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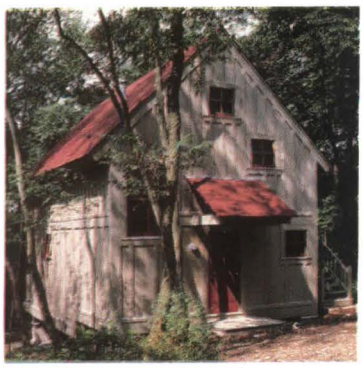

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BUILDING TYPES STUDY 681

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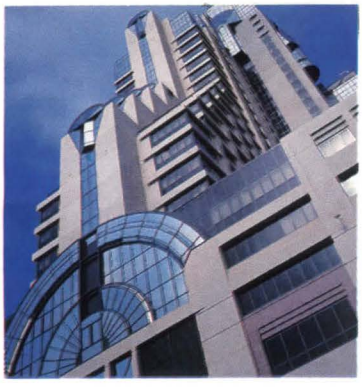

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BUILDING TECHNOLOGY

PRACTICE

COVER
Ellis Island Restoration, New York City. Technical presentation drawing, ink on vellum, by Beyer Blinder Belle/Notter Finegold + Alexander, Restoration Architects.

Say goodbye to the dark ages. The days when quarry tile was always brick red and 6″ x 6″.

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What remains the same is what's always made

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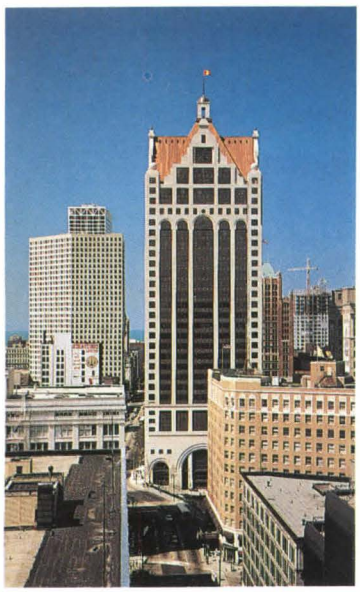

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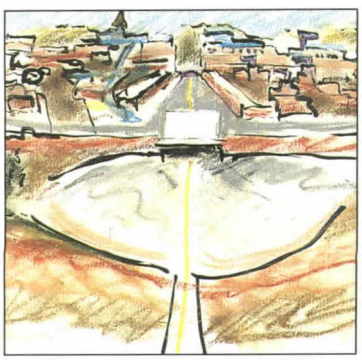

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BUILDING TYPES STUDY 682

Looks Can Be Deceiving

Photographer: © 1989 Andrew Kramer, AIA

Architect: *Gensler & Associates Architects*
Los Angeles, California

Project: *Delta Air Lines, Inc.*
Terminal 5, Los Angeles International Airport

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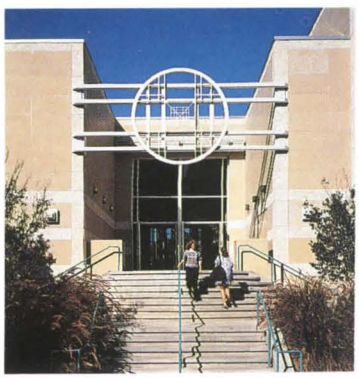

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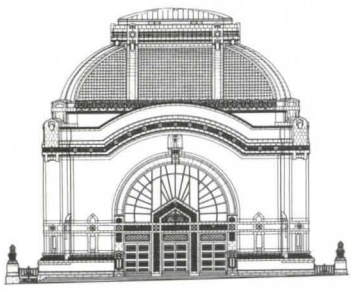

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PRACTICE

COVER
Price Center, University of California at San Diego; Kaplan/McLaughlin/Diaz, Architect; Photographer: ©Nick Merrick

SUPPLEMENT ON LIGHTING IS INCLUDED WITH THIS ISSUE (with U. S. and Canadian copies only)

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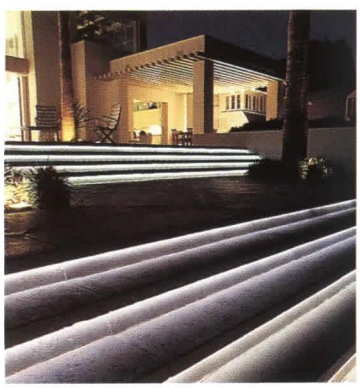

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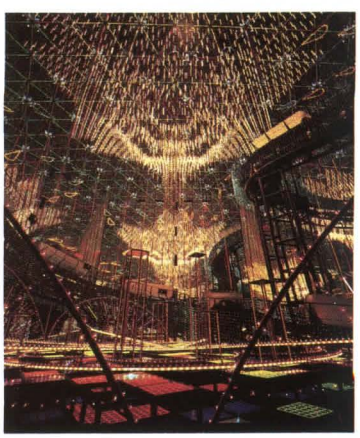

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COVER
Convention Place Station,
Downtown Seattle Transit Project
TRA, Architects
Lightsource Inc., Lighting Consultant
Photographer: ©Robert Pisano

SEEING THE LIGHT

RECORD's lighting supplement helps you catch up on the latest in lighting design and technology.

Late last winter, publisher Roscoe Smith, Atlanta district manager Greg Bowerman, and I began exploring the idea of publishing a supplement to a summer issue of RECORD, a supplement supporting our normal editorial by featuring articles on lighting. With the enthusiastic support of the International Association of Lighting Designers (IALD) and the Illuminating Engineering Society of North America (IESNA), sponsors of Lightfair, we decided to go ahead with the project. Our major reason for selecting the lighting field came from architect readers of RECORD, who told us they needed specialized information about lighting, information they couldn't find covered sufficiently in other publications.

With the assistance of officers and members of IALD and IESNA, we began mapping out the content for this supplement. At all times keeping the RECORD reader in mind, we searched out projects and features in four key areas: commercial (page 28), retail (page 14), landscape (page 16), and interior lighting (page 35). In addition, we scheduled articles on technological developments in the lighting field, addressing such issues as glare control and energy conservation (page 39), as well as exploring the latest design innovations that grew out of the new technology (page 21). We also included such features as "When and How to Hire a Lighting Designer" (page 8); "A Guide to Lamps and Controls" (page 39); and a six-page report on new products and literature in the lighting field (page 49).

We wish to thank IALD, particularly president Helen Diemer; IESNA's Bill Hanley; and all the architects, lighting designers, and lamp, fixture, and controls manufacturers who were interviewed for the articles in this supplement. Thanks also go to members of the RECORD staff, including Editor-at-Large Don Canty; Technology Editor Jim Russell; Interiors Editor Karen Stein; New Products Editor Joan Blatterman; Art Director Alberto Bucchianeri; Senior Associate Anna Egger-Schlesinger; Designer Lilian Engel; and Editorial Production Manager Annette Netburn for their contributions. Special thanks go to those who handled the project on the business side: Assistant Publisher Liz Hayman; Business Director Joe Wunk; and Advertising Production Manager Laura Marchisio.

We hope you like our first lighting supplement. Your reactions and comments are welcome, and will help us decide if we should include this feature with a future issue.

CAROLYN DE WITT KOENIG, *Managing Editor*

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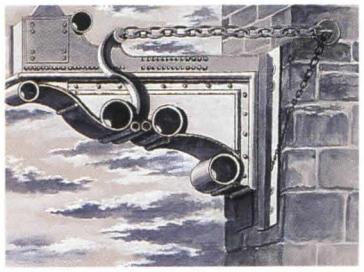

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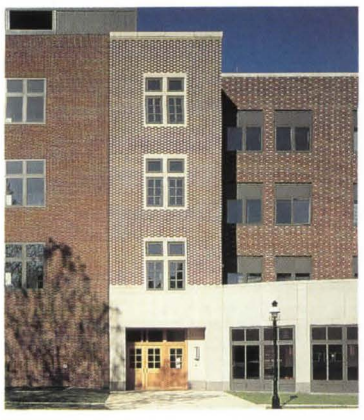

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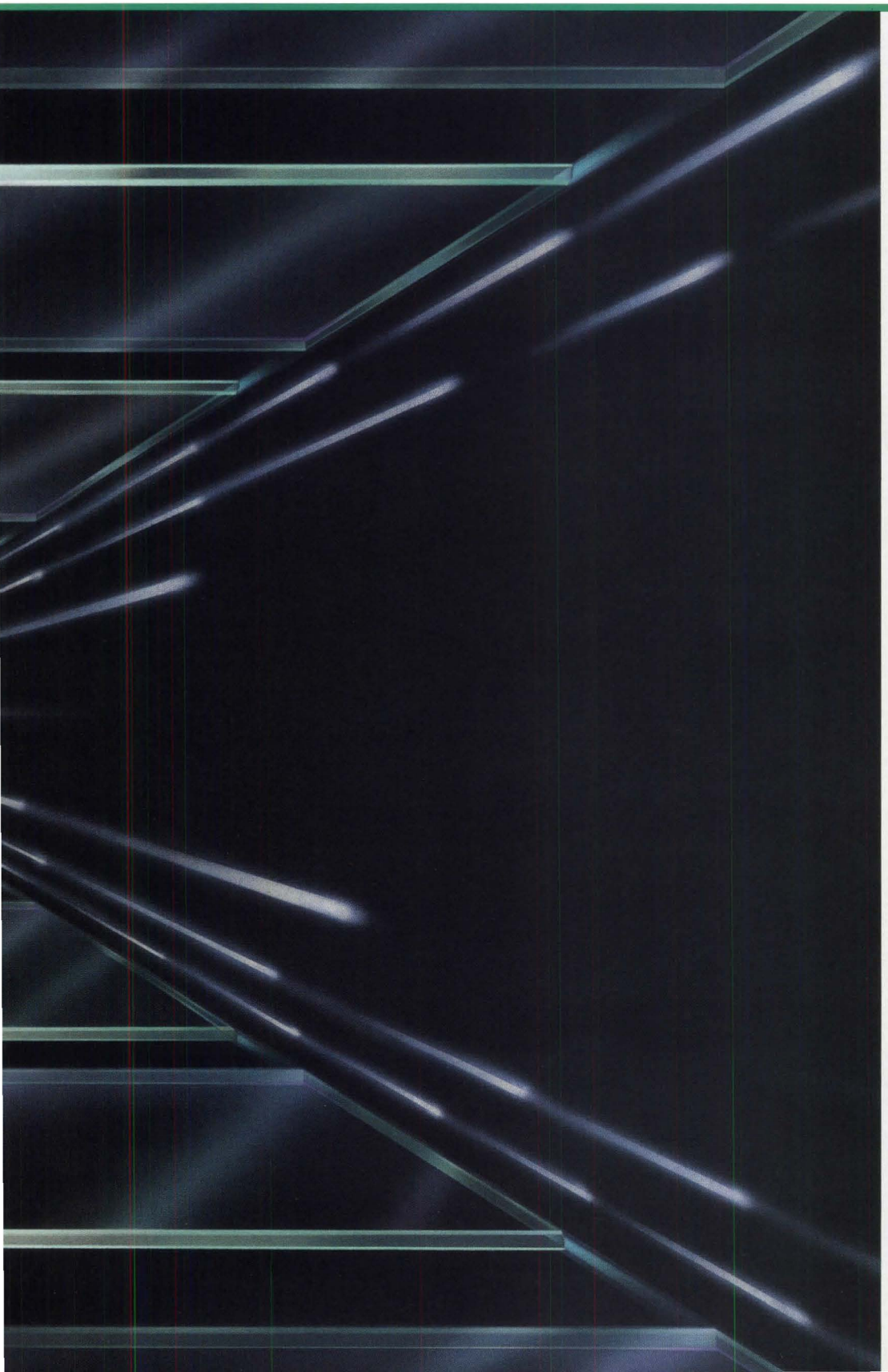

The beginning of an exciting new era in the history of glass is about to begin.

A time when advanced glassmaking technology completely revolutionizes architectural trends. A time when flat glass products can no longer be considered a simple commodity.

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Over the next several months, we invite you to learn more about these unique glass products, as well as others LOF currently has under development. Once you do, you'll understand why architects, builders and fabricators throughout the world consider LOF to be Light Years Ahead in today's glass industry.

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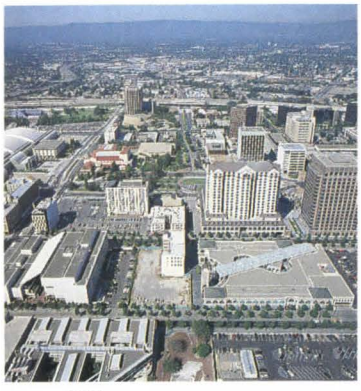

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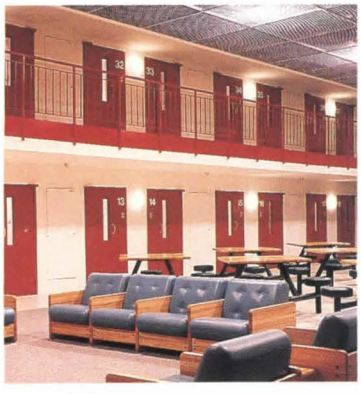

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BUILDING TYPES STUDY 684

BUILDING TECHNOLOGY

PRACTICE

COVER: Manhattan Triplex Apartment, New York City; Steven Forman, Architect; Photographer: ©Paul Warchol

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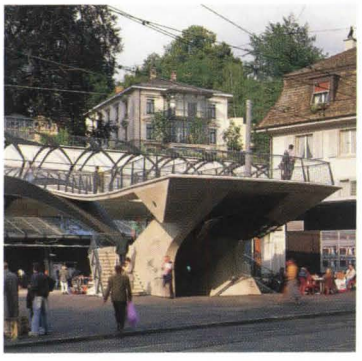

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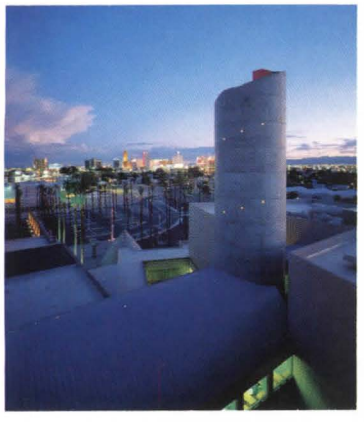

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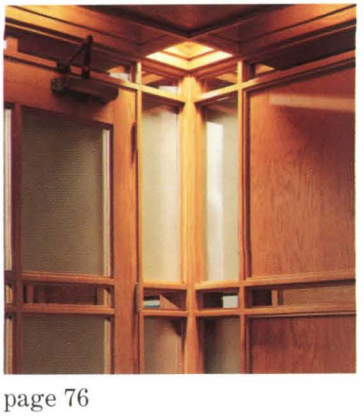

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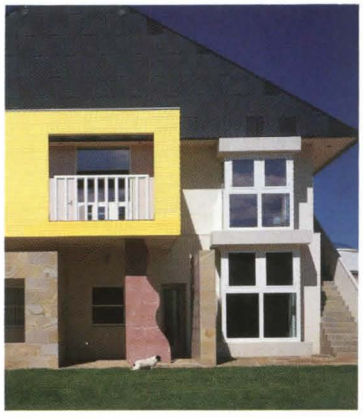

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BUILDING TECHNOLOGY

PRACTICE

COVER: Las Vegas Library/Discovery Museum, Las Vegas, Nevada;
Antoine Predock, Architect
Photographer: ©Timothy Hursley

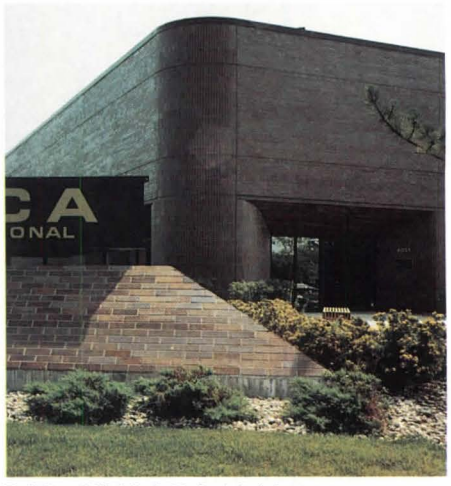
BP America Building, Cleveland, Ohio
Architect: Hellmuth, Obata & Kassabaum, Inc.
Photo: Bill Schuemann

Imperatore Library, Englewood, New Jersey
Architect: Bohlin Powell Larkin Cywinski
Photo: Christopher Barone

The Humana Building, Louisville, Kentucky
Architect: Michael Graves
Photo: Pashall/Taylor

Frank Moody Music Building, University of Alabama, Tuscaloosa, Alabama
Architect: Fitts & White
Photo: Balthazar Korab Ltd.

Unity of Dayton Church, Huber Heights, Ohio
Architect: Woolpert Consultants



Building Officials & Code Administrators International, Inc., Flossmoor, Illinois
Architect: Linden Group, Inc.
Photo: Linden Group, Inc.

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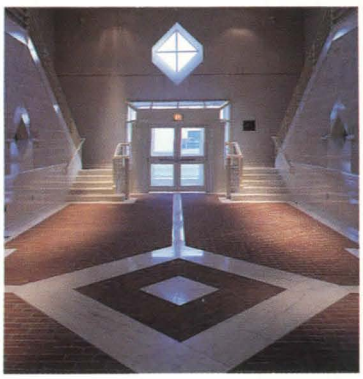

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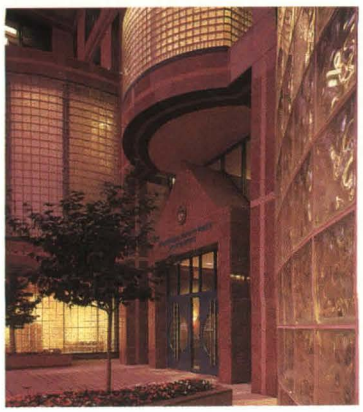

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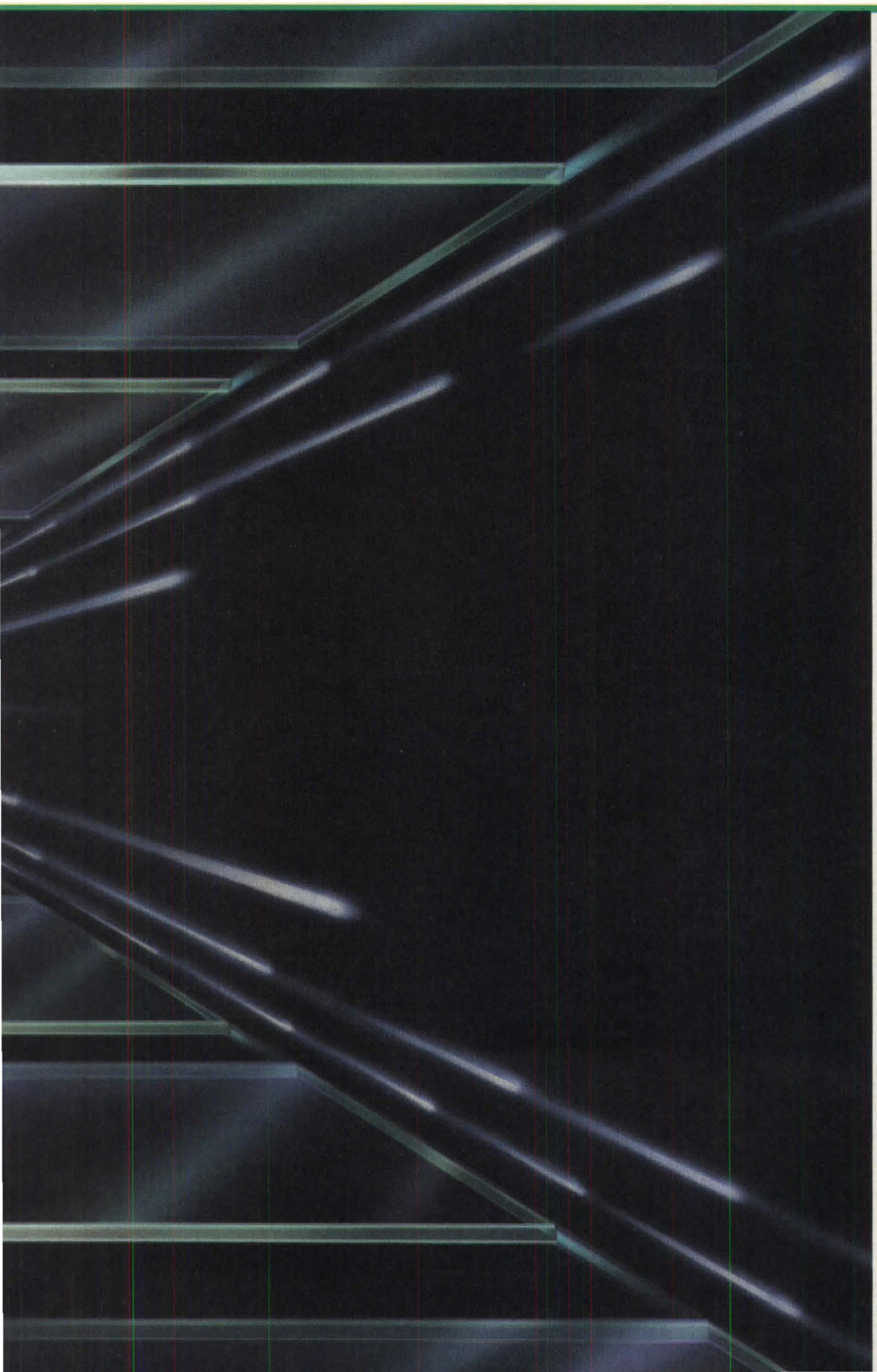

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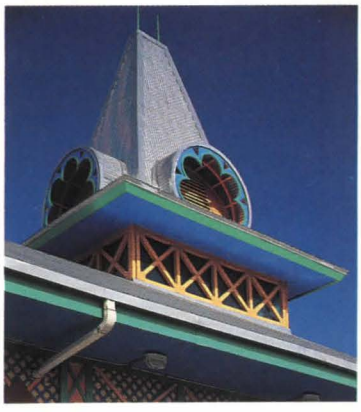

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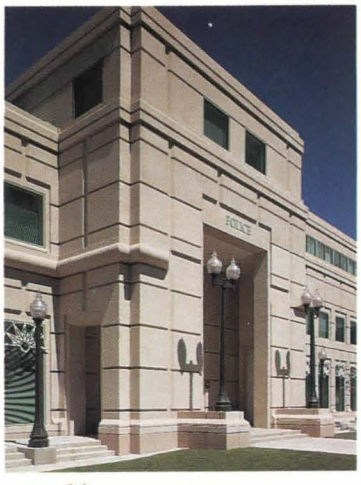

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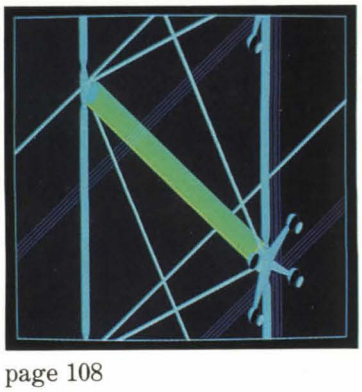

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BUILDING TECHNOLOGY

PRACTICE

COVER: Aurora Municipal Justice Center, Aurora, Colorado; Skidmore, Owings & Merrill/Washington, D. C., Architect
Photographer: ©Ron Johnson

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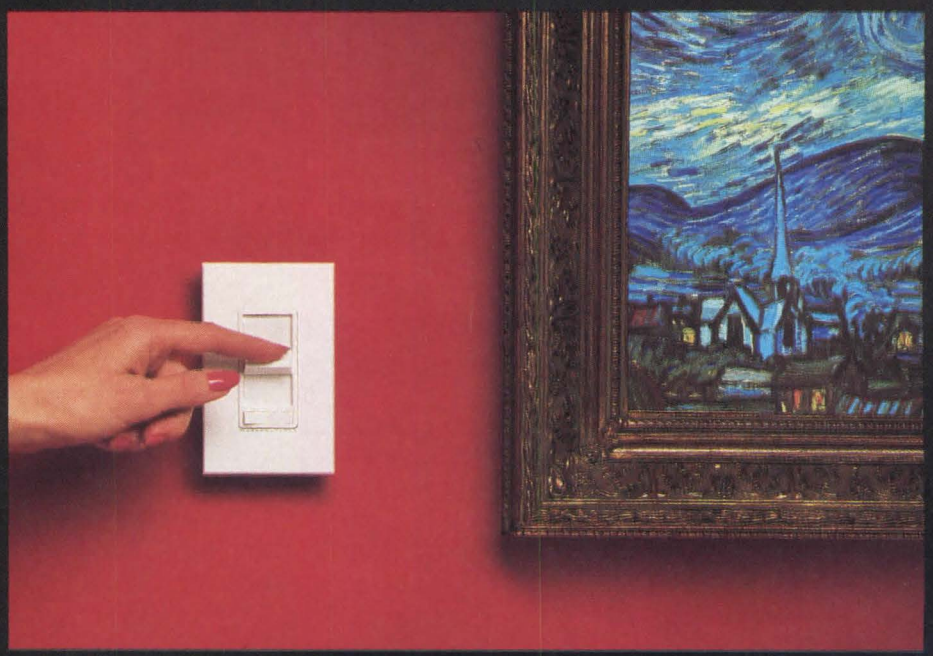

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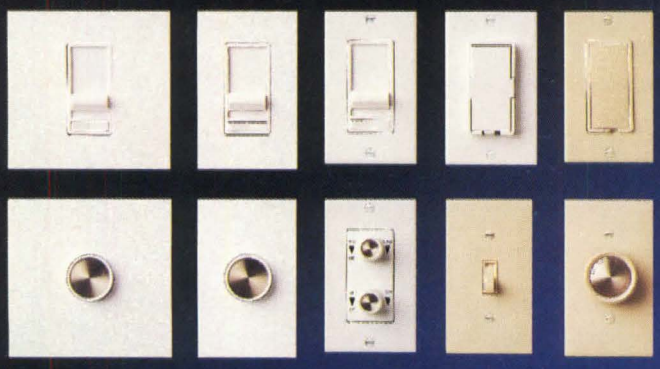

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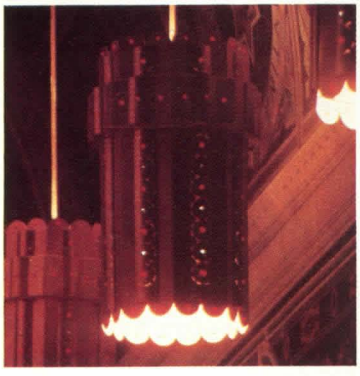

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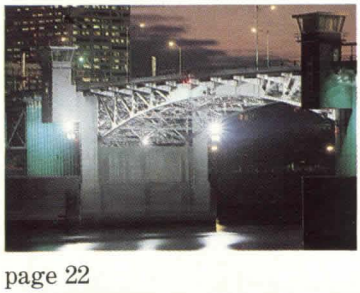

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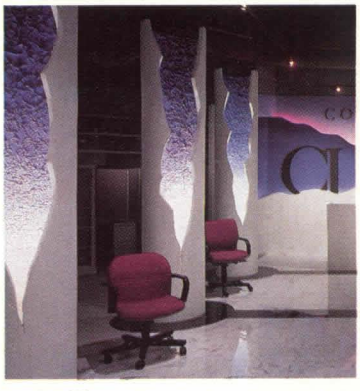

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COVER
Two Bridges
Willamette River
Portland, Oregon
PAE Consulting Engineers, Lighting Consultant
Photographer: ©Richard Strode

Warm welcomes

I commend you on RECORD LIGHTING [August 1990 supplement to RECORD]. My hat is off to you for both the clarity of the articles as well as the accompanying art work and photographs. I hope that the "lighting magazines" will take note of your issue.

CHIP ISRAEL
Design Studio Manager
Grenald Associates Ltd. Architectural Lighting Consultants
Culver City, California

We are a brand-new company that, through coverage of a new product in RECORD LIGHTING [page 50], has gotten vital exposure. In fact, I just began negotiating a hotel deal which came directly from a designer's query after she had read RECORD LIGHTING. Thank you for this vehicle.

GREGORY P. SEEI
Partner
Stonelights, Ltd.
Barrington, Illinois

EE Admonishments

Your August, 1990 issue of RECORD LIGHTING has several statements in it which I find offensive and inaccurate. In your article entitled "When and How to Hire a Lighting Designer" by Joseph Wilkinson [page 8], the following quote was used: "No electrical engineer can satisfy the complex needs of special space, and a lighting designer assures you of a truly independent judgment in the selection of manufacturers and the design of special lighting for the problem at hand."

First, there are many electrical engineers who embrace the challenge of designing lighting systems for "special spaces" and who are well qualified to do so from both a technical as well as a creative standpoint. Second, to say that a lighting designer has greater independent judgment in the selection of manufacturers is false.

You also stated: "The electrical engineer usually takes care of service areas and general work spaces." For the lighting designer to handle strictly the high impact areas and pass off the general work spaces to an electrical engineer shows little concern for anything but decorative lighting. Lighting must function well throughout a facility in order to be a quality lighting project.

THOMAS A. CARLINS, P.E.
Astorino/Branch Architects & Engineers
Pittsburgh, Pennsylvania

Mr. Wilkinson replies:

I can appreciate that you take exception to the opinion of Robert Gatje, of Richard Meier & Partners. Although we published his remark, it was Mr. Gatje's opinion and not a judgment of RECORD LIGHTING.

Regarding your objection to the sentence: "The electrical engineer usually takes care of service areas and general work spaces:" While those assignments, I think, are generally the responsibility of the electrical engineers, my sentence was not well written. It could be inferred from it that electrical engineers do an indifferent job on this work or that electrical engineers might be incapable of more demanding work. I'm sure that is not true of Astorino/Branch, nor other electrical engineers.

I strongly object to the statements about electrical engineers made by Joseph Wilkinson in his article "When and How to Hire a Lighting Designer." The electrical engineer has the vast scope of expertise, not only in the field of lighting design but in all facets of the vast field of engineering, while the so-called lighting designer is only half vast in this area.

L. BARCLAY STANLEY
Sampson Randall & Press
Los Angeles, California

It is not very often that I am so offended that I feel the need to respond to a magazine article. In rebuttal to your article on "When and How to Hire a Lighting Designer," I feel that I am a "lighting designer" as well as a "professional consulting electrical engineer." As such, I do the lighting design and fixture selection as well as that which requires wiring. I do the lighting by choice and my clients are satisfied that I understand "the complex needs of special space" and I have good taste and an appreciation of the esthetics involved.

AUDREY G. CAPLAN, P.E.
Caplan Engineering Company
Pittsburgh, Pennsylvania

Corrections

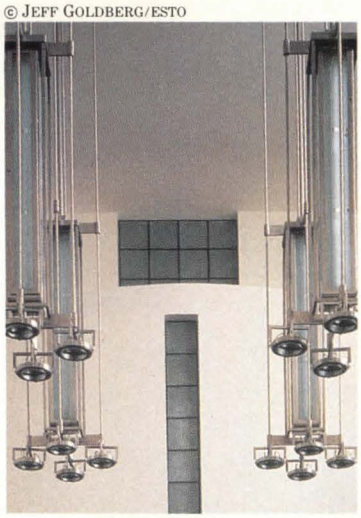
The correct name of James Stewart Polshek's firm is James Stewart Polshek and Partners [RECORD LIGHTING, August 1990, page 11]. Lighting design for the Santa Monica Pier [also on page 11] should have been credited to John Levy of Childs Associates.

In addition, captions on page 11 were out of order. The photograph numbered 13 shows the lighting fixtures in the U. S. Embassy in Oman, a building designed by James Stewart Polshek and Partners, with light fixtures designed by Howard Brandston; the photograph was taken by Jeff Goldberg of ESTO. Photograph 14, of Moore Ruble Yudell's Santa Monica Pier, was taken by Henry Bowles. The photograph in the sidebar shows St. Andrew's Abbey Church in Cleveland, designed by architects Woollen Molzan and Partners, with lighting design by William Lam; the photographer was Balthazar Korab. Above are the same images with the correct captions and photo credits.

The lighting of Centrust Tower, Miami [August, page 9], was done by Douglas Leigh, The Douglas Leigh Organization, Inc., New York City.

The name of the architectural firm that designed the Irmas house [August, page 16] is Warner and Gray, Inc., Architects, of Santa Barbara, Calif. Jack Lionel Warner is principal in charge.

© JEFF GOLDBERG/ESTO



U. S. Embassy, Oman, James Stewart Polshek and Partners, architect; Howard Brandston Lighting Design.

© BALTHAZAR KORAB

St. Andrew's Abbey Church, Cleveland, Woollen Molzan and Partners, architect; William Lam Inc, lighting.

© HENRY BOWLES

Santa Monica Pier, Moore Ruble Yudell, architect; John Levy, Childs Associates, lighting.

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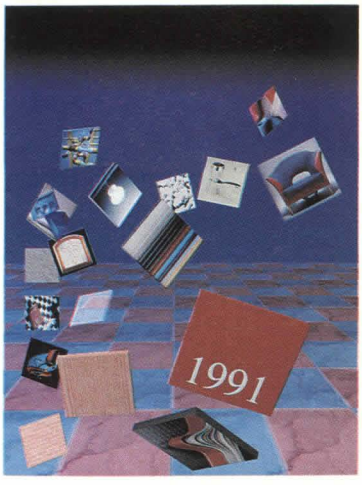

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Of particular assistance to the editor in the preparation of this issue were:
Joan F. Blatterman, editor-in-charge
Annette K. Netburn, editorial production
Lilian R. Engel, editorial production assistant/designer
Susan R. Bleznick
Joseph F. Wilkinson

Manufacturers' index for Product Reports 1991

Companies whose products and literature appear in the editorial section of Product Reports, pages 48-162, are listed at right. Following the company names are Reader Service Numbers. The index to advertising that appears in this issue is on page 195.

ARCHITECTURAL RECORD

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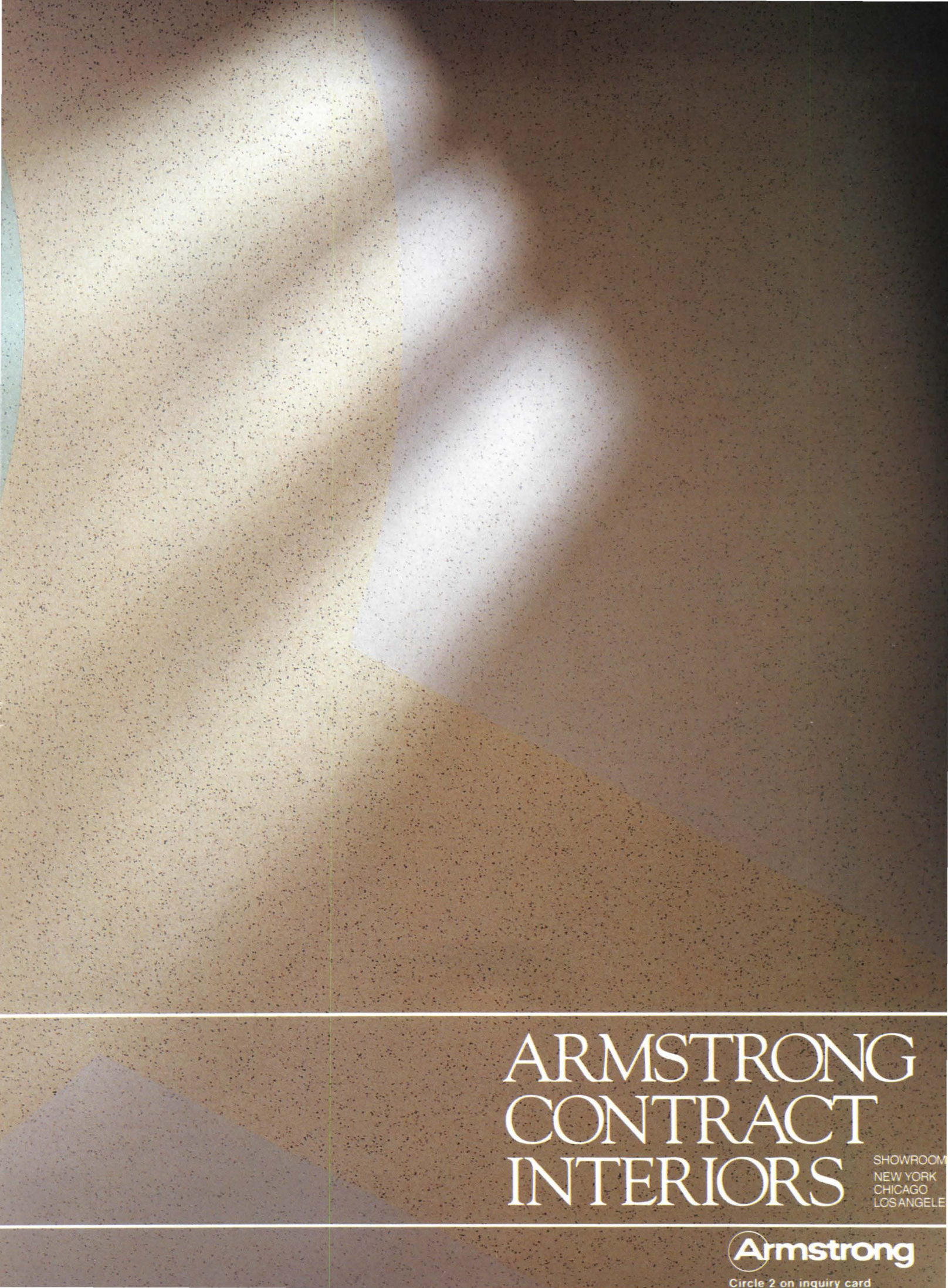

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Hiring and being hired

Thank you for David Greusel's wonderful series on hiring and interviewing for architectural firms [RECORD, April 1990, pages 34-37, and May 1990, pages 43-45]. The articles dealt with a difficult and confusing subject in an honest and insightful manner. For those who read the articles and, more important, believe the author, they are an excellent source of information.

In my experience as a corporate recruiter, I have seen hundreds of applicants and dozens of employers who should heed the advice in these articles. Interviewing and hiring need not be as traumatic as they have become. Anyone with the ability to organize his thoughts and pay attention to details can become a competent interviewer.

One word of advice for the interviewer that I would add to Mr. Greusel's would be to think before you interview. Prepare for the interview by writing down the abilities, skills, talents, and personality traits you are looking for, and then write questions that will detect these. You will be able to "remember" better if the relevant information is written down, and you will make better decisions by preparing for the interview ahead of time.

GREGORY CHARTIER
PRESIDENT
SMALL BUSINESS CONSULTING SERVICES
Ossining, New York

I thoroughly enjoyed and was enlightened by the articles "How to Land a Job in an Architectural Firm," by David Greusel, and "What the Job Market Holds for Graduates," by Nicholas Basta [RECORD, April 1990, pages 34 and 41]. I am an aspiring architect who is very pleased to know that RECORD caters to the needs of aspiring as well as accomplished architects.

IRAN SCOTT
Fort Washington, Maryland

Charting construction costs

RECORD has been publishing construction costs for as long as I can remember. My offices, both past and present, have used this part of your publication since 1962 to keep a chart of building costs, and over the years we have had owners request updated costs for insurance purposes and for replacement budgets.

I am writing to find out if you have discontinued this page.

VICTOR D. HALLORAN
ARCHITECT
Green Bay, Wisconsin

Thank you for your support of our Construction Costs page. No, we have not dropped it—simply redesigned it. It appeared in February 1990 on page 60 and in June 1990 on page 37.—Editor

The Maple Leaf Forever

The article on the new Canadian Chancery written by Peter Blake [RECORD, March 1990, pages 56-65] is most flattering. The photography, superb.

JOHN C. OSLER, MINISTER
PUBLIC AFFAIRS
CANADIAN EMBASSY
Washington, D. C.

A view from South America

I eagerly accept your invitation to let you know about my impression of the new ARCHITECTURAL RECORD.

I have been a reader of RECORD since I was a student, and although I live in Brazil, in a different social-cultural-economic reality, it is surprising how your magazine considers matters so meaningful to me. I refer not so much to specific designs as to problems inherent in our profession. For instance, "An Agenda for the Nineties," by Donald J. Canty, in your January 1990 issue, exemplifies what I mean. The matters discussed apply in many ways to our situation.

About the new typography, new departments, and especially the increased examples of good design, I can only applaud.

ARCHITECTURAL RECORD, bravissimo!

MASSIMO FIOCCHI, ARCHITECT
São Paulo

Correction

The architectural designer of the chemistry building at Dartmouth College [RECORD, May 1990, page 27] is Ellenzweig Associates, Inc., of Cambridge, Massachusetts, in association with R. M. Kliment & Frances Halsband Architects of New York City.

ABC BPA

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DESIGN

Americans in Paris Get a New Home

As architect of the American Center in Paris, Frank O. Gehry thinks of the building as "an American in Paris," one that somehow merges French "politeness to the street" with Gehry's own distinctive brand of California exuberance.

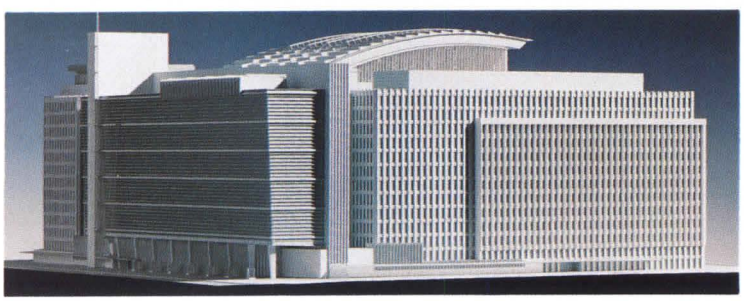
The American Center will provide studios, theaters, and apartments for Americans studying the visual and performing arts in Paris, as well as classrooms for the center's American Language Program. (The institution's former quarters on the Boulevard Raspail in Montparnasse were sold in 1987.)

On its outside edges, Gehry's design presents fairly straightforward facades to its Right Bank neighbors, which include the new Bastille Opera and the proposed Bibliothèque de France, among others.

On the southwest corner, however, the city required a *pan coupé*, a beveled corner symmetric with that on another building facing Bercy Park. Here the architect could let his American expressionism run more or less rampant (above right), creating a cylindrical leaning elevator tower, a sloping zinc awning, and a glass wall that will open in warm weather.

Associate architects are the Parisian firm Saubot et Jullien Associates.

World Bank Expands Its Modern Offices



Kohn Pedersen Fox Associate's design for additions to the World Bank headquarters called for a new and complex approach to the issue of context—an approach that includes not only the larger architectural milieu of Washington, D. C., but the immediate context of two fairly new buildings already on the site, one designed by Vincent Kling, the other by Skidmore, Owings & Merrill.

The three-phase design by William Pedersen projects two office wings sympathetic to their Modernist neighbors. In Phase I, a vertically mullioned wing with adjacent elevator tower (at far left of model) replaces two old buildings. Phase II will add a wing with horizontal spandrel beams to replace another pair of obsolete buildings; the headquarters' major entrance will face Pennsylvania Avenue from this wing. A large arched skylight, also part of Phase II, will cover an existing courtyard. Phase III, to be completed in six years, calls for restoration of the Kling and SOM buildings.

KPF led the consortium that won the bank's design competition. Other members included the architectural firms Kress Cox Associates PC of Washington, D. C., and Naegele, Hofmann, Tiedemann of the Federal Republic of Germany, and interior designers Kohn Pedersen Fox Conway of New York City.

Colorado County Develops Its Seat of Government

Colorado's Jefferson County, which has small cities and government offices spread over the countryside west of Denver, will consolidate its facilities by creating a county seat on a 193-acre site outside the town of Golden. The county asked C. W. Fentress, J. H. Bradburn and Associates to master plan the center and to design two buildings—the Human Services headquarters, now completed, and the County Seat (right), where construction has just started.

At the center of the County Seat, a 125-foot-high rotunda supports a traditional dome—one of the major intended functions of the emblematic dome is to confer prominence on hitherto diffuse government facilities. The rotunda also establishes a point for grand entrances.

Functionally, the rotunda serves as an entrance for the two precast-concrete wings: on the left, a small-windowed administration wing with offices for 26 departments, and on the right, the large-windowed courthouse, which provides three separate circulation systems, including an underground passage for defendants brought from the county jail.

A small detached building provides a drive-in window for the payment of taxes and fines and for the registration of motor vehicles, a facility that the architects think is novel for this kind of building.

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Briefs

Rice University has named Alan Balfour dean of its School of Architecture. He has been acting dean at the Houston school since January, when Paul Kennon, who had served since 1989, died. Balfour was a faculty member at Georgia Institute of Technology and is a graduate of the Edinburgh and Princeton schools of architecture.

Behnisch & Partners of Stuttgart, West Germany, have received the 1990 R. S. Reynolds Memorial Award for distinguished architecture using aluminum. Their winning design was the German Postal Museum in Frankfurt (above), an underground building with an aluminum superstructure. The prize carries an award of $25,000 and an aluminum sculpture.

Architect Norma Sklarek of Los Angeles has joined ARCHITECTURAL RECORD's board of editorial contributors. Sklarek is with the Jerde Partnership in Los Angeles, where she is principal for technical architecture.

Architect Harvey Gantt of Charlotte, North Carolina, will oppose Republican Senator Jesse Helms in this year's election for Helms's seat in the U. S. Senate. Gantt, who is a fellow of the American Institute of Architects, won the June 5 Democratic primary run-off. He is also a former two-term mayor of Charlotte.

The World Monuments Fund, which has supported more than 50 preservation projects in 15 countries, has selected for its current program the American Heritage Center for Conservation and Training at the Church of St. Ann and the Holy Trinity in Brooklyn, New York. The fund, located at 174 East 80th Street in New York City, seeks money for the center's apprentice programs for stained glass and sandstone restoration.

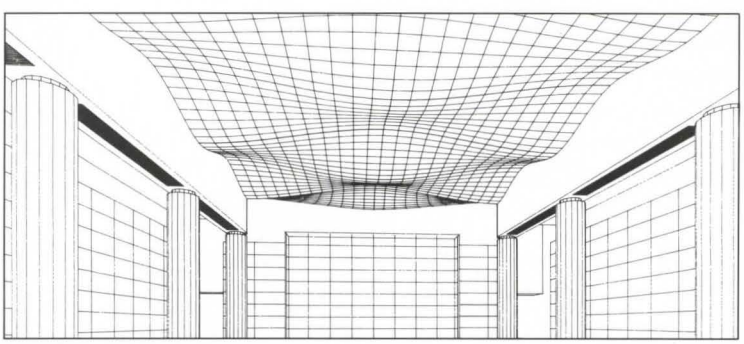
Space Monitors Top Colorado Lab

Nothing better illustrates the puzzling historical collisions of our times than the addition of a laboratory for advanced scientific research within the traditional precincts of academia.

When the Denver firm of Hoover Berg Desmond was commissioned to design the Laboratory for Atmospheric and Space Physics for the University of Colorado at Boulder, George Hoover reports, he persuaded the owner that its familiar tile roofs did not express the whole truth about the literally far-out astrophysical research—designing and calibrating space-probe equipment.

The new building's basic materials include buff sandstone walls and red tile roofs, like those elsewhere on campus. At the same time, the lab needed roof-mounted equipment to monitor radio transmissions from space; Hoover used these balloonlike receivers for architectural composition.

Nonetheless, the building is meant as much for people as for high-tech equipment. The lab expects to receive an almost constant flow of international visitors who will want to see the experiments but who will also be eager to converse with the resident scientists. On the south elevation (above), a roofed porch provides a solarium with dining and conference space—as well as a superb view of the Rocky Mountains.



Brooklyn Museum Expansion Proceeds

James Stewart Polshek has compared New York's Brooklyn Museum to an elderly person "whose innards are not in great shape." For that reason, the museum hired Polshek's firm and Arata Isozaki & Associates to redesign much of the interior of the Beaux Arts building designed by McKim, Mead and White in 1893.

The renovation is the first phase of a master plan designed by Isozaki/Polshek and selected from five entries in a 1986 juried competition [RECORD, January 1987, page 43]. Phase I of the renovation is projected to cost $31 million and will be done within the existing building. The entire West Wing will be gutted and renovated to include three floors of galleries, a top-floor skylight, a floor of curatorial office suites, and art storage space.

The renovation will give the public its first access in more than 60 years to the museum's West Wing, the oldest part of the building. The Isozaki/ Polshek renovation will be unveiled in 1992 for the Columbus Quincentennial celebrations with an exhibit of the museum's Spanish Colonial art.

A 460-seat auditorium features an undulating ceiling (left) with a series of intersecting hyperbolic paraboloids designed by Isozaki. "Spatially, the auditorium is going to be quite spectacular," Polshek said. It is designed for film screenings, lectures, and recitals.

Russ Altermatt and Peter George served as acoustical consultants for the renovation. With mechanical rooms located above and below the undulating ceiling, "We took a certain amount of care to isolate sound," Altermatt explained.

"We're still reworking the master plan," Polshek said. Future phases of the plan might take about 30 years to complete, contingent on funding.

SUSAN R. BLEZNICK

Precut Logs Clad a Girl Scout Camp

Because Camp Tohikanee in Bucks County, Pennsylvania, wanted to extend the pleasures of outdoor camping through the winter months, the Freedom Valley Girl Scout Council asked architect Susan Maxman of Philadelphia to design two new campsites. (Maxman had already designed Camp Tweedale, another Girl Scout camp seen on pages 64-67 of this issue, for the same client.)

Each of the campsites has three cabins for sleeping and a program building for dining and recreation. Quetit (below), designed to accommodate handicapped scouts, has one-story cabins on a relatively flat site, whereas the wilder Wyconda site has two-story cabins.

Though Maxman likens the style of the buildings to rugged Adirondack lodges from the early years of the century, their structure consists of sophisticated kits of precut timber, reminiscent of Lincoln Logs.

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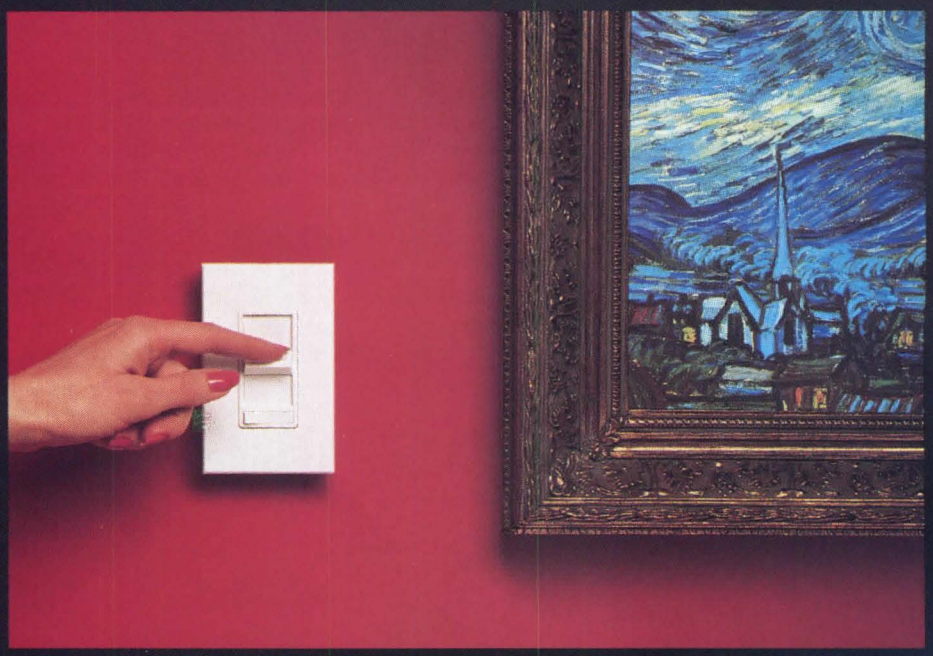

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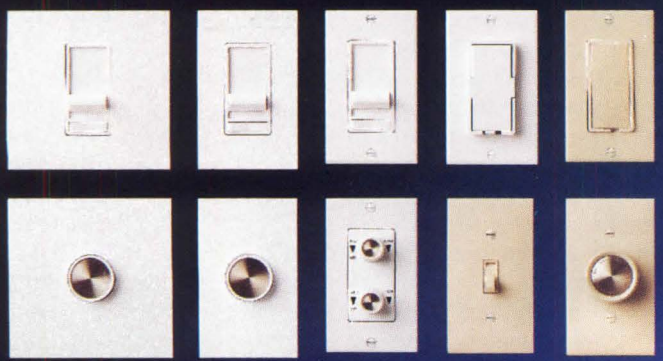

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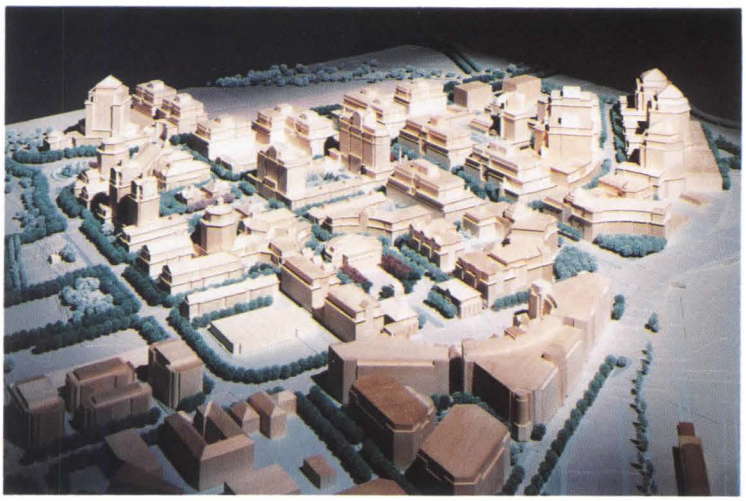


Design is under way for Carlyle, a mixed-use project on 76.5 acres in Alexandria, Virginia. Located about 10 miles southwest of Washington, D. C., the project will be "truly mixed use throughout," reports design partner Brian Shea of Cooper, Robertson & Partners. The New York City firm created the master plan for the project.

Carlyle borders an 18th-century district called Old Town, which has been designated an historic landmark, and it is an extension of the existing Alexandria city grid. "There's an attempt to organize a complete mixed use on every block," with retail, commercial, and residential buildings interspersed throughout the project, Shea said. Residential space accounts for nearly half of the project, and offices take up 40 percent.

The remaining space is occupied by a hotel, a 15-story county courthouse, and retail space. The plan calls for a mix of scales on every block: three- and four-story row houses, six- and seven-story office buildings, and taller buildings up to 15 stories. Parking will be above and below grade and the new community is convenient to the Washington's commuter Metrorail line and Alexandria's bus system.

The Oliver Carr Company, a private developer in the Washington area, originated the idea for Carlyle. The project, referred to as an "edge city site," is an attempt to transform the urban fringe of Alexandria, with its railroad yard and industrial waste areas, into a $1-billion complex. Norfolk Southern Corporation, a railroad company, joined with Carr to build Carlyle. Three years of planning were spent on the project, which Shea estimates will take 10 to 15 years to complete. Construction is expected to begin in 1991.

Cooper Robertson's plan calls for open space, including gardens, parks, and a fountain court, to occupy about 34 percent of Carlyle.

The plan comprises five distinct precincts: Market Place, with a theater; The Gardens (center of the plan), with a hotel and residences on the square and nine-story office buildings; Fountain Court, site of the courthouse, low-rise residential buildings, and office space; Residential Green; and Black Heritage Park. **S. R. B.**

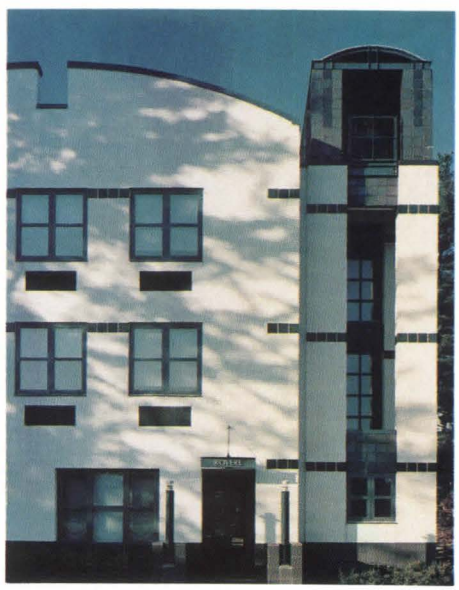
NCMA Launches New Awards Program

This year saw the inauguration of a new architectural awards program: the Concrete Masonry Design Awards of Excellence, to be cosponsored biennially by the National Concrete Masonry Association and the American Institute of Architects.

The winners were chosen for design distinction and to showcase the innovative potential of an essentially modest material. "The winning entries were those that showed the beauty of the block in its simplest, most elegant form," according to jury chairman Gerald Horn of the Chicago firm Holabird & Root.

Among the winners were James Stewart Polshek & Partners of New York City for the design of the Bard College Alumni Houses in Annandale-on-Hudson, New York (right). Other winners included: Bowie Gridley Architects of Washington, D. C., for the Fairview Marketing Center in Falls Church, Virginia; Hornberger, Worstell & Associates of San Francisco for the Hyatt Regency Scottsdale in Arizona; Pappageorge Haymes, Ltd., of Chicago for Larrabee Commons luxury housing in Chicago; Rey de la Reza AIA Architects in Houston for the Little Cedar Bayou Park in La Porte, Texas; RNL Design/Anderson Mason Dale of Denver for Lookout Mountain School in Golden, Colorado; and Wolff/Lang/Christopher Architects, of Rancho Cucamonga, California, for the Upland Police Facility in California.

In addition to Horn, the jurors were Edward M. Tower of San Francisco, and Graham Davidson of Hartman Cox Architects, Washington, D. C.



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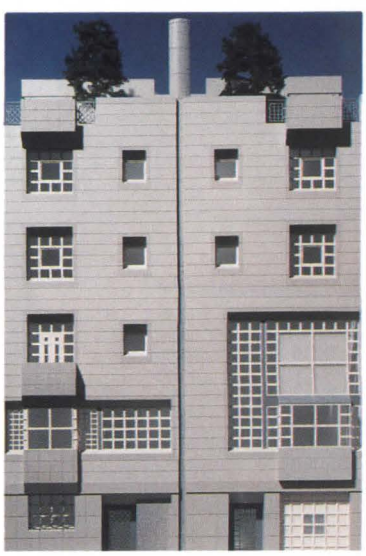

Two Town Houses Recall Past Glamor

The single-family Manhattan town house seems just a dreamlike memory, but developer Phyllis Rosen thinks there is not only a desire but a market for the building type. For East 85th Street, Gwathmey, Siegel & Associates have designed a pair of houses, now under construction, for typical Manhattan townhouse sites — two 25-foot frontages flanked by large apartment buildings.

Though the limestone-clad buildings with their gridded wooden fenestration look alike, the composition of the lower three floors just as clearly reflects interior differences. The top floors contain bedrooms and exercise rooms.

The building on the west (at right in photo) has a first-floor garage, surmounted by a double-height atrium lit by a large window distinguished by an onyx medallion. The other building also has a two-story atrium, which is discreetly placed behind the single-height living room overlooking the street.

Both town houses will have roof-top terraces and basement swimming pools.

Competition Calendar

For its 1990 World Habitats Award, Britain's Building & Social Housing Foundation seeks entries of innovative and successful human settlements around the world. Awards include two £10,000 prizes — a £3,000 personal prize and £7,000 for the presentation. Preliminary entries are due July 31. For information: Peter Elderfield, Director, Building & Social Housing Foundation, Memorial Square, Coalville, Leicestershire LE6 4EU, England (530/510444).

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HOW THREE ARCHITECTS MARKET THEMSELVES

The final part of an article in which architects are encouraged to use the marketing approach that works for them. By Nicholas J. Polites

Three firms with very different marketing approaches have found success in taking advantage of their firm's differences. While each chooses to remain relatively small, it has positioned itself in ways that suit the personalities of its principals—one, by the simple force of a lone person's persuasion, another by carefully building on early successes, and a third, after a bumpy start without marketing, by an analysis of potential strengths. **C. K. H.**

SAMUEL WHITE

Buttrick White and Burtis

The New York firm of Buttrick White and Burtis started off the hard way, remodeling kitchens and bathrooms and doing the odd weekend house for family members, and pulled itself up by growing with clients and networking. It was founded in the mid-'60s by Harold Buttrick, and became a partnership when Samuel White, a young architect who was practicing in Philadelphia but longing to return to his native New York, joined it in 1977.

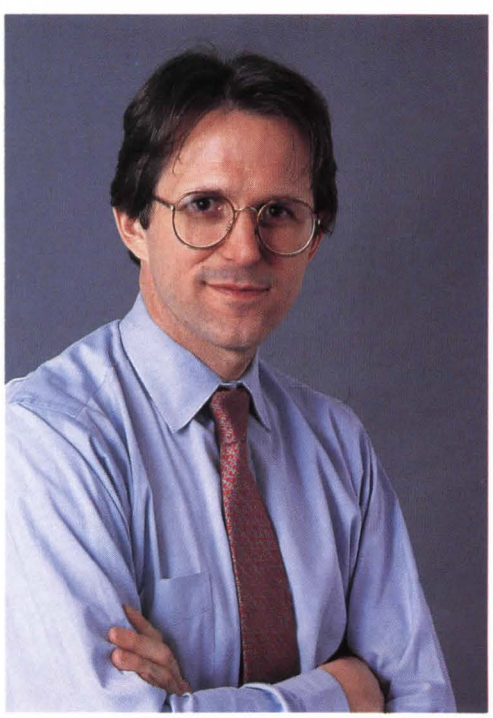
A long stretch of small remodeling jobs greeted him when he got back, and he recalls saying to himself, in anguish: "If I see another bidet, I think I'm going to scream."

But perseverance paid off, and the firm's young clients moved up in the world, taking their architects with them. Kitchens and bathrooms became $4- and $5-million townhouse and cooperative-apartment renovations, classroom remodeling jobs became entire school buildings, design for a two-lawyer office became three floors of offices at Rockefeller Center as the firm outgrew one office after another.

Today, BWB has four partners and a staff of 40. Commissions are more or less evenly divided among institutional, commercial, and residential projects. The firm claims to be the premier architect for the private-school market in New York and has Tower Records as a major client.

While much of the work continues to come from repeat business and referrals, the firm's marketing effort has been getting serious lately. Two years ago a marketing consultant was brought in to help the partners focus on the kinds of clients they would like to get, those they could realistically expect to get, and what they should do to get them.

Law offices were identified as one major target. The firm has a good track record in that area, the work is profitable, and the partners have excellent access to lawyers. Each of them attended a private secondary school and Ivy League college before going on to architecture school; three are from New York, and they have a wide circle of family, friends, acquaintances, and classmates to network.



BO PARKER

White: Starting the hard way, but perseverance pays off.

A directory of New York law firms and legal staffs provides the leads, and a portfolio of their law-office design work serves to position the firm. White calls it "the silver handshake."

Not long ago the partners crossed the threshold into the brave new world—for them—of short lists and interviews. They have had to learn their way around.

As finalists for a project for the prestigious Pierpont Morgan Library, "We went from 12 to 9 to 6 to 4 to 2," says White. He and Buttrick went into the interview uncertain of themselves, not quite knowing how to interest the committee without threatening them. They talked about mundane considerations such as flashing and roof repairs, instead of dwelling on possibilities and opportunities. The other firm got the job. White was crushed.

But when the opportunity to design a new building for the Riverdale School in New York came up, White spent weeks preparing for the interview, researching the client and the best approach to take. By the time the meeting took place, he knew precisely what buttons to push.

He got the job.

LELAND COTT

Bruner/Cott & Associates

Proving that an approach that does not work for one architect may work for another, Bruner/Cott & Associates manages to maintain an image both as architect and developer without intimidating other developers. The Cambridge-based firm started in 1972 by buying an old factory in Boston's South End and converting it into housing for artists. By recognizing the rehabilitation potential of New England's rich inventory of mill structures, it got in on the ground floor of the adaptive-use movement. It also succeeded in positioning itself as a firm that understands developers' concerns with budget. By the time the bottom dropped out of the housing market in the late '70s and early '80s, BCA had built thousands of housing units—some of them award-winners—either through its own development company or for other developers.

No sooner had the firm begun scurrying about in search of new markets when a commission to renovate a beautiful, old, but severely fire-damaged structure for Burberry's in downtown Boston fell into its lap as a result of its past success in dealing with problem structures. This propelled BCA into retail and other kinds of

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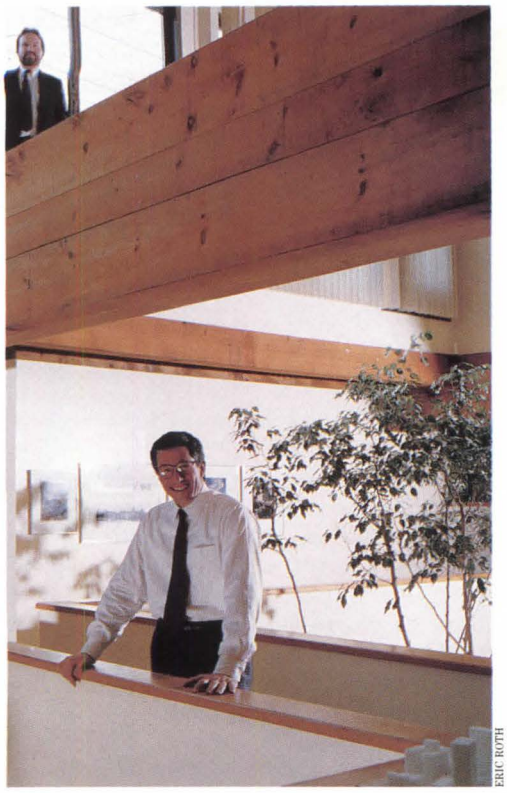


ERIC ROTH

Cott: Early growth from positioning and helter-skelter happenings.

commercial architecture. About the same time, Harvard University asked BCA to rehabilitate an antiquated athletic building that had serious structural problems. After it was finished, the university commissioned the architects to adapt an old apartment building behind Gund Hall into academic offices, thus giving them still another credential.

While much of Bruner/Cott's early growth came from positioning—in part deliberate, in part fortuitous—much of it occurred in helter-skelter fashion, taking its toll in overwork and panic. "I still remember going down to the bookstore at Harvard Square and buying about a dozen books on business management and running your own firm," says Leland Cott. Shortly after, the partners brought in a business manager so they could go back to being architects.

These days, the 30-person architectural firm (35 counting development and property-management-company employees) is better organized. Cott remains in charge of marketing and promotion. "I personally believe the principals in our firm ought to be in charge of business development, because they know the firm best, and they're whom the client really wants to talk to," he says, but they employ a vice president to ferret out leads, keep abreast of trends through the professional marketing societies, help put together proposals and presentations, and assist in final negotiations with all the firm's clients.

Leads who are not personally known to BCA's principals get a letter from Cott expressing interest and requesting an interview. "I try not to end the letter by saying, 'I'll call you in a week,' because I get loads of letters like that that I throw out after two weeks when the person never calls," he says. "Sending those kinds of letters doesn't work." Sometimes Cott's letters lead to interviews. But, he adds, "Those kinds of prospects are few and far between. They don't always pan out."

Instead, BCA continues to rely on referral, reputation, and repeat work from developers, some of whom have returned three or more times. Cott attributes this to the kinds of attitudes that he and his partners instill into the staff—i.e., that theirs is a service organization dedicated to the client's best interest; that, as architects, they listen hard to what the client is saying; and that they see their role more as members of the team than as its leader.

Recently, the firm completed its first two downtown Boston office buildings and is working on a third. It got these jobs, Cott thinks, because of its track record in understanding development and its costs. Though it hasn't done much residential work lately, BCA remains committed to housing for public-welfare reasons. It now has an urban designer and soon expects to market to municipalities and other agencies. Cott takes an active role in many professional and civic organizatons.

HUGH JACOBSEN

Hugh Newell Jacobsen Architect

"I never market," the distinguished architect Hugh Newell Jacobsen asserts flatly, and goes on to half quote, half paraphrase his old teacher, Louis Kahn. "You never solicit. You don't sit outside the president of the bank's office with a little brochure and your hat in your hand, smiling. You don't call him. He's got to call you."

While waiting for the phone to ring, though, Jacobsen doesn't stand idly by. He uses all the tried-and-true public-relations techniques that architects traditionally have relied on to position themselves and attract clients. "The only advantage of being published, of giving lecture tours, of having a book published on your work," he says, mentioning a few of the things he does, "is that when the members of the board of trustees of a blue-chip university sit down to decide who's going to be the architect of their new art gallery, dormitory, library, art school, you want to be on the list, to at least have a shot at it." Collegiate buildings make up 60 to 80 percent of Jacobsen's practice.

As part of his strategy he also goes after honors, and he has over 90 national design awards to show for it. "For this little firm that's not bad," he points out. Including himself, his office employs seven registered architects who design between $50 and $60 million worth of construction a year. "Now with those 91 awards I'm very impressive," he says. "But the thing you don't know is that I've entered 23,000 competitions."

There are other benefits besides winning. The only way a small office like his can get objective criticism and validation, Jacobsen thinks, is by submitting its work to the scrutiny of a panel of peers. "You learn when you lose," he says. "Now I call up the members of the jury and I say, "Tell me, what went off? You remember it?" He goes on: "It moves you. You think. Once you start copying yourself, you're dead as a smelt. There are no solutions in architecture. There are only approaches."

Jacobsen claims to have designed every building type in the book, and goes to great lengths to avoid being perceived as a specialist. "You get type-cast like Lassie in this field," he notes wryly. Thus he refuses to have a brochure. "People say, 'What do you do?' and I say, 'What do you want?' And then I run through my loose-leaf notebook and throw them that building type. It's crazy. But there it is.

Jacobsen: "People ask, 'What do you do?' And I ask 'What do you want?' "

Jacobsen's approach has kept him busy for nearly all his 30 years in practice. But it has one drawback. Despite current work in three foreign countries and 18 states, he has done only one project within driving distance of his Washington office in the past 14 years. □

Mr. Polites is a free-lance journalist in New York who specializes in writing about art and architecture. His previous article appeared in June 1990, page 35.

FEDERAL BUILDING CODE: WHY STILL A NO-GO

Architects need to watch for the possibility of a fourth building code.

By M. Stephanie Stubbs and Douglas E. Gordon

It's back . . . the debate about switching from the existing multiple building-code system in this country to one code. It's a debate that runs hot and cold, depending on events, and it has been heating up lately, in part because of a possible National Fire Protection Association proposal to restructure NFPA Standard 1, entitled "Fire Prevention Code."

Why a new NFPA code

The proposed new text for NFPA 1 is intended to create a field-inspection document for fire marshals that will be suitable for 70 to 80 percent of routine fire-safety inspections without the need for them to take additional codes or standards into the field, according to Grey Kyte, executive secretary for the Fire Marshals Association of North America. Most of the proposed standard consists of extracts from other NFPA documents. NFPA 1 currently is an outline of which NFPA codes and standards should be used, he explains.

"The executive leadership of the Fire Marshals Association of North America recognized a need for the NFPA to provide a comprehensive fire code that addresses the needs of fire marshals, inspectors, and others responsible for establishing minimum levels of safety," states the proposal submitted in July 1989 to NFPA by FMANA President J. Benjamin Roy Jr.

With an accelerated schedule, the NFPA hopes to have the revised NFPA 1 ready for a report to its 1991 annual meeting. To that end, the NFPA technical committee creating the new document has been increased from nine members to 25 since July 1989. That fact and another, that a draft of the proposed new text has not been circulated outside the NFPA Fire Prevention Code Technical Committee, have generated charges that NFPA is trying to rush its own building code into effect. Kyte denies this, arguing that this is a matter of improved life safety, especially where there is no existing building code. It is not a turf war between fire marshals and building officials, he says.

Although the new document proposes to legislate construction regulations, as well as building operations and maintenance, it is not intended as a building code. The FMANA proposal emphasizes:

"This proposal is not a building code. It is not intended to be a substitute for a building code, its use, or its need. However, it recognizes that many jurisdictions do not have building codes but desire basic minimum fire safety. It is intended to provide the basic fire and related life-safety standards that address the immediate threat of physical danger from fire, explosions, or other hazardous conditions (e.g., hazardous materials)... This proposal should be and can be compatible with any existing building code. Some modification may be required in either the fire code or building code or both."

Along with the proposed new edition of its Fire Safety Code, NFPA has generated a model adoption ordinance intended for use by local lawmakers to adopt NFPA 1 in their jurisdictions. Despite the NFPA assurances that the proposed new text is not intended to be a model code itself, the language of the model adoption ordinance indicates that NFPA would like the new document to supersede "all other ordinances and parts of ordinances with which it is in conflict."

Why the code is of concern to architects

Because the new NFPA 1 contains requirements with far-reaching implications, it has many architects concerned. For instance, the proposed document would require sprinklers in all one- and two-family housing, in both new and, within a compliance schedule, existing buildings.

Kyte explains that the actual implementation into building regulation law is a matter for local jurisdictions to decide. "You have to remember too," he adds, "that the NFPA technical committee has been making changes to the initial proposal." NFPA is scheduled to release the draft for public comment some time in mid-August 1990, Kyte says. Readers may request the draft by writing to the NFPA in Quincy, Mass. The deadline for written comments to NFPA is October 12, 1990.

Turf battles and the status quo

For architects and building officials alike, "code" has been a four-letter word. As nearly as anyone can tell, there are 39,000 separate codes in the U. S.—building, plumbing, electrical, fire, gas, amusement-park, energy—all different and all carrying the weight of state or local law. Almost from their beginning at the turn of this century, there has been discussion of creating one model code.

Because of various regional concerns and political circumstances, though, local codes evolved so that many are based on one of the three national model codes, BOCA Basic/National (mostly Northeastern U. S.), SBCCI Standard (mostly in the Gulf states), and ICBO Uniform (mostly Midwest and Western states). Because they are adopted and adapted at the grassroots level and seem to be one of the last bastions of Jeffersonian democracy, local codes hang on and maintain the allegiance of many architects. Critics commonly cite that the codes are not consistent with one another. "The perfect performance code would be two paragraphs, saying: 'All buildings should be safe, sanitary, not fall down, and be comfortable,' " according to Preview Group president David Collins, a member of theAIA's building performance and regulations committee.

But, he explains, reality dictates that a code spell out requirements in clear English. "The result is, we need a thousand. But we also need all of them to be perfectly acceptable and equivalent, so that design can be solved in any number of ways." The three model codes are not equivalent, he continues, and that has little to do with their application in different sections of the country. "Their discrepancies have nothing to do with climate. For instance each of the three model codes happens to prescribe a different way of calculating heights and areas. No one method is right or wrong; they're just different."

Other criticisms of the model codes are that they are supplemented (and sometimes confused) by a variety of specialty codes. And many localities have their own technical amendments; codes conflict with

FORREST WILSON GRAPHICS

other regulatory requirements in a given jurisdiction, including zoning, preservation, federal, and state; and building officials and product manufacturers dominate the codes-amendment process, with insufficient input by design professionals.

Architect Herbert Eisenberg, principal of Eisenberg Haven Associates, points out, "The codes grew organically, with a lot of accretion, which isn't necessarily bad." Codes began as fire codes. The National Board of Fire Underwriters was set up to provide insurance companies with information on which to base their claims, an effort that resulted in publication of the National Building Code in 1905.

Now, Eisenberg and others claim, the establishment of NFPA 1 as a building code is an attempt on the part of fire marshals to regain turf in the building regulations field. "The fire marshals want to get control of the heights-and-areas section of the code back. The Fire Marshals Association of North America, one of the largest components of NFPA, got close to creating a building code with the original Standard 1, but it had no constituency."

A no-vote for a fourth building code

Eisenberg, who is one of the few architects who has seen a draft of the proposed new NFPA Standard 1, says that it differs from the original in that it does not defer to any other code in force in a jurisdiction. "The fire marshals don't want their 'code' subrogated anymore," he says. "But it is not a complete code, it lacks precise wording and explanation. It might say: 'The atrium has to be sprinklered,' but doesn't define what constitutes an atrium."

The Building Performance and Regulations committee of the AIA discussed the issue at a meeting in November 1989. Chairman William Anderson says: "We favor more uniformity among the existing codes, but we prefer private involvement to federal. NFPA's representative said that it was putting existing codes in one package. But no outsider has read a draft, and the rumors persist. The committee is opposed to a fourth building code."

This stance is consistent with AIA's public policy, which long has supported building performance regulations that are "consistent in their development, adoption, interpretation, enforcement, and application": that is, the three-model-code system. The AIA also supports the Council of American Building Officials and its Board for the Coordination of Model Codes (BCMC), a consortium of the three code groups established in 1972 to foster consistency and uniformity among themselves.

The differences among the three are not significant enough to warrant one federal code, Eisenberg believes, and if Standard 1 goes into effect, it will be a fourth. "The federal government won't get involved if the private sector is doing its job."

Collins agrees with Eisenberg's forecast on the role of a revised Standard 1. "As I understand it, Standard 1 would be a building code, to be used parallel with the NFPA Life Safety Code." He sees the value as keeping the model groups on their toes, and pushing them toward consistency. "I think it's a wonderful threat."

A yes-vote for three codes

Working on the opposite side of the codes fence in Cincinnati is the Hamilton County building commissioner, Ralph Liebing, author of *Construction Regulations Handbook* (John Wiley & Sons, 1987), who concludes: "I really don't see going to less than three codes. It's a system that works and is entrenched."

The three groups have an incentive to maintain the status quo. For one thing, they make their money publishing codes and all the changes yearly reviews generate. Further, one of the most common oppositions to one federal code is that it would take forever to get a change approved. Another question is the role that industries and manufacturers would play. In our existing system, Eisenberg says, industries compete with one another and keep one another honest. "Manufacturers are the best-financed group in the process," Anderson adds, "which means they are able to finance research. The manufacturers don't vote, but their input is good."

A federal building code might negate the local character and emphasis that was the reason the three developed, Liebing says. "There are serious seismic concerns in the West, and the older building stock in the Northeast creates its own set of fire concerns. Further, a federal code would create an enforcement nightmare."

The one-code vote

Not all members of the AIA building performance and regulations committee balk at the idea of a federal building code. Joel "Tick" Vicars is a former AIA staff director of the committee, now performing plan review for municipalities in California and Hawaii. His work covers 250 jurisdictions within California, ascertaining compliance with the UBC, the California State Building Code, and local ordinances.

Vicars maintains that each set of regulations for the 250 is different, and in his position he can see the value of a one-code system. "One set of federal construction standards could be maintained with one-third the effort of maintaining the model codes," he says. "One of the major problems with the codes is interpretation on the local level. Having one federal standard would allow development of one training program for building officials and allow a forum for determining their own interpretations within a consistent framework."

A better answer: consistency

While consensus holds the one-code system as a pariah concept, consistency among the three is a much desired goal, and the Board for the Coordination of Model Codes seems to be the best hope for achieving it, maybe even as one code. Collins says, "It amazes me how close BCMC is to developing a consensus code by taking the best of all three. They currently are putting this forth as a reference supplement of the three. It really says the same thing as the codes, but it says them in a different way. If you put the word "federal" in front of it, you'd have another model code that is a lot more rationally conceived than anything we've got now. If somebody worked hard at it, it could be a model code, but I don't think anyone will do it. No one wants to ruffle anybody else's feathers; it's the topic of turf wars."

In support of strengthening consistency among the codes, Liebing says, "The answer might be to make the three codes as consistent as possible. The BCMC is a step in that direction." Liebing personally thinks that NFPA should not come out with a fourth code. It would be more useful if NFPA 101 (Life Safety Code), with which health facilities must comply, were more consistent with the existing model codes. Anderson adds, "Designers of health facilities believe that they wouldn't have to comply with the NFPA standards and one of the model codes if NFPA had a superseding building code of its own. Most architects agree with this argument, although there is no consensus."

Part of achieving more consistency among the codes implies research-based criteria for developing them. Eisenberg points to the Canadian Building Code, which is supported by the Canadian Research Council as a potential model. "The Canadian code is an example of what AIA policy calls for: 'development by rationally conceived criteria,' " he says. "It is voluntary for adoption by the provinces. In fact, if we could develop a research-based federal code, I'd even say it was a good idea. But there isn't that kind of scientific thinking in code-development groups today."

Should architects be concerned over the development of what may be a fourth building code, or is Standard 1 a tempest in a teapot? "It's more like a kettle simmering on a stove," says Collins . "It could boil over anytime, especially if not watched." □

Ms. Stubbs and Mr. Gordon are architectural writers in Washington D. C.

CODE KODE CHODE CODE KODE CHODE

AN ARCHITECT OF ARCHITECTS

As an architectural consultant, Bill Lacy matches high-profile architects with major commissions. By David Masello

One of the things I'm most proud of in my career is occasionally I've been able to divert architecture in a direction that I think is helpful," remarks Bill Lacy, who heads his own New York City-based architectural consulting firm. An especially visible manifestation of that notion is the Old Post Office building in Washington, D. C. What would have made "magnificent rubble" according to former *New York Times* architecture critic Ada Louise Huxtable, the Old Post Office is instead one of the capital's most resplendent structures. That it now houses the National Endowment for the Arts is in part due to the efforts of Lacy, who during the early 1970s was director of N. E. A's architecture and design program. His calls to save the structure were at a time when saving old buildings was not in vogue.

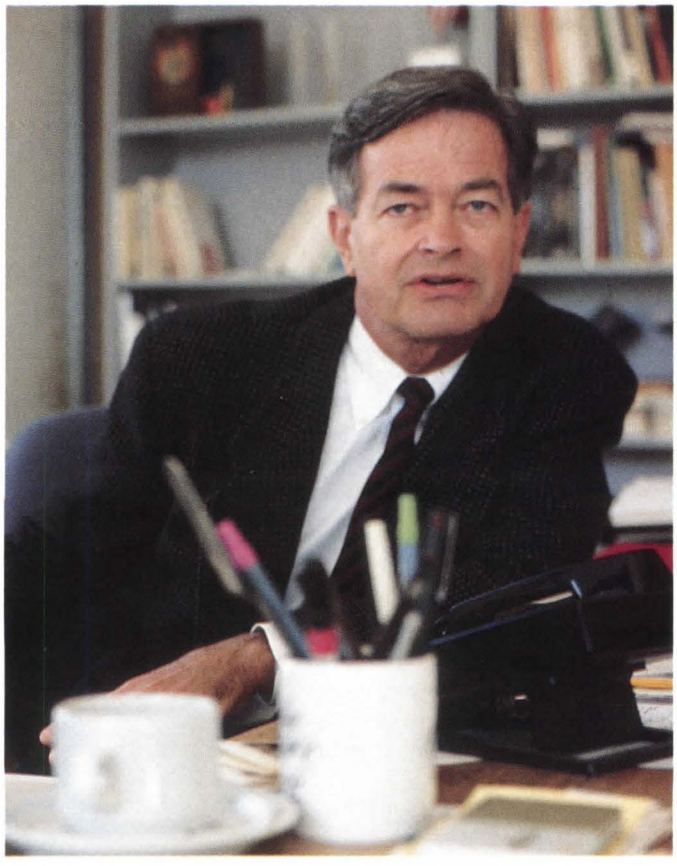
While saving landmark buildings will always remain one of Lacy's most resonant legacies, his influence on new buildings is what now defines much of his career. Given his role as consultant for such major projects as the $100-million Main Library in San Francisco, the Toledo Museum of Art's new Art School, and the $500-million Getty Fine Arts Center in Los Angeles, Lacy has come to be recognized as an architect of architects.

The tall, rangy Oklahoma native speaks with a slight good-old-boy accent that combines the subtlest drawl with the ease of speech found in the Plains states. However, the backdrop outside the floor-to-ceiling arched windows of his office in the former DeVinne Press Building, a 1885 Romanesque Revival building in Manhattan's East Village, is vastly different from that of his hometown of Broken Bow, Oklahoma. Today, Lacy wears Italian-cut suits and fields calls from the likes of Fiat's Giovanni Agnelli, the Hyatt Corporation's Jay Pritzker, Philip Johnson, and Frank Gehry.

After pointing out the dramatic renovations going on throughout the building in which he works, Lacy settles back in his Eames chair. In trying to find a role model for his eclectic career, Lacy begins by saying that "Like the late Charles Eames, I am proudest of the fact that I am a licensed architect." Lacy goes on to outline that he is also past president of Cooper Union and the American Academy in Rome.

Currently, in addition to his private consulting business which he incorporated in 1988, Lacy is secretary to the jury for the Pritzker Prize, is involved in a national design campaign for the National Endowment for the Arts, and is writing a book on architects and their drawings.

"The way I describe myself is that I give advice on architecture and design to various clients for various objectives," Lacy explains. "On the one hand, I work with clients to develop a process to guide them through the selection of an architect—to try to create a match or fit between the program, the client, the site, and a particular architect." Lacy stresses that "I don't give them an architect; I try instead to set up a process by which they will arrive at a choice that I think is the correct one."



DIANNE ARNDT

Bill Lacy in his New York City office.

How Meier got the Getty

Perhaps his most pronounced involvement so far has been with the J. Paul Getty Trust. When it was decided in 1983 to build the J. Paul Getty Fine Arts Center in Los Angeles, Harold Williams, the Trust's president and CEO, and Nancy Englander, then director of program planning, hired Lacy to help select a site. Later, Lacy acted as chairman of the Architect Selection Committee that chose Richard Meier for the project. Lacy's role still continues today as chairman of the Architectural Advisory Committee. In the latter role, Lacy gives criticism during the design phase, another component of his business.

The anatomy of the decision that led to Meier's receiving the Getty commission is bureaucratically, politically, and esthetically complex. Lacy's first duties were to form a selection committee that comprised several leading architectural scholars, business leaders, and patrons of the arts. The selection committee then reviewed buildings by seven leading firms, later narrowing the list to three names—James Stirling and Michael Wilford, Fumihiko Maki, and Meier. A second group, the site committee, then took field trips to buildings designed by the three firms. A letter was sent to each team asking for specific methods, as well as reassurances that the committee would be kept informed of all design decisions. Once Meier was chosen, the Getty decided to form yet another committee to oversee the architect's work during the design phase.

How Gehry came to Toledo

Unlike the Getty, context appeared to be a major issue for the design of a new $10-million art school for Toledo's art museum, an imposing neo-classical structure whose conspicuous presence

makes it a landmark in the Ohio city. When the museum's director, David Steadman, called Lacy, he and the museum's board of directors were sure that they wanted a new art school, but could not decide if they wanted it to echo the old museum building or contrast with it. "Part of the search for the architect was first to answer that question," Lacy says. "When we finally ended that search, it turned out to be Frank Gehry. So we know what happened there!"

Timing was also an important consideration for the Toledo project. By the time Steadman assumed the directorship of the museum in July 1989, the project for the art school had been put on hold since the resignation of his predecessor. By February of that year, six months before Steadman's role as director became official, he hired Lacy. "We realized that we needed somebody who was very *au courant* with what was going on in architecture, and who could speed up the process," Steadman says about his decision.

Lacy had fully organized the search by May and by November the choice of Gehry had been made. Even though Steadman had just come from the Chrysler Museum in Norfolk, where he oversaw a major building program and had gained considerable experience in choosing an architect and seeing a project through, he required, nonetheless, an expert from the outside. "The committee needed the expertise of someone who could walk us through the process and come up with suggestions. The choice of Gehry was unanimous. But it was a daring choice because we live in a conservative city."

And like the J. Paul Getty committee, the Toledo Museum's board had spent considerable time touring architects' buildings and offices. "By the time we actually had interviews with architects, the committee members were articulate and well-versed about architecture," Steadman adds.

Pei Cobb Freed goes to San Francisco

The ongoing project involving San Francisco's Asian Art Museum and the city's Main Library has combined Lacy's reverence both for great old buildings and for new architectural masterpieces. Marjorie Stern, Director of the Friends of the Library, remembers first calling up Ada Louise Huxtable to ask for advice on building a new main library. Huxtable enlisted the help of Lacy, and together they formed a roster of architects from which the city's selection committee could choose. According to Stern, "The main library was a monument- . . . but it was built incorrectly in 1917. Its columns and sweeping staircases wasted space, and the city had simply outgrown the facility."

Lacy and Huxtable were instrumental in the decision to commission Pei Cobb Freed & Partners for the new library building,

> "I don't give them an architect; I try instead to set up a process . . ."

which will fill the missing square in the city's Civic Center, thus completing the Beaux Arts grouping. "And James Freed's capital triangle project proves that's he's able to create a Modernist context for a Classical setting," Lacy adds.

Meanwhile, the Asian Art Museum, which now occupies half of the De Young Museum, will move into the old public library building. "But that move creates a set of problems," Lacy comments. "It's an old building that has to be converted from one use to another." According to Lacy, the museum will choose its architect for the renovation project by October 1990.

Lacy admits that there are few competitors in his business. "There are people who serve as design advisers on various projects and who run competitions, but in the area we deal with, which is mostly public buildings, I think we are alone. This business came about as a natural consequence of what I was already doing." After being asked to help with the Getty project while Lacy was still at Cooper Union, he was approached in 1985 by the Rothschild Foundation to form a search committee for the Supreme Court Building for the State of Israel, and later by the Texas Instruments corporation. "We can intervene at a certain point and help the client get through the first stage (what I regard as the most critical stage next to deciding to build), namely *who* to get to do the actual design."

As for his fees, Lacy charges a flat rate based on the project, taking into account how long the search will last, and whether or not the client and search-committee members will be visiting various architects' projects.

Organizing the Pritzker Prize

As secretary to the jury for the Pritzker Prize, the Nobel-styled annual award for architecture, Lacy organizes the jury and its membership and helps produce the publication that describes the recipient's work. Throughout the fall, the jury sends out inquiries to various parties to nominate architects. The jury meets in February to make its decision, and the award is announced in April or May. "There is a steady stream of business associated with running the prize," Lacy admits. Funded by the Hyatt Foundation, which is under the aegis of the Pritzker family, the prize was first awarded in 1979 to Philip Johnson.

A dynamic especially comforting to both architects and clients is Lacy's open-minded acceptance of a variety of design styles. "If you're in practice, you naturally feel that the architecture you're doing is the only way, whereas I can appreciate Peter Eisenman, Michael Graves, Robert Stern, Fay Jones, Hugh Hardy, James Wines, and so on . . . . I feel that there is a right project for each of these designers. What happens is that the client usually gets them confused and gets the wrong architect for the wrong project. Someone once asked if clients get the architects they deserve. In most cases, yes! But do architects get the clients they deserve?"

As a part of a grander mission intended to ensure that clients and architects get what each mutually deserves, Lacy is working on a national campaign to highlight American design under the umbrella of the National Endowment for the Arts. The project entails assembling a book, *Discovering American Design*, that features the best in American design—everything from pianos and flashlights to shopping carts and tea kettles—as well as donated ads by major corporations. "The project will serve two purposes: to restore confidence in American products, and to reach industry, subliminally, by setting standards that will alert and inspire corporate leaders to recognize the importance of fine-quality projects," says Lacy.

In the meantime, Lacy's long-time interest in drawing is being explored in a book entitled *One Hundred Contemporary Architects: Architects and Their Drawings.* "I wanted architects to send drawings that represent the beginnings of their thinking on projects. I'm not as interested in the plans, elevations, sections, and isometrics as in the gestural drawing . . . how the idea started in their heads."

Lacy has fashioned an architectural career that now manages to encompass everything but the actual practice of architecture. Asked if he misses the daily rigors of being an architect, Lacy confides that "Occasionally I think I'd like to design something again, but then I recover and regain my sanity. Architecture is a grueling profession. People think it's akin to watching a ballerina perform and thinking that's what dance is all about. The part that doesn't show in architectural practice is getting the jobs, dealing with all the minutiae that go into creating a building . . . the politics, the client negotiations, reckoning with the projects that never get built. I practiced architecture at various points in my career, and there is a satisfaction that comes from designing a building and seeing it built that is unmatched. But I derive a lot of satisfaction from what I do. I do enough designing and thinking about design to keep me *very* contented." □

David Masello is Special Projects Editor at Avenue *magazine.*

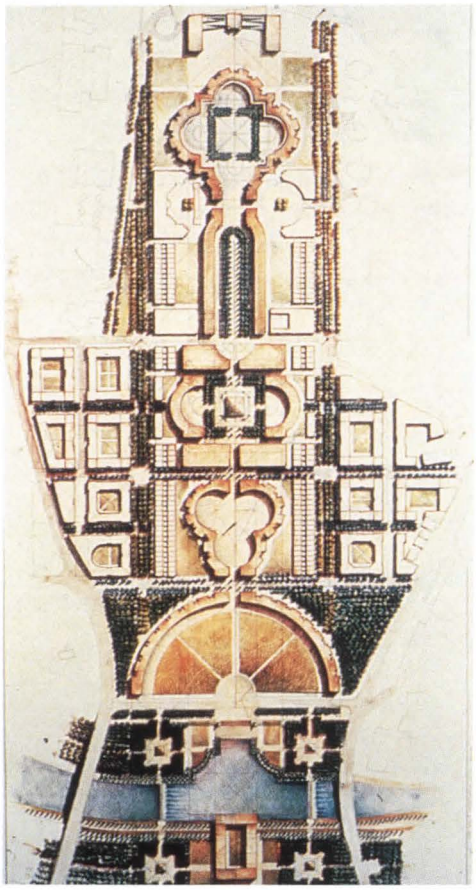
BOFILL PLAYS THE PROVINCES

Thanks to monumental new projects by Catalan architect Ricardo Bofill, Montpellier has shed its image as a backwater to emerge as one of France's most popular places to live. By Marc Wortman

For most of its history, Montpellier, a 1,000-year-old city in the south of France, represented everything about the provinces that Parisians disdained. Little-changed since Rabelais went to medical school there more than four centuries ago, Montpellier was long a backwater of French culture. But in the last 12 years, the city has turned itself around to emerge as one of the fastest-growing and most desirable places to live in France. Much of the credit for this transformation goes to Catalan architect Ricardo Bofill, whose bold urban designs have given the city a new cachet among the young and well-educated.

In 1979 new municipal leadership set out to establish Montpellier as a sunbelt high-technology center and enhance its reputation as a Mediterranean resort. To bring urban excitement and some architectural pizzazz to a once-sleepy outpost, the city hired Bofill to develop a master plan and design a new mixed-use neighborhood outside the historic city center. The plan is already bearing fruit: in the last two decades the city's population has doubled to nearly a quarter-million.

Although he has done a handful of buildings in America, Bofill is best known for his influential Neoclassical style and monumental designs for new towns such as Marne-la-Vallée and Cergy-Pontoise outside Paris. Those projects have attracted their share of controversy, but they also have done much to nudge urban design in France away from the deadly new-town formats of the 1960s (infamous for their hodge-podge super-graphics and sinister Corbusian knock-offs) and toward architecturally unified developments with an enhanced sense of place.



Adding a new neighborhood

In his plan for Montpellier, Bofill directed development along two skewed axes that cross at the Place de la Comédie, the city's historic center, where an opulent fountain is bordered by hotels, storefronts, cafés, and an impressive Neoclassical theater. Narrow medieval streets, historic buildings, and ancient stone ramparts, however, prohibited any large new development within the city center. As a result, Bofill's grand new neighborhood, called Antigone, was built just beyond the old downtown on 50 acres of underused military and industrial land that stretches all the way to the Lez River.

Now nearing completion, Antigone is baroque in both its scale and its use of formal geometry. Seven-story buildings sur-

Antigone's site plan (top) reveals the project's axial organization, while its architecture (above) shows Bofill's love of baroque design.

round a keyhole-shaped park complete with cypress-edged promenades and landscaped plazas. The mixed-use development includes 2,000 apartments (both market-rate and subsidized), 600,000 square feet of office and commercial space, and 100,000 square feet of retail, all decked out in the architect's trademark Neoclassical style. Just beyond Antigone's walls are smaller apartment blocks and office buildings designed by various architects to specifications set by Bofill.

Changing scale and function

Antigone's ornamental elements, such as fluted columns and classically arranged windows, recall buildings in the old part of Montpellier. But Bofill's energetic designs transform the old into something quite different by changing their scale and even their function. Enormous half columns, for example, house elevators and serve as hinges between different parts of the complex, rather than supporting pediments or beams. Cantilevered cornices, which jut out imposingly from buildings, serve as sunbreaks and add a sense of enclosure to open plazas.

As in most of his work, Bofill plays here with geometry on a massive scale, incorporating a great plaza and an outdoor amphitheater (one of his favorite forms) into the project's design. The grand sweep of the imposing marble plaza attracts a daily parade of the affluent young professionals who now make Montpellier their home. All vehicular traffic (except for commercial deliveries and public transportation) has been rerouted underground or onto loop roads, creating one of Europe's largest pedestrian zones.

Two impressive elements help anchor Antigone to its site. At the head of the complex, Bofill designed a U-shaped office building that connects the higher elevation of the old city with the lower-lying new urban complex. A triumphal double stairway steps up the front of the building in a series of ramps and plant-edged terraces.

At the other end of Antigone, across the Lez River, stands Bofill's new regional governmental center, the Hotel de la Région. The area's tallest structure, the Hotel is a luminous form sheathed in reflective glass on its outer facades and clear glass within the archway. As the focus for the entire new quarter, the grand arch makes walking along Antigone's central avenue an inspiring architectural experience, similar to strolling down the great boulevards of Rome, Milan, and Bofill's native Barcelona.

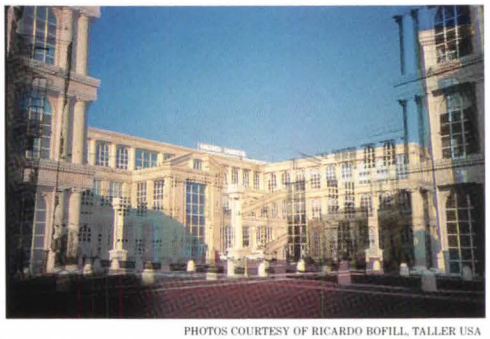
More on the boards

For future expansion, Montpellier is looking to an area known as Port Marianne, farther down the Lez and closer to the Mediterranean. Bofill has developed a master plan for this area as well, using three boat basins as the centerpiece of yet another classically ordered project with symmetrical parks, low- and mid-rise apartment blocks, office buildings, and an amphitheater.

Although Bofill's blend of high art and populist leanings, executed in modern materials such as reinforced concrete, can seem willfully perverse, his work must be understood in the context of previous French new-town disasters and the tradition of mixed-use development that has worked well in French cities. Bofill's architecture, which can look bombastic in the center of France, makes more sense in Montpellier, where it is linked to the old city and has a strong sense of place. By successfully incorporating subsidized with market-rate housing and weaving grand public spaces into the project's fabric, it has opened a dialog between the private and public realms.

Yet even here, Bofill's brand of monumentality does not elevate its residents so much as it celebrates an inflated concept of democratized urban grandeur. Less grandeur in a more varied and humanely scaled format would have made this extension of an historic city more valuable as an example of urban design. □

Marc Wortman has written on architecture and culture for Connoisseur, The New Haven Register *and the* Yale Alumni Magazine



A cornice doubles as a sunbreak (above). Office building (below) links Antigone with the old city.

PHOTOS COURTESY OF RICARDO BOFILL, TALLER USA

Double checking dimensions before *construction has traditionally been the responsibility of the contractor.*

CHATS FROM POOLSIDE

Heat and humidity bring out an architect's private concerns

Earlier this year your editor was in his swim trunks enjoying relief from the 95-degree Houston heat by doing laps in the hotel pool. It was the time of the AIA convention, and as luck would have it the pool's only other occupant was also an architect. On learning the identity of his new poolmate, the architect, principal in a small firm in eastern Tennessee, used the occasion to unload some concerns that had long bothered him. These boiled down, in essence, to two questions:

1. Is it true that architects come in two types, those who design for the client and those who design for the magazines?

2. Why do architects, especially out-of-town firms he often runs up against at job interviews, feel constrained to use complex jargon in trying to impress clients, since from his observations the effect is opposite to that intended?

Since these are two common concerns, let me try to respond in order:

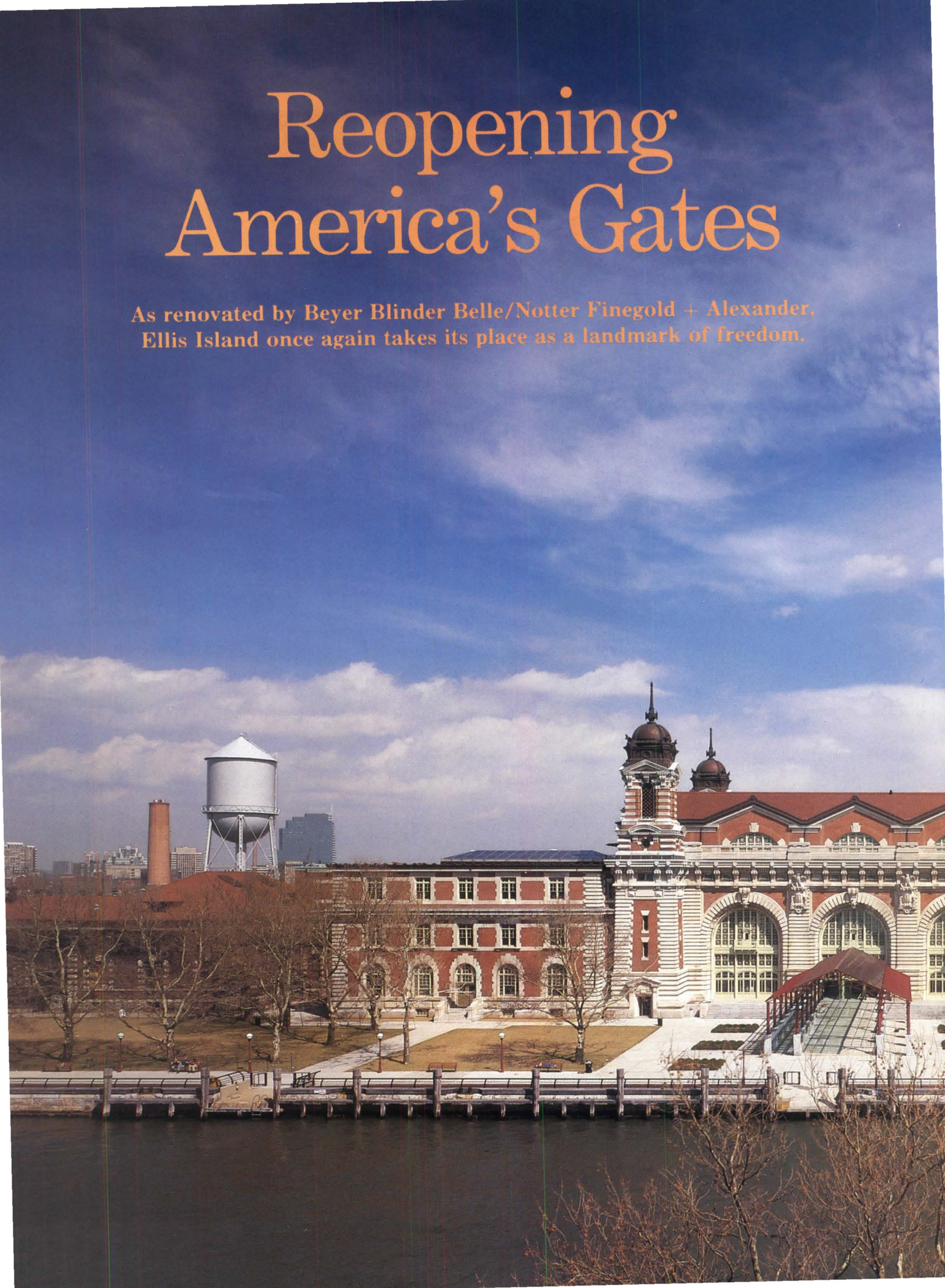
1. There is a natural, if illogical, tendency among firms to be guided by the design of projects published in the major architectural magazines. Firms feel that publication implies endorsement, and that emulating such designs boosts the firm's odds on being published, and the ability to use reprints to impress prospective clients. But such logic implies that published projects are selected according to some arbitrary yardstick that ignores program, response to program, and technical excellence. Magazines will at one time or other publish a project for its novelty quotient—some magazines more often than others. And projects submitted with good photography, fine drawings, and thorough—and readable—supporting data unquestionably do have a leg up. But to believe that the architect's role is anything other than satisfying the client is wrong, misplaced, and dangerous.

2. The jargon that especially bothered my poolmate was "colliding volumes," which a competitor had, it seems, used in (unsuccessfully) trying to impress a building committee made up of a service-station manager and other solid local citizens. The habit of using such jargon often goes back all the way to architecture school, where it is nurtured in part by the resident, largely nonpracticing gurus we cited on this page last month. Nor are the magazines always models of lucid style. The schools we cannot change overnight. The magazines should try harder to see that clarity begins at home.

STEPHEN A. KLIMENT

Reopening America's Gates

As renovated by Beyer Blinder Belle/Notter Finegold + Alexander, Ellis Island once again takes its place as a landmark of freedom.



Few places strike as responsive a chord in the American psyche as Ellis Island. Designed in the Beaux Arts manner as a grand gesture of welcome, the island embodied the hopes and fears of millions of immigrants—hopes of a better life, fears of being turned away at the gates to the promised land.

During the nearly 100 years since the first civic structure was built on the island, though, attitudes to immigration have swung from the poetic sentiments of Emma Lazarus ("Give me your tired, your poor, your huddled masses yearning to breathe free . . . ") to the exclusionary policies of Congress during the 1920s and '30s. The complex and often contradictory emotions raised by the waves of immigration that struck American shores left their mark on the architecture of Ellis Island—shaping its original design, scarring it during years of neglect, and finally inspiring its dramatic rebirth as a museum of the immigrant experience.

As designed by the firms of Beyer Blinder Belle and Notter Finegold + Alexander, the renovated Ellis Island recaptures the spirit of a time when government could build both magnificently and sensibly. From 1892, when the federal government built the first immigration facility on the island (a wooden structure that burned down five years later), to the 1930s, when the last building

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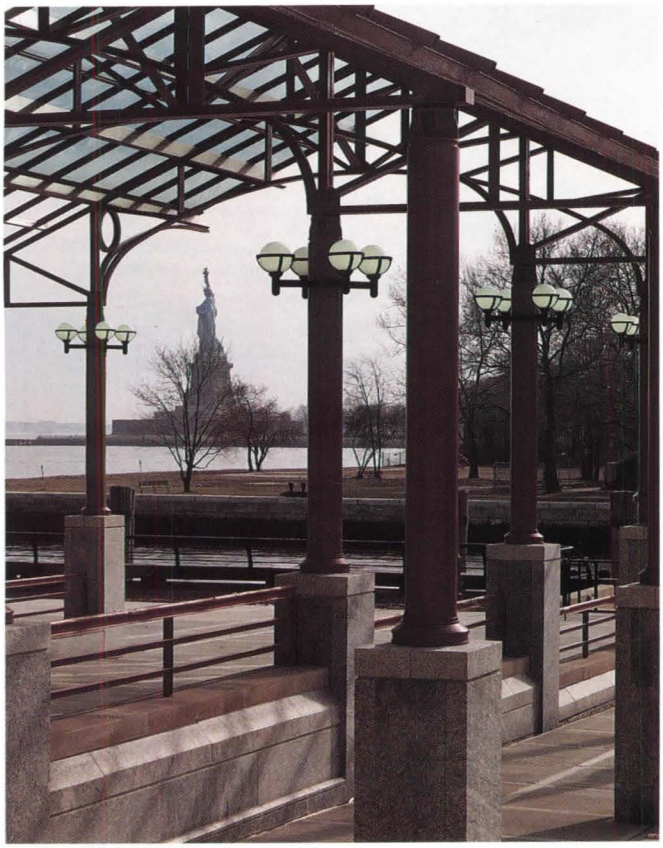
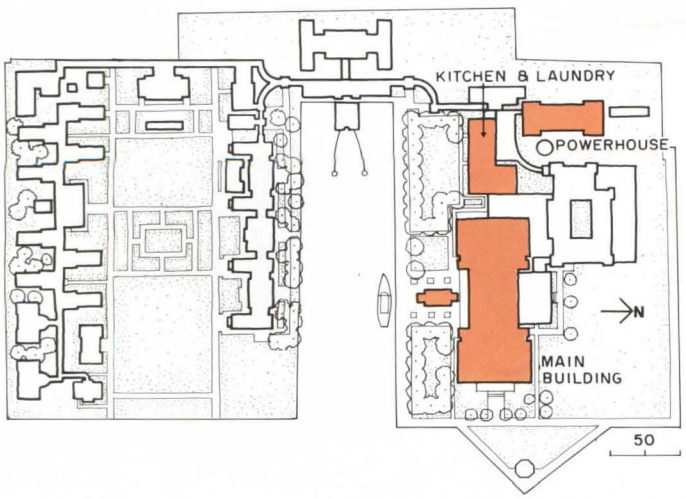
A new glass and steel canopy extends 114 feet.



An entry ramp provides access for the handicapped.



COURTESY OF BEYER BLINDER BELLE/NOTTER FINEGOLD + ALEXANDER

Ellis Island in a previous era.

was constructed in a classic WPA style, the processing center grew to become a set of 33 buildings, some utilitarian, most handsome, and one spectacular. The island itself grew too, from a slender sandbar to a 27.5-acre site built mostly from dirt excavated during the construction of the New York City subway system.

The centerpiece of the island has always been the Main Building, designed in a French Renaissance style by Boring & Tilton, a small firm that beat out the likes of McKim, Mead & White in a competition held in 1897. While most Beaux Arts architects worked on buildings of this size exclusively with stone, Boring & Tilton used brick with touches of limestone, granite, and terra cotta to make their Ellis Island design warmer and less intimidating, says John Belle, the partner-in-charge of the restoration. The building's plan is "simple, but very effective," says Belle, with grand spaces in the central pavilion and support services in the two wings.

A blend of old and new

Although steeped in the past, Ellis Island's eight-year-long renovation is also very much a product of our time, incorporating the latest mechanical systems and state-of-the-art restoration techniques. Most importantly, it reflects current approaches to historic renovation by rejecting the kind of architectural re-creations found at Colonial Williamsburg, while including a few frankly modern intrusions. "You don't replicate history," states Belle. "You don't try to fool the visitor into *thinking* something is old when it just came off the truck last week."

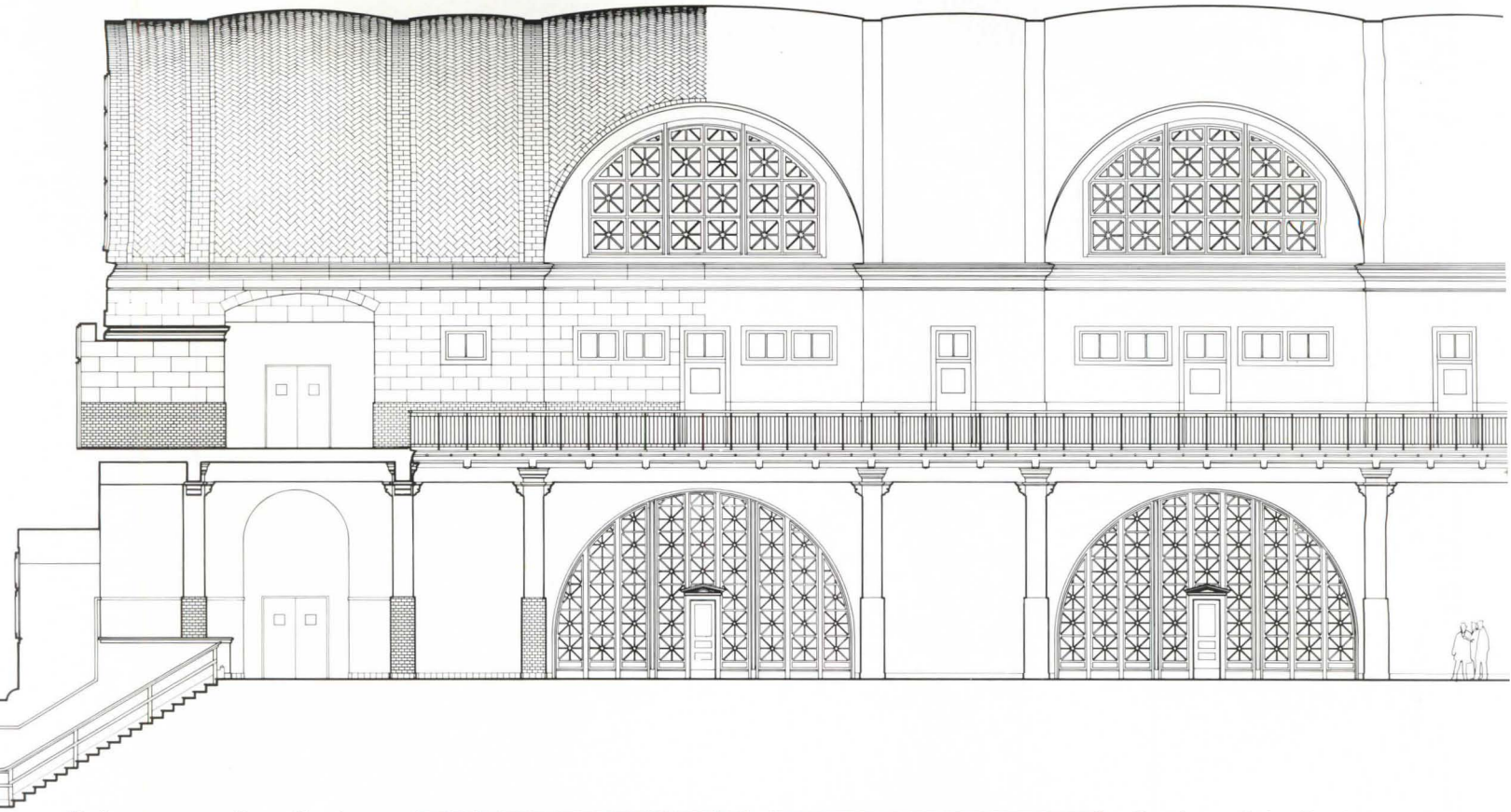
All of the players involved in the project, including the National Park Service (which commissioned the architects), the Statue of Liberty/Ellis Island Foundation (the private fund-raising organization that hired construction manager Lehrer McGovern Bovis), and the architects themselves, agreed that major elements no longer extant would be replaced with clearly modern designs. But the new elements would assume the footprints of the old ones to stay in scale with the past.

The most prominent replacement elements are a 114-foot-long canopy on the front of the Main Building and the principal stair inside. Built of steel and 5/8th-inch-thick tempered glass, the canopy not only follows the footprint of a previous one, but its columns are placed where old supports had been. To help identify the canopy as new construction, the architects painted the metal what they call "Ellis Island red," a rust color that complements the building's original pea-green trim.

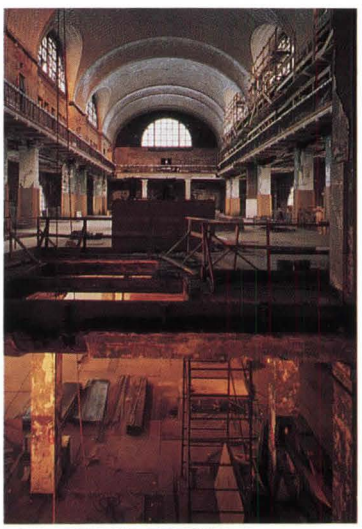
The main (or Registry) stair posed a problem because no plans of it remained and because it had been moved from just inside the center section of the building to a location farther east sometime before 1918. Since the later location conformed to the plan of the Registry Room on the second floor and made more sense in terms of traffic flow, BBB/NFA put their stair there as well. The understated but elegant design of the new stair seems at home with the older architecture around it.

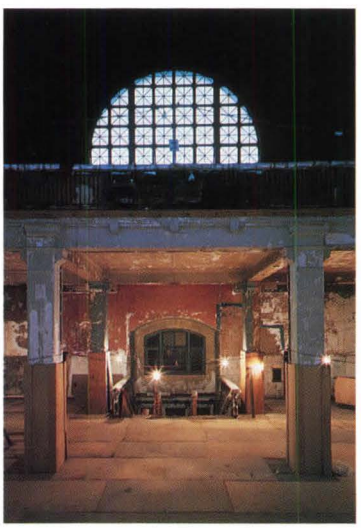
Like many historic structures, the Main Building at Ellis Island changed often over time, complicating the task of restoring it to any one particular period. Although the peak immigration year was 1907, the building reached architectural maturity in 1918 when Guastavino tile vaulting was installed in the Registry Room. Since this two-story space was not only Ellis Island's most spectacular architectural event but also the most important

The view from the Main Building looking across the channel to the south end of the island includes a new copper dome and globe (foreground), hospital and administration buildings (midground), and the Statue of Liberty (background).



Before renovation, the two-story Registry Room (right) was in a dangerous state of disrepair. Broken windows and leakages in the building fabric allowed rain and snow into the grand space. Work on the room included repairing original window sashes, replacing broken panes, eliminating interior partitions that had been added after the 1918-1924 restoration period, cleaning the Guastavino vaulting, and re-creating historic plaster techniques such as Caen stone and sandpaint.





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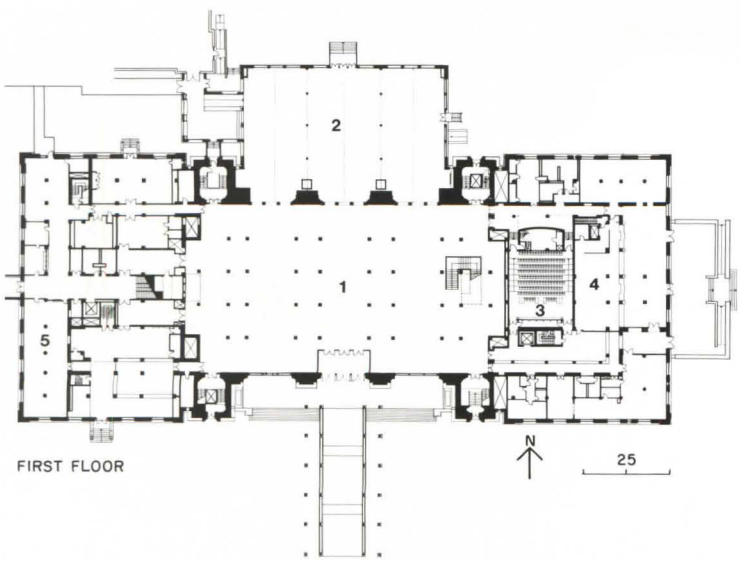
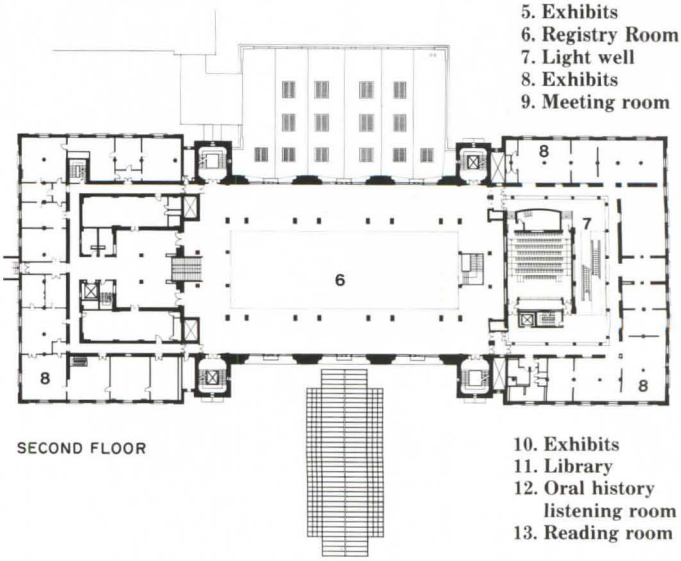
Section of the Registry Room (above) shows the scoring lines for Caen stone on the mezzanine level and the herringbone pattern of the Guastavino vaulting tiles. The north facade of the Main Building (opposite) was steam-cleaned, and a new terne-coated stainless-steel roof was built over the Railroad Ticket Office (foreground opposite).

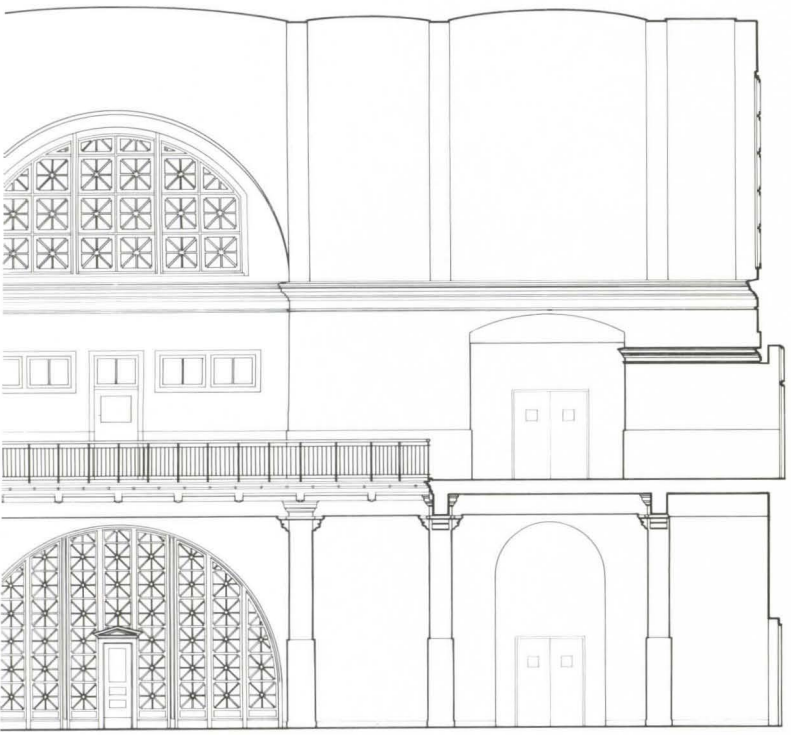


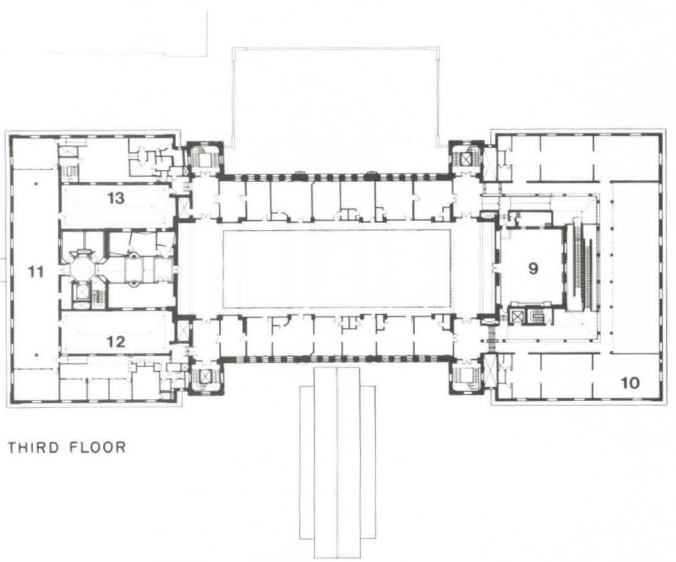
FIRST FLOOR



SECOND FLOOR

1. Baggage Room
2. Railroad Ticket Office
3. Theater
4. Food service
5. Exhibits
6. Registry Room
7. Light well
8. Exhibits
9. Meeting room
10. Exhibits
11. Library
12. Oral history listening room
13. Reading room





THIRD FLOOR

waystation on the immigrants' path through the building, the architects used it as a historic benchmark and established 1918-1924 as their restoration period.

Scope of the project

Although the Park Service had hoped to include all five of the structures on the north end of the island in the project, the $156-million budget only permitted converting the Main Building into the immigration museum, repairing and retrofitting the Powerhouse, and stabilizing the Kitchen & Laundry Building with weatherproofing and a new roof. Plans for the south end of the island call for a private developer to convert the various administration and hospital buildings into a world conference center.

"The mission of the project," explains Richard Wells of the National Park Service, "was to preserve a national landmark and turn an immigration center into a museum. Inherent in that are a lot of contradictions." Part of Wells's job as project director was to apply the standards for historic preservation set by the U. S. Department of the Interior. While these standards emphasize the conservation of a building's historic fabric, they must be interpreted for each project, says Wells.

A different perspective was brought to the project by the other co-client, the Ellis Island Foundation, which focused on commemorating the immigrant experience. "Forty percent of the American population can trace their roots through Ellis Island," says Stephen Briganti, president of the Foundation.

"One of the biggest challenges was resolving the programmatic requirements with the fabric of the buildings," says principal James Alexander. To determine what they could fit into the buildings, the architects prepared a monumental 12-volume historic structures report that analyzed the buildings' cultural history, the alterations and additions made to them from their construction to their closing in 1954, and the physical condition of the structures prior to restoration. The report identified which spaces were most appropriate for new uses and which should be preserved as they had been in the past—or as James Rhodes, project manager for the architects, explains, which were "soft" spaces and which were "hard."

The softest spaces turned out to be in the two wings of the Main Building, which had seen a great deal of change over the years—from an extra story added between 1911 and 1914 to a number of interior renovations. Light wells in the wings also left the building fabric more exposed to the elements than the central portion of the structure, resulting in greater damage.

The architects, therefore, decided to insert major new spaces such as a library, two theaters, exhibit areas, and dining and food service areas in these wings. The boldest move here was to enclose the two light wells with skylights. By "capturing" this unused space, the architects increased the square-footage available for new uses without changing any of the exterior elevations. In the East Wing, the captured space became a two-story atrium orienting visitors to exhibits and housing a pair of escalators; in the West Wing, the skylit spaces will be used as a reading room and an oral-history listening room.

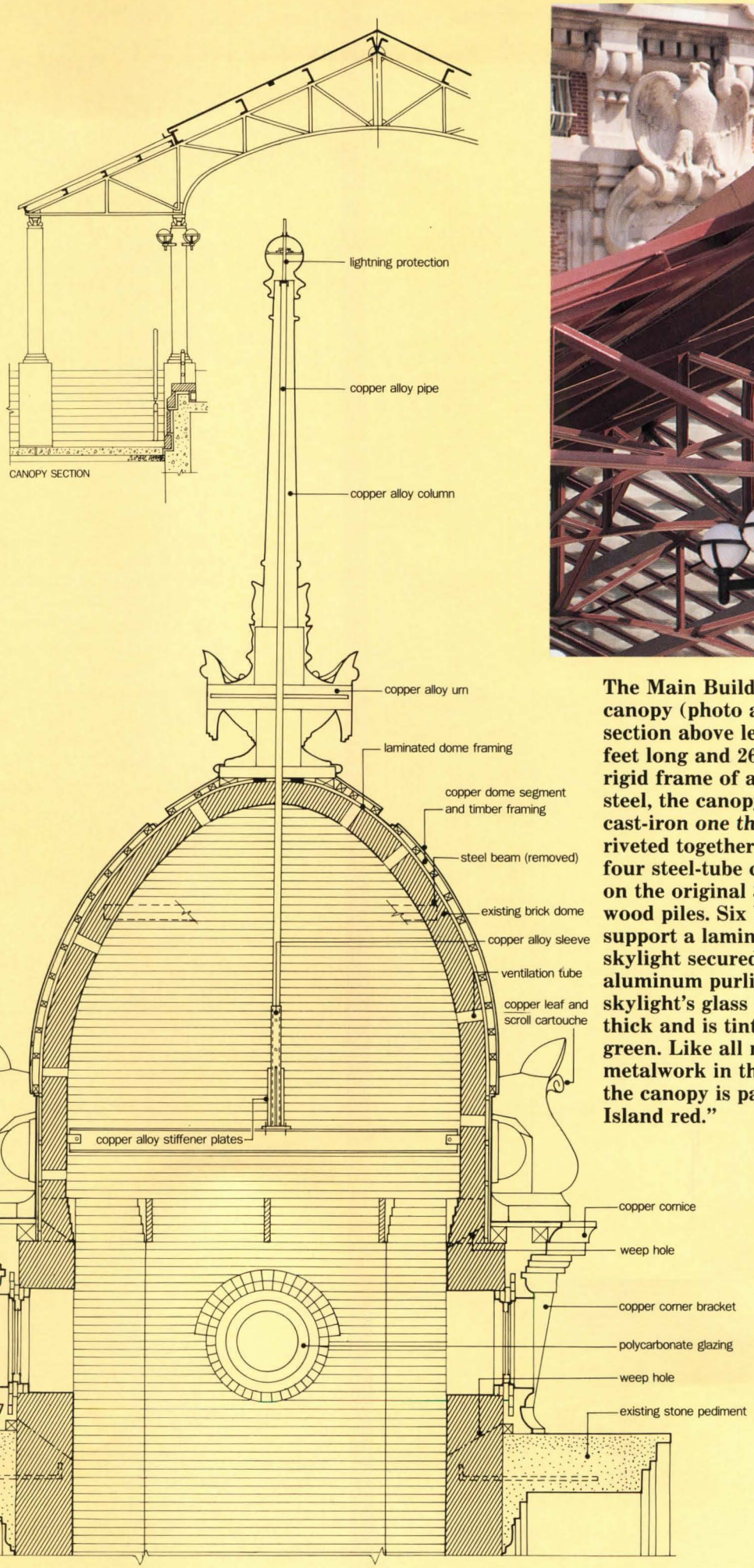
Stabilizing a magnificent wreck

Before any physical work could be done, the building had to be dried out. To prevent warping and buckling, moisture was drawn out very slowly—using large heaters outside the building and pressurized dry air inside—over a period of two years.

Once stabilized, the building was a magnificent wreck. A few people considered preserving the structure as a ruin, a daring approach that was rejected as being infeasible.

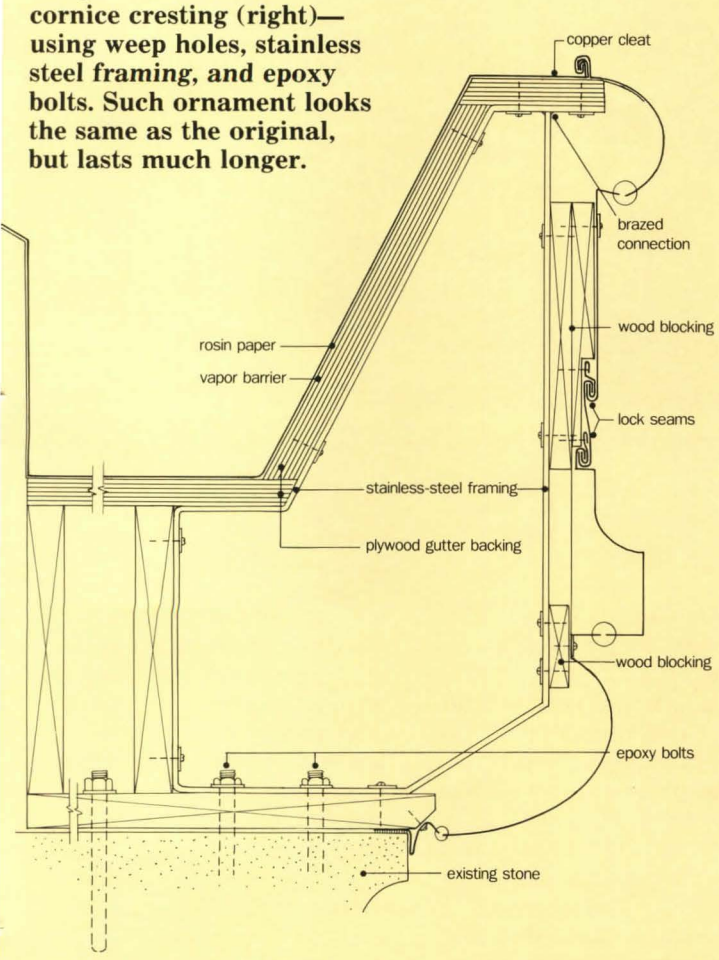
Fortunately, the building was in good structural condition, although some steel and brick had been eroded by tidal waters just above and below the ground floor. After replacing these elements, the architects inserted a waterproof membrane around the base of each column. Over the central pavilion, they repaired as many of the original Ludowici clay roof tiles as possible and

Deteriorated metal posed one of the most pressing technical problems for the Ellis Island preservation team. The Main Building's four 14-foot-wide domes (section right) had weakened so much that several years before the current renovation concrete parging had to be poured over them to prevent further damage. BBB/NFA removed these protective coverings, then repaired the brickwork and wooden lattices supporting the domes' copper cladding. The metal skin itself was replaced with new copper, fabricated by Simpson Munder Fiebiger & Kent, the same studio that had worked on the armature of the Statue of Liberty. New finials built of copper 3/4 to 2 inches thick replaced old sheet-metal ones and were flown in place on top of the domes by helicopter. Other decorative metalwork such as cheneaux and cornice cresting was replaced with new replicas. According to Bruce Heyl, one of the project managers, the new copper ornament is an improved version of the old. Not only is the new copper twice as heavy (32 ounces per square foot, compared with 16), but it is supported with a steel (instead of wrought-iron) armature. Weep holes, pop rivets, cleats, folded locked seams, and expansion joints also help ensure better performance and longevity.

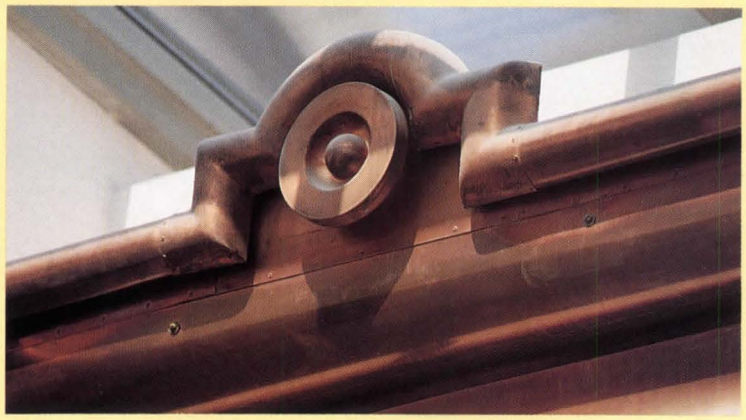


The Main Building's entry canopy (photo above and section above left) is 114 feet long and 26 feet tall. A rigid frame of all-welded steel, the canopy replaces a cast-iron one that had been riveted together. Twenty-four steel-tube columns rest on the original 30-foot-deep wood piles. Six bents support a laminated-glass skylight secured on aluminum purlins. The skylight's glass is 5/8-inch thick and is tinted light green. Like all new metalwork in the project, the canopy is painted "Ellis Island red."

Instead of slavishly replicating faulty copper techniques, the architects reproduced original designs—such as the cornice cresting (right)—using weep holes, stainless steel framing, and epoxy bolts. Such ornament looks the same as the original, but lasts much longer.



CORNICE CRESTING SECTION



A new cheneau graces a cornice in the light well.

Cast-iron columns and panels were cleaned and repainted.

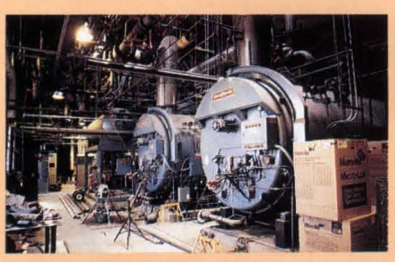
BUILDING UP STEAM

Fitting new mechanicals into old buildings required ingenuity.

Behind (and beneath) the historic facades at Ellis Island is a completely new mechanical system that provides power, water, heat, and cool air to the entire island. The heart of this system is the refurbished Powerhouse, where two new 500-horsepower boilers and one new 250-horsepower model generate steam at 125 pounds per square inch.

As each of the 33 buildings is renovated, it can tap into the system, just as the Main Building and the Kitchen and Laundry Building have done so far. A pressure-reduction station at each building drops the steam pressure to 15 psi, which is reduced once more to either 3 or 5 psi for radiators.

Although electric heat could have been installed in the buildings, steam is an important factor in maintaining the proper humidity level. "We also felt that the sound of steam hissing from radiators was part of the building's ambiance," explains Bruce Heyl, one of the project managers.



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New boilers in an old setting.

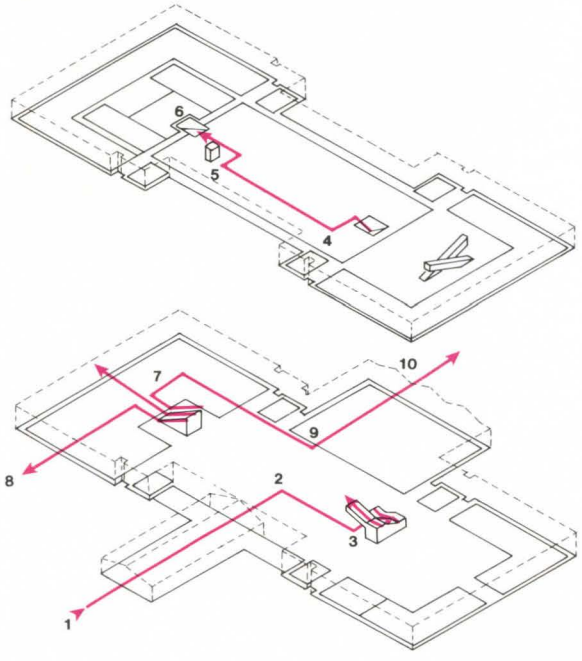
Cooled air, a new convenience, is distributed to all floors by seven air handling units in the basement of the Main Building. Cold water comes from a 500-horsepower chiller in the Powerhouse.

A low-ceiling basement combined with a high watertable, and the need to maintain as much of the original building fabric as possible made fitting ductwork and mechanicals into the Main Building very difficult, says Vincent Benic, the project manager in charge of mechanical services. Existing shafts adjacent to the stair towers on either side of the building served as major locations for ducts, but had to be supplemented with secondary shafts carefully punched in appropriate places.

The most noticeable mechanical feature in the entire project is the 250,000-gallon water tower which replaces twin towers that had deteriorated beyond repair. Although new, the 143-foot-tall steel tower is a replica of its predecessors and was built by the same supplier, the Pittsburgh-Des Moines Water Tower Company. The only major difference is the use of welding, rather than riveting in the tower's construction. **C. A. P.**

A light well leads to new exhibit space.

Exterior details have been restored indoors.

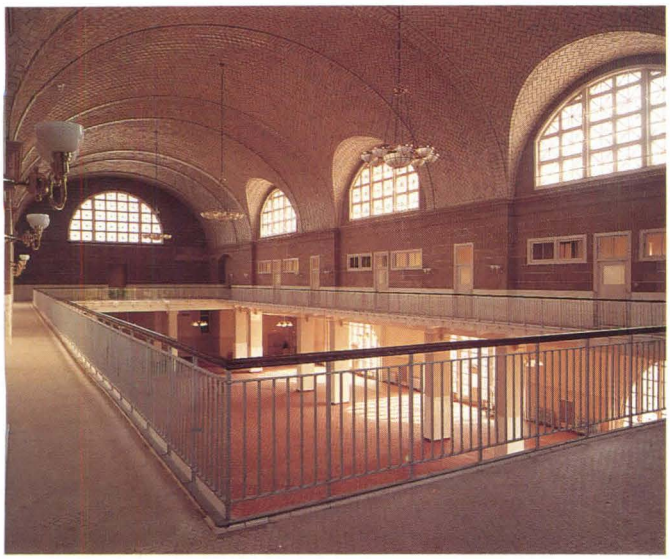


By enclosing a light well (above), the architects captured space for escalators and new exhibit areas. Black marble on the floor (above left) shows where an exterior wall had once stood. Diagram (left) shows the path immigrants took through the Main Building. From ferries immigrants entered under the canopy (1), then left their bags in the Baggage Room (2) and climbed the Registry Stair (3). Once upstairs, they filed through the Registry Room (4 and photo opposite) and past inspection stations (5). At the Stair of Separation (6), immigrants were divided into three groups. Those to be detained went to a separate building (7), while those heading for Manhattan went to the ferry slip (8). People going to points west went to buy tickets at the Railroad Ticket Office (9) and then to the Jersey City ferry (10).

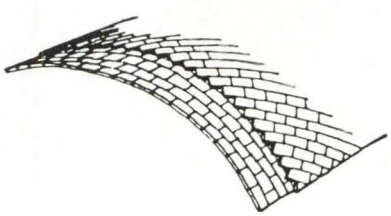
Roof of the Railroad Ticket Office has been rebuilt.

New Registry Stair starts in the Baggage Room.

The Guastavino vaulting in the Registry Room (below and opposite) is built of three layers of thin terra-cotta tiles set in a bed of portland cement. The technique was brought over from the Catalonia region of Spain and proved



successful in spanning great spaces. Diagrams (below) show various ways of laying the tiles other than the typical herringbone pattern. Floor tiles in the Registry Room were laid as mirror images of the vaulting tiles.



placed new tiles on dormers and other angled surfaces where the subtle difference in their color would not be noticed. For the 1904 extension known as the Railroad Ticket Office on the back of the building, the architects built a new terne-coated stainless-steel roof. New drainage and rubber membrane roofs were constructed for the building's two wings.

On the building's exterior, bricks were repointed and windows were repaired with new caulking and panes (original sashes were retained). The most troublesome task, though, proved to be cleaning the facades. After testing chemical solutions and discovering some streaking on the soft limestone, the architects used low-pressure steam instead.

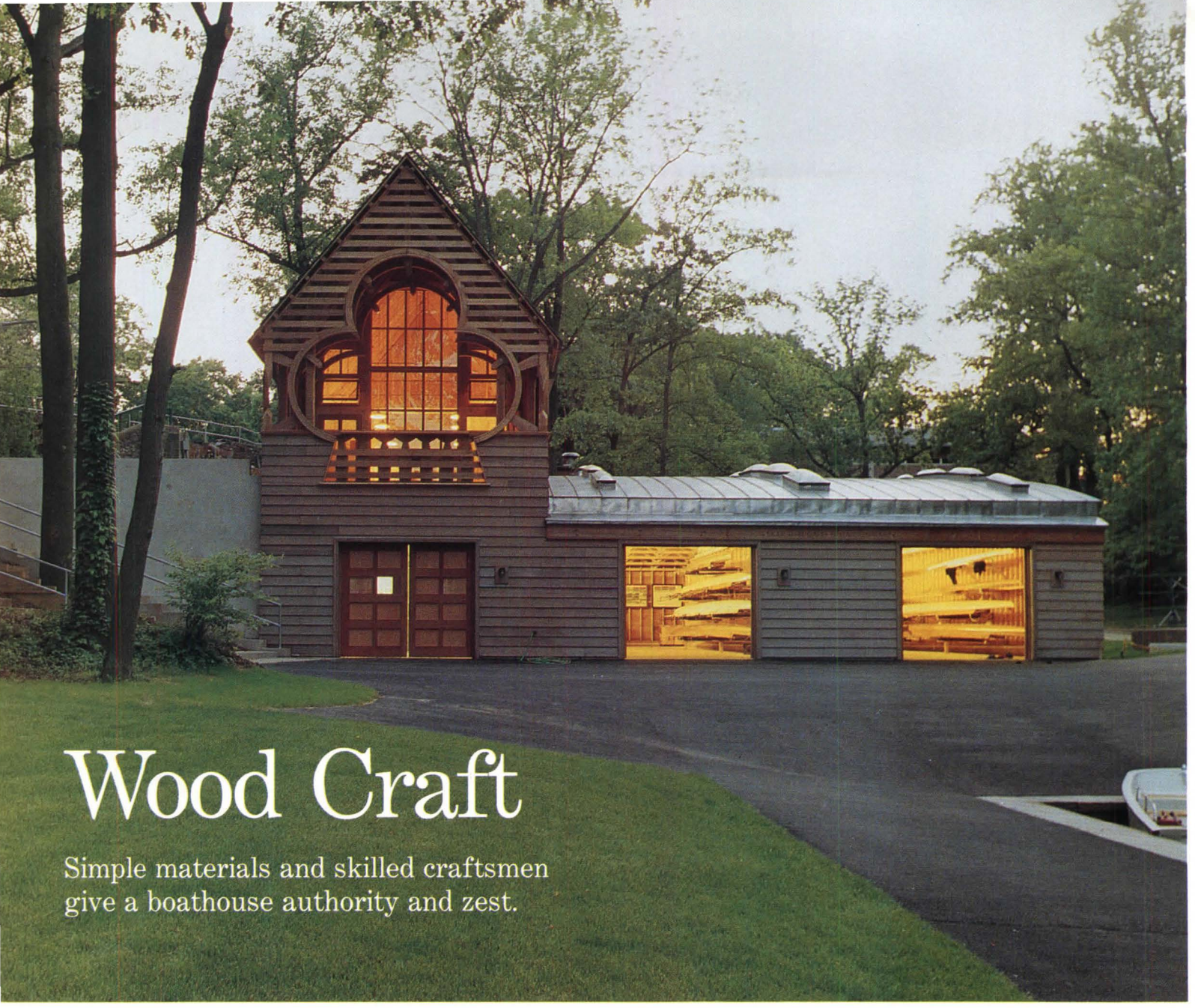
An important theme of the interior restoration was re-creating the path immigrants followed through the building—from the first great room where they left their baggage, up the main stair on the east, into the Registry Room, then down a second stair on the other side of the room, and either to the Railroad Ticket Office for those going to points west or to a ferry terminal for those heading for New York. Although an exhibit called "The Peopling of America" will be installed in the Railroad Ticket Office, and some old baggage carts and luggage will be displayed in the first-floor Baggage Room, the National Park Service has wisely decided to leave the building's great spaces mostly open, to let the architecture speak for itself.

Certainly one of the most impressive rooms in all of New York, the Registry Room has been cleared of its many accretions and lovingly restored. Its Guastavino vaults, constructed of three layers of thin terra-cotta tiles set within beds of portland cement, once again command attention. After cleaning the vaults, the architects inspected each of the 28,282 tiles and discovered that only 17 needed to be repaired or replaced.

The walls on the mezzanine level of the Registry Room presented an unusual challenge. Finished with Caen stone, a type of plaster whose formula had long been forgotten, they lured the architects into the realm of materials research. After much experimentation, the architects succeeded in re-creating the material. "One of the byproducts of this project," says John Belle, "has been to reaffirm the importance of doing basic research on materials and methods of construction."

When Ellis Island once again opens to the public in September, it will present a different picture than the one last seen by visitors in 1981. Nine years ago, the buildings were almost ruins—haunted by echoes of their past, but still remarkably beautiful. "The ghosts may be gone," says Ellis Island Foundation president Briganti of the landmark, "but the spirit and condition of the buildings as the immigrants knew them have been wonderfully preserved." **Clifford A. Pearson**

Restoration of Ellis Island
New York City
Owner: *National Park Service*
Client: *Statue of Liberty/Ellis Island Foundation*
Architects: *Beyer Blinder Belle/Notter Finegold + Alexander, Inc. Architects—John Belle, James Marston Fitch, George M. Notter, Jr., James G. Alexander, partners; Vincent Benic, Bruce Heyl, Sherman Morss, Jr., James Rhodes, project managers; Bessie Ballantine, Ralph Carmosino, Guillermo Chavarria, Richard Curran, Don Fiorino, Richard Franko, Nan Gutterman, Ynes Leon, Joe Navarro, Mary Overly Davis, Don Porter, Frank Powell, Steve Roth, Bonnie Sevy, John Stubbs, project team*
Engineers: *Lockwood, Kessler & Bartlett (civil); Robert Silman (structural); Syska & Hennessy (mechanical)*
Consultants: *Jules Fisher & Paul Marantz (lighting); Stephen Tucker (specifications)*
Landscape Architect: *Bruce Kelly (historic landscape); Hanna Olin (landscape)*
General Contractor: *Lehrer McGovern Bovis*



Wood Craft

Simple materials and skilled craftsmen give a boathouse authority and zest.

Boathouse, St. Andrew's School
Middletown, Delaware
Richard Conway Meyer Architect

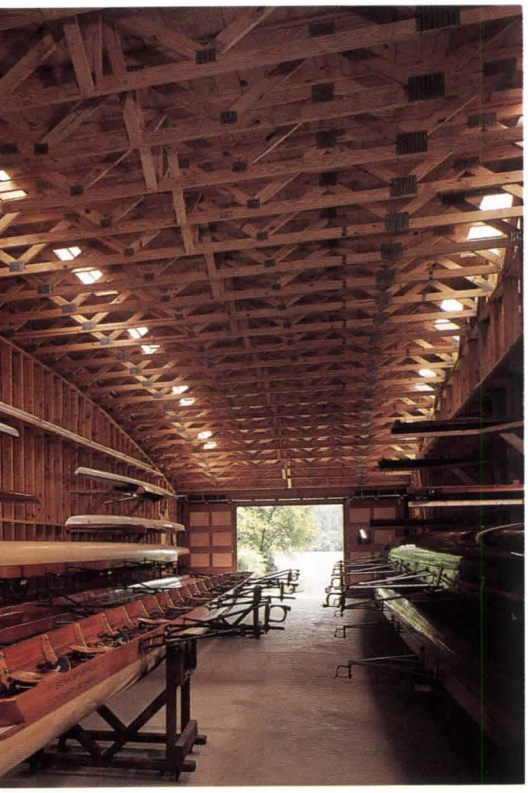
In architect Richard Meyer's view, it's hard to design a bad boathouse: "All you really need is a secure, well-ventilated storage shed." But the boathouse he recently designed for St. Andrew's School is also a friendly presence that unassumingly graces its new-formed site at the mouth of a freshly dredged inlet from the large pond around the campus fringe.

Long and low with a gently bowed roof, the shed matches the sturdy delicacy of the racing shells it houses. The structure is shaped by metal-plate-connected wood trusses with outer walls of 10-inch beveled cedar siding, which is left unsheathed to let the entire wall act as a ventilating system. In addition, like the homes of traditional rowing clubs, the boathouse includes a social area—in this case, an elaborated warming room for crews and fans. Shifted to one side of the building, atop a fire-walled repair bay, the meeting room is a steep-pitched, open-ceilinged enclosure, framed of exposed timber with plywood sheathing and sparsely furnished with billiard and pachinko tables.

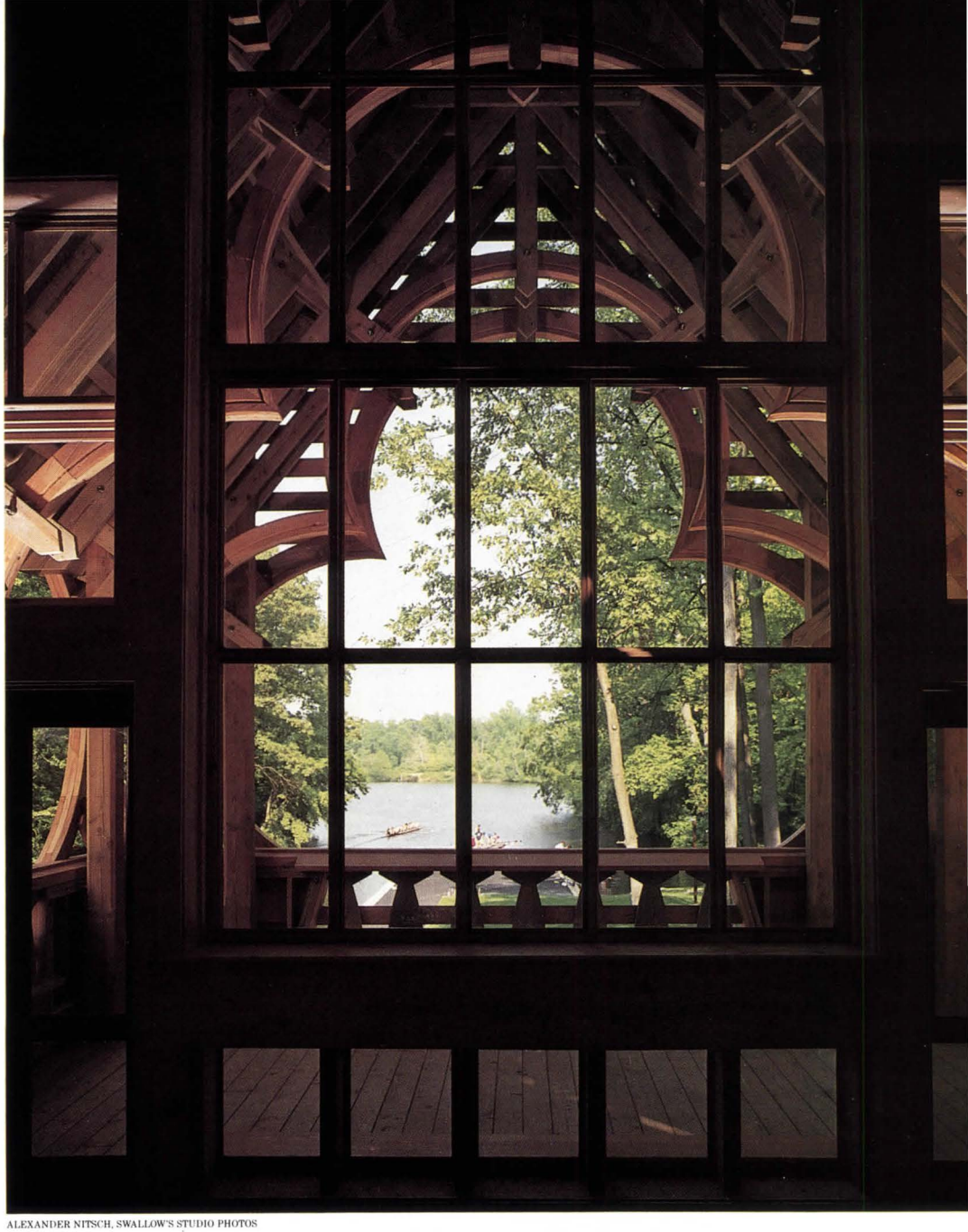
The rustic attic and spare, sleek shed are related by an open porch that locks the two elements together, at the same time introducing the ranked trefoil arches which are the source of much of the boathouse's freshness and wit. As evidenced by corner "posts" of wood whittled to pencil points that fail to touch, the laminated-cedar arches supplement bolted timber trusses supported on pine columns.

The porch is also the main showcase for the successful collaboration between the architect and the builder's skilled mechanics, which produced the building's visual and tactile charm. Bypassing shop drawings, Meyer instead installed clerk-of-the-works Melanie White who, aided by templates, models, and a cordless telephone, resolved critical details by working directly with the craftsmen in the field. **M. F. G.**

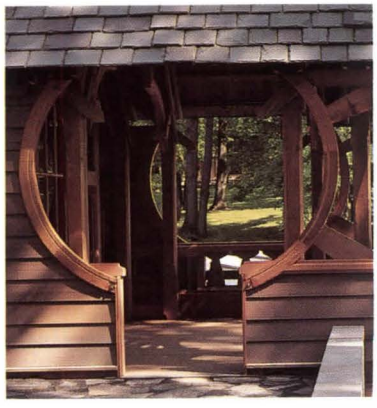
Boathouse, St. Andrew's School
Middletown, Delaware
Owner: *St. Andrew's School*
Architect: *Richard Conway Meyer Architect—Jeff Wilson, project architect; Melanie D. White, clerk-of-the-works*
Engineers: *Keast and Hood Company (structural); Energy Consortium Inc. (mechanical); Duffield Associates, NTH Consultants (geotechnical)*
Letter Cutter: *Richard Grasby; Kim Haskell (stencil)*
Consultants: *Arena & Co. (costs)*
General Contractor: *Phillips Home Builders—Daniel P. Burris, Sr., principal; David Dennison, master carpenter; Alfred Lloyd, millwork*

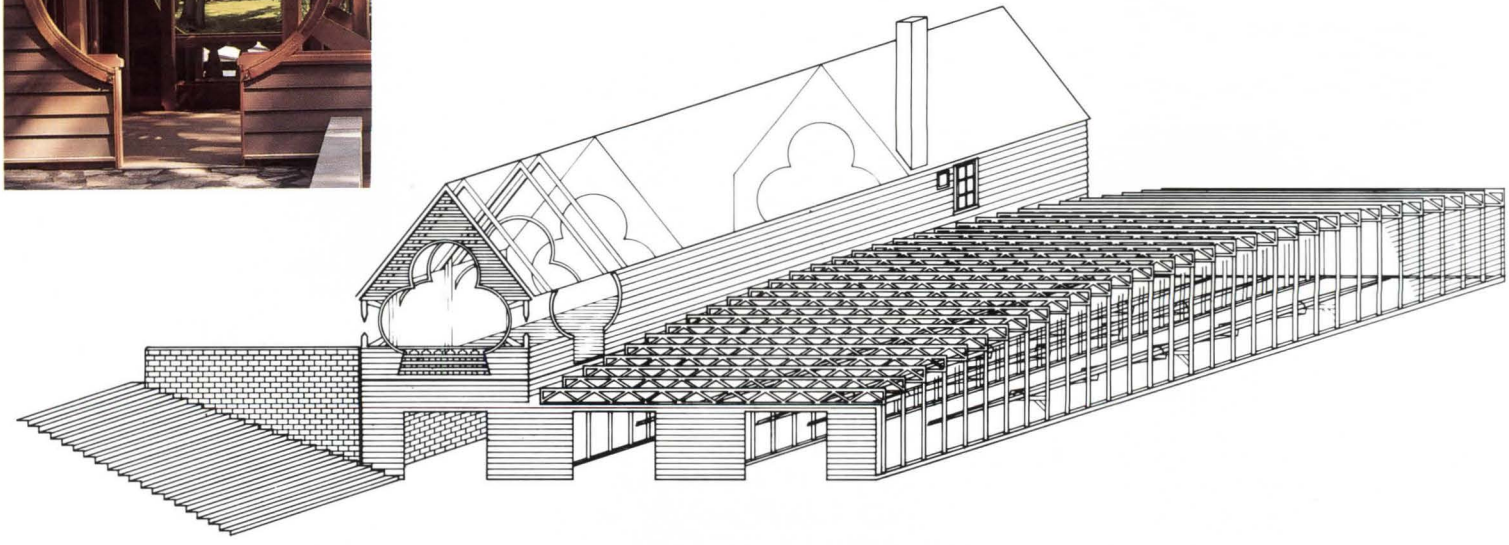


The rustic timber framing and exposed wood surfaces used for the boathouse's low-slung storage bays and steeply gabled second-level social spaces are complemented by roofs of terne-finished stainless steel and slate, respectively. Trefoil arches and simple arcs embellish a front porch that doubles as a viewing stand for crew racing.



ALEXANDER NITSCH, SWALLOW'S STUDIO PHOTOS

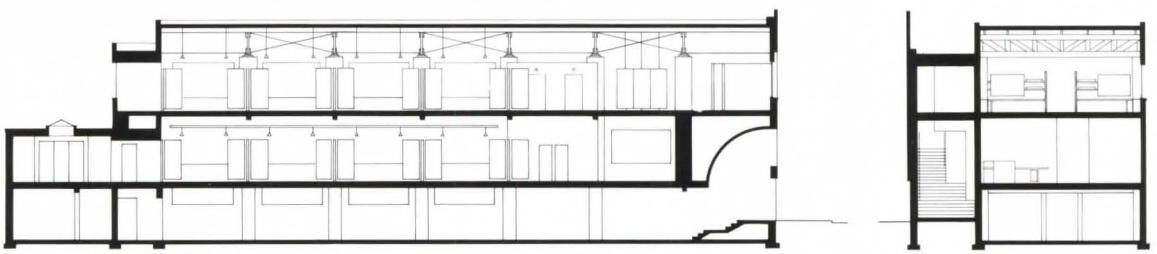




A Plane Solution

A run-down men's club in downtown Toronto is reborn as a finely crafted mixed-use structure housing a graphic design studio and retail space.

©WOLFGANG HOYT PHOTOS, EXCEPT AS NOTED



LONGITUDINAL SECTION

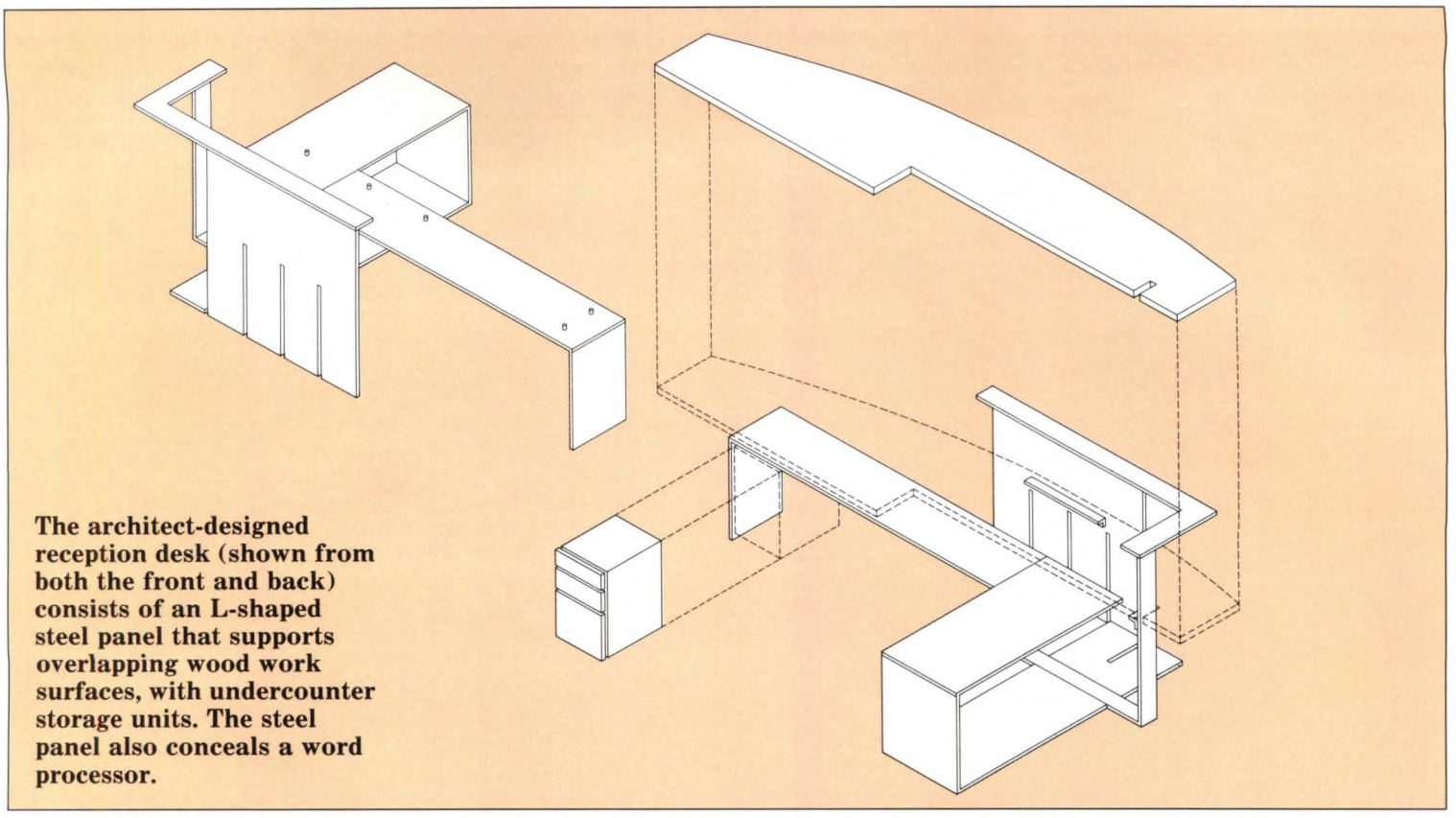
CROSS SECTION 5

284 King Street East
Toronto, Ontario
Kuwabara Payne McKenna Blumberg, Architects

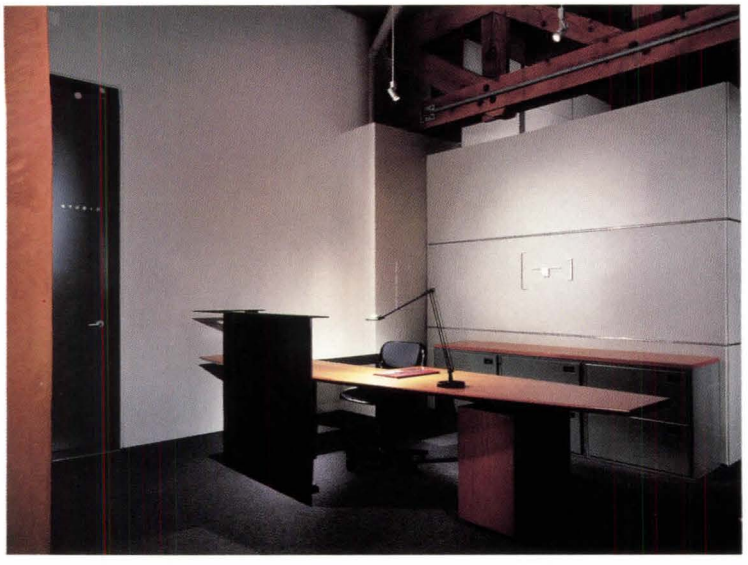
"Diverse" is how Bruce Kuwabara characterizes the firm of Kuwabara Payne McKenna Blumberg, a partnership of four former associates of Barton Myers who established their own Toronto practice in 1986 when Myers moved his office to Los Angeles. In four years, KPMB has grown from 16 people to a staff of 40, securing multimillion-dollar civic commissions [RECORD, January 1990, pages 30-31] and more modest interior jobs that permit the architects to realize their ideas on a decidedly faster-paced schedule.

In the latter category is the recently completed renovation of a former Toronto veterans' club into a mixed-used facility housing the two-story, 8,000-square-foot design studios of Tudhope Associates, a 25-person graphics and corporate image-making firm, and 4,000 square feet of street-level retail space. The architects sought to give much-needed urban presence to the undistinguished exterior of 284 King Street East, a run-down 1940s structure on a major artery at the edge of downtown Toronto (see map below), by attaching two giant stucco panels to a repainted brick shell (above). Partner-in-charge Marianne McKenna chose to keep window openings at their existing size, but exaggerate their relative scale by adding oversize aluminum mullions and sills that reinforce the effect of sliding planes. Within the openings, the architects inserted a combination of fixed panes, operable casements, and glass block to admit natural light as necessary. (Additional light is provided by fluorescent and low-voltage fixtures.)

Perforated metal screens attached to steel poles can be rotated to enclose a semiprivate meeting area that is lit by low-voltage tungsten-halogen fixtures.



The architect-designed reception desk (shown from both the front and back) consists of an L-shaped steel panel that supports overlapping wood work surfaces, with undercounter storage units. The steel panel also conceals a word processor.



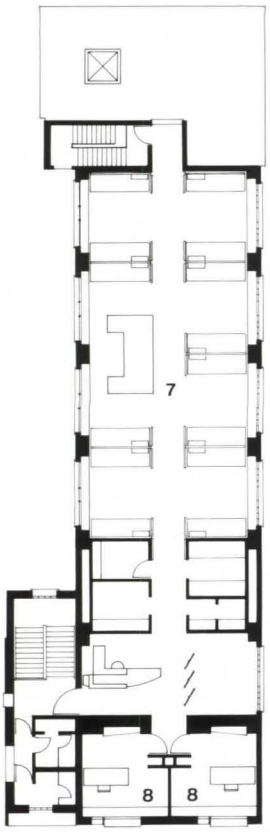
STEPHEN EVANS

The entrance to Tudhope Studios is along King Street East, where KPMB cut away the new stucco skin to reveal the old shell. (The partially underground shop can be reached from a parking lot on the western side of the building—see plans opposite page.) Inside the offices, thick masonry walls coated in muted orange Marmorino, an Italian marble plaster finish, vertically connect the two floors while separating the principals' offices and meeting rooms horizontally from reception areas *(opposite page)*. In the more open design studios, existing wood beams and trusses were sandblasted clean and then structurally reinforced with steel (photo above right). McKenna and her associates used the 18-foot bays between windows along both sides of the rectangular space as modules for individual workstations, which are separated from one another and the central aisle by perforated metal screens. Similar screens mounted on metal poles can be adjusted to enclose an informal conference room on the third floor (previous page).

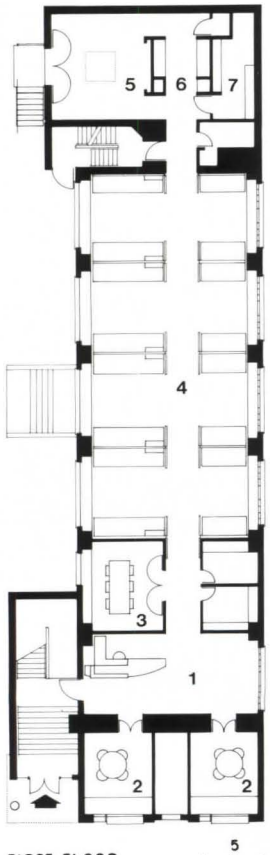
To underscore the contrast of steel and wood throughout the interior, the architects designed reception desks for the second and third floors of gun-metal steel with richly grained Australian lacewood countertops (drawing above). The result—an effective mix of the rustic and the refined—is a textbook example of how seemingly incongruous elements can be blended into a cohesive whole.

KAREN D. STEIN

OWNER: *Tudhope Associates, Inc.*
ARCHITECT: *Kuwabara Payne McKenna Blumberg Architects—Marianne McKenna, Bruce Kuwabara, partners-in-charge; Howard Sutcliffe, project architect; Luigi LaRocca, Bev Horri, Neil Morfitt, project team*
ENGINEERS: *M. S. Yolles & Partners (structural); Merber Corporation (mechanical); Carinci Burt Rogers Engineering (electrical)*
GENERAL CONTRACTOR: *J. D. Strachan Construction, Svend Neilsen (interior millwork)*



SECOND FLOOR

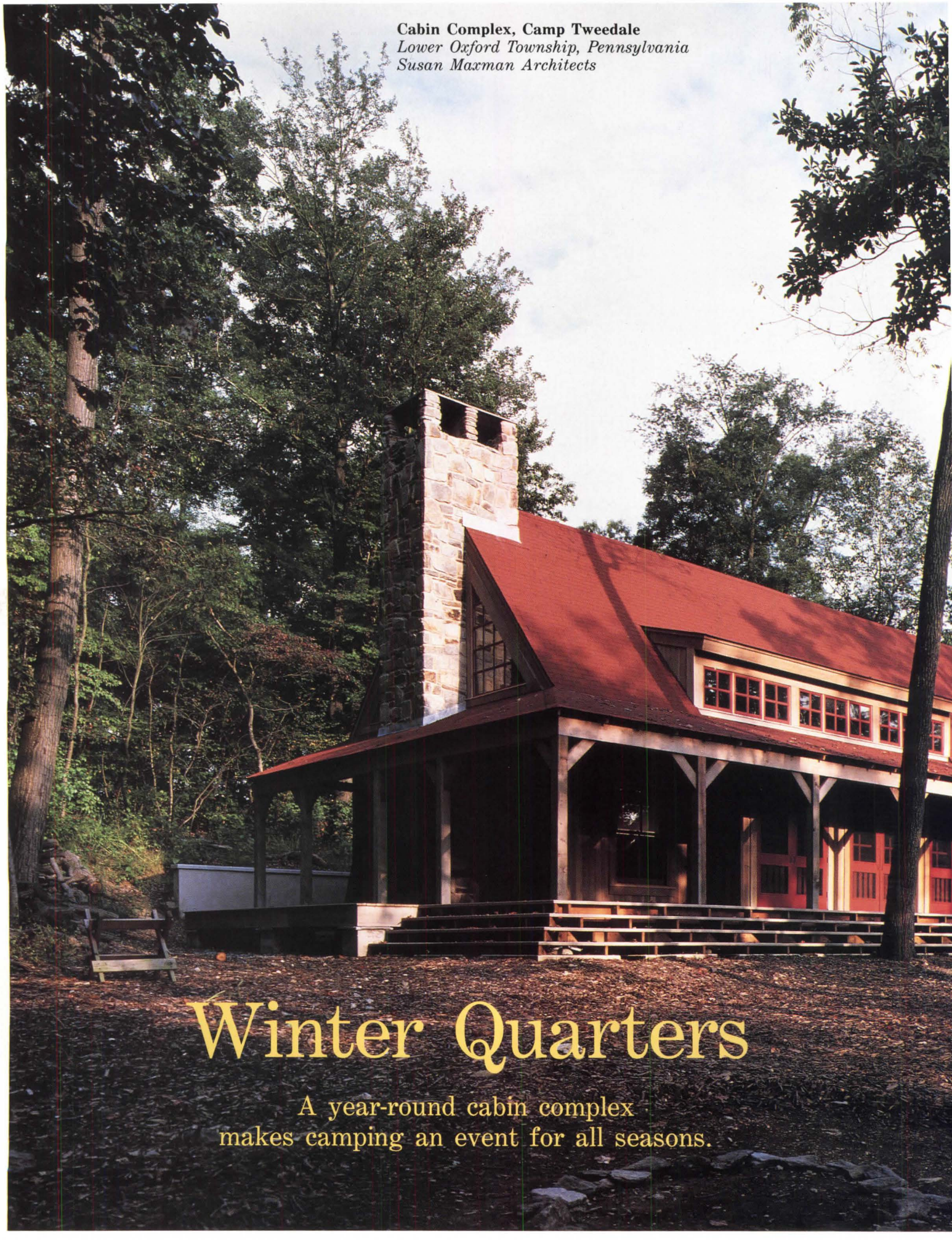


FIRST FLOOR

5

1. Reception
2. Meeting room
3. Conference room
4. Administration
5. Lunch room
6. Kitchen
7. Studio
8. Partner's office

A wall coated in brandy-colored Marmorino, an Italian finish of fine marble powder, separates the partners' office and meeting rooms from the reception area on both floors of Tudhope Studios. The architects used richly grained Australian lacewood for the worksurfaces of reception desks and for custom cabinetry in the partners' offices.



Cabin Complex, Camp Tweedale
Lower Oxford Township, Pennsylvania
Susan Maxman Architects

Winter Quarters

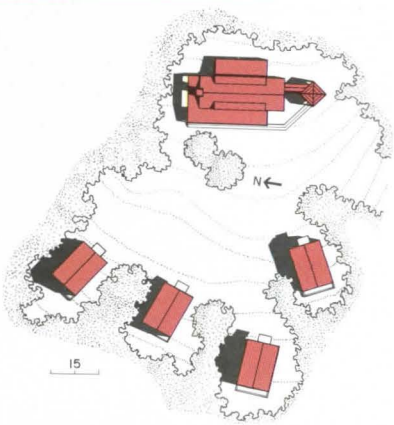
A year-round cabin complex makes camping an event for all seasons.

From spring through fall, Philadelphia-area Girl Scouts—from five-year-old Brownies to badge-bedecked veterans of seventeen—flock to the rolling woodland of the regional scouting council's Camp Tweedale, where the girls have been accustomed to roughing it in tents pitched atop wooden platforms. Now, outings continue through the winter months as well, courtesy of a new year-round campsite that blends linkage to the outdoors with the coziness of heated, weathertight shelter. Planned and positioned to celebrate its siting around a hilltop glade, the complex comprises a program building for dining and indoor activities, and four snug sleeping cabins tucked into the slopes that fall away from the clearing.

Seen first is a sturdy lookout tower skewed to face the approach path but joined to the main building by an abbreviated second-story bridge and deep wrap-around porch. With its exposed frame construction, steep-pitched roof, and massive double-sided stone fireplace, the dining/assembly hall recalls local camp and park structures of the early 20th century, updated (and brightened in anticipation of gloomy winter days) by clerestory dormers, glazed gable ends, and side-by-side French doors. The light-filled two-story space within is edged on one side by an open kitchen big enough for group cooking and demonstrations, while the end opposite the fireplace encloses ground-level service areas. Above, a "Juliet" balcony crosses a mezzanine activity area giving on to the tower's bridge and bench-lined "treehouse" sitting room.

Susan Maxman Architects' emphasis on visually merging indoors and outdoors and offering a range of large and small places where campers may gather is carried through to the

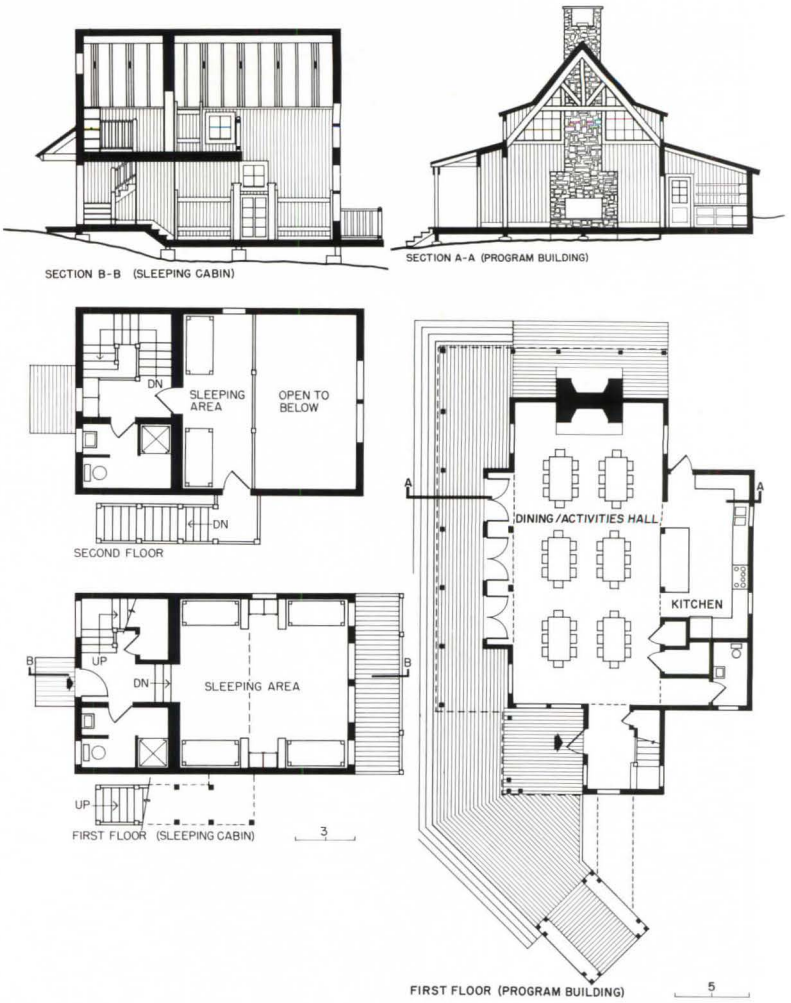
A rustic "lodge" that serves as dining hall and indoor recreation space (left) is the center of activity for a winterized camp site. Across the clearing, four smaller sleeping cabins (above) nestle in the woods.



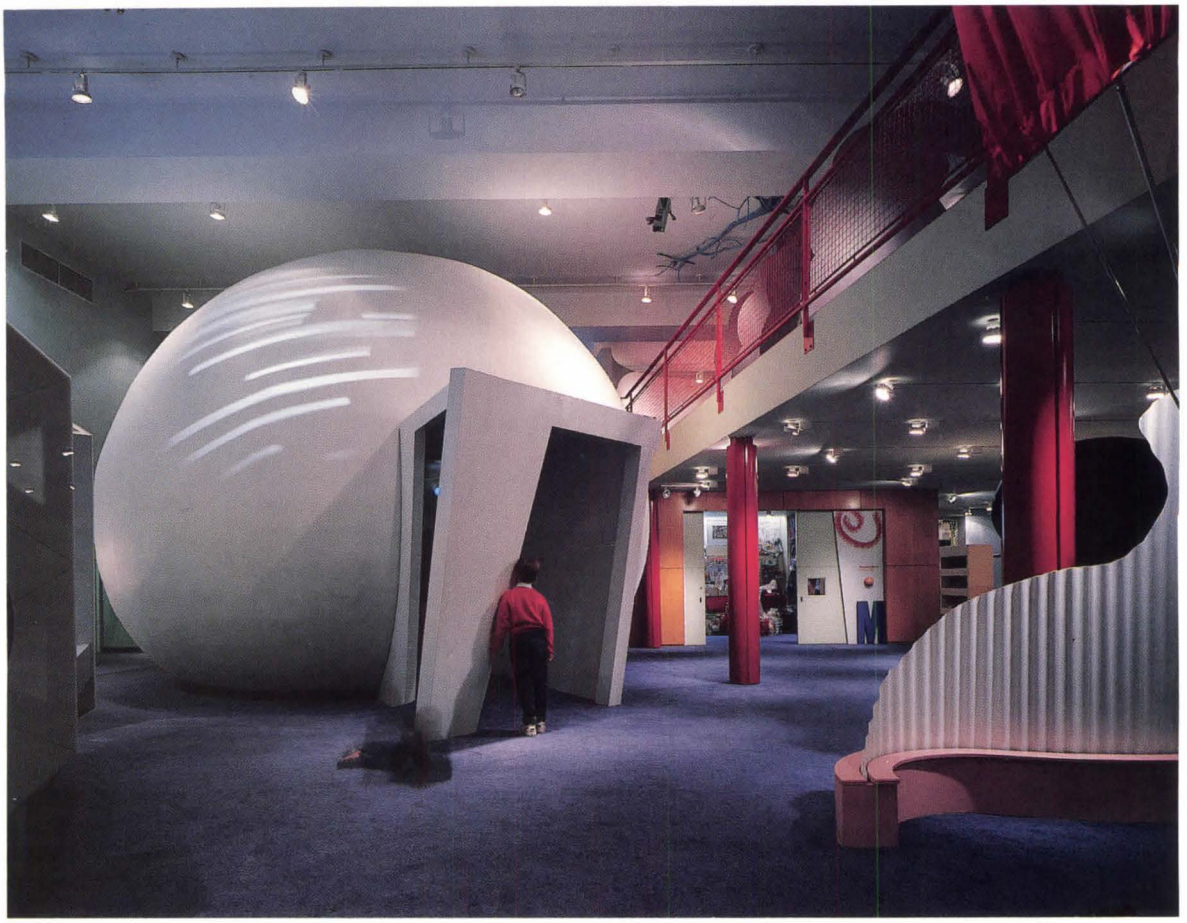
peak-roofed two-story cabins, archetypal house forms that might have been drawn by Brownie scouts but were also designed to recall the platform tents they replace. Each 12-girl cabin contrives a variety of sleeping arrangements: two sets of bunks in a loft area, two under the loft, and two under the high open ceiling. Small square windows alternate with larger openings, including big low-silled openings meant to be climbed through to reach the cabin's cantilevered rear deck. A side stair doubles as an upper porch and second exit from the loft.

Chosen for its sympathy to the setting, relatively low cost, and ability to age gracefully, exposed wood is used throughout for finished surfaces as well as structures framed with diagrammatic directness. The program building combines rough 6- by 6-inch and 8- by 8-inch fir support posts and interior roof trusses with cladding of 1- by 6-inch V-grooved cedar boards, while the smaller cabins are conventionally framed and more economically sheathed in cedar plywood dressed up with 1- by 3-inch or 1- by 4-inch cedar battens. Ceilings are exposed pine and fir decking, and interior wall paneling is lightly stained pine beaded board. Rustic natural wood exteriors are complemented by jaunty barn-red trim and roofing. **MARGARET GASKIE**

Cabin Complex, Camp Tweedale
Lower Oxford Township, Pennsylvania
OWNER: *Freedom Valley Girl Scout Council*
ARCHITECT: *Susan Maxman Architects—Susan Maxman, principal-in-charge; Kathryn B. Cleveland, project manager; Jeffery C. Hayes, project architect*
ENGINEERS: *Ortega Consulting (structural); Bruce E. Brooks & Associates (mechanical/electrical)*
LANDSCAPE ARCHITECT: *Shusterman & Shiller*
GENERAL CONTRACTOR: *Osborn General Contractors*



The big two-story program building (facing page) brings outdoors in with clerestories, a glazed gable around the stone chimney, and a continuous row of French doors. Opposite the fireplace wall, spaces for services (including warm-air heating), are topped by a small mezzanine activity area (above). Dining tables and chairs are stored beneath the kitchen island. Each of the four cabins is similarly linked to the outdoors (left) while accommodating 12 girls in bunks arranged for variety of sleeping arrangements and easy supervision. The open two-story space is heightened by a step down from the entry vestibule.



New School of Thought

A New York City children's museum boasts an interior landscape that marries learning and play.

By David Masello

Children's Museum of Manhattan
New York City
Paul Segal Associates, Architects

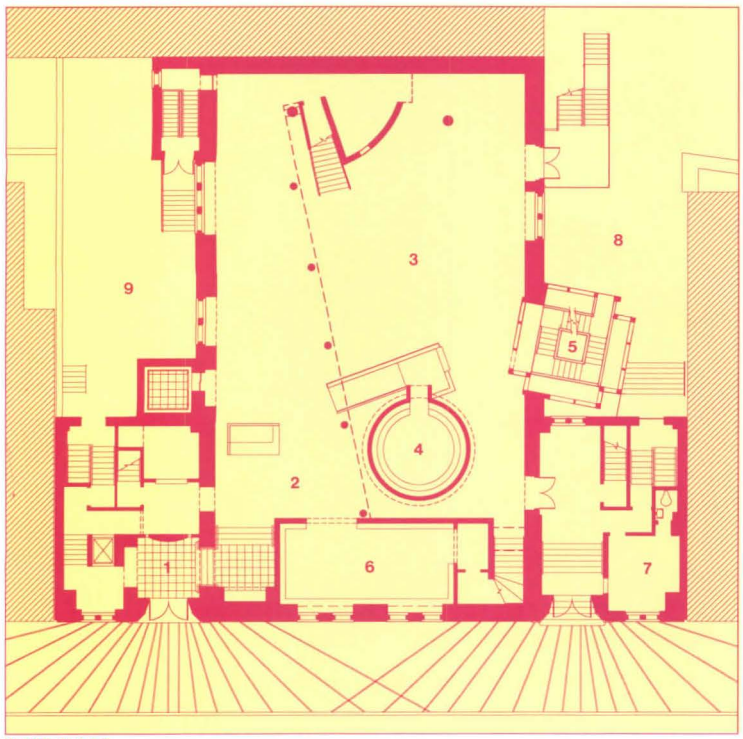
Kids are not easily fooled—especially by adults—and when it comes to play they are surprisingly finicky. As a parent of young children, Joan Krevlin, Paul Segal Associates' project architect for the Children's Museum of Manhattan, recognized the need "to create a space of clear forms, clear geometries, and lots of color without being cute. And we've achieved in the museum a background that is fun, lively, and speaks to kids." Contained within a 36,000-square-foot space on Manhattan's Upper West Side is a kind of interior playground that is at once educational, whimsical, and spirited—ingredients necessary for winning the attention of children.

After more than 15 years in an antiquated building on West 54th Street, the museum sought a larger facility situated in a residential setting. A capital fund drive raised $12 million, and work began in 1988 on renovating a four-story circa-1920s parochial school on West 83rd Street.

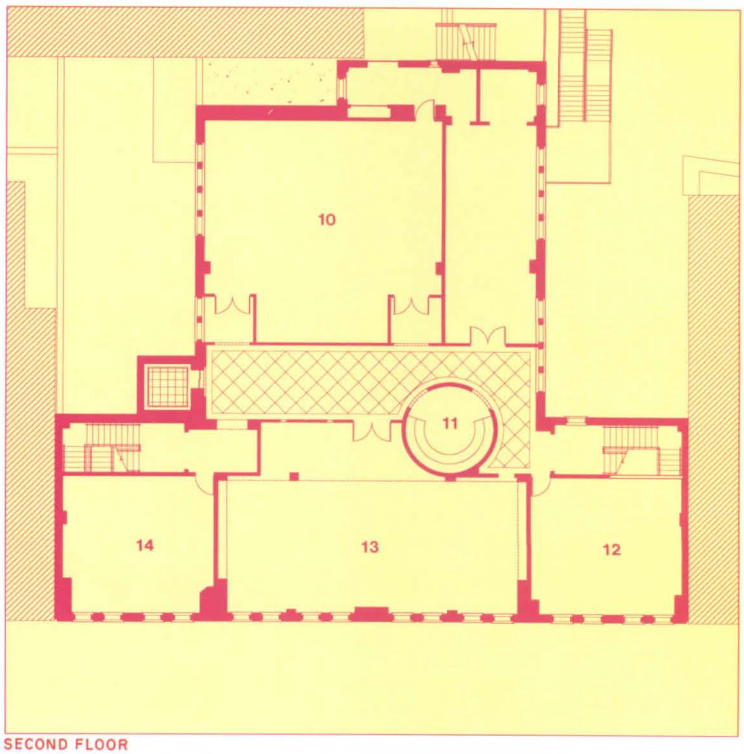
The museum's ambitious program called for large open spaces that would contain rotating exhibits, traditional classrooms, state-of-the-art workshops and theaters, and administrative offices. To accomplish this agenda, the architects nearly had to gut the building and install a new air-cooled hvac system, though they were able to retain some of the original classrooms, windows, and period fixtures such as wooden lab desks and glass-door cabinets. Minimal exterior work included new front doors and construction of a handicapped-accessible second entry.

Amid the cacophony and animation of children on the museum's main entry floor, visitors can discern elaborate exhibit stations complete with levers, buttons, and other devices that encourage interaction. At the center of this 4,110-square-foot space is the "Brainatarium," one of the few permanent exhibit fixtures that Paul Segal Associates designed. This 19-foot-diameter white gunite sphere was constructed wholly within the museum. As Joan Krevlin recalls, "a small crew from Idaho came in and blew up a nylon balloon that was then anchored on a steel frame. Reinforcing mesh was placed inside it, and lightweight gunite concrete was then sprayed within. After the concrete hardened, the balloon, acting as a mold, was removed and the finished sphere was revealed." Subsequent plaster resurfacing resulted in a smooth and even surface.

Inside the sphere a small amphitheater accommodates 30 people who sit on carpeted steps to view a four-minute orientation projected onto the dome. Acoustical spray contains the sound of the show within the sphere. "The Brainatarium is the literal starting point and reference point for the museum," remarks Krevlin. "Kids can get overwhelmed in new places, so the sphere provides spatial reference, something they can see from any point on the floor."



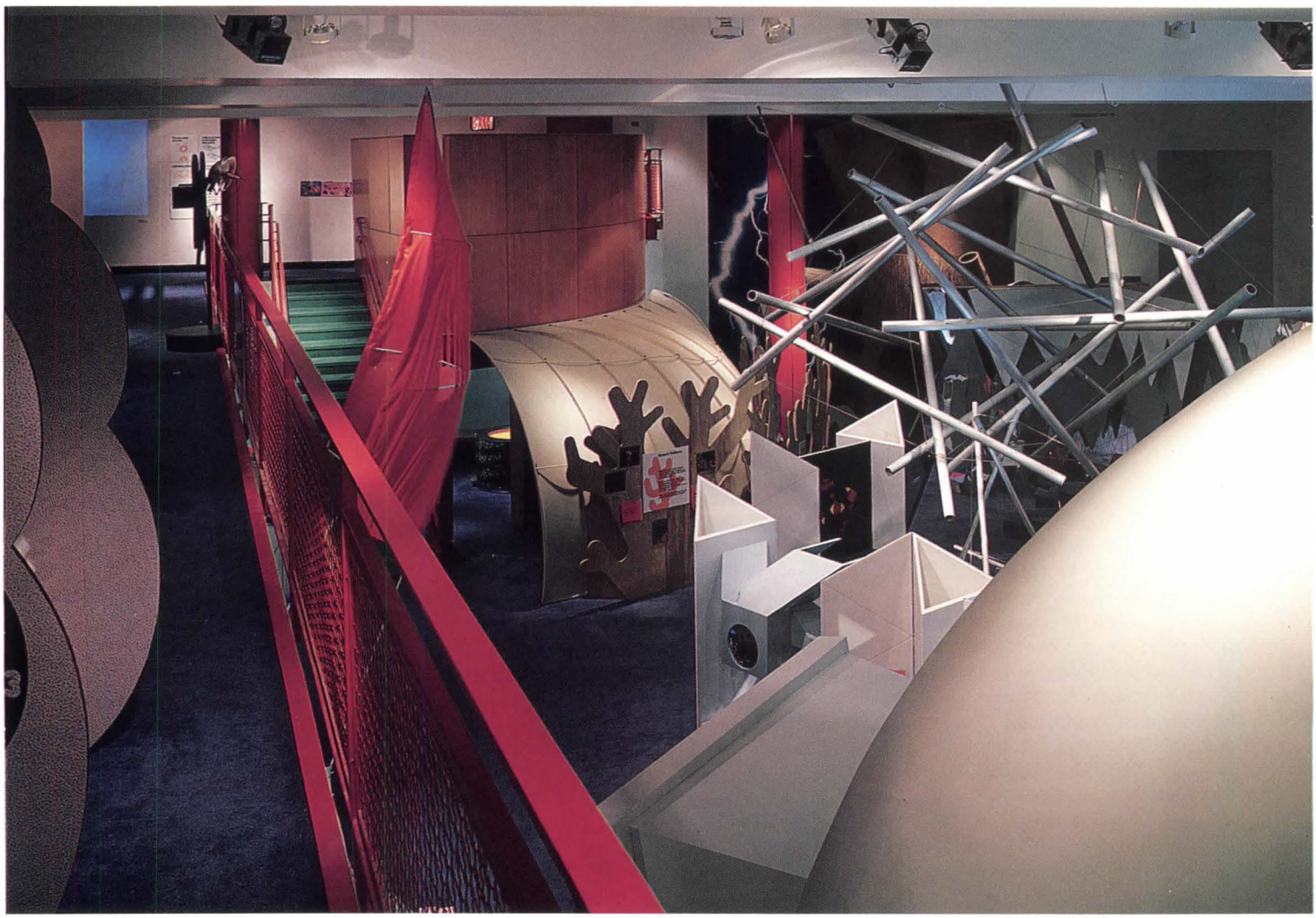
FIRST FLOOR

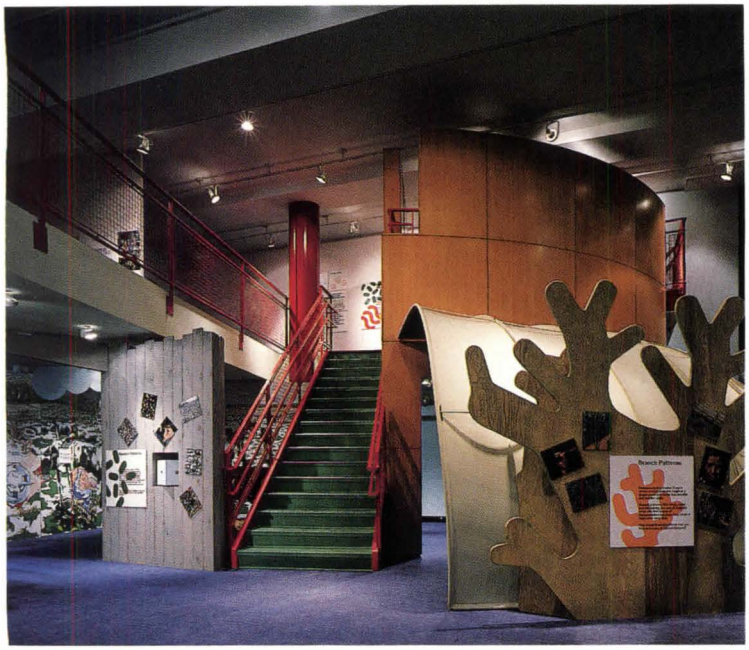


SECOND FLOOR

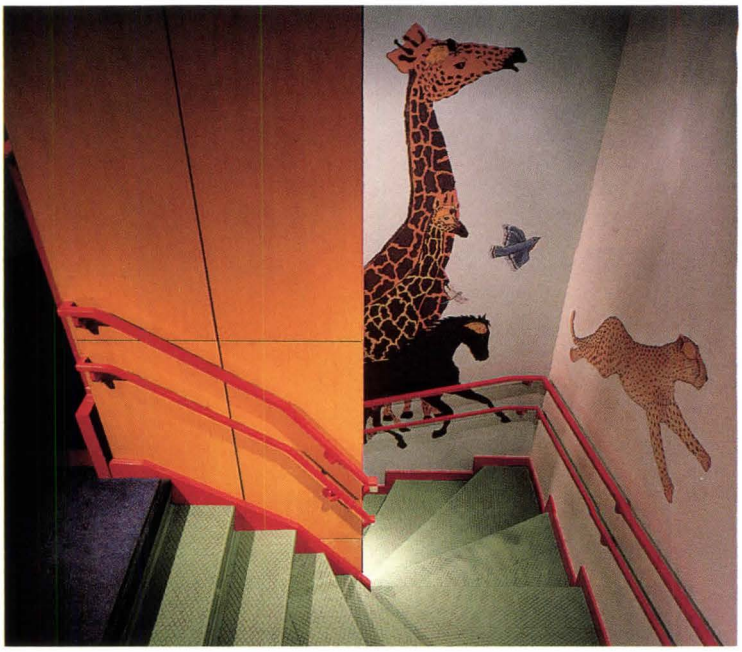
1. Entry
2. Lobby
3. Exhibit gallery
4. Brainatarium
5. Future DNA stair
6. Museum shop
7. Office
8. Exhibit garden
9. Toddler garden
10. Theater
11. Amphitheater
12. Computer center
13. Media center
14. Toddler center

In order to provide an additional 1,200 square feet of exhibition space, Paul Segal Associates inserted a steel-frame and concrete-slab mezzanine into the museum's 19-foot-high main space (below), which overlooks exhibits designed by Lee Skolnick and director Bette Korman.

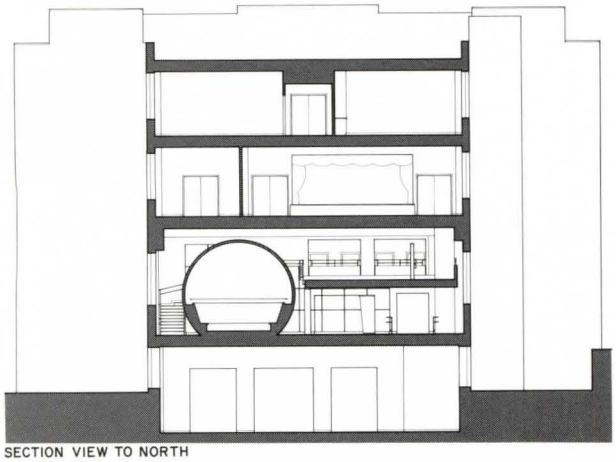




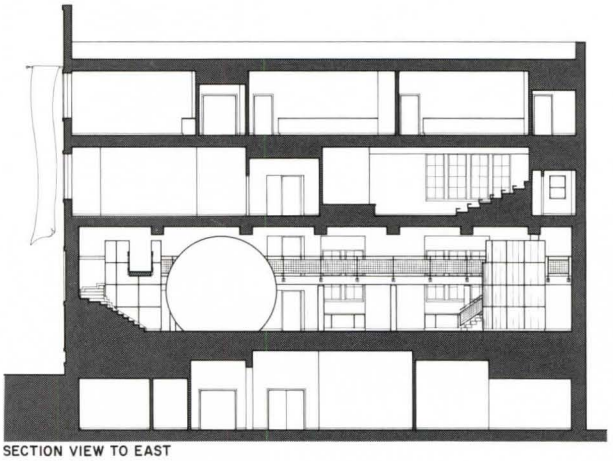
A plywood exhibit on patterns shields a quiet refuge.



Figures from Noah's Ark lead to the mezzanine.



SECTION VIEW TO NORTH



SECTION VIEW TO EAST

Outside the sphere, a mezzanine overlooking the main floor provides 1,200 square feet of additional exhibit space. Here, as in other coves and pockets created by exhibit configurations, are quieter refuges. Such varied scales of space are crucial to children who need places of respite and introspection; they also act as controls for a museum that could otherwise become chaotic.

The second floor is equipped with the 2,000-square-foot Time Warner Center, a sophisticated media room where children can produce their own videotapes and television news shows. Also on this floor is a 150-seat performing arts space, a birthday-party room, and the early child education center. While the building enjoys natural light, it is especially pronounced on the third floor, where traditional classrooms and museum offices are lit both by tall windows overlooking the street and by original clerestory windows. An open community gallery occupies the basement.

A pronounced sense of scale and color contributes greatly to the museum-going experience. All signs, elevator buttons, and hardware fixtures are at "kid" height, or below 54 inches. Handrails are set at both code height and "kid" height, and the mezzanine railing has see-through mesh wiring that diminishes the temptation for children to climb over it. Bathroom mirrors are also set at double heights. Red interior columns and handrails, green elevator cabs, blue carpeting, fanciful checkered bathroom tiling, and other boldly hued finishes are clearly meant to stimulate children. Had the budget allowed, Krevlin wanted to create display boxes out of the basement windows, which from the street are at the perfect height for children.

Lee Skolnick Associates designed the museum's temporary exhibits "to make the space as physically exciting as possible." Says Skolnick, "Sometimes children's museums can become too education based. Things need to be visually arresting and impressionable to motivate kids. We think of the exhibits as a series of events that collage together." While few of the children running through and climbing over the exhibits are able to express their responses to the museum, Krevlin and Segal admit to seeking some youthful guidance. As Krevlin says, "In terms of the architecture for the museum, we each consulted kids we knew—ours."

David Masello is Special Features Editor of Avenue *magazine in New York City.*

Children's Museum of Manhattan
New York City
OWNER: *Children's Museum of Manhattan*
ARCHITECT: *Paul Segal Associates—Paul Segal, partner-in-charge; Joan Krevlin, project architect; Robert Weir, Til Globig, Peter Burke, Peter Rees, Michael Canter, Vivian Dwyer, design team; John Van Mulders, construction phase administrator*
ENGINEERS: *Robert Silman Associates (structural); Ambrosino, DePinto & Schmieder (mechanical/electrical)*
CONSULTANTS: *Lee Skolnick Associates, Bette Korman (exhibition design); Jerry Kugler Associates (lighting); Vignelli Associates (graphic design)*
GENERAL CONTRACTOR: *Target Builders*

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The Search Continues

Four low-rise condominium projects—two subsidized and two charging market rates—deal with various aspects of a churning national housing scene.

Although the four projects featured on the following pages are all low-rise condominiums, each exemplifies a different characteristic of a national housing scene marked chiefly by uncertainty.

Two of the projects, in Boston and San Francisco, are part of the desperate quest for affordable housing and were created by nonprofit organizations that are increasingly active players on the urban scene. For all of their similarities in program and intent, however, they present quite different visages: one a set of pugnacious brick row houses in Boston, the other wood-frame San Francisco Victoriana. The third complex, located on the coast of Maine, represents the proliferation of recreation-oriented luxury developments; the fourth, in Pennsylvania's Delaware Valley, involves the adaptive use of other building types for residential purposes, serving both the cause of preservation and the housing market.

Addressing the nation's housing woes

Although none of the projects featured here directly addresses the visible and tragic condition of the homeless, architects *are* taking a role in solving this national problem, both as individuals and through the AIA's "Search for Shelter" project. Started in 1986, this program has involved cooperative action with more than 100 other national and local organizations. The built results can be seen in more than 70 cities, serving both the general homeless population as well as such special segments as battered women, teenage mothers, and the de-institutionalized mentally ill.

The number of homeless Americans is a fraction of low-income individuals and families living in squalor. The federal government has ceased subsidizing low-income housing construction and while there are bills in both the House and Senate that would partially restore the federal role through use of the so-called "peace dividend," they are unlikely to overcome concerns about the federal deficit.

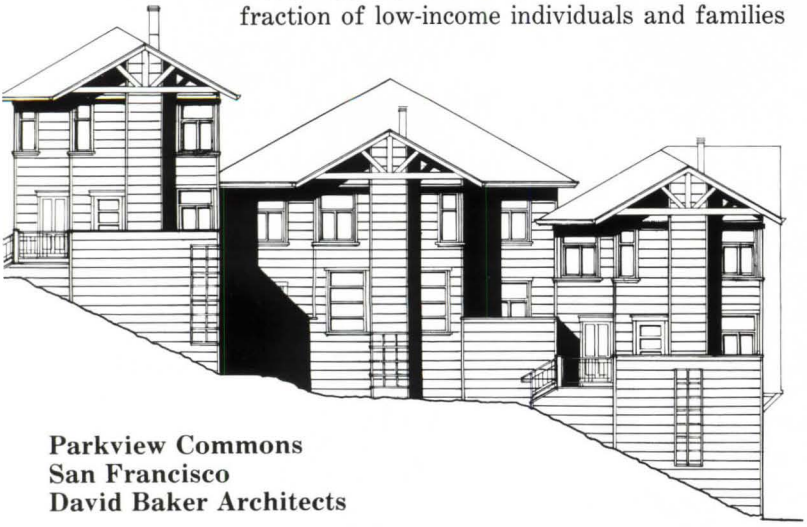
What is more, the country's low-income residential stock has been steadily declining in recent years as public housing built during the 1950s and '60s has fallen into decay. Federal funds to rehabilitate them also have been cut off, leaving many local housing authorities virtual slumlords.

A specter of further depletion of the low-income housing stock is that hundreds of thousands of units built under the Section 8 program over a generation ago could today be transformed into market-rate buildings. Section 8 had a 20-year limit on prepayment of federal mortgage funds and removal of obligations to reserve the units for low-income residents. The limit is now up and a moratorium imposed on prepayment and conversion ends this fiscal year. (To its credit, the Bush Administration is willing to act, and even spend, to retain existing low-income housing, and a favorite idea of HUD Secretary Kemp is to sell the buildings to their tenants.)

Although no one has offered any easy solutions to the housing crisis, there are some intriguing new directions being pursued. One is formation of community land trusts, where residents band together to buy land and build housing on it, usually employing sweat equity. An even more rapidly spreading concept is cohousing, an approach pioneered in Scandinavia that involves communal building and common facilities that reduce individual unit sizes. There are some 40 cohousing groups active in the U. S., most formed in the last two years.

Finally, there is suddenly the prospect that housing may become a major labor-management issue. In April President Bush signed a bill ending the Taft-Hartley Act's 43-year old prohibition against unions bargaining for housing benefits. A great many employers already are providing such benefits to keep employees content and in place, especially in areas of rampant real-estate inflation. Some companies help with down payments, while others support community development corporations in building affordable housing. Now the change of law will let companies and unions set up housing trusts.

DONALD J. CANTY



Parkview Commons
San Francisco
David Baker Architects

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MARKETING HISTORY

Canalside condominiums incorporate a 19th-century mill.

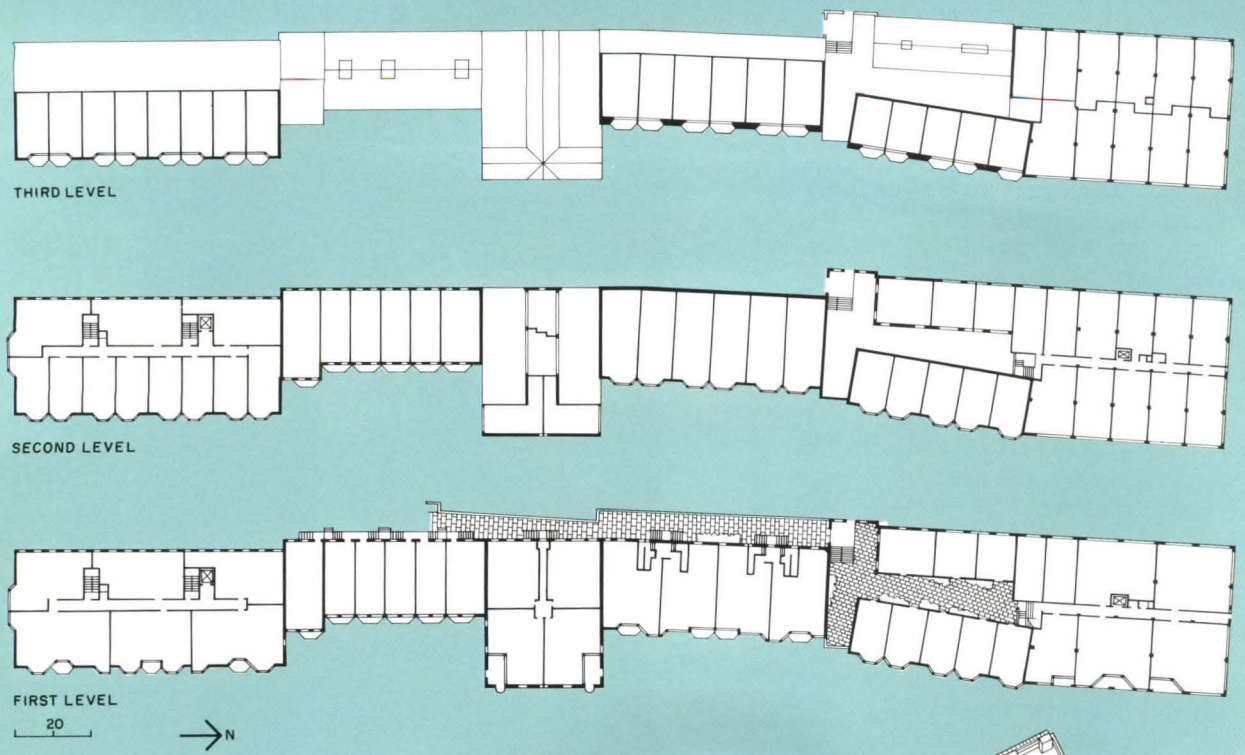
The Waterworks
New Hope, Pennsylvania
Cecil Baker & Associates, Architects

According to local legend, the site of The Waterworks was always an island, and George Washington used it to hide boats from view as he prepared his attack on Trenton. What is known for sure is that the parcel has been an island since 1829, when the Delaware Canal opened on the western bank of the Delaware River.

The earliest buildings on the property included a stone house built near the locks and a larger stone building that sheltered a water wheel and pumps used to keep the canal at a navigable level. Although the canal had stopped functioning in 1931, when the island became site of the Union Paper Mill, other buildings were added until as recently as 1942. The row of buildings was a mix of styles and materials—"a remarkable hundred-year case study of Bucks County mill architecture," according to architect Cecil Baker.

During the 1970s, after the paper mill went out of business, the buildings were used only sporadically as warehouses. Given the complex's imposing architecture and the site's splendid views across the Delaware, various developers began envisioning the site for possible adaptive use, and in 1986 the River Road Development Corporation launched The Waterworks, a 62-unit condominium project that blended new and old construction.

The task facing architects Cecil Baker & Associates wasn't easy. The buildings varied in condition, age, construction; they



The architects placed new construction on the footprints of 19th-century mill buildings that occupy a narrow strip of land between the Delaware River and the Delaware Canal (top photo opposite and drawings above). Along the canal (inset photo opposite), infill buildings retain the overall configuration, massing, and height of the old mill structures.

largely filled the site, all but ruling out parking and open space; and the island was accessible only by four bridges over the canal. Finally, the site had a disturbing tendency to flood during the spring thaw.

The architects quicky ascertained that the trusswork in some of the buildings was unsuitable for conversion to residential use. Yet the borough required that the island retain its historic villagelike appearance when viewed from the mainland. The architects' solution was a careful piece of surgery. They removed 20th-century infill between the oldest buildings and exposed existing stone walls. They created a courtyard and placed parking on the ground floor of the mill, elevating the residential units above the flood level.

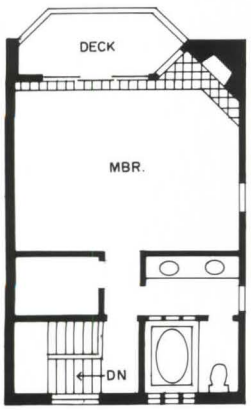
The complex had changed so frequently over time that the architects made no attempt to restore it to a particular period. They did retain the buildings' footprints, however, along with the original structures' overall massing, especially on the canal side of the project. Where new buildings were added, the architects followed the roof slopes of the old.

New construction predominates on the river side, where the architects took full advantage of the views by including large glazed bays and rooftop decks. Like the older buildings, the new structures vary in depth and configuration. All told, the complex boasts 30 different unit types, ranging from flats, duplexes, and triplexes entered from interior corridors, to town houses entered directly from outside.

In sum the architects satisfied the borough's desire to retain a sense of antiquity while giving the developer a highly marketable housing complex. **D. J. C.**

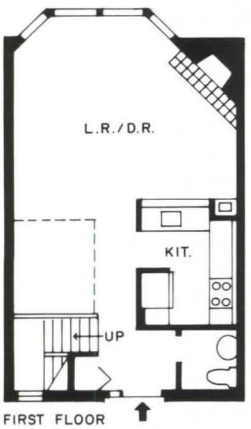
The Waterworks
New Hope, Pennsylvania
OWNER: *River Road Development Corporation*
ARCHITECT: *Cecil Baker & Associates—Cecil Baker, principal-in-charge; William Cheeseman, project architect; Joseph Denegre, James Ruckman, project team*
ENGINEERS: *O'Donnell & Naccarato, Inc. (structural); Snyder Hoffman Associates (mechanical/electrical); J. G. Parks Associates (civil); BCM Eastern, Inc. (sewers/water treatment)*
LANDSCAPE ARCHITECT: *Edward Boyer*

A central courtyard (top right) incorporates pieces of the old mill, blended with new facades. A row of red-brick town houses on the canal side of the project is embellished with period lamps and details.

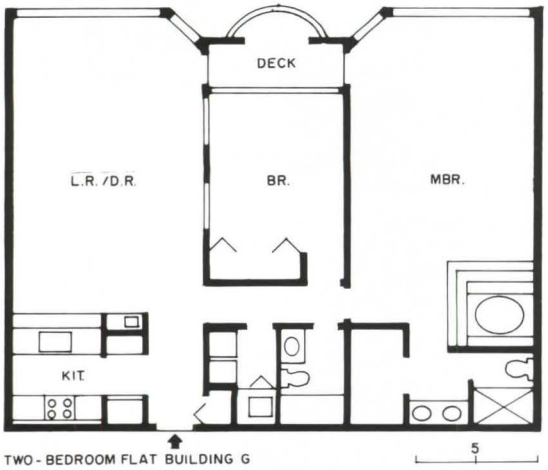


THIRD FLOOR

SECOND FLOOR



FIRST FLOOR
TOWNHOUSE BUILDING B



TWO-BEDROOM FLAT BUILDING G

Fitting The Waterworks complex into the footprint of the old mill buildings produced a remarkably broad range of building types and unit configurations, which aided the developers in marketing the project. Plans (left) show a pair of representative dwelling types: a three-story two-bedroom town house and a two-bedroom flat. In a town-house interior, an arched opening (far left in top photo) is on axis with a pedestrian bridge over the canal, one of four links to the mainland. A corner fireplace and waterfront views across the Delaware River into southern New Jersey enhance a duplex interior (bottom).

Round and three-sided bays give the street facades of Back of the Hill a measure of individuality.

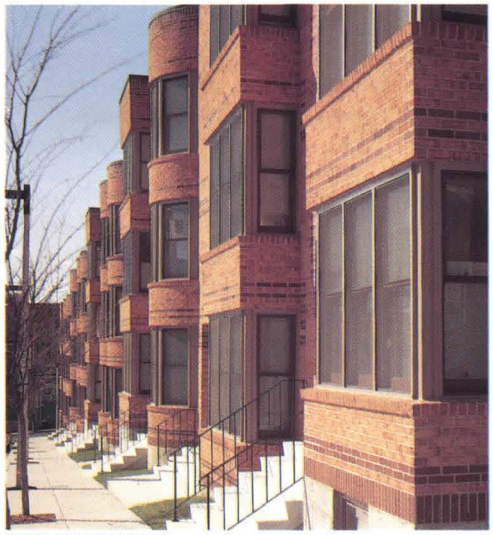
RETURN OF THE ROW

Union-sponsored affordable housing reflects Boston's rowhouse tradition.

Back of the Hill Rowhouses
Boston, Massachusetts
William Rawn Associates, Architects

This project contributed 165 units of mostly affordable housing to Boston in the form of rowhouses climbing a steep four-square-block site. It unifies the city's Mission Hill neighborhood and emulates existing densities and street patterns.

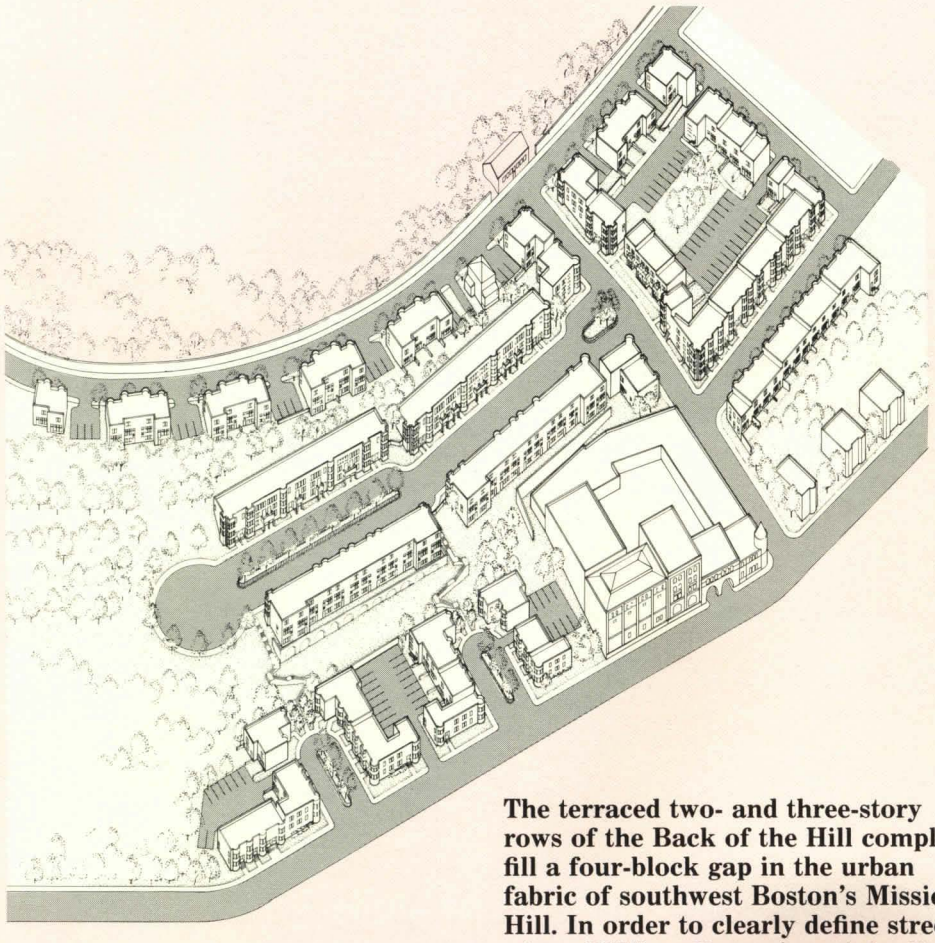
The houses have shallow setbacks that help define the streets as "carefully crafted public spaces," in the architect's words. Several streets have landscaped medians and iron fences. Facades are organized into three rowhouse types, with either a round bay window, a square bay window, or a projecting porch and balcony. The houses are clad in multicolored brick veneer on concrete-block bearing walls supporting precast-concrete floors. The brick color changes as the houses ascend the hill: dark red with black trim at the bottom, orange with red trim in the center, and buff with yellow trim at the top.



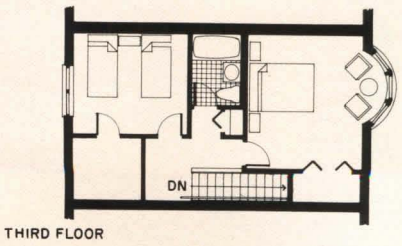
©STEVE ROSENTHAL PHOTOS

Each unit typically has a formal living room and a combined kitchen-dining-family room with a 10-foot, eight-inch ceiling. Sixty-six percent of the units are classified as affordable with one-bedroom units selling for $69,500-$89,000, two-bedroom units for $79,000-$105,000, and three-bedroom units for $87,500-$107,500. **D. J. C.**

Back of the Hill Rowhouses
Boston, Massachusetts
OWNER: *Bricklayers and Laborers Non-Profit Housing Company*
ARCHITECT: *William Rawn Associates—William L. Rawn III, principal-in-charge; Alan Joslin, project architect; Diane Sokal, job captain; Laura Yanchenko, Charles Brainerd, Jim Loman, design team*
ENGINEERS: *LeMessurier Consultants (structural); C. A. Q. Planning and Engineering (civil); Crowley Engineering (mechanical)*
GENERAL CONTRACTOR: *Turner Construction Company*



The terraced two- and three-story rows of the Back of the Hill complex fill a four-block gap in the urban fabric of southwest Boston's Mission Hill. In order to clearly define street edges, William Rawn Associates lined the community's streets with double rows set behind narrow front yards. Unit plans have parlors and combined kitchen-dining-family rooms, some with "French balconies."



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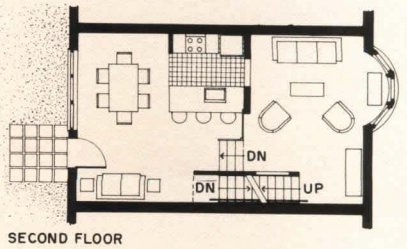
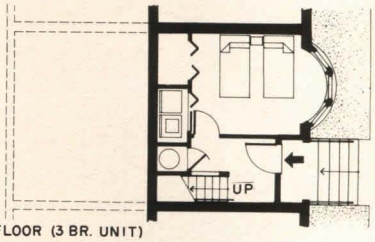
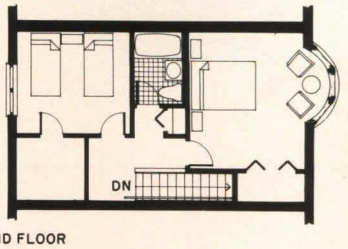


SECOND FLOOR



FIRST FLOOR (3 BR. UNIT)



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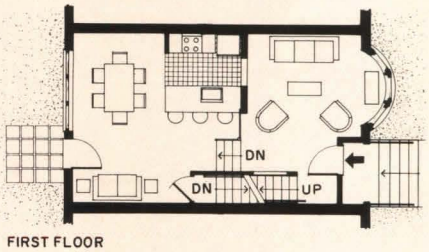

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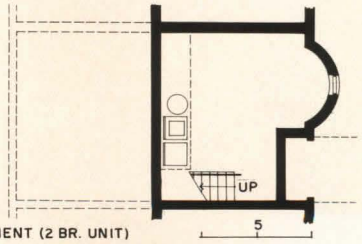
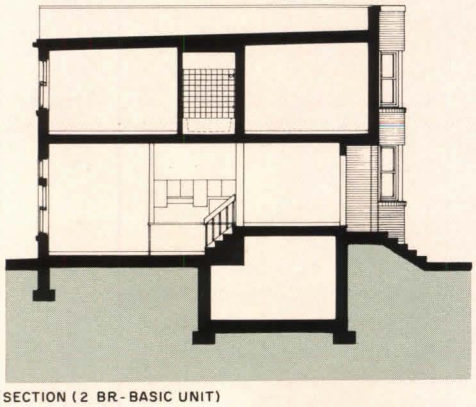
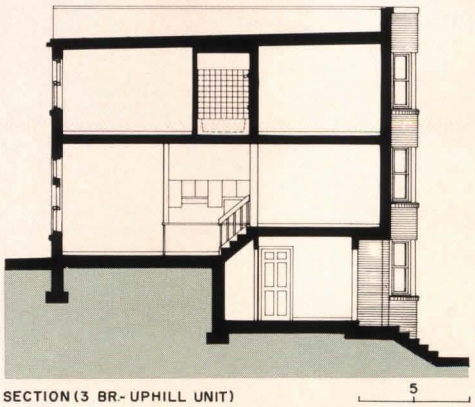


BASEMENT (2 BR. UNIT)



SECTION (2 BR- BASIC UNIT)



SECTION (3 BR- UPHILL UNIT)

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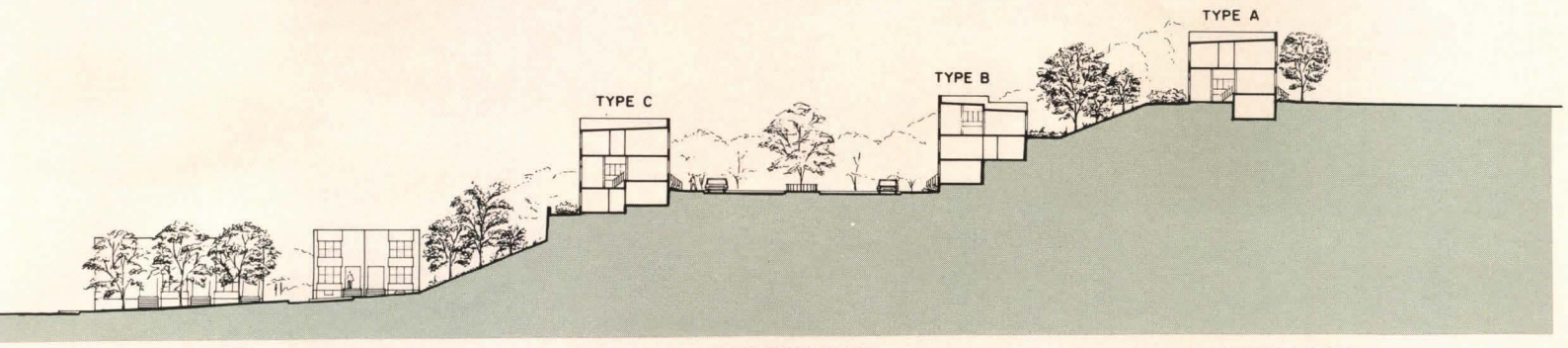

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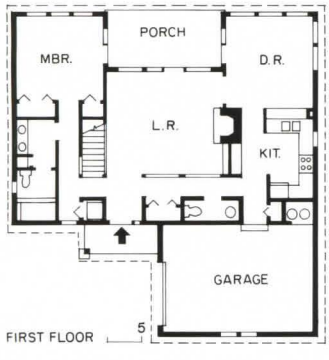
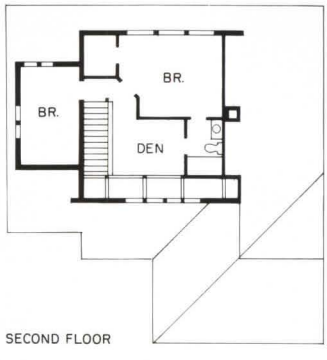
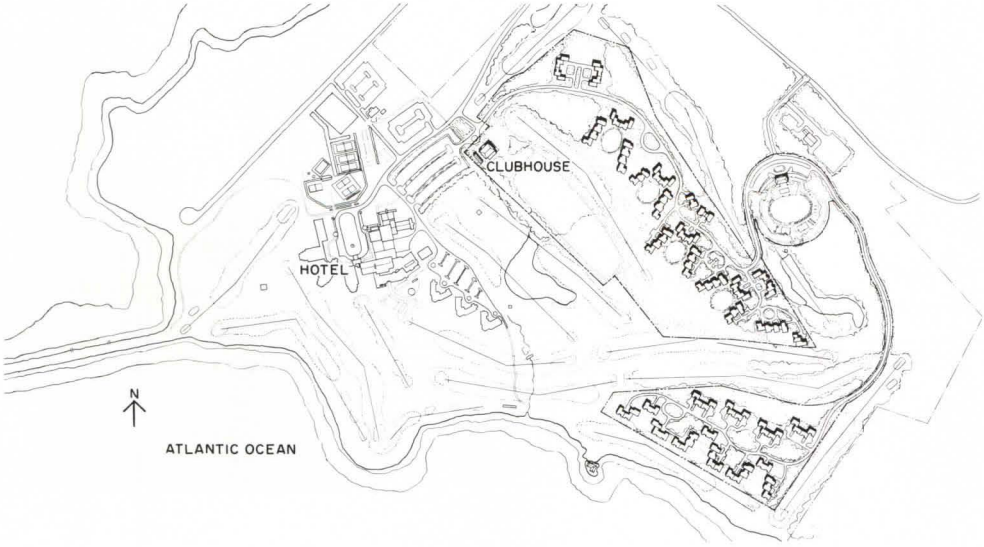






DOWN HOME IN MAINE

An oceanside cluster evokes summer cottages of the past.

Samoset Resort and Village
Rockport, Maine
Sasaki Associates, Architects

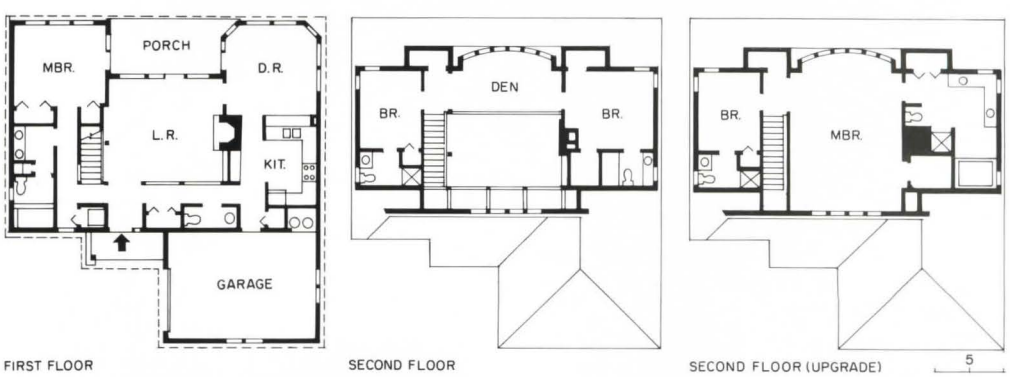
The issue in this development along the central Maine coast was not price but amenity. The project, like similar developments around the country, adjoins a golf course and is geared mainly to empty-nesters seeking either full-time residences or weekend retreats.

Samoset Village's 112 bungalow-like units are arranged around the golf course in 8- to 12-building clusters. Thirty percent enjoy views of the golf course, while the remainder overlook Penobscot Bay. The cottages are adjacent to a 250-room resort and conference center and have access to its recreational facilities, in addition to two swimming pools of its own.

A significant issue facing Sasaki Associates was regionalism. The architects contend that they took their design cues from "a study of nearby cottages built by local citizens as second homes, situated on the rocky coast and withstanding ocean winds and salt spray." Like the earlier buildings, Samoset's units have weathered shingle siding, white-painted trim, and wide overhanging roofs pierced by large dormers. Entries boast distinctive arches and gables, and tapered columns rise from generous front porches.

Sasaki's landscaping—a combination of bayberry, beach plum, roses, and perennial flower borders—reinforces the project's coastal character. The dwelling units feature two basic floor plans. The larger, at 1,635 square feet, has its master bedroom on the ground floor along with a combined living-dining room and kitchen. **D. J. C.**

Samoset Resort and Village
Rockport, Maine
OWNER: *Samoset Resort Investors*
ARCHITECT: *Sasaki Associates, Inc.—John R. Orcutt, principal-in-charge; Cynthia Plank, landscape architect and project manager; Andrew Weaver, project architect*
ENGINEER: *John Hollywood (civil)*
GENERAL CONTRACTOR: *Laukka Construction Company*



While some units at Samoset Village face the golf course (top), others overlook Penobscot Bay. Sasaki Associates designed the project to evoke the 19th- and early 20th-century vacation houses of coastal Maine. The units feature broad, sheltered porches and are organized in clusters of 8 to 12 around a "village green" large enough for community parties and lawn games.

AFFORDABLE CALIFORNIA HILL TOWN

This sprightly complex is the best housing bargain in high-priced San Francisco.

Parkview Commons
San Francisco, California
David Baker Architects

©JOHN SUTTON PHOTOS

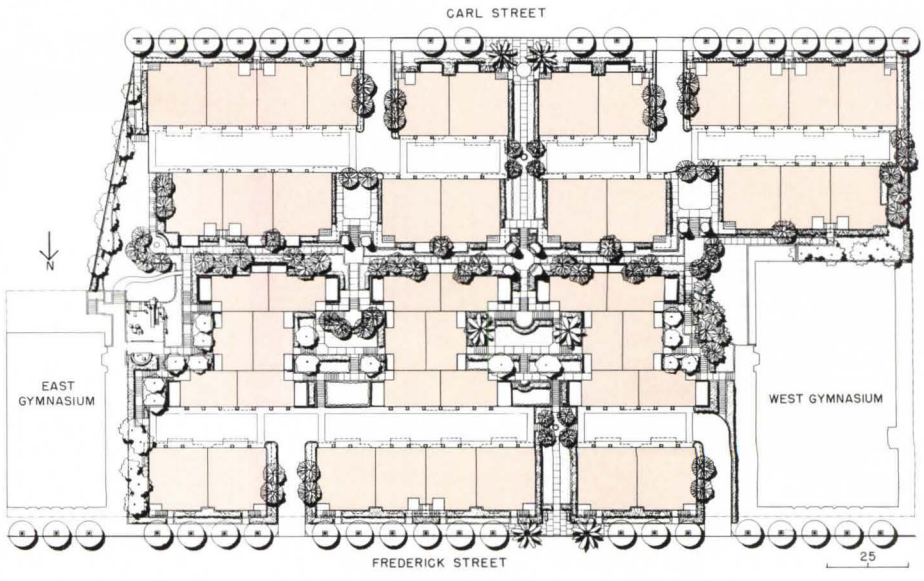
A view down the steep site reveals the project's combination of midblock cottages and three-story flats facing the street.

Amid one of the nation's most inflation-ravaged real-estate markets, qualifying buyers at Parkview Commons can acquire a brand-new, four-bedroom "lease-hold condominium"—likely as not with views, a fireplace, and a deck—for as little as $99,000. Qualifications include an income limit, size of household, and no previous home ownership.

Achieving this kind of bargain, not to mention architectural quality, involved a controversy-beset process stretching over a decade. It also took an expert nonprofit developer and some fiscal legerdemain that other cities in need of affordable housing might well emulate.

The project site was the old Polytechnic High School, located just south of Golden Gate Park between the Inner Sunset and Haight-Ashbury districts. In the late 1970s the San Francisco school board closed the school and demolished all of the complex except for two Art Deco gymnasiums now being remodeled as community centers.

For four years the school district tried to sell the site, but under pressure by community groups the city obtained a 75-year lease, at a token sum, for housing use. Residents purchase their dwellings, but lease the land beneath them. The city provided a subsidy to lower the units' price, and in return holds a second mortgage on the property and a "lease lien" in the amount of the difference between the sale price and market value. To prevent specu-



Above: Buildings of the University of California's San Francisco campus loom over Parkview Commons.

Below: Three-story units along Frederick Street evoke San Francisco's classic wood-frame flats.

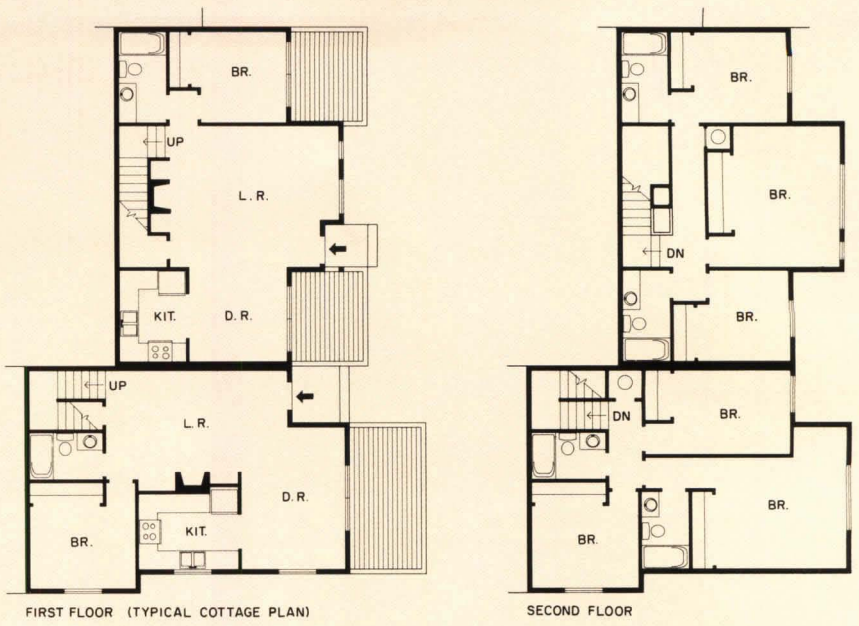
lation the city also holds a four-year option on the properties and a permanent right of first refusal if any are offered for sale.

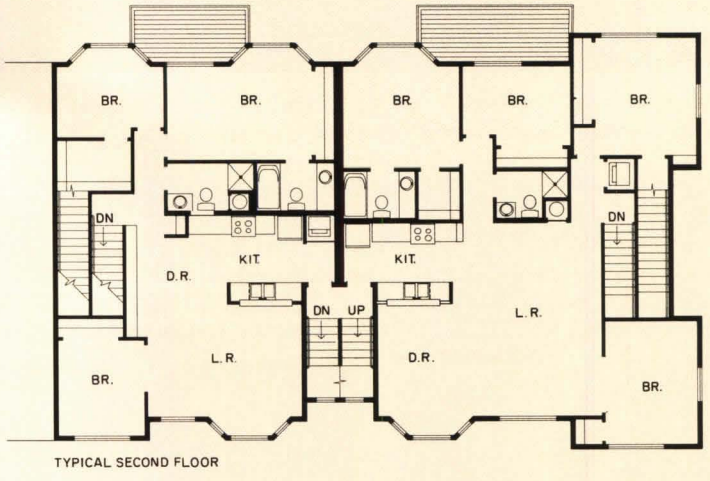
Parkview Commons has two building types: three-story neo-Victorian flats facing streets and two-story midblock "cottages"—a total of 114 affordable housing units ranging from studios to four-bedroom units. The projecting bays and decorative cornices that David Baker Architects incorporated into the project seem very much at home in San Francisco's wood-frame residential core. Where the houses face the street in an almost unbroken row, they could be mistaken for remodeled existing housing stock.

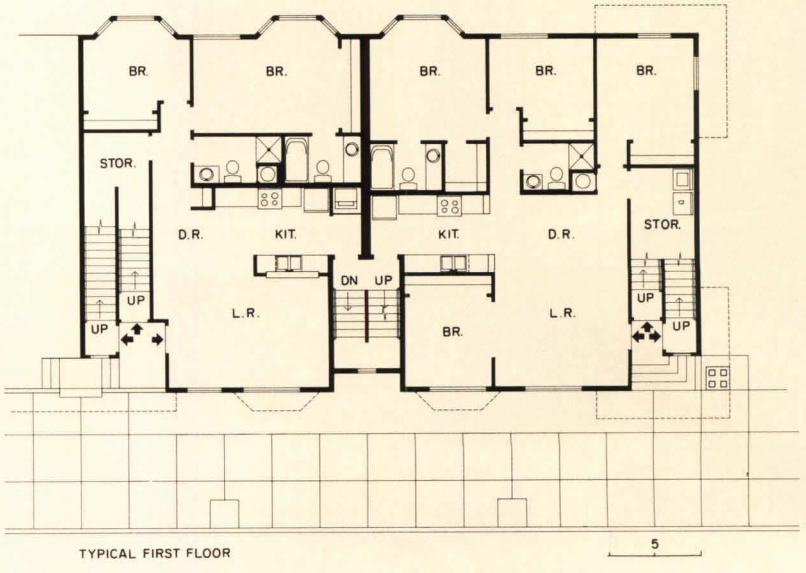
Yet for all of its contextual virtues, the complex also strongly resembles an Italian hill town. Red-tile-roofed towers punctuate the street facades, and the buildings are linked by networks of stairs and walkways as they climb the steep site. Along the way is a variety of sheltered, well-used courtyards and other open spaces. The result is an appealingly intricate and varied urban composition. **D. J. C.**

Parkview Commons
San Francisco, California
OWNERS: *Bridge Housing Corporation and Pacific Union Development Company*
ARCHITECT: *David Baker Architects—David Baker, Peter MacKenzie, Nancy Whitcombe, Tomo Fushimi, project team*
ENGINEERS: *Peter Culley & Associates (structural); CSW Consultants (civil)*
LANDSCAPE ARCHITECT: *Omi Lang Associates*
GENERAL CONTRACTOR: *Hunter/Moffett Construction*

Although cottage units are entered from interior courts (above), handicapped-accessible units are located in street-facing flats, thus eliminating the need for stairs.







Above: Midblock cottages line an interior courtyard. Below: A pair of typical interiors. Amenities include fireplaces, decks, hardwood kitchen cabinets, dishwashers and garbage disposals, radiant heat, and prewiring for cable TV. Many of the units can be entered directly from garages beneath.

Our Final Exam.

Let's see if you can handle some simple arithmetic. Take 2500 energetic students. Multiply each one by several grand exits a day. Now multiply again by a 200 day school year. Finally, carry that figure out over years and years. The result: a cycle count as rugged as a climb up Mt. Everest.

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WHAT'S THIS BUILDING MADE OF?

Specifying recently introduced building materials means extra research and asking the right questions.

It is said that wealthy building patrons in Italy once prized painted faux-marble over actual stone—it was proof they could afford to hire the highly skilled artisans.

Nowadays, the word "synthetic" seems to precede just about everything, and we are more likely to prize the "original," whatever that may be. Nevertheless, new materials often offer considerable benefits, especially when backed by research and realistic testing. However, assurance that they are suited for the intended use sometimes entails considerable effort by the architect. In the following stories, we focus on two products that have benefitted from advances in materials research. Glass-fiber reinforced concrete (GFRC) is finding a niche as wall cladding, and glass-fiber reinforced plastic (GFRP) is increasingly seen in historic restorations. (See also New Products, RECORD, June 1990, page 115, for a discussion of cast stone.)

©STEVE ROSENTHAL

This stonelike cornice is glass-fiber reinforced concrete.

What many new products have in common is their resemblance to materials they are intended to replace or from which they are derived. GFRC, once installed, can be indistinguishable from precast concrete. GFRP is a chameleon: it can look like stone, concrete, or wood. If you thumb through Sweet's Catalog File, you will find a number of synthetic versions of familiar materials. But you will sometimes find no mention of what a product is actually made of—a key concern to the architect who must stand behind his or her evaluation of its performance.

Fibers in your future?

New products seem to come out in clusters, following technology advances. Polymers have made rigid materials flexible (polymer-based stucco) and elastic materials longer-lived (sealants). Improved glass fibers, the element common to both materials covered this month, permit fabrication of panels and moldings that are only 3/8-in. to 1-in. thick.

"There is increasing interest in methods of fabricating with new fibers," says Surendra Shah, director of the Science and Technology Center for Advanced Cement-based Materials, recently established at Northwestern University by the National Science Foundation. He expects to see even more use of fiber-reinforced products in the future.

It is ironic that much of the innovation in exterior claddings has come about through the growth of historic preservation work. Renewed interest in the '70s and tax breaks in the '80s brought a flood of money into a long-ignored area and stimulated the search for products that could be used when the budget wouldn't allow archeological perfection or when original materials had become unobtainable. Nor should it be surprising that much preservation work is in the area of fixing older "faux" materials—the most prominent being terra-cotta, which has stood in convincingly for sandstone, limestone, and granite.

Standards prepared by ASTM or by industry associations may usually be consulted to determine reasonable performance values for recently developed materials. Some materials are so new, though, that consensus standards have yet to be developed.

How do you evaluate unfamiliar products?

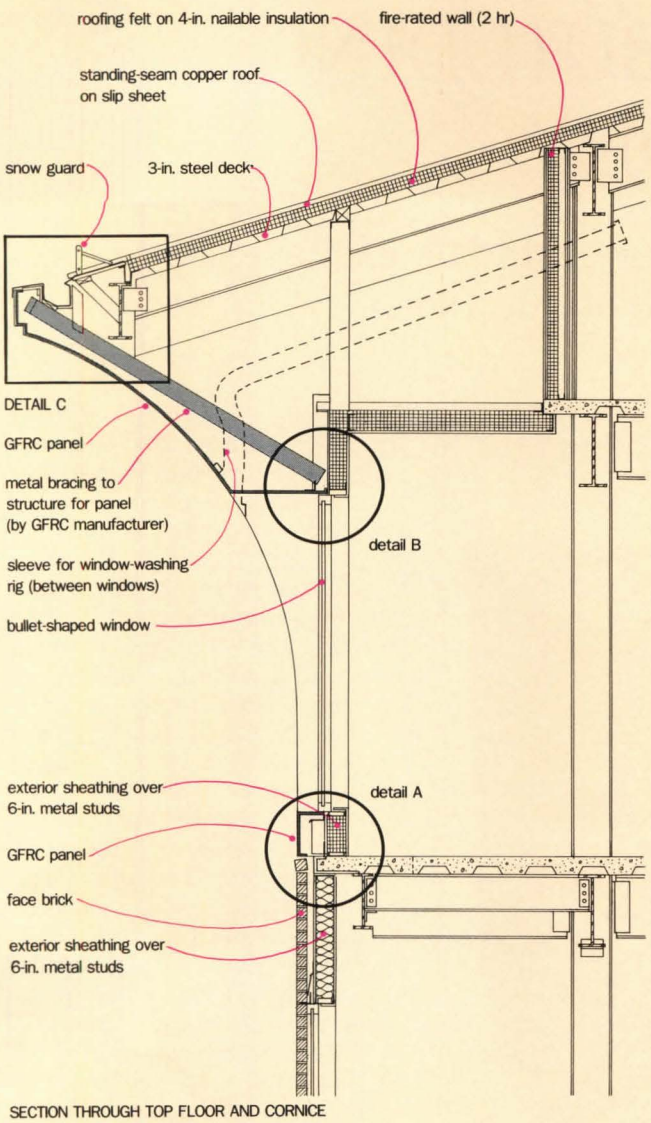
Often the architect is breaking the trail in the use of a product; and so while it may seem prudent to avoid products that have not been around for some time, there are methods to specify them with confidence.

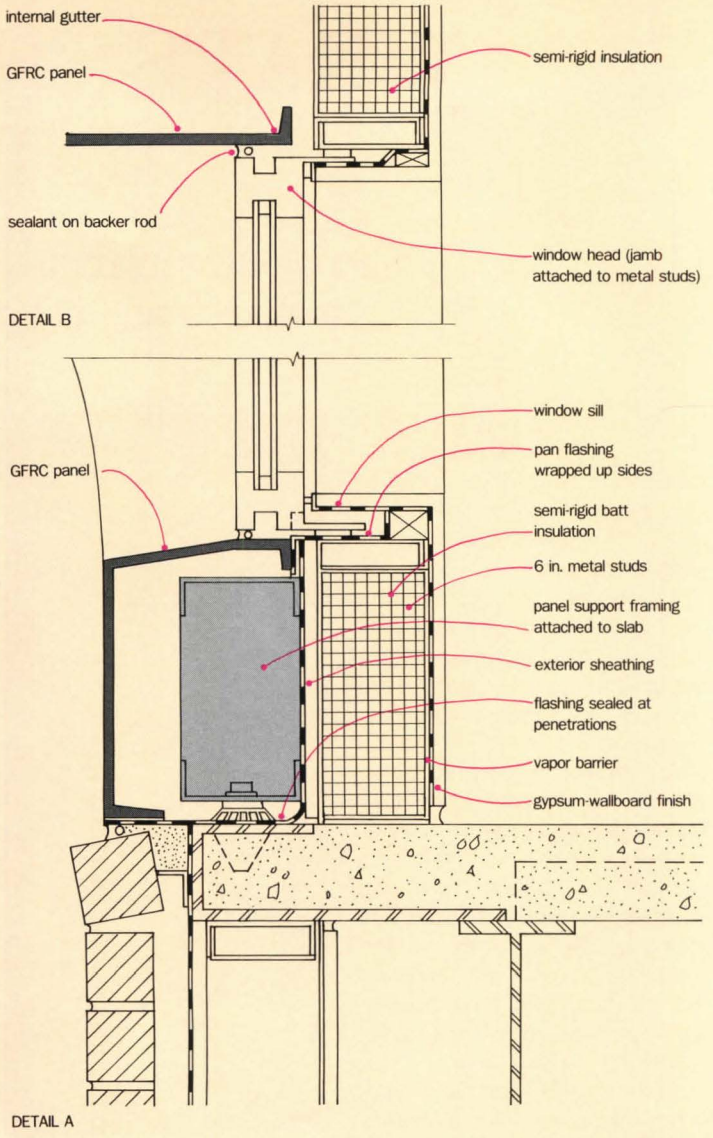
•*Do the research.* Check with other architects who have used the material you are considering. Read the literature and the articles that have been written about it. Those authors often offer consultation services. Talk to manufacturers of materials (that originally had non-building uses) to determine their understanding of the construction field. Accelerated-aging tests, suited to actual exposures, are often cited by experts as indicative of in-situ performance, where real-time field evaluation is lacking.

•*Find an experienced manufacturer.* Look at installations; see the factory; work together to define suitable installation details and specifications. With products, such as GFRC, that are relatively easy for start-up manufacturers, some "mom and pop" shops cannot deliver consistent quality.

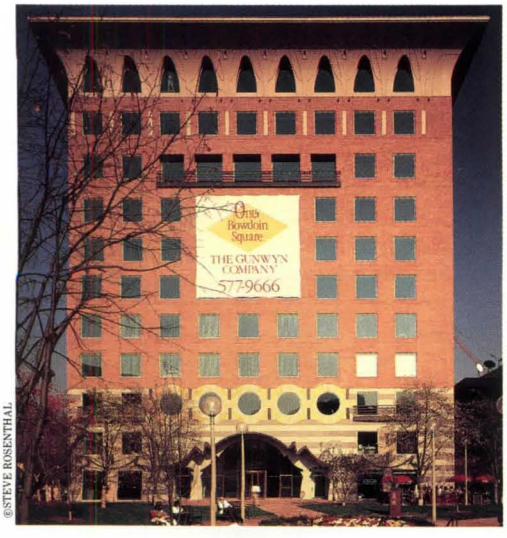
•*Fully document the installation.* Only by drawing and specifying the product in the most complete way will unanswered questions surface. Review the drawings and specifications with potential suppliers. A negotiated contract with the most promising installer may avoid trouble later on. Require the manufacturer and installer to take responsibility for aspects of the project totally under their control. The architect may not save money on new products expected to lower construction costs; expect to spend extra time coordinating the detailing of adjacent materials, especially flashing, sealants, and attachments.

JAMES S. RUSSELL





GFRC: THIN, LIGHTWEIGHT



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One Bowdoin Square's *top-floor* "cornice" is 39 panels of GFRC.

Weight was a factor at One Bowdoin Square in Boston, a speculative office building that is an extension and recladding of an existing 1950s structure (photos previous page and left, drawings above). Since four stories were added, architect Graham Gund explained, "GFRC [glass-fiber reinforced concrete] gave us a sculptural quality in something that was light but would resemble stone. The building was too short to shape the top by taking away portions of the upper stories. Carrying the lines of windows up into a cornice gave a sense of completion."

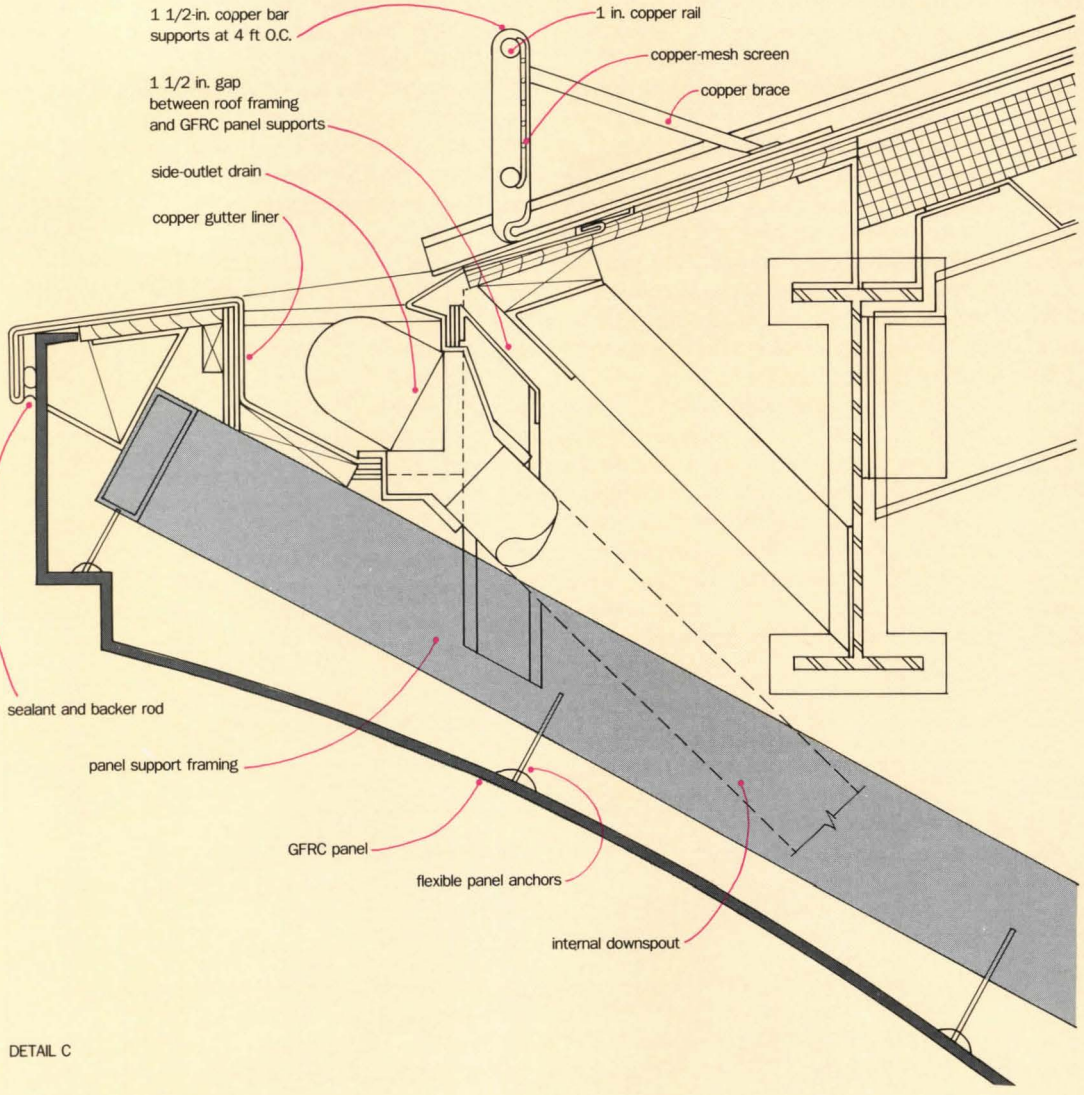
Though GFRC replaces stone or terracotta in restorations (where Gund first encountered it) and is formed into lightweight decorative moldings and fascias on new construction, it is most widely used as a curtainwall panel.

Panels laid-up in thin layers

The skin of a GFRC panel is laid up in thin layers by a method similar to that used for fiberglass yacht hulls. The "resin," though, is a portland-cement and aggregate slurry pumped through a spray gun, where it is combined with chopped alkali-resistant glass fibers. A reinforcing framework of steel shapes or metal studs, attached with special connectors, stiffens the panels and conveys wind and other lateral loads to the structural frame.

Though a single cementitious formulation can be used for the entire cladding thickness, designers usually call for an exposed-to-view face mix that delivers a desired color and finish bound to a "structural" or backup mix. Because of local variations in the quality of sand, cement, and additives available to the manufacturer, each job mix is designed to meet the architect's and the engineer's criteria, just like concrete.

GFRC is particularly appropriate in cases where it is important to reduce dead load. Edward Knowles, vice president of Lafayette Manufacturing in Hayward, Calif., says that panels typically weigh 15 to 20 psf versus 60 to 80 psf for precast. Lightness has particular advantages in seismic areas where the structural frame may have to be beefed up to resist the inertia of massive cladding in lateral accelera-



One Bowdoin Square
Boston, Massachusetts
Graham Gund Architects

GFRC's low unit weight was a significant advantage at One Bowdoin Square. Each full-floor panel is about 14 ft high and projects 8 ft horizontally. Three molds were used, two for left- and right-facing corners and one for the facade. Because of the panel size, a retarder was used to slow-dry of the face mix while the backup material was being sprayed on. Scribed lines were made by applying rubber strips to the mold.

tions. The lower weight can also cut costs for structures built on soils with low bearing capacity.

GFRC's unique characteristics

"You can't assume that working with GFRC is the same as concrete construction," says Donald M. Schultz, a consultant to CTL, Inc., which advised the Marriott Corporation on the largest GFRC project to date (page 94). "The product is different, and it's engineered differently." Among the differences cited by experts:

•*Thermal and moisture movement:* Designing lightweight systems to account for movement is critical. Though a massive masonry or concrete wall can absorb stresses without noticeable dimension changes, a thin membrane will expand or contract. GFRC's movement is complex. First, it shrinks on curing, and because of its high cement content, it shrinks more than precast concrete. Panel movements due to subsequent wetting and drying are also greater. The thermal coefficient of expansion is unusual because it varies with humidity. Donald Pfeifer, a vice president with the Chicago engineering firm of Wiss, Janney, Elstner, says that recent studies have confirmed that the thermal coefficient ranges from two to three times that of concrete depending on moisture content. Some GFRC failures have occurred because of this heretofore little-understood behavior. The coefficient of thermal expansion of facings such as tile, stone—even concrete—may not be compatible, and stresses have caused cracking through both the facing and backup.

To overcome this problem (the most serious one indicated for the material), Lafayette's Knowles recommends that stone facings be mechanically attached to the panel and separated from the backup surface by a slip sheet or other bond breaker. Pfeifer explained that a cementitious facing formulated to closely resemble the backup mix (with, say, a sandblasted or small-sized exposed-aggregate finish) will tend not to develop significant differential movement stresses.

•*Effects of aging:* GFRC's structural characteristics change over time. It loses some strength and becomes more brittle. Accelerated-aging tests have established ultimate values for these strength and strain changes that must be considered in the design of panels.

•*Fire resistance:* GFRC's cement-aggregate-glass formulations are noncombustible, although building officials may require testing of some versions that include a copolymer curing agent. Since the GFRC skin is thin, it is limited in its ability to resist fire-induced heat flow. Hence, resistivity of the entire assembly sometimes depends on the fire-endurance characteristics of the insulation and interior finish. The detailing of panel joints merits special attention so they do not become conduits to smoke and flames.

•*Surface treatments:* A thinner, less expensive panel can be made without a facing, but an unprotected structural mix may develop a fine network of surface cracks that do not affect strength or permeability, but are unattractive and will become visibly dirty.

Defining responsibilites

Hard-to-solve problems crop up during

fabrication and erection when design and engineering responsibilities have been left unclear. Architects should design panels in consultation with a manufacturer to be sure that shapes and finishes are readily fabricated. (It's easy to forget that you need a draft—a slight splay—in returns to unmold a panel.) The architect details flashing and water-diverting accessories.

The manufacturer selects the appropriate cementitious mix to meet the architect's structural and appearance requirements, designs the supporting framework, and chooses the skin-to-framework attachments and their location. The manufacturer, architect, and building engineer together work out the number, location, and details of panel-to-building attachments.

The sizing and location of panel joints can be complicated because of the potential variation in—and wide range of—thermal and moisture movements. While manufacturers will advise, this is ultimately the architect's responsibility. Sealants must be able to accept the range of anticipated movement and should be tested for adhesion and compatibility. Attach the frames of windows and other openings to the panel's supports, not to the skin.

Controlling cost, controlling quality

An early working relationship among panel manufacturer, architect, erector, and window manufacturer is very useful. Many owners object to this for the obvious reason that it can be hard to keep a lid on prices without the competitive pressure of bidding. Where the architect has little experience in the material it might be best to use it with a construction manager constantly monitoring costs.

"This is a handmade product," declares Donald Schultz. While this is not strictly the case, the architect must specify quality control procedures and, in all likelihood, establish a fabrication-to-erection quality-assurance program. While samples are adequate for preliminary design decisions, only full-scale mockups can convey finish and tolerance qualities and acceptable variations. Depending on the size and complexity of the job, continuous or intermittent testing of the mix and fiber disposition within forms can be specified (molds sometimes have special tabs added for making samples). On-site observers should look for transit damage and proper sealant installation. To assist architects who are GFRC neophytes, several engineering firms offer their expertise as consultants. **J. S. R.**

Further information:

"Recommended Practice for Glass Fiber Reinforced Concrete Panels," Precast/Prestressed Concrete Institute, 175 West Jackson Boulevard, Chicago, Ill. 60604 (312/786-0300)

GRC and Buildings, by M. W. Fordyce and R. G. Wodehouse. Boston: Butterworth, 1983.

Articles forthcoming from the American Concrete Institute (Hanson, Roller, et al, authors) and from the 1990 FIP Congress (Scott and Pfeifer, authors) cover recent developments.

42 STORIES HIGH, 1-IN. THICK

How they did the biggest GFRC job.

Though neither Marriott nor DMJM architects set out to erect the largest building yet clad in GFRC, there were several circumstances that made use of the material advantageous. First, the architects sought a relatively lightweight wall system so that the structural frame, in an earthquake, would not have to resist the inertia of a heavy cladding. The design's complex plan and stepped silhouette involved correspondingly more perimeter area, so the enclosure weight took on increased significance. Further, San Francisco's Planning Commission (which, by law, has a lot to say about building design) wanted to see a stonelike finish (though exuberant fanlike glazed shapes burst through at the top of the completed building, right).

An experienced team was assembled: DMJM had previously designed large GFRC projects, and two earlier Marriott projects had been faced with GFRC. The project was nevertheless intensely scrutinized by Marriott's architecture and construction division and engineers at Wiss Janney Elstner. CTL, Inc. (a materials-testing and engineering firm) developed specifications and a quality-assurance program. "They were being a bit more cautious because this was the biggest application," recalls Donald Schultz, a consultant to CTL.

©RUSSELL ABRAHAM

The San Francisco Marriott Hotel

During fabrication, a full-time quality-assurance inspector was assigned to Lafayette Manufacturing's plant. Another inspector monitored panel erection.

Typical wall panels were fabricated to be 10 ft high by 18 ft wide and included the jambs and sill of a single window opening (the bottom of the panel above formed the window head). Smaller pieces were fabricated for spandrels and column covers. In all, 150 molds were used to produce 340,000 sq ft of cladding.

The GFRC skin was reinforced by a combination of painted structural-steel tubes and galvanized light-gauge steel studs. Sandblasted to a lightly etched finish, the skin's buff color contrasts with reddish granite-veneered precast panels installed at the lowest floors.

By the time the project was finished late last year, nearly every expert on GFRC had been involved. In fact most of the participants had a role in preparing PCI's 1987 recommended practice document. Thus, as the state-of-the-GFRC-art, the performance of the San Francisco Marriott's facade will certainly be closely watched. **J. S. R.**

GFRP MOLDS HISTORY

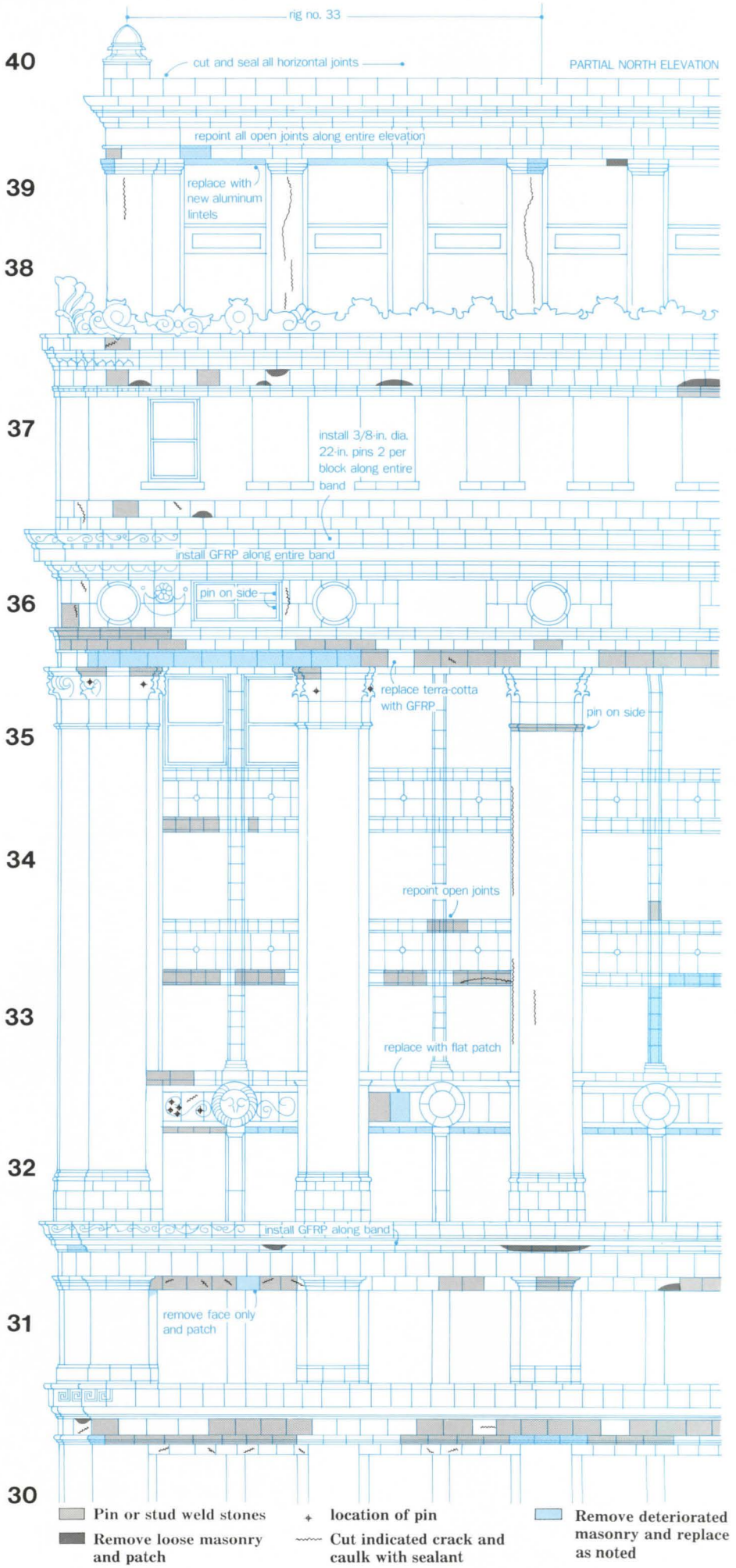
"Philosophically, we'd rather use original material, but sometimes you can't for time, production, or cost reasons," says Kate Ottavino, an associate with Ehrenkrantz, Eckstut & Whitelaw. Ottavino was describing the decision to use glass-fiber reinforced plastic (GFRP) in the restoration of the 40-story brick and terra-cotta facade of 120 Broadway, in New York City (below). The elaborately detailed projecting terra-cotta molding courses were badly deteriorated on the 1.2-million-sq-ft building, which was completed in 1915 to plans of architect Ernest R. Graham.

Ottavino and Denis Glen Kuhn, a partner at Ehrenkrantz, Eckstut & Whitelaw, worked together to find a suitable repair and replacement material. The firm considered using terra-cotta (which was not then available in sufficient quantity) and precast concrete (more appropriate to use when it would be supporting stones over itself, which was not the case at 120 Broadway) before settling on GFRP. All of the materials had been successfully used on previous projects. "We look at these materials on a case-by-case basis," reported Kuhn.

From boats to buildings

It's easy to mistake GFRP for GFRC (previous story) or for any of a number of pro-

Drawings (right) were prepared from field surveys for remedial GFRP work at 120 Broadway (above).



prietary products that compete in the same markets. To add confusion, GFRP is sometimes referred to as FRP or GRP. GFRP came to construction from the boat-building industry. To be serviceable on buildings, however, different types of glass fibers, resins, and gelcoats are often used.

GFRP is used primarily to produce decorative moldings of limited size, but it is capable of rendering a fineness of detail limited only by the skills of the mold maker. Many fabricators are used to making decorative items and don't have the expertise to meet the engineering and environmental demands of cladding, although 300,000 sq ft of GFRP minarets, domed spires, and cupolas were recently installed at the Trump Taj Mahal, a 4.2-million-sq-ft hotel and casino in Atlantic City, by MFG/Union City, of Union City, Pa. (Nine Indian elephant statues were, however, made of GFRC.)

Among GFRP's advantages is the range of colors that can be produced in the gelcoat. At 120 Broadway, the finish matches the original terra-cotta (bottom right). Ironically, the terra-cotta had been glazed to look like granite. To evoke Donald Trump's vision of Oriental luxury, nearly every color in the rainbow, including metallic finishes simulating brass and gold, was created in the gelcoat at the Taj Mahal.

Defining performance and quality

There is no standards-setting body or trade association for GFRP architectural products, so the architect must define and assure performance based on research by the plastics industry and boat builders. "Off-the-shelf gelcoats are often not appropriate for fire resistance or ultraviolet light resistance," says Kim Beasley, a consultant with Wiss, Janney, Elstner. The fabricator may have to try several blends of resin, gelcoat, and glass fibers to comply with requirements for strength and finish.

Since the color-matched gelcoat may come from one manufacturer, and the glass fibers from a second, a quality-assurance program should be put in place to verify that the pieces consistently meet specifications. Ehrenkrantz, Eckstut & Whitelaw, working with engineering consultants Wiss Janney Elstner, developed their own quality program for 120 Broadway, which they hope can become a standard. Testing criteria were developed for hardness, glass and filler content, gelcoat thickness, water absorption, blistering, delamination, and flame spread. Some tests were performed on the pieces themselves, others on tabs of material attached to the molds.

Case study: 120 Broadway

The preparation of such a detailed specification and quality-assurance program was warranted by the scope and complexity of the restoration of 120 Broadway. Once known as the Equitable Building, it is massive—so big in fact that it is the structure credited with inspiring New York City's 1916 zoning ordinance, the first in the country. The facade had deteriorated substantially, and the city asked that it be brought into line with strict facade-integrity regulations. The building is a designated landmark, so the architects knew that they could not depart from historical details in any substantive way.

To establish the full scope of work entailed a dilemma: should the architects document every square foot of the building (giving the owner a complete picture of what was needed, but taking on an expensive process), or should remedial details be developed which are then applied by the contractor as needed?

The owner approved complete documentation of the building by the architects, who checked every stone from a swing stage and redrew the facade, coding each problem stone for a potential remedy (a portion of one facade redrafted from the contract set for legibility is shown on page 95). Stones in projected molding courses that occurred at several vertical intervals in the building had sustained the greatest damage. The architects designed three options for stabilizing and replacing stones (examples opposite), which were then cost-estimated.

Through REMCO, a contractor specializing in restoration, the architects found Rocca & Noto, a company that had fabricated GFRP for historic buildings and new construction. The company calls itself a "sculpture studio," which reflects the artisan roots of its trade. Rocca & Noto made molds from original drawings as well as details supplied by Ehrenkrantz, Eckstut & Whitelaw. The metal supports and attachments to the building were detailed by the architect and the engineer. Mario Rocca, the company president, says that over 50,000 sq ft of GFRP were installed.

Both the owner's cost constraints and the GFRP fabricator's limited capacity caused the work to be done over a period of six years. Even today, there are minor areas of uncompleted work, but the owner has been able to upgrade a marginal (leasewise) structure to class-A status, and take advantage of its excellent Wall Street location. Even if landmark regulations permitted demolition, there is another reason the owners chose restoration over replacement. Current zoning would only allow the erection of slightly over half the existing square footage on the site. **J. S. R.**

Steel brackets reinforce the GFRP and attach it to the structure.

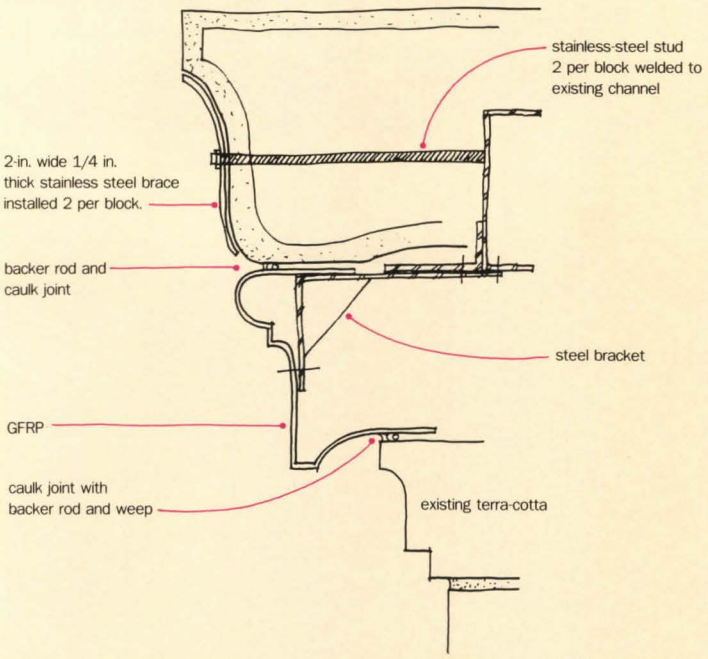
The material is capable of rendering a fineness of detail that is limited only by the skills of the mold maker.

The gelcoat's color and pattern match the original terra-cotta cladding.

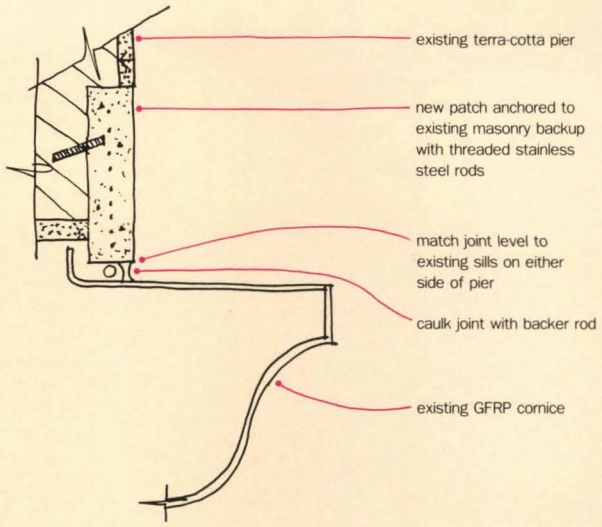
Further information:

GRP and Buildings, by A. Leggatt. Boston: Butterworth, 1983.

Also consult glass-fiber manufacturers' literature.



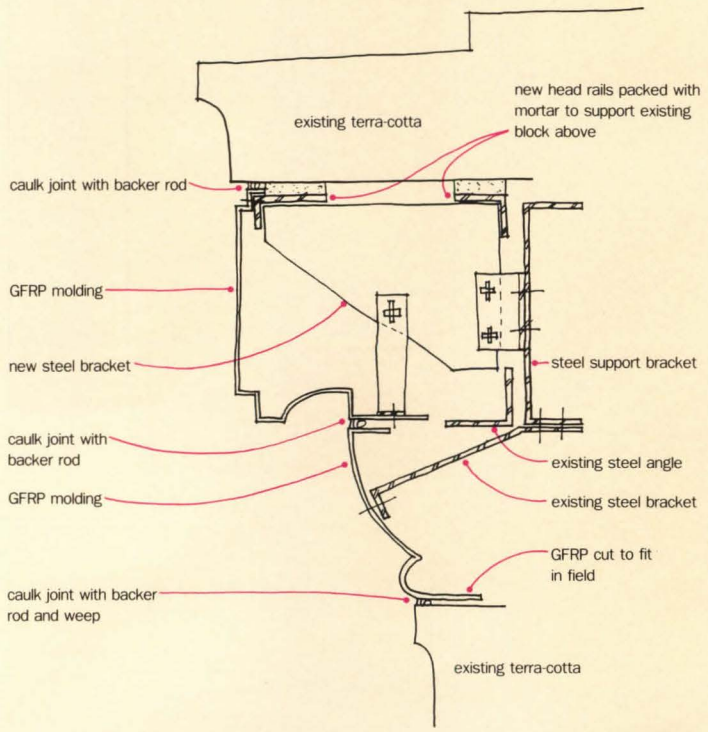
STABILIZATION AND GFRP REPLACEMENT 32ND FLOOR



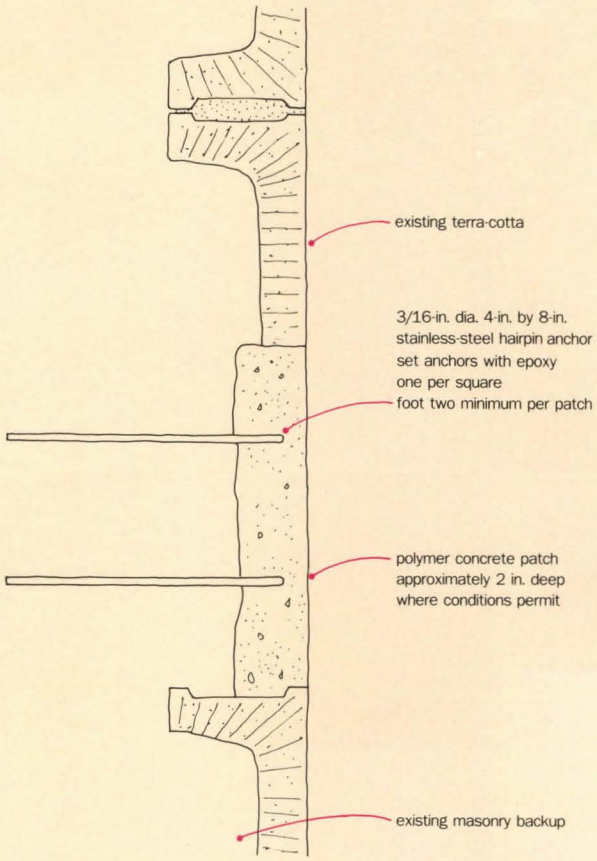
EIGHTH FLOOR SILL DETAIL—OPTION 2

120 Broadway
New York City
Ehrenkrantz Eckstut & Whitelaw, Architect

For areas of severe deterioration the architects suggested more than one remedy to the owner. Among the alternatives were stainless-steel bracing plates to stabilize loosened terra-cotta pieces (above left), polymer-concrete patches (below right), and GFRP replacements (above right and below left). Pieces had to be fabricated and installed to match the levels of existing blocks of terra-cotta, yet allow the insertion of new sealed movement joints (the building itself had none).



TWO-PIECE GFRP REPLACEMENT 31ST FLOOR



POLYMER CONCRETE PATCH DETAIL

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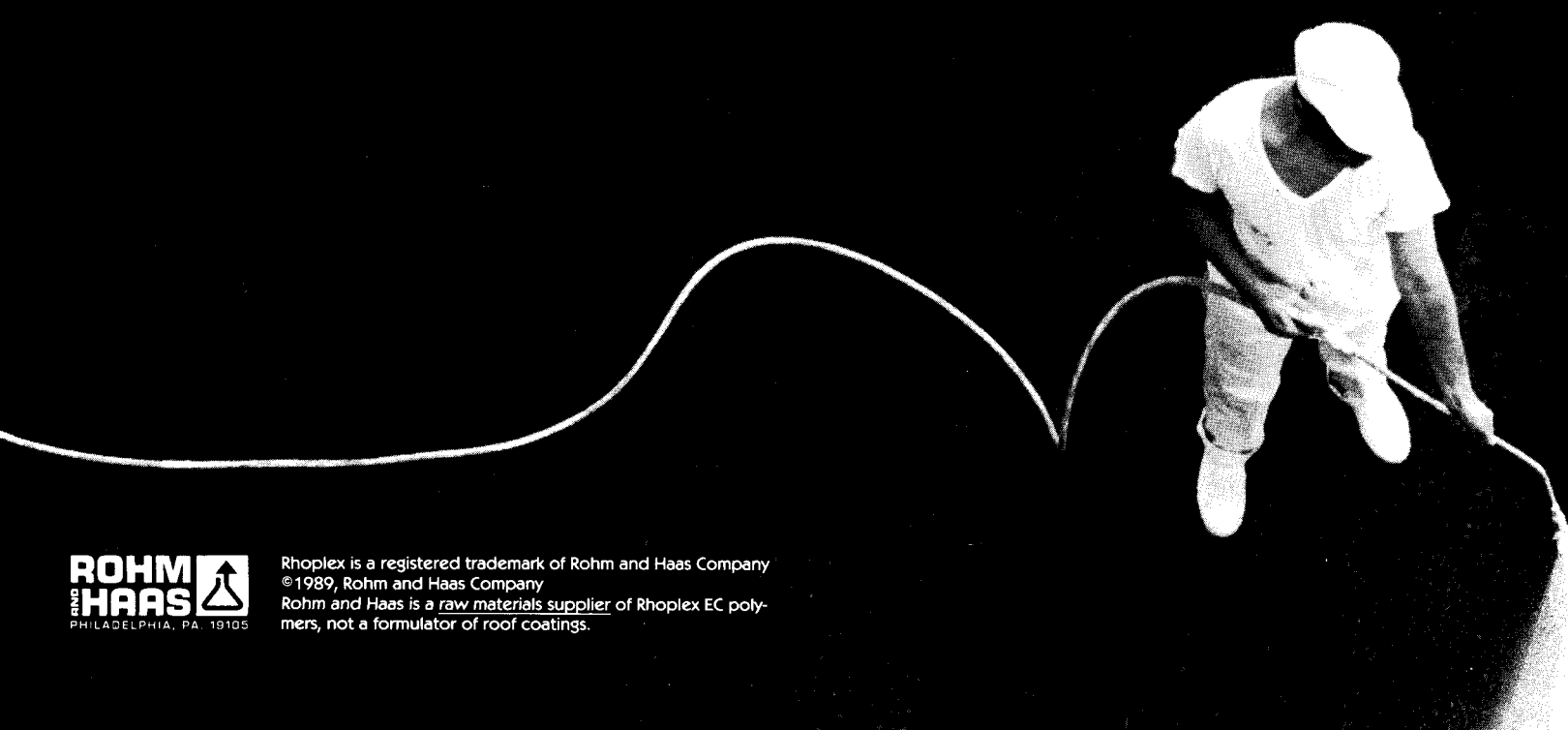

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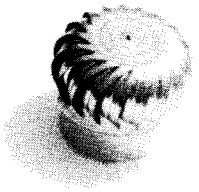

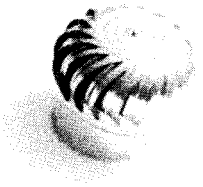

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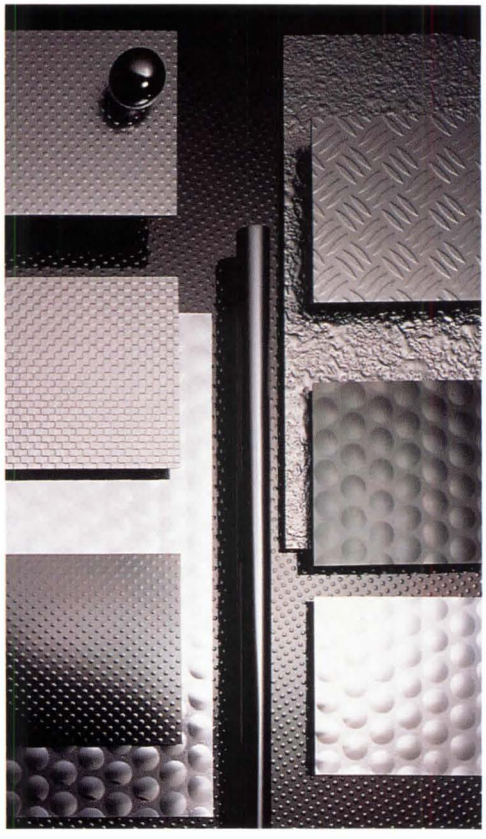
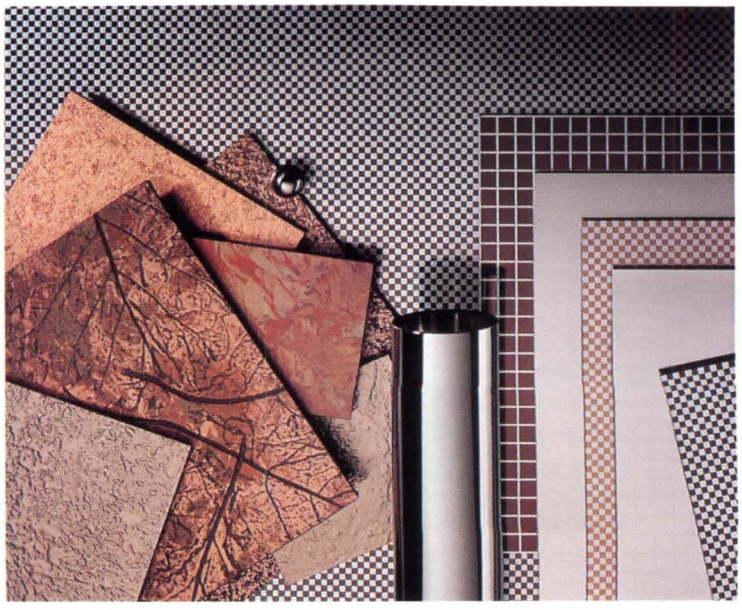
Made in Italy
Abet Laminati's new Falsi pattern is "stone reinterpreted," available in a textured finish said to have the feel of natural rock. A solid panel, Straticolor, offers an unusual edge detail comprising alternate layers of black and colored laminates that produce a striated look at the cut face. The bar counter, below, shows the material cut across the grain.

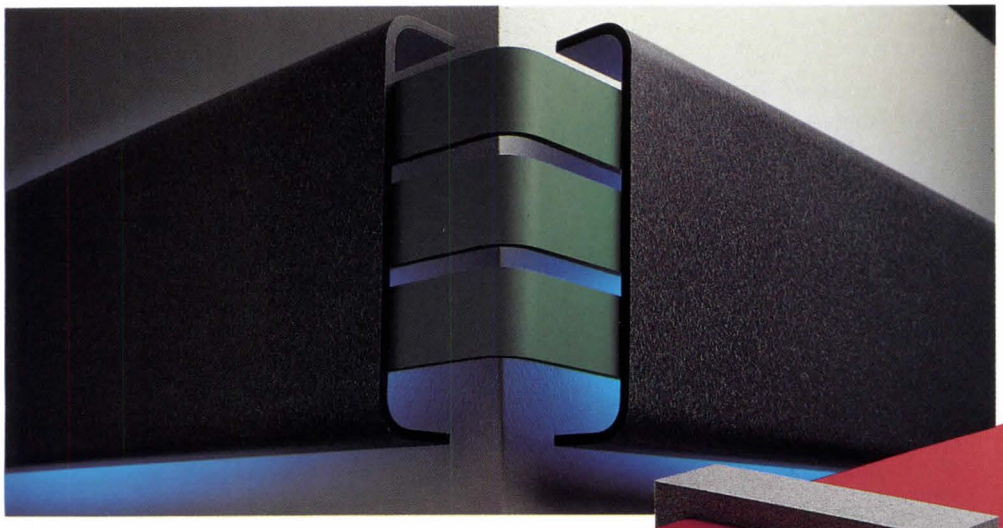
Falsi stone-patterned laminates (right) and Straticolor solid panels (below). Abet Laminati spa, Edgewater, N. J. *Circle 300*

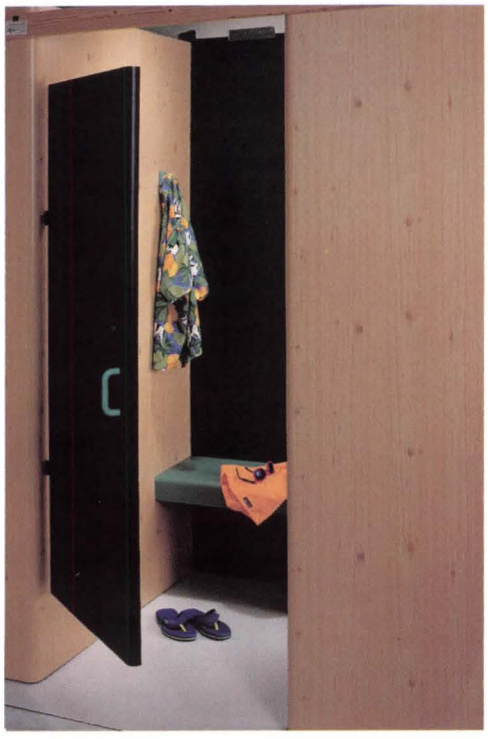
Solid-metal textures
Formica has a new International Collection of 30 Euro-styled metal designs, available in solid-metal, laminate-backed, and strip formats. For interior use, metallic colors include black, copper, bronze, brass, aluminum, chrome, and pewter, protected with various finishes against staining, corrosion, and oxidation. Embossed geometric patterns impart a structural quality to an aluminum surface, while mottled and antiqued treatments suggest patinaed or hand-hammered copper. Unique two-tone graphics—checkerboards, grids, and pinstripe cords—are high-tech designs with an etched appearance. Sheets of solid alu-

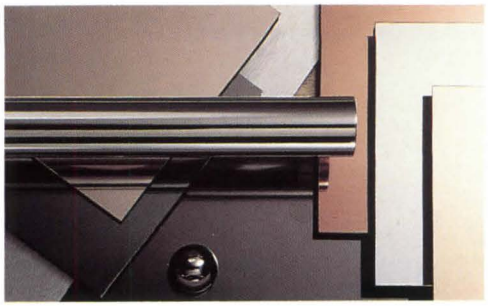


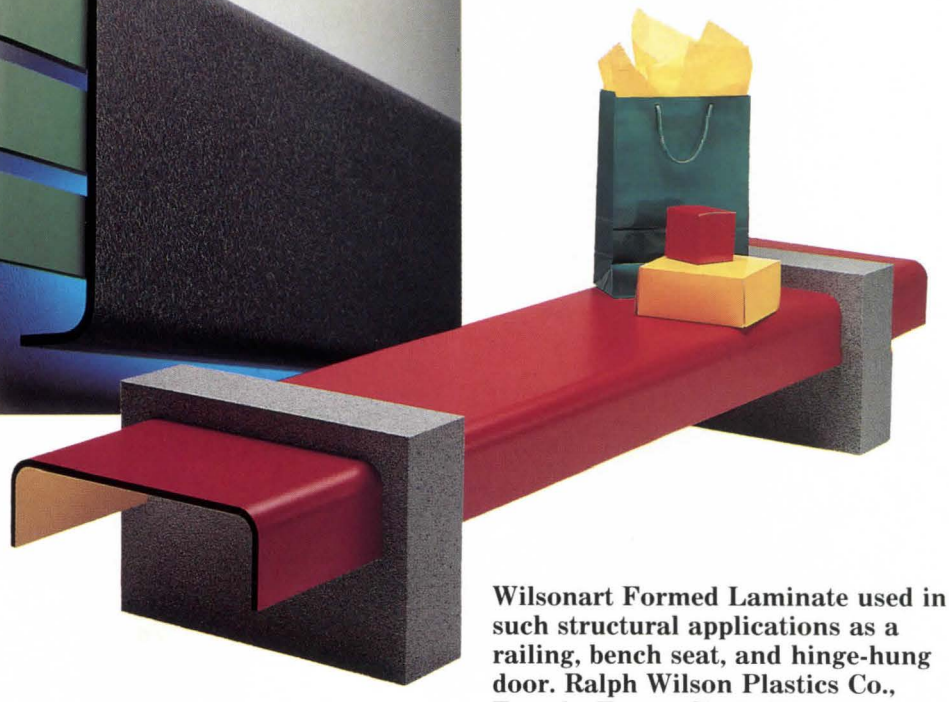


A variety of decorative metal designs from Formica: embossed aluminum, embossed copper, and two-tone finishes (above), and brushed textures (small photo opposite). Formica Corp., Cincinnati. *Circle 301*









Wilsonart Formed Laminate used in such structural applications as a railing, bench seat, and hinge-hung door. Ralph Wilson Plastics Co., Temple, Texas. *Circle 302*

minum come with polished, brushed, or mirror-finished surfaces. Metals can be hand-formed to conform to curves or bends in the substrate.

Stand-alone

From Wilsonart, Formed Structural Laminate is just that: solid phenolic panels that can be ordered in L-, C-, and S-curved shapes. Composed of multiple layers of resin-impregnated sheets, the structural material comes with two "good" faces in four thicknesses, from 1/8- to 1/2-in. Each decorative side can be any of the maker's solid-color, woodgrain, or patterned laminates: two alike or two different. While not recommended for exterior applications, the laminate is water-resistant and suitable for damp and humid areas. The material's formability suggests a range of applications not usually associated with a laminate product. The bench seat above is made with a double-ended C shape, for example, and the wall *protector/railing* configurations use a C shape connected by smaller L shapes. Formed Laminate panels are dense enough to hold screws well, creating a door for a dressing cubicle; an L shape is used for the bench.

Products continued on page 103

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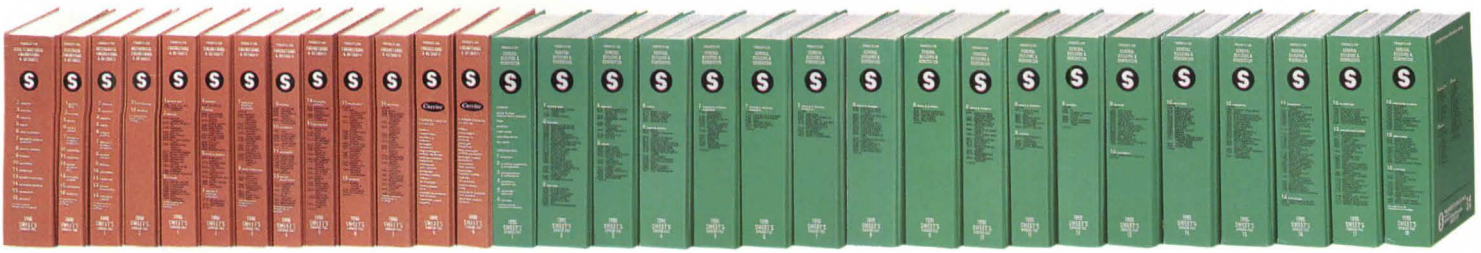

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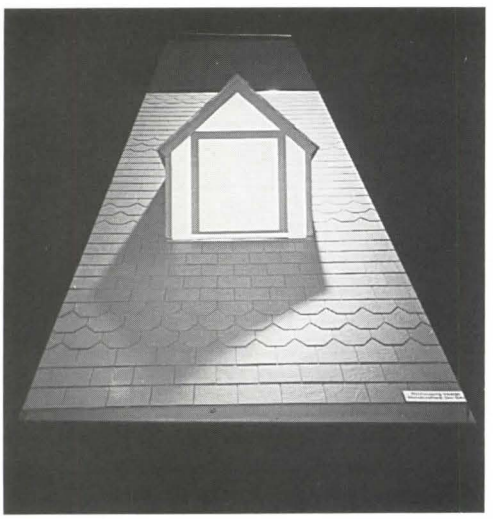
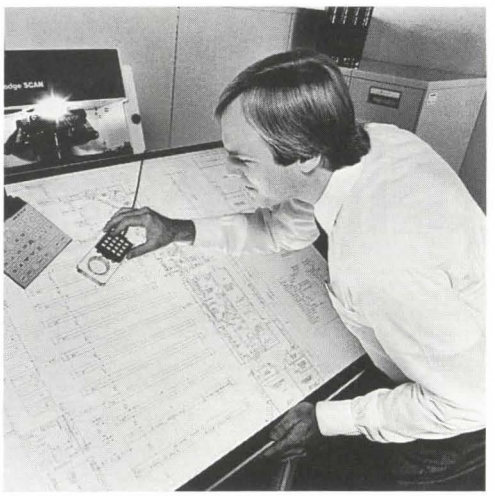
Continued from page 101

Fire-retardant roll roofing
Awaplan Premium FR, a Krayton/SBS-modified bitumen roll-roofing system, is now available for cold-process adhesive installation as well as currently used hot-mop methods. The cold-process technique, adaptable to most roof slopes, allows a wide application window of from 40 to 140 deg. F, and eliminates any adhesion or performance problems resulting from over- or under-heating molten bituminous materials. TAMKO Asphalt Products, Inc., Joplin, Mo. *Circle 303*

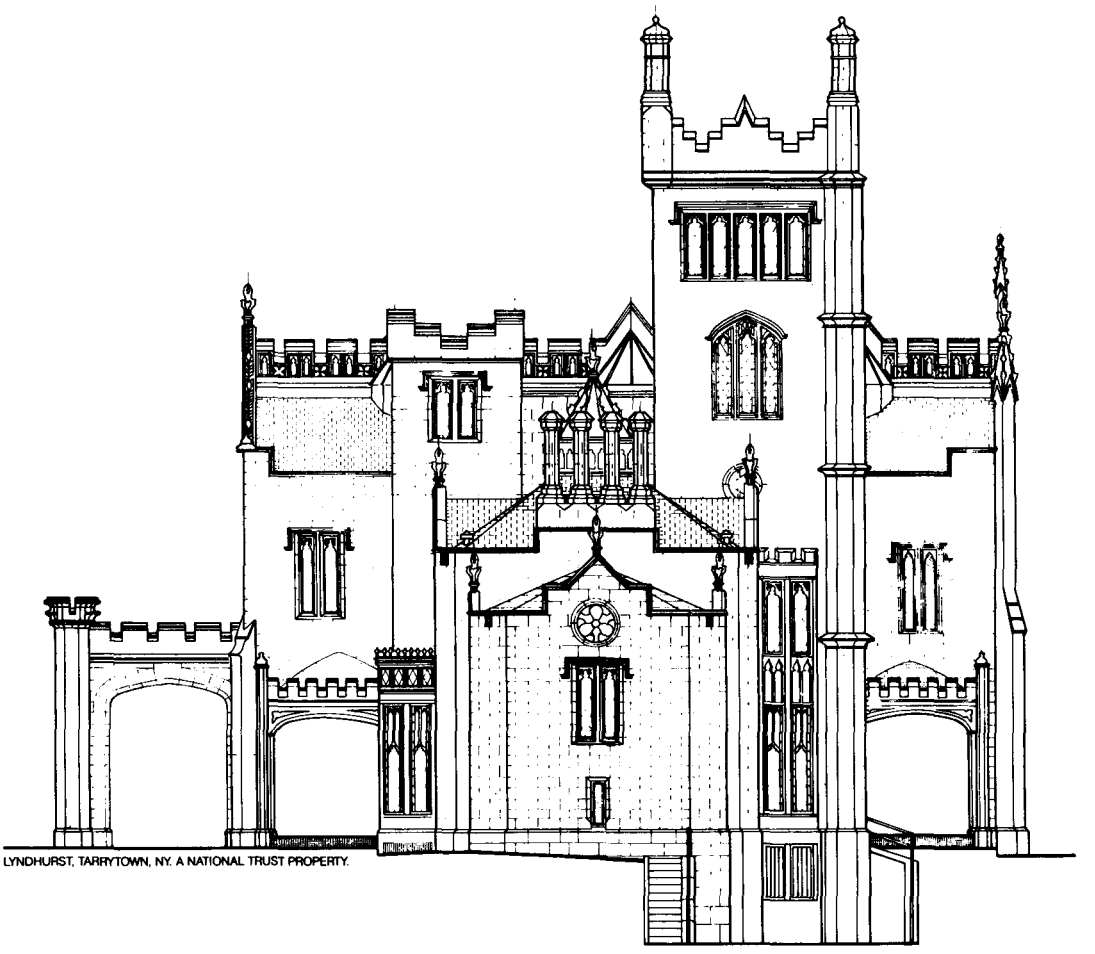


Fiber-cement roofing shingles
Simulated-slate shingles are offered in a range of appearance and texture options, including new staggered-butt, random-width, and ribbon-row profiles. The maker's Roofscaping installation concept demonstrates various combinations that create special designs for commercial and residential roofs. FibreCem Corp., Charlotte, N. C. *Circle 304*



Take-off/estimating system
A stand-alone workstation, said to enable an estimator to do a take-off more accurately and quickly than using rulers, combines an Altek cursor-driven digitizer with F. W. Dodge's SCAN viewer and plan service. By laying the point-and-stream cursor on the SCAN viewing screen and sliding it over the displayed project's plans, the system automatically calculates all dimensions, volumes, and unit counts, even of rounded objects. Features include automatic scaling. F. W. Dodge, New York City. *Circle 305*

PRESERVATION PLAN ON IT



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AUTODESK AEC ARCHITECTURAL IS NOW ASG ARCHITECTURAL

What's in a name? A great deal if you're a devotee of Autodesk's package. Here's how to get new add-ons. By Steven S. Ross

ASG Architectural 4.0/10

This is the successor to AutoCAD AEC Architectural, the earliest of AutoCAD add-ons for architects. Enhancements include easier creation of multistory buildings by cloning floor plans, better tools for creating shaded drawings and walk-throughs, and an interface to manufacturers' on-disk catalogs. The software is slow with the plain-DOS version of AutoCAD, but runs nicely with AutoCAD/386.

Review

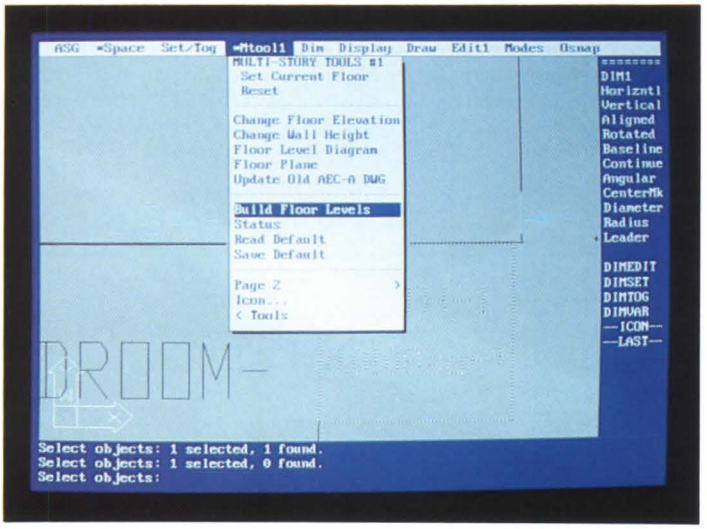
First, a little history. Autodesk, the creators of AutoCAD, licensed AEC Architectural from an ASG predecessor company in 1984. This September, Autodesk will stop selling the program. The license reverts back to ASG. In the meantime, ASG has started selling its newest version of the software under the name ASG Architectural. ASG itself was formed last summer by the merger of Archsoft (the old AEC people) and Chase Systems.

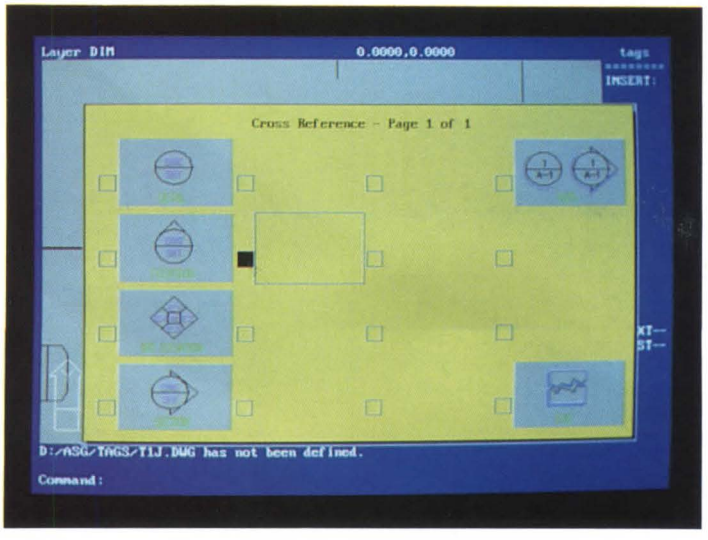
In other words, if you own Autodesk AEC Architectural and want to upgrade it, you go to ASG now, not Autodesk. ASG also sells other AutoCAD add-ons of interest to architects—for structural analysis and drafting, plumbing, 2-D and 3-D piping, and so forth. You buy the Core package and add any of the others, together or separately. For better or worse (mainly worse) they share the same general digitizer overlay approach, and a tendency to spread drawings through dozens and dozens of layers. All this may slow things down a bit, but really helps when it comes to bringing into your firm new draftsmen for big jobs.

ASG also sells training videotapes for its products. They are general, covering functions in all versions of AutoCAD 9 and 10, and aimed at users (for now) of AutoCAD AEC Architectural.

ASG Architectural is feature-laden, but has always run fairly slowly compared to less functional packages from other vendors. Nevertheless, because it has carried the Autodesk label, and because so many of its features have been needed by so many firms, it has outsold all competitors. Now, with the advent of AutoCAD 10 using the Phar Lap DOS extender (AutoCAD/386), speed is less of an issue.

Designers at smaller firms can use ASG Architectural to block out spaces, for instance. A pull-down menu offers access to several choices for doing the blocking on-screen. You can specify width and depth of the room, for instance, or the total area and the width (the depth is calculated by the software).





Turning a single plan into a multistory building (top) is as easy as using a pulldown menu. Tags are flexible. Standard styles are built-in; others can be added. You choose a tag by activating the small square next to it—not (as would be the case with most Macintosh software) the tag itself. Tags can be cross-referenced.

Once the spaces are in their places, you can use them as the basis for the final drawing by converting outlines to walls, cutting the walls for windows and doors, and then extending the walls upward in a third dimension. You can create spaces as 3-D objects, too, and move them relative to one another on the vertical axis. Thus, it is easy to do 3-D bubbles of structures such as split-level houses.

Using the multistory feature, you draw a floor plan, specify its location in the vertical axis, and add new floors at a specified distance from the first level. Each floor gets its own set of layers, however. Thus, drawing file sizes expand dramatically at the touch of a few keys. You can help things by customizing the package to use fewer layers. Out of the box, every different category of object (desks, windows) gets its own layer to call home.

This makes it easy to pull attributes of the various layers off the drawing file separately, and into, say, a database program for automatic schedule creation. But so few practices use the drawing as a data source that the extra layers may not be worth it. The schedule manager included with ASG Architectural makes it easy to handle the information, however. Like most software of its type, you can create separate listings for what should be copies of the same object—e. g., two descriptions for identical chairs.

You will also want to add lots of symbols of your own, or doll

up the symbols that come with the package. They are pretty spartan, with the exception of the hatch patterns for surfaces. There are patterns for most brick and siding choices, and for many utility finishes as well.

Symbols are arranged in CSI Masterformat order. Because many on-disk manufacturers' catalogs are set up the same way, it should be fairly easy to add them to your symbol libraries and keep track of them through ASG Architect.

Using Core software

The Core software contains a nice facility for adding descriptive tags to any object. The tags are invoked from ASG Architectural directly; the two programs act as one inside AutoCAD. The Core also handles text generation, bills-of-materials, and libraries of symbols and manufacturers' catalogs. Out of the box, walls as double lines are easy to add to any drawing. Walls as triples (exterior walls with insulation, for instance) are drawn twice—one wall next to the other. This makes it easy to assign different attributes to different parts of the wall (cladding, insulation, and so forth), but does take more time.

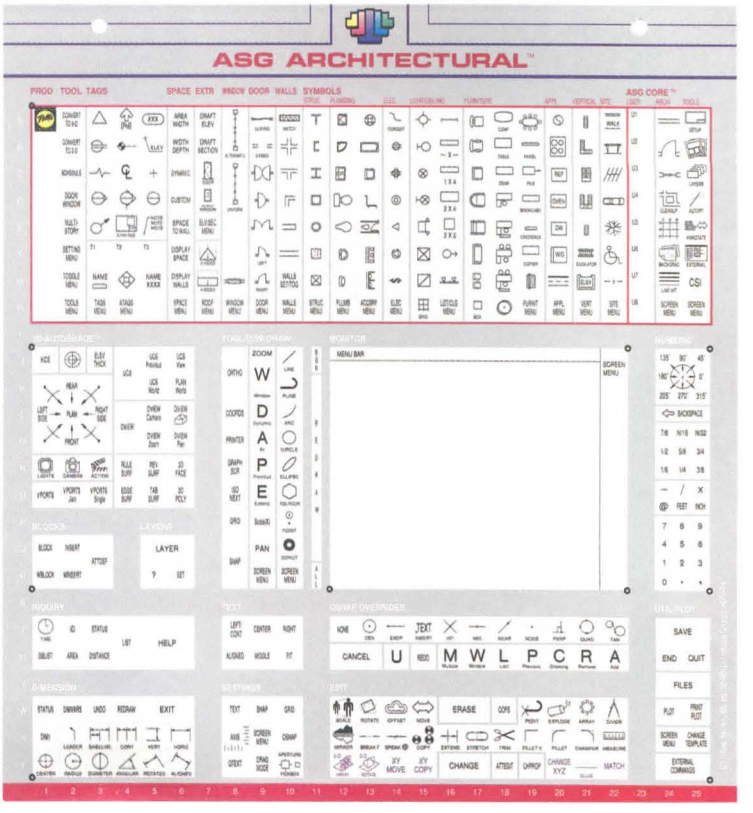
The Fastdoor mode allows you to position openings and install doors and windows into them, in just two steps. A long row of identical windows, for instance, can be done automatically. Roofs are also easy. In general, you specify where you want to put the roofline with a rubberband drawing tool, check to see if everything is okay, then tell the software to complete your section. On slanted 3-D roofs, you can lose track of where the slope is, relative to the AutoCAD world coordinates.

Aside from the multistory feature, the other major improvements come under the general heading of "eye tools." You place a camera or eye inside the drawing and move around, or even through, it. Essentially, the tools make AutoCAD's DVIEW command easier to use—more intuitive at only a slight speed penalty. Unlike older versions of AEC Architectural, drawings are compatible with AutoShade. One very nice touch: In multistory mode, the eyespecified heights are relative to the floor you are on, and not the total height of the entire building.

You can specify a path for your camera eye to roam, and then specify how often it stops and "takes a picture." Thus, you can build up almost-animated walk-throughs.

In short, it is easy to see why this package's predecessors have been so popular, aside from the Autodesk connection that has now been dissolved. The improved speed of new versions of AutoCAD running on the new generation of UNIX and Intel 80386-based DOS computers has helped, too. But as with earlier versions, you will probably do lots of customizing to produce artistically pleasing work at an economically reasonable pace. □

Circle 306



You'll want to use the tablet menu instead of the DRAW menu which, though it's roughly midscreen and in a good position for most work, cannot be repositioned.

Nutshell Summary

Equipment required: Computer capable of running some version of AutoCAD 10. Monitor and video card capable of displaying AutoCAD pulldown menus strongly recommended. Digitizing tablet, at least 11 by 11 in., strongly recommended. For MS-DOS or PC-DOS systems, a computer using Intel 80386 cpu chip strongly recommended. Various versions of ASG Architectural are available for DOS, OS/2, Sun/UNIX, Apple Macintosh, and DEC/Ultrix.

Vendor: ASG, 4000 Bridgeway, Suite 309, Sausalito, CA 94965-1451. Phone 415-332-2123. Prices: $1,000 for ASG Architectural, requires ASG Core for an additional $500. Includes Pella designer door and window CAD library. Upgrade from AutoCAD AEC Architectural, $500.

Manuals: ASG Architectural and ASG Core each come with a fat looseleaf manual for installation, reference, and tutorials. Each also comes with a short videotape covering issues of general orientation. They tell prospective users what to expect when they sit down at the keyboard. The tutorials in the package are excellent.

Some functions are in ASG Architectural. Some, like tags and layer management, are in the Core. You may find yourself switching back and forth between the two packages' binders. There's no cross-referencing of one manual's data in the other.

Ease-of-Use: This is a huge program, with hundreds of commands. The files, taken together, require more than 7 MB on your fixed disk–about twice the space of AutoCAD itself. Because one on-screen menu almost inevitably leads to another, use of the digitizing tablet to pick commands is recommended.

You may want to spend some time reconfiguring the tablet overlay, however. It follows the standard AutoCAD style (pioneered by the early versions of this very program) that puts menu commands and tools at the top, and numeric functions on the right. Less commonly used commands, such as for dimensioning and editing existing objects, are the easiest to reach.

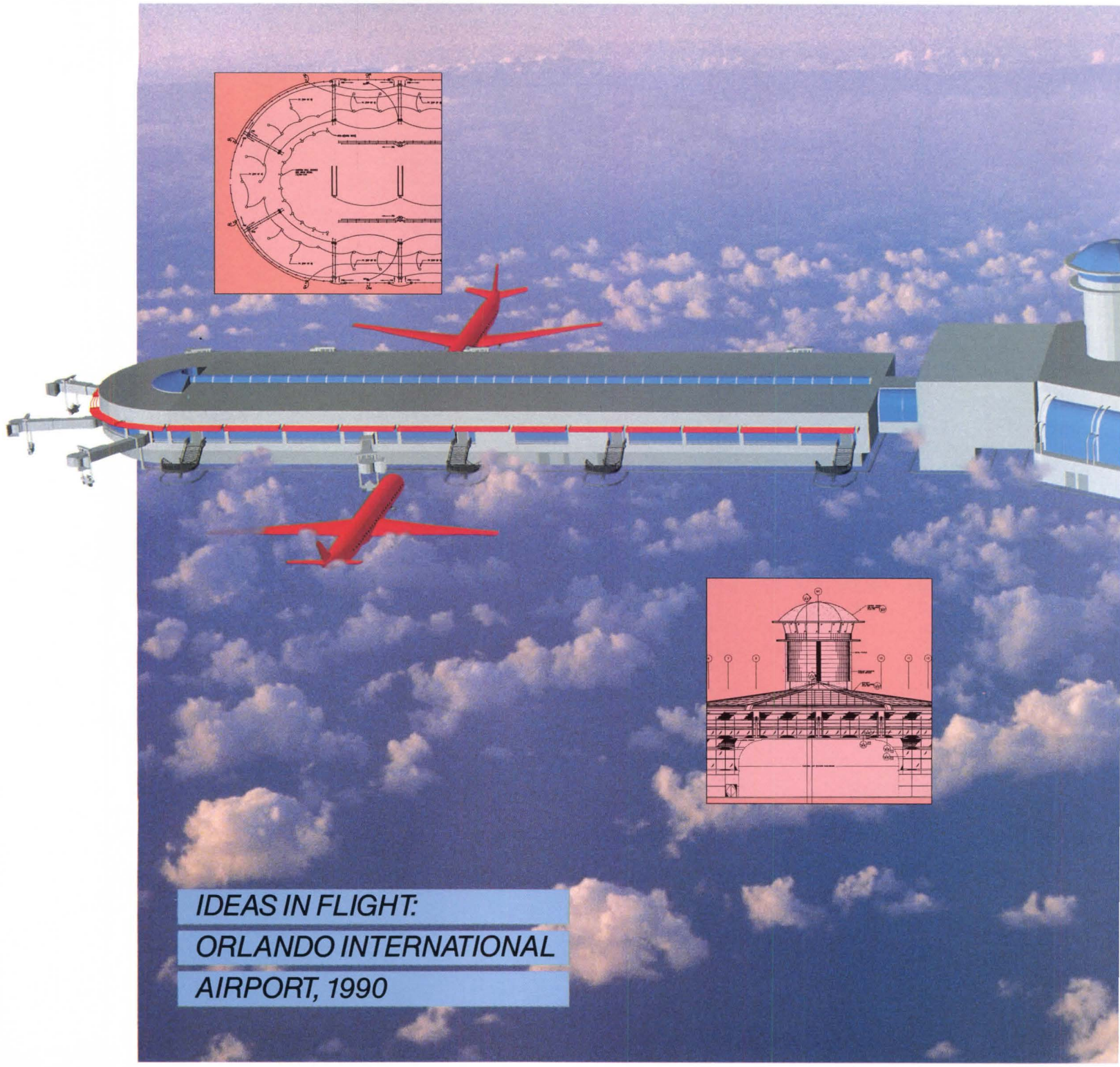
Error-trapping: Adequate. It is tough to lose an entire file, but easy to make mistakes that require using the UNDO command. One way to lose a file is to start replicating floors using the multistory commands. The file can get too big for the disk space available.

Deliberately trying to install the software in restricted disk space produced the proper error messages. The process stops with a warning that the disk is probably full.

You select 2-D or 3-D symbols before entering the library. But the icons look about the same. It turned out to be easy to confuse one for the other. But the resulting errors are easily fixed.

AutoCAD drawings that were not originally created with AEC Architectural or ASG Architectural invoke the plain AutoCAD menu system when they are brought into AutoCAD to edit.

YOUR IDEAS. OUR SOFTWARE TECHNOLOGY.



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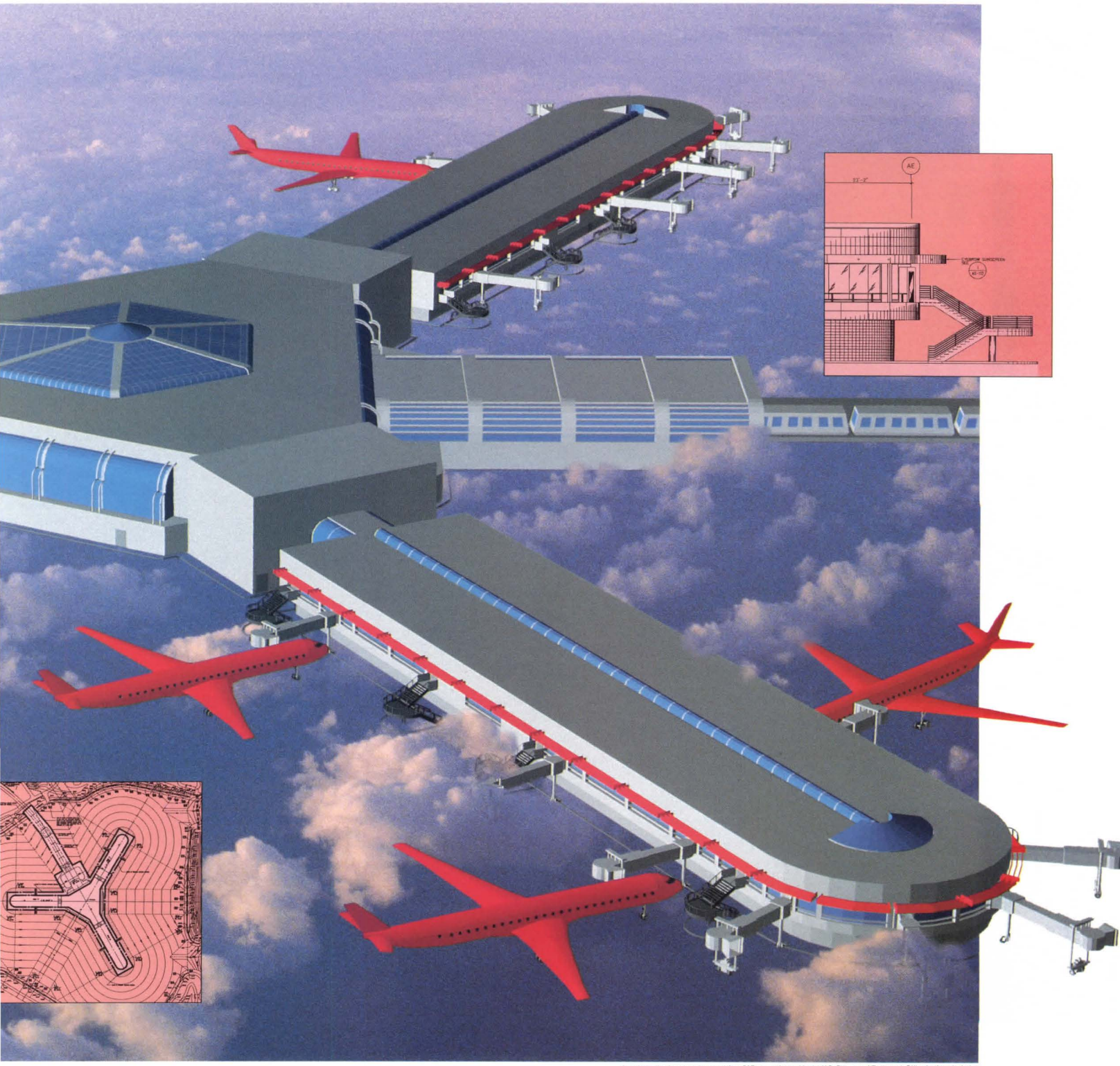
ORLANDO INTERNATIONAL AIRPORT, 1990

This project was on a fast track. In late 1987, with air traffic exceeding all expectations, the Greater Orlando Aviation Authority decided to expand their airport. *Ten years* ahead of schedule. They called in KBJ Architects, of Jacksonville, Florida, who worked on the original project back in the 70s. ■ The expansion plan called for new passenger terminals, parking garages, a hotel complex and ground transportation systems, as well as new runways, taxiways and aprons. The schedule allowed only 30 months between the first drawings and the first passengers. ■ KBJ had three times the work due in one-third the time. They chose AutoCAD.® ■ There were



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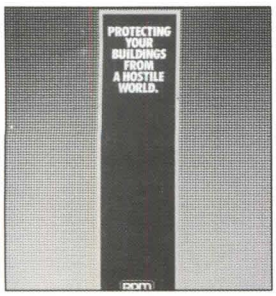
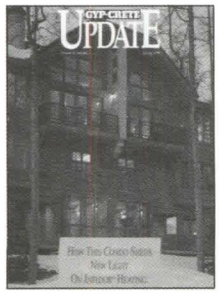
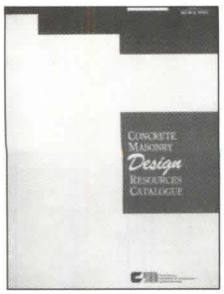


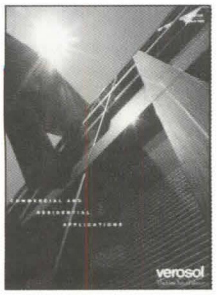
Coating systems
A capabilities brochure highlights elastomeric waterproofing and single-ply membrane systems. It details the uses and features of products for roofs, decking, and walls, and describes preventive maintenance items. Republic Powdered Metals, Medina, Ohio. *Circle 400*



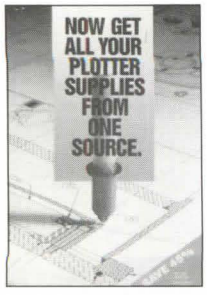
Radiant floor heating
A quarterly journal, *Gyp-Crete Update*, highlights in-use applications of the company's products. Radiant heating is featured in the Spring 1990 issue. The entire floor becomes a radiator when an Infloor system is installed. Gyp-Crete Corp. Hamel, Minn. *Circle 401*



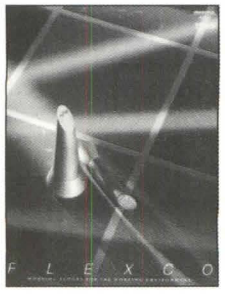
Concrete design resources
Concrete Masonry Design Resources Catalogue is a 60-page book that details a broad variety of publications and audiovisual materials that can be purchased. A section on architectural applications is included. National Concrete Masonry Association, Herndon, Va. *Circle 402*



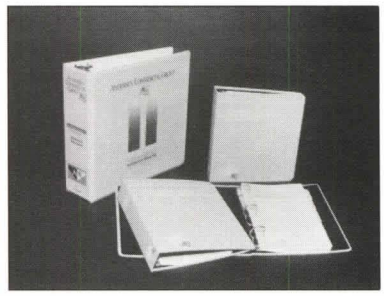
Pleated shades
A design brochure highlights Verosol's pleated fabric shades for commercial and residential projects, made of metallized fabrics that help control room temperature year-round. Flame spread and other test data are included. Verosol, Pittsburgh. *Circle 403*



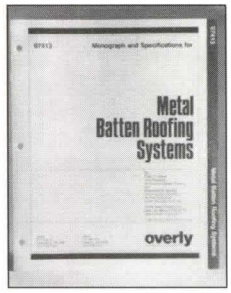
Plotter supplies
A new plotter-supplies catalog explains toll-free ordering from four regional order centers in the U. S. and Canada. The catalog describes savings on a complete line of pens, media, and electrostatic toners for all makes of equipment. AM Bruning, Martinez, Calif. *Circle 404*



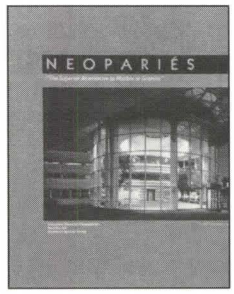
Rubber tiles and stair treads
A brochure introduces Assurance Plus, a new line of rubber tiles and duotone stair treads made with a skid-resistant surface pattern. The compression molded treads are available in eight high-visibility color combinations. Flexco Company, Tuscumbia, Ala. *Circle 405*



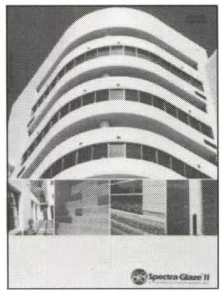
Window-detail software
Andersen's free CADD-I computer-aided design programs and Architectural Detail File comprehensively cover technical design and application information on the company's complete line of wood-frame windows and patio doors. Andersen, Bayport, Minn. *Circle 406*



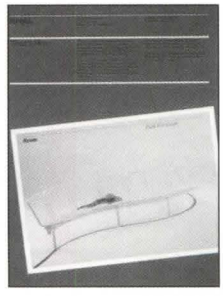
Metal-batten roofing
Revised design and loading monograph and specifications guide explain the advantages of metal batten roofing. The monograph covers metal roof design as well as anchorage and joint designs. A bibliography is included. Overly Manufacturing, Greensburg, Pa. *Circle 407*



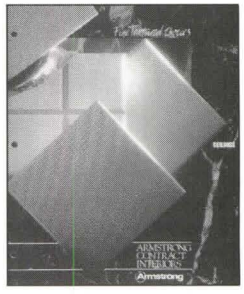
Wall cladding
Neoparies crystalized glass is introduced in a four-page color brochure. It includes information on product appearance, weather resistance and durability, zero water absorption rate, design flexibility, and product specifications. NEG America, Des Plaines, Ill. *Circle 408*



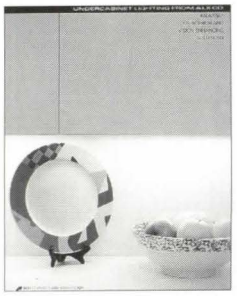
Masonry wall systems
A color catalog illustrates custom, preglazed masonry wall systems. A variety of installations are shown, both exterior and interior. Glazed block is shown in 80 standard colors. The Burns & Russell Company, Baltimore. *Circle 409*



Park furniture
Kroin has expanded its Park Furniture Program to include a new series of durable park benches and seating alternatives made of wire mesh, steel, and wood materials, and 160 color options. Kroin Inc., Cambridge, Mass. *Circle 410*



Acoustical ceilings
A 20-page brochure gives color descriptions of a full line of textured acoustical ceilings. The collection comprises eight different ceilings, each of which features a classic design in a soft surface texture. Armstrong World Industries, Lancaster, Pa. *Circle 411*



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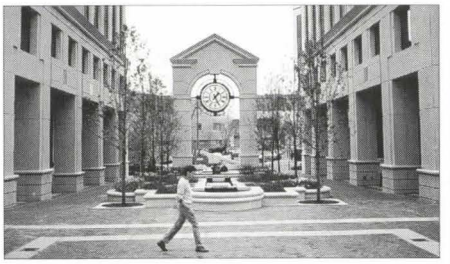

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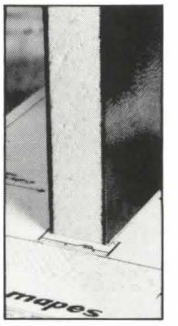

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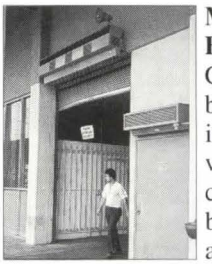

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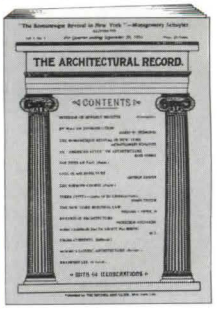

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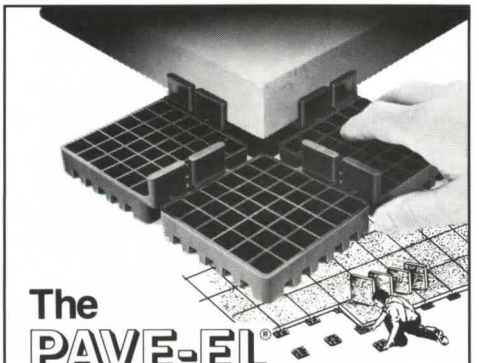

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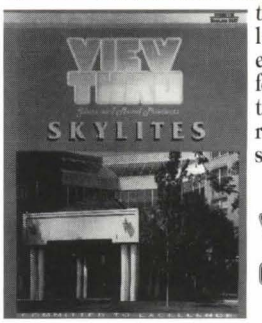

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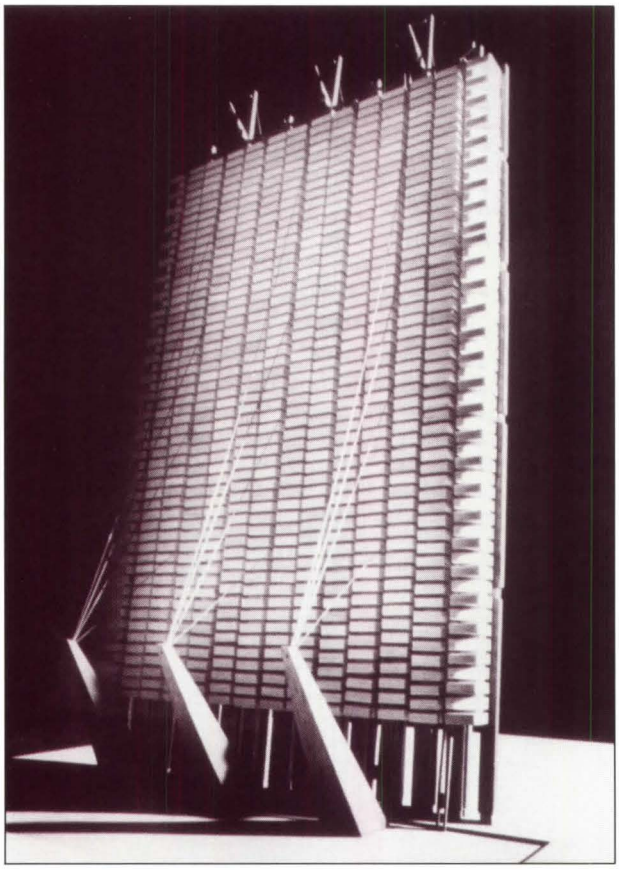
Tilting at Convention

Radical skyscraper scheme seeks understanding owner.



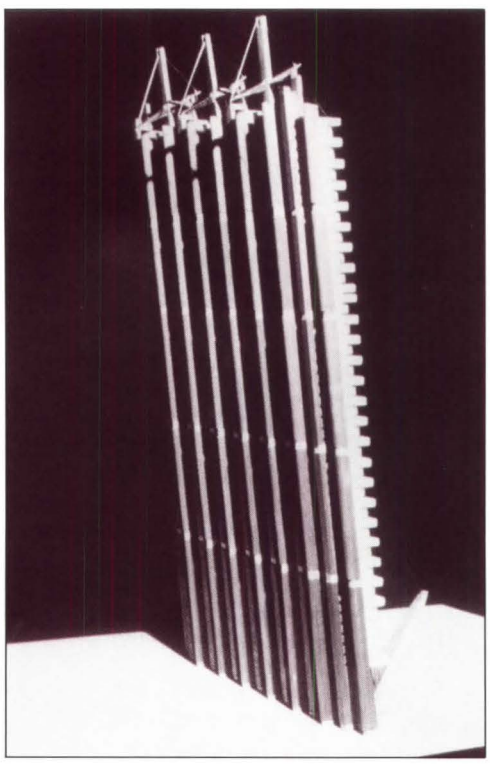
It's easy to dismiss Elemér Zalotay and Douglas Cooper as engineering Don Quixotes. After all, their proposal for a slanting high-rise literally tilts at the wind—if not at windmills—and their concept has an unleashed bravado that we're not used to seeing in the sober precinct of high-rise design and engineering. Right now their scheme is just an idea, with various patents pending, and the designers are looking for a client willing to give it a try.

The designers' claim for its value, though, is economic rather than esthetic. They say that the apartment building shown (one of several variations) requires only one-seventh the steel of a conventional skyscraper of similar size and square footage. With built-in economies of prefabrication, the project is calculated to come in at about half price overall.

Wind as a determinant

One could quibble. Apartment buildings in the U. S., for example, are almost never framed in steel. Nevertheless, Zalotay, an architect and engineer who practices in Berne, Switzerland, and Cooper, an architect who practices with Zalotay and in Britain, have something here. It is conventional wisdom that resistance to wind and other lateral forces is usually the key constraint in high-rise design. Cooper and Zalotay are perhaps the first to use them as design inspiration. Slip-form concrete cores are constructed at a slight tilt. These readily convert wind pressure impinging from the angle direction into compressive forces, which are efficiently carried by the concrete to the ground. Tension cables, attached to the cores every 10 stories or so, resist wind forces from the other side.

The cores are segmented near the cable attachments and can move independently so that moments (which increase in proportion to the distance from the cable attachment) are limited by the height of a single segment which considerably reduces the forces that have to be countered. In a conventional skyscraper, the overturning force of the wind at the base is multiplied by the entire building height.



Zalotay and Cooper's slanting high-rise directly expresses the resistance of governing lateral forces.

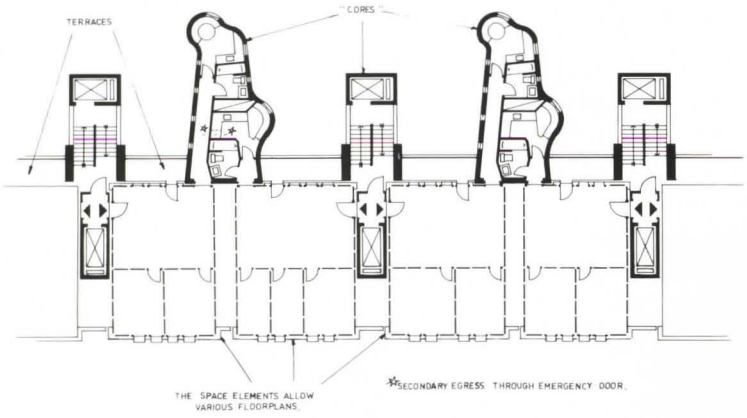
The example scheme contains some 800 apartments, in which kitchens, baths, and stairs are stacked within the cores, and living spaces are distributed in nonslanting prefabricated "space elements." Though these modules aren't central to the structural scheme, their method of construction (a three-dimensional truss system) and the way they would be tied back to the cores and to each other (bolted into place through a cushioning sandwich of neoprene and steel plates) have been completely thought out. The building's construction details are explained energetically in the assorted group of sketches (opposite).

Not easy to love

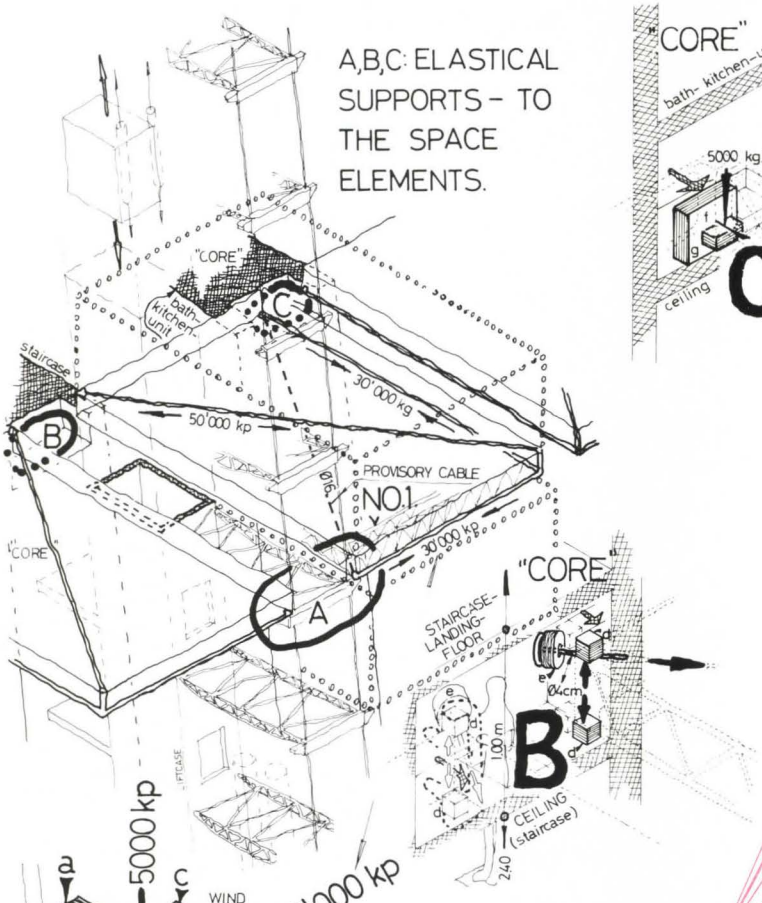
All of the designers' elaborations and justifications aside, this proposal will be a hard sell. Though visually powerful, the scheme just doesn't have the esthetic equilibrium we expect to see in a more conventional solution. And, for most building sites, we know that wind can come from many directions. The project's inelegance can be ascribed to the use of a different response for the same force as it comes from a different direction. And some people will never get used to elevators ascending at an angle; some contractors may have trouble figuring out how to install a stair in a sloping shaft.

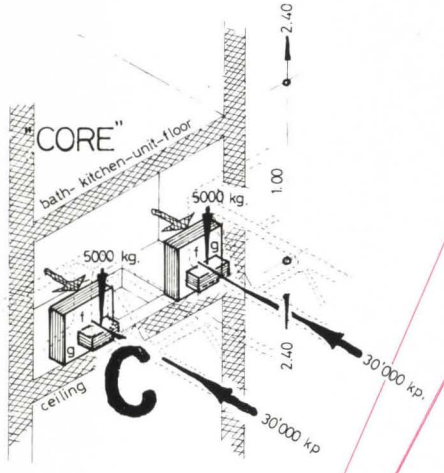
Nevertheless, the project is engaging in its unabashed audacity. One can imagine serried ranks of these slabs set adrift on the Great Plains, their "bows" headed into the eternal westerly winds. Compared to the mute structures of today's skyscrapers, the expressiveness of the rigging, which evokes the romance of sailing yachts, is genuinely satisfying. **J. S. R.**

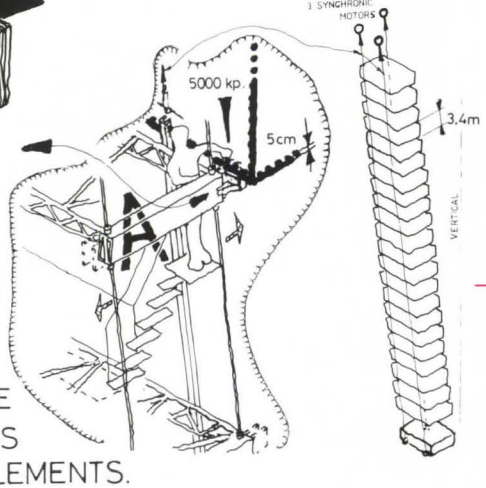
For ease of fabrication and installation, rectangular elements enclosing most of a floor's usable space (plan left) are factory-assembled and self-supporting, and are bolted ino place through elastic metal-and-neoprene cushions (middle and bottom left).



TYPICAL GROUND-PLAN.







MOUNTING OF THE ELASTICAL JOINTS TO THE SPACE ELEMENTS.

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