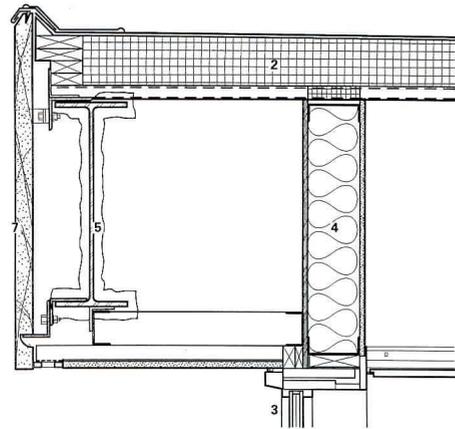
ROOF SECTION AT STRUCTURAL STEEL ENCLOSURE

**TOP:** New structural steel beams above extended second-floor roof allow continuous gallery ceiling.

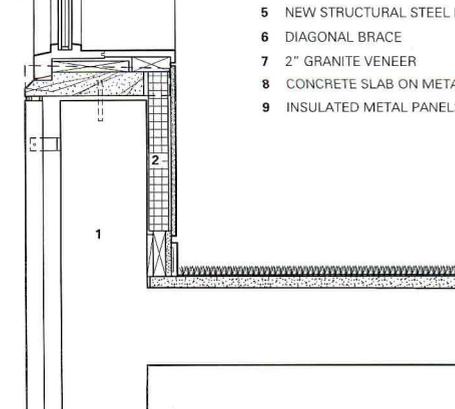
**ROOF SECTION:** New metal-framed plywood roof enclosure above enlarged second-floor gallery houses twin steel beams (top). Secondary beam (bottom) is suspended by hangers to support intermediate roof load above ceiling.

**WALL SECTION:** New steel frame of west exterior wall addition above entrance is inserted into cavities of original loadbearing concrete wall; 2-inch-thick granite panels fasten onto new frame.

- 1 EXISTING CONCRETE WALL (REMOVED)
- 2 NEW STRUCTURAL STEEL BEAM
- 3 HANGER ROD
- 4 RIGID INSULATION
- 5 3/4" PLYWOOD ON METAL STUDS
- 6 FLASHING
- 7 SUSPENDED GYPSUM BOARD CEILING



- 1 EXISTING CONCRETE STRUCTURE
- 2 TAPERED RIGID INSULATION
- 3 INSULATED GLASS
- 4 6" BATT INSULATION
- 5 NEW STRUCTURAL STEEL BEAM
- 6 DIAGONAL BRACE
- 7 2" GRANITE VENEER
- 8 CONCRETE SLAB ON METAL DECK
- 9 INSULATED METAL PANELS



WALL SECTION OF WEST ADDITION

1/4" = 4.67/11cm

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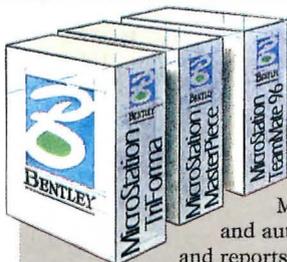
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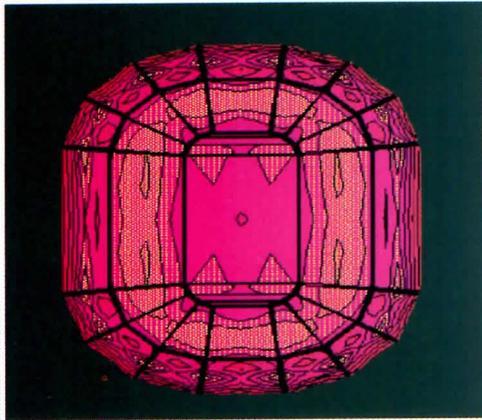
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## Digitizing Acoustic Designs



*Computer modeling software measures sound in new and renovated theaters.*

Comfortable seats and clear sight lines can't save a performance hall with flawed acoustics. To avoid costly failures, conservative acousticians stick to proven spatial configurations, since experimentation doesn't always succeed. But a new generation of acoustic modeling software is challenging the status quo. With increasingly reliable programs to measure and analyze sound, acousticians can now test and refine designs before opening night, reducing the margin of error and encouraging innovation.

The behavior of sound within a space is entirely dependent on the room's shape and structural constitution: Sound travels both directly from a source to a listener and indirectly, having been reflected off and diffused by multiple surfaces such as walls and ceiling planes. The strength and timing of each reflection depends on the size, orientation, and sound-absorptive or -reflective quality of these surfaces, explains Richard Talaske, principal of the Talaske Group, acoustic consultants based in Oak Park, Illinois.

Acoustic analysis software allows designers to predict a room's isolation characteristics based on its geometry and sound transmissivity values of materials. The output varies: traditional spreadsheet applications behave like electronic number-crunchers and yield, for example, a room's reverberation times or the noise levels of its mechanical equipment. In addition, these spreadsheet applications take the drudgery out of recalculating reverberation times with every design iteration.

The time that elapses between when a sound is emitted and when the last reflection reaches an audience member is measured in milliseconds: too little reverberation is too dry, too much results in an echo. The human ear can discern between pleasant reverberations and unsavory echoes, but it takes a computer to quantify the difference.

Acoustic modeling programs allow acousticians to evaluate sound distribution visually through ray-tracing and contour maps. Computer simulation software models

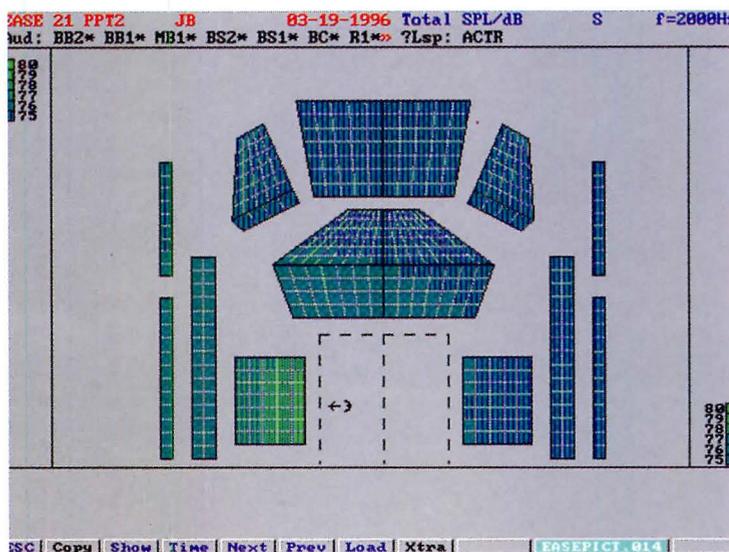
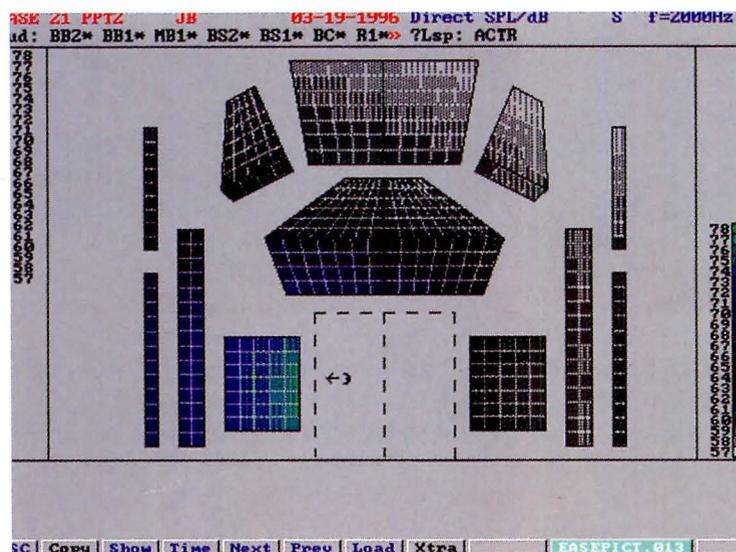
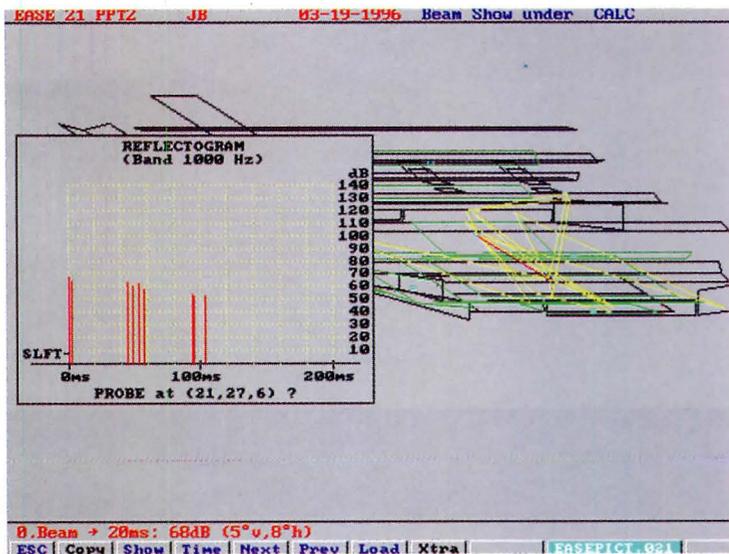
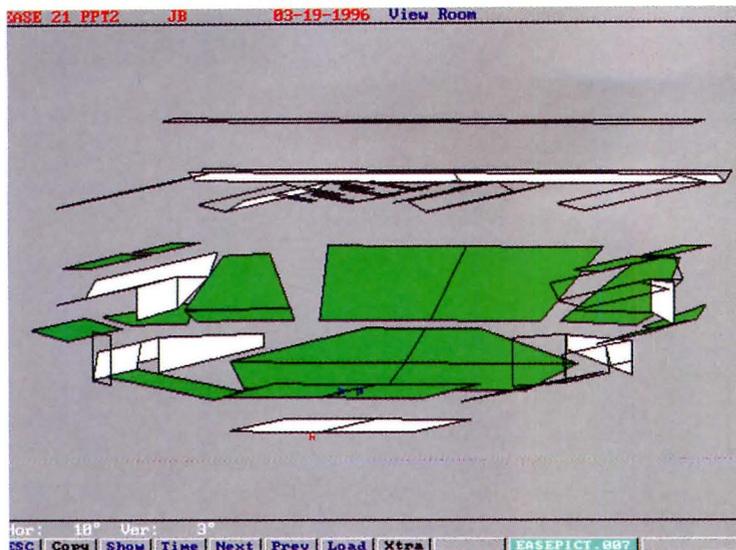
different types of construction, like masonry or drywall, to simulate how well these different materials block sound from traveling between spaces. The software's three-dimensional output can also be translated into a two-dimensional spectrographic display, which charts frequency of pitch, or loudness, over time. "When properly used, such programs help acousticians avoid overdesigning," points out Paul Scarbrough, principal of Norwalk, Connecticut-based Jaffe Holden Scarbrough Acoustics.

For the truly computer-literate, the high end of acoustic modeling is auralization. Like animation for the ears, auralization is a melding of a three-dimensional model with music or speech recorded in a reflection-free environment, called anechoic sound. This sound is then "played" in a computer model through a mathematical process called convolution.

Acousticians' exploitation of computer applications depends on a project's complexity. Not all offices rely on auralization. "Because our office has worked on more than 1,500 designs, we're often able to rely on our experience and, quite simply, avoid those things that didn't work," observes Scott Pfeiffer, principal of Chicago-based Kirkegaard & Associates. "When we're asked to go outside of our typical experience, we turn to acoustic modeling." Ultimately, acoustic design has more to do with the interpretation than the collection of data. "Identifying a response that musicians are comfortable playing in is the tricky part," points out Pfeiffer.

Complex phenomena such as the direction of sound from instruments and the diffraction, or bending, of sound around building elements are difficult to predict. Warns Talaske: "The snappy graphics and fantastic renderings must be approached with caution."

Research continues toward advancing the realism of the modeling process. "We do not live and die by the results of calculations and models," agrees Pfeiffer, "but we do use them carefully and in the most advanced designs that we pursue."—Ann C. Sullivan



**Pittsburgh Public Theater  
Pittsburgh, Pennsylvania  
Michael Graves, Architect  
The Talaske Group**

Through auralization, the Talaske Group previewed the acoustics of a new theater in Pittsburgh, scheduled to open in 1998. The Oak Park, Illinois-based acoustic consultant is working with architect Michael Graves and theater consultant Fisher Dachs to deliver articulate sound evenly to a 650-member audience seated on three sides of the stage.

"One of the difficulties associated with a thrust-type stage is that a performer is often facing away from a significant section of the audience," points out Richard Talaske, principal of the Talaske Group. "Because the human voice favors a forward orientation, we need to redirect sound to the patrons seated behind the performer."

The theater will provide an intimate venue for repertory theater as well as occasional chamber music recitals, which complicates the design strategy because the two types of performances have different acoustic needs.

For example, lightweight construction materials support clear speech because they reflect mid- and high-pitched sounds; whereas massive surfaces are better suited for music because they reflect warm, low-pitched sounds.

To satisfy both performance types, the exterior structure will be constructed of grout-filled concrete block with a plaster finish; and interior sound-reflecting surfaces will consist of wood, plaster, and fiber-glass-reinforced gypsum.

To test its strategy, the Talaske Group turned to Renkus-Heine's Electro Acoustic Simulators for Engineers (EASE) acoustic modeling software. The program helps con-

firm room configurations and the size, placement, and orientation of sound-reflective surfaces.

The acoustician generated wireframe models in which surfaces are defined as individual planes. Specific source and receiver locations are designated, and, based on the shape of the room, EASE produces the room's impulse response, or sound reflection signature. This impulse response represents the contribution of each surface in the room according to its loudness, or sound pressure level, over time.

A mathematical process called convolution melds the surface-study results with anechoic sound. "Using simple digital-to-analog output, we're able to listen to the combined response," explains Talaske, "which gives us a very good flavor of how the room will sound when it's built." As a result of the computer modeling, Talaske suggests subtle refinements to the theater configu-

ration, such as adjusting sound-reflecting surfaces by 2 or 3 degrees or adding reflecting devices.

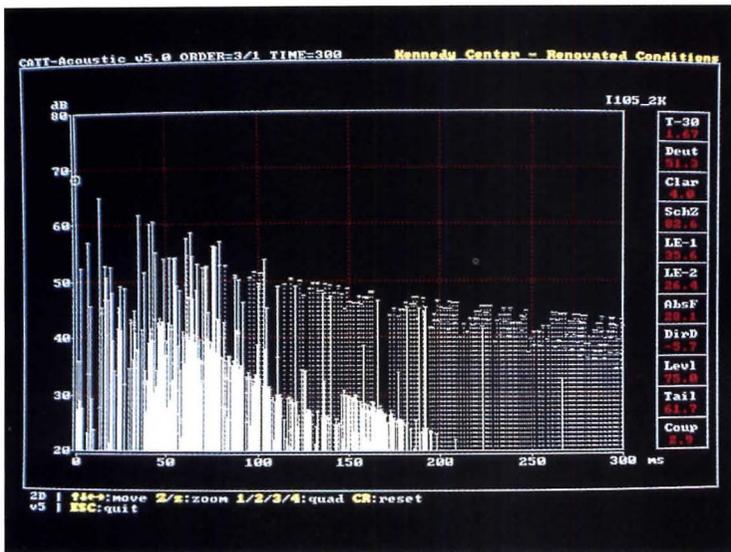
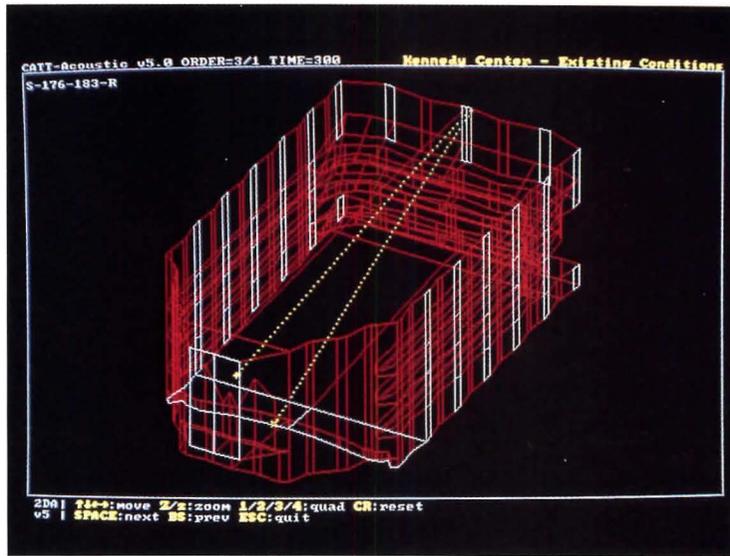
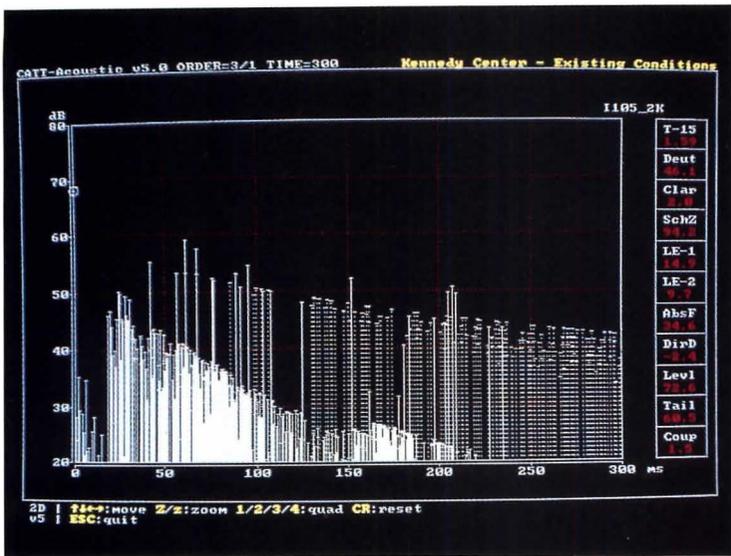
For the most part, EASE verifies conditions the acoustician expects to occur. When a project requires a higher degree of sophistication, a physical model of the space is constructed and impulse responses are measured, or sound is played within it and digitally recorded. Both computer-generated and physical models allow the firm to "listen" to the project; but physical representations more accurately measure complex phenomena such as diffracted sound.

TOP LEFT: EASE models primary sound reflecting surfaces (green).

TOP RIGHT: Impulse response tabulates reflections between specific source and receiver locations.

ABOVE LEFT: Sound distribution without reflections indicates non-uniformity.

ABOVE: Reflective surfaces redirect sound to entire audience.



**John F. Kennedy Center  
Washington, D.C.  
Quinn/Evans Architects  
Jaffe Holden Scarbrough**

A comprehensive effort to upgrade life-safety systems and accessibility in Edward Durrell Stone's 1971 John F. Kennedy Center for the Performing Arts afforded Jaffe Holden Scarbrough Acoustics the chance to improve the concert hall's acoustics by eliminating echoes and strengthening ensemble conditions and increasing sound projection. Scheduled for completion in the fall of next year, the acoustic design strategy was validated with the help of software developed by Swedish acoustician Bengt-Inge Dalenbäck called Computer-Aided Theatre Technique (CATT)-Acoustic. Jaffe Holden Scarbrough selected CATT-Acoustic partly because the program can import files directly from AutoCAD,

which is much better suited for geometric modeling than traditional text-based acoustic software, explains consultant Gary Madaras. In addition, floor plans generated by Quinn/Evans Architects provided a starting point for the acoustic model. From these floor plans, Jaffe Holden Scarbrough generated a three-dimensional model of the 2,759-seat hall, performed computer calculations to determine the dispersal of sound in the room, and compared the computer results with physical measurements to verify the model's accuracy. This process revealed a lack of reflected-sound energy within the first 100 milliseconds following direct sound and, in particular, a sizable gap of 25 to 50 milliseconds between direct sound and early reflections.

To bolster early reflections and decrease the gap, Jaffe Holden Scarbrough is reorienting the stage walls so that the downstage edges are 6 to

8 feet closer to the longitudinal axis of the hall. "By making the walls closer to parallel, we're doing two things: helping on-stage acoustics for the performers and getting more reflected-sound energy earlier to the people in the orchestra-level seating," explains Madaras.

The firm is also building a series of suspended reflectors 25 feet over the stage. The reflectors significantly decrease the existing path lengths of reflected sound, from instruments on stage up to the 49-foot-high ceiling and back down to the performers. As a result, sound returns sooner to performers, improving ensemble conditions.

CATT-Acoustic also chronicled late-arriving, high-level reflections at 150 and 210 milliseconds after direct sound which cause echoes during performances. To decrease the level of these reflections, Jaffe Holden Scarbrough proposes selectively replacing existing finish mate-

rials on the echo-causing rear ceiling, under-balcony, and upper wall surfaces with sound-absorbent plaster. The challenge is to maintain the hall's reverberation time and add just enough absorption to attenuate loud, late reflections.

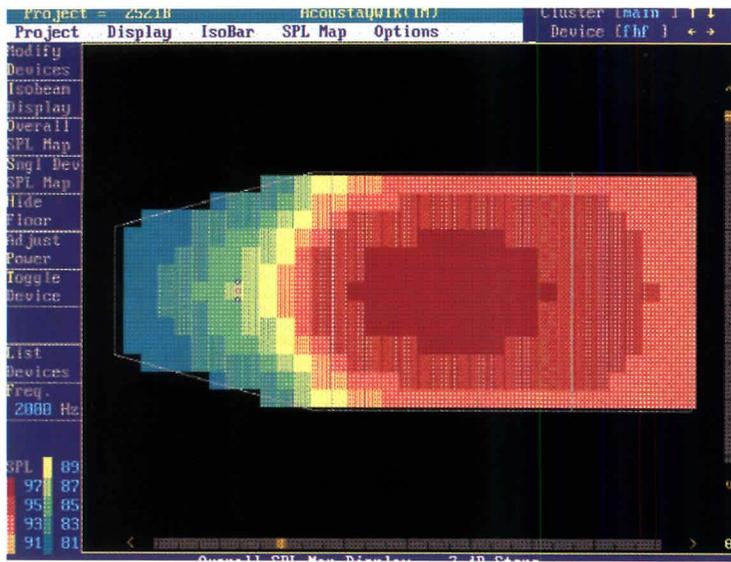
The effect of these architectural changes is shown on the renovated impulse response: Strong early reflections exist where there used to be a long gap; more sound energy arrives within the first 100 milliseconds; and the echoes at 150 milliseconds and 210 milliseconds are gone.

**TOP LEFT:** Impulse response reveals loud, late reflections.

**TOP RIGHT:** Model of existing hall shows sound-reflecting surfaces.

**ABOVE LEFT:** Impulse response of renovated hall shows strong early reflections, no echoes.

**ABOVE:** Renovated hall includes dispersed accessible seating and new stage level seating and overstage reflectors.



**Cultural Life Center  
 Roberts Wesleyan College  
 Chili, New York  
 SWBR Architects  
 Ostergaard Acoustical Associates**

Acoustician Ostergaard Acoustical Associates employed a range of software applications, from acoustic modeling to architectural drafting to spreadsheets, to test and refine its acoustic design strategy for the auditorium and rehearsal hall at the new Cultural Life Center at Roberts Wesleyan College. Designed by SWBR Architects of Rochester, New York, with theater consultant Robert Davis, the facility is slated to host programmatically diverse functions, including concerts, theater productions, and chapel services. Adjustable components designed to maximize sound quality for each performance type were tested through computer analyses.

To improve clarity for speech performances, for example, Ostergaard designed a central loudspeaker cluster. The firm turned to AcoustiQuik, a modeling program from Mark IV Audio that generates sound-pressure-level contour maps to provide a graphic glimpse of how sound is distributed. After selecting equipment, orienting the devices, and indicating how much power each component has, contour maps display the absolute and relative levels of sound, explains R. Kring Herbert, Ostergaard project manager. "They tell us whether sound distribution is acceptably uniform throughout the facility." The firm also utilized Autodesk's AutoCAD LT, a scaled-down version of AutoCAD 13, to draft loudspeaker configurations and equipment diagrams, as well as specific sound-isolating construction details.

To provide appropriate reflections for various kinds of performances,

an acoustic canopy positioned forward of the stage features operable plywood shutters. Additionally, a custom-designed concert enclosure with sound-diffusing surfaces retracts to expose the stagehouse.

To test the effectiveness of these devices, Ostergaard relied on time-saving, automated number-crunching programs. The firm collected data pertaining to size, location, material, and sound absorption for each surface of the room and fed the information into Quattro Pro, a spreadsheet program, to calculate room reverberation times.

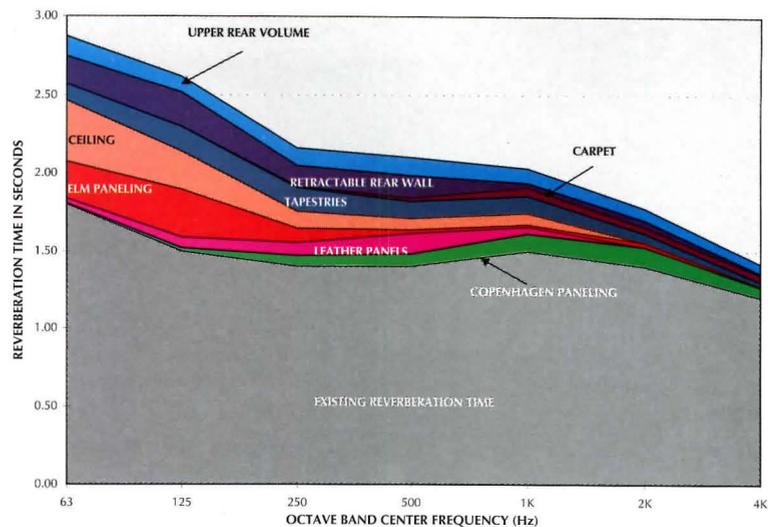
Similarly, exposed ceilings in both the auditorium and rehearsal hall raised critical concerns about the noise levels of mechanical equipment. For every fan, diffuser, and segment of ductwork, Ostergaard collected acoustic data and fed the information into Quattro Pro to calculate the noise level of each piece in octave frequency bands. Ac-

cordingly, diffusers were eliminated and air ducts were sized to reduce turbulence noise and acoustically lined to attenuate fan noise.

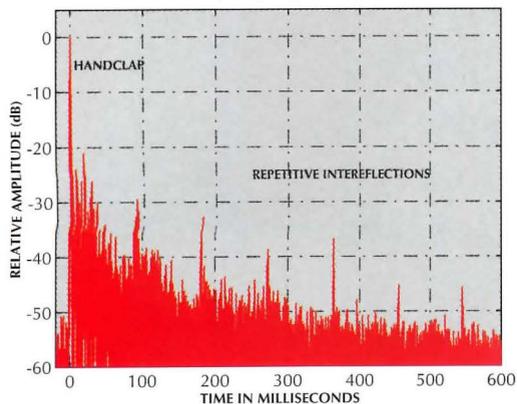
Although not graphically stimulating, the obvious benefit of the electronic spreadsheet is its ability to compute multiple iterations almost instantaneously. "The software can be very labor-intensive in terms of entering data, but it's particularly great in terms of 'what ifs,'" attests Herbert. "Once the values are entered, the results of refinements can be evaluated with very little effort."

Today, Ostergaard also works with Renkus-Heine's EASE when projects require more extensive modeling and auralization.

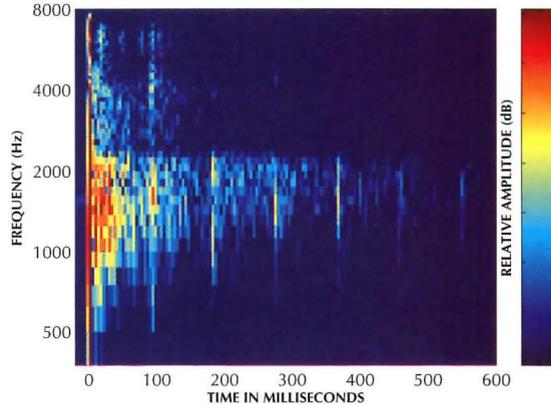
**TOP LEFT AND RIGHT:** Contour maps display loudspeaker sound distribution. **ABOVE LEFT:** Canted walls in rehearsal hall reflect sound and eliminate echo. **ABOVE:** Adjustable acoustic canopy regulates reverberations in auditorium.



full frequency impulse response



spectrogram



ABOVE LEFT: Royal Festival Hall's projecting box seats contribute to poor reverberation time.

ABOVE: Material modifications yield incremental improvements in the hall's overall reverberation time.

FAR LEFT: Impulse response reveals high frequency sounds reflected between side walls.

LEFT: Spectrogram plots high frequency for sounds in first 600 milliseconds following direct sound.

**Royal Festival Hall**  
**London, England**  
**Allies and Morrison, Architect**  
**Kirkegaard & Associates**

Designed by Leslie Martin and Robert Matthew for the 1951 Festival of Britain, the 2,901-seat Royal Festival Hall is one of the largest venues of its time, although not the most successful in terms of acoustics. Decades of hosting world-class performances have not abated the hall's reputation for being "too dry": Its extremely absorptive materials and lightweight construction cause sound waves to decay quickly.

An electronic reverberation-enhancement system installed in 1965 somewhat improved the hall's acoustics. But critics want even better sound—increased bass response and better ensemble conditions—without artificial boosters.

Today, London-based architect

Allies and Morrison is renovating the historic hall with acoustic consultant Kirkegaard & Associates of Chicago and British theater consultant Technical Planning International. The acoustician proposes changing fundamental components of the hall, including its signature projecting boxes and overstage canopy. Computers play an important role in justifying the firm's aggressive approach.

Kirkegaard relies on computer software first to quantify existing problems and then to test and validate proposed remedies. The firm records sounds in the hall and feeds the results to MatLab, a software package from the Math Works. This program generates a logarithmic time signal—a representation of sound energy dispersed over time—which is then graphically translated in a spreadsheet program.

For example, listeners in the hall today can discern harsh, strident

tones known as "flutter." To remedy this problem, Kirkegaard recorded clapping from various key locations in the hall. Using Matlab, the firm pinpointed high-frequency sound resonating back and forth between the hall's side walls. Kirkegaard proposes to modulate these surfaces to eliminate high-frequency interreflection.

In the same manner, Kirkegaard investigated musicians' complaints of poor ensemble conditions by testing the strengths and times of arrival of early sound reflections. A balloon was burst at the orchestra leader's position and digitally recorded from the middle of the cello section. Rather than a sustained, smooth sequence of reflections, the equipment picked up a cluster of strong reflections. To spread out and diminish these reflections, Kirkegaard proposes reorienting the overhead canopy.

In addition, Kirkegaard plans to

remove the top two rows and two front tiers of the hall's projecting side boxes to improve the strength and duration of high-quality reverberations. These primary wall surfaces are critical to acoustics and, while encumbered with boxes, can't sustain interreflection of sound.

To test these proposals, Kirkegaard uses a modeling program from the Technical University of Denmark called Odeon, which models the surfaces of the hall in wire frames and tracks sound relative to specific source and receiver positions through ray tracing. Thousands of rays emanating from the source position strike wall and ceiling surfaces, which absorb some energy and reflect the rest, before reaching audience members. Reverberation time is measured by the intensity and timing of each ray arriving at a source point. By changing interior surfaces, Kirkegaard can refine the hall's acoustics.

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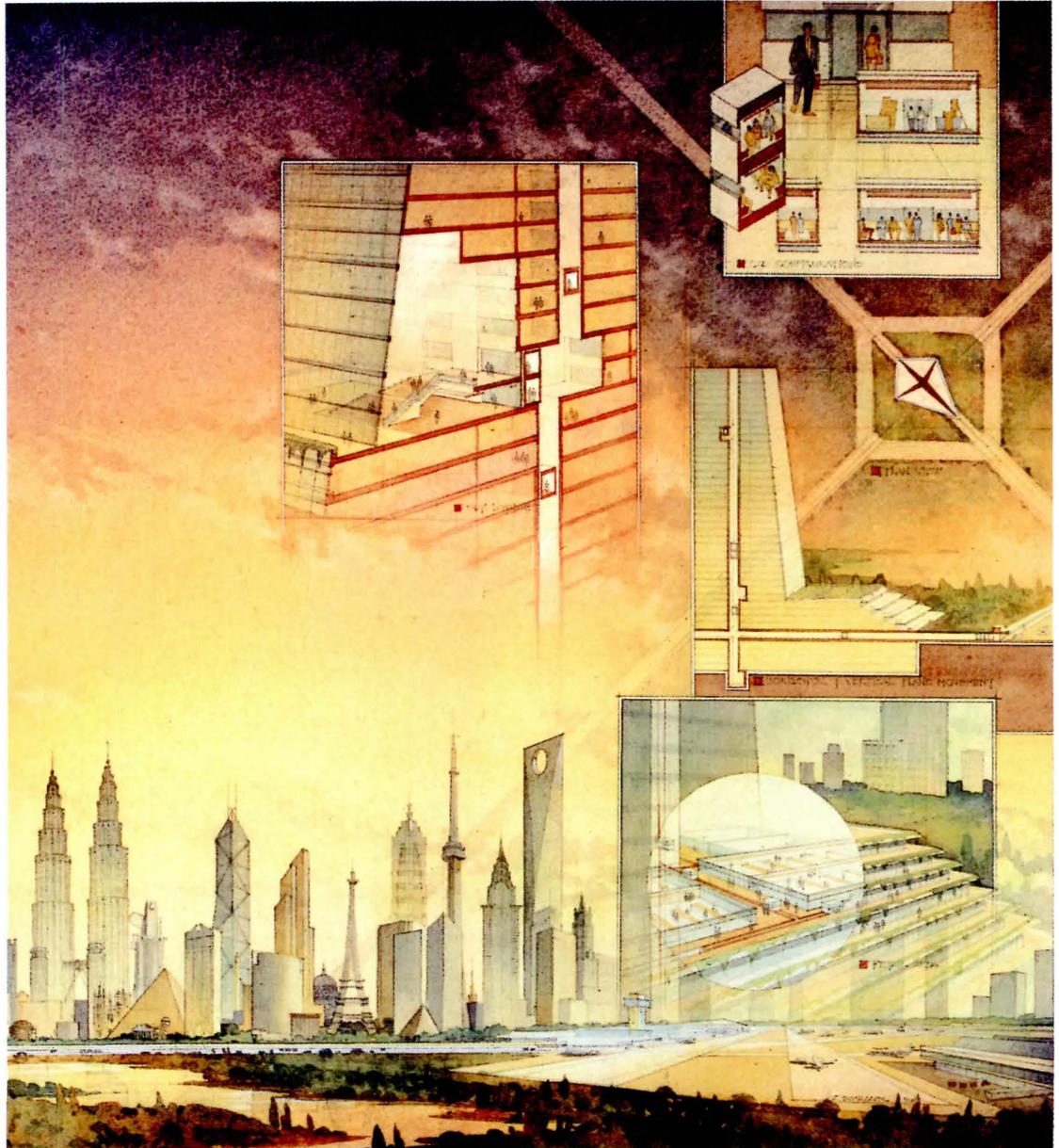
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## **New Elevator Moves Up, Down, and Sideways**

In July, Otis unveiled its Odyssey Integrated Building Transit System, the first elevators designed to move both vertically and horizontally within a building. At an airport, for example, passengers would be able to park their cars in a satellite garage, enter the elevator cab, and ride from the remote location up to and

across the terminal to their gates.

Otis's system also provides an efficient transit system for high-rises. Multiple cabs can be operated in a single hoistway, increasing a building's rentable space. The system is continuously monitored by an automated dispatching program that compensates for variations in traffic patterns to avoid delays.

The glass-enclosed cab, called a Transitor, can be custom-designed

to incorporate different movement technologies, such as air suspension, hoists, wheels, or other propulsion devices, depending on the specific needs of the building.

Otis is currently constructing a prototype of its new elevator in Bristol, Connecticut, and the company expects the first full-scale Odyssey system to operate in approximately two years.

*Circle 401 on information card.*

## Products

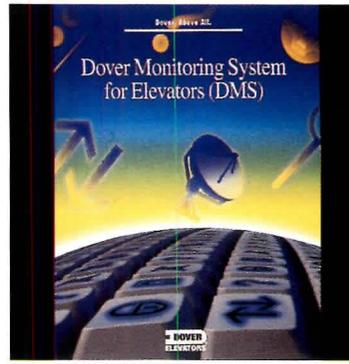


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### Elevator system

Schindler Elevator Corporation's Miconic 10 Elevator System reduces travel times by as much as 30 percent by minimizing traffic scheduling conflicts. Passengers enter their destinations on a keypad before getting in the cab, allowing the system to allocate a car that will take them to their floor with the fewest stops. An "accessibility button" for passengers with disabilities prompts voice commands and adjusts door opening and closing times.

*Circle 402 on information card.*



### Elevator monitor

The Dover Monitoring System from Dover Elevators is equipped with a personal computer, monitor, and keyboard to evaluate an elevator's performance by providing information about its status and traffic operations. The monitor records average wait times, total number of calls, drive failures, and other data for review and analysis. Elevator access restrictions can be programmed from a single location to control passenger entry and exit.

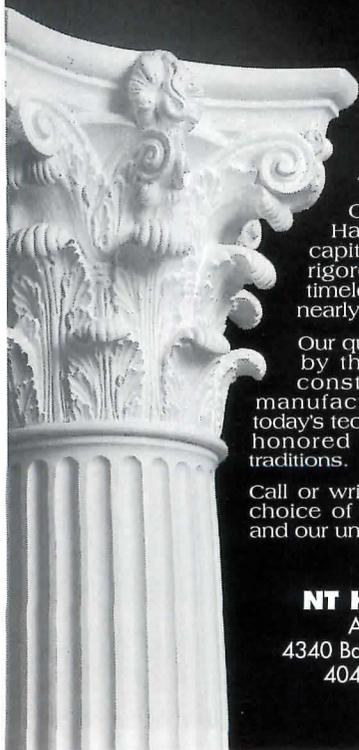
*Circle 403 on information card.*



### Residential flooring

Formica's residential flooring system, previously available only in Europe, is now being introduced in the U.S. The new flooring line has been modified for U.S. applications, with longer planks and new colors and finishes. The 25 designs include oak, maple, and pine woodgrain collections, and three varieties of sandstone matte finishes. The 8-by-48-by-3/16-inch composite planks can be assembled as a floating floor, installed over existing level subfloors.

*Circle 404 on information card.*



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### Curtain wall coating

Keeler & Long's Megaflo fluorocarbon coating is now available in a new version that dries at ambient air temperature, eliminating the need to bake the finish. Purportedly the only finish of its kind that can be applied over earlier fluorocarbon coatings, Megaflo allows for color coordination between existing and new building components. The finish can be applied to galvanized steel, aluminum, concrete, or glass, and is available in new gloss colors. *Circle 405 on information card.*



### Wall assembly

Kawneer's 1600 Wall System<sup>3</sup> allows glazing to be installed from either the interior or the exterior, eliminating the need for platform scaffolding. The system includes the IsoStrut thermal break, a one-piece, continuous thermal barrier that bonds between the interior and exterior aluminum, reducing condensation and increasing structural performance. The Kawneer system can be used in either slab-to-slab or curtain wall applications. *Circle 406 on information card.*



### Polycarbonate glazing

POLYGAL polycarbonate structured sheet (PCSS) was specified by Pfau Architecture and Eyecandy in designing the Swatch Pavilion at the 1996 Olympic Games. The translucent glazing is available in a variety of dimensions and colors and can be cut, drilled, arched, and fastened using ordinary tools, and is purportedly impact-resistant and lightweight. The material's thermal performance allows it to be applied in atriums and as skylights. *Circle 407 on information card.*



### Custom bricks

Handmade bricks by Fort Worth-based Acme Brick Company are available in standard and custom block dimensions. The custom blocks can be manufactured to match Acme's King Size brick (3 by 2<sup>3</sup>/<sub>8</sub> by 9<sup>5</sup>/<sub>8</sub> inches) or standard modular dimensions. Cove headers, double chamfered coping caps, and other specialty shapes are available to meet exact specifications. Drawings are provided for each design, and colors can be custom matched. *Circle 408 on information card.*

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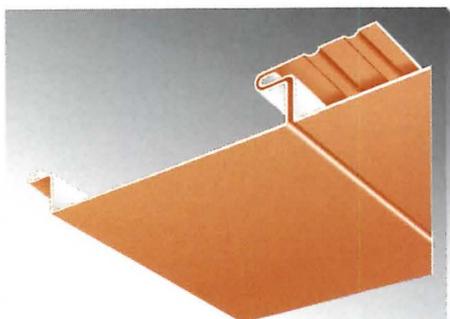
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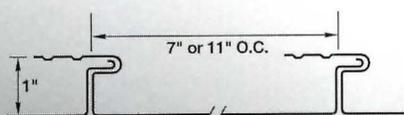
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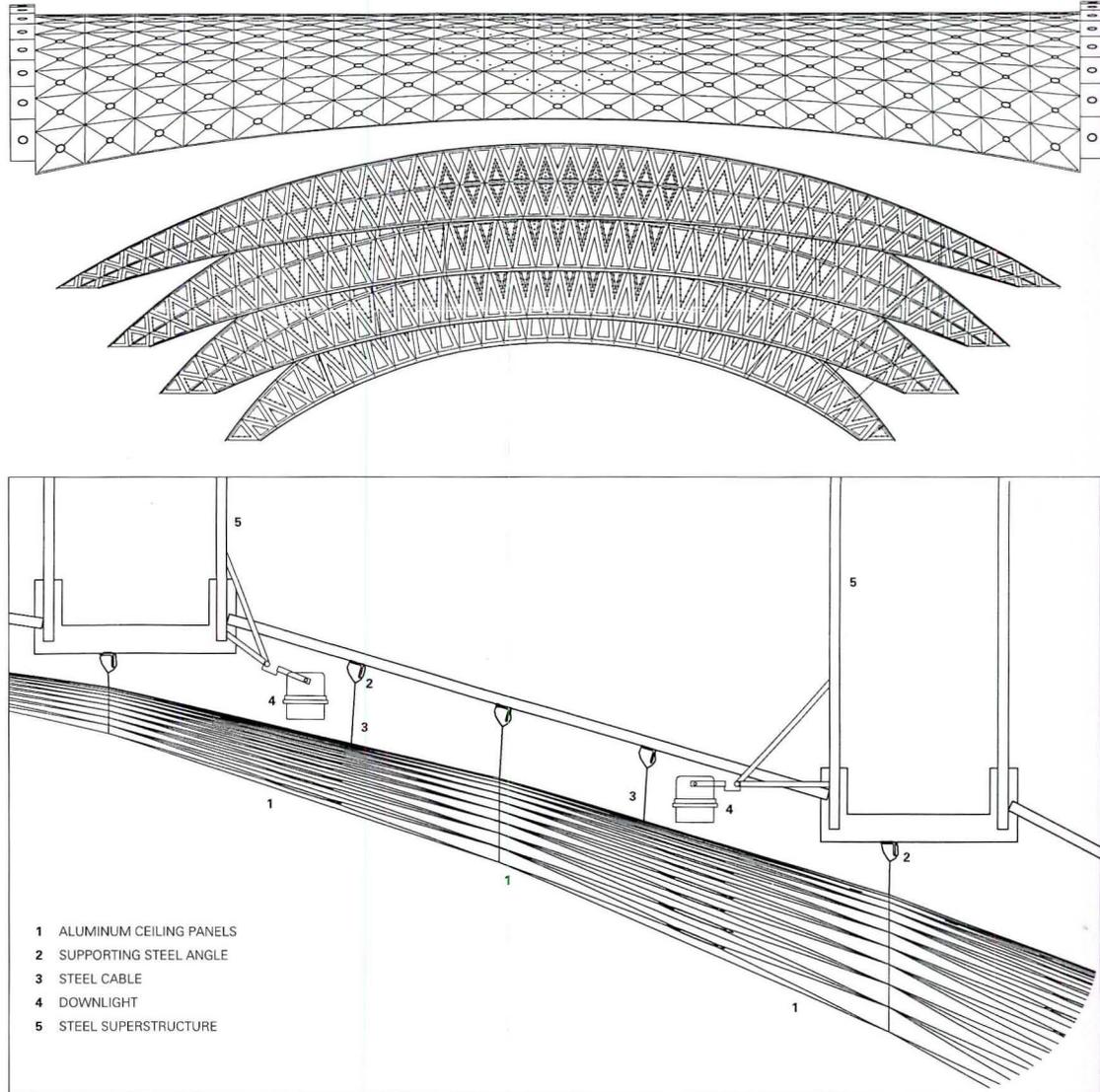
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**Aronoff Center for the Arts  
Cincinnati, Ohio  
Cesar Pelli & Associates, Architect**

The 2,700-seat interior of Procter & Gamble Hall, part of Cesar Pelli's new Aronoff Center for the Arts in downtown Cincinnati (pages 120-127), is crowned by a vaulted aluminum ceiling and a series of segmented arches adjoining the theater's proscenium. Pelli formed these curved profiles from flat, triangular aluminum panels. These 1/2-

inch-thick painted panels, pierced with 1/8-inch-diameter holes, allow sound in the theater to be reflected from gypsum board and glass-fiber-reinforced concrete (GFR) units mounted above the metal panels.

Both the reflectors and the perforated ceiling are hung from the theater's steel-framed structure with steel wires. Fiber-optic lamps inserted into openings in the panels and downlights mounted above create patterns of light and color on the auditorium's ceiling.—R.A.B.



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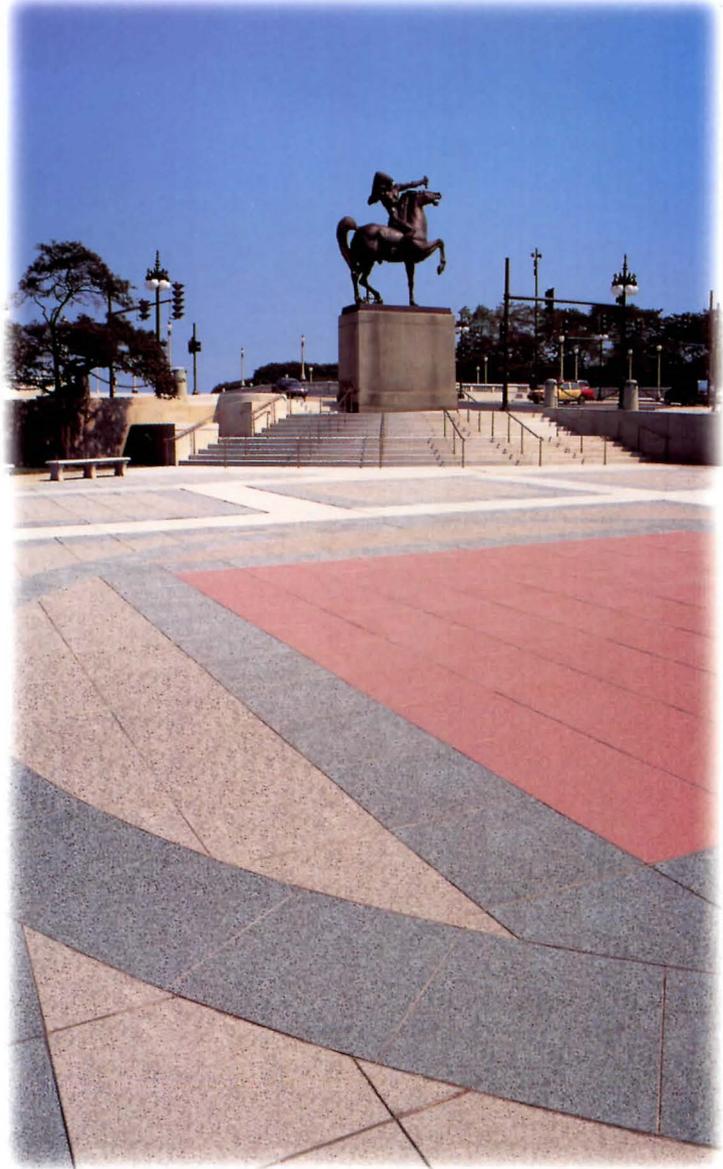
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