ARCHITECTURAL RECORD
10/1994
SEVEN DOLLA

UFO's

Thanks to us, you have a little less to be afraid of.

GHOSTS

Wallboard performance reaches *new heights.*

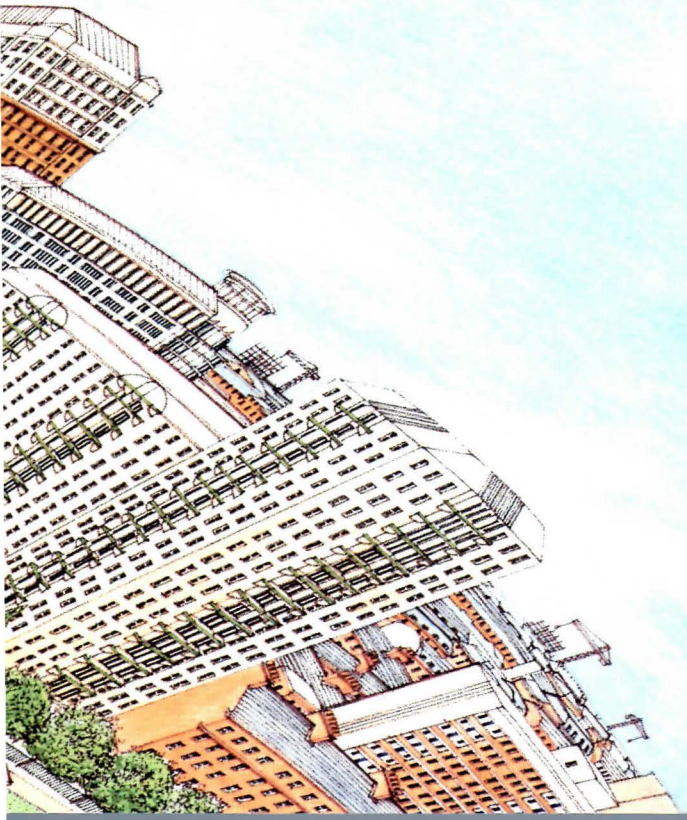
When extra performance is required, you now have an option: FiberBond wallboard panels from Louisiana-Pacific.

Ordinary gypsum wallboard is fragile and easily abused. But FiberBond panels are so strong and durable they can help your project keep its original appearance.

Because it has no paper faces to tear and its composition is reinforced with wood fiber from recycled newspaper, FiberBond is the panel of choice for use in public spaces with high traffic corridors. It resists dents, breakage, and puncturing. it increases wall and ceiling rigidity. It's moisture tolerant, fire resistant, and provides sound and thermal insulation.

And if that's not quite strong enough, there's also FiberBond VHI for wall applications. With a layer of fiberglass-mesh reinforcement creating a very high impact resistance, VHI panels meet demanding requirements for schools, hospitals, and prison interiors.

If you want your projects to reach a performance high, call us today for a free brochure: *1-800-299-0028 ext. 110.*



Louisiana-Pacific
FiberBond Wall & Ceiling Panels

, Louisiana-Pacific and FiberBond are registered trademarks of Louisiana-Pacific Corporation. © Louisiana-Pacific Corporation 1994. All rights reserved.

Letters

Elitism in Licensing

Your editorial entitled "Elitism Has No Place in Licensing," which appeared in the August 1994 issue of ARCHITECTURAL RECORD, has inspired me to write. I was very pleased to see an issue such as the discrimination resulting from broad assumptions made by the NCARB addressed in a national forum.

I must express my disappointment with a policy that monopolizes creative thought in architecture to benefit those mainly of considerable affluence. In a democracy founded on personal freedoms and dedicated to the preservation and advancement of free enterprise, one must question how far have we as a society progressed when artistic endeavors are allowed to be regulated out of reach of many talented and competent individuals. Let's face it, more often than not the level of technical expertise required to make a building safe and sound is fairly academic and can be obtained through research, creative problem solving, or enlisting the services of a consulting engineering firm (a practice not uncommon even with formally educated and licensed architects). I think Le Corbusier said it best when he described architecture as the point when "art enters in." To assume that only the narrow path as defined by the NCARB insures good, safe designs could be compared with the notion that only the nuclear family provides a child proper life foundations. By today's enlightened standards of equality these protectionist measures driven by the architectural community are conspicuously inappropriate.

S.L. Shimel
Pittsburgh

Discrimination

Thank you for your article on being "out" or openly lesbian or gay in the design profession. [RECORD, June 1994, page 36]. It does miss several significant facts.

AIA associate general counsel Beth Davis is being disingenuous when she says that no discrimination complaints have been made formal. I made such a complaint to Syl Damianos, then president of AIA, about discriminatory practices at the Dallas office of RTKL Associates. (For those who know that RTKL has an internal non-discrimination policy, I note only that RTKL's commitment to it seems stronger in L.A., Baltimore, and D.C., where municipal ordinances reinforce it.)

As I recall, I raised the issue of changing the code of ethics first with my complaint to the AIA in late 1989. Davis referred me to Seth Weine of New York and a couple of months later to Steve Glassman of Baltimore. The three of us working together struggled to get the issue of sexual-orientation discrimination considered. Glassman wound up with more influence on the process because of his proximity to D.C. and, I believe, his greater "acceptability" to AIA staff and officers as a licensed architect rather than interns as Weine and I both were.

While OLGAD (Organization for Lesbian and Gay Architects and Designers) is doing great things, the oldest organization for lesbian/gay design professionals is the Alliance for Design Professionals (ADP) in Dallas. It has provided support for more than 10 years and done so in a much more hostile city.

Continued on page 125

Calendar

October 5-7
HealthFocus Facilities Design Forum on healthcare planning and design, The Merchandise Mart, Chicago. 800/677-6278.

October 6-9
National Organization of Minority Architects conference and design-awards presentation, Chicago Hilton. Contact Michael Rogers, 708/575-3630.

October 7-8
Organization of Black Designers first design conference, Midland Hotel, Chicago. 202/659-3918.

Through October 8
Exhibition of winning entries from the Public Space in the New American City Competition, Nexus Comtemporary Art Center, Atlanta. 404/688-1970.

Through October 9
Furniture masterpieces by architects, designers, and craftsmen on exhibit at Metropolitan Museum of Art, New York City.

October 10 to January 14
"The Photographer as Architect: Photography in the Heroic Age of Construction," Canadian Center for Architecture, Montreal.

October 13-15
Urban Waterfront Planning, Development, and Culture Conference, Hotel Monteleone, New Orleans. 202/337-0356.

Through October 21
"Green Design New York" exhibit, A&D Building, New York City. 212/749-8026.

October 26-30
The National Trust for Historic Preservation conference, Park Plaza, Boston, on "Preservation, Economics and Community Rebirth." Call 800/944-6847.

October 29
Career day for high school students, organized by National Institute for Architectural Education, The Roosevelt Hotel, New York City. Call 212/924-7000.

Through November 30
"Sex, Cities and Satellites" lec-

Continued on page 125

ARCHITECTURAL RECORD

McGraw-Hill MPA ABC

ARCHITECTURAL RECORD (Combined with AMERICAN ARCHITECT, and WESTERN ARCHITECT AND ENGINEER) (ISSN0003-858X) October 1994, Vol. 182, No. 10. Title ® reg. in U. S. Patent Office, copyright ©1994 by McGraw-Hill, Inc. All rights reserved. Indexed in Reader's Guide to Periodical Literature, Art Index, Applied Science and Technology Index, Engineering Index, The Architectural Index, the Architectural Periodicals Index, the Avery Index to Architectural Periodicals, and the Construction Index.

Every possible effort will be made to return material submitted for possible publication (if accompanied by stamped,self-addressed envelope), but the editors and the corporation will not be responsible for loss or damage.

Executive, Editorial, Circulation and Advertising Offices: 1221 Avenue of the Americas, New York, NY 10020. 212/512-2000.

Officers of McGraw-Hill, Inc: Chairman: Joseph L. Dionne. President and Chief Operating Officer: Harold W. McGraw III. Executive Vice President, General Counsel and Secretary: Robert N. Landes. Senior Vice President, Treasury Operations: Frank D. Penglase.

Associated Services: Sweet's Catalog Files (General Building, Engineering, Industrial Construction and Renovation, Light Residential Construction, Interiors), Dodge Reports and Bulletins, Dodge/SCAN Microfilm Systems, Dodge Construction Statistics, Dodge regional construction newspapers (Chicago, Denver, Los Angeles, San Francisco).

Subscription rates are as follows: U. S. Possessions $54.00, Canada $65.00 (payment in U. S. currency, GST included); all other Foreign (including Air): $160.00, add $60.00 annually for air freight delivery. Single copy price $7.00; For Foreign: $10.00. For Subscriber Services: 609/426-7070.

Change of Address: Forward changes of address or service letters to Fulfillment Manager, ARCHITECTURAL RECORD, P. O. 566, Hightstown, NJ 08520. Provide both old and new address; include zips code; if possible attach issue address label.

Guarantee: Publisher agrees to refund that part of subscription price applying to unfilled part of subscription if service is unsatisfactory. Publisher reserves right to accept or reject any subscription.

Copyright and Reprinting: Title ® reg. in U. S. Patent Office. Copyright ©1994 by McGraw-Hill, Inc. All rights reserved. Where necessary, permission is granted by the copyright owner for libraries and others registered with the Copyright Clearance Center (CCC) to photocopy any article herein for personal or internal reference use only for the base fee of $1.50 per copy of the article plus ten cents per page. Written permission must be secured for copying. Write Reprint Manager, 1221 Avenue of the Americas, NY NY 10020; Fax: 212/512-4256. For reprints in bulk-orders, call 609/426-5494 for price quotations and orders.

Subscription List Usage: Advertisers may use our list to mail information to readers. To be excluded from such mailings, send a request to ARCHITECTURAL RECORD, Mailing List Mgr., P. 0. Box 555, Hightstown, NJ 08520.

ARCHITECTURAL RECORD (ISSN0003-858X) is published monthly by McGraw-Hill, Inc. Second class postage paid at New York NY and additional mailing offices. Postage paid at Montreal, Quebec, Canada. Canada Post International Publications Mail Product Sales Agreement No. 246565. Registered for GST as McGraw-Hill, Inc. GST Number R123075673

Postmaster: Please send address changes to: ARCHITECTURAL RECORD, Att: Fulfillment Manager, P. O. Box 566, Hightstown, NJ 08520. This issue is published in national and separate editions numbered or allowed for as follows: Regional sections: 15E, 16E, 16W

Paradox

Editor
Stephen A. Kliment, FAIA

Managing Editor
Carolyn De Witt Koenig

Senior Editors
Charles K. Hoyt, FAIA
Karen D. Stein, (Managing)
James S. Russell, AIA (Managing)
Charles D. Linn, AIA (Managing)

Associate Editors
Joan F. Blatterman
Clifford A. Pearson

Design Director
Anna Egger-Schlesinger

Editorial Production Manager
Annette K. Netburn

Assistant Production Editor
Janna L. Robinson

Architectural Illustrators
Peter M. De Witt
Muriel Cuttrell (Consultant)

Design Consultant
Massimo Vignelli

Editorial Advisory Panel
William J. Stanley, III, AIA
Ivenue Love-Stanley, AIA

Contributing Editors and Consultants
David Ballast, AIA
Robert Campbell, FAIA
Kristine Fallon, AIA
Phillip Kidd, Finance
Robert Murray, Economics
Peter Piven, FAIA
Steven S. Ross, Computers
Norma Sklarek, FAIA

Correspondents
Aaron Betsky, Los Angeles
David Cohn, Madrid
Claire Downey, Paris
Beth Dunlop, Miami
Pam Kinzie, AIA, San Francisco
Victoria S. Lautman, Chicago
Nancy Levinson, New England
Tracy Metz, Amsterdam
Gerald Moorhead, FAIA, Houston
Naomi R. Pollock, AIA, Tokyo

Group Director, Circulation
Dawn Downes-Cosgrove

Director, Classified and Small Space Advertising
Eve DeCarlo

Director, Special Projects
Charles T. Pinyan

Director of Business and Production
Joseph R. Wunk

Director, Financial Operations
Helen Lisica

Business Manager
José Quiñones

Publisher
Roscoe C. Smith III

Vice President and Group Publisher
Howard M. Mager

Inquiries and submissions of work for publication may be sent to the editors listed below who are responsible for the subject areas named:

Carolyn De Witt Koenig, design news
Karen D. Stein, houses, interior design
Clifford A. Pearson, observations, books
Charles K. Hoyt, at large
James S. Russell, technology, practice
Joan F. Blatterman, new products
Charles D. Linn, RECORD LIGHTING

PRINTED IN U.S.A.

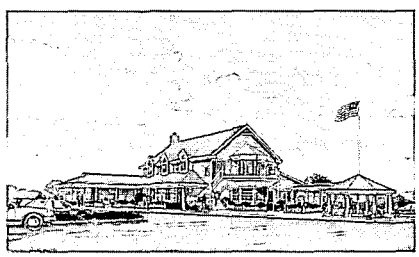
It is an axiom that the volume of debate about architectural form varies in inverse proportion to the volume of construction activity. In other words, the greater the recession, the more vigorous the dialogue. That said, we are today without question in a period when the profession, emerging from this recession at a slower pace than from the last one, is taking a close look at what kind of architecture is emerging as we approach that admittedly artificial milestone in time, the year 2000.

Look for a moment at the drivers of an emerging architecture and at probable outcomes. Certain drivers are beyond dispute—focus on local culture; fast-changing demographics; concern for the environment; dwindling open land; restricted resources; rising public participation in the planning and design process.

As to probable outcomes, a global RECORD survey of architects (see article on pages 74 to 81) endorses a scenario that calls for an architecture not governed by any one style (if by style you mean any broadly accepted vocabulary of forms), accompanied by a rush of new building types triggered by those various drivers; an architecture in which the personality of the architect is likely to bow to local tastes and local issues; an architecture where technology is more likely to be merely refined and used in service of the architecture than as a dominant force—in other words, a framework dominated by local influences and expressed context.

Nevertheless, an odd paradox continues to color the critical debate about style. Observe the image below: it is the new gateway to Martha's Vineyard designed by architects Domenech Hicks & Krockmalnic for the one-million travelers who land by ferry on the island each year. As architects we often ignore something that Prince Charles and his advisers seem to see all too well—that the public has a long memory and powerful associations between architectural form, content, and meaning that unfailingly confound the most strenuous efforts of Modernism and other movements. There are architects who throughout the stylistic turmoil of the past 50 years never abandoned traditional styles. Mott Schmidt carried the torch of tradition successfully from the 1920s well through the 1970s. Cleveland-based Montgomery Copper clothed in a traditional coat everything from suburban houses to TV stations. Today we see the likes of Allan Greenberg and Robert Stern cultivating a similar-minded clientele. And they are sustained by that huge group of loyalists, the builders of single-family tract houses, who provide and will continue to provide for future generations the house (and variations) symbolized so powerfully by Stern's house carried in the June 1994 cover story of *LIFE* magazine.

So if you gather from today's debates that style is dead, think again. To loosely paraphrase Victor Hugo's famous saying, no architect, no critic can defeat the power of an idea whose time is not yet up. *Stephen A. Kliment*



IT'S HARD ENOUGH TO GET ONE ROOM AT THIS HISTORIC HOTEL. IMAGINE WHAT IT

Since 1875, the Sheraton Palace Hotel has been one of San Francisco's most beloved institutions. So when its restoration was being planned in 1989, every effort was made to preserve the details of its original design. Among other things, that meant the replacement of nearly 600 windows. And because of their experience in such projects, Marvin Windows and Doors was chosen. First to receive attention from Marvin and their local distributor were the hotel's graceful curved glass windows, an area in which Marvin's expertise is particularly well known.

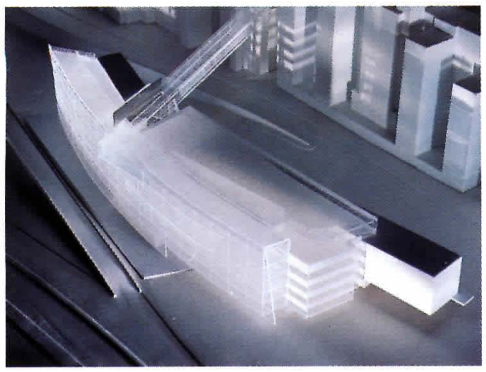
No less of a challenge were the hotel's 585 aging double-hungs. Each demanded the same craftsmanship and attention to detail in order to maintain sightlines and replicate the historical profiles of the originals. And to guarantee their durability and consistency, each would have to incorporate the same performance features, too.

So Marvin suggested Magnum Tilt-Pac replacement sash, known for their strength, energy efficiency and economic advantages. And went on to propose glazing them with a special laminated glass to further insulate the rooms from the noise of the busy streets below.

In all, close to 600 windows in over 30 different sizes were designed and built to exacting, historical

New York City

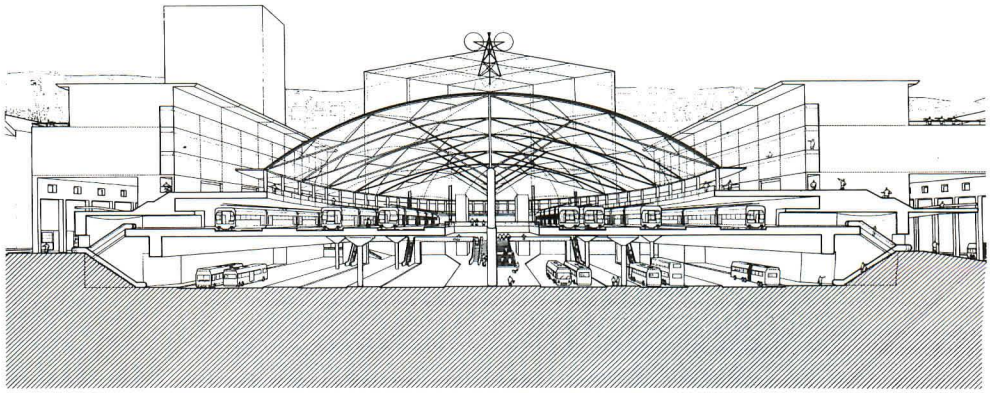
A Bridge to Better Mental-Health Care

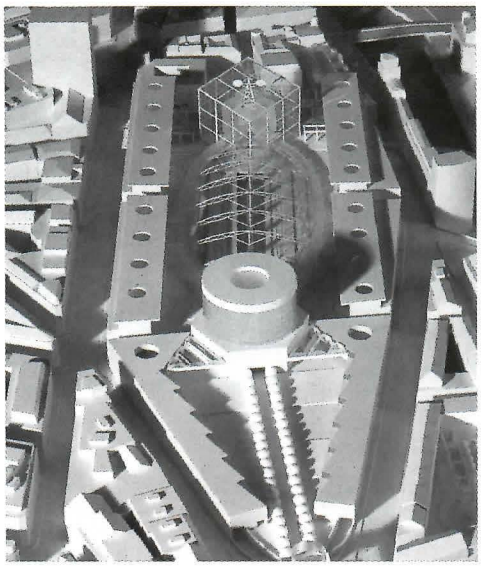


The $79-million New York State Psychiatric Institute (NYSPI) designed by Ellerbe Becket is under construction on a site sandwiched between two major Manhattan roadways. The research wing (upper left in model) will feature flexible interiors to accommodate changing projects and a pedestrian bridge across Riverside Drive to a research tower at one end of Columbia Presbyterian Medical Center. A second bridge (not shown in this model) will cross from a health-care pavilion at the other end to the NYSPI patient wing (lower right), which orients all daytime activities toward greenery and the Hudson River. The curved glass curtain-wall river facade "responds to the speed of cars on the West Side Highway but sits gently in the landscape," says design principal Peter Pran. *Jill Lerner* is project director; Timothy Johnson, project designer. ■

Spain

Bilbao Train Station to Restore The Romance of Travel





Hurry-up-and-wait could become a pleasurable prospect in Michael Wilford and Partners' Abando Station redevelopment in Bilbao. The facility will permit direct connections among two rail lines, local and suburban buses, a 1,500-car garage, and a metro station—all in a setting of public gardens, colonnades, and shopping arcades that will double as extensions of the city's greenways and create pedestrian routes between the medieval and 19th-century sectors. Trains will make a dramatic entry from hillside tunnels directly into a grand hall covered by the glazed oval dome surrounded by public roof gardens in the center of the model. Encircling the station, a world trade center in the tubular tower; offices, a hotel and a post office in the long rectangular blocks; and housing in the angled wings will further anchor the site as the heart of Bilbao. ■

New York City

Grade-School Design Exploits Odd-Shaped Site

Perkins Eastman and Ben Thompson Associates have massed the new P. S. 109 in Harlem to follow both the rigid grid of city streets and the skewed site plan of a housing project that surrounds it on three sides. The rotation generates wedges of green-tinted glass that poke through eight white brick slabs to the building's rear (not shown) and, on the inside, become reading alcoves. "The sphere outside the science and art classes is a potential Percent-for-Art project." ■

To Design The Perfect Glass Colors, Our Engineers Didn't Go To The Lab. They Went On Vacation.

Admittedly, it's a strange place to design glass colors. But not when that glass is Azurlite® from PPG. Because no other glass can match the beautiful Mediterranean-blue color of Azurlite. And when combined with one of four exciting coatings, you'll understand why the gulf between us and the competition is ever widening. Our Solarcool® coating lends Azurlite a distinctive deep-sea green color. While Stainless adds reflectivity to a deeper blue tint. Antique cuts down on reflectivity, while creating an even richer ocean blue-green hue. And Titanium reduces reflectivity even further to heighten a blue color so deep, you can almost dive right in. Solarcool coating is available directly from PPG, while Stainless, Antique and Titanium applications are available from your fabricator. Like Azurlite itself, coated Azurlite offers superior energy efficiency, especially when used in an insulating unit with Sungate® coated low-E glass as the inner light. And, of course, both Azurlite and coated Azurlite keep structures cool and well lit on the inside. And strikingly beautiful on the outside. So if you're looking for the right glass color, turn to Azurlite from PPG. Because with new colors like these, you're guaranteed to make a splash on any skyline. Call 1-800-2-GET-PPG for more information.

PPG

Azurlite, Solarcool and Sungate are registered trademarks of PPG Industries, Inc.

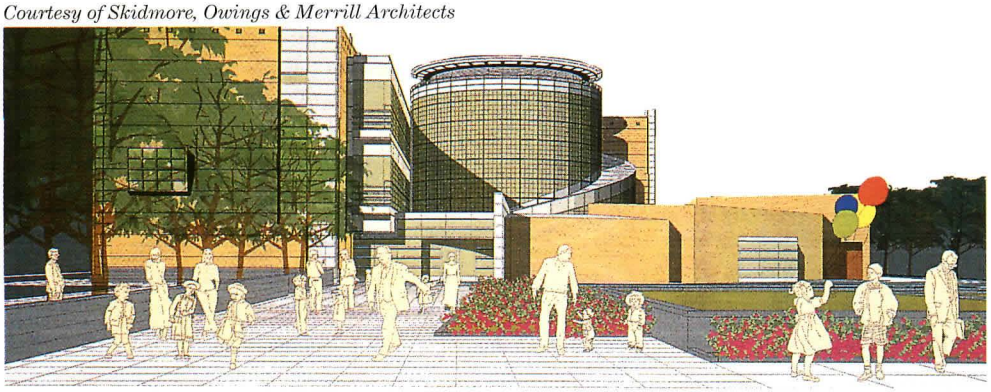
AZURLITE
Glass by PPG Industries

Circle 13 on inquiry card

Iowa

Studios and Galleries Makeup Downtown Sioux City Arts Center

Courtesy of Skidmore, Owings & Merrill Architects



Construction has begun on Skidmore, Owings & Merrill's new Sioux City Art Center. The $7-million downtown facility will gather strongly articulated building elements around a light-filled circular atrium wrapped by a main staircase to studios and galleries for the permanent collection of midwestern art; educational and administrative areas can be closed off during performances and social gatherings. In keeping with the texture and tone of Sioux City's many brick buildings, the exterior will be sheathed in a tan, elongated Roman-style brick. ■

California

Art+Architecture to Lure Passengers To Mass Transit

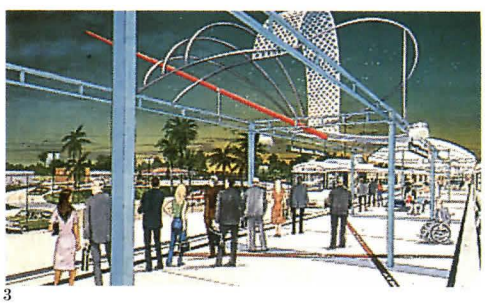
Los Angeles County's Metro Green Line, due to open in May 1995, will feature stations that are works of art. The MTA Art for Rail Transit program, designed to bring architects and artists together in early planning stages, relied on community-based panels to select artists for its 14 stations. Torgen Johnson and Kim Yasuda, working with California Department of Transportation architects at the Vermont/I-105 station (1), created two greenways that signify the regreening of the Gardena community. The El Segundo Blue Butterfly and the history of flight are depicted in a Charles Dickson mural (2) at Escudero-Friebourg Architect's Mariposa (Spanish for butterfly) stop. Sally Weber's arcs (3) denote celestial phenomena at the Long Beach/I-105 stop by Caltrans. *Donna Pizzi*

Douglas Johnson

1

Maya Emsden

2



3

France

Mail-Order Maison

Jacques Dirand

Surrounded by a deep veranda and rough-hewn timber columns, Philippe Starck's 1,458-ft model house for the mail-order catalogue "3 Suisses" is half pagoda, half cabin, and completely reproducible. A $900 kit provides plans, sketchbook, construction notes, a hammer to get started and a video featuring Starck in his own zinc-roofed version of the same house. Built for $210,000 without the site or furnishings, it is, he says, an "honest" house for all tastes. If the public agrees, other architects will be called to follow Starck's lead. *Claire Downey*

EverGreen™

What are you waiting for?

- Revere **EverGreen™** architectural copper is pre-patinated—an instant classic.
- What you spec is what you get—if your plan calls for elegant copper roofing with a true patina, why wait years?
- Not paint, not a surface coating—Revere **EverGreen™** has the same properties as naturally aged copper.

For information or to request a sample call **800-950-1776.**

REVERE

AMERICA'S LEADING PRODUCER
OF ARCHITECTURAL COPPER

***REVERE COPPER* PRODUCTS, INC.**
P.O. Box 300, Rome NY 13442-0300

Circle 14 on inquiry card

1801 REVERE

Briefs

Winners

•$250,000 goes to Frank Gehry as the first winner of the Dorothy and Lilian Gish Prize. The prize recognizes outstanding contribution to the arts. The jury: Arthur Penn, John Williams, Carol Burnett, Roddy McDowell, Hugh Hardy.

•Among this year's winners of the Chrysler Award for Innovation in Design are Lebbeus Woods, Cranbrook's Katherine and Michael McCoy, landscape architect Achva Stein and environmental engineers John and Nancy Jack Todd.

•The only architect among 10 artists representing the U.S. in an exchange program funded by the NEA and Mexico's Instituto Nacional de Bellas Artes, Juan Frano Violich of Kennedy & Violich Architecture, is spending the last quarter of 1994 in the Yucatán exploring the relationship between standardized construction materials and local work methods.

•John C. Womack, Oklahoma State University , placed first in the library-design competition sponsored by the Association of Collegiate Schools of Architecture/American Wood Council; Kyle Lommen, University of Oregon, was second, and Kevin Bergeron, University of Maryland, third. Sean Ervin, Washington University, won first place in the open-submissions category, followed by Nick Nguyen, Woodbury University, and Marcel Trepanier and Alain Malenfant, Université Laval, Quebec. Jurors were Joseph Esherick, Graham Gund, and E. Fay Jones.

Changes

•Susana Torre will become the first architect since Eliel Saarinen to head the Cranbrook academy when she takes office early in 1995.

•The Architectural History Foundation has ceased its independent publishing activities, with Cambridge University Press acquiring most of AHF's projects. MIT Press will continue to distribute the backlist as well as several new titles due over the next two years. The Vincent Scully, Jr. Research Grant will be continued but the Samuel H. Kress Publication Fellowship will end this year.

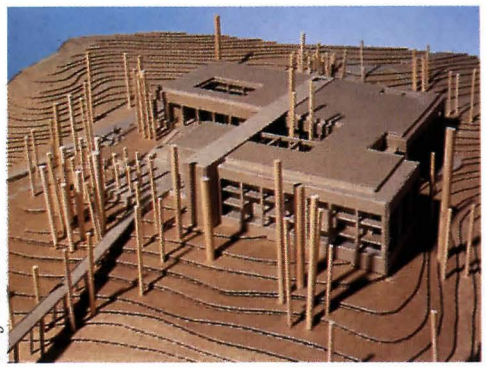
• Beginning in 2000, a degree from an NAAB-accredited program will be required for most U.S. applicants for registration.

•Homer L. Williams now heads NCARB.

•The Callison Partnership has established a strategic alliance with Correa-Correa Arquitectos of Santiago, Chile. ■

California

Santa Cruz Library Addition Respects Redwoods

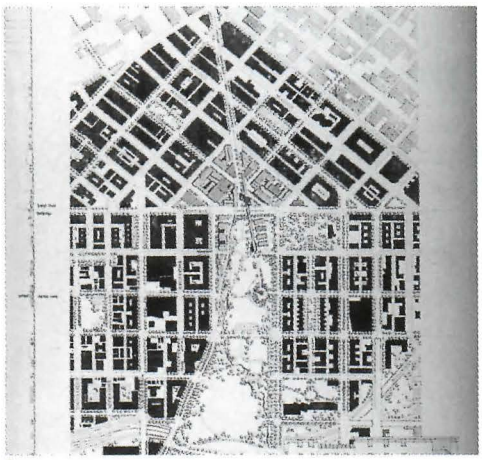


Greg Williams

The $22-million McHenry Library addition at the University of California at Santa Cruz, by BOORA with Daniel T. Casey Architect, affects a campus famed for its spectacular site, where, says BOORA's Stanley Boles, "There's a march for every threatened tree." The study model at left weaves the addition in among mature redwoods, and creates an outdoor plaza and bridge leading to the student center. This draws together two previously isolated—and not fully used—structures to form a cohesive unit designed to draw students towards it. ■

Washington

Innovative International Student Competition Tackles Seattle Commons



1

Callison Partnership photos

2

Peter Culley and Rachel Stevenson, University of Washington exchange students from the University of Liverpool, U.K., have won the Callison Partnership International Student Design Competition, focused on linking Seattle Commons—a 470-acre residential and business area surrounding a large lake-front park—to downtown. The Culley/Stevenson plan (1) uses a long bridge incorporating a light-rail station, restaurants, museums, and art galleries. Second prize (2) went to Daniel Richardson, Christopher Patano, and David Ruby (University of Idaho) for restoring the topography of 100 years ago. Montana State's Cynthia Ann Holweger-Larson won third prize (3) for her urban village. At the award event it was clear that the jury had focused more on which philosophical approach to endorse than on purely design issues. The controversy over the Seattle Commons plan added a real-life quality to the competition that appealed to the students. The results will be published as a book. *Pamela D. Kliment*

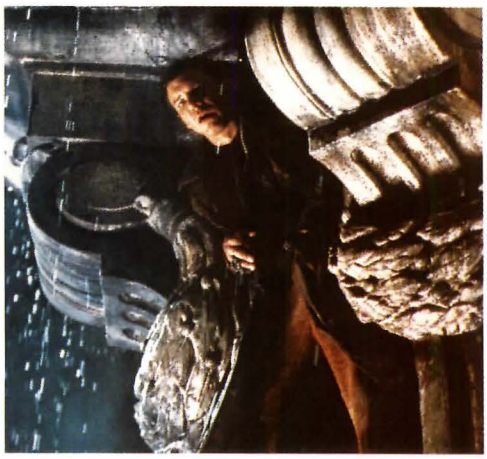
3

SEF-FR® UL

INHERENTLY FLAME RESISTANT MODACRYLIC FIBER BY MONSANTO

Blade Runner Still on the Cutting Edge, Familiar as it is

A 12-year-old movie makes some pretty good predictions about the future, namely that some things will never change.



An essay by senior editor Charles Hoyt in this issue of RECORD takes a look at the future of architecture. When the topic was proposed, my reaction was,"Who needs it?" We can observe almost everything we need to know about the future just by watching the 1982 movie *Blade Runner*, which starred Harrison Ford, was directed by Ridley Scott, and production designed by Lawrence Paull.

In this dark sci-fi thriller, Ford's character, Deckerd, is called upon to exterminate a dangerous gang of replicants—human-like robots—whose warranties are literally about to expire. They have migrated to earth from outer space ("the colonies") intent on tracking down their manufacturer, hoping they can persuade him to extend their four-year life span. The place is Los Angeles, and the year 2019. A deep brown fog covers the city during the entire movie, a most believable effect, and it never seems to stop raining, indicating that perhaps Oregon's coastal climate has migrated south.

Blade Runner is compelling because its sights are so familiar to us, even though the landscape is dominated by megastructures not unlike the huge projects Paul Rudolph designed for the Lower Manhattan Expressway in the 1960s. Despite blimp-like, audio-spouting billboards that promote a new life in intergalactic space, and flying cars that lock onto buildings to become elevators, the real action is still at street level. There is a dominant Asian influence everywhere, from the Ginza-like neon advertising to the noodle shops where Deckerd slurps down his meals. English and Spanish no longer appear to be L.A.'s mother tongues, and considering the influence the Pacific Rim is exerting on our culture now, that is totally believable too.

Deckerd's own architectural tastes harken back to the 20th century, however. His 97th floor apartment seems to have been designed by a Frank Lloyd Wright replicant (licensed, no doubt, by the Frank Lloyd Wright Foundation, as is presently everything else Wrightian) with walls done in what look like decorative precast blocks from the Ennis house.

The replicants are taken in by an oddball genetics designer who lives alone in a huge but dilapidated building (actually the Bradbury Building in Los Angeles before it was restored, RECORD, January 1993, pages 108-111). One wonders why this building hasn't taken a wrecking ball in the side by 2019. Maybe it's rotting on the Register, but no doubt about it, it has more character than a lot of the newer buildings. Maybe the genetics designer has made the Bradbury his home because there *still* isn't enough affordable housing in L.A. Or else he has a real sweet rent-control deal, and a landlord who isn't about to spend one dime fixing the place up. (I think I know this landlord. Or at least his father.)

Other familiar sights in *Blade Runner* include gigantic billboards for Coca Cola, hordes of people riding bicycles, poor ventilation in offices supplemented by ceiling fans. People still can't get a cab in the rain. Like many of us, the evil manufacturer of the replicants enjoys reading by candlelight. Deckerd gets his news from the tabloids, not a CD ROM-driven personal data reader.

Blade Runner *is compelling because it assures us in the future people will continue to cling to the things they like now: buildings with architectural character, Coca Cola, an active street life, and soft candlelight. Things that work well, like bicycles, ceiling fans, and newspapers will continue to be with us. But there still won't be enough affordable housing to go around.*

We like *Blade Runner* partly because it reassures us that in the future, people will like the things they like today: an active street life, candlelight, noodles, Frank Lloyd Wright. And objects that suit their purpose well, like bicycles, ceiling fans, and (contrary to what the multimedia gurus say), newspapers, will still be with us. In 2019 there still won't be enough affordable housing, the Bradbury will still be more interesting than a lot of the Modernist dreck built between now and then, and architectural journalists will still spend hours daydreaming about starting new lives on distant planets. *Charles Linn*

Dover elevators think fast. And react fast.

Dover elevator doors can change directions quicker than a three-year-old. And that's pretty fast.

Our MicroLight™ Door Protection System creates an invisible curtain of infrared light beams that extends from top to bottom of the elevator opening. If anything interrupts a single one of those beams while the door is closing, the door re-opens—instantly and safely.

No touch needed.
Unlike mechanical safety edges, MicroLight requires no contact to re-open the door. Since the infrared beams are spaced approximately two inches apart they effectively cover the entire opening, whereas the traditional photo-electric eye provides protection at only two points.

For new or remodeled elevators.
MicroLight is available on all new Dover elevators and also as an add-on feature for remodeling. It's one of a whole range of Dover modernization products designed to help you meet ADA requirements and to make your old elevators perform even better than when they were new.

Another Dover winner.
MicroLight represents the kind of advanced technology that has kept Dover out front for more that 50 years. And why more people who buy elevators buy Dover, above all.

For more information call your local Dover office or write Dover Elevator Systems, Inc., P. O. Box 2177, Memphis, TN 38101.

DOVER® ELEVATORS

Dover. Above All.

Rules for Planning The Ideal City

Elizabeth Plater-Zyberk, who helped plan the new town of Seaside, Florida, reviews Michael Sorkin's prescription book for making a healthy city.

Local Code: Constitution of a City at 42° North Latitude, *by Michael Sorkin. New York: Princeton Architectural Press, 1993, 128 pages, $15 (paper).*

Reviewed by Elizabeth Plater-Zyberk

Michael Sorkin's *Local Code* is a prescription for urban health that describes the rules for making an ideal city. In its highly precise, technical, and regulatory manner, the book not only reflects its time, but tries to surpass the tradition of utopian-town planning.

Is it possible that in the history of building, no writer has attempted such a comprehensive document before? Indeed, its ambition may lead some to label Sorkin's endeavor as folly. Nevertheless, anyone who has engaged in writing rules for building can appreciate its initiative and depth, as well as the shortcomings that are inevitably part of the territory.

Few have attempted to define so completely the paradigm for a healthy city, an ambiguous ideal that makes success or failure difficult to measure. Nonetheless, the idea of the healthy city seems to be emerging in our time. Its definition is evolving empirically, without a lab for pre-testing on species other than humans. Every human settlement is a living experiment and each city is a laboratory. Any ideal, whether design or policy, that survives to the stage of implementation is buffeted by unpredictable human reactions and its ultimate success cannot be wholly assessed for many years.

For example, 20th-century suburbia seemed to be a good idea at the time of its initiation. After all, its intention was to provide an alternative to those urban conditions that threatened personal and social health. Now, still in the same century in which some of the greatest models of suburban new towns were built, one can propose, with agreement from both academic and lay circles, that we have built too much suburbia, along the way degrading its original model, the Garden City, and undermining the core city. Several generations of urban growth under this misguided model have produced the metropolis, a new urban form that has spread ills beyond the generating core where they were to have been left behind. Bloated like an overweight body, the metropolis suffers from a pathology rooted in bad habits now copied regionally. The harm is well documented: environmental damage, the institutionalization of poverty, a sprawling infrastructure that defies maintenance, virtual elimination of a civic realm and civic life, and the ascendancy and perpetuation of that private indulgence, consumerism.

In addition to behavior traditionally recognized as beneficial, Sorkin's town code encourages the latest pathologies with little resistance or modification. Unfortunately, Sorkin eschews any graphic illustration that would make his model quickly accessible to a general audience. But everyone will appreciate his efforts to codify an ideal inspired by today's environmental and social needs.

Some of his proposals are indisputably desirable, such as those he calls "heliotropisms," which guarantee all buildings access to sunlight and a direct relationship to the sky. Other proposals are less obvious in their intent to induce environmental or social goals. For example, there is the clause that says, "An area is a portion of the City which has been specified by design... Areas must be different. Dissimilarity of areas must exceed 15 percent of area, volume, or vector ratios and percentage distributions."

Navigating the vocabulary

Why *Local Code* employs terms that at first seem abstruse and may even offend some readers is unclear. The reader's efforts to navigate the vocabulary, though, will eventually be rewarded by the discovery that most terms are related to something already known. A "Hab" is a residence, a "Nabe" is a neighborhood, and "Tecton" seems to be a euphemism for building style.

In the absence of a physical model, the abstract nature of many of these elements opens the door to uncertain interpretation. Still, *Local Code* speaks to all city users and should not be mistaken for an academic exercise of little applicability. Many of the elements described are already embodied in places we admire, and the underlying principles can serve as encouragement for those involved in community design.

In the end, the physical vision that emerges from *Local Code* is one of a human settlement that unquestioningly accommodates 20th-century urban inventions. For example, superhighways and pedestrian bridges are rationalized as systematic elements of the new urban context and given new labels. Sorkin catalogs and identifies the desired way different types of infrastructure should work and then sets limits on them and provides for greenbelt farming and public space. His vision tries to assimilate all the elements of the current American metropolis, foregoing his usual role as a critic.

Distancing himself from others

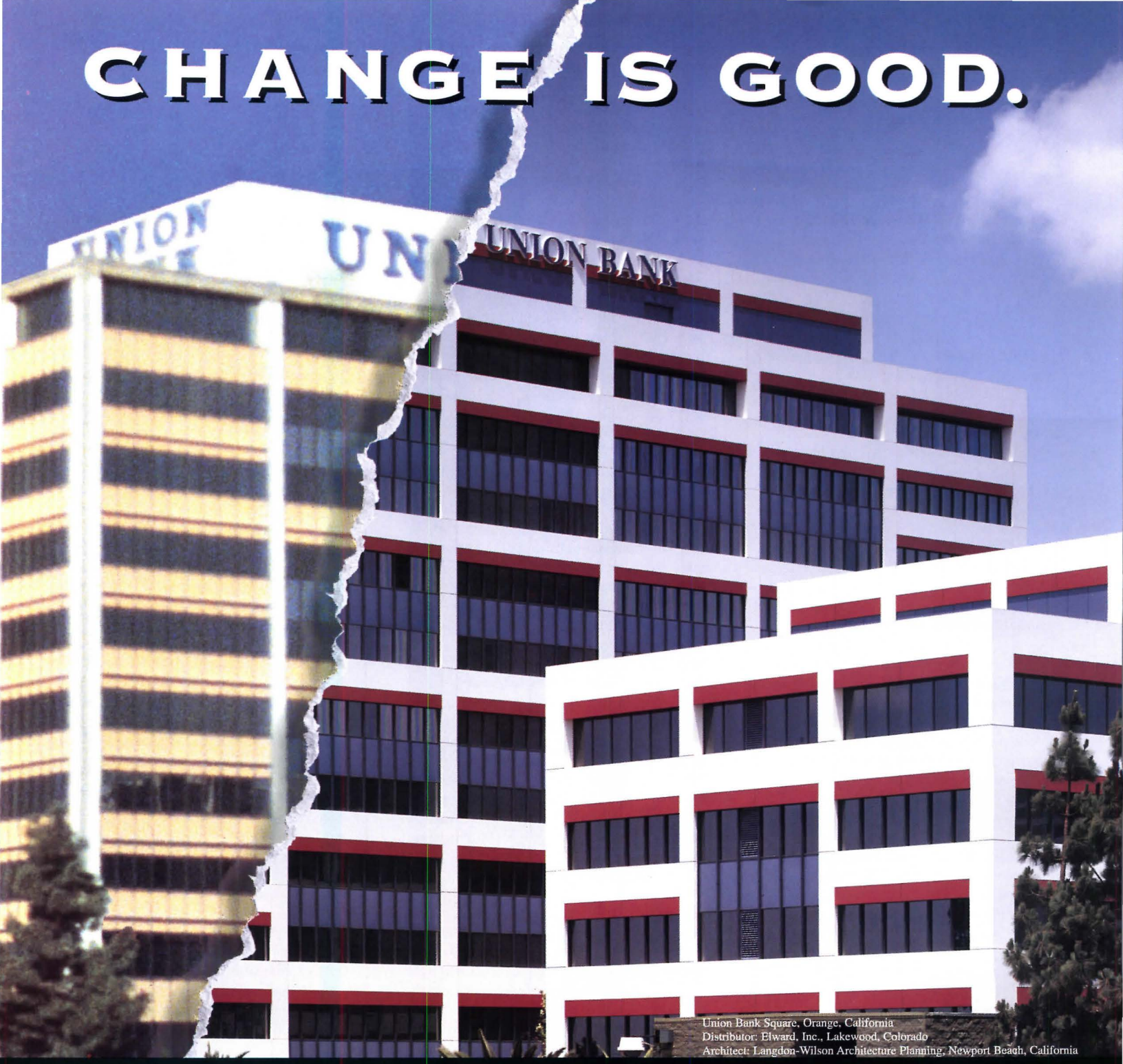
Within this inclusivist approach, certain troublesome aspects deserve scrutiny and qualification. Most of these arise from Sorkin's apparent desire to distance his work from that of contemporaries and to lay his own foundation for already accepted or recognized conventions. For example, his Bill of Rights for City Dwellers does not recognize the earlier and similar Bill of Community Rights that was elaborated by Elizabeth Moule and widely disseminated by Nick Patsaouras in his 1992 mayoral campaign in Los Angeles. While some of Sorkin's measures are set in American cities today, others are probably not feasible—such as the minimum of 25 restaurants and cafes per Nabe.

Still other measures can only be verified by designs illustrating and testing them. This would be a worthy response to *Local Code*—to be used as assignments for university design studios or as amusement for recreational urbanists. Certainly, the challenge of applying computer capabilities to Sorkin's graphic specifications should make some codophiles shiver with anticipation. Indeed, the book's conclusion invites such endeavors.

By itself, this book is not the ultimate prescription for urban health. But taken in perspective with contemporary efforts to address urban issues, *Local Code* provides encouragement to continue experimentation and acknowledges a larger arena of responsibility for even the most impenetrable circles of architectural design and writing.■

Elizabeth Plater-Zyberk is a principal of Andres Duany & Elizabeth Plater-Zyberk, Architects.

CHANGE IS GOOD.



Union Bank Square, Orange, California
Distributor: Elward, Inc., Lakewood, Colorado
Architect: Langdon-Wilson Architecture Planning, Newport Beach, California

Make the old new again when you retrofit with Alucobond Material, the economical, flexible way to turn an outdated building into an ultramodern structure.

Installation is fast and easy. Alucobond Material goes right over the old exterior without the need to remove or pre-treat the existing building material. And with new, cost-efficient systems now available for attachment, it's even more affordable. Choose from a wide variety of standard colors and finishes. Or use our in-house, coil coating custom-color capabilities to add just the right color to restore or improve on a building's original beauty.

For more information about retrofit as well as new construction applications, call 1-800-382-6445 or 502-527-4200. Or write Alucobond Technologies, Incorporated, P.O. Box 507, Benton, KY 42025. And make a change for the better.

A·T·I®
Alucobond Technologies, Incorporated

Circle 17 on inquiry card

Briefly Noted

How Buildings Learn: What Happens After They're Built, *by Stewart Brand. New York: Viking Penguin, 1994, 229 pages, $30.*

Reviewed by Angelica Semler

A geodesic dome stands abandoned along an Arizona highway. Although eye-catching, the structure is practically useless for any new purpose because its peculiar dimensions are suited only for its original tenants—a restaurant, a bar, and a real-estate office.

Exploring the dome and numerous other U.S. and British buildings from their envelopes to their layouts, Brand—the man who created *The Whole Earth Catalog*—advocates designing structures that are equipped for change. He maps out and illustrates the interior and exterior changes a building undergoes between the time it's constructed and the time it becomes a pile of rubbish, discussing why some buildings survive change with glory while other fail with misery. "A building is not something you finish," he says. "A building is something you start."

Although Brand believes all buildings grow, only some improve. In addition to the initial design, the tenants and frequency of turnover decide how well a structure survives.

Brand introduces ideas such as high-road buildings—whose endless beauty and character invite preservation—and low-road buildings—whose adaptability and affordability invite continual changes.

Anecdotes pull the reader through the book as much as the subject matter. Brand even includes a tale of himself and his wife converting a 1932 tugboat into a houseboat. By examining landmarks like Mount Vernon and Montpelier, the author makes this a topic of the past and the present.

Pushing for architects and designers to look beyond the exterior, Brand expounds the idea of considering the building not only for its elegance today but its usefulness tomorrow.

Angelica Semler, a student at Kent State University, was a summer intern at Architectural Record.

The Old Way of Seeing: How Architecture Lost Its Magic (and How to Get It Back), *by Jonathan Hale. Boston: Houghton Mifflin, 1994, 197 pages, $25.*
Outlining the design characteristics of pre-1830 structures—before architecture became a self-conscious endeavor—Hale praises pre-Modern designers on their use of light and shade, contrast, proportion, and balance. The results of these efforts were works full of grace and spirit, says Hale. In comparison, he labels most Modern architecture bland and lifeless. He explores why buildings have lost their sense of style and considers methods for regaining the magic of old. Black-and-white photos support Hale's theories, but the book would have been stronger had the author used more specific examples and relied less on generalization. *A.S.*

The Making of Beaubourg: A Building Biography of the Centre Pompidou in Paris, *by Nathan Silver. Cambridge: MIT Press, 1994, 192 pages, $25.*
This book offers a behind-the-scenes look at the highly charged and difficult process of designing and building the once controversial and now popular Paris museum. After an international design competition was won by architects Renzo Piano and Richard Rogers, the project was plagued by a long series of political, legal, and artistic battles. Based on interviews with the project's major players, this book progresses mostly chronologically, although a few topics are handled separately. The straightforward writing makes for an easy read. But the book is sparsely supported with unexciting black-and-white photographs that fail to communicate the building's vibrant nature. *A.S.*

Mies van der Rohe: Barcelona Pavilion, *by Ignasi de Solà-Morales, Cristian Cirici, and Fernando Ramos. Barcelona: Gustavo Gili, 1993, 74 pages, $35 (paper)*
Written by the architects who carried out the reconstruction of the Barcelona Pavilion in the 1980s, this large-format book includes one section on the design and building of the 1929 landmark and another on the recent rebuilding of it on its original site. Drawings and old photographs of what was originally called the German Pavilion for the Barcelona International Exposition, as well as gorgeous color photographs of the new structure, offer an in-depth examination of this icon of Modernism. *C.A.P.*

Lloyd's Building: Richard Rogers Partnership, *by Kenneth Powell. London: Phaidon Press, 1994, 60 pages, $30 (paper).*
A title in Phaidon's "Architecture in Detail" series, this large-format book provides an exhaustive look at Richard Rogers' high-tech London landmark. Large photographs and enough drawings to build your own Lloyd's bring the building sharply into focus. Powell, the architectural correspondent for the *Daily Telegraph* in England, has written a thorough text that examines everything from the selection process and the role of the client to the building's structure and services. *C.A.P.*

The Show Starts on the Sidewalk: An Architectural History of the Movie Theater, *by Maggie Valentine. New Haven: Yale University Press, 1994, 208 pages, $35.*
From penny arcades to multiplex cinemas, this architectural history of the movie theater covers a broad range of work that has been done over the years. The book focuses on the career of S. Charles Lee, who designed more than 300 theaters, mostly in California, resulting in a strong geographic bias. But the author offers in-depth looks at famous movie palaces such as the Fox Wilshire and Tower in Los Angeles and includes in her scope theater novelties like Cinerama and 3D. *A.S.*

The Design Encyclopedia, *by Mel Byars. New York: John Wiley, 1994, 612 pages, $60.*
Focusing on the last 125 years, this hefty volume covers the full range of applied and decorative arts. The book includes 4,000 entries with information on designers, design organizations, manufacturers, studios, and movements and styles. More than 100 black-and-white images are grouped in four sections. The book includes lists of key design exhibitions, from the 1851 Great Exhibition in London to the 1992 Seville Expo. *C.A.P.*

The Dictionary of 20th-Century Design, *by John Pile. New York: De Capo Press, 1994, 293 pages, $19.*
More of an encyclopedia than a dictionary, this volume offers extensive definitions on a variety of terms useful to those in the design profession. From the design of furniture to that of buildings, the book covers a range of topics from Chinaware, clothing, styles, equipment, and schools. The 1,200 entries include basic explanations, historical information, impacts on the industry, and specific examples of works. Black-and-white photographs support the text. *A.S.*

Introducing the one feature that makes high-performance Mipolam® homogeneous PVC flooring perfect.

Azrock support.

AZROCK
INTEGRATED COMMERCIAL
FLOORING

Mipolam,® the world's first PVC flooring, is known for meeting the strictest standards in performance-critical situations. By combining selected Mipolam® conductive tiles and sheets with heat welding rods, you can create a monolithic membrane that prevents static build-up and seals out trouble. Mipolam® is now exclusively available throughout North America from Azrock. Rely on the comprehensive sales support of Azrock for Mipolam® and our entire Integrated Commercial Flooring System. Call your local Azrock distributor or 1-800-921-1717.

Mipolam.® In stock at Azrock.

AZROCK®
COMMERCIAL FLOORING

Mipolam® is a registered trademark of Hüls Troisdorf AG

Circle 18 on inquiry card

Indicators

Calif. raises: Good when you get them

Among the most comprehensive of salary surveys, a June 1994 review by Management Design, a consulting firm for architects, shows that relatively few California architects received raises. Those who did, however, generally received increases well above the rate of general inflation. Also, few small firms added staff in the last year; those in the 41- to 90-person range were most likely to have hired. For the entire report ($150) call 415/989-0128. For more on compensation, see RECORD, March 1994, pages 32-35. ■

Salary Change Since June 1993

California Architectural Firms

Source: © Management Design 1994 Survey for California Architectural Firms

Yes, big firms pay better

As the average salaries charted show, California architects tend to earn more than do AIA members nationally (AIA principals average $59,300, for example), but the trend to better pay at larger firms is true in both California and firms nationwide. Also, a much higher percent of staff received bonuses at the large firms in the survey, and the amount they received tended to be greater, exacerbating pay differences between large and small firms. Of those firms with reward programs, almost all offer annual bonuses. ■

1994 Salaries* No. individuals/Avg. base salary

Firm Size	1 to 5	6 to 15	16 to 40	41 to 90	91 or more	All Firms
Managing Principal	120/$56,228	146/$80,397	102/$98,871	53/$123,871	37/$113,865	458/$85,815
Director of Architecture	5/$53,900	40/$62,375	39/$69,500	36/$93,847	37/$86,851	157/$76,860
Project Coordinator	21/$44,964	107/$45,881	154/$52,615	91/$59,276	105/$66,111	477/$55,022
Job Captain	22/$32,852	72/$36,479	97/$41,722	99/$43,462	114/$42,658	404/$40,995
Project Designer	14/$31,946	36/$39,958	53/$47,140	56/$56,853	68/$57,380	227/$50,518
Senior Designer	6/$32,750	30/$37,150	62/$41,440	45/$49,283	67/$48,736	210/$44,587
Junior Designer	4/$29,750	20/$27,800	24/$28,250	45/$26,517	51/$31,338	144/$28,781
Office Manager	27/$28,194	57/$33,368	25/$36,350	18/$39,653	17/$441,618	144/$34,675
Marketing Coordinator	1/$31,250	8/$27,688	19/$34,092	12/$36,750	12/$39,250	52/$34,856

Received bonus since June 1993? Yes/No

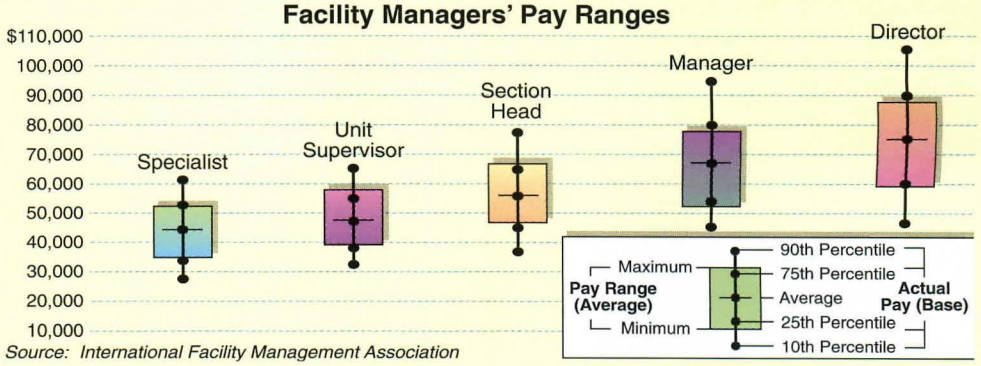
Principal	6.4%/93.6%	40.8%/59.2%	47.2%/52.8%	61.5%/38.5%	80.0%/20.0%	30.8%/61.2%
Management Staff	4.7%/95.3%	38.1%/61.9%	45.7%/54.3%	59.1%/40.9%	62.5%/37.5%	31.5%/68.5%
Staff	26.9%/73.1%	49.0%/51.0%	50.9%/49.1%	47.8%/52.2%	61.5%/38.5%	41.8%/58.2%

Source: © Management Design 1994 Survey for California Architectural Firms ** California Firms, June 1994*

Pay is better outside private practice

Do architects who choose facilities management earn more? Yes, shows "Profiles '94" (IFMA, $50/$100, 800/359-4362). Even the lowest 10th percentile of facilities managers (many are engineers or have business degrees) earn more than the median income of similarly experienced and educated architects in design firms. Consider AIA's 1994 figures (compare left to right on chart): Intern, $24,700; Architect I, $30,000; Architect II, $34,300; Architect III, $38,600. Principal, $59,300. ■

Facility Managers' Pay Ranges



Source: International Facility Management Association

The Profession This Month

- **Where Washington Slept, a City Restores and Restores and Restores:** The unique challenges of preserving wood structures. *Page 44*
- **Give and Takings: When Do Land-Use Rules Trample Property Rights?** Property-rights activists demand compensation when regulations decrease private-property values. This is fast becoming the land-use battle of the decade, potentially affecting everything built. *Page 50*
- **Is 3D Imaging the key to CAD's Future?** A visit to the Siggraph computer-imaging show suggests some new directions for computers in the design field. *Page 54*
- **Practice 2000:** Scenarios of architectural life that technology will permit in the 21st century. *Page 56*
- **Spotlight on Sidelights:** Our product report focuses on inventive glazing of doors, sidelights, and entrances. *Page 60*

Where Washington Slept, a City Restores and Restores and Restores

By Sheri Olson

Restoring exterior wood cladding of structures as old as the 18th-century Morris-Jumel mansion, a historically as well as architecturally significant building in upper Manhattan, posed unique challenges for the firm of Jan Hird Pokorny Architects and Planners. It's more difficult to resolve the common preservation dilemma—what's restored versus what's replaced—when considering a material as potentially ephemeral as wood. In this case, the architects also had to contend with ungraceful earlier restorations and a city procurement process focused too much on low bidder and too little on the painstaking skills needed.

Built in 1765 as a summer villa on a 100-acre farm stretching from the Hudson to the Harlem rivers by British Colonel Roger Morris, the Morris-Jumel mansion features a large portico believed to be the earliest existing colonnade in the United States. The elegant Georgian residence most likely survives due to its brief use as General George Washington's headquarters during the Revolution. The house was purchased in 1810 by wealthy French émigré Stephen Jumel, who modified the exterior to reflect the prevailing Federal style. After Jumel's death, his widow, Eliza Bowen, married ex-Vice President Aaron Burr in the front parlor.

Pokorny's firm, which specializes in historic-preservation work, first became involved in 1986, when it was engaged to do a conditions survey. Among the many deteriorated areas found, the most serious were bulging exterior walls and siding pulling away at the base of the building, signifying rotting of the timber frame at the sill and the basement window lintels. Many of the problems were a legacy of fluctuating maintenance attention by New York City's Department of Parks and Recreation, which has owned the property since 1903. Limited funds allowed the architect to address the structural problems and restore the exterior to its Jumel period.

Between and behind the house's widely spaced studs, masons had built an infill brick wall, called nogging. It's not known why the house used this technique: it could have been poor quality bricks and mortar that required a wood cladding. Or, the architects speculate, it may simply have been less expensive to give the house a sophisticated, stone-like appearance using wood rather than the real thing. At any rate, the bricks may have trapped rising damp from the foundations, causing extensive deterioration near the sills.

In the repairs, the architects' priority was to retain as much of the original building fabric as possible. Richard Pieper, the director of preservation at Pokorny, believed it was important to "allow the building to show its age while making sure it stayed intact." Thus, even battered wood siding and original wrought nails were numbered and saved as cladding was removed. Wherever possible, damaged items were stabilized in place by the direct injection of liquid epoxy (following pages), which also minimized disturbance of adjacent areas. Only extremely deteriorated members were replaced with new pressure-treated wood. At irreparable joist ends, wood blocks were installed as nailers for the lowest siding boards. Three-fourths of the $600,000 budget was spent on these hidden structural repairs. The cladding and water table were slightly altered to reduce infiltration. Later phases of work should reduce rising damp.

Restoring the previously restored

Since the mansion had undergone a series of changes almost from the beginning, the architects chose to restore the house to its "Jumel period," the era of most historical and architectural significance. In the process, the firm had to evaluate (and sometimes undo) inappropriate or over-enthusiastic earlier restoration efforts. Carved wood ornament was damaged in the 1950s when propane torches were used to burn off old layers of paint. This time heat guns and heat plates permitted less damaging removal. Hand scraping was still called for in intricate areas.

To correctly duplicate details of the decorative roof balustrade, the architects worked from 19th-century photographs. Though the architects replaced the balustrade using select pine (locating rare five-by-five in. stock to replicate carved-urn finials), they knew that accommodating future replacement of

Continued on page 122

Sheri Olson is an architect, teacher, and writer with her own firm in New York City.

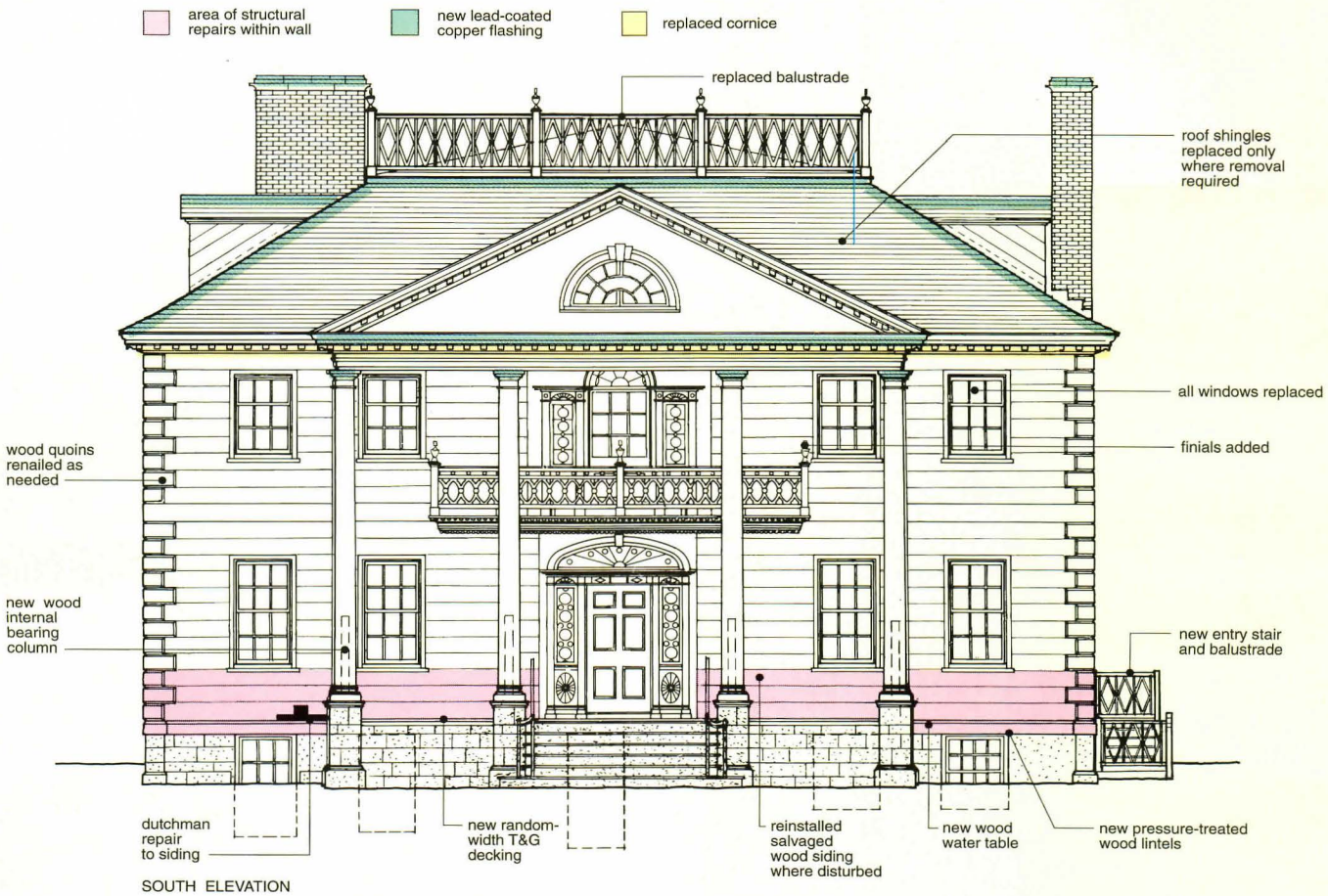
© NYC Parks Archive

© Alajos Schuszler, NYC Parks archive

© Max Ulrich, NYC Parks archive

A materials analysis revealed that the Jumels painted the mansion a light grey, probably to further its resemblance to stone (early view, top). This time the architects left in place about five percent of the paint for future preservationists. The mansion during (above) and after (middle) its 1934 restoration, some of which had to be undone. Opposite: the scope of main facade exterior work (top). Views of completed restoration (bottom). Fencing is for succeeding phases of work including drainage, disabled access, landscaping, and interior restoration.

What to save, what to replace—this preservation dilemma is even more difficult to resolve when the material is potentially ephemeral wood and when the subject is a much-restored 1752 mansion.

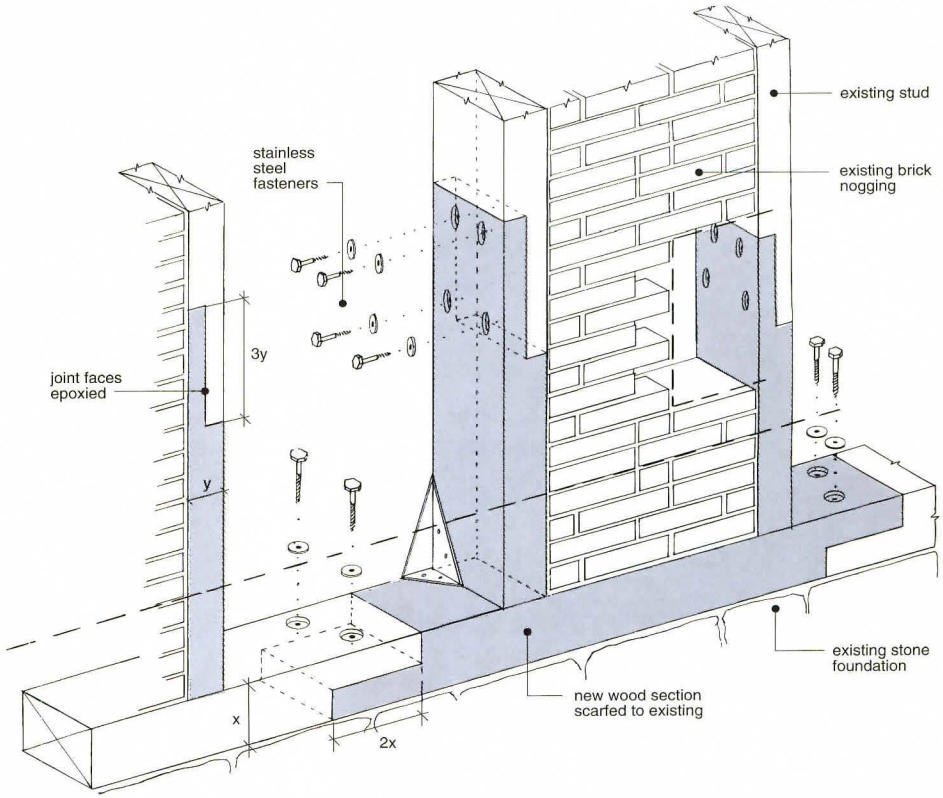


SOUTH ELEVATION

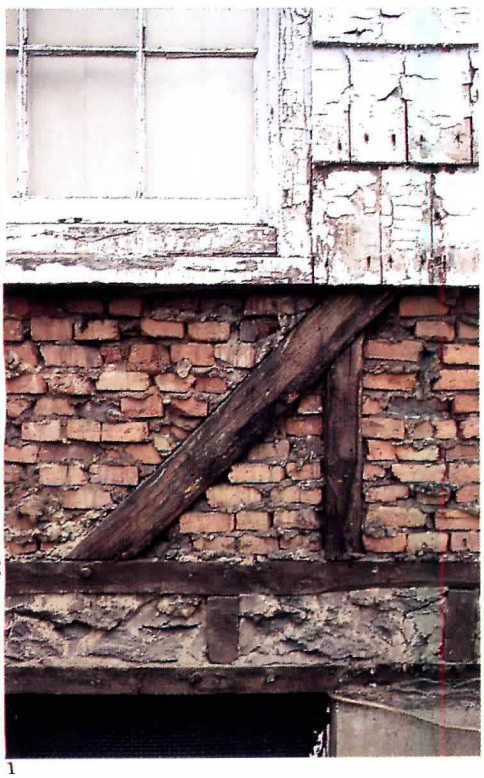
© Eduard Hueber photos this page

Restoring Exterior Walls

To repair deteriorated sills (1 below), shingles and original nails were numbered for reinstallation prior to removal (2). Initial test probing of exterior walls revealed that the brickwork nogging, typically discontinuous between structural wood-framing members, was carried a full six-inches inside the frame, essentially creating a masonry building within a wooden structure. It's not entirely clear why this was done—but it does explain why the house has been variously described as wood or brick. New sections of pressure-treated wood (4) were scarfed in place and connected to the existing structure by epoxy and stainless-steel connectors (right). To avoid disturbing nogging in good condition, some deteriorated vertical framing members were taper cut and removed. New pressure-treated members were installed and fiberglass rods were inserted into the joint to prevent flexing. In some areas members were consolidated in place by drilling a series of holes at an angle and then filling them with liquid epoxy (3). The architects taught the builders how to drawshave 33-inch-wide hand-split shingles to match rotted originals.



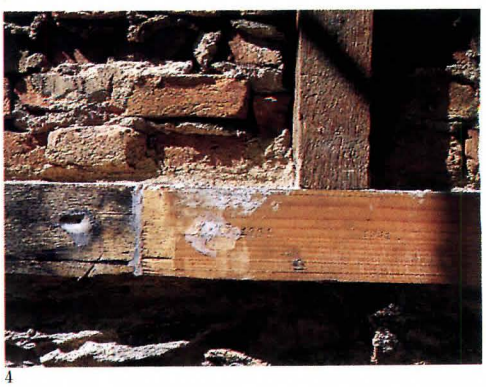
SCARF JOINT AT WALL FRAMING



1

2

3

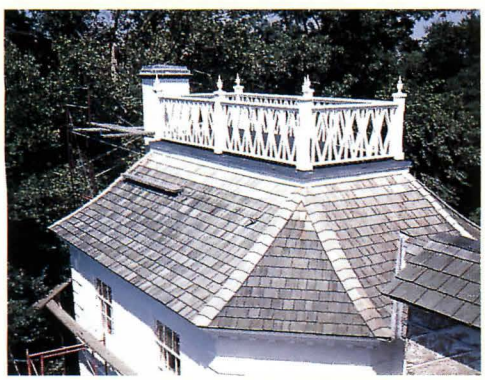


4

Photos this page and opposite courtesy Jan Hird Pokorny Architects

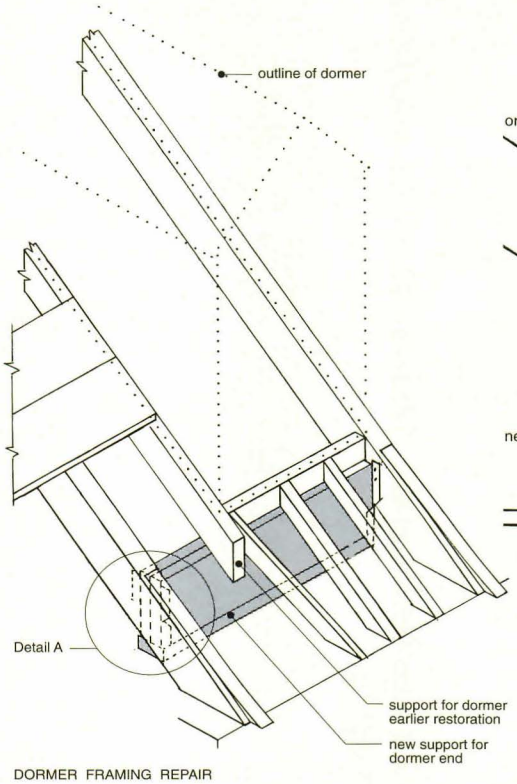
Shoring up dormers

Dormers sagged because one side had originally been supported only by the roof deck. A restoration done during the Jumel period had attempted to correct the problem by adding a trimmer and header at the unsupported side (drawing right) braced by nailers. Water entry rotted these supports and the dormers sagged again. In the latest restoration, Pokorny Architects hung new framing members between the original rafters to support the non-original trimmer and header (detail) and added new flashing.

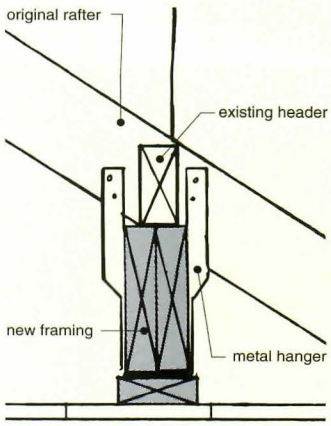


A replaceable balustrade

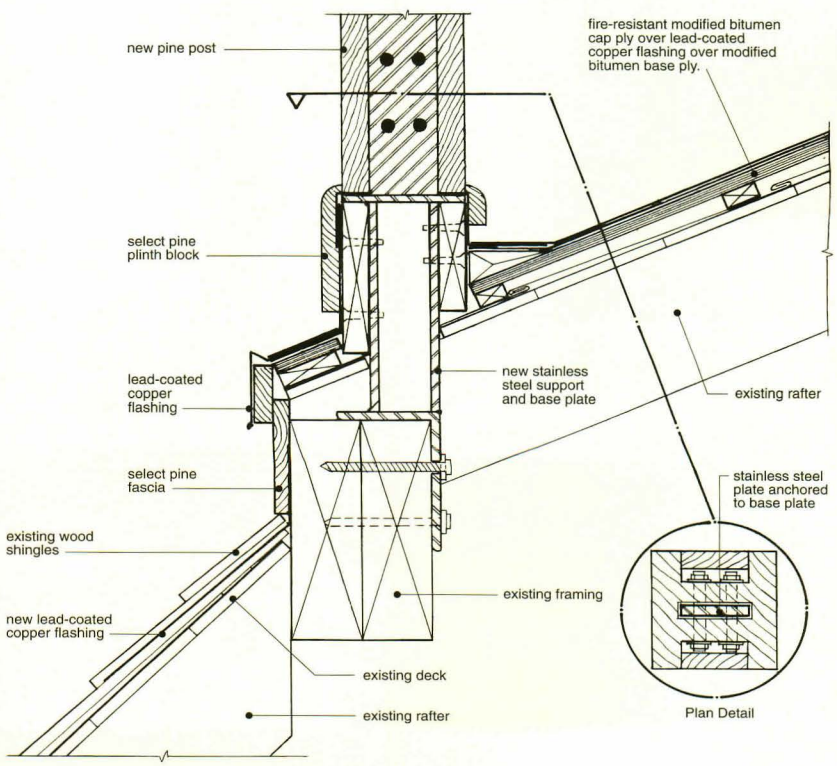
Rotted balustrade posts, rails, and urn finials were replaced on the main roof and octagon-shaped wing of the residence. New pine posts were sleeved over stainless-steel anchorage plates attached to stainless-steel posts penetrating the roof, accommodating inevitable future replacement without disturbing the membrane. The low-slope built-up roof inside the balustrade was removed down to the original metal roof, then replaced with a modified-bitumen system.



DORMER FRAMING REPAIR



DETAIL "A"

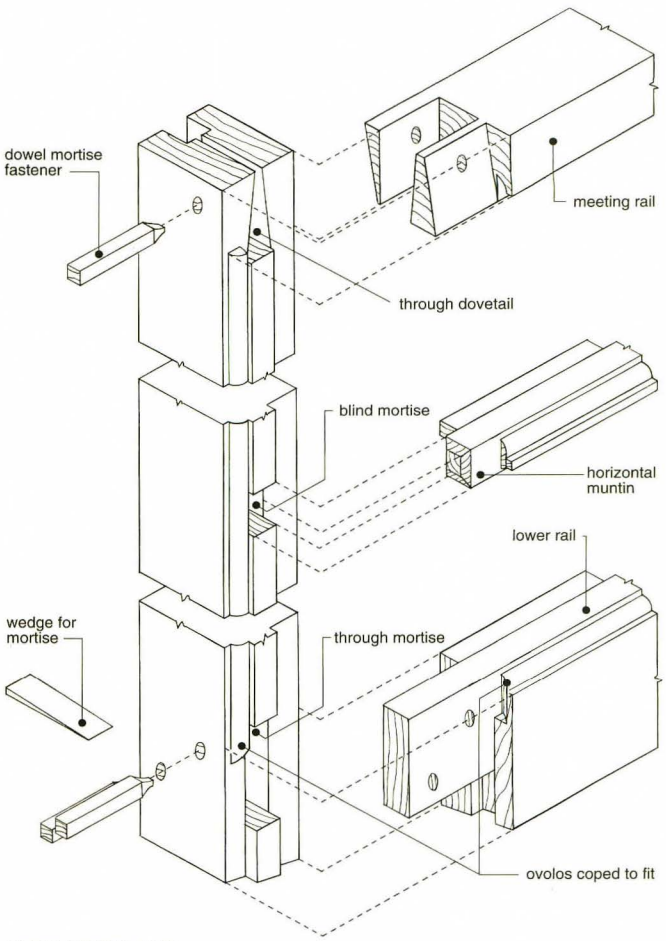


ROOF BALUSTRADE POST

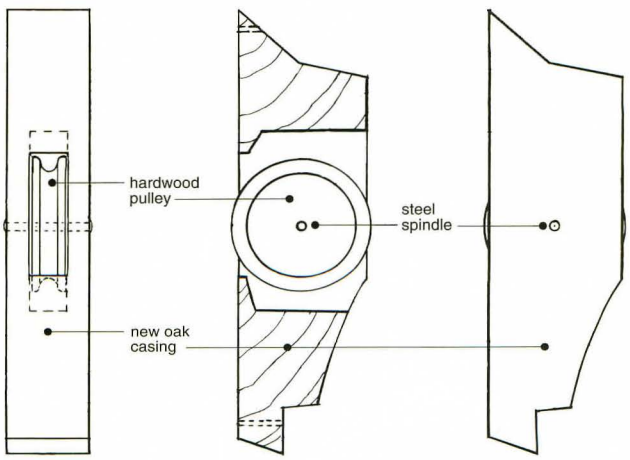
Windows joined the old way

A priority for the architects was the replacement of inappropriate windows installed as part of previous renovations in the 1930s and '50s. The architects drew the elegant dimension of the new sashes, rails, and muntins from the glass lights of the only remaining original door. The wood joinery of the new windows replicates the traditional mortise-and-tenon detailing of the early 19th century. All through connections were wedged and pinned. A blind mortise was used at the muntin and stile connection. The entire frame is of select white pine, except for the sash pulleys, which have an oak casing with hickory wheels. The window panes are the first installation in the United States of a new glass developed to combine ultraviolet radiation filtration with the subtle imperfections of of glass that would have been used in the house. Each sheet is hand-blown using the cylinder method, which leads to distortions and occasional pitting. The glass does not entirely block ultraviolet rays, but does provide three times the blockage of regular glass, enough to protect the Napoleonic period furnishings inside.

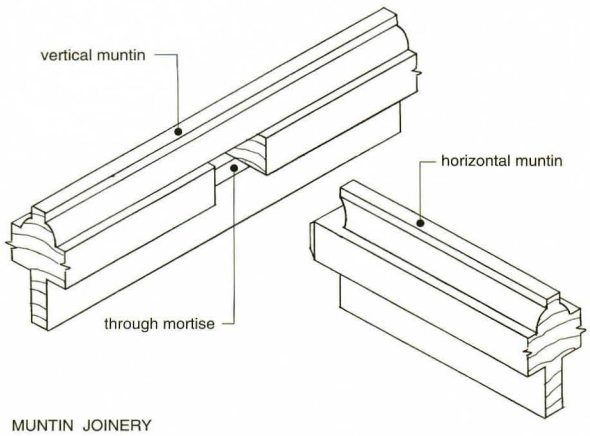
© Eduard Hueber photo



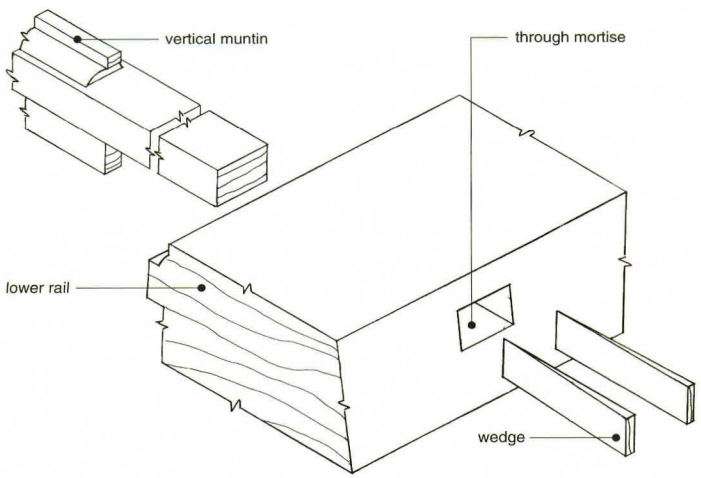
WOOD LOWER SASH



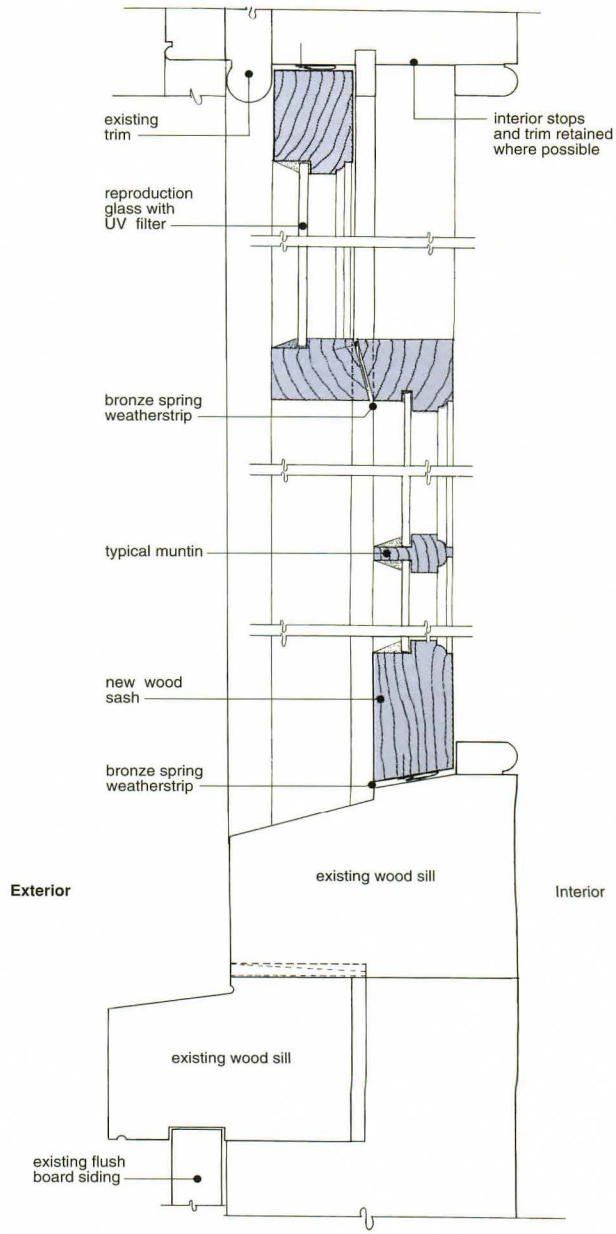
NEW WOOD REPLICATION PULLEY



MUNTIN JOINERY



MUNTIN / LOWER RAIL JOINERY



FIRST FLOOR WINDOW SECTION

Credits

Morris-Jumel Mansion, New York City (Open to the public Tuesday-Sunday 10:00 to 4:00)
Owner: *New York City Department of Parks and Recreation*
Restoration Architect: *Jan Hird Pokorny Architects and Planners—Richard Pieper, preservation director; Michael Devonshire, senior architectural conservator; Christina Wallace, Dale Flynt, project team.*
Engineers: *Robert Silman Associates (structural); Michael Dalton/Aldo Ricci (electrical)*
Consultants: *Glenn Boornazian (mortar analysis); Frank S. Welsh (finishes analysis)*
General Contractor: *Perna Contracting; Blumberg and Butter (site superintendent)*

Give and Takings: When Do Land-Use Rules Trample Property Rights?

"America has reached a crisis in the law of property as planners at all levels of government pile restriction upon restriction, leaving owners all but unable to move without official permission."—Roger Pilon, *The Wall Street Journal*, February 28, 1992

"In Congress and in state legislatures around the country, well-funded corporate coalitions are waging a campaign to peel back hard-won public protections, including crucial health, safety, labor, civil rights, consumer and environmental laws."—*Sierra Club News*, 1994

While complaints about government actions trampling private property rights have been a staple since the republic began, the argument—as the statements above demonstrate—has taken on new fervor in the last few years. The property-rights battle is one in which the outcome could have profound effect on the design professions, for at issue is nothing less than the current system of government land-use regulation—of zoning and preservation ordinances, building and life-safety codes, and environmental laws, among others.

So far the fields of this battle encompass the U.S. Supreme Court and lower courts, Capitol Hill and state legislatures across the country. And its combatants comprise a diverse coalition of interests. On one side is the burgeoning self-styled property rights movement, whose proponents argue that government regulations too often violate the constitutional rights of land owners. Adherents include conservative legal theorists and deregulationists; groups of developers, realtors, and builders, including the National Association of Homebuilders; numerous business consortiums—including the American Farm Bureau Federation, National Forest Products Association, and American Mining Congress; and citizens' groups ranging from tax-limitation advocates to snowmobilers.

On the opposite side of the battle, emphasizing the importance of regulations as a check to unfettered development and despoliation, are most major environmental groups; a network of national and local preservation organizations and professional associations of planners, landscape architects and the AIA; growth-management and anti-sprawl advocates; and various labor unions and consumer groups. Though it opposes the property-rights agenda, AIA has not actively lobbied.

© *James S. Russell photos*

Property-rights advocates have attacked regulations, such as ocean-front development controls in areas subject to erosion (above), since they often severely limit a property owner's development options. Environmentalists argue that society's wider needs come first, especially since insensitive development often exacts costs from all taxpayers. Hundreds of millions of federal dollars, for example, have gone to rebuild eroded beaches that threaten buildings (though work at home, left, was privately funded). See also RECORD, January 1993, pages 38-39.

Property rights and the courts

To understand the current controversy, it is necessary to look at property-rights law and its interpretation by the Supreme Court. At the heart of the matter are the last 12 words of the Fifth Amendment to the Constitution: "nor shall private property be taken for public use, without just compensation."

For more than a century after its ratification, this "takings" clause, which is rooted in English common law, was widely understood to apply only to the physical taking of property that occurred when government used its power of eminent domain to buy land to build roads, schools, and so on. Not until 1922 did the Supreme Court introduce a new takings interpretation. In *Pennsylvania Coal Company v. Mahon*, the plaintiff invoked the takings clause against a state regulation intended to protect surface structures by limiting the quantity of coal that could be mined. The Court ruled in favor of the company, reasoning that a regulation could so reduce the value of property as to constitute a *regulatory* taking for which compensation is required.

For the next half century, the Court did little to develop this potent new concept. According to Joseph Sax, a law professor at Berkeley and an authority on environmental and land-use law, "For many years courts accepted the view that regulation was a necessary part of doing business, of balancing individual liberty and community good, in the very complicated modern state." By the mid-

Property-rights activists demand compensation when regulations decrease private-property values. This is fast becoming the land-use battle of the decade, potentially affecting everything built.

1980s, however, three Supreme Court cases marked a new era, one that was less tolerant of the burdens regulations could exact (opposite and page 53).

In their decisions in these and other cases, the Court drew new limits on the degree to which government could regulate land use without compensating owners. Most observers agree that the chief significance of these cases lies not in the specific decisions, which were sufficiently equivocal to allow each side to claim some victory. And, as attorney Paul Edmundson, of the National Trust for Historic Preservation, points out, these decisions do not fundamentally challenge the state's right or ability to regulate. Rather, as Edmundson, says, "These cases are significant largely because they exist at all—because for so many years the Court did so little with this issue."

The "linchpin" of preservation

The recent decisions have primarily affected environmental rules, but the legal rationale under attack is similar to that which underpins historic-landmark designation, design controls, and other essentially esthetic restrictions. Organizations like the National Trust for Historic Preservation regard the property-rights agenda with considerable apprehension because historic preservation has been the focus of two major takings cases. In 1978, in *Penn Central Transportation Co. v. New York City*, the Supreme Court ruled that the city's preservation ordinance did not constitute a regulatory taking when it denied the owners of Grand Central Station use of air-rights over the landmark to build a high-rise. Based on the rationale that the owners retained some viable economic use of the property, and that the regulation served a genuine public purpose, this decision was, as Paul Edmundson of the Trust says, "the linchpin" of the preservation movement. In 1991, the Pennsylvania Supreme Court ruled that Philadelphia's preservation ordinance did effect an unconstitutional taking of property when landmark designation to a theater interior prevented the owner from dividing it [RECORD, January 1993, pages 70-73 and 102-107]. Although the Court reversed its own decision in 1993, preservationists nationwide saw takings as again a weapon that could be successfully wielded by anti-landmark forces. Today, says Pratt Cassity, director of the National Alliance of Preservation Commissions, "we know that any broadening of the definition of takings that affects environmental regulation might affect us as well."

Zoning and planning chaos?

City and regional planners, too, are watching the struggle closely; they understand that property-rights activists seek to curtail governments' ability to set standards for land development, or to impose conditions (such as the provision of affordable housing, parks, or playgrounds) upon real-estate developers. Even a concept as entrenched as zoning might be threatened since it, too, was legitimized in an important early takings case. In *Village of Euclid v. Ambler Realty*, the Court's 1926 ruling that zoning did not constitute a regulatory taking was as vital to planning as the *Penn Central* ruling was to preservation. Nancy Willis, government affairs coordinator of the American Planning Association, underscores the importance of the decision when she says, "With the sweep of a pen, takings legislation could wipe out almost 70 years of planning tradition." Or, as James Murley, executive director of 1,000 Friends of Florida, a growth-control group fighting that state's property-rights movement puts it, "without regulations, we'd have Houstons everywhere."

Private rights, public responsibilities

Two fundamentally different conceptions of the relationship between private rights and public responsibilities lie at the very center of the takings debate. Property-rights activists, whose movement is rooted in the deregulation agenda of the Reagan Administration, believe that government at all levels has stitched private owners into a regulatory straitjacket that unlawfully restricts their freedom to use their property. They press for an interpretation of the takings clause that would require government to pay owners for virtually any decrease in property value attributable to regulation. Richard Epstein, a University of Chicago law professor and author of *Takings: Private Property and the Power of Eminent Domain*—a 1985 book that helped establish the movement's intellectual foundation—sees only two justifications for the uncompensated regulation of property. "If a regulation prevents a harm or

Court Case 1: Imposed Development Conditions Must Meet Public Purpose

Case: *Nollan v. California Coastal Commission*
Decided: U.S. Supreme Court, 1987.
At issue: The Nollans sought to tear down their existing oceanfront house and build a larger one. Pursuant to a policy encouraging improved public beach access, The California Coastal Commission agreed to permit construction on condition that the Nollans extend a path across their property. The Nollans called this an unconstitutional taking.
Decision: The court agreed with the Nollans, noting that the path requested didn't actually improve public access. Justices found no "essential nexus" between the state's exaction (the specific ceding of property for access) and and the public purpose the exaction was supposed to serve.
Implications: Property-rights activists regard this as one of the first important ruling limiting what they see as the government's uncontrolled power to diminish the value of private property through regulation. The ruling shifted the burden to prove regulations valid from owners and developers to officials. Environmental groups were encouraged by the fact that the court interpreted the issue narrowly, accepting the established validity of exactions as long as they serve a legitimate purpose and are essentially connected to the burdens of the proposed development. *N. L.*

nuisance to others, or if it offers the owner benefits that offset his losses, then it's a reasonable regulation and no compensation is needed." Roger Pilon, director of the Center for Constitutional Studies at the Cato Institute, a conservative Washington think tank, proposes an equally broad takings definition: "When a regulation prohibits an otherwise legitimate use and diminishes the value of property," he says, "then a taking has occurred, and the government is obliged by the Fifth Amendment to pay the owner."

Property-rights advocates emphasize that they oppose not the state's authority to regulate, but its failure to pay owners who incur economic losses due to regulations. In other words, says Pilon, "If the state wants to achieve some public good, [individual] private citizens shouldn't have to bear the full financial burden. If government wants to limit my otherwise legitimate use of property, then government should pay me." Property advocates also stress the distinction between "preventing a public harm"—a power of government that dates to the English common law of nuisance—and "obtaining a public benefit." Applying this distinction, they concede government's right to regulate (without compensating owners) the location of garbage dumps, but not a similar right to limit development to conserve wilderness or protect historic places.

A "radical redefinition" of rights

To the coalition of environmental, preservation, planning, labor, and social-action groups that oppose the property-rights movement, such strict definitions of takings law, if implemented, would dramatically readjust the longstanding balance in American society between individual liberty and collective welfare. Essentially, the two groups differ profoundly on a matter of emphasis: property-rights activists accept the state's regulatory authority but wish to see it restrained; environmentalists and others support private property rights but believe they must be integrated within a framework of social responsibility. "The takings advocates are proposing a radical redefinition of our rights as private citizens and our responsibilities as members of society," says John Echeverria, chief counsel of the National Audubon Society. "At heart the movement is an attack on a community's right to set standards for air and water quality, for building and site planning, for health and safety, for consumer protections of all kinds."

Recent court decisions have primarily affected environmental rules, but the legal rationale under attack is similar to that which underpins historic landmark designation, design controls—even zoning.

Echeverria and others in the pro-regulatory coalition question the usefulness of the harm/benefit distinction, arguing that in practice the line between the two can blur to obscurity. "The argument can cut both ways," says Paula Carrell, director of state lobbying for the Sierra Club. "You can define a regulation that limits development around a city as serving a purely visual or recreational purpose—but you can define the same regulation as a way of preventing smog and congestion and thus as preventing harm." The harm/benefits argument has often, in fact, been subject to creative interpretation: in a famous case early in this century, billboards were banned not on esthetic grounds but on the reasoning that they served to shelter criminal acts.

Defenders of the current regulatory system also question, on philosophical and practical grounds, the burden of compensation that property-rights activists would place on federal and local agencies. They point out that virtually all land-use regulations affect (and most probably enhance) property values. As lawyer and city planner Jerold Kayden, a senior fellow at the Lincoln Institute of Land Policy, has written, "In a world where government action often increases as well as diminishes property values, it would be foolish, if not unworkable, to require a precise accounting of benefits and burdens every time government acts."

Property rights in the legislatures

Frustrated that the judiciary hasn't defined the concept of regulatory takings broadly enough, property-rights proponents have organized an energetic, nationwide campaign aimed at the passage of both federal and state "takings" bills. Specifically, they have developed two approaches. "Assessment" bills would require public agencies to review regulations for their takings implications. "Compensation" bills would require government to pay owners for regulatory-related losses of property value.

The typical compensation bill, for instance, sets a threshold of 50 percent; thus if a regulation halved the value of property, the regulating agency would be required to write the owner a check. The campaign's rhetorical pitch is distinctly populist, and the titles of proposed bills—"Property Owners Bill of Rights," "Homeowners Compensation Act"—reflect a kind of little guy-versus-mighty-government sentiment.

Members of environmental, preservation, and other groups who oppose takings bills describe the campaign as dishonest and the legislation as potentially disastrous. To this coalition, takings bills would serve the dubious purpose of codifying a right already guaranteed in the Constitution. ("Takings: Solution without a Problem" was the title of a recent editorial in a Maine newspaper.) They assert that such bills, for all their populist appeal, would do less to protect individual citizens than to allow big corporations to evade regulatory burdens. "The property-rights movement is as much about big business as mom and pop," says Catherine Gilliam, project coordinator of the American Resources Information Network, a coalition set up to oppose takings legislation. "Its roots are as much Astroturf as grass."

Gilliam and others argue that takings bills would severely undermine government's ability to protect the public. Assessment bills,

they assert, would require public agencies to devote staff time—and thus taxpayers' money—to preparing analyses that serve little point. Takings assessments, says Echeverria of the National Audubon Society, would focus "undue attention on one particular right at the expense of all other important constitutional rights." And compensation bills, if strictly enforced, would require a vast and destabilizing redistribution of money, effectively forcing public agencies to pay for the right to regulate environmental quality and land development. Such bills would clearly make cash-strapped agencies reluctant to regulate at all, for fear of eventual liability.

Since 1991, takings bills have been introduced in 41 state legislatures and in both branches of the U.S. Congress. To date the campaign has had limited success: takings bills, mostly watered down, have been passed in only seven states. Both sides see the stakes as extremely high. The property rights movement is well-funded and has has successfully gotten their message out, especially in the West. The coalition of mostly non-profit groups that opposes the bills is not as substantially underwritten as their adversaries. Still, takings legislation has mobilized the environmental lobby—including The Wilderness Society, National Wildlife Federation, Sierra Club, and National Audubon Society—because some bills specifically target laws like the Clean Water Act and Endangered Species Act. As Paula Carrell of the Sierra Club says, "If passed in great number—which at this point we think unlikely—takings bills could potentially undo two decades of environmentalism."

Preservationists and planners, although not as embattled as the nature organizations, have also been working hard to defeat takings bills. Architects, however, have not prominently taken a stand, a potentially risky course. True, takings battles can easily pit designers against each other: one proposes altering or demolishing a landmark, for example; others organize against it. Architects do have expertise that when applied to regulations or owners' needs may meet broad public goals without placing undue burdens on property owners. Architects can't play such a mediating role, however, if they are not more involved. *Nancy Levinson*

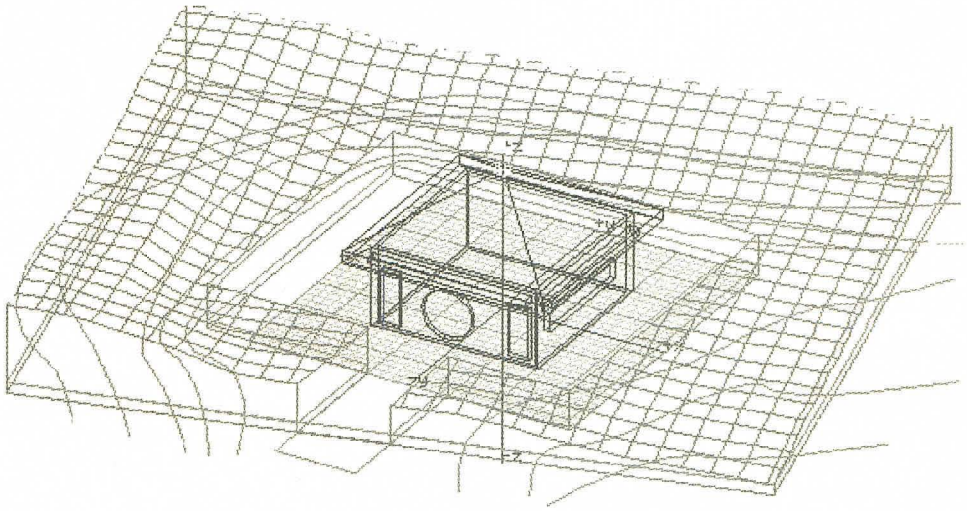
Court Case 2: Rules Can't Reduce Value to Zero

Case: *Lucas v. South Carolina Coastal Council*
Decided: U. S. Supreme Court, 1992
At issue: David Lucas, a South Carolina developer, bought two oceanfront lots in 1986, paying almost $1 million. Regulations intended to reduce storm and erosion damage had the effect of prohibiting any building on Lucas's lots. Lucas claimed he was entitled to compensation.
Decision: The Court ruled that the regulations would constitute a taking if the land was deprived of all economic value (except in the case where a regulation prevents a nuisance use or activity). It returned the case to the lower court to determine whether the taking had actually occurred. That court indeed called the case a taking; the state bought the lots from Lucas, and has since sold the land to another developer with plans to build.
Implications: *Lucas* seemed a blow to environmentalists. By intending to reduce property damage (as well as protect oceanfront ecology), the state's regulations would seem to pass the "nuisance" test. And the state's turnaround on permitting development seemed to bulwark property-rights activists' claims that many regulations are capricious. Those who support such regulations were heartened by the narrowness of the decision, noting that the Supreme Court did not declare a taking, and that regulations almost never cause a complete loss of economic value. *N.L.*

Court Case 3: Exactions Must Be Proportional to Harm

Case: *Dolan v. City of Tigard*
Decided: U.S. Supreme Court, 1994
At issue: Florence Dolan sought permission from the City Planning Commission of this suburb of Portland, Ore., to expand her plumbing supply store and pave her parking lot. The Commission agreed on condition that she dedicate some of the property adjacent to a stream for a public greenway (to minimize flooding exacerbated by the additional paved area) and for a bike path (to ease traffic congestion generated by the expanded store). Dolan contended that these exactions constituted a taking.
Decision: The court agreed that a taking had occurred. While the exactions were valid in theory, the court reasoned that the government had not adequately demonstrated that they were in reasonable proportion to the impact of the planned expansion.
Implications: Property-rights activists hoped that the court would use this case to write a definition of regulatory takings so broad that it would guarantee owners compensation for virtually all losses due to regulation. To the relief of the coalition of environmental, preservation, and planning groups who supported the City of Tigard, the court again interpreted the case narrowly. Still, the decision means regulations must not only pass the "essential nexus" test of Nollan but an additional "rough proportionality" test. This test may slow the kinds of growth-control and environmental regulations that seek to place more of the costs of urban sprawl and environmental protection on developers rather than taxpayers. *N. L.*

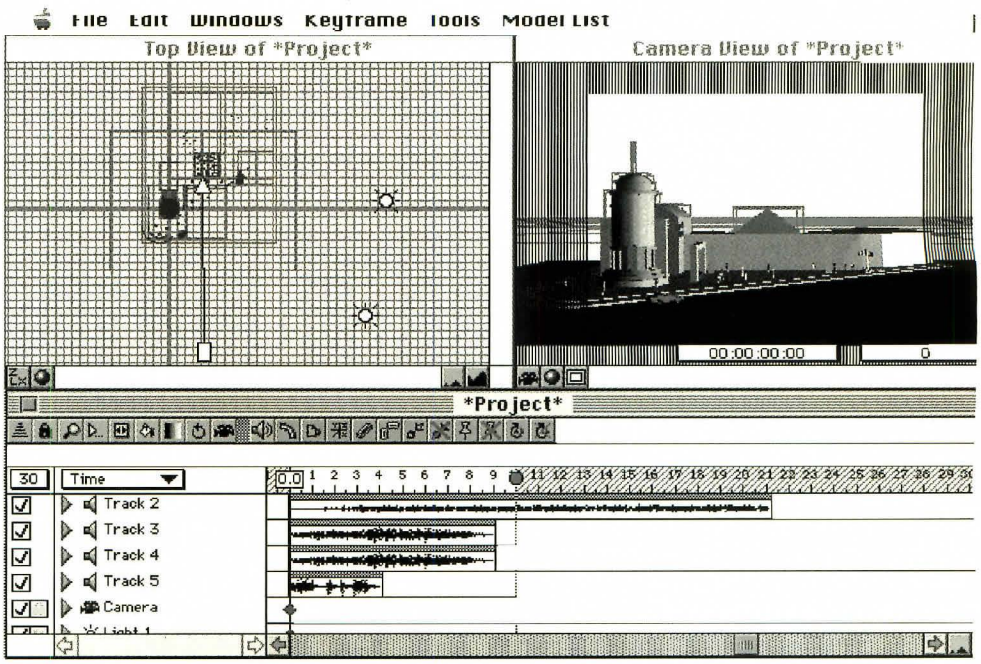
Is 3D Imaging the Way CAD Is Going?

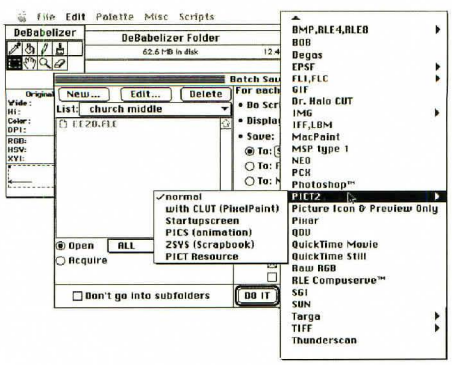


By Curtis B. Charles and Karen M. Brown
Imaging software, such as 3D modeling and animation packages, is among the fastest developing of software technologies. Thus a visit seemed in order to Siggraph '94, a trade show that has become the established venue for virtual reality, multimedia, and imaging. Held last July in Orlando, it did indeed reveal an abundance of possibilities. The price-to-performance ratio of desktop computers is so appealing now that many users can consider power-hungry applications that once cost thousands of dollars.

Is virtual reality the future?
With its ability to allow designer and client to realistically experience an unbuilt place or space, virtual reality would seem to be a natural for architecture. Attendees lined up to explore a classical Italian cathedral or "drive" a shiny red car down a "race track." Such systems capture the imagination, holding out the hope that we'll soon have at home something akin to the Holo-deck of the Starship Enterprise, where you can "visit" different places and times. Today's elaborate setups—the clunky headset, huge goggles, electronic gloves, and highly sophisticated computer system—may affect practice, but are a long way from becoming part of the office.

One product, though, could soon find its way onto our desktops: Apple Computer's QuickTime VR. This soon-to-be-released software does not require any of the headset or glove paraphernalia currently associated with virtual reality, and it will work on more powerful Macintosh computers (though exact requirements for smaller machines are not yet available). And you won't have to sell the firm's assets to purchase the system. Apple has not released prices; the software will come inside a lot of inexpensive software. In QuickTime, you'll be able to create three-dimensional spaces on your computer and move around within them. Now some modeling programs let users do the equivalent of turning a physical model in your hand, but





The terrain modeler in form•Z (top) allows easy study of cut-and-fill options. You can work with basic models in simple wireframe mode as above. Or the modeler offers rendering tools to give greater solidity and a more finished look. Electric Image Animation (screen view, above) offers a leap in animation speed. DeBabelizer (left) helps you work with files from a wide variety of imaging applications.

Curtis B. Charles and Karen M. Brown are principals in C4 Studio, a Miami-based architectural imaging firm. They are authors of the book, Computers in the Professional Practice of Design.

Applications exhibited at the Siggraph computer show suggest new ways for architects to approach design, rendering, and animation.

only with very simply rendered models. QuickTime VR will add much more sophistication while requiring much less power. You can even add the actual site to the model as a background by scanning photos into the computer (in order). Instead of the two-dimensional site-analysis panoramas most designers make by cutting-and pasting photo prints together, the scanned panoramas can be merged and arranged in their actual relationship to the proposed project, permitting examination of the model within an accurate rendition of its setting.
Circle number **300**

Should you design in 3D?
CAD's genesis as a two-dimensional production tool has limited its use for design, where a project is often developed through sketches and study models. Industry leader AutoCAD, for example, empowers 3D design through add-ons offered by third-party developers and by its own corporate cousins. But many of these are not integral packages that work the way architects work. The power and sophistication of packages that start with 3D sketch models are making impressive strides.

Though Siggraph featured numerous 3D imaging tools, almost all were devoted to creating broadcast and special-effects graphics. One modeling package, autodessys' form•Z [reviewed in RECORD, January 1994, page 36], has been developed specifically for the architectural market and makes a powerful case for designing on your computer in 3D from the beginning. It runs on Apple's 6803X and RISC-based computers (with future plans for Intel-based machines). An example of the sophistication of the tools is Terrain Modeler, which was demonstrated at the show. With topographic data entered, the designer can interactively analyze cut-and-fill options until the optimal arrangement is found (opposite top). It's a much faster, more flexible, and more interactive version of the cardboard topographic models many designers use. Of course the building design, made using the program's other sophisticated imaging tools, can then be merged with the terrain model.
Circle **301**

Improved rendering; faster animation
Nowhere at Siggraph was the future of imaging more apparent than in the categories of animation (to make a tour or "walk-through" of a project) and photorealistic rendering—applying textures and building materials to a 3D computer model. Though most rendering applications claim to have animation capabilities, you are for now better off using a stand-alone modeling product, and importing the object to rendering applications like StudioPro (Strata Inc.)
Circle **302**
Also consider RenderMan/Showplace (Pixar).
Circle **303**
Both of these products are available for Macintosh and Intel-based computers.

Animations can wow clients or win over skeptical community groups. To make convincingly rendered models with smooth movement is still—in the view of many users—too time-consuming for the value of the information conveyed. Much increased speed is coming to animation, though at a price. Electric Image Animation, a package for the Apple Macintosh, is probably the most expensive desktop software of its kind, weighing in at about $7,500. Its speed, though, may make you a convert (opposite middle). Take the situation where you're prepared to present a project to a client, but the client asks for a last-minute change. With Electric Image, you don't have to reschedule; you may be able to make changes in minutes, then adjourn for lunch while the program renders the altered image through the entire animation sequence. (Other programs may take overnight to accomplish the same task.) The revised animation is ready for review by early afternoon.
Circle **304**

While Electric Image Animation is king of the speed dominion on the Macintosh, Autodesk 3D Studio and Crystal Topas Pro are joint rulers of the Intel-based world. Crystal Topas runs on both Macs and PCs.
Circle **305**

Autodesk is unlikely to put 3D Studio on the Macintosh. Like its corporate cousin AutoCAD, 3D Studio dominates the PC environment. 3D Studio is a sophisticated rendering and animation imaging tool of proven compatibility with AutoCAD.
Circle **306**

With hundreds of third-party developers adding plug-in modules, 3D Studio may be leaving Crystal Topas behind. Both, however, offer impressive performance for the $3,500 price.

No 3D imaging tool is an island
As designers explore the design and presentation possibilities of computers, many companies are now offering products that traditional architectural renderers have been using for years. Entourage—the use of people, cars, buses, fountains, trees, aircraft, shrubs, furniture, clouds, and so on—brings renderings to life and conveys the scale of the project or space. Instead of tracing autos or people, you can now buy 3D versions on CD-ROM disk. (3D in this instance means that if you change your viewpoint through moving the station point in real time or through animation, you will see the object from the changed angle as well.) The following are all good sources: Visual Design from Schreiber Instruments, Denver
Circle **307**
Acuris Clip Model Library 1
Circle **308**
Blocks and Materials, from Ketiv & Modern Medium
Circle **309**
Viewpoint Datashop
Circle **310**

No file format is an island
With so many imaging software applications on the market, you should expect that members of the design team, consultants, and in some cases clients may be using different applications for the same project. This is a classic recipe for chaos—that is, unless you own an inexpensive (around $200) utility called DeBabelizer. DeBabelizer works with image files produced on different computer platforms or different software applications (opposite bottom).
Circle **311**

It maintains data and color integrity while reading, manipulating, processing, and saving graphics across formats and platforms including Macintosh, DOS, Windows, Sun, Silicon Graphics and XWindows. ■

'Virtual Office' Is Set to Lure Architects into 21st Century

By Steven S. Ross

What happens to the practice of architecture, and to architects, if current economic and technology trends continue? What might these lead to in terms of drawing styles, size of practices, relationships with clients and other consultants, and day-to-day work patterns?

For example, inexpensive software, computer power, and communications technology make it possible for smaller practices to do world-class work, both in design and in project management.

In this article we extrapolate the trends, and present three scenarios of architectural life in the early 21st century.

Sam's Story—A Sole Practitioner

Modern communications make possible the "virtual office." The office can be wherever the architect is. Architects scattered across town or across the planet can discuss designs and construction progress, even hooking their computer screens together to view everything from remote sites.

This benefits clients and practices—offices can handle clients and projects over a wider geographical area, because at least some meetings can be held "electronically." And clients have greater access to the architect. But the technology may have been oversold by equipment and software vendors. We still expect at least the creative end of the process—initial design choices—to be made by architects working face-to-face.

The reason: A few scribbles, accompanied by a long explanation and some body language, can transfer more information between design collaborators than can all but the most detailed drawings transmitted by the most powerful communications software. The following scenario seems quite likely within the next five years or so.

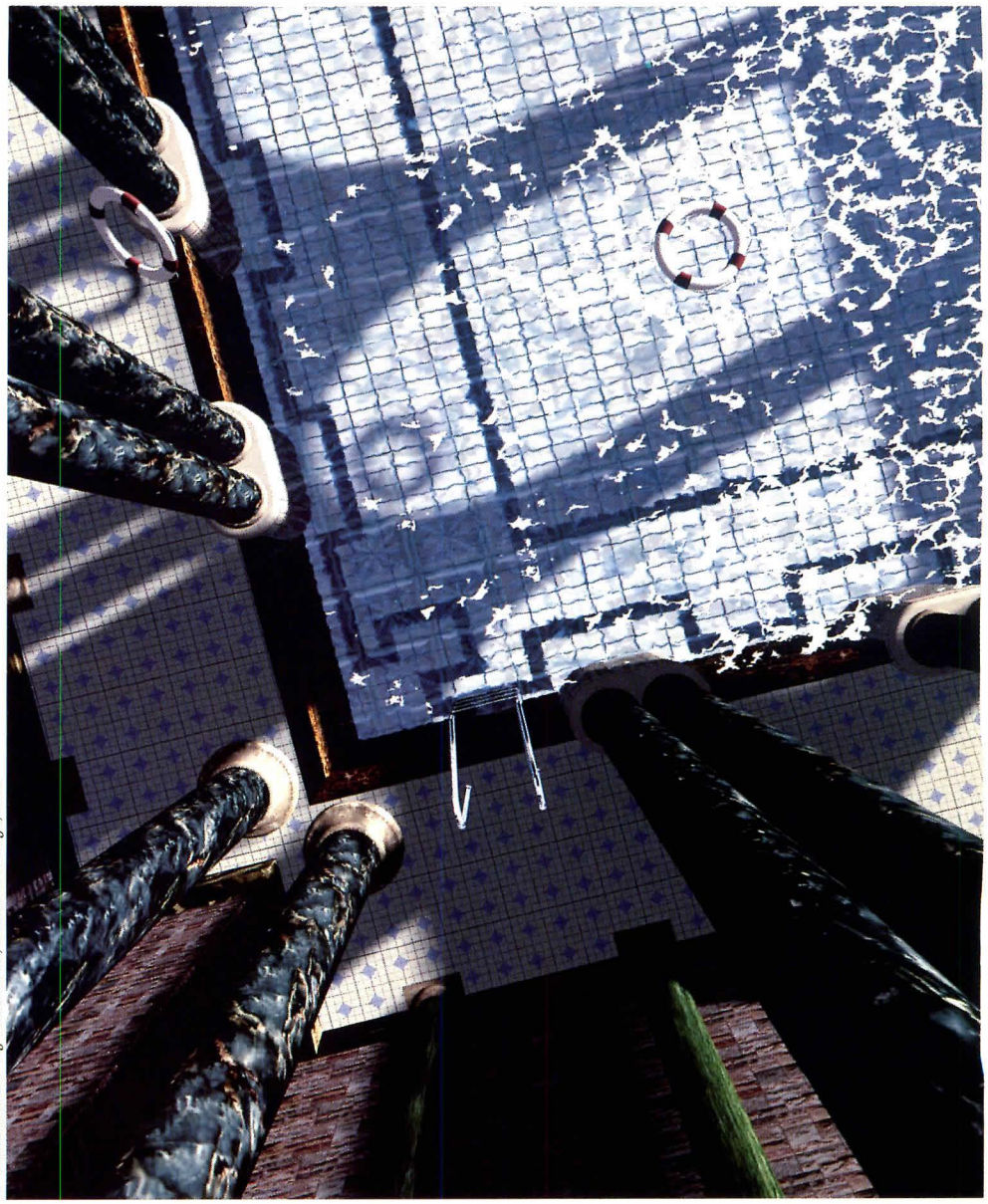
"He who lives by the cellular phone dies by it," Sam said, as he slammed down the receiver.

"Slammed" was hardly the word; the phone weighed only a few ounces, and that included the digital voice recorder—a memory chip that stored his voice in digital form.

"We'll get the signal back in a few moments, boss, as soon as we get out of this tunnel and away from those trucks," the driver said.

"You're right, Charlie—it's just been a long day. I was recording my notes all morning at the Dunwoody site. Just wanted to phone them in to home base and have Millie type them up and E-mail them to the subs."

"Boss, do you even have time to check Millie's work before the letters go out? Millie's just a computer connected to a phone, after all."



© "Bath House" by Alex Arko, Electric Image, Inc.

ElectricImage Animation System 2.0 was used to render "Bath House," created by Alex Arko of Electric Image, Inc.

Though "walk-through architecture" on a screen is in its infancy, and powerful communications software seems to be on hold, the "virtual office" is probably only five years away.

"Sure. I get copies of the outgoing mail delivered to my terminal at home or on the road. I make corrections before giving Millie the OK. But with grammar checker and built-in knowledge of architecture, Millie usually says things better than I could—and adds references to earlier correspondence, the project drawings, contracts and so forth as needed. Everything goes into a database attached to the drawings, so that we can flag changes and generate the as-builts."

"What's on the agenda for tomorrow, Boss?"

"I'll be back at the office working with those drawing files from the 120 North Road renovation. Must have passed stuff back and forth with HVAC and structural consultants about a dozen times. Everybody's using different software, different hardware, even different operating systems. But all the construction plans eventually come together."

Corporate 2000

It is hardly a secret that an increasing percentage of architects will end up working in government agencies and corporate settings. The computer is partly to blame. It makes the design and tracking of changes to a building and its contents more cost-effective.

More complex buildings, with energy-saving systems and more sophisticated environmental controls, require close watching by design-savvy professionals as well.

And, because the nation's office space is overbuilt, there will be increasing competition for desirable tenants—competition that includes offering better allowances for tenant fit-up and customization—even new fit-ups every five or 10 years for tenants who stay.

Archibus, Jacobus Technologies, Primavera, and many others have pioneered inventory and project management software tailored to this market. What might these jobs be like? Our scenario assumes that technology will handle more of the routine chores, leaving time for other tasks. But how much the extra time might translate into creative time is debatable.

Larry staggered into his front door at almost midnight. "I thought your joining the corporate world was going to make your hours more regular," a voice called from the semi-darkness.

"Sorry, Hon. Four new tenants are moving in next week, and we're enlarging our own space. Busy, busy, busy."

"You've seen that much work before, without the crazy hours. What's wrong now?"

"The Southrup job is the big bottleneck. The space they're taking over has been continuously occupied for more than 30 years. We never went in and made good drawings of it. Even if we had drawings on paper, really old-style, we could have scanned them in a few minutes and generated clean files. We didn't even know exactly where the utilities were, or how much hvac and electrical capacity we had there."

"I thought you had a magic machine to take care of that," his wife, Joan, said.

"There was no trouble defining the basic space. We taped a few red one-foot squares to the walls and dropped a few on the floor to act as scales, then videotaped everything. We then fed the tape into our CAD system. The software calculated distances and wall angles from the squares, and provided a 3D model of each room in a matter of seconds. We even got an inventory of the furniture out of the exercise. The software recognizes desks, different chair types, and so forth. What we didn't get was a view of the pipes in the walls, or the wiring. Sure as heck wasn't in line with the rest of the building, either. Ended up doing all of the tracing by hand."

"Was that the end of it?"

"No such luck. The new tenant, Southrup, wants to put in all sorts of fancy wall coverings, carpets, and so forth. We took their drawing files and ran them through our code database, and found a few minor problems. In addition, our cost estimating program shows they'll be a bit over budget, but they don"t want to pay the extra—they want us to swallow it. The boss wants us to figure out a compromise—they get the look but for about 15 percent less."

"Don't you wish your boss was an architect rather than an MBA?"

"On days like today, sure. On the other hand, we ended up finding a solution to all the problems—the software searched the databases of thousands of vendors and plugged their products right into our drawings of the space, right on the screen. Lighting systems, wall coverings, new floors. Got dizzy looking at it all. We were able to sit at the terminal with our tenant's guys and gals and let them choose from dozens of materials—all *cheaper and all* up to code."

"Was that the end of it, then?"

"Not entirely. The computer ordered most of the stuff automatically, but one wall treatment they wanted would have taken too long to get in. At least that's what the supplier's computer said. But Sally tried the old-fashioned phone, and the supplier swore she could deliver on time. Southrup wouldn't buy in—they insisted on believing the computer instead of my live associate! At least we didn't have to enter the change by hand at the keyboard; when the order is automatic, the bill of materials is generated automatically, too."

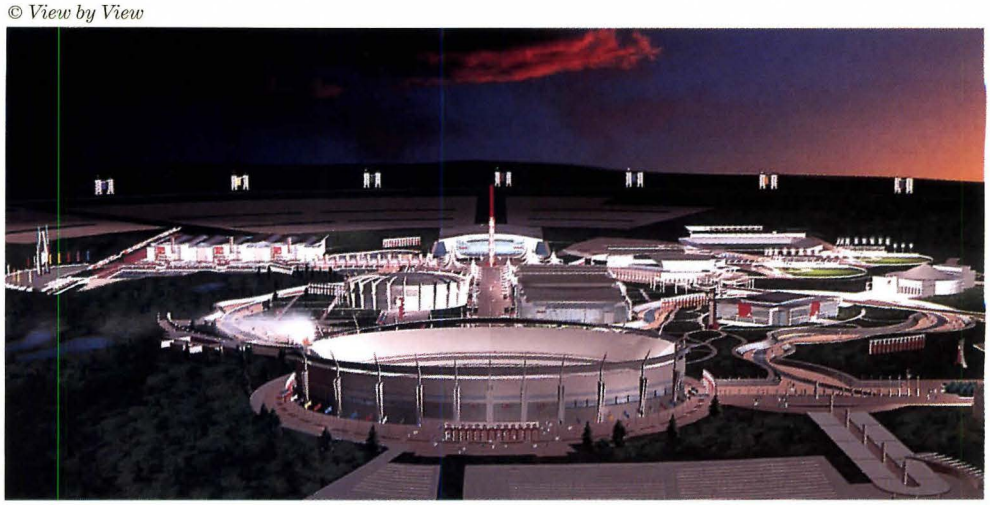
"Larry, do you ever feel you've lost the creative edge? Sorry you left private practice?"

"Not really. Our own expansion gives me the creative jollies—even the boss loves it. And there are certainly more chances for creativity, more materials and more combinations, than there used to be on interior fit-ups. The designs are more complicated, too, now that we don"t have to do much drafting, even on the screen.

"And I love sitting with clients, going through the options and letting a design solution grow on them. The immediate feedback —on a lot of little projects—really is fun. And there isn't much drudgery. Once you set up the system, the software keeps track of the routine stuff—the inventories and so forth. But we sure as heck have lost our appetites for late-night work."

continued on next page

© *View by View*



"Istanbul 2000" was rendered and animated with Electric Image Animation System by the San Francisco firm, View by View, for Istanbul's bid for the Olympic Games in year 2000.

Norma's Story—A Large Practice

There's a feeling among some architects that increasing computer power will narrow the scope for design creativity. This would happen if, for instance, only some manufacturers computerized their catalogs, or if design professionals followed the "advice" of computers without discrimination. There are, for instance, packages that design stained glass windows, stripe parking lots, lay out ductwork, and so forth.

So far, however, extra computing power has been used to explore more design options in a given time, rather than to channel designs into predictable paths. The way has been led by Softdesk, KETIV and others, with sophisticated AutoCAD and MicroStation add-ons and with links to vendor-supplied details and product catalogs on disks. Intergraph and IBM have particularly strong links between CAD and structural design software.

The power has also been eyed to involve clients in more of the decision-making process. While this increases the potential for frequent design changes and for possibly destructive client influence, those dealing with sophisticated clients should benefit.

There's also concern that, to maximize the use of computer power, drawings will have to be clogged with detail—and that adding the detail (defining a vendor for a specific fixture, for instance) will detract from the creative process. So far, however, software has evolved in such a way that you can add detail as needed and as wanted.

This "modular" approach to design—where the drawing is seen as only one aspect, one manifestation, of the project database works best when big projects are handled by teams or predefined taskforces within a practice. Here's how it plays out on a large project, just a few years from now.

Norma and her junior associate, Bill, were bringing their client up to speed on the nearly finished design for Manhattan Village Mews, a mixed-use development proposed for Westchester County, just north of New York City. Here it was, almost Thanksgiving 1999. Construction was scheduled for spring. Her initial presentation was straightforward, using a large-screen terminal connected by digital phone line back to her office. First, she narrated a short on-screen overview tour, zooming in from a regional view to the project itself. Then, the client team took over at the mouse pad, microphone and keyboard, simulating a walking tour of the site.

One from the client team checked out the retail spaces. Another was there to look at the residential structures. A third checked transportation corridors. A fourth wanted to look at rough cost estimates; still another at site preparation costs, and possible environmental problems.

About half the time, the computer responded to oral commands from the assembled team.

Bill allowed himself a smile as the babble continued, but Norma remained a bit tense.

"What's the problem, Norma?"

"Client expectations have gotten so high in the past few years," she said. "At this stage, they used to settle for rough renderings and a cost estimate within 15 percent of final bid. Now they want everything figured so much closer, checked so carefully—and it's still six months before the first earth is turned on the site. They need the animations to sell space, to sell the financial people, the planning board, the neighbors. The banks want so much more detail, to reduce their risk. It all comes back to us."

"But we know this project inside out," he protested. "We've both worked on hardly anything else for the past six months. The team approach is what attracted me to the firm when I graduated in '92."

A sharp discussion broke out among the client team members. "Norma, what's the basis for the high foundation costs expected here, at the north end of the site?"

Norma went to the terminal with Bill and tapped a few keys. After a few moments of discussion, Bill answered:

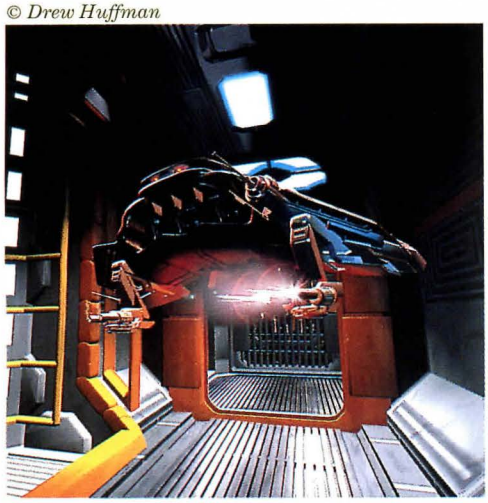
"The geographical information system database strongly suggested a moderately high water table there; we traded off extra foundation costs rather than build higher, to match the first floors of structures here and here."

"What was the GIS evidence?"

"Sandy soil, vegetation, and some historical data going back to the '20s," Norma said, as

What will project and inventory-management software mean to tomorrow's architect? Extra time, perhaps. More creative time? Don't bet on it.

© Drew Huffman



"Iron Helix" by Drew Huffman, Drew Pictures, using ElectricImage Animation.

© Hayes Davidson

"Jubilee Line," part of London Transport's extension of the Jubilee Line tube, rendered with ElectricImage Animation System.

she tapped the keys. "Ah, here it is...and here's our study of the major design alternatives we considered. Note in this column that the final decision was between these two alternatives. They have almost identical construction costs and design values, but the extra foundation work will ultimately save on maintenance."

"Yeah, but the foundation cost will come earlier in the project; we'll have to pay for it earlier," one client-team member noted.

"We've covered that in the estimate, right here," Norma replied. "Eight extra months at 5 percent annual interest. It's still a cost tradeoff."

The presentation went on for hours—at least it seemed that way. In the car, on the way back to the office, Norma mused:

"When I made partner 10 years ago, I thought I had escaped the everyday details, to concentrate on design. After all, there were over 70 architects here, and plenty of young people like you on the way up. Then we hit the dry spell in 1990, and only began recovering four or five years later—in 1995, when you were hired. By then, we had decided among ourselves that designers had to pass on rough designs as computer files, rather than as rough sketches. It saved us time, it saved us money, and it gave us a bit of an edge over competitors.

"That meant we still had jobs, even if we had to do more details. As time went on, we discovered that the designs were better, too—we could use the computer to check shadows, bulk, pedestrian circulation, and so forth."

"Well, the two years I spent as a draftsman after graduation for the Florida state transportation department didn't do me any harm, I guess, before you hired me," Bill said. "Drafting for engineers and planners is a lot drier than drafting for a real architectural design operation. But I learned how a GIS works. "

"That's why we actually hired you over some other good candidates, as I remember. All of you had a creative spark, of course, but you had that and more."

"I had a suspicion that the firm would become more hierarchical, with us lower-level people being put in our place, as business improved, though," Bill said. "In fact, I was warned about that by the principal of a smaller practice that was recruiting me at the time. But it didn't happen, obviously."

"Well, there was no sense to that," Norma said. "True, I spend perhaps 20 to 25 percent of my in-office time on the computer now, either doing conceptual design or checking reports, or 'flying through' a nearly completed design to see what a client will see when we do the presentation. In exchange, I no longer have to interact with the entire practice, only with my own team—for this big project, with another partner, six associates, and outside planners and engineers."

"Who actually decides who's in charge of a project," Bill asked. "Do you partners take turns?"

"Sometimes, but the designer with the best ideas on a project concept has the edge running the team. And remember, it's not simply an honor. The boss has to master things they never taught us in architecture school—management, economics—and in a creative way. But once you master them, it is empowering. Your designs are better, more creative, and easier to defend in clients' eyes."■

Entry Options

312

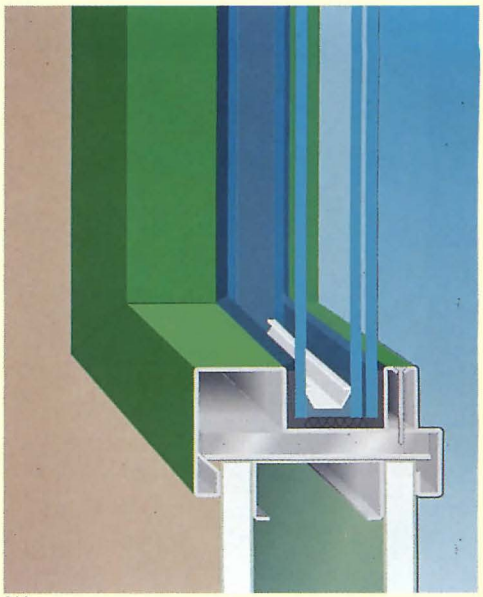
312. Palladian-style entry
A fully glazed round-top residential door may be ordered surrounded by sidelights at a compatible scale. Units, built -to-order in a choice of woods and a range of heights and widths, are furnished primed and ready to paint. Kentucky Millwork, Lexington, Ky.

313

313. Outswinging patio door
A new hanging option on Caradco's one- or two-panel French-style Manor door line saves the interior swing space required for inward-opening versions. Door interior surfaces are natural wood ready for priming or staining; exteriors are available in primed wood, or clad in white-, bronze-, sandstone-, or custom-color aluminum. ADA-compliant low-profile sills are offered on several door-panel widths; standard heights are 6-ft 8-in. and 8-ft. Caradco, Rantoul, Ill.

314. Fire- and attack-resistant glazing
ContraCrime, a polycarbonate sheet and fire-glazing assembly, has been designed specifically for the 45-minute performance requirements of such fire-rated and secure applications as nursing stations in a psychiatric hospital or prison day rooms. Lights are made up of a polycarbonate (Lexan) interlayer sandwiched between a tempered glass light and a 1-in.-thick Contraflam panel. With an overall thickness of 1 1/2-in., it is thin enough to fit into standard 14-gauge fire-rated hollow metal detention door frames without adjustment. Large panels of the ContraCrime assembly—48-in. wide by 102-in. high—have been tested to ASTM E-163 (for fire-rated windows). It also has an attack resistance of 17.55 minutes according to the California Department of Correction's Security and Attack test, which involves multiple attacks using sledge hammers, propane torches, and ball-peen hammers. Configurations to meet higher attack levels are available.

As of September 1994, this source will offer a clear, fire-rated safety glass called SuperLite, made in the United States and available on short lead times. It will replace Pyroswiss, a product for similar applications. Safety and Fire Technology, Inc., Division O'Keeffe's, Inc., San Francisco.



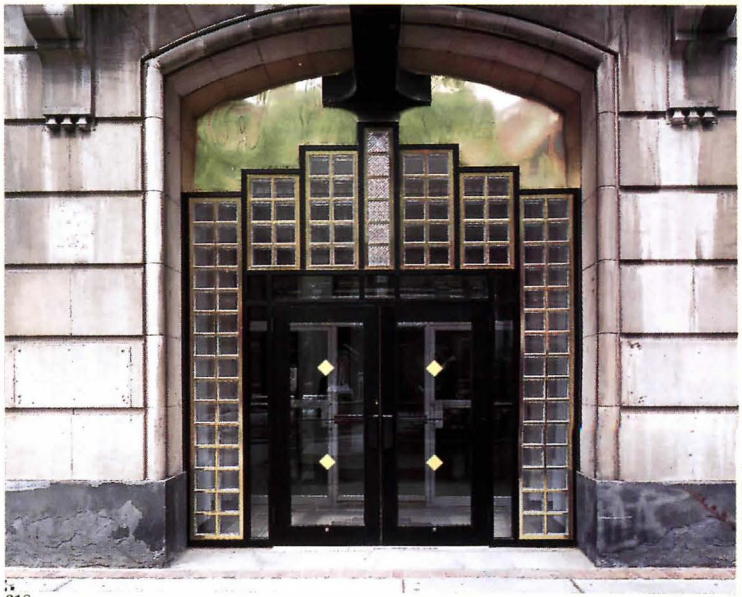
314

315. Full-vision fire door
Ceco's new door is said to be the largest non-wired 45-minute glazed opening available in steel door and framing products. Glazed with a Contraflam polymer-gel panel, the vision light meets impact-safety requirements for hazardous locations, as required by CPSR 16, CFR 1201 Cat. II, and ANSI Z.97.1. It has been tested for 20- and 45-minute fire ratings on fully glazed doors up to 4- by 9-ft, and single-pane vision lights of up to 32 sq ft. Ceco Door Products, Brentwood, Tenn.

315

Innovative doors—for entry, passage, and cabinet—offer a number of light-transmitting glazing and sidelight configurations.

316



318

© Britt Stokes

© Steve Hall photo

317

316. Beyond the bathroom
The latest in a series of finely crafted modular cabinets originally intended for the luxury bath, F Series cabinetry offers several un-medicinal color and design options. Made of anodized aluminum with a satin finish, door frames may be ordered in silver, gold, black, blue, green, turquoise, or red. Glazing choices include clear, frosted, patterned obscure, or double-sided mirror glass instead of standard mirror; the interior back of the cabinets is mirrored, as shown. Cabinets come 16-, 20-, or 24-in. wide by 4-, 6-, or 8-in. deep; height is 30 or 40 in., and they can be stacked. Shelf lighting may be specified. Robern, Inc., Bensalem, Pa.

317. Doors as Art
An architectural artist involved in creating large-scale work that incorporates glass with bronze, steel, and marble, Stephen Knapp has constructed curved walls 9 ft high by 28-ft long entirely of kiln-formed glass. The pair of doors pictured, on semi-permanent exhibit at Chicago's Merchandise Mart, provide a close view of what the technique can achieve.

The kiln-forming process heats sheet glass almost to melting, making it slump or sag into molds. The upper surface of the glass stays smooth, while the underside follows the pattern and texture of the mold. The gas or electric kilns used are large enough to permit forming glass in 4- by 6- or 8-ft pieces. Set-up work can be done before the doors are heated, and notches or patch- fitting holes can be made. The fabricating process keeps the edges flat, so the finished door fits standard metal rails, as shown. Kiln-formed glass can be tempered to meet safety codes, and is suitable for commercial and residential use, indoors or out. Although only about 1/2-in.-thick, light diffusing and refracting through the patterns gives an impression of greater depth. Stephen Knapp, Worcester, Mass.

318. Glass-block door surround
The IBP aluminum grid carries glass block "lightly"—without the visual weight of mortared installations. Grid pieces are interlocking extrusions, in a choice of six standard colors for the interior face. The stair-stepped glass-block sidelight and transom, placed in a 19th century store in Oneonta, N.Y., was designed by Lee Richard Friedman, Architects. Innovative Building Products, Inc., Acme Brick, Fort Worth, Texas.

More glazed doors and specialty glass are covered in Product Literature, page 117.

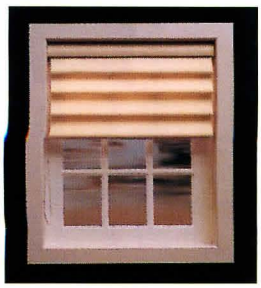
Product Briefs

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

319. Priced right
The Pronto office chair is said to combine high ergonomic performance with affordability: a list price that starts at $435 purchases a range of user-adjustable functions from seat height to back tension. Available in an armless version, or with wood or polyurethane-foam armrests (also adjustable). Girsberger, Inc., Smithfield, N.C.

320. Good wood
A multilaminar veneer, made in Italy under exacting environmental controls using wood from fast-growing farmed trees, Formica Ligna surfacing can replicate standard grains such as mahogany and cherry, and exotic species, as well as birdseye and burl patterns; or dramatic abstracts such Gulfstream, shown on a Knoll table. Fabricates like any laminate. Formica Corp., Cincinatti.

321. Hard wood
A source of hard rock maple counters and butcher block for professional kitchens since 1887 offers residential countertops in sizes up to 145- by 25-in. fabricated for standard, corner, sink cut-out, run-out, and island installations. Finish options include matte oil and, for non-cutting surfaces, Tuff-Var semi-gloss. Backsplash available. Fax 800/433-2667. John Boos & Co., Effingham, Ill.

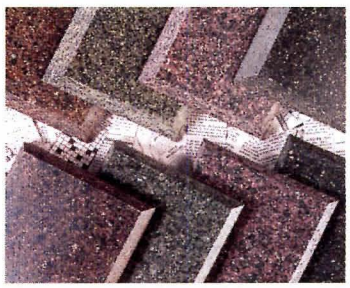


322. Roman-look roll-up shades
New Vignette "shadings" are made of woven polyester fabric fastened in soft folds to a knit rear panel. They're raised into a discrete curved headrail by a continuous-cord loop. Design options include three fabric-fold sizes (to 4-in.-deep), widths of up to 6 ft, satin- or basket-weave cloth, and 15 colors. Hunter Douglas Window Fashions, Broomfield, Colo.

323. Modern textiles
An expanded Archives Collection includes Modern American designs appropriate for residential, hospitality, and contract use. Based on original patterns by Ruth Adler Schness and introduced in the late '40s and early '50s, five coordinated designs include silk-screened casements and all-cotton woven upholsteries. Unika Vaev USA, Norwood, N.J.

324. Arts & Crafts wallcovering
Called Field Guide, the pattern shown is from a new line of acrylic-coated Modern Bungalow Papers intended to evoke hand-made effects. The "worn tile" look was done by casting sepia-toned floral sketches in pigmented plaster, and separating the design into screenprints by hand. Rolls are 26-in. wide; class A rated. Carolyn Ray, Inc., Yonkers, N.Y.

325. Old craft, modern palette
Made by Tibetan exiles in Nepal using unbleached sheep's wool and colored in vibrant modern tones by Swiss metallic dyes, Tufenkian carpets express an ancient textile technique in lively contemporary designs. Motifs include reinterpreted, abstract primitives, Arts and Crafts, Deco, and Southwestern patterns. Tufenkian Ventures, Inc., New York City.



326. Faux-stone biocomposite
Made by combining a soy-flour resin with cellulose fiber gleaned from recycled newsprint, Environ has the apparent pattern depth of natural stone, but can be cut, screwed, and glued like hardwood. Harder than oak, it has a Class II flame-spread rating, and is suitable for millwork and interior vertical and non-wet horizontal surfaces. 800/324-8187. Phenix Biocomposites, Inc., Mankato, Minn.

Short Takes

Bad science strikes again
Compelled to ignore (as federal regulations require) contradictory and sounder research, Health and Human Services head Donna Shalala included glasswool (fiber glass) in the annual Report on Carcinogens, as an initial step in hazard identification. The HHS listing was mandated by results of experiments that injected or surgically implanted large (relative to the subject) amounts of the material into rats, although the Secretary acknowledged that the listing criteria needed review. Meanwhile, Canadian scientists have already found, following a review of all current research including inhalation studies, that the insulation is harmless under the circumstances of everyday life: "unlikely to be carcinogenic to humans."

More M & As
• Firestone Building Products of Carmel, Indiana, bought the EPDM single-ply roof-membrane business of Colonial Rubber Works, Kingstree, S.C., a division of M.A. Hanna Co.
• Modu-Line Windows, of Wausau, Wisconsin, has acquired the extrusion dies and all rights to the architectural-aluminum products formerly made by Marmet Corporation, also of Wausau.
• Chicago Metallic, a major manufacturer of ceiling products, has bought Alcan's ceiling-products business.
• Hardware manufacturer Newman Tonks acquired Hartmann Sanders, a maker of architectural-wood columns in Doraville, Ga.

MACINTOSH & ARCHITECTS

COMPUTER AIDED PRACTICE

This computer image, by Santa Barbara Studios, is for the television production of *500 Nations*.

A NOTE FROM THE EDITOR

Terry A. Beaubois, AIA
Terry Beaubois & Associates
Palo Alto, California

1. *Affordable digital cameras*
2. A truly portable, fast, powerful, color lap-top computer and
3. A desktop computer with the speed and power of a workstation.

These are the three advances in the last year that motivate me to communicate to other architects about the opportunity that exists for us to either re-establish the architect as a major player in the building design-construction process or to further develop our roles as such (depending on your view of what position architects currently hold).

From the overview of the Computer Aided Practice we can look at how these tools can work for us. Many architects feel that it is time for us to look at the entire practice and how we can use computers in the business, the science, and the art of architecture. Not just drafting, not just word processing, not just accounting. These are very important, but they are just parts of the practice of architecture.

Architects have the opportunity to evolve as leaders in the approaching multimedia, computer-oriented business environment. In my opinion, architects have always been multimedia professionals. We use paper, pencils, pens, cameras, slides, mylar, posterboard, videos - anything we can get our hands on - to communicate our ideas about buildings made of wood, steel, glass, concrete, plaster, marble, and tile.

Computers and computer-multimedia are just new tools for us to put to use.

I have learned a lot from the many architects that I interviewed in preparation for this article. There are many talented architects all over the country finding extremely creative uses for their computer hardware and software. Many architects find that it makes them more competitive. Many find it makes the practice of architecture exciting. It is my hope that their stories will be of value to you in your practice.

Terry Beaubois has been using computers in the practice of architecture since 1978. A graduate of the University of Michigan College of Art and Architecture, Masters of Architecture program in 1972, he has practiced architecture in Michigan, Massachusetts, and California. His design experience includes hospital, high-tech, public, hotel-resort, and residential design.

He has lectured at Stanford University on the advanced use of computers in the practice of architecture and to the AIA PIA on Computer Aided Practice. In addition to his architectural practice he is the president of RDC MultiMedia. RDC specializes in producing digital media for the building industry.

APPLE MACINTOSH AND ARCHITECTS

Publisher
Roscoe C. Smith
Architectural Record

Editor
Terry A. Beaubois, AIA
Terry Beaubois & Associates

Editorial assistant:
Kelly Davenport
Terry Beaubois & Associates

Project Manager
Creighton C. Nolte, AIA
Technical Markets
Marketing Manager
Apple Computer, Inc.

Art Direction
Clarke/Thompson

Creative Director
Nicholas F. Parslow

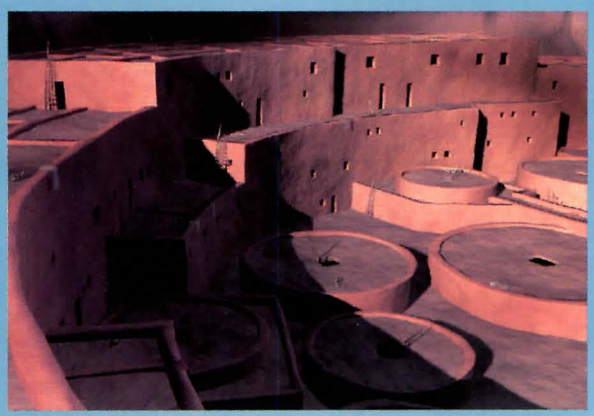
Art Directors
Glen Fuenmayor
Viviane Tubiana

The Cover Image

Not the image you would expect to accompany an article on computer aided practice? This is a detail from a computer rendering of Pueblo Buenito in Chaco Canyon, New Mexico. This image is representative of using your computer to do old things in new ways, doing something you might not have not thought of using the computer for; getting results much better than you may have thought possible from a computer; and not becoming extinct.

This archeological recreation is by Santa Barbara Studios, Santa Barbara, California for *500 Nations*, a television production by Pathway Productions, Inc., which will air in the Fall of 1994.

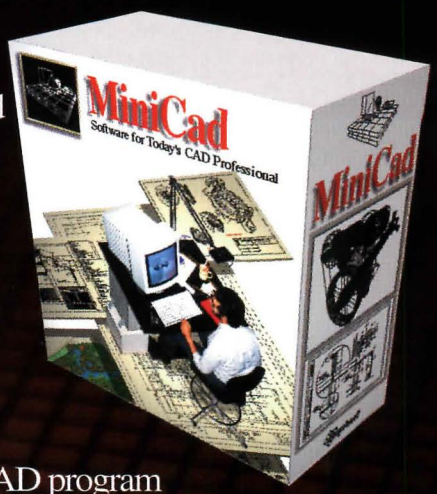
Modeled with form•Z, rendered with Renderman, animated with Wavefront.

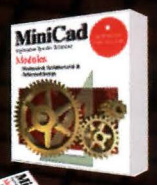


Should the New MiniCad 5 be your CAD Program?

Take the Quiz.

- I want a full-featured, proven market leader which can handle any job: 2D, 3D, cost estimation and client presentations.
- I want a program that runs on both the 68K-based Macintosh and the Power Macintosh. At no extra charge!
- I want a CAD program that is tailored to my needs, with specialized tools for architecture, mechanical engineering and design.
- I want an expandable CAD program which can be customized for specific solutions easily and inexpensively.
- I don't want to spend a lot for training or experience an enormous learning curve.
- I want an established company with constant R&D funding, so that my investment stays safe.





Accelerated for Power Macintosh

3 Free Application Specific Modules
Mechanical, Architectural, & Advanced Design

MiniCad 5 offers all of the above and more. Hailed as the "features champion" by *Macworld* Magazine, MiniCad 5 includes: • big speed increases on both 68K-based and PowerPC based Macintoshes • translators for importing and exporting to the other major CAD products • multi-media training CD • 18 months of free technical support • no-hassles 30-day money-back guarantee through authorized dealers • $495 Claris CAD upgrade price and free Claris CAD translator • an upcoming Windows version. MiniCad has long been the price/performance leader in Macintosh CAD. Join the thousands who have increased their productivity by using MiniCad and make MiniCad 5 your CAD program.

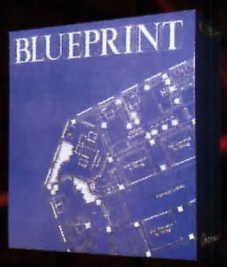
Azimuth

The ultimate map creation tool, including nine cartographic projections and more! Used by US News & World Report. 4 mice

Also from...

Diehl Graphsoft Inc.

Graphsoft



Blueprint

Full-featured 2D drafting. Experience ease of use, high precision and an affordable price. 4 mice. MacWorld Editor's Choice!

10270 Old Columbia Road, Suite 100, Columbia Maryland 21046 Ph:410-290-5114 Fax: 410-290-8050

Power Macintosh is a trademark of Apple Computer Inc. MiniCad, Blueprint, and Azimuth are trademarks of Diehl Graphsoft, Inc. Claris CAD is a trademark of Claris Corp.

Circle 23 on inquiry card

VIEW BY VIEW

San Francisco, California
Mieczyslaw Boryslawski

Mieczyslaw Boryslawski has a passion for his work. His work is creating some of the most highly developed and beautiful architectural computer images done to date. Currently working on a project with the AIA and the *White House*, he proudly discusses the opportunities he has had — really opportunities that he has pursued and created — to be involved in numerous exciting architectural efforts. They include images for the Istanbul 2000 Olympic bid proposal, the Yerba Buena development in San Francisco, the South African Olympic 2004 bid, and a $200 million R&D campus for Chiron Corp. with Ricardo Legorreta. His background includes a degree in architecture from the University of Capetown, construction management experience with Bechtel, and early computer involvement with Architrion.

View by View created this image of the White House on a Macintosh computer, as part of a project with the AIA. A CD-ROM that will be produced about the "Greening of the White House" is under way and in October 1994, an announcement event will occur at the United Nations.

"Architects could be much more advanced than we are. My dream is for architects to get better fees and design better buildings that are less costly to build, because the quality of the imagery done during the design stage accomplishes two things: 1) it communicates the value of the architect in the design and construction process and 2) it allows for crucial decisions to be made during the design process, when they are less expensive to deal with, rather than expensive changes during construction."

Hardware: Power Macintosh • 950 Quadra • 2 gigabyte hard drives • 74MB RAM per machine.

Yerba Buena Entertainment/ Retail Center
Architects: SMWM,/ Gary E. Handel Associates
Developers: WDGV, San Francisco with Millennium Partners, N.Y.

The Passionate Perspectivist

He views the computer as a "tool for survival" and is dedicated to using off the shelf hardware and software. "Anyone who is talented without a computer, will have talent on the computer. An architectural firm could do all of their modeling and rendering in-house, we can teach them how." But, many architectural firms can't justify the cost of having that level of computing power and software resources in-house. These firms can consider modeling their buildings on their own computers and then engaging a service bureau, such as View by View, to achieve the higher level of architectural computer rendering.

Always on the cutting edge, Mieczyslaw, along with his partner France Israel, is taking a leadership role in pushing the limits of what can be done with architectural computer imaging. View by View is co-sponsoring a conference in San Francisco where about 400 members of the American Society of Architectural Perspectivists will meet and view each others' work.

View by View's future plans include live-linking to architects' and developers' computers in various locales via ISDN lines and to continue to put their talents to work on projects all over the world. **M&A**

"My dream is for architects to get better fees and design better buildings that are less costly to build."

Computer Aided Practice.

You're on the job site and take a picture with your digital camera, download it to your color laptop computer, modify the image using a graphics program, make some notes, and then head back to the office. Later that afternoon you bring the image up on a desktop computer and further modify the image. You then generate a letter of agreement/contract on the word processor and a proposed project schedule. That afternoon you show it to your client, comments are made, and the project proceeds.

Fiction? The Future? No, it's what some architects are doing today. What used to take weeks can now happen in days, if you are set up to perform efficiently. As the case studies in this article feature, architects can and are taking advantage of the technological advances which are changing computers — both hardware and software.

The question of what leads to successful computer use in an architectural firm is an important one. Computers can and will play a significant role in the practice of architecture. A recent study done for Architectural Record reports that 94% of the firms included in the survey have at least one computer in their office. In many offices the ratio of people to computers is at or approaching 1 to 1.

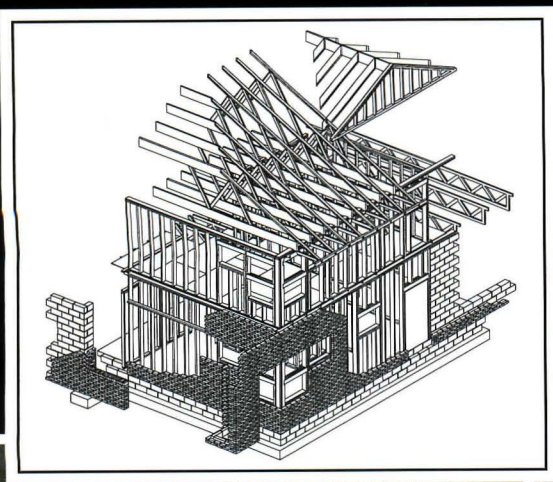
The most popular applications for computers in the architect's office are word processing, specification writing, accounting, and drafting, according to the survey. Yet, most of the focus on computers in the architect's office has been on CAD, or computer aided drafting.

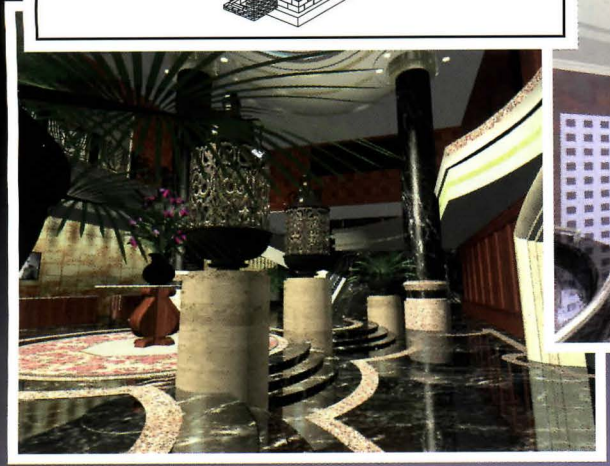
The speed and capabilities of computers are continually advancing and it is appropriate to update the consideration of the role of the computer in the architect's office. Computer Aided Practice is taking into consideration *all* aspects of the practice of architecture and how the computer can assist in the performance of a variety of tasks including, but not limited to, drafting.

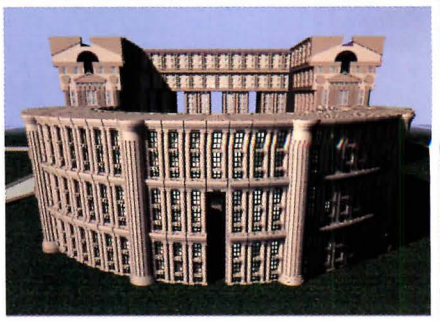
As our clients' use of computers continues to increase, and as our clients expect better and faster services from us as professionals, we will rely more and more on the power and speed of computers. Knowing the capabilities of current hardware and software is imperative.

Apple Computer has set its technology track as a company and created an opportunity for architects to follow a path that starts where you are today and helps you to stay on top of the successful practice of architecture.

CONTINUED ON PAGE 6







All models created with **form•Z**. *Below:* Le Corbusier's Ronchamp by Mark Niemi, auto•des•sys, Inc., rendered with **form•Z**. *Above, clockwise from top left:* Model by Sean Thompson, Heather Cross, and Charlene Tu, University of Cincinnati; Building by Sullivan Gray Bruck Architects, model by Marty Clayton, Electric Pictures, Columbus, OH, rendered with InfniD; Richard Bofill's building at Marne-la-Vallee, France, model by Mitsuyuki Ishi, Tokyo, Japan, rendered with ElectricImage; Bathroom by George Chang, George Chang Design, Emeryville, CA, rendered with Strata StudioPro; Hyatt Hong Kong, model by Teresa Williams, See^3, Culver City, CA, rendered with ElectricImage.

form•Z

3D form synthesizer

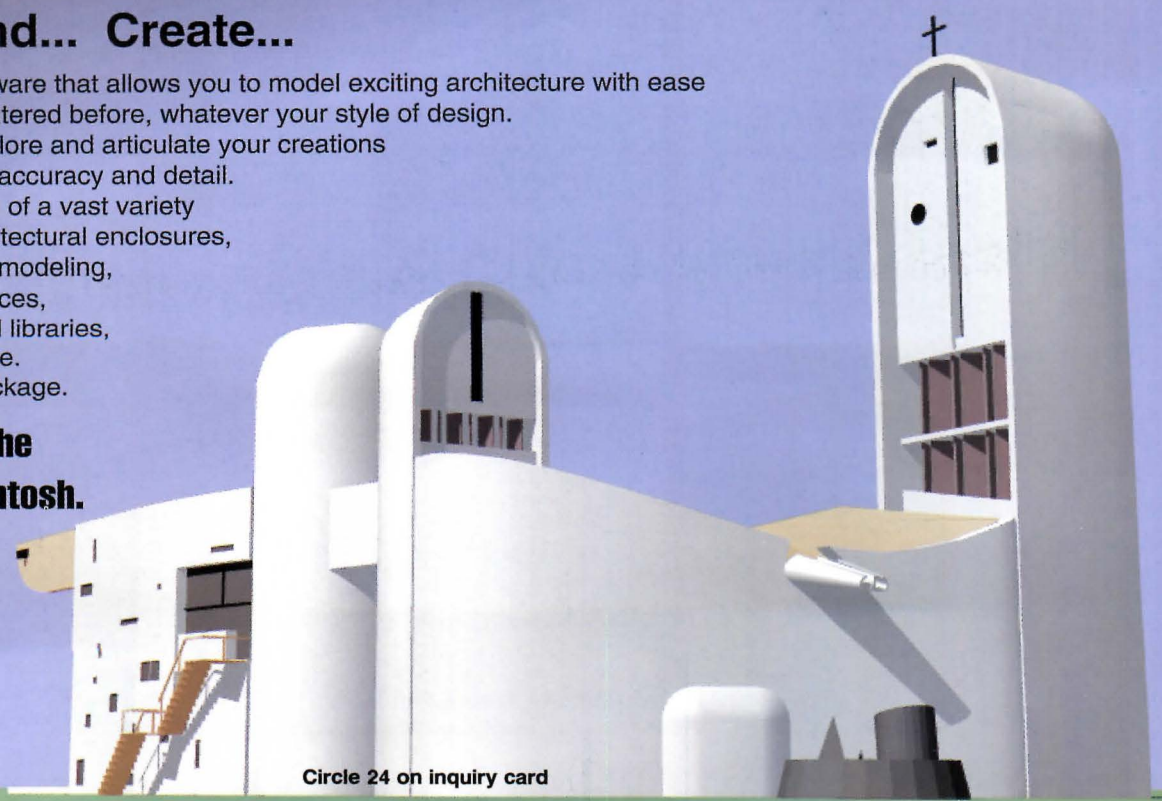
MACUSER EDITORS' CHOICE AWARD 1993 WINNER

Accelerated for Power Macintosh

Visualize... and... Create...

with the award winning software that allows you to model exciting architecture with ease and versatility never encountered before, whatever your style of design.
Sketch your ideas, then explore and articulate your creations beyond sketching with high accuracy and detail.
Quick interactive generation of a vast variety of 3D forms, including architectural enclosures, Boolean operations, terrain modeling, NURBS based curved surfaces, 3D text, 2D/3D symbols and libraries, rendering, drafting, and more.
All integrated in a single package.

form•Z runs on the 68K and Power Macintosh.



autodessys inc
2011 Riverside Drive
Columbus, Ohio 43221
(614) - 488 - 9777
fax (614) 488-0848

Circle 24 on inquiry card

ORCUTT/WINSLOW PARTNERSHIP

Phoenix, Arizona
Mark Patterson, AIA

Mark Patterson is a Systems Administrator and Project Manager at Orcutt/Winslow Parnership in Phoenix, Arizona. "We're finding that computers are involved in literally every aspect of what we do now. Scheduling, estimating, design, drafting, just everything. And it's been very well received by our clients. The more computers we get, the more work we get, the more people we get. The Phoenix architectural market is thriving and we've been able to position ourselves well to meet the increased demands and increased expectations of our clients as a result of computerizing our practice."

"Based on our experience, we are eager to encourage architects to get involved with Macintosh computers. Many firms are tied to their DOS machines because of their clients, but we have proven through technology that we can work with clients' and consultants' DOS files even more efficiently and economically", Patterson said.

"This cutting-edge technology is changing the way we think about architecture and the way we practice architecture", Patterson comments. In Orcutt/Winslow's search for easy transportation of drawings between clients and consultants, a bbs (bulletin board service) seemed like a concept that would be feasible. With the help of their local vendor, they located some software that allowed them to set up their bbs — Telefinder by Spider Island software and FirstClass by SoftArch. "It has worked for us for two years. It really saves time and it's a great system. Our clients or consultants can send us a file, any time, day or night. Also, using the DXF translator in ArchiCAD, it automatically translates DOS to Mac when files are sent to the bulletin board."

Recently the Orcutt/Winslow Partnership purchased a non-linear video editor — an AVID system — and did a marketing commercial for a client. Using ArchiCAD, they modeled the Phoenix Valley and did a fly-by and zoomed into one of their buildings. "Combining ArchiCAD and AVID we are poised on the verge being able to do full video animations and our clients love it!" says Chuck Hill of Orcutt/Winslow.

Orcutt/Winslow uses renderings done in ArchiCad to finalize design concepts and obtain client approvals.

"This capability allows us and our clients to explore various options. We have found that ArchiCAD is being used as both a design tool and a production tool. We are using it 70-80% as a production tool, 20-30% as a design tool. As we learn more, it will come closer to 50-50%. In version 4.5 there is a dynamic link between floor plans and sections. We also use ArchiCAD for details and a detail library."

Orcutt/Winslow's administrative operations are 90% computer based. They are now utilizing Microsoft Project for their project scheduling. Excel provides for manipulation of database information such as cost estimating. All transmittals are done on computers. "Our people are editing their minutes in the field and then sending them to the clerical staff for proofing. 60-70% of our documents and correspondence are done by the architects themselves."

More Computers, More Work!

Orcutt/Winslow is in the process of developing a comprehensive database for their projects. "Clients are expecting more information and we need to be able to track all of the information about a project from start to finish — initial client contact through final inspection. We are evaluating Filemaker Pro, 4th Dimension, and FoxPro to manage all of the data."

In Business since 1972, the Orcutt/Winslow Partnership is an architecture, planning, research, interior design firm specializing in the design of people-specific, energy efficient educational, healthcare, commercial and government projects. **M&A**

"Computers are involved in every aspect of what we do."

Hardware: 40 computers total, all Macintosh • 20 dedicated CAD stations • everything from an old FX (still reliable) to Quadra 950's • Apple LAN running on Apple Share • Will be adding Power Mac as a server • plan on 1st quarter of next year getting Power Macintoshes office wide • either upgrade Daystar and Apple.
Software: ArchiCAD • Excel • Apple File Exchange • Microsoft Project • PageMaker.

CONTINUED FROM PAGE 4

Three Levels of Computer Users.
For purposes of this discussion we are looking at three levels of computer users. Level One is a Novice, Level Two is a Computer User, and Level Three is a Power User. After that, we discuss where this is all headed for architects and architecture.

Level One - Computer Novice:
If you have never used a computer yourself, do not panic. Not only is it not too late to start — it's a great time to start. You have missed a lot of the "early adopter" struggles with computers and now prices of hardware are lower than ever. The numbers for speed and storage are greater, plus there are more and better software programs for architects and our related tasks. But there is no need to wait any longer.

Look at your computer use as something that is not going to happen over night. Think of it like learning to walk, learning to talk, or learning to drive a car. Give yourself time and don't be hard on yourself — it is somewhat complex. It will also include encountering unfamiliar words (like RAM, ROM, LAN, etc.) but you will eventually pick up on the ones that will be important for you to use.

But do set a path for yourself, and get on it as soon as possible. My concern is that architects who don't come up to speed on computers themselves (not just the staff in their drafting room) are going to be left out of the business world that is rapidly developing. One look at the cover of any current business magazine will show you what your clients are dealing with — LANS, WANS, the Internet, CD-ROMs, Online, Electronic Commerce, MultiMedia, the WIRED Company, and Enterprise Workflow. And even if you don't deal with corporate clients, with the popularity of home computing it may not be long before a residential client hands you her program requirements on a floppy disk.

Students
If you are a student, Apple has some great new products and they have special prices for the educational market. Definitely check out your local Apple Campus Reseller.

You should be learning a word processing program and a drafting program at a minimum. The more you can do on a computer when you graduate, the more valuable you will be to potential employers.

Microsoft Word or WordPerfect are common word processing programs. Drafting programs like MiniCAD and PowerDraw are good to begin with. For 3-D work consider ArchiCAD. If you are headed for a big firm you will need to be aware of AutoCAD and MicroStation. MiniCAD, PowerDraw, Architron and ArchiCAD have already released a Power Mac version of their software and it has been announced that MicroStation will be coming out in a Power Mac version.

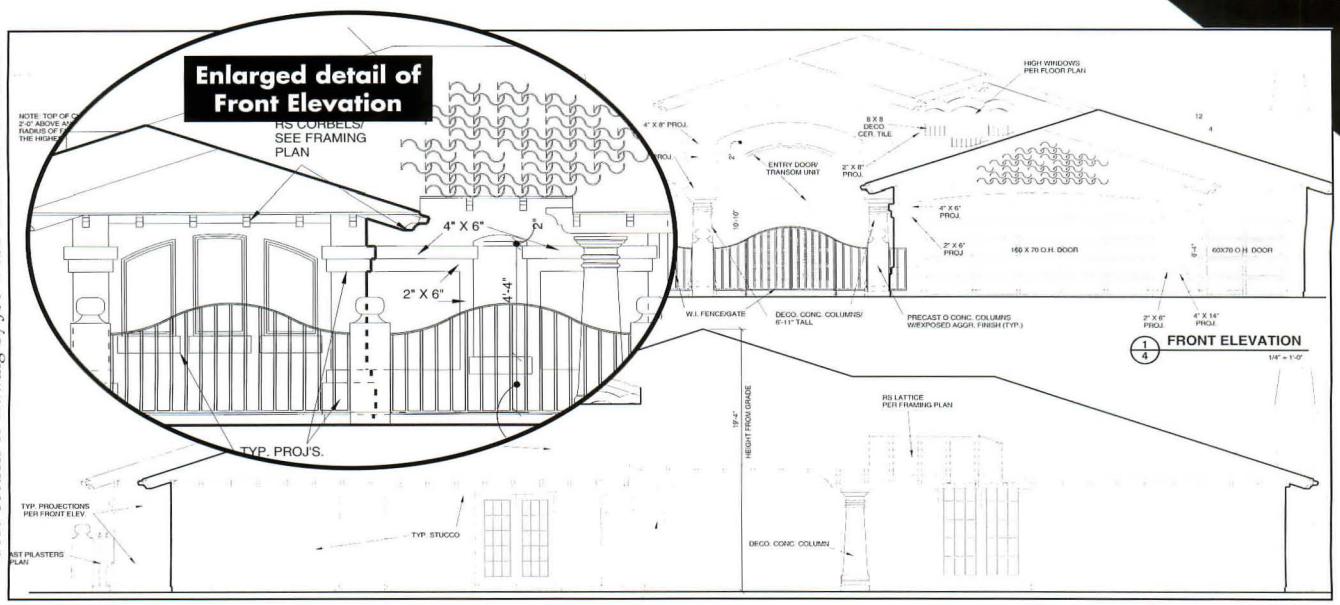
CONTINUED ON PAGE 8

Don't Get Left Out

New! Available now.

PowerCADD™

the Power Macintosh version of PowerDraw



Reduced section of drawing by Joe Webb created in PowerDraw

Engineered Software,

It's been almost a year since I started using PowerDraw in my architectural practice, and I'd like you to know how pleased I am with my decision to purchase your product. After just two days of working with PowerDraw, I was able to start my first working drawings. I was quite comfortable with the results and have since gotten to the point that I'm probably twice as fast using PowerDraw as hand-drafting. While I was concerned, at first, that I might be "left out" by not using a PC-based system and software, I've recently completed a large contract that was started on a PC using AutoCAD. Translating the DXF files was easy, and there was virtually no difference in working with the files.

What was really gratifying was working with your patient and supportive staff every time I had a question. They gave me confidence and led me to realize that this indeed is very highly-refined software. That realization ended the frustration of learning and turned it into pleasant discovery. I'm completely satisfied with PowerDraw.

Sincerely,

Joe Webb

Joe Webb, Architect

Phoenix, Arizona

PowerDraw™

IN 41 COUNTRIES AROUND THE WORLD

ENGINEERED SOFTWARE™

CALL 910-299-4843 OR FAX 910-852-2067

IN CANADA 204-453-8111

1990 HONORABLE MENTION MacUser

MACWORLD MW EDITORS' CHOICE January1993

Circle 25 on inquiry card

ALAN BROWN ARCHITECTURE/ CONSULTING

Atlanta, Georgia
Alan Brown

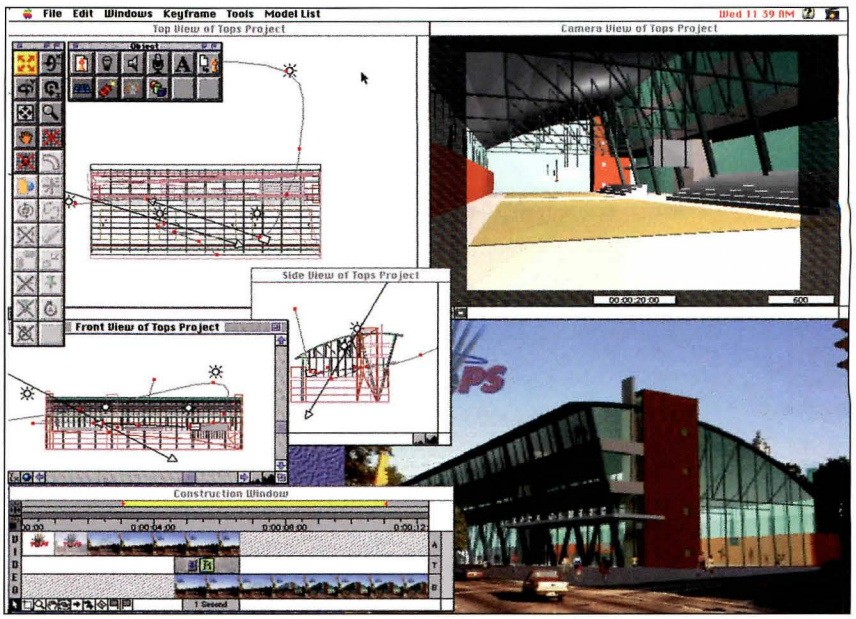
Alan Brown is an architect who works out of his home office, with clients all over the U.S. "With fast modems, computers, and my own BBS, it's like my clients are in the next room," Alan asserts. "While the information highway is currently just fiction, there are things one can do right now. The ability to communicate over the telephone lines can make some of the information highway happen today."

Alan makes it work with a Macintosh Classic as a BBS (Bulletin Board Service) connected by a modem to a telephone line. Alan uses Telefinder, a communications program which resides on the Classic, to manage the BBS activity. He has supplied each of his clients with a high-speed modem, which they connect to their computers. With this system Alan can send a file or receive a file from any client, any time of day. "They put files in, I put files in - it really is like they are in the next room. You can take a 10 megabyte Photoshop file, compress it in QuickTime (using QuickTime's JPEG compression) to 1 Meg and send it by Telefinder over phone lines." In this way Alan can send his Photoshop illustrations and large files to clients and service bureaus.

Alan recently worked with Nix Mann & Associates, a healthcare architectural firm in Atlanta. Working with Jimmy Smith, an associate at Nix Mann, Alan assisted with a competition submittal for a healthcare client in Birmingham that had asked for a videotape submittal from each firm. Alan modeled the existing site in form•Z; animated the model in Electric Image; and then edited it using Premiere. The schematic plans were done in Blueprint, he altered photographic images using Photoshop, and brought it all together in Director. Because Jimmy is recognized for his sketching ability, they included a segment of video footage of him drawing — a strong concept that could be presented better in motion than in stills.

Power User

"Working with Apple equipment is more like working on your desk with penciland paper. I make use of Illustrator and Premiere, in addition to MiniCAD, Blueprint, and Microstation. They may not be the tools we would immediately think of as being software programs for architects, but they should be considered." **M&A**



A gymnasium design in Atlanta demonstrates the process of integrating photographic images and computer models to create Quicktime movies.

"Working with Apple equipment is more like working on your desk with pencil and paper."

Hardware: (Using Macs since 1987) • Quadra 800 with VideoVision Studio • Power Macintosh 8100 • PowerBook • Macintosh IIcx with Rocket • Macintosh Classic • Newton • Quadra 650 • SONY Hi8 V-Deck (Macintosh Compatible).
Software: (Alan uses "25 programs all of the time" his main ones include:) • form•Z • Electric Image • Premiere • Photoshop • Blueprint (and MiniCAD) • Illustrator • Director • Stratavision 3D (Studio Pro) • Freehand • Canvas • Intergraph Microstation.

CONTINUED FROM PAGE 6

More firms than ever are looking for graduates with computer experience, but not all. We are still in a transition period where you may graduate with computer skills and find that they exceed what is required of you at firms where you may apply for work. They may not even use computers, but you could be the one to introduce the firm to computers and help them get started!

Recent Grads

If you are job seeking or a recent hire, having a computer at home is a good move. Obviously it is best if it is compatible with the ones at work. Each Macintosh can read and write to Macintosh and IBM compatible 3.5" diskettes, so you can put data from your office PC on a diskette and continue working on your project at home on your Mac, running Apple's PC Exchange. This allows you to work at home and gives you some flexibility as to when you leave the office. Night and weekend work can still be a part of many architectural efforts and you may enjoy it more at your own place, when it is acceptable to your employer.

Level One Principal

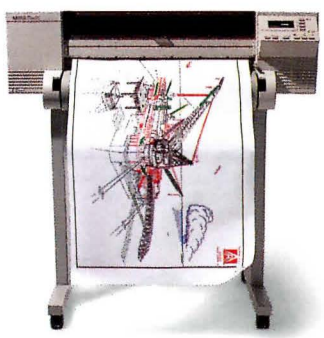
As Steven Ross, consulting editor to Architectural Record, has pointed out, many computer novices are actually the principals or owners of the architectural firm. There may be many reasons why someone in this position has not yet gotten a computer. If computer use in the office has been restricted to word processing, spreadsheets, or CAD only, you may have been able to get by with computers in your firm, but not on your own desk.

If you are a sole proprietor or small firm with no computers, seriously consider getting one and getting started. My suggestion to Level One principals is to first find someone who is knowledgeable about computers, either someone in your firm, another architect, or a consultant, to help you with your transition. Do everything possible to chart a path that will work for you.

Depending on how fast you want to proceed with computer use and how much growth you are anticipating in your firm, you can tailor the selection of your first computer. If you are going to buy one computer and it will be the only one in the office for years, try to buy as high-end as you can afford. If you get a Power Mac now, it will grow with you for years. If you think you will be growing and getting more computers, you could start off with a Quadra that is upgradable to the PowerPC chip and either get a new computer or upgrade when you've outgrown it.

CONTINUED ON PAGE 10

The Unplodder.



5-minute plots

The HP DesignJet 650C plotter never plods.

$7,495*

You've waited long enough. It's time you owned an HP DesignJet 650C—the plotter that delivers final-quality, D-size, color plots in under five minutes. And for a limited time, when you buy an HP DesignJet 650C from the same dealer who provides a demo, you'll get $300 off your purchase.

Just imagine working with brilliant, 300-dpi color for area fills, shading and data differentiation. As well as crisp, 600-dpi-quality monochrome.

Circle 26 on inquiry card

And with HP's proven inkjet technology you'll meet with no pen-related problems.

Options include true Adobe™ Postscript™ Level 2 software and HP JetDirect cards for connections to most popular networks. For more information and the name of your local HP demo dealer, call 1-800-851-1170, Ext. 8373.†

HEWLETT® PACKARD

*E-size model priced at just $8,995. Suggested U.S. list prices. Adobe and PostScript are trademarks of Adobe Systems Inc. which may be registered in certain jurisdictions. †In Canada call 1-800-387-3867, Ext. 8373. PE 12422 ©1994 Hewlett-Packard Company

BURNSTUDIO ARCHITECTS PA

Raleigh, North Carolina
Norma DeCamp Burns, FAIA

Norma DeCamp Burns, FAIA, is President and Principal of Burnstudio Architects PA in Raleigh, North Carolina. Norma has overseen the transition in her office from all hand drafting to all Macintosh computer use in architectural practice.

Norma emphasizes that her architecture practice places a high level of importance on design and attention to detail. "I deliberately put off getting into computers for as long as possible, thinking that the longer I waited, the better chance that hardware would become less expensive and the software would improve. I am very satisfied with our decision to go with Macintosh computers, because they fulfilled all my expectations."

Norma is too busy to take time out from her practice for instructional classes and training, so the ease of use of the Macintosh computer combined with the available software pleases her. She uses PowerDraw as her drawing software, and admits, "I don't even have time to take advantage of everything that PowerDraw can do."

Burnstudio's projects are primarily commercial, institutional, and recreational. One of their current projects is RDU Center. This 35,000 s.f. Regional Town Hall for the Raleigh-Durham airport is intended to provide a forum for regional meetings.

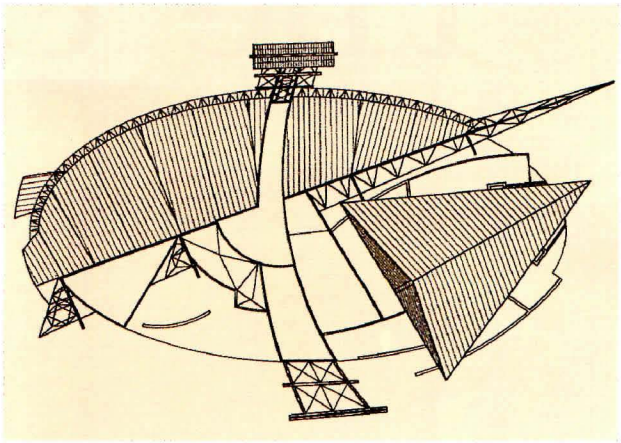
"This project is the first project since I have been in practice in which the client has given me the opportunity to do the kind and quality of architecture I feel myself capable of doing. This project has given me the freedom to create — to deal comprehensively with the functional and formal issues of a building."

"I developed the design on the computer from the beginning, after a series of sketches on tracing paper which developed the parti. At that point, I decided to try the design on the computer. It has worked out wonderfully."

"I began by teaching myself how to design on the screen using overlays the way I use tracing paper. The Macintosh and PowerDraw allowed us to draw and calculate forms like an elliptical building that would have been difficult to do without the assistance of a computer."

"We are also furnishing the building. We have constructed our own customized furniture symbols, adding them to the standard symbols library that comes with the software package."

"The amount of documentation that goes along with State work is enormous. It is such a relief to have all the required forms on the computer. From an organizational standpoint, it frees up staff, who can then spend more time on architecture."



Regional Town Hall for the Raleigh-Durham Airport.

"There are two things that I particularly enjoy about having a computer aided practice:

1) We can take a drawing, easily change the scale, and use it in a presentation to a business group or for a packet of marketing information.

2) We can more easily make wholesale changes in the building design when the client decides to change something, or quickly demonstrate alternative arrangements."

With her Powerbook 165, Burns can go mobile and call in from out of town. This ability to communicate in words or images from a distance is a crucial advantage.

Another advantage was hiring a consultant as a resource. "I think that the best money we ever spent was finding a very helpful professional computer consultant who was compatible with our firm. I recommend hiring someone who is not just giving you a few demonstrations, but will stay with you, particularly when you have a crisis. It is important to have someone you can turn to when you need hardware fixed, have a question about networking, or are planning for technical growth and change. I can't imagine what I would have done without a knowledgeable person available." **M&A**

From Hand Drafting To All Macintosh

"I developed the design on the computer from the beginning."

Hardware: Macintosh SE (printer server, plotter server, word processing Macintosh IIcx upgraded) • Macintosh IIci 8/0 • Macintosh IIvx5/0, • Etherwave • modems • HP plotter and a laser printer.

CONTINUED FROM PAGE 8

I think that we are all going to be doing business multimedia in the future, so Quadras and Power Macs are the best computers to get you there.

You could try "on the job training", a practical approach for many architects. If you have never used a computer before, learn a word processing program first. It is the easiest kind of program to use. Write a letter or a proposal you need to write, rather than doing an exercise not related to your work. You will use word processing for many tasks — letters, proposals, contracts, and invoices. Even if you have staff doing word processing in your firm, and you are only doing rough drafts and final checks, the process works much better if you are handing diskettes back and forth rather than marked-up hard copy.

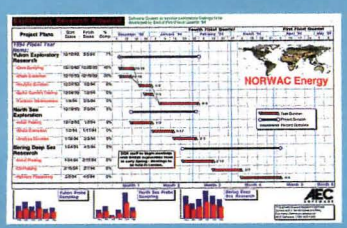
One sure way to accelerate your learning curve is to enlist the assistance of an architect or service bureau that specializes in computer graphics. With the guidance of a pro, you can jump right into sophisticated graphics and drawing programs — some of the most rewarding work you can do on a computer.

I have talked to some architects, who are principals in their firms, who have avoided getting a "desktop" computer. If that is the case, I recommend getting a PowerBook 540c, which is a great laptop computer — it has the power of a Quadra and mega-storage. You can take it with you — home, business trips, the beach. You can learn the computer and practice in privacy, whenever and where you want to. After a while, you will be showing pictures of your firm's projects on your PowerBook screen to clients — even showing them QuickTime movies!

In my opinion, the new trackpad cursor control, color screen, and ability to do graphics programs quickly, make the 540c ideal for an architect. I never was comfortable with the track-ball cursor control device, but I became quite proficient with the trackpad in minutes.

Level Two - Computer User:
At this level, you have a number of computers in your office and you are thinking about networking them, if you haven't already. AppleTalk is a great and easy network. If you have outgrown AppleTalk, EtherNet is the next step up (in speed and cost). Check out the EtherWave system by Farallon. The Macintosh Quadra and Power Mac lines offer built-in Ethernet networking capabilities. Networking your computers allows you to share files from computer to computer, which increase efficiency in your office.

At Level Two you are doing all of your proposals, letters, and invoices on your Macs. At least one person is proficient at word processing and spreadsheet programs. You are doing most of your drafting and even starting to do design work on your Macs. Someone in the office is thinking about getting a new Mac, with a CD-ROM drive, if you don't have one already. You're trying to decide between a Quadra and a Power Mac — get the Power Mac. You may not need a Power Mac at every station in your office, but if the function is CAD or graphics and the programs are already available or soon will be (see list of Power Mac software at the end of this article), the increase in speed will make for happier, more efficient workers.



If you are interested in a project scheduling software, take a look at FastTrack Schedule by AEC Software. You can get charts that look like — well, like they were done by an architect (not a "computer"). Easily updated and colorful, it's a program that will impress your clients and even a contractor or two. For more complex, interrelated scheduling and CPM charting, take a look at Claris' MacProject II.

By now, someone in your firm — if not you — is comfortable with spreadsheet programs, like Microsoft Excel. And you are probably ready to look at a computerized bookkeeping system or accounting software. Depending on your needs, a basic program like Quicken will get you started or you can check out a program like MacArchitect. MacArchitect addresses the issues of billing and project records from an architect's point of view (because it was developed by an architect!). It helps you to track your time and money for all of your projects, and to maintain a database of past work. Whatever your needs, the Macintosh can be of great assistance.

If your are using your 2-D and 3-D CAD programs to their limits and want to explore 3D conceptual design tools, look at form•Z, UpFront or Design WorkShop. FileMaker Pro is a good program for database management of mailing lists and project information.

Level Three - Power User:
Now you're smokin'! You've got your Apple QuickTake 100 digital camera, your PowerBook 540c, and your Power Macintosh 8100av. There's nothing you can't do at this point.

You've got your favorite 2-D and 3-D CAD programs, conceptual modeling program, Photoshop for image retouching, and an inkjet color plotter. You're showing what a design of yours will look like in perspective overlaid on a photograph of the site —you're a design studio.

You have your video deck, VideoFusion, Premiere, and Director for making and editing QuickTime movies for your next presentation — you're a movie studio.

You're flowing your Word documents into QuarkXPress, importing photo images from Photoshop, and designing and printing your next proposal — you're a printshop.

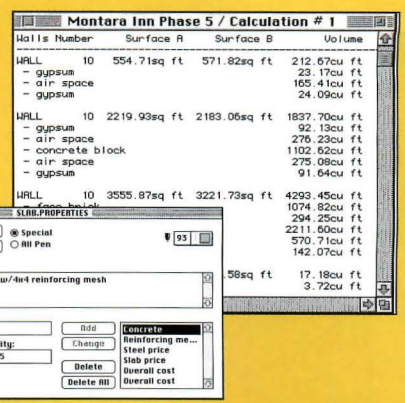
You've got a modem, you're hooked to AOL, eWorld, and AIA On-Line and you just read an article about a guy that has his own computer bulletin board for his clients and you're thinking, just maybe...?

Where will it end?

CONTINUED ON PAGE 1

Bill of Materials

ArchiCAD's Bill of Materials can be displayed at every stage of the design and is always accurate to 7 decimal places. The Bill of Materials tracks all of the building components including their area, volume, price and any other specifications which you've attached them to (such as manufacturer, model, labor charges, R-factor, BTU, etc.). The Bill of Materials can also be exported to any spreadsheets, database or word processor.



T. Olle Lundberg, Lundberg Design, San Francisco: *Most of our work is custom residential. ArchiCAD's "Bill of Materials: enables us to provide accurate quantities to the contractor for preliminary estimating. This feature saves us quite a bit of time developing our door and window schedules since they're automatically generated in the course of building the 3D model. Accurate tracking of building costs is critical, and for us ArchiCAD provided an invaluable tool in improving the effectiveness of cost projections.*

ArchiCAD®

For more information, call: 1-800-344-3468 GRAPHISOFT

#8 IN A SERIES

ARCHICAD : COMPLETE ARCHITECTURAL SOFTWARE

Circle 28 on inquiry card

SANTA BARBARA STUDIOS

Santa Barbara, California
Will Rivera

Will Rivera is an architecture graduate from Cal Poly, San Luis Obispo. While at Cal Poly he had some exposure to computers and the Macintosh, but most of the Mac work was word processing and graphics — writing and market studies. "I was originally very skeptical about computers, because I started on PC's and I got turned off to them. After being exposed to the Macintosh it was much easier for me to pick up and learn computers," says Will.

Two years ago, at a Siggraph conference, Will met John Grower, one of the founders of Wavefront Technologies, and the founder of Santa Barbara Studios. This meeting led Will into his dream job.

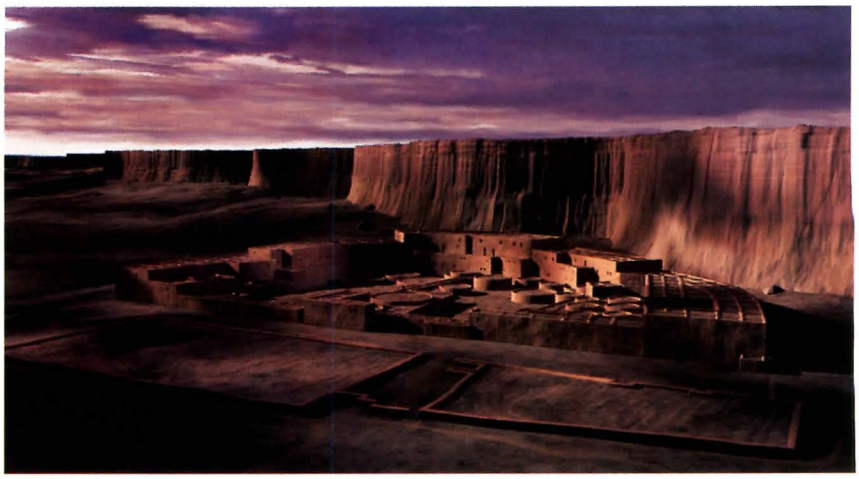
Will began working on computer models of archeological sites for a television program produced by Pathways Production, Inc. called "500 Nations." Kevin Costner was executive producer and host of the program. Santa Barbara Studios was contracted to create a walk-through animation of three major archeological sites. Cahokia, in St. Louis Missouri; Pueblo Buenito in Chaco Canyon, New Mexico; and Palenque in Mexico.

For Cahokia, some models were built by hand and then digitized. Pueblo Buenito in Chaco Canyon was started on Wavefront then completed in form•Z, using features for rounding walls, doors, and windows.

By the time SBS began Palenque, all of the modeling was being done in form•Z. "form•Z is the most wonderful tool.

Computer model of the Main Palace of an ancient Mayan structure.

Hardware: Quadra 950 • SGI workstations.
Software: form•Z • Photoshop • Minicad • Wavefront programs, including Image and Preview • Pixar's Renderman.



Computer model of Pueblo Buenito, an archaeological site in Chaco Canyon, New Mexico.

Architecture Goes Hollywood

It's great for designing in 3 dimensions, sculpturally. It is a great spline based modeler. It has the accuracy of a CAD program, yet it is very intuitive! One of the great features of form•Z is you can scan in plans and then trace over them." Will describes some of the challenges modeling Palenque represented. "Palenque is comprised of many detailed buildings on the Main Palace and other temples scattered around the site. The closer the camera gets to the buildings, the higher the resolution of the model must be in order to show the smoothing out of corners of walls."

Will also built a computer model of an ancient Mayan structure that was embedded in a comet for an episode entitled Masks for Star Trek, the Next Generation. The Enterprise attempts to blow up the comet with its fazers. The fazers hit the ice and reveal an object three times the size of the Enterprise. The object turns out to be a library which resembles a giant computer chip, and holds all of the information from an ancient race in a distant galaxy. Will modeled this in form•Z from scratch — no plans.

Will encourages architects to use computers as a design tool. "In general, architects in the past have been using computers as an afterthought — more as a presentation tool instead of a design tool. Architects are starting to understand the potential of the computer as a design tool and it's great to see this shift happening!" M&A

"After being exposed to the Macintosh it was much easier for me to learn computers."

CONTINUED FROM PAGE 11

Brave New Architect

It is certain that "digital" is the direction toward which all information is headed. Storage media will continue to increase in capacity and the speed with which we can transmit digital information will continue to increase. CD-ROMs will play a greater role each year as more information becomes available in that format and as more businesses have the ability to play CD-ROMs on their desktop computers.

CDs like "The Great Buildings Collection" will be followed by many other titles for architects. Product manufacturers will utilize CDs for delivering their product literature, and magazine publishers will explore CDs as a vehicle for delivering their editorial and advertising content. Eventually more of this information will be available "online" (as with AIA Online) and the online technology will continue to improve.

There is no question that computers will continue to get faster and more powerful, and that software programs will continue to evolve. In the coming months, exciting new technologies like Apple's QuickTimeVR will change the way architects are able to model and display space on the computer. Any decision you make today regarding computers will not be your last. The important thing is to get on a "path" that takes you in the direction you wish to head for the rest of your career.

Apple Computer's move to the more efficient and powerful RISC based computing with the Power Macintosh, and their leadership in multimedia computing, is clearly a step in the right direction for architects. Our work is architecture — the art, business, and science of designing buildings. We can be leaders in the application of computer technology in the building industry. We need the best tools we can find to help us perform our work. Take a look at the new technology that is available to help you, and then start or continue on your path to successful use of computers in *all* aspects of your practice.

CONTINUED ON 14

The Plot Thickens.

For architects, graphic designers and design engineers, ink jet output with sharper colors, crisper images and finer lines is becoming more crucial everyday.

Rexham Jet Set™ paper, film and vellums are the perfect solution for every CAD plotting need. From check plots to full color output, Rexham Jet Set™ provides the perfect media to suit every need.

By working closely with the world's largest and best-known printer equipment manufacturers, Rexham Graphics is able to develop and manufacture paper and film that brings out the best of each and every technology. In fact, Hewlett-Packard Company® has officially approved JSB-24, 24lb coated opaque paper for use in the Hewlett-Packard DesignJet 650C Color Ink Jet Plotter.

And when it comes to producing brilliant full-color output for large displays, look to Rexham Magic™ low glare and high gloss photographic papers, presentation papers and clear, white and backlit films. Rexham Magic™ brings out the best of ink jet digital printing technology–for the HP 650C and Encad Novajet.

No matter what your specific imaging needs may call for, the color is brighter, the density is deeper, the drying times are faster and the image is crisper on Rexham CAD Series™ and Rexham Magic™ papers and films.

To get the whole story on Rexham Graphics and our full line of products and services call: 1-800-628-8604, or visit your local dealer.

REXHAM GRAPHICS JET SET™ INKJET FILM AND PAPER

REXHAM GRAPHICS

28 Gaylord Street, South Hadley, MA 01075-2894

Plots courtesy of Adobe Systems Incorporated and Autodesk, Inc.

Circle 27 on inquiry card

BAGH TECHNOLOGIES

6700 Parc Avenue, suite 250,
Montreal, Qc, Canada H2V 4H9
T: (514) 273-0522, F: (514) 273-3059

For a free brochure and video or to locate the nearest authorized BAGH Center call 1-800-561-0522 in the US and Canada or (514) 273-0522 in Latin America.

Circle 30 on inquiry card

Available for Macintosh, PowerMacintosh and DOS systems.

DXF is a registered trademark of Autodesk Inc. ©1993. Architrion is a trademark of UNIC Technologies Inc. ©1993. QuikTime is a trademark of Apple Computer Inc. ©1993. QuickTime option is only available on Macintosh® version. PowerPC and the PowerPC logo are trademarks of International Business Machines Corporation used under license therefrom.

STEED, HAMMOND, PAUL ARCHITECTS

Cincinnati, Ohio
Michael Dingeldein, AIA

Michael Dingeldein is a project architect and

Interior perspective of Lakota High School Theater.

MACINTOSH & ARCHITECTS

CAMBRIDGE SEVEN

Cambridge, Massachusetts
Peter G. Kuttner, III, AIA

Peter Kuttner is a partner in the Massachussetts firm Cambridge Seven Associates. He tells about the evolution of computer use in one of the country's most creative design firms. "We've had Apple computers in the office since 1981 or '82 when we had Apple II's for project management on Visicalc. In '85 we got HP minicomputers because the software program we wanted to use, a CAD program called Arplan from SKOK, only ran on that platform. When SKOK upgraded they came out with a PC version and then we switched to 4 IBM-clone CAD stations."

"When the Macintosh first came out, we started using them in the office for word processing functions only. Then we found that the administrative assistants with Macintoshes could also start doing marketing graphics and database work. Then one of our construction administrators got one. Next we started using them for marketing, project management, and even more graphics on detailed exhibit projects."

In addition to architectural design, Cambridge Seven does graphics and exhibit design, and the Macintosh computers have become very important for creating their presentations. "We can go straight from our Macs to a transparency, final type etched in metal or vinyl, or to product design almost like a CAD/CAM system. Or we can go straight from disk to a negative for silk screening. Using the Macintosh, even our study models tend to look like finished products."

"We treat our exhibit graphics like a giant page layout. Using Quark XPress or Pagemaker, we can import the graphics we have created in Illustrator, or images scanned into Photoshop, and can produce a 'page' that is 7 feet high." Peter continues, "we work with many exhibit vendors. In the past there would be design drawings and blueprints, and reviews. Now they can take all of our design work on disk and go right to finished product. For example they can output straight from our Quark layout to a giant Kodalith for backlit signage."

Slowly but surely over the years the number of Macintosh computers in the office has increased to 17 and they now have 6 PCs for CAD.

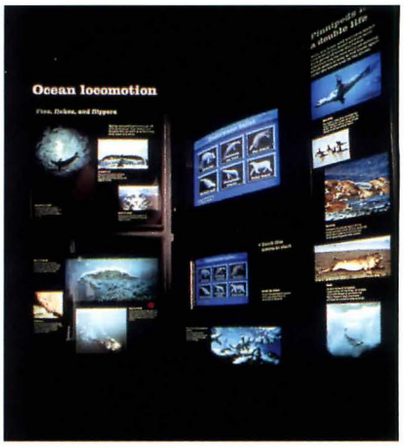
Peter comments that as with most architectural firms "the schematic design phase is only 15% of the project. Peter has a Macintosh SI computer on his desk and produces most of his own reports and letters, or at least gets them started in Word 5 before sending it by AppleLink to his administrative assistant for the finishing touches.

Cambridge Seven has used their Macintosh computers to organize their marketing information and all of their project sheets. They have standard templates that they use for form letters and to respond to Requests for Proposals.

"We have been trying to bring the PC CAD systems into design. It is a good production tool that hasn't been successfully used for design. I went for Windows training because it was hard for me to tell whether I was frustrated with Windows because of things inherent in Windows, my familiarity with Macs, or for some other reason. To me it still feels encumbered. You can tell that you are inside of a shell. Just the naming of pages and files makes a difference."

Increasing Use Of Macintosh

Currently Cambridge Seven is developing their Macintosh multimedia production capabilities on a Quadra 850 AV for a paid architectural competition for a Korean client. M&A



Cambridge Seven recently completed a project at the Baltimore Aquarium.

"We treat our exhibit graphics like a giant page layout."

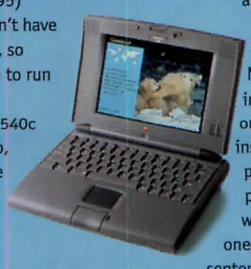
Hardware: Apple II (since 1982 - to do Visicalc) • 18 Macintoshes, 6 DOS/Windows PCs • (The Macs are linked with Appletalk and share a second link with with the MS-DOS machines).
Software: Word • Excel • Filemaker Pro • DrawPro • PowerPoint • Premier • Virtus Walk-Through • Pagemaker • Quark XPress • ModelShop.

CONTINUED FROM PAGE 14

GOIN' MOBILE!

The Apple PowerBook
The 520c is a great solution for mobile users who want color, power, and speed now — and want to be able to upgrade to the PowerPC (first half of 1995) when it is available. (It doesn't have a math coprocessor function, so check the programs you wish to run for this requirement.)

The PowerBook 540 and 540c have everything the 520's do, plus they are faster and have bigger hard drives.



Apple Power Macintosh
They're fast.
They're powerful.
They can run DOS and Windows (with Softwindows software).

They're the upgrade you've been dying to get, or the reason to buy a Mac, if you don't have one yet. A blazingly fast Macintosh that can work like a workstation and still treat you like you're on a Mac.

There are three Power Macintoshes to choose from and some models are also available in an "AV" model for those of you who want to have 2 MB of VRAM, NTSC and PAL input and output, and 11 instead of 8 built-in ports to support peripherals. (You know who you are — you're the ones who understood that sentence and you are already doing audio-visual productions.)

Virtually all Macintosh software programs will run on the Power Macintosh in what is being called the "emulation mode". This means that it is running the program just as it would run on a Performa or Quadra. Applications written to take advantage of the Power Macintosh run 2 to 6 times faster than on non-PowerPC Macintosh models.

And many of your existing Macs can be upgraded to PowerPC level performance! M&A

NIX MANN & ASSOCIATES

Atlanta, Georgia
Jimmy Smith

Jimmy Smith is an associate of Nix Mann & Associates, a 90-person healthcare architectural firm in Atlanta, Georgia. "I am excited by the potential of using a computer to design, now, but I have taken a different approach to computers than some other architects. I'm coming at it from a drawing background, with almost an aversion to computers. I still like to sketch and design, using pens and pencils."

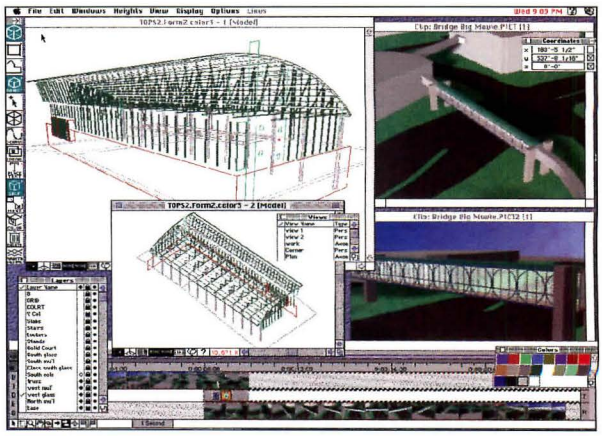
"I feared the loss of the human side of design and I was glad that I could instead integrate it into the process of working on the computer. My hunch is that my clients were just as concerned as I was, that the computer would have a dehumanizing effect on our design. When you can show your clients that you can utilize state of the art technologically and not lose the human touch, then you've accomplished something."

Alan Brown was hired by Nix Mann to work with Jimmy on using computers in the design process. "Alan takes an untutored approach to teaching computer use. He doesn't necessarily go by the manual, but says that you can toy with it this way and that way. Alan helped us do a video, where we used pixelated sketches over photo-graphs. I like to scan in one of my freehand drawings, and then start messing with it in Photoshop. I can put my sketch over a photograph of the site and blend them together into an final image that clients love.

"It's interesting, I have not read any manuals. I was using Photoshop and I wanted to "smear" part of an image and I hadn't learned how to do that. Then I saw the little thumb on the Photoshop toolbox and I wondered if it might do what it looked like it would do — and it did! We also learn from each other in the office. We share ideas on how the programs work.

"Before I started using a computer, I thought they just did CAD. Now I've even tried sketching on a computer tablet. We're really beginning to use computers in the creative aspects of architecture. **M&A**

Hardware: Quadra 610.
Software: I am not sticking to one particular software package.

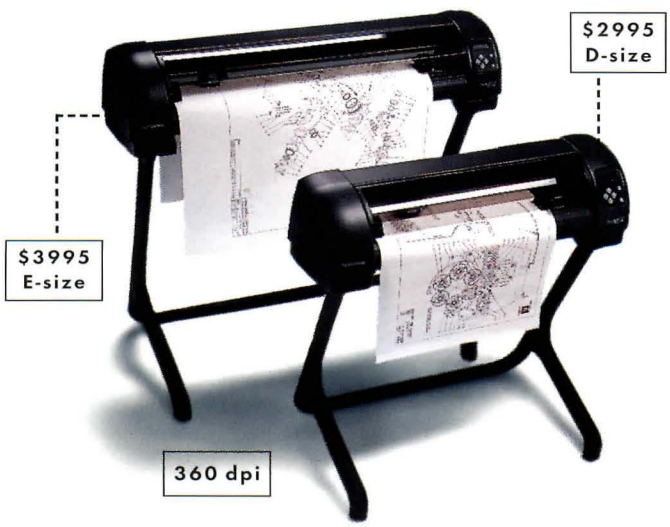


Integrating hand sketches with live video using Adobe Premier and a 3D computer model.

Experienced Designer Computer Novice

"It's interesting, I have not read any manuals."

We just widened the appeal of inkjet plotting.



INTRODUCING
THE TECHJET™ DESIGNER SERIES

At CalComp, we know that great minds need their space.

And thanks to our new large-format inkjet plotters, we're making it easier than ever to showcase any big idea.

That's because both Designer models offer 360 dpi, laser-quality output. Fast print engines that deliver large D-size plots in under 4 minutes, E-size in under 8.

As well as a wide range of connectivity options.

Plus, both have multiple media capabilities.

Standard 4 MB RAM.

Menu-driven LCD control panels, that make them easy to use.

And low prices, that make them easy to own.

For more information, just call your local CalComp reseller, or 800-445-6515, ext 535.

Because when it comes to inkjet plotters, we're making quite an impression.

TOOLS OF THE TRADE

CalComp
A Lockheed Company

List price in U.S. dollars. All product names are trademarks of their respective holders. TechJET is a trademark of CalComp Inc. © 1994 CalComp Inc.

Circle 31 on inquiry card

The Simplicity of One Touch Financial Management.

MacArchitect

Software for Making a Profit

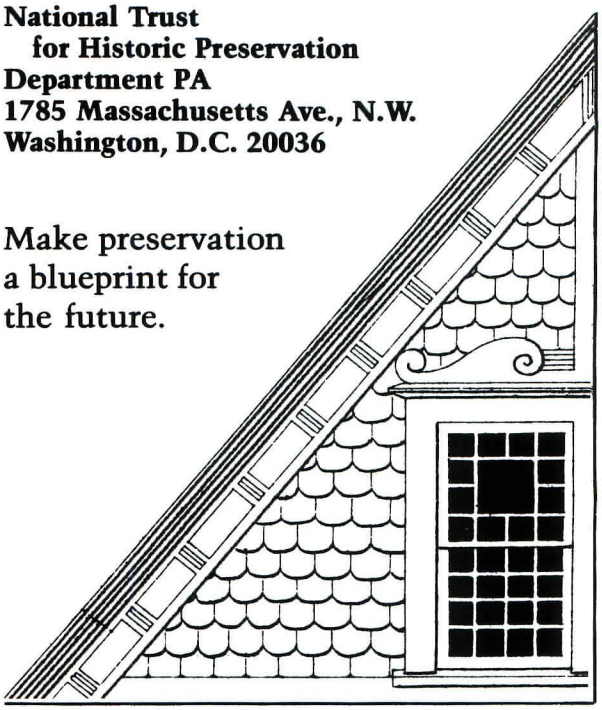
BEEDEE Corporation–(206) 443-1010
Sales Calls only: (800) 484-7397 code 6222
Circle 32 on inquiry card

PRESERVATION
PLAN ON IT

Write:

National Trust
for Historic Preservation
Department PA
1785 Massachusetts Ave., N.W.
Washington, D.C. 20036

Make preservation
a blueprint for
the future.



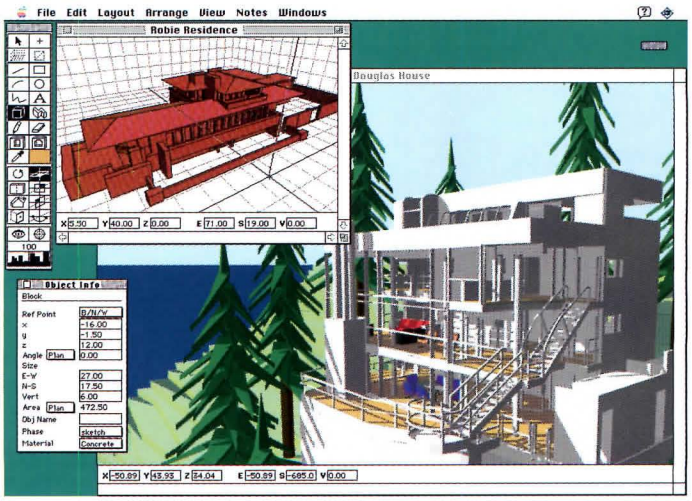
DesignWorkshop™ ...intuitive 3D CAD

"With DesignWorkshop, the computer interface no longer gets in the way of the creative process."
–Macintosh Sci. & Eng. Report, 3-93

"... the most direct 3-D interface short of a data glove"
–MacWEEK, 4-25-94

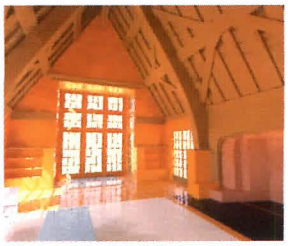
"... a beautifully designed program"'
–MacUser UK, 5-27-94

"... an excellent tool for architectural design conceptualization"
–MacWorld, 5-94



Models evolve with your ideas from concept through detailing

Model interior & exterior



Export for lighting analysis

Now available for Power Macintosh with radical 6–10X acceleration

The shortest path from your ideas to computer visualization, based on a **design-oriented, 3D** direct manipulation interface. With other software you build a model by drawing in plan, and renderings are look-but-don't-touch. In DesignWorkshop, you quickly and easily create real solid models in live 3D perspective with real openings and object-based shadow casting.

Call 800-203-8324, fax 503-346-0782 **Artifice, Inc.**

Circle 60 on inquiry card

The following essay sums up an undertaking by RECORD's editors who sought the projections of architects and critics throughout the world on the future of design. Said another way, this was about designing the future. To gather those views, RECORD held two roundtables, one in Houston and one in New York City, and corresponded with or interviewed, in person or by phone, close to 40 architects and critics. The outcome is surprising, in the sense that few took it upon themselves to predict a particular style. Rather, the consensus went, we will see an array of new building types engendered by new needs and new demographic groupings; but as to style, or "looks," those decisions are to be made locally, shaped by local conditions and strongly influenced by far greater local citizen involvement in the design and planning process.

Rounding out the feature section are five buildings spanning a wide range of form and content. Two train stations by Santiago Calatrava, one in Lyon, the other in Lisbon, portray this brilliant architect and engineer's zeal for romanticizing structure in the service of architectural impact. A museum by Álvaro Siza in the old Spanish pilgrimage town of Santiago de Compostela captures Siza's genius for respecting the old while asserting the identity of the new. There's a library for the blind by Ayers/Saint/Gross. A medical library for Vanderbilt University by Davis Brody & Associates accommodates the emerging era of computer-transmitted information, while an administration building for the Washington State Department of Ecology by Keating Mann Jernigan Rottet preaches environmental correctness. *S.A.K.*

Manufacturers' Sources listed on page 121

Design Futures

1954. Visions of the future are utopian. Bullet-like cars soar on raised highways across a verdant landscape. Sparkling towers dot the horizon in splendid isolation. Technology is about to lift day-to-day chores and cares from our shoulders. Best of all, everything new is good—without a doubt, better than anything old. Still, there are reassuring constants: Family, the corporation, and the military will remain society's basic units. Responsibilities and expectations will remain clear-cut.

"There was a consensus of social goals and technical means," says Robert Geddes, professor of architecture, urbanism, and history at New York University, former dean of Princeton's School of Architecture, and a founder of the firm of GBQC. "There was exploration of design possibilities. But it was always grounded in Cubism and Constructivism," far different from "the confusion of today."

1994. Sitting in stalled traffic, tired drivers look down from those elevated highways, and see garbage, polluted waters, and abandoned buildings. If air pollution is not too thick, they see towers that have melded into a solid dark mass blocking the sun. Low box-like structures squat across the remaining horizon. The people in the car alongside don't share the same values. They may hate their families. They may not even speak the same language. Popular visions of the future are less like the idyllic Father Knows Best, *and more like* Blade Runner *(see page 29). It's time to pick ourselves up and look at the future again.*

To see what buildings and, indeed, our environment will be like in the next 10 to 25 years, RECORD recently spoke with nearly 40 thoughtful architects and critics from around the world, in roundtables in Houston and New York City and through individual interviews. Together, they constructed a vision that is, if not perfect, at least based on correcting the mistakes of the past. Charles K. Hoyt

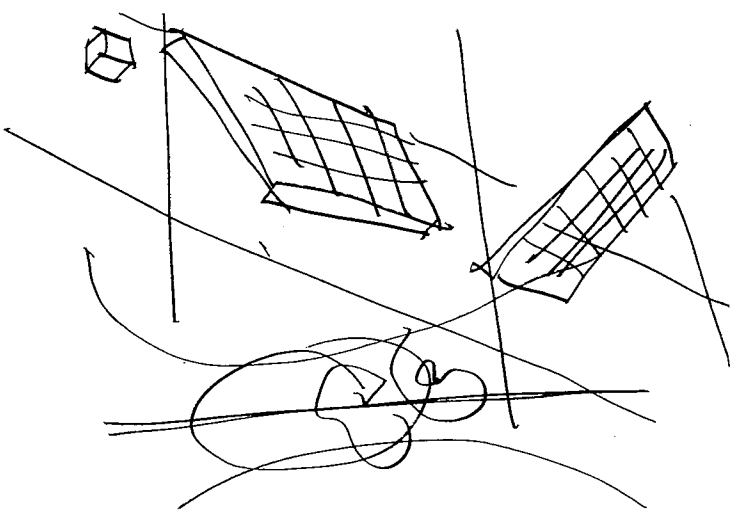
"If I could predict design 25 years from now, I'd be doing it now," said Robert Geddes quoting Louis Kahn at the start of the New York City roundtable. Here are some clues:

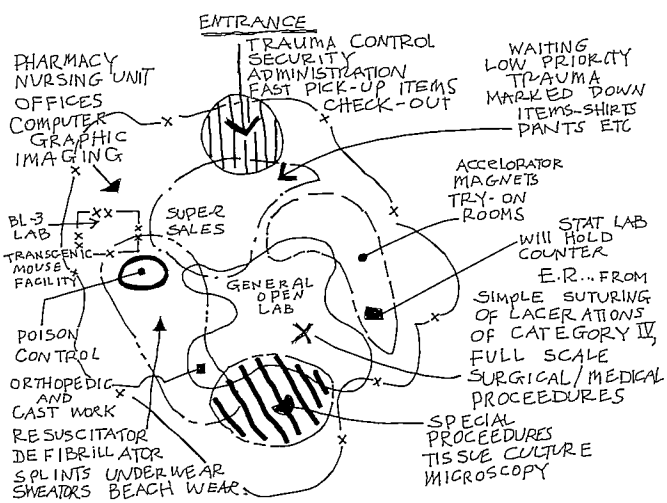
- A changing ethnic makeup of the world, and especially the U.S. population: people of different backgrounds will live and work in close proximity, bringing together different values, differences in economic strata, and different needs for buildings.
- There will be a growing percentage of people with special needs in housing, recreation, and healthcare [RECORD, May 1994, page 27].
- The explosion of new communications and information technologies, will greatly affect where and how people work, and have special impact on life as we know it now.
- Fewer natural and economic resources will mean making better use of both new construction and existing buildings.

Searching for a tongue

Will there be one design language or many? Almost everyone interviewed by RECORD saw a trend toward design that is more contextual, and builds on architectural tradition. "The most important task for the future will be to order two divergent paths," said Kisho Kurokawa, speaking from Japan, referring to the need to express localized architectural identities based on climate, economy, and culture, as opposed to the universal architectural solutions pressed on designers by the spread of instant international communications. He sees the answer in the abstract expression of traditional forms built with the most up-to-date construction techniques.

Will this argue against architects working abroad? "They may respond to local expression with a fresh eye," says Ushida Findlay Partnership's Kathryn Findlay, who admires the work of British architect Peter Salter in using traditional wood construction, "as never before." Guillermo Vázquez Consuegra, paraphrasing Rafael Moneo, agree. He foresees a reaction against "an excess of individual-





RECORD invited views about the future of design from an international array of architects and critics. Here's what they said...

ism" or personal imprints on design, and added, "You cannot be continuously innovating. In the end it becomes repetitive and boring." "The survival of a work of architecture will depend on its integration into social context," says Graham Gund, who sees greater contrasts emerging in different sections of Boston. "A universal design language won't work," he says flatly. Mehrdad Yazdani of Dworsky Associates disagrees, saying, "Collaborative efforts among architects will create more uniformity in design and less experimentation."

Christopher Genik of Daly, Genik says, "We foresee practices that will emphasize ingenuity over innovation using design modification and refinement." Even Renzo Piano, whose work was cited most frequently by architects contacted in Europe and Japan as modeling the future, was once considered a radical individualist for his design of the decidedly non-contextual Pompidou Center in Paris. Now, he too seems to have succumbed to context. Writing in *The New Yorker* [August 22, 1994, page 63], author Calvin Tomkins refers to Piano's subdued design for the Menil Collection in Houston as "an indication of changing attitudes inside and outside the profession." Tomkins quotes Piano: "Architecture must be reinvented to interpret the revolution in science in terms of social life." Peter Samton of Gruzen Samton views the work of architects as a response to the context they work within: "Architectural design will take cues from the way each culture faces the peculiar challenges of its time, its location, and its history." Dominique Perrault refers to new buildings in Paris and Berlin mostly hidden by their surroundings: "Erasing architecture can be very encouraging," he says.

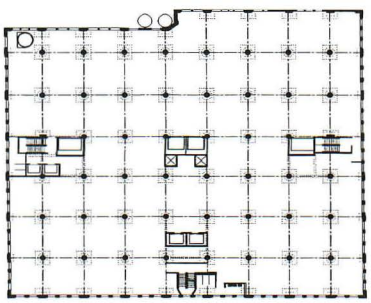
The big picture

"Our greatest challenge over the next 25 years will be to correct the built environment's mistakes and to protect what's left of the natural environment," says Samton. "We must weave together the fabric of broken communities and reinforce their special qualities." He echoes the viewpoints of participants in both RECORD roundtables. In the New York City session, Thomas Hanrahan of Hanrahan & Meyers spoke of the partners' theoretical work in restructuring neighborhoods in New York City and Chicago to produce more desirable future qualities with special attention to green space between buildings. (The results will be exhibited in Chicago in November.) Robert Geddes spoke of his collaboration with Rem Koolhaas and local architects to create a new neighborhood in Rotterdam (page 79, bottom right), which he describes as the most progressive city in the world in carrying through master plans.

Speaking from Barcelona, Eric Miralles said that "architecture should be a tool for investigation into the nature of cities comparable with sociology." Geddes talked of the importance of open space in the Rotterdam and other projects, concluding: "Landscaping will become the mother of all arts." He urged architects to become involved in zoning to turn around current antiquated laws that prohibit vibrant mixed-use neighborhoods in areas as such as urban loft districts. Dennis Kuhn of Ehrenkrantz & Eckstut adds, "We should forget about zoning for specific uses in the future and just zone for bulk and open space." He spoke about two of his firm's projects in Los Angeles, which involve reshaping the spaces between existing buildings to make them more viable. "Landscape design will have a significant impact on the profession of architecture," he says.

In Houston, Gerald Moorhead, who led the second RECORD roundtable, spoke of the gradual upgrading of his neighborhood, which Frank Kelly of PBK Architects pointed out would have been prevented from evolving if the city had enacted zoning. Val Glitsch spoke of the advantages of a large city divided into neighborhoods, in which Moorhead felt that the "module of comfort" would be 300,000 to 400,000 people. Kelly spoke of the importance of architects controlling landscape design: "Everyone sees a patch of grass with a bush

"Peer pressure creates a convergence of building types," says Taft Architects' Danny Samuels. He illustrates them (far left) as the box (for houses), the super box (for such types as shopping malls), and the tower (for offices or apartments). The only real design variation has been the skin, which created a barrier to natural ventilation. Abramovitz Kingsland Schiff's Gerald Schiff points out that the same bubble diagram (near left) can serve a variety of functions, which may mean more flexible plans and a variety of uses for the same structure.



Walter Chatham and Ehrenkrantz & Eckstut's Denis Kuhn find the model for truly flexible buildings in the 19th-century loft (plan, left), which they point out can be put to any use from industry to living. Kuhn lists large floor area, multiple elevator cores, and large windows as required attributes. Tigerman McCurry's design for K-Zone, an indoor-outdoor retail outlet in Utsonomiya City, Japan, takes flexibility to new limits with walls that seem to defy gravity.

"There's a lot that we as architects don't know, such as how to build successful communities."—Max Bond

and a tree as good when, in reality, it might have more impact combined with other open space and be replaced by a facility that better serves the neighborhood." Taft Architects' Danny Samuels saw one of the greatest urban blights in parking lots. The group agreed that, with trees, better paving, and better siting, parking lots could become open space instead of dead space. "They should become part of the public domain and be designed by architects," concluded Samuels. The architects agreed their main problem in Houston was getting clients and the public to see buildings as part of a larger context.

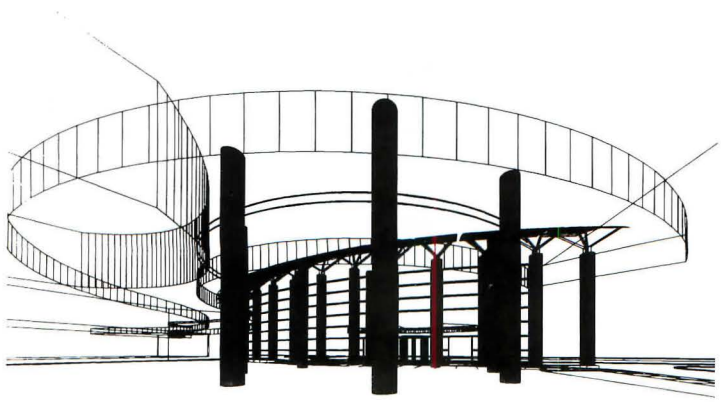
Voice of the people

A shift in the perceived role of the architect as master designer who ignores context and uses buildings to make personal statements may come as a result of increasing client involvement and public design review. "Make design a participatory process," recommended Glitsch. "Play up workability, maintenance, and function. Steer conversation away from how it looks." She was referring to the way she deals with her clients' tendency to think of design as "simply laid on top of the the construction process." But her advice may well come in handy for work on all projects in the future. In the New York session, several predicted a growing public participation in the design process—and with it a need for architects to communicate their value and guide the process. Davis Brody & Associates' Max Bond: "There is a lot we [architects] don't know, such as how to build successful communities," he said in reference to troubled neighborhoods in the U.S. inner cities. "We export to other countries not only the wrong models, but the wrong attitudes. We are alarmingly wrong to preach to people without bringing them into the design process." Critic Suzanne Stephens, former editor of *Oculus* magazine, challenged the group in saying, "But many architects complain about having to work with community groups." "Especially when so many community groups have the wrong model," added Robert Geddes. William Rawn of Boston came out most strongly in support of Stephens: "Public design review is an issue that goes to the heart of the problems the profession must face. It represents the public's increasing frustration with controlling the nature of the buildings and land around them—with development and architecture run rampant. It represents the increasing populist tendencies in our increasingly diverse culture. But it also could be argued as another incursion on architects' design responsibility. Is public design review simply another player—along with the development manager, the construction manager, the experts of every stripe—stepping in to take over the architect's role in the building process?" Bond doesn't think so. "I am convinced that we must involve the users and the community. If we think more about what our role is, it will make it much easier. We have been the most rigid in the whole design process. There will be many ways of functioning and it will be wrong to say there is only one way to be a great architect." The result? More push towards design diversity and a weakened personal stamp as varied communities and users exert their pressures.

Will critics play a strong role in influencing public opinion? Not like they used to, says Stephens, "not without the consistent criteria for evaluating architecture that critics had in the past." She cited Ada Louise Huxtable, Lewis Mumford, and Jane Jacobs as critics whose "internal integrity gave them conviction. They were articulate and authoritative." Stephens' was a comment on the growing differences in attitude among the many groups that will constitute future society. "Users change the standard by which you judge good design," said Bond.

Radical visions

Of all the architects interviewed, Kisho Kurokawa's vision of life in the future was the most radical: "Lifestyle in the 21st century will return to that of the nomads," he predicts. "People will constantly be moving. Buildings will become like hotels where anyone can live and work in



Graham Gund Architects' design for the North Shore Center for the Performing Arts in Skokie, Illinois (left) illustrates design evolution away from historicist allusion. Instead, the building will rely on plain massive two-story columns supporting a translucent roof to convey a strong civic character. Hariri and Hariri's house design (right) illustrates the sisters' predictions about greater freedoms both for architects and for the client. They see houses in the future serving multiple functions including office and entertainment. They also predict prefabricated components with architects merely designing the connections. More in the spirit of concern for ecology than for style, Walter Chatham gives a different view of the house of the future (far right). While the components may seem tongue-in-cheek, all are being used or considered for use today.

"We seem to have less money for building because all of us have so many other things—cars, TVs, equipment."—Graham Gund

comfort." Michael Bobrow of Bobrow Thomas had a different idea, saying, "The imagery of this world will be stimulated by masters of multi-media, capable of creating infinite changing visions. Architecture will be simulated by these sights, comfortable to the creators, but radical to many." Does he see *Blade Runner*? No, he sees "poetic interpretation of design." Stephens is less positive about the role of electronic media. Citing society's endemic problems, she predicted that "entertainment and consumerism will be the American public's ethos, to make them forget that everything is on the decline." Bond echoed Stephens' observation. "We seem to have less money for building because all of us have so many other things—cars, TVs, videos—equipment." Graham Gund adds, "People are growing more aware that life is finite. They want to enjoy it. This leads to greater concern with quality, as opposed to quantity of space." All of this could be pointing toward smaller floor areas, augmented by electronic enhancements, or it could echo Kurokawa's vision of a world populated by nomads, none of whom has a permanent home.

Tight budgets to spur innovation

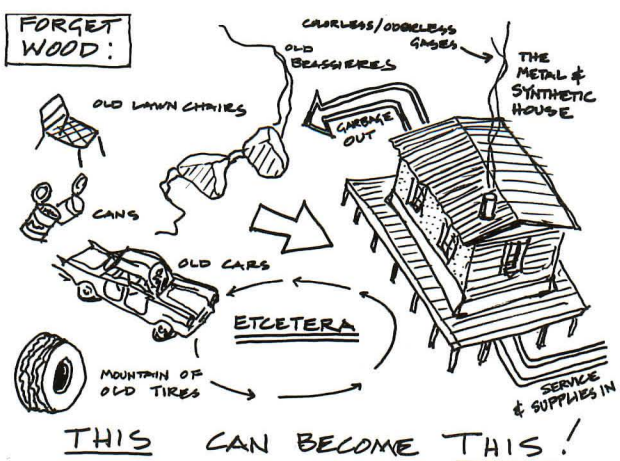
Given all of society's other needs, in the future construction budgets will get even tighter. "Given a choice, the majority of clients go with the most exciting design offered," observes Florian Wierzbowski principal Stephen Wierzbowski from Chicago. "The problem occurs when they are grossly underfunded. That's bad business and it creates bad architecture." Shin Watanabe quotes his partner in ADH Architects, Yoko Kinshita in Tokyo: "Form follows finance." But at the Houston roundtable architects claimed they challenged economics through ingenuity. Val Glitsh noted, "I've never had a big budget." Tight budgets help her take a fresh look at "regular old materials that have been around forever." "Turning the ordinary into the extraordinary," added Gerald Moorhead. Danny Samuels praised the virtues of standard components ordered from catalogs: "It's more fun to pare things down." "I've only had one or two big-budget jobs in my whole life," said Frank Kelly. "Even so, we used to think nothing of specifying custom extrusions. Now it's back to the catalogs."

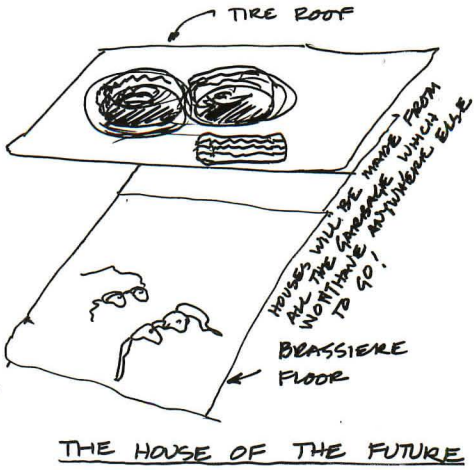
At the New York City roundtable, Haines Lundberg Waehler's senior partner Theodore Hammer said economic conservatism will always influence design. "We are moving from a world of people searching for yield to one in which they will search for economic safety." The result, according to Bobrow Thomas partner Julia Thomas, who takes a more pragmatic view than Bobrow's: "The majority of design will be highly impacted by economic pressures to stay on the safe or commercial side." Hammer concludes the best service architects can offer their clients is advice on building better for less.

New building types respond to shrinking budgets

Just as Kurokawa predicted multiple users for spaces in the 21st century, others predicted multiple uses. At the New York City roundtable, Walter Chatham described a current project for Seaside, Florida, which will be both the civic center promised in the original masterplan and an income-producing conference center for rent to outside groups. He cited the 19th-century loft as "still the most flexible type of building for many uses," accommodating such uses as light manufacturing, offices, studios, and apartments. "If adaptability is built into it, there's no reason a school will not be able to easily become an office building or an office building become a residential structure. In the 21st century, all buildings will become multifunctional—a 9-to-5 office, an administrative space after 5, an adult-education center in the evenings."

Max Bond added, "Architects will be less concerned with the specifics of a program and make spaces constantly more flexible." Architect Gisue Hariri of the sister team Hariri and Hariri added an extra twist to the idea of multi-functionalism. "It will create the need for more generalized spaces, which may lead to more prefabricated systems of





"The future of the library does not lie in the storage of information."—Hugh Hardy

construction, and architects will focus on individualized connections."

A future for familiar building types

• Houses. "Whenever I make a presentation to groups about a just and sustainable society," says Alice Gravitz, executive director of Co-Op America, "I ask them to draw their solutions. The results are amazing. No matter who they are—inner-city kids, activists, or business people—the results are much alike. There is a nice house representing comfort, quality of life, and economic security. Family and friends relax or play outside in a green yard by a meadow or forest and, often, near a lake, stream, or ocean." Hariri and Hariri's vision is more formal (see page 77, bottom left). Chatham has a vision that goes to the heart of sustainability (below right) if not to the hearts of many building their dream home. Houses have their roots in so many varied visions, they are bound to remain the most diverse building type.

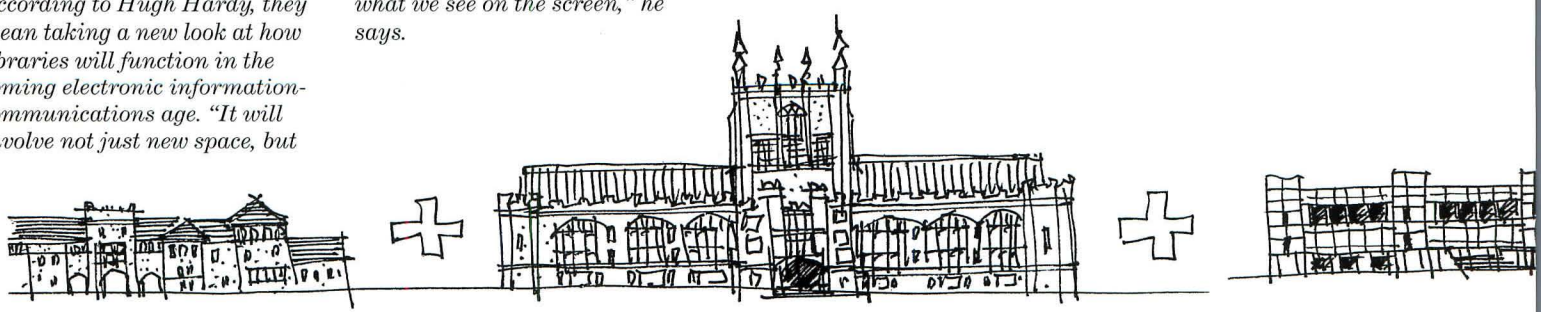
• Schools. Primary schools may be more like community centers. "They are going to become central points for dispensing all kinds of things," said Chatham. He pointed to current experiments in the Midwest where schools are taking on family counseling for troubled students, nutritional programs, and healthcare. The inevitable growth of space for functions that go beyond formal education may be offset by a shrinking need for classrooms due to electronic communications (see Libraries), and some communities may no longer be able to afford to build buildings that serve educational purposes alone.

• Laboratories. "The key to good labs of all types is and always will be flexibility," declared Gerald Schiff of Abramovitz, Kingsland, Schiff, a firm with extensive laboratory experience that even includes design of a research ship for the National Science Foundation. He referred to large unobstructed floor plates, fed by easily altered perimeter utility systems. This allows constant relocation of partitions, rerouting of air-handling ducts to avoid contamination, and updating new wiring for new technology. Usually this means rectangular floor plates, although he foresaw a diagram for a building of amorphous shape that could accommodate any function, including labs (see bottom right, page 74). What did he predict for the next 20 years? More space. "Back in the 1970s, we started off with 10,000-square-foot floors. We're up to 15,000 square feet and we've done 27,000. They're getting bigger and bigger. The equipment is getting smaller and smaller, but more people are needed to operate it. You'll have 100 people on a floor working in concert."

He says work patterns are changing from a single scientist in a cubicle pursuing one goal, to work groups, which will make many partitions in current labs obsolete. Hammer, whose firm also does many labs, saw similar patterns emerging. Other changes include the need to provide sensitive equipment with "clean" power and to shield it from electromagnetic interference from other equipment and structural steel. Security, animal-testing facilities, and protecting workers from radiation, toxic substances and biological hazards will also pose new concerns for architects. Schiff says architects will have to work very hard to to keep the massing of laboratories from resembling discount warehouses (see Samuel's basic building typologies, page 74, bottom left).

• Libraries. "The future of the library does not lie in the storage of information," said Hugh Hardy. Electronic information will reduce the need for storing so many books and librarians will become experts in navigating the Internet for special databases instead of card catalogs and reference books. This will make architects rethink the use of existing space as well as new, Hardy said, referring to his Vassar College project (see diagram below). Will book-laden libraries ever be completely replaced by terminal-accessed databases? "Printed infor-

Hardy Holzman Pfeiffer's problems in adding to two existing library buildings for Vassar College goes beyond finding a fitting architectural vernacular. According to Hugh Hardy, they mean taking a new look at how libraries will function in the coming electronic information-communications age. "It will involve not just new space, but looking at how existing space can be reused as well." Does he see an end to libraries as repositories of books? "They will continue to be needed to verify what we see on the screen," he says.



"I will not need new methods. Design will always start from tradition and refine and then refine again."—Kobun Nakamura

mation under a publisher's imprint carries the presumption of accuracy," he added. "What is found on the electronic screen appears without certification. It could come from anywhere. Traditional libraries offer a means to confirm the record."

• Museums. What about incorporating in museums the sort of flexibility that seems so important in other building types, such as labs? Chatham pointed to the difference between the original National Gallery in Washington and its much newer East Wing. He recalled that the architectural press called the original building, built in the 1930s, "hideously old-fashioned" and the East Wing "modern, totally cool, and progressive." But his father-in-law, who was an associate director for the East Wing, said "the staff used to pull their hair out" trying to fit shows into the triangular space, while the original building with its "boring enfilade plan" accepted exhibits with ease. "You could put anything in it," again referring to the 19th century loft prototype as the model of the future.

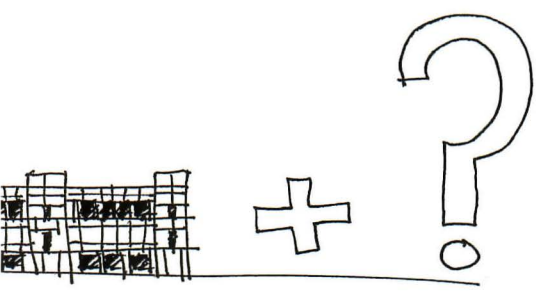
Others say art museums won't change much, but see facilities dedicated to specialized subjects, such as publishing, broadcasting, or historic episodes, like the Holocaust. Max Bond noted, "These have a tricky balance between moralizing and entertainment—and the architecture is about how to engage the viewer." He noted that one group wanting to mount exhibits at Davis Brody's Civil Rights Institute in Birmingham were really thinking of entertainment, not display of artifacts. Suzanne Stephens suggested that the architecture of some museums, such as that dedicated to the Holocaust in Washington, D.C. [RECORD, July 1993, pages 58-67] would be an important part of the viewer's experience. Some observers considered inappropriate of the imagery of the Museum of Television and Radio in New York City, noting that the ephemeral nature of the exhibits—the playing of videos and recordings for audiences—is belied by its "old stone-clad-institutional appearance. Perhaps there's something about our society that will continue to require that sort of validation in museums," said one observer. "There's no substitute for the real thing," said Gerald Schiff, referring to the idea of seeing the Mona Lisa on a 9- by 12-inch color screen.

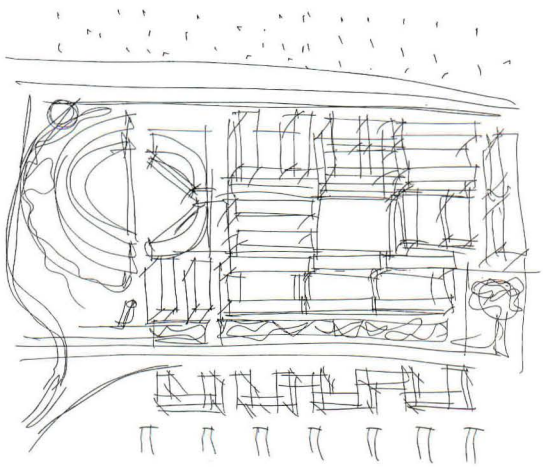
Denis Kuhn suggested that, for some types of museums, it is appropriate using a building that is itself an artifact. He referred to Ehrenkrantz & Eckstut's current work on the Museum of the American Indian in New York City, which faces a special challenge in that it utilizes a major historic building built for a totally different function, as may many future museums. "It will be easier to convert an existing structure in an inner city than build new," he noted, adding that, in the case of an existing building, there may be important lessons to learn—such as leaving intact original statuary on the Indian museum that could be construed as "anti-native" today, but was seen as a view of historical events acceptable when the building was erected.

New technologies get mixed reviews

Quite a few architects interviewed see new architectural technologies as a continuum of past ones. "Some types of buildings, such as houses, have well-established delivery techniques," said Taft's Danny Samuels. "The constraints of conventional construction are liberating," he added. "Design can continue to be a play on what a given system is capable of without having to stop and reinvent it for each project." Frank Kelly added, "There may be new coatings, but the guts will stay the same." These sentiments were echoed by some foreign architects. "I will not need new methods," says architect Kobun Nakamura of Japan "Design will always start from tradition and refine and then refine again."

Kunihide Oshinomi, the architectural manager of Kajima, one of the world's largest and most progressive design-build firms, is also skeptical of great changes in basic structural technology. "Compared with





The Alexander Concourse in Rotterdam illustrates architects' growing concerns with issues of city planning and landscape. It is a proposed new area of the city, where two major highways, a train station, and a metro line currently meet in a no-man's land. Working with local architects including Rem Koolhaas, Robert Geddes illustrates the team's proposal (right), designed to become a lively neighborhood of mixed-use, mid-rise buildings; hybrid uses are arranged in small blocks. The new streets would connect metro stations, the train station, and vehicle transfer points , as well as linking the city to a greenbelt.

"You don't cut down a tree anymore. You pull chips off the workshop floor, and mix in binding agents to make a beam." Walter Chatham

other technical advances, structural systems will be very conservative." Spanish architect Alberto Capo Baeza added, "New materials will be welcome only to the point that they solve existing problems. Structural innovation won't make gravity disappear." According to *Calvin Tomkins*, even Renzo Piano's new Kansai Airport is based on the relatively venerable tensile theories of Buckminster Fuller. Notes Walter Chatham painfully, "We reached a point in the late 1960s when just about everything structurally possible was assumed desirable. We have some pretty horrific buildings as a result. So there's some backing off structural expressiveness."

"Improvements such as window-wall gaskets increase design freedom," said Graham Gund, "but limited skilled labor will influence what can be realistically built." "I would be very pessimistic about a new material," said Theodore Hammer. "Assuming that indeed we are in for more stringent and cautious economic times, conventional materials should be used in unconventional ways," he recommended, echoing the attitudes of small-firm architects in Houston. Walter Chatham, however, sees design freedom in standardized components. "There's no point in reinventing the same detail 10,000 times," he said. Kuhn pointed to precedent in even the most conservative design: the pattern books of the 18th century.

William Pedersen cited a "coming together of craftsmanship and technology," referring to the use of computers and laser and water-jet machines to shape materials like glass and stone to previously impossible tolerances. Thomas Hanrahan compares this new relationship between computer-driven manufacturing machines and new materials to the use of plastics in refining the shape of the automobile. "Think about how rudimentary metal car bodies were 60 years ago, relative to their refinement today," he reminded. "Computers can now be used to allow architects to develop components that could not even be depicted before, let alone manufactured." Such customized components are a trademark of his firm's minimalist designs.

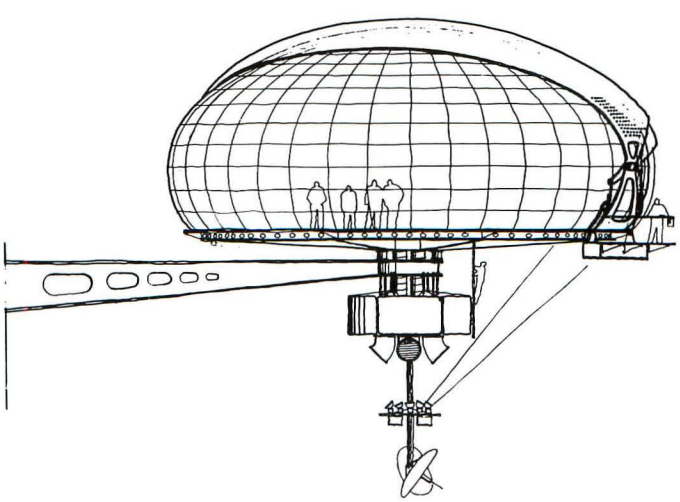
Other architects discussed the changing nature of materials themselves. Hardy predicts further evolution of materials that are highly refined, yet made of natural materials or waste products. "If a new material comes along to resolve the two poles, it will make a big difference," he said. "My guess is it would come from the transformation of a natural material." "There are no traditional materials left," said Walter Chatham, citing the wood products industry's use of materials that were formerly considered waste. "You don't cut down a tree anymore. You pull chips off the workshop floor and mix them with a bunch of binding agents to make a beam," he added. In Paris, Dominique Perrault suggests that "glass is a material that needs to evolve. If we could make structure, stairs, floors out of glass, we would gain a maximum of natural light." Others' ideas were more basic. Martin Pawley in London suggests a massive program similar to the Apollo to develop "construction materials and to push components' evolution towards industrial production." This would "produce truly effective and efficient technologies for low-energy controlled-climate buildings," he says.

"Open access to information on what is happening worldwide is creating radical change in our ability to interpret the coming together of design, construction, and materials in a more sophisticated technology," says Julia Thomas, who cites certain building types such as airports are already being affected. At the New York City roundtable, Robert Geddes said that "architecture was wrong in leaving engineering to engineers. "Kisho Kurokawa sees involvement in engineering as a whole new opportunity: "Future architects should create new engineering. Then architecture will change." One possible result:

The greening of architecture

The groups' discussion of materials led almost directly into the topic of

Lingotto Fiere is a complex of exhibition halls and cultural facilities in part occupying a former Fiat plant with a spectacular concrete structure (far right). It combines two concepts of the future—advanced technological design by Renzo Piano and ecologically sound recycling. The "flying" conference room (right), which features a convex ceiling for acoustic projection, is suspended above the original buildings on a steel superstructure. It is intended for high-level conferences.



List of participants in RECORD's roundtables to explore the future: *NEW YORK CITY, August 3, 1994: Max Bond, Davis Brody & Associates; Walter F. Chatham, architect; Robert Geddes, New York University; Theodore Hammer, Haines Lundberg Waehler; Thomas Hanrahan, Hanrahan & Meyers; Hugh Hardy, Hardy Holzman Pfeiffer Associates; Denis Kuhn, Ehrenkrantz & Eckstut Architects; Suzanne Stephens, architectural critic; Gerald Schiff, Abramovitz Kingsland Schiff. HOUSTON, August 4, 1994: Gerald Moorhead, architect and moderator; Val Glitsch, architect; Frank Kelly, PBK Architects; Danny Samuels, Taft Architects.*

sustainable or so-called "green" architecture and materials. Sustainable materials can be described as those requiring the least energy to manufacture and creating the least toxicity when thrown away. Operable windows and recycled materials are not dramatic developments but have an enormous impact on the shape of a building. Kuhn brought up preservation: "These ideas reinforce the whole notion of preservation as the ultimate in sustainability," because they require far fewer new materials in the first place. He described a current renovation of a million square feet for the Department of the Interior involving 4,000 deteriorated wood windows. "It's much easier to argue for repair today," he said. "Five years ago aluminum replacements would have been natural." Hugh Hardy: "We're going to be forced to take a longer look at re-using stuff. Remember when the AIA only gave awards to new buildings?" He was alluding to the new visibility of recycled buildings in its annual awards program.

"We are seeing too many relatively new buildings succumbing to premature obsolescence because of wear and tear," says Peter Samton. "Buildings should be designed as open frameworks to allow successive, new systems and interior finishes that can be clipped on and peeled away." Architecture that is worthy of the name has [and always will be] perfectly adaptable to new uses," says Alberto Camp Baeza, putting a new spin on Samton's concept. "Life spans of new buildings are too short and waste energy," says Kunihide Oshinomi. "Buildings will last longer and be more durable," he adds. Kurokawa recommends new materials such as "paving that is porous but durable—able to support tanks but absorb rain and allow it to seep into the soil."

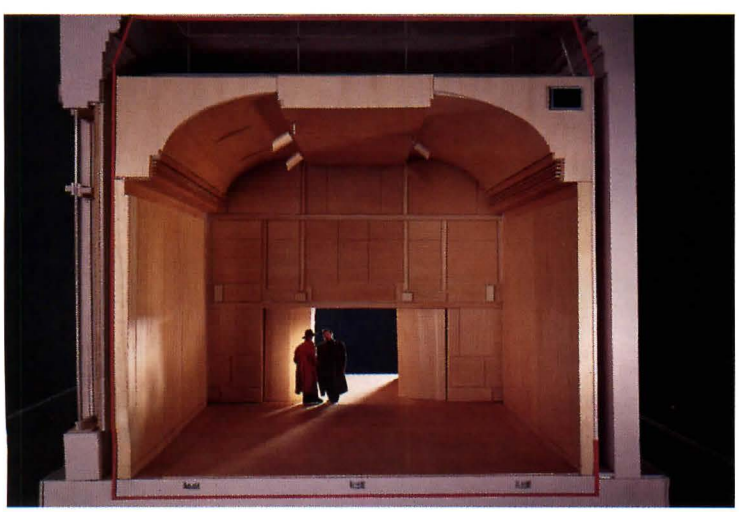
Julia Thomas sees hope in society's changing attitudes that favor ecology. Kobun Nakamura predicts a return to solar-energy panels, which he sees as evolving into more visually appealing building elements. In Houston, Danny Samuels recommended the book *How Buildings Learn* by author Stuart Brand. The message: "Some buildings can change, but architects can't," he said. "Sustainability is inevitable," observes Julia Eizenberg. "Like adapting new ADA rules, rules like this will take time—a lot more time."

What buildings will look like

Critic Martin Pawley believes that industrialization will loosen "the grip of deadening, trivializing academic notions of eternal values." Writing in *The New York Times*, popular author Douglas Coupland sees the spirit of the new age epitomized in Rem Koolhaas's building at the French entrance to the Channel Tunnel, which he likens to a "space station crashed into a small respectable town." Said Chatham: "Ultimately, what buildings will look like is a question of taste." What once was the only real generator of basic building style, climate, has been largely negated by mechanical systems. Still, the basic issues of commodity, firmness, and delight remain.

Hugh Hardy spoke up for eclecticism, including incorporation of historic styles. Said RECORD editor Charles Linn, "Eclecticism is very much what democracy is about." Robert Geddes said his heart was really with Modernism, but he would leave this meeting shaken, concluding that the real issue is authenticity. Thomas Hanrahan strives for a expression of spaces and materials.

How will all of this be resolved? "Coming back home to Genoa," Tomkins quotes Renzo Piano, "is not about nostalgia. It is a reaction to too much information—too much knowing and not having time to understand." And, from such sifting of many voices, the future of architecture will emerge. *Charles K. Hoyt*



"Preservation is the height of ecology," says Denis Kuhn of Ehrenkrantz & Eckstut, which is just completing remodeling of the New York City Customs House, a landmark of vigorous 19th-century design, into the Museum of the American Indian, as well as facilities on the upper floors for the city bankruptcy courts. It combines two concepts of the future: sustainability and multiple use. A basic problem faced by the architects was the need to provide a setting for the display of artifacts at odds with the character of the Beaux Arts interiors. Another was to provide protection from light and introduce climate control in a building designed for a maximum of daylight and a minimum of mechanical ventilation. The solution (section left) was to insert entirely new rooms and systems within the restored walls without touching them.

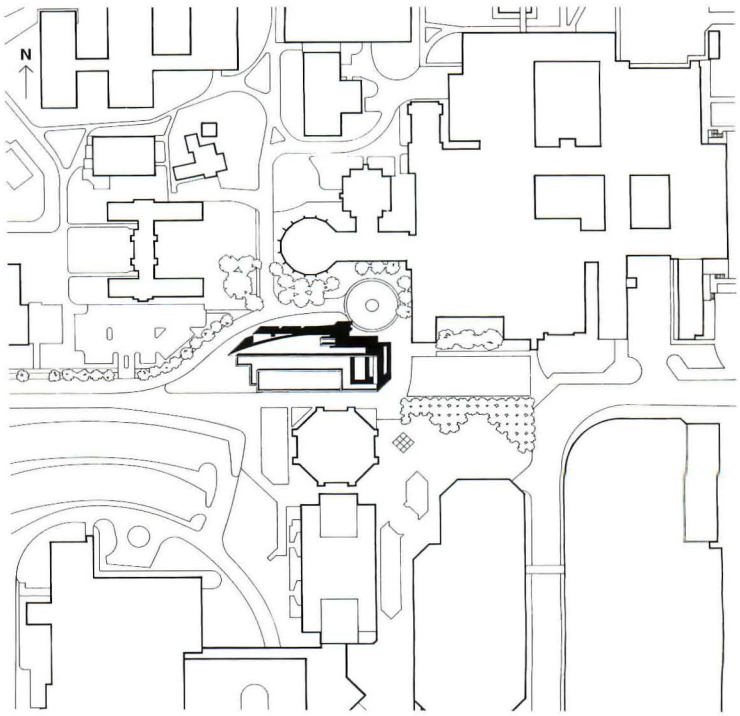
Learning Curve

Eskind Biomedical Library
Vanderbilt University
Nashville, Tennessee
Davis, Brody & Associates, Architect
Thomas Miller & Partners,
Architect of Record

With one foot still in the print era and the other in the electronic age, the Eskind Biomedical Library is poised for the future. While electrical wiring and computer cabling are neatly tucked out of sight, the library's relationship between old and new is dramatically expressed in its curving glass curtain wall breaking free of a more traditional concrete envelope. "This building is a transition from the traditional library to the library of the 21st century," says T. Mark Hodges, the library's director.

In medicine, information becomes obsolete quickly, and the march to electronic distribution of data and text is applying intense pressure on institutions to adapt. According to Hodges, 93 percent of requests in his library are for publications not more than 7 years old. While printed texts will always have an important place in the library, their role relative to electronic sources will change markedly in the next 10 years. As a result, the architects of the new 80,000-square-foot library designed a building that would evolve in step with the medical profession. The most visible sign of this evolution will be the gradual replacement of about half of the library's book stacks by computer workstations. To make this transformation possible the architects called for special cable and wire trays in ceilings in the stacks areas and made them accessible via flip-up boxes in the floor above. Working on a 28-foot planning module, the architects coordinated the placement of book shelves, overhead wiring trays, lighting, and the building's concrete columns, so that when stacks come out, wiring and lighting will be properly located for computer study carrels.

Built on a key site between Vanderbilt's sprawling medical center and its historic undergraduate campus, the library acts as a high-profile hinge tying together what had been frayed edges. "The client wanted a 'crown jewel' for the campus," says Steven Davis, the partner-in-charge for Davis Brody & Associates. "So we designed a building with a sweeping glass front that would welcome students during the day and serve as a lantern at night."



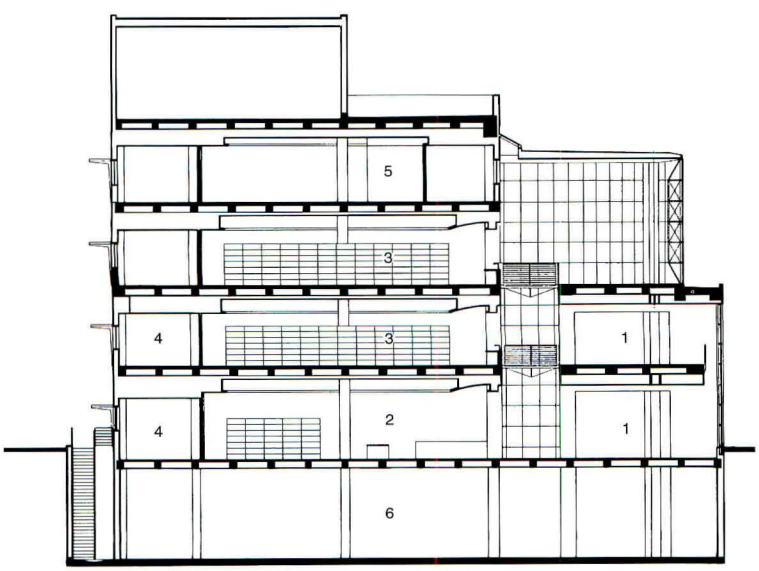
Centrally located within the medical school and the university, the library is a key shared resource. Responding to the direction of the sun, the building's glazing on the northeast and northwest (below) differs from the west and east (bottom).

© *Paul Warchol photos*

Incorporating an arcaded walk on its east and picking up the trail of Garland Avenue on its north, the library uses these two existing axes to anchor itself to its site. To ease the shift in scale from large medical center facilities (on the east and south) to smaller undergraduate buildings (on the north), the library steps down with a trio of smaller volumes extending from the 49-foot-high glass curtain wall. Perhaps due to the power of the curving front, the flat and mostly precast back of the building seems a bit timid and underdeveloped.

Held in place by a hybrid system of quarter-inch stainless-steel tension rods and conventional vertical steel trusses, the library's curtain wall is totally self-supported. "This is the first truly self-supported tensile curtain wall in the U.S.," states Davis. "And it's not just a plane of glass, but is curved too." But by using standard metal piping in the vertical trusses and modified off-the-shelf clevis connectors, the architects, with consultants Advanced Structures Inc., were able to keep the cost of the curtain wall within budget. (Custom curtain wall can cost $300 a square foot and more, says project designer Frank Michielli, but the system developed for this project now costs about $100 per square foot.) Because it faces almost due north and gets direct sunlight for only a few hours in June, the wall can use clear glass, one-inch thick and insulated. As a result, it brings daylight deep into the building's interior. It also provides a simple organization to the library's basic functions: lounges and reading areas hug the curving glass wall, while stacks and support services that need less daylight line up on the south side. In between, a four-story-high atrium serves as the building's main east-west path.

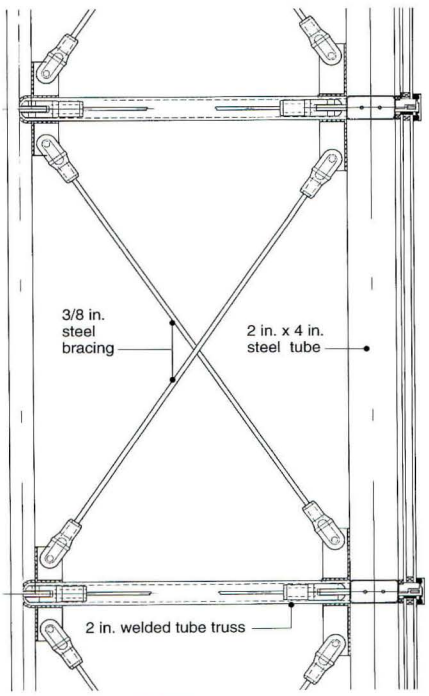
A concrete-frame structure mostly clad with acid-washed precast panels, the library is a traditional building with a high-tech building emerging from it, explains Michielli. While wood railings and touches of cherry-veneer paneling evoke images of old libraries, the building's sophisticated wiring and cabling system lets students and doctors plug in their portable computers almost anywhere, including reading areas and lounges. As Davis explains, "This library is ready to jump on the information superhighway." *Clifford A. Pearson*



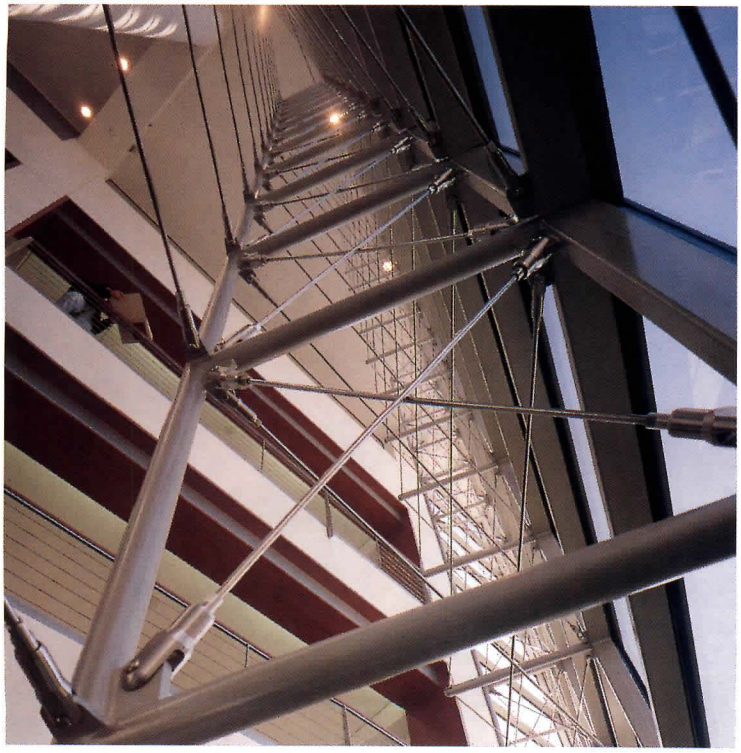
1. *Reading*
2. *Reference*
3. *Stacks*
4. *Work/meeting*
5. *Offices*
6. *Storage*

Up Close

Let there be light! In the old days, college libraries often evoked fortresses or thick-walled baronial halls in which wainscoting and small-paned leaded windows created rich but dark interiors. In fact, the Vanderbilt undergraduate library is just such a building. The architects for the Eskind Biomedical Library, though, decided to make a clean break with this tradition and use daylight as an important element in its design. While the 49-foot-high curved glass curtain wall with its horizontal tensile rods and vertical cross-braced trusses (drawing below and photo 3, opposite) is the most dramatic aspect of the library's daylighting plan, it works in conjunction with several other key elements. These include: a four-story-high atrium that helps bring sunlight into the center of the building (section below left), a third-floor terrace that ties a board room with the outdoors (2), aluminum sun shades that protect small windows on the the south elevation, and narrow gray-tinted skylights running along the south edge of the atrium.



VERTICAL TRUSS DETAIL



Return to the Heroic

© Paul Rafferty/ARCAID photos

*With its soaring wings and elegant vaulted roofs, the recently completed Satolas station connecting the airport and the high-speed TGV (*train à grande vitesse*) in Lyon, France (opposite and following pages) marks a climax in the rapidly growing body of work of Santiago Calatrava. Architect, engineer, and sculptor all in one, Calatrava has reintroduced powerful, symbolic form to the prosaic commission, making public works into works of art. Amsterdam-based RECORD correspondent Tracy Metz interviewed Calatrava, asking, among other things, what it means to be an architect and an engineer at a time when the role and content of the public realm are uneasily shifting.*

Tracy Metz: Is there a distinction between architecture and engineering?

Santiago Calatrava: It's out of fashion to make a distinction. The division between the two is a result of the politics of the 19th century. Technical schools established certain traditions of teaching, which were projected into the 20th century. I, on the other hand, believe in an understanding of architecture similar to that of Frank Lloyd Wright or Mies van der Rohe. Wright had technical training before he went to work with [Louis] Sullivan. His precision in the use of materials, his respect for technology: to me, those are the key to his poetics. Both engineering and architecture serve the art of construction. My ideal is to make works of pure engineering that are inspired by the soul of the artist.

TM: Has there been a change in the way architects and engineers are educated? Is the training they receive still too disparate?

SC: The training of engineers is still strongly directed toward the analysis of phenomena through mathematical models. They don't learn to interpret nature in a purely visual way, by drawing. Many schools are now trying to bridge the gap by teaching engineers both the history of engineering and the history of art. I can't stress enough how important it is for an engineer to realize that the profession is not just part of a technical process, but also part of the culture of the 19th and 20th centuries. An engineer can make a cultural contribution. The Golden Gate Bridge [in San Francisco] is every bit as much an expression of our culture as the architecture of the skyscrapers in New York City.

TM: The late 20th century "emancipation" of engineering is not just a matter of attitude, but also of technology—the advent of computers.

SC: Computers liberate the engineer from the technical analyses which have always been difficult and time-consuming tasks. They give the engineer more time to concentrate on the nature of the work itself. They also give more freedom to reflect on how to construct an object and to think up innovative solutions. Engineering has always been a matter of finding ingenious answers, and new technology can help. Engineering is the art of the possible.

TM: What role does logic play in your work?

SC: This attitude toward architecture—not high-flying esthetics, but the self-evident logic of the tectonics of construction, the logic of materials—is as old as the pyramids of Egypt. It has, and will always, belong to the basic tenets of the art of building. Now we work with concrete, steel, glass, but, like the Egyptians, we have no other pretense than to combine components and let the light come in.

TM: Your work is primarily in Europe. Do you notice a difference in building practice from the U.S., where construction is standardized to a greater degree?

SC: I don't have much experience in the U.S., but Europe by its very nature has a more elaborate network with a tradition of small practices. America is a huge country, where the engineering market is controlled by a few large firms. They are capable of doing many different things, but the situation still tends to create uniformity. In Europe, the existence of a large number of firms rooted in different cultures makes for more opinions and, therefore, more diversity.

TM: Be it stations, airports, bridges, museums or schools, 99 percent of your work comes from winning competitions, and almost all of those competitions are conducted by public bodies.

SC: Apparently it is my destiny to do public commissions. It's time for authorities to become sensitive to the dignity of public works. Their responsibility is not to make public works as cheap as possible, but as beautiful as possible. Art is not just in museums, but also on the streets: what we use and touch, what we walk on and drive in every day. Bridges, stations, airports: they are built to serve society. They are the tangible products that survive us, the heritage that we leave behind for following generations. Good architecture is good for everybody, not least for the people who commission it. It shows that a building can be not only functional, but also representative of the spirit of a place, of what a community wants to be, of how it wants to portray itself to the outside world.

TM: The bridge you designed in Barcelona is a case in point. Upon completion it became a symbol of the city.

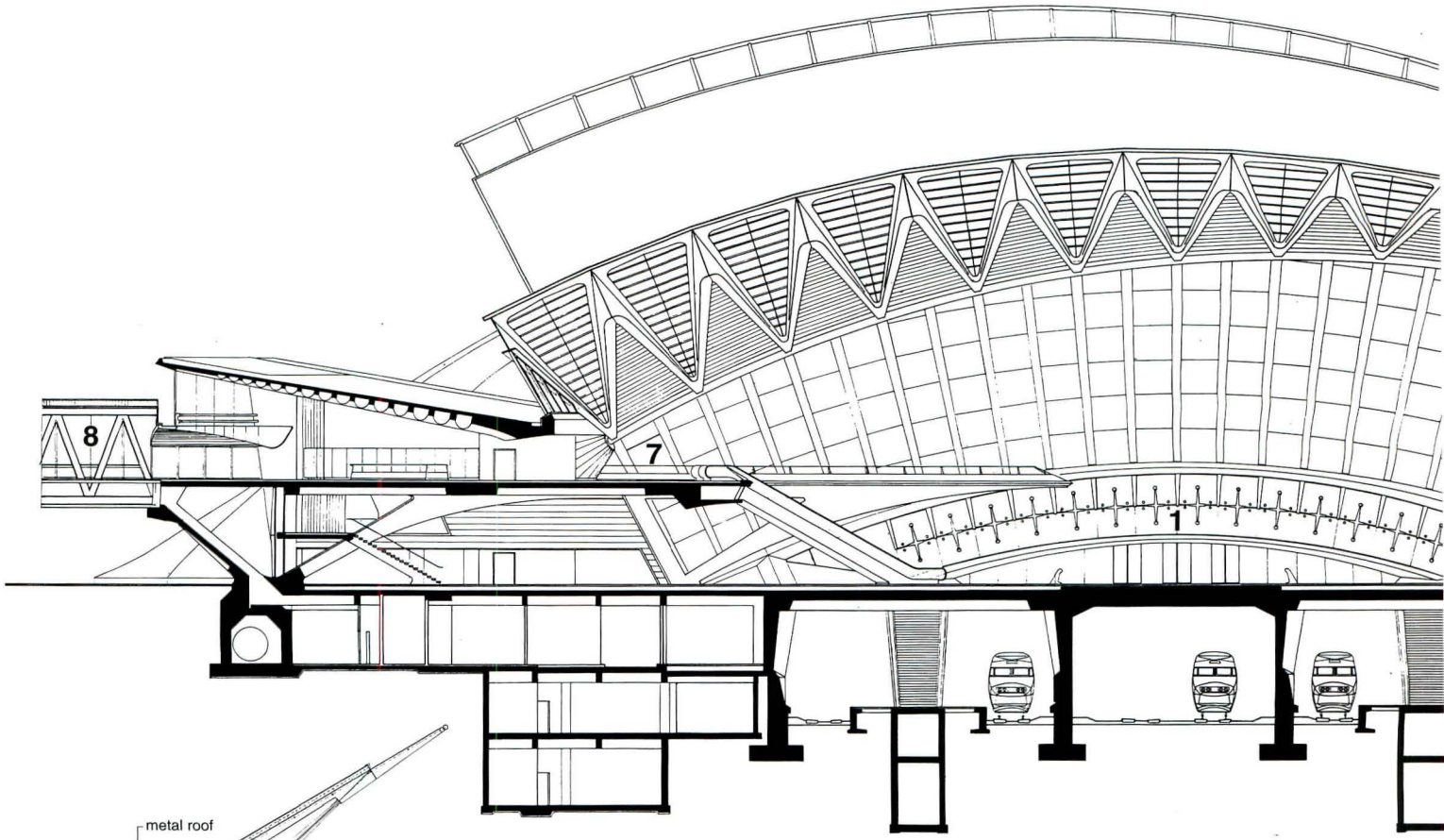
SC: Bridges are not just standard objects determined by cold calculation. Some are ugly, others are very beautiful. It's a matter of design quality. A bridge is more than a way of crossing an obstacle. As soon as we recognize that, we are on the way to discovering that it is a work of art. The Golden Gate Bridge is one of the masterpieces of the 20th century, and I mean not just of the art of construction, but of all the visual arts.

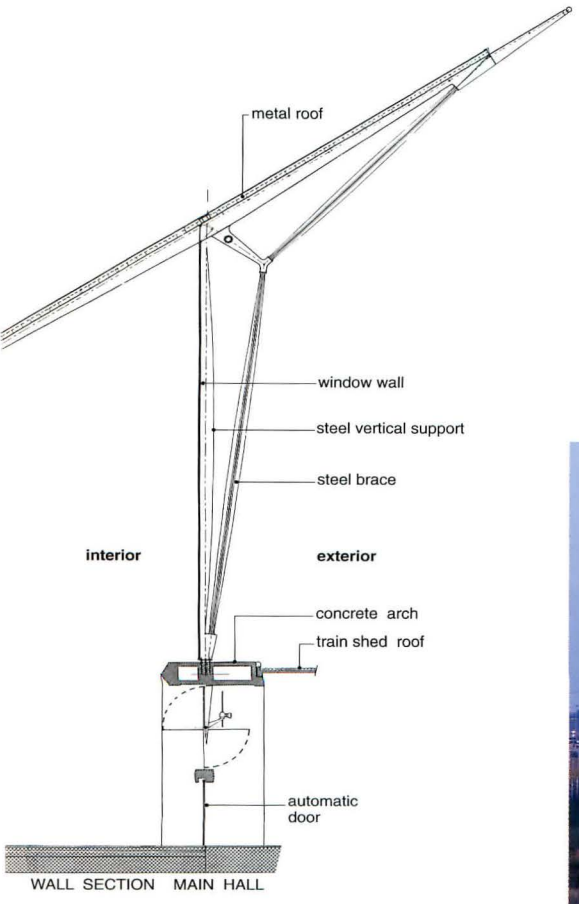
TM: In the Satolas competition program, the city of Lyon asked for a building that would serve as a regional symbol. How does your design accomplish this?

SC: At the presentation of our design I used a famous painting as an illustration, Salvador Dali's

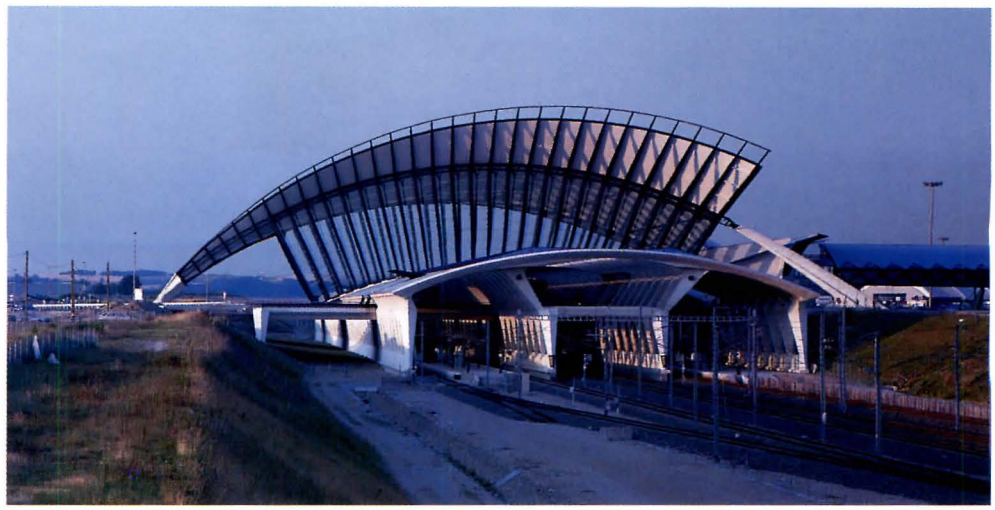
continued on page 94

Lyon Airport Railway Station
Lyon, France
Calatrava Valls, Architect

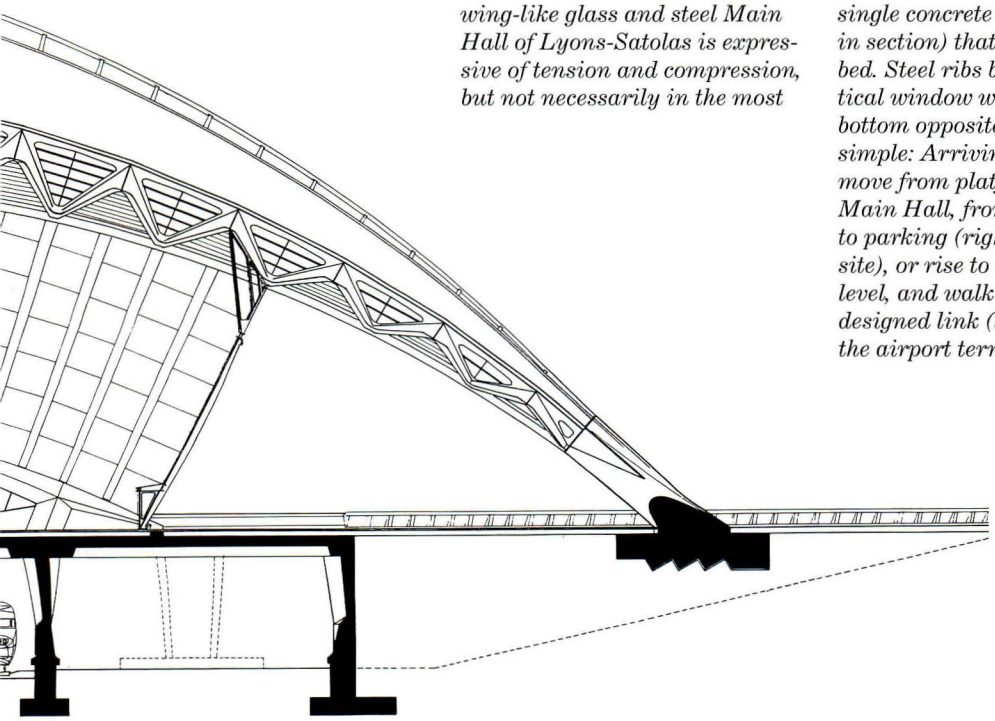




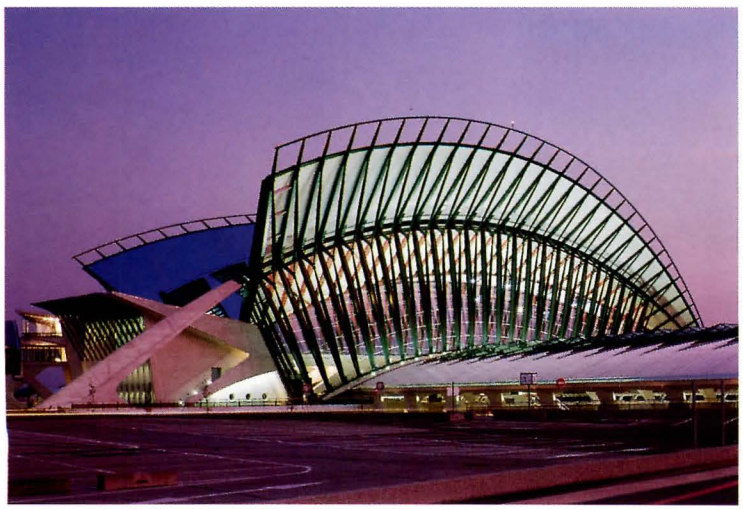
WALL SECTION MAIN HALL

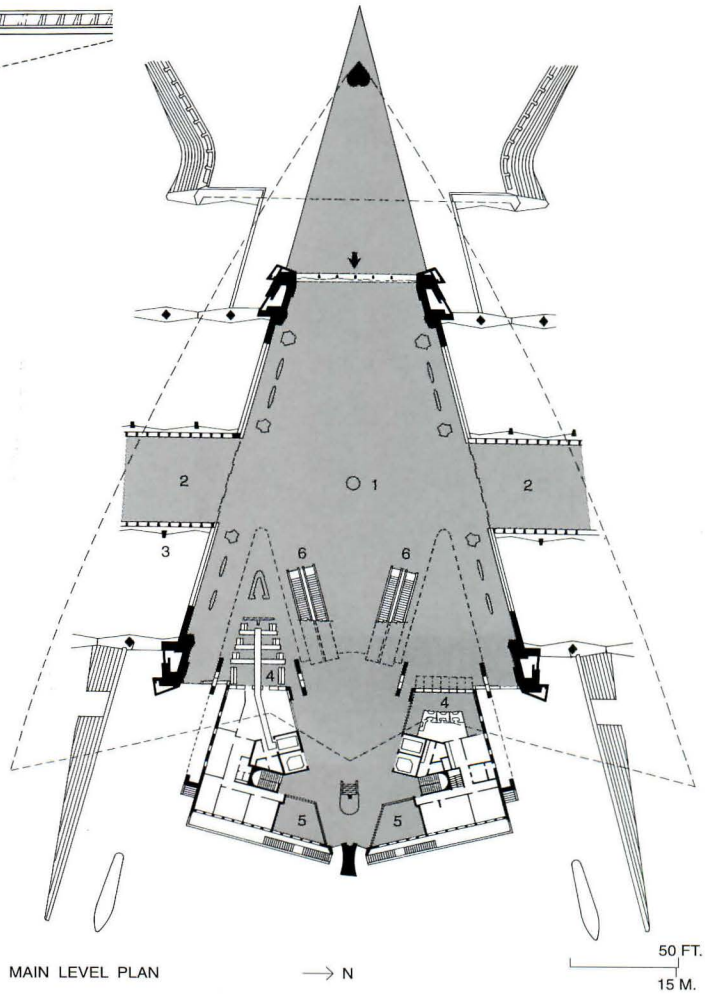


TGV Takes Wing: *Like the little models Calatrava used to make using household leftovers (wood, hooks, balls of string), the wing-like glass and steel Main Hall of Lyons-Satolas is expressive of tension and compression, but not necessarily in the most structurally economical way. The depth of the roof's folds brace the four lightweight supporting arches (converging at a single concrete haunch at right in section) that span the track bed. Steel ribs brace the huge vertical window wall (drawing bottom opposite). The program is simple: Arriving passengers move from platforms up to the Main Hall, from which they exit to parking (right in photo opposite), or rise to a mezzanine level, and walk via a Calatrava-designed link (left in photos) to the airport terminal.*



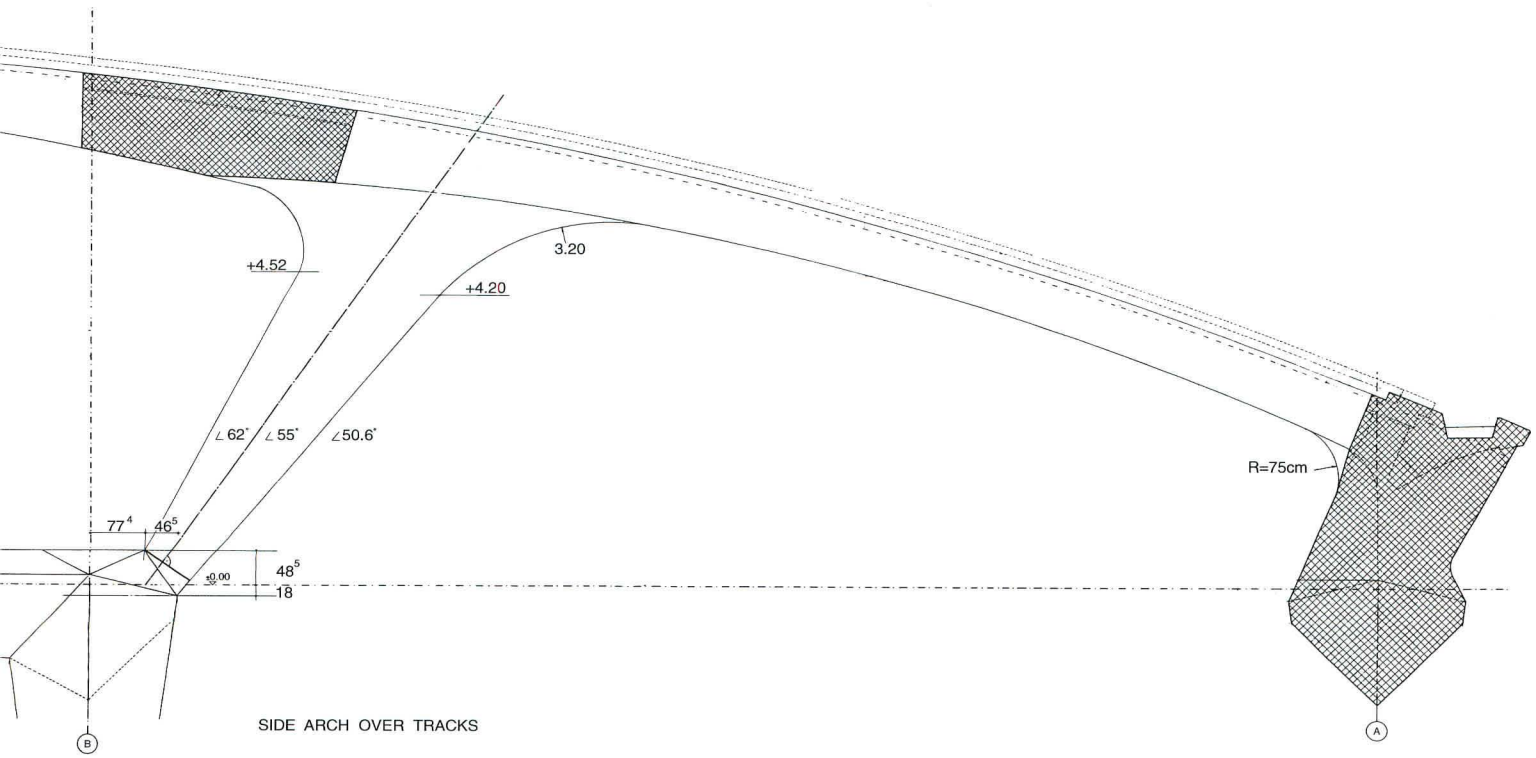
1. *Main Hall*
2. *Access to trains*
3. *Tracks below*
4. *Ticketing and office*
5. *Retail*
6. *Escalator to mezzanine*
7. *Mezzanine*
8. *Link to airport terminal*
19. *Magna aliquam*
20. *Erat volutpat*
21. *Loremipsum*
22. *Dolorsit*





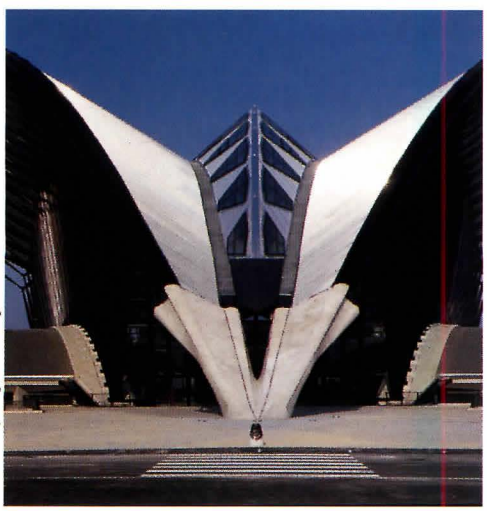
MAIN LEVEL PLAN → N

50 FT.
15 M.

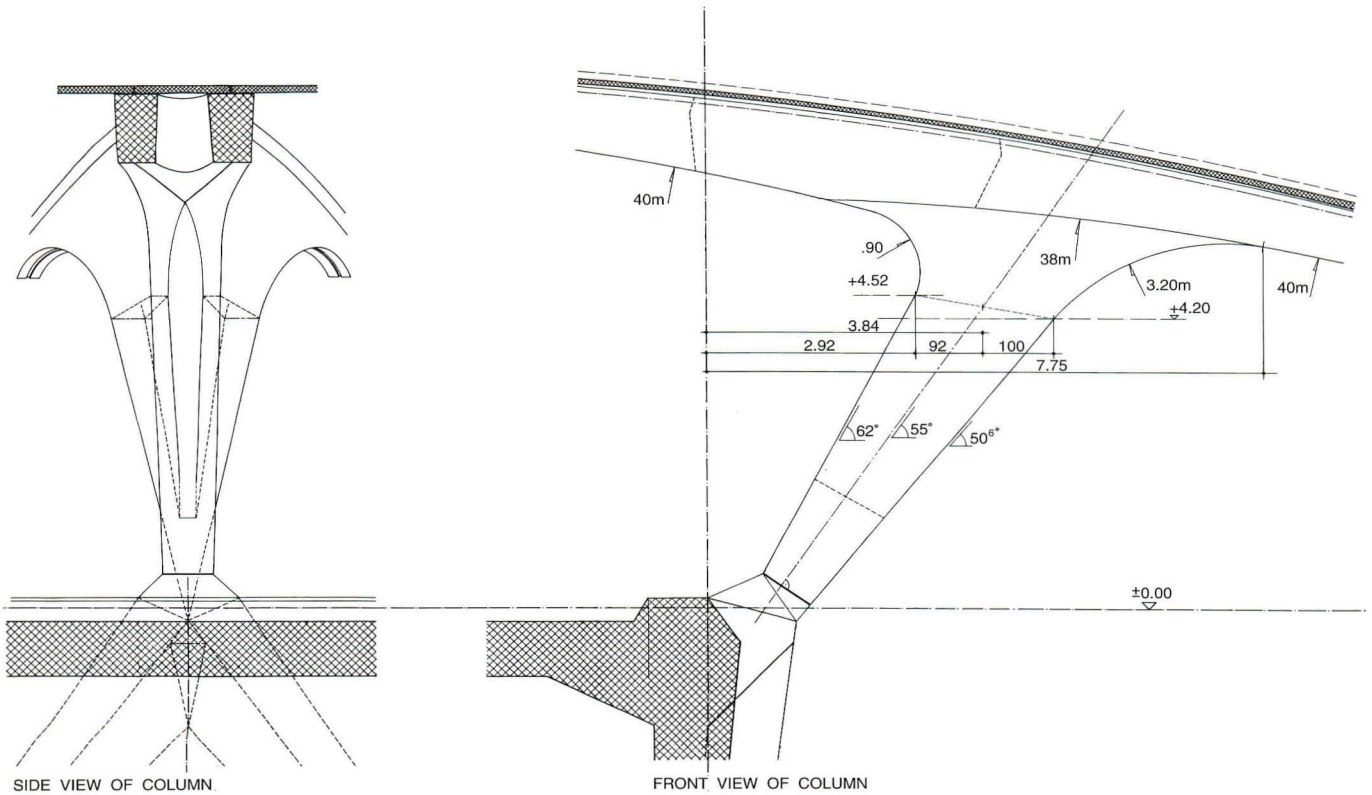


SIDE ARCH OVER TRACKS

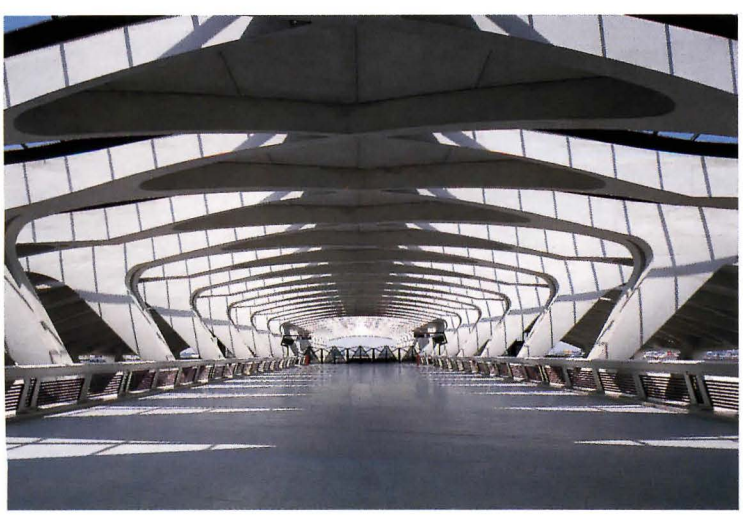
Calatrava doesn't adhere to the ideology of minimum material—the Holy Grail of 20th-century engineering—making him a pariah in some engineering circles. Nevertheless, the expressive power of Lyon has already made it a tourist attraction. It's not just the Main Hall's spectacular interior (opposite right photo), with its sculpted mezzanine connecting the station to the airport, but the combination of lightness and fluidity in the poured-in-place, lattice-roofed vault that spans the three-bay track level (drawings above and middle photo below). Passengers move under the center of the vault (opposite left) to reach escalators to platforms (below right). Calatrava sees the switch from concrete beneath to steel above as crucial, asserting that the design and the material must be suited to each other. J.S.R.

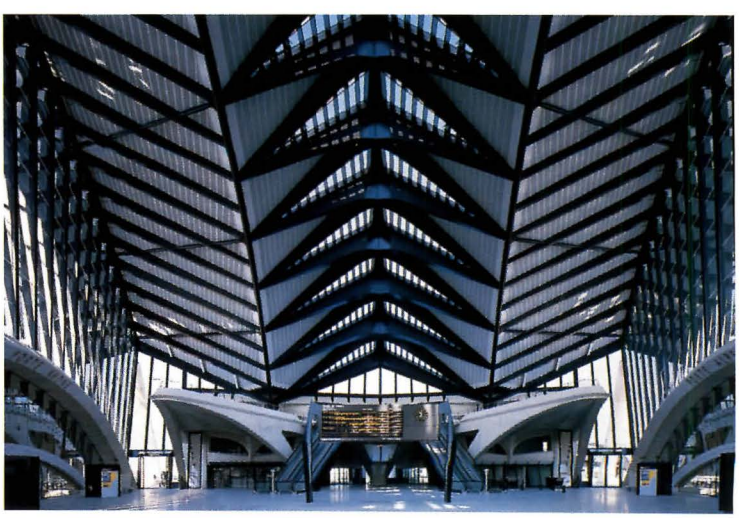


©Paul Raftery/Arcaid photos



Credits
Lyon Airport Railway Station
Lyon, France
Architect/Engineer: *Calatrava Valls—Santiago Calatrava, principal-in-charge; Alexis Bourrat, Sebastian Memet, project team*
Associate Engineers: *Peter Lüthi and Aldo Cerullo*
Consultants: *Christopher Bartz (electronic systems); Pierre Vedegrain SNCF (platforms); Planitec*
Project Management: *Calatrava Valls EURL*





Continued from page 88
Melting Watches. "Our building is like this painting," I said. "Once you've seen it, you'll never forget it." Not only is it unusual for a regional authority—in this case, Lyon—to hold an international competition, but also unusual was the fact that the competition was not for a political or institutional building, but a large public one—a TGV station and airport connection. It was obvious from the start that in order to give a building that is 1,650 feet long and 200 feet wide some architectural expression, it would have to be articu- lated. That is how I came to the idea of a transparent central hall that serves as a pedestal for two wings. Four or five years before I started on this design I had made a sculpture of black granite and brass, about three feet high, with a great triangular, leaping shape. I discovered that I still had this shape in the back of my mind. But then I have always regarded my sculptural work as mental preparation for my architecture.

TM: Can you comment on criticism of the project's cost [approximately $130 million]?

SC: Given the magnitude of the work, the project was not so expensive. There were infrastructure elements that had nothing to do with the architecture as such: bridges, tracks, all sorts of technical facilities. A station on this scale is by definition a major investment. The participants are glad that they took the opportunity to connect the airport and the new TGV line on a scale worthy of Paris. Four months before the work was finished, the region invited people to come and see the station. More than 40,000 people came.

TM: Your design of a station in Lisbon, Portugal [approximately one mile from an existing station] also includes a monorail to the airport, retail facilities, and parking. Does the design represent a shift in your approach to large-scale public works?

SC: Lisbon is a very beautiful and old city with a strong urban character dating back to the Baroque era. We have created a double system of avenues and moved the station into their axis [drawings right]. The building of a station has consequences for public trans- portation, but also for the use of the city around it. By changing the station, we also influence the plan of Lisbon. Urbanistically, the project builds on my station in Zurich. It's an intervention in the existing structure of the city; it's embedded in a strong context. It's a different situation from Lyon-Satolas, which is far from the city and only has a connection to the airport.

TM: Thanks to "an empirical understanding of nature," is the engineer better equipped than the architect to evoke respect for the landscape?

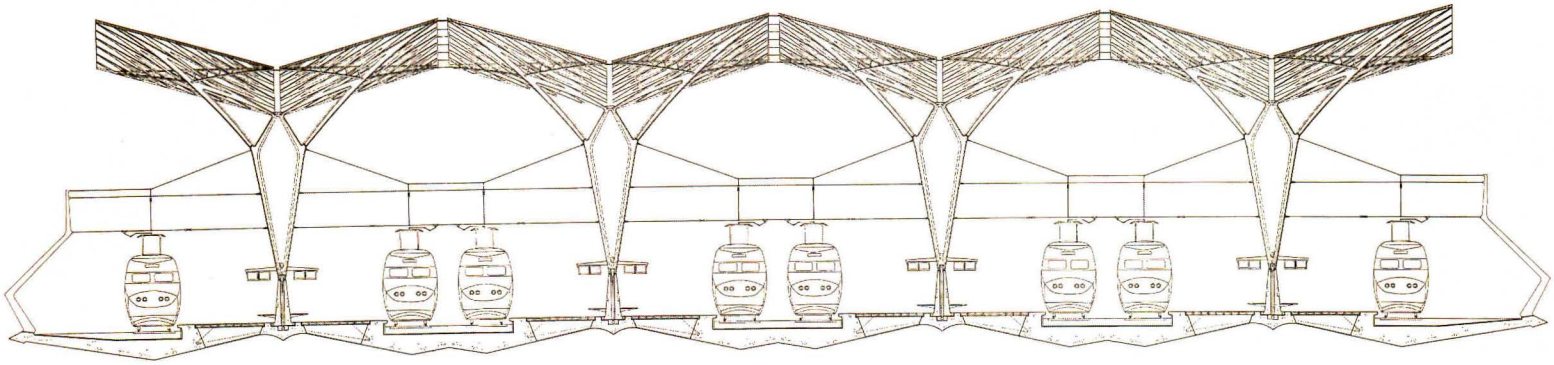
SC: We think too schematically, as if someone is either artistic or pragmatic, but never both. My approach is synthesis. To my mind it is ridiculous to say "these circumstances allow for an artistic bridge, those demand a pragmatic station." The transformation of something that looks banal on the surface into a work of art is a matter of attitude and talent. A piece of canvas and a tube of paint are poor things in and of themselves, but together they can become a great painting that far transcends the simple materials it is made of. That is what I feel when I look at some simple object made by Frank Lloyd Wright: here is an exceptional artist using the simplest of materials to convey his inspiration to me, the viewer. This is the philosophy that ultimately makes our works into our heritage. We are accustomed to regarding a painting as a bearer and transmitter of a cultural message over time, but a station and a bridge can do the same. Even if you are not consciously aware of your surroundings, they can can influence you. They can uplift you, even if it's only for an instant.■

Orient Station Lisbon, Portugal

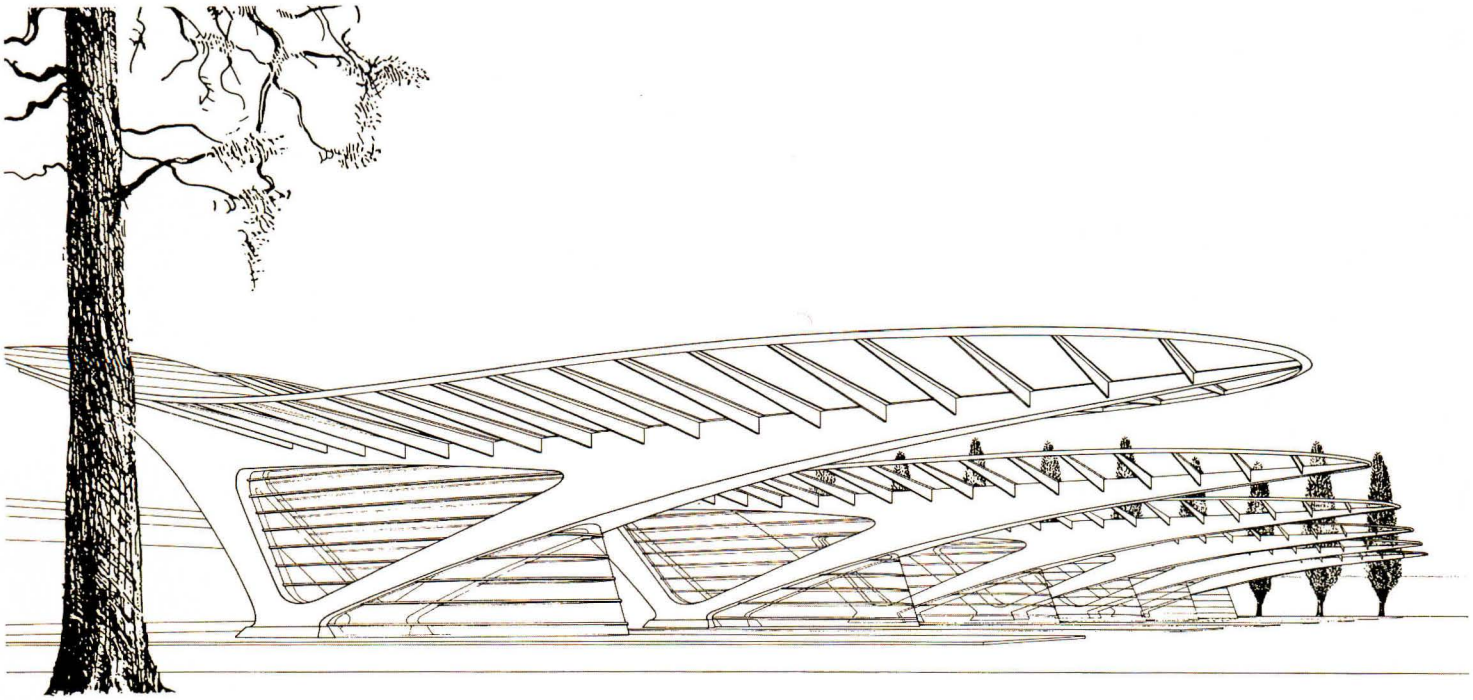
Suturing the City: Calatrava's critics have claimed that his bravura gestures may be suited to open places like the countryside outside Lyon, but not to the dense messiness typical to urban sites. Calatrava's response is this competition-winning design for a new multimodal station at the partly built-up northeast edge of Lisbon. It's as intricate as a watch: Rib-like concrete forms (similar to those used at Zurich's Stadelhofen station—RECORD, October 1990, pages 54-61) enclose a below-grade metro line (section below). Subterranean levels open up to a vaulted tracery of steel and glass that sweeps down, like a row of stitches, to form canopies over platforms that run perpendicular to the metro for buses, private autos, and taxis (opposite middle).

Local and international trains run on yet a higher level parallel to the buses; a branching steel canopy (opposite top) forms a tracery over platforms. A canopy linking bus and train levels covers a projected monorail line. Knitting together these disparate modes via stairs, ramps, and elevators is a concourse that runs under the tracks, then over the bus platforms. A lower concourse runs below the bus platforms but above the metro. The forms of the canopies are intended to direct prevailing breezes, cooling waiting passengers.

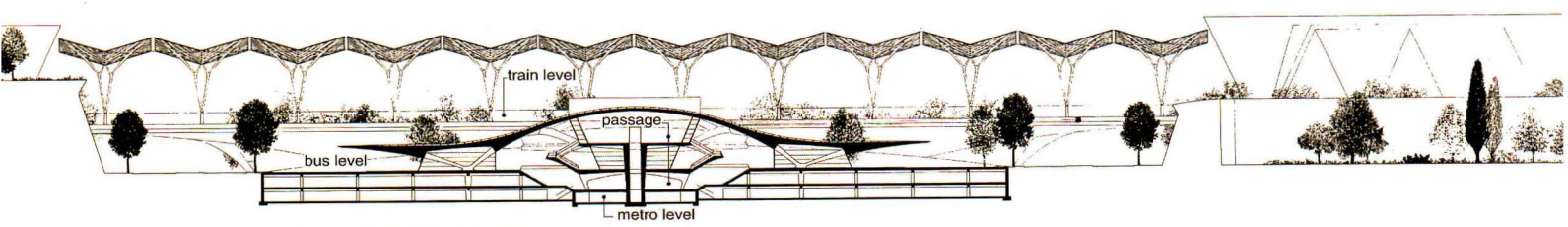
Using berms and retaining walls, Calatrava has sunk this vast complex into the existing streetscape. Still, it is at once junction (linking a neglected industrial quarter to new housing, retail and commercial development) and gateway: an entrance plaza leads visitors to Expo '98, a planned international fair. Calatrava Valls is working with SNCF, the French railroad, and local engineer *TECNEP*. Completion is expected late in 1997. *J. S. R.*



CROSS SECTION THROUGH TRAIN LEVEL



CANOPY AT BUS LEVEL



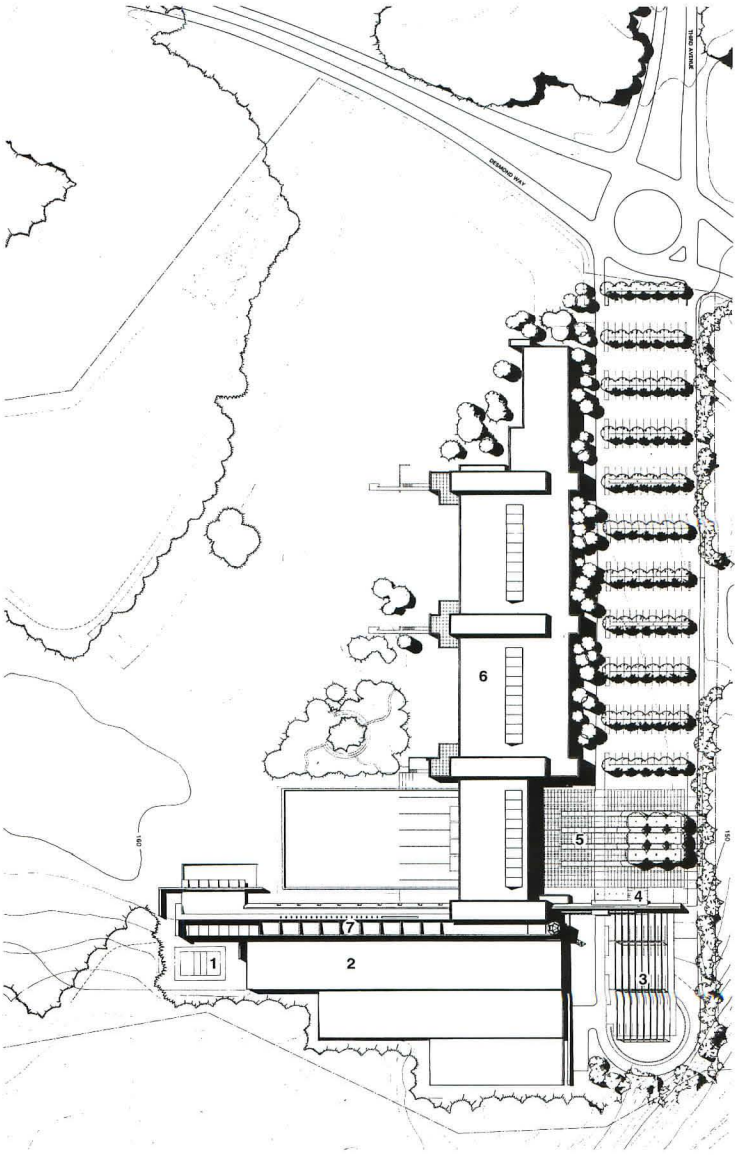
LONGITUDINAL CROSS SECTION

A new office building for a bureaucratic organization deeply involved in environmental issues should undergo a high degree of scrutiny: how well does the proposed parti use the site? Are daylighting and energy consumption issues addressed? How are construction waste and pollutants handled? Does the building inspire its occupants?

Richard Keating of Keating Mann Jernigan Rottet, partner-in-charge for the Department of Ecology Headquarters, freely admits that his solution for the building—winner of a state of Washington competition—didn't rely on high technology for solutions to these problems, but on common sense and environmentally-sensitive design practices. The building is sited among a lush stand of spruce trees adjacent to a meadow, left when part of the forest was logged to create farmland. Keating's design was the only one of five entries that didn't consume most of the meadow with the building's footprint and the nearly 800 parking spaces required by the program. "I thought there would be a lot of whiz-bang things I would incorporate into the building to make it substantially more ecologically sensitive than the average office building. With the budget we had, we couldn't afford whiz bang. But there are a lot of good things in the energy codes, and current glass and insulation technology is also good, so it's not like we needed to go out and reinvent a lot of things."

That left Keating to deal with "the poetics of the site. I quickly saw that you either chop the trees down and create a sea of parking where the trees were, or you put the cars in the meadow." This would not have been a very inspiring sight. "I said to the client, 'you've got to come up with a little more money and put up a parking structure', and they agreed. We used the building to isolate traffic, as a barrier between traffic and the land." The result was an L-shaped office building, with a service wing that contains a parking garage, food service, training rooms, and a library. The opposite leg of the building contains three stories of office space split into two zones by an atrium (see photos and Up Close, second page following). The atrium floor is filled with rocks, and used by staff as a meeting space.

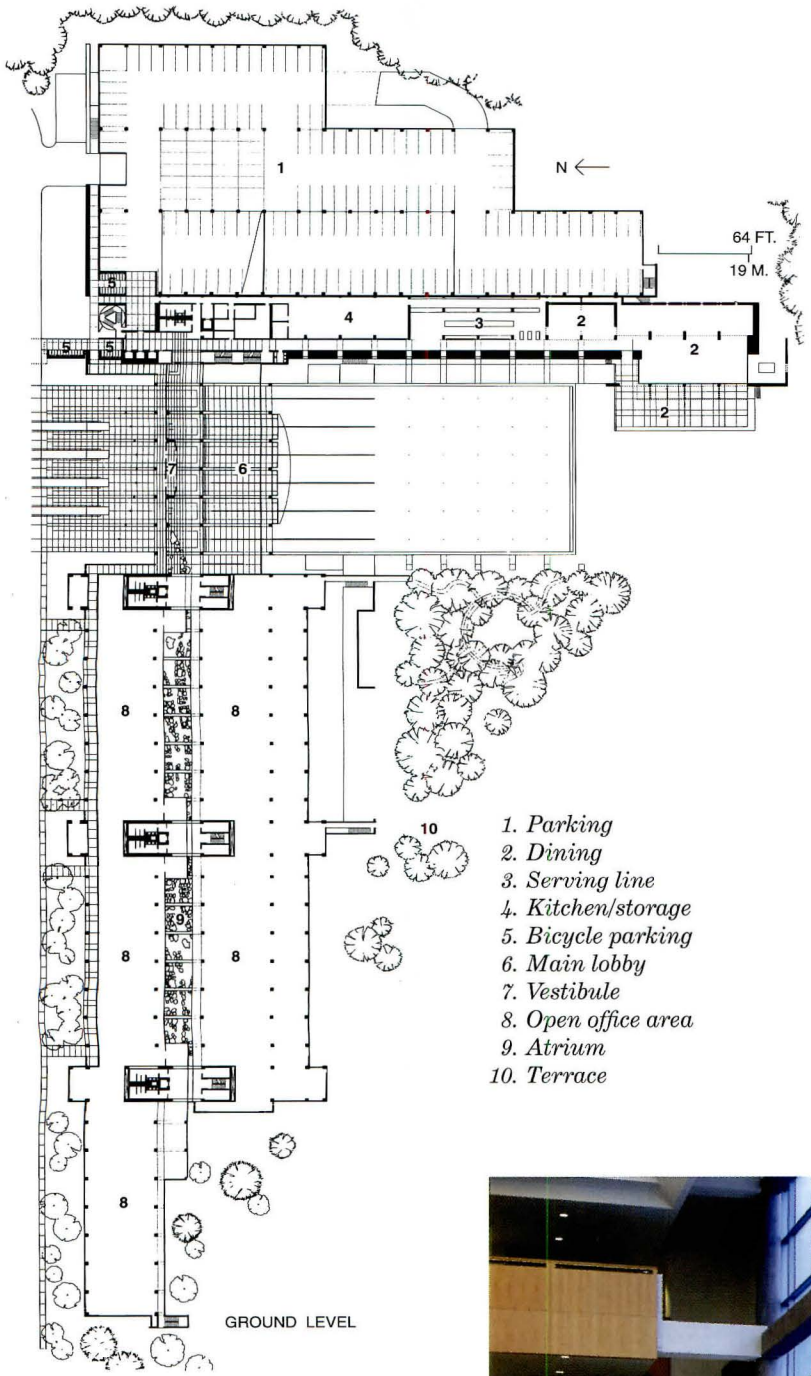
Where possible the building was constructed of renewable materials, and to meet Washington state regulations, waste construction materials were recycled. For example, trees felled when the site was cleared, were incorporated into retaining walls. All storm water runoff goes through sediment ponds and filtration vaults before it percolates into the site. Using daylighting to reduce cooling and lighting loads is expected to save $92,000 in energy costs annually (at present utility rates) and the building is estimated to be 35 percent more efficient than is required by Washington State's already stringent energy codes. To remove fumes left over from construction, fresh air was pumped through the building for 30 days before it was occupied. *Charles Linn*



1. *Recreation area*
2. *Park structure*
3. *Visitor parking*
4. *Bus stop*
5. *Main entry*
6. *Office wing*
7. *Service wing*

The massive footprint required by the original competition's program for the Department of Ecology Headquarters and almost 800 surface parking spaces would have consumed most of the existing wooded site and meadow. Architect Richard Keating proposed a building that would incorporate a parking structure that for very little extra cost saved the meadow and most of the trees (above). A glass arcade (opposite top and opening spread) connects the parking garage and service wing to the office wing (bottom opposite), where a dining and meeting area brings workers to the meadowside.

© *Strode Eckert Photographic*



1. *Parking*
2. *Dining*
3. *Serving line*
4. *Kitchen/storage*
5. *Bicycle parking*
6. *Main lobby*
7. *Vestibule*
8. *Open office area*
9. *Atrium*
10. *Terrace*

Up Close

A crucible for ideas. Richard Keating sees office buildings as "crucibles for getting people together to generate ideas." He figured that without some sort of special treatment at its first level, the atrium in the Department of Ecology Headquarters would look like that of a shopping mall. "I thought if I could find symbols for tectonics, land, and the sky, it would transform the character of the space into something that was suggestive of the forces of the earth, that was appropriate for this building. We took a bunch of big boulders and strewed them out in the atrium to create that kind of crucible. The best ideas are generated when people are not forced together. Sticking systems furniture in an atrium to try make it a place usually denies people the opportunity to be casual." To meet ADA requirements, wheelchair-accessible paths were created between boulders.

Credits

Department of Ecology Headquarters
Lacey, Washington
Owner: *State of Washington*
Architect: *Keating Mann Jernigan Rottet; Richard Keating, principal-in-charge; Paul Danna, Robert Jernigan, Dana Taylor, Cory Ticktin, Chuck Crawford, Michael Mann, Jose Palacios, project team*
Managing Architect: *McGranahan Partnership*
Engineers: *Skilling Ward Magnusson Barkshire (structural); Flack + Kurtz (MEP); Anne Symonds & Associates (civil); Cerami Associates (acoustical); Indoor Environmental Engineering (air quality); Edgett Williams Group (elevator)*
Contractor: *M.A. Mortonson Company*

Pilgrimage to Santiago

Galician Center of Contemporary Art
Santiago de Compostela, Spain
Álvaro Siza, Architect

Álvaro Siza's museum of contemporary art in Santiago de Compostela, Spain, is an unforgettable encounter between a master architect and a unique site. Siza first won recognition for small projects around his native Porto, Portugal, where he was born in 1933. Over the years, he has forged a remarkable personal language from the original sources of Modernism, filtering traditional notions of space, light, form, and movement through place and circumstance. He received the European Economic Community's Mies van der Rohe prize in 1988 and the Pritzker Prize in 1992; currently he is working on major commissions in Portugal and abroad.

The Medieval town of Santiago, capital of the province of Galicia and Porto's Spanish neighbor to the north, is an enclave of lichen-covered granite walls and church towers enveloped in verdant hills, mist, and daily rain showers—a place first made famous in 813, when the remains of Apostle St. James were discovered. It is 50 miles inland from Finisterre, considered the end of the world until the voyage of Columbus. In a neglected corner of the old city, still a popular pilgrimage site, on a hill beside the 17th century monastery of Santo Domingo de Bonaval, the museum is between the monastery's abandoned terraced gardens, now being restored by Siza, and a spectacular city panorama waiting to be discovered above the rooftops of the modest houses across the street.

As is typical to his work, Siza was guided by his first impressions of the site. The Baroque facade of the monastery fascinated him; particularly a curious double entry on the two faces of an inside corner, opening to the cloister and church, respectively. Siza placed the entry to the museum here too, inverting the monastery's corner facade to produce the two overlapping L-shaped volumes that rule his design.

Siza's architecture is like his sketches: precise yet suggestive, concealing a surprising richness and authority in its apparent modesty. Clad in local granite, the museum is set above the street like a stepped platform. A cutout in the main facade directs visitors toward the entrance, the route reinforced by an oddly angled soffit that mirrors an access ramp below. The building's end wall hangs from above, leaving a low horizontal slot with a fragmented view of the monastery's doorway (bottom right).

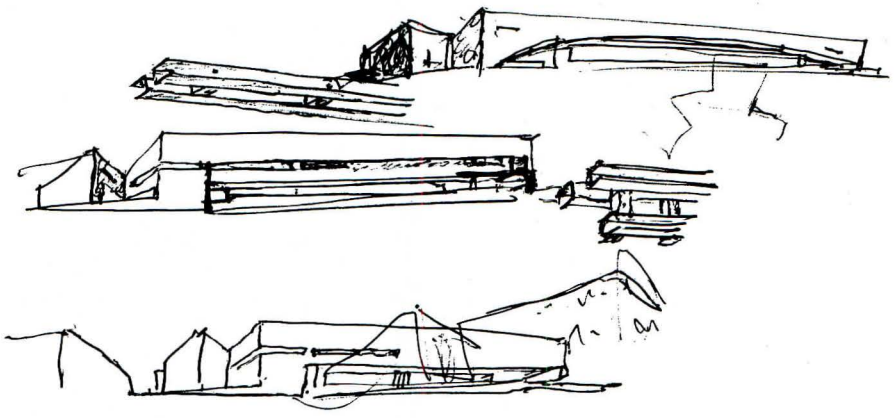
The museum's large vestibule opens into a triangular atrium with a clerestory window and monumental stair, a void between the two angled volumes of the design. The two levels of galleries beyond are arranged *en filade*, with parallel circulation corridors, although the winding path through them is full of incident and surprise, including a double-height space invisible on the ground floor revealed as a precipice terminating the upper floor galleries. It's the plan's L-shape re-expressed vertically. Other strangely beautiful details display Siza's genius for shaping space and light, from the heavy suspended soffits under the skylights of the upper galleries to the trussed, angled clerestory of the library or the soft, disoriented light caught by the inside face of the facade's horizontal soffit. A tour through the building ends on the rooftop sculpture terrace, where another ramp rises above the parapets to provide city views directly over the entry's prow.

The sculptural quality of Siza's work echoes the formal minimalism of American architecture in the 1970s—the long spans, crisp stonework, and angular shapes of I.M. Pei's East Wing of the National Gallery in Washington, D.C., for example. But Siza's geometry lacks the inner mathematical rigor of Pei's building; it is broken by the site, open to accident and invention. *David Cohn*

©*Jeff Goldberg/Esto photos*

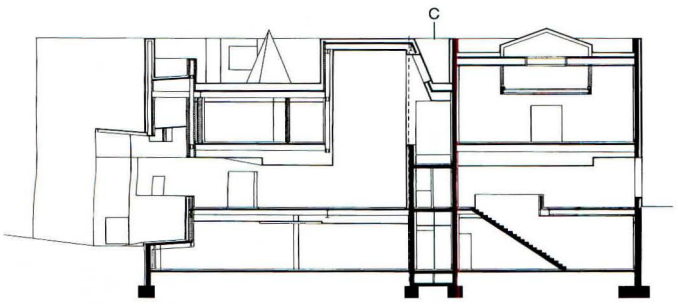
Siza's design grew out of the setting (top), its mass stepped like a nearby mountain—the first sign that the pilgrims had reached their goal. The museum is in the gardens of a 17th century monastery, on a hill that provides views of Santiago from a rooftop sculpture terrace (middle).

The long horizontal soffit of the front facade, which shelters the vestibule and second floor offices, points towards the entry at the end of the building. The entry's angled volumes, clad in mortarless granite hung on metal studs, mirror the Baroque facade of the adjacent monastery, as seen in Siza's sketches (below). Galleries and support spaces (offices, library, and auditorium) are separated by continuous corridors (sections below, which are keyed to floor plan on following pages).

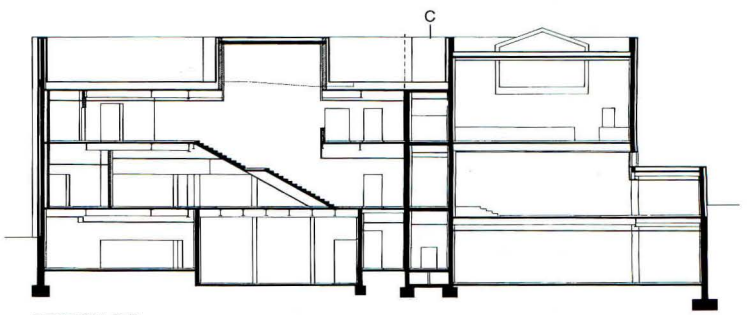


Up Close

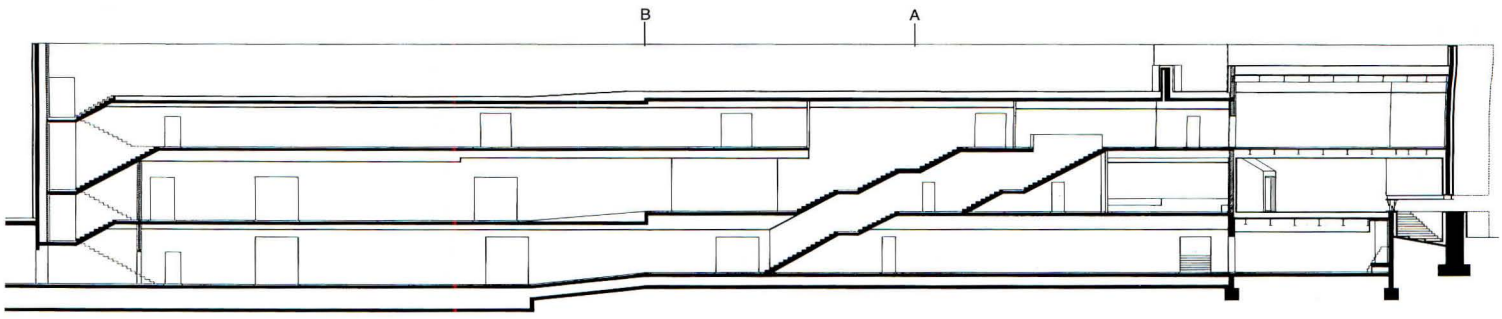
Building with history. When it opens in a year or more (local officials are still organizing the institution), the Galician Center for Contemporary Art will be part of a regional cultural center installed in a former monastery. The large walled garden, which Siza is now restoring as a public park, once served the monastery as a working farm. While rebuilding collapsed stone terraces and ramps and clearing overgrown vegetation, Siza and his team discovered ruined granaries, a mill, an ancient spring with tunnels feeding a medieval *lavandaria* for washing clothes, capitals from the cloister of a lost convent, and buried stairs. The park's most remarkable artifact, however, is a forbidding Baroque cemetery sunk into the hillside, empty since the last century, like a Roman piazza lined with vacant niches. Siza's restoration consists of consolidating these remains, but otherwise leaving them virtually as found—"as if we had never been here," according to landscape architect Isabel Aguirre. Spanish sculptor Eduardo Chillida's work *The Door to Music* will be placed on one of the terraces, and, at the top of the hill, Siza will build a small museum for the Eugenio Grannell Foundation in an old oak grove. As seen from the park's terraces, the eccentric stone walls of Siza's museum emerge from the hillside with the same artifice he has used in the restoration: as if they had always been there.



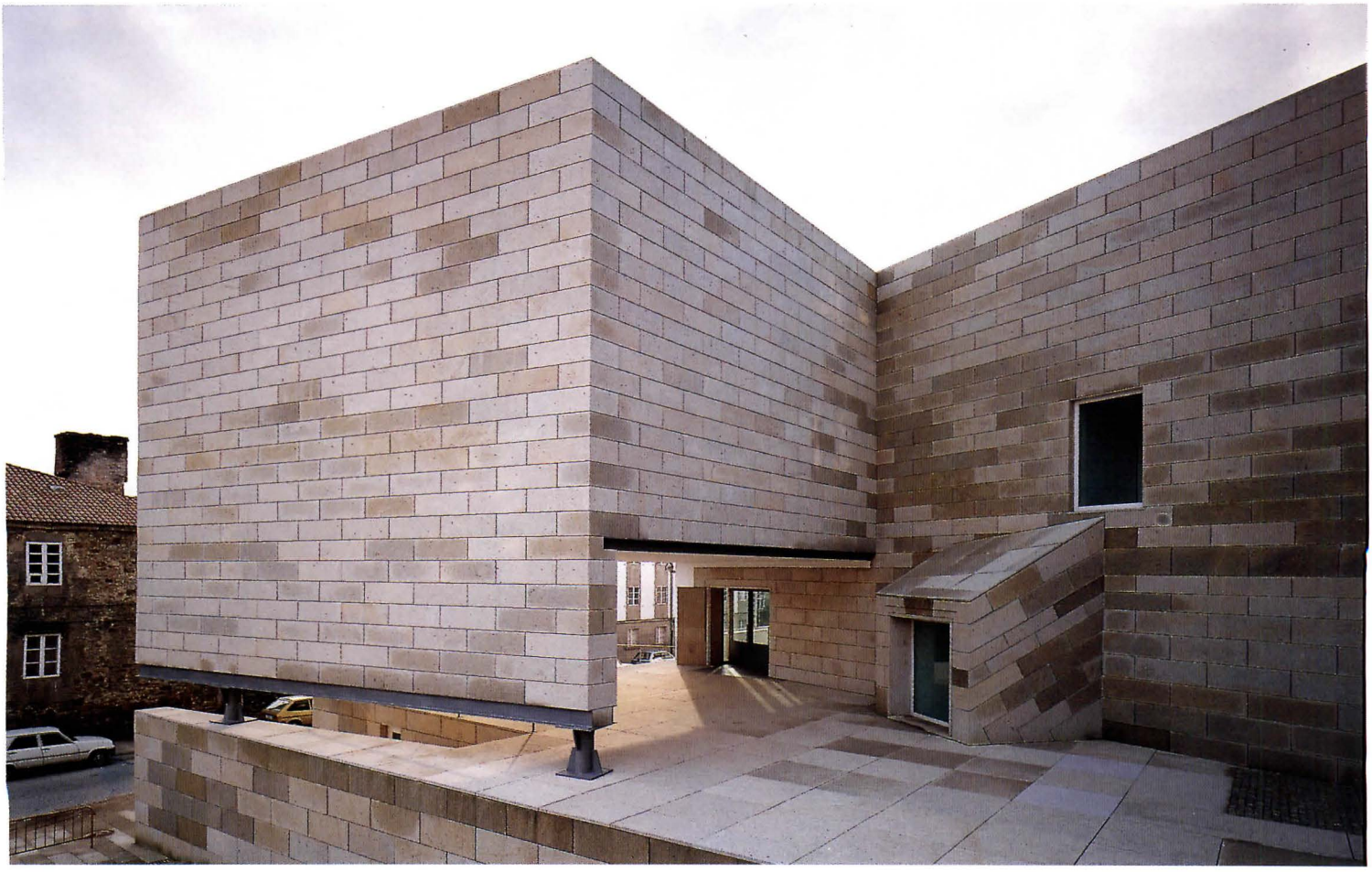
SECTION A-A

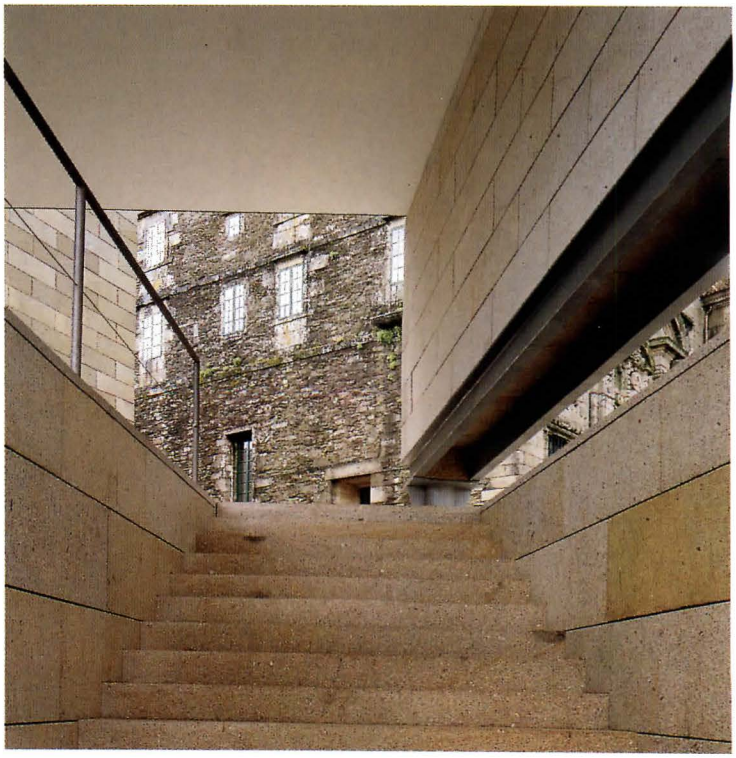


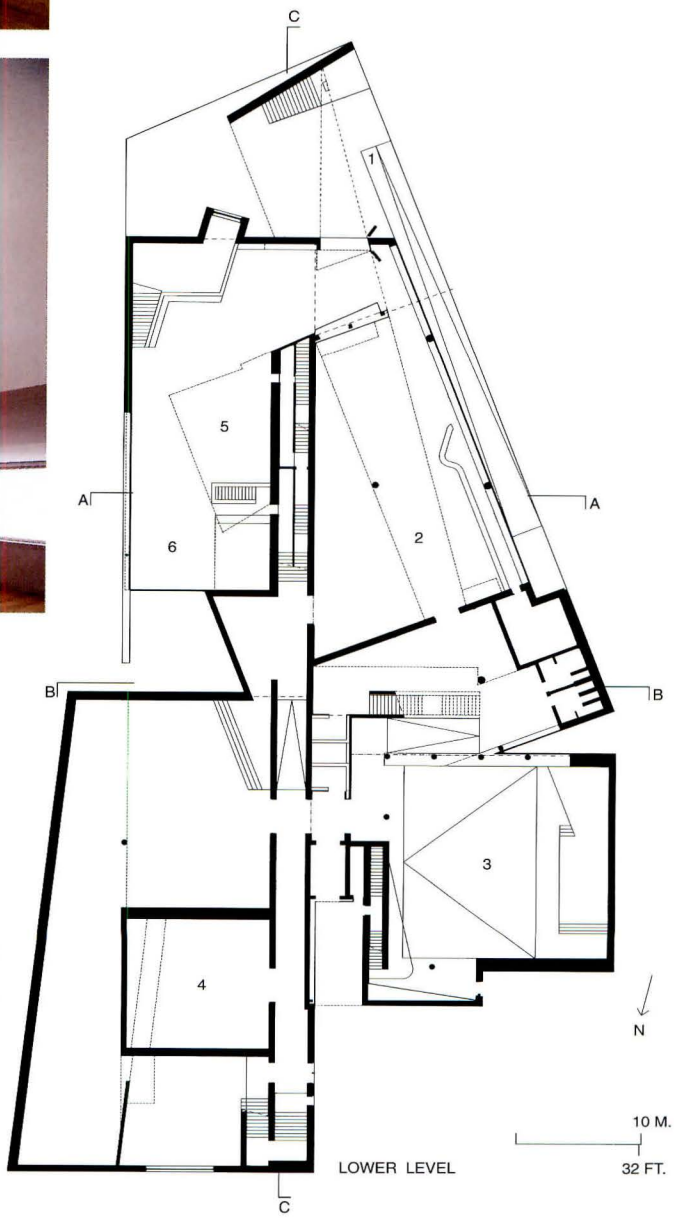
SECTION B-B



SECTION C-C







The interiors reveal Siza's genius for shaping space and light. A suspended central soffit throws light from skylights to the walls of an upper level gallery (top left). At the end of the first level gallery sequence, a stair beckons to the second floor (bottom left). The vestibule (opposite top) and triangular atrium (opposite bottom right), elegantly defined by a wall on one side and a floating soffit on the other, meet in a sharp angle. The clerestory window above is shared with the main stair.

The plan (left) is composed of two intersecting L-shaped volumes. On the second floor, galleries run the length of the rear volume, while the library occupies space above the auditorium. Additional galleries and service areas are located in the basement.

Credits
Galician Center of Contemporary Art
Santiago de Compostela, Spain
Architect: *Álvaro Siza, Architect—Álvaro Siza, Joan Falgueras, Mona Trautman, Jordi Fossas, Rafael Soto, Angel Fibla, Joan Genis, Joan Claudi Minguel, Jordi Maristany, Yves Stump, João Sabugúerio, Jane Considine, Tiago Faria, Anton Graf, Cecilia Lau, Elsiario Miranda, Luis Cardoso, Miguel Nery, Carles Muro, project team*
Engineer: *EuroConsult*
Consultant: *Isabel Aguirre (landscaping)*
General Contractor: *Construtora S. José*

1. *Entry ramp/ portico*
2. *Vestibule*
3. *Auditorium*
4. *Temporary exhibitions*
5. *Bookstore*
6. *Cafe with terrace*

Guiding Light

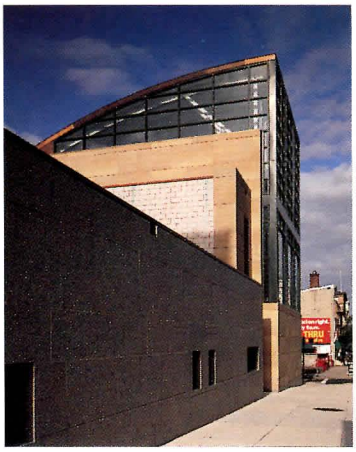
Maryland State Library
for the Blind and
Physically Handicapped
Baltimore, Maryland
Ayers/Saint/Gross Architects

The Maryland State Library for the Blind and Physically Handicapped may be located behind Baltimore's imposing 1934 Enoch Pratt main library, but there is nothing backdoor about it. Architects Ayers/Saint/Gross have given the building its own presence through large-scale volumes and an imposing front door of its own. Even so, much of the 40,000 square-foot building is a poured-concrete structure below sidewalk level. Directly under the reading room and meeting room are three floors of support facilities including stacks for Braille and large-type-face books, a book-repair facility, mechanical and computer rooms, and a recording studio where volunteers record books. Further to the east (see plan next page), under a service courtyard serving both buildings, are new support facilities for the main library.

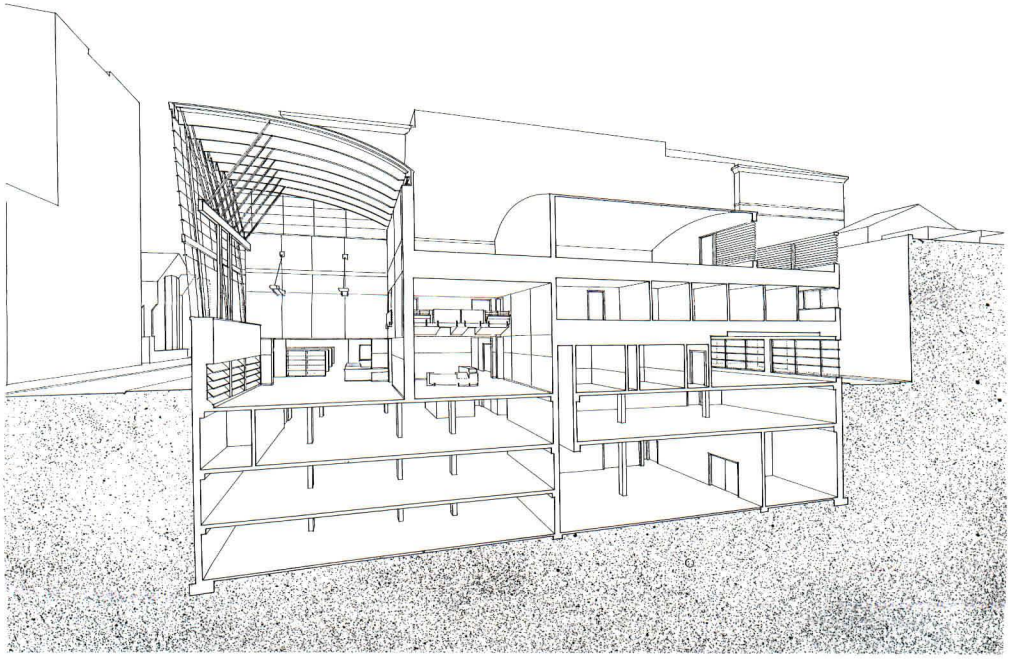
Principal Adam Gross sought to avoid the unnecessary "sensory circus" that he found touring other similar facilities. Most sight-impaired people have at least some light perception. Hence, the high reading room's north-facing glass wall provides a strong source of light to help orient users. The curved top chord of the truss, explains Gross, serves both to deflect the light downward and to give an impression of motion that shows users that they are not in just another static space. Other details, such as a curved reception desk that gently guides users toward the reading room, and finishes that differ in tactile quality in each space to help users discern their location were included in the $8.5-million construction cost. Palmitic limestone cladding is used to blend the new facility with the old. Eventually a three-story addition to the main library will extend over the shipping area and children's library. The addition will align with the height of the reading room, drawing all buildings into one unified composition.

Use of the library complex has grown dramatically since the new addition was completed, indicating the need for such facilities for the handicapped. Gross says the building would not have been possible without the encouragement of now retired director Lance Finney, whom Gross describes as unusually open to fresh ideas.
Charles K. Hoyt

© *Alan Karchmer photos*



The large scale of the steel-and-glass wall of the main reading reading room helps keep the Maryland State Library for the Blind from being overshadowed by the imposing Enoch Pratt main library, which is sited in front. The large scale of its wide steel canopy emphasizes the Library for the Blind's separate public entrance. The masonry wall (left) not finished with the warm limestone that covers the rest of the building indicates the profile of a planned extension to the Enoch Pratt.

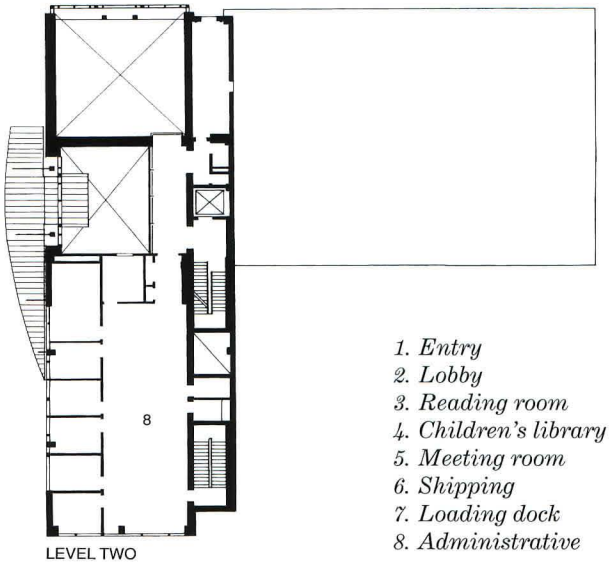


Most users of the building have at least some light perception, so. architects Ayers/Saint/Gross provided users with different finishes in each space (top and below left) to provide a tactile reassurance of location, and daylit the main reading room with a north-facing glass wall (opposite).

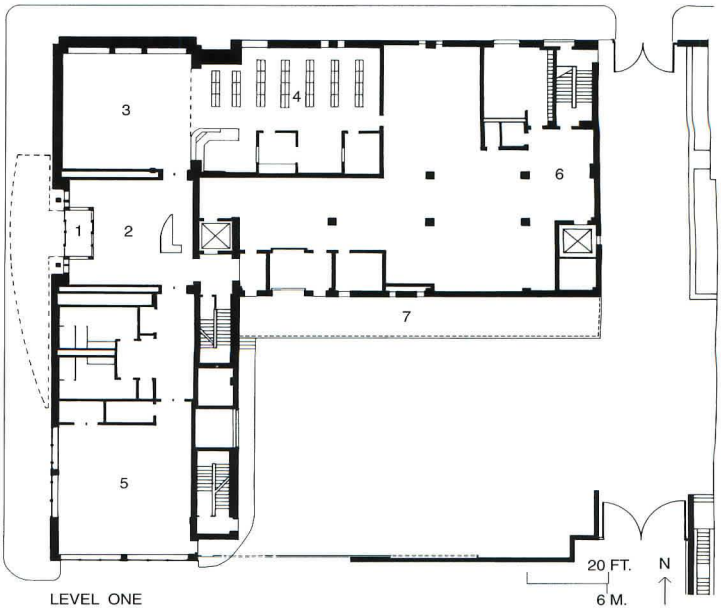
Credits

Maryland State Library for the Blind and Physically Handicapped
Baltimore, Maryland

Owner: *The State of Maryland*
Architect: *Ayers/Saint/Gross–Richard Ayers, Adam Gross, Fritz Read, Jim Patz, Earl Purdue, Laurie Stubb, Steve Longo, Lex Schwartz, project team*
Engineers: *Whitney Bailey Cox & Magnani (civil and structural); Burdette Koehler Murphy (mechanical, electrical and plumbing)*
Consultant: *Anna Kale Associates (lighting)*
General Contractor: *Costello Construction*



1. *Entry*
2. *Lobby*
3. *Reading room*
4. *Children's library*
5. *Meeting room*
6. *Shipping*
7. *Loading dock*
8. *Administrative*



Safe to spec anywhere.

Bright bright whites. Rich deep blues. Now Aquafleck® brings all the colors of the world to your multi-color specs. With it, your color palette is limitless.

Aquafleck is the environmental choice. It generates no noxious fumes and no hazardous waste, so you can specify it for any building in the world. It easily beats all VOC/VOS requirements. Yet it's extremely durable, and touch-up is easy.

So make any wall your very own work of art--safely--when you specify Aquafleck. For samples and information, call California Products at 1-800-533-5788 extension 24.

California Products
CORPORATION
Est. 1926 Cambridge, MA

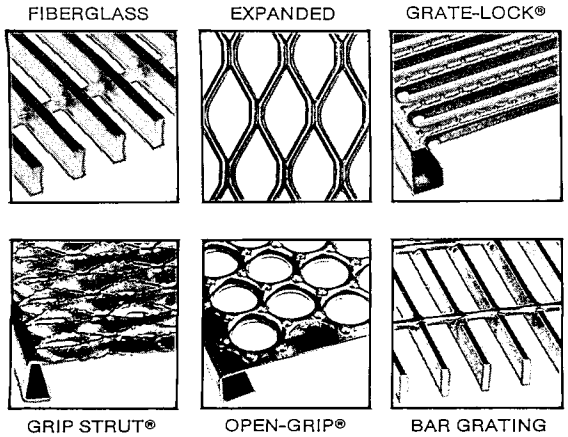
Circle 40 on inquiry card

New Products

327. Taking the weight off

User research reveals that uncomfortable seating can make office workers twitch and fidget. Un-easy chairs can even motivate unproductive (for the boss) trips to the water cooler. Bill Stumpf and Don Chadwick, creators of the Equa chair 10 years ago, also realized that one chair format—no matter how ergonomically sophisticated—couldn't possibly fit all body types. So when they developed Herman Miller's new Aeron seating, they made sure it came in three sizes. And beyond the size range, Aeron offers some truly innovative construction, appearance, and function features. Most obvious is its resilient perforated-fabric seat pan and back. Said to give a completely different ride from upholstery, the suspension system distributes weight evenly, "unloading" the spine by supporting the body at all points. And its self-venting capacity keeps the user's body cooler, promising a saving on office hvac costs. A patented Kinemat tilt mechanism spontaneously supports the user's preferred posture, from a VDT-oriented, on-top-of-the-task, forward slant through full recline. Aeron will be introduced this month at the Orgatec trade show in Cologne, Germany. Herman Miller, Inc., Zeeland, Mich. ■

Safety Gratings!



All Types
All Metals
24-Hour Shipment

The Hole Story®

TOLL-FREE
1-800-237-3820
FREE CATALOG

"Service Centers Coast to Coast"

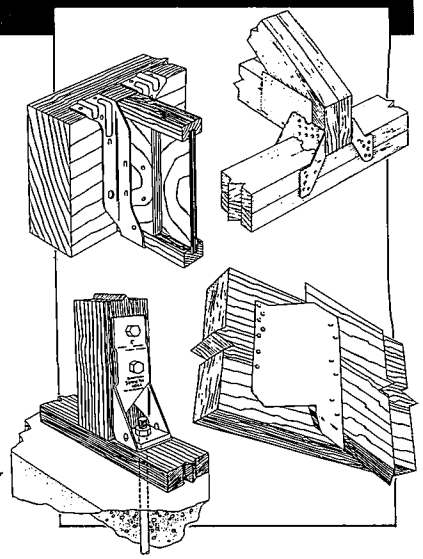
McNICHOLS CO.

FAX: 813-289-7884 TELEX: 52706

Member Steel Service Center Institute

Circle 41 on inquiry card

In constructing superior wood structures, Strong-Tie® connectors have no equal!

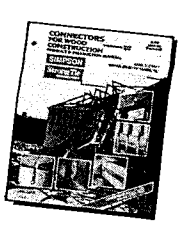


No matter what your design challenge--post and beam, wood web, or plated truss--in new construction, remodeling or renovation, we have a Strong-Tie connector to meet your needs.

Our products are manufactured of high-quality steel, engineered to perform to code or better, and reflect the excellence that comes from over 35 years of superior service to the building industry. What's more, with our exclusive computerized manufacturing program, custom specials can be produced almost as quickly as off-the-shelf products.

So when you're designing a wood frame structure, specify Simpson Strong-Tie Connectors. They'll save time and money ... and you'll know the quality has **no equal!**.

FREE FULL-LINE CATALOG
Our 1994 catalog has 80 pages, with 10 new products, plus specification tables and application drawings. Loads based on 1991 NDS standards adopted by ICBO.
SWEETS 06060/SIM



SIMPSON
Strong-Tie® CONNECTORS

SIMPSON STRONG-TIE® COMPANY, INC.

≠ *The World's "No Equal" Timber Connector Company*

Brea, CA • Columbus, OH • Jacksonville, FL
McKinney, TX • San Leandro, CA

National Toll-Free: 800-999-5099

Circle 42 on inquiry card

You bet we can. With LONWORKS™ technology from Echelon, your building systems can talk nonstop. LONWORKS-based systems are truly interoperable, and are up and running in buildings worldwide. HVAC, lighting, security, life safety, elevators and energy management systems share information and operate together, with more flexibility at lower cost. Perhaps that's why companies like Honeywell, Johnson Controls, Siebe Environmental Controls and Staefa Control System are incorporating LONWORKS in their products. Even the Intelligent Buildings Institute endorses LONWORKS as "an open protocol for building automation."

LONMARK
Look for the LONMARK for products that work together.

For your next project, specify products that include LONWORKS from Echelon. Call 1-800-879-7566 for a free 40-minute video. If you'd like to know more, let's talk. Because, when it comes to LONWORKS, boy can we talk.

ECHELON™

Echelon Corporation, 4015 Miranda Avenue, Palo Alto, CA 94304, Telephone (415) 855-7400, FAX (415) 856-0153.

© 1994 Echelon Corporation. LONWORKS, LONMARK and the Echelon and LONMARK logos are trademarks, and Echelon is a registered trademark of Echelon Corporation. Other names may be trademarks of their respective companies.

Circle 43 on inquiry card

CALL FOR ENTRIES

RECORD HOUSES 1995

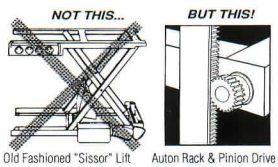
The editors of ARCHITECTURAL RECORD announce the 40th annual RECORD HOUSES awards program. This program is open to any registered architect; work previously published in other national design magazines is disqualified. Of particular interest are projects that incorporate innovative programs, building technologies, and use of materials. There is an entry fee of $15 per submission; please make checks payable to ARCHITECTURAL RECORD. Submissions must also include plan(s), photographs (transparencies, slides, or prints), and a brief project description bound firmly in an 8-1/2 by 11-in. folder—and be postmarked no later than October 31, 1994. Winning entries will be featured in the 1995 RECORD HOUSES. Other submissions will either be returned or scheduled for a future issue. If you would like your entry returned, please include a self-addressed envelope with appropriate postage.

Submissions should be mailed to:
Karen D. Stein
RECORD HOUSES
ARCHITECTURAL RECORD
1221 Avenue of the Americas
New York, New York 10020

Conceal, Reveal, Swivel with a touch of a finger

AUTON POP-UP TV LIFTS

YOU BUILD THE FURNITURE - WE'LL PROVIDE THE AUTOMATION

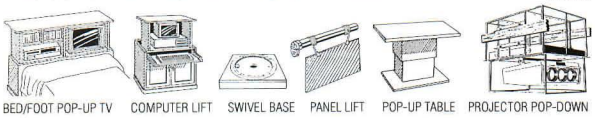


Old Fashioned "Sissor" Lift — Auton Rack & Pinion Drive

Since 1955, the Auton Company has served the design community with quality motorized systems that utilize remote controls and small powerful motors. Motorized platforms glide smoothly and quietly on four racks and pinions, even swivels at a touch of a button.

Installed in homes, offices, conference rooms and luxury hotels worldwide such as the Mirage, Treasure Island, Caesars Palace, Taj Mahal, Shangri-La, Auton is the lift system professionals use with confidence.

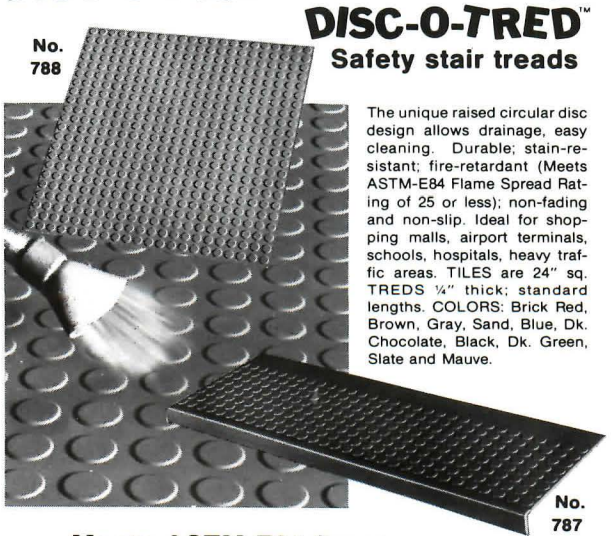
AUTON COMPANY P.O. Box 801960 · Valencia, CA 91380-1960 · (805) 257-9282
FAX (805) 295-5638 · Beverly Hills (310) 659-1718 · Honolulu (808) 734-1260
Auton does not make furniture. US & Foriegn Pat. Pend. Made in the USA


BED/FOOT POP-UP TV · COMPUTER LIFT · SWIVEL BASE · PANEL LIFT · POP-UP TABLE · PROJECTOR POP-DOWN

Circle 44 on inquiry card

MUSSON

DISC-O-TILE™ Safety rubber flooring &
DISC-O-TRED™
Safety stair treads



The unique raised circular disc design allows drainage, easy cleaning. Durable; stain-resistant; fire-retardant (Meets ASTM-E84 Flame Spread Rating of 25 or less); non-fading and non-slip. Ideal for shopping malls, airport terminals, schools, hospitals, heavy traffic areas. TILES are 24" sq. TREDS ¼" thick; standard lengths. COLORS: Brick Red, Brown, Gray, Sand, Blue, Dk. Chocolate, Black, Dk. Green, Slate and Mauve.

Meets ASTM-E84 flame spread *rating of 25 or less*

For Free Brochure & Samples, write:
MUSSON RUBBER CO.
P.O. Box 7038 • Akron, Ohio 44306

Circle 45 on inquiry card

LOOK AT IT THIS WAY

NOT EVERYONE SEES THINGS FROM THE SAME PERSPECTIVE. THAT'S WHY WEYERHAEUSER CAN MAKE DOORS IN VIRTUALLY ANY DESIGN IMAGINABLE. WHATEVER YOU SEE IN A DOOR, WE CAN CRAFT IT. FROM CUSTOM LITE PATTERNS TO INTRICATE INLAYS OF VENEERS, WEYERHAEUSER DOORS ARE THE MOST LASTING AND EFFECTIVE WAYS TO PERSONALIZE THE INTERIORS OF YOUR BUILDINGS. EVEN THOUGH OUR DESIGNS CAN BE AS INDIVIDUAL AS YOU ARE, WE ENSURE THE CONSISTENCY OF APPEARANCE OF EVERY DOOR IN YOUR PROJECT. IT'S THIS COMPREHENSIVE APPROACH THAT MAKES WEYERHAEUSER THE RIGHT CHOICE FOR YOUR DESIGNS, NO MATTER HOW YOU LOOK AT IT. FOR MORE INFORMATION ABOUT WEYERHAEUSER ARCHITECTURAL WOOD DOORS, CALL 1-800-869-DOOR.

Weyerhaeuser

There Is No Equal.™

WEYERHAEUSER ARCHITECTURAL DOOR DIVISION SALES AND SERVICE CENTER 1401 EAST 4TH ST., MARSHFIELD, WI 54449-7780.

Circle 46 on inquiry card

Manufacturer Sources

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

Pages 82-87
Eskind Biomedical Library, Vanderbilt University
Davis, Brody & Associates, Architect
Thomas Miller & Partners, Architect of Record
Tensile-braced curtain wall: Harmon Contract. Acid-wash precast concrete: Southern Cast Stone. Ballasted EDPM roof: Carlisle SynTec Systems. Fully adhered membrane roof: Cooley. Aluminum windows and entrances: Kawneer Co., Inc. Glazing: Viracon. Stainless-steel entrance: Dawson Doors Div., Dawson Metal Co. Locksets: Yale Div., Yale Security Inc. Exits: Von Duprin. Hinges: Hager. Closers: LCN. Acoustic ceilings and resilient flooring: Armstrong World Industries. Office furniture, library carrels, panel fabric, and files: Knoll International. Lounge seating: Bernhardt. Laminate surfaces: Wilsonart. Carpeting: Harbinger; Masland.

Pages 96-101
Department of Ecology Headquarters
Lacey, Washington
Keating Mann Jernigan Rottet, Architects
McGranahan Partnership, Managing Architect
Plaza pavers: Hanover Architectural Products. Precast panels: Architectural Precast Structures Ltd. Metal Roofing: ASC Pacific, Inc. Reglets: Fry Reglet. Pole-top lights: Gardco. Entrances, curtainwall, and clerestories: Harmon Contract. Recessed downlights: Lithonia Lighting. Railings and stair tower: Acme Iron Works.

Pages 108-111
Maryland State Library for the Blind and Physically Handicapped, Baltimore
Ayers/Saint/Gross Inc., Architect
Limestone and granite: Kasota Stone, Inc. Curtain wall and aluminum-framed ribbon windows: Kawneer Co., Inc. Sheet-metal roof: Copper. Maple-veneer interior doors: Eggers Industries.

Corrections
- The following names were inadvertently left off the design team of the Andy Warhol Museum design by Richard Gluckman Architects [RECORD, Sept. 1994]: En-chuan Liu, Jennifer Crawley.
- In our August story, "Knowing When You've Made It," an editing error attributed a "blue collar and residential clientele" to A. O. Boggs. The work was actually by Arthur Dyson of Fresno. Though firm principal Julie K. Rayfield was quoted accurately elsewhere, her name and firm were misspelled. The firm is AI/Boggs, and it is based in Washington, D.C. and Richmond, Va.
- In our September story on remodeling Chiat/Day Advertising's offices in California, the city should have been given as Venice, not Santa Monica.

Addendum
- The July 1994 Sources column should have included Hunter Douglas Architectural Products, Inc. as the manufacturer of the perforated-plank metal ceiling specified for the ticketing pavilion of the International Terminal, O'Hare Airport, Chicago.

New Products

328. Hybrid document management
A scan-to-file option, shown with the high-volume 7700 engineering digital laser copier/plotter/scanner system, approaches the plan-scan process differently: instead of compressing an image into a file as the scanner works, the 7707B scans the document first, then compresses the scanned image into an electronic file. This greatly reduces the time needed for placing data from original (hard copy) building plans into electronic format: a typical D-size plan can be scanned, compressed, and stored in under 60 seconds. Océ-Bruning, Chicago. ■

If you can spend only 10 minutes a year thinking about rolling doors...

Perforated, see-through ScreenGard™ slats form a security curtain used in commercial, institutional, and industrial applications.

Maybe we can help.

You've got the building. And your building has openings. We've got the doors. And the engineers.

Rolling doors, shutters, closures, and grilles that fit openings at loading docks, in fire walls, for every application from airplane hangers to pharmaceutical lockers. Horizontal closures for escalators and chemical tanks. Coils that are face-mounted, recessed, overhead, or on the side.

Binder contains over 50 drawings with details, clearances, and specifications. With this data file on your shelf and Cornell's number on your Rolodex®, 10 minutes a year sounds about right.

Engineers who answer the phone when you call. Consultative professionals who know doors, codes and ratings. People who care about your project.

Full specifications in Sweet's GB&R, IC&R, and ENG files and in electronic SweetSource 08330/COR. To access technical services for specifications and drawings or to receive literature, please call or fax toll-free.

Tel 800.233.8366
Fax 800.526.0841

Crestwood Industrial Park
Mountaintop, PA 18707

CORNELL
IRON · WORKS
New solutions. Since 1828.™

Circle 52 on inquiry card

Finish the job *right* with . . .

PATENT #5,005,334

HANDY SHIELD™

SAFETY COVERS

with Velcro!

HANDY-SHIELD Safety Covers for drain and supply lines prevent burns and abrasions from contact with pipes under wash basins. This protection is required where Federal and State Accessibility standards are followed.

- **Easy installation in seconds with Velcro!**
- **Quick installation cuts labor cost**
- **Available in 7 different colors**
- ***Easily replaced after maintenance***
- **Meets ADA requirements**
- **Universal fit for retro-fit**

free catalogue!

PLUMBEREX SPECIALTY PRODUCTS

31855 Date Palm Drive • #3, Suite 196 • Cathedral City, CA 92234

(619) 322-1772 · FAX (619) 327-2594

Circle 53 on Inquiry Card

New TimberForm® Colonnade™ steel bench 2646 with Purpleheart slats.

New Site Furnishings

Contemporary and traditional design families of matching benches, ash receptacles, litter containers, planters, bollards and bike racks are illustrated in **TimberForm®** brochures and a full catalog. **Call toll-free 1-800/547-1940, Ext. 516.**

Columbia Cascade

1975 S.W. Fifth Ave. Portland, OR 97201 FAX 503/223-4530

Circle 54 on Inquiry Card

Custom Fit Blow-In-Blanket Insulation

The Blow-In-Blanket System (BIBS) produces a custom fit, seamless blanket of insulation with higher R-Values and superior sound control in all types of construction. Using BIBS allows you to effectively insulate any wall design without compromise.

ark-seal **1-800-825-8992**

2190 S. Kalamath St.,• Denver, CO • 80223

Circle 55 on Inquiry Card

Wood *continued from page 44*

these items, with their heavy exposure to weather, was essential. They detailed a post anchorage system permitting removal of the balustrade without disturbing the roof. Crown molding installed in the '70s was removed from around the entire building and replaced with one more correctly detailed.

Also on the roof, the architects had found sagging dormers. When built, one side had been supported only by the roof deck, not by framing. A previous fix hadn't worked. Pokorny's firm hung new framing between original rafters to support the dormers permanently. The butted and sealed wood shingles at the ridge lines were replaced with lapped shingles over lead-coated-copper flashing.

On sides of the house not usually seen from the street, the original builders had used 33-in.-long split-cedar shakes. The architects removed standard shakes installed during the '70s and replaced them by duplicating historic techniques. Even an exterior stairway to the basement added by a 1934 WPA project was removed and infilled, allowing a porch above to be returned to its original configuration.

A subtle but esthetically important improvement was the restoration of historically accurate windows (pages 48-49). Not surprisingly, most suppliers preferred modern gluing and stapling techniques to historic wedges and pins. Architectural Components, a restoration millwork specialist in Massachusetts, met the architect's standards.

The architect as advocate

Because relatively few subcontractors have the ability to do highly skilled restoration, Pokorny has always sought to prequalify those doing the work. This, however, was inconsistent with City policy that emphasized low bidder. Because the City did not enforce the specifications for contractor experience, Michael Devonshire, Pokorny Architects' senior conservator, actually taught technicians conservation techniques, such as how to make paint-removal tools that fit tiny molding profiles, and how to use a drawshave tool to make shingles. The enormous time expended drained the architects' budget, but by then, "the building had become the client," as Michael Devonshire puts it. He said the house needed an advocate within the City-agency labyrinth. Now, funds for the second phase have been released. The chain link visible in photos is to protect badly needed new site-drainage work. ■

Fish flourish in PALCO's streams

Caring for the forest and all the life within it is a responsibility we take seriously. That's why we started our fisheries program in 1972.

Since then, we've raised more than half a million salmon and steelhead in rearing ponds at two separate locations and released them into their native habitat—the Eel River watershed.

An even more aggressive wild fisheries program began in 1990 with the construction of a native salmon and steelhead hatchery on Yager Creek.

Our current program is unique and entirely voluntary. In addition to raising fish, we work cooperatively with the California Department of Fish and Game to identify ways to improve the waterways and fish habitat on our property. Our employees, with help from the young people in the California Conservation Corps, are restoring streams and protecting wildlife. We've already opened up over 30 miles of new and renewed fish habitat in seven tributaries of the Eel River.

Our company history of more than 125 years has proven that we all benefit from caring for the land and streams. Please call us for more information.

PALCO

The Pacific Lumber Company

100 Shoreline Highway, Suite 125B
Mill Valley, CA 94941 • (415) 331-8888

Circle 56 on inquiry card

Letters *continued from page 4*

I also decry the "coastal" bias in your article. Bias certainly exists on the coasts and in large cities (Chicago being the one non-coastal location mentioned), but all the cities mentioned have municipal non-discrimination ordinances, i.e. some means of recourse to address discrimination. The areas where the AIA revised policies could have an impact are in places like Dallas, Tulsa, Birmingham, etc., where no city protections exist and where the bias is arguably much greater. In places like these, it's not just a matter of being demoted to designing elevator lobbies but one of being fired or not even being hired.

Tom Neal
B. Arch. 1989
University of Oklahoma

Corrections

•CGHP's Castle Lane project for the disabled [RECORD, April 1994, page 13] came in only 0.36 percent over budget, not 36 percent. In addition, the photo accompanying the item was "flopped" (printed back to front).

•The correct credits for CineMania Theater by Ellerbe Becket [RECORD, August 1994, page 63] are: Jon Pugh, project director; Tom Goffigon, project manager; Mehrdad Yazdani, design principal; Katherine Demetriou, designer; David Woo, Matt Ralsten, John Frane, Terence Young, project team.

•Credits for the Passenger Terminal Building, Osaka, Japan [RECORD PACIFIC RIM, July 1994, pages 26-31] should have noted that Nikeen Sekkei, Aeroports de Paris, and Japan Airport Consultants were members of the design joint-venture team with Renzo Piano Building Workshop Japan. Site supervision was executed by Kansai International Airport Co. and Nekken Sekkei.

•Credit for the Sogo Complex design [RECORD PACIFIC RIM, July 1994, page15] should have gone to RTKL Associates for client Tasei Corp., with local architect Arkitek MAA.

•Construction managers for the International Terminal at Chicago O'Hare International Airport [RECORD, June 1994, pages 116-123] were Gilbane Building Co. in joint venture with UBM, Rubino & Mesa, Globetrotters Engineering, and d'Escoto Inc. ■

Calendar *continued from page 4*

ture series, Southern California Institute of Architects, Los Angeles. 310/574-1123.

November 3 to January 15

"Thresholds" series' *subject is Rem Kool*haas, with five projects presented at Museum of Modern Art, New York City. 212/708-9400

Competitions

•Student Design Competition entries due October 7 at Society of American Registered Architects. Call 312/763-5767 for details.

•General Services Administration's deadline for submissions to its Design Awards is October 14. Projects must have been developed for GSA between January 1, 1989 and July 1, 1994. Call 202/501-1888 for details.

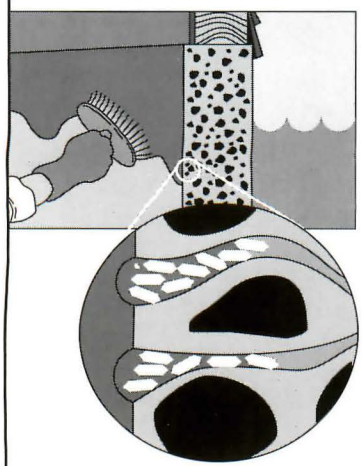
•"Urban Dwelling" competition entries to be judged by Fumihiko Maki, are due October 17 by mail only. Send to Entries Committee, Shinkenchiku-sha Co., 31-2, Yushima 2-chome, Bunkyo-ku Tokyo 113 Japan.

•Entries for design competition for a new sports stadium at Phillips Exeter Academy are due October 29. Call 603/772-4311; fax 603/778-9563.

•"Making Cities Livable" deadline for submission of paper abstracts is November 1. Call 408/626-9080, fax 408/624-5126.■

XYPEX®

CONCRETE WATERPROOFING BY CRYSTALLIZATION



When mixed with water and applied as a cementitous coating, the active chemicals in XYPEX generate a non-soluble crystalline formation wihtin the pores and capillary tracts of concrete.

Among its many uses, XYPEX is ideal for waterproofing reservoirs, sewage and water treatment tanks, tunnels, manholes, underground vaults, foundation walls and parking decks.

For further information contact:
XYPEX CHEMICAL CORPORATION, 13731 Mayfield Place, Richmond, B.C., Canada V6V 2G9 (604) 273-5265 Fax (604) 270-0451

Circle 58 on inquiry card

GIVE SMOKERS ROOM TO SMOKE SO EVERYONE HAS ROOM TO BREATHE.

Even smoke-free facilities have smokers. That's why Ultrum offers a complete line of ash urns and benches ideal for outdoor smoking areas. The durable materials deliver years of use with virtually no maintenance. And the stylish designs — available in 21 colors — coordinate well in any space... indoors or out. For complete details, call your local representative and ask for our full-color catalog. So everyone can breathe easier.

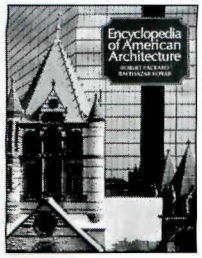
1-800-457-0573, extension 5369

·ULTRUM·

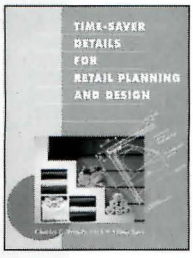
P.O. Box 121 • Fort Payne, Alabama 35967 • Facsimile (205) 845-2649/(205) 845-9361

Circle 59 on inquiry card

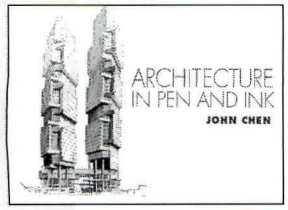
A Wealth of Ideas, Inspiration, and Information for Design Professionals



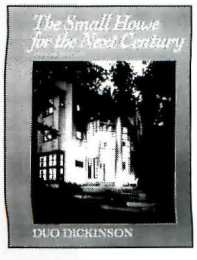
ENCYCLOPEDIA OF AMERICAN ARCHITECTURE
Second Edition
Robert T. Packard, AIA, and Balthazar Korab
672 pp., 505 full-color photos, 75 line illus., 8 1/2 x 11
0-07-048010-9, $89.50 (Hardcover)



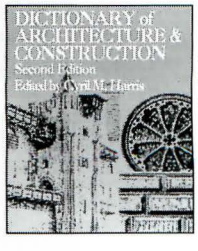
TIME-SAVER DETAILS FOR RETAIL PLANNING AND DESIGN
Charles E. Broudy, FAIA, and Vilma Barr
224 pp., 220 illus. (20 in full-color), 8 1/2 x 11
0-07-004386-8, $45.50 (Hardcover)



ARCHITECTURE IN PEN AND INK
John Chen
256 pp., 200 illus., 11 x 8 1/2
0-07-011079-4, $32.95 (Hardcover)



THE SMALL HOUSE FOR THE NEXT CENTURY
Second Edition
Duo Dickinson, AIA
224 pp., 180 halftones, 60 line illus., 30 full-color photos
8 1/2 x 11, 0-07-016828-8, $39.95 (Hardcover)



DICTIONARY OF ARCHITECTURE AND CONSTRUCTION
Second Edition
Cyril M. Harris, Editor
736 pp., 350 illus., 7 3/8 x 9 1/4
0-07-026888-6, $59.50 (Hardcover)

McGraw-Hill, Inc. • New York, NY

AVAILABLE AT THESE FINE BOOKSTORES

Alabama
Auburn University Bookstore
1360 Haley Center
Auburn, AL 36849
(201) 844-4241 Fax: (205) 844-1697

Smith & Hardwick
3900 Clairmont Avenue
Birmingham, AL 35222
(205) 591-9970

California
Builders Booksource
1817 Fourth Street
Berkeley, CA 94710
(510) 845-6874 Fax: (510) 845-7051

Builder's Books Inc.
7943 Canoga Avenue
Canoga Park, CA 91304
(818) 887-7828 Fax: (818) 887-7990

Stacey's Bookstore
19625 Stevens Creek Boulevard
Cupertino, CA 95014
(408) 253-7521 Fax: (408) 253-5861

Irvine Sci-Tech Books
4040 Barranca Parkway
Irvine, CA 92714
(714) 733-1002

Building News Bookstore
3055 Overland Avenue
Los Angeles, CA 90034
(800) 873-6397 Fax: (800) 202-1129

H G Daniels Co.
2543 W. 6th Street
Los Angeles, CA 90057
(213) 387-1211

Opamp Technical Books
1033 N. Sycamore
Los Angeles, CA 90038
(213) 464-4322 (800) 468-4322

Technical Book Company
2056 Westwood Boulevard
Los Angeles, CA 90025
(310) 475-5711 Fax: (310) 470-9810

UCLA Lu Valle Commons Bookstore
308 Westwood Plaza
Los Angeles, CA 90024
(310) 825-4014 Fax: (310) 206-8227

Stacey's Bookstore
219 University Avenue
Palo Alto, CA 94301
(415) 326-0681 Fax: (415) 326-0693

Stanford Bookstore
135 University Avenue
Palo Alto, CA 94301
(415) 327-3680

San Diego Technical Books
4698 Convoy Street
San Diego, CA 92111
(619) 279-4990 Fax: (619) 279-5088

Builders Booksource
300 DeHaro Street
San Francisco, CA 94103
(415) 575-3980 Fax: (415) 863-8180

Stacey's Bookstore
581 Market Street
San Francisco, CA 94105
(415) 421-4687 (800) 926-6511
Fax: (415) 777-5017

William Stout Architectural Books
804 Montgomery
San Francisco, CA 94133
(415) 391-6757

Earthling Bookshop
698 Higuera Street
San Luis Obispo, CA 93401
(805) 543-7951 Fax: (805) 543-8488

El Corral Bookstore
Cal State Poly University
San Luis Obispo, CA 93407
(805) 756-1101 Fax: (805) 756-5351

Chaucer's Bookstore
3321 State Street
Santa Barbara, CA 93105
(805) 563-0010

Hennessey & Ingalls
1254 3rd Street Promenade
Santa Monica, CA 90401
(310) 458-9074

Colorado
BiblioTek
1655 Walnut Street
Boulder, CO 80302
(303) 443-7037

University Book Center
Campus Box B-36
Boulder, CO 80309
(303) 492-6411 Fax: (303) 492-0421

Chinook Bookshop
210 N. Tejon Street
Colorado Springs, CO 80903
(719) 635-1195 Fax: (719) 635-0792

McKinzey-White Booksellers
8005 N. Academy Boulevard
Colorado Springs, CO 80920
(719) 590-1700 Fax: (719) 531-7631

Auraria Book Center
955 Lawrence Street
Denver, CO 80204
(303) 556-3230 Fax: (303) 556-3736

BiblioTek
1430 Blake Street
Denver, CO 80202
(303) 534-3460

The Tattered Cover
2955 E. First Avenue
Denver, CO 80206
(303) 322-7727 Fax: (303) 322-2279

United Techbook Co.
249 Main Street
Longmont, CO 80501
(303) 651-3184 Fax: (303) 651-3405

Connecticut
University of Connecticut Co-op
81 Fairfield Rd.
Storrs, CT 06268
(203) 486-3537

District of Columbia
Borders Books & Music
1801 K Street, NW
Washington, DC 20006
(202) 466-4999 Fax: (202) 466-2403

Reiter's Scientific & Professional Books
2021 K Street, NW
Washington, DC 20002
(202) 223-3327 Fax: (202) 296-9103

Reprint Book Shop
455 L'Enfant Plaza, NW
Washington, DC 20024
(202) 554-5070

Florida
University of Miami Bookstore
Student Union Building
Coral Gables, FL 33214
(305) 284-3343

University of Florida Bookstores
University of Florida, The HUB Bldg
Gainesville, FL 32611
(904) 392-0194, Ext. 126

Kingsleys Book Emporium
24 N. Boulevard of Presidents
Sarasota, FL 34236
(818) 388-5045

Georgia
Architectural Book Center
229 Peachtree Street, Suite B05
Atlanta, GA 30303

Engineers Bookstore
748 Marietta Street
Atlanta, GA 30318
(404) 221-1669 Fax: (404) 221-1119

Oxford Bookstore
360 Pharr Road
Atlanta, GA 30305
(404) 262-3333

Illinois
Prairie Avenue Bookshop
711 S. Dearborn
Chicago, IL 60605
(312) 922-8311 Fax: (312) 922-5184

Borders Book Shop
1600 16th Street
Oak Brook, IL 60521
(708) 574-0800 Fax: (708) 574-2409

Maryland
Borders Books & Music
11301 Rockville Pike
North Bethesda, MD 20895-1021
(301) 816-1067 Fax: (301) 816-8940

Maryland Book Exchange
4500 College Avenue
College Park, MD 20740
(301) 297-2510 Fax: (301) 209-7118

University Book Center
University of Maryland
College Park, MD 20742
(301) 314-2665

Massachusetts
Borders Book Shop
85 Worcester Road
Framingham, MA 01701
(508) 875-2321 Fax: (508) 875-3205

Boston University Bookstore
660 Beacon Street
Boston, MA 02215
(617) 267-8484

Building News Bookstore
77 Wexford Street
Needham, MA 02194
(800) 873-6397 Fax: (800) 202-1129

Harvard Coop
1400 Massachusetts Avenue
Cambridge, MA 02238
(617) 499-2000

Quantum Books
4 Cambridge Center
Cambridge, MA 02142
(617) 494-5042

MIT Coop
3 Cambridge Center
Cambridge, MA 02142
(617) 499-3200

You Do It Electronics Center
40 Franklin Street
Needham, MA 02194
(617) 449-1005

Michigan
Borders Book Shop
31150 Southfield Road
Birmingham, MI 48025
(810) 644-1515 Fax: (810) 644-6484

Borders Books & Music
43075 Crescent Boulevard
Novi, MI 48375
(810) 347-0780 Fax: (810) 347-6956

New Hampshire
Dartmouth Bookstore
33 South Main Street
Hanover, NH 03755
(603) 643-3616

New Jersey
Newark Book Center
10 Academy Street
Newark, NJ 07012
(201) 642-7956

Princeton University Store
36 University Place
Princeton, NJ 08540
(800) 624-4236 (in NJ)
(800) 631-0137 (elsewhere)
Fax: (609) 924-9651

New Mexico
Page One
11018 Montgomery, NE
Albuquerque, NM 87111
(505) 294-2026 Fax: (505) 294-5576

New York
Cornell Campus Store
Ithaca, NY 14850
(607) 255-3421

Barnes & Noble Bookstore
105 Fifth Avenue
New York, NY 10003
(212) 807-0099

McGraw-Hill Bookstore
1221 Avenue of the Americas
New York, NY 10022
(212) 512-4100

Urban Center Books
457 Madison Avenue
New York, NY 10022
(212) 935-3592

Borders Books & Music
1000 Hylan Drive
Rochester, NY 14623
(716) 292-5900 Fax: (716) 292-1485

North Carolina
Intimate Bookshop
Eastgate Shopping Center
Chapel Hill, NC 27514
(919) 929-0414

Atticus Books
801-B Friendly Center Road
Greensboro, NC 27408
(910) 854-1169

North Carolina State University Bookstore
P.O. Box 7224
Raleigh, NC 27695
(919) 515-3573

Ohio
Booksellers Cleveland
24031 Chagrin Boulevard
Beachwood, OH 44122
(216) 831-5035 Fax: (216) 765-2660

Books & Co.
350 E. Stroop Road
Dayton, OH 45429
(513) 298-6540 Fax: (513) 298-7895

Booksellers Cleveland
21611 Center Ridge Road
Rocky River, OH 44116
(216) 333-7828 Fax: (216) 333-2714

Pennsylvania
Gene's Books
King of Prussia Plaza
King of Prussia, PA 19406
(215) 265-6210 Fax: (215) 265-6260

Architect's Book Center
117 S. 17th Street
Philadelphia, PA 19103
(215) 569-3188

How-To-Do-It Bookstore
1608 Sanson Street
Philadelphia, PA 19107
(215) 563-1516

University of Pennsylvania Bookstore
3729 Locust Walk
Philadelphia, PA 19104
(215) 898-7520

Chester County Book Co.
975 Paoli Pike
West Chester, PA 19380
(215) 696-1661 Fax: (215) 429-9006

Texas
Taylor's Technical Books
253 Lincoln Square
Arlington, TX 76011
(817) 548-TECH

University Bookstore
University of Texas at Arlington
501 W. Nedderman Drive
Arlington, TX 76019
(817) 273-2785

University Co-op
2246 Guadalupe Street
Austin, TX 78705
(512) 476-7211

Texas A&M Bookstore
Memorial Student Center
College Station, TX 77844
(409) 845-8681

Major's Scientific Books
2137 Butler Street
Dallas, TX 75235
(214) 631-4478

Taylor's Technical Books
5455 Beltline Road
Dallas, TX 75240
(214) 239-TECH

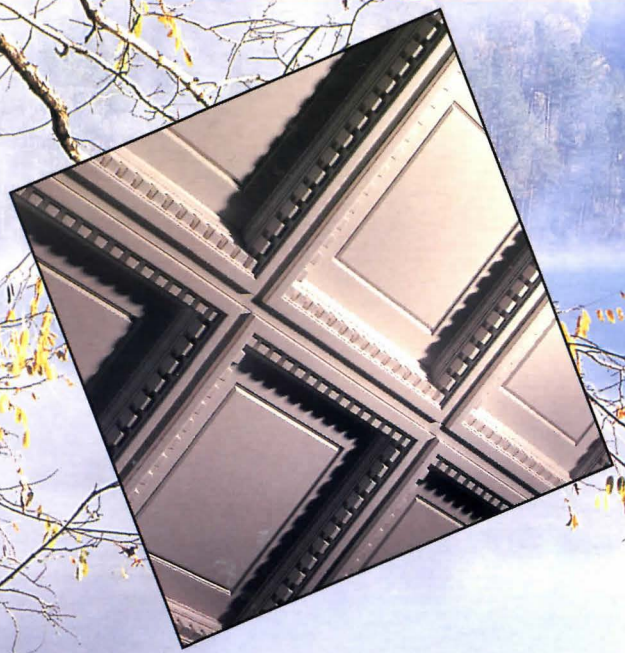
Brown Book Shop
1517 San Jacinto
Houston, TX 77002
(713) 652-3937 Fax: (713) 652-1914

Major's Scientific Books
6640 S. Main Street
Houston, TX 77030
(713) 522-1361 (800) 221-9697
Fax: (713) 524-5860

Virginia
Virginia Tech Campus Bookstore
Virginia Tech
Blacksburg, VA 22061
(703) 231-5991 Fax: (703) 231-7786

Borders Book Shop
Tyson's Square
8311 Leesburg Pike
Vienna, VA 22182
(703) 556-7766 Fax: (703) 556-6458

THE BEAUTY IS THE ACCESSIBILITY.



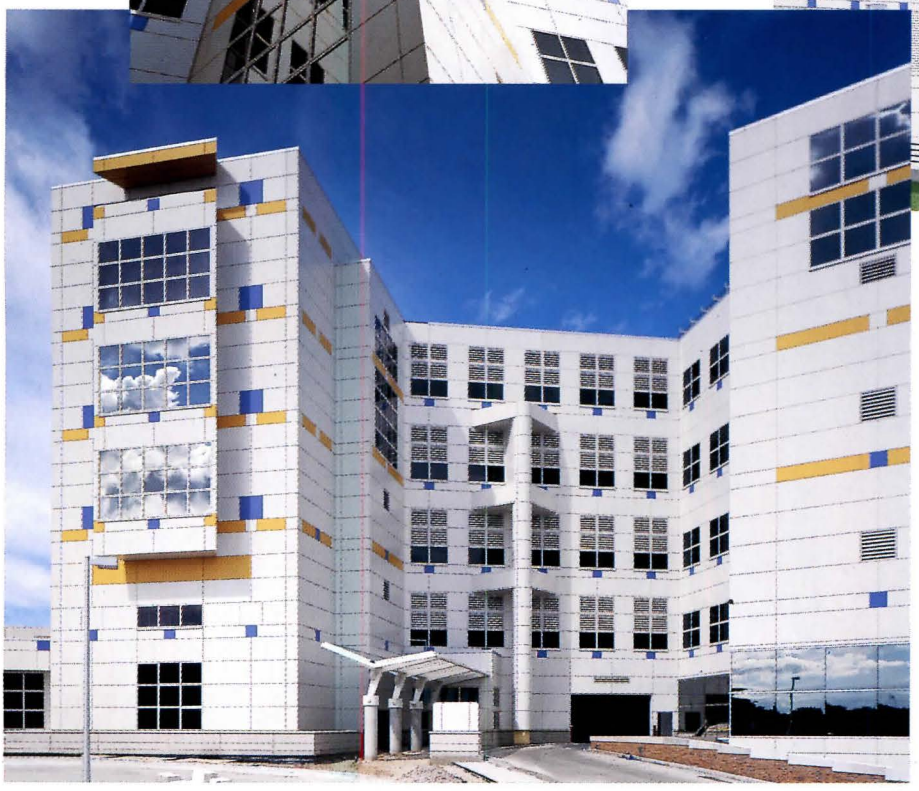
CADRE™ and QUADRA™ ceiling panels provide accessibility to everything above with no aesthetic compromise. Panels which recreate the elegance of handcrafted ornamental plaster. Or the rich detail of woodgrain. Made of fire-resistant, glass-reinforced gypsum in a variety of designs, colors and finishes, so they're a natural complement to traditional or contemporary interiors. For more information, call (800)950-3839. And see just how accessible beauty really is.

USG Interiors

© Copyright 1994, USG Interiors, Inc.
CADRE and QUADRA are trademarks of USG Interiors, Inc.
First in a series of landscape photographs by Gary Irving. For a poster, call (800)950-3859. Posters available only while supplies last.

Circle 90 on inquiry card

Remarkable skin alleviates burning at major hospital.



There's a new kind of technology now in use at Milwaukee County Medical Center. With Reynobond® FR aluminum composite panels in place, this major urban hospital has a protective skin featuring the only solid plastic core that meets all Class A fire resistance requirements of the model building codes — with no exceptions. This includes flame spread, smoke generation, and fuel contribution.

Reynobond's superior FR panels possess the only solid thermoplastic core that's both fire resistant and non-halogenated. They've passed the stringent I.C.B.O. Multi-Story Fire Test and comply with the city of New York's toxicity code, even in a 5mm thickness.

In addition, the flatness, formability and attractive finishes of Reynobond FR make for an aesthetically pleasing appearance that is sure to catch the discerning eye of any architect.

Just call (804) 281-3629 for more information, or write Reynolds Metals, Construction Products Division, P.O. Box 27003, Richmond, VA 23261.

We think you'll find that our remarkable fire-resistant panels are just what the doctor ordered.

Reynolds
REYNOBOND®
Aluminum Composite Material

From the Construction Products Division of Reynolds Metals Company. © 1993 RMC
Reynobond® is a registered trademark of Reynolds Metals Company.

Circle 89 on inquiry card