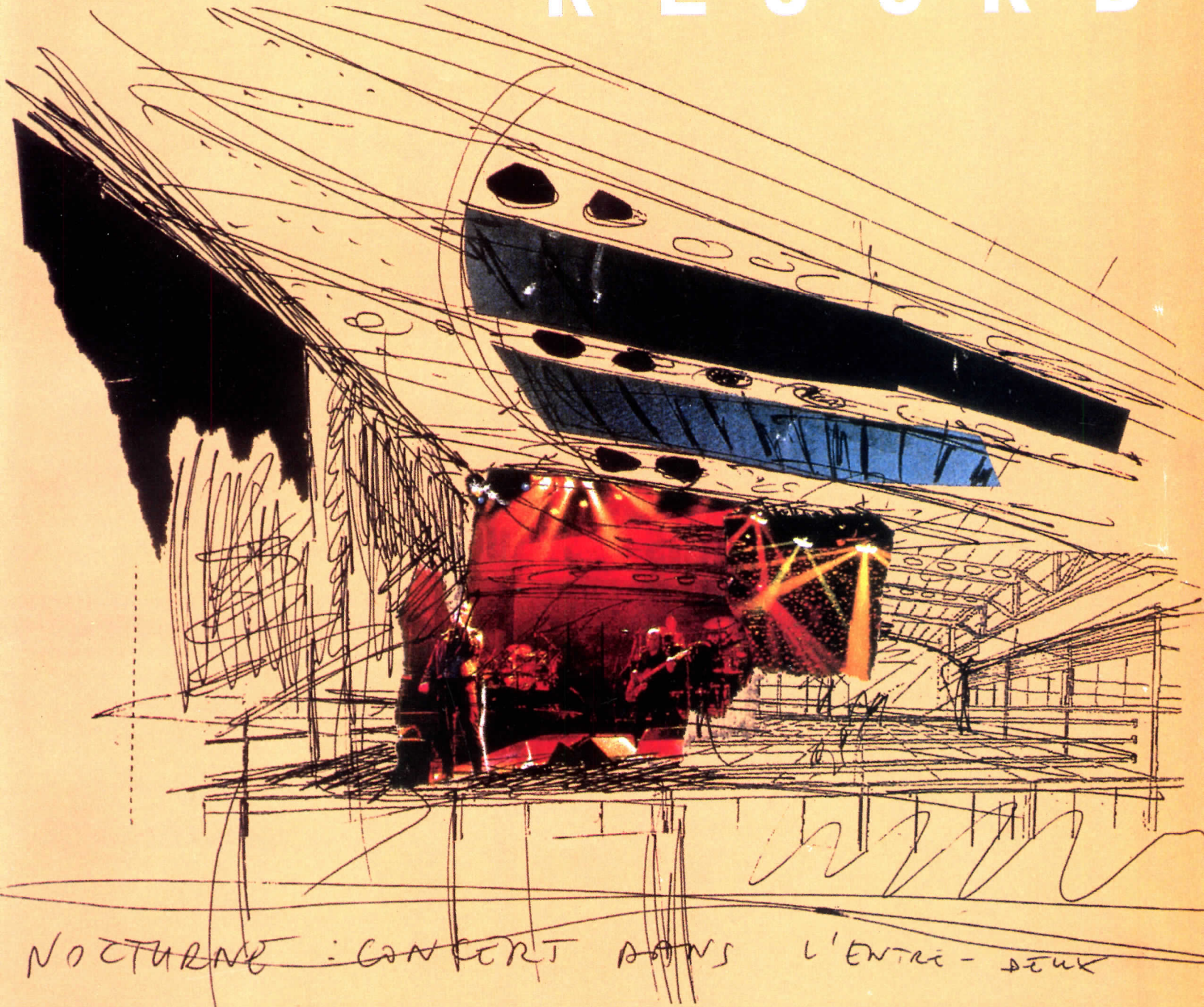


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ARCHITECTURAL RECORD

01.1998



Dialogue

- 15 Editorial** **18 Letters** **20 Speak Out**
22 Mentors **24 Pulse** **42 Dates/Events**

News

- 29 Yoshio Who? MoMA's New Architect**
29 Funds for Federal Buildings Cut
32 PSFS, A Modernist Icon, To Be Converted to a Hotel

Features

- 50 America's Best-Managed Firms: How to Succeed with Expanded Services**
In the new, relationship-oriented architecture, staying with a client beyond design and construction by offering expanded services is proving to be very lucrative.
- 56 Construction Aims at a Steady Pace for '98**
Offices and schools are leading construction starts in a slower-growing but steady economy.

Projects

- 68 Commerzbank, Frankfurt, Germany**
An ambitious skyscraper with naturally ventilated skin and gardens in the sky reinterprets the building type as well as benefiting workers and the surrounding city.
Sir Norman Foster and Partners
- 80 The Georgia O'Keeffe Museum, Santa Fe, New Mexico**
The spare, understated galleries of this museum, carved out of an old church, allow the artwork to take center stage.
Richard Gluckman Architects
- 86 Le Fresnoy, Tourcoing, France**
A masterful hybrid of old and new construction delivers Bernard Tschumi from his long-held reputation as a paper architect.
Bernard Tschumi Architects

Building Types Study 757

- 103 Senior Housing: A Quiet Revolution**
Innovative homes for the elderly move away from bleak warehouses toward humane designs for living.
- 108 Weinberg Terrace, Pittsburgh, Pennsylvania**
Perkins Eastman Architects
- 112 Three Residential Projects for the Elderly, Holland**
Architectenbureau Wytze Patijn; EGM Architecten; Mecanoo Architects
- 114 Goddard House, Brookline, Massachusetts**
CBT/Childs Bertman Tseckares

Technology


- 123 The Alchemy of a New Material** 
Autoclaved aerated concrete, now available in the United States, offers a host of architectural virtues.

Kitchen and Bath Portfolio

- 135 Eleven Selections**
Family gathering spaces and luxurious private retreats.

Products

- 147 A Turning Point for Corian** **151 Product Briefs**
148 Surfacing for Countertops **156 Product Literature**
- 163 Reader Service Card** **174 Manufacturers' Spotlight**
172 AIA Continuing Education Self-Report Form **179 Classified Advertising**
182 The Future

 **Continuing Education:** The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "The Alchemy of a New Material" (pages 123–26). The self-report form appears on page 172.

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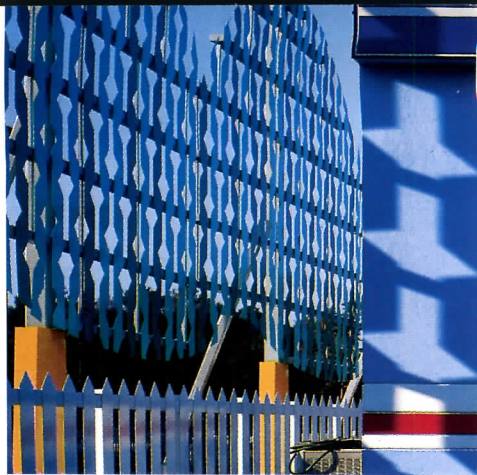


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ARCHITECTURAL RECORD

02.1998



Dialogue

- 13 Editorial** **16 Letters** **18 Speak Out** **20 Mentors**
22 Pulse **41 Correspondent's File** **46 Dates/Events**

News

- 34 Resignation and Lawsuit Upset SOM**
36 Small and Midsize Firms More Likely to Pirate Software

Features

- 54 Listening to Contractors**
How do contractors view architects? With abundant goodwill.
- 58 VSBA Today**
Icons and symbols still speak to us, say Robert Venturi and Denise Scott Brown.
- 68 Chandigarh After Corbusier**
Michael Sorkin compares Corb's city to New Delhi and Lutyens's ordered world.


Projects

- 82 Project Diary: Rhys Carpenter Library, Bryn Mawr, Pennsylvania**
A library addition becomes a state-of-the-art scholarly facility.
Henry Myerberg Architects
- 92 Kaze-no-Oka Crematorium, Nakatsu, Oita Prefecture, Japan**
A crematorium distills themes of Fumihiko Maki's rich career.
Maki and Associates
- 100 Portfolio: Eight Uncommon Projects**
Creative solutions for projects of small size or limited scope.

Building Types Study 758

- 119 Adaptive Reuse: Tackling the Really Big Ones**
Projects like redeveloping downtowns, military-base conversions, and heritage areas are leading architects to work at a heroic scale.
- 122 Otis College of Art and Design, Los Angeles**
Bobrow/Thomas and Associates
- 126 Salt Lake City Hardware, Salt Lake City**
FFKR Architecture/Planning/Interior Design
- 130 James N. Gray Company, Lexington, Kentucky**
Franklin N. Gray Design Services; Lucas/Schwering Architects
- 134 Vassar College Admissions House, Poughkeepsie, New York**
Linda M. Yowell, Architect

Technology & Practice

- 141 Lowering the Risks of Reroofing** 
Redoing roofs often means contending with rusting fans, abandoned conduits, clogged drains, and mistakes made by others.
- 149 Taking Care of Business**
Power-packed software can help firms manage, market, and fine-tune their projects.

Lighting


- 185 Introduction**
- 187 Creative Uses**
- 191 Skylights Let Sun into Johnson & Johnson Building**
The Lighting Practice
- 195 GM on 5th Takes Visitors on a Fantastic Road Trip**
Haverson Architecture and Design
- 201 Diffracted Sunshine Creates Display in Puente Hills Mall**
Peter Erskin, solar artist; Gallegos Lighting Design

Lighting Technology

- 205 Lincoln Looks Best Basking in Incandescent Glow**
Einhorn Yaffee Prescott Associates
- 208 Motion Sensors Come into Their Own**
- 210 Designing Daylighting Systems for Art Museums**
University of Michigan Lighting Simulation Laboratory
- 213 Lighting Resources**

Products

- | | |
|--|-------------------------------------|
| 225 Open-Window Options | 229 Product Briefs |
| 226 Energy-Efficient Windows | 236 Product Literature |
| 241 Reader Service Card | 254 Manufacturers' Spotlight |
| 248 AIA Continuing Education Self-Report Form | 258 Classified Advertising |
| | 260 The Future |

 **Continuing Education: Three**
AIA/ARCHITECTURAL RECORD continuing education opportunities are offered: "Lowering the Risks of Reroofing" (page 141), and special advertising sections provided by the Metal Building Manufacturers Association (page 152) and the National Wood Window and Door Association (page 166).

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CIRCLE 3 ON INQUIRY CARD

ARCHITECTURAL RECORD

03.1998



Dialogue

- 15 Editorial** **18 Letters** **20 Speak Out** **22 Mentors**
24 Pulse **27 Books** **54 Dates/Events**

News

- 37 Koolhaas Will Apply Hybrid Theories in IIT Commission**
44 On the Web: Easing Toward a Sustainable Education

Features

- 64 The State of Architectural Criticism Today**
Has the mainstream U.S. press reached a new low in its analysis of architecture? *by Suzanne Stephens*
- 70 Through the Viewfinder: Worldly Remains**
Photographer Richard Barnes documents a hauntingly beautiful discovery made during a routine seismic upgrade.
- 76 Key Players in Health Care: The Clients To Know**
The field of health care is changing, and opportunities for architects are changing right along with it.

Projects

- 88 Project Diary: Monona Terrace, Madison, Wisconsin**
One of Frank Lloyd Wright's great visions is finally realized after 59 years in the works—but is it really Wright?
Monona Terrace Design Venture
- 102 Napa Valley Museum, Yountville, California**
In an unusual fund-raising move, a museum builds one-third of its new headquarters to attract attention. It's working.
Fernau & Hartman Architects
- 110 Houston Industries Plaza, Houston, Texas**
An unorthodox real estate deal and a major revamping allow a 1970s building to keep up with the competition.
DMJM Keating

Building Types Study 759


- 123 Retail Facilities: Main Street Goes Suburban**
Friendly, small-scale shopping—like the Main Streets of days gone by—has recaptured the imagination of mall-weary suburbanites.
- 128 Virgin Megastore, Orlando, Florida**
Stenfors Pali Fekete Architects
- 132 Rocky Ridge Town Center, Roseville, California**
Mark Dzewulski Architect
- 136 Edwards Business Center, Edwards, Colorado**
Circle West Architects

Technology

- 145 Designing for Security** 
Securing against terrorist attacks has become a top priority for federal buildings. The trick is not to end up with a bunker.

Products

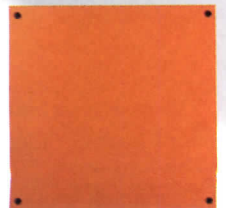
- | | |
|--|-------------------------------------|
| 155 The I-Joist Debate | 159 Product Briefs |
| 156 Building with I-Joists | 166 Product Literature |
| 184 AIA Continuing Education Self-Report Form | 199 Manufacturers' Spotlight |
| 187 Reader Service Card | 204 Classified Advertising |
| | 206 The Future |

 **Continuing Education:** *The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Designing for Security" (page 145). The questions appear on page 182; the self-report form appears on page 184.*

Cover: *Monona Terrace, Madison, Wis. Monona Terrace Design Venture. Rendering © Frank Lloyd Wright Foundation. Photo © Scott McDonald/Hedrich Blessing. Above: Napa Valley Museum, Yountville, Calif. Fernau & Hartman Architects. Photo © Richard Barnes.*



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Dialogue

- | | | |
|---------------------|-----------------------|--------------------------------|
| 15 Editorial | 22 Mentors | 47 Correspondent's File |
| 18 Letters | 24 Pulse | 54 Dates/Events |
| 20 Speak Out | 27 Exhibitions | |

News

- 35 Post Office to Become New Penn Station**
- 40 Focus on: Stadiums and Arenas**

Features

- 66 Listening to Interior Designers**
A panel discussion uncovers some tensions in the working relationship between architects and interior designers.
- 70 Making a Spec House Special**
New York architects Hariri and Hariri team up with a suburban Virginia developer to create a modern alternative to traditional speculative housing.
- 76 America's Most Visited Houses**
Michael Sorkin guides an idiosyncratic tour of two domestic shrines—the White House and Graceland—and contemplates the national mania for celebrity.

Building Types Study 760

- 89 Record Houses 1998**
Introduction by Karen D. Stein
- 90 Hogan/Mayo House, Del Mar, California**
Cheng Design and Construction
- 98 Rozzelle-Ragan House and Studio, Piedmont, North Carolina**
Frank Harmon Architect
- 102 Oliver House, San Francisco**
Jim Jennings Architecture
- 110 Emerson Residence, Duluth, Minnesota**
Salmela Architect
- 116 Stowe, Vermont, Residence**
The Office of Peter Rose
- 124 Watrous-Weatherman Residence, Brooklyn**
Leslie Gill Architect; Bryce Sanders Architecture/Design
- 130 64 Wakefield Drive, Atlanta**
Scogin Elam and Bray Architects

Technology

- 149 The Nature of Green Architecture** 
Architects are getting serious about sustainable design. Can they make their buildings successful?

Products

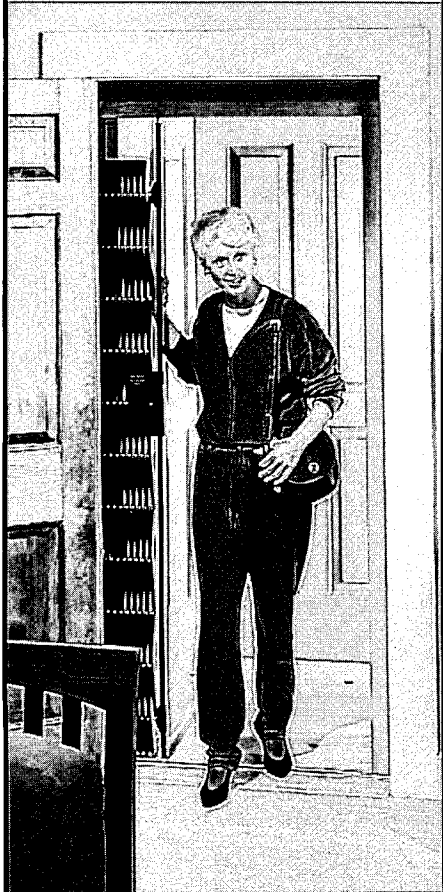
- | | |
|--|-------------------------------------|
| 161 Spanish Tile | 165 Product Briefs |
| 162 Tiles of Texture | 170 Product Literature |
| 181 Reader Service Card | 193 Manufacturers' Spotlight |
| 188 AIA Continuing Education Self-Report Form | 198 Classified Advertising |
| | 200 The Future |



Continuing Education: The AIA/ARCHITECTURAL RECORD Continuing Education opportunity this month is "The Nature of Green Architecture" (page 149); the self-report form appears on page 188.

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Above: The Jungle Room, Graceland, Memphis. Photo © Timothy Hursley. See page 76.

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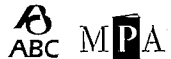
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ARCHITECTURAL RECORD

05.1998



Dialogue

- 17 Editorial 20 Letters 24 Speak Out
26 Mentors 28 Pulse

Departments

- 33 Books 43 Exhibitions 55 Correspondent's File
67 Dates/Events 394 The Future

News

- 75 Renzo Piano Wins 1998 Pritzker Prize

Features

American Institute of Architects 1998 Honors & Awards

This year's winners, with an essay by historian William J.R. Curtis.

- 104 Essay
108 Architecture
118 Interiors
124 Urban Design
128 Firm Award
130 25-Year Award

136 Young Architects Profiles

Six who graduated in bad times are thriving in a boom economy.

Projects

- 152 **Spencer Theater for the Performing Arts, Ruidoso, New Mexico***
Antoine Predock Architect
160 **Beyeler Museum, Basel, Switzerland**
Renzo Piano Building Workshop
170 **Old State House, Hartford, Connecticut**
Smith Edwards Architects
176 **California Science Center, Exposition Park, Los Angeles**
Zimmer Gunsul Frasca Partnership

*On the Web: Take a virtual tour of the Spencer Theater at www.archrecord.com.



Continuing Education:


The AIA/ARCHITECTURAL RECORD continuing education opportunities this month are "Evaluating Hidden Site Conditions" (p. 247) and a section sponsored by the National Wood Window and Door Association (p. 221).

Cover: *Spencer Theater for the Performing Arts, Ruidoso, New Mexico.* Antoine Predock Architect. Photo © Timothy Hursley. Above: *Beyeler Museum, Basel, Switzerland.* Renzo Piano Building Workshop. Photo © Christian Richters.

Building Types Study 761

- 199 **Industrial Buildings: A New American Factory**
An appreciation of Albert Kahn, an early pioneer of the modern factory building.
202 **The New York Times Printing Plant, Flushing, New York**
Polshak and Partners Architects
208 **Mercedes-Benz Assembly Plant, Tuscaloosa County, Ala.**
Albert Kahn Associates
214 **Valeo Electrical Systems, San Luis Potosi, Mexico**
Davis, Brody & Associates

Technology

- 239 **Building Over, Around, and Through**
On difficult sites the logistics of construction may drive design.
247 **Evaluating Hidden Site Conditions** 
Don't let archaeological or ecological finds take you by surprise.

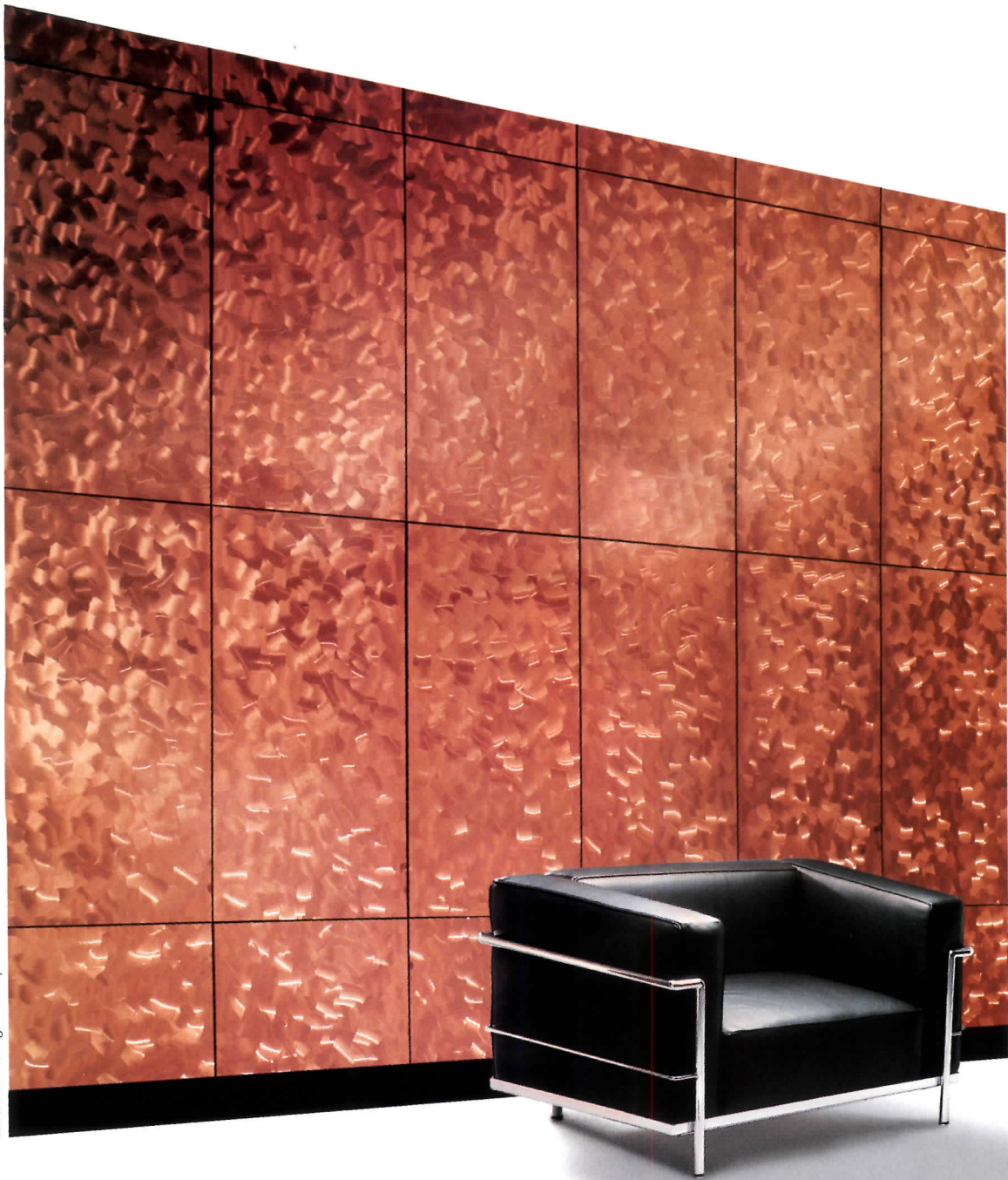
Lighting

- 259 Introduction
261 Creative Uses
275 **Interview: How Designers Applied Classical Lighting to a Modern Theater**
Fisher Marantz Renfro Stone
283 **Cajun Rhythms Inspire Vibrant Lights of Zydeco Grille**
The Lighting Design Group
287 **Radio City Meets Motown in Las Vegas Fantasy World**
Joe Kaplan Architectural Lighting Design
291 **Lighting for New Eastman Chemical Offices Is Economical and Effective**
Pacific Lightworks
295 **Reassessing the Value of the High-Pressure Sodium Lamp**
301 **Halogen's New Challenger: Miniature Metal-Halide Lamps**
303 **Lighting Resources**

Products

- 333 **Mobile Aisle Storage** 339 **Product Briefs**
334 **Expanding Storage Space** 348 **Product Literature**
375 **Reader Service Card** 392 **AIA Continuing Education Self-Report Form**
380 **Manufacturers' Spotlight**
388 **Classified Advertising**

LeCorbusier Lounger courtesy of Gorden International, NY, NY.



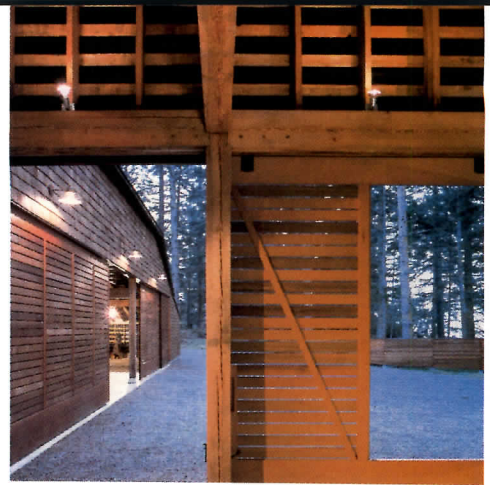
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ARCHITECTURAL RECORD

06.1998



Dialogue

- 15 Editorial** **18 Letters*** **20 Speak Out***
22 Mentors* **24 Pulse***


Departments

- 31 Correspondent's File** **52 Dates/Events**
232 The Future

News

- 37 Disney's Imagineers Go Wild with Reality-Based Park**
39 Murrah Building Replacement: In Search of a Secure Space

Features

- 68 The Urban Vibe**
Michael Sorkin wanders through Amsterdam, Vienna, Berlin, and New York to experience each city's vibe.
- 72 Changing the Face of Practice with Digital Technologies** 
Going beyond CAD, architects are using computers to tie everyone together.

Projects

- 90 Hong Kong Exhibition and Convention Center Extension**
Wong & Ouyang; Skidmore, Owings & Merrill, associated architect
A 1.7 million-square-foot addition looks toward China and, perhaps, to the future.
- 102 Equipment Building, San Juan Island, Washington**
Thompson and Rose Designers
A farm shed in coastal Washington State demonstrates that there can be elegance in utility.
- 108 Small Projects**
A portfolio of structures that go beyond the functional to reach for the witty, the sublime, or the lyrical.
- 118 Ontario Provincial Police Headquarters, Orillia, Ontario**
Dunlop Farrow Inc. Architects; W. M. Salter & Associates
Inviting the public inside, a new police complex offers openness without sacrificing security.

*On the Web: You can also find these on our Web site at www.archrecord.com.

Building Types Study 762


- 137 The Way We Work**
Exploring and understanding a corporation's goals is the first priority in designing a successful alternative workplace.
- 142 Swiss Bank Center, Stamford, Connecticut**
Skidmore, Owings & Merrill
- 148 Robert L. Preger Intelligent Workplace, Pittsburgh**
Pierre Zoelly, AIA; Center for Building Performance and Diagnostics, Carnegie Mellon University; Bohlin Cywinski Jackson
- 154 Silicon Graphics, Mountain View, California**
Studios Architecture

Technology

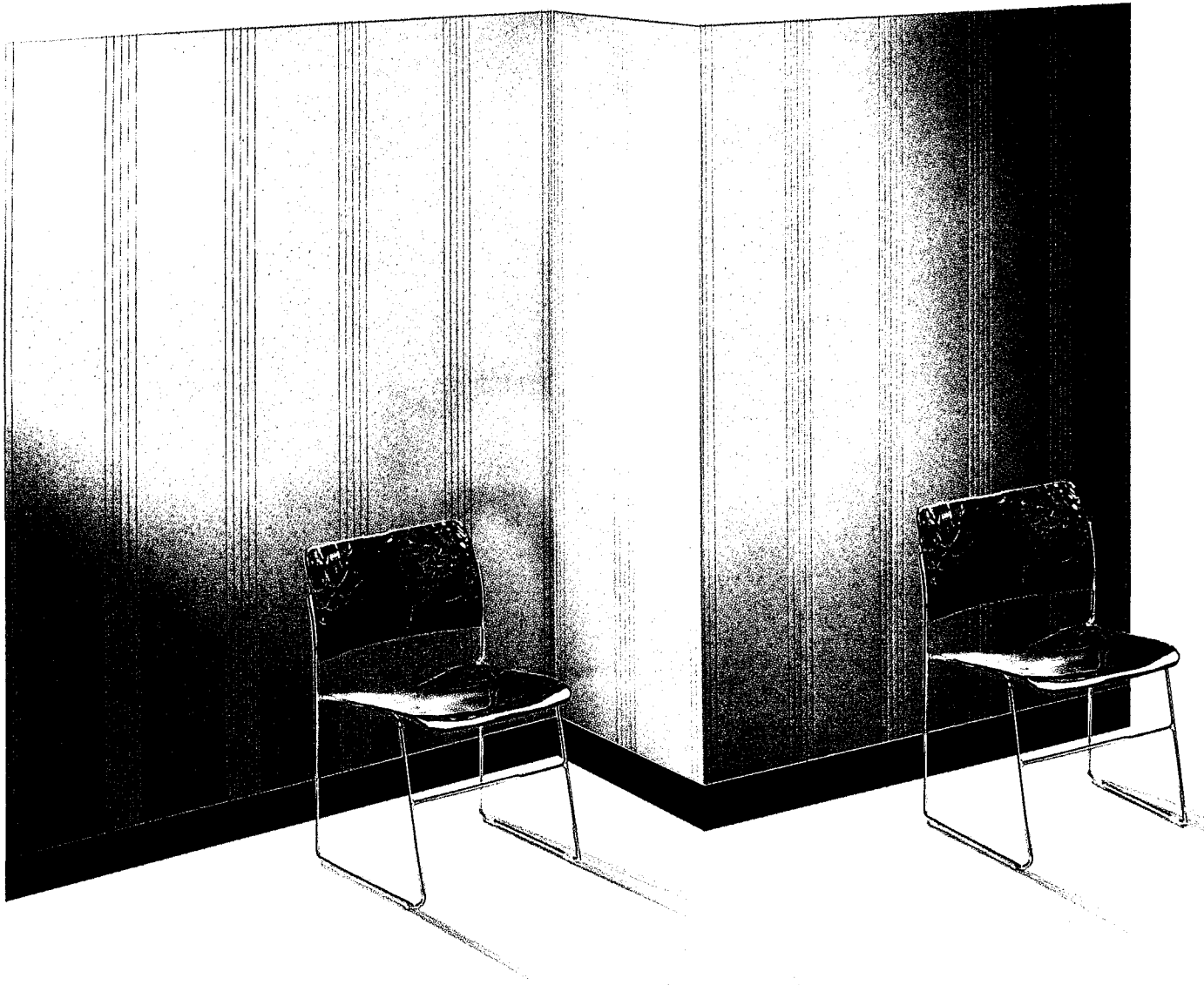
- 171 Making the Most of the A/E/C Systems Show**
This year's computer expo will be bigger than ever. Try a little planning, and the experience won't be lost on you.
- 175 Entering the Third Dimension**
Sophisticated software and powerful hardware are changing the way architects work. But it's too soon to close the door on 2D.

Products

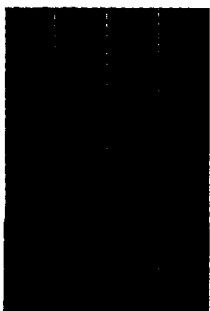
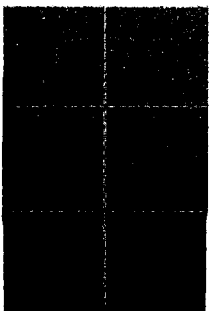
- | | |
|-------------------------------------|---|
| 189 Foam Fire Suppressant | 197 Product Briefs |
| 190 Fire Safety Products | 202 Product Literature |
| 213 Reader Service Card | 230 AIA Continuing Education Self-Report Form* |
| 220 Manufacturers' Spotlight | |
| 226 Classified Advertising* | |

 **Continuing Education:**
The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Changing the Face of Practice with Digital Technologies" (page 72). The self-report form appears on page 230.

Cover: Hong Kong Exhibition and Convention Center Extension. Wong & Ouyang; Skidmore, Owings & Merrill. Photo © Steinkamp/Ballogg.
Above: Equipment Building, San Juan Island, Washington. Thompson and Rose Designers. Photo © Chuck Choi.

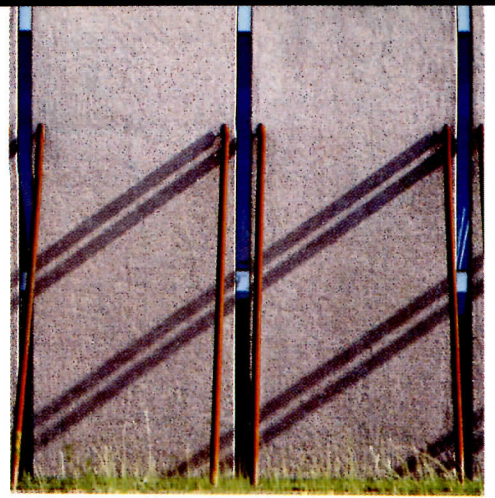


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ARCHITECTURAL RECORD

07.1998



Dialogue

- 7 Editorial** **10 Letters*** **12 Speak Out***
14 Mentors* **16 Pulse***

Departments

- 21 Books** **25 Correspondent's File**
44 Dates/Events **148 The Future**

News

- 31 Transportation Equity Act Means More Projects on the Road**
33 Proposition 224 Is Voted Down in California

Features

- 52 Listening to Clients: What Do They Think of Architects?**
According to our panel, more clients in all sectors of the economy are hiring in-house architects to coordinate their building efforts.

Projects

- 58 Project Diary: Ronald Reagan Building and International Trade Center, Washington, D.C.** ^{www}
Pei Cobb Freed & Partners Architects; Ellerbe Becket Architects & Engineers
After 11 years of struggle and delay, a government megaproject offers lessons in working with multiple clients and design/build.
- 72 McNitt Building, Oklahoma City, Oklahoma**
Elliott + Associates Architects
A straightforward, economical building designed for a concrete contractor celebrates a hard-working material.
- 78 Main Building at Steepletop, Millay Colony for the Arts, Austerlitz, New York**
Michael Singer, designer; LineSync Architecture and Planning, architect of record
A new studio-residence building allows visiting artists to live and work in a universally accessible environment.


WWW On The Web: Take a virtual tour of this project at www.archrecord.com.

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Building Types Study 763


- 87 Where We Seek the Light**
Daylight is the common denominator in places of worship, no matter what the religion or design style.
- 88 Temple Beth Shalom, Hastings-on-Hudson, New York**
Edward I. Mills & Associates in joint venture with Perkins Eastman Architects
- 92 St. Thomas More Catholic Church, Sarasota, Florida**
Carl Abbott, FAIA, Architects/Planners
- 96 Joseph Slifka Center for Jewish Life, Yale University, New Haven, Connecticut**
Roth and Moore Architects
- 102 West Wall, St. Mark's Cathedral, Seattle, Washington**
Olson Sundberg Architects; Ed Carpenter, artist

Technology

- 109 Understanding Accessibility Laws** 
While courts consider architects' liability for ADA compliance, the federal government reviews and revises design guidelines.

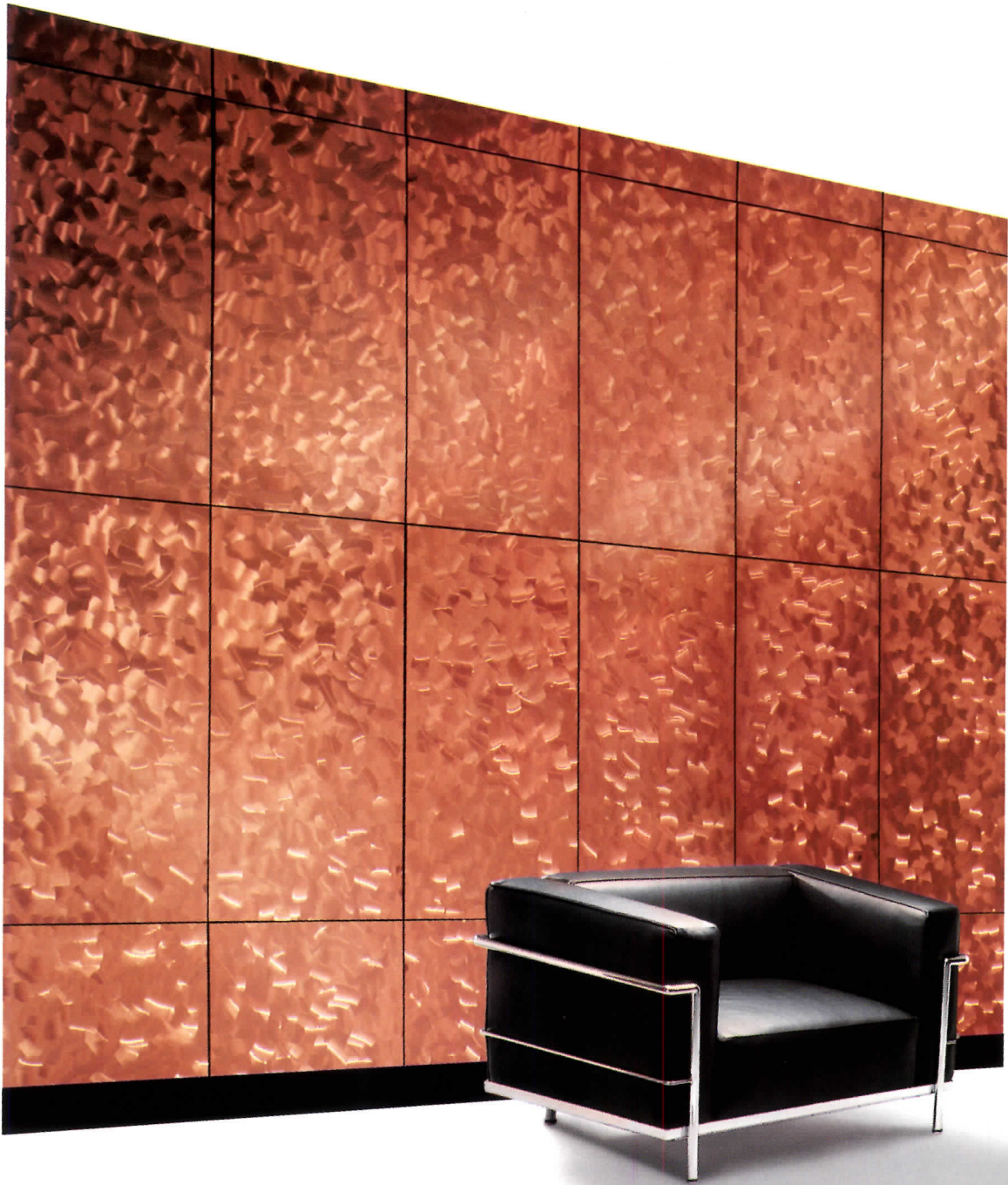
Products

- 117 Products for Millay Colony** **121 Product Briefs**
118 ADA-Compliant Products **126 Product Literature**
129 Reader Service Card **140 Manufacturers' Spotlight**
138 AIA Continuing Education Self-Report Form* **145 Classified Advertising**

 **Continuing Education:** The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Understanding Accessibility Laws" (page 109). The self-report form appears on page 138.

Cover: Ronald Reagan Building and International Trade Center, Washington, D.C., Pei Cobb Freed & Partners Architects. Photo © Timothy Hursley.
Above: McNitt Building, Oklahoma City. Elliott + Associates Architects. Photo © Bob Shimer/Hedrich Blessing.

LeCorbusier Lounger courtesy of Gordon International, NY, NY.



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CIRCLE 3 ON INQUIRY CARD

ARCHITECTURAL RECORD

08.1998



Dialogue

- 13 Editorial** **20 Speak Out*** **24 Pulse***
16 Letters* **22 Mentors***

Departments

- 29 Correspondent's File** **206 The Future**
33 Dates/Events

News

- 41 Flawed Design and Falling Bricks Doom Amsterdam Mall**
43 Pei Communes with Nature at Japan's Miho Museum

Features

- 58 When Bigger Is Better**
A survey of "very large" firms indicates that economies of scale need to be balanced with creative management practices.


Projects

- 74 Criticism: Addition to Lewin House, Santa Monica, California**
Steven Ehrlich Architects
A contemporary architect adds a beautiful pavilion to Neutra's famous Modernist house. But is it a happy marriage?
- 80 Guthrie Pavilion, Shah Alam, Selangor, Malaysia**
T. R. Hamzah & Yeang
Tensile technologies and irregular geometries turn a suburban development's gateway building into a tropical high-wire act.
- 86 Kiasma Museum of Contemporary Art, Helsinki, Finland**
Steven Holl Architects; Juhani Pallasmaa Architects, associate architect
A museum that garnered controversy in its early stages now offers a dramatic embrace of Helsinki's treasured architectural legacy.

Building Types Study 764

- 105 Taking Our Leisure**
Places that create a visceral relationship with their visitors foster interaction and entertainment based on thought, not spectacle.
- 106 Oceans Pavilion, Lisbon, Portugal**
Cambridge Seven Associates
- 112 Boyd Park, New Brunswick, New Jersey**
Parsons + Fernandez-Casteleiro
- 116 P. S. 1 Contemporary Art Center, Long Island City, New York**
Frederick Fisher + Partners
- 122 Elmhurst Art Museum, Elmhurst, Illinois**
De Stefano + Partners

Technology

- 131 Improving Glass Performance** 
New films, coatings, and laminates make glazing safer, stronger, and more energy-efficient without sacrificing transparency.

Lighting

- 143 Introduction**
144 Creative Uses
147 Fire & Ice Restaurant Sizzles with Hot and Cool Color and Light
Prellwitz/Chilinski Associates
- 150 A New Light Brightens a High School for Creative and Performing Arts**
The Lighting Practice
- 155 Three Interactive Lighting Installations Fill a Blue-edged Darkness**
Lightforms '98
- 159 Case Study: An Elementary School that Saves Energy and Is Visually Comfortable**
Rochester City School District, lighting design; R.P.I. Lighting Research Center DELTA team, evaluation
- 166 Lighting Resources**

Products

- 175 Trade Show Round-up** **182 Product Literature**
177 Product Briefs
- 187 Reader Service Card** **200 Manufacturers' Spotlight**
198 AIA Continuing Education **204 Classified Advertising Self-Report Form***

WWW

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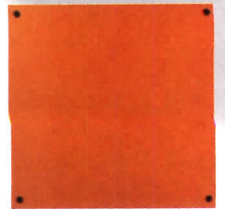


Continuing Education: The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Improving Glass Performance" (page 131). The self-report form appears on page 198.

Cover: Kiasma Museum of Contemporary Art, Helsinki. Steven Holl Architects. Photo © Paul Warchol.
Above: Addition to Lewin House, Santa Monica. Stephen Ehrlich Architects. Photo © Julius Shulman/David Glomb.



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ARCHITECTURAL RECORD

09.1998



Dialogue

- 15 Editorial** **20 Speak Out*** **24 Pulse***
18 Letters* **22 Mentors***

Departments

- 35 Correspondent's File** **68 Dates/Events**
43 Books **228 The Future**

News

- 51 Tallest Tower in Latin America in the Works for Mexico City**
56 Interview: Maya Lin Finds Inspiration in Nature

Features

- 82 Through the Viewfinder: Brasília's Modernism Emptied**
Photographer Todd Eberle takes a new look at Oscar Niemeyer's 40-year-old utopian city.
- 88 South America's Building Boom**
Brazil, Argentina, and Chile lead the way to economic revival, creating a lively climate for design.

Building Types Study 765

- 107 Record Interiors**
Introduction by Karen Stein
- 108 Herman Miller Showroom, Chicago, Illinois**
Krueck & Sexton Architects
- 114 Portfolio: Tsao & McKown**
A recent series of interiors demonstrates the firm's wide range of cultural and aesthetic references.
- 120 CD Warehouse, Norman, Oklahoma**
Elliott + Associates
- 124 Corning Glass Center 2000, Corning, New York** ^{WWW}
Smith-Miller + Hawkinson Architects
- 132 M. C. Ginsberg Objects of Art, West Des Moines, Iowa**
Herbert, Lewis, Kruse, Blunck Architecture

Computers

- 145 Computers in Architecture**
Introduction by Charles Linn, AIA, and Wendy Talarico
- 147 Planning a Computer Technology Strategy**
With a good plan, architects can identify, choose, and implement technology strategies to complement their business goals.
- 151 The Latest Software for Architects**
A round-up of products introduced at this year's trade shows.
- 159 Exploiting Advances in Computer-Aided Architecture**
Case studies demonstrate how five firms have harnessed the power of the computer to make their practices work better.
- 169 Buyer's Guide: What To Buy and How To Buy It**
Asking the right questions allows design professionals to select appropriate hardware and peripherals.

Technology

- 181 Safer, More Attractive Staircases** 
Stairs can be made beautiful and less hazardous with good design and the creative use of materials.

Products

- 189 Paints and Stains** **198 Product Literature**
191 Product Briefs
- 209 Reader Service Card** **219 Manufacturers' Spotlight**
216 AIA Continuing Education Self-Report Form* **225 Classified Advertising**

WWW

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Continuing Education: The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Safer, More Attractive Staircases" (page 181). The self-report form appears on page 216.

Cover: Herman Miller Showroom, Chicago, Illinois. Krueck & Sexton Architects. Photo © Paul Warchol.
Above: Bruno Giorgi's The Warriors stands before Oscar Niemeyer's Planalto Palace, Brasilia. Photo © Todd Eberle.

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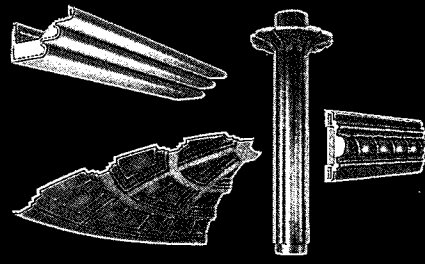
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CIRCLE 3 ON INQUIRY CARD

ARCHITECTURAL RECORD

10.1998



Dialogue

- 15 Editorial** **24 Speak Out*** **28 Pulse***
20 Letters* **26 Mentors***

Departments

- 35 Books** **76 Dates/Events**
37 Exhibitions **236 The Future**

News

- 49 NBBJ Plans Largest Office Complex in Scandinavia**
52 Interview: Ken Burns on "Frank Lloyd Wright"

Features

- 88 The Business Week/Architectural Record Awards**
The second annual awards honor projects that use architecture to find solutions for business.
- 108 Listening to Engineers**
In their struggle for respect, engineers are often pitted against or allied with architects.

Projects

- 124 Debis Tower, Berlin, Germany**
Renzo Piano Building Workshop
A striking presence on the Berlin skyline, the new tower for a Daimler-Benz subsidiary revives the skyscraper.
- 136 Church at St.-Benoit-du-Lac Abbey, St.-Benoit, Quebec**
Dan S. Hanganu Architectes
A modern take on traditional Benedictine austerity completes a long-unfinished church in the Quebec countryside.


WWW

* You can find these on our Web site at www.archrecord.com, your source for a virtual tour of recently featured projects, an index of past articles, and more.

Building Types Study 766


- 149 Reeducating the Masses**
New and renovated buildings fulfill programmatic requirements while bringing harmony to their campus surroundings.
- 150 James S. McDonnell Hall, Princeton University**
Gwathmey Siegel + Associates Architects
- 154 Stamford Campus of the University of Connecticut**
Perkins Eastman Architects
- 158 Stanley F. Druckenmiller Hall, Bowdoin College**
Ellenzweig Associates, Inc.
- 162 Center for Library and Information Resources, Emory University**
Shepley Bulfinch Richardson and Abbott
- 164 Master Plan and Chancellors Hall, Southampton College**
Mitchell/Giurgola Architects

Technology

- 171 Living and Working within the Code** 
Understanding and complying with codes are vital to seeing a project successfully through completion.

Products

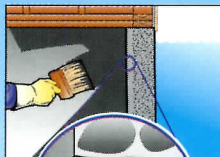
- 191 Metal Cladding** **204 Product Literature**
197 Product Briefs
- 210 AIA Continuing Education Self-Report Form*** **227 Manufacturers' Spotlight**
221 Reader Service Card **232 Classified Advertising**

 **Continuing Education: The AIA/ARCHITECTURAL RECORD continuing education opportunities this month are "Living and Working within the Code" (page 171) and the sponsored sections "Break-Through Technology Heightens the Performance of Windows and Doors" (page 176) and "Certified Forest Products: Solutions for Sustainable Design" (page 181).**

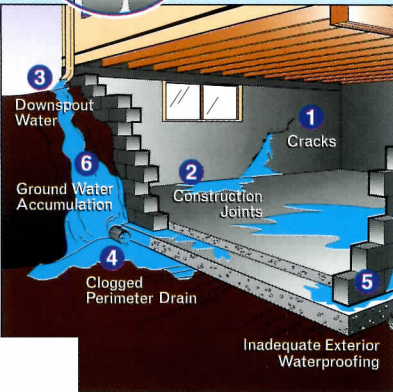
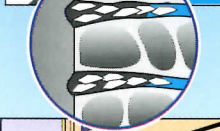
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Above: *Praxair Distribution Center, Ankeny, Iowa. Herbert Lewis Kruse Blunck Architecture. Photography © Farshid Assasi.*
See the other winners of our annual Business Week/Architectural Record Awards, beginning on page 88.

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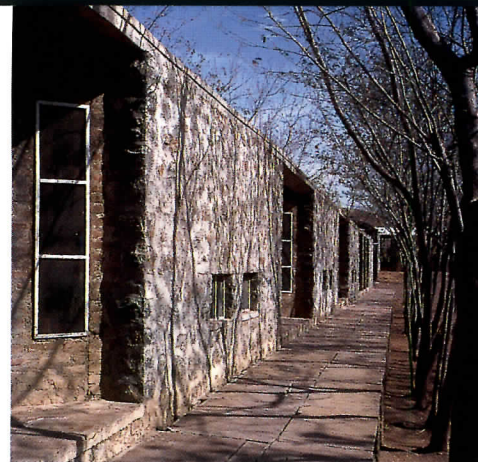
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ARCHITECTURAL RECORD

11.1998



Dialogue

- 15 Editorial 24 Speak Out* 30 Pulse*
20 Letters* 28 Mentors*

Departments

- 37 Correspondent's File 218 The Future
58 Dates/Events

News

- 43 The Twin Cities Navigate a Return to Their River Roots

Features

- 68 **The Aga Khan Award: Honoring Substance Over Style**
International in scope, diverse, and serious, this may be the wisest architectural prize program we have, says Robert Campbell.
- 74 **Designing Megahouses: When Money Is No Object**
How do architects feel about working on enormous houses for the conspicuous consumption of their megarich clients?

Projects

- 82 **Project Diary: Royce Hall, University of California, Los Angeles**
Anshen + Allen; Barton Phelps & Associates, design architect
After earthquakes wracked its iconic towers, a symbolic campus building has been restored and, in the process, redefined.
- 92 **Hong Kong International Airport, Hong Kong** ^{www}
Foster and Partners
Battling the clock and taming a huge space were just two of the challenges facing the architects of the world's largest air terminal.

Building Types Study 767

- 109 **Resort Hotels: Destination Architecture**
Today's resorts provide entertainment, education, and pampering.
- 112 **Hotel Explora in Atacama, San Pedro de Atacama, Chile**
Germán del Sol, Arquitecto
- 118 **Las Ventanas al Paraiso, Cabo San Lucas, Mexico**
HKS Architects
- 120 **Pousada de Santa Maria do Bouro, Braga, Portugal**
Souto Moura Arquitectos
- 124 **Four Seasons Resort at Sayan, Bali, Indonesia**
Heah & Company; HST Architects, associate architect

Technology

- 133 **Restoring a Nebraska Landmark** 
Creating a database that maps out each stone on the facade makes it possible to chart and diagnose flaws in the capitol building.

Lighting


- 143 Introduction
145 Creative Uses
151 **War Memorial Opera Restoration Gives Building a Second Chance to Sing**
Auerbach + Glasow
155 **Diners Discover Einstein's Mass-Energy Relationship Redefined at mc²**
Architectural Lighting Design
161 **Screw-In Dimmable Compact-Fluorescent Lamps: Finally a Reality**
165 **An Air Force Lighting Installation Shows How Sulfur Lamps Can Succeed**
CES/Way, Fusion Lighting, Cooper Lighting, 3M Lighting
168 **Lighting Resources**

Products

- 177 Recreational Equipment 188 Product Literature
181 Product Briefs
- 194 **AIA Continuing Education Self-Report Form*** 208 **Manufacturers' Spotlight**
203 **Reader Service Card** 213 **Classified Advertising**

WWW

* You can find these on our Web site at www.archrecord.com, your source for a virtual tour of recently featured projects, an index of past articles, and more.

 **Continuing Education: The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Restoring a Nebraska Landmark" (page 133). The self-report from appears on page 194.**

Cover: Hong Kong International Airport, Hong Kong. Foster and Partners. Photograph © Dennis Gilbert/VIEW.
Above: Lepers Hospital, Chopda Taluka, India. Photograph © Ram Rahman, courtesy Aga Khan Foundation. See story beginning on page 68.



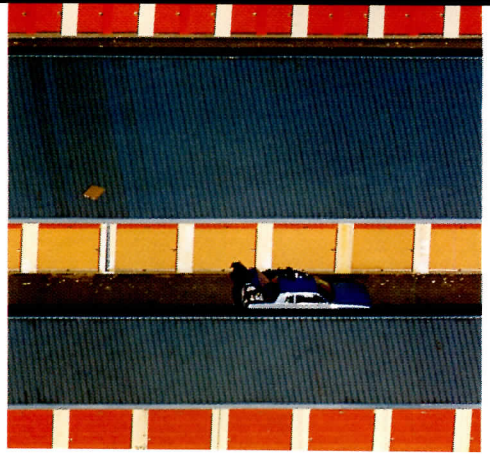
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ARCHITECTURAL RECORD

12.1998



Dialogue

- 9 Editorial** **14 Speak Out*** **18 Pulse***
12 Letters* **16 Mentors***

Departments

- 21 Books** **47 Dates/Events**
25 Exhibitions **186 The Future**
31 Correspondent's File

News

- 36 Cyberspace Replaces Classrooms in Architecture School**
36 Designing in the Homeland: An American Goes Back to Iran

Features

- 54 Earthly Inscriptions**
A portfolio of Alex S. MacLean's photographs of urban sprawl show the effects of human intervention on the landscape.
- 60 Planning for Firm Succession**
No matter when a firm confronts it, the issue of leadership transfer can be touchy; planning can smooth the transition.


Building Types Study 768


- 69 Detention Facilities: Locking Them Up**
While politicians may be calling for prisons that punish offenders at the lowest cost, architects and facilities operators understand the need to tailor the approach to the population, especially in the case of juveniles.
- 72 Grand Valley Institution for Women, Kitchener, Ontario**
Kuwabara Payne McKenna Blumberg Architects
- 76 Federal Detention Center, SeaTac, Washington**
NBBJ
- 78 Mecklenburg County Jail Central, Charlotte, North Carolina**
Little/HOK Joint Venture Architects
- 82 Crossroads Juvenile Detention Center, Brooklyn, New York**
Kaplan McLaughlin Diaz

Product Reports 1998

- 89 Introduction**
While the most dramatic product innovations this year were in the area of technology, the judges also found much to admire in improved building materials, both traditional and new.
- 91 Readers' Choice Awards**
The winners of this year's Readers' Choice Awards.
- 92 Product Judges 1998**
The 1998 judges were a well-rounded and eclectic group.
- 94 The Products**
Our panel of judges chose 101 products from 16 categories: General Data, Site Work, Concrete, Masonry, Metals, Woods & Plastics, Thermal & Moisture, Doors & Windows, Finishes, Specialties, Equipment, Furnishings, Special Construction, Conveying Systems, Mechanical, and Electrical.

Technology

- 131 Building Comfort with Less HVAC** 
Architects and engineers must work together to reduce a building's thermal load and downsize the heating and cooling plant.
- 139 Look for Higher Technology Benefits**
The real advantages of computer technology to an architectural firm often go far beyond the perceptions of the principals.
- 158 AIA/CES Education Self-Report Form*** **168 Catalog Preview**
163 Reader Service Card **182 Classified Advertising**

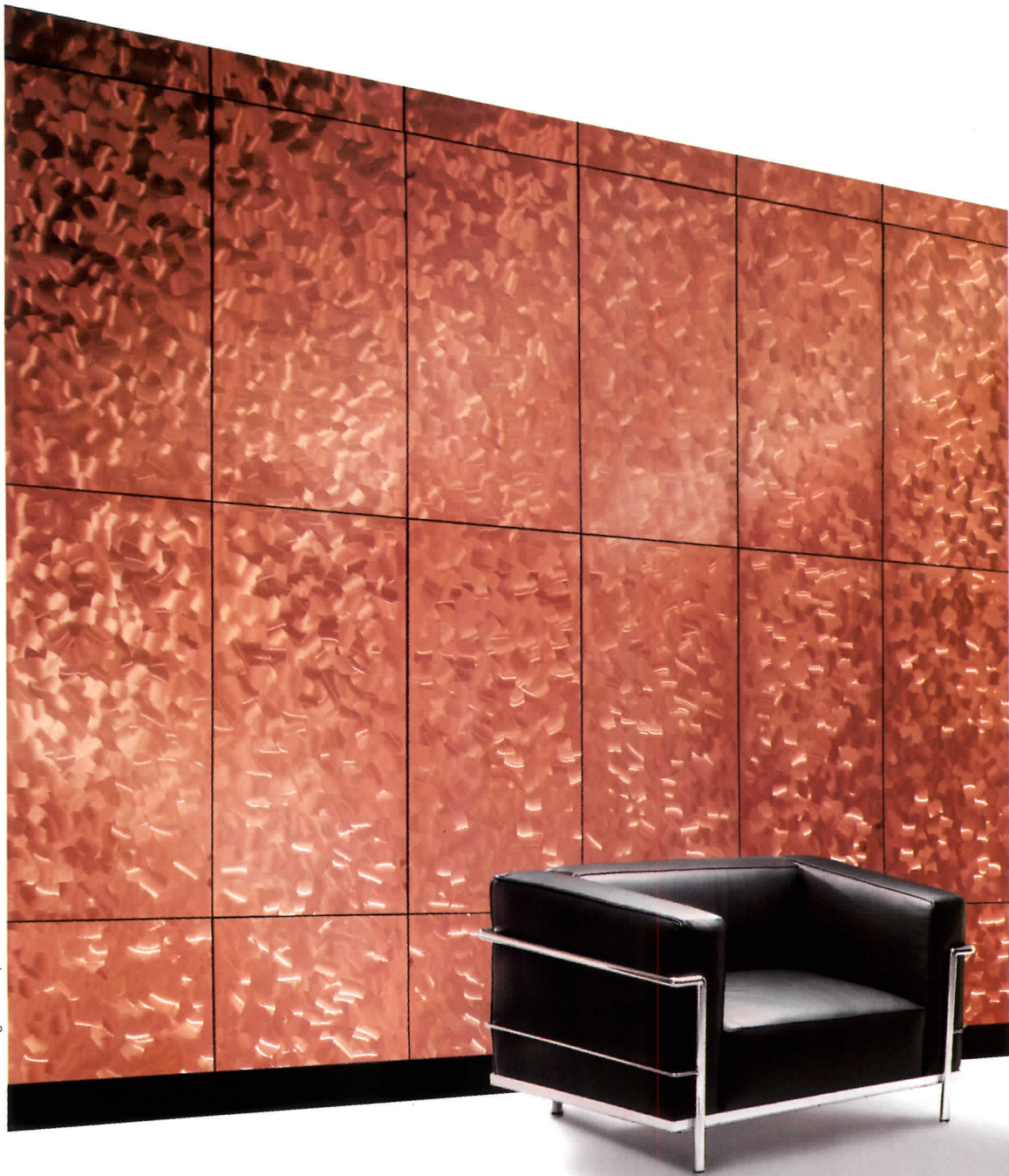
 **Continuing Education: The AIA/ARCHITECTURAL RECORD continuing education opportunities this month are "Building Comfort with Less HVAC" (page 131) and the sponsored sections "Versatile Aluminum Window and Door Frames" (page 146) and "Fiber Optics Revolutionizes Lighting Design" (page 152).**

Cover: *Grand Valley Institution for Women, Kitchener, Ontario. Kuwabara Payne McKenna Blumberg Architects. Photograph © Steven Evans.*
Above: *Self-storage lockers, Lowell, Massachusetts, 1993 (detail). Photograph © Alex S. MacLean. See story beginning on page 54.*

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LeCorbusier Lounger courtesy of Gordon International, NY, NY.



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CIRCLE 3 ON INQUIRY CARD



EDITORIAL

A New Way of Seeing

BY ROBERT A. IVY, FAIA

A stranger said something that changed the way I will view cities, perhaps forever. Last December, I was talking to friends in front of a hotel on Connecticut Avenue in Washington, D.C., waiting for a cab. A doorman, overhearing our conversation, asked what we did for a living and why we were visiting the capital. We explained that we were architects in town for a meeting, summarily waved him off as a person looking for a tip, and piled into the next available car, eager for a warm dinner and a cool drink. There was, after all, the day's business to review.

The doorman's parting line, delivered without a trace of irony and with discernible pride in his hometown, was the zinger: "Enjoy it: you built it!" I looked up just as he smiled; then the cab lurched into a U-turn across traffic toward Pennsylvania Avenue and careened into the damp evening, the wheels humming through the rain.

We sat in silence as his words washed over us, then erupted in a collective shout at the profundity of his remark. "You built it." Three words. I stared out the window at the blurred lights of the buildings speeding by. From that moment, it was as if I could see each structure with fresh insight, unique and whole, the product of individual and collective energies.

I scanned the blocks as you might scan a book, first by page, then by line. Each section of precast concrete or limestone marking the facades, each fanciful carving, each plaza and park—all had been informed by or inspired by or made by an architect. We passed rows of unnamed offices; famous buildings like James Hoban's president's house and James Renwick's gallery building; the Ellipse, the Mall, the Holocaust Museum. The buildings formed streets; the streets connected into a three-dimensional urban wonder. There was no component on the long, wet route that an architect had not touched.

Armed with that knowledge, that new way of seeing, I have been personally humbled and professionally challenged. If the city represents the

highest expression of our collective persona, the most complex and meaningful repository of our culture, then we must enjoy it: not in a superficial way, but in the exercise of all of our professional strength and creativity.

Not that design can completely solve what architects refer to as "the urban agenda." Idealism, untempered by the realities of the marketplace, untried in social subtleties, and naively apolitical, can be harmful. Witness the wholesale demolition of high-rise, low-income housing taking place, a well-intentioned, widespread failure of a social experiment inspired by the work of a great architect—Le Corbusier.

In their quest for urban solutions, architects have natural allies in the nation's mayors, particularly those who gathered in November at Harvard for the Mayors' Institute on City Design. This group knows, as architects do, that good design can promote the health of cities and their citizens; with vision and political skill, mayors can transform the urban landscape in a way architects can only suggest. They also know, as architects often are unaware, the human limits of their dreams.

Mayors and public housing directors came to Cambridge to discuss "Housing and the City," an issue that professional participants like Michael Pyatok, FAIA, and Joan Goody, FAIA, grapple with every day. The room was often still as several components of a multidimensional equation sat around a common table, reaching for answers. The conference, a collective enterprise, proved that the doorman's remark, for all its wisdom, was incomplete: while it may be true that we built the city, we didn't build the city alone.

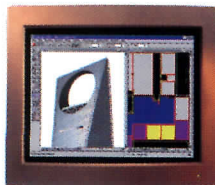
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LETTERS

Becoming an architect

In response to Robert L. Morgan's article "Becoming an Architect: Motivation to Fail?" [November, page 28], I say amen.

Throughout my years in architecture school, I was told by professors and students that architecture is labor-intensive and lacking in rewards. While looking for a job, I found very few practitioners willing to give advice on securing a position in the field I had sold my soul to in college. Upon completing the Intern Development Program, I spent my meager savings on the application to take the A.R.E. I soon discovered that I was not ready to take the exam, having spent much of my internship drawing stair and toilet details.

I worked for five firms before I found an office that cares about intern development. The firm has motivated me to learn and be excited about the field I came to love as a student. I hope that architecture's practitioners, educators, and interns will take it upon themselves to motivate the up-and-coming creative thinkers to succeed, grow in the field, and reap its rewards. Belittlement, outrageous exam prices, long work hours, and lack of support will have a negative effect every time.

—Stacy L. Rudd, Assoc. AIA
Austin, Tex.

I am a 1996 graduate of a professional degree program. To go through architecture school in the United States is to have a violent passion for the importance of the built environment. You couldn't keep me out of the field if you tried. However, a formal license to practice architecture is irrelevant in terms of my ability to have an impact on the built environment. Two years at any MBA program would provide a stronger foundation for that impact than would a three-year internship and a demonstrated ability to move some icons around

on a computer screen. I say this with the utmost respect and passion for design and construction.

While our profession's economy cannot absorb the roughly 4,500 graduates every year, it seems to me that the AIA would welcome that kind of potential increase in membership. The AIA should work to keep those graduates as articulate representatives of the profession in whatever way they choose to contribute to it. Instead, the AIA relies on NCARB to determine its pool of potential members through an Internship process that keeps the institute at arm's length.

As Morgan says, "The educational environment," presumably including internship, "drives away the very people who could implement change." The AIA needs to separate Intern and associate issues. It shouldn't label associates second-class citizens, but should, instead, give them decision-making power and representation in the institute. Let the public know that we recognize the diversity necessary to function in the 21st century.
—Cassius Pealer
New Orleans, La.

From NCARB's perspective

I would like to address the advantages of the computerized A.R.E.

The fundamental advantage of the computerized exam is its reliability. The Computer Mastery Testing method, developed by ETS, reduces what was once a gray area to a clear line separating candidates who pass from those who fail. The increased reliability reassures NCARB's member jurisdictions that new registrants have demonstrated entry-level competence, and it tells candidates that they have been assessed fairly. Other benefits include faster delivery of exam results and more opportunities to take the exam at a greater number of sites. Furthermore, the new exam closely resembles the way architects practice. Drafting skills were required to complete the graphic divisions of the pencil-and-paper exam, but as our profession increas-

ingly embraces computer technology, fewer candidates tend to master drafting skills. (A practice disk helps testers who are not computer-fluent.)

Not only are these advantages expensive to implement but the number of test takers has been far below the figure we had projected. Whatever the reasons (exam fees, delayed completion) for this shortfall, the loss of income is affecting our budget for future exam development, and we are concerned that the natural growth of the profession is being stunted. All architects have a stake in seeing that the transition from the old exam to the new is clearly the way to go.

—Ann R. Chaintreuil, FAIA
President, NCARB
Rochester, N.Y.

A slap in the face

Frank Gehry's Guggenheim Museum in Bilbao [October, pages 74–87] is either a great building or its critics aren't getting much press. I expect the latter is the case. The museum looks like a giant chain mail-clad hand slapping Basque tradition and culture in the face.

It is possible both to respect the past without mimicking it and to make advances in architecture while working within a traditional architectural language. Gehry has seemingly imposed his own vision on the project without any consideration for regional traditions. Is this building ushering in a new architecture for the 21st century or is it a huge, crumpled titanium can littering a provincial Spanish city?

—Richard Battaglia, AIA
Portland, Oreg.

Risky business

Mark C. Friedlander's article on design-build [September 1997, page 20] neglects to fully discuss the issue of risk. Many architects feel that they are hindered from embarking on design-build ventures by the stringent requirements of their licensing bodies. They don't want to recognize that the main limitation is their inability to fund risk.

The author's suggestion that risk is minimized by laying it off on the general contractor is naive and involves the assumption that architects can con clients into letting us undertake the project as consultants. We would then choose a contractor who will do half the front-end work and take all the back-end risk and pay us a fee for the introduction.

—Martin M. Poizner, OAA, FRAIC
Toronto, Ontario

When and where

Thank you for featuring modest residential remodeling projects in your November 1997 issue. There were, however, two inaccuracies in the article on the Follows Residence [pages 122–23] in the Silverlake district of Los Angeles. First, the Northridge earthquake occurred in 1994, not 1993. Second, the article states that "the house is only two blocks from the site of the recent L.A. riots." This is not true. The "site" of the 1992 civil disturbance is several miles south of Silverlake.

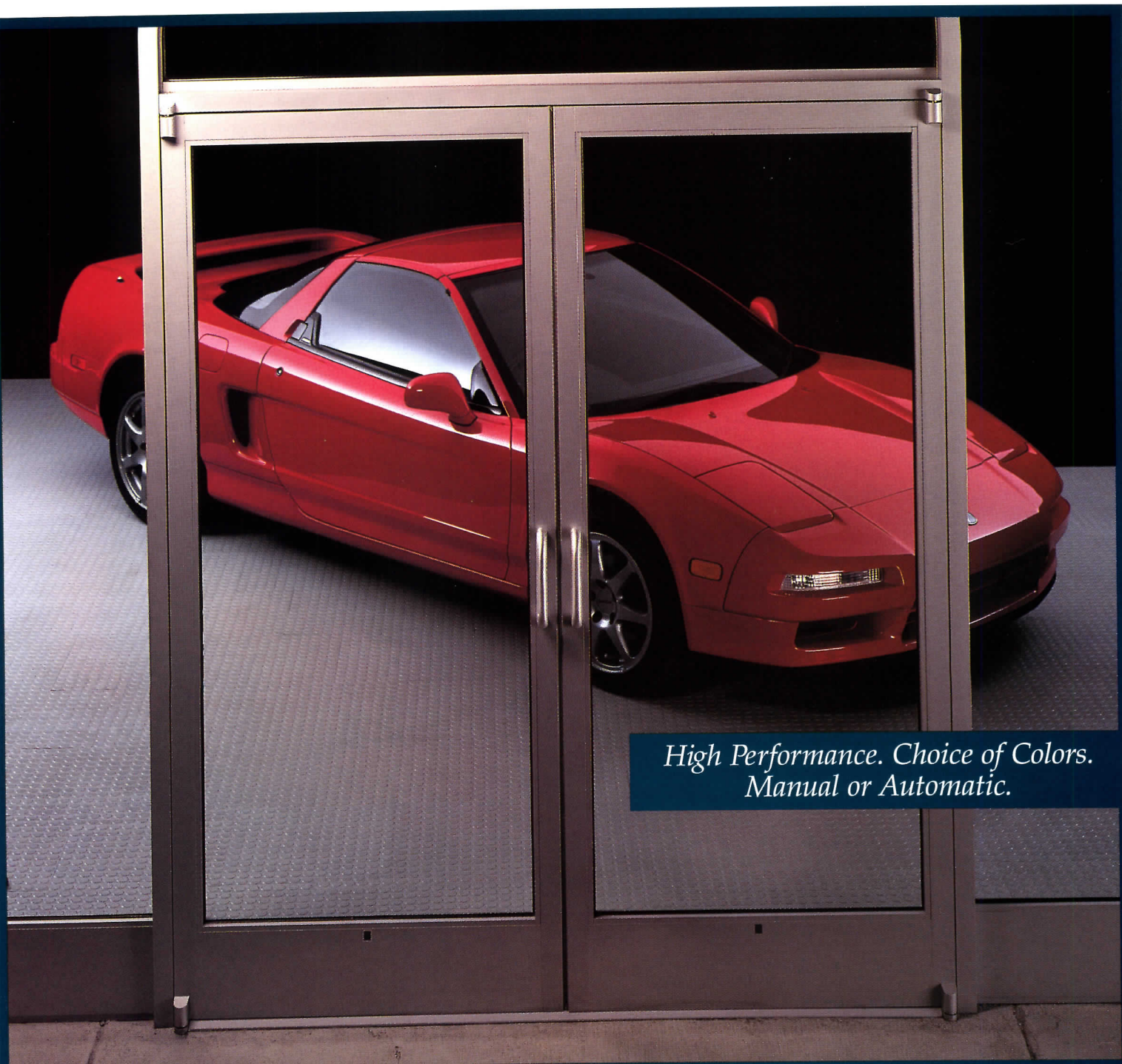
—Steven Owen Paige
Los Angeles, Calif.

Credit due

As the general contractor for the Flying Fish Café [November 1997, pages 153–55] at Disney Boardwalk in Orlando, Florida, I am proud to see the project receive the recognition it deserves. But I take exception to the project credits. McDevitt Street Bovis is listed as general contractor. This firm was facility contractor for the Boardwalk development, with the exception of four tenant spaces. Jack Jennings and Sons, Inc., served as tenant general contractor for the Flying Fish Café and three other projects.

—Howard Long
Jack Jennings and Sons, Inc.
Orlando, Fla.

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LEE W. WALDREP



*Lee W. Waldrep is assistant dean for academic affairs in the College of Architecture at the Illinois Institute of Technology. He graduated with a Master of Architecture from Arizona State University and completed a doctorate in counseling and student development at The American University. Waldrep is currently writing a book entitled *Becoming an Architect: From Legos to Licensure*.*

If a young person who wanted to be an architect sought your advice, what would you do? Would you encourage him or her by sharing the positive aspects of the profession—the creativity and variety it offers, in addition to the opportunity to improve the quality of life by affecting the built environment? Or would you highlight the negatives—five to seven years of schooling, a minimum three-year internship, a daunting licensing exam, and long hours with low pay?

As an educational administrator, I meet aspiring architects every day. I encourage them wholeheartedly, providing them with the statistics and resources they need to make an informed career choice. I tell them that for trained architects, opportunities abound. An architectural education can be the springboard to a variety of careers.

Statistics from the United States Department of Labor project that by 2005 the number of positions available to architects will increase by 25,000 to a total of 121,000 jobs. National Architectural Accrediting Board (NAAB) statistics indicate that by 2005 there will be 60,000 graduates vying for those 25,000 positions. Based on these numbers, we should immediately shut down half the architectural degree programs before supply overwhelms demand.

But consider this: According to 1991 American Institute of Architects statistics, one-sixth (more than 8,000) of AIA members indicated that their primary professional activities were outside an architectural firm or private practice. Both

the AIA and the American Institute of Architecture Students (AIAS) emphasize alternative careers for trained architects. In *Career Options: Opportunities through Architecture*, the AIAS lists more than 100 disciplines where architecture graduates can apply their skills.

As an architect, you may have colleagues who are earning their livelihoods in related fields. In fact, you may be one who has entered a field that builds on your education as an architect. In the spring issue of its college newsletter, Texas A&M University profiled two graduates who capitalized on their education as architects, one to become an Air Force instructor and one a sculptor.

Anecdotal estimates suggest that only 50 percent of graduates enter the profession and become licensed architects. If this is true, we should not be worrying about closing down architecture programs. Rather, we should be finding ways to show graduating architecture students how their hard-won skills can contribute to success in a variety of fields. Conversely, our schools and professional organizations should be networking with other professional and business groups, informing them of the broad, creative, problem-solving skills that trained architects possess. One need not become a licensed, practicing architect to make a contribution with these skills.

One resource designed to help future “educated-as-architects” graduates is *Careers in Architecture: Choices, Pathways, Success*. Published by the AIA, this book devotes a full chapter to “looking

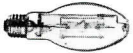
beyond architecture,” highlighting careers in landscape architecture, interior design, lighting design, acoustical design, engineering, construction, urban and regional planning, environmental and behavioral research, and architectural history, theory, and criticism. As the chapter concludes, “the bottom line is that the building enterprise is an exceedingly broad field; the possibilities are endless.”

So the next time a young man or woman comes to you inquiring about becoming an architect, you can feel confident giving him or her your complete encouragement. We need more architects who are not architects. As Leslie Kanes Weisman of the New Jersey Institute of Technology recently said, “Architectural graduates are in command of the powerful problem-defining and problem-solving skills of a designer. I am certain that they will be fully capable of designing their own imaginative careers by creating new definitions of meaningful work for architects that are embedded in the social landscape of human activity and life’s events.” ■

Contributions: *If you would like to express your opinion in this column, please send submissions by mail (with a disk, if possible) to Speak Out, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail to rivy@mcgraw-hill.com. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive final text approval.*



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CIRCLE 11 ON INQUIRY CARD

MENTORS *A director of information technology asks how to gain firmwide acceptance of rapid and frequent digital changes.*

Linda Joy Weinstein, AIA, is president and principal consultant of CYBER-architecture, a technology change agency. She is currently serving as chair of the AIA's national computer-aided practice PIA. She can be contacted via E-mail at cybertec@csi.com.



As the director of information technology in a large architecture firm, I see a divergence of acceptance of new and even mainstream computer technologies within the company. Our strategic technology plan calls for a great deal of change, including the adoption of several new systems. Keeping in mind that the effective life of most hardware and software is 18 months or less, how can my IT team implement these changes firmwide yet maintain a level of comfort for our end users—the staff?

—John Collier, Director of Information Technology
Ehrlich Rominger Architects
Los Altos, Calif.

Linda Joy Weinstein, AIA, responds: You already took the first step on the road to digital calm when you developed a strategic technology plan (STP). This road map should clearly audit where you are now and what measurable objectives you want to achieve, and should align with your firm's core values, service philosophy, and business plan. The STP is not a static document but rather a framework that will allow you to evolve and refine your strategy at regular intervals. The STP requires you to assess your mission, your shared vision, and the comfort levels of the key people involved.

In order for you to demonstrate the value of technology in your firm, processes such as introducing new systems, implementing and mainstreaming them, and cycling out software and hardware need to

become fundamentals of your department. The repercussions of a poorly managed software/hardware life cycle can be quite costly for design firms. Continuously track performance and measure improvements in your practice and service to your clients. Flag areas where your plan needs to evolve.

We all know that change is painful. Economist J. M. Keynes's words still ring true a half-century later: "The real difficulty in changing the course of any enterprise lies not in developing new ideas but in escaping from old ones." Architecture firms are made up of people, and people have expectations. People expect that any changes you plan to make will be difficult and will leave them with less power. Try to manage their expectations and allow them a sense of comfort in letting go of old programs and processes.

Following are some points to consider as you plan:

Training and retraining

Remember your superusers, the staff members who know computer technology well. They are a powerful asset in helping peers and in establishing a strong support system. Centralize training. Accumulate a body of learning that can be used as a consistent reference.

Inform and be informed

Help your users understand how important their knowledge is in transforming raw data into information. Understanding how their work affects the rest of your firm is critical. Inform everyone of impending changes and be specific about how

you will help them through those changes. Don't hold back information from your staff on what is at stake here. It costs a lot to keep trailing-edge technologies in place. Measure progress and let them know how their efforts in embracing new methods and systems have improved the whole firm.

Balance power and knowledge

To insure management's buy-in and support, confirm that your strategic technology plan aligns with the firm's business plan. New tools should provide staff members with better information, empowering them to make decisions. IT and firm management need to let go. Encourage people to utilize their new abilities by making decisions themselves and taking responsibility. To lead this process of change, you must support this process of change.

Assessing your technology and core values may be simple enough for you to execute, but other aspects of your technology plan may require input from a consultant. You are making a significant investment in information technology, and a consultant can bring rapid insight to your team. ■

Questions: *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail to rivy@mcgraw-hill.com. Submissions may be edited for space and clarity.*



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CIRCLE 12 ON INQUIRY CARD

PULSE RECORD readers were asked:
Should more architects lead design-build teams?

YES: 90%

NO: 10%

Yes: This month's question brings to mind an article I wrote for *Fine Homebuilding* in 1987. Here's an excerpt: In design-build ventures, "the design process is extended onto the site, and we are able to avoid the locked-in mind-set that governs most building projects once they are committed to paper. Throughout the construction process, we can adapt the design to whatever exigencies arise. In this way, the architect-builder becomes part of the drama that unfolds as a structure grows and assumes its many-faceted character. [The] process results in a more appropriate product."

—Steve Badanes
Jersey Devil
Palm Springs, Calif.

Yes: Design-build is, I believe, the most effective way to meet clients'

aesthetic and functional needs, especially in residential work, and it offers architects an opportunity to provide enhanced services and increase profits. As the owner of a design-build firm, I have found that construction-cost estimates can be provided to clients much earlier in the process. What's more, with an intimate knowledge of the design intentions, my firm is better able to value-engineer a project without compromising its integrity.

—Michael Pagnotta, AIA
Ship Bottom, N.J.

Yes: The person leading a team should have a vested interest in the outcome of a project and be familiar with the design intentions. This is not always the case when nonarchitects are in charge. I am constantly dismayed by the way architects relinquish their responsibility for a

project to others. If an architect doesn't have faith in his or her own abilities as a master builder, why should anyone else?

—Michelle Balfourt, Architect
Fort Lauderdale, Fla.

Yes: I believe that design professionals have allowed the construction industry to steal too much of the design process. Contractors often use "construction management" to control the design process, limiting the designer's contact with the client and risking the liability of the design team. I believe that construction managers try hard to avoid the issue of liability. If designers must assume liability for their projects, they should be in the lead position.

—Mitch Miller, ARA, CDT
Batten Architects
Bethlehem, Pa.

No: As stated, this month's question is too simplistic. It does not acknowledge the complexity of the issues involved in design-build. Size, location, and organizational structure are among the major factors in a firm's suitability to take on the lead role in a design-build situation.

My feeling is that architects typically do not have the fiscal resources or the day-to-day construction management experience to lead design-build teams. This is often a consequence of a given architect's education, experience, and disposition. Our schools do little to help architects learn how to use a hammer or hang drywall, for example. Contractors, on the other hand, tend to have hands-on experience in the building trades.

—J. Michael Bergen, AIA
Architecture+
Troy, N.Y.

This Month's Question

Should state governments require continuing education for licensure of practicing architects?

More and more state governments now require continuing education for maintaining a license to practice architecture. Currently five states—Alabama, Arkansas, Florida, Iowa, and Kansas—require continuing education, and Louisiana maintains a voluntary system. As of the year 2000, two more states—Tennessee and South Dakota—will require it. The trend is growing, with at least 24 states seriously weighing legislation.

Should state governments require continuing education for licensure of practicing architects? Yes No

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YOSHIO WHO? MOMA'S NEW ARCHITECT

What is likely to be the most prominent American architectural commission of the next several years has been awarded to Yoshio Taniguchi, an architect who is little known outside his native Japan. On



December 8 the Museum of Modern Art (MoMA) in New York City unveiled Taniguchi's preliminary design for an expansion, which may ultimately more than double the museum's current 73,000 square feet of exhibition space.

Taniguchi was chosen after a controversial 18-month-long selection process. The museum conducted a worldwide search, then

invited 10 architects to submit conceptual design ideas. The list was then winnowed to three: Taniguchi, Herzog & de Meuron, and Bernard Tschumi. After further design work, museum trustees and staff selected Taniguchi's scheme. The architect "demonstrated exceptional creative vision," says museum chairman Ronald S. Lauder.

An exhibition of the 10 finalists in 1997 was derided as inscrutable, but the complexities with which the competitors struggled came out of a directive to do nothing less than "rethink the idea of the Museum of Modern Art," according to Glenn D. Lowry, the museum's director.

Taniguchi has made a reputation in Japan as a designer of museums of austere grandeur, many of them for private clients. His work includes the Nagano Prefectural Museum (1990), the Marugame Genichiro-Inokuma Museum of Contemporary Art (1991), and the Toyota Municipal Museum of Art (1991-95). He was trained at Harvard's Graduate School of Design as well as Keio University.

FUNDS FOR FEDERAL BUILDINGS CUT Congress was rough on funding for federal buildings in fiscal 1998. Lawmakers sharply trimmed construction programs at many agencies.

A grim picture emerged at the General Services Administration (GSA), which will receive no funds for new construction in 1998. Last year, GSA got \$658 million. The Bureau of Prisons' facilities account was sliced by 36 percent to \$255 million. The Department of Veterans Affairs saw its construction budget chopped by 29 percent to \$178 million, although it did receive \$4.3 million for advanced planning and \$3.5 million for design of future projects.

Though funding for these bellwether programs is down, there are bright spots. The National Park Service construction budget was raised by 8 percent to \$215 million, including \$15 million for planning. And the State Department will get \$9.5 million to design a new U.S. embassy in Jerusalem.

Other agencies that traditionally have not been big builders are becoming more active, according to Stuart Binstock, the AIA's vice president for federal affairs. He cites the National Institutes of Health, where a massive renovation and expansion of the Clinical Center is under way. Said Binstock, "The market has shifted, and our members who do federal work are keenly aware of that." *Tom Ichniowski*



Taniguchi was the least known of the competing architects, and the MoMA addition will be his first project outside Japan. Herzog & de Meuron, based in Basel, Switzerland, has built an international reputation for projects of almost childlike minimalism [RECORD, May 1995, pages 84-91]. Bernard Tschumi, a Swiss-born architect who is dean of Columbia University's architecture school, is best known for his Parc de la Villette, in Paris. [See pages 86-95 for more on Tschumi.]

The MoMA job is so complicated because both the program and the site are complex. The Museum Tower, which Cesar Pelli completed in 1984 along with an addition and reorganization of the museum, stands squarely between the site the museum acquired and its existing buildings. Taniguchi has wrapped the tower with most of the major galleries, including those for MoMA's permanent collection. Reflecting a renewed commitment to the art of the present, the design directs visitors first to galleries

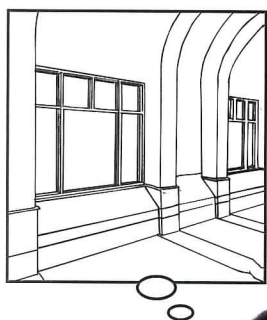
featuring contemporary art.

Taniguchi will remove the escalator lobbies Pelli added to the museum, returning the original 1939 Philip L. Goodwin and Edward Durrell Stone building to its former relationship with Philip Johnson's 1952 sculpture garden.

While little of Pelli's remodeling of the museum will survive, Taniguchi's design inserts the vertical circulation into Pelli's tower and slips an atrium around it, which has the curious result of making the tower visually freestanding for the first time and thereby more prominent (photo above). The new galleries will be larger and taller; required zoning setbacks are claimed as skylights, offering a mix of "white cube" and naturally lit galleries. A 1964 addition by Johnson will be retained, but another 1952 addition will be sacrificed.

The museum has not yet finalized the size or budget of the project but expects to complete the building in time to celebrate its 75th anniversary in 2004. *James S. Russell*

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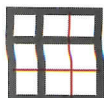
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CIRCLE 15 ON INQUIRY CARD



BUTTERFLIES FLUTTER BY IN NEW GLASS CONSERVATORY

Just a few miles down the road from the honeymoon haven of Niagara Falls, Canada, is a welcome antidote to the kitsch of this border region: the Niagara Parks Butterfly Conservatory, which is located in the Botanical Gardens of the Niagara Parks Commission. Designed by Baird/Sampson Architects of Toronto, the 11,000-square-foot home for butterflies is the largest facility of its kind in North America.

The expressive glazed steel structure, a contemporary cousin of the Victorian glass house, perches on a terraced Warton limestone podium, which subtly invokes the exposed strata of the nearby Niagara Gorge.

Thousands of butterflies—some raised on-site, others brought in as chrysalides from Mexico, the South Pacific, and other butterfly conservatories—are regularly released into the display environment through a glass “emergent case” that is visible to the public. The butterflies can be viewed in flight up close from a meandering pedestrian path, which wends its way through a simulated tropical

environment past a dramatic 30-foot waterfall.

The 52,000-square-foot program also includes a 200-seat auditorium, presentation rooms, 17,500 square feet of greenhouses, and a service building containing laboratories and teaching facilities. The \$9 million facility has already proven a huge financial success. Attendance at the conservatory exceeded expectations by 40 percent in the first 11 months of operation. *Beth Kapusta*

CHARRETTE PROMISES RENEWAL FOR MIAMI'S 'DECORATOR'S ROW'

Miami's Design District is finally rebounding from a two-decade-long decline. Buyers flocked to this once flourishing “decorator's row” for furniture, tile, and textiles until a plague of urban ills forced the showrooms to move out. Most headed about 25 miles north to an expressway-handly complex in the Broward County town of Danian.

Now a new community-based plan developed by the Miami firm of Duany & Plater-Zyberk (DPZ) holds out promise for renewal. The plan was developed during a six-day charrette—an intensive workshop pioneered by DPZ—that drew hundreds of participants to the Design District in late October. Elizabeth Plater-Zyberk, who is also dean of architecture at the University of Miami, led the effort to forge a new physical identity for the district with recommendations for height limits

and setbacks. The charrette was unusual in that the planning area was expanded to include an additional 20-block stretch of Northeast Second Avenue, incorporating the main business district of Miami's Little Haiti.

The idea for the charrette came from Craig Robins, who owns the district's most significant historic building, the newly restored 1921 Moore Building (below), as well as 11 other structures. A lawyer-turned-developer, Robins has been influential in restoring Miami Beach's Art Deco district, particularly in projects done in tandem with Island Records' Chris Blackwell. Robins's hope is to give the Design District, where to-the-trade-only businesses have long dominated, a new identity as a showcase for artists, designers, and craftspeople that is open to all. *Beth Dunlop*



THROUGH THE LEIPZIGER LOOKING GLASS An up-and-coming team of young architects has done what most only dream of: they have won a major urban commission in an international competition. Their solution challenges the avant-garde in a country known for daring design.

The boisterous Berlin firm of Hufnagel Pütz Rafaelian Architects solved the riddle of how to build a museum of fine arts in the city of Leipzig, Germany, that is free of hackneyed historicism yet responsive to 1960s postwar renewal. Their method is material.

A glazed cube is planned to peek out over the rooftops of the city. First transparent, then matte, then glittering, it will house one of Germany's most important painting collections. The designers combined classical urban design with titillating translucency, squeezing the museum into a tightly hemmed-in urban fabric. The firm's proposal sets up a sensible hierarchy for future development, with the museum occupying the city's top architectural echelon like a modern-day, crystalline cathedral. Says Michael Rafaelian, “The city will assimilate the museum just as it did the medieval churches centuries ago. It will become the veritable kernel of urban life.”

The firm's long-term involvement in the project will depend on its ability to accommodate small-scale shops around the museum's perimeter, making it a fully integrated cultural quarter, not just an isolated architectural island. *Claudine Weber-Hof*

DENVER ARCHITECT STRIVES FOR PUBLIC BUILDINGS THAT OPEN THE MIND

In 1992 Denver architect Michael Brendle, AIA, was asked to turn a drab, 1960s branch library—called “the mausoleum” by some patrons and workers—into a place that people might actually want to visit. In his bold, industrial-inflected redesign for the Ross Cherry Creek Library, Brendle created a new facade with glass-block windows, exposed trusses, and colorful geometric forms (right). Attendance at the library, in an affluent shopping district, has increased ever since, and Brendle's redesign has won several awards. (Michael Brendle Architects was named 1997 Firm of the Year by the AIA's Western Mountain Region.)

Working primarily in the public realm—designing libraries, schools, churches, and recreation centers—Brendle has brought postmodern aesthetics to Colorado, not known for its embrace of assertive Mod-

ernism. But Brendle insists he isn't out to shock, even as he strives for architecture that “opens the mind.”

“I want people to sit up and take notice,” he said, “but I hope they feel comfortable in my buildings.” Most public buildings, he believes, have just the opposite effect. “They're not fun,” he says. “They're not enjoyable buildings to be in or go to. They take themselves way too seriously.”

Brendle is currently working on several Colorado projects: public libraries in Fraser and Lafayette; an events center at Northeastern Junior College in Sterling; an environmental learning center at Colorado State University in Fort Collins; a roadside tourist center near Trinidad; and a library remodeling in Littleton. The firm was recently commissioned to design its first out-of-state project, a new public library in Johnston, Iowa. *David Hill*



PSFS, A MODERNIST ICON, TO BE CONVERTED TO A HOTEL One of the most daring skyscraper designs of its time, the 1932 PSFS building, in Philadelphia, is slated to be converted from corporate headquarters to a 585-room hotel. Designed by George Howe and William Lescaze, it was a key building in the development of a uniquely American approach to Modern architecture—innovative in wiring, glazing, and air-conditioning—and one of only two American skyscrapers included in the Museum of Modern Art's pioneering 1932 International Style exhibition.

The building's small floor plates—on the order of 8,000 square feet—are regarded as more suitable to a hotel-room layout than to office space. PSFS is near the successful new convention center, which has created a room shortage. Also, the building, the Philadelphia Saving Fund Society's headquarters until its collapse in 1992, is empty. But conversion to a hotel may be far from an ideal future for the landmark. Everything from the Bauhaus-inspired Cartier clocks on each floor to the furnishings in the banking hall were conceived as a unified design. Its machined detailing and crisp elegance bespeak a place of work, an aesthetic fundamentally at odds with the domesticity aspired to by hotels.

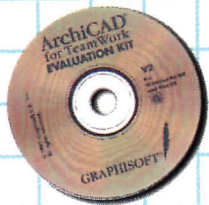
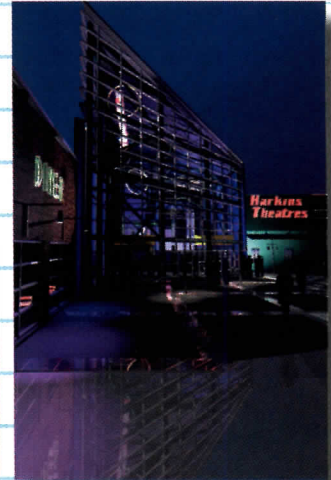
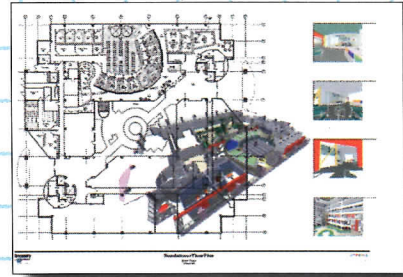
The developers, Philadelphia-based Preit-Rubin and the Loew's hotel chain of New York City, have hired Bower Lewis Thrower as architect and Daroff Design as interior designer. Both are well-established Philadelphia firms, but neither has a track record in the sensitive reinterpretation of such a prominent landmark. The design is not finalized; indeed, a number of issues, such as a proposed addition and the mounting of a Loew's sign along with the famous PSFS sign that crowns the building, are under negotiation with the local landmarks board.

Among the great interior spaces that will require alteration are the three-story banking hall, which will be remade as a banquet space. A rooftop board of directors suite—which until the collapse of the bank was intact down to its original architect-designed furnishings—will house catered events. The conversion has attracted little protest in the local historic preservation community. But once the design is made public, it will certainly be scrutinized intensely. *James S. Russell*



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CIRCLE 16 ON INQUIRY CARD



NATIVE TRADITIONS BUILT INTO HEALTH CENTER DESIGN

A healing circle and a sweat lodge will be incorporated into the design of a community health center being built for the Mi'kmaq aboriginal community at Eskasoni in Cape Breton, Nova Scotia. The \$8 million project for the Eskasoni Health Care Commission is the first in the province to embrace traditional First Nations healing practices.

A specialist in health-care-facilities architecture, William Nycum & Associates of Halifax, developed the program and master plan. The 35,000-square-foot single-story structure is slated for construction in mid-1999.

A circular area at the health center's approach will be used for ceremonies to contact the Great Spirit; Mi'kmaq lore holds that the power generated in the circle will promote healing. The area will be surrounded by alder, hemlock, and juniper trees.

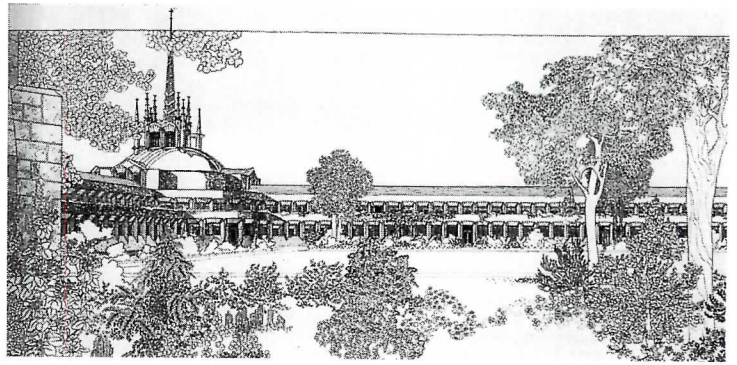
Mi'kmaq shamans will share

offices in the health center and their herbal medicines will be stored on site.

The center will accommodate all the primary care needs of the 3,300 Eskasoni Mi'kmaq, including ambulatory care, emergency services, social work, health promotion education, and community health services. The center also will house 28 beds for long-term care.

A dome-shaped sweat lodge built from wood with the bark side out will stand behind the main structure. Heated by a fire pit at its center, the sweat lodge is designed to hold 12 people. Its main entrance will face the rising sun at the summer solstice.

Project manager Jim Torbert said that the design principles guiding the project include the seasonal cycles, natural materials, the earth, natural light, the circle, animal lore imagery, and the river as the course of life. *Andrew Safer*



WALTER BURLEY GRIFFIN: INSPIRATION TO THE PRAIRIE SCHOOL

Frank Lloyd Wright's last major public building, the Marin County Civic Center (1957), is a knockoff of Walter Burley Griffin's first Australian building, Newman College, built in Melbourne in 1915 (drawing above). Wright and Griffin (1876–1937) both designed a seemingly endless colonnade of arches reaching toward a low-slung dome and contrasting spire. Visual energy courses along the colonnade to distill at the dome and explode heavenward up the

spire. This dynamic made Wright's building serve perfectly for the establishing shot in the 1997 future-world thriller *Gattaca*. But hardly anyone had ever heard of Griffin's wonder—or Griffin.

Until last October, that is, when the school of architecture at the University of Illinois, Urbana, held a three-day symposium on Wright's former assistant aimed at establishing this Prairie School designer as an architectural force in his own right. The conference covered Griffin's work on three continents—the United States (1906–13), Australia (1913–35), and Northern India (1935–37).

Several presentations explored a Prairie School surprise: the strong religious and spiritual currents that run through much of Griffin's work. The Stinson Library (Anna, Illinois) is at once temple, rune, and altar. Griffin's competition-winning design for Australia's capital, Canberra, is arrayed like a cosmic mandala, and his late designs employ many Hindu forms.

The conference organizer, professor Paul Kruty, suggests that the lesson for contemporary architects is that decoration can be seamlessly incorporated into a formalist aesthetic.

Next October a second conference on Griffin will be held at the University of Melbourne. At the same time a documentary on the architect by PBS producer Alison Davis will be released nationally as a companion to Ken Burns's PBS series on *Wright*. *Richard D. Mohr*

“LATTELAND” IS VIEWED THROUGH “BEANTOWN” EYES In a twist on regional AIA awards programs, Seattle recently assembled a jury of architects from Boston. The result: recognition of projects that go beyond skin-deep beauty to focus on issues architects are grappling with in both regions.

Jurors M. David Lee, FAIA, Sheila Kennedy, AIA, and Robert Campbell, FAIA, reconstructed their decision-making process for an audience of 800 local architects—including mayor-elect Paul Schell, Hon. AIA. Individual projects became the starting point for an often humorous discussion of larger themes.

One hot topic was the search for authentic regional design. “Boston is slowly converting itself into ‘Bostonland’ in the rush to commodify its past,” said Campbell. To avoid the same pitfalls, the jury cautioned North-

west architects to move beyond “fetishized” wood details to address Seattle’s identity as a regional center.

Five of the eight merit awards highlighted urban design issues such as stimulating downtown housing and creating new civic spaces. Hewitt Isley won merit awards for two mixed-use waterfront projects, the Bell Street Pier and the Harbor Steps Apartments. According to Lee, these projects treat downtown not as “a sick patient awaiting resuscitation” but as a vibrant place to work and live.

George Suyama Architects was honored for a design that combined office, retail, and gallery spaces (left). It was praised for the deft handling of its urban facade, a restrained material palette, and creative programming. It also answered the jurors’ call for a little more “grunge” as an antidote to the treacly niceness of Seattle architecture. *Sheri Olson, AIA*





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CIRCLE 17 ON INQUIRY CARD

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PARTICIPATION CONTINUES TO GROW IN CANSTRUCTION FOOD DRIVE

In 1992 the first CANstruction food drive was held in Seattle, with architects creating a spontaneous exhibit from the cans collected: a topographical map of Washington State.

One year later, New York and Denver turned CANstruction into a design-build competition and CNN covered it. By the next year, with John F. Kennedy, Jr., hosting the



Top and above: two designs created by New York City firms for the 1997 CANstruction competition.

awards ceremony in New York City, CANstruction was officially a major event. Nineteen cities and hundreds of architects participated in CANstruction 1997, sponsored by the American Institute of Architects and the Society of Design Administration.

In New York City, 31 firms competed. Their colorful, whimsical, startlingly realistic designs, using 50,000 cans in all, included a fish

leaping out of water; a bed complete with headboard, footboard, pillow, quilt, and nightstand; and a classic Ford convertible with running board and whitewall tires.

Cheri C. Melillo, from Butler Rogers Baskett in New York, is the force behind CANstruction's rapid expansion. As soon as she heard about the Seattle food drive, Melillo envisioned what it could become: architects predesigning projects, selecting cans to fit the projects, and executing their ideas for awards in competitions around the country—with the biggest winners being 30 million hungry Americans.

She had no doubt that the design community would jump aboard. "These people live to compete," says Melillo, who is now chairperson of CANstruction. "They compete all day in design competitions—to build the museum, to build the new city hall."

Long Island, with more than 7,000 cans, joined this year. Cincinnati was another first-time entry, with 19,000 cans.

In Seattle, organizers turned away firms for want of space. They're looking for a bigger venue for next year. In the meantime, slides of regional winners will go this spring to the AIA/SDA convention in San Francisco, where a national winner will be chosen. *Debra Morgenstern Katz*

DRAMATIC ROTUNDA FORMS 'VILLAGE' CENTER OF AFRICAN AMERICAN MUSEUM

Children smile when they enter Detroit's newest museum. It's not a children's museum, yet it captures their attention. And that's exactly what Sims-Vapner Architects and Associates set out to do when they designed the Museum of African American History—the largest museum of its kind in the world.

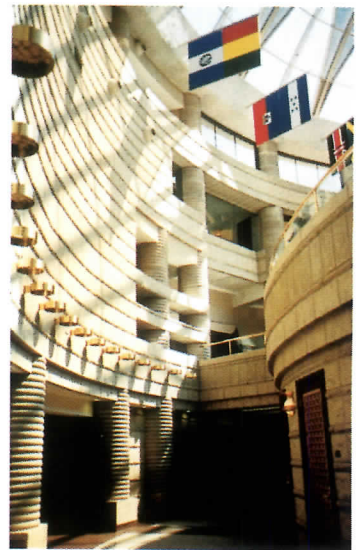
The \$38 million circular structure opened in April 1997. The 120,000-square-foot building, which is owned by the city, is located in Detroit's cultural center, near the Detroit Science Center and the Detroit Institute of Arts. The construction manager for the project was Jenkins/Turner, a joint venture.

A 400-piece, 100-foot-diameter glass dome is the design's focal point. The dome arches over the lobby and features a traditional African hut and flags of African nations along its base; the lobby floor is embellished with a terrazzo design by artist Hubert Massey. Harold A. Varner, FAIA, says the rotunda is a gathering place that's like the center of an African American village. Coleman A. Young, Detroit's mayor for 20 years, lay in state in the rotunda after his death in November.

Museum President Kimberly Camp said that plans for the new museum began when Young decided five years ago that the museum needed a larger space.

In addition to three exhibition galleries, a theater, and classrooms, the museum houses a research library, a restaurant, and the Coleman A. Young archives. *Susan R. Bleznick*

The glass-domed rotunda of the Museum of African American History, designed by Sims-Vapner Architects.



TRAINING MASTER MASONS The urgent need for masters of the trowel trades was underscored by the recent renovation of the 100-year-old Thomas Jefferson Building of the Library of Congress in Washington, D.C. Much of the nearly four acres of marble covering walls, piers, staircases, and floors in the 326,000-square-foot Book Palace, as it is known, had deteriorated after a century of use.

Many of the skilled craftsmen who worked on the nine-year restoration belong to the International Brotherhood of Bricklayers and Allied Craftworkers. The union's International Masonry Institute (IMI) sponsors a national training program for these tradesmen, including a 12-week program in stone and terrazzo work.

The need for training is increasing as big projects like airports and schools use terrazzo and mosaic, said William "Butch" Rovder, the union's stone director. A return to the use of stone and mosaic has revealed a shortage of craftspeople in some parts of the country. But the IMI hopes to rectify the situation. In addition to its 12-week residential program, the institute runs a customized, mobile training center. The IMI also trains younger workers. When students leave the comprehensive program, "the majority can work on a project alongside a master craftsman," says Rovder. *Sherie Winston*

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NEWS BRIEFS

Recent grads face salary gender gap A survey of architecture and interior design students shows a significant gender gap in entry-level pay among those who secured positions upon graduation. In architecture, the starting salary for female graduates was, on average, \$1,600 less than the salary of male graduates. Female interior design graduates received about \$2,000 less than their male counterparts, despite constituting nearly 90 percent of the graduating class. The survey is part of a larger, ongoing study, conducted by professors Ann Black and Anton Harfmann at the University of Cincinnati, that will follow the career paths of approximately 500 graduates of architecture and interior design programs.

Huge casino opens in Sydney Star City, a 2.1-million-square-foot casino and entertainment complex, opened in November 1997 at the



Star City, Sydney, by the Hillier Group and Cox Group.

site of a former wharf on Sydney's Darling Harbor. The complex is the Princeton, N.J.-based Hillier Group's largest foray into entertainment architecture to date. Designed with Cox Group, an Australian firm, the \$600 million complex "celebrates the diverse Australian landscape" through the use of sandstone and the "fiery oranges, deep blues, and forest greens" of the Great Barrier Reef and the outback, say the archi-

tects. It is the largest building to be constructed in Sydney since the Opera House opened in 1973.

New chairman for National Building Museum Harold L. Adams, FAIA, chairman of the Baltimore-based RTKL Associates, has been named chairman of the National Building Museum in Washington, D.C., the second architect elected to that position since the museum's inception in 1980. Adams insists that the museum is not a museum of architecture but

a museum of everything and everyone that contributes to the built environment. A central effort of his three-year term will be to install a permanent exhibit entitled "The Building of America," which will take up the entire second floor. "This story is going to include architecture, of course," he says. "That's the sexy part of the story; lots of people are interested in it."

Latest Bhutanese addition in Texas For the new 130,000-square-foot Undergraduate Learning Center at the University of Texas, El Paso, university president Diana Natalicio demanded that the structure be built in the Bhutanese style. This follows a tradition begun in 1914 when, after reading an article in *National Geographic* magazine, the wife of the then university president realized how similar the foothills of the Himalayas were to the landscape of the UTEP campus in the foothills of the Franklin Mountains. The \$14 million building has

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the towers, arched windows, red brick banding, and decorative mandalas common to Bhutanese architecture. Architect David Albidrez says that the massing of Bhutanese architecture proved flexible enough to accommodate both large auditoriums and small classrooms.

No AIA Gold Medal In a recent vote, the AIA's board of directors failed to reach the three-fourths majority necessary to select a winner of this year's Gold Medal, the organization's highest award. This is the 40th time since the medal was first awarded in 1907 that no architect has been selected. Richard Meier, FAIA, received the award last year.

Connecticut firm wins South Korea's grand prize Tai Soo Kim Partners of Hartford, Connecticut, has received the South Korean Grand Prize for architecture for its 800,000-square-foot L. G. Chem

Research and Development Park in Daeduk. An elongated, three-story atrium serves as a circulation spine for the \$120 million complex, allowing sunlight even into facilities where the most secret research takes place, areas that in most buildings are sunlight-deprived. In the past, the firm primarily designed

L. G. Chem Research and Development Park, Daeduk, South Korea, by Tai Soo Kim Partners.



civic buildings throughout New England, but large-scale corporate projects in South Korea—the native country of its founding partner Tai Soo Kim, FAIA—now account for a majority of business.

Insurance rates drop Liability coverage costs for architectural and engineering firms dropped 22 percent over the last two years, according to a recent study by J&H Marsh & McLennan. This is due to higher competition among insurance providers and to fewer losses incurred by firms. Firms with more than 500 employees have benefited the most, with an average 49 percent drop in rates. Recognizing a good deal, firms have raised their limit of liability coverage by an average of 24 percent.

New Agnes Martin gallery A recently completed 6,000-square-foot addition to the Harwood Museum in Taos, New Mexico, will house seven new works by Mini-

malist painter Agnes Martin. Kells and Craig Architects of Albuquerque, who designed the \$1 million gallery, wrangled with town officials to allow a more contemporary exterior to join the traditional street facade; they eventually had to compromise. The interior space, which includes 2,000 square feet from the original building, presented an even greater challenge, as there was the danger of overwhelming Martin's subtly colored paintings.

Departure of Architecture editor Deborah Dietsch, who was editor-in-chief of *Architecture* magazine for eight years, has left the publication. No reason was given for her departure, though publisher Steve Donohue said it was related to moving the magazine from Washington, D.C., where it was founded by the AIA, to New York City to join other publications of its current owner, BPI Communications. Donohue indicated that a search was under way for Dietsch's successor. ■

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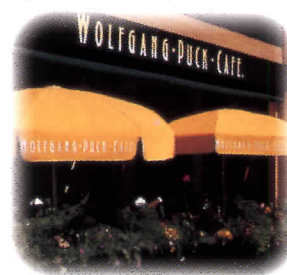
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CIRCLE 20 ON INQUIRY CARD

DATESEVENTS

Calendar

Architecture-Works by Gordon Matta-Clark

West Hollywood, Calif.

Through January 18

Eight architectural sculptures produced from 1971 to 1977 by Gordon Matta-Clark, the late artist (and architect by training). MAK Center. 213/651-1510.

Charlotte Perriand New York City

Through January 24

The career of this modernist, who began her career working with Le Corbusier and Pierre Jeanneret on interiors and furniture, is the focus of this retrospective. Furniture, lighting, and photographs are on display. Architectural League, Urban Center. 212/753-1722.

Harry Weese: The First 50 Years Chicago

Through January 31

A photographic retrospective of the Chicago firm's work. Also on view is "Chicago Union Station: After the Rush," showcasing the 1926 railroad terminal. Chicago Architecture Foundation. 312/922-3432.

Other Soundings: Selected Work by John Hejduk Montreal

Through February 1

The first retrospective of this major architect and thinker gathers together some 500 examples of his work, including drawings, models, books, and photographs from 1953 to 1997. Canadian Centre for Architecture. 514/939-7000.

The Bronx Community Paper Company

New York City

Through February 8

An exhibition chronicling the design of a state-of-the-art recycling plant and paper mill by architect Maya Lin. Municipal Art Society. 212/935-3960.

Philippe Starck Designs: Reinventing the American Hotel Philadelphia

Through March 1

A sampling of the French designer's objects and interiors, featuring everything from furniture to utensils. Also on view will be elements from a guest room at New York's Paramount Hotel. Philadelphia Museum of Art. 215/763-8100.

Signs and Wonders: The Lights of Times Square New York City

Through March 8

Actual signs as well as photographic records are on display in this exhibition tracing the development of technology and imagery in Times Square advertising. New-York Historical Society. 212/873-3400.

Zaha Hadid: Painted Projects San Francisco

Through March 10

The first solo museum presentation of the work of the Iraqi-born British architect includes two dozen paintings of cities and buildings in assemblages of exploded lines and planes. San Francisco Museum of Modern Art. 415/357-4000.

Robert Adam: From Sketch to the Finished Drawing New York City

Through April 5

An exhibition of the work of architect Robert Adam (1728-1792), considered the father of the Classical Revival in Britain, includes 65 drawings, models, objects, and books on loan from the Sir John Soane Museum in England. Frick Collection. 212/288-0700.

DX Permanent Collection Toronto

Through April 19

An exhibition of works in the collection by 20th-century Canadian industrial designers, including Jan Kuypers. Design Exchange. 416/363-6121.

Civics Lessons: Recent New York Public Architecture Washington, D.C.

Through May 11

Projects in New York City initiated by public agencies working with architects between 1985 and 1995. Organized by the AIA New York Chapter in conjunction with the New York Foundation for Architecture, the show emphasizes the link between public investment in architecture and the economic, social, and aesthetic quality of the city. National Building Museum. 202/272-2448.

Toy Town Montreal

Through May 31

An exhibition exploring how toys from several cultures have represented the village, town, and city. Twenty-six toy towns from the Canadian Centre for Architecture's collection—ranging from early 19th-century German wooden villages to recent CD-ROMs—are on display. 514/939-7000.

A. G. Rizzoli: Architect of Magnificent Visions New York City

January 17-March 8

Drawings by the late draftsman, including his vision for a mythical city, YTTTE (Yield to Total Elation). Museum of American Folk Art. 212/977-7298.

International Air-Conditioning, Heating, Refrigerating Expo San Francisco

January 19-21

The annual exposition at the Moscone Center includes 1,000 exhibitors as well as technical sessions and committee meetings. Contact International Exposition Company, 15 Franklin Street, Westport, Conn. 06880; call 203/221-9232; fax 203/221-9260; or E-mail ahrexpo@aol.com.

Temple Bar: Dublin New York City

January 23-March 11

A number of buildings by young Irish architects, all planned in 1991 by

Group 91 for an area of Dublin's medieval city center. Urban Center. 212/935-3960.

Fresh Furniture Pittsburgh

January 23-April 18

A survey of contemporary furniture designed and crafted in the United States. Society for Contemporary Crafts. 412/261-7003.

Fabrications

New York, San Francisco, and Columbus, Ohio

January 31-April 12

Organized jointly and presented simultaneously at the Museum of Modern Art in New York, the San Francisco Museum of Modern Art, and the Wexner Center for the Arts in Columbus, Ohio, this exhibition features full-scale commissioned projects by such architects and designers as Mockbee/Coker, Eric Owen Moss, Smith-Miller + Hawkinson, and Hodgetts + Fung. 212/708-9756 (MoMA).

Build Safe '98 Rosemont, Ill.

February 17-19

The eighth annual Construction Safety Conference, to be held at the Holiday Inn O'Hare International. Call Gayla Bockrath, conference manager, at 800/552-7744.

Alvar Aalto: Between Humanism and Materialism New York City

February 19-May 19

The first large-scale retrospective in the United States to present original drawings and models of work by the renowned Finnish architect, designer, and town planner. 212/708-9400.

Breaking Through: The Creative Engineer

Washington, D.C.

February 26-November 8

An exhibition that examines the role and process of creativity in the field of engineering through a series of case studies. National Building Museum. 202/272-3606.

continued on page 44

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CIRCLE 21 ON INQUIRY CARD

DATESEVENTS

continued from page 42

Competitions

Kenneth F. Brown Asia Pacific Design Award

Registration deadline: January 23

The School of Architecture of the University of Hawaii at Manoa, in cooperation with the Architects Regional Council Asia, invites entries in the second Kenneth F. Brown Asia Pacific Culture and Architecture Design Award program. Projects completed between January 1987 and January 1997 in Asia and the Pacific Rim may be entered. Contact Brown Design Award Program, 2410 Campus Road, School of Architecture, UH Manoa, Honolulu, Hawaii 96822; call 808/956-3515; fax 808/956-7778; or E-mail kbda98@hawaii.edu.

Young Architects Forum

Entry deadline: January 27

"Position Paradox" is the theme of the 1997-98 Young Architects Forum, sponsored by the Architectural League of New York. Architects and designers who have been out of undergraduate or graduate school for 10 years or less may enter a portfolio, which may include several projects. Winners will be invited to exhibit their work at the Urban Center and present lectures in the spring. For further information or to receive an entry form, call 212/753-1722.

Infill Housing for Chicago

Registration deadline: January 30; submission deadline: March 27

Women in Planning and Development and Westside Habitat for Humanity invites Infill housing design ideas for four parcels of land in Chicago's West Garfield Park/North Lawndale community. Anyone may enter this one-stage competition. Contact Women in Planning and Development, P.O. Box 61-8061, Chicago, Ill. 60661-8061.

Ceramic Tile

Submission deadline: January 31

The Tile Promotion Board's Spectrum International Ceramic Tile Design Competition honors creative excellence in residential and commercial ceramic tile design. Architects, interior designers, contractors, builders, retailers, manufacturers, distributors, and others who have influenced the specification or installation of ceramic tile may enter projects completed between January 1996 and December 1997. Winners will be announced at the International Tile and Stone Expo's All-Industry Awards in Orlando, Florida, in April. Call the Tile Promotion Board at 800/495-5900 or 561/743-3150; or fax 561/743-3160.

International Arts Fellowship

Application deadline: January 31

The Academy Schloss Solitude offers 6- to 12-month residential fellowships in architecture, design, fine art, video/film/new media, music, literature, and theater. Entrants must be 35 or younger. Information may be requested by postcard from Academy Schloss Solitude, Stiftung des Offentlichen Rechts, Solitude 3, 70197 Stuttgart, Germany.

Vincent Scully Research Grant

Application deadline: February 2

The Architectural History Foundation announces the Vincent Scully Research Grant, a \$10,000 biannual award to facilitate the publication of a monograph on American architecture. Preference for the grant will be given to projects that are substantially complete and/or under active consideration for publication. Applications must include a proposal, an outline of how the award will be used, and other materials. Architectural History Foundation, 350 Madison Avenue, New York, N.Y. 10017; fax 516/944-5961.

Boston Society of Architects Awards

Health care submissions deadline: February 2; housing and interiors deadline: March 1

Categories for the Boston Society of Architects' 1998 design awards program are health care, housing (single- and multifamily), and interiors. The first category is open to New England architects and those with projects in the region; the second and third are open to Massachusetts architects and those who have designed projects in the state. The interiors category is also open to interior designers. Call the Boston Society of Architects at 617/951-1433 x221; fax 617/951-0845; or E-mail bsarch@architects.org.

Italian Ceramic Tile

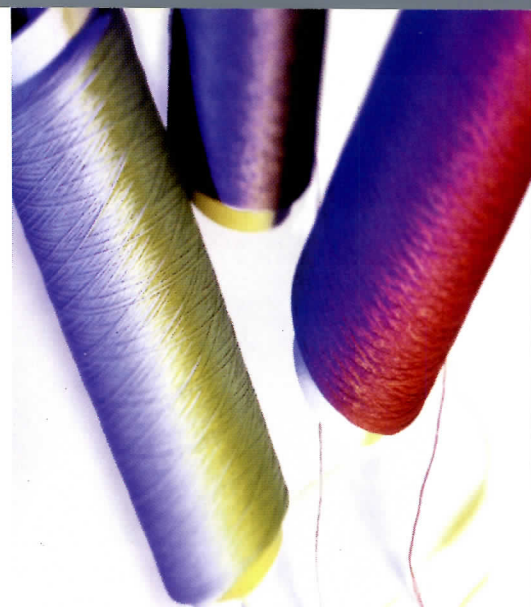
Submission deadline: March 15

Assopiastrelle, the Association of Italian Ceramic Tile and Refractory Manufacturers, announces its 1998 design award. The \$5,000 prize recognizes designers or architects who have created innovative settings using Italian ceramic tiles. Projects must be completed by February 28. Write Abbate Communications, 222A Sixth Avenue, 2nd floor, Brooklyn, N.Y. 11215; or call 718/783-3160.

DuPont Benedictus Awards

Submission deadline: March 9

The 1998 DuPont Benedictus Awards for Innovation in Architectural Laminated Glass, sponsored by DuPont and the AIA with the support of the International Union of Architects, recognizes outstanding or (continued on page 160)



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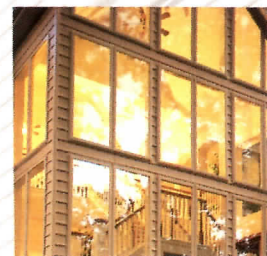
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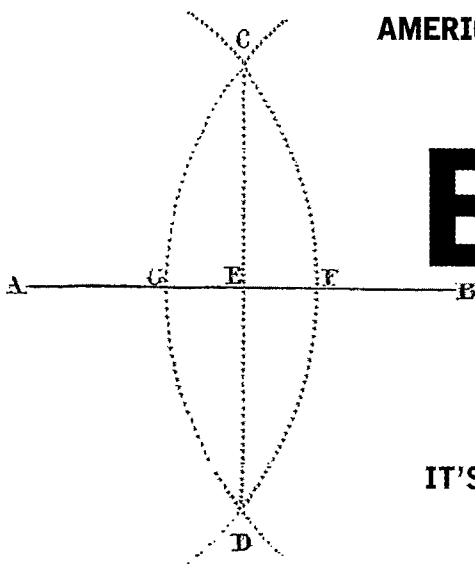
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AMERICA'S BEST-MANAGED FIRMS

How to succeed with

**EXPANDED
SERVICES****IT'S NOT JUST DESIGN ANYMORE. ARCHITECTS ARE MAKING MONEY BY STAYING INVOLVED DURING THE ENTIRE LIFE OF A BUILDING.**

by Clifford A. Pearson



A skew Nixon Ferguson Architects will do almost anything for a good client. Based in Memphis, Tennessee, where Federal Express has its hub, the firm has done all kinds of work for FedEx for 20 years—acting as owner's representative and project manager on some jobs, putting together requests for proposals on others, and working as design architect on still others.

Bottom Duvivier Architects of Redwood City, California, employs a different business strategy—they have identified a service no one else is providing and developed a tool to help deliver it. The service is gathering and analyzing information on how people work in particular office environments, a process the architects call "discovery," which they employ before programming a client's workplace. The tool is a proprietary piece of software called 3T, which creates a database of useful information on a company's employees and the ways in which they get their work done.

From predesign to postoccupancy, architects are expanding the services they offer. According to the 1997 American Institute of Architects Firm Survey, commissioned by the AIA and the McGraw-Hill Companies Construction Information Group, expanded services are generating a large portion of firm growth. In 1996 nearly 40 percent of architects' net billings came from expanded services, up from 22 percent in 1990. In dollar volume, these services jumped 150 percent, compared with an increase of just 11 percent for design services for the period. Why has there been such an explosion in expanded services? "The market is demanding it," says Kermit Baker, chief economist for the AIA. "Clients are looking for someone to provide soup-to-nuts services."

Architects aren't the only ones expanding the kinds of services they provide. Other professionals, including lawyers and accountants, are pursuing the same strategy, reports Robert Gutman, a lecturer in architecture at Princeton University and a consultant to architects. Indeed, some legal firms are doing accounting work, and a few of the big accounting firms are doing strategic business consulting, which often includes facilities planning. The result is a blurring of distinctions between the professions, with architects sometimes finding themselves running up against giant entities such as Anderson Consulting, the management consulting firm.

The motivation for all these professionals to expand their services is twofold, explains Gutman: first, to expand revenues; and second, to "get a better grasp on the problems facing their clients."

"The only way a 25-person firm like us can compete with the big firms is to add value to the process," explains Lisa Bottom, of Bottom Duvivier Architects. The firm's 3T computer program "is a way for us to establish intellectual rigor in the process," she adds.

"What we're seeing is a shift in the role played by some architects, from one that's project-oriented to one that's relationship-oriented," explains Richard Hobbs, FAIA, vice president of professional practice for the AIA. Instead of delivering a project and then moving on, architects are trying to serve clients on a long-term basis, providing a variety of services before architectural design starts and after it is completed.

Rewriting the rules

To reflect this changing role, the AIA has rewritten one of its most basic contract documents—the Owner/Architect Agreement (B141). The new document organizes services into six categories—project administration, planning and evaluation, design, construction procurement, contract administration, and facility operation—no longer making a distinction between "basic" and "additional" services. The implication is that architects can perform all kinds of work during the life cycle of a building, depending on the needs of the client.

CLIENTS ARE LOOKING FOR SOMEONE TO PROVIDE SOUP-TO-NUTS SERVICES.

"What you want to provide is a *program* for a client, not just a project," says Paul Nakazawa, an architect whose firm, Pearson Egan Nakazawa, works as a management consultant to design firms. "This way you get a continuous stream of work." Being involved with a client on an ongoing basis and getting to know its business allows the architect to become a trusted advisor, not just a service provider, explains Nakazawa. Trusted advisors have the inside track on getting future projects, and they don't have to compete on the basis of fee alone.

Lewis Goetz, AIA, whose firm, Greenwell Goetz Architects, in Washington, D.C., specializes in corporate interiors, explains his mission this way: "Our job is to understand all of the issues [facing a client] and come up with a process and a plan to solve them." For large corporate clients, the issues often include human resources, technology, and coping with change, in addition to design considerations. "The key is convincing the client to let us put together the package" of services and

consultants, rather than having the client or another consultant do it, says Goetz.

A few years ago, Greenwell Goetz helped “reengineer” Mobil Oil’s headquarters in Fairfax, Virginia. “We offered Mobil a team approach, including programming, technology advocacy, change management, project management, and design,” relates Goetz. “Technology advocacy,” explains the architect, is “finding better applications of technology to help people do their work. You’re not changing the process, but improving the tools.” Although Mobil had renovated their headquarters not long before Greenwell Goetz reengineered it, the company understood that changing approaches to work and new business tools required a new kind of workplace.

“The new paradigm is for architects to serve clients as facilitators and integrators,” says Hobbs. While architects don’t have the expertise to provide all services, their training and overview of the building process allows them to organize and direct the entire building team. Ironically, by expanding beyond “traditional” services, architects are starting to regain control of the building process, which they lost during the past few decades as engineers, project managers, and contractors sliced larger pieces of the pie for themselves.

Changing needs of clients

In the wake of the recession that followed the 1987 stock market crash, corporate America underwent a series of dramatic changes as companies laid off employees and contracted for services that had been provided in-house.

In the past, corporate facilities departments oversaw the building needs of big companies. Today, many corporations have eliminated these departments or shrunk them significantly. Even as business picked up in the 1990s, many corporations kept their payrolls lean. This situation has created a host of opportunities for architects.

“Clients are looking for someone to provide one-point responsibility” for the work formerly done by in-house departments, says Stuart Rose, whose firm, Professional Development Resources, advises design firms. “They want to find a few good vendors or consultants with whom they have built trust,” reports Rose. “The way the market is working these days, you’ll get either all of a client’s work or none of it.”

The way to earn trust is to show you understand your clients’ businesses as well as they do. That often means focusing on particular kinds of clients. “Narrow your client types and provide more services,”

recommends Mark Zweig, president of Zweig White Associates, a Natick, Massachusetts, consulting firm. “Architects tend to do just the opposite,” looking far and wide for clients to whom they can sell the same services.

Working from a focused base of clients, Askew Nixon Ferguson Architects (ANFA) offers a broad range of services, going as far as spinning off a couple of companies to offer construction management and facilities management. Set up as separate corporations, these two entities can work on projects for which ANFA is not the architect as well as those for which it is.

The most important lesson ANFA has learned about providing expanded services, says Stephen Hill, AIA, a principal at the firm, is “Always ask your clients if they want fries.” Just as McDonald’s management knows it can increase sales at virtually no expense by training its clerks to ask the right questions, ANFA makes sure its clients know about all of the services it provides in addition to architectural design.

“The cost of selling more services to an existing client is about one-seventh that of selling your firm to a new client,” states Rose. “And if you start doing that, you find that your whole marketing focus is different. Instead of sending out brochures and looking for new clients, you’re aiming for a 95 percent repeat-business rate.”

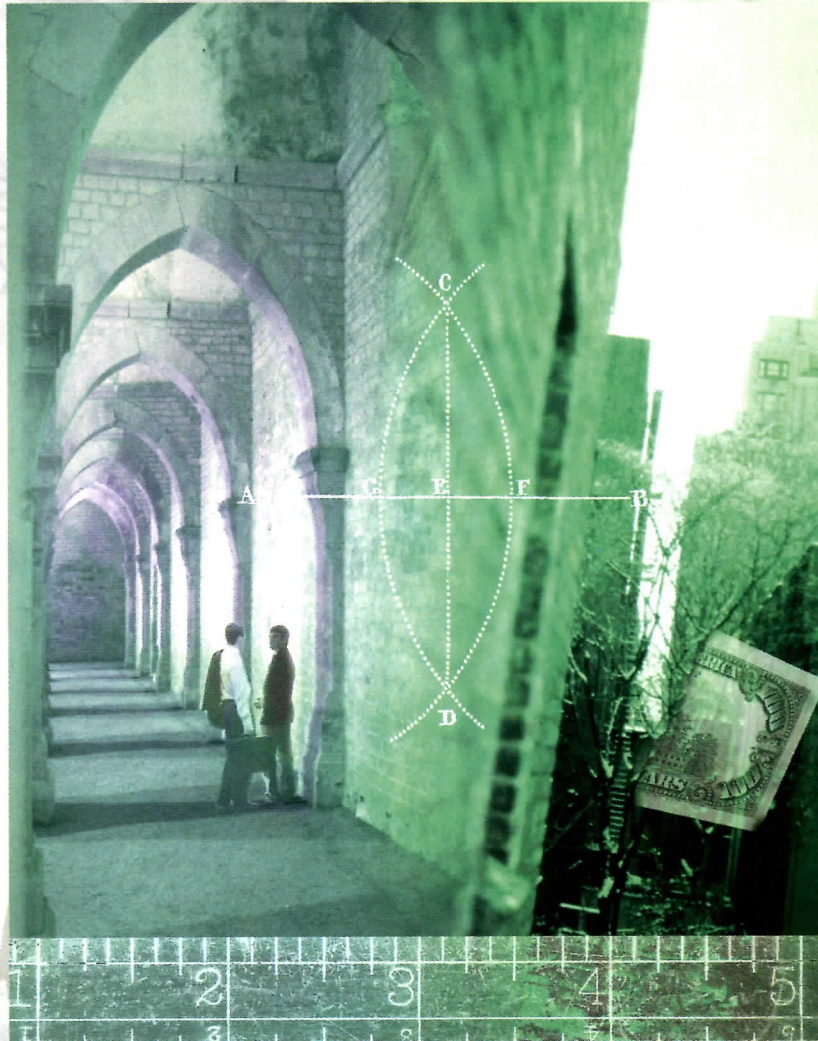
Organizational issues

Like ANFA, some firms have set up independent groups to provide services other than architectural design. For construction management or design-build operations, liability may be an issue, so

having independent companies may make sense. Separate organizations may also encourage the entrepreneurial spirit to flourish and allow employees and shareholders to be rewarded according to the success of their efforts.

Separating expanded services from architecture can sometimes give a firm more credibility with clients. Smith Group, a Detroit-based company that includes architectural firms in three cities, an engineering firm, and separate groups for real estate strategy, development, and program management, doesn’t use the word “architecture” or “architects” in the names of any of its firms. Instead it uses the phrase “Solutions for the natural and built environment” to identify what it does, explains Arnold Mikon, FAIA, chairman, president, and CEO of Smith Group.

“We’ve found that generally speaking if we present ourselves as an A/E with expanded services, all the client hears is ‘A/E’ and we’re



From its beginnings in 1962, Cambridge Seven Associates (C7A) has gone beyond the traditional boundaries of architecture. Founded by a group of urban planners, architects, exhibit designers, and graphic designers, the 65-person, Cambridge, Massachusetts, firm has continued to integrate multiple fields of design.

But over the last two decades, the firm has involved itself in an increasingly broad portion of the building process—including market analyses, construction management, and even at-risk development. The firm has enough confidence to take equity positions in some of its projects, in part because it has developed expertise in a particular building type (aquariums) and because it knows its home market (Boston) so well.

Aquariums are an unusual building type. Because municipal or regional organizations often propose building an aquarium before a team of experts is in place, C7A has assisted clients in determining the scope, testing the feasibility, programming, developing the content, and marketing of every aquarium project that it has undertaken in the past 25 years, states Peter Kuttner, one of the firm's partners.

Having provided such services for many years, C7A decided to differentiate them from its work as architects and designers and set up

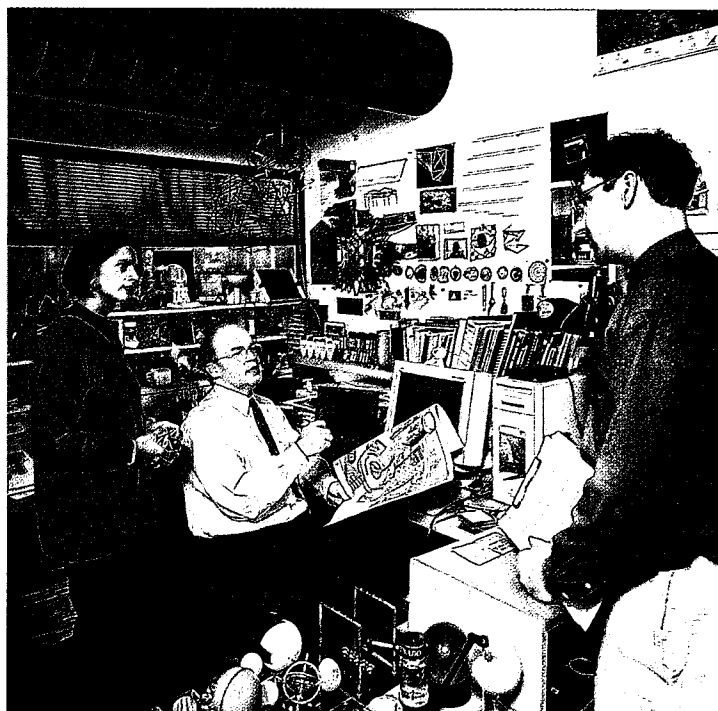
a separate company, International Design for the Environment Associates (IDEA), in 1990. While the original shareholders of IDEA were all C7A partners, the company now has some shareholders outside of C7A and a chief operating officer, Frederick Wales, who has a background in construction and was once a submarine officer.

C7A's entrepreneurial streak began in the mid-1970s when Prudential Insurance hired it to design a multimedia show called "Where's Boston?" and made C7A partner Peter Chermayeff the executive producer. After two years, the show's stage was damaged during a hurricane. When Prudential didn't rebuild it, C7A bought the rights to the show, reassembled it on a different site, and ran it as a money-making enterprise for 13 years.

"Being in show business gave us an idea of what we could do beyond architecture," notes Chermayeff.

In the early 1980s, the firm acted as codeveloper of a \$65-million mixed-use project it designed in Cambridge—a hotel, housing, and retail complex called Charles Square. Later, C7A sold its interest in the project for a profit. "This gave us a taste for real estate," says Chermayeff.

When the city of Lisbon approached C7A about working on an aquarium for its 1998 expo, the firm decided that the tight



Flanking principal Peter Kuttner are designers Meena Hewett and Marc Rogers. International Design for the

Environment Associates' offices are in a separate building close to Cambridge Seven Associates.

deadlines and international setting made it too difficult to work in a traditional capacity as architect. So it proposed a turnkey development in which IDEA (in joint venture with a Portuguese contractor) would guarantee a maximum cost and control almost all aspects of the aquarium's design, construction, and start-up operations.

As for future entrepreneurial ventures, "We're looking to do

something with museum-shop retailing or educational retailing," states Chermayeff. "It would be an extension of what we do with exhibit design and might be another spin-off company."

Taking financial risks, admits Chermayeff, "can be dangerous" and "isn't everyone's cup of tea." He adds, "I'm not sure how many architects have the stomach for this type of work. But I thrive on it." ■

dismissed from consideration for these [other] services," says Mikon. By dropping the words "architecture" and "engineering" and emphasizing the broad scope of expertise they provide, the company is more successful, says Mikon.

Some consultants warn that separating expanded services too much may minimize their beneficial impact on the rest of the firm. "There are some good reasons to run them as entrepreneurial operations, but there is the danger they will always exist as ancillary functions to the rest of the firm," explains Louis Marines, president of the Advanced Management Institute in San Francisco.

"One of the key unanswered questions in our profession today is, How should I organize my firm?" says Marines. "Should it be by building type, geography, function, or service? Expanded services make this issue even more complex." Most experts agree, though, that there is no one correct answer. The right organization depends on the needs of the clients and the capabilities of the architectural firm.

Fitting expanded services into a firm

Another key question is whether to bring expanded-service capabilities in-house or develop a network of consultants with whom you work on a regular basis. "Owning" these capabilities may give the firm a stronger presence in the field but may burden it with extra overhead and make it less able to adapt to changing market conditions.

"Our basic approach is to focus on our core competencies, then bring in outside consultants who are the best in their business," states Lewis Goetz. "After all, why would a really great engineer want to work for an architectural firm? Great engineers want to work for engineering firms." Goetz tries to work with the same consultants on a regular basis, but he has no contractual arrangements with any of them.

Some firms are experimenting with more formal alliances, not only with consultants but with other architects. The Star Alliance, which includes architects, engineers, planners, and consultants from 14 companies in North America, is perhaps the most ambitious of these under-

takings. Started five years ago by Marines as a way for a group of large and medium-size firms to share expertise and to network, it is now starting to function as a megafirm in its own right and has hired its first CEO.

"Star is an experiment," says Gray Plosser, president of KPS Group, a member firm, located in Birmingham, Alabama. "It's a way of allying design organizations to let them grow, expand, and provide stronger financial results than they could on their own," explains Plosser. Asked if Star has made a positive impact on his firm's bottom line after five years, Plosser says, "I think it'll take two more years for us to see if Star is as valuable as we hope it will be."

A different kind of partnering is being explored by Callison Architecture, a large Seattle-based firm, which is marketing its corporate consulting services by developing a demonstration workplace in conjunction with AT&T Wireless Services, Barclay Dean Interiors, Steelcase, and other companies. To show how it can redesign corporate offices, Callison and its collaborators took 5,000 square feet in a Seattle office building and built a workplace called Future@Work where potential clients can walk through a series of innovative interiors.

Services that run the gamut

Recognizing that architectural design represents only a small part of a building's life cycle, firms are getting involved both earlier and later in the process. By and large, though, architects are a lot more active in the planning and predesign stages than in construction and postconstruction. According to the 1997 AIA Firm Survey, 15 percent of responding firms' net billings derived from planning and predesign services, while only 2.3 percent came from construction services and 3.9 percent from postconstruction. Interior design accounted for 18 percent of firms' net billings.

Predesign services have the advantage of involving the architect early in the process and increasing the firm's chances of getting more work later on, explains Zweig. "But back-end services help maintain relationships with clients," he adds.

J. Robert Hillier, FAIA, chairman of the Hillier Group, explains it this way: "Such services as strategic facilities planning have given us the opportunity to get on board for projects before they were fully scoped out as projects." But Hillier's firm provides a full range of expanded services, including site-feasibility studies, programming, real estate pro forma analysis, construction management, and design-build. "Many of the expanded services have a very high value-added aspect for the clients," reports Hillier, "enabling them to become higher-fee services with much less liability and none of the vicissitudes of the project being delivered by a third party, such as a general contractor."

Machado and Silveti Associates in Boston also tries to participate in the early stages of a project. "Our most successful projects—from

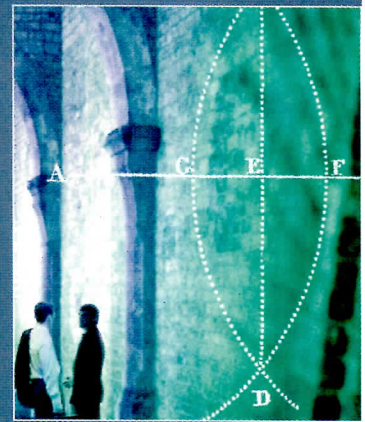
"WHAT YOU WANT TO PROVIDE IS A PROGRAM FOR A CLIENT, NOT JUST A PROJECT," SAYS CONSULTANT PAUL NAKAZAWA.

our own viewpoint as well as our clients'—result from a process in which we help clients define the problem of a project and not just provide them with a solution," explains Timothy Love, one of the firm's vice presidents. For example, the 38-person firm has had a relationship with Princeton University since 1987 that has involved developing a database of the existing campus buildings, master planning, advising on future development, and designing projects such as a parking structure and a dormitory. "Due to our long relationship with Princeton, we share responsibility with the client for the stewardship of the campus," says Love.

Machado and Silveti is also renovating the J. Paul Getty Villa in

EXAMPLES OF EXPANDED SERVICES

1. Facilities information management: design, installation, and maintenance of a CAD database that records, tracks, and monitors the human and physical resources in a client's portfolio of facilities. (KPS Group)
2. Thematic development for hotels, restaurants, and casinos. (The Hillier Group)
3. Turnkey development of aquariums, starting with feasibility analysis and including everything from architectural and exhibit design to collection of animals, training of staff, and start-up operation. (Cambridge Seven Associates through sister company IDEA)
4. Retail prototype design and rollout. (Callison Architecture)
5. ADA services: accessibility audits, surveys, recommen-



dation reports, and client training in complying with the Americans with Disabilities Act. (HOK)

6. Designing and installing 3D interactive architectural environments. (Asymptote Architecture)
7. Marketing and promotional services: preparing models, signage, and presentation materials for clients to use at special events. (GGLO)

Malibu, California, transforming it from a general museum of art into a specialized museum for antiquities, now that the new Getty Center has opened in Los Angeles. "For the Getty Villa project we recommended that the programming effort and the preliminary design phase be done simultaneously," explains Love. This allowed the two processes to inform one another and helped the client "clarify [its] own institutional mission."

Construction and postconstruction services take architects farther afield from the old-time definition of what an architect does. But they may represent a greater opportunity. "If one looks at the life of a building, from gestation through birthing to adolescence and adulthood to obsolescence and reuse, it is clear that more of the spectrum is post-

rather than predesign," explains KPS's Plosser. "I think we make a significant mistake in centering the discussion on building (the verb) rather than buildings (the noun)."

In 1996 O'Donnell Wicklund Pigozzi and Peterson Architects (OWP&P), a 239-person firm in Chicago, began offering facilities consulting. Although integrated with the rest of the firm, facilities consulting at OWP&P has its own leadership and offers services unique to its division, including database creation and management and provision of on-site personnel to manage a building's operation. When OWP&P kicked off the service, "we had the problem upside-down," admits

Pat Rosenzweig, a spokesperson for the firm, “focusing on software rather than on client need.” Eventually, OWP&P hired an experienced leader in the field to offer clients a full range of facility management services.

Doing it all: from feasibility study to fish handling

When the Genoa Aquarium opened in 1992 as part of Italy’s 500th anniversary celebration of Columbus’s landing in America, it featured a

“THE WAY THE MARKET IS WORKING THESE DAYS, YOU’LL GET EITHER ALL OF A CLIENT’S WORK OR NONE OF IT,” STATES MARK ZWEIG.

building designed by Cambridge Seven Associates. No surprise there: Cambridge Seven has designed aquariums around the world over the last three decades—from Boston and Chattanooga to Osaka, Japan. But the firm’s involvement in the Genoa project didn’t start or stop with architectural design. A company set up by Cambridge Seven, called International Design for the Environment Associates (IDEA), provided an array of services including market feasibility, business-plan development, programming, construction, exhibit design and installation, even animal collection and introduction of animals into their exhibits.

And that’s not all. IDEA helped set up the Italian organization that would operate the aquarium, recruiting and training a team of administrators, plant operators, animal-care specialists, and promotion and marketing executives. So Cambridge Seven and its subsidiary

essentially designed the client, as well as the aquarium building.

Small firms are also finding opportunities in expanded services, often in specialized niches. For example, Asymptote Architecture, a New York City firm headed by Hani Rashid and Lise-Anne Couture and staffed with a handful of young, computer-savvy architects, has been successful with computer-related services. For a large financial institution in New York, the firm is developing “a real-time information environment” that

will include an interactive 3D model of the institution’s famous building. The client had originally hired a computer firm for the project, says Rashid, but wasn’t happy with the result. Only after seeing what Asymptote could do did the client realize that an architect brings together the computer and spatial skills necessary for the project.

Challenges to expanding services

With new services come a host of new challenges and issues for architects to address. The first is figuring out which additional services to provide. “Listen to your clients,” advises almost every consultant. If your existing clients need certain kinds of work, you should help them get it—either by providing it yourself or bringing in consultants.

But timing is an important issue as well. “Entering the market at the right time is imperative,” states Larry Self, executive vice president of Hellmuth Obata + Kassabaum. “Being too early can be as detrimental as being too late.” And what works one day may not work as well the next, something ANFA discovered with its computer-aided facility management (CAFM) services. “Six years ago we went into CAFM as we found many of our clients needing these services,” recalls ANFA’s Hill. For three years, the firm made healthy profits from facility management. But the market changed, competition increased, and the firm’s success with these services has diminished, admits Hill.

Not only does the market have to be ready, but the firm must be prepared as well for its dive into new territory. “I’ve seen some small firms bomb out by expanding into services they weren’t yet capable of providing,” says Princeton’s Gutman. “A firm must be prepared technically and have the human capital as well,” advises Paul Nakazawa.

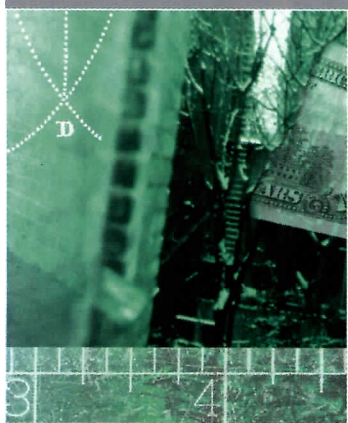
Another danger is spreading yourself too thin. Providing new services “may divert a firm from its essential purpose,” warns Peter Piven, a principal consultant at the Coxe Group. “We counsel firms not to go too heavily into new businesses all at once,” he says. If a firm provides many services distinct from design, does it endanger its identity as an architecture firm? Few of the consultants and architects interviewed for this article saw this as a serious problem. “It’s possible for a firm to travel too far afield and lose its identity,” says Gutman. “But I don’t see it happening much.”

Success comes with a few dangers. One problem in providing expanded services “is the heavy dependence on highly skilled individuals without much second-tier backup,” states Hillier. “This creates a workload-leveling dilemma, not to mention the ‘held hostage’ aspect of having a very specialized service be dependent on a very specialized individual who could get a better salary offer tomorrow.”

The architects who are providing expanded services know it isn’t easy to do it well. Getting the right people and keeping them, figuring out which skills need to be brought in-house and which can be outsourced, establishing the best mix of services, and learning how to market them are all issues that must be addressed.

Ultimately, expanded services raise the question of value. Is a

KEY LESSONS



1. Celebrate the individuals and their special skills that enable you to provide expanded services well. (The Hillier Group)
2. “Always ask your clients if they want fries.” That is, let them know about all the services you provide. (Askew Nixon Ferguson Architects)
3. Strive to make clients understand the value of each service to their business. This will help develop long-term relationships. (HOK)

4. Whatever service you add to your practice must be specific to a particular market niche. Prospects must be highly targeted with a clear message. (Smith Group, Inc.)
5. Don’t wait. (KPS Group)
6. Take your architect hat off and learn to listen to people. (Sherman Greiner & Halle)
7. Leadership is critical. Additional services must be led by an expert. (O’Donnell Wicklund Pigozzi and Peterson Architects)
8. Provide an aggressive professional development program for employees to expose them to a variety of disciplines. (GGLO)
9. Expanded services should be the outgrowth of close collaborations with your clients. (Machado and Silvetti Associates)



Raphael Arsenian, Maria Casey, Donald Simpson, Steve Hefta, and Gray Plosser in the Birmingham, Alabama, offices of KPS Group.

"A few years ago, we realized, whether we liked it or not, that we were in the information business," says Gray Plosser, president of KPS Group, a 70-person architecture firm based in Birmingham, Alabama. "Architects tend to see information as something they use but always throw away," he says. "But the information itself has great value."

Managing information has been the key to KPS's approach to growth. The firm offers a range of services from strategic facility planning and programming to program management and relocation assistance. But designing and then maintaining the information systems used to manage buildings and building portfolios is the most important

element in the firm's package of expanded services.

One of KPS's biggest clients is BellSouth, which owns about 50 million square feet in more than 9,000 buildings. KPS designed and installed a sophisticated CAD database that allows the client to record, track, and monitor this huge inventory of buildings. The system is "an intelligent graphic database" that covers not just the spaces in the facilities but the people who work in them, explains Plosser.

KPS also trains BellSouth employees to use the system and ran a help desk at the start of the project. Although KPS provides software and operational systems, the critical element it provides, says Plosser, is ongoing consulting ser-

VICES. "What we really sell is intelligence"—expert advice.

Another important client is Compass Bank, which is based in Alabama and has operations in Florida and Texas. KPS works with Compass on its capital facilities strategy, helping with budgeting, site selection, architectural design, interior-space planning, and even the installation of furniture and office equipment.

Being involved with these companies during the full life of their buildings means KPS is connected with its clients on a continual basis. "Once you're inside a client's business all the time, you're a more valued part of their operations—and you're much less expendable," says Plosser. "Our desire is to stay

connected with the client and the client's real estate assets."

Continual access to a client means knowing about projects before anyone else and getting the jump on the competition. And being involved with buildings during their entire life cycle, not just during the relatively brief period of design and construction, means a steady and predictable source of revenue. "It reduces the peaks and valleys of the business cycle," reports Plosser. "Building goes in cycles, but management and maintenance go on all the time."

Five years ago, most of KPS's expanded services were interior design projects, which represented about 10 percent of the firm's billings. Today, new services such as facility-information and program management account for about 35 percent of KPS's billings—with an additional 15 percent represented by interiors work. "Expanded services are where our most explosive growth is," states Plosser.

Recently, KPS set up a subsidiary company so it can offer design-build services, and has bids out on two such projects. "That's the next horizon for us," says Plosser. ■

service valuable enough to clients for an architect to provide it? If so, how should the firm bill for it? While architects would like to bill based on the value that the service brings to the client—rather than on an hourly or fixed fee—everyone understands this is easier said than done.

Even evaluating a firm's success with expanded services can be difficult. Some up-front work may not add much directly to earnings but might bring in lucrative jobs later on. So instead of seeing each service as a profit center, it may make more sense to look at a firm's overall percentage of repeat business. Firms that are successful in broadening their scope of work achieve repeat-business rates of 80 percent and higher.

What's clear is that the amount of work architects are doing beyond design has grown considerably this decade and should continue to grow as the role of the architect changes. Boutique and star firms may be able to thrive on their reputations for design only, but most other firms will find that competitive pressures are pushing them into offering a broader scope of services. ■

Firms Surveyed

- Asymptote Architecture, New York City, 5–9 employees**
- Askew Nixon Ferguson Architects, Memphis, 30 employees**
- BOORA Architects, Portland, Oreg., 80 employees**
- Bottom Duvivier Architects, Redwood City, Calif., 25 employees**
- Callison Architecture, Seattle, 361 employees**
- Cambridge Seven Associates, Cambridge, Mass., 65 employees**
- DES Architects + Engineers, Redwood City, Calif., 125 employees**
- GGLO Architecture/Interior Design,**

Seattle, 75 employees

- Greenwell Goetz Architects, Washington, D.C., 52 employees**
- Hellmuth Obata + Kassabaum, St. Louis, 1,884 employees**
- The Hillier Group, Princeton, N.J., 394 employees**
- KPS Group, Birmingham, Ala., 70 employees**
- Machado and Silveti Associates, Boston, 38 employees**
- O'Donnell Wicklund Pigozzi and Peterson, Chicago, 239 employees**
- Sherman Greiner & Halle, Concord, N.H., 7 employees**
- Smith Group, Detroit, 651 employees**

PHOTOGRAPHY: © MARK GOUGH

Construction Aims at a STEADY PACE FOR '98

**THE ECONOMIC FORECAST PROMISES SUSTAINED GROWTH,
BUT AT A SLOWER RATE. OFFICES AND SCHOOLS LEAD THE PACK.**

In the extended, well-paced recovery of the 1990s, the construction industry has reached cruising speed. So while the rate of growth for new construction starts eased up in 1997, at an estimated 2% from 1996's 8%, the overall level of activity remains healthy. Loss of momentum in a few project types has been more than made up by others in the "balancing act" pattern of recent years. For instance, construction of single-family housing relaxed its vibrant pace of 1996, but highways, hotels, and even office buildings picked up the slack with renewed vigor. Not surprisingly, the solid performance of the economy during 1997 helped keep public works and nonresidential buildings on an upward track.

After growing at a brisk 3.8% rate for all of 1997, the economy is projected to settle back to a more sustainable 2.3% during 1998. At the same time, supportive demographics and available funding should continue to benefit the construction industry, alleviating the negative impact of a slower business environment and allowing for a 3% advance in construction contracting. Here are the main points for the coming year's construction market:

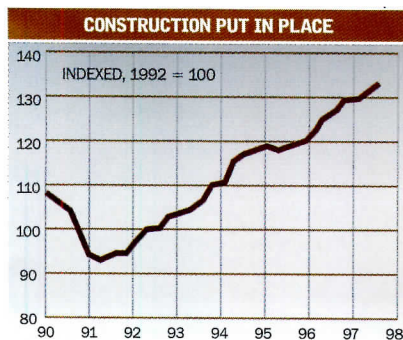
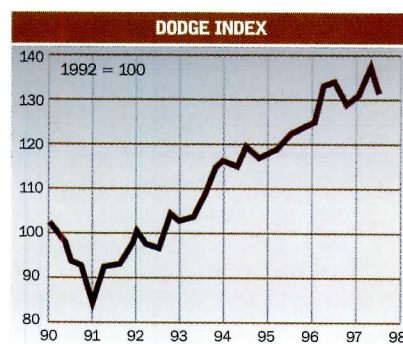
Single-family housing units will post a 2% decline in 1998 as lower overall economic growth dampens housing demand. Dollar volume for this sector will still be up 1%, reflecting a moderate increase in construction prices and a greater share of activity in the West and Northeast, relatively high-cost regions.

Public works construction will climb 3%, supported by funding levels approved by Congress for fiscal 1998 and the continued healthy fiscal condition of state and local governments.

Income properties will advance 6%—the same increase as in 1997—led once again by double-digit growth for offices. Multifamily housing will continue to strengthen, albeit from a depressed level, but the hotel category appears to have peaked after several years of robust activity. Construction of both stores and warehouses is projected to be flat in 1998.

Construction of manufacturing buildings will climb 6% as manufacturers increase capacity in response to 1997's strong economy. Institutional building will advance 5% because of an acceleration in new school construction. Religious and amusement-related construction (such as theaters and sports arenas) will stay steady at a high level. The clinic component of health care facilities will pull back from its recent surge, and the hospital segment is expected to stabilize at a

Adapted from the F. W. Dodge Construction Outlook '98



low level after five years of decline.

Economic environment

The construction industry proceeded through 1997 at a healthy clip. The Dodge Index of construction contract value edged up slightly at the start of 1997, surged ahead during the second quarter, and then settled back again during the summer months. These ups and downs averaged out to a generally upward trend, and total construction activity for 1997 rose 2%. While less robust than the 8% reported for 1996, this rise still represents the sixth consecutive year of expansion for the construction industry.

By category, the stars of 1997 were highways and bridges, supported by hotels, offices, manufacturing plants, theaters and sports arenas, health clinics, and religious construction. On the downside, store construction experienced a predicted decline, but the soft activity for warehouses was not anticipated. School construction in early 1997 remained at last year's flat pace but has since shown improved levels of contracting in response to rising enrollments.

By region, the Northeast has finally joined the recovery process after years of lagging behind the rest of the country. From January to September 1997 the Northeast's volume climbed 9%, supported by long-delayed improvement in its housing market and a surge in public works activity (mostly related to Boston's Central Artery project). The South Atlantic economy has also advanced, although at a more modest 4%, thanks to the ongoing strength of its housing market and a brisk rate of commercial activity. The West experienced a sluggish first half of the

1998 NATIONAL ESTIMATES: DODGE CONSTRUCTION POTENTIALS

	1996 ACTUAL	1997 PRELIMINARY	1998 FORECAST	% CHANGE 1998/97
NONRESIDENTIAL BUILDINGS				
FLOOR AREA (MILLIONS OF SQUARE FEET)				
OFFICE BUILDINGS	138	155	177	+14
STORES & SHOPPING CENTERS	235	223	217	-3
OTHER COMMERCIAL BUILDINGS	344	351	341	-3
MANUFACTURING BUILDINGS	153	163	168	+3
TOTAL COMMERCIAL & MANUFACTURING	870	892	903	+1
EDUCATIONAL BUILDINGS	166	170	181	+6
HEALTH CARE FACILITIES	76	76	74	-3
OTHER NONRESIDENTIAL BUILDINGS	175	189	192	+2
TOTAL INSTITUTIONAL & OTHER	417	435	447	+3
TOTAL NONRESIDENTIAL	1,287	1,327	1,350	+2
CONTRACT VALUE (MILLIONS OF DOLLARS)				
OFFICE BUILDINGS	\$17,063	\$ 18,725	\$21,500	+15
STORES & SHOPPING CENTERS	16,027	15,475	15,525	-
OTHER COMMERCIAL BUILDINGS	18,369	19,500	19,725	+1
MANUFACTURING BUILDINGS	12,963	12,700	13,500	+6
TOTAL COMMERCIAL & MANUFACTURING	64,422	66,400	70,250	+6
EDUCATIONAL BUILDINGS	21,281	23,175	24,825	+7
HEALTH CARE FACILITIES	10,899	10,600	10,700	+1
OTHER NONRESIDENTIAL BUILDINGS	22,834	23,775	25,100	+6
TOTAL INSTITUTIONAL & OTHER	55,014	57,550	60,625	+5
TOTAL NONRESIDENTIAL	119,436	123,950	130,875	+6
RESIDENTIAL BUILDINGS				
DWELLING UNITS (THOUSANDS OF UNITS)*				
SINGLE-FAMILY HOUSING	1,073	1,035	1,015	-2
MULTIFAMILY HOUSING	723	295	305	+3
TOTAL RESIDENTIAL	1,346	1,330	1,320	-1
FLOOR AREA (MILLIONS OF SQUARE FEET)				
SINGLE-FAMILY HOUSING	2,171	2,106	2,070	-2
MULTIFAMILY HOUSING	304	332	345	+4
TOTAL RESIDENTIAL	2,475	2,438	2,415	-1
CONTRACT VALUE (MILLIONS OF DOLLARS)				
SINGLE-FAMILY HOUSING	\$128,675	\$126,225	\$127,750	+1
MULTIFAMILY HOUSING	17,607	19,775	21,225	+7
TOTAL RESIDENTIAL	146,282	146,000	148,975	+2
NONBUILDING CONSTRUCTION				
CONTRACT VALUE (MILLIONS OF DOLLARS)				
HIGHWAYS AND BRIDGES	\$30,767	\$33,600	\$34,125	+2
SEWERS AND WATER SUPPLY	15,176	15,000	15,750	+5
OTHER PUBLIC WORKS	16,432	16,950	17,425	+3
TOTAL PUBLIC WORKS	62,375	65,550	67,300	+3
UTILITIES	2,413	2,250	2,350	+4
TOTAL NONBUILDING CONSTRUCTION	64,788	67,800	69,650	+3
ALL CONSTRUCTION				
CONTRACT VALUE (MILLIONS OF DOLLARS)				
TOTAL CONSTRUCTION	\$330,506	\$337,750	\$349,500	+3
DODGE INDEX (1992 = 100)	131	134	139	

* F.W. DODGE BASIS

year, but has since regained momentum, posting a 2% rise at 1997's three-quarter mark. Both the South Central and Midwest regions have decelerated slightly since 1996, with respective declines of 1% and 2%, as their housing sectors have dropped to what looks like a more sustainable pace.

While general economic conditions are expected to become more sluggish over the next few quarters, the availability of funding should remain high, providing important support for the construction industry. Banks continue to increase their volume of lending—commercial and industrial loans showed a 10% increase in the first nine months of 1997 over the year earlier. Even if the rate of loan growth slows down in 1998, it is still a high level of lending.

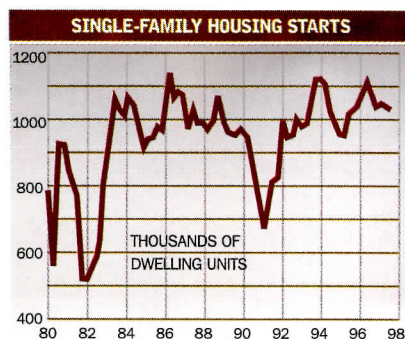
For commercial real estate, the past two years have seen a surge of liquidity, helped by the rapid expansion of real estate investment trusts and commercial mortgage-backed securities. For the institutional and public works markets, the municipal bond rate remains at a manageable level—after creeping up to 5.9% last April, the municipal bond rate has since slid back to 5.4%.

Single-family housing

Through much of the 1990s, construction of single-family homes has proceeded at a healthy pace. Steady expansion was reported for the 1992–94 period, followed by a mild correction in 1995, which coincided with that year's sluggish business conditions. Activity bounced back strongly in 1996, rising 9% to 1.07 million units, supported by both a resurgent economy and deferred housing demand from the previous year. While the 1996 housing pattern did reveal some loss of momentum as the year came to a close, a modest rebound then took place at the beginning of 1997, setting the stage for yet another good year for home building.

A less robust economic environment is expected for 1998. With some erosion in consumer confidence taking place as job growth slows, potential home buyers will become more cautious, causing home buying to ease up from the robust pace of 1997. Any sign of a pickup in inflationary pressures may also cause mortgage rates to edge upward, although a move much beyond the 8% mark is unlikely. On balance, fixed mortgage rates are expected to average close to the 7.6% reported for all of 1997. Construction of single-family homes will decline 2% to 1.02 million units for 1998 as a whole.

- **Single-family housing in 1998 will retreat a modest 2% to 1,000 million units.**
- **While the cost of financing may edge up from current levels, fixed mortgage rates are expected to stay within the fairly narrow band of 7% to 8.5%. Other economic variables, such as employment growth and consumer confidence, will be the important determinants of housing activity.**
- **The regional latecomers to this decade's housing recovery, the Northeast and the West, should see continued improvement in 1998, at least partially offsetting a mild slowdown in other parts of the country.**



Income properties

With economic growth up in 1997, activity for income properties—commercial buildings and multifamily housing—has picked up as well. Contracting was projected to rise 4% in 1997 to 1,060 million square feet, marking the fifth straight year of growth, and the sequential recovery of the various structure types has given this sector greater staying power. Stores and shopping centers were the first to experience recovery, in 1993, followed by warehouses over the next two years, with a limited push also coming from multifamily housing. Since 1994, hotel construction has been the strongest growth market, but it may have reached its peak. Now it's the turn for offices to show healthy expansion, and 1997's office improvement is expected to carry over into 1998.

- **The income property group in 1998 will climb 2% in 1998 to 1,080 million square feet, following the 4% increase estimated for 1997.**
- **Office construction will lead the way in 1998 with a 14% rise, helped by lower vacancy rates and rising rents in many metropolitan areas around the country.**
- **Multifamily housing will contribute with a modest gain, but hotels will ease back from a robust 1997, and stores and warehouses will continue to show a gradual loss of momentum.**

The mid-1990s have also seen the increased use of such financial instruments as real estate investment trusts (REITS) and commercial mortgage-backed securities (CMBS). By tapping public markets, these instruments have increased the investment funds directed at real estate.

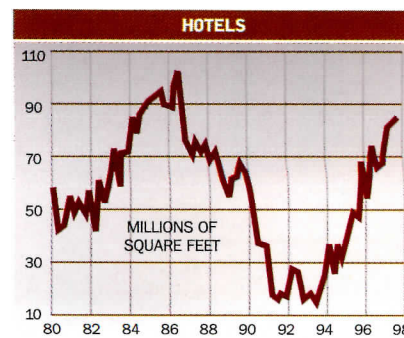
In 1998 an economy growing in the range of 2% to 2.5% will not seriously impact the amount of funding directed at real estate. Overall, income-property square footage is projected to rise 2% to 1,080 million square feet, as continued improvement for offices compensates for mild slippage by stores, warehouses, and hotels. The activity in 1998 will be the highest level of income property square footage this decade, yet it will still be about 40% below the peak of the mid-1980s.

Stores. Store construction has experienced the most typical cyclical pattern of the income-property categories, reaching a near record peak in 1995 at 263 million square feet. The expansion efforts of the large discount retailers and specialty superstores were responsible for most of 1995's strength, in combination with the lagging benefit derived from the strong housing market of 1992–94.

The 1997 retreat for stores has turned out to be gentler than the prior year, for several reasons: Single-family housing was particularly strong in 1996, and housing typically leads the pattern for retail construction. In addition, 1997 saw the start of several large mall projects.

Warehouses. The retreat for stores has had a negative impact on warehouses. Contracting weakened during the first half of 1997, and as a result the year saw warehouses drop 8% to 175 million square feet. In 1998 a slower economy and reduced store construction will lead to a further decline for warehouses, as activity falls 3% to 170 million square feet.

Hotels. Hotel construction continues to proceed at a brisk pace. In 1996,

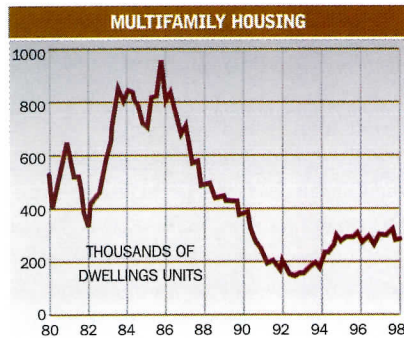


activity jumped 29% to 64 million square feet, and the healthy performance in 1997 made for another gain of approximately 20%, to 77 million square feet, which would be the highest annual total since 1986. The extended-stay and economy segments of the lodging industry are driving this surge; there has yet to be much construction of full-service hotels.

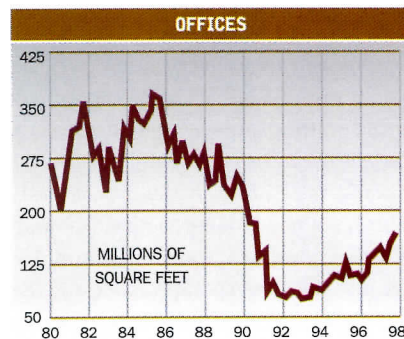
Hotel/casino projects have also been strong. Las Vegas saw the start of several large projects in 1997, including the \$500 million Paradise and the \$200 million Paris. Through the first nine months of 1997, Dodge data showed 8 million square feet of hotel starts in Las Vegas, eclipsing the previous full-year record of 7 million square feet, set in 1992.

With retrenchment for the limited-service segment soon to set in, hotels will retreat 3% in 1998 to 75 million square feet. A greater amount of full-service hotel projects next year should soften the extent of the decline.

Multifamily housing. After leveling off in 1996, multifamily housing strengthened during the early months of 1997. Activity has shown the greatest pickup in the South Atlantic region and the Northeast while staying lackluster in the West. For all of 1997, an 8% gain to 295,000 units is projected. Although apartment vacancies remain high nationally, some parts of the nation are seeing tightening markets along with rising rents. With this localized push, multifamily housing should continue its moderate upward path during 1998, advancing 3% to 305,000 units.



Offices. The office market is finally showing the healthy percentage growth witnessed by the other income properties earlier in the decade. During 1996, new office projects strengthened as the year progressed, resulting in a 20% gain to 138 million square feet. Metropolitan areas reporting gains of one million square feet or more in 1996 were Atlanta, Phoenix, Dallas, Oakland (Calif.), Charlotte (N.C.), New York, Cleveland, Seattle, Salt Lake City, Portland (Oreg.), and Denver. Nationally, office construction slipped at the start of 1997 but rebounded strongly during the next two quarters. As a result, offices are projected to show a 12% increase in 1997 to 155 million square feet.



Dodge data show that most of the construction upturn is coming from one- to three-story structures, such as those in suburban markets. But the office recovery has begun to include a wider range of structures, and 1997 saw a few high-rise projects make it to the groundbreaking stage, including a \$215 million 48-story office tower in Times Square, the first major new office structure to be started in midtown Manhattan in the 1990s.

Positive factors will continue to be present this year, even with a slower economy. As a result, office construction is projected to advance an impressive 14% in 1998 to 177 million square feet.

Manufacturing buildings

Construction of new manufacturing plants in the mid-1990s has reached an extended plateau, similar to that of the 1980s. The manufacturing building category in 1998 is projected to rise another 3% to 168 million square feet. One large project expected to start in 1998 is a \$1.2 billion Jeep assembly plant in Toledo, Ohio, according to plans announced by the Chrysler Corporation over the summer. Should the economy slow in 1998 as expected, the level of manufacturing construction after 1998 likely will recede.

- Construction of manufacturing plants will increase 3% in 1998 to 168 million square feet, advancing for the second year in a row.
- The strength of the economy in 1997, with steady gains in industrial production and capacity utilization rates, will spur 1998's higher level of plant construction.
- 1998 will probably be this decade's peak for new manufacturing buildings as construction catches up with demand generated by strong earlier growth.

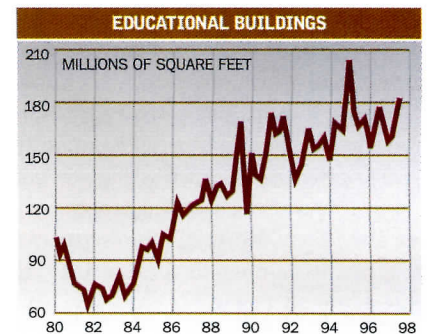
Institutional buildings

Institutional building is getting back on track. It enjoyed a lengthy expansion in the 1990s, but growth had gone flat in 1996. Providing the most support has been recreation-related construction, but an added boost has come from clinics, courthouses, and churches. By the third quarter of 1997, school construction was able to resume its upward trend. With this emerging strength, institutional building for all of 1997 is estimated to rise 4% to 435 million square feet.

The slower-paced economy of 1998 will not dampen the moderate upswing for institutional building, even if bond rates do edge up a bit. Demographic pressures will continue to drive greater construction activity, particularly for schools, and project financing is ample and inexpensive. While federal support for a variety of building programs has been scaled back [see page 29], that amount of funding is small compared with that of state and local governments. On balance, the environment will remain positive for institutional building in 1998, enabling contracting to climb 3% to 447 million square feet.

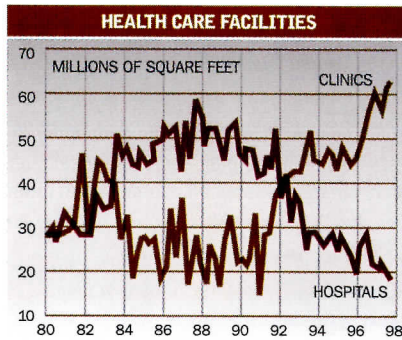
Educational buildings. The demographic pressures are certainly present for further growth in school construction. Over the next 10 years, 29 states, mostly in the South Atlantic and the West, will experience rising enrollments. California will grow most, increasing by 920,000 students, while steep enrollment gains will also be seen in Texas, Georgia, North Carolina, Arizona, Virginia, and Florida. Stable-to-declining enrollments are projected for the District of Columbia and 21 states, most of which are located in the Northeast and North Central regions.

Funding is necessary for new construction to take place, and the passage of recent bond measures across the nation indicates more money is becoming available. In the November 1996 elections, a number of school construction initiatives passed, such as a \$1.8 billion measure in North Carolina, a \$643 million measure in Nevada, and a \$228 million measure in Virginia. In June 1997 California voters approved more than \$1.3 billion in school bond measures, while



Los Angeles voters in April approved a \$2.4 billion measure, with the proceeds to finance needed renovations and repairs over the next 10 years. This money may at least be partially responsible for the increased amount of school construction taking place in the second half of 1997, and the push will carry over into 1998. With such financial support, school construction is projected to climb 7% in 1998 to 181 million square feet.

Hospitals and other health care facilities. The last few years have been difficult for hospitals, since the increasing power of HMOs has led to more hospital mergers and closings. For 1998, hospital construction is projected to remain flat at its current low level, while clinic construction (sparked by pressure from managed-care providers to move procedures from inpatient to outpatient) eases back from its 1997 surge. This results in a mild 3% decline to 74 million square feet for the health care category.



Other institutional buildings. After sliding 12% in 1995, the public building category made a partial 5% rebound in 1996 and was poised to climb another 4% in 1997 to 43 million square feet. About half this category consists of detention facilities, which reached an all-time high of 25 million square feet in 1994.

The prison segment of public buildings fell to 17 million square feet in 1995, before posting a 1996 total of 20 million square feet. The pressure for new prison construction remains strong, though, due to the sharp rise in incarceration rates and overcrowding from the mid-1980s to the present. Whether prison construction will continue to grow nationally depends on funding, and it's assumed that spending by federal and state governments next year will remain close to current levels.

- **Square footage of institutional projects will advance 3% in 1998 to 447 million square feet.**
- **Rising student enrollments and overcrowded classrooms will spur more school construction as this market continues to strengthen following its 1996 pause.**
- **Segments of institutional building that posted strong growth in 1997—clinics, theaters, sports arenas, and churches—should remain high in 1998.**

Other segments of the public buildings group are likely to move in divergent directions in 1998. Boosted by the increase for the General Services Administration's construction program, courthouse projects were up about 20% in 1997. This rise is not likely to be maintained in 1998, however, given scaled-back federal funding. Post office construction also picked up in 1997, and this improvement is more likely to continue into 1998. In early October, the U.S. Postal Service approved its five-year capital plan, which includes facility commitments of \$1.9 billion for fiscal 1998, up from the prior year's \$1.7 billion. The overall public buildings category should produce a 3% gain in 1998 to 44 million square feet.

Religious construction was robust in 1997 and is expected to climb 25% to 40 million square feet, which would be this category's greatest amount in 30 years. A slower pace for the economy in 1998 is not expected to dampen the prospects for religious construction, which has shown a tendency to lag economic activity. Another year at 40 million square feet is projected.

Construction of recreation-related structures (theaters, convention centers, sports arenas) has shown steady growth since 1993. In 1996 this category climbed to 60 million square feet, its highest level since 1973, led by a 45% surge for new theater projects and a 34% jump for sports arenas. Major cinema chains are in the midst of an expansion push, with theaters going up as part of a stand-alone facility or as part of a retail complex. Sports arena starts in 1997 have included the \$250 million baseball park for the Milwaukee Brewers, the \$245 million baseball park for the Seattle Mariners, and a \$72 million indoor arena in New Orleans, adjacent to the Superdome. With this support, contracting for the overall amusement category in 1997 was projected to rise 11% to 66 million square feet.

Maintaining cruising speed

Adding up the dollar amounts of the various sectors results in a gain of 3% for 1998. To some extent, the picture is similar to what occurred in 1997. Single-family housing will not show much in the way of growth, but it will remain at what can be considered a healthy level of activity. Improvement by other categories will be necessary to keep the industry-wide expansion going, and an economy advancing at the anticipated 2.3% should allow this to occur.

The most likely candidates for strengthening in 1998 are offices and schools, as each should benefit from enhanced construction funding. The manufacturing building category also appears to be a safe bet for at least a modest increase, due to its lagged response to 1997's strong business climate. While the public works sector at mid-October is subject to uncertainty, given the pending status of important legislation, the healthy fiscal posture of state and local governments will continue to provide a base of support. Retail construction is probably the category most vulnerable to decline, but severe retrenchment is not likely to occur in a moderately growing economic environment.

What are the risks in 1998? A major stock market correction might trigger a loss of consumer confidence, leading to a sharp slowdown in consumer spending and possibly a mild recession. The Federal Reserve would then take quick action by lowering interest rates, limiting the extent of the decline. Or the economy will continue on a strong growth track, putting upward pressure on wages and ultimately prices. The Federal Reserve falls behind the inflation curve and is forced to raise interest rates substantially over several rounds of monetary tightening. This has a quick dampening effect on housing, but the full extent of the ensuing slowdown won't be felt until 1999 or 2000. While these scenarios are plausible, the most probable one remains another "soft landing" taking place in 1998, whether it is engineered by the Fed or it happens on its own. And, it should be remembered, the soft landing of 1995 still permitted growth by both income properties and institutional building.

When the lengthy expansion of the 1990s started back in 1992, it was clear that it would assume a different character from that of earlier construction cycles. The depressed condition of commercial real estate at that time ensured that the cycle would unfold in a much more gradual manner, which also gave it the potential for greater staying power. The steady demographic support for single-family housing also contributed to stability, as did the greater role now being played by institutional building and public works, two sectors that typically avoid sharp fluctuations. Another year of moderate growth is not a sure thing, but both the construction industry and the economy are not currently facing the imbalances that were present at the end of the previous decade. The 3% gain predicted for total construction in 1998 makes it seven straight years of growth, meeting the potential for a lengthy and well-paced expansion during the 1990s. ■

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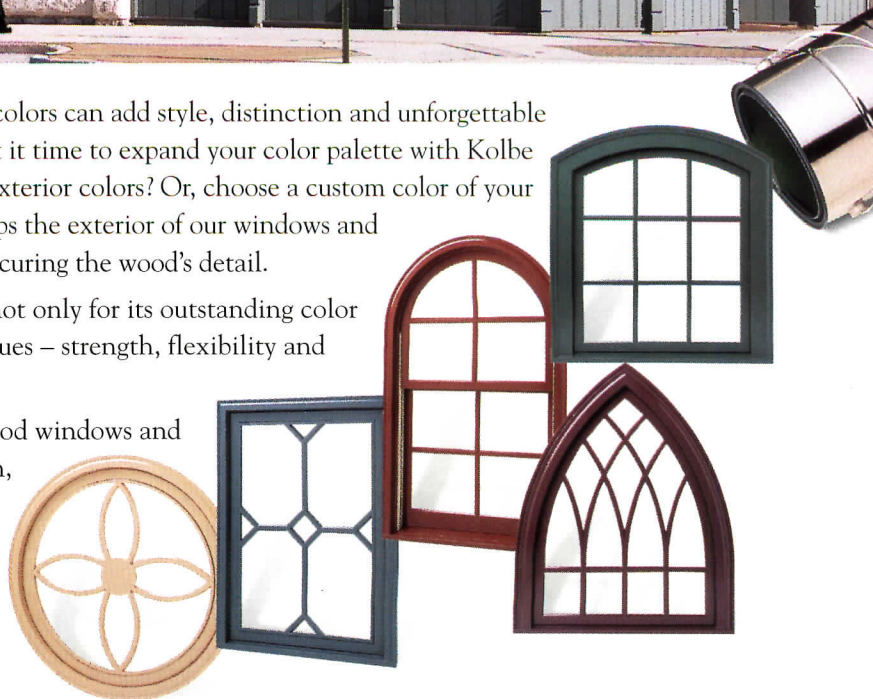
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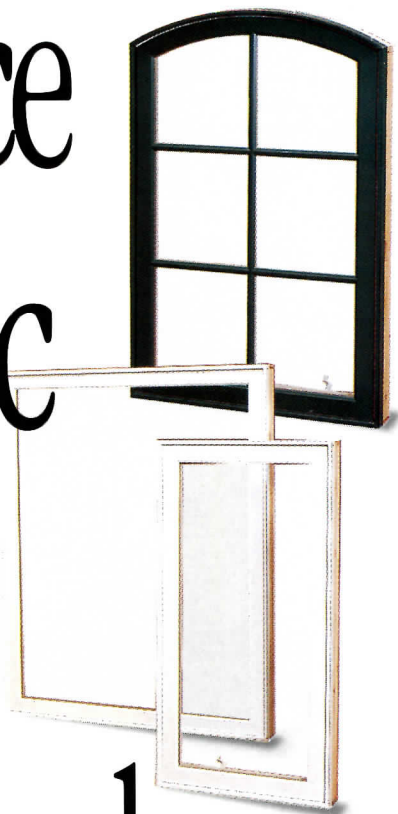
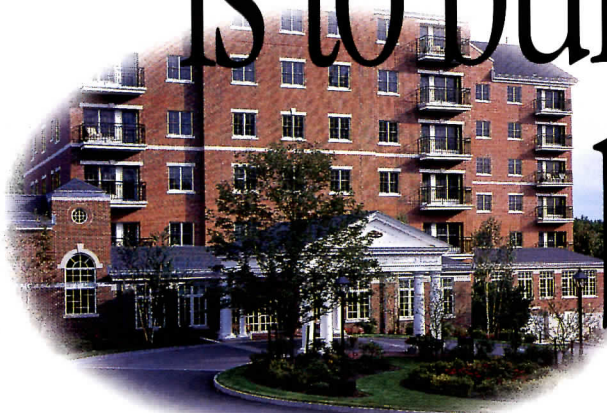


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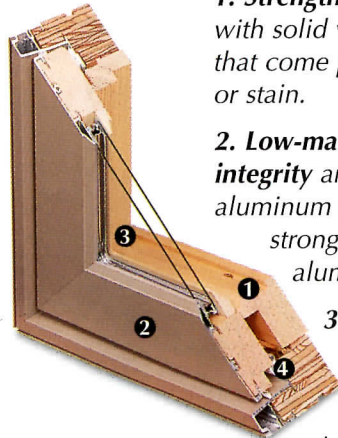
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It has been called an “energy churner with celestial gardens,” a “column of advertising,” the “eco-tower,” and Frankfurt’s “only true skyscraper.” Such varied reactions to Sir Norman Foster and Partners’ Commerzbank express German ambivalence toward tall buildings, which have often been criticized as energy wasters and symbols of the overweening domination of economic interests over the collective identity of the city. This tower has drawn so much debate because it is the most ambitious attempt yet to integrate environmentally responsible technologies into a tall building as well as reinterpret the type in a way that benefits both workers and the surrounding city.

The Commerzbank headquarters is a product of the unique political and economic climate that existed in Frankfurt-am-Main in the early 1990s. At that time, the city was governed by a coalition of Social Democrats and “Greens,” who had resisted large-scale development in the city’s historic center. Once in power, though, the coalition was reluctant to alienate the interests that underpinned the city’s economy. Bowing to pressure from the banks, officials allowed a high-rise financial quarter to develop between the main train station and the historic center (the Romer), an area well served by public transportation. While erecting skyscrapers enabled the banks to concentrate their operations in emblematic structures, the city, in exchange, did not hesitate to impose a range of requirements to make tall buildings more acceptable within the cityscape.

When Commerzbank, one of Germany’s leading banks, elected to build a new high-rise adjacent to its existing 348-foot-high tower in the heart of the new banking quarter, Green Party politicians, interested in seeing their energy-conserving agenda incorporated into the design of a prominent high-rise, urged the company to erect a “green” skyscraper. The bank embraced the idea and in 1991 sponsored an invited competi-

tion for an ecologically oriented building, which was to save energy, be economical to operate, offer a flexible workplace, and present a positive corporate image.

tion for an ecologically oriented building, which was to save energy, be economical to operate, offer a flexible workplace, and present a positive corporate image.

The winning team, Foster and Partners, proposed a triangular plan, with the elevator and stair cores pulled to the apexes so that a 49-story ventilating atrium could be carved out of the tower’s center. The configuration was shaped to maximize the amount of daylight entering the building, optimize views, and minimize shadows cast by the new tower on the old. (The old headquarters is only 26 feet away from the new building’s western corner.) In a break from the high-rise norm, Foster proposed 13 three-story-high gardens spiraling around the atrium. Although the gardens and atrium added volume to the building, they allowed internal and external offices to be naturally ventilated and receive direct sunlight, as mandated by German building codes.

The scheme also offered a new vision of office work. The triangular form divided the floor plate into three areas that were of manageable size but deep enough that perimeter private offices could face an informal internal space, suggesting a less hierarchical, more interactive office culture. The gardens also would offer settings for informal meetings

Project: Commerzbank, Frankfurt, Germany

Architect: Sir Norman Foster and Partners—Norman Foster, Spencer de Grey, Ken Shuttleworth, Mark Sutcliffe, Brandon Haw, Hans Brouwer, David Nelson, Robin Partington, Graham Phillips, Stefan Behling, Winston Shu, John Silver, Paul Kalkhoven, Chris Abell, Arthur Branthwaite, Chris Eisner, Tom Politowicz, Christopher Allercamp, Giuseppe Boscherini, Simon Bowden, Thomas Braun, George Brennan, Caroline Brown, Eckhardt Burling, Angus Campbell, Kei-Lu Cheong, Charles Collett, Penny Collins, David Crosswaite, Nigel Curry, John Drew, Matthew Downing, Alex Gounaris, Pauline Hanna, Ken Hutt,

Nadi Jahangiri, Mike Jelliffe, Michael Jones, Joachim Kappeler, Natalie Maguire, Nidolai Malsch, Matthias Massari, Stig Mikkelsen, Paul Morgan, Uwe Nienstedt, Swen Ollmann, Donia Parmasche, Stefan Ponur, Logan Reilly, Giles Robinson, Cormac Ryan, Thomas Scheel, Paul Scott, Mandy Bates, Kinna Stallard, Brian Timmone, Huw Turner, Peter Unkrig, Ken Wai, Andreas Wolff, Robert Watson, Alan Wilkinson-Marten, Louisa Williams, Michael Wurzel
Engineers: Ove Arup and Partners with Krebs and Keifer (structural, traffic, fire); J. Roger Preston with Pettersen and Ahrens (mechanical); Schad and Hölzel (electrical)
Construction Manager: Weidleplan

Mary Pepchinski is a Berlin-based architect, teacher, and writer.



Local officials required a low-scale base to tie the new tower and the old headquarters (above) into the scale of the surrounding area. Shops and housing wrap the block next to the Kaiserplatz entrance (left).

or chance encounters. And the ability to see people on other floors might encourage the dissolution of psychological barriers between them.

It was this integral approach that won Foster the project, explained Uwe Nienstedt, project director for Foster and Partners. The romantic appeal of the gardens and atrium, and the fact that they offered an amenity anyone could appreciate, helped keep the concept intact as cost-cutting pressures mounted during design development.

FOSTER WON A COMPETITION FOR AN ECOLOGICALLY ORIENTED TOWER.

Following the competition, Foster's office collaborated with a range of consultants to optimize the design and to flesh out the structural and mechanical concepts. During this phase, a number of ideas were either eliminated or altered. For example, the original plan, labeled the fish tail because of the way the elevator core extended from one corner (plan, page 76), was reshaped to improve circulation. The skip-stop elevator system was substituted by a conventional type to simplify wheelchair access to all floors, and the cores were tucked into rounded corners. Two bridges leading to the existing tower were also eliminated, as the client deemed this access unnecessary (an underground tunnel links the towers). The atrium was divided into three vertical segments, because detailed analysis—including wind-tunnel tests and computational fluid dynamics testing—showed that breezes would be too strong and hard to control. (The divisions, built in steel-framed glass, also offer better smoke control in case of a fire.) The highest gardens in each division horizontally vent the shaft.

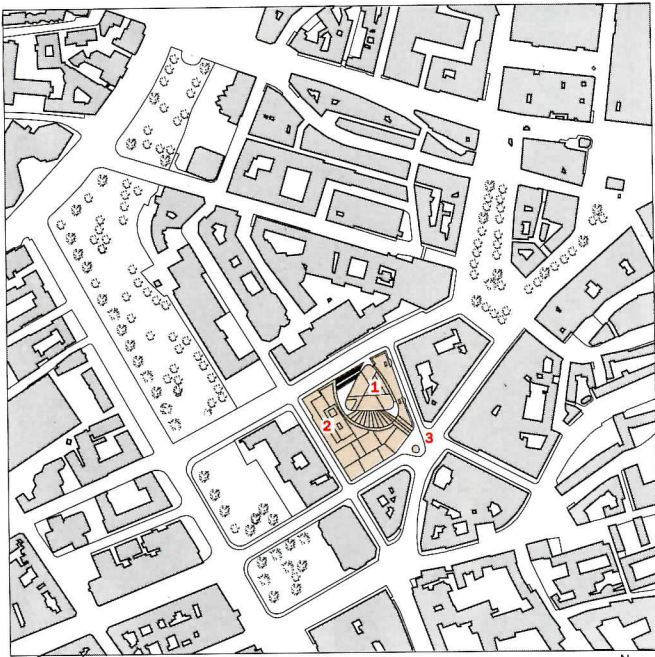
Although zoning limited the tower's height to 607 feet, city planners felt the structure was too bulky for Frankfurt's skyline. They demanded that it become thinner and taller, to the dismay of Commerzbank officials, who wanted larger floor plates and did not want to incur the additional costs. The city prevailed, and the tower's plan became smaller, while its height rose to 725 feet at its western core. A penthouse for mechanical systems and an antenna extend the tower's total height to 984 feet, which makes it, for the time being, the tallest building in Europe.

As constructed, nine 46-foot-high gardens spiral up the tower. Their exteriors are faced with operable, doubled-glazed panels, but they are completely open to the atrium. The tower's gardens are planted according to their orientation: the south-facing gardens are Mediterranean (citrus and olive trees, thymian, lavender), the western are North American (grasses, maples, rhododendrons), and the eastern are Asian (bamboo, magnolias, hydrangea). The combination of gardens and atrium, and the desire for flexible, column-free office space, led the engineers, Ove Arup Partnership, to devise a unique structure (opposite).

The smaller floors mandated by local officials were less of a hardship than first envisioned because the bank reconsidered the idea of meeting areas surrounded by offices ("Kombi-büro"), adopting a conventional plan of mostly private offices. The idea of a communal space—for secretaries and shared resources such as files and meeting areas—remains, but the space devoted to it is now much reduced. Glass office partitions bring light and views into the spaces.

The tower earns its ecological stripes in its handling of the office areas. In a tall building, merely supplying operable windows for ventilation unbalances the mechanical system; even a tiny opening can draw in

TECHNOLOGY



SITE PLAN



GROUND FLOOR

- | | |
|----------------------------|---------------------------|
| 1. New tower | 7. Elevator lobby |
| 2. Existing tower | 8. Plaza restaurant |
| 3. Kaiserplatz | 9. Entrance to auditorium |
| 4. Main entrance | 10. Shops/residential |
| 5. Vestibule | |
| 6. Lobby with atrium above | |

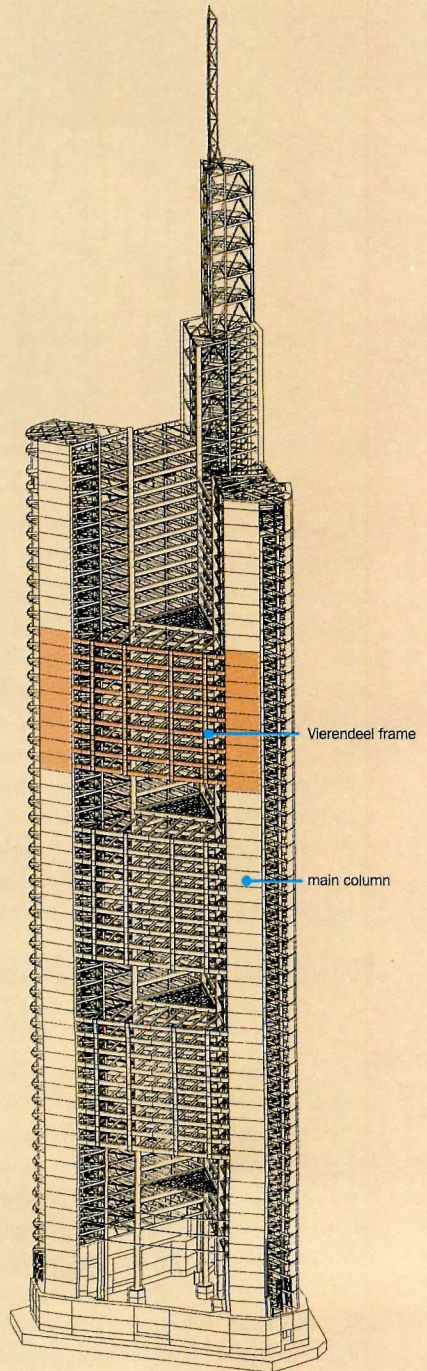
Commerzbank's unique geometry generated a unique structural solution. With column-free floor plates, no central core, and sky gardens interrupting much of the perimeter, a conventional structural system was out of the question. Ove Arup and Partners, structural engineers, made giant Vierendeel trusses out of the external framing of the eight floors between each garden level (drawing right). They span 112 feet and tie into three pairs of massive composite steel and concrete columns at each corner. (All-reinforced-concrete construction is the norm in Germany.) The column arrangement, with special horizontal link frames that pass between elevator shafts, braces the Vierendeels horizontally. Wind-load assumptions were tested in a wind tunnel, but local regulations did not permit the acceptance of a design based on these results, so the framing sizes are larger than the design team first proposed, according to Ove Arup.

Special software was run to optimize the performance of flanges and webs for beams and columns, which enabled a considerable lightening of the structure. The combination of wind and gravity loads showed that all the Vierendeels resisted similar stresses and could therefore be fabricated identically, which saved money and permitted considerable prefabrication.

Floors not only span column-free between the corners, they span without interruption from interior to exterior. They are concrete-wrapped steel, with beams notched near the perimeter to fit ductwork and other services. The floor-to-floor height is thereby maintained at a modest 12 feet 4 inches. Structurally, the floors act as diaphragms, distributing horizontal loads to the perimeter vertical tubes and bracing them.

The huge concentrated loads on the corner columns and the proximity of the existing Commerzbank tower meant that the design of the foundation was extremely challenging. Because of poor soil quality, many of Frankfurt's towers

are on raft-and-pile foundations. Working with local geotechnical experts Katzenbach und Quick, Ove Arup drove 111 concrete piles 149 feet through layers of sand, clay, and gravel to support the massive corner columns in limestone and dolomite. *James S. Russell and Mary Pepchinski*



At the center of the lobby (below) the tower's atrium rises the full height of the building (right). It is divided in thirds by

steel-framed glass screens, which offer smoke-passage protection and divert exhaust air through the topmost garden.



a seeming maelstrom. To permit natural ventilation, Foster's office designed a double facade (called a Klimafassade, or climate facade) comprising an exterior layer of fixed, single-glazed, laminated, radar-absorbent glass; a middle air cavity; and an interior double-glazed (with low-e glass) operable panel (details, page 77). Occupants can receive controlled, cool outside air when offices are warm or close off the internal panel; the sun will contribute some controlled solar heat gain in winter.

Conventional perimeter radiators under the floor supply heat when needed. A water-filled grid above the perforated-metal ceiling system is the backup cooling system. When chilled, it absorbs excess heat. Mechanical ventilation supplies only fresh air. The ceiling system also contains recessed lights, smoke alarms, sprinkler heads, and a movement sensor. Wiring is routed through a raised access floor.

systems in unoccupied spaces. Environmental conditions in the tower gardens are also under BMS control. Based on information provided by weather stations located throughout the building, the system operates the gardens' facade panels to limit swings in temperature and air movement. Under-floor heating also moderates the gardens' temperature in winter months.

Additional environmentally oriented features include washrooms supplied only with cold water and toilets flushed with "gray" water from the cooling towers. Fire stairs are finished with second cuts of granite, economically upgrading their appearance and encouraging their use.

What is it like to be in this towering utopia? It is a heady experience to actually stand in one of the gardens and look across a 12-story-high atrium with two other gardens opening onto it. Your eye is drawn to

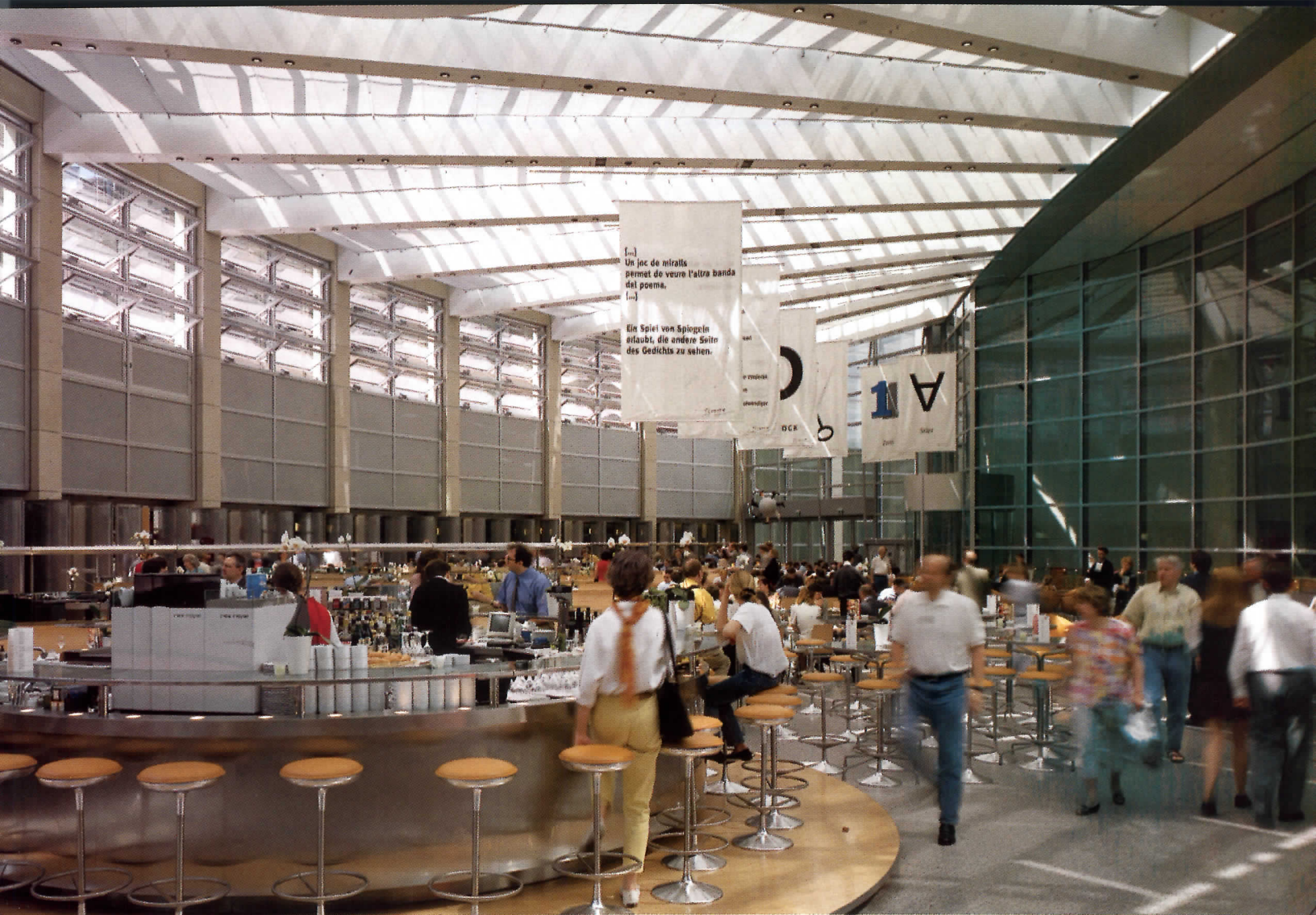
FEW WOULD DISAGREE THAT THE TOWER IS THE MOST AMBITIOUS ATTEMPT YET TO INTEGRATE ENVIRONMENTALLY RESPONSIBLE TECHNOLOGIES.

The scheme not only conserves energy, it permits users unprecedented control of their environment. Next to the door, switches control lights and operate both the interior facade panel and the louvers. When the window is activated, a motor runs for half a minute before the top tilts open roughly a foot. The interior office air is immediately cooler and slightly breezy. Due to the aerodynamic profiles of the spandrel vents, there is no noise from the air flowing into the office.

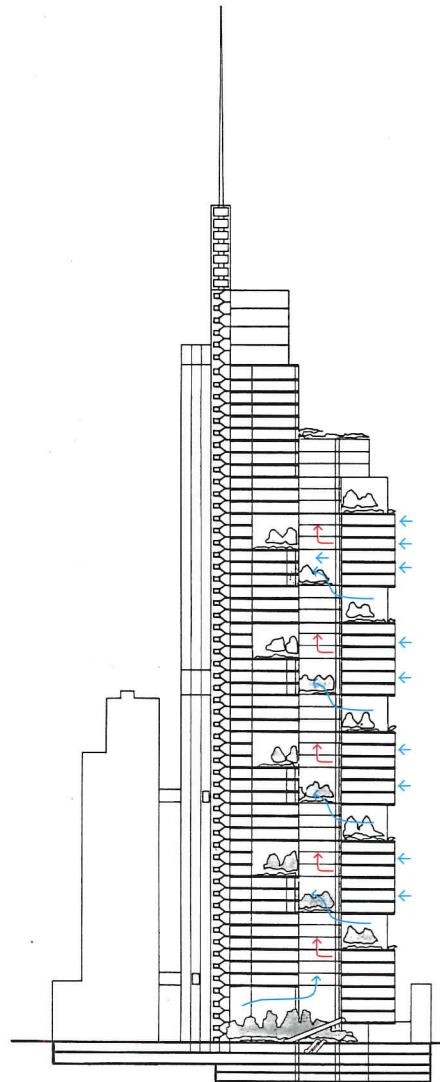
The structure's building management system (BMS) is unusually sophisticated, constantly analyzing ambient conditions and displaying a light to indicate whether the operable facade panels may be opened. The BMS can automatically adjust the curtain wall louvers as well as the fresh air and ceiling-panel water supply. Using occupancy sensors, it shuts off

greenery above and below, which frames the city roofscape beyond. The sun streams in, a cool, fragrant breeze wafts from one garden to another. It's an extraordinary reversal of a Modernist aesthetic: the garden in the machine rather than the machine in the garden.

Though Foster's office refers to these atrium segments as vil-lages, the wealth of spatial experiences seems to be more about realizing a sensual aesthetic than redefining the workplace. The gardens feel like outdoor places and function as public spaces: people confer, eat lunch, drink coffee, or simply pause for a moment's reflection. (Two gardens have buffet-style cafeterias; the rest are supplied with vending machines.) You sense that a kind of community has been created, one that could become familiar and intimate, so unlike the usual imposing (*text continues*)

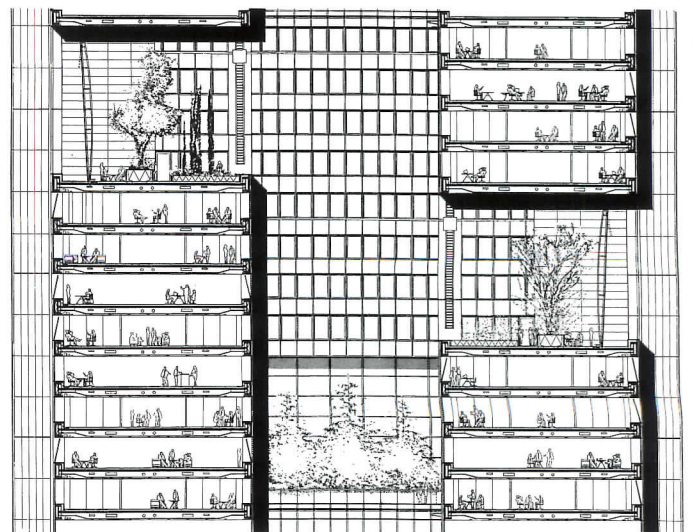


At the insistence of local authorities, the architect wrapped the base of the tower with shops and housing. The most dramatic of these amenities is a skylit café with furnishings designed by artist Alfredo Arribas (left). This café opens onto the lobby rather than the street. It is deep in the block and up a flight of stairs.



SCHMATIC BUILDING SECTION

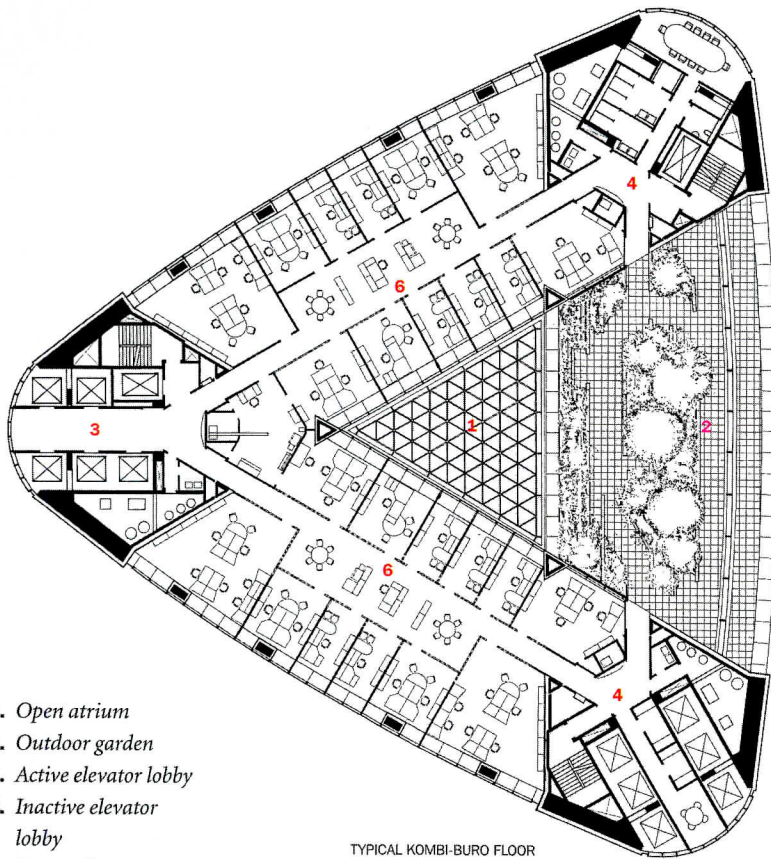
Workers who face the central atrium (opposite) may open windows to vent exhaust air. As warmer air rises, it draws cooler air from the outside via operable panels in the glazed wall (diagram left and photo top left). Exhaust air is vented out the topmost garden in each 12-floor "village." The building management system controls the openings in the gardens' glass facades to compensate for high air velocities in the tower.



PARTIAL TOWER SECTION

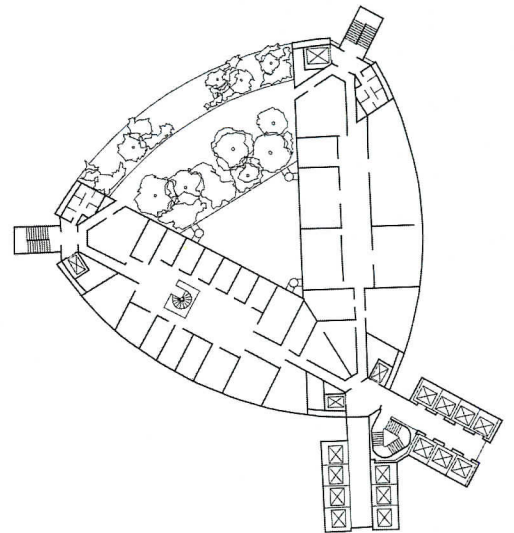
A large, multi-story atrium with glass walls and a central courtyard area. The atrium is characterized by its extensive use of glass, which allows for a high level of transparency and natural light. The structure is composed of multiple levels, with a central courtyard area that is visible from all sides. The glass walls reflect the surrounding environment, including trees and buildings, creating a sense of connection to the outdoors. The overall atmosphere is bright and open, with a focus on architectural detail and natural light.

With many floors visible across the atrium, Commerzbank hopes to foster a sense of community among the approximately 150 employees in each multifloor "village."

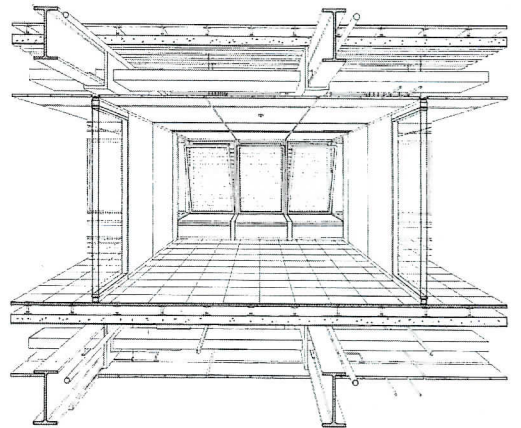


1. Open atrium
2. Outdoor garden
3. Active elevator lobby
4. Inactive elevator lobby
5. Team offices
6. Private offices surrounding informal meeting areas (Kombi-büro)

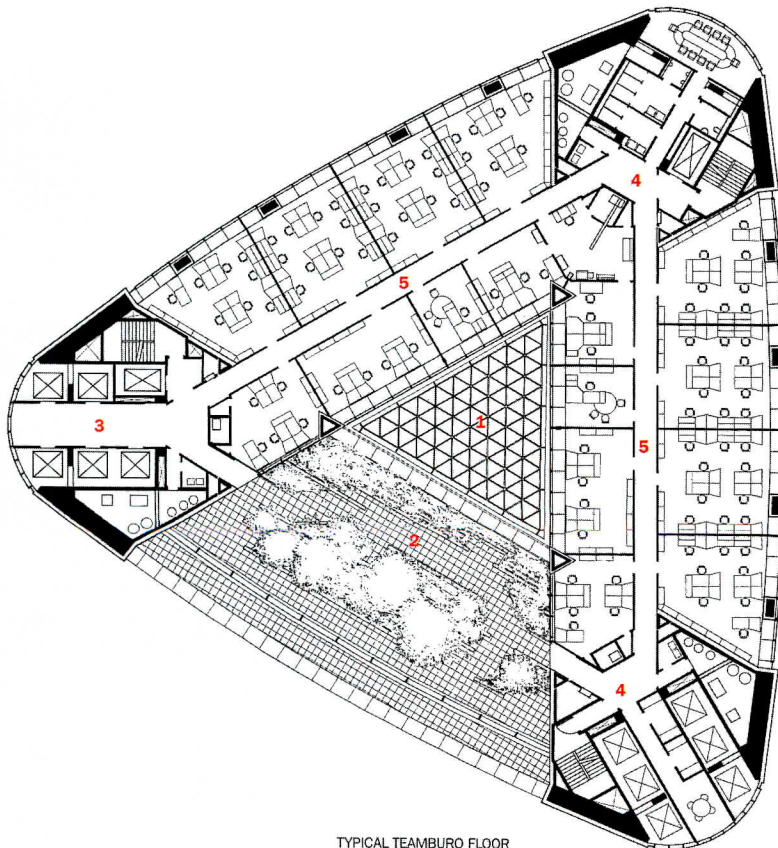
TYPICAL KOMBI-BÜRO FLOOR



Foster's competition-winning design showed elevator and stair cores pulled out of the mass of the building (above) and deeper floor plates. The original design included more area for team meetings than was ultimately built (floor plans left).



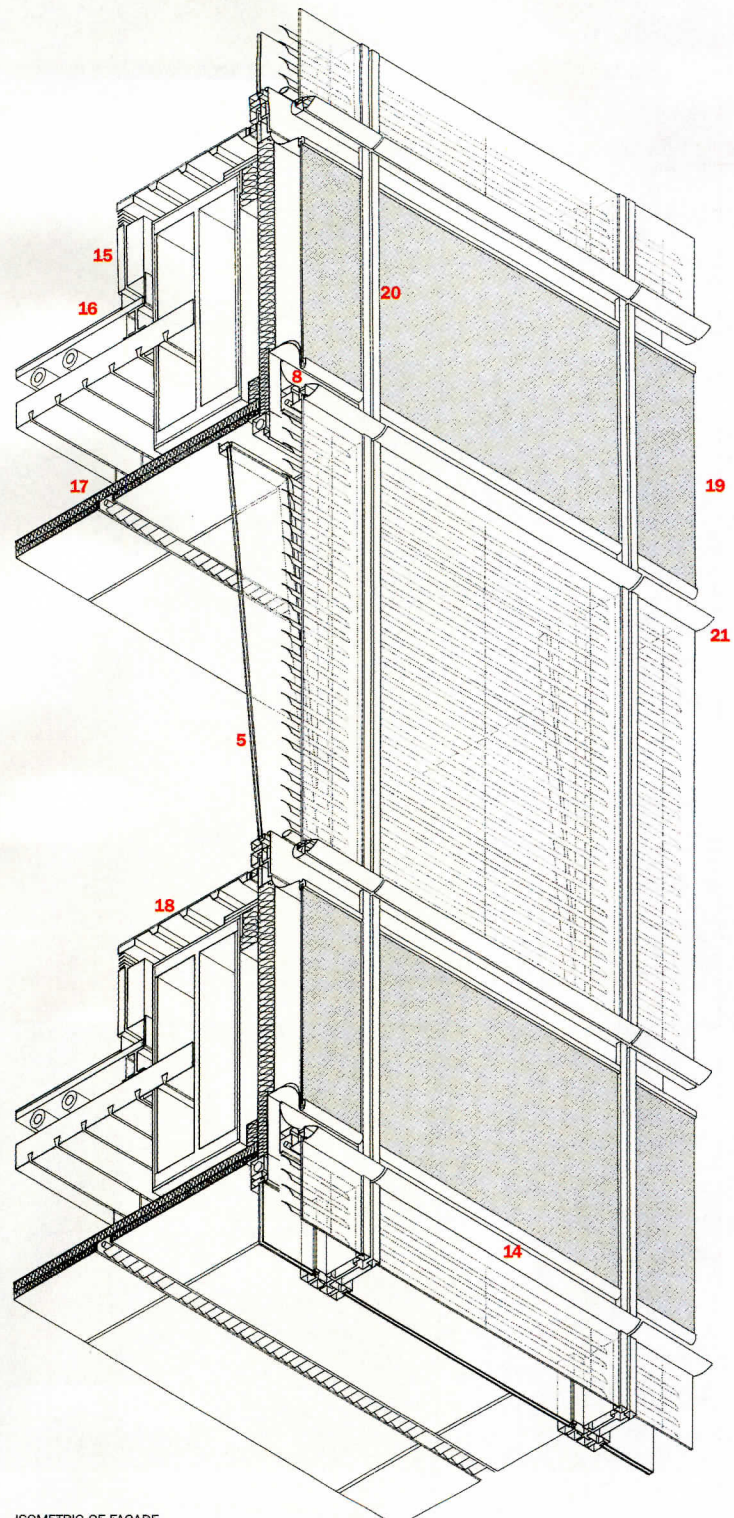
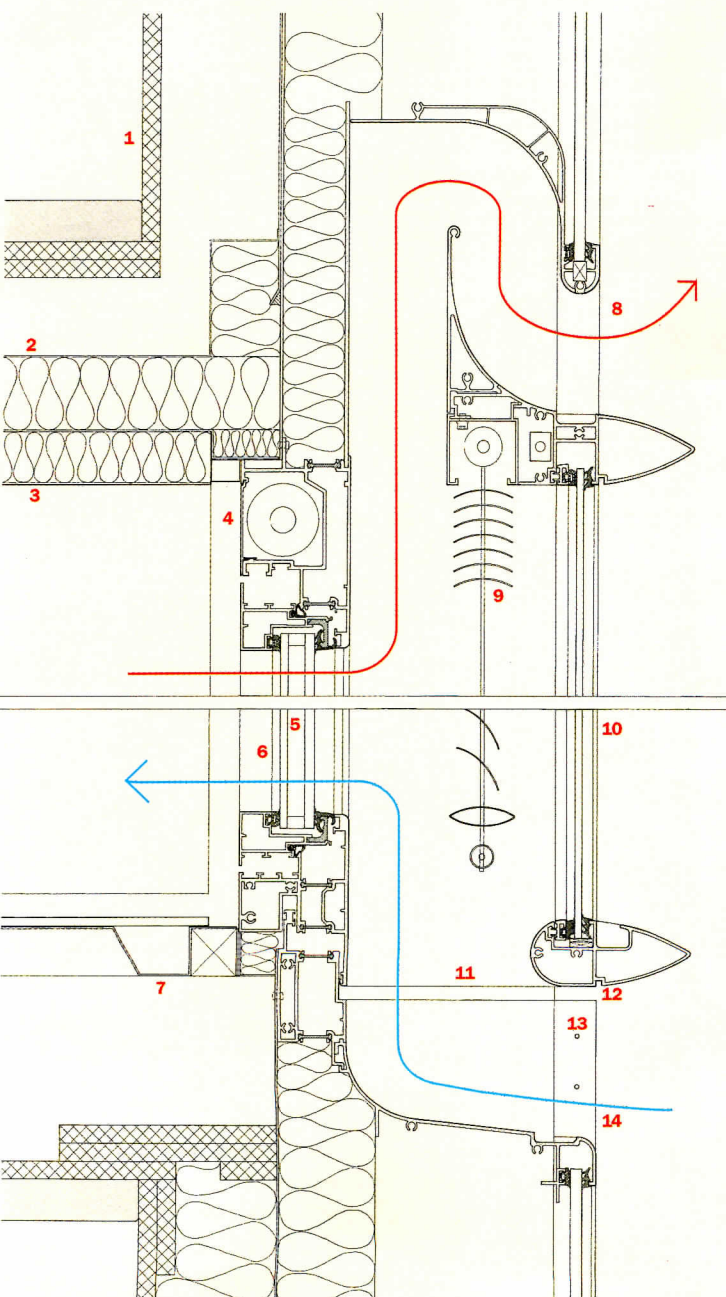
TYPICAL OFFICE



TYPICAL TEAMBÜRO FLOOR



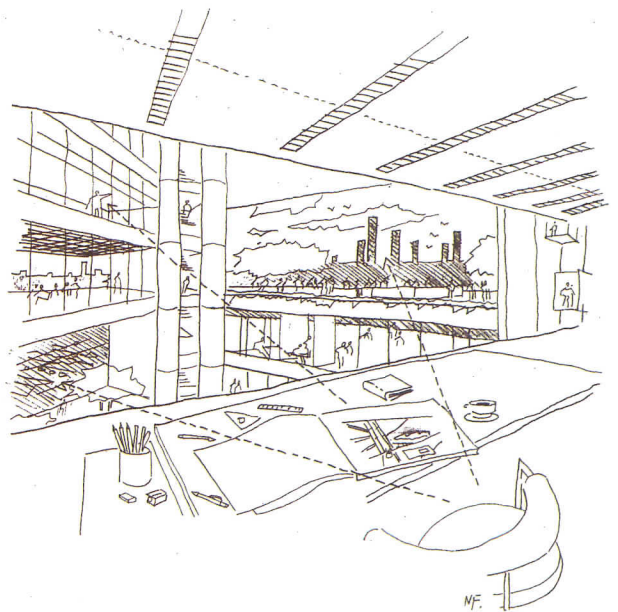
- 1. Fire protection
- 2. Insulation
- 3. Chilled ceiling panel
- 4. Window motor drive
- 5. Low-e double glazing
- 6. Operable inner unit
- 7. Metal sill support
- 8. Air exhaust
- 9. Motorized blind
- 10. Laminated outer glass light
- 11. Panel break
- 12. Drip profile
- 13. Vermin wires
- 14. Air intake
- 15. Perimeter convector
- 16. Raised floor
- 17. Perimeter diffuser
- 18. Glass sill
- 19. Glass spandrel
- 20. Mullion with equipment guides



ISOMETRIC OF FACADE

Air flows freely into the space between the two glazed facades (section left) and is admitted to offices only when the user operates the inner panel. The air-handling slots of the double facade are visible on

the tower's exterior (photo opposite). The facade is tightly integrated with the building's mechanical and lighting systems (section opposite and isometric above).



As built, the offices are impressively true to Foster's idealized vision of a transparent workplace (above and bottom left). Light even streams into the team-

meeting areas at the deepest point of the floorplate (top). With floor-to-ceiling glass, glare-controlling automated internal shutters are essential (top left).



downtown tower. Yet there is a voyeuristic quality to this world of glass walls and partitions, where everyone can be watched, where each person in pursuit of his or her individual task is perpetually on display.

The building is not without mundane problems, evident in a recent visit. In the Kombi-büro areas, some workers were actively using their communal space as intended, while others used it to store extra file cabinets. On the 35th floor, where a cafeteria is located in the garden, food smells drift into the adjacent corridors at lunchtime. Conversations from a crowd in a garden—even ambient noise from open office windows—made the atrium surprisingly noisy. The standard office furnishings were neither designed nor chosen by Foster and Partners, and although they are bright and functional they are clearly not consistent with the architectural aesthetic.

To tie the tower into the prevailing low scale of the neighborhood, local officials mandated that the tower be wrapped by a seven-story structure containing shops, housing, a 500-seat auditorium and parking spaces for 300 cars and 200 bicycles (page 70). But because the combined lobby and public plaza is located one story above street level and is barely visible to the average pedestrian, it acts as more of a barrier than an extension of the life of the city. Also, the vast main entry stairs are located on a lifeless side street and are therefore little used; the small rear entry stairs, leading from the heavily trafficked Kaiserplatz, seem to be much preferred.

While the tower has been praised in the German media, it has not silenced skyscraper skeptics. Critics have called it too massive and more of a dominating presence than early renderings promised. Its elevations are also less crystalline and transparent than anticipated,

encouraging those who feel the whole endeavor—gardens and all—is an arrogant fortress for an elite class.

It's too soon to know if Commerzbank will be seminal, whether this vision of "the workplace of the future," as Nienstedt calls it, will stimulate others to take the next step. It may portend a shift of tall-building innovation away from the United States, the traditional incubator of skyscrapers. Naturally ventilated double curtain walls are appearing on numerous projects now, for example.

In the short term, of course, the measure of such a radically new skyscraper is whether its technical innovations save energy and whether gardens and other informal meeting places improve satisfaction and productivity. Dr. Horst Grüneis, director of Commerzbank's Central Building Department, estimates that the building requires 25 to 30 percent less energy than the already strict German norms, a difference attributable primarily to low air-conditioning loads. Real numbers, he says, "can be calculated in two or three years, after the systems have been given a fine-tuning." Grüneis says he is satisfied. "We are given lots of praise when our office workers leave at night and tell us that they don't feel tired—this means that their productivity increases. This is more important to me than great architecture or sky gardens." ■

Sources

Facade: Josef Gartner & Co.

Glass: E. Glasbeton

Demountable partitions/chilled

ceiling system: Clestra Hauserman, Huppe Form

Suspended metal ceilings: Schmid Montage

Automatic glazed doors: Glasbau Hahn

Lock system/hardware: Erbacher and Kolg, Kaba Gallenachschutz

CRITICISM: Richard Gluckman's latest project, **THE GEORGIA O'KEEFFE MUSEUM**, shows why he's an architect of choice for the art world.



by David Dillon

Richard Gluckman Architects occupies a warehouse in TriBeCa with concrete floors, large industrial windows, and spectacular views of the Hudson River and lower Manhattan. The office is more than a studio; it's a statement of architectural principles: keep it simple, work with the givens, don't impose.

Gluckman, AIA, started developing these principles in the mid-1970s, when he arrived in New York City from Boston to open a practice with his roommate from Syracuse University and by chance found himself designing a town house for Heiner Friedrich, then director of the Dia Foundation (now Dia Center for the Arts). Dia was just beginning to acquire and renovate industrial buildings to exhibit the work of Donald Judd, Dan Flavin, James Turrell, and other Minimalist artists. Soon Gluckman was doing the renovations and serving as an expeditor on various major installations, such as Walter De Maria's *Broken Kilometer*. Although Gluckman knew little about art, the way these artists handled space convinced him that they were the best architects of the 1970s. "Heiner kept saying, 'Don't design. Strip the room to its essentials so you know what it's about.' It wasn't Minimalism to me. It was just a reductive process," he says. Thanks to Friedrich and Dia, Gluckman was able to avoid the Postmodern invasion of New York in the early 1980s, and when it was over he found himself the architect of choice for many prominent contemporary artists.

By now Gluckman has designed some 40 commercial galleries in the United States and Europe, as well as the Andy Warhol Museum in Pittsburgh [RECORD, September 1994, pages 74–79] and the new Georgia O'Keeffe Museum in Santa Fe. Most are renovated spaces carved out of inherited buildings, and all display the spare, understated aesthetic that has enabled him to visually support such powerhouse talents as Richard Serra (for whom he designed a house), Rem Koolhaas (a collaborator on a Manhattan performance space), and the late Gianni Versace (a

retail client). "They trust me because they assume I'm unassuming," Gluckman says. "They know that I'm not going to infringe on their work by inserting some egocentric stylistic element into the space. I'm committed to the art, and that's what has developed my reputation."

The Georgia O'Keeffe Museum, the first major museum ever devoted to the work of an internationally known woman artist, was an ideal commission for Gluckman. Located a few blocks from Santa Fe's main plaza, within the shell of a 1905 Spanish Baptist church-turned-art gallery, it is a thick-walled, flat-roofed structure that doesn't call attention to itself. Because of the city's strict historic ordinances, which regulate the height, color, materials, and massing of every downtown building, Gluckman had few architectural opportunities on the exterior. So he focused most of his energies on the galleries.

During her lifetime, O'Keeffe was dictatorial about how her work was displayed, often rehanging entire shows at the last minute because they didn't conform to her vision. She demanded spare, neutral spaces, with plenty of room between paintings and nothing to disturb the meditative calm. Gluckman's design accommodates these demands without sacrificing architectural sophistication. His galleries are subtle combinations of hand-plastered walls, textured terrazzo-ground floors, and rich natural light similar to that found in O'Keeffe's landscapes. Their restraint makes the art pop, while their spatial variety gives the tiny building grandeur. Gluckman took many of his design cues from the colors, textures, and pragmatic simplicity of O'Keeffe's home in Abiquiu, 50 miles north of Santa Fe.

"We brought back soil samples to get the color of the plaster right," Gluckman explains, "and the floors have some of the qualities of earth. But the references in the museum are also to the entire Southwest and to the history of that building. Abiquiu was just one source."

The galleries form a subtle procession that provides a comprehensive introduction to O'Keeffe's art and a clear sense of progression

Project: *The Georgia O'Keeffe Museum, Santa Fe, New Mexico*

Architect: *Richard Gluckman Architects—Richard Gluckman, AIA, principal-in-charge; Robert White, project architect; David Saik, Raphaela Bortoluzzi, project team*

Architect of Record: *Greg Allegretti, AIA*

Engineers: *Ove Arup and Partners (structural, mechanical); M & E Engineering (electrical, plumbing)*

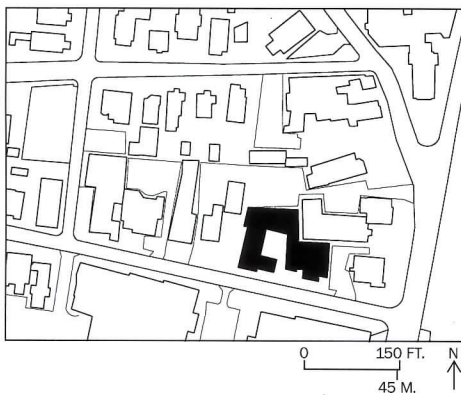
Consultant: *Richard Wilder (landscape)*

General Contractor: *Wolf Corporation*

Contributing Editor David Dillon is the architecture critic for the Dallas Morning News. His last article for RECORD, in the November 1997 issue, was on competitions.



The installation in the entry gallery respects O'Keeffe's desire for spare, neutral spaces. The colors and textures were inspired by her Abiquiu home.

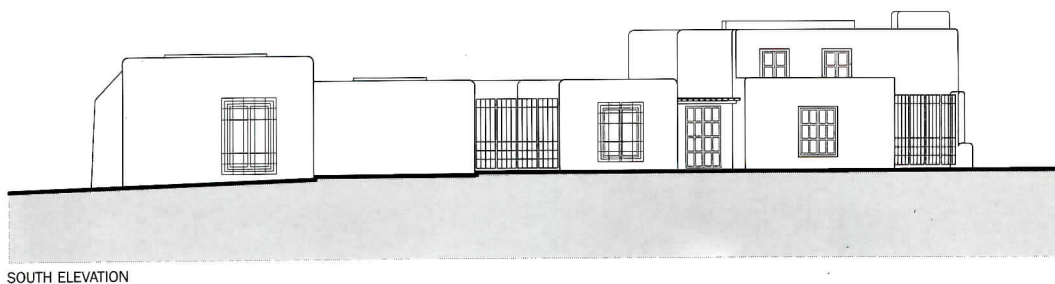
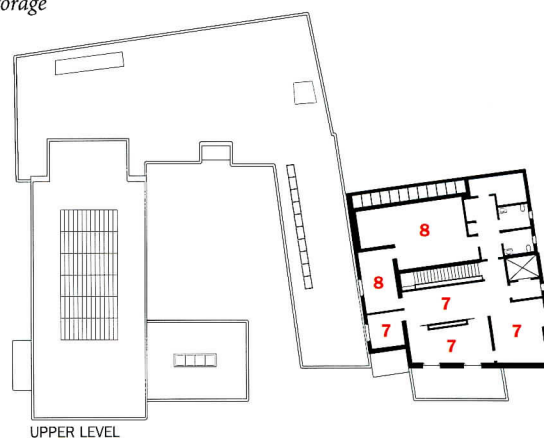
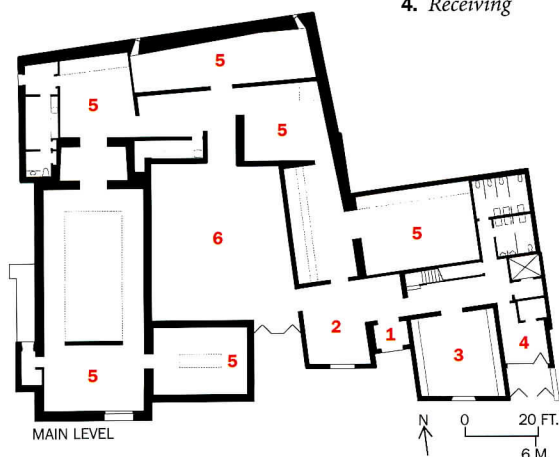


The massing, setbacks, and windows of the Georgia O'Keeffe Museum reflect Santa Fe's desire for "residential character" (top). Gluckman inserted the museum into a tight

downtown site previously occupied by a church-turned-art gallery (plan above). The courtyard features O'Keeffe's sculpture *Abstraction, 1945* (right).



- 1. Entry
- 2. Entry gallery
- 3. Store
- 4. Receiving
- 5. Gallery
- 6. Patio
- 7. Office
- 8. Storage



The building footprint follows the perimeter walls of previous structures. The museum shop, the orientation gallery, and offices were squeezed into a two-story wing.

from early to late work. Although only 116 of her estimated 2,200 works are here, it's still the largest collection of O'Keeffe's in the world.

The first gallery is an O'Keeffe primer, containing only three paintings: *Black Cross and Red Sky*, 1929; *Black Place III*, 1944; and *Jimson Weed*, 1932, one of her monumental flower paintings. Spirituality, landscape, and nature—her great themes—are presented here in a clear, straightforward way that anticipates the drama to come. The remaining galleries are more spatially eccentric, recalling the interior plan of the church and the gallery. Walls curve or slant, ceilings hover or soar, and skylights are placed asymmetrically in order to generate a spatial energy to complement the visual energy on the walls.

A dark, cloistered space with a gently curving interior wall contains works on paper, including watercolors from the 1917 *Nude Series* and several vivid Texas landscapes painted while O'Keeffe was an art teacher in Amarillo. Neighboring galleries feature early pastels, flower paintings, Southwestern oils, and seldom-seen paintings of kachina dolls.

The skylights are critical for leading visitors from gallery to gallery. In one room they wash the walls with the sharp, even light found in many O'Keeffe landscapes; in another the skylight beckons from a corner, like an opening in a kiva. Their irregular placement creates a mood and a pacing that underscores the narrative of the art.

The most dramatic space, the climax of Gluckman's carefully orchestrated procession, is the main gallery, which contains large abstract landscapes such as *My Last Door*, 1954 and *Spring*, 1948. This gallery was the sanctuary of the Baptist church and is still framed by the narthex and side chapel. Here the walls rise to a broad central skylight, which proclaims the importance of the room and the art it contains.

O'Keeffe spent much of her life in sacred places, from Anasazi ruins to her house in Abiquiu, which was once a Catholic convent. It is entirely appropriate that her museum have a religious space as well.

Gluckman agonizes over details that other architects might ignore. The hand-troweled plaster walls turned out pinker than he wanted, and in one gallery the ceiling joists are not parallel to the side

O'KEEFFE DEMANDED SPARE SPACES, WITH ROOM BETWEEN PAINTINGS.

walls. "If only we'd had a few more months we could have fixed that," he says ruefully.

The museum's nine galleries surround an open courtyard. One corner contains medicinal sage and jimson weed, a bleached cow's skull, and a solitary tree—all icons of O'Keeffe's art; her cast-aluminum sculpture *Abstraction*, 1945 stands in another corner. The courtyard is the museum's most explicit reference to Abiquiu and a work of art in its own right.

At 13,000 square feet, the Georgia O'Keeffe Museum is extremely small to serve its visitors. (Within three months of its opening, the museum had already exceeded its projection of 150,000 visitors annually.) The scale, like the facade, reflects the demands of the historic-district review board, which imposed a 23-foot height limit even though a nearby hotel exceeds 80 feet. The cap forced offices, the museum shop, and an orientation gallery into a small wing and reduced storage and conservation areas to a bare minimum. But the most serious consequences have been for circulation. Even though 60 percent of the interior is galleries—



Gluckman varied the position of skylights to create visual and spatial drama throughout. In the entry gallery (top left) the skylight is a slender rectangle; in other galleries it is a

nearly invisible slot or a mysterious corner (top and bottom right). In the main gallery (bottom left) the skylight is centered to emphasize the space's importance.



the standard is 25 to 30 percent—visitors have to retrace their steps through the exhibition because there are no secondary exits. Plans to extend the museum into a courtyard next door were rejected. As a result, the museum is limiting attendance to 200 people at one time, which means long lines of unhappy tourists on the sidewalk during peak periods. A second phase of construction on nearby blocks is already under discussion.

Santa Fe considers visual coherence an asset in an era of chaotic urban sprawl. But there is also a hint of mummification in design regulations that deem a pseudo-adobe supermarket with vigas poking

most celebrated current project, the \$25 million renovation of the Whitney Museum of American Art in New York City, designed by Marcel Breuer, will be largely invisible from the street. Yet in its mix of office space and permanent-collection galleries, it's more complex than most new buildings. "It's a backbreaker," says Gluckman.

The architect's strong showing in the recent Modern Art Museum of Fort Worth competition, won by Tadao Ando, may change his course. He responded superbly to the museum's request for a building that "encourages the contemplation of art without distracting details." His five spare pavilions, connected by a seemingly floating roof of louvers,

GLUCKMAN'S GALLERIES ALL DISPLAY AN UNDERSTATED AESTHETIC THAT VISUALLY SUPPORTS THE WORK OF POWERHOUSE TALENTS.

through all four walls more acceptable than a thoughtful modern building. In the name of safeguarding the public realm, the boards frequently design the buildings. "Review boards should be involved in restoration, not renovation," argues Gluckman. "We wanted a more abstract quality on the street, for example, but were told to add more windows so that the museum would look more residential. But it's not a residential building."

Despite all the restrictions, Gluckman has given Santa Fe a subtle and sophisticated museum that honors the art it houses and the community it serves. What he wants now is to design a new building, from the ground up, without accommodating the whims of previous owners and occupants. For all his success, Gluckman resents being type-cast as a "gallery guy" who shouldn't be trusted with a facade. Even his

light boxes, and sunscreens, promised a rich dialogue between structure and light, viewer and space. The quiet elegance and spatial inventiveness of a Gluckman gallery was re-created at a civic scale. A tough loss but, Gluckman hopes, a preview of things to come. ■

Sources

Low-E insulated skylights: *Viracon*
Aluminum skylight: *Supersky*
Custom wood doors: *Larry Armijo*
Cabinet hardware: *Blum, Accuride*
Paints: *Wellborn*
Files: *Office Specialty*

Recessed track lighting: *Nulux*

Dimming system: *Macro Electronics*

Skylight lighting: *Lithonia Lighting*

Incandescent downlights: *Edison*

Price, Inc.

Store cabinet lighting: *Norbert Belfer Lighting*

The grand staircase of Le Fresnoy acts as an awning for the ground-floor entrance.



Bernard Tschumi's reputation as a paper architect is challenged by his "in-between" building for **LE FRESNOY.**

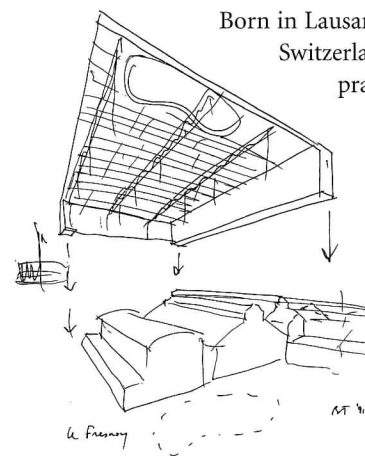


by Karen D. Stein

The year 1988 marked a turning point for Bernard Tschumi. His most celebrated architectural commission up to that date—the urban plan for the 125-acre Parc de la Villette in Paris—had been dragging on for six years and was in its umpteenth battle with a seemingly endless succession of bureaucrats who were unsure of his red-painted garden “follies.” His new work seemed doomed to remain mostly on paper.

Then he was named dean of the Graduate School of Architecture, Planning, and Preservation at Columbia University. A prestigious academic position offered welcome job security and a ready-made laboratory for experimenting with ideas, a draw for any architect and particularly the theory-minded Tschumi. But he quickly discovered, as he did when starting his architectural practice, that there was no fixed job description. “I had no idea what the job of a dean was,” recalls Tschumi. “You have to invent the job around you.” Discussing the varied demands of the Columbia faculty and student body, Tschumi says, “They’re so diverse. If you let all the atoms exist in constant motion, it’s a great place. If you let them all congeal into one mass, it’s a problem. The skill is to keep the atoms circulating.”

Rather than segregate his practice from his academic life over the last decade, Tschumi has allowed the two aspects of his career to influence each other. He has not only mastered the art of mixing at Columbia but has brought his skill as an alchemist to his practice of architecture. Tschumi’s ability to be more than one thing—theoretician and practitioner—to more than one group of people has something to do with the peripatetic nature of the profession and something to do with how perceptions of him shift depending on the situation.



Born in Lausanne, Switzerland, and raised in both Switzerland and France, where his father practiced architecture, Tschumi has citizenship in both countries, though he’s been a resident of the United States since he moved to New York City in 1976. He’s Swiss to the French, American to the Swiss, and—perhaps most significant—European to Americans. For most of his career he’s been as much outsider as insider, which makes him exotic in either camp.

Tschumi’s professional identity is open to constant interpretation, and so is his architecture, a condition that he exploits in his theories of space. In a recent volume of his work Tschumi writes: “Architecture resembles a masked figure. It cannot easily be unveiled. It is always hiding: behind drawstrings, behind precepts, behind habits, behind technical constraints. Yet it is the very difficulty of uncovering architecture that makes it intensely desirable. This unveiling is part of the pleasure of architecture.”

It’s a truism that an architect’s work is autobiographical. So it comes as no surprise that one of the central preoccupations of Tschumi’s recent architecture—and the main theme of Le Fresnoy, the National Studio for Contemporary Arts in Tourcoing, France—is what he’s called the “strategy of the in-between.” At Le Fresnoy the “in-between” refers to the space where the existing building and Tschumi’s insertions meet. It also evokes the overall result of the project: a hybrid between old and new construction.

Project: *Le Fresnoy, National Studio for Contemporary Arts, Tourcoing, France*

Architect: *Bernard Tschumi Architects—Bernard Tschumi, principal-in-charge; Tom Kowalski, Jean-François Erhel, Véronique Descharrières, François Gillet, Mark Haukos, Yannis Aesopos, Henning Ehrhardt, Douglas*

Gauthier, Vincent Thevenon, Paul Huchard, Robert Young, Jim Sullivan, Eric Liftin, Robert Moric, Sheri Olson, Jordan Parnass, Tsuto Sakamoto, project team

Engineers: *Tetraserf (structural); Louis Choulet (mechanical)*

Consultant: *Sylvia Kurz (landscape)*



Tschumi came to Le Fresnoy in the same way he's come to the other significant projects of his career: through competition. Winning the commission for La Villette in 1983 put him in the international spotlight as an architect-provocateur. However, a 12-year gestation period for the 25 follies of La Villette (each between 2,000 and 12,000 square feet) took a toll on his reputation as a builder. The public unveiling of Le Fresnoy revived his reputation and helped Tschumi make it to the final round of the competition to design the extension of New York City's Museum of Modern Art last fall. He's a contender again.

**“THE BUILDING WAS IN BAD CONDITION,”
REMEMBERS TSCHUMI, “BUT THE
SPACES WERE SO FASCINATING.”**

“The program is crucial,” says Tschumi of Le Fresnoy. Indeed, the idea of the interdisciplinary institution and its three-dimensional realization are now so intertwined it's difficult to unravel the pedagogical mission from the architectural effect.

Located in northern France near the growing megalopolis of Lille, Le Fresnoy is a graduate school for a range of artistic disciplines—cinema, video, visual arts, performing arts—all of which are meant to interact and cross-pollinate. As is typical in France, it's entirely funded by the federal and regional government (in this case, the Ministry of Culture and the Nord Pas de Calais). Tuition is free. Alain Fleischer, Le Fresnoy's director and also a founder, explains, “Our main idea is crossing all the

arts, including new technologies. It's more a producing school than a traditional graduate school. Students work with famous artists and choreographers to produce work on a professional scale and with professional means.”

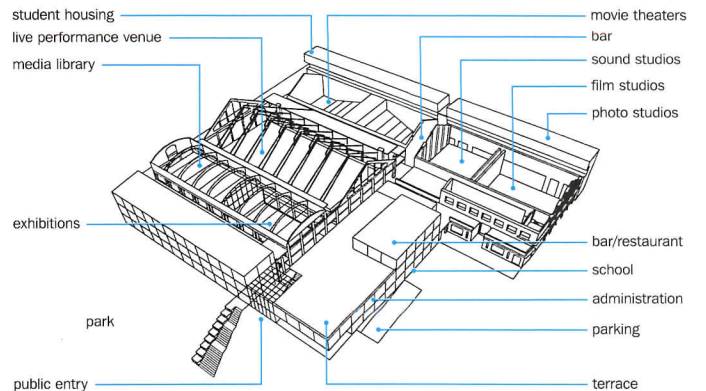
When Fleischer and his colleagues were touring the region for possible sites for the school, they fixed on Le Fresnoy, a forlorn group of buildings that in its 1920s heyday had been an entertainment palace complete with the first movie theater in northern France and a wrestling arena, among other features. Designed by its owner, a local contractor, the complex was a marvel of open-span industrial space and remained so even in its dilapidated state. “The project really started when we were given this place,” says Fleischer of its catalytic role.

While the competition brief mentioned the importance of the existing buildings, most of the entrants ignored them. “Keeping the old buildings was our wish,” recalls Fleischer of the jury's sentiments. “Many of the architects ignored this. Others pretended to keep the old buildings. But Tschumi was the only one to really do it.”

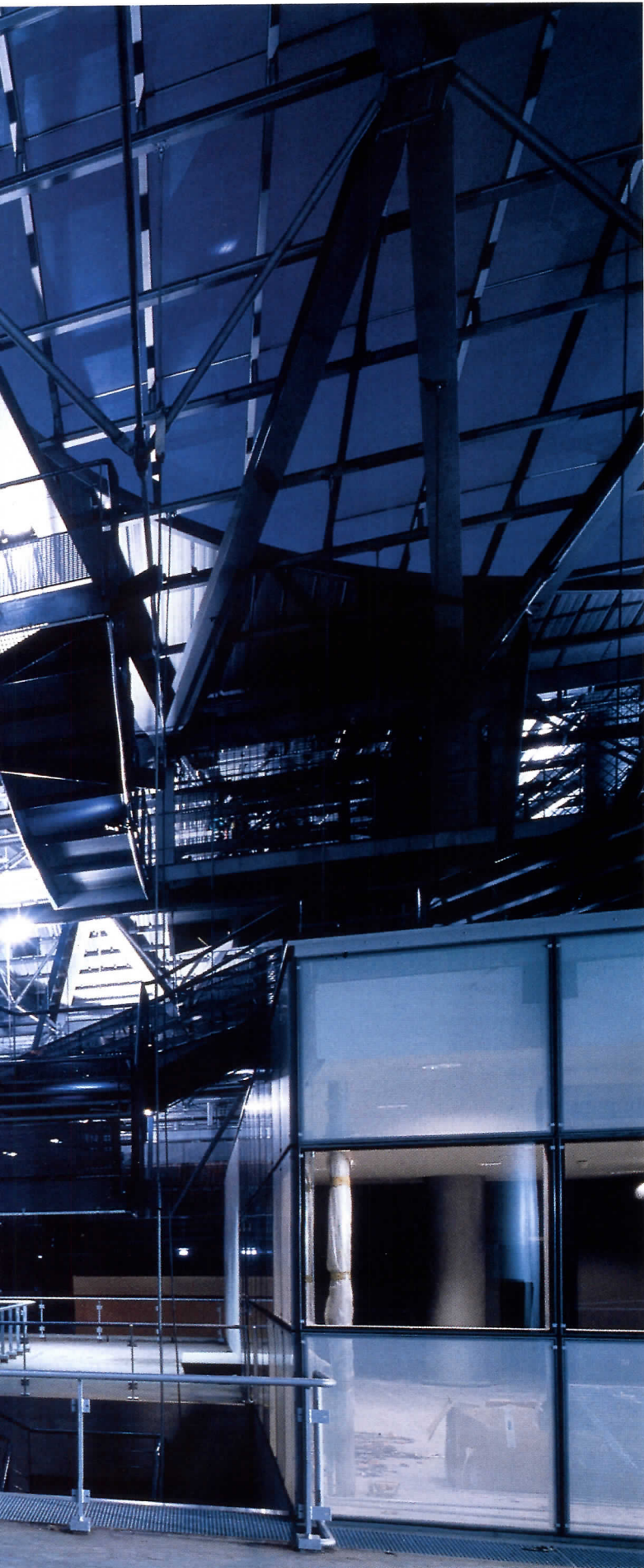
Tschumi remembers the assignment's emphasis differently, a discrepancy due, perhaps, to the surprisingly pleasant impact of the spaces themselves. “In the competition requirements, we were encouraged to demolish everything. Then I came to France and saw the spaces and I felt a reticence to do so. I knew that at \$100 per square foot [the proposed budget], I couldn't build spaces like that.” For Tschumi, who sees himself as testing architecture's limits, finding himself pleading for “preservation” was indeed sobering. “The building was in bad condition, (*text continues*)



A canal and highway run along the north side of Le Fresnoy (left, top and bottom). The existing buildings (right) were given a fresh coat of yellow paint (above and opposite).



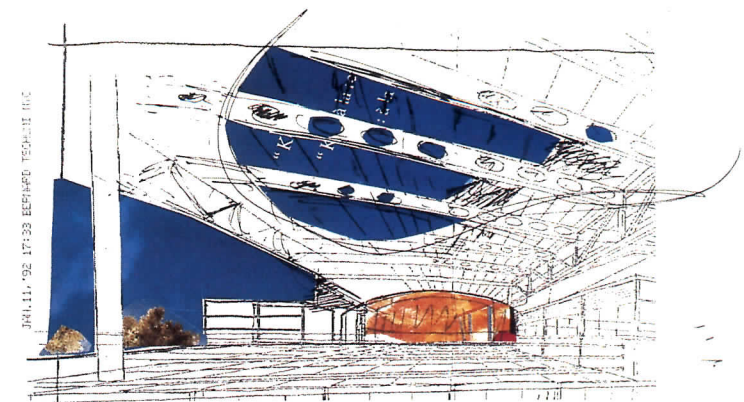
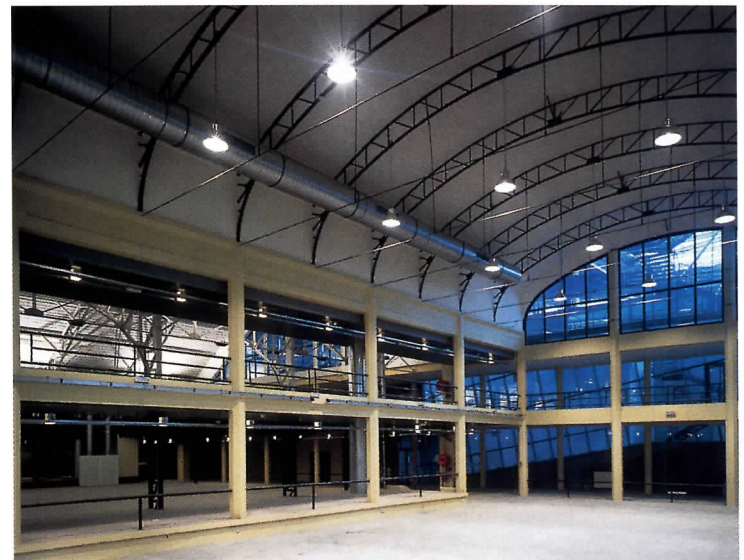


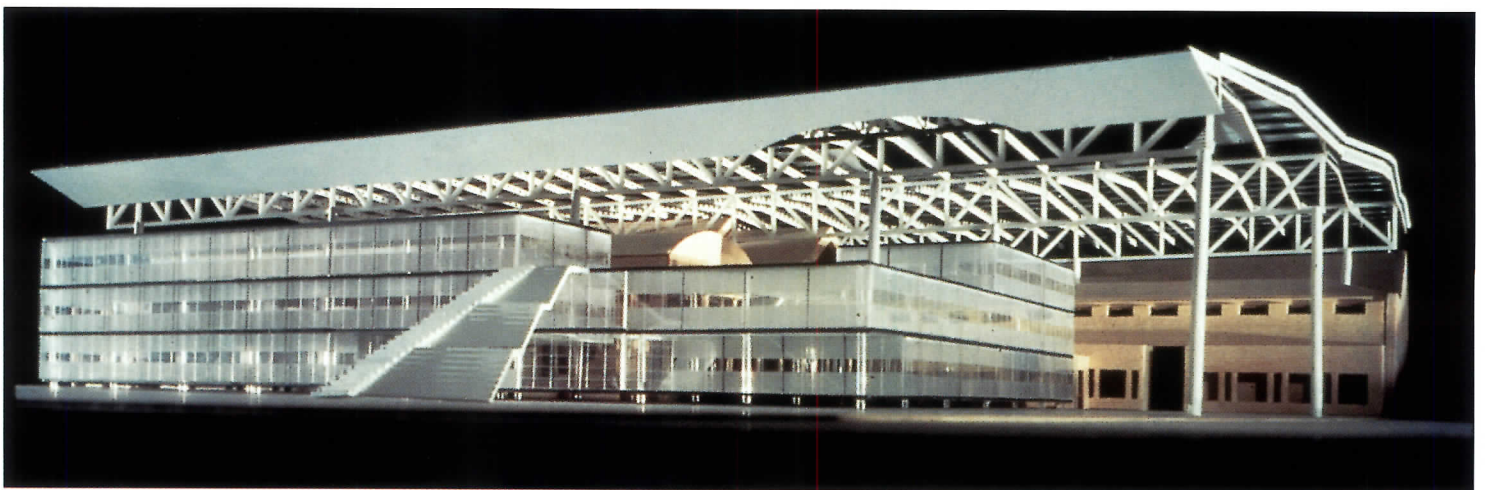
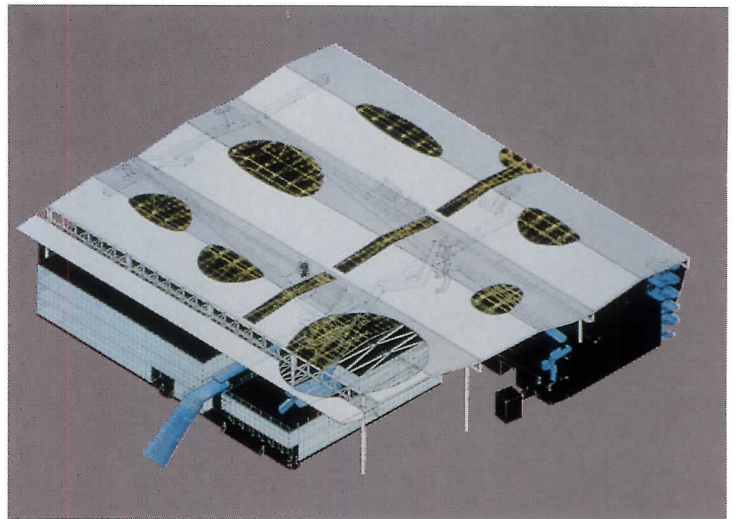
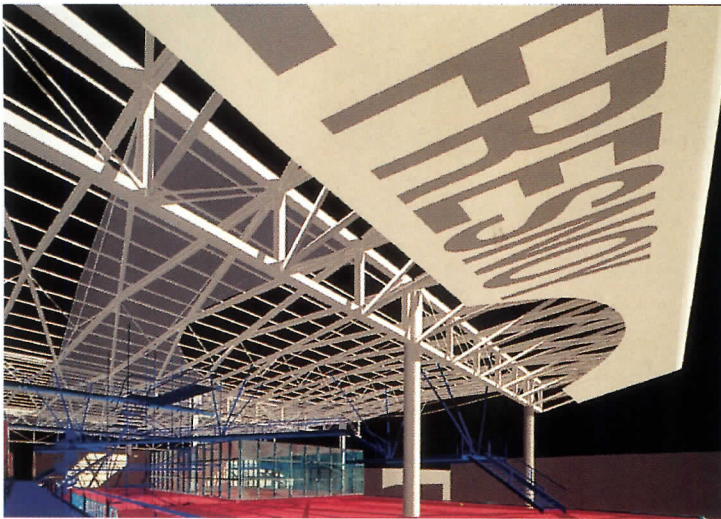


The grand exhibition hall (left and below) was once a roller rink complete with mezzanine. Inside the space, Tschumi added a

second-floor library, reaffirming his box-within-a-box strategy. Wood planks have been inserted between the trusses of the

second grand hall (above) to improve acoustics for live performances. New ducts and lighting are hung from the roof.





but the spaces were so fascinating,” explains Tschumi. “I thought at the time, ‘It’s crazy to demolish this,’ and I’m not a conservationist.”

Between the first design phase of the competition in October 1991 (with six competitors) and the second phase in February 1992 (with only two teams remaining) Tschumi met with the client group every two weeks to dissect the program. The design developed very quickly, Tschumi says, and by the spring of 1992 the project was officially his. He expanded the team working on the project in his Paris and New York offices, incor-

TSCHUMI’S “IN-BETWEEN” IS EXPRESSED BY A WEB OF BLUE-PAINTED STEEL CATWALKS.

porating former Columbia students into his Manhattan studio for marathon sessions of program discussion—workshop critiques of ideas and theories about the project—and model building and computer analysis. Sorting out the mandates of the local and regional planning office regarding permissible building height for a public facility delayed the start of construction until April 1994. A maximum height of 67 feet was eventually agreed on.

The overall concept is simple. “My first reaction [to the complex] was ‘Let’s put a big umbrella over it to keep the rain out and avoid dealing with the snow,’ since the engineers said snow loads were going to be a big problem,” says Tschumi. So was born the “in-between.” Tschumi’s umbrella became a 295-by-304-foot steel roof 64 feet high at its

peak. All the HVAC equipment and staging mechanics are hung from the roof, puncturing the tiled roofs of the existing buildings as necessary. The spaces beneath have been salvaged and reworked, depending on the needs of the program—in all some 53,500 square feet of existing space were retained and 84,300 square feet of new space were built; 24,000 square feet were demolished. One grand hall, originally a roller rink, now serves as exhibition space, with a media library tucked in its back half as a box within a box. The second grand hall is for live performances. Wood planks backed with sound-absorbent material were inserted between steel trusses to improve the space’s acoustics.

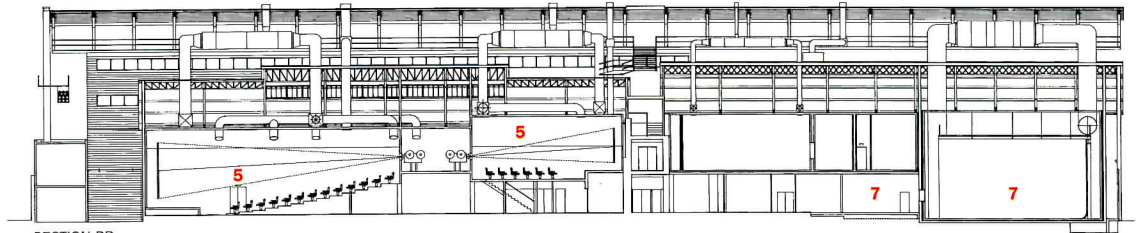
A rotted structure on the north part of the complex was demolished to make room for production studios and a block of artist-in-residence and student housing. Additions were boldly rendered to distinguish them from existing pieces. A glass wall near the entrance has giant mullions set at an angle to signal its newness. A curtain wall on the south facade was made as sleekly modern as possible by removing mullions from an off-the-shelf system. The “in-between” is expressed by a web of blue-painted catwalks that wind their way below the giant roof, functionally interconnecting the various venues. Semi-elliptical windows in the corrugated-steel roof admit daylight, giving the upper levels of the complex the feeling of a city within a city. The ramps and stairs permit views into the various spaces below and out over the motley brick landscape of Tourcoing, once a textile-production center.

The giant roof presented technical challenges, but they were nothing compared to the delays caused by contractors, the choice of

Computer drawings were used as study tools. The name of the project was incorporated into the roof's overhang by using contrasting layers of metal grating (opposite, top left). Program spaces are layered on top of and adjacent to one another (sections right and plan below). The bar of student housing occupies the north end of the complex, where a rotted 1920s structure was demolished. The giant roof screens the terrace of the café.



SECTION AA



SECTION BB

1. Administration
2. Exhibition space
3. Live performance venue
4. Media library
5. Movie theater
6. Housing for students and artists-in-residence
7. Studios



UPPER FLOOR

whom was dictated in part by regional politics. The contractor in charge of producing shop drawings for the roof was doing an excellent job, according to Tschumi, until he was jailed for political corruption. One of the subcontractors, a painter, held up delivery of the entrance's grand staircase for months because of a dispute with a steel contractor; the painter was then murdered by his wife, reports Tschumi, and the stair was delivered days later. When the building opened in November, HVAC work remained unfinished because the subcontractor in charge had gone bankrupt.

While the human drama of the various contractors delayed completion and increased costs—not to mention personal anguish—it is now part of the lore of this former amusement palace. Resuscitating an old building while creating a new one proved to be the biggest drama ever staged in this venue. Says school director Fleischer of the outcome: "There's a strong relation between old and new. The new is protecting the old. When you look at the building, you see the past and the future, the finishing of this century and the beginning of a new one. The old building is for exhibition and the new one is for production."

For Tschumi, the project is, as always, about keeping atoms in motion. "I believe in creating certain conditions that will result in something unexpected," he says, admiring the view of his reconstituted Le Fresnoy from an upper catwalk. "These are spatial effects that you can't design. They happen because you set up certain conditions." ■

Sources

Corrugated metal: Framatec

Steel: Reynolds Batiments

Glued glass, glass panels: Cekal (PolyGlass D)

Metal doors: Gubri

Sliding doors: Sobanor

Wood doors: Van Henis

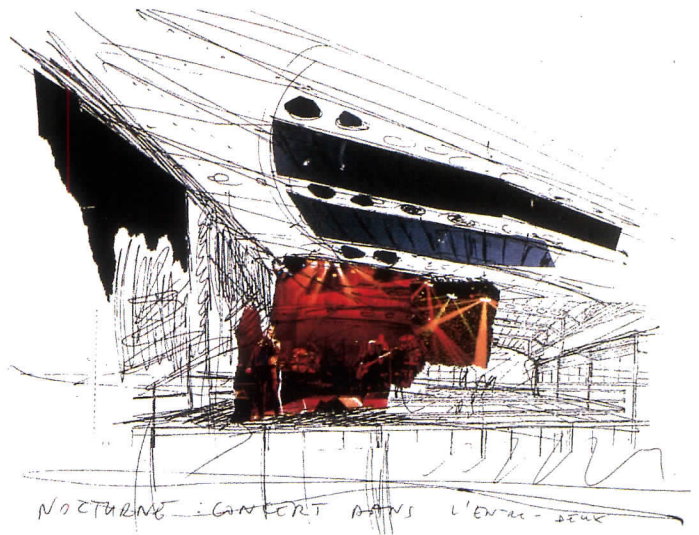
Locksets: D-Line

Acoustical paneling: Tectum, Inc.

Gauloise blue enamel on walkways: La Seigneure

Carpet: Flotex

Elevators: Kone



A curtain wall designed by Tschumi has thick, tilted mullions to signal its newness (opposite). Blue-painted walkways and stairs fill the "in-between" (left and below).





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SENIOR HOUSING

A Quiet Revolution

MARKET-DRIVEN FORMULAS AND TIGHT COSTS HAVE LED TO LOOK-ALIKE DESIGNS, BUT NEW RESEARCH ON THE NEEDS OF THE ELDERLY CAN INSPIRE INNOVATION.

by Sheri Olson, AIA



1

Pittsburgh, Pennsylvania

A nonprofit sponsor offers a range of social opportunities in a project attached to a community center.



2

Holland

Do the Dutch do it better? Holland and Scandinavia have traditionally been innovative in humane housing of the elderly, pioneering the trend toward more diverse solutions such as congregate care and assisted living. But the country's population is rapidly aging, creating new challenges in financing both housing and health care for the elderly. Three projects show that innovation hasn't waned, but it operates within tighter constraints.



3

Brookline, Massachusetts

CBT works with residential massing to fit a large project with a complex program into a built-up residential neighborhood.



Construction of housing for senior citizens is booming, and the variety of building types is proliferating. But the market is sending mixed messages to architects: while progress in geriatric care offers the elderly more independence later in life—creating opportunities for design innovation in facilities for the aged—managed care and Medicare are putting the brakes on costs. The potential for growth and profit has sent capital flowing into this market, but lenders' aversion to risk has encouraged cookie-cutter design.

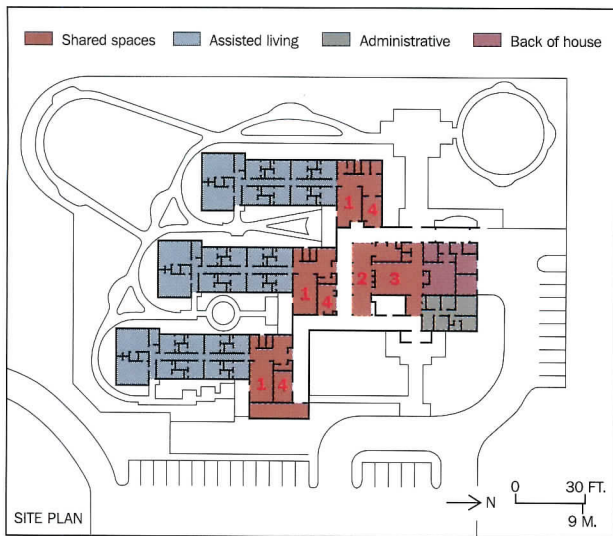
Then there are the senior citizens themselves, who are demanding facilities more humane than the nursing homes they felt forced to place their parents in. (Thirty percent of Americans would rather die than live in a nursing home, according to a recent survey in the *Journal of the American Geriatrics Society*.) The picture of old men and women warehoused in bleakly institutional nursing homes with dark, dreary corridors, little privacy, and unpleasant sounds and smells is being swept away by several trends: explosive growth in the number of people over 85, an influx of investment capital, and the revamping of the health care industry. The anti-institutional backlash means that nearly all senior housing built today resembles overscale Victorian houses, cushy clubs, or anonymous hotels.

High growth in the number of very old

For architects who can make sense of the ambiguities and contradictions of the senior housing market, however, there is opportunity. The fastest-growing segment of the United States' population is people 85 and older, and their ranks are expected to quadruple by 2050. In real terms they will still make up less than 5 percent of the population; but the numbers remain impressive, with an anticipated increase from 5 million people over 85 in the year 2000 to almost 20 million by 2050.

People retiring between 1994 and 2015, dubbed the Silent Generation, are wealthier, healthier, and living longer than the World War II-era generation before them. They are also exacting consumers. "They clip coupons but buy Cadillacs," explains Sharon Brooks, of Sharon Brooks & Associates Advertising in Richmond, Virginia. According to focus groups she has coordinated, the new retirees want housing that is downsized but upscale. (Dining space to accommodate family gatherings and a guest room for visiting grandchildren are important, as is home-

Sheri Olson, AIA, is an architect and writer based in Seattle.



1. Pantry
2. Library
3. Great room
4. Other activities

At Woodside Place, a pioneering project designed by Perkins Eastman and based on research on Alzheimer's patients, Dutch doors prevent residents from wandering into each other's rooms. Picture rails holding mementos and old photos jog faltering memories.



office space. They expect privacy yet also want to be part of a community as they increasingly engage in volunteer activities and return to school.

Not all senior citizens are created equal. "The first mistake many people make is to treat those over 65 as a monolithic group," says Paul Klaassen, CEO of Sunrise Assisted Living in Fairfax, Virginia. The biggest differences arise during the aging process. "The needs of a 65-year-old are vastly different from those of someone 85," says Victor Regnier, professor of architecture and gerontology at the University of Southern California. Senior citizens between 65 and 75 are still active and generally healthy, while those between 75 and 85 may require anything from minimal assistance to full-time skilled nursing.

To accommodate this diversity, care and housing choices are becoming increasingly specialized. "In the past, a nursing home was the only choice; now a full spectrum of care is available," says Mark Schulte, CEO of Brookdale Living Communities in Chicago, though categories blur from place to place. "Independent-living" projects most resemble conventional condo communities, but they may target specialized facili-

ties or amenities at younger and still ambulatory residents. "Congregate-care" residents have their own apartments but may take one or more meals in a group setting and receive other daily help. "Assisted living" is for the frailer elderly who want a homelike setting where they receive meals, subacute medical care, and help with such everyday tasks as bathing and grooming. Specialized facilities are required for the ambulatory elderly facing Alzheimer's disease or dementia. Continuing-care retirement communities (CCRCs) bring together independent living, assisted living, and a skilled-nursing facility on a single campus. CCRC residents typically pay an entrance fee as well as monthly fees, receiving future increases in care with little or no additional charges.

Currently, assisted living is the hottest senior housing market, estimated to reach \$33.1 billion in revenues by 2000 with nearly 4.1 million beds. According to David Schless, executive director of the American Seniors Housing Association (ASHA), 68 percent of new construction is assisted living, 18 percent is congregate care, and 8 percent is in CCRCs.

The popular perception that Snowbelt seniors flee to the Sunbelt upon retirement obscures the reality that only 5 percent actually

move away from their community. Most projects attract residents from within a six- to seven-mile radius. ASHA's 1997 construction survey shows Texas leading in the number of projects being built, followed by California, Florida, Arizona, North Carolina, Pennsylvania, Michigan, Tennessee, New York, New Jersey, and Oregon. Together these 11 states account for more than half of all senior housing under construction.

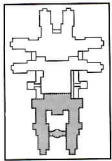
Increased investor interest

Growth in this sector has also come about because investors see profit potential. "In the past 24 months there has been a tremendous increase in the money available to develop senior housing," says Schless. A large part of this new capital comes from Real

Estate Investment Trusts (REITs) seeking to diversify their portfolios. "A few years ago the 14 health care REIT portfolios had only 2 to 3 percent of their holdings in long-term care or assisted living; today eight of them have 25 percent," explains Schless.

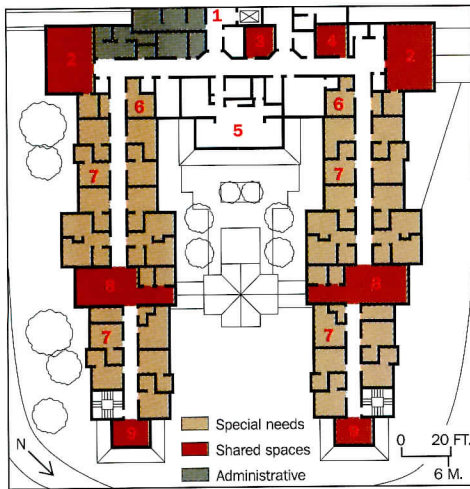
Wall Street and bonds are also sources of funds, but the majority of financing is from more conventional sources such as banks. Retirement housing has a number of inherent risks, however, and lenders are increasingly involved in decision making as a means to reduce them. "We're currently working on a project managed by [banking firm] Herbert J. Sims & Company in conjunction with Smith Barney, and the lender's representative comes to all of the team meetings," says Brooks.

The entry of hospitality groups like Marriott and Hyatt into long-term care in the mid-'80s legitimized the industry for many investors. "Previously, senior housing with personal-care services was seen primarily as a health care or hospital environment," observes USC's Regnier. "But lodging chains recognized that there was a problem with what was being built, and that there was profit to be made by creating



In Sykesville, Maryland, Copper Ridge, another project for Alzheimer's patients by Perkins Eastman, divides small clusters of skilled-nursing beds with common rooms.

1. Hall to entrance
2. Dining
3. Activity
4. Barber/beauty
5. Physical therapy
6. Tub/shower
7. Resident rooms
8. Living room
9. Den
10. Sitting area
11. Garden room
12. Secure courtyard



more residential environments.” These for-profit companies also gave a wake-up call to nonprofit groups that have tended to stress social service—presuming residents’ need for aid rather than encouraging independence. “By bringing their emphasis on customer service to senior housing, the hospitality groups placed the consumer in control,” adds Regnier. They also changed the look of retirement housing. “Hyatt in particular put a spin on design, making projects more residential in character,” says James Culpepper, principal of Culpepper McAuliffe Meaders in Atlanta.

Nonprofit groups—primarily churches and synagogues—continue to be major players in the development of senior housing, and although they may build fewer projects than for-profit developers, they are not necessarily smaller. Not surprisingly, nonprofits place a greater emphasis on the emotional well-being of the elderly, having introduced an array of social spaces into projects early on. “These agencies are concerned with the spiritual, not just the physical, component of aging,” says Julie Snow, AIA, Minnesota. Her firm is currently working on a large new elder-care training facility for the Evangelical Lutheran Good Samaritan Society in Sioux Falls, South Dakota.

Where the architect fits in

Fees in this market tend to be low (often on the order of 3 to 8 percent, depending on project size and the complexity of regulations), as do construction budgets (comparable to local residential-construction norms), encouraging adaptation of existing building types rather than innovation.

Klaassen, of Sunrise, found that some architects’ preconceived notions about care of the elderly interfere with his efforts to respond to the market. “You have a 40-year-old male architect designing for an 85-year-old woman,” claims Klaassen. “What you get is an overly romanticized version of an elderly person’s needs.” He works with an architecture firm that produces construction documents of designs he often draws himself. “I usually spend three to four hours a week drafting floor plans and elevations to get the look I want,” says Klaassen.

More typical are the companies with staff architects who develop prototypical designs and oversee local architects hired to adapt them to specific sites. “A lot of the large developers of assisted-living

projects have in-house architects, and senior housing is all they do. It’s the cookie-cutter approach,” says Mark Simpson, AIA, a principal of Bumgardner Architects in Seattle. His firm finds that nonprofit groups are more likely to seek full professional services since they typically build only one project. Some large developers come to design firms to enhance the quality of their projects. “We hire outside architects because we’re looking for a higher level of design than what you might get with in-house staff,” says Mark Schulte. “To avoid the steep learning curve, we tend to work with firms that we have developed a relationship with or that have experience with the project type.”

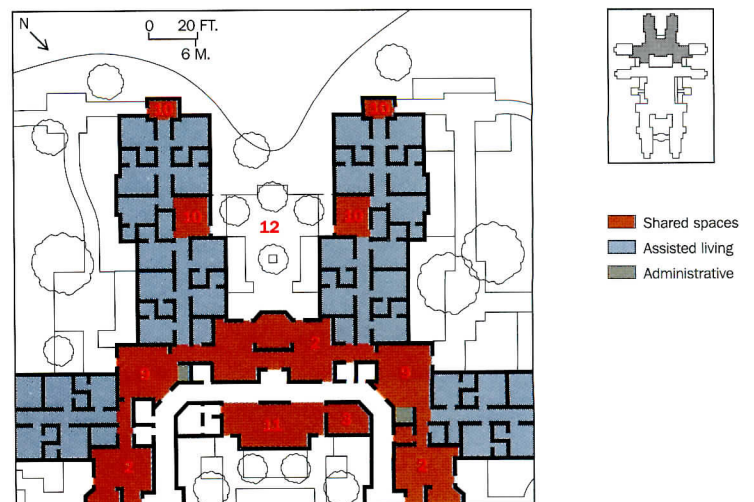
Design based on market research

Many architects are put off by the uniform appearance of typical senior housing projects: the style range seems to encompass little more than Victorian mansion and Shingle Style bungalow. Senior housing in countries like Holland, Denmark, and Sweden seems to be more socially innovative and visually exciting than what is built in the United States (pages 112–13). Some observers blame American building codes for the banality of the work here, but this doesn’t explain the heavily nostalgic design of most assisted-living projects, which don’t fall under the strict regulations nursing homes do.

“Codes are a favorite whipping boy,” says Regnier, “but the difference [between projects in the United States and Europe] is more likely attributable to a stronger tradition of modern design in multifamily housing in those countries than has ever existed here.” REITs as well as traditional lenders also tend to prefer the tried and true. “Innovation is expensive, and this is a cost-driven industry,” remarks Andrew Bank of CareMatrix, New York, developers and operators of senior housing. “It’s a luxury unless it’s driven by necessity.”

Also, say developers, extensive market research shows that conservative designs appeal to prospective residents. “People are basing major life decisions on the way these environments appear,” says Regnier. The message marketers are receiving is that 80-year-olds—and their adult children, who are usually involved in housing decisions—want something comfortable and familiar. “Does this mean that we all have to spend the end of our lives in an old-fashioned-style building?” asks Maury Childs,

The assisted-living wing at Copper Ridge broke new ground by offering a wide variety of social opportunities, such as a garden room, a kitchen that can be used by residents, and a safe, outdoor “wandering” garden. The style is residential, not institutional.



The Hallmark, in Chicago, draws affluent congregate-care residents who want to be close to downtown amenities or don't want to move far from home. Other projects cater to a mix of needs within a single high-rise.



FAIA, principal with CBT/Childs Bertman Tseckares, Boston. "I hope not, but the pressures on architects to comply are tremendous." Some of this pressure comes from people concerned about an institution moving to their neighborhood. "Developers feel that they need to be able to stand up at a community meeting and say, 'This looks just like your house'—even if it's an uninspired neocolonial," adds Childs.

Is there room for design innovation in an industry driven by cost and the market? It depends on how you define innovation, say architects in the field. James Culpepper believes creativity is essential to imaginatively resolve the complex issues he is presented with daily when designing for Hyatt. The area where both developers and residents appear to be most receptive to bold ideas is inventive programming. "In one project we developed a business center where residents can get on the Internet to check stocks or to E-mail a friend in Africa," says Culpepper. Architects are reinterpreting trends in the world at large—like the popularity of bookstore cafés—and introducing them into retirement housing. Such elements improve "curb appeal" but also enhance residents' quality of life.

And there are indications that consumers may tire of cloying designs. "Some seniors are asking, 'Do I have to live with cute all the time?'" says David Høglund. As their numbers increase, there may be a larger market for more diverse design. "I'm sure there are seniors who would go for a Frank Gehry project as long as it didn't compromise function or impede independence," says Daniel Cinelli, director of life environments at O'Donnell Wicklund Pigozzi and Peterson Architects in Chicago. In an attempt to define a market niche, some developers may be willing to push the design envelope. "CBT is currently working with a start-up company that wants to stand out from the competition by doing something fresh," explains Childs.

Changes in care and in reimbursement drive innovation

Because stock solutions don't remain appropriate for long in this fast-moving market, there are ample opportunities for those who can recognize the next trend. Many elderly people are able to remain in their own homes longer than they might have in another time, say experts, so senior housing is attracting an older and frailer market. Currently, the average new resident is a woman in her late 70s or early 80s.

Senior citizens who would have been placed in nursing homes in the past are now going into assisted living. Usually greater independence is beneficial. Assisted living is also less expensive: \$71 per day per bed versus \$110 for a private room in a skilled-nursing facility. "You really don't need someone with a medical degree to change a shirt," says Simpson.

"There's been a shift away from 100 to 200 units—which is more institutional—toward 60 to 85 units, which allows for more cluster housing," says Childs. Although smaller, these buildings are still 50,000 to 60,000 square feet, a difficult fit in any residential neighborhood. "We're always fighting with the scale, trying to disguise how big they are," says David Høglund. This is one reason why Klaassen prefers Victorian-style architecture for the projects he develops. "It's familiar and, unlike some styles, still looks residential as it gets larger." But Høglund believes a literal translation is not necessary: "We try to recall proportions and scale while relating to the context." His projects have won several AIA/American Association of Housing for the Aging awards.

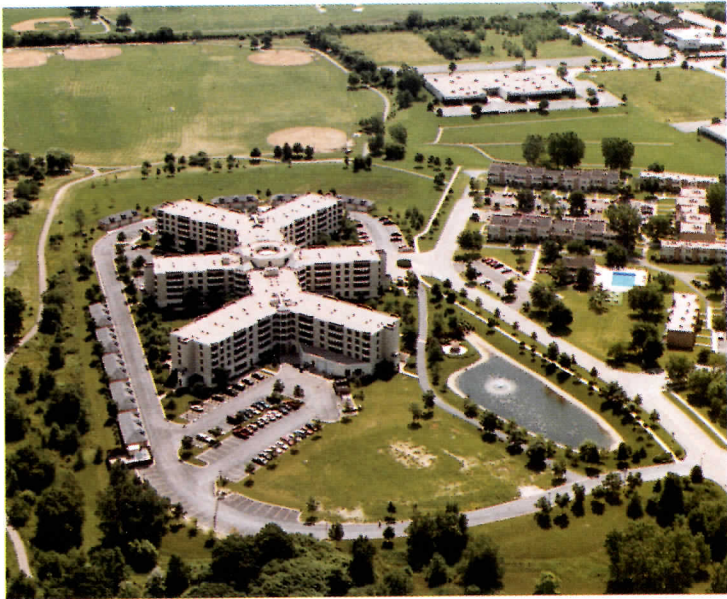
The most dramatic advances in senior housing design are for elderly people with Alzheimer's or other forms of dementia. Instead of being tied to wheelchairs or heavily medicated, these residents can now safely move about within assisted-living environments tailored to meet the challenges of their disease. Høglund worked with specialists from SeniorCare, a nonprofit group, to develop Woodside Place outside Pittsburgh, a ground-breaking project in long-term care. In addition to smaller-scale units with residential finishes, the project demonstrates the importance of a homelike environment in alleviating residents' anxieties. "Lessons learned from Alzheimer's patients have trickled down to all types of senior housing," says Cinelli. His firm applies "therapeutic way-finding"—relying on themes (in one scheme, a piano and framed sheet music) rather than labels or colors—to help residents recall where they are.

New luxury high-rise senior housing

Manhattan will soon see its first luxury housing designed specifically for the elderly, part of a growing trend of retirement housing in urban areas. Many elderly people want to remain close to cities to be near cultural attractions and their adult children. Typically these projects are built in large urban areas—places that have a surrounding critical mass of affluent suburbs from which to draw residents. Since this building type is more complex and expensive than the typical outer-suburb development (units may rent for \$3,000 a month, with an additional \$1,500 to cover meals and housekeeping), it attracts only the most experienced developers. According to Jon McMillan, an urban designer with senior housing developers Landmark America in Portland, Maine, many urban high-rise projects are similar to the 200-plus-unit, 14-story project slated for Battery Park City in Manhattan. It will be about 70 percent independent living and 30 percent assisted living. "Seniors like the idea that the next level of care is available," says McMillan, "but most people don't want to see someone worse off than themselves."

Age segregation versus integration

In the suburbs, merchant builders are beginning to incorporate units specifically for the elderly into larger developments. "This is one of the



Low land costs in outer suburban areas appeal to developers of both independent-living and assisted-

living projects, such as the Devonshire, built by Brookdale Living Communities in Lisle, Illinois, west

of Chicago. The 321-unit project was designed by BCA Architects and built on 14 acres.

most fascinating developments in senior housing,” says Sharon Brooks. “We’ve come full circle, from taking seniors out of the community to incorporating them back into it.” Bumgardner Architects is currently working on a 3,000-acre project in Utah that sites higher-density independent living on smaller lots clustered around parks—not just the retirement-community-standard golf course. “It’s the defensible space idea,” explains Mark Simpson. “Since the elderly are more likely to be home during the day, we thought they might help keep an eye on what’s happening in the park.”

Still, some retirees prefer a gated community and the ability to go to the pool without being splashed by children. Most CCRCs today are less elaborate than the Del Webb-type retirement communities such as Sun City that focus only on active adults. Few new CCRCs are built because they are large (typically with a budget of \$50 to \$70 million per project) and the financing model (buyers turn over a great deal of money up front in return for having all their medical needs covered) is complex and losing favor.

In a new twist on senior housing, some universities are developing CCRCs for alumni and faculty. Residents can audit classes, use campus libraries and sports facilities, or even play in the school band. “It’s a more sustainable form of retirement than just playing golf,” says Cinelli, whose firm designed the Pines, a retirement community developed for Davidson College in South Carolina.

The biggest challenge: serving the underserved

In most large metropolitan areas, the market-rate spectrum of residents in senior housing doesn’t reach much below a \$50,000 annual income. And many of the 1.6 million senior citizens currently in nursing homes live in miserable surroundings. “Little attention is being paid to

the middle-income level,” says Landmark America’s McMillan. “At some point, the government may have to step in to help.” While his company has developed some senior housing utilizing tax subsidies aimed at low-income housing, not surprisingly most companies primarily target the affluent elderly.

With the rise of managed care and lower Medicare reimbursements restricting the options of the lower- and middle-income aged, the burden increasingly falls on their children. “Currently, the majority of seniors receive care from family—sons, daughters, daughters-in-law,” explains ASHA’s Schless. With limited incomes and too little time, many in this “sandwich generation” find the demands crushing [see also “Balancing the Equation,” RECORD, March 1996, pages 24–27]. Using Medicare or Social Security to underwrite assisted living for a broad swath of middle- and lower-income elderly would be costly and does not currently appear to have enough of a political constituency.

Regnier’s book, *Assisted Living Housing for the Elderly: Design Innovations from the United States and Europe* (New York: Van Nostrand Reinhold, 1994), includes an examination of Sweden’s system of “service houses” that lighten the load on adult children by providing noontime meals, health care, and physical and occupational therapy. Some American developments offer adult day care, but they are often not financially viable in low-density, car-dependent areas. Still, some states are beginning to shift Medicare funds to home- and community-based services, though at \$83 per day for an average in-home visit and \$30 per day for adult day care, these, too, can stretch government budgets.

On the other hand, pension-law changes, as well as Medicare and Social Security improvements, have meant that fewer older people than ever are poor. In general, they are living longer and are healthier. As the baby boomers age, the political consensus that has made this level of senior welfare possible is likely only to strengthen. ■

The Bumgardner Architects terraced curving streets into a sloping site to make on-grade access possi-

ble in back-to-back units at Providence Point, an independent-living community in Issaquah, Washington.



1 Weinberg Terrace Pittsburgh, Pennsylvania

AN UPSCALE HOME FOR THE ELDERLY IS PART OF A LARGER EFFORT TO PRESERVE AND STRENGTHEN ONE CITY'S JEWISH COMMUNITY.

by Charles Linn, AIA

Project: Weinberg Terrace, Pittsburgh, Pennsylvania

Owner: Jewish Association on Aging

Architects: Perkins Eastman Architects—Bradford Perkins, resource principal; J. David Hoglund, principal-in-charge; David Hance, project architect; Kurt Jorgensen, Cornell Allen, Rick Yestadt

Architect of base building: UDA Architects—Don Carter, Paul Ostergaard, Peter Kreuthemeier

Interior Designer: Perkins Eastman Architects—Susan DiMotta, Polly Stone

Engineers: Structural Engineering Corporation of Pittsburgh (structural); Dodson Engineering (mechanical); Caplan Engineering (electrical)

Consultants: LaQuatra Bonci (landscape); Gerontological Services (marketing)

General Contractor: NADCO Construction

Project Statistics

Gross area: 62,500 sq ft

Net rentable area: 29,700 sq ft

Number of units: 9 studio, 44 one-bedroom, 9 one-bedroom deluxe

Weinberg Terrace is located in Squirrel Hill, a predominately Jewish neighborhood in Pittsburgh. "What's interesting about Squirrel Hill," says architect Dave Hoglund of Perkins Eastman Architects, "is that it became the center of the Jewish community at the turn of the century and still is today." Many Jewish areas—as well as other ethnic neighborhoods—disappeared as people fled to the suburbs from the inner city after World War II.

Realizing that this enduring neighborhood was indeed a treasure, in 1994 Pittsburgh's Jewish leaders launched a fund-raising drive called the Renaissance Campaign to preserve and strengthen Squirrel Hill's Jewish community. This highly successful drive raised \$50 million, which was used to build day schools and facilities for the aging, to expand the Jewish Community Center, and to support cultural programs.

One result of the Renaissance Campaign was Weinberg Terrace, an assisted-living facility located in the same building as the offices for a Jewish family services organization and an annex to the original Jewish Community Center, which is across the street.

Closeness benefits community

Weinberg Terrace's prime spot in a vibrant area is a refreshing change from the typical sites of homes for

the elderly: large, inexpensive tracts on the outskirts of town or in suburban areas. According to Hoglund, building on smaller lots in residential neighborhoods is the current trend for such projects, since it fosters a positive connection between the inhabitants and the community.

Weinberg Terrace subscribes to the notion that keeping the elderly engaged with their surroundings benefits everyone. Since it is located in a mixed commercial and residential district, residents have ready access to services of all kinds, can live near their families, and can participate in many aspects of Jewish life, given their proximity to the new community center. Weinberg Terrace dwellers can visit the center—which has a gymnasium, an auditorium, and a Holocaust museum—without leaving their building.

Hoglund is quick to point out that while "integrating" older and younger people in the same facilities can be positive, no one is forced to mix. Weinberg Terrace and the Jewish Community Center annex have different entrances so that Weinberg's residents can maintain a sense of security and privacy.

Keeping up appearances

Although designing assisted-living facilities in a nostalgic style is another industry trend, the Tudor-style Weinberg Terrace stands

among homes of a similar character. "The only difference," notes Hoglund, "is that the houses across the street are 4,000 to 5,000 square feet and Weinberg Terrace is 60,000." To break up the mass of the building, double-gabled ends terminate each of the wings, and the fourth story of the building is tucked under dormers. Hoglund notes that the firm would have preferred to build fewer but larger floors for staffing reasons, but Weinberg's small site made additional stories necessary.

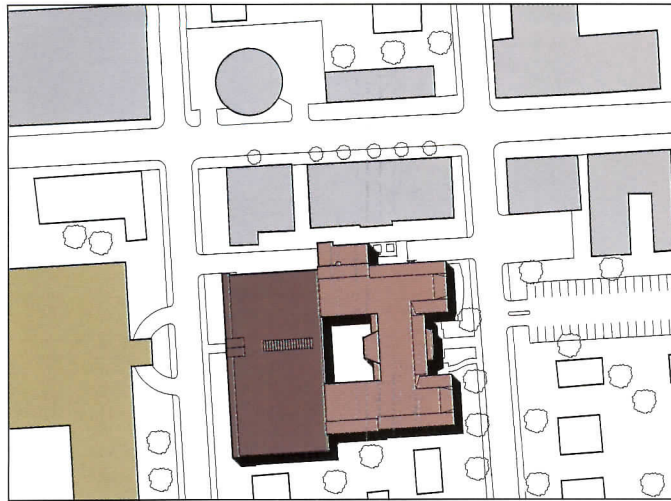
The facility's first floor is devoted to public spaces—a large lobby, an outdoor courtyard, small and large dining rooms—and service areas such as the kitchen, storage space, and a laundry room. The small dining room can be reserved for special occasions. Several rooms are taken up by the Weinberg Club, an adult day-care program that offers activities and hot meals.

Weinberg Terrace's interiors are meant to give it the look of a residential hotel. Although the furnishings and finishes look as if they came from an upscale hotel, they are not unusual in today's marketplace, Hoglund says. "Most of the assisted-living facilities being built now are aimed at unsubsidized, higher-income people."

The residential stories of Weinberg Terrace each hold three

- Existing Jewish Community Center
- Jewish Community Center expansion
- Weinberg Terrace
- Commercial

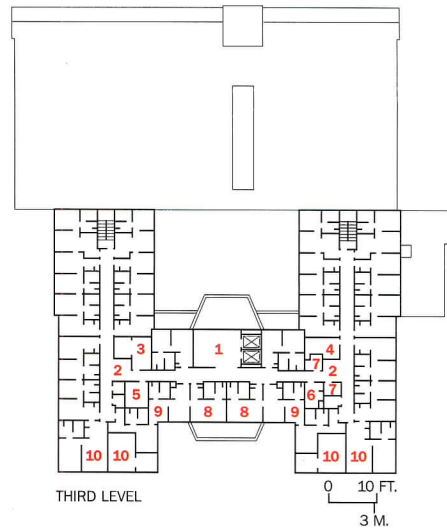
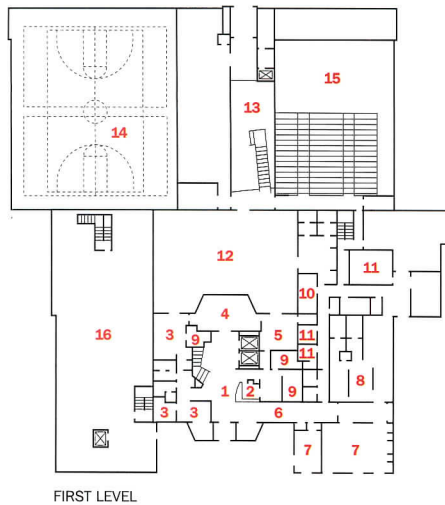
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Weinberg Terrace's double-gabled wings (below left) help break up the scale of the building. As if borrowed from a grand hotel, the main staircase (bottom right) connects the ground-floor lobby with the second-floor elevator lobby, fitness room, and hallway.



1. Main lobby
2. Reception
3. Day-care program
4. Formal parlor
5. Activity room
6. Gallery
7. Dining rooms
8. Kitchen
9. Administration
10. Workshop
11. Back-of-house
12. Courtyard
13. Community center lobby
14. Gymnasium
15. Theater
16. Family services



1. Elevator lobby
2. Wellness center
3. Sitting area
4. Laundry room
5. Spa bathing
6. Administrative office
7. Housekeeping/supply
8. Studio
9. One-bedroom unit
10. Deluxe one-bedroom unit

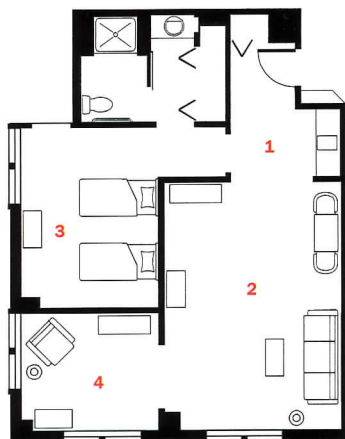


The first-floor plan (top left) illustrates Weinberg Terrace's connection to the expanded Jewish Community Center and a family-services center. These facilities have

their own entrances to protect the privacy of residents, yet they can be accessed directly from the Terrace. The gallery (above left) is a semiformal space with relaxing, soft light



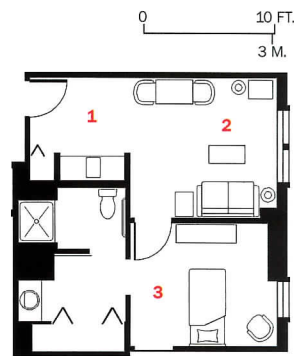
where residents can enjoy conversation and meet friends. The formal dining room (above right) is reminiscent of an upscale restaurant with Colonial furniture and fine table settings.



ASSISTED-LIVING 1-BEDROOM UNIT - 700 SF



ASSISTED-LIVING STUDIO UNIT - 400 SF



ASSISTED-LIVING 1-BEDROOM UNIT - 450 SF

1. Kitchenette
2. Living room
3. Bedroom
4. Sitting room
5. Studio

types of apartments: a studio, a one-bedroom, and a “one-bedroom deluxe,” which has a sitting room and space for a fold-out couch for overnight guests. All apartments are equipped with tea kitchens, for preparing snacks or light meals. “The units may be small, but they are real apartments,” says Hoglund.

Rooms have been set aside near the elevators on each of the three residential floors for recreation—card playing, exercising, reading. (There is also a beauty parlor and barber shop.) This setup effectively gives each floor a “living room,” so residents don’t feel the only place to be, other than alone in their room, is the first floor, where there may be too much activity.

Client participation in design

Hoglund notes that in designing facilities for the elderly, working with an educated client allows for the greatest innovation. “What really makes a difference is having clients who understand the difference between assisted-living and nursing care and are motivated about doing something innovative.”

Weinberg Terrace’s owners understood that there is a symbiotic advantage to keeping their elderly in Squirrel Hill: it helps preserve the culture of the community, and residents derive support from family and friends in a setting that, for many of them, has lifelong familiarity.

The humane motivation to provide aging people with the extra support they need in their later years as they need it—rather than “warehousing” them prematurely in nursing homes—is conveyed in the very design of Weinberg Terrace. “We were trying to deliver a message,” says Hoglund. “This is not just a modified nursing home that has been fitted out with nice carpeting and light fixtures. Living here is really like living in an apartment building.” ■

Sources

Exterior masonry: *McAvoy Brick, Edwards Precast*

EIFS: *Dryvit*

Built-up roofing: *Koppers*

Aluminum windows: *Traco*

Entrance doors: *Kawneer*

Wood doors: *Weyerhaeuser, Mohawk*

Sliding doors: *Door-o-matic*

Acoustical ceilings: *Armstrong*

Paints and stains: *PPG*

Wall coverings: *J.M. Lynne, Wolf Gordon, Genon*

Plastic laminate: *Nevamar, Wilsonart*

Wall tile: *Dal-tile*

Resilient flooring: *Toli, Armstrong, Altro*

Carpet: *Lees, Durkan*

Lighting: *SPI, Visa, Halo, Visa, Arroyo Craftsman*

Elevators: *Otis*

Plumbing fixtures: *Kohler, American Standard, Elkay*

Wood columns: *Somerset*



The tea kitchen in one of Weinberg Terrace’s apartments (top) shows the extent of

appliances and food storage areas. The high level of furnishings and finishes in the formal

parlor (above) is now becoming typical of assisted-living facilities everywhere.

2 Do the Dutch Do It Better?

AN AGING POPULATION POSES NEW CHALLENGES TO A NATION KNOWN FOR HUMANELY HOUSING ALL.

by Tracy Metz and James S. Russell, AIA

Project: *Toonladder, Almere, Holland*
Architect: *Architectenbureau Wytze Patijn*
Number of units: *200 units for residents of varying levels of acuity*

Project: *Humanitas Bergweg, Dordrecht, Holland*
Architect: *EGM Architecten*
Number of units: *180 units, equally divided between independent living, assisted living, and skilled-care nursing*

Project: *Villa Oudroze, Amsterdam*
Architect: *Mecanoo Architects*
Number of units: *Seven units of assisted living for gay elderly residents*

While Americans worry about how to pay housing and health-care costs for the rapidly rising numbers of elderly people, the day of reckoning has already arrived in Holland. A high percentage of the country's fast-graying population relies on government-subsidized housing and health care, and waiting lists are lengthening. There is no consensus to roll back benefits for the old, however, since the young fear they will forfeit their own coverage.

Holland and the Scandinavian countries pioneered alternatives to nursing homes, and getting away from "the batteries of cells where people are stored," as one architect put it, is still a key goal.

Facilities sponsored by religious and civic groups have long been a part of the Dutch housing landscape, but a small project in Amsterdam, the Villa Oudroze ("old rose"), may be the first project specifically for gay elderly residents (opposite bottom). The seven-unit project, which is attached to an older, larger complex for senior citizens, is based on the idea that living with like-minded people is stimulating and will counter the isolation that many elderly face. Mecanoo Architects provided a small communal area divided from the lobby, which faces a garden, by a curving, artist-designed wall.

Using shared spaces to keep residents active and stimulated is a goal of the Toonladder project

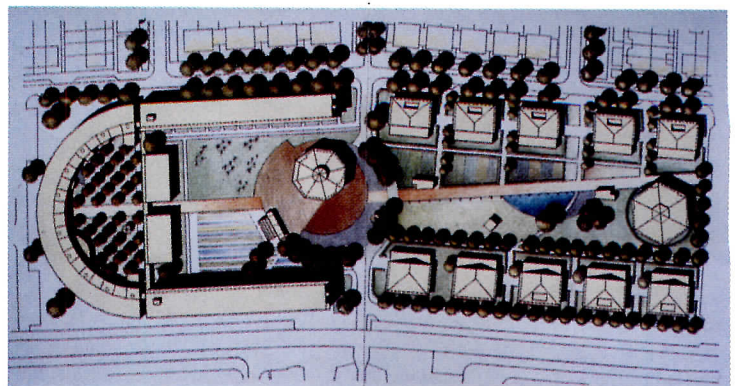
(below), whose name refers to the musical scale. Assisted-living units in the Ronde Hof ("round house") face a glazed atrium, but private unit entrances also open directly onto the street. Two of the four-unit, rectangular "quartets" have enclosed gardens where residents with dementia can safely wander. Eight rooms surround a kitchen and shared living space in the hexagonal "octet."

Just as in the United States, Dutch designers are attempting to provide aging residents with higher levels of care without requiring them to move. Assisted-living beds are being added to existing medical or skilled-nursing projects so that common facilities, such as clinics and examination areas, can be efficiently shared. (Some facilities are also reaching out to meet needs in surrounding neighborhoods.) The new projects are known as lean-ons,

because of this interdependent relationship.

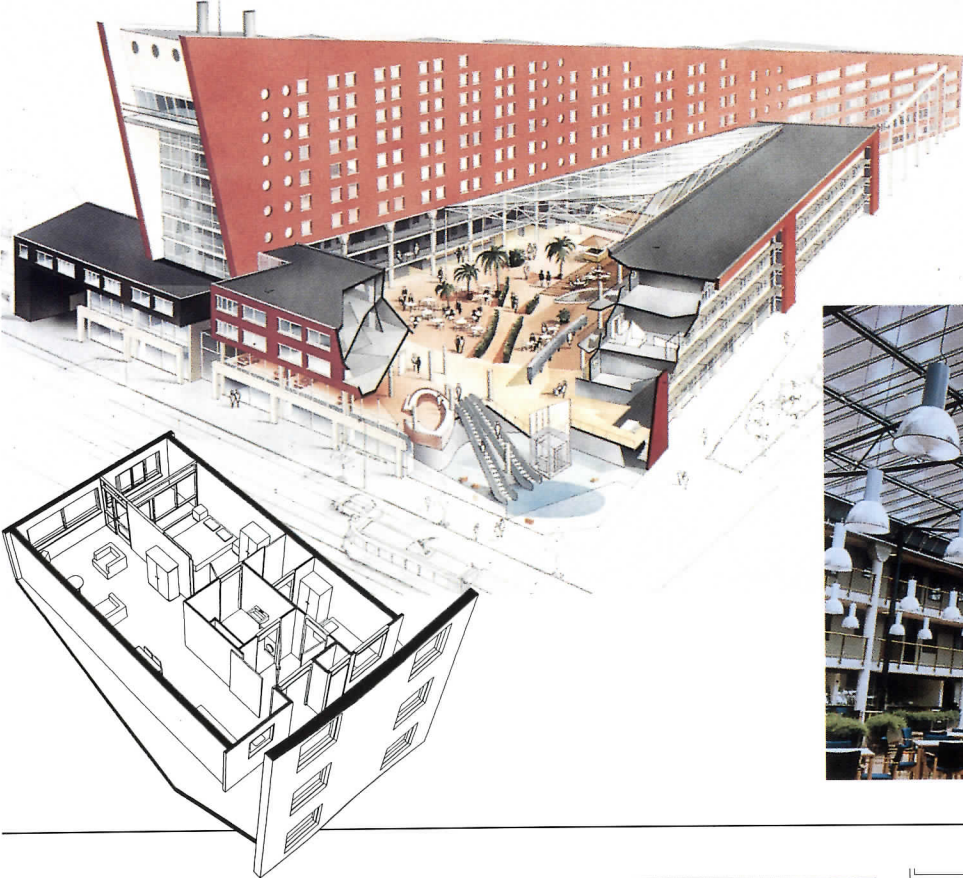
In some units in the Humanitas Bergweg project (opposite top), the entire bathroom can be used as a shower stall, so that a stretcher can be wheeled in if necessary. The bedrooms also have communicating doors (axonometric), which can be closed for privacy or opened when a care giver or family member needs to monitor the resident's condition. Another housing cooperative not only provides sleeping facilities for family members but makes a contract with them to prepare meals or perform other duties as a means of increasing family involvement. ■

Named after types of musical compositions, buildings in this development accommodate differing levels of acuity and mobility. Administrative areas are in the centrally located "concertmeester."



Project: *Toonladder, Almere, Holland*

Project: *Humanitas Bergweg, Dordrecht, Holland*



A sweep of skylight glazing covers an atrium that unites the wings of this 180-unit project, creating common meeting spaces for residents. Design measures have been

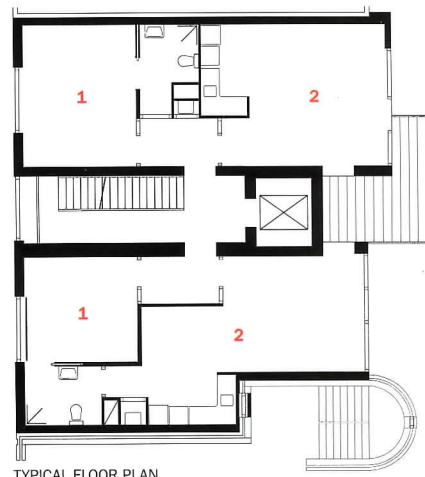
taken to allow occupants to remain in the development as their mobility decreases: the bathrooms, for instance, can accommodate stretchers when necessary.



Project: *Villa Oudroze, Amsterdam*

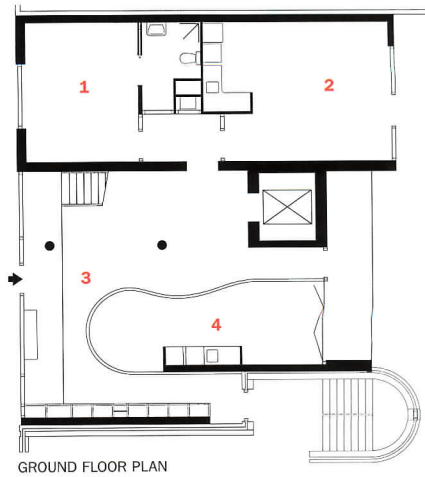
Added to an existing housing development for senior citizens in one of Amsterdam's historic districts, this seven-unit project was designed for the gay elderly. Recognizing a

tendency among some older people to isolate themselves, Mecanoo Architects augmented assisted-living units with a communal kitchen and laundry that faces a garden.



- 1. Bedroom
- 2. Living/dining
- 3. Vestibule
- 4. Social room/laundry

TYPICAL FLOOR PLAN



GROUND FLOOR PLAN

3

Goddard House Brookline, Massachusetts

AN ASSISTED-LIVING FACILITY IN A RESIDENTIAL NEIGHBORHOOD STRIKES THE RIGHT BALANCE BETWEEN COMMUNAL AND INDEPENDENT LIVING.

by Charles Linn, AIA

Project: Goddard House, Brookline, Massachusetts

Owner: Goddard House

Developer: National Development of New England

Manager: ADS Senior Housing

Architect: CBT/Childs Bertman Tseckares—Maury Childs, FAIA, partner-in-charge; Alfred Wojciechowski, senior designer; Scott Booth, AIA, project architect; Jeff Stikeman, Sherif Anise, Jay Wood, project team

Interior Designer: Wellesley Design Consultants—Ann Webb-Johnson, Chuck Steinman

Engineers: Aberjona Engineering (structural); ADA Engineering (mechanical/electrical); GEO Engineering (civil)

Landscape Architect: Beals Associates

General Contractor: Cranshaw Construction of New England

Project Statistics

Construction cost: \$7.5 million

Gross area: 81,000 sq ft

Net rentable area: 49,000 sq ft

Number of Units: 75 assisted-living, 40 special-needs

Brookline, Massachusetts, is a small town bordering downtown Boston's southwest edge. In recent years, the community's small hospital lost most of its patients to larger, better-equipped facilities, so it was closed and demolished. Faced with a newly empty six-acre lot in the middle of their chiefly residential neighborhood, the residents of Brookline began to seek appropriate uses for what was then the largest vacant parcel of land in their town.

"A group of neighbors called and asked me what assisted living was all about and whether it would be right for this site," recalls Ted Tye, a partner at National Development of New England, which develops assisted-living communities. National Development's target market is elderly people who can no longer care for themselves but are physically well enough not to require skilled nursing care. "What they were really looking for was something that would anchor the redevelopment of their residential area, which an assisted-living facility would do beautifully," Tye says.

Determining need

To study the economic feasibility of building an assisted-living complex in a given location, Tye's organization typically surveys the surrounding population for people over 75 with the means to afford the facility. The immediate neighbor-

hood is the logical place to market an assisted-living home, since potential residents will be attracted by the promise of a continuing connection to their community. Tye says, "In a town whose population is as concentrated as Brookline's we would expect that people who come to our facilities for assisted living already live within a radius of five miles." People with special needs stemming from Alzheimer's disease, dementia, or other memory-impairing illnesses may come from farther away, since there is a general shortage of facilities equipped to serve them. If the developers determine that enough people in the immediate area can afford and would use an assisted-living home, the project may be deemed economically feasible.

National Development usually invests in and builds its own properties, continuing to hold an equity stake in them after they are up and running. However, in this case, the developer approached Goddard House, a nonprofit organization that has operated a nursing home near Brookline for more than 100 years. "The board of directors of Goddard House had been thinking of expanding their operations for some time," says Tye. "Over a series of discussions, we said to them, 'We're going after this site in Brookline, and it would be perfect for you.' Goddard House provided equity, and we

acted as the developer and owner's representative. We brought in ADS Senior Housing as the facility's manager and CBT/Childs Bertman Tseckares as the architects."

Image building

Goddard House is a rambling structure built in the Shingle Style. Its exterior design was an issue not only with the City of Brookline (the city planning department appointed a design review board made up of several architects as well as a landscape architect) but also with the marketing department of the facility. "You have to remember," says senior designer Alfred Wojciechowski, "that in addition to selling to the people who are going to live at the home, you may also be marketing to their sons or daughters. No one wants to make their parent live in a building that looks institutional."

Because Goddard House is not a nursing home, it was built under the residential-hotel section of the building code. This allowed for the introduction of materials typically found in residences—such as exterior wood shingles—which would not have been permitted under the section of the code applying to nursing homes of this size. On the inside, apartments are furnished with hardware, moldings, and doors more appropriate to a fine residence than an institution.

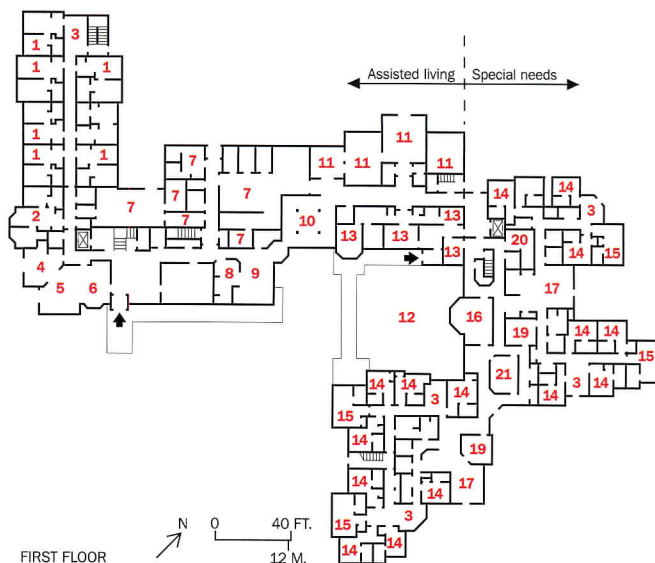


Goddard House's plan is labyrinthine, but for good reason. The exterior walls jog so the building has the greatest possible amount of perimeter wall, and therefore windows, on this restricted site. The design also avoids "bowling alley" hallways. The nooks and crannies created by the twisting hallways are natural places for living rooms, kitchens, and a library.

The building's exterior (below) is done in the Shingle Style, reflecting the developer's awareness of a two-tiered market: prospective residents may be drawn to such a building because it seems familiar, and their adult children—who often play a big role in deciding on a home for their parents—will appreciate the absence of institutional qualities.



- | | |
|---------------------|--------------------|
| 1. One-bedroom unit | 11. Dining rooms |
| 2. Two-bedroom unit | 12. Garden |
| 3. Living room | 13. Administration |
| 4. Program room | 14. Single unit |
| 5. Library | 15. Double unit |
| 6. Café | 16. Great room |
| 7. Back-of-house | 17. House dining |
| 8. Store | 18. Kitchen |
| 9. Country kitchen | 19. Parlor |
| 10. Palm court | 20. Wellness room |
| | 21. Crafts room |



Goddard House's entry (below), dining room (bottom), and a kitchen and dining area (below right) show how finishes and furnishings integrate to create a comfortable home for residents.



Facility organization

The three-story Goddard House is divided into two basic parts: one wing for those who are in assisted-living care and one for those with special needs. The L-shaped assisted-living floors are furnished with living rooms, cafés, libraries, and program rooms—places where residents may rest or meet friends. Meals are served from a buffet, café, or kitchen.

"Houses" for special needs

Each floor of the special-needs wing is subdivided into two "houses," and each house is organized around a kitchen and dining area. Limiting the number of people per house to 12—with one staff member for every six residents—makes for a consistent communal environment.

This setup also fosters the residents' sense of independence, which is easily compromised in housing for the elderly. "We're trying to create a new way of thinking about these kinds of facilities," says Wojciechowski, "by giving the residents the opportunity to be able to do what we all like to do—like choose when to eat. We're trying to give them as much autonomy as they can handle, and as much as they choose to."

Assisted-living and special-needs residents share some of Goddard House's spaces, where they may occasionally get together



for an organized activity, such as a concert. But since special-needs patients tend to be much stronger physically than the typically frail assisted-living residents and may be prone to violent outbursts, the two groups do not mix very well. "If you're in assisted living," says Wojciechowski, "you don't want someone acting up around you who might push or shove you." Special-needs residents are given free access to a secured garden area, where they may sit or walk along paths that always lead back to the building. ■

Sources

Windows: Andersen
Elastomeric roofing: Firestone
Exit devices: Monarch Hardware
Acoustic ceilings: Armstrong
Paints and stains: Benjamin Moore
Wall coverings: Zoffany, F. Schumacher, Seabrook Wallcoverings
Resilient flooring: Toli International
Plumbing: Chicago, Elkay, American Standard

The Alchemy of a New Material

AUTOCLAVED AERATED CONCRETE IMBUES A COMMON BUILDING MATERIAL WITH A NUMBER OF ARCHITECTURAL VIRTUES.



by Michael Chusid, AIA

The alchemists of old searched for a philosopher's stone that could transmute base materials into articles of greater value. Perhaps this ancient quest has at last been fulfilled in the form of autoclaved aerated concrete (AAC), a manufactured building stone. While it may not be gold, AAC imbues a common building material with enough virtues to enchant the alchemist in any architect. It is lightweight and structurally sound. It is exceptionally fire resistant and thermally and acoustically insulating. It is durable, dimensionally stable, and resistant to water penetration, termites, vermin, and decay. It is easy to handle and compatible with existing construction practices. It is economical and environmentally appropriate. It can be used straight from the factory or given sculptural expression and bas-relief designs. And it provides in a single material a range of performance virtues previously available only by assembling a number of products. To this litany of praise for AAC we can now add another advantage: it is available in the United States.

And it's about time, too. For while AAC was invented more than seven decades ago, it has been unavailable in the United States except for a handful of demonstration projects. It is produced in more than 200 factories throughout Europe, Asia, the Middle East, Africa, Australia, and

Autoclaved aerated concrete can be used with a wide range of building styles.

Latin America and has been used successfully in almost every climate and building type. By some estimates, a greater volume of AAC is produced every year than any building material except regular concrete.

AAC was produced in Quebec during the 1960s and early 1970s and was used in buildings that have stood the test of time in harsh Canadian and Midwestern environments. Now three North American factories are in full production, ground has been broken for two others in Florida and Arizona, and industry insiders are predicting that the material will be available throughout the country within a few years.

The introduction of AAC into the United States is driven by changes in the construction marketplace. Lumber-price inflation has challenged builders to look for alternatives to wood framing. Many U.S. designers have become familiar with AAC while working on international projects. The environmental qualities of AAC have made it increasingly

THE ENVIRONMENTAL QUALITIES OF AAC MAKE IT ATTRACTIVE.

attractive. AAC can satisfy the more stringent construction standards promulgated in the aftermath of recent hurricanes and earthquakes. Anecdotal evidence also suggests an increased concern overall for the quality of construction and life-cycle value, due perhaps to the aging of the baby boom generation.

These factors, plus the continuing strength of the construction economy, have given investors the confidence they need to commit the \$20 to \$30 million or more required to build an AAC plant.

Introducing AAC

AAC is a factory-produced lightweight precast concrete and can be produced as large building blocks, panels, or planks. Manufacturing begins by mixing portland cement, lime, silica sand or fly ash, water, and aluminum powder or paste, and pouring the slurry into a large mold. If panel reinforcing is necessary, steel bars or welded wire mesh are also put in the mold. The aluminum reacts with the products of hydration in the concrete to release millions of tiny hydrogen gas bubbles and expand the mix to approximately five times its original volume. The hydrogen evaporates and leaves behind a closed-cell, cellular concrete mixture. When the expanded mix has set, the "green" aerated concrete is removed from its mold and cut into blocks or slabs of the required size and configuration. The material is then steam-cured in a pressurized autoclave. This results

Michael Chusid, AIA, is a consultant to building-product manufacturers. His Los Angeles-based company, Chusid Associates, helps develop and market innovative building systems. He can be reached by E-mail at michael@chusid.com or by telephone at 818/986-9901.

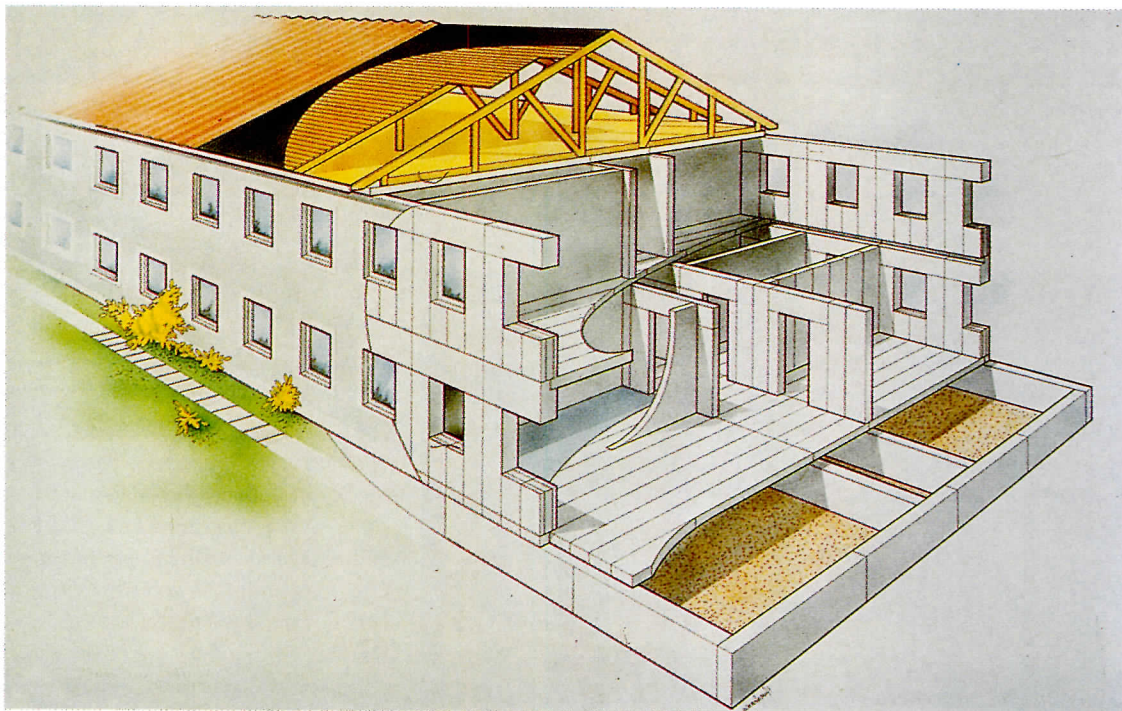
Continuing Education This month's installment of the ARCHITECTURAL RECORD/AIA Continuing Education series looks at autoclaved aerated concrete. After reading the article, complete the questions (page 170) and check your answers (page 172). AIA members may fill out the self-report form (page 172) and send it in for two AIA Learning Units.—Mark Scher, AIA Director Professional Education Products and Services

Learning Objectives:

After reading this article, you will be able to:

1. Evaluate the environmental, safety, and welfare characteristics of autoclaved aerated concrete (AAC).
2. Identify at least 10 characteristics that illustrate AAC's flexibility as a building material.
3. Cite economic, fabrication, and performance factors for using AAC in the U.S.

Reinforced AAC panels can be used as a pre-fabricated structural system. The panels are much lighter in weight than conventional pre-cast concrete, reducing dead loads and simplifying construction. AAC also provides thermal, noise, and fire resistance, making the system suitable for hotels, apartments, schools, nursing homes, and other low- and mid-rise buildings.



in a fully hydrated concrete that is lightweight, strong, thermally efficient, and more dimensionally stable than regular concrete. In fact, autoclaved aerated concrete turns to rock, forming microscopic crystals of the mineral Tobormorite, a form of calcium silicate hydrate.

While AAC can be used in much the same way as other types of masonry or prefabricated building panels, there are important differences. For example, the light weight of AAC makes shipping and handling easier. Instead of the 8-by-16-inch block used in conventional concrete masonry unit (CMU) construction, AAC can readily be laid in blocks up to 12 by 24 inches or more in size. These larger blocks allow walls to be erected more rapidly, yet their light weight (20 pounds per square foot of an 8-inch-thick wall for AAC vs. 37 pounds for normal-weight CMU) reduces the risk of back injuries among masons. AAC blocks are solid units and do not need to have hollow cores. Instead of the mortar bed used in conventional masonry joints, AAC is laid with a thin-bed adhesive mortar. Since the solid units have a large area of adhesion, AAC joints develop sufficient strength for walls to function monolithically, even without reinforcing.

construction proceeds more quickly than with other building materials. These attributes make AAC a potentially popular material for do-it-yourself builders.

AAC weighs just 25 to 50 pounds per cubic foot, compared to 150 pounds for normal reinforced concrete. The lower-density version of AAC has more voids and offers greater insulation; the higher densities are used where greater strength is required. Depending upon density, AAC provides compressive strength of 300 to 900 pounds per square inch, enough to support load-bearing buildings of three to four stories. Reinforced panels are capable of carrying typical floor, roof, and wind loads with spans as great as 20 feet. AAC has been used satisfactorily in seismically active and hurricane-prone regions around the world.

Energy, environment, and AAC

Much of the current appeal of AAC is its apparent environmental correctness. It is manufactured from raw materials that are in abundant supply, and it uses these raw materials efficiently since AAC is mostly air. Other than energy for autoclaving and the emission of water vapor, the

THE PHYSICAL STRUCTURE THAT MAKES AAC AN EFFECTIVE THERMAL INSULATOR BOOSTS ITS FIRE-RESISTANCE AND ACOUSTICAL PROPERTIES.

AAC panels are typically produced in thicknesses from 3 to 16 inches, 24 inches wide, and up to 20 feet in length. Integrally reinforced AAC panels can also be used structurally in floor and roof decks as well as walls. This allows AAC to be used to prefabricate a complete building envelope and partition system. Compared to conventional precast panels, lightweight AAC panels can be positioned with light cranes or derricks. Wall panels can be installed vertically or horizontally and edges can be profiled to create interlocking joints.

A practical construction system

Because of AAC's workability and its light weight, it is very easy to build with. The masons and carpenters who have worked with the material report that the learning curve for AAC installation is short, and that con-

struction process is clean and nearly free from waste. While current U.S. producers use silica sand in their product, AAC can also be produced with fly ash recycled from coal-burning power plants, creating a demand for a product that is now considered waste. AAC is inert, nontoxic, and not a source of indoor air pollution. The material has a green "cradle-to-cradle" life cycle. At the end of a building's useful life, AAC panels can be disassembled and reused. Or, when demolition is indicated, AAC debris can be pulverized and used in the manufacture of new materials.

At an R-value of 1.25 per inch, AAC has less insulation value than glass fiber or insulation boards but significantly outperforms conventional concrete (with an R-value of 0.1) or masonry. This insulation performance is enhanced in three ways. First, an AAC wall or roof deck provides solid insulation, without the cold spots associated with

through-wall framing members or fasteners. Second, the dimensional stability of AAC reduces the propagation of cracks that could allow air leakage. AAC buildings may be so well sealed that ventilation may even be required to provide necessary air changes. And third, AAC provides thermal inertia, which reduces fluctuations in a building's heating and cooling demands. Because of its unique physical structure, AAC provides greater thermal inertia than conventional masonry despite its relatively low mass. In many temperate environments, an 8-inch-thick AAC wall provides more than the required thermal protection without additional insulation.

AAC can be used without vapor barriers in many climates and building types. In buildings with high relative humidity, however, such as paper mills or swimming pools, condensation and freezing within the material may damage the wall. To avoid this, it may be necessary to use an interior finish with a low vapor permeability to keep moist air from entering walls, and an exterior finish with a high vapor permeability to allow moisture to evaporate.

The physical structure that makes AAC an effective thermal insulation also gives it desirable fire resistance and acoustical properties. In panel form, AAC offers up to 4 hours of fire resistance with 4-inch-thick wall panels, and 8 hours with 8-inch-thick panels (ASTM E-119, load-bearing). Not only are these values significantly higher than those of other common wall systems, they are available in a wall that is both lightweight and simple to install. This makes AAC panels attractive for use in shaft walls, area separation walls, and other critical fire-resistance applications. Acoustically, a 4-inch-thick partition offers a sound-transmission class (STC) of 41, comparable to the performance of a metal stud partition with 5/8-inch Type X gypsum board on both sides, common in office settings. Thicker AAC walls produce higher STC ratings.

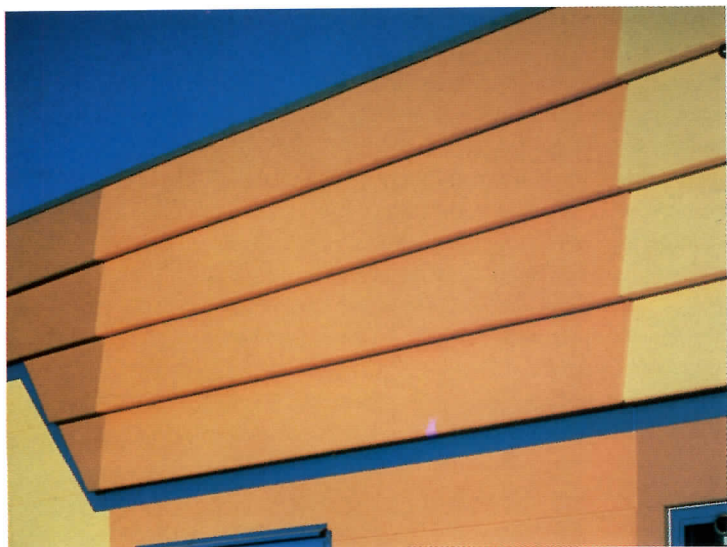
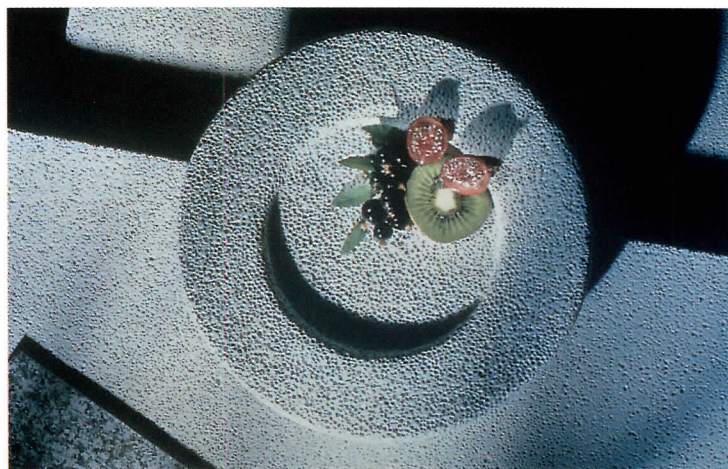
Exterior surfaces are typically plastered, finished with textured coatings, or given veneers of tile or thin brick. If left exposed, as is sometimes the case in less developed countries or utilitarian structures, the AAC surface can be damaged by abrasion and will become stained when airborne dirt and moisture collects in open pores. However, finishing can

usually be postponed until a more convenient time if AAC is installed during inclement weather or if a delay is required for efficient construction scheduling. Interiors can be given a plaster or drywall finish, covered with heavy-bodied wall coverings, or painted. In industrial buildings, the light color of AAC may be acceptable if left unfinished.

A new age of stone carving

AAC can be shaped with simple hand or power tools. The surface can be incised to create reveals, signage, and graphics. In Japan, it is common to rout a grid pattern into the surface of AAC panels to create shoji screen-like proportions. Corners of walls can be rasped to create rounded edges or entases, and arches can be cut with saber saws. Horizontal panels can be tapered to create a clapboardlike profile. Adhesive mortar can be used to laminate thin slabs or strips of AAC to an otherwise flat wall to build up quoins, cornices, and other ornamentation. Bas-relief treatments can be carved into the surface of an AAC wall.

While traditionalists will climb onto scaffolds to carve walls in situ, digitarati will choose instead to feed their computer files into



Relief and ornamentation can be carved or milled into AAC walls. While AAC is easily cut, with a finish coating it

is no more prone to vandalism or abuse than wood siding, plaster, or other common building materials.





numerically controlled machines to mill designs in the factory.

In its ability to be shaped, the concrete “foam” of AAC is similar to the plastic foam used in exterior insulation and finish systems (EIFS). Relief work in EIFS is limited, however, by the difficulty of wrapping complex shapes with reinforcing mesh. Since the coatings used with AAC do not generally require a mesh, AAC permits much greater exploration of its sculptural qualities.

However, this exploration of decorative form is surprisingly rare, even among European designers who have had the most history using AAC. Indeed, most projects constructed with AAC seem to exploit the material’s flatness. But given the current vogue for nonlinear forms in architecture, it is certainly an area ripe for experimentation.

Acceptance in the American marketplace

When transferring a foreign building technology into the United States, there is always an adjustment period as material compatibilities are tested and the new product is integrated into domestic construction practices. An architect detailing AAC for the first time must work closely with the AAC producer and with manufacturers of the windows, flashing systems, and other materials that abut or tie into the AAC. To install wiring, piping, or tie-down rods, raceways are routed in AAC walls and then covered with grout or patching compound. Simple ties and anchors, similar to those used in other types of masonry or precast-concrete work, are used to attach AAC to other construction materials. Trim and other elements can be fastened to AAC with conventional nails and screws or with special anchors.

The bottom line on AAC is, of course, its affordability. AAC is competitive with other building materials, and it offers benefits that can reduce the total cost of a project. For example, the light weight of AAC compared with conventional concrete and masonry yields overall structural economies by reducing the mass that must be considered in seismic design and the dead load transmitted to foundations and superstructure members. AAC is economical to ship and handle and installs easily without special crews or equipment. Prefabrication and quick erection shortens construction time, reducing construction and financing costs. AAC’s durability, fire resistance, and energy efficiency may reduce property-insurance premiums and operating expenses, contributing to the product’s life-cycle value.

Lightweight and easy to work with, AAC blocks can be cut with hand or power tools and are compatible with conventional building techniques.

Note that product performance and recommended details vary from manufacturer to manufacturer and should be verified with AAC producers and applicable codes. After many years of laying the groundwork for AAC in the United States, National Evaluation Reports on the material, approved by all the national code bodies, are on file with the model code agencies. The American Society for Testing and Materials is in the final review process of a standard for AAC units, and the American Concrete Institute is drafting standards for engineering AAC.

Current and future availability

The first two AAC plants in America are both operated by leading international AAC producers. Hebel has a plant in Georgia, and Ytong has an operation in central Florida. Contec makes AAC in Monterey, Mexico, and has sales offices in Texas. Equipment for another plant in Florida is on order, and work has been started on a plant in central Arizona. While AAC’s light weight makes it feasible to ship, each plant will primarily serve a local geographic area. The economical shipping radius increases, however, for buildings with stringent fire-resistance or other performance requirements. And for special projects, boatload quantities from overseas plants put AAC within reach of most of North America.

While the foundations for using AAC have been laid, its future in North America remains to be seen. To become anything more than a specialty building product, AAC will have to compete against wood framing, traditional masonry, conventional types of precast concrete, and metal building panels—construction systems that are deeply entrenched in the American way of building. Furthermore, AAC must compete against other new systems, like light-gauge steel framing and stay-in-place concrete forms, that are also fighting for an expanded share of the

AAC WILL HAVE TO COMPETE AGAINST TRADITIONAL AMERICAN MATERIALS.

U.S. market. AAC producers will have to invest not only in more plants but also in additional marketing to train a generation of designers and builders in its use.

Still, the growing number of U.S. projects completed with AAC attests to the material’s worthiness. It has been used in hotels, housing, offices, and industrial buildings and is winning its share of converts. In an age of high-tech innovation, it is ironic that one of the most important building systems of the future may be a 70-year-old material. Yet the years ahead present the construction industry with the challenges of meeting the needs of a growing population while at the same time conserving resources and improving the quality of human habitats. If AAC can help us meet these challenges, it will be alchemy indeed. ■

For Additional Information

“Autoclaved Aerated Concrete—Properties, Testing and Design,” RILEM Technical Committees 78-MC A 51-ALC Recommended Practices (London: E & FN Spon Division, Chapman and Hall, 1993).

Robert G. Mathey and Walter J. Rossiter, Jr., “A Review of Autoclaved Aerated Concrete Products” (Washington, D.C.: U.S. Department of Commerce [NBSIR-87-3670]).

Manufacturers

Hebel USA, 2408 Mount Vernon Road
Atlanta, GA 30338; 770/394-5546;
800/35HEBEL; www.hebel.com

Texas Contec, 200 West Expressway 83,
Suite K, San Juan, TX 78589;
956/783-5422; fax 956/783-5155

Ytong Florida, Ltd., 1930 Lars Sjoborg
Boulevard, Haines City, FL 33844;
800/986-6435; fax 941/422-2914
www.ytong.com

KITCHEN & BATH PORTFOLIO

Kitchens and baths are central focal points for both architects and their clients. However, while some architects want to blur the lines between traditional public and private space, many clients are demanding that their kitchens be family gathering and entertaining places and that bathrooms be private and luxurious retreats. Also thrown into the mix are nontraditional materials incorporated into the design scheme, such as restaurant-style stainless-steel backsplashes and a patchwork of col-

ored plywood panels, which seems to be all the rage. On the following pages, readers will find ARCHITECTURAL RECORD's fourth annual Kitchen and Bath Portfolio—highlighting eleven projects from the United States, Canada, and Mexico that deal with these design issues. Each project was selected from recent residential work submitted as part of our Record Houses award program. Once the editors selected the projects to be published in the April issue as the Record Houses of 1998, the remaining entries were reviewed specifically for their kitchen and bath designs. Other work was submitted independently. If you are interested in sending in a kitchen and/or bath project for the fifth annual portfolio, please do not hesitate. We look forward to hearing from you.

—Elana H. Frankel, *New Products Editor*

UPDATING A 1950s HOUSE FOR A YOUNG, STYLISH FLORIDA COUPLE



Formica's Ligna was used for the mahogany-veneer partition wall. The stainless-steel kitchen backsplash

wraps around and blends into the mahogany wall. A Carrara marble counter serves as a visual transition

to the white Corian kitchen countertops and provides a good location for car keys or the day's mail.

The remodeled kitchen and dining areas of this home were designed to complement the clean, spare lines of the existing 1950s architecture with a more modern, open plan.

Sarah H. Gerber, the project's architect, facilitated this open plan idea and transition between spaces with a mahogany-veneer partition wall (left). The wall, a floating plane that slices through the living area into the kitchen, leaves a skid mark on the maple flooring (shown below as purple heart, bubinga, and ebony inlays).

Gerber further opened the space by continuing the kitchen counter, unbroken, into the adjacent dining area. The counter and its base cabinetry were designed as furniture to reduce the definition between kitchen and dining room.

In keeping with the open plan, the television's swivel arm allows one miniature set to be viewed from both rooms. For future use, a phone

line has been installed in the kitchen so the television stand can easily be adapted to a computer stand with Internet connection—for downloading recipes to refer to while preparing meals.

Architect: Sarah H. Gerber, Winter Park, Florida

General Contractor: Winter Brothers Construction

Sources: Corian (solid surfacing countertops); Formica Ligna, stainless-steel backsplash, Carrara marble countertop, chrome halogen accent light, mahogany veneer (partition wall); Regal Cabinets (custom cabinetry); Hafele (nickel-plated brass and brushed-aluminum hardware); Franke (sink and faucet); Miele (wall oven); Subzero (refrigerator); Lightolier (downlighting); Philippe Starck/Luminaire (Olly Tango maple-veneer chairs); Luceplan (Costanza pendant light); Sarah H. Gerber (dining room table)



ONE SOUTHWESTERN ARCHITECT AND THE BEAUTY OF TWO UNIQUE PROJECTS

The kitchen and dining area (below) is the main daily living space for a Los Duranes, New Mexico, family. Once two separate rooms, this large space is now used for entertaining and family gatherings. According to architect Garrett Smith, AIA, the interaction between outdoors and indoors is key to the design, as is the requirement to create spaces within a space that accommodate a variety of uses.

The kitchen is direct in plan but flexible and well laid out for large gatherings or daily family use. The dining area is set apart from the kitchen by certain design elements, including a fireplace and pylons at one end of the kitchen. These pylons hold sliding pocket doors to visually close off the kitchen when the cook needs privacy.

Exposed wood trusses are combined with hand-plastered walls and warm gray concrete floors to

create a comfortable ambiance. The lighting enhances the use of materials, angled walls, and refined detailing.

For another New Mexico project, a 3,000-square-foot house that is also often used for entertaining, Smith created a small, intimate powder room (right) as a surprise for guests.

Intentionally designed with utility of space in mind, this cozy powder room relies on color, tile materials, and the sink's single graceful piece of cut glass for its visual impact.

Echoing the natural hues of the surrounding New Mexican landscape, the bathroom's subtle and organic color scheme lends itself to the traditional Southwest pueblo style. However, the space remains distinctly contemporary, with the sink's clean, geometric lines and overlapping and intersecting planes.

Architect: Garrett Smith, Ltd., Albuquerque

Sources: Kitchen—Weathershield (doors and windows); Kohler (sink); Moen (faucet); ABHT Laminati (plastic laminate); Wedgewood 1935 (range and oven); Brian Flynn (kitchen terrazzo); Cottonwood Woodworks/

Designed by Garrett Smith, Ltd. (casework)

Powder room—Fiandre (tiles); Irving Uffer/Wholesale Mirror in Albuquerque (glass top); Kroin (faucet and lavatory); Elger (toilet); John Suttman (brushed-steel pieces); Garrett Smith (hand-colored plaster walls)



A MANHATTAN PREWAR WRECK IS REHABBED WITH MAHOGANY

The project team had a few overall design concepts for this needy New York City apartment—mahogany paneling, metal railings, and aluminum and glass pivoting doors. Ultimately, the design depends on the continuity of these materials; the kitchen and master bath are shown here as examples.

The custom aluminum and glass doors used in the kitchen cabinets (far right) match the pivoting glass doors that separate the entry foyer from the dining room. The mahogany cabinets match the mahogany paneling used throughout the apartment. Black Formica countertops with aluminum edging pick up the palette of the black-and-white checkerboard floor.

In the master bathroom (right), the aluminum detailing used to fashion door handles and shelving throughout the apartment informs the design of the bathroom vanity.

Architect: Joel Sanders, Architects, New York City
Sources: Richard Goloveyko, ACME Designs (cabinet doors and bathroom vanity); Richard Newton (millwork)



KITCHEN & BATH

A COLORFUL MEXICAN RETREAT DESIGNED FOR THE WHOLE FAMILY

When a Cuban-American couple with five children and eleven grandchildren wanted to create a family vacation home in Baja, they called on FORS Architecture.

The kitchen, meant to be the heart of the house, opens to the

main living spaces. With as many as 30 people in the house at one time, however, the couple also wanted the kitchen to be visually shielded. This was accomplished with a dramatic blue wall (right).

The downstairs suite of bedrooms, designed for the children and grandchildren, has a yellow tiled bathroom (left), which is divided by a custom fabricated galvanized door. One side has a shower and sink; the other, a toilet and sink. The brightly colored tiles are distinctly Mexican, and the planning answers the demands of a large family.

Architect: FORS Architecture/ Fuenteville, Sotinsky, Berkeley, California
Sources: Kitchen—Behr (paints); Stonco (ceiling fixtures); Philippe Starck/Alessi (juicer); Muebles Morelia (dining table); Bathroom—Tecate Tile (handmade Talavera tiles)





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REMODELING A MASTER BATH HIGH IN THE HOLLYWOOD HILLS

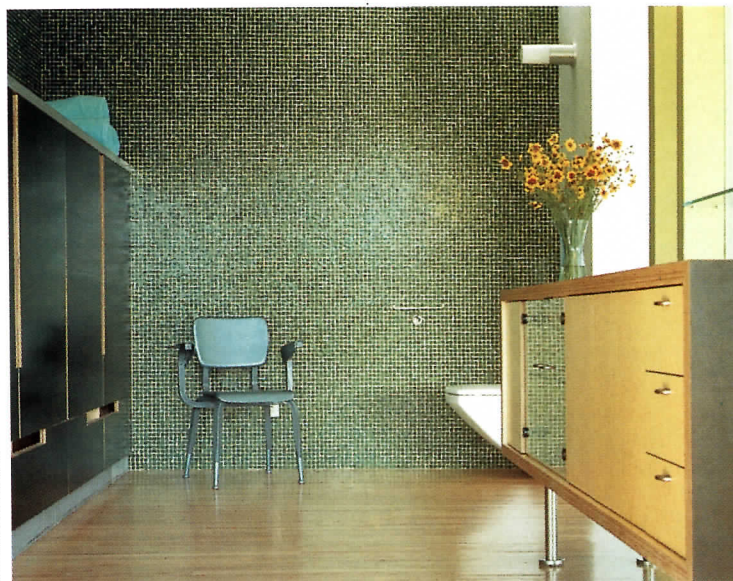
This California client had a few simple requests for a new master bathroom: a steam shower, a single sink, a toilet, limited clothing storage, and a better connection to the pool. The redesign took all of this

into account and created a sense of overlapping spaces for both bath and bedroom. The bathroom's exterior wall was redesigned as a series of 4-by-6 posts with fixed glazing and continues inside to partially

divide the space (below). The bedroom's wood floor was extended into the sink and wardrobe area. The sink and wardrobe area were combined as an extension of the bedroom, with a vanity and closet space. The toilet will be partially screened by a sliding obscure glass panel, not yet installed.

Architect: Koning Eizenberg, Venice, California—Tim Andreas

Sources: Finland color plywood and Finland birch plywood (casework, vanity, door, and closet); Philippe Starck (toilet and sink faucet); Paul King Construction (project contractor and wood stud framing at glass wall); Halo (wall lights)



A NEW YORK CITY TOWN HOUSE IS LOVINGLY RESTORED

In restoring this century-old, five-story town house on the Upper West Side of Manhattan, the owners were particularly concerned about the dark and narrow spaces that are common in this type of building. To

address the problem, Safdie Rabines Architects removed portions of the floors to create double-height spaces and allow for natural light.

A built-in breakfast area off the kitchen offers views of the back gar-

den and deck. But it is the large Syndacrete island counter that is the kitchen's focal point (below right).

In the master bathroom (below left), sycamore cabinetry, maple flooring, and glass tile combine for a minimal yet warm feeling. Tiles are used to form shallow trough sinks and an elaborate steam shower.

The renovated building now contains five bedrooms, six bathrooms, a study, a den, an office, an eat-in kitchen, dining and living rooms, a large deck, and a private garden, all in the heart of Manhattan.

Architect: Safdie Rabines, San Diego, California—Ogawa Depardon, administrative architect

General Contractor: Rose Lee Renovations

Sources: Kitchen—Avodire wood veneer from Certainly Wood (custom wood cabinets); Syndesis, Inc. (island countertop); Franke (island sink); Russell (cooktop); Subzero (refrigerator); Hafele (cabinet pulls); Targetti (island light fixtures)
Master bathroom—Bisazza Mosaico Vetricolor 20 glass tiles (countertops, trough sink, bath surround, and steps); sycamore wood veneer from Certainly Wood (custom wood cabinets); Dornbracht/Tara Edition (sink and bath faucets); S. A. Bendheim (textured glass)



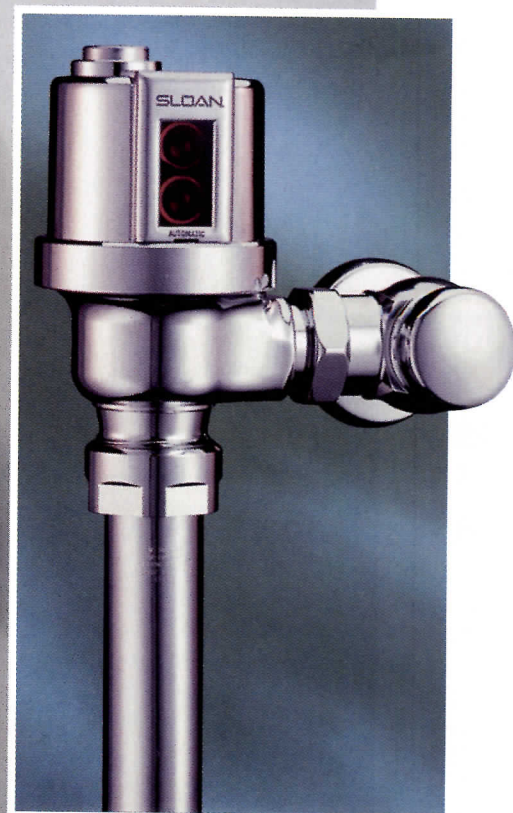
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CIRCLE 50 ON INQUIRY CARD

A PRIVATE CANADIAN RESIDENCE FOR A MAN WHO LOVES CITY LIFE

Five unfinished town house units were converted into a single town house for this urban bachelor pad. The result—in keeping with the client's desires—is a house that stands apart from anything else in the city of Vancouver, British Columbia.

The kitchen design concept was to create a service wall with

ample storage and work surfaces (below). The system, manufactured by Designlines Furniture Systems, contains interchangeable custom cabinet and drawer units attached to an aluminum E-01 E'Lips extrusion. Spanning from floor to ceiling, the system has keyways on each side to allow for the attachment of cast-aluminum bracketry at any

height, which can hold custom-made desktops, work surfaces, storage components, support brackets, and lighting. Signage or displays can be attached for commercial use.

Kitchen storage was created as a series of furniture components on a flexible, aluminum extrusion system set against the wall. The kitchen has an 18-foot-long stainless-steel island, constructed in one piece and containing all the necessary mechanical equipment.

The kitchen work surfaces (bottom) are polished slabs of Granirex—a composite of granite and resin—with tapered edges, cantilevered off stainless-steel brackets. The backstops are stainless-steel hardware from Denmark. The floors are polished concrete formed in a stainless-steel grid.

The streamlined washroom (left) features a cantilevered Corian composite sink and an ample countertop fitted onto a brushed stainless-steel support bracket. The mirrors are hung off single-eye support castings.

The room's main attractions, however, are the elegant double shower stalls—partitioned with sheets of glass—and the highly stylized European bidet.

Architect: *Busby + Associates Architects, Vancouver, British Columbia*

Sources: *Kitchen—Design Furniture System (furniture system); Granirex (work surfaces)*

Bath—Corian (sink and countertops); Vola (taps and hardware)



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CIRCLE 51 ON INQUIRY CARD

A CALIFORNIA FAMILY'S VALUES ARE EASILY DESIGNED INTO A NEW SPACE

The kitchen is the central gathering place in this two-story Santa Monica residence and reflects two important values that the family shares: the love of literature and the love of cooking.

The space is articulated by a variety of wood surfaces, including white maple floors, cabinets made from Finland white birch, and colored plywood panels in red, yellow, and butterscotch (bottom right).

The colored panels wrap from the kitchen into the entry space, providing visitors with a hint of the kitchen as they enter the house. Yet the kitchen space does not unfold until the visitor turns the corner or ascends the freestanding stairway to the mezzanine-level library, which is trimmed with a stainless-steel railing of wire mesh (top right).

The angle of the stairway in relation to the mezzanine creates a landing, which the family says feels

like a small stage. The double-height kitchen atrium is washed in natural light, which pours through a 15-by-20-foot skylight. Like a trellis structure, the exposed beams provide shade. Directly below the skylight, the countertop of the central island is a white maple butcher block. The countertops adjacent to the sink are stainless steel.

To connect the ground-floor kitchen space with the library, a dialogue is created between the cabinetry colors below and the brightly colored spines of the books above. The kitchen opens up to a pantry wall, which provides ample storage for everyday glasses and dishes. As the wall extends in either direction, it erodes where it turns the corner into the family room and the dining room.

Throughout the newer part of the house, the floors have been redone in maple.

Architect: Marmol and Radziner, Santa Monica, California

Sources: Subzero (refrigerator); Dacor (ovens and cooktop); Kitchen-Aid (dishwasher); Elkay (sink); Indy (recessed lighting fixtures); Bruck (low-voltage lighting fixtures); White maple with semigloss water-based polyurethane finish (flooring); Finland white birch and natural, red, yellow, and brown plywood (cabinets)



A DARK NEW YORK CITY LOFT BECOMES A LIGHT-FILLED ENVIRONMENT

The primary concern in renovating this New York City loft was a desire for light. Although the apartment is large, it has windows only in the front. To overcome the original layout—a series of small, gloomy rooms—translucent, movable partitions and freestanding cabinets were built, which allow light to penetrate into the entire apartment. In keeping with the architect's straightforward design objective, the emphasis in the kitchen (right) is on simple shapes and natural wood.

Architect: S. Russell Groves, New York City

Sources: Frigidaire (stainless-steel appliances); standard stainless-steel restaurant table (worktable); Piet Hein/ICK (beech and aluminum table); Arne Jacobsen/ICF (beech chairs); Natural MDF (cabinets); stainless steel (countertop)



COMFORT AND PLEASURE FOR A RELAXING WEEKEND GETAWAY

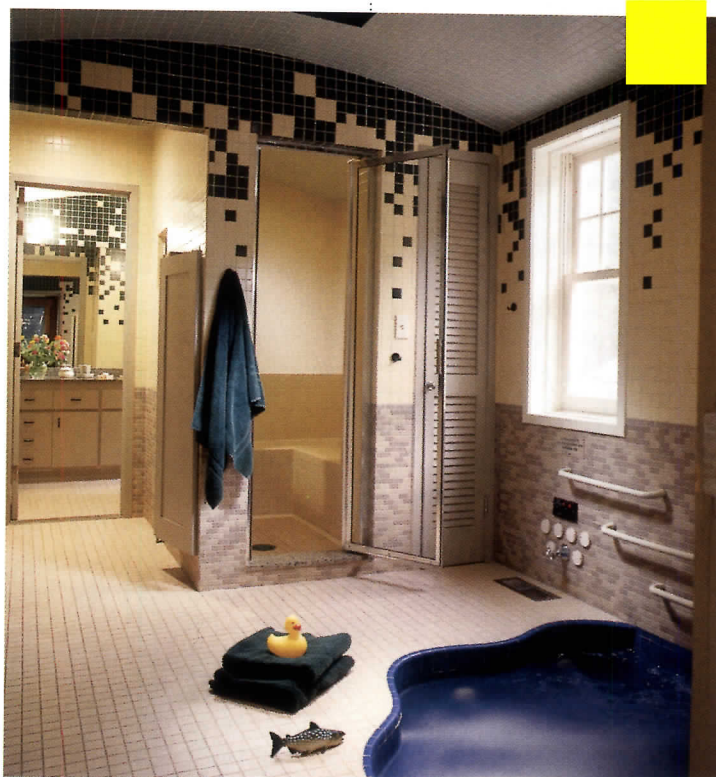
A fast-paced family dubbed their upstate New York weekend house "a pleasure palace to unwind." And nothing could be more relaxing than a spa room added onto the traditional bathroom. A deep blue sunken jacuzzi tub was custom cut with four ergonomically correct seats built in (right). Across from the tub, a steam room rounds out the soothing space. To maintain a streamlined look, the sophisticated exhaust fans and ductwork needed for ventilation are located in another part of the house; a simple ceiling vent is used in the spa room.

The kitchen (below) was designed with a playful motif, including imported granite countertops shaped and colored as pieces of fruit; custom maple cabinetry manu-

factured at a local mill; and fresco-style linoleum floors.

Architect: *Centerbrook Architects, Essex, Connecticut—Jefferson B. Riley, FAIA, and Charles Mueller, AIA*

Sources: *Bathroom—American Olean (ceramic mosaic tiles); Mr. Steam (steam generator); Hewi (spa tub handrails and bathroom accessories); spa tub custom tiled*
Kitchen—Forbo Industries (linoleum); Centerbrook (custom maple cabinetry); Subzero (refrigerator); Garland (range and oven); Kitchen-Aid (dishwasher and microwave); Elkay (sink); Speakman (kitchen sink fittings); Benny Lacca and Sons, Inc. (imported granite countertops); Halo and C. J. (lighting); Russ Alger and Don Hills (built-in wall unit)



NEW PRODUCTS

A TURNING POINT FOR SOLID SURFACING, AND THE FUTURE LOOKS BRIGHT

Keeping up with Corian is not easy. Traditionally, the solid surfacing material, a blend of acrylics and natural minerals from DuPont, has been used to create ready-to-install vanity tops, top-mount sinks, edge treatments, work surfaces, and decorative inlays for residential and commercial applications.

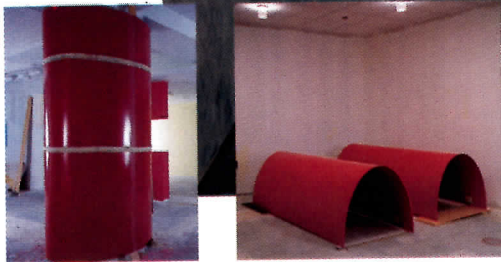
Today Corian can be angled, sandblasted, routed, sculpted, or engraved for custom tub and shower surrounds, wall cladding, wainscoting, and window trim. One company even partnered with Corian to create built-in appliances faced with solid surface panels. The possibilities seem endless.

So when John Mack from HLW International in New York City saw an 8-foot column in the middle of a Manhattan public relations firm's reception area, he was immediately inspired to think outside the Corian box. As project designer and partner in charge of design for the office remodeling job, Mack wanted a sleek, seamless, monolithic form to take shape. He also wanted the column's color to stand out yet blend in with the overall project's palette.

Mack immediately went to George Shagawat, vice president of Mielach Woodwork, and Bruce Bartholomew, the plant's superintendent, for help. The Edison, New Jersey-based company has used DuPont Corian solid surfacing material in conventional applications, such as vanities, countertops, walls, floors, and sinks, for years. Familiar with the product's abilities and limitations, they knew that their extensive knowledge of the product was about to pay off.

Shagawat and Bartholomew had bent Corian before (for the front of a desk and a counter apron), but

when they first heard about covering an elliptical column, they knew they were in for a challenge. . . or two. First, they had to create a male and female press, then bend each with heat—not as easy as it might seem with such a stable product as solid surfacing. After each half came out of a thermal forming oven, the Corian was lathed over the form



until it took to the contour. It was left to cool and set for an hour.

The installation process brought its own minor problems. The Corian was sent out to the office site in two halves. Pulling the presses together in the field and making the joint tight enough—in other words, creating a seamless fit—took some time and ingenuity. With a bit of liquid Corian to fill in the joint, the column was strapped and tightened with band clamps. After two days, the joints were sanded down. The entire process,

from start to finish, took about a week. According to employees, the column—and its color, called Hot—supports the office design well and is holding up nicely.



The column (above) was covered in Hot, one of Corian's latest Design Portfolio colors. Male and female presses were made, sealed, and then tightened with band clamps.

Commercial settings

New commercial applications for solid surfacing material, like the one described above, are becoming more mainstream. Not every project is going to include covering an 8-by-4-foot elliptical column, but Corian can now be considered more than just a residential countertop material.

According to John Burr, com-

Developed more than 30 years ago, solid surfacing is a durable, non-porous material that has become the kitchen and bath product of choice. Nowadays, though, more and more architects are looking to solid surfacing for commercial applications, such as health care facilities, retail outlets, and, as you'll read in this story, office renovations. One innovative furniture designer has even entered the solid surfacing scene and created a line of chairs. The future of solid surfacing looks even brighter. The scoop: look for exterior cladding applications in the near future. —Elana H. Frankel, *New Products Editor*

mercial marketing manager for Corian, users can expect to see a host of new commercial products for both interiors and exteriors.

"Corian has a workhorse ethic with aesthetic appeal," says Burr. "It's ideal for high-traffic areas, such as dormitories or hallways." Though Corian has been used in commercial settings for years, the company has answered (or will answer) commercial concerns that will help market the product in new ways.

In the past, for example, Corian has been limited to relatively neutral tones. But with the success of Design Portfolio, a line of vibrant colors that includes Hot, the company is trying to create textured-looking colors that are brighter and more energetic. Soon the commercial community will be able to custom-match corporate or Pantone colors as well as paint swatches for reception areas or work spaces. Corian's Buffalo, New York-based lab will produce the color sample in five days.

Also, Corian will increase the hygienic attributes of solid surfacing in order to meet the needs of health care and food service facilities. Expect new products in late May.

Finally, solid surfacing will be seen as wall cladding for retail stores, malls, and office buildings as well as more exterior uses. Responding to the needs of the marketplace, Corian is developing a durable and aesthetic alternative to spandrel glass or column cladding for exteriors. And though Corian has been used in exteriors for a while now, new products will expand on its durability, graffiti resistance, and versatility. 800/4-CORIAN. DuPont Corian, Wilmington, Del. **CIRCLE 150**

HARD CHOICES FOR COUNTERTOPS: ALTERNATIVE SURFACING MATERIALS

On the following two pages, readers will see several alternatives to Corian that are available in the marketplace. Although solid surfacing and its cousins are popular (as seen in the four companies represented on these pages), we've also included other surfacing choices for countertops: one in concrete and one in crystallized glass. Why?

Because some clients are looking for an alternative to the polish of stone, the coolness of plastic, or the grout lines that come with ceramic tiles. Others appreciate the lighter-than-stone quality of glass architectural panels, which reflect light and create a soft, lustrous appearance. As they say, to each her own.

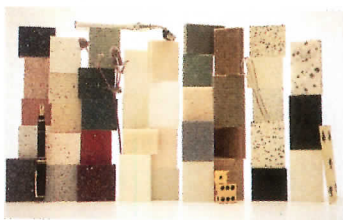
Concrete cone

Michael Agins's design, using Buddy Rhodes concrete in the conical table (right), is standard bar height, 44 inches high and 30 inches in diameter. For installation, a metal pipe that fits up the center of the table was welded to a metal plate. The plate was drilled into the subfloor; then hardwood was laid on top. The illusion: The cone balances on the floor. The reality: It's a very stable table. 415/641-8070. Buddy Rhodes, San Francisco. **CIRCLE 151**



Collective surfacing

Formica's Surrell solid surfacing material is a combination of polyester resin and mineral filler. Featured below is a photograph of the company's entire line, 40 designs in five collections. From left to right, the first three columns represent the Granite collection; columns four and five are the natural tones of the Solid collection; the newest additions include columns six and seven, the Spice Mists colors (Ginger Root, Spanish Paprika, Cayenne, and Pesto); the eighth column is the Revolution collection; and the last column is called Innovations, reflecting the look of terrazzo. 800/FORMICA. Formica Corporation, Cincinnati. **CIRCLE 152**

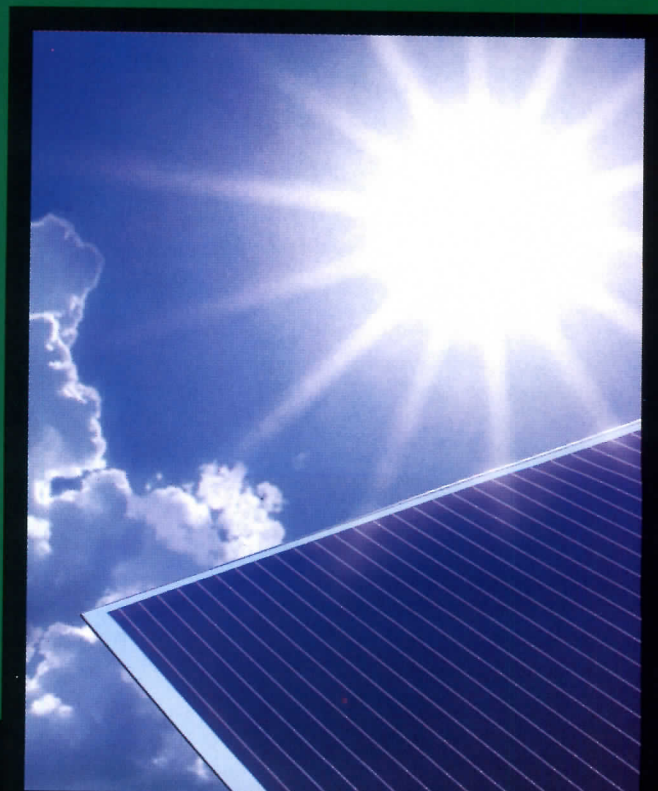


Slab art

Wilsonart International's Solid Surfacing Veneer (SSV), shown here in Grey Mirage, is thinner than traditional solid surfacing. Fabricated like laminate, the 1/8-inch-thick product is all-acrylic and offers a natural stone-like look with the performance features of solid surfacing: it is repairable, nonporous, impervious to water, and stain-resistant. It can be bonded to plywood, unlike its 1/2-inch-thick solid surfacing cousin. Sheets of up to 61 by 145 inches, in 1/4-inch increments, are available for wall panels or toilet partitions. Wilsonart's SSV is backed by a 10-year installed, transferable, limited warranty. 800/433-3222. Wilsonart, Temple, Tex. **CIRCLE 153**

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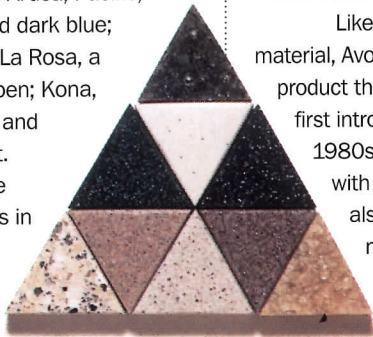
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Pyramid scheme

Recently, Avonite introduced nine new solid surfacing colors. From the top of the pyramid, left to right: Brazilian Blue, mirroring an expensive-looking granite; dark bluish green Cypress; Artica; Pacific, a brown flecked dark blue; Kaleidoscope; La Rosa, a dusty rose; Aspen; Kona, a purplish red; and Autumn Wheat. Though Avonite offers 57 colors in all, these nine new colors include the latest granite-looking solid surfacing material that ranges from simple neutrals to deeper, more intense tones. As seen here, the color range is not limited to only nature's choices.



Autumn Wheat, Brazilian Blue, and Kaleidoscope, the three Crystelle colors, are among the most natural-looking solid surface granite replicas. The six new Formstone

granites are grouped together as Artica, Aspen, Cypress, Kona, La Rosa, and Pacific. And on an environmental note: the particulates in the new color Kaleidoscope are made from prime reclaimed solid surface materials.

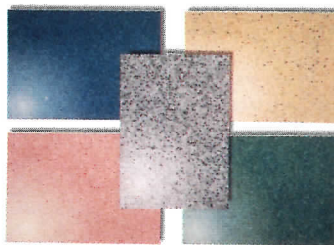
Like most solid surfacing material, Avonite, a polymer-based product that was first introduced in the mid-1980s, is often compared with natural stone materials, such as granite, marble, slate, and agate.

But one of the main differences is that solid surfacing won't stain permanently. Cleaning is done with a damp cloth and ordinary soap, household ammonia, liquid detergent, or an abrasive cleaner. Scratches can be removed by buffing the surface lightly with a Scotch Brite pad. 800/4-AVONITE. Avonite, Belen, N.M.

CIRCLE 154

Soft options

Swan recently introduced 10 new colors in solid surfacing fabrication sheets and molded accessories. Five of them are shown here. The Tahiti line features 10 aggregate shades with softer hues that are gaining popularity for restaurant and cafeteria tabletops and commercial furniture, such as service counters, reception and check-in desks, and wall surfacing. With the addition of the new colors, custom fabricators now have an array of 28 Swanstone solid surfacing shades from which to choose. The company also offers a new kitchen sink catalog, highlighting its complete collection. 314/231-8148. Swan Corp. St. Louis, Mo. CIRCLE 155



Crystallized counters

Shown above is an Ohio beauty salon's receptionist's desk made from Neoparies's cladding material. The architectural panels, made from crystallized glass, have a standard thickness of 3/8 inch and are available in eight colors and a variety of blended and pigmented hues. Flat, curved, and corner panels are also available. Resistant to acid, alkali, heat, cold, scratching, and abrasion, the panels also repel moisture. Surface stains are easily removed from the panels with a mild, neutral detergent and water. 800/733-9559. NEG America, Itasca, Ill. CIRCLE 156



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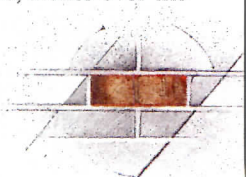
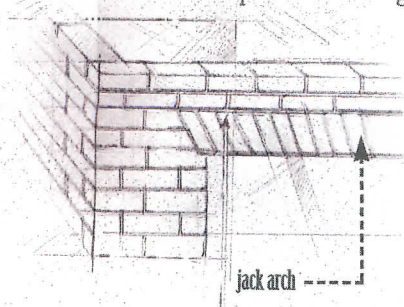
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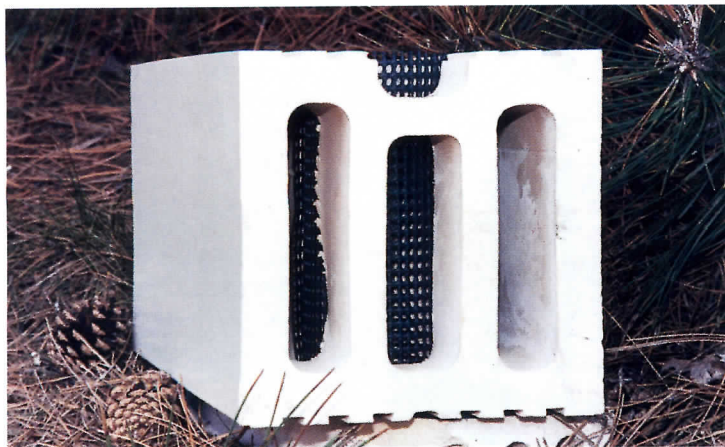
► Acoustical test site
Johns Manville has expanded their acoustical testing capabilities to support their existing and more recent products, such as new acoustical insulations for manufacturers of office furniture, acoustical panels, and furnaces. In addition to a wide range of traditional acoustical test apparatuses for ceiling and wall panels, Johns Manville now uses a new hemi-anaoic chamber (shown) with a robotic microphone-positioning system to scan acoustical materials and finished products for sound-intensity mapping. The company



has also improved on their impedance tube techniques and airflow apparatuses. 800/654-3103. Johns Manville Corporation, Denver, Colo. **CIRCLE 158**

▼ Ceramic masonry unit
With both horizontal and vertical reinforcing, Stark's structural glazed facing tile can now stand up to seismic activity as well as high traffic and vandalism, making it suitable for manufacturing plants,

hospitals, schools, and gyms. All units conform to ASTM C-126 specs and the Facing Tile Institute Selected Size quality (Grade SS ground ends). Available in three sizes. 800/321-0662. Stark Ceramics, Inc., Canton, Ohio. **CIRCLE 159**

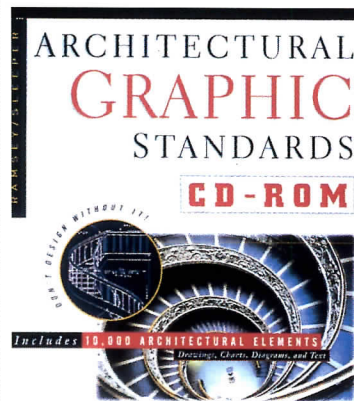


▲ Lapis lazuli tiles
Traditionally, lapis lazuli, a symbol of luck and wealth, was cut for jewelry or ground into powder for cosmetics. Until recently this gemstone was available only in limited quantities, from the farthest reaches of the Andes and remotest Afghanistan. As a result, few architects incorporated it into building work. Today large blocks of lapis are imported by LapisChile for ornamental, custom-made tiles and surfaces. Similar in appearance to some higher-grade Italian marble, lapis complements marble accents for floors and other decorative installations. Due to demand, larger pieces for one-surface floor and wall inserts are in development. 207/871-1310. Access Chile, Portland, Maine. **CIRCLE 160**

▼ Blue suite settee
In the late 1920s Eiel Saarinen designed the Blue Suite Settee in Cranbrook's American Bauhaus style. Now, in the late 1990s, the Adelta International Company in Helsinki has been authorized by Saarinen's grandson to reproduce the



▼ Updated graphic standards
When Architectural Graphic Standards joined the electronic age and went CD-ROM, many of those reference bibles found their way into the recycling bin. With the latest release, version 2.0, more than 50 percent of the structural, mechanical, and electrical system illustrations appear in vector format and can be CAD edited; users are provided with Web access; and a new file format (.DGN) provides data access to MicroStation. 212/850-6000. John Wiley & Sons, Inc., New York City. **CIRCLE 163**

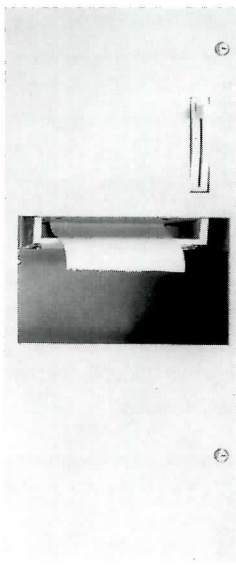


settee. In the United States, the M2L company carries the blue-gray lacquer and gold-leaf piece with exclusive upholstery by Irma Kukkasjarvi. The updated classic sells for \$2,550. 212/832-8222. M2L, New York City. **CIRCLE 161**

► Metric conversion calculator
Instead of spending precious hours programming conversion factors and formulas into your calculator (or trying to work them out in your head), try the pocket-size, travel-friendly Metric Conversion Calculator from 1-Step. Translates with one touch. 800/9-METRIC. 1-Step, San Diego. **CIRCLE 162**



PRODUCT BRIEFS



◀ Public washroom accessory

The Simplicity collection includes a variety of washroom accessories for public and institutional facilities. The Roll Paper Towel Dispenser and Waste Receptacle (shown) is constructed of Type 304 stainless steel with a cover-all door that fits neatly into the frame. The dispenser's size, 16 $\frac{1}{8}$ by 41 $\frac{1}{4}$ by 9 $\frac{1}{8}$ inches, fits paper towel rolls 8 or 9 inches wide and 800 feet long in preset lengths. The dispenser mounts 16 inches from the floor to the bottom of the unit (handicapped is 40 inches to level); the removable stainless-steel waste container measures 10 gallons. 914/476-9000. American Specialties Inc., Yonkers, N.Y.

CIRCLE 164

▶ Handsome handshower

Hansgrohe's Crometta Handshower complies with the American National Standards Institute (ANSI) water-saving rate recommendation of 2.5 gallons per minute. Another feature, the Rub-It cleaning system with silicone spray nozzles, easily removes lime-scale with an occasional wipe of a damp sponge. Connected to a Hansgrohe hose, Crometta becomes a handheld accessory or tub and shower cleaner. Lists for \$20; guaranteed for five years. 800/719-1000. Hansgrohe, Inc., Cumming, Ga. CIRCLE 165



▲ Sleek sinks

Until 1842 Duravit (or Duraba as it was known) produced only tableware. In 1912 the product range was extended to include sanitary items such as ceramic chamber pots. Today Duravit designers have taken it upon themselves to meet a



modern-day challenge: making visits to public bathrooms a more aesthetically pleasing experience. Their solution: the Architec range of sleek washbasins (shown), 22 $\frac{1}{2}$ inches wide with generous surrounds. 888/387-2848. Duravit USA, Inc., Duluth, Ga. CIRCLE 166



▲ Showerhead restyled

Speakman's Anystream showerhead has had a facelift. To begin with, it now conforms to ANSI's water-flow recommendation of 2.5 gallons per minute. Also, the design integrates a built-in volume and pressure control that can alter flow patterns from hard-and-brisk to a soothing massage. The new showerhead is available in chrome, brass, and white finishes. 800/537-2107. Speakman Company, Wilmington, Del.

CIRCLE 167

▼ Dual-use protection

The single-piece Lav Shield hides piping, faucet connections, mixing valves, trap primers, and hot-water heaters. Molded from Boltaron 4353, it protects wheelchair users from scalding. The Lav Shield satisfies NFPA Class A interior-finish material safety code 101 and BOCA Class 1 interior-finish material code for fire and smoke ratings. A one-size-fits-all configuration can be used in most new or retrofit ADA-conforming lavatories. 800/340-5969.

Truebro, Ellington, Conn. CIRCLE 168



▲ Retractable shower doors

Kohler's Helios shower doors are trackless panels that at first retract, then pivot in or out to provide unobstructed access and expanded space. What does that really mean? No more bumping your head on a top rack. Choose from four- or two-panel doors to accommodate a variety of bath and shower installations. Constructed of aluminum, the doors come preassembled. The tempered safety glass may be ordered in three silk-screened patterns: crystal clear with wave, an overall leaf motif, or a shoji screen (pictured). 800/4KOHLER. Kohler Company, Kohler, Wis. CIRCLE 169



▲ Cool new bath fixture

Handcrafted and sculpted from Starphire, a clear white glass from Porcher, the Glacier Basin measures 22 inches around by 5 inches deep. The contemporary-styled, frosted banana leaf design etched into the back side of the basin beautifully (and cleverly) hides most water spots. The Glacier Basin retails for approximately \$2,295 and comes with an integral faucet deck to facilitate the installation of any single-hole faucet set. 800/359-3261. Porcher Ltd., Chandler, Ariz. CIRCLE 170

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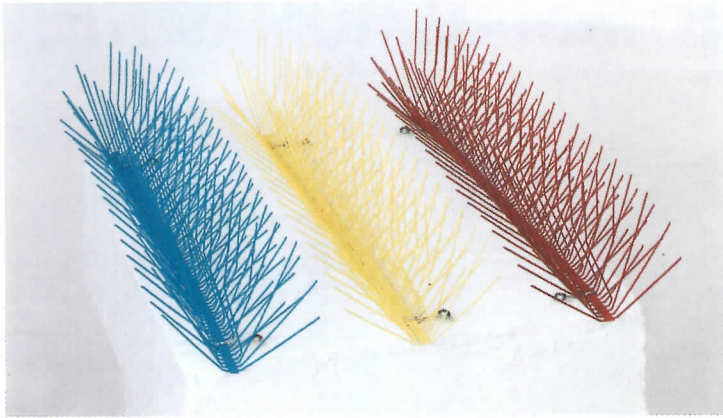
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CIRCLE 55 ON INQUIRY CARD

PRODUCT BRIEFS



▲ Colorful bird control

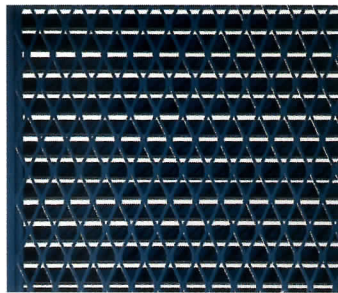
Pigeons are determined and intelligent animals. Hot foot gel, rubber snakes, and loud sounds will not deter them from roosting on a landmarked ledge or nesting in an intricately designed nook or cranny. So what's an architect to do? Nixalite's Architectural Bird Control, with rows of 316 stainless-steel needle strips,

prevents those flying creatures from nesting or even getting too comfortable. With an added color powder coating, this bird control device can be made virtually invisible. The Colorcoat option comes in several standard shades with custom matching available. 800/624-1189. Nixalite of America, Inc., East Moline, Ill.

CIRCLE 171

▼ Digital documentation

Agfa enters the high-end digital camera market with ePhoto 1280. A 2-inch, color LCD is attached to the camera, which suits professional needs, generating up to 1.228-million-pixel images from its 1280 mode and an optical swivel zoom lens. What's the really big news? It's under \$1,000. 800/926-2432. Agfa, Wilmington, Mass. CIRCLE 172



▲ Aluminum louver and frame

Designed to glaze within EFCO's window frames or be installed in stand-alone units, the Louv-Air Series LA-125 A/C louver system of metal wall grilles protects HVAC systems. 800/221-4169. EFCO Corporation, Monett, Mo. CIRCLE 174



► Hand and chair rails

Solid Pennsylvania hardwood rails from Korowood feature integrated, flexible bumpers locked into aluminum retainers. The bumpers are offered in matching colors to coordinate with Koroseal wall-coverings and Korogard protective wall-coverings. The wood is available in red oak or maple with four stain options: unfinished, clear varnish, red oak, or cherry. 800/628-0449. Korowood, Fairlawn, Ohio. CIRCLE 173

▼ Freestanding furniture

In response to the current trend in mobile workstations (that also look good), New York-based designer Edward F. Weller, III created the Gemini collection of freestanding furniture and casegoods for Halcon. The collection, which is available in a variety of warm woods and inlaid patterns, includes

mobile work surfaces and storage pedestals that can be moved into various configurations. A perforated-metal panel provides a ribbed, impact-resistant covering for the mobile pedestal. A specially finished composite board can be ordered for desktop surfaces. 507/533-4235. Halcon, Stewartville, Minn.

CIRCLE 175



▼ Electric fireplace trimmings

If a wood-burning fireplace is out of the design question, a Symphony electric fireplace is the next-best auxiliary heat source—delivering about 4,500 BTU of total heat. The Symphony plugs into a standard 120-volt circuit and does not require venting or pipelines. To ensure safety, no combustible energy sources are used to produce the flame, so the front glass stays cool and there's no danger of carbon monoxide poisoning. Fits into most fireplace openings; available with trim and mantel surrounds.

519/650-3630. Dimplex North America Ltd., Cambridge, Ont. CIRCLE 177

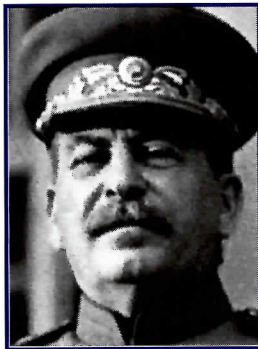


▲ Splashy wall accents

Earthenware tile combines the look of antique, handmade European tile with a contemporary palette. It is available in 10 colors, ranging from neutrals with a glossy or matte finish to bolder accents like cobalt blue, maize, brick, and woodland green with a translucent finish. For both residential and commercial settings, Earthenware can be used on walls, countertops, and backsplashes (shown) and is offered in most trim configurations. 214/309-4879. American Olean Tile, Dallas. CIRCLE 176

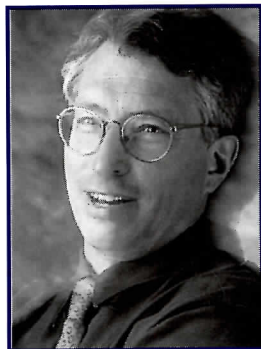


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PRODUCT LITERATURE

Roof asset management

AlliedSignal Commercial Roofing Systems has prepared a four-page summary of roof asset management that describes how it is used by building owners, roofing consultants, and roofing materials manufacturers. "Managing Roofing Assets Through Life-Cycle Analysis" outlines the challenges facing the roofing industry in tracking roof life cycles. The report suggests that statistical data can be used in a meaningful fashion—to improve roofing materials and application methods, for example, or to monitor maintenance. Recently published in a peer-reviewed journal, the summary is now widely available as an Allied Signal reprint. 800/221-6490. AlliedSignal, Cary, N.C. **CIRCLE 178**

Hurricane protection

Saflex, a manufacturer of plastic interlayer, introduces a free brochure designed to provide information about the use of laminated glass in hurricane-prone areas. The brochure, "Laminated Glass for Effective Hurricane Protection," offers an in-depth look at the effects a hurricane can have on building and the importance of adequate protection for glazed openings. Saflex plastic interlayer is a polyvinyl butyral (PVB) used in manufacturing laminated glass. 800/24-TOUCH. Saflex, part of Solutia Inc., St. Louis, Mo.

CIRCLE 179

Boiler plant orientation

"Boiler Plant and Distribution System Optimization Manual," by Harry Taplin, P.E., has just been published by the Fairmont Press. Completely revised and edited, this guide to boilers details information on a systematic approach to improving boiler plant and distribution system efficiency. For this second edition, a new boiler plant orientation chapter has been added to the beginning of the book, giving an overview of the key boiler plant optimization issues and solution approaches. The author then takes the reader step-by-step through each of the technical, practical, and managerial aspects of boiler performance improvement. The softcover edition is priced at \$74. Also available: "Energy and Environmental Visions for the New Millennium" (softcover \$98) and "Performance Contracting: Expanding Horizons" (hardcover \$82). 770/925-9388. The Fairmont Press, Lilburn, Ga. **CIRCLE 180**

Roofing video

Polycoat Systems, a distributor of the Dow Corning Seamless Silicone Roofing System, has a video offering background information on the weathering properties of silicones and discussing the Dow Corning system. The video reviews roofing installation and step-by-step procedures. 800/547-4004. Polycoat Systems, Inc., Hudson Falls, N.Y.

CIRCLE 181

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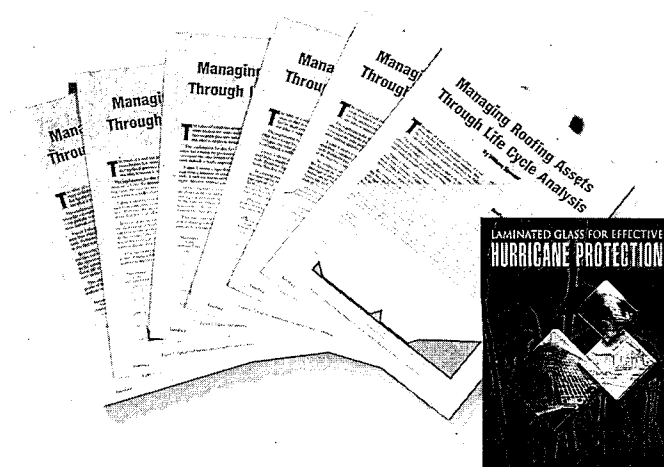
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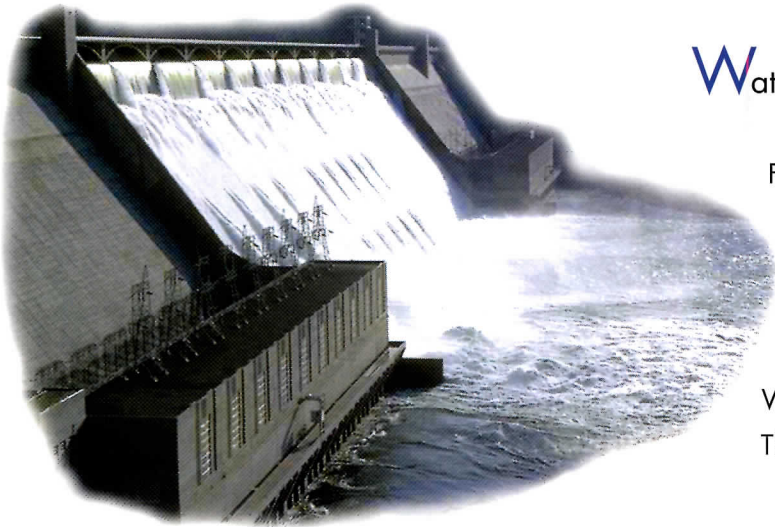
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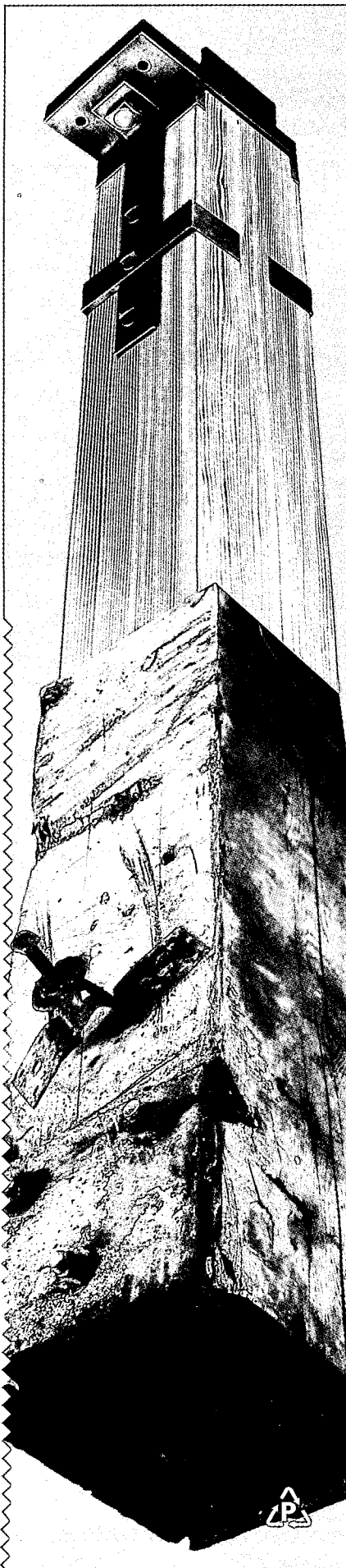
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PRODUCT LITERATURE

Recessed-monitor system

Nova Solutions has developed an interactive CD-ROM (free) about their recessed-monitor system, which provides a clear line of sight and maximizes workspace by locating all computer components below the work surface. Users view their computer monitors through a tempered-glass viewing port on the work surface. In doing so, the user looks at the screen at a downward angle that is natural for reading. Scientific evidence indicates that a downward gaze angle can reduce the eye and neck strain that are often caused by eye-level monitors. 800/730-NOVA. Nova Solutions Inc., Effingham, Ill. **CIRCLE 182**

Interactive CD-ROM

The National Wood Window and Door Association recently published the "I.S. 1-A-97 for Architectural Wood Flush Doors." In preparation for almost a year, the information on the CD-ROM reflects the latest industry materials and methods. One new feature is the recognition of structural composite lumber as a core material in 3-, 5-, and 7-ply constructions. Use of this material offers further protection against warping and telegraphing. The new standard also recognizes three types of door grades: premium, custom, and economy. 800/223-2301. National Wood Window and Door Association, Des Plaines, Ill. **CIRCLE 183**

Environmental remediation

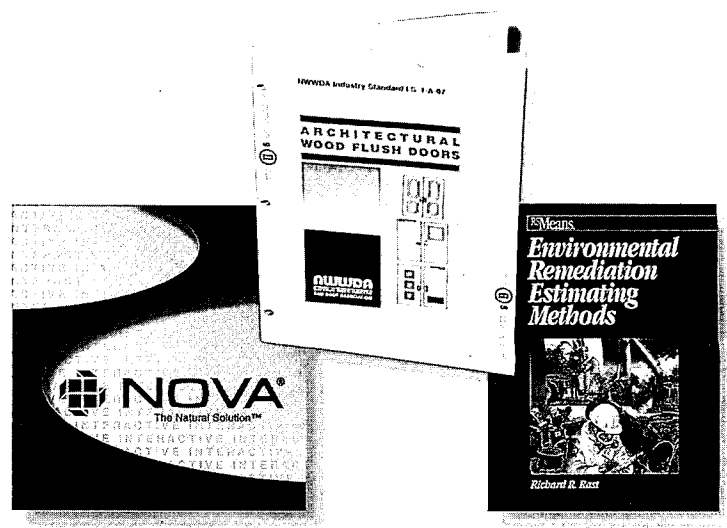
Means Company's "Environmental Remediation Estimating Methods," a guide to comparing and predicting long-term costs of environmental remediation projects, was researched and written by Richard R. Rast, president of Delta Technologies Group, a Denver-based consulting firm specializing in cost- and time-management services for the environmental and construction industries. This 550-page book brings together detailed explanations and estimating guidelines on remediation protocols, from air sparging to UST closure, including installation and operational costs. \$99.95. 800/334-3509. R. S. Means Company, Inc., Kingston, Mass. **CIRCLE 184**

RCMA news

The Roof Coatings Manufacturers Association (RCMA) has released its newest Tech-Note on the subject of "Recommendations for the Application of Aluminum Coatings." This useful publication provides recommendations for procedures for applying asphalt aluminum roof coatings. 301/348-2003. RCMA, Calverton, Md. **CIRCLE 185**

Concrete tech manual

The NCMA has developed the "Manual for Concrete Masonry Design and Construction" on CD-ROM. \$90. 703/713-1900. National Concrete Masonry Association, Herndon, Va. **CIRCLE 185**



CIRCLE 60 ON INQUIRY CARD

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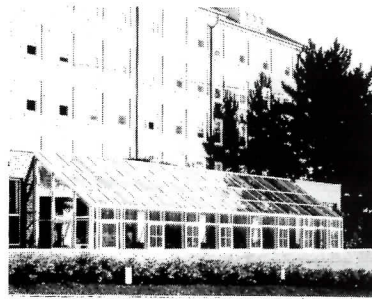
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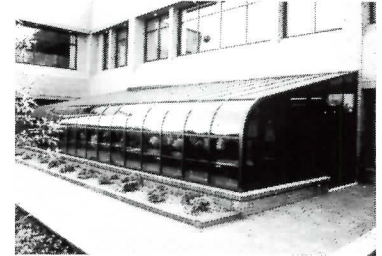


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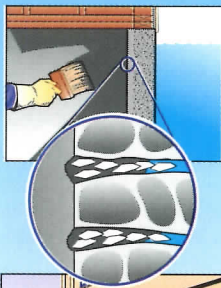


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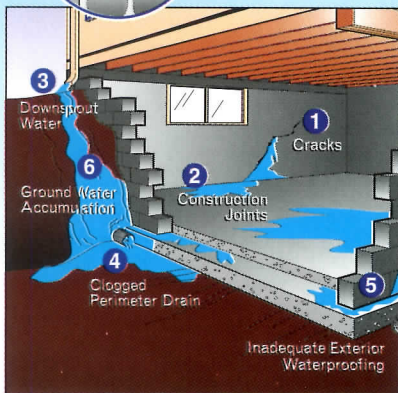
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DATESEVENTS

continued from page 44

significant commercial and residential architecture that uses laminated glass. Winners will be announced at the AIA national conference in May. A student ideas competition for the design of a courthouse is also being held. Write Stephanie Vierra at the AIA, 1735 New York Avenue, NW, Washington, D.C. 20006; call 202/626-7446; or E-mail vierras@aiaemail.aia.org.

Van Alen Prize: The East River

Registration deadline: April 8; submission deadline: May 20

The 1998 Van Alen Prize in Public Architecture calls for entries that investigate, envision, and promote the design of a better public realm for New York City's East River. Entrants may propose design ideas from the vast scale of the entire district to the minute scale, as long as the proposal is conceived as having an impact on the East River's identity in the city. Students, studios, faculty, and professionals from anywhere in the

world may enter. Contact the Van Alen Institute, 30 West 22nd Street, New York, N.Y. 10010; fax 212/366-5836; or E-mail vanalen@vanalen.org.

Vital Signs Student Competition

Submission deadline: June 15

The Vital Signs Project, administered through the University of California, Berkeley, announces its 1998 Student Case Study Competition. Undergraduate and graduate students in ACSA member schools of architecture and ABET member schools of architectural engineering in the United States, Canada, and Puerto Rico are asked to investigate, measure, evaluate, and report on the performance of existing buildings. Contact Gail Brager, Vital Signs, UC Berkeley, Berkeley, Calif. 94720; E-mail vitalsigns@ced.berkeley.edu or visit www.ced.berkeley.edu/cedr/vs/act/act_main.html.

Please submit information for exhibitions, conferences, and competitions at least six weeks prior to the magazine's publication date (i.e., February 15 for the April issue).

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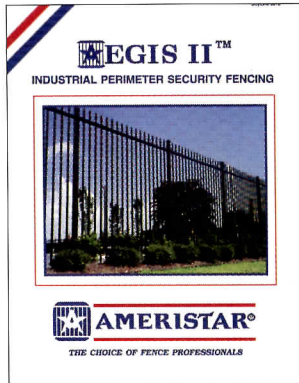


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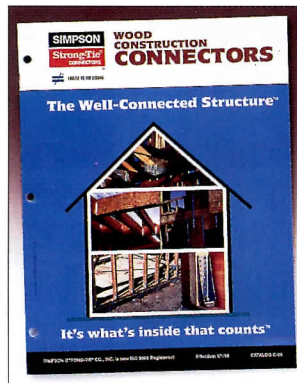


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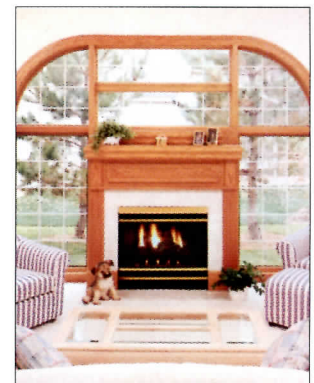


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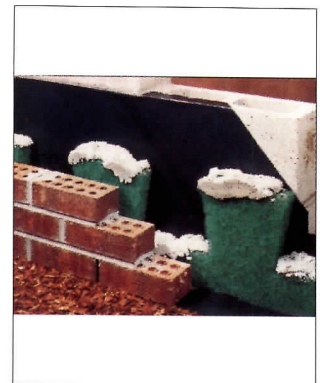


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Buckingham-VA Slate

CIRCLE 90 ON INQUIRY CARD

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is placed on top of the flashing inside the cavity, where it catches & permanently suspends mortar droppings above the level of the weep holes. Its patented dovetail shape prevents mortar from forming a dam, its shape with its 90% open weave allows water & air to easily move through the net & out the weeps. It's 100% recycled non-degradable polyester & is avail. in a 2-inch width. For a CAD disk, call (800) 664-6638.

Mortar Net

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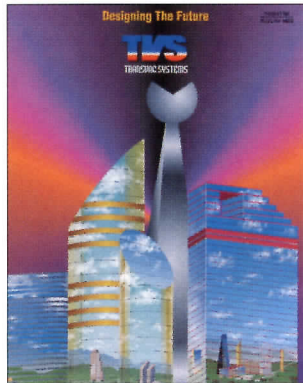


We have given special attention to each & every component of our fence. Every item is designed for strength, durability and low maintenance. No other company builds a complete fence - rail, rivets, brackets, pickets and posts, that are stronger, more durable, have more security or lower maintenance costs than our fences. Monumental Iron Works, 6500 Eastern Ave., Baltimore, MD 21224. Tel: (410) 633-6500, Fax: (800) 239-2963.

Monumental Iron Works

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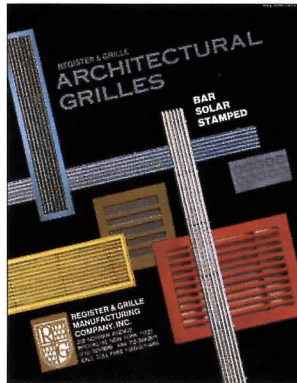


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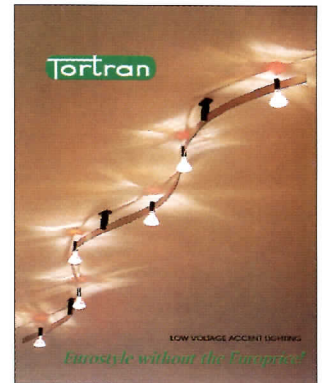


Unusual visual effects emerge when our grilles are designed for area effects. Versatility is the theme. R&G offers architects and interior designers many ways to express the changing forms of metal with the integrity of R&G's architectural grilles. Custom or standard finishes are available plus any grille can be made in matching color to blend with your deco. 202 Norman Ave., Bklyn, NY 11222. 800-521-4895, Fax: 718-349-2611.

Register & Grille Mfg., Co

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New Dowcraft Twin Wall**



Twin Wall is custom-designed for scientific research and hi-tech manufacturing facilities. Clean lines, durable finishes, optional filler cores permit Twin Wall to perform in categories to Class 10. Acoustical rating: STC 41 up. Self-supporting steel walls shipped ready to install. Heights up to 16 ft. Send for new brochure. Dowcraft Corporation.

Dowcraft Corporation

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H Window Co.

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Mapes Industries, Inc.

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Truebro, Inc.

CIRCLE 99 ON INQUIRY CARD

**Easy Swing
Double Action Doors**



Eliason has announced the availability of a new '98 Easy Swing door Price/Spec catalog. Doors are illustrated in full color with complete specs, prices and application data. Doors are gravity operated open to a light assist and close automatically after a slight time delay. Many sizes, styles and decor options. Doors are sold direct and catalog is sent no charge. Eliason Corporation, PO Box 2128, Kalamazoo, MI 49003. Tel: 800-828-3655 Fax: 800-828-3577

Eliason Corporation

CIRCLE 100 ON INQUIRY CARD

**New Pemko
Full Line Catalog**

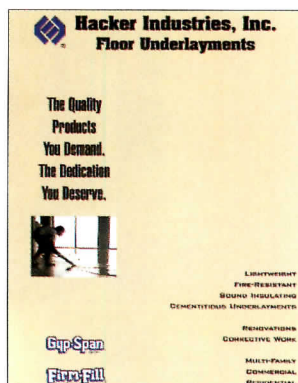


Among the new products featured in Pemko's 135 page 1998-9 catalog, are HSS2000 (an intumescent fire life-safety product), FG3000 (an amazing glazing compound which allows for much larger lites in rated doors), security door bottoms to deter lever handle break-ins), new special purpose continuous geared hinges, ADA compliant rubber and aluminum ramps, as well as expanded brush products.

Pemko

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Hacker Industries, Inc.

CIRCLE 102 ON INQUIRY CARD

Peerless Jumbo® Mounts

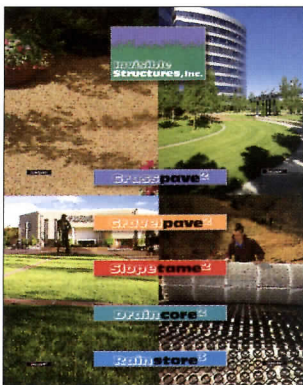


Feature adjustable height, width, tilt & swivel. Mounting plate allows the fine-tuning of gravity in relation to degree of tilt, while top clamps provide stability. Constructed of heavy gauge steel with durable epoxy finish, mounts are avail. in sizes to accom. 13" - 42" screens & 125lb. - 300lb. UL listed & CSA cert. Several OSHPD apprd. VCR attachments & tamper resistant security fasteners opt.

Peerless Industries

CIRCLE 103 ON INQUIRY CARD

New Invisible Products Roll Out

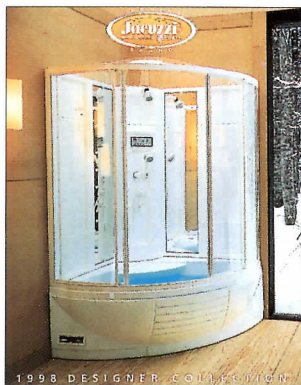


3 new invisible products have been added to the family of Grasspave² & Gravelpave² - Slopetame², Draincore², & Rainstore². For 16 years we have provided grass paving ring structures with 92% void area for root development. Now we're applying this technology to erosion control, drainage, & water storage with easy installation in 9 roll sizes. Call our knowledgeable staff for CADD details, specs, & product specs at (800) 233-1510. Web Site: <http://www.invisiblestructures.com>

Invisible Structures, Inc.

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Jacuzzi Whirlpool Bath



Jacuzzi Whirlpool Bath — presents The 1998 International Designer Collection of whirlpool baths, faucetry and the J-Dream™ Family of shower systems. This full-color catalog features beautifully styled products, integrating the most innovative luxury features. For more information please call 1-800-288-4002. (www.jacuzzi.com). Catalog free of charge.

Jacuzzi

CIRCLE 105 ON INQUIRY CARD

Grand Manor Shingle

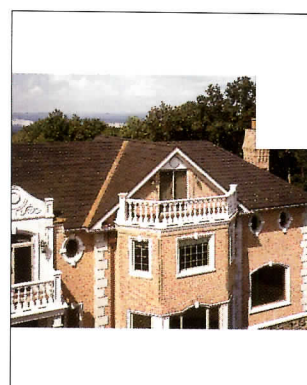


CertainTeed's Grand Manor Shingle® is a super heavy-weight shingle built on two full-size one-piece shingles with random 8" tabs applied on top. Patented shadow lines and a unique color palette give Grand Manor the look and depth of natural slate and wood. UL Class A. 40-year limited, transferable warranty on commercial applications. Algae-resistant. Meets ASTM D 3462—Tear Strength.

CertainTeed Corporation

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Celadon™ Ceramic Slate™

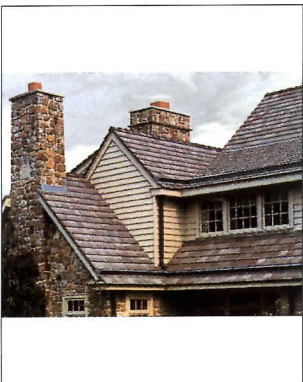


A kiln-fired, interlocking clay roof tile designed to look like thick slate with a breaking strength greater than 300 pounds; impervious to freeze-thaw degradation with less than 1% moisture absorption; color will not fade, flake, or effloresce—offered in slate gray, slate red, montpelier green, plumstone, and brunswick black. Sixty-year limited, transferable warranty.

CertainTeed Corporation

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CIRCLE 108 ON INQUIRY CARD

Wood Products Promotion Council

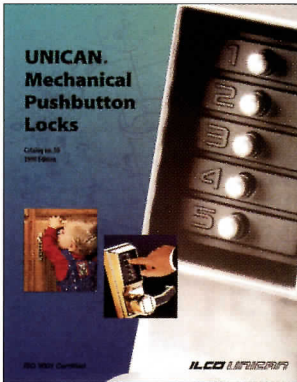


A brochure produced by major N. Amer. wood products trade associates highlights the many environ. benefits of wood. The brochure, titled "You'll never run out of trees," offers info on reforestation, efficient use of nat. resources, recycling, energy use & other environ. issues for architects, engineers, builders, remodelers, furniture manufacturers, & retailers. For a free copy of the brochure, fax Wood Works at (503) 224-3934.

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Circle Redmont, Inc.

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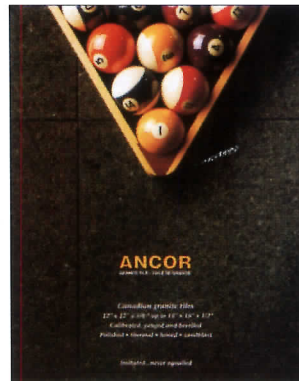


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OFFICIAL PROPOSAL

**METROPOLITAN WASHINGTON AIRPORTS AUTHORITY
REQUEST FOR QUALIFICATIONS
NATIONAL AIRPORT TERMINAL A REHABILITATION**

THE METROPOLITAN WASHINGTON AIRPORTS AUTHORITY (the Authority) is soliciting qualifications submittals from design teams interested in providing complete Architect/Engineer (A/E) services for the design of Terminal A Rehabilitation, Additions and Related Improvements at Washington National Airport.

The Authority intends to contract with the A/E team that best demonstrates a commitment to superior architectural and engineering design and management, and best meets the selection criteria for this project. It is the Authority's intent that the completed facility have a very high level of passenger service and design quality, equivalent to and complementing the adjacent new Terminal B/C.

Terminal A is listed in the National Register of Historic Places, and will be rehabilitated in accordance with the Secretary of the Interior's Standards for Rehabilitating Historic Buildings. The rehabilitated building, including planned extensions and related improvements, will be a 250,000 to 300,000 square foot, fully functional domestic airline terminal for seven (7) to nine (9) large jet aircraft and two (2) to three (3) regional carrier aircraft.

The total estimated construction cost of improvements to be designed under this contract is in the range of \$50 to \$100 million. The total pre-design and design services period is expected to begin in Fall 1998 and last approximately 2-1/2 years. The lead firm(s) and major subconsultants will be expected to have extensive, recent and relevant design and design management experience with similarly-sized airport passenger terminals, related airside and landside civil works, and complete rehabilitation of National Register public buildings.

The A/E services contract will include a requirement that there be a minimum of 30 percent (30%) Local Disadvantaged Business Enterprise (LDBE) participation. An LDBE is defined as a small business concern which is organized for profit and which is located within a 100 mile radius of Washington, D.C.'s zero mile marker. To qualify as a small business concern for purposes of this advertisement, a business entity's average annual gross receipts over the last 3 years must not exceed \$8 million per year. The receipts of all affiliates shall be counted in the total of the business entity's gross receipts. The Authority strongly encourages the participation of minority and women owned businesses. For information on this program, or for additional information on small business standards pertaining to other specialty areas in this project, please call Mr Ronnie Edwards, Office of Equal Opportunity Programs, at 703-417-8625. **The Authority may, at its discretion, elect to hold a Special LDBE Outreach Open House in early January 1998 for potential prime offerors to meet with potential subconsultants.**

Responses to this Request For Qualifications (RFQ) must include the following: (1) statement of commitment to meeting the 30% LDBE participation requirement; (2) identification of the proposed LDBE firm(s) and their tasks; (3) documentation of LDBE certification (e.g. letter from the Equal Opportunity Programs Office or current certification number); and (4) LDBE certification application or indication that the firm has a pending LDBE certification application, for each proposed LDBE (waiver of this requirement shall be considered only under extreme extenuating circumstances). This information shall be provided as an attachment to your submittal. Failure to provide the required LDBE documentation will result in a finding of non-responsiveness, and the team's submittal will not be considered further.

Interested LDBE firms should contact the Authority's Business Opportunity Hotline at 1-800-833-0415 (outside the Metro area), or 703-417-8372 (Metro area), or visit our website at <http://www.MetWashAirports.com> for current information on this and other upcoming projects.

An information package has been prepared that explains the project in more detail, as well as the Authority's A/E team selection criteria, selection process, design disciplines required, program objectives and Qualifications Submittal requirements. Copies must be requested in writing; verbal/telephone requests cannot be accepted. Please contact:

Metropolitan Washington Airports Authority
Procurement Operations Branch, MA-15
44 Canal Center Plaza, Suite 301
Alexandria, VA 22314
Attention: Ms. Linda Gragg, Contracting Officer
Phone: 703-417-8662
Fax: 703-417-8993

Do not contact Airports Authority consultants, or Airports Authority personnel other than the Contracting Officer, regarding this solicitation.

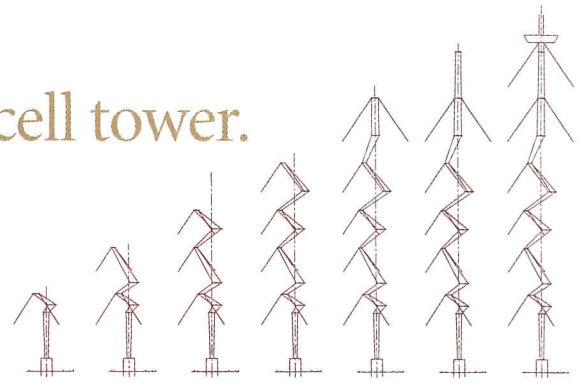
The due date for Qualifications Submittals is Wednesday, January 28, 1998 at 1:00 p.m.

No other general notification of this project will be made and no further action beyond submission of the information listed in the information package is required or encouraged. This is not a request for proposal.

The Authority is not an agency of the United States Government.

THE FUTURE *Stealth design:* When a cell tower is not just a cell tower.

BY JOAN BLATTERMAN



As digital cellular and personal communication systems compete for prime antenna sites and try to meet the objections of landowners and zoning groups, architects should become familiar with the design implications of these telecommunications technologies.

Digital cellular and personal communication system (PCS) transmissions are nonionizing types of radio waves sent at relatively low frequencies over short distances (one-half mile to five miles) in a line of sight from transmitter to receiver. In fact, digital cellular uses the old UHF spectrum that was used for 1950s TV broadcasting.

Architectural design has to deal with whiplike and flat-pan

antennae that need to be placed at elevations of about 140 to 200 feet, just above the tops of the highest trees. For reasons of cost and zoning expediency, existing structures are preferred sites for antennae, and telecommunications firms have large real estate and design groups whose first priority is to obtain permission from property owners and local authorities to use office buildings or utility structures such as old incinerator chimneys, water tanks, and bridges as cell sites.

Facing opposition—even moratoriums—due to antenna-induced visual clutter, wireless vendors are turning to camouflage techniques to conceal their devices. The receiving and transmitting units range in size

and configuration, but tend to be narrow shapes only 6½ inches wide by about 4 feet long, or flat-pan arrays of about a foot wide and 6 feet high. An antenna may be placed on the exterior of the parapet wall on each of a building's four sides; it may then be painted to match the wall or stuccoed to blend with an EIFS facade.

As many as 70 percent of the cellular/PCS sites in a given geographic area may be in existing structures, and some of the concealment techniques are ingenious. For example, cellular antennae in a church bell tower (a much-sought-after spot) can be hidden behind louvers made of radio-frequency-transparent fiberglass that replicate the copper originals.

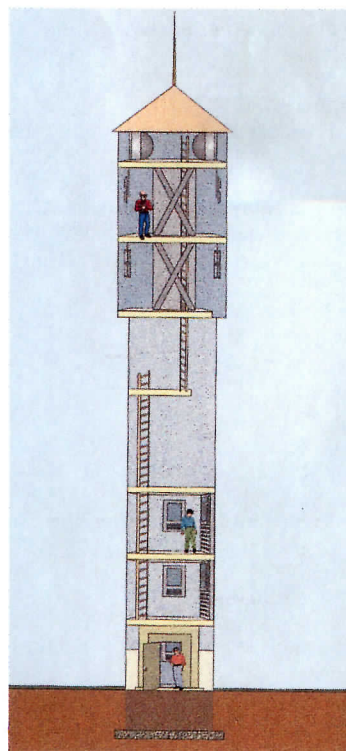
But the antennae are only the tip of the cellular iceberg: each site needs an enclosure of about 12 by 15 by 10 feet to protect the transmission and receiving equipment (which costs in the half-million-dollar range). These units can be placed apart from the antennae, in a prefab metal building at the base of the tower, or even underground in a waterproof vault if necessary. Where the size and load capacity of a roof permits (equipment can weigh over 10,000 pounds), enclosures can be placed up top as well; a pad or sub-framing may be needed to spread

the weight to the columns. But where existing structures are not available or appropriate for cellular/PCS antenna sites, wireless providers erect freestanding towers, which the public tends to hate.

To disguise the inherently obtrusive nature of cellular/PCS towers and address zoning concerns, firms such as AirTouch and Bell Atlantic Mobile are adopting a stealth approach, designing towers with a more contextual appearance: as forage silos in dairy country or faux white pines near a forest preserve.

Shown here is one of the newest of these more aesthetically pleasing sites, a 144-foot "bell tower" on the grounds of a convent in Mendham, New Jersey. Designed by engineers Edwards and Kelcey, Inc., for Bell Atlantic Mobile, it incorporates architectural details and materials of nearby historic structures. The camouflage tower is constructed of stacked prefabricated modules; the cast-in-place foundation has a relatively compact footprint. The transmission equipment is placed in precast-concrete modules that form the bottom third of the tower; no auxiliary enclosures or guy wires are needed. The middle section is hollow, holding the stair to the top section. Here the cellular and PCS antennae are enclosed completely with decorative FRP panels. Bell Atlantic is sharing the location with other wireless carriers, reducing the need for other antenna sites in the area.

For more on wireless communication systems, see the Cellular Telephone Industry Association's Web site at www.wow-com.com. ■



A Romanesque facade camouflages the Mendham Telecommunications Facility (left), owned by Bell Atlantic Mobile. Architect Gunnar Birkerts used a "hide in plain sight" approach, making an AirTough Cellular tower into a work of art (above).

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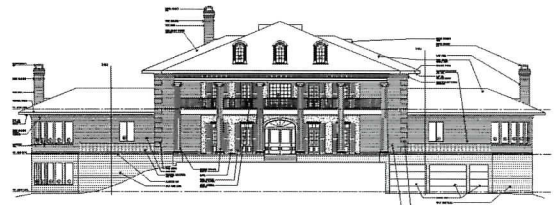
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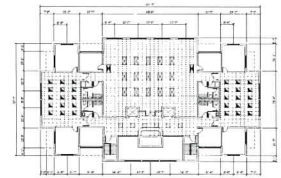
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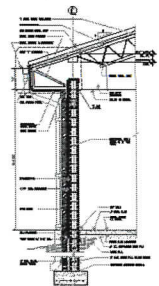
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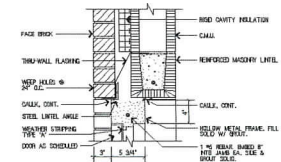
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Plan



Section



Details



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