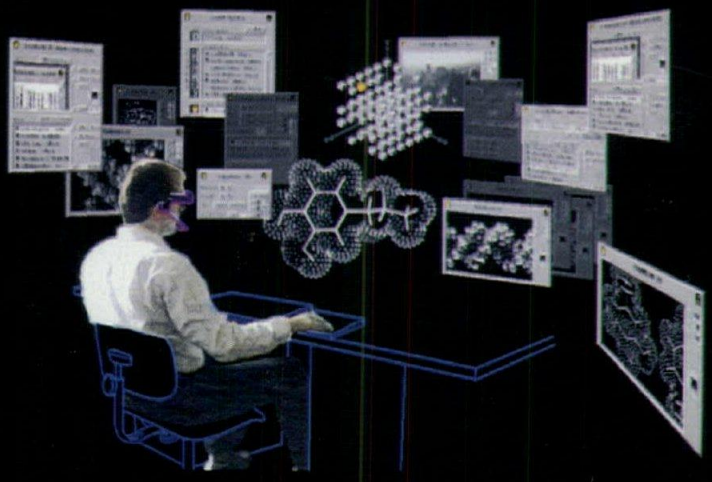
PA

Progressive Architecture

A Penton Publication March 1994



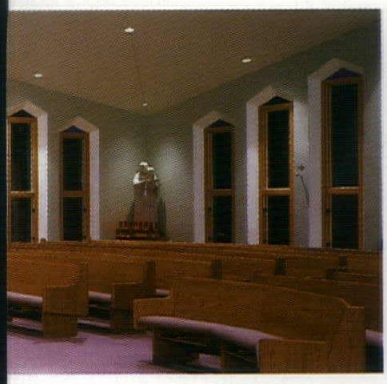
HYPE vs. REALITY

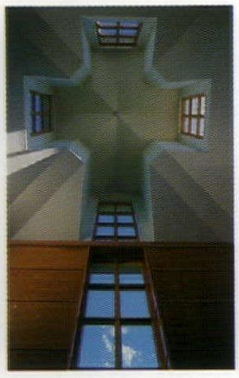
THE CHANGING WORKPLACE

Also in this issue: STUDENTS BUILD
TECHNICS FILE: ROOFING
CRITIQUE: MALL OF AMERICA
KIERAN TIMBERLAKE & HARRIS

AN ENLIGHTENED ARCHITECT CALLS ON ROME AND ANDERSEN TO HELP A CHURCH

As a student in Rome, architect Al Fitzpatrick studied the design of St. Peter's. "Daylight was used as a source of inspiration and tranquility," he said.





He wanted to bring that same light here to St. Joseph's—create a sanctuary in a hectic world. So he specified Andersen® windows. Said Fitzpatrick: "Andersen enabled us to use many sizes, configurations and special effects."

Special effects, we asked? "In the sanctuary windows we angled the return of the Andersen head, jamb and sill to produce an uplifting yet tranquil effect."

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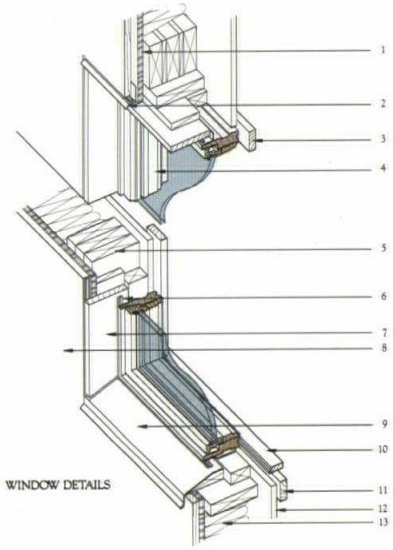

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2. METAL HEAD FLASHING WITH DRIP
3. WOOD CASING
4. ANDERSEN® PERMA-SHIELD® CASEMENT WINDOW
5. 2 x 6 WOOD STUDS
6. CONTINUOUS SEALANT WITH BACKER ROD
7. WOOD TRIM
8. VERTICAL WOOD SIDING
9. METAL SILL FLASHING
10. WOOD STOOL
11. WOOD APRON
12. 5/8" GYPSUM BOARD
13. BATT INSULATION

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EPPING, NEW HAMPSHIRE

DESIGN ARCHITECT:
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PROJECT MANAGER:
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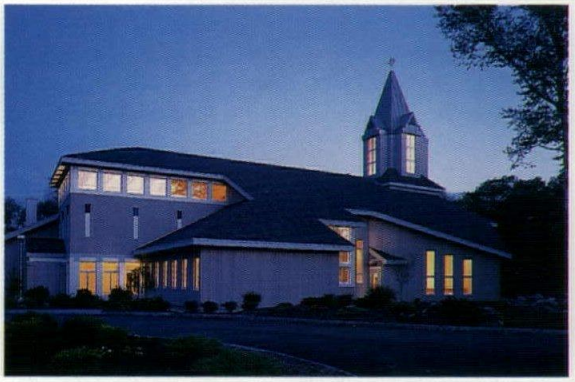
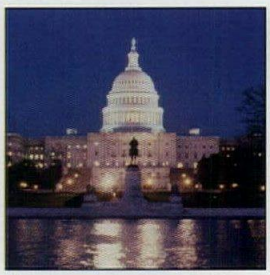
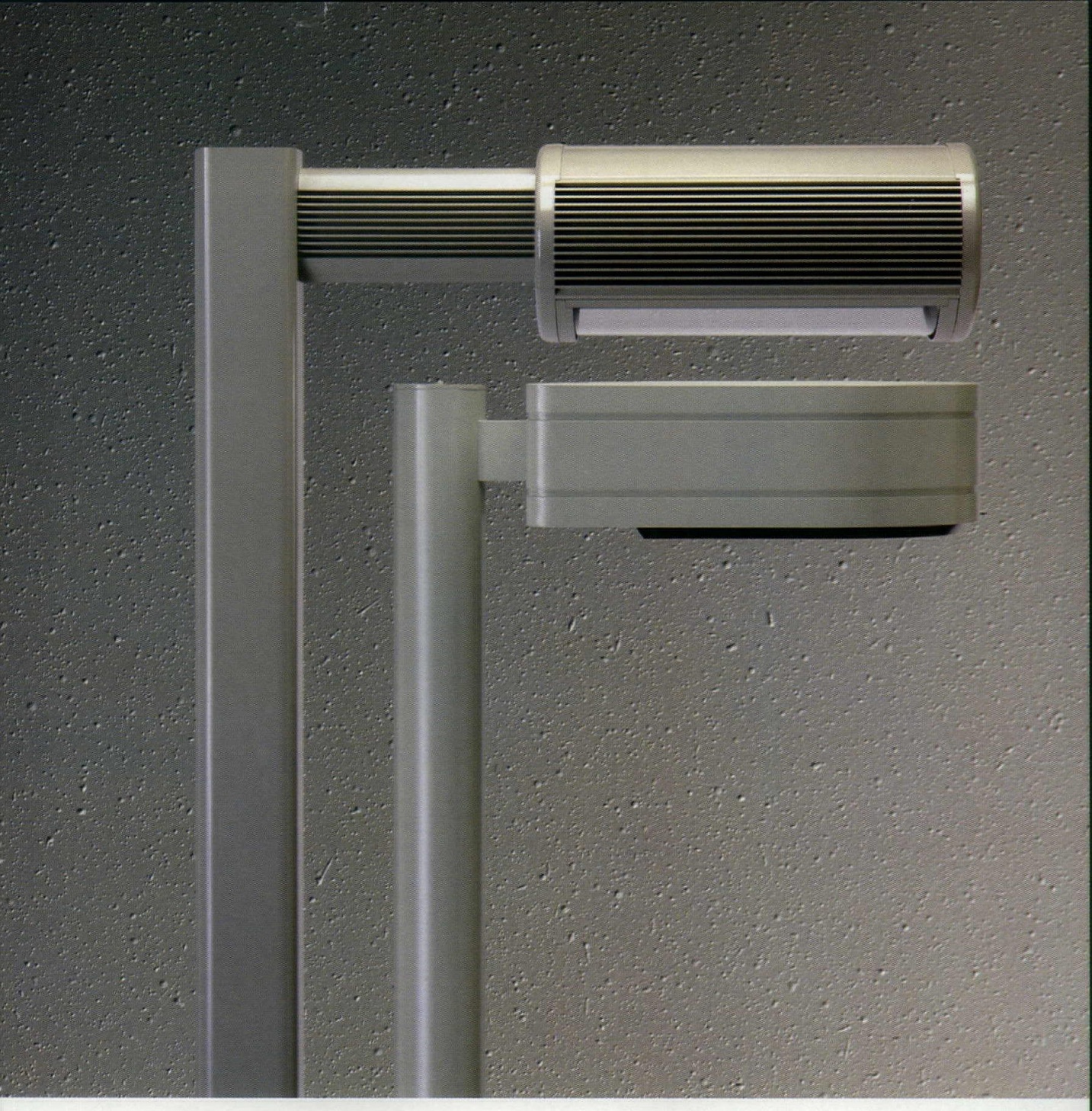




The same quality and performance selected by the Capitol Architect to light America's most famous landmark is built into every Sterner Luminaire.

Lighting Concepts So Brilliant, They Even Float.

Maybe it's because we're located in the land of 10,000 lakes. Maybe it's because we pay attention to every little detail. Or maybe it's the extra-curricular design meetings at the Blue Note. Whatever the reason, we make lighting fixtures that float. Like our new Softform fixture, the Sedona, shown just below the Sierra. To build it, we created a method of fabrication that combines a die-formed aluminum extrusion with a one-piece canopy, mechanically crimping them together for a water-tight seal. And we know it's water tight, because we filled it with rocks and floated it out on Lake Winsted for a month. In January, no less. The result of this effort is area and roadway lighting so well made that it's not only water proof, it's dust proof, dirt proof, and bug proof.



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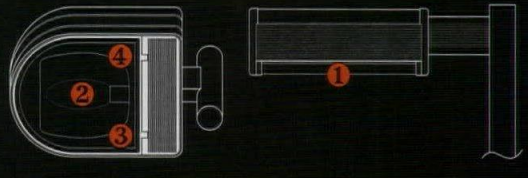

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News

Features

EDITOR IN CHARGE: Mark Alden Branch

COVER: *Images from today's workplace, top photo by Jim Leftwich/Orbit Interaction. Bottom photo by Neil Selkirk. Cover design by Julie Anne Yee*

PHOTO THIS PAGE: *Abandoned real estate scheme south of Santa Fe, New Mexico; photo by Alex MacLean (p.60).*

Coming Next Month: Is the AIA Worth the Price of Admission? • The Work of Glenn Murcutt • Industrial Incubators • Architectural Research • Critique: Middleton Inn

The Apple Report On PowerPC

Number 2 – RISC Performance and Cross-Platform Compatibility

Many of the most popular applications have been or are being optimized to take advantage of the high-performance PowerPC processor.

PowerPC chips are faster and less expensive than Pentium chips – so are the personal computers they will run.

A complete Macintosh system with PowerPC will cost well under $2,500, but will offer better performance than higher-priced Pentium-based systems.

With SoftWindows, Macintosh with PowerPC will have the ability to run DOS and Windows applications, unmodified.

For more information about Macintosh with PowerPC, call 1-800-732-3131, ext. 150, in the U.S. We'll send you a copy of our informative, free booklet, *PowerPC Technology: The Power Behind the Next Generation of Macintosh Systems*. In Canada, call 1-800-665-2775, ext. 910.

In the first half of 1994, Apple will introduce a new family of computers that already has the entire computer industry standing on end.

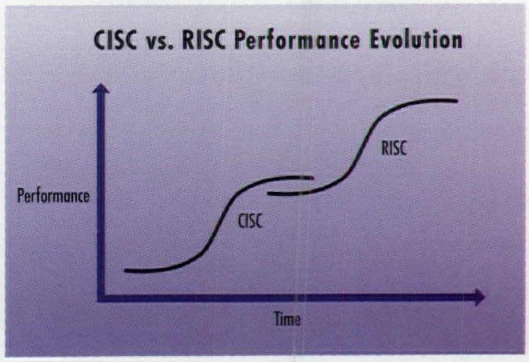
They will offer better performance than computers based on the X86 microprocessors. They will be extremely competitive on a price basis. And they will be compatible with Windows and DOS applications, by using SoftWindows software.

They will be based on the revolutionary new PowerPC™ microprocessor, created jointly by Apple, IBM and Motorola.

For the first time, desktop personal computers will take advantage of RISC chip architecture previously found only in high-performance workstations. This advance will make possible quantum improvements in the way we manage and work with information.

RISC vs. CISC.

Tremendous advances have been made in CISC architecture over the years. However, the physical limitations of the new, high-performance CISC design mean that CISC chips must be significantly bigger and more complex, and must run at hotter temperatures to perform the same tasks as comparable RISC chips. Consequently, the newer generation of CISC chips, like the Pentium, are much more expensive to manufacture. Which means that personal computers powered by PowerPC chips can offer a significant advantage in price as well as in performance.



As you can see on the chart, RISC microprocessors offer dramatically greater potential for growth, leading us well into the next century and increasing the practicality of features like voice recognition, videoconferencing, object-oriented software and multimedia capabilities – functions that will be integral to doing business in the 21st century.

More compatible personal computers.

Apple's new generation of Macintosh® personal computers built around the PowerPC chip offer the ability to run MS-DOS and Windows applications, as well as Macintosh software. Moving from one environment to the next will be seamless and, even more importantly, it will be effortless.

PC users who move to Macintosh with PowerPC will gain access to the large number of new applications which take advantage of the incredible performance of the new PowerPC chip.

Higher-performance optimized applications.

When PowerPC microprocessor-equipped Macintosh computers begin shipping, software developers including Microsoft, WordPerfect, Adobe, Aldus and Claris will begin shipping new versions of their most popular software, specifically rewritten to take full advantage of the new processor's capabilities.

These optimized, sometimes called "native," applications will offer significantly faster performance than their MS-DOS, Windows or current Macintosh counterparts.

Unprecedented value.

Because RISC-based personal computers cost less to manufacture than equivalent systems based on CISC chips, we will be able to make this technology available for well under $2,500 for a complete mainstream desktop system.* Competitive with a lower-performance, Pentium-based PC.** Watch for Apple Report #3, coming soon.

Apple

A House Divided

Architectural criticism has become split into two seemingly opposed camps. On one side are the journalists writing for daily newspapers, trade journals, and consumer magazines, who have a healthy skepticism about the architectural scene. Too many in this camp, however, confuse criticism with straightforward reporting (most common in the smaller newspapers), unquestioning description (characteristic of the trade journals), or personality profiles (a particularly annoying aspect of the consumer shelter magazines).

The divide that separates architectural journalists from academic critics says a lot about the condition of architecture itself.

On the other side are the academic critics who publish in scholarly journals, student-run publications, and small-circulation books, and who bring to the subject both depth and breadth of knowledge. But all too often such criticism lapses into the dull recitation of fact (a problem in much historical and technical writing), into obscure, jargon-filled analysis (to which every post-structuralist critic is prone), or into highly personal effusion about architecture (typical of the phenomenologists). What is rare, on either side, are critics who can address the underlying ideas and larger meanings of architecture and who can convey them clearly and concisely to the public and the profession.

None of this would matter much if architectural criticism were the pursuit of just a few writers and academics. But it isn't. Criticism mirrors architecture itself – and you don't have to look too far to find the reflection of one in the other.

The divide among critics, for example, echoes the widening gap between architectural practitioners and educators. There are exceptions: educators who sustain successful practices and practitioners whose work is studied in the academy. But for the most part, the two groups seem to be growing apart as practitioners grapple with rapidly changing market conditions and educators face pressures to become more like their peers in other academic departments.

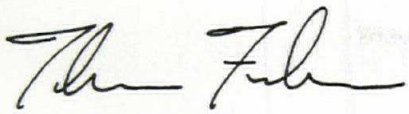
There has, of course, always been some division between practitioners and educators in this field; it is almost inevitable when an applied profession such as architecture is taught mainly within research universities. What has changed in the last two decades is the declining interaction between the two. To go from architectural offices to studio juries, as I often do, is now to travel between two realms whose concepts and whose very language seem not of the same culture.

A similar division appears to exist within the world of practice itself. Architects, we are often told, design only a small fraction – 5 percent? – of the buildings constructed each year. But such a figure is based on the percentage of buildings custom-designed by architects for particular clients. Architecturally trained people, in fact, have some involvement in most of what gets built, whether they work for house-plan shops turning out designs to be mass produced by home builders, for retailers developing prototype stores or displays, for companies fabricating building systems or products, or for corporations replanning office space or factory floors. Such work affects a large segment of the population, yet it remains largely invisible within the profession.

You could argue that a division has always existed between high-style, custom architecture and popular, mass-produced building. Or you could point to efforts in recent decades to break down that barrier, as some architects have looked to vernacular or pop architecture for inspiration. But the fact is that when architecture becomes too popular, academic critics dismiss it, and when it seems too esoteric, journalist critics do the same. Again: two camps, two cultures.

The social critic Walter Benjamin once wrote that, "The greater the decrease in the social significance of an art form, the sharper the distinction between criticism and enjoyment by the public. The conventional is uncritically enjoyed and the truly new is criticized with aversion." Benjamin's observation should be a warning to us all. The longer we tolerate the split between the academic and the journalist critic, between the architectural educator and the practitioner, between high-style and popular architecture, the greater the decrease, as Benjamin puts it, in the social significance of our art form.

We would all be better off in a house not so divided, where there weren't false differences among educators, practitioners, and critics. Maintaining such divisions, as Benjamin reminds us, is simply to court our own irrelevance. □



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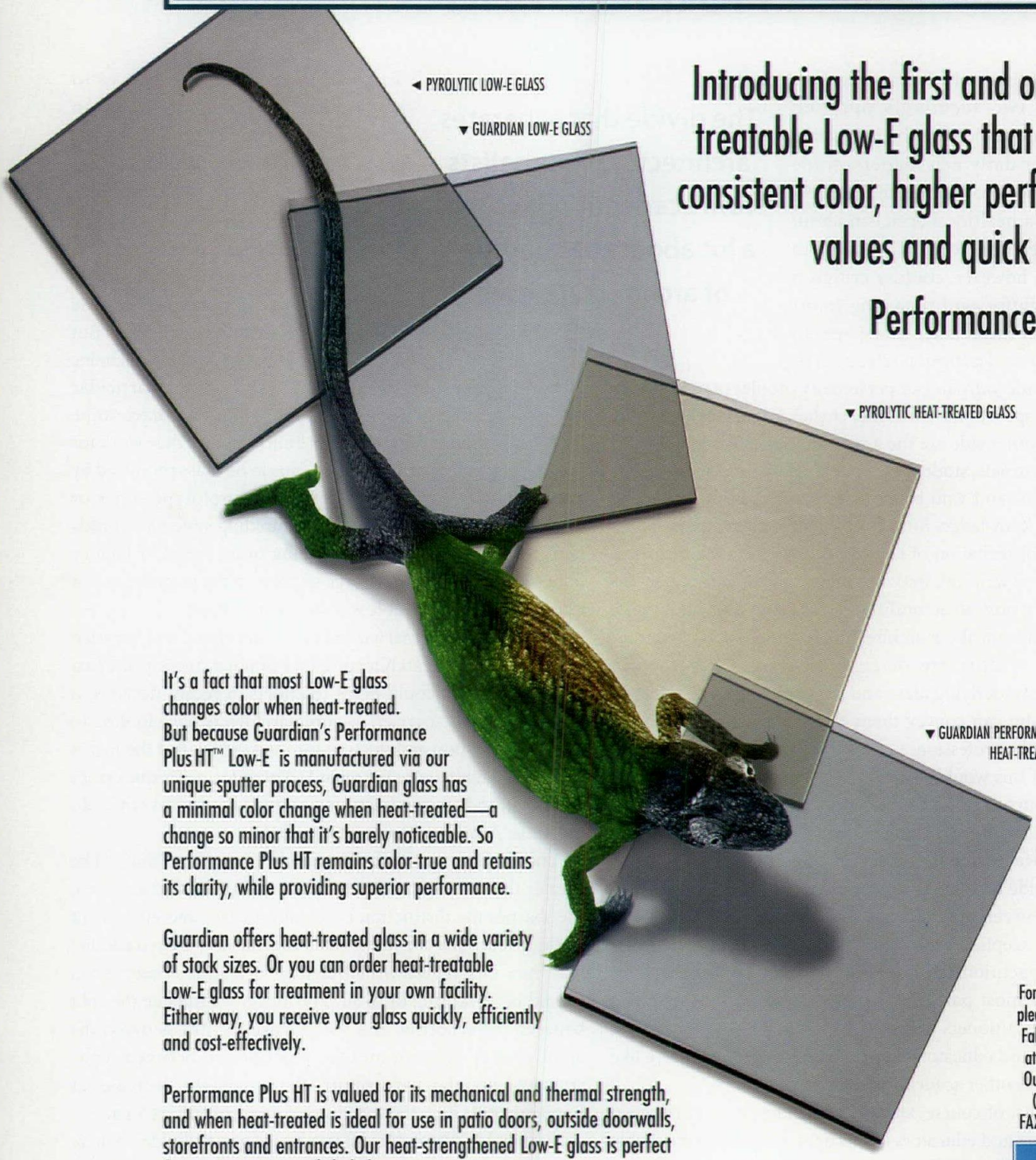

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Appreciating Lautner

Many thanks for the John Lautner interview (P/A, Dec. 1994, p. 64). In a world where, as Mr. Lautner says, everything is marketing and money, it is refreshing to see a small amount of space devoted to the last original genius in American Architecture. It is one of the ongoing tragedies of our time, for which we will be judged harshly in the future, that so many mediocre, faceless buildings were built without John Lautner. If time and tide had allowed him the volume and quality of commissions that Wright, S.O.M, H.O.K., and X.Y.Z. enjoyed, our world would be as beautiful as it might have been.

William Badrick
Studio X
Portland, Oregon

New Urbanism

It is important to point out that the "new urbanism" (P/A, Dec. 1993, p. 36) does not need to be clothed in traditional architecture. Porches, intimate scale, and design guidelines can be created in any style.

Traditional architecture serves other purposes for the new urbanism. It provides a memorable image for a complex set of ideas. This image reinforces the "learning from the golden past" message. Unlike many images created by architects, it has strong appeal for developers and the public.

Although the linking of image to message has helped "sell" the new urbanism, I think that the discussion will be clarified if they are considered separately. The new urbanism has some valuable ideas. The traditional image seems to be about the packaging of those ideas.

Stephen Wallet
Bowlus, Edinger & Starck, Architects
San Diego, CA

CORRECTIONS

Nashville Arena Credits

One of the competing teams for the Nashville Arena (P/A, Nov. 1993, p. 18) was misidentified as an "all-Nashville team" of Earl Swensson Architects and Gresham-Smith & Partners. In fact, this team also included HNTB Architects Engineers Planners of Kansas City, Missouri.

NOMA Awards Amplification

In a News article (P/A, Dec. 1993, p. 14) naming winners in the annual competition held by the National Organization of Minority Architects, we did not fully identify one project: Brown-Kaplan Townhomes, Dorchester, Massachusetts, by Chisholm Washington Architects, Cambridge.

Facility Planners Award

The annual award given by the Council of Educational Facility Planners International (P/A, Jan. 1994, p. 20) is the James D. MacConnell Award, not McDonnell as we reported.

Home On The Range

The new age exterior

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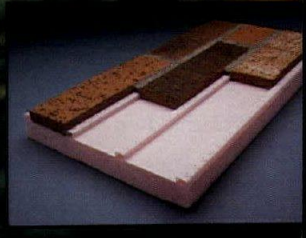

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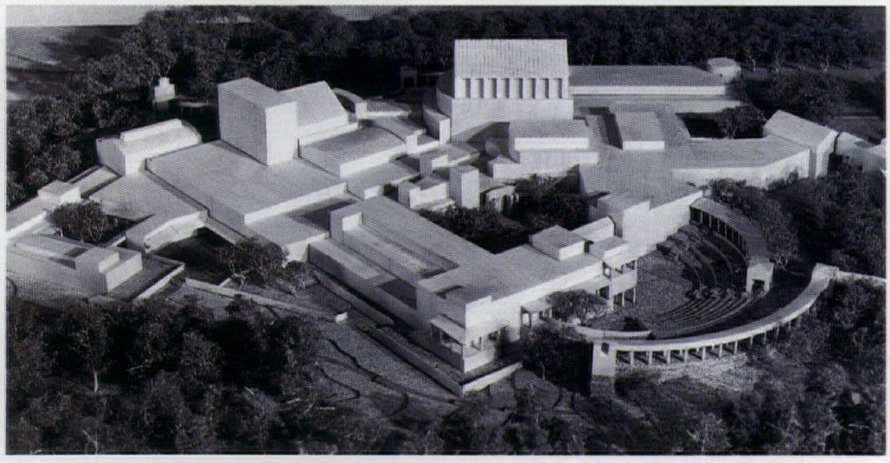
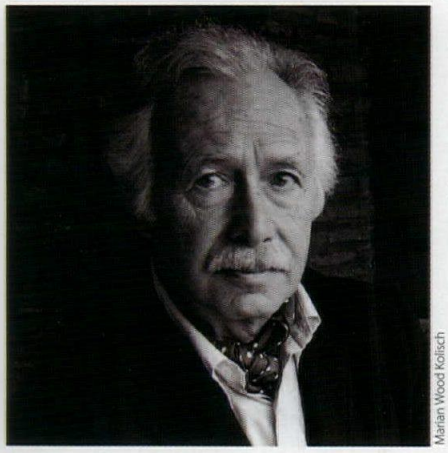
News



MRY Chosen for Maryland Arts Center

A jury has recommended the design of Moore Ruble Yudell of Santa Monica, California, over four competitors for the Maryland Center for the Arts, an $80-million project on the University of Maryland campus at College Park. The firm's associate architects are Ayers/Saint/Gross of Baltimore. Their design, (above) described by jurors as "a kind of academic village," was praised for its "rich mix of humanly scaled forms and spaces." Also competing were Pei Cobb Freed & Partners, New York; Barton Myers Associates, Los Angeles; Antoine Predock Architect, Albuquerque; and a joint venture of Cesar Pelli & Associates, New Haven, and RTKL Associates, Baltimore. □

Pietro Belluschi Dies at 94



Marian Wood Kolisch

AIA Gold Medalist Pietro Belluschi, 94, died on February 14 at his Portland, Oregon, home. The Italian-born Belluschi (see P/A interview, June 1990, p. 122) helped make Portland the center of a spare, woodsy Northwest Modernism before shifting to an industrial aesthetic with his Equitable Building of 1948 in Portland, a paradigm for the glazed office tower that predated S.O.M.'s Lever House in New York by five years.

After selling his practice and moving East in 1950 to be dean of architecture at MIT, Belluschi took up an unconventional mode of practice as a design consultant for far-flung projects. He had a hand in such large-scale structures as the Pan Am Building in New York (1963) and St. Mary's Cathedral in San Francisco (1971). He is much more fondly remembered for some 50 churches and synagogues that balanced Modernist severity with traditional forms and textures. □

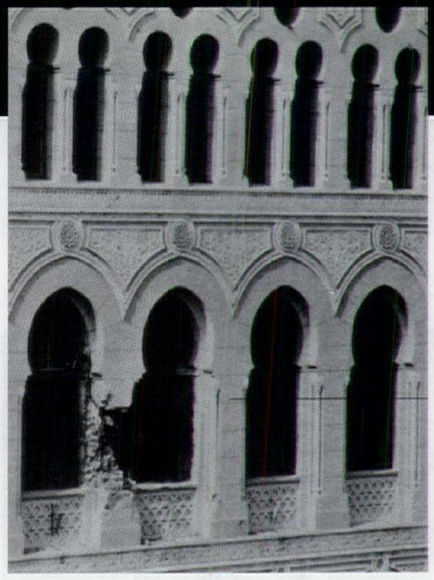
Publishing Exec to Head AIA

Terrence M. McDermott, a former executive at Cahners Publishing, has been chosen from a field of 400 applicants as the AIA's new executive vice-president/chief executive officer. McDermott, who succeeds James P. Cramer, takes the AIA helm on March 1. His 24-year career with Cahners included eight years as publisher of *Building Design and Construction* and five years as company president. AIA president William Chapin said that McDermott "brings a wealth of business leadership common sense to the AIA." □

Lawsuit Over O'Hare Terminal

The City of Chicago has filed a $40-million lawsuit against Group One Design, the consortium that designed the International Terminal at O'Hare Airport (P/A, June 1993, p. 88). The city charges that design errors resulted in inadequate electrical and fire protection systems (these have been corrected) and that the "meeters and greeters" lobby is too small for the terminal's traffic load. Sandy Stevenson, president of Group One member Perkins & Will, would not comment on the allegations except to say that the designers are in discussion with the city and are "committed to resolving our differences." □

Historians Mourn Yugoslavian Sites



In the wake of the destruction of the 16th-Century bridge at Mostar in Bosnia on November 9, the Society of Architectural Historians has issued a resolution expressing outrage that "architectural and cultural sites have become the focus of military attacks." Meanwhile, the Chicago Athenaeum has mounted an exhibition of photos of the Bosnian destruction (right) running through April 16. □

Memorials to Moore, Coast to Coast

It is fitting that the late Charles Moore (P/A, Feb.1994, p. 20) has been remembered at memorial observances in four different places he called home. Colleagues, disciples, admirers, friends, clients, and relatives gathered in New Haven, Los Angeles, Austin, and at Sea Ranch on the California coast. Speakers recalled Moore's legendary humor and the insights he gave them. Music ranged from Kurt Weill to Puccini, jazz and mariachi bands, and a shakuhachi solo. His ashes were buried in a family plot in Monterey, California. Endowments are being started to support student efforts at Yale, Berkeley, and UCLA, and to preserve his Austin house as a study center. □

Now Just Holt Hinshaw

The San Francisco firm once known as Holt Hinshaw Pfau Jones has shed another name. Partner Wes Jones has left to form his own San Francisco office, known as Jones, Partners: Architecture. Peter Pfau left the firm, now known as Holt Hinshaw Architects, in 1992. The firm was founded by Paul Holt and Marc Hinshaw in 1980; since first teaming up with Pfau and Jones in 1986, they have won six awards or citations in the P/A Awards program. □

Student Crit in "Virtual Classroom"

Buckley Photography

A studio at the New Jersey Institute of Technology jumped headfirst into cyberspace in December, using the Internet computer network to present their design projects to colleagues at MIT and the University of Texas-Austin. The project assignment, given by special lecturer Peter Anders, (left in photo) was to design a fictitious "McLuhan Media Center" for the NJIT campus. □

Have You Been Exploited by an Employer?

If so, P/A would like to hear about it for an investigative article in an upcoming issue. Write or fax Thomas Fisher at P/A (600 Summer Street, P.O. Box 1361, Stamford, CT 06904, FAX 203-348-4023) with a description of your situation or a phone number where you can be reached. Correspondence will be kept confidential. □

Books

Otto Wagner, Reflections on the Raiment of Modernity *edited by Harry Francis Mallgrave, U. of Chicago Press, Chicago, 1993, $55 cloth, $29.95 paper.*
Ten scholars evaluate the shift in Otto Wagner's work from historicism to an aestheticized functionalism, a transition similar to one that many Post-Modern defectors are trying to make today. While the essays are well researched, their plodding style is in marked contrast to the ease and gracefulness of Wagner's own work.

Making Better Places: Urban Design Now *edited by Richard Hayward and Sue McGlynn, Butterworth, Oxford, England, 1993, $44.95.*
The Joint Centre for Urban Design at Oxford University compiled this collection of 18 essays in support of its vision of traditional urbanism. The quality of the essays varies as much as the subjects, which range from edge cities to the use of CAD in urban design.

Barrier-Free Residential Design *by Albert A. Peloquin, AIA, McGraw-Hill, New York, 1994, $50;*
Building for a Lifetime *by Margaret Wylde, Adrian Baron-Robbins, and Sam Clark, Taunton Press, Newtown, Connecticut, 1994, $44.95.*
These two books, which complement each other, offer valuable information on residential design for the disabled. The first volume, which complies with and includes ADA guidelines, is organized by domestic space function, and presents the pertinent design issues and solutions. The second book looks at the entire home environment and includes information on remodeling.

Gwathmey Siegel: Buildings and Projects 1982–1992 *introduction by Peter Eisenman, Rizzoli, New York, 1994, $60 cloth, $35 paper.*
This survey documents the firm's commercial, institutional, and residential projects in unusually generous depth. Eisenman's introduction is a formal analysis of the firm's houses.

Briefly Noted:

The Edge of the Millennium: An International Critique of Architecture, Urban Planning, Product and Communication Design *edited by Susan Yelavich, Whitney Library of Design, New York, 1993, $30 paper.*
Record of a symposium organized by the Cooper-Hewitt Museum in New York.
Thomas Jefferson's Academical Village: The Creation of an Architectural Masterpiece *edited by Richard Guy Wilson, University Press of Virginia, Charlottesville, 1993, $19.95 paper.*
Exhibition catalog covering Jefferson's ideas and influences for the UVA campus.

Jože Plečnik Lives Again

The late Slovenian architect who inspired Post-Modernists a decade ago emerges as a symbol for his newly independent homeland.

by Michael Z. Wise

Michael Z. Wise

Model of Plečnik's proposed Parliament building (above) and postage stamp bearing its image (above, left).

Nearly half a century after Yugoslav Communists shelved architect Jože Plečnik's plan for a cone-shaped Slovene parliament, the bizarre design has been resurrected – on paper, at least. The image of his monumental building now adorns Slovene postage stamps and appears in section on banknotes issued by the tiny country that broke with the rest of Yugoslavia in 1991.

Meanwhile, when Slovene diplomats moved into a new consulate in midtown Manhattan this past September, they sought a distinctive way of decorating the reception area. Two Plečnik-designed lampposts taken from one of his newly restored bridges in the Slovene capital of Ljubljana provided the solution.

The symbolic attention being accorded Plečnik in the two-year-old independent state represents a rare convergence of culture and politics; a posthumous triumph for an eccentric figure who sought to use the beauty and grandeur of architecture to instill in his countrymen a sense of their own dignity.

The Slovenes' rediscovery of Plečnik follows a series of exhibitions of his work that have traveled through Western Europe and the United States over the last decade. A student of the Viennese *fin-de-siècle* master Otto Wagner, Plečnik emerged from the Austrian Secessionist movement to forge his own idiom based on deep knowledge of the classical past. His ingenious reworking of historical architectural elements found esteem among Post-Modernists like Michael Graves, Robert Venturi, and James Stirling in the mid-1980s. (P/A published a retrospective article on Plečnik – which included the Parliament building – in October 1985.)

The architect's model of the parliament, dubbed by Plečnik a "Cathedral of Freedom," has become the centerpiece of the new Architectural Museum of Slovenia in Ljubljana. "The rediscovery of his plans for a Slovene parliament became a symbol for a common Slovene home," said Culture Minister Sergij Pelhan in an interview. Several of Plečnik's buildings in Ljubljana have recently been restored, including the Three Bridges at the heart of the city and Zale, the complex of 14 funeral chapels built alongside the main cemetery and entered through a propyleum recalling Palladio. Mayor Jože Strgar says the city plans to construct a covered bridge over the Ljubljanica River according to Plečnik's designs next year.

In 1947, Plečnik designed the parliament building to house the National Assembly of Slovenia, then part of Communist Yugoslavia. His plan called for an elongated cone-shaped roof supported by 12 inward leaning columns. It would tower 394 feet above the ground, with a diameter of 164 feet and a spiral exterior reminiscent of Bruegel's painting of the Tower of Babel or Tatlin's monument to the Third International.

The design found some admirers, but according to the current vice president of the Slovene National Assembly, Lev Kreft, such a grandiose structure would have alarmed federalist leader Marshal Tito, and the Slovene leadership shrank from following through. A more humble building in white and green marble, with bronze sculptures of workers and socialist realist murals, was built in 1956. Plečnik died in 1957 after lamenting that he was "fading into the dusk," replaced by a new generation of Modernists who admired the prevailing International Style.

"They wanted to hide his example," Peter Krečič, director of the architectural museum, said of the Communist authorities. "But young *(continued on page 23)*

Early Lessons From the "Medium" Quake

Building codes helped save lives during the Los Angeles earthquake, but should they be rewritten to help save buildings?

by Morris Newman

Fred Stocker

Of all recently built structures, parking structures, like this one at California State University at Northridge, were the most vulnerable, because of the extraordinary loads that roof decks exerted on widely spaced columns. Most of the collapsed parking structures lacked shear walls.

The surprise of the January 17 earthquake in Los Angeles was that structures in the city withstood the jolt adequately, if far from ideally.

"I think we are going to find that newer buildings, by and large, performed rather well," said Los Angeles structural engineer John A. "Trailer" Martin, Jr. Another engineer, Atila Zekioglu, who is an associate in the Santa Monica office of Ove Arup Partnership, added that "whenever we have loss of life, it is hard to say we have come out okay. But in a highly populated area, most buildings did well, and comparatively few buildings came down."

The positive tenor of those conclusions may invite skepticism, given some of the numbing statistics of the recent quake, which registered 6.8 on the Richter scale, according to some accounts. The most powerful to hit the region this century, the temblor caused the deaths of nearly 60 people, and left 6,646 buildings in at least partially unsafe conditions, including 2,195 housing units.

Yet the bottom line is that only a few buildings were actually shaken down throughout the vast region strongly affected by the quake – including most of Los Angeles County, along with Ventura County to the west. The single most tragic occurrence was the collapse of the Northridge Meadow apartments, which resulted in 16 fatalities.

But 4:31 a.m. proved to be very good timing for most people: the great majority of Los Angeles residents were at home, and most houses did not collapse. The loss of life could have been hundreds of times worse if the quake had hit during rush hour on the buckled freeways, or during business hours for the office buildings and shopping centers that buckled over or slumped altogether.

Vertical Movement Was a Surprise

While it may be too early for architects and engineers to pinpoint the lessons of the Los Angeles earthquake, one emerging notion is that buildings were inadequately reinforced for the colossal vertical thrust or "displacement" that characterized the Northridge shaker. "This was a surprise. In all cases, we design buildings to withstand the lateral movement, not the vertical," said architect Adrian Cohen of Widom Wein Cohen, whose home and office both sustained major damage. Another lesson was that the soils in parts of the Los Angeles region were softer and more apt to amplify earthquake forces than was earlier thought; this could explain the highly uneven distribution of damage throughout the region.

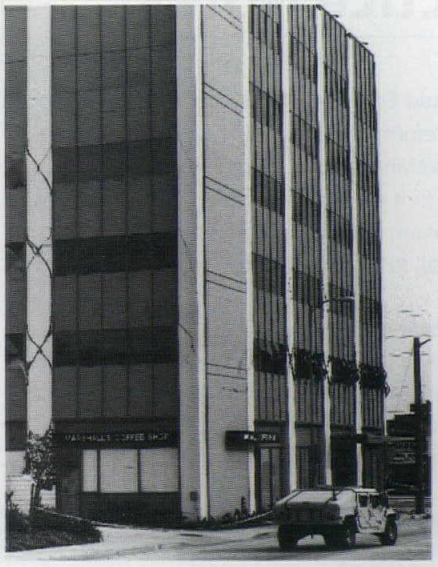
Parking structures were among the few types of recent buildings to be damaged severely in the quake, according to engineer Martin. "The parking structures were too flexible, for whatever reason, and columns took loads that they were not intended to take," he said.

But most failures in the quake can be diagnosed according to basic seismic principles, says Martin. "The buildings that did well had clear 'load paths' for lateral loads, as opposed to walls that featured clerestories or high columns or other beautiful things." Symmetry, another basic principle of seismic engineering, also helped buildings survive, according to Martin.

New Emphasis on Saving Structure

Building codes generally get upgraded following major disasters like the L.A. quake. The stricter codes that quickly followed the Sylmar, California, earthquake of 1971 get much of the credit for keeping buildings from collapsing in the recent quake, and even stricter codes are expected to follow. Yet codes may be inherently limited, because they represent only a "minimal standard" of performance, according to Martin.

The Los Angeles quake, however, may



Fred Stocker

The failure of this 30-year-old medical office building in West Los Angeles was likely due to the wide spacing of spandrels and a lack of adequate shear walls. The uncontrolled rocking motion of the building shattered the windows in the front elevation. The unusual bubbles of the front elevation were probably insulating layers of plastic or acrylic that bulged out from the stress exerted by the motion of the building during the quake and many aftershocks. This building was one of the few to be condemned and demolished in the first few days after the temblor.

force a reevaluation of the purpose of codes. "We know the codes are there to save lives, not to save buildings. Now, there may be more emphasis on saving the structure, through base isolation and other new seismic reinforcement technologies," said architect Cohen.

The most sobering realization from the quake, perhaps, may come from what could happen, as opposed to the devastation that has already occurred. The L.A. quake was only a medium-strength earthquake, and was far less powerful than the hypothetical Big One, which could register 8 or even 9 on the Richter Scale. (The Loma Prieta quake that shook San Francisco in 1989 hit 7.2 on the Richter scale.) The point is, if the Medium One could do this much damage, the devastation promised by an "8" is unimaginable – and inevitable. The most compelling case for both retrofitting and new codes is that Californians can expect something much, much worse from the state's restless plate tectonics, and within our lifetime.

The inherent limit of codes is that they apply only to new construction. Engineer Zekioglu thinks it's time for a change of attitude. "We really need to be more proactive toward the maintenance of existing structures, and encourage retrofitting," he says, adding that building owners should undertake such work before waiting to be prompted by new *(continued on page 23)*

Calendar

COMPETITIONS

U.S./Mexico Border Town Student Competition
Deadlines: registration-April 15, submission-April 29
Students are invited to enter "Beyond the Border," a competition for a new town on the U.S./Mexico border; entries must be in a CAD format. Contact Laslo Vespremi, Graphisoft (415) 737-8665, FAX (415) 871-5481.

Laminated Glass Awards
Deadline: submission-April 22
The annual Benedictus Awards is an international awards program honoring innovation in the architectural use of laminated glass; a separate student category calls for the redesign of the Bauhaus in Weimar. Contact Christine Hess, ACSA, 1735 New York Ave., NW, Washington, DC 20006 (202) 785-2324.

HarbourSite Copper Technology Center
Deadlines: registration-April 22, submission-April 29
Students of architecture, design, and planning are invited to propose a technology center for Toronto's waterfront. Contact AIAS, 1735 New York Ave., NW, Washington, DC 20006 (202) 626-7472, FAX (202) 626-7414.

EXHIBITIONS

A Future for Cabrini-Green
Peace Museum, Chicago. March 3–May 28
Redevelopment proposals from Cabrini-Green residents, neighbors, artists, and architects have been assembled by the S.H.A.P.E., an ad hoc group of architects and artists.

The Barn as Cultural Icon
National Building Museum, Washington, D.C.
March 17–September 11
As traditional farms disappear, barns have become an endangered building type; restoration ideas and new uses are displayed.

CONFERENCES

WestWeek 94
Los Angeles March 23–25
The contract furniture show's theme is "Interactive Relationships: Architecture, Interiors, and Imagination." Contact WestWeek 94 Registration, PDC, Ste. M60, Los Angeles, CA 90069 (310) 657-0800, FAX (310) 659-5214.

Urban Space
Santa Monica, California. March 27–March 31
"Cine City: Film and Perceptions of Urban Space 1895–1995" is a symposium and film series. Contact David Jensen, Getty Center, 401 Wilshire Blvd., Santa Monica, CA 90401 (310) 458-9811 ext. 7084.

Design-Build
Washington, D.C. March 30–31
The Design-Build America conference will explore practice issues. Contact Professional Services Managment Journal, 10 Midland Ave., Newton, MA 02158 (800) 537-7765 , FAX (617) 965-5152.

National Planning Conference
San Francisco April 16–20
"Regions and Cities: Merged Destinies" is the theme of the American Planning Association's (APA) national conference. Contact Reenee Kaiser, APA, 1313 E. 60th St., Chicago, IL 60639 (312) 955-9100.

Practice Notes

Health Care Plan Could Cost Architects

Clinton's health care reform plan, according to William Fanning of the Professional Services Management Journal, could potentially increase what the average firm pays for group medical coverage by 30 percent. On average, firms are now paying roughly 6.1 percent of payroll for such coverage. Call (617) 965-0055 for information on PSMJ.

CADD Group Seeks Standardization

The National Institute of Buildings Sciences (NIBS) has formed a CADD Council to promote standardization and integration of hardware and software serving the design and construction industry. The council is free and open to all interested parties. Call (202) 289-7800.

Publications on Contracts, Liability

New publications to help keep your firm out of trouble: DPIC's free booklet *Introduction to Better Contracts* (fax request on company letterhead to (408) 649-3240, attn. Communications Department), and the Professional Liability Agents Network's *Essential Steps to a Claims-Free Practice*, 2nd Edition (send $30 with order to PLAN, 8811 Colesville Road, Suite G106, Silver Spring, MD, 20910).

Technics Notes

Strengthening Weak Foundations

Researchers at the Georgia Institute of Technology have demonstrated the ability of an electrically powered torch to melt and vitrify soils into rocklike glassy materials five to ten times stronger than unreinforced concrete. The new technology may be used to stabilize landslide areas, soil under structures subject to excessive settlement, vertical slopes adjacent to excavations, and foundations with excess water seepage.

Insurer Plan for Buildings

According to *The New York Times*, the property and casualty insurance industry has begun efforts to improve construction materials and methods in an effort to stem disaster losses. The newly formed Insurance Institute for Property Loss Reduction will start with a sweeping study of building codes and their enforcement, leading to a rating system of local codes and their enforcement that would be a factor in setting insurance premiums. The institute also plans to sponsor research into wind engineering, seismic and wind retrofitting, and the wind resistance of commercial buildings.

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Jože Plečnik Lives Again

(continued from page 13)

people were curious about his work. Because he was rejected he became even more of a legend." When independence was achieved after a 10-day battle against Yugoslav federal forces, an unofficial congress of émigré Slovenes met in June 1991 and urged that the moment had arrived for the parliament building to be realized.

"The idea still lives," said Krečič. But Slovene officials give little sign that it will become reality amid current budgetary restraints. Culture Minister Pelhan said that the existing parliament suits Slovenia's needs at the present. "Our primary concern is that Plečnik's buildings be preserved as part of our heritage," he said. Krečič suggests that perhaps it does not really matter whether the cone-topped parliament ever looms over Ljubljana. "We should not turn it into a Tower of Babel with all of its ambitions and pain," he said. "We need to view it with a bit of humor as something we could do. Perhaps it may be more fruitful if the idea remains alive on paper and in our minds." □

The author, a freelance journalist based in New York, has written about architecture for The New York Observer, The Washington Post, *and* The Independent *of London.*

Lessons From the Medium Quake

(continued from page 15)

legislation. In many cases, seismic "fixes" may not be costly, and could include such low-tech remedies as injecting epoxy into concrete columns or adding a layer of plywood sheathing to a wood-framed wall, behind the exterior stucco. "It may be quite simple, but it still has to be done," Zekioglu added. "If we expect our structures to perform well in earthquakes, I think we should maintain them." □

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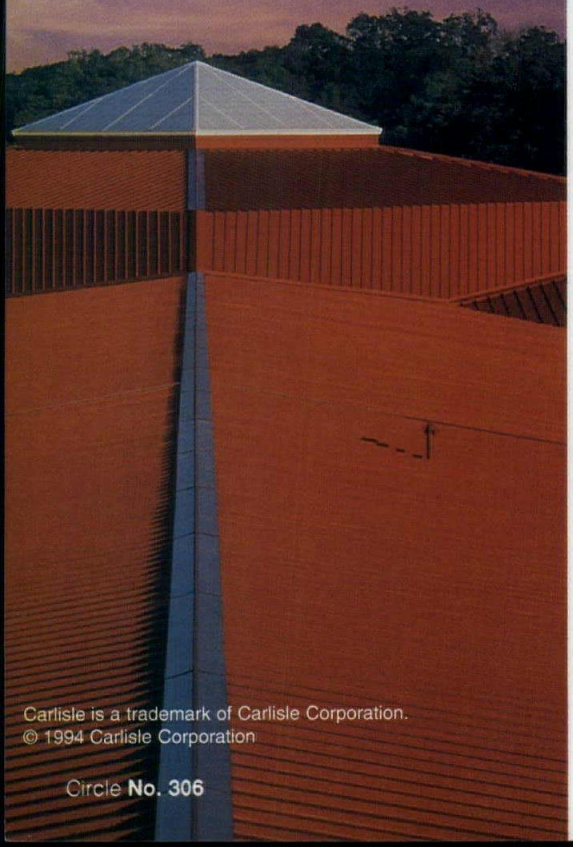

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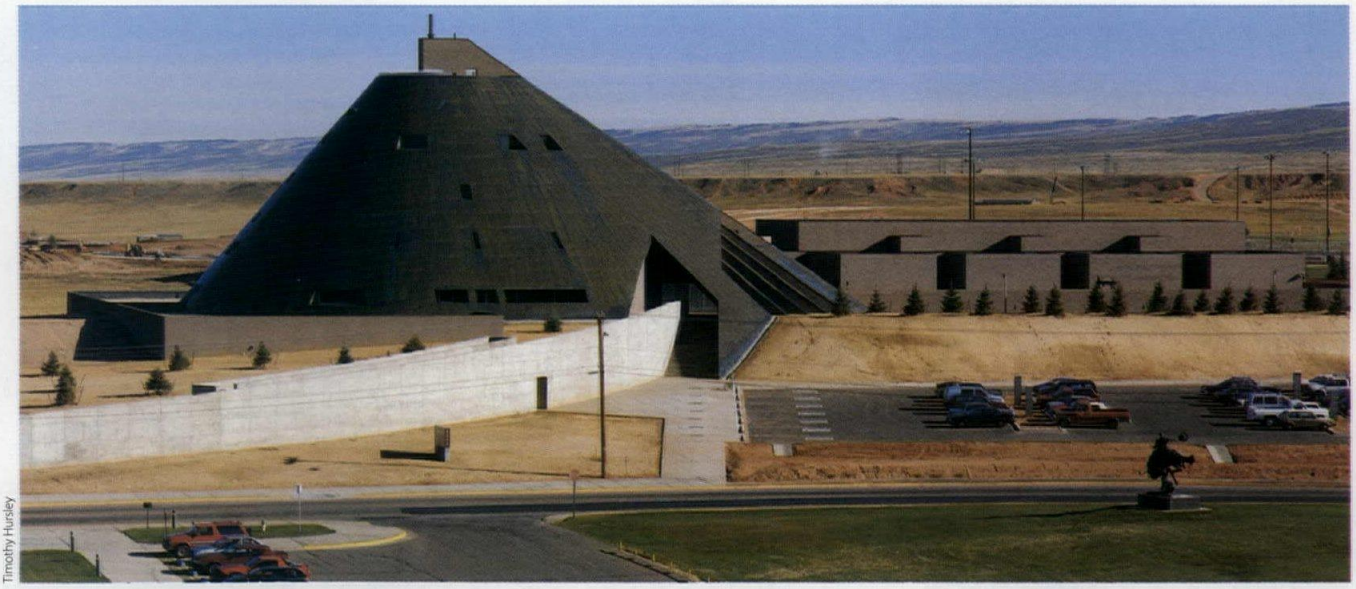
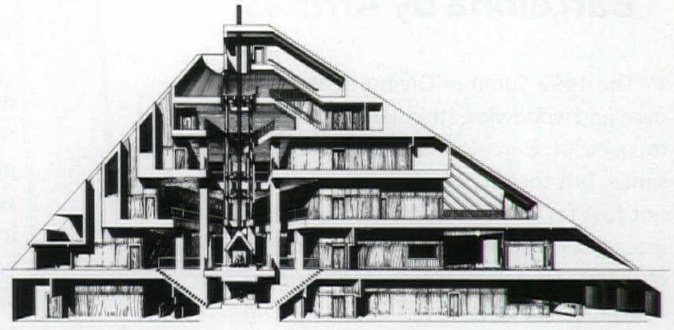


Timothy Hursley

Predock's American Heritage Center/Art Museum Completed

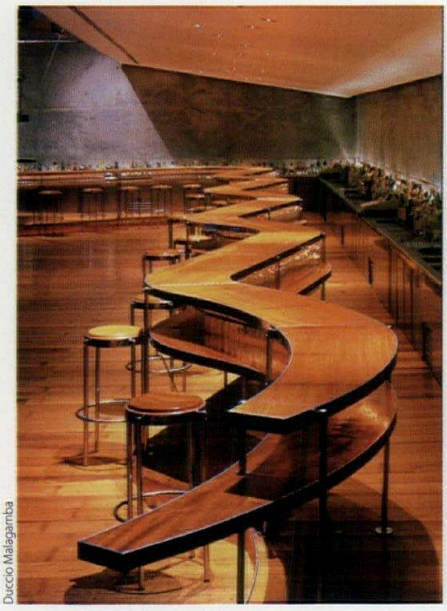
Antoine Predock's recently completed University of Wyoming American Heritage Center and Art Museum in Laramie, a competition-winning design and recipient of a citation in the P/A Awards (Jan. 1990, p. 96), symbolizes Native American architecture and the rugged landscape of the West. Unlike the teepees it was designed to evoke, the Heritage Center's giant, patinated-copper-clad cone, with a leaning central axis, does not enclose an open interior volume, but a narrow atrium cut through five floors of archival research facilities. Attached to the cone's base is the Art Museum; its geometric volumes, inspired by Pueblo architecture, are constructed of sandblasted concrete blocks cast with a coarse aggregate.



SECTION THOUGH AMERICAN HERITAGE CENTER

Ornament Completes Chicago Library

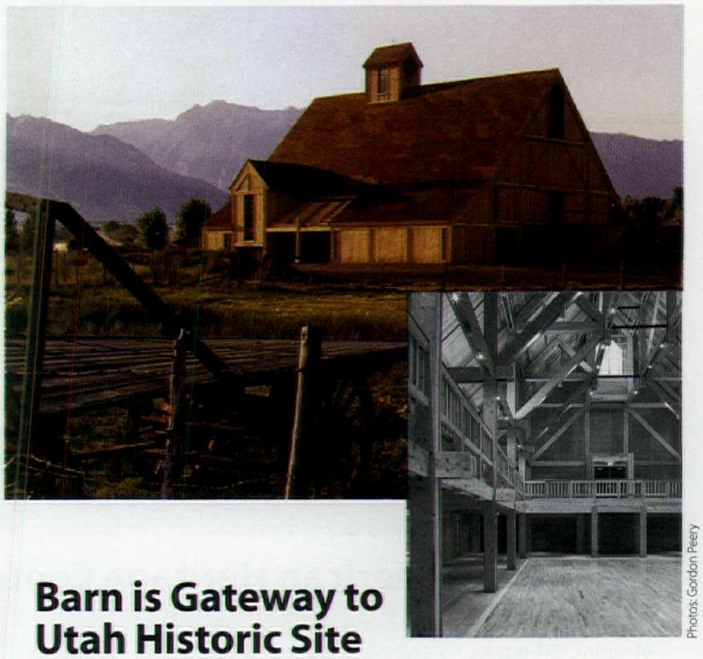
Cost put them in jeopardy, and fabrication delayed their arrival, but the acroteria and pediment pieces for the Harold Washington Library Center in Chicago (P/A, Feb. 1992, p. 60) were finally hoisted into place last summer. The ornament is scaled to the massive, ten-story structure designed by Hammond Beeby & Babka of Chicago. Some pieces are 35 feet tall, and the 20-foot wing span of the owl over the State Street entry is something to behold. The foliate pieces were designed by Yale architecture professor Kent Bloomer; sculptor and architect Raymond Kaskey designed the owls.



Duccio Malagamba

Night Club in Barcelona by Arribas

The 1992 Summer Olympics are long over, and worldwide attention is no longer focused on Barcelona's cultural renaissance, but the city's building boom was not just for the television cameras. The recent completion of the Estandard nightclub by Alfredo Arribas Arquitectos Asociados is a sign of the city's ongoing revival. Though slightly more restrained than some of the firm's earlier work (P/A, Sep. 1991, p. 90), the club's dynamic interior is not for wallflowers.



Photos: Gordon Peery

Barn is Gateway to Utah Historic Site

Architects Astle/Ericson & Associates say that the "activity barn" they designed for the Wheeler Historic Farm was meant to provide a "transition in time" from a paved parking lot to a historic farm complex (circa 1903). The barn's many functions include information center, exhibit hall, theater, and reception hall. The architects, based in Salt Lake City and Omaha, tried to accommodate these demands without destroying the "intimate scale" of the complex. The rough-sawn spruce used throughout – neither kiln-dried nor graded – comes from the same source as the original farm buildings.

Two Artists' Communities in Tucson

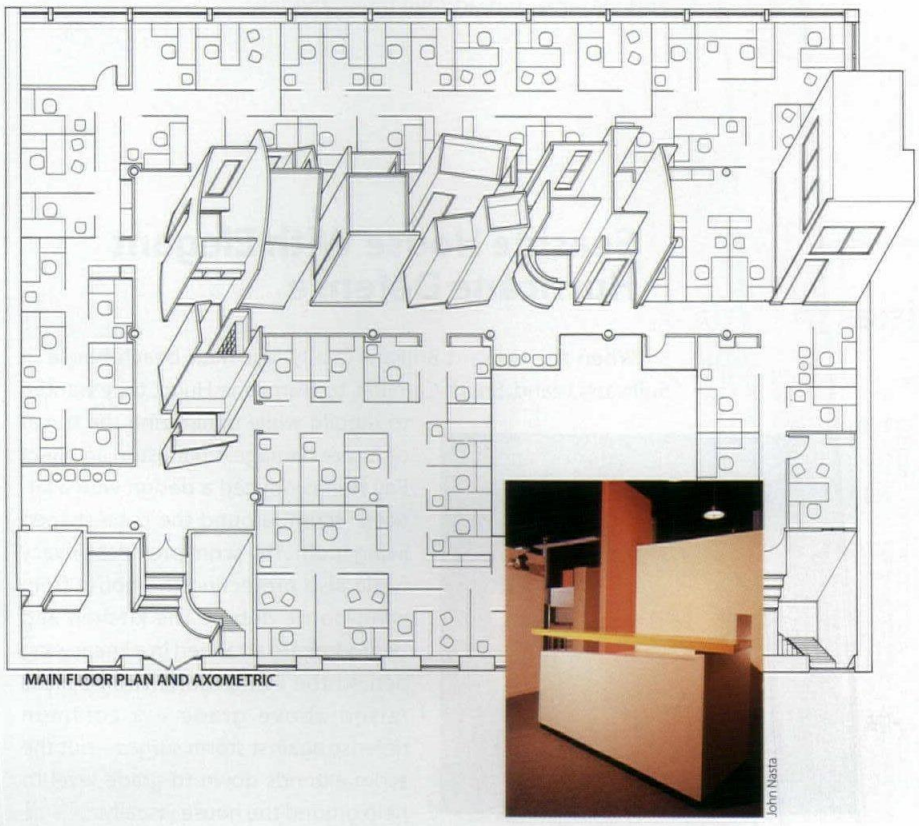
Since the early career of Le Corbusier, the artist's studio has prompted inspired architecture. Carrying on that tradition are the Manlove and 15th Street Studios in Tucson, Arizona, designed by Hoffman Perkins Design. Privately financed and located in a residential/industrial area near downtown, the two clusters of repetitive units are built of inexpensive, low-maintenance materials (exposed block, steel windows, concrete floors) and are cleverly arranged to create varied private and semi-public outdoor space. The Manlove units (right) have two-story studios with lofts and attached bedroom/bath wings; the 15th Street units (far right) have both two-story studios with lofts and detached, high-ceilinged work spaces.

Photos: Brad Hansel

Holl and Acconci Redesign Storefront Gallery

The Storefront for Art and Architecture (P/A, Jun. 1987, p. 94), a gallery with a reputation for politically charged exhibitions and programs, invited architect Steven Holl and artist Vito Acconci to redesign its tiny, wedge-shaped space on the outskirts of New York's Soho district. The unlikely collaborators focused on the façade, designing a wall of pivoting panels to replace the old storefront – a windowless, wood-clad wall. The concrete- and -wood fiber panels were cut into variously sized geometric shapes; when opened, both the gallery and the street are on view. Storefront intends to commission a redesign every two years.

Paul Warchol

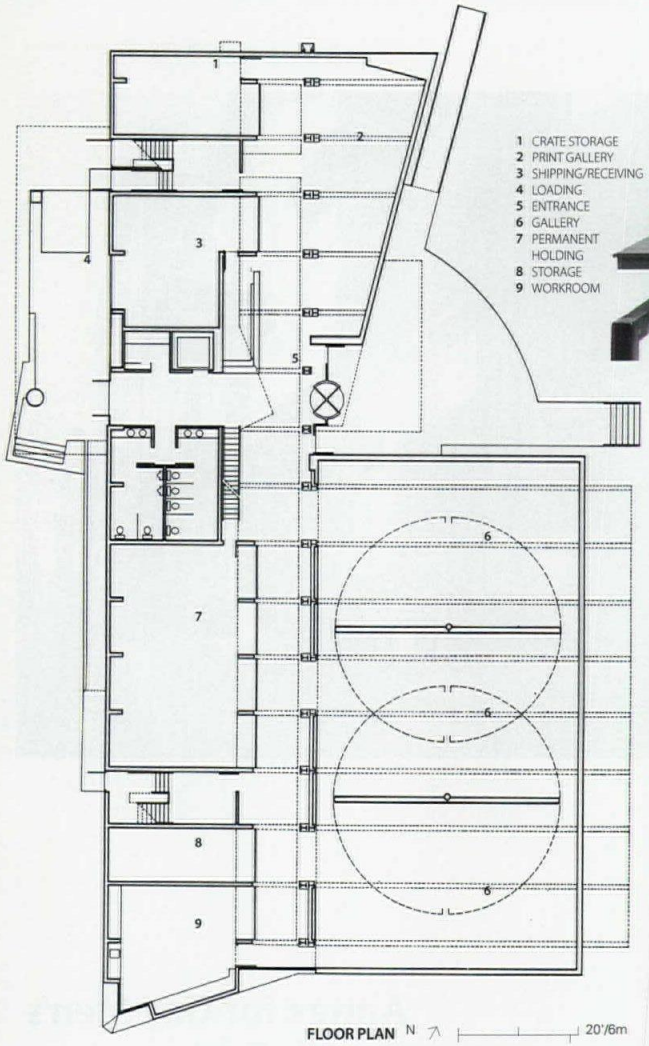


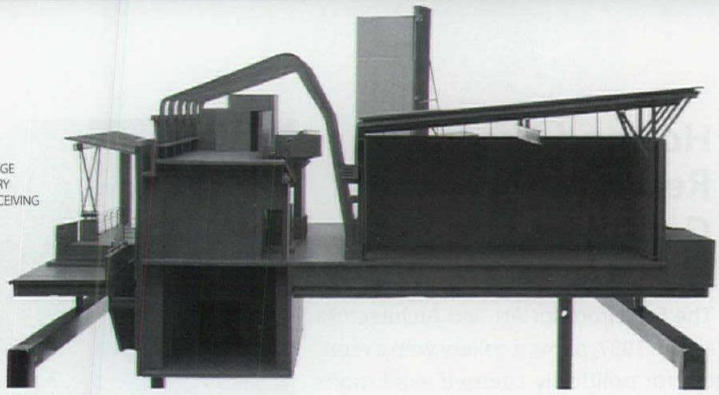
MAIN FLOOR PLAN AND AXOMETRIC

John Nasta

Annex for Gay Men's Health Crisis Organization

The second annex for New York's Gay Men's Health Crisis (GMHC) was built to accommodate the nonprofit organization's extraordinary expansion since its founding in 1981. On a tight budget of $35 per sq. ft., William Green & Associates, New York, was charged with housing some 50 modular workstations, 20 meeting rooms of different sizes, storage, and service areas in the ground and basement levels of a converted industrial building on West 20th Street in Manhattan. Green gave the crowded office floor liveliness and character by locating "public" spaces, such as the reception areas, mailroom, telephone room, and small, acoustically shielded meeting rooms (where clients can confer with legal counsel), in a series of colorful, sculptural forms arrayed along the central axis of the plan.

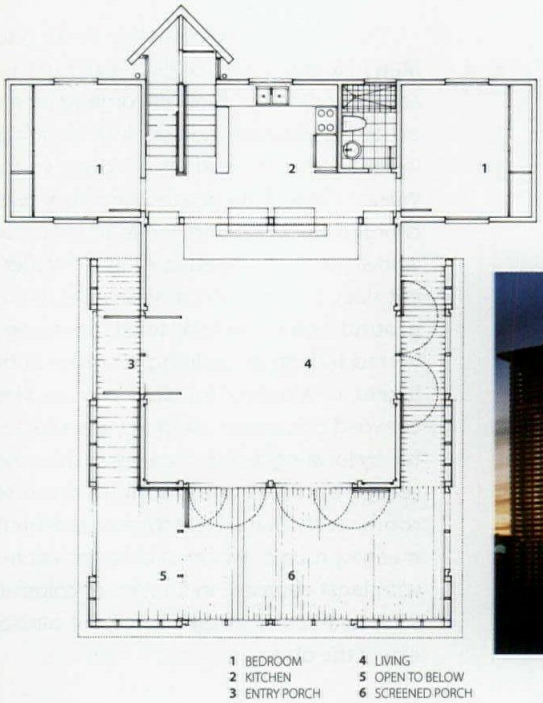




Simon Scott

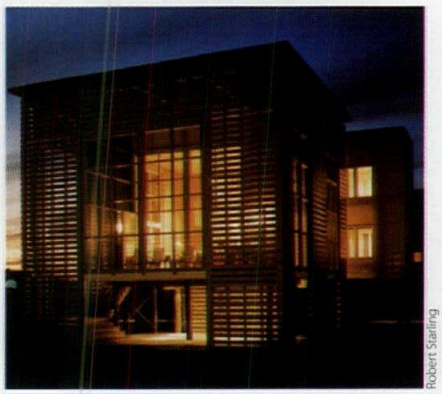
Cardew Designs Gallery for Vancouver Campus

Vancouver Architect Peter Cardew's new Morris and Helen Belkin Art Gallery at the University of British Columbia in Vancouver is designed with "no hierarchical isolation" of its less public functions. Cardew, winner of a 1991 P/A Awards Citation (P/A, Jan. 1991, p. 112) has divided the 15,000-square-foot building roughly equally into gallery space, art handling and storage, and administration, all of which share a common circulation corridor. Rolling doors separate the art handling areas. The building, which has an exposed steel frame that is asymmetrical in section (above), has white glazed brick walls and a zinc roof to match the other buildings in the arts quadrangle it will complete. The $2.65-million building will be completed this fall.

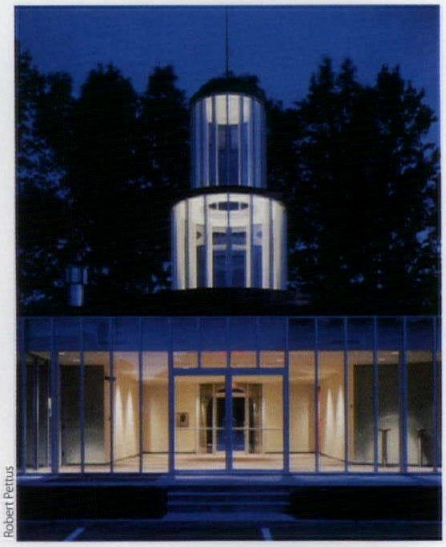


Seaside House With Elegant Hurricane Defense

When the Howard Brilliant family lost their beach house at Sullivan's Island, South Carolina, to Hurricane Hugo, they wanted to rebuild while minimizing the threat of future damage. Charleston architect Ray Huff produced a design with a latticed "scrim" around the cube-shaped living room. The scrim provides privacy while also protecting the house from wind-borne debris. The kitchen and bedrooms are arranged in a linear wing behind the living room. The house is raised above grade – a common defense against storm surges – but the scrim extends down to grade level to help ground the house visually.



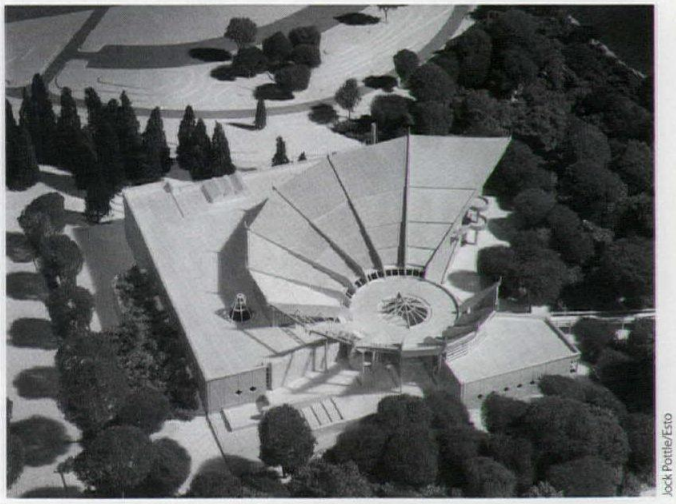
Robert Starling



Robert Pettus

Beacon of Hope Illuminates Adult Education in St. Louis

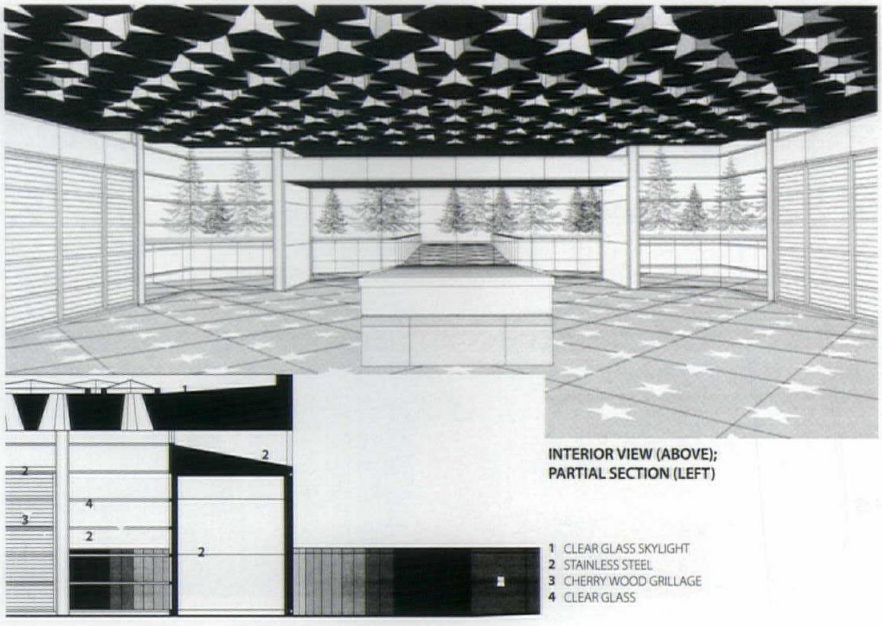
When lighted, the glass beacon atop the new Thomas Dunn Learning Center, an adult education center in St. Louis, is a symbol of hope for a blue-collar community in a city where it is more common to relocate to surrounding suburbs than it is to confront the root causes of urban decay. The long, bar-shaped building, designed by Ittner & Bowersox, St. Louis, is reminiscent of the strain of hybrid Modernism popular in the postwar years.



Jock Pottle/Esto

Support Facility for Indian Museum

Construction will begin later this year on the National Museum of the American Indian's Cultural Resources Center in Suitland, Maryland, a 150,000-square-foot care and storage facility for the museum's two branches in Washington, D.C., and New York. The building will also be the first piece of a campus of such facilities for other Smithsonian museums. The design seeks to address both native cultural and spiritual ideas (the organically derived roof structure) and Western institutional concerns (the rectilinear base facing the future campus). The design is a joint venture of James Stewart Polshek & Partners, Metcalf Tobey & Partners, and the Native American Design Collaborative.



INTERIOR VIEW (ABOVE); PARTIAL SECTION (LEFT)

1 CLEAR GLASS SKYLIGHT
2 STAINLESS STEEL
3 CHERRY WOOD GRILLAGE
4 CLEAR GLASS

Ceiling of Stars for Air Force Cemetery

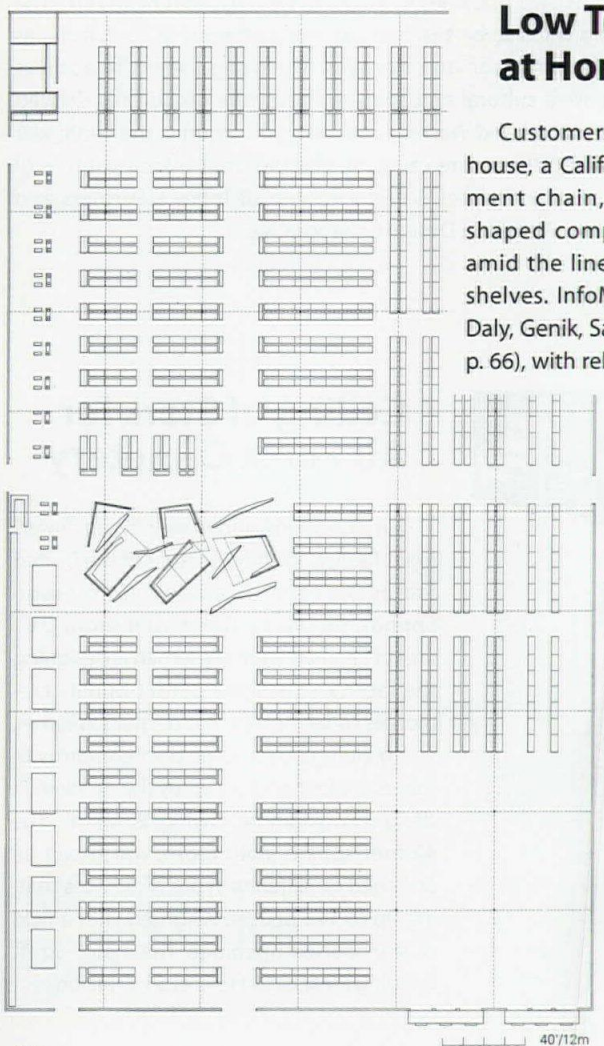
Fundraising is under way for an "interment facility" in the cemetery of the United States Air Force Academy in Colorado Springs, Colorado. The Washington, D.C., firm of Lehman Smith Wiseman is designing the facility, which will permit burial ceremonies to take place in inclement weather. The building's geometric plan conforms to the seven-foot grid set up by the Academy's designers, Skidmore, Owings & Merrill. The 42-foot-square main room, which can be arranged for different types of services seating up to 125 people, is lighted with a field of star-shaped openings. The 2,352 -sq -ft building is expected to cost $1.5 million.

Åke Eson Lindman

SECTION 10'/3m

Alba Designs Spanish Chancellery in Sweden

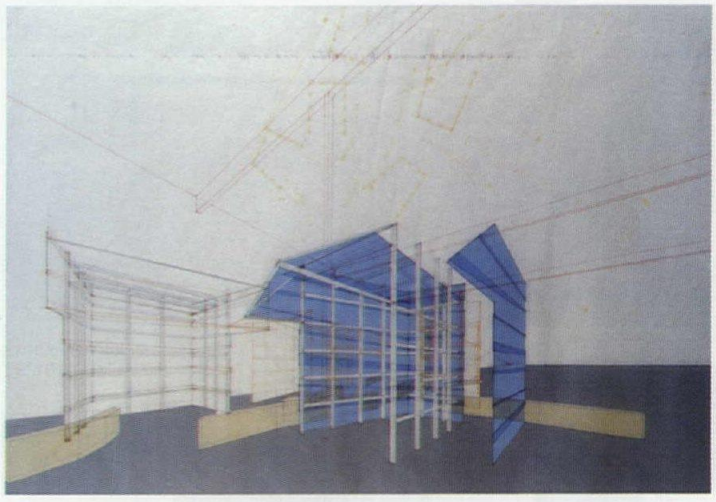
Designed in Madrid by Spanish architect Angel Fernandez Alba (P/A, Sep. 1991, p. 28), the new Spanish Chancellery in Stockholm is an exercise in contextualism by an architect in a foreign land. Alba's cultural center combines vernacular features with an elevation inspired by Gunnar Asplund's masterpiece, the Villa Snellman. Restricted by the site's two-story height limit, he ballooned the gambrel roof and raised the basement floor level, creating four floors of usable space.



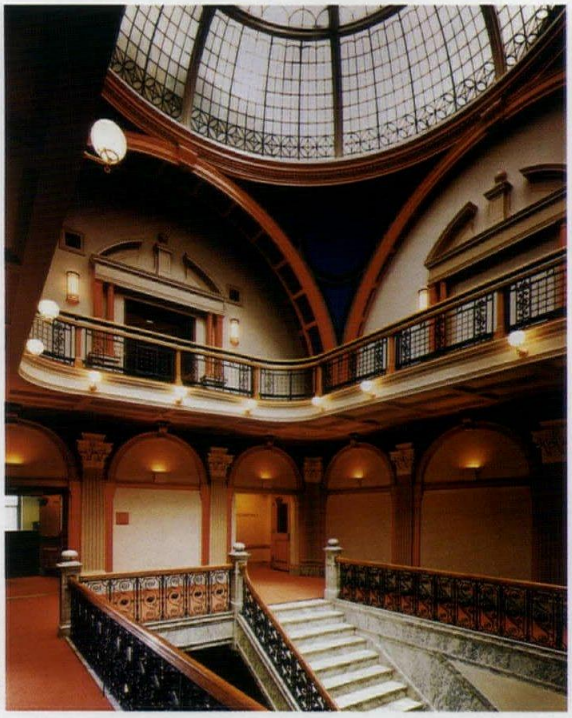
40'/12m

Low Tech Meets High Design at Home Improvement Chain

Customers of the Home Base Warehouse, a California-based home improvement chain, will soon find curiously shaped computer information centers amid the linear forest of product-laden shelves. InfoMedia Centers designed by Daly, Genik, Santa Monica (P/A, Nov. 1993, p. 66), with relatively simple computerized services capable of supporting increasingly sophisticated data retrieval, will be inserted into a number of new stores slated for construction in Southern California. Each is a cluster of irregularly shaped volumes clad in translucent coextruded polycarbonate sheets. The first prototype will be completed this year.



Daly Genik



Richard Mandelkorn

New Life for a Classical Courthouse

The Superior Courthouse in Lawrence, Massachusetts, is enjoying a third lease on life. Designed in 1858 by George Baker, the building burned down a few months after completion and was reconstructed in 1859. Its east wing burned in 1981 and was left unoccupied until Perry Dean Rogers & Partners of Boston completed a recent expansion and restoration of the building. Much of the damaged interior was rebuilt, duplicating original details. The architects inserted a new intermediate floor in a double-height space to gain additional square footage within the existing envelope. The domed atrium at the heart of the courthouse was returned to its former glory.

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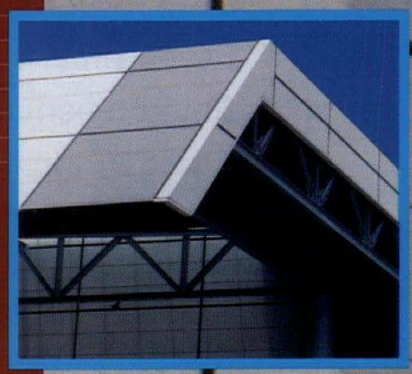

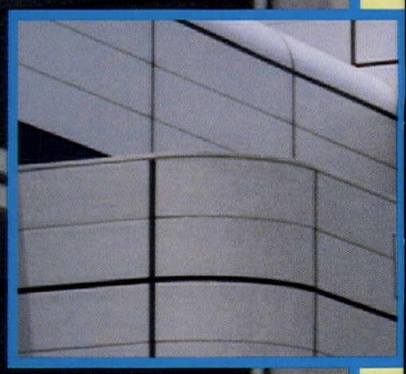

Houston Intercontinental Airport Mickey Leland Terminal Houston, Texas
Architect: Pierce Goodwin, Alexander & Linville/Goleman-Rolfe Architects
General Contractor: Sae/Spaw Glass, Inc.

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Salone

Participate in the planning of P/A!
Fax us your opinions!

This issue of P/A is a very different kind of magazine from those you received last year. In planning for future issues, it is crucial for us to gather reactions from a large number of readers. So after you have perused this issue – reading whatever captures your interest – please take a few minutes to answer the questions below and FAX your opinions to us at (203) 348-4023. The editors of P/A will be very grateful for your help!

Circle the appropriate number on the scale below:

How would you rate this issue for accessibility/ease of reading?
Very easy to read 5 4 3 2 1 Very hard to read

In this issue, how adequate was the information on subjects covered?
Very adequate 5 4 3 2 1 Very inadequate

What is your opinion of the changes represented in this issue, as compared with last year's P/A?
Very positive 5 4 3 2 1 Very negative

What part(s) of this issue did you particularly like?

_____

What part(s), if any, did you dislike?

_____

Are there any features of past P/As, not found in this issue, that you would like to see continued?

_____

Any other comments you would like to share with us?

_____

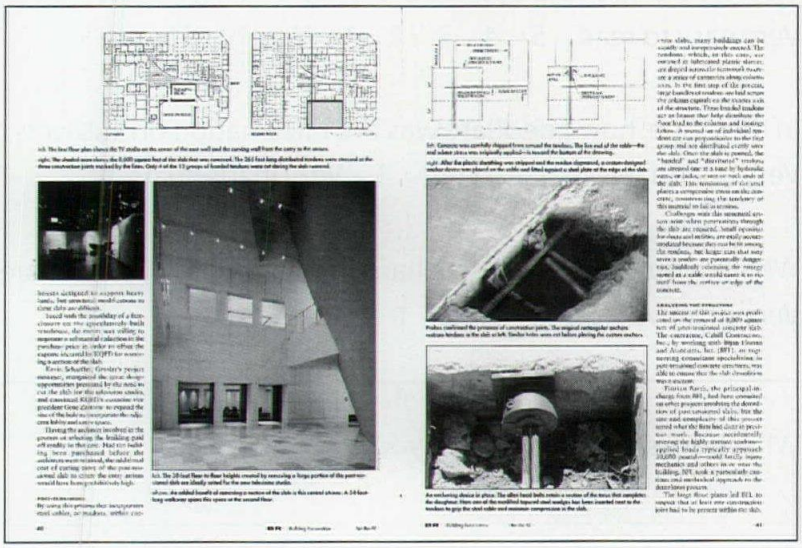
_____

_____

_____

If you have additional suggestions, a letter on the subject would be very much appreciated.
Please fax to (203) 348-4023 or mail to Progressive Architecture, 600 Summer Street, P.O. Box 1361, Stamford, CT 06904

BUILDING RENOVATION



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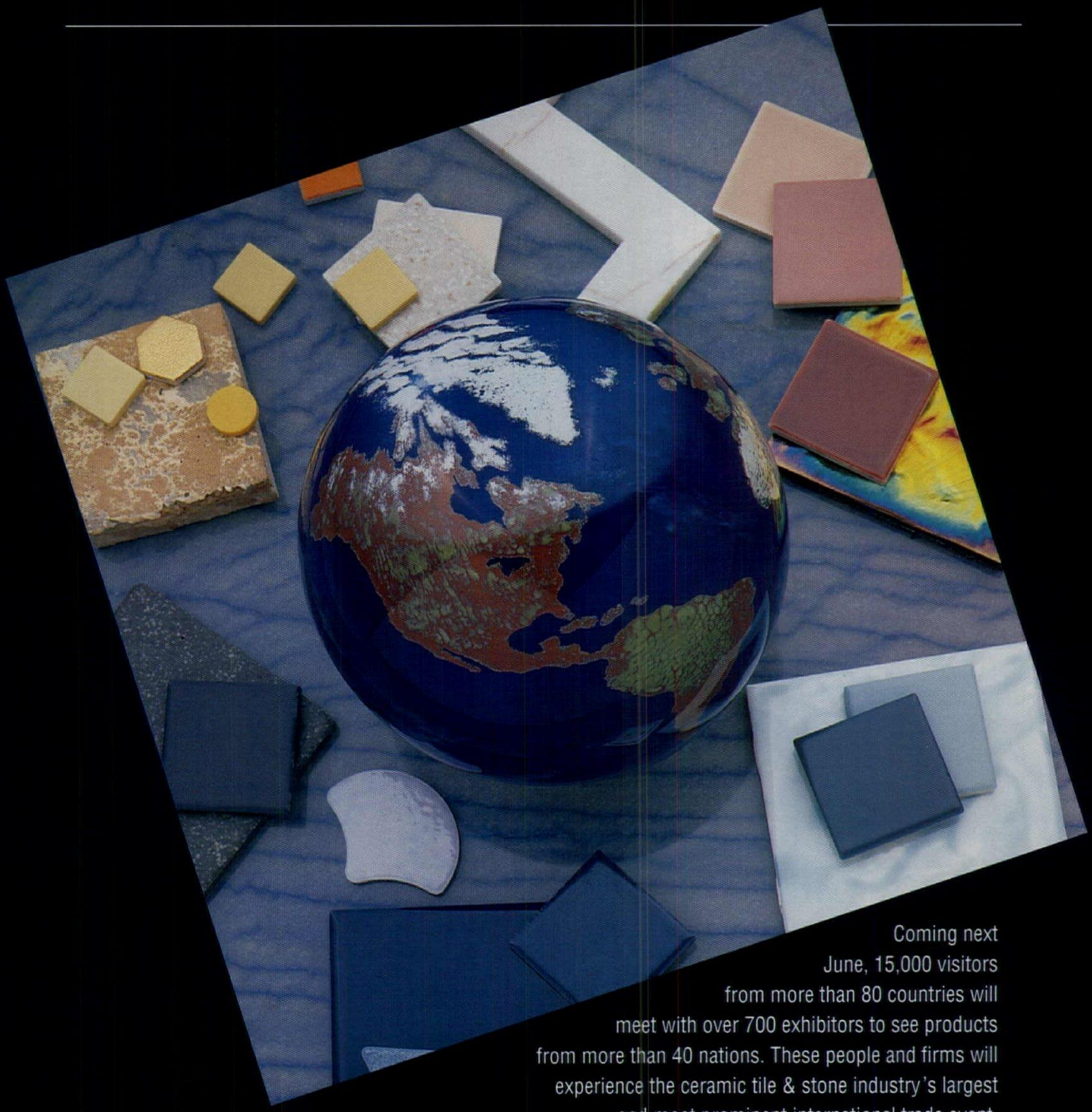
Where the World of Tile & Stone Meet



Coming next June, 15,000 visitors from more than 80 countries will meet with over 700 exhibitors to see products from more than 40 nations. These people and firms will experience the ceramic tile & stone industry's largest and most prominent international trade event.

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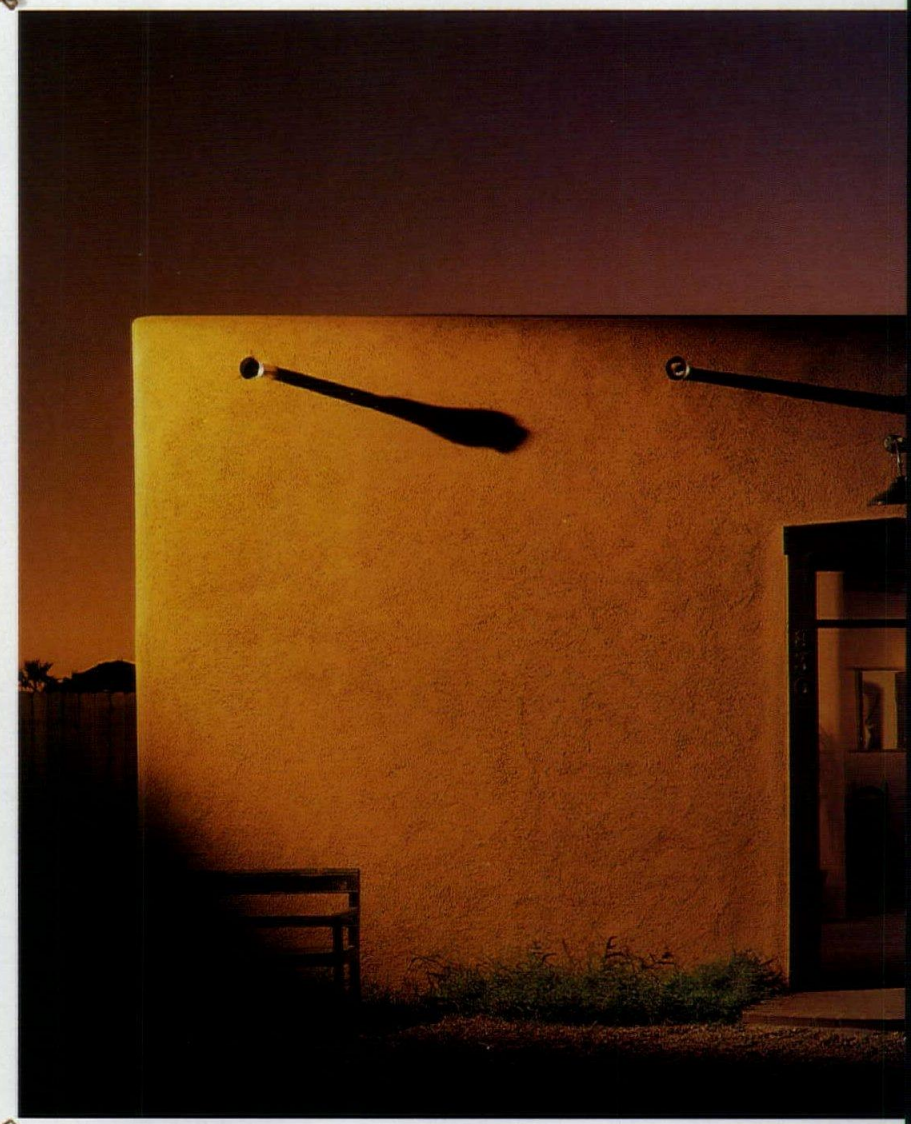
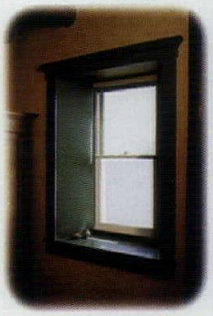
IN THIS CASE, THE BEST WINDOWS ON EARTH ARE ALSO THE BEST



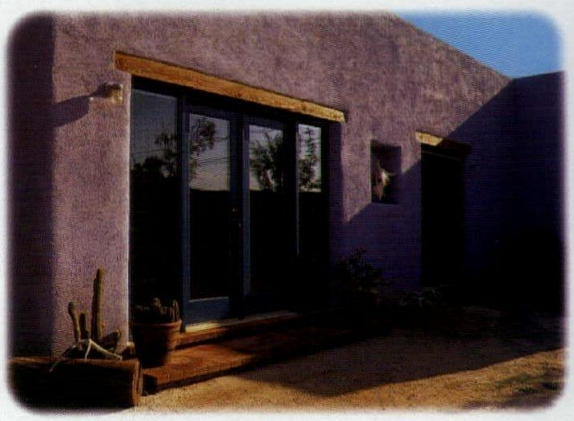
When Tom Wuelpern of Rammed Earth Solar Homes, Inc. began planning the Meyer Street Project, one goal was uppermost in his mind. Tom wanted the new buildings to blend seamlessly with those in the adjacent Barrio Libre National Historic District; an area that was once the heart of Tucson, Arizona's Hispanic community. Tom and his partners were immediately drawn to Marvin Windows and Doors, given Marvin's reputation for historical replications.

From the outset, they knew that getting the right windows and doors would require some tough demands. But as the project progressed, they learned a few things about their supplier.



They learned that Marvin could provide virtually any shape or size jamb extension – even those for adobe walls up to 26" thick. And Marvin could save them time and money by factory-mulling all the assemblies and by factory-installing the special casings and crown molding Tom requested.

And, they learned Marvin could provide a Southern Low E glass coating specially formulated for the hot, desert climate. Plus, the coating was virtually invisible, so energy costs could be reduced without sacrificing aesthetics.



Above all, the people at Rammed Earth learned of Marvin's willingness to tailor its products to their

WINDOWS IN EARTH.

demands. And they saw firsthand how committed Marvin was to staying personally involved in the project.

Today, the successful development of the Meyer Street Project continues. And the Arizona State Historic Preservation Office is so impressed, it has formally petitioned the National Parks Service to include Meyer Street and the surrounding neighborhood in the Barrio Libre Historic District.

MAKE US YOUR FIRST CALL, NOT YOUR LAST RESORT.

If there's a look you're trying to achieve or a window problem you can't solve, call the one company you know will have the right solution. Call Marvin Windows and Doors at **1-800-346-5128** (1-800-263-6161 in Canada). Or mail the coupon for a free catalog featuring the entire line of made-to-order Marvin windows and doors.

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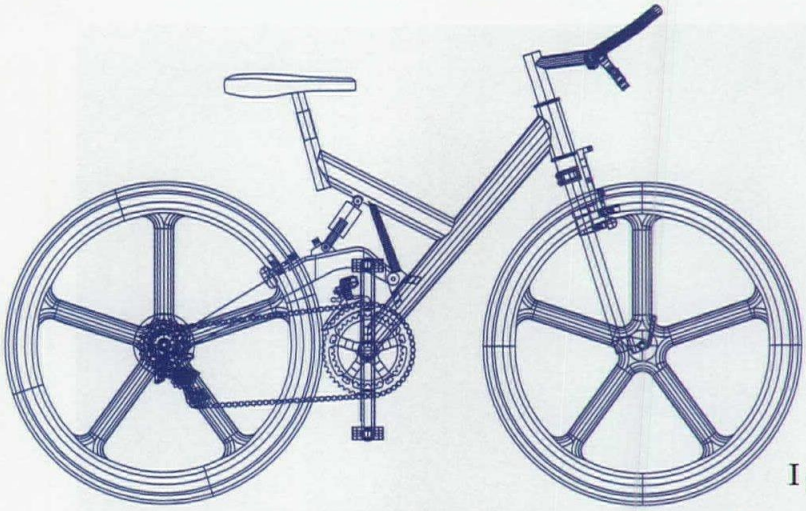

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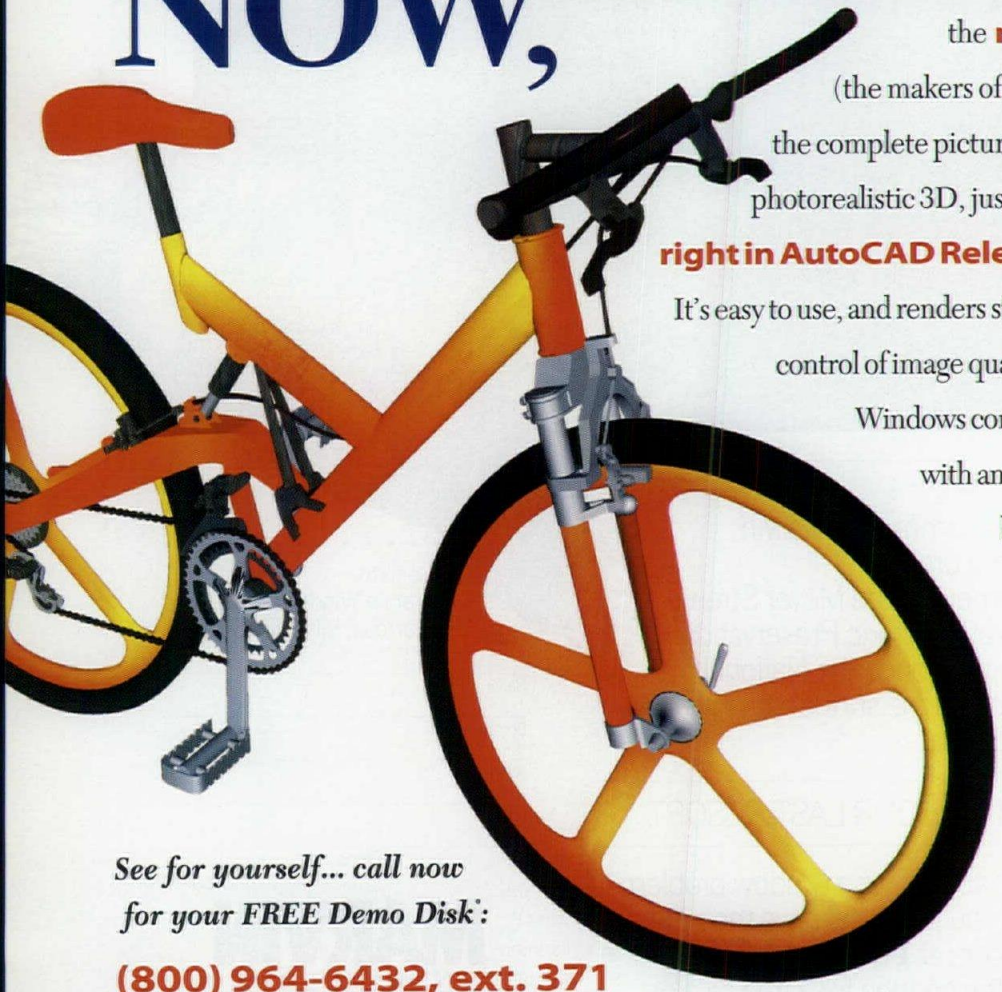

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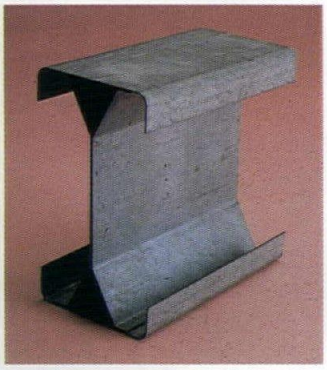
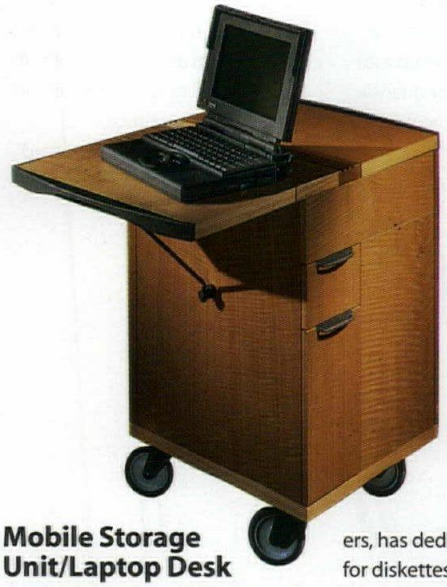
Lightweight Steel Beams and Joists Introduced

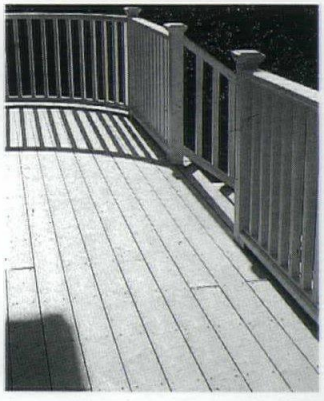


Fabricated from cold-rolled steel, the new Light Beam structural beams and joists are up to 55 percent lighter than conventional hot-rolled I-beams according to LBN Corporation, a research and development company. The design of Light Beam's cross section allows for a combination of different thicknesses of steel to provide strength where needed while avoiding excess weight. Designed for large commercial and industrial projects, it is believed to be particularly appropriate for seismic and high-wind zones. The beam, 8 to 30 inches deep, can span 75 feet without bracing for practical loading conditions. Light Beams are manufactured from high-strength 50 KSI bare, painted, or galvanized steel; parts are prepunched, precut, and prenotched, and rolled-formed and joined in an automated process. All connections in the field are made with bolts; welding is not required.
Circle **100** on reader service card



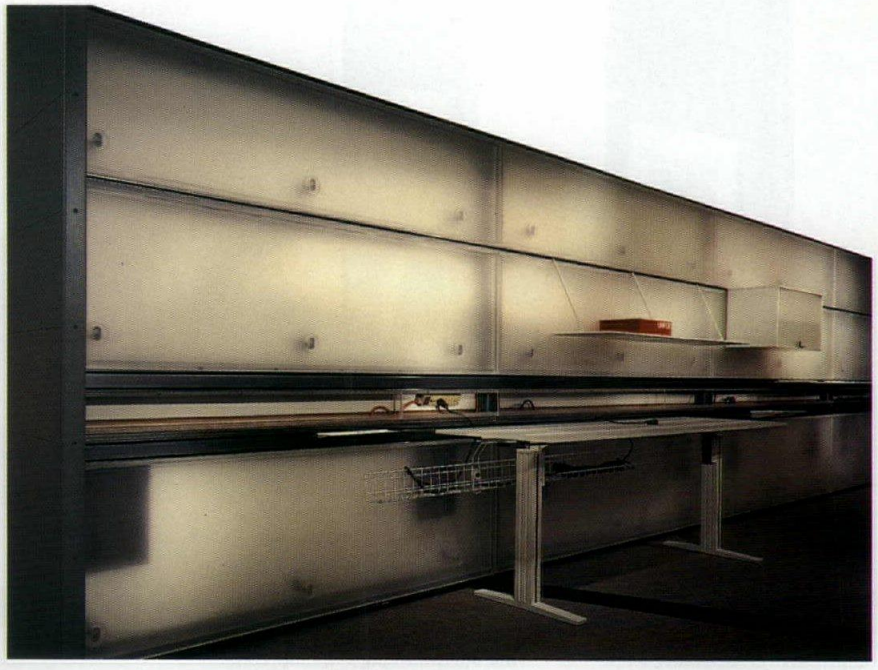
Mobile Storage Unit/Laptop Desk

Addressing the need for adaptable workspace, Knoll has introduced a freestanding, mobile wood storage kiosk with a top that flips up to accommodate a laptop computer. The Knoll Companion, set on casters, has dedicated storage space for diskettes, paper, computer manuals, and other necessities. Though designed to be integrated with the company's System 6 line, it is suitable for any office.
Circle **101** on reader service card



Reclaimed Wood, Plastic for Decking

Researchers at Mobil Chemical Company have developed a new composite material from reclaimed wood and plastic (50 percent manufacturing wood waste from the furniture and pallet-making industries and 50 percent plastic film used to make plastic bags). Trex, manufactured by the company's newly established Composite Products Division, can be used for commercial and residential decking, outdoor furniture, industrial flooring, and other applications. The material resists UV rays, moisture, and solvents and does not crack or splinter. It accepts paints and stains.
Circle **102** on reader service card

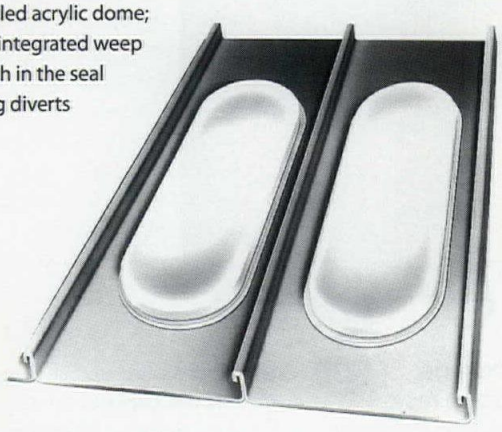


System Wall as Planning Element

Designed to be a spine structure around which groups of workers can be organized, Unifor's Projetto 25 is conceived as a planning element to be incorporated into the building during design development rather than as an afterthought. Channels in the wall carry HVAC and cable services to the ceiling, avoiding the difficulty of wall-to-floor wire management; in addition, the channels are used to support shelving and other accessories. An extensive range of finishes may be specified.
Circle **103** on reader service card

Light-Transmitting Metal Roof Panels

Sealbrite™ is new light-transmitting panel for standing seam roofing systems offered by Sequentia.® The metal panels are precut and formed to accept a monolithically sealed acrylic dome; an integrated weep path in the seal ring diverts condensation. According to the manufacturer, ASTM tests have proved that the Sealbrite assemblies perform as designed with no air infiltration or leaks and superior structural performance.
Circle **104** on reader service card

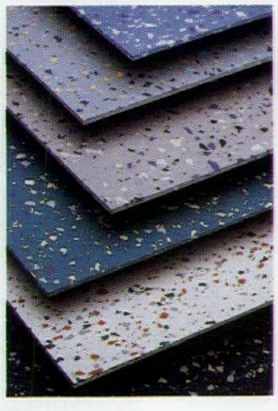


User-Adaptive Swivel Task Chair

Pronto is a new upholstered, swivel task chair manufactured by Girsberger. Designed on the premise that a sophisticated chair is not for executives only, Pronto offers substantial adaptability at an "affordable" price. Its seat and backrest can be adjusted independently; with synchronized adjustment, the seat and back follow the user's movement simultaneously and dynamically, locking into the desired position. Wood or polyurethane foam armrests, stationary or height adjustable, are optional features.
Circle **105** on reader service card

Tools for Collaborative Work Environments

Anticipating an increasing need for office furniture that supports the activities of collaborative work environments, Metro Furniture has introduced Team Work, a collection of mobile, multifunctional pieces. The collection includes a wide range of cleverly detailed stacking, auxiliary, and conference tables (with tabletop pop-up power and data docks), a wall-mounted white board, mobile presentation easel, and mobile AV cart/lectern and utility carts. In addition, a free-standing cabinet, called the Fifth Wall, integrates presentation, communication media, and equipment; it holds a video monitor, white board, storage space for small work tools, a UL-approved plug strip, and space for TeamWork carts and occasional tables.
Circle **106** on reader service card

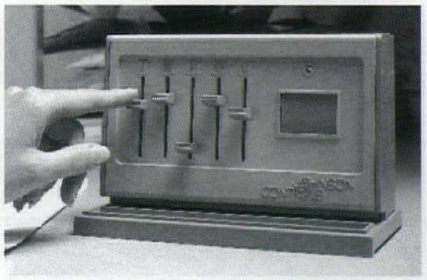


Speckled Rubber Flooring for High Traffic Areas

Freudenberg Building Systems' Norament 925 B Lago is a new speckled rubber flooring for heavy traffic areas; it is constructed to hide stains, scuffs, and indentations. The nondirectional, speckled pattern is available in six colors.
Circle **107** on reader service card

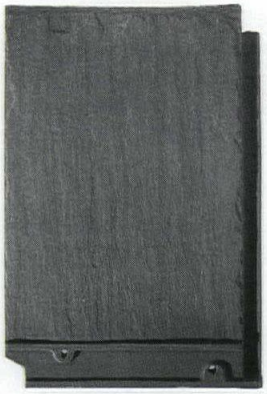
"Off-Modular" Systems Furniture

The Transwall Corporation has introduced Reasons, a new "off-modular" panel stacking system designed to more readily conform to changing work patterns. The wall height, for example, can be changed to meet specific visual and acoustical requirements. In addition, the individual, four-inch-thick panels can be removed and replaced with white boards, storage components, and wood veneer, laminate, glass, pass-through, and perforated steel air flow sections. For wire-management, a ten-inch-high removable section is located at desk height on both sides of the panel. A variety of panel widths and standard heights are available.
Circle **108** on reader service card



Individual Environmental Controls for Open Plan Offices

In response to the heightened awareness of environmental issues in the workplace, Johnson Controls has developed a product that allows workers to control above and below desk temperature, lighting levels, acoustics, and air flow within their own workstations. Personal Environments® modules include a desktop control box and an under-desk electrostatic air filter that removes particulate matter such as smoke, dust, and pollen. A sensor in the control box automatically shuts down the system when the workstation is unoccupied. One of the first major installations of PEM units was at West Bend Mutual Insurance Company in Milwaukee, Wisconsin; for more information about this installation, see Hype vs. Reality: The Changing Workplace, p. 51.
Circle **109** on reader service card



Ceramic Roof Slate

Manufactured by CertainTeed using new engineering and design techniques, Celadon™ Ceramic Slate™ is an "affordable," kiln-fired clay roofing product designed to have the same appearance and performance characteristics as premium-cost clay roof tile. The interlocking slates, available in gray, green, red, purple, and black, weigh 580 pounds per square and are 10 7/8" x 15 3/4" with a 3/4-inch nominal thickness. Backed by a 60-year limited warranty, Celadon™ slate exceeds the requirements for Grade 1 roof tile under ASTM C1167-93, the standard specification for clay roof tile.
Circle **110** on reader service card

"Environmentally Friendly" Blueprint Machine

The Diazit Company has announced the introduction of the Omnitrac 120-EF, an "enviromentally friendly" blueprint machine. Its built-in Super-Trac Ammonia Arrestor System with a heat dissipater roller is said to offer the lowest ammonia levels available. When expended, the ammonia and arrestor cartridge can be returned to the supplier for recycling.
Circle **111** on reader service card

Bituminous Membrane Roofing Specifications

A Guide to Preparing Modified Bituminous Membrane Roofing Specification, published by the Asphalt Roofing Manufacturers Association (ARMA), highlights the factors that contribute to the successful application of roofing systems. In addition to ARMA-member company listings, standards and code organizations, and reference sources, the guide also includes information about roof design, assembly, components, maintenance, replacement, and other topics.
Circle **200** on reader service card

Fire-Rated Glass Brochure

Technical Glass Products has published a brochure describing the characteristics of FireLite, a wireless, fire-rated glass ceramic, and the new safety rated version, FireLite Plus. The new brochure provides specifications, comparative technical data, and design applications, and it outlines the availability of fire-rated frames. (An older brochure on these products was incorrectly shown in Information Sources, P/A, Dec. 1993, p. 100.)
Circle **201** on reader service card

ARCHT™ Redesigned as ADS Application

ARCHT, a design, presentation, and documentation software from Ketiv Technologies, has been redeveloped in ADS™ application for AutoCAD® Release 12; previously, ARCHT was an AutoLISP™ application. The redesign features include a simplified user interface with new dialog boxes; quick access menus to all functions; conversion of schematic designs to 3D models or to 2D working drawings; and an extensive library of 2D plan, 2D elevation, and 3D "render-friendly" blocks (the new Navigator™ interface allows quick visual access to all available blocks).
Circle **117** on reader service card

Software for Joint Movement Calculations

ChemTec Publishing's Joint Specifier® is a new software program for the proper specification of sealants. The features of this software include internal databases for joint design and sealant specification; a description of sealant application; a database of building materials; and a database of climatic conditions in the U.S. and Canada, including temperature profiles and sun radiation data for approximately 300 cities.
Circle **112** on reader service card

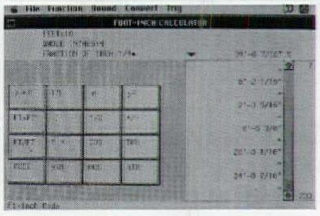
Macintosh Drafting Program

Engineered Software's PowerDraw,™ a Macintosh drafting program with full CAD capacity, includes Externals in Version 4.0. An external, a plug-in module that allows the user to save memory and screen space by loading only the necessary tools, is an additional tool, a menu command, or a palette that can be added to PowerDraw. Other features include built-in plotter drivers, 32-bit color customization, and two-point perspective and isometric views.
Circle **113** on reader service card

MicroStation Version 5

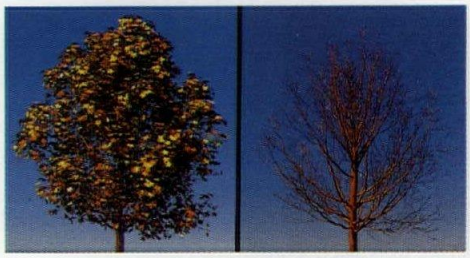
Now available from Intergraph is MicroStation Version 5, CAD software for Windows/DOS and Windows NT. V5 offers several new features including associative patterning/hatching and user-defined linestyles that can be used in conjunction with multilines. Photorealistic rendering capabilities include light sources, shadows, pattern and bump mapping, surface textures, transparencies, and onscreen flythrough animation.

Through March 31, registered MicroStation users can receive an upgrade to V5 at a reduced cost. Available later this year will be MicroStation for Intergraph workstations, Macintosh, Sun SPARCstations (Solaris 1 and 2), HP Series 700 workstations, IBM RISC System/6000 workstations, Digital's AXP PCs, and Silicon Graphics' Indigo family of RISC-based graphics systems.
Circle **114** on reader service card



Foot-Inch Calculator for Macintosh

The Foot-Inch Calculator software program for Macintosh, written by architect Neal Duncan, makes a scrolling, printable tape of your calculations. To test different values or to correct an error, users can edit the tape, and the program recalculates automatically.
A Trig-Solvers feature solves common trigonometry problems. The software is compatible with Macintosh System 7.
Circle **115** on reader service card



Photorealistic Tree Software Upgraded

Onyx Computing's TREE™, a modeling and rendering softwarethat produces photorealistic trees for Macintosh platforms, has been upgraded and expanded. TREE 2, the new version, can model and render conifer trees. TREE LIBRARY contains a variety of ready-to-use broadleaves and conifers and the capacity to be expanded with additional trees custom-made by the user. TREE PROFESSIONAL is a modeling program that allows the user to adjust the values of parameters to model trees of different types in different stages of growth and in different seasons.
Circle **116** on reader service card

Make CAD work for you!

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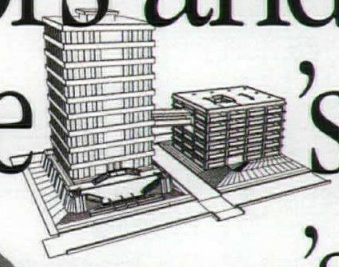
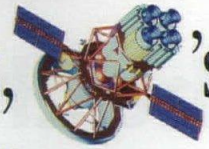
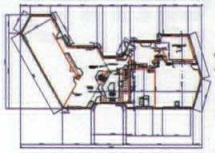
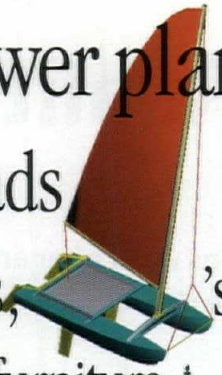
you can do Windows™ and walls and doors and floors, ceilings, whole  's,  's, trains, boats,  's, chains,  's, diamond rings,  's and things,  's, power plants, topo maps,  's, helicopters, roads and bridges, circuit boards,  's power lines,  's, airports, furniture, digital terrain models,  's, skateboards, the  ,  's, chemical plants,  's, golf courses, anything you can think of ... even the kitchen  .

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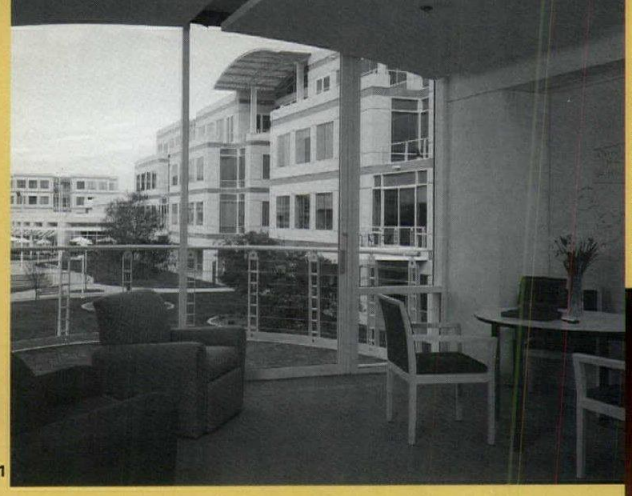
INTERGRAPH



Apple Computer Inc. Mark Darley/Esto

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Apple Computer Inc./Chas McGrath

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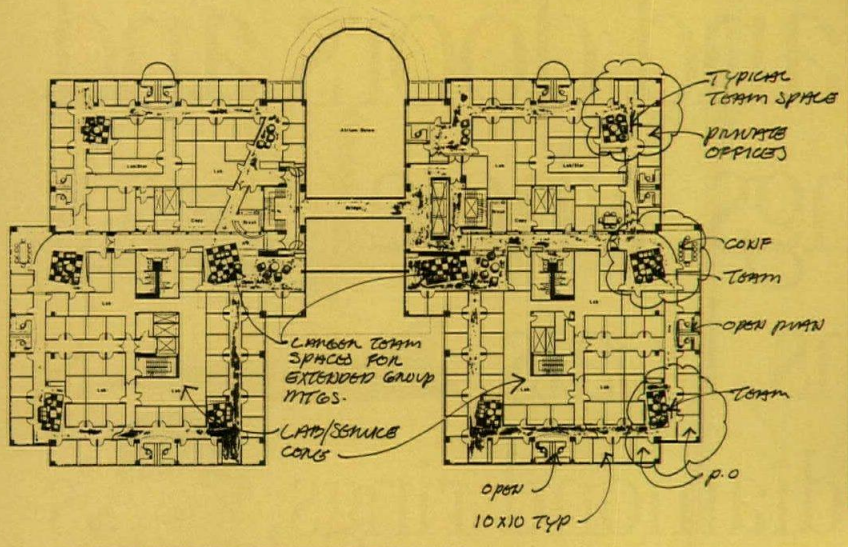


APPLE COMPUTER R&D CAMPUS, BUILDING ONE, SECOND FLOOR PLAN

N ← 40'/12m

Hype vs. Reality: The Changing

Changes in the way Americans work offer architects opportunities of visionary proportions. Will the profession rise to the challenge or remain myopic? ***by Ziva Freiman***

The Big Picture

It's ironic that our understanding of the information age is clouded by so much media hype. Scads of recent stories have trumpeted the Information Superhighway (500 channels on TV!!), the Electronic Town Hall, the Office of the Future, and all things Virtual. The "breathless tenor of the prose," as Lewis Lapham put it in the January *Harper's*, has managed to trivialize changes of truly staggering consequences.

The lack of a bigger picture hinders architects from taking advantage of mind-boggling opportunities inherent in the way work and business are being reconfigured, and in the implications of those changes for the makeup of our communities and the evolution of our cities. To separate the workplace and its internal design challenges from broader social and cultural repercussions is to commit what author Charles Handy, in *The Age of Unreason*, calls "the sin of modern life ... reducing things to their component parts and thereby too often missing the meaning and message of the forest in a minute examination of its trees."

With that in mind, this article aims to provide an overview not only with respect to the changing workplace, but in a broader context: concrete examples of current thinking in the design of buildings, planning of interiors, and development of product prototypes are accompanied by excerpts from various sources. What transpires from it all is that in the world of architecture, as in the world of business, how well we

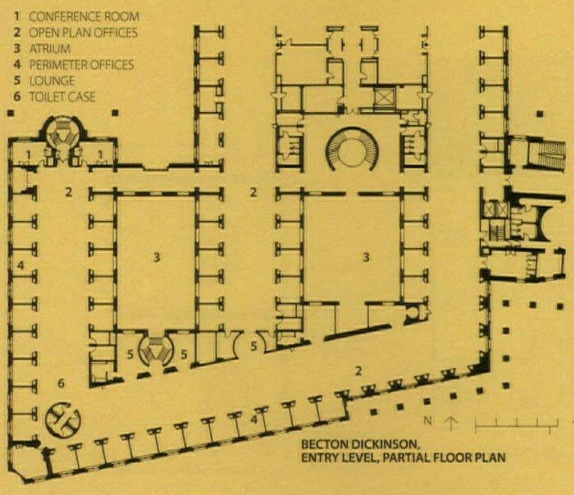
Group Space

Along with the benefits of the electronic revolution, enlightened corporations recognize ill effects in its dispersal and increasing isolation of workers. To counterbalance these, many companies are designing facilities that include extensive team-dedicated spaces in buildings that promote a sense of community and common purpose.

Apple Computer, for example, commissioned Hellmuth, Obata & Kassabaum, San Francisco, and four interior design firms to design a new research and development campus in Cupertino, California. The recently completed six-building complex, arrayed around a central quad, integrates the diverse needs of the R&D engineers who are most productive when provided with discrete spaces for collaborative and individual work. Eighty percent of the interior space is devoted to private offices, and 20 percent has been allocated for team activity. Located off circulation routes and directly outside private offices, these team spaces hold casually arranged furnishings, which can be reconfigured by the staff as desired, and various communications media such as floor-to-ceiling white boards (2); more intimate meeting areas are located in private and shared offices (1).

Taking a somewhat different tack, Becton Dickinson, a manufacturer of medical/diagnostic devices, invited Kallmann McKinnell & Wood to integrate management offices, laboratories, an auditorium, dining rooms, and common areas (3) in the second phase of its campus in Franklin Lakes, New Jersey. The first building, admits KM&W principal Fiske Crowell, is "a rabbit warren" of workstations and enclosed private offices, the result of company hierarchy now deemed obsolete. For this phase a standard footprint (13'4" x 10') for work modules was established, regardless of seniority; and all workspaces are furnished with freestanding or fixed components from Unifor.

Research conducted by the Buffalo Organization for Social and Technological Innovation (BOSTI) recommends that a team's "conceptual and technological playground" should also be accessible to coworkers, who might supply "complementary insights and information."



BECTON DICKINSON,
ENTRY LEVEL, PARTIAL FLOOR PLAN


Mario Carrieri

3

Workplace

cope with change will depend entirely on our willingness to change too, and on our ability to integrate different kinds of knowledge, to pool resources, to synthesize.

Major Trends at Work

Enabled and vastly accelerated by technology, and driven by imperatives for cost efficiency, flexibility, and responsiveness, work in the information sector is changing in every respect. Affecting workers in myriad fields (sales, accounting, public service, government, financial services, data processing, media, law, cultural institutions – the list goes on and on), these well-documented transitions are having immediate impact on the structures of organizations, the makeup and skills of the workforce, and the formation of new kinds of workplaces.

The Changing Organization

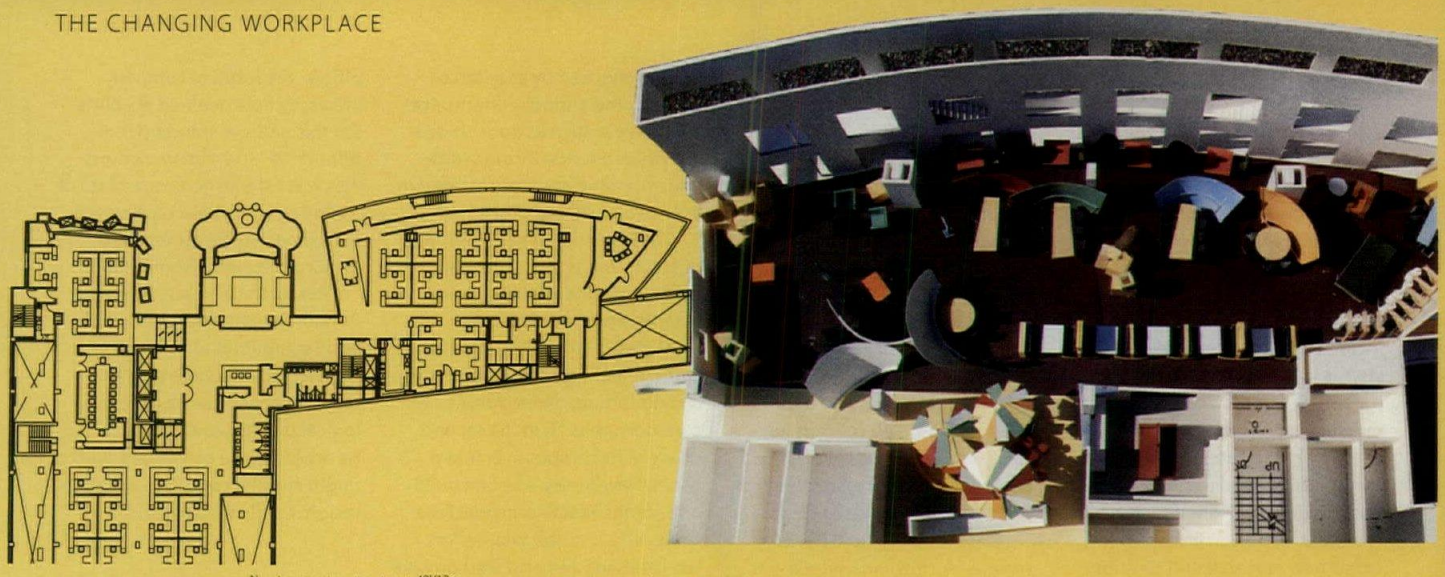
In his influential book, *The Age of Unreason*, Charles Handy characterizes the fragmenting and "scattering" of orga-

Requisites of New Construction

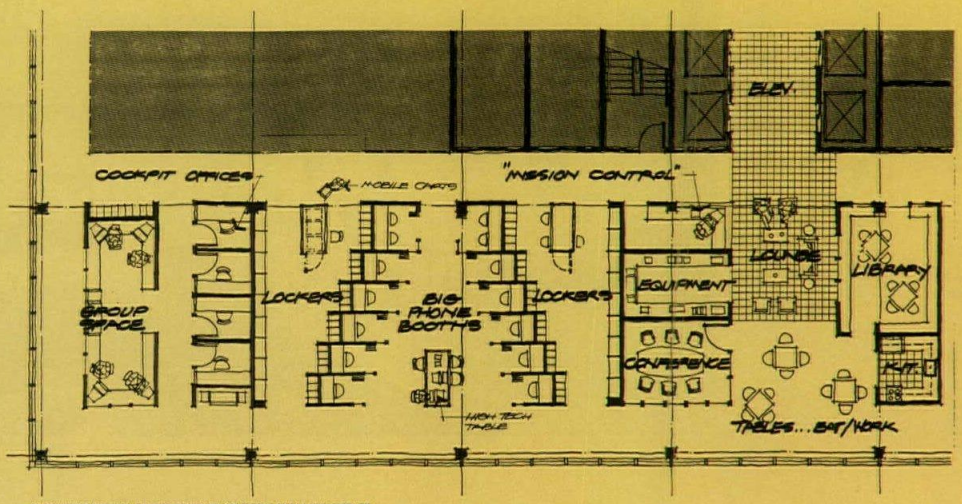
New construction of offices ... must accommodate the much wider variety of space types needed by vertically integrated and team-based organizations. They need offices, of course, but intermixed with spaces for training; laboratories; workshops; showrooms; media studios; research and development; production.... And to accommodate both global business hours and extended "normal" hours, people must have access to late-night food and a range of off-hours amenity spaces and services ... either in-building, or nearby and safe. Where land is available, both the spatial mix and need for amenities can be provided in a campus plan....

Some natural consequences of the changes we are experiencing are the loss of opportunities for informal learning (the way most things are learned in organizations), the loss of work-related social networks, [and] some psychic distancing from the organization. These happen because of shorter duration teams and decreased cycle times, more work in the field and home (and less in the office), folks electronically networked rather than spatially co-located. It is becoming very important to purposively design workplaces that maximize and support face-to-face contact of all kinds. ***Michael Brill***

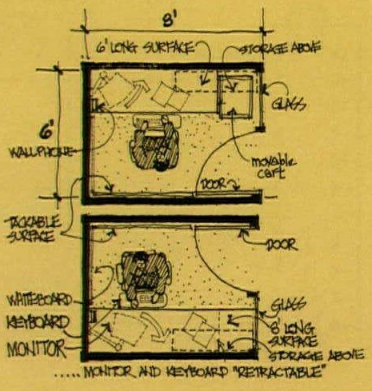
See note on page 51



CHIAT/DAY "BEFORE" PLAN



NONTERRITORIAL PROTOTYPE PLAN FOR SATELLITE OFFICE



COCKPIT OFFICE

nizations: by the beginning of the 21st Century, he predicts, less than half the workforce will be employed full time. The reason for the shift is the tripartite "shamrock organization," in which a small core of essential executives and full-time workers is augmented by outside contractors and part-time help. "This is not a new way of organizing things," Handy explains. "What is new is the growth of this way of organizing in big businesses and in the institutions of the public sector. All organizations will soon be shamrock organizations."

Alongside the emerging shamrock organization, Handy describes the gradual development of the federal organization, in which a variety of individual groups are allied under a common flag with some shared identity. "Federalism seeks to make it big by keeping it small," he writes. "It is the method which businesses are slowly, and painfully, evolving for getting the best of both worlds – the size which gives them clout in the marketplace and in the financial centers, as well as some economies of scale, and the small unit size which gives them the flexibility they need, as well as the sense of community for which individuals increasingly hanker." [1]

The Changing Workforce

Handy's commentary is focused to a large extent on Britain, although his perceptions apply just as well to other developed countries. The implications of similar organizational shifts in the United States are insightfully analyzed in a forthcoming book entitled *"Now" Offices, No Offices, New Offices ... Wild Times in the World of Office Work* by Michael Brill, self-styled "architect gone bad" and leader of the interdisciplinary Buffalo Organization for Social and Technological Innovation (BOSTI). According to Brill and coauthor Cheryl Parker, the profile of the workforce is moving towards a "diamond" shape, with smaller clerical staffs and fewer managers at either end of the hierarchy, and more professionals in the middle.

The miracles of communication technology make it possible for these "knowledge" workers to operate with considerable autonomy, an individualistic work mode Brill finds "consonant" with the American character: "People are out there with their laptops and cellular telephones, riding the range, prospecting, being cowboys and cowgirls again."

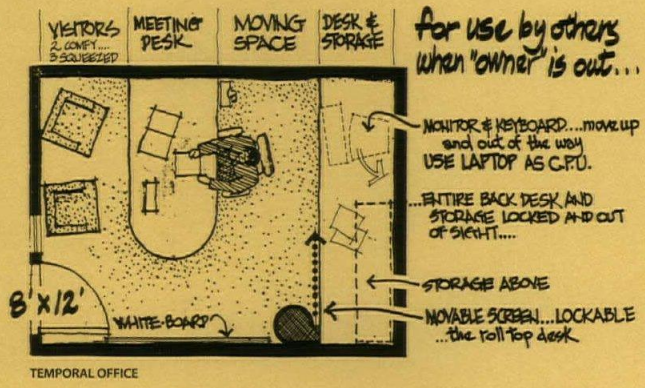
Place as Tool

The notion of employees as cogs in a machine is being tossed out the window by some corporations. Instead, these companies are remaking their facilities to enable specific types of work. Strategies vary, but the basic shift toward conceiving the workplace as a tool to enhance productivity and employee satisfaction can benefit the bottom line.

The West Bend Insurance Company headquarters in West Bend, Wisconsin, appears to be a run-of-the-mill suburban complex, but closer inspection reveals an environmental strategy that benefits employees and community alike: for example, perimeter circulation routes in the open office wings allow natural light to reach all of the workstations (5); and employees can individually adjust air flow, climate, lighting, and acoustic barriers in their workstations with environmental control systems from Johnson Controls. (Unfortunately, the underdesk apparatus is bulky, as it has not been integrated into the design of the furniture.) West Bend also looked at the big environmental picture, and has restored a prairie on roughly one-third of its 160-acre site. Heightened worker satisfaction has yielded a decline in both absenteeism and turnover since the building's completion in 1991.

Another workplace strategy is the nonterritorial office, where small workstations are used by a company's mobile staff as needed. However attractive as a means to cut corporate real estate costs, the relatively confined nonterritorial workspaces must be complemented by other spatial amenities. In one instance, a major office machine manufacturer recently commissioned Michael Brill of BOSTI to design a nonterritorial prototype for 67 of its satellite offices; his proposal includes both small, nondedicated workspaces (called Phone Booths, Cockpits, and Temporal Offices) and more generous and comfortable common areas, outfitted with the range of office equipment found in airport business lounges.

A third strategy, and one of the most radical, calls for the elimination of hierarchy-driven standard office planning. Chiat/Day, the ad agency that commissioned Frank Gehry to design its Santa Monica, California, headquarters (P/A, Mar. 1992, p. 66), has now brought in Lubowicki/ Lanier to gut the regimented interiors (see "before" plan) and replace them with a "virtual agency," where creativity is best fostered by cross-fertilization: with no dedicated offices, the building, wired for all current and potential technologies, will house myriad team-oriented and common spaces; at the heart of the project is the club house (see study model 4), with playful furnishings casually arranged for a free exchange of ideas.



TEMPORAL OFFICE


©Howard N. Kaplan

5

Yet at the same time that high solo performance is sought and rewarded, the importance of teamwork has become an article of faith in many companies, as the prerequisite of creative problem solving; witness the swath cut by team-oriented Total Quality Management throughout corporate America.

People can work wherever they can pitch a laptop, enabling organizations to cut back on their two greatest fixed costs, salaries and real estate. The "shamrock" organization's downsizing and "outsourcing" of tasks take care of the first; new kinds of workplaces are evolving to address the second.

The Changing Workplace

In many service industries, substantial numbers of office workers are found to be out of their offices a good deal of the time – on the road or on site with clients. The concept of the "nonterritorial" office capitalizes on this phenomenon by reducing the number of personally assigned offices in favor of shared workspaces, which fall into two broad categories: "free address" workstations, available on a first-come, first-served basis; and "hotelling," in which workers may reserve a work-

Good Design is Good Business: The Proof

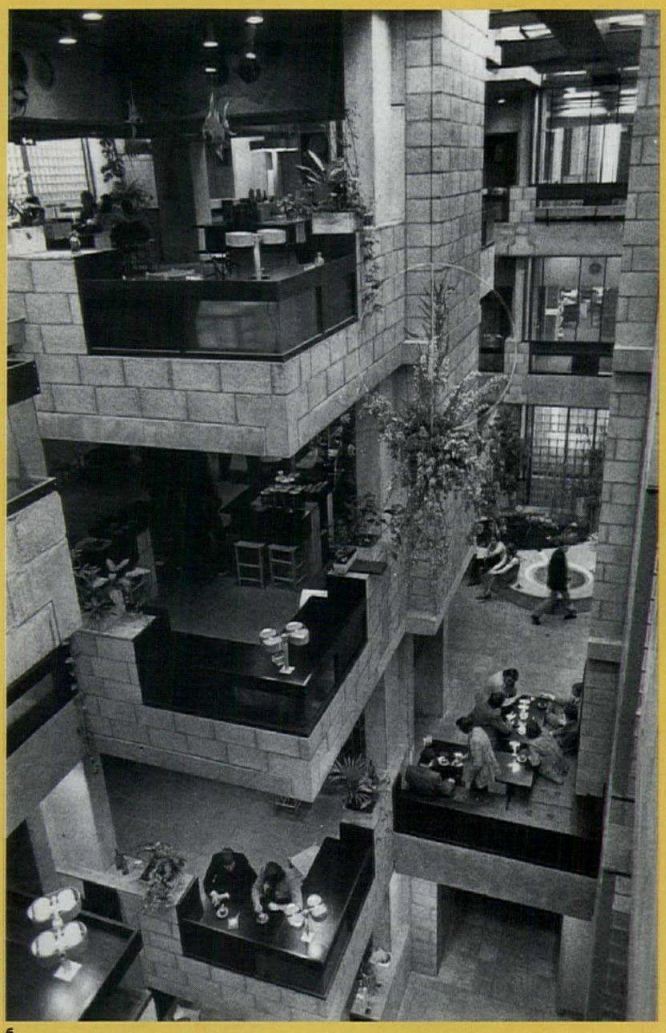
BOSTI's research project's results are based upon data gathered in a multiyear nationwide survey of some 8,000 workers in about 100 companies. The study explored three important issues about the physical environment of the workplace:

- Does it affect productivity and quality of worklife?
- Which qualities of the workplace have the most powerful effects and for what job categories?
- What is the economic value of appropriate design, and what is the cost of inappropriate design?

The various studies show that if you provided a very supportive work environment, the dollar value of the benefits would most probably equal from 3 percent to 20 percent of salary annually for workers in all job categories. We do not believe a productivity benefit much over 5 percent is actually attainable in practice, but even that level provides an economic benefit great enough to pay for new high-performance interior workspaces in a few years.

Michael Brill

Excerpted with permission from *"Now" Offices, No Offices, New Offices ... Wild Times in the World of Office Work* by Michael Brill and Cheryl Parker of BOSTI, to be published by Teknion, Toronto, 1994.



Herman Hertzberger

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Joop van Reeken

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MINISTRY OF SOCIAL WELFARE AND EMPLOYMENT, SECOND FLOOR PLAN

N 40'/12m

space for the duration of hours or days (in some companies, corporate concierges handle the reservations, reroute calls, and will have your files, nameplate, and even personal paraphernalia moved in before you arrive).

Another strategy, "telecommuting," encourages workers to work at least part of the time at home, or to commute to less expensive satellite offices, while remaining electronically connected to the main office.

Companies employing these strategies in various combinations have seen significant reductions, in some cases by as much as two-thirds, in real estate costs.

While the Bureau of Labor Statistics has not begun to tabulate nonterritorial office use, some data are available on the extent of telecommuting. Link Resources, a New York research and consulting firm, conducts the National Work-at-Home survey, which reaches a random sample of 2,500 households. In 1993, they report, 7.6 million Americans worked part- or full-time at home during normal business hours, a net increase of 1 million over 1992. This figure is likely to rise, since as a voluntary work mode, telecommuting is not as widespread as it may become once companies institute it on an involuntary basis.

More significant, the total number of homeworkers (including part- and full-time self-employed, and "high-tech corporate afterhours homeworkers") exceeds 41 million, roughly a third of the adult workforce.

What Does it Mean for Architects?

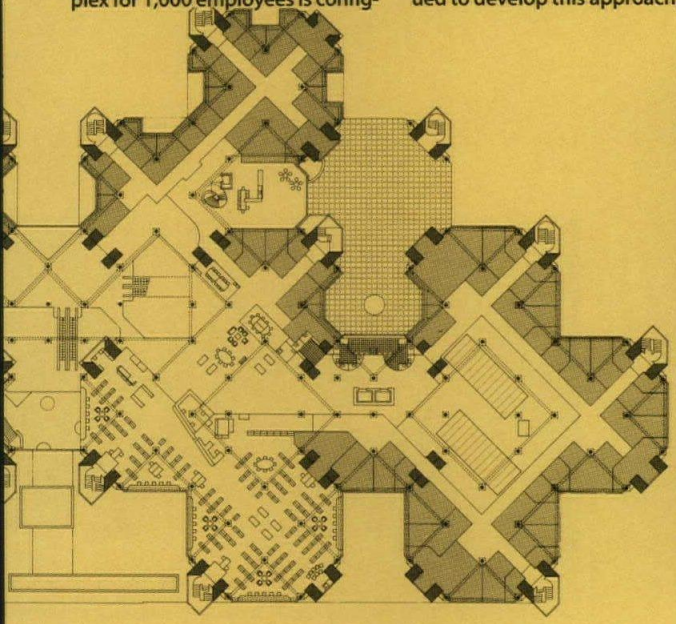
Given the rate and pervasiveness of the changes in the way Americans work, and the impact these changes will have on the way Americans live, it stands to reason that architects must change too – on every level – not only by expanding the scope of their design concerns, but by altering design processes and modes of practice, and ultimately reconceiving their professional roles.

Let's begin by examining immediate challenges in the workplace itself. This is one of the few areas in which the argument that good design is good business can actually be substantiated, thanks to a series of studies conducted by various groups over the past 15 years, which conclusively link organi-

A European Paradigm

In the early 1970s, while corporate America was busy marking the landscape with hermetically sealed office towers and rambling suburban complexes (with little regard for context or transportation), a very different paradigm was emerging in Europe. Dutch architect Herman Hertzberger led the way with his Centraal Beheer insurance company headquarters in Apeldoorn, Holland (6). Completed in 1972, the massive complex for 1,000 employees is configured as an urban fabric, weaving together interior streets, office clusters linked by raised walkways, atriums, and common spaces to maximize visual intrigue and social interaction. Two decades after its completion, Centraal Beheer, considered a success by its employees and workplace mavens alike, offers many benefits related to communal space now being sought in the U.S. Hertzberger himself has continued to develop this approach, most recently with the Ministry of Social Welfare and Employment, a 1990 urban reclamation project in The Hague for 2,000 government employees. Located across from a train station on a derelict site surrounded by roads and tramlines (a strategic response to commuter traffic reduction), the ministry's faceted façades (8) break down the scale of the building and provide maximum penetration of natural light and air (through operable windows). All communal facilities are located off of or along the central circulation artery, which extends from the main entrance. Unlike Centraal Beheer's rough concrete finishes (recently reworked in a lighter palette), the Ministry's interiors (7) have softer colors.

Generally, American observers agree, the Europeans put considerable emphasis on environmental amenities for workers. In Paris, reports Vivian Loftness of the Advanced Building Systems Integration Consortium, the new Ministry of Finance by Chemetov & Huidobro exemplifies this approach, with landscaped roof terraces and operable windows throughout the six-story campus.



Arnold Merine Jackson

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zational effectiveness to the physical quality of the workplace (see findings of BOSTI research project on page 51).

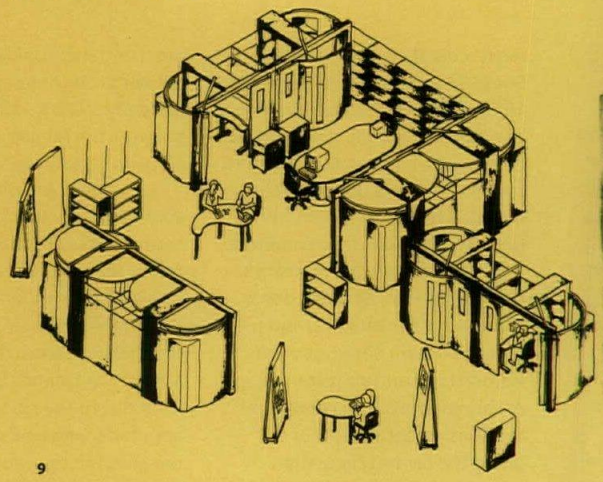
Happily, there are signs of a corollary shift in the mindset of organizations, which renders them more receptive to making an investment in design. "*Quality* has become the new watchword of many organizations. It is not another gimmick," writes Handy in *The Age of Unreason*. "For too long too many businesses were concerned with the fast buck, or the short-term bottom line of residual profit, or more technically still, the medium-term earnings per share. Money was all. With that as your goal, it made sense to treat people as costs to be minimized, to keep tight controls on everything which might cost money, and to reduce as many operations as you could to a predictable routine. It works only if nothing ever changes (and so can be rigidly programmed), if people are unquestioningly obedient (and so can also be rigidly programmed), and if the cheapest is regarded as the best."

Research carried out by Franklin Becker and William Sims, the founders of Cornell University's International Facility Management Program, corroborates the notion that the basic

A Scenario for Downtown

We're getting to the point where it's viable, feasible, and almost necessary to consider converting major class A office buildings in downtown areas to housing. There are a number of architectural and urban design issues involved. One is that the typical office floor plate is considered too deep for good apartment design. A potential answer is to combine offices and housing on the same floors. This is an architectural challenge. The logical candidates for downtown housing are in the affordable range: large or new families; the indigent; the working poor; singles; and the elderly who won't or can't opt for retirement villages out in the suburbs. Most downtowns do not have the food markets, health services, retailing required for that kind of population. That's another set of issues you have to build in.

Excerpted from an interview with Michael Pittas



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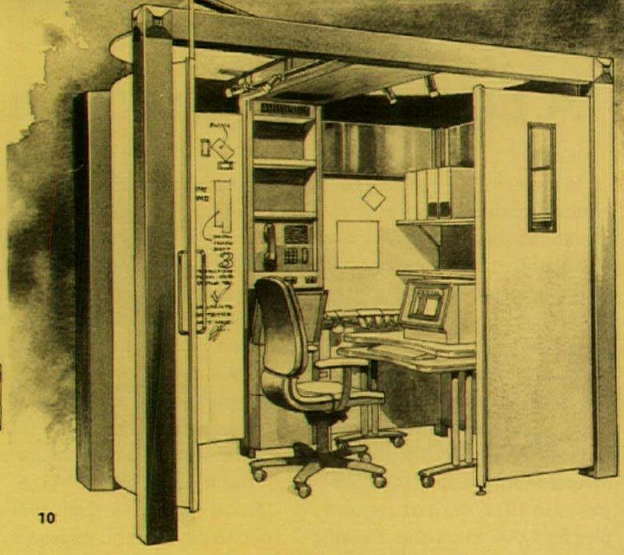

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Vitra

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U.S. Army Corps of Engineers

12

motivation of an organization has direct impact on its effectiveness, insofar as its objectives extend beyond the short-term mentality that has bedeviled American companies for so long. "To be successful, management must make a genuine commitment to enhancing productivity by listening to staff members and working with them to identify the tools they need to be able to work effectively," they wrote in a report coauthored with Bethany Davis and published in *Facilities Design and Management* (Feb. 1991).

New Design Concerns

Assuming willingness on the part of the client, what are the foremost design challenges in the workplace? By most accounts, these would be the design of space conducive to team work, and the incorporation of communal and public spaces that effectively increase interaction among colleagues (see excerpt, page 49).

One of BOSTI's collaborators, architect Michael Pittas, puts the imperative for collective space in a broader context, describing what he calls "the productivity paradox." Individuals are now measurably more productive than they have been in the history of modern work, he says, but that increase "has not translated into increases in productivity at the group scale, the divisional, the departmental, organizational, or even in the gross national product." Pittas's track record as former director of comprehensive planning for New York City and of the design arts program for NEA, suggests grounds for his understanding of operations at an institutional scale. A new type of space needs to be studied, he emphasizes. "We need quality spaces that improve the productivity and efficiency of team work, which is an area architects have not really concentrated on."

A Different Design Process

The construction of suburban work complexes will continue, with new buildings as well as retrofit of atypical space (irregular or smaller floor plates) commissioned by smaller, more adaptable organizations. In whatever installation, such satellite or telecommuting centers will require a broad array of amenities and services, many of which, if not built from scratch, will need refurbishing or supplementing.

Telecommuting and Main Street

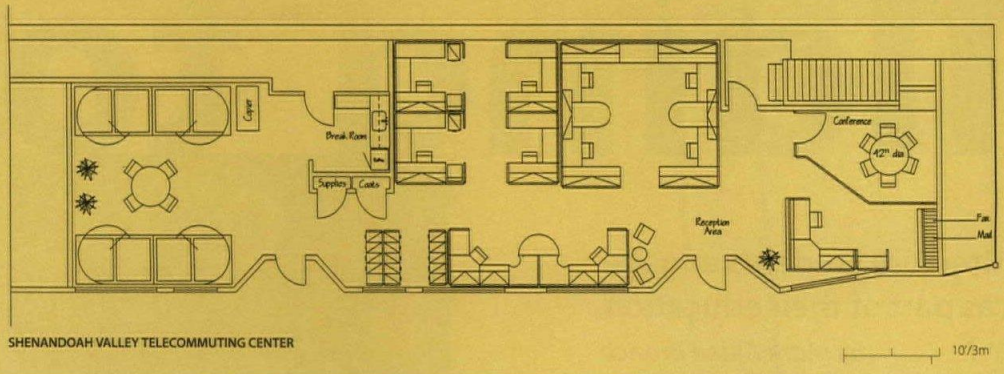
The Federal government is taking the lead on telecommuting, and its possible role in reinventing Main Street USA. Its Shenandoah Valley Telecommuting Center, the first installation in the Federally funded pilot program, gets high marks from Mark Howard, a telecommunications specialist who uses the Winchester, Virginia, site three days a week. No longer a "car monster," tired and frustrated before arriving at the office, Howard is happy to have the extra three or four hours a day to coach his son's Little League team; lower parking fees and lunch bills are another benefit of his smalltown life.

At the moment the idea is terrific, but the implementation leaves much to be desired. As designed by the General Services Administration's Space Design Staff, the Winchester office is a hodgepodge of different workstations, poorly configured in their narrow space; it also fails to take advantage of its street-level location (12). The disappointing interiors are not unusual: "Currently, most satellite offices are indistinguishable from conventional central offices, but that needn't be the case," argues Cornell professor Franklin Becker in *TeleTrends*, the newsletter of the Telecommuting Advisory Council.

The furniture industry is, in fact, beginning to consider ways of supporting changing workplace needs. Herman Miller, for example, is currently addressing the social and structural nuances of changes in the workplace, favoring incremental changes over the promotion of revolutionary products. "Everyone gets to the future at a different time," says Advanced Applications Manager Rick McKeon.

Vitra is also speculating about the impact of new corporate structures. Addressing the gap between new work strategies and "outmoded conventions," in office systems, the Vitra Design Museum's "Citizen Office" project/exhibition, encompasses several scenarios. One, an open work module (11) proposed by Andrea Branzi, takes the paperless office at face value; it would seem that storage, acoustics, and privacy are no longer an issue.

Steelcase is developing new products to support collaborative workspaces and telecommuting facilities (see Winchester floor plan). Its Personal Harbor (10), continually developed through use in various "test sites" and outfitted with a worksurface, task light, and climate controls, is a prototypical mobile pod, now on the market, designed to be configured around a commons area (9). User response at one of the test sites is mixed: Linda Bronson Repp, a systems specialist at DuPont, feels confined: her desktop computer occupies most of the 48-sq-ft Personal Harbor's worksurface and she notes a lack of acoustic and visual privacy (curious coworkers peer through the uncovered windows). These problems, says product manager David Lathrop, were known before the test sites were opened; newer generations of the product will address them, though he divulged no specifics. *Abby Bussel*



SHENANDOAH VALLEY TELECOMMUTING CENTER

Faced with an overwhelming variety of choices, it's clear that organizations reconfiguring their workplaces will rely on diverse solutions, says Vivian Loftness, a founder of the Advanced Building Systems Integration Consortium (ABSIC), a university-industry partnership based at Carnegie Mellon's Center for Building Performance and Diagnostics. In regard to both new construction and retrofit of office buildings, "the key issue," she stresses, "is not so much which solution is the one for an organization, but how to establish the infrastructure to support constant change."

When services begin to have as short a life as the furnishings, it becomes imperative for architects to get up to speed on building systems, Loftness asserts, to become familiar with the various options and flexibilities. "But architects also have to become much more talented in early team processes, where they bring in consultants to discuss options and come up with a strategic plan." If architects are to act as integrators of the construction effort, their own design process must change to allow for more input of diverse expertise early on. In no small part, the knowledgeability *(continued on page 89)*

Suburban Repercussions

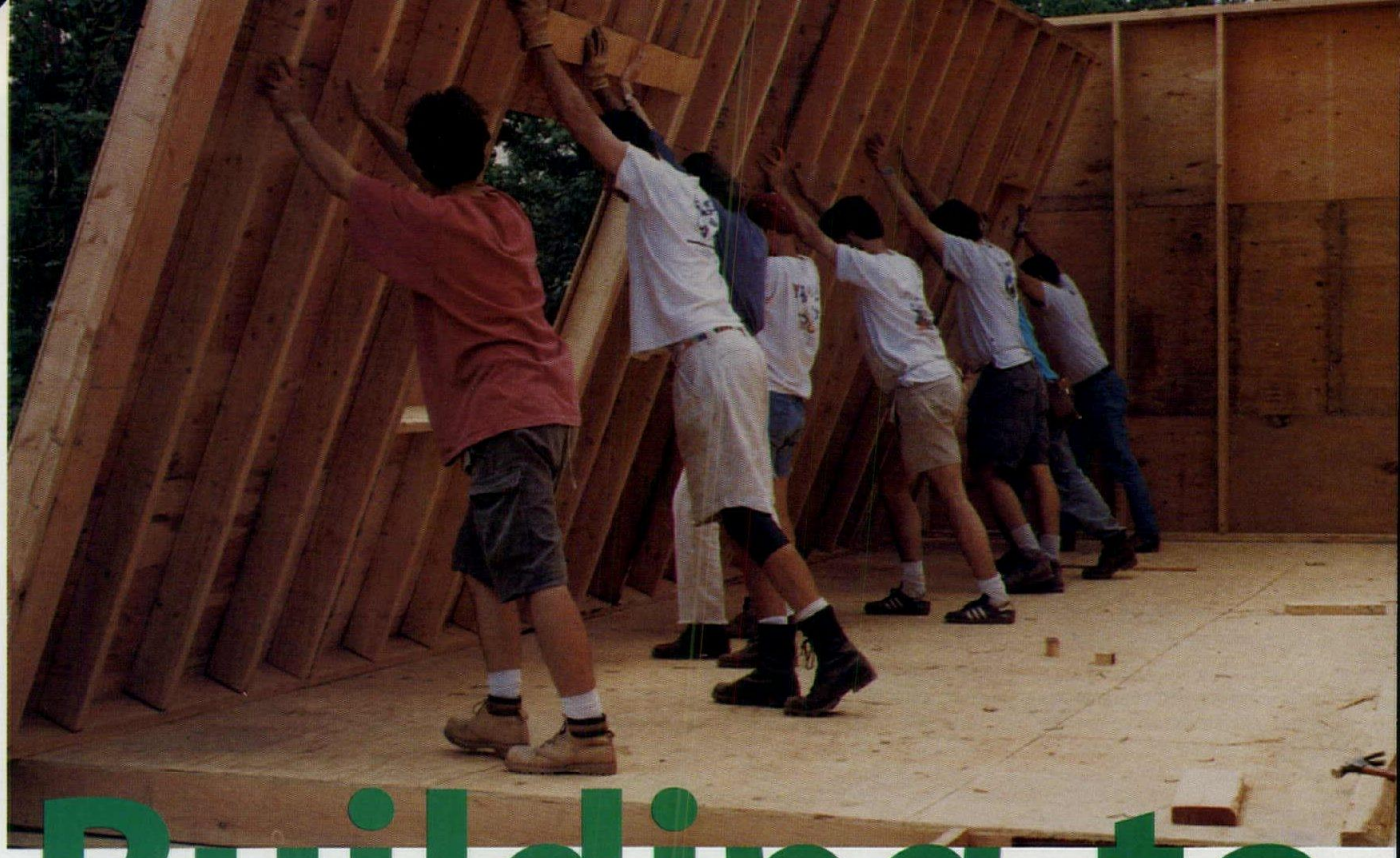
In white-collar communities with a large proportion of their workforce not commuting any longer, the daytime adult population will increase by a factor of two or three. What are the consequences of that? It's likely that those people working from their homes, and occasionally commuting to the city, will become much more active in their communities. They'll go to PTA meetings, little league games, town meetings, become civically involved – because they are there.

More people in one piece of geography, doing productive work, with more disposable income – that's a natural magnet for retail, entertainment, food, and other kinds of personal services.

Now, there are two ways that can go: of course, the strip development on the edge of suburban communities may increase; it would be unfortunate, although there can be architectural challenges in that too, because the land is much more valuable.

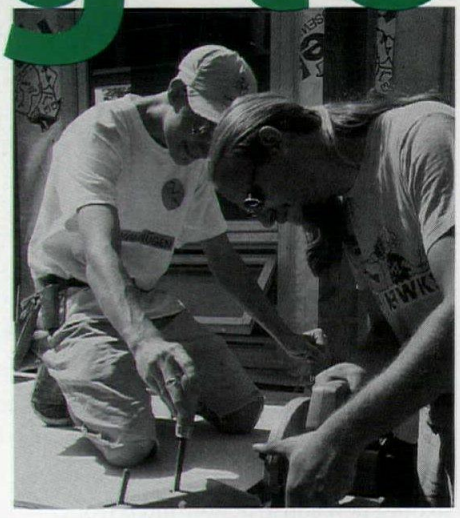
The alternative is the reinvention of Main Street USA.

Excerpted from an interview with Michael Pittas



Building to

More and more architecture students engage in building projects as part of their education. Shouldn't all of them? *by Mark Alden Branch*



This spring and summer, dozens of architecture students around the country will wield hammers, saws, and tape measures along with their drafting tools. They will worry about materials, tight budgets, and demanding clients. These students, at Yale, Ball State, Catholic University, the University of Washington, and others, will take part in an educational idea whose time has come: a studio where students build their own design.

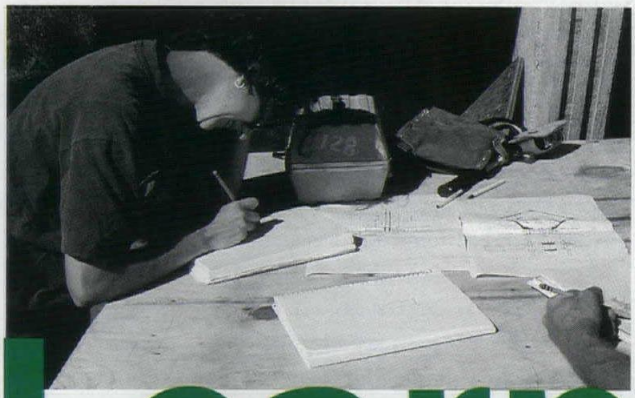
It may seem strange to people outside the profession to learn that *every* architecture student doesn't take part in building something as part of his or her education. But ever since architects began defining themselves as professionals in the 19th Century, designing and building have been seen as two distinct fields, and architectural education treated students accordingly.

But the common-sense idea that architecture students should know firsthand what the building process looks like has taken hold more and more in recent years, just as many architects have taken on broader roles in construction and development. Steve Badanes, a founder of the design-build group Jersey Devil, has for years built his own work; more recently, he has taught building studios at several schools. "The pendulum is coming our way," says Badanes. "Students are much more interested in building now than they were 15 years ago."

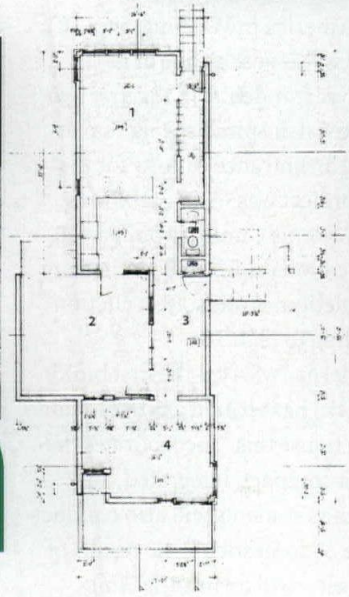
Yale's Time-Honored Initiation

The First-Year Building Project at Yale predates much of this change, having been established in 1966 by the late Charles Moore, then chairman of the Department of Architecture. It has continued through several deanships and has proved adaptable to varying social and academic climates. In the early years, under Moore, students built community centers, clinics, and other public buildings in the Appalachians. In the

Yale students (left) raise a wall at their 1993 project. Two students at Catholic (below left) make cuts in siding. At Yestermorrow (below), on-site sketching is encouraged.



Learn



Urban House at Yale

Yale's 1993 project, a single-family house in the impoverished Newhillville area of New Haven, presents a guarded face to the street (above). The house is planned around an outdoor room. Student designers: Jae Cha, Eric Chang, Issa Diabate, Lloyd Fisk, Jim Harrington, Dolly Hernandez, Russell Katz, Kwang Soo Kim, Michael Levy, Hugh Patterson, Todd Stodolski, David Taylor, James Unkefer.

late 1970s and early 1980s, formal issues seemed to take priority, as programs became simpler (park pavilions were popular) and the designs more fanciful. Most recently, since 1989, the students have been designing and building houses in New Haven in partnership with Habitat for Humanity, the nonprofit housebuilding group.

Every first-year graduate student at Yale must take the course. At the beginning of the spring semester, students are presented with a program, a site, a client, and a budget. After initial research, each student prepares a scheme. These are reviewed by faculty, and the students are placed in teams based on similarities in their design approaches. The teams produce second-round schemes, from which the project to be built is selected by a jury that includes faculty, visiting critics, Habitat representatives, and the client family that has been chosen by Habitat. (The client family will put in a certain number of hours building the house as a down payment.) After the design is selected, all the students take part in preparations, costing, and construction, which continue throughout the summer.

The competitive aspect of the program can be difficult for students whose projects are not selected, especially when they must then take roles in building the chosen project. "There are some hard feelings, but they wear off quickly," says Mike Levy, who was one of the designers of last year's house (above). Paul Brouard, a Yale-trained designer-builder who has overseen the project for the past 26 years, adds that new class leaders – not necessarily the top designers – often emerge from the construction process.

Yale's new dean, Fred Koetter, emphasizes the role the project plays not only in learning about construction, but in better understanding the New Haven community – and, by extension, the issues involved in creating architecture in the city. "When I was at Yale before [in the mid-1970s], I felt that to devote a semester to one little building was questionable," says Koetter. "But moving to actual problems in the city is fantastic."

In recent years, Brouard has steadily increased the students' role, making them responsible for the management of the project as well as its construction. "They have to decide how to run the project and how to use their manpower to the best advantage," he explains. Students learn to order materials, deal with building officials, and coordinate labor on the jobsite. The design that is developed in the studio is for the most part followed in the field, except for the kinds of changes that are typical of any project of this size.

Why doesn't every school make such a program a requirement for students? Brouard mentions the likelihood that liability and contractual issues scare off many big institutions. Koetter thinks money is another important reason: even though Habitat for Humanity provides materials (some of which are donated), money must be raised every year to

allow some students to stay and continue construction over the summer. "Money is a struggle every year, but that struggle is part of the experience," Koetter says. Fundraising is under way to create a permanent endowment for the project, which was recently renamed the Charles Moore Building Project in honor of its founder.

Fourth-Year Studio at Catholic

While Yale is the only school that requires a building course, it has become an increasingly regular option at other schools. Catholic University of America in Washington, D.C., is offering its fourth building class this year as one of its "alternative studios" for fourth-year students. In the first two years, students built a Constructivist-inspired speaker's platform (P/A, Oct. 1992, p. 24) and an entrance canopy for the architecture school. Last year's project was more ambitious: students under the direction of Vytenis Gureckas built a 410-square-foot "starter house or vacation cabin" (below) in a university parking lot. (Upon completion, it was sold at auction and moved to a rural site according to plan.)

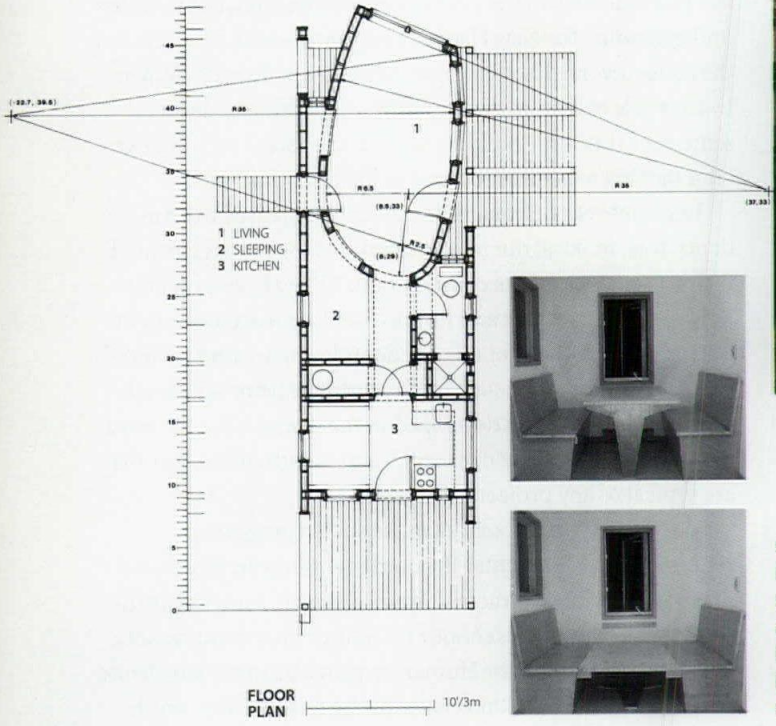
This year, Professor Ann Cederna (who led the first building studio with Douglas Frederick) has written a program for a steel-framed, 200-square-foot house that "incorporates the newest in technology by way of a compact, integrated, and efficient habitat module." Cederna's students will also conduct research on the changing nature of domesticity, the results of which – along with the house itself – will form a traveling exhibition. The house has a real client, who will take delivery after the exhibition has run its course.

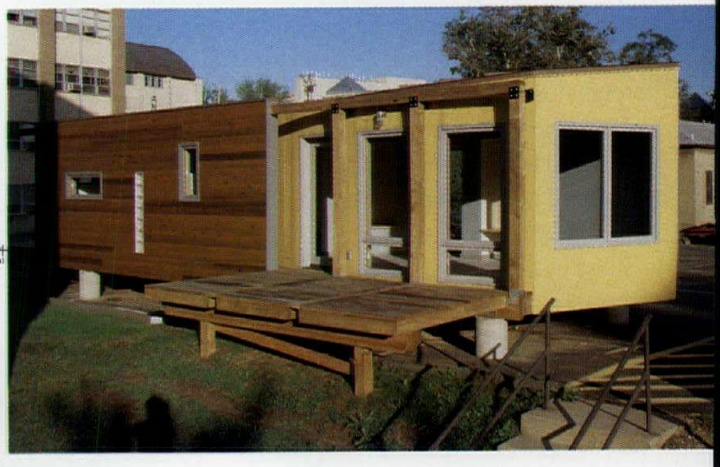
The mechanics of Catholic's course are similar to those at Yale: students first design alone, then are combined into competing teams. Here, too, the traditional separation of the design and construction phases is maintained, and the degree to which the finished product matches the drawings is a point of pride. Vytenis Gureckas says that on-site changes to last year's house amounted to little more than "paint colors and door swings."

A less typical studio was also mounted under Catholic's auspices last summer: Maryland architect Travis Price led nine students on a nine-day expedition to northern British Columbia, where they built a "meditation temple" (facing page) for author/ anthropologist Wade Davis. Price's students developed their design before leaving Washington, D.C., and determined what materials would be needed (since they would be 350 miles from the nearest supplies upon their arrival). Price says the design was achieved by consensus: "Everybody sketched, and certain common elements came out."

At Yestermorrow, Designing on Site

While universities see building projects as useful teaching tools, they are a model for practice at the Yestermorrow School in Warren, Vermont. Founded in 1980 as a kind of summer camp for nonarchitects who wanted to design and build for themselves, Yestermorrow has had annual summer programs for architecture students since 1984. The school, which was founded by Yale graduate John Connell, subscribes to the notion that designs should grow and change in response to their site and to the construction process. "We want stu-

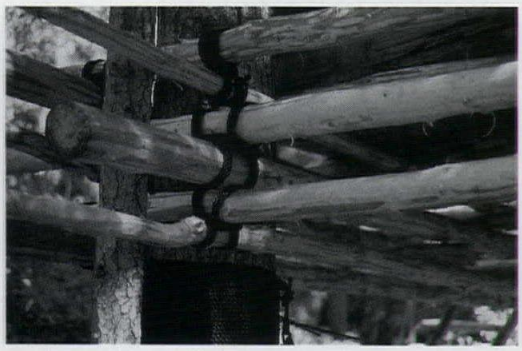




Catholic's Portable House

The tiny house built by students at Catholic last year (above) juxtaposes orthogonal spaces with an egg-shaped living area. "Double-functioning" areas like the dinette/ sleeping space (left) increase efficiency. Student designer: Todd Biggerman.

Student participants:
Amy Adams, Chris Barnett, Macke Bentley, Miriam Buczkowski, Paul Czarapata, Rebecca Fellerman, Catherine Kudlik, Jim Leonetti, Kevin Link, Tiffany Lockhart, David Mallon, Mike Wheeler, Franco Ravitch-Zerati.



Building in the Wild

The students from Catholic U. who traveled to British Columbia last summer built a "meditation temple" using materials they brought with them and logs found on site. An eight-foot cube with decorative aluminum panels sits within a treehouselike form (left). Logs were lashed together with rope (above). Student participants: Keith Bomely, Karine Dammer, John Michael Day, Joseph Ferucci, Liz Fleck, Jesse Guerra, Drew Makin, Mary McGarrity, Kristin Wangenstein.

dents to see that the construction process provides opportunities for place-making," says Gunnar Hubbard, the school's executive director. Yestermorrow's faculty includes Steve Badanes and John Ringel of Jersey Devil.

Architecture students who come to the school can choose from a basic four-week design-build course and shorter courses in sustainable design, architectural crafts, and interiors. Each year's crop of about half a dozen students adds a bit more to a slowly evolving "experimental building."

"We work at full scale the way you'd build a model in the studio," says Hubbard. "For instance, windows might be cut out of walls after the walls go up." Instructors encourage design on site, and the result is often aesthetically unconventional. "But it's just stick-framed construction," says Hubbard. The students typically receive academic credit after they return to their schools. (Negotiations are under way to provide pre-approved credit with several schools.)

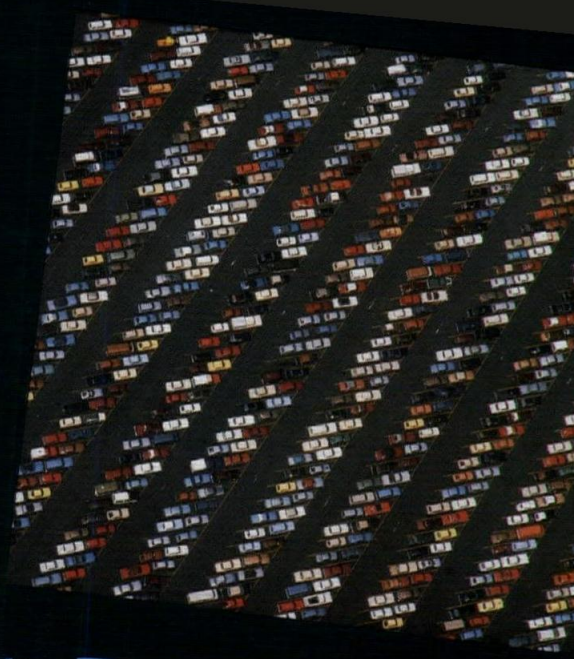
This year, in addition to its regular programs, Yestermorrow is trying something new: instead of bringing students to Vermont, Yestermorrow instructors are going to the schools. A rotating group of Yestermorrow faculty are teaching what Hubbard calls a "tag-team studio" at Ball State University this spring, turning a downtown Muncie, Indiana, storefront into a community center. Hubbard hopes to provide faculty for such studios on other campuses in the future.

Jersey Devil's Badanes has been something of a design-build circuit rider in recent years, leading projects at the Universities of Washington and Oregon and at the University of Technology in Helsinki. He also had a regular teaching post in the short-lived architecture school at the University of California at San Diego. There he led one project, a pergola at the Tijuana school being designed by James Hubbell (P/A, June 1992, p. 76), before the school of architecture was abruptly shut down. He has since taken a part-time teaching job at the University of Washington, teaching two building studios there.

For student projects, Badanes typically chooses programmatically simple public projects such as pavilions and park structures. He avoids the competition approach used at Yale and Catholic, preferring instead that his students arrive at a design through consensus. "The design might be better if one person did it, but they need to learn that almost every project involves collaboration." His students, like those at Yestermorrow, are taught that design doesn't end until construction does. "We try to do a good set of drawings, but if an opportunity presents itself or if a mistake is made, we brainstorm right there. You get a certain feedback from what you're building, like a sculptor does."

Building on Success

Whether their goal is to promote a more integral approach to practice or simply to make students more aware of the realities of construction, universities are becoming more and more interested in design-build. Both Yale and Yestermorrow are getting a number of inquiries from other schools about how to set up such programs, often generated by students who – as Gunnar Hubbard describes it – "are frustrated sitting in construction class looking at slides." At Yale, both Koetter and Brouard speak of broadening the social implications of their program, perhaps developing a kind of corps of design-builders that would improve housing stock in cities while training high school students. Even if these educational efforts don't change the shape of architectural practice, they are a healthy sign that education is, at long last, beginning to bridge the gap between design and construction. □



Flight Pattern

Insightful aerial photographs were inspired by experiences in architecture school.

Photographer and aviator Alex MacLean began recording the appearance of America from the air while pursuing an M.Arch. degree at the Harvard Graduate School of Design.

He realized that the 35mm camera could be a potent tool for understanding patterns of development. As his photographs gener ated surprisingly potent geometrical images, they could also vividly document some of the mindless imposition of simplistic order over natural complexity – along with some flat-out abuse of our terrain.

For more than 20 years, MacLean has been flying over virtually all of the country in his Cessna 182, steering his plane with one hand and steadying his camera with the other. In 1975, he formed his own aerial photography company, Landslides. A collection of his photos has been published in *A Look at the Land: Aerial Reflections on America*, with text by Bill McKibben (Rizzoli, New York, 1993).

North of Los Angeles, the irregularities of the natural landscape have been translated into bare, flat terraces (left) that serve the developers' small-minded program. In geometry and color, this transformed landscape resembles a crude terrain model, whether handmade of cardboard or generated with a simple computer program.

Cars parked at Disney World in Florida (above) form a benign pattern, but Look at the Land reminds us that, on average, each vehicle shown releases its own weight in carbon dioxide every year.

A view of new tract houses in Palm City, Florida (above), shows how little the casual curves of a street do to mitigate the uniformity of the developer's product.

In a view of Staten Island, New York (facing page, top), the two-family and single-family houses can be distinguished by the rhythm of above-ground pools in their backyards.

The regularity of apartment buildings in the Bushwick area of Brooklyn, New York (facing page, bottom), is broken by fire damage to vacant buildings. Clotheslines at the upper left are poignant evidence of buildings still occupied. ■

EAST STROUDSBURG UNIVERSITY CENTER

Tom Bernard

Serious About Systems

The Philadelphia firm of **Kieran, Timberlake & Harris** begins with the basic constituents of architecture – a room, a structural bay, a water-shedding detail – to design structures of surprising diversity.

by Thomas Fisher

One of the more important – and most difficult – aspects of designing is deciding how to begin. Where, amidst the myriad facts of a project, is the path that leads in a promising direction, along which design solutions are likely to be found? Every designer must find his or her own way in this. Nevertheless, seeing how others make such decisions, how they begin the design process and then develop it, still has value.

In that regard, it is worth studying the work of Kieran, Timberlake & Harris, a ten-year-old architectural firm in Philadelphia. All three partners – Stephen Kieran, James Timberlake, and Samuel Harris – worked in the office of Venturi & Scott Brown, but their approach to design recalls that of another Philadelphia great: Louis Kahn.

Kahn's Influence

Kahn's architectural influence has generally been twofold. Close adherents have tended to borrow from his formal vocabulary, especially his late work: large-scale arched or circular openings in brick walls, for example, or naturally finished wood or metal infill within concrete structural frames. Others have drawn inspiration more broadly from Kahn's metaphysical musings about architectural phenomena: the quality of natural light, the presence of space, the nature of a material.

Kieran, Timberlake & Harris have pursued a third direction: evolving a systematic design process from Kahn's more poetic perceptions. This process results in buildings that sometimes recall those of Kahn (their classroom building at The Shipley School), and sometimes don't (the laboratory at Rider College). But Kahn's ideas about the spatial and temporal nature of architecture are everywhere present in this work.

Spatial Beginning

Kieran, Timberlake & Harris begin a design with a very simple spatial idea, drawing from Kahn's view that the room remains the most basic architectural element and that space is inseparable from the systems that serve it. "In many of our projects," says James Timberlake, "we have developed an incremental structural unit which guides the making of the building." In the Shipley School, that unit is the classroom; in the Rider College building, the laboratory; in the Stufano Residence, the individual room. "This unit is rigorously scrutinized," adds Kieran, "as to program accommodation, proportion, and materials."

From this basic block, other choices follow. "Structural systems are sought that are consistent with this unit," says Kieran. Sometimes those systems are clearly expressed on the exterior of the building, as in the exposed timber frame of the Allingham Residence; other times, they are handled more subtly, as in the East Stroudsburg University student center, whose concrete structure has a definite grain that separates the new construction from the old.

Integrated with the structure are the various mechanical, plumbing, and electrical systems, which "are didactically exposed in each building," says Kieran, "making the delivery

Barry Halkin

CIENCE AND TECHNOLOGY CENTER, RIDER COLLEGE

Catherine Bogert

MIDDLE SCHOOL, THE SHIPLEY SCHOOL

of services legible." At the Shipley School, for example, the exposed mechanical ducts run down the hallways and branch into each classroom, reiterating the movement of students through the building.

Temporal Layering

Layered onto this assemblage of structural units and systems is a conception of their buildings over time, an idea they call differential longevity. "Unlike high Modern theory," notes Kieran, "which assumed all new structures to be temporal, or Classical theory, which assumed all building elements to be permanent, we assume some portions of our buildings ... to be permanent, including structure and enclosure, and other portions, such as partitions and mechanical enclosures, to be temporary." This is perhaps most evident on the buildings' interiors where, for example, bearing walls or piers are exposed and naturally finished, while nonbearing partitions are painted and detailed in such a way that they can be removed with a minimum of trouble.

This strategy stems from Samuel Harris's long experience as a building diagnostician. "We know how materials fail," says Harris, "so we have tried to reverse that process and to explore its formal implications." For example, the firm tries to avoid using sealants or exterior coatings, both of which are prone to failure. Instead they detail exterior walls to shed water and to weather naturally, reducing the maintenance cost and increasing the life of a building.

The Process, Pro and Con

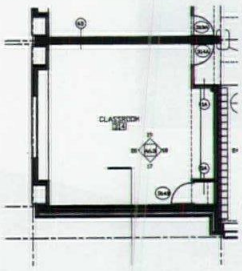
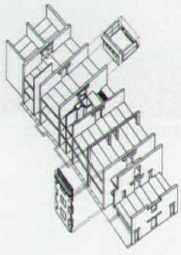
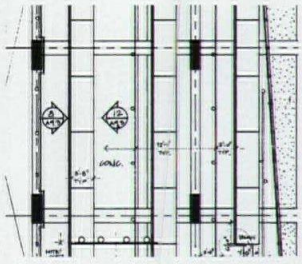
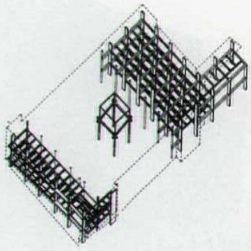
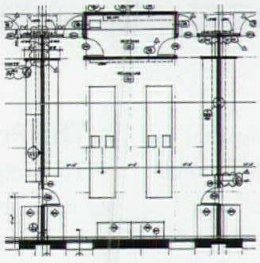
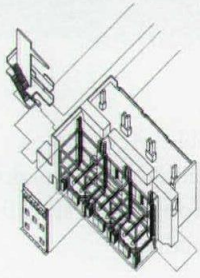
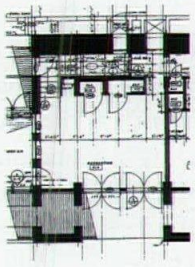
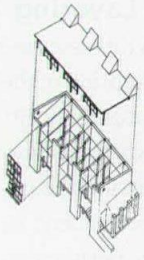
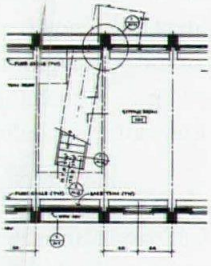
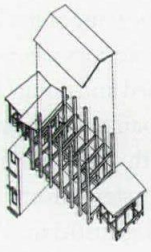
The simplicity and clarity of this process are unassailable, but it is not without pitfalls. A design that evolves from basic units, for instance, may never reach a point where the parts get synthesized into a figurative whole. An example is the Shipley School, which has fine details, but a certain disjointedness in overall form. Also a logical process such as this can become too closed a system, obscuring other values. While the location and massing of Kieran, Timberlake & Harris buildings are unerring, the logic that drives the selections of exterior materials – the slate at Shipley or the granite at East Stroudsburg – does not always jibe with neighboring structures.

Still, there is much to admire and learn from this work. Counter to many current design trends, these buildings make no overt historical references, allude to no literary or philosophical theory, and indulge in no personal expression. As such,they produce no identifiable style or signature image – a liability given the media's near obsession with categorizing or personalizing things.

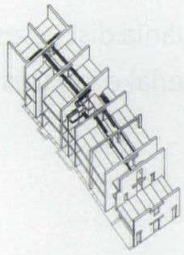
But the strength of this work lies precisely in its resistance to such trends. Kieran, Timberlake & Harris remind us that, whatever value architecture has as a cultural artifact or as an expressive medium, basic issues such as structural simplicity, spatial clarity, and physical durability remain central to the architect's task and still open to formal exploration. □

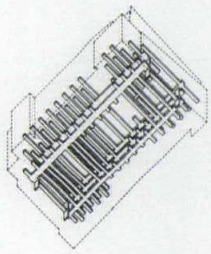
KIERAN TIMBERLAKE & HARRIS

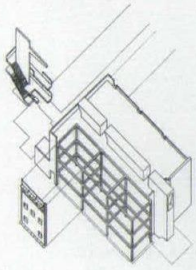
This matrix indicates how the firm proceeds from an analysis of structural and spatial units to their assembly into integrated systems accommodating the program and the site.

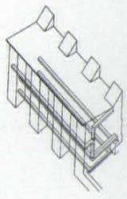
	Unit	Assemblage
The Shipley School Middle School **Bryn Mawr, Pennsylvania**		
East Stroudsburg University Center **East Stroudsburg, Pennsylvania**		
Rider College **Science and Technology Center** **Lawrenceville, New Jersey**		
Stufano Residence **Dover, Massachusetts**		
Allingham Residence **Kent County, Maryland**		
	The process begins, says Stephen Kieran, with an "intensive study of the basic block or spatial unit of the building. This unit is rigorously scrutinized as to program, accommodation, proportion, and materials (and) becomes the basis for much of what follows."	"The nature of the basic block," continues Kieran "determines much of the assemblage strategy, as structural systems are sought that are consistent with this unit. The particular system selected depends largely upon its ability to contain and order the assemblage of basic spatial units."

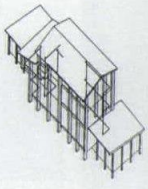
Systems





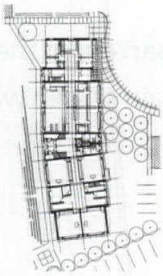


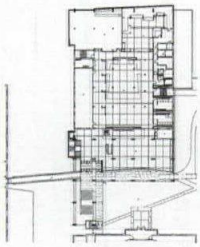


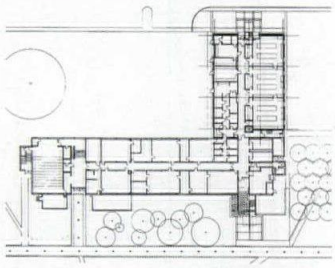


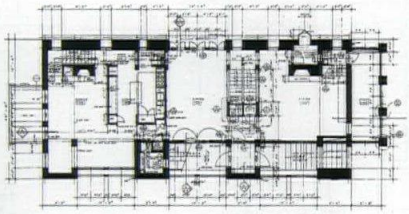
The firm then proceeds to integrate the mechanical, electrical, plumbing, and fire protection systems with the structural assemblage, usually following the overall spatial order. These systems, says Kieran, "are didactically exposed in each building, making the delivery of services legible."

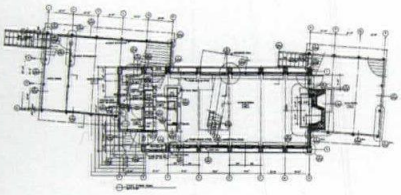
Floor Plan





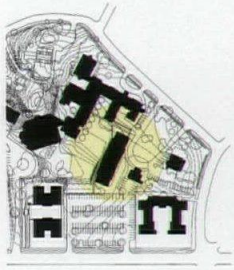


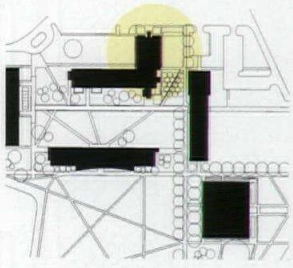


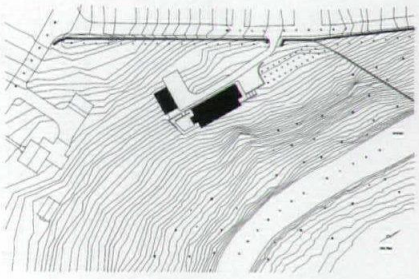


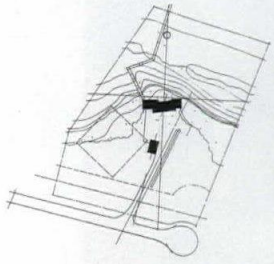
The floor plans, as a result of this process, tend to be very straightforward, mirroring the firm's emphasis on the legibility of building systems. As in much of Kahn's early work, the appeal of these projects lies not so much in spatial diversity as in the richness of materials and assemblies.

Site





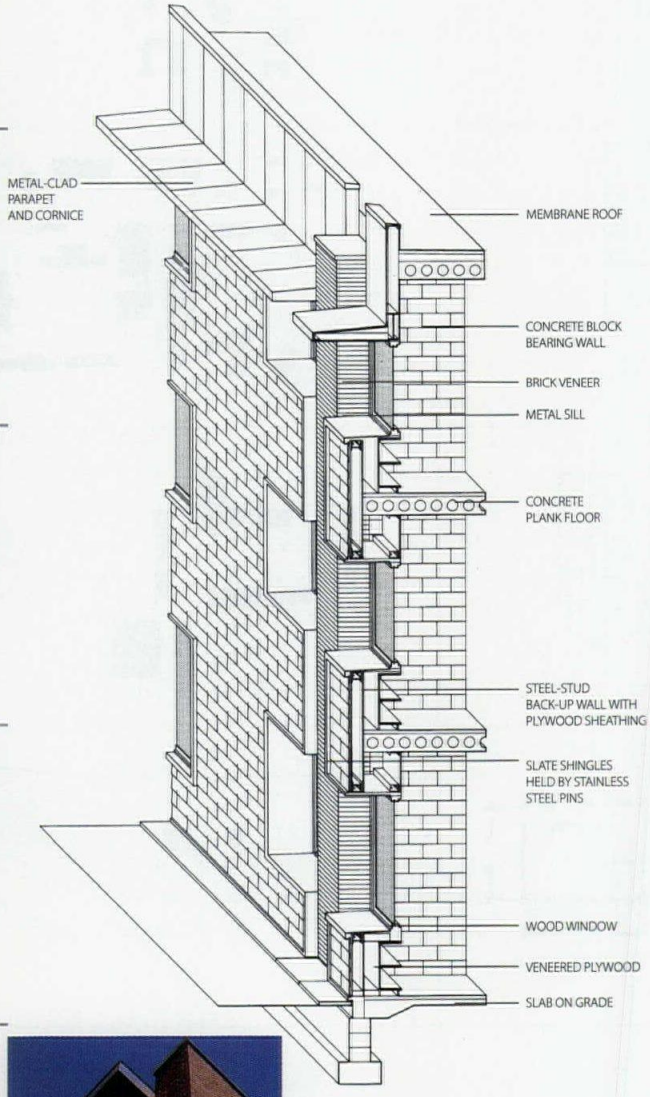


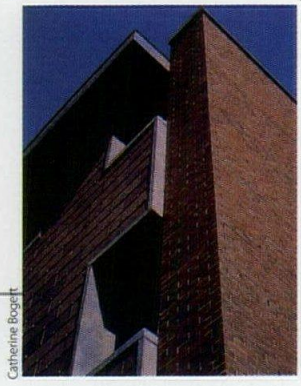


The placement of the buildings – especially evident in the school projects – respects the spatial order (if not always the material palette) of surrounding buildings. The Shipley School building, for example, defines a quadrangle that hardly existed before.

The Ends of Finishing

David Leatherbarrow of the University of Pennsylvania discusses the implications of rain screen walls in two Kieran Timberlake & Harris buildings.

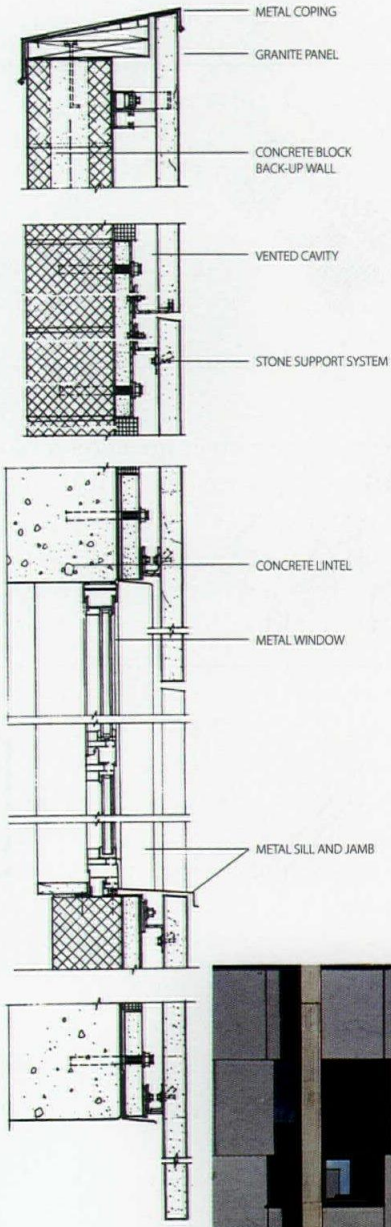


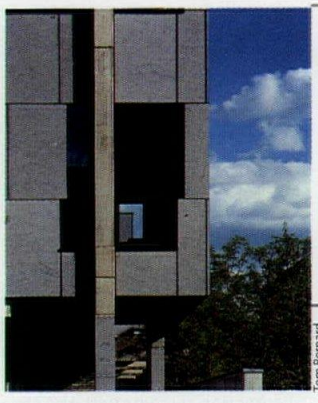


Catherine Bogert

WALL SECTION
MIDDLE SCHOOL,
THE SHIPLEY SCHOOL

4'/1.2m





Tom Bernard

WALL SECTION
UNIVERSITY CENTER,
EAST STROUDSBURG UNIVERSITY

10"/.25m

Finishing in architecture is generally understood to be the process of bringing to an end, of completing or putting the final touches on a building. While we commonly assume that this end is unambiguous and definite, finishing is quite indefinite in contemporary practice – not really final at all. Because Kieran, Timberlake & Harris have accepted this fact, they have designed some of today's better buildings, to be studied as successful projects, but also because they lead us toward a new idea of built architecture as an "open work."

Mass-produced elements are found in varying proportions in all contemporary buildings. Unlike the materials of preindustrial production, these (dry) elements are finished in factories, not on (wet) building sites. As construction utilizes more elements of this kind, for reasons of efficiency, economy, accuracy, and control, site work becomes an assembly process.

Further, when mass-produced elements are conceived together as a system – a cladding system for example – not only are they premade before site work begins, but their position with respect to one another is pre-fixed in the proscribed "logic" of construction. Selection of a system thus "finishes" the design (or some of its aspects) at the very outset of the design process, just as mass-produced elements "finish" construction before site work begins.

To those architects for whom invention is a goal, this realization might seem very discouraging. In the work of Kieran, Timberlake & Harris, however, an alternative conclusion presents itself: mass-produced elements and systems can sustain architectural invention when influences of place and climate are acknowledged and incorporated into the building.

My point of focus is the rain screen wall, different forms of which Kieran, Timberlake & Harris have used in both the Shipley School and the East Stroudsburg University buildings (facing page). Unlike conventional curtain or cavity wall systems, rain screen cladding counters the widespread and seemingly natural prejudice of sealing the outer surface of a building. Rather than imitate the unbroken skin of an airplane or a submarine (enclosures that are essentially placeless), the outer surface of these buildings contains "open" joints that allow (some) rain, wind, and temperature to "pass through" the building's skin into an intermediate vertical channel, bounded on its inside by a weatherproof membrane.

"Finishing is quite indefinite in contemporary practice – not really final at all."

The fact that the building's resistance to climate is on the inside of the wall suggests that the points of potential problems are all those places perpendicular to the waterproof membrane, such as the window and door surrounds, which seem somewhat awkward at Shipley and vulnerable at East Stroudsburg. But my hunch is that the rain screen wall's mediated resistance to climate, which is also a graduated acceptance of place, will prove to be successful in both projects.

These buildings are "open works," then, in two senses: they are open physically to rain, wind, and temperature, and they are open conceptually to systems of industrialized production and to the longstanding characteristics of place, especially of weathering, but also of orientation. When design opens its operations in this way, it brings the project closer to the actual conditions of weathering, while also enriching that "idea." The most instructive, if difficult, lesson to learn from these buildings is that their indefinite beginnings and endings strengthen the project by weakening the controlling hand of the designer.

The author is Chairman of the Department of Architecture at the University of Pennsylvania. His recent books are The Roots of Architecture Invention: Site, Enclosure and Materials *and* On Weathering: The Life of Buildings in Time, *coauthored with M. Mostsafavi.*

The Shipley School
KTH team: Scott Wing, project architect; James Timberlake, Stephen Kieran, Samuel Harris, Patreese Martin, John Poros, Richard Blender.
Consultants: French & Parello (structural); Yerkes Associates (civil), Vinokur-Pace (MPE), George Patton (landscape) Tigue Lighting (lighting).

East Stroudsburg University Center
KTH team: Christopher Macneal, Steven Irvine, project architects; Stephen Kieran, James Timberlake, Samuel Harris, Richard Blender, Richard Hodge, John Poros, Charles Waldheim.
Consultants: Brinjac, Kambic & Associates (structural, civil, MPE), Lisa Roth (landscape), Tigue Lighting (lighting).

Rider College Science & Technology Center
KTH team, phase I: James Wallace, project architect; Stephen Kieran, James Timberlake, Samuel Harris, Amy Floresta, Charles Horak, Richard Maimon; **phase II:** Richard Hodge, project architect; Claire Donato, James Wallace.
Consultants: French & Parello (structural), Boles, Smyth Associates (civil), Vinokur-Pace (MPE), Payette Associates (laboratory).

Camp Snoopy lies at the center of the megamall, under a steel and glass roof. The scale jump from the overhead enclosure to the carnival structures below is unsettling.

Critique: The Vatican of Consumption?

Is the Mall of America the mecca of consumer culture, or just another Midwest attraction akin to the world's biggest ball of string? An inside look at this emporium of the Prairie *by Michael J. Crosbie*

I ventured to the Mall of America as a pilgrim. As a member of late-20th century consumer culture, I could not go to this behemoth in Bloomington, Minnesota, as anything but. One goes to the "megamall"–the largest shopping mall in the country that defines capitalism for the rest of the planet–the way Catholics go to the Vatican, the way Muslims go to Mecca, the way gamblers go to Vegas, the way kids go to Disneyland. I went to the megamall to see how architecture could serve as a vehicle of transcendance, the way it does at those other shrines.

What I found was wanting. It is a big mall: 77 football fields worth of enclosed space, 44 escalators, 12,750 parking spaces, 2.9 miles of hallways, 100,000 daily visitors, 109 surveillance cameras. But as an architectural fantasy it is anemic. It rarely rises above its "mallness." It is not the "metamall."

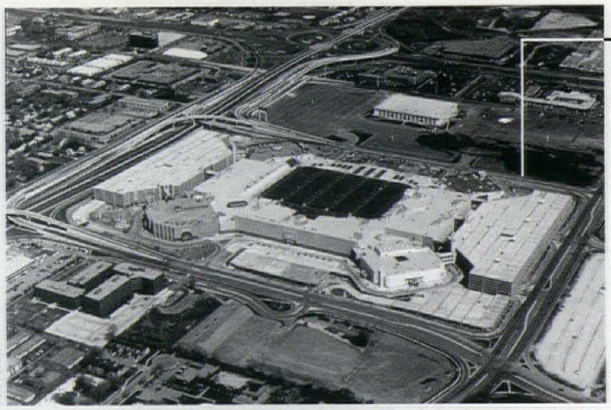
This could not be for lack of talent. The megamall was the brainchild of the Ghermezian family, who developed Canada's 5.2-million-square-foot West Edmonton Mall–that garish, glitzy, otherworldly mall with submarines and "replicas" of European streets, a hockey rink and a beach under glass. The Ghermezians responded to a request from the city of Bloomington to develop the stadium site where the Minnesota Vikings and Twins played before the teams moved to Minneapolis. The Mall of America, at a whopping 4.2 million square feet, was the draw that Bloomington wanted – an attraction that would pull tourists in from 11 surrounding states and two Canadian provinces.

The concept plan for the megamall was designed by Maurice Sunderland Architecture of Calgary, Alberta, architects for West Edmonton. When the Ghermezians teamed up with an Indianapolis-based developer, Melvin Simon & Associates, Simon took the development lead and tapped the Jerde Partnership of Venice, California, to design the megamall. In retail design Jerde is perhaps best known for San Diego's Horton Plaza, a center-city mall that uses bright colors, bold patterns, and a meandering pedestrian path to create an entertaining shopping experience.

Jerde took Sunderland's basic donut parti of retail surrounding a central amusement park and refined it. The four retail legs or "avenues" connecting the anchor stores and surrounding the core were "themed" for variety (four malls in one!) and to help keep shoppers from getting lost. South Avenue is meant to be "upscale and sophisticated" (according to a press release); East Broadway is "high tech and trendy"; North Garden is a "lushly landscaped street"; West Avenue is a "quaint European village." In the middle of it all sits "Camp Snoopy," a seven-acre amusement park cum indoor wilderness run by Knott's Berry Farm, complete with a rollercoaster, water flume, and about 50 other rides.

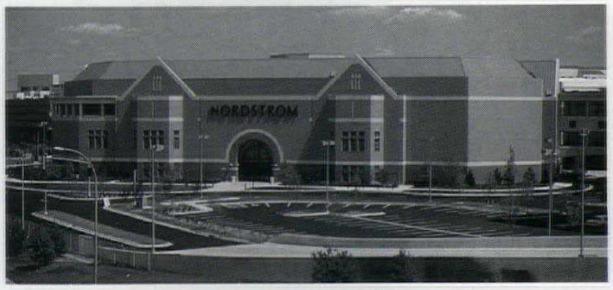
Living on the Edge

I drove to the Mall of America from the Minneapolis-St. Paul International Airport, which is right next door. I could



Bob Perzel

The site is hemmed in on all sides by highways, with the megamall sprawling like a huge spaceship in an Edge City galaxy. Future phases call for hotels to be built adjacent to the megamall.



The facades of the anchor stores are a study in contrasts. This is Nordstrom's quasi-Tudor revival. Experienced shoppers now know where to park to get in and out fast, keeping their trek through the megamall to a minimum.

Tourists come from far and wide to collect their trophies from the megamall. Tour packages now bring visitors from abroad – as far away as Australia and Japan.

Bob Perzel

have taken a shuttle bus, but driving allowed me to circumnavigate the megamall and to get lost before I got inside. The megamall resides in an Edge City netherworld, hemmed in on all sides by six-lane highways and exit ramps. Instead of parking directly, I cruised the ring-road, meandering through strange, back-lot outdoor spaces – a no-man's land inhabited only by tractor trailers, garbage trucks, and other motorists desperately seeking an entry to the parking garage.

The exteriors of the four anchor stores (each seemingly designed by a different architect) are as contrary to each other as they are to the megamall's striped wrapper. Bloomingdale's white marble confection contrasts with Sears' PoMo faux stucco, which plays off Macy's restrained classicism next to Nordstrom's pseudo-Tudor revival. According to Charles Pigg, project manager in the Jerde office, the exterior was to have been covered with super graphics and color to relate to the Edge City scale, but that was cut for budget reasons.

Once in the garage, I quickly found a space near one of the multilevel pedestrian bridges that deliver you into the belly of this beast. The first thing you hear is the screaming. The shrieks of roller coaster riders in Camp Snoopy blend with the gentle strains of muzak and the din of tourist-shoppers promenading through the megamall's three levels. A knot of Japanese tourists passes by, followed by a foursome of retirees decked out in feed caps and polyester pantsuits.

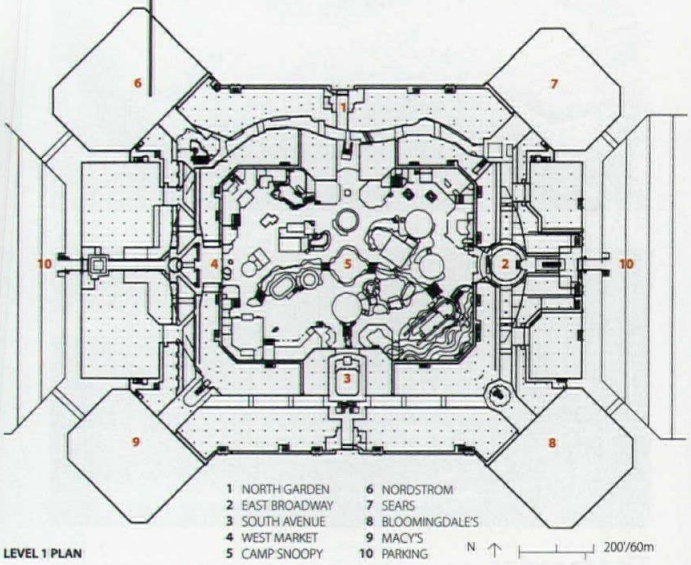
Themes Like Old Times

Because the megamall is one continuous loop, it's possible to walk endlessly around and around the cloister of Camp Snoopy in an eternal quest for consumption. The design of each of the four "avenues" is different from the others, which helps orient one and reinforces the "shopping as entertainment" concept, but they don't live up to their respective "themes." Charles Pigg notes that as the project moved from design development to construction documents the design was value-engineered, and lost a lot of the bright colors and strong patterns that Jerde wanted. Cheaper materials were also selected in reaction to plunging rental rates as the economy moved into recession. "We wanted the mall to be bold," explains Pigg, "but it got 'blanded' out."

East Broadway, the "look of the future, contemporary, upbeat" avenue with an overscaled rotunda for performances at its midpoint, looks more like an airline terminal. The North Garden is a mélange of salmon-colored walls and flooring, hanging flower pots and trellises, and an odd assortment of railings, columns, and street furniture. The garden has a forbidding scale that, contrary to Frank Lloyd Wright's advice, no amount of vines can help. South Street's "cosmopolitan fashion and flair" is meant to conjure images of a Roaring '20s Grand Hotel. But its pink walls, indirect cove lighting, massive pendant fixtures, and fluted columns give it more the ambiance of a gigantic funeral parlor.

Legoland, designed by Jeter, Cook & Jepson Architects of Hartford, Connecticut, is a colorful respite in the midst of the megamall's otherwise restrained, bland decor. The Lego oasis allows parents to relax while their kids play with free samples.

The plan is essentially a donut of themed promenades surrounding the Camp Snoopy amusement park, with anchor stores at the corners. Early plans called for the camp's glass roof to extend over the promenades as well.



LEVEL 1 PLAN

"The first thing you hear is the screaming. The shrieks of the roller coaster riders in Camp Snoopy blend with the gentle strains of muzak and the din of tourists"

By far the most architecturally successful promenade is West Market. It has nothing to do with "quaint European villages," but its Victorian train-shed imagery has just the right amount of unselfconscious allusion to 19th-Century shopping galleries such as Moscow's GUM store. West Market's little kiosks at ground level give it pedestrian vitality, and angled bridges offer welcome vantage points for those who go to malls to people-watch.

But a bigger problem with the themed avenues is their very concept. The Mall of America's themes not only don't suggest the things they're named after, the names have nothing to do with shopping. Why Broadway? Why not Fifth Avenue? Why North Garden? Why not Rodeo Drive? If you wanted to create a metamall, why not theme it according to the great shopping meccas of the world? One minute you're walking down Milan's Galleria, turn the corner and Chicago's Magnificent Mile.

Meanwhile, everyone at Camp Snoopy seemed to be having a good time in this carnival under glass, but the scale of the structure overhead makes the flora and rides seem smaller than they actually are. Rather than a columnless space (like the one at West Edmonton, which was ruled out here because of cost) Camp Snoopy's space is invaded by huge tubular columns that crash incongruously down: steel and HVAC ducts "grow" out of rock outcroppings. The effect is less a sense of bringing the outdoors in than of being inside The Thing That Ate the Minnesota State Fair.

At the opposite entertainment pole from Camp Snoopy is the "Upper East Side," a sort of attic rumpus room for young adults. Here on the fourth floor is a 14-screen movie theater and an assortment of restaurants, bars, and nightclubs that are open until 1:00 in the morning. Once again, the theme seems odd (why not "The Village"?) and the architecture is little more than holes punched into blank walls.

Does it Play in Peoria?

Despite all of the above, the Mall of America has been a success as a shopping mall. If its architecture doesn't stand up to the hype, the 40 million annual visitors don't seem to mind. The Mall of America is pulling them in from far and near. Most visitors come from within 150 miles, but over 30 percent come from beyond that range. Northwest Airlines offers package deals, and many shopper-tourists fly in from Canada, the United Kingdom, Japan, Switzerland, Germany, even Australia.

Five thousand bus tours a year bring serious shoppers from America's heartland. "It's quite the place," noted a woman I spoke with at the megamall. She and her daughter had traveled from North Dakota to visit a doctor, and were taking in the mall as a side trip. A family from Wisconsin, sitting next to me in one of the megamall's numerous food courts, was in town for a wedding and allotted a few days for

The West Market promenade is perhaps the most architecturally coherent piece of the megamall, with its train shed imagery and diagonal bridges. Kiosks line the lower level.

The South Street promenade is pretentious in its formality, with fluted columns, pendant fixtures, and applied moldings. From the ground level, the three-story promenade is daunting, its scale anything but welcoming.

an outing. Other out-of-state visitors were also properly awed.

Do the locals steer clear of this tourist trap? Not exactly. Twin Cities retailers were betting that the novelty would soon wear thin and customers would return to their pre-megamall shopping behavior, but that hasn't happened. A recent survey of Minnesotans found that 80 percent of those polled said that shopping was their main reason to visit the megamall, compared to 51 percent a year before.

"The response to the Mall of America has surprised everyone in the local retail field," says Gail MarksJarvis, a business reporter with the *St. Paul Pioneer Press*. She adds that shoppers who might be intimidated by its size have learned "how to shop the mall." They know where their favorite stores are and where to park to get close enough so that they can run in and out.

The effect on the local urban cores has been mixed. For St. Paul the mall has proved a boon to the city's downtown hotels, which now fill up from the tourist trade. Downtown businesses cater to lunch-time shopping from office workers, and so they haven't been affected much. For Minneapolis, it's a different story. "It would be extreme to say devastating," notes Linda Mack, architecture critic for the *Minneapolis Star Tribune*, "but it's had a major impact on downtown." In the megamall's first year business at Minneapolis's downtown shopping center, according to one estimate, dipped by 12 to 15 percent.

Ironically, the mall's biggest influence has been on Southdale, a shopping mall just five miles away in Edina, Minnesota. Designed by Victor Gruen and completed in 1956, Southdale was the country's first enclosed shopping mall. A safe, clean, environmentally controlled cocoon for shoppers, it spurred the construction of the skyway system in downtown Minneapolis. Now Southdale is under attack from one of its own grandchildren. Girding up before the onslaught, Southdale underwent a renovation and expansion before the Mall of America opened. Sales at Southdale reportedly declined by as much as 20 percent during the first year of the megamall, but have rallied somewhat.

Whither the Megamall?

With such impressive fiscal performance, it's hard to imagine the Mall of America becoming a dinosaur. But as not much else than a big mall it is vulnerable to the next consumer/entertainment fad that comes along. Consumption alone won't sustain it in a world where people hop on the information superhighway to shop.

In an odd way the Mall of America may turn out to be like the Vatican after all. Remember that St. Peter's Basilica, Catholicism's largest edifice, was constructed just as the Protestant Reformation was undermining the power of the Church. Likewise, the Mall of America may have opened just as malls in America began their fall from grace. Between the megamall's groundbreaking in June 1989 and its completion in August 1992, the amount of mall construction nationally plunged by two thirds. The megamall may one day be a quaint relic for a consumer culture that makes its pilgrimages by phone. □

Project: Mall of America, Bloomington, Minnesota.
Design Architects: The Jerde Partnership, Venice, California.
Project Architects: HGA/KKE (Hammel Green Abrahamson/Korunsky Kran Erickson Architects), Minneapolis.
Competition Design Architect: Maurice Sunderland Architecture, Calgary, Alberta, Canada.

Is One Gravel Stop Like Another?

They may all look the same, but a well-designed gravel stop is no accident. Here's a checklist of nine issues to consider. *by Harrison B. McCampbell, AIA*

The gravel stop serves a dual function in roofing. On the one hand it is an edging material, often made of metal, that acts as a termination point for the roofing system it surrounds. Usually bituminous-based roofing materials cannot successfully make a 90-degree turndown without fracturing (most single-ply membranes can), so the gravel stop covers the material at its termination and is flashed in. On the other hand, the stop performs a function for which it is named – simply a device for preventing the roofing gravel that protects the flood coat of asphalt or that holds down a loose-laid, single-ply membrane from spilling over the edge of the roof. It also helps divert water away from the building's wall with a "drip edge" along the bottom.

Here are nine areas of concern in designing or selecting a gravel stop that will fit your particular building's needs:

1 Flange. The first and foremost function of the flange is to provide an acceptable anchoring platform to insure stability. This is achieved with a flange width of between three and four inches. Less than three inches does not allow proper spacing for staggering nails, exposing the stop to possible uplift damage from winds coming up the outside face of the building. More than four inches is simply superfluous. Proper flange width also allows ample spacing of the nails away from the edge of the stop so that the flashing material can safely cover the fastener. At least 1½ inches of membrane adhesion between the membrane's outer edge and the outermost nail are required to diminish the chance of a fishmouth at the nail, which will admit water at a point where a nail penetrates the membrane.

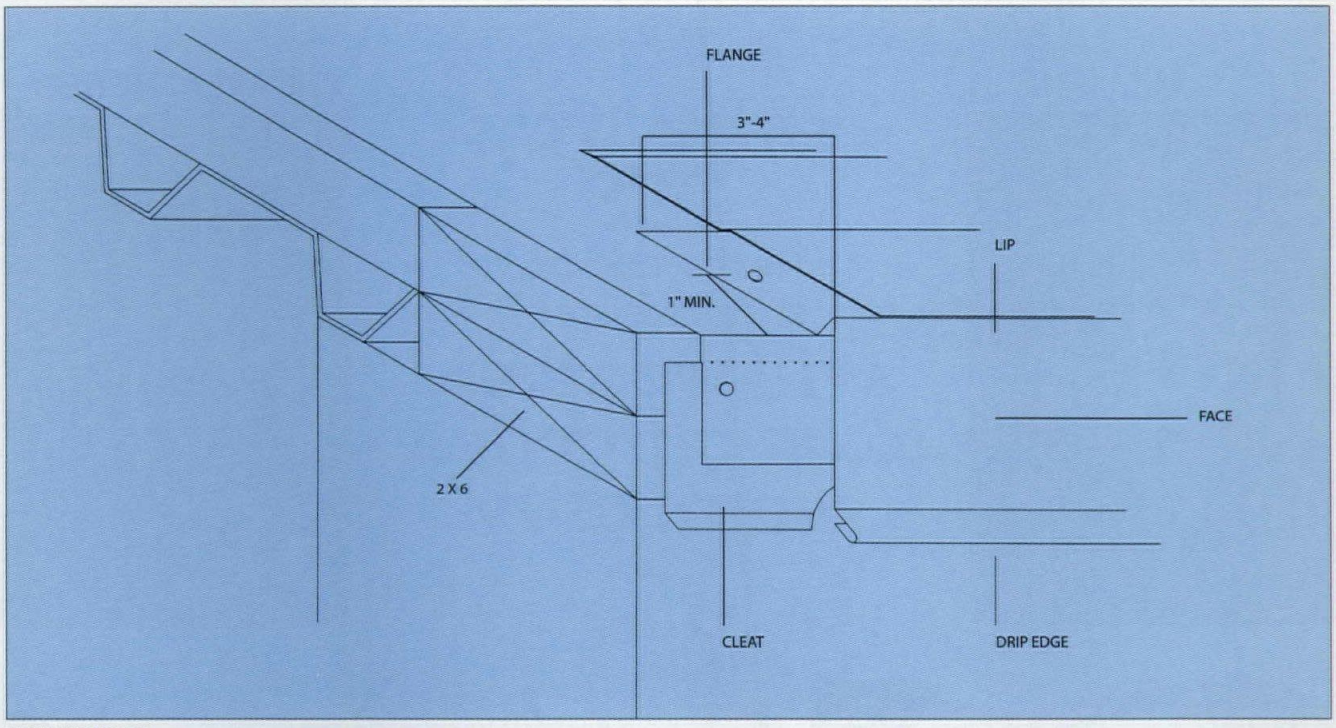
2 Lip. The height of the lip should be only as high as the gravel it holds back. Occasional slots or perforations in the lip are preferred if the height exceeds ¾-inch to allow water drainage. The lip usually turns back at a 135-degree angle but can be done with a 180-degree turn if the metal does not fracture. If a smooth-surface roof is called for, the lip can be practically nonexistent. A straight 90-degree turndown or a small rise, to give a crisp edge along the fascia, is sufficient.

3 Face or Fascia. The outside edge of the stop is its most visible part, and its depth is governed by function and appearance. Too small a face can lead to functional problems, and one too large can lead to problems with metal distortion or wind. The face should be deep enough to cover the wood nailer that the gravel stop is fastened onto. The bottom edge of the face should be at least ¾-inch below the bottom of the nailer, allowing ½-inch for the drip and ¼-inch cover for protection of the wood. If the face exceeds six inches, distortion of the metal will occur (unless the gauge is of a sufficient thickness to prevent it), seriously affecting the appearance of the building. Also, a depth of more than six inches, unless properly secured, can peel up in high winds.

4 Drip Edge. Water sheeting down the face of a gravel stop will tend to migrate back onto the building's façade through cohesion. This can be prevented by simply turning the bottom ½-inch of the gravel-stop face out 45 degrees to form a drip edge. Folding it back with a 180-degree hem will also add to the stiffness and line of the drip, but this presents problems at the joints of the metal unless a cover plate is used.

5 Cleat. This is the exterior securing device for the stop and one of the most important elements of a successful edge termination. It is either a continuous piece (usually made of sheet metal) beneath the drip edge, or individual pieces fastened along a regular pattern. The gauge of the cleat should always be lower (thicker) than the metal it is holding in place.

6 Material. The most common material for gravel stops is galvanized sheet metal. From a life-cycle cost standpoint it makes for a good long-lasting edge material. In some cases, however, the old method of hot-dipped molten zinc has been shown to be superior to the electrolytically "flashed" method used today. For those who want the appearance or who have the money, mill-finish aluminum, stainless steel, copper, and other more expensive metals are good choices. Rubber and plastic have also been used in recent years, usually to offer a wider range of aesthetic choices. Some single-ply roofing



GRAVEL STOP DETAIL

manufacturers offer their own trim pieces that are covered, along with the membrane, in a total-systems warranty.

7 Thickness. A stop of sufficient thickness, when formed on a sheet-metal break, should remain flat in the planes of the face and the flange and hold a straight line along the edges. The SMACNA (Sheet Metal and Air-Conditioning Contractors National Association, 703-803-2980) manual is the best guide for determining a sufficient thickness. Relying on the local (or national) building code to set the requirements does not insure you will get what is best for your project. Codes simply set minimum standards that allow no room for error.

8 Fastening. The SMACNA manual should be used as a reference for the type and frequency of fastening. Areas of concern in holding the stop in place are along the flange, at the joints, and along the drip. Flange fastening is almost always staggered to prevent the face from turning up in a strong wind when the cleat fails. Joint fastening should allow for proper movement between adjoining materials while holding the stop securely. The drip edge is held down with the cleat. The substrate along the edge below the stop should be a treated wood nailer. A 2x6 is recommended to allow ample area for seating the flange and proper room for fastening. If water is to drain over the stop, the nailer should be flush with the top of the roof substrate or insulation. If interior drains are used, a stacked nailer raises the gravel stop to make it higher than the roof plane and to kick it back away from the edge.

9 Flashing. Because most leaks occur at edges and penetrations, it is critical that proper flashing techniques and materials be used. The NRCA (National Roofing Contractors Association, 708-299-9070) manual provides a full set of details for both fastening and flashing along gravel stops for assorted roofing materials. Some areas of concern are compatibility of flashing and roofing membrane materials; proper adhesion of materials; sealant along the flashing edges, if required; ample flashing material past joints and fasteners; and regular maintenance. When installing flashing in a built-up or a modified bitumen roofing system, make sure that the metal in contact with bitumen-based material is primed for optimum adhesion. Set the flange and layers of flashing in roofing cement, for instance, when installing a built-up roof, as an added precaution against water entry. □

The author is an architect and principal of McCampbell & Associates, a roofing and waterproofing consulting firm in Knoxville, Tennessee.

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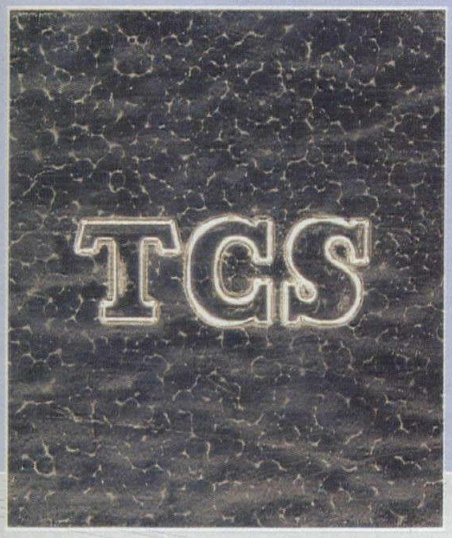

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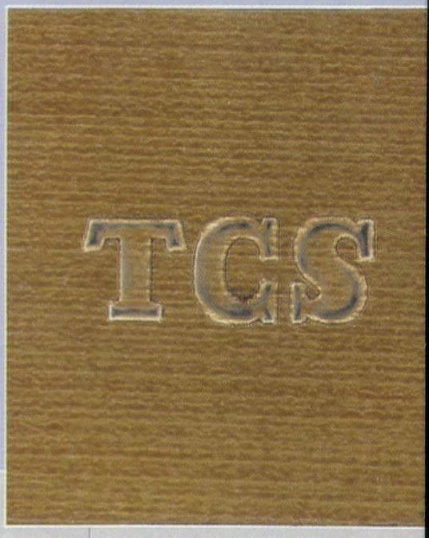
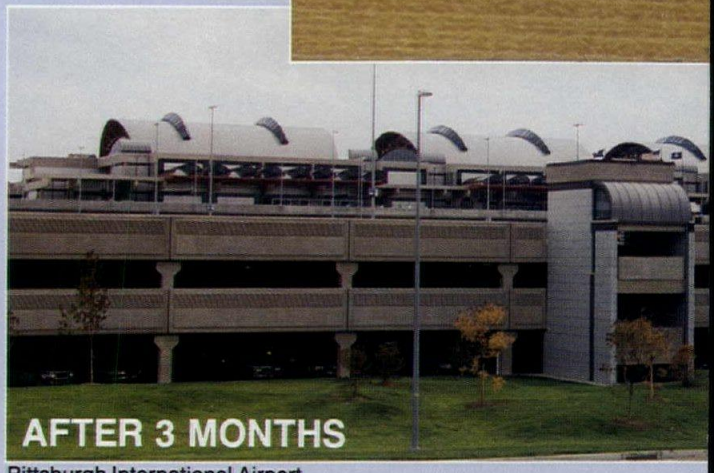


Hinsdale High School, Hinsdale, Illinois
Architects: Cone & Dornbusch



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Roof Warranties: Worth the Paper They're Printed On?

The perils of roof warranties, and how to avoid them *by Steve Hardy*

Abstract: Roofing warranties may provide a false sense of security for the architect and the building owner. Manufacturer warranties often contain exclusions and limits to coverage not explicitly stated. Different types of warranties are appropriate for different kinds of coverage. The owner has certain responsibilities to maintain the roof under warranty. Architects can limit liability with proper roof system design and field inspection.

Roof leaks and liability exposure are facts of life that architects and others in the building trade dread. If a roof leaks, the client often expects the architect to accept liability. Many design professionals use the roof warranty as an instrument to get a leak-free roof and, in the event of a problem, to transfer liability to another party – the material manufacturer that issued the warranty.

But the architect's liability exposure may be increased when specifying a warranty. A warranty does not always guarantee a leak-free roof nor does it always give the building owner relief from roof leaks. As a roofing consultant I have inspected scores of roofs that have failed while still under warranty. Most often the building owner (the warrantee) gets no relief from the material manufacturer (the warrantor). The owner is usually confused, then angry. A warrantied roof usually costs more than a nonwarrantied system, but the owner was told by the architect that a warranty would protect him in the event of roof leaks, so why must he now pay for another new roof?

The Manufacturer's Viewpoint

Manufacturers of roofing materials are not in the design business, a fact they will quickly point out. They only make roofing products, which must be cut, shaped, and placed by roofing applicators to rooftop and roof-deck equipment. Nor do they design, manufacture, or install rooftop or roof-deck components. Therefore, if a roof leaks or fails around a rooftop component, such as a ventilator that is not installed properly, the warranty won't cover it. If the water that intrudes around that component spreads to other areas of the roof, the subsequently affected area and the resulting roof damage will not be covered under the warranty either.

The argument presented to the manufacturer by the architect or owner is: "Your representative looked at the roof and you accepted it as warrantable!" Yes, the manufacturer will admit, "But we are not hired to, nor do we, engage in the design of roof systems. If you will look closely at our warranty, you'll see that we state clearly it does not cover our roofing material when applied to or over items that are not designed or installed to manufacturer and industry standards. We know you are aware of this because you were given a warranty, and this statement is in paragraph D, clause 4, line number 7." You then get out your magnifying glass and read the fine print.

Why You're Not Covered

In further understanding this, a few examples are in order. A rooftop power ventilating fan may come from the factory mounted to a metal base and flange. The base is normally four to six inches high. Roof industry standards and material manufacturers' specification manuals require that all roofing at such penetrations terminate a minimum of eight inches above the roof surface. For roofing to be installed properly around the power fan assembly, it must be raised to the required height by a wooden curb, to which cant strips and roofing are applied. All roofing is then attached at the top of the curb with fasteners eight inches on center. If this is not done (and normally it isn't) then any leakage around the power fan is not covered by the warranty.

Another example is a failure caused by roof insulation not firmly attached to the roof deck. The unattached roof insulation moves and warps, causing the roof system to split and crack. When confronted with this, the material manufacturer may deny coverage under warranty because its specification manual and industry standards state that all roof insulation must be firmly attached to the roof deck or substrate. Their inspector has no way of knowing that the insulation is not

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The author, a roofing consultant with Summit Specialty Systems in Nederland, Texas, specializes in evaluating roofing systems and system design.

attached when he performs the warranty inspection of the completed roof.

Any damage caused by traffic across the rooftop (window washers, HVAC mechanics, etc.) is not covered under a warranty. Also normally excluded is damage caused by ice and snow, acts of God, roof loss or damage caused by ponding water, damage or loss because of deck deflection or movement, sheet-metal flashings, and damage caused by expansion and contraction of such. Some warranties don't cover any of the base flashings, even though they are bituminous materials produced by the manufacturer. In order to get a warranty for these items, a "Flashing Endorsement" may be required.

The Exclusion Game

Often there is not enough money in the budget to install a superior roof system, including dual layers of roof insulation, wood curbs for power fan motors, raised blocking at roof edge, etc. If a manufacturer will not issue a warranty because the roof as designed doesn't have all the bells and whistles required by stringent roof industry standards, the architect's normal response is to find a manufacturer that will. In order not to lose the job, the sales representative will issue a warranty with the normal exclusions.

One exclusion is of materials that warrantors do not manufacture. Most warranties cover only items by the manufacturer, unless specifically stated otherwise. When a roof fails it is almost always directly related to the components not manufactured by the warrantor. And the building owner is out of luck.

This hazard can be avoided by designing and specifying a roof having a "full system warranty." All materials used in the roof should then be included in the warranty. A full system warranty fee (either a lump sum or one related to the roof area) is normally required. In many cases the most expensive components the manufacturer produces are required, sometimes in generous amounts.

A Necessary Evil

Many manufacturers hope that eventually labor and material warranties will be a thing of the past, because of misunderstandings between parties about responsibility and remedies offered under warranties, as well as the manufacturers' cost of warranty administration and legal expenses.

Manufacturers are in the business to produce and sell products. Without sales, they cease to exist. Sales representatives use the warranty to sell materials. If one manufacturer initiates a warranty program that no other manufacturer offers, that manufacturer will start to take product sales from the others. Architects want

Are You Covered?

How prevalent are roofing claims? DPIC Companies, a provider of liability insurance for design professionals, recently released statistics on the subject. The statistics derive from analysis of 400 claims where roofing was the principal issue, and resulted in more than $12.5 million in covered losses. Analysis found that:

- Roofing problems were the primary factor in nearly 10 percent of all closed claims against architects, followed by walls (9 percent), construction administration (8 percent), HVAC, and flooring (both 7 percent).
- Approximately 40 percent of roofing claims were filed within 12 months of the date the alleged error was made.
- In 68 percent of the cases, the owner/developer/client filed claims for roofing problems. Third parties filed 20 percent, while contractors/subcontractors filed 11 percent.
- Three building types make up more than half of all roofing claims: condominiums (19 percent), commercial/industrial projects (17 percent), and schools (15 percent).
- The average insurance payment on a roofing claim was more that $62,000. Hospitals were the highest (averaging $145,000), followed by prisons ($115,160),and high-rise hotels ($110,000). Condominiums averaged more than $76,000.
- Seventy-one percent of roofing claims were filed over design errors. Other causes included specification errors (10 percent), inadequate construction observation (7 percent), negligent inspection and poor work safety (both 4 percent).

Michael J. Crosbie ■

the most comprehensive and long-lasting warranty they can get for the least cost. A vicious circle is set up, where manufacturers cannot allow one particular product line to offer a warranty program that is superior to all others.

Warranty claims and the related expenses have caused major manufacturers to abandon, sell, or bankrupt entire product lines. As roofing becomes more expensive, lawyers become more aggressive. To boost sales and marketing, warranties also become more aggressive. Manufacturers have no choice but to play the warranty game. If they abandon or curtail their warranty program while others do not, their sales can be drastically affected.

Warranty Types and Conditions

Roof warranties fall into four common categories:

- warranties that encompass material performance only;
- labor and material warranties, which are prorated and decrease in value as the roof ages;
- warranties that will pay to only a specific dollar limit, which usually does not exceed the cost of the original installation;
- no dollar limit (NDL) warranties that pay all material and labor cost, no matter what the amount. An NDL warranty is usually provided for only a full system warranty design. If your client requires a roof warranty, a full system NDL warranty is the best, but be prepared to pay top dollar for it!

Some manufacturers offer dual-term warranties, such as five-year/five-year or ten-year/ten-year. At the end of the first term the manufacturer and contractor examine the roof. Any additional work required to renovate and restore the roof is performed at a cost to the building owner. The second term of the warranty is then initiated. Additional exclusions may be added for the second term.

Owner Responsibilities

An important item often overlooked is the owner's responsibility under the warranty. The owner cannot directly engage a contractor to do work on the warrantied roof system. Instead she must notify the material manufacturer of any roof performance problems or any additions or renovations planned for the roof system. The manufacturer then provides written approval of the proposed work and a list of the approved contractors to perform the work. If this process is not followed, a warranty will often be voided. A complete paper trail is important.

Periodic inspection of the roof system, although not a specific requirement of a warranty, is strongly urged by material manufacturers. If large areas of the roof system deteriorate or fail because of lack of inspection and care by the owner, it is possible that the warranty will exclude coverage for such losses.

Although warranties may cover both labor and materials, coverage may be denied if the materials are not installed to the manufacturer's specifications and requirements. Only manufacturer-certified and -approved applicators can install warrantied roof systems. Manufacturers screen contractors before certifying them and have training programs for applicators.

Usually a contract between the contractor and the manufacturer states that any problems experienced on the warrantied roof shall be repaired at no labor cost to the manufacturer. If leaks develop because of improper application of materials, the original roofing contractor is legally bound to repair the affected area at no cost to the manufacturer.

In the event the roof leaks because of improper application of materials and the original contractor is no longer in business, the manufacturer may not be legally bound to the owner to correct such deficiencies. Warranties state in the exclusion section that all materials not installed to all of the manufacturer's current published specifications and requirements are excluded from coverage. This means that all requirements in the manufacturer's specification manual may apply to the construction; these specification manuals are several inches thick.

Manufacturers will not (and should not) design the roof for you.

A cursory inspection of the completed roof by a manufacturer's representative cannot determine the adequacy and correctness of many items such as: inner-ply bitumen moppings; temperature of the bitumen during construction; placement and installation of roof insulation; flashing plies at roof penetrations, etc.

How to Cover Your Assets

There are ways architects can protect themselves and the building owner. The best way is to design a complete roof system. All roof penetrations and details must be accurately and completely drawn, noting all roofing and flashing components to be used. Often architects go to the National Roofing Contractors Association (NRCA), the Sheet Metal and Air-Conditioning Contractors National Association (SMACNA), or material manufacturers' manuals and copy standard details. But the actual roof penetration, equipment, or component is usually not the exact design, shape, height, or configuration illustrated in the standard details. The detail must be tailored to your design.

During the design stage, one should consult a technical representative in the roofing manufacturer's warranty department. Sales representatives are usually very competent at

sales and service, but for technical assistance and guidance go directly to the manufacturer. Fax your preliminary drawings and design information to the technical consultant. If it is a reroofing project, send photographs, core sample analysis, and any other survey information that could be helpful. I have found that most reputable manufacturers are very willing to work with the architect at this stage, and it's free!

However, manufacturers will not (and should not) design the roof for you. This will put them in a position of liability they will not assume. When a design is completed, send the entire set of contract documents to the warranty department for review.

Working With the Contractor

During the contractor-submittal process, require a letter from the manufacturer's warranty department stating that all contract documents relating to the roof system have been reviewed, that all materials are physically and chemically compatible with each other, and that the system, as designed, is suitable for the specified warranty. If a full system warranty is specified, require a statement from the manufacturer verifying that all materials, from the roof deck up, excluding metal flashings but including the roof materials used to seal the metal flashings, are included under the warranty. Also require a statement from the manufacturer that the roof contractor is an approved applicator of the material manufacturer and is in good standing. The address and location of the building should be included in the written statement from the manufacturer.

Submittals should also include every item that is to be used in roof construction. Submittals must verify that all materials conform to references within the specifications as they relate to, but not limited to, American Society for Testing Materials (ASTM), Factory Mutual (FM), and/or Underwriters Laboratories (UL) standards. Since contractors often select materials that are equal to what was specified, send the entire submittal package to the material manufacturer for review and approval.

This may seem like a lot of trouble, and some manufacturers will not want to provide the statements listed above. By the time you get to the contractor submittal process, the bidder will have found a manufacturer who will work with you on the project. It is to the manufacturer's advantage to work with you. If the roof system is designed and specified completely and installed accurately, the roof should last the intended life span.

Field Inspection

One other problem remains. We know that we have a proper and complete roof design, but how do we know that the roofing crew is going to install the system as designed and specified? A full-time, qualified inspector is the best investment of the client's roofing money. From a liability position it is ideal if the owner hires the inspector. However, many manufacturers can suggest a qualified roof inspector. The key word here is qualified. The roofing manufacturer's sales representative can usually provide the names of local people who are qualified inspectors.

Since full-time inspection normally costs from 5 to 8 percent of the total roof cost, it is often not provided. In that case, the roofing foreman should be required to complete and submit a daily report. The report should list the major items of concern during roof construction, such as acceptability of roof deck, proper layout and attachment of roof insulation, ambient temperatures, weather conditions, size of crew, and type of equipment used that day.

If a built-up roof is being installed, list the temperature of mopping bitumen (at the mop cart) and the temperature at the kettle of the heated bitumen. These readings should, at a minimum, be taken hourly. Also require the foreman to confirm that a sufficient "puddle" of hot bitumen was present at all times in front of the roof felt roll during installation, that all felts were completely broomed in, and that workers stayed off roof felts until the bitumen cooled to ambient temperature.

A full-time, qualified inspector is the best investment of the client's roofing money.

You can include a daily report form in your Contract Documents (the best way) or you can require the contractor to submit a report form to you for approval prior to beginning work. Include a roof plan, usually on the back of the form, and have the work area for that day shown on the drawing. In addition, require the contractor to take photographs daily during the roof construction process.

Conclusion

It should be understood that this discussion of warranties has been in the broadest terms. Since a warranty is a legal instrument, lawyers are the people best qualified to determine how the wording is to be interpreted, what is the manufacturer's intent, and how relief is provided under terms of warranty. Each manufacturer's warranty program is different, and each warranty claim must be evaluated on a case-by-case basis. But keep in mind that an unenforceable warranty may increase your liability, not diminish it. □

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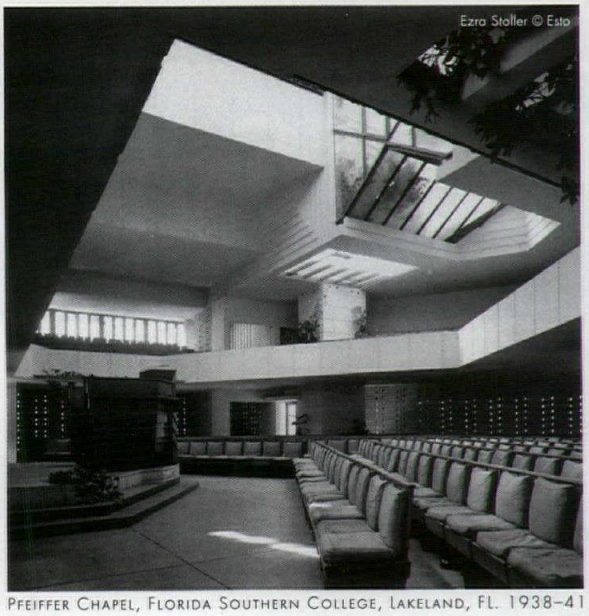
MAY COME INSIDE,
AND THE INSIDE
MAY, AND DOES,
GO OUTSIDE.



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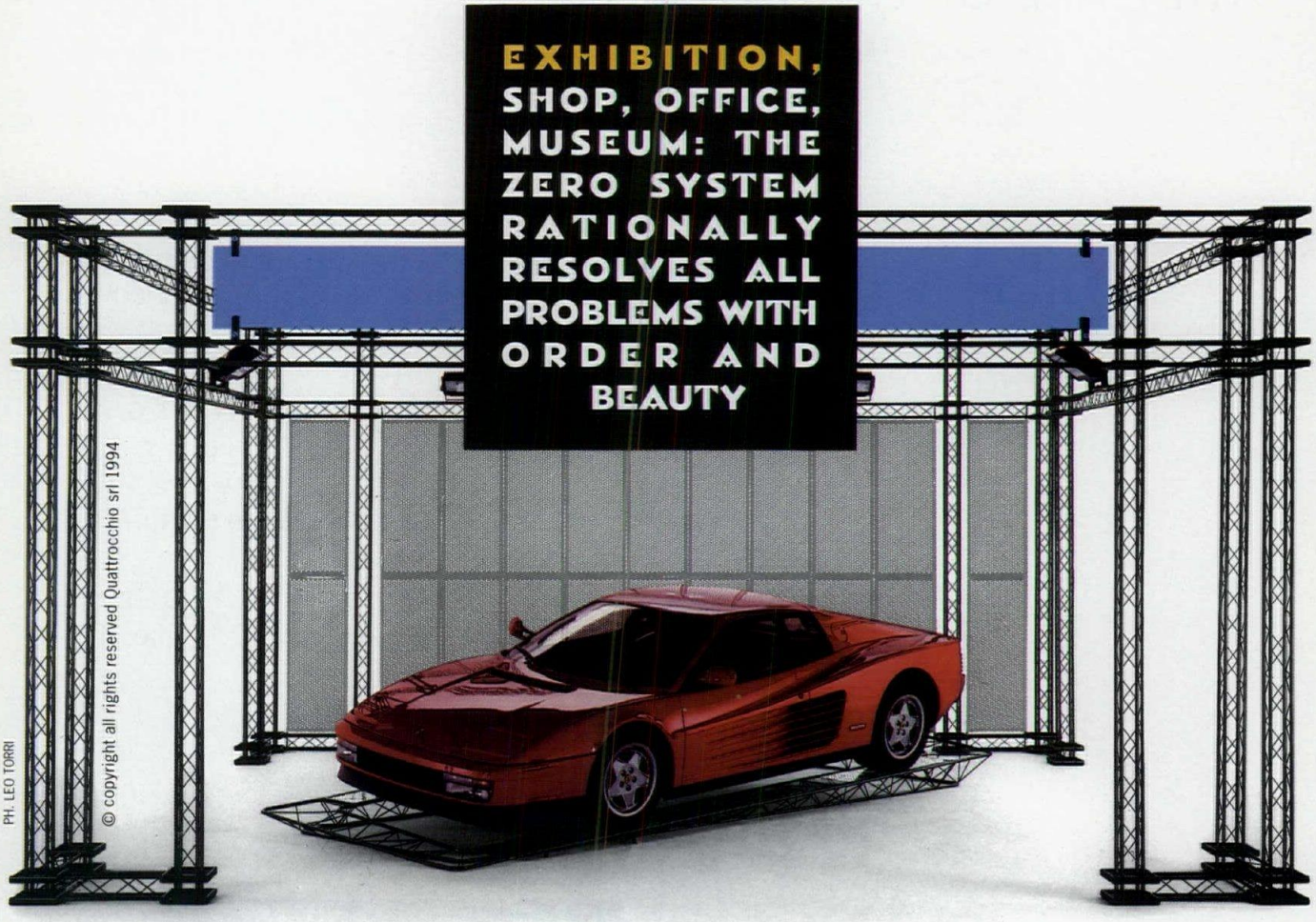

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Keep a Lid on It

A Design Guide on How to Prevent Roof Blowoffs

by Kevin Cash

Abstract: Roof systems can be damaged by winds below hurricane force. The way roofs are affected depends on roof height, design, method of attachment, and surrounding structures. A checklist for designing wind-resistant roofs is provided.

1 An adhered roof system exposed to high winds has delaminated at the insulation facers.

Hugo. Andrew. Iniki. Over the last several years we've seen the destruction that high winds can cause to buildings, on a large scale. Much of the destruction has been to roofs and roof structures. The current industry literature is filled with narratives of what happened and why. But roofs suffer wind damage every day, and at wind speeds far lower than hurricane force. While we can learn from the results of disasters, how can architects improve the performance of roofing systems under "normal" conditions?

The document most referred to by structural engineers for structural and cladding design is ASCE 7, "Minimum Design Loads for Buildings and Other Structures." It incorporates design for wind in Chapter 6. Yet the industry standards most used make no reference to this standard, and have different requirements. This wind design check list presents issues to consider when designing roofs for wind resistance. Design of actual components can be left to the manufacturer (the size and spacing of fasteners for instance), but the specific design requirements should be set and checked by the architect.

Mean Wind Speed

Design is based on the mean wind speed in a certain location. From this number a general uplift value is calculated and modified by coefficients for edge effects and an "importance factor" of the building. (Hospitals, emergency buildings, etc., are considered to have greater "importance" than other structures.) The wind speeds are determined from charts published by various entities, the two most common again being American Society of Consulting Engineers (ASCE) and Factory Mutual (FM). The ASCE chart uses a 50-year return interval (2 percent chance of achieving a given wind speed in any given year) while the FM chart uses a 100-year return interval (1 percent chance in any year). For important buildings, or those insured by the group of insurance companies that require compliance with FM recommendations, the FM chart is more appropriate. For the average industrial or commercial building, ASCE may be more appropriate.

Height

The height of the roof and of surrounding structures has a great influence on wind loads. The wind velocity given in the ASCE and FM charts is measured 30 feet above the ground, and increases with height. But it's not just the height of the roof or of buildings that needs to be considered. For a building on a hill, the effective height is increased by the hill's height. For a building in a valley, the higher surrounding hills can channel the wind, dramatically increasing wind speed. Local geographic conditions must be known and accounted for, but these can be neglected by manufacturers unfamiliar with particular building sites. Similarly, the effects of surrounding construction must be considered.

All the various design methods take this into account through terrain roughness tables. Research under way at the University of Western Ontario's Boundary Wind Tunnel confirms that groups of buildings of the same size reduce effective wind speeds but increase turbulence. How this affects roof loads is still under study.

Perimeter Condition

Wind loads are generated when the wind flow is interrupted. The interruption causes a "stalling" or slowing of the wind speed. This reduces pressure, causing suction on the roof. The effects can be magnified if eddies of turbulence are formed. Once the stalling effect is overcome, the wind resumes a relatively uniform flow. This explains why perimeters generally see higher wind loads than interior areas. The wind stalls

The author, an associate with Simpson Gumpertz & Heger in Arlington, Massachusetts, is a frequent contributor to P/A on roofing technics.

at the perimeter, increasing uplift, and becomes more uniform as it passes over the general roof area. Several things can affect the magnitude of the perimeter loading:

Wind direction. Generally the worst loads are generated by a quartering wind (45 degrees to the corner). Current practice is to use the worst-case loads for design. Work on high-rise structures in the boundary wind tunnel, however, has shown that a "smeared" effect, taking into account wind flows from all directions, can be more appropriate. Current research at the University of Western Ontario and at Texas Tech is attempting to quantify this and gust effects for low-rise buildings.

Edge height. Parapets can be detrimental or helpful, depending on their height. Parapets tend to create turbulence as the wind flows over them and down the back side. This turbulence can dramatically increase uplift pressures at the perimeter when relatively low parapets (under three feet) are used. Higher parapets tend to force the turbulence away from the perimeter, so the effects are smaller, but felt over a larger area. Low roof edges do not induce significant turbulence to increase wind effects. The loads are simply based on stalling pressure differences.

Edge details. The calculated uplift loads on roofs are currently based on the assumption of airtight construction. Vented overhangs, large open structures or structures with large openings, or mechanical conditions (positively pressurized buildings from HVAC or stack effects) may increase loads. Gaps or discontinuities at perimeters can permit air infiltration under the membrane. The roofing industry is just beginning to understand and implement the use of air barriers for these types of construction. Air barriers will become more common in the future to help control uplift loads, and to assist in controling moist air movement in buildings.

Rising walls. These elements should be considered a part of the roof perimeter. The turbulence created by these walls may increase uplift on the roof at the wall base more than at what is traditionally considered the perimeter. Penthouse walls and large rooftop-mounted HVAC units can create turbulence, and hence, increased loading.

Particular care is needed in typical industrial/commercial low-rise areas where high parapets (for signage or as HVAC screens) are used on the fronts of buildings. These parapets rise above the general roof height of the low-rise area and may subject the roof below to significantly increased uplift pressures, particularly if the parapet faces the prevailing wind. We have seen damage to mechanically fastened roof systems where the screw fasteners either backed out or were pulled out of the deck at the base of these high parapet walls because of the increased pressure (2).

System Review

Each roofing system has its own potential problems from wind loads that require review during design. Systems are generally classified by their method of attachment:

Calculating Perimeter Size

The size of perimeter areas such as corners and edges is currently calculated in a variety of ways. FM uses eight feet as their corner/perimeter dimension. The Single-Ply Roofing Institute calculates corner and edge sizes based on building height. ASCE uses both building height and plan dimensions. Which method is correct?

The most conservative method for edge width calculation is ASCE, but even it does not take positive pressure effects into account. For these special conditions or for structures that use lightweight structural metal decks or roofing, the maximum load will occur at the structural inflection points. The perimeter width should be considered as twice the distance from the edge to the inflection point, or the ASCE calculated width, whichever is greater.

Fully Adhered

The membrane is adhered to its substrate with an adhesive. Built-up roofing is a fully adhered system, and most single-ply systems can be fully adhered. The substrate can be insulation, either mechanically fastened or fully adhered to the structural deck (depending on the deck), or it can be the structural deck itself.

It is rare to achieve full adhesion with any material because of irregularities in the substrate and the inability of the membrane to conform to these small irregularities. If the unadhered areas remain small (generally less than one inch in diameter) blisters in built-up roofs will not form, and there is little chance that single-ply membranes will be affected. As the number and size of defects grow, however, blistering in built-up membranes is more likely, and the single-ply membrane adhesive "peels" (its weakest failure mode) as the wind blows across the roof surface, causing further debonding. Unadhered areas can be reduced by keeping insulation butt joints (a prime cause of irregularities) smooth and tight.

The second major problem with fully adhered systems is delamination of the insulation facers (1), particularly isocyanurate insulation. The adhesive strength of the insulation facer is typically the weak point in the assembly, and it should be evaluated as part of the design.

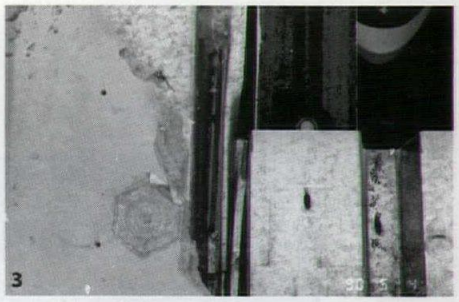
A third problem with these systems is fastener back-out. This can be alleviated easily by mechanically securing a layer of insulation, and covering it with a second, denser layer of insulation set in an adhesive such as hot asphalt. Joints in the insulation should be staggered to reduce the tendency of joints to "telegraph" through the membrane, and to reduce air infiltration to the membrane.

Ballasted

The membrane is loosely laid over the substrate, and is held in place with stone ballast, cement-covered insulation boards, or pavers. EPDM is the most commonly ballasted membrane, although PVC membranes can also be ballasted.

Ballasted roofs are the heaviest roofs available. Generally

the structural designer assumes a ballasted roof to weigh 10 to 15 pounds per square foot, depending on office practice. They often weigh more, particularly when pavers are required. The roof designer must coordinate his requirements for ballast with the structural engineer. In retrofit projects, it is imperative that the structure be checked before installing a ballasted roof. Many cities do not permit roofs to be ballasted with loose stones because they can become projectiles in highwinds.



2 Suction at the base of a wall can cause screw fasteners to pull free or back out.
3 Elongated holes in light gauge metal deck are created by membrane fasteners oscillating in high winds.

The effective uplift on a ballasted roof can be significantly reduced by applying it over air tight structures. If the building will have metal deck construction, then an air retarder should be used. For roofs under 100 feet high, the Single-Ply Roofing Institute (SPRI) publishes a design guide for ballasted roofing. Cross referenced with the wind loads developed from ASCE, this document generally produces good, conservative designs for the size and weight of ballast required. The size of the ballast is just as important as the weight used. The larger the ballast, the less likely that it will be displaced by higher winds. Many manufacturers have special requirements for roofs over 70 feet, and they should be consulted for these requirements.

For higher roofs, pavers are generally required. Paver weights need not equal the uplift forces calculated by ASCE to be effective. Pardo and others have shown in tests that air circulates between the pavers, permitting pressure equalization, reducing the effective uplift force. The results of these tests are expressed in straightforward charts that utilize wind speed, as opposed to uplift pressure.

Mechanically Fastened

The membrane is secured with bars or discrete fasteners, through any insulation, to the structural deck. These are typically used over metal decks, although they can also be used over concrete decks. Most single-ply membranes can be mechanically fastened.

The use of mechanically fastened systems is currently being questioned. FM created a new, larger testing frame to qualify mechanically fastened systems, claiming it to be a more accurate representation of the "real world" because it reduces the influence of edge clamping effects. Few systems passed the new test with their old fastener spacing. Unreinforced systems performed particularly badly. For the moment, architects should not use mechanically fastened unreinforced membranes.

The fastener is the heart of the system. Its attachment design should be based on field pull-out tests, with appropriate safety factors. Since mechanically fastened roofs flutter as the wind blows across them, the fasteners are subject to dynamic, as well as static, loads. The field test program should include dynamic cycling in place of the fastener in the deck. The tear resistance of the membrane must also be considered.

As the fasteners undergo uplift cycles in the deck, two problems may occur. Screw holes in light gauge metal decks can become oval in shape (3), reducing pullout values from over 300 to under 25 pounds. This problem is more likely with increasing thicknesses of insulation (the moment arm of the screw becomes longer). Tests on steel stud/brick veneer walls led the Brick Institute of America to recommend 18-gauge metal studs as a minimum to prevent screw fastener pull-out. And the screw fasteners in walls are spaced closer than those put in roofs! Serious consideration should be given to increasing the thickness of metal decks for mechanically fastened systems.

When checking shop drawings of fastener layout, make sure the lines of fasteners run perpendicular to the metal deck. If they run parallel, the fasteners will load a single rib of the metal deck, seriously overstressing it. Also, make sure the structural engineer has designed the deck for uplift loads; metal deck attachments today are typically designed for only shear loads.

Conclusion

Architects can provide owners with wind-resistant roofs. But they should not depend solely on the membrane manufacturer to understand all the challenges a particular building may present. The manufacturer can make recommendations, but it is up to the designer to decide whether these are adequate. This can be done only if the designer understands the forces at work and the limits of the materials. □

Recommended Reading

"Wind Design Guide for Single Ply Roofing Systems," Single Ply Roofing Institute, Deerfield, IL., (708) 940-8800.

"ASCE 7-88, Minimum Design Loads for Buildings and Other Structures," American Society of Civil Engineers, New York, NY, (212) 705-7496.

"Dynamics of Roofing Membranes in Wind," M.S. Zarghamee, ASTM STP 1088, Wallace/Rossiter, Philadelphia, 1990.

"Wind Test Methodology for Loose-Laid Elements and Components," J.E. Pardo, ASTM STP 1088, Wallace/Rossiter, Ed., Philadelphia, PA, 1990.

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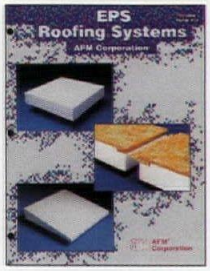

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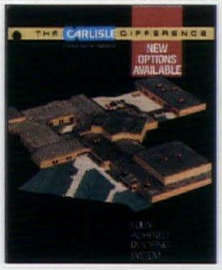

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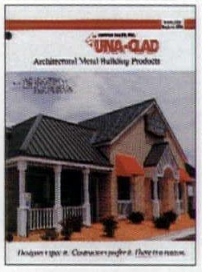

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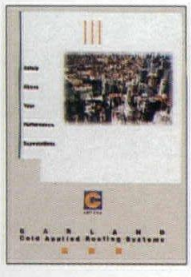

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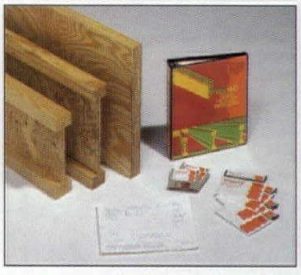

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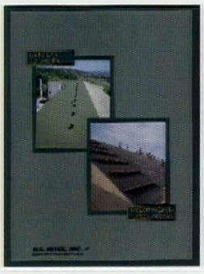

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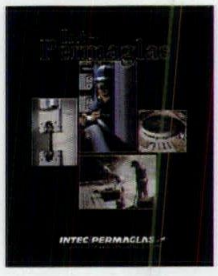

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Hype vs. Reality: The Changing Workplace

(continued from page 55) of architects and their capacity to function as part of an integrated design/engineering team become all the more crucial when one considers how clients in this market have changed: they require considerably more than "good image" from architects and many are increasingly savvy about what they need. "American companies are rethinking themselves; they're more self-conscious than anybody in the world right now," observes Michael Jaroff, director of research and special program development at MIT's school of architecture. "The clients are driving the process." In the case of sophisticated clients, cognizant of the course before them, architects should certainly not be the ones to hold them back. And in the case of short-sighted or ignorant clients, architects should be in a position to provide imaginative guidance.

The Macro Challenges

Back to the big picture. In speculating on the consequences of a rising number of people working at home, due to the institution of involuntary telecommuting, Pittas draws a fascinating scenario for American communities in which the adult daytime population will increase substantially. Beyond the impact they are bound to have on the local economy, such homeworkers are likely to become more civically involved (see excerpt from interview, page 55). Also, electronically linked professionals would not need to relocate for a job. And so, from "communities of nomads," Pittas suggests, we would see the emergence of "communities of place."

It's encouraging that thinking along the lines of reinventing Main Street is actually being implemented, and at the government level, no less. Loftness points to a series of pilot projects launched by the Feds, in which satellite offices in the suburbs surrounding Washington, D.C. are being established to ease long commutes. At a telecommuting symposium held last June by the GSA, Loftness recalls, "one of the recommendations we made very strongly was that they should not be building any new buildings but rebuilding Main Street in lots of small towns."

Winchester, Virginia, is the site of one such pilot project: a telecommuting center designed to accommodate up to 40 workers in 14 nonterritorial workstations, housed on the ground floor of a retrofitted building overlooking the town's pedestrian mall (see pages 54–55). By some reports, the bureaucracies that are supposed to free Federal employees for telecommuting may have to be dragged into it kicking and screaming; nonetheless, Loftness says, architects may "create the idea that telecommuting can go back and recapture the most romantic of our existing infrastructure." That will require further change in the way archi- *(continued on page 91)*

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Hype vs. Reality: The Changing Workplace

(continued from page 89) tects perceive their role. "Rebuilding communities has tremendous market potential," Loftness contends. "But architects need to be proactive – they can't wait for corporate giants to rediscover Main Street. They really have to be the instigators in making that happen."

Finally, there is the question of how telecommuting and the proliferation of satellite offices will affect downtown. Brill offers a gloomy prognosis for new office building construction in the city centers, as the vacancy rate exceeds 20 percent.

Pittas, spinning off a corollary scenario for the downtown office glut, suggests that we are rapidly approaching the point where adaptive use of Class A office towers, for new types of mixed-use housing and offices, is becoming economically feasible and even desirable (see portion of interview, p. 53). The introduction to downtown of a full-time population, in addition to many workers who will continue to commute, reestablishes the threshold for various services absent till now in our central business districts.

This is Your Wake-Up Call

It's clear that the changing workplace offers architects much more than just commissions. Whether in exploring how to introduce communal space into the office, or how to shape the public realm of our small towns, or how to bring affordable housing to our city cores, these are vast cultural opportunities the likes of which we have not seen for decades. Pittas invokes the "socioeconomic, technological imperatives" of the 1920s and 1950s, remarking how "Wright, Corb, Mies, all redefined the workplace – Johnson Wax, the United Nations, Seagrams were absolutely radical departures from what had been the idea of workplace and they became prototypes for 50 years' worth of development." It would seem that architects may have as important a part to play now, with one crucial difference: we should be doing this in collaboration among ourselves, pooling knowledge and expertise within the profession, as well as cooperating with other disciplines. Such complex challenges can no longer be the province of the lone hero.

This feature is the product of a collaboration between Senior Editor Ziva Freiman and Associate Editor Abby Bussel, who researched and compiled the design examples presented here.

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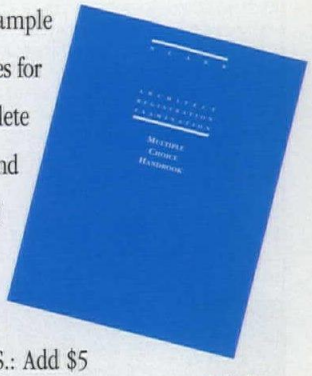

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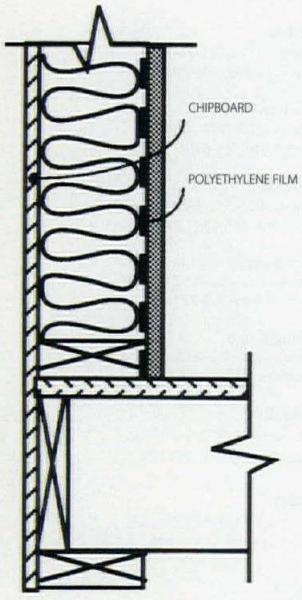
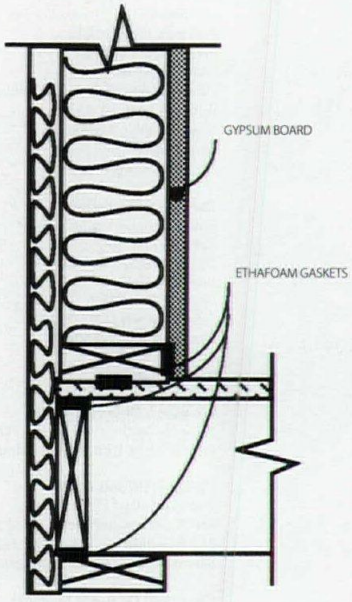
Selected Detail

Wood-Frame Airtightness

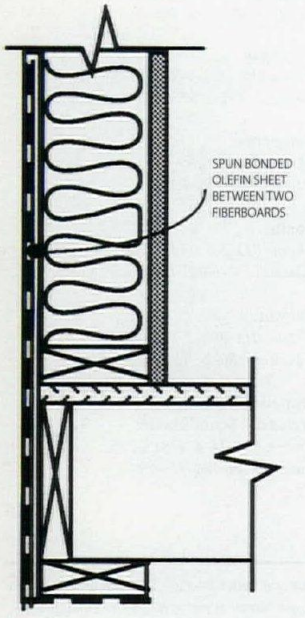
CSI DIVISION 06112



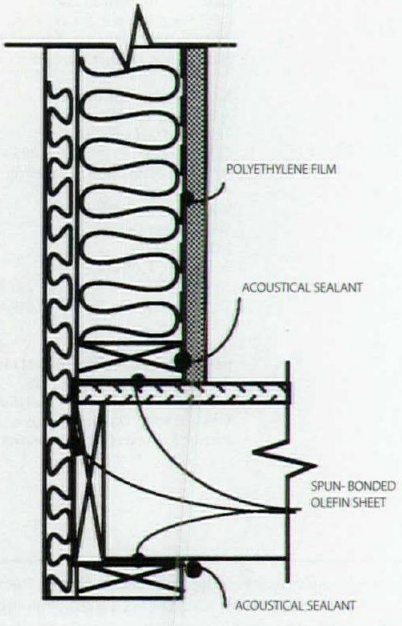
1 TRADITIONAL



2 AIRTIGHT DRYWALL



3 EXTERNAL AIR BARRIER



4 POLYETHYLENE INSERT

Tests on four types of wood-frame header joist assemblies revealed a clear advantage of one over the other three for airtightness. The assemblies tested included: a "traditional" approach (1) with a polyethylene vapor barrier installed between the framing and the interior finish; an airtight drywall approach (2) with gaskets to join gypsum wallboard to other components of the air barrier assembly; an external air barrier approach (3) with two layers of fiberboard sandwiching spun-bonded olefin film installed on the outside of the studs; and a detail (4) with a sheet of polyethylene sealed to a spun-bonded olefin sheet with acoustical sealant.

The four assemblies were subjected to a series of air pressure differentials, both positive and negative, in an air leakage test chamber. The traditional assembly (1) leaked the most, while the airtight drywall approach (2) leaked the least – approximately one-tenth as much as the traditional assembly. The external air barrier detail (3) and the poly detail (4) leaked at about the same rate, approximately 26 percent of the traditional assembly.

Wall details were built very carefully for the tests, and designers should expect higher airflow rates in actual construction. Furthermore, the test results did not consider durability of sealing techniques, sensitivity of the systems to site conditions, or construction imperfections – factors that will affect the long-term airtightness of walls. Madeleine Z. Rousseau □

The author is a researcher at the National Research Council of Canada's Institute for Research in Construction.
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