75TH ANNIVERSARY YEAR

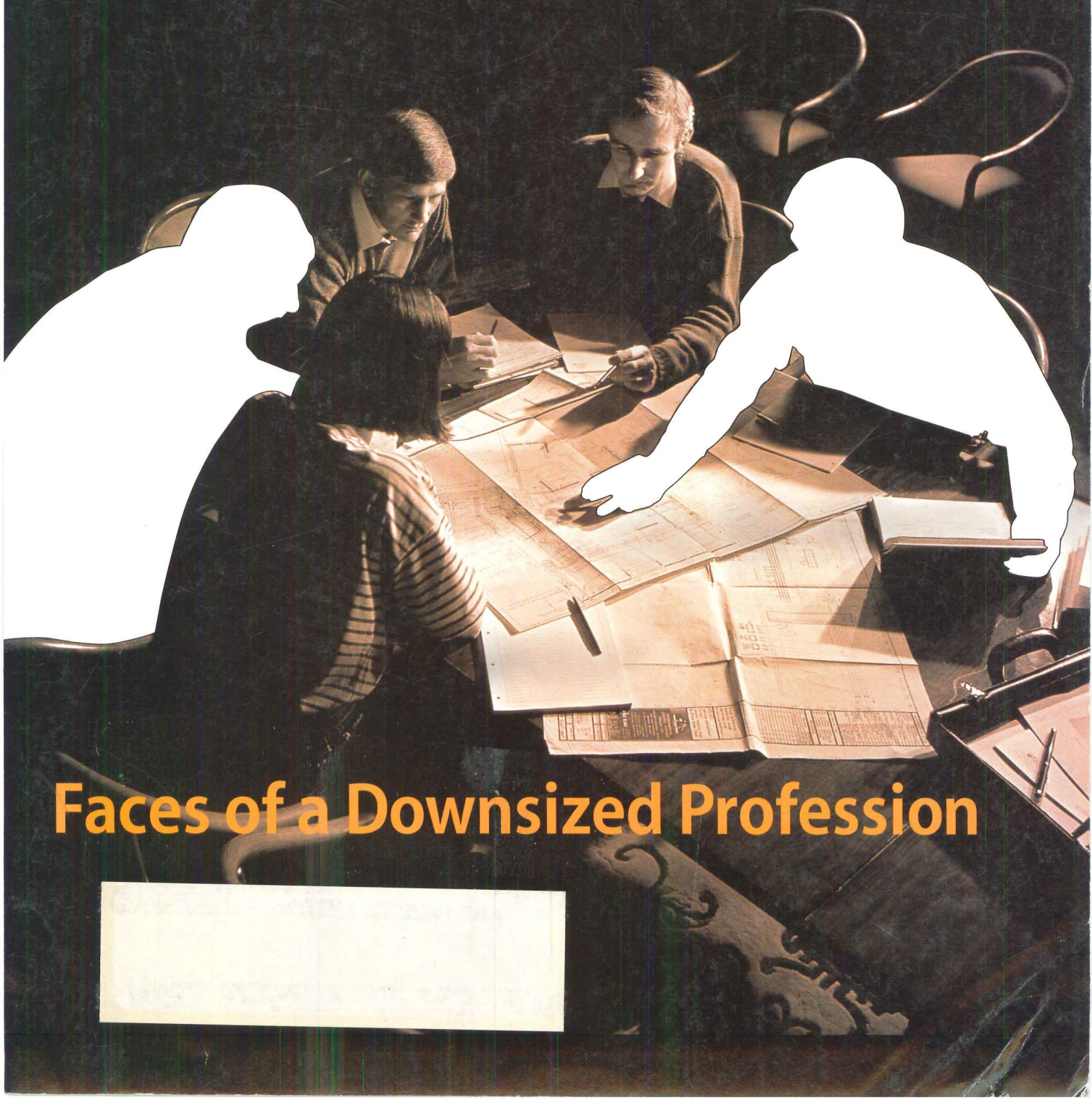
PA

Progressive Architecture

A Penton Publication June 1995

Also in this issue

- Why Can't Johnny Size a Beam?
- Process: Twin House
- Critique: San Antonio Conservatory
- Dutch Architects: Mecanoo and Wiel Arets
- Technics: Fire Safety



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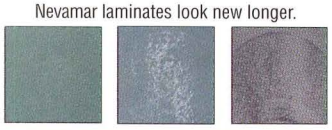

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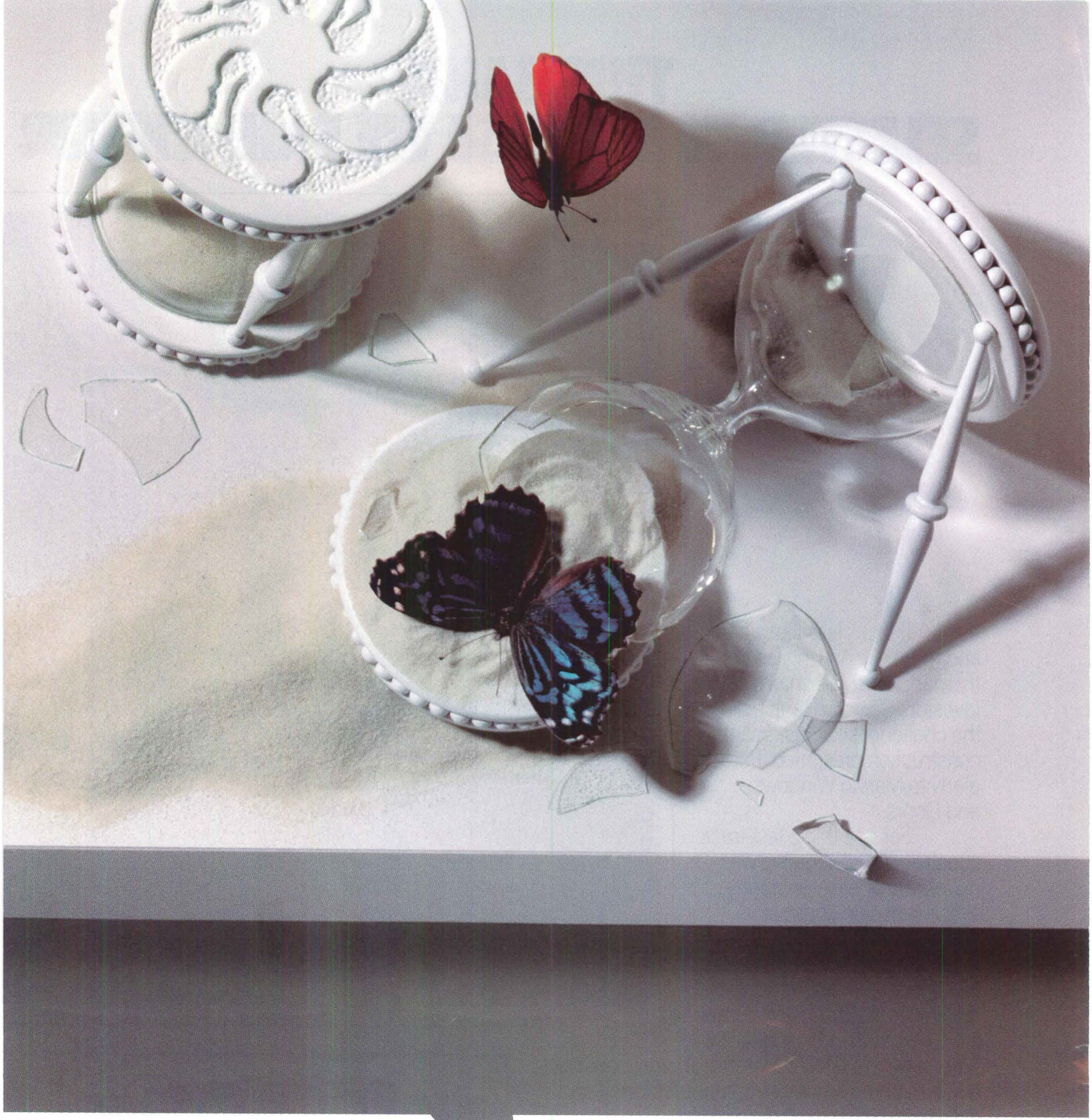

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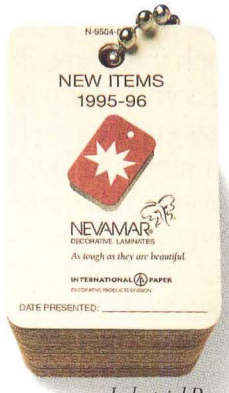

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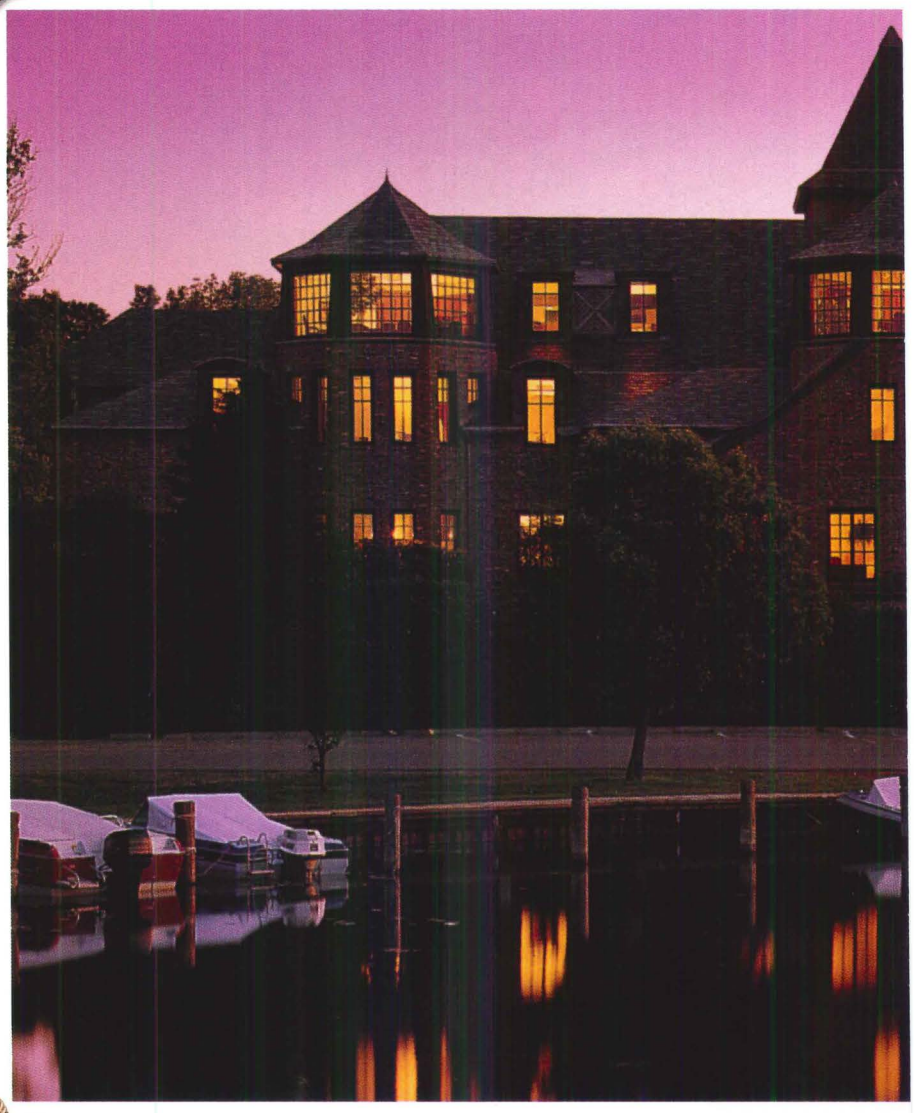

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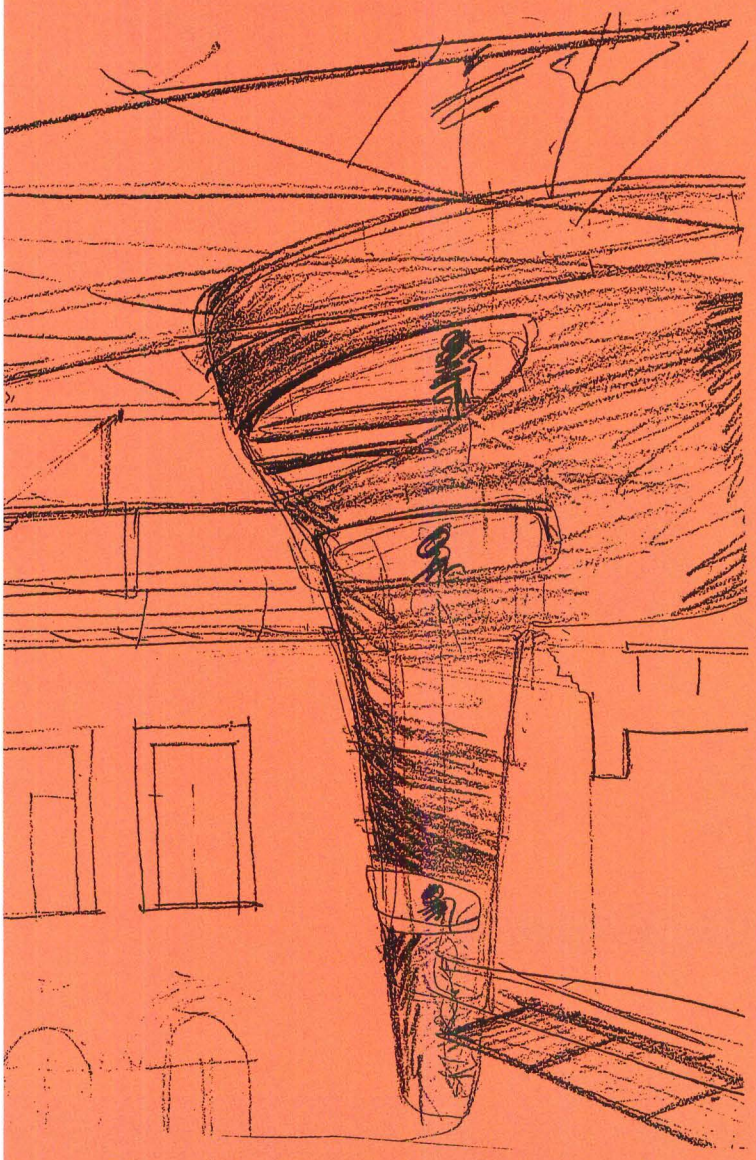
News

COVER
Cover design by Julie Anne Yee. Photo by David Ash/Tony Stone Images, with electronic retouching.

FACING PAGE
Sketch of the conference room, National Nederlanden Hungary and ING Bank by Erick van Egeraat (p. 96).

Features

EDITOR IN CHARGE: Abby Bussel



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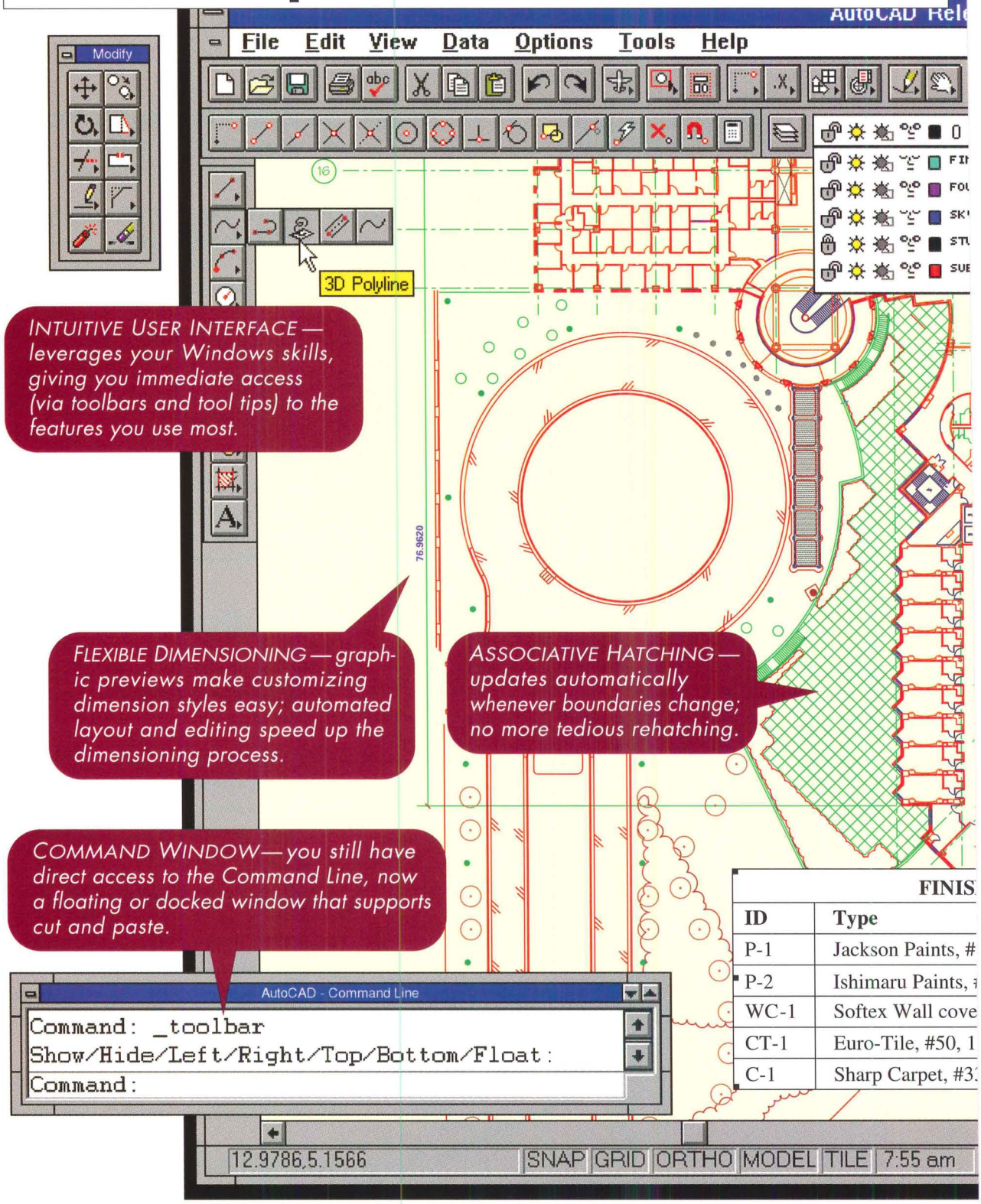

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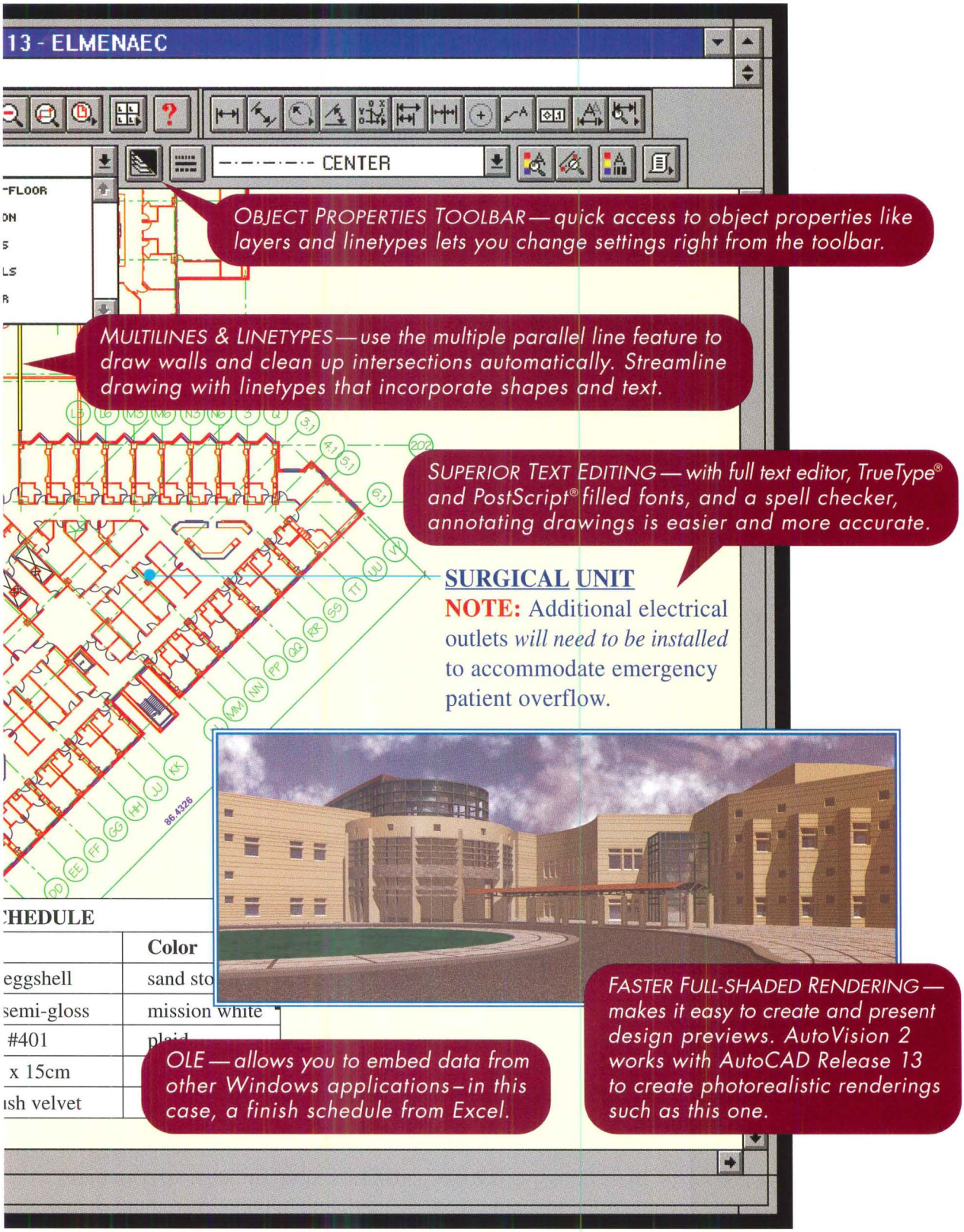

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Just Say No, Thank You

The word among developers is: never ask architects to provide drawings for free, because some may refuse. Instead, hold a competition, and architects will come flocking to your door, providing many times the number of free design ideas. Apart from what this story says about the abuse of competitions, it gets at the assumption, especially widespread among powerful clients, that architects are easy prey, able to be coerced into giving away services. There is, unfortunately, an element of truth here; the oversupply of architects and the severity of the recession, along with our eagerness as designers and our tendency to be trusting optimists, all play into the hands of greedy clients. The question is: without becoming wolves ourselves, how can we stop being sheep for slaughter?

Working *pro bono* for a worthy cause is one thing. But when wealthy clients expect architects to provide uncompensated work, we must learn to say no.

We can, of course, just say no to these clients. Or, as an architect recently put it to me in a letter, "I believe that architects are best served by realizing that they are free to create, choose, and decline their conditions of commissions. We are not victims to be exploited." Such refusal to be victimized is an important defense against predatory clients. But it is an individual solution that does little to address the overall problem, just as saying no to drugs can save one person from addiction, but does not stop the dealers.

We must, instead, find ways to say no collectively. This runs up against at least two obstacles: the inability of an organization such as the AIA to do anything that the Department of Justice might construe as restraint of trade and the difficulty of reaching unanimity in a diverse profession such as ours. But these obstacles do not mean we are helpless. Indeed, simply sharing information among ourselves may be the most powerful defense we have. Let me give an example.

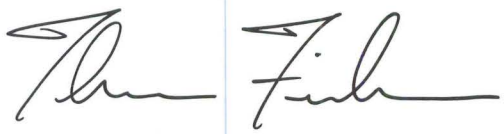
Disney is developing a town called Celebration, in Florida. It has enlisted, for its "Featured Architects Program," several architects who are preparing "schematic house designs" for a "Celebration Plan Book" and a few other architects who are designing demonstration houses to be built. None of the architects commissioned for this work whom I have talked to are being compensated. And as long as everyone remains silent, clients like Disney will get away with such behavior.

One architect, however, approached me after having declined the commission because of "Disney's policy of noncompensation," as this architect wrote in a letter to architect Joseph Barnes of The Celebration Company. In response, Tom Lewis, Jr., FAIA, Vice President of Disney Development Company, wrote, "we realized this was a rather unique arrangement ... but Celebration is a very unique opportunity .... Your endeavors would have been more than sufficiently rewarded indirectly, through exposure of you and your work."

So apparently powerful is a client like Disney that this architect also wrote to me, saying: "I am reluctant to participate in a conversation that presents ... Disney (or anyone else) as bad and wrong." Certainly Disney is not alone in its treatment of architects; other developers might say that Disney's only mistake was to ask architects for free drawings, as opposed to holding a competition. Nor can we blame Disney for the intensely competitive situation among architects. We let even a company whose CEO has earned $300 million since 1984 get by without paying our often ridiculously low fees.

Yet we have every right to start fighting back. For example, we might begin to share among ourselves information about clients who try to take advantage of us. Has the time come to establish an architectural "better business bureau," where complaints can be filed and clients can be checked out before we accept commissions? We might also put peer pressure on architects who are involved in commissioning uncompensated work or in setting up exploitative competitions. This might entail everything from friendly persuasion to a refusal to associate. It might even involve bringing AIA members before the National Judicial Council, since the AIA's Code of Ethics states that "members should ... compensate (their associates and employees) fairly." Finally, those who have some leverage with certain clients might begin to act on behalf of others. A well-known practitioner has apparently been working behind the scenes to get Disney to change its mind about its "policy of noncompensation." Even if he fails, his actions are commendable.

Breaking the silence about such clients not only might reduce their numbers, but might show us that our real power lies in sharing information and acting as a community. □



Thomas Fisher

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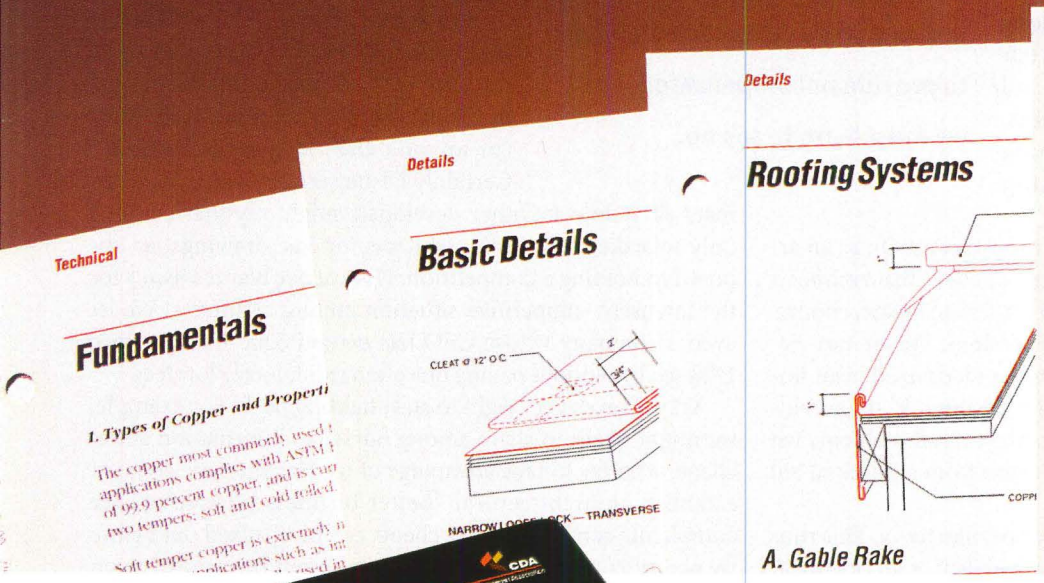

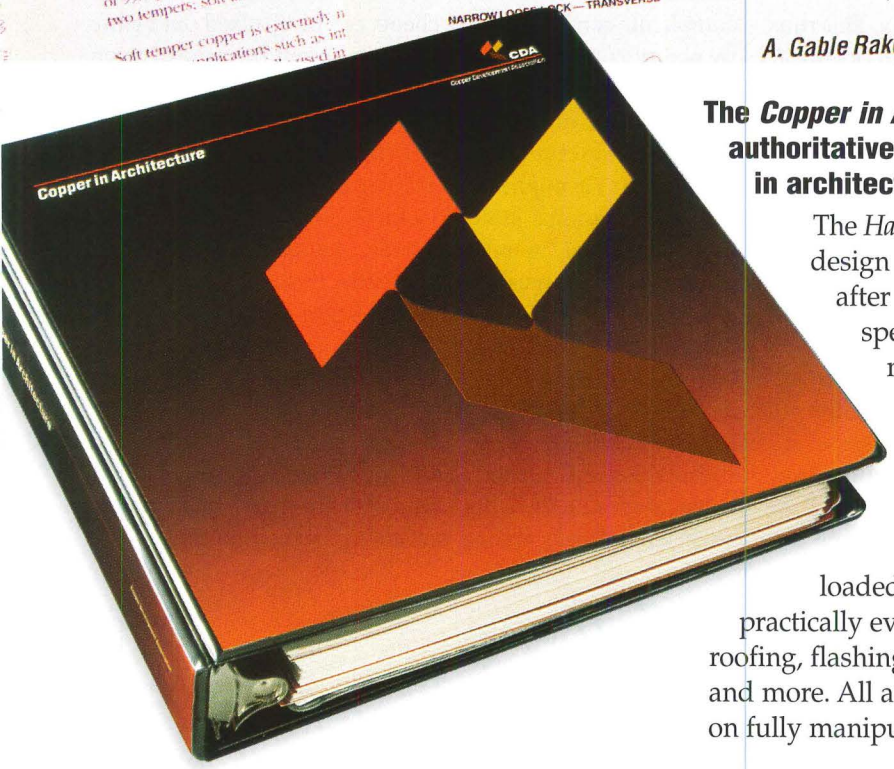

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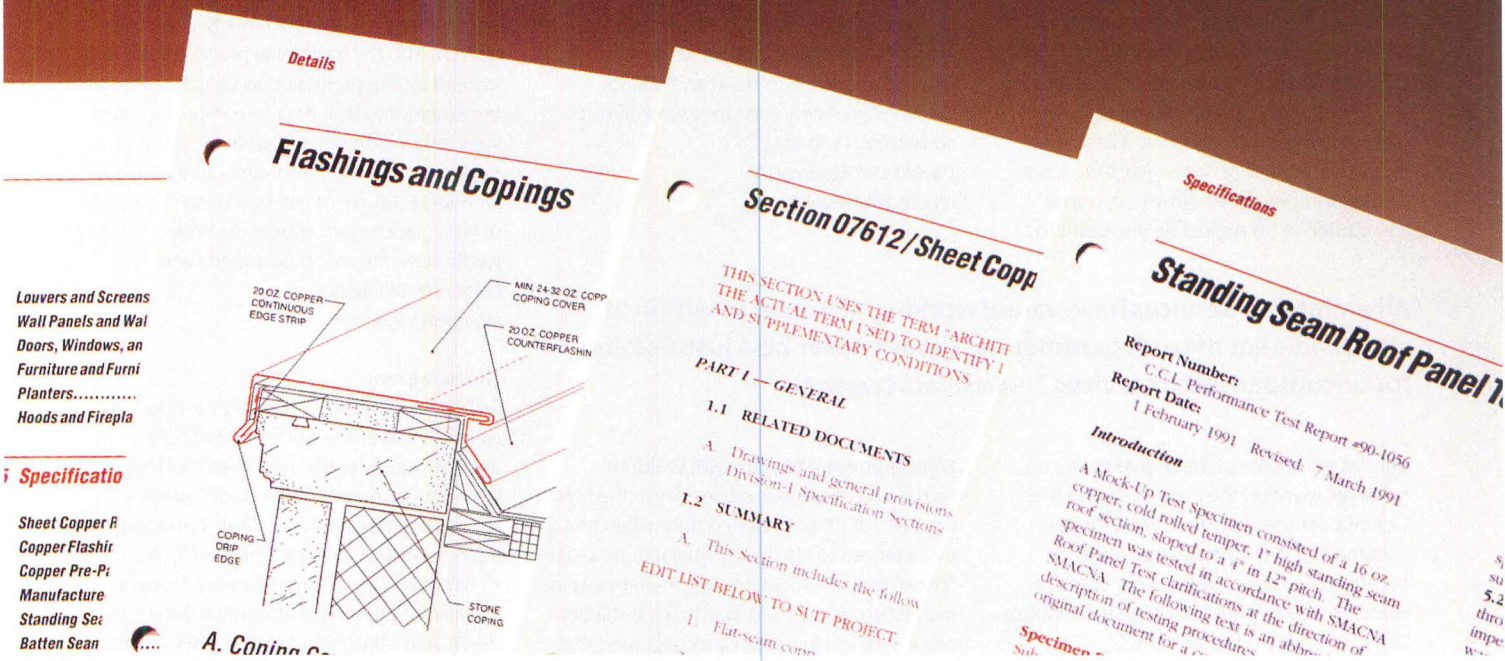

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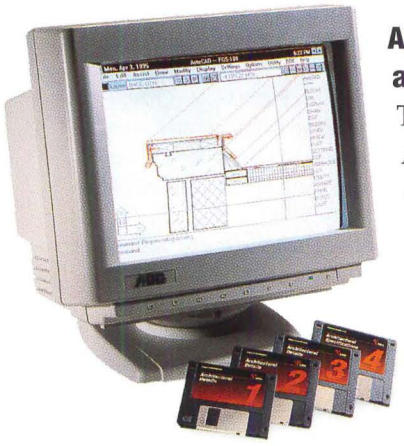

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Architecture and Guns

In reference to your editorial in the March 1995 issue, you state that perhaps the AIA should adopt a position on gun control. I fail to see the logic to your rationale. As architects, we are trained to examine a given problem and explore the multiple solutions that exist for it. Perhaps, as architects, we should examine the situation of public safety more closely.

On the surface, it would seem that gun control would solve the problem of crime-ridden neighborhoods and barren public spaces. If we look beyond this superficial analysis, we note that the presence of guns stems mainly from other crime activities, the most notable one being the drug trade. It seems that you have noted this in your reference to Zane Yost's work in Bridgeport. Your description mentions the drug trade as the problem and the murder rate as a result of it.

The solution to the problem of violence lies not in the control of guns; it lies in the successful control of drugs. Yost's work is a prime example of that. Nowhere in your description of his project do you point to guns as the source of the problem. You do, however, mention the drug trade and the violence associated with it. While I would certainly not disagree that gun violence accounts for a major percentage of this, a control on guns would not stifle the violence. Surely you can understand this.

Yost's solution was not an implementation of gun controls but a control of the drug trade in the neighborhood. This successful regulation was the solution that decreased violence. Without digressing into the argument too deeply, there are many examples of how gun control does little or nothing to regulate violence. I suggest the AIA take a position on the issue of drug control.

Bob Yori, Jr.
Washington, D.C.

Guns: Another Shot

Once again, P/A has shown how out-of-touch it is with the workings of our profession. Instead of addressing topics that come up in the trenches day-to-day, you insist on forwarding controversial social agendas. This may make for lively office fodder around the morning coffee break, but it does little to assist the overburdened marketplace.

Rationalization is the second strongest human urge. I am sure that our profession could come up with hundreds of reasons to support every cause imaginable, including gun control (Editorial, March P/A). Unfortunately, by diluting our collective identity into issues that have only marginal effect on our profession, we become irrelevant. We need to be focused on our profession, and get on with the business of Architecture. If we don't, other professions will continue to erode the need for our services. Unless the general public perceives that our opinion on a particular social cause has direct impact and value, we will be viewed as just another group of nosey neighbors shooting their mouths off about something they do not understand, or worse, have no business getting involved in.

Let's try to refocus P/A into a resource that the professional turns to every month, instead of shaking its head and asking the question "Why can't they write about something I can use?"

David J. Dell'Agnese, AIA
Milwaukee, Wisconsin

"All architects' services have value; working at home, or within an alternative set of work parameters, should never be a justification for uncompensated services." – ***Barbara D. Conrey, AIA***

Free Services by Women with Children

Re the letter from Robert Beckley in the March issue (p. 10): Dean Beckley is right when he says that we need to reconsider what it means to be "inside" the profession; there are many more ways to practice architecture than in the traditional office setting. However, I am concerned that he also seems to use nontraditional practice to justify uncompensated services.

We struggle as a profession to convince the public of the value of our work; for women architects, the struggle to prove our worth is magnified. Of course, as a humanistic profession we should do some *pro bono* work for worthy causes. If so, then a monetary value should be assigned, so that all parties understand that the architect's services have a donated value. But to justify the donation of services by a woman architect as commendable "while she raised a family" perpetuates the idea that home-based architects are not doing architecture deserving of compensation.

Too often the practice of architecture is defined as occurring only in a typical office setting, with eight- (or twelve-) hour days, and inflexible work schedules. As your article points out, women are leaving the profession in droves because of the rigid structure of most practices. Therefore, it is troubling for the dean of a major architecture school to champion free services by a woman architect, simply because she has chosen to work from her home while raising children.

Twenty-five years ago I was discouraged from entering architecture school by an associate dean who said that I would only "waste" my education by staying home and having babies, and might in fact steal the place in class from someone (a man) who "really wanted to be an architect." I persisted, graduating with an M.Arch. in 1978, and have had a successful home-based firm for twelve years while raising two sons. Although the practice of architecture has changed since I went to school, it seems that the perceptions about practice alternatives have not.

The solution is not for architects, women or men, to give away our work because we don't fit into the traditional practice mold, but instead for the profession to stretch the mold by recognizing that it is more important how well, rather than where, our services are performed. All architects' services have value; working at home, or within an alternative set of work parameters, should never be a justification for uncompensated services.

Barbara D. Conrey, AIA
Montpelier, Vermont

The New Exam

Before I read Michael J. Crosbie's article "The New Exam, Will it Change the Profession?" in the April issue, (p. 49) I had been mulling over the impulse to write "somebody" about my anxiety over the new ARE. That "somebody" now can be P/A, and for that I thank you.

What initially prompted my concerns was a review of the six vignettes of Division C in the NCARB CERTIFIER of March 1995. The news reports I had seen earlier about the change in the building design part of the exam into a vignette format were met with a feeling of mild uneasiness, but when the full impact of this change became apparent, that uneasiness changed to full-blown alarm.

Many, if not most, of my concerns were expressed quite succinctly by Mr. Crosbie, and his exploration of the pros and cons serves well the open discourse this issue needs. I would like, however, to share my assessment of the situation.

This change appears to me to be another, perhaps cataclysmic, step in the progressive "dumbing down" of the profession. Other steps include the pernicious retreat from responsibility, leaving vacuums quickly being filled by alternative sources, such as design/build contractors, construction managers, and interior designers. Some of this has been prompted and abetted by the legal and insurance industries and the climate of the fear of litigation *(continued on page 14)*

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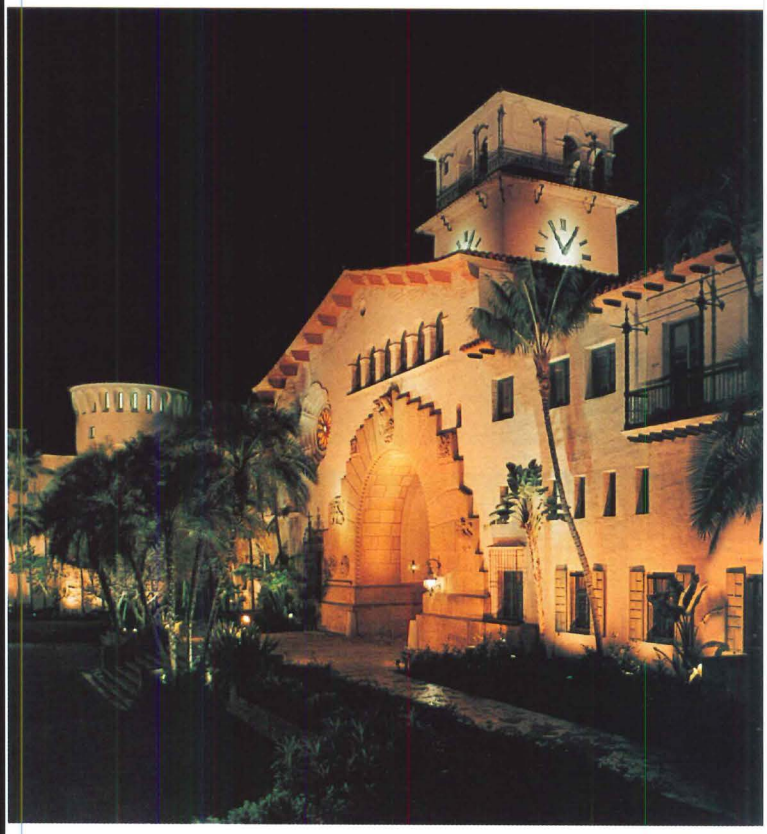

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Views

(continued from page 12) rampant in the nation in general and in construction and business management in particular. If architects are anything, we should be risk-takers, but events and circumstances seem to be conspiring to suppress us into stark timidity, and allowing those more bold to step into the breach, taking away our traditional areas of responsibility and leaving us an ever-shrinking role to play.

More important, though, the new building design part of the exam ignores, and as a result diminishes, a vital part of what the practice of architecture should be – the synthesizing of diverse requirements, forces, and desires into a coordinated three-dimensioned concept.

The changes in the exam seem to be driven by the desire of NCARB to make grading easier, rather than making it more meaningful and reflective of a candidate's competence. Crosbie said much, and probably rightly, about the advent of CAD and its impact on the exam. This to me is another example of the wrong end of a process driving it. The wrong questions appear to have been posed in determining what the ARE ought to be. Rather than accommodating a process to the task of determining the acceptability of a candidate for registration, the new format seems to be accommodating the content, criteria, and structure to the standardized processes of testing and grading applicable to purely quantifiable disciplines. While much of the material in the discipline of architecture can be measured this way, there is much in architecture that is not quantifiable, but is, or should be qualifiable. This is what the building and site design divisions of the exam traditionally have been about, and should continue to be.

After serving as a grader for the ARE in 1985, I remarked to a friend that the objective of the exam seemed to be no more than to prove that a candidate would not endanger the public or embarrass the profession. That's a pretty low threshold and not one we should take pride in or be willing to accept. Compared with the new format and content, that exam ten years ago was immeasurably better, however flawed.

When I stood for registration in 1968 it covered fewer areas of vital interest than it attempts to today, and yet it seemed adequate to the task and manageable. It covered the basics, and in the conceptual areas of building and site design, it would still meet today's needs. In the 1970s there was a period in which graduates of accredited schools did not have to face a design problem in the exam. This was so unpopular that the design problem eventually was restored. Since reinstatement of the design problem, candidates admitted to the exam have been given a building program several weeks in advance of the exam date so as to be better prepared on that day. I am undecided as to the efficacy of this particular innovation, but I can see nothing especially wrong or detrimental to the candidate in the way we took the exam in 1968, when we knew nothing of the nature or scope of the design problem until the morning we walked into the examination room.

I suppose my remarks show my bias, but I have difficulty in the coddling of candidates implicit in the trend the structure of the exam seems to have taken in the years since I faced it. I passed all parts on one try. I did that not because I was smarter or more gifted than others, but because I was able to discipline myself to study rigorously and to work with quick, focused competence. It seems to me that these are traits that all architects should develop and maintain, and standards to which we should be held. The structure of the exam tested indirectly for these traits and standards in 1968 but appears no longer to do so, and it should.

Are we really asking the right questions about the process for admittance to the profession as well as in the process? If the new format and narrowed content are any indication, I believe we are not, and furthermore that the future of the profession is dire if we fail to correct these deficiencies.

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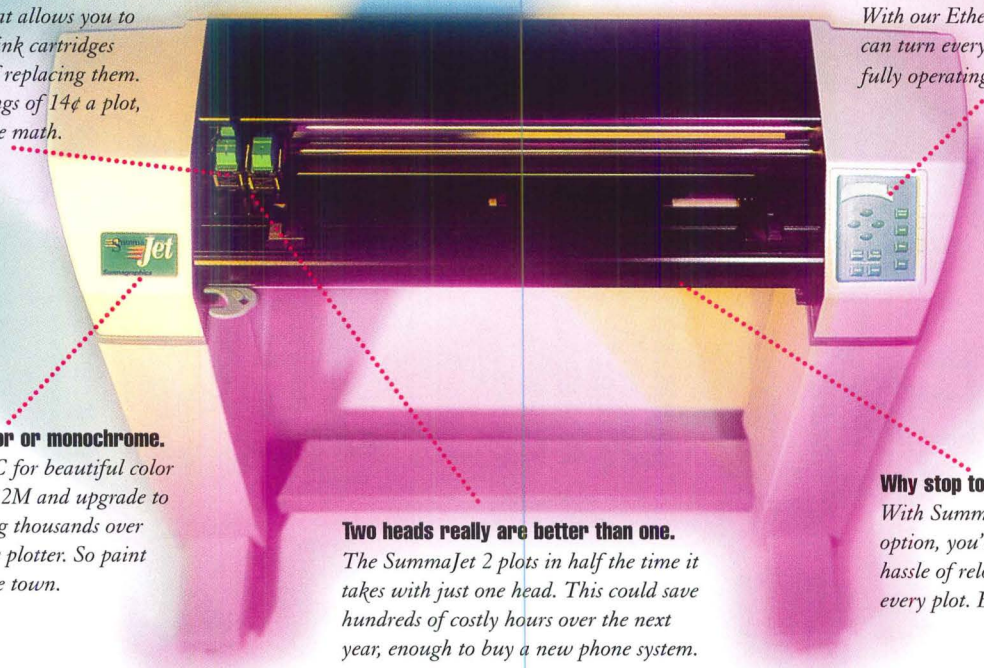

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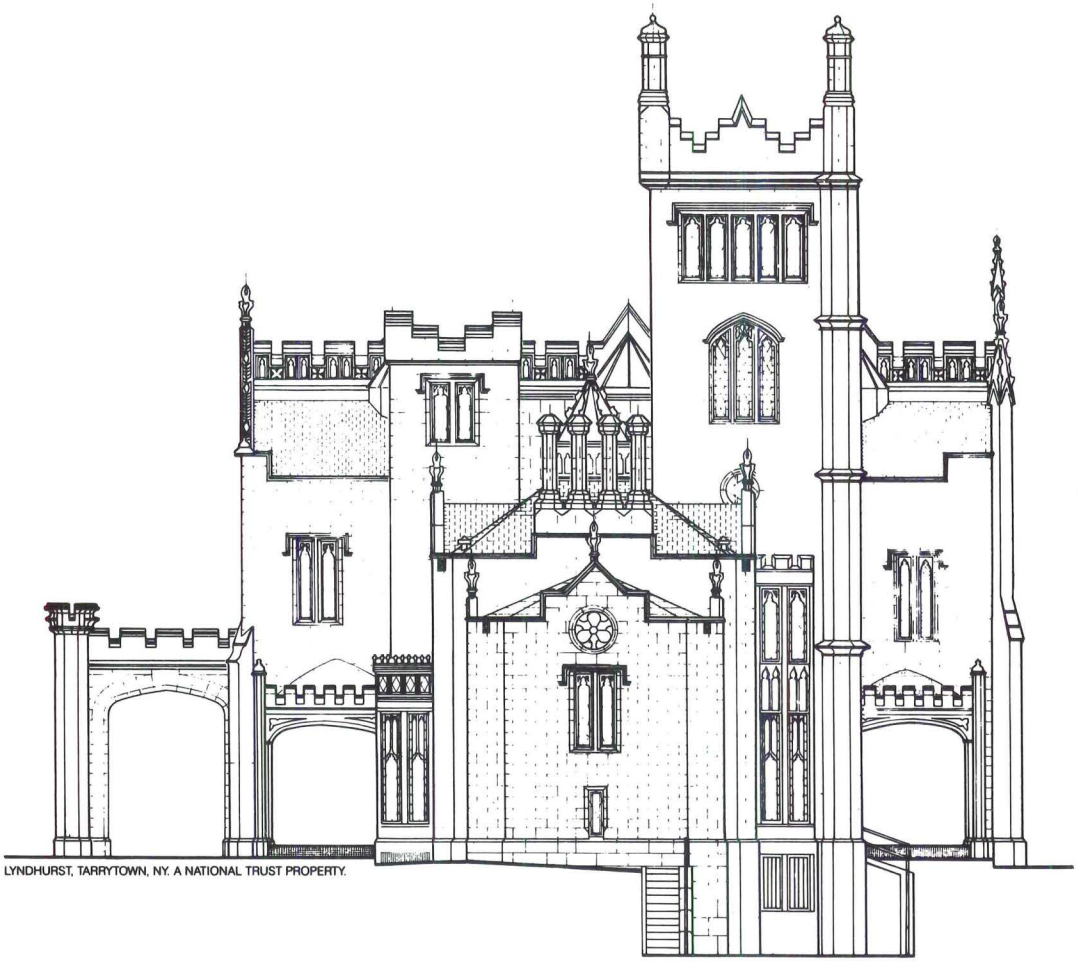

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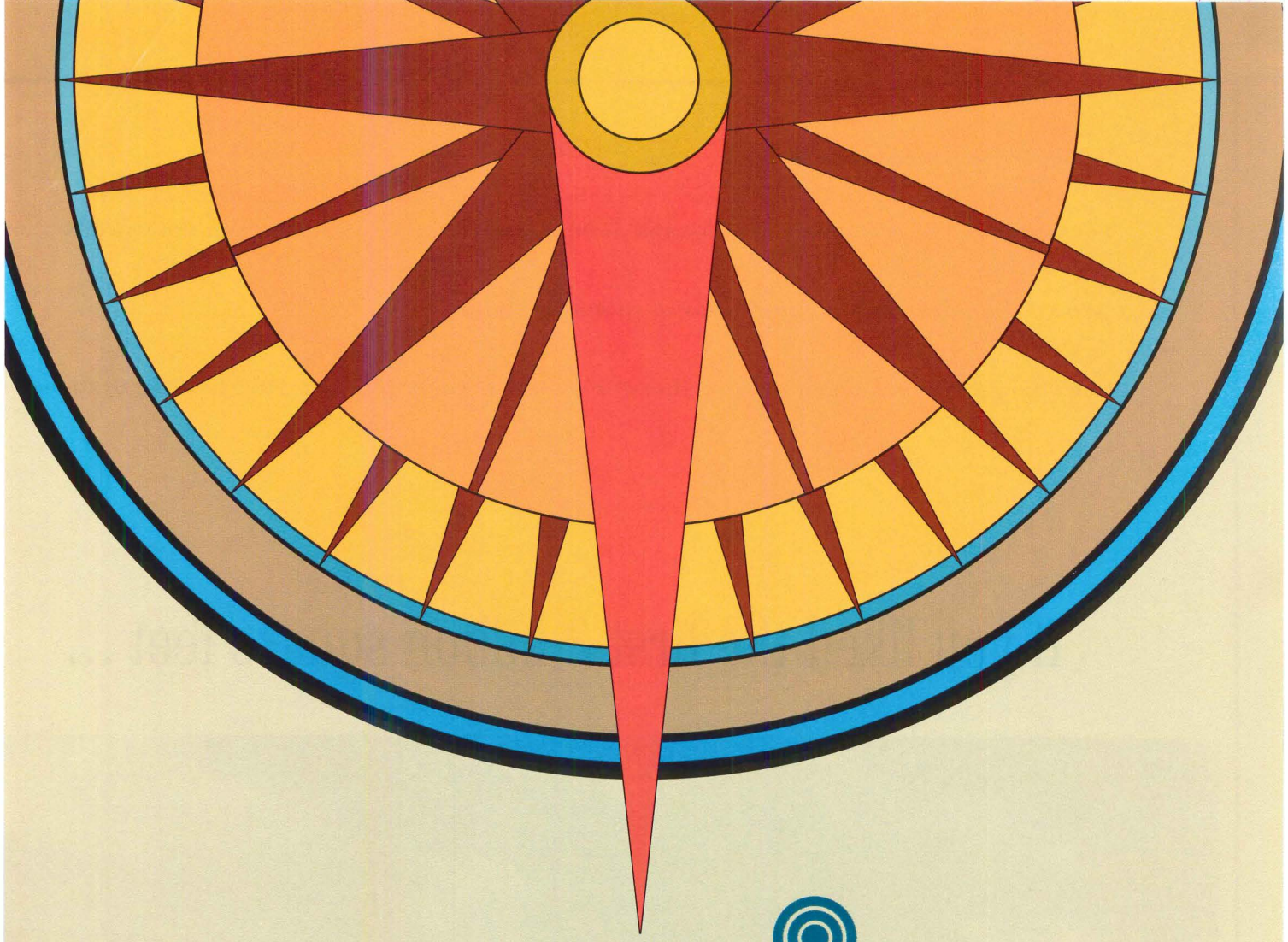

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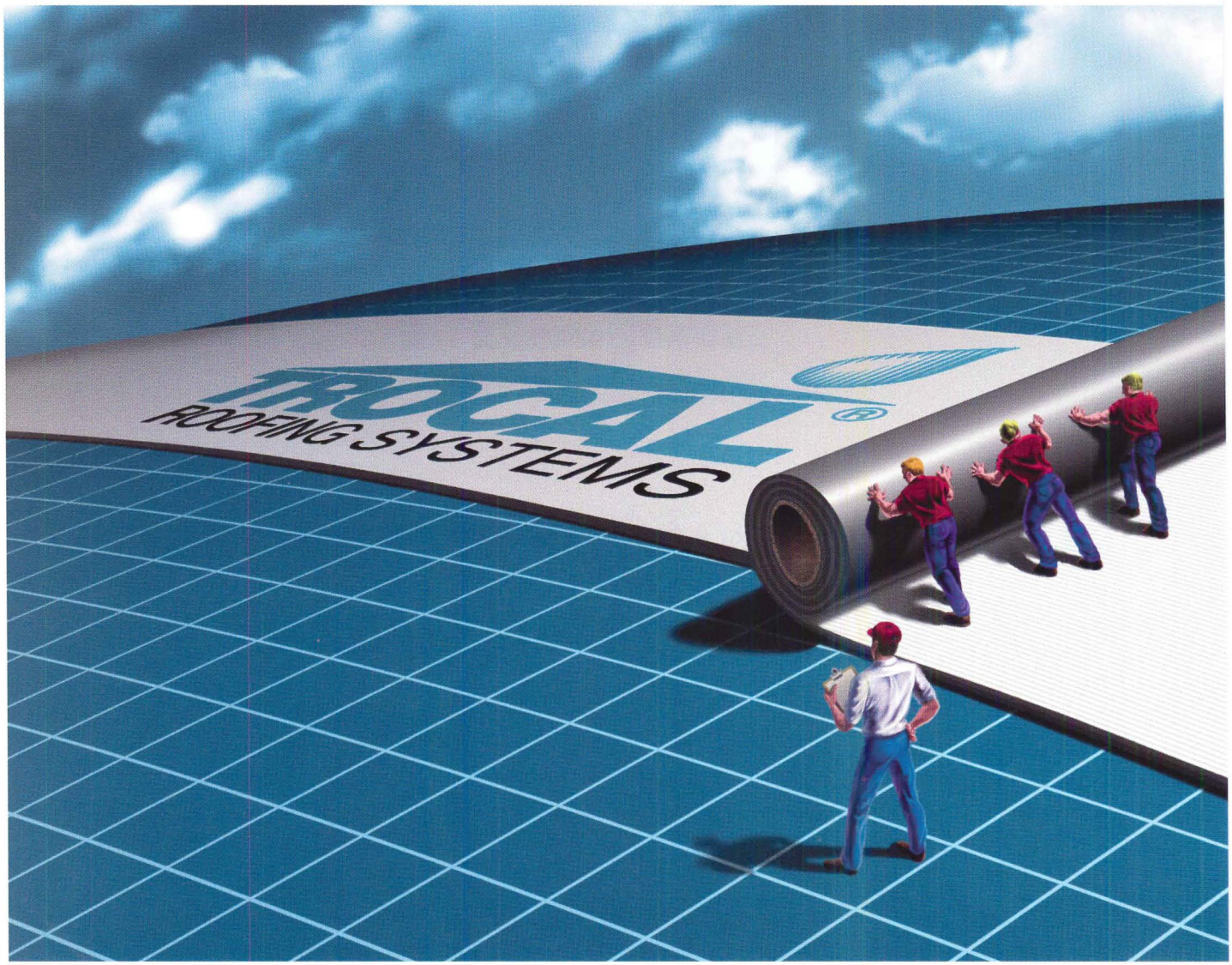

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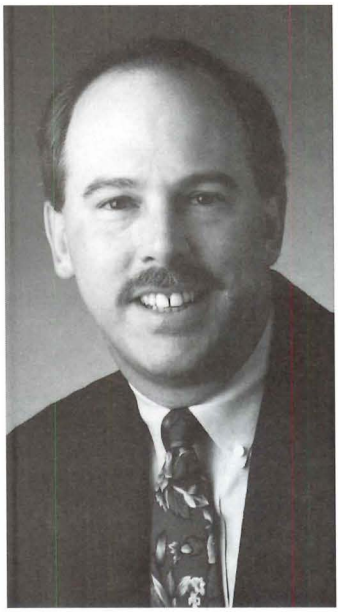
Starting Points



Michael J. Johannes
1995 SPRI President &
Executive Vice President
HPG Roofing Systems
Somerset, NJ

We at SPRI are pleased to present this special section on Flexible Membrane Roofing Systems. As designers, owners or installers, you are undoubtedly aware of the dramatic changes that have swept the roofing industry in the last 20 years. SPRI is the industry trade association for the suppliers of roof membranes and components to the commercial roofing industry, including thermosets, thernoplastics and modified bitumens. The association, in its 13-year history, has been instrumental in guiding the direction of these changes to positive, technological advances and, ultimately, to an unprecedented variety of sound, well-engineered roofing systems.

As manufacturers working together, we have succeeded in bringing a higher degree of consistency to the industry, both in our products, through greater emphasis on quality control and standards development, and in roofing practices, through the development of appropriate guide specifications and guidelines for design and application. Such guidelines include procedures for seaming, designing effective edge details, and testing pullout strengths of roofing fasteners.

Through official liaison with other roofing professionals, such as contractors, consultants, and designers, SPRI members have brought their expertise and knowledge far beyond the manufacturing community. Cooperative research projects have been undertaken with other industry groups in the areas of wind design and performance, development of test methods and recover. As an accredited canvasser of ANSI standards, SPRI is uniquely positioned to propose standards for approval through a true consensus process.

Educational programs, publications and documents are all available from SPRI. Several of these publications and documents are highlighted in this special section. One of these is a document published jointly by SPRI and the National Roofing Contractors Association entitled *Manual of Roof Inspection, Maintenance, and Emergency Repairs for Existing Single-Ply Roofing Systems*. It provides important guidance to building owners, and to architects in how to advise building owners, about the care and maintenance of their new roof. SPRI's flagship publication, *Flexible Membrane Roofing: A Professional's Guide to Specifications*, has just become available in its fourth edition. This is the industry's most complete reference guide to products, system designs, application methods, and testing procedures. No architect's or contractor's library is complete without this volume. We sincerely hope you will take advantage of this and other SPRI publications.

There has never been a better assortment of roofing options from which architects, specifiers and building owners could choose. With that advantage comes a significant challenge – to design and select appropriate systems for each and every application. It is increasingly important for specifiers to work closely and directly with system suppliers to ensure that the most appropriate design is selected and that qualified professional roofing contractors provide the installation. The process is really a three-pronged one: material, design and installation must all be right for the project to succeed. The products and systems supplied by SPRI members all have the potential to provide long-term satisfactory performance, as long as quality criteria are met in all three areas.

There are a number of explanations for the rapid and overwhelming acceptance of flexible membrane roofing among architects, contractors and owners. Whatever your personal analysis, one universal truth is that the endurance of these systems is directly attributable to their successful track record of performance and to the dedication by their manufacturers to upholding the necessary standards of quality and excellence.

We hope SPRI is a useful resource to those who design, specify, install or own quality roofing systems. We're here if you need us.

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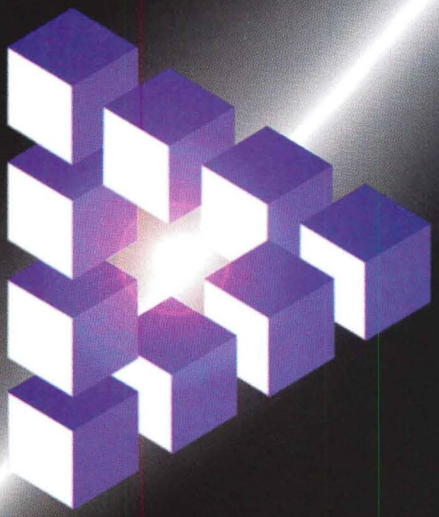
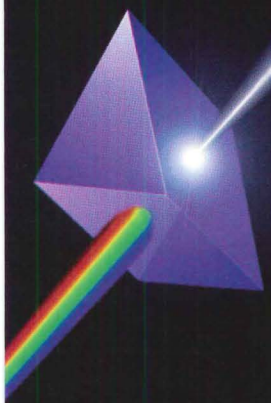


With a full spectrum of roofing products, Schuller is your best source for high-performance roofing systems. Whether you specify EPDM single ply or modified bitumen roofing, we have a complete solution... including roof insulations, accessories and fasteners. As your single-point source, we supply components that work together as a system...which is why we offer one of the most comprehensive guarantee programs you can find.

Like SPRI, Schuller is committed to a strong industry, with top-quality products and high levels of performance. Our common goal is to give designers and builders the very best in single ply roofing systems.

So when you specify single ply roofing...or other roofing systems...remember the high-quality, single-point source...Schuller. For more information, call 800-654-3103.



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In an effort to reduce stress, man has tried yoga, meditation and even colonic irrigation. May we suggest heat-weldable roofing?

While it has yet to catch on in certain circles, heat-weldable roofing is a great way to beat the stress associated with glues, tapes and other seaming methods. We should know. For 15 years, Stevens has pioneered only heat-weldable, reinforced rubber roofing. Why? Because it's the strongest, most reliable seaming method. Which helps explain why nearly one billion square feet of Hi-TUFF® have been installed worldwide. For more on **Hi-TUFF/EP** or Hi-TUFF/Hypalon, call 800-621-ROOF. It could help keep those frayed nerves of yours calm for the next 10-15 years.

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A user's guide to flexible membrane roofing

Successful roof system design, installation and maintenance is a complex process, far more so than many people may realize. In fact, it can be just this perfunctory attitude or lack of attention to details that can make roofing even more complicated a matter than it needs to be. With roofing, an ounce of prevention is truly worth a pound of cure, all the way from conducting thorough pre-job planning meetings to performing semi-annual maintenance inspections.

With the tremendous increase in roofing material and system choices over the past decade, designers, contractors and building owners may find it beneficial to re-evaluate their options.

Those who think of single plies as a comparatively new type of roofing system might be surprised to learn that the first single-ply roof membrane in the U.S. was installed back in 1957. Renowned architect Eero Saarinen chose a neoprene rubber roof to top his dramatically sculptural building for Yale University's Ingalls Ice Arena in New Haven, CT. This flexible membrane was ideal for use on the cable-suspended wooden roof deck. Furthermore, when the indoor rink finally needed to be reroofed 25 years later, the roof system was replaced by another similar factory-fabricated product.

EPDM single-ply roofing was installed on this roofing project for its handling and performance advantages. (Photo courtesy of Schuller Roofing Systems, Denver, CO)

Shortly after the Yale project, Dulles Airport outside Washington, D.C. also was protected by a rubber roof. Nearly 40 years later, single-ply systems have garnered about 55 percent of the commercial roofing market.

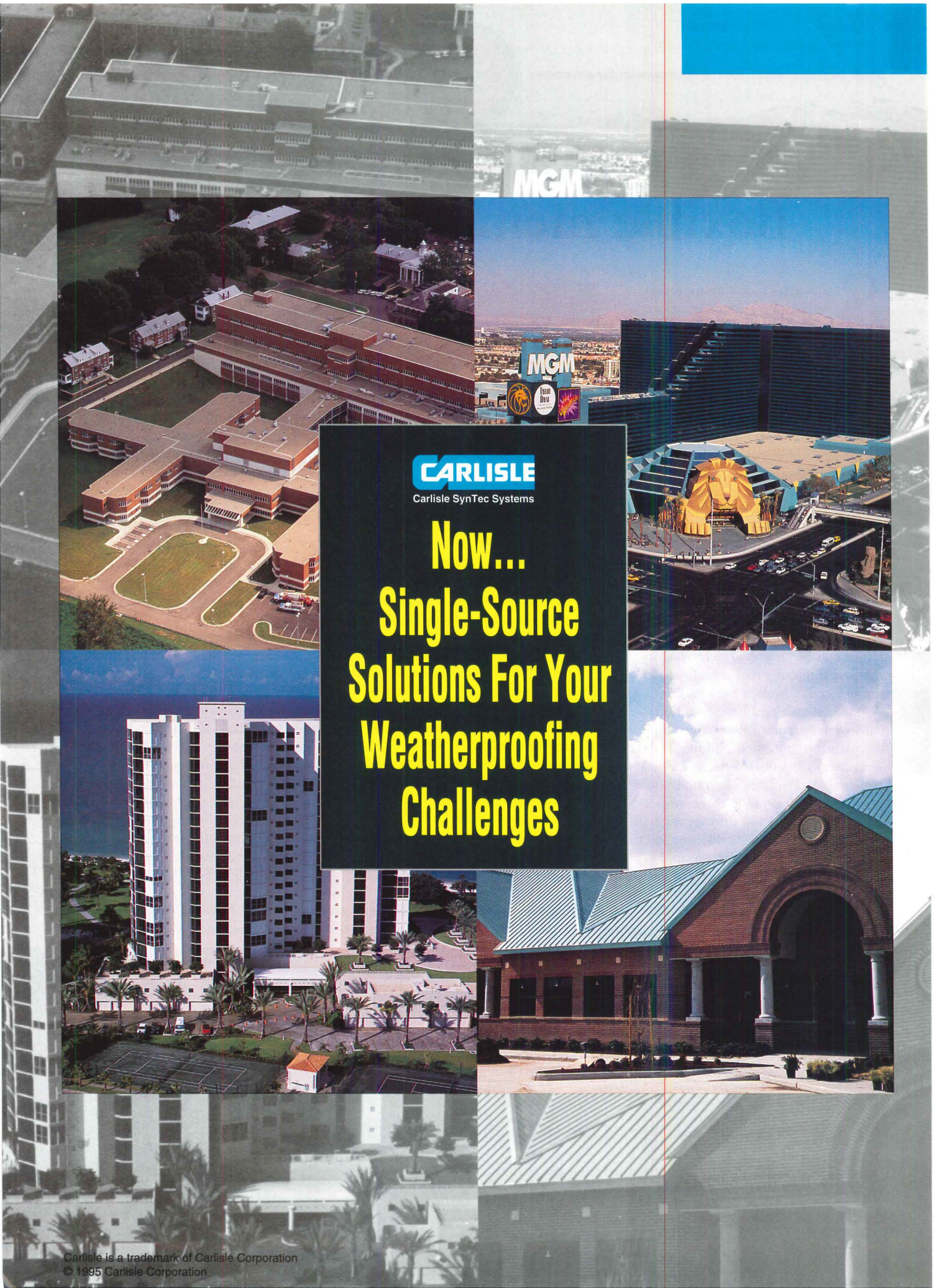
Single-ply roof systems, or flexible membrane systems as they're now more accurately termed, offer a wealth of material and performance advantages that have proven themselves in the field. Key advantages, system-wide, are:

- flexibility;
- ability to accommodate building movement;
- design versatility;
- aesthetic appeal;
- ease of installation;
- weatherability;
- rot resistance; and
- factory-fabrication, with all the inherent quality control advantages that go along with membranes being formed indoors under carefully monitored conditions.

One of this roofing method's greatest advantages is a full range of choices of product, color, appearance, application methods, and engineering/design solutions.

These products are manufactured to meet strict quality control standards and to provide specific physical and mechanical properties. They are used in combination with other components that have been individually evaluated for compatibility and long-term performance. The result is a finished roof system that acts synergistically to provide watertight, weatherproof, high performance protection to the building interior. Upgrading the energy efficiency of the roof is an easily achieved additional benefit, with many different

Roof leaks caused by constant vibrations from high-volume printing presses housed in the six-story Chicago Tribune Freedom Center presented a recover challenge solved by a mechanically fastened PVC roof system. (Photo courtesy of HPG Roofing Systems, Somerset, NJ)



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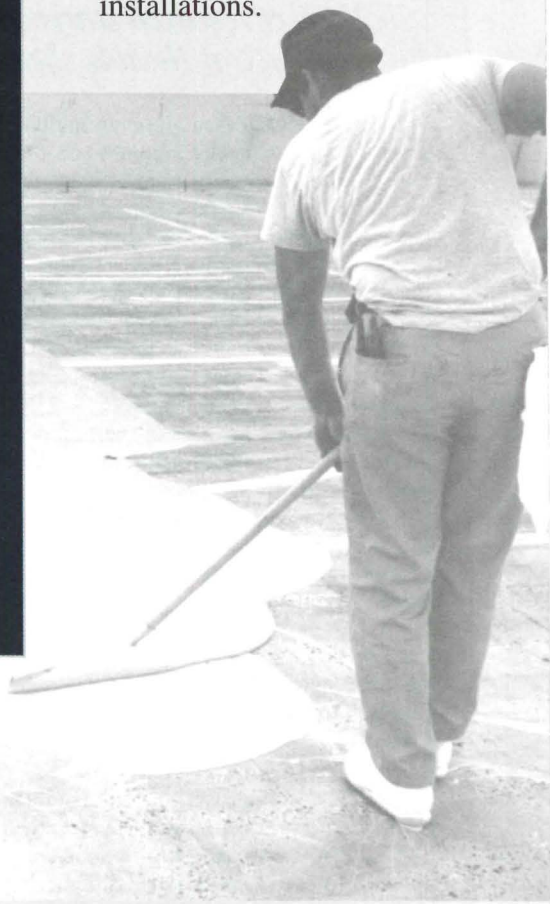
Buildings pictured left, top to bottom;
VA Hospital
MGM Grand
Club LeCiel Park Tower
Sugarland Professional Plaza



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choices of roof insulation available.

Flexible membrane roof systems can be designed to fit any building configuration, which is particularly useful on dramatic architectural shapes. For example, the library at Aurora, NY's Wells College consists of a challenging 68 roof planes.

Flexible membrane roofing systems offer long service lives and favorable life-cycle costs, plus they are easy to maintain for optimal performance.

Since there are a wide variety of flexible membrane systems to choose from, there are a number of ways to install these roofing products. Depending on membrane and roof deck type, they can be attached to the deck and roof insulation with mechanical fasteners, adhesives including special glues or hot asphalt, or loosely laid with gravel ballast or concrete pavers. Industry parlance for those application categories would be, respectively: mechanically fastened, adhered, and ballasted.

The membrane sheets themselves can also be seamed together at overlaps in a number of ways, including liquid adhesives, heat welding or seam tapes.

Selection depends upon a number of factors including: existing roof, deck type, roof height, weight-bearing capacity, design wind loads, slope, anticipated traffic and potential for abuse, and in some instances, local building codes. With respect to building codes and compliance with them, single-ply systems are available that meet all requirements for fire and wind resistance.

Generally, ballasted systems are restricted to roofs having a slope no greater than 2 inches in 12 inches, and are only suitable when the structure is capable of withstanding the added weight of the ballast.

Weight-bearing capacity must be evaluated to include dead loads, such as existing roof systems, without encroaching on live load capacity. This system usually incorporates the use of a rigid insulation board; the insulation may be placed below the membrane in a standard ballasted system, or above

These premium roof drain products are compatible with all membrane types. (Photo courtesy of U-Flow Roof Drain Systems, Inc., Buffalo, NY)

the membrane in an inverted roof assembly. The inverted approach would be particularly applicable when unique conditions of interior humidity or unusual vapor drive patterns exist, or when total membrane protection from foot or mechanical traffic is desired. Ballast used in both the standard approach and the inverted approach may be stone or concrete pavers, or specially designed lightweight interlocking pavers, or a combination of these. Pavers also provide protection to the membrane from abuse or excessive traffic, and may be attractive surface materials, as well.

Building height and location may also contribute to the design of the bal-

Going by the numbers:

Market research statistics chart consistent growth in use of flexible sheet membrane systems

SPRI's statistical program annually analyzes the roofing market with respect to usage by three generic product categories: thermoset, which covers EPDM and CSPE; thermoplastic, covering PVCs and TPOs; and SBS modified bitumen. While the pure data are confidential, the following report provides comparative statistics that are significant.

The total annual increase in usage of flexible sheet membranes reported for 1994 was 10.2 percent over 1993. Usage of thermoset materials increased by a total of 6 percent in 1994 compared to 1993. Thermoplastics logged an increase of 25 percent for the same period, and SBS modified bitumen gained 21 percent. (APP modified bitumen is not reported due to a shortage in the required number of participants.)

A geographic analysis of membrane shipments of all types reveals that 35 percent of all membrane shipments reported were used in the North Central region of the United States; 32 percent were used in the South; 22.5 percent in the Northeast; and 10.5 percent in the West. These figures are not significantly different from those gathered in 1993 which indicate that 36 percent of all shipments were used in the North Central region; 30.7 percent in the South; 23 percent in the Northeast; and 10.3 percent in the West.

An analysis of all membrane shipments reported by application method indicated that 37.8 percent were used in adhered systems; 33.2 percent were used in ballasted systems; and 29 percent were used in mechanically fastened systems. In 1993, 37.6 percent of all membranes were used in adhered systems; 34 percent were used in ballasted; and 28.4 percent were used in mechanically fastened roof systems.

In 1995 through February, usage of thermosets was up 39.4 percent over 1994; thermoplastics show a 9.4 percent increase for the same period; and SBS modified bitumen shipments have increased 30.6 percent, bringing the industry total to a dramatic 34.2 percent increase over 1994 figures for the same period.

An interesting comparison may be made between total shipments reported in 1994 versus 1984, although some caution must be exercised due to the change in participation during the 10-year period. If one assumes that the volume of shipments sold by companies who were participating in the survey in 1984 has been taken over by those still participating (which is probably a fair assumption given that those who no longer participate have sold their business to "survivors" or have simply closed up shop), then a loose comparison is possible.

Are you ready? The numbers indicate that there has been a 150 percent increase in usage of flexible membranes over the last 10 years!

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Many of America's best roofing contractors have made a commitment to GenFlex Roofing Systems. And for good reasons. Like our training programs covering pre-job installation through on-the-roof job starts and in-progress procedures. And our exceptional technical support from the earliest design stages through installation. Even our award-driven inspections that judge excellence in installation performance and attention to detail. They also trust our permanence in the market with backing from GenCorp. A $2 billion Fortune 200 company with technological expertise covering everything from Penn tennis balls to polymer membranes. Make a long-term commitment to a better performance roofing system. Call 1-800-443-4272 today!

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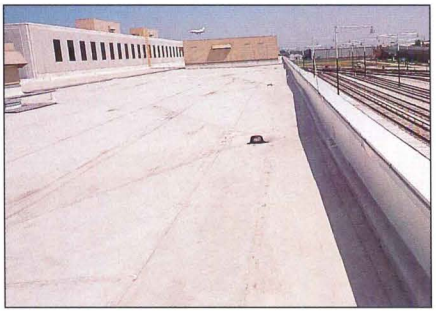
lasted system. Increasing degrees of wind uplift resistance can be achieved by altering the ballast pattern, either by increasing the ballast weight or stone size, or by adding positive attachment at the more vulnerable corners and perimeters. This is a good example of how single-ply systems can be tailored to the specific conditions of a particular roofing project.

SPRI has published a series of wind design guides for the various roofing systems, one of which deals specifically with ballasted applications, and authored ANSI RP-4-94, the proposed American National Standard, "Wind Design Guide for Ballasted Systems." (SPRI is an accredited ANSI canvasser.)



Tapered roof insulation was used on O'Hare Airport's new International Terminal to enhance drainage. (Photo courtesy of NRG Barriers, Portland, ME)

The world's largest hotel/casino, the new MGM Grand in Las Vegas, doesn't need to rely on the luck of the house with over 880,000 sq. ft. of EPDM roofing to protect it from the elements. (Photo courtesy of Carlisle SynTec Systems, Inc., Carlisle, PA)

SPRI at a glance

SPRI consists of more than 50 member companies who manufacture and supply a wide variety of roofing materials, including sheet membranes, raw materials, insulations, fasteners, pavers, and adhesives and tapes.

Founded in 1982, when the single-ply segment of the commercial roofing market was about five percent, SPRI has seen its market share grow substantially to about 55 percent today.

SPRI is organized like most volunteer associations. Its governing body is the board of directors, which consists of the officers comprising the executive committee (president, president-elect, vice president, secretary, treasurer, and immediate past president) and directors. Its direction is guided by a long-range strategic plan, which spells out its mission: to enable all members to operate more effectively in the marketplace by focusing their collective efforts on legislative, code and regulatory issues and on the development and distribution of technical information and statistical data.

The plan identifies five specific objectives of the association:

1) to intervene in and increase impact on code and testing issues;
2) to monitor, anticipate and intervene in environmental legislation and regulatory issues that would restrict the use of members' products;
3) to expand market and statistical research services provided to members;
4) to offer a vehicle for investigation and research of technical issues; and
5) to communicate to the industry SPRI's activities and accomplishments.

Information about SPRI membership is available by contacting SPRI headquarters c/o The Center for Association Management, Inc., 175 Highland Ave., Needham, MA 02194.

Mechanically attached roof systems may be most appropriate over penetrable substrates, such as steel or wood roof decks. They are typically very lightweight, and because the membrane is exposed, can take advantage of a smooth or even colorful appearance to satisfy any aesthetic needs in the roof design. They use a variety of mechanical fastening devices to provide positive attachment of the membrane to the structure, and are particularly adaptable to individual rooftop conditions.

Steep slopes or irregular shapes can be accommodated easily. Again, proper roof system design is an integral contributor to performance, as wind loads must be understood and provided for in the attachment pattern.

Many new fastener installation tools have been developed recently to provide efficiencies in speed and ease of application, as well as providing improvements in installation reliability. There have also been significant developments in the use of corrosion-resistant coatings used in fastener manufacturing, which help to enhance long-term performance even when some moisture is present in an old roof system.

Fully adhered single-ply roof systems are also lightweight, smooth surfaced and can incorporate colors for aesthetic appeal. They are typically adhered to a compatible rigid insulation board, which has been mechanically fastened or fully adhered to the structural deck. These systems take maximal advantage of single-ply's inherent flexibility, through their ability to absorb structural movement without compromising adhesion.

Improvements in adhesive technology have led to the development of environmentally friendly materials, such as water-based adhesives. Such adhesives are especially suitable in warmer climates and where environmental regulations preclude use of solvent-containing materials.

Domes, barrels, and irregularly shaped surfaces are ideal candidates for fully adhered single-ply roof systems, as are non-nailable roof decks.

Whatever application methods are used, all flexible membrane roofing systems share the advantage of having been factory fabricated under strict quality control conditions with

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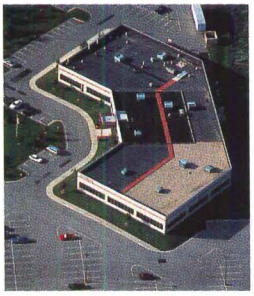
A name synonymous with rubber entered the roofing scene in 1980 and quickly built a reputation for quality materials, systems and craftsmanship. Firestone Building Products was founded on the premise that not only could superior roofing materials be manufactured but that *complete roofing systems* could be offered from a single source. Since that time, millions of square feet of roofing systems have been installed worldwide. Firestone manufactures Polyisocyanurate insulation and roofing systems based on EPDM and Modified Bitumen.

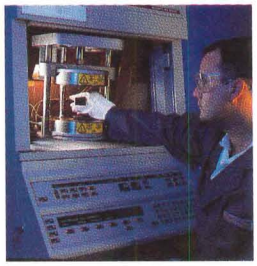


INNOVATIVE COVERAGE

The Firestone product line that began with EPDM has grown to include a full line of membranes manufactured in ten facilities throughout North America. Today Firestone is positioned to be your single source of supply for anything from membrane to pipe boots to insulation. Leadership through innovation has developed such products as the QuickSeam Tape System. With millions of lineal feet installed, QuickSeam is fast becoming the preferred method for EPDM roofs. We cover you with complete systems so you'll never have to go anywhere else.

TECHNICAL COVERAGE

We believe no other roofing manufacturer offers you Firestone's commitment to quality. We invest heavily in research and development to produce the finest, high performance roofing products and systems that make your job easier. Every Firestone system provides a durable solution to your design and installation challenges. Our technical expertise is second to none. Whether it's UL, FM or another model building code approval that you require, Firestone has a system that's got you covered.



COMPLETE COVERAGE

It's knowing the products we make are worthy of the name Firestone. And we stand behind our materials with a warranty–that's single-source responsibility from the deck up. More than just words, it's a commitment we couldn't deliver on if we didn't believe in our roofing systems. Combine this with knowledgeable and responsive sales and service and quality installers and you'll discover why Firestone is the only company for all your roofing needs.

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resulting ease of installation versus other roofing systems. All can satisfy building codes for fire-resistance requirements and a host of other factors to ensure life safety of building inhabitants.

Although there are a number of individual chemical types of products, SPRI, like the industry as a whole, groups them into three generic categories of flexible membranes: thermoset, thermoplastic, and modified bitumens. Membranes within these categories share a number of similar characteristics and physical properties.

Thermoset membranes include EPDM (ethylene propylene diene monomer) and CSPE (chlorosulfonated polyethylene) which was first introduced in the early 1950s under the trade name Hypalon.*

In thermoset materials, polymers are cross-linked either during the manufacturing process itself or, in the case of CSPE, during exposure to heat and light over time. The process of forming these linkages is known as curing. Due to this characteristic, seaming at overlaps is variously done by means of a liquid adhesive, specially formulated pressure-sensitive tape or heat welding.

EPDM is an elastomeric compound which exhibits a high degree of ultraviolet, weathering and abrasion resistance as well as low-temperature flexibility and resistance to acids, alkalis, and some animal and vegetable oils. The sheets are typically black, and are also available in reinforced, white and fire-resistant formulations. EPDM seams are formed with adhesives; in addition, technological advances have resulted in the development of high-performance pressure-sensitive seam tapes which are rising in popularity due to their environmental advantages.

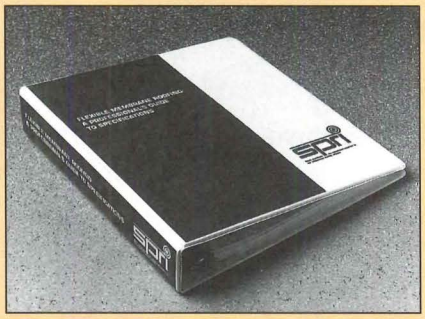
CSPE, or Hypalon, is a self-curing elastomer. As manufactured, the polymer molecules are not yet cured. Upon exposure to heat and light, they become cured. The sheets are generally light colored and reinforced. They exhibit a high degree of resistance to weathering, and a broad range of

The new DowElanco World Headquarters in Indianapolis was recently covered with a combination of fully adhered, reinforced mechanically attached, and ballasted EPDM roofing systems. (Photo courtesy of Firestone Building Systems, Carmel, IN)

Rosser International, Atlanta, specified 240 squares of mechanically attached PVC roofing to rehab the Myrah Keating Smith Community Health Center in St. John, U.S. Virgin Islands. (Photo courtesy of Sarnafil, Canton, MA)

SPRI Resources

From its inception 13 years ago, SPRI has always believed that one of its essential purposes is to serve as a resource to all segments of the roofing industry. In order to communicate most effectively, SPRI's emphasis has always been on providing objective, balanced and non-proprietary technical information to make quality reference materials available. These principles guide the development of all SPRI educational materials.



Representative of these ideals is the just-published, fourth edition of SPRI's comprehensive manual entitled *Flexible Membrane Roofing: A Professional's Guide to Specifications.*

Arguably the most complete guide in the industry on the subject of membrane roofing materials, systems and designs, this manual covers a wide variety of subjects related to commercial roofing.

New sections in the manual's fourth edition include SPRI's "Wind Design Guide for Edge Systems," a cross-referenced "Index of Manufacturers' Design Details," "Disposal Options for Insulation Materials," and "Cold-Applied Modified Bitumen Systems." Other features provide "Guidelines for Fabrication of Field Splices Using Hot-Air Seaming Procedures" and "Standardized Pullout Test Procedures for Fasteners."

Many other sections have been updated, including wind design guides for fully adhered, mechanically fastened and ballasted systems as well as product data and test procedures.

With the National Roofing Contractors Assn., SPRI has also produced the Manual of *Roof Inspection, Maintenance and Emergency Repair for Existing Single-Ply Roofing Systems.*

To order these or other SPRI publications, please use the coupon on the back cover of this special section or contact SPRI c/o The Center for Association Management, Inc., 175 Highland Ave., Needham, MA 02194.

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chemicals and pollutants. Seams are usually joined by heat welding.

Thermoplastic membranes include PVC (polyvinyl chloride); PVC blends or alloys such as CPA (copolymer alloy), EIP (ethylene interpolymer) and NBP (nitrile alloys); and TPO (thermoplastic polyolefins)

Thermoplastic membranes are distinguished from thermosets in that there is no cross-linking or vulcanization — they can be repeatedly softened by heating and they harden when cooled. This enables them to be joined together by heat or solvent welding; these welds possess bond strengths that equal or surpass the strength of the base material.

PVC membranes are also reinforced, are typically light colored, and exhibit a high degree of resistance to fire, bacterial growth, industrial chemical atmospheres, root penetration, and extreme weather conditions. Seams are formed by heat or chemical welding. Early formulations, some of which are still successfully used today, incorporate the use of stabilizers and plasticizers to provide flexibility and UV resistance. Newer formulations have incorporated other polymeric additives to achieve the same results. These "PVC blends" are also reinforced, light colored, and have heat-welded seams.

TPO membranes are based on polypropylene and ethylene propylene polymers. They are also heat-seamed and available in a variety of thicknesses and colors.

A white, reinforced, 60-mil Stevens EP flexible membrane roofing system was installed over the existing 100,000-sq.-ft. built-up roof of the Jefferson Houston Elementary School in Alexandria, VA. (Photo courtesy of JPS Elastomerics Corp., Holyoke, MA)

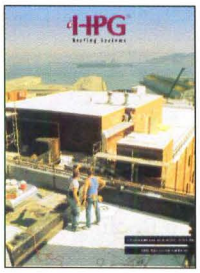
Modified bitumens get their name from the fact that chemical modifiers are added to bitumen to raise softening points for increased flexibility and elasticity, as well as improved cohesive strength, toughness and resistance to flow at high temperatures.

Depending on the modifier used, these products are further subdivided into APP (atactic polypropylene) or SBS (styrene-butadiene-styrene) membranes.

The single-ply segment of the roofing industry has been responsible for its transition from a "black art" to a science, incorporating a combination of chemistry, physics, biology and engineering. As a result, the entire roofing industry has been led to a higher technological playing field.

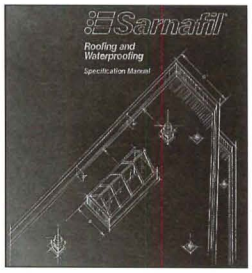
**Hypalon is a registered trademark of the DuPont Company.*

SPRI Literature Review



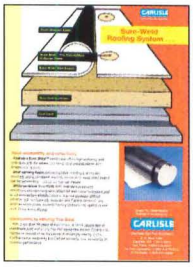
"Commercial Roofing Systems: The Recover Option", is a new six-page brochure from HPG Roofing Systems that outlines the advantages of preserving existing undamaged roofing and insulation when installing a new roofing system over older, deteriorating systems. The cost and performance benefits of recovering with lightweight, reinforced HPG thermoplastic roofing systems are detailed.
Phone: 1-800-457-6634.

HPG Roofing Systems. Circle No. 362.



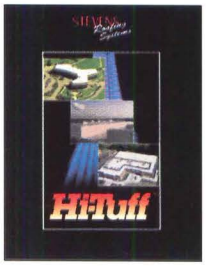
Sarnafil Inc., a roofing systems manufacturer for over thirty years, introduces a new 300-page design/specification manual for roofing systems. It is lavishly illustrated and includes highly instructive, full-color cut-aways of the mechanically attached Sarnafast, mechanically attached engineered, and fully adhered systems.The systems offered by Sarnafil are also highlighted by drawings showing how to complete common roofing details. Phone: 1-800-576-2358.

Sarnafil, Inc. Circle No. 365.



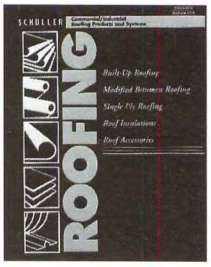
Carlisle's new Sure-Weld Roofing System incorporates a molecular-bonded polyolefin white-on-black .045" reinforced membrane that offers dimensional stability and long-term UV and ozone resistance. Hot-air welding fuses splices together, creating a monolithic assembly and a consistent appearance. Sure-Weld is environmentally considerate because it is compounded without chlorine.
Phone: 1-800-233-0551.

Carlisle SynTec Systems. Circle No. 360.



Stevens Roofing Systems is a leading manufacturer of heat weldable, reinforced rubber roofing systems sold under the Hi-Tuff/EP and Hi-Tuff/Hypalon brand names. Hi-Tuff products are available in white, black (Hi-Tuff/EP only), and gray. They are distributed globally and are available in 45- and 60-mil thicknesses.
Phone: 1-800-621-ROOF.

JPS Elastomerics. Circle No. 363.



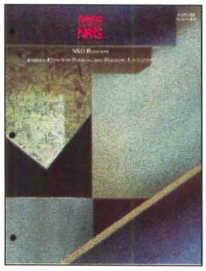
Schuller Roofing Systems recently published a 40-page illustrated short-form catalog that features single ply, built-up and modified bitumen roofing systems, insulations, and accessories. Featured are materials and methods, product descriptions, technical data and specifications, with detail drawings and photos. Also included is a section on reroofing.
Phone: 1-800-654-3103.

Schuller Roofing Systems. Circle No. 366.

"Firestone ISO 95+ Insulation" and "Firestone Tapered ISO 95+ Insulation" are new brochures from Firestone Building Products Co. that include updated information on the company's complete line of polyisocyanurate insulation for commercial roofing applications.

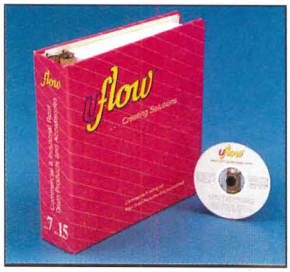
This literature provides complete, detailed information on product applications, code compliance, physical and thermal properties and warranty information.
Phone: 1-800-428-4442

Firestone Building Products. Circle No. 361.



NRG Barriers, headquartered in Portland, Maine, has been an industry leader for over twenty years in the manufacturing of energy-efficient polyisocyanurate foam insulation. Their product line includes flat, tapered (or sloped), nailable and composites. Manufacturing facilities can be found in Maine, Pennsylvania, Florida, and Indiana.
Phone: 1-800-343-1285.

NRG Barriers. Circle No. 364.



U-Flow Roof Drain Systems, Inc. introduces a new technical binder. It includes a section on product information and data sheets, product guide specifications, typical product flashing details, roof membrane manufacturer flashing details, a list of completed projects, U-Flow bulletins, additional reference materials and electronic technical and specification information. The technical details are available in print or electronic format. Phone: 1-800-51U-FLOW.

U-Flow Roof Drain Systems, Inc. Circle No. 367.

Reports from the field: Why they buy single ply

Larry Meyers, senior architect/engineer at Wiss, Janney, Elstner Associates, Inc., Chicago, found that a flexible membrane system met the firm's singular roofing needs recently on the Seattle Kingdome project. The dome's steeply sloped roof surface eliminated a number of roofing options, but a mechanically fastened PVC flexible membrane system was the design team's number one draft choice.

In fact, 70 percent of Meyers' roofing work is single ply, including PVC, modified bitumen and EPDM systems. On the Kingdome project, he used PVC because of his firm's confidence in its heat-welded seams.

For reroofing occupied buildings in particular where bitumen fumes can be a problem, Meyers recommends single-ply systems.

The largest roofing contractor in the U.S. is unequivocally committed to single-ply roofing systems. In fact, single plies comprise more than 50 percent of commercial roofing operations at Bryant Universal Roofing, Inc., based in Phoenix, AZ.

This contractor has installed flexible membrane roofing systems on a far-ranging variety of projects, including the dramatic Excalibur and MGM Grand Hotels in Las Vegas and the America West Arena, home court for the winning Phoenix Suns. Bryant Universal has itself garnered every prestigious roofing industry award, including SPRI's 1995 Contractor Achievement Award.

Wayne Mullis, founding CEO and chairman, notes that there are a variety of factors for the popularity of single plies. As a contractor, he appreciates the material handling advantages and labor savings they may offer in areas where access to the roof surface is challenging.

One of single plies' many other strong selling points, Mullis notes, is its ability to go over existing roofing due to its flexibility and relatively lighter weight (obviously excluding ballasted systems) — provided that the roof is suitable for recover.

As the supervisor/design and construction for the Arlington, VA school system, architect Mark Krause has to contend with decreasing tax bases and tight budgets, so economics has certainly been a factor in his choice of single-ply roofing systems.

Furthermore, with the white-colored membranes he prefers to use for Virginia's hot, humid summers, Krause figures he's also saving somewhat on energy costs due to the membranes' reflectivity and subsequently reduced loads on the schools' air conditioning systems.

As a conscientious facility manager, Krause does note that it is important to inspect roofs after maintenance workers or week-end student revelers may have visited; he's also taken measures to limit access to the roofs as much as physically possible.

In the 11 years since he joined the school system, Krause has specified 10 flexible membrane roofs including CSPEs, PVCs and SBS modified bitumens.

Teaming up for success

SPRI is a professional trade organization consisting of over 50 member companies who pool their resources to help advance the roofing industry as a whole.

Nearly 20 of these companies are specifically membrane manufacturers or marketers; many others supply raw materials, roofing components like fasteners, insulation or reinforcements, or professional services.

As of press time, the following is SPRI's membership roster:

ADCO Technologies, Inc.
Michigan Center, MI
517-764-0334

ARCO Chemical Co.
Newtown Square, PA
215-359-2000

Ashland Chemical Co.
Ashland, OH
419-289-9588

Atlas Roofing Corp.
Atlanta, GA
404-952-1442

Bayex, Inc.
Amherst, NY,
716-691-3351

Buildex, div. of ITW
Itasca, IL
708-595-3500

Robert D. Byrd & Associates
Big Bear Lake, CA
909-866-5777

Carlisle SynTec Systems
Carlisle, PA
717-245-7000

T. Clear Corp.
Hamilton, OH
513-870-920

Construction Fasteners, Inc.
Wyomissing, PA
215-376-5751

Dow Chemical U.S.A.
Midland, MI
517-636-1093

Du Pont Co.
Wilmington, DE
302-773-2206

Duro-Last, Inc.
Saginaw, MI
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Enspec, Inc.
Columbus, OH
614-459-3340

Envirospec, Inc.
Buffalo, NY
716-689-8545

Exxon Chemical Co.
Southfield, MI
313-350-6524

Firestone Building Products Co.
Carmel, IN
317-575-7000

Fluor Daniel, Inc.
Greenville, SC
803-281-4208

GAF Materials Corp.
Wayne, NJ
201-628-3000

GenFlex Roofing Systems
Maumee, OH
800-443-4272

W.P. Hickman Co.
Asheville, NC
704-274-4000

Hoechst Celanese Corp. Cramerton, NC
704-824-4466

Hoechst Celanese Corp. Spunbond Business Unit
Spartanburg, SC
800-845-7597

HPG Roofing Systems
Somerset, NJ
908-302-4228

Innovative Roofing Consultants
Salt Lake City, UT
801-278-8917

Inspec, Inc.
Minneapolis, MN
612-546-3434

JPS Elastomerics Corp. Stevens Roofing Systems
Holyoke, MA
413-533-8100

MM Systems
Tucker, GA
404-938-7570

Masonite Corp.
Chicago, IL
312-634-2766

Metal-Era, Inc.
Waukesha, WI
414-549-6900

NRG Barriers, Inc.
Portland, ME
800-343-1285

Oak Ridge National Laboratory
Oak Ridge, TN
615-574-0022

Olympic Fasteners
Agawam, MA
800-633-3800

Owens-Corning Fiberglas Corp.
Toledo, OH
216-633-6735

Rawlplug Co.
New Rochelle NY
914-235-6300

Sarnafil, Inc.
Canton, MA
617-828-5400

Schuller International Manville Roofing Systems Div.
Denver, CO
303-978-2000

Seal-Dry/USA, Inc.
Little Rock, AR
501-663-1926

Seaman Corp.
Wooster, OH
216-262-1111

SFS Stadler, Inc.
Reading, PA
216-273-7171

J.P. Sheahan Associates, Inc.
Midland, MI
517-832-7600

William L. Sheffey Consultant
Pomona, CA
909-590-6336

Shell Chemical Co.
Houston, TX
713-241-8151

Simpson Gumpertz & Heger
Arlington, MA
617-643-2000

Siplast
Irving, TX
214-869-0070

State Farm Insurance Companies
Bloomington, IL
309-766-4216

Structural Research, Inc.
Middleton, WI
608-831-5333

TACC International Corp.
Rockland, MA
617-878-7015

Tamko Asphalt Products, Inc.
Joplin, MO
417-624-6644

Tru-Fast Corp.
Bryan, OH
419-636-6715

U-Flow Roof Drain Systems, Inc.
Buffalo, OH
716-854-1521

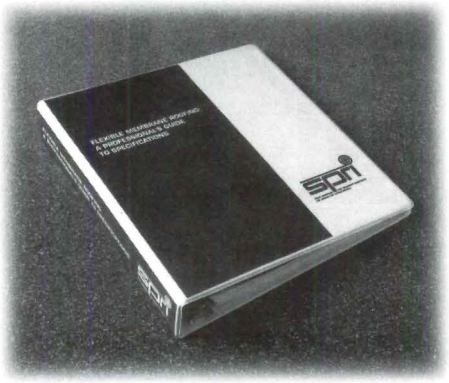
Uniroyal Adhesives & Sealants Co., Inc.
Mishawaka, IN
800-336-1973

Versico, Inc.
Akron, OH
800-992-7663

Westile
Littleton, CO
303-791-1700

GOOD ROOFING IS NOT ALL BLACK & WHITE

But the NEW 4th edition of SPRI's *"Professional's Guide"* should be read all over!



If you specify, install, or consult on commercial/industrial roofing projects, you need *FLEXIBLE MEMBRANE ROOFING: A PROFESSIONAL'S GUIDE TO SPECIFICATIONS,* the complete technical reference source for commercial and industrial roofing by the recognized industry leaders. SPRI has put all the information you need into one handy reference guide NOT AVAILABLE FROM ANY OTHER SINGLE SOURCE.

Some of the key information provided:

UPDATED Product information about membranes, insulation, fasteners, pavers and fabrics

UPDATED Test Data and Procedures

UPDATED Application Guidelines

UPDATED Wind Design Guides for Roof Systems

UPDATED Glossary of Terms

PLUS

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NEW Cross-referenced Index for Manufacturers Design Details

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NEW Cold-Applied Modified Bitumen Systems

NEW Standard Pullout Test Procedure for Fasteners

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Deadline for Submissions: September 8, 1995

43rd Annual P/A Awards

Jury

Will Bruder
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William P. Bruder-Architect, Ltd.
New River, Arizona

Santiago Calatrava, Architect
Principal
Santiago Calatrava Valls SA
Zurich and Paris

Douglas Kelbaugh, FAIA,
Professor of Architecture and Urban Design
University of Washington, Seattle

Noel Michael McKinnell
Founding Partner
Kallmann, McKinnell & Wood, Boston

Patricia Patkau
Principal
Patkau Architects
Vancouver, British Columbia
Associate Professor
University of British Columbia

Progressive Architecture announces its 43nd annual P/A Awards program. The purpose of this awards competition is to encourage outstanding work in architecture and urban design before it is executed. Awards and citations will be designated by a jury of distinguished, independent professionals, basing their decisions on overall excellence and innovative ideas. In an effort to address the broader concerns of the profession, P/A is encouraging the jury to take into account various considerations in addition to formal qualities: response to program and context, management of the design and construction process, technical solutions and details, social and economic contributions. Potential entrants are urged to interpret the call for "outstanding work" as broadly as possible, consistent with the awards program's limitation to specific projects that have been accepted for execution.

Judging will take place in October 1995 and winners will be notified, confidentially, by October 31. Public announcement of the winners will be made in January 1996, and winning entries will be featured in the January issue of P/A. Clients, as well as professionals responsible, will be recognized. P/A will distribute information on winning entries to national, local, and specialized media.

Eligibility

1 **Who Can Enter.**
Architects and other environmental design professionals practicing in the U.S., Canada, or Mexico may enter one or more submissions. Proposals may be for any location, but work must have been directed and substantially executed in offices in those countries.

2 **Real Projects.**
All entries must have been commissioned, for compensation, by clients with the authority and the intention to carry out the proposal submitted. In the case of design competitions, the proposals eligible are those the client intends to execute.

3 **Architectural Design Entries.**
Entries in Architectural Design may include only works of architecture scheduled to be completed after January 1, 1996. Indicate anticipated completion date on Projects Facts page (see item 7, below). Prototypical designs are acceptable, if commissioned by a client.

4 **Urban Design Entries.**
Entries in Urban Design must have been accepted by a client who intends to base actions on them. Implementation plans and anticipated schedule must be explained in entry.

5 **Verification by Client.**
The jury's decision to premiate any submission will be contingent on verification by P/A that it meets all eligibility requirements. To that end, P/A will contact the clients of projects the jury selects for recognition. P/A reserves final decision on eligibility and accepts no liability in that regard. Please be certain your entry meets the above rules.

(Submission requirements and entry form on the following page)

Entry Form: 43rd P/A Awards Program

Please fill out all parts and submit, intact, with each entry (see paragraph 12 of instructions). Copies of this form may be used.

Entrant:
Address: _____

Credit(s) for publication (attach additional sheet if necessary):

Entrant phone number:
Project:
Location:
Client:
Client phone number:
Category:

Entrant:
Address: _____

Project:

I certify that the submitted work was done by the parties credited and meets all Eligibility Requirements (1-5). I understand that any entry that fails to meet Submission Requirements (6-18) may be disqualified. Signer must be authorized to represent those credited.

Signature

Name (typed or printed)

Fees:
Subscriber $90 ☐ Non Subscriber $125 ☐ Entry plus one-year subscription, $125 ☐

Awards Editor/Progressive Architecture
600 Summer Street, Stamford, Connecticut 06901-1403
Project:
Your submission has been received and assigned number_____
(P/A will fill in this number and return this receipt. Please retain it for reference.)

Entrant:
Address:

(Receipt)

Awards Editor/Progressive Architecture
600 Summer Street, Stamford, Connecticut 06901-1403

Entrant:
Address:

(Return label)

Submission Requirements

6 Binders.
Entries must consist of legibly reproduced graphic material and text adequate to explain it, in English. All entry material must be firmly bound in binders no larger than 17" in either dimension (9" x 12" preferred). Avoid fragile bindings. Supplementary documents such as research reports or urban design appendices may be bound separately to avoid unwieldiness, as part of the same entry. Occasional fold-out pages are permissible, but unbound material in boxes, sleeves, etc., will not be considered.

7 Project Facts Page.
To assure clear communication to the jury, the first page in the entry binder must list PROJECT FACTS under the following explicit headings: Location, Site characteristics, Surroundings, Zoning Constraints, Type of Client, Program, Construction systems, Funding, and Schedule. Give hard data (square footages, costs, specific materials) where possible. All Project Facts should fit on one page. Paragraphs amplifying this data, covering design philosophy, etc., should be included on subsequent pages.

8 Documenting the Process.
It is desirable for entries to document the design process, as well as its result: entrants are encouraged to include copies of preliminary sketches, alternative preliminary schemes, information on context and precedents for the design, and excerpts from working drawings.

9 Research Behind Projects.
While P/A is cosponsoring a separate annual competition for architectural research (results of the 2nd annual Research Awards competition in July 1995 P/A) we encourage the inclusion of any research done in support of a specific architecture or urban design project that is otherwise eligible.

10 No Original Drawings.
Original drawings are not required, and P/A will accept no liability if they are submitted. No models, slides, or videotapes will be viewed by the jury.

11 Anonymity.
To maintain anonymity in judging, no names of entrants or collaborating parties may appear on any part of the submission, except on entry forms. Credits may be concealed by tape or any simple means. Do not conceal identity or location of projects.

12 Entry Forms.
Each submission must be accompanied by a signed entry form, to be found on this page. Reproductions of the form are acceptable. Fill out the entire form and insert it, intact, into an unsealed envelope attached inside the back cover of the binder.

13 Entry Categories.
For purposes of jury procedure only, please identify each entry on its entry form as one of the following: Educational (including any campus buildings), House (single-family), Housing (multifamily), Commercial, Cultural, Governmental, Health-related (including nursing homes), Industrial, Recreational, Religious, Urban design. Mixed facilities should be classified by the largest function. If unable to classify, enter Miscellaneous.

14 Copies of Key Pages.
To provide P/A with basic information on your entry, even if it is not premiated by the jury, please include one set of xeroxes reproducing six or more key pages of the entry (including Project Facts page), stapled separately and slipped inside the back cover of the binder.

15 Entry Fees.
Entry fee must accompany each submission. Fee is $90 for P/A subscribers, $125 for nonsubscribers. (Nonsubscribers can choose to subscribe at a special rate of $35 per year and pay the $90 entry fee; see entry form.) Make check or money order payable to Progressive Architecture. Canadian and Mexican offices must send drafts in U.S. dollars. Fee must be inserted in unsealed envelope with entry form (see 12, above).

16 Entry Receipts.
P/A will send a receipt by October 1, which will indicate an entry number to save for your reference.

17 Return of Entries.
P/A intends to return all entries by January 1, by U.S. Mail. P/A assumes no liability for loss or damage.

18 Entry Deadline.
Deadline for sending entries is **September 8, 1995**. All entries must show some date marking as evidence of being in the carrier's hands by September 8. Hand-delivered entries must arrive at P/A's offices (address below, 6th Floor reception desk) by 5 p.m., September 8. In order to assure arrival in time for the jury, P/A recommends using a carrier that guarantees delivery within a few days.

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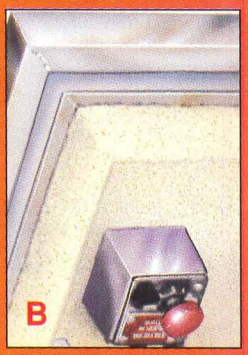
Photo B...*Composite cover design with fire proof coating.*

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



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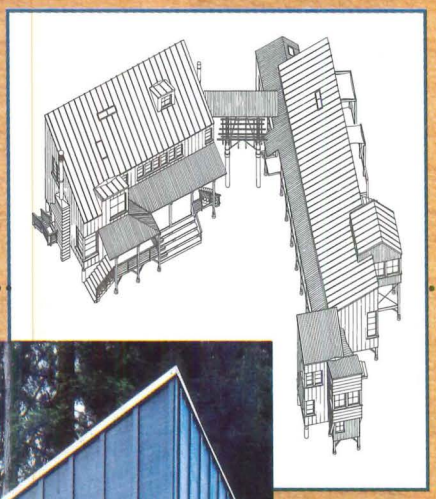


The American Wood Council Invites Entries in the 1995 Wood Design Award Program —the fifteenth annual program honoring design excellence in wood buildings.

Consortium Housing
Fernau & Hartman
1994 Merit Award

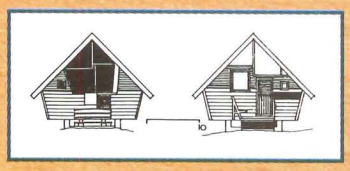
To qualify, the greatest part of the buildings' exterior must be wood, and wood members must form an integral part of the projects' structure.

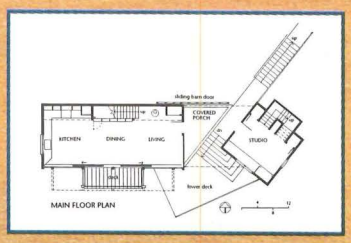
A wide range of wood product applications is encouraged in buildings of varied type and scale. Residential, nonresidential, new, and remodeled buildings finished since January 1992 are eligible.

Winning designs will demonstrate an understanding of the special properties of wood, including strength, durability, environmental benefits, versatility, and, of course, beauty.

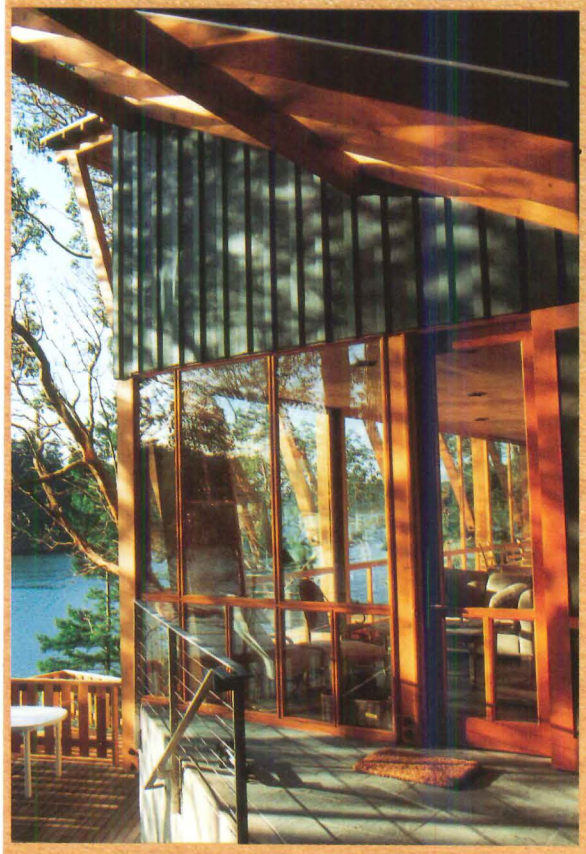
Award-winning projects will be publicized in local and national media. Winning architects, builders, general contractors, and structural engineers will receive award certificates, and be featured in the 1995 Wood Design Award Program book of winners which is distributed to AIA member firms, and to others upon request.

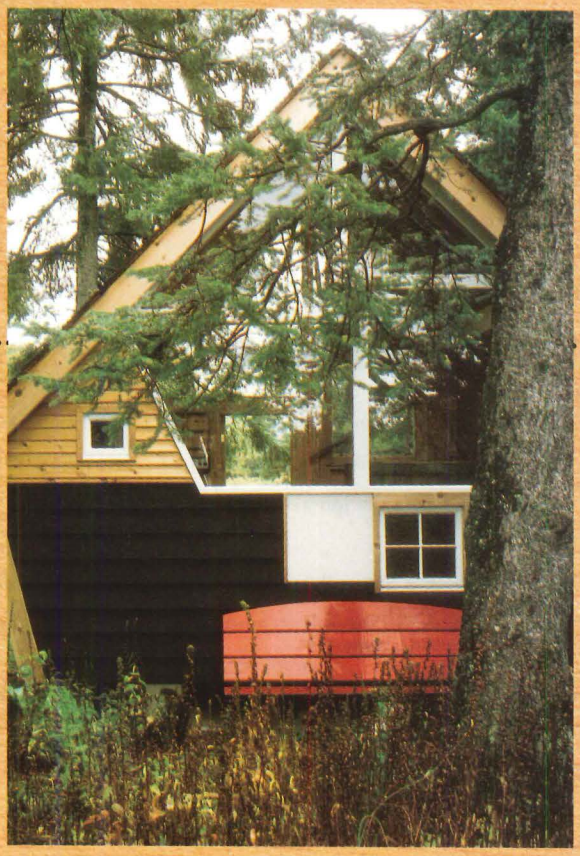
Loken Residence
David D. Salmela, AIA
1994 Citation Award





Decatur Island Residence
Miller-Hull Partnership
1994 Merit Award





Call for Entries

THE JURY:

FRANCES HALSBAND, FAIA
Klimint & Halsband
New York, New York

LAURA HARTMAN
Fernau & Hartman
Berkeley, California

PROFESSOR JOHN WEBSTER
Department of Architecture
University of Tasmania, Australia

To receive entry forms, send your name, address, phone, and fax numbers, with the number of entries you intend to submit, to:

Wood Design Award Program
American Wood Council
1111 19th Street, NW
Suite 800
Washington, D.C. 20036.

There is no entry fee.

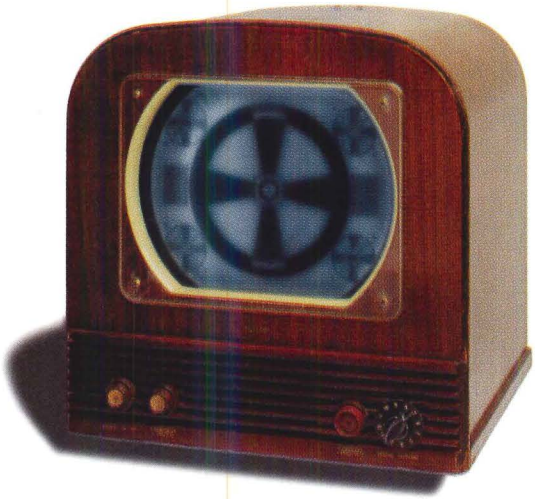
Circle **No. 319**

The American Wood Council of the American Forest & Paper Association assures broad regulatory acceptance of wood building materials, develops design and construction guidelines for wood structures, and encourages user preferences of wood products by communicating wood's superior qualities and inherent benefits.

It Was Extravagant

Nobody Needed One

Everybody Wanted One



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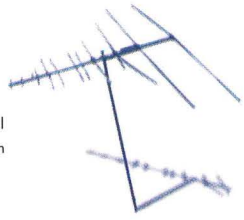

1971 | 1974 Cost of Defense deductible option | Contract review course 1981 | TeamCover project insurance 1987 | Mediation Works! incentive program 1988 | 1989 Split limits option | Partnering incentive 1993

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AIA Atlanta Convention: A Learning Experience

The annual rite of the national AIA Convention was re-enacted May 4–8 in Atlanta, a city in the throes of preparing for the 1996 Olympic Games. From a base at John Portman's original Hyatt Regency Hotel – mother of all atriums – the attendees were shuttled through a tangle of on-ramps to the vast and impersonal Georgia World Congress Center, where they were offered a staggering array of seminars and workshops – their values measured in continuing education points. At business sessions, there was a brief rebellion against continuing education requirements, but a voice vote sustained the program.

General sessions stressed entrepreneurship, adaptability, and alternative professional roles. The big political event was the exceptional six-candidate contest for First Vice President/President-Elect (the one who will be President in 1997). In the run-off between the top two vote-getters, Raj Barr-Kumar of Washington, D.C., beat out Ronald Altoon of Los Angeles. A Fellow of the AIA, Barr-Kumar has previously served as a national AIA Vice President. Born in Ceylon (now Sri Lanka), he will be the first AIA President who is not of European ancestry. □

Gehry's American Center in a Financial Bind

The building is fine, but the client may not survive; that's the word on the American Center in Paris, which last year opened an impressive new home by Frank O. Gehry & Associates (P/A, June 1994, p. 27) but is short of operating funds for the exhibitions and events it intended to mount. The center's director, Marie-Claud Beaud, says of the building, commissioned by her predecessor, "It's great, but is it necessary?" She finds the allocation of space inappropriate for her vision of the center's mission, and she particularly faults its location in the Bercy neighborhood, where regeneration efforts have slowed. Whatever the wisdom of the organization's building program, its current problem is raising operating funds in an economic climate whose difficulties, including a deflated dollar, were not foreseen. □

Jim Argo: *The Daily Oklahoman*/SABA

Damage in the Oklahoma City Bombing May Exceed $500 Million

In addition to its heavy human toll of 166 deaths, the April 19 bombing of the Alfred P. Murrah Federal Building in Oklahoma City inflicted extensive damage on downtown buildings, some of which were architecturally or historically notable. Losses could range from $500 million to $1 billion, said Paul Sprehe, a director of HTB, Inc., who analyzed the explosion's effects as a part of a group of consulting engineers.

In architectural terms, the greatest loss may have been the Murrah building itself. Designed for the General Services Administration by local firms Shaw & Associates and Locke, Wright & Foster, the building was voted one of Oklahoma's ten best by the Oklahoma Chapter of the AIA in 1983. Architect James Loftis, who designed the building while at Shaw & Associates, says the GSA asked for a design that addressed two important early 1970s concerns: energy efficiency and the risk of bombing by Vietnam War protesters. While the latter concern resulted in a reinforced concrete structure that remained stable after the bombing, the quest for indirect sunlight led to the use of a glass curtain wall on the north face, which proved especially vulnerable.

The GSA decided last month to demolish the structure with a controlled explosion. Many Oklahomans want its site to be preserved as a memorial, in which case a new Federal Building will probably be built nearby. Approximately 70 other buildings in the downtown area were damaged by the blast (see Report, p. 65). Two of the city's oldest churches, which sit on either side of the Murrah building, suffered severe damage: St. Joseph's Old Cathedral lost its roof and stained glass windows, while the First United Methodist Church sustained structural damage and will likely be razed. State preservation architect Eva Osborne said about 20 of the damaged buildings were listed on or eligible for the National Register of Historic Places.

Among those killed were Oklahoma City architect Donald Lee Fritzler, 64, and his wife, Mary Anne Fritzler, 57, who had an appointment in the Federal Building's Social Security office that morning. Fritzler, an architect for 34 years and principal of Fritzler and Associates since 1980, had designed many churches in Oklahoma and Texas. His wife worked in the firm as an administrator until late last year. □

Books

G. E. Kidder Smith

Pietro Belluschi: Modern American Architect *by Meredith L. Clausen, MIT Press, Cambridge, Massachusetts, 1995, $60.*
The exasperating career of Belluschi (1899–1994) is treated in a well-crafted biography that sheds light on decades of American architectural practice. Emigrating from Italy in the 1920s, Belluschi wound up coincidentally in Portland, Oregon, where he produced some wonderfully austere Northwest Regionalist Modern buildings in the 1930s, then the elegant and precedent-setting Equitable Building in 1948. International acclaim – along with his imposing looks and courtliness – led him to the deanship at M.I.T. and to a series of consulting-architect commissions that tarnished his reputation within the profession. (The Pan Am tower in New York and St. Mary's Cathedral in San Franscisco were the most damaging.) After his retirement to Portland, he was known mainly for his outspoken opposition to Michael Graves's Portland Building (1980), but meanwhile he resumed designing good buildings in his original Northwest mode. (Shown above: Portsmouth Abbey church, Rhode Island, 1957–60).

The Power of Place: Urban Landscapes as Public History *by Dolores Hayden, MIT Press, Cambridge, Massachusetts, 1995, $30.*
Part social history, part cultural geography, part architectural polemic, this book argues that the meaning of space and buildings derives only marginally from those who design them, and largely from those who make them, inhabit them, and alter them over time. Thus architects, says the author, must "learn to design with memory rather than against it." The book does more, though, than just make a plea for architectural preservation. It makes a case for using physical artifacts to reveal memories, especially those that the dominant culture has suppressed – the history, for example, of women or people of color. Implicit in this is the idea that a truly radical architecture is not one of flashy forms, but of social and political substance, confronting us with what we have done and who we are, rather than just comforting us with only what we want to see.

Workplace by Design: Mapping the High-Performance Workspace *by Franklin Becker and Fritz Steele, Jossey-Bass, San Francisco, 1995, $27.*
Arguing that the workplace is, next to people, the most important asset of an organization, the authors proceed to outline what they call the "ecology of the workplace." Ecology is the operative word here, because they demonstrate that an effective office depends not just on its design, but on an "integrated workplace strategy" that includes how it is managed, how employees are treated, how technology is used, and so on. The authors analyze the non-territorial office, and give several examples of how it is working in various companies, but they also stress that it must be done for business, not just for cost-cutting reasons. The social ecology of the workplace, like a natural ecology, must evolve and cannot be forced or inhibited, an important reminder for designers trying either to leave their mark or simply to accept the traditional office.

The Architecture of the Jumping Universe, A Polemic: How Complexity Science is Changing Architecture and Culture *by Charles Jencks, Academy Editions, New York, 1995, $20.*
Charles Jencks has jumped from being an apologist for Post-Modern historicism to being an advocate of "cosmogenic" architecture – architecture that embodies recent scientific theories of chaos and complexity. And yet Jencks has really not jumped all that far: as in his earlier historicist phase, he remains a formalist here, content with buildings that symbolize complexity, however superficial that may be. (The most superficially symbolic architecture in the book is Jencks's own.) What he misses is the real complexity of architecture: the myriad flows of energy, material, labor, money, and ideas that go into even the simplest building. The value of complexity science for us is not as the generator of a new style, but as a tool to help us understand the apparently chaotic conditions of making architecture.

Briefly Noted

The Architecture of Incarceration, *edited by Iona Spens, Academy Editions, London, 1995, $50.*
Documentation of the building type's emergence in the late 18th Century through many contemporary examples.

Ben van Berkel: Mobile Forces *edited by Kristin Feireiss, Ernst & Sohn, VCH Publishing, New York, 1995, $60.*
Projects, built and unbuilt, by the young Dutch architect, one of an emerging generation of Modernists with brash new ideas (see p. 57 and p. 80).

Earth To Spirit *by David Pearson, Chronicle Books, San Francisco, 1995, $17.95.*
International survey of environmentally responsible architecture.

Turner Brooks: Work *by Turner Brooks, Princeton Architectural Press, New York, 1995, $27.95.*
Monograph illustrating the New England architect's quirky take on the vernacular.

World War II and the American Dream: How Wartime Building Changed a Nation *edited by Donald Albrecht, MIT Press, Cambridge, Massachusetts, 1995, $45 cloth, $25 paper.*
Critical essays examining the Post-War period; published in conjunction with an exhibition held at the National Building Museum (P/A, Feb. 1995, p. 35).

Obituaries

John Hancock Callender, longtime editor of *Time-Saver Standards for Architectural Design Data* before his retirement in 1982, died March 30 in Lansdale, Pennsylvania. An architect educated at Yale and New York University, Callender, 86, became a proponent of prefabricated housing early in his career, when he conducted research for the John B. Pierce Foundation. He supervised the remodeling of laboratories for the Manhattan Project to build an atomic bomb.
Fred Travisano, an architect and Prix de Rome recipient who was assistant director of development for the City of Trenton, a special lecturer at New Jersey Institute of Technology, and a partner in the design firm of Mostoller and Travisano, died March 30 at his home in Princeton. He was 54.
Frederick D. Nichols, a retired University of Virginia architecture professor who spearheaded and supervised the restoration of Thomas Jefferson's Rotunda at the university, died April 9 in Charlottesville. He reversed the changes made by Stanford White after a fire in 1895. Nichols, 84, established the university's department of architectural history.

Prisons on the Cheap

When more than 100 hungry architects and construction industry leaders met for breakfast at New York's Yale Club in April, they hoped to get encouraging news about upcoming prison construction projects, boosted by the prospect of the federal crime bill's $10.3-billion appropriation for that purpose. Instead, they learned that one of the largest privatization companies, Wackenhut Corrections Corporation of Coral Gables, Florida, competitively designs, builds, finances, and operates correctional facilities, using five in-house architects and a Texas construction firm to turn out projects around the country, especially in the 13 states that allow privatization. The net result: fewer design and construction opportunities for local firms from all levels of government.

Still, Larry Solomon of the National Institute of Corrections reports that about 40 to 60 new state prisons go on line every year. And since the crime bill's grants to the states for prison construction contain a requirement that violent offenders serve 85 percent of their sentences, many states and counties will need more beds. Large states, including California, Florida, and Texas, are in the midst of programs involving design and construction of many prototypes, using government staff members, privatization companies, and outside consultants. Privatization may save up to 18 percent in operational costs, making it attractive to some jurisdictions. □

Robie House Museum

The Frank Lloyd Wright Home and Studio Foundation in Oak Park, Illinois, has devised a plan under which it would eventually operate Wright's Frederick C. Robie House on the University of Chicago campus as a house museum. The three-story house, built in 1909 and currently used as offices of the university's alumni association, is the object of a restoration fund drive aimed at raising $2.5 million. Under the new agreement, the university would lease the house to the foundation, which would then open it to the public. □

Lighting the Ginza's Sky

Courtesy Coca-Cola

The largest three-dimensional neon Coca-Cola sign in the world has recently been erected at the peak of the San-Ai building in the Ginza district of Tokyo. Equipped with two miles of neon tubing, the new sign is semi-circular, wrapping around 220 degrees and measuring 48 feet in diameter. Thanks to newly developed energy-efficient electronic transformers that reduce electrical consumption by a third, the sign is not only flashy but economical, as 49-foot-tall signs go. □

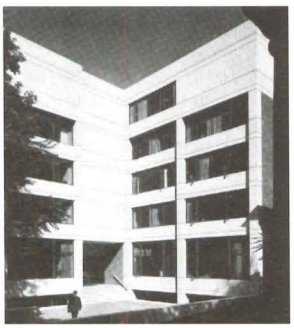
Plater-Zyberk Named Dean

Miami architect and professor Elizabeth Plater-Zyberk has been appointed dean of the School of Architecture at the University of Miami, where she has taught since 1979. A leader with her husband and partner, Andres Duany, in the "New Urbanism," Plater-Zyberk founded the school's Master of Architecture program in suburban and town design and has been director of UM's Center for Urban and Community Design. Duany & Plater-Zyberk have worked on master plans for cities such as Trenton, Providence, and Los Angeles in addition to their well-known involvement in Seaside, Florida, and other resort and suburban developments. Plater-Zyberk succeeds Roger L. Schluntz, who resigned effective May 31 with plans to return to the faculty after a year's leave of absence. □

The Architects Collaborative Suspends Operations

Fifty years after it was founded by a group that included Walter Gropius, The Architects Collaborative (TAC) ceased conducting architectural business on April 10. Its president, John Hayes, said the firm, one of the standard-bearers of American Modernism, stopped work on its commissions after its financier, BayBank, mandated that all client payments go directly to the bank, not to TAC. Although BayBank took control over access to TAC's offices in Cambridge, Massachusetts, where telephones were not being answered, the firm was not in bankruptcy at this writing; Hayes continued to function as president, and the board of directors remained intact.

Hayes and two of TAC's founding partners, John C. Harkness and Norman C. Fletcher, are establishing an interim firm, The Collaborative for Architecture, Inc., which will be succeeded in a few months by The Architects Collaborative International, Inc. This debt-free corporation will take on new projects and, it is hoped, will employ many of the 45 who recently worked at TAC. The collaborative design process that is the firm's namesake will be as fundamental to the new organization as it was to the original one, said Hayes. The partners intend to complete commissions TAC had under way.



The partners of TAC in the Harvard Graduate Center (top, from left to right): Sarah Harkness, Jean Fletcher, Robert McMillan, Norman Fletcher, Walter Gropius, John Harkness, Benjamin Thompson, Louis McMillen. TAC office building, Cambridge, Massachusetts (above).

Earl Flansburgh, a TAC "alumnus," said working there in the 1950s and early 1960s "was like a second master's degree." The Harvard Square office attracted the best graduates of MIT and Harvard and gave them exceptional freedom and responsibility. TAC produced some outstanding mid-century Modern buildings, particularly for academic and institutional clients, and at its peak ranked among the nation's largest architecture firms, with 386 employees and branch offices in San Francisco and Rome. □

BART Makes Tracks For the Airport

After 23 years of debate over 93 different proposals, the Bay Area Rapid Transit board and the San Mateo County Transit District have decided to extend BART's rail line directly into San Francisco International Airport. The project, involving construction of eight miles of track, carries a daunting price tag of about $1.27 billion, but the rail line is expected to do more than any other proposal to relieve traffic congestion and cut air pollution. "There are some things you do because it is the right thing to do," said BART Director Dan Richard. Projected for completion as early as 1999, the rail extension relies mostly on funds already in place. But a large chunk – $209 million – is yet to be appropriated by a tight-fisted Congress. Stay tuned ... □

Calendar

COMPETITIONS

Small House Awards
Deadline, submission: June 30
Built and unbuilt single-family houses (up to 1,250-square-feet) designed to be environmentally responsible and energy efficient may be entered in this program. Contact International Small House Competition, 156 Aylesworth Hall, SE, Colorado State U., Ft. Collins, CO 80523-1575. Tel. (970) 491-5575. FAX (970) 491-4855.

DuPont Antron® Design Awards
Deadline, submission: July 1
Commercial interiors completed since June 1992 that use carpet made of 100-percent DuPont Antron® nylon are eligible for this awards program. Contact DuPont Antron Design Award Center, Burson-Marsteller, 230 Park Ave. S., New York, NY 10003. Tel. (212) 614-4877.

Architecture and Film
Deadline, submission: July 31
Films and videos on architecture, design, landscape architecture, public art, or the city may be entered in the 2nd International Biennale Film and Architecture Competition. Awards will be presented at the Biennale in Graz, Austria, in the fall. Contact film+arc.graz, Rechbauerstrasse 38, A-8010 Graz, Austria. Tel. 43 316/842487. FAX 43 316/829511.

Ruth and Ralph Erskine Fellowship
Deadline, submission: July 31
This biennial award of $10,000 honors a built project designed for the underprivileged members of society. Contact Erskines Stipendiefond, Svenska Arkitekters Riksforbund, Norrlandsgatan 18 2tr, S-111 43 Stockholm, Sweden. Tel. 46 8 679 27 60. FAX 46 8 611 49 30.

Rethinking Public Space
Deadline, registration: August 1
Surface, the new journal of the UCLA Department of Architecture and Urban Design, is sponsoring a multidisciplinary competition for design ideas in conjunction with its first issue on "public space and social form." There is a $5,000 first prize. Contact Surface, Dept. of Architecture and Urban Design, 405 Hilgard Ave., 1317 Perloff Hall, Los Angeles, CA 90024-1467. Tel. (310) 825-4776. FAX (310) 825-7745. E-Mail: surface@gsaup.ucla.edu.

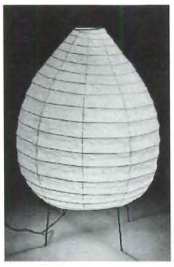
Civic Center for Wagga Wagga
Deadline, submission: August 4
The City of Wagga Wagga, Australia, has announced a two-stage international competition for the design of a new civic center. Contact Victoria Dalglish. Tel. 61 69 235 375. FAX 61 69 235 385. Or write to: B.L. Andrews, General Manager, PO Box 20, Wagga Wagga, NSW 2650, Australia.

World War II Memorial
Deadline, registration: August 15;
submission: November 1
The State of Maryland has announced a national competition for the design of a $3-million memorial to honor its World War II veterans. Contact Design Competition, State of Maryland World War II Memorial Commission, Department of General Services, Office of Procurement, 301 W. Preston St., Baltimore, MD 21201.

P/A Awards
Deadline, submission: September 8
The 43rd Annual P/A Awards program recognizes projects scheduled for completion after January 1, 1996. See p. 39 for details.

EXHIBITIONS

Light Sculptures by Noguchi
Through September 17
Museum of Decorative Arts, Montreal.
"Quiet Light" is traveling exhibition of Noguchi's paper and metal-frame lighting. The installation was designed by architects Tod Williams and Billie Tsien. (Shown at right: Model 23N, circa 1968.)


Kevin Noble

Fragile Dwellings
Through November 8
National Building Museum, Washington, D.C.
Powerful images of makeshift homes are presented in "Fragile Dwellings: Photographs of Homeless Communities by Margaret Morton" (P/A, Aug. 1993, p. 78).

Popularizing Architecture in the U.S.A.
June 14–October 29
Canadian Center for Architecture, Montreal.
Using postcards, souvenir buildings, and world's fair memorabilia, this show highlights some of the ways that public awareness of the built environment is created.

Contemporary British Architecture
June 21–September 30
National Academy of Design, New York.
On view will be a survey of work by British architects, both Modernists and Classicists.

CONFERENCES

CSI Convention
June 23–25
Minneapolis.
The Construction Specifications Institute's 39th annual convention will include more than 1,000 exhibition booths and 30 educational sessions. Contact CSI, Convention Registration, 601 Madison St., Alexandria, VA 22314. Tel. (800) 689-2900. FAX (703) 684-0465.

Traditional Cities
July 9–11
Chicago.
Application of traditional urban design and architectural principles to sustainable cities is the subject of "The Art of Building Cities" conference and exhibition. Contact Michael Lykoudis, School of Architecture, U. of Notre Dame, Notre Dame, IN 46556. Tel. (219) 631-6168. FAX (219) 631-8486.

Green Buildings Demystified
August 13–15
Big Sky, Montana.
Sponsored by the U.S. Green Building Council, "Green Buildings Demystified: Bottom-Line Performance Through Environmental Efficiency" will cover the design, construction, operation, maintenance, and dismantling of environmentally efficient buildings. Contact USGBC, 7900 Wisconsin Ave., Suite 404, Bethesda, MD 20814. Tel. (301) 657-3469. FAX (301) 907-9326.

Practice Notes

Architects in an Economic Vise
Two recent studies by *Professional Services Management Journal* highlight the financial squeeze gripping most architects. Although design fees have increased slightly since last year, 92 percent of those surveyed say price competition is growing and almost 75 percent engage in fee bidding. But overhead rates are rapidly rising. During the next decade, PSMJ expects computers to raise architects' overhead rates by 80 percent, and overhead rates as a whole will rise to 230 percent. For more information, call PSMJ at (617) 965-0055.

Our Friends in Congress, Again
Just months after the AIA identified architects' Republican friends in Congress (P/A, March 1995, p. 18), the Institute is fighting a Republican effort in the Senate to rescind $1.8 billion in appropriations already approved for General Services Administration projects – mostly courthouses, border stations, IRS offices, and federal office renovations. AIA lobbyist Albert Eisenberg says the AIA supports deficit reduction involving "thoughtful choices, not ill-considered slashes" of projects long planned. For more information, call Carl Schwartz of AIA at (202) 626-7463.

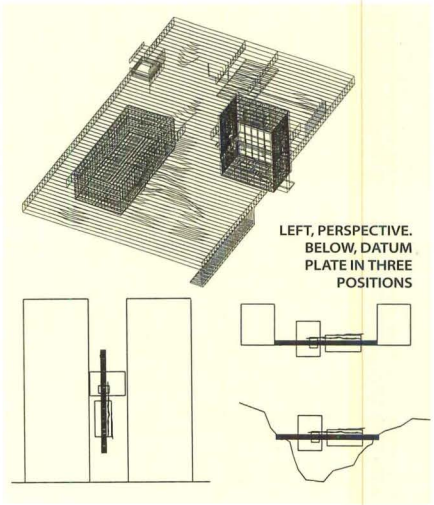
Technics Notes

Recycled Wood Flooring
Scientific Certification Systems, which certifies environmentally sustainable materials, says recycled wood flooring is now available from International Wood Products. The material is retrieved from 19th-Century buildings slated for demolition, and includes formerly decimated, federally protected species such as heart pine. Contact SCS at: Ordway Building, One Kaiser Plaza, Suite 901, Oakland, CA 94612; phone (510) 832-1415; fax (510) 832-0359.

Mortar Performance
According to the National Research Council of Canada, an investigation of the relationship between freeze-thaw performance and the physical properties of mortar reveals that the best performance is achieved with mid-range flow and mid-range water-to-binder ratios. Mortar with a low water-to-binder ratio and no flow performed as poorly as those with high ratios and flow. For more information contact: M.L. Thomson, Materials Laboratory, Institute for Research in Construction, National Research Council of Canada, Montreal Road, Ottawa, KIA 0R6, Canada; phone (613) 993-1596; fax (613) 954-5984.

Downward With the Peso

U.S. architecture firms working in Mexico have been hard hit by the collapse of the peso, which has halted a NAFTA-driven Mexican construction boom. RTKL says its Dallas office has reassigned staff members to other jobs, now that Mexican projects are on hold. Another Dallas firm active in Mexico, Haldeman Powell, has had to lay off 25 percent of its staff. Principal Donald Powell says it will be six months to a year before development resumes in Mexico. □



LEFT, PERSPECTIVE. BELOW, DATUM PLATE IN THREE POSITIONS

Defying *Genius Loci*

Sometimes the best way to win a competition is to question its very assumptions, which is what French designer Zainie Zainul did in winning the Grand Prix in the 1995 NARA/TOTO World Architecture Triennale competition. Sponsored by the Association for the World Architecture Exposition and judged by Kisho Kurokawa, Toyo Ito, Hajime Yatsuka, and Taro Ashihara of Japan and Dominique Perrault of France, the competition sought "ways of interpreting and expressing relations between building and locales." The winning project instead attempts "to construct an architecture which is independent of any context, therefore liberating itself from any imposed restrictions." A "datum plate that contains all necessary technical and structural support" functions as a "plateau" into which "programmatic elements may be inserted (plugged in) independently." This plateau removes any constraints of a site – bridging over valleys, cantilevering off slopes, filling the gap between buildings – an idea that recalls both the early Metabolist work of Kurokawa and the horizontal podium of Perrault's National Library. The competition goal of striving "to discover ... the *genius loci*" and the competition winner's goal of wanting to be free from it evince two of the conflicting drives of architecture right now. □

NEW YORK–NEW YORK HOTEL AND CASINO

Placing Bets on New York

Las Vegas is where great architecture goes to die. First, it was the Roman Forum cast in plaster, then the Great Pyramid entombed in dark glass. Now, it is New York City's landmarks lined up as if before a firing squad. The new $350-million, 2,119-room New York-New York Hotel and Casino, designed by Las Vegas architects Neal Gaskin and Ilia Bezanski, will have a 150-foot-tall Statue of Liberty greeting visitors, a 300-foot-long Brooklyn Bridge giving access to the casino, a 203-foot-high Coney Island roller coaster encircling the complex, and ten highrises – including the Empire State, Chrysler, Seagram, and CBS Buildings – huddled together and roughly one-third their original size. At their feet will be "re-creations" of the Guggenheim, Radio City Music Hall, and the Museum of Modern Art. In Las Vegas, one should never read too much into anything. But New York-New York seems to be a simulation of a simulation, recalling not the real city so much as the compressed, romanticized image of it that we see in the background of car and clothing ads and late-night reruns of "Taxi." For millions of people, that is the reality of New York, to which this hotel and casino remains remarkably faithful. The only thing missing at this point is a re-creation of the movie *Escape from New York*. □

Good Fulton & Farrell

Refreshing Dr. Pepper

The Dr. Pepper bottling plant in North Dallas, a 1940s Moderne landmark that recently became a *cause célèbre* when its owner considered demolishing it, will be renovated as a retail center, with Barnes & Noble as a principal tenant anchoring the space behind the building's monumental entrance and lobby. The limestone building, known for its distinctive clock tower, sits at a key intersection in an area booming with stores and restaurants, and when Dallas's first rail line opens next year, a station will adjoin it. Good Fulton & Farrell of Dallas has designed the renovation so that signs will be carried on a steel frame across the structure's front, leaving the building itself untouched. While the decision to save the building has been generally applauded, *Dallas Morning News* critic David Dillon complained that instead of a "strip shopping center surrounded by acres of asphalt," this transit node cried out for dense development. He faulted the city for disbanding its planning team responsible for development around rail stations. □

Gerard Halary © Archipress

Paris Blockbuster

This spring, the new National Library of France was delivered vacant to the French government, to be dedicated by a departing President Mitterrand as the coda to his *grands projets*. Before the library actually opens to the public in early 1997, 12 million books and many facilities, including 3,500 reading places, remain to be installed.

As architect Dominique Perrault and supporters have been saying in the face of widespread criticism, it may be "premature" to judge his competition-winning design, and "unfair" to do so by its exterior alone. But the library's dominant L-shaped towers – the four 240-foot-high "open books" – are very much on hand to be judged, and with the interior courtyard unfinished and removed from public view, they are really all one has to go on.

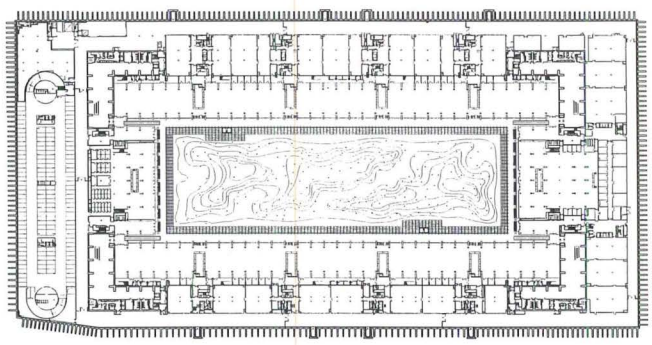
For the moment at least, public reactions have tended to be a little like this one from an aghast New Yorker on a recent visit: "Library? It looks like the *projects*!" Given an air of abandonment and disarray by hundreds of *okoumé* wood shades unevenly deployed behind their otherwise regular glass exteriors, the towers do ring an unfortunate echo of the grim suburban *cités* around Paris.

An immediate furor greeted Perrault's project when it was first unveiled four years ago. One critic decried its "perverse, illogical inversion that inters humans below grade and elevates old books in glass towers." Others, accepting the architect's position that rare books, even in glass towers, could be protected, welcomed the tranquility promised by the library's huge, tree-filled sunken courtyard, ringed with reading rooms, study areas, and research facilities. Somewhat disingenuously, the design was even defended on grounds that all books would soon be consigned to the scrapheap of history and here was a new type of library, suited for the electronic information age.

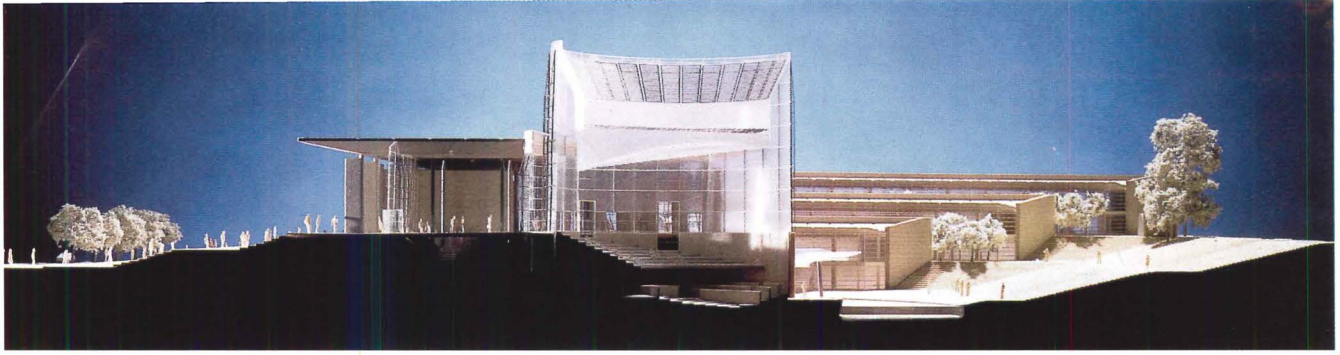
Regardless of what happens within, the library site will remain handicapped by an utter lack of connection to its surroundings. The towers turn inward, appearing heavy, dull, and unapproachable. They make no gesture to meeting the ground and, rising, they merely stop (two stories short of the original design – an unhappy compromise that has harmed their proportions). Worse, not only is the complex cut off from the Seine by fast-moving road traffic and rail lines, but it forms an insurmountable barrier between the river and the *arrondissement* of which it is nominally a part. Thus, the intrinsically public nature of the institution is profoundly thwarted.

Thomas Vonier

Robert Cesar/BNF © Archipress



RESEARCH AND STUDY AREAS, GARDEN LEVEL PLAN



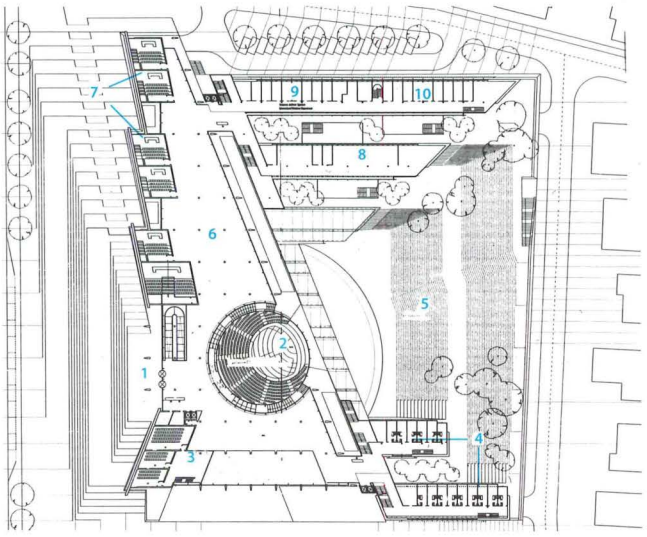
SECTIONAL MODEL

An Idealistic House for Government

The London branch of Kohn Pedersen Fox Associates has won a competition for the new House of Representatives in Nicosia, Cyprus. Designed with D. Kythreotis and Associates and Battle McCarthy Consulting Engineers, the 140,000-square-foot building was shaped by political and environmental concerns. According to the architects' statement, its "primary role is to encourage citizens to participate in the democratic process." Intended as a latter-day Agora, a vast public foyer lined with meeting rooms is placed adjacent to the translucent alabaster drum housing the plenary hall. Security considerations are addressed via sectional and planimetric splits that sequester portions of the building. However, it remains to be seen whether the extensive free-access areas are viable from that standpoint.

Housed in linear wings flanking a private parliamentary garden to the rear, the offices of the administrators and Representatives overlook sunken courts. Sections through this portion reveal an effort to reduce heat build-up during the day by means of deep overhangs, massive construction, and evaporative cooling; by night natural ventilation is intended to precool the structure.

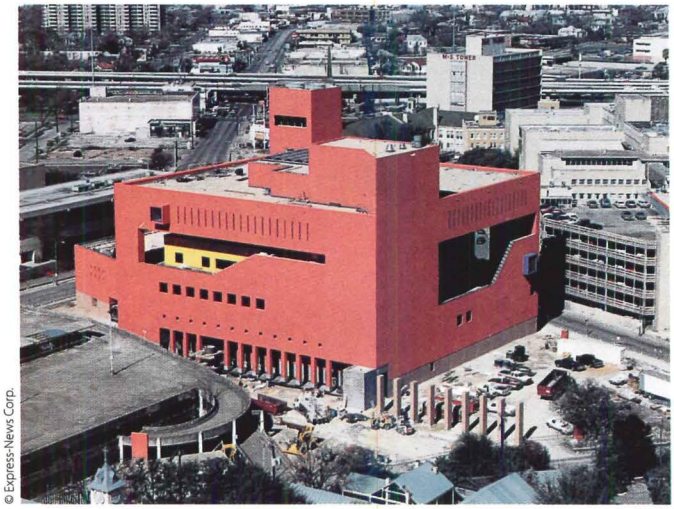
The project is scheduled to go into construction in 1996, at an estimated cost of 15 million Cypriot pounds ($37 million).



MAIN FLOOR PLAN

N ↑ 100'/30m

1 MAIN ENTRANCE
2 MEETING CHAMBER
3 ROOMS FOR PARLIAMENTARY GROUPS
4 REPRESENTATIVES' OFFICES
5 GARDEN
6 FOYER
7 MEETING ROOMS
8 ARCHIVES AND ACCOUNTS
9 INTERNATIONAL RELATIONS DEPARTMENT
10 PUBLICATIONS DEPARTMENT



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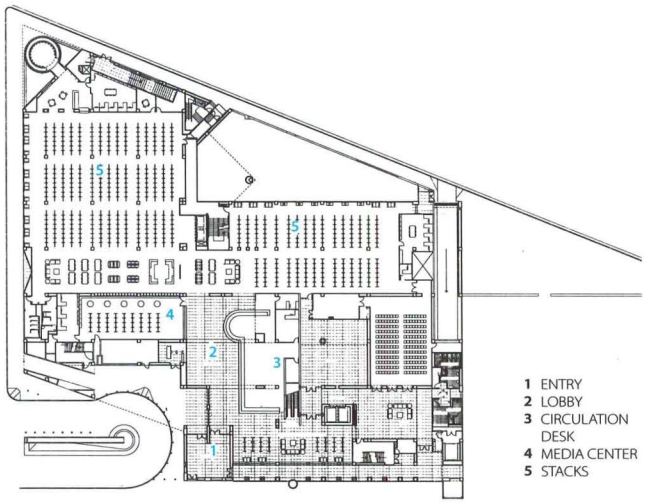


FIRST FLOOR PLAN

N ↑ 40'/12m

1 ENTRY
2 LOBBY
3 CIRCULATION DESK
4 MEDIA CENTER
5 STACKS

It's a Legorreta

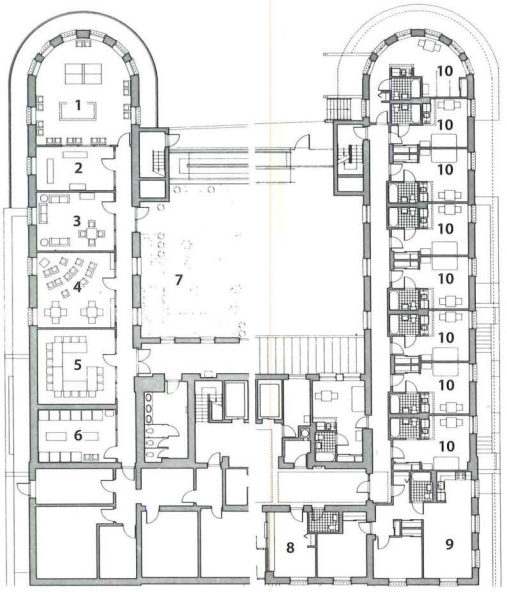
With its new Central Library, San Antonio joins several cities across the country that are boosting civic pride with name-brand architecture. Inaugurated in May with much fanfare, but not yet open to the public, the 240,000-square-foot, $28-million building by Mexican architect Ricardo Legorreta is billed as a state-of-the-art "library of the future" and painted an eye-popping color (dubbed "enchilada red" in a local newspaper contest).

Legorreta's bold palette has received mixed reviews in work north of the border (the Solana business park near Dallas, Pershing Square in Los Angeles), and the library is no exception. Here, under San Antonio's intense sun, the color is surprisingly appealing. And Legorreta's trademark use of form to create dramatic shadows is also effective. Local firms Sprinkle, Robey Architects and Johnson-Dempsey & Associates were part of the joint venture team.

©Algis Norvila 1994

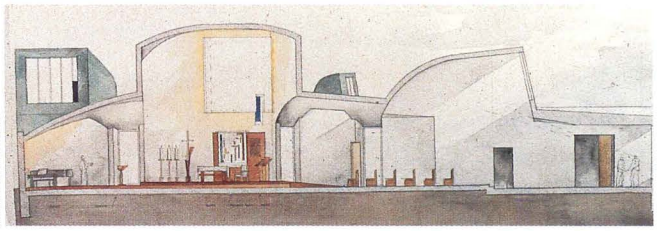
A Dignified Place to Live

In the 1980s, developers tried hard to gentrify Manhattan's Lower East Side, hoping to transform the area's stock of turn-of-the-century buildings into luxury apartments. But their plans never really panned out, which was fortuitous for the residences of Gouverneur Court, a new 123-unit SRO skillfully created from the remains of an abandoned hospital on the FDR Drive. The object of several failed redevelopment proposals, the building, completed in 1901 and attributed to McKim, Mead & White, was bought in 1991 by Community Access. Winner of an affordable housing award from the Preservation League of New York State, the project was designed by Peter L. Woll Architect with Beth Cooper Lawrence and completed last year. It contains: housing for people with a history of psychiatric disability, people with AIDS, and low-income and homeless people; on-site support specialists and services; and, between its two curved bays, a 2,000-square-foot courtyard.



1 RECREATION
2 WEIGHTLIFTING
3 SMOKING LOUNGE
4 TV LOUNGE
5 CLASSROOM
6 LAUNDRY
7 COURTYARD
8 RECEPTION/ SECURITY
9 SUPER'S APARTMENT
10 DWELLING UNIT

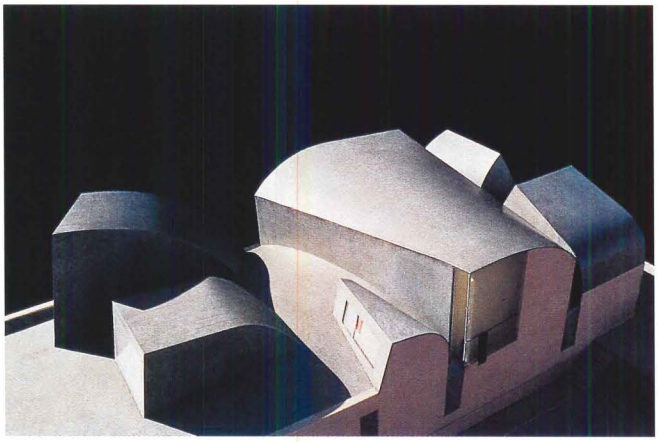
HALF OF CELLAR (LEFT)
AND FIRST LEVEL FLOOR PLANS (RIGHT)



Steven Holl Architects

Gathering and Reflecting Light

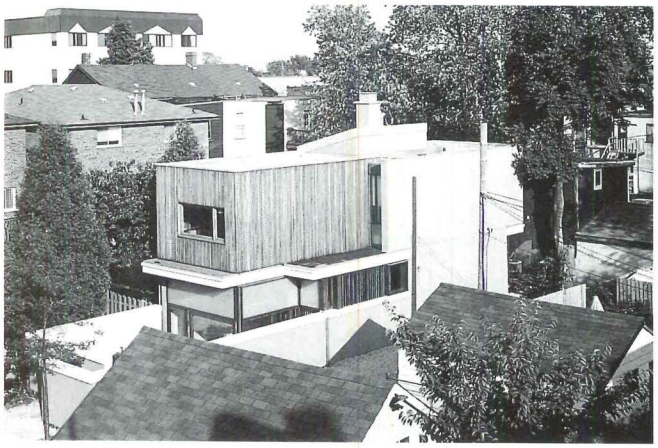
The exploration of light is an essential part of most religious buildings. And it is just such an exploration, shorn of architectural clichés, that Steven Holl, Architects, in association with Olson/Sundberg Architects, have pursued in their beautifully conceived Chapel of St. Ignatius, for Seattle University in Seattle. The plan of the rectangular structure seems almost banal: a corner entrance leads to a small narthex and an irregularly shaped nave, which is flanked by small chapels and other support rooms. But the chapel's section is truly remarkable, explaining the plan's simplicity. Light scoops of various sizes and orientations rise above the processional and worship spaces. "Each of the light volumes," say the architects, "corresponds to a part of the program of Jesuit Catholic worship. The south-facing light corresponds to the procession, a fundamental part of the mass. The city-facing north light corresponds to ... the mission of outreach to the community. The main worship space has a volume of east and west light." Some light enters directly, other light is bounced off colored panels and filtered through colored lenses, suffusing the chapel with "a mysterious glow of reflected color fields." If the design is implemented faithfully, this small chapel promises to be one of the eloquent religious buildings of our time.



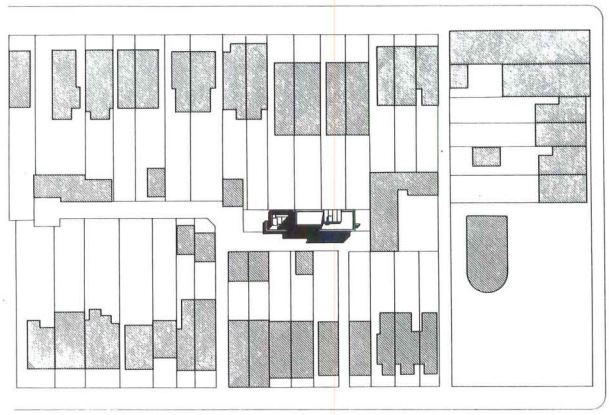
Steven Holl Architects

GROUND FLOOR PLAN

1 NARTHEX
2 VESTING SACRISTY
3 BRIDE'S ROOM
4 RECONCILIATION CHAPEL
5 ALTAR
6 CHOIR
7 BLESSED SACRAMENT CHAPEL
8 REFLECTING POOL

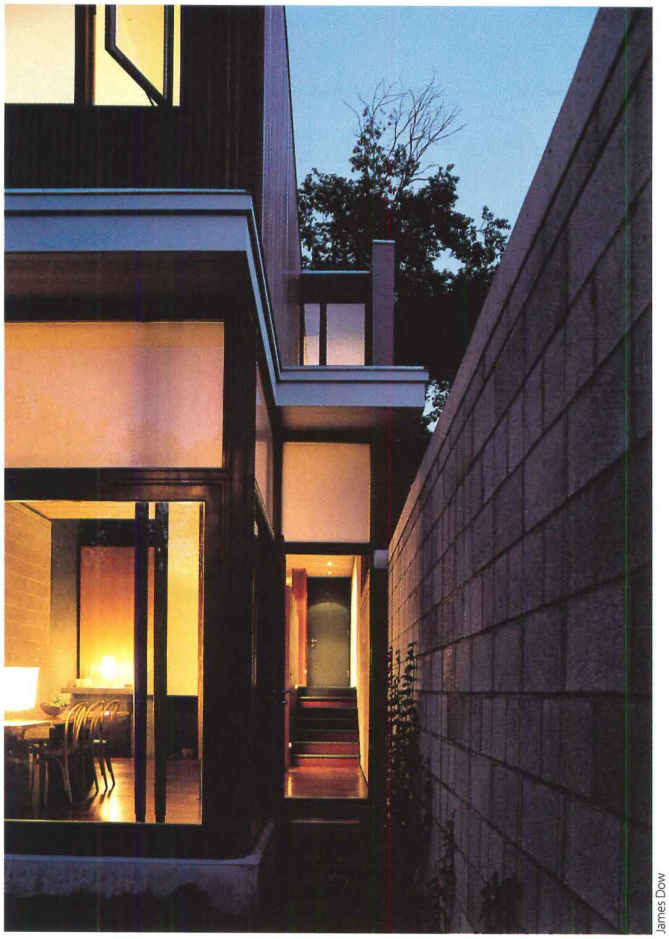


Steven Evans



SITE PLAN

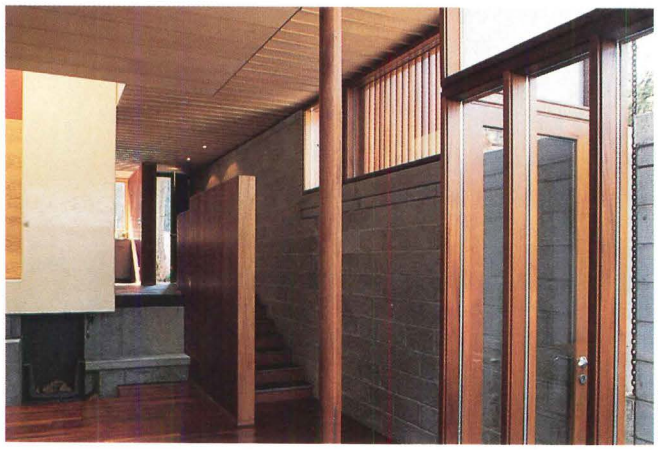
N 100'/30m



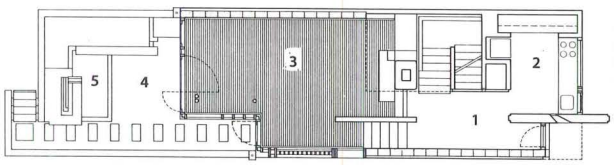
James Dow

The Making of Place

The best architecture can create a place where none existed before, making the most ordinary site special. This Toronto house designed by Brigitte Shim and Howard Sutcliffe for their own use is a perfect example of such placemaking. The 17-foot-wide structure stands in an alley formerly occupied by old cars and surrounded by backyards and garages. To gain privacy, Shim & Sutcliffe wrapped a stuccoed wall around the site and worked in section to gain added room: the 11-foot-high living/dining room and the garden are recessed three to four feet below grade, while the fireplace and stair create a vertical shaft of space in the center of the house, culminating in a skylight. In plan, similar strategies are pursued to create the illusion of expansiveness. The mahogany-and-glass end wall of the main living space pivots open, making the garden part of the room, while upstairs, the office borrows from the stair hall to form a space 33 feet long. Combine this spatial sensitivity with an overall sensuousness – the feel of polished wood against the hand, the sound of water dripping into the pool in the garden – and you are left to marvel at how much architecture can be packed onto a tiny site, one that hardly existed before.



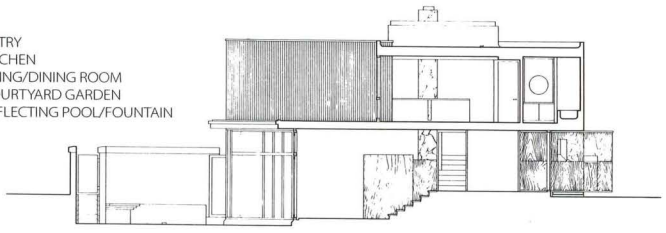
James Dow



GROUND FLOOR PLAN

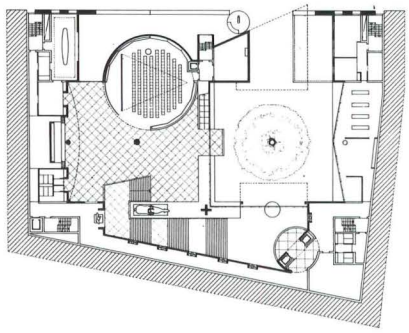
10'/3m

1 ENTRY
2 KITCHEN
3 LIVING/DINING ROOM
4 COURTYARD GARDEN
5 REFLECTING POOL/FOUNTAIN



LONGITUDINAL SECTION

10'/3m



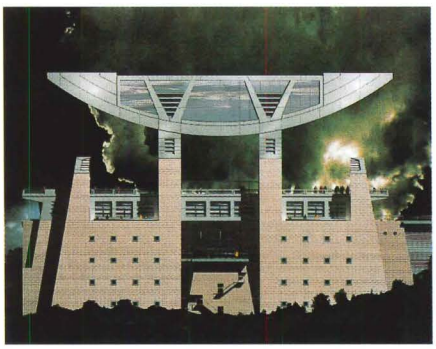
MAIN FLOOR PLAN N ← 100'/30m

CUTAWAY MODEL LOOKING EAST

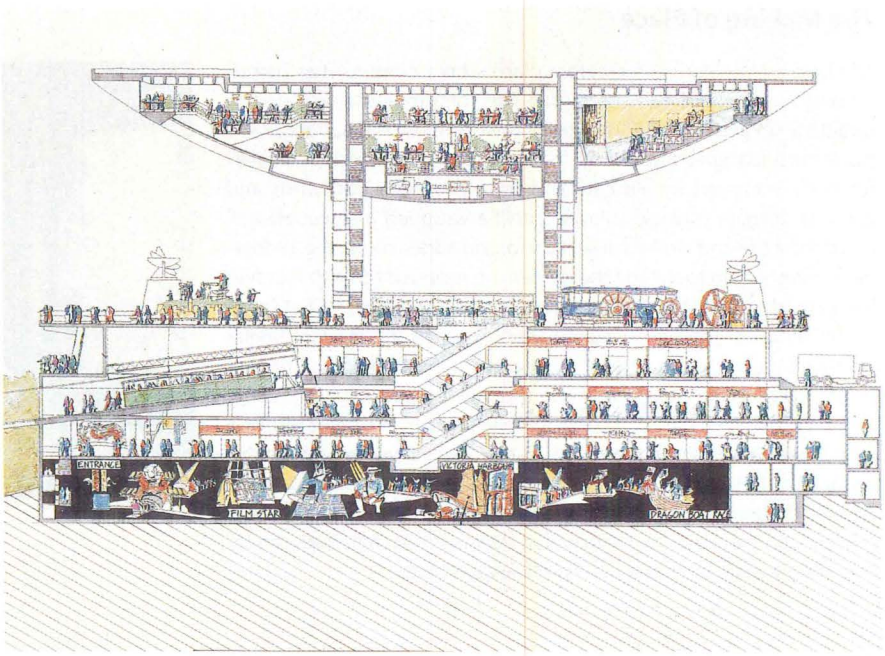
Plum Job

In its first major commission since the death of James Stirling, Michael Wilford & Partners overcame seven prominent English firms vying for the new $28-million Embassy in Berlin. Located on the site of the 19th-Century British Embassy, not far from the Brandenburg Gate, the 55,000-square-foot building is to open in 1999, when Berlin becomes the German capital once more.

Occupying a lot hemmed in by existing buildings, Wilford's competition-winning scheme proposes five levels of offices and other embassy functions lining the periphery of two primary courts envisioned as grand public spaces. A monumental stair leads up to the *piano nobile* with its winter garden, dining room, and circular conference room. The ambassador's trapezoidal office, housed in a glass-fronted box, protrudes from the building's only façade; that current gesture notwithstanding, Wilford's rather bland punched-window treatment of the masonry-clad street wall – a concession to the traditional surrounding fabric – has excited sniping among colleagues sensitized to any hint of historicism. Among the runners-up, with significantly more contemporary designs, were Alsop & Störmer and Nicholas Grimshaw & Partners.



NORTH ELEVATION



LONGITUDINAL SECTION 40'/12m

Over the Top

The London firm of Terry Farrell & Company is supervising the construction of its competition-winning design for the redevelopment of the Peak in Hong Kong. The 85,000-square-foot building replaces the existing smaller Peak Tower, which occupies one of the most dramatic sites in the world, overlooking Victoria Harbor and visible from afar as the backdrop to the stunning Central District cityscape. The structure will incorporate the existing tram station and will contain retail and a "theme ride" in its granite-clad podium; restaurants will be located in the "bowl," an extensively glazed concrete-framed form supported on massive legs and clad in silver anodized aluminum.

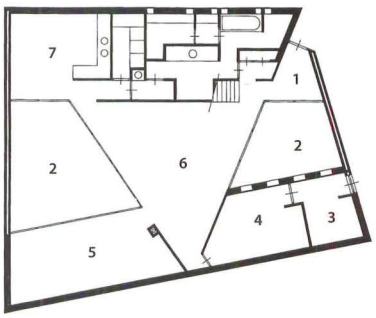
Farrell's ambition for the none-too-subtle silhouette is to create a symbol for Hong Kong in the manner of the Sydney Opera House, the Eiffel Tower, and Big Ben. Scoff if you will, but brash as it is, the project may fit Hong Kong to a T; it certainly won't be the first vulgar edifice in town.

© Michel Boesveld

© Michel Boesveld

House as Polemic

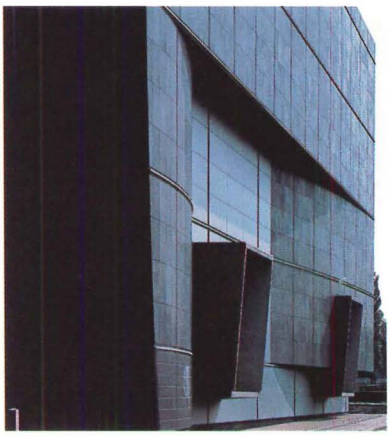
The house that Dutch architect Mart van Schijndel designed for himself dissolves, quite literally, the notion of building as object. Submerged into its site in the center of the City of Utrecht, the roofscape appears, at first glance, to be an architectural ruin, raising a question about architecture's preoccupation with form over placemaking. As the object in the landscape demands attention, van Schijndel's house rejects it. At the same time, the spare, highly tectonic house – rendered in stone, concrete, and glass in muted colors – is jewel-like, almost precious, in its precision. The plan was organized by running two lines from the corners on the north side of the irregularly shaped site to the middle of the south side, creating a triangular form between two patio wells.



1 ENTRANCE
2 PATIO
3 WORKSHOP/STORAGE
4 STUDY
5 LIBRARY
6 LIVING ROOM ("HALL")
7 KITCHEN

GROUND FLOOR PLAN N ↑ 20'/6m

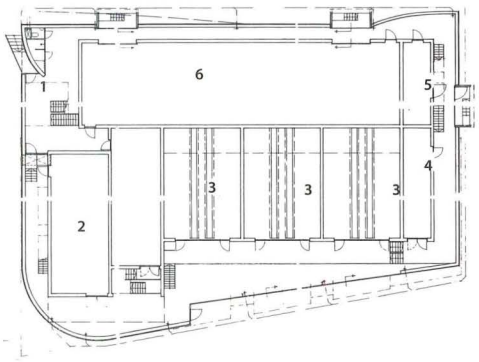
Jan Derwig



Kim Zwarts

Substation in Modern Drag

Designed by Ben van Berkel of van Berkel & Bos, Amsterdam, this substation in Amersfoort, Holland, is a decorated shed dressed in a robust grid of panels; it has two doors and a loading dock, but no windows. The substation's two interlocking volumes, one clad in panels of basalt lava and the other in aluminum, house three electrical transformers. The shifting volumes, one projecting and one receding, suggest the transformation of electricity within. Its light, reflective side is oriented to the parklike landscaping of the city's town hall, and its dark, earthy façade looks out to a highway and railway line. With the substation, van Berkel has substantially upped the ante for the architecture of infrastructure, not by exposing its inner workings but by artfully suggesting function through materiality and implied movement.



1 ENTRANCE
2 CABLE ROOM
3 TRANSFORMER
4 TELEPHONE EXCHANGE
5 CENTRAL SWITCHBOARD
6 KILOVOLT ROOM

GROUND FLOOR PLAN N ← 40'/12m

Admixtures for Colored Concrete

L.M. Scofield Company introduces eight new colors to its line of Chromix® Admixtures for Color-Conditioned Concrete. The admixtures are water-reducing and set-controlling. They provide nonfading, integrally colored concrete and improve the strength of the concrete and its finishing characteristics. Twenty-four colors are now available.
Circle **100** on reader service card

Privacy Glass at the Flip of a Switch

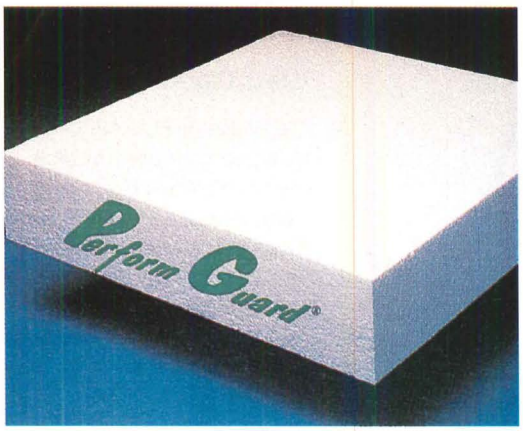
Viracon Privacy Glass, developed by Viracon and 3M, is a laminated glass that instantly switches from frosted to clear, allowing total privacy or unobstructed views. The panels are designed like a sandwich: two sheets of glass enclose a paper-thin film that holds electrically sensitive liquid crystals. When a small amount of electricity is sent through the film the molecules in the liquid crystals line up, transforming what appeared to be frosted glass into clear glass. Likewise, when the electricity is turned off the crystals return to their random state, diffusing the transmission of light; at the same time, glare and UV light transmission are reduced. The panels are suitable for use in windows, interior glass walls, and skylights, and are available in single-glazed and insulating units.
Circle **101** on reader service card

Acoustical Panels

Wilhelmi acoustic ceiling and wall panels, now distributed in North America by Tectum, are designed with high resistance to impact and humidity and have a Class-A flame spread rating. Made with pine, the panels can be cut into various shapes and sizes and can be either sound-absorbing (60 to 80 percent) or sound-reflecting.
Circle **102** on reader service card

Wall-Mounted Workstation

Peter Pepper Products' compact Express Desk workstation is suitable for use in healthcare facilities, nursing stations, and patient and examination rooms, among other locations. The wall-mounted unit, which folds down from the wall, is only 4" wide when closed. The Express Desk complies with ADA requirements and is constructed of hardwood with a laminated work surface for easy maintenance.
Circle **103** on reader service card



Insect-Resistant Insulation

AFM Corporation introduces Perform Guard® Insect Resistant EPS rigid insulation. Its natural mineral additive, which repels insects, is built directly into the noncorrosive and nontoxic insulation. The product can be used in the manufacturer's structural panels and concrete forming system and in many other applications including exterior sheathing, concrete void fillers, drywall backer, and block inserts. Perform Guard does not contain any CFCs, HCFCs, HFCs, or formaldehyde.
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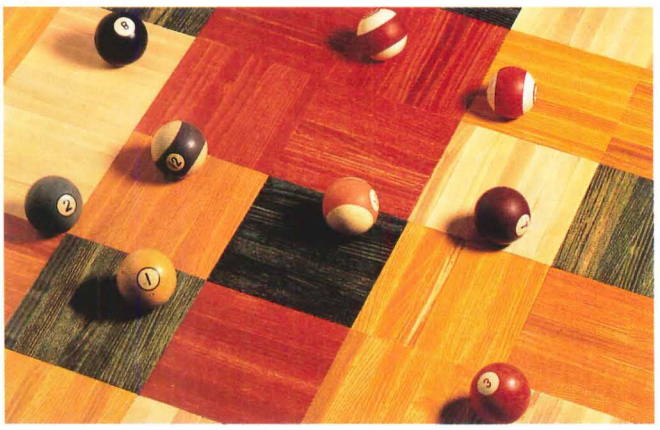

Wood Floor Tile Colors

Six new colors have been added to PermaGrain Products' line of parquet wood floor tiles. The new colors include Natural Maple and five accent colors: Garnet, Lime, Tangerine, Amber, and Indigo. This makes a 24-color palette now available to designers. The tiles are available in 12" x 12" or 6" x 12" tiles; 1" x 25" bands; and 2" x 14" pickets. They are UL-listed for slip resistance and meet all current ADA requirements.
Circle **105** on reader service card

Prepackaged Roofing System

Supra-Slate ColorBlends, prepackaged blended roofing is now available from Supradur. The slates are asbestos-free and noncombustible. The blended packages include Chesapeake (black mixed with accents of gray); Berkshire (green mixed with gray); New England (green with highlights of gray and purple); Westchester (a blend of equal parts black, gray, and purple); and Gettysburg (a combination of black, gray, green, red, and purple).
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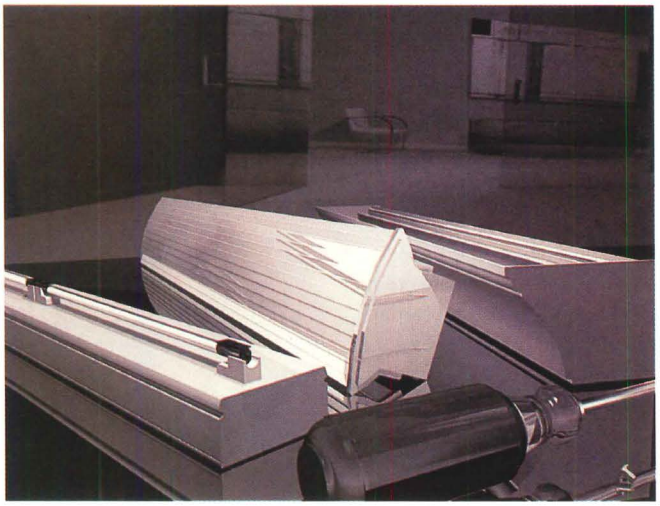


Energy-Efficient Fixtures

Starfire Lighting introduces the Tru-Lux™ fixtures for use with Osram Sylvania's new T2 lamp, which is the "size of an unsharp ened pencil", and generates the same lumen output as an equivalent wattage compact fluorescent lamp. The Tru-Lux™ fixtures, designed by Blackman Design Associates with Starfire, also incorporate Osram Sylvania's Quicksense™ ballast technology that maximizes lamp output and power usage. Suitable for both residential and commercial applications, the fixtures are available with a variety of lamping, mounting, and finish options.
Circle **107** on reader service card

New Roofing Membrane

HPG Roofing Systems' new V-2 roofing membrane is a rubberized thermoplastic alloy membrane suitable for use in mechanically fastened and adhered new and reroofing applications. Reinforced with warp-knit, weft-inserted polyester for superior puncture resistance, the membranes are offered with a complete line of accessories.
Circle **108** on reader service card

Multichannel Surface Raceway System

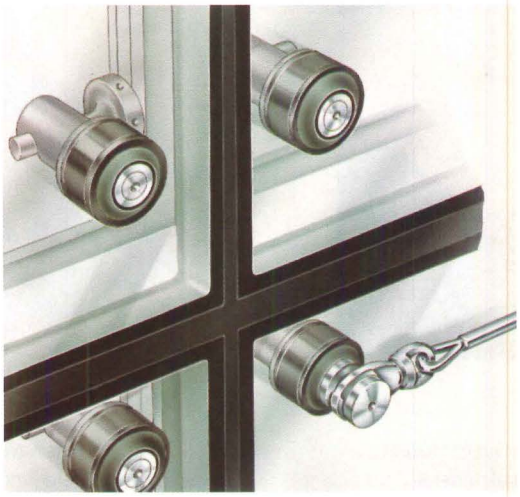
Wiremold Company's 5400 Nonmetallic Series Raceway is a compact, multichannel surface raceway system designed to secure and protect power, data, voice, and other low-voltage wiring. Available with two or three compartments with a breakaway divider, the product allows low voltage and power wiring to be run in the same raceway, giving building owners increased flexibility for future moves and changes.
Circle **109** on reader service card

Fire Blankets Brochure

USG Interiors offers a detailed brochure on its Thermafiber® Sound Attenuation Fire Blankets (SAFB) Insulation, a partition cavity material. Complete product performance and technical data are provided with cutaway illustrations.
Circle **110** on reader service card

Asphalt Roofing Shingles

The Slateline® series of asphalt roof shingles is available from GAF Materials Corporation. The nonlaminated, dimensional shingles feature GAFGRIP® self-sealing adhesive for faster sealing and stronger wind resistance. The shingles have a Class-A UL rating for maximum fire and wind protection.
Circle **111** on reader service card

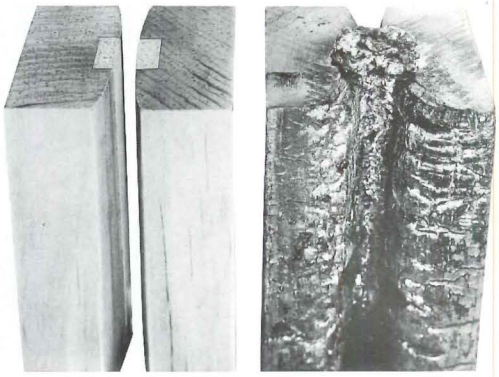


Glass Cladding System

The Pilkington PLANARCLAD glass cladding system distributed by W&W Sales has a flush exterior surface with mechanical fixing details. Weep, ventilation, and drainage holes are not required. The panels can be of solar-controlled or low-emissivity glass. The system has been independently tested for structural integrity and resistance to air and water penetration, and accommodates all normal building tolerances.
Circle **112** on reader service card

Track Lighting

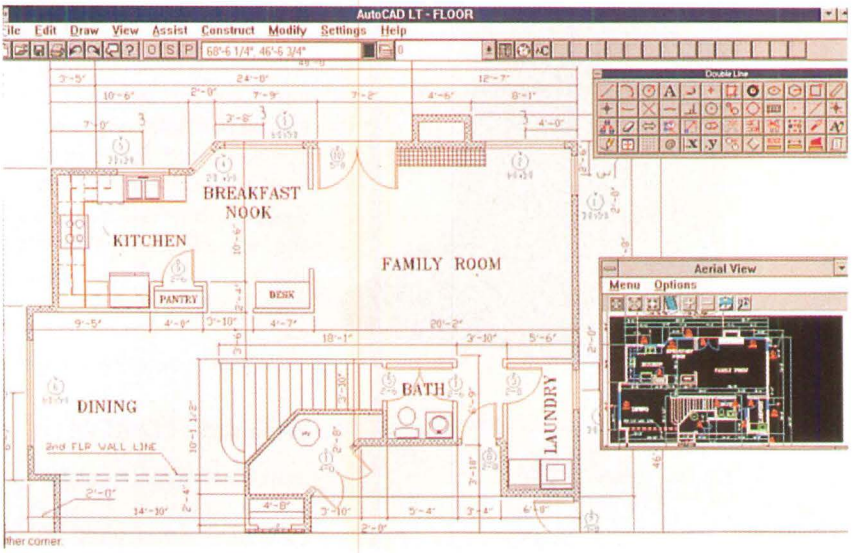
Staff has introduced the 1350/1360 (double lamp) series of compact fluorescents for retail applications. The track-mounted fixtures provide a wide distribution of light for general coverage, a louver system for glare control, and vertical adjustment for adaptation to any interior. The aluminum fixtures have a baked-enamel finish and are available in black or white.
Circle **113** on reader service card



Fire Protection for Doors

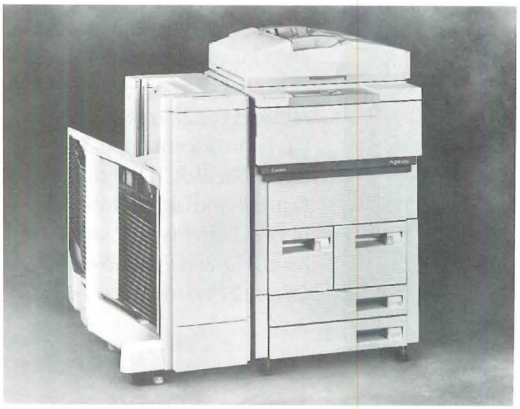
Door openings can be protected from penetration by flames, heat, and smoke with the FS3003 intumescent seal by Zero International. Mortised directly into door edges and frames, or built into door gaskets, FS3003 activates at a low temperature to effectively seal the spaces between door, frame, and saddle, but will not force the door open. The urethane-based material foams and expands gradually with rising heat, forming a coarse blister structure that becomes a highly heat-resistant barrier. The intumescent is available in a variety of add-on seals and meets all applicable ASTM, UL, UBC (43-2), and NFPA standards.
Circle **114** on reader service card

Computer Products



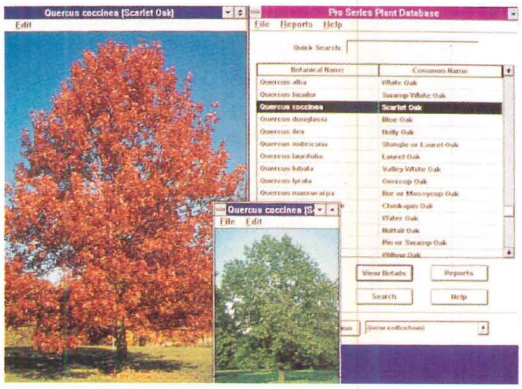
AutoCAD LT

Autodesk has announced a new release of its low-cost 2D software. AutoCAD® LT Release 2 for Windows™ eases drawing setup with predefined borders and title blocks, simplifies drafting with associative hatching and direct distance entry, speeds up the learning curve with dialog boxes and tool tips, and aids in the drawing of complex shapes with divide and measure commands. The company also has released AutoCAD LT Symbols, which includes over 1,500 standard architectural and engineering symbols.
Circle **115** on reader service card



Mid-Volume Copiers

A new 50-copy-per-minute copier, the NP 6050, has been introduced by Canon. The machine has a 100-sheet document feeder, a capacity of 4,050 sheets, a three-second first copy time, and an accelerator that allows the copier to run up to 20 percent faster than its rated speed. An optional stapler sorts up to 40 sets of documents.
Circle **116** on reader service card



Landscape CD-ROM

Green Thumb Software has developed a CD-ROM database containing detailed information on more than 2,000 plants. The Pro Series Database, compatible with Microsoft Windows,™ offers high-quality photographic images, an audio pronunciation guide, and reporting capabilities. Green Thumb specializes in landscape software.
Circle **117** on reader service card

Cost-Estimating Software

Marshall & Swift have developed a package of estimating software and construction cost data for architects involved in both residential and commercial projects. Providing instant access to updated labor and materials costs, the software covers over 30,000 components, provides over 600 illustrations, and includes local multipliers for over 825 areas in North America.
Circle **118** on reader service card

Macintosh Software Directory

The 1995 edition of the Builder Software Directory, published by the Macintosh Construction Forum, describes the many software packages available to architects, engineers, and contractors on the Mac. Cost and ordering information for each package is provided, along with the names and addresses of Mac consultants.
Circle **119** on reader service card

Scanning Hardware and Software

ScanCENTRAL, from IDEAL Scanners & Systems, is an integrated hardware and software scanning system. It includes a 36-inch-wide high-resolution scanner, a large-format laser plotter, CD-ROM archiving, and document conferencing. Users can scan, convert raster images to vector files, manipulate data, and coordinate plotting. It also allows drawings to be distributed over TCP/IP networks or the Internet.
Circle **120** on reader service card

Computer Products

Image Management Software

Motorola is now offering software for image and document distribution, called WaveSoft™. Able to retain up to 65,000 layers of color annotations on drawings, the program also allows users to pan and zoom existing documents. The program provides translators to convert scanned drawings directly to TIFF, accommodating documents up to 11′ x 11′.
Circle **121** on reader service card

Visual Information Management

Version 5.0 of Aperture™ Visual Information Manager is updated software for facility managers, easing the generation of reports, color coding different occupancies, and displaying the data relevant to an image. Aperture Technologies' software also allows you to customize drawing and report windows, with updated tool palette.
Circle **122** reader service card3

Low-Cost Pencil/Pen Plotters

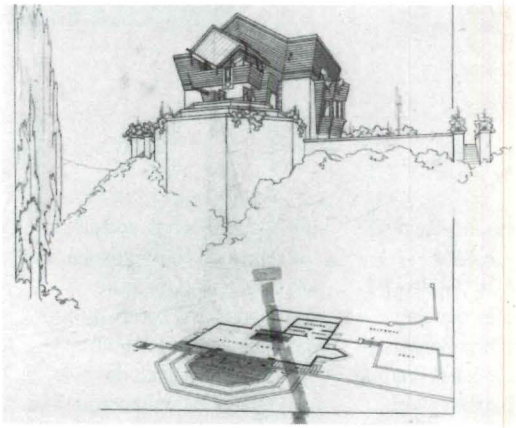
Mutoh America has announced its latest line of pencil/pen plotters, XP-300 and XP-301. With a maximum plotting speed of 45 inches per second, the new low-cost plotters feature an automatic pencil lead feeder and are capable of mixing pen ink and pencil lead in the same drawing.
Circle **123** on reader service card

Lightweight Graphics Tablets

DrawingSlate II for PCs and Macs is a low-cost, pressure-sensitive graphics tablet from CalComp. With an active surface area of 6" x 9", the tablet has a slightly textured face recalling traditional paper media, resolution up to 2,540 lines per inch, and a pen holder for easy access. The tablets weigh 1.5 pounds.
Circle **124** on reader service card

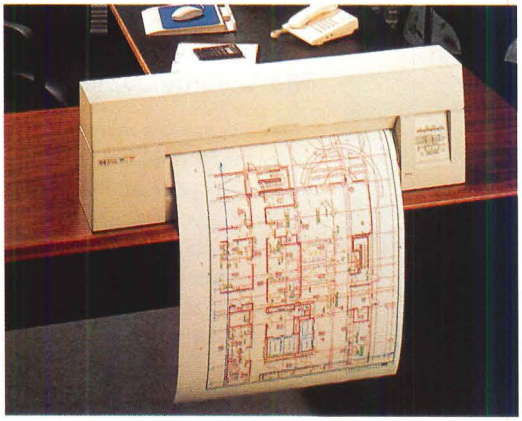
Portable Workstation

RDI Computer Corporation has introduced the PowerLite 85, the first SPARC®-based notebook size workstation. The computer has 2.4 GB of internal hard disk storage, an internal floppy drive and fax modem, and an optional 10.4-inch high-resolution color display, all in a 8.5-pound package.
Circle **125** on reader service card



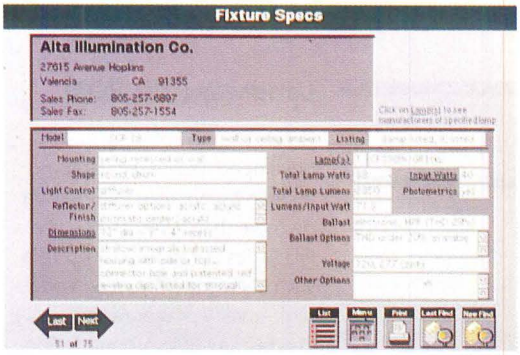
Wright on CD-ROM

Frank Lloyd Wright: Presentation and Conceptual Drawings is a CD-ROM from the Oxford University Press that contains 5,000 of the architect's drawings, including designs for carpets, furniture, and magazine covers as well as drawings for over 860 projects. Insight™ software by Luna Imaging allows users to search, rearrange, pan, zoom, compare, and print drawings.
Circle **126** on reader service card



Inkjet Plotters

Two new low-cost, large-format inkjet plotters have been introduced by Hewlett Packard. The monochrome DesignJet 230 replaces the 220 plotter, which has been discontinued. The DesignJet 250C is the company's first low-end large-format color plotter. Both machines can handle D- and E-size drawings.
Circle **127** on reader service card



Compact Fluorescent Directory

Iris Communications has released the 1995 Energy Source® Compact Fluorescent Lighting Directory on diskette. A comprehensive source, the directory gives detailed specifications for each lamp. The Fixture Specs screen offers data on fixture mounting, shape, reflector, ballast, and power needs. Over 8,000 products are included.
Circle **128** on reader service card

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Circle **No. 331** on Reader Service Card

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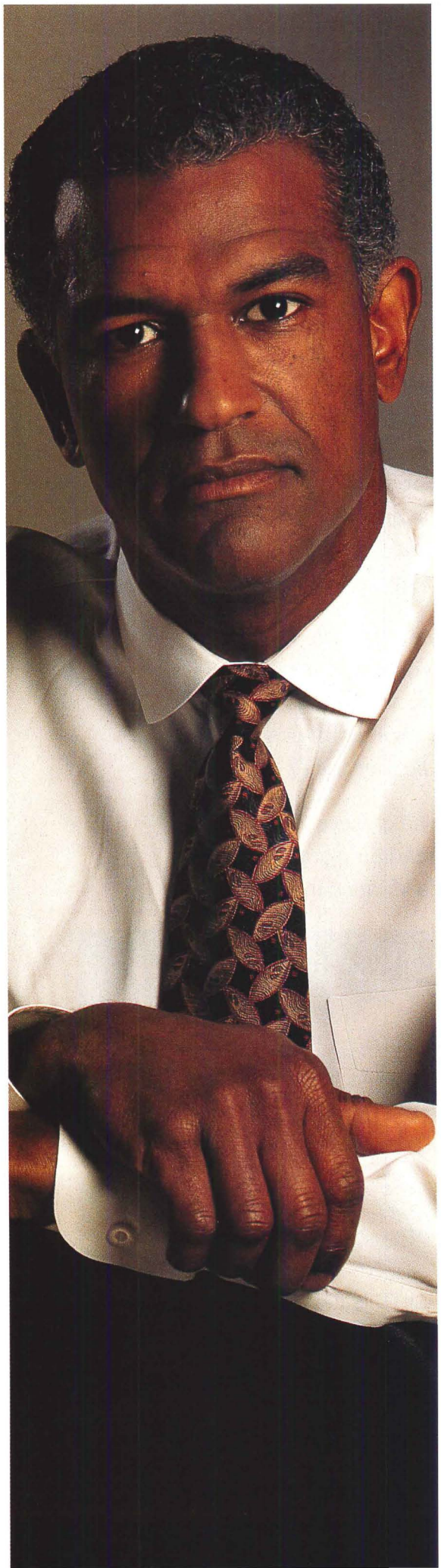

Come hear Apple CEO Michael Spindler speak at A/E/C Systems '95 on June 7 in Atlanta.

With Power Macintosh and the Mac OS, you can use multiple monitors at once. So, for example, you can work with two levels of a design, each on its own monitor. Or track automated analyses on one screen. While you express your ideas on another.

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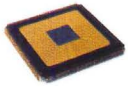

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Apple

A Safety Lesson from Oklahoma City

Nothing can keep people safe during a mammoth bombing like that of the Alfred P. Murrah Federal Building. But assessing the potential for glass damage beforehand can reduce injuries and damage. *by Tom Harpole*

Photos: Tom Harpole

Seven blocks from the Oklahoma City Federal Building, Scott Norville points to a laminated glass door (above) that remained intact when the adjacent display windows of plate glass were destroyed by the bombing. Eddie Joslin (right) inspects a sheet of laminated glass that cracked during the explosion but remained in its frame until workers removed it.

No more than an hour after the April 19 bombing of the Murrah Federal Building, Professor Scott Norville, whom I had previously observed blowing up hundreds of windows in blast tests, phoned me to meet him in Oklahoma City to see what we could learn from the enormous destruction there. For the next three days, Dr. Norville, director of Texas Tech's Glass Research Center and the world's leading researcher of blast effects on glass, Milt Smith, a Texas Tech industrial engineering professor, and I, a licensed explosives engineer, surveyed the damage.

To those who have spent years methodically recording the effects of explosions at Texas Tech's blast testing arena in the ochre desert near Lubbock, the horror in Oklahoma City was unspeakably perverse. The three of us walked on a seemingly endless carpet of broken glass as we made a long, spiraling trajectory outward from the remains of the Federal Building. Within two blocks of the epicenter, no glass in buildings survived intact. "Overpressure" – abnormally strong pressure generated by the blast – threw glass into the buildings' interiors and onto the sidewalks, the streets, and other areas.

During the no more than three-tenths of a second of the explosion, overpressures at the epicenter are estimated to have reached 4,320 pounds per square foot. No office building that people would want to work in could be constructed, at reasonable expense, to keep its occupants unscathed in such a powerful onslaught. Approximately 70 buildings in a 25-block area are said to have sustained structural damage. Our objective, in examining glass damage, was to determine how building design and materials can help protect people and property in an explosion's vicinity, outside the target building itself.

The Danger of Flying Glass

Beyond the few blocks closest to the Federal Building, hundreds of buildings lost glass in a violent shock wave of air pressure that traveled some two miles to the north and at least five blocks to the east and west. Of the 432 people injured in Oklahoma City, more than 80 percent were lacerated by flying glass. This is typical in a bombing. "The most significant damage to people and property in approximately 75 percent of all bombings is the failure of architectural glass," says Dr. Ron Massa, a security consultant who is president of the Loron Corporation in Burlington, Massachusetts. "The glass acts as part of the bombers' weaponry. Unfortunately, that includes the glass in untargeted structures near the blast."

Some of the windows that endangered the occupants of buildings in Oklahoma City contained glass covered with an adhesive film. "These films were originally conceived for thermal performance," says Massa, who considers it ironic that they have come to be called "security films." Examples of failed polyethylene terephthalate (PET) film were discovered as far as a mile from the bomb site in Oklahoma City. One of the many examples we found was at the *(continued on page 66)*

Tom Harpole of Avon, Montana, is a freelance writer and a member of the Society of Explosives Engineers.

A Safety Lesson from Oklahoma City *(continued from previous page)*

Fred Jones Ford engine remanufacturing facility, six blocks south and six blocks west of the Federal Building. People who were inside at the time of the blast reported that plain glass windows vibrated and shook for a couple of seconds, but did not shatter. Windows covered with the film broke immediately; annealed glass shards separated from the film and flew 15 feet into the offices.

"There isn't a credible glass testing lab in the country that could substantiate the claim of the PET film industry that their product strengthens glass," Norville states. "You'd be better off leaving your windows alone than applying PET film." In fact, he says, glass is weakened when the edges of the film are trimmed by razor, scoring the glass.

Advantages of Laminated Glass

The characteristics of glass that protect people and buildings in the vicinity of an explosion are the same ones that allow trees to survive fierce winds by bending instead of breaking. Within two blocks of the epicenter, we noticed that hardwood trees, which grace much of Oklahoma City, remained intact, seemingly in full leaf despite being subjected to overpressures estimated at 15 pounds per square inch. "The trees are able to absorb energy, move with it, and bounce back," Norville explains. Similarly, laminated glass can cope with tremendous blows. It is, he says "the only kind of glazing I've tested under these conditions that can absorb energy. Even though it fractures, the interlayer holds all the glass in place. If laminated glass had been used exclusively in Oklahoma City, 75 percent of that glass would have stayed intact."

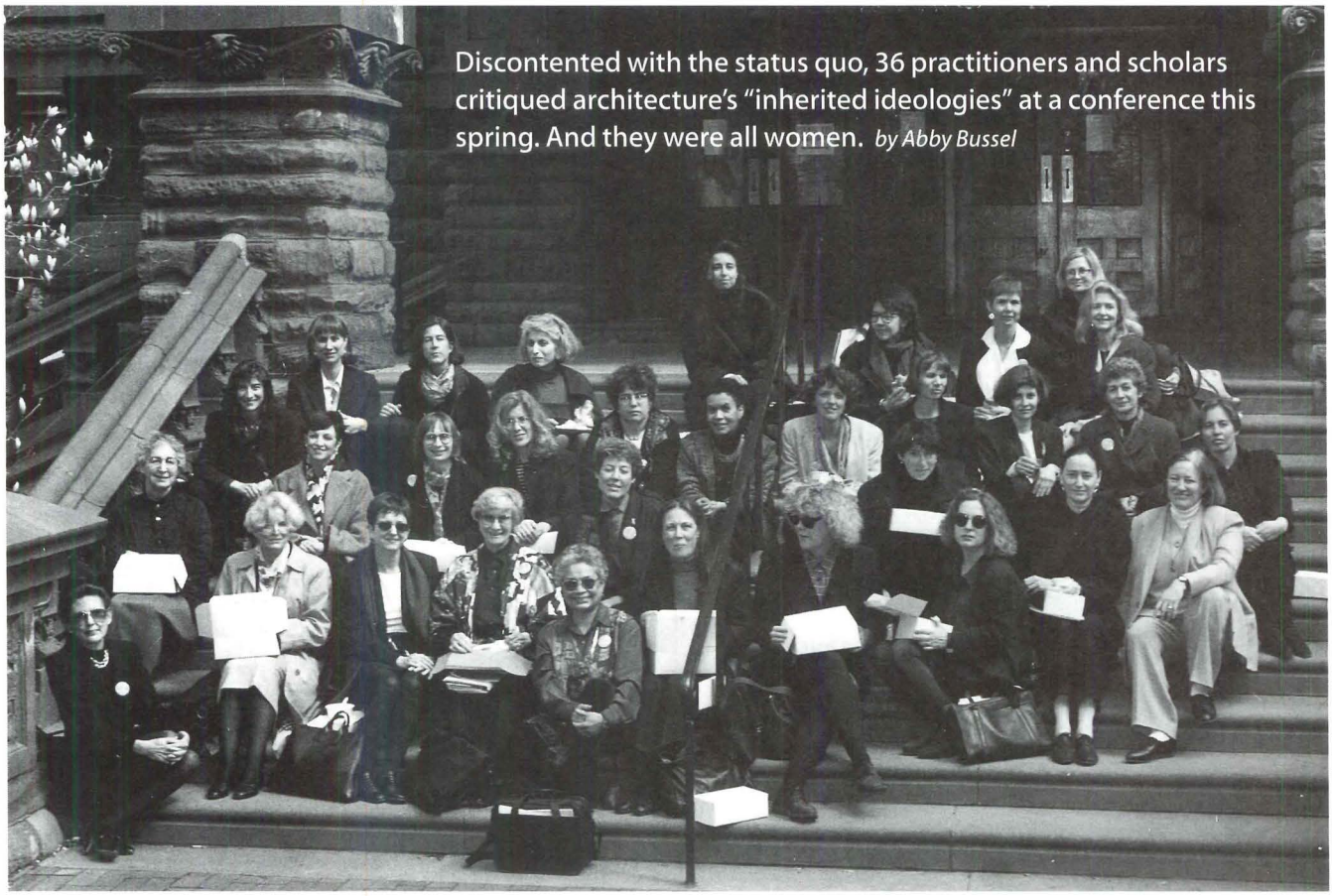
Standard laminated glass consists of two or more plies of glass bonded by polyvinyl butyral (PVB), the interlayer used in car windshields. Laminated security products can be made with any type of glass: annealed (plain plate glass), heat-strengthened (a hardened glass with more tensile strength), or fully tempered (glass that breaks in diced pieces rather than in shards). Laminated glass, like monolithic (single-layer) glass, may be specified for virtually any application, regardless of the building's aesthetic, visibility, or heat-transfer requirements.

A further benefit of laminated glass is that in staying intact, it keeps the building weatherproof. After the bombing, heavy rain in Oklahoma City poured into buildings that had lost their windows. Many laminated-glass windows, however, continued to protect interiors even when the glass had cracked.

Massa notes that the U.S. lags behind other countries in recognizing and using laminated glass as a storefront security measure. Europeans employ laminated glass in more than 45 percent of their retail establishments. Australian stores use it almost exclusively. Though it frequently costs about 30 percent more than tempered glass, experts such as Norville believe laminated glass should be used near any site where an explosion, either accidental or deliberate, might occur. Prime locations for such glass are those near government buildings, refineries, chemical plants, grain elevators, and Planned Parenthood clinics, to name only the most obvious.

In a vulnerable society, architects and their clients must adjust their thinking about threats to people and property. Casualties and damage can be reduced through closer attention to glass and its installation. □

Challenging Historic "Truths"



Discontented with the status quo, 36 practitioners and scholars critiqued architecture's "inherited ideologies" at a conference this spring. And they were all women. *by Abby Bussel*

Don Camera

History was made in the City of Brotherly Love this spring, when 36 of the most accomplished women in architecture participated in a two-day conference entitled "Inherited Ideologies: A Re-Examination," at the University of Pennsylvania. And approximately 400 people turned up to hear what they had to say. Assembling a diverse group of architects, landscape architects, curators, theorists, educators, and historians from across the country "to talk about public places and private space and the role of women in designing, inhabiting, and understanding each," the conference organizers set out to challenge the historic "truths" that have guided the making of architecture, and to present new ways of thinking about and creating space.

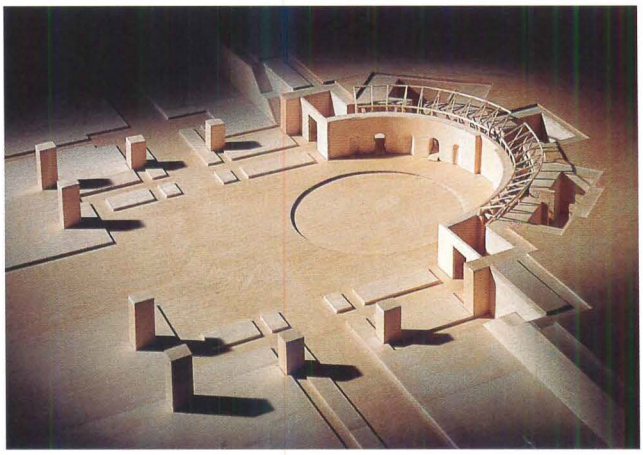
Sponsored by Penn's School of Fine Arts and its Annenberg Public Policy Center, the conference was organized by an interdisciplinary group of women design professionals, who have been meeting regularly since 1992, along with the coordinators of the Annenberg Center's 1994–95 series of conferences on "Women in the Public Sphere." The program was structured as a dialogue, with about half of the participants presenting a thesis or built work and the other half responding or offering alternative perspectives. It was a promising concept, but the intensity of the presentation schedule left little time for a real dialogue – an unfortunate situation given the intellectual power gathered in one room. Aside from a few papers that devolved into academic gymnastics – which rendered them as exclusionary as the ideological constructs they were meant to deflate – the majority of the participants made clear arguments, suggesting new directions in practice, education, and theory.

The Death of Howard Roark

Though the conference was short on real projects, one that embodied the trials and successes of women in the public sphere was Weiss/Manfredi Architects' competition-winning design for the Women's Memorial and Education Center in Washington, D.C., presented by architect Marion Weiss. To be inserted into a 1930s Neo-Classical hemicycle at the gateway to Arlington *(continued on page 70)*

Conference organizers and attendees included: (bottom row, left to right) Patricia Conway, Conference Chair; Denise Scott Brown; Beatriz Colomina; Beverly Willis; Sharon E. Sutton; Lauretta Vinciarelli; Catherine Ingraham; Jennifer Bloomer; Sheila de Bretteville; Susana Torre; middle row, left to right: Mildred Friedman; Diana Agrest; Zeynep Celik; Diane Favro; Leslie Kanes Weisman; Alice Friedman; Ghislaine Hermanuz; Kathryn Gleason; Sylvia Lavin; Mary McLeod; Joan Ockman; Christine Boyer; Lynne Breslin; top row: Marion Weiss; Donna V. Robertson; Sheila Kennedy; Homa Fardjadi; Diane Lewis; Esther da Costa Meyer; Dana Cuff; Margaret Crawford; Ann Bergren. Not in photo: Diana Balmori, Annette Fierro, Anuradha Mathur, Anne Vernez Moudon, Adèle Naudé Santos, and Anne Whiston Spirn.

Diversity *(continued from previous page)*



Jock Pottle/Festo

The Women's Memorial and Education Center in Arlington, Virginia, by Weiss/Manfredi Architects.

National Cemetery and sponsored by a group of women veterans, the memorial, said Weiss "is about an assumption that the true power in architecture begins not with the architect, but with a site and the aspirations of an enlightened client." On axis with the Lincoln Memorial, the project "is about a site perceived as a remnant in spite of its central location on the monumental axis, and a set of individuals perceived as peripheral in spite of their critical role in the military service of this country."

Weiss's presentation played off arguments made by other conference participants. Dana Cuff, associate professor of architecture and urban planning at UCLA, spoke about the increasingly political position architects will find themselves in when citizens, under government mandate, are invited to speak out about the design of private and public developments that affect their neighborhoods. According to Cuff, architects who believe they are serving only their immediate client fail to acknowledge and benefit from their larger civic role as stewards of the public realm. The contentiousness surrounding contemporary development has been felt by Weiss/Manfredi, which had a grueling experience with countless public agencies in Washington. Five years in the making and set for official groundbreaking this month, the memorial project, says Weiss, should put to rest the myth of the hero-architect "indifferent to the dynamic circumstances and uncertainties inherent in both the design and review process."

Advocating a Social Education

The broadened roles suggested by Cuff and exemplified by Weiss/Manfredi's memorial offer provocative new ways of thinking for the profession, approaches that should become part of architectural education. Two architecture professors, Leslie Kanes Weisman of NJIT and Sharon Sutton of the University of Michigan, have established community service studios at their schools that address the social and political role of the architect. Their programs put students out in the field, working in the "messy" world of real projects where they are forced to make their own value judgments. "Working for social justice is not antithetical to good architecture," believes Weisman.

It is through such paradigm shifts in architectural education that the profession can learn to diversify its role and become more broadly relevant. The question to be considered by the conference participants and the profession at-large is how to expose this critical reassessment to those men and women, students and practitioners, academics and theorists, who perpetuate exclusionary ideologies in a rapidly changing world, where the old way of doing is no longer appropriate. □

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The recession officially ended in March of 1991, but for architects there has been no return to normal.

by Philip Langdon

Faces of a Downsized Profession

For many architects, the past six years have been a soul-wrenching time. From 1989 to 1992, the number of architects practicing in the United States plummeted from 143,000 to 113,000, according to the Establishment Survey of the Bureau of Labor Statistics. Architectural employment has since recovered somewhat – to 124,000 as of this February – yet there remains widespread uneasiness about what lies ahead.

The recession lasted longer and cut more deeply in architecture than in the economy as a whole, and the severity has spurred firms to find ways of doing things differently. Many have learned to operate more efficiently and have entered new specialties or new geographic areas. Some have found ways to solidify long-term ties to their clients. Quite a few have learned to collaborate skillfully with other firms or with consultants, thus becoming more

David Ash/Tony Stone Images

nimble. But not all of the firms' responses to their difficulties are likely to serve them well serve them well in the long run. And for thousands of individuals, the consequences have been painful in the extreme.

The worst effect of the recession and its aftermath was that many serious, hard-working people lost their jobs. Firms that expected the downturn to be temporary initially turned to the venerable practice of "lending" unneeded employees to other firms, with the understanding that they would return once work picked up. But with so much of the profession suffering at the same time, that tactic in many cases became infeasible. Then the real layoffs began.

Where the Ax Fell

"The first reaction was to get rid of entry-level people," says Tom Beeby of Hammond, Beeby & Babka in Chicago. After that proved insufficient, many firms cut jobs from principals on down. A former employee of a large office, who asked not to be named, recalls that the tensest time of each week was Friday afternoon, when telephones would ring on some desks, summoning those employees to a conference room where they would be given the bad news impersonally. "It was not always handled the way you would want it to be handled," he says. In most instances, those being laid off were not even given a meeting with the partner they'd been working for.

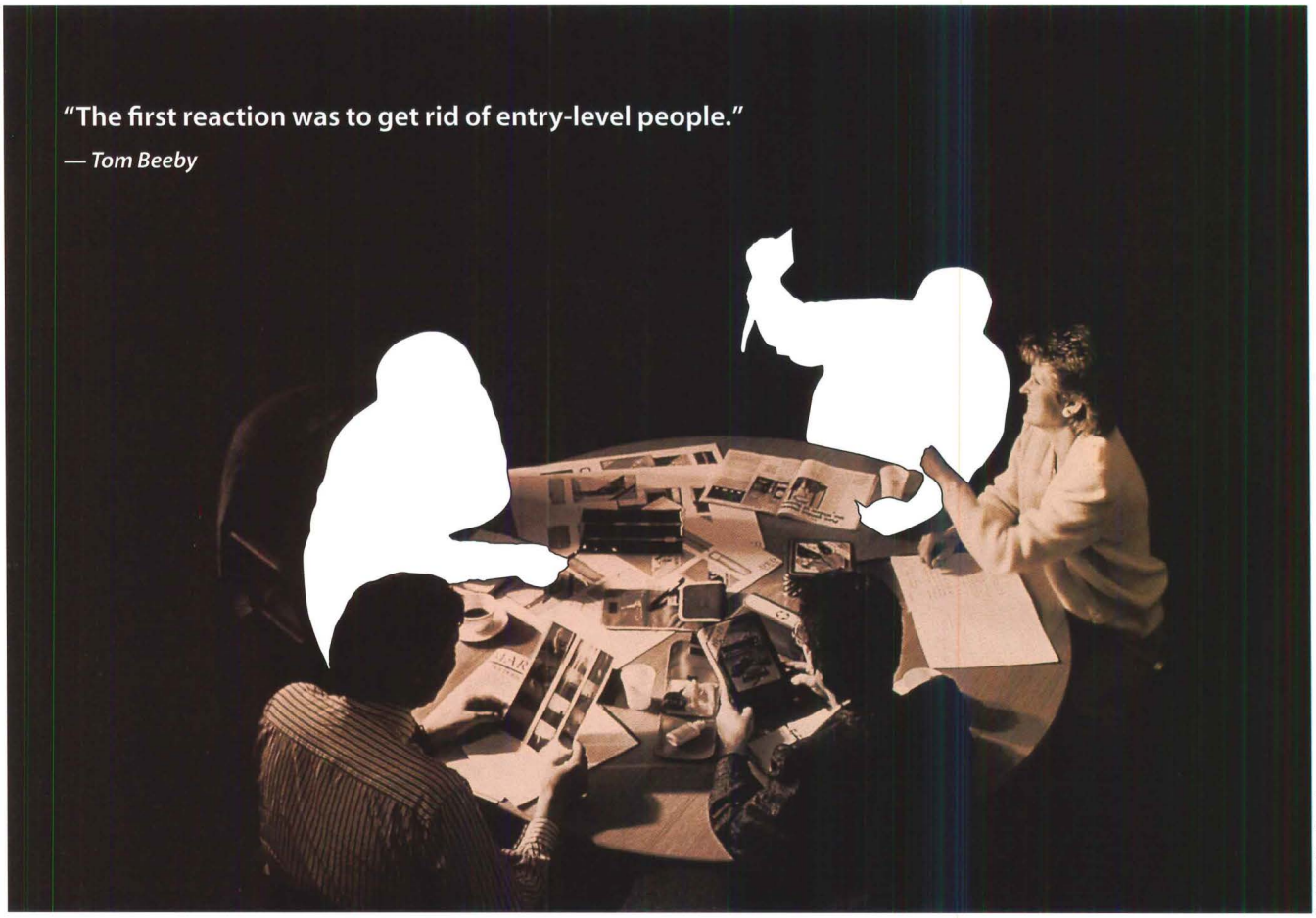
In the Boston area, an architect laid off by a 60-person firm recalls being shocked because her dismissal seemed to come with no warning or logic. "Why did they pick me?" she asks. "There were others at my level of experience who had joined the firm after me who were not laid off. There was an office person still in architecture school. All of a sudden you're aware that there are no rules everybody is playing by."

Even in firms where the criteria seemed clear, employees often found the decisions disheartening. "The firm looked at employees mainly in terms of their salaries, more than their individuality," said an architect at a big firm. "People were laid off after 25 years because of their salary, without regard to whether they were loyal or productive or dead wood."

Some firms, usually smaller ones, opened decision making to the entire staff. At The Design Partnership in San Francisco, the staff voted to take a 20 percent pay cut, which lasted about four months, rather than dismiss people. An organizational psychologist was brought in to talk with staff members individually about their concerns and to have the staff meet as a group to "build an office family," as Mardelle Shepley, a former employee now teaching at Texas A&M, describes it. "I think," she says, "it did change people's attitudes toward one another to some degree."

Here Today, There Tomorrow

Management specialists in recent years have propounded the idea that firms can no longer afford to keep large staffs through thick and thin. Firms are being encouraged to retain a smaller core staff and to augment it as needed with temporary



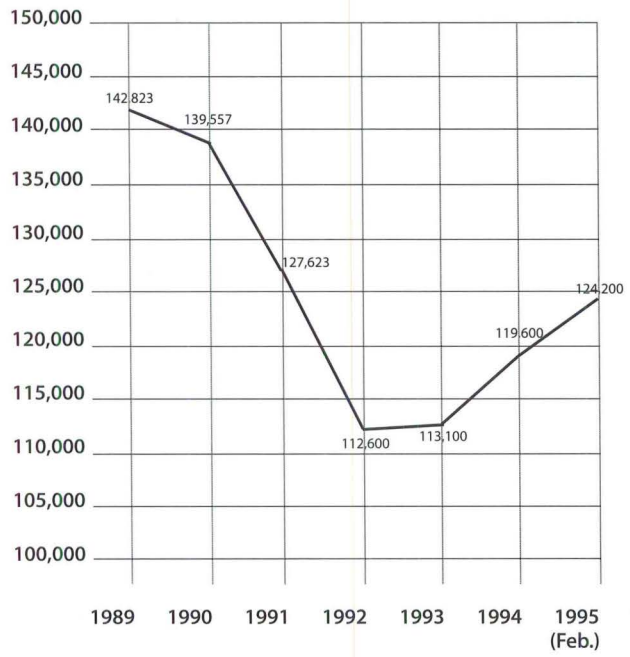
David Ash/Tony Stone Images

employees, consultants, and others not permanently on the payroll. *The New York Times* reports that American companies turned to temp agencies for nearly 2 million workers last year, almost quadruple the number in 1983. While there are probably relatively few architectural firms that have embraced downsizing as an ideal practice for stable times, these are plainly unstable times, and many firms have committed to downsizing at least until the long-term demand for architectural services becomes clearer.

In large cities, there are now agencies that specialize in supplying temporary architectural workers. Boston is one city where this institutionalized approach to short-term employment has taken root. Although many firms continue to regard hiring through a temp agency as undesirable, others that initially resisted it now regard it as a source "for worker bees or serious talent they didn't have on staff," says Stephen Dill, who from 1990 through 1992 ran the Boston office of a temp agency called Consulting for Architects (CFA). Earl R. Flansburgh + Associates of Boston, which at its peak had 72 regular employees, had to dismiss 14 permanent employees in eight months – more than had been laid off in the previous 25 years for lack of work. "We wanted to make sure we didn't get in the same position again," says principal Earl Flansburgh. So 14 of the firm's 54 current job slots are filled by agency temps.

Temping is certainly not for everyone – Dill says "a lot of people couldn't handle the pressure of coming in on a Friday afternoon, working through the weekend on a charrette, and

Employment of Architects
Source: Establishment Survey, U.S. Bureau of Labor Statistics



Charting an Alternative Career

Kaplan McLaughlin Diaz in San Francisco laid off Trudy Levy in October 1993. "I picked up work almost immediately because of CAD expertise," says the 48-year-old former project architect. After several months of freelancing, she joined Berry Stafford – like her, an architect without full-time work – and started a new business, Image Integration. Its objective: showing architecture firms how to organize masses of information, including slides, computer-generated renderings, and schedules, into a system easily accessible by computer. "Basically, what we do is tell architects that they should digitize," she says.

"I had never envisioned myself having my own company," Levy says, happy over how well the new role suits her. "We're beginning to get out of the red," she says, and beginning to get jobs from nonarchitectural firms with photo libraries. Levy continues to do a little architectural work for friends – "putting together proposals, scoping out the work involved, reviewing documents" – but when asked if she considers returning to practicing architecture full-time, she replied, "I don't think so. I was feeling kind of stale in architecture, and now I'm enjoying myself."

"I May As Well Be Insecure on My Own"

In 1983 Ernesto Buch designed a beach pavilion that stands at the end of Tupelo Street in Seaside, Florida. A beguiling combination of Classical and vernacular influences, his little wooden gateway to the Gulf of Mexico became one of the most memorable symbols of that influential resort. Buch served as Seaside town architect for a year and then joined the staff of the prominent Classical architect Allan Greenberg – a promising start to a career, it would seem.

But the severe instability of the past several years has frustrated many architects, and the soft-spoken Buch is one of them. He started his own firm in 1987, and later, after a big project fell through, he took the route many follow during down times, going back to school – in his case, Harvard's Graduate School of Design. Then he returned to Greenberg's office, but a three-year sojourn there ended in 1993 when much of the firm relocated to Washington, D.C. This spring Buch has been finishing a large addition to a country house, and searching for new work. "I love architecture, but it's really difficult to make it as an architect," Buch said recently at his office in New Haven. "Sometimes, when I get discouraged, I think I should concentrate on becoming wealthy so I can practice architecture as a hobby." Still, he has resisted becoming an employee in someone's else's firm again. "If I want to be insecure," he says, "I may as well be insecure on my own."

turning it out" – but it does give flexible individuals a potentially valuable opportunity to experience a variety of firms. "We can place you at Richard Meier's doing a stair detail, at Gensler doing a corporate interior," says David C. McFadden, owner of CFA, which also operates in New York and Chicago. "Portfolios are made more diverse." A long-term reward is that firms like Flansburgh's eventually hire some of their temps for regular positions after seeing them on the job.

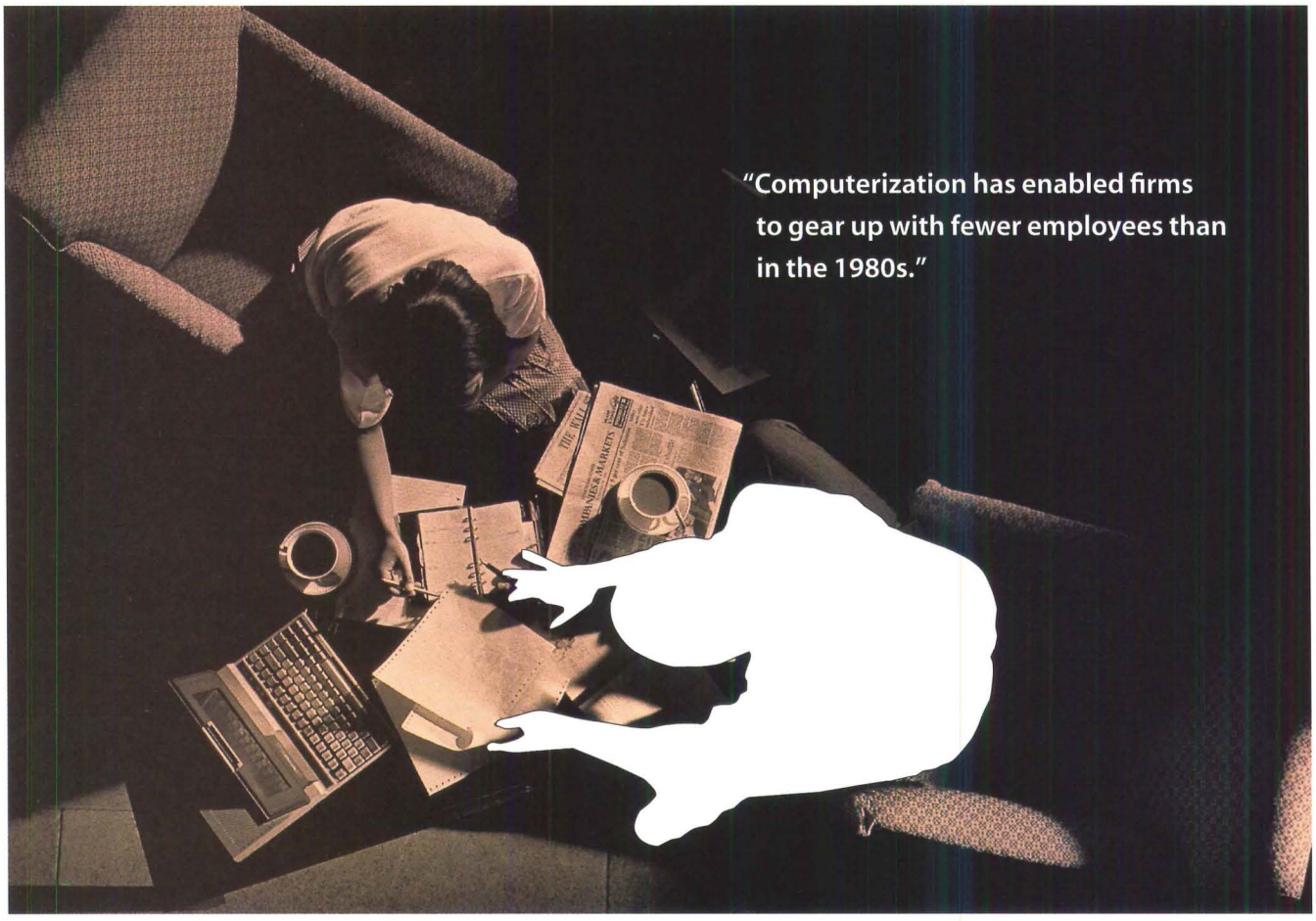
Machines Replace People

Many firms, in the aftermath of the recession, have exhibited a heightened enthusiasm for computerization, which has enabled them to gear up for increasing work with fewer employees than in the 1980s. Bill Fanning, research director for the *Professional Services Management Journal,* says architecture firms have cut back on the hiring of "drafters, spec writers, cost estimators – almost anything you could buy a computer for." For instance, Bruner/Cott & Associates in Cambridge, Massachusetts, shrank from a peak work force of 45 to fewer than a dozen during the worst of the downturn. The firm has since regained its soundness partly by broadening its range of work (to athletic and food service facilities and other specialties) and partly by putting "computers on virtually everyone's desk," according to partner Leland Cott. "The office now has about 20 people, and we're doing the work of about 30."

Along with investing in automation, most firms "are trying to regain strength after hard times by asking their employees to work longer, harder, faster," says Jim Franklin, a resident fellow at the AIA who has helped laid-off architects establish practices. Like it or not, this is consistent with general trends in the economy. Businesses in many fields are asking more of their employees as they respond to global competition.

On the question of whether downsizing is a good solution in the long run, the jury is still out. Though staff cutbacks may be hard to avoid, they inflict costs on a firm. A laid-off Boston area architect said her former employer's decision to dismiss people at the first sign of a downturn dampened the staff's attitude. Once a firm displays quickness to wield the ax, it never knows which employees will leave at the first opportunity. Staff retention becomes more difficult, and the firm ends up devoting some of its energy to breaking in replacements. "It takes about a year for a new employee to be completely up to speed," says New Haven architect Robert Orr. So there is reason to be skeptical of downsizing's most ardent proponents. In the long run, experienced staff members give an organization a valuable consistency and save it from costly mistakes.

Some argue that the individuals most hurt by the trend toward a downsized profession are those fresh out of school. "Architects are refusing to take entry-level people," says Beeby, a former Yale dean. "Kids getting out of school are told to come back in two or three years" – a phenomenon that, if it were to become the norm, would make it impossible to get the on-the-job training they need. In counterpoint is the fact that recent graduates know more about computers than do many



David Ash/Tony Stone Images

middle-aged architects. Proficiency with CAD has become a key to employability. So the young generally possess at least one valuable skill, along with the traditional enticements of youth: abundant energy and relatively low salary demands. It's possible, then, that the biggest losers in downsizing are not recent graduates but those who have been in architecture for 10, 20, or 30 years – long enough to be more expensive to hire, old enough to want to spend evenings at home, and vulnerable enough to still be bouncing from job to job.

Bounce Until You're Broken

Douglas Pegues Harvey, a 49-year-old architect in San Antonio, has bounced from Houston to Austin to Houston to San Antonio to New Jersey and back to San Antonio over the past dozen years, following almost exactly boom-and-bust construction cycles in those places. "It's like riding the surf except the waves are big and dangerous and the bottom is covered with coral, and there's a severe undertow," says Harvey. Educated at Rice and Princeton, Harvey doesn't see his moves – sometimes riding the wave, sometimes being scraped against the bottom during the unemployment cycle – as extraordinary. "Stories like this are endemic all over the country," he says. "No job is secure. The only thing that makes a job secure is if you own the business, and then only if the work continues to come in."

Prolonged bouncing endangers careers. A woman who was a designer for a Bay Area firm and who has worked for a series of firms since first being laid off in 1989 says, "If you're laid off from a prestigious design firm, at first you're seen as good material. But if you're laid off and start bouncing, you take an enormous cut in status and security and potential for upward advancement. After a while I'm not sure whether you're still seen as good material." Enthusiastic about architecture, she nonetheless observes, "What I'd really like to do is to work my way up in a firm again." The best opportunities for doing that are currently in booming sections of the South and Southwest.

Working for Yourself

During cutbacks, many laid-off architects – and others who decided to jump before they were pushed – formed their own firms. Consequently, at the same time that many firms shrank, the number of establishments offering architectural services rose from 15,957 in 1989 to 17,320 in 1993, the last year for which figures are available. Nationally, it's impossible to say whether these small, young firms are, in the aggregate, faring better or worse than their older, larger competitors. But in New York, Joseph Vance, who willingly left a firm in 1991 to start his own, maintains that "for the most part, these one- and two-man shops seem to be busier than most 'established' offices." Small shops, Vance says, have thrived not by underbidding large firms (though that occurs) but by offering the personal attention of principals, something that big firms find it hard to give each client.

Computer-aided design has put small firms on much the same footing as big firms, Vance says. "Small firms can now afford the same hardware and software as the larger firms, and, through the productivity gains, they can produce larger projects on their own." CAD modeling *(continued on page 122)*

The Flexible Life of a Temporary

Matthew Donnelly in Melrose, Massachusetts, was one of the first to sign up when an agency for temporary architectural workers opened its doors in Boston around the beginning of 1990. "I was in a firm that was kind of shrinking, and I thought that rather than just stay there and let my fate be decided, I would try this," he recalls. His first assignment was doing exterior wall sections and exterior details for a research lab being designed by Kallmann, McKinnell & Wood. Five years later, he is still a temp, moving from firm to firm, and says, "I think it's great. It enables me to pursue a lot of other interests: a little carpentry, a little design-build with my brother, an idea for temporary housing for refugees, and my own house, which is a work in progress." Thirty-five years old, married, with two children, Donnelly says that this spring his typical day has gone like this: Out of bed at 6:30, early morning calls to private clients, 8 a.m. train to Boston, and then 10 to 12 hours working in the firm where Consulting for Architects has placed him on an assignment. When temp work falls off, he shifts to jobs he has generated from his own clients. "It's kind of an odd existence," he says, quickly adding, "The flexibility is nice. I probably have the right entrepreneurial bent."

After the Layoffs: "Nobody Feels Permanent"

The downturn didn't touch Robert Orr & Associates until 1993, but all at once clients canceled their plans for houses, and Kenneth Clark, an associate in the firm, was laid off. "It was upsetting," says Clark, a 34-year-old architect who had been with the New Haven firm and its predecessor, Orr & Taylor, since 1986. "I didn't work at all for three to four months," he says. "I was very disenchanted. I felt like so much of me was invested in the profession." To figure out what to do next, he attended a career change workshop at New York University. "It was useful in telling me that I did want to stay in design," he says. As business conditions began to improve, Orr took him back part-time for a few months, and he is again a full-time associate at the firm. But the period without work left an indelible impression on Clark and on many of the other architects he knows. "Nobody feels permanent," he says. "There's a lot of disillusionment." The big question that Clark says he and others ask themselves is: "How can we become indispensable?" They feel pressure to master additional skills that could help them weather ups and downs in the future. For Clark, that may mean learning interior design, even if it requires leaving the firm for a while to get the necessary training. Just being good at what he already knows doesn't seem to be enough.

The Demanding Detail

Thomas Leeser's Twin House challenges some of the conventions of construction documents, while proving that post-structuralist architecture is eminently buildable. *by Thomas Fisher*

Architectural theorists rarely talk about the seemingly mundane subject of contract documents. But the Twin House, designed by New York architect Thomas Leeser, shows that the subject is ripe for discussion, that working drawings are architectural "texts" as worthy of critical scrutiny and as revealing of power relations within the construction industry as any building.

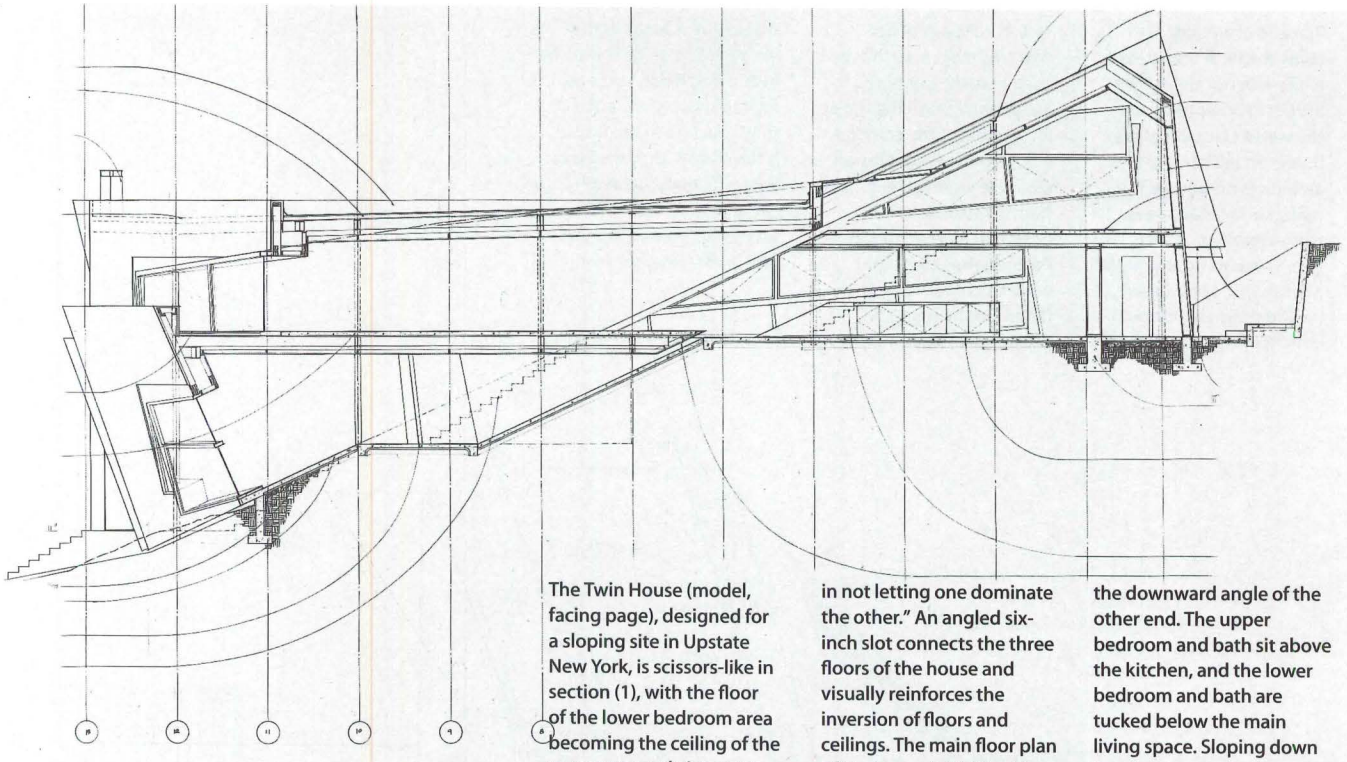
The 3,300-square-foot structure, commissioned by twin brothers, one an eye surgeon and one a brain surgeon, is hardly your conventional vacation house; its central kitchen and living area, flanked by bedroom/bathroom suites, is encased in a wood-plank skin that is folded, creased, and then draped over a steel frame. And the working drawings are no less unconventional. Although they contain the expected plans and elevations, wall sections and foundation details, many of the sheets look like fabrication drawings for an industrialized object rather than for a house. Enlarged plans of some parts of the house, for example, indicate every stud and angle as necessary to show how the sloping walls, floors, and ceilings intersect. Likewise, the complex window and skylight elements are drawn in axonometric as well as in elevation, "to help the manufacturer build them," says Leeser. An unusual design requires unusual drawings.

Or no drawings at all. "We had to build a lot of models," says Leeser, "to understand how parts of the house went together," and it was these models, says Jerome Leiken of Gryphon Construction, who estimated the job, "that were a tremendous help in coming up with prices." That, in turn, raises the question of whether, in this age of 3D software and automated modelmaking, buildings will be built more directly from physical and electronic models, with some types of working drawings dispensed with altogether.

Another question raised by this project has to do with the relation of architect and contractor. In some ways, the Twin House has been exhaustively detailed: each piece of the folded exterior wall, for example, is drawn in true elevation, like clothing patterns. In other ways, however, those drawings have an abstractness, suggesting that many details would be worked out during construction, which, says Leiken, is becoming the norm even for high-end houses. "We negotiate a lot of details with architects on site."

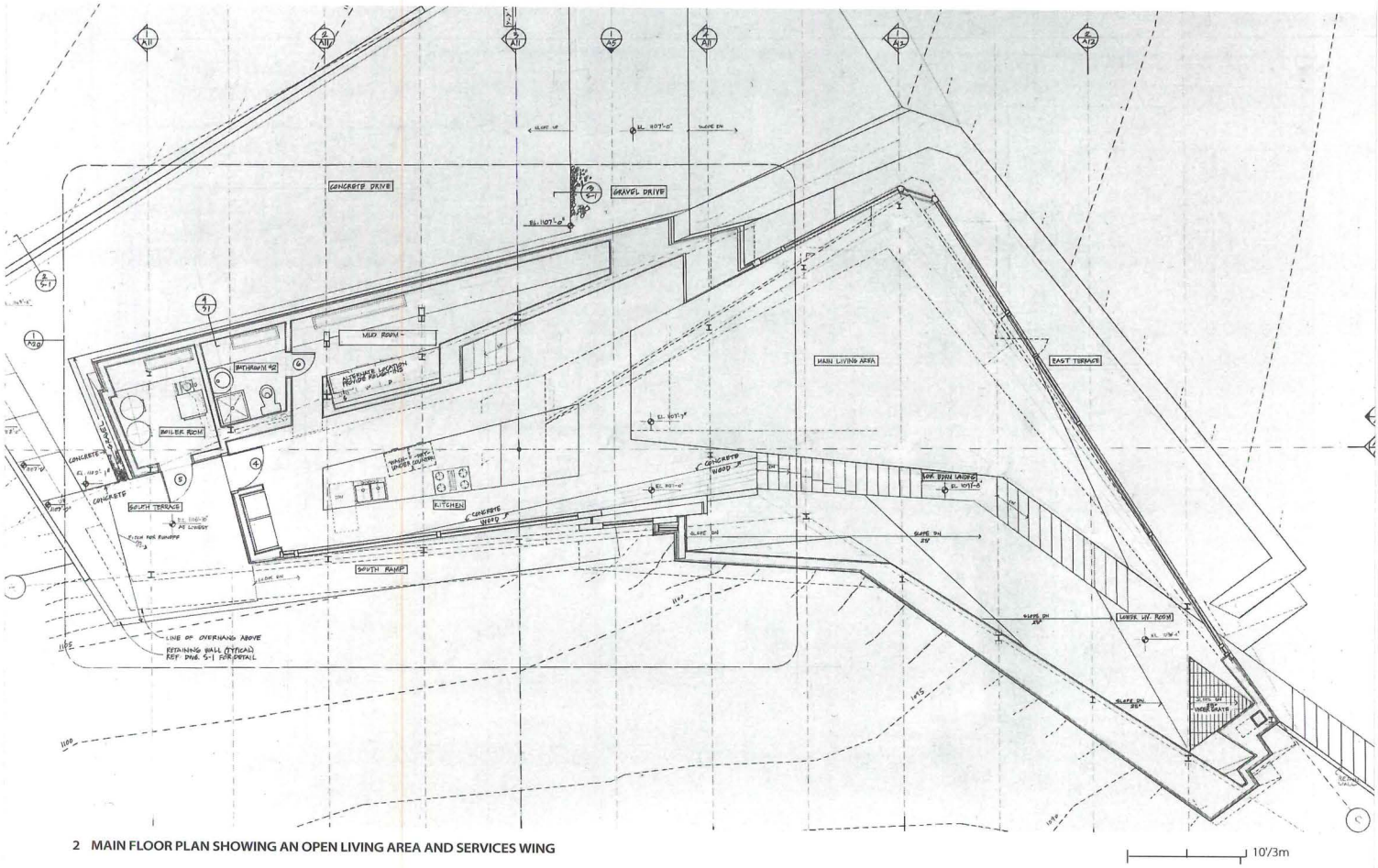
The project is currently on hold, although not because it couldn't be built. "I didn't find anything that wasn't buildable," adds Leiken. Nor was the $227 per square foot cost out of line for a house such as this. "Custom houses like this can range from $100 to $300 per square foot," says Jim Savio of Gryphon Construction, "depending upon their complexity."

Even if never built, however, the Twin House will remain a document of the dramatic changes going on in construction practices as well architectural design right now. It reveals the tensions that exist between old drawing conventions and new modeling techniques, between the old hierarchy of architect and contractor and new collaborative relationships, and between the old division of architecture from industrial design and a new blurring of their boundaries. Formally, the Twin House is one-of-a-kind, but pragmatically it may have many twins indeed.



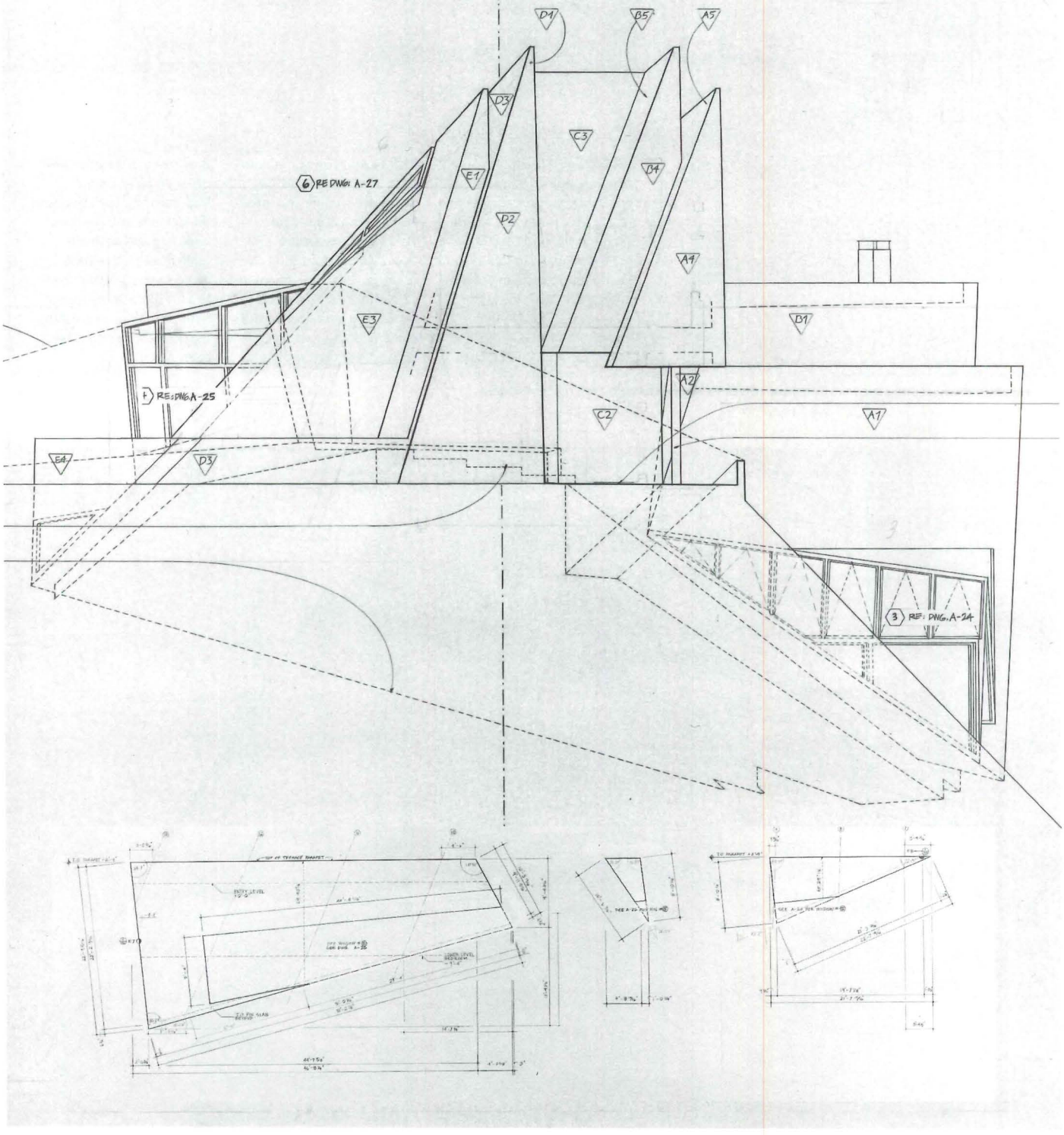
The Twin House (model, facing page), designed for a sloping site in Upstate New York, is scissors-like in section (1), with the floor of the lower bedroom area becoming the ceiling of the upper one and vice versa. "I was interested in the psychological relationship of twins," said Leeser, "and in not letting one dominate the other." An angled six-inch slot connects the three floors of the house and visually reinforces the inversion of floors and ceilings. The main floor plan of the house (2) folds at its center into a shallow V, with one end of the structure, upwardly angled, inverting the downward angle of the other end. The upper bedroom and bath sit above the kitchen, and the lower bedroom and bath are tucked below the main living space. Sloping down to a fireplace at the lowest point in the house is a den, the house's "inferno," says Leeser.

1 LONGITUDINAL SECTION SHOWING UPPER AND LOWER BEDROOMS FRAMING A CENTRAL LIVING AREA

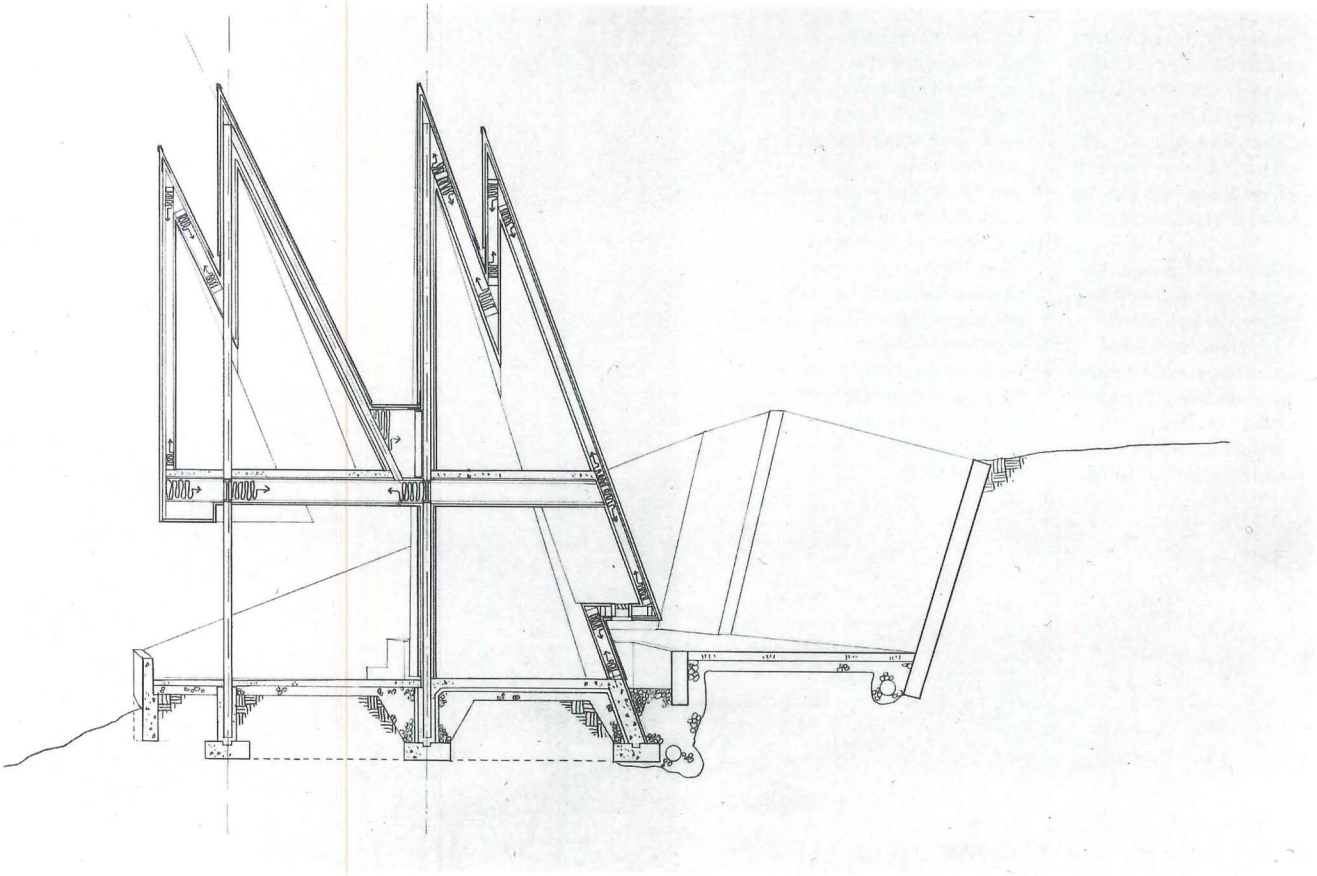


2 MAIN FLOOR PLAN SHOWING AN OPEN LIVING AREA AND SERVICES WING

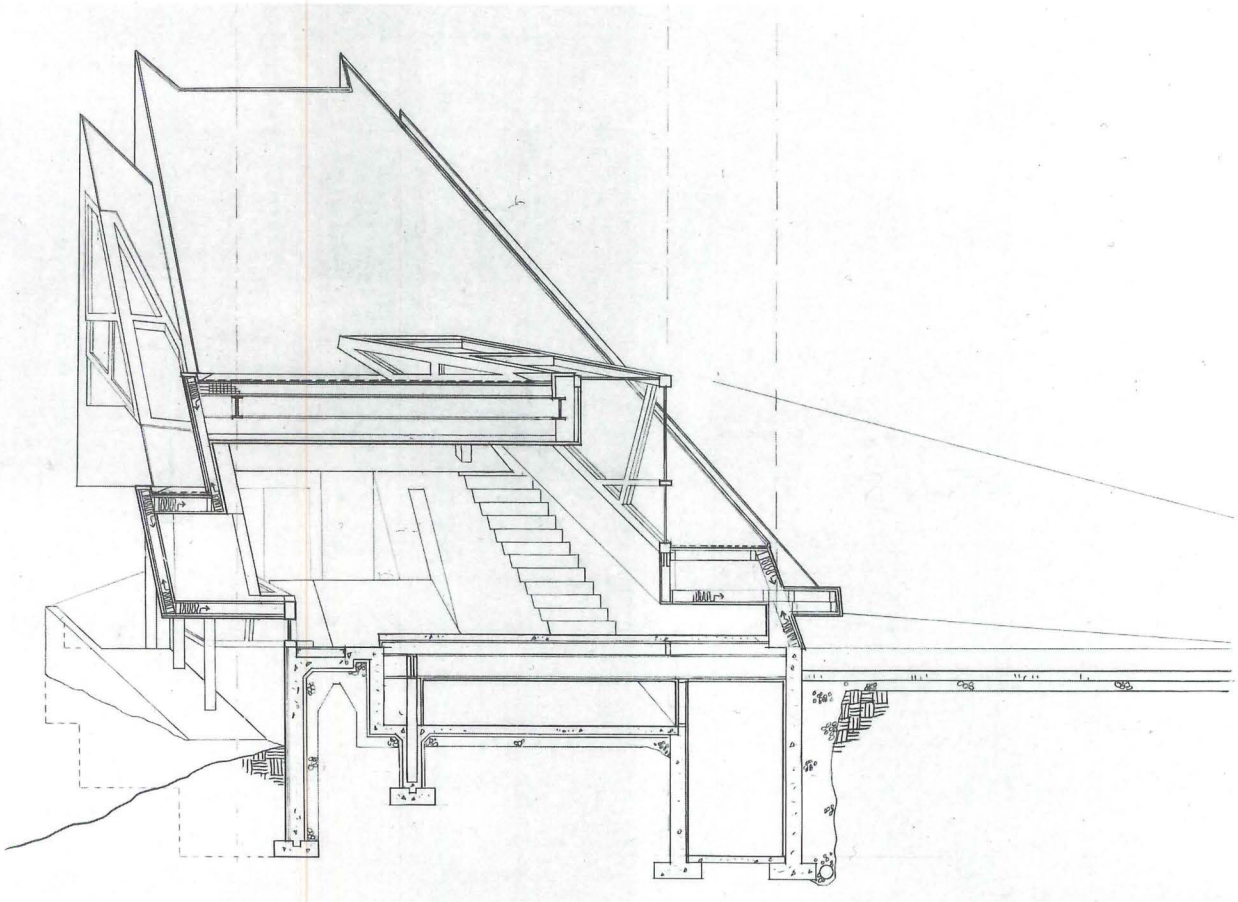
The end elevations (3) show the folds and creases in the exterior skin of the house. In order to depict the wood-clad skin of the house accurately, the architects numbered the many surfaces and drew true elevations of each one. "It was a trigonometric nightmare," says Leeser, having drawn it without benefit of computers. The result is a series of flat patterns that recall those used to make clothing. Sections through the house (4, 5) indicate the complex wood-framed skin draped over a straightforward steel frame. This structure, designed by Ove Arup & Partners, has eight-foot-wide bays extending the length of the house, providing a regular rhythm within the house's highly irregular form. The difficulty in drawing these sections, says Leeser, is that "not a single section in the house is the same." They decided, however, that a section every second column line was sufficient to communicate what was going on.



3 END ELEVATION WITH EXTERIOR KEYED TO DIMENSIONED DRAWING OF EACH SURFACE

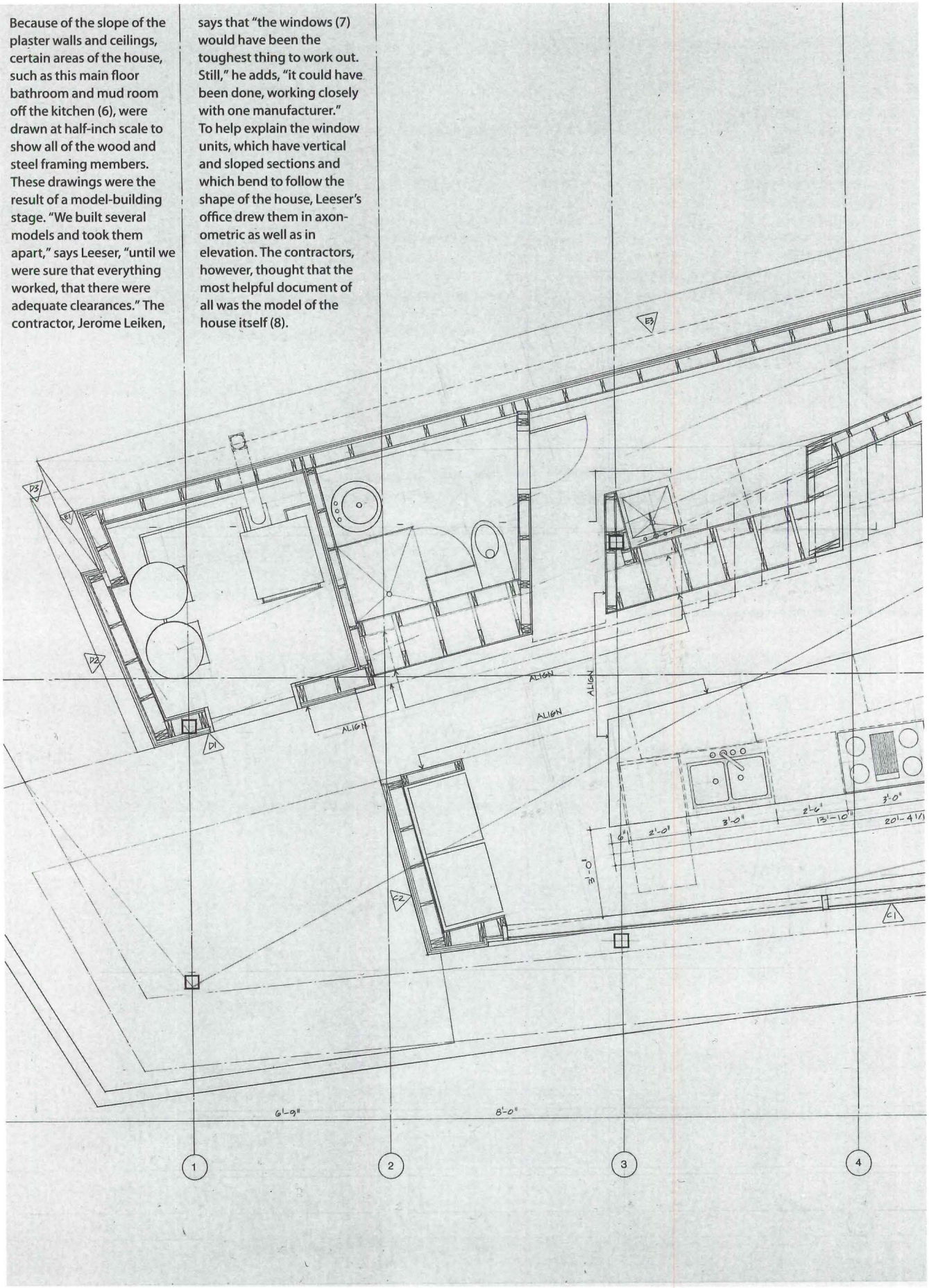


4 SECTION THROUGH UPPER BEDROOM AND UTILITY ROOM

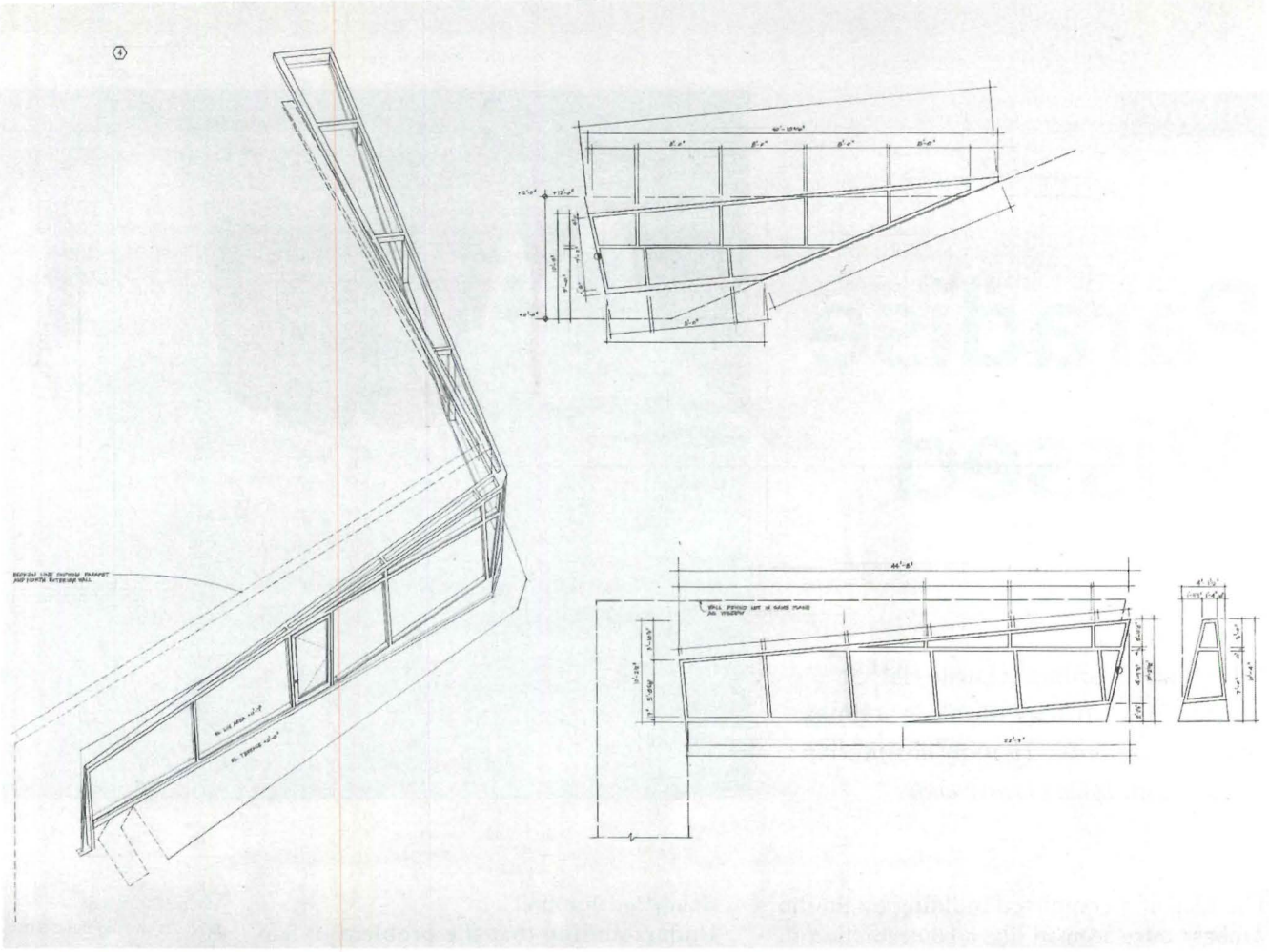


5 SECTION THROUGH MAIN LIVING SPACE SHOWING KITCHEN AND STAIR TO UPPER BEDROOM

Because of the slope of the plaster walls and ceilings, certain areas of the house, such as this main floor bathroom and mud room off the kitchen (6), were drawn at half-inch scale to show all of the wood and steel framing members. These drawings were the result of a model-building stage. "We built several models and took them apart," says Leeser, "until we were sure that everything worked, that there were adequate clearances." The contractor, Jerome Leiken, says that "the windows (7) would have been the toughest thing to work out. Still," he adds, "it could have been done, working closely with one manufacturer." To help explain the window units, which have vertical and sloped sections and which bend to follow the shape of the house, Leeser's office drew them in axonometric as well as in elevation. The contractors, however, thought that the most helpful document of all was the model of the house itself (8).



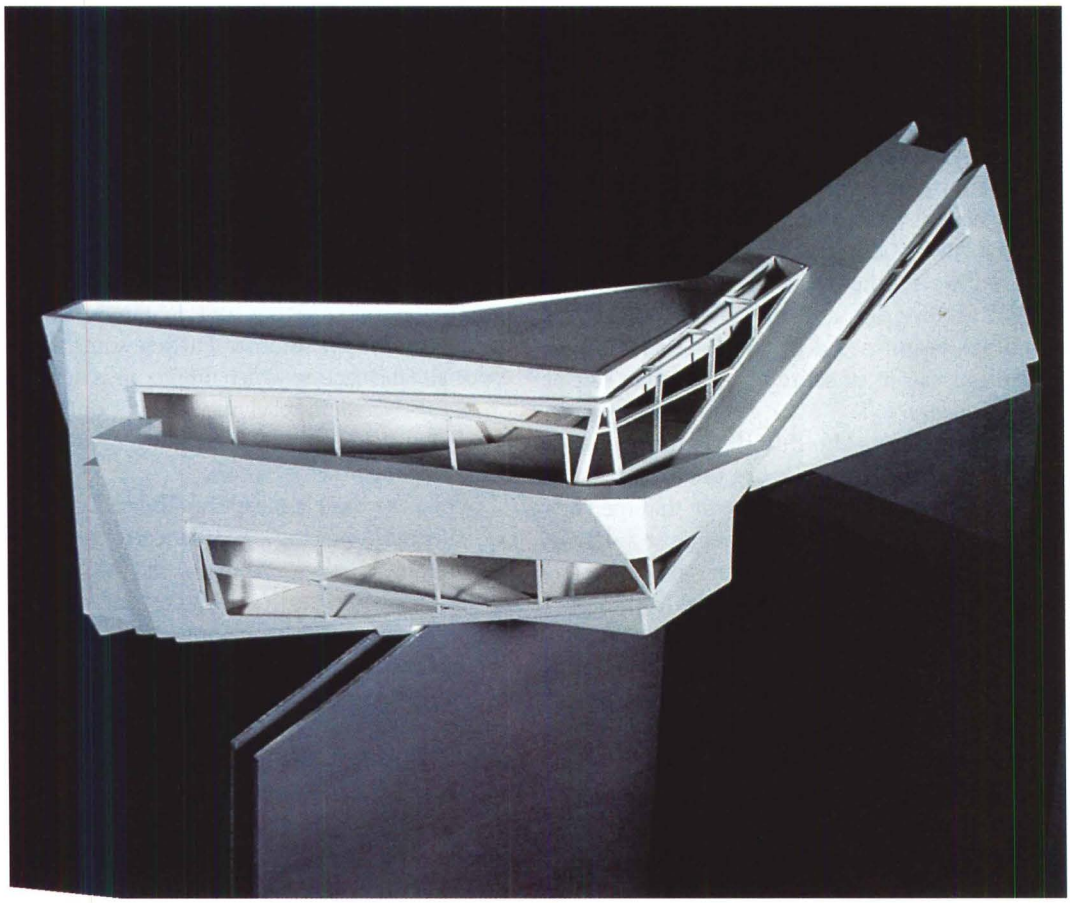
6 PARTIAL LARGE-SCALE PLAN INDICATING STRAIGHT AND SLOPING WALL FRAMING



7 AXONOMETRIC EXPLAINING WINDOW ASSEMBLY

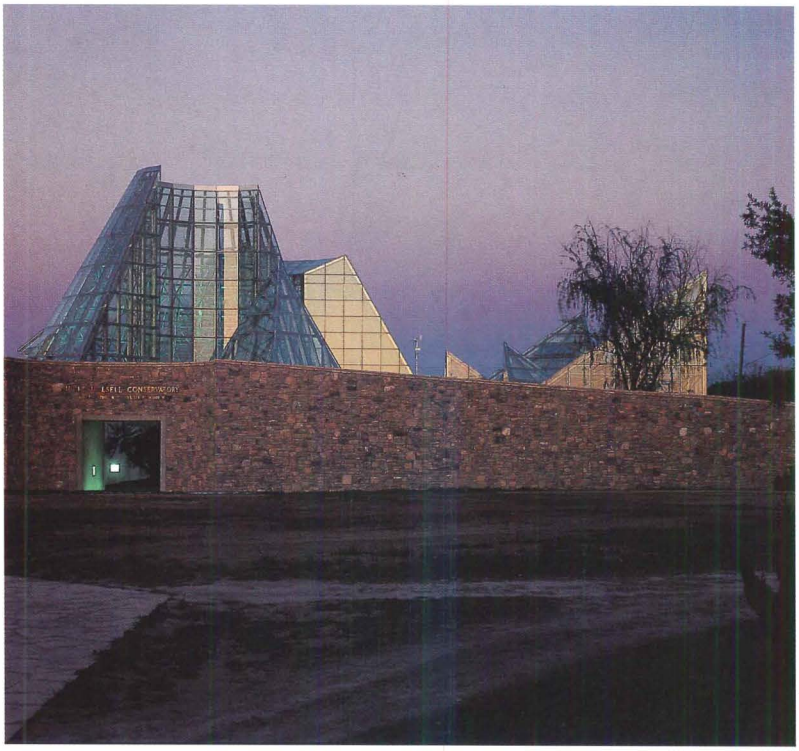
DIMENSIONED WINDOW ELEVATIONS

Project: The Twin House, Liberty, New York.
Architect: Thomas Leeser, Architecture, New York (Thomas Leeser, principal; Bill Rockwell, Jörg Gleiter, Jennifer Hocking, Michelle Lederer, Cary Syress, Andrea Jütten, Juanita Cheng, project team; Ching-Wen Lin, Lea Mungone, John Cays, model).
Consultants: Guy Nordenson, Ray Crane, Ove Arup & Partners (structural).
Construction managers: Jerome Leiken, Jim Savio, Gryphon Construction.



8 MODEL SHOWING HOW WINDOW ASSEMBLIES FIT INTO THE GEOMETRY OF THE HOUSE

Paradise Missed



Greg Hursley

A stone-faced wall provides an enigmatic entry to the conservatory, but **its mystery is thwarted by the high-tech roofscape beyond.** Since this photo was taken, the ramps leading down to the entrance have been retrofitted with cumbersome handrails, further diminishing the effect.

While Emilio Ambasz's Lucile Halsell Conservatory in San Antonio is at times poetic, it has proved largely ill-suited to its function. *by Mark Alden Branch*

The idea of a completed building by Emilio Ambasz once seemed like a contradiction in terms, not so much because the New York architect had not managed to get anything built, but because the very presentation of his work seemed so surreal as to deny the possibility of its existence in the real world.

So it was Ambasz's detractors, as much as his admirers, who looked forward to the completion of his first major work in 1988, San Antonio's Lucile Halsell Conservatory, a citation winner in the P/A Awards Program (January 1985, p. 120). The real world, they argued, isn't the blanket of bright green grass and unbroken blue sky of Ambasz's visions. And it's much easier to build greenhouses out of scored acetate than out of steel and glass.

All true enough. But if we accept that Ambasz's familiar models are unattainable abstractions, can we nevertheless say that the conservatory matches the transcendent spirit of those models? Yes and no. There are transcendent moments in a visit to the building, but prosaic realities have a way of breaking the spell.

The conservatory is part of the San Antonio Botanical Gardens, which consist mainly of native Texas plants displayed in naturalistic settings representing different parts of the state. Ambasz was commissioned to design the complex by the Ewing Halsell Foundation, a philanthropic body that helped found the gardens in the mid-1970s.

Going Underground

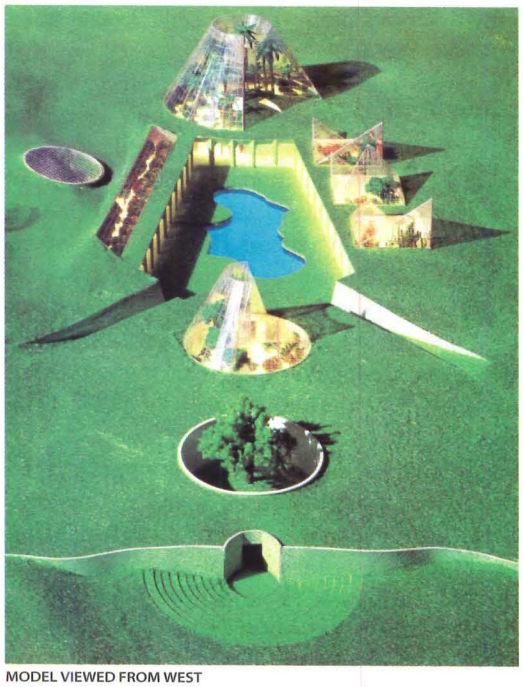
Understanding that the problem in San Antonio was keeping plants cool – rather than warm, as in most such facilities – Ambasz proposed a solution familiar to followers of his work: bury the building. Using berms and an existing hillside, Ambasz's design arranged earth-sheltered, skylighted plant rooms around a trapezoidal courtyard.

The only trouble with this idea is that it doesn't work, according to Don Pylant, the conservatory's senior horticulturist. "It was an attempt to change physics," says Pylant, explaining that the earth around the rooms retains heat, making it difficult to cool them in the summer. Further, some plants, especially the cacti to which one room is devoted, do not thrive when receiving sunlight only from above. Pylant is no fan of his building, saying it has been "a problem since day one."

While the basic concept of a buried building was rather self-effacing – antithetical to the idea of the building as object – Ambasz used the skylights to give the conservatory a distinctive architectural image. Their eccentric, incomplete forms – partial cones, sliced-up cubes – are easy to admire as sculpture. They are crisply detailed, with the glass effectively glued to the mullions by silicone sealant, leaving the surface beautifully smooth.

The roofs don't have the transparency that Ambasz's idealized model promised, but they are handsome objects, surprisingly free of the clunkiness that often results when such fantasy meets

Mark Alden Branch

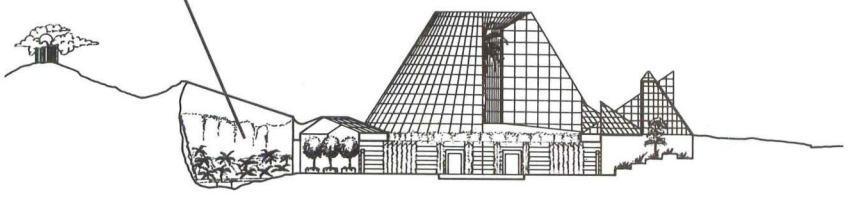


MODEL VIEWED FROM WEST

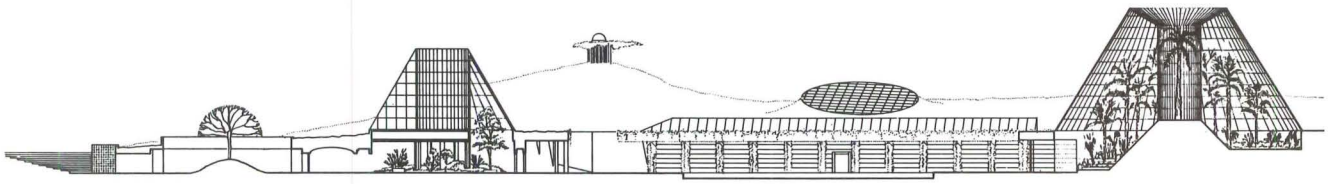
Ambasz's model denies both the building's surroundings and the realities of construction; still, **at its best, the conservatory retains some of the spirit of this abstraction.**

Ambasz's solution to the Texas heat was to bury the plant rooms, using berms and an existing hillside; the conservatory's **horticulturist says it doesn't work.**

The large palm room and four other plant rooms open onto **a lush, idyllic courtyard** surrounded by a loggia. From here, the roofs of the plant rooms can be admired as a sculptural ensemble.

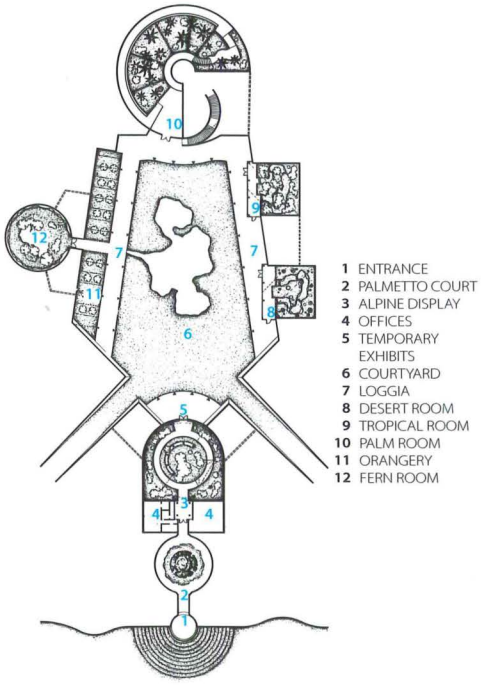


CROSS SECTION

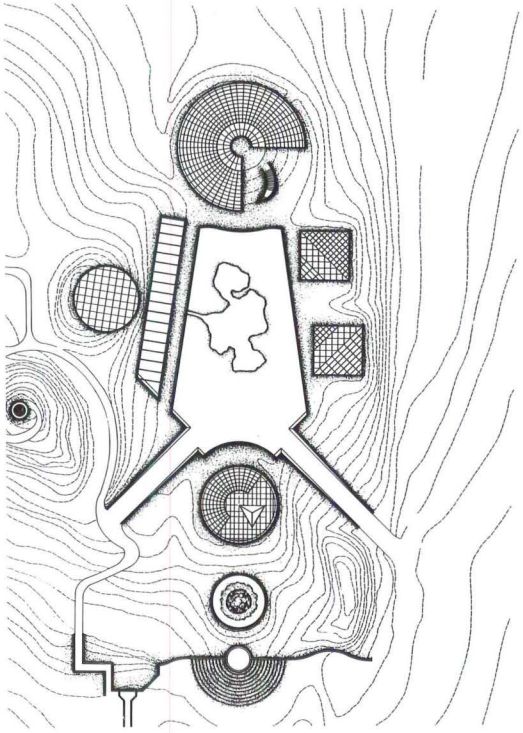


LONGITUDINAL SECTION

There is an inherent conflict in the conservatory's plan between the linear procession set up by the entry sequence and the circular procession around the courtyard. Ambasz claims the axial focus on the palm room would be less pronounced if the courtyard were planted more fully.



FLOOR PLAN



ROOF PLAN

built reality. But Pylant says the shapes have nothing to do with function, and don't aid in the growth or display of plants. "They are 100-percent architecture," he says.

Ambasz acknowledges that the roofs are purely sculptural, but contends that the conservatory's previous horticulturist had been willing to "plant in the microenvironments he received." In other words, Ambasz had been assured that the form did not matter, as the plants could adapt to the building.

A look at photographs taken when the building opened reveals that time and nature have improved it. The plants are more mature now and make a better foil for the hardness of the concrete, steel, and glass of the architecture. In the meantime, though, the conservatory has had to do what Pylant describes as "a tremendous amount of retrofitting." One problem involved Ambasz's decision to set each room on its own foundation, allowing them to move independently in the shifting soil. But these shifts caused the electrical conduit that runs from room to room to shear. Also, says Pylant, the concrete walls have been notoriously leaky.

A Less than Grand Procession

In the plan of the conservatory, Ambasz develops a sense of procession reminiscent of religious architecture. As in a temple complex or in a cathedral, the entry sequence seems to be designed to evoke an otherworldly sense of transformation. Approaching from the botanical gardens, a visitor is confronted by a sober stone wall, broken only by an opening within a semicircular apse. You pass through the opening into a space that has a sparse beauty: a drum-shaped, concrete-walled court with a palmetto plant at its center.

From the court, you move into a disappointingly workaday transitional space, with walls of concrete block and a ceiling of shiny metal. Besides providing access to offices, the space (shown on early plans as a ticket counter) houses a display case with a small alpine exhibit and bulletin boards. After the quiet mystery of the entrance and the circular court, this space is deflating, like encountering a church softball sign-up sheet in the narthex of Chartres.

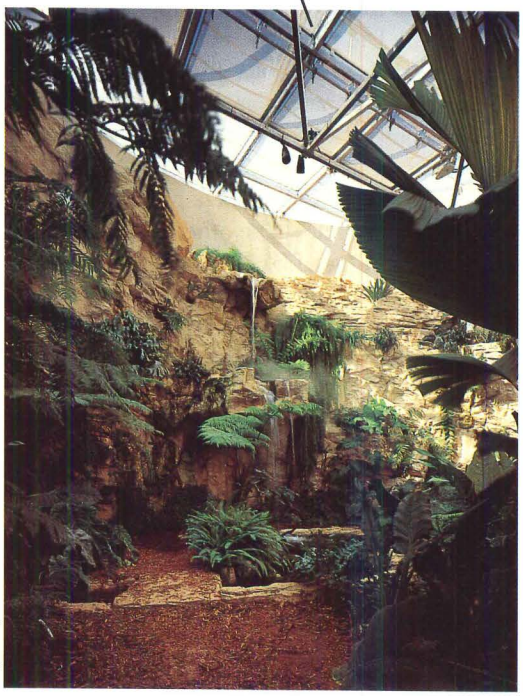
Next, you enter the first of five rooms topped with distinctive, sculptural skylights. This one, devoted to temporary exhibitions, is least effective at exploiting the shape of its skylight. All of the plant life is at ground level or eye level, making it easy to pass through without even noticing the glass-enclosed space overhead.

It is in the trapezoidal courtyard, the next stop in the sequence, that Ambasz's arcadian vision comes the closest to realization. Emerging from the temporary exhibition room, you see the palm room, the conservatory's largest structure, straight ahead in a view enhanced by forced perspective. The courtyard's greenery is lush and healthy, and has begun to overtake the architecture in the way that Ambasz intended. Vines are starting to cover up the concrete columns and ceiling of the loggia that surrounds the court.

Richard Payne

It can be **a tight squeeze among the cacti in the desert room,** where the paths are too narrow for two people to pass comfortably. Here, as in the tropical room and the temporary exhibit room, the roof shapes are used to little advantage.

In the fern room, architecture takes a back seat to an atmospheric naturalism, complete with mist, artificial rocks, and a waterfall. **The fern room has an understated flat skylight,** in contrast with the more extroverted forms of the other plant rooms.



Greg Hursley

Vines are overtaking the concrete columns and ceiling of the loggia, **a shady spot that is a welcome respite** from the plant rooms and the courtyard.

Mark Alden Branch

Greg Hursley

Two sets of steps provide **alternative exits from the courtyard,** allowing visitors to avoid a return trip through the entry sequence. This stair leads to a gazebo that overlooks the conservatory. The vegetation is thicker now than when this photo was taken.

And here, the outside world is essentially hidden; views out are limited to the sky and to Ambasz's own sculptural roofscape.

The system of circulation, which is very specific up to entering the courtyard, becomes ambiguous there. The five major plant rooms all open onto the court, but are not connected to each other. Such a strategy is an effective way of preventing "museum fatigue"; the courtyard and loggia repeatedly refresh weary eyes and overheated bodies. But it is curious that the plan, which offers a tightly controlled procession from entrance to courtyard, doesn't arrange for the palm room, the most spectacular space, to be the grand finale. People naturally visit the rooms in a circuit around the courtyard, which places the palm room either second or third in sequence. After that, the smaller rooms are anticlimactic.

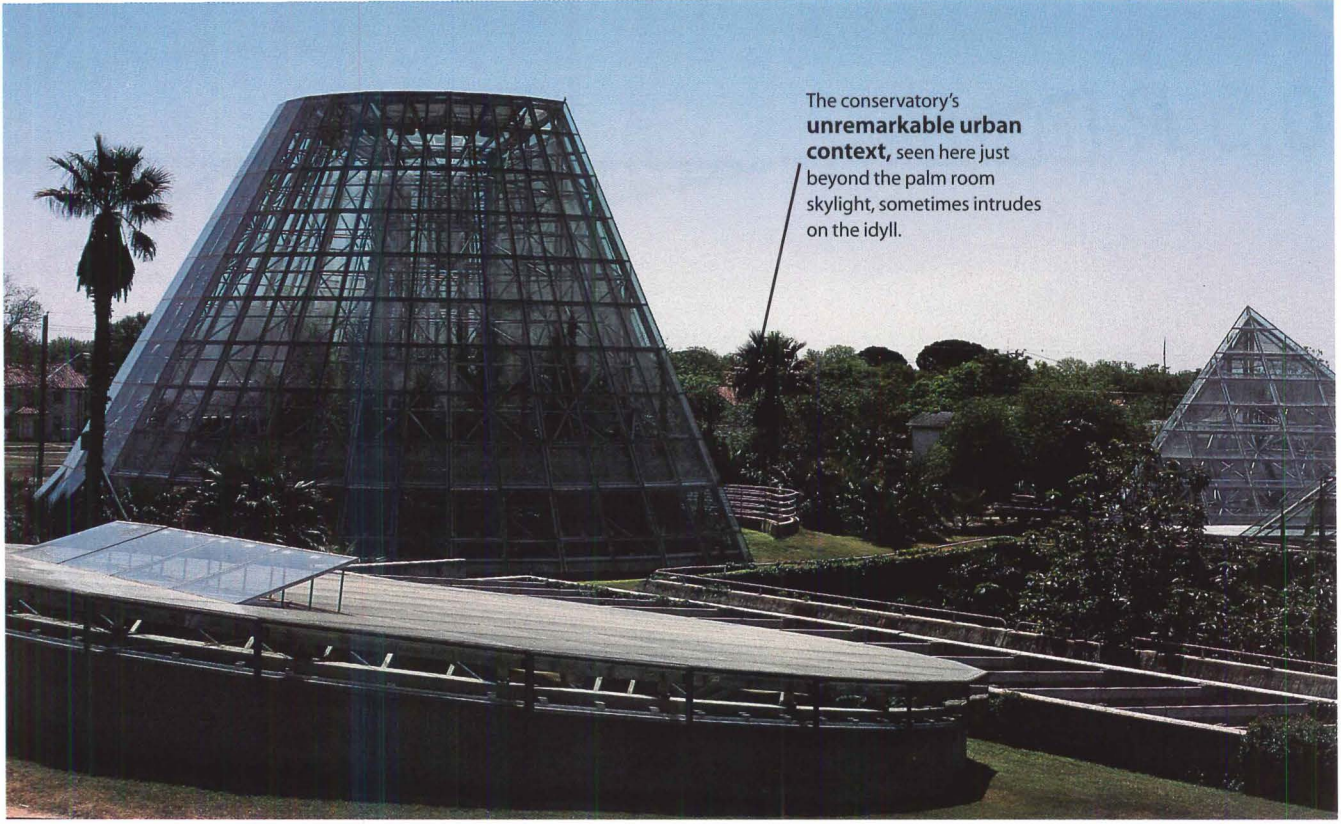
Ambasz says he did not intend for the palm room to be so axially prominent. "The courtyard was supposed to be a grand garden that would distract you," he says. If the courtyard were planted more densely, he maintains, the palm room would not be as dominant. "I don't like to give away the whole house from the front door," he adds.

Mixed Reviews for the Plant Rooms

You could easily miss the nondescript entrance to the fern room, a circular space lined with artificial rocks and topped with a flat skylight located behind the loggia on the north side of the courtyard. Here, Ambasz's architectural image disappears almost entirely, yielding to a pleasant, cheerfully artificial imitation of nature, complete with a waterfall.

Along the south side of the courtyard are two rooms housing desert and tropical plants. The fact that their roofs are identical (though differing in rotation by 90 degrees) betrays the arbitrary nature of these forms; they are driven more by aesthetics than by horticultural advantage. Neither of these spaces is an effective display environment. Their paths are too narrow to allow one person to pass another comfortably, which discourages people from stopping to appreciate the plants. (The problem becomes more serious when busloads of schoolchildren visit.) And the desert room, in particular, is unreasonably hot. While a conservatory is one place in South Texas where you should not expect the air to be chilled to 70 degrees, this room was hard to bear for more than a minute. (The other rooms use mist to cool things down for plants and people.)

In the palm room, though, architecture and nature come together in an exhilarating way. More than anywhere else, the soaring roof forms here are put to good use, housing a variety of beautiful palm trees. You climb a curvilinear ramp to reach an elevated vantage point at canopy level. Much of the delight comes from the necessary climate-control systems, which provide sensory experiences along the journey: air-conditioning ducts lined up alongside the ramp create an upward breeze on the palm leaves. And every few minutes, a cool mist is emitted from above. Meanwhile, some of the window panes



The conservatory's **unremarkable urban context,** seen here just beyond the palm room skylight, sometimes intrudes on the idyll.

Mark Alden Branch

near the top open and close automatically, regulated by thermostats. The room celebrates, instead of hiding, the artifice required to keep these tropical plants alive.

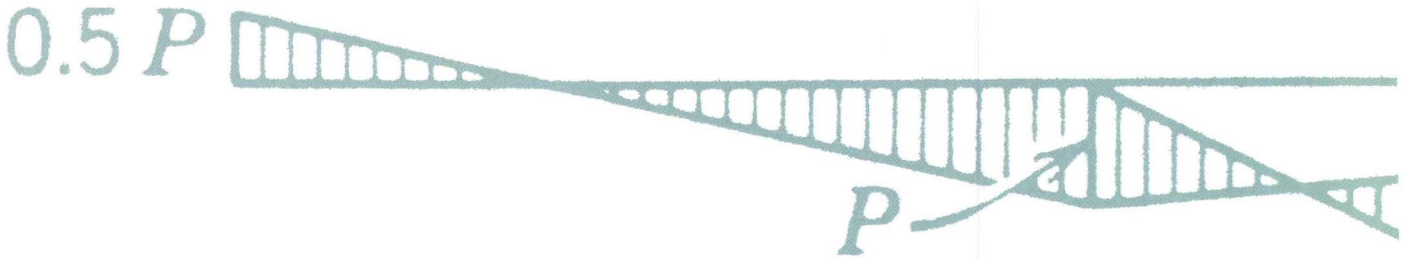
The down side of the procession through the palm room is the gradually unfolding view of the conservatory's surroundings. While the neighborhood that abuts the conservatory is not blighted, it is ordinary, and that is disappointing at this climactic moment. Just as in the transitional space near the entrance, this view is jarringly prosaic. Once again, we are reminded that this isn't Arcadia, just San Antonio. (Ambasz says the foundation had originally intended to buy and raze the houses and to close the street.)

But in the end, occasional lapses in poetic vision are the least of this building's troubles. Given that the distinctive roofs of the plant rooms are not especially appropriate for their contents, and the more serious problems caused by displaying the plants in a subterranean setting, this building is indeed flawed. Moreover, contrary to expectations, the problems are in its conception, not its implementation. □

The conservatory's horticulturist complains that **the palm room's conoid shape allows for only a few tall palms.**

Richard Payne

Architects: Emilio Ambasz & Associates, New York, and JonesKell, San Antonio (architects of record).
Client: Ewing Halsell Foundation, San Antonio.
Cost: $6.7 million.



Are we giving architecture students a second-class education in technology and professional issues? Is there a better way?

by Michael J. Crosbie

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Why Can't Johnny

Architecture may be an art and a science, but at most architecture schools that equation is pretty lopsided. The design studio is the jewel in the crown of architectural education. Its glistening size commands the hearts and minds (and time) of students, while the so-called "support" courses (structures, materials, acoustics, lighting, environmental systems, professional practice courses) often get short shrift. These other subjects may get lip service in the design problem, but the primary thrust in most studios is form-making unfettered by such mundane considerations as: Will it stand up? What's it made of? How will you heat it? Is it affordable?

Practitioners see things differently. Into their offices come new graduates, armed with portfolios filled with the labors of design studio, looking for employment. But most graduates seem mystified (or bored) with architecture's science. One architect I spoke with, in charge of hiring in an office of a large multinational firm, says he doesn't even expect graduates to know anything technical. "Why," practitioners may well ask, "can't Johnny size a beam?"

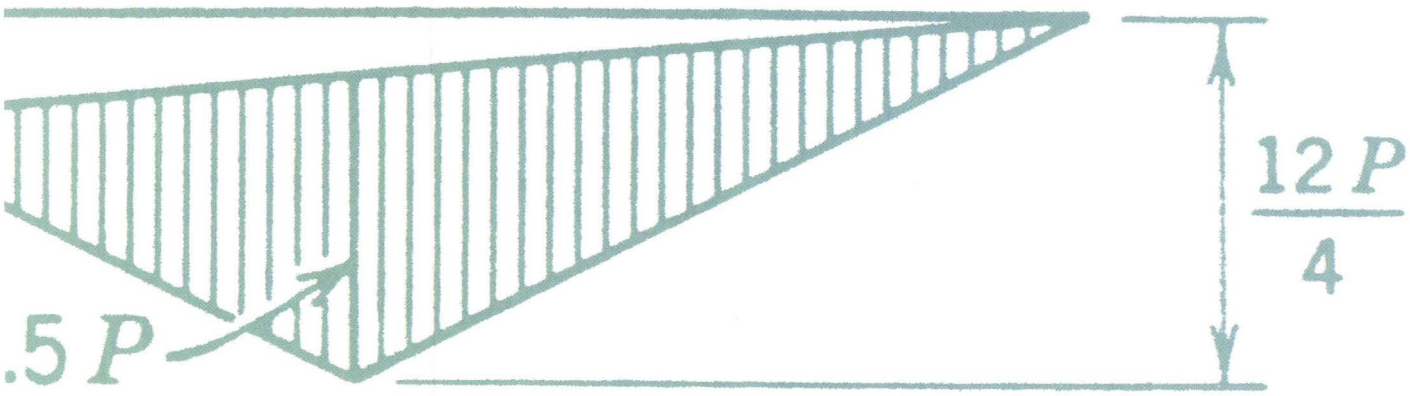
The division between art and science is nothing new in architectural education, points out Bruce Dilg, who recently completed a study of how students are prepared for practice. Sixty-five years ago, when F.H. Bosworth and Roy Childs Jones made a study of the architectural programs in North America, they noted that "schools in the United States have shown a tendency in general to minimize construction in the so-called straight architectural courses. The emphasis on architecture as a fine art in many cases tended to create disdain of the scientific foundation on which the art rests." Bosworth and Jones warned of emphasizing one over the other: "In the one case practical considerations are allowed to stifle imagination and creative ability; in the other, the aesthetic considerations so completely dominate that the final designs have little if any relation to reality."

The fault does not rest solely on the design studio. Technical instruction in architecture school is often just as unhinged from the reality of practice as is design. Students spend countless hours memorizing formulae, crunching numbers, and solving abstract technical problems that have little relation to an actual architectural project.

It's All Design

"An academic program in architecture needs to recognize that engineering is as much a design discipline as architecture," says Edward Allen, an architect and the author of various technical books on architecture, a lecturer at Yale's architecture school, and the editor of *Connector*, a lively newsletter for technology educators. Allen points out that most structures courses for architecture students deal only with calculating the size of members. "This is a misplaced emphasis, because in practice most architects do little or no sizing of structural members, while they are continually involved in selecting and configuring systems for their buildings. A structures course for architects ought to have a bias toward the selecting and configuring processes, which are the ones architects need to know about." The emphasis is often misplaced by academy-bound engineers who teach architecture students and who have little if any experience in actually designing structural systems.

This doesn't mean architecture students shouldn't know how to calculate. "They should learn basic statics and strength of materials, and some typical calculation techniques," says



Size a Beam?

Allen, but with more time devoted to selecting, configuring, and designing details such as connections. Allen adds that this emphasis applies also to teaching HVAC, lighting, acoustics, materials and methods, and construction.

The processes of selecting and configuring are, of course, what students do in studio. Thus, the studio might be the ideal setting for teaching technical, even practice-related, subjects. Some schools attempt to marry studio projects with technical issues by overlaying the programs with technical requirements. Or students are asked by their technology professors to use a current studio project to work out structure, HVAC, or lighting schemes. This is often a shotgun marriage, however. Several technology professors I interviewed said that design critics see the studio as their turf, and are not happy when students do other work in studio (even after hours), especially "support" course work. One gets the impression that, at many schools, the technology instructors are the Rodney Dangerfields of the faculty. They get no respect.

Breaking the Caste System

One way to overcome the friction between studio critics and those who teach technology, materials, and professional courses is to make them one and the same. At a time when school budgets are shrinking, faculty who can teach both also make good economic sense. "All of our technology faculty teach within the studio as well," says Raj Saksena, dean of the architecture school at Roger Williams University (where I'm an adjunct faculty member).

Saksena admits that finding faculty who can do both is not easy. "When we searched for acoustical, lighting, and mechanical faculty, we had candidates with impressive résumés, but they didn't know how technology integrates with design. The best candidates are architects who are also engineers," says Saksena, such as Paul Donnelly, who, in addition to teaching conventional structures at Roger Williams, also teaches a contemporary technologies studio where students analyze cutting-edge structural systems, often with the aid of computers, and then apply their research to a design project.

"The studio attempts to address the need of educators and the profession as a whole to transform technological advances into the realm of architectural thought," says Donnelly. "The studio's philosophical agenda is to close the gap between architectural purpose and technological necessity and efficiency. A discussion of the theory of technology should happen in a design studio." Such a studio demonstrates that teaching technology and practice courses as "design" not only makes the material relevant, it also communicates to students the fact that everything an architect does is design.

An Integrated Technology Sequence

Columbia University takes a different tack by not attempting to integrate its technology courses into the studio, but by running the courses as their own "mini" design studios. "Our approach to building technology is design oriented," says Anthony Webster, director of Columbia's Building Technologies curriculum. "The whole idea is to integrate the technology, and to view it as an aspect of design." Its New York setting allows the school to draw on many of the world's leading engineers and technically oriented architects as critics and teachers in the program.

Columbia requires six courses in its Master's program: two each for structures, enclosures and environments, and build-

ing systems. There's emphasis on hands-on learning. When studying enclosure systems, for example, the students build full-scale details of wall sections. The architecture school also has access to the engineering school lab where the strength and behavior of materials can be graphically demonstrated.

Within these technical courses students are given design problems, such as the design of a luminaire when studying lighting, for example, or of a pedestrian bridge as part of building science. Webster notes that these design problems are not just number crunching – making sure the bridge can support its load, for instance – but involve formal design issues as well.

In the first Building Systems course students study the interrelationships between structure, environmental conditioning systems, and the envelope. They then prepare a research project, with critiques by architects and engineers, analyzing an existing building as to how it meets (or fails to meet) its various technical demands. In the last session the students design a project that will integrate environmental conditioning systems, structure, and the enclosure system with other factors such as codes and life safety requirements. The students must prepare a technical report for the building (including structural, cladding, HVAC, and lighting calculations) and drawings that show the relationship of these technical aspects to the building's spatial qualities and to its formal, architectonic expression.

In many schools the role of the conventional design studio is too dominant in relation to the so-called "support" courses. But as a vehicle to teach technical and practice material, the studio isn't being exploited to its full potential.

Working Drawings as Design

The design studio approach can also be used to teach professional practice. At Arizona State University in Tempe, Max Underwood has developed a course that considers the development of working drawings as a design problem. "The seminar helps the students to understand CDs not as an isolated event in the life of a project," explains Underwood, "but the implications of the drawings as a tool to a larger end." – for example, how design decisions made early in the project are carried out through construction, or modified in the working drawings, or changed in execution. Students begin to understand design as an activity that continues throughout the project.

Underwood also presents historical studies of construction theories with emphasis on concepts of construction, methods, and materials. Students examine the built work of contemporary architects to understand how it embodies the architect's design theories. The students then develop what Underwood refers to as a "collaborative set of details and working drawings." They choose a project under construction in the Southwest by such prominent architects as Antoine Predock, Will Bruder, or Frank Gehry, and, based on schematic drawings, design the working drawings for the project. They visit the project sites and talk with the contractors and craftspeople.

"The students are usually shocked to discover that a design decision might actually happen on the construction site," observes Underwood, "that a detail drawing might get tossed altogether, and figured out right there. They also build a respect for the contractors, masons, material manufacturers, and an understanding of the collaborative nature of contemporary architecture and construction." In a visit to the architect's office, the students present their working drawings and compare them with the actual CDs. "For the Crawford House by Morphosis, the students worked on details that the office was in the process of developing," says Underwood, "so they became part of the dialogue, part of the speculation and the decisions being made."

Practice By Design

At Catholic University's architecture school, associate professor Barry Yatt demonstrates that even potentially dry issues in professional practice can be explored as design. In a studio that Yatt taught with architect Don Little, the realities of running a practice are fused to the design problem. After interviewing each other as potential "partners," the students organize into "firms" of four to compete for a job. They receive "letters" from the project's building committee, code officials, the client's contractor, and the historic planning commission. The design is developed at meetings with these different parties, with the students trying to balance the often diverse demands of each. Students correspond with the constituents by letter between meetings. In one studio the students got a strong dose of reality when one of the "firms" was "fired," and found itself without a project. Disgusted with a partner who was not holding up her end of the work, the other three members of a firm contemplated sacking her.

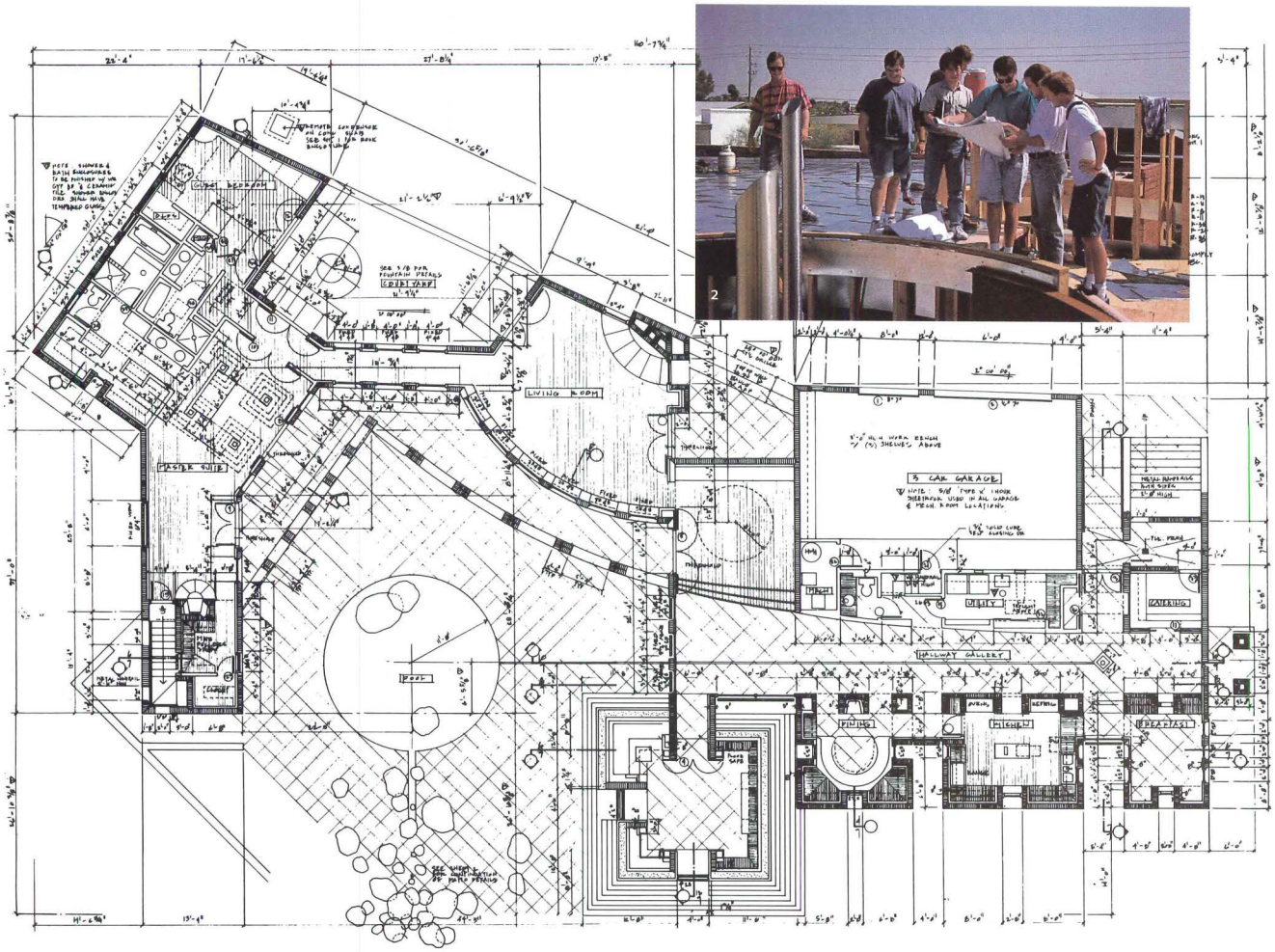
For Yatt, teaching professional practice as design is the only way to go. "As soon as you distance practice issues from the reality of design, all you're doing is feeding students facts that have no relevance."

Conclusion

"Teaching design is the central strength of a good architecture curriculum," says Kirk Martini, who teaches architecture and civil engineering at the University of Virginia. "To make the most of that strength, design instruction should permeate the curriculum, rather than being isolated in studio courses."

In many schools the role of the conventional design studio is too dominant in relation to the so-called "support" courses. But as a vehicle to teach technical and practice material, the studio isn't being exploited to its full potential. Presenting technical and practice issues within the context of design makes them relevant to students, it reflects practice in a more realistic way, and it gives students more food for thought in their design speculations.

Ultimately, Why can't Johnny size a beam? may be the wrong question to ask. The bigger question for architectural education is answered, in part, by the examples above: How can students gain an intuitive understanding of technical and practice knowledge to help them to make intelligent, responsible design decisions? □



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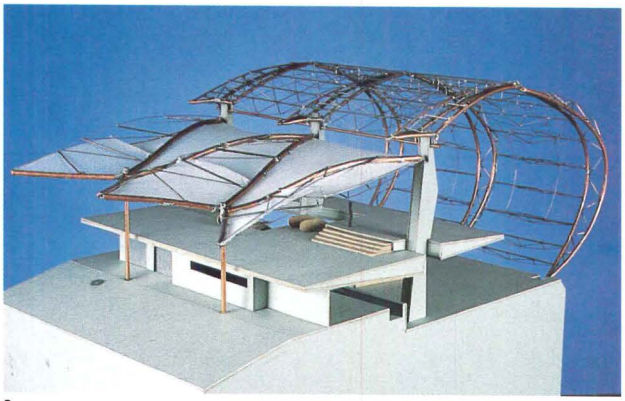

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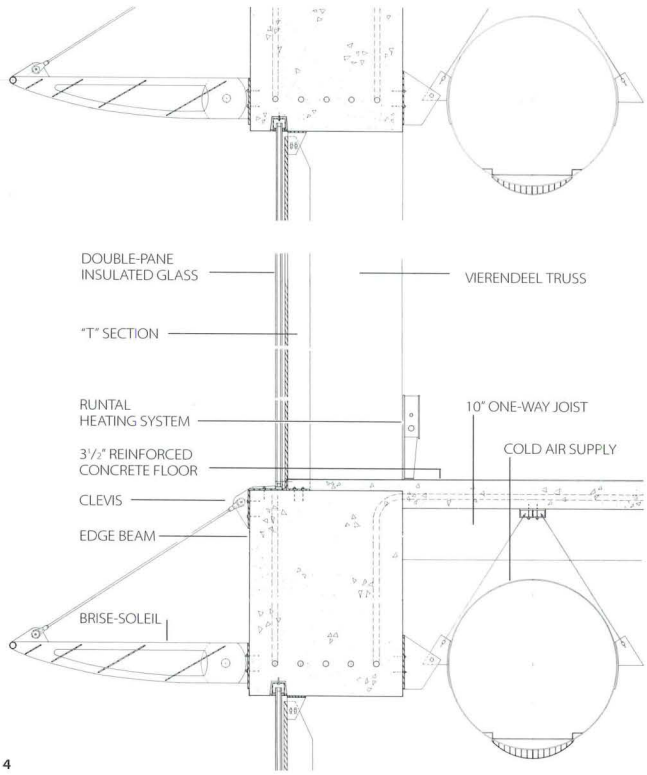

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Working drawings (1) of Antoine Predock's Fuller Residence by Arizona State University students Doug Brimhall, James Dutcher, and Todd Trainer were developed after site visits and consultation with the architect. While developing drawings ASU students visit the Karber House under construction (2), with architect Eddie Jones.

Paul Donnelly's Contemporary Technologies studio at Roger Williams University begins with a study of precedents, and then proceeds to a student project, such as the design of an airport terminal (3), two bays of which were modeled by student Aaron Richter.

In Columbia's Building Systems II course students design an industrial loft showing the integration of various building technologies (4). The wall section is from a project by George Murillo, Susan Dunlope, and Larry Zeroth, with Fritz Reade and Jay Hibbs as critics.

Modern Departures

In 1990, Rem Koolhaas galvanized the architectural community in the Netherlands when he convened a symposium around the question "How Modern is Dutch Architecture?"[1] His intention was to challenge a smug complacency about the continuing Modernist tradition in the Netherlands. In essence, Koolhaas claimed that contemporary Dutch architectural practice had pursued the legacy of Oud, Duiker, Stam, and Rietveld for too long, without questioning its relevance and legitimacy. His blunt exposure of the tradition's longevity, banality, and limited expression conveyed the image of tired decadence and mediocrity, of a movement that had lost whatever radical edge it might once have possessed.

Five years later, Koolhaas's question still reverberates in Dutch architectural debate, but the success of his attack on complacency has been due in no small part to the very lack of complacency in Dutch architectural circles. Indeed, the attack was symptomatic of a pervasive mood of self-deprecation that is difficult for outsiders to understand, given the rich and sophisticated architectural scene in the Netherlands. It is tempting to see here the same uneasiness expressed by Dutch Calvinists in the face of their glorious 17th-Century culture, a discomfort identified by cultural historian Simon Schama as "the embarrassment of riches." How else can one explain the chronic dissatisfaction with an architectural community that harbors not only such diverse luminaries as van Eyck, Herzberger, and Koolhaas, but also a vigorous younger generation now maturing? Dutch embarrassment surfaces most explicitly in reaction to what has been interpreted as a stubborn and blind adherence to Modernism. But while it may be fair to say that the persistence of Modernism prevented the superficial pastiche of Post-Modern classicism from ever taking root in the Netherlands, this was not due to any entrenched dogmatism. Rather, it was because of an engagement in the continuous working out of Modernist implications.

Modernism has become the vernacular of Dutch architecture, fulfilling Berlage's turn-of-the-century vision of a shared collective expression. However, unlike the deterministic vision of the early Modernists, whose rhetoric exploited teleology and ideology, the practice of Modernism in the Netherlands has been pursued as an open-ended research program in which a set of parallel propositions has been tested and reformulated in dynamic interaction with changing technological, social, and cultural assumptions.

Some local critics have deplored what they perceive as the absence of theory and the rise of a hedonistic and unprincipled individualism, and others, like Koolhaas, have castigated a dull adherence to Modern forms, but these contradictory complaints yield an alternative description: the healthy competition between architectural hypotheses within the shared framework of the Modernist legacy. That version of the Dutch architectural scene becomes more convincing when we examine the range of younger firms. Whatever they may owe to earlier formulations, the current streams of exploration involve independent, open-ended lines of inquiry, neither predetermined nor limited by a fixed definition or measure of Modernism. Koolhaas's question, "How Modern is Dutch architecture?" becomes irrelevant. "How Modern" cannot be the issue because Modernism has never been a quality that could be measured in degrees. Who could claim that the handicraft of Rietveld, the technical lyricism of Duiker, and the geometries of Oud were ever commensurable?

In this article, the examination of two architectural firms, Mecanoo Architekten and Wiel Arets Architect & Associates, one generated in the pragmatics of Delft, the other in the metaphysics of Eindhoven, is by no means intended to suggest a polarity of positions. Rather, it is meant to chart the breadth and depth of current practice in the Netherlands.

Effortless Effort

Mecanoo was formed in 1980 before its five partners had completed their architectural degrees in Delft.[2] The partnership emerged because the group had won a competition for the design of housing for young people on a difficult site in the center of Rotterdam. Their elegant solution reconciled strict housing regulations with innovative, flexible floor plans and responded gamely to the demands of the site with a strong sculptural presence. This project on the Kruisplein initiated the series of remarkable housing projects with which the firm was most closely associated in its early years. In urban infill projects in Delft, Rotterdam, and the *(continued on page 99)*

Associate Professor of Art at the University of Massachusetts in Boston, the author is currently working on The Metaphorical City, *a book that examines the image of Amsterdam at the turn of the century.*

1. Rem Koolhaas in *Hoe modern is de Nederlandse architectuur?* (Rotterdam: Uitgeverij 010, 1990), pp.11–20.
2. The original members of the firm were Henk Doll, Erick van Egeraat, Francine Houben, Roelf Steenhuis, and Chris de Weijer. Erich van Egeraat has left Mecanoo this spring and opened his own firm.

Freed from Modernist dogma, a younger generation of Dutch architects is exploring bold new ideas. Two firms – Mecanoo and Wiel Arets – lead the way.

by Nancy Stieber

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1

2

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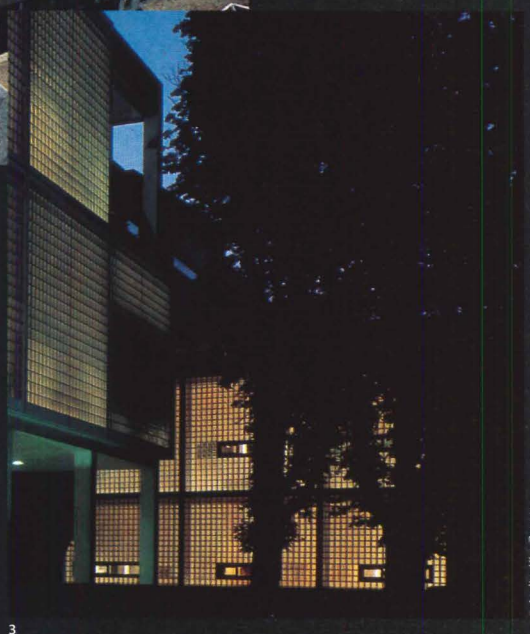
mecanoo

In the historic core of Maastricht, Netherlands, a new square (1) is formed by two projects: Mecanoo's Herdenkingsplein housing (2), a roughly U-shaped structure clad with sensuous materials and deftly integrated into the urban fabric; and Wiel Arets's extension to the Academy for the Arts and Architecture (3), whose severe geometric forms, minimally articulated in a Cartesian grid of concrete and glass, break that fabric.

wiel arets



3

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4 © Christian Richters

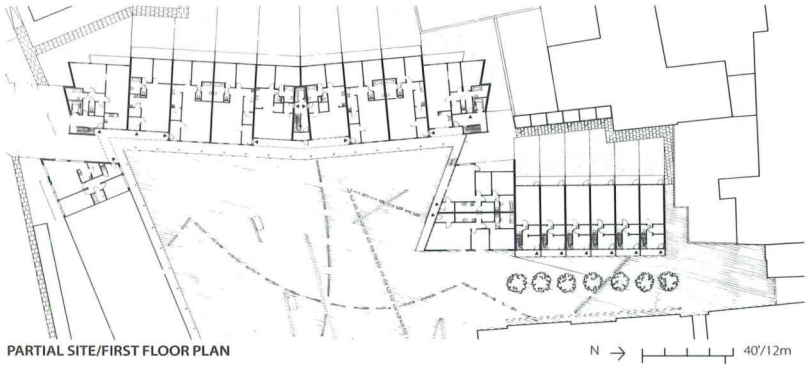
mecanoo

Herdenkingsplein Housing

Mecanoo's housing and landscaping project is designed to reconfigure an urban square in the City of Maastricht. The three-sided structure is articulated with a layered, irregular rhythm of windows, balconies, and wood cladding. Each of the open-plan units has a balcony overlooking the square or a terrace on the back of the complex. (The landscaping is incomplete in these photos.)

Project: Herdenkingsplein Housing, Maastricht, Netherlands.

Architect: Mecanoo Architekten, Delft (Erick van Egeraat, Francine Houben, Chris de Weijer, project architects).
Client: Stichting Pensioenfonds Rabobank, Utrecht, and Gemeente Maastricht.
Completion date: 1994.



PARTIAL SITE/FIRST FLOOR PLAN

5 © Christian Richters

Hague, Mecanoo's weaving of the Modern idiom into the 19th-Century urban fabric appears effortless. Inspired by Tony Garnier and Ernst May, the firm applied the same idiom in new peripheral districts outside Groningen, Delft, and Rotterdam.

The consistent reference to the white cubic forms of heroic Modernism, complete with citations from Oud and Aalto, led inevitably to accusations that Mecanoo represented a Dutch Post-Modernism in which architecture was reduced to stylistic quotation and Modernism reduced to ornament. At the same 1990 conference organized by Koolhaas, the architectural critic Hans van Dijk accused the firm and its ilk of academicism. Modernism had become a formula learned in school, he claimed. Shorn of its ideological content, Modernism was reduced to a merely formal tradition. In this view, Modernism became a technique learned in the academy in much the same way that Beaux-Arts Classicism had been inculcated at the turn of the century.

That criticism downplayed Mecanoo's social commitment to a high quality of housing design. The firm had made a study of housing history and had reexamined housing norms. Its early achievement lay precisely in its ability to defy the limitations of norms while working within them, in the seemingly paradoxical reconciliation of pragmatic realism and purely architectural values. The consistent mark of this firm has been an intelligent *esprit*, expressed in sensual materialism. In its housing projects, the most salient characteristic has not been the recycling of Modernist quotes, but the eliciting of architectural response in the face of constraints. It pulls off the exciting and dangerous paradox of extracting fantasy from function. As such, the relevant reference to the era of heroic Modernism lies not in literal quotation, but in the Dada lurking within De Stijl.

This playful spontaneity is just as apparent in Mecanoo's recent work, which represents a practice broadened considerably from housing commissions to libraries in Almelo and Delft, schools in Silvolde and Utrecht, and other building types, while moving to sites abroad (Hungary, Denmark). Consider the firm's pleasure pavilion on the river's edge in Rotterdam, the restaurant Boompjes that resonates with the rusted materials and undulating metals of the harbor, changing our perception of the workaday ships, boats, and barges visible through its windows. Equally striking is the restoration and transformation of a Neo-Renaissance building in Budapest as the local headquarters for the Nationale Nederlanden Hungary and ING Bank. The building's façade was painstakingly reconstructed to respect the historic context, as required by the local historic commission. But this earnest politesse coexists with an outrageous commentary on the roof line: a growth, an appendage, some organic creature, like the outburst of capitalist energy released from its hiding place in Post-Communist Hungary. Affectionately dubbed "the whale," it uses sensuous materials of glass, zinc, and laminated wood to house the board room. This is architecture which is self-aware but not introspective, active rather than contemplative.

Perfect Imperfection

In the heart of Maastricht, a city of venerable Roman foundation with a medieval core, Mecanoo has recently contributed a housing and landscape plan that *(continued on page 104)*

Almelo Public Library

As with their housing projects, Mecanoo's public buildings employ playful forms and flexible plans to fulfill the diverse needs of the people who use them. The new public library (6) for the City of Almelo is just such a project. It is organized as a series of geometric and curvilinear forms, each finished in a different material: cobalt blue panels mark the main entrance façade; black brick walls enclose the main linear volume, which houses service areas and administrative offices; copper panels cover the long, curving street façade; and concrete-and-glass fan-shaped forms house a variety of reading areas (7).

The architects' design of the reading areas demonstrates their keen understanding of user needs; here, they have created secluded areas for those who wish to study, reading tables in an open plan for more casual use, and intimate nooks. The ground floor of the library contains an exhibition space, a café, and a periodicals area.

Project: Public Library, Almelo, Netherlands.
Architect: Mecanoo Architekten, Delft (Henk Doll, project architect).
Client: Stichting Openbare Bibliotheek Almelo.
Completion date: 1994.

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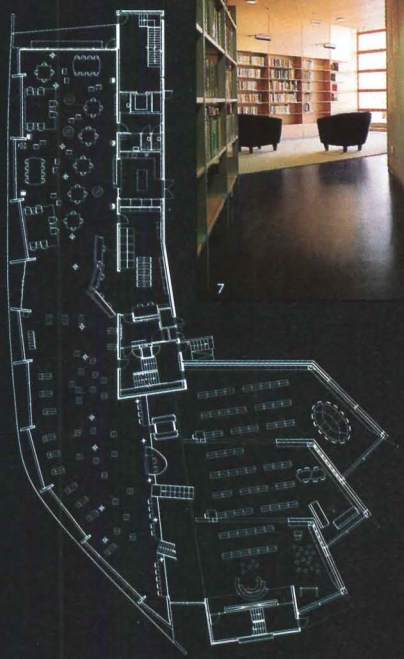


GROUND FLOOR PLAN N → 40'/12m

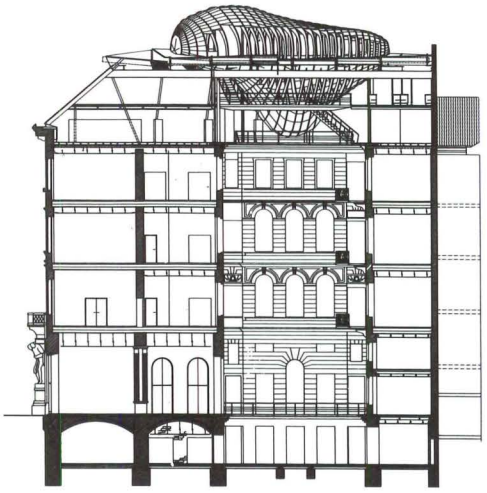
Photos these two pages: © Christian Richters

8

Nationale-Nederlanden and ING Bank

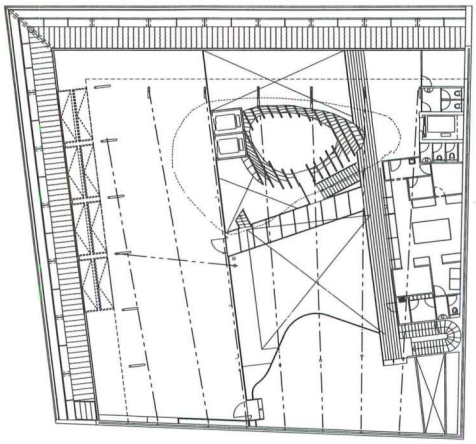
The Budapest headquarters (8) for this Dutch bank adheres to historic building codes with its careful restoration of the former apartment building's Neo-Renaissance façade. But the courtesy ends there; inside and on the roof, the architects make a subversive and playful display. Designed by Mecanoo partner Erick van Egeraat before he left the firm this spring to establish his own office, the organic form of the conference room (10) bursts through the new roof of glass beams and panels (11, see Selected Detail, p. 131) and the offices are organized around a central atrium (9), where the windows from this formerly open-air courtyard are left unglazed. Known as "The Whale," the zinc-clad conference room is built of 26 laminated timber members hung from the main steel loadbearing structure.

Project: Nationale-Nederlanden Hungary Ltd., and ING Bank, Budapest, Hungary.
Architect: Erick van Egeraat Associated Architects, in association with Savany & Partners, Budapest (Erick van Egeraat, Tibor Gall, project architects).
Client: Nationale-Nederlanden Hungary Ltd., and ING Bank.
Completion date: 1994.

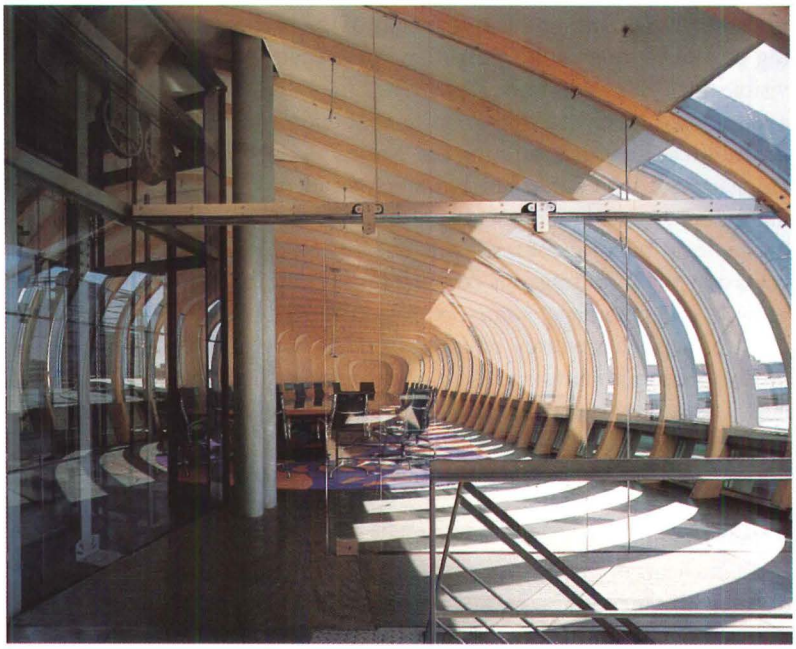


SECTION 40'/12m

9



THIRD FLOOR PLAN 40'/12m



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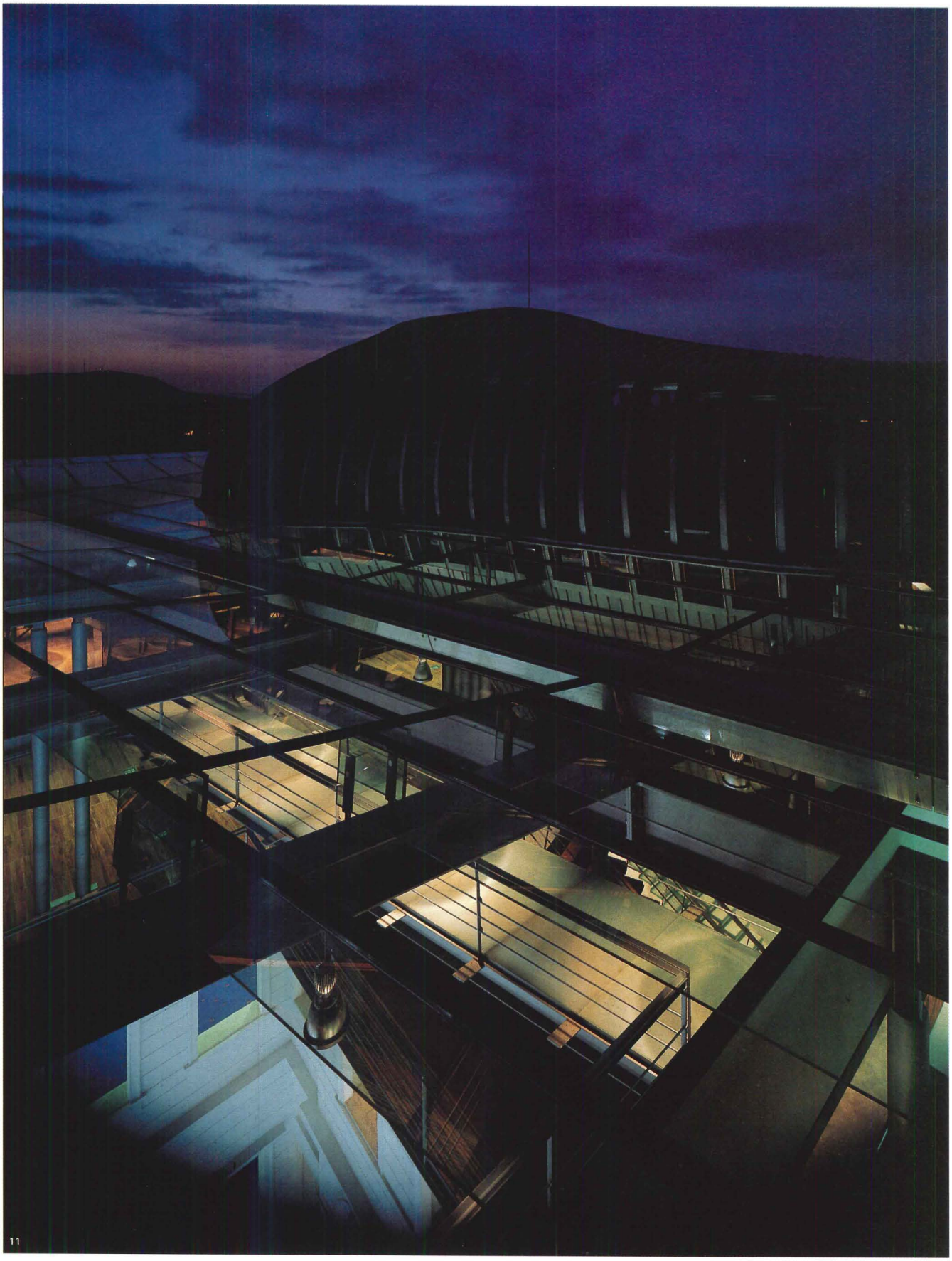

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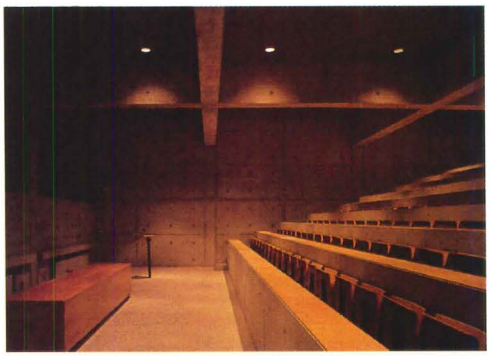
Photos these two pages: © Atelier Kim Zwarts



13

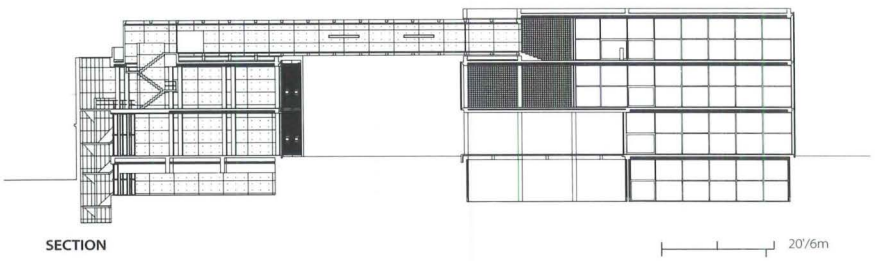
wiel arets

Academy for the Arts and Architecture

The extension of the existing Academy of Arts and the integration and extension of the Academy of Architecture in Maastricht both complete and disrupt a newly created urban square. The annex to the main existing structure contains an auditorium (13), a library, a café, and a roof-top terrace, joined together by a ramp that connects to the main circulation bridge (14). The bridge leads to the other, freestanding part of the extension. Here, behind a façade of glass block (12, 15) are six new studios and workshops.

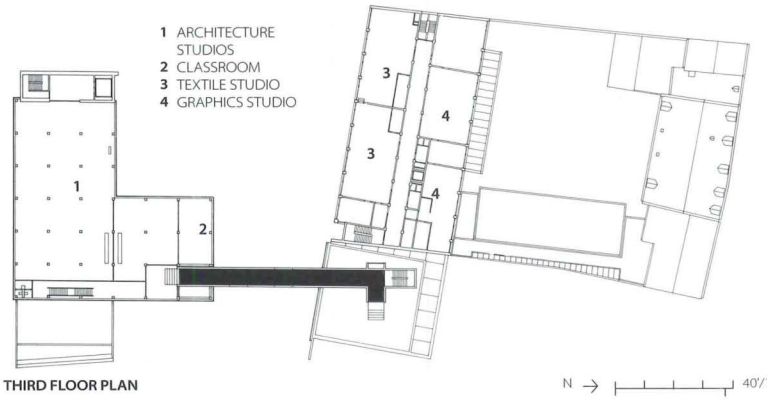
Project: Academy for the Arts and Architecture, Maastricht, Netherlands.
Architect: Wiel Arets Architect & Associates, Heerlen, Netherlands (Wiel Arets, principal; Jo Janssen, project architect).
Client: Rijkshogeschool, Maastricht.
Completion date: 1993.

14



SECTION

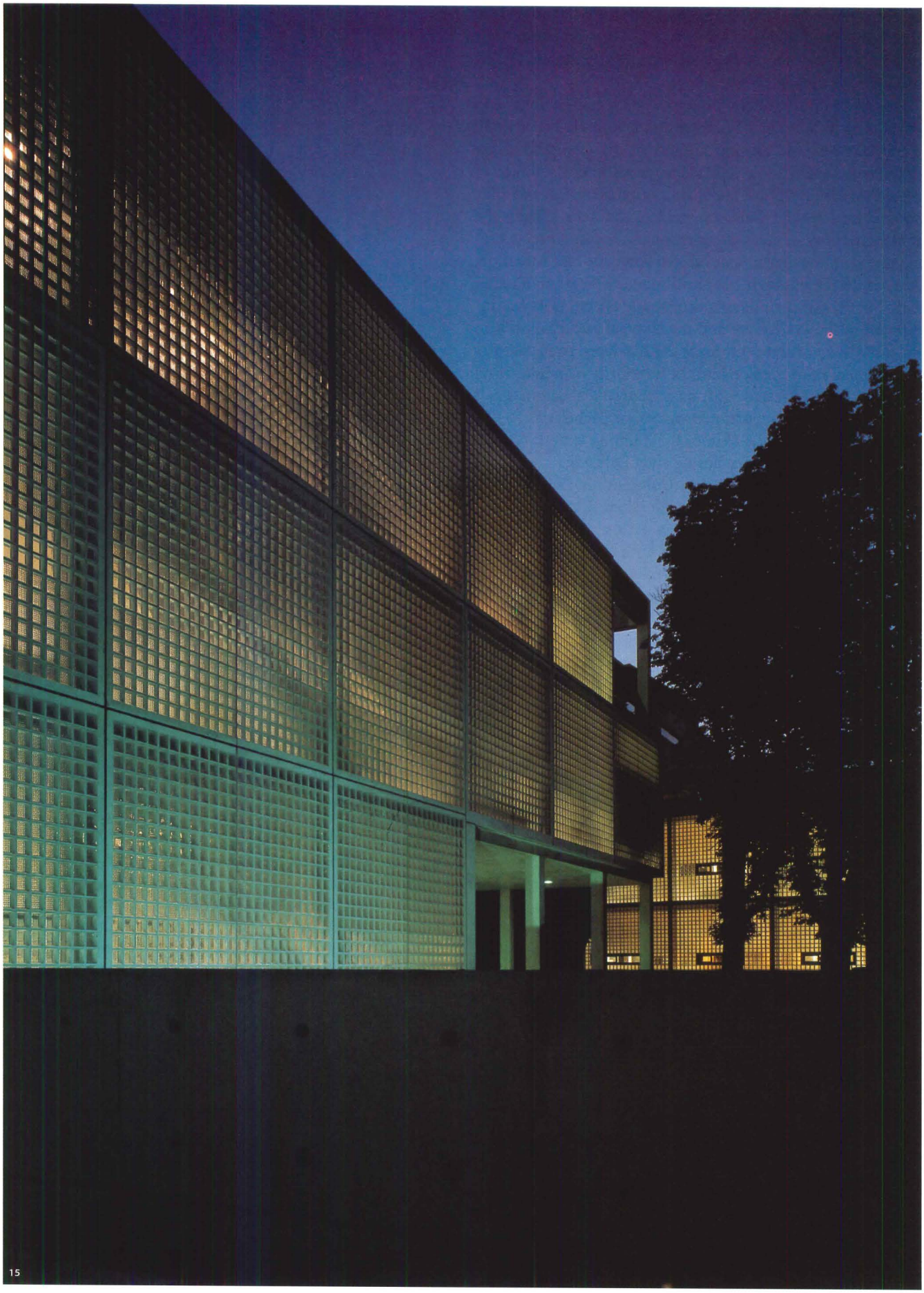
20'/6m



THIRD FLOOR PLAN

N →

40'/12m



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weaves a newly configured square into the urban fabric. Here, the firm's net of trapezoids and triangles encounters the autonomous grids of the new Academy for the Arts and Architecture by Wiel Arets.

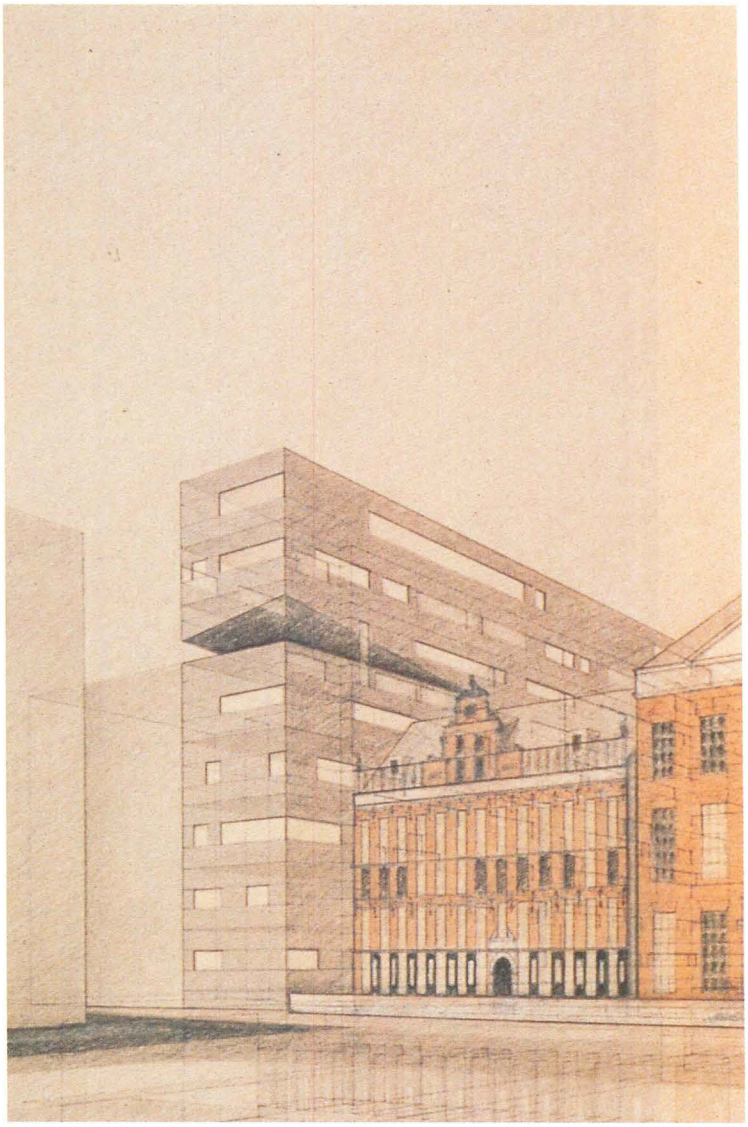
Arets's building pierces the square, both completing it and disrupting it. It is not a building that readily discloses itself. Three blind cubes, housing studios, sit detached and askew in the square, accessible only via an aerial walkway linked to the perimeter block. The tantalizing surfaces of glass walls, inscribed by a regular Cartesian grid of concrete, suggest the impenetrability of a casket or reliquary, a container as precious and entrancing as its protected contents. Like Mecanoo, Arets is dependent on the sophisticated exploitation of materials, but to entirely different purpose and effect. Arets is as interested in the evanescent and the ethereal as Mecanoo is in the physicality of architecture. At the Academy, Arets takes us on an exploratory mission into the interiority of architectural experience, forcing us to confront a set of spatial enigmas as if the building were an illustrated version of Bachelard's *Poetics of Space*. Like a veil, the skin of the building is both opaque and transparent, at once enclosing and disclosing.

Arets trained at the Technical University in Eindhoven, a school oriented toward engineering when first established, which eventually gave rise to a generation of students bent toward theory. He has collaborated with the Dutch philosopher Eric Bolle and developed a symbiotic relationship with the architectural critic Joost Meeuwsen, both products of Eindhoven. His practice is in Heerlen, which is located, like Eindhoven, in the south of the Netherlands, far from the traditional Dutch cultural centers. Yet Arets is anything but a regionalist. Aside from the international associations he has formed by teaching at the Architectural Association in London, and at Columbia University and Cooper Union in New York, his identity lies beyond the regional or national, and he is particularly adamant about denying any tie to the Dutch Modernist tradition. Rather than being claimed by any place, his work is lodged in text.

Arets's projects have been consistently accompanied by texts that are not so much explanations or justifications as independent trajectories in words, verbal counterpoints to the visual. His writings constitute a series of explorations into the autonomous nature of architecture that parallel a series of projects, largely unbuilt, among them the prize-winning designs for the Academy of Arts in Amsterdam, a theater in Delft, and a courthouse in Groningen.

An Invisible Catalyst

A number of themes emerge from the text/projects. Arets prefers the suggestiveness of translucency over the false promise of clarity. Through a puritan subversiveness, his work thwarts harmony and reconciliation, instead fomenting conditions of unpredictability and change. Architecture, in his most recent writings, is virological; like a virus, architecture operates invisibly as a catalyst of events. Indeed, throughout Arets's work the recurring notion is that architecture is most potent where it "disappears." In Maastricht, Arets's first major commission to be executed, the Cartesian perfections of the plan and façade are belied by the insinuation of the disjunctive

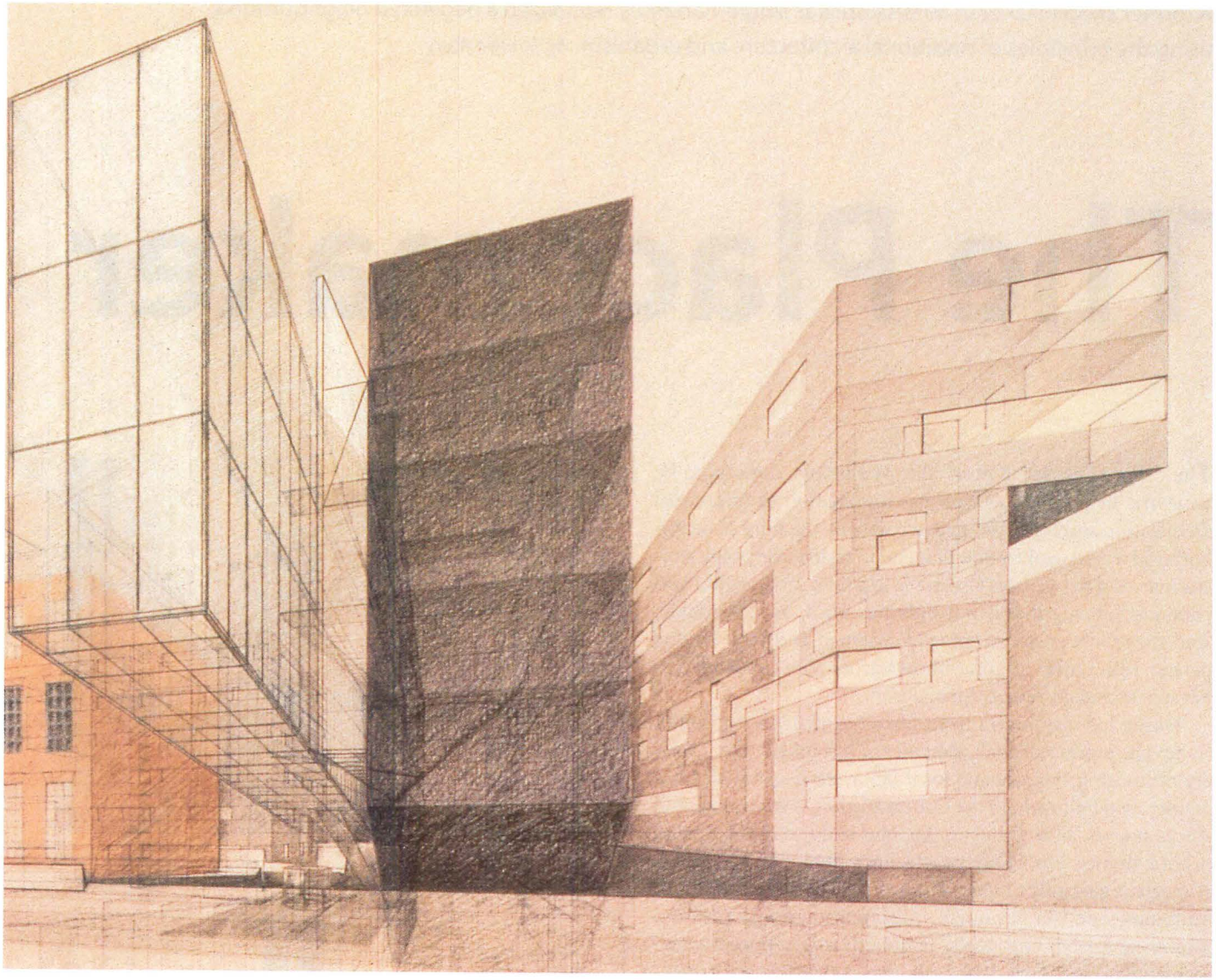


16

building into the urban fabric. The city is subtly transformed by the operation of an architecture that intimates rather than flaunts its genius.

In the Netherlands, Arets's work has inspired critical comparisons with Terragni, Kahn, Grassi, and Ando. Deleuze, Derrida, Foucault, and Baudrillard are summoned to provide theoretical parallels and glosses. Arets has drawn Dutch architectural criticism into the higher realms of international debate to a degree achieved by only one or two others of his generation. As a result, he is viewed by some as a welcome draft of intellectualism in a Dutch desert of sober practicality.

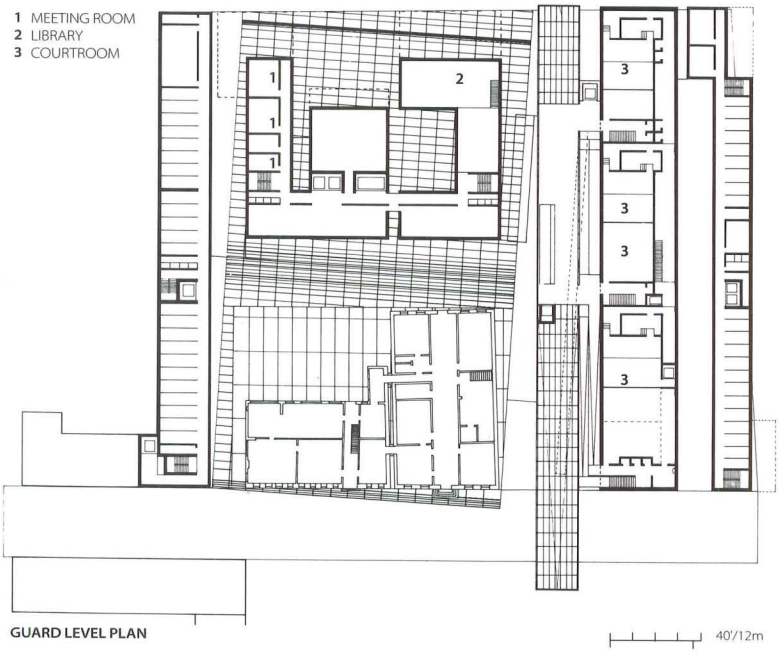
Arets's investigation of the conceptual in architecture has little in common with Mecanoo's sensuous materiality. His urban incisions and cuts contrast with their interweavings. The distance between these two firms indicates the broad extent of the territory currently being investigated by Dutch architects. It is surprising that a country that can produce such fecund, mature, and disparate explorations as these need be embarrassed by its riches, let alone attack itself for complacency. But chronic dissatisfaction and restlessness may be the very sign of cultural vitality. □



Groningen Court House

A competition entry for the design of a new courthouse (16) in the City of Groningen, this unbuilt project investigates the physical manifestations of the judicial process. The dynamic character of legal disputes was the point of departure for the design. Three connected but distinct volumes were conceived: a zinc-clad one for the police court and administrative offices; a marble-clad courtroom complex; a large hall to contain the main foyer and porter services would be enclosed in sandblasted glass walls.

Project: Groningen Law Court, Groningen, Netherlands.
Architects: Wiel Arets Architect & Associates, Heerlen, with Lise Anne Couture, Hani Rashid.
Client: Department of Justice and RGD, Municipality of Groningen.



A former shop teacher in Mississippi has single-handedly revitalized a neglected neighborhood, using the principles of traditional architecture and urbanism. *by Marilyn Avery*

The Placemaker

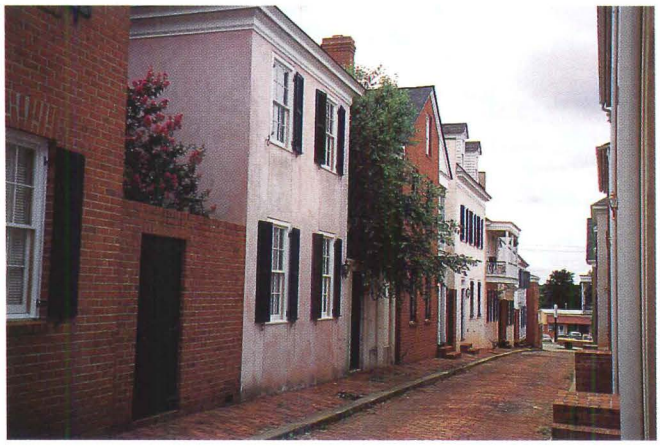
The Cotton District of Starkville, Mississippi, appears to be a historic neighborhood with its combination of traditional architecture and finely grained urbanism – the kind of neighborhood where wealthy families tend to reside over many generations. But the Cotton District is less than 25 years old and contains housing that is not only beautiful, but affordable. And the whole area was actually designed and built by one person: Dan Camp, a former shop teacher with a personal interest in architecture and urban design.

Taking his inspiration from historic towns in the South, Camp has produced small apartments, assembled into a variety of housing types, using local labor, local materials, and handcrafted millwork. In the Cotton District, brick, wood, and stucco houses, all with the proportions and the aged patina of historic homes, line shady streets. Each door, window, fence, and gate is elegantly crafted with wood detailing evocative of buildings found in Savannah, Alexandria, and Charleston. Flowering bushes and neatly trimmed hedges border small manicured lawns. Pedestrian walkways connect an assortment of public and semipublic spaces and lead to narrow streets. Residents walk slowly and talk to each other on the street.

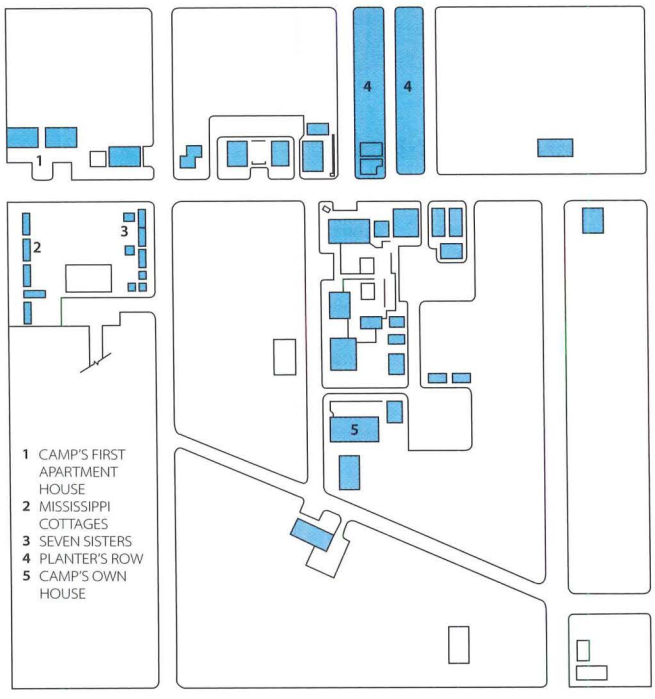
Camp has single-handedly transformed the Cotton District, one property at a time, into an identifiable place. And his efforts have not gone unnoticed. Among advocates of the New Urbanism, Camp has many admirers. While lecturing at the Starkville campus of Mississippi State University, architect and urban planner Andres Duany saw Camp's "historic neighborhood" and invited him to present it at the first Congress for New Urbanism in 1993 (P/A, Dec. 1993, p. 36). Camp was well received at the conference, which was dominated by projects in early stages of development.

Getting Started

A native of Baton Rouge, Louisiana, Camp studied industrial arts at the university in Starkville, graduating in 1962. After teaching industrial education in Vicksburg for two years, he came back to Starkville in 1967 as an assistant professor and taught blueprint reading, drafting, and shop classes. In

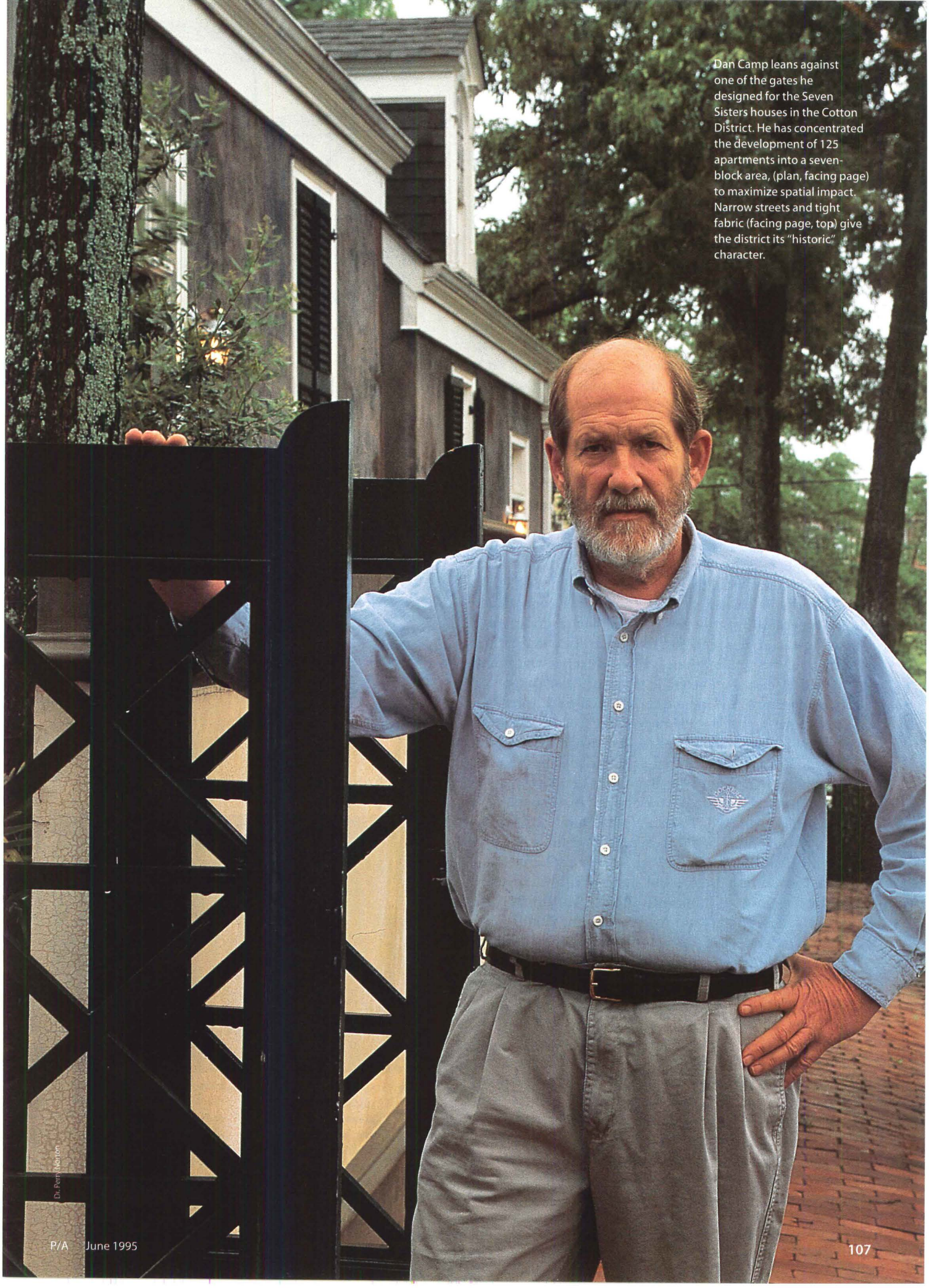


Duany Plater-Zyberk



SITE PLAN OF THE COTTON DISTRICT SHOWING CAMP'S PROPERTIES

The author is an architect practicing in Miami Beach, Florida. She is president of Rock Soup Development, a company that designs affordable housing for special populations.



Dan Camp leans against one of the gates he designed for the Seven Sisters houses in the Cotton District. He has concentrated the development of 125 apartments into a seven-block area, (plan, facing page) to maximize spatial impact. Narrow streets and tight fabric (facing page, top) give the district its "historic" character.

Dr. Pete Norton

1969, he went into the development business, building his first apartment house in the Cotton District.

His first building was a two-story, wood-clapboard structure containing eight residential units. He had made some money in the stock market and used the profit to buy a lot in a blighted area of Starkville. Adjacent to a former cotton mill, the neighborhood included primarily low-cost worker housing when the mill was in operation. After the mill closed in the 1950s, the area deteriorated and property values plummeted. When Camp began working here in 1969, he saw potential in the low land costs (houses on 45' x 90' lots were selling for $3,000 or less) combined with the proximity to the university, half a mile away.

His plan was to build an apartment house and rent out the units to students. To secure the mortgage financing, Camp "put a spit-shine" on his shoes and took the local savings-and-loan board to the site. Despite the existing conditions and against conventional judgment, the board members approved the mortgage, with the contingency that Camp find construction financing. He got the money he needed and the building came in on budget. He rented out the units to students and put the profits into the construction of his second project.

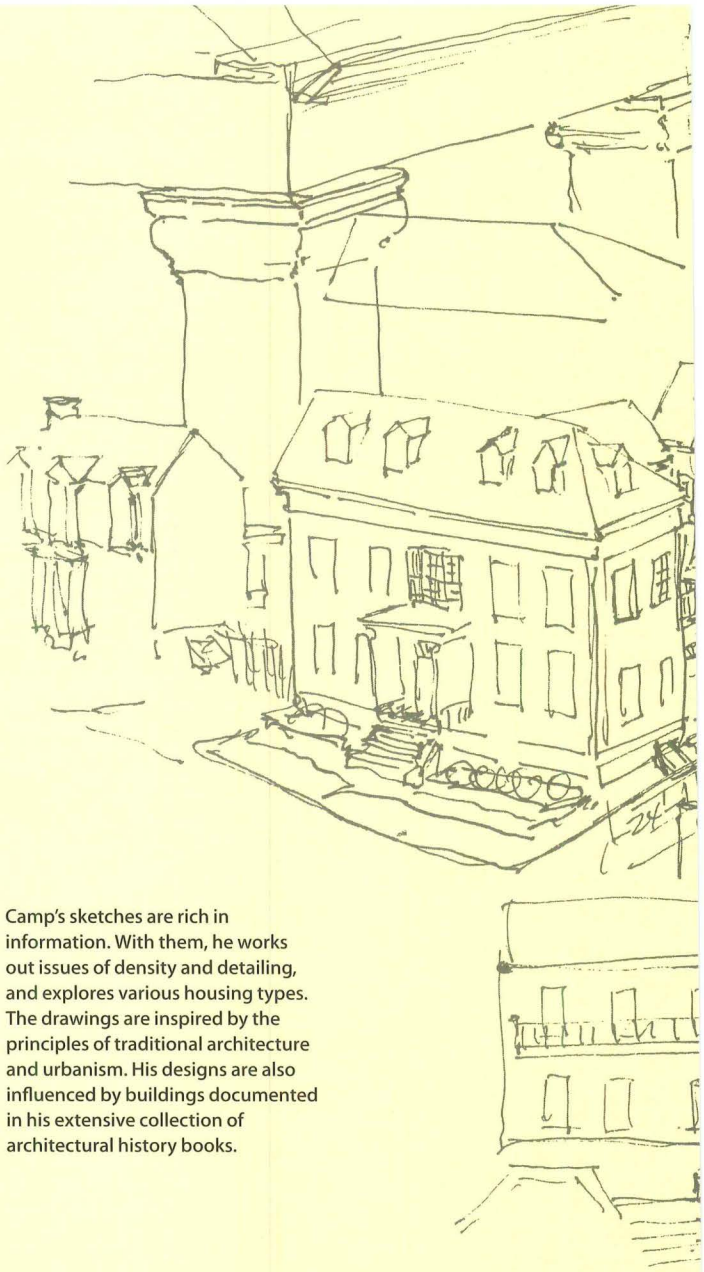
By 1972, Camp had built a total of 16 rental units. His net income from the units was higher than his salary from the university, so he left his teaching position and began working as a full-time, independent contractor. Using his own plans, Camp built houses for himself, for clients, and on spec in and around Starkville. His primary interest, however, continued to be his Cotton District properties. With the completion of more housing came an appreciation for the implications of the placement of the buildings relative to each other, and Camp began to focus his attention on the design of urban spaces.

Spanning an entire block and conceived as a historic street, "Planter's Row" is his largest single effort to date. Begun in 1986, it required a minimum lot size variance from the town's PUD Ordinance, which allowed greater densities than the town's zoning laws. Camp's reputation for developing high-quality projects was well-established by this time, so the variance was quickly granted. The main public space in Planter's Row is a narrow brick-paved thoroughfare defined by zero-lot-line townhouses. The houses feature the distinctive millwork and wood detailing found throughout the district. Rather than renting out the houses, Camp sold them in order to nurture a sense of permanence in the neighborhood.

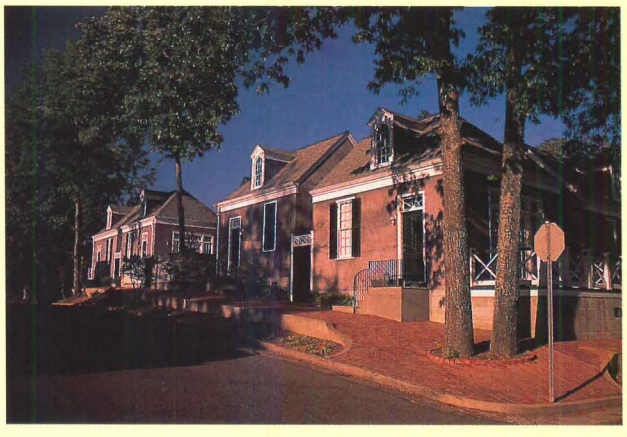
Currently, Camp owns 125 units, with rents ranging from $285 per month for a studio to $535 per month for a two-bedroom with a study. The rents are not subsidized by any government program.

The Process

Camp's approach to the development of the Cotton District has been intuitive and personal. He loves woodworking and building. He admires traditional architecture and has spent countless hours studying and sketching traditional architecture in historic neighborhoods in Vicksburg, Savannah, New Orleans, Alexandria, Natchez, and small Southern towns. On the urban level, he studies historic street detailing and how buildings, fences, walls, and landscaping *(continued on page 110)*

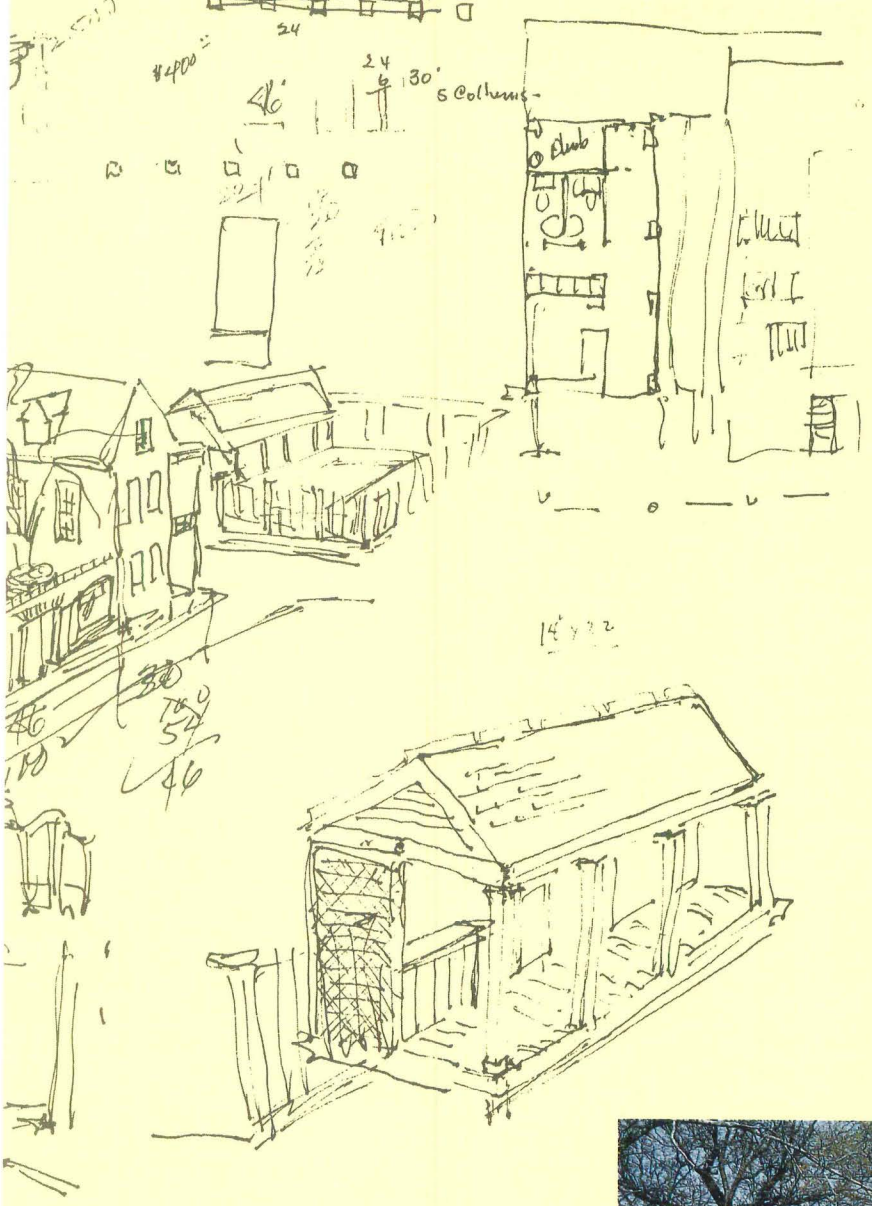


Camp's sketches are rich in information. With them, he works out issues of density and detailing, and explores various housing types. The drawings are inspired by the principles of traditional architecture and urbanism. His designs are also influenced by buildings documented in his extensive collection of architectural history books.



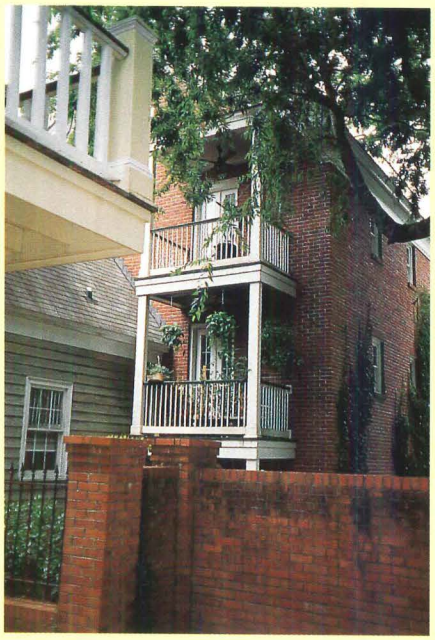
Dr. Perry Norton

The Seven Sisters houses (above), like all of Camp's newly constructed and rehabilitated projects in the Cotton District, are detailed with handcrafted millwork. All of the windows, doors, shutters, dormers, balconies, stairs, railings, and trim moldings in the district are custom-milled by Camp and his crews. This increases Camp's control over the appearance of the neighborhood and reduces construction costs: there is no need to specify components from manufacturers.



Marilyn Avery

His consistent use of porches and balconies (above and below) increases each unit's habitable space and encourages a sense of community.



Marilyn Avery

Dr. Perry Norton

By increasing the density of the Cotton District – with the help of flexible zoning laws – Camp has been able to achieve a compact urbanism (left). There are two efficiency apartments with sleeping lofts in each of the Mississippi Cottages (above). Each unit is 380 square feet.

define urban spaces. On the architectural level, he notes housing types and residential forms. On the level of detailing, he sketches and reproduces in his workshop the simple and ornate millwork that he observes on historic architecture.

Camp's process is as straightforward as he is. He begins by sketching each project, striving "to enhance the street with the look of the building." He keeps voluminous sketchbooks filled with rough, information-rich drawings of buildings and details he has seen, as well as his own conceptual sketches. With "a basic plan and an elevation or two," he runs his ideas by Larry Bell, the head of the Starkville Building Department. After answering any questions Bell may have, Camp receives his permit. Construction generally begins immediately. The foundation and rough framing are completed by a subcontractor and the finish carpentry and detailing are done by Camp and his crews. The entire process takes three or four months.

A Strategy for Placemaking

Central to Camp's success is his use of small, affordable apartments grouped within commodious residential building types – mansions, rowhouses, sideyard houses, and courtyard houses – and outbuildings. The use of larger residential typologies gives the units a dignity they could not sustain alone. The design of small spaces endowed with well-crafted detailing is not unlike the division into apartments of once elegant, single-family urban residences. His use of simple floor plans, based on traditional architecture, and the compact size of the apartments serve to keep construction costs low. Exterior balconies and porches maximize habitable space.

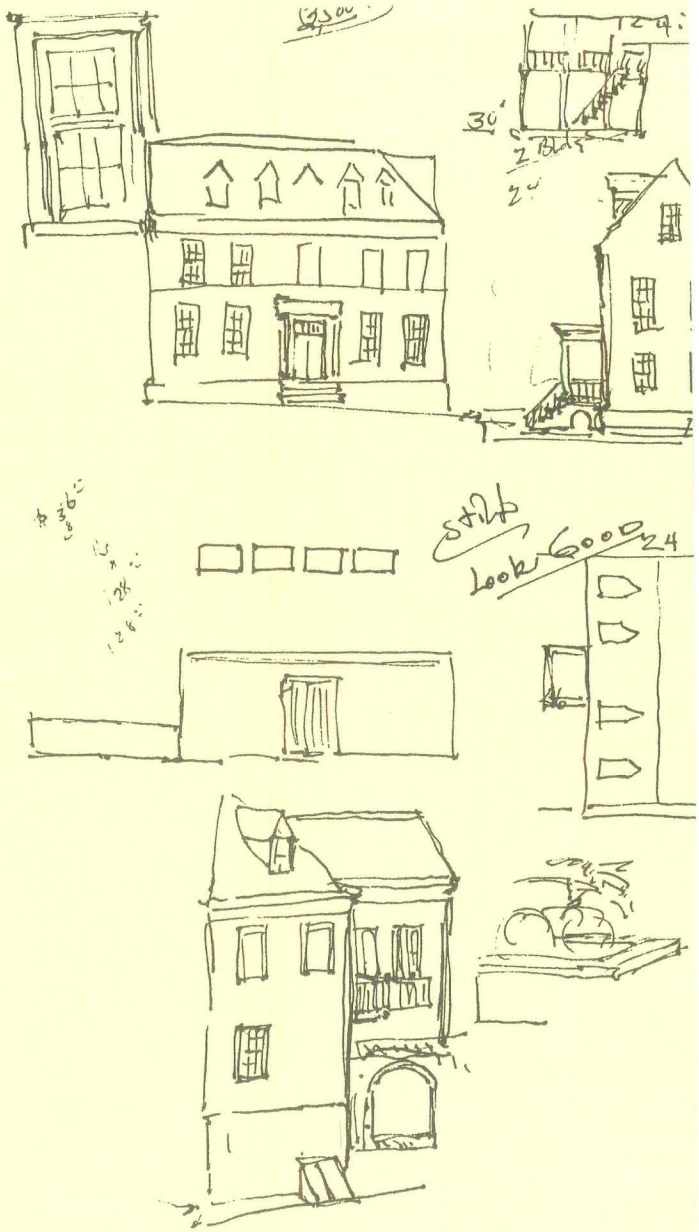
The traditional urbanism that guides Camp's approach maximizes the district's livability, and the density of the development increases its profitability. He has concentrated his buildings in areas where he can control both sides of the street to ensure spatial definition. Further, he inserts mews whenever possible to create an intimate scale for the neighborhood's public and semipublic spaces.

A Model Placemaker

With his focus on small-scale, incremental intervention, Camp's strategy for placemaking has intriguing implications for the development of affordable housing for single individuals, special populations, and people in need of transitional housing. Camp has chosen to rent his units to college students, a group that has high turnover rates and low incomes – characteristics shared by the populations hardest hit by the affordable housing shortage. Camp's rigorous maintenance program is a substantial part of his strategy to ensure the value of the housing and the livability of the neighborhood.

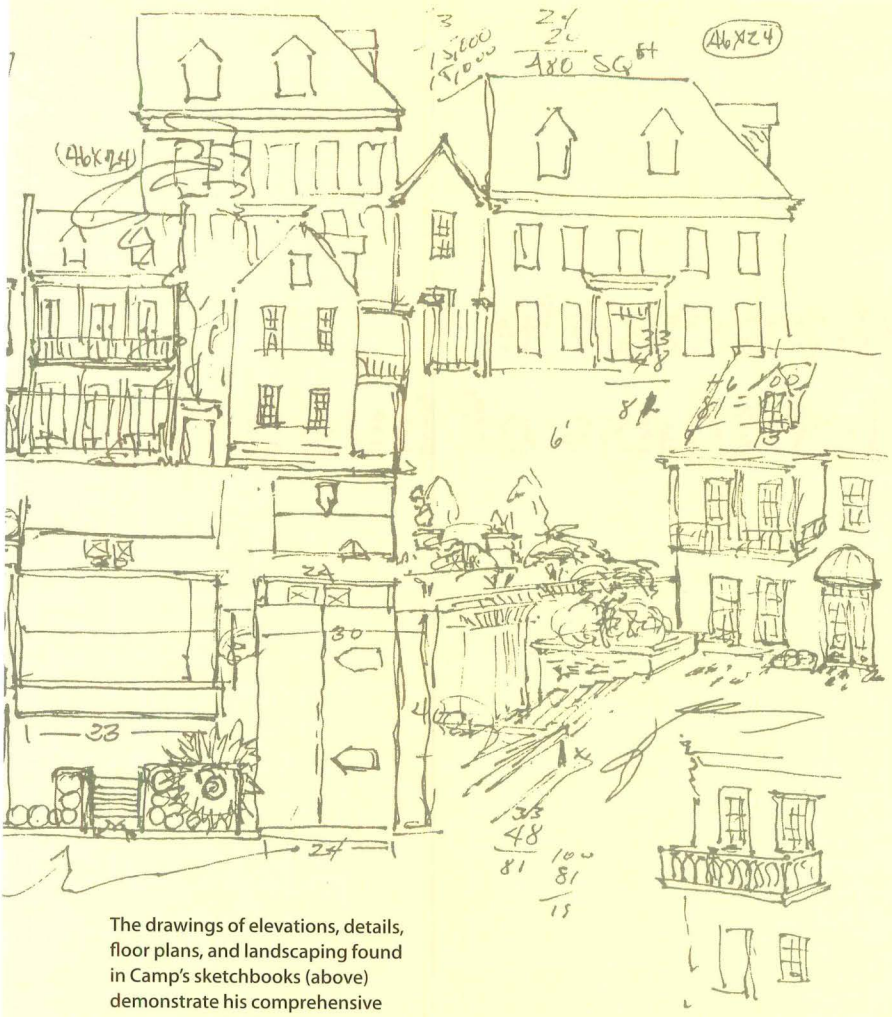
Most zoning laws preclude the use of the elements that give the Cotton District its visual impact; zero-lot-line development and units with minimal square footage are illegal in most urban areas. However, many cities are now using overlay zoning as a tool to revitalize selected areas, and codes are being rewritten to encourage compact urbanism.

Like any good model, the principles guiding the development of the Cotton District suggest one way, but not the only way, to increase affordable housing stock, restore urban fabric, revitalize neighborhoods, and create better places to live. □



Marilyn Avery

The construction of Planter's Row (above) required a minimum lot size variance from the town's PUD Ordinance, which allowed greater densities than the town's zoning laws. The mid-block lane created by the development is one of the district's many small-scale urban interventions. All of the units in the row, Camp's largest single effort to date, have private outdoor courts and overhanging balconies.



The drawings of elevations, details, floor plans, and landscaping found in Camp's sketchbooks (above) demonstrate his comprehensive approach to the development of the Cotton District. Many of his designs are built directly from the sketches. Camp and his crews rely on their years of experience to construct the buildings, often without the use of individual floor plans.

Marilyn Avery

Residential outbuildings (above), which contain some of the most spacious units in the district, with high ceilings and private courts, are found throughout the neighborhood. Appearing to be ancillary structures, these buildings are sited to define outdoor spaces.

Duany Plater-Zyberk

Camp's use of minimum square-footages to produce affordable housing units within larger residential types is derived, in part, from one of his early designs (left). Completed in 1976, this 12′ x 18′ house was constructed using a balloon frame, and includes a sleeping loft. It is the model on which the Seven Sisters houses and the Mississippi Cottages are based.

Duany Plater-Zyberk

The Cotton District buildings enclose a highly articulated series of public and semipublic outdoor spaces including streets, mews (above), alleys, footpaths, yards, and courts. The district makes extensive use of flowering shrubs, shade trees, trimmed hedges, garden wall, brick sidewalks, and brick driveways.

While our contemporary buildings lack the "robustness" of older structures to resist fire, we can design for these shortcomings. *by Donald O. Dusenberry*

The Inflammable Lightness of Buildings

Abstract

Contemporary buildings lack the quality of "robustness" that is critical in their ability to survive fires. Open spaces inside buildings, and relatively slender structural frames and enclosure elements, can contribute to fire spread and failure. Careful attention to structural detailing, and recognizing and correcting shortcomings in fire protection, containment, and structural redundancy, can compensate, in part, for the fragility of modern structural frames and building envelopes.

The response to fires of midrise and highrise buildings constructed in the past 30 years is very different from that of older buildings. The earlier buildings were robust: their over-built structural frames with hefty materials had inherent resistance to the effects of fire, and reserve capacity to sustain themselves during and after fires. Modern construction usually is not inherently robust. Today's materials and systems often result in light framing and thin enclosures, with relatively low survival reserve in buildings.

To compensate for at-risk features of modern buildings, building codes require comprehensive fire protection. Codes usually have several chapters devoted to the description of systems for fire suppression and protection. However, codes generally do not require analysis of the effects of heat and fire on structural frames. Structural designers following current engineering practice rarely concern themselves with the high stresses and large deformations that are likely to occur in fires, the degradation of material strength that intense fire creates, or the loss of stability associated with high temperatures. They trust (or hope) that suppression and protection will work. In fact, often suppression systems are not fully effective for intense fires, and structures are lost.

We can learn much by studying the performance of buildings that have been subjected to severe fires. We might even revive older technology to enhance the robustness of the new structures we design. To do this we need to understand the effects that fire has on buildings and what contributes to their robustness.

Fire Effects on Structures

We have no codified procedures for analyzing fire effects on structural frames. Like earthquakes and tornadoes, the effects of fires are nearly impossible to anticipate accurately. Consequently, we have few reliable studies of integrated building response to fires. But we do have data on the effects of high temperatures on different materials.

Building fires commonly achieve temperatures in excess of 900 degrees Centigrade. Steel and concrete start to deteriorate at about 300 degrees Centigrade. Even in short-duration fires of low intensity, structural members can be exposed to sufficient heat to be damaged.

Steel loses both stiffness and strength when it begins to deteriorate in a fire. By the time a steel member reaches approximately 550 degrees Centigrade, it has lost approximately 30 percent of its capacity. In this condition, most structural steel members are at risk of failure.

At temperatures above 300 degrees Centigrade, concrete undergoes chemical changes that permanently reduce its strength. In addition, stresses develop in heated concrete members from thermal gradients, differences in thermal expansion coefficients for concrete ingredients, and steam generated by boiling internal moisture. These stresses can cause spalling, cracking, and deterioration of the bond between the concrete and the embedded steel (1). These strength losses, combined with materials degradation, place concrete at risk of complete failure.

Prestressed concrete is, in general, more prone to failure than reinforced concrete. Tendons lose strength above approximately 300 degrees Centigrade. Structures with unbonded tendons can be particularly susceptible to damage, because tendons can lose prestress over their entire length (the full length of some buildings) when any one section of the tendon has been heated enough to be softened. Damaged prestressed concrete is often the most difficult to repair.

Thermal expansion of the structure often produces the worst fire damage. At fire temperatures, both steel and concrete can expand by 1 to 1.5 percent. Few structural systems can accommodate this movement. Columns, slabs, and beams that support a super-heated floor can be

The author, an engineer, is a senior associate with Simpson Gumpertz & Heger in Arlington, Massachusetts.

damaged, even when they themselves are cool and are away from the fire zone (2).

Fire Robustness

To deal with these devastating effects, we must provide a level of robustness that increases the likelihood that the frame of a burning building will survive. If we could combine the robust structural systems and envelopes of the buildings of the late 19th and early 20th Centuries with today's detection, suppression, and protection systems, we would have the best conditions for preserving buildings from fire.

Perhaps one of the greatest assets of older buildings is sheer mass: heavy masonry construction, terra cotta partitions, steel frames embedded in masonry walls. These elements deter fire spread and delay the effects of high temperatures on structural members. Add to these features the massive exterior walls with relatively small windows common to buildings of this era, and vertical fire spread is further deterred.

In contrast to these earlier examples, today's buildings use efficient, delicate frames made of high-strength materials, exposed structural members, atriums and open floor plans, lightweight and flexible partitions, and light curtain walls with large expanses of glass. These features all contribute to fire spread and to the rapid degradation of structural function; they detract from fire robustness.

How do we design robust structures? We can't go back to designing massive masonry and steel buildings. However, by careful consideration of the three primary concepts of robustness – protection, containment, and redundancy – we can assure structural integrity in modern structures both during and after fires.

Protection

The first line of defense against fire in a building is protection. The essential requirements of all building codes are the same: in appropriate cir-

1 SPALLING AND CRACKING OF FIRE-DAMAGED CONCRETE

2 CRACKED PRECAST BEAM LOCATED BELOW THE BUILDING'S FIRE ZONE

cumstances we must provide detection and alert systems, automatic and manual fire suppression and fire-fighting systems, containment, and rated insulation barriers for structural members. The specific options for providing compliance are numerous (the Underwriters Laboratory Fire Resistance Directory gets thicker every year).

Modern construction lacks one of the best providers of protection in older buildings: mass, both structural and nonstructural. The ability to analyze known loads on structures with great accuracy has led to what may be considered "fragile" frames. Contemporary frames have little reserve strength and they are not forgiving for extraordinary load events, including fire. These optimized frames must be protected.

Perhaps the single most effective form of protection used in modern buildings is the sprinkler system. When sprinklered buildings have not performed well, it has usually been because the sprinkler systems were not functioning properly or they were substantially overwhelmed by the fire.

Fire damage investigations have revealed that some of the most unlikely building elements add significantly to fire robustness. During the investigation of a fire in an open parking garage, we found that two-inch-thick cellulose fiber plank installed on the bottom of a waffle slab to insulate the floor of the occupied space above served well as fire protection. The intense fire severely damaged unprotected ribs of the floor system, but the four-inch-thick slab above the fiber plank was completely unaffected (4). The insulation was charred but intact.

Something as simple as elastomeric gym floor covering, which absorbs heat and temporarily deters heat flow to structural members, can add protection. During another investigation, we found that the extent of damage to the structural concrete of a floor slab in a gymnasium correlated with damage to the floor covering. Although the fire had affected the entire gym area, the extent of damage to the floor covering varied (3). In different regions, the covering was melted, charred, or completely burned away. We found that the only instances of severe concrete damage were where the covering was completely gone. As long as the covering did not fully burn, the concrete was protected.

We should never rely on unrated coverings to provide protection required by the code. But architects should know the potential benefits even unrated coverings can provide and should consider these benefits when appropriate.

Containment

When we can't prevent, suppress, or protect against a fire, we can try to contain it. Modern buildings often include features that hinder containment – atriums, grand lobbies, and open floor plans. These features are not consistent with containment, and they can limit robustness. With such open spaces, additional care must be taken to design with frequent and secure fire walls, fire partitions, and automatic closures.

Lightweight curtain walls are another weakness in the containment of fires. Because of their thinness and construction, curtain walls are often severely distorted during fires. This can create breaches that allow fire to spread rapidly between floors, even with code-conforming firestopping at interfaces (7). Also, modern curtain walls often have large, closely spaced windows that act as paths for fire to spread along.

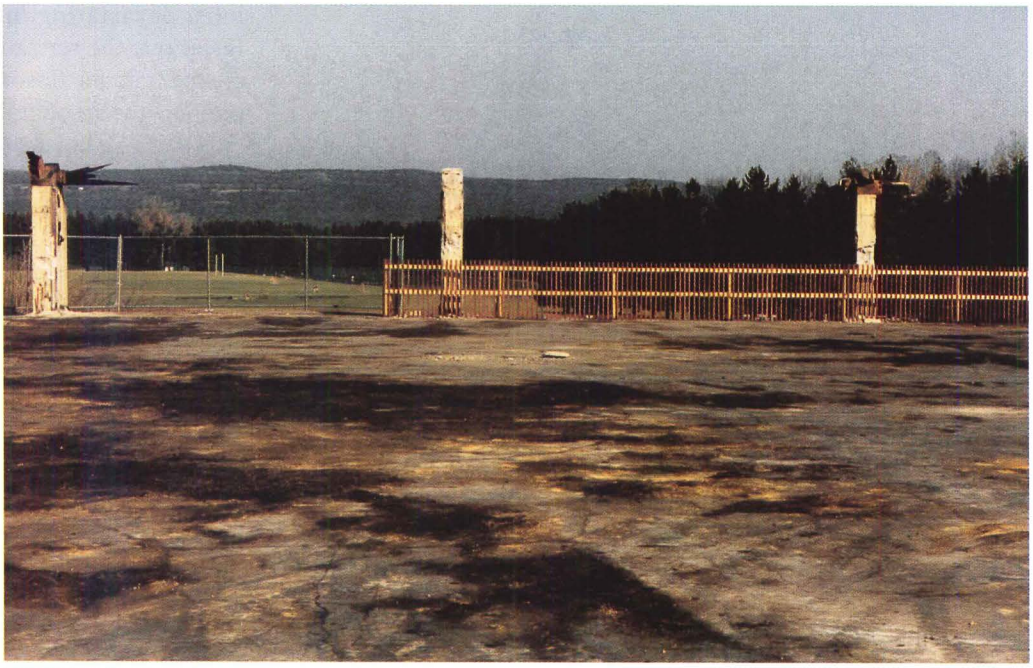
Some modern codes require flame shields – baffles that extend beyond the plane of the wall – to delay fire transmission. The use of such shields, adequate spacing between windows of adjacent floors (at least 36 inches by some codes), and other strategies to prevent external fire spread may prove beneficial in any multistory building. In designing firestopping, consideration should also be given to the large movements and distortions of structural and architectural elements that can move out of place during a fire.

Redundancy

Under current practice, buildings are not designed for fire loads. Nevertheless, we can build into structures the ability for them to survive intense fires, albeit with serious damage. One essential method is to provide general structural integrity through redundancy.

Redundancy in fire-robust design can take many forms. Often it can be provided simply through structural continuity and basic attention to structural detailing. For instance, beams that are structurally continuous through their supports have redundancy that helps them survive fires. Unlike simply supported beams that fail in bending as one section yields, continuous beams must yield at midspan and at each end before failing. Therefore, as a fire affects the strength and stiffness of the middle of a continuous beam, it will sag but will not fail immediately. Each half of the beam can work as a cantilever.

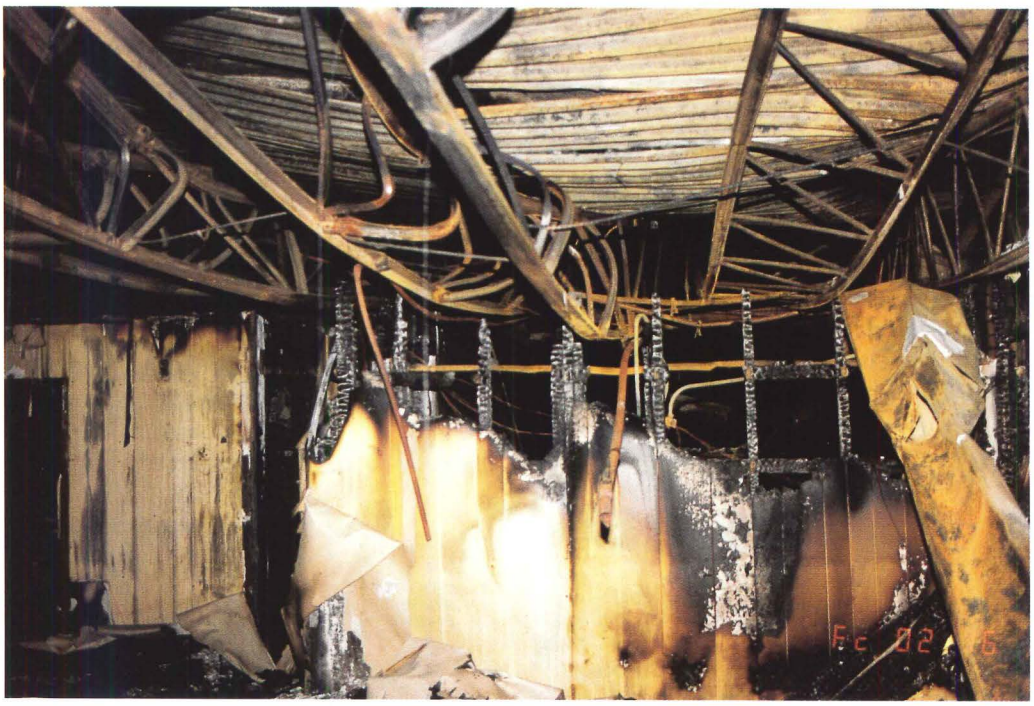
Beams with adequate attachments to supporting members have another form of redundancy that is double-acting for fire-heated beams (8). As a beam is heated, it loses strength. At the same time, a well-anchored beam is constrained by the surrounding structure as it is forced by the heat to expand. This causes the beam to compress, reducing the maximum tension in the lower portion of the beam at midspan – the same location where fire-induced strength reduction is usually



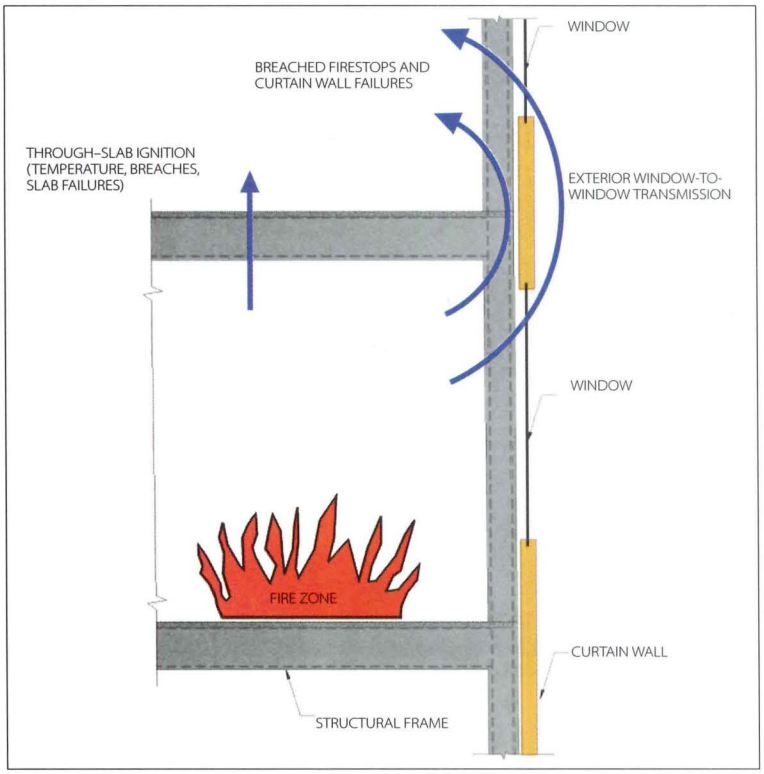
3 ZONES OF SLAB DAMAGE DISCERNIBLE ON CONCRETE GYMNASIUM FLOOR

4 CONCRETE WAFFLE SLAB PROTECTED BY INSULATION, WITH UNPROTECTED RIBS DAMAGED BY FIRE

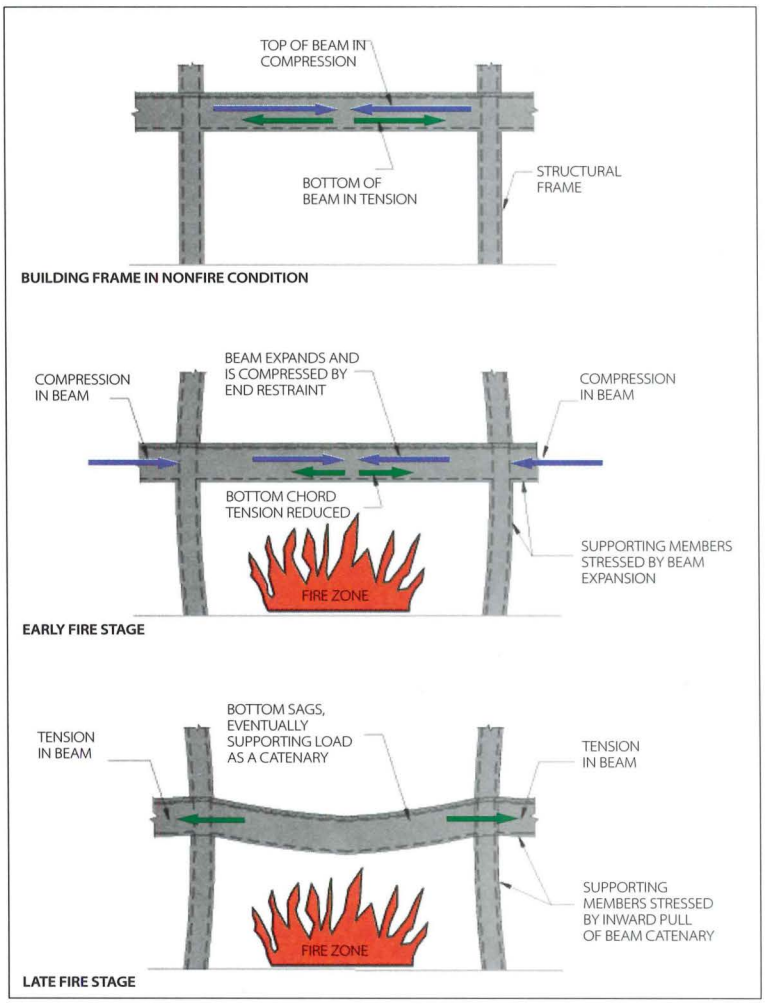
5 FIRE-DAMAGED BEAMS SUPPORT LOADS THROUGH CATENARY ACTION



6 FIRE-DAMAGED BAR JOISTS SUPPORT LOADS THROUGH CATENARY ACTION



7 PATHS FOR FIRE SPREAD



8 BEHAVIOR OF A RESTRAINED BEAM DURING A FIRE

most devastating in intense fires. In many instances, the restraint of expansion helps to compensate for fire-induced strength loss and prolongs the life of the beam.

If the fire is not extinguished rapidly, however, flexural strength of heated beams will be overcome. When this happens, beams sag dramatically. Fortunately, well-anchored beams do not necessarily fail completely upon loss of flexural strength. As a heated beam softens and sags, it begins to act as a suspended tension structure (5, 6). For beams of common proportions loaded during a fire to near their design strength, tensile forces in the connections from catenary action can be on the order of only 10 to 15 percent of the room-temperature yield strength of the beam. Even severely weakened beams, in other words, can support substantial load as a catenary.

Conversely, beams that are not adequately anchored to the structure are likely to fail. At deflections of 10 to 20 percent of the beam span (common for intense fires), the ends of beams that are not adequately anchored can be overstressed or the beams can lose bearing.

Summary

Architects should be concerned about robustness for fire-resistance in the design of buildings. Many structural frames do not have inherent reserve for strength losses from fire. Open spaces and relatively fragile structural and nonstructural elements potentially contribute to fire spread.

Modern building codes require extensive and complicated analysis of structural frames for the effects of many sources of load: dead loads, live loads, snow and rain, seismic events, and wind storms. We might assume that our buildings will withstand intense fire loads if we meet the building codes. But the codes are essentially silent on the effects that fires have on building frames. We usually either believe that the code protection requirements are adequate to prevent fatal damage to our buildings, or we accept that severe fires will destroy our buildings.

These are not the only options. Careful attention to structural detailing, recognizing and correcting shortcomings in containment, and providing additional protection can compensate, in part, for the fragility of modern structural frames and building envelopes. With proper attention, fire robustness in modern construction can be substantially improved. □

Fire codes applicable anywhere in the world, based on performance, are now closer to reality. A progress report. *by Richard W. Bukowski*

Fire Codes for Global Practice

Abstract

Architecture in a world economy, with multinational clients and a global range of building materials and systems, demands fire codes based on performance. The International Council for Building Research is now working on methods to verify compliance under performance-based fire codes. Performance codes have several advantages: code objectives clearly stated and understood by all parties, and analytical methods, data, and assumptions formalized in a single code of practice.

Imagine that a multinational corporation wants you to design for it a signature building that will be reproduced in a dozen countries. Your job will be to develop a single design that complies with the individual fire-code requirements in each nation and satisfies all local authorities. After you obtain copies of the relevant codes and have them translated into English, you will likely discover that you have to use unfamilar, locally produced products and materials since only these have been certified to meet the local requirements. Many of the code allowances available in the U.S., when fire sprinklers, alarms, and smoke-control systems are used, are unavailable under these prescriptive codes, especially in Asia.

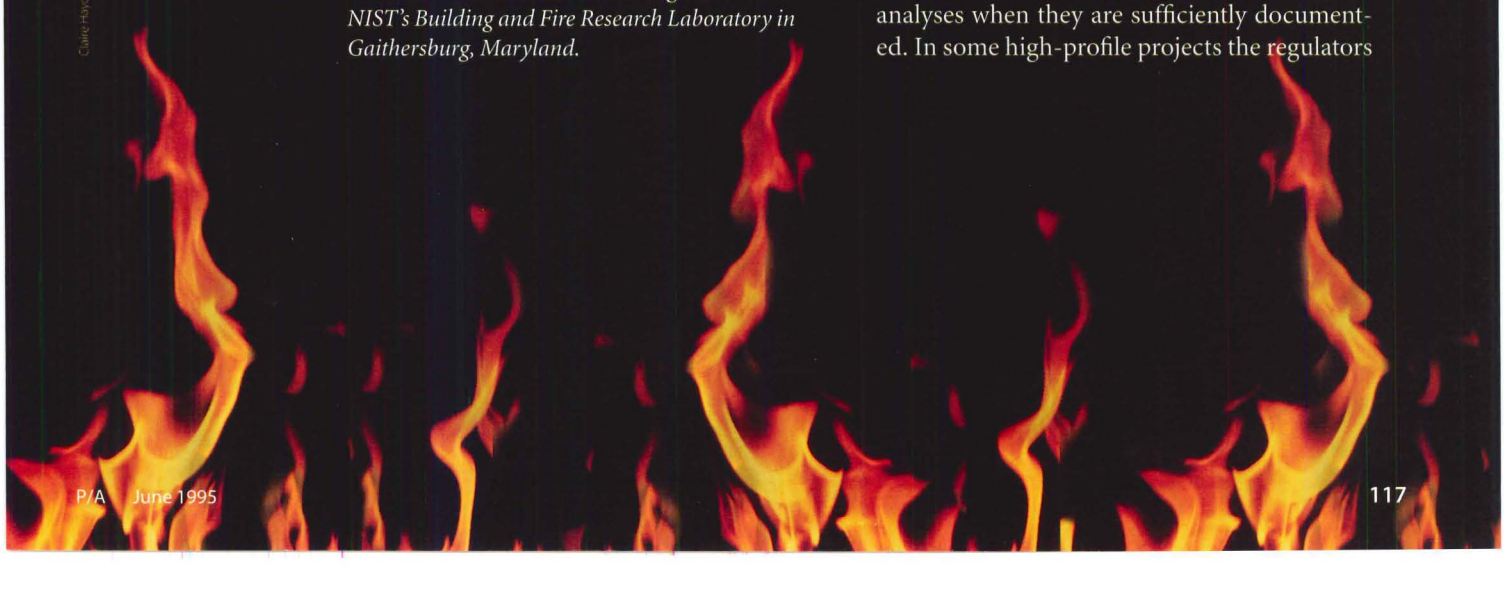
Sound like a challenge? By the end of the decade this may be a task requiring only a single design analysis package that will be acceptable nearly anywhere in the world. The International Council for Building Research (CIB), Working Commission 14 (chaired by the author) is developing a common method of fire safety engineering analysis to underpin performance-based fire codes. There is a parallel effort under CIB Task Group 11 to coordinate the development of performance-based building codes. This is part of a worldwide interest in moving away from prescriptive codes, driven by a desire to make the regulatory process more flexible and more cost effective. Programs to develop performance codes are under way in Eastern and Western Europe, North America, and across the Pacific Rim.

The Building and Fire Research Laboratory (BFRL) at the National Institute of Standards and Technology (NIST) is recognized as a leader in predictive fire models and their application to fire hazard and fire risk assessment. The evolution of these analytical tools over the past decade has allowed the transition to performance-based codes. Quantitative determinations can now be made as to whether a given design meets explicit performance objectives.

The author is a Senior Research Engineer at NIST's Building and Fire Research Laboratory in Gaithersburg, Maryland.

Code Equivalency

Alternative approaches to fire safety around the world were examined under the "equivalency clauses" in the codes. Under these clauses, the architect must convince the local authority that the difference from the prescriptive requirement still meets the intent of the code. In recent years it has become common to use analytical methods to justify variances from code requirements. Most code officials with whom we have spoken are willing to accept such analyses when they are sufficiently documented. In some high-profile projects the regulators



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have sought second opinions from independent parties to increase their confidence.

Performance Objectives

Performance-based codes have several advantages over these ad hoc methods. First, the code objectives are clearly stated and understood by all parties. Second, the analytical methods, data, and assumptions are formalized in a "code of practice," avoiding disagreements over procedures. Third, the former, prescriptive requirements are retained as "deemed to satisfy" provisions, providing continuity and a simpler method for the majority of projects where a performance analysis may not be warranted.

The greatest appeal of performance codes is the provision of explicit objectives independent of the methods used to achieve them. These objectives are universally based on the concepts of protection of life and property, with some variations for cultural and societal differences. For example, in their new performance code, officials in New Zealand decided that the code should not require that owners protect their property from a fire. Insurance carriers there now set such requirements as a condition of coverage.

Under a performance code the designer is free to use any means to assure that the occupants of a building can be safely evacuated. Codes of practice are being developed that provide guidance on characterizing fires, occupant loading and characteristics, and other parameters as a function of occupancy type. For example, in a mercantile occupancy in Australia, several types of fires, numbers of customers (including the mix of disabled), and allowances for staff training and fire department response are all specified. These are used as design criteria in the same way design loads are.

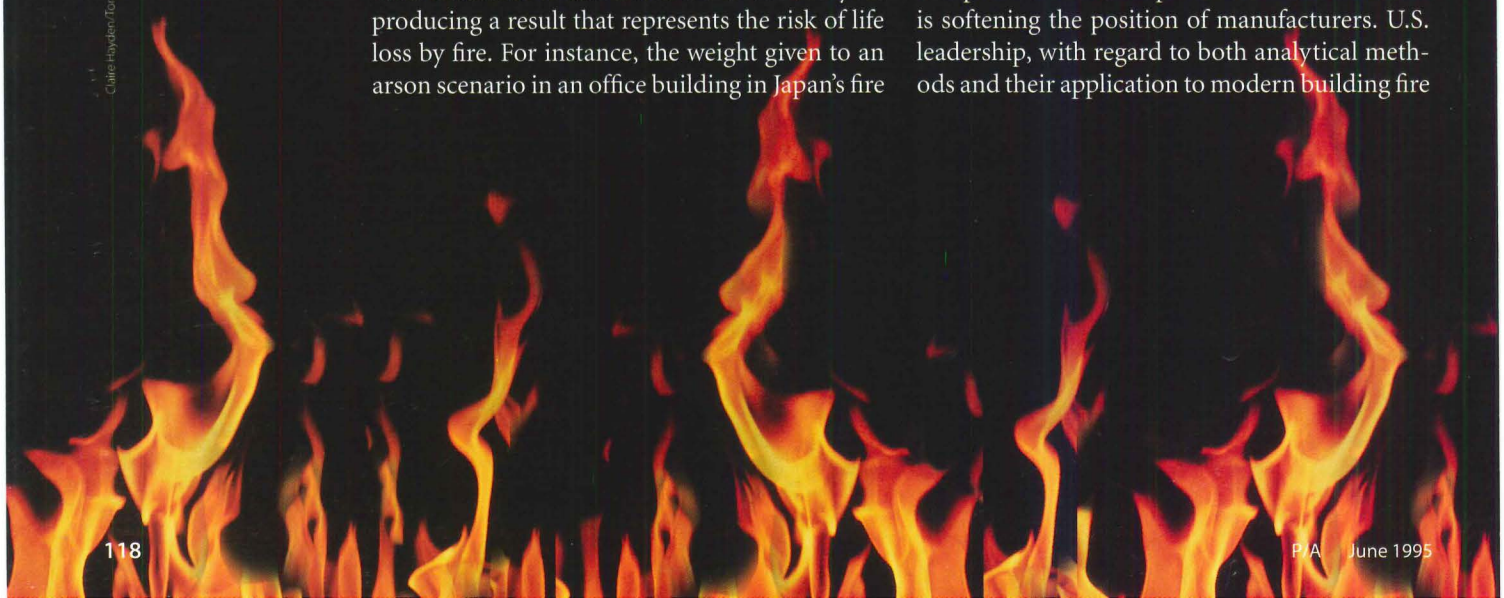
Fire scenarios likely to occur in the given region are based on actual experience, and so vary from country to country. The frequency of these scenarios is accounted for in the analysis, producing a result that represents the risk of life loss by fire. For instance, the weight given to an arson scenario in an office building in Japan's fire code is lower than it is in England, because Japan has a lower rate of arson.

The ultimate criteria for acceptability of any design reflect the degree to which society accepts fire risk; either implicitly in the risk presented by building designs considered acceptable under the prescriptive code, or explicitly under performance codes. Thus, individual countries will establish their own criteria, and a common evaluation method will be used to establish compliance. Several years ago an architect fought a protracted battle with code officials in London over the use of a textile roofing system proposed for a covered shopping area. The material had a coating purported to have high toxity when exposed to fire. Under the new UK performance code and engineering code of practice, this arrangement could easily be shown to be acceptable.

Resistance to Change

There are those who are uncomfortable with changing a system they feel is working well. Regulators are overwhelmed by the complexity of performance-based analysis, and lawmakers are reluctant to acknowledge that some losses are inevitable, even in code-compliant buildings. Material and product producers have also grown comfortable with traditional test methods and their ability to produce products that pass. However, in every country where performance codes have been introduced experience has shown these fears to be unfounded. For example, new product test methods require measurement of a product's reaction to fire and its acceptability, dependent on the context of use, as opposed to universal acceptance as opposed to universal acceptance.

In spite of these concerns the process is clearly moving forward. The widespread desire for regulatory reform is attributed to the perception that in an increasingly competitive world, prescriptive codes limit economic development. The promise of more open international markets is softening the position of manufacturers. U.S. leadership, with regard to both analytical methods and their application to modern building fire



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safety design, is leading to increased design business in other countries. Some U.S. fire-protection consulting firms cite this view as the reason for significant growth in the demand for engineered designs for high-rise buildings in the Pacific Rim and South America. Because the U.S. is now viewed as a leader in this area, U.S. architects can use this knowledge to better sell their services for work abroad.

Next Steps

While the U.S. is a leader in analytical methods and their application to modern building fire safety design, by most accounts America is lagging behind other countries in the transition to performance codes. The U.S. has a multiplicity of codes instead of a single, national code, common in many countries. The three model code organizations, plus the Society of Fire Protection Engineers and the National Fire Protection Association, are studying what their role should be and how they can encourage the transition. Beyond overhauling the codes and standards process, the task of educating architects, engineers, code officials, and builders is daunting. Generally, designing to specific performance levels for energy, acoustic, environmental, fire, and other requirements will result in more dependence on specialty engineering. But performance codes will all demand increased understanding by the architect in coordinating these consultants. Expertise in performance codes will also provide the architect with another valuable service for a global array of clients.

Testing laboratories are struggling with the need to move from providing lists of acceptable products to providing the certified performance data needed by these new methods. Professional societies are examining their roles in providing peer review of the evolving methods and the development of the needed codes of practice. We are in a period of rapid technological change and all parties need to work together to assure that the evolution goes smoothly.

BFRL sees its role as developing and verifying the predictive tools as well as providing a national focus in the international standards arena. As part of NIST, we assist industry in technological development and in remaining competitive. We welcome the opportunity to work with the design community through the American Institute of Architects and other organizations.

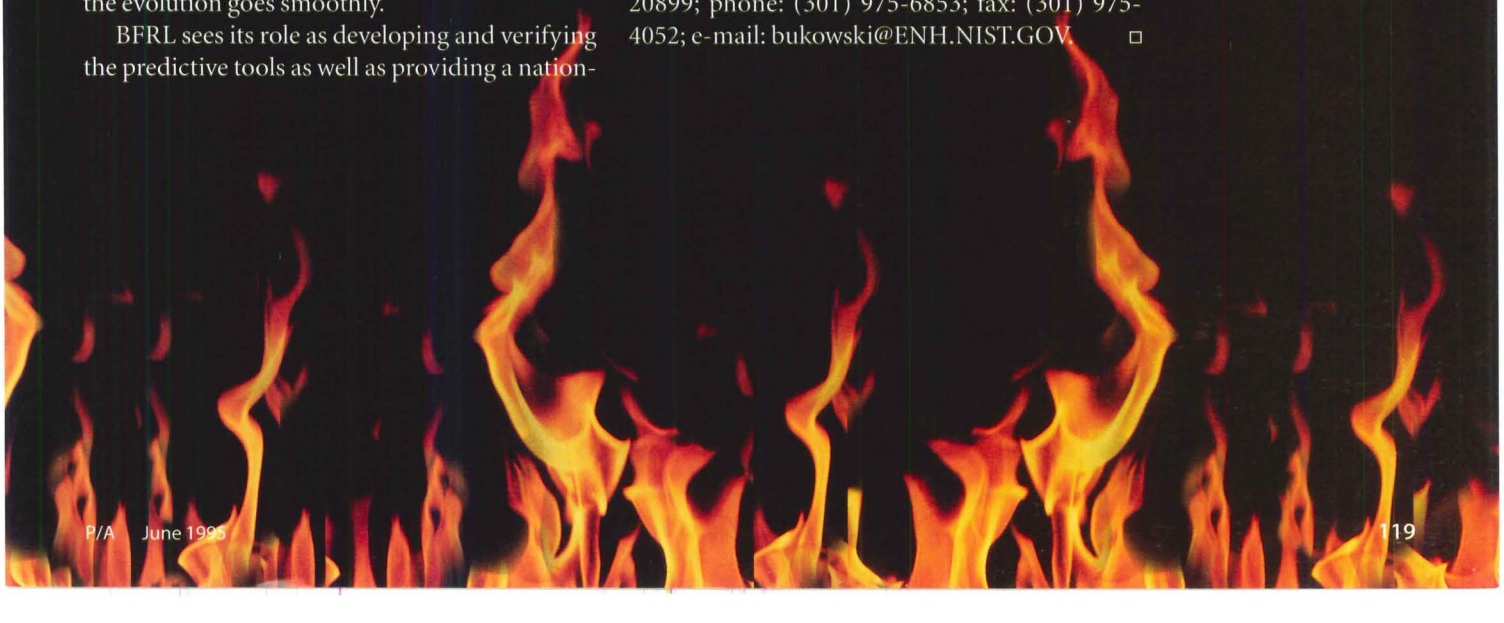
Final Thoughts

Making the advance to performance-based fire codes in this country is going to take a coordinated effort by all of the institutions and organizations with stakes in the process. Clearly, the model code groups and professional societies are trying to shape their role. Code officials are dealing with increasingly complex, alternate design analyses, and many of them are gaining confidence in the accuracy of such methods. BFRL is continuing to invest in advancing the technology and in integrating our analytical tools with CAD to encourage the use of these tools by the design community. For example, we are working on linking our fire models to architectural CAD software so that designs can be quickly evaluated in the architect's office. By moving to a system where the ultimate performance is clear, the methods to meet that level of performance are left to the designer. Without prescriptive codes and greater choice for the architect, it should be possible to produce more cost-efficient buildings with no sacrifice in fire safety.

With worldwide acceptance of a common evaluation method, it should no longer be necessary to deal with a range of sometimes conflicting local code requirements. This should go a long way toward the elimination of barriers to trade in the design and construction industries.

For More Information

Architects who want more information on the development of performance-based fire codes can contact the author at the Building and Fire Research Laboratory, National Institute of Standards and Technology, Gaithersburg, MD 20899; phone: (301) 975-6853; fax: (301) 975-4052; e-mail: bukowski@ENH.NIST.GOV. □



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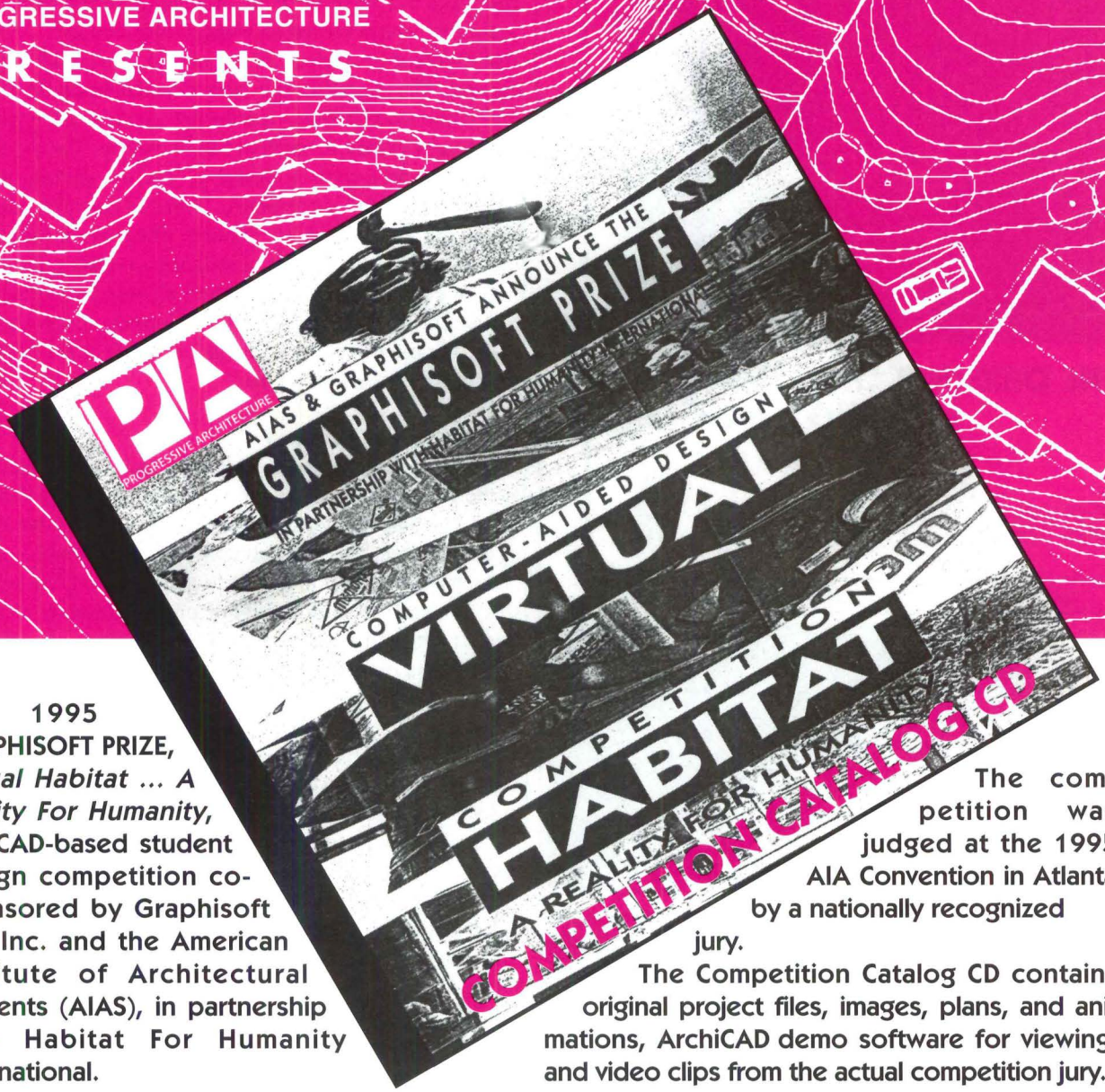

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GRAPHISOFT

Downsized Profession *(continued from page 79)*

and rendering software enables small firms to produce presentation images as good as those of the big firms, further "leveling the playing field in the eyes of the client," he says.

Tiny, recently established firms have in some cases gathered together in shared offices, obtaining, through their collective resources, access to an array of computers and other equipment that would exceed an isolated firm's budget. "There are five different businesses in our studio," says Walter Raleigh Stewart, who operates a two-person firm beneath the skylights and white wood trusses of a former car dealership garage in Larkspur, California, north of San Francisco. The five firms in Larkspur, and a sixth in Berkeley, "end up working together much of the time," says Stewart. "We're all networked together so we can exchange data." Stewart, whose work includes the planning of five new towns in Indonesia, collaborates not only with Bay Area firms but with others all over the world, thanks to computers, modems, and other distance-dissolving equipment. For many architects, being independent has never been so interconnected as it is today.

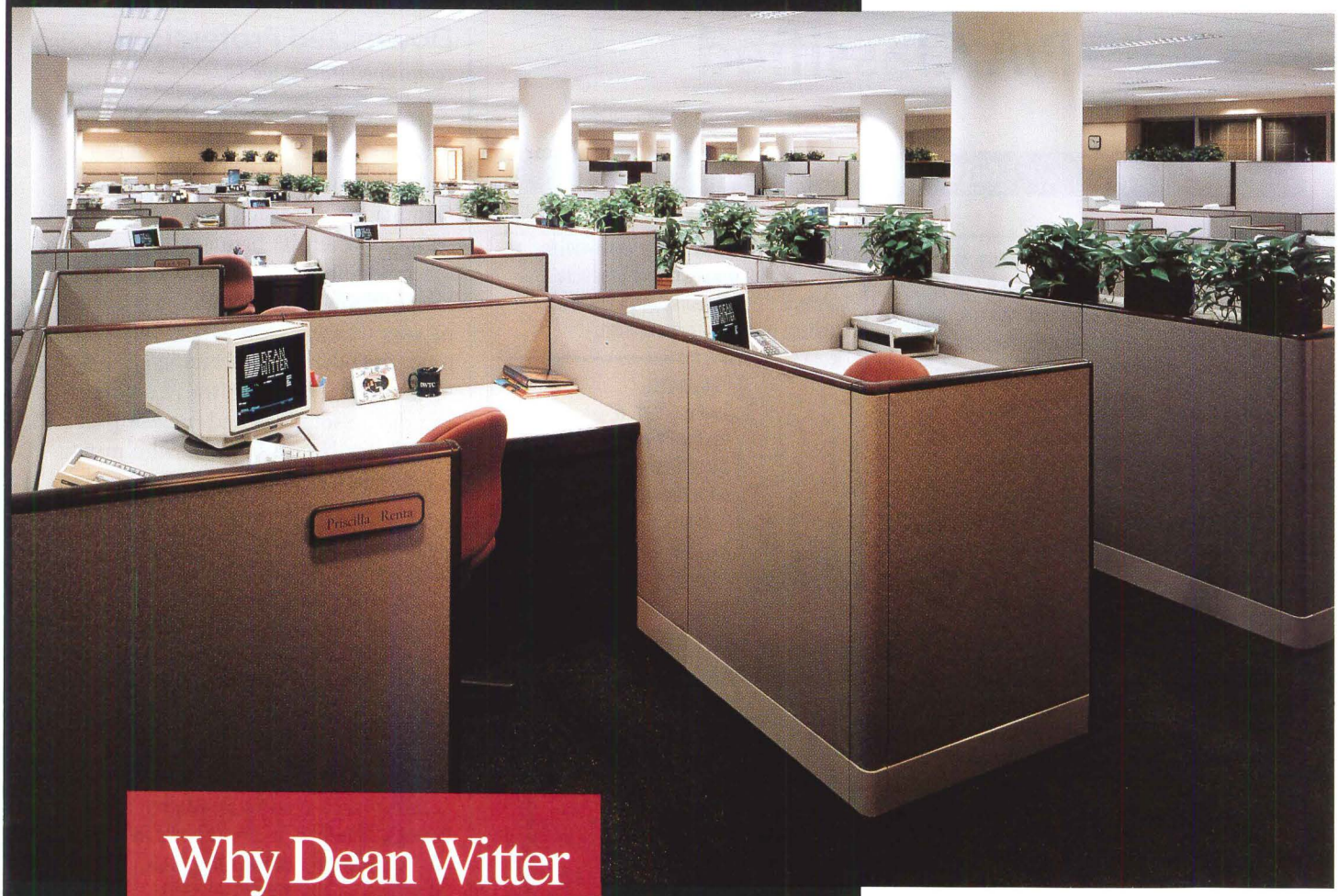
A Refreshing Change

Some architects, after the jolt of losing their positions, found that going on to new things was a refreshing change. "I like it much better," said a designer who, laid off after 15 years by a Connecticut firm, ended up with greater design responsibility at a firm not far away. "I was getting bored," he now realizes. Richard W. Kuhn, a senior project designer at Ellerbe Becket until that firm's Los Angeles office closed, said, "Getting out of the office has presented all sorts of opportunities," including collaboration with a Santa Monica firm, the Nadel Partnership, on projects in China and Saudi Arabia. "I was kind of tucked away in one firm for five years," he says. Life as a consultant "has allowed me to see a lot of what's going on in a variety of firms."

"Some middle-aged and elderly architects are saying they haven't been laid off – they've 'graduated,'" says Franklin, who has helped many of them set up independent practices. "They're out from under the bureaucracy of a big firm. Many continue to specialize in the building type in which they had specialized. They're a happy group."

Mark Zweig, a management consultant and newsletter publisher, maintains that for those who have survived the decline in architectural employment, the outlook may be brighter than it was a few years ago, since the number of professionals competing for work has presumably been brought more in line with the quantity of work available.

Firms have learned to regulate their expenses more stringently. Big-city firms have scaled back perquisites for working late, such as company-paid dinners and taxi rides home. Firms that used to hire in anticipation of a major project now delay their hiring until the contract is signed, says Thomas Fridstein, managing partner of SOM's Chicago office. More frugal policies on overtime pay have been adopted by some firms, and it's not uncommon to devote less time than in the past to exploring design alternatives. "There's less extravagance all the way around," says Zweig. *(continued on page 124)*



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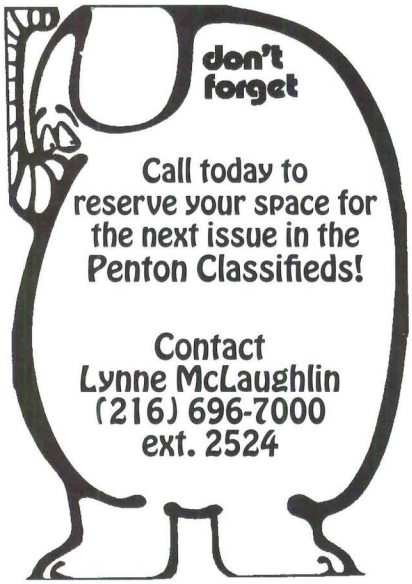

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Downsized Profession

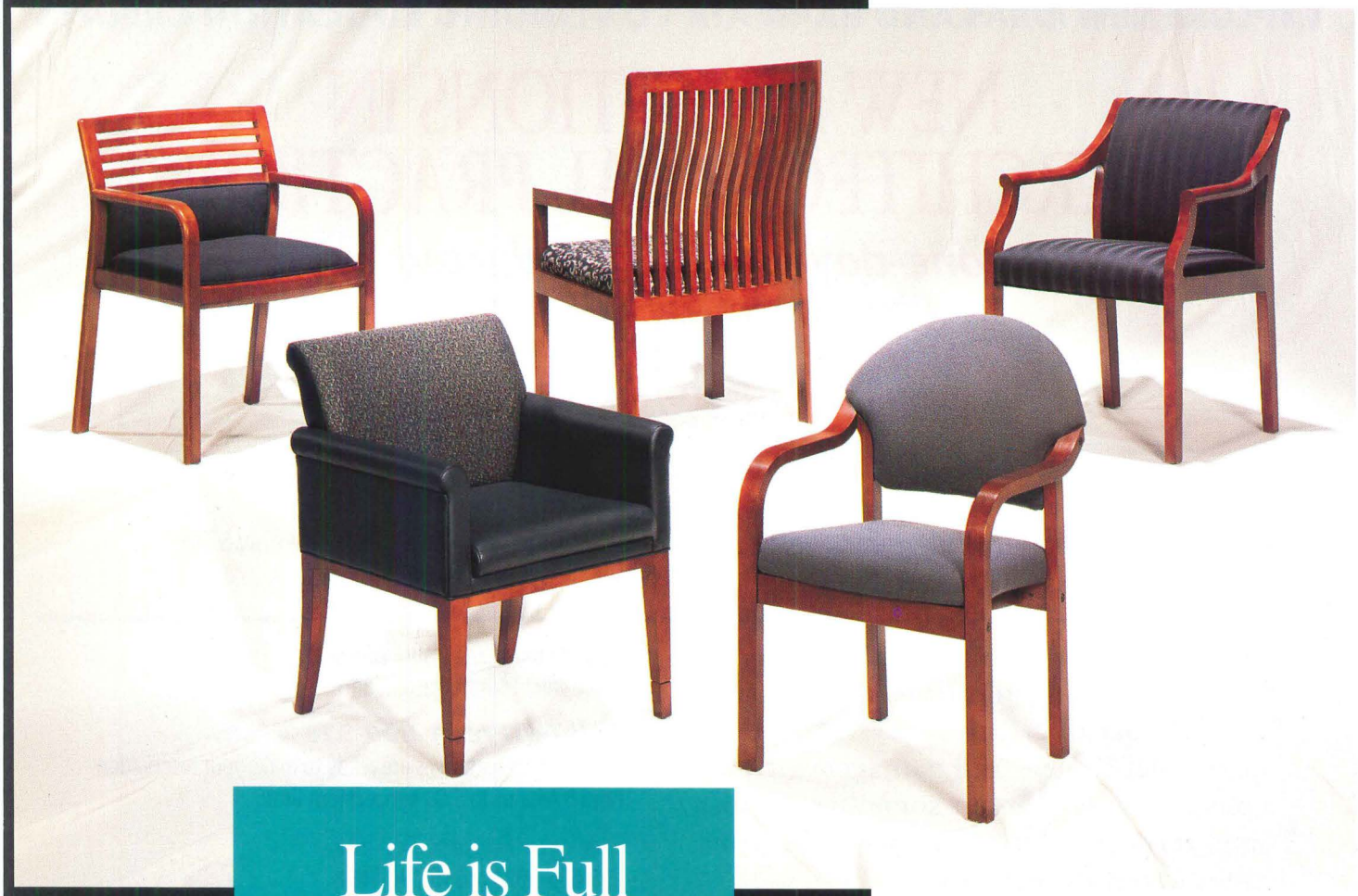
(continued from page 122)

In some firms, financial information is being shared more readily with the staff than it used to be. ADD, Inc., a Cambridge, Massachusetts, firm that suffered when its primary field, spec office buildings, collapsed, says it wants its employees to know when clients aren't paying, when jobs are taking too much time, and other facts that impinge on the firm's livelihood. That way, employees can devise solutions and prevent problems from becoming overwhelming. Employees feel less in the dark.

Firms have, in some cases, tried an approach that Richard Fitzgerald of the Boston Society of Architects calls "hiring the client." ADD, eager to enter the retail building field, hired an architect who had been a developer – someone who "knows all the developers by name and who knows the major stores, so he can participate in planning that reflects the preferences and nuances of the clients," says ADD president, Wilson Pollock. The client-oriented hiring paid off. Work on retail buildings now makes up 30 percent of ADD's business.

Responding to the difficulties of the past few years, many firms are concentrating more on service and on unglamorous but profitable lines of work, such as regularly assessing clients' building needs – advising them on how much money to set aside for building maintenance and improvements and how to maintain their facilities. Those who become established in fields like this are likely to enjoy a steadier flow of work, shielding themselves from the sharp gyrations of construction markets.

The difficulties of the last several years, then, have generated an abundance of ideas and strategies for coping with an uncertain economy. Many individuals and firms have examined their goals and methods with heightened discipline. Some have abandoned architecture or given up romantic notions about it, but those who have survived, seems on the whole to have enhanced their capacity for dealing with adverse conditions. Given the cyclical nature of the economy, that capacity will soon enough be put to the test. □



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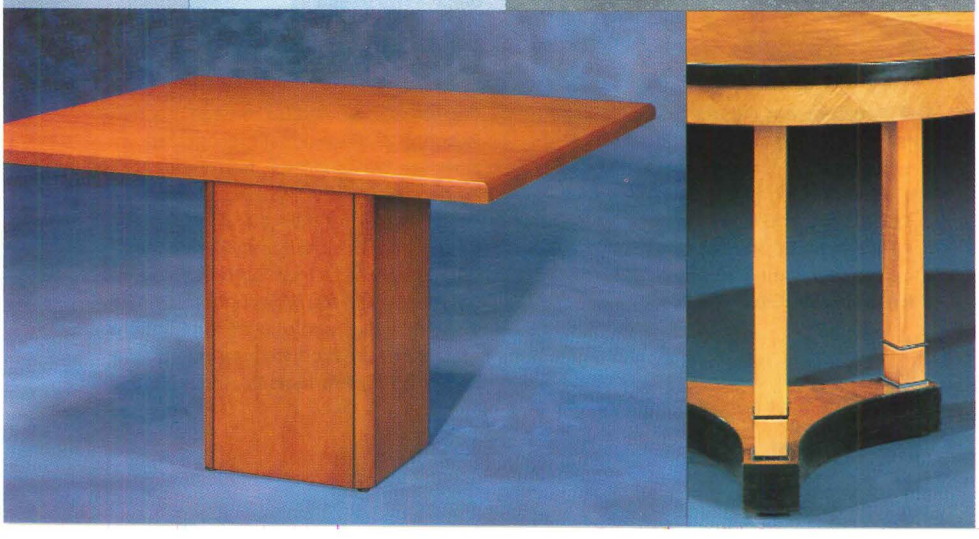

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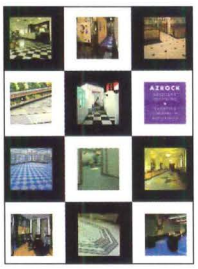

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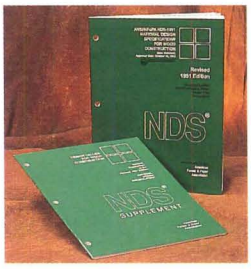

The American Forest & Paper Association and the American Wood Council announce the publication of *National Design Specifications® for Wood Construction*. This is the nationally recognized guide for wood structural design and is supplemented with "Design Values for Wood Construction."
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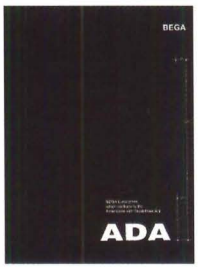

This new four-page flyer shows the lighting products available from BEGA that conform to ADA standards. A simple, easy to follow grid of product photographs indicates each product number and the corresponding page number for the BEGA Catalog No. 6. An index on the back page denotes lamp and dimensions for each product.
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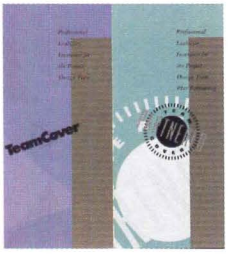

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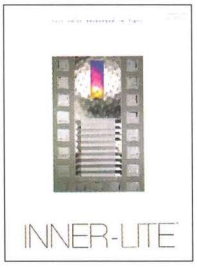

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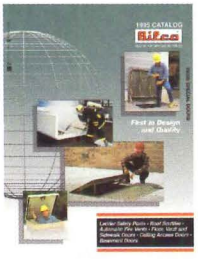

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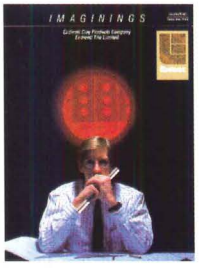

"Imagings" is a beautiful 16-page brochure featuring all the nationally recognized, authentic Ironspot colors from Endicott Clay Products Company. The products highlighted in this free, full-color brochure include: face brick, residential brick, thin brick, pavers, brick murals, pool coping, special shapes, and tile. Project photos, dimensional drawings, and color/texture options accompany the product descriptions.
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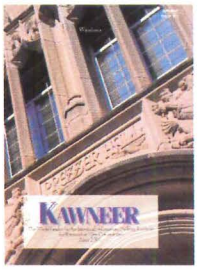

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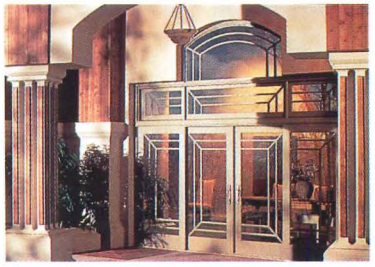

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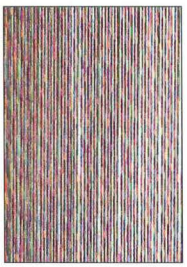

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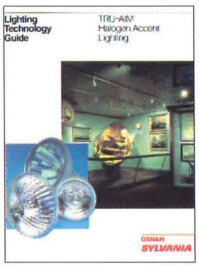

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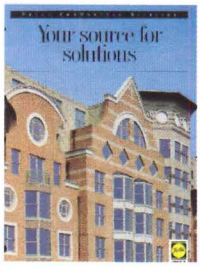

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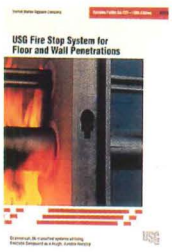
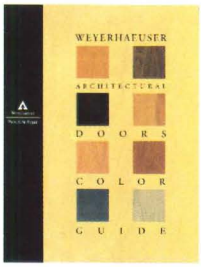


United States Gypsum Corporation's *USG Fire Stop System for Floor and Wall Penetration* is a 12-page brochure with technical and application data on a wide range of UL-classified systems and designs for the USG Fire Stop System. The system's primary component is FIRECODE Compound, which effectively blocks smoke, gas, flames, and water from passing through penetrations in concrete floor and gypsum board wall assemblies.
United States Gypsum Co. Circle No. 398

The SummaJet 2 Series of ink plotters are priced as low as $2,299, making them the most affordable large-format ink jet plotters available. Special features include refillable ink cartridges and two interchangeable heads to minimize cost of ownership; a monochrome to color upgrade path, roll feed, and Ethernet options allow the plotter to grow with the customer.
Summagraphics Corporation. Circle No. 396



The Weyerhaeuser Door Division's new line of designer colors is certain to enhance any project. The factory finish is hassle-free, beautifully consistent, and environmentally safe. By ordering the factory finish, the doors arrive ready to install. By specifying Weyerhaeuser designer colors, you can be certain the finish will look great, saving yourself the hassle and headache of on-site finishing.
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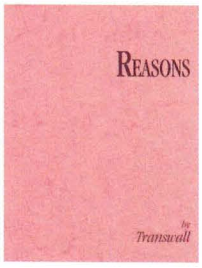


REASONS by Transwall is a flexible furniture system for the reengineered office of the 1990s. It is a stacking system that provides for quick changes, but also features sliding off-module panel attachments and storage component capabilities. It provides flexible arrangements for both private offices with acoustical requirements and teamworking areas. The panel cavities are easily accessible for changes in cable data management.
Transwall Corp. Circle No. 397

This new software diskette from Xetron demonstrates the full capability and features of the doorTek 282 Windows™-based access control system. The demonstration disk highlights easy to use functions for security in office buildings, schools, hospitals, parking garages, and other facilities requiring a PC for multiple operations.
Xetron, a Division of Pittway Corp. Circle No. 400

Selected Detail

Glass Roof Structure

CSI SECTION 13123

The exposed roof structure of the Nationale-Nederlanden Bank headquarters in Budapest (see p. 96), designed by Dutch architect Erick van Egeraat (formerly a partner with Mecanoo Architects in Rotterdam), seems to achieve the impossible. A voluptuous volume (known as the "whale"), containing a boardroom, breaks through the roof and is supported by glass. How did the architect do it?

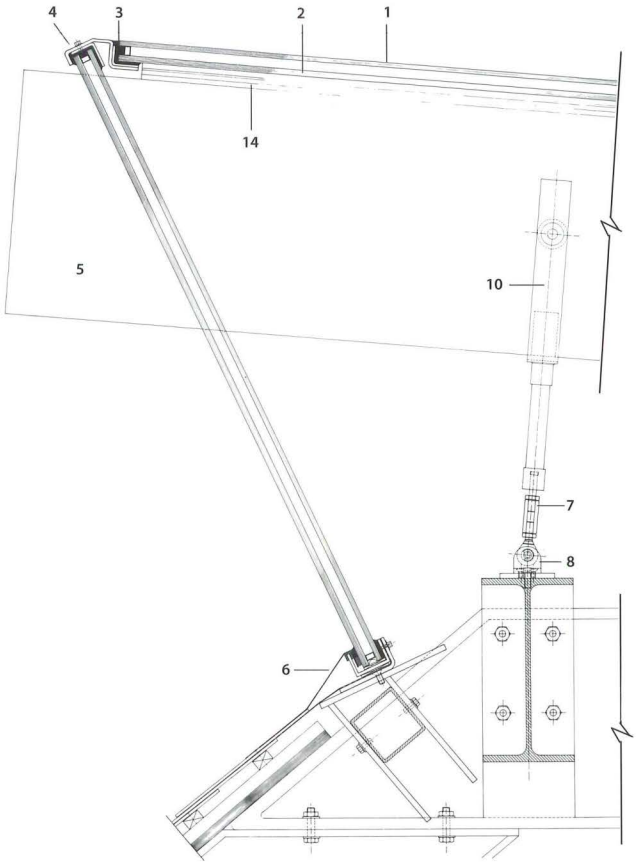
"The details of the glass roof and the whale are explicit and also extreme," explains van Egeraat, "but they try to find an equilibrium with the rest of the details in the design." Laminated glass rafters, 16 inches deep and a little over an inch thick, support a transparent roof of glass in which the whale appears to float. The average length of the glass rafter span is 11' - 4".

The rafters are composed of three layers of glass – a load-bearing central plate sandwiched between two shatter-resistant plates. Hinged stainless steel rods with forked ends tie the glass rafters into the building's steel structure. Van Egeraat did not want to violate the transparent glass roof with metal frames, so an extruded aluminum profile was designed to be partially concealed above the glass rafters.

Michael J. Crosbie

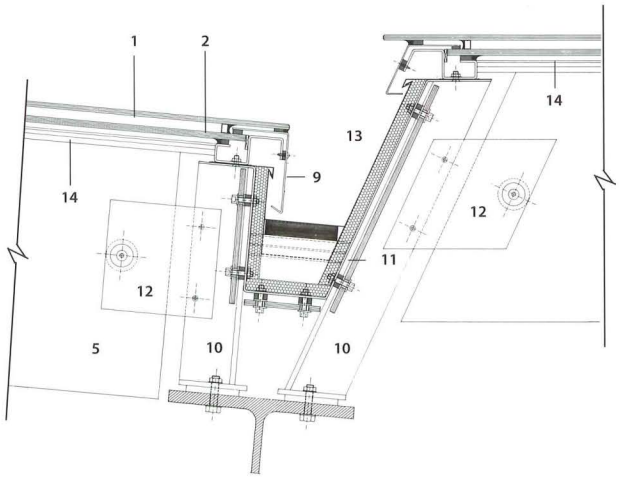
Christian Richters

GLASS RAFTERS SPANNING FROM ROOF EDGE TO CENTRAL BEAM (ENCLOSED ABOVE PENDANT LIGHTS)



SECTION THROUGH ROOF EDGE

1'/.3m



SECTION THROUGH CENTRAL BEAM

1 ¼" TEMPERED GLASS
2 ⅜" TEMPERED LAMINATED GLASS
3 SILICONE SEALANT
4 STAINLESS STEEL PROFILE
5 16"-DEEP LAMINATED GLASS RAFTER
6 ZINC FLASHING
7 HEXAGONAL LEVELING NUT
8 STAINLESS STEEL BASEPLATE
9 ANODIZED ALUMINUM PROFILE
10 STAINLESS STEEL SUPPORT ROD
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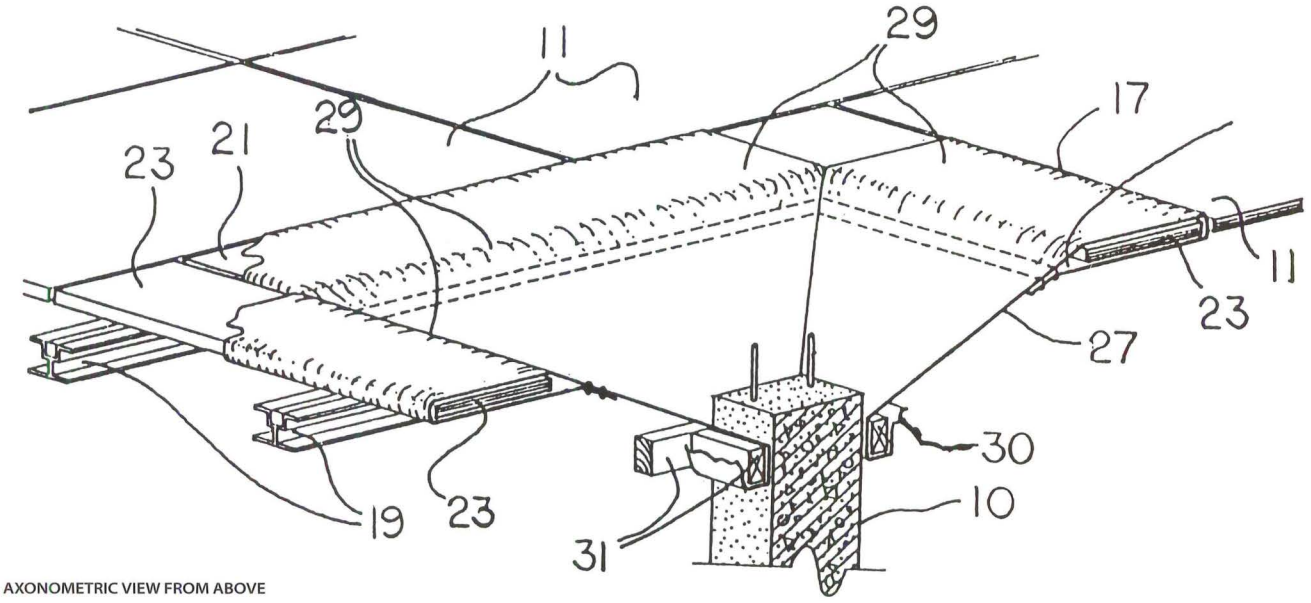
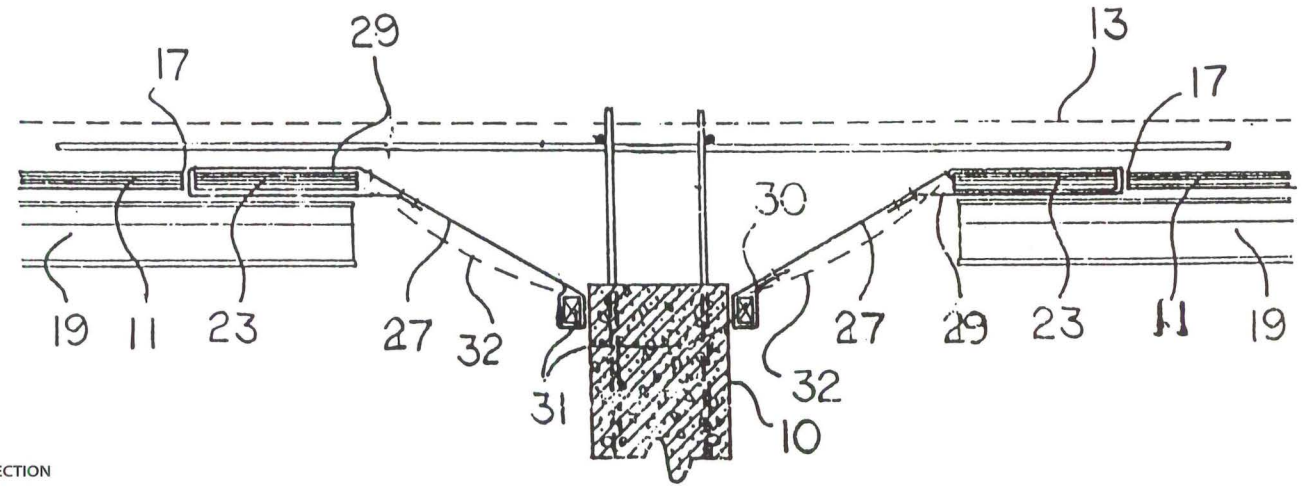
Selected Detail Fabric Formwork for Concrete

CSI SECTION 03100



AXONOMETRIC VIEW FROM ABOVE



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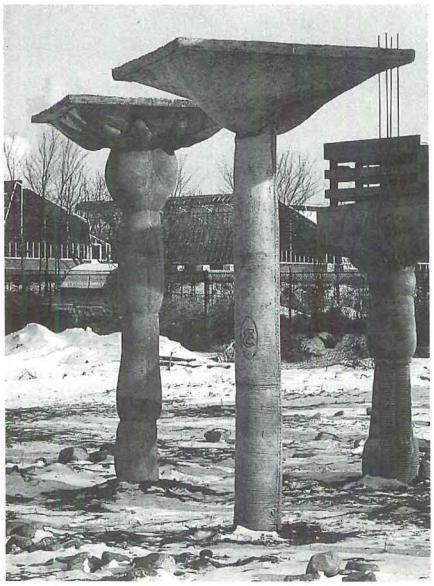

Occasionally an architect's ideas are novel enough to patent. Such is the case of Mark West's fabric formwork for concrete, which won an award for architectural research (see page 88). These drawings, part of West's patent application and drawn to the style required by the Patent Office, show the detailing and construction of fabric formwork for column capitals. West has also developed techniques for concrete columns.

The flared capital is square in plan. The capital surmounts an existing column (10) and is integral to a concrete floor poured on a plywood deck structure (11). The inverted pyramidal shape is formed by looping an impervious fabric (27) around flat plywood panels (21, 23). The panels are joined by connecting plates to create a compression ring and are supported from below by beams or joists (19).

According to West's patent application, the fabric sheets are cut, folded, stitched, and joined mechanically or with adhesives around the panels. The details indicate stitching on the underside of the form. The fabric is stretched and secured around the top of the column with an annular collar or frame (31) which holds the flexible material tight against the column. Conventional reinforcing bars extend up through the column and are tied into the horizontal reinforcing in the concrete deck. When the concrete is poured, some bulging of the fabric is expected, indicated by a dashed line (32).

West says that the column capitals in the photo (left) are more elaborate than this detail would produce. "The device illustrated here is the 'basic Chevy'," he explains. More expressive profiles are achieved by billowing the formwork. Michael J. Crosbie □

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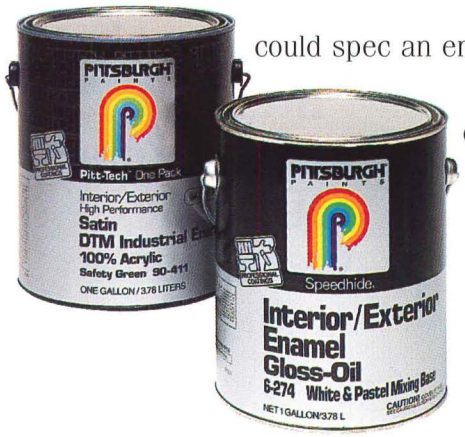

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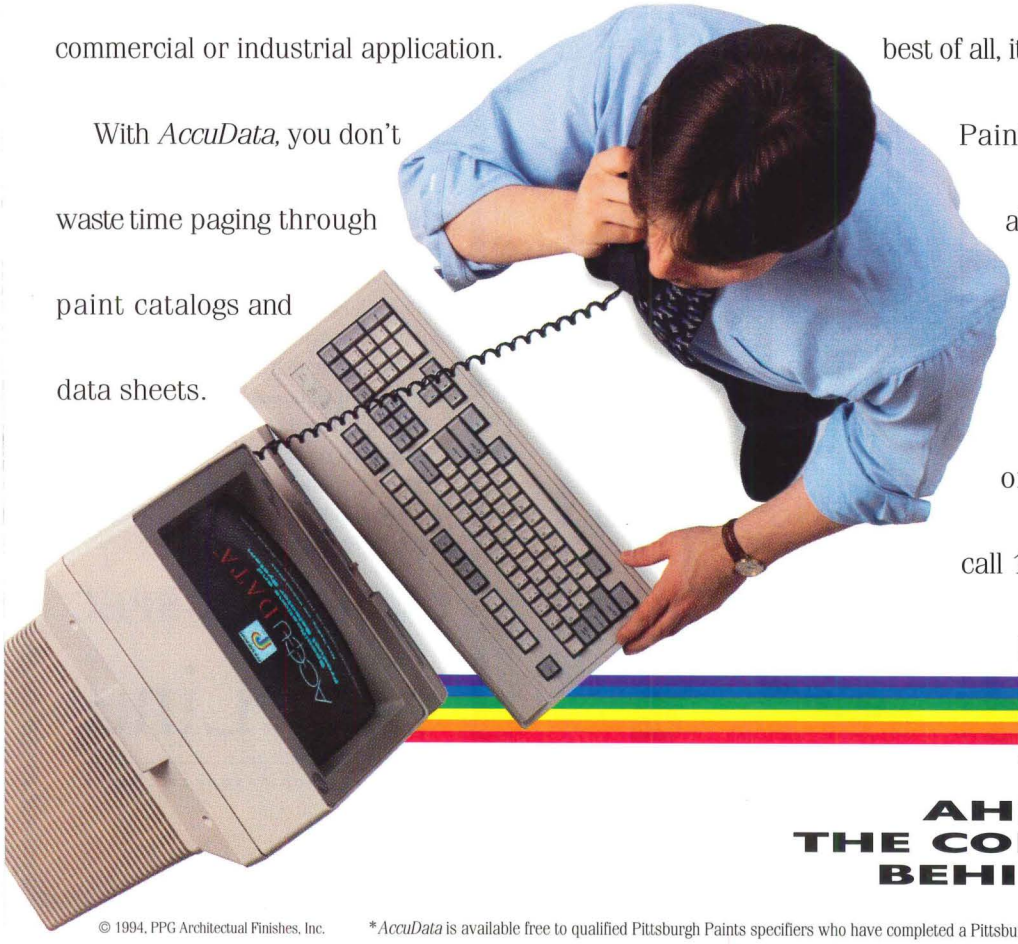

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Architect, Mayor, Environmentalist: An interview with Jaime Lerner

(continued from page 84) for a city. A city too must be a shared cause, and I think that this is what Curitiba represents. You don't change a country with economic methods alone. There is no economic tool that can endure in the absence of a national will if the people as individuals don't feel respected. The most visible sign of respect for the citizen is in the quality and delivery of services.

I'm going to say a couple of things that explain why so much has happened in Curitiba. First, it was the determination of an idealistic team, fantastic people. Second, I think, is the simplicity of our approach. Cities are not as complicated as the merchants of complexity would have us believe. Third, is getting started. We don't ask for all the answers, because if you want all the answers, you are always postponing the possibility of the intervention. You can always do better studies, you can always do better projects, but sometimes, you just have to start.

Di Giulio: What do you think are the most viable cities in the world?

Lerner: I find the European vision in relation to the city very good. It is the dispersed city that is the most difficult to resolve; living here, working there, leisure over there. The more you mix functions within a city, the more humane it becomes. The more you mix functions, the more you mix income, the better the city becomes.

I think that many of the disastrous problems we see in the world's cities stem from a misinterpretation of the Charter of Athens. The Charter of Athens defined the functions of urban life; living, working, circulation, recreation. It didn't say that they necessarily have to happen separately. All the times in history that economic activity was conceived of as separate from human feelings, from the way that people actually live, it has led to disaster. So the American cities that are more integrated, like Boston and New York, are much better.

Di Giulio: How do you see the role of the architect in the next century?

Lerner: I think that the role of the architect is to propose possibilities. If the architect loses this characteristic, he ceases to be an architect. We've been blessed with this ability by our training. It's important that we fulfill our role as professionals, because it's only by proposing that things are changed. We have to direct the planning of megacities in three fundamental ways. The first is to direct growth. The second regards decisions about technology (transportation, sewage). And the third is to integrate the formal economic sector with the informal sector of the economy. If not, we'll have the illusion that we are planning a city, when in fact we are only planning 60 percent of a city, because 40 percent is informal. The informal sector isn't a tragedy; we just need to learn how to use it. A street fair, for example, is an informal sector that installs itself for four or five hours within the formal sector, and then retreats. We have to incorporate the informal sector into the life of the great cities.

Di Giulio: How can other cities in Brazil and around the world best learn from Curitiba's example?

Lerner: When you think about your particular reality, you can solve a problem. It's the same thing as in music. Tolstoy said if you want to be universal, sing about your village. When you set your mind to solving a problem within a specific reality you can arrive at a universal solution. □

Critique

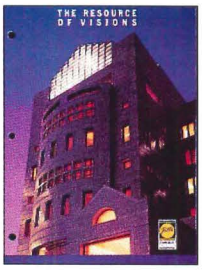
From Highboy to Boom Box

(continued from page 105) space in the absence of the AT&T "Genius of Communication" statue that once dominated the room. (Already, a kiosk with video monitors has shattered the reverent silence here. Sony won't rest until we're unable to *not* watch TV.)

Sony Wonder, the company's replacement for AT&T's InfoQuest, is set to open this month. Preview tours revealed an interactive – and hyperactive – environment done up with galvanized steel, dramatic lighting, a high-definition video theater, and – you guessed it – lots of video monitors. Here, visitors will be able to play at producing records, making videos, and operating robotic equipment, with no admission charge. This is a heavily programmed environment, but one that will be popular, especially with younger people; it's another reasonable way for Sony to work off its floor-area debt to society, and another reason the galleria space should be as unprogrammed as possible.

Who Comes Out Ahead?

In the end, do Sony Plaza's amenities constitute a reasonable trade for the increased density and decreased sunlight caused by the building? Most people would probably say yes. But the business of applying qualitative – and nearly always subjective – criteria to zoning and planning is inherently problematic. The same process that gave us Sony Plaza, after all, also gave us its intensely disliked predecessor. Our understanding of what makes good urban places ought to be complete enough to keep cities from making bad trades like the one they made with AT&T. But wherever there is room for negotiation, there is room for cities to capitulate to developers and corporations. Sony has manipulated the process so as to allow its public space to be as self-serving as possible. In this case, the aesthetic result is not so bad. But with this kind of precedent for privatization and "activation," what will the next developer's negotiations bring? □



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Jessica is a charming chair with a frame made of a single curved steel wire. Its double back of translucent polypropylene, available in different colors, gives it a friendly appearance and provides comfortable, pressure-free support. The seat is made of molded black polyurethane and is upholstered.
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