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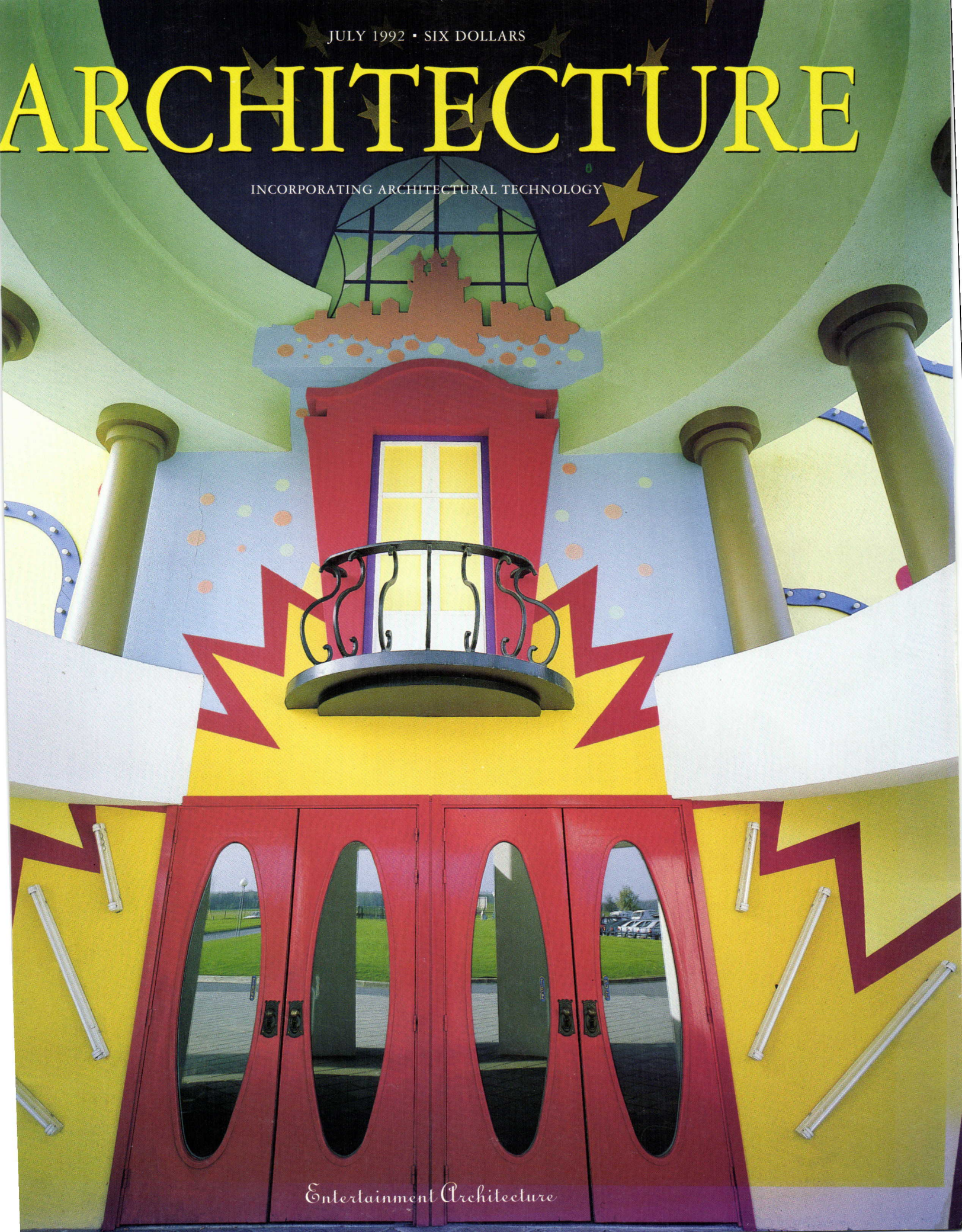
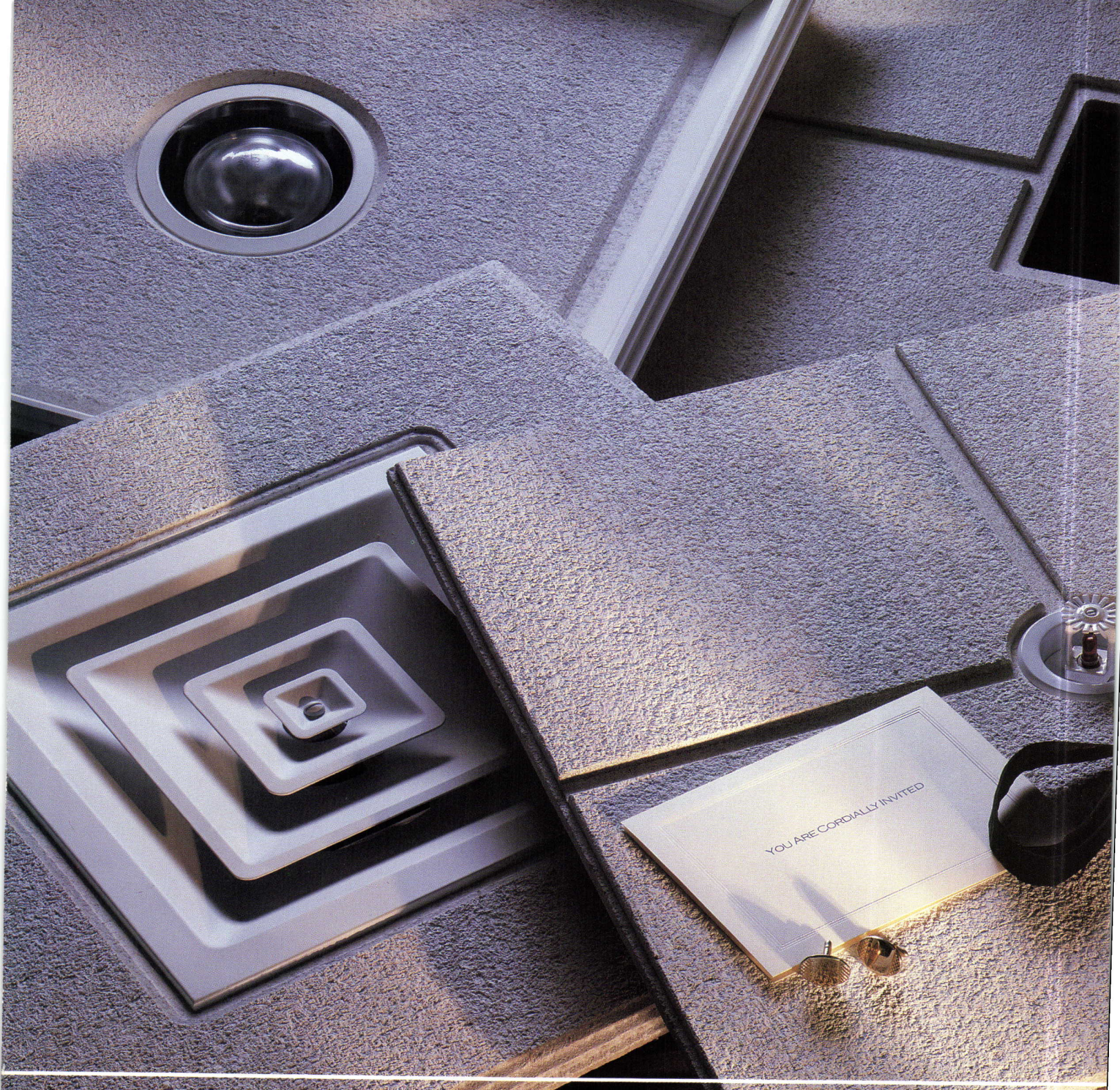


Entertainment Architecture



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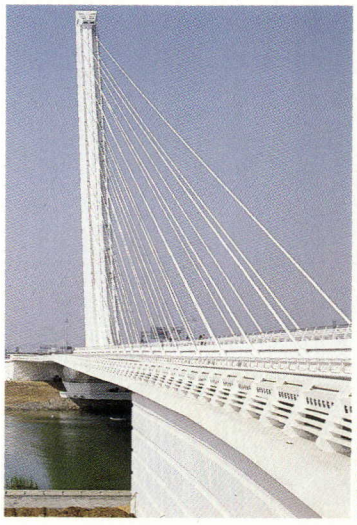
Entertainment's Lessons

IT HAS BECOME FASHIONABLE TO DISMISS EXAMPLES OF ENTERTAINment architecture, the subject of this month's issue, as cultural wastelands unworthy of serious consideration. The easy target of such criticism is the recent spate of projects commissioned by the Disney Company, a multibillion-dollar industry built entirely on leisure. "Disneyfied" has become a pejorative term applied to buildings deemed as sanitized and artificial as the Magic Kingdom's Main Street and its simulated "lands."

Disney's growing empire and other entertainment colonies may not offer the most innovative architecture of our day, but they do provide significant lessons in urban design. The fantasy of the Magic Kingdom, for example, is tightly controlled by an efficient backstage operation, a virtual city within a city, unseen by the millions who visit the theme park. Its successful separation of "served" and "servant" spaces, which takes Louis Kahn's dictum to the extreme, is a valuable model for other public spaces. Disney's latest creation, Euro Disney outside Paris (pages 41-63), adds a welcome twist to this formula with a pedestrian-oriented plan that is neatly linked to public transportation, elevating the hotel and theme park complex to a new level of urbanism. With its low-scale buildings, lakeside promenades, and centrally located train station, bus depot, and parking, Euro Disney seems absolutely civilized when compared with the desolate housing projects designed by Ricardo Bofill and others just a few miles away.



PAOLO ROSSELLI

ALAMILLO BRIDGE, SEVILLE, BY SANTIAGO CALATRAVA

Other entertainment architecture featured in this issue achieves even more successful urban integration. HOK Sport's Oriole Park at Camden Yards in Baltimore (pages 64-71) assumes a civic presence in its downtown location, spurring renovation of a 19th-century warehouse and railroad station. Inspired by old-fashioned ballparks, the architects tailored the stadium to its site, giving the new building a human scale that fits into the adjacent residential neighborhoods.

Likewise, Expo '92 (pages 72-79) has brought civic amenities to its host city, Seville. The fairgrounds on the island of Cartuja comprise a complex of gardens and pavilions, interlaced with a sophisticated telecommunications network, that will become a research park after the exposition closes in October. Seville has also invested in new infrastructure—$10 billion worth of highways, bridges, an airport, hotels, housing, and cultural facilities. New construction throughout the city and fairgrounds reveals both environmental sensitivity and national diversity.

The successful planning of this trio of entertainment venues is due to a high level of architectural patronage, involving clients' willingness to risk new design prototypes. The urban plan and regionally inspired hotels of Euro Disney resulted from a charette among five firms, rather than a prescribed formula from Orlando's Disney World; the Orioles's model ballpark at Camden Yards developed as a result of HOK Sport's continuing investigations into baseball stadium design (pages 88-89); and the successful infrastructure of Expo '92 proceeded from Seville's decision to invest in the best Spanish talent.

While elements of these projects may stress theatrical effects over architectural substance, such large-scale recreational settings should not be entirely dismissed. As popular attractions, they are rare opportunities to educate the public about the value of design. Moreover, when fine-tuned to the particulars of a place, as in Baltimore and Seville, entertainment architecture can catalyze tourism and urban renewal, invigorating local economies and restoring civic pride. ■

—DEBORAH K. DIETSCH

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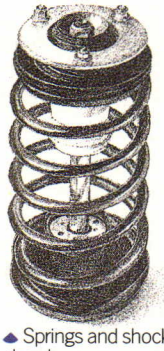

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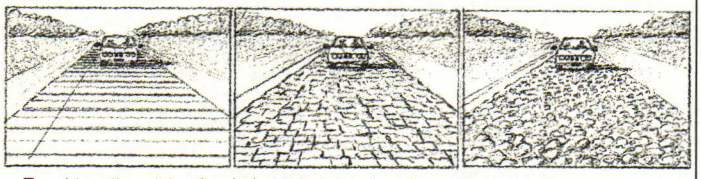

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Practice Makes Perfect

Your May issue on practice alternatives had more "meat" for the profession to chew on than I've seen in any publication for a long time. The articles in the Technology and Practice section were both interesting and timely; "Carving a Niche for the '90s" (pages 95-101) was especially on target for our firm. Thanks for keeping the profession focused and thinking forward into our future.

Rand Elliott, AIA
Elliott + Associates Architects
Oklahoma City, Oklahoma

I enjoyed the article "New Directions in Project Delivery" (May 1992, pages 87-91) and, although I found some of the comments reassuring (yes, we are embroiled in a contractor delay claim on a government project), it's inexcusable that the public-sector client—the group that most major architectural practices live on—is also the one that attracts most of the delay claims. The hybrid design-build delivery system may be an attractive alternative, although it can diminish the design architect's control during the documentation and construction phase. However, the traditional design-bid-build system will be around for some time, and it's important that the AIA inform the profession and these client groups of the pitfalls, so together they can formulate strategies to dig us out of this delay-claims hole. Panels such as yours are a good start.

Hank Koning, AIA
Koning Eizenberg Architecture
Santa Monica, California

I've never before written a letter to the editor of a professional journal, but then I've never read such a superb issue as the one you published in May. I read it cover to cover, and couldn't put it down. The topic of practice alternatives is timely and critically important as we attempt a long-overdue redefinition of the practice of architecture. The featured profiles of architects, roundtable discussion, and articles on alternative delivery systems and total quality management were well-written and beautifully coordinated into a useful and provocative document. The issue has already generated significant discussion within our office, and promises to be a significant resource. Keep up the good work!

Steven G. Ziger, AIA
Ziger Hoopes & Snead
Baltimore, Maryland

Your editorial "Silent Architects" addresses a problem of long standing within the American Institute of Architects. Although I have been a member of AIA ever since my registration as an architect in California, as a civil servant engaged in public-works architecture, I felt like an unwanted stepbrother—my local chapter has been oriented solely toward those in private practice.

Public works such as dams, pumping plants, fish hatcheries, and bridges are mainly designed by public agencies with their own engineering staff. In many instances, to keep costs down, very little thought is given to long-term consequences, with emphasis on expediency instead of form and functional efficiency. However, I have had a unique op-

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portunity to impress upon the engineers of California's State Water Project that such public-works projects need architects.

I totally agree with your point that "these architects working outside private firms are just as valuable to this process as their conventional counterparts." It is high time that the AIA give more attention, recognition, and encouragement to these "silent" architects.

Frank Vincent Lee, AIA
Grants Pass, Oregon

Corrections

In 1983, Dennis Irvine, not Michael Irvine, founded Irvine Associates Architects (May 1992, page 99).

Richard Gluckman Architects is currently at work on the Andy Warhol Museum in Pittsburgh (May 1992, page 25).

Dominick Associates Architects merged with Urban Design Group, the firm that should be credited as design architect and architect-of-record for Disney Development Company's Wilderness Lodge Resort (May 1992, page 50).

July 9-11: International Design Exposition at the Anaheim Convention Center. Contact: Bill Schoenfisch, (914) 658-8393.

July 23-26: "Genuine Regionalism," the AIA Design Committee meeting at the Maine Maritime Academy in Castine, Maine. Contact: Sheri Daniel, (202) 626-7300.

Aug. 1-2: "Campus Master Planning," AIA Architecture for Education Committee program in Minneapolis with the Society for College and University Planning. Contact: Cristopher Gribbs, (202) 626-7589.

Aug. 3: Registration opens for an affordable multifamily housing design competition, sponsored by the San Diego Housing Commission. Contact: (619) 525-3610.

Aug. 15: Registration deadline for an AIDS housing design competition cosponsored by the City of Boston Public Facilities Department and the Boston Society of Architects. Contact: Timothy Smith, (617) 635-0331.

Aug. 21: Deadline for entry forms for AIA/San Francisco Interior Architecture Awards. Contact Yoshiko Asato, (415) 362-7397.

Aug. 31: Deadline for submitting to the Chicago Athenaeum International Exhibit on Black Architects. Contact: Carolyn Davis, (312) 266-0269.

Sept. 23-24: Capital Design Week at the Washington Design Center in Washington, D.C. Contact: (202) 554-5053.

Sept. 24-27: "21st-Century Outlook: Images of the Architectural Profession," joint conference in Berkeley, California, of the AIA Corporate Architects, Public Architecture, and Architects in Education Committees. Contact: Marc Gravellese, (202) 626-7539.

Sept. 26-Nov. 14: National Institute for Architectural Education career days. Contact: Lauren Yessayan, (212) 924-7000.

Oct. 15-17: "Design America," Designer's Saturday at IDCNY and throughout Manhattan. Contact: IDCNY, (718) 937-7474.

Oct. 28-30: Metalcon International 1992 at McCormick Place in Chicago. Contact: Claire Kilcoyne, (617) 965-0055.

Oct. 30-31: Emerging Classical Architects conference, sponsored by the Classical Architecture League. Contact: Michael Lykoudis, (219) 239-6168.

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NEWS

Barcelona's New Architecture • Chicago's Rookery Restored

Los Angeles Riots Spur Design Community Action

MONTHS BEFORE VIOLENCE BROKE OUT IN South Central Los Angeles, the local branch of the National Organization of Minority Architects (NOMA) had been planning ways to encourage the citizens living and working along the blighted Crenshaw corridor to improve their surroundings. When the riots began in April, NOMA was preparing a letter to send to area newspapers urging residents to call for better neighborhoods. Since then, the organization has doubled its efforts by meeting with community groups and aligning itself with professional associations anxious to do more than replace those structures that were lost. "It is not a question of rebuilding, but of recreating," states NOMA President W. Pedro Newbern.

Just how to recreate a devastated area the size of Boston presents serious challenges to a profession that has been criticized for abandoning social issues over the last two decades. The question of where and how to start rebuilding has given rise to a flurry of meetings and coalition-building within the Los Angeles design community. More than 12 groups, including NOMA, AIA/Los Angeles, the Asian American Architects/Engineers Association (AAAE), the Korean American Institute of Architects (KAIA), and the Society of Hispanic Professional Engineers (SHPE), have formed the Council of Organizations Allied to Lead Initiatives That Institute Opportunities Now (COALITION). Since mid-May, COALITION has established a hotline (213-380-1751) to coordinate volunteers and services; conferred with former Baseball Commissioner Peter Ueberroth, now head of the Rebuild L.A. task force; and convened weekly meetings to try to determine how the design community can best facilitate reconstruction. Architect Gregory Villanueva and other SHPE members, for example, have been organizing residents in the South Central Los Angeles Pico-Union district and in unaffected East Los Angeles neighborhoods to determine plans for redevelopment and physical improvements. "Rather than look to civic leaders, we want to help residents ask themselves what they want their community to be," explains NOMA's Newbern, who has been attending neighborhood meetings in the Vernon Central area, and building ties with additional community groups since late May.

On the advocacy front, the Local Initiatives Support Council (LISC), a national organization that provides financial and technical assistance to nonprofit developers, has been working alongside the city's Coalition of Nonprofit Developers to help merchants, homeowners, clergy, and other community members assess their redevelopment needs. Once they determine their goals, neighborhoods will invite design professionals to participate in planning workshops. The goal of this two-stage process, which has begun in 10 South Central and East Los Angeles neighborhoods, is to make "each community its own builder," according to Denise Fairchild, director of LISC in Los Angeles.

This new, community-based planning process reflects a shift from late-1960s urban renewal efforts. As AIA/Los Angeles President-elect Kate Diamond points out, "Architects now have an important opportunity to demonstrate that the quality of planning and design can make a difference in the overall health of the community." But she adds, "We are not the solution, we are just a part of it." As more community groups assess the damage and begin to pinpoint their needs, COALITION will continue to assemble teams of architects, planners, and landscape architects in order to guide residents and business-owners through the rebuilding process.

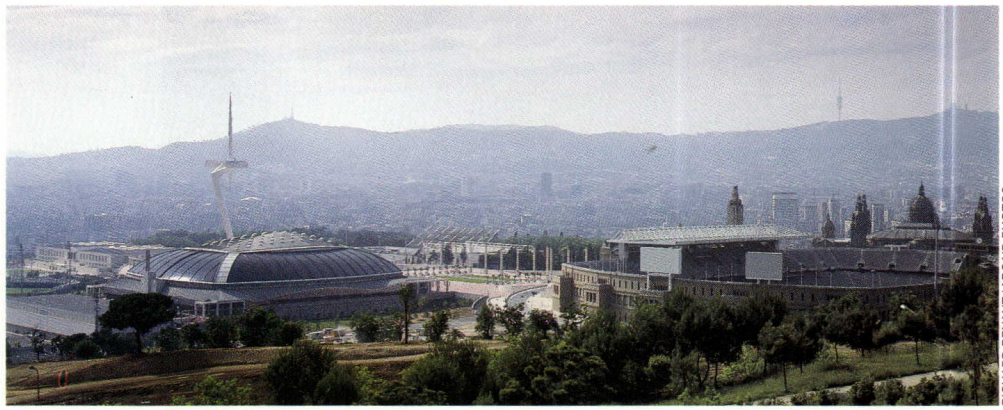
—KAREN SALMON

BARBARA FANTONE

Burned-out buildings and debris still dominate areas of the South Central Los Angeles streetscape. Historic buildings damaged during the riots include three 1920s-era commercial buildings (top) and a postwar furniture store (top right). James D. Black (above, left in photo), member of the AIA/Los Angeles Disaster Emergency Services Committee's task force; Seraphima Lamb, co-chair of COALITION; Richard Appel, President of AIA/LA; and task force committee Chair Carl F. Meyer survey the ruins of one of approximately 1,200 buildings damaged during the riots.

DETAILS

James Stuart Polshek and Partners, **Metcalf Tobey & Partners**, and the **Native American Design Collaborative** have been selected to design the National Museum of the American Indian Collections Research Center, a 200,000-square-foot museum and storage facility in Suitland, Maryland. **Robert A.M. Stern Architects** is designing a feature animation film studio for Disney's new Burbank campus, masterplanned by **Cooper Robertson and Partners**. Japanese architect **Arata Isozaki** won an international competition to design a convention hall on a 62,000-square-foot site near the train station in Nara, Japan. Finalists included **Hans Hollein**, **Mario Botta**, **Christian de Portzamparc**, and **Tadao Ando**. In May, **Ando** was awarded the first Carlsberg Architectural Prize of $250,000 by Queen Margrethe of Denmark. **Tod Williams Billie Tsien & Associates** has been selected to design a visual and performing arts center for Clark University in Worcester, Massachusetts. Located in Telluride, Colorado, **Rob Wellington Quigley**'s house for movie director Oliver Stone is scheduled to be completed this month. Architect **David Raphael Singer**, with artists Robert Irwin and Richard Fleischner, is designing galleries for the San Diego Museum of Contemporary Art's second location, within **Helmut Jahn**'s America Plaza. **Milton Herson**, a New Jersey real estate attorney and developer, has been named commissioner of the U.S. General Services Administration's largest unit, the Public Buildings Service, which manages more than 7,400 government-owned or leased buildings. San Francisco-based **Crosby Helmich Yandell & Drake Architects** has been commissioned to design a museum in Montebourg, France, dedicated to the U.S. Air Force's role in the Normandy invasion during World War II. **Herbert Muschamp**, a New York-based writer and founder of Parsons School of Design's graduate program in design criticism, has succeeded **Paul Goldberger** as the architecture critic of the *New York Times*. The partners of **Notter Finegold + Alexander** have separated to form two new firms: **Notter + Associates** of Washington, D.C., and **Finegold Alexander + Associates** of Boston.



RICHARD BRYANT / ARCAID PHOTOS

SAN JORDI SPORTS PALACE, ARATA ISOZAKI (LEFT), 1929 OLYMPIC STADIUM (RIGHT)

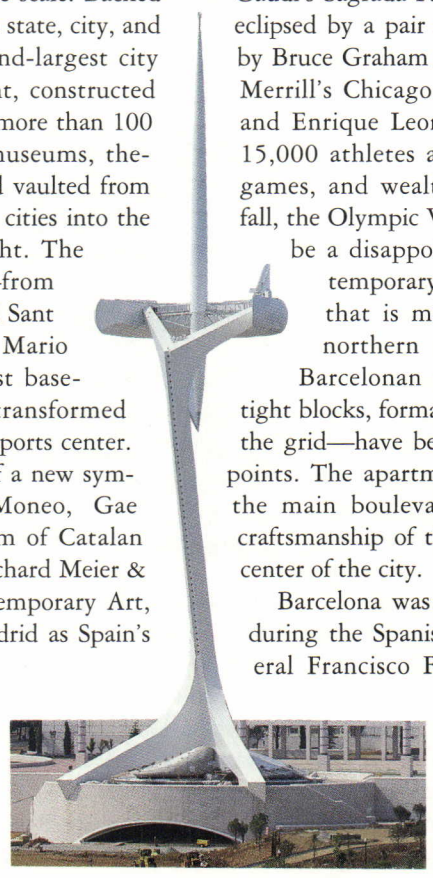
Olympics Boost Barcelona's Urban Design

ALL EYES ARE ON BARCELONA THIS MONTH FOR THE OPENING OF THE 1992 Summer Olympics. But Barcelona's eyes are elsewhere, as they have been from the beginning. As Mayor Pasqual Maragall told the International Olympic Committee in 1983, "Barcelona doesn't need the Olympics to feel itself fulfilled. But if you give us this vote of confidence, you will contribute a great deal to helping us carve out our role in the world."

Barcelona was anointed host city for this year's summer games because it was already reinventing itself on a heroic scale. Backed with more than $7 billion in state, city, and private funds, Spain's second-largest city has reclaimed its waterfront, constructed three major freeways, built more than 100 parks and plazas, added museums, theaters, and concert halls, and vaulted from the second tier of European cities into the top rank virtually overnight. The new athletic facilities—from Arata Isozaki's monumental Sant Jordi Sports Palace to Mario Corea's low-key, minimalist baseball stadium—have transformed Barcelona into a European sports center. And with the completion of a new symphony hall by Rafael Moneo, Gae Aulenti's National Museum of Catalan Art, and in late 1993, of Richard Meier & Partner's Museum of Contemporary Art, the city may soon rival Madrid as Spain's cultural capital.

Yet, unlike Madrid, Barcelona has never doted on monuments. It is a city of details and textures, of Antonio Gaudi's iridescent mosaics and undulating facades, of discreet additions to Gothic and Renaissance buildings, of an expansive public life that takes over its streets and squares. For decades, Barcelona's only skyscraper was Gaudi's Sagrada Familia Church—recently eclipsed by a pair of mediocre skyscrapers by Bruce Graham of Skidmore, Owings & Merrill's Chicago office and Inigo Ortiz and Enrique Leon of Madrid. Home to 15,000 athletes and coaches during the games, and wealthy Barcelonans in the fall, the Olympic Village has turned out to be a disappointing pastiche of contemporary and historicist designs that is more Miami Beach than northern Mediterranean. Basic Barcelonan planning principles—tight blocks, formal squares, the rhythm of the grid—have been compromised at key points. The apartment buildings that line the main boulevards lack the flair and craftsmanship of their counterparts in the center of the city.

Barcelona was the center of resistance during the Spanish Civil War, and General Francisco Franco made it pay by withholding money for roads, schools, parks, and other essentia



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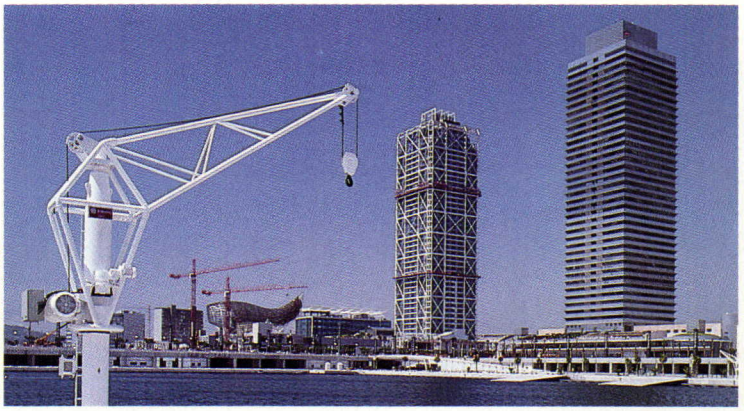

TOWERS BY SOM/CHICAGO (LEFT) AND INIGO ORTIZ AND ENRIQUE LEON (RIGHT)

RICHARD BRYANT/ARCAID

OLYMPIC VILLAGE HOUSING, ELIAS TORRES AND JOSE MARTINEZ

public projects. What few commissions were available were given to outsiders. "We were completely ignored during those years," recalls Barcelona architect Cristian Cirici. "All the significant public projects went to Madrid architects who were friends of government functionaries." When Franco died in 1975, champagne corks popped all over the city, followed by a massive rebuilding program under Socialist Mayor Narcis Serra (now vice-president of Spain), and his successor, Maragall. They appointed Oriol Bohigas, head of the city's leading architecture firm, to direct the office of city planning. Combining the savvy of a Philip Johnson with the political clout of a Robert Moses, Bohigas abandoned the idea of a grand master plan in favor of hundreds of strategic interventions that, in his words, "would act as focal points to regenerate the surrounding areas." His goal was to reinforce the historic center of the city without alienating the outlying areas, to be antisprawl without being antisuburb.

Bohigas passed out some commissions to international stars. In addition to Meier and Aulenti, Norman Foster was awarded a new communications tower and Frank Gehry a shopping arcade and a fish on the beach. Bohigas also saw to it that many commissions went to talented Barcelona architects, who had been limping along for years on teaching and designing additions. Many of the city's best designers—Jaume Bach and Gabriel Mora, Elias Torres and Jose Martinez, Jordi Garces and Enric Soria, Esteve Bonnell, and Beth Gali—received important public projects for the first time in their careers.

Typically, these Barcelona architects favor sober forms and spare detailing, expressing the natural reserve that makes Catalonia so different from the rest of Spain. The notable exception is Santiago Calatrava's tower (facing page), an overwrought, abstracted Olympic torch that is visible throughout the city. Consequently, Barcelona has been spared the jagged edges and skewed planes of Deconstructivism, as well as the pseudo-Classical antics of the Postmodernists. Even resident bad-boy Ricardo Bofill, the Julio Iglesias of Spanish architecture, has toned down his act in Barcelona. His new airport consists of restrained steel-and-glass pavilions, with lush gardens placed in between, and not a Classical arch or pediment in sight.

The city has proved equally enlightened about its urban spaces. Since 1981, more than 100 new parks and plazas have been completed, ranging from simple squares that bring light and air to oppressively dense neighborhoods, to avant garde projects such as Helio Pinon's and Albert Viaplana's Plaza de Estacio de Sants (center right), which pushes the limits of contemporary urban design. Last year, the city's parks and urban spaces program won the coveted Prince of Wales Prize in Urban Design from Harvard University.

Yet, despite the international acclaim, some Barcelonans believe the city has gone too far, overspent itself, and thereby mortgaged its future. Others fear that, in trying to rejoin Europe, Barcelona is losing its focus and identity, becoming just another Mediterranean industrial city. Barcelona's economy may indeed be shaky for the next few years, but its identity remains intact. From the Hansel and Gretel gatehouses at Gaudi's Parc Guell to the continuous urban carnival along the Ramblas, it is like no other city anywhere. Layered and intertwined like one of Gaudi's designs, it remains a powerful argument for the primacy of center and history in an era of anonymous edge cities. —DAVID DILLON

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PLAZA DE ESTACIO DE SANTS, PINON AND VIAPLANA

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Chicago's Rookery Restored

SOME 50 YEARS AFTER ITS FAMED LIGHT court was darkened by insensitive owners, Chicago's landmark Rookery building officially reopened May 6 after a $92 million restoration spearheaded by millionaire Chicago futures trader L.T. Thomas Baldwin III. Designed by John Wellborn Root and Daniel Burnham and remodeled by Frank Lloyd Wright, the 104-year-old Rookery now combines the architectural glories of the late 19th and early 20th centuries with high-tech building systems that should make it profitable well into the 21st century. Loaded with state-of-the-art technology and gleaming with the luster of Root and Wright, the Rookery's restoration is doubly significant for preservationists around the nation.

Located in the heart of Chicago's financial district, the 12-story building derives its name from the days after the Great Chicago Fire of 1871. A temporary city hall occupied the corner of LaSalle and Adams streets, and a horse barn at the rear of the property attracted flocks of pigeons. The bird-infested site soon became known as the rookery, and try as they might, the developers who erected an office building there in 1888 couldn't shake the name. Nor would the playful Root let them; he designed four likenesses of birds, three of which seem to be cackling out loud, in the arch framing the building's entrance.

Root and Burnham, of course, accomplished much more, creating one of the great transitional structures in Chicago's fabled architectural history. Although the Rookery's hulking red-brick and granite facades exemplified the loadbearing construction of the late 19th century, the building also employs the skeletal frame construction that helped make Chicago the birthplace of the skyscraper. Inside, a symphony of light and ironwork dazzles the visitor in the light court and oriel staircase that soars above it. Wright, who remodeled the interior in 1905, enhanced its brilliance with white Carrara marble walls and Prairie Style decor. But a 1930 Art-Deco remodeling by Chicago architect William Drummond seriously compromised the spaces of the Rookery. The crushing blow came in the 1940s, when owners covered the court's skylight with paint and tar paper.

Baldwin and his architects, the Chicago firm of McClier Corporation, have treated the building with far more care. Unlike other restorations, which slavishly seek to turn back the clock to a single date, this one carefully melds parts of all three of the Rookery's stylistic periods, a tell-it-like-it-is style of preservation that sits well in rational Chicago. The real significance of the job, however, may be economic. In recent years, the financial viability of landmarks around the country has suffered as developers of new—but largely empty—office towers charge bargain-basement rents, long the primary attraction of older buildings. In contrast, the Rookery is the first restored historic landmark in Chicago to be categorized as a Class-A office building, with top-of-the-line heating, air-conditioning, electrical, elevator, security, and telecommunications systems. Already, 46 percent of its space has been leased, indicating the Rookery's economic, as well as esthetic, triumph. ■

—BLAIR KAMIN

Blair Kamin writes for the Chicago Tribune.

McClier Corporation incorporated renovations subsequent to Root and Burnham's original design. Wright's brilliant light court (above and right) is now protected by a skylight.

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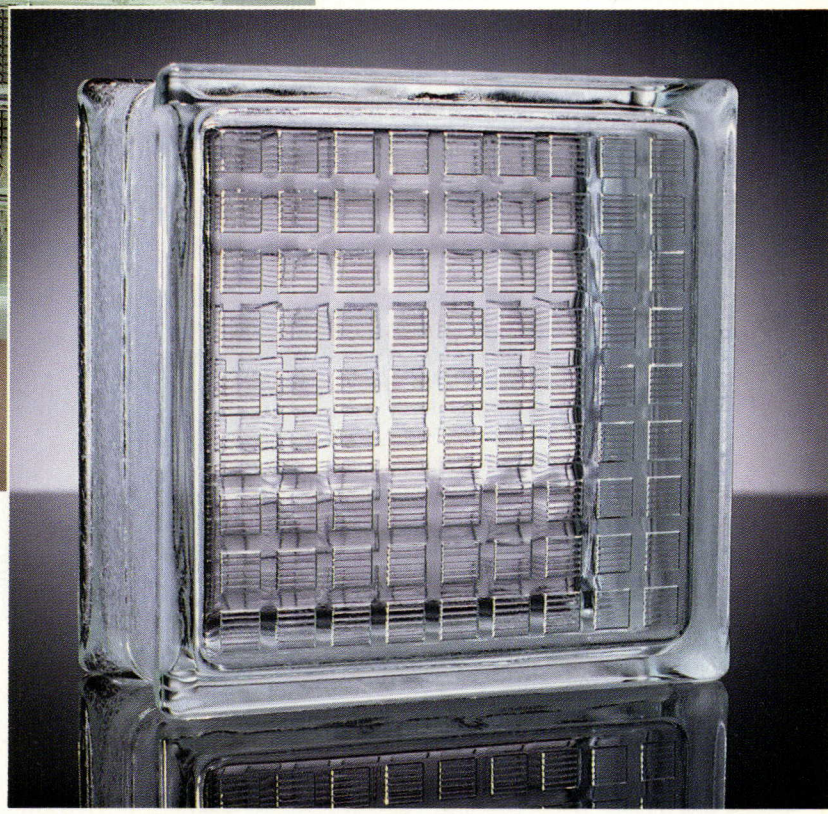

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Wisconsin Society Announces 1992 Awards

EIGHT PROJECTS, INCLUDING A HAMBURGER restaurant, a church converted into office space, and an historic inn, earned accolades in the Wisconsin Society of Architects' 38th annual design awards competition. Jurors S. Fiske Crowell, Jr., of Boston-based Kallmann, McKinnell & Wood, Steven Goldberg of Mitchell/Giurgola Architects in New York, and Diane Legge-Kemp, a Riverside, Illinois-based architecture and landscape consultant, lauded the careful detailing, craftsmanship, and lasting esthetic of the winning projects. Top honors went to Milwaukee-based Hammel Green and Abrahamson for an 18,000-square-foot, brick-clad office building with a generous shingled roof, and to Potter Lawson Architects of Madison for a masonry and glass insurance company headquarters. The jury applauded the Integrity Mutual Insurance Company building as a successful composition of Modern forms surrounding a traditional courtyard. Additional projects, such as the Covenant United Methodist Church and the West Bend Mutual Insurance Corporate Headquarters, were cited for resourcefully responding to site constraints. Jurors admired Kubala Washatko's Jacobson Rost Advertising Agency for preserving the tranquillity of a church interior through natural lighting and low office partitions. They also recognized Kopp's Restaurant for its strong civic presence, and the sensitively restored Washington House Inn. Stationside Village, a series of moderate-income houses by Zimmerman Design Group was honored for a friendly streetscape. ■

Honor Award
920 South Waukegan Road Commercial Building
Lake Forest, Illinois
Hammel Green and Abrahamson, Architects

Honor Award
Integrity Mutual Insurance Company
Appleton, Wisconsin
Potter Lawson Architects

STEVE POAST

Merit Award
Kopp's Restaurant
Brookfield, Wisconsin
Kubala Washatko Architects

Merit Award
West Bend Mutual Insurance Corporate Headquarters
Milwaukee, Wisconsin
Zimmerman Design Group, Architects

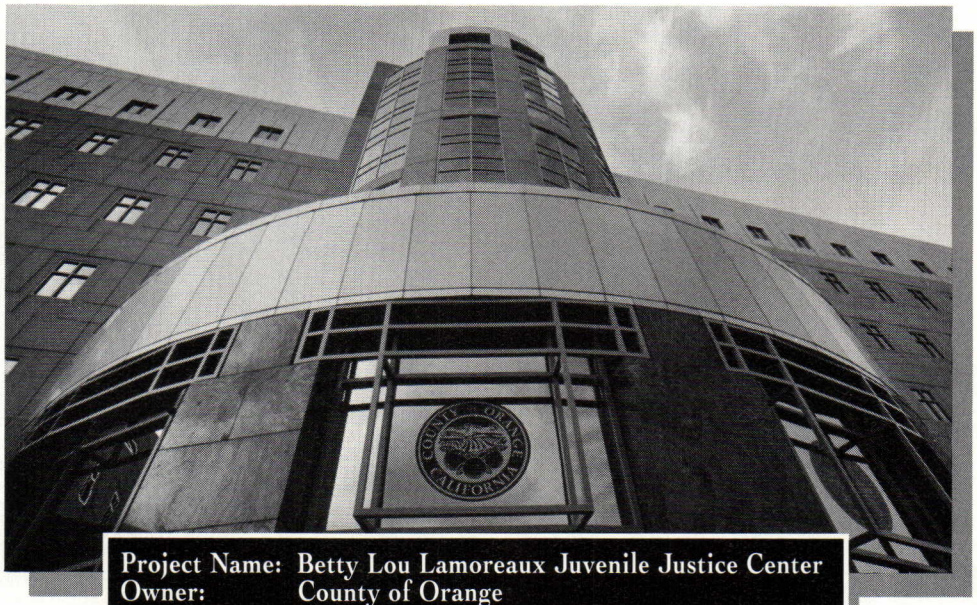
Merit Award
Covenant United Methodist Church
Fond du Lac, Wisconsin
Kenton Peters & Associates, Architects

Merit Award
Stationside Village
Kenosha, Wisconsin
Zimmerman Design Group, Architects

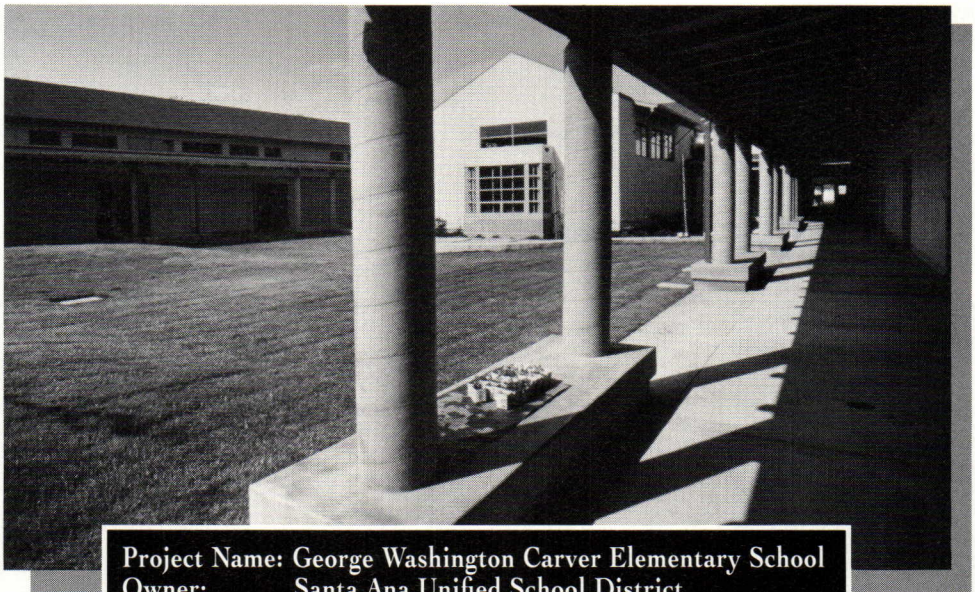
Merit Award
Washington House Inn
Cedarburg, Wisconsin
Kubala Washatko Architects

Merit Award
Jacobson Rost Advertising Agency
Sheboygan, Wisconsin
Kubala Washatko Architects

WIN.



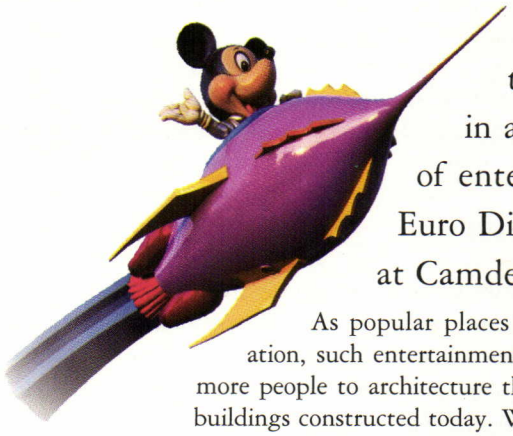
Project Name: Betty Lou Lamoreaux Juvenile Justice Center
Owner: County of Orange
Architect: Rowland/Ehrenkrantz Kamages
Engineer: Ludovise and Associates, Inc.
Engineer: Toft Wolff Farrow Associates
Consultant: Heery/Vanir Construction Management



Project Name: George Washington Carver Elementary School
Owner: Santa Ana Unified School District
Architect: RTA/Blurock Architects, Inc.
Engineer: Robert Bein, William Frost & Associates

C R E A T I V E

Mickey Goes To Paris



ARE FANTASY, FUN, AND FRIVOLITY REPLACING THE traditional principles of firmness, commodity, and delight in architecture? In this issue, we examine the growing trend of entertainment architecture through its leading indicators: Euro Disney outside Paris, Expo '92 in Seville, and Oriole Park at Camden Yards, Baltimore's new downtown baseball stadium.

As popular places of leisure and recreation, such entertainment venues are exposing more people to architecture than any other type of buildings constructed today. What kind of design is offered with the price of admission? Does entertainment architecture deliver any lasting benefits other than a good time?

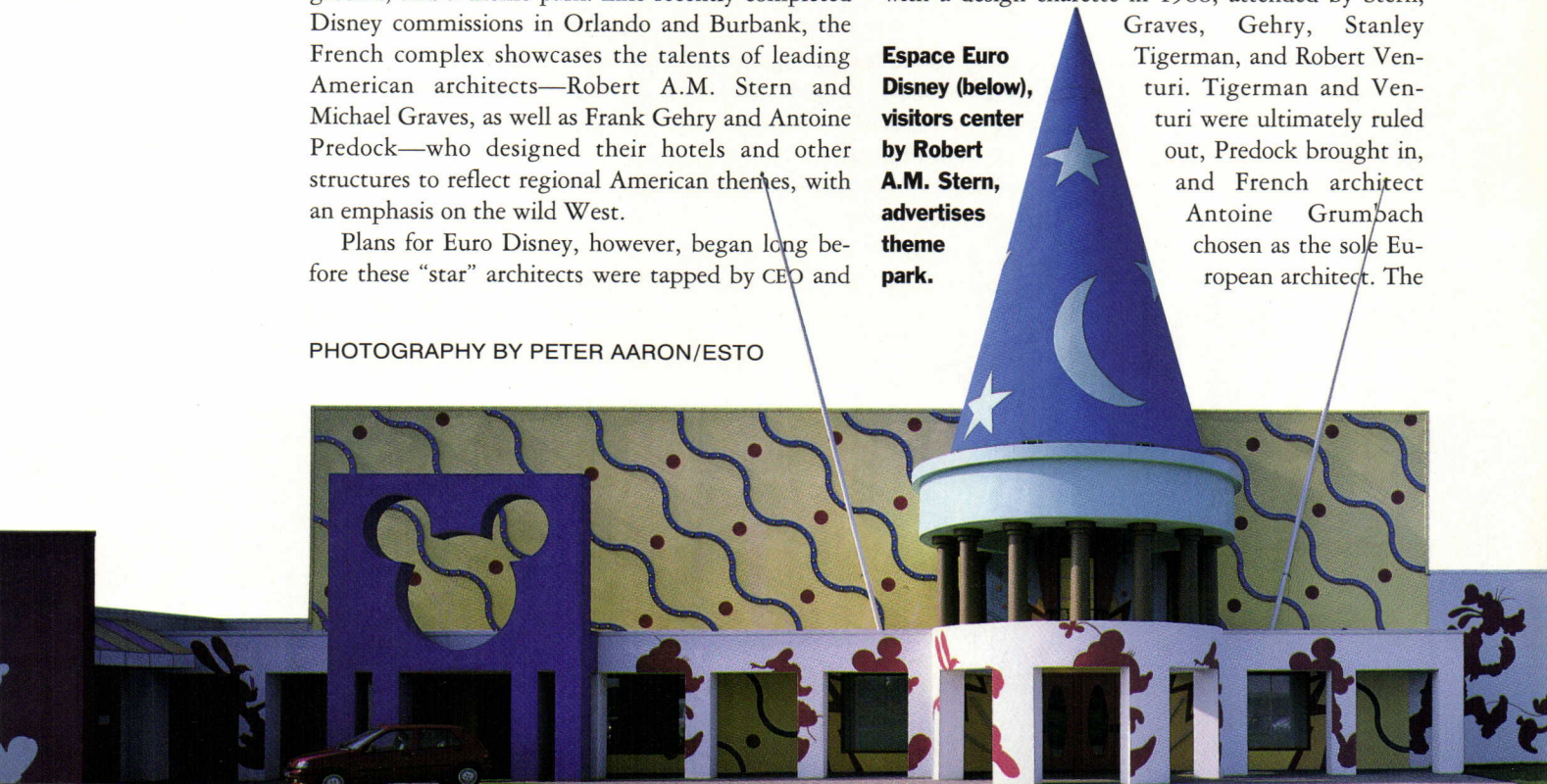
Unlike the amusement parks and sports arenas of the past, the new entertainment architecture is being commissioned by clients savvy to the market value of high-profile design. The leader of today's enlightened patronage is the Walt Disney Company, whose most ambitious design project to date, Euro Disney, opened in April. Built on 4,800 acres of former beet fields in Marne-la-Vallée, a Paris new town, Disney's $4.4 billion European venture comprises six hotels, an entertainment center, a campground, and a theme park. Like recently completed Disney commissions in Orlando and Burbank, the French complex showcases the talents of leading American architects—Robert A.M. Stern and Michael Graves, as well as Frank Gehry and Antoine Predock—who designed their hotels and other structures to reflect regional American themes, with an emphasis on the wild West.

Plans for Euro Disney, however, began long before these "star" architects were tapped by CEO and Chairman Michael Eisner. When Eisner joined Disney in 1984, the company had already been evaluating sites within Europe for its second foreign theme park. Tokyo Disneyland, opened in 1983, had proved a hit, breaking U.S. attendance records for a single day just four months after it opened. Disney theme parks in the U.S. were also clearly popular among Europeans, and with the removal of trade barriers by 1992, the corporation decided to move full-steam ahead, narrowing its choices to France and Spain. Despite Spain's warm climate, France, with its proximity to other European cities, proved a better location, and the country offered Disney an enticing package of tax breaks, construction loans, major road expansions, and a $150 million extension of its commuter rail line.

The planning of the hotels and theme park began with a design charette in 1988, attended by Stern, Graves, Gehry, Stanley Tigerman, and Robert Venturi. Tigerman and Venturi were ultimately ruled out, Predock brought in, and French architect Antoine Grumbach chosen as the sole European architect. The

Espace Euro Disney (below), visitors center by Robert A.M. Stern, advertises theme park.

PHOTOGRAPHY BY PETER AARON/ESTO



outcome of the initial charette is Euro Disney's greatest asset: a pedestrian-oriented plan that links hotels and theme parks with parking, public transportation, and entertainment facilities. The hotels are arranged around a man-made lake and river, and for the first time, Disney has positioned a hotel as a gateway to its theme park, the Neo-Victorian Hotel Disneyland, conceived by Disney's Imagineers and implemented by Wimberly Allison Tong & Goo of Honolulu.

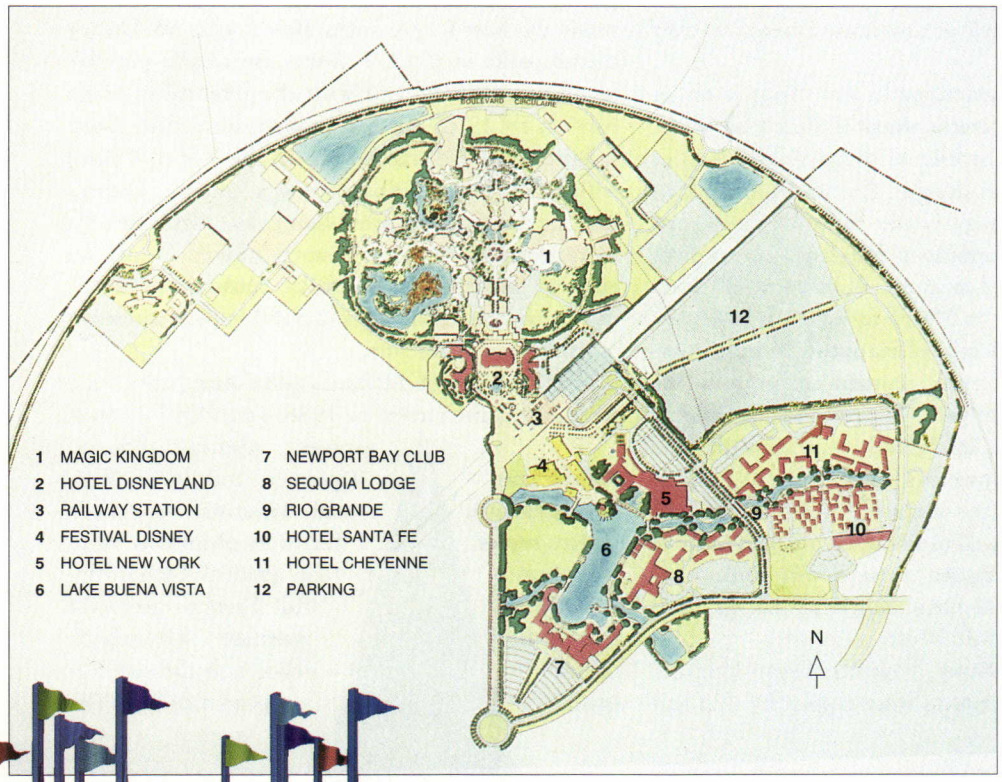
Compared to the recently completed projects in Orlando, however, Euro Disney's architecture is disappointing. Most of the hotels are inflated in proportions to accommodate 1,000 rooms, and their separate themes coexist uncomfortably with one another. The luxury hotels by seasoned Mouseketeers Robert Stern, who was recently appointed to Disney's board of trustees, and Michael Graves, architect of Disney's Burbank headquarters and Orlando hotels, are clearly not the architects' best. Despite its elegant detailing and gracious interiors, Stern's Newport Bay, a gigantic version of his Yacht and Beach Club in Orlando, is too overblown for its prominent location, dominating the main vehicular entrance with its colonnaded bulk. Graves's hotel draws upon his familiar Italianate vocabulary and saturated color palette, but lacks the decorative flamboyance of the Swan and Dolphin. Billed as the Hotel New York, its stripped-down volumes have nothing to do with the skyscrapers and brownstones of Manhattan. Antoine Grumbach's Hotel Sequoia, themed to convey rustic mountain lodges and expansive Prairie Style houses, also suffers from mixed regionalist messages and hulking proportions.

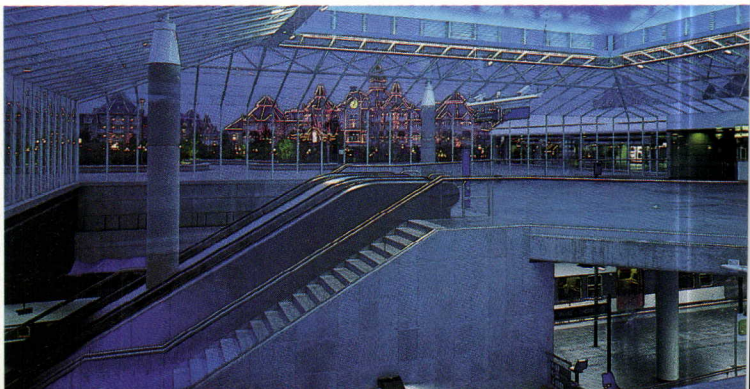
More successful are Stern's cowboys-and-Indians Hotel Cheyenne and Predock's pueblolike Hotel Santa Fe, miniature towns of discrete buildings linked by squares and streets. Both borrow from Western films, treating their themes as cinematic sequences. Stern's Cheyenne plays it straight with a stage set of false-fronted buildings, while Predock takes a more cynical view of the West, dotting his sparse landscape with quirky artifacts such as a meteorite, junked cars, and a UFO. Stern's playful Espace Euro Disney, a 33,000-square-foot visitors center located to the west of the hotel and theme park complex, is also successful. Topped by a conical roof—an architectural rendering of the sorcerer's hat Mickey wore in *Fantasia*—and painted with silhouettes of Disney characters, its brightly colored exterior offers the autoroute an appropriately animated billboard for the hotels and theme park.

The most original building at Euro Disney isn't a hotel, but Frank Gehry's Festival Disney, a shopping, restaurant, and entertainment center. The sprawling, low-rise ensemble is punctuated by a grid of 66-foot-high striped columns that march among the architect's signature sculptural sheds. Various themes of the restaurants and stores—1950s diner, wild West rodeo theater, surf shop—are confined to exterior signage and building interiors. At dusk, Gehry's bold, steel-clad columns glow with reflected light from neon signs and support a lacy canopy of lights, creating a glittering, nighttime circus for adults.

In the future, Festival Disney may be expanded to occupy the last empty lot on the lake, depending on the success of the current theme park facilities. Already, Disney is marching ahead with further plans for its French outpost. Now under development is a 2,700-room hotel designed by Arquitectonica, scheduled to open in 1995; a corporate headquarters designed by Aldo Rossi; a golf club, 700-room hotel, and convention center by Gwathmey Siegel & Associates; an exclusive enclave of custom houses designed by Gwathmey Siegel, Charles Moore, Hugh Newell Jacobsen, and Jacquelin Robertson; and 5,400 units of employee housing. Whether any of these developments will surpass Euro Disney's first phase and produce more provocative, contemporary architecture remains to be seen. ■

—Deborah K. Dietsch





The French Reaction

WHAT DO THE FRENCH THINK OF MICKEY MOUSE AND HIS LATest kingdom? As soon as the plans for Euro Disney were unveiled, members of the French intellectual elite denounced the entire project as a "cultural Chernobyl." *Le Monde* echoed this view in a cartoon of "L'Angélus du Soir," the much-loved 19th-century French painting by Jean François Millet on view in Paris at the Orsay Museum. In the cartoonist's pen and ink redo, the humble French peasant couple who, in response to the toll of a distant church bell, pause from their work in the fields to pray, are sporting Mickey Mouse ears. The church on the horizon has become Euro Disney's centerpiece, Sleeping Beauty's Castle (bottom right). Forever lost, or so the drawing tells us, is France's religious faith, replaced by comic strip mythologies. Well on its way out is the ancient French agrarian culture.

Few French view Euro Disney so darkly as the *Le Monde* cartoonist. Most accept it as a culturally nonthreatening fun fair and resort. They like the wild West kitsch, including the Santa Fe and the Cheyenne hotels, but find one serious flaw—the entire complex is too expensive for all but Europe's well-to-do. The two-night package at the resort hotels, including admission to the theme parks, ranges from $223 per person at the Santa Fe to $778 at Hotel Disneyland (bottom left). For a family of four with two children under 12, spending only a single day within the theme park, the tickets alone cost 750 francs ($144). As a result, ticket sales so far have been poor. If Euro Disney is to meet its goal of 11 million visitors a year, or average 30,000 per day, it may be forced to reduce its prices.

Pierre Merlin, a French architect and planner who participated in the early development of Marne-la-Vallée, the new town east of Paris whose outermost rural sector became the 4,800-acre site of Euro Disney, believes the French government made a deal for which the only winner will be Disney. France bid high to attract Euro Disney to French soil, hoping to create jobs, secure billions of francs in revenue, and at least $700 million in foreign currency each year. Disney statisticians projected the employment of at least 30,000 French to build the park and its infrastructure, and 14,000 to staff it by opening day. In the matter of staffing, however, it turns out that the unemployed are presently getting some, but not enough, help from Disney. Only 70 percent of the theme park's employees are French, and a current Euro Disney press release boasts that its workers come from 37 different nations. Nevertheless, the French government retains high hopes for jobs, expecting that 65,000 French will be hired to serve the additional hotels, recreational facilities, office parks, and residential developments that will have been added when the entire site is developed by the year 2017.

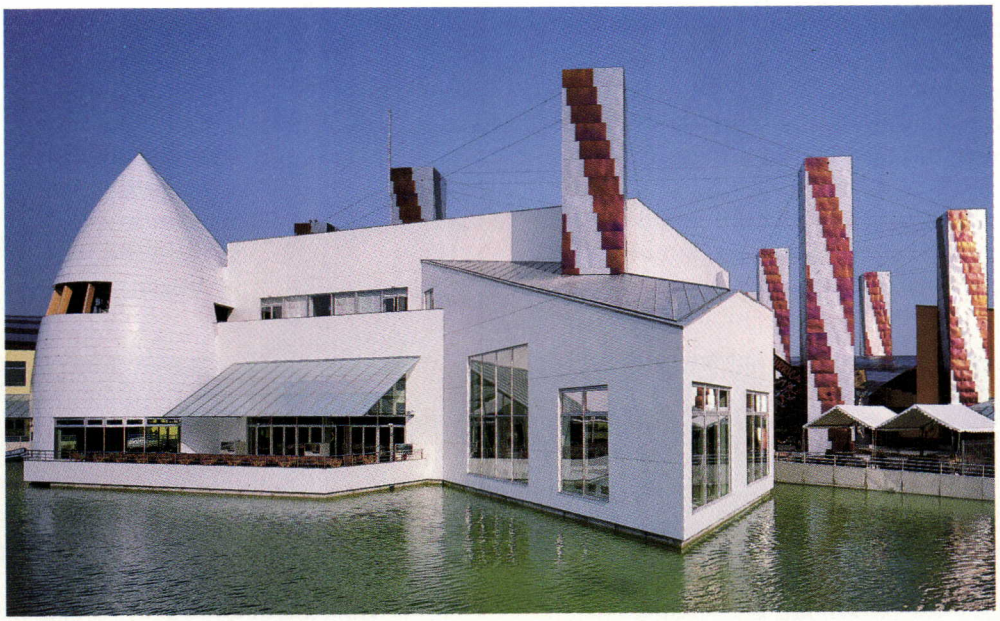
In return for these benefits, the French government made the land available to Disney at its 1971 price—$5,000 per acre, with 20 years to complete all of the land purchases at no price increase. Other favorable financial arrangements include the allowance of below-market interest rates combined with generous tax breaks, permitting Disney to buy nearly half of a $3 billion venture for less than $200 million in equity and other expenses. "So far," deplores Merlin, "there have been 1 million francs of public investment for every job created, and all we are getting is a Disney caricature of American culture. The architecture itself is unimportant. If Disney had used the best architects in France, it would not have justified the project." Government funds, assert Merlin and others like him, should have gone to schools, public housing, health programs, and other investments in the public interest.

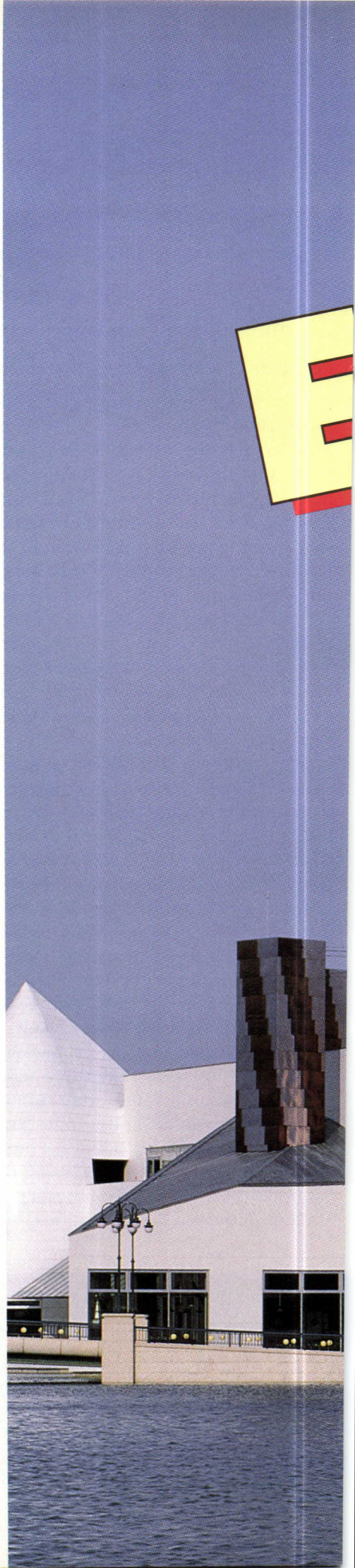
But many thoughtful French citizens have a different view. As a Parisian architect points out, "Too much is being made of the imposition of American culture on France. Paris needs large hotels with full resort facilities just beyond the city limits. Europeans want leisure, golf, tennis, swimming, and a place to bring the children, just like everyone else." Furthermore, tourism in the entire Seine and Marne region, and the rest of France, will benefit, and tourism is what Euro Disney is really about.

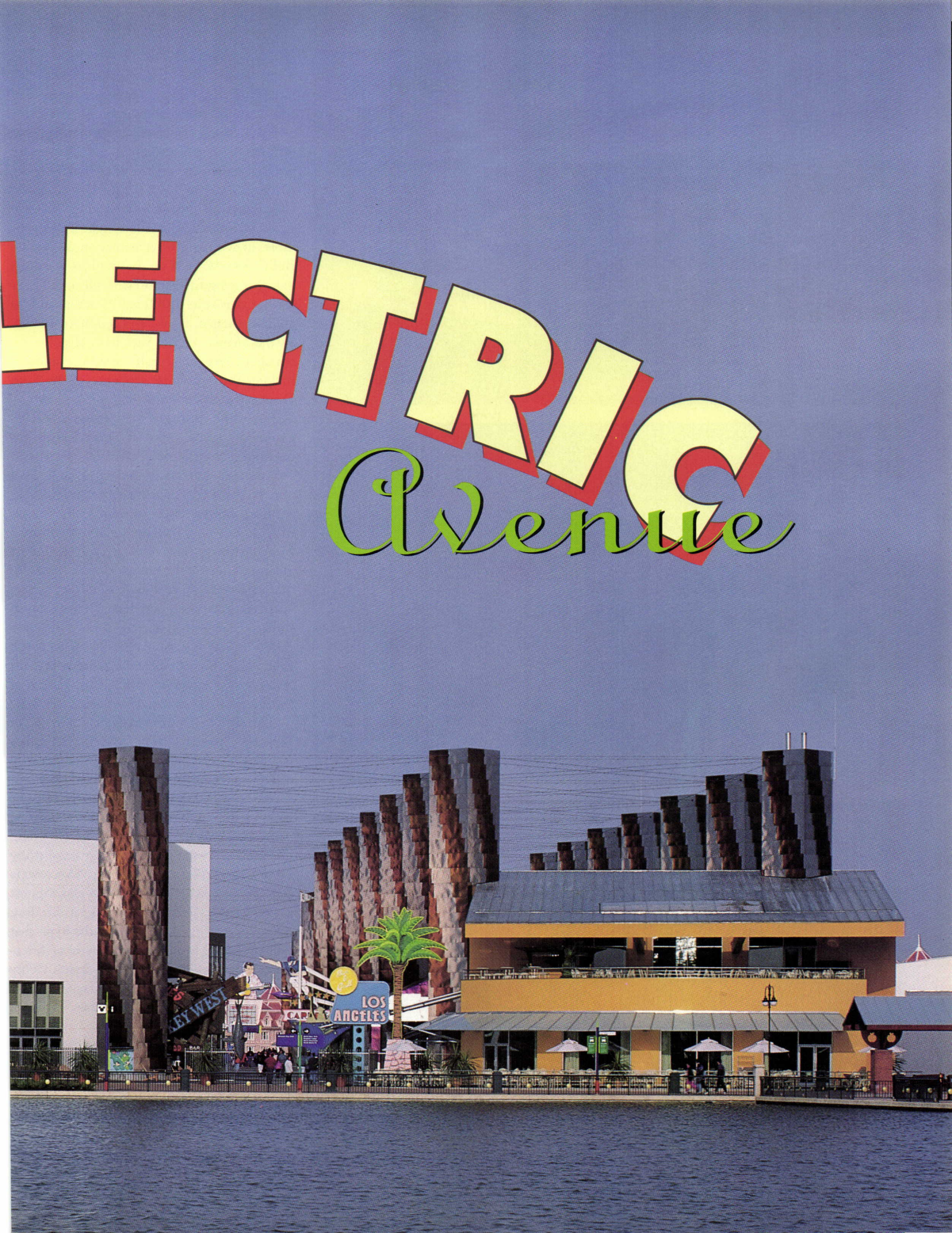
—MILDRED F. SCHMERTZ

Visitors enter by car through tollbooths (facing page, left) or by train through station (facing page, right). Hotel Disneyland (left) serves as gateway to Magic Kingdom.

Festival Disney
Frank O. Gehry & Associates, Architect






LECTRIC
Avenue
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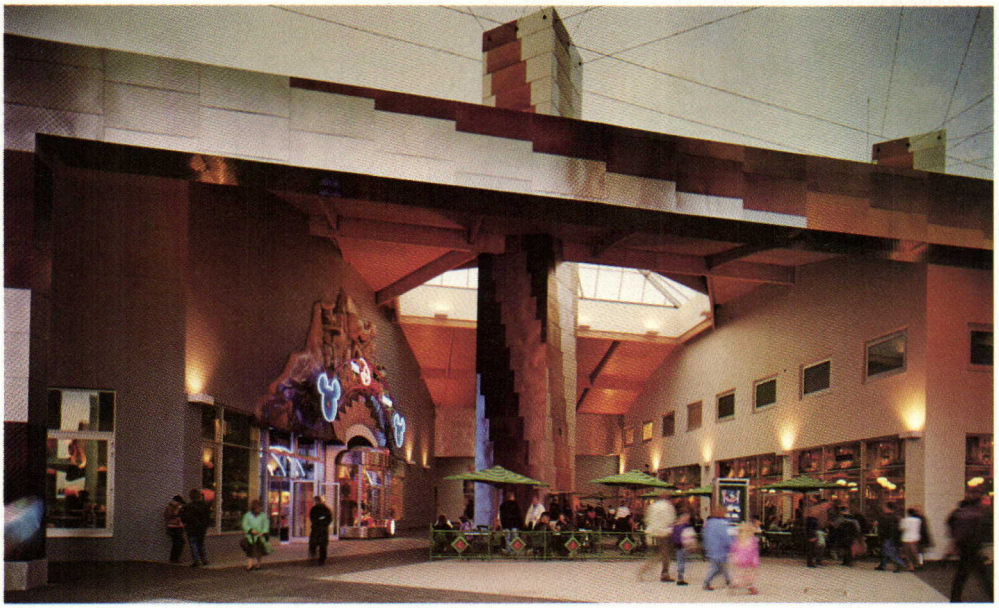
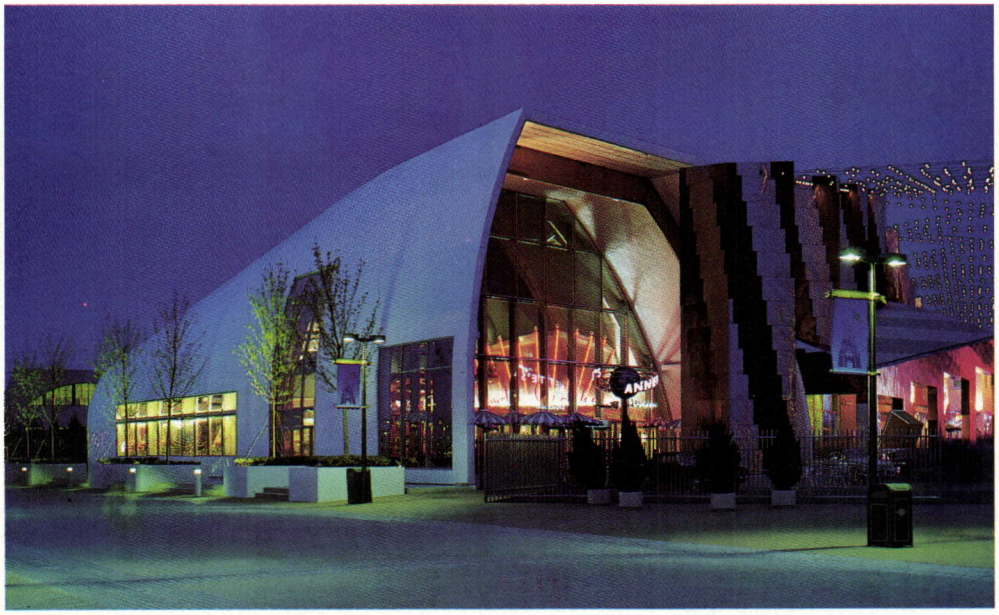
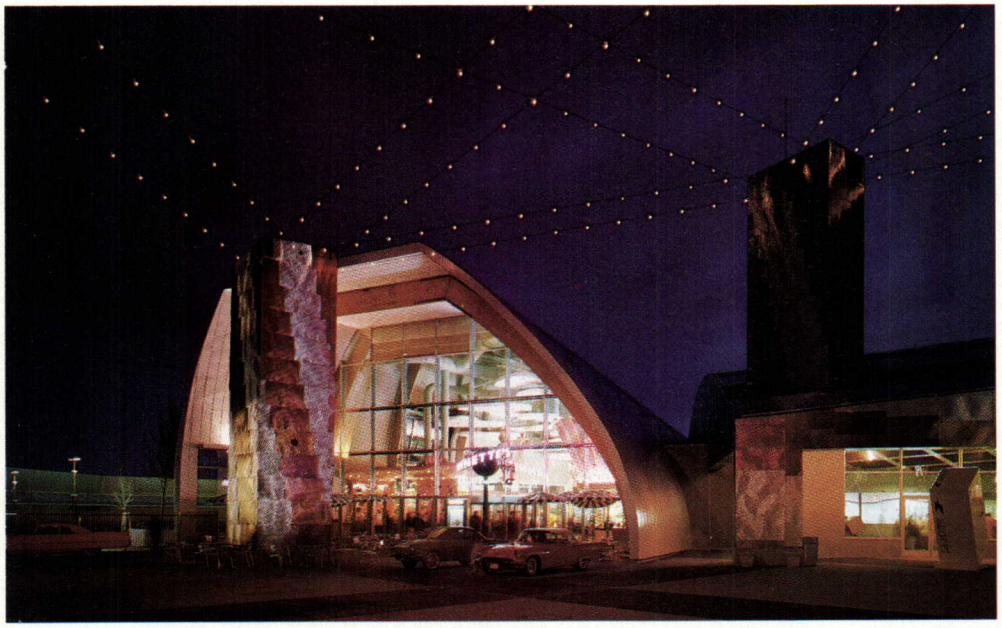






FESTIVAL DISNEY IS SANITIZED HONKY-TONK, a distillation of commercial Americana. Offered to Euro Disney visitors as a glimpse of the genuine American way of life, this 183,000-square-foot entertainment center includes a saloon, a discotheque, shops, and not-too-expensive restaurants that purport to be typical of Key West, Los Angeles, Chicago, and New York. At a 1950s-style diner, waitresses roller-skate right up to your table, and a nightly reincarnation of Buffalo Bill's 1883 Wild West Show plays as crowd bait. Bringing the Far West to life at a dinner theater that seats 1,000 are 25 actors and 50 animals (horses, bison, and longhorn cattle). In the vicinity of the vast barn that houses the show, one can actually smell the animals, making this particular sequence of the Euro Disney dream feel almost like a real place.

Given the variety of these cultural and regional references, architect Frank Gehry was not asked to "theme" Festival Disney, and the complex is certainly the better for it. Had a theme been requested, Gehry would probably have refused. "I try to rid myself," the architect once said, "of the burden of culture." More fortunate than Michael Graves, Robert Stern, and Antoine Predock, who were required to serve up grandiose simulacra of various lost American settings, Gehry simply turned to his own collected works and resurrected his fish and whale forms, his eccentric geometries, his vibrant color palette, and his mastery of abstraction. He left the design of the interiors and signage to others.

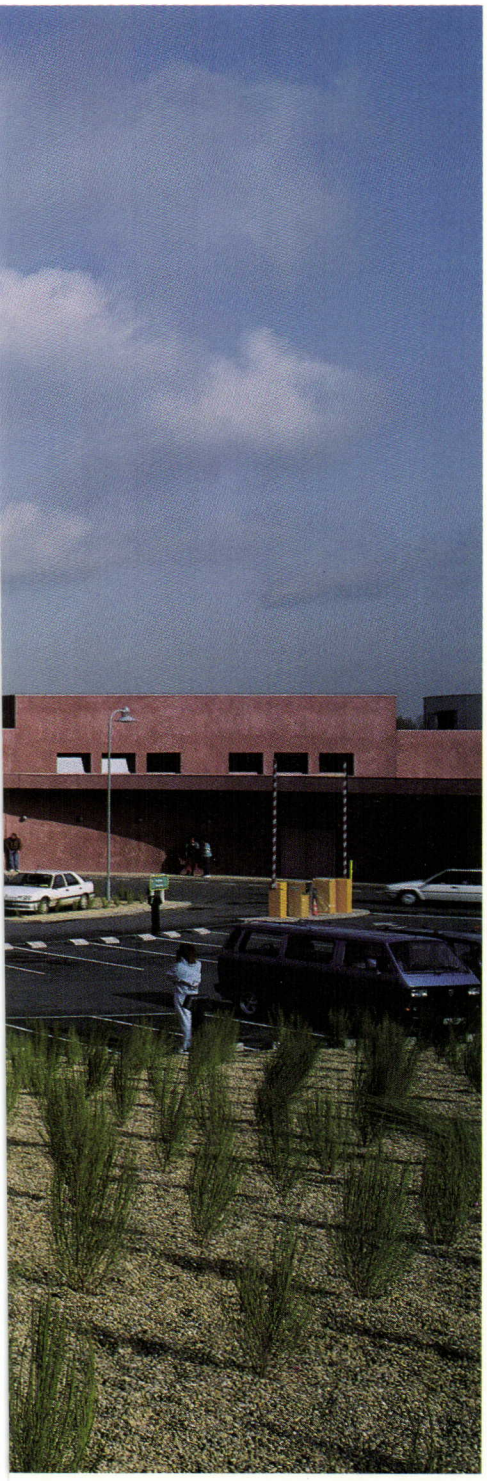
The architect of the American Center in Paris and the new Disney Concert Hall in Los Angeles is certainly a showman in his own right, worthy of Euro Disney. His entertainment center cannot be missed. It is built within a grid of 66-foot-high towers sheathed in a diagonally striped pattern of ruby and silver quilted stainless steel that powerfully signals the building's presence. The towers conceal an outdoor sound system and support a web of tiny lights that create a dazzling canopy in the night sky. Given the hype that exalts Michael Eisner as a patron of architecture, it is incredible that, so far, Frank Gehry has produced the only genuinely contemporary set of buildings in all of Euro Disney. —M.F.S.

Festival Disney is organized around a grid of 66-foot-high columns (previous pages) and a central promenade lined by restaurants and shops (facing page). Gehry's curved, sculptural forms include a "fish" (center left), which houses a 1950s-style diner (bottom left) and a skylit "whale" (top left).


STEAKHOUSE

Hotel Santa Fe
Antoine Predock, Architect

DESERT TRAILS

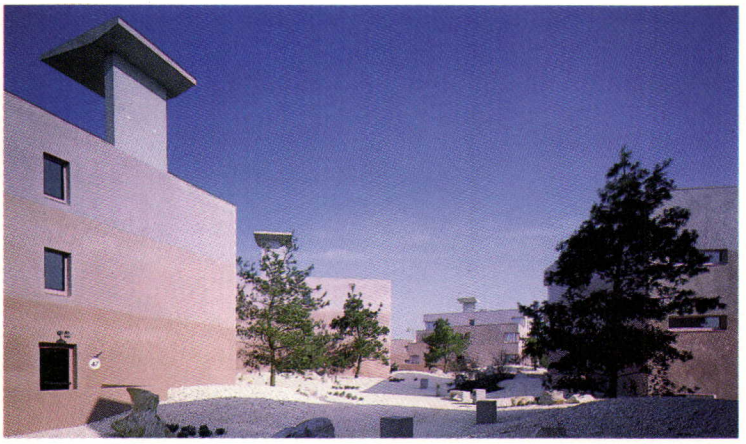


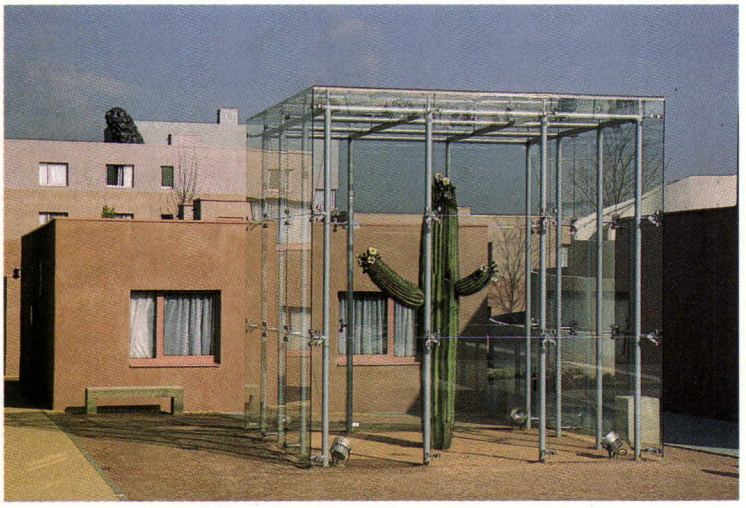
Hotel forecourt is designed as a drive-in movie (these pages). Guest wings are massed to recall desert mesas and buttes (top right). Rooftop garden of commons building (facing page) includes maze (above right).

"ARCHITECTURE IS LANDSCAPE IN DRAG," DECLARES ANTOINE PREdock, whose belief is clearly expressed by his Hotel Santa Fe. Clustered to recall sandstone buttes and mesas, and stuccoed in graduated earth colors, the 1,000-room colony evokes the architect's native Southwestern terrain. But this 35-acre site is clearly Predock's version of the desert; a bare-bones landscape littered with the debris of contemporary culture: junked cars, a drive-in movie, a UFO.

The architect dispersed the 42 buildings of the hotel along the southern bank of the man-made "Rio Grande," placing the tallest structures at the site's northern boundary to protect lower guest wings and adjoining courtyards from the winds that buffet the flat site. To meet Disney's theme requirement, Predock treated his Southwestern imagery as a cinematic narrative of five "trails." Stretched down the center of the site, for example, is the "trail of infinite space," a promenade intended to represent an endless highway. The "trail of monuments" leads through rocky courtyards, offering "mountain" views of stepped and shifted guest wings topped by Corbusian "spoilers"; the "trail of water" leads from the top of the tallest building down a narrow viaduct to a pool and streams.

Other symbolism is more obscure. The "trail of legends" consists of five guest wings, each colored to represent archetypes of the wild West: good and evil (half black, half white); money (silver); the gold rush (gold); a jail (gray); and a whorehouse (red). Without an explanation, the structures, which contrast with their pastel neighbors, appear to have been painted the wrong colors by mistake. Moreover, their stuccoed facades fail to obscure the budget-conscious, stripped-down detailing of the project. Predock's saving grace is his "trail of artifacts," a series of icons scattered throughout the site, including a cactus in a glass cage, a smoking volcano, and a meteorite embedded in a roof. Within the Santa Fe's all-too-Spartan landscape, these wacky set pieces add an appropriately sardonic note. —D.K.D.





Trail of water emanates from viaduct (facing page). Trail of legends evokes wild West archetypes through colored facades (top left). Trail of monuments leads through "buttes" (second from top). Trail of artifacts includes concrete "snake" (second from bottom) and caged cactus (bottom left).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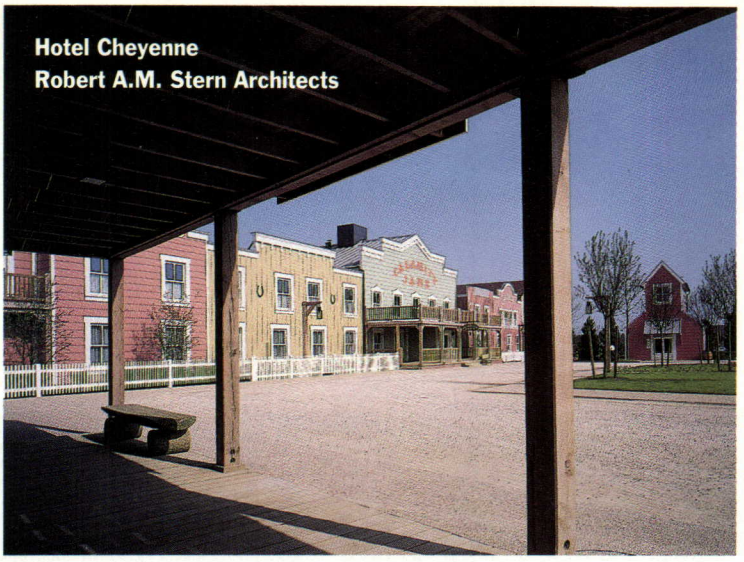


Hotel Cheyenne
Robert A.M. Stern Architects

NEW FRONTIER

WANT TO LIVE ON DESPERADO STREET? CHECK IN AT Euro Disney's Hotel Cheyenne. This 1,000-room, moderately priced facility was conceived by Robert A.M. Stern and his team not as a literal 19th-century wild West town, but as a movie back-lot version of one, where guests are actors in their own vacation. According to Stern, "The hotel capitalizes on what we have all grown up to expect from the West through movies. It has little to do with the real thing." Europeans love Hollywood Westerns, so it is expected that they will love this hotel. The *Michelin Guide* to Euro Disney tells the vacationing family that turning a corner, they may even run into some trigger-happy characters. The young people from many nations who work in the hotel are decked out in cowboy clothes with a distinct Ralph Lauren flair, and they have been taught to say, "Howdy." Stern once went so far as to suggest that klieg lights be trained on the scene, but decided that hyper real sets, as in a movie, would suffice.

The "town square" includes a cafe, saloon, fort, and general store. Storefronts, barns, a schoolhouse, and a water tank are concocted with the same care and affection that Hollywood set designers bring to their work. Streets are arranged to create vistas with curious and lovely little Western buildings at the ends of each one. All the familiar props are on hand, composed in a painterly fashion—corral gates, tipis, covered wagons, white picket fences—with a few flourishes: antlers, bags of oats, harnesses, and saddles. And the surface of the streets? Not the mud of the true West, nor the asphalt one expects everywhere, but a layer of dirt and small pebbles bound together in concrete. It is the same stabilized dirt found in the Tuileries—Stern's homage to Paris. —M.F.S.

Inspired by scenes from Western films like "High Noon," the Hotel Cheyenne comprises 14 frontier-style, two-story structures with movieland false fronts (facing page, top), arranged around town squares (top and center left) and vistas (bottom left). Main lobby (facing page, bottom) is patterned after a 19th-century Western hotel.


HOTEL


HOTEL

Newport Bay Club
Robert A.M. Stern Architects

DO EUROPEANS KNOW ANYTHING ABOUT turn-of-the-century New England? Enough to spend as much as $240 per night in a 1,098-room hotel called the Newport Bay Club, when they could be in Paris? Euro Disney hypes this sprawling creation as "a charming yacht club atmosphere," a mega-structure with a 233-foot-long colonnade. In truth, Newport Bay is no more a yacht club than Mickey is a mouse. But the 580,000-square-foot luxury hotel is, nevertheless, one more skillfully executed fantasy by Robert A.M. Stern, an architect who was doing Disney long before Disney ever heard of him.

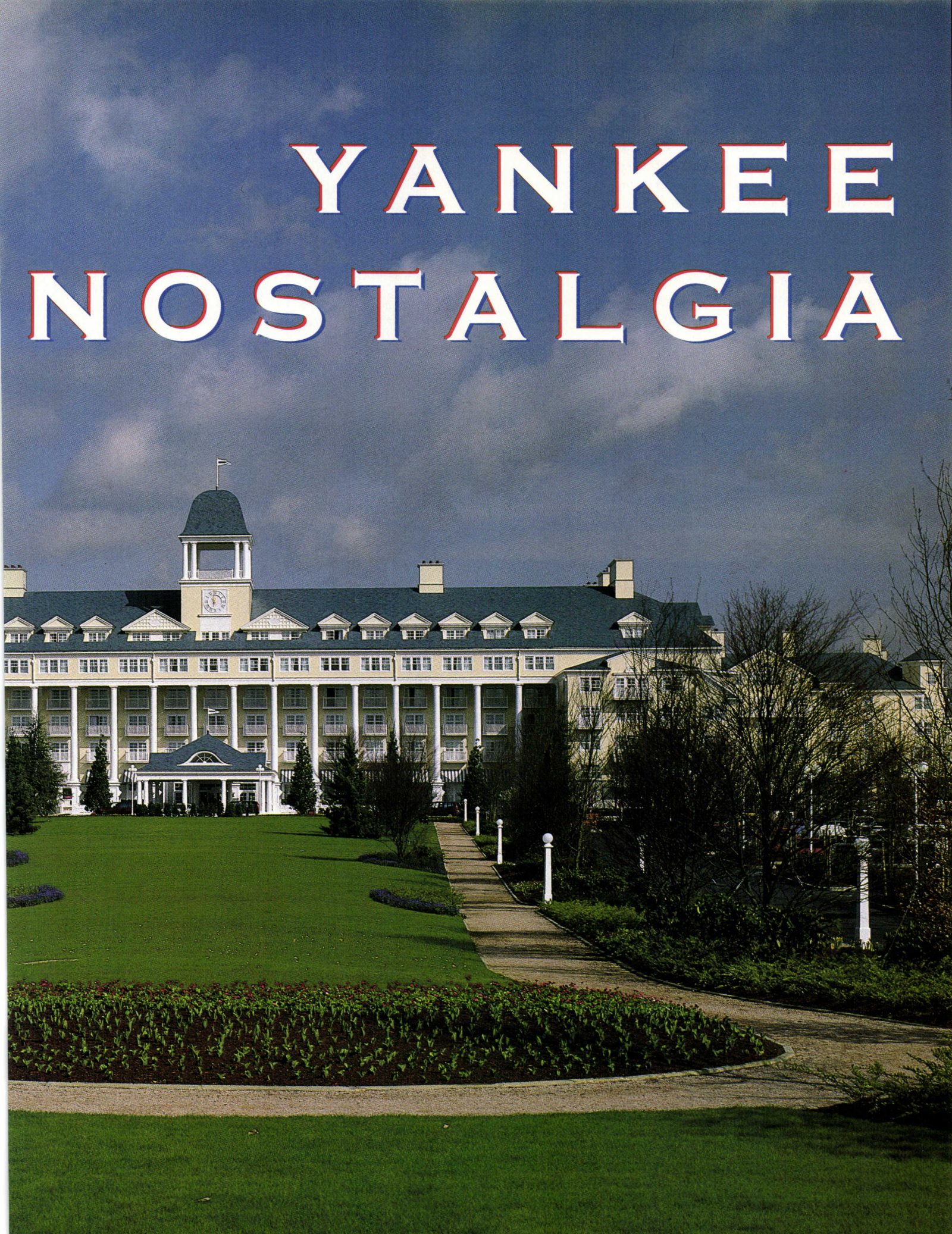
Michael Eisner can be pretty sure that this nostalgic recall of a lost, upper-class-Yankee way of life will play in Marne-la-Vallée, because similar idealizations at Orlando's Disney World have been great successes with European tourists. In Florida, Stern designed two adjoining resorts, styled as a circa-1900 New England yacht club and a Cape May, New Jersey, beach club (ARCHITECTURE, June 1991, Pages 90-93). All three resorts dwarf their Shingle and Stick Style precedents, which are relatively small structures built for a self-limiting elite. Stern's hotels, however, are convincing period revivals because of the architect's mastery of historically accurate, scale-reducing details.

The Newport Bay Club boasts them all—a cupola, countless chimneys, recessed porches, dormers, and awnings. By varying the massing, complicating the roofs, and shifting the wall planes, Stern breaks down the building into segments seen by themselves, thereby concealing the hotel's true size

Romantically recalling nautical building types of turn-of-the-century New England, Newport Bay Club embraces the southern end of Lake Buena Vista (below). Its south facade (facing page) includes entrance portico and landscaped expanse bounded by a croquet field.

©DISNEY

YANKEE NOSTALGIA

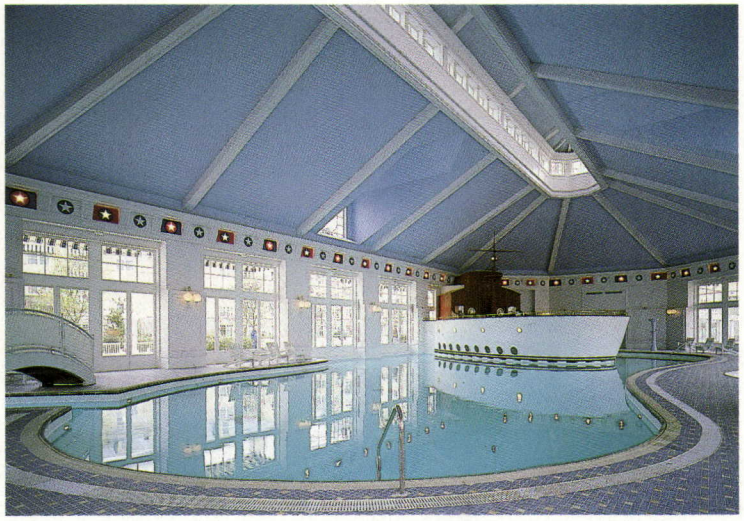


except from the air or from across the man-made lake. A well-landscaped esplanade, a spiffy little lighthouse, and a thoughtfully located Victorian lakeside pavilion balance and complete the composition. Stern admits that his inspiration for this hotel comes not from New England, but from the great hotel on Michigan's Mackinac Island in Lake Huron. Nevertheless, most of the stylistic references, particularly on the interior, can be traced to the nautical and beach life of the East Coast.

For the interiors, the Stern team, headed by Alex Lamis and Paul Whalen, collaborated with the Atlanta-based Design Continuum's Hugh Latta and William Post, with whom they worked in Orlando. The Newport Bay Club interiors are lavish. Walls that look like plaster, for example, are constructed of plaster. Stern reports that the French are very good craftsmen, and it shows: woodwork, paneling, and cabinetry are beautifully detailed and finished. The architects and designers worked with singular zest, artfully placing well-chosen nautical, regional, and historical artifacts in all the appropriate spots. Murals for the principal restaurant evoke the style and subject matter of Winslow Homer (boys in straw hats lolling on a rocky beach among the lobster pots). To help Europeans get the point, the rooms are adorned with vintage photographs and drawings of the summer houses, hotels, clubs, boats, docks, and piers of the era, as well as of yachtsmen, fishermen, and families enjoying the New England summer.

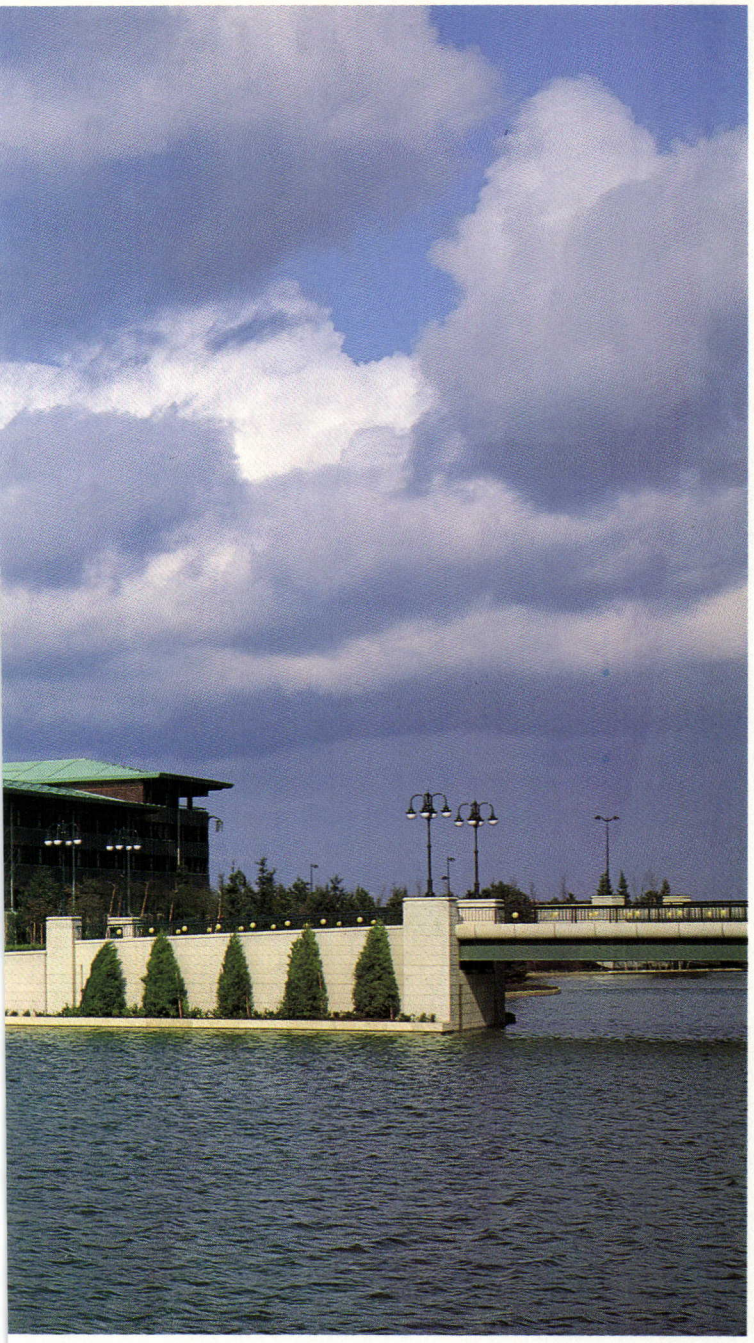
Among all the lost Americas evoked by the Euro Disney hotels, the Newport Bay Club is the most architecturally successful because Stern knows how to fuel our nostalgia. He is the ideal architect to invent and execute a theme for Disney; he obviously whistles while he works. —M.F.S.

Grand entrance staircase (facing page, left inset) and main dining room (facing page, right inset) exemplify the high-quality French craftsmanship throughout the hotel. Indoor pool (below) is located in an oval pavilion at lake's eastern shore, behind lighthouse (left in large photo).



Sequoia Lodge
Antoine Grumbach, Architect

RUSTIC REDUX



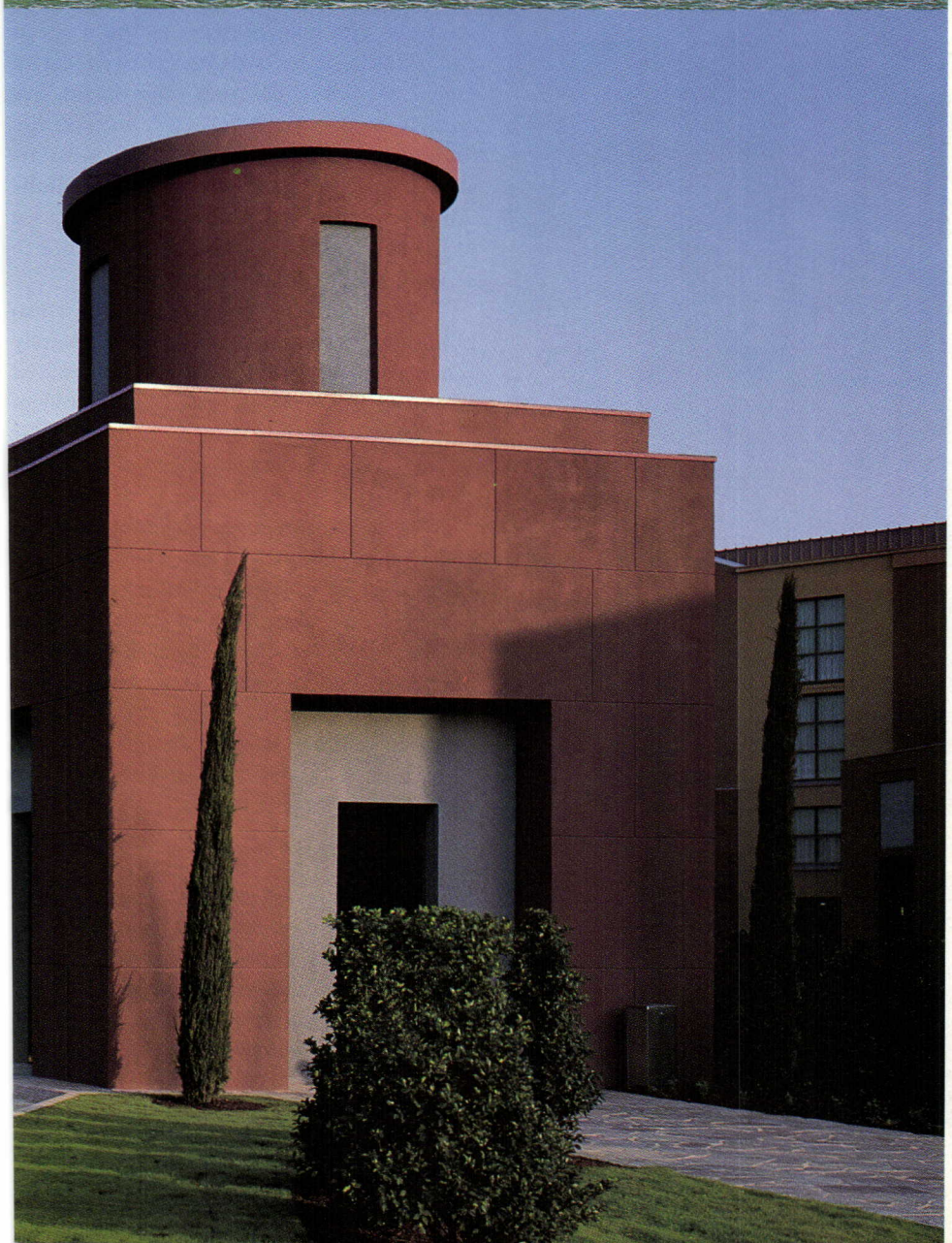
EURO DISNEY'S TRIBUTE TO AMERICA'S MOST authentic architecture, the Prairie Style, is designed, ironically, by the only French architect to create a hotel on the site. Antoine Grumbach was selected from a roster of European architects to design the Sequoia Lodge, based on his decision to scale down the 1,011-room hotel into a lakeside complex of separate buildings. Located between Michael Graves's Hotel New York and Robert Stern's Newport Bay Club, the hotel consists of a seven-story main block facing the lake and five smaller lodges to the east, surrounded by pine, cedar, and sequoia trees imported from the Pacific Northwest.

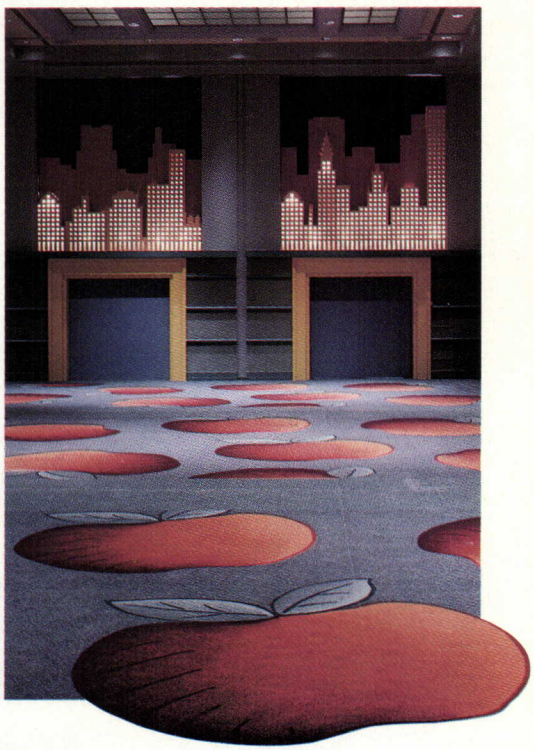
Grumbach cites a Montana vacation as the source of his inspiration, and the hotel's stone and timber massing indeed conveys the rustic air of a mountain hunting lodge. Topped with overhanging, green-tiled roofs that simulate weathered copper, the sprawling hotel also recalls Prairie Style horizontality. Inside, the mood is Arts and Crafts, with overtones of Frank Lloyd Wright. Lobbies, lounges, and restaurants are outfitted with exposed wooden beams, stone fireplaces and walls, and reproduction Stickley furniture.

But Grumbach's unfamiliarity with these American architectural precedents is all too apparent; the stolid Sequoia looks more like a gloomy, overscaled Swiss Alps chalet than a Rocky Mountain lodge or Great Lakes retreat. Unlike his American counterparts, the Parisian architect lacks a flair for combining well-known architectural references into a playful ensemble. As a result, the heavy-handed, redwood-veneered Sequoia lacks the lighthearted, knowing historicism of its neighbor, Stern's Newport Bay Club, or the idiosyncratic regionalism of Predock's Santa Fe. Grumbach's heart does not belong to Mickey, and it shows. —D.K.D.

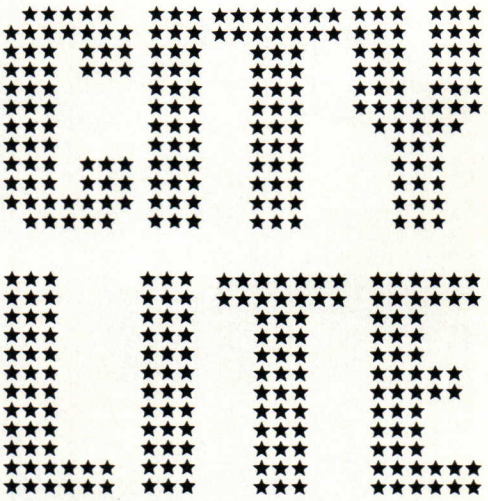
Sequoia Lodge is divided into a main block (facing page, top) and five smaller buildings arranged around courtyards (facing page, bottom left). Timber-trussed porte cochère (facing page, bottom right) and stone fireplace in lounge (bottom left) evoke mountain lodges; lobby lighting (below) recalls Wright.

Hotel New York
Michael Graves, Architect





H. DURSTON SAYLOR



Hotel New York is billed to resemble Manhattan landmarks such as brownstones (top left), skyscrapers (bottom left), and Rockefeller Center (above), but Graves's Big Apple imagery is confined to interiors, such as carpeting (top) and skyscraper-adorned convention center walls.

H. DURSTON SAYLOR

WHEN MICHAEL EISNER WISHED UPON Michael Graves's particular star, his dream for Hotel New York failed to come true. What Eisner asked Graves to do, Robert Stern could have done in his sleep. All the boss wanted, after all, was a 574-room luxury convention hotel with 6,600 square feet of convention facilities that would evoke a slice of the Big Apple by suggesting skyscrapers, brownstones, and Rockefeller Center.

What Eisner got from Graves instead is a stripped-down collage of the architect's favorite Italianate volumes, with nary a remote hint of the hoped-for Manhattan significations. The most laughable failure is Rockefeller plaza, which is nothing more than a flat rectangular plane decorated with a map of Manhattan and flanked by a pair of ugly little pavilions. The five-story stuccoed wings meant to recall brownstones resemble old-law tenements instead, and the vertical panels on the facade of the nine-story block look more like giant striped signboards than skyscrapers. The pool pavilion at the western end of the complex is decorated to suggest a David Hockney painting, but again has nothing to do with New York. In fact, the project's only New York reference—the triangular openings along the base of the southern elevation—is to the ill-fated Whitney Museum additions, Graves's failed attempt to actually build in Manhattan.

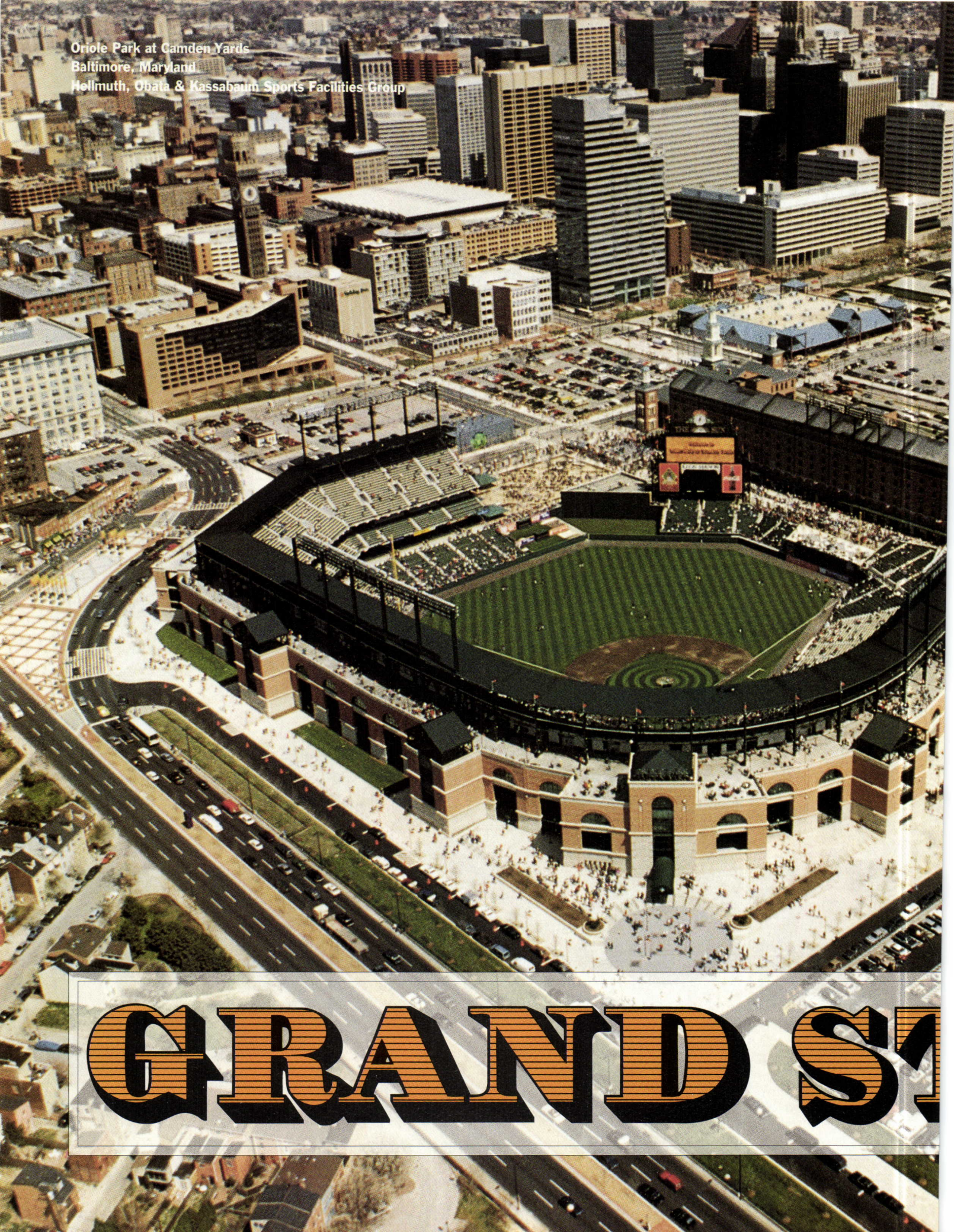
Inside the hotel, the themed Art Deco public spaces are dark, somber, deliberately funereal, and tomblike. Dimly illuminated signs, old Broadway posters, photographs of skyscrapers, and theater memorabilia are lost in the gloom, serving as memento mori of the era buried there.

Why did the architect of the superb Swan and Dolphin Hotels at Disney World in Orlando perform so badly in Marne-la-Vallée? Is it because Graves is too strong a talent to be chained to a theme? The Orlando hotels are original and glorious creations because when he designed them, Graves was not required to tell any story other than his own. Producing a Disney version of Manhattan plainly didn't interest him. ■

—M.F.S

Pool pavilion (top left and facing page, top) evokes Hockney's paintings. Lobby (center left) includes Big Apple decor; dining room (bottom left) resembles low-budget Rainbow Room. Barrel-vaulted volumes (facing page, bottom) contain convention facilities.

Euro Disney project credits appear on page 117.


Oriole Park at Camden Yards
Baltimore, Maryland
Hellmuth, Obata & Kassabaum Sports Facilities Group
GRAND S

PERRY THORSVIK / BALTIMORE SUN

Three-tiered, 48,000-seat Oriole Park at Camden Yards (these pages) is sited to offer skyline views. Restored 1898 warehouse provides tantalizing right-field target. The urban design of the 85-acre site includes a linear plaza between warehouse and stadium, parking for 5,000 cars, and a plan for a future football stadium.

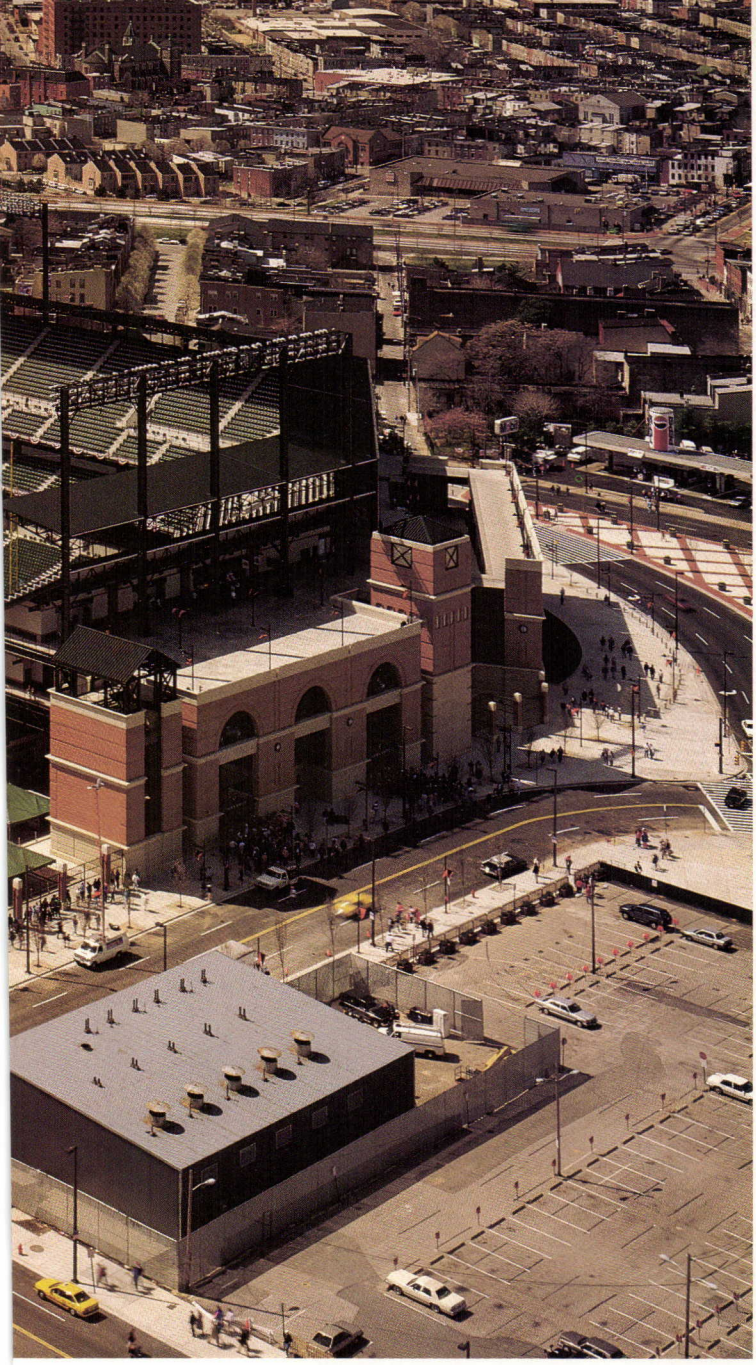
BALTIMORE AND

BALTIMORE, THE WRITER H.L. Mencken once observed, is "the one genuine cathedral city of our fair republic." Mencken was referring to the city's role as home to the first Roman Catholic cathedral in the United States, Benjamin H. Latrobe's 1818 Basilica of the Assumption. But the edifice that's engendering near-ecclesiastical rapture in Baltimore these days is the new home of the Orioles baseball team, just west of the rejuvenated Inner Harbor. With its curved brick facade, arched openings, asymmetrical field, and refurbished warehouse neighbor, Oriole Park at Camden Yards has taken its place in baseball's pantheon of beloved green cathedrals, joining Brooklyn's Ebbets Field, Boston's Fenway Park, and Chicago's Wrigley Field.

Oriole Park is on the cutting edge of a design trend that is changing sports architecture around the country. In recent years, team owners have realized that stadiums and arenas need not be feats of pure engineering or vast, domed extravaganzas—concrete doughnuts that are practically indistinguishable from one city to the next. Having pushed that type of structure as far as it will go with Toronto's multipurpose SkyDome, architects are now designing buildings that incorporate modern amenities while reflecting the cities they're in and the traditions of the sports for which they're designed.

In Baltimore, Hellmuth, Obata & Kassabaum's Kansas City-based Sports Facilities Group (HOK Sport) has taken this concept to the limit with a project that blends the urban quirkiness of classic ballpark shrines of the early 1900s with the high-tech creature comforts of the 1990s. From the beginning, Baltimore's newfangled, old-fashioned ballpark at 333 Camden Street was envisioned as an intimate place where major league baseball could be played the way it should be: under the sky, on natural grass, near the heart of the city. Design concepts that convey those messages include breaking down the scale of the exterior, putting seats as close as possible to the action, and creating an asymmetrical field—a throwback to turn-of-the-century ballparks—with odd nooks and crannies that keep the game interesting.

Baltimore's neo-traditional ballpark was conceived for the Orioles and the Maryland



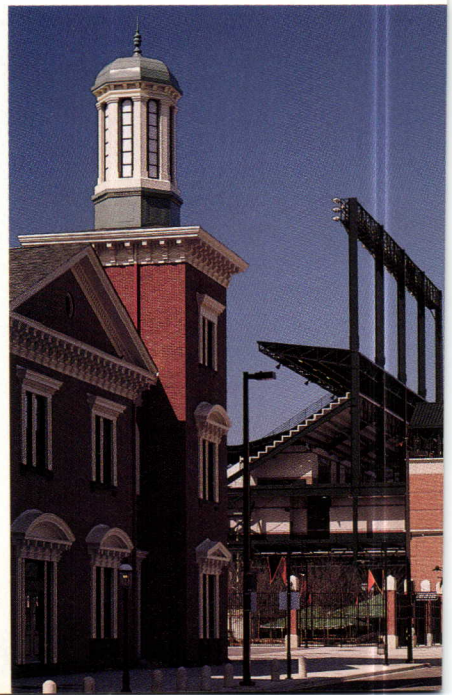
Built on a former rail yard, Oriole Park (above) includes preservation of a linear railroad warehouse and Camden Station (bottom left in top photo). Eutaw Street was reopened as a pedestrian mall (left) and extends south as a landscaped promenade to parking lot (facing page, bottom left); 1911 Bromo-Seltzer tower dominates the skyline.

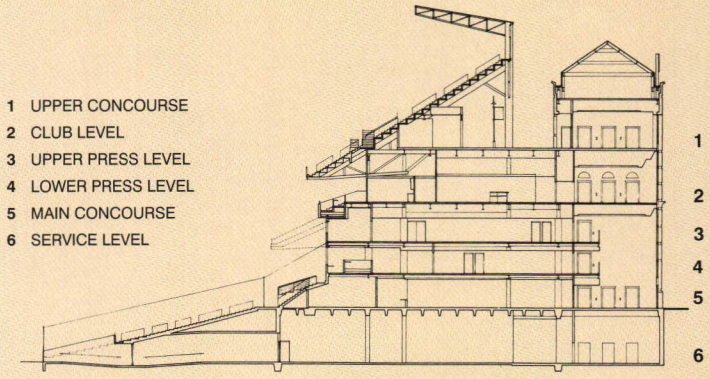
Stadium Authority, a state agency that built the ballpark with state lottery revenues. HOK Sport Senior Vice President Joseph Spear, principal-in-charge of the project, says the design team never lost sight of its clients' goals of making sure the fans were comfortable, the playing conditions optimum, the traditions of baseball intact. Yet Oriole Park celebrates Baltimore along with baseball. From any one of its 48,000 seats, spectacular, picture-postcard views of the downtown skyline serve as a backdrop to the game. Even the roomy concourses leading to the concession stands have overlooks that offer splendid views of the Ridgely's Delight and Mount Clare neighborhoods, and landmarks such as the castellated 1911 Bromo-Seltzer tower. While containing all the modern amenities fans expect, Oriole Park also fits its setting so well that it could only be right for Baltimore.

This respect for the local cityscape grew out of a master plan for the 85-acre site that prescribed a way to insert the large-scale ballpark into the established urban fabric in such a way that it would feel as if it had always been there. Developed by HOK Sport, local firm RTKL Associates, and Wallace Roberts & Todd of Philadelphia, with help from Baltimore's planning department and the local AIA urban design committee, among others, the plan called for the preservation of the Baltimore & Ohio Railroad's 1898 freight warehouse to the east and Camden Station, an 1857 railroad terminal to the northeast. The 1,116-foot-long, eight-story-high warehouse, a mighty structure that complements the scale of the ballpark, was restored to house shops and pubs, the Orioles' administrative offices, banquet and meeting facilities, and a posh restaurant. The majestic brick building also serves as a backdrop to right field, offering left-handed power-hitters a tantalizing target that rivals Fenway Park's "green monster" as baseball's most significant architectural feature.

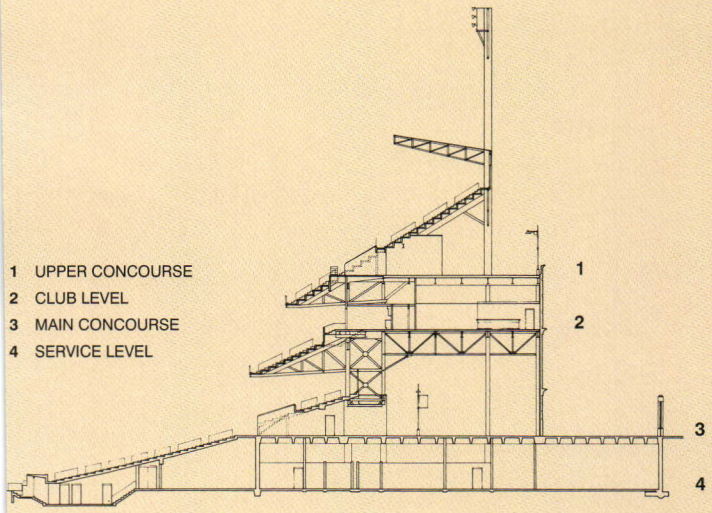
The master plan recommended that the curved seating bowl conform to the existing street grid and be separated from the warehouse by a distance of 60 feet. Eutaw Street, the corridor between Oriole Park and the warehouse, was designed to be part of the ballpark's lower concourse during games—a festive linear plaza where fans are free to roam around—and a pedestrian-only mall at other times. By designing a curved shell that almost touches the warehouse, the architects established a dialogue between the two supersized building elements, giving them equal weight.


NO PARKING CAB STAND

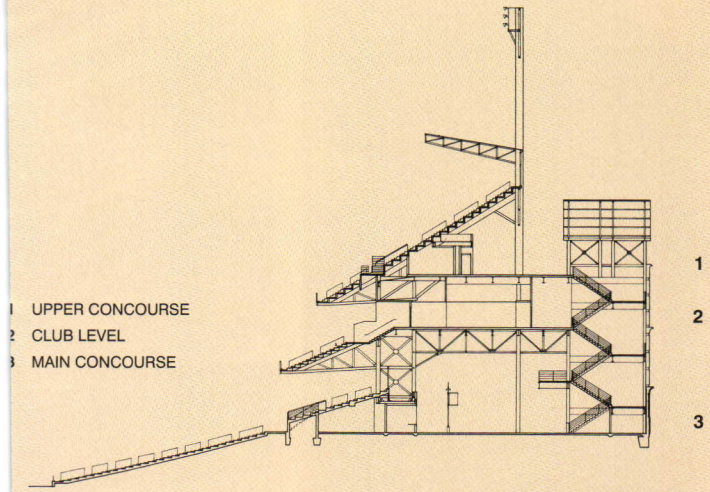




SECTION AT HOME PLATE



SECTION AT FIRST BASE



SECTION AT THIRD BASE

Camden Street elevation (facing page, top) echoes restored 1857 station next door. Metal roofs are hipped for elevator towers (facing page, bottom left) and gabled for staircases (facing page, bottom right). On Russell Street (facing page, bottom left), upper concourse doubles as viewing platform. Sections (left) reveal truss system for supporting upper deck.

The result is a pleasing tension between the long warehouse and the seating bowl, which is sliced off exactly where Eutaw Street cuts through the site, as if by a buzz saw. Along with the train station, whose exterior has been artfully restored by local architects Cho, Wilks and Benn, the warehouse instantly identifies Camden Yards as Baltimore's home for baseball. And, by making outfield walls parallel to the streets just beyond the ballpark, the architects created a field with quirks and idiosyncrasies that interject a degree of chance into each game. In recognition of the master plan's power and effectiveness, the American Institute of Architects gave it one of seven 1992 Urban Design Awards of Excellence.

Once the siting issues were resolved, HOK successfully broke down the ballpark's apparent scale by setting the upper deck back from the street, resulting in a facade that appears as five stories, rather than its true nine stories. The firm decided to support the upper deck and sun screen with steel trusses, making those elements appear lighter and more transparent than they would in concrete, and more like many older ballparks. By setting the upper deck back from the street, the architects also turned the upper concourse into a continuous viewing platform five stories off the ground.

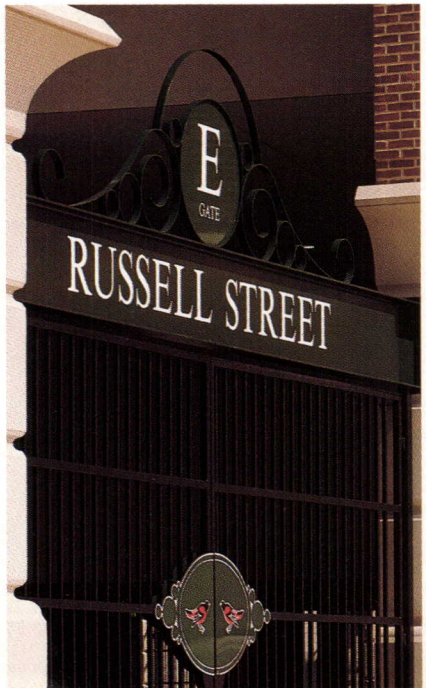
HOK Sport made another important break from the recent past in the exterior treatment of the ballpark. The architects took components, such as exit ramps and stair towers, that have typically been left to engineers, and turned them into architecture, cladding them in red brick and precast stone veneer along with the rest of the facade. The articulation represents a clear response to the adjacent warehouse and train station, imbuing the ballpark with a human scale. Each elevation looks different, reflecting the area it faces, and there is no backside.

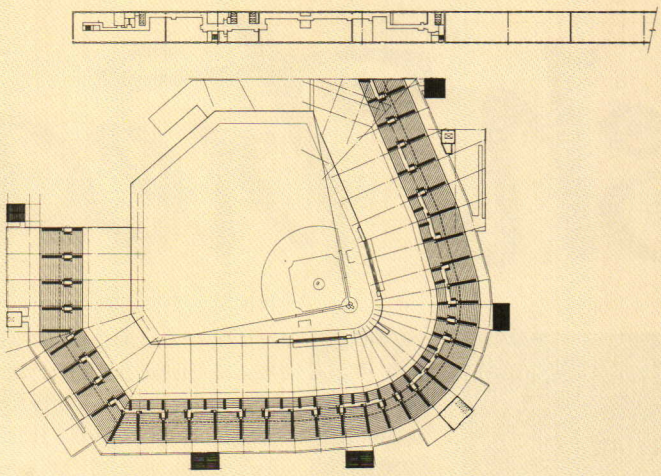
Contributing even more to the project's success is HOK Sport's painstaking attention to detail. From the dark-green slatted seats, which bear the 1890s Baltimore Baseball Club logo at the end of each row, to the vintage scoreboard with its ornithologically correct oriole weather vanes, designers made a conscious effort to draw from design elements that trigger memories of older ballparks. "The whole idea was for it to be a ballpark, not a stadium," Spear says. "The community had a vision that allowed us to design a park that evokes grand old stadiums from the past."

One of the few architectural offices in the country that specialize in sports design, HOK

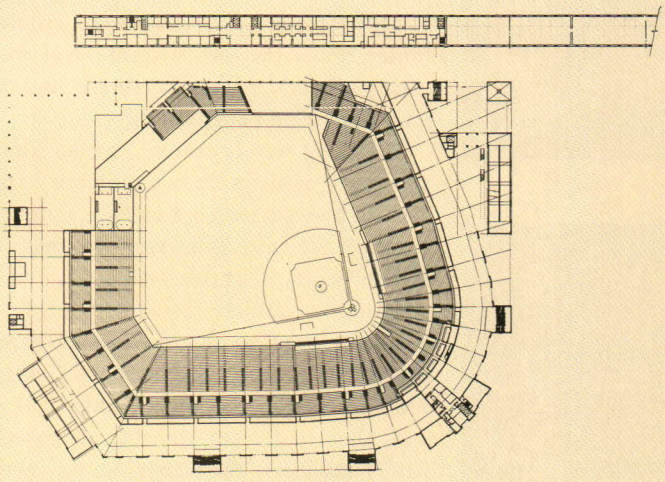

LEGG MASON
328


WOMEN

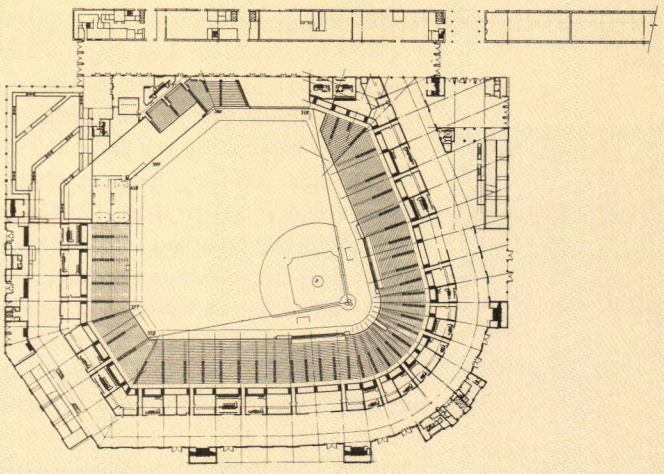

E
GATE
RUSSELL STREET



UPPER SEATING/SIXTH-FLOOR WAREHOUSE



LOWER PRESS LEVEL/LOWER SEATING LEVEL/SECOND-FLOOR WAREHOUSE



MAIN CONCOURSE/FIRST-FLOOR WAREHOUSE

Sport had taken architectural batting practice with two earlier projects that evoke traditional parks—Pilot Field in Buffalo and New Comiskey Park in Chicago (see pages 88-89). In Baltimore, Orioles majority owner Eli S. Jacobs, a New York financier with an avid interest in architecture and urban planning, knew how a much-loved ballpark could help boost attendance. Jacobs, who grew up watching the Dodgers play at Ebbets field, pushed for a "modern, old-fashioned" design. He and Orioles President Larry Lucchino also had the foresight to employ an in-house architect, Janet Marie Smith, to represent their interests. As the Orioles' vice president for stadium planning and development since January 1989, Smith—whose career includes representing the owners of Battery Park City in New York—was influential in many of the key decisions that made the ballpark seem so familiar. "We want people to feel as if they've been there before, even if it's their first visit," she explains.

Given how well Oriole Park turned out, it is inevitable that other ball clubs will want to clone it. That is already happening to some degree, with projects such as the neo-traditional ballpark the Texas Rangers are building in Arlington. For HOK Sport, the urge to merely imitate the past is worrisome. "Many ball clubs would probably be satisfied if we simply repeated what we did in Baltimore, but we wouldn't be," notes Spear. "Because of that, the next one will be more challenging." Indeed, the lesson of Camden Yards is not to make nostalgia the new cookie cutter. The lesson is that the best design solutions come out of the place itself. ■

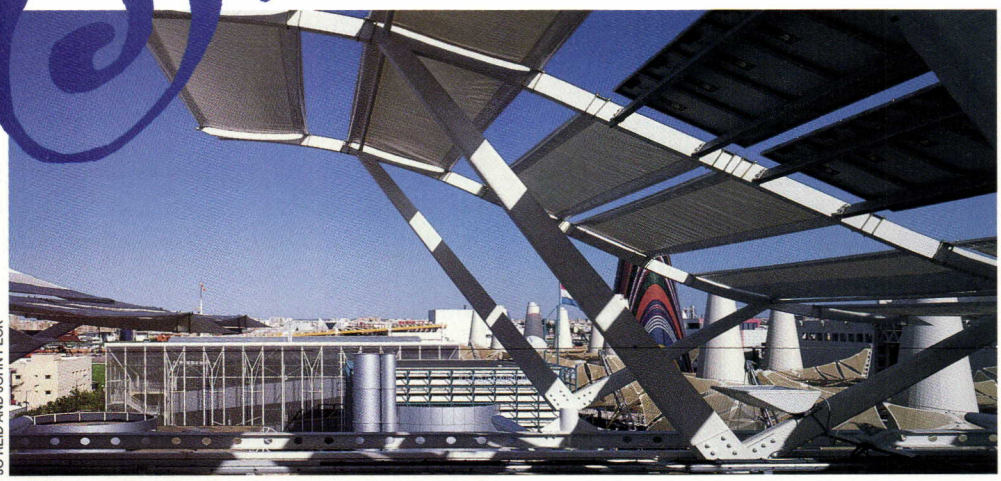
—EDWARD GUNTS

Details include a vintage scoreboard that serves as a frontispiece to the skyline beyond (facing page, top). Slatted seats feature logo of 1890s Baltimore Baseball Club at the end of each row (facing page, bottom right), and signs are marked with street names as well as gate numbers (facing page, bottom left and center).

ORIOLE PARK AT CAMDEN YARDS
BALTIMORE, MARYLAND

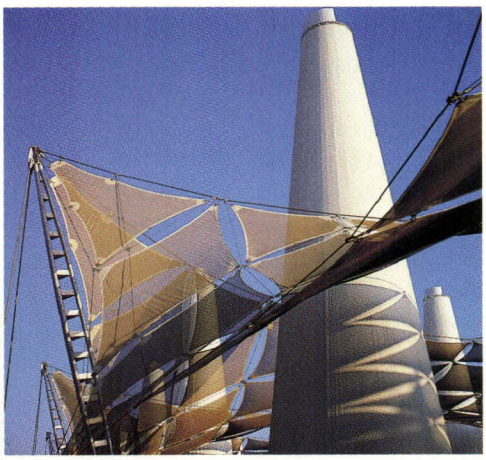
ARCHITECT: Hellmuth, Obata & Kassabaum Sports Facilities Group, Kansas City, Missouri—Joseph E. Spear (principal-in-charge); Ben Barnert (senior project architect); Steve Evans (project manager); David Alexander, Helen Maib, Craig Meyer, Brad Burgoon, Susan Carter, Chris Castrop, Matthew Connolly, Stewart Ervie, Marilyn Feris, David Gile, Dan Jones, Steve Leuthoid, Tom Usher, Daniel Weber (design team)
LANDSCAPE ARCHITECT: Wallace, Roberts & Todd, Philadelphia, Pennsylvania
MASTER PLANNER/URBAN DESIGN TEAM: Hellmuth Obata & Kassabaum; RTKL Associates; Wallace Roberts & Todd
ENGINEERS: Bliss & Nyitray (structural); KCI Technologies (mechanical/electrical); Rummel, Klepper & Kahl (civil); Joiner Consulting Group (acoustical)
CONSTRUCTION MANAGER: Barton Malow/Sverdrup
COST: $106.5 million
PHOTOGRAPHER: Jeff Goldberg/Esto, except as noted

Spanish treas



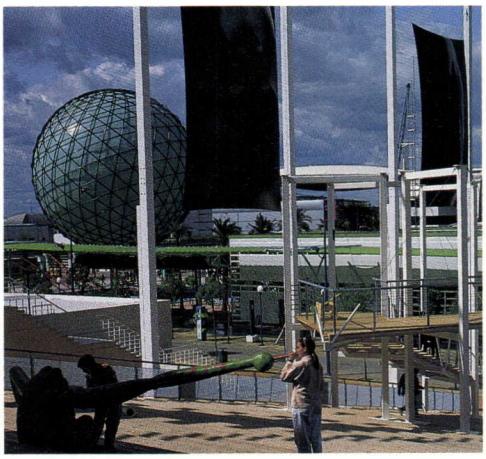
JO REID AND JOHN PECK

VIEW OF EXPO '92 FROM BRITISH PAVILION



BEN JOHNSON/ARCAID

AVENUE II—BOULEVARD OF EUROPE
JEAN MARIE HENNIN AND
GEORGE LIPPSMEIER

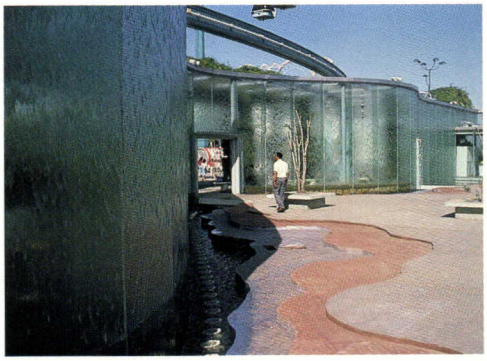


BEN JOHNSON/ARCAID

AVENUE III
ANTONIO CANO, PEDRO SILVA, AND
MANUEL ALAVAREZ

NICHOLAS KANE/ARCAID

THE PALENQUE
JOSÉ MIGUEL DE LA PRADA POOLE



AVENUE V
SITE, LUIS CALDERON

SANTIAGO CALATRAVA'S ALAMillo suspension bridge is the first sight a visitor is likely to see when entering Seville from the city's new Rafael Moneo-designed airport. Gleaming white in the Andalusian sun with cables fanning out like strings of a great harp, its tall, tautly angled steel pier is an apt symbol for Expo '92, the fourth universal exposition since the end of World War II. The Catalonian engineer's bridge is just the sort of techno-feat we still expect of world's fairs, an esthetic high point rooted in elegant engineering.

Expo '92 was organized to coincide with the 500th anniversary of Columbus's voyage and its unexpected consequence of bringing together the cultures of two continents. But the fair's official theme—"The Age of Discoveries"—could be generic. World's fairs owe their origin to the development of industrial capitalism and international free trade. From the first exposition in London 141 years ago, they have consistently celebrated the new, particularly the technologically new. At the same time, they have also celebrated architecture. We often remember fairs by their structures—the Crystal Palace in London, 1851; the Eiffel Tower in Paris, 1889; and Mies van der Rohe's German Pavilion in Barcelona, 1929, known ever after as simply the "Barcelona Pavilion."

Gerry Robinson, an American public relations associate for Expo '92, observed after months in Seville that "a country has to feel good about itself to throw a party like this," a dictum that certainly helps explain why Chicago, which was to share the Columbus fete with Seville, bumbled away the opportunity. It does not, however, explain the architectural failure of the United States in Seville (ARCHITECTURE, April 1992, page 15). Together with the Barcelona Olympiad this summer, Expo '92 is clearly a showcase for post-Franco Spain, for its democracy, its planners, engineers, and architects, and the speed with which they have played catch-up with the northern tier of the European Eco

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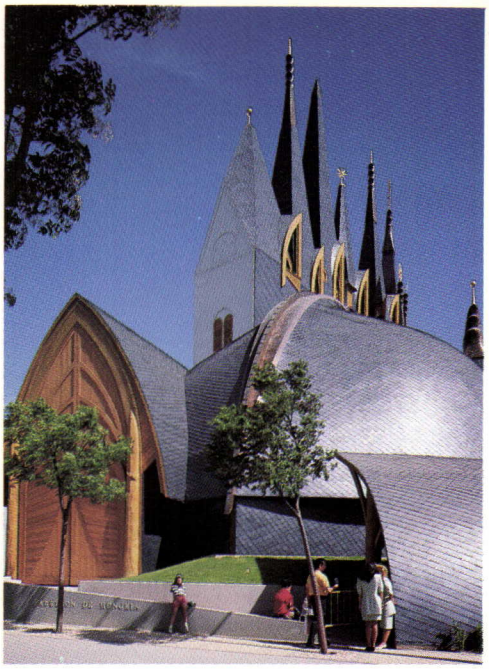
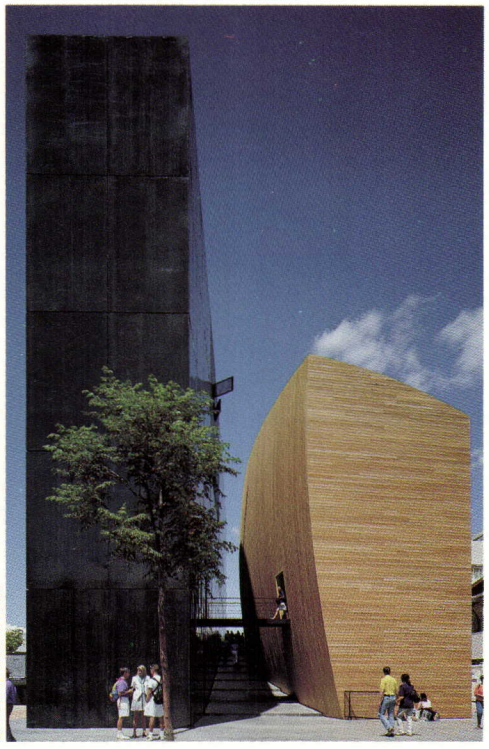
ALAMILLO BRIDGE, SANTIAGO CALATRAVA



HUNGARIAN PAVILION, IMRE MAKOVECZ
(AND FACING PAGE)

JAPANESE PAVILION, TADAO ANDO



JO REID AND JOHN PECK

FINNISH PAVILION, PIRKKONEN AND ANAKSENAHO

west is an elongated grid of streets and avenues, where most of the national and corporate pavilions are situated. In both areas, pedestrian ways are covered by a two-tiered trellis system, with leafy vines along both upper and lower tiers—significant parts of what Expo officials tout as an "integrated bioclimatic system" to increase comfort levels in Seville's blistering summer heat. Throughout the fairgrounds, one is never far from shade—officials report that as many as 25,000 trees and 300,000 shrubs were planted—or water. There are waterfalls, waterwalls, waterways, and, of course, fountains in all public spaces and pavilions. Thousands of computer-controlled, mist-emitting water "micronizers" have been secreted throughout the site.

And yet, variety within the overall uniformity was encouraged, not only in the architecture of the pavilions but in the design of public spaces. Separate design teams were commissioned for the different avenues—notably SITE for Avenue V, a 300-meter-long, undulating glass waterwall; and Jean Marie Hennin and George Lippsmeier for Avenue II, the Boulevard of Europe.

Tent structures abound. The Boulevard of Europe is boldly demarcated by 12 enormous canvas-covered structures (one for each of the EEC nations) whose bold, chimneylike shapes echo the still-intact smokestacks of a ceramics factory that once occupied the island of Cartuja. More remarkable are the 100 pointy-top cones shading the Palenque, a mid-site entertainment venue, and the huge canvas "cloud" hovering over the German pavilion, supported simply by taut cables attached to a soaring steel pier.

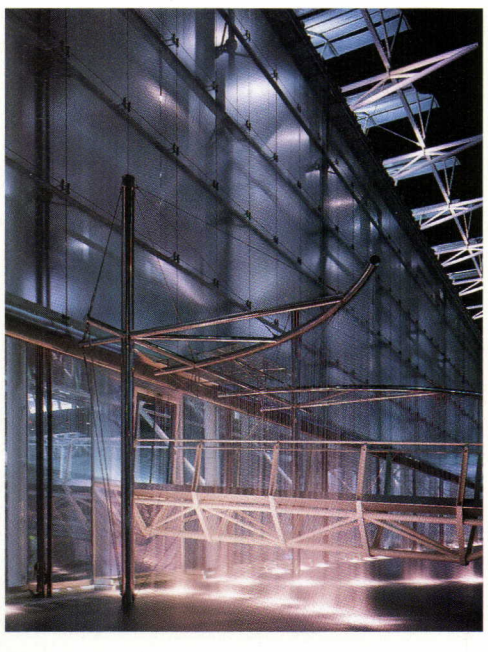
Architecturally, the prevailing late Modernist climate reflects the intentions of the urban designers to create a late-20th-century ensemble. The most telling symbolic group of buildings is that of the autonomous regions of Spain, a sequence of bright Modernist containers arrayed in a graceful curve around the Lake of Spain. These buildings collectively prove that, to contemporary Spanish architects, Modern architecture continues to be a liberating impulse.

Of the national pavilions, those from the Middle East and a cluster of Southeast Asian countries opt for straightforward regional imagery. Morocco's pavilion stands out, a jewel of finely crafted Islamic tile and stonework combined with lots of clear glass. So, too, does SITE's Saudi pavilion with ornamental wooden screens and mud brick walls. But the unofficial prize in the national category unquestionably belongs to Hungary. Indeed, this country's pavilion is the most passionately coherent architectural statement at the fair. Designed in an "organic" style by Imre Makovecz—a 57-year-old Hungarian architect who claims Antonio Gaudi, Frank Lloyd Wright, and Bruce Goff as antecedents—the building obviously borrows from a national, rural vernacular. Its barn-humped roof with seven distinctive steeples is at once picturesque, metaphorically convincing, and formally powerful. No architecture at Expo expresses structure more directly. Constructed entirely of wood, the pavilion's interiors soar. The narrow passageway under the hollow steeple is almost scary in its expressionistic force. The main room is cathedral-like, and a tour-de-force gallery contains an entire leafless oak tree, its root system visible through the plate-glass floor.

> The prize in the national category goes to the Hungarian pavilion, the fair's most passionately coherent architectural statement.

Japan's monumental pavilion, by the redoubtable Tadao Ando, cuts a striking image, remindful of the archaic power of wooden temple architecture. Its slanted front and back facades, entirely covered in horizontal wooden planks, are pierced at the center by a steep, ceremonial staircase leading to an observation platform. Rising from the platform are two stunning four-posted column structures whose cross beams, in an expanding sequence of overlapping squares, pay tribute to the tradition of Japanese joinery. The pavilion's billing as the largest wooden structure in the world, surpassing the 1,250-year-old Todaiji Temple in Nara, is questionable—its wooden posts support a lightweight roof, but interior floors are supported conventionally by steel and concrete. Still, the building is an impressive contemporary expression of a national tradition.

The United Kingdom's is the best of the high-tech pavilions, certainly the star among the larger national buildings on the site. To build a big pavilion is a daunting challenge: it's expensive, and every slip shows. Belgium did well at this game with an open structur



Grimshaw's British pavilion (top) is sheathed on the east by a suspended glass wall, cooled by a curtain of water (above). North and south elevations are shielded by steel-supported fabric panels (facing page). Roof louvers support solar panels that activate pumps for waterwall.

with movable sunscreen walls by architects Thomaes, Driesen, and Meersman, as did the Netherlands with a semi-transparent building by Peter Trimp and Fred Temme. Like the U.K.'s, these national buildings are big, airy boxes with sail-like coverings, within which are ramps and platforms for circulation and exhibits. But at the British pavilion, by London-based Nicholas Grimshaw & Partners, architecture is the main message. Its principal facade is a stupendous glazed waterwall designed by Grimshaw and sculptor William Pye, the best of many on the site. The pavilion's sides and back are coated sailcloth held taut by vertical trusses. A roof line of swooping, winglike panels (containing photovoltaic cells to provide some of the pavilion's energy needs) contributes to the overall feeling of lightness. Inside, it's like a late-model airplane hangar; every metal joint is a jewel.

The architects of these pavilions obviously did not have to contend with the unusual constraints that bedeviled designers of the pavilions intended for ordinary use after the fair—such matters as efficient office floor plans and heights. Unsurprisingly, the permanent structures, with a few notable exceptions, such as the Pavilion of Navigation, are unexciting. They're pretty much what one would expect to find in a late-20th-century corporate office park. Then, too, it's hardly surprising that most of the really outstanding architectural attainments at Expo '92 are on the small side.

> Designed by Nicholas Grimshaw, the United Kingdom's is the best of the high-tech pavilions, a star among the larger national buildings.

Luxembourg's pavilion, for instance, by Paczowski-Fritsch and Associates, is a simple but striking little factory. A cube with double facades on all four sides, the outer layer consists of a striking grid of green-painted steel, supporting taut canvas awnings to shade the glazed inner layer. Sweden's contribution, by Alenius, Silfverhielm, and Ahlund, is a sweet, sophisticated combination of wood and metal, vernacular and high styles. Finland's building, a spare but dynamic contrast of two boxes—one elegant, curved, and sheathed in wood, the other rectilinear and clad in dark, polished steel—was designed by a group of architecture students who won a national competition. Norway's pavilion, by Pal Henry Engh and LPO Arkitektkonor, is another minimal sculpture, an aluminum-covered tube that appears almost to float in a pool of water. Switzerland's pavilion, by Vincent Mangeat, is a captivating combination of wit, seriousness, and structural ingenuity. With its tower of paper polygons, the structure is a charming, first-rate exposition of Swiss design and art. Czechoslovakia's modest box, by Martin Nemec, attains mystery by the simplest means—it's cloaked in a triple layer of black industrial-strength wire.

Three distinguished buildings designed by Spanish architects will provide Seville with new civic amenities. Nestled close to the river, the Pavilion of Navigation and its nearby viewing tower by Sevillian architect Guillermo Vasquez Consuegra is elegant and welcoming. Basically a long shed, the pavilion has a gracefully curved roof supported by huge beams of laminated wood. The tower, a bold concrete object in the form of a ship's prow, breaks the slow-moving water of the Guadalquivir. Rafael Moneo's airport appropriately recalls both Roman and Moorish antecedents while relying on 20th-century engineering. The Maestranza Theater, located in the city just across the river from Cartuja Island, is a superb contextual work by Sevillian architects Aurelio del Pozo and Luis Marin.

Expo '92 demonstrates the benefits of long-range planning for events ordinarily conceived as temporary, evanescent. The superb urban design, reminiscent in spirit if not in detail of the World's Columbian Exposition held 99 years ago in Chicago, readies the reclaimed flood plain for decades of use after the fair. The infrastructure improvements help to prepare Seville and the whole of southern Spain to enter the global economy. The parks, trees, water features, and other permanent facilities will continue to contribute significantly to the city's quality of life. There seems little question that Seville will be better off after the fair than before. Expo '92 is an excellent standard for the next universal exposition, already scheduled for Japan in 2005, and, indeed, for all such international gatherings. ■

—BENJAMIN FORGEY

Benjamin Forgey is the architecture critic of The Washington Post.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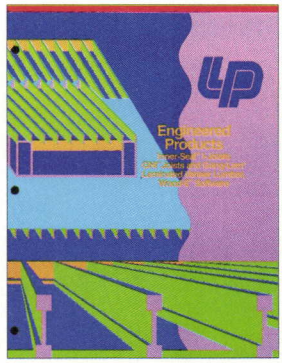

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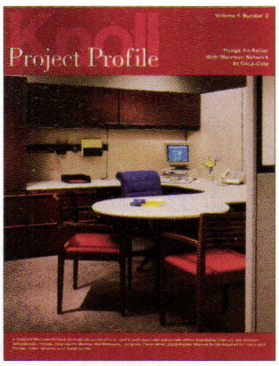

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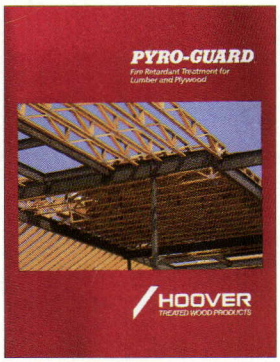

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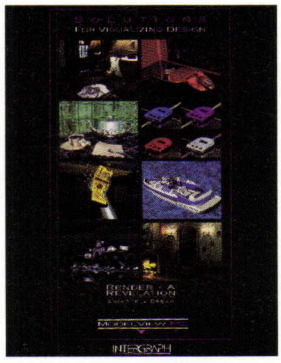

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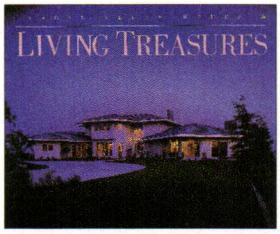

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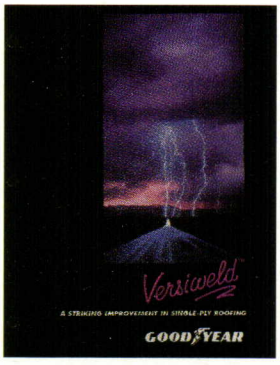

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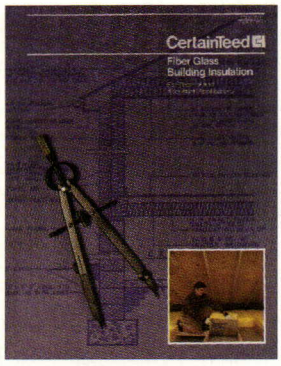

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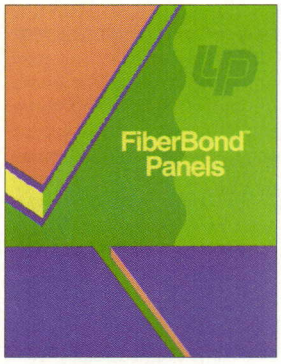

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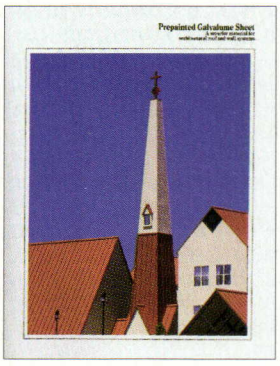

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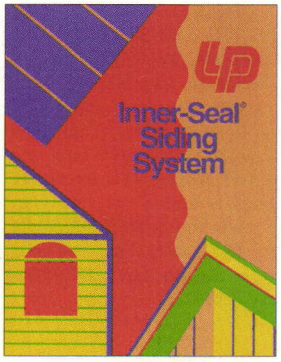

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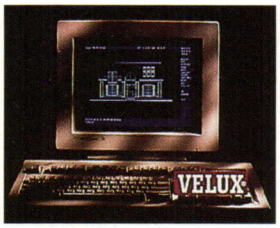

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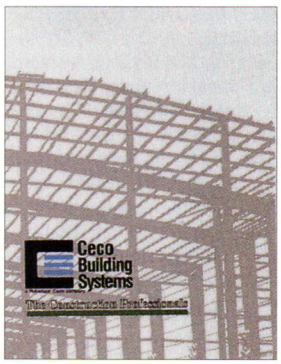

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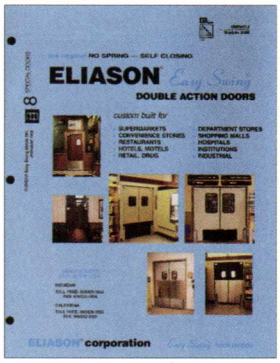

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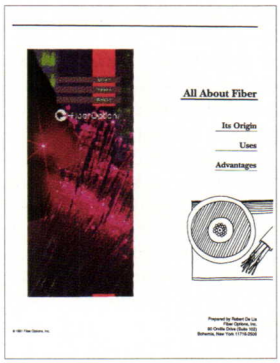

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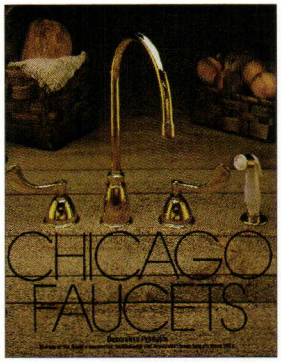

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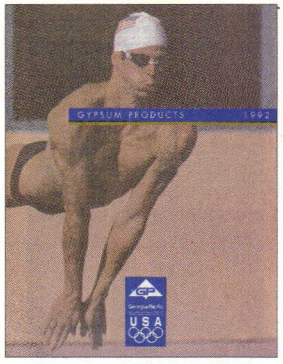

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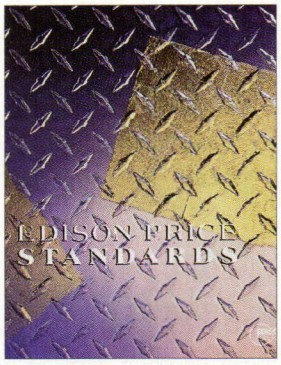

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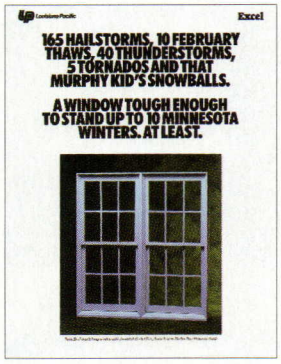

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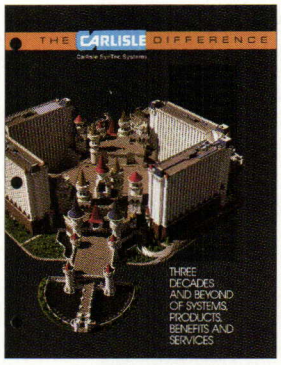

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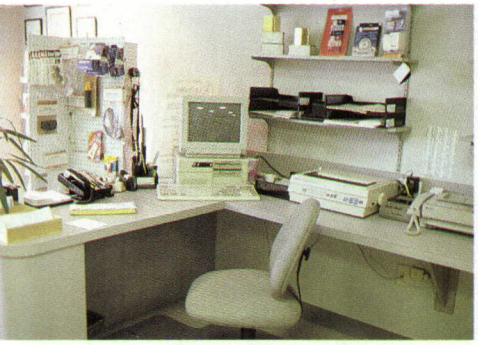

Universal Design Conference in New York

TO DESIGN UNIVERSALLY MEANS MAXIMIZING the number of people who are able to use a product, be it a can opener or the house that contains it. The universal design concept, which has received renewed attention due to the 1990 Americans with Disabilities Act, addresses the need to include as many people as possible in everyday activities. An international conference, "Universal Design: Access to Daily Living," was held May 14-15 at the Grand Hyatt Hotel in New York City. Cosponsored by the Pratt Center for Advanced Design Research, the Cooper-Hewitt National Museum of Design, and Columbia University's College of Physicians and Surgeons, the conference aimed to educate the design community on how to create environments accessible to all.

Adjustable-height desks (top left) and stairways retrofitted with rail-guided automatic chair lifts (top right) were some of the designs discussed by panelists Arnold Wasserman, Ronald Mace, and George Covington (above, left to right).

Elements to greater access—big buttons, high-contrast colors, and easily located and adjustable controls—were discussed, of course. But the best tool for achieving accessible design goals may be good planning. Architects who consider disabled people as part of the general population will naturally incorporate greater accessibility from the moment they begin a project. According to Ronald Mace, director of North Carolina State University's Center for Accessible Housing, the precepts of universal design "create one environment that suits the needs of all people." Just as no architect would call for 2-foot-high steps, no one thinking in universal terms would choose an entrance inaccessible to wheelchairs.

One commonly expressed reservation to the ADA is that it will increase costs. But, according to Marco Damiani, assistant executive director of United Cerebral Palsy of New York City, 69 percent of all ADA-required accommodations cost less than $500. Retrofitting, as any building owner will attest, is what costs.

Including people with disabilities is more important now than ever before—due not only to the ADA, but to demographics. There are presently some 40 million Americans with disabilities, and the nation's population is growing older. With increased life expectancies and the baby-boom generation approaching middle age, it is estimated that 21 percent of the population will be 65 or older by the year 2030, up from 13 percent today. This group will both demand accessibility and be able to afford it. In other words, accessible design has extraordinary market potential, but then, good design has always meant good business.

—STEVEN BODOW

Accessible Resource

For a nominal fee, the Jackson, Mississippi-based Institute for Technology Development now offers a new database search service to assist architects seeking product literature on suitable barrier-free building products. For more information, contact: (601) 234-0158.

Austin Pilot Project Wins Green Award

EcoWatch

A LOCAL INITIATIVE BY the city of Austin, Texas, to encourage sustainable residential design and construction practices received global recognition last month at the United Nations Earth Summit in Rio de Janeiro, Brazil. Of the 12 awards presented by the Toronto-based International Council for Local Environmental Initiatives, an organization formed by the U.N. in 1990 to recognize environmentally sustainable developments, Austin's Green Builder program was the only United States winner. First instituted this year, the city's voluntary pilot project was developed by its Environmental and Conservation Services Department in conjunction with consultants Pliny Fisk III and Gail Vittori of the Austin-based architecture and planning firm, Center for Maximum Potential Building Systems (ARCHITECTURE, May 1991, pages 64-71). The program rates newly constructed houses according to environmentally sensitive elements such as water, waste, and energy-conserving systems, and their incorporation of indigenous materials. The design criteria are outlined in the city's "Green Builder Guide." A sustainability rating for each house is determined by adding up point values assigned to building materials and construction methods according to their environmental merit. Points are awarded for standard features such as low-flow faucets, which are worth one point, to more radical technologies such as wind-powered electricity generation systems, which are worth 15 points. For further information on Austin's program, contact the city's Environmental and Conservation Services Department: (512) 499-3500. ■

—M.S.H

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Sports Architecture Firms

Kansas City offices are transforming the way stadiums and arenas are designed.

IN THE 1970S, IT WAS THE CORPORATE OFFICE tower. In the 1980s, it was the festival marketplace. But in the 1990s, the sports arena has become the foundation on which American cities are laying their hopes for revitalization. More than a dozen communities across the country are planning new baseball parks, football stadiums, or basketball and ice hockey arenas—many in important urban settings. These new sports palaces are the "cathedrals of the next century," maintains Ronald Turner, senior vice president and director of the Kansas City office of Ellerbe Becket. "They used to be engineering-driven, but now they're entertainment complexes, minicities." Unlike the saucer-shaped arenas of the 1960s, today's projects fit comfortably into cities. And, instead of striving to be all-purpose, many of these new facilities are tailored to a single sport.

The new sports projects range from ballparks in Cleveland, Denver, and Chicago to arenas in Phoenix, Boston, Philadelphia, and Tampa. Industry experts estimate that more than $1 billion worth of projects are currently on the drawing boards—more than twice the amount in design five years ago.

This flurry of sports design activity is fueled by league expansions and competition between cities vying to lure franchises. But the bottom line is often the team owner's desire for increased revenues to offset rising player salaries. Team owners have discovered that architecture sells—and that new facilities with deluxe skyboxes and other amenities bring higher ticket prices, greater attendance, and more food and beverage sales. And public officials, anxious to keep teams from leaving town, are helping replace obsolete facilities by arranging attractive funding packages. "People are demanding better facilities," contends Ronald Labinski, senior vice president of Hellmuth, Obata & Kassabaum's Sports Facilities Group. "Fans want more. Players want more. Owners want more. Everyone is on a learning curve."

Kansas City is the sports design capital of the United States, home to three of the busiest firms in the field. They are HOK Sport, the only office that devotes 100 percent of its time to the design of sports facilities; Ellerbe Becket, whose four-year-old Kansas City office is home to the company's Sports and Public Assembly Facilities Group; and Howard Needles Tammen & Bergendoff's Sports Architecture Group. The firms all have connections to Kivett & Myers, the Kansas City firm that worked with architect Charles Deaton in the early 1970s on the city's Harry S Truman Sports Complex. Today, these spin-off firms are the prime contenders for all commissions for major and minor league facilities, college athletic facilities, and renovation and modernization of existing sports arenas.

The sports market is difficult for newcomers to break into because sports projects are more complicated than other building projects, and clients generally look for architects with extensive previous experience. Unlike general practitioners, sports designers must be knowledgeable about myriad technical elements, from seat widths to sight lines to deck slopes. Large sports facilities also require the specialized talents of lighting designers, acousticians, and urban planners. This explains why the practices leading the field represent the largest multidisciplinary firms in the country, with in-house talent capable of addressing a wide range of disciplines from structural engineering to interior design.

In the past, few architecture firms specialized in sports design due to a limited client pool and a market dominated by engineering firms. Clients were unwilling to take risks on those practices without a proven track record. As architects and urban designers become a more important part of the equation, doors are opening to first-time players such as David M. Schwarz Architectural Services, the Washington, D.C. firm that is working with HNTB and HKS of Dallas on a new ballpark for the Texas Rangers. For those who become involved through joint ventures or by joining existing firms, sports architecture can be highly rewarding. As HOK's Joseph Spear puts it, "These are places where memories are made." —EDWARD GUNTS

TODD ENDORF

HOK Sport management committee (left to right): Ronald J. Labinski, Chris Carver, Joseph Spear, Raymond Chandler, Dennis Wellner, James Walters, Ben Barnett, Randy Dvorak, Earl Santee, with helmets of teams whose facilities the firm has designed.

TODD ENDORF

Ellerbe Becket Senior Vice Presidents Ronald Turner and Paul Jorgensen (front, left to right) and Vice Presidents Richard deFlon and Gordon Wood (back, left to right).

TODD ENDORF

HNTB Associate Eric J. Piper, Partner Richard L. Farnan, and Associate Terry K. Miller, director of the sports architecture group (left to right) with Rangers Stadium entry.

Urban Revivalists

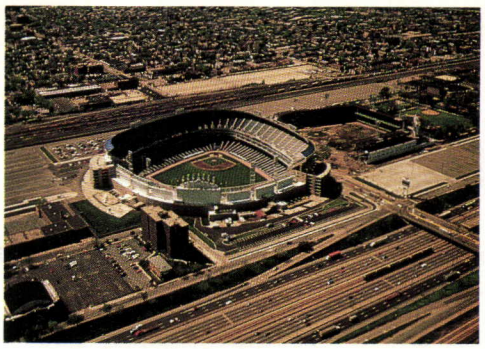
Hellmuth, Obata & Kassabaum
Sports Facilities Group

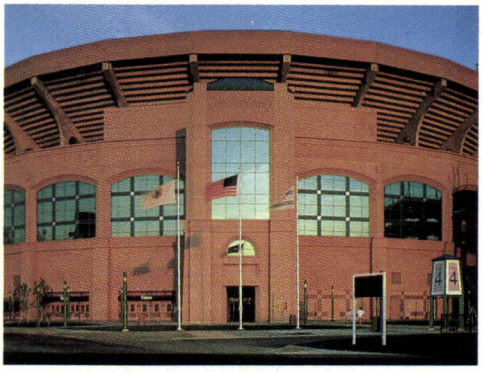
AFTER DESIGNING ONE OF THE BEST-RECEIVED sports facilities in a generation, what do you do for an encore? That's the challenge now facing Hellmuth, Obata & Kassabaum's Sports Facilities Group, architects of record for Oriole Park at Camden Yards (pages 64-71). Hailed by *Baseball Weekly* as the first of the "neo-classic" ballparks and by the *New York Times* as an antidote to 50 years of "wretched stadium design," the Baltimore complex has clearly set a new standard for other architects to emulate.

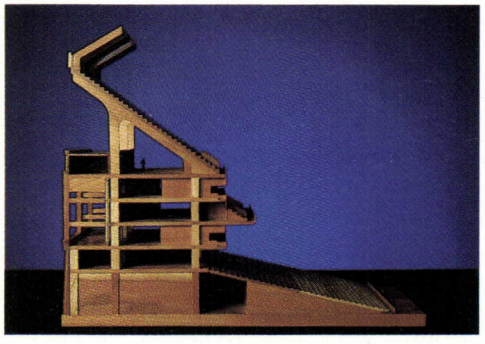
Despite the rave reviews, HOK principals say they aren't about to turn Oriole Park's design into a formula. "We're not repeating the same thing over and over again," vows Joseph Spear, senior vice president of HOK Sport and principal-in-charge of the project. The ballpark's design was "right for Baltimore," Spear contends, "but it wouldn't be right anywhere else." Having shown convincingly that sports designers should abandon the cookie-cutter approach, HOK is seeking to take what it has learned to create ballparks and other facilities that are equally right for their specific settings.

Now under construction for the Cleveland Indians, HOK's $144 million, 42,000-seat ballpark is scheduled for completion in 1994. Construction will start this fall on Coors Field, a $120 million, 40,000-seat ballpark near Denver's historic Larimer Square, to be occupied by the Colorado Rockies in 1995. HOK is also modifying its design for Miami's Joe Robbie Stadium for the Florida Marlins, and the firm was recently selected to create a 48,000-seat ballpark in San Jose for the relocating Giants, a project that was subsequently put on hold when voters rejected its funding plan. The architects have also worked closely with all five cities still vying for a National Football League franchise, including Baltimore.

Because of their size, complexity, and public nature, large sports projects can have a gestation period of seven to 10 years. HOK often secures commissions by completing a feasibility study and working with team owners to evaluate possible sites. Each project is assigned to one principal who oversees it from its beginning stages through to the punch list. The size of the project team varies with the program, ranging from four architects for a spring training camp to 25 or more for a major league ballpark.







New Comiskey Park
Chicago, Illinois

Opened in 1991, New Comiskey (top) was the first major league facility by HOK to blend state-of-the-art spectator services with elements reminiscent of bygone ballparks. The precast concrete exterior incorporates windows of colored glass (above center) that recall arches in the original Comiskey Park, and the grass playing surface is open to the air. Contemporary amenities include 84 fully furnished suites, four party suites, a stadium club, shops, and a pre-game picnic area. Unlike the Orioles, the White Sox requested a symmetrical field and inward orientation to protect the field from the wind, explains HOK Senior Vice President Joseph Spear. "It was a different set of design parameters for a totally different site." Cherrywood model of stadium section (bottom), used by the architects to study three-dimensional qualities during design, reveals 35-degree slope of upper deck and field at grade.

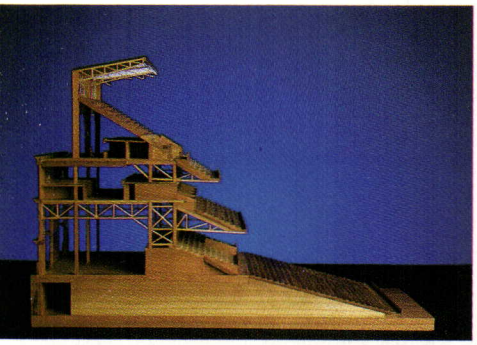
Spear and Senior Vice President Ronald Labinski maintain that their current volume of work is as much as the eight-year-old Kansas City office has ever had at one time, including the late 1980s. They believe it is the direct result of years of experience in the field, the firm's contacts, the positive response to Oriole Park, and the firm's stature as the country's only design office dedicated solely to sports architecture. With a staff of 143 architects, planners, and support personnel, HOK Sport is the third-largest of the 13 worldwide offices of St. Louis-based Hellmuth, Obata & Kassabaum.

Although the Sports Facilities Group was launched in December 1983, several of its senior members have been colleagues since the 1970s. They were brought together by Labinski, who worked for Kivett & Myers as project architect for Kansas City's Arrowhead Stadium, part of the Harry S Truman Sports Complex. In 1974, Labinski became a founding partner of Devine James Labinski Myers, where he began to assemble a team of young architects interested in sports design. The roster included Joseph Spear, Chris Carver, and Dennis Wellner—today, three of the nine managing principals of HOK Sport. From there they moved to HNTB for a brief stint in the early 1980s.

In 1983, Labinski and his colleagues decided they wanted to break away and develop a practice with the single focus of sports architecture. In St. Louis, the principals of HOK learned of their plans and offered an association that would allow the group to control its own work and remain in Kansas City. Since opening in December of that year, HOK Sport has completed design or planning work for 17 major league ball clubs, more than 30 colleges and universities, and more than 40 minor league and spring training facilities. In 1991, the group's billings reached $18 million. Current projects include arenas in Anaheim, Chicago, and London, a domed stadium in San Antonio, and a rugby stadium in Hong Kong.

Located in a former garment factory, the office maintains separate design teams for various subspecialties, including major league ballparks, major league football stadiums, minor league and spring training projects, amateur and collegiate projects, and master planning. In-house specialists provide interio design, programming, engineering, graphics, signage, computer-aided design, and other skills to serve the different teams.

Company principals maintain that design



Oriole Park at Camden Yards
Baltimore, Maryland

With its curved brick facade (top), arched openings, and upper deck fashioned of steel trusses (above center), Oriole Park is the most successful example to date of HOK's move to create traditional-style ballparks with modern amenities. It takes many of its cues from a restored 1898 warehouse that serves as a backdrop to right field. Amenities include 5,000 club seats, 72 skyboxes, and three party suites, with shops, pubs, and restaurants inside the warehouse. "The overriding idea was to rethink the values of the past, in details, in saving the warehouse, in fitting the ballpark into the urban fabric," explains Spear. "It set a new standard in terms of flexibility and in the mixture of old and new. For years to come, clients will say, 'It has to be this good.' " Model of stadium section from infield (above) reveals 31.3-degree slope of upper deck and playing field located 18 feet below street level.

ers in this field should have a genuine interest in sports. "We are all, to some degree, vicarious athletes who took our lifelong interests in sports and made them into a career," contends Labinski. "We're as much fans as we are architects," adds Carver.

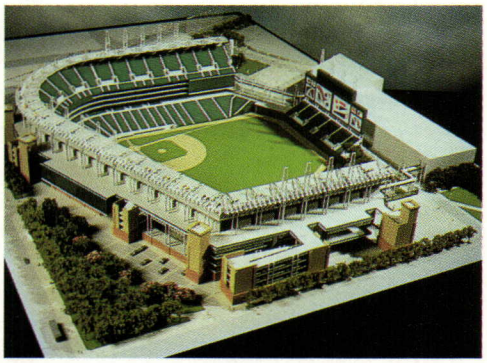
Among the concepts HOK takes credit for pioneering are: the introduction of revenue-generating club-level seating and lounges in ballparks; development of a football-baseball stadium that provides fans of both sports with good seats; and the creation of integrated seating for people in wheelchairs.

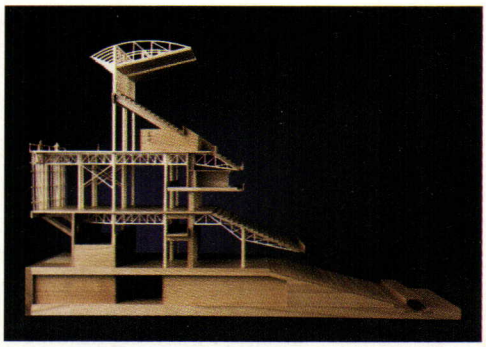
But the firm's most lasting contribution may be leading the move toward traditional-style ballparks with modern amenities. Spear notes that Baltimore's Oriole Park at Camden Yards project is not the first time he showed how an old-style ballpark can fit into an existing urban setting and help spark a city's rejuvenation. HOK's 19,500-seat Pilot Field in Buffalo helped transform that city's image when it opened in 1988 as home for the Triple-A League Bisons.

After Buffalo, HOK Sport turned its attention to Chicago, working to renovate Wrigley Field and designing the 43,000-seat New Comiskey Park, which opened in 1991. With Comiskey, HOK explored ways to make the exterior reflect some of the character of older ballparks, a direction it pursued even further in Baltimore. But the White Sox wanted a more inward-oriented ballpark to shelter Chicago fans from the region's fierce winds. For a major league park that opened its arms to the city, the designers had to wait for Baltimore.

With Oriole Park representing the ultimate in the retro-park genre, HOK is moving future projects in new directions that capture the spirit of each city. The design for Cleveland's ballpark, for example, will be more obviously contemporary than Oriole Park, with much less of a historical feel. The site is located on a 60-foot-high bluff overlooking the Cuyahoga River, with a dozen bridges visible in the distance. Given this strong context, the building will emphasize exposed steel over brick construction.

HOK Sport is also likely to be remembered for helping trigger a back-to-the-city movement for sports projects. Spear and Labinski both believe the success of Baltimore's ballpark will convince more teams and municipalities to build stadiums and arenas close to downtown. "Let's face it, cities are having a tough time now." Labinski points out. "A lot of people will see how valuable Oriole Park is to Baltimore and its image."





Cleveland Indians Baseball Park
Cleveland, Ohio

Part of Cleveland's Gateway complex, which will also include an indoor arena, the 42,000-seat ballpark (above) represents an effort by HOK to provide a more "progressive" image while still incorporating popular qualities from classic baseball shrines, including an asymmetrical field and dramatic views of the city's skyline (top). Stressing exposed structural steel more than brick, the design reinterprets images that are symbolic of Cleveland, including the sculptural qualities of steel bridges that cross the Cuyahoga River and the structural system of the Cleveland Arcade. Model section from infield (above) reveals more expressive use of exposed structural steel than in HOK's other two projects, including an inverted bowstring truss to support sunscreen. Upper deck slopes 31.6 degrees and field is 20 feet below street level. Construction began this spring and will be completed in 1994.

Arena Specialists

Ellerbe Becket
Sports and Public Assembly Facilities Group

IF HOK SPORT IS THE KING OF THE BASEBALL-only ballpark, the Kansas City office of Ellerbe Becket is the undisputed king of an even more prevalent type of sports facility—the indoor arena. And just as HOK is trying to reverse the antiurban mistakes of 1950s and 1960s stadiums, Ellerbe Becket is trying to undo the damage created by the antiseptic arenas of the same era, but with high-tech design that clearly looks to the future.

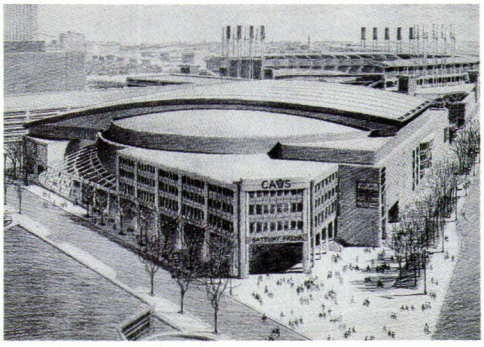
In city after city, franchise owners are moving to shift professional basketball and ice hockey teams to new $50 to $100 million arenas with more seating, luxury suites, well-equipped concession areas and other amenities that help generate profits. Over the past four years, Ellerbe Becket's Sports and Public Assembly Facilities Group in Kansas City has designed more than a dozen of these arenas, which double as concert halls when teams are out of town. The first to be completed is the America West Arena in Phoenix, which opened last month, and the firm's portfolio of current projects and renovations represents more than $1 billion worth of construction.

The firm creates arenas that depart dramatically from engineering-driven boxes, elevating sports facilities to a new generation of design. Its projects are often highly sculptural, with curved walls, sweeping or tilted roofs, and giant windows that reveal activity inside. Asymmetrical footprints, distinctive graphics, or other individualizing characteristics reflect particular sites, budgets, and clients. In many cases, the architects sink the court or rink level into the ground so the main concourse is at street level; they thus create food courts that not only serve arena patrons at night, but office workers during the day. "We're able to make these projects more than sports projects," maintains Ronald Turner, senior vice president and director of Ellerbe Becket's sports office. "They're urban catalysts for cities."

While responding to urban issues, Ellerbe Becket gives its sports palaces a luxurious, upscale atmosphere. The firm's arenas typically contain more comfortable seats throughout and a higher total number of seats—from 12,000 to 19,000—than the facilities they replace. They also have a higher percentage of premium seats; more posh lounges and first-class restaurants; concession areas that feature gourmet foods; and luxury suites or "superboxes" with amenities such as catering, wet bars, private bathrooms, refrigerators, televisions, and private phones.

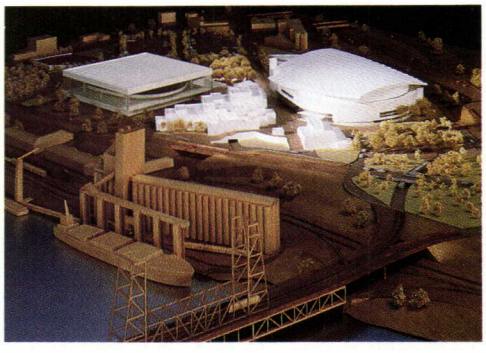
America West Arena
Phoenix, Arizona

The new home for the NBA's Phoenix Suns seats 19,500 for basketball and 20,500 for concerts. Located next to an existing convention center, the arena addresses the city with a landscaped entry court.



Cleveland Arena
Cleveland, Ohio

A 20,000-seat arena for the Cleveland Cavaliers, with 96 luxury boxes, will be part of a new downtown sports district that also includes a 42,000-seat open-air baseball park, structured parking, shops, and offices.



Oregon Arena
Portland, Oregon

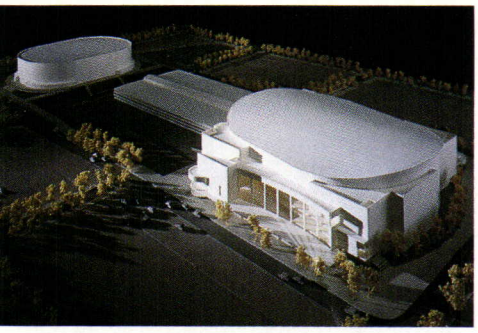
To be constructed near the existing Oregon Convention Center, a 20,120-seat arena for the Portland Trail Blazers will form the cornerstone of a new commercial and entertainment district just east of downtown Portland.

Because nonsports bookings can account for a high percentage of a facility's revenues, the architects also experiment with ways to improve sight lines, acoustics, and lighting, and to reduce set-up times for various events. "Arenas used to be seats around an event floor," Turner muses. "Now, they represent the best of hotels, theaters, concert halls, festival markets—all the lessons we have learned about making places fun."

The America West Arena, for example, was built not only as the new home for the NBA's Phoenix Suns but as an activity center for the city of Phoenix. Located next to an existing convention center on the southern edge of the central business district, it seats 19,500 for basketball and 20,500 for concerts, and includes a restaurant, offices, and a food court. To address the city, Ellerbe Becket placed the arena's main concourse at street level and gave the complex a landscaped entry court. Similarly, Ellerbe Becket conceived the New Boston Garden as an entertainment anchor for a large, mixed-use development in the heart of that coastal city. It will be constructed above a public transportation terminal and behind the existing arena, sharing a 6-acre site with two office towers, a hotel, and an underground garage. With a curved roof line, large bay window, and powerful graphics, the $85 million project exemplifies the firm's efforts to create bold images that look forward to the future, not back to the past. "Although the Boston Bruins are very traditional, this building is not," Turner contends. "It's going to be the symbol of Boston's future."

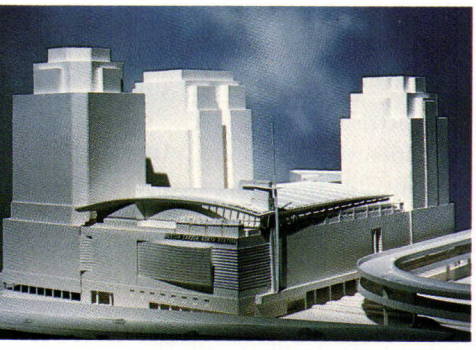
The quest by the 112-person sports group for innovative design is part of a larger push for cutting-edge work throughout the firm. With more than 1,000 employees in five offices, including its home base of Minneapolis, Ellerbe Becket now rivals HOK as the largest architectural and engineering firm in the United States. Although cutting-edge design is more often associated with smaller "boutique" firms, Ellerbe Becket President John Gaunt has made it his mission to prove that a large, full-service firm can consistently create work that is just as exciting, for a variety of building types.

The Kansas City office was launched in 1988 by Turner and Michael Hallmark, both formerly employed by Howard Needles Tammen & Bergendoff. When Hallmark later moved to Ellerbe Becket's Los Angeles



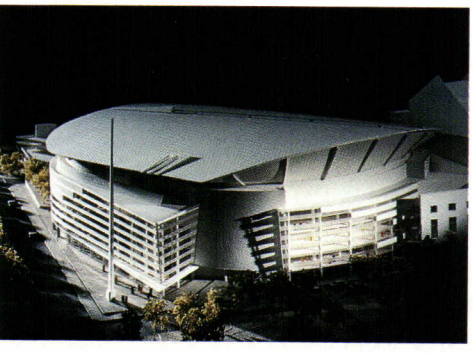
New Spectrum II
Philadelphia, Pennsylvania

The future home of the NHL Philadelphia Flyers and NBA Philadelphia 76ers will seat 19,000 for hockey and 16,500 for basketball on the former site of Philadelphia's recently demolished John F. Kennedy Stadium.



New Boston Garden
Boston, Massachusetts

The New Boston Garden will share a 6-acre site with two high-rise office towers, a hotel, and a new commuter train station. The arena will include a 500-seat private restaurant and lounge with a view to Boston Harbor.



Kiel Center
St. Louis, Missouri

Planned for the site of an existing auditorium, Kiel Center, an 18,500-seat arena for the St. Louis Blues, will be situated adjacent to the historic Kiel Opera House, which is scheduled for renovation in a later phase of the project.

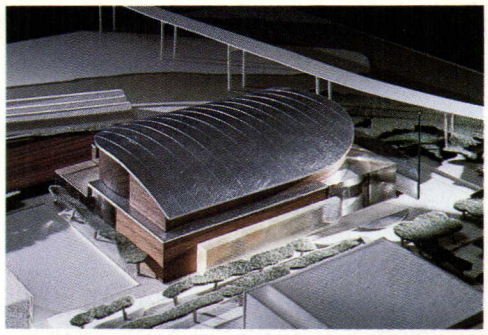
office, Turner became its sole director. Other principals are Paul Jorgensen, the office's director of operations and second in command; Gordon Wood, a Kivett & Myers alumnus who worked on Arrowhead Stadium and the Toronto SkyDome, among other projects; William Johnson, Jr., also from HNTB; and Richard deFlon, a stadium expert formerly with HOK Sport. Lisa McCracken, another HOK Sport alumna, manages the firm's interior design department.

Last year, Ellerbe Becket was hired by the National Basketball Association to draft design guidelines for new arenas. The work not only familiarized its principals with the latest advances in arena design but led many teams to commission the firm when planning new facilities. Although the Kansas City office is not exclusively devoted to designing sports projects, they account for 95 percent of its work. Convention centers, theme parks, recreational complexes, hotels, and other places of public assembly constitute the other 5 percent; many of these projects include master planning of special entertainment districts within cities.

Turner believes in creating buildings that have more spice and vibrancy than the previous generation of arenas. He will not hesitate to consult or collaborate with designers from other Ellerbe Becket offices when necessary, enlisting the expertise of New York-based Design Principal Peter Pran for the Boston project, for example. Turner also participates in joint ventures with other firms if he believes that is the best approach. The firm recently teamed up with Heery International and others on a proposal to coordinate planning and design of the stadium for the 1996 Olympic Games in Atlanta.

While moving aggressively to fill the arena niche, Ellerbe Becket is unwilling to concede other types of sports commissions to HOK, HNTB, or any other practices. The firm has been developing plans for a new football stadium for the Washington Redskins and a 67,000-seat soccer stadium in Liverpool, England. And the company is counting on deFlon, who worked on Oriole Park at Camden Yards and the New Comiskey Park while with HOK Sport, to help bring in more baseball and football-related commissions.

Ultimately, Turner considers his firm to be in the business of creating entertainment architecture. "These kinds of buildings bring together the largest cross-section of America, from the CEO to the little guy with a family," he notes. "The more entertaining we can make them, the more people will want to be there."

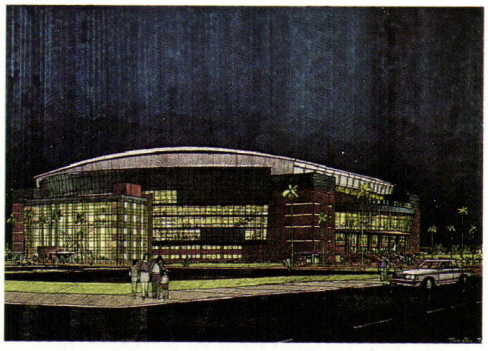


Buffalo Arena and Entertainment Complex
Buffalo, New York

A 20,000-seat arena for the Buffalo Sabres, with 80 private suites, three restaurants, and two food courts, has been proposed as a catalyst for revitalizing the city's central business district.

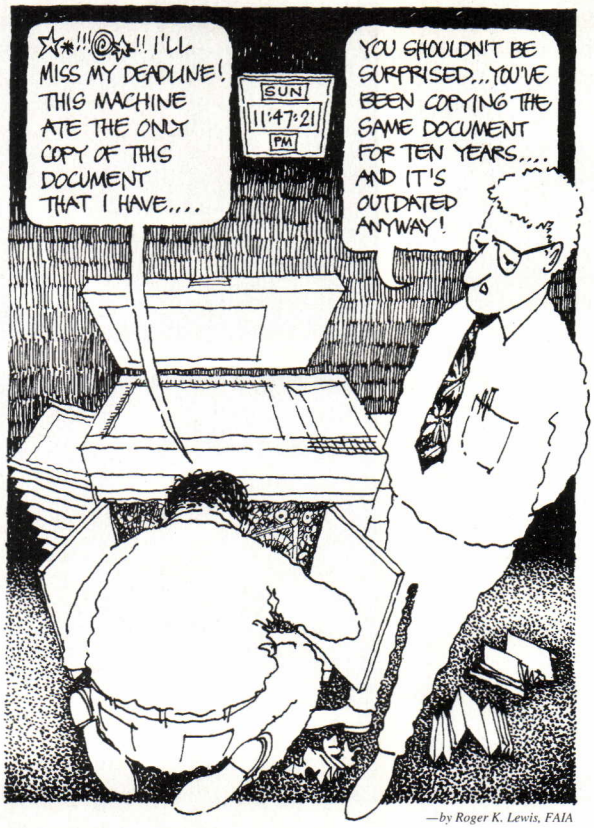
Quad City Civic Center
Moline, Illinois

An 11,000-seat multipurpose facility and 215,000-square-foot convention center are part of a complex that also contains a 150-room hotel, parking for 1,800 cars, and space for outdoor events.



Tampa Coliseum
Tampa, Florida

A 19,500-seat arena for the Tampa Bay Lightning includes 86 suites, nine "superboxes," and 3,500 premium seats. The new facility will be constructed south of Tampa Bay Stadium near the city's airport.



—by Roger K. Lewis, FAIA

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THE AMERICAN INSTITUTE OF ARCHITECTS

ARCHITECTURE

Masonry

TECHNOLOGY PORTFOLIO

Concrete Block Prototypes

Two new buildings demonstrate design developments in masonry roof, floor, and wall components.

PAGE 98

Masonry Cleaning

In removing dirt and pollutants, architects must develop comprehensive conservation strategies.

PAGE 102

Detailing Concrete Block

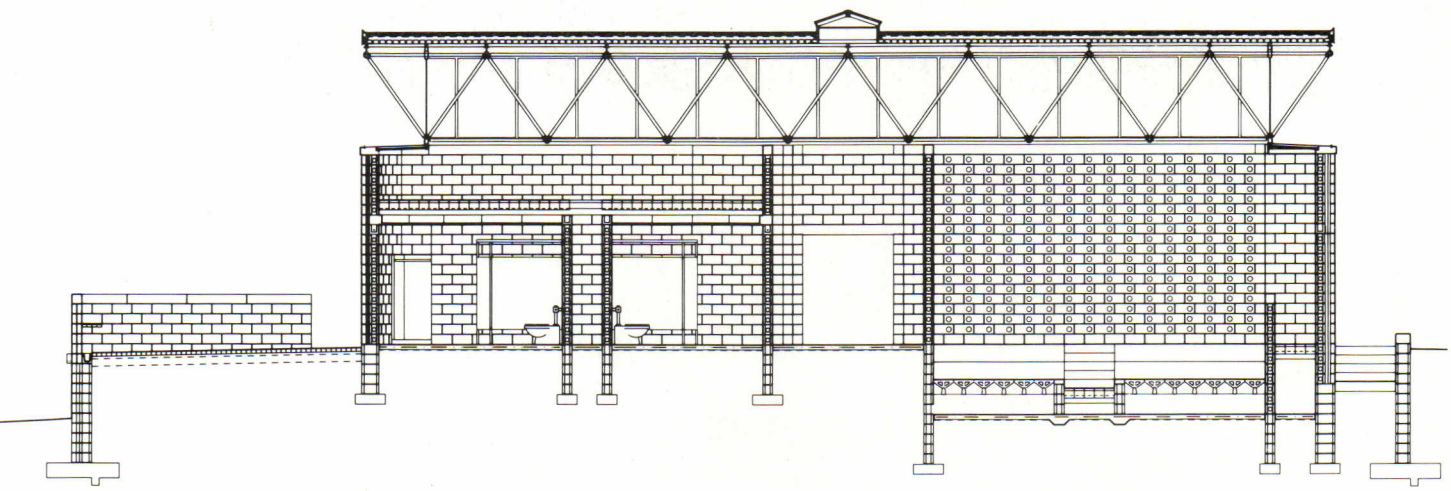
Weep holes, secure mortar bonds, and waterproof coatings limit moisture in single-wythe masonry walls.

PAGE 108

Resources and Information

Industries and associations, restoration publications, and books for further reading.

PAGE 112



VIRGINIA POLYTECHNIC INSTITUTE RESEARCH AND DEMONSTRATION FACILITY

Concrete Block Prototypes

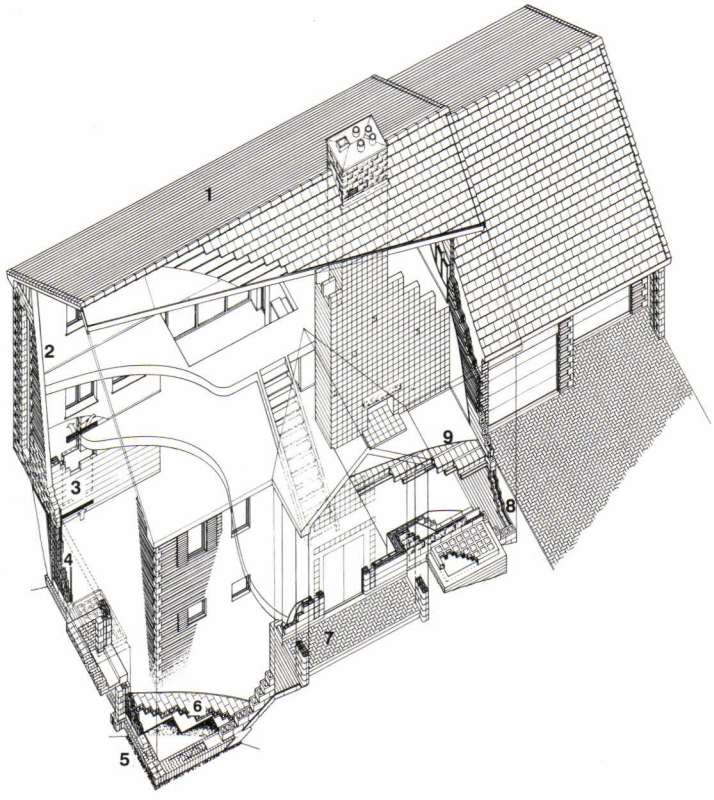
Model buildings expand the design potential of concrete masonry units.

IN 1983, THE NATIONAL CONCRETE MASONRY Association (NCMA) created a product research and development division, enlisting staff architect Jorge Pardo to invent new types of concrete block and expand their construction applications. NCMA's investigations have resulted in the recent completion of two buildings—a single-family house at the National Association of Homebuilders' (NAHB) Research Park in Upper Marlboro, Maryland (ARCHITECTURE, June 1992, page 85), and a 7,000-square-foot masonry research center and testing facility on the campus of Virginia Polytechnic Institute and State University in Blacksburg, Virginia. These projects mark the first full-scale use of prototype blocks resulting from the NCMA's research efforts, which were conducted in association with Virginia Tech's civil engineering department. Both structures serve as models for studying, testing, and demonstrating the design and construction potential of newly devised concrete masonry roof, wall, floor, and foundation components.

Many of the systems contained within the NAHB house are refinements of block form and assembly methods used to build Virginia Tech's research facility, the first of the two projects to begin construction. Designed by architect and Associate Professor Jack Davis (with technical assistance from Pardo), the research center's most successful development is "biaxial" block—a conventional concrete masonry unit manufactured with prepunched holes in its sides, offering pathways for integrating wiring, plumbing, and flexible ductwork within the wall, even after it is constructed. The openings also permit the installation of outlets and direct mounting of wall fixtures on the exposed block. According to tests by the NCMA, the biaxial prototypes are 10 percent lighter than conventional CMU and do not sacrifice any of the strength of traditional block in wall construction.

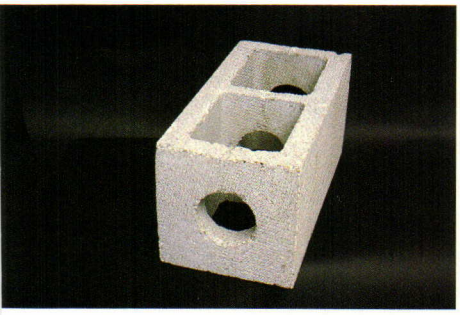
Masonry block for residential structures in the United States has traditionally been relegated to foundations due to a limited

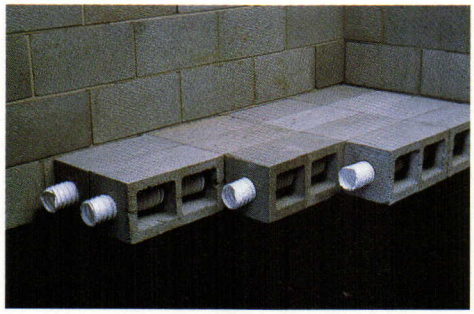
NCMA's masonry house at NAHB's Research Park (above and right) tests and exhibits concrete block prototypes (diagram below). Many of the systems were also developed for Virginia Tech's research facility (facing page, top and bottom left). A block manufactured with holes (facing page, center left to right) integrates mechanical and electrical systems within walls and floors (facing page section, bottom right).

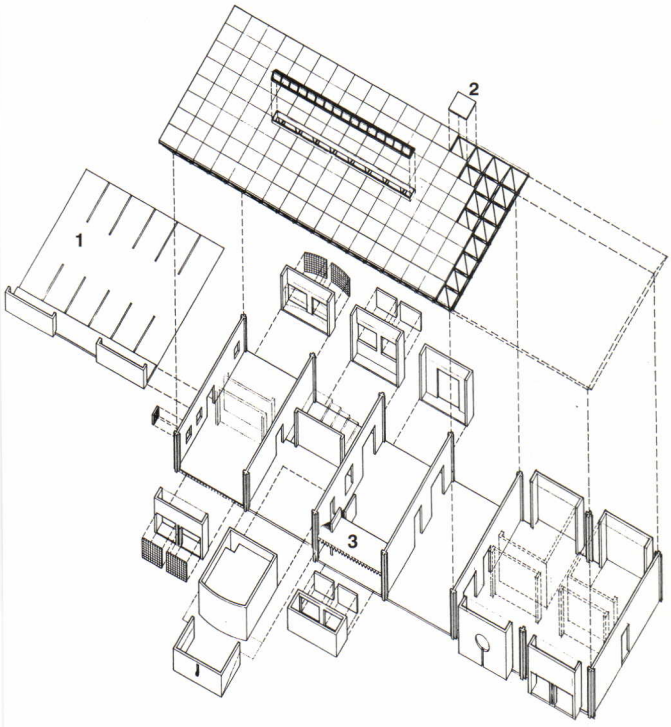


1 CONCRETE ROOF SHINGLES
2 SINGLE-WYTHE FRAMING SYSTEM
3 TROMBE WALL
4 GROUTLESS POST-TENSIONED BASEMENT WALL
5 INTERLOCKING FOOTINGS
6 CMU FLOOR PLENUM
7 INTERLOCKING CONCRETE PAVERS
8 ARCHITECTURAL CONCRETE FORMING SYSTEM
9 CMU FLOOR SYSTEM

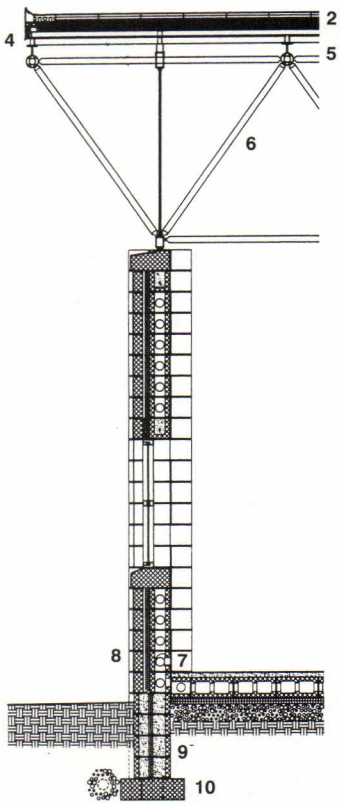
NCMA/NAHB RESEARCH HOUSE







1 INTERLOCKING PERMEABLE CONCRETE PAVERS
2 CONCRETE ROOF PAVERS
3 SUSPENDED BLOCK FLOOR SYSTEM
4 RIGID INSULATION
5 METAL DECK
6 SPACE FRAME
7 BIAXIAL BLOCK
8 4-INCH CMU VENEER
9 8-INCH CMU FOUNDATION
10 SEGMENTED FOOTING



RGINIA POLYTECHNIC INSTITUTE RESEARCH AND DEMONSTRATION FACILITY

TYPICAL WALL SECTION – RESEARCH FACILITY

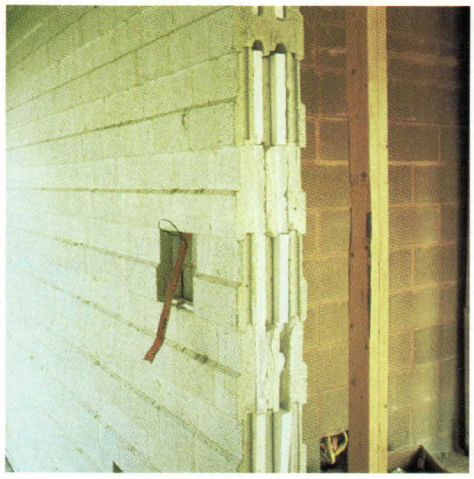
palette of shapes and finishes, and the need for skilled masons, which raises installation costs. Therefore, the systems designed for the NAHB house are intended to both reduce labor and offer an expanded range of block shapes and surfaces. For example, a concrete block floor system developed at Virginia Tech was modified for the NAHB house to eliminate the need for scaffolding and construction by skilled masons. Pardo redesigned the system's masonry floor blocks with an arched underside, creating a structurally stable platform that permits them to be laid on concrete joists without mortar. When left exposed from below, these arches also create a coffered ceiling. Thin-shell units, another system refined by NCMA for the house, were molded to produce reveal lines that look like siding when stacked. The units double as formwork by creating a cavity wall for an inner layer of poured concrete or insulation.

To assemble blocks faster and eliminate the need for skilled masonry construction, the NCMA also developed mortarless, or "dry-stack" systems, and tested flexible mortar substitutes such as water-based acrylic adhesives. For example, Pardo and his colleagues created a rigid wall system by threading steel cables through sleeves within stacked blocks, fastening them to the top and bottom courses, and post-tensioning the cables with a hydraulic jack.

Pardo readily acknowledges that a typical house would be unlikely to ever require the entire array of block types developed by NCMA. Some systems are likely to have limited application, proving economical only as construction alternatives under certain conditions. For example, solid, interlocking blocks can be laid to create a continuous footing where it would otherwise be difficult to provide equipment for poured concrete. According to NCMA's research, because the suspended block floor eliminates the need for a crane, it is comparable in cost to precast floor slabs for structures less than 20,000 square feet.

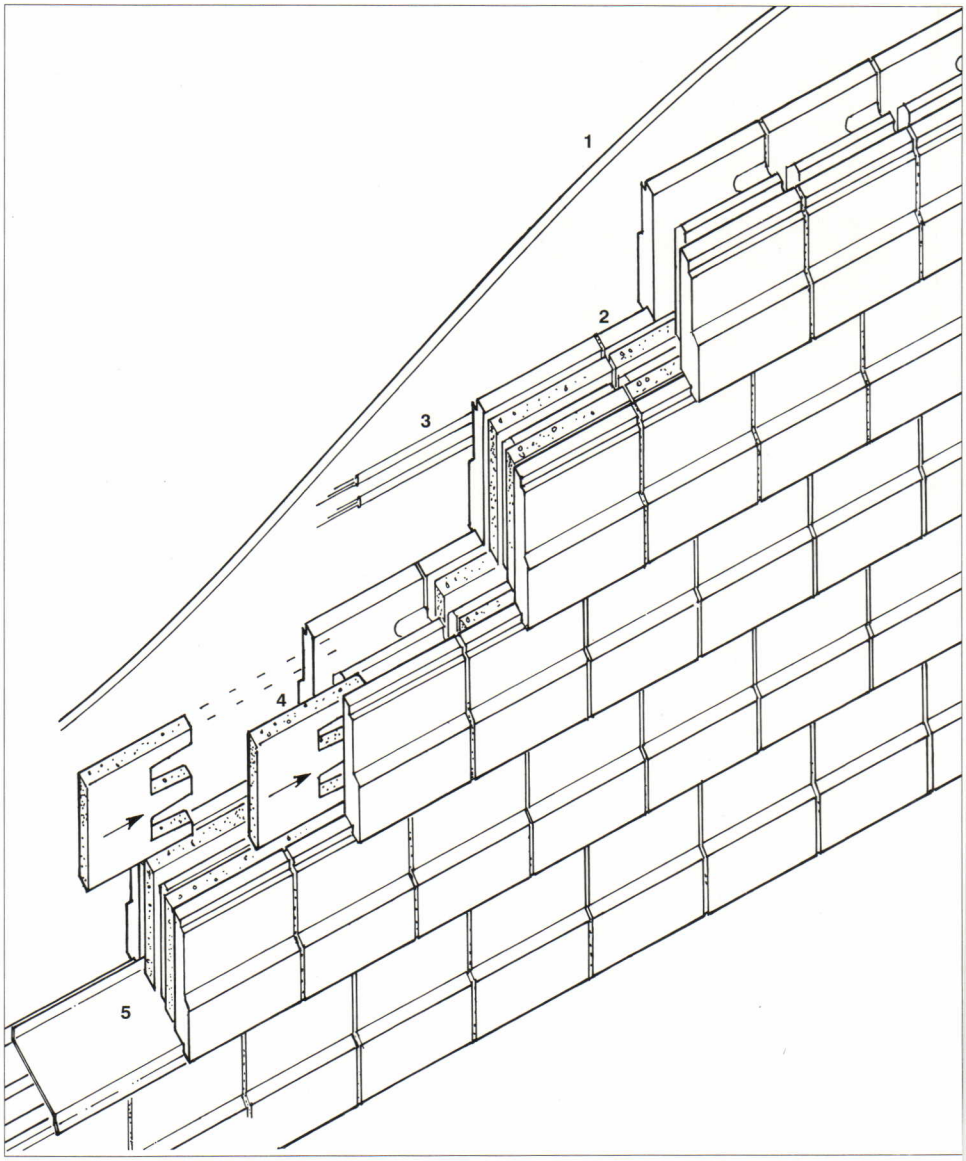
After several years of testing and design, the NCMA is now equipped to distribute its engineered molds throughout the United States to regional block manufacturers who request them. The acceptance of these newly developed masonry systems is now dependent on the NCMA's ability to convince architects of their economical and design possibilities. For more information, contact NCMA: (703) 713-1900. ■

—MARC S. HARRIMAN



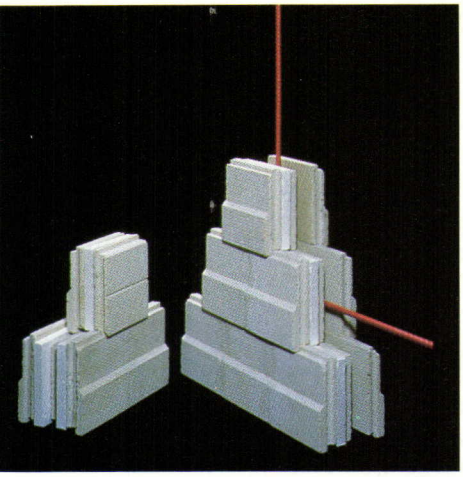
NCMA

NCMA developed masonry systems that reduce the amount of skilled labor required for laying conventional block and provide a more dynamic exposed surface than traditional concrete masonry units. One such system is composed of molded face units that interlock and are joined with adhesives to create a wall that resembles siding (left) and does not require mortar for assembly. When covered with sheets of gypsum board on the interior, the grooves create raceways for electrical wiring. The cavity between the outer two block layers is designed to provide space for installing rigid insulation (below).

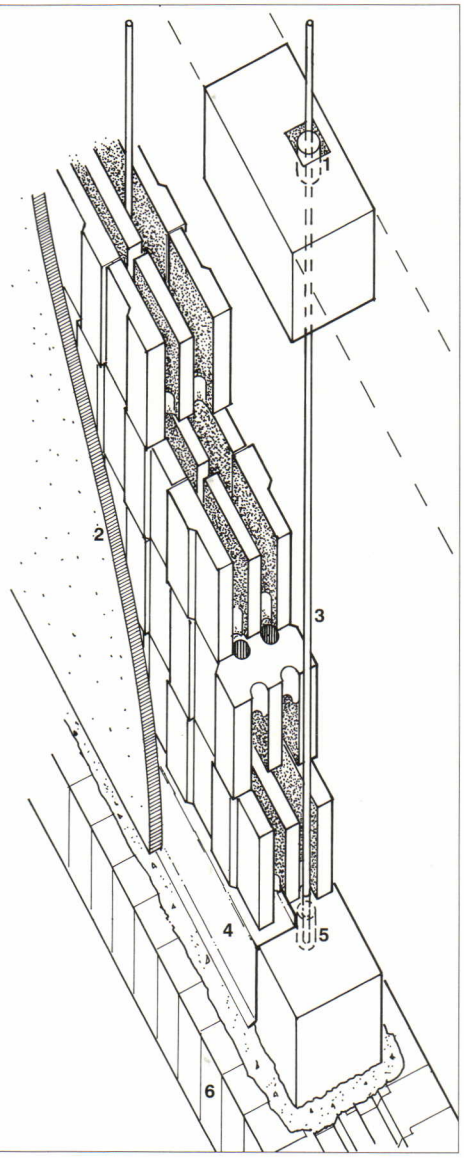


CONCRETE BLOCK SIDING SYSTEM

1 INTERIOR GYPSUM BOARD SHEET
2 ADHESIVE-BONDED INTERLOCKING BED JOINTS
3 INTEGRAL ELECTRICAL DISTRIBUTION RACEWAY
4 FACTORY-INSTALLED INSULATION
5 FLASHING

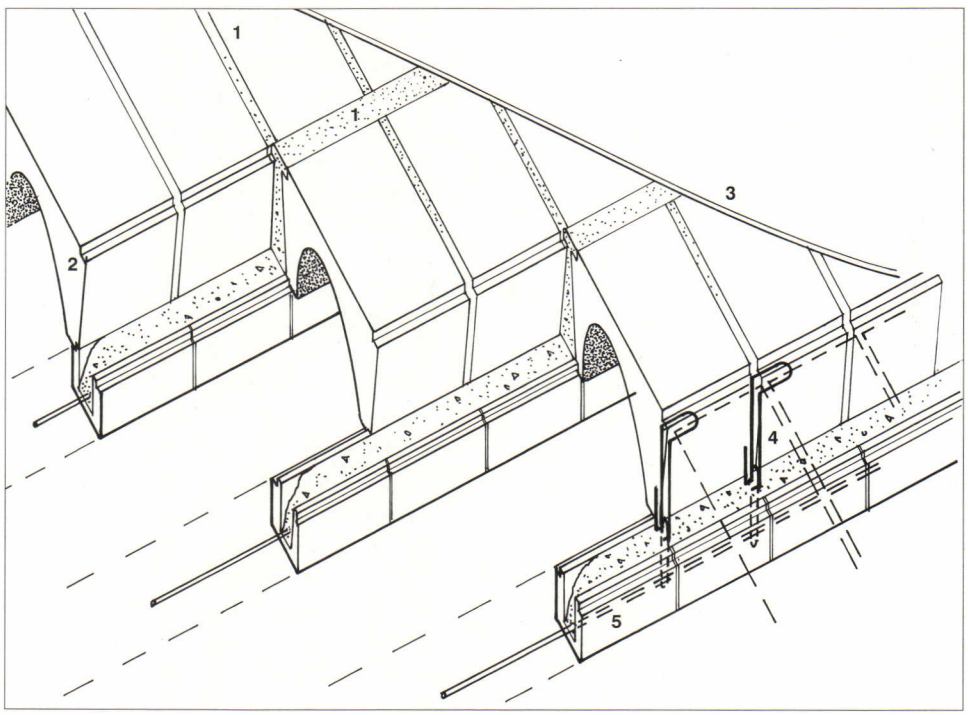


Several methods for "dry-stacking" block eliminate the need for mortar joints, construction by skilled masons, and the equipment and formwork necessary for poured concrete systems. Secured to specially designed fittings within the base course, steel rods are threaded through sleeves within the wall of stacked interlocking blocks (top left) and affixed to the top course. The reinforcing rods are post-tensioned to compress the blocks into a structurally stable foundation wall. The foundation sits on solid concrete block segments that interlock with one another to form a continuous footing (bottom left). Prefabricated concrete joists provide the framework for supporting concrete blocks with arched bases, creating a solid masonry floor (bottom right). When laid end-to-end and fastened to the joists by steel clips, the arched blocks form a secure platform for builders while they construct the suspended floor (top right). Once completed and left exposed, the floor system also creates a coffered ceiling over the room below (center right), successfully meeting NCMA's objective to develop masonry block systems that double as both building structure and finish.



POST-TENSIONED CONCRETE BLOCK WALL

1 SPECIAL TERMINATOR FIXTURE BLOCK
2 EXTERIOR INSULATION
3 STEEL TENDON IN PROTECTIVE SHEATHING
4 FLASHING
5 SPECIAL RECEPTOR FIXTURE BLOCK
6 SEGMENTAL FOOTING



SUSPENDED BLOCK FLOOR SYSTEM

1 FIELD-GROUTED JOINTS
2 INTERLOCKING COMPRESSION COFFER UNITS
3 FINISH FLOORING
4 COMPOSITE ACTION CLIPS
5 PREFABRICATED REINFORCED JOISTS

Masonry Cleaning

Removing pollutants requires knowledge of materials and chemical interactions.

SAN FRANCISCO'S SHELL BUILDING WAS 60 years old before it was earmarked for cleaning, and even then the decision was only coincidental, as part of a repair effort. Having survived the 1989 Loma Prieta earthquake with only minor damage to its facade, the 1929 landmark required repairs and replacement of some of the terra-cotta panels cladding its first two stories. San Francisco-based architects Carey & Company Architecture planned to treat the aged facade with a restoration cleaner to remove layers of soil and blend any color differences between the old and new panels. But the architects ran into a practical hitch. The highly caustic cleaner presented a hazard to passers-by if splattered, and the increased cost of ensuring public safety would exceed the project's established budget. General cleaning was therefore reserved for the first two stories, which were not only the most soiled, but also contained the replacement panels. A third-floor belt course formed a natural break in the facade; beyond it, spot-cleaning was applied to rust and other noticeable stains. The outcome was a refurbished edifice at the lower levels, but a preserved patina at upper stories.

The response to the Shell building's soiled facade indicates the varied nature of masonry cleaning projects today. While often accomplished in conjunction with a larger repair effort, a cleaning project rarely follows a single, prescribed pattern. When to clean, how to clean, how much to clean, and who supervises the cleaning can vary from building to building because no two conditions are ever exactly the same. Preservationists generally agree, however, that cleaning should be minimal and as gentle as possible to avoid damaging the masonry.

The architect's area of responsibility in masonry cleaning is subject to wide interpretation. Some architects allow contractors maximum leverage in carrying out the work, as long as the desired result is achieved. Others write tight specifications that ensure their involvement in the project until they are satisfied with the results. Some firms retain an architectural conservator, or employ one in-house, who effectively assumes responsibility for testing and quality control. In all cases, cooperation between architect and contractor is essential.

Cleaning variables

BUILDING FACADES CAN BECOME TARnished in many ways: due to natural causes such as weather conditions, mildew, or algae growth; by man-made contaminants such as automobile exhaust and graffiti; and from building components themselves, such as rusting iron grillework. A cleaning program depends not only on the type and amount of dirt to be removed, but also on financial considerations, esthetic goals, building function, public safety, and material conservation.

For example, if a building was designed in the Gothic style, its restoration architect may prefer to retain accumulated soil in crevices, where it reinforces shadows and emphasizes ornamentation. Often, a single structure is composed of several masonry materials, such as granite, brick, and terra-cotta, which are intended to blend in appearance over time. The cleaning process for such buildings must be modified to maintain the original balance of textures and shades. And, if the building was damaged during previous cleanings—whether by improper chemicals, excessive concentrations, or harsh abrasives—a light layer of dirt may be warranted to mask bleached or scarred surfaces.

Because of these many variables, an architect planning to clean a masonry building should carefully identify the facade materials, investigate the physical properties of each, and understand their reactions to various pollutants and cleaners. However, since masonry materials come in many guises, misidentification, and the subsequent application of the wrong cleaner, is a common problem. "Very light sandstones from Ohio can look a lot like Indiana limestone," notes Judith Selwyn, architectural conservator and president of Preservation Technology Associates in Boston, Massachusetts. "Cast stone can be manufactured to look like granite," she adds.

Oily dirt may actually protect some masonry—such as porous sandstone—from harmful environmental agents, but other masonry deteriorates when exposed to pollutants, and must be cleaned to be preserved. When subjected to acid rain, for example, marble is chemically transformed from calcium carbonate to calcium sulfate, commonly known as gypsum. Much like a cancer, the gypsum eats its way into the marble, turning it into a powder. Depending on the severity of the encrustation, gypsum may be water-rinsed or chemically removed from marble facades to prevent further destruction.

Choosing a process

APPROPRIATE CLEANING METHODS FOR specific types of masonry are well-established. The National Park Service, which advocates selection of the gentlest means possible in every instance, produces literature that includes clear guidelines on methods and procedures (see table, page 107).

Water washing is the most versatile cleaning method and can be applied to all types of masonry. It includes a variety of techniques, ranging from soaking with a fine mist—the gentlest procedure—to more forceful low- and medium-pressure washes, steam, and water in combination with chemicals. The chief danger of applying water is its tendency to seep into masonry, often corroding hidden metal elements and consequently staining the facade.

Chemical cleaning employs one of three types of formulations: acidic compounds, which are applied to most granites, sandstones, slate, unglazed brick, unglazed terra-cotta, and concrete; alkaline compounds, for cleaning limestone, marble, calcareous sandstone, glazed brick and terra-cotta, and polished marble and granite; and organic solvents, which can remove paint from the same masonry materials that are compatible with alkaline compounds. To

avoid damaging the masonry surface, chemical cleaners must be applied in the proper concentrations by building-cleaning professionals and supervised by restoration architects or architectural conservators.

Acid-based cleaners must be removed from the masonry by a thorough water rinse or a chemical neutralizer to stop the cleaning action before it causes the surface to deteriorate. Alkaline compounds must be rinsed off for the same reason, but require a two-part process: a slightly acidic wash stops the alkaline reaction, and is followed by a thorough water rinse.

Poulticing is a cleaning procedure that draws stains out of masonry and into a poultice material, usually an absorbent substance such as talc or shredded paper mixed with an organic or chemical solvent to form a paste. The poultice is applied to a solvent-treated surface. By covering the solvent, thereby preventing rapid evaporation, the poultice allows adequate time for the solvent to dissolve the stain. It also provides a substrate to accept the staining material after it has been pulled from the masonry. The solvent is first absorbed by the masonry and then reabsorbed into the poultice, drawing out the stain and solvent as the paste dries in the process. Poulticing is particularly effective for removing stains from porous masonry.

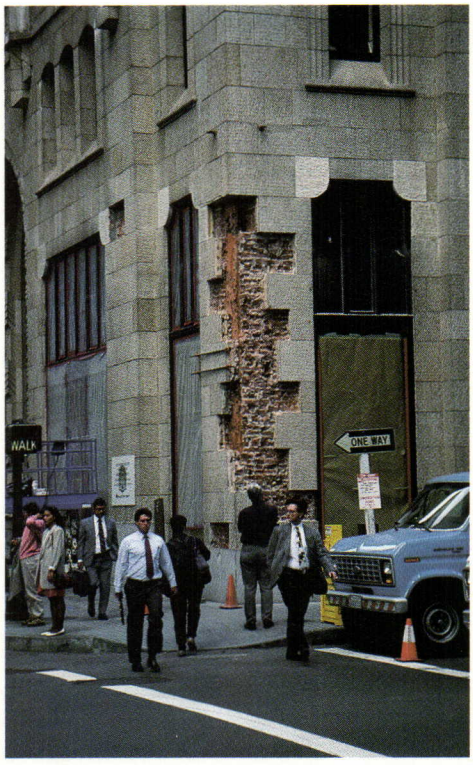
Though once a common method, abrasive cleaning such as sandblasting is generally not recommended for masonry. Such processes wear away dirt or paint, but at the same time erode the surface of the stone or brick. The Park Service's guidelines on masonry cleaning provide explicit warnings against the dangers of abrasive cleaning, especially for soft masonry materials such as brick and terra-cotta. Applications on some types of rough-cut granite, limestone, or sandstone are occasionally acceptable, but only with abrasives other than sand, which is a particularly harsh medium. Gentler substitutes include ground slag or volcanic ash, pulverized walnut or almond shells, rice husks, ground corncobs, and glass beads.

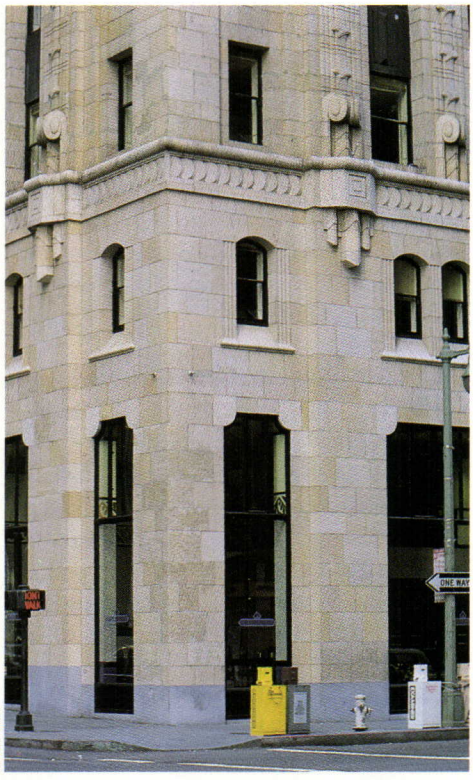
Matching cleaning method and masonry may seem a simple matter once the material is evaluated. Experienced architectural conservators know, however, that even properly identified masonry can react in unexpected ways. For example, bricks react differently to cleaners depending on how they were manufactured. Water-struck bricks, which have a smooth surface, can be cleaned fairly easily, but sand-molded

Shell Building
San Francisco, California

Carey & Company Architecture combined the cleaning of the first two stories of the Shell building (below left), a downtown San Francisco landmark, with repair work required after the 1989 Loma Prieta earthquake. Damaged terra-cotta panels were repaired or replaced. The facade was then cleaned with a chemical that also acted as disinfectant to impede algae growth. New panels, including curved units in openings (below right), visibly blend with older panels after cleaning (bottom right).

JANE LIDZ





JANE LIDZ

bricks require more effort. Similar differences exist among all the categories of masonry materials.

Additional cleaning complications arise when a building features two or more materials in close proximity to one another. The materials' different aging and absorption characteristics often mean that each surface must be treated separately with a different cleaner, and that each must be protected from compounds intended for its neighbor.

Test before cleaning

TO DETERMINE THE CONDITION OF THE masonry surface and its reaction to cleaning, architects should test-clean sections of the building that exhibit a typical range of problems, applying different cleaners in varying concentrations on different test patches. Test-patch size is proportional to building size and can vary from 1 square foot to several stories. Test areas should be identified by tags, and the cleaning methods and materials should be recorded in detailed notes.

Christina Wallace, architect and conservator for Carey & Company, warns that many stains may not be removed by general cleaning. "One method or cleaner may clean the majority of the building," Wallace points out, "but there will always be areas with stains from rust, grease, or graffiti that need additional treatment." Furthermore, no treatment is foolproof. Removing graffiti, for example, is always problematic, because masonry materials are porous and absorb the pigments and binder resins from offending media, such as felt-tip pens, crayons, lipstick, and spray-paint. Though powerful paint removers and chemical cleaners may remove most of the markings, residual traces are invariably left behind. Many cleaners stain one or more of the substrates on which they might be used, requiring care in their selection.

The changing boundaries of specifications

ARCHITECTS NEW TO MASONRY CLEANING may think that their job is done when it passes into the contractor's hands. More experienced practitioners have found that their work is not over until the project is completed as specified.

Wilbert Hasbrouck, of the Chicago-based firm Hasbrouck Peterson Zimoch Sirirattumrong, describes how a cleaning project can run into trouble even when an architect has performed his or her duties conscientiously. His firm was initially con-

Weld Hall
Cambridge, Massachusetts

Harvard's Weld Hall (above), a 19th-century structure with a granite base, brick facade, and sandstone window trim, is undergoing extensive testing by Boston-based Preservation Technology Associates, an architectural conservation firm, before cleaning begins later this year. Because it was the most soiled, the sandstone was test-cleaned first, followed by general testing of all the masonry surfaces. Four different cleaners were applied, one of which worked well enough to be tried in as many as five different concentrations. The dark and light patches on the dormitory's surface (center and bottom left) represent several different treatments between uncleaned areas. Beginning as 1-foot-square patches, the sample areas will be enlarged to 8-foot squares in the final test sequence. Specifications will be written only after the testing is completed.

Preparation and eventual cleaning require close cooperation between architectural conservator and contractor. For Weld Hall, testing and cleaning procedures were developed by the conservator; the contractor is designing scaffolding and protection for nonmasonry surfaces and immediate vicinity. Preservation Technology Associates is directing the methodology, including such details of the cleaning process as the amount of water pressure and type of spray tip.

The Rookery
Chicago, Illinois

After 104 years in Chicago's Loop, the Rookery (left) was covered with a heavy encrustation of black carbon material—the combined effect of layers of pollutants, beginning with coal smoke in the office building's early years, followed by automobile exhaust and acid rain—obscuring the rich texture of the masonry. The cleaning strategy for the Rookery involved starting at the top and proceeding down the facade as quickly as possible to prevent dirty run-off from further staining the building. The difference between the cleaned and uncleaned masonry was dramatic, as illustrated by the detail of a granite block at street level (below center). The stately entrance of the Rookery provided the architect with one of the most gratifying surprises of this cleaning project. Dark and severe before the treatment (bottom left), the original pink hue of the granite masonry emerged afterward (bottom right), a delightful enhancement of the building's overall design.

tracted as restoration architects of the Rookery, the historic Burnham & Root-designed office building in Chicago's Loop (page 105). After carefully analyzing and testing the building's granite and brick facade, Hasbrouck specified a chemical cleaner at a precise concentration, but the masonry did not respond as expected. The contractor prodded for greater concentrations of the cleaner until the architect became suspicious and demanded further tests. The tests revealed that both the type of cleaner and its concentration were different from those specified. "Had the contractor continued to apply that cleaner," Hasbrouck recalls, "the Rookery would be destroyed today." The building would have been badly "burned," its protective outer surface dissolved, which would eventually lead to spalling.

In addition to job-site involvement, careful specifications can protect against abuses. Page Ayres Cowley, director of preservation for New York-based Platt Wyckoff & Coles Architects, offers additional advice: "Prequalify the cleaning contractor or write very stringent experience requirements into the contract," she recommends. "You can also request that the manufacturer's representative visit the job site to check on the contractor's method." Cowley adds that specifications should require contractors to be responsible for all local and state statutory requirements for permits and licenses. Contractors with experience in masonry cleaning will need less guidance from both architects and manufacturers.

Hazardous cleaners

EVEN THOUGH CHEMICAL CLEANERS HAVE been used on masonry for many years, they are not yet properly understood by all contractors or architects. The public's general concern over such environmentally hazardous substances is also affecting the future of masonry cleaning projects. Safety of application techniques as well as containment of harmful chemicals, both during and after the project, continue to be debated. Rather than weigh the fine points of where to place the responsibility in this area, architects need to develop specifications for dealing with new safety requirements. Becoming familiar with masonry cleaning is an important step toward this goal. ■

—VERA M. STEINER

Vera M. Steiner is a Barrington, Illinois-based engineer who specializes in construction writing.

JEFFREY FETZER

JEFFREY FETZER

Texas Capitol
Austin, Texas

Built soon after the Civil War, the Texas State Capitol's granite facade (above) had predictably become soiled (bottom left). The building responded well to cleaning by water spray (bottom right), the gentlest method recommended by the Park Service. Because the Capitol is constructed of a particularly hard type of Texas granite, its masonry could be subjected to a somewhat higher water pressure than is usually applied to granite. The normally alkaline water was modified to a neutral range. Elaborate protection techniques (left) were put in place to safeguard the environment from chemical pollution. All run-off was led to plastic-lined containment ponds at the base of the building, where the water was allowed to settle. Modified water was conducted into the sewage system, while polluted water was taken away in barrels and deposited at legal waste sites.

Summary of Cleaning Techniques

Substance to be Removed	Acid-Sensitive Masonry **Limestone, marble, calcareous sandstone, glazed brick, architectural terra-cotta, polished granite**	Non-Acid-Sensitive Masonry **Sandstone, slate, granite, unglazed brick, unglazed terra-cotta, concrete**
Dirt and/or pollutant crusts	Water wash Water + nonionic detergent Acidic cleaner (ammonia or potassium hydroxide)	Water wash Water + nonionic detergent Acidic cleaner (hydrofluoric acid)
Paint (oil, latex, acrylic coating, vinyl, epoxy, urethane-type coatings)	Alkaline paint remover (ammonia or potassium hydroxide or trisodium phosphate) Organic solvent paint remover (methylene chloride)	Alkaline paint remover (ammonia or potassium hydroxide or trisodium phosphate) Organic solvent paint remover (methylene chloride)
Whitewash and cementitious paints	Acetic acid *or* very weak solution of hydrochloric acid	Acetic acid Hydrochloric acid
Iron stains (Rust)	Poultice with sodium citrate in water + glycerine *or* ammonium oxalate	Poultice with oxalic acid or orthophosphoric acid + sodium salt of ethylene diamine tetra-acetic acid (EDTA) in water *or* dilute hydrofluoric acid
Copper stains	Poultice with ammonium chloride *or* ammonium hydroxide + ammonia	Poultice with ammonia (+ EDTA) *or* dilute hydrofluoric acid
Industrial stains (smoke, soot, grease, oil, tar, asphalt, waxes)	Scouring powder with bleach Water-based household detergent Ammonia Mineral spirits Alkaline cleaner Poultice with one of the following: Sodium bicarbonate (baking soda), Acetone, Ethyl acetate, Naptha, Amyl acetate, Mineral spirits, Toluene, Methylene chloride, Xylene, Perchloroethylene, Trichloroethylene, Ethyl alcohol Dry ice/carbon dioxide (tar, asphalt, gum)	Scouring powder with bleach Water-based household detergent Ammonia Mineral spirits Alkaline cleaner Poultice with one of the following: Sodium bicarbonate (baking soda), Acetone, Ethyl acetate, Naptha, Amyl acetate, Mineral spirits, Toluene, Methylene chloride, Xylene, Perchloroethylene, Trichloroethylene, Ethyl alcohol Dry ice/carbon dioxide (tar, asphalt, gum)
Plant and fungal stains (lichens, algae, moss, mildew)	Dilute ammonia Bleaches Hydrogen peroxide Sodium hypochlorite Chloramine-T	Dilute ammonia Bleaches Hydrogen peroxide Sodium hypochlorite Chloramine-T
Graffiti	Organic solvent or alkaline paint remover Lacquer thinner or acetone Organic solvent (methylene chloride) [see also **Paint**]	Organic solvent paint remover Lacquer thinner or acetone Organic solvent (methylene chloride) [see also **Paint**]
Salt/efflorescence	Water wash Water (poultice)	Water wash Water (poultice)
Bird droppings	Water wash Water + detergent + chelating agent such as EDTA	Water wash Water + detergent + chelating agent such as EDTA Acidic cleaners (hydrofluoric acid)

Techniques are listed from gentlest to strongest.

Detailing Concrete Block

Successful performance of single-wythe walls depends on drainage system design.

CONCRETE BLOCK WAS ONCE RELEGATED to the back alleys and loading docks of buildings, or hidden behind coats of heavy paint or stucco. In the 1980s, the widespread introduction of architectural concrete masonry units (CMU) such as split-faced, ribbed, fluted, and burnished block changed all that. New textures and new colors have made esthetic camouflage unnecessary, and concrete block has become an acceptable finish material for many building types. Depending on the type of unit selected and the structural requirements of the design, masonry walls may be single- or multi-wythe; solid or hollow; grouted or ungrouted; reinforced or unreinforced; loadbearing or non-loadbearing.

Most commonly, architectural concrete masonry is constructed of 8-by-8-by-16-inch hollow block units laid in a single wythe for both loadbearing and veneer applications. As with all masonry, when designing with single-wythe CMU, the architect must first choose between loadbearing and non-loadbearing systems. Loadbearing walls are more resistant to bending than non-loadbearing walls because the compressive load of the bearing walls counteracts flexural tensile stresses. For either option, the designer must then decide whether to reinforce the selected masonry system with grout and steel bars.

Single-wythe reinforcement

UNREINFORCED LOADBEARING MASONRY walls are usually designed by rules of thumb and are limited to areas of minimal seismic activity. Requirements for lateral support are based on very conservative length- or height-to-thickness ratios, which generally restrict floor-to-floor height or pilaster spacing to 18 or 20 times the thickness of the wall. A single-wythe, 8-inch concrete block wall would thus be limited to 12 to 13 feet between laterally supporting floors or pilasters.

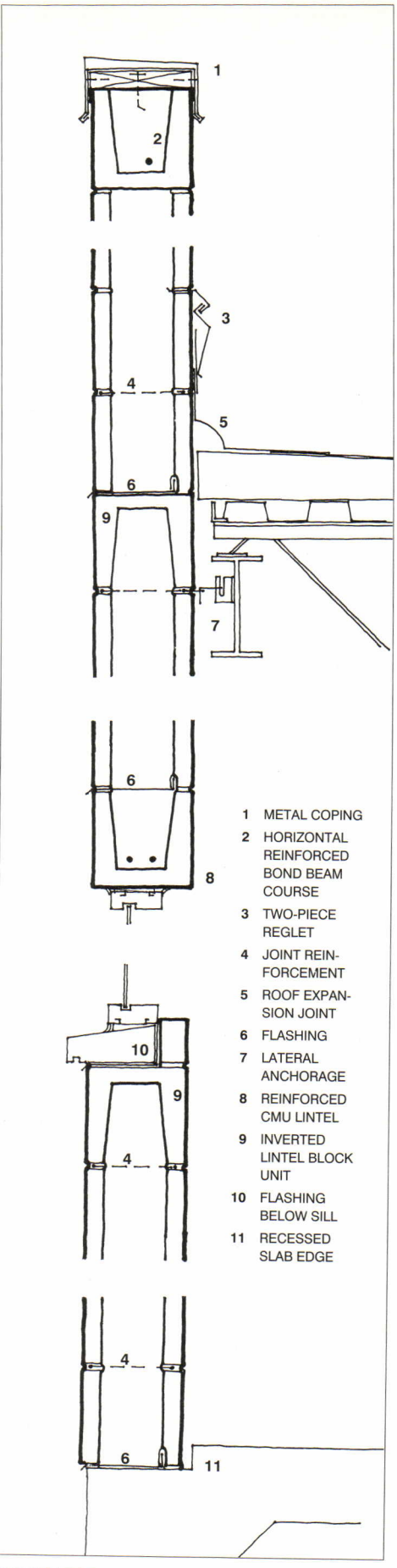
In contrast, the proportions of a reinforced loadbearing wall must be determined analytically by working-stress or ultimate-strength calculations. The minimum thickness required for any wall height or length is based on calculated resistance to service loads rather than rules of thumb. Grout, which differs from mortar in its consistency, ingredient proportions, and aggregate, is placed within the concrete units to secure steel reinforcing bars, increasing the wall's flexural strength and allowing greater wall height between floors. Such reinforcement is selectively added only where analysis indicates that anticipated loads will produce flexural stresses higher than those allowed by code for unreinforced masonry. Structurally reinforced, loadbearing, single-wythe CMU walls are particularly economical with architectural units, because they incorporate structure, exterior finish, and weathering envelope in one element.

Non-loadbearing masonry veneers may be empirically designed as panel walls or analytically designed as curtain walls. Most 4-inch veneers are designed as unreinforced panel walls supported by shelf angles at each floor and laterally anchored to a backing wall. Most 8-inch veneers, however, are built as single-wythe curtain walls, which do not require intermediate anchorage. They are vertically and horizontally reinforced to resist wind loads and transfer stresses directly to floor, roof, and foundation connections. Reinforced single-wythe CMU curtain walls are capable of spanning more than 25 feet between lateral connections at the foundation, floor, or roof.

The introduction of color and texture has changed the face of concrete masonry. Sculpted units (top), ribbed, burnished, and split-faced units (center and bottom) no longer require stucco as a decorative and protective coating.

Movement and moisture control

ALL CONCRETE MASONRY WALLS SHRINK irreversibly with the initial loss of moisture from the units, and subsequent volume changes caused by thermal and moisture fluctuations continue throughout the life of the structure. The amount of individual unit shrinkage can be limited by specifying moisture-controlled units. Shrinkage cracking in a wall is controlled by metal joint reinforcement, and control joints at regular intervals and at points of weakness or high stress. Two-piece flexible anchors and un-



HOLLOW CORE SECTION

bonded slip joints are used to avoid cracking caused by differential movement between veneers and structural frames, and between loadbearing walls and connecting elements such as floor slabs, joists, and beams.

Failure to accommodate movement or achieve a sound mortar bond can produce cracking, permitting excessive moisture penetration. Porous masonry units may absorb moisture, and vapor transmission can cause condensation on or inside the wall. But most leaks in masonry walls occur at cracks, defective joints, window openings, copings, and parapets. Moisture trapped in a masonry wall can cause efflorescence, freeze-thaw damage, corrosion of metal accessories, deterioration of insulation, and mildew.

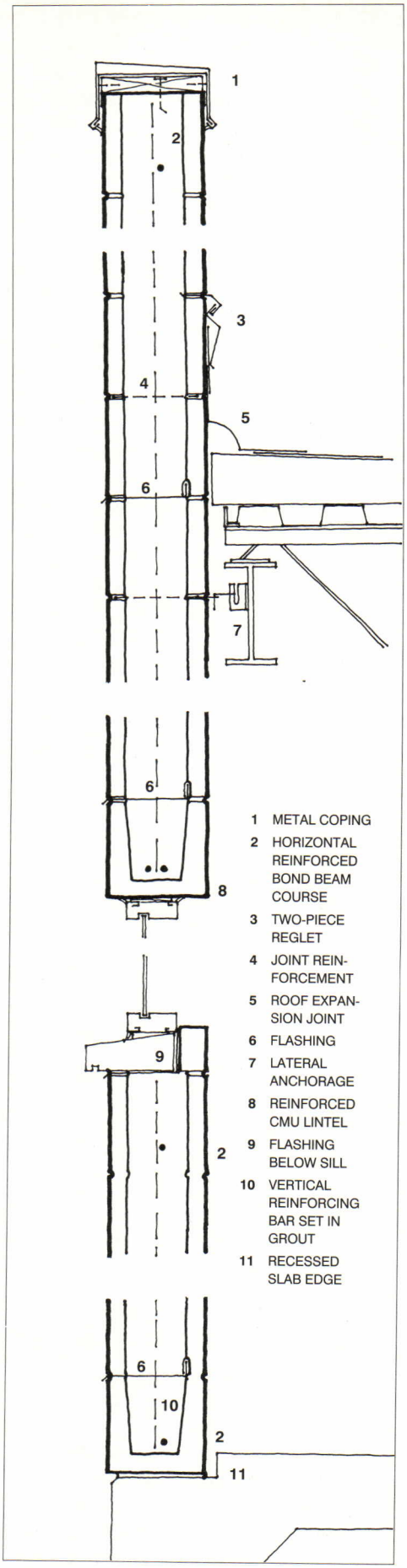
The basic principles of masonry design apply to single-wythe walls as well. Along with a strong mortar-to-unit bond and movement accommodation, they require careful placement of flashing and weep holes to collect and divert moisture without damaging constituent materials. The location of insulation, its relative thermal resistance, and the judicious use of vapor retarders are also important to the successful performance of single-wythe walls.

Flashing and weep holes

IN ORDER TO CONTROL MOISTURE PENEtration as effectively as masonry cavity walls, the hollow cores of 8-inch single-wythe concrete units can be used for drainage, but require careful attention to flashing and weep hole details. Although moisture penetration can be limited through good design and workmanship, it is virtually impossible to entirely prevent moisture in a concrete masonry wall. Water enters through defective joints, windows, or at other locations and must be collected and expelled. Without a system of flashing and weep holes, moisture is trapped within the wall.

Single-wythe CMU walls must incorporate flashing at critical levels such as roof and floor intersections, lintels, sills, and at the base of the wall. At floor and roof intersections where shear-wall or lateral-support connections occur, or at grouted cores where reinforcing steel penetrates the flashing, a nonhardening mastic should be ap-

Single-wythe concrete masonry walls may be built of hollow units (left) or the cores can be grouted and reinforced with steel bars (right). In both cases, horizontal steel reinforcement can be incorporated into bond beams and lintels.



GROUTED CORE SECTION

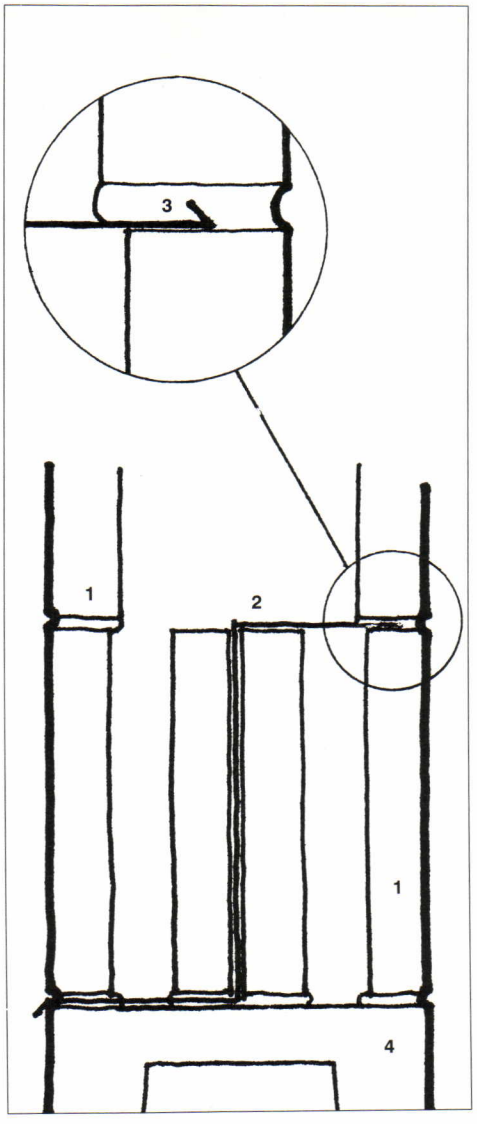
plied as a sealant around each bar or connector. The unbonded plane created by the flashing is not important structurally, because codes require that reinforced masonry be designed without considering any flexural-strength contribution by the masonry. The reinforcing steel is sized and located to resist all tensile stresses.

External drainage must be provided in the course immediately above the flashing. In face-shell bedding, where the mortar is placed only on the side walls (face shells) of hollow units, a gap occurs at the partitions between the cores (cross webs), allowing water to flow horizontally along the flashing. To drain accumulated moisture, weep holes can be installed in the vertical mortar joints at 16-inch intervals. With full-mortar bedding, in which mortar is placed on both the face shells and the cross webs, the mortar forms dams around each core, so weep holes must be located in the horizontal mortar joints at every ungrouted drainage core. Cotton wicks or removable oiled-rod or oiled-rope weeps are better than plastic weep tubes, because any mortar that drops into the core can easily block the small tube openings. If loose-fill insulation is poured into the block cores, it must be moisture-resistant, must not obstruct drainage, and must be prevented from spilling out through open weep holes.

In walls composed of 8-inch-thick conventional block, flashing must be stepped within the wall to direct collected moisture toward the wall's outside face. This is accomplished by substituting two 4-inch units for one 8-inch unit at the course where the flashing is located. The upper portion of the flashing should be bent to form a dam to prevent moisture that strikes this area from flowing toward the interior.

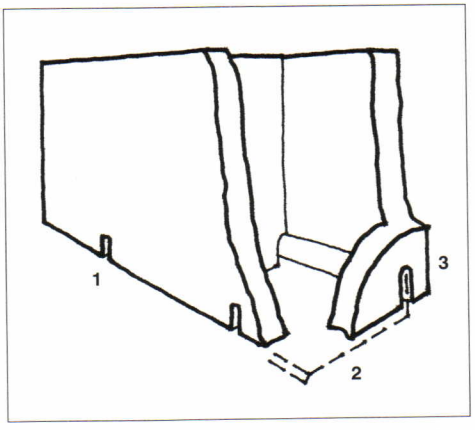
A new block design developed by the National Concrete Masonry Association (NCMA) simplifies the placement of flashing and weep holes in single-wythe block walls. NCMA's flashing block incorporates built-in weep slots and an integrated reglet to receive the back leg of the flashing. Such an assembly requires metal flashing with sufficient rigidity to maintain its shape while the block is placed over the vertical leg.

Metal flashing and weep holes discharge moisture from the wall. Flashing is stepped between two 4-inch units in conventional block construction (top right). NCMA has developed an alternative flashing block (bottom right).



FLASHING WITH CONVENTIONAL BLOCK

1 4-INCH BLOCK
2 FLASHING
3 BENT LEG
4 INVERTED LINTEL BLOCK UNIT



ALTERNATIVE FLASHING BLOCK

1 WEEP HOLE SLOT
2 METAL FLASHING
3 FLASHING REGLET

Water-repellent coatings and admixtures

CONCRETE BLOCK IS POROUS AND ABSORPtive, and a clear water repellent may be applied to limit the moisture absorption of the units without changing the wall's appearance. These water repellents are often advertised as a cure-all for moisture problems in single-wythe CMU walls, and are often incorrectly referred to as "sealers" or "waterproof" coatings. Water repellents partially fill the pores in the face of the masonry to prevent capillary absorption, but they should serve only as an adjunct to total system design, and not as the first and only line of defense. No water repellent, regardless of its chemical composition, will solve the problems of poorly designed or constructed masonry walls.

The most widely used water repellents are silane and siloxane compounds, which penetrate masonry surfaces and react chemically with water to form silicone resins. Although the molecular structure of these compounds allows them to penetrate to a depth of about 3/8 of an inch, the pores are not completely blocked, so transmission of moisture vapor remains high, and the wall can "breathe." No single type of water repellent is equally suitable or effective on all types of concrete masonry, because physical and chemical properties vary so widely. Compatibility of substrate and surface treatment should always be evaluated on an individual basis.

Recent attempts at solving moisture absorption problems in porous concrete block include the development of integral water-repellent admixtures for both the block and the mortar to provide protection through the full depth of the units. In masonry that contains such admixtures, water that strikes the face of the wall runs down the surface instead of being absorbed into the unit. Most manufacturers report no deterioration of water repellency at the surface and no requirements for maintenance, but some admixtures with high solubility may eventually wash out of the wall.

However, untreated mortar will not develop a satisfactory bond with treated block. Reduced mortar bond can negate the advantages of the block admixture by allowing moisture to penetrate the wall freely through microscopic voids at the bond line. Mortar that is also treated with water repellent admixtures achieves a better bond and better moisture resistance, but only if the admixture is chemically compatible with that used in the unit.

Controlling condensation

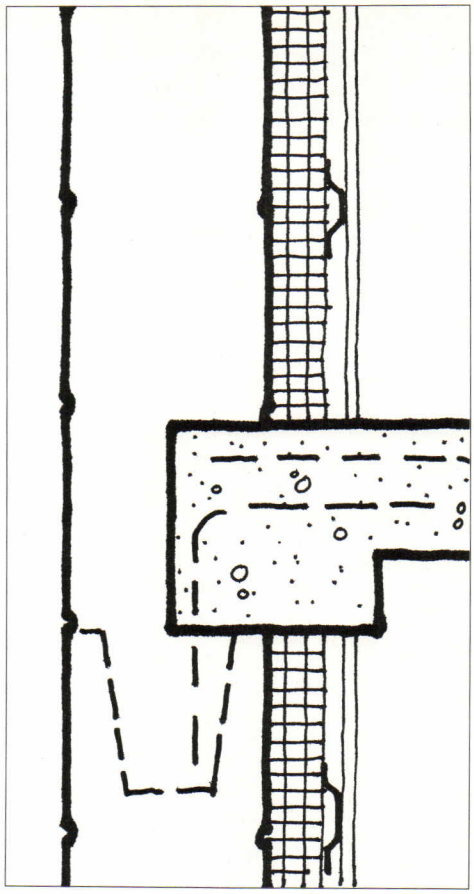
THE METHOD OF INSULATING A SINGLE-wythe wall will depend on heating and cooling requirements for each particular building project. Loose-fill insulation provides a relatively low R-value, and most brands settle over time, leaving an uninsulated gap at the top of the wall. Foam insulation inserts generally provide higher R-values than loose fill. Both types present problems of thermal bridging, or gaps in insulating value, at cross webs in the blocks. High R-values and more uniform coverage are provided by board or batt insulation located at the interior face of the wall between studs or metal channels.

A vapor analysis should be performed for all single-wythe walls to determine their potential for condensation, which occurs when warm, moist air is cooled below its dew point. The type, amount, and location of insulation affects condensation within the wall, however, and must be taken into consideration. Thermal bridging occurs where cross webs and grouted cells prohibit continuity of the insulation, creating variable R-values at different locations. The varying R-values in turn produce changes in the location of the dew point within the wall, complicating the precise calculation of condensation points for any given set of temperature or humidity conditions. Vapor retarders and air barriers can control vapor flow and condensation, but they must be located correctly to avoid trapping moisture in an undesired location.

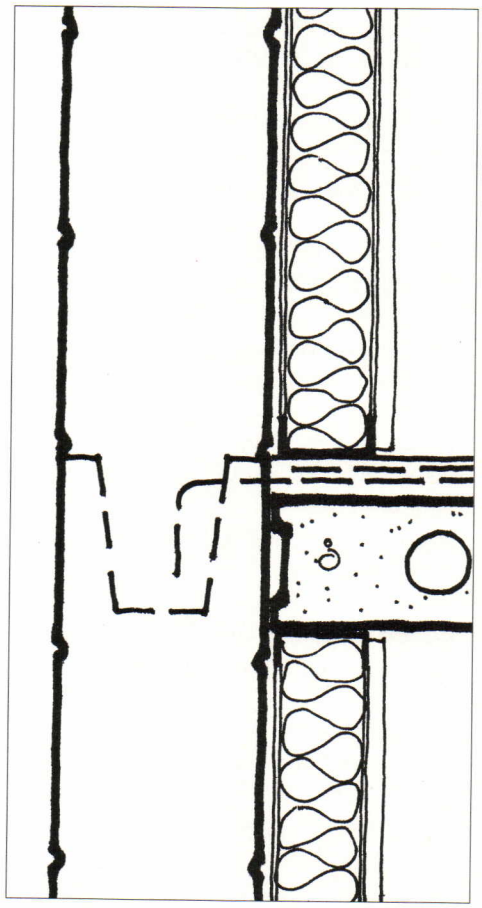
Air barriers are intended to prohibit the uncontrolled flow of moisture-laden air through building enclosures. Such barrier materials with low vapor permeance may also serve as vapor retarders. Some vapor retarder materials, however, may not be strong enough to resist air flow unless they incorporate a rigid backing.

Vapor retarders and air barriers generally belong on the warm side of the insulation. Under cold winter conditions, warm, moist, inside air is driven toward the cooler outside atmosphere, so the vapor-control plane should be toward the inside. Under hot, humid conditions, warm, moist, outside air is driven toward air-conditioned interior spaces, so the vapor-control plane should be toward the outside. Vapor retarders placed on the warm side prevent moist air from reaching its dew point at cooler temperatures within the wall. In some locations, vapor flow may reverse as the seasons change, so careful analysis is required to determine optimum vapor-control measures.

Improperly locating a vapor retarder can be as damaging as not providing one when needed. In cold climates, exterior coatings that do not "breathe" can trap moisture in a wall, where it may accumulate as frost until a spring thaw releases in liquid form. In hot climates, vinyl wall coverings act as vapor retarders on inside surfaces, often causing mildew growth and deterioration of the underlying gypsum board. In any climate, condensation may also cause wetting of insulation materials, sometimes reducing their thermal value. Excessive moisture from condensation can also promote corrosion of metal items or accessories within the wall, and the masonry units themselves may be saturated unless they are treated with integral water repellents.



RIGID INSULATION IN "Z" CHANNELS



BATT INSULATION BETWEEN STUDS

To provide more uniform thermal coverage, rigid board insulation (top right) or batt insulation (bottom right) may be located at the inside face of the wall in addition to or instead of loose-fill insulation placed in hollow block cores.

Successful drainage

ALL MASONRY IS PERMEABLE TO MOISTURE. The materials are porous, the joints are numerous, and the construction is handcrafted under diverse weather conditions, usually without the benefit of professional inspection. Single-wythe walls are most vulnerable to moisture penetration because they usually offer no second line of defense. Solidly grouted single-wythe walls can be more resistant to water penetration than those of hollow units, and walls treated with water repellents may be more resistant to absorption than untreated walls, but neither is a barrier to leakage through defective joints, parapets, or window openings.

The keys to successful performance of single-wythe masonry walls include limiting the amount of moisture that enters the wall, and expediting the removal of moisture to prevent damage. Methods of limiting moisture penetration include a complete bond between units and mortar, full mortar joints, and adequate allowance for movement. The primary means of removing moisture from masonry walls are continuous flashing and unobstructed weep holes. Good detailing is essential to both. ■

—CHRISTINE BEALL

Christine Beall, AIA, CCS, is an architect based in Austin, Texas.

Masonry

RESOURCES AND INFORMATION

INDUSTRY ORGANIZATIONS

American Concrete Institute
P.O. Box 19150
Detroit, Michigan 48219
(313) 532-2600

Brick Institute of America
11490 Commerce Park Drive
Reston, Virginia 22091
(703) 620-0010

Cast Stone Institute
Pavilions at Greentree
Suite 408
State Highway 70
Marlton, New Jersey 08053
(609) 858-0271

Indiana Limestone Institute
400 Stone City Bank
Bedford, Indiana 47421
(812) 275-4426

International Masonry Institute
823 15th Street, N.W.
Washington, D.C. 20005
(202) 783-3908

Marble Institute of America
33505 State Street
Farmington, Michigan 48335
(213) 388-0472

The Masonry Society
2619 Spruce Street
Suite B
Boulder, Colorado 80302
(303) 939-9700

National Concrete Masonry Association
2302 Horse Pen Road
Herndon, Virginia 22071
(703) 713-1900

National Lime Association
3601 North Fairfax Drive
Arlington, Virginia 22201
(703) 243-5463

Portland Cement Association
5420 Old Orchard Road
Skokie, Illinois 60076
(708) 966-6200

BASIC REFERENCES

"Technical Notes on Brick Construction," loose-leaf series published and updated periodically by Brick Institute of America.

"NCMA-TEK," loose-leaf series published and updated periodically by National Concrete Masonry Association.

Principles of Brick Masonry, Brick Institute of America, 1989.

Indiana Limestone Handbook, Indiana Limestone Institute, 1985.

Concrete Masonry Handbook, Portland Cement Association, 1991.

Masonry Design Manual, Masonry Institute of America, 1979.

Masonry Design and Detailing, 2nd edition, Christine Beall, McGraw-Hill, 1987.

Reinforced Masonry Design, 2nd edition, Robert Schneider and Walter Dickey, Prentice-Hall, 1987.

CONSERVATION REFERENCES

Association For Preservation Technology International
P.O. Box 8178
Fredericksburg, Virginia 22404
(703) 373-1621

Preservation Assistance Division National Park Service
U.S. Department of the Interior
P.O. Box 37127
1100 L Street, N.W.
Room 4141
Washington, D.C. 20013
(202) 343-9578

"Preservation Briefs," loose-leaf series published and periodically updated by the National Park Service.

Masonry: How to Care for Old and Historic Brick and Stone, Mark London, National Trust for Historic Preservation, The Preservation Press, 1988.

Keeping It Clean: Removing Exterior Dirt, Paint, Stains, and Graffiti from Historic Masonry Buildings, Anne Grimmer, U.S. Department of the Interior, Technical Preservation Services, 1988.

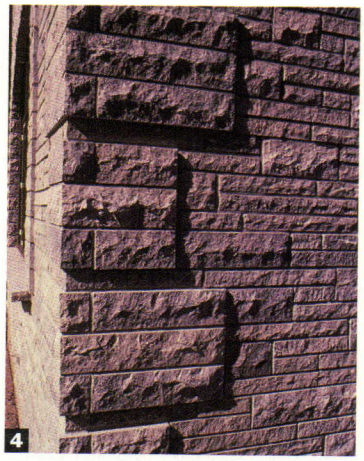
Maintenance and Repair of Architectural Sandstone, Michael Lynch and William Higgins, New York Landmarks Conservancy, Technical Preservation Services Center, 1982.

The Conservation of Building and Decorative Stone, J. Ashurst, et al., Butterworth Books, 1991.

Set in Stone

Masonry building products for exterior and interior applications.

1. Cold Spring Granite Company offers domestic granite in 28 colors and eight finishes. Circle 401 on information card.
2. Granite and Marble Resources supplies French limestone, Indian granite and sandstone, Italian marble, and domestic stone. Circle 402 on information card.
3. Harding & Cogswell fabricates Indiana limestone cladding, limestone-faced precast systems, and its Thin Wall system. Circle 403 on information card.
4. Arriscraft Corporation offers Adair marble from Ontario in a range of finishes. Circle 404 on information card.
5. The Verona Marble Company manufactures Agglosimplex floor and wall tiles from marble pieces. Circle 405 on information card.
6. The Stone Products Corporation produces an interlocking Carolina Ledgestone system. Circle 406 on information card.
7. Natural CutStone offers Crab Orchard Stone from Tennessee for stairs, fireplaces, and curbs. Circle 407 on information card.



Brick cladding

ENDICOTT CLAY PRODUCTS COMPANY PRODUCES bricks in a range of shapes, sizes, colors, and textures (above). Endicott also offers Thin Brick, a 1/2-inch-thick kiln-fired cladding material available in three textures. According to the manufacturer, Thin Brick may be applied over any structurally sound substrate, including a number of prefabricated, polystyrene foam panel systems.

Circle 408 on information card.

Brick panels

EXTERIOR/INTERIOR SYSTEMS HAS EXPANDED its National Brick Panel System by introducing 3 5/8-by-7 5/8-inch and 3 5/8-by-11 5/8-inch panels that utilize Endicott Clay Products's 1/2-inch-thick brick, among other thin-brick products. Appropriate for commercial, residential, and remodeling applications, the system allows moisture that has permeated the brick and mortar to drain down the face of the panel and exit through weep holes installed above grade level.

Circle 409 on information card.

Rugged tiles

AMERICRAFT II TILE IS A LINE OF UNGLAZED quarry tile produced by the Florida Brick and Clay Company. The tiles, suitable for interior and exterior applications, are fabricated from graded shales and fire clay to provide uniform density, low porosity, and durability.

Circle 410 on information card.

Pastel brick

THE GLEN-GERY CORPORATION, MANUFACturer of molded brick, offers the Pastel Series in six colors ranging from aqua to salmon. Glen-Gery has also introduced a bevel-edged paver (below) for walkways, driveways, pools, patios, plazas, parks, and restoration projects.

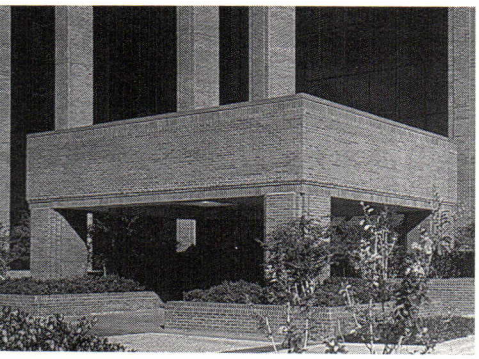
The paver is available in a variety of colors. Glen-Gery Corporation.

Circle 411 on information card.

Big bricks

INTENDED TO REDUCE TOTAL MASONRY costs and speed construction, King Size Brick by the Acme Brick Company measures 3/8 inches taller and 2 inches longer than standard bricks, while maintaining the same width. Introduced in the 1950s, Acme King Size Brick can be used in place of conventional brick for houses and commercial buildings (below left). It is available in 100 colors and a variety of textures. Acme also produces the IBP Glass Block Grid system which eliminates the need for traditional mortar in the installation of glass block. Glass blocks are inserted into a metal frame lined with a vinyl thermal barrier; the assembly is then coated with silicone. The system is appropriate for windows, walls, skylights, and floors. The grid system is available in a variety of sizes, shapes, and colors. Acme Brick Company.

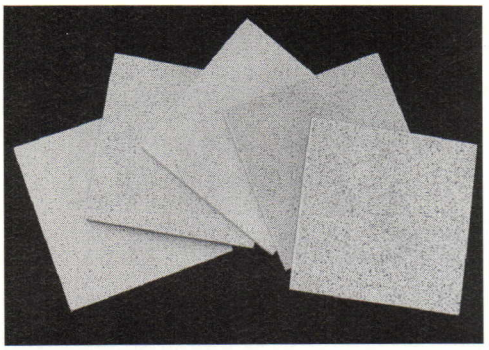
Circle 412 on information card.

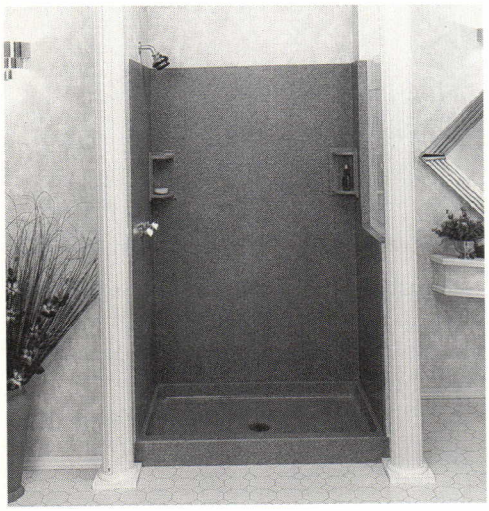


Green bricks

THE BRICK INSTITUTE OF AMERICA PROmotes the environmental sensitivity of brick products, including structurally sound masonry materials made from sewage sludge and petroleum-contaminated soils in combination with clay. Bricks that fail to meet manufacturing standards are inexpensively crushed and used in planters, flower beds, walkways, borders, and other landscaped areas (right). These brick chips require little maintenance, and they do not rot, erode, fade, disintegrate, or harbor insects. They can also be used to manufacture new bricks. The Brick Institute of America.

Circle 413 on information card.





Solid surfaces

THE SWAN CORPORATION, WHICH PRODUCES kitchen sinks, countertops, and bath products in Swanstone (top), its solid surface material, introduces five colors to its kitchen line: Mocha Galaxy, Almond Galaxy, Gray Galaxy, Rose Galaxy, and Blue Galaxy. Swanstone shower-wall panels (above) can be cut or combined for a range of shower installations. The company also produces matching shower floors and offers a wall-panel-trim kit and corner-molding-strip package in addition to a corner soap dish. The Swan Corporation. *Circle 414 on information card.*

Diffuser finishes

TITUS HAS INTRODUCED THE SERIES 100 Finishes for its ML and CT diffuser lines. The collection includes either a polished or high-luster finish, which is intended to give the appearance of chrome, brass, bronze, or pewter. *Circle 115 on information card.*

Rugged flooring

TNEMEC PRODUCES A RANGE OF HIGH-PERformance flooring systems that incorporate surfacers, fillers, primers, troweled mortars, and laminates. The systems are available in a variety of surface textures and colors including a decorative quartz finish, and are suitable for commercial buildings, food preparation areas, pharmaceutical plants, laboratories, schools, correctional facilities, pulp and paper mills, chemical processing plants, and manufacturing facilities. In addition to flooring systems, Tnemec manufactures a line of coatings for architectural and industrial use. Tnemec Company. *Circle 416 on information card.*

Truck restraint

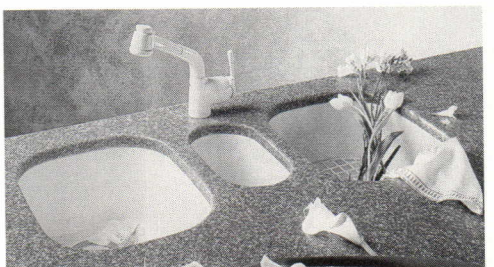
BEACON MACHINERY OFFERS THE MODEL BBC-51 Bear Claw, an electrically operated truck restraint designed to withstand forces up to 30,000 pounds. Beacon Machinery. *Circle 417 on information card.*

In-wall amplifier

DUKANE INTRODUCES IN-WALL AMPLIFIER units with electronic sound system components contained within compact flush- or surface-mounted enclosures. Dukane Corporation. *Circle 418 on information card.*

Fire protection

STAR SPRINKLER CORPORATION INTRODUCES the Starmist Recessed Pendent Quick Response Sprinkler to its Galaxy line of Glass Bulb Sprinklers. The Starmist Model is designed to respond to heat five times faster than standard sprinklers, and it allows up to 1/2 inch of adjustment after the ceiling is installed. The sprinkler and escutcheon are available in a variety of finishes. *Circle 419 on information card.*

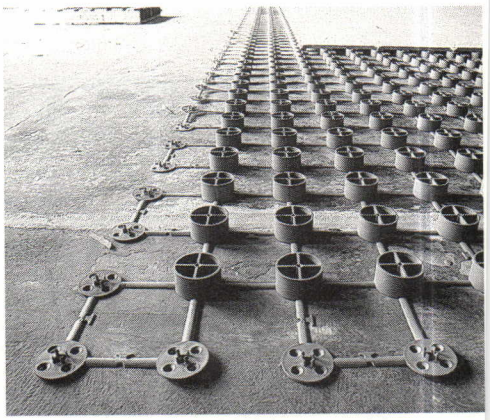


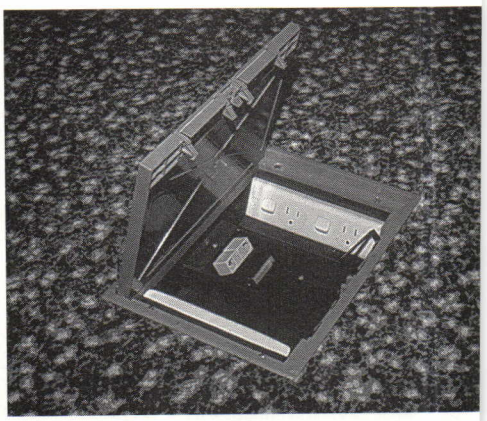
Sink flexibility

FRANKE, MANUFACTURER OF SINKS, FAUCETS, and custom accessories, adds colorful quartz composite sinks to its Elements undermount line (above). The elements include rectangular and elliptical models in a chip- and stain-resistant material, and can be mounted alone or in combination. *Circle 420 on information card.*

Rubber surfacing

DESIGNED TO RESURFACE DAMAGED AND unsightly pavement and flooring, FlexTech by Bomanite is a rubber coating for concrete, asphalt, metal, and additional surfaces. FlexTech is produced from resins and recycled rubber granules that are mixed on-site and troweled over existing walkways, decks, patios, and driveways. The substance can be color-coated, used as grout, or imprinted with Bomanite patterns. *Circle 421 on information card.*





Access flooring

ALLSTEEL INTRODUCES CABLEFLOOR, A FLEXI ble access flooring system (top) designed t accommodate wire and cables in automate offices. Each electrical box (above) serves tw workstations. When installed on a structura slab, Cablefloor produces a finished height c 2 3/8 inches. *Circle 422 on information card*

Texas limestone

THE AMERICAN LIMESTONE COMPANY, BASE in Dallas, distributes Texas-quarried lime stone in a variety of colors including gra salmon, ivory, saffron, and beige. Finishes ir clude glossy, sawn, split-face, bush-ham mered, and honed. *Circle 423 on information car*

EURO DISNEY CREDITS

FESTIVAL DISNEY *(pages 44-47)*

DESIGN ARCHITECT: Frank O. Gehry & Associates, Santa Monica, California—Frank O. Gehry (design principal); Robert G. Hale (managing principal); Vincent L. Snyder (project designer); Bruce Biesman-Simons (project architect); Andrew Alper, Gaelle Breton, Michael Sant, Marc Salette (design team)
ARCHITECT OF RECORD: Saubot et Julien Architects, Paris—Jean Rouit, Marc Rozo, Jean Luc Bichet, Jean Christope Salvan, Nathalie Bessec (design team)
ENGINEERS: O.T.E. Ingenierie (structural); INEX Ingenierie (mechanical); BETEC (electrical)
CONSULTANTS: Bruce Mau Design (graphics); Morris Nathanson Design (exterior signage/food & beverage interiors); Brand & Allen Associates (retail interiors)
CONSTRUCTION MANAGER: Bovis

HOTEL SANTA FE *(pages 48-51)*

DESIGN ARCHITECT: Antoine Predock Architect, Albuquerque, New Mexico—Antoine Predock (principal-in-charge); Jon Anderson (project architect); Jeffrey Wren, John Bass, (design team)
ARCHITECT OF RECORD: Fernier & Associates, Paris—Aris Atamian, Laurence Fernier (project architects)
LANDSCAPE ARCHITECTS: EDAW; Sasaki Associates (lakefront)
INTERIOR DESIGNERS: Tricia Wilson and Associates
ENGINEER: Fernier & Associates
CONSULTANTS: Jules Fisher and Paul Marantz (lighting); Douglas Harding Group (graphics)
CONSTRUCTION MANAGER: COTEBA

HOTEL CHEYENNE *(pages 52-53)*

DESIGN ARCHITECT: Robert A.M. Stern Architects, New York City—Robert A.M. Stern (principal-in-charge); Alexander P. Lamis (architect-in-charge); Paul Whalen (architect-in-charge of conceptual design); Daniel Lobitz (senior assistant); Christopher Blake, Keller A. Easterling, Maria Resende (assistants)
ARCHITECT OF RECORD: Viguier et Jodry et Assoces
LANDSCAPE ARCHITECTS: EDAW; Sasaki Associates
INTERIOR DESIGNERS: Tricia Wilson and Associates (design); InterArt Etudes (production)
ENGINEER: Gerba 7
CONSULTANTS: Jules Fisher and Paul Marantz (lighting); Lighting Design Partnership (interior lighting); Douglas Harding Group (graphics)
CONSTRUCTION MANAGER: COTEBA

NEWPORT BAY CLUB *(pages 54-57)*

DESIGN ARCHITECT: Robert A.M. Stern Architects, New York City—Robert A.M. Stern (principal-in-charge); Paul Whalen (architect-in-charge); Valerie Hughes, E.J. Jarboe, Robert Miller, William Nolan, Edward Tuck (assistants)
ARCHITECT OF RECORD: Macary-Menu, Paris
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INTERIOR DESIGNERS: Design Continuum (design); Pascal Desprez (production)
ENGINEERS: Bethac (mechanical/electrical/plumbing); Structure Ile De France (structural/civil)
CONSULTANTS: Jules Fisher and Paul Marantz (lighting); David Carter Associates (graphics)
CONSTRUCTION MANAGER: COTEBA

SEQUOIA LODGE *(pages 58-59)*

DESIGN ARCHITECT: Antoine Grumbach, Paris—Antoine Grumbach (principal-in-charge); Francoise Sogno (project architect)
ASSOCIATE ARCHITECT: Sandoz et Alexandre, Paris
LANDSCAPE ARCHITECT: EDAW; Sasaki Associates
INTERIOR DESIGNERS: Tricia Wilson and Associates (design); Boyer (production)
ENGINEER: Get Ingenierie
CONSULTANTS: Jules Fisher and Paul Marantz (exterior lighting); Lighting Design Partnership (interior lighting); David Carter Associates (graphics)
CONSTRUCTION MANAGER: COTEBA

HOTEL NEW YORK *(pages 60-63)*

DESIGN ARCHITECT: Michael Graves, Architect, Princeton, New Jersey—Michael Graves (principal); Patrick Burke (associate-in-charge); Jesse Castanda, Mark Kelly (job captains); Amy Cheun, Ian Fleetwood, Erica C. Weeder, Ron Witte (design); Wendy Bradford, Susan Butcher, Michelle Stivelman (interiors)
ARCHITECT OF RECORD: Macary-Menu, Paris
LANDSCAPE ARCHITECT: EDAW; Sasaki Associates
INTERIOR DESIGNERS: Michael Graves, Architect (design); InterArt Etudes (production)
ENGINEER: Sechaud & Bossuyt & Cie
CONSULTANTS: Jules Fisher and Paul Marantz (lighting); Lighting Design Partnership (interior lighting); David Carter Associates (graphics)
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Roof Drains *CSI Division 07710*

Retrofitting Old Drains

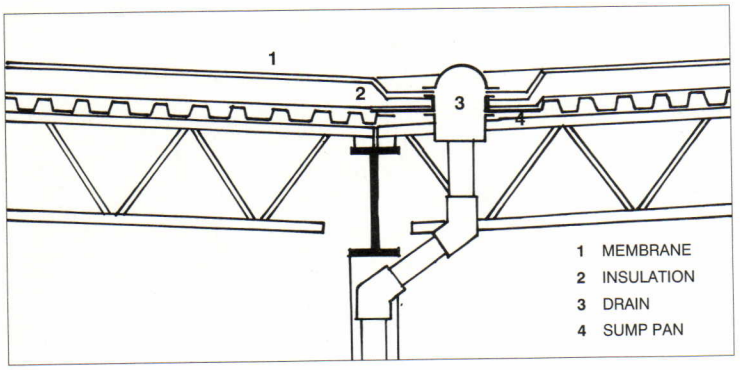
Leaks on flat roofs often occur at roof drains, which over time can corrode and fail. Because such failures usually occur a decade or more after installation, retrofitting existing drains can prove difficult because manufacturers may have changed drain designs or, in some cases, may no longer be in business. Replacing an existing steel drain with a completely new one can be expensive, because the entire unit must be removed down to the drainage pipe, a process that requires replacing the roof deck and disrupting building use. Such a replacement can cost anywhere from $700 to $2,000 per drain. A less costly alternative would be to install a retrofit drain, which has an adjustable sleeve to fit any size drainage pipe. Retrofit drains are made of plastic and are less costly than steel drains, but nearly as durable. They are installed over the existing drain, allowing the building to remain in constant use. The cost of an installed retrofit drain is approximately $200.

Richard Scheick
The RBA Group
Morristown, New Jersey

Metal deck drainage

For conventional flat roofs on metal decking, drains should be set in depressed sumps, preferably with sheet metal sump pans to accommodate the deck's slope and ensure that the drain is level. If the framing cannot be sloped, crickets should be installed to direct water to the roof drain. With a properly detailed sump placed at the low point of the roof, residual water will not collect on the membrane.

Archibald Currie, III
Yale University Facility Planning
New Haven, Connecticut



ROOF DRAIN SECTION

Access Floors *CSI Division 10270*

Loads and Static Electricity

Anticipated loading conditions for access floors should always be determined from the client prior to writing specifications, since it is the client who will purchase and locate equipment on the floor. Critical conditions include dynamic loads such as the rolling and impact loads of normal use, initial computer installation, and room construction, and concentrated live loads once computer equipment is in place. Another "load" to be considered is static electricity, high levels of which can cause problems with data storage on computer disks, the functioning of computer hardware, and annoying shocks. Access floor carpeting should be specified with built-in inhibitors to dissipate static electricity. Maintaining relative humidity above 40 percent will also mitigate static buildup. The currently accepted maximum level of static electricity in carpets when tested in accordance with the American Association of Textile Chemists and Colorists Standard 134 is 2 kilovolts for data processing environments, unless otherwise recommended by the computer manufacturer. In residences, the maximum is 5 kilovolts, while in commercial environments, it is 3.5 kilovolts. If extensive computer use is anticipated, the 2 kilovolt maximum might be considered.

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

Carpet Tile Finishes

Carpet tile has become a popular finish for access floor panels, especially in office spaces. The "free-laid" installation method assumes that carpet tiles (generally available in 18-inch-square tiles) and access floor panels (approximately 24 inches square) will not align. This system is suitable where the underfloor plenum is rarely opened. However, where frequent access is necessary, such as in computer development labs, this method is not advisable because it requires the removal of at least four carpet tiles to pull one floor panel. In such cases, it is best to specify that each access panel be covered with a carpet tile trimmed to its exact size. Gluing the carpet to the tile is not advisable because of the effort required to replace it when it wears out. Flexible alternatives include Velcro or magnetic strip fasteners. The additional initial cost of trimming the carpet to the panel size will be recovered by saving time in pulling only one carpet tile for each access panel.

William H. Garbus, AI
IBM Real Estate and Construction Staf
Stamford, Connecticu

Architects are encouraged to contribute their Neat ideas, including drawings, sketches, and photographs, for publication. Send the submissions to: NEAT *File, Michael J. Crosbie, 47 Grandview Terrace, Essex, Connecticut 06426, or by fax (202)828-0825.*

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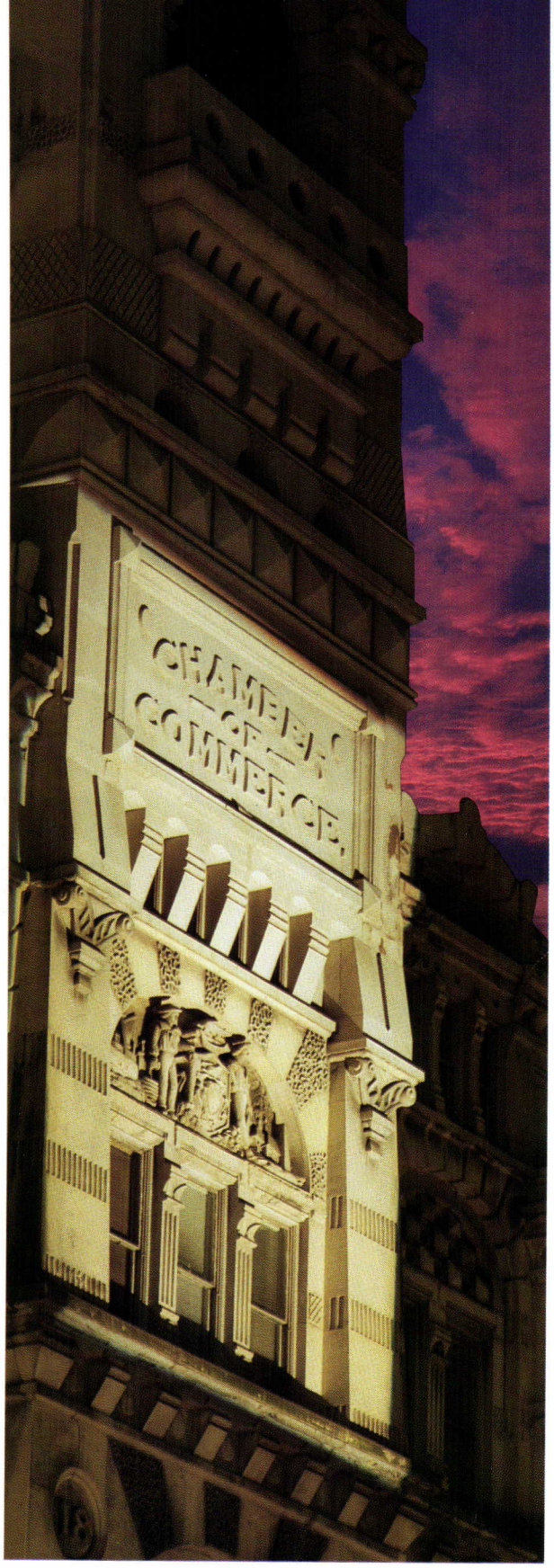

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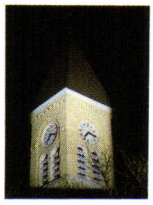

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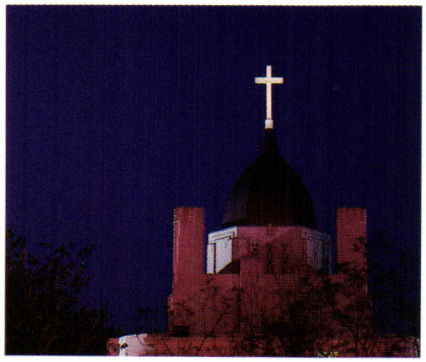

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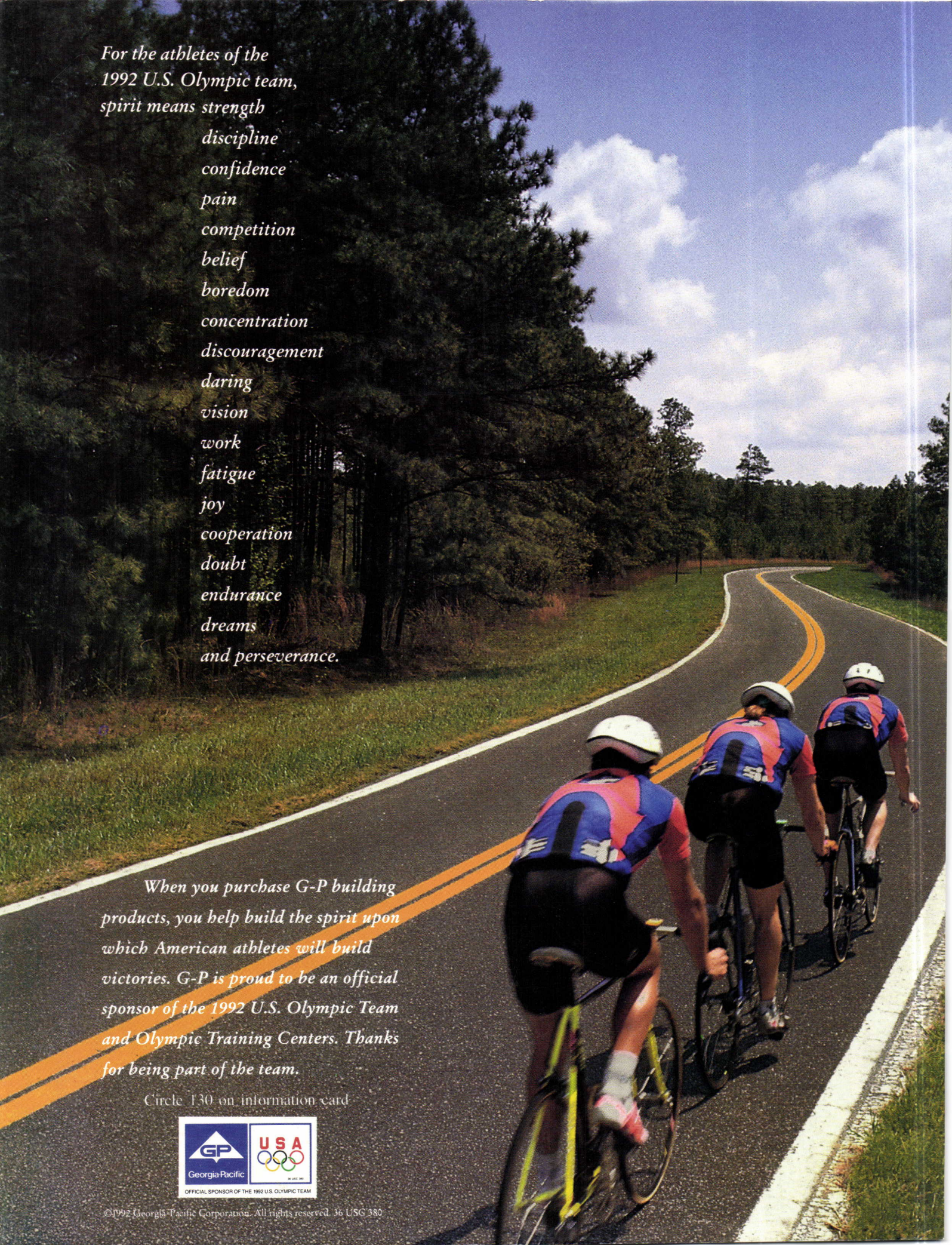
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