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135. Cue Cards walk you through basic CAD operations.
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137. Multiplatform license includes DOS, Windows 3.1x, Windows NT and Windows 95.
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140. No more ACAD.PWD file.
141. The ability to turn off the automatic Backup files.
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143. OLE 2.0 with drag and drop allows you to dynamically embed spreadsheets, video clips, Word documents into

154. Optimized for 32-bit Windows operating environments, resulting in 20%+ increase in performance over 16-bit Windows 3.1x.
155. WHIP driver (High Performance Driver for Windows) increases performance, including near instantaneous redraws.
156. Real-time Pan.
157. Real-time Zoom.
158. Incremental saving of the drawing file.
159. Faster regens due to more drawing data stored in memory during working session.
160. No regen on Window resize.
161. Optimized output on selected Windows system printer drivers.
162. Improved HP GL/2 plotting performance on Windows and DOS platforms.

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 On-line Tutorial steps through basic features.
 On-line Quick Tour shows AutoCAD's capabilities.

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145. Read drawing files created in previous AutoCAD releases.
146. Save as a Release 12 drawing file.
147. ARX(object-oriented development platform) allows for tighter integration with 3rd party software.
148. Broad peripheral support.
149. Undo support for external database links and operations.
150. Output to STL format.
151. Xref and Block support for non-graphic links.
152. ASI access to ASE link mechanism.
153. ASILISP contains new LISP functions for accessing external databases.

163. ADS applications run faster.
164. AutoLISP programs run faster.
165. Pager included for large drawing memory management.
166. Multiple sessions of AutoCAD.
167. Windows 95 user interface.
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169. Supports Universal Naming Convention (UNC) for Files and External References.*
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Letters

Poundbury protests

The May (1996) issue of ARCHITECTURAL RECORD contains a one-page-long review of Leon Krier's Poundbury (page 15) so unrelentingly detrimental to its reputation that one could only hope that the correspondent was merely innocent of matters urban, rather than simply slanderous. I undertook a correction which resulted in a text, also one page long—the correction of misinformation taking no less effort than its willful promulgation.

To the submittal of this letter, I received the following reply “Regretfully, we will not be able to publish Andres Duany’s letter in ARCHITECTURAL RECORD, since it would occupy at least a full printed page.” The need of the precious page for other purposes being self-evident, I desist from my attempts and direct those interested to access this useful text through the Web at http://www.dpz_architects.com Andres M. Duany
Andres Duany and Elizabeth Plater-Zyberk, Architects, Inc.
Miami, Florida

The Poundbury article in the May issue makes no comment on financial success or sales acceptance, nor any indication if the residents like it or not. (Why would anyone buy or wish to live in a house where the kitchen and bath are “add-ons” as appears desirable to your editor?)

Your editorial policy seems to be a series of pompous tirades against those who “step on your turf.” HRH may be doing a good job or a bad job, who knows. There is no way to tell from this drivel.

Bill Price II
Price Real Estate
Burlington, North Carolina

‘Sinister’ museum?

I enjoyed Cheryl Kent’s review of Joseph Kleihues’ new museum in Chicago [ARCHITECTURAL RECORD, August 1996, pages 80-87]. Especially, I share her concern for a grand Chicago building tradition now in apparent decline. And, bravo for taking a stand for simplicity and restraint!

But I am not certain the new museum reinvigorates tradition. There is something peculiarly sinister about that building. Axial and monumental it is, but it lacks the amiable grace and strength of the best Chicago work. Mies’s buildings are composed of ineffectively proportioned rectangles; Kleihues, on the other hand, has resorted to the use of the square to organize his facades, a somewhat tyrannical cliché used in the most prosaic contemporary designs.

Also, street-level entries are not necessarily the purview of modern museums. Both the Uffizi and Pitti museums, although designed for other uses, have worked just fine for many years as repositories of fine art. Grand stairways are, perhaps, an anachronism of a false monumentality in an age where each public building is now required to be accessible.

James A. Gresham, FAIA
Gresham & Beach Architects Inc.
Tucson, Arizona

Academia revisited

The July issue on Academic Buildings [RECORD, July 1996] is more a look backward than forward. Why does a retro-garde project like the Colgate Darden Graduate School of Business Administration at the University of Virginia (pages 72-79) have eight full pages devoted to it
Continued on page 120

Calendar

October 16-February 2

“Viewing Olmsted” exhibition of 155 photographs of the work of North America’s most important landscape architect. Canadian Center for Architecture, Montreal. Call 514/939-7000, fax 514/939-7020 to request further information.

October 19-21

The American Society of Landscape Artists annual meeting and exposition; Los Angeles Convention Center. Details available by phone, 202/686-2752, or fax 202/686-1001.

October 23

The Society of American Registered Architects (SARA) convention will be held in Atlanta at the Swissotel. Call 770/454-9019 for more information.

October 26

ARCHITECTURAL RECORD and the Cooper-Hewitt National Design Museum will hold a symposium on “Creating the Modern House: Forty Years of RECORD HOUSES” in the auditorium of the McGraw-Hill Building, 1221 Avenue of the Americas, New York, N.Y.

Panel discussions include:

- ◆ Lifestyles and residential design
- ◆ Design ideas that started with RECORD HOUSES
- ◆ Client-architect relations
- ◆ Houses of the future.

Participants include Charles Gwathmey, Will Bruder, Ulrich Franzen, Jack Travis, Gisue Hariri, Leslie Gill, John Johansen, Robert Campbell, Suzanne Stephens, Thomas Hine, and Charles Gandee.

There is a \$75 fee for RECORD subscribers and Cooper-Hewitt members; \$35 for students; \$100 for all others. To register, call the Cooper-Hewitt at 212/860-6321.
Continued on page 29

Boston

AIA Holds Third Diversity Meeting

Minority architects attending the third annual AIA Diversity Conference were challenged to combine expertise with activism, in an impassioned keynote speech by educator Leslie Kanes Weisman.

"The efficacy of the profession in coming decades will depend upon knowledge of public policy, global markets, sustainable design, universal design, information technologies, and diverse cultures," Weisman, author of *Discrimination by Design*, told the more than 125 architectural practitioners and educators from 27 states at the August conference in Boston.

Architect Marc Maxwell, local chair of the event, urged attendees "to raise expectations of what we expect from the AIA." Many of the other speakers concurred with Maxwell, emphasizing that minority groups should not only be accepted by, but influential within, the AIA.

Washington, D.C., architect Raj Barr-Kumar, who next year will become the AIA's first non-white president, pledged support to broaden the diversity agenda and urged the audience to take a more active role in AIA affairs. "Minority culture members must do more than merely show up at the AIA; they must take action as leaders."

The three-day conference included seminars on affirmative action, the difficulties for gays and lesbians of coming out professionally, the marketing potential of staff diversity, and the need for affordable housing and urban-design strategies that address diverse constituencies and changing demographics.

To obtain the conference proceedings, including specific recommendations for action, call AIA in November at 202/626-7482. Next year's conference will take place August 22-24 in Seattle. *Nancy Levinson*

Texas

100 Architects and 12 Students Help Out After Church Burnings in South



Elevation of the Church of the Living God

In the wake of rampant church burnings throughout the South, architects have been volunteering their time and labor. After two predominantly African-American churches in Greenville, Tex., were severely damaged on consecutive nights, 100 members of the Dallas AIA Chapter and 12 students from the University of Texas at Arlington donated their services to help rebuild the 7,000-sq-ft New Light House of Prayer and the 5,500-sq-ft Church of the Living God. Construction of both churches will be executed by the Texas Baptist Men, volunteers who build churches around the country. Dennis Stacy, president

of the Dallas AIA Chapter and chair of the New Light House of Prayer design team, said the volunteers are pushing to get both churches built in time for Christmas. "We are trying to show that these crimes will not be tolerated or accepted," said Stacy. The AIA's new Regional Disaster Assistance team is seeking architects who can provide qualified guidance for renovation and reconstruction projects. The AIA is currently working with the National Council of Churches of Christ, U.S.A., and HUD to distribute technical support and a list of "architects-on-call."

"Architects have shown a huge outpouring of goodwill," said Elizabeth G. Miller, the Council of Church's director of construction and re-building services. For more information, contact Jonathan Moore at AIA, 202/626-7375. *Katherine Kai-sun Chia*

New York City

Work to Start on New Rossi Building

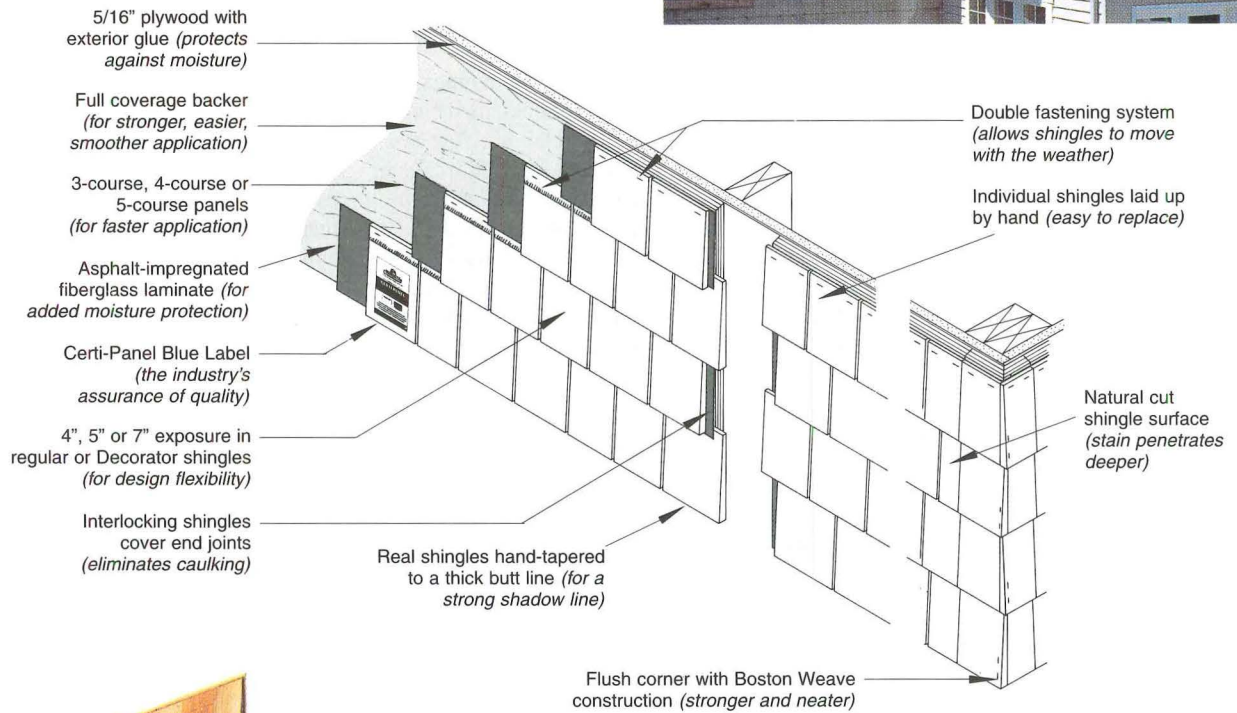
Scholastic Inc., a leading publisher of educational materials, will begin construction in December of a 115,800-sq-ft, 10-story office building adjacent to their current headquarters on Broadway in New York City's SoHo district. Designed by Aldo Rossi, in collaboration with Gensler Associates, the building, slated for completion in 1998, incorporates materials inspired by SoHo's turn-of-the-

century Cast Iron Historic District: patinated steel, buff-colored stone, terra cotta, painted metal, and glass. Since the building extends through the block, the Broadway facade (bottom left) will reflect the Classically formal architecture of neighboring buildings while the opposite Mercer Street facade (bottom right) will echo SoHo's industrial heritage. ■ *(News continues)*



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HUD Pushes "New Urbanist" Principles for Inner-Cities

Housing and Urban Development Secretary Henry G. Cisneros has recommended that public-housing officials from around the country start applying "new urbanist" principles to the redesign of troubled inner-city housing projects. New urbanist architects use ideas extracted from traditional town plans to design new communities that are pedestrian-oriented and organized around mixed-use neighborhoods.

While new urbanist developments such as Seaside, Fla., and the Kentlands outside of Washington, D.C., have attracted attention during the past 10 years, the new urbanists have also been criticized for working mostly in suburbia and on "greenfield" sites beyond metropolitan centers. The new HUD endorsement should give new urbanist planners the chance to bring their ideas downtown to tough public-housing projects.

The first such opportunities will come from Hope VI, a HUD program created in 1993 to find innovative means of transforming the nation's most severely distressed housing projects. Two billion dollars has been appropriated for the program so far and \$1.5 billion has been awarded to 38 public-housing authorities.

"Hope VI is the end of public housing as we know it," stated Christopher Hornig, HUD's deputy assistant secretary for public-housing investments, at a two-day seminar in August in Cambridge, Mass. The seminar was sponsored by HUD, the Congress for the New Urbanism, and the Housing Research Foundation. The Hope VI program encourages local authorities to work with private developers to create mixed-income, mixed-use communities, explained Marc Weiss, special assistant to Cisneros. *Clifford A. Pearson*

Four New Projects at Cranbrook Follow In the Footsteps of Eliel Saarinen



Addition to Brookside Lower School

Cranbrook is reviving its building tradition with four new projects that complement the Eliel Saarinen/Henry Booth legacy.

The \$8.1-million, 20,410-sq-ft addition to Booth's Brookside Lower School, designed by Canadian architect Peter Rose, is near completion. The new wing includes music studios, science laboratories, and an early childhood center all joined by a window-lined walkway. "The architect chosen had to sustain [Brookside's] homelike quality which, architecturally, makes it a nurturing environ-

ment for children," said a Cranbrook spokesperson.

Groundbreaking for the New Institute designed by Steven Holl took place on September 7. The \$27-million project includes renovations to the original Cranbrook Institute of Science designed by Saarinen and a new adjoining 27,000-sq-ft U-shaped wing to be completed in 1998. Visitors will enter the New Institute through the Light Laboratory, a glass tower fitted with prisms and lenses to create a constantly changing display of light and color by refracting artificial and natural light.

Architect Dan Hoffman, head of the Cranbrook Architecture Office, will design the majority of the science exhibits in the old and new wings with a team of architects, scientists, and industrial designers. Other projects waiting in the wings include new studios for the Academy of Art, designed by Rafael Moneo, and the new Athletic Complex and Natatorium, designed by Tod Williams and Billie Tsien. ■

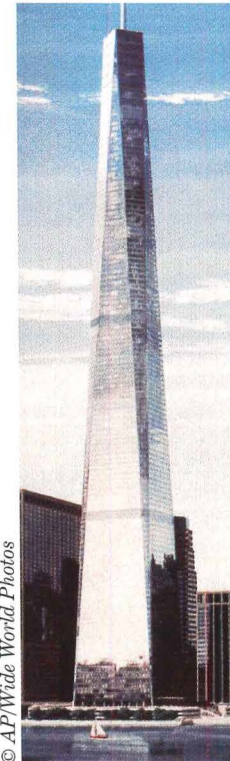
Swiss Firm Designs Dominus Winery

One of California's most distinguished wineries will soon be housed in a structure that is an elegant version of a road-cut. Adapting the strategies of highway engineering to the world of grand crus, the Swiss firm of Herzog & de Meuron has designed a 300-ft-long green container for Dominus Winery that will be completed for the harvest in 1998.

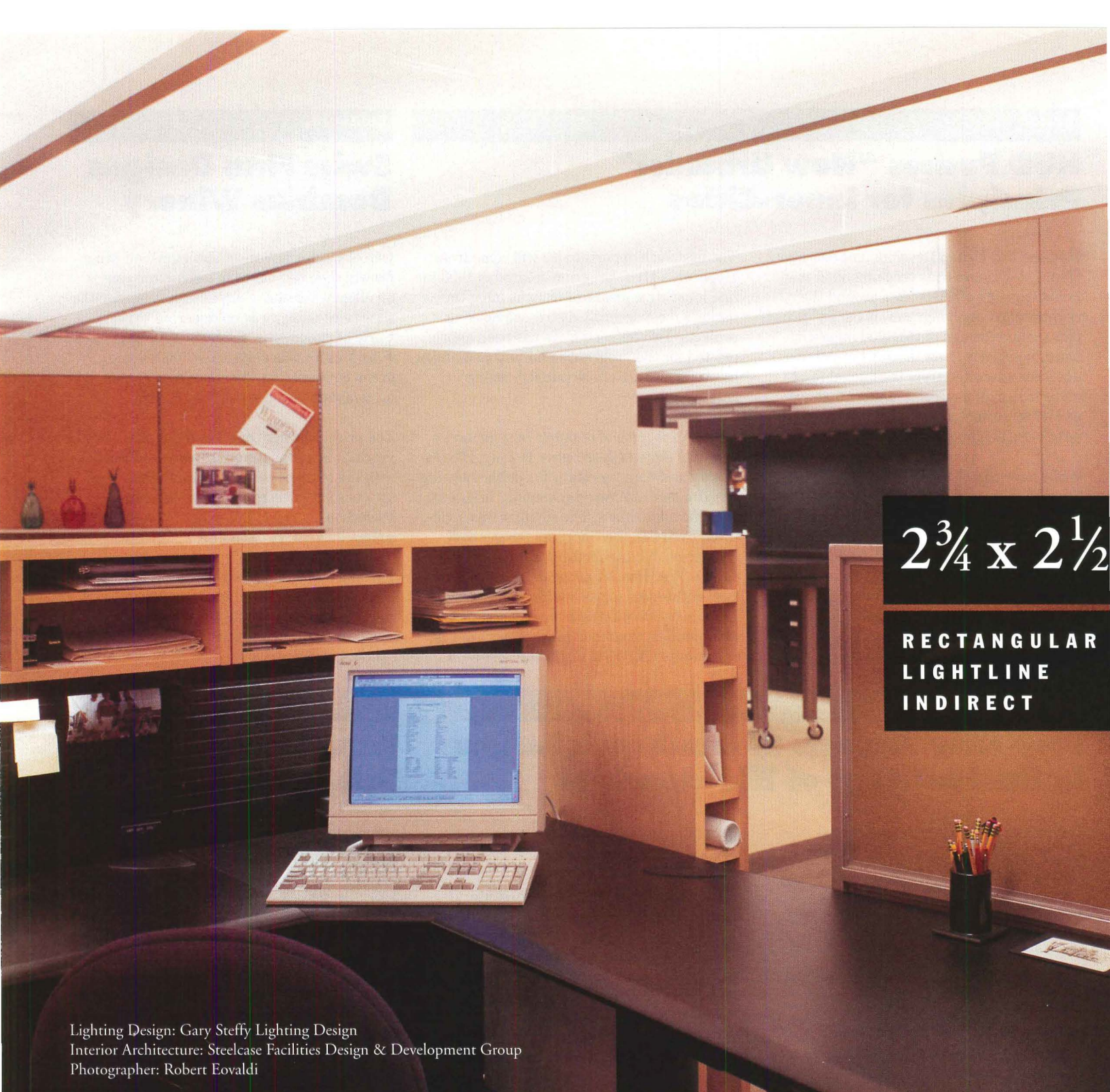
The project brings together the makers of Petrus, one of the grandest wines of France, with the mavericks of muted materials who are currently designing the massive Tate Powerhouse project in London. It is the first American venture for both.

The building will be a box-within-a-box: the outer skin is a scaffolding of "gabions," the metal webs that restrain rocks next to highways, and will contain loosely piled local rocks. *Aaron Betsky*

Trump Tries To Be Tallest, Again



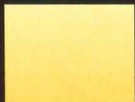
Donald Trump has whipped up yet another scheme for the world's tallest building—a 140-story skyscraper designed by Kohn Pedersen Fox for the New York Stock Exchange. Defeated a decade ago with a similar proposal in midtown, this project would be built at the foot of Wall Street on a concrete pier jutting into the East River. The plan also includes a Kennedy Center-esque trading-floor operation on an adjacent site. *Peter Slatin (News continues)*



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Briefs

Foster to Build at Canary Wharf

Sir Norman Foster has been commissioned to design a \$475-million, 500,000-sq-ft office building for Citibank at Canary Wharf in London. The location will serve as the front office for corporate banking in the United Kingdom and will be completed by the year 2000.

U. of Minnesota Chooses Architects

Antoine Predock of Albuquerque, N.M., and executive architect Short Elliott Hendrickson, Inc., of St. Paul, Minn., have been awarded the commission for the new \$27.4-million, 230,000-sq-ft Gateway/Alumni Center at the University of Minnesota. The campus centerpiece will include a heritage gallery, meeting rooms, memorabilia shop, and offices. Construction will begin in spring 1997.

New Battery Park City Complex

Perkins Eastman Architects of New York City and Proteus, a Stamford, Conn.-based real-estate development firm, have been selected by the Battery Park City Authority to build a new \$110-million, 488,000-sq-ft hotel and entertainment complex at Battery Park City in Manhattan. Groundbreaking is scheduled for November and completion by late summer 1998.

New VP at World Monuments Fund

Laurie Beckelman will leave her current position as the executive director of the Public Theater/New York Shakespeare Festival to become the vice president for external affairs at the World Monuments Fund. Prior to working with the theater, Beckelman was chairperson of the Landmarks Preservation Commission. ■

U.S. Firm Wins Shanghai Competition But May Lose The Commission



A U.S. architectural firm is learning the hard way that international design competitions in China may leave the winner empty handed.

Anshen + Allen, Architects of San Francisco with the

East China Architectural Design & Research Institute finished first in the Shanghai Way To Fund International Finance Center competition for the two-tower, 1.23 million-sq-ft mixed-use complex located at the transition point between the historic Bund district and the developing area north of Suzhou Creek. As the winner, A+A should have been awarded the design commission. However, the original client group, a joint venture of Chinese insurance companies, was recently

restructured and the reconfigured group now intends to bring in another architect, coincidentally the second-place finisher.

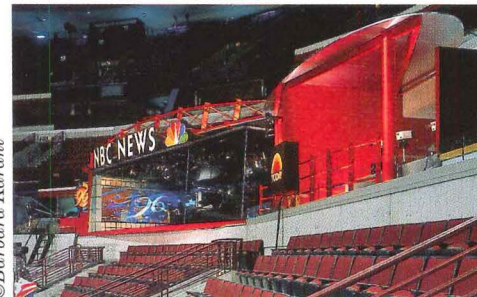
A+A has protested and is currently working with the Chinese government's Tendering Office and the Department of Construction to strengthen Chinese rules so that the competitions do not lose international credibility.

A+A's design beat out submissions from Fox & Fowle Architects of New York City, John Seifert Architects of the United Kingdom, B+H Architects of Canada, and Won Ouyang Architects of Hong Kong.

The \$133-million center will include a 20-story office tower; a 25-story live/work tower with retail space, public plazas, an open five-story Great Hall, and the Floating Pagoda Hall that contains bridges at every fifth level to connect the live/work and office components. *Katherine Kai-sun Chia*

Chicago

T.V. Studio Is "Craned" Into Place



© Barbara Karant

With only one month to construct, how do you turn five United Center sports arena skyboxes into a temporary television studio for the Democratic National Convention, without damaging the existing space? Chicago architect Valerio Dewalt Train, Associates designed a 50-ft-long steel truss assembly for NBC and craned the entire studio into place, causing an uproar among other networks with their generic perches. ■

Washington, D.C.

WWII Memorial Competition Is Down to Six Finalists

The American Battle Monuments Commission (ABMC) has announced six finalists from a field of 400 entrants who will participate in the next round of the World War II Memorial Competition.

The 12-member evaluation board, made up of design professionals and World War II veterans, selected Brian Ambroziak, a graduate student at Princeton University School of

Architecture; Friedrich St. Florian, architect and former dean of the Rhode Island School of Design; Diana Balmori, landscape architect, Balmori Associates, Inc, New Haven, Conn.; Bernard J. Wulff and William C. Jackson, RTKL Associates, Inc., Washington, D.C.; Rafael Vinoly, FAIA, Rafael Vinoly Architects, PC, New York City; and Marion Weiss and Michael Manfredi, Weiss/Manfredi Architects, New York City.

The finalists each receive \$75,000 to develop their preliminary visions into definitive designs that will fulfill the objectives of the ABMC, as directed by Congress in May 1993, to create a special place of great honor on the Mall in Washington, D.C., and "to commemorate the lasting significance of World War II on America and the world." ■

Two Teams Will Get Convertible Ballparks from NBBJ



NBBJ Sports and Entertainment of Seattle has a pair of baseball stadiums under way. The Pacific Northwest Baseball Park (above), for the Seattle Mariners, will feature a retractable roof and a natural grass playing field. Close-in angle seating will get fans right up to the action. NBBJ teamed with

HKS of Dallas and Eppstein Uhen of Milwaukee to design Miller Park (left), the future home of the Milwaukee Brewers. This park will also feature a convertible roof, though the overall design takes its stylistic cues from turn-of-the-century parks. Miller Park is scheduled to open in the spring of 2000. ■



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Former Rockefeller Center Management VP Is Top Pick for Architect of the Capitol



Alan Hantman (left), has diverse experience, ranging from the renovation of Rockefeller Center's Rainbow Room to assistant chief architect for a Saudi Arabia desalination plant.

A special Congressional panel has named Alan M. Hantman, a former Rockefeller Center Management Corp. vice president, its top choice to be the next Architect of the Capitol. Alternate selections are architect John Burgee, of John Burgee Architects, Millerton, New York, and William L. Ensign, the acting Architect of the Capitol.

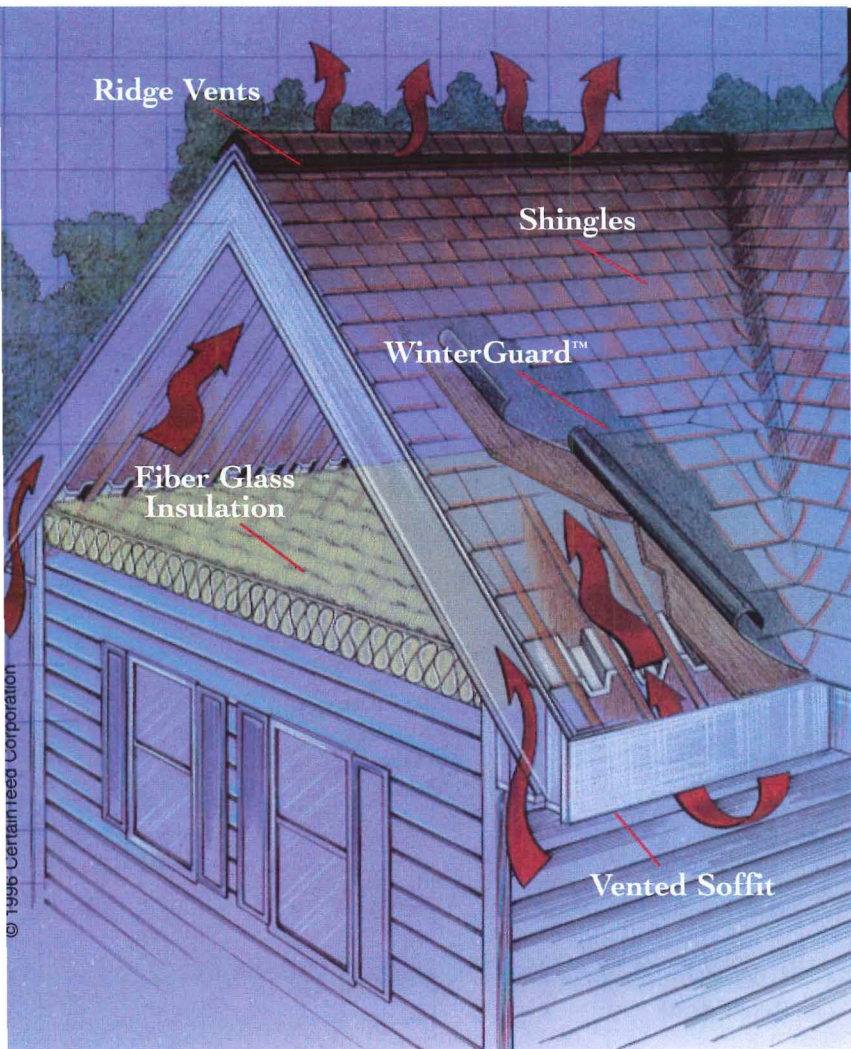
The recommendations were forwarded to President Bill Clinton Sept. 18; however, the President isn't obligated to nominate any of

the three. But the recommendation by the bipartisan, 14-member Architect of the Capitol Selection Commission carries weight. An aide to Senate Rules Committee Chairman John Warner (R-Va.) says he hasn't seen indications that Clinton would name someone who isn't on the list. Clinton's nominee then must clear the Rules Committee and the full Senate. The Warner staffer says a confirmation hearing won't take place before Congress adjourns. In the meantime, Ensign will continue as acting Architect. The former Architect of the Capitol, George M. White, retired in November 1995 after 24 years.

Hantman, who turns 54 in October, is the Congressional commission's first choice "by a substantial margin," Warner wrote in a letter to Clinton. The Bronx, N.Y., native joined Rockefeller Center Management Corp. in May 1986. He rose to the post of vice president for facilities planning and architecture before becoming a consultant. One of the

highlights of his tenure, according to Vince Silvestri, spokesman for the Rockefeller Group, was supervising the \$25-million renovation of the Rainbow Room. Before coming to Rockefeller Center, Hantman was with Cushman & Wakefield's development consulting group, and had been assistant chief architect with Gibbs & Hill, where his largest project was a \$2-billion desalination project in Saudi Arabia. Hantman most recently has been a consultant to Rockefeller Center Management Corp., and its new ownership group.

From 15 candidates, six were selected for personal interviews. Besides the three on the commission's list, the others were George Hartman, partner with Hartman-Cox Architects, Washington, D.C.; Kathryn Vernon-McKeen, Connecticut Department of Public Works director for program management; and Michael Boechiocchio, assistant vice president with the University of California System. *Tom Ichniowski*



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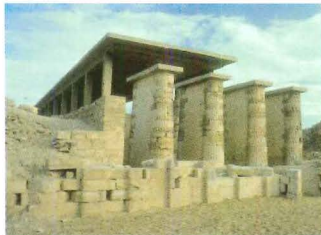
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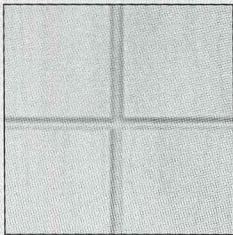
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Calendar

Continued from page 8

Through October 27

"City of Ambition: Artists & New York, 1900-1960," an exhibition designed by London architects Nigel Coates and Andrew Onraët, includes New York City in oils and pastels by Georgia O'Keeffe; photographs by Berenice Abbott and Margaret Bourke-White; and films by D. W. Griffith. Whitney Museum of American Art, New York City, phone 212/570-3633; fax 212/570-1807.

October 28-31

Computers for Contractors '96 at A/E/C Systems Fall, Orange County Convention Center, Orlando, Fla. Call 800/451-1196; fax 610/458-7171 for details.

November 7-9

Interplan '96 will hold its show at the New York Coliseum, with seminars and an interior-design and planning exposition. The A&D building also plans to expand exhibitor space at its West 58th St. location. Call 800/950-1314, ext. 2611 for details.

November 13-15

"Architecture and Urbanism at the Turn of the Third Millennium" conference will be held at Sava Centar in Belgrade, Yugoslavia, presenting symposia on Society in Transition, Sustainable Development, Migrations, Architecture in Context, New Technologies, and Education. For details, fax Arkitonski Fakultet at 381-11-3224-122.

November 14-17

The Ninth Symposium on Healthcare Design will be held at the Boston Marriott Copley Place Hotel. For details, call 510/370-0345 or fax 510/228-4018.

November 15-February 23

"An American Embassy in Berlin" examines the recent architectural competition for the American Embassy in the German capital. Models and drawings by all semi-finalists as well as the winner, Moore Ruble Yudell and Gruen Associates, will be shown at the National Building Museum, Washington, D.C., 202/272-2448, fax 202/272-2564.

November 22-January 12

"The Architecture of Santiago Calatrava" moves into the Milwaukee Art Museum (MAM) with an exhibition that will include models, drawings, and photos of the Spanish-born architect and engineer's major works. Calatrava's first completed project in the U.S., scheduled to open in 2000, is an expansion of MAM. Call 414/224-3240 for exhibit details.

Through December 8

"Breuer's Whitney," an exhibit in the lobby gallery of the Whitney Museum of American Art, New York City, takes a critical look at

the design, reception, and continuing legacy of architect Marcel Breuer's 30-year-old building of "upside-down ziggurat of cantilevered 'setouts' and trapezoidal bay windows" on Madison Avenue that became an instant landmark. Included in the exhibition will be Michael Graves's proposed additions to the Whitney from the mid-80's; photographs of Robert Venturi's Bicentennial exhibition; and drawings of the projected conversion of the fifth floor into galleries. Call 212/570-3633 or fax 212/570-1807 for details.

Through December 15

The drawings of Louis Kahn are on exhibit at the Jewish Museum, New York City, and include architectural drawings and models surveying Kahn's synagogue projects. Call 212/423-3271; fax 212/423-3232 for details.

Competitions

◆ Submissions for the 1996 Wood Design Award Competition, sponsored by the American Wood Council, are due Oct. 11. Projects submitted must have been completed since January 1993, and have used wood as an integral construction material for structural and finish applications. For information and entry materials, call Ron Ingram at AWC, 202/463-2769, or fax him at 202/463-2791.

◆ International Making Cities Livable Conferences is calling for submission of papers and exhibit proposals by Oct. 15. The first IMCL conference will be March 8-12, 1997, in Charleston, S.C.; the second April 15-19 in Santa Fe, N.M. Call 408/626-9080 for details; fax 408/624-5126.

◆ GSA 1996 Design Awards entries are due Nov. 8 at noon. Eligible are designs of GSA-authorized projects, with construction completed or begun between Jan. 1, 1991 and July 1, 1996. Call Marilyn Farley at 202/501-1888 for details and entry form.

◆ Submissions to the biannual Rudy Bruner Award for Excellence in Urban Environment are due Dec. 13. First-prize winner receives \$50,000; honorariums of \$1,000 go to each of four additional finalists. Contact Bruner/Cott & Associates for an application or more information at 130 Prospect St., Cambridge, MA 02139; phone 617/492-8400; fax 617/876-4002.

◆ The Society of Architectural Historians is offering two fellowships that would allow winners to travel to the group's annual meeting next April in Baltimore; and two cash awards, one for research on Spanish, Portuguese, and Ibero-American architecture (\$1,000), the other for work on an Historic American Building Survey (\$7,500). Application forms are available from the Society, 1365 North Astor St., Chicago, Ill. 60610-2144; phone 312/573-1365. ■

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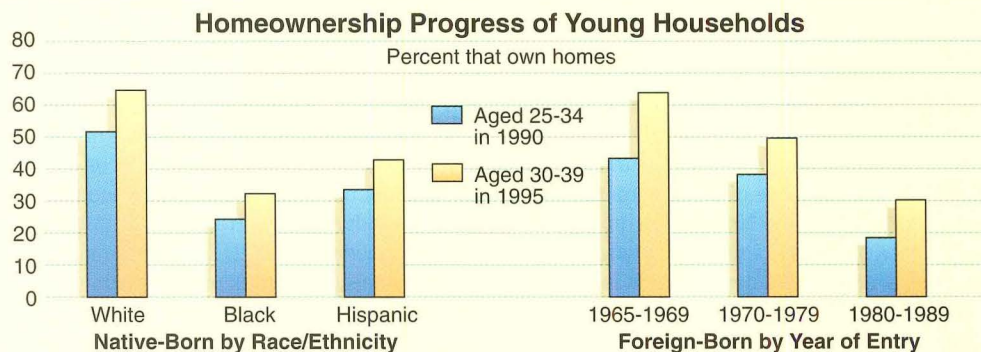
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Indicators

Immigrants move up to homeownership

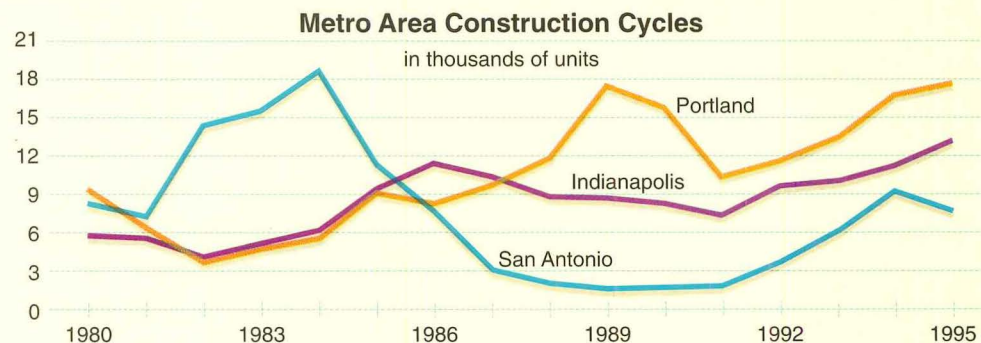
A study, "The State of the Nation's Housing," shows some surprising trends. Though much has been made of the stagnant earnings of those in their 20's, improvement in affordability means that a higher percentage of first-time buyers has been able to enter the market. Also, homeownership rates of immigrant groups that have been in the U.S. for a long time approaches that of native-born whites. Seventy-two percent of all whites own, while 42 percent of blacks and hispanics do. For study copies, call 617/496-7908. ■



Source: Joint Center for Housing Studies, U.S. Census

Big variations in metro markets

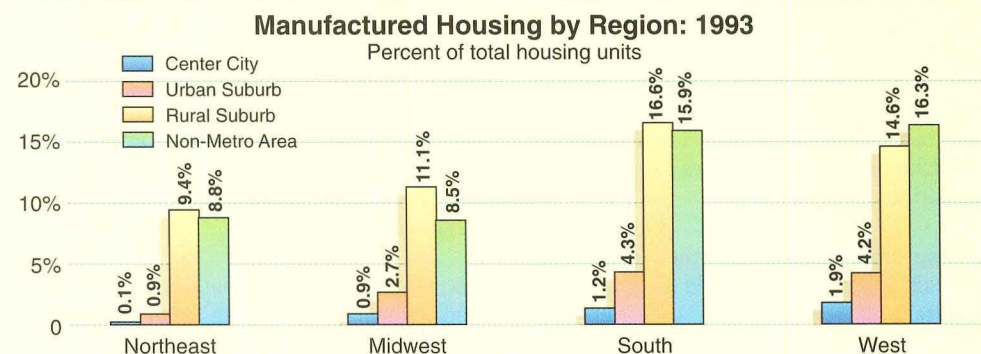
Most housing statistics suggest that there's little variation in markets throughout the nation. The Harvard University Joint Center for Housing Studies report cited above begs to differ. San Antonio's boom, for example, was cut short by the mid-1980's oil bust, while Portland, making up for earlier weakness, skipped the last recession. Indianapolis recently surpassed its 1980's peak. Future affordability may be compromised as price rises outpaced inflation in more than half the metro areas tracked, the study says. ■



Source: Joint Center for Housing Studies, U.S. Census

Manufactured housing: regional phenom

"One beneficiary of the strong demand for single-family homes and the decentralization of development is the manufactured-housing industry," reports the Joint Center study, especially in the West and South. Today, manufactured houses are larger, and offer such amenities as central air conditioning. Increasingly buyers also own the land their unit sits on (47 percent in 1993). This makes such housing a better investment because owners get favorable loan and tax treatment, and profit from land appreciation. ■



Source: Joint Center for Housing Studies, 1993 American Housing Survey

Charts by Leleanor Glynn

Short Takes

◆ New indoor air-quality standard

The American Society of Heating, Refrigerating and Air-Conditioning Engineers has released a revised standard for review, Standard 62-1989, "Ventilation for Acceptable Indoor Air Quality." The standard takes into account such troublesome indoor-air issues as ventilation-system inefficiencies, pollutant off-gassing from materials and furnishings, and microbial growth in ventilation systems. [For more on indoor air,

see RECORD, February 1996, pages 36-69.] ASHRAE: 404/636-8400.

◆ Construction contracts slip in July

Construction contracts receded for the third month in a row, reports F.W. Dodge. Both residential and non-residential building declined 2 percent. Of non-residential, manufacturing buildings jumped 23 percent, while institutional types rose 2 percent.

◆ Architect designs musical instrument

The Brain Opera, a computer-generated musical work, was developed at MIT's Media Lab. The structure of the work was intended

to incorporate audience participation, and the Lab called on Amherst, Mass.-based Ray Kinoshita, an architect, to devise suitable means for the public to "play" and "compose." She made a forest-like environment that included urns to enclose computer screens, microphones hung within fabric pods, curved-metal joysticks, and headsets shrouded in fabric. The piece ran in August at New York City's Lincoln Center and will travel. Can Kinoshita be considered the first architect of cyberspace? ■

A Shakeup in Seismic Assumptions

By Paul B. Rosta

Aftershocks from the January 1994 earthquake in Northridge, Calif., continue to rumble through the architectural and engineering communities. Surprisingly strong ground motion, combined with the unexpectedly poor performance of steel moment frame buildings in the Northridge quake, may have a long-term impact on design. Another controversial development is the growing interest in a "performance-based" approach to seismic design, which goes beyond minimum code requirements (intended only to protect life safety). It aims to limit damage, reducing economic losses.

Changes driven by Northridge may be reflected well beyond those areas with greatest seismic risk. By 2000, officials from the organizations responsible for America's three model building codes—Uniform Building Code (UBC), Standard Building Code (SBC) and The Building Officials and Code Administrators (BOCA)—will have developed a nationwide model code, the International Building Code, which is expected to incorporate some of the latest seismic requirements. This and improved structural-design techniques will have much more influence than would have been the case 20 or 30 years ago, says David R. Bonneville, vice president of engineering at Degenkolb Engineers Inc., San Francisco. He is chairman of the Structural Engineers of California's seismology committee.

In some cases, the impact of the Northridge quake on design will be visible on the surface. In curtain-walls, for example, stone-veneer systems will require larger joints, more space around glass panes, and wider mullions to cover up the gaps, predicts Tom Sabol, a Los Angeles-based structural engineer and president of Englekirk & Sabol Inc., Los Angeles.

Quakes pack more than expected punch

One repercussion of the Northridge quake that has garnered major attention among geologists and engineers is the "near-source" effect, also called the "near-field" or "near-fault" effect. The terms refer to the phenomenon that "buildings near the fault

Paul B. Rosta is the Los Angeles correspondent for Engineering News-Record.

are getting hit very hard very early" with strong pulses of energy, explains John A. Martin Jr., president of John A. Martin & Associates Inc., a Los Angeles-based structural engineering firm. Buildings within 10 km of the fault could experience forces as much as double those presumed by current design standards, says Ronald O. Hamburger, vice president at EQE International Inc., a San Francisco-based firm specializing in seismic work. Buildings within 2 km of the fault are most at risk, says Bonneville. New provisions under consideration for the 1997 UBC would establish stricter guidelines. At press time the code's guiding International Congress of Building Officials had not yet approved the changes, but they will be included in the Structural Engineers Association of California's influential "Guidelines for Lateral Force Requirements," called the "Blue Book."

Codes to reward simple building shapes

The changes aim to recognize that well-designed, well-detailed and regular-shaped buildings tend to perform well, Bonneville says. Irregular structures tend to "displace or drift quite a lot in certain parts of the building near the irregularity," explains Hamburger. The new provisions would encourage greater redundancy in structural systems, with the result that "an architect who makes a building regular and redundant will be rewarded with lower seismic forces," resulting in lower construction costs, Hamburger says.

The new provisions "are not saying a building needs to be a box or [has to] have the same floor plan as it goes up the building," Bonneville says. "You can still have lots of articulation in the skin, cladding, and things hanging off the building." Nevertheless, Hamburger predicts that the changes will restrict design irregularities, such as three-sided plans or "highly unusual plan shapes." Architects advising clients on site selection should consider likely significant cost increases for development in near-fault zones, Hamburger says.

Should you design to protect contents?

Many owners don't realize that seismic provisions in building codes are intended only to protect life safety—that a building that pro-



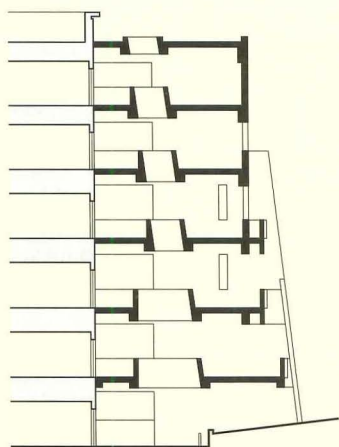
© James S. Russell

ducts occupants is permissible even if the quake makes it unusable. After owners sustained huge economic losses in the Northridge event, however, the concept of performance-based design has gained more support. What this means is that the owner would specify the level of protection desired and the architect and engineer would upgrade the design accordingly.

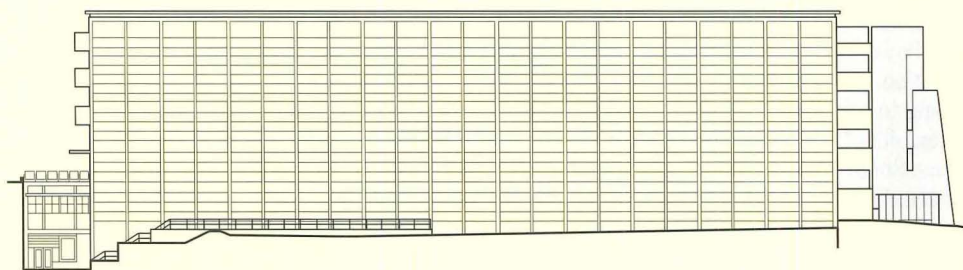
Already critical facilities, such as those for police and hospitals, are designed to a standard that allows uninterrupted operation even through a quake. Now more private owners are deciding that the additional investment is worthwhile. In setting standards for performance, owners and design teams will consider the total value of a building combined with its contents, says Chester A. Widom, a partner in Widom Wein Cohen, Santa Monica, Calif. His firm recently designed a \$30-million medical building for a major California company. Because the structure houses \$350-million worth of equipment, the owner regards the cost of base isolation and redundant structural systems as a prudent investment. The building will be fully functional and self-sufficient for six days after a major quake, Widom predicts, long enough that services should be restored.

Performance design standards "will have a major impact on the architect and the architect's team in designing a building," Widom says. The architect and engineer will base architectural and structural choices on the owner's willingness to invest in design ele-

California's Northridge Quake has upended assumptions about steel-frame design, the adequacy of building codes, and the dangers posed by falling bookshelves and flying light fixtures.



EAST ELEVATION/SECTION



EAST ELEVATION

Israel Callas Chu Shortridge Design Associates seismically reinforced this 1959 classroom building at UCLA through an external concrete-framed stair tower buttress (toned

area above). It was the least obtrusive alternate offered by engineer Nabih Youssef & Associates and permitted reorientation of the entry to reflect new traffic patterns.

ments that will protect the building's post-quake habitability and contents. "Instead of arbitrarily accepting the code as being the standard by which an individual owner would build a building, the owners will face the issue of what they wish the building to do," Widom explains. The architect's responsibility is "to understand that the technology is out there" and to present all the options to the owner, Bonneville says.

Over the next several years, the Structural Engineers Association of California will develop guidelines for performance-based design with an aim to changing the UBC, says Bonneville. In a separate \$8-million project funded by the Federal Emergency Management Agency, the Applied Technology Council (ATC), Redwood City, Calif., is developing guidelines for seismic rehabilitation of buildings as a subcontractor to the Washington, D.C.-based Building Seismic Safety Council. The guidelines will "allow an owner to design for damage control," says Chris Rojahn, ATC's executive director.

As promising as performance standards sound, there are skeptics. "It's very difficult to predict exactly how buildings are going to perform," Sabol says. "I'm not sure we can relate them with great accuracy to all kinds of earthquakes . . . To expect too much from this in the beginning is probably unrealistic." EQE's Hamburger acknowledges that "it's easy to be off in ground-motion predictions by 30 to 40 percent or more." Still, he maintains that because it is more conservative,

"any structure designed to performance standards would have significantly less damage" than code-minimum structures.

Unexpected steel-frame failures

Indeed, if anyone thought seismic-damage prediction was an exact science, the Northridge quake burst that bubble. In recent years, use of a steel moment-resisting frame to support buildings "almost became a panacea" in seismic zones, says Charles H. Thornton, principal at Thornton-Tomasetti Engineers, a New York City-based firm specializing in designing tall buildings for seismic zones, but "unfortunately it didn't perform."

The quake produced unexpected damage to hundreds of moment frame buildings located near the areas of greatest shaking. At column-to-beam connections, welds cracked, columns fractured, and bolts sheared off. A mandatory Los Angeles city inspection program for buildings in high-risk areas has so far revealed damaged connections in about two-thirds of 200 buildings, says Karl Deppe, an assistant chief of the city Department of Building and Safety. Although no buildings using the system collapsed in the Northridge quake, weakened joints are at risk in a future strong temblor, engineers say. Deppe noted that steel-frame buildings in the Kobe quake, one year after Northridge, sustained "exactly the same kind of damage."

Controversy continues over the source of the problem, with the steel industry blaming

design, and engineers criticizing components and workmanship. Among structural engineers, Hamburger says, a consensus has developed that some combination of inherent design deficiencies, poor workmanship in the field, and inadequate toughness of steel welding materials led to the damage. Connections can be repaired with little permanent architectural intrusion, but repairs can disrupt business, points out Jefferson W. Asher, a principal in KPFF Consulting Engineers Inc, Santa Monica.

A switch to concrete framing?

The damage is challenging the preeminence of the steel moment frame, once the system of choice for most commercial and institutional buildings. "We are examining the old 'this will be a moment frame' routine and looking at other systems now," engineer Martin says. "People are looking at alternative systems a little more closely," agrees Sabol of Englekirk & Sabol. In planning a fast-track project, "I'd probably stay away" from the steel-moment frame, says Hamburger.

Because of the need for testing and additional reinforcement (following pages), the cost of connections has "probably doubled or even tripled" since the Northridge quake, says Hamburger. Inspection and repairs cost up to several thousand dollars per connection. Concerns that much of the damage stemmed from inadequate workmanship will require more inspections in the field, increasing project costs.

Steel moment-resisting frames earned popularity because of the flexibility they offer in placing bays, walls, and non-structural elements. Now, according to Martin, "Engineers are going to have to start looking at [limiting] that flexibility" in designing structural systems. Some owners, architects, and engineers are choosing more conservative, seismic-design concepts such as eccentric-braced frames (EBF). Thornton says his company has recommended EBFs on two projects in California earthquake zones. Unlike moment-resisting frames, EBFs do not rely on the through-thickness capacity of

"Today you brace and tie all lighting fixtures, ceilings, and shelving, but I think owners better go back and retrofit those things they haven't."—Chester Widom

the column flange, thus taking the pressure off the connection, Thornton explains.

Hospitals present special challenges because of more demanding seismic standards and the evolving health-care market. Hospital owners prefer the flexibility offered by steel moment frames, which allow about 30-ft clear spans as opposed to 20 to 24 ft for concrete frames. "In planning hospitals, you try to produce as open a floor plate as possible because hospitals are constantly undergoing renovation work," explains James L. Harman, project manager for Hellmuth, Obata & Kassebaum, referring to a new building at St. John's Hospital and Health Center in Santa Monica. "The more interruptions you have to the floor, the harder it is to retrofit in an intelligent manner."

In some cases, hospital clients are opting for eccentric-braced frames, says Kenneth E. Lee, principal at Lee, Burkhardt, Liu, a Santa Monica, Calif.-based firm specializing in healthcare facilities. Taking into account the rigidity of the braced-frame bay, "We've tried to lay out modules so they're repetitive," and they've grouped functions with similar needs. The space needs of traditional medical-surgical-nursing suites are less likely to change than services like radiology, and is suited to the EBF, Lee says.

In the short term, "you'll see more concrete buildings" says Asher of KPF Consulting Engineers. More engineers are looking at concrete moment frames for buildings up to 10 stories tall, Hamburger reports. "Concrete frames were regarded as more difficult to design before Northridge, but concrete design didn't change a whole lot" after the earthquake, because most such structures performed according to expectations, he explains. Although the concrete moment frame is more expensive than the steel frame, Asher says, "You can come up with very economical concrete solutions that

produce good performance."

For all the present uncertainty, some engineers still believe that the hesitation about using steel moment frames is only temporary. Despite the extra cost, "The desirability of open-type design still seems to be driving people to steel frames," Hamburger says. Asher predicts that "in the not too distant future we will have an acceptable solution." The problem has sparked research and testing at various structural engineering firms, yielding a variety of concepts for improved design of the frame. The designs aim to strengthen the connection by carrying the force away from the connection's weakest point—the weld (opposite). Some have been provisionally accepted by localities. The steel moment frame will remain the predominant system "but with a lot more care about quality," Depepe says.

Base isolation passes the test

The Northridge quake has also sparked new interest in the still-uncommon method of base isolation, which uses steel-and-rubber shock absorbers to separate the building from its foundation. The Northridge earthquake, says HOK's Harman, was the first major earthquake to demonstrate a significant amount of overturning and uplift, so engineers are accounting for these forces. The superstruc-

ture can absorb energy, but "trying to isolate the superstructure from ground motion is, in my opinion, the best way to do it," Harman says. Owners have used base isolation to protect buildings providing essential services or with sensitive contents. Says Michael Bobrow, chairman of Los Angeles-based BTA Inc., "You can have a design that reflects the functional requirements internally and still use base isolation."

St. John's Hospital's new main building will be base isolated. HOK is designing the hospital in joint venture with the Santa Monica office of Stone Murracchini Patterson, and will use a concrete frame for the hospital's two below-grade levels. "Without adding non-essential weight to the building, we've increased the ability to fight overturning and uplift and we're putting the mass of the building where we need it," Harman says.

The Northridge earthquake has also spawned greater awareness and new developments in the use of viscous dampers. "Five years ago, we didn't even know they existed," says Christopher C. Martin, managing partner at Albert C. Martin Associates (ACMA), a Los Angeles-based architecture firm. ACMA is principal design consultant for the retrofitting of Los Angeles City Hall.

These shock absorbers, generally about 10-ft long, are placed on the top chord of a shear wall and allow the shear wall to transmit energy from its diaphragm to a structure's frame over a period of micro-seconds rather than all at once, Martin explains. The dampers minimize rotation placed on the moment-frame joint, says Asher.

The design challenge is to integrate viscous dampers into the superstructure and still maintain the structure's architectural appearance, Asher says. Although dampers are most effective on the building's exterior, this tends to "conflict with architectural appearance," he notes. Dampers can also be hidden effectively in a ceiling.

When light fixtures fly

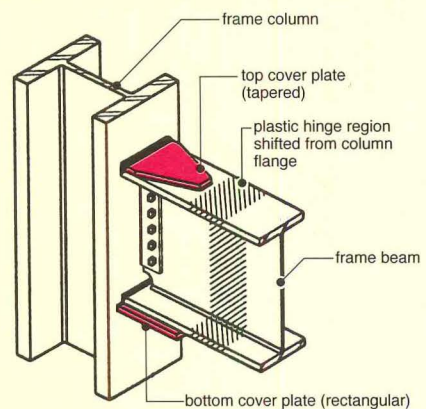
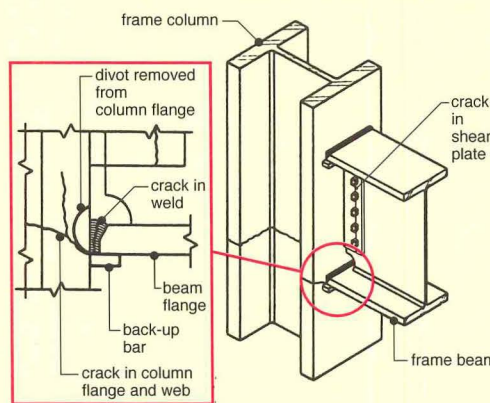
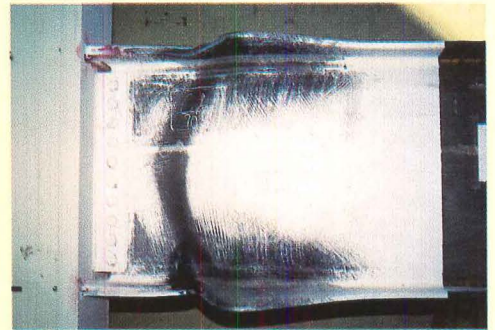
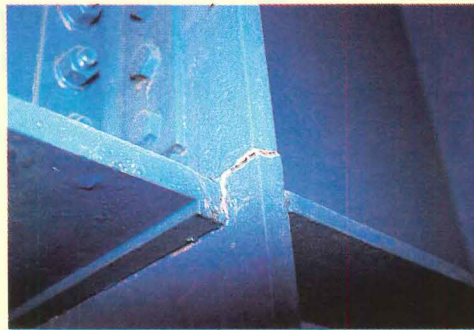
For all the attention being paid to structural systems, the Northridge quake also pointed up the importance of damage caused by inadequately anchored non-structural elements,

such as light fixtures, transformers, fans, ducts, and ceilings. "I would say that additional leadership is probably needed" in this area, Sabol contends, because problems with the Northridge quake suggest that no single design professional now takes charge. "Architects don't want to assume additional responsibility for [components] they don't feel qualified to design," he explains. Structural engineers aren't being compensated to design bracing for non-structural components, so "it continues to fall through the cracks," he argues.

Bonneville says that architects should be aware of a "massive change in design of non-structural components" coming in the 1997 UBC, although this will more immediately affect structural and mechanical engineers. Before Northridge, he points out, the code did not acknowledge the greater forces exerted upon non-structural components in upper stories by higher accelerations. The new provisions will not "change where things are put," but instead "will affect the way things are braced and anchored," Bonneville says.

Even though the institutional work Widom Wein Cohen specializes in has always required close attention to non-structural elements, Widom says, "certainly our consciousness was raised" by Northridge. "We're spending much more time looking at details, making sure non-structural elements are as secure as they could possibly be." Owners whose buildings are legally non-conforming are considering bringing their fixtures up to code, Widom says. "Today you brace and tie all lighting fixtures, ceilings, and shelving, but I think owners better go back and retrofit those things they haven't," Widom says.

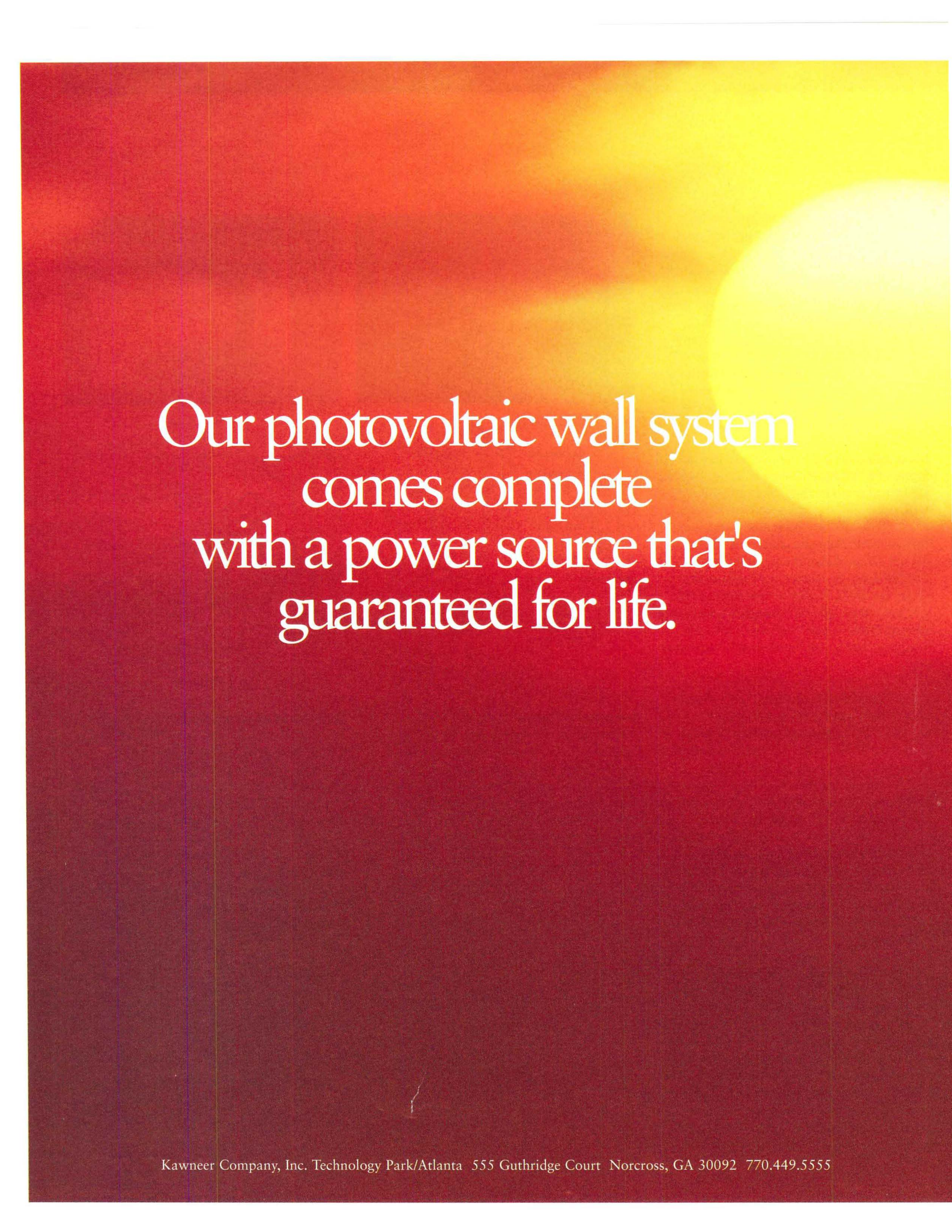
Perhaps the most intangible impact of the Northridge quake is on the dynamics within the project team. Sabol claims that he has found "a greater willingness on the part of architects to accommodate more of the structural impositions on the project than in the past. It's made some of our work easier." The earthquakes have "actually drawn all of our team members together because it's a common enemy—it's a common burden that we share," says Lee of Lee Burkhart Liu. ■



COVERPLATE

Surprise failures: Tests of steel moment resisting frame construction that attempted to duplicate Northridge quake motions showed some unexpected weakness in the connections. Crack in the tested connection (top) propagated from the bottom beam flange through the column flange. The drawing above shows other types of failures.

Remedial connection: Engineers tested several alternatives to improve moment-frame connections. Among the most successful is shown in the drawing above. The addition of cover plates (tone) welded to the beam reduced forces on the beam-to-column welds and moved the plastic hinge (deformation that absorbs energy) away from the vulnerable column—evident as the dark area in test specimen (top) and hatched area in drawing. Testing was by Englekirk & Sabol Engineers; University of Texas, Austin; and Georgia Institute of Technology, Atlanta.



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Satisfying Users: Would You Put Your Profit on the Line?

Imagine your client asking that you put all of your profit for a project on the line: if you, the architect-engineer and your contractor partner meet schedule and budget goals, you both receive two-thirds of your profit. Three months after the building is completed, its users fill out a questionnaire—painstakingly negotiated between you and the owner's representative—that is designed to measure whether quality goals established for the building during the design phase were met. If the users agree that they have been, you receive the remaining one-third of your profit. If not, you don't.

There is nothing imaginary about this scenario. Such an agreement is in force between Ciba-Geigy, a pharmaceutical manufacturer, for its new Tarrytown, N.Y., Additives Laboratory, and the design-build team of HLW International, a New York City-based architecture-engineering firm, and Sardoni Skanska Construction Co. of Parsippany, N.J. The carefully negotiated system of incentives seems to have worked: the building was completed early and under budget. The questions that loom ahead are whether such remuneration systems will become commonplace, and whether or not they are good for the practice of architecture and the quality of the built environment. If the answer to the first question is yes, what does it take to make them work?

Fast, under-budget work rewarded

HLW originally worked with Ciba-Geigy during the programming and conceptual-development phases of the design of the laboratory. Sardoni Skanska then contracted with HLW to complete the schematics and design-development and construction drawings. Both entered into an agreement with Ciba-Geigy to share in part of Ciba's savings if budget, cost, and quality goals were met.

HLW was rewarded with \$100,000 for meeting milestones for document delivery, and for meeting cost verification goals at 50 percent of design completion. Sardoni Skanska was rewarded for beating construction deadlines and bringing the project in under budget. Their reward was \$100,000 for each month the project came in ahead of schedule, and a 40 percent share of the \$3.3 million, capped at \$800,000, saved by Ciba-



Leevi Kiil, CEO of HLW International (left), and Mike Healy (right), president of Sardoni Skanska, put a substantial portion of their profit for a Ciba-Geigy lab on the line, based on the outcome of a user survey.

Geigy when the project came in under its guaranteed \$40-million budget.

These sorts of incentives are not exactly new. But letting the end-users vote on their satisfaction with the building to determine whether the design-build team receives a share of their profits is. At stake for Sardoni Skanska is \$205,000 and for HLW \$90,000.

Leevi Kiil, chief executive officer of HLW, says, "I feel good about projects that we do conventionally. But I think what did happen and had to happen because of the quality incentives was that we not only had to meet the time and budget standards, we had to aggressively bring the lab users into the process so they knew what they were getting and took part in the process of designing the building." Goals for the performance of the building were established between the design-build team and a team of future users of the building early in the design process, and tracked throughout design and construction in weekly meetings.

Few of the questions that users will "vote" upon when answering the questionnaire, 90 days after occupying the new lab, are subjective. Most have to do with measurable criteria that a well-designed laboratory should meet: Is there enough electric light and daylight? Do fume hoods function properly? Is acoustical control sufficient? Is thermal comfort adequate? Were staff members kept well-enough informed during the construction process? All 15 questions on the questionnaire can be answered with a simple yes or no, and all were agreed to by

Ciba-Geigy, HLW, and Sardoni Skanska. For the bonus to be collected, the building must achieve a 75-percent-favorable rating.

A user-determined incentive at the end of the project serves several useful purposes. It makes satisfying the client absolutely critical—although most architects would say that as far as their own practices were concerned, it always has been. Beyond this, the user-quality incentive creates a critical check-and-balance mechanism not found in situations where only time and budget incentives are used: with quality driving the end-result, it keeps the design-build team from selling out and simply building the building as quickly and cheaply as possible.

Mike Healy, president of Sardoni, elaborates, saying, "We collectively have a good hunk of change riding on the fact that the people living in the building are happy with the facility. It's not just a 'throw it up and worry about it later' type of deal. Making the users happy is really important to all of us, not only from a design perspective but also from a construction perspective—the level of finish and quality of workmanship it would take to make them happy with the facility."

Incentives create teamwork

Ciba-Geigy prefers this type of arrangement not only to get the most from their fees but also to promote team-building. Ciba-Geigy project manager George Batcher explains, "Typically when we deal with providers of architectural or engineering services, we don't like to pay the normal fee structure. We like to make earnings on the job performance-related. We like to deal with those people who are willing to put something at risk along with us, to assure our satisfaction in the final outcome."

It might seem that Batcher has little faith in the effort design-build teams typically put into their work, but neither HLW or Sardoni Skanska were put off by this implication. Both seem happy with the incentives approach and all three parties agree that the incentives encourage teamwork. "You actually find that team members enjoy the process," says Healy. "It has a tendency to pull the companies together into one team to achieve the project goals."

HLW International and their design-build partner Sardon-Skanska are gambling nearly \$300,000 of their profits on an end-user survey at the just-completed Ciba-Geigy Additives Laboratory in Tarrytown.

"We have the same commitment, we're judged on the same criteria, and the best part of the process is to actually establish those goals and criteria, because it functions as a team-building process." Kiil seems to agree that putting the profit for the job on the line was a motivator to their success. "The collaboration between the two firms and the client was very important: if one failed, essentially the other failed. If one succeeded, we could all succeed together."

Making it work

Whether one agrees with the use of incentives or not, there are lessons learned from listening to the parties involved in the Ciba-Geigy project. One is that the process won't work unless the owner has a commitment to deal fairly with the design-build team. If the owner's primary motivation is to take money out of the pockets of the design-build team, the process surely won't work. Kiil comments, "That the client was willing to deal with us fairly and take the time up front to plan this out properly were the main issues. If the client is willing to do that, I would deal with any client, no matter what the building type, on this kind of basis."

A second lesson is that user input throughout the design and construction process is critical and criteria on the post-occupancy survey of end-user satisfaction be as objective as possible, if not outright measurable. According to

Batcher, "We identified the parameters of the new facility that the people had voiced the greatest desire to attain, and we tried to prepare a survey that would address those features and the manner in which the project was carried out. I think the criteria we chose to ask questions about are pretty measurable; it's not just asking 'how do you like this place?' It's very specific."

"You would think the bonus would be over and above what they're getting, not jeopardizing their livelihoods." —Richard Hobbs, of the AIA Practice and Prosperity Initiative.

The larger context

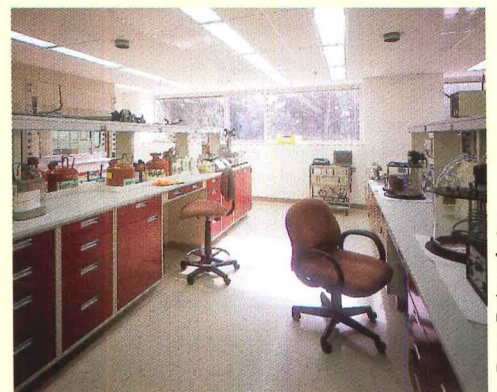
In a larger context, some situations may not be right for the use of end-user satisfaction evaluations. Robert Gutman, a lecturer on architecture at Princeton University, says, "Overall I like the idea of users evaluating their buildings. It seems to go along with trends in other professions—hospitals undergo a lot of user evaluation these days, and litigants are becoming much more involved in how their cases are handled.

"However, I have evaluated some laboratories, and found that there is a great deal of variance in the attitudes of scientists toward their labs. A scientist whose grant has just been cancelled may take it out on the build-

ing. Another issue is whether we evaluate the whole building based on the viewpoint of the janitors, or the executives, or just the lab managers and technicians, or whom?"

Also, an office building might house people working in a corporate culture that has such serious problems that the workers would not be satisfied with any building, despite the

best efforts of the design-build team. Would a questionnaire about whether a building met its initial quality goals be unaffected? Some workers, for example, might resent leaving an inadequate building with private offices for a new one with cubicles. To them, sumptuous lobbies or a sun-filled atrium may not be as important as being able to close a door. Others may believe money that should have gone into pay and benefit increases, research, new equipment, or product development was diverted into capital spending. Their vote might go against the building. No matter how good a job the design-build team may have done in meeting their quality goals, users may deem they have fallen short for any
(Continued on page 121)



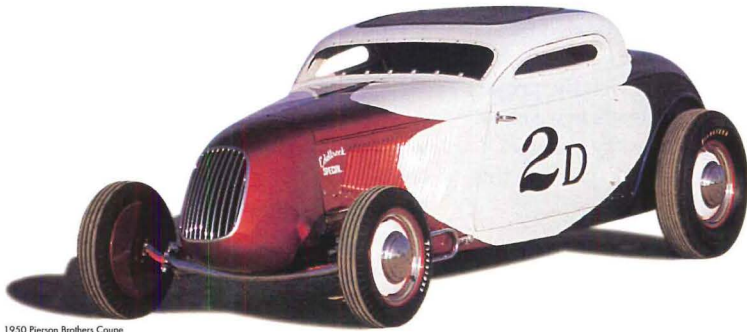
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Users of the new Ciba-Geigy Additives Laboratory (left and above) will fill out a very objective questionnaire three months after occupying the building. The design-build team receives additional profit if the facility receives a 75-percent approval rating.

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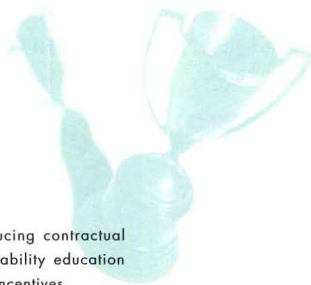
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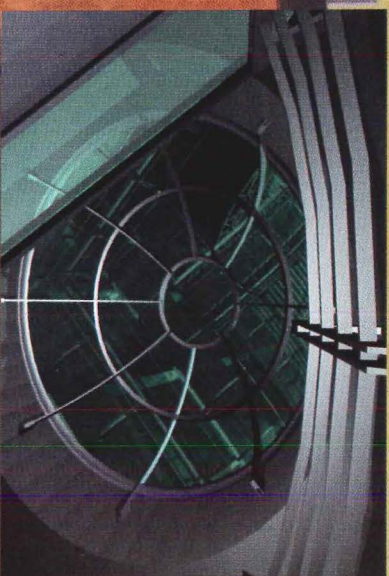
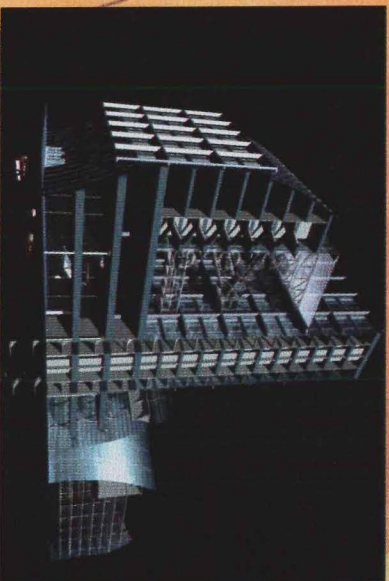
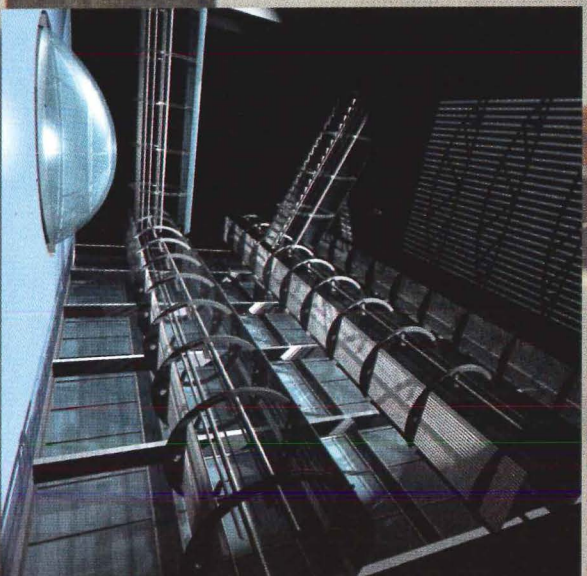
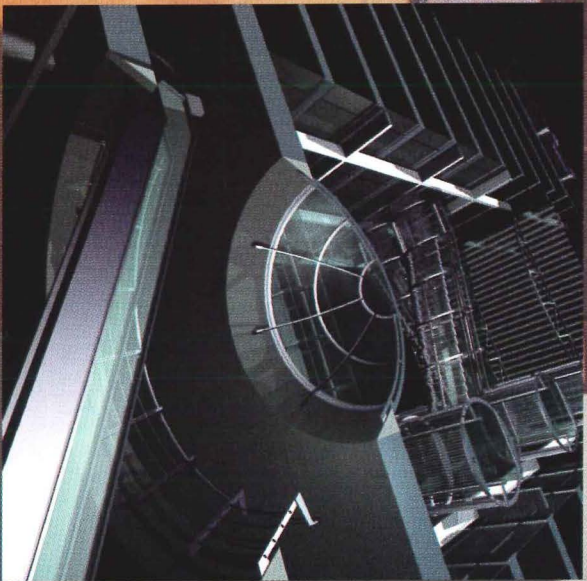
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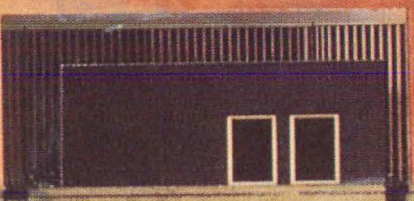
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Merging Virtual Technologies Change the Rules of Collaboration

By B.J. Novitski

While architects have benefited from both higher bandwidth telecommunications and more powerful desktop computers, the combination of these technologies now promises to ease communications burdens, enabling distant professionals to work with each other almost as if they were side by side. Today audio, video, internet, and electronic white-board technologies are noticeably simplifying some of the management and administrative burdens of construction communications. Those exploring the leading edge of such technologies are seeing entirely different ways people can interact—and an entirely new design opportunity for architects.

Not for big firms only

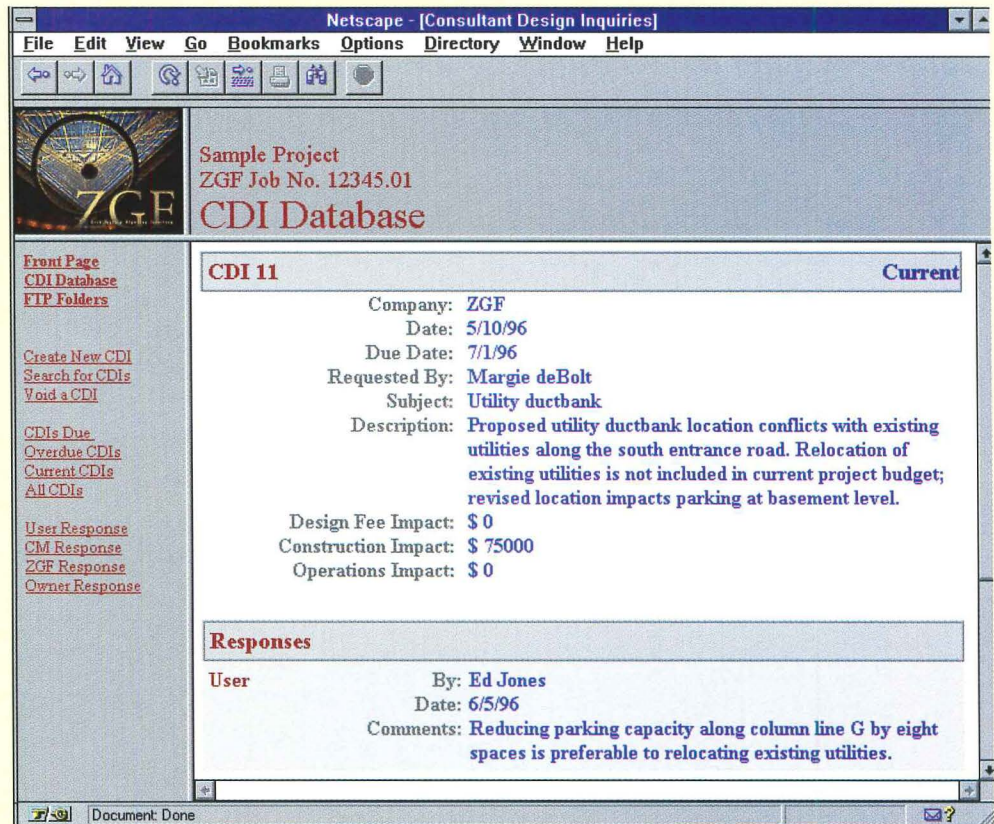
One firm realized benefits from a very simple approach. Participating in forums on such commercial on-line services as CompuServe and America Online has helped the four-person Minneapolis firm of Strapko, Pahl & Associates, Ltd., identify clients and out-of-town associated architects in their dental-office design specialty. They use the services' e-mail facility for messaging and file sharing with engineers. "In small firms," says James Strapko, "we have to think long and hard about every technology purchase. We're less interested in experimentation than in finding something that works." Strapko sees the next step as client presentations via desktop video-conferencing. Ironically, their obstacle is persuading the client to invest in the increasingly less-costly equipment.

NBBJ, one the country's largest firms, is using telecommunications and network technologies to tie its offices in seven cities more closely together. With most design and con-

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struction document work done with CAD, the firm has standardized the software operating on each office's local-area networks (LANs) and instituted wide-area networks (WANs) to connect the LANs. Now anyone in any office can share files across the country as easily as across the room.

CAD files can be easily shared via the WAN, and some face-to-face meetings can be replaced with video-conferencing. According to Tim Stiles, the director of information systems at NBBJ's Seattle office, this connectivity has several major advantages. He can more easily trouble-shoot technical problems at the satellite offices because he can have access to their data. Also, NBBJ can share human resources. If one office needs a larger design team temporarily, it can "borrow" staff members who are geographically distant without requiring them to relocate physically.

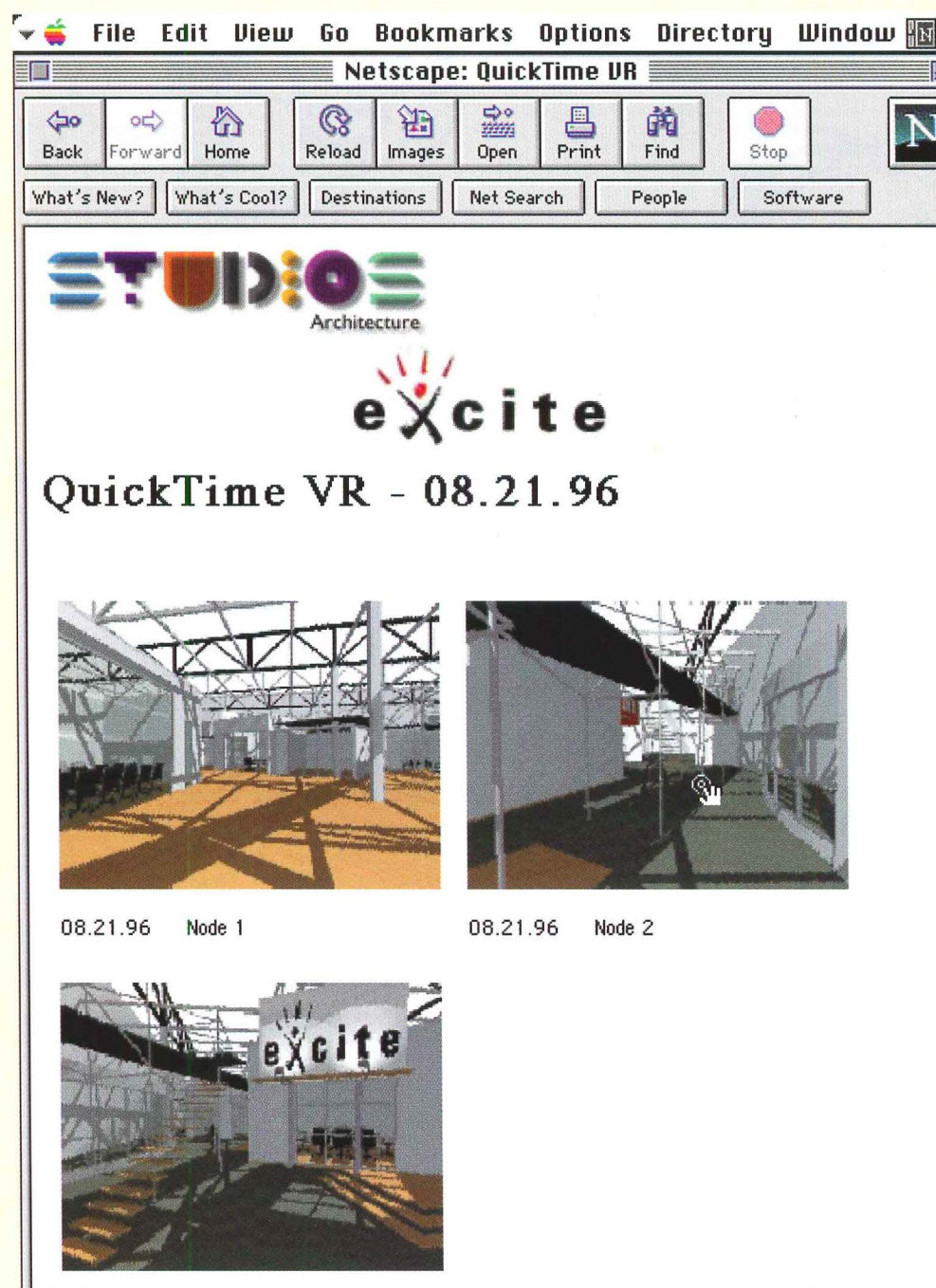
This staff sharing also extends to the firm's specialists. A medical-equipment planner, for example, who resides in one city can be listed

as part of a team in a proposal by any other office. This gives a small office the ability to compete for more complex health facilities than it could otherwise. Interestingly, Stiles says, clients have readily accepted this practice. They are now so accustomed to the "globalization" of their own businesses, that they easily believe that an architecture firm can distribute its expertise nationally. Stiles concludes: "This makes us more fleet of foot in satisfying the needs of our clients."

Quick query response

Zimmer Gunsul Frasca, in Portland, Ore., a technically advanced large firm, has constructed a means to support communications within a design team using off-the-shelf technologies. They set up what they call a consultant design inquiries (CDI) database on a private World Wide Web site, or intranet (above). On a large health-care project, consultants, the client, user groups, and the construction manager share information during the design and construction-documents phases. When consultants have a question, they post it to the ZGF Web server,

On-line environments are emerging as a useful way for ever-larger and more complex design and build teams to ease communication and widen participation.



Zimmer Gunsul Frasca handles day-to-day requests for project information through a private site on the World Wide Web (opposite). Each user needs only browser software and the project's password. Studios Architecture updates models of a design and posts them on a special Web site (above). Users can move around or walk through the models.

which is accessible by password to authorized members of the design and client teams.

Anyone on the team can view the questions, respond, and view responses by others. Unlike e-mail, where queries can be hard to track and users can only view graphics files if they have the same software as the sender, the Web server displays all graphics and text, whether users have PCs, Macintoshes or Unix workstations. Team members need only common Web-browser software, which means there is virtually no training required. The Web site also contains regularly updated project data, CAD files, meeting notes, schedules, and standards.

The idea, says ZGF's Ken Sanders, is to give a geographically distributed team easy access to key information about a project without each team member having to track inquiries and responses independently. Among the advantages of the system is that the current status of queries is available to everyone. Also, says Sanders, it heightens awareness of which unresolved issues are key at any given time.

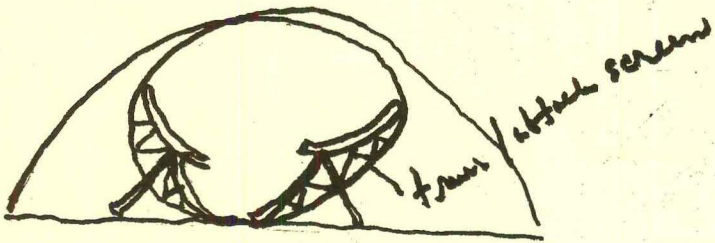
ZGF didn't write computer code; it put the system together with commercial software. What's experimental here, Sanders notes, is finding the right dividing line between issues that are best resolved using the CDI database and those that should be dealt with in meetings or more formal communications. The firm is currently developing a more ambitious Web-based system for tracking requests for information, submittals, and other construction-phase communications.

Mixing old and new technologies

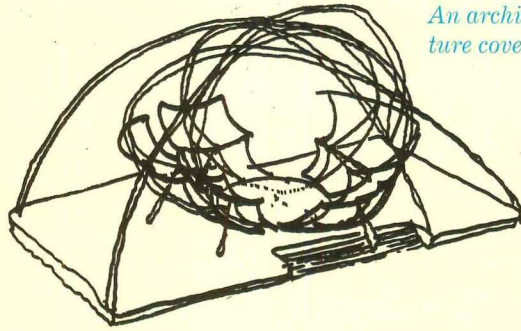
Both architects and computer hardware and software makers are pushing electronic collaboration to new levels of sophistication. Intel and AutoDesk sponsored an experiment in which Los Angeles architect Eric Owen Moss combined a variety of media through computer and video-conferencing technologies to communicate a complex design to an audience thousands of miles away.

Moss and his team worked entirely from California with French architect Frederic Genin and a client group, both working in Monaco on an exhibition hall for Imagina, Europe's

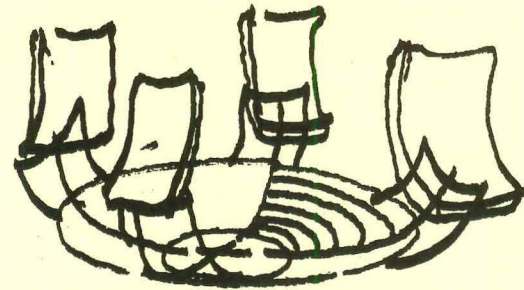
Telecommuting Design



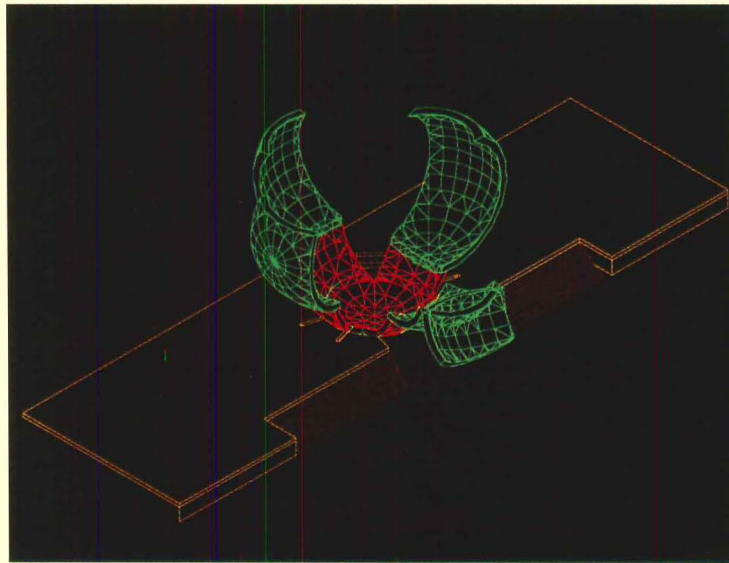
Eric Owen Moss mixed CAD and conventional media in a design for an exhibition hall. Scanned-in sketches were presented on-line.



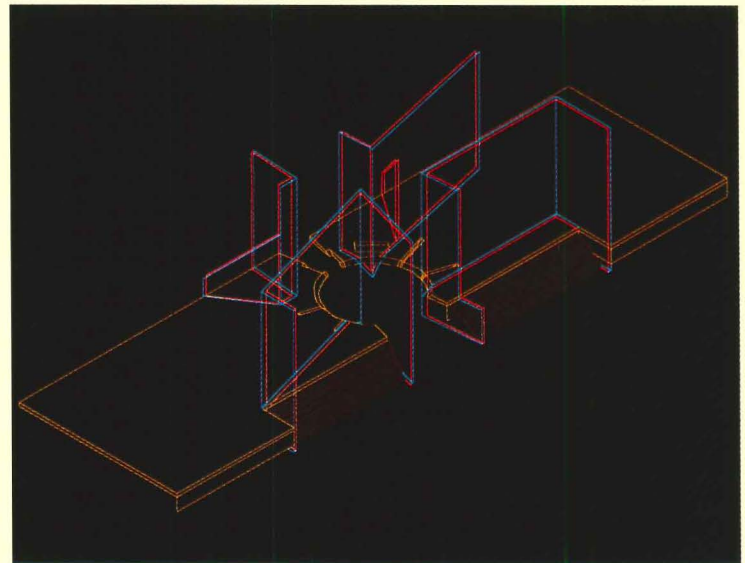
The hall can be used as a single spherical volume or divided. An arching structure covers exhibits.



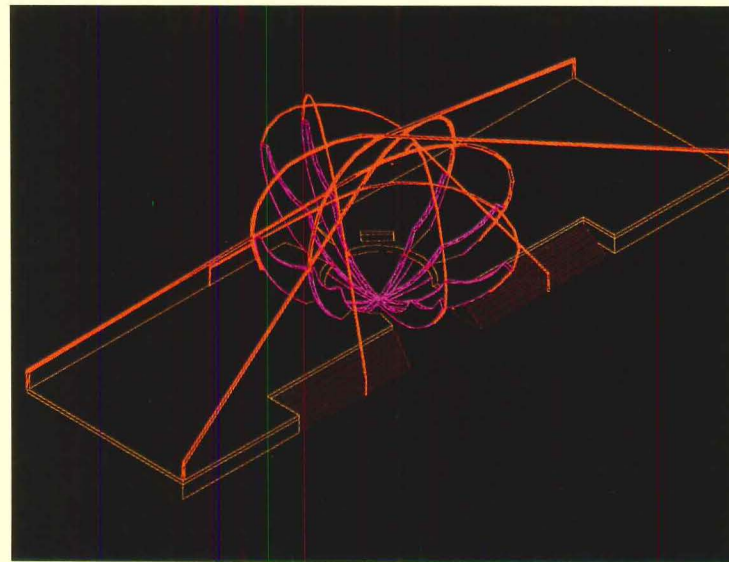
The glass-roofed exhibit area is temporary. Removed, sections of the hall can open to harbor views.



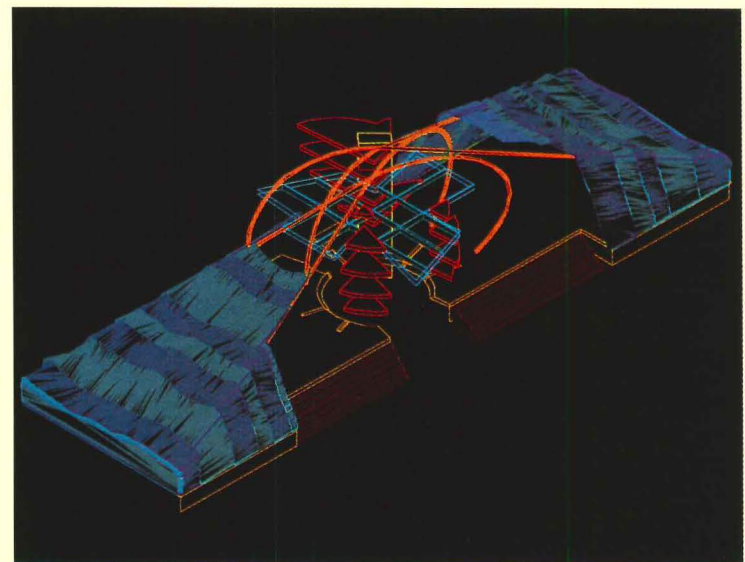
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largest computer graphics show. They communicated through Intel ProShare, software that supports video-conferencing from computer desktops. High-speed ISDN telephone lines simultaneously transmitted computer files, video imagery, and audio signals. In addition, the software's "shared notebook" displayed pre-recorded text, images, CAD files, and any digital or digitized material participants wanted to share. All the attendees could view the same "page," mark it up, "flip" to other pages, and use pointers to draw others' attention to an item being discussed, all while carrying on a conversation.

In preparation for design, Paul Groh, an architect on Moss's staff, created several digital stills from a video of the city's waterfront, which Moss used to study the urban context. Then the architect began sketching—his customary design process (opposite). Groh and others on the staff built both a physical and an AutoCAD model of the design. (The two kinds of models "inform each other," explains Groh.) Groh assembled the computer drawings and scans of the free-hand sketches on the ProShare notebook.

While Moss explained the design concept in video-conference, he pointed his computer's camera at the physical model and, with the gestures common to any architectural presentation, was able to communicate the complex form more thoroughly than if he had had to choose between electronic and traditional media. In theory, Genin could have also worked more on the AutoCAD model, thus adding to the interactivity of the design process, but because of the complexity of the design, Moss's office did most of the work.

Groh observes that the unconventional communication process had its growing pains. For example, the remote parties had to invent a protocol for deciding when it was the other's turn to draw. In time, he says, everyone became more comfortable. "It was probably like this with the first telephones," Groh says. "People had to learn what to say when they picked it up and how to know when to let the other person talk."

Moss is somewhat skeptical about whether these technologies will have a profound effect on the practice of architecture. He notes: "It

would have been very difficult and time-consuming to communicate this kind of complexity in traditional media. So the technology was a tremendous asset. But however dexterous the software is, there still is something imponderable in the content of the work, which architecture will always be about. Ask yourself: Have word processors meant we have more Dostoevskys? Has CAD given us more Gaudis?"

Still, as long as technology adds to, and doesn't detract from the number of ways a design can be represented, Moss is happy to continue pushing the limits of how technology can serve his design process.

Remote-control walk-throughs

Helping clients understand a project before it is built has always been one of an architect's key challenges. The most effective techniques, such as renderings, physical models, and computer imagery, are expensive and time-consuming. And very often architects must stop what they're working on in 2D media in order to create these 3D visualizations.

After sketches and physical models were begun, AutoCAD models take the design to greater detail. One theater permutation is cruciform (1). Glass walls around sphere supports (magenta) show possible divisions

of exhibition space (2). Metal pipe struts (3) support a glass roof over the exhibit space (4). The computer rendering below shows the hall, without the exhibition structure, set within a digitized city view.



Studios Architecture, in San Francisco, has devised a shortcut. The firm is remodeling a manufacturing and lab space for Excite, a young, fast-growing Internet company. The architects place frequently updated animations of the space on a private Web site, so the clients can stay current with design progress and offer comments (page 47).

Key to making this work is ArchiCAD, from Graphisoft. ArchiCAD is one of very few CAD systems in widespread use in this country in which designers make the design as a 3D model. Rather than stopping design, moving a 2D CAD project to 3D, then rendering it, the architect can quickly add surfaces and textures to the model and post it.

ArchiCAD supports Apple Computer's QuickTime VR software (which is free from www.apple.com). The owner doesn't need ArchiCAD, but can view the model using QuickTime—moving it around or “walking through” it using only a standard mouse for navigation. According to Studios's designer/systems administrator Bradley Skaggs, these walk-throughs have proved as

effective as physical models in helping clients understand the space. What's new is that these animations can be distributed via the Web because Netscape, the most popular Web browser, also supports QuickTime.

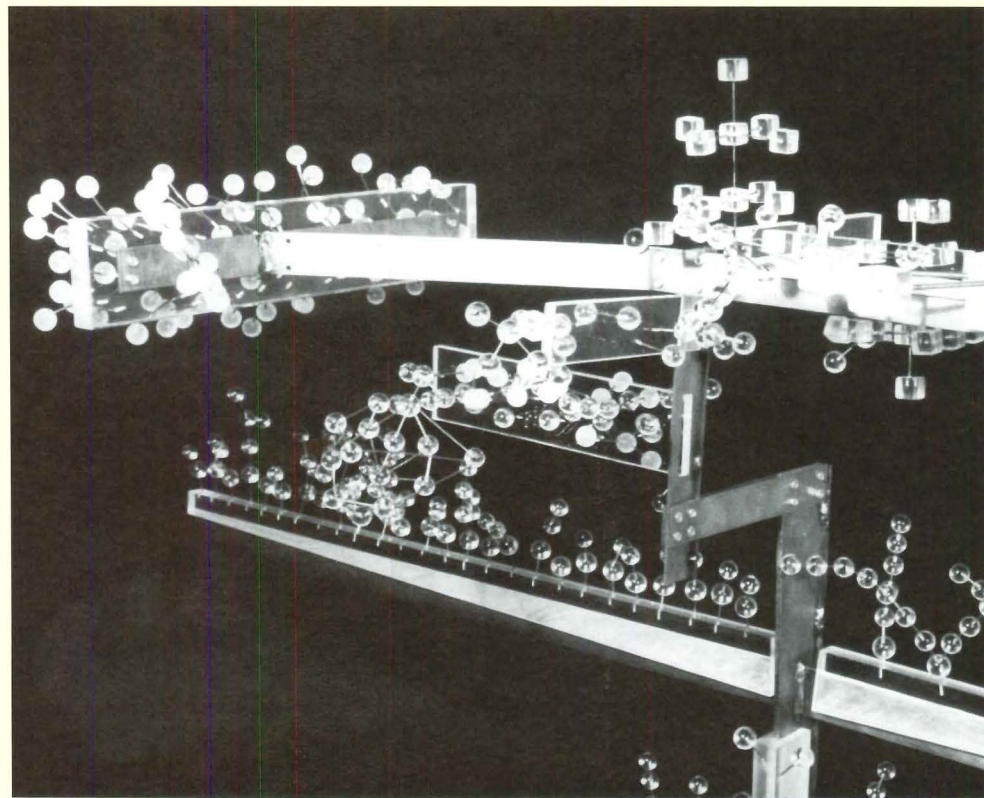
And because the animations are so easy to create and to post, the architects can give their clients frequent updates. Skaggs's next step is to add a “chat” feature to the firm's Web site so that comments about the design can be published in the form of an ongoing discussion between client and architect.

A virtual design review

At the Human Interface Technology Laboratory at the University of Washington in Seattle, an ambitious project is underway to combine the technologies of the Internet and virtual reality. Led by James Davidson and Dace Campbell, the GreenSpace project studies ways to support the collaborative work of architects who are geographically distant from one another. The researchers seek to simulate the discussions that occur when architects gather to review a design in progress.

Such a simulation, they believe, should include multiple views of the design at various scales, audio conversations, and pointing gestures that are visible to other participants. An impression of an immersive environment is created when users wear a headset with stereo viewing monitors. A hand-held device enables users to navigate the “space” in real time and manipulate objects in it. Users have found the sense of being in the space and the ability to move through it very powerful, even with the relatively schematic representation of form and surface rendering available.

Just as important, anyone connected to the site can “meet” in the space. In GreenSpace II, the participants explore three alternatives for a hotel guest room. (These were modeled by students from the university's architecture department—opposite.) Abstract faces are icons that show the location of participants within the space; conversation is augmented by hand icons that can gesture and point. Each virtual room has a work table with small-scale models of all three rooms. With a combination of gestures and voice



New Jersey Institute of Technology students Michael Lisowski and George Paschalis made a model to portray the “architecture” of on-line “rooms” created by participants in a multi-user domain, in this case, a site called MediaMOO. Since it was defined by keyboard, no one knew what it looked like. Originators at MIT's media lab arranged the site to metaphorically echo the layout of their actual Pei Cobb Freed-designed building (top level of model). Users added many more free form “rooms” (lower part of model).

Though the study of emerging on-line domains is still new, Peter Anders sees a new cyber-architecture—complex three-dimensional virtual places best designed by those with architectural skills.

commands, the participants can cut plans and sections from these models for further study.

Although the current system works only on high-powered Unix workstations, Davidson reports that they would like to make their system work on the PCs more common in architectural offices. And although manipulating the environment in real time is still limited, the researchers say their next goal is to enable participants to collaboratively develop and modify the design as they walk through it.

An architecture for cyberspace

Architect Peter Anders wonders whether virtual places, which, after all, have no gravity and therefore no top, bottom, inside or outside, need to confine themselves to metaphors of the physical world. At the New Jersey Institute of Technology in Newark, student researchers working under his direction have been examining this question by researching spatial representations for Internet-based environments called multi-user domains (MUDs). Until recently, MUDs were used primarily for playing games like “Dun-

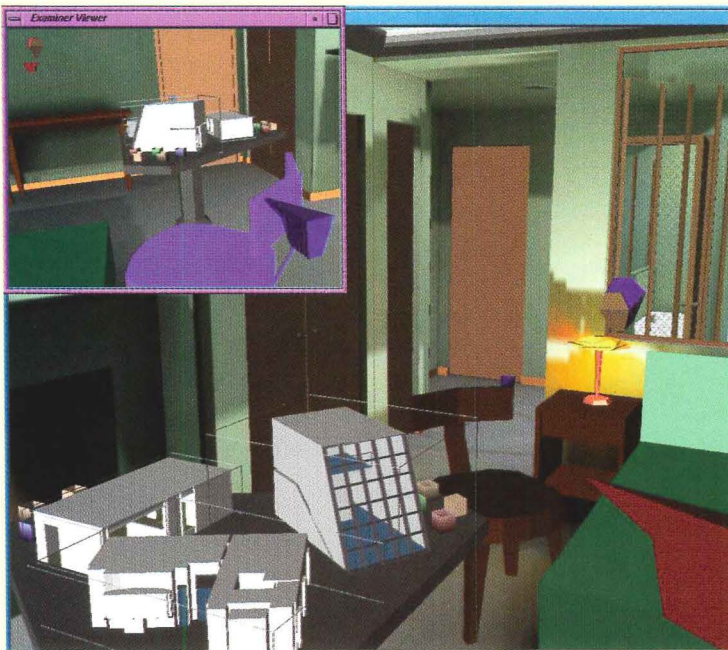
geons and Dragons” on-line. Players navigate through a series of game “spaces” by typing commands, such as “N” to move to the next space “north” (as the game defined it). Since such spaces have been arranged through keyboard commands, the relationships among them aren’t graphic or spatial, they are verbal and, because navigation rules aren’t necessarily obvious, they are ambiguous, even intentionally confusing.

By analyzing how these “spaces” have been made, and creating graphical representations of them (opposite), Anders’s group hopes to learn which metaphors that occur in on-line worlds but don’t occur in the natural world are useful. How do you replace terms like “north” or “south,” for example?

Current MUD users think in terms of rooms and other cues from physical environments and environments inspired by video games (“dungeons”). “Some have constructed their own home towns,” he says. But there’s no reason to be confined by such metaphors. Anders and his team are trying to figure out what at base is necessary to make such

domains useful. They found that MUDs are three dimensional, but that doesn’t mean you need to “move” through them. Computer animation techniques—pans, change of viewing angles, and morphing—all prove to be useful graphic ways to denote relative position and movement. Making an object fade, for example, makes it appear to move away.

It is too soon to tell how useful such domains may be one day, but they offer the potential to redefine such common interactions as “meetings.” Although this study of the relationship between abstract, graphically simulated, and real space is still in its infancy, Anders notes that what’s learned may form a cornerstone of a new cyber-architecture—complex three-dimensional virtual places best designed by those with architectural skills. “This work offers a new area of architectural endeavor,” he says. “Because architects are trained in spatial design, community planning, esthetics, graphic communication, and the use of computers, they are in a unique position. As spatial MUDs are created, those skills will be vital to developing a rich cultural setting for future ‘mediated’ societies.” ■



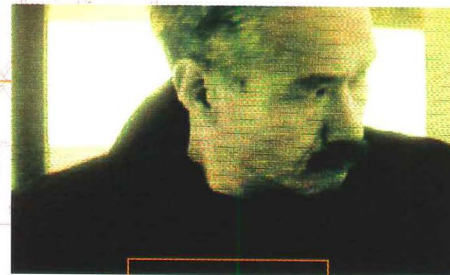
The Human Interface Technology Lab’s GreenSpace II project includes virtual rooms that participants can “move” around in. Red “hand” is used to gesture.



Face-like polygons denote the position of participants within the space. The small models on the table can be manipulated. A participant is shown slicing a section.



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CAD for Planning— And More

By Steven S. Ross

This month we look at a major upgrade to ArchiCAD. It comes at a time when Autodesk and Bentley systems have upped the ante in architectural CAD software, with object-oriented databases and lots of available add-ons. Against the titans, ArchiCAD performs well. It has functionality where it counts and it is particularly at home on a Macintosh.

AutoCAD's latest versions do not run on the Mac. Bentley's does, but the company is not pushing MicroStation for the Mac.

ArchiCAD, from early in its evolution, has also been a planning tool. Lately the titans have taken that functionality a step further, too. Autodesk has add-on mapping software and the more general database add-on, AutoCAD Data Extension 2.0, reviewed last month [ARCHITECTURAL RECORD, September 1996, page 55]. Bentley has a new GIS-focused add-on, GeoGraphics, which will be reviewed in a future issue.

ArchiCAD 5.0

Vendor: Graphisoft USA, 235 Kansas St., Suite 200, San Francisco, CA 94103, 415/703-9777, 800/344-3468, <http://www.graphisoft.com>
AOL: Graphisoft, cdale@graphisoft.com

Equipment required: Power Macintosh (strongly recommended) or any 68xxx Mac with math co-processor software, System 7.5, 24MB physical RAM on Power Mac, 16MB on older Macs; 32MB or more strongly recommended. CD-ROM drive strongly recommended. We reviewed on a Power Mac 8100 and on a Quadra 610 with Power Mac card, both with 24MB, and then with 32MB. There is a Windows 95 and NT version as well, for Intel-type CPUs.

Cost: Various pricing schemes. \$4,995 buys ArchiCAD itself, PlotMaker (otherwise \$295), StairMaker (\$95 separately), ArchiSite (otherwise \$495) and enhanced support package (otherwise \$750). This does not include Atlantis Render, which is \$595, or \$495 purchased with ArchiCAD.

Version 5.0 adds quite a few goodies to what was already a fine package. Like many of its European cousins, ArchiCAD, out of the box, tries to be a complete solution for designers and drafters. For the Macintosh, it remains the most complete solution. With ArchiCAD,

you can rough out a design in a matter of minutes in 2D or 3D, check sun shadows, do hard-line drafting around the rough, add non-graphic data to each element, quick-shade, render, and create a walk-through animation. (The Windows version allows you to play back an animation in QuickTime VR, but not to create one.)

But times change, and Graphisoft is also highlighting "new open business opportunities" for architects and others to develop add-on software for ArchiCAD. Graphisoft distributes a new Software Development Kit that allows independent developers an interface to the underlying ArchiCAD database.

We looked at some of the add-ons: StairMaker 2.5 (the treads and risers are laid in; you add the rest), Atlantis Render (fast, with excellent control of light sources and surface textures), and ArchiSITE (converts contour maps to 3D models that can be rendered and merged with ArchiCAD projects). The modules' tool icons show up right inside the standard ArchiCAD tool palette. The base package comes with QuickTime VR and 3D objects organized by CSI division for \$3,795.

Small offices will find ArchiCAD particularly attractive. It can tackle large projects if you need to, and it's easy to use. It can exchange files with AutoCAD, but not perfectly. And this release still isn't meant for networking. It has no file locking or tracking utilities for network use. So it is not an ideal solution for projects that require the same files to be simultaneously accessed and edited by many team members.

Nevertheless, there are many refinements in 5.0. On the database side of the core ArchiCAD package, there's now a "zone" tool you can use to split the design of a building into functional areas—office space, mechanical, and so forth—and sort building elements grouped by zones. Floor areas and volumes calculate automatically by zone as the design evolves. Facilities managers should also find this feature useful.

The database allows new calculations on objects such as the price of footing concrete. ArchiCAD has always been strong in this area, with a fine bill-of-materials database.

Graphisoft's ArchiCAD 5.0 performs well against the titans, and functions where it counts. It's particularly at home on the Mac.



Two rendered images in QuickTime VR. You can use the mouse cursor to move intuitively around and over the church (top) and through a building (above).

But in some cases, you had to pull the data into another program such as an Excel spreadsheet to do calculations. Now, you can script the relationship between the height of a steel beam and its weight and bearing area, or between weight and price of an object as well as quantity and price.

Work on large projects is easier with 5.0's shared access to multiple object libraries. The libraries can be browsed visually (even in 3D). Both 2D and 3D objects in them can have intelligence—that is, associated data. There are also better links between the database and ArchiCAD's macro language, GDL.

On the drawing side, GDL has new features such as boolean variables and an unlimited number of calculation variables. You can also cut through a 3D image in any plane, and base calculations on the objects the cutting plane encounters.

The cutting-and-calculation process is helped

by better ways to edit in elevation or in any number of horizontal sections, rather than only in plan. There's also a new free-form fence (marquee) tool for object selection, along with selection by various criteria such as color, line weight, material, and so forth.

Now drawing tools include splines and Bezier curves that can be transformed into building elements the same way the wall tool can draw a double-line that is actually a wall in 3D. There are also more dimensioning options (cumulative, angular, radial and nominal dimensioning for openings), more line types, and more hatch patterns.

Drafting speed is improved with an "intelligent" cursor akin to those Ashlar and Diehl Graphsoft have built into their CAD programs. It can snap to intersections, tangents, and perpendiculars. There's no direct way to snap to a non-touching intersection point along a non-printing coordinate line as there is in AutoCAD 13, or to snap to a midpoint as there is in Ashlar Vellum, but you can quickly extend lines to "virtual" hotspots in space, then snap to them instead. ArchiCAD is nimble enough—even on a medium-powered Mac—to make this natural, although it takes a few steps.

ArchiCAD 5.0 also adds an "intelligent" Rectangular Column drawing tool that lets columns embed themselves in walls. Curved walls look nicer—with smooth surfaces—and roofs and slabs can follow the curve of wall.

The Roof tool is better—with good control over pitch and type (including domes and vaults). You get up to four changes in slope on a hip roof, and can also draw any overhang, or let the system do it automatically.

Photorealistic rendering now includes texture mapping. There's also that extra-cost add-on, Atlantis Render for ArchiCAD, that does high-quality ray tracing; you can modify the appearance of the final image just by dragging in materials and finishes. It works on the Mac and in Windows 95 or NT, and is ideal for presentations of interior design. There's also an alliance with Lightscape, for rendering on a Windows NT computer.

ArchiCAD was the first CAD package—actu-

ally, the first non-Apple software, period—to create QuickTime VR animations. With Version 5.0, the controls for such things as lighting and camera angles are totally within ArchiCAD itself. QuickTime files demand relatively low memory and speed from Macs and Windows machines.

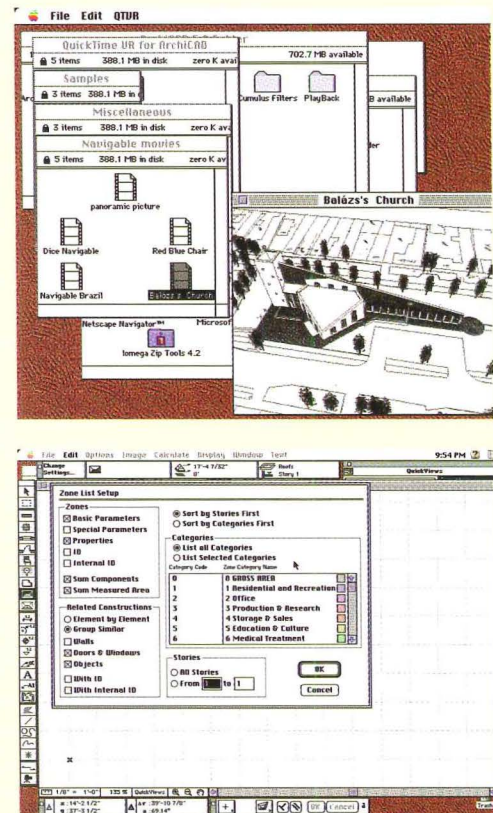
Drawing in ArchiCAD is easy—most of our users rough things out in plan. But each line—for a wall, as an example—has a default height and properties that have been specified or can be changed. Once a floor plan is started, however, you can also edit sections or elevations in Model View; the edits will be reflected in the plan view. You can't create new elements in Model View, only edit existing ones. At any time, you can decouple a view from the model and play with it. Multi-floor buildings can be built a floor at a time, but you can make global changes.

As CAD files have grown to include much non-drawing information, file translation has become rather tricky. AutoCAD DWG and DXF files (including Release 13) can be imported or exported in 2D only, but you can include 3D data in symbols. When ArchiCAD imports an AutoCAD file, it opens a new object directory for each block it sees in the incoming file so that you can edit or preserve blocks one at a time. There are many controls for translation of line styles, type faces, etc.

ArchiCAD files for Windows and Mac handle library symbols in different ways, but translation back and forth is seamless—ArchiCAD on either platform considers files from the other as binary compatible. Merging more than one project file into a single project can be tricky because so much information is involved. ArchiCAD tries to match up floors in an incoming project file with the floor you're working on, for instance. Merging a project containing a building with another containing mainly the site information can also be done.

Manuals: Well-written paperback reference guide, startup guide, GDL reference guide, and separate guide for PlotMaker and for each of the other add-ons. There's no tutorial (a rather good one is available for \$29.95 from Graphisoft).

Ease-of-use: As easy as it can be for such a complex package.



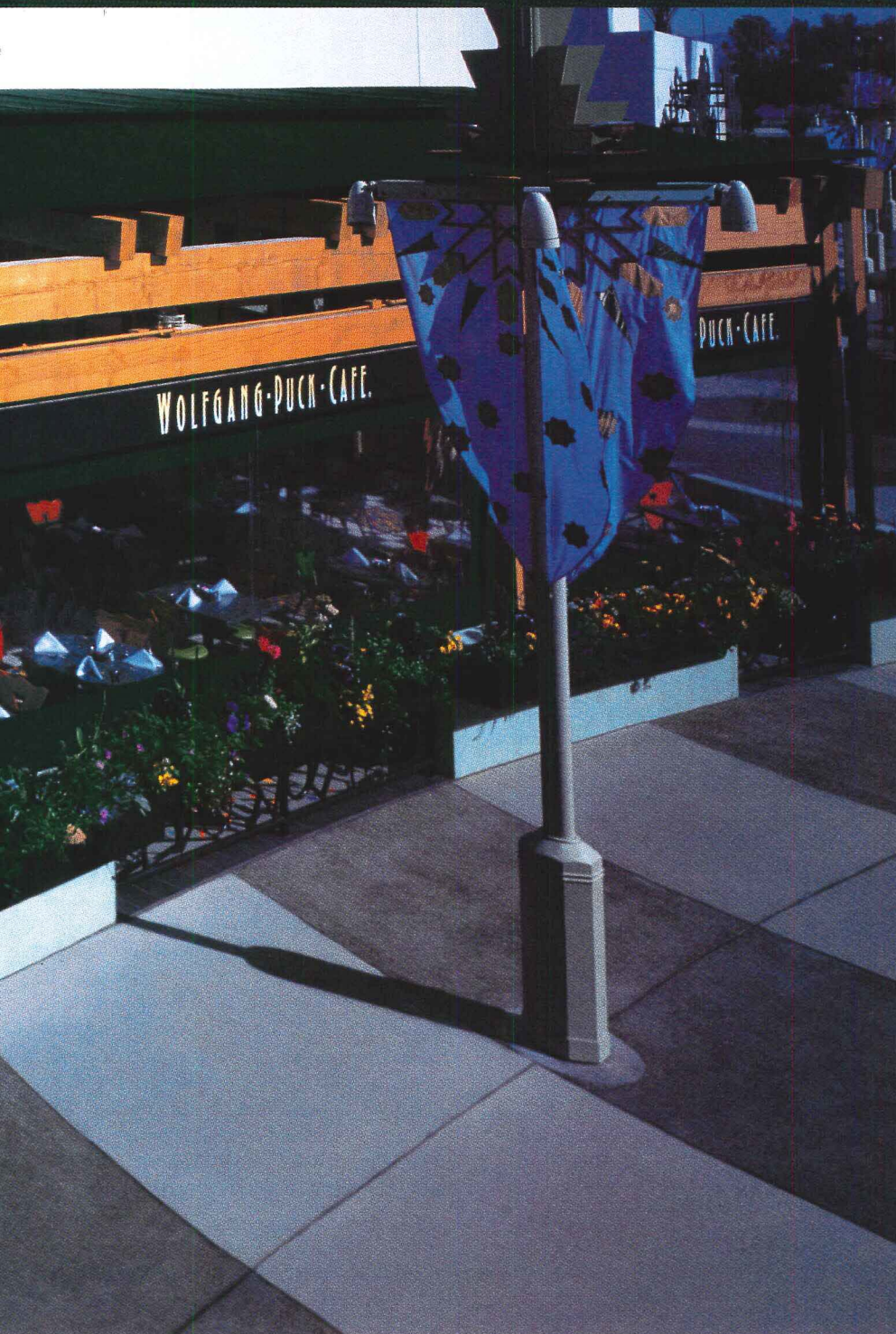
Top: Getting ready to add simple hip roof (actually a mansard) to project. Rendered ArchiSITE image at lower right has been merged with the building's project file.

Above: Specifying building-use zones with new 5.0 tools.

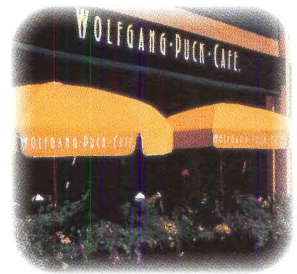
Error-trapping: Make sure you've totally surrounded a hole with the free-form fence; otherwise, you may distort the hole if you try to stretch the selected items. There's a good Undo function with unlimited steps. Version 5.0 ships with 4.55 so that you can continue working on a current project in the older version as you upgrade to the newer one for new projects. File formats convert to the newer version automatically. ■

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Plumbing Designs Meet New Rules

Water-conservation laws and Americans with Disabilities Act guidelines are having a big impact on what fixtures look like and how they work.

Plumbing news: After January 1997, federal law will prohibit the manufacture of commercial toilets that use more than 1.6 gal. per flush (residential-use models must meet this standard already). Faucets are currently restricted to a water flow of no more than 2.5 gal. per minute. Water-saving rebate programs, such as New York City's toilet giveaway, have demonstrated how effective low-volume toilets are in reducing water use. The Department of Housing and Urban Development estimates that replacing each existing water closet with a 1.6 model would save 70 percent of the water now used annually by households in the U.S. —Joan F. Blatterman

153. Plus ça change...

Commercial plumbingware of yesteryear has been subtly tuned for ADA compliance and re-issued as the Architectural line for residential use. Based on a cartridge valve that closes with (not against) line water pressure,

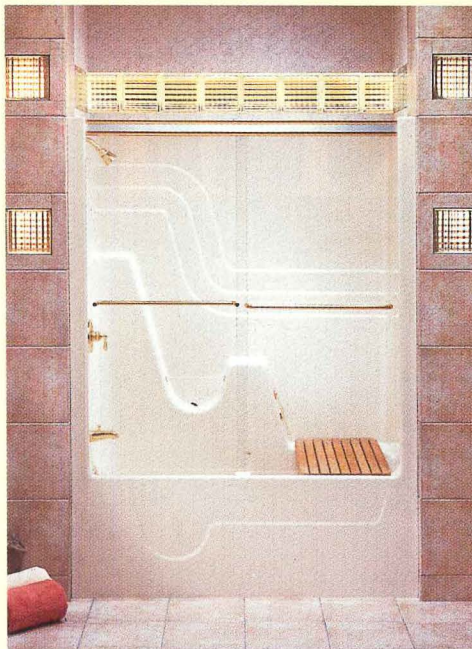


153

the rugged fittings offer interchangeable spouts, including double-jointed pot-fillers, circa 1954 curves, and goosenecks; foot-pedal controls are an option. 708/803-5000. The Chicago Faucet Co., Des Plaines, Ill.

154. Performance-contracting service

Sloan Valve Co., a major supplier of flush valves and assisted-flush plumbing equipment, announced a new water-management service for commercial and institutional facilities. To be called Sloan Hydronics and marketed to building owners and A/E professionals, Sloan says the service will develop a detailed water-use audit of a planned or existing facility, create a water-saving plan, and enable the facility to purchase any needed technology out of water-bill and sewage-rate savings. 800/671-6971. The Sloan Valve Co., Elk Grove Village, Ill.



155



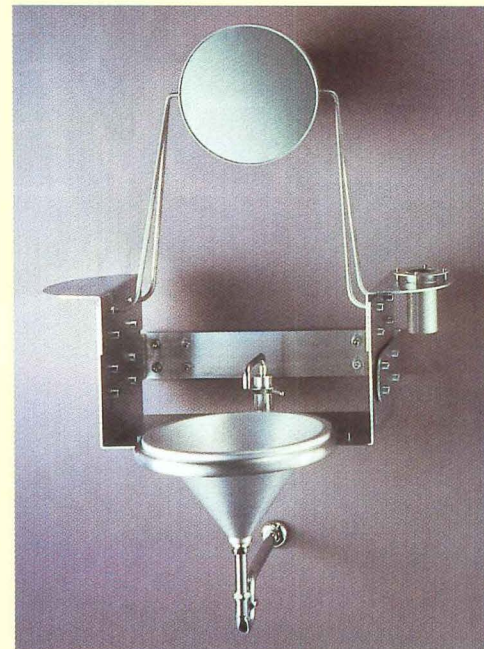
156

155. One-piece tub/shower/whirlpool

A new design, Status is an extra-deep tub with four massage jets and 80-in.-high enclosure fronted by a frameless (no metal track) shower door. Made of fiberglass, the tub/shower design can be specified gel-coated in any of 24 colors; dimensions are 5-ft long by 36-in. wide. 800/955-0316. Universal-Rundle, New Castle, Pa.

156. Drop-in basin

From Kohler's new Folio Suite, described as offering "simple styling usually found at a much higher price point," this vanity-top lavatory has a sweeping, 25-in.-wide shape not often found in a drop-in configuration. The Folio line also includes a whirlpool bath, pedestal and self-rimming lavatories, and a gravity-flush, low-volume toilet. 414/457-4441. Kohler Co., Kohler, Wis.



157



158

157. Industrial-tech washbasins

A wall-hung version of Toto's Cera basin style, Multiple lavatories are built on an aluminum framework accented with red, blue, and green shelves, supports, and accessories such as towel holders. Up to three units can be linked together along a wall. 714/282-8686. Toto Kiki USA, Inc., Orange, Calif.

158. Sleek and ADA compliant

Designed to meet ADA wheelchair-clearance and mounting-height requirements in public washrooms without calling attention to that fact, VTA (Vanity Top A) lavatories incorporate universal-design features in a clean-lined unit made of a single piece of Surell solid surfacing. (Sinks are shown without plumbing in photo above.) Units can be "seamlessly" joined for a totally smooth counter. 513/786-3400. Formica Corp., Cincinnati, Ohio.

"Off the Rack" PV Curtain Wall



159-a



159-b

159. Complete low-volume toilet line

American Standard offers water closets that meet the most stringent water-saving regulations, whether for residential or commercial use. The china bowls of these 1.6 toilets have been subtly recontoured to accommodate the different hydraulics and line pressures of the shorter, more-forceful flow generated by assisted-flush tanks. The Heritage residential toilet (a) incorporates a Flushmate pressurized-air tank in its low-profile design. While somewhat louder in operation than gravity models, the assisted-flush toilets work in only 3 seconds, and tank refill is silent and nearly instantaneous. In commercial products (b), where high performance is vital, the low-flow, water-pressure flush technology permits a simplified drain configuration, making them almost jam-proof. 908/980-3000. American Standard, Inc., Piscataway, N.J. ■

160. Double-duty

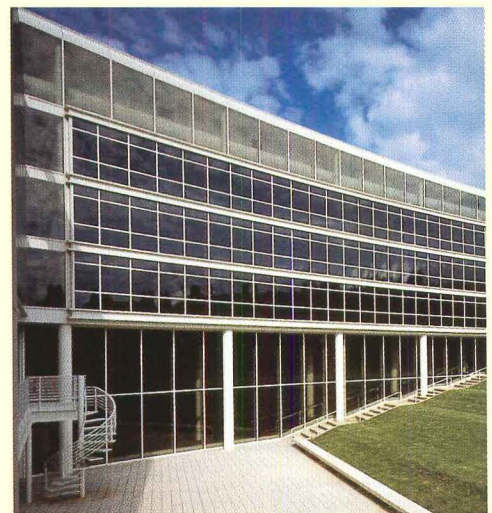
Kawneer's new 1600 PowerWall is described as the first fully tested and integrated photovoltaic curtain-wall system. Developed with Maryland-based Solarex Corporation, a manufacturer of both polycrystalline and thin-film types of solar cells, PV modules can produce enough electrical energy—up to 240 watts each—to substantially lower utility bills. Consisting of polycrystalline cells, PowerWall panels are available in standard infill dimensions. At 1/4-in. thick, they are thin enough to fit within a standard glazing bite. The lightly textured sun-side surface is blue; a clear Tedlar backing applied to the inboard surface (a) gives that side a gray appearance—and allows the panels to meet the ANSI 97.1 safety-glazing standard.

Incorporated into the 1600 inside- or outside-glazed framing system (b), the PV modules meet all other ANSI, ASTM, and AAMA building-envelope tests for static and dynamic wind loading and air and water infiltration, as well as Uniform Building Code 2334 H.2 for seismic performance. Photovoltaic panels can be retrofit into existing spandrel systems, and blank panels can be produced to mimic the operating modules for a uniform-appearing facade.

The installed cost of a PV curtain wall should be considered in the context of the cladding material it preempts, whether stone, span-

drel glass, or metal panels. Life-cycle costs must also reflect the dollar value of the electricity generated (which will depend on the size, solar orientation, and latitude of the installation), and should factor in a certain amount of environmental good will.

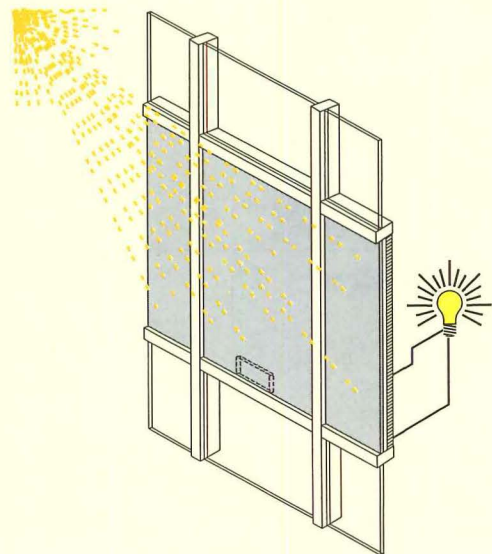
Curtain wall provides DC output power generation. Each module can have its own AC inverter (indicated in drawing, c), and generates usable electricity independently. Current can be fed directly into a building's system, and can significantly offset the watts per sq ft draw of a facility. 770/449-5555. Kawneer Company, Inc., Norcross, Ga. ■



160b



160a

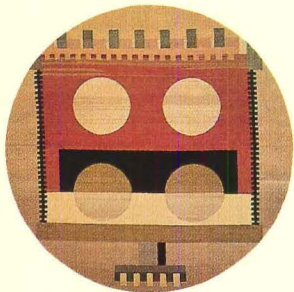


160c



161. Custom-color vent louvers

The New Concept gable vent can be ordered in PVC or metal in any of 400 baked-enamel finish colors. Less costly than extruded-aluminum units, vents are designed for flush mounting in vinyl-sided, stucco, brick, or other exteriors. Custom-size and -shape louvers, such as this Gothic arch for a church renovation, are a specialty. 800/635-6448. New Concept Louvers, Inc., Springville, Utah.



162. Rugs for special spaces

Scotland-born and Milan-trained architect David Shaw Nicholls has turned his hand to flat-weave and tufted-pile specialty rugs. From his Cosmo Cities collection, an unusual round, double-sided "super Kelim" comes in diameters up to 12 ft; the 10-ft size costs about \$3,850. A stitched outline detail gives a three-dimensional quality. 212/388-1000. David Shaw Nicholls Corp., New York City.



163. Conservatory addition

Room-sized glazed structures based on classic English garden rooms are made with hardwood framing, insulating safety glass, and triple-wall polycarbonate roof panels. Units can be as small as a vestibule or as large as a full-size family room. Meets U.S. codes for snow- and wind-loading. Modular approach is said to lower installed cost. 800/963-8700. Hartford Conservatories, Woburn, Mass.



164. Flame-resistant fabric

Jewel non-translucent glass-yarn textiles are pigment-dyed, and do not need an interliner to prevent show-through, even over hard-to-hide-yellow substrates. When used as a cover for acoustical panels, as shown in this bank installation, fabrics meet or exceed U.S., German, Canadian, and British flammability and toxicity standards. 800/438-7465. Land Fabrics, Island Park, N.Y.



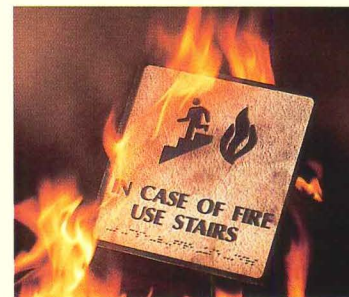
165. Agglomerate stone counter

Made in Canada using high-pressure cast-stone technology, Granirex offers consistent coloration and large slab sizes (up to 4 by 10 ft, 3/4-in. thick). Three new shades—red and brown Hearthstone and Classic Mahogany—bring the standard color range up to 20. Also comes in a 3/8-in. thick tile format that withstands the heaviest traffic. Samples: 773/471-0700. Terrazzo & Marble, Chicago.



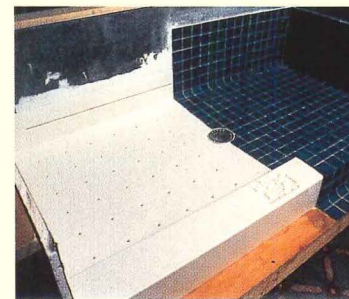
166. Cast cabinet hardware

Larger than most knobs and pulls, new "architecturally detailed" hardware line includes a curved bail drawer pull and a matching door knob, shown here in Regency Brass finish, as well as straight pulls and oblong and square knobs. Mounting-screw placement accommodates either 3-in. or 96-mm spacing. Catalog: 815/969-6308. Amerock Corp., Rockford, Ill.



167. "Indestructible" signs

Kroy's ADA 300 signage line is said to combine a high level of durability with graphic and design flexibility. Made by a new process that integrates text, graphics, Grade II Braille, and color details on one piece of Micarta fire-labeled laminate, signage is suggested for heavy-use sites such as schools, hospitals, and factories. 800/733-5769. Kroy, Inc., Scottsdale, Ariz.



168. "Leak-proof" shower pan

Made of flame-retardant Noryl resin, the Tile-Redi pan liner will take ceramic or marble tile directly, using standard thin-set mortar. Moisture-resistant tile-backer board meets flush with the top of the 1/2-in.-wide preformed curb. Pan is sloped to drain; outlet height can be adjusted to tile thickness. 888/445-TILE. Tile-Redi, Pompano Beach, Fla. ■

Short Takes

If it's not too late...

Prepared for people living in areas susceptible to wildfire, the Firewise Home Page has a landscaping checklist—what to plant and where to put it—and an informational section on protecting your home from wildfire: www.firewise.org/ (Web page); 937/237-1085 (phone). Co-sponsored by the National Fire Protection Association, the U.S. Fire Administration, and the Forest Service.

Hazardous window treatments.

The New York Times reports that the Consumer Products Safety Commission (CPSC) has issued a warning against vinyl mini-blinds imported from China, Taiwan, Indonesia, and Mexico. Often made with lead as a binding agent, the plastic in these blinds tends to deteriorate in sunlight and release the lead into the dust on the slats. American blinds contain no lead, and reformulated imports will

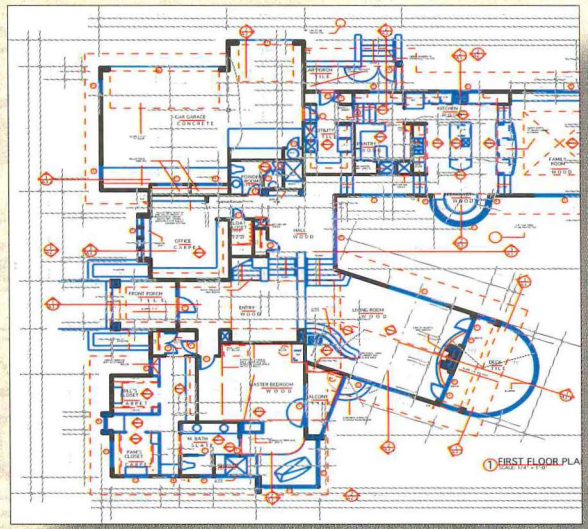
be so labeled. The safety group also points out the possible fire hazard offered by popular torchière-style halogen lamps. These light sources are known to develop an in-use temperature hot enough to ignite curtains or other combustible material placed in contact with bulb or shade; at least 30 fires have been associated with halogen pole lights so far, according to the CPSC. ■



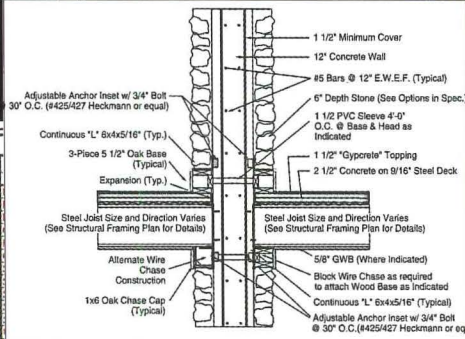
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*Image 1



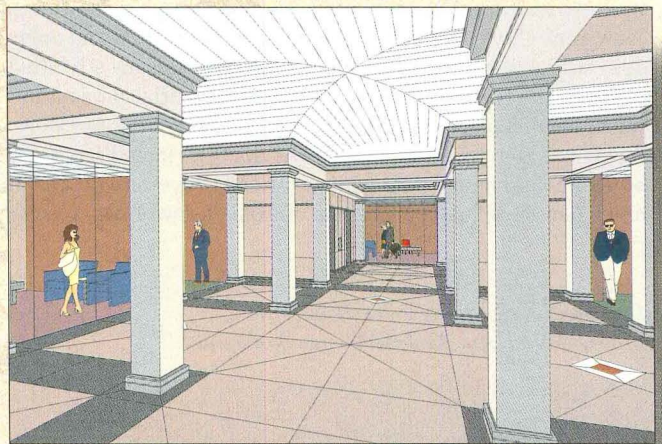
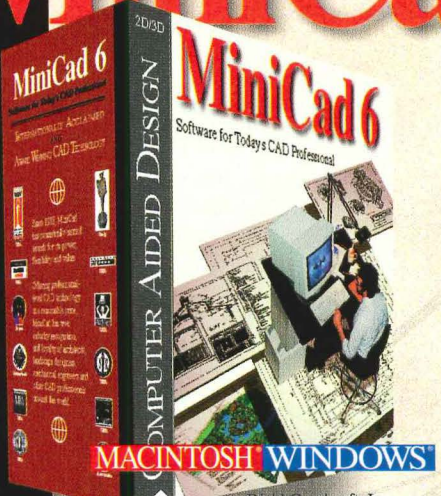
*Images 2

SCHEDULE		Materials / Finish	
#	Description	Material	Finish
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102		1x6 wd	1x4 wd
103		1x6 wd	1x4 wd
104		1x6 wd	1x4 wd
105		1x6 wd	1x4 wd
106		1x6 wd	1x4 wd
107		1x6 wd	1x4 wd
108		1x6 wd	1x4 wd
109		1x6 wd	1x4 wd
110		1x6 wd	1x4 wd
111		1x6 wd	1x4 wd
112		1x6 wd	1x4 wd
113	Entrance Room	12x12 Ceramic	Gwb/Gwb/Gwb
114	Kitchen	12x12 Ceramic	Gwb/Gwb/Gwb
115	Breakfast Nook	12x12 Ceramic	Gwb/Gwb/Gwb
116	Rear Vestibule	12x12 Ceramic	Gwb/Gwb/Gwb
117	Spa Room	12x12 Ceramic	Gwb Var. Gwb/T&G Wd & Gwb
118	Bath w/Shower	12x12 Ceramic	Gwb/Gwb/Gwb
119	Side Foyer	12x12 Ceramic	Gwb/Gwb Var. Gwb/Gwb/Sloped
120	Laundry	Sheet Vinyl	Gwb/Gwb/Gwb
121	Mud Room	Part'd Concrete	Gwb/Gwb/Gwb
122	Tool Room	Part'd Concrete	Gwb/Gwb/Gwb
123	Garage	Part'd Concrete	Gwb/Gwb/Gwb

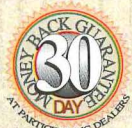
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*Image 1 - Courtesy of Francois Levy, Dick Clark Architects, Austin, TX
*Image 2 - Courtesy of Cameron Lacy, DCL Architects, Wayne, PA
*Image 3 - Courtesy of David Brunke, Herring & Trowbridge Architects, Herndon, VA

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Powerful Forms for a Hard-Working Town

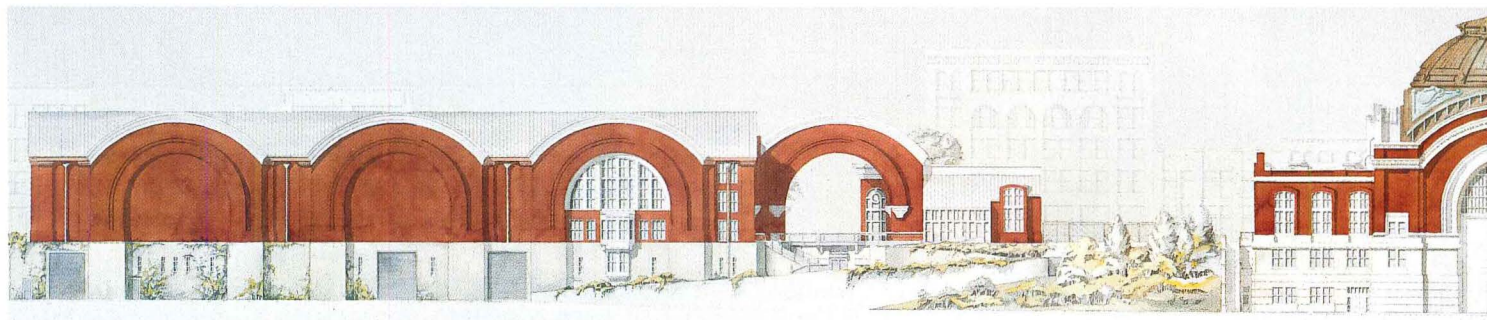
A major new building, the Washington State History Museum, is helping revitalize downtown Tacoma. How the project was conceived, designed, and built offers lessons for architects.

The Washington State History Museum helps complete Tacoma's urban puzzle. This major museum set in a small, working-class city fits alongside its neighbor, Tacoma's historic Union Station, like a long-lost, equal wing. How the project came to be built there reveals a great deal about the complex process of making architecture: the nature of contemporary architectural practice, of competitions, of great names and unknowns, how joint ventures work, the vital role of a good client and the advantages of vision and civic will.

The story begins with Tacoma, a muscular city of paper mills, cranes, and docks. The nation's sixth busiest port boasts a proud history: Tacoma had been the terminus of one of the transcontinental railroad's main lines, the Northern Pacific, in 1873. Formerly Seattle's competitor in population and prosperity, this community of 180,000 people lagged in the shadow of Mt. Rainier as Seattle blasted skyward into aero/cyberspace. Cut off from the waterfront by train tracks, highways, and decrepit warehouses, her depot abandoned by AMTRAK in 1985, her downtown languishing, Tacoma needed a boost. Its leaders sought a renewed identity for the city. The adaptive re-use of the depot came first.

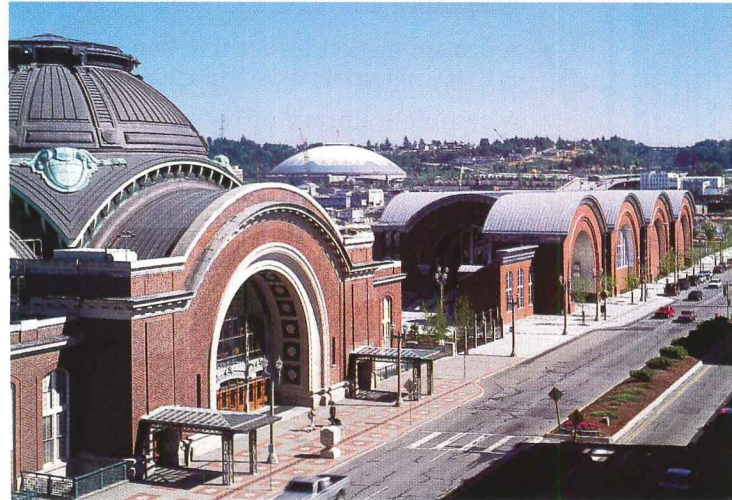
Tacoma's finest historic building, a railroad depot called Union Station, was a local architectural icon. The copper-domed Beaux-Arts building boasted strong form and strong parentage—designed in 1911 by Reed and Stem, the architectural firm that planned the heart of New York City's Grand Central Station. Renovated and enlarged in 1991 with a low-scaled addition for the federal court's Ninth Judicial District, the renovated depot served as the initial catalyst for the revitalization of Tacoma's historic warehouse district. Plans were formulated for two other significant changes, including the renovation of warehouses into a new campus for the University of Washington and a new state history museum. Tacoma's downtown was changing.

Brick walls sit over a concrete base in Moore/Andersson Architects' new museum.



Visitors enter the Washington State History Museum (opposite) through a grand arch.

© Timothy Hursley photos



The four arches of the new museum (above far right) line Tacoma's Pacific Avenue, and mirror Union Station's forms (above left).

Enter the client. The Washington State Historical Society, housed in inadequate quarters in Tacoma, sought a new museum. In a critical decision, the board of directors and the museum director, David Nicandri, determined to hold an international competition to select an architectural firm. The organization was committed to exceed local or even regional expectations. "We had to break the paradigm," he says. "Otherwise the museum would have been designed and funded with only local significance."

Washington's Department of General Administration and the Historical Society's board selected Bruno Freschi, dean of the School of Architecture and Planning at SUNY Buffalo, to assist with the competition as professional advisor. No stranger, Freschi had been helping Tacoma forge a new vision for the city, particularly along the waterfront. Freschi's international contacts and his experience with competitions helped convince the board to aim high. "I tried to position this for Tacoma's next century."

*Washington State History
Museum
Tacoma, Washington
Moore/Andersson Architects*



Polished aluminum panels with custom hex nuts line the undersides of arches (right). Masonry arches (opposite right) exhibit corbelling and spring from metal brackets. Lead-coated copper fascias mimic curved forms, although they are actually constructed from segmented, straight pieces. Large aluminum-framed, paned windows bring light into the main lobby, and scale to the building entrance.



After a program was devised by the San Francisco firm of Robinson Mills + Williams, Freschi helped structure a competition. All Washington architects could submit; 48 others with special qualifications were invited. Thirty architects from 11 states and 6 countries responded. The Society's board of trustees narrowed the list to four finalists, each of whom received \$35,000 to produce a conceptual design: Moore/Andersson from Austin, Texas; Vancouver and Los Angeles architect Arthur Erickson; Michael Graves from Princeton, New Jersey; and Hammond Beeby and Babka from Chicago.

Winner includes an outdoor amphitheater

The seven-person jury, chaired by former Governor Daniel J. Evans, included architects, architectural critics, and prominent Washingtonians. After reviewing schemes that ranged from an evocation of the Pacific Northwest (Graves) to a nostalgic interpretation of historic national park hotels (Beeby), the jury unanimously selected Charles Moore's and Arthur Andersson's winning submission on May 4, 1991.

Michael Sullivan, who was a board member of the historical society and the city's former preservation officer, lauds the architect's solution above the others: "They were all interesting, but they did not capture the context and sensibilities of the city" (as the Moore/Andersson scheme did). He admires that the team borrowed the "brick and forms unabashedly and the...metal roof that mirrors Union Station, but not so grand as to match Union Station."

"We developed a train barn to the train station," says Andersson.

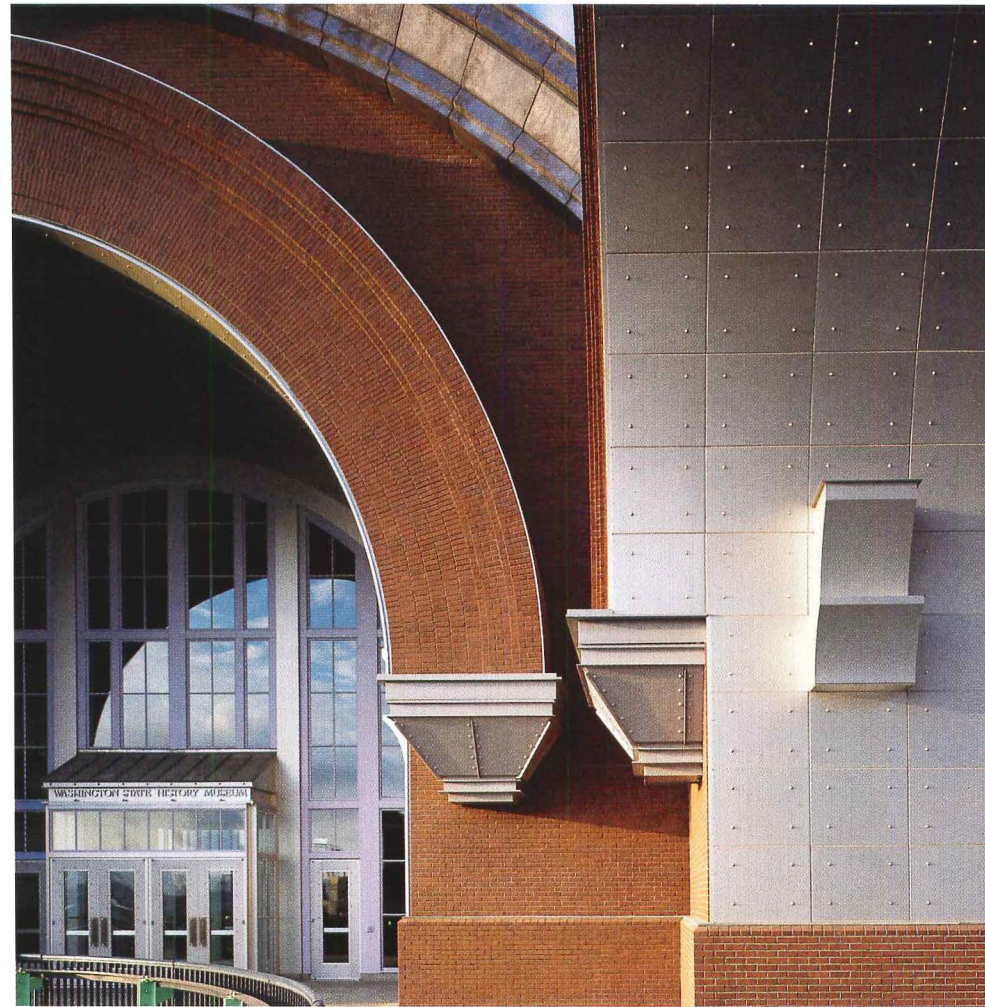
Moore/Andersson composed a simple palette of materials, primarily brick and concrete, markedly less ornate or embellished than Union Station's. The winning scheme offered one amenity its competitors did not—an outdoor amphitheater, a large urban space that was to become the project's "gift to the city."

The competition forced the architects to address fundamental questions up-front. The height of the building became an early issue. Nicandri reports that rather than set the history museum at the lower height of the court's new wing, the determination was made to allow the museum to mirror the scale of warehouses across Pacific Avenue. Another fundamental understanding was "separating off and opening up" the building from the depot. Rather than connect the museum with the depot at the concourse level, 88 feet of landscaped hillside clearly separate the two buildings.

Andersson mentions the "materiality" of the museum, a quality that he attributes in part to early conversations with Freschi. Both interior and exterior are detailed with an eye for brick's ability to arch, for concrete's plastic qualities, and for its pliancy in mass and form. Undersides of exterior arches are covered in aluminum panels, a material that adds luster to dark recesses. Moore's initial suggestion, by contrast, was for small-scale, gold ceramic tile to underscore the arches, a decision which would have lessened their mass. Inside, the program called for over 100,000 sq ft of exhibit, storage, administrative, and public spaces. The permanent exhibit alone, described in the program as "the great survey exhibition of the

Moore's Last Project?

The Washington State History Museum can claim to be Charles Moore's last project. Moore died in 1993, ten days after the ground-breaking. Partner Arthur Andersson, who had worked with Moore since 1981, described his mentor's contribution: "Charles had a single-handed ability to design that was astonishing. His idea bank was phenomenal and was intact through his 80's. His role, while very critical, was more than lines on paper. His conversations with us were about what the lobby would be like: spaces that were like Piranesi's etchings. Without his energy and guidance we would not have won the competition." Through Moore's Los Angeles office, his influence on the revitalization of Tacoma will continue: Moore Ruble Yudell has been the leading architectural firm in the development of the University of Washington's Tacoma campus.



history of the State of Washington," demanded clear spans across much of the 20,000 sq ft exhibit gallery, a requirement that forced the architects to consider concrete vaulting. Freschi believes that the competition yielded an additional benefit by preparing the board to become knowledgeable and conversant with the issues they would face as the project moved toward construction.

Architects face a 25 percent cut in funds

Overseeing the process throughout, formally conducting selections and bidding, and representing the client-agency at the state level was James Copland, a senior architect with the State of Washington. His role as project manager for the state, as he describes it, was to "see that all parties were represented fairly to protect the process and educate the client." Most projects that fail, he thinks, can be traced to inadequately prepared or informed owners.

An immediate concern owners and architects faced was a 25 percent reduction in total funding. Upon notification that they had won, Moore and Andersson were immediately informed that an underground parking garage, a component of the design, had been eliminated with a stroke, and that other alterations would be required. Moore, unfazed by the cuts, declared that less money often produces better results.

Another crucial requirement was securing an associate architect for the team. Copland helped serve as broker, introducing the Texas team to Olson Sundberg, Seattle architects who had just completed

work on the Seattle Art Museum. Their experience with architect Robert Venturi served as "an eight-year master class" in architecture, according to Rick Sundberg. Olson Sundberg had developed a reputation for craft, care, and skill in how things are put together. Unlike Moore/Andersson's six-person office, Olson Sundberg's 18-person office relied on the computer. The match was made when Moore walked into the firm's office, surveyed their careful detailing and finish work, and declared, "O.K., now we can get going here."

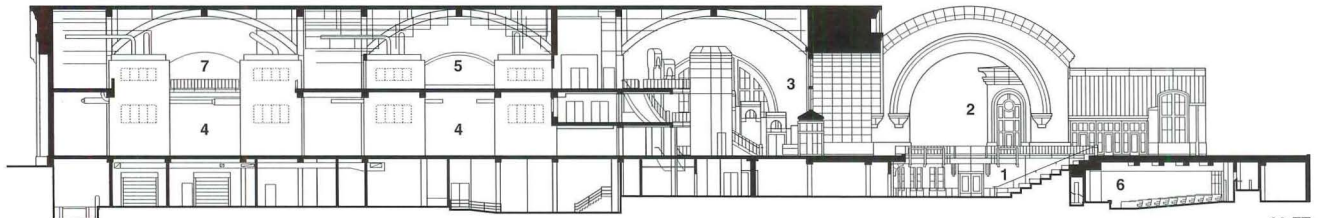
Each firm brought clearly identified strengths. Moore/Andersson, which had developed significant elements of the design in the competition, led the effort through the schematic phase. When the project reached design development, "we became more invested in the project," says Sundberg, "and began working with sub-consultants." He acknowledges the complementary nature of a relationship based on shared values; however, initial decisions were often deferred to the design architect for concurrence. "We were not trying to outshine Moore/Andersson," Sundberg says. He also cites airline travel for face-to-face meetings between the associated architects as a boon to the relationship.

Work shifted between Texas and Seattle as the job progressed. The topics were far-ranging, but conversations were compressed by a quick five-month window for construction-document preparation. Both companies had to agree, quickly, on the esthetic issues surrounding detailing of brick and concrete, the primary building materials. Here is how they worked: Moore/Andersson developed the

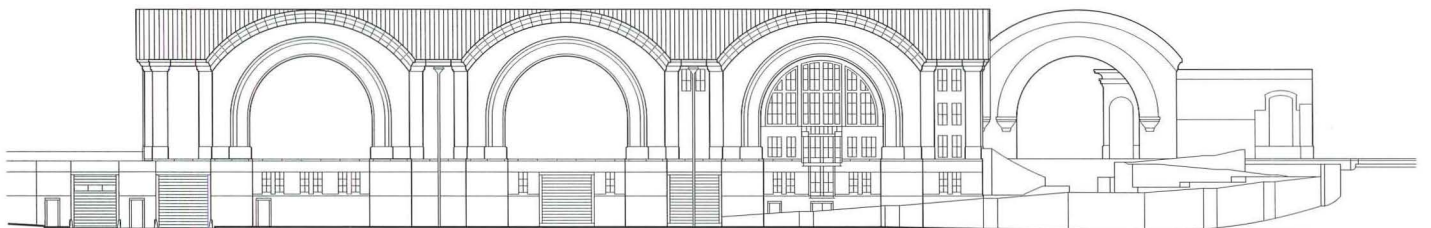


The outdoor amphitheater (above), rises from the concourse level to the entrance.

- | | |
|-----------------------|-----------------------|
| 1. Amphitheater | 5. Temporary exhibits |
| 2. Open | 6. Auditorium |
| 3. Lobby | 7. Future exhibits |
| 4. Permanent exhibits | |

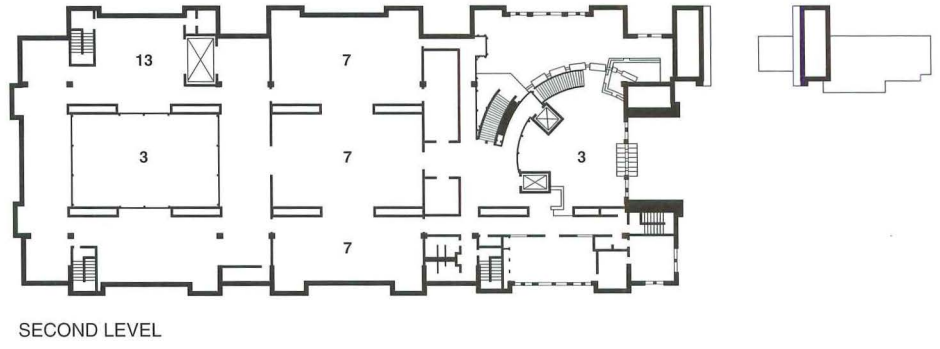


SECTION A

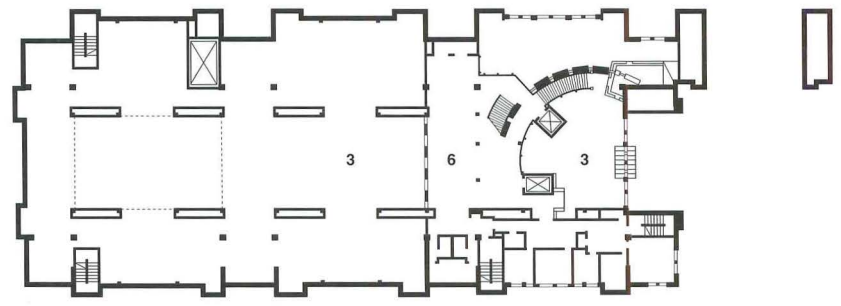


EAST ELEVATION

The building plans explain the museum program. The concourse level houses storage and education functions, including classrooms and the auditorium; permanent exhibit space is on the first level behind the lobby; offices and community-meeting spaces are on the mezzanine. The second level includes traveling exhibitions and the board room.

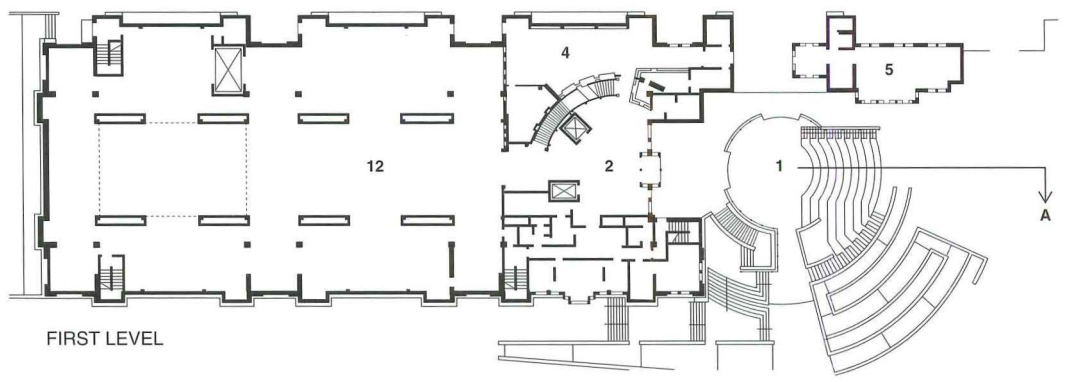


SECOND LEVEL

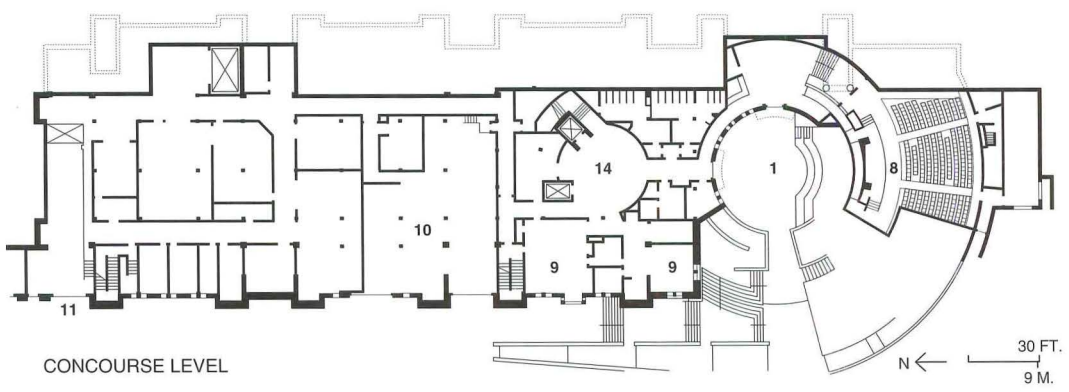


MEZZANINE LEVEL

- 1. Amphitheater
- 2. Lobby
- 3. Open to below
- 4. Bookstore
- 5. Cafe
- 6. Mezzanine
- 7. Temporary exhibits
- 8. Auditorium
- 9. Activity room
- 10. Mechanical equipment
- 11. Loading dock
- 12. Permanent exhibits
- 13. Future exhibits
- 14. Concourse lobby



FIRST LEVEL



CONCOURSE LEVEL



proportioning systems for the large masonry arches in Texas; Olson Sundberg, which had little experience in brick, detailed the walls to achieve the proportions. Olson Sundberg, which had a strong history in concrete detailing, took the lead in working out that material's handling. Andersson, who wanted a curved metal fascia, allowed the Seattle architects to devise a faceted, segmented substitution—a more practical solution. Although both architects mention the challenges posed by the heroic scale of the concrete work, “structurally, the building went together beautifully,” Sundberg says.

The association of architects paid off. When the history museum was bid, “we had wonderful drawings,” says Copland, the state’s project manager. Contractors were pre-qualified for bidding, reviewed for previous experience on projects of comparable scale and type—a first for the State of Washington for a design-bid-build project. Nevertheless, there were risks involved in a bid that was decided on lowest cost. “There were no alternates [additional design elements that are sometimes used to control bid cost], just one number.” Of seven final bidders, three were within \$50,000 of the estimate. “We had a contractor [Ellis-Don Construction, Inc.] and away we went.”

A complicated schedule of charge orders

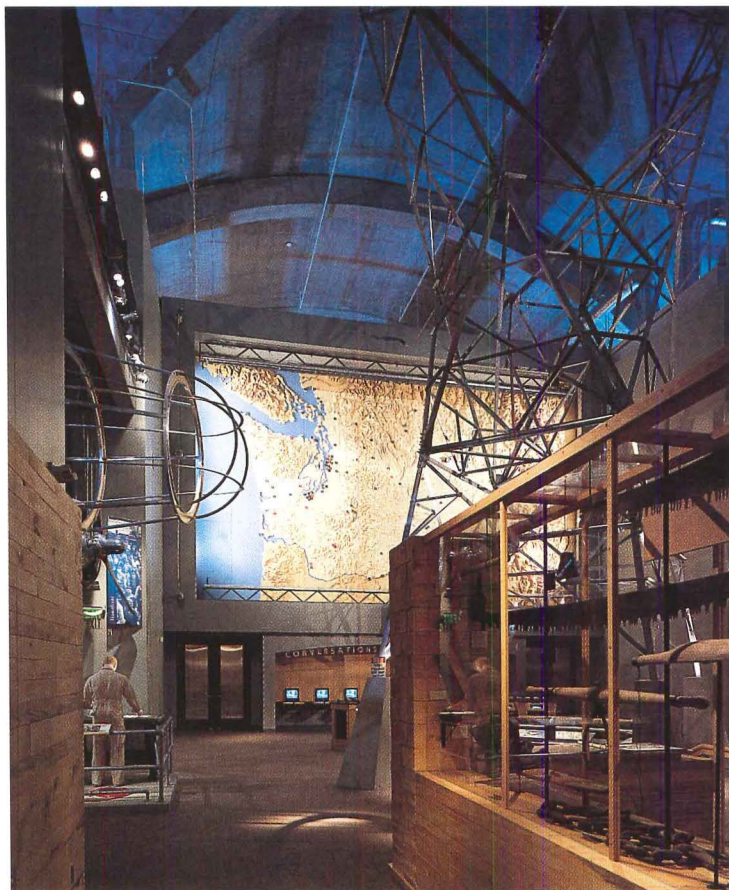
Two factors compounded the builders’ difficulties. First was the challenge of pouring 52-ft-high concrete walls. Many were accomplished in single pours; one of the first pours took 14 hours. A second challenge was the phasing of exhibit design, written on a separate contract, with general construction. Exhibit design followed construction of the building by one phase, according to Copland, requiring “a kind of third project in between—modifying the building as it was being constructed—and a lot of electrical and communication work.”

Keeping track of the complicated schedule, of change orders and progress could have been daunting to a museum with a small staff and no experience in new construction. A licensed engineer employed by the Historical Society followed the project throughout the construction phase as a special construction manager, acting much like a traditional “clerk of the works.” In addition, the museum had designated a project coordinator within its executive staff, Redmond Barnett, who has since become the head of exhibits.

Although the schedule had to be modified as it progressed, the project was completed on time. Change orders brought the building’s total construction cost, exclusive of exhibits and fees, to \$23 million. The possibility of adding a second phase for the total project remains, awaiting further funding. “We could continue to function and connect two additional bays like opening a valve,” says Copland.

The building opened to favorable reviews on August 10, 1996. Michael Sullivan thinks that the demanding process worked for Tacoma: “The museum has been the creator of character and purpose, defining the streetscape, bringing people here for leisure and intellectual time.” According to Nicandri, the staff appreciates the new museum’s “capaciousness, its ability to hold things and people.” But he says that the most flattering reviews have come from patrons who “thought that the building had always been there and had just been remodeled.”

Robert Ivy



The permanent exhibit hall, as conceived by designer Herb Rosenthal, houses interactive displays and an electrical transmission tower. The entrance lobby (opposite) rises 52 ft to a precast-concrete, vaulted ceiling. Walls and arches are poured-in-place concrete. Freestanding elevator towers lend scale and help orient visitors.

Credits

Washington State History Museum

Tacoma, Washington

Architect: Moore/Andersson Architects—Charles W. Moore; Arthur W. Andersson, principal-in-charge; Steven Dvorak, project designer; Susan Benz, project manager

Associate Architect: Olson Sundberg Architects—Rick Sundberg, principal-in-charge; Scott Allen, project manager

Project Management: Dept. of General Administration, Div. of Engineering and Architectural Services, State of Washington

Engineers: Chalker, Putnam, Collins & Scott (structural); Affiliated Engineers, Inc. (mechanical/electrical);

Consultants: Summit Technology (civil); Nakano Dennis Landscape Architects (landscape); Peters & Myer Illumination Design Collaborative (lighting)

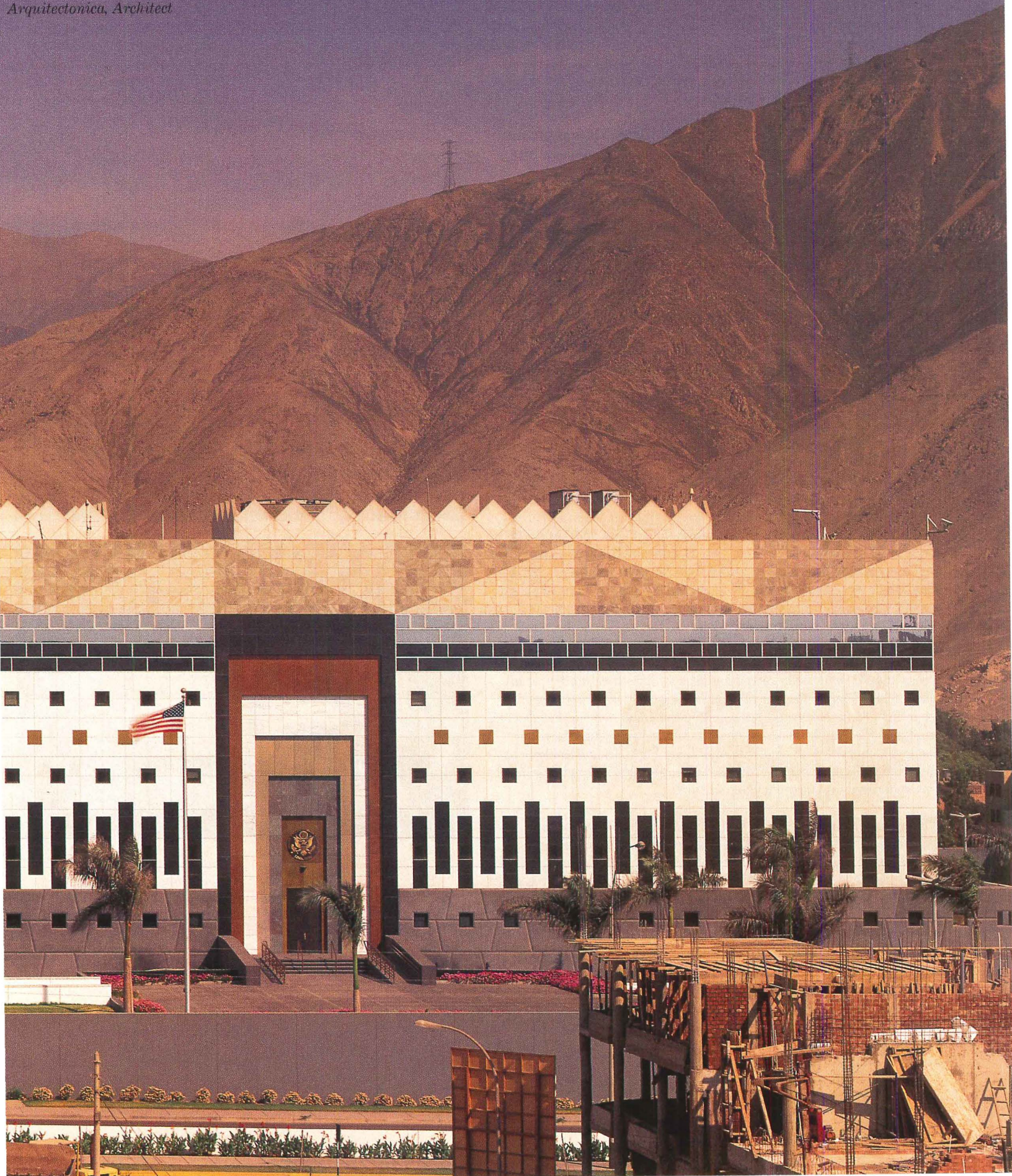
General Contractor: Ellis-Don Construction, Inc.

A Fortress With No Apologies

*Designed in the wake of attacks on
U.S. facilities, an embassy puts
security first. Has it gone too far?*



*United States Embassy Chancery Building
Lima, Peru
Arquitectonica, Architect*



One of the most secure buildings in the entire world," is what the facility manager of the new United States Embassy in Lima, Peru, calls his charge. It certainly looks that way. It's longer than a football field by nearly a third (a typically American form of measurement), some 90-ft high, with few windows, and, like a Medieval fortress, surrounded by seemingly impenetrable walls. When the building was being designed in 1989, Lima was one of the most dangerous cities in the world. The activities of a terrorist group known as The Shining Path, participants in a civil war that, according to *The New York Times*, had cost 35,000 lives and \$25 billion in damage, included frequent attacks on the former U.S. embassy, a more open, street-front structure in the city's downtown.

A new world

At the time it seemed only prudent to design an embassy that would meet the strictest security standards. But the Peru that greeted the new embassy, dedicated with appropriate pomp and circumstance on July 4, 1995, is a changed place. With the capture of the leaders of the Shining Path in 1993, the era of widespread lawlessness and near economic dissolution is, if not over, then in remission. The Peruvian economy has been transformed under the leadership of President Alberto Fujimori, now in his sixth year and second administration. Inflation has dropped from 7,500 percent to 10 percent annually and economic growth has set a record in Latin America. Fujimori is getting high marks from his constituency for his war on crime and poverty, and his aggressive enticement of foreign investment. Currently, he enjoys an approval rating of over 60 percent.

The changes of the last half decade are evident throughout Lima. A new crop of strip shopping malls has been layered on top of the existing fabric that includes grand Spanish Colonial mansions and civic monuments, tree-lined plazas, and standouts of International Modernism. The once perilous drive from the airport through some of the city's poorest sections to more affluent downtown neighborhoods like San Isidro and Miraflores is now paved with outward signs of prosperity, American-style: new outposts of Kentucky Fried Chicken, Tony Roma's, and Blockbuster Video.

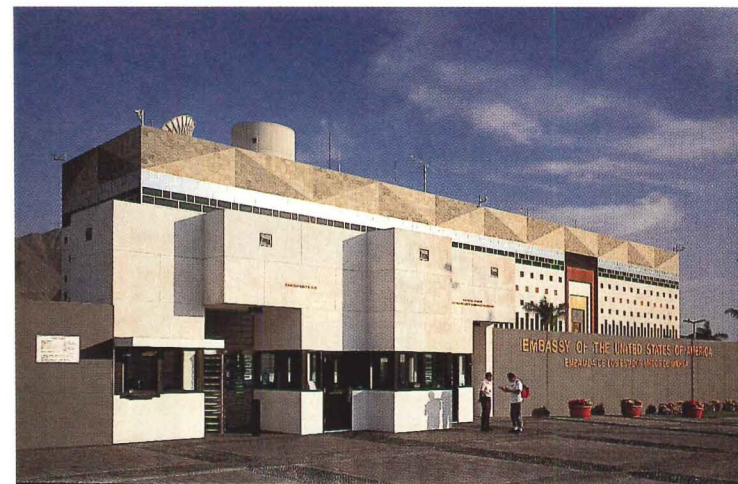
But, even as Fujimori's economic turn-around is touted in the foreign press and Peru has been repositioned as a tourist destination, holdouts of The Shining Path have been making very different news. The guerrilla group took credit for bombing the Lima home of Peru's chief military officer and a central police station in early August. A full-fledged comeback is deemed impossible by Fujimori and unlikely by international experts on terrorism, who argue that the Shining Path has splintered into irreconcilable factions.

There remains, however, a powerful monetary incentive for the group's activities since it offers protection to coca growers in the dense jungle of the Huallaga valley, the country's main coca-growing region, which is said to be responsible for the raw material for nearly half of the world's cocaine supply.

The new-generation embassy

While Peru is undergoing intense political and physical change, so is the very nature of U.S. embassies, not only in their role as emissaries of American culture, political and economic policies, and moral values, but also in their public appearance. "U.S. embassies were, until recently, designed to convey the image of a nation confident in its guiding principles and open to the world," stated Stuart L. Knoop, an expert in embassy design, in this magazine [*RECORD*, August 1992, pages 36-37]. But embassy design was irrevocably changed in 1983,

The embassy campus is located in the Monterrico section of Lima, east of downtown (opposite). It is in the foothills of the Andes mountains on land that was once used for polo fields. The Lima Polo club still maintains two playing fields behind the embassy.



© Peter Aaron/Esto photos

Visitors to the embassy must pass through a sally port (above). The majority are applying for entry visas to the U.S. and must proceed to the consular courtyard at the building's north end rather than queue out front as at the former embassy. A courtyard with palms is used for formal visits (top).





when the U.S. Embassy and marine barracks in Lebanon were attacked by truck bombs. America responded to the Beirut attack with the passage of the Omnibus Diplomatic Security Act of 1986 and the institution of new embassy design guidelines.

Finding the right site, right architect

An important early step for the U.S. Department of State's Office of Foreign Building Operations (FBO) in overseeing the design of a new-generation embassy is the selection of the site, one large enough to accommodate the new FBO preference for 100-ft setbacks from the street and parking separated from the building. Convenience for employees, visiting Americans, and the over 400 Peruvians who seek entry visas to the U.S. daily is sacrificed for safety. Amid the sprawl of Lima, the choices were limited, and the FBO eventually purchased 1 1/2 polo playing fields from the Lima Polo Club, a total land package of some 21 acres, in Monterrico, a growing residential and commercial neighborhood in the east edge of the city, near the foothills of the Andes.

The Miami-based firm Arquitectonica was selected as architect based on the qualifications of the team it assembled. Principal Bernardo Fort-Brescia's Peruvian heritage, an asset in the firm's capture of the \$54-million Banco de Credito commission in Lima [RECORD, February, 1989, pages 90-99] was, the architect claims, a mixed blessing when it came to the U.S. embassy because of political tensions that then existed between the U.S. and the host country. His firm's previous experience with the bank, which was at a scale, structural complexity (the building is in an earthquake zone), and level of finish unusual for Lima at the time, outweighed any perceived risks of divided loyalties. What's more, he, like all members of his firm who worked on the project and all firms that do work for the FBO, was subject to background checks to obtain security clearance.

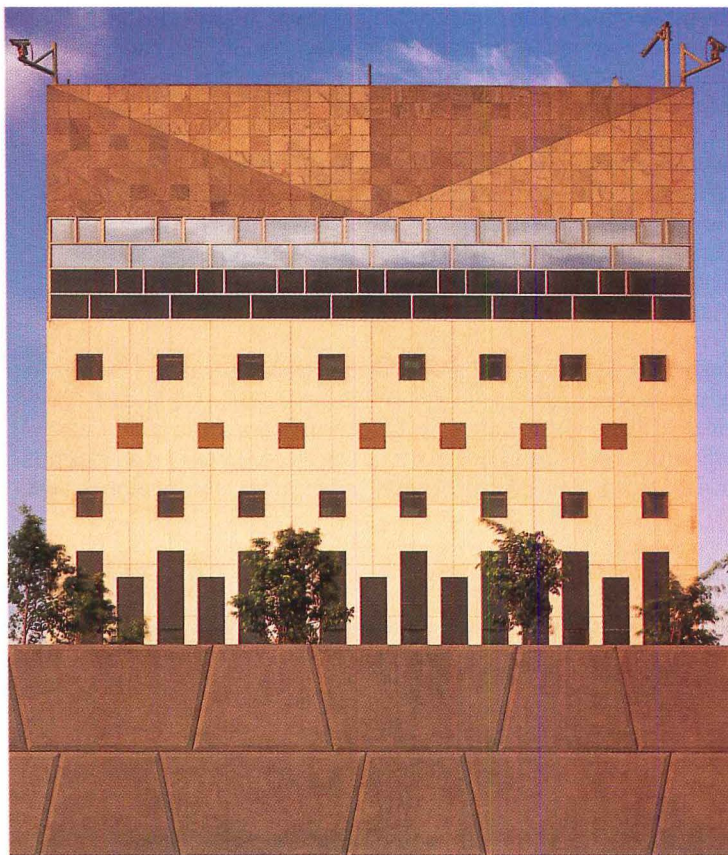
The message is "keep out!"

Like many of the embassies built since 1986, (Bolivia, Chile, Columbia, Cyprus, El Salvador, Kuwait, Jordan [RECORD, May 1993, pages 66-73], Oman, Thailand, Venezuela), the Lima embassy puts a different face on foreign diplomacy. Forget architecture as goodwill ambassador. The message now is "keep out!" Following the adoption of the more stringent guidelines, which in addition to setback requirements, also limit the percentage of surface area that can be devoted to windows and the actual size of the openings (in this case, 15 percent of the structural bay of 32.5 ft wide by 13 ft high), virtually pre-determines a bunker-like appearance.

As with the Banco de Credito, Arquitectonica's brash style proved ideally suited to the task. The firm originally proposed three possible schemes within a masterplan that included an Ambassador's residence, Marine dormitories, and an annex office building (all of which remain unbuilt, for now), which is consistent with FBO requirements. A Z-shaped structure and a courtyard scheme were dismissed in favor of the single rectangular volume that was ultimately built because, says Fort-Brescia, the "corner is the weak point" for blast resistance. "The fewer corners, the better."

The program was big and complex—from offices for the Ambassador and a vast array of staff to consular services; accommodations for Drug Enforcement Agency personnel; information libraries; and medical, security, and housing services for members of the Foreign Service stationed in the host country. To accommodate these functions, the rectangular block had to be enormous: 200,000 sq ft in five stories. The architects studied the proportions of various rectangles,

The front entrance, which is primarily for ceremonial use, is framed in alternating bands of American and Peruvian stone and metal (opposite). The bronze door was designed by Arquitectonica principal Laurinda Spear.



The facade was designed as a tapestry to cloak the five-story bulk and minimal fenestration, "a Modern architectural version of a pre-Columbian textile," according to Arquitectonica (above). Different materials give the illusion of depth. (Terrorists can't scale flat surfaces.) Reinforced perimeter walls are meant to resemble rock patterns of Inca structures.

eventually accepting that the building would have no subtle manipulation of form, save for the ceremonial entry framed by alternating planes of stone and metal that give the appearance of a forced perspective. "There is a moment when you decide there are no apologies," says Fort-Brescia of attempts to disguise the building's bulk. "How do you give life to this coffer? You make it into a mural."

"Neo Andean" style

Arquitectonica quite literally took inspiration from Peruvian history, modeling the base of the building on the structures of the ancient cities of Cuzco and Machu Picchu. (For more contemporary, defensive purposes, the trapezoidal panels are welded to steel plates embedded in concrete.) Layered on top are more Modern references that commingle Peruvian and American cultures. A grid of gold squares is meant to refer to Peru's rich mining heritage. Sized to match the windows, they make the wall look less formidable. The bands of tinted glass suggest ashlar-patterned stone while recalling the strip windows of Modern office buildings.

Meant to create the illusion of depth along the top is a triangular pattern of two shades of limestone, anchored to the concrete structure, like all facade cladding, by steel bolts on support angles. Glenn Cameron, local FBO civil engineer and project director, calls the overall mixture of patterns and materials "Neo-Andean style." Patrick Collins, FBO's chief architect, calls it a "billboard building."

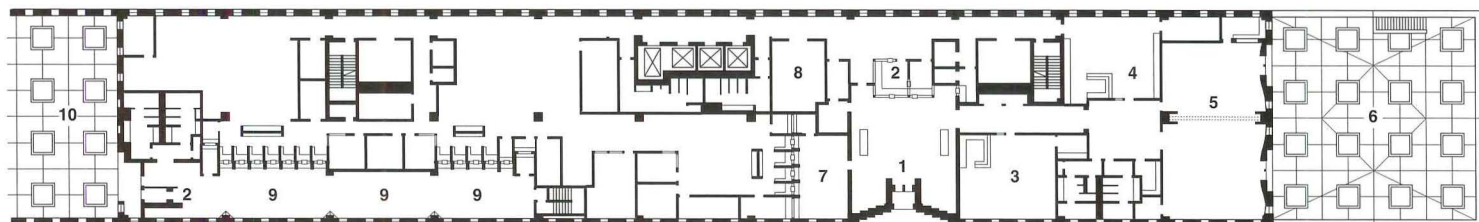
Inside, the building's footprint is highly flexible because it "allows for large chunks of contiguous, adjacent floor space," says Miguel Aparicio, FBO's project architect for Lima, who rates the overall plan of offices as "very successful," particularly since embassy staff is continuously growing and shrinking, affected by government cutbacks and

the changing demands of the host country. A main corridor along the east wall provides views to the mountains and, says Aparicio, reduces the need for orienting graphics. A landscape plan that includes palm trees and lush lawns is proving costly to maintain, since it rarely rains in Lima and the local river that was to be diverted for irrigation does not meet American Food and Drug Administration health and safety standards. (A water-treatment facility is in the works since, as embassy workers concede, high water bills for the use of city water, which is a precious commodity, are not good for public relations.)

The dawn of yet another era

While the Lima embassy employs elaborate security techniques, recent events—the attack on barracks in Saudi Arabia and the destruction of the Murrah Federal Building in Oklahoma City—suggest that the notion of who "the enemy" is is subject to change. Are architects to design against a "war or a weirdo?" asks Fort-Brescia.

Whatever the defensive position, the overall public image of the ultra-secure embassy is uncomfortable to many, including those who work inside the walls. As FBO's Collins explained to RECORD regarding the design competition for the new U.S. embassy in Berlin [RECORD, March 1996, pages 36-43], diplomatic personnel are increasingly resistant to living behind walls. In fact, FBO relaxed building-setback requirements for embassies currently being designed, including Berlin and Ottawa, partly to avoid the effect of a fortified compound, partly to respond to the realities of an urban context, and partly due to the prohibitive cost of applying the 1986 standards around the world. These developments shed new light on the Lima embassy: is it, one year old, anachronistic already or, is it, in an ever-volatile world, harbinger of the future? Certainly it's one of a kind. *Karen D. Stein*

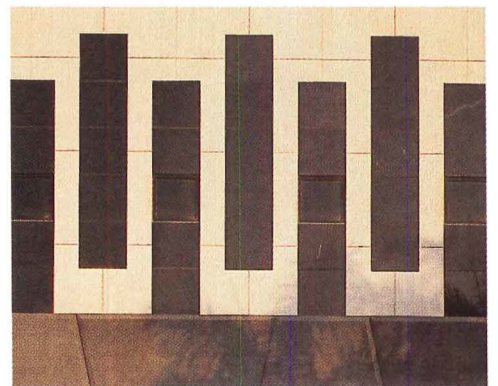
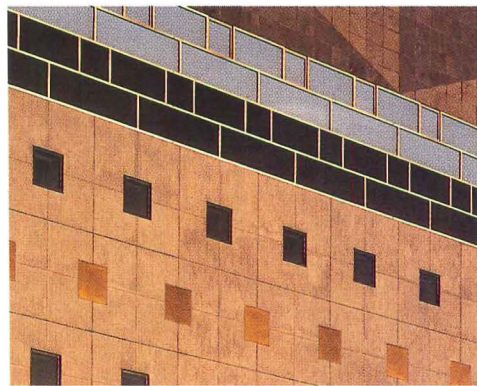


GROUND FLOOR

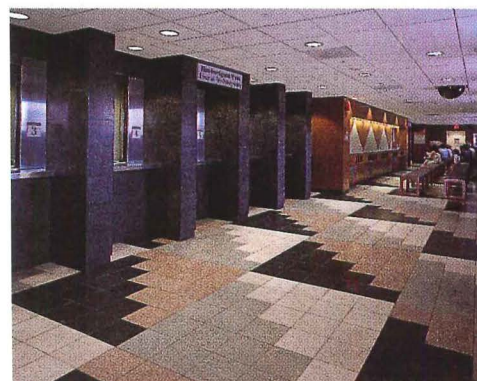


Due to U.S. Department of State security requirements, only a schematic floor plan can be shown.

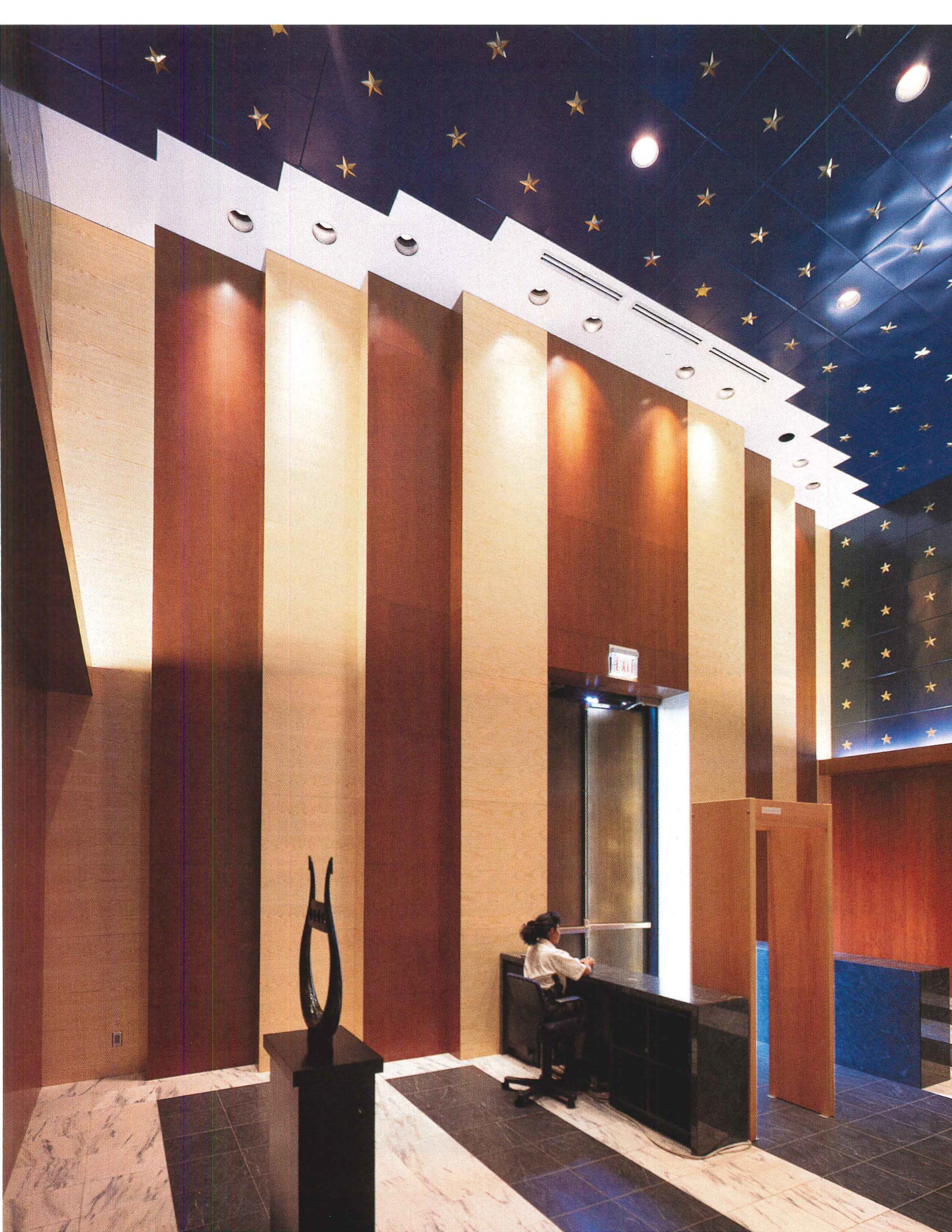
- | | |
|--------------------------------|------------------------|
| 1. Ceremonial lobby | 6. Reception terrace |
| 2. Security checkpoint | 7. Library |
| 3. Business information center | 8. Conference room |
| 4. Research center | 9. Consular services |
| 5. Auditorium | 10. Consular courtyard |

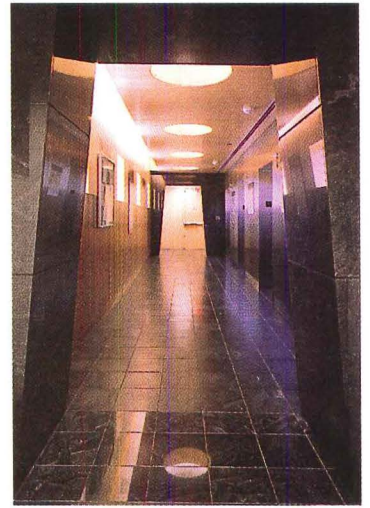


Arquitectonica's use of materials counters the impression of impenetrability. Gold-painted stainless-steel squares mimic windows (above middle) and, along with strips of tinted glass at the building's top, give the impression of more openings. The architects took advantage of a higher grade on the north side to create a protected forecourt for consular services (top), where Peruvians come to apply for visas to the U.S.



Inside the consular area, one of the most heavily-used sections of the embassy, is a waiting room with terrazzo floor patterns that are meant to recall Peruvian textiles (left). Consular officials review visa applications from behind protected booths.





Walls of the ceremonial lobby are lined with two wood species creating broad stripes, while the ceiling is covered in blue metal panels with gold stars (opposite and top). A security checkpoint is occupied by a receptionist and an on-duty Marine who direct visitors (above). Upstairs, corridors are lined with black granite columns. Their forms were derived from ancient Incan structures (top right).

Credits

*United States Embassy
Chancery Building
Lima, Peru*

Architect: *Arquitectonica—Bernardo Fort-Brescia and Laurinda Spear, principals-in-charge; Armando Trujillo, Martin Wander; project managers; Sergio Bakas, project architect; Ailsa Simon, Eduardo Luaces, Dan Zabowski, Peter Alvarez, Janice Rauzin, Diana Farmer; Tony Moreno, team*
Engineers: *EDAW (civil); Lehr & Associates (mechanical/electrical/plumbing); Riva Klein & Partners (structural); Law Engineering (geotechnical)*
Consultants: *Arquitectonica with MBB Design (interiors); EDAW (landscape); Robert J. Laughlin & Associates (lighting); Cini Little International (kitchen)*
General Contractor: *J.A. Jones and Graña Montero*

A Quiet Sanctuary By the Highway

Responding to an appeal from General Douglas MacArthur, American missionary Dr. George Gurganus came to Japan in 1949 with the hope of helping the war-ravaged country rebuild itself. Little did he know that some 45 years later his efforts would produce the 800-member Tokyo Church of Christ, and that the congregation's wooden building would be overflowing. Nor could he have imagined that the modest church would be replaced by a new structure designed by Fumihiko Maki, one of post-war Japan's leading architects.

The opportunity to erect a bigger facility came in 1994 when the Tokyo Metropolitan Government bought a third of the church's property. The land, which faces one of Tokyo's multi-lane ring roads, as part of a program to relieve traffic congestion by widening major thoroughfares. The handsome compensation the members received enabled them to realize their dreams of expansion.

One of the project's greatest challenges was siting the large hall on the small plot, given severe restrictions on shadows the building could cast on the surrounding residential neighborhood. Maki limited the length of the shadows by stepping down the building, put daily functions, such as offices, fellowship hall, and children's room, on the larger first floor and the main sanctuary on the second. This allowed the creation of a sequence of spaces: the church-goer is gradually disengaged from the noise of the city, starting at the entrance lobby, and proceeding up the grand stair, through the sanctuary foyer, and ending at the heart of the 24,000-sq-ft church, its 700-seat sanctuary.

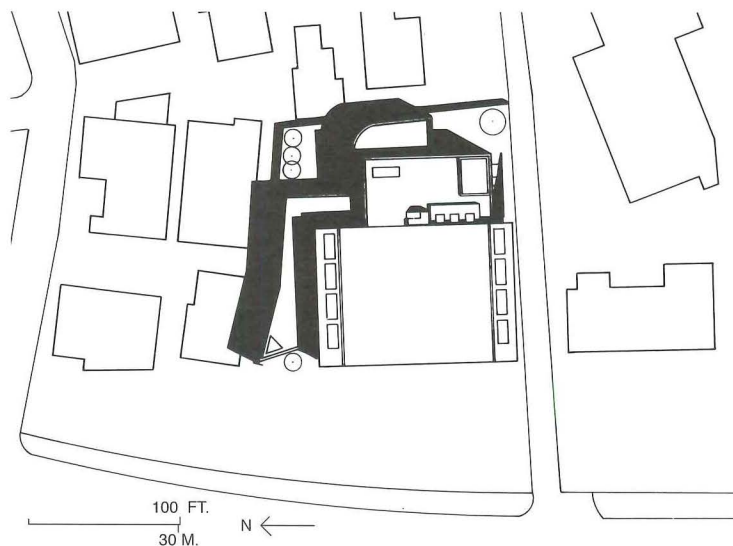
Though the hall is oriented toward the street, the translucent glass wall forming the podium's backdrop on the inside and the front facade outside separates them entirely. The milky-glass enclosure lets in abundant daylight, creating a contemplative atmosphere where the play of light and shadow change throughout the day and filtering out distractions from the city beyond. The wall is composed of four layers of glass, two exterior and two interior, separated by a 30-in. air space that not only houses its Vierendeel truss structure but also functions as a vast return air plenum where hot air is drawn into ceiling ducts by natural convection. While ceramic frit on the outer pane helps reduce heat gain and glare from the western exposure, two thin sheets of fiberglass tissue sandwiched between the inner-glass layers create a "shoji" effect inside.

Clusters of pendant light fixtures are suspended over the congregation like constellations. "Metaphorically I wanted to produce a small cosmos," explains Maki. At either side, the curved surface is contained by splayed walls, and where wall and ceiling meet, skylights bring additional daylight into the depths of the sanctuary. In contrast to the dramatic ceiling and monolithic glass wall, Finnish white birch adds warmth to the hall. Outside, sumptuous materials and glossy finishes were also minimized in favor of concrete, glass, and aluminum panels painted a translucent, brownish-silver gray to reduce their metallic sheen. "We didn't want the church to look too luxurious given the spirit of the place, but at the same time the materials had to have an enduring quality," says Maki. In his first church, Maki has employed his familiar vocabulary of materials and motifs, but this time they tell a new poetic tale. *Naomi R. Pollock*

A four-layered glass facade screens out the city's sights and sounds while filling the church sanctuary with daylight.

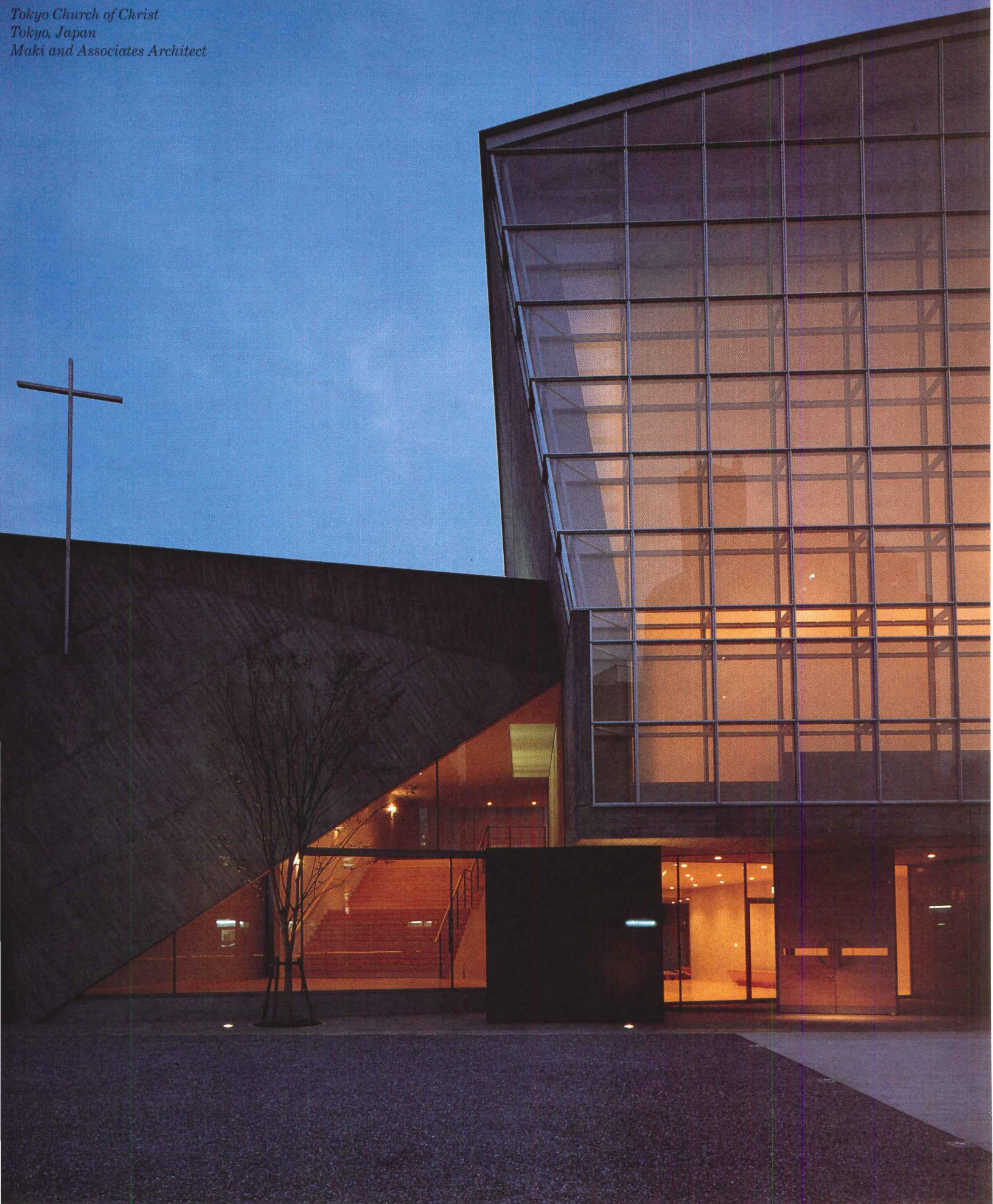


© Toshitaru Kitajima



The church's glass facade and arched stainless-steel roof stand out even against the backdrop of one of Tokyo's busiest ring roads (above). The large panes of glass establish the rhythm of the facade (opposite). The sanctuary and third floor are stepped back from the third floor to limit the length of shadows on adjacent property (site plan).

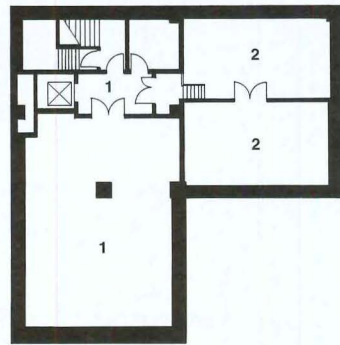
*Tokyo Church of Christ
Tokyo, Japan
Maki and Associates Architect*



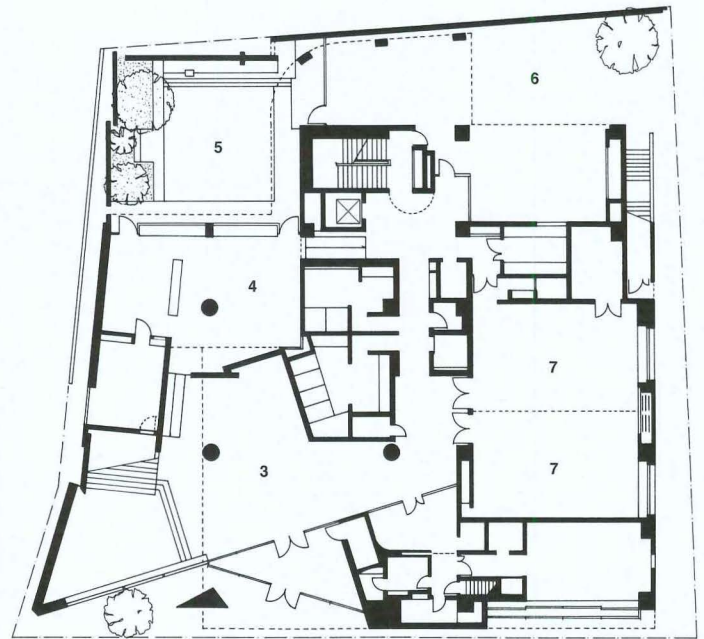
Conceived of as a big house, the church has plenty of spaces (plans below) for informal gatherings. A wood grille edits out the street (opposite top left). From the outside, the glass

facade reads like a modern curtain wall (opposite top right). From the inside, the wall, whose cavity is lined with thin sheets of fiberglass tissue, recalls a traditional "shoji" screen (opposite

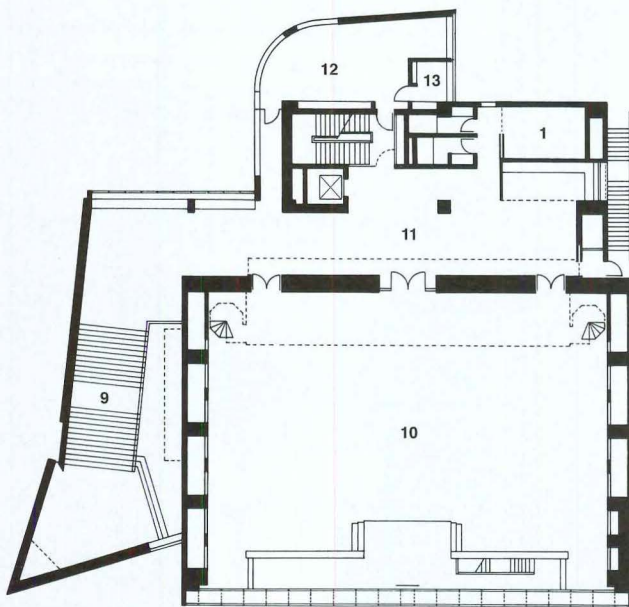
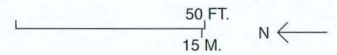
bottom left). Spiral stairs lead up to the balcony in the main hall (opposite bottom right).



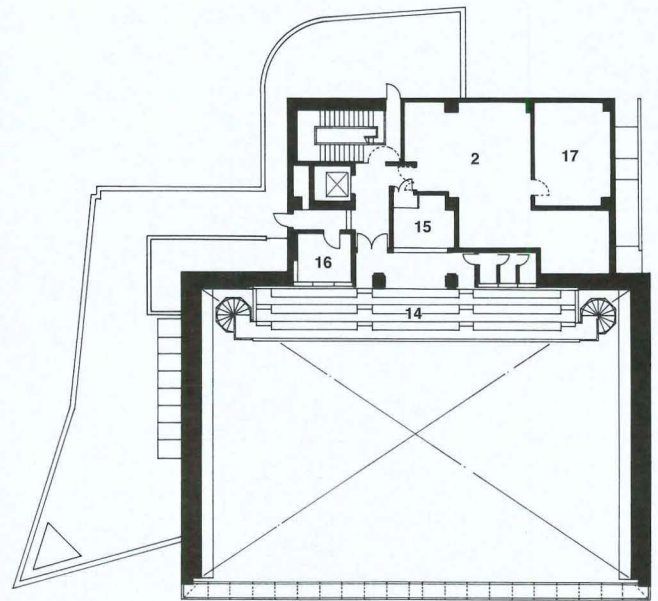
BASEMENT



FIRST FLOOR

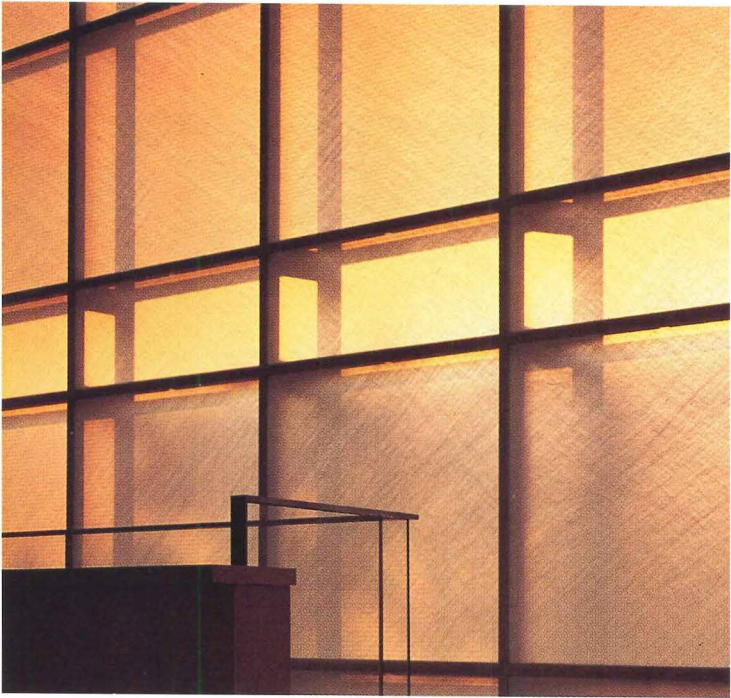
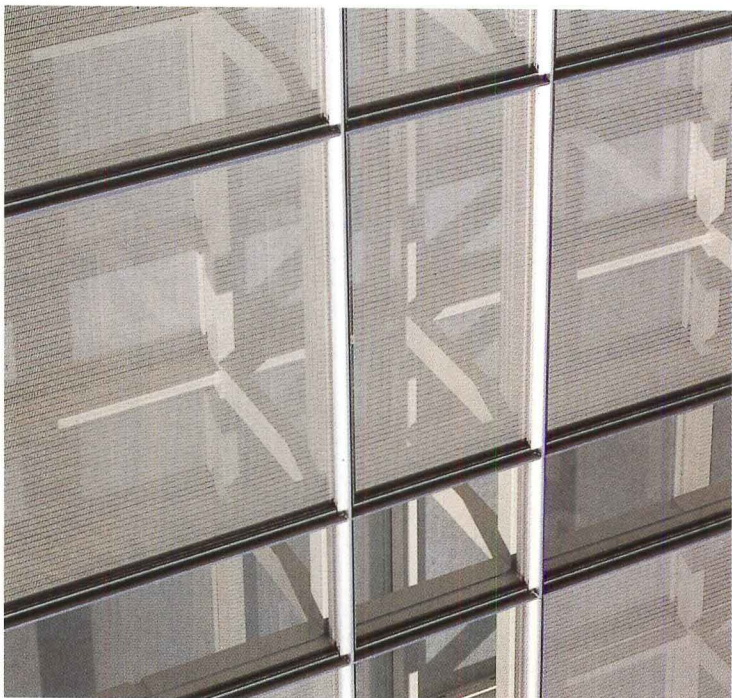
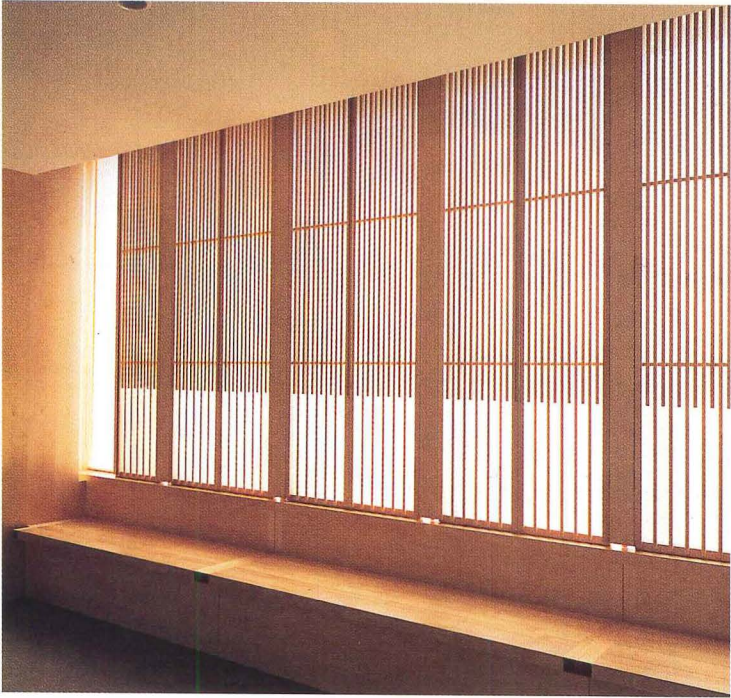


SECOND FLOOR



THIRD FLOOR

- | | | |
|---------------|---------------------|---------------------|
| 1. Storage | 7. Meeting hall | 13. Study |
| 2. Mechanical | 8. Nursery | 14. Choir loft |
| 3. Lobby | 9. Main stair | 15. Projection room |
| 4. Lounge | 10. Main hall | 16. Infants' room |
| 5. Garden | 11. Foyer | 17. Cooling tower |
| 6. Parking | 12. Conference room | |



The main sanctuary can accommodate seating for 500 on its flat floor. An additional 200 seats are on the balcony at the rear of the room. Pendant fixtures and sconces designed by Maki complement the daylight filtering in through the sanctuary's glass wall and edge skylights.





Credits

*Tokyo Church of Christ
Tokyo, Japan*

Architect: *Maki and Associates—Fumihiko Maki, principal; Iwao Shida, associate-in-charge; Reiko Tomuro, project architect; Tetsuya Mori, Mark Mulligan, designers*

Interior Designers: *Maki and Associates*

Engineers: *Kimura Structural Engineers (structural); Sogo Consultants (mechanical, electrical, plumbing, and lighting)*

Consultants: *Kumiko Nagano, G Planning (planning); Nagata Acoustics (acoustics); Maki and Associates (landscaping); Yamagiwa Lighting (special lighting)*

Designed To Lure Cars Off the Road

Stripped of giant signs, this gas station at Disney World by Hardy Holzman Pfeiffer Associates acts as its own billboard.



*Exxon Service Station
Lake Buena Vista, Florida
Hardy Holzman Pfeiffer Associates, Architect
Orlando Alonso Architects,
Architect of Record*



Rescuing the gas station from the anonymity of the everyday landscape was the challenge facing Hardy Holzman Pfeiffer Associates (HHPA) when the Disney Development Corporation hired the firm to design an Exxon service station at Disney World. "It forced us to think about something we take for granted," says Hugh Hardy, the principal on the project. And since the client wanted to see four schemes before selecting one, "we had to think about it in four different ways."

Located at the main entrance to the Epcot Hotels complex (where Michael Graves's Dolphin and Swan hotels grab attention), the new gas station serves as a kind of gatehouse to the heavily themed environment just down the road. Competing corporate themes, though, aren't welcome in the Disney universe, so the giant logos sitting atop towering poles and the bright-as-day lighting schemes that oil companies typically use to call attention to their gas stations were ruled out-of-order here. The building would have to be its own billboard, readable from a moving car.

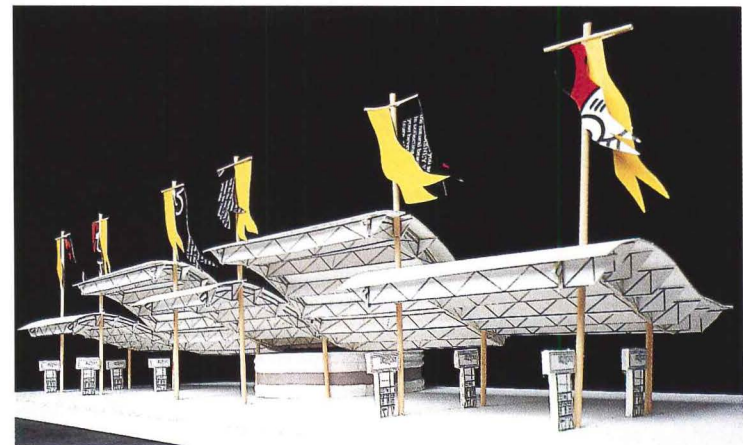
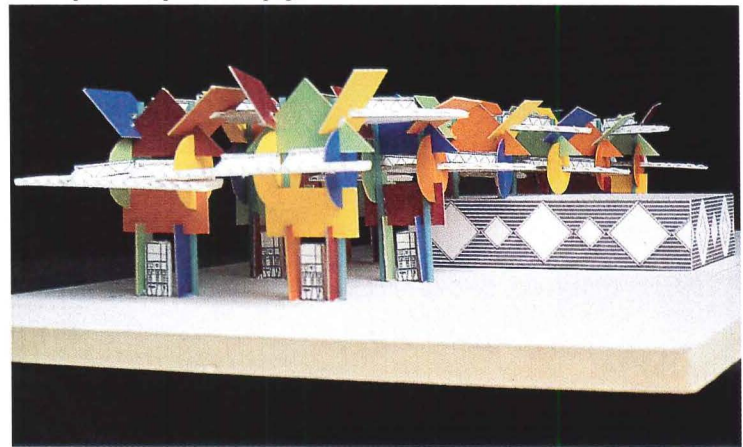
"We wanted something open and transparent, something that would glow at night," explains Hardy. In the scheme Disney selected, the dominant structure is a gabled canopy hovering above eight gas pumps and a 2,000-sq-ft service building. At night, 1000W quartz uplights bounce off the underside of the structure's corrugated metal roof, turning the station into a beacon on the flat Florida terrain. "Most buildings are about enclosure," says Hardy. "But this one is open. It's just a porch. I love the simplicity of it."

Seeing the station as a pavilion in a garden, Hardy considered adding plants and vines to the trellised gables. "Maintenance, though, was a problem," he reports. "Getting controlled growth of the greenery would have been almost impossible." The architects had more success introducing green areas around the structure, rather than on it. While gas stations at corner locations usually run parallel to one of the intersecting streets, HHPA decided to angle it between the two streets so it would have a high profile from all directions. And by pulling the station back from the corner, the architects were able to create landscaped areas on all sides. "We didn't want to pave the whole site," notes Hardy.

The layout of the station itself (including turning dimensions and the distance between gas pumps) followed rules set by Exxon. But the architects had some fun with the service building, dressing it up as a "Key Largo hut" with Caribbean colors and hipped roof, says Hardy. The small building has metal louvers over a glass curtain wall, so it can be protected from the Florida sun. A small building with mechanical equipment is just behind the station—closer than Hardy would have liked but necessary for technical reasons.

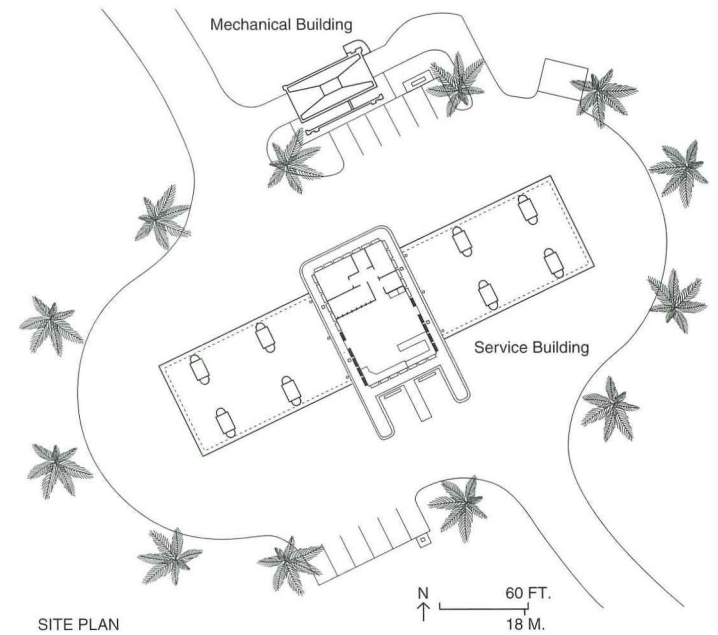
The schemes for the project that didn't get off HHPA's drawing board ranged from a pumped-up Lego set to a suburban commuter's vision of the Shingle Style to a wavy high-tech design (models and drawing, above right). The one that got built is the most straightforward, says Hardy. "It's probably the one that will look best over time."

For a site about a mile away, Disney hired Venturi Scott Brown & Associates (VSBA) to design another gas station. "We told both firms to be interesting and respond to their sites," says Peter Rummell, chairman of Walt Disney Imagineering, which includes the Disney Development Corp. For a more "urban" location, VSBA designed a building with supergraphics and cut-outs. Given its wooded site, HHPA's trellis scheme seems right, says Rummell. "Neither design would have worked on the other's site." *Clifford A. Pearson*



FRONT ELEVATION

At night, the station glows from the inside (opposite), like a beacon on the road to the Magic Kingdom. The structure is a simple steel frame with metal roof. Layers of overlapping vinyl lattice create see-through gables. Speaking of the design of the entire project, architect Hugh Hardy says, "We wanted as many layers as possible." To give the service station the sense of being an oasis, the architects surrounded it with a ring of palm trees (plan opposite) and landscaped areas beyond that. Alternative schemes (above) show a wide range of approaches to gas-station design.



Credits

*Exxon Service Station
Lake Buena Vista, Florida*
Architect: Hardy Holzman
Pfeiffer Associates—Hugh
Hardy, partner-in-charge;
Manuel Mergal, project
manager; James Brogan,
Kristopher Nikolich, design team
Architect of Record: Orlando
Alonso Architects
Engineers: Innovative
Engineering Group
(mechanical); Lace Consulting
(electrical); L.B.O. & Associates
(structural)
Landscape Architect: Ivey,
Harris & Walls
General Contractor: B & M
Construction

Hotels Are Back, But...

Hotels are the fastest growing construction category in the U. S. right now, but not all of it offers opportunities for architects. To find commissions, they should sharpen their focus.

FW. Dodge projects hotel construction up 20 percent this year—to more than 60-million sq ft. This makes the building type the fastest growing in the U. S. Of course, it had a long way to come from 1991, when it had plummeted to 14.6 million sq ft. As Hilton president Dieter Huckstein puts it: “In the mid-1980s, spending \$300,000 to \$400,000 [on construction] per key was not uncommon, while the average business person was only willing to spend [an unprofitable] \$100 rate per night.” The result, says Westin director of project management Rod Odegaard: Mortgage lenders became reluctant owners of properties constructed in an overbuilt luxury market.

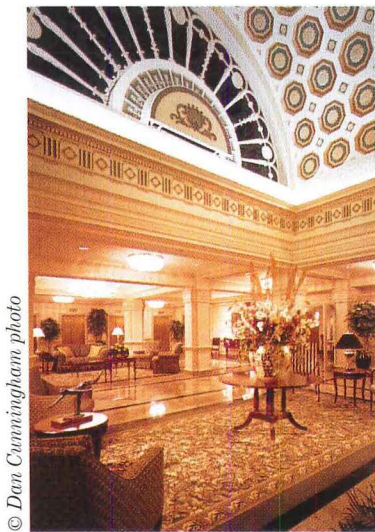
Today’s developers are more realistic. They focus on differing markets—including a large one for cookie-cutter economy hotels. These are often built to prototypes and offer architects little opportunity. Three other prospering markets, however, do:

1. Luxury business hotels abroad. U. S. involvement is mainly through the major chains, which rely on brand-name recognition to attract a clientele eager for speedy service, electronic communications and meeting facilities lacking in older hotels. *Standard & Poors* cites prime opportunities in developing countries, such as Southeast Asia and the former European Communist Bloc. But architects may have to

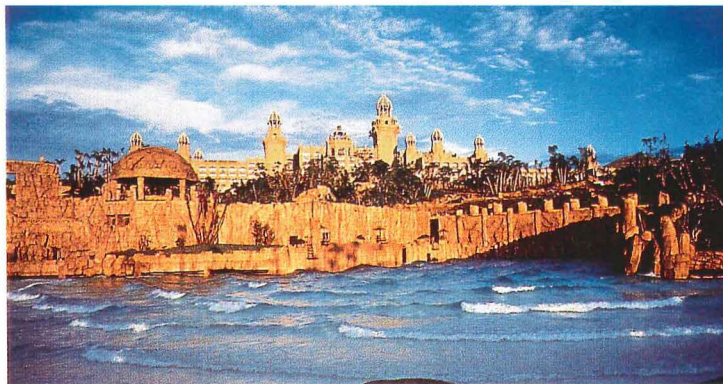
court a foreign client to get the design job. U. S. chains often operate or simply lend their names to hotels built by others. And American expertise in modern hotel design is no longer the entree that it once was, before others entered the field.

2. Resorts. Despite a seasonal nature, leisure destinations now are 36 percent of all hotel business, reports the American Hotel and Motel Association. Year-round occupancy rates of 71 percent in 1995 (vs. an all-hospitality average of 66 percent) are projected higher in 1996. This is a healthy market. To capture work in it, architects may need to indulge in some design fantasy (see Sun City photo, below). Owners and operators no longer rely on a clientele content to relax or pursue a single sport, such as golf or skiing. Now they promise “a total escape” to excitement, adventure, and romance—and often require designers to provide an appropriate fictional theme setting.

3. Renovation. Hotels spent almost \$1 billion on overhauls last year and the amount is going up. Most chains are in aggressive programs. Westin alone is spending “several hundred million,” claims CEO Jurgen Bartels. When big chains employ outside architects on any type of work, they generally must have a hotel-design track record. The better route to commissions for smaller architectural firms may be the boutique chains of renovators, such as the Kimpton Group based in San Francisco, with 19 hotels up and down the West Coast, and the Gotham Hospitality Group in New York City (see page 106), now working on its fifth project. These developers buy older buildings, many with architectural distinction, and turn them into small moderately priced hotels with often unconventional layouts where an architect’s design creativity means more than big chains’ efficiency formulas. As one architect says, “Stick with the markets where design counts.” *Charles K. Hoyt*



© Dan Cunningham photo

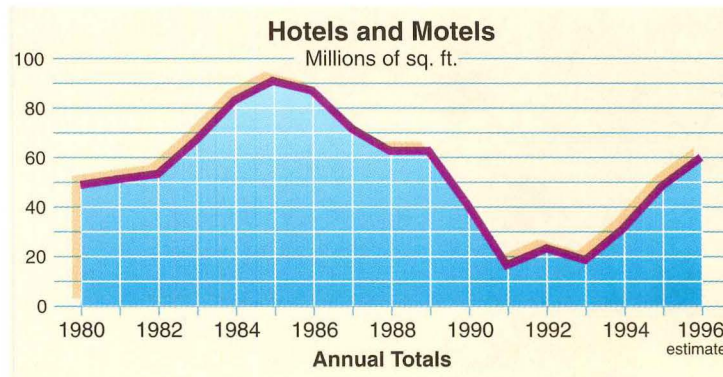


The graph (below left) tracks ups and downs of hotel construction. The most promising segments for architects in this market:

Renovation that captures past glories: The recently opened *Crowne Plaza* in Washington, D. C. (top left), is Brennan Beer Gorman/Architect’s makeover of a large-scale 1922 hotel stripped of detail in the 1970s.

Luxury for business people abroad: Architect Jose Cartana Gubran puts glamour into top suites outside the U. S. (bottom, left) at the new *Conrad International Hotel*, Barcelona.

Fantasy environments for resorts: In the middle of a desert, *Wimberly Allison Tong & Goo* summon images of the Raj, complete with a jungle-wildlife motif and man-made ocean, at the just-built *Palace of the Lost City* in Sun City, South Africa.



Hyatt Regency Hotel

Fukuoka, Japan

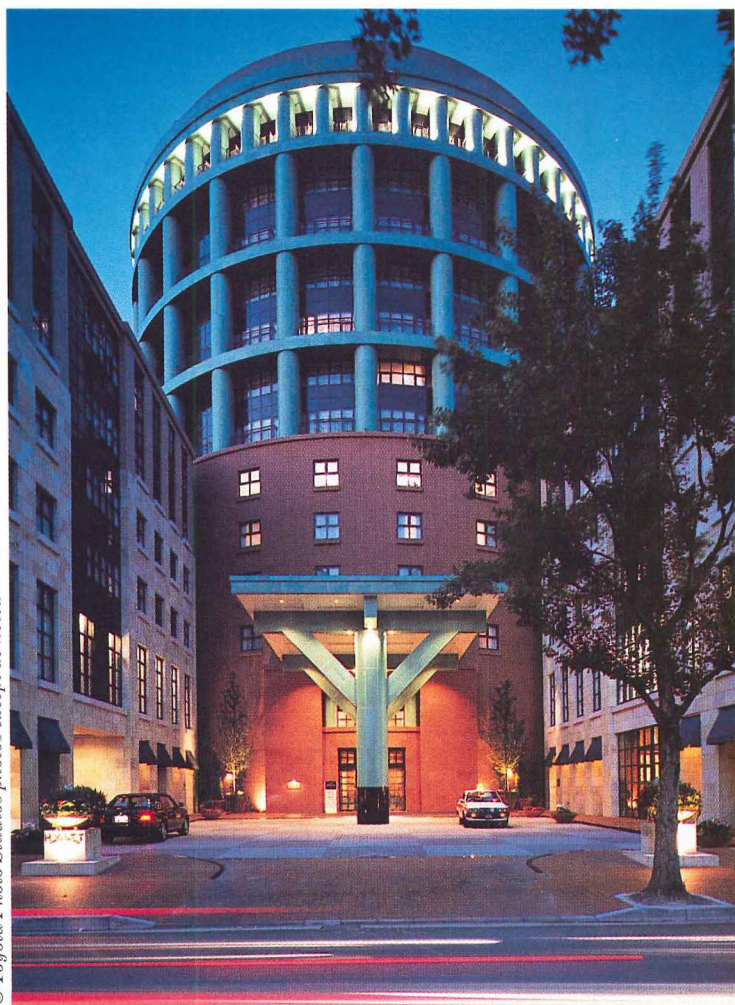
Michael Graves, Architect

Fukuoka Jisho Company

Maeda Corporation, Associate Architects

An overtly business-oriented hotel abroad run by an American chain, the Fukuoka Hyatt is built to operate in tandem with an attached 120,000-sq-ft office building housing prestigious Japanese firms. These use the complex's 260-room hospitality component to put up visiting guests and for runover operations in conference rooms and offices that are quickly converted from sleeping quarters. Other

business people from elsewhere in Japan sleep in rooms by night and convert them to do business with local companies by day. Bonuses for Hyatt are the unanticipated guests from outside Japan who stay for the same purpose, tourists who stay for the attraction of Michael Graves, Architect's spectacular building design, and the steady booking of the banquet hall for local social functions. *Continues*



The hotel (above) and an attached office building are built on a tight linear site (plans, following pages). While the function of both buildings is essentially business, their elaborate public rooms draw constant social events. Weddings are especially popular; the bride and groom choose this location just to be photographed within the gold-leafed stair pavilion (above, right) after the ceremony.

© Toyota. Photo Studios photos except as noted

© Nacasa & Partners photo

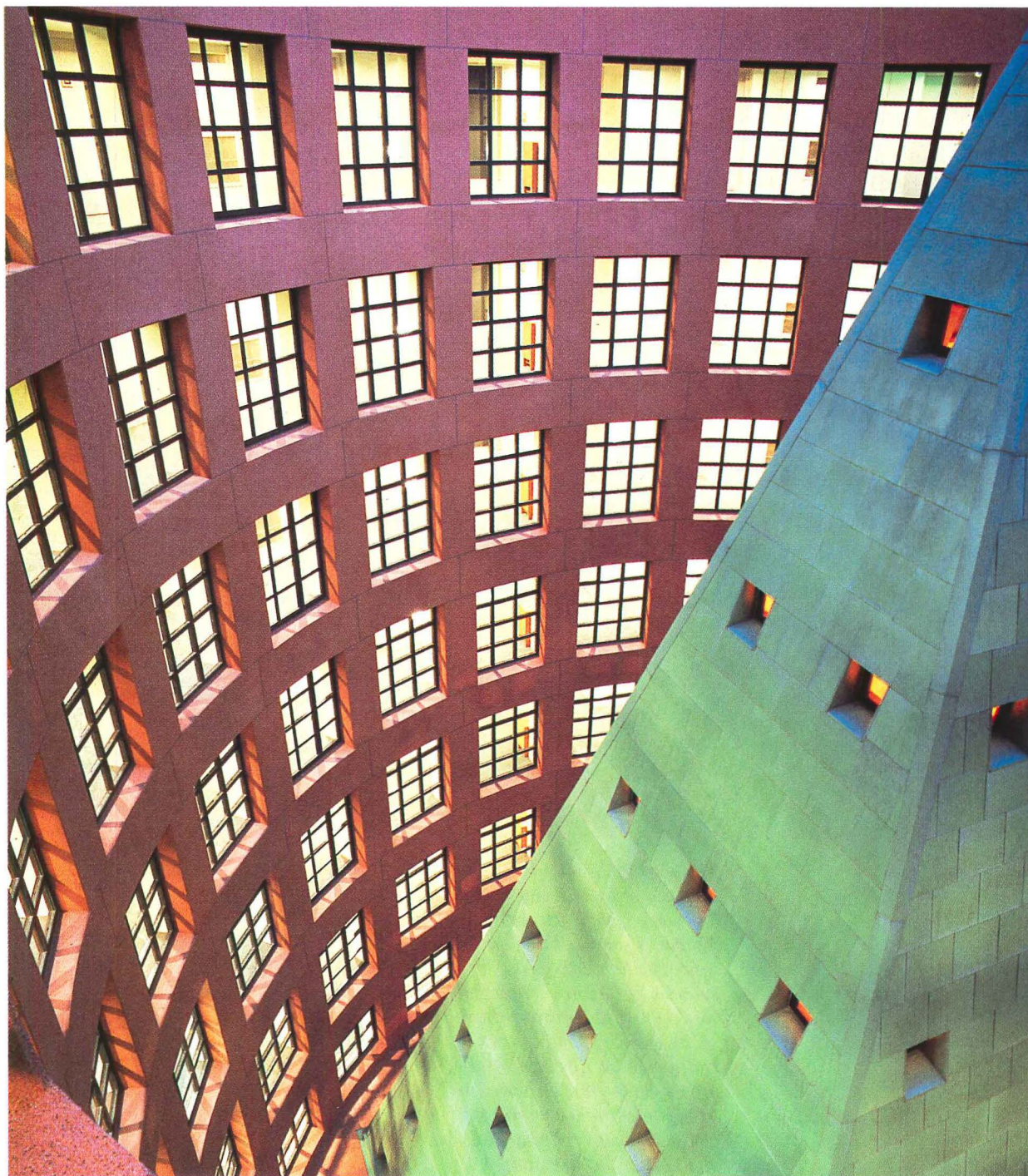
To the Japanese user, accustomed to close quarters, the Fukuoka Hyatt is a deluxe hotel, although Americans might expect more spacious guest rooms to qualify for that description. Even their ingenious double-use layouts (plan, opposite, right) might seem overly utilitarian to Western eyes—not to mention their ability to sleep four or five people in a single room. But ship-like efficiency,

rich materials, and architect-designed furniture capable of being bent to a number of tasks have much to teach us, not only about Pacific Rim expectations, but about creating a sense of luxury within the constrained economics of today's hotel development and construction.

Ironically, Michael Graves and his design team put a new twist on Hyatt's typical tall atriums,

although the operator was not signed up until after design. They capped the endless-seeming central void half way up its 13-story height with a copper-sheathed pyramid roof lined with gold leaf. It gives this space more defined proportions and—punctuated with small skylights (below)—gives guests in the glass-walled corridors above it the visual interest of peekaboo views inside through small ports.

Fukuoka, in the south of Japan near Korea, is growing in commercial importance because of the increase in trade with the Communists. Land values have skyrocketed and Graves's team was under constant pressure to maximize site use within strict local zoning controls of height and sky-exposure planes. High land costs also drove the Japanese bank-developer, Fukuoka Jisho, to maximize potential



Instead of looking down into Hyatt's usual atrium, guests on upper floors look out at the sculptural shape of its roof.

income by upgrading finishes to produce higher room and facility-rental rates. Hence, all the marble and gold leaf. The hotel exterior is clad in red sandstone. Heavy 20-oz copper sheathes the upper columns. Forecourt wings are covered in white sandstone. The structure is composite reinforced concrete and steel box beams for earthquake reinforcement. Graves's senior partner Tom Rowe credits the final

design's integrity to "a respectful working relationship" with construction contractor Maeda, which also did engineering and final drawings, and to his own many long trips. One problem was the Japanese practice of using accustomed suppliers; after working with one company to perfect the verdigris-copper finish, the architects had to start again with another, which, Rowe reports, produced an excellent

result. Would he have done anything differently? "There should have been a third auto entrance into the tight hotel forecourt, but retail use won out in its place." Charles K. Hoyt

Credits

Hyatt Regency Hotel

Fukuoka, Japan

Owner: *Maeda Corporation*

Architect and Interior

Designer: *Michael Graves—*

Michael Graves, design principal; Thomas Rowe, senior associate-in-charge; Patrick Mulberry, project manager; Alexey Grigorieff, job captain; Kim Armour; Wendy Bradford, Jesse Castaneda, Lorissa Kimm, Andrea Wang, project team

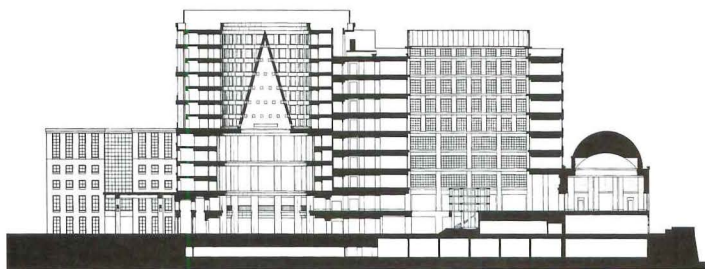
Associate Architects:

Fukuoka Jisho Company, Ltd.,

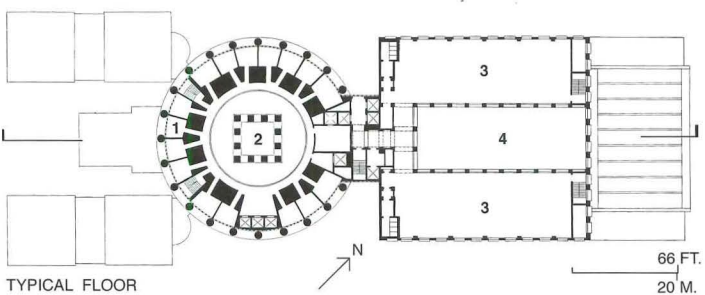
Maeda Corporation

Engineer and General

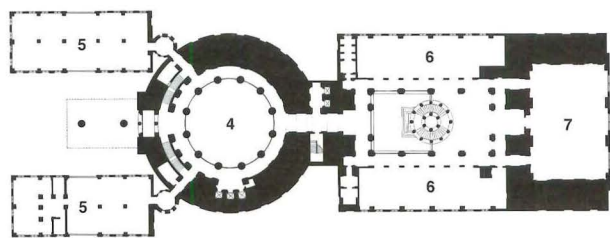
Contractor: *Maeda Corporation*



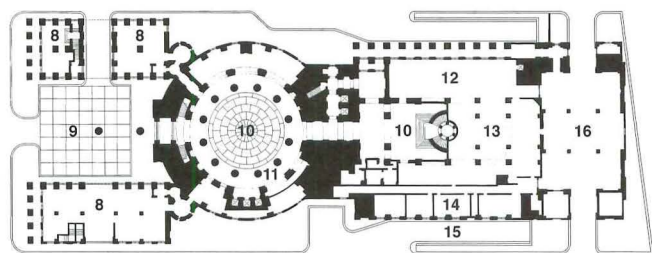
LONGITUDINAL SECTION



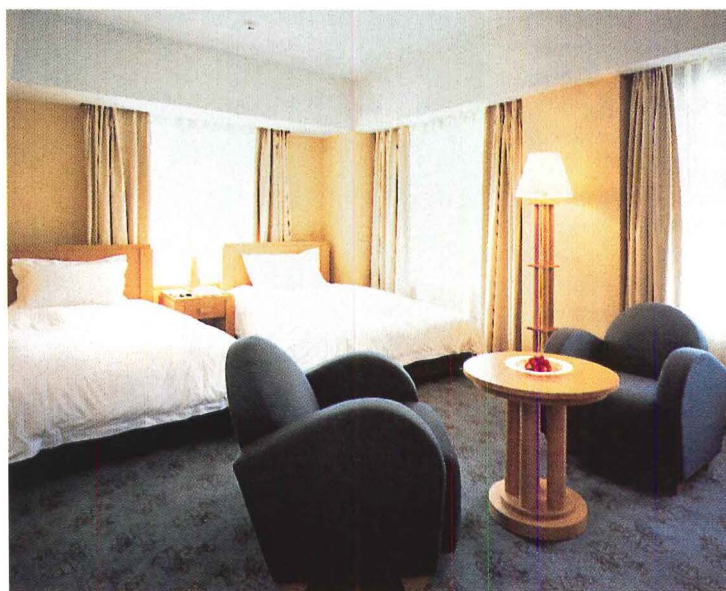
TYPICAL FLOOR



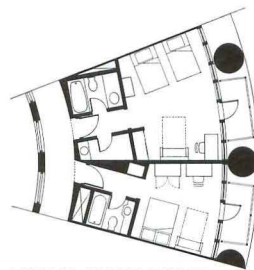
SECOND FLOOR



GROUND FLOOR



Two of many guest-room types and arrangements (plan, below) are set up to sleep a maximum number of people in beds that fold down and on convertible couches that pull out.



TYPICAL GUEST ROOMS

- | | | |
|-----------------|--------------------|--------------------|
| 1. Guest room | 5. Business center | 9. Entry court |
| 2. Pyramid roof | 6. Restaurant/bar | 10. Lobby |
| 3. Offices | 7. Banquet hall | 11. Reception |
| 4. Atrium | 8. Retail | 12. Cafe |
| | | 13. Kitchen |
| | | 14. Mechanical |
| | | 15. Ramp to garage |
| | | 16. Service entry |

Costa Rica Marriott

*San Jose, Costa Rica
Zürcher Arquitectos
Spillis Candela & Partners
Associated Architects*

Spanish colonial architecture stands in startling contrast to Spillis Candela's sleek curving facades for USAA's Tampa regional offices [ARCHITECTURAL RECORD, July, 1994, pages 56-61]. But the designers had their reasons (see text).

Like fantasy environments offered by many current resorts, the surroundings at the just-opened Costa Rica Marriott evoke an escape to another time and place—in this case, the tropical country's colonial past. The approach is through a coffee plantation reminiscent of an era when small-scale farming was profitable and bean plants' shiny green leaves covered the countryside. The hotel's architecture

too recalls history—despite modern plumbing, two swimming pools, four tennis courts, and a golf-driving range.

Unlike typical resorts' fantasy environments, this one was created for more reasons than luring guests. A wave of demolition to make way for new construction in the 1950s destroyed much of Costa Rica's colonial heritage; local developer-



© John Gilliam photos

builders, Guido Castro and his wife Ileana, were determined to put some of it back. There could be little question about their new building's style—as well as many of its ancient components.

Designer Aramis Alvarez, a principal in Miami-based architect Spillis Candela & Partners, spent 10 days before starting work traveling with the couple, studying Spanish colonial buildings

from Guadalajara to Mexico City—measuring proportions and photographing details. Doña Ileana scoured Costa Rica demolition storage yards for authentic colonial building parts. Finds included local grey volcanic-stone portals, columns, and 5 in.-thick pavers, a monumental wooden town-house carriage entrance with pedestrian passages, and enough ancient terra-cotta barrel tile to cover the whole roof.

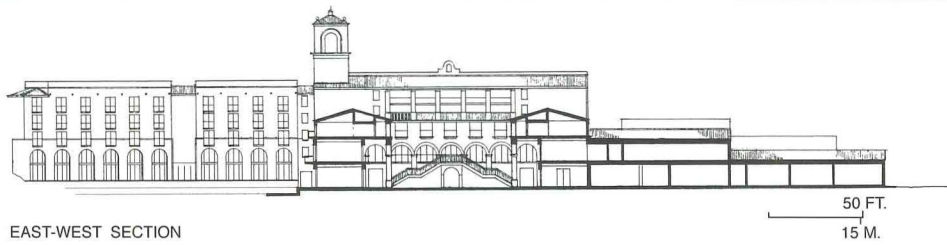
The new hotel was to be much bigger than any colonial-era hacienda—an effect exaggerated when Marriott came on the scene at the end of design and raised the room count from 180 to 250, requiring an extra story on the west wing and an extension of the east wing. Still, Alvarez worked hard to keep down the scale of the building, as well as to assure the best views. He located the building on an abrupt 10-ft

drop in the sloping site so that the first floor of public rooms and service spaces (plans overleaf) opens to views and grounds to the south, and is buried into a hillside on the north—invisible to arriving guests. He had a platform erected where the new second-floor entry level was to be and stood on it, adjusting both building orientation and floor levels for optimal sight lines on the spot. *Continues*

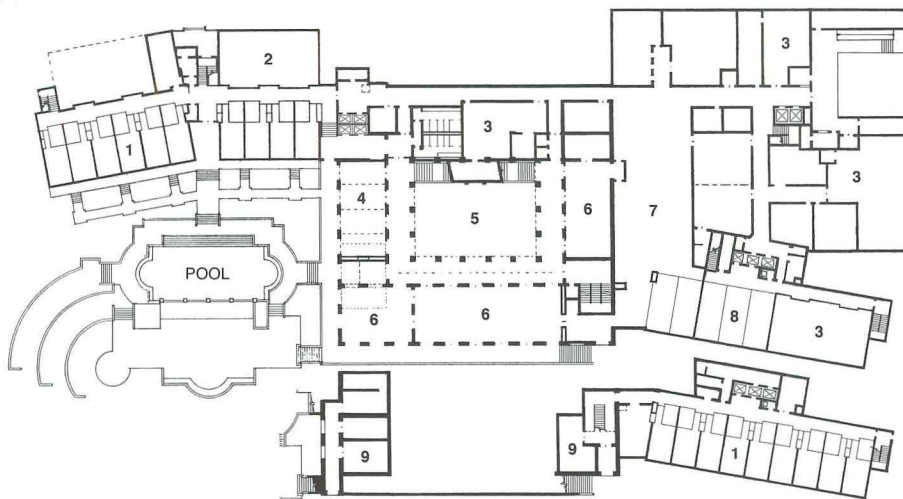


The central courtyard (left) replaces the grand lobby found in hotels in less clement climates and captures the building's originally intended scale before the west wing (opposite, left) grew by a floor and the east wing grew by a bay for Marriott.

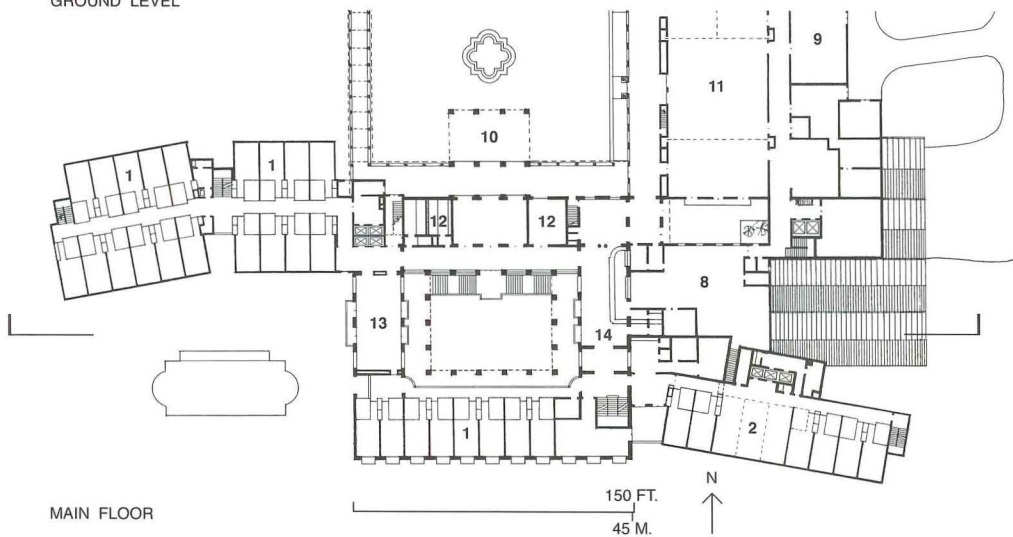
A steep slope across the middle of the site allows many of the first-floor support facilities to be buried unobtrusively under ground while public spaces on this floor face the grounds and the view to the south (plan and section, right).



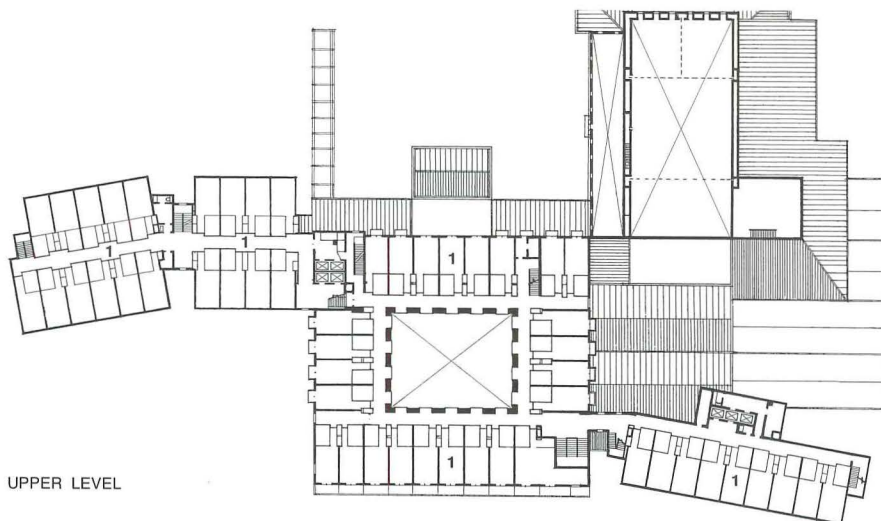
EAST-WEST SECTION



GROUND LEVEL



MAIN FLOOR



UPPER LEVEL

- 1. Guest rooms
- 2. Health club
- 3. Maintenance
- 4. Lounge
- 5. Open courtyard
- 6. Dining
- 7. Kitchen
- 8. Administration
- 9. Mechanical
- 10. Main entrance
- 11. Ballroom
- 12. Support
- 13. Bar
- 14. Registration

Like many resorts, this one serves several audiences—relaxed tourists, working conventioners, and locals who use it as a social center. Hence, the architects had already designed support facilities large enough to accommodate the last-minute room-count increase.

Local architect Ronald Zürcher offered help, not only on Costa Rican building practice (he exe-

cuted the construction documents), but on such traditional details as the different shapes of openings in the roof-top ventilator towers, which carry bathroom exhausts and break up the large expanses of tile. Engineers Franz Sauter & Asociados developed the earthquake-resistant egg-crate concrete structure—in effect, a huge truss in which the structure around each room acts as a member. Sections of the

building are isolated by construction joints that allow them to move independently. The roof, according to local custom, is steel joists covered with corrugated metal, then plywood, and finally tile. *Charles K. Hoyt*

Credits

*Costa Rica Marriott
San Jose, Costa Rica
Owner: Marriott Hotel Corporation*

Associated Architects:

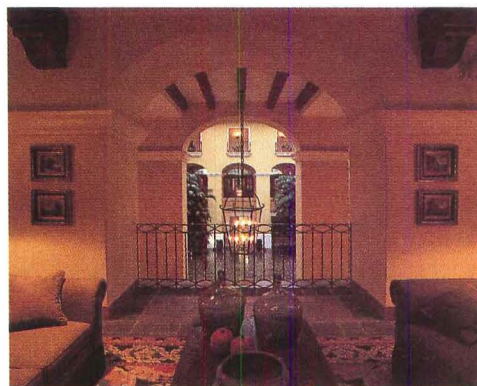
Zürcher Arquitectos, S. A.—Ronald Zürcher, architect of record

Spillis Candela & Partners, Inc.—Aramis Alvarez, partner

Engineers: *Franz Sauter & Asociados (structural); Cañas y Sequeira (mechanical, electrical)*

Consultant: *Edward D. Stone & Associates (landscape)*

General Contractor: *Gálvez y Volio Asociados, S. A.*



Benches, paving, lintels, and door frames have been recycled from colonial-era structures (colonnade left and lobby above). Artisans have replicated the period detailing in plaster (left).

Hotel Mansfield

New York City
Pasanella + Klein/Stolzman + Berg
Architects

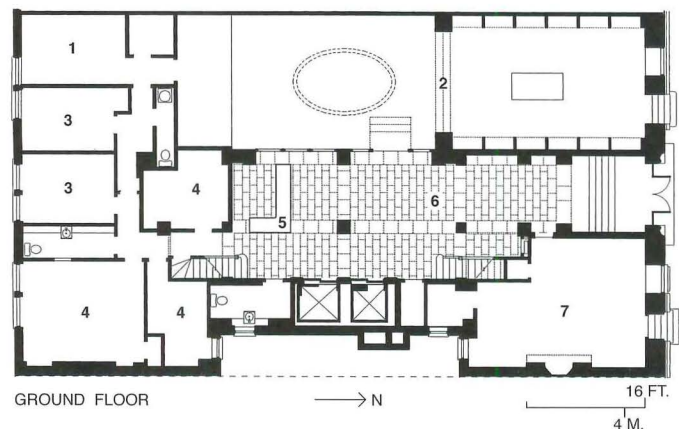
“It turned out to be much more of a restoration job than we expected,” says Henry Stolzman, of Pasanella + Klein/Stolzman + Berg Architects. The ornate 1902 building had been designed as rooms for affluent bachelors. When Stolzman started work, these generous spaces on the upper eight floors were intact, while the lobby floor seemed so cleanly swept of Beaux-Arts detail during a 1960s alteration,

it appeared to belong in a different building. But, as drywall and suspended ceilings came down, layer after layer, the original lobby emerged from behind—complete with much of its molding and even small single-bulb ceiling lights. Stolzman, who did two previous hotel conversions, was pleased. He had not been relishing the difficult task of melding period feeling and 1990s sensibilities in a total redesign.



The location is a side street just emerging from many garish latter-day alterations near Times Square. Ground-floor stonework (above) had been hidden by the plywood and plastic-laminate facades of a fast-food eatery and a bar on either side of the main entrance, which itself was concealed by a massive awning. The stripped-copper bay windows are treated with a finish to preserve their

bright color, which enlivens the north-facing facade. The reception lobby (above, right) has walls of polished plaster lit by can fixtures recessed in the new Bulgarian limestone floor. Many of the furnishings are found objects, including Philippine 1930s furniture in the adjacent lounge (plan). This space offers a home-like atmosphere in a library section toward the street and an area for small concerts.



The owner, Gotham Hospitality Group, caters to guests seeking up-scale accommodations at moderate prices and has found the economies of renovation the best route to filling that role. This client is its own general contractor and knows costs. Both client and architect understand those aspects of preservation that make functional and economic sense. In the Mansfield's case, the lobby and the rooms upstairs survived.

The benefits were twofold. First, despite the need to install new plumbing and wiring, the basic fabric of the building did not have to be replaced—nor did much of the wood flooring and room trim. Bathrooms were given new life by reglazing big, heavy cast-iron tubs and other period fixtures, originals of a style now copied by manufacturers at great cost. The other benefit of using the original plans was

the ability to retain such existing conditions as the unusual emergency egress patterns (plan below) that would otherwise have to be altered in new construction. Still, there was ample ingenuity of design: Aside from turning undesirable rooms into airy suites (photo below, left), the architects created duplex penthouses from former storage lofts on the ninth and tenth floors. *Charles K. Hoyt*

Credits

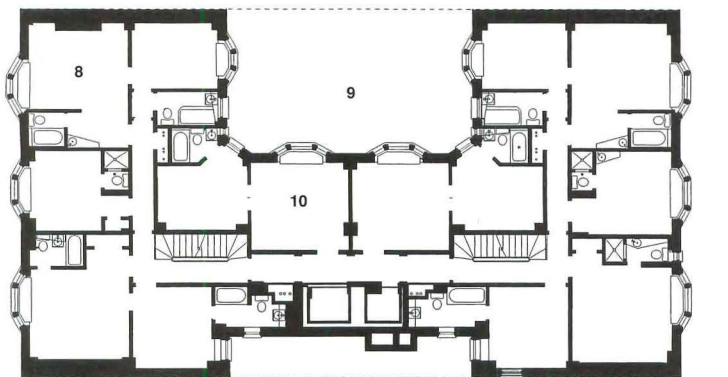
*Hotel Mansfield
New York City*

Owner: *Gotham Hospitality Group*

Architect: *Pasanella + Klein/
Stolzman + Berg Architects—
Henry Stolzman, Tim Witzig,
Jonathan Schechter; project team*

Engineer: *Jack Green
Associates (MEP)*

Consultant: *Johnson
Schwinghammer (lighting)*



1. Kitchen
2. Lounge/breakfast
3. Storage
4. Office
5. Reception
6. Lobby
7. Video/coffee/
conference
8. Guest room
9. Light well
10. Suite

The architects created suites (center of plan, left) by combining large guest rooms facing the central light well with small once-dark rooms in the corners (above, left). Existing floors were stained black. Furniture designed by the architects includes a convertible nightstand-desk (above) found in typical guest rooms. Beside it is a curtained circular closet holding clothes, suitcases, and a TV-stereo unit.

SECOND FLOOR

Hotel explora

*Patagonia, Chile
Germán del Sol & José Cruz O. Arquitectos,
Architect*

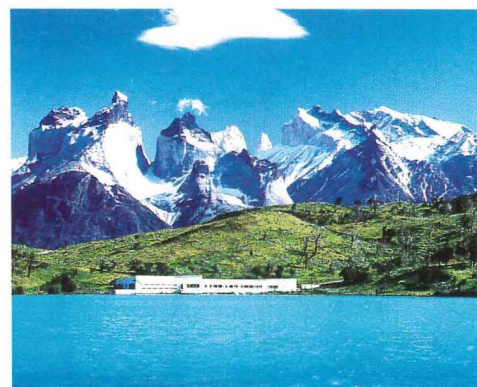
When in Patagonia, don't try competing with the scenery. An avid outdoorsman, Chilean architect Germán del Sol knew his Hotel explora in the middle of the Torres del Paine National Park in the remote southwest of his country would have to defer to its setting: majestic horn-shaped peaks, glacier-fed lakes, and lush lenga-wood forests (photo bottom). So he designed the 30-room luxury hotel as if it

were a ship resting lightly on sometimes stormy seas. Indeed, weather in the park can be unforgiving with winds often reaching 70 miles per hour. Simple, rugged forms work best in this climate.

Rather than trying to blend the hotel into its setting, del Sol followed the example of the ancient Greeks who designed their temples as counterpoints to nature. "We didn't want to tame nature,



To preserve the untamed spirit of Patagonia, "there's no intermediate space between indoors and out," says del Sol. So the pool house sits on the edge of the water (right) and the main building (above) has no porch, terrace, or yard.



Polished wood and clean lines give interiors the feeling of a yacht. The main public spaces (opposite left) cascade down a series of steps and ramps. Windows in the pool building offer views to those who are swimming or standing (opposite right).

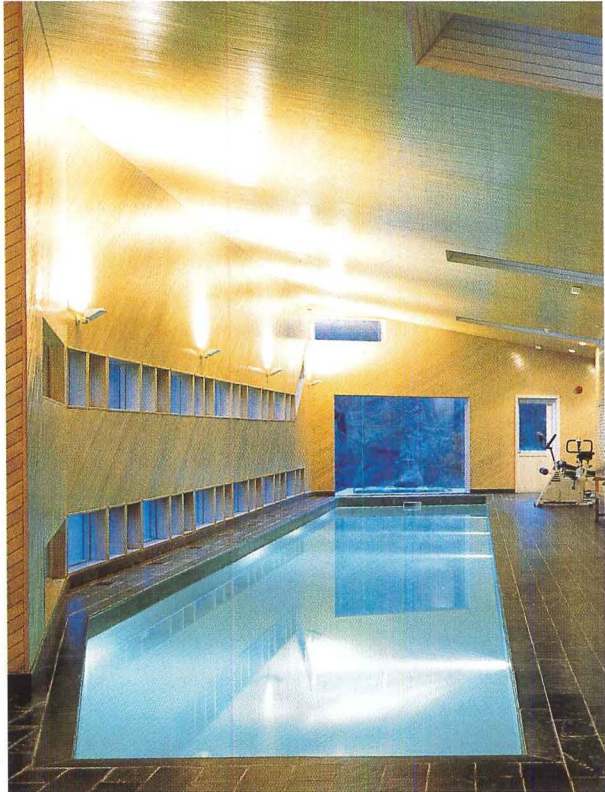
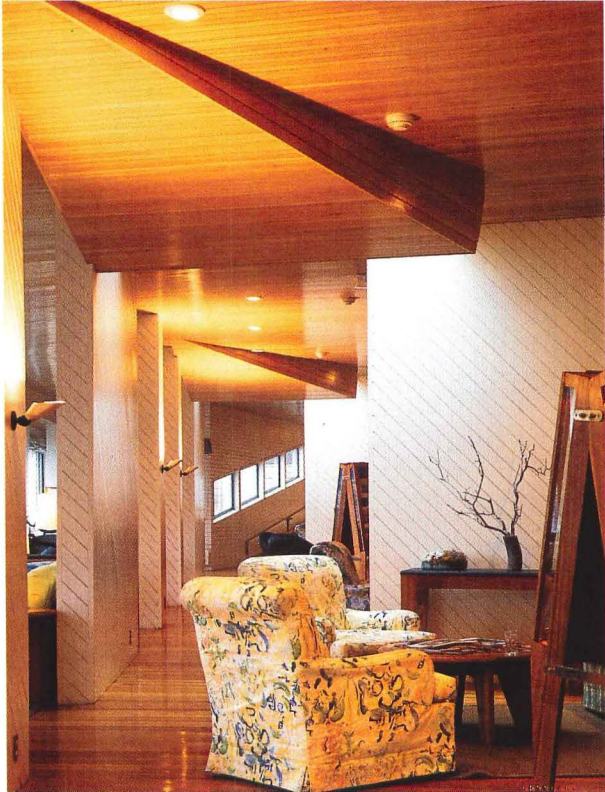
but to create a clear distinction between the man-made and the natural," explains del Sol. Providing access to the wilderness, while offering a luxurious refuge, is what the Hotel Explora is all about. The first of what is hoped will be a small group of hotels in remote parts of Chile, the Explora in Patagonia offers guests a variety of guided treks by foot, boat, van, horse, and mountain bike.

To minimize damage to the terrain, the hotel is a series of small structures: a one-story pool house, a service building, and a main building with two floors of guestrooms, a public floor with lounges, bar, and dining, and a lower level with reading room and staff quarters. Connecting the buildings to each other and to Lake Pehóe are boardwalks raised above the ground to protect the native flora.

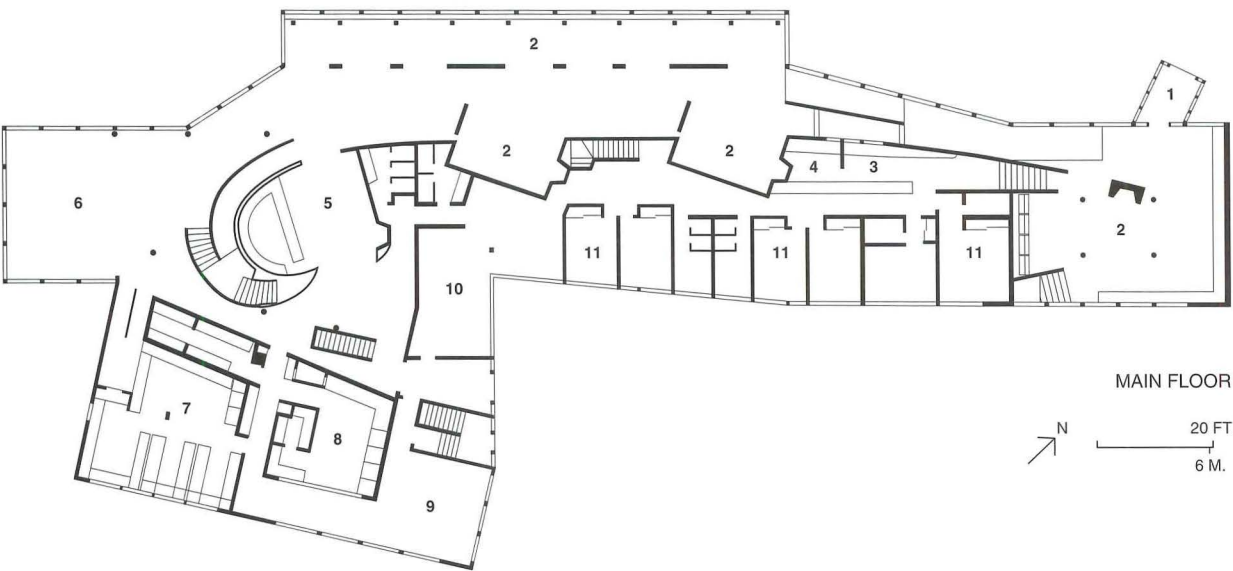
The buildings are concrete-frame structures with poured concrete slabs and even concrete walls between guestrooms (for privacy). Exterior cladding is laminated pine, while inside lenga wood and cypress were used. Because the best views face north (the direction of the sun in the southern hemisphere), the double-glazed windows were kept small. But del Sol adjusted the height of the windows during

construction so all would frame views. *Clifford A. Pearson*

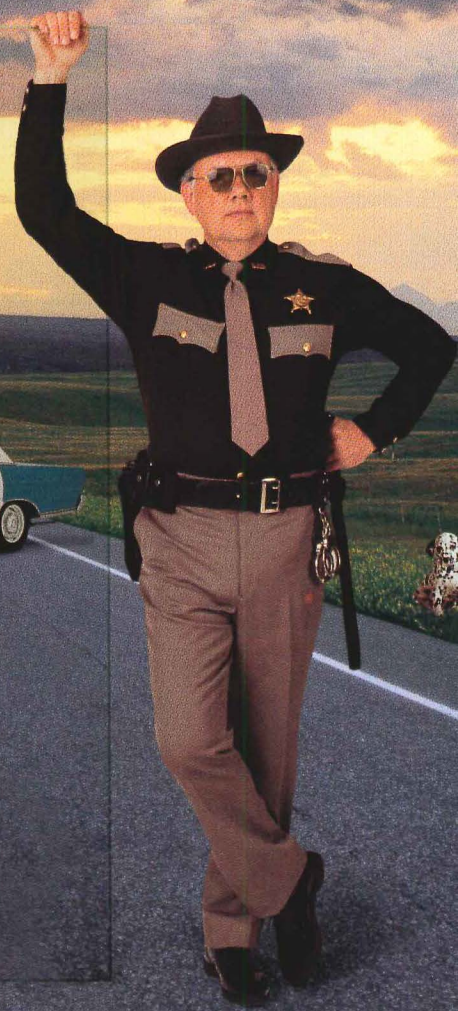
Credits
Architect: *Germán del Sol & José Cruz O. Arquitectos—German del Sol, partner-in-charge; Patricio Parada, Horacio Schmidt, Juan Purcell, Carlos Venegas, Hernán Fierro, Jorge Schmidt, project team*
Interior Designer: *Ana Paz Turell*



- 1. Entry
- 2. Lounge
- 3. Reception
- 4. Administration
- 5. Bar
- 6. Dining
- 7. Kitchen
- 8. Laundry
- 9. Staff dining
- 10. Staff lounge
- 11. Staff bedroom



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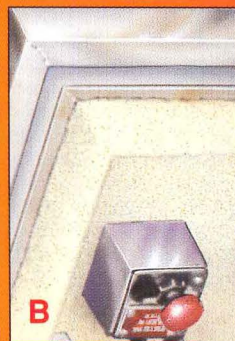
Photo A...Automatic self-closing system.

Photo B...Composite cover design with fire proof coating.

Photo C...Cover recess accepts custom floor covering.



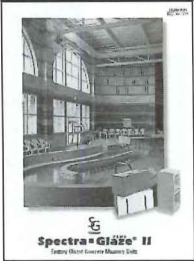
A



B



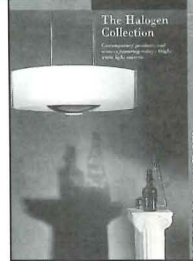
C



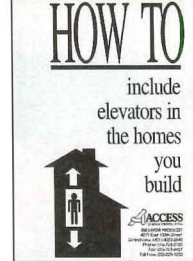
197. Glazed concrete masonry
A color portfolio illustrates the design versatility, structural performance, and decorative appeal of factory-glazed concrete masonry units for interior and exterior wall construction. All standard colors shown; custom colors may be ordered. There are design and installation videos available. 410/837-0720. The Burns & Russell Co., Baltimore.



198. Site furnishings
Landscape Forms's 1996 catalog has 20 pages on seating, site amenities, planters, benches, and umbrellas. Indoor and outdoor materials include powder-coated metal; hard maple, jarrah, redwood, and red oak; and fiberglass and Polysite, a graffiti-resistant composite made of recycled HDPE. 800/521-2546. Landscape Forms, Inc., Kalamazoo, Mich.



199. Halogen pendants/sconces
A color brochure displays contemporary-style decorative interior lighting, including Gemini, Crescent, Blue Ice, Dazzle, Mono Points, and Lyte-jack pendants and sconces. Light-source options include line-voltage and low-voltage halogen and krypton lamps. All UL-listed, many fixtures are ADA-compliant. 800/223-0726. Lightolier, Inc., Fall River, Mass.



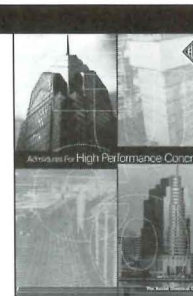
200. Pre-planning elevators
A concise booklet explains the cost, construction, and equipment parameters required for several types of home elevators, and illustrates how to accommodate hoistway, loading, electrical, and access requirements for a future elevator when designing a multilevel home. 800/825-1220. Access Industries, Inc., Grandview, Mo.



201. Architectural metal doors
Prefabricated glazed and solid-face doors can be specified in stainless and galvanized steel or Muntz metal in any of 20 standard embossed or abraded surface-design options. Sections show stile-edge, vision-light, and door-bottom details. 805/684-8626. Forms + Surfaces, Santa Barbara, Calif.



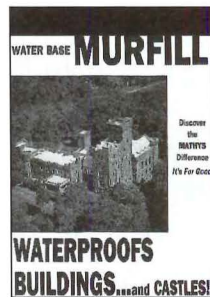
202. Sun-screening system
Catalog illustrates manual, motorized, and computer-operated sunshading installations in commercial, residential, and institutional applications. Shading can conform to any glazing configuration, including dome skylights and large atriums; shade-cloths permit a range of visibility and glare-control options. 718/729-2020. MechoShade, Long Island City, N.Y.



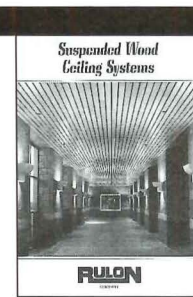
203. High-performance concrete
A product brochure describes different concrete additives and how each improves the compressive strength, set time, and freeze-thaw durability of concrete materials. Case studies of plant buildings, high-rise structures, and hotels demonstrate how admixtures benefited the concrete-design needs of each project. 800/321-7628. The Euclid Chemical Co., Cleveland.



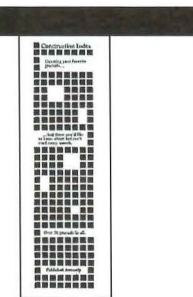
204. Designing with carpet
A new quarterly for architects and interior designers, *Inspirations* describes how nature and the built environment interact in the designs of individual practitioners. The inaugural issue profiles The Cranbrook Academy of Art and Nila Leiserowitz, Design Director with Gensler/Santa Monica. 800/241-4826, x8657. Milliken Carpet, LaGrange, Ga.



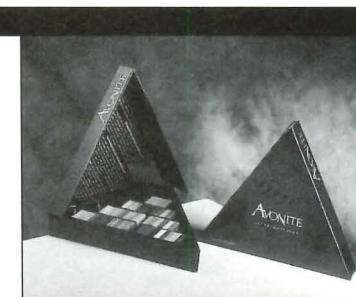
205. Waterproof building skin
A water-based elastomeric coating, Belgium-made Murfill is said to insure high water-vapor transmission while completely waterproofing surfaces. Capable of 400 percent elongation, it can bridge new cracks and dissimilar materials to create a monolithic, decorative facade over most substrates. 914/592-4010. Advanced Coating Technology, Elmsford, N.Y.



206. Wood-slat ceilings
The Rulon system consists of planks, grilles, cubes, and squares of natural wood installed using an unusual clip-rail method that does not need visually obtrusive cross rails. The ceiling's good acoustical performance can be improved with fiberglass-batt backings. All styles can be specified Class A; 12 wood species available. 800/227-8566. Rulon Co., Souderton, Pa.



207. A/E/C publication index
The ArchiText Construction Index references over 50 architectural, interior design, construction, and industry- and material-specific journals annually. Articles are organized by the appropriate CSI section. Available in print, an on-line search capability is planned. Homepage gives a sample search; call 312/939-3202 for address. ArchiText, Chicago.



208. Solid-surface sample kit
A new program for architects and designers supplies 2-in.-square samples of all 45 current colors available in Avonite solid-surface material. Product updates, installation tips, and performance data can be referenced at www.avonite.com (Web page). 800/428-6648. Avonite, Belen, N.M.
Continued on page 119

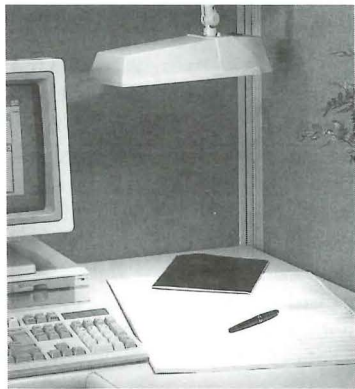
For more information, circle item numbers on Reader Service Card.

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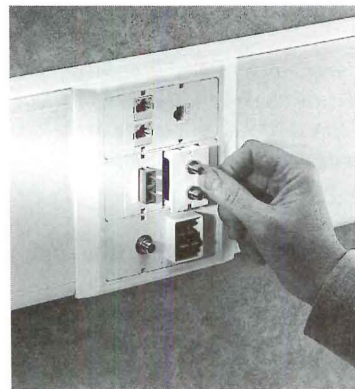
169. UL-listed deck insulation
Foamular Thermapink can be installed directly over unperforated steel roof decks. Tested under Underwriters Laboratories' new intermediate-scale test for the fire performance of roof assemblies, these insulation boards do not need a thermal barrier, such as gypsum board or perlite, to meet ICBO, BOCA, and SBCCI codes. Made using a Hydrovac process said to impart a smooth, impact-resistant skin surface and a tight, closed-cell structure, Foamular extruded polystyrene is said to be "virtually impervious" to water and moisture absorption. Its R-value will not degrade over time. 800/GET-PINK. UC Industries/An Owens Corning Co., Toledo, Ohio.



170. Adjustable task light
With a magnetic mounting base that allows the fixture to be positioned anywhere under an above-desk shelf, the Adjusta-Shelf light can also tilt and swivel to direct light where needed—onto source documents or telephone dial, for example—without washing out a computer screen. Unit takes an 18W compact-fluorescent lamp behind a parabolic louver that shields the bulb even when the fixture is at eye level. Housing measures 14 1/2 in. long. 800/345-9103. Dazor Manufacturing Corp., St. Louis, Mo.



171. Cast-limestone planters
Longshadow planters, such as the Lake Forest and Lake Bluff models shown above, include designs based on the horizontal lines and stylized plant and Celtic motifs used by Frank Lloyd Wright and other members of The Prairie School. Units are made of a frost-proof, hand-cast reconstituted limestone, said to look and weather just like carved stone. Standard finish is Buff Indiana; custom "aged" patinas and ornamentation can be specified. Sold primarily through design professionals, a trade-price list is available. 618/893-4831. Classic Garden Ornaments, Ltd., Pomona, Ill.



172. Communication interface
CAS (Communication Activation Series) devices snap into all Wiremold low-profile, baseboard-like raceway systems, Tele-Power poles, and many surface- and flush-mount boxes. Inserts and faceplates come in ivory, gray, and white to match the surrounding raceway. Devices provide a common interface for low-voltage unshielded twisted pair, shielded twisted pair, coaxial, and fiber-optic cables; an integral recess allows for labeling each jack location. 800/451-3683. Interlink Technologies, A Wiremold Co., Bristol, Ct. ■

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HOK Architects

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Manufacturers' Sources

For your convenience in locating building materials shown in this month's feature articles, *RECORD* has asked the architects to identify the products specified.

Pages 70-77

Washington State History Museum
Tacoma, Washington
Moore/Andersson Architects
Lead-coated copper roof: Overly Manufacturing Co. Aluminum-panel cladding: custom by architects, fabricated by McKinstry/Roberge. Brick: Denver Brick. Precast pavers: Custom Concrete Casting. Aluminum-framed windows: Custom Window Co. Entrance: Stephen Enterprises. Pulls, locksets, and operating hardware: Corbin Russwin Architectural Hardware. Acoustic ceiling: Celotex. Maple veneer paneling and cabinetry: Master Millwork, Inc. Laminate surfaces: Formica Corp. Paints: Parker Paints. Coatings on metal: Tnemec. Exhibit-space carpet: Lees Commercial Carpet (Sisalcraft). Elevators: Otis. Signage: A.S.I. Exterior and interior uplighting: Elliptipar, Inc.

Pages 88-93

Tokyo Church of Christ
Tokyo, Japan
Maki and Associates, Architecture and Planning, Architects
Steel-truss curtain wall: fabricated by Hagiura Kogyo. Sash: Nihon Steel. Fiberglass-interlayer shoji glass, frit glass, and vision glazing: Figla Company, Ltd. Chandelier fixtures: custom design by Maki & Associates, fabricated by Yamagiwa.

Pages 94-97

Exxon Service Station
Lake Buena Vista, Florida
Hardy Holzman Pfeiffer Associates, Architect
Storefronts: Kawneer Co., Inc. Aluminum louvers: Valiant Products, Inc. Corrugated-steel roof: MBCI (M Panel). Vinyl lattice: Cross Industries. Metal-halide fixtures: Hubble (Sports Lites). Fluorescent floodlights: Legion Lighting.

Pages 106-107

Hotel Mansfield, New York City
Pasanella + Klein Stolzman + Berg Architects PC, Architect
Restoration of original masonry and metal elements: Hanif Decorating. Custom woodwork: Thomas Meyn, Hopper Cabinetry. Paints: Benjamin Moore & Co. Reception desk: Fabricated by Patrick Mackin. Limestone flooring (lobby): Paris Ceramics. Art Glass panels (guest suites): Denise Amses. Shelf/desk: Chatham Installations. Custom lighting: Don Kainen. Architectural metalwork: Studio Source (metal-mesh dome); Anthony Carta Specialty metals (ironwork at elevators); Lost City Arts. ■

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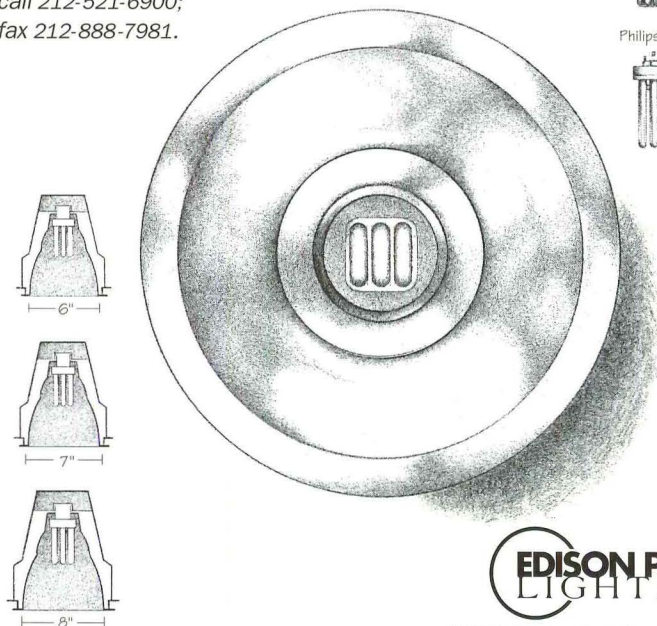
GE Blax T/E



Osram/Sylvania Dulux T/E



Philips PL-T

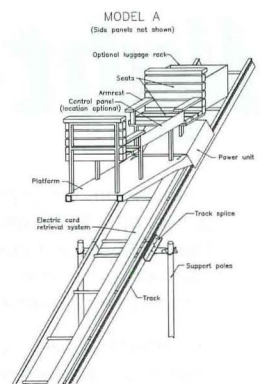
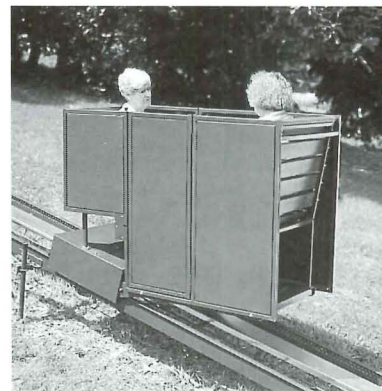


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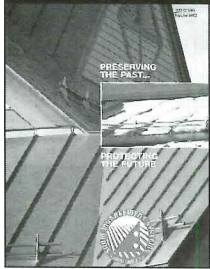
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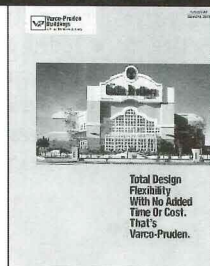
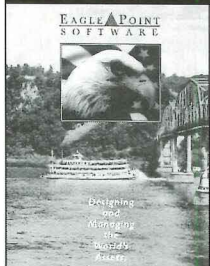
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Product Literature



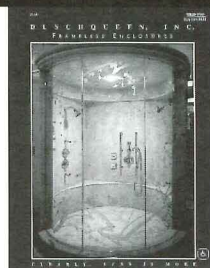
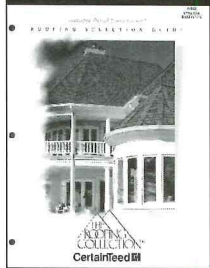
208. High-tech snowguards
A catalog on the Vermont Snowguard explains how the aircraft-aluminum pipe system readily adapts to the configurations of specific roofs, including those of standing-seam metal. Loading, design, and pricing data given; devices can be ordered in mill-, powder-coat, or Kynar finishes. 802/888-7100. Snow Management Systems, Morrisville, Vt.

209. Versatile railings
A pocket-size booklet on the Snap Tight Aluminum Railing explains how interchangeable parts permit "unlimited" fence and stair-rail styles and unique use of color (uprights and rail in different colors, for example) from in-stock components. Meets UBC codes; passes salt-air weathering tests. 800/661-2773. S.T.A.R. System Int'l., Ltd., Burnaby, B.C.



210. Software directory
A 38-page catalog highlights all of this vendor's AEC software, including acquisitions such as Landcadd site work and ECOM structural-design programs. Project- and data-base-management features are built into every product. Text details hardware requirements and capabilities of each program. 800/678-6565. Eagle Point, Dubuque, Iowa.

211. Steel framing systems
A brochure illustrates the design and span options offered by this metal-building manufacturer. Beam and column and open-web truss framing and insulated roof-deck and wall panels are engineered to meet program needs of specific industrial and commercial building projects. 901/767-5910. Varco-Pruden Buildings, Memphis, Tenn.



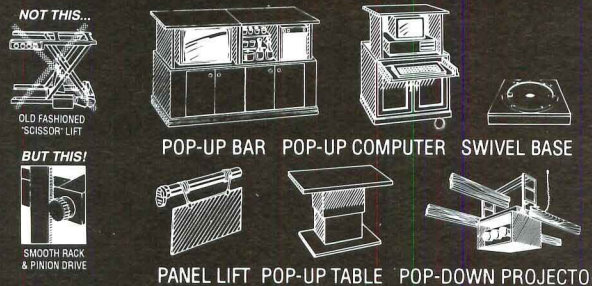
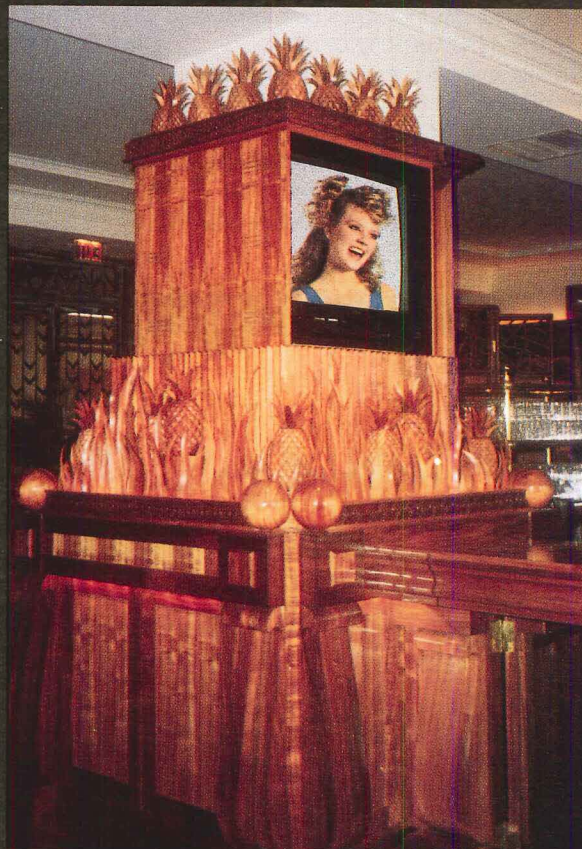
212. Roof guide/software
A new architectural binder covers all CertainTeed roofs, including Celadon tiles, fiberglass and asphalt shingles, and three-layer slate- and shake-look Shingles. Showcase sections have large color photos of each product; PC and Mac-compatible disks (included) have performance data and three-part specs. Free. 800/233-8990. CertainTeed Corp., Valley Forge, Pa.

213. Bent-glass shower stall
This fabricator's "frameless construction" minimizes the visual distraction of metal fittings on high-style glass shower enclosures. A color portfolio introduces the Neo Solutions stall, with a double-bend, 27-in.-wide door that fits into a standard neo-angle base. Options include curved and etched glass. 800/348-8080. Duschqueen, Inc., Wyckoff, N.J. ■

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Letters

Continued from page 8

while other more avant-garde and educationally adventurous projects remain ignored? What is it that we architects should learn from this? (Not one of Mr. Stern's best works.) Some of us are in fact offended by the writer's obvious rationalization about "inexpensive" construction or three different types of brick work to more justify this Jefferson knock-off.

In fact, there has been significant progress in academic architecture in recent years on an array of campuses—the Memorial Hall at Harvard by Venturi Scott Brown, which the July issue also features, is such an example. It combines the best of the old and new.

With only two major magazines servicing the architectural community and a new relationship with the AIA, ARCHITECTURAL RECORD has an even greater responsibility in communicating to the profession. The noteworthy aspect of Stern's design—i.e.: the Jefferson Connection—could have been easily told in one or two pages. The remaining six pages of mainly traditional and

other ordinary interiors could have been replaced by a host of compelling and programmatically ambitious projects that your constituency deserves to examine.

*Bernard Marson
Bernard A. Marson Architect
New York City*

I was very disappointed by the heavy concentration on Neoclassical structures in your July issue on Academic Buildings. Particularly astonishing were the eight pages devoted to the School of Business Administration at the University of Virginia—a timid and banal complex which, while seeming to follow Jefferson's famous village, has none of its richness, complexity, scale, and modesty. Robert Stern has done much better.

There are many other examples of inventive and original modern work in our universities which you could have used, and which your readers deserve to examine.

*Paul Willen, FAIA
Chappaqua, New York*

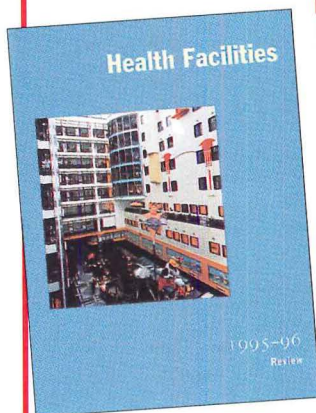
Corrections

- ◆ The name of the watercolor-look software on page 59 of RECORD's August issue was incorrectly identified. It is "Piranesi" from Graphic Data Systems; 800/678-4120.
- ◆ The credits for Kiel Center Arena [RECORD, August 1996, pages 114-117] should have listed Interior Space Inc. as the sole company that performed all architectural and interior-design services for the center's suites.
- ◆ The credits for the Museum of Contemporary Art [RECORD, August 1996, pages 80-87] should have included Habib Husain as project architect for the associate architect/engineer firm, A. Epstein and Sons International, Inc.
- ◆ The name of Saverio Manago was misspelled in the credits for the University of Cincinnati's Engineering Research Center [RECORD, July 1996, pages 86-91]. Also, the university's student population is 35,000.
- ◆ In the August RECORD, pages 110-113, the credits for Coors Field should have included Grenald Associates (facade lighting) and ME Engineers (interior and site lighting, Joy Yamada; sports lighting, Scott Gerard). ■

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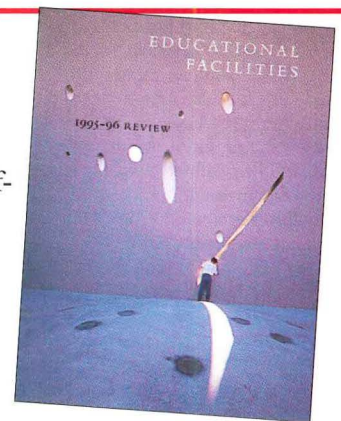
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Money continued from page 43

number of reasons having little to do with the measurable qualities of the building.

A change in the way fees are structured and paid as radical as the arrangement between Ciba-Geigy and the design-build team is bound to bring up a lot of questions among architects, most obviously, "why must we do this?"

Healy answers by summing up something of the perception currently plaguing architects. "I think the term 'customer focus' often gets lost in the design process. Designers are very good at designing solutions that they think are the right solutions to a customer's problems, but quality incentives force them to really focus on what the customer is saying and solving their problems. Designers can build the perfect building from their perspective, and completely miss the mark of what the client wants. It could be a wonderful building, but not serve the client's purpose."

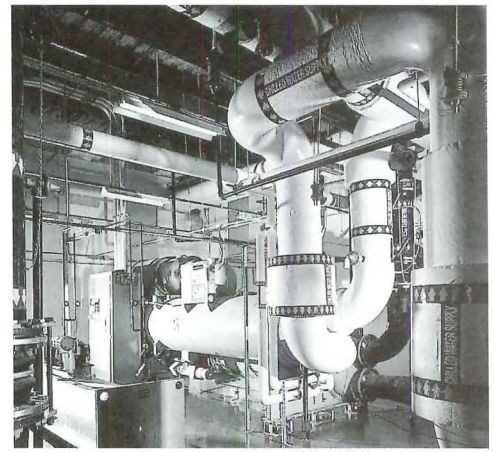
Richard Hobbs, an AIA vice president working on the institute's Practice and Prosperity Initiative, says, "I think it's fantastic that they're tying incentives to the benefits

received by this high-performance building, if in fact the architect or the team defines what they're going to be measured by. But you would think the bonus would be over and above what they're getting, not jeopardizing their livelihoods. We certainly don't want to start undercutting the fee structure."

Hobbs does see incentives, if properly structured and fairly negotiated, as an opportunity. "To me, this example ties right into our Practice and Prosperity Initiative. It talks about architects expanding their role in the process, becoming involved with facility life-cycle; it talks about a facilitator-integrator role; it talks about the understanding of a corporate culture."

Batcher believes "without a doubt" that Ciba Geigy received a better building than they would have without the incentives, and continues, "I think architects need to find a more creative way of conducting their business with their clients, something that is different than the old way that they're accustomed to." Gutman, of Princeton, concludes, "If it works, we may see a lot of it. Customer service seems to be the way of the future."

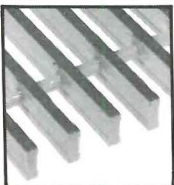
Charles Linn



The complexity of the mechanical equipment in the Ciba-Geigy Additives Laboratory shows how great a challenge was faced by HLW and their partner, Sardoni Skanska, in completing the facility several months early.

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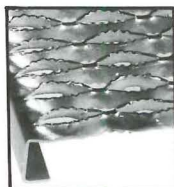
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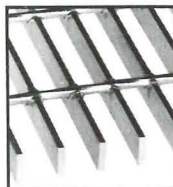
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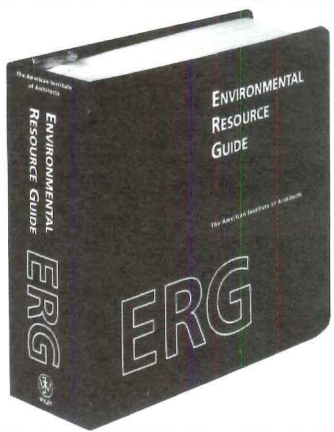
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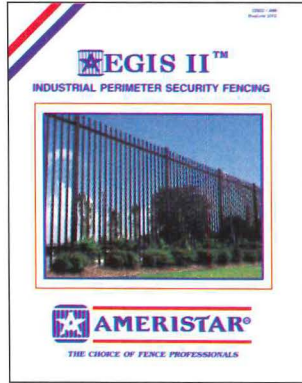
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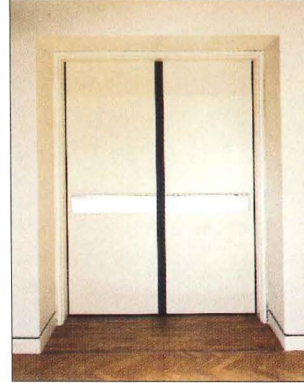


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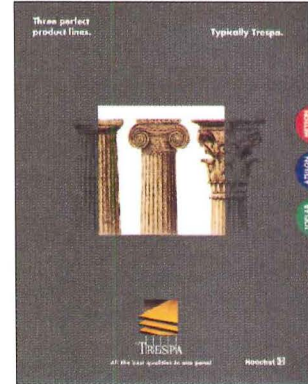
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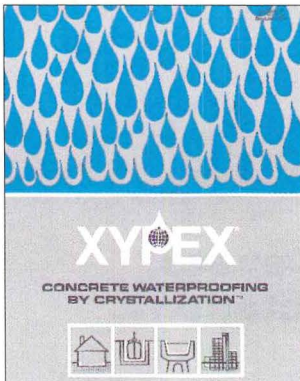


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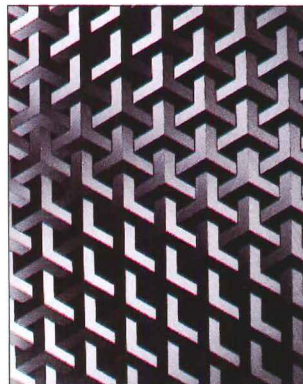


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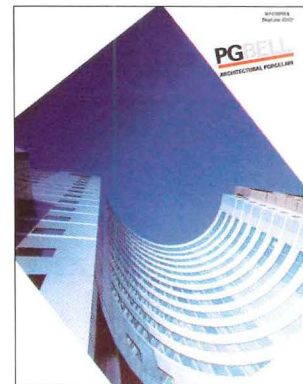
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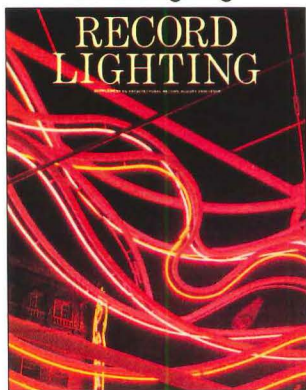
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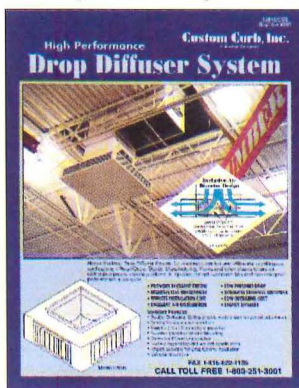


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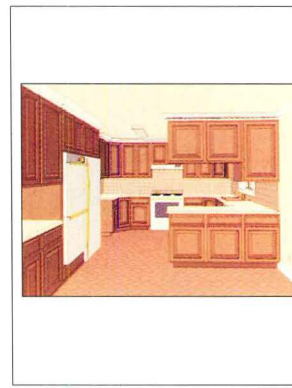


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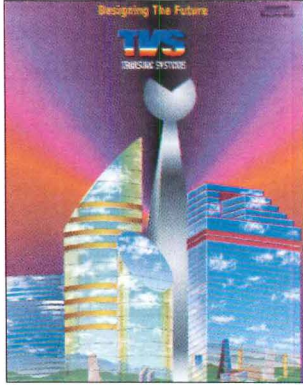
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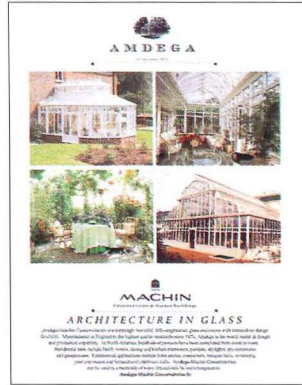
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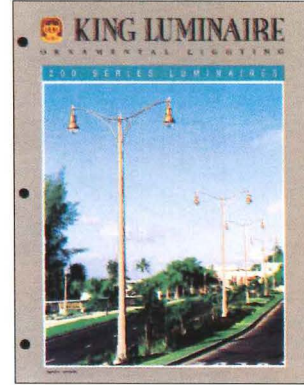
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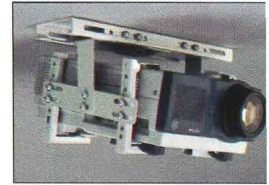


King Luminaire combines the great photometrics you need with the quality and appearance your project must have. Engineered to provide maximum lighting performance with minimal long term maintenance, King Luminaire fixtures and poles offer versatility, quality and a long, long service life. We specialize in buyer satisfaction. Call us at 1-800-268-7809.

King Luminaire Co., Inc.

Circle 93 on Inquiry card

Mount for LC Projector



Designed to accommodate LC projectors weighing up to 75 lbs. the new Peerless PJRL Projector Mount is adjustable height (5 5/8" - 9 3/8") and width (10" - 25 3/4"). It features 0° to 10° forward and backward tilt, heavy-gauge steel construction, rubber-lined clamping mechanisms at the four corners, and full 360° rotation when used with the optional extension column. Available in gray or black, the PJRL30, may be mounted directly to the ceiling.

Peerless Industries

Circle 94 on Inquiry card

Discover American Frame



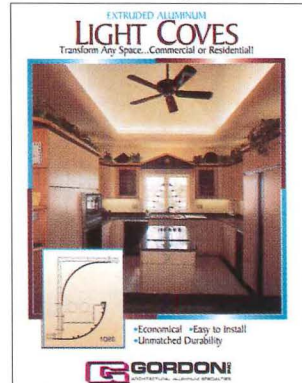
For 23 years, American Frame has offered quality picture frames at a low cost. Our catalog showcases custom-cut metal and wood frames and mats. We have a variety of services to suit your needs; which includes providing do-it-yourself frame kits for individual projects to providing framing for large projects.

To order our catalog or to learn more about our framing services call **800-537-0944**

American Frame

Circle 95 on Inquiry card

Gordon Extruded Aluminum Light Cove



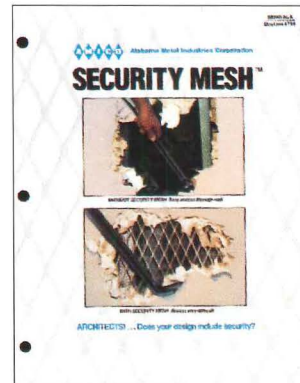
A new 8 page brochure discusses the advantages of using extruded aluminum light cove versus GFRG shapes in both residential and commercial applications. Positive locking splices insure tight joinery; factory mitered and welded corners eliminate labor intensive field work. For your free light cove brochure or complete 70 page product manual

call 1-800-747-8954 or fax 1-800-877-8746.

Gordon, Inc.

Circle 96 on Inquiry card

Security Mesh

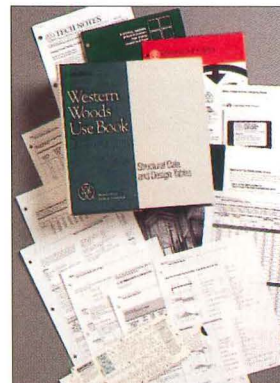


Security Mesh sheets are steel mesh panels used as a penetration resistance shield behind drywall finishes. These sheets are to be attached to metal studs and track or wood supports designed for use in walls. **Basic Use:** Prisons, government offices, strip malls, record storage rooms, computer rooms, courthouses, museums, mini warehouses, apartments, condominiums, pharmacies, art galleries, mail rooms, airport security, banks, hospitals, police stations and general office security.

Amico

Circle 97 on Inquiry card

1996 Western Woods Use Book



Now you can buy the 1996 Western Woods Use Book for just \$60. It's compatible with all model building codes and comes with software to aid in design changes in design, h updated column and beam tables and comes a handy binder that makes future updates easy.

Western Wood

Circle 98 on Inquiry card

Manufacturers' Spotlight

Wood Windows and Doors



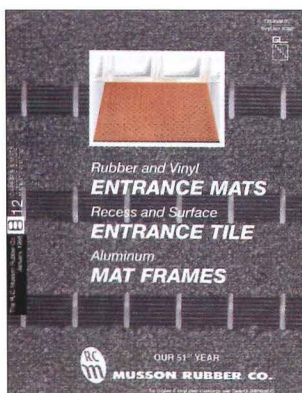
For 75 years, Zeluck has served both architects and custom builders with architectural wood windows and doors unparalleled for flexibility, quality and service. Zeluck offers a wide selection of glass and hardware, and timber from responsibly managed forests. Our triple hungs, European casements, tilt & turns, copper clad, bent units, bi-folding doors, lift-sliding doors and French doors are but a portion of our product line. Whether a custom home, hotel, institution or historical project, we can make your fantasy a reality.

For a free catalog, call
 800-233-0101 • 718-251-8060

Zeluck

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Designed For Safety



Brochure details our complete selection of quality entry matting. Musson has the experience to guide, the ability to customize, and the facilities to produce surface or recess entrance mats that meet your specific needs. Sample products are made of rubber, vinyl and olefin carpet-like fibers. Others include fluff cord and traffic entry tiles, aluminum/vinyl roll-up mats aluminum mat frames. To request copies, contact Bob Segers, Musson Rubber Co., P.O. Box 7038, Akron, OH 44306 1-800-321-2381. Fax: 330-773-3254

Musson Rubber Co.

Circle 100 on Inquiry card

Raymond Enkeboll Designs ©1996



Raymond Enkeboll Designs ©1996. Crafts an extensive array of Architectural elements carved in solid woods. New 104 pg. Color Product Catalog, shows a selection of capitals, corbels, moldings, onlays, panels etc. Stocked in Maple and Red Oak, available for immediate delivery. Bound catalog \$20, binder version \$30. Visa & MC welcome. Complimentary brochure available. Raymond Enkeboll Designs 16506 Avalon Blvd. AR10, Carson, CA 90746. Phone: (310) 532-1400 Fax: (310) 532-2042

Raymond Enkeboll Designs

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IBM CATIA/CADAM Solutions



Let IBM's CATIA/CADAM AEC Plant Solutions (CCPlant) streamline your plant design, construction, and operation processes. CCPlant provides plant owners, operators, engineering, and construction firms access to engineering and design data across their businesses.

For more information about **CCPlant** call 1 800 395 3339

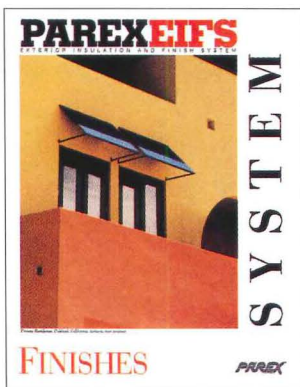
or e-mail us at:

peravage@vnet.ibm.com

IBM

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Build trust into your walls



A new Finishes brochure describes how Parex enhances finishes and coatings with the very latest in polymer technology. Interior and exterior, new and retrofit, upgrades or extensive renovations. Parex 100% Acrylic Finishes and Coatings resist the most damaging elements. Select a Siliconized or Elastomeric Finish for ultimate performance. Blend an elegant Cerastone® designer finish that's scratch resistant and easy to repair. Get your free Finishes brochure today at Parex 800-537-2739 (LEPAREX)

Parex Inc.

Circle 103 on Inquiry card

Formglas Inc.



Quarrycast® by Formglas is a lightweight "moulded stone" manufactured with glassfiber reinforced inorganic minerals. We offer many exciting applications for interior use. Installation is quick and only requires regular carpenters tools. A complete wall system offers 5/16" thick veneer panels, outside corners, baseboards, cornices, door frames, etc. Custom components are also available, as well as additional colors.

FAX: (905) 669-9483
 After July 15 FAX (416) 635-6588

Formglas Inc.

Circle 104 on Inquiry card

Truebro, Inc. Lav-Shield™ Lavatory Protective Enclosure

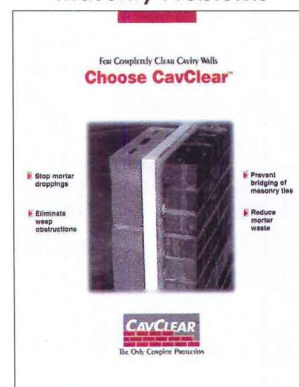


Another ADA undersink solution from TRUEBRO is the all new Lav Shield™ under lavatory enclosure. Designed to meet the aesthetic and dimensional criteria for accessible lavatories where insulation cannot adequately cover electronic faucet connections, mixing valves, trap primers and instantaneous hot water heaters the Lav Shield™ performs while providing knee and toe clearances for wheelchair users.

Truebro, Inc.

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Innovative Solutions to Masonry Problems



New products offer design solutions for cavity wall problems. CavClear™ products assure top quality by preventing mortar accumulations in the air space. Moisture migrates freely to unobstructed weeps. Adjustable masonry ties are protected from mortar droppings. A clear air space results in proper movement isolation, reduced cracking and long-term performance of the building system. Ensure a clear cavity by specifying CavClear. Call us toll free at (888) 436-2620.

CavClear/Archovations

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OUTLOOK '97

Executive Conference

October 23rd and 24th at the
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Top construction and building product executives will gather for the 57th annual advance presentation of McGraw-Hill Construction Information Group's *Construction Outlook*-an analysis of the economic environment, statistics and market trends that will shape business in '97.

Industry decision-makers at the Outlook '97 Executive Conference will also benefit from the unique, inside perspectives of featured speakers :



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Chris Matthews



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Dan Quayle, 44th Vice President of the United States and vigorous advocate for economic growth.

Chris Matthews, best-selling author, CNBC host, ABC commentator and Washington Bureau Chief for the *San Francisco Examiner*.

William Safire, Novelist and Pulitzer Prize winning political columnist for *The New York Times*.

Robert Peck, Commissioner for Public Building Service of the GSA.

Donald Tapscott, author of *The Digital Economy and Paradigm Shift*

David Wyss, Chief Economist for DRI/McGraw-Hill.

Robert Murray, Vice President of Economic Affairs for McGraw-Hill Construction Information Group and author of *Construction Outlook '97*.

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