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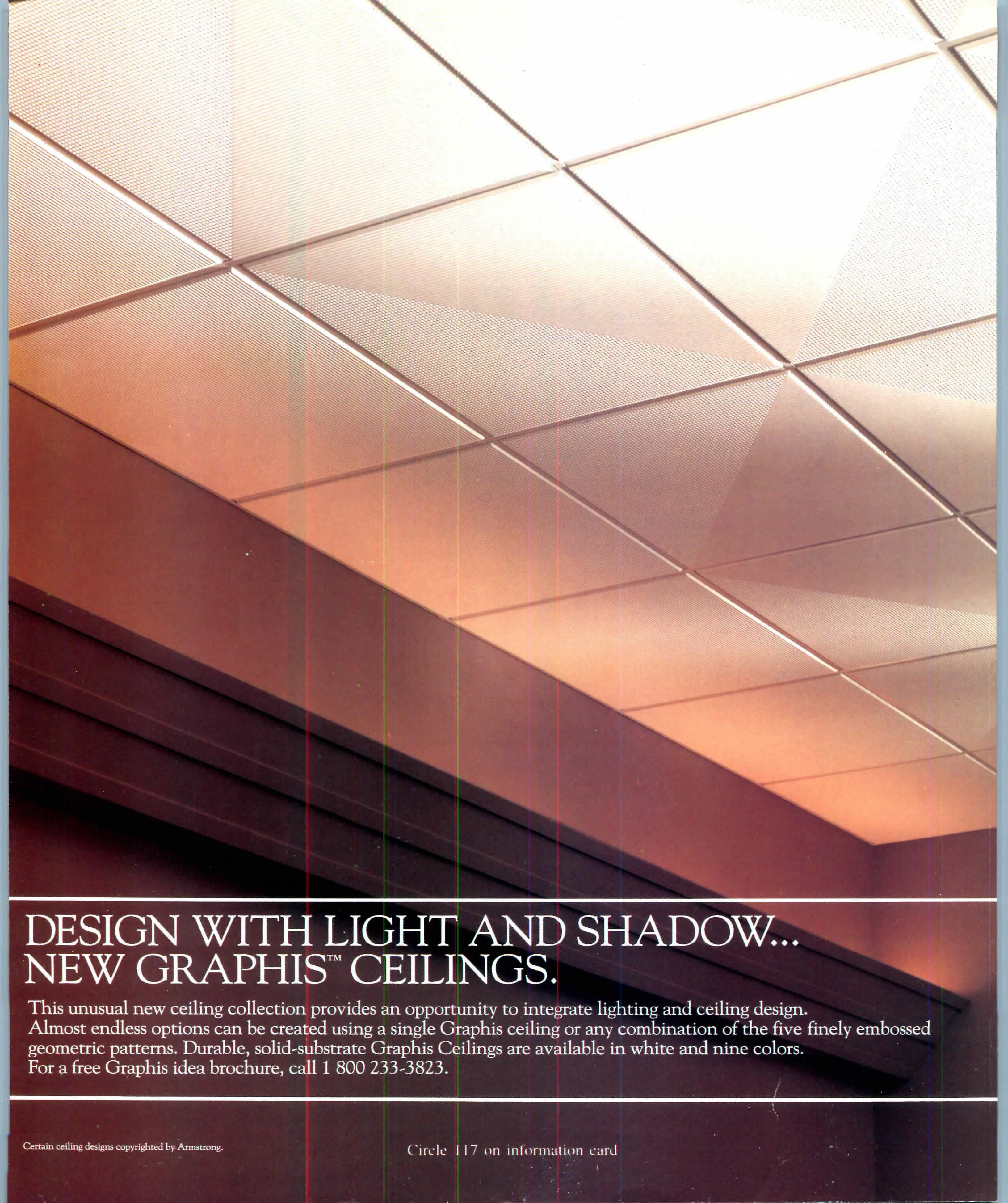
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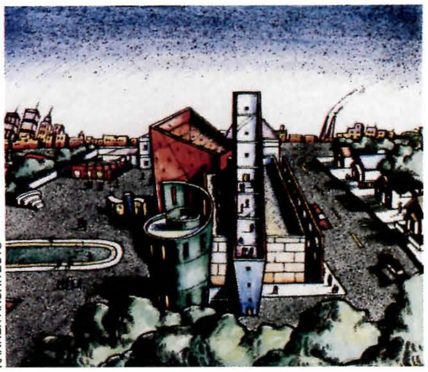
Editor's Page

Infrastructure for Children

In designing schools and child-care centers, architects are creating a framework for improving education, families, and neighborhoods.



KANNER ARCHITECTS

Rebuilding our infrastructure of highways, bridges, and railroads has become a national priority. A society's infrastructure, however, should not only focus on its physical capital, but its human capital as well. Just as roads and bridges establish a framework for improving our society, schools and child-care centers establish a framework for improving the skills of our citizens, enhancing our economy in the process. Faced with another baby boom, architects must meet this challenge by creating new prototypes. Day-care centers, family- and community-oriented schools that defy conventional models, and healthcare facilities for children with AIDS are emerging as provocative new design problems and possibilities. As buildings for our youngest citizens, these structures warrant architects' most innovative thinking.

Now that nearly 40 percent of women in the American work force are mothers, day-care programs currently operating in church basements, outmoded classrooms, and suburban houses are no longer adequate. Architects must design new environments for occupants as young as a few weeks, who may spend as many as 10 or 11 hours a day inside these buildings. The expected expansion of Head Start will accelerate the demand for more of these facilities, especially in low-income areas. And, in some localities, the number of children born with HIV will increase so dramatically that special centers will have to be built to fulfill their medical requirements. Architects will be tested to design not only comfortable and supportive day-care settings for this population, but group homes and transitional housing as well. In designing these prototypes, many in inner cities, architects must find ways of knitting together fractured neighborhoods.

As the toddlers of the 1990s approach school age, public schools—75 percent of which were built before 1960—must be updated to accommodate not only changing demographics, but changing curriculums. Architects designing schools for future generations must be attentive to new ways of teaching that emphasize apprenticeships, hands-on learning, computer networks, and thinking over rote memorization. Architects must not only create environments for learning, but family-oriented centers for the 21st century.

In Buffalo, for example, the Virginia-based firm LEA/Passantino+Bavier has broken the traditional elementary school mold to design a building that truly reflects its neighborhood's needs: The Jefferson/Best Early-Childhood Education Center will incorporate a variety of community facilities, including a day-care center for the children of teenage mothers, a pediatric health clinic, an after-school program for latchkey children, and meeting and adult education rooms. Similarly, in Massachusetts, five experimental "microsociety" schools teach students math by letting them hold jobs, operate businesses, and pay their taxes. In Miami, a "workplace" school allows employees of Miami International Airport to be close enough to their children during the day that they can meet for lunch. In Minnesota, legislation has been introduced for a new type of "charter" school, to be run by teachers.

These examples emphasize that architects must be ready to meet the challenge of creating buildings that respond to changes in the family, the work force, and society. To prepare the profession, architects should host a national symposium on the pressing need for better inner-city schools, supportive environments for day care, and specialized healthcare facilities. Such a gathering of architects, educators, government leaders, and child psychologists could call attention to projects in place, prioritize needs, and encourage clients to risk new designs. Symposium participants would come away with the important message that a better infrastructure for children is as vital to our future as shoring up a bridge or widening an interstate highway.

Deborah K. Dietsch

Letters

Reviewing design review

For every design project set before a design review panel (February 1993, page 33) there are war stories. Through the institution of design review boards, the public is saying something quite powerful to the architect: "We don't trust you as a member of the professional team." To the developer, the mistrust is a healthy skepticism about what public interest is being served at the community's expense. Yet when directed toward the architect, the mistrust points to conflicting values about beauty and appropriateness.

Architects are trained to solve problems by designing buildings, and they are frustrated and confused when a review board focuses not on the design of their buildings, but on whether to build at all. Sadly, architects have become the battering ram of the developer. The architect keeps revising his scheme as a tool for the developer to breach the wall of public opposition. The architect is, in essence, a pawn in the service of the paying client—the developer—who must simultaneously be responsive to the needs of the nonpaying design review board.

Although some architects may value the idea that the public does have an ownership interest in the streets and view corridors of building sites, generally speaking, the public hasn't really been engaged in the design process. The negative experiences of design review support the rationale of creating guidelines or criteria by which designs are to be judged. The public design review of buildings should also be recognized as a legitimate process. It is being demanded by the building-using public to open what they perceive to be a closed loop.

Diane Georgopulos, AIA
Hyde Park, Massachusetts

Productivity myths

Architects place their confidence in many myths, as Norman Kaderlan points out in "Enhancing Firm Productivity" (December 1992, page 91), and when it comes to increasing productivity, they are ready to believe nearly anything. One widely held belief is that higher staff utilization rates yield higher profits. But to have any hope of improving profitability, staff must be aggressive and charge for all appropriate time against projects. At the same time, management must be equally aggressive about billing for time and collecting. Improved productivity is a result of a total approach.

Howard G. Birnberg, AIA
Birnberg & Associates
Chicago, Illinois

Jail break

Our firm was pleased to see our work published in your February issue ("Reforming the Reformatory," page 109). However, we would like to point out one error. Though inmates at the new San Joaquin County Jail have the ability to lock themselves into their cells by means of a dead bolt, they do not carry keys to their own cells. Only the supervising deputy has the ability to unlock these dormitory lock sets with a key from outside the cell.

Gregory Sheehy, AIA
Dworsky Associates
Los Angeles, California

Events

April 9
Submission deadline for the 1993 Society for Environmental Graphic Design competition. Contact: (617) 868-3381.

April 24
The Environment, Sustainable Development, and Design, a conference open to the public at Harvard University. Contact: (617) 495-4315.

May 1
National Trust for Historic Preservation's 1993 Honor Awards nomination deadline. Contact: Greta Terrell, (202) 673-4067.

May 4
The Future of the New York Region, a program sponsored by the AIA New York City Chapter. Contact: (212) 683-0023.

May 17-19
The 1993 International Conference on Tall Buildings in Rio de Janeiro, Brazil, sponsored by the Council on Tall Buildings and Urban Habitat. Contact: 21/253-0083.

May 17-27
Photovoltaic Design and Installation, an energy education program in Carbondale, Colorado. Contact: (303) 963-0715.

May 18-June 25
The Architect and the Photograph, an exhibition in New York, sponsored by the National Institute for Architectural Education. Contact: (212) 924-7000.

June 8-10
Autodesk Expo '93, a Computer Show in Anaheim, California, coinciding with A/E/C SYSTEMS '93. Contact: (800) 451-1196.

June 10-11
1993 Symposium on Computer Integrated Building Sciences in Anaheim, California. Contact: Harold Jones, (405) 325-1947.

June 10-12
Aquarium Planning and Management workshop in Chicago, sponsored by the Waterfront Center. Contact: (202) 337-0356.

June 14-17
NeoCon exposition in Chicago. Contact: (312) 527-7555.

June 14-18
Reconstruction Ahead, a design conference in Aspen, Colorado. Contact: (212) 725-2233.

June 17
Rethinking the Suburbs, a conference at the Maryland Institute College of Art. Contact: (410) 225-2119.

June 18-21
AIA annual convention, coinciding with the Congress of the International Union of Architects in Chicago. Contact: (202) 626-7395.

June 21-23
International Lighting Exposition in Toronto, Canada. Contact: Anita Schachter, (416) 890-1846.

June 21-23
Architecture + Children, an international summit on education reform at University of New Mexico, Albuquerque. Contact: (505) 277-7422.

News

AIA Urban Design Awards Announced

BACK OF THE HILL ROWHOUSES: Rawn's affordable housing for Boston.

CHARLES RIVER: Revamped artery.

EXPOSITION PARK: ZGF's avenue.

Efficient transportation, secure neighborhoods, and environmental sensitivity were honored by this year's AIA Urban Design Awards program. Six winners were chosen in January from more than 100 entries by a jury comprising John Kriken, partner of Skidmore, Owings & Merrill; Harvey Gantt, former mayor of Charlotte, North Carolina; and Theodore Liebman, partner of the Liebman Melting Partnership.

The jury honored one built project—the Back of the Hill Rowhouses by William Rawn Associates of Boston. The 165-unit development creates a new neighborhood of affordable houses atop Mission Hill, a steep, formerly neglected site near downtown Boston. Jurors lauded the project, which was completed in 1989, as high-density housing that respects prevailing housing patterns.

Two visionary proposals were selected, including the Charles River Crossing and Interchange, a major piece of Boston's Central Artery/ Tunnel project. According to the jury, Charles River Crossing was honored for reminding drivers that "crossing a river is more than a utilitarian event." The urban design scheme includes a new cable-stayed bridge, designed by Wallace, Floyd, Associates, and an interchange that will connect a new tunnel under downtown Boston to Interstate 93.

A proposal for lighting downtown Milwaukee earned kudos for its thoughtful approach to reinvigorating the city and for encouraging community participation in the process. Developed by Milwaukee-based Kahler Slater Architects with lighting consultant Claude Engle, the Landmark Lighting Project attempts to link districts and neighborhoods after dark, heightening their safety while reinforcing the city's architectural character. Early in the design phase, town meetings allowed citizens to analyze three zones of the city. Implementation of the plan began in 1990 and is expected to continue for the next two decades.

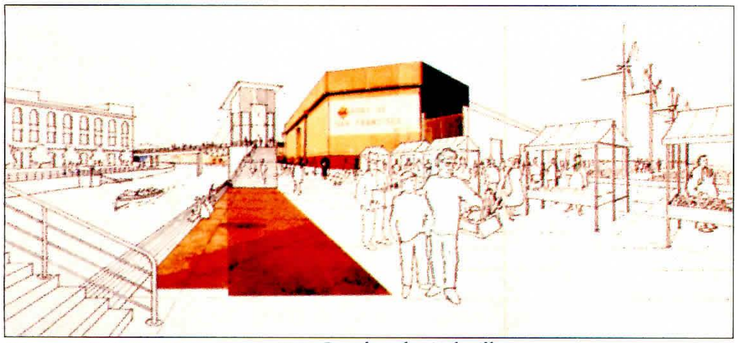
The Zimmer Gunsul Frasca Partnership's master plan for Los Angeles's Exposition Park was commended by jury members as a successful integration of several disparate elements, including parking for the site's Memorial Coliseum and Sports Arena, public gardens, and cultural institutions. Collaborating with landscape architect Peter Walker, William Johnson and Partners, ZGF's Newport Beach office neatly accommodated four functions within the 160 acres: a spectator events area; a cultural events quadrant; a tree-shaded avenue that will formally invite visitors to the park; and green space at the site's corners to serve surrounding neighborhoods. These improvements are expected to begin next fall.

The jury did not limit its selections to physical improvements, recognizing two urban design efforts that have influenced public policy. An environmental study by New York-based Meridian Design Associates was honored as a valuable tool to help architects and urban designers understand their environmental responsibility. Spearheaded by Bice Wilson, architect and principal of Meridian Design Associates, the project documents the cumulative effect of development on the Mianus River watershed, which includes parts of Westchester County, New York, and Fairfield County, Connecticut, (ARCHITECTURE, February 1993, page 83). Since its unveiling last fall, five towns within the watershed have established a planning organization to determine how they can minimize the negative impact of building on the region.

The jury also awarded an internship program that offers architecture students at California Polytechnic State University in San Luis Obispo the chance to work in San Francisco's Department of City Planning. The program has allowed students to develop strategies for innovative nonprofit housing. The jurors noted the importance of exposing aspiring architects to the social implications of the built environment and forging partnerships between academia and the profession. —*Karen Salmon*

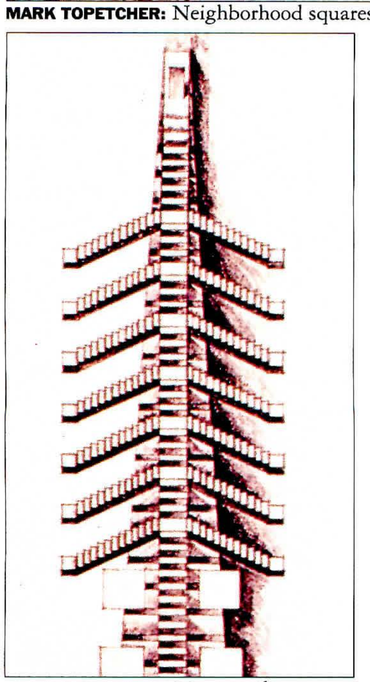
News

EVANS HEINTGES: Salvaged ships.

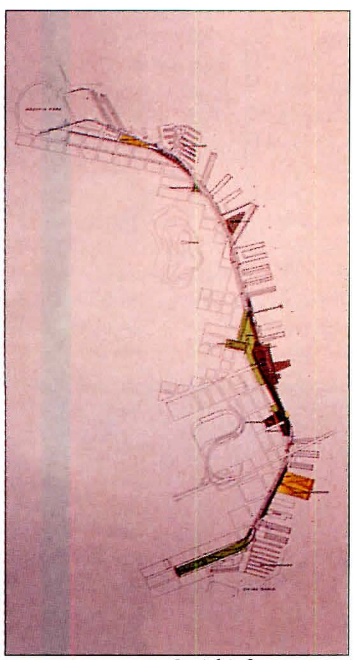


JILL STONER AND CHARLES DUNCAN: Canal and windmills.

MARK TOPETCHER: Neighborhood squares.



KEITH G. MOSKOW: Pier parcels.



NO ARCHITECTURE: Social infrastructure.

San Francisco's Waterfront Competition

Grand schemes may no longer provide solutions to the large-scale redevelopment of American cities. Given the increasing diversity of our urban culture, the true challenge of contemporary urban design is the creation of flexible frameworks for change that are deliberately ambiguous and open-ended. This new approach emerged clearly from San Francisco's Call for Vision competition for the redesign of its waterfront, which attracted 215 entries from around the world. The competition's five winners, announced in February, reflect how the most far-thinking urban schemes are moving away from the design of buildings, streets, and open spaces to process-oriented solutions.

The competition was sponsored by the Center for Critical Architecture (CfCa), a San Francisco-based nonprofit group whose goal is to initiate a dialogue between architects and public agencies responsible for reshaping a 3.5-mile area of the San Francisco waterfront. This district, which stretches from Aquatic Park to China Basin, is now dominated by parking lots and abandoned piers, "a void begging to be filled by some new public presence," explains Pamela Kinzie, CfCa's executive director.

The opportunity to reshape this area coalesced as a result of several important events, most notably the 1989 Loma Prieta earthquake that destroyed the double-decked Embarcadero freeway and the ramps connecting it to the nearby Bay Bridge. Another impetus for the competition was an evaluation of the Embarcadero by the Port of San Francisco, which owns much of the land between the city and the bay and is now attempting to identify new uses for its underutilized properties. The formal process of analysis was mandated several years ago by public referendum and is just now nearing completion.

The competition asked entrants to propose "bold, comprehensive, and inspirational planning proposals" that would address both generic problems related to abandoned waterfronts and the particular circumstances of San Francisco. Entrants were told their designs need not comply with existing regulations, on the assumption that an excellent scheme could change local zoning. As a result, the jurors praised those schemes that put forward "strategies to develop possibilities," in the words of Japanese architect and juror Fumihiko Maki, rather than designs for specific buildings. "Instead of the work of an individual," notes juror Mary Miss, a New York environmental artist, "we chose processes for making things over time." Other members of the jury were Boston architect Jorge Silvetti, Princeton professor Alan Colquhoun, San Francisco journalist Harold Gilliam, San Francisco landscape architect Mary Margaret Jones, New York architect James Stewart Polshek, and San Francisco architect Stanley Saitowitz.

After deliberating for two days, the jury selected five winners:

NO Architecture, a San Francisco firm, won for proposing a "social infrastructure" based on five events: a yacht race, a film festival, a marathon, a music festival, and a car race.

Jill Stoner and Charles Duncan, architects based in Bolinas, California, called for eliminating automobiles from the waterfront and replacing the existing roadway with a canal. Across the canal, activities related to the "farming of the bay" would occur, employing windpower, desalinization, and giant barges.

Evans Heintges Architects of New York proposed bringing high-technology industry, research and development, and education to the waterfront in salvaged ships along the abandoned piers.

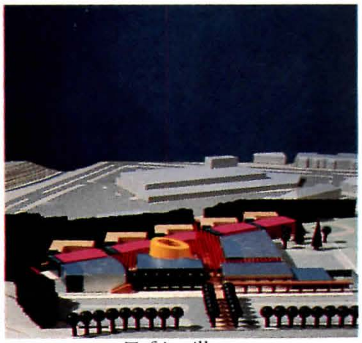
Boston architect **Keith G. Moskow** called for dividing the entire waterfront into parcels equivalent to the size of the historic piers. These lots would be sold to developers who could do whatever they liked with them, as long as they followed urban guidelines.

San Francisco architect **Mark Topetcher** proposed eight new "squares" around which to develop waterfront neighborhoods and re-create selected aspects of the shoreline.

To convince the public of the competition's merits, the winning entries, plus three citations and some 60 schemes, will be exhibited this month in San Francisco at the Bayfront Gallery and then at the Embarcadero Ferry Building through June 6. Kinzie says the best outcome of the competition may be the establishment of an independent, public/private entity to monitor, coordinate, and streamline the development of the entire waterfront area.

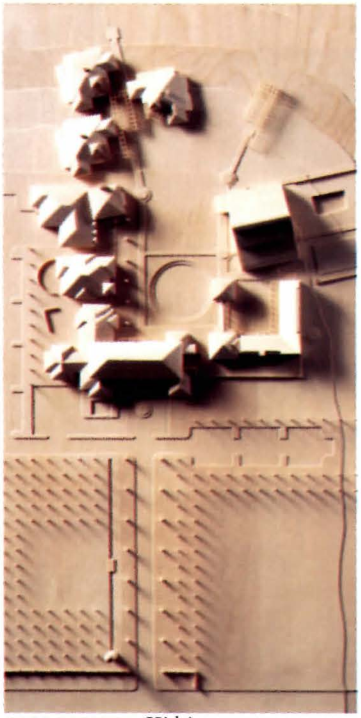
—David Moffat

SONY CHILD-CARE CENTER: Ehrlich's undulations.



LAB SCHOOL: Taft's village.

LAB SCHOOL: Site plan.



CASA PACIFICA: Kids' cottages.

Child-Care Center Planned for Sony

Like Warner Bros. (pages 70-75), Sony Pictures Entertainment has decided to build a child-care center for its employees' kids. Topped by an undulated copper roof, Steven Ehrlich's design for the 9,000-square-foot center will be sited across the street from Sony's studio lot and adjacent to its special effects building in Culver City. Ehrlich describes the curving building as the next generation of his whalelike Shatto Recreation Center in Los Angeles (ARCHITECTURE, September 1991, pages 70-73).

The Santa Monica architect rendered the 100-child facility with a repetitive, brick pattern and arranged its interior to include a multipurpose room, a string of support spaces, and an enfilade of glass-enclosed classrooms to the rear.

From the classrooms, wood-framed sliding glass doors allow direct access to a covered porch and walled playground. For added security, Ehrlich will collaborate with local artist John Okulick to devise concrete walls and steel gates along the street that incorporate the name of the complex—My First Sony—which refers to the company's line of children's electronic toys. The $2 million project is scheduled to begin construction this June.

Taft Architects Designs Laboratory School

Intended to support innovative teaching methods and relieve overcrowding in the Houston Independent School District (HISD), a 170,000-square-foot "learning village" by the local firm of Taft Architects comprises classroom clusters, support spaces, auditorium, gymnasium, and library for kindergarten through eighth grade on a 10-acre site in southwestern Houston. The program was developed jointly by HISD and Rice University's Center for Education to serve 1,200 children, 400 of whom will be bused in daily from surrounding schools to take advantage of the new facilities.

The scheme incorporates five staggered classroom clusters, arranged to preserve a wetland on the site's western edge; a spine of support classrooms and laboratories; and a library defined by a ring of study carrels at the core of the complex. The library, which is flanked by an auditorium and a gymnasium, is sited within what Taft calls the village square. This interior courtyard is tucked behind the administration wing and main entrance to the east and is visible from corridors along the perimeter. To call attention to the scheme's various components, the architects selected a range of building materials, including split-faced concrete block for the classroom spine, brick for the auditorium and administration wing, and stucco for the library. Construction of the $10.5 million project began last fall and is expected to reach completion this December.

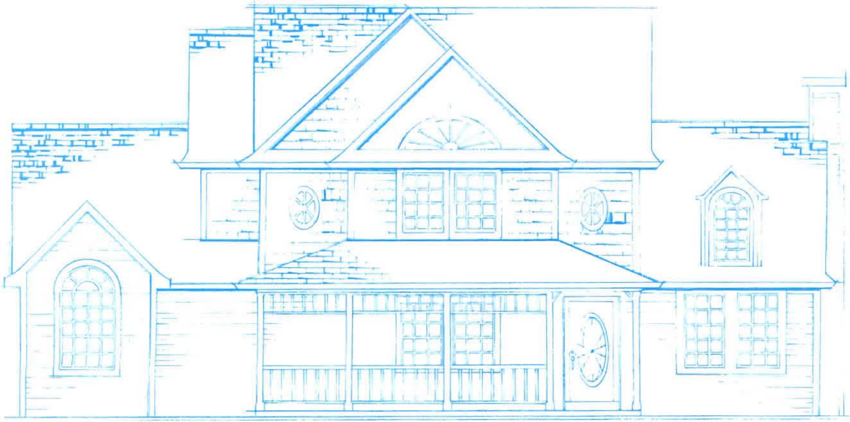
Emergency Shelter for Children

Los Angeles-based Bobrow/Thomas and Associates has designed Casa Pacifica, a 60,000-square-foot emergency shelter for abused and neglected children that provides an alternative to foster care. Located in Ventura County, the center incorporates living quarters; dining, recreation, and medical facilities; and a school for 75 children, ranging in age from newborns to 17-year-olds. Youth Connection, a nonprofit organization, will run the complex, which is supported by the county.

Single-story, wood-framed structures will create an informal, camplike setting. These skylit, stuccoed buildings are arranged around a quadrangle to create a secure environment. Linked by trellises, the residential cottages incorporate porches and single bedrooms for up to 16 children. Currently under construction, the $8 million project will be completed early next year. —*K.S.*

Details

The Smithsonian Institution has selected **Geddes Brecher Qualls Cunningham** of Philadelphia, Canadian architect **Douglas Cardinal**, and **Johnpaul Jones**, a Native American from Oklahoma, to design the National Museum of the American Indian. The building is scheduled to open in 2001 on the last open plot on the Mall in Washington, D.C. The New York team of **Roberta Washington** and **Mitchell/Giurgola Architects** has been selected to design the $80 million Harlem International Trade Center. Williams College has selected Houston-based **Carlos Jimenez** with **Cambridge Seven Associates** to design a 32,000-square-foot art studio building adjacent to the campus art museum. **Antoine Predock** won a competition to design a $12 million student services building for the University of California, Santa Barbara. In Portland, Oregon, **GHA Architects** won a competition for the expansion and renovation of the Lewis & Clark College library and the design of two new buildings: a humanities center and a visual arts complex. The National Fund for the U.S. Botanic Garden has announced the winners of its design competition for the 3-acre National Garden on the Mall in Washington, D.C. **Valerio Simini** of Lucca, Italy, won the Environmental Learning Center category; **Martin Allen Haber** of Atlanta won the Rose Garden category; and **Baldev Lamba** of Hamilton Square, New Jersey, won the Water Garden category. **Edward Larrabee Barnes** of New York is designing the Henry R. Luce Hall for international and area studies at Yale University. **Skidmore, Owings & Merrill** of San Francisco is consulting on the design for a new teaching hospital in Shanghai, China, that will become the country's first pediatric acute care facility. Architectural historian **Vincent Scully** and architects **Andres Duany** and **Elizabeth Plater-Zyberk** have been awarded the first annual Seaside Prize for their contributions to the quality of American communities. **Lee Copeland**, former dean of the University of Pennsylvania Graduate School of Fine Arts and the University of Washington College of Architecture and Urban Planning, has joined the Seattle-based firm of **Edward Weinstein Associates**. The firm is now called **Weinstein Copeland, Architects**

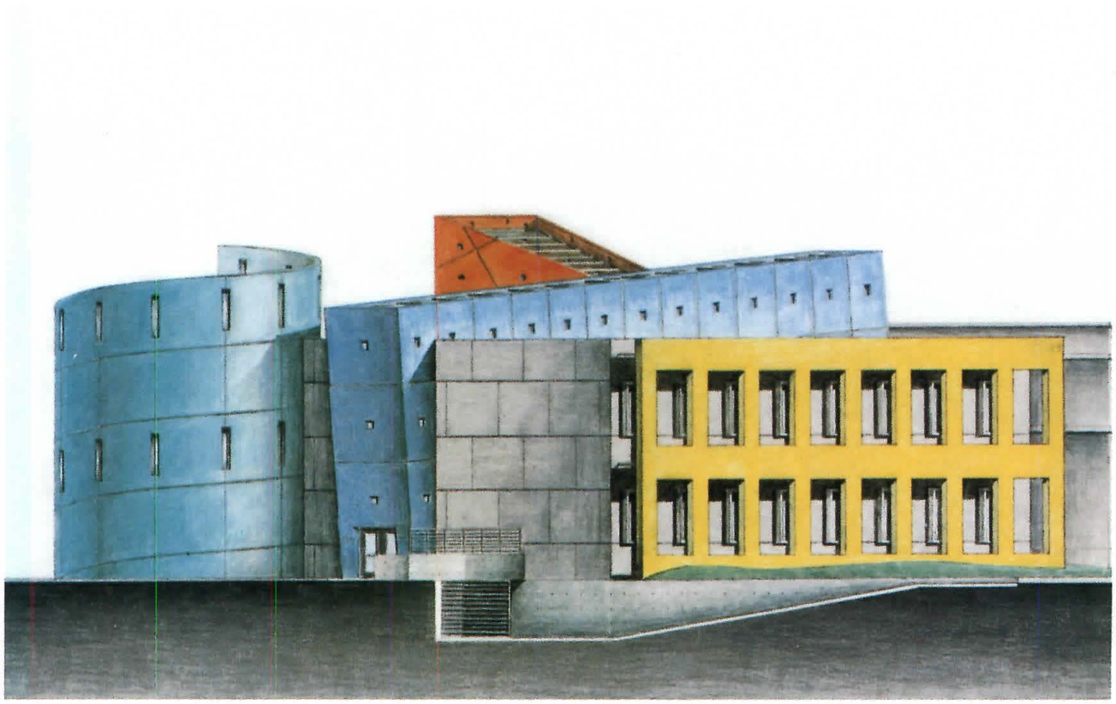


THE PLAN

CERTAINTEED VINYL SIDING
& DECORATIVE MILLWORK

A SATISFIED CUSTOMER

The value is equal to the

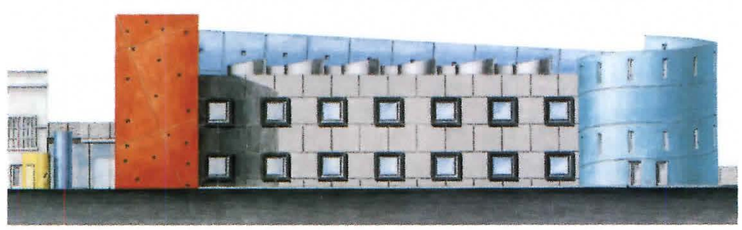


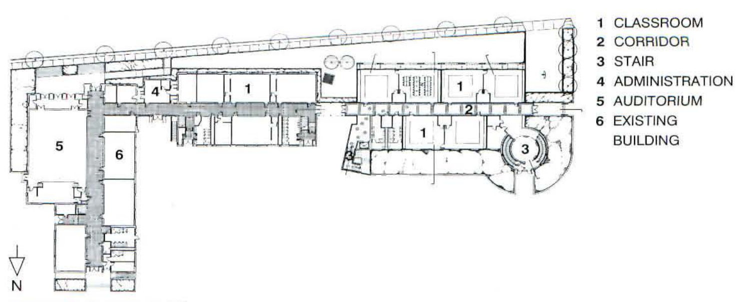
Nevin Avenue Elementary School
Los Angeles, California
Kanner Architects

A 47,400-square-foot addition to Nevin Avenue Elementary School is designed by Kanner Architects as an assemblage of brightly painted volumes to animate a tough neighborhood in South Central Los Angeles. The Los Angeles-based firm housed 12 classrooms and skylit circulation spaces within five distinct forms: two wings of stacked, orthogonal classrooms connected to a wedge-shaped central corridor; a trapezoidal stair-and-elevator tower studded with glass blocks; and a cylindrical stairwell. While providing access to classrooms, the central spine adjoins an existing 42,700-square-foot facility to the east.

To shade classrooms from direct sunlight, the architects placed a screen wall supported by steel rods 5 feet from the building. In addition to designing the new building, which rests above a 72-car parking garage, Kanner Architects devised an outdoor lunch pavilion. The firm is also responsible for overseeing the rehabilitation and landscaping of existing facilities. To stay within the $5.7 million budget, the architects specified the building components to be finished in painted cement plaster. Construction is scheduled to begin this summer and finish next year.

—Karen Salmon





GROUND FLOOR PLAN

Promoting Family Health

Architects can make a difference in children's healthcare by designing sensitive, family-centered environments.

Few architects have medical degrees. Yet by virtue of our experience in working with medical clients, we have become an important part of the healthcare team. To be most effective in this role, we must use our collective knowledge—and the power of architectural design—to promote health and healing. This knowledge is particularly important in the planning and design of children's healthcare facilities. Children are the most vulnerable of all patients, more environmentally sensitive than adults. Children also belong to families, and children's facilities must be holistically planned so that siblings, parents, and even grandparents can be comfortable in their surroundings.

Taking the lead

We lack neither resources nor examples of how to "do it right" when it comes to the design of healthcare facilities for children. The information base is enormous, and organizations that provide useful data are numerous and accessible. So why don't the examples of good healthcare design outnumber the examples that leave children and their families feeling frightened, confused, and isolated?

I contend it is because, in many cases, we design to the standards of care set forth by our clients, regardless of our own professional knowledge and standards. We are equally content to provide pedestrian projects for "average" clients on a tight budget and creative, thoughtful projects for clients who commit greater resources to the design and construction of their facilities. In our effort to "respond" to our clients, we may compromise the minimum standards that, as architects, we know are essential to the design of supportive, healing environments.

There are three areas in which I believe architects can make a significant contribution if we take the lead in designing environments for family-centered children's healthcare: the pediatric intensive care unit (ICU), the lobbies and public spaces of our public hospitals, and juvenile isolation areas.

A pediatric intensive care unit is the classic technology-driven healthcare environment. Even when it is understood that many intrusive design elements are the direct result of life-saving technology, the ICU is a frightening place for all involved. It demands reducing noise and light, protecting children from distressing sights, designing a supportive environment for the family in its care for critically ill children, and facilitating communication among hospital staff and the child and his or her family. And we must take the lead in ensuring such a supportive environment in the ICU—with or without a direct mandate from our client.

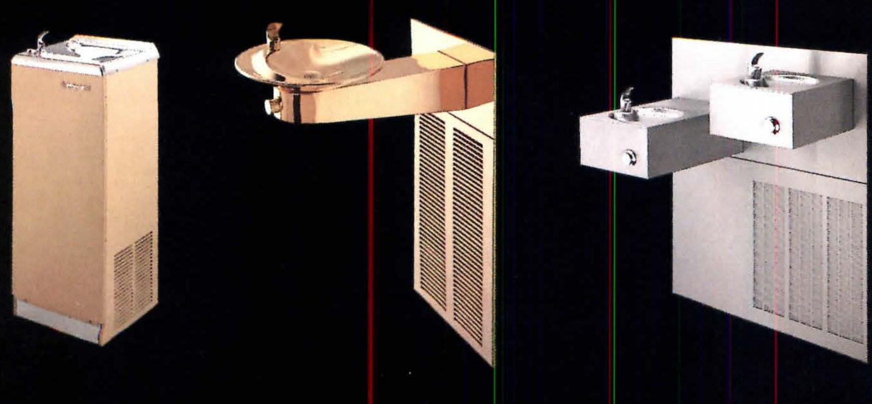
Public spaces, private emotions

The second example involves the lobbies and waiting areas in our hospitals. As a substitute for the primary-care physicians they don't have, many families turn to public hospitals and emergency rooms for the care of their children. When this happens, lobbies and waiting areas become the places where families make life-and-death decisions and are forced to live until a crisis is over. Fear, anxiety, confusion, and often grieving may beset children and families in varying intensities throughout their stay. We must provide comfortable places to act out these emotions.

To make matters worse, signage only in English sets up a language barrier that can anger and intimidate family members. Isn't it time we used our ingenuity and common sense to acknowledge the diversity of family needs and to design spaces that provide privacy, comfort, and an environment that's easy to understand regardless of class, education, and cultural background? As architects, we can't solve the problems that poverty brings to sick children, but we must find ways to protect these children and their families from being further traumatized by the environments we design for their care.

Finally, I want to challenge architects and planners to reevaluate the design of isolation areas for children. Years ago, we quarantined


It was our creation, after all.



sick children to prevent them from infecting others. Today, we isolate immuno-compromised children from others with infectious diseases, contact with plants and animals, and even certain foods. Deprived of the kinds of interaction we consider psychologically healthful, these children may be cut off from any sense of community. How can healing occur in such isolation?

Architecture of connections

Perhaps it is heresy for architects to suggest, as many physicians and nurses already have, that the single-bedded room now popular in newer hospitals may not be the best way to deliver care to children. By separating children from one another, we have compromised the communal atmosphere of the ward, where physicians and nurses could watch over groups of children and where parents and children could share in the knowledge and care of others.

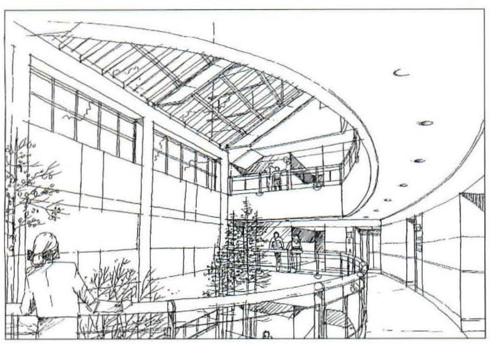
We must find ways to engage, entertain, and communicate with these isolated children. Through sensitive design, an experience of connection can be introduced even where physical isolation is required. Are there windows placed where a child in bed can look outside? If so, what can they see? Why not build an aquarium or a terrarium containing animals? We must reexamine architecture that divides and isolates so that the environments we design encourage intimacy and create a spirit of caring.

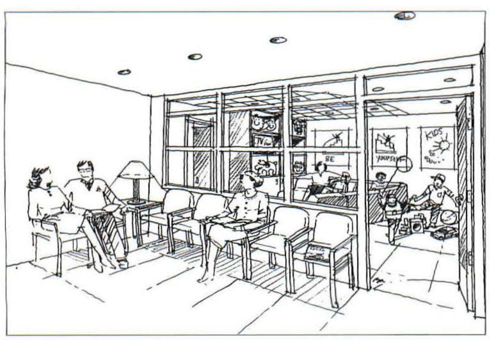
In the end, all architecture is healthcare architecture. We have the ability to shape human experience—for good or for ill—through the environments we design. That's why most of us become architects in the first place. The unique quality of healthcare design is that many of the people whose experiences we shape are in distress, and our work may either diminish or increase their distress. What differentiates us from our healthcare clients is that we are experts in different aspects of how environment contributes to health.

It's time for architects to take greater credit—and greater responsibility—for the power of architecture as a health-enhancing endeavor. We have much to learn from our healthcare clients, and they have much to learn from us. Our job is not only to respond to the direction of our clients, but also to use our professional expertise to promote health and healing. If we take this challenge seriously, we can make an even greater contribution to the future of children's healthcare.

—*John Gaunt*

J. Gaunt is CEO *of Ellerbe Becket in Minneapolis.*





DISNEY CANCER INSTITUTE AT FLORIDA HOSPITAL: Ellerbe Becket's design of atrium (top) and radiation oncology waiting/play area (above).

Architecture for kids

The growing children's rights movement opens new frontiers for architects.

PAUL HESTER

ABOVE: Caryakid designed by Venturi, Scott Brown & Associates for Children's Museum of Houston symbolizes importance of young visitors.

In St. Charles, Illinois, 9-year-old Nicole Schoo and her 4-year-old-sister, Diana, survive nine days home alone, while their parents vacation in Mexico. In Washington, D.C., 9-year-old Anastasia Somosa asks President Clinton on national television to help her sister, who has cerebral palsy, move out of "special education" and into a mainstream classroom. In Orlando, Florida, 12-year-old Gregory Kingsley becomes the first child in the country to "divorce" his parents, after testifying in court that they mistreated him.

These cases and others are pushing children's rights to the top of America's agenda. From Nannygate to Deadbeat Dads, Head Start to Family Leave, the Safe Schools Initiative to Free Immunization, children have grabbed the headlines and tugged at the nation's heartstrings. How could it be otherwise in a year when America elects its first baby boomer President and also benefits from a First Lady who champions children's rights?

President Clinton has delivered a strong message of hope for children, proposing increased spending for Head Start, universal immunizations, and nutrition programs. "Perhaps the most fundamental change our new direction offers," Clinton declared in his State of the Union address, "is its focus on the future and its investment which I seek in our children."

From headlines to drawing boards

It seems inevitable that children, in many ways America's most silent and disadvantaged minority, would wind up in the spotlight. The current focus on children's issues stems largely from their sheer increase in numbers—the result of America's baby boomers producing a boom of their own. According to the U.S. Census Bureau, 4.1 million children were born in America in 1990, 1991, and 1992, almost as many as the 4.3 million born in 1957, the peak year of the postwar baby boom.

The awareness of children's rights has quickly created an important frontier for America's architects. As the need for better child-care centers and schools leaps from the headlines to the drawing boards, the profession is being challenged to develop new solutions, spurred by a growing contingent of child psychologists, early learning specialists, caregivers, and other child-related consultants. These experts contend that children's cognitive, social, emotional, and physical development is greatly influenced by the quality of their environments—whether child-care centers, schools, or their own backyards—where they spend their formative years and that make-do design approaches of the past will no longer suffice.

Such experts say architects must do a better job of tailoring environments for children, just as they tailor environments for the elderly and disabled. Architects must create places that nurture children and foster their development, not hinder it. "Because it is for our future generations, I can't imagine any place where design matters more," contends Anita Rui Olds, a California-based consultant for children's facilities.

Project types for children

This recognition of children's design needs is spurring an increasing number of child-related architectural commissions. Opportunities range from birthing centers that reflect the latest advances in neonatal care and obstetrics; to schools designed for today's computer-literate "tekkies"; to a wide range of child-friendly museums, exploratoriums, and play centers. And a new breed of child-design specialists is emerging to create them. "I would say it's a movement," states architect Richard J. Passantino, president of LEA/Passantino + Bavier, an Arlington, Virginia-based firm that specializes in child-related projects. "It's one of the most important issues that architects face."

Current child-related design is concentrated in four building types.

- ***Child-care and learning environments:*** The federal government is currently the country's largest single client of child-care centers. The U. S. General Services

TRACEY LANDWORTH

Administration (GSA) operates 92 centers, each with an average of 75 children, ranging in age from 6 weeks to 5 years, and is building another 10 to 12 every year. The GSA has also developed a prototypical "minicenter" for supporting fewer than 75 children.

Corporate America is establishing hundreds more day-care centers for its employees, such as a new facility built by Warner Bros. (pages 70-75), and so are community groups and for-profit franchises such as Kinder-Care. A 1992 report commissioned by the Child Care Action Campaign estimated the number of children in nurseries and preschools would increase from 3.7 million in 1992 to 5.3 million by the year 2000.

▪ **Schools:** Design of educational facilities, a source of steady work for many firms, has received a boost as many school districts and administrators launch a wave of additions, alterations, and new buildings. Some projects are initiated in response to the increased number of school-age children. Others, including projects by the New York City School Construction Authority (pages 54-63), are generated by the need to upgrade or replace obsolete buildings. Legislation can also trigger construction projects, such as when local "potty-parity" ordinances require schools to have comparable lavatories and athletic facilities for boys and girls, or when the Americans with Disabilities Act requires more mainstreaming of children with disabilities.

The educational reform movement will be an important generator of future projects, predicts Gary T. Moore, a University of Wisconsin-Milwaukee architecture professor and design consultant. Around the country, Moore reports, school administrators are exploring ways to break the mold and create facilities that embody new teaching concepts. They include incorporating multipurpose spaces to accommodate innovative curriculums, clustering classrooms in new ways, decentralizing teachers' offices so they are closer to their classrooms, and downsizing schools in general.

▪ **Healthcare:** Advances in obstetrics, pediatrics, gene therapy for children, and other specialized treatments are shaping new models of healthcare for children. Projects range from medically managed day care for children with AIDS (pages 89-95) to shock trauma centers for life-threatening injuries. In California, a new pediatric hospital by NBBJ incorporates children's play concepts into acute-care facilities (pages 76-81).

▪ **Recreation and entertainment:** Children's museums are the fastest growing type of museum in the country, with more than 350 worldwide, 250 in the U.S., and at least five more in the planning stages. Their high profile is due in part to the participation of such well-known design firms as Venturi, Scott Brown & Associates, architect of the new Children's Museum of Houston (pages 46-51). Also designed with children in mind are an assortment of parks, zoos, aquariums, science centers, amusement parks, and other complexes that blur the edges between education, entertainment, and retailing.

A growing contingent of child psychologists, early learning specialists, caregivers, and other consultants contend that children's cognitive, social, emotional, and physical development is greatly influenced by the quality of their environments during their formative years, and that make-do design approaches will no longer suffice.

Design based on research

Architects willing to pursue these and other child-related commissions are likely to discover that designing for kids is not child's play. A growing body of data indicates that environments designed for preschool children have a strong impact on their cognitive and social development. Architects can no longer fake it by creating buildings that are merely playful or whimsical. Their work has to be backed by research.

PAUL HESTER

Designing for kids is not child's play. Experts recommend that architects adopt a multidisciplinary approach to designing for children. The architect and client, they contend, must form a diverse project team that includes interior designers, child psychologists and consultants, community representatives, and children who will use their spaces.

Making buildings playful is "certainly helpful for kids," Moore states. "But it is not anywhere near enough. There are fundamental organizational schemes for child-care centers that we now can base upon well-substantiated research." Studies show, for example, that there should be two entryways to every space that accommodates children, and that day-care centers should be broken down as much as possible to houselike parts.

"Children learn about their world through their senses—by looking, touching, tasting, smelling," adds Patricia F. Kinney, deputy director of the Office of Child Care and Development Programs at the GSA. "I urge architects to get down on their knees and move around to get a sense of a child's world." Kinney notes that many child-care centers are designed with more flaws than positive features. They range from cramped conditions to mazelike layouts to obstructed areas where children could be vulnerable to abuse by child-care workers.

Adds Olds, "When it comes to children, we have to put aside many of the customary designers' rules and trends and ask ourselves: Does this feel right? Would I, as a child, have really appreciated it? The needs of children are very different from those of adults." Another impediment to good design for children is that architects rarely consult with the young clients for whom they are designing. One exception is a treehouse designed by Glenn + Williams Architects (pages 52-53). The Baltimore firm interviewed its clients, then aged 5 and 3, and created a design that would free the children's imagination.

Striving for teamwork

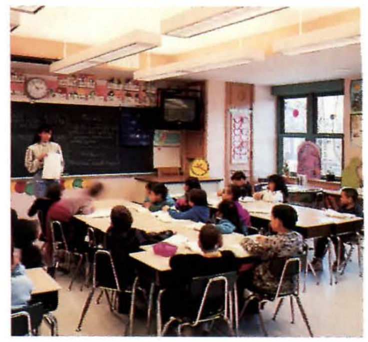
Experts recommend that architects adopt a multidisciplinary approach to designing for children. The architect and client, they contend, must form a diverse project team that includes interior designers, child psychologists and consultants, community representatives, as well as children who will ultimately use the space.

Architects are taking a variety of other steps that will give them a better understanding of and increased sensitivity to children's design issues. The AIA's Architecture for Education Committee, for example, held its first conference on early education and preschool design in February. AIA committee members are also building bridges with other organizations, such as the National Association for the Education of Young Children.

The GSA is about to issue comprehensive design guidelines for federal day-care centers, spelling out minimum recommended sizes for indoor and outdoor spaces and other key criteria. The guidelines will also be useful to private companies, community groups, or others planning to build or expand child-care centers. In addition, the American Public Health Association and American Academy of Pediatrics have released a resource manual called "Caring for Our Children," and the Center on Effective Services for Children is developing a series of guides to give communities "how to" information on designing, financing, and constructing childhood facilities.

Like many of the young clients it serves, the children's design movement is very much in its infancy. A wide gap still exists between the awareness of design problems and architects' ability to solve them. But more and more architects have made an encouraging start, as revealed in this issue. For these pioneers within the nascent field of children's design, there is still plenty of room to grow.

—*Edward Gunts*



CHUCK CHOI

ABOVE: Classrooms such as those in New York City's PS 92 by Gruzen Samton Steinglass must accommodate more functions, fewer students. **FACING PAGE:** Rios Associates' plywood furniture for the Warner Bros. Children's Center offers flexible arrangements of seating and playing surfaces.

Children's Museum of Houston
Houston, Texas
Venturi, Scott Brown & Associates

decorated shed

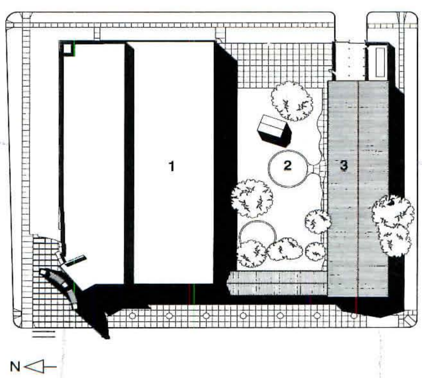
Anyone searching for a quick, neat summary of Robert Venturi's architectural ideas should visit the new Children's Museum of Houston. Although it cost just under $4 million, the 43,000-square-foot building is filled with the kind of quirky inventiveness that has marked Venturi's career from the beginning. It mixes bold color with a pop Classicism that is neither tedious nor tendentious. It speaks the language of children without talking down to them. It is the quintessential decorated shed.

The new museum, which opened in November, culminates four years of dogged effort by its board of trustees and volunteers to find a new home. Founded in 1980, the institution grew over the decade until attendance reached 150,000 annually in 1989. With no prospects of expanding its existing building, the board purchased a site at Binz and La Branch streets, a few blocks from Hermann Park and Houston's Museum of Fine Arts.

Venturi, Scott Brown & Associates was chosen from a list of more than 40 architects. The board members wanted a well-known architect to boost the building's fund-raising prospects and were impressed with Venturi's unbuilt proposal for Euro Disney and his design for the Seattle Art Museum (ARCHITECTURE, August 1992, pages 56-65). They were even more attracted by Venturi, Scott Brown's reputation for producing imaginative designs on tight budgets.

Venturi and the Houston firm of Jackson & Ryan Architects responded with a shrewd, functional building that combines traditional civic architecture with the Spartan esthetic of a black box theater. The centerpiece is a monumental hall, called the Kids Gallery, that runs the full east-west length of the site. Classrooms and a gift shop line its north side, and permanent exhibits border the south. The Kids Gallery is intended to serve as a temporary exhibit space and ceremonial gathering place, although at the moment it primarily functions as a long, interior street. An exhibition workshop and storage space

ABOVE: Children's Museum turns a monumental Classical face to Binz Street. Freestanding entrance portico gently parodies Houston's Museum of Fine Arts up the street.
SITE PLAN: Museum complex consists of decorated shed containing offices and exhibition spaces (left) and prefabricated service and storage wing (right) that enclose a courtyard.
FACING PAGE: Monumental columns are anchored by cast stone bases, with shafts and capitals covered in synthetic stucco.

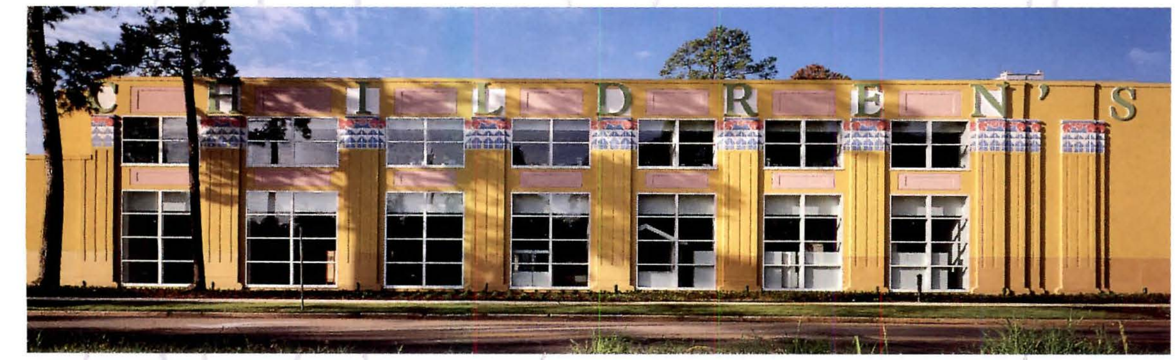


SITE PLAN
1 MUSEUM
2 COURTYARD
3 WORKSHOP/STORAGE


MUSE

have been banished to a prefabricated metal shed at the rear of the site, away from the exhibits; the shed and the L-shaped museum frame an outdoor courtyard.

The museum's north facade, along Binz, appears conventionally civic from the street, with a row of pilasters and brightly painted capitals. But, characteristically, Venturi invokes Classicism only to undercut it. The pilasters are unevenly spaced, as are the letters in the word "CHILDREN'S" along the cornice.



ABOVE: North elevation represents playful adaptation of the iconography of nearby adult institutions, especially the Museum of Fine Arts, which includes a traditional masonry rear facade and a steel-and-glass Miesian front.
RIGHT: Columns' monumental scale is complemented by decorative details.
FACING PAGE: The 13 "caryakids" are rendered with 13 different hair and skin colors, making an unequivocal statement about the value of cultural diversity. They are constructed of inverted Y, steel columns encased in fiberglass.

The "C" sticks out beyond one end of the building, while the "S" fends for itself on the other. The museum's west facade is covered in corrugated-metal siding and features a covered walkway supported by 13 "caryakids," Venturi's playful fiberglass version of the draped caryatids that hold up the roofs of Classical buildings. Buses pull up under a broad canopy and decant children directly into the orientation theater off the entrance lobby.

The building's playful spirit is captured by its entrance. Four jumbo Classical columns, painted yellow, support an oversize curved pediment with "MUSEUM" written in gigantic poster letters. This assemblage has no right angles and looks slightly unsteady. Such juggling of scales and symbols has distinguished Venturi's institutional work from the beginning.

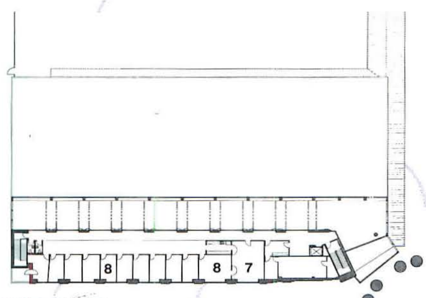
Although these witty blends of Pop Art and high culture are well-known Venturi staples, they baffled the trustees at first. "We had to spend six weeks walking them through the design," recalls Melinda Poss, chair of the building committee. It was not the only tense moment during the design process. Venturi wanted the proscenium arches in the Kids Gallery to be more representational, like arching trees, perhaps, or figures from Hansel and Gretel. "But the trustees felt that this would be imposing too much on the children's imaginations," Venturi laments. Despite these obstacles, the architects avoided the black box atmosphere of many museums. Light pours through tall arched windows at the ends of the Kids Gallery, as well as from clerestories that flood the second-floor offices with daylight. The proscenium arches in the ceiling may be Kmart versions of their flashier counterparts in Seattle, but they enliven the space nonetheless. Simple, low benches line two wainscoted walls, recalling school corridors or the waiting rooms of vintage train stations. The gallery is intended to be a signature space, one that visitors will recall long after they've forgotten the rest of the museum.

The exhibits vary dramatically in quality and sophistication. The largest are two re-created village scenes from Mexico and Taiwan, complete with classrooms, houses, and market squares. They are skillfully and lovingly crafted, yet seem curiously static for a generation weaned on MTV. Several others, including the video studio and the supermarket, seem old hat. By contrast, an environmental exhibit on pollution promises to give children an irresistible opportunity to dump

garbage and fake chemicals down a toilet or a kitchen drain and then watch them flow into special aquariums representing the bays and estuaries of the Texas Gulf Coast.

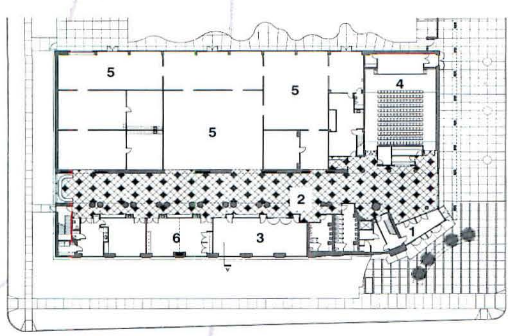
When the kids get too tired or too hyper to function, they can escape to the museum's courtyard. Venturi insisted that this outdoor space be treated as an activity area and not just a patch of grass. At the moment, it contains a bubbling bayou, a greenhouse, large planter boxes, and several street games.

ABOVE, LEFT TO RIGHT: Entrance lobby to Kids Gallery is flooded with daylight. North side is lined with classrooms, offices, and a gift shop. South side incorporates entrance to exhibition. **PLANS:** Ground floor consists of flexible exhibition areas, auditorium, and gathering space. Administrative offices are located on second floor. **FACING PAGE:** Decorative arches in Kids Gallery, constructed of painted particleboard, add festivity.



SECOND FLOOR

1 LOBBY
2 KIDS GALLERY
3 GIFT SHOP
4 AUDITORIUM
5 EXHIBITION
6 CLASSROOM
7 CONFERENCE
8 OFFICE



FIRST FLOOR

There's probably too much stuff in too small a space, but children thrive on jostling.

With only a $3.8 million budget, the museum shows signs of economy everywhere: in the quality of materials and finishes, such as synthetic stucco, drywall, and corrugated metal, and the straightforward, no-nonsense treatment of the individual spaces.

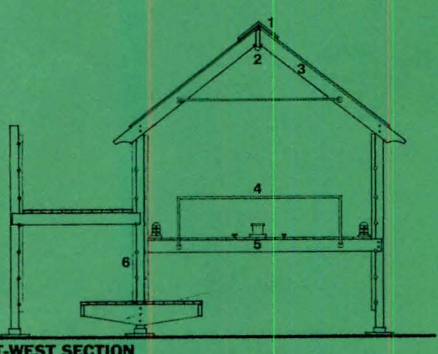
Yet the results do not look cheap. And much of the credit belongs to Jackson & Ryan, the local firm that prepared the budget, produced the working drawings, and kept the board's expectations in check without destroying its dreams.

In designing the Children's Museum, Venturi's career has come nearly full circle. Twenty years ago, in the early 1970s, his firm was often asked to come up with innovative designs on shoestring budgets. Although modest, Houston's newest museum demonstrates that even after 25 years, Venturi's ideas are still very compelling.

—David Dillon

Stacy's and Michael's Treehouse
Bethesda, Maryland
Glenn + Williams Architects

Into the Woods



1 PLASTIC RIDGE
2 2X8 RIDGE BEAM
3 2X6 RAFTER
4 METAL RAIL
5 2X6 JOIST
6 4X4 POST

EAST-WEST SECTION

ABOVE: View through trees and section show unsheltered platform and playhouse formed from cedar posts.
FACING PAGE, TOP: At dusk, children's treehouse glows like lantern when illuminated from within.
FACING PAGE, BOTTOM: Section detail (right) and photos show points where purlins project through plastic sheets that clad the treehouse (center) and where wood frame emerges (left).

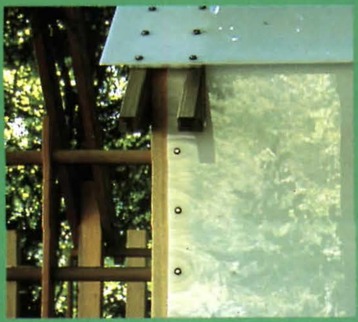
When a Washington, D.C.-based developer decided to give his grandchildren a gift, he didn't run out to a store and buy it. Instead, the developer commissioned Glenn + Williams Architects of Baltimore to design a treehouse and let his grandchildren serve as clients. The architects interviewed the children, Stacy and Michael, then aged 5 and 3, and made a scale model. Explains Partner J. Lee Glenn, "With children, you get a different perspective. They said: 'It has to be taller than a giant. It has to be a train. I've got to be able to sleep in it.'"

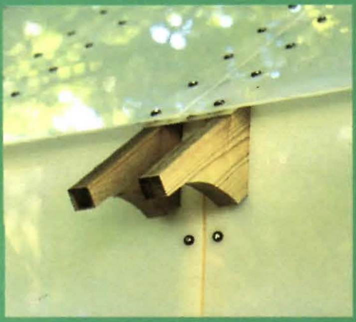
The result of this unusual architect-client collaboration is a building that is architecturally sophisticated yet tailored to its young owners. In fact, the backyard treehouse turned out to be a "next-to-tree-house" because the architects decided it would be safer to build their design on the ground rather than in the treetops. Nestled in a stand of tall pines, the 400-square-foot structure consists of a large deck and a partially enclosed shelter. It is built from 4-by-4, custom-milled cedar posts placed on a 2-foot module. The roof and sides are clad in 1/4-inch-thick translucent plastic panels, affixed to the framework with neoprene washers and stainless steel screws.

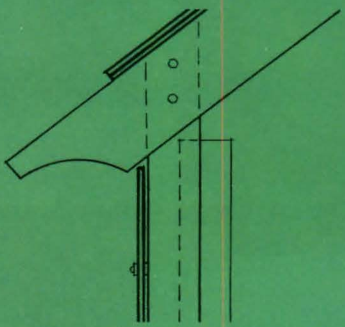
By organizing the treehouse as a sequence of sliding planes and then selectively removing various elements of the framework, the architects created a building that gradually erodes to become part of the landscape. Within 22 feet, it progresses from an enclosed structure to an open deck to a freestanding lattice. Within the lattice, horizontal dowels and vertical 1 by 4s double as bars and ladders, offering a variety of play opportunities.

In their effort to free the children's imaginations with a structure that is rooted in abstraction, Glenn and Williams have also provided a lesson about the limits of shelter—and the possibilities. One day the structure is a space ship. The next day it's Cinderella's castle. Ultimately, the treehouse can be whatever its small clients want it to be.

—Edward Gunts







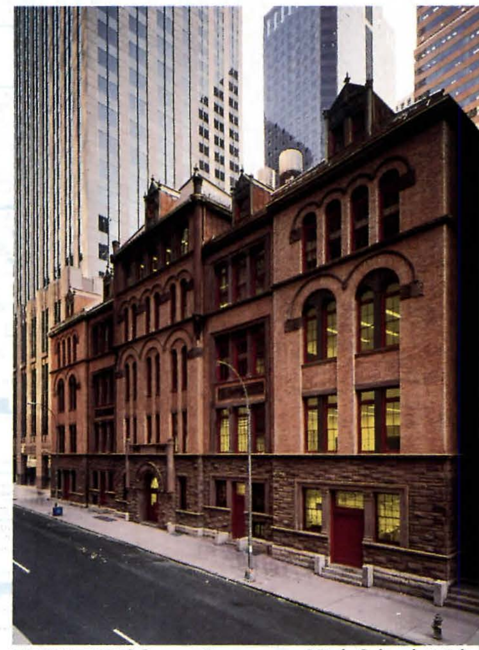
Portfolio of New York City Schools

educating New York

MANHATTAN: IS 90, Richard Dattner Architect.

STAN RIES

MANHATTAN: PS 128, Richard Dattner Architect.



ELLIOT FINE

MANHATTAN: Murray Bergtraum High School, Midtown Campus, Jack L. Gordon Architects.

THESE PAGES: The enabling legislation for the New York City School Construction Authority requires that not less than 40 percent of the value of all projects completed in a fiscal year, including design, construction documents, and supervision, be performed by employees of the authority. The remaining 60 percent of projects are completed by architectural firms with New York offices.

If President Clinton succeeds in persuading Congress to improve both education and infrastructure, as promised by his economic stimulus plan, he should begin by encouraging school construction. Clinton and Education Secretary Richard Riley might well look to New York City, which not only boasts the largest school system—1 million students and 62,000 teachers—but a new way of efficiently constructing various types of schools. Five years ago, the Board of Education created the New York City School Construction Authority (SCA), an entire city agency devoted to designing, constructing, and rehabilitating public schools. Now in the fourth year of its first five-year plan, the authority will complete, on schedule, a $4.3 billion program to build 50 new schools and 30 additions and to finish 70 major renovations and countless related physical improvements. Over the next 10 years, SCA expenditures on new school construction and refurbishment are projected to reach $24 billion. The size of this construction program, its efficiency, and its high architectural quality should set a standard for other school building programs throughout the nation. The SCA's achievement is all the more remarkable given the Board of Education's recent history of shocking neglect of its school buildings and its failure to generate essential new construction.

Task force takes action

Amy Linden, the Board of Education's chief executive, division of school facilities, reports that her agency is the third-largest real property manager in the country, exceeded only by the U.S. Postal Service and the U.S. Department of Defense. Nevertheless, she notes, as recently as five years ago, the board received only $40 million from New York City each year for direct maintenance costs and approximately $200 million for capital projects. For 12 years—from 1976, when New

STAN RIES

BRONX: PS 266 annex, School Construction Authority.

BRONX: IS 206A, School Construction Authority.

BRONX: PS 37, Liebman Melting Partnership.

York City temporarily lost its credit rating, to 1988, when the SCA was launched—the board was unable to procure adequate funds to carry out routine maintenance of existing schools or build needed new facilities. Lack of financial resources was compounded by bureaucratic delays and mismanagement.

In April 1987, the Board of Education, belatedly responding to impending catastrophe, appointed a 12-member task force on capital financing and construction to examine the physical condition of New York's 1,050 public school buildings (totaling 103 million square feet), including annexes, minischools, and central offices; to develop a long-term capital revitalization plan to reverse the physical deterioration of the schools; and to bring them up to the highest contemporary pedagogical and environmental standards. In addition, the task force sought to devise a means to fund the plan; to rectify, through improved organizational and implementation strategies, management weaknesses throughout the entire design, construction, and maintenance process; and to eliminate burdensome approvals mandated by other public agencies. The task force toured schools in the five boroughs and conducted interviews with superintendents, principals, teachers, and custodians, as well as city officials, school officials from other cities, educators, architects, and members of the construction industry.

A school system in crisis

The task force found New York's schools to be in even worse shape than expected. Its inventory of the physical and functional condition of the buildings, the first ever in the history of the board, revealed overcrowding in more than 400 schools, and more than 600 schools required major repair work, including HVAC upgrades. More than a third of the schools still burned coal; half were over 45 years old; and some were nearly 100 years old. In many schools, due to deterioration, overcrowding, or both, children were without drinking fountains, toilets, or playgrounds. Often combination gymnasium/auditoriums were being used to handle student overflow, with one class relegated to the stage, and several other classes clustered in the former gym—all without any form of visual or acoustical separation.

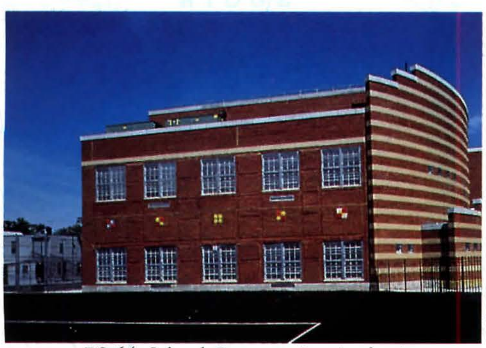
Architect Thomas Spiers, the School Construction Authority's vice president of operations, summed up the devastating effect wreaked by the lack of maintenance: "If you don't fix the roof, water leaks through and ruins the ceiling. Plaster falls on the kids. Many New York City schools have their upper floors closed off because the plaster has collapsed. Water gets into the walls and it freezes and pushes out the brickwork. Water gets to the structural steel and rusts it. We never did the stitch in time. Now we have to do nine stitches, and it will cost billions."

WADE ZIMMERMAN

QUEENS: PS 54 minischool, William A. Hall.

STAN RIES

QUEENS: PS 62, School Construction Authority.



STAN RIES

QUEENS: PS 64, School Construction Authority.

Creating a construction authority

The task force, spearheaded by Linden, completed its work in less than six months. "We decided that school construction and rehabilitation were simply beyond the competence of the Board of Education," Linden relates. "We concluded that the dollars we would be able to raise through New York City capital funds would be sufficiently substantial for the board to have its own independent authority." It took a year for the state legislature to pass the bill creating the new authority. Finally, in 1988, the School Construction Authority was established as a public benefit corporation empowered to design, construct, and perform major rehabilitation of New York City's schools, while improving the efficiency, economics, and quality of the process.

Essential to the success of the SCA was the establishment of its five-year capital plan. Linden reports that "in the old process every single project was a budget line item, and each one had to be negotiated with City Hall. Given $4.3 billion and five years in which to spend it, we were able to determine how to split the money between constructing new schools and modernization."

So that the time to design and build a new school could be reduced from eight years to four or five, the enabling legislation exempted the authority from restrictive regulations and other time delays. No city or state agency could impose its oversight on the work of the authority. In addition, the SCA was released for five years from New York state's Wicks Law, which requires agencies undertaking certain public construction to conduct separate bidding for plumbing, heating, and electrical contracts. The legislation also spared the SCA from the city's Uniform Land Use Review Procedures (ULURP). The agency was given zoning override powers, but community and school district boards could not override the authority's decisions. Local boards can, of course, act in an advisory capacity, and the authority considers it imperative to win their support. Albert A. Gallardo, director for external affairs, makes sure the local community knows what the agency is doing. "We are very different," he explains, "from city agencies that come unannounced and start to dig up the street. Before we begin, we tell them that we're going to be around for three or four years to build a school. We warn them that we will drive piles, and some of their houses may shake."

The SCA is permitted to enter into its own contracts and pay its own bills without consulting with the office of the City Controller. To check the backgrounds of outside contractors—including architects, consultants, vendors, and builders—the SCA has its own inspector general system, with special powers to fight corruption in the building trades. According to authority trustee Meyer S. Frucher: "We are after generalized corruption—bid rigging, shoddy work, all the ways you can steal.

QUEENS: PS 69, Urbahn Associates.

BROOKLYN: IS 2, Richard Dattner Architect.

STAN RIES

BROOKLYN: PS 195, School Construction Authority.

We have the most comprehensive, toughest inspector general's office ever, because unlike such offices elsewhere, ours is backed by official law enforcement. We have police powers. Any contractor working with the authority had better be clean."

Striving for good design

Because the legislation establishing the SCA released the newly formed authority from the bureaucratic sign-offs that typically cause a wide range of complications and delays, the SCA can work as efficiently as a private entity. While the Board of Education determines what new schools should be built and where, with a program for each project, the SCA is independently responsible for design and construction. SCA's newly appointed president and chief executive officer, Barry E. Light, stresses that the authority is seeking the best design possible, and architectural firms that are not usually involved in public projects are hard at work on the SCA's schools. "We are trying to make our schools objects of civic pride, befitting their role as focal points in their communities," Light points out. "I am also excited by the fact that 40 percent of SCA's architectural design is done in house."

Kenneth Karpel, SCA's chief architect, points out that because the new agency has a large budget and is hiring architects during a recession, the SCA is able to engage the interest of top firms. But, Karpel adds, finding the best architects for new school work is not that simple. Once the way to get a New York City school job was to be on good terms with a borough president, but today, an architectural firm must meet standards that the agency is presently in the process of refining.

To this end, the SCA has engaged New York architect Bonnie Roche to suggest selection procedures, including questionnaires and ranking systems, that will provide the authority with comprehensive information

DAVID ANDERSON

QUEENS: PS 233, Gran & Sultan, Architects.

DAVID ANDERSON

QUEENS: PS 233 interior.

ROY WRIGHT

QUEENS: PS 14, Gran & Sultan, Architects.

from which to choose the right firm for the job. Roche reports that although the authority seeks established firms in New York with successful relevant experience, it is also looking for small, young firms that are willing to joint venture with larger offices.

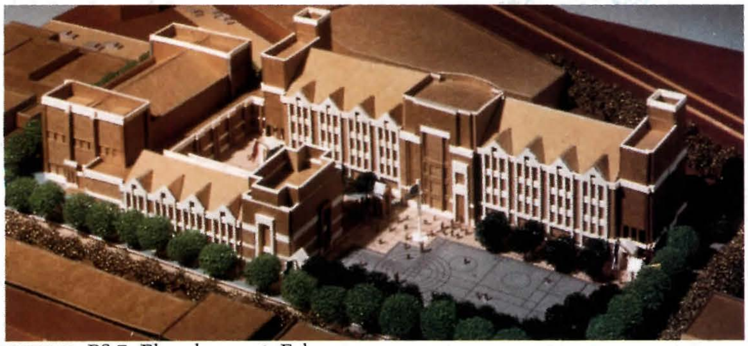
So far the SCA has assembled an excellent group of New York architects to design most of the 50 diverse types of new schools in its five-year program, including minischools to provide badly needed classrooms and special facilities for the disabled. Included are large well-known firms, such as Perkins & Will; Ehrenkrantz & Eckstut; and Hellmuth, Obata & Kassabaum as well as smaller firms, such as Gran & Sultan (above) and Michael Fieldman (pages 64-67). Although four prototype schools now finished or nearing completion (pages 60-63) were not commissioned by the authority, the SCA's review and value engineering procedures improved and expedited their design and construction.

In-house design and production

The SCA's staff of 600 includes 180 architects, designers, and engineers directly engaged in the design, production, and engineering of new schools and additions, as well as for capital improvement projects, such as roof replacements and upgrades of mechanical systems. "We do most of these improvements in house," reports architect Alfred O. Venturini, SCA's director of design and engineering. "Labor-intensive and requiring a long learning process, it is not the type of work to give to outside consultants."

The agency also employs 140 technically trained project managers. Their role is not to design but to coordinate all projects, including those created by in-house teams and by outside professionals, and to serve as liaisons with the Board of Education. The project managers—accountable for quality, safety, scheduling, and budgets—are the means by which the School Construction Authority

MAP: COURTESY OF H.M. GOUSHA



QUEENS: PS 7, Ehrenkrantz & Eckstut.

JAMES R. MORSE

QUEENS: West Queens H.S., Gruzen Samton Steinglass.

QUEENS: Townsend Harris High School, Hellmuth, Obata & Kassabaum.

controls all aspects of design and construction.

Although striving for good design, the SCA can be accused of failing to break new ground. For example, the authority has paid little attention to developing smaller schools on smaller sites, at a scale between its mini and mega schools. But the SCA is, nevertheless, fostering new strategies for economical and timely school construction, which is paramount, given years of neglect.

Furthermore, the earliest completed schools, most notably the prototype schools, are responsive to their respective neighborhood contexts through such various formal devices as gables, clock towers, and ornamental detail. However, the need for economy is now leading the authority to develop simpler functional volumes, minus the costly, customized details of the prototypes.

"By designing clean, uncluttered schools, the SCA is making the best possible use of taxpayers' dollars," maintains Philip Szujewski, managing partner of Perkins & Will's New York office, the architect of two recently completed prototype schools.

Model for federal programs

If the Board of Education's new 10-year plan for renovation and new school construction is carried out with the same level of success now being achieved in the SCA's first five-year cycle, New York City's public schools will be in a state of good repair soon after the turn of the century, and enough new schools will have been constructed to provide a seat for every child. Meanwhile, both agencies have high hopes that President Clinton and Congress will deliver on the promise of federal aid to the nation's schools. The New York City public school system is particularly deserving, not only because of the magnitude of its needs, but because of the competence with which these needs are at last being met.

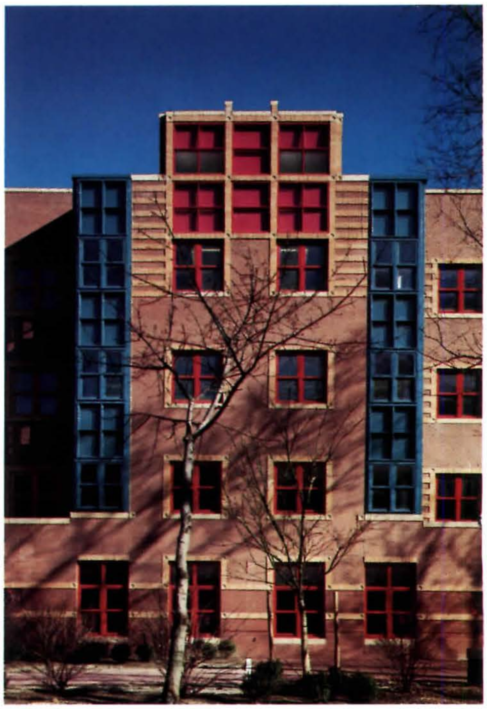
Meanwhile, New York City Mayor David N. Dinkins, on behalf of the Board of Education, has requested $188 million this year to be earmarked directly for capital improvements to the schools, in addition to the current budget of $900 million a year.

The accomplishment of New York City's School Construction Authority, which is unique among American cities, is already sending a message to other large urban areas: School construction is important enough to have its own agency. Each city that includes school construction in its public works system should consider creating such an independent agency for the benefit of its children. Educational building requires its own focus, removed from the preoccupations of bureaucracies that build bridges, sewer systems, and water treatment plants. If other U.S. cities begin to expand and rebuild their school facilities, as they must, New York City could become their model.

—*Mildred F. Schmertz*

Primary Schools 5 and 6
New York City
Gruzen Samton Steinglass, Architects

urban modules

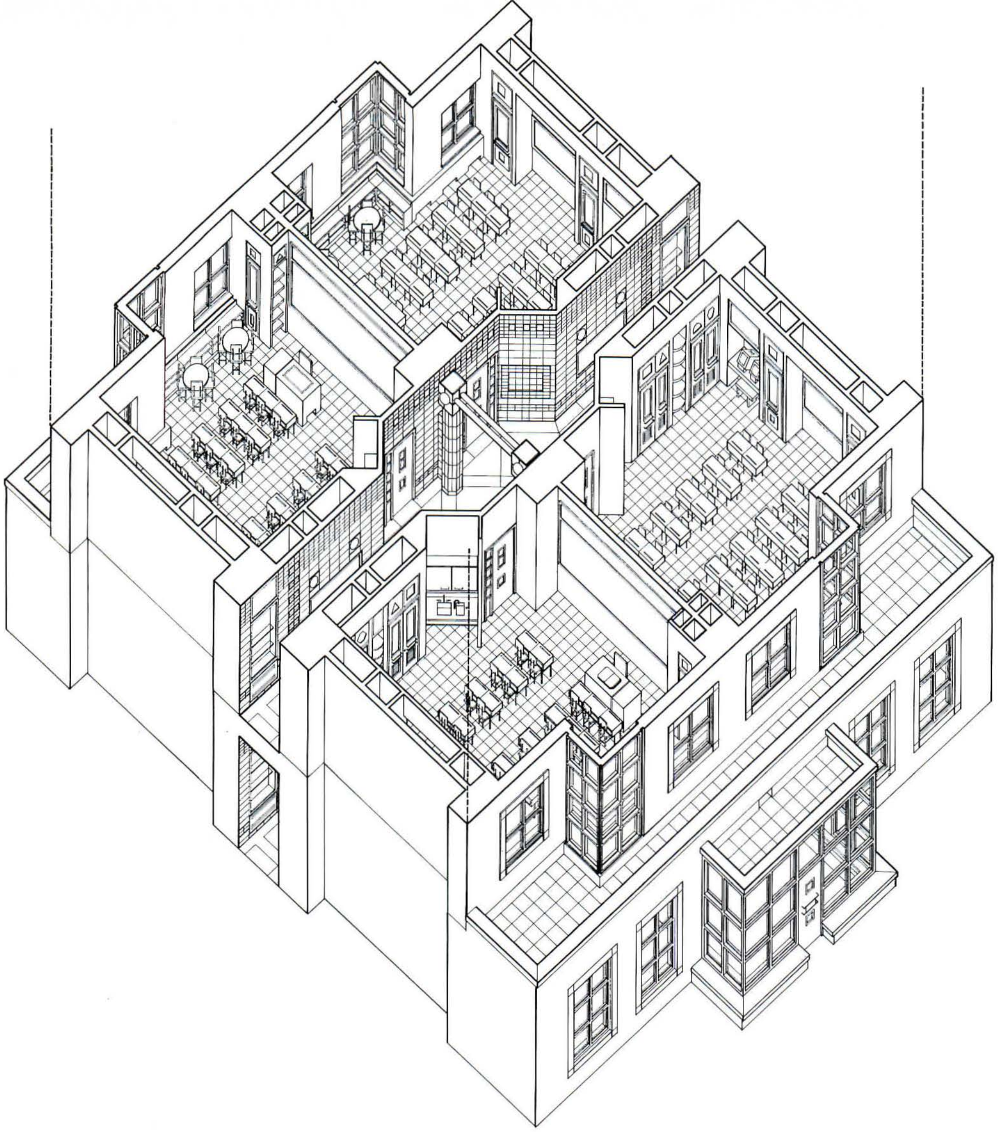


TOP LEFT AND RIGHT: PS 6 (left) in Brooklyn and PS 5 (right) in Manhattan are composed of identical modules that are varied to suit their particular site. PS 5 has 250 more students than PS 6 and has an additional classroom module. **ABOVE LEFT AND RIGHT:** Modular classroom facades of PS 6 (left) and PS 5 (right) are similar except for roof profiles and material palettes.

The New York City Board of Education launched a program in 1986, two years before the SCA was formed, to meet the needs of school districts being affected by new waves of immigration in Manhattan, Queens, Brooklyn, and the Bronx. Through this program, the board sought to speed up construction after a decade in which new school building had come to a halt.

The Board of Education initiated the program by requiring four top New York firms to design prototypical schools from four modules composed of standardized, replicable components that could be arranged in various ways on separate urban sites. The aim was to transform school building in New York City from an eight-year process to a four-year process by compressing site-selection, design, and construction-document time; by submitting for city agency approval 12 school designs that were essentially variations of four; and by reducing the construction period through the use of identical structural components and systems. The contract between the SCA and the four architectural firms—Perkins & Will; Gruzen Samton Steinglass; Ehrenkrantz & Eckstut; and Richard Dattner—allows the SCA's in-house architects to make future use of the prototypes for other sites, should they choose to do so.

By the time the SCA was created, the prototype designs were well under way and were reviewed, revised, value-engineered, and constructed by the new authority. Four prototypes are now complete—two by Gruzen Samton Steinglass (these pages) and two by Perkins & Will (following pages). PS 6 (above left) is a four-story, 77,487-square-foot primary school, located in the Flatbush section of Brooklyn, that accommodates 650 students from pre-kindergarten through sixth grade. PS 5 (above right), another four-story primary school, located in upper Manhattan, comprises 93,200 square feet, and



accommodates 900 students through fifth grade. The two schools share similar four-story classroom modules (drawing, above): Each floor of PS 5 consists of three clusters of four, 25-student classrooms; each floor of PS 6 contains two clusters.

Both schools include a separate administration module—a four-story structure—that consolidates teacher support, administration offices, and other specialized program spaces. A "commons" module, incorporating the auditorium, cafeteria, and gymnasium, can function independently of the rest of the school for community and after-hours use. Connector modules containing lobby areas, elevators, and stairs are inserted between the classroom, administration, and commons modules. These links, variable in size and shape, serve as knuckles that permit the prototype components to join at various angles and levels, allowing flexible adjustments to accommodate site conditions and additions.

Gruzen Samton Steinglass varied each prototype through changes in treatment and interpretation to project an individual identity sympathetic to each school's context. PS 6, for example, is located next to the former Flatbush Town Hall, a New York City landmark. Architects Peter Samton and George Luaces acknowledged the school's architecturally distinguished neighbor by adding roof gables and a skeletal cap of painted steel to crown the entrance. Apart from their soft-toned brick and quietly colored casement trim, also chosen in deference to the landmark, the modules are identical to those of PS 5.

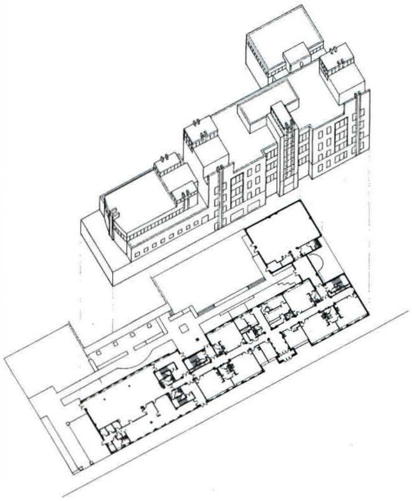
In contrast, PS 5, sandwiched between a roadway and a riverfront with no immediate neighbors to which to defer, is appropriately rendered in bold brick patterning and a saturated, lively color palette. Both schools benefit from the attention given to window grilles, fences, gates, and landscape design.

—*M.F.S.*

AXONOMETRIC: Four classrooms are clustered around small lobby.
TOP: Lobby and corridor walls are surfaced in colorful tiles surrounding carefully located exhibit areas.
ABOVE: Classrooms feature teaching areas, study alcoves, bay windows, and generous storage cabinets.

Primary Schools 23 and 279
New York City
Perkins & Will, Architects

bronx benchmarks



AXONOMETRIC: PS 23 consists of four modules (left to right): Lunchroom/auditorium with curved rear wall; pair of four-story classroom modules for 600 students; administration tower; and one-story gymnasium at the rear.
TOP LEFT: Administration module is flanked by identical classroom modules. Portion of lunchroom/auditorium block appears at far left.
TOP RIGHT: Lunchroom/auditorium block adjoins play area.
ABOVE RIGHT: Classroom module reveals Art Deco-inspired detailing.

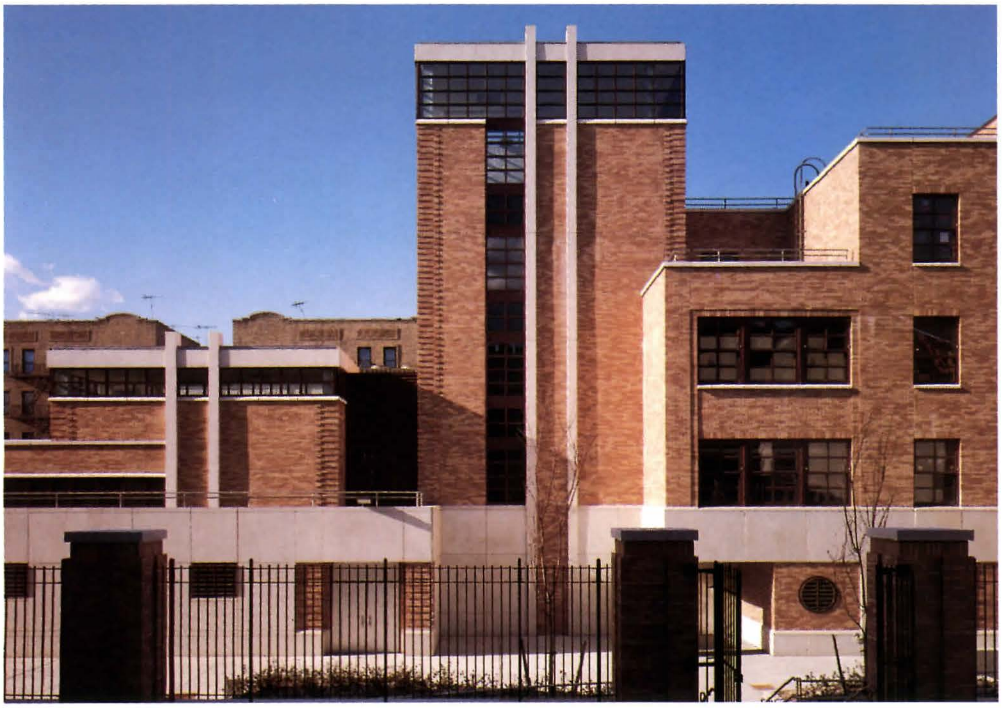
Primary Schools 23 (above) and 279 (facing page), both located in the Bronx, are the first of the New York City Board of Education's prototype schools to be completed by the School Construction Authority. Designed by Perkins & Will, the elementary schools share the basic concept of all the prototype schools now completed or under construction (previous pages).

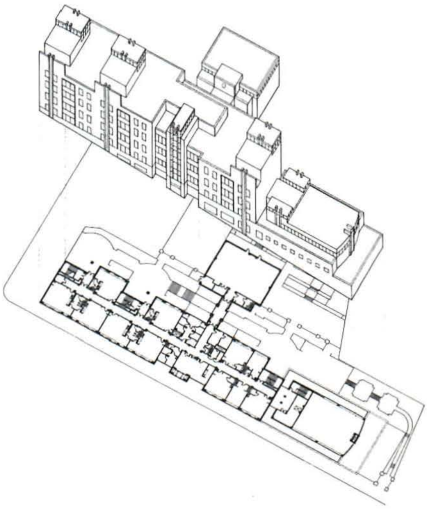
Philip Szujewski, managing partner of Perkins & Will's New York office, calls the basic building blocks of these new schools "protoparts." They consist of four modules: a four-story classroom cluster for 300 students, including regular classrooms, special-education classrooms, and teacher work areas; a four-story administration resource tower, including administrative offices, a teacher's lounge, library, and shared resource space for art, science, and computer studies; a community center composed of a two-story lunchroom/auditorium; and a one-story gymnasium. These modules were designed to be configured in a variety of ways to adapt to site conditions and school capacity requirements.

The 300-student teaching cluster vertically integrates school age groups, with pre-kindergarten and kindergarten classrooms on the ground floor and the upper grades on the top floors. Special-education classrooms and teacher resource centers are located within each cluster, rather than being relegated to one area of the complex. The classrooms are arrayed as pods surrounding lavatory facilities and a stair tower, which helps students identify their cluster and classroom locations.

The administration resource tower houses the shared academic and support infrastructure of the school, as well as a two-story library and belfry reading room. In both Bronx schools, this protopart is placed to mark the formal entrance and lobby and serves as a hinge for connecting the other modules.

Because today's urban school must play an





important civic role in its neighborhood, the communal modules in the two Bronx schools include a lunchroom open to the community after hours, along with an auditorium. They are designed as two-story elements to provide a change of scale for complexes that are predominately four stories. In both locations, these community centers provide added security by offering a separate entrance for non-school-hour community events.

Having designed the pair of completed Bronx schools and three others—one more in the Bronx and two in Brooklyn—Perkins & Will proposes additional refinements to its prototypes. Considerable savings would be achieved, the firm believes, if each module were contained within a rectangular footprint, thereby simplifying building foundations, exterior wall construction, and interior plan configurations. Reducing the number of window openings, as well as the number of window types, would reduce the cost of fabrication. Roof configurations could be simplified, eliminating small roofs, bell towers, clerestories, and elaborately concealed mechanical penthouses. The savings could be reassigned to increase building area, providing additional administrative or storage space; to upgrade interior finishes; and to enhance campus security provisions.

Architect Szujewski points out that prototype schools are not appropriate for every site. Some New York City school sites are too small, too steep, or irregularly configured, requiring complicated sitework and expensive retaining walls. Prototypes, where appropriate, should not be planned too specifically for current usage, but should be designed to adapt well to future programmatic changes. The Perkins & Will prototypes are straightforward and functional and will wear well with time. As Szujewski points out, "We tried to design a cost-effective Model T, good for everyone." —*M.F.S.*

AXONOMETRIC: PS 279 comprises four basic modules (left to right): two, four-story classroom modules; gymnasium connected to administration module; another four-story classroom module; and lunchroom/auditorium block.
TOP LEFT: Lunchroom block is connected to adjacent classroom module.
TOP RIGHT: View from rear reveals lunchroom block (left) and classroom module with stair tower.
ABOVE LEFT: Masonry details, fenestration, and cornice design refer to stripped down Modernism of the 1950s.

Primary/Intermediate School 217
New York City
Michael Fieldman & Partners

island rigor

ABOVE RIGHT: Viewed from Manhattan, across the East River, PS/IS 217 masses robust volumes of common elements against long bar of classrooms.

Roosevelt Island's new primary/intermediate school recaptures the verve and sense of adventure that surrounded the 1970s launch of the now-seasoned "new town in town" it serves. Originally known as Welfare Island, the 2-mile-long sliver of land in the East River between Manhattan and Queens was a repository for New York City's chronically ill and indigent; renamed Roosevelt Island in the early '70s, it was slated to become a showcase residential community. Though economic realities truncated the master plan by Philip Johnson and John Burgee, the venture has succeeded in creating a vital village, whose notable collection of architecture demonstrates that large-scale, high-density housing need not be grim.

Among its more striking innovations, Roosevelt Island boasted a public school, PS/IS 217, that divided its facilities for children from kindergarten through the eighth grade into minischools associated with each of the village's apartment towers. Over time, however, the aging component buildings became difficult to maintain and administer, and the school as a whole lacked both growing room and a full complement of facilities—library, auditorium, gym—that enrich classroom teaching. The availability of a just-right site on the village's Main Street provided an impetus to consolidate operations into a single building and build a school that would serve as a pilot project of New York City's School Construction Authority.

In light of the fledgling agency's mandate, it was perhaps a point in architect Michael Fieldman's favor that the firm had never designed a school. Fieldman's show-and-tell presentation was necessarily short on show, but it was long on tell: a sensitive verbal exploration of the experience of schooling from the perspective of a child and his parents. Entrusted with the commission, Fieldman continued the inquiry, seeking within the con-

fines of program and site an unhackneyed concept of what a school should be.

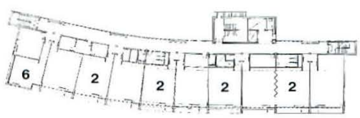
To Fieldman, a clear hierarchy of plan, section, and volumetric expression is the strongest way to shape spaces that are comfortable to and comprehensible by the people who use them—a goal with particular resonance for a school. The near-diagrammatic layout of the miniature campus arrays classrooms in a slim, four-story bar that follows the gentle curve of Main Street. Shared facilities—auditorium, gymnasium, library, and dining rooms—occupy a weightier two-story block that thrusts westward to the East River's edge. Here, an offset two-story cube housing music and art classrooms encloses the third side of the playground, which doubles as campus quadrangle and entrance court. Joining the academic blocks, the main circulation paths are raised to the status of distinct elements within the composition. The articulated enclosures of the main stair, linking the commons and classroom buildings, and the smaller freestanding stairway, between the commons building and the arts pavilion, bracket the promenade that is the school's heart: a glass-enclosed, two-story corridor. This hallway stretches from the building's entrance to the East River and provides access to the special-use spaces.

As it meets Main Street, the school assumes a more public identity of openness and accessibility. The tall, slim windows and glass-block corner panels that bring light and air to the individual classrooms present a composite facade of glass to the street, interrupted only by metal panels that add needed enclosure for the first-floor administration suite and upper-level laboratories. The permeable expanse is modulated by a concrete grid that both frames the classrooms and shields them from intense morning sun.

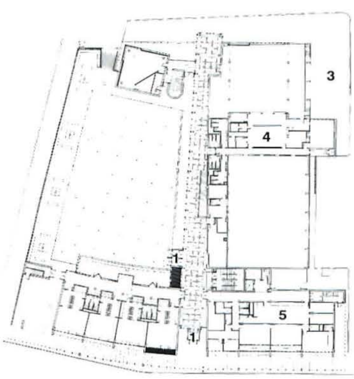
At the school's main entrance, the grid skips a module to form a deep, two-story re-

ABOVE LEFT: Rotated cube of the arts pavilion marks the entrance to the school campus from river esplanade.
TOP: Classroom block meets village center with an open glass facade disciplined by a deeply profiled concrete sunscreen. Matching the gentle arc of Main Street, the building extends its web of arcades with a bright red canopy.
ABOVE: At the river end, commons block exploits light and views with extensive glazing in the ground-floor cafeteria and a "walled" terrace off the library above it.

1 ENTRANCE VESTIBULE
2 CLASSROOM
3 CAFETERIA
4 KITCHEN
5 OFFICE
6 SPECIAL EDUCATION



FOURTH FLOOR



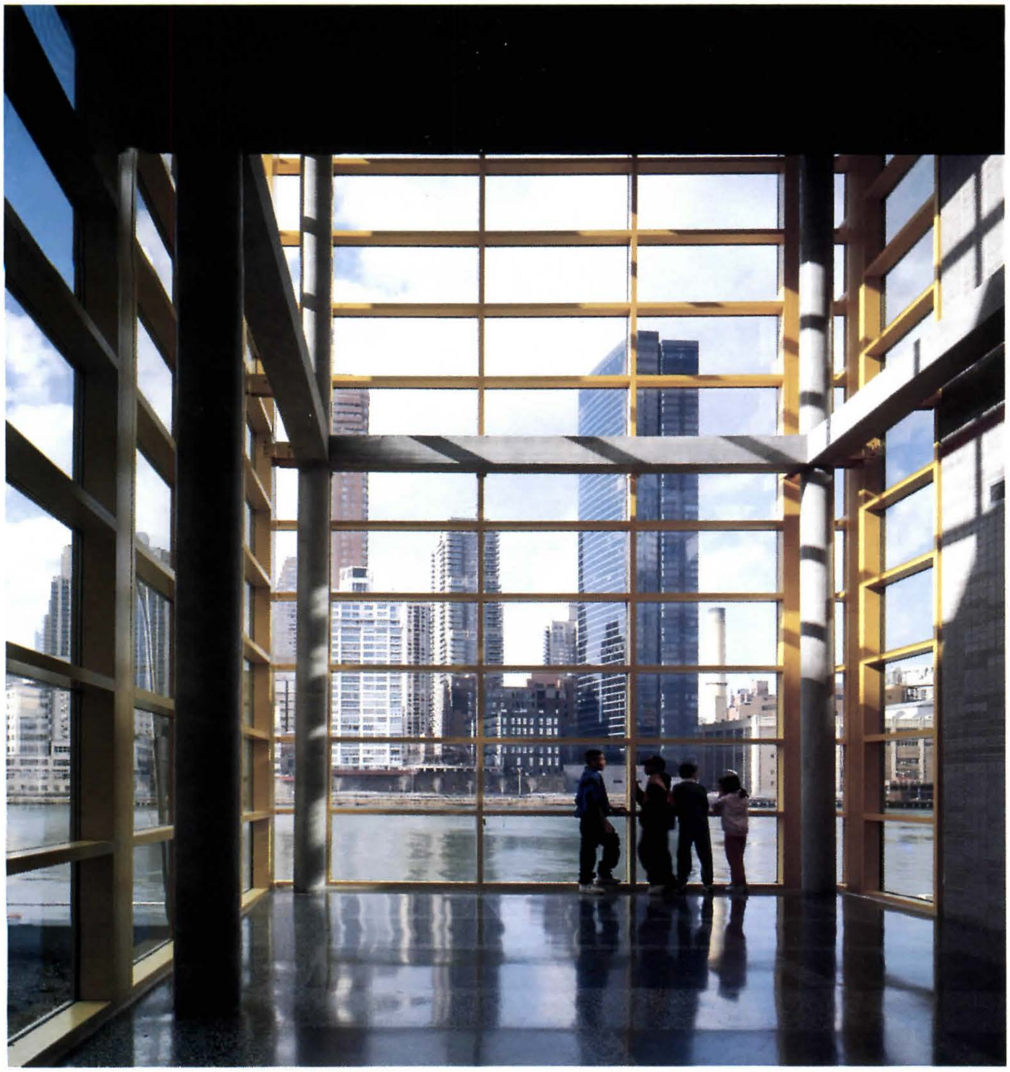
FIRST FLOOR

ABOVE RIGHT: Dwarfing its small concrete vestibule, the two-story opening that frames the main entrance introduces a double-height lobby to the interior street. **FAR RIGHT, TOP:** Central promenade overlooks courtyard through steel-framed wall lined by soapstone-smooth concrete columns. Inner wall repeats gray-brick cladding of the building exterior. **FAR RIGHT, BOTTOM:** On second level, promenade links typical classroom floor with auditorium and library.

cess sheltering a concrete cube that serves as a vestibule to the two-story space that introduces the promenade. Projecting from either side is a glass canopy on a bright-red cantilevered metal frame that establishes continuity with a network of pedestrian arcades.

The school's southernmost ground-floor bay is a void that permits passage beneath the classroom building to the playground. From it, a brick-paved strip follows the fence at the open side of the quadrangle to a second entrance from the esplanade along the riverfront. From the transitional space of the courtyard's big outdoor room, older children enter directly to the promenade, climbing the nearby main stair to classrooms on the three upper floors. Here, too, single-loaded corridors are more than chutes that funnel students to their classrooms. Long strip windows bestow outdoor views that lend a surety of orientation. The inner walls of the corridors have become huge bulletin boards displaying in dizzying abundance the colorful fruits of class projects. Discipline is reasserted, however, by the measured march of exposed columns—freestanding at the recesses that mark entries to classroom pairs, engaged elsewhere. Within the classrooms, bared mechanical ducts and piping coated in grasshopper-green reinforce the subtle pedagogy of the always evident structural frame.

Despite its verve, the classroom building conveys a quality of self-containment that is literal as well: It can be securely sealed off while allowing village residents after-hours access to the school's special-purpose facilities. The inwardness of the classroom wings also heightens the drama of the grandly extroverted promenade, which is at once a vibrant interior street and an immense window opening the ordered world of the school to its community and the city beyond. Slightly inflected to reflect the site geometry, the corridor's south-facing glass wall reaches from its



juncture with the classroom building to the edge of the site, where it turns to wrap a double-height cube that looks across the river to Manhattan. To minimize its bulk, the large volume of the gym adjoining the classroom component was lowered to basement level. But any hint of the subterranean is eliminated by a ground-level wall of glass block that floods the space with light. A shallow stair provides direct access from the promenade, as well as from the main stair of the classroom building. Set above the gym on the second level of the commons, the 350-seat auditorium is a hermetic black box lined with perforated-steel acoustical panels.

By contrast, the cafeteria and library at the far end of the commons take full advantage of their riverside setting. The ground-floor cafeteria combines walls of glass block with a window expanse affording river and skyline views. Less effusive in outlook, the open space of the second-floor library is halved by a glazed partition, with more intimate areas defined by the reference desk and a folding wall. A short, glass-block-enclosed passage leads from the promenade past a rounded stair tower to the brick cube of the arts pavilion, which contains a first-floor art studio and a second-floor music room. Separated from the other classrooms to reflect the private nature of the pursuits it houses, the pavilion is also slightly rotated, as architect Fieldman explains, to align more precisely with the cultural center of Manhattan.

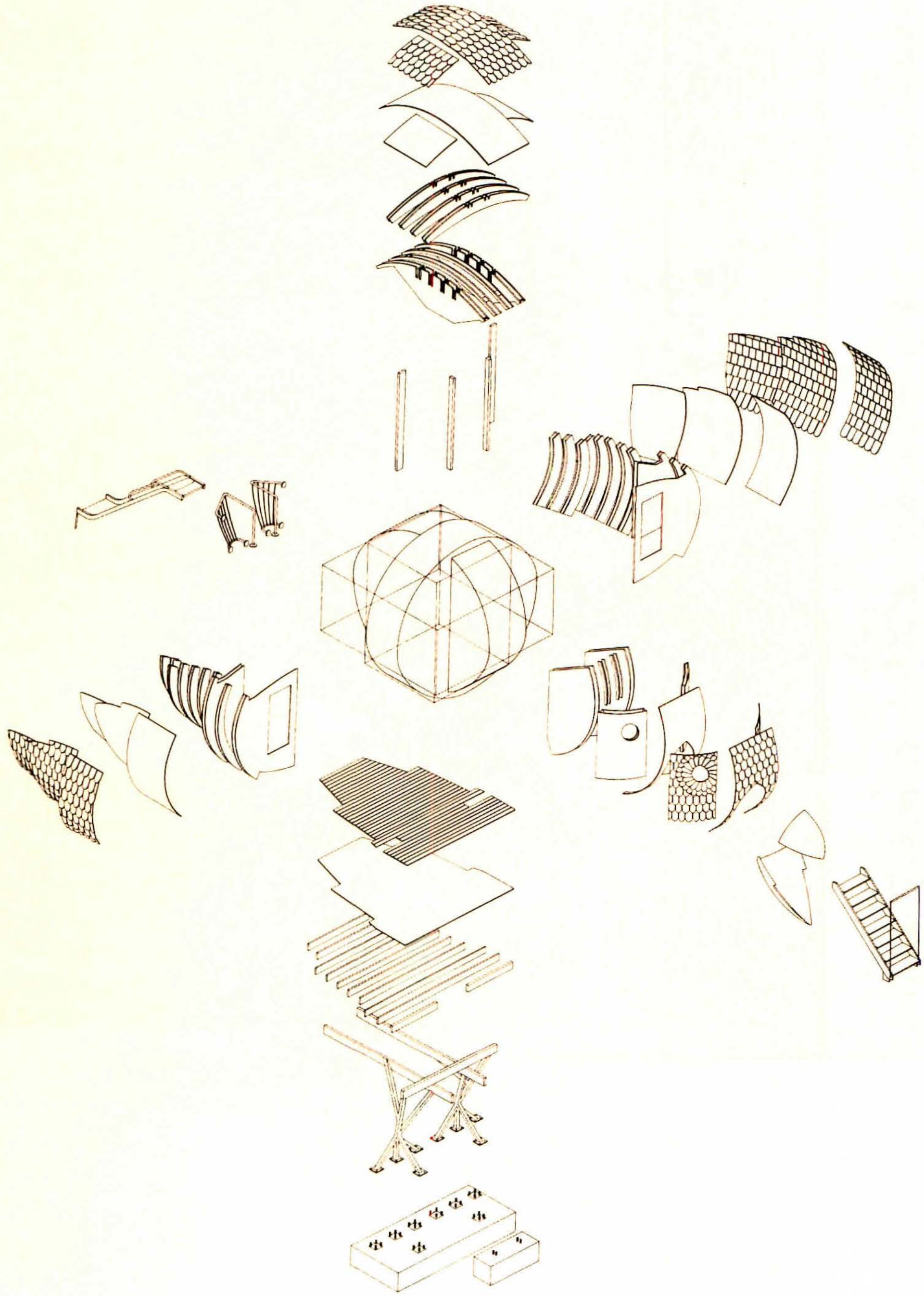
As such intellectual subtleties suggest, PS/IS 217 is not easy architecture. Yet the tectonic vigor of its bold forms, both tempered and intensified by Fieldman's relentless attention to detail, yields a clarity that prompts the inquiring eye to understanding. In its marriage of discipline and adventure, the school represents a model for the learning process at its most rewarding.

—*Margaret Gaskie*

ABOVE LEFT: Site-long reach of promenade ends with a dramatic, glass-wrapped two-story space with sweeping views of East River and Manhattan.
TOP: Stair enclosures include skylit cylinder at the arts pavilion.
ABOVE: Main stair forms node between the classroom and commons building.

The Chicken
Malibu, California
William Adams Architects

fowl play



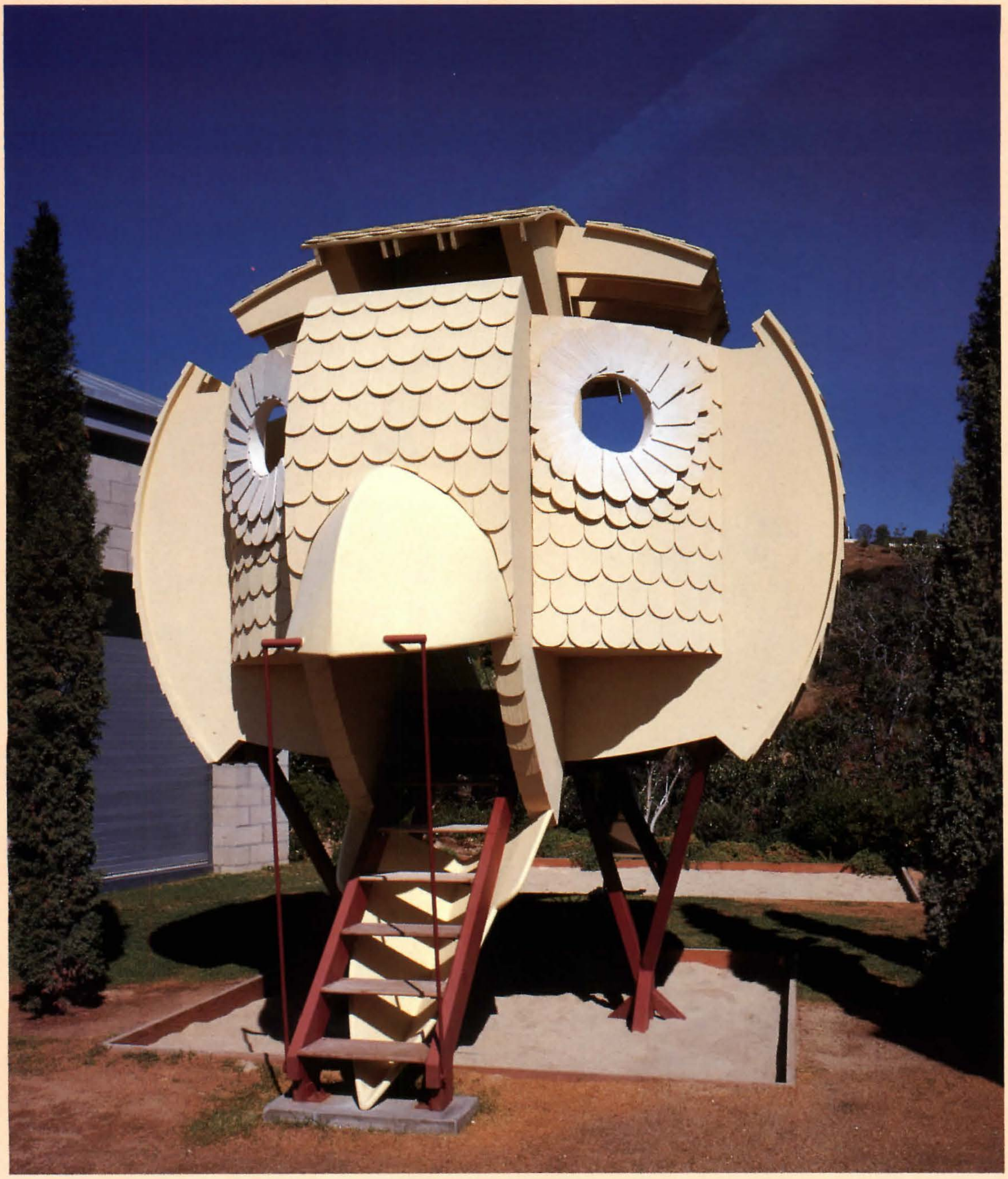
Neither an eagle nor an osprey, but a 14-foot-high chicken watches over the Pytka residence in the Topanga/Malibu hills, 25 miles west of Los Angeles. Designed by Santa Monica architect William Adams as a playhouse for the two children of a filmmaker and a clothing designer, the 80-square-foot folly is perched at the entrance of a 10-acre estate, for which the architect has designed five buildings over the past decade.

While Adams intended his structure, with its beaked entrance canopy, curved wings, and slide tail, to be loosely interpreted—its owners have dubbed it "the Chicken." The structure was originally conceived as an indoor sleeping loft for a nanny, with a play area below. Adams designed the elevated room to rest on spindly legs, which led him to elaborate the birdlike form. Delighted with the concept, the owner determined that it was more appropriate as a play space. He decided to place it into the landscape where it could double as jungle gym and folly.

The bird roosts between two pavilions that house a library, a music room, and a dance studio. In both buildings, roll-up doors facing the Chicken can be raised to create a recreation area. Although whimsical, the bird's compact form is highly architectonic, structured of ordinary, lumberyard materials. The body, raised 8 feet off the ground, is supported by two steel legs and a staircase. Curved struts are sheathed in shingles to create a feathered appearance. So that visitors approaching the complex could not escape the Chicken's stare, Adams rotated the bird $12^1/_2$ degrees from the orthogonal axis of the studios to face an entrance path. Children peering out the bird's eyes can spy on visitors, watch for ships on the Pacific, or gaze at the Los Angeles skyline.

Meanwhile, the architect is busy designing two new studios for the site, neither of which will rival the whimsy of his latest creation. Amidst the evolving, Adams-designed complex, the Chicken stands out, serving the noble role of watchbird.

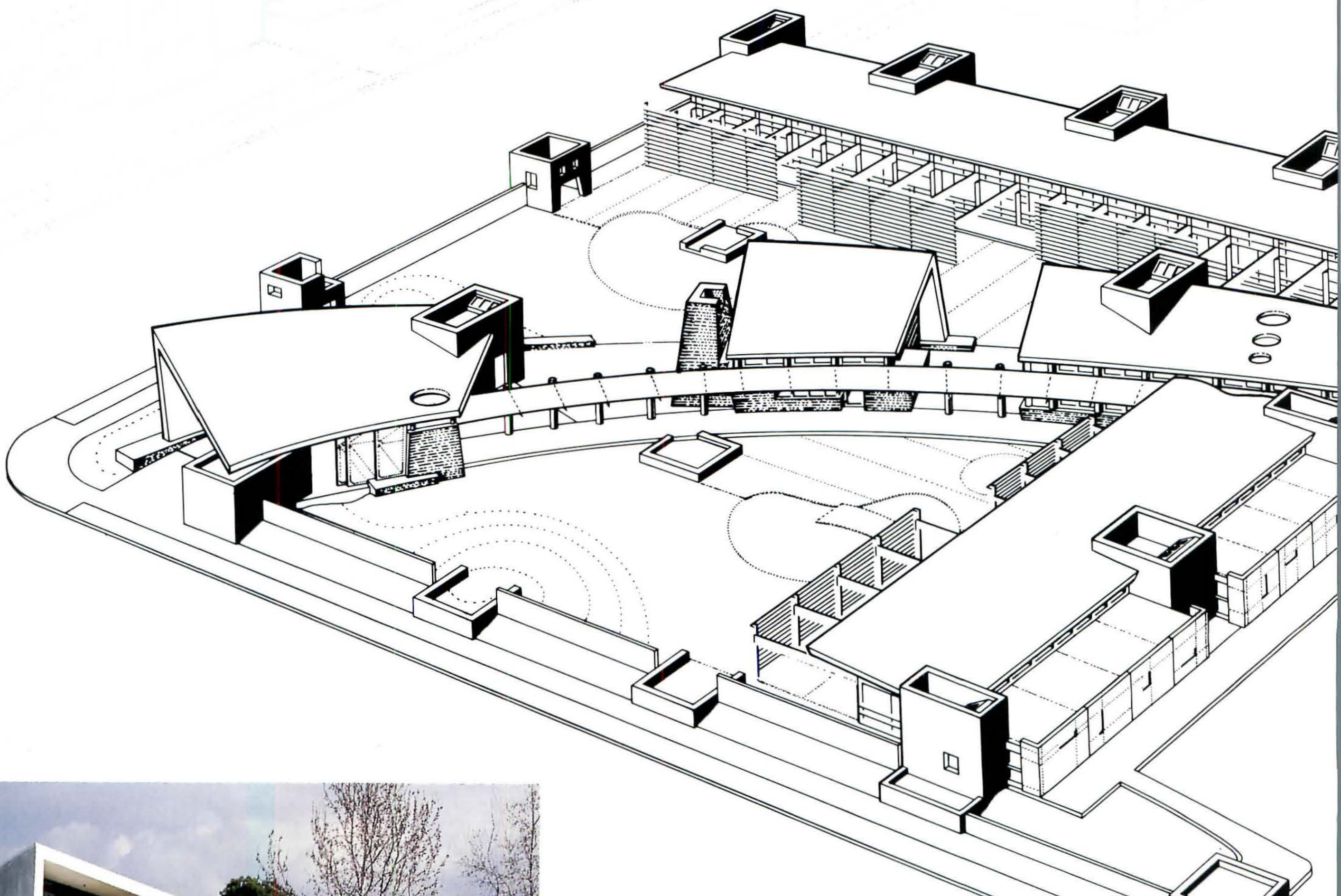
—Karen Salmon



TOP AND FACING PAGE: Supported by steel legs, Adams' 80-square-foot, timber shelter is entered up a stair and under a beaked canopy.
FAR LEFT: Perched in a sandbox between a pair of studios for dance and music, the fowl greets visitors before they approach the main house, designed by Adams and completed in 1981.
CENTER: Curved roof appears to float 6 feet above the folly's child-scaled playroom; slide provides escape route.
LEFT: Built-in seats beneath porthole eyes allow children to spy on visitors.

Warner Bros. Children's Center
Burbank, California
Rios Associates, Architects

animated daycare



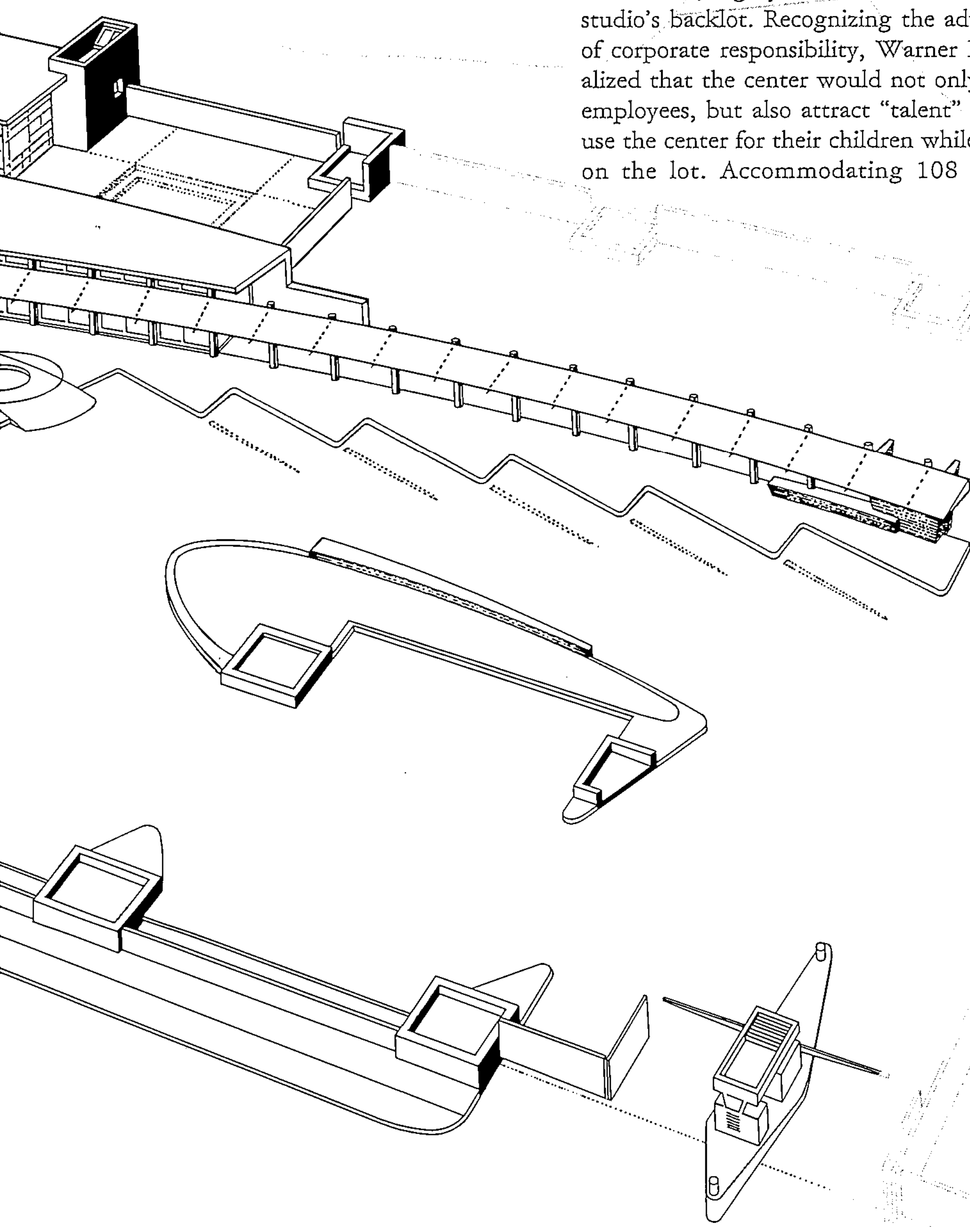
THESE PAGES: Children's Center is dynamically positioned at the southwest corner of the Warner Bros. backlot. Sculptural administrative and assembly spaces attached to a curved spine intersect an L-shaped classroom block. **ABOVE:** Cartoon-inspired flowerbox, adorning facade of storytelling room, announces the presence of the center.

Tweety Bird and Sylvester, Porky Pig and Yosemite Sam, Bugs Bunny and Daffy Duck are not up to their usual tricks at Warner Bros. Children's Center, a stone's throw from beautiful downtown Burbank. Although the cartoon characters' likenesses are displayed in laminated glass, no explosions or body-flattening missiles enliven the scene. Instead, it is architecture that makes this child-centered complex a "very animated place," according to Principal Mark Rios of Los Angeles-based Rios Associates.

Warner Bros. is the first of the major motion picture studios to build its own child-care center, highly visible on a corner of the studio's backlot. Recognizing the advantages of corporate responsibility, Warner Bros. realized that the center would not only benefit employees, but also attract "talent" who can use the center for their children while filming on the lot. Accommodating 108 children from infants through 5-year-olds, the 9,500-square-foot center offers extended hours, recognizing that work in the studio often exceeds a 9-to-5 schedule. And, despite the fact that this is one of the most tightly regulated building types in California, this child-care complex is anything but institutional.

Because of the long hours some children will spend in the complex, Rios Associates designed a diversity of spaces, with widely varied materials, textures, and spatial qualities. The firm took its clientele very seriously, attempting to understand "how children will learn, predict how they may move, and think of ways in which their spaces can change and transform over the course of a day," as Rios explains. The architects' approach emphasizes natural light, connections between indoor and outdoor spaces, and a variety of stimulating, tactile surfaces. Specific architectural forms are tailored to these factors.

The interdisciplinary approach of the design team covered architecture, landscape architecture, furniture, and graphics. Rios points out, "I really don't define the office as an architecture firm, but rather as a design firm." The architect, who holds a Master's degree in architecture and landscape architecture from Harvard University, is eager to credit members of his staff for their work on the center, in particular, project architect

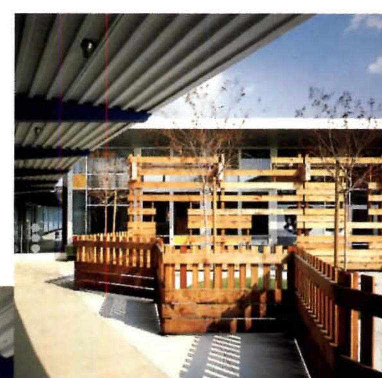


Frank Clementi, who designed furniture and graphics, and Hsuan-Ying Chou, who worked on the interiors. Recognizing the collaborative nature of design and the fact that creative energy can be enhanced by teamwork, Rios Associates defies the notion that this working method is "design by committee." In the Children's Center for Warner Bros., the benefits of such collaboration are apparent in the attention paid to every detail, resulting in an environment for children that is ordered and disciplined, yet lively and fun.

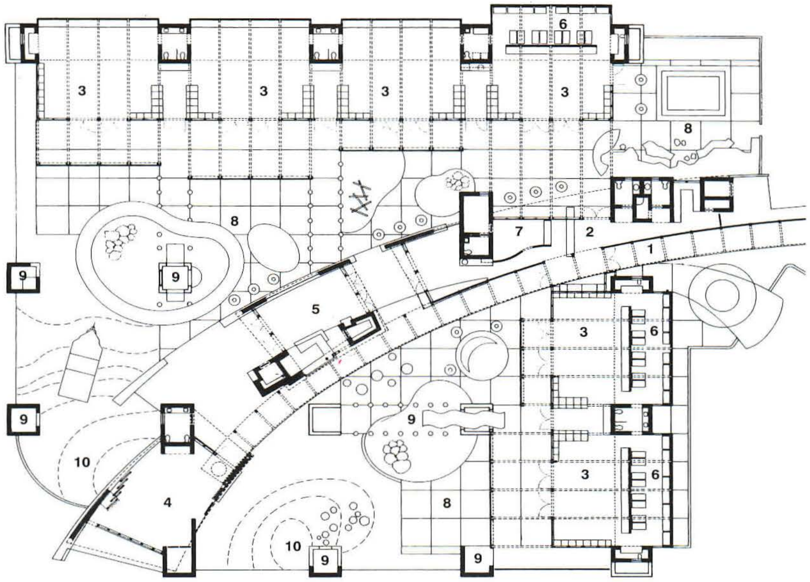
Like the dynamic relationship between warring characters in Warner Bros. cartoons, the Children's Center comprises two contrasting building types. Two wings of rational, repetitive classroom spaces form an L, open to the corner facing adjacent residential streets, while the rear elevations of these wings face the backlot and parking lot. Slicing diagonally through the site, from the northwest corner to the southwest, is a long, curved pavilion housing offices, lunchroom, and storytelling room. The entrance to the complex is positioned at the intersection of the two building forms; from the front door, virtually all spaces, both indoors and out, are visible. This clear diagram neatly organizes the varied elements that make up the complex. The site is further overlaid with a number of stucco-covered boxes, arranged on a grid. These boxes enclose service spaces in all three building wings and form freestanding playhouses and planters in the outdoor space between buildings. At the corner of the site, the angled storytelling room announces the studio's child-care center to the neighborhood.

The classroom wings are organized with low-ceilinged quiet areas at the back. The main classroom spaces are open and airy, separated only by yellow plywood cubbyholes and storage cabinets at the entry areas, which allow the classrooms to be read as both distinct and continuous. Other movable cabinets can further subdivide the rooms. Spatial continuity in a noisy environment is allowed by the employment of acoustical devices, such as carpeting and sound-absorbing batts above the perforated aluminum ceiling, as well as separations in the mechanical systems to discourage illnesses spread by airborne germs. Glulam beams extend to the exterior,

BELOW, FAR LEFT: Burnished aluminum Roadrunner affixed to dry-stacked flagstone wall serves as signage for the Warner Bros. center.
BELOW, CENTER: Curved steel-framed spine supports canopy infilled with translucent laminated glass.
BELOW, NEAR LEFT: Douglas fir fencing forms a staggered edge, serving as a screen wall in front of the classrooms. Its imagery is based on the framing of movie sets, visible from complex.



1 COVERED WALKWAY
2 ENTRANCE/RECEPTION
3 CLASSROOM
4 STORYTELLING ROOM
5 LUNCHROOM
6 NAP AREA
7 OFFICE
8 PLAYGROUND
9 PLAY STRUCTURE
10 AMPHITHEATER



GROUND FLOOR

PLAN: To the north and east, classrooms frame play spaces; storytelling room is located at corner of site. Circulation for the assembly spaces is arranged along curved spine.
LEFT: Dead tree acts as a "treehouse" in one of the play areas. Western-themed lunchroom beyond is fronted by large stone mass shaped as a symbolic fireplace; it holds a hibachi.
BELOW: Colorful plywood stools and laminate-covered tables are designed by Rios Associates. Tables may be used separately or arranged, as shown, in caterpillar configuration.

providing continuity with the outdoors. Facing the play areas, walls are composed of deep-section aluminum-framed glazing; daylighting is varied through clear, ribbed, and translucent laminated glass, which is decorated with cartoon characters and children's artwork. These playful facades happily accept the children's designs as well as the firm's.

The administrative and assembly spaces are linked by a curved spine composed of a steel-framed arcade and canopy, which ends at the storytelling room. In this wing, Rios Associates combined brightly colored plywood, redwood-framed glazing, dry-stacked flagstone walls and sculpted masses, and colorful furnishings. The lunchroom's stone serving area is right out of a television Western. In the storytelling room, the firm designed plywood chairs and stools as well as a colorful rug. Even exit signs show the hand of the design team.

Rios credits post-war school design in California as inspiration for his complex, with its one-story classroom wings open to exterior spaces, and the well-known California Modernists. References to Rudolph Schindler are apparent in the articulated section of the classrooms and in the more sculptural stone pieces. Richard Neutra's more rational, repetitive ordering, as well as his extensions of the interior structure to the outdoor spaces, are also evident in the classrooms. And, like many California Modern works, the exterior spaces of the Children's Center are as carefully designed as the interiors.

Along the perimeter of the outdoor spaces at the street edge, fern pines will grow to both form an edge and to define child-scaled spaces beneath the foliage. The infants' outdoor play space has a sunken grass court to serve as a play yard, and a miniature jungle-like landscape offers many textures of greenery. Each red stucco playhouse has its own theme, including a lath house and a treehouse.

The attention paid to detail and the quality of spaces in this project provide an environment that is lively and varied without condescending to the children whose needs are well-served. Warner Bros. appears to be very happy with its new facility, and should be. Along with an LA/AIA Design Award for the project, Warner Bros. received the Hollywood Legacy Award for its civic contribution. And happily for children whose parents work for smart corporations, Rios Associates is at work on two more child-care centers, for MCA/Universal in Los Angeles and Mattel Inc. in El Segundo. It seems fitting that these entertainment and toy corporations that benefit so much from children's desires are benefitting children in return, through environments that nurture their welfare and spirit.

—Judith Sheine

Judith Sheine is a Los Angeles-based architect.

GEORGE RAND

LEFT: Storytelling room accommodates a number of functions, including costume performances. Positioned before a redwood wall, cozy chair designed by Domestic Furniture was customized by Rios Associates.
FACING PAGE, LEFT: Reception desk of colorful plywood guards entrance. Behind desk, curved plywood volume houses director's office.
FACING PAGE, CENTER: Classrooms are open, light-filled spaces, separated only by low plywood storage units. Glulam beams extend to the exterior.
FACING PAGE, RIGHT: Carpet in storytelling room was designed by Hsuan-Ying Chou of Rios Associates. It is divided into sections to facilitate several activities and decorated with letters from a multicultural alphabet.

Children's Hospital and Health Center
San Diego, California
NBBJ Architects

Medical Mission

Pint-size patients arriving at the new wing of Children's Hospital and Health Center in San Diego must think they're off to a day of fun and games. With its red roofs, playfully articulated facades, and lively decoration, the 190,000-square-foot building appears like a fantasy castle atop a mesa perch. Designed by Seattle-based NBBJ, the newly opened hospital may not be as fantastic as a Disney theme park, but it possesses a similar ability to provoke smiles among its young visitors.

"We started out with a sort of Star Wars/Disneyland entertainment feature that would be part of the building," recalls project manager David Noferi of NBBJ. "But as we talked about how to make the building sophisticated, we tried to get away from strong references to Disneyland and cartoon characters. Instead, we developed a series of surprises throughout the building." Such surprises include downspouts that empty into concrete collector cubes decorated like tic-tac-toe boards, interactive art specifically geared to children, courtyards landscaped with playful themes, and small clusters of patient rooms designed to look like cozy neighborhoods. Design meetings between the architects and client focused on feelings rather than forms. "We wanted something that was not intimidating," says Blair Sadler, the hospital's president and CEO. "Kids are not little adults, so their environment needs to be different."

ABOVE: NBBJ divided hospital mass into pavilions and inserted second-floor play courts, enclosed by curved walls, between angled wings.
BELOW: Steel stair towers are pulled away from building and expressed as sculptural elements.
FACING PAGE: Clock tower anchors front elevation and represents time as vital agent in healing process.

Sandwiched between two busy north-south freeways, Children's Hospital is sited on a 29.5-acre campus with several other medical buildings, including Sharp Hospital to the south. The new wing houses 114 beds, 18 outpatient exam rooms, and San Diego's first pediatric emergency room. Moreover, the new structure is by far the friendliest medical architecture on the campus, quite a contrast to the stern, Modernist, six-story Mary Birch Hospital for Women, designed by Stichler Design Group of San Diego and opened last fall.

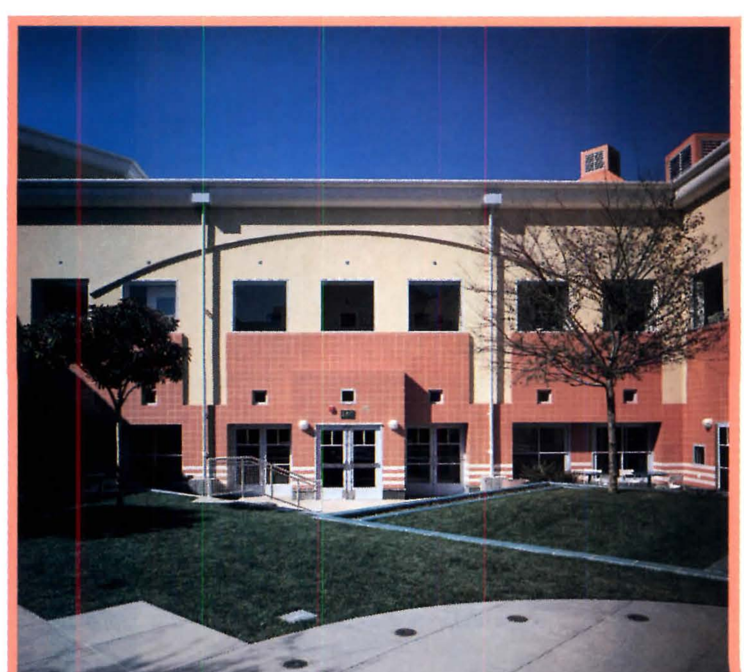
NBBJ's new building sustains its sunny disposition from many perspectives. Motorists passing on Interstate 805 to the east catch a fleeting, fairy-tale impression of the red roofs and the 60-foot clock tower that marks the east-facing entrance. But as visitors

approach along Health Center Drive, the main access road on the east, the building loses some of its dreaminess and is revealed as an assemblage of familiar regional elements.

In simple terms, the building is a square doughnut rotated 45 degrees off the street grid and organized around a central clock tower and courtyard. Six smaller triangular courts are symmetrically distributed along the building's four exterior elevations.

Facades are Classically ordered: bases of gray concrete block accented by horizontal bands of red and white tile and split-face red block; shafts of sand-colored, synthetic stucco; and a crisp, crowning cornice line provided by gables and rounded parapets. Red metal "Bermuda" roofs call to mind the Victorian-era Hotel del Coronado, a prominent landmark across the Coronado Bridge from San Diego; while the clock tower serves as a beacon, like the lighthouse on Point Loma in San Diego Bay. Purists may cringe at this somewhat naive regionalism, but there's no denying the building has struck an emotional chord, drawing rave reviews from employees, parents, children, and some 10,000 curious San Diegans who streamed through during an open house in February.

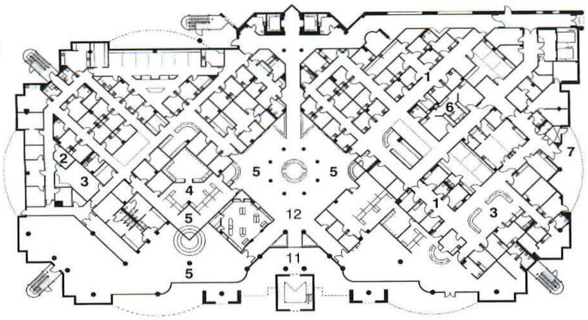
ABOVE: Parklike second-level courtyard offers retreat for staff and families and provides daylight to interiors. Small-paned windows add intimate scale.
BELOW: Patient wings are clad in stucco with rusticated bases of concrete block.
FACING PAGE: San Diego artists Ellen Phillips and Jess and Mary Dominguez designed curved wall in courtyard with tile mosaic and bronze sculptures.



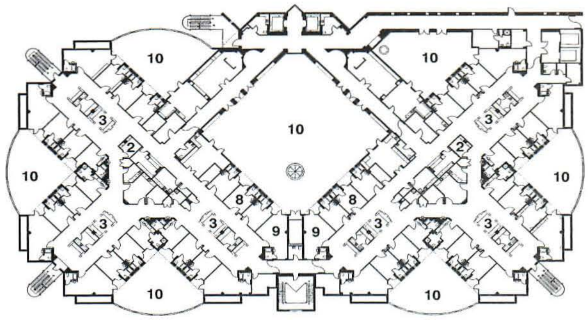
Visitors enter through the base of the tower, reaching a square main lobby, rotated 45 degrees off the entry axis, with admissions counters in two corners. The lobby doubles as a reception area and waiting room for families of children visiting outpatient clinics on the south end of the first floor. The north end is occupied by more clinics, radiology, and the emergency room, which has its own lobby and a discreet ambulance drop-off. Standard patient rooms are on the second floor, while the third floor houses rooms for critical care and pediatric intensive care. An elevated, enclosed bridge joins the new wing's second and third levels to the adjacent hospital.

NBBJ designed each patient floor to consist of three "neighborhoods" of 10-bed units; each 10-bed unit is arranged around a nursing station that incorporates iconic residential imagery. Counters resemble garden walls or fences; columns look like lampposts; and green carpets are treated as "lawns." At night, fiber-

1 EXAM ROOM
2 CONSULTATION
3 NURSES' STATION
4 ADMITTING AREA
5 WAITING ROOM
6 RADIOLOGY UNIT
7 AMBULANCE ENTRANCE
8 SINGLE PATIENT ROOM
9 DOUBLE PATIENT ROOM
10 PLAY COURT
11 MAIN ENTRY
12 INFORMATION/ RECEPTION



FIRST FLOOR



SECOND FLOOR

optic constellations of stars twinkle in vaulted ceilings above the nursing stations.

Centrally located lounges along the building's east and west sides are as comfy as living rooms, extending the residential imagery with nonfunctioning fireplaces and gabled television cabinets. Patient rooms approximate children's bedrooms, with bright cabinets for clothes and toys and art prints that children can select from a catalog. Second-level rooms all incorporate exterior doors that lead to the six perimeter courtyards. These triangular courts were landscaped by KTU+A of San Diego with themes. The Sensory Court, for example, includes plants of varied textures, appearances, and scents; the Court of Names has plants with children's names, such as Johnny Jump-Up and Creeping Jenny.

The large central court is an outdoor escape hatch for medical personnel, parents, and patients able to leave the second-floor rooms. There's a big patch of lawn for picnics and a conical skylight that pushes up above the lobby into the court like a jester's cap, anchoring the center of a circular miniplaza. A curved, freestanding wall wraps this plaza to screen patient rooms behind it and is decorated with a tile mosaic.

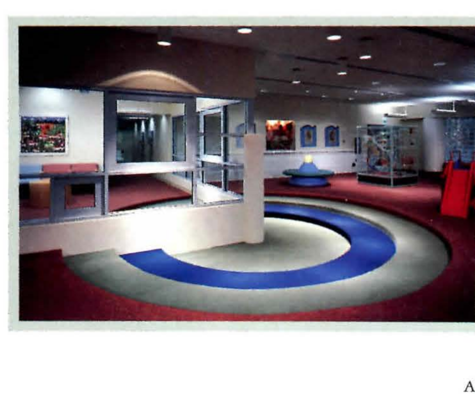
ABOVE: Second-level lounges on eastern side of hospital feature gabled cabinets and colorful furniture.
BELOW: Circular first-floor reception desk of stainless steel and plastic laminate evokes a toy drum.
FACING PAGE, TOP: At night, fiber-optic constellations twinkle above nurses' stations.
FACING PAGE, BOTTOM LEFT: Outside first-floor cafe, colorful chairs double as recycling bins.
FACING PAGE, BOTTOM RIGHT: Play area features sunken, circular seating.

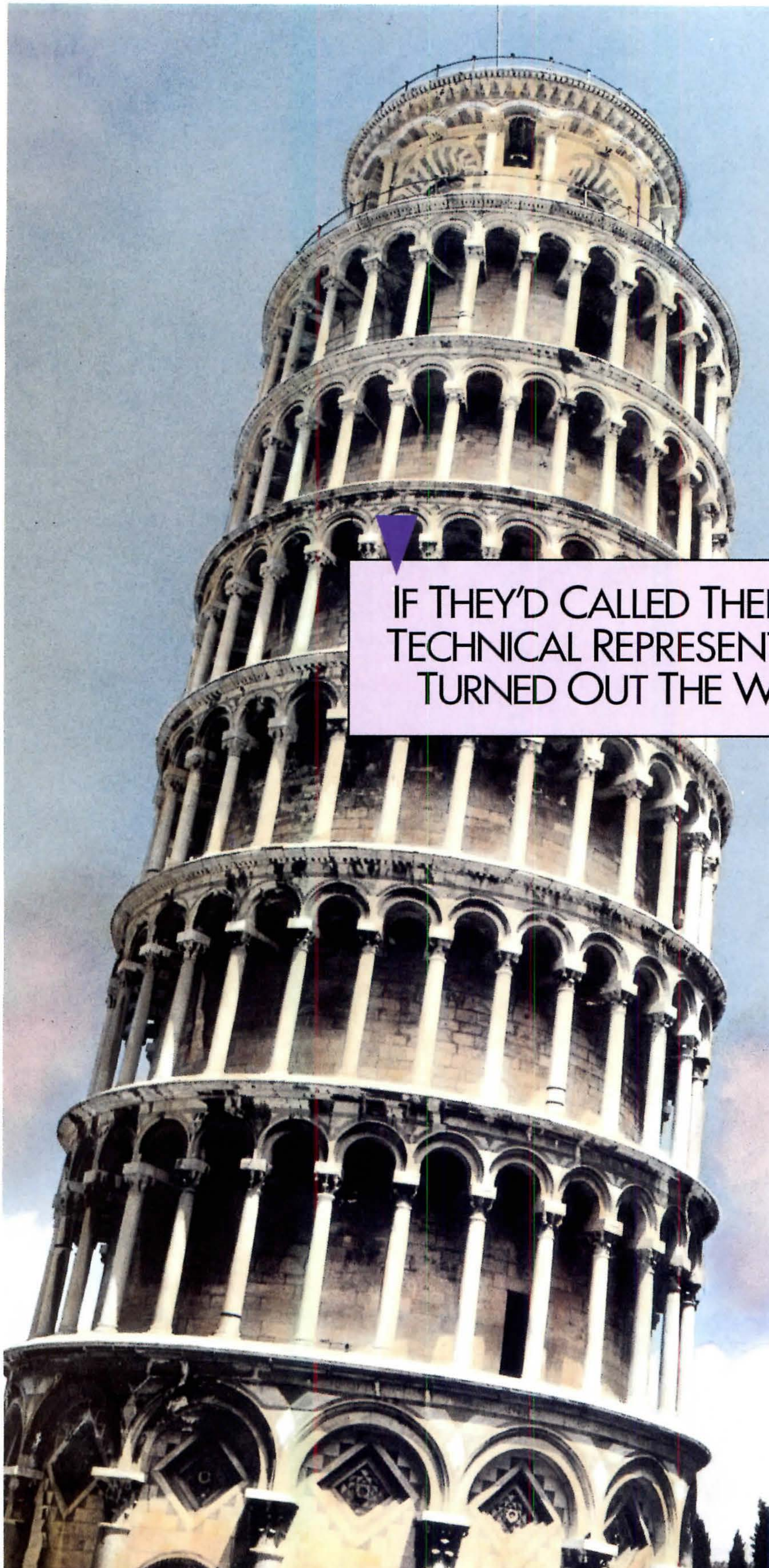
Although sensitively attuned to children, several aspects of NBBJ's spirited designs are being altered to comply with the hospital's safety requirements. A tiered ground-level play pit near the lobby, perceived as a safety hazard, is due to be filled in. Colorful circular benches will probably be removed because they encourage children to climb—and risk a fall. Interior fountains flanking the main entry, with their potential for hazardous, slippery surfaces, were changed to planters early in the design process. In the total scheme, however, these changes are minor. They don't diminish the impact of this new precedent in children's healthcare, which suggests that good feelings and healing should go hand in hand.

According to Sadler, the new wing, which he claims cost no more per square foot than other new area hospitals, has only one genuine drawback: Parents and kids relegated to the old wing are jealous of those assigned to NBBJ's cheery, comfortable addition.

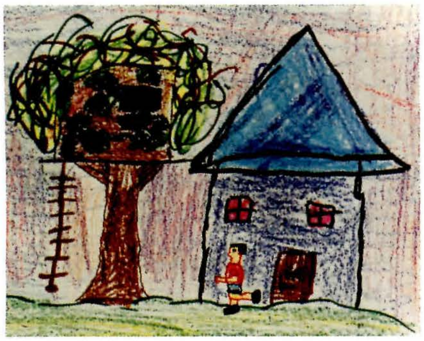
—Dirk Sutro

C A F




The Leaning Tower Of Pisa – Pisa, Italy

Technology & Practice



ABOVE: Drawing by a school child for Boston's Kirk Scharfenberg House for Children with AIDS.

This month's Technology & Practice section addresses the subject of shelter. We begin with a practice article that reveals a new market for architects: new healthcare and residential shelters for children with AIDS. A computer article follows, discussing ways of integrating software into an umbrellalike system that can be used by architects, consultants, contractors, and clients alike. And a trio of articles examines the most basic, physical side of shelter—new developments in roofing technology.

Designing for Children with AIDS

We extend this issue's coverage of architecture for children with an article on emerging prototypes for children born or diagnosed with HIV and AIDS. Although their numbers are increasing, these children are also living longer, thanks to a better understanding of the disease. To create life-affirming environments for children with AIDS, healthcare providers are turning to architects throughout the United States to devise innovative facilities that combine medical and residential functions. Our practice article examines how these hybrid buildings are programmed, designed, and supported through volunteer and pro bono services.

Integrated Software

CAD software has advanced over the past decade, but separate systems for architects, engineers, consultants, and fabricators have largely defeated the potential efficiency of such computer automation. This month's computer feature discusses advances in consolidating automated files into a single electronic-building-reference source for design and construction team disciplines.

Roofing Portfolio

A three-article series provides a comprehensive overview of recent developments in roofing technology. We examine the restoration of Monticello's roof, a case study of how contemporary materials simulate historic details; the building code reform prompted by Hurricane Andrew and its effect on roofs; and the energy-conserving benefits of radiant heat barrier technology.

Some architects are switching to a less expensive joist system. And they're keeping it quiet.

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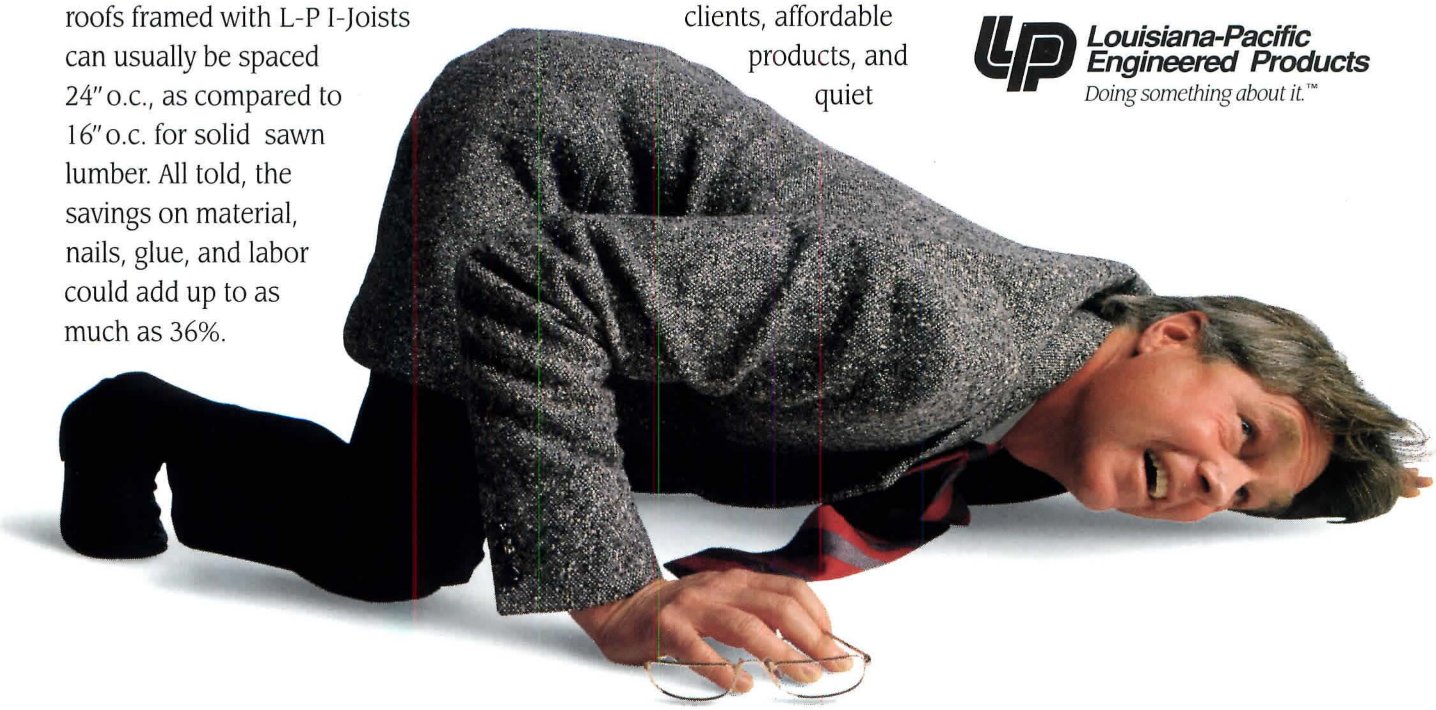


Circle 161 on information card

Architects and homebuilders predict better markets and more jobs in 1993.

Homebuilders Focus On Environment

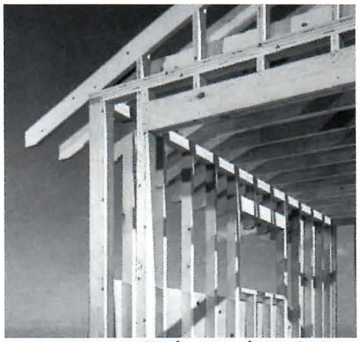
Environmental issues dominated discussion at the 49th Annual Convention and Exposition of the National Association of Homebuilders (NAHB), held in February in Las Vegas, Nevada. One important topic of conversation among the more than 60,000 participants was the scarcity of quality lumber. The wood industry attributes this reduction to the federal government's decision to cordon off old growth timber—enough to construct 360,000 houses—on 7.5 million acres of government-owned land to protect the northern spotted owl. This decision has fueled a dramatic rise in lumber prices—up 75 percent in February from October 1992 prices. Combined with an increased demand for housing—more than 1.2 million housing starts in 1992, and a 10 percent increase projected for 1993—the diminishing supply of lumber has escalated the cost of an average 2,000-square-foot home by $4,000, according to NAHB. Such escalating costs could stunt the continued growth of a now-improving housing market.

As a result, many industry experts are reevaluating traditional wood framing methods. Steel studs, once considered an anomaly to housing construction, and greater use of engineered lumber manufactured from wood scrap and smaller, inferior species (ARCHITECTURE, September 1991, pages 97-101) are becoming desirable alternatives. The NAHB Research Center is currently studying such materials and techniques as cost-effective substitutes for its newly constructed Resource Conservation House, completed this past December at the organization's research park in Upper Marlboro, Maryland (Architecture, June 1992, page 85). NAHB researchers are monitoring the house for its seasonal energy performance.

Environmental conservation took on a more positive light when NAHB, in conjunction with the American Forests, announced the first award winners of their newly formed Global Releaf for New Communities program, designed to recognize developments that successfully plant and preserve tree stands on building sites. The winners include The Maples, a 55-unit community for the elderly in Wenham, Massachusetts; Apple Valley, a 160-acre subdivision in Oklahoma City; The Townhouses of Westridge, a 106-unit subdivision in Island Lake, Illinois; and Baltimore Life Insurance Company's new 101,000-square-foot office headquarters in Owings Mill, Maryland.

Also extending the green theme was the 3,074-square-foot New American Home, a prototype designed and built each year near the NAHB convention site to embody emerging trends in the housing market. Designed by Santa Monica, California-based Johannes Van Tilburg & Partners, the house incorporates many resource-conserving materials and techniques, such as recycled rubber pavers and cellulose fiber insulation recovered from newspaper. Low-emissive, heat-reflective glazing; low-flush toilets; and such xeriscaping techniques as drought-resistant plants respond to the site's desert climate. —*M.S.H.*

NEW AMERICAN HOME: Johannes Van Tilburg & Partners' "green" house.



WOOD FRAMES: Endangered species?

LUMBER: 1992-1993 price increases.

Architect Poll Reveals Economic Upturn

A February telephone survey of 300 architecture firm principals conducted by the AIA shows signs of increasing optimism within the profession. Of those polled, 80 percent replied the recession's effect on their practices was over or had at least bottomed out, up 28 percent from the last such AIA survey conducted in May 1992. Another encouraging statistic revealed that 46 percent of AIA members have found increased business opportunities in their geographical regions; only 16 percent noted a recent decline. The number one reported market comprised educational facilities, followed by commercial projects, healthcare, single-family houses, and renovation.

Nearly one-third of the principals noted increased hiring in their firms. The greatest gains were among firms with 20 or more architects, where 58 percent reported increased hiring compared to only 33 percent last May.

According to a geographical breakdown of responses, New England; the East North Central states of Illinois, Indiana, Michigan, Ohio, and Wisconsin; and the East South Central states of Alabama, Kentucky, Mississippi, and Tennessee reported the most new hires. The smallest gains occurred in the Pacific region (Alaska, California, Hawaii, Oregon, and Washington) and the South Atlantic, inclusive of Delaware, Maryland, Washington, D.C., Virginia, West Virginia, North Carolina, and South Carolina. Not surprisingly, these two regions also reported the smallest percentage of new hires. Only one in four architects in the West North Central region of Iowa, Kansas, Minnesota, Missouri, North Dakota, Nebraska, and South Dakota reported increased business. —*M.S.H.*

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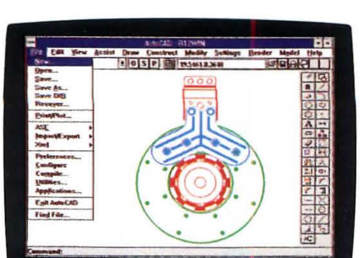

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Designing for Children with AIDS

As life expectancy for babies born with HIV increases, architects are being called upon to create new types of child-care centers.

BRYAN'S HOUSE: Asst. Director Frye and resident.

PLAYROOM: Pedimented doors lead to offices.

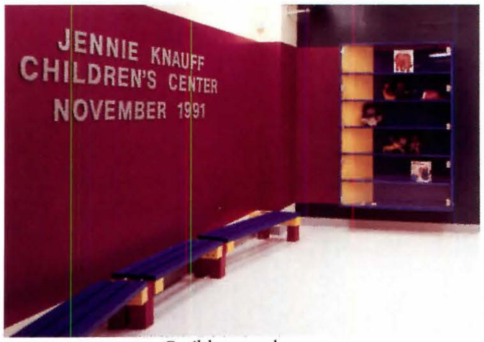
In the courtyard of a California home for children, a 3-year-old boy, known here as "Kevin," proudly pushes a toddler car big enough to accommodate "Sara," his 21-month-old playmate. He's following another vehicle navigated by his twin brother, "Sean." Kevin can only walk if he leans on the car or some other support; he wears braces on both his legs, and his feet still turn in like a baby's. Kevin is HIV-positive, which means his body harbors the virus that causes Acquired Immune Deficiency Syndrome, or AIDS. Sara, who has just learned to crawl, almost died of an AIDS-related illness last summer. Sean is a healthy 3-year-old in a family afflicted with HIV. These children and others like them across the nation are prompting architects, designers, contractors, artisans, and an array of private citizens to create a new building type: day- and overnight-care centers, often combined with residences, for children whose lives are affected by AIDS.

BLACKMON/WINTERS PHOTOS

WEST ELEVATION: Residential style.

Bryan's House
Dallas, Texas
Chris A. Rador, Architect

Bryan's House, opened in 1988, was founded by a nurse afflicted with HIV whose son Bryan died of an AIDS-related illness at 7 months. The center offers HIV-positive children free day care; overnight care as needed; or a permanent home. Located near downtown Dallas, the center includes a 2,130-square-foot administrative building in a two-story house built in the 1940s. In 1990, Dallas architect Chris Rador designed a 5,600-square-foot addition to house day-care areas, three bedrooms, and offices. Rador joined the two volumes with a lobby entered from a parking lot at the rear. A simple pediment of geometric shapes in primary colors (top) unifies the complex, which includes a nursing center, nursery for 10 infants, and two bedrooms for older children.

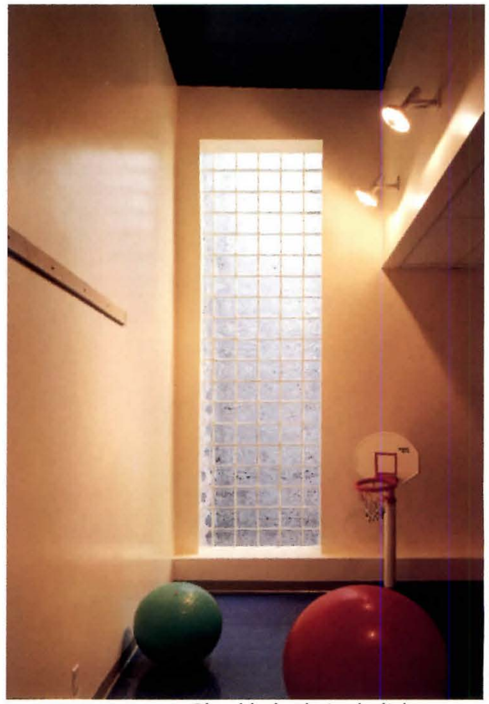


STREET ENTRANCE: Caribbean palette.

STAFF LOUNGE: Privacy with a view.

MAIN ENTRANCE: Adjacent to theater.

BULLETIN BOARD: Teaches shapes and colors.



PLAY-THERAPY ROOM: Glass block admits daylight.

OTTO BAITZ PHOTOS

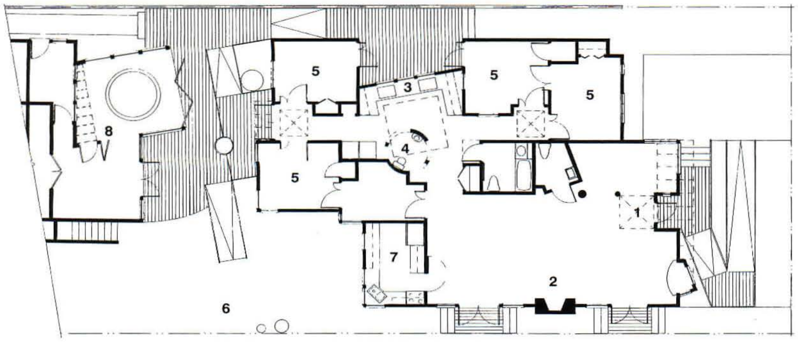
Jennie Knauff Children's Center
Bronx, New York
Caples Jefferson, Architects

Caples Jefferson, a three-person firm based in Manhattan, was commissioned by the Association for the Help of Retarded Children to design an 8,000-square-foot day-care center in the South Bronx for 60 developmentally delayed children, about 60 percent of whom are HIV-positive. The center, located in the 1929 Loew's Paradise Theater on the Grand Concourse, occupies the second story of the theater's rehearsal wing and includes six classrooms, two playrooms, and offices. Reached by elevator from a first-floor entrance, classrooms face east, incorporating large windows that address the busy thoroughfare. A corridor separates offices from classrooms; bathrooms and therapy rooms bracket classrooms.

More children with HIV

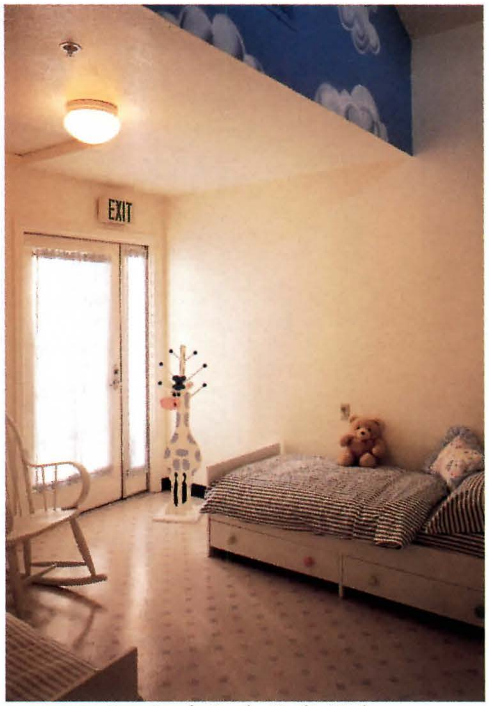
The number of children like Kevin, Sara, and Sean is rapidly increasing. According to the Atlanta-based Centers for Disease Control (CDC), 1,995 children under age 13 had been diagnosed with AIDS by 1989, and 1,643 of those were younger than 5. By the end of 1992, 4,249 children under 13 had AIDS, 3,432 of whom were under 5 years old. The CDC does not track HIV-positive children, but the Newark-based National Pediatric HIV Resource Center recently estimated that 20,000 children are infected with the virus. AIDS is the ninth-leading cause of death among children 1 to 4 years of age, and experts predict an explosion of AIDS in young children as the number of heterosexual women infected by the virus increases, and as yet-untested youngsters are diagnosed. The state of Colorado, for example, anticipates 20 new diagnoses of HIV in children per year; in Massachusetts, there may be 50.

Along with the sad increase in the number of AIDS-afflicted and HIV-positive children comes a happier medical fact: Children with AIDS are living longer. Advances in treatment, including a pediatric dose of AZT, along with early diagnosis and prevention may keep AIDS-related illnesses at bay, allowing many HIV-positive children to lead normal lives. "We are very grateful that we need this house," remarked Judith Kurland, Boston's commissioner of health and hospitals, at the opening of the Kirk Scharfenberg House, a day- and home-care center in Boston. According to Dr. Myron Levin, head of pediatric infectious diseases at Children's Hospital in Denver, "We initially thought this was a rapidly fatal disease for children born with HIV infection. Now the outlook is better. More children have a longer lifespan than we ever guessed." Just like adults, children react differently to the AIDS virus, and some who are infected at birth may survive a



FLOOR PLAN

BATHING AREA: Skylight and circular toilet room.



BEDROOM: Interior design by Leslie Zinberg.

IAN TERVET

MAIN ENTRANCE: Contextual whimsy.

decade or longer with few bouts of illness. Sean and Kevin, the twins at the California residence, are a striking but not uncommon example of how indiscriminate the AIDS virus can be.

Specialized centers

For architects, there is no single formula for designing centers to house or care for HIV-positive children. In fact, a current public-policy debate questions whether distinct centers for such children are necessary, or whether children with HIV should be integrated into existing programs for the medically fragile. "There were no programs or prototypes for this building type when we started our design," notes Julia Smith of Buck, Smith & McAvoy in Boston, designer of the recently opened Scharfenberg House.

Therefore, a big part of Smith's job was working closely with caregivers, nurses, agencies, and parents to determine what kind of facility would best meet their needs. In general, whether housed in renovated or new structures, these centers require a nurses' station; rooms for counseling and other family support activities; play areas for young children; and offices for administrators, social workers, teachers, nurses, and physical therapists. If the centers offer "respite" care—temporary housing for children whose families are unable to care for them—or a permanent home to children whose families are no longer intact, they may include bathing areas, bedrooms, and family rooms. "AIDS is a family disease," notes Susan Streng, director of Bryan's House in Dallas, Texas.

Supported by government and private funds, these new, medically managed homes and centers offer services to families free of charge. Of the five facilities featured in this article, those in Boston and Dallas offer day care, respite care, and permanent housing. A center in the Bronx offers only day care;

Baby House II
Los Angeles, California
Diane Caughey, Architect

Baby House II, designed as a residence for newborns to 5-year-olds, shares a courtyard with Caring for Babies with AIDS' original, one-story stucco house in Los Angeles. The two structures presently accommodate 14 children in transitional housing. Designed with a family room whose south-facing doors address the original house, the new stucco-clad building is arranged around a central, skylit bathing area, with a circular toilet room for young children. A child-sized window seat permits views of passing garbage trucks; electrical outlets are positioned above the reach of toddlers; and a physical therapy pavilion includes a playroom and a skylit whirlpool.

TODDLER PLAYROOM: Designed by C+J Katz.

BATHROOM: Designed by Elizabeth Speert.

DAY-CARE WING: Victorian detailing.

PRESCHOOL PLAYROOM: Interior design by C+J Katz.

Kirk Scharfenberg House for Children with AIDS
Mattapan, Massachusetts
Buck, Smith & McAvoy, Architects

For a day- and overnight-care center on the grounds of a hospital south of Boston, architect Julia Smith designed a rambling Victorian-style structure with a veranda, double-hung windows, separate entrances for day-care and residential areas, and a gabled roof that shields mechanical equipment in the attic. A 4,100-square-foot day-care area for 25 children includes a lobby, two playrooms, and a nap room and is separated from a residential wing by a spine of administrative offices. Bedrooms surround a 300-square-foot bathroom. The Boston Interior Design Community coordinated the furnishing of the rooms, donated by 25 area designers.

renovated and expanded houses in Los Angeles and Washington, D.C., now serve as group homes.

Protecting children with HIV

Most states prohibit discrimination against HIV-positive children by schools and child-care centers. Yet parents who may themselves be HIV-positive and desperately need to work to retain health insurance have found their children barred from classrooms, even though there has never been a documented case of HIV transmission among children. "AIDS is the most horrible four-letter word you have ever heard," says Rick Watson, founder of a Denver day-care center for such children. Even where confidentiality laws effectively prevent discrimination, a growing number of communities advocate medically managed day-care centers and group residences as protection for the HIV-afflicted children they house.

Traditional child-care centers are notorious breeding grounds for such common diseases as ear infections and chicken pox—mild ailments for most children, but lethal illnesses for those with compromised immune systems. "People worry about the threat from anyone who has AIDS," explains Cherry Frye, assistant director of Bryan's House, which has offered day care, respite care, and permanent housing since 1988. "In fact, we're the ones who present the threat of illness to those with AIDS and HIV. At Bryan's House, we go to great lengths to ensure good health."

Joan McCarley, executive director of TERRIFIC, a Washington, D.C., nonprofit agency that runs several group homes for children with HIV or AIDS, points out that these children may tire easily, need permanent IVs, may be unusually susceptible to food allergies, or require feeding tubes. While many architects are familiar with conventional day care's requirements—building accessibility,

FAMILY ROOM: Interior design by Bloomingdale's.

BEDROOM: Designed by the Cooper Group.

VESTIBULE: Interior design by Bloomingdale's; painting by Michel Pouliot.

DAVID FOSTER PHOTOS

1 RESIDENTIAL ENTRANCE
2 ALCOVE
3 DINING ROOM
4 FAMILY ROOM
5 BEDROOM
6 KITCHEN
7 BATHROOM
8 DAY-CARE ENTRANCE
9 PRESCHOOL AREA
10 TODDLER ROOM
11 NAP ROOM
12 OFFICE
RESIDENTIAL
OFFICES/MECHANICAL
DAY CARE

FLOOR PLAN

plentiful daylight, durable interior finishes—they are usually unaware of what constitutes an adequate child-care center for families affected by HIV. Even the agencies that administer such programs are constantly redefining their facilities as the HIV-infected population changes.

Flexible prototypes

After operating for only a year in a renovated two-story bungalow, Bryan's House commissioned Dallas architect Chris Rador to design a 5,600-square-foot, two-story addition. Rador placed day care on the first floor and designed a second story to house bedrooms for older children; at the time, this arrangement was compatible with Dallas's building code. Today, three years after the expansion, Bryan's House requires more space for babies, and a revised building code prohibits children under age 6 from occupying the upper stories. Rador's second story will become offices, and his original nursery has already expanded into a first-floor room designed to be a nurses' station. "My advice to architects," offers Rador, "is to make these buildings flexible, to change with the needs of the children and the disease." The architect also incorporated pull-down beds into his design; in the daytime, the beds fold into the wall so that older children's bedrooms become play spaces for children in day care.

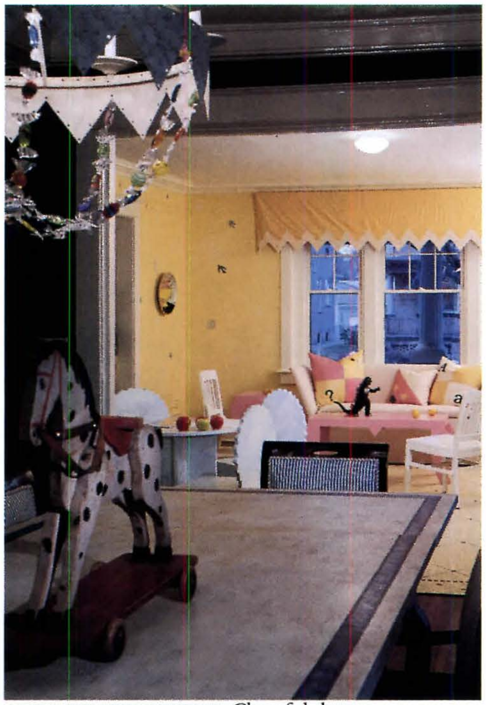
When the Scharfenberg House opened in September 1992 in Boston, it joined Bryan's House as the first medically managed facilities for children with HIV to offer day care and temporary overnight accommodations, as well as permanent housing. Julia Smith, architect of the Boston center, notes that different communities are likely to experience different needs, so that no two prototypes are exactly alike. In Washington, D.C., for example, children are integrated into conventional day-care settings, but many require overnight or transitional housing when their parents are too ill to care for them. Boston's Scharfenberg House finds that although its overnight population is relatively low, entire families with HIV may need transitional housing. Notes Smith, "The program for the Scharfenberg House has been changing all along, as the problems change."

Architectural variety

As AIDS in children has spawned these day- and home-care centers, the buildings themselves have generated a variety of architectural innovations, in structures that range from renovated Victorian houses to spacious, contemporary facilities. In Los Angeles, architect Diane Caughey designed a 4,000-square-foot house for Caring for Babies with AIDS (CBA), a nonprofit program seeking a new structure that would not attract attention in its residential neighborhood. Sharing a courtyard with CBA's original two-story


DINING ROOM: Amy Cornell's abstract expressionism.


LIVING ROOM: Mary Drysdale's lighthearted esthetic.


LIVING AND DINING ROOMS: Cheerful decor.


LIVING ROOM NOOK: Whimsical seating and games table.


NORTH ELEVATION: Neighborly appearance.

Francis Xavier Bagnoud House
Washington, D.C.
Wnuk/Spurlock, Architects

When Temporary Emergency Residential Resource Institute for Families in Crisis (TERRIFIC) acquired a Victorian house as a gift, the nonprofit agency turned it into a residence for HIV-positive children ages 6-12. The Washington chapter of Design Industries Foundation For AIDS (DIFFA), a fund-raising organization of design professionals, spearheaded volunteer efforts of Washington interior design firms to furnish the rooms, while local architect Steven Spurlock oversaw restoration of the house. Renovations included upgrading HVAC and plumbing; installing a new kitchen; turning a second-story screened porch into a sun room; and reconfiguring bedrooms.

stucco house, Caughey's gabled pavilion houses children under 6 from HIV-infected families. In Dallas, architect Chris Rador similarly designed Bryan's House with a hipped roof, cedar shingles, and painted window trim to make the architecture appear homelike. "For some children," explains Director Susan Streng, "this is really the only home they have; for others, it is by far the nicest home they have."

Rick Watson, founder of ONEDAY (the name comes from a song Watson wrote about AIDS), a Denver nonprofit dedicated to helping children with HIV, has been turning a two-story, turn-of-the-century house into a service center for families affected by AIDS. Working with volunteers from Denver's design community, ONEDAY purchased the 1896 house because it was zoned as a group home for troubled teenagers. Buildings for children under 5 years old, however, are subject to different life-safety codes—such as prohibitions on occupancy above the first floor and adequate fire exits. Rainbow House, as the center is called, hopes to offer counseling, provide day care, and house families of children visiting Denver hospitals—all programs with different guidelines and regulations. "You can't just put them all in one house because you want to," advises architect Randall Steinke, who has been assisting ONEDAY with the permit process. Steinke suggests that other architects involved in renovations research local zoning and safety regulations that apply to the age group in question and start with an appropriate facility.

Of course, many architects will capitalize on code restrictions to create innovative designs. In California, architect Diane Caughey developed a scheme to meet fire-safety requirements, which called for 44-inch-wide doors in the babies' bedrooms of Caring for Babies with AIDS. To achieve a residential appearance, the architect designed a conven-

BASEMENT FIRST FLOOR SECOND FLOOR THIRD FLOOR

1 PLAYROOM
2 OFFICE
3 MECHANICAL/STORAGE
4 LIVING ROOM
5 DINING ROOM
6 KITCHEN
7 BREAKFAST ROOM
8 FOYER
9 SUN ROOM
10 BEDROOM

VESTIBULE: Trish Cavallaro and Jonathan McIntyre's hand-painted walls.

BEDROOM: Duvall/Hendricks nighttime imagery.

ANICE HOACHLANDER PHOTOS

tional, 36-inch-wide door adjacent to an 8-inch-wide hinged panel, which can be opened in the event of fire and is wide enough to wheel a baby's crib through. Julia Smith, architect of the Kirk Scharfenberg House, transformed a requirement for fire exits in day-care rooms into a way of bringing in daylight. "I treated the doors as windows," Smith explains, specifying double, tempered-glass doors that allow toddlers and even infants to peer outside. Says Chris Rador, architect of Bryan's House, "In design, the more limitations, the better the results. You're not operating in a vacuum. The input from clients and agencies can be turned into pluses instead of minuses."

Getting involved

Architects who want to work with organizations developing day- or overnight-care centers for children with HIV should contact the pediatric department of their local children's hospital, where social workers may be aware of planned home-care settings.

The New York-based Design Industry Foundation For AIDS (DIFFA), an organization comprising volunteers from the design professions, sponsors community projects for people with HIV, and its 13 local chapters may provide information on ongoing projects. DIFFA's Washington, D.C., chapter, for example, recently coordinated the volunteer design schemes of 14 interior designers, whose donations furnished the showcase Francis Xavier Bagnoud House for children with HIV ages 6-12.

Architects who have worked on projects for children with AIDS or HIV say they invariably cut their fees, spent far more time than they were financially compensated for, or charged no fee at all. Such dedication has produced several handsomely decorated designer showcases in centers for HIV-infected children around the country. They offer their young occupants such cheerful environments that, to the one-time visitor or to the reader of these pages, the "house beautiful" appearance may obscure the underlying harsh reality—many of the children in these decorative settings are dying. Architect Sara Elizabeth Caples recalls a Saturday post-occupancy visit to the Jennie Knauff Children's Center she designed for children with HIV in the Bronx: On a classroom door was posted, as if it were a notice for a field trip or a birthday party, a memorial service folder for one of the children. "His picture was next to it, so that he could be remembered by the other children and the teachers," Caples recounts. "It was posted in such a way that you realized death wasn't such an unusual experience here." Adds Rador, speaking of Bryan's House in Dallas, "This is the kind of place that makes you come back every day, and where you count your blessings."

—Heidi Landecker

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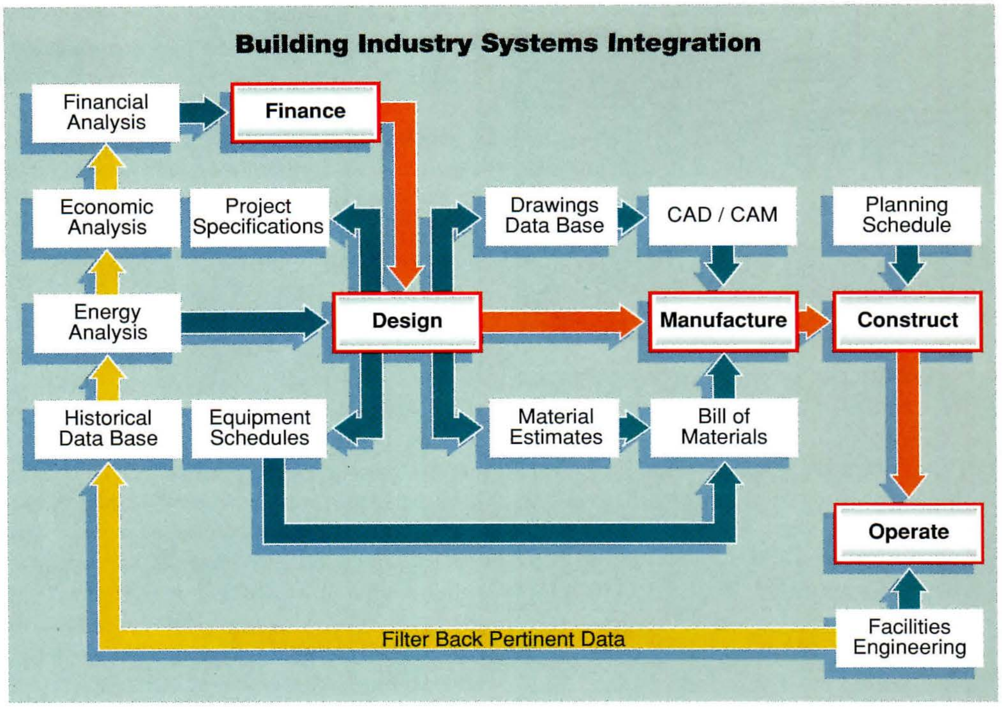
Integrated Software

New electronic models enhance communication among design and construction disciplines.



RIGHT: In a model designed by University of Oklahoma Professor Varkie Thomas, integration is a flow of electronic information through financing, design, manufacturing, construction, and building operations, with information recycled for future projects.

The Achilles' heel of CADD technology has been its failure to unify the diverse aspects of architectural practice. Automation may aid isolated activities in design, documentation, and management, but without electronic communication between the various processes, CADD offers few gains in overall efficiency compared with traditional methods. Most information transfer among design and construction professionals continues to take place on paper.

Even in a computer-intensive scenario, an architect may create drawings electronically but give printouts to the engineer or cost estimator. The consultant then selects information from the drawing and enters it into the computer through a discipline-specific analysis program. Later, the contractor receives paper documents and redraws them electronically as shop drawings. And eventually, the owner receives paper as-built drawings. If each party creates its own electronic data from scratch, the efficiency of automation is lost.

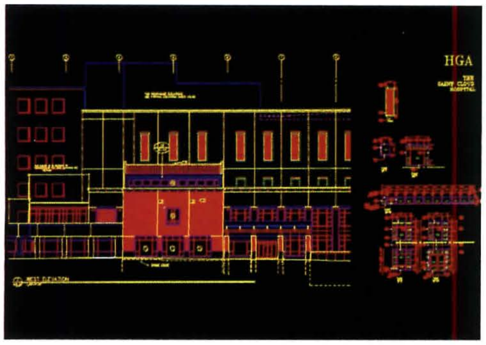
Many experts believe that a true computer revolution in the construction industry will happen only when the many design and construction processes are unified through a universal electronic model of a building. Such an ideal model would contain the visual and spatial qualities formed by the architect and the physical and economic properties contributed by the engineers and specifiers. Moreover, the model would be "intelligent," so if any component were changed, other related elements would be automatically updated to fit. Architects, engineers, construction schedulers, facility managers, renovation architects, and, ultimately, demolition engineers would use the same massive model for storing and retrieving design information.

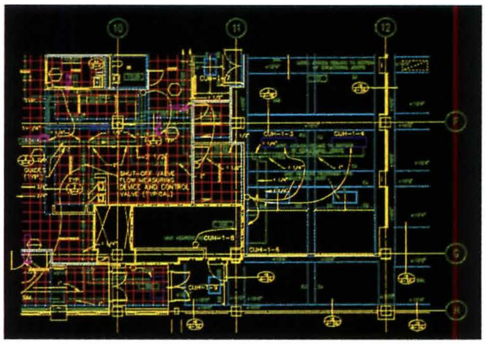
Model of integration

University of Oklahoma professor Varkie Thomas, formerly associate partner of Skidmore, Owings & Merrill, has been studying integration issues for more than 20 years. "If automobiles and televisions were manufactured and maintained the way buildings are today," Thomas asserts, "few people would be able to afford them." He argues that the design and construction professions have become specialized because of the increasing complexity of buildings, and this fragmentation has resulted in a breakdown in communications.

Now, some architectural software is being developed using the same compartmentalized approach. Thomas observes: "The obstacles that fragment the building industry and prevent it from achieving the efficiencies of manufacturing are not technical—they are mainly political and administrative."

His goal is to reunite the professions through a single model for data exchange, "without compromising the uniqueness of each building, the special requirements of each client, or the creative design talents of architects and engineers." To promote these ideas, Thomas is starting an interprofessional organization, the Society for Computer Integrated Building Sciences (SCIBS).





TOP: With integrated software from Softdesk, Hammel Green Abrahamson combines window details with building elevations, coordinating design changes at one scale with needed modifications at another scale. **ABOVE:** Similarly, by combining architectural, mechanical, and electrical plans, HGA's architects and engineers can ensure coordination of information.

Families of applications

While Thomas and others tackle the institutional problems, some commercial software vendors are working on the technical ones, developing families of professional applications that facilitate communications among architects, engineers, and construction and facilities managers.

Some of the commonly used integrated packages are from Accugraph (El Paso, Texas), ASG (Sausalito, California), Intergraph (Huntsville, Alabama), Sigma Design (Burlington, Massachusetts), and Softdesk (Henniker, New Hampshire). Each company offers a wide variety of applications, including architectural design, detailing, rendering; links to specifications and cost-estimate databases; and civil, mechanical, structural, and electrical engineering. Because all applications operate on a common file structure, each professional enjoys discipline-specific symbol libraries and analytical tools while maintaining access to others' data files.

One benefit of this access is improved design coordination, according to Joel Zwier, an associate of Hammel Green Abrahamson (HGA) in Minneapolis. A Softdesk Auto-Architect user, Zwier typically gives electronic files of reflected ceiling plans to in-house electrical engineers as a base for electrical drawings. "We then use their plans as a base to make sure the lights are in the right places as we refine our design," Zwier explains. "This coordination helps ensure that the ducts fit below the structure without interfering with the lights or with the ceiling heights."

But the computer won't do everything for you. "Coordination requires attention and negotiation," Zwier adds. HGA also enjoys a two-way data exchange with some of its clients. Many of HGA's hospital clients, for example, now have their buildings documented on AutoCad. The architects' CADD drawings are adapted for facility management, and the clients in turn give electronic drawings of existing buildings to HGA for developing additions and renovations.

David Downing is an architect and CADD manager of the multidisciplinary firm Einhorn Yaffee Prescott (EYP) in Albany, New York. EYP architects and engineers each use an ASG application along with Core, ASG's base program. They rely on AutoCad's reference file capability, which allows any team member to call up another's drawing as a background without endangering the original files. This process is different from the traditional exchange of base drawings on paper because changes by one discipline are immediately evident to the others. Despite the advantages, Downing believes the benefits of integration are constrained by traditional task segregation within large firms and in this country's AEC industry in general. "Where we'll really see the efficiency benefit," he predicts, "is when CADD starts facilitating communications outside the firm. But for now, giving the contractor information, such as quantity counts, from our CADD drawings would require us to assume more liability. This will take a different type of process than we have today."

An engineering and construction firm that has begun experimenting with ways to limit liability while exchanging electronic data is the Ralph M. Parsons Company, in Pasadena, California. The firm sends Intergraph files to a steel fabricator to help with the preparation of shop drawings and fabrication. To avoid liability problems, CADD project coordinator Randy Carbone explains, "They use our information, but we're still responsible for checking their drawings. We haven't stopped the paper trail."

Parsons has also developed ways to move design data into the field with 3D models normally reserved for client presentations. For example, when structural steel is delivered to a construction site, its bar codes are scanned into an on-site computer, and a 3D model is printed with color codes to indicate which steel has arrived and which hasn't. The foreman can use this graphic to tell workers what part of the building will be worked on next. "Initially, builders were wary of the word 'computer,'" Carbone says. "They don't want to deal with text or numbers. But print out a glossy picture of the model, and they feel more comfortable."

Links and interfaces

Other software development companies are working on methods to integrate the diverse tasks of design and construction. For example, AutoCad, the most commonly used CADD software in the world, is now available in Release 12 for Windows. This graphical user interface (similar to that of Macintosh) adds power to AutoCad not only by making the program easier to use but also by providing links between it and other Windows applications. Users can copy and paste material between applications, and the dynamic data exchange, or DDE, feature ensures that changes to a drawing will automatically appear in any report or document that the drawing has been copied into.

Timberline Software (Beaverton, Oregon), a creator of cost-estimation and accounting applications, has been aggressively pursuing software links with other companies. Timberline now provides translators to facilitate the transfer of data between cost estimation and R.S. Means (Kingston, Massachusetts) cost databases, Primavera (Bala Cynwyd, Pennsylvania) project management, and ASG and Softdesk CADD software.

Although Alias Sonata (Toronto, Ontario) is better known in Europe than in North America, this powerful design system embodies "parametric elements," which may hold the key to future integrated systems. Every object in a project database is given "intelligence" about itself and its relation to other elements. For example, a change to an element in one drawing will result in a change to the same element in other drawings and schedules. Interference between elements, such as ducts running through beams, is automatically flagged.

Research directions

While commercial software focuses on common file formats and parametric databases, university researchers are studying other approaches to integration. At the Center for Integrated Facility Engineering (CIFE) at Stanford University, researchers are developing computer-based methodologies for improving communications between disciplines. CIFE director Paul Teicholz is exploring the role of software in helping architects and engineers collaborate early in design, sharing expertise and information more effectively than is now possible through paper drawings.

James Turner, a professor of architecture at the University of Michigan, worked for several years on IGES, an international standard for exchanging 2D data between dissimilar CADD systems. But he believes that neutral exchange formats, which give a "snapshot" of the data at one moment, will not be sufficient for sophisticated modelers in the future. "Good CADD systems will have to be dynamic," Turner insists, "so that when one entity changes, it will send a signal to others that are dependent on it." He has developed diagrammatic methods for documenting networks of building components, properties, and relationships with the aim of supporting dynamic architectural design.

Edward Smith, professor of architecture at the University of Utah and president of Architectural Computer Services in Salt Lake City, has joined research efforts with Kajima Corporation, one of the largest design and construction firms in Japan. Smith proposes devising a modeling system that would provide a complete and unified description of a building. Such a computer model, a "virtual building," would contain information about geometric and physical attributes of the building in a hierarchical structure of building components, assemblies, and systems.

This model, which would incorporate everything known about a building under design, could support analysis such as cost estimates and structural design and be drawn as rendered perspectives or construction documents. Some software companies, including Cadkey (Windsor, Connecticut), are also developing such so-called "object-oriented" CADD systems.

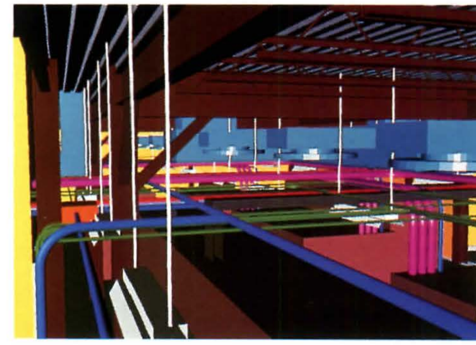
New data model

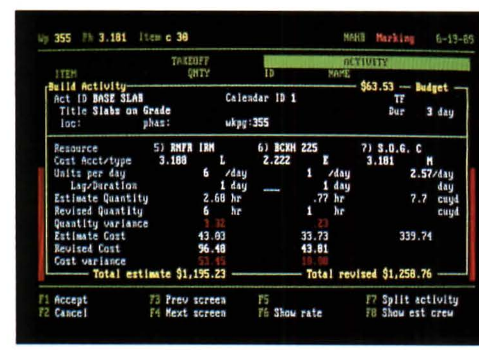
"There is no magic that will solve these problems for us," contends Charles Eastman, professor of architecture at the University of California, Los Angeles. He believes that a single, complex building model will satisfy integration needs only if the kinds of buildings, technologies, and analyses are severely restricted. "To develop a model that would accommodate every possibility," Eastman claims, "would require defining objects having so many properties and interactions that they could not be easily manipulated." Instead, Eastman and his colleagues have proposed a modular "engineering data model" that would be composed as required for each building project.

This engineering model would provide a means for integrating a wide range of design knowledge, not all of which would need to be anticipated by project architects and team members before design began. A graphical interface would allow an architect without computer expertise to customize and combine software modules containing selected analysis procedures and domains of design knowledge.

According to everyone involved, these research efforts will require a great deal more work, and they hope that part of the impetus to solve the technical and social problems will come from the architectural and design community. To bring together researchers and practitioners interested in these issues, Thomas, Teicholz, Eastman, and others will hold a symposium, sponsored by the Society for Computer Integrated Building Sciences, in June in Anaheim, California, coinciding with A/E/C Systems '93. The two-day event will focus on recent work in design software integration and prospects for the future.

—B.J. Novitski





TOP: By rendering multidisciplinary information in 3D using Intergraph, architects and engineers from Ralph M. Parsons check for interference between ducts, pipes, and structure.
CENTER: Sonata, a high-end modeling program, combines photorealistic rendering capabilities with an underlying building database, which stores attribute information about building components.
ABOVE: Collaboration between software developers Timberline and Primavera has resulted in the integration of cost estimating and project scheduling.

Technology & Practice

Peak Performance

ARCHITECTURE ROOFING PORTFOLIO

Protection from the rain, the sun, and the cold has always been a roof's primary function. But today, yet another environmental factor has to be considered when providing shelter: the effect of roofing systems on our natural resources and ecosystems. This green dimension was clearly present at the National Roofing Contractors Association's 106th Annual Convention and Exhibit in San Antonio, Texas, last February. The 6,000 participants reviewed an exhibition of the latest environmentally sensitive materials and techniques—from VOC-free, single-ply seams to polyisocyanurate insulation without ozone-depleting CFCs. Seminar topics ranged from federal regulations on asbestos and asphalt to waste management and recycling of roofing materials.

In the following roofing portfolio, we address the relationship between roofing and the natural environment through a trio of articles that concern restoration, code reform, and energy-conserving technologies.

Jeffersonian Invention

Thomas Jefferson, our third President and a respected architect, was plagued with a leaking roof in his own house and experimented with new materials and techniques to extend the life of his design. A recent restoration of Monticello reflects Jefferson's innovative ideas, translated into modern materials that resist both natural elements and man-made pollutants.

After Andrew

With winds greater than 160 mph, hurricanes play havoc with just about any roofing material and system. Our feature on the aftermath of Hurricane Andrew in Florida examines the roof failures caused by last year's devastating storm. Poor workmanship, deficient materials, and improper inspections are just a few of the culprits. Local community, code, and insurance groups are still struggling for strategies to prevent a recurrence of the destruction.

Radiant Heat Barriers

Stretched out under a hot sun, a roof in a southern climate can be a heat sink. The solar radiation that it absorbs translates into higher air-conditioning bills. When appropriately placed, thin membranes of reflective foil, called radiant heat barriers, keep this heat in the attic and out of the living space, and save money and resources. Our article on radiant heat barriers describes the benefits of the technology and how these insulating barriers should be installed.

Jeffersonian Invention

A $1 million restoration of Monticello reinstates the innovative roofing system of the historic house.

CHARLES SHOFFNER


GITCHELLS STUDIO

ABOVE: Monticello boasts newly completed, $1 million roofing restoration. To replicate its appearance during Jefferson's lifetime, roof was refinished in exposed tin-plated, stainless steel shingles. **FACING PAGE:** Before the five-year restoration, Monticello's rooftop consisted of a painted, lead-coated copper dome and standing-seam metal roof.

This year marks the 250th birthday of Thomas Jefferson, and visitors to Monticello are in for a surprise. Over the past five years, Albany, New York-based restoration architects Mesick Cohen Waite, on behalf of the Thomas Jefferson Memorial Foundation, have conducted the most accurate reconstruction work on the house since Jefferson's death in 1826.

One of the most notable results of this rehabilitation is visible from the rolling foothills of the nearby Blue Ridge Mountains: Monticello's standing-seam metal roof and painted white dome now shine with a new, highly reflective tin-plated surface, the results of a five-year, nearly $1 million project to restore the landmark 18th-century house to its appearance when the third U.S. President lived there.

Jefferson himself would hardly have been astonished to see scaffolding and construction crews on the grounds of his 5,000-acre pastoral residence. "Architecture is my delight, and putting up and pulling down one of my favorite amusements," he once mused. Even during his final years of retirement from public life, Jefferson continued to experiment with the latest materials and methods resulting from the nascent Industrial Revolution, even tinkering with mundane roofing details. With 13 skylights, six chimneys, an elaborate balustrade, a 400-foot entablature, and a dome—the first ever to crown an American house—Monticello is considered to represent the most complex roofscape of any house in early 19th-century America.

Previous roof restorations

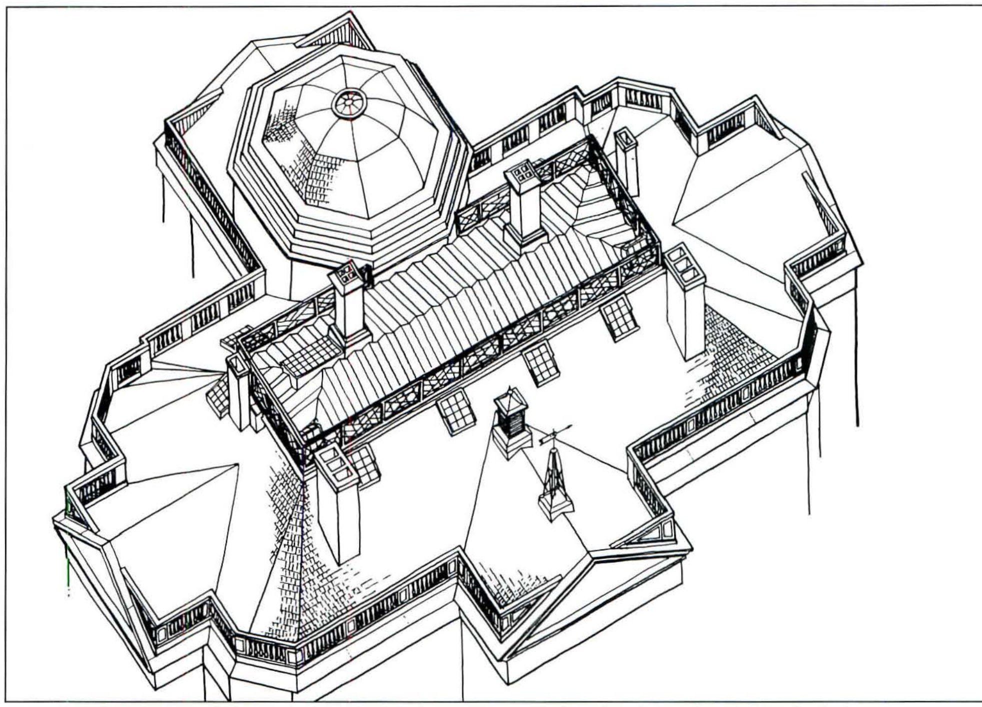
While Jefferson's penchant for innovation and invention was well-known, until Mesick Cohen Waite undertook some initial roof investigations, "We had no idea of the richness of the technology Jefferson employed," notes William L. Beiswanger, Monticello's director of restoration. Much of the roof designed by Jefferson had been modified or encapsulated by subsequent 19th-century owners. In 1923, when the Thomas Jefferson Memorial Foundation purchased the property, the original roof sheathing boards were stripped and the roof replaced with a standing-seam, terne roofing system, further removing evidence of its original design and construction. A partial roof reconstruction by the foundation in 1955 removed additions made after Jefferson's death, such as dormer windows and a hipped roof, and restored the dome's plinths. But the foundation took liberties in refinishing the dome, using historically inaccurate materials such as painted, lead-coated copper; asphaltic felt; and terneplated steel. "No one had really thought about restoration from the point of view of the technology employed," Principal John Mesick explains. "That kind of careful restoration had never been done." Plans for a comprehensive restoration of the often-patched roof were accelerated by extensive water damage to the attic and plaster ceilings in 1987.

Original roofing details

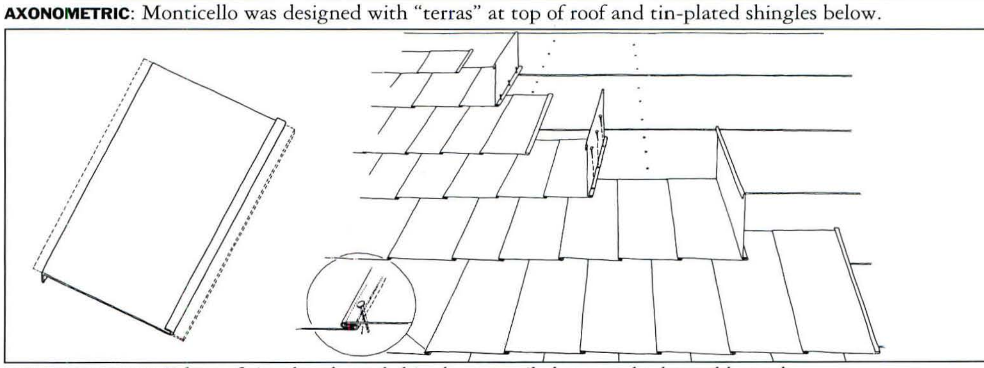
Almost none of Jefferson's original working drawings for Monticello survived. But Mesick Cohen Waite and foundation staff were able to piece together a history of the roof's construction—what had been executed and when—by comparing the building's remaining physical evidence with archival illustrations, photographs, invoices, and Jefferson's copious notes. Since the third President's distinguished public career required frequent and prolonged absences from Monticello, the foundation also found extensive correspondence with tradesmen and suppliers.

The history of Monticello encompasses the development of roofing technology in this country as well as the beginnings of Classicism in America. Jefferson began designing the house in 1768, at the age of 26, when he inherited the estate from his father. Eschewing the Georgian style common to his Virginia neighbors, Jefferson turned to a Neoclassical vocabulary based on the work of 16th-century Italian architect Andrea Palladio.

TOP: Removal of roof's perimeter sheathing during initial investigations revealed severe rotting of original rafters and joist ends.
CENTER AND ABOVE: New white oak members, matching original framing, were spliced to the original rafters and joists and then covered with new marine plywood and rubber membrane.



AXONOMETRIC: Monticello was designed with "terras" at top of roof and tin-plated shingles below.



SHINGLE DETAILS: Edges of tin-plated, steel shingles are nailed at metal tabs and lapped.

After his return in 1789 from a five-year diplomatic mission to France, Jefferson expanded the house from eight to 21 rooms and drastically altered its original profile to reflect the architectural fashions of Europe. He removed the second floor and replaced it with a low-profile roof line and erected an encircling balustrade to create the illusion of a one-story structure.

The house in fact encompasses three full stories: 11 rooms on the first floor, including Jefferson's bedroom and study; six bedrooms on the 8-foot-tall second story; and four rooms on the third floor, capped by an octagonal dome. Speculation persists over what this grandly scaled, domed room was intended for, since access to the upper stories is limited to two narrow, 24-inch-wide winding staircases. Jefferson also added two symmetrical L-shaped wings at the basement level, flanking the north and south ends of the main house, to provide covered access to such outbuildings as the kitchen, smokehouse, and carriage house.

In 1802, Jefferson decided to replace Monticello's conventional hipped roof, originally clad with chestnut shingles, with a serrated profile of sheet-iron-clad ridges and valleys he dubbed "terras," an innovation that later came to be known as "the President's zigzag roof." The terras afforded a lesser pitch while providing avenues for water to drain. To the west of the central terras, the dome was sheathed in lead around the upper 5 feet of its crown. Chestnut shingles wrapped the section that was connected to three wooden plinths, which were painted and clad with painted sheet iron on the treads to provide a drip edge. The plinths dropped to a cornice concealing a copper-lined gutter, which was installed in 1807. Jefferson also devised a built-in system of sheet-iron-lined diverting gutters, commonly referred to as a "Philadelphia gutter," behind the balustrade.

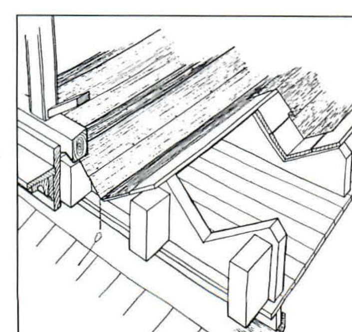
By 1822 Jefferson had replaced the remaining wooden shingles of the dome with tin-plated, wrought-iron shingles, which he had also specified for the pavilions at the newly constructed University of Virginia. By piecing together the dome's original tin-plated shingles, which were removed and stored in a nearby barn by restoration architect Milton Griggs in the 1950s, the architects were able to discern a ghost line that revealed where the original lead crown had overlapped the tin shingling. The evidence also revealed that the crown's installation was far from uniform in dimension.

Jefferson's correspondence confirms that the painted wood balustrade atop Monticello was raised above the roof's surface to allow water from overflowing gutters to run unimpeded beneath it. Iron brackets, discovered by project architect Jeffrey Baker in nearby stables on the property, were found to fit into holes in the balustrade framing and original rafters to anchor the balustrade to the main structure. Once the paint was stripped from the balustrade, the restoration team determined that as many as 50 of Jefferson's original locust balusters were still intact. Evidence of a $2^{1}/_{2}$-inch lead pipe in the masonry walls led the architects to believe Jefferson had installed internal downspout leaders.

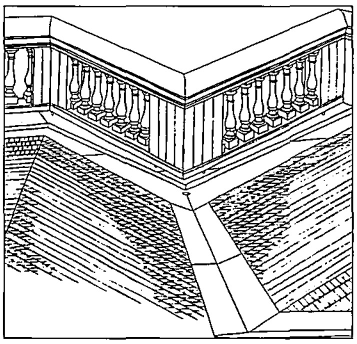
Lessons from the past

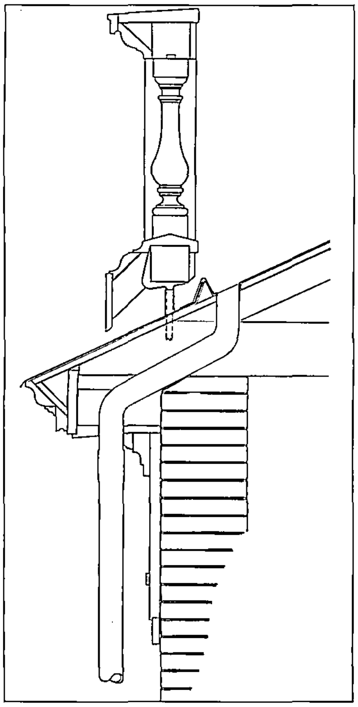
Although Jefferson hoped that his roofing system would last 100 years, it began to leak soon after it was installed. But even when his innovation proved faulty, it was uniquely Jeffersonian. "We wanted the roof to reflect Jefferson's latest thinking in technology while improving on its original performance," notes Beiswanger. Therefore, the architects and foundation decided to replicate the original roof's visual imperfections, but resolved not to duplicate exactly Jefferson's installation methods, which would only re-create the maintenance problems that had plagued him.

For example, the architects devised a new method for fastening the metal shingles. Sheet-metal workers nailed them through metal tabs soldered to their ends rather than through their interlocking lapped edges.



TOP: Upper 5 feet of dome was sheathed in lead and crowned by a nearly 2-foot-diameter, glazed oculus.
CENTER AND ABOVE: Upper portion of Monticello's hipped roof was designed by Jefferson to shed water through a unique system of small ridges and valleys sheathed in sheet-iron, called "terras."





TOP: Jefferson devised a system of built-in, sheet-iron-lined gutters to channel water from hipped roof to balustrade. **ABOVE:** Evidence of lead pipes within walls led Mesick Cohen Waite to reinstate internal downspout leaders at corners behind balustrade.

They also increased the 2-inch head lap originally specified by Jefferson to 4 inches to provide a greater tolerance for movement between the shingles' edges due to thermal expansion and contraction. Thirty-gauge stainless steel hot-dipped in tin was used to simulate the hot-dipped, tin-plated wrought iron Jefferson imported from Wales. This tin surface will eventually oxidize to a flat, whitish gray, much like the face of a well-worn nickel, which features the west facade of Monticello.

The architects anticipate that pollutants such as acid rain and emissions from nearby utility plants—unfortunate by-products of progress Jefferson certainly never envisioned—may erode the tin surface within 75 to 100 years. The underlying stainless steel, however, is expected to last much longer, according to Mesick.

The materials and detailing of the roof's underlayment, invisible to the eye, are pure 20th century, in order to ensure longevity and watertightness. Beneath the terras and tin shingling on the dome, a layer of filter cloth over an ethylene propylene diene monomer (EPDM) membrane is adhered to a new layer of 3/8-inch-thick marine plywood sheathing. All fasteners such as nails and screws are stainless steel to prevent corrosion from an electrolytic reaction created by contact between dissimilar metals. The architects also repaired the roof's original framing by splicing new wooden members to the white oak rafters and joists.

Illuminating details

To bring daylight into Monticello, Jefferson designed 13 skylights of seven different types, three of which opened using a pulley-operated system of counterweights, providing access to the roof. The architects replicated Jefferson's specification that individual panes be lapped several inches over one another, providing an 1/8-inch air space to prevent capillary action from drawing moisture inside. During the restoration, a mock-up of the system was placed on the roof for a year and proved successful without leaking. To resist hailstorms, which also reportedly plagued Jefferson's homestead, some of the new glazing is laminated.

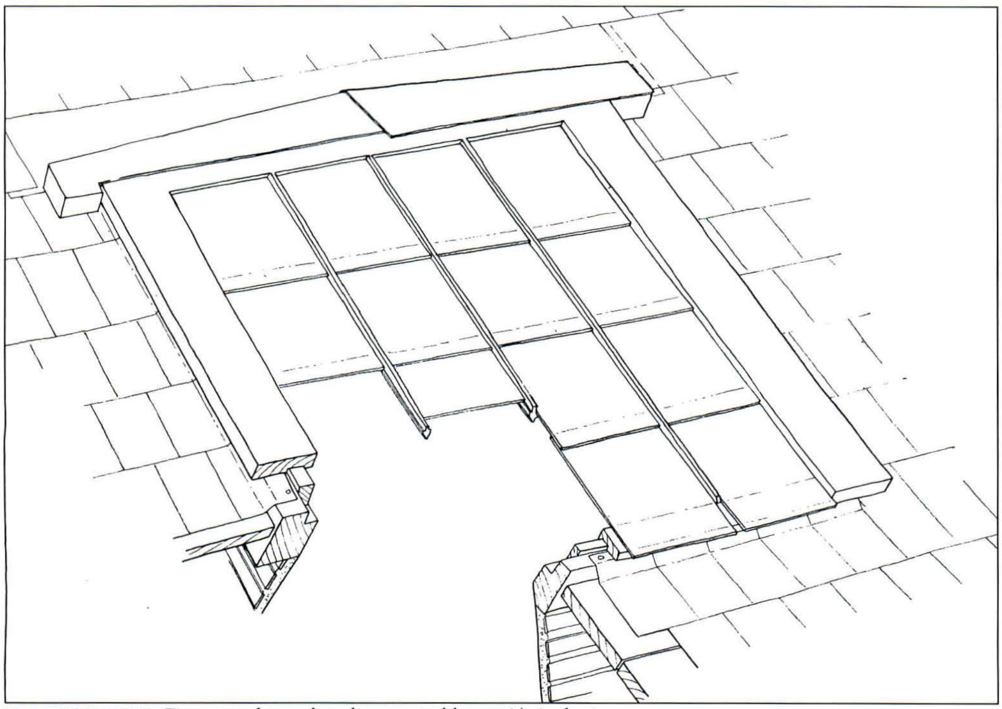
From his letters, Jefferson made two attempts to obtain a single, 4-foot-diameter piece of glass from Boston for the dome's oculus. Both times, however, the shipments apparently arrived broken, leading Jefferson to construct the oculus in several pieces with a 22-inch-diameter circular central pane. The foundation, however, commissioned and imported from Austria a saucer-shaped section of glass, sized to Jefferson's original specifications; a molded, translucent plastic cover will shield it from harm.

To ensure qualified bidders for the contract work, Mesick explains, "We tried to track the sets of hands that were going to do the work rather than the reputation of the firm." The virtual extinction of the art of lead roofing in the United States led the architects to a lead worker in England, where such skills are more prevalent. But rather than conforming to precise contemporary techniques, the architects instructed the Norwich, England-based company, Anglia Lead, to replicate the far less exact dimensions typical of Jefferson's era. With such minute attention to authenticity and craftsmanship, combined with the benefits of modern materials, it appears that Monticello will finally benefit from what Jefferson had hoped for—and what all homeowners pray for—a roof that will truly last a century.

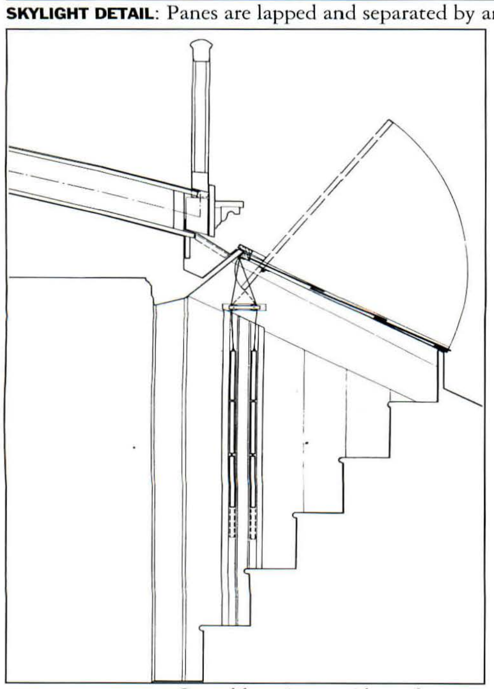
—*Marc S. Harriman*

PROJECT CREDITS

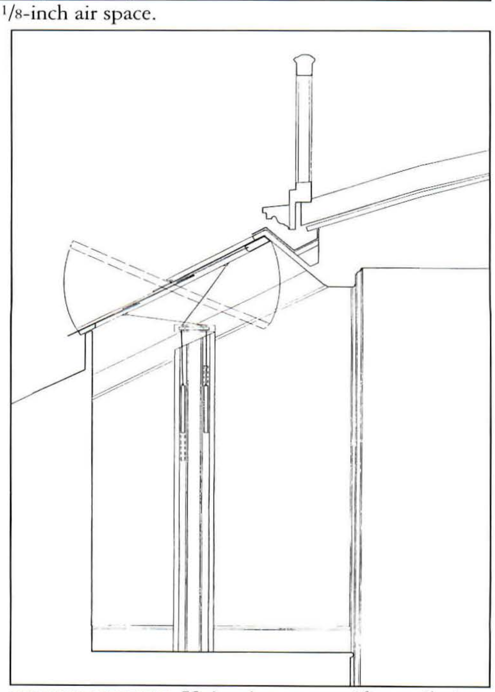
CLIENT: Monticello, Thomas Jefferson Memorial Foundation
ARCHITECTS: Mesick Cohen Waite, Architects, Albany, New York—John Mesick (partner in charge); Jeffrey Baker (project architect)
GENERAL CONTRACTOR: Henry H. Lewis Contractors, Owings Mill, Maryland
PHOTOGRAPHER: Thomas Jefferson Memorial Foundation, except as noted



SKYLIGHT DETAIL: Panes are lapped and separated by an 1/8-inch air space.



SKYLIGHT SECTION: Operable units provide roof access.



SKYLIGHT SECTION: Units pivot to provide ventilation.

TOP: Mesick Cohen Waite reconstructed skylight's surround according to Jefferson's original specifications. **CENTER:** Based on Jefferson's sketches, skylights were reconstructed with individual, overlapping glass panes. **ABOVE:** Operable skylights, mechanically controlled by a system of weighted pulleys, provide natural ventilation and access to the roof from the third story.

After Andrew

Eight months after the hurricane devastated buildings throughout South Florida, the results are in on what went wrong and why.


AP/WIDE WORLD PHOTOS

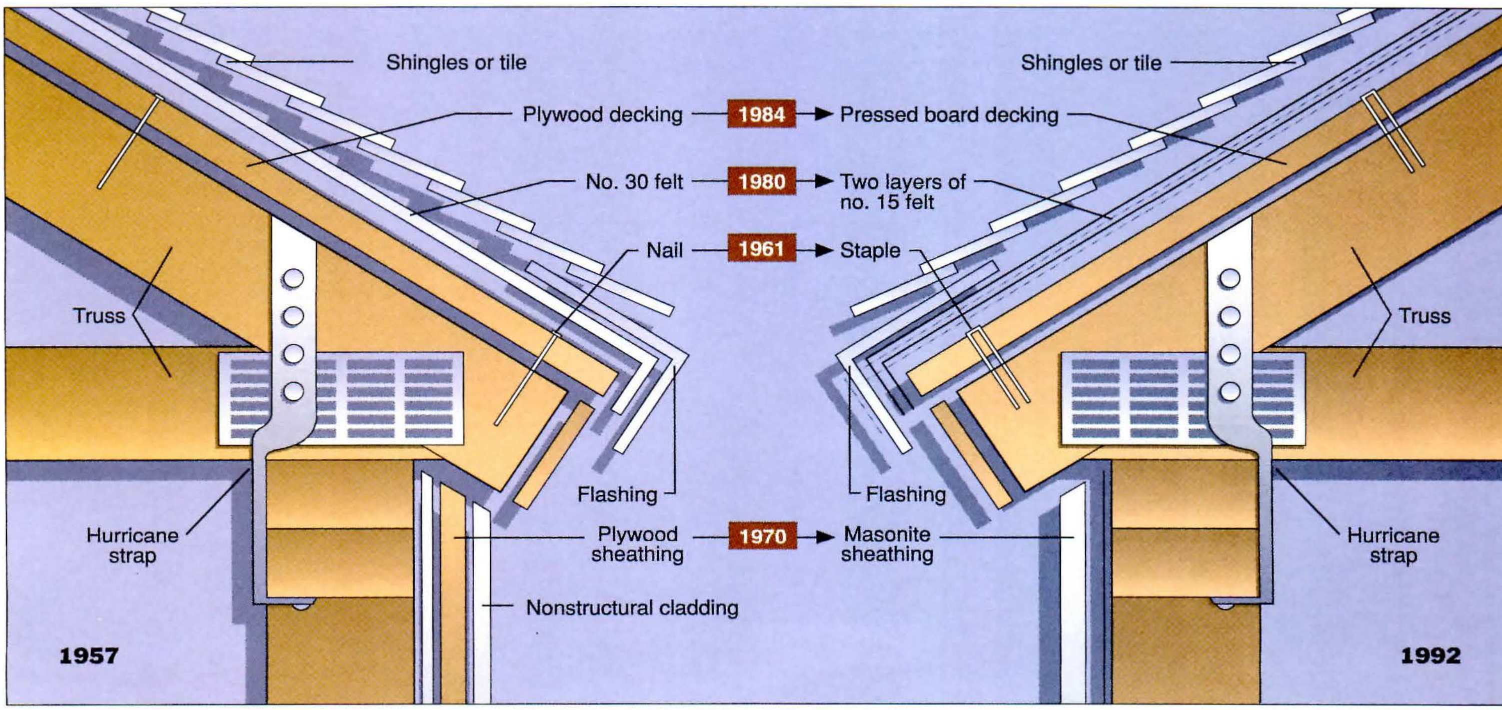
The terrifying winds of Hurricane Andrew, with gusts of more than 160 miles per hour, had barely subsided last August when architects and emergency management teams flocked to South Florida to take stock of the damage. Here's what they found: 160,000 people rendered temporarily homeless, an estimated 8,000 businesses damaged or destroyed, and one-third of the county's mobile homes smashed to splinters. The majority of losses occurred in buildings whose walls were left standing—but whose roofs were blown away. "Eighty-five percent of property destruction was related to roofing system and roofing material failures," concluded a Dade County grand jury in December.

The reports still emanating from industry groups and regulatory agencies in the wake of the hurricane are unanimous in stressing the pitiful performance of South Florida's roofs. According to the January findings of the state's Department of Community Affairs, nine out of 10 houses in the storm area lost some portion of their roofing materials. "It's a national disgrace," says Dale Perry, a professor of architecture at Texas A&M University and president of the Wind Engineering Research Council.

Damage assessment

The litany of roofing failures is long. According to the Dade County grand jury report, "Shingles, pneumatically applied roofing staples, and inferior quality underlayment and wafer board sheathing failed to withstand Hurricane Andrew's wind forces. Roof tiles, when poorly installed, became flying missiles. Shingle roofs peeled off like banana skins. Roofing felt underlayment became flying sails in Andrew's winds, exposing home interiors to post-hurricane rains and causing additional property destruction."

A damage assessment team made up of faculty from the University of Miami School of Architecture and architects from the Mi-



ami chapter of the AIA quickly mobilized to inventory building failures. Their report pinpointed eave flashings, metal stops, and drips as common failure points that led to the peeling away of roofing felts and sheathing.

Shingles and tile

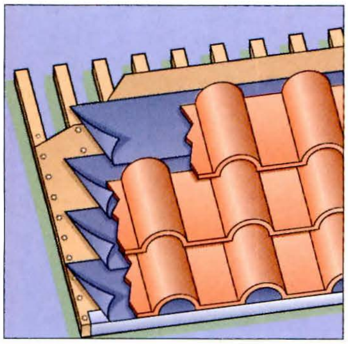
Shingles were among the poorest performers. The Federal Emergency Management Agency (FEMA) observed high losses of asphalt shingles and felt underlayment. "Evidence of substandard workmanship included torn shingles and inadequately attached shingles," a December report from the agency points out. "It appeared that many of the shingles and adhesives were not adequate for the wind speeds that occurred. This was evidenced by the tears and pullouts at staple connections." Thomas L. Smith, director of technology and research for the National Roofing Contractors Association, notes that of the several roofs he inspected, none had fasteners in the proper location. "All of the fasteners were located above the self-seal strip, except for one job where they were incorrectly located in the strip," relates Smith.

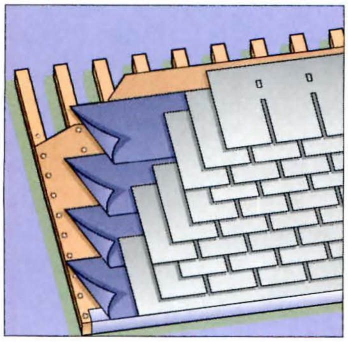
With regard to extruded-concrete and clay-tile roofs, FEMA's building performance team observed failures caused by the nailing and mortar connections. Underlayment failure, lack of bonding between underlayment and mortar, and lack of bonding between mortar and tile were all observed by FEMA. "Clay tiles were more susceptible to shattering from impact of debris, but had comparatively better adhesion to mortar than extruded concrete tiles," FEMA reports.

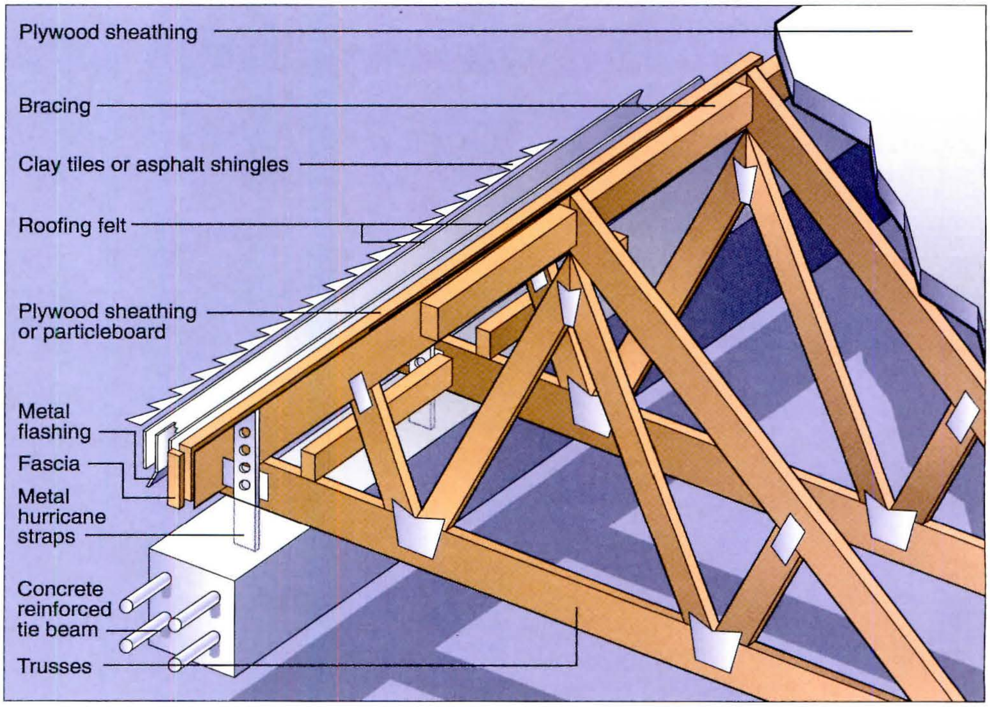
Roof sheathing

A significant number of houses in South Florida have built-up tar and gravel roofs, and large numbers of houses lost their roof sheathing because of inadequate reinforcement at the edges or an insufficient number of attachments to the trusses. In thousands of cases, roof systems failed because the ply-

FACING PAGE: Roofs across south Dade County bore the brunt of Hurricane Andrew's fury, which packed sustained winds of 140 mph and gusts in excess of 170 mph, according to the National Hurricane Center.
ABOVE: In 1957, the Dade County Board of Rules and Appeals developed the South Florida Building Code (left). Over the course of 30 years, its standards were gradually changed—some say weakened—to include alternative building materials (right).







TOP: While some clay tile roofs sustained little hurricane damage, many lost tiles that were attached with small amounts of mortar, rather than placed in a thick mud bed. Other tiles shattered when struck by flying debris.
ABOVE: Widespread failures of asphalt-shingle roofs were attributed to tears caused by nailing guns, improper nailing patterns, and design specifications that failed to meet the 120-mph-wind standard in South Florida.
ABOVE RIGHT: Properly braced structural frames give roofs a better chance of surviving high winds. For gabled roofs supported by masonry walls, the South Florida Building Code specifies hurricane straps that anchor trusses to reinforced concrete tie beams at the top of the wall.

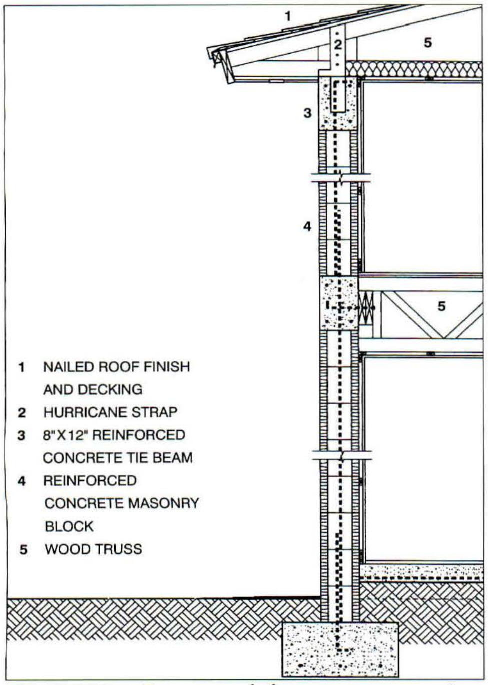
wood or particleboard sheathing separated from the trusses, and often the sheathing was the only thing holding the trusses in place.

The loss of sheathing and subsequent truss failure was particularly common on houses with gabled roofs, many of which were built with end-wall trusses anchored to a tie beam on top of a concrete masonry wall. When the gable end was buffeted head on by hurricane-force winds, the loss of sheathing, combined with a lack of proper bracing for lateral loads, caused the roof trusses to collapse. Gable ends blew in or out, or collapsed due to inadequate bracing or materials.

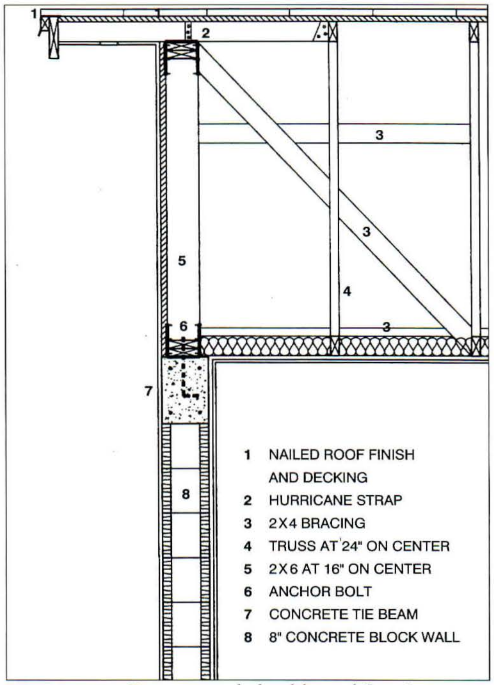
Steel roof decks were frequent culprits on small commercial buildings. Often, the welds or fasteners attaching the metal roofing to the framing pulled through. According to a report by the American Plywood Association, "There also appeared to be minimal attachment of the metal roofing systems to the supporting walls. This would, of course, minimize the effectiveness of the metal roofing to act as a diaphragm for the structure." Precast concrete double-T decking failed in several cases where it lacked a sufficient bearing surface or was unable to withstand the wind load reversal once air pressures had built up inside the building. Many roofs were damaged as a secondary result of compromises to the building envelope, specifically doors and windows. Once the cladding was penetrated, sufficient pressures built up inside the structure to blow the roof off from the inside.

Strengthening the code

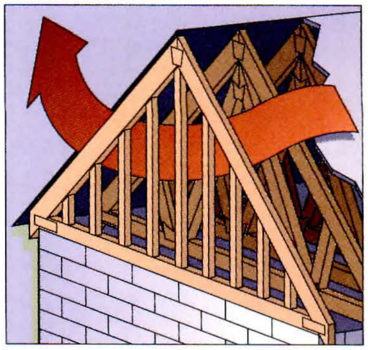
Dade County passed an emergency ordinance by mid-September that took immediate action to strengthen the South Florida Building Code. The new ordinance:
—prohibits the use of staples for tin cap, shingle, and sheathing installation;
—establishes that eave flashing and gravel stops be nailed 4 inches on center with galvanized roofing nails or other approved nails;
—requires the use of 30-pound felt underlay-

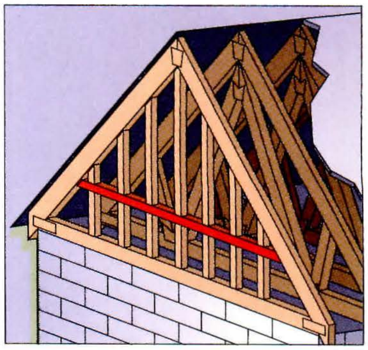


WALL SECTION: Recommended masonry construction.



WALL DETAIL: Recommended gable-end framing.





FAR LEFT: Details for generic two-story reinforced masonry wall show proper anchoring and recommended applications of roofing materials.
NEAR LEFT: Side view of gable-end framing shows location of diagonal bracing. A more conservative approach would be to build the entire gable end of concrete block, a practice that some Florida localities require.
TOP: In absence of proper lateral bracing, Andrew's winds blew off the roof's sheathing, and many trusses collapsed.
ABOVE: Gabled roofs were more likely to survive the storm when lateral bracing was properly tied into the gable-end truss. Hipped roofs fared even better.

ment (previously, two sheets of 15-pound felt had been allowed);
—requires that hips, ridges, and starters be nailed and secured with plastic cement;
—mandates six nails be used per shingle;
—outlaws the use of composite board, wafer board, oriented-strand board, or structural particleboard as sheathing; and
—requires that all tiles be nailed with two galvanized nails or be set in a bed of mortar and glued with an approved adhesive.

Critics charge the changes in the building code were a knee-jerk reaction to appease the public. Meanwhile, the Dade County Board of Rules and Appeals delivered an ultimatum to roofing-tile and asphalt-shingle manufacturers to show by May 1 that their products can meet the code's standard of withstanding 120 mph winds. Other observers maintain that it was not the code but its poor enforcement that led to so many roofing failures. "Buildings that were built according to the code held up pretty well," reports Eugenio M. Santiago, a Coral Gables structural engineer who testified before the grand jury.

The jury agreed that a lack of code enforcement contributed greatly to property destruction. The final report from the Florida Department of Community Affairs urges mandatory inspections to determine that all critical load path members and connections comply with the code.

Widespread publicity about Andrew's destruction has prompted a number of initiatives outside the immediate storm site. Last month, researchers who specialize in natural disaster mitigation met at the University of Miami to coordinate a national research agenda. Meanwhile, cynics in Dade County say that the construction industry has returned to business as usual. As recently as last November, 60 percent of the roofs being built were failing inspection. "It's like being an alcoholic," explains Santiago. "You have to admit you have a problem first."

—Vernon Mays

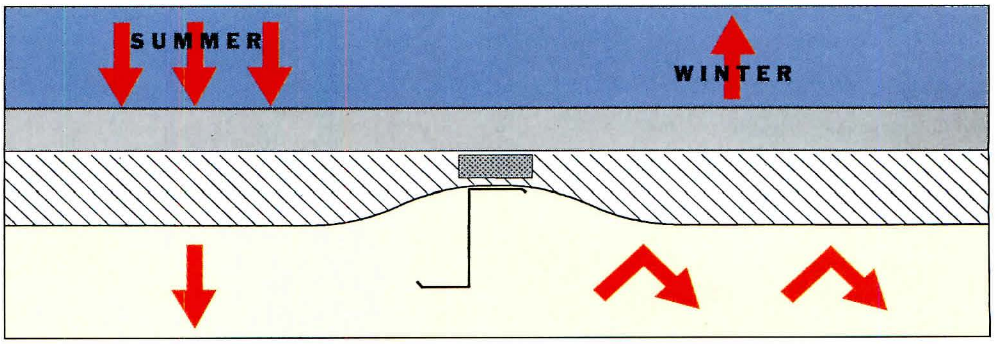
Radiant Heat Barriers

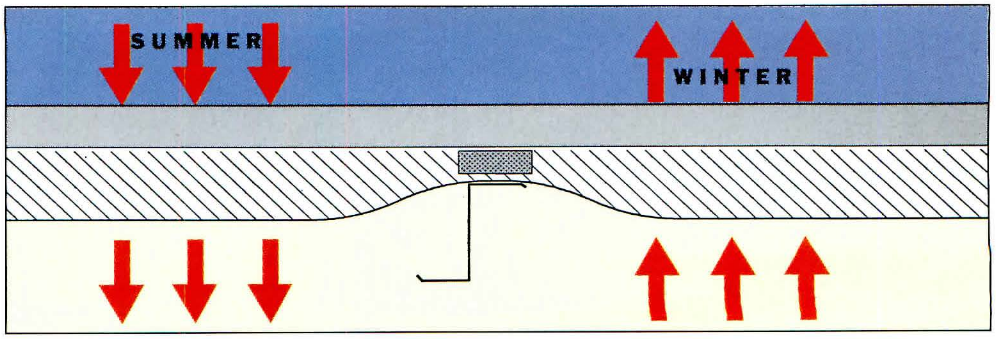
Reflective foil installed under roofs boosts energy efficiency in southern climates.

Energy conservation technologies are likely to attract new attention during the coming months, given President Clinton's proposed higher taxes on oil and natural gas. Architects are well advised to look to a simple but effective means of saving energy—radiant barriers. This technology consists of inexpensive, paper-thin membranes that can produce significant energy savings when installed below roof decking by preventing heat from the sun from being transferred to the building's interior. Radiant barriers consist of a reflective foil surface, usually aluminum foil, and a stiffener such as paper, cardboard, or plastic. The most common radiant barrier incorporates a stiffener sandwiched between two reflective foil surfaces; but radiant barriers with one reflective surface can be just as effective if correctly installed. Tests performed by the Oak Ridge National Laboratory, the Florida Solar Energy Center, and others in recent years have demonstrated that properly installed radiant barrier systems can reduce air-conditioning costs by 8 percent to 12 percent in residential buildings in the southern United States. Radiant barriers can also be effective in low-rise commercial and industrial buildings in hot climates.

Transferring heat

Radiant barriers help keep buildings cool because they block radiation, one of the three ways heat is transferred. Most of the conventional energy-conservation systems used in the United States, such as batt insulation and double-glazed windows, are designed to prevent heat transfer from a warmer surface to a cooler surface by conduction and convection. Conduction is the molecular transfer of heat through solid objects that are in physical contact. According to Philip Fairey, principal research scientist with the Florida Solar Energy Center and author of a series of "Design





RIGHT: When shiny side of a radiant barrier faces an air space, barrier radiates only 5 percent of summer sun into the building. In winter, barrier reflects 95 percent of heat back to structure. **BOTTOM RIGHT:** In buildings without radiant barriers, 90 percent of summer heat is absorbed by roof materials. In the winter, interior heat is absorbed by roof and radiated out from building. **FACING PAGE, AXONOMETRICS:** Four locations are recommended for attic radiant barriers (clockwise from top left): attached to the underside of roof deck, draped over rafters, attached between rafters, and attached to rafter bottoms. **FACING PAGE, SECTIONS:** When foil surface of radiant barrier must be hidden, the barrier can be installed below the roof decking (top). A radiant barrier can be draped between bar joists below the roof decking in a flat roof (bottom).

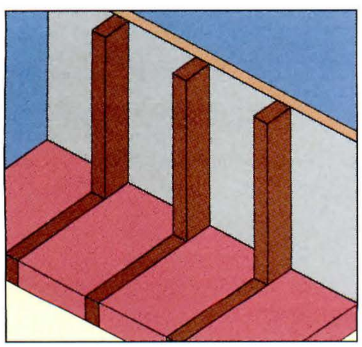
Notes" on radiant barriers, radiation is the transfer of heat across air from one surface to another surface that is in direct alignment with the first, much the way a television signal travels from a transmitter to an antenna. The ability of a material to absorb or radiate heat is described by its emissivity value, which ranges from a low of 0 to a high of 1. A material with a low emissivity value is able to absorb and reradiate only a small amount of heat and can be used to block that energy transfer. Many common building materials, including glass and many types of paint, have emissivity values of 0.9, meaning that they can retransmit through radiation 90 percent of the heat they absorb. Aluminum foil, by contrast, has an emissivity value of 0.05, meaning that it can radiate just 5 percent of the thermal energy that strikes it.

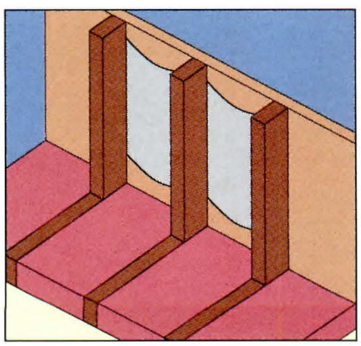
In a building that does not contain a radiant barrier, energy from the sun heats the roof and is transferred by conduction through the roofing materials to the inside of the building. The heat is then radiated across the attic air space and absorbed by the attic floor or batt insulation on the attic floor. The heat then gradually passes through the floor or insulation to the ceiling and, eventually, into the building's interior.

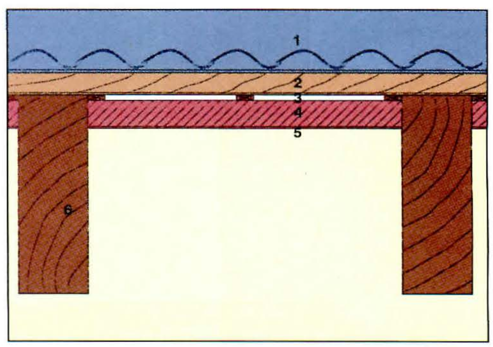
Barrier effectiveness

For a radiant barrier to be effective, its shiny, or reflective, side must face an air space. Contrary to what common sense might suggest, warns Lonnie Ward, president of Spectrum Contracting, a Lewisville, Texas-based radiant barrier company, it is not desirable for the radiant barrier's shiny side to face skyward to reflect the downward energy from the sun. Radiant barrier technology earned a bad reputation in the late 1980s when one supplier set up a pyramid-type marketing scheme in which customers were charged exorbitant prices for radiant barriers and given highly inflated figures on how much they could expect to save on their utility bills. Tests have shown that in attics with R-19 insulation, radiant barriers can reduce ceiling heat gains by 16 percent to 42 percent, reducing summer cooling bills by as much as 17 percent.

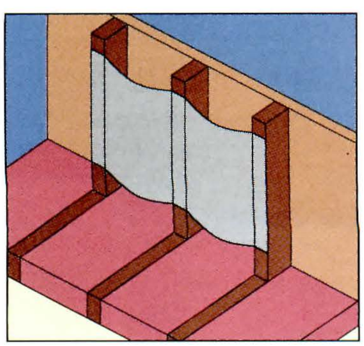
Radiant barriers can be installed in several different positions under sloped attic roofs. In a "Radiant Barrier Attic Fact Sheet," sponsored by the U.S. Department of Energy, investigators from the Oak Ridge National Laboratory suggest four alternative locations. In new construction, radiant barriers can either be placed directly under the roof deck, with the reflective side facing down into the attic, or draped over the rafters, again with the reflective side facing down. In existing buildings, the radiant barrier can either be attached between the rafters near the roof deck or fastened to and draped between the bottoms of the rafters, with the reflective side facing down into the attic air space.

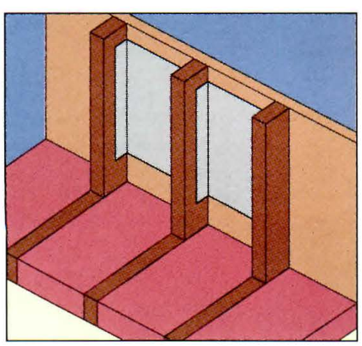


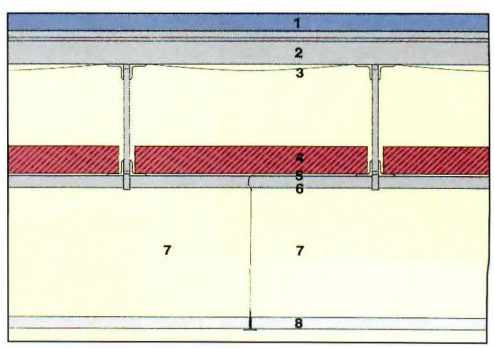




1 TILE ROUT
2 STRUCTURAL DECKING
3 RADIANT BARRIER
4 RIGID INSULATION
5 CEILING FINISH
6 STRUCTURAL BEAM







1 BUILT-UP ROOFING
2 STEEL DECK
3 DRAPED RADIANT BARRIER
4 RIGID INSULATION
5 VAPOR BARRIER
6 HANGER BEAM
7 PLENUM SPACE
8 SUSPENDED CEILING

Industry officials generally recommend draping the radiant barrier and leaving an air space of 2 to 3 inches between the barrier and the roof deck to create an additional ventilation space. According to Roy N. Akers, president of the Ontario, California-based Radiant Insulation Manufacturers Association, the typical ventilation ratio of 1 square foot for every 150 square feet of floor area is appropriate for attics with radiant barriers to enhance the barrier's effectiveness and to prevent moisture accumulation.

It is not necessary for the radiant barrier to form an airtight seal with the roof, since its purpose is to block energy that travels in a straight line. If the radiant barrier is to be hidden behind another material, as in a cathedral ceiling, it is recommended that the foil's reflective side face an air space that is at least 3/4-inch deep.

A fifth location for radiant barriers—directly on top of the attic floor and attic insulation, with the reflective side facing up toward the air space—was popular in the mid-1980s. Although this placement makes the barriers easy to install, it is no longer recommended because of several problems, according to researchers. Water vapor rising from the house into the attic in cold weather, for example, is stopped by the radiant barrier, condenses, and wets the insulation, eventually causing damage. Researchers also found that in as little as a year, these radiant barriers lost as much as one-half of their effectiveness because dust accumulating on the foil surface altered the barrier's emissivity.

Winter applications

The jury is still out on whether radiant barriers are energy savers or energy wasters during the winter months; various tests, including one performed by Oak Ridge National Laboratory, have come up with conflicting data. The ability of radiant barriers to block the upward and outward flow of heat from the inside of the building through the roof in cold weather could save homeowners money. At the same time, however, radiant barriers block desirable winter sun from warming the house. "The solar gain you might expect will be reduced by the presence of the aluminum foil," says David W. Yarbrough, chairman and professor of chemical engineering at Tennessee Technical University in Cookeville, Tennessee. Radiant barriers are most effective in warm climates in which air conditioning costs are far more worrisome than heating bills, and the technology is more economical when included as part of new construction because installation costs are lower. Architects designing residential or commercial buildings in which the sun beating down on the roof promises to send cooling costs soaring may be wise to consider including radiant barriers in their building plans.

—Virginia Kent Dorris

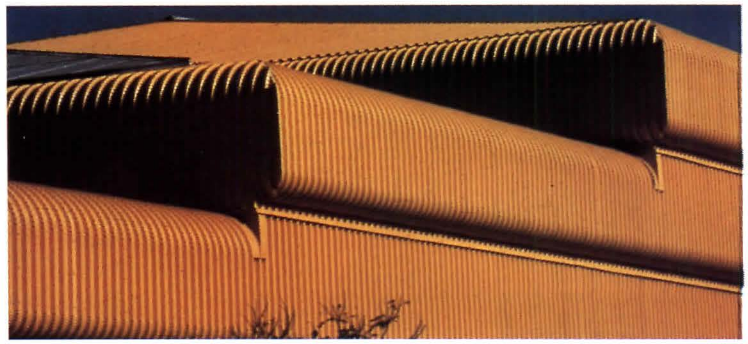
RIGHT: An idealized equation predicts the transfer of heat by radiation between the roof and floor of a flat-roof building with a floor temperature of 75 degrees. The equation is applied in two situations: for an interior roof material, such as wood or paint, with high emissivity, and for a low-emittance radiant barrier. The equation assumes infinite interior parallel planes.

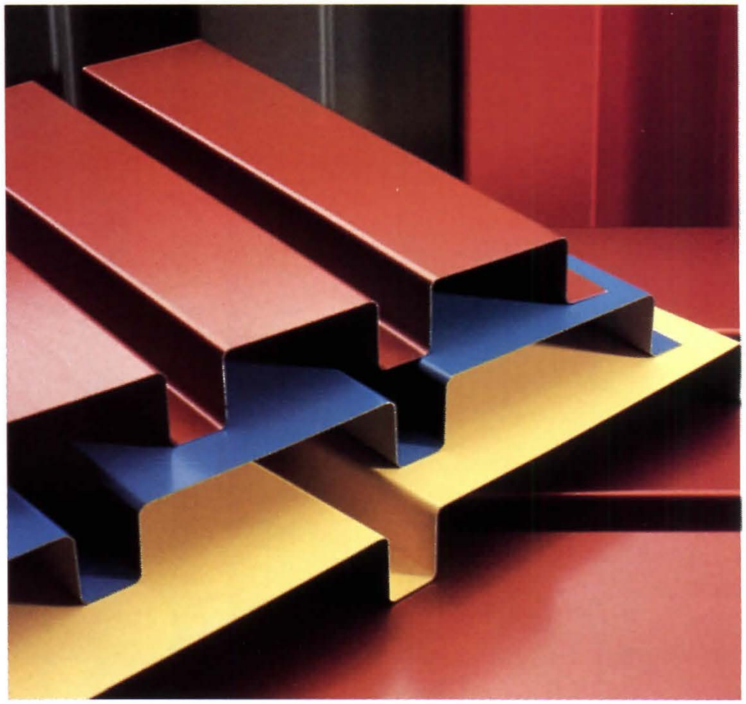
HEAT TRANSFER BY RADIATION WITH 75-DEGREE F FLOOR TEMPERATURE

Surface Temperature in Degrees F for Interior Roof Material	*BTUs per 1,000 S.F. Horizontal Interior Roof Surface*		*Change in BTU/hour per 1,000 S.F.*
	E of .90	*E of .05*	
150	88,347	4,908	83,439
140	74,502	4,139	70,363
130	81,333	3,407	57,926
120	48,817	2,712	48,105
110	36,933	2,052	34,881
100	25,658	1,425	24,143
90	14,971	832	14,139
80	4,853	270	4,583
75	0	0	0
70	4,719	262	4,457
60	13,763	765	12,998
50	22,300	1,239	21,061
40	30,349	1,686	28,663
30	37,929	2,107	35,882
20	45,058	2,503	42,555
10	51,755	2,875	48,880
0	58,038	3,224	54,814

Products

Roofing systems are detailed to provide insulation, strength, and versatility.





TOP: Revere Copper Products manufactures shingles from solid copper that are purported to endure the life of the building. The shingles do not require extra roof support or framing and do not require special decking, sheathing, or underside venting. They can be installed over conventional plywood or solid lumber substrates.
Circle 401 on information card.

ABOVE: Promar Corporation introduces the Progard Securement Assembly. The system consists of a securement base that is installed along the roof perimeter and at the curbs of rooftops; a single sheet membrane, which is draped into the base; and a metal netting, which is rolled out on top. An EPDM retaining rod is then inserted in the extruded aluminum base to lock both layers in place. This system purportedly eliminates punctured membranes and wind uplift.
Circle 402 on information card.

TOP: Curveline molds up to 100 varieties of metal panels produced by more than 30 manufacturers of metal panels and systems. The company produces standing-seam and batten-seam-concealed fastener panels as well as "B" deck and other decking profiles. This system allows an architect to select paneling from the manufacturer of choice and specify the desired radii and angles of curvature. Metals such as stainless steel, painted or unpainted galvanized steel, aluminum, and aluminized steel can be formed and applied as contoured roofs, walls, fascias, mansards, canopies, decking, and other components.
Circle 403 on the information card.

ABOVE: NAT Industries introduces Verti-Line metal roofing and wall paneling. The ribbed panels are fabricated with a 90-degree angle, allowing architects to customize architectural reliefs and shadowing. As a roofing system, Verti-Line positions the panel's ribs in an upward direction to simulate the look of battens or standing-seam roofing. As a metal wall system, the panels are customized in coverage widths of 28 to 36 inches and pitches ranging from 4 to 12 inches. They are designed for vertical or horizontal applications. Verti-Line is available in 18- to 26-gauge galvanized G90 steel or aluminum, in various colors.
Circle 404 on the information card.

Asphalt shingles
CertainTeed Corporation announces the winner of the Remodeling 1992 House of the Year Award, which incorporates the company's Grand Manor shingles. Grand Manor is manufactured for residential developments and light commercial projects. To appear slatelike, the shingles are layered to expose 8 inches of the tabs instead of the standard 4 inches. In addition to Sherwood Forest (above), the shingles are available in colors ranging from silver and blue to brick red and black.
Circle 405 on the information card.

Roofing source
Neste Thermo produces Modified Bitumen Roofing Systems, a commercial roofing catalog, offering information on bitumen products and roofing systems as well as general roofing. This catalog consists of diagrams depicting installation of systems such as nailable wet decks, structural concrete decks, and base and surface membranes. Specifications for applying Neste Thermo's roofing systems are explored in detail within the catalog.
Circle 406 on the information card.

Metal paneling
ASC Pacific's Select Seam roofing panels are designed to be installed over solid substrates with concealed snap-on battens as the roofing system. ASC Pacific offers special colors and finishes, including stucco embossing, low gloss, and copper patina. Select Seam panels are also available in 16- and 20-ounce copper. This roofing system can be shaped in the field and is primarily designed for commercial and institutional applications.
Circle 407 on information card.

Tensioned membrane
Sheerfill Architectural Membrane (above) is designed by Birdair to create tensioned fabric structures and skylights. The fabric membrane consists of a woven electrical grade fiberglass substrate coated in Teflon and is translucent, lightweight, and durable. The Sheerfill Architectural Membrane gradually changes in color from its original light beige to pure white with continued exposure to sunlight. The membrane transmits diffuse, color-balanced natural light and becomes luminous when backlit at night.
Circle 408 on information card.

Single-ply membrane
Goodyear Tire & Rubber Company offers the Mop-Down Versigard roofing system for a transition from built-up roofing to single-ply membrane applications. The damaged deck material is replaced, hot asphalt is spread over the decking, and Goodyear's black Versigard membrane is rolled out on top. As a subsidiary of Carlisle SynTec Systems, Goodyear will operate independently and will maintain its present distribution program.
Circle 409 on the information card.

Copper components
The Kosempel Manufacturing Company creates customized copper components for building design and construction applications. The components are created for functional and ornamental purposes. Kosempel's metal spinning and hydoforming techniques can be applied in restorations of historic structures or new designs. The patina characteristic of copper provides corrosion-resistance and can be aged to simulate the appearance of naturally aged copper when faced with spot repairs.
Circle 410 on the information card.

Clay finials
No. 9 Studio Pottery handcrafts clay finials (above) and manufactures the decorative embellishments to suit specified roof pitches and ridge shapes. The finials are press-molded and colored to client specifications or can be finished to retain the natural hue of terra-cotta clay. The manufacturer also offers additional architectural ceramics for exteriors and interiors. These decorative pieces vary from traditional handmade clay tiles and fittings to thinly fired and glazed stoneware reliefs.
Circle 411 on the information card.

Insulated steel
Garland Company supplies R-Mer Lite, an insulated steel roofing system that consists of a pre-painted white membrane with a baked polymeric finish embossed for strength. The membrane does not require ballast, added structural support, or installation procedures involving pumps, torches, or noxious chemicals. This lightweight system weighs less than 1 pound per square foot and is installed on existing roofs. Its unique plateau- and valley-patterned surface accommodates the natural movement of buildings.
Circle 412 on the information card.

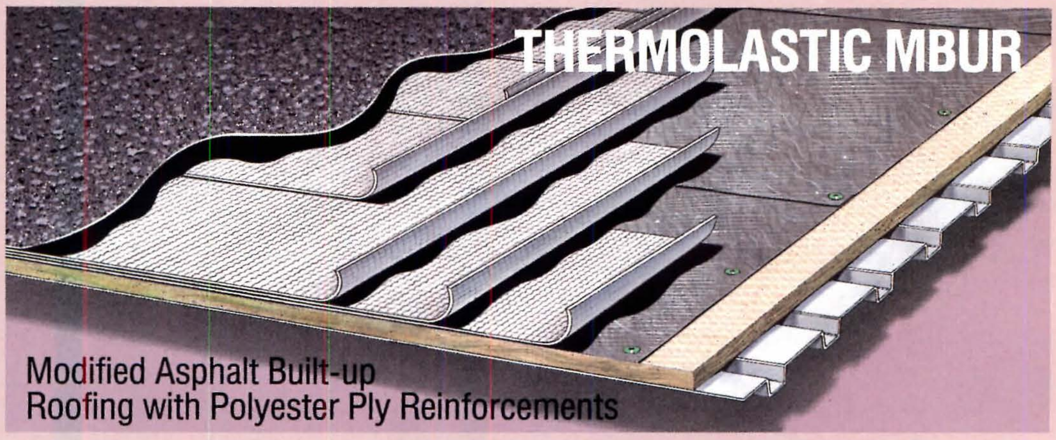
Heat-welded membrane
Stevens Roofing introduces JPS Elastomerics Corporation's Hi-Tuff/EP, a black, heat-welded, scrim-reinforced, single-ply roofing membrane. Hi-Tuff/EP is based on an ethylene propylene polymer and provides a tear strength up to 55 pounds. This system does not use tapes or seam adhesives and can be mechanically attached, fully ballasted, or vented on new or retrofit installations.
Circle 413 on the information card.

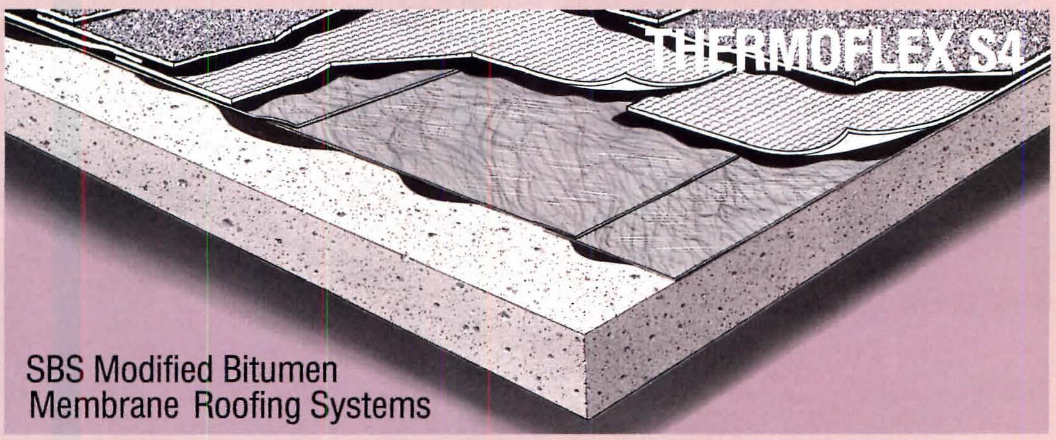
Lightweight roofing
Decrabond (above) produces a lightweight, pressure-formed, 26-gauge galvanized steel panel for roofing applications. A fine coating of natural stone chips is bonded to the primed steel base to enhance its fire retardancy. An acrylic resin is then applied to the system to resist algae and lichen growth. Decrabond is available in nine natural colors for traditional and modern design. An interlocking structure and a horizontal fastening method enable the panels to withstand high winds and resist fastener pull out.
Circle 414 on information card.

Fire retardant shingles
Chemco manufactures FTX fire retardant for cedar shakes and shingles and offers a limited lifetime warranty on the fire retardancy of the roof. A vacuum extrudes moisture and air from the wood cells and injects the shingles with the FTX chemicals. The materials are then thermally cured to lock in the fire retardant. These shakes and shingles carry the Cedar Shake and Shingle Bureau's Certi-Guard approval. Certi-Guard indicates the shingles meet class B and C building code specifications.
Circle 415 on information card.

Colored membranes
Sarnafil offers 23 color options for specifiers of roofing membranes. The colored membranes can be applied to create signs on roof surfaces and to complement exterior building designs. Sarnafil's membranes are constructed of a reinforced, thermoplastic, single-ply roofing substance that is formulated with colorfast pigments to achieve long-term color stability. The colors are resistant to ultraviolet rays, chemicals, and pollutants.
Circle 416 on the information card.

PROVEN PERFORMERS





For over 30 years, our roofing systems have stood up to some of the most punishing weather conditions imaginable—tropical sun, hurricanes, hail, rain and snow.

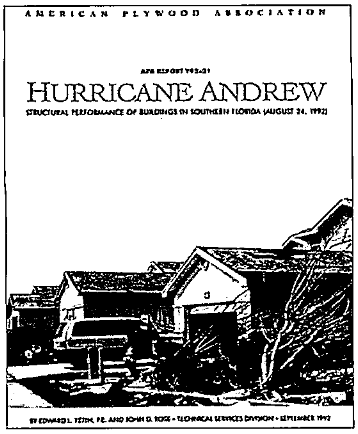
Whether installed by hot asphalt or cold adhesives, our technologically advanced roofing systems are more reliable than ever. They feature either seamless, monolithic built-up membranes or the most user friendly SBS modified bitumen membranes made anywhere.

All NESTE/Thermo roofing systems are Classified "Class A" by U.L. Plus, each is backed by 10, 15 and 20 year warranties.

(800) 882-7007 / (619) 272-0061
P.O. Box 86379, San Diego, CA 92138

Circle 187 on information card

NESTE
Thermo



Hurricane assessment

The American Plywood Association (APA) offers a structural performance report assessing the damage caused by Hurricane Andrew. APA's report T92-21, "Hurricane Andrew, Structural Performance of Buildings in Southern Florida," explores the performance of wood systems; masonry/wood construction; wood panel roof sheathing performance; roof covering performance; manufactured and modular homes; and low-rise commercial structures. Published photographs allow for the examination of building construction details and hurricane damage. Possible solutions are expressed through diagrams proposing gable-end wall details for masonry and wood-framed walls.
Circle 417 for more information.

Roofing insulation

ACCU-R Program EPS is a roofing program sponsored by the Society of Plastics Industry. SPI monitors molders of polystyrene foam insulation to ensure that their products meet or exceed industry standards when applied. EPS (expanded polystyrene) is a closed cell, lightweight foamed plastic designed for insulating single-ply and built-up roofing systems. It has a compressive strength of 10 to 60 pounds per square inch.
Circle 418 on information card.

Sheathing brochure

Eternit offers a brochure describing Promadeck, a fiber-reinforced cement roof sheathing. The sheathing may be used wherever codes require a noncombustible roofing.
Circle 419 on information card.

Drainage board

Tapered Fesco Board (above), designed by Manville Roofing Systems, creates a slope to improve roof drainage on level or near-level roofs. Fesco Board can be applied to built-up, modified bitumen, and single-ply membrane roofing systems. During manufacturing, the board's perlite particles are exposed to intense heat, expanding 10 times their original size to create glasslike beads that provide an insulating effect.
Circle 420 on the information card.

Cement shingles

FibreCem Corporation introduces Beaver Shingles, a cement shingle that is constructed without asbestos, combining organic fibers, cement, silica, water, and other additives. Beaver shingles are designed with three rounded tails to give an impression of numerous small shingles. The shingle is designed for flexibility for applications on hipped roofs, vertical cladding, and areas of rolling pitches. The shingles are purported to prevent deterioration and moisture absorption, and they are well-suited for coastal regions and other areas with high humidity.
Circle 421 on information card.

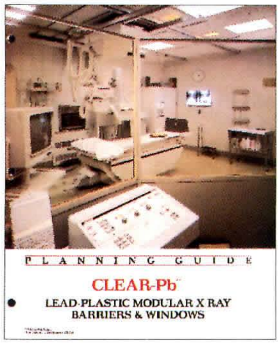
Cellular glass insulation

Pittsburgh Corning introduces Foamglas insulation, a lightweight, rigid material composed of tiny, individually sealed glass cells impermeable to moisture. Foamglas is nontoxic and unaffected by most corrosives, fuels, and oils. The glass component creates a noncombustible insulation that minimally changes dimensions when subjected to varied temperatures.
Circle 422 on information card.

ARCHITECTURE'S LITERATURE PORTFOLIO

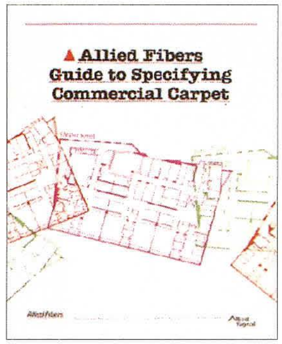
The Literature offered on these pages (with rare exception) are free for the asking. Simply fill out one of the postage paid reader service cards located elsewhere in this issue, circle the appropriate numbers and drop it in the mail.

Nuclear Associates



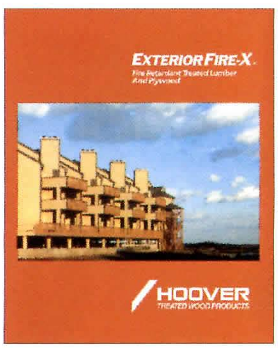
FREE X-RAY ROOM PLANNING GUIDE. Made of lead-impregnated, transparent plastic, CLEAR-Pb® X-Ray Room Shielding from Nuclear Associates provides complete radiation protection with panoramic viewing in hospital x-ray, CT and special procedures rooms. Features include prefabrication for quick on-site assembly, shatter-resistance, 200 stock sizes, choice of lead equivalencies. Free CLEAR-Pb Planning Guide available.
Circle 3.

AlliedSignal Fibers



Allied Fibers Guide to Specifying Commercial Carpet is one of the industry's most valuable working tools. It covers everything from choosing an installation contractor to subfloor preparation and post-installation clean-up. It also includes the advantages of Allied Fibers' 100% nylon Anso HTX — High Technology Cross-X-Bonding — commercial fiber system. For a free brochure, call 1-800-545-ANSO.
Circle 5.

Hoover Treated Wood Products

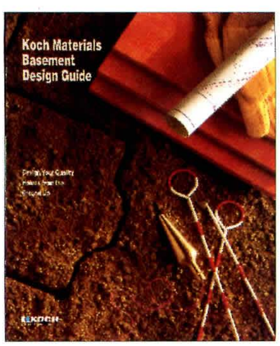


EXTERIOR FIRE RETARDANT WOOD. Exterior fire retardant treated lumber, siding and plywood meets code requirements for exterior decks, stairways, siding and many other applications. Available in cedar, pine, douglas fir, redwood and other softwood species. UL listed. Treatment has little effect on wood color and it can be stained or painted.
Circle 7.

TimberForm® Site Furnishings

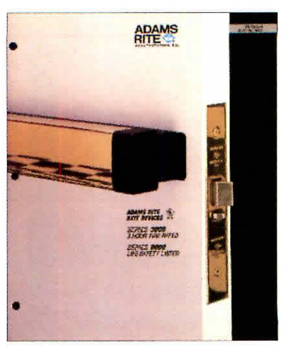
Over 350 different site products are presented in an 88 page technical catalog. Choose from cast iron, perforated metal, steel, welded wire and wood products offered in a dozen design series ranging from traditional to contemporary. Seating, litter containers, ash receptacles, picnic and game tables, bollards and bike racks are offered in 170 designer colors. Marine Teak, Alaska yellow cedar and Douglas fir slats are available. Call 1-800/547-1940 (ext. 777) or
Circle 9.

KOCH Materials



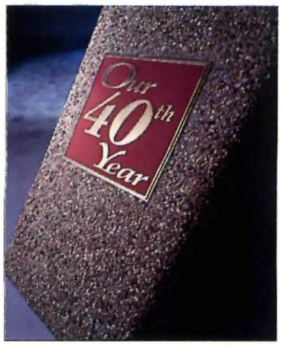
This brochure highlights construction techniques and design considerations that help make the basement into a livable space. By using these recommendations and Koch Materials' Tuff-N-Dri Exterior Foundation Waterproofing System, leaky basement walls can be eliminated. The system comes with a 10-year limited warranty.
Circle 11.

Adams Rite Manufacturing Co.



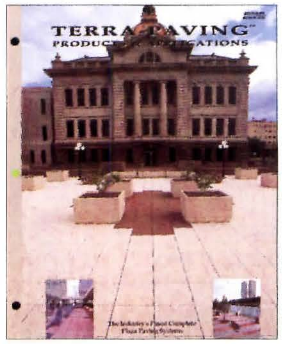
Exit devices — 32-page catalog shows Adams Rite Mfg. Co. touchbar exit devices Series 8000 (listed for life safety) and Series 3000 (listed for fire doors rated up to 3 hours). Ten finishes of aluminum, brass, bronze and stainless materials are shown along with various matching entry trim, electric operation, monitoring and other options. Contact: Adams Rite Mfg. Co., 4040 S. Capitol Ave., P.O. Box 1301, Industry, CA 91749; 213-699-0511, Fax 213-699-5094.
Circle 13.

Wausau Tile Inc.



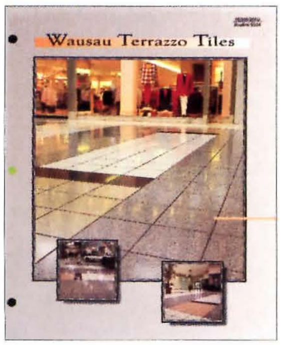
Terra-Form Division of Wausau Tile celebrates the companies 40th anniversary with several new products in its 36-page 1993 catalog. Featured are waste containers, tables, benches, planters, signs, ash urns, bollards, and recreation products, all of solid reinforced concrete. Hundred of styles, colors and finishes are shown. Custom products available. Shipped from WI, FL and CA. Wausau Tile Inc., (800) 388-8728, FAX (715) 355-4627.
Circle 15

Wausau Tile, Inc.



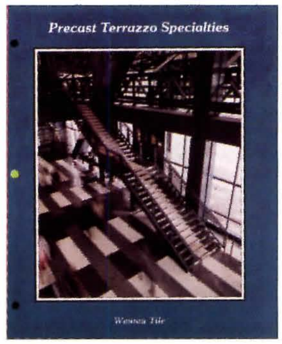
Terra-Paving Division of Wausau Tile is recognized nationwide as the leading source for precast concrete pavers and the unique complete roof/plaza deck system "Terra System One." The full color catalog illustrates installation methods for a variety of roof deck and on-grade applications. Terra-Pavers are available in custom or stocked colors and surfaces in several sizes. Test results exceed all others. Wausau Tile, Inc., (800) 388-8728, FAX (715) 355-4627.
Circle 17.

Wausau Tile, Inc.



Wausau Terrazzo Tiles, from Wausau Tile's Terra-Paving Division provide all the benefits of traditionally installed terrazzo at a fraction of the cost and with even more versatility. Polished and slip-resistant "New Rustic" finishes are pictured in full color in the 1993 catalog. Tiles are available in dozens of stocked colors or in custom colors. They are nominal 12" sq. x 7/8", and weigh 10 lbs. They are installed by the tile trade. Made in the USA. Wausau Tile, Inc. (800) 388-8728, FAX (715) 355-4627.
Circle 19.

Wausau Tile, Inc.

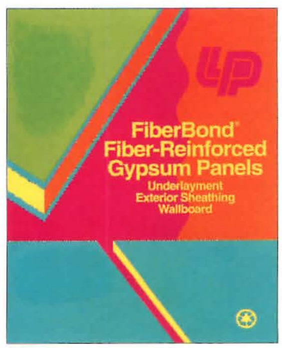


Precast Concrete and Terrazzo from the Terra-Paving Division of Wausau Tile is the industry leader for solid concrete and terrazzo tread & risers, base, copings, column covers, wall panels and other custom architectural precast items. All can be manufactured to match Wausau Terrazzo Tiles, Terra-Pavers, or Terra-Form site furnishings. Literature illustrates standard options and shows typical applications. Established in 1953. Wausau Tile, Inc. (800) 388-8728, FAX (715) 355-4627.
Circle 21.

CertainTeed Corporation

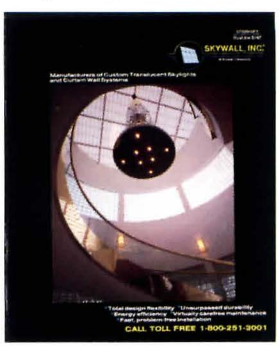
CEDAR IMPRESSIONS™ CertainTeed Corporation now offers Cedar Impressions™, a distinctive flame-retardant polypropylene siding panel manufactured in molds patterned from real cedar shingles. Offering the authentic look of cedar perfection shingles without the maintenance worries, this 48" x 14" panel installs like a traditional siding panel and has interlocking tabs for a virtually seamless look. Call 1-800-233-8990 for more information.
Circle 23.

Louisiana-Pacific



FiberBond® is a fiber gypsum panel reinforced with recycled newspaper available for three applications: wallboard for interior walls and ceilings; new exterior sheathing designed for use on the outside of sidewall framing; and new underlayment provides an excellent base for thin, resilient floor coverings. All three have a solid, impact-resistant surface; excellent sound control; thermal insulation; and moisture tolerance.
Circle 25.

Skywall, Inc.



Create Striking Effects, Capture Nature's Energy! Design your next project with Skywall Custom Translucent Skylights & Curtainwall – virtually shatterproof, impact resistant & maintenance-free. The light weight of these skylights makes it possible to use them in many ways not possible with other systems. All styles available, including new SkyCurve & custom configurations. Complete staff available to help with drawings, specs & load calculations. Call Skywall, Inc., 1-800-251-3001.
Circle 27.

Allmetal, Inc.

Contoured Muntin Bar Now Available From Allmetal, Inc. Allmetal, Inc., manufacturers of laser-welded air spacer and accessories for the insulating glass, door and window market, has recently expanded its line to include contoured muntin bar in a variety of colors. Custom color match capability is also an available option. For more information on Allmetal's contoured muntin, or any of their product line, please contact: ALLMETAL, INC., One Pierce Place, Suite 900, Itasca, IL 60143. Phone: (708) 250-8090. Fax: (708) 250-8387.
Circle 29.

ARTISTRY.

ConAgra Corporate Complex—*Omaha, NE*
Architect: *Opus Corporation—Minneapolis, MN*

Artistry. Tangible evidence that what's imagined, can in fact be brought to life.

The aesthetically beautiful ConAgra Corporate Complex personifies Endicott's ability to artistically transform clay and idea into 900,000 face brick; 35,000 sq. ft. of tile; 50,000 special shapes; 550,000 pavers (approx. 122,000 sq. ft.).

Regardless of project application, the unrivaled elegance, durability and versatility of Endicott products provide exciting design possibilities that are limited only by the imagination.

For samples and the name of the distributor in your area, contact Endicott Clay Products Company today.

This visual introduction to Endicott Clay Products/Endicott Tile Limited features breathtaking project/special shape applications, a dazzling array of colors, textures, hand-crafted murals and innovative design possibilities. Contact Endicott for your ***free*** *VHS tape today.*

Endicott Clay Products Company
Post Office Box 17
Fairbury, Nebraska 68352
402/729-3315

Circle 193 on information card

Endicott

U-Flow Roof Drain Systems, Inc.

RetroDrain® is a retrofit roof drain which simplifies the replacement of existing broken roof drains. Installation from the roof top into the existing roof drains result in not having to cut roof decks and ceilings or gain access to the interior of the building. The Retro Drain is available in PC/PET Resin or Aluminum models. A vandal proof model, called the SuperDome, is available with a Cast Aluminum Strainer Dome. For information, contact U-Flow Roof Drain Systems, Inc., P.O. Box 6489, Buffalo, NY 14240 (716) 854-1521.
Circle 31.

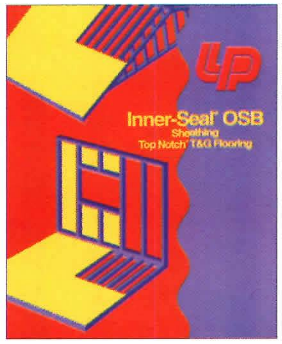
Transwall Corporation

TRANSWALL'S PRIVATE & OPEN PLAN PARTITIONS ENHANCE OFFICE SPACE. Transwall offers a full line of private and open plan office partitions. All systems include a wide choice of fabrics, baked enamel finishes and trim. Work surfaces, storage units and accessories readily interchange between lo and hi-wall. Free-standing computer support furniture blends with panel-mounted work surfaces. Electrical and electronic support is system integrated. For more information call 1-800-HI-1-WALL
Circle 33.

Velux-America Inc.

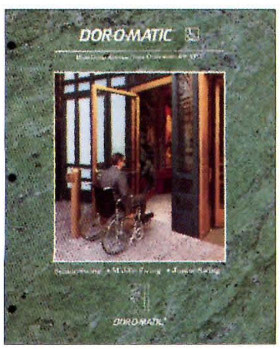
NEW VELCAD SOFTWARE — Velux introduces first CAD software designed exclusively for roof windows and skylights. Designed in Microsoft Windows™ 3.0. Operable within or out of AutoCAD®. Accommodates two levels of user experience. Can generate and receive DXF files. Allows printing of detail drawings and specs and, with AutoCAD, manipulation of elevations, drawings and schedules. Contains a drawing viewer for printing and viewing head, jamb and sill details. VELUX AMERICA INC.
Circle 35.

Louisiana-Pacific



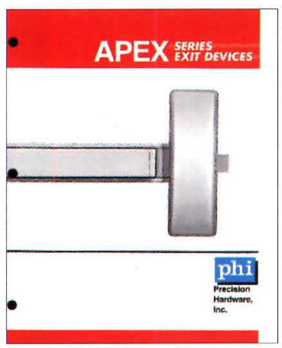
Long after construction, L-P's Inner-Seal Top Notch™ T&G flooring stays flat. With vertical notches in the tongue and panel ends, water on the job site drains and damage to the panel surface is prevented. Our moisture-resistant sheathing offers consistently trouble-free performance. On side-walls, swelling around windows is kept to a minimum. The panel is sound on both sides, edge-sealed, and easy to cut and nail.
Circle 37.

Dor-O-Matic



Dor-O-Matic's new handicap access door operator, the Middle-Swing® features the same quiet, reliable electro-mechanical drive with simplified microprocessor controls. Moderately priced, for low or high traffic areas. Cost effective way of meeting ADA recommendations. Meets ANSI/BHMA A156.19 and U.L. requirements. For more information, call or write: Sales Manager, Automatic Door Division, Dor-O-Matic, 7350 West Wilson Ave, Harwood Heights, IL 60656-4786, 1-800-543-4635. In Illinois call: (708) 867-7400. Fax: (708) 867-0310.
Circle 39.

Precision Hardware, Inc.

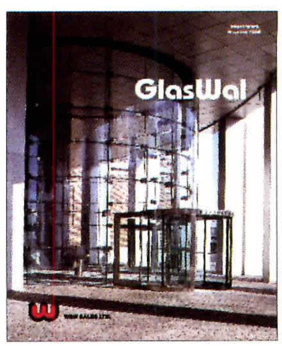


PANIC & FIRE EXIT HARDWARE — Write Precision on your next specification and you won't find us written on your next punch list. Uniquely designed to meet your challenging applications with extraordinary value to meet your clients demanding budget. "Make A Sound Decision, Choose Precision." Proudly made in the USA. Call 1-313-326-7500 for your free brochure.
Circle 41.

Xypex Chemical Corporation

Concrete waterproofing by crystallization. Although applied as a slurry coating, Xypex is a chemical treatment which waterproofs by penetrating the concrete with a crystalline formation which 'plugs' the pores of the structure preventing water seepage. Xypex is ideal for use on the 'inside' of wet underground structures. Xypex Chemical Corp. 604-273-5265.
Circle 43.

GlasWal



GlasWal is part of the growing family of structural glass building products, marketed and installed by W&W Sales Ltd. throughout the U.S. All GlasWal projects are custom designed, engineered and built to meet job site conditions. This new brochure illustrates W&W's patented insulated GlasWal IG with heat soaked double sealed face panels, permitting large expanses of glass to become an uninterrupted glass wall.
Circle 45.

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

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

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

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

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

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

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

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

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

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

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

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

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

Solve it with G-P.℠

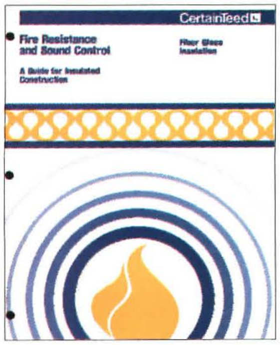
Georgia-Pacific

OFFICIAL SPONSOR OF THE 1992 U.S. OLYMPIC TEAM

*Depending on space, loading and beam size.

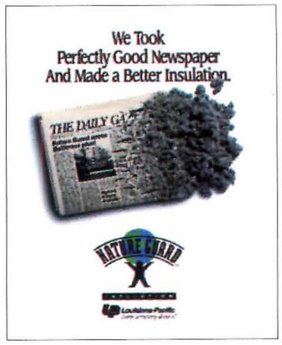
Circle 195 on information card

CertainTeed Corporation



Sound Control and Fire Resistance Brochure. New 12-page brochure offers architects data on the sound control and fire resistance properties of fiber glass insulation. Explains terminology, details existing codes and states standard measurement procedures. Also contains detailed drawings of more common wall assemblies for buildings
Circle 47.

Louisiana-Pacific



Nature Guard insulation costs less than fiberglass and has a 3.8 R-value per inch - higher than rockwool or fiberglass. Its fluffy, natural fibers completely seal the wall cavity, resulting in lower air infiltration and greater sound absorption. Made from 100% recycled newspaper, it helps keep our environment cleaner.
Circle 49.

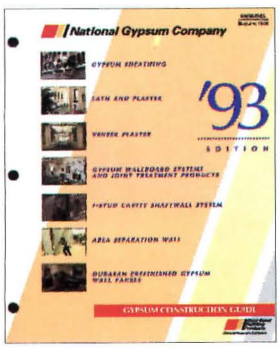
Envirospec, Inc.

A PRACTICAL SOLUTION TO ROOF PAVER STONE APPLICATIONS. New bulletin shows a better way to transform a roof into a patio, terrace, balcony, walk-way, plaza podium, promenade, or just plain roof deck, using the Pave-El Pedestal System. Designed to elevate, level, and space paver stones for drainage in any weather, Pave-El reliably protects roof, paver stone, membrane and insulation. Envirospec, Inc., Ellicott Station Box 119, Buffalo, NY 14205 (716) 689-8548.
Circle 51.

Mitsubishi Electric

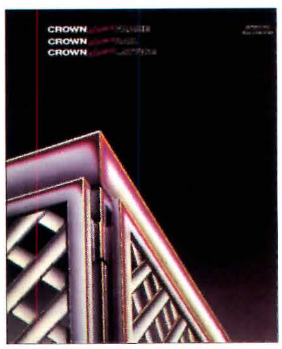
Electronic Catalog Automatically Inserts Air Conditioning Specs, Drawings Into Plans. Instantly insert Mitsubishi's Mr. Slim® specs and drawings into drawings when using CADD programs such as AutoCAD®, Intergraph®, or AutoCAD® for Windows®. Simple pull-down menus allow selection, includes capacity charts, symbols, and installation diagrams. Diskette and instruction manual FREE. For IBM Personal PS/2, PC/AT, PC/XT® and compatibles. Call (404) 368-4840 or write, MITSUBISHI ELECTRIC. FREE DISK.
Circle 53.

National Gypsum Company



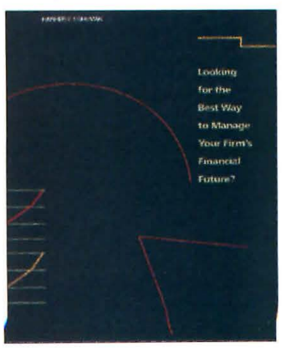
New Gypsum Wallboard Construction Guide. National Gypsum's 140-page Gypsum Wallboard Construction Guide is a complete reference library designed to meet the needs of architects, specifiers and contractors. Written in the CSI/Master Format System, each section is color coded and contains technical data, detailed drawings, specifications and recommendations for installation. For technical information call 1-800-National.
Circle 55.

CROWNaluma CORP.



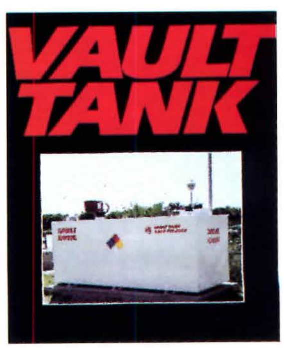
Maintenance-Free Lattice System. Aluminum frames/rails designed for use with CROSS VINYLattice provide a complete, easily installed, durable lattice system. Ideal for balcony and utility enclosures, building facades, fences and trellises. Entire installations can be shipped in pre-assembled sections thus reducing labor costs and waste. CROWNalumaCORP will custom fabricate to meet special design or code requirements. For quotation send drawings to 3174 Marjan Dr., Atlanta, GA 30340. Phone: 800-521-9878. Fax: 404-457-5125.
Circle 57.

Harper and Shuman, Inc.



Financial Management Systems. The only systems sponsored by the AIA. Harper and Shuman develops, sells and supports financial management software specifically for architectural and engineering firms. CFMS (Computer-based Financial Management System) runs on the DEC VAX and MICRO/CFMS runs on PCs and networks. A modular approach lets you buy only what you need. **Call today 1-800-872-4050. Harper and Shuman, Inc.**
Circle 59.

Lube Cube

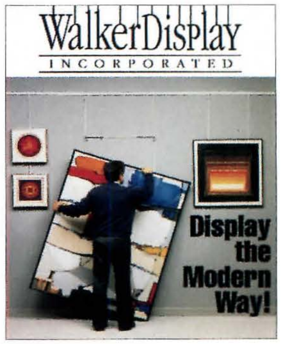


Aboveground Fuel Storage. Approved for aboveground storage of flammable and combustible liquids, Lube Cube Vault Tanks consist of a 6" concrete vault between two steel tanks. Complete tank now meets UL-2085 listing for insulated tanks. UL-listed double wall inner tanks are available. Lube Cube Vault Tanks are mounted on supports to allow complete visual inspection and easy access.
Circle 61.

Supradur Manufacturing Corporation

SLATE REPLICA. Supra-Slate II, an asbestos-free fiber-cement shingle for use in place of quarried slate, provides "UL Class A" security, freeze-thaw protection and maintenance freedom. Manufactured with beveled edges, it offers "storm-anchor-free" installation and is available in Bangor Black, Pennsylvania Gray, Vermont Green, Rutland Red or Granville Purple. For full information, call Supradur Manufacturing Corporation at (800) 223-1948 or in NY (914) 967-8230.
Circle 63.

Walker Display



The Walker System adds that missing touch in many designs. A beautiful system for displaying art in lobbies, corridors, or board rooms, its no nail design is unmatched. The Walker system can be color matched, installed on any surface, and is already widely accepted. Call or send for your free catalog (800) 234-7614.
Circle 65.

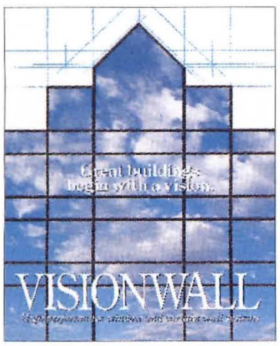
Stoneforms™ Landscape Lighting

Cast stone (FRC) illuminated landscape sculptures are offered in four unique styles. Fiber reinforced concrete lighting fixtures offer increased toughness and tensile strength. Choose from six natural colored mineral finishes. Shown above is the organically inspired Sierra style rendered in the Pumice finish. This model is available for incandescent or low voltage use, other designs are offered for fluorescent or HID lamps. Catalog available from WoodForm, Inc., of Portland, Oregon.
Circle 67.

Endicott Clay Products Co.

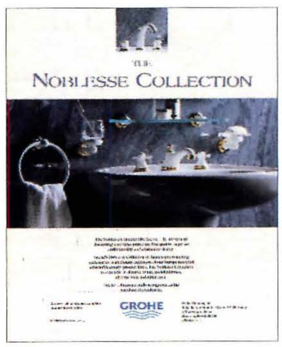
Read the book, see the movie. . ." In Partnership With The Imagination" is an aesthetically beautiful **brochure** featuring all the authentic Ironspot colors, a multitude of face brick and paver applications, and full-size product foldouts. It's also a **film.** A visual masterpiece capturing the grace and elegance of Endicott's nationally-renowned product line. For your **free** copies, circle the number listed below.
Circle 69.

Visionwall Technologies, Inc.



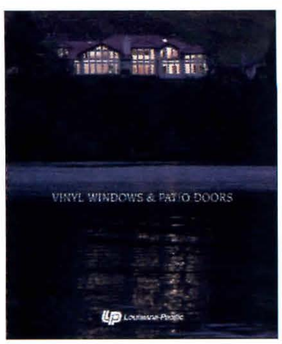
High Performance Window and Curtain Wall System. Create comfortable, energy-efficient indoor environments with the VISIONWALL® high performance window and curtain wall system. Features R-8 glazing, structural aluminum frame with 3 inch deep thermal break, great resistance to condensation, and excellent acoustical attentuation properties. Custom designed and precision manufactured for commercial, institutional and industrial applications.
Circle 71.

Grohe America, Inc.



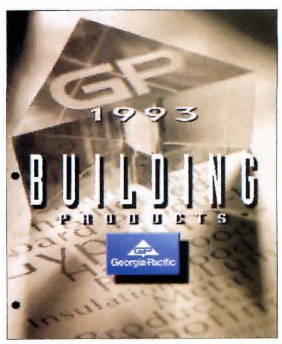
Grohe's Noblesse Collection by Grohe . . . for those with discerning taste who appreciate fine quality, superior craftsmanship and distinctive design. Grohe's Noblesse Collection of faucets and matching accessories is an elegant extension of their European-styled "affordable quality" product lines. The Noblesse Collection is available in chrome, white, polished brass, chrome/gold and white/gold.
Circle 73.

Louisiana-Pacific



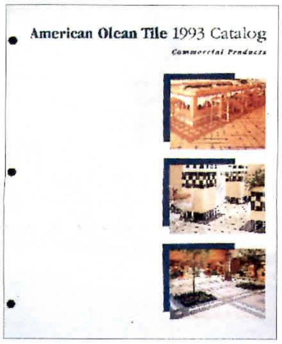
Louisiana-Pacific's vinyl windows and patio doors meet the most demanding new energy codes and are a perfect fit for new construction as well as replacement. Made with a new generation of stronger, modified uPVC, they resist rust, rot, scratches and dents. And they're available in a wide range of sizes and styles, including a large variety of custom shapes.
Circle 75.

Georgia-Pacific



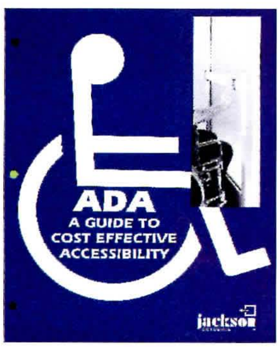
Divided into eleven product categories, the **1993 Georgia-Pacific Building Products Catalog** features information on decorative panels, engineered board products, gypsum, hardwood plywood, insulation, lumber, metal products, millwork, roofing, siding and structural panels. Call 1-800-BUILD-GP for your free copy.
Circle 77.

American Olean Tile Company



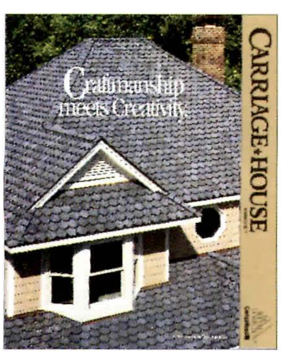
American Olean's 1993 Commercial Catalog Answers Specifiers' Needs. Full-color, 60-page catalog shows a full range of commercially-rated, quality ceramic tile, natural stone, installation materials, design services and Sample Xpress — a sample service for specifiers. An easy reference to determine size, color, trim, availability, usage, test results and ratings. Twelve products are identified as ADA COF recommended. Write to American Olean Tile Company, 1000 Cannon Avenue, Dept. A, Lansdale, PA 19446. **Circle 79.**

Jackson Exit Device



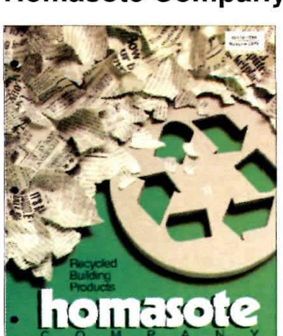
ADA CLEAR WIDTH PROBLEM SOLVED. You don't have to make costly door changes to meet ADA standards. The narrow profile, Jackson 2100 series exit devices are the only panic bars now available that meet the 32 inch ADA requirement in existing 36 inch doorways. Send for this free brochure today. Call 800-533-6229. CA only 800-585-6533.
Circle 83.

CertainTeed Corporation



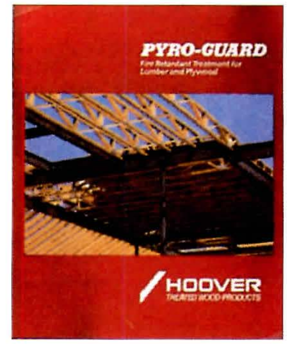
Carriage House Shangle™ Product Brochure. This 8-page product brochure features CertainTeed's Carriage House Shangle™, its newest designer asphalt shingle with a unique chamfered cut to provide the look of hand-crafted slate roofs. This free brochure includes color photos of Carriage House along with product specifications and warranty information.
Circle 87.

Homasote Company



Homasote Company's 1993 Sweet's Brochure of Recycled Building Products. This easy to read brochure provides a comprehensive description of the Homasote Company's full line of recycled building products — designed and manufactured with today's environmental concerns in mind. Included are detailed specifications, general application data, a variety of test results, sizes, codes and other relevant information. For more information contact Homasote at 1-800-257-9491.
Circle 91.

Hoover Treated Wood Products



NATIONAL EVALUATION REPORT ISSUED. PYRO-GUARD third generation fire retardant treated lumber and plywood is thoroughly strength-tested at high temperatures for roof sheathing, trusses and other structural applications. NER-457 on PYRO-GUARD contains strength adjustments and use recommendations based on a 50-year predictive period. Like all NER reports, it is subject to re-examination, revisions, and possible closing. Hoover Treated Wood Products, Inc.
Circle 81.

Wire Crafters Inc.

Four page brochure describes this line of all steel woven wire lockers for multi-family building storage areas. Choose from single or double tier units. A variety of in stock or custom sizes available. Easy to install. Many advantages over solid wall lockers. Send for free brochure or call 1-800-626-1816. Wire Crafters Inc., 6208 Strawberry Lane, Louisville, KY 40214-2900.
Circle 85.

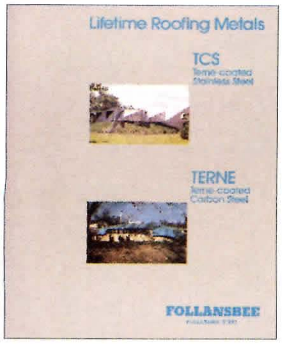
Advance Lifts, Inc.

Only an Advance Safety Dock Lift can service all trucks. If your dock is too high or too low or if you don't have a dock, you need a dock lift. A dock leveler installed at a 48" dock can only service a limited range of trucks – a dock lift can service them all. Dock accidents occur when you try to load or unload trucks that don't line up with your dock – a dock lift eliminates the problem. Avoid accidents and improve productivity at your dock by making it 100% accessible with a dock lift.
Circle 89.

SPI Lighting

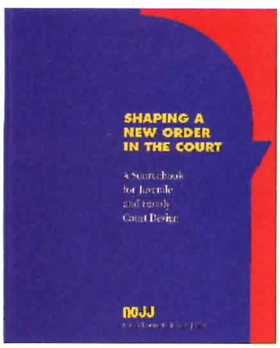
New Options Series Ideal For Low-Ceiling Applications. The contemporary, low-profile fixture series provides exceptionally wide, balanced indirect light distribution. In addition to pendant units, the Options series also includes wall and ceiling-mount fixtures as well as wall sconce and pier mount versions. Down-lighting and an acrylic bottom shield in a variety of shapes and colors are offered as accessories.
Circle 93.

Follansbee Steel



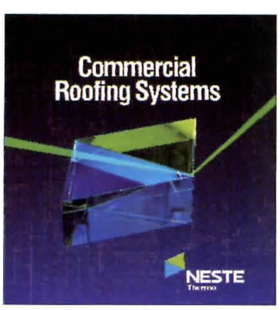
Two Lifetime Roofing Metals. Two roofing metals are manufactured by Follansbee Steel. TCS, terne-coated stainless steel, is 304 architectural stainless coated with a terne alloy. Terne is copper-bearing carbon steel coated with the same terne alloy. TCS does not require painting and weathers naturally to a warm, attractive gray. Terne requires painting with TerneCoat, a two-paint system developed by Follansbee.
Circle 95.

National Center for Juvenile Justice



A Sourcebook for Juvenile and Family Court Design. Compiles the insights of those who have built juvenile and family court facilities within the past decade and molds these lessons from the crucible of experience into a set of design principles for juvenile and family courts. A 78-page focused reference document assembled with professional guidance from an eminently qualified panel of judges, architects, social workers, and court administrators. Order today at $32 per issue by phone (412) 227-6950 or by FAX (412) 227-6955.
Circle 99.

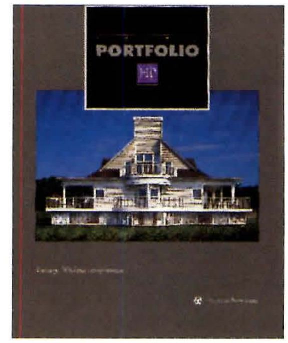
NESTE/Thermo



Free Commercial Roofing Systems Catalog. A complete catalog of our technologically advanced roofing systems, including detail drawings, specifications, physical properties and warranty information. A tremendous aid to specifiers of commercial roofing systems. Cold Process Roofing Systems; Modified Asphalt Build-up Roofing Systems; SBS Modified Bitumen Roofing Systems. NESTE/Thermo, P.O. Box 86379, San Diego, CA 92138. (800) 882-7007, (619) 272-0061.
Circle 103.

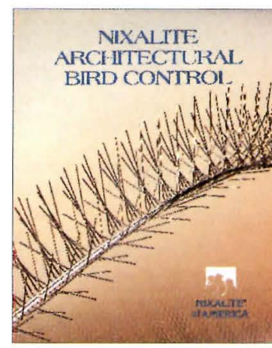
For further information on Architecture's Literature Portfolio:
Jan Johnson
Johnson & Associates
1625 Oak Hill Road
Chester Springs, PA 19425
Phone: 1-800-642-4866
Fax: 1-215-983-0655

Wolverine Technologies



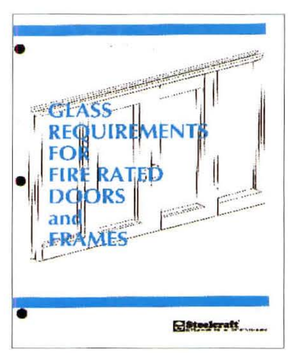
Restoration Portfolio HP™ is the luxury High-Performance vinyl siding for architects committed to total quality and customer satisfaction. Its strength, bold shadowlines, rich colors, satin-like finish and complementary accessories provide a lifetime of outstanding beauty for homeowners who demand the ultimate in beauty, durability and convenience. Luxury without compromise. Contact Wolverine Technologies at 1-800-521-9020.
Circle 97.

Nixalite of America Inc.



NIXALITE ARCHITECTURAL BIRD CONTROL. The Bird and Climbing Animal Control standard bearer for quality, **Nixalite of America Inc.**, offers a new color brochure describing the versatility and effectiveness of their Stainless Steel Needle Strips. Worldwide use of almost a century qualifies Nixalite as pioneers in bird, climbing animal and human intruder deterrents.
Circle 101.

Steelcraft



Glass Requirements For Fire Rated Doors and Frames. Steelcraft has added to its product information base an eight page brochure and Technical Data Sheet that outlines the requirements of glass in fire rated doors/frames and covers wire glass and many of the clear glazing materials that can now be included in fire rated doors and frames. To obtain your free copy of Catalog No. 585 and/or Technical Data Sheet 107-21, write to Steelcraft Manufacturing Co., 9017 Blue Ash Road, Cincinnati, Ohio 45242, or call (513) 745-6400.
Circle 105.

Pemko Manufacturing Co.

Weatherstrip/Thresholds/Continuous Hinges. Pemko's full-line catalog illustrates a broad line of weatherstripping and threshold products. Pemko offers many fire labeled, smoke labeled, barrier-free access, sound tested, and custom fabricated products. New products include: ADA compliant ramp threshold assemblies, PemkoHinge™ continuous geared aluminum hinges, non-handed reversible automatic door bottoms, a series of locking astragals, and smoke-labeled gasketing. Call (805) 642-2600; toll-free (800) 283-9988.
Circle 107

Last Chance

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

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

ACI Glass Products
Get the facts on the entire ACI Glass product line.
Circle No. 44

Advance Lifts, Inc.
Write for free information on our Advance Superdock.
Circle No. 90

AFM Corporation
Our R Control building panel electronic CADalog is free to qualified professionals.
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American Marazzi Tile
The honesty of natural stone; the serenity of contemporary color: Dolomiti by Marazzi.
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American Olean Tile
We offer more tiles, installation products and support services than anyone else.
Circle No. 12

American Stair-Glide
We offer a wide range of Porch-Lift Vertical Platform Lifts.
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Andersen Corporation
In today's designs, it's the brand that helps architects take value to new heights.

Armstrong World Industries
Possibilities™ vinyl sheet flooring features fabric-like visuals.
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Artiface
Send for details on our Intuitive 3D CAD.
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ASC Pacific, Inc.
Our steel roofing systems electronic CADalog is available to qualified professionals.
Circle No. 130

ASG
Find out why ASG CAD technology is intelligent CAD Technology.
Circle No. 30

ASG-Vertex
Get details on our Electronic CADalogs™. The intelligent building product catalogs.
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Autodesk, Inc.
Send for our free brochure outlining our new easy-to-learn AutoCAD® for Windows.
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Bethlehem Steel
Call or write for information on prepainted Galvalume Sheet.
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Specify Bobrick; the only complete line of washroom accessories that meets ADA Guidelines.
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Bradley Futura Faucets with Accu-Zone control save water and maintenance.
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Cedar Shake & Shingle Bureau
Announcing 1993 Cedar Shake & Shingle/AIA Architectural Awards Program.
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Chicago Faucet Co.
Send for our new ADA compliant Product Catalog today.
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Cold Spring Granite
Write us for the latest innovations in Granite construction technologies.
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Cosmit
Find out why so many people come from all over to attend the Salone del Mobile.
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Today's Dorma line of surface closers is unequaled by any other in the world.
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DPIC Companies
Find out more about our Professional Liability Education Program.
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Eliason Corporation
Get the details on our custom built Easy Swing® Double Action doors.
Circle No. 6

Finestone-Simplex Products Div.
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Circle No. 134

Follansbee Steel
TERNE and TCS®, terne-coated stainless steel, are establishing records of longevity.
Circle No. 86

Forbo Industries
Introducing Marmoleum—the new standard in linoleum.
Circle No. 70

Georgia Pacific
G-P Dens-Glass® Gold is named for its unique gold alkali-resistant coating.
Circle No. 110

Glen Raven Mills
Find out more about Sunbrella® acrylic fabric and Sunbrella Firesist(R) fabric.
Circle No. 48

Gold Bond Building Products
We've consolidated our product literature into a comprehensive guide.
Circle No. 38

Grohe America, Inc.
Our commercial faucets have no equal when it comes to design, engineering and reliability.
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Haws Drinking Faucet
We have a style, a color, and a finish that's suited for your every mission.
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We give you a choice of windows that offer the option to tune a building for the most energy efficiency possible.
Circle No. 68

Institutional Products Corp.
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Circle No. 96

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JPS Elastomerics Corp.
Our roofing systems electronic CADalog is available to qualified professionals.
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Kawneer Company, Inc.
Serving the most advanced needs of the architect.
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Kim Lighting
Introducing Curvilinear Cutoff Series—Send today for more information.
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LCN Closers
We have a door closer for most entrance accessibility situations.
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Louisiana-Pacific
Send for details on our Inner-Seal Lap Siding.
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Merchandise Mart
Call or write for more information on Neocon 1993.
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Mitsubishi Electronics America
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Musson Rubber Co.
Fluff Cord Tile is exceptionally durable in heavy wear areas. Get details today.
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National Propane Gas Assn.
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Keep birds off your structural designs—include Nixalite® Architectural Bird Control.
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Nucor Vulcraft Div.
Before your next project, consider Vulcraft steel joists.
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Let our Commercial Division provide innovative solutions for your window challenges.
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Pemko Products
Introducing Pemko Hinge™—Continuous geared aluminum hinges.
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Petersen Aluminum
Send for more information on our PAC-CLAD Roofing System.
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Our walls last because we put performance and quality first.
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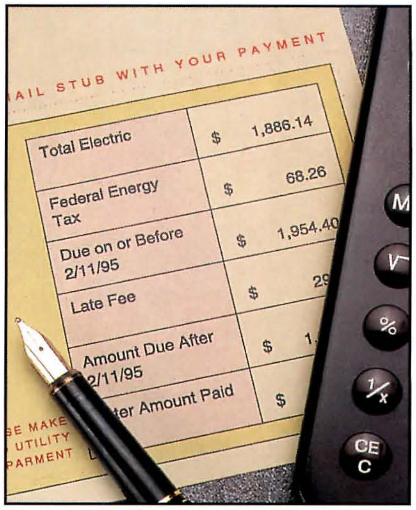
BILL BILL



ANY QUESTIONS?

Clinton's new energy policy means your taxes will be gauged by a thermometer... and your old leaky roof could push your "contribution" deep into the red. Premium Polymers roofing systems are unique insulating waterproof blankets of protection which control operating expenses by maximizing heating and cooling dollars. Continuous polymeric layers of coverage seal the roof, dramatically reducing thermal transfer and energy robbing moisture. And while you're saving precious energy resources and tax dollars, you can also please "Al" by using Premium systems which are 95% less ozone depleting than those old CFC bearing roofs.

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The Engineered Roofing Resource

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Circle 147 on information card

Project Credits

CHILDREN'S MUSEUM OF HOUSTON HOUSTON, TEXAS

ARCHITECT: Jackson & Ryan Architects, Houston—Jeff Ryan (principal-in-charge); Martha Seng (project architect); Charles Keith, Dean Stermer, Louis DeLaura (design team)
ASSOCIATE ARCHITECT: Venturi, Scott Brown & Associates—Robert Venturi, Denise Scott Brown (principal designers); Steven Izenour, R. David Schapp, Nancy Rogo Trainer (project designers)
LANDSCAPE ARCHITECT: SWA Group
ENGINEERS: Haynes Whaley Associates (structural); CHP & Associates (mechanical/electrical); R.A. Peyton & Associates (civil)
GENERAL CONTRACTOR: H.A. Lott
COST: $3.9 million—$90/square foot
PHOTOGRAPHER: Paul Hester

STACY'S & MICHAEL'S TREEHOUSE BETHESDA, MARYLAND

ARCHITECT: Glenn + Williams Architects, Baltimore, Maryland
GENERAL CONTRACTOR: Alpine Pools
PHOTOGRAPHER: Richard Anderson

PRIMARY SCHOOL 5 NEW YORK CITY

ARCHITECT: Gruzen Samton Steinglass Architects, Planners & Interior Designers, New York City—Peter Samton (partner-in-charge); George Luaces (associate partner/principal designer); Mani Muttreja, Lorraine Maxwell, Norris McLeod, Liz Ortiz, Deirdre Weeks, Moses Ros, John Soracci, Yuh-Hwa Hung (project team)
LANDSCAPE ARCHITECT: Landgarden
ENGINEERS: Severud Associates (structural); Syska & Hennessy (mechanical/electrical)
CONSULTANTS: Domingo Gonzalez Design (lighting); Amis Construction (cost); Romano Gatland (food service)
CONSTRUCTION MANAGER: George A. Fuller
GENERAL CONTRACTOR: E.W. Howell
COST: $23.4 million
PHOTOGRAPHER: Chuck Choi

PRIMARY SCHOOL 6 NEW YORK CITY

ARCHITECT: Gruzen Samton Steinglass Architects, Planners & Interior Designers, New York City—Peter Samton (partner-in-charge); George Luaces (associate partner/principal designer); Mani Muttreja, Lorraine Maxwell, Liz Ortiz, John Pease, Gabriella Teodor, Juan Posse, Yuh-Hwa Hung (project team)
LANDSCAPE ARCHITECT: Landgarden
ENGINEERS: Severud Associates (structural); Syska & Hennessy (mechanical/electrical)
CONSULTANTS: Domingo Gonzalez Design (lighting); Amis Construction (cost); Romano Gatland (food service)
CONSTRUCTION MANAGER: U.R.S.
GENERAL CONTRACTOR: Turner Construction
COST: $18.5 million
PHOTOGRAPHER: Chuck Choi

PRIMARY SCHOOL 23 NEW YORK CITY

ARCHITECT: Perkins & Will, New York City—Phil Szujewski (principal-in-charge); Ephraim Wechsler (principal-in-charge); Barbara D'Agostino (project manager); Deepika Ross (project architect); Victoria Brancu, Ed Gulamerian, Elizabeth Pacheco, Aaron Schwartz, David Whitaker (design team)
LANDSCAPE ARCHITECT: Zion & Breen
ENGINEERS: Weidlinger & Associates (structural); H.C. Yu & Associates (mechanical/electrical)
GENERAL CONTRACTOR: Petrocelli Construction
COST: $38 million
PHOTOGRAPHER: Chuck Choi

PRIMARY SCHOOL 279 NEW YORK CITY

ARCHITECT: Perkins & Will, New York City—Phil Szujewski, Ephraim Wechsler (principals-in-charge); Barbara D'Agostino (project manager); Deepika Ross (project architect); Victoria Brancu, Ed Gulamerian, Elizabeth Pacheco, Aaron Schwartz, David Whitaker (design team)
LANDSCAPE ARCHITECT: Zion & Breen
ENGINEERS: Weidlinger & Associates (structural); H.C. Yu & Associates (mechanical/electrical)
GENERAL CONTRACTOR: Petrocelli Construction
COST: $32 million
PHOTOGRAPHER: Chuck Choi

PRIMARY SCHOOL/ INTERMEDIATE SCHOOL 217 NEW YORK CITY

ARCHITECT: Michael Fieldman & Partners, New York City—Michael Fieldman (principal-in-charge); Miles Cigolle (design partner); Ed Rawlings (project architect); Clint Diener, Charles Orton, David Hendershot (project team)
CONSTRUCTION MANAGER: HRH Construction
GENERAL CONTRACTOR: Herbert Construction
COST: $21.4 million—$214/square foot
PHOTOGRAPHER: Chuck Choi

THE CHICKEN

ARCHITECT: William Adams Architects, Santa Monica, California
STRUCTURAL ENGINEER: Parker-Resnick
GENERAL CONTRACTOR: Serrurier & Associates

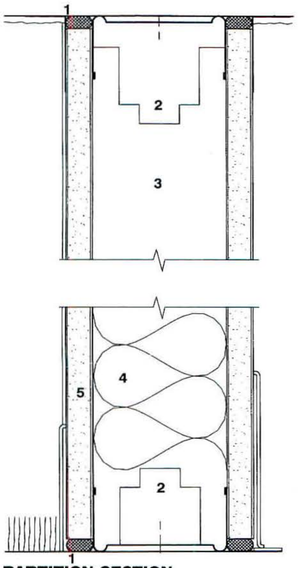
WARNER BROS. CHILDREN'S CENTER BURBANK, CALIFORNIA

ARCHITECT: Rios Associates, Los Angeles, California—Mark Rios (principal); Frank Clementi (project architect); Hsuan-Ying Chou (interior design); Julie Smith, Charles Pearson, Virginia Faust, Dana Sigal, Richard Levy (design team)
ENGINEERS: Niver Engineering (structural); Mirahmadi & Associates (mechanical/electrical); Engineering Concepts (civil)
CONSULTANTS: Paul S. Venklausen & Associates (acoustical); Family Resource Centers (child care); Finish Hardware Technology (hardware)
COST: Withheld at owner's request
PHOTOGRAPHERS: David Hewitt and Anne Garrison

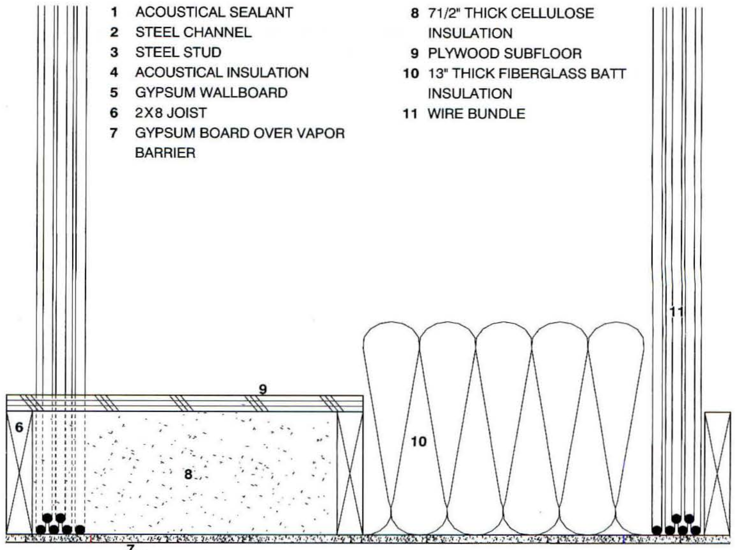
CHILDREN'S HOSPITAL AND HEALTH CENTER SAN DIEGO, CALIFORNIA

ARCHITECT: NBBJ, Seattle, Washington—James O. Jonassen (principal-in-charge); Patrick T. James (principal-in-charge of design); Peter Damento (lead designer); David L. Noferi (project manager); James Brinkley (lead hospital planner); Marcel A. Schwarb (lead technical architect); Christopher Larson (interior designer); Scott Boyer, Rosemary Carraher, Robin Dalton, C. Henry Liu, Michael McCann, Tony B. Stewart (design team)
LANDSCAPE ARCHITECT: KTU+A
ENGINEERS: Willis-McNaughton and Associates (structural); G.E.M. Engineering (mechanical); Brown-Zammitt Engineering (electrical)
CONSULTANTS: Towne, Richard & Chaudiere (acoustical); David Robinson Design (graphics/signage); SyArt Parking Structures (parking); Basmaciyan-Darnell (traffic); Lerch Bates Hospital Group (materials handling); Group Delta Consultants (soil/geotechnical); The Aesthetics Collection (art)
GENERAL CONTRACTOR: Centex Gold Construction Company
COST: $32 million—$168/square foot
PHOTOGRAPHERS: David Hewitt and Anne Garrison

No excuses after this information exchange



PARTITION SECTION



INSULATION: Cellulose (left) fills less space than fiberglass (right) with same R-value.

Insulation

CSI Section 07220

Loose-fill Performance

We insulate wood truss roof systems with loose-fill, blown-in cellulose fibers that are chemically treated with a fire retardant to exceed the fire safety tests established by ASTM C 739. Loose-fill cellulose offers many advantages over fiberglass batt insulation: It is ideal for angular, sloped, or vertical surfaces and can be installed to a uniform thickness. Air infiltration is reduced, thus providing higher energy efficiency. Cellulose fibers also absorb sound and reduce noise penetration better than fiberglass. Within a typical 2 x 8 joist or rafter, with a nominal $7^1/2$-inch thickness, cellulose provides an insulation value of R-30. It would take nearly 13 inches of fiberglass to achieve the same value (top right).

J. Kenneth Payne, Jr., AIA
The Moseley McClintock Group
Richmond, Virginia

Detail Correction

The partition section in February's NEAT file (page 128) would not be held firmly in place, since the drawing does not indicate that the head track, or channel, is fastened to the structure above. The drawing (top) details the proper way to construct a structurally sound partition wall with the desired acoustical insulation.

William Krisel, AIA
William Krisel, Architect
Los Angeles, California

Fasteners

CSI Section 06050

Nail Substitutes

During our forensic investigations of wood structures, we discovered that "sinker" nails had often been substituted for the common nails specified by the building's architect or engineer. Sinker nails are one size smaller in diameter and one size shorter than common nails and, therefore, have less structural strength than the design values calculated for common nails. They usually are coated in a greenish or yellowish vinyl for easier penetration into wood framing members. But this vinyl coating also allows the nails to pull out when placed under stress. Sinker nails have approximately 7 percent to 36 percent less shear strength than comparable common nails. Therefore, the California State Architect's office will not permit them to be specified for school projects, and architects would be well advised not to allow such nails to be used for any of their projects. When noting nail sizes for wood framing—especially floor and roof diaphragms—and plywood shear panels on their drawings, architects should specify that all fasteners be common nails. They should also verify proper nailing practices by conducting a sampling of nail size and spacing during periodic site visits.

Edward K. Takahashi, AIA
O'Leary Terasawa Partners, Architects
Los Angeles, California

Firestopping

CSI Section 07270

Partition Alternatives

The composition of sound attenuation blankets can directly affect the ability of fire-rated wallboard partition assemblies to resist the spread of flames and heat. For example, a one-hour fire-rated steel-framed partition usually contains a sound attenuation blanket with a layer of wallboard attached to both sides of the studs. When the partition consists of Type X 1/2-inch (12.7-mm) wallboard with a glass-fiber sound attenuation blanket, the assembly will not pass the one-hour rating if it is fire-tested in accordance with ASTM E119 Fire Tests of Building Construction and Materials. This failure has been attributed to glass fiber's tendency to disintegrate when subjected to temperatures as high as 1,050 degrees Fahrenheit (565 degrees Celsius). However, when the same assembly is tested with Type X 5/8-inch (15.9-mm) wallboard, it will pass the one-hour rating test. Mineral fibers, too, can resist temperatures of more than 2,000 degrees Fahrenheit (1,100 degrees Celsius). Substituting mineral fiber for glass fiber in either wallboard assembly has been documented to pass the one-hour test.

Timothy T. Taylor, AIA, CSI, ASTM
Skidmore Owings & Merrill
Washington, D.C.