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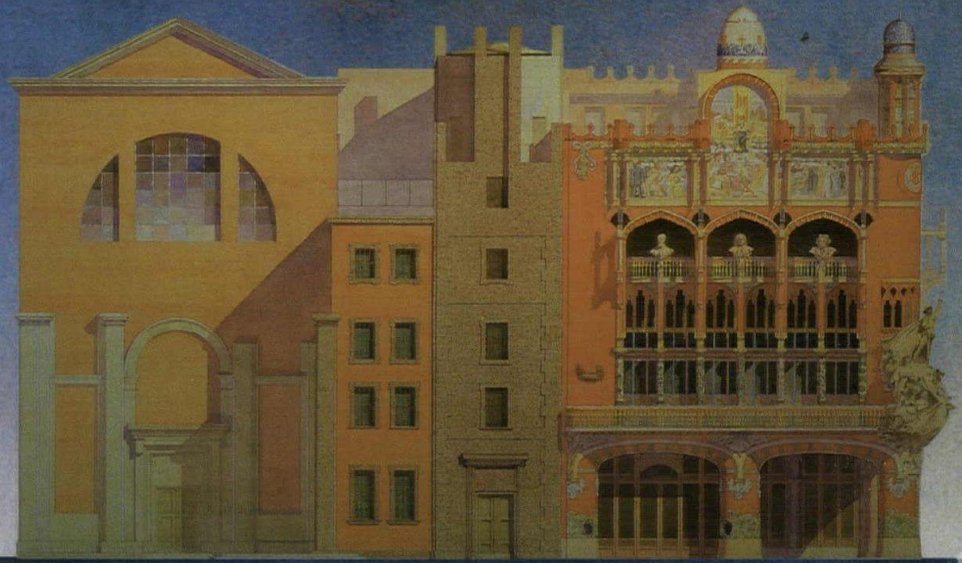

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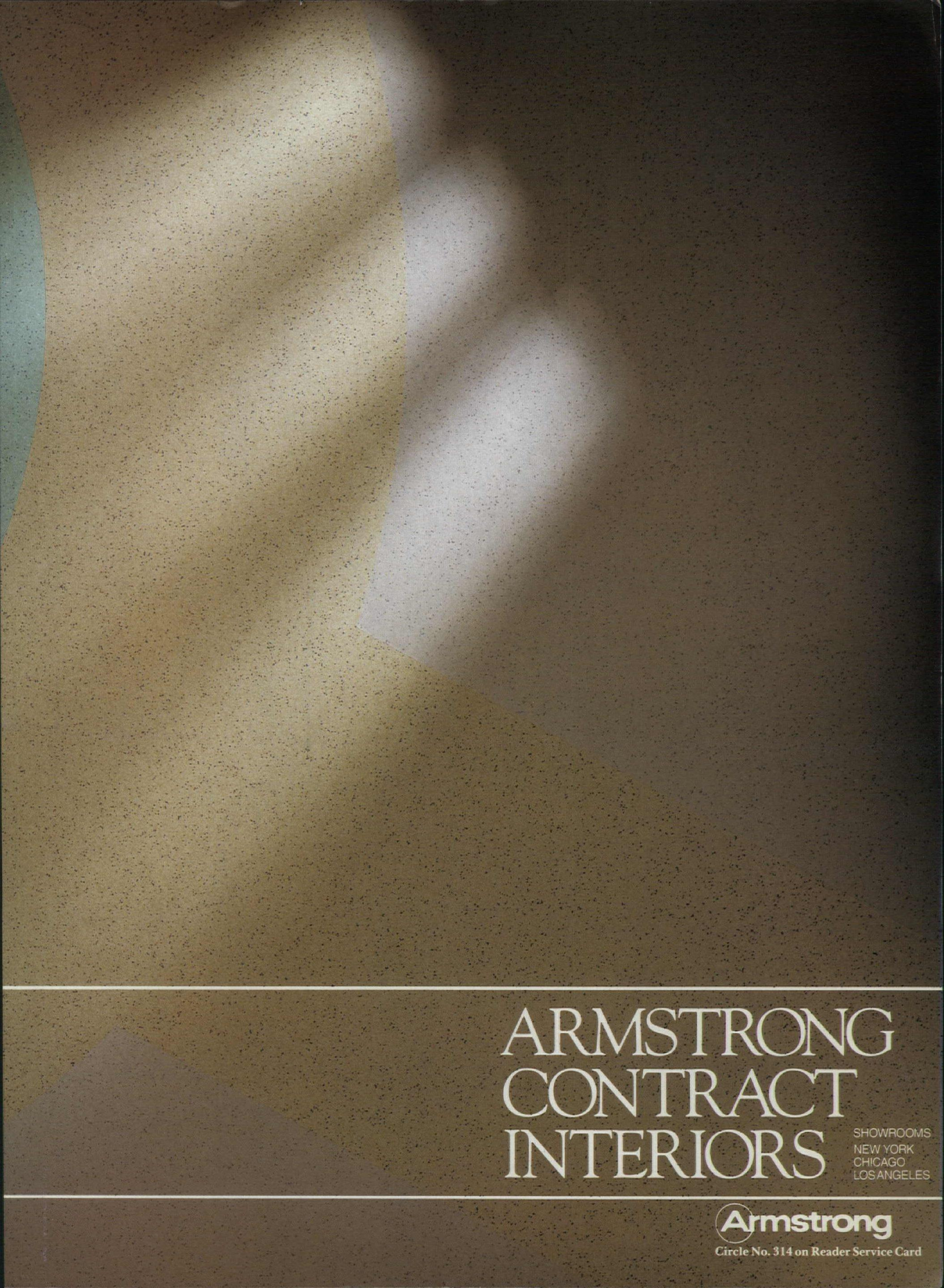

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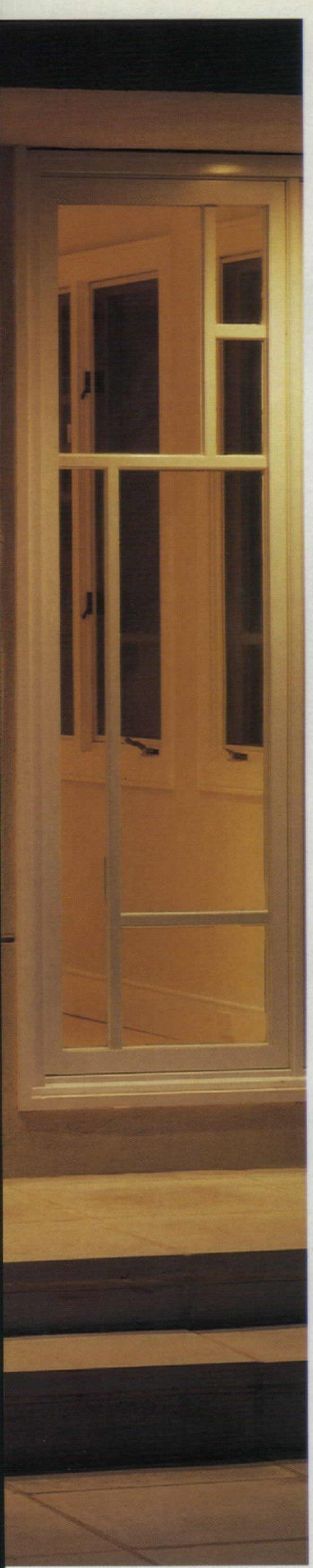

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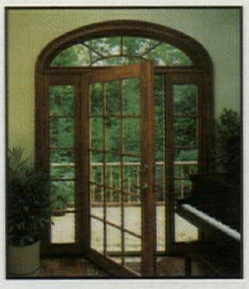

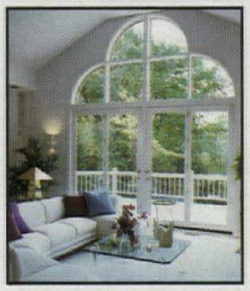

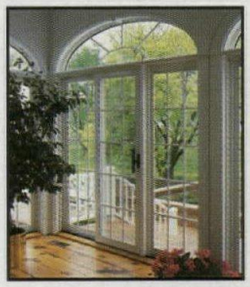

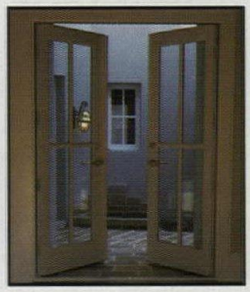

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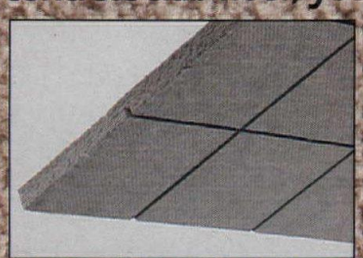

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Progressive Architecture June 1990

P/A

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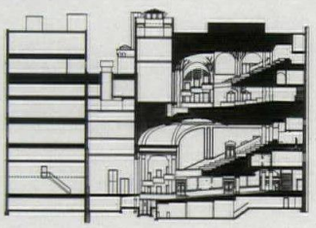

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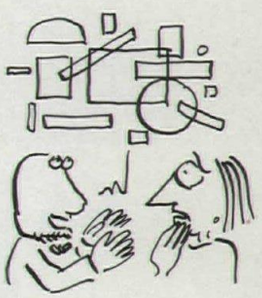

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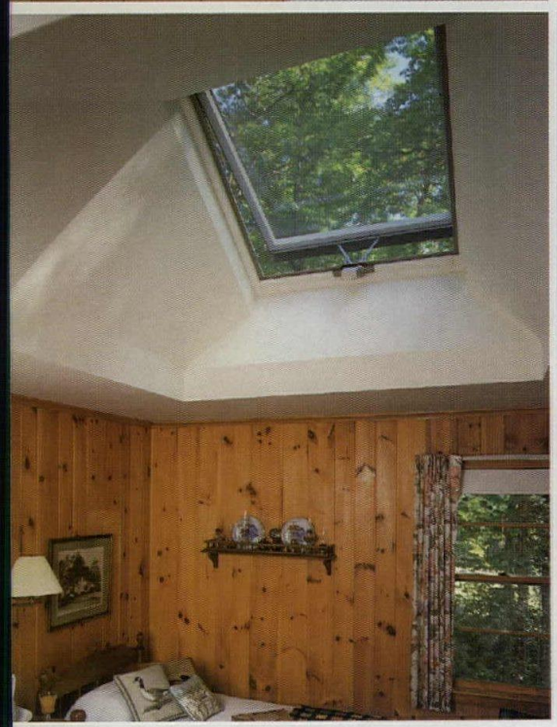
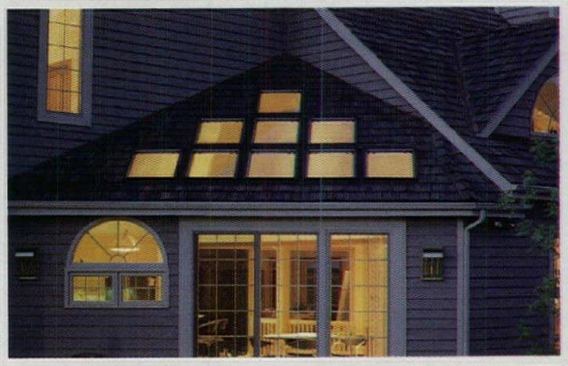
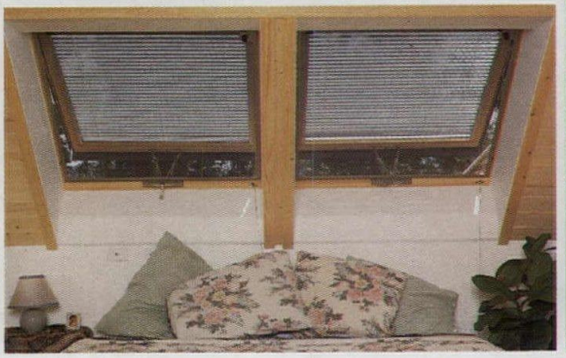
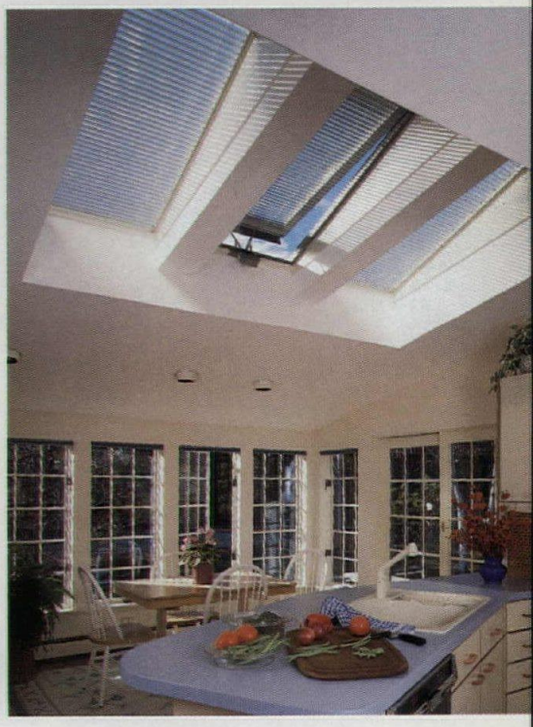

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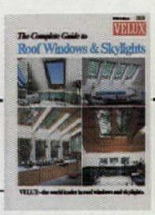

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Editorial: Lifestyles of the Not So Rich But Possibly Famous

Regarding the lifestyles of architects, common stereotypes picture a more unconventional character than sober statistics portray.

Most of us have built up a mental picture of the typical architect's personal life, and P/A's latest Reader Poll (page 63) puts this to the test. The stereotypical architect in my view would be male, middle class in origin, divorced and remarried at least once, something of a workaholic, but owning a boat for hours of escape. He would have an urban townhouse and a country place as well (possibly of his own design); he would drink moderately to excessively, would be a former smoker, and would drive a fine imported car somewhat beyond his means. He would support liberal causes while courting conservative clients. Now admittedly this image, formed over a period of decades, may be a bit dated, but it gets some support – and some contradiction – from this latest Reader Poll.

Those who responded to our poll include, of course, a substantial minority of women (13 percent), and they seem to resist stereotyping. A remarkably high proportion of the women architects that I know – at least half – are married to other architects. Our statistics show, however, only a small minority of architects of either sex having spouses in the same field. The husband-wife firm (which was rejected as a model by 89 percent of readers in a previous poll on women in architecture – P/A, Oct. 1989, p. 15) may be a passing institution that was somehow instrumental in integrating women into the profession over past decades, but is no longer valid. (Still, the long hours and intensity of architecture education and practice must tend to favor interoffice romances.)

It is not clear why architects perceive divorce as common among them, when only 18.6 percent of our poll respondents had been divorced. One reason is that for those over 40, this rate rises to 33 percent. Then, too, it seems that many of the best-known architects are no longer with their first spouses. This seems to jibe with a piece of wisdom I heard in architecture school: that we should not hope to have both a successful marriage and a successful career in architecture. Marital instability is seen as part of the self-sacrifice required for success in this field.

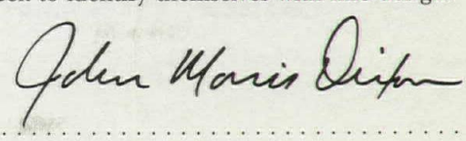
A middle class background – something we did not attempt to measure in our poll – seems almost essential for an architect. This may be an acceptable field for the wealthy (at least for the younger children in wealthy families), and a few well-known examples come to mind (Philip Johnson, I.M. Pei, Graham Gund), but the work habits of architects do not jibe well at all with a patrician lifestyle. Young people from low-income families, on the other hand, tend to be insufficiently informed about architecture to identify it as a career choice; nor are they likely to see it as a reliable means toward security and social status, as are careers in medicine or law. It is, therefore, difficult to recruit future architects from underprivileged minority groups – but that doesn't excuse us from trying.

In starting an architecture firm of one's own, family wealth can be a big help, since the moderate amount of start-up money required is hard to borrow from banks. In this connection, conventional advice from decades past was to marry into a wealthy family. Most of us know of instances where this happened, and it made sense socially; architects had a rather romantic image as potential spouses (but seemed less risky than poets or painters) and were on the whole acceptable to the rich in-laws. To some extent this advice would apply even today, but in this time of later marriages the spouse might be someone who has become affluent on his or her own (e.g. a prosperous lawyer or broker).

This poll confirms my impression that most architects see themselves as liberals. It may be that a group committed through their education to planning things just doesn't trust a *laissez-faire* economic system to meet all needs; and a dedication to Modernism implies a devotion to change, rather than respect for the past. Now that the profession has a substantial body of Neo-Traditionalists again, we can expect to see a more conservative posture from them culturally, if not politically.

One intriguing aspect of this poll is the strong correlation between liberalism and dissatisfaction with one's standard of living. I don't think this is because liberals are inclined to be dissatisfied with their lot, but rather because those architects who reach their desired living standard become, by virtue of that fact, more conservative – dedicated to continuity rather than change.

We still do not know why architects tend to overreach when buying cars – perhaps because this is one of the biggest and most public ways they can demonstrate their superior taste. The Porsche seems to be a large-scaled equivalent of the black-framed glasses, the Mont Blanc pen, and other objects by which architects – in all aspects of their lives – seek to identify themselves with fine design. ■



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Riches in P/A

I sat down with April P/A last night and found so much to enjoy – the angry letter from Berkeley, the good News Report, the well laid-out calendar, Nina Hartung's piece, the case study of the Arizona State Architecture School, the terrific survey of campus plans, Gutman's commentary, and the excerpt from Vitruvius. Thanks for a rich issue!

Barbara M. Walker
Ossining, New York

East/West in Arizona

While I enjoyed your editorial in the April issue [p. 9] on the possibility of an East-West division in design and find your notions intriguing, I believe the real difficulty in acceptance by locals of the Arizona State School of Architecture addition [P/A, April 1990, p. 81] may be rooted in climatology, rather than culture.

I recall that in our courses in architectural history (at Auburn), our instructor, Edward Marty, drilled into us that a critical determinator of form, until the time that environmental technology allowed us to overcome it, has been climate. He illustrated this precept with many examples, but the one I remember with the most frequency and clarity involved Gothic cathedrals.

The Gothic idiom, he told us, originated in Northern France and England, where the skies were frequently overcast and humidity was high, creating a somewhat hazy atmosphere through which we view these structures. For this reason the busy spikiness of the Gothic made sense and was actually needed to give definition to the form through the haze and under dim skies with directionless, weak sunlight, and windows were made as large as technically possible in order to "scoop" in the light.

In contrast, buildings evolving in regions of relatively clear skies and hard, bright sunlight should exhibit an entirely different set of characteristics. There we should expect to find plain wall surfaces finished in light colors, thick walls to give insulation from the heat, and small windows, perhaps deeply recessed, to control the harsh sunlight, all descriptive of what we know as Mediterranean Architecture.

To illustrate, he noted that when the Gothic form in all its glory was transported to the hostile climate of Seville, the results were disastrous, producing a visually swarming, shimmering thing, not unlike a gigantic spider, coming alive and quivering in the hot sunlight.

I believe the Arizona State Building suffers from this same phenomenon, with the fine-scaled gridding of wall surfaces, large windows with prominent muntin patterns, and extended, regular bays. The photo on page 82 seems to illustrate this particularly well, the bell tower on the right clinching the argument.

None of this is to detract from the obvious quality and worth of the building in terms of the given program and the designer's intentions. It is just that an important factor seems to have been overlooked in developing the design.

Frank Orr
Orr/Houk & Associates, Architects
Nashville, Tennessee

Architecture's Social Potential

In [Robert Gutman's] article he proposes that "Architecture is the art of building design" [P/A, April 1990, p. 120]. I disagree: Architecture is the design of space for people. Sometimes that space is within a building, oft-times it is not. When the spaces are wonderful, the architecture is art.

From your definition, you conclude "Architecture cannot produce changes . . . reduce isolation . . . and produce . . . a sense of community." And you are absolutely correct if that was the correct definition. However, since "Architecture is the design of space for people," it must of necessity be ". . . contingent on the social characteristics of the inhabitants . . ." and, therefore will, in fact, if properly designed as spaces, create the "sense of community" you correctly yearn for.

I would refer you to the book "Defensible Space" [Macmillan Company; also P/A, October 1972,

(continued on next page)

(continued from page 9)

p. 93] where the authors study intensely this very issue; concluding that, in fact, properly designed spaces reduce crime, increase self-worth, etc. Once we realize what architecture really is and start teaching it to our young, we will begin to make progress towards our "goals and ideals."

Jerome Morley Larson, Sr., AIA
Red Bank, New Jersey

Prince Charles and His Message

What the Prince and most of us rightfully criticize is the execrable quality of the over-all cityscapes of the late 20th Century. We must realize that all these dreadful buildings are built for others, either by bureaucrats, well-meaning or not, or by developers who have been assured of a desperate demand by the 20th-Century disaster of two world wars, population explosions, and the roller-coaster nature of populist economics.

These conditions have nothing to do with the aesthetic preferences of architects, but they account for the uniquely dreadful aspect and quality of most of our cityscapes. There is no denying that before "building for others" became prevalent during the Industrial Revolution, cities and towns gave the impression of being well-made and harmonious.

In response to this, we have become mad about preservation; no wonder that recent architectural design is nostalgic, sometimes even to the point of silliness. Let us hope that in the future the disasters of our century will no longer play a role, and architects will no longer have to pretend that they can cope with catastrophic events as if they were part of a day's work.

The same people who are the clients and developers also have to be the consumers and users if we want a fundamental improvement in architectural work.

Constantine Vichey, AIA
New York, N.Y.

Architectural "Cloak of Lead"

There are several items in the April 1990 P/A which compel me to comment. The first was the suggestion in the editorial that the Continental Divide is the territorial marker between the East and West. Most Westerners consider the Mississippi River to perform that dubious function.

The second is Christopher Alexander's letter regarding Prince Charles. Having spent eight years off and on as a student in the same building Professor Alexander works in [the School of Environmental Design at the University of California, Berkeley], I and others sympathize with his criticism of architecture professors . . . "creating a subtle and highly repressive atmosphere of esoteric knowledge." We always thought that the guilty party was just insecure due to his or her lack of ideas. Most of the people I respect believe they can see through the more "occult" justifications for designs.

Having said that, I fear Professor Alexander is somehow missing the point regarding the architectural agenda of Prince Charles. While I can understand why someone faced with the anachronistic and preposterous task of being a king in the 21st Century would prefer a reactionary architecture emphasizing historical elitism, I cannot understand why anyone else would consider it to be in their best interests.

Allow me to quote another individual of historical importance from the *Guidelines to Design or Renovate a Church* based upon Vatican Council II. "Sometimes the Church has compelled architects to 'adapt' or 'modify' art forms which were the fresh and valid creations of a once-living culture, long since become extinct. This was wrong." Pope Paul VI in the name of the Church, apologizes to the artists of our time saying: "But in all sincerity and boldness we admit we have caused you pain. This we have done by imposing imitation on you as a first canon – on you who are creators, constantly giving life to a thousand new ideas and innovations. We have this style, it was said to you, and you must adapt to it; we have this tradi-

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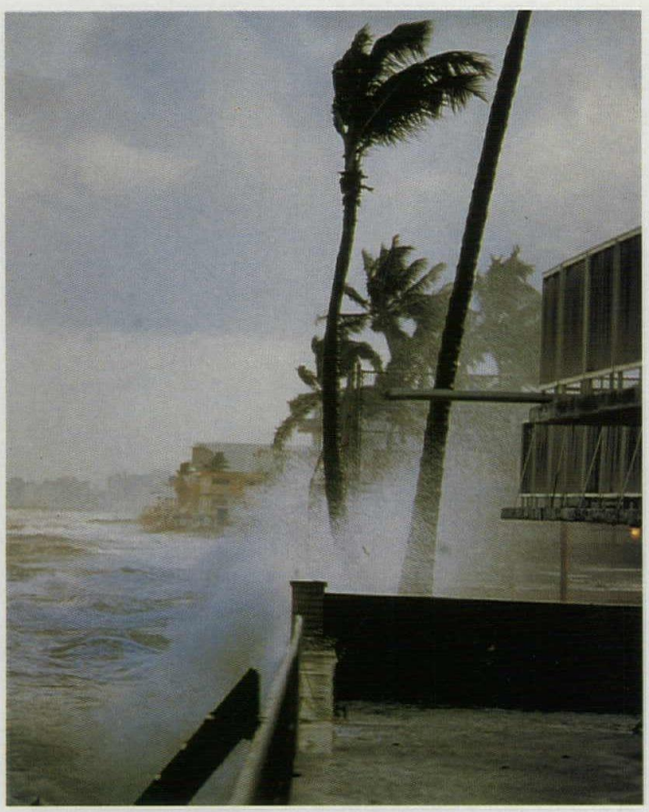

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tion, and you must be faithful to it; we have these masters, and they must be followed; we have these canons, and they cannot be ignored. Forgive us for having sometimes placed upon you a cloak of lead!"

Prince Charles is trying to give us a far heavier "cloak of lead" than any teacher of mine ever did.
Richard Arango, AIA, Principal
Seckinger Arango Architects
Coral Gables, Florida

[Regarding the East-West boundary, Antoine Predock himself had spoken of the Pacific Basin, vs. the Atlantic, so the Continental Divide had a special pertinence. The 100th Meridian is another commonly used boundary. Thanks for the interesting Vatican II quote. – Editor]

The Present and the Future

I, like most I would suspect, was pleasantly shocked by the tone of Christopher Alexander's letter in your April 1990 issue [p. 11].

Although the specific focus of his anger (Tom Fisher's commentary on Prince Charles) surely was not worth his blistering words, the underlying cause of Alexander's wrath is. The cause of his anger, as I see it, is the professional arrogance that inevitably creates a self-serving series of "correct" aesthetic norms. As with any focused, highly educated group there is a tendency to legitimize self-interest with a carefully calculated set of generalizations.

As a group, architects have genuine concerns, but they present them as objective truths rather than propaganda. When we ignore common sense and ethical accountability via the black-box of "taste" we are not being honest. The aesthetic results of blind self-interest are obvious and an easy dog to kick.

Trying to find any collective wisdom in describing the vagaries of aesthetic evolution is inherently problematic. In the mindset of soundbites and 96 cable-ready channels, "Good Taste" becomes so simplistic and transitory that whatever cultural credibility architects once had is waning. You cannot wish away our failings; they house us, and we walk amid and through them every day. On the other hand, to assume the buildings the past gives us were the norm is simply wrong. The surviving structures were most often the best of their time. To cross-reference the mediocrity of most buildings built today against the state-of-the-art survivors of antiquity is simply Luddite wishful thinking.

Most of our grossly insensitive buildings will be plowed under, but how can we limit the window of vulnerability for future generations? Surely the self- serving quality of any professional organization is inherently apologists, so the AIA cannot be expected to be objective. I think P/A and other independent magazines should put more conscientious effort into reflections about our collective sense of aesthetics. Simple journalism is not enough.

Progressive Architecture has been a leader in personalizing this profession. By publishing interviews as well as critiques, photos of the architect as well as of the work, the sense of a design mystique is lessened. So how about an entire issue focused explicitly on the future of architecture? The various perspectives would be fascinating.
Duo Dickinson, Architect
Madison, Connecticut

[P/A published an issue on the Future of Architecture in May, 1977, but, of course, the future is not what it used to be. – Editor]

Campus Credits

The Inquiry article on Campus Infill (P/A, April 1990, pp. 100–107) had an inaccurate credit for the Science and Technology Center at Syracuse University. The architect was Kling-Lindquist, and Koetter, Kim & Associates was the design consultant; Michael Dennis & Associates was also a consultant. For the Carnegie Mellon University project, credit should have read: Michael Dennis, Jeffrey Clarke & Associates in association with TAMS/Architects, Engineers, and Planners.

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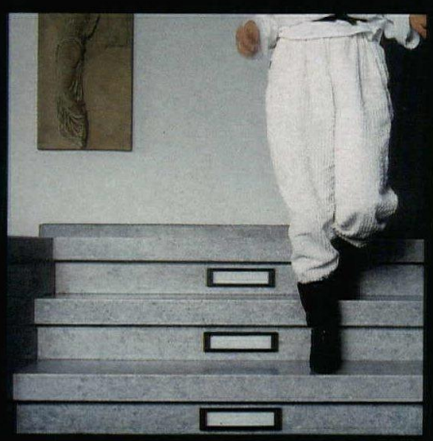

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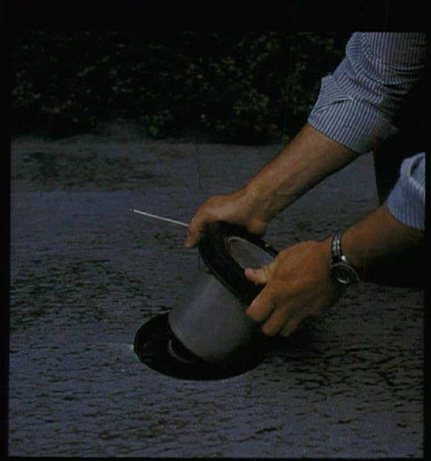

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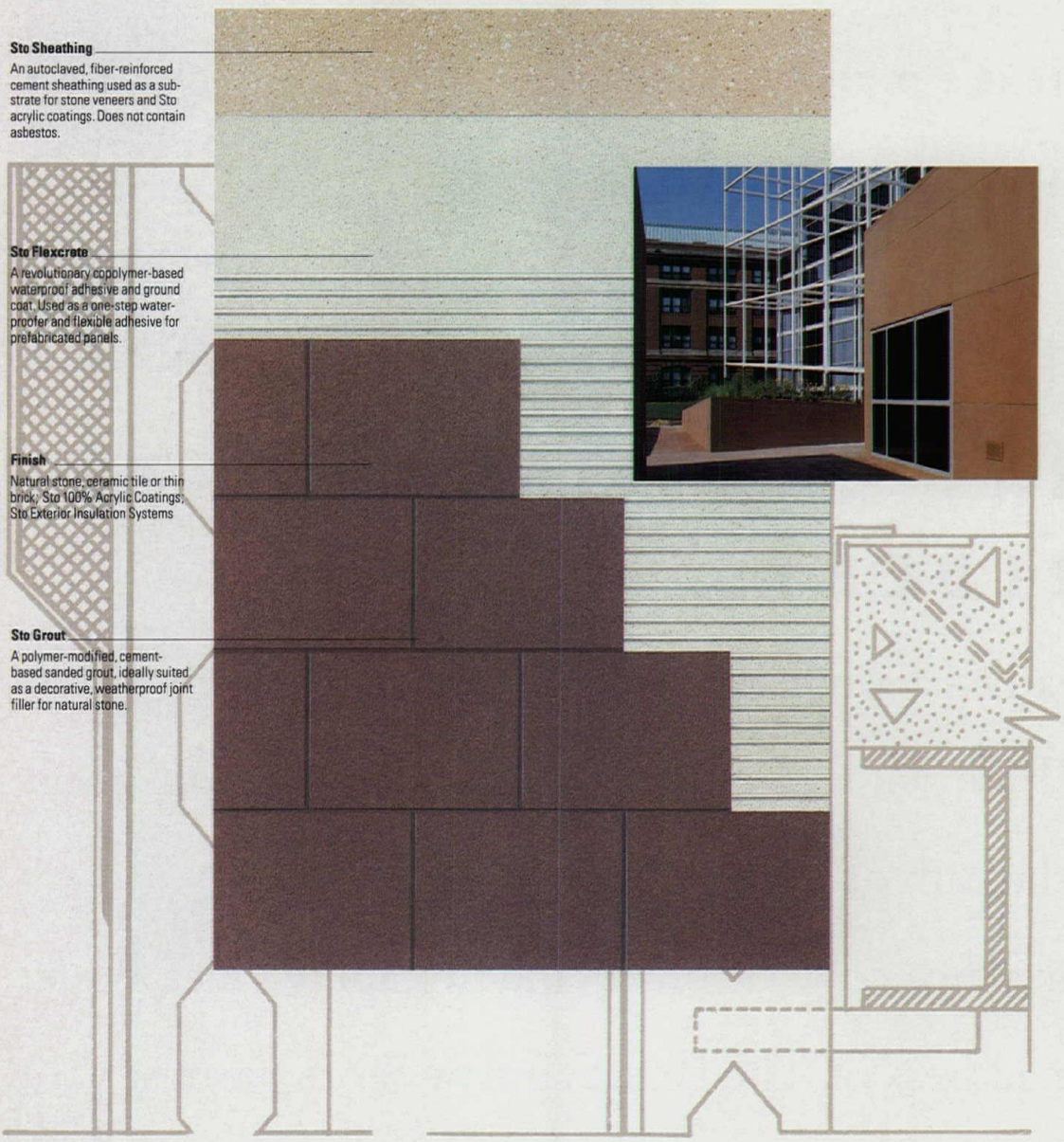

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Progressive Architecture announces its 38th annual P/A Awards program. The purpose of this competition is to recognize and encourage outstanding work in architecture and related environmental design fields before it is executed. **Submissions** are invited in the three general categories of architectural design, urban design, and architectural research. Designations of first award, award, and citation may be made by the invited jury, based on overall excellence and advances in the art.

JURY FOR THE 38TH P/A AWARDS

Architectural Design: *Ralph E. Johnson,* AIA, Senior Vice President and Design Principal, Perkins & Will, Chicago; *Rem Koolhaas,* AA, Principal, Office of Metropolitan Architecture, Rotterdam, and Professor, Technical University, Delft; *Samuel Mockbee,* FAIA, Partner, Mockbee-Coker-Howorth Architects, Jackson, Miss. and Memphis, Tenn., and Adjunct Faculty Member, School of Architecture, Mississippi State University, Jackson; *Adèle Naudé Santos,* AIA, Principal, Adèle Naudé Santos Architect, Philadelphia, and Professor of Architecture and Urban Design, University of Pennsylvania, Philadelphia.

Urban Design: *Eric R. Kuhne,* AIA, Principal, Eric R. Kuhne & Associates, New York, and Adjunct Professor, New Jersey Institute of Technology, Newark; *Dean Macris,* Director of Planning, Department of City Planning, San Francisco.

Research: *Dana Cuff,* Associate Professor of Architecture and Planning, University of Southern California, Los Angeles, and Director, CLEW Associates, Berkeley; *Donald Watson,* FAIA, Principal, Donald Watson, FAIA, New Haven, Conn., and Dean, School of Architecture, Rensselaer Polytechnic Institute, Troy, New York.

Judging will take place during October 1990. Winners will be notified, confidentially, before October 31. Public announcement of winners will be made at a ceremony in New York in January 1991, 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 arrange for coverage of winning entries in national and local media.

Turn page for rules and entry forms.

DEADLINE FOR SUBMISSIONS: SEPTEMBER 5, 1990

Entry form: 38th P/A Awards Program

Please fill out all parts and submit, intact, with each entry (see paragraph 14 of instructions). Copies of this form may be used.

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I certify that the submitted work was done by the parties credited and meets all Eligibility Requirements (1–7). All parties responsible for the work submitted accept the terms of the Publication Agreement (8–9). I understand that any entry that fails to meet Submission Requirements (10–18) may be disqualified. Signer must be authorized to represent those credited.

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Eligibility

1 Architects and other environmental design professionals practicing in the U.S. or Canada may enter one or more submissions. Proposals may be for any location, but work must have been directed and substantially executed in U.S. and/or Canadian offices.
2 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 submitted design must be the one the client intends to execute. (For special provision in Research category only, see Item 6.)
3 Prior publication does not affect eligibility.
4 Architectural design entries may include only buildings and complexes, new or remodeled, that are scheduled to be completed after January 1, 1991. Indicate *schedule* on synopsis page (Item 12).
5 Urban design entries must have been accepted by the client who intends to base actions on them. Explain *implementation plans* on synopsis page (Item 12).
6 Research entries may include only reports accepted by the client for implementation or research studies undertaken by entrant with intention to publish or market results. Explain basis of eligibility on synopsis page (Item 12).
7 The jury's decision to premiate any submission will be contingent on verification by P/A that it meets all eligibility requirements. For this purpose, clients of all entries selected for recognition will be contacted by P/A. P/A reserves final decision on eligibility and accepts no liability in that regard. Please be certain entry meets above rules before submitting.

Publication agreement

8 If the submission should win, the entrant agrees to make available further graphic material as needed by P/A.
9 In the case of architectural design entries, P/A must be granted the first opportunity among architectural magazines for feature publication of any winning project upon completion.

Submission requirements

10 Entries must consist of legibly reproduced graphic material and text adequate to explain proposal, *firmly bound* in binders no larger than 17″ in either dimension (9″ x 11″ preferred). No fold-out sheets; avoid fragile spiral or ring bindings. Unbound material in boxes, sleeves, etc., will *not be considered.*
11 No models, slides, films, or videotapes will be accepted. Original drawings are not required, and P/A will accept no liability for them.
12 Each submission *must include* a one-page synopsis, in English, on the first page inside the binder, identifying the project and location, clarifying eligibility (see Item 4, 5 or 6), and summarizing principal features that merit recognition in this program.
13 To maintain anonymity, no names of entrants or collaborating parties may appear on any part of submission, except on entry forms. Credits may be concealed by any simple means. Do *not* conceal identity and location of projects.
14 Each submission must be accompanied by a signed entry form, to be found on this page. Reproductions of this form are acceptable. All four sections of the form must be filled out, *legibly.* Insert entire form, intact into *unsealed* envelope attached inside back cover of submission.
15 For purposes of jury procedure only, please identify each entry as one of the following: *Education, Houses (Single-family), Housing (Multiple-unit), Commercial, Industrial, Governmental, Cultural, Recreational, Religious, Health, Urban Design, Applied Research.* Mixed-use entries should be classified by the larger function. If unable to classify, enter *Miscellaneous.*
16 Entry fee of $90 must accompany each submission. An early submission fee of $75 per entry will be accepted for entries postmarked August 22 or earlier. (Canadian offices please send drafts in U.S. dollars.) Fee must be inserted into *unsealed* envelope containing entry form (Item 14 above). Make check or money order (no cash, please) payable to *Progressive Architecture.*
17 P/A intends to return entries intact, but can assume no liability for loss or damage.
18 Deadline for sending entries is September 5, 1990. Early submission deadline is August 22 (Item 16). Any prompt method of delivery is acceptable. Entries must show postmark or other evidence of being en route by midnight, September 5 (August 22 for early submissions). Hand-delivered entries must be received at street address shown here, 6th floor reception desk, by 5 p.m. on specified date.

Pointers for submissions

based on recent jurors' observations

- *Document site and surroundings with photos and drawings.*
- *For additions and remodelings, clearly indicate old and new.*
- *If design projects involved substantial research, explain it concisely.*
- *For research entries, indicate applicability to design.*
- *For buildings and urban design, give basics of funding, rental of space, etc., as applicable.*

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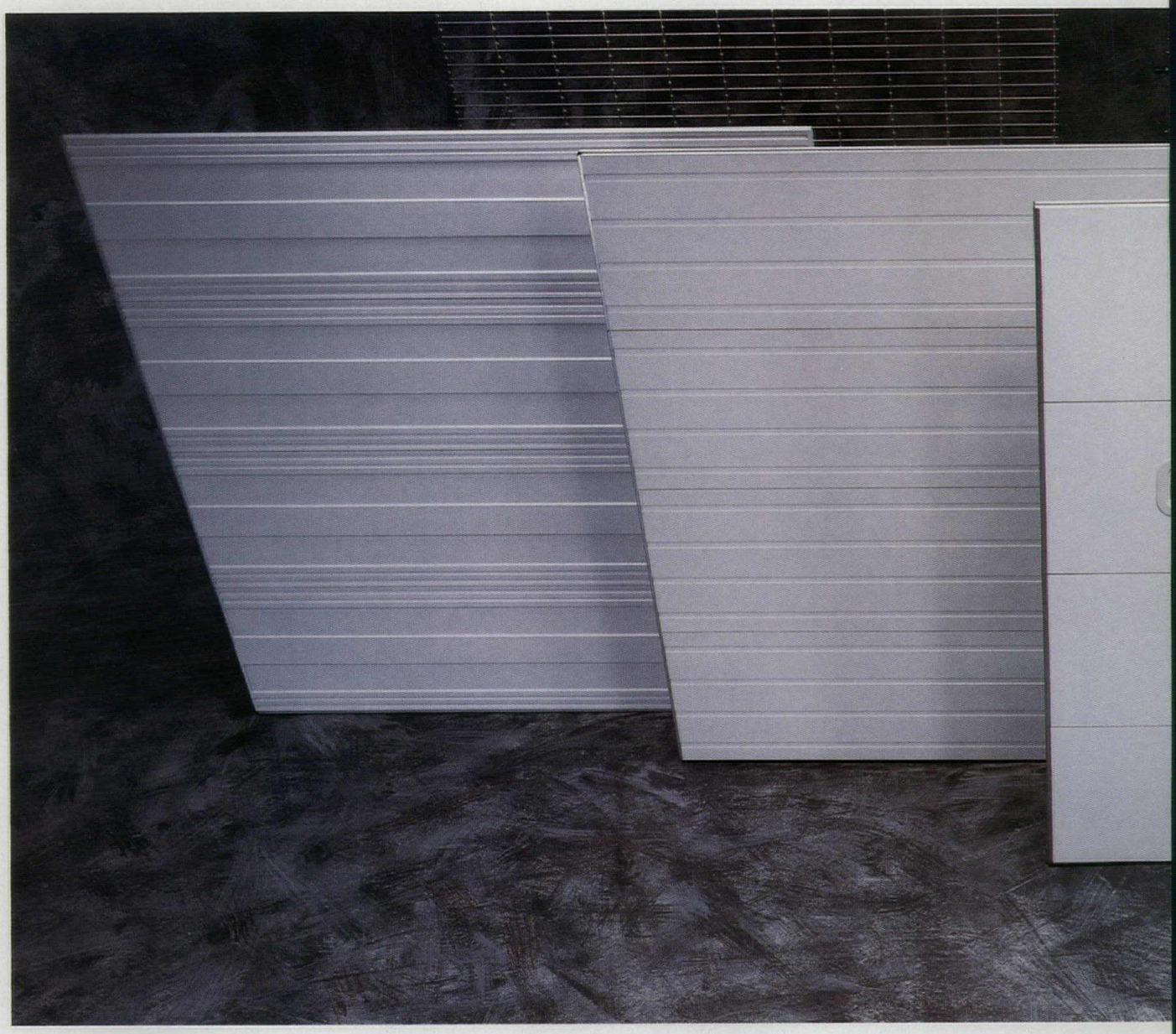

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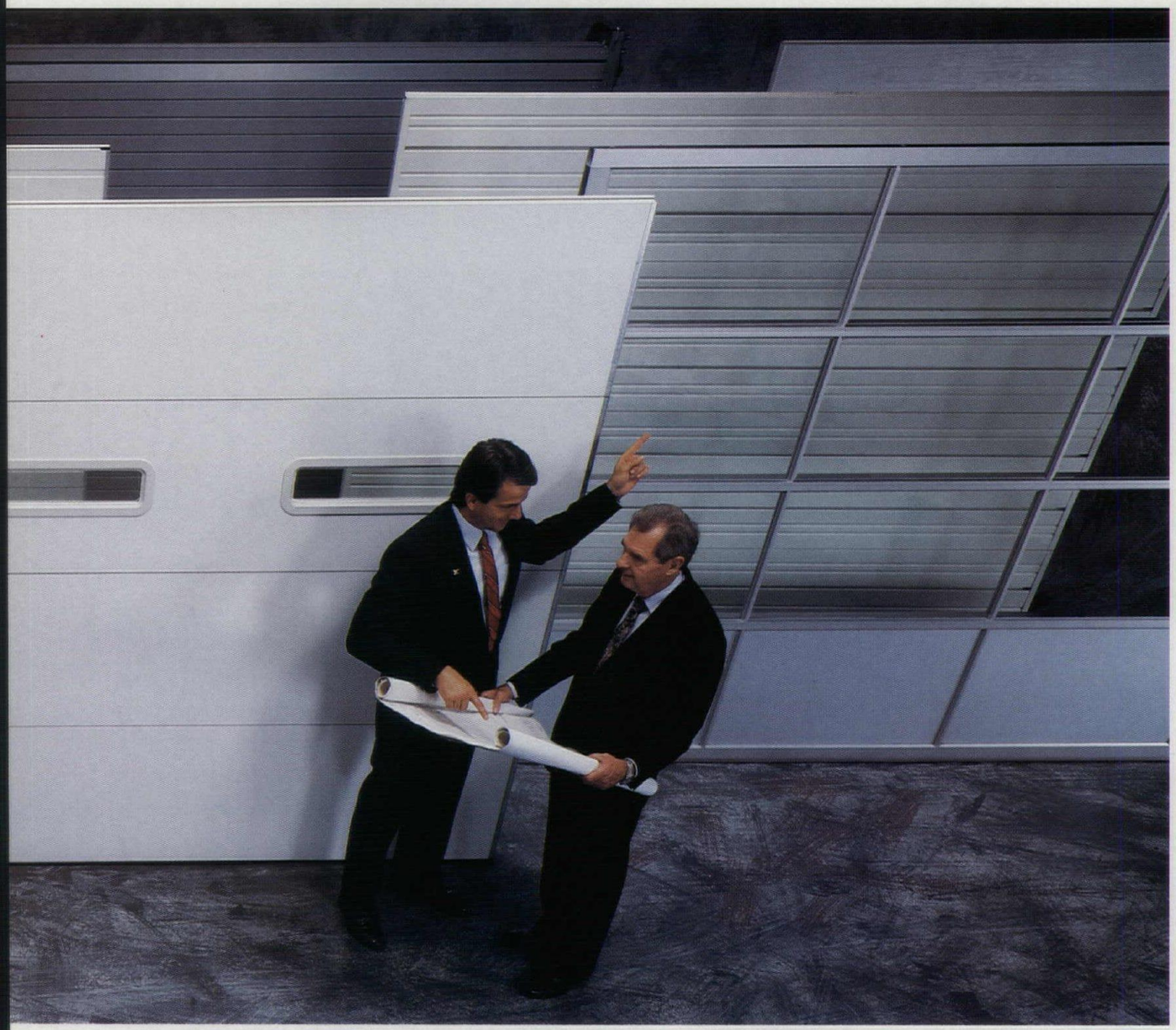

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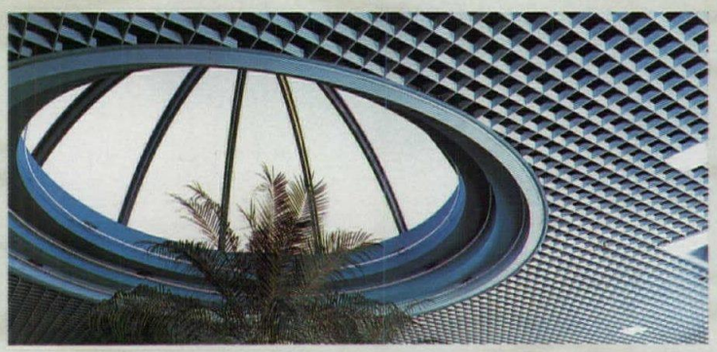

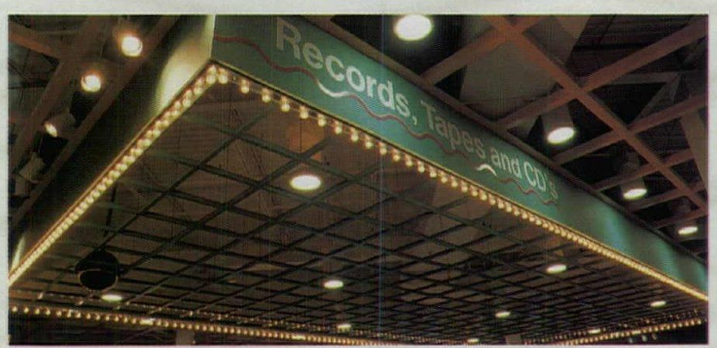

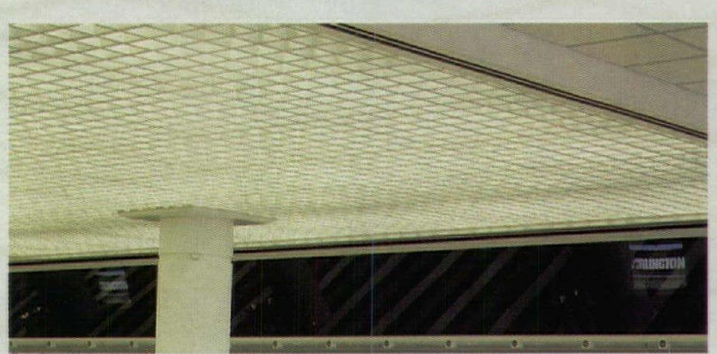

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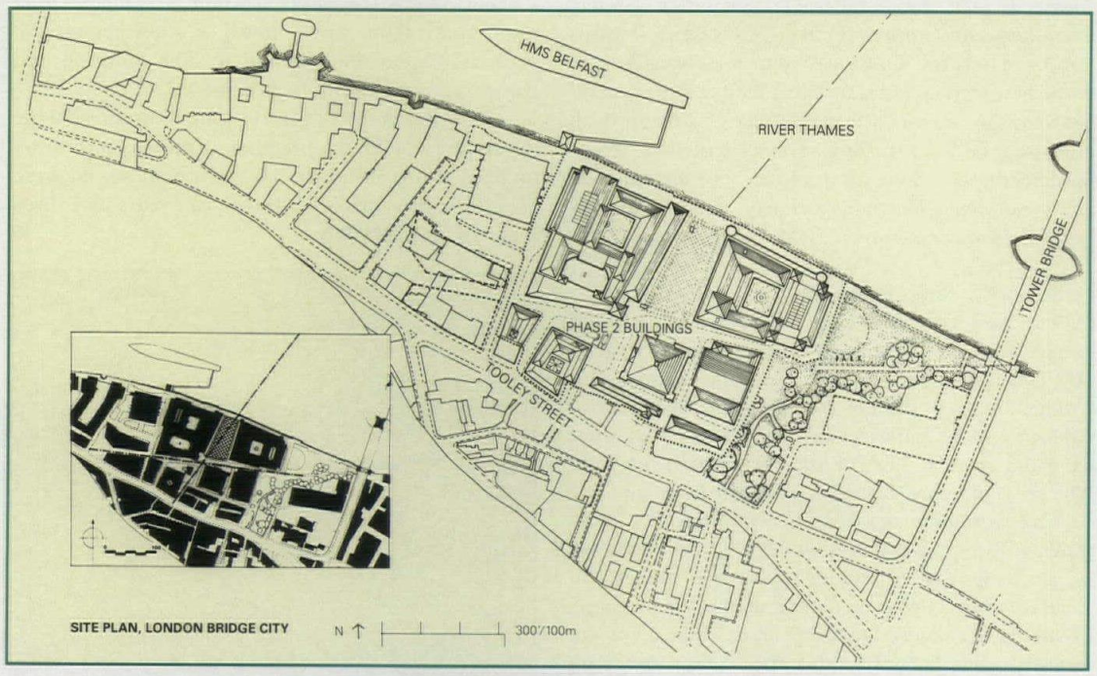


London Bridge City: Venice on the Thames

While blow-by-blow accounts of the battle over Paternoster Square singed many a page in the British architectural press, a less highly publicized – though no less significant – controversy brewed over phase two of London Bridge City, a 1.2-million-square-foot, mixed-use project bankrolled by the St. Martins Property Corporation and the Kuwaiti Investment Office. The proposed development involves a historically sensitive site – riverfront acreage directly south of the Tower of London between London and Tower Bridges – for which schemes were drawn up by John Burgee Architect with Philip Johnson, Michael Twigg Brown & Partners, and John Simpson & Partners. And, as in Paternoster Square, 34-year-old Classicist John Simpson came away with the commission.

The story of the second phase began more than two years ago when St. Martins commissioned Burgee to design a scheme that could hold two or three banking houses, professional offices, and retail space. Burgee's glass-clad Houses of Parliament-inspired design was presented to the London Docklands Development Corporation, a local planning committee, and criticism rang out from a variety of sources.

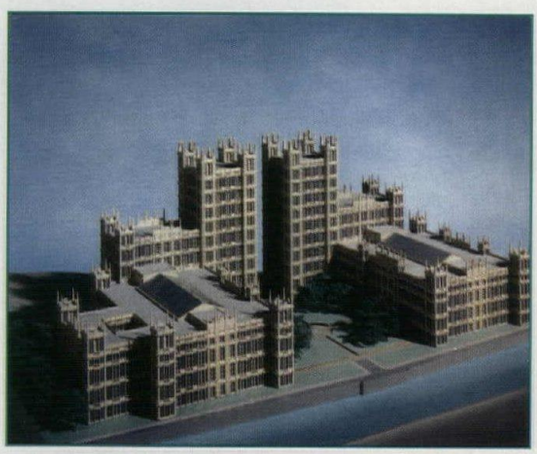
Two public agencies with authority to review and comment on proposals (but no real approval power), the Royal Fine Arts Commission and English Heritage, pressured the LDDC to request reduction in height and bulk; no request was made for aesthetic revision. Modifications were fulfilled and the LDDC approved the design on the second go-round.

Before formal approval could be granted, however, then-Secretary of State for the Environment Nicholas Ridley exercised his power to review all projects involving the built or natural environment. Ridley opened a public inquiry, a process somewhat akin to a courtroom proceeding in the U.S., and appointed an inspector, Michael Parsons, to serve as judge and report his findings to the secretary of state.

Fearful that Burgee's scheme would be turned down and their plans for phase two mired in planning purgatory for years to come, St. Martins asked John Simpson & Partners and Michael Twigg Brown & Partners (a London firm responsible for some of the buildings in phase one and the original guidelines for phase two) to produce alternate schemes for presentation at the inquiry. Simpson proposed his own version of Venice's Piazza San Marco with campanile in tow, and Twigg Brown offered a series of low-rise Modernist buildings. Parsons was thus free to review and accept or reject any of the proposed designs.

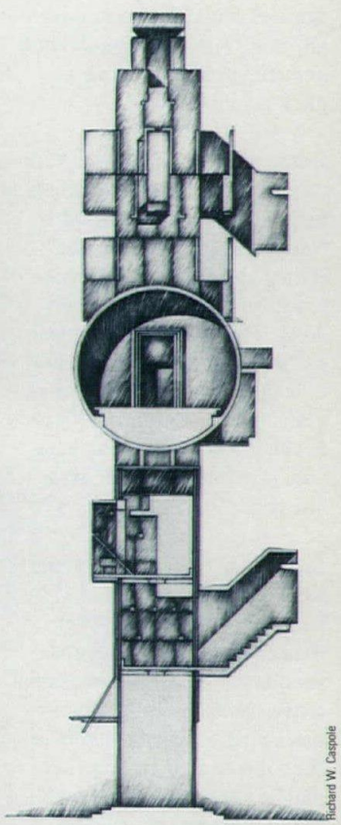
(continued on next page)

Site plan (top) and rendering (above) of Simpson's scheme.



Burgee and Johnson's ill-fated scheme.

This month: features on preservation (pp. 84–105) and preservation news (p. 26).



George Ranalli explores the nature of enclosure in the above project and others. Projects, p. 128.

Ross Miller considers controversial museum additions. Perspectives, p. 124.

Pencil Points

Kohn Pedersen Fox Associates, New York, in collaboration with KressCox Associates, Washington, D.C., and Naegele, Hofmann, Tiedmann, West Germany, has won a competition to design a two-million-square-foot main complex for the World Bank in Washington, D.C. Co-finalists were: Cannon Corporation, Grand Island, New York, with Moriyama & Teshima Architects, Canada, and Dissing + Weitling, Denmark; and Skidmore, Owings & Merrill, Washington, D.C., with Nikken Sekkei, Japan, and Charles Correa, India.

Johnson Fain & Pereira Associates, Los Angeles, has been named architect for a proposed 125-story (or more) mixed-use tower on the Trump-owned Ambassador Hotel site in Los Angeles. The Wilshire Boulevard site is predominantly residential, and Trump's plan is likely to elicit public outcry.

On the shortlist for the New York City police training facility competition are: Ellerbe Becket, New York; Edward Larrabee Barnes/John M.Y. Lee, Architects, New York; Davis Brody Associates, New York; Norman Foster, London; Perkins & Will, Chicago; Venturi & Scott Brown, Philadelphia; and Rafael Viñoly Architect, New York. The complex is slated for a nine-acre site in the Bronx.

Students at the Yale University School of Architecture, in partnership with Habitat For Humanity, are for the second year designing and constructing a two-family house for low-income single-parent families in New Haven as their first-year building project. The program requires students to see the project through completion of framework; the house is completed by students, the future residents, and volunteers.

Also at Yale, architect-alumna Maya Ying Lin has been commissioned to create a monument commemorating the arrival of women undergraduates 20 years ago. Lin designed the Vietnam Memorial in Washington, D.C., and the Civil Rights Memorial in Montgomery, Alabama.

London *(continued from previous page)*

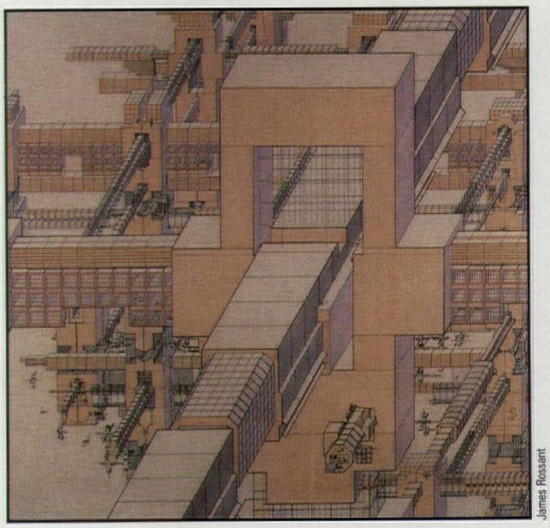
The five-week-long inquiry took place a year after Burgee's plan was first called in; after lawyers examined and cross-examined "witnesses," Parsons approved only the Simpson scheme in a formal report to the new secretary of state Chris Patten. Patten called the Simpson scheme "acceptable," gave it his approval, and suggested St. Martins develop it further before implementation. Soon after approval of the Simpson scheme, *Building Design* magazine quoted St. Martins's deputy managing director, Malcolm Savage: "We would have preferred more flexibility; it's our site. Property developers preferred the Twigg Brown scheme. It was the easier solution, it could be built more quickly and would produce a quicker return. And there's no doubt about it: The Simpson and Burgee designs are more expensive."

As for the project's future, John Simpson says the developer is "taking a breather at the moment to try to reassess [its options]." Reassessment would have been a more valuable endeavor two years and three schemes ago. **Abby Bussel** ■

Rossant's "Cities in the Sky"

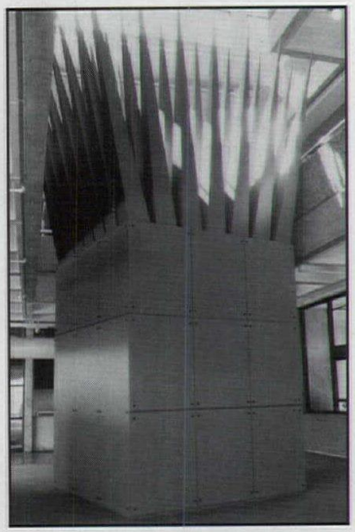
The New York firm Conklin Rossant has realized its share of city designs, including Reston, Virginia (1962) and the new capital of Tanzania, Dodoma. But partner James Rossant is also exploring the nature of cities in a more fantastic way in a series of drawings executed since 1978. The drawings are at the John Nichols Gallery in New York through June 16.

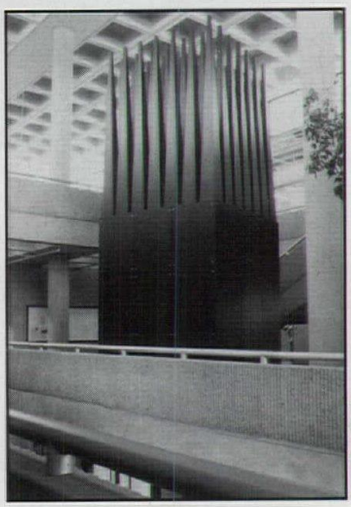
The exhibition is titled "Cities in the Sky," and much of Rossant's exploration deals with the potential of a zero-gravity environment. Grids of linear, enclosed "streets" are a recurring theme, as are large, glass-covered object buildings. But while there are some tangible lessons in this speculation, the work seems to be foremost an avocational exercise and a commentary on the nature of cities today. This is especially true of the oldest drawings, which are full of comic references to historic architecture and Post-Modernism. The intricate work, done in ink on mylar, rewards close scrutiny. **Mark Alden Branch** ■



James Rossant

Detail from one of James Rossant's paper "cities."





Hejduk's "House of the Suicide" (above) and "House of the Suicide's Mother" (right) at Georgia Tech.

Photos: Susan Sanders

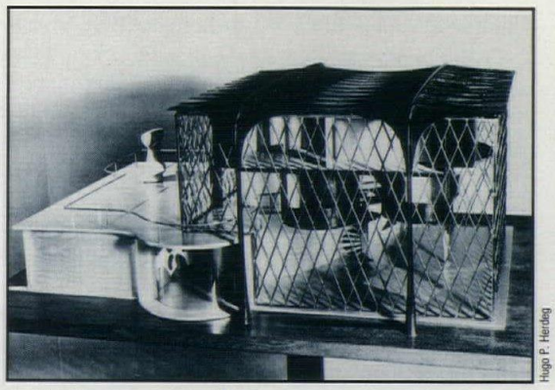
Hejduk Houses at Georgia Tech

The construction of two houses, conceived by John Hejduk, at the Georgia Tech College of Architecture has brought to life one of the powerful narratives from Hejduk's book *Mask of Medusa.* Entitled the "House of the Suicide" and the "House of the Mother of the Suicide," they are disturbing in both form and content. Each is a 9′ x 9′ box with a roof of 49 triangular steel "shards of memory." Built on separate levels within the atrium of the architecture building, the mother (the black box) looks over the son (the gray box) with one slit-like window. The house of the suicide has been sealed shut, while inside that of the mother, tiny points of light enter through pin holes at the tops of the shards, creating a meditative yet not entirely comforting space.

The project, supervised by Professor James Williamson, began four years ago as a means to involve students in the theory and then construction of an important architect's work. With the help of students, Williamson saw to it that the project was constructed precisely to details worked out with Hejduk. A collection of drawings traces the process, which strayed slightly over time from the original narrative.

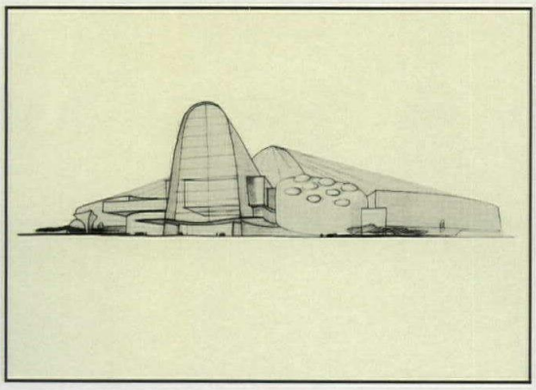
An event marking the completion of the project brought Hejduk, along with poet and critic David Shapiro, to Georgia Tech on April 11. There, Shapiro read his poem entitled, "The Funeral of Jan Palach." Palach, a Czechoslovakian dissident who himself committed suicide during the 1968 uprisings, was an important inspiration for the project. The houses will travel to other temporary homes, bringing both an architectural and a timely humanitarian message. **Claire Downey** ■

The author is a freelance writer living in Atlanta.



Hugo P. Herdeg

Paul Nelson's Suspended House.



Nelson's Palace of Discovery project.

Paul Nelson Exhibit Opens Columbia Gallery

On April 4, Columbia University hosted a double-feature premiere: the opening of a new architecture gallery in Buell Hall on the Morningside Heights campus, and its inaugural exhibit on Paul Nelson (1895–1979). Those who've looked at Modernism in detail have esteemed Nelson, an American architect who spent most of his career in France, for his paintings, projects, and hospitals. Those unfamiliar with his work will turn from the comprehensive exhibit (or its catalogue, *The Filter of Reason: Work of Paul Nelson,* published by Rizzoli and Columbia Books on Architecture) with a broadened perspective on Modernism.

Two particularly strong projects, the Suspended House (1936–1938) and the Palace of Discovery (1938, in collaboration with Oskar Nitzchke and Frantz Jourdain) affirm the Modernist credo that the creative genius can generate compelling new architectural forms. A model of the house, on loan from MoMA, features a continuous steel column and roof system with suspended rooms set in a latticed cube of metal and glass. The Palace of Discovery, a proposed "people's university" of science, has a tall, conic hall linked by tension cables to a circular roof that covers an open-plan exhibit area.

The precursors to these startlingly creative projects were the paintings and sculpture of Braque, Leger, Giacometti, and Calder, with whom Nelson fraternized. Auguste Perret, Le Corbusier, and Buckminster Fuller were familiar to Nelson, but it appears that sculpture was his personal inspiration (his paintings of the 1930s, included in the show, show a strong sense of space). Le Corbusier prefigured his layered buildings in his Purist paintings; Nelson's architecture, on the other hand, is organized by organic forms that are not embedded in a collage but remain distinct. They are sculptural volumes that become architectural spaces – from operating rooms in a hospital to vast exhibit halls.

Terence Riley, a New York architect, curated the show in collaboration with Joseph Abram, a painter and architect from Nancy, France, and Kenneth Frampton, a professor at the Columbia Graduate School of Architecture, Planning, and Preservation. The exhibition will travel to the Graham Foundation in Chicago and the Canadian Centre for Architecture in Montréal. The university held a symposium entitled "Machine/Body" on April 6 and 7, to discuss the milieu that surrounded Nelson in the 1930s and 1940s.

In the months to come, Buell Hall will feature more large exhibitions in its 2200 square feet of gallery space, with occasional conferences and shows on young designers and architectural photographers. Older than its surrounding buildings (it was built in 1876), Buell is unpretentious, with rooms that won't overwhelm the work on display. Expanded ventures in publishing are also underway at Columbia, which is consolidating its position as a center of architectural theory and history. **Philip Arcidi** ■

San Francisco Freeway Quandary

On April 16, San Francisco's Board of Supervisors voted 6-to-5 to demolish the Embarcadero Freeway, which cracked in the October 17 earthquake, if a suitable replacement can be built with federal funds. This vote gives mayor Art Agnos until August to pursue funding for two alternatives: a suppressed freeway or a surface-level road. The first would cost about $120 million; the second, proposed by the Northern California AIA Urban Design Committee, about $41 million. CALTRANS, the state transportation agency, estimates $32 million to retrofit the existing freeway.

Predictably, strong support for removing the freeway is countered by fierce opposition. Although many agree that the city's waterfront would be more civilized and glamorous without the double-decker structure, the merchants in North Beach and Chinatown, who claim they will be out of business if the freeway remains inoperative for a period of years, just want it fixed – fast.

Supporters of removal say that the city's economic future would be brighter if the mile of waterfront from the Ferry Building north to Washington Street were cleared of its concrete barrier. Darker questions have also been raised within the engineering community about the safety of even a much stronger double-decker structure when the "Big One" hits, because of soil conditions along the Embarcadero. The AIA Urban Design Committee supports a surface-level road because they believe it is unlikely that funding will permit a suppressed freeway. There is concern, though, that a surface level road would not carry enough traffic.

Whatever lies ahead, it is certain that no aesthetic gain will come from retaining the present freeway. Pulitzer Prize-winning critic Alan Temko's impassioned plea in the *San Francisco Chronicle* to "tear the monster down" revealed that the remedial work planned by the engineering firm of T.Y. Lin International would encase the columns in bands of steel covered by a layer of concrete, increasing their girth by a foot in every direction. Wrote Temko, "Deprived of the sun, the waterfront would be an even colder and more forbidding place than it is today because the patched and thickened freeway would set an all-time record for ugliness." **Sally Woodbridge** ■

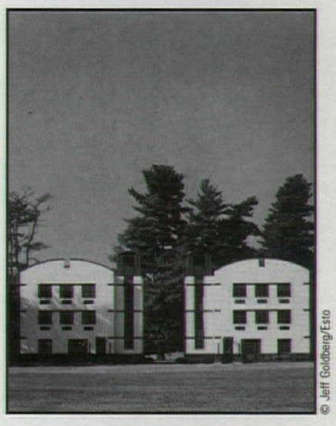
Concrete Masonry Design Awards

Seven architecture firms were honored on May 22 at the AIA convention with the first Concrete Masonry Design Awards of Excellence. The program, sponsored by the National Concrete Masonry Association and the AIA, recognizes "the innovative use of concrete masonry products." The winning architects and projects are:

- Bowie Gridley Architects, Washington, D.C., for the Fairview Park Marketing Center, Falls Church, Virginia;
- Hornberger, Worstell & Associates, San Francisco, for the Hyatt Regency Hotel, Scottsdale, Arizona;
- James Stewart Polshek & Partners, New York, for the Bard College Alumni House, Annandale-on-Hudson, New York;
- Pappageorge Haymes, Ltd., Chicago, for Larrabee Com-

(continued on next page)

R. Greg Hursley



© Jeff Goldberg/Esto

Stephen Fridge

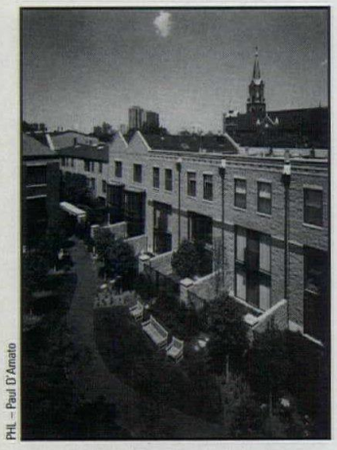
Lookout Mountain School (top), Bard College Alumni Houses (middle), and Hyatt Regency Scottsdale (bottom), Concrete Masonry Design Award winners.

Concrete Awards *(cont. from page 25)*

mons luxury housing, Chicago;

- Rey de la Reza Architects, Houston, for Little Cedar Bayou Park, LaPorte, Texas;
- RNL Design/Anderson Mason Dale, Denver, for Lookout Mountain School, Golden, Colorado;
- Wolff/Lang/Christopher Architects, Rancho Cucamonga, California, for the Upland Police Facility, Upland, California.

The jury that chose the winners from 197 entries was chaired by Gerald Horn of Holabird & Root Architects, Chicago, and included Edward M. Tower of Tower Architects, San Francisco, and Graham Davidson of Hartman Cox Architects, Washington, D.C. Winners received a concrete sculpture designed by Susan Jacobs Lockhart of Taliesin Associated Architects. ■

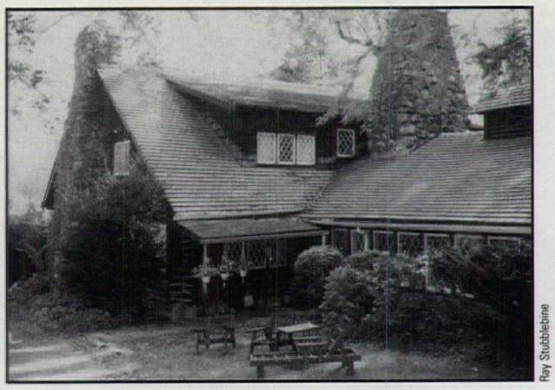


PHL – Paul D'Amato

Fred Daly

Tom Fox

Concrete Masonry Award winners: Larrabee Commons (top), Upland Police Facility (middle), and Little Cedar Bayou Park (bottom).



Ray Stubblebine

Main house at Stickley's Craftsman Farms.

Preservation: Stickley's Craftsman Farms

Gustav Stickley's Craftsman Farms in Parsippany, New Jersey, designed in 1907 as both a home for the Stickley family and an active community for practitioners of the Arts and Crafts style, now sits bucolically on 27 of its original 600 acres awaiting restoration and rehabilitation as the Center for the Study of the American Arts and Crafts Movement.

The preservation program currently underway has been the result of an unusual relationship between a private organization, the Craftsman Farms Foundation, and a public entity, the Township of Parsippany-Troy Hills. The two came together spurred by a developer's proposal to make the farm into a centerpiece for a 54-unit condominium complex by Robert A.M. Stern. Unenticed by the notion of more housing in their town and realizing the significance of Craftsman Farms, the town requested funding from Green Acres Monies – a state program for the preservation of open land and historic structures. The Craftsman Farms Foundation was established in January 1989, and by September, through a combination of Green Acres and local funds, the township bought 27 acres and 6 of 11 original structures from the Farny family, owners of the farm since Stickley's bankruptcy in 1917.

The main house, three cottages, a workshop, a 19th-Century farm building, and the grounds are now maintained by the town, while the foundation is responsible for raising funds for research, restoration, and the scheduling of programs. While "restoration is the first priority," according to chairman Elaine Hirschl Ellis ($750,000 must be raised to complete the necessary work), the foundation also hopes to create a program of lectures, exhibitions, and arts and crafts workshops. A new building proposed for the farm, out of view of the main house, would hold a small auditorium, climate-controlled space for archives, and a collection of furniture and artifacts not appropriate for the house.

Rather than render the house and its contents precious, enshrined behind ropes and signs reading "Do Not Touch," the foundation hopes to retain the utilitarian philosophy of the Arts and Crafts Movement by allowing visitors a restrained form of free rein. "The last thing we want to see happen is to have the main house be hermetically sealed," says foundation president Robert Guter.

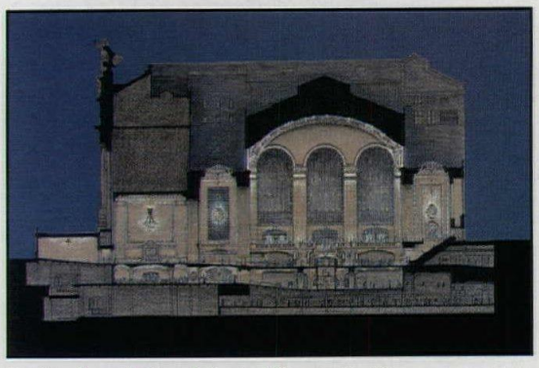
If all proceeds according to plan, the restoration of Craftsman Farms will serve as a valuable model of historic preservation as a collaboration of public and private efforts and help to enhance the legacy of the American Arts and Crafts Movement. The farm will be open to the public spring through fall on a "regular but limited" basis and by appointment. **Abby Bussel** ■

Preservation: Grand Central Restoration

In recent years, waiting at New York's Grand Central Terminal has not been entirely pleasant; its vast, vaulted concourse still invokes awe, but the building's integrity has suffered indignities and disrepair on the smaller scale. In a decade, if redevelopment plans spearheaded by the New York architects Beyer Blinder Belle proceed as planned, it may become a hub of stores and restaurants, as well as commuter trains. They envision the restored station (a registered landmark built in 1913 to the designs of Reed & Stem and Warren & Wetmore) as a pedestrian focal point for New York, an enclosed counterpart to the urban plazas typical of Europe.

John Belle proposes that the consortium's changes at Grand Central will restore the civic stature the terminal once had. A ramp leading to the lower lobby will be uncovered, the waiting area on the Vanderbilt Avenue side will be expanded, and a new glazed arcade will rise on Lexington Avenue. The upper and lower lobbies of the terminal will be better synthesized; their perimeters will be restructured to provide more room for restaurants, stores, two cinemas, and a large space for receptions and performances. Ultimately, the mezzanine will encircle the main concourse on three sides.

The architects said that they have no direct prototype for their rehabilitation program, other than the terminal itself – it is a paradigm among multifunctional structures and more nearly "a city within a city" than most buildings. The renovation initiative is testimony to the terminal's durability as a city landmark – as both a work of architecture and a public forum.



Section through Grand Central Terminal with concourse at right of center.

The project, a joint effort that includes Harry Weese & Associates, the engineers STV/Seelye Stevenson Value & Knecht, Vignelli Associates Design, and the lighting consultants Jules Fisher/Paul Marantz, will upgrade railroad services and infrastructure, restore the concourse ceiling, and remove advertisements (such as the illuminated Kodak mural) and insensitive alterations that have compromised the interior. There is not yet a concerted plan to offer the terminal's numerous homeless people alternative shelter and support, but the architects acknowledged that the homeless will have to be accommodated, both for their sake and the success of the rehabilitated terminal. The entire package will cost $400 million, to be generated from public and private sources, as well as returns from retail tenants. **Philip Arcidi** ■

(News Report continued on page 28)

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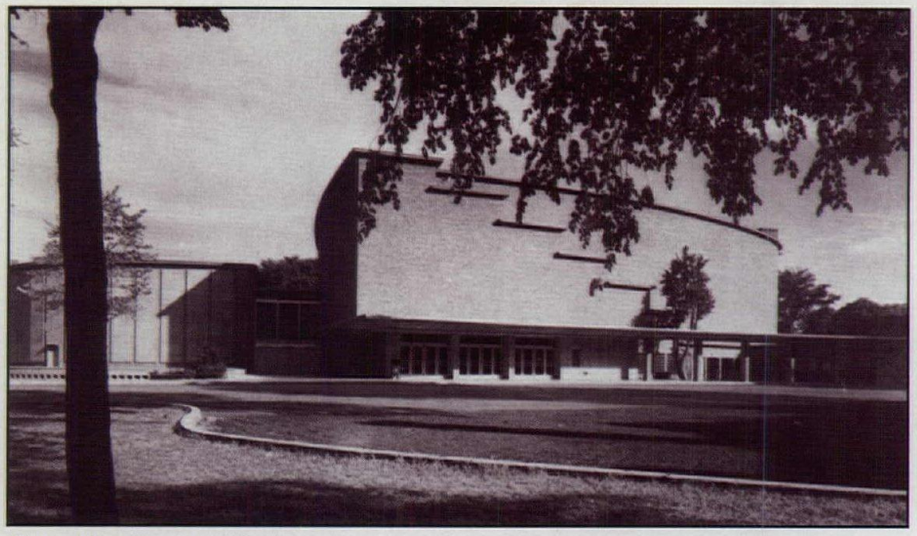


Eliel and Eero Saarinen's Kleinhans Music Hall (1940), to be restored.

Preservation: The Saarinens in Buffalo

In celebration of the 50th anniversary of the Kleinhans Music Hall in Buffalo, New York, Buffalo State College's Burchfield Center recently sponsored an exhibition "Kleinhans Music Hall: The Saarinens in Buffalo, 1940 – A Streamline Vision." The show, curated by Buffalo architect Theodore Lownie of Hamilton Houston Lownie, Architects, traces the development of the building and attempts to place it in the careers of Eliel and Eero Saarinen.

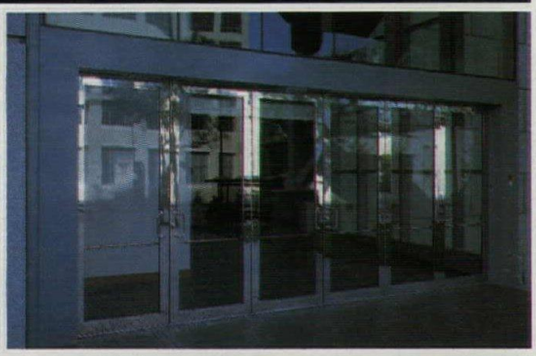
The exhibition and opening symposium were intended to direct attention to a proposed $12-million restoration and rehabilitation of the hall. In the show, a display of designs by local architects from the years 1935–1938 contrasts with the Saarinens' innovative invited entry. Knowledge of the Saarinens is enhanced by a section illustrating the arts and crafts philosophy embraced at Cranbrook. The exhibition concludes with a presentation of final plans, photographs, and examples of hall furniture that further demonstrate the idea of Kleinhans being a synthesis combining Eliel's principles of craftsmanship with Eero and Charles Eames's emerging Modernist aesthetic.

The symposium, held on March 10, expounded the significance of the Kleinhans Music Hall commission. Peter Papademetriou, Professor of Architecture at New Jersey Institute of Technology and P/A Correspondent, delivered the keynote address "Eero Saarinen and the 'Search for Form.'" Papademetriou's findings, further articulated in his essay, "In Search of a Modern American Architecture: The Saarinens After Cranbrook," for the show's catalog, noted the development of Eero's career, including previously unknown work in Finland in the mid-1930s. Ronald Beckman, Associate Professor at Cornell University, spoke of the innovative seating design developed by Eero Saarinen and Charles Eames for the hall's Mary Seaton Room. In addition, Susan Turner, Director of the feasibility study, placed the hall in its local historical context. The hall, home of the Buffalo Philharmonic Orchestra, received National Historic Landmark status in 1989. The intent of the exhibition is to further raise appreciation for the architectural achievement of the building and its value as a civic and cultural center for Buffalo. **Mathew Ginal** ■

The author is a student at the University of Buffalo.

(News Report continued on page 30)

the Classics



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Public space in proposed redevelopment of Houston's Fourth Ward.

Preservation: Flap Over Houston Historic District

In Houston, black community activists and preservationists are facing off against big developers in a dispute over the future of nearly a square mile of land at the western edge of downtown targeted for new middle-class housing. Proponents say their plan would bring growth (and needed tax revenues) back from the suburbs and save Houston's downtown. Critics charge that the plan will kill the remnants of a once-thriving black neighborhood and destroy some of the city's most important historic fabric.

On one side are Cullen Center and American General Inc., two of the biggest Houston players in real estate and insurance; along with Ayrshire Development they want to acquire and redevelop the 600 acres known as Freedmen's Town/Fourth Ward, founded in the 1860s by ex-slaves and the center of black Houston through the 1940s. The area became a national historic district in 1984. In recent decades the area has become one of the city's most blighted. The city's housing department also stopped maintaining the adjacent Allen Parkway Village, a 1000-unit 1930s-progressive public housing complex (also a national historic district).

Plans for Founders Park, as t
area, propose clearing away Al
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In their place, the developers wou
units of new housing, 440,000 sq
space, and 1.3 million square feet o
concepts were developed by Houste
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Making the project commercially r
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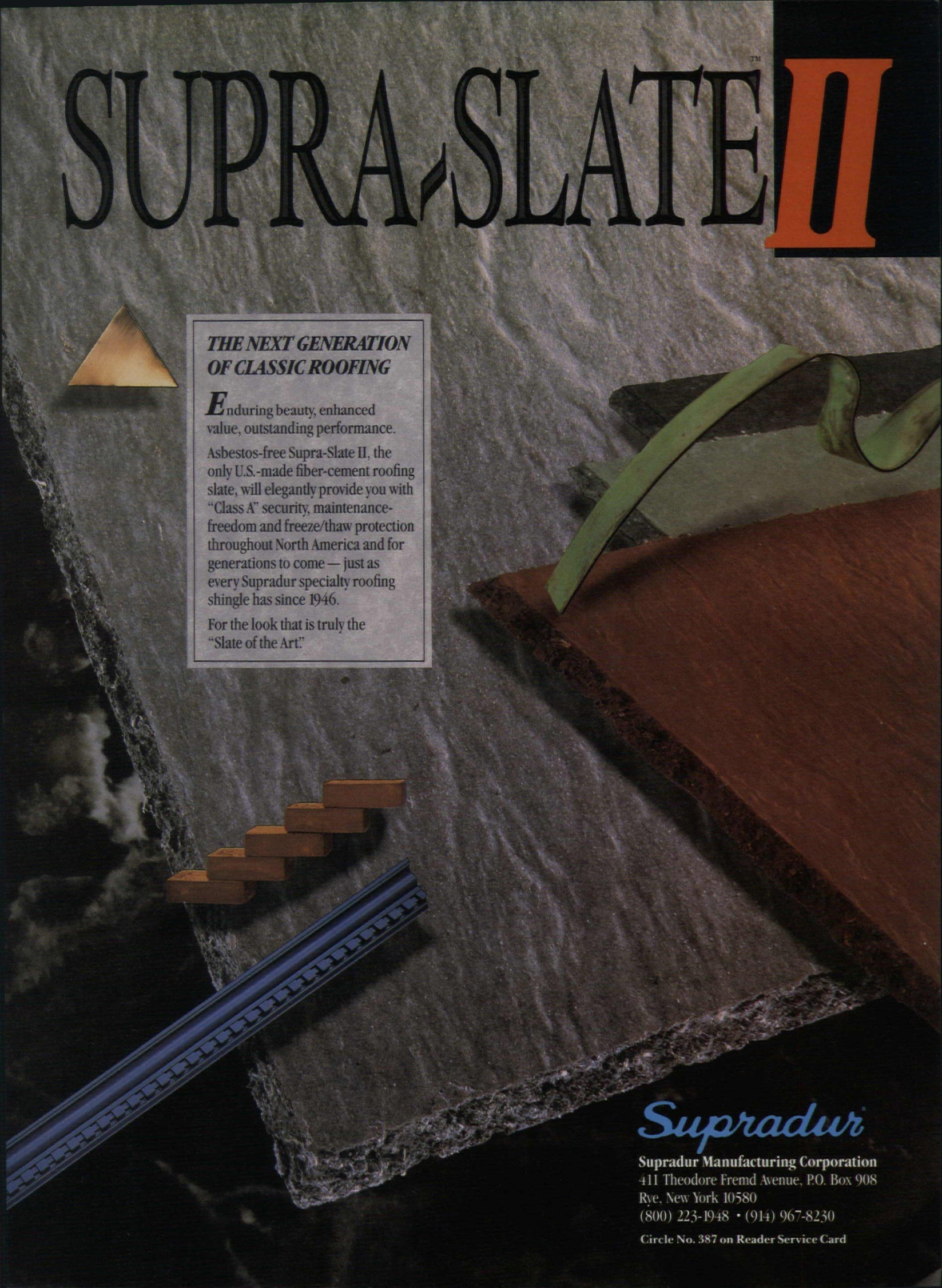
things that might scare off middle-cla
the existing public housing and most
5000 inhabitants – have to be moved.
for the city's help in creating a special t
finance the area's infrastructure, the de
they will dedicate a third of the revenue g
the district (estimated at $120 million) to cr
units of public housing; 200 would be in
Park, the rest "scattered-site" housing in ot
borhoods.

"Instead of a top-down mega-plan, we ne
thing that supports what is already in place,"
chitectural historian Nia Dorian Becnel. "Bot
are national historic districts, and you ca
bulldoze them." She adds that the community
redevelopment plan will be ready by July.

Joel Warren Barna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Calendar

Exhibitions

Architecture As Art
Through June 30

New York. Renderings and drawings by New York area firms, including Beyer Blinder Belle, Fox & Fowle, and James Stewart Polshek, are on view. Michael Ingbar Gallery.

IN-TER-VENTIONS
Through July 14

San Francisco. "In transcending traditional distinctions between architecture and sculpture, the exhibitors [artists Dennis Adams and Andrea Blum and architects Ken Kaplan and Ted Krueger] challenge viewers to question their assumptions about modern cities." 2AES.

Richard J. Bertman
Through July 29

Cambridge. Works by Boston architect and sculptor Richard J. Bertman are on view. The Massachusetts Institute of Technology Museum.

Airport Architecture
Through September 2

Montréal. Hangars, terminals, and circulation and runway systems designed between 1928 and 1930 echoed and responded to early aviation technology. Works by Le Corbusier, Ernest Cormier, and Lloyd Wright are exhibited. Canadian Centre for Architecture.

NYC/AIA Design Awards
Through September 2

New York. "New York Architecture: 1990 NYC/AIA Design Awards" is a presentation of works honored in the chapter's annual awards program. National Academy of Design.

New American Furniture
Through September 3

Washington, D.C. Twenty-six American furniture makers were asked to design and build pieces that "reinterpret and combine [traditional] forms, decorative elements, or construction technologies." The show originated at the Museum of Fine Arts, Boston. Renwick Gallery, Smithsonian Institution.

Architecture of IBM
Through September 30

Washington, D.C. "IBM: Excellence in Building" (P/A, May 1990, p. 26) documents architectural and landscape design of the company's corporate facilities from the 1950s to the present. National Building Museum.

Bank Architecture
Through September 30

Washington, D.C. "Money Matters: A Critical Look at Bank Architecture," from Houston's Museum of Fine Arts, is a photographic survey of Canadian and U.S. bank architecture from the 1790s to the present. National Building Museum.

Ernest Cormier
Through October 14

Montréal. An exhibition of sketches and drawings analyzes Cormier's designs for the Université de Montréal in the context of his other works and as an influential force in the design of university architecture both domestically and abroad. Canadian Centre for Architecture.

The Doghouse
June 8–October 14

New York. The Cooper-Hewitt, in collaboration with Eyes for the Blind, invited architects and designers to submit proposals for doghouse designs for exhibition in the museum's garden; 24 realized schemes will be on display. Braille labels, large-type signage and brochures, and specially designed paths are planned in an effort to make the show accessible to sight-impaired visitors. Cooper-Hewitt Museum.

Visionary San Francisco
June 14–August 26

San Francisco. Utopian plans – both built and unrealized – for San Francisco from the turn of the century to the present are supplemented by four commissioned "visionary" plans by teams of architects and writers. Museum of Modern Art.

Constructivist Architecture
June 28–September 4

New York. Over 150 original works on loan from the Shschusev Architecture Museum in Moscow, shown for the first time in the United States, will offer a look at one of the richest collections of Constructivist projects from the 1920s. Museum of Modern Art.

Competitions

Great American Home Awards
Submission deadline June 30

Washington. Exterior or interior rehabilitation, sympathetic additions, and bed & breakfast inns are the four categories for nomination in an

(continued on page 34)

Calendar *(continued from page 33)*

awards program for restoration of old and historic houses sponsored by the National Trust for Historic Preservation and *Historic Preservation* magazine. Contact Home Renovation Awards, % National Trust, 1785 Massachusetts Avenue, N.W., Washington, D.C. 20036 (enclose a self-addressed stamped envelope).

Arnold W. Brunner Grant
Proposal deadline July 2

New York. Submission of proposals for the $12,000 Brunner Grant, sponsored by the New York Chapter of the AIA, may be in any area of "architectural investigation which will effectively contribute to the knowledge, teaching, or practice of the art and science of architecture." The investigation should result in a written work, design project, research paper, or other form of presentation. U.S. citizens "engaged in the profession of architecture . . . or related fields" are eligible. Contact New York Chapter/AIA, 457 Madison Avenue, New York 10022 (212) 838-9670.

Postal Facility Design
Entry deadline July 2

Washington, D.C. The U.S. Postal Service, in cooperation with the Design Arts program of the National Endowment for the Arts, has made a call for projects or programs completed between January 1, 1980 and January 1, 1990, that "reflect outstanding achievement in the design, construction, renovation, or preservation of Postal Service facilities." Contact National Honor Awards, office of Design and Construction, Facilities Department, U.S. Postal Service, 475 L'Enfant Plaza, S.W., Washington, D.C. 20260 (202) 268-3899.

Balboa Park
Registration deadline July 6

San Diego. Teams of architects, landscape architects, and visual artists are invited by the City of San Diego to submit design concepts or samples of previous work in a two-stage competition for the design of a pedestrian plaza and 1000- to 1500-vehicle parking garage in Balboa Park. Five finalist teams will receive $25,000 honoraria; the winning team will be commissioned to design the facility. Contact Competition Registrar, Park and Recreation Department, Conference Building, M.S. 37, Balboa Park, San Diego 92101 (619) 236-5726.

21st Century Landscapes
Submission deadline July 7

Washington, D.C. *Landscape Architecture* magazine has made a call for unbuilt projects – speculative, abandoned, and to-be-built schemes are eligible – in an effort to stress "the need for critical design thinking and exploration in landscape architecture." Anyone may enter. Contact *Landscape Architecture,* Department UL, 4401 Connecticut Avenue, N.W., Washington, D.C. 20008.

Southern Home Awards
Entry deadline July 31

Birmingham, Alabama. *Southern Living®* magazine has announced a call for entries in its 1991 residential design awards program. Winning entries will be published in the May 1991 issue. Contact *Southern Living®*, Box 523, Birmingham, Alabama 35201 (800) 292-8667 ext 6359 (enclose a self-addressed, stamped envelope).

World Habitat Awards
Entry deadline July 31

Leicestershire, England. Entries in the two-stage international competition sponsored by Britain's Building and Social Housing Foundation are asked to submit housing projects that offer practical and human solutions to current housing problems worldwide. Contact Peter Elderfield, Building 4, Social Housing Foundation, Memorial Square, Coalville, Leicestershire LE6 4EU (530) 510444 or FAX (530) 510332.

Fulbright in Architecture
Application deadline August 1

Washington, D.C. A Fulbright fellowship in architecture is being offered by the United Kingdom Fulbright Commission for nine months in the U.K. Applicants must be U.S. citizens and have a minimum of three years professional experience. "The award is appropriate for emerging or mid-career architects working outside academia . . ." Contact CIES, Box UKA, 3400 International Drive, N.W., Suite M-500, Washington, D.C. 20008 (202) 686-7878.

Brickell Bridge
Registration deadline August 20, submission deadline November 20

Miami. A two-stage design competition for the "architectural enhancement and illumination" of the 70-year-old Brickell Avenue Bridge is being sponsored by the Downtown Development Authority of the City of Miami, through the New World Center Foundation. Contact Clyde Judson, Downtown Development Authority, One Biscayne Tower, Miami, Florida 33131.

(continued on page 36)

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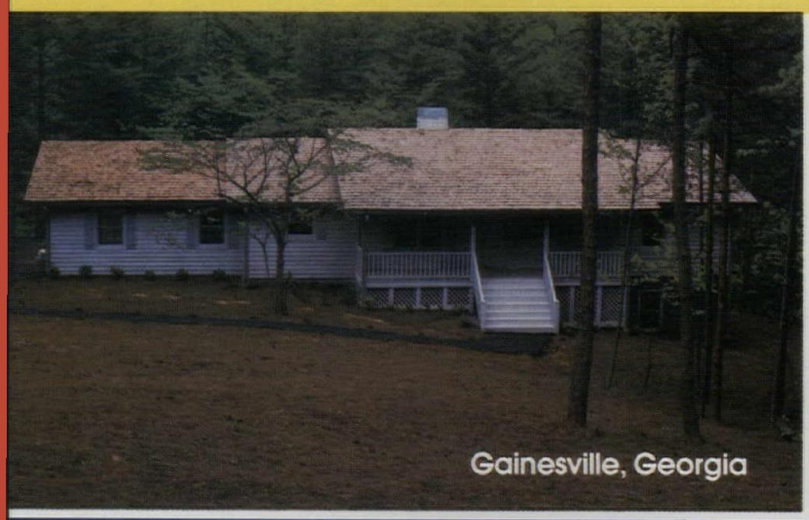

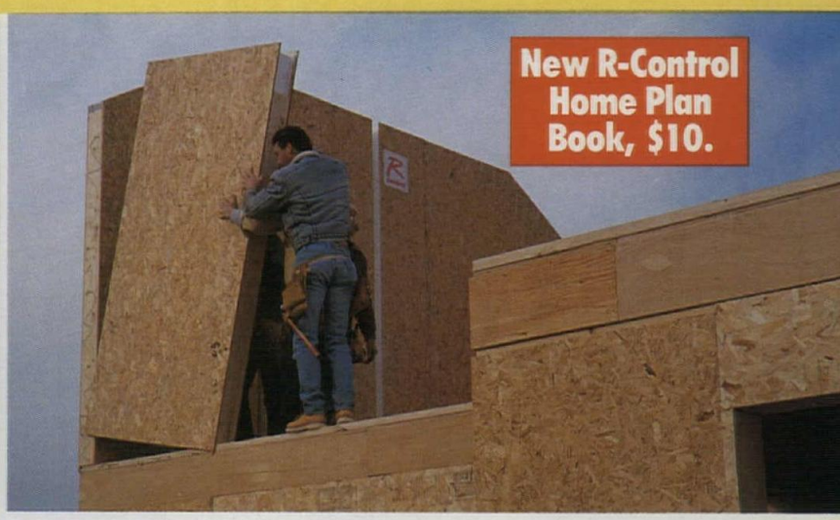

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Calendar *(continued from page 34)*

Schoolyards Competition
Registration deadline September 1, Submission deadline October 1

New York. An international student competition for the design of two elementary schoolyards is sponsored by the Children's Environments Research Group. First prize is $1000; winning and selected entries will be displayed at the Schoolyards Conference in New York, October 1990. Contact Rosario Mora/Schoolyards Competition, Children's Environments Research Group, City University Graduate Center, 33 West 42nd Street, New York 10036 (212) 642-2970 or FAX (212) 642-2971.

Conferences

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Lighting World
June 14–16

Chicago. The semiannual Lighting World exposition – new product launches and seminars on product, technology, and industry trends – will be held at McCormick Place North. Contact Lighting World, % National Expositions, 15 West 39th Street, New York 10018 (212) 391-9111.

Growing by Design
June 17–22

Aspen, Colorado. The 40th International Design Conference will concentrate on the built environment as seen and felt by children: "... we are our children's past, their heritage, the shapers of their aesthetic values and the designers of the world they inherit." Contact Deborah Murphy, IDCA, P.O. Box 664, Aspen, Colo. 81612 (303) 925-2257.

Third World Housing
June 18–29

Cambridge, Massachusetts. An international shelter workshop is divided into two week-long sessions. The first will be on the roles and responsibilities of lenders, governments, and communities in urban planning; technical workshops will be held during the second session. Contact Nabeel Hamdi or Reinhard Goethert, MIT, Department of Architecture, 77 Massachusetts Avenue, Building N52-492, Cambridge, Mass. 02139 (617) 253- 8376.

CSI Convention
June 29–July 1

Chicago. The Construction Specifications Institute's 34th annual convention and exhibition will offer 39 educational sessions – on topics from construction technology to business administration. Over 1000 booths of nonresidential building products will be on display. Contact CSI, 601 Main Street, Alexandria, Virginia 22314-1791 (703) 684-0300.

IESNA Conference
July 29–August 2

Baltimore. "Lighten Up" is the theme for the Illuminating Engineering Society of North America's annual conference. Technical papers will be presented and educational seminars and workshops held at the Omni Inner Harbor Hotel, Baltimore. Contact Diane Darrow, 345 East 47th Street, New York, New York 10017 (212) 705-7269.

Affordable Housing
August 13–19

Cambridge, Massachusetts. Harvard University Graduate School of Design is holding a week-long institute to "address the design, development, construction, rehabilitation, and management" of affordable housing. Three courses are offered and may be taken separately or as a group. Contact Professional Development, Harvard University GSD, 48 Quincy Street, Cambridge, Massachusetts 02138 (617) 495-9340 or FAX (617) 495-9347.

Nordic/Baltic Triennial
September 24–26

Tallinn, Estonia. Participants at the first Nordic/Baltic Architectural Triennial, "Metropolism and Provincialism," will concentrate on questions such as: "What should the role of architecture be in order to preserve national identity in an integrated Europe?" Contact Finnish Association of Architects, Etelaesplanadi 22A, 00130 Helsinki, Finland, tel. 358-0-640801 or telefax 358-0-601123; or Union of Estonian Architects, Lai 29, 200110 Tallinn, Estonian SSR, tel. 7-0142-442337/432244.

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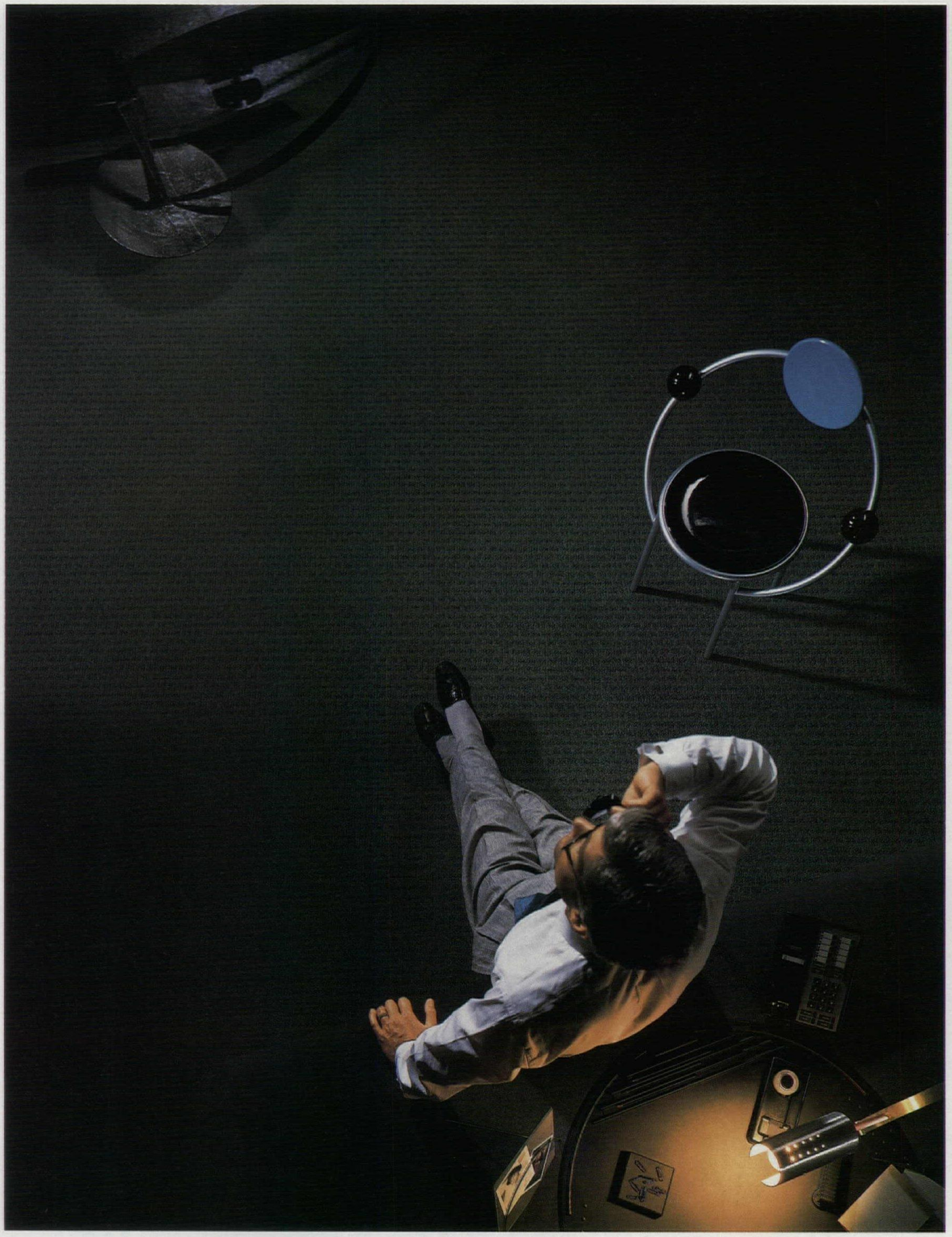
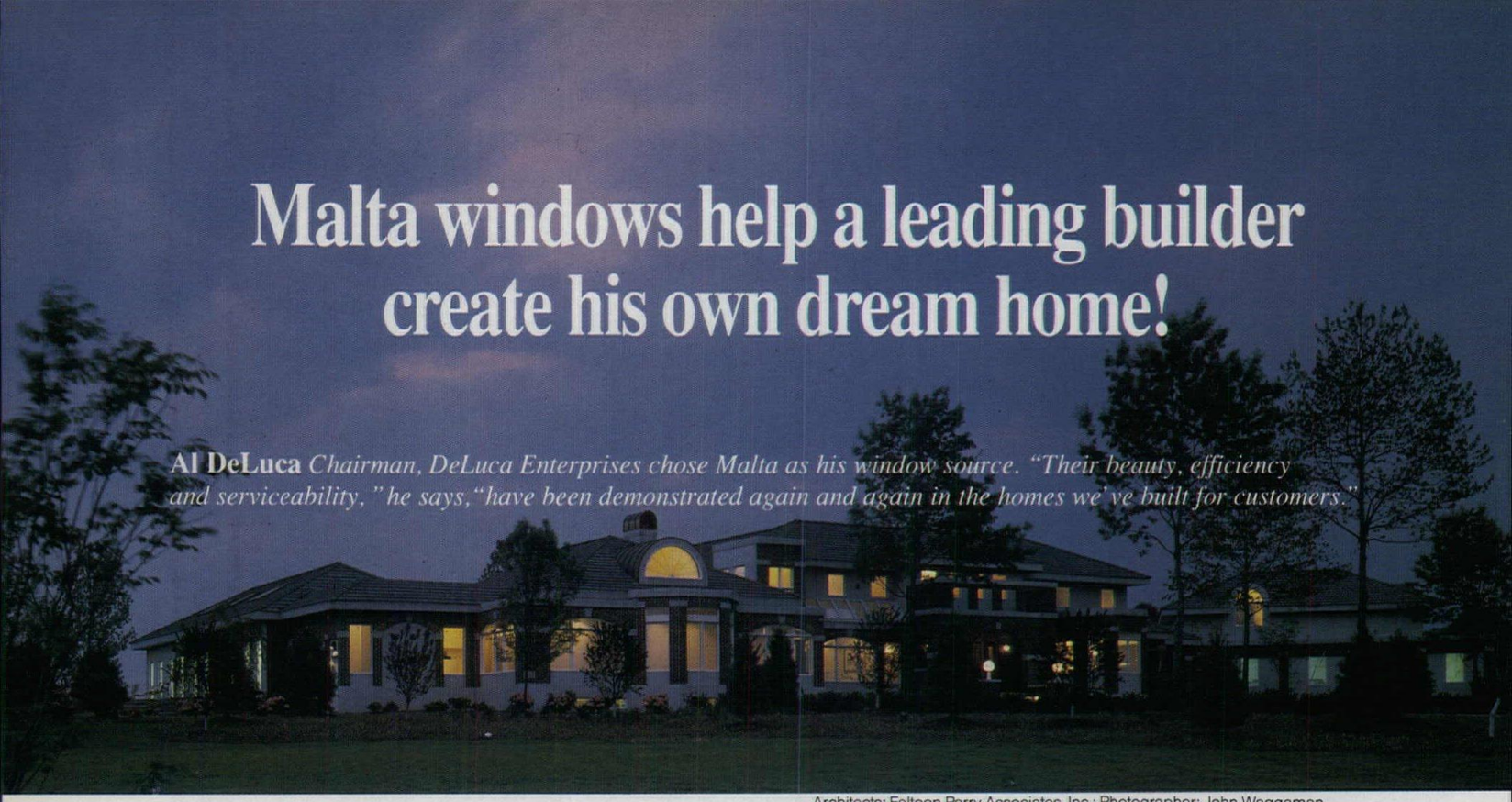


Malta windows help a leading builder create his own dream home!



Al DeLuca *Chairman, DeLuca Enterprises chose Malta as his window source. "Their beauty, efficiency and serviceability," he says, "have been demonstrated again and again in the homes we've built for customers."*

Architects: Feltoon Parry Associates, Inc.; Photographer: John Waggaman

Amberlea, the DeLuca estate in Bucks County, Pennsylvania, features an array of distinguished Malta Windows and Patio Doors.

Part of the reward of being a professional builder is creating dream homes for families. So, it's not surprising that an experienced builder like Al DeLuca built a true dream home for himself.

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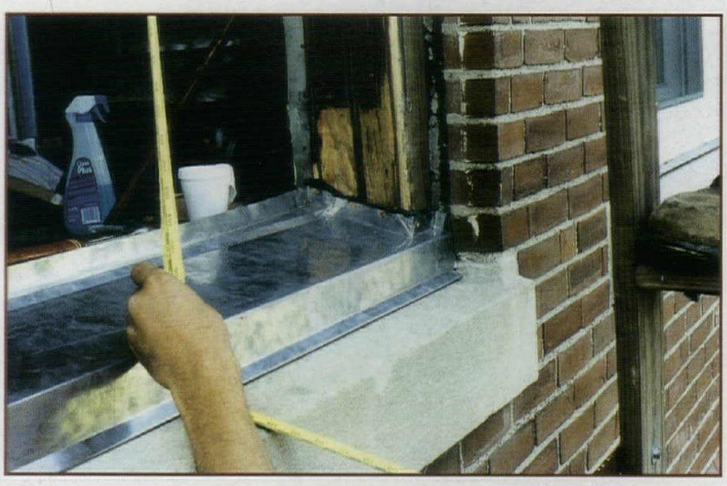
Technics Topics

Building failures investigator **James C. Myers** recommends materials and practices too often neglected by architects and contractors.

Window Sill Flashings: The Why and How

A sales representative of a large window manufacturer visited my office recently to show me a sample horizontal sliding window. As he presented the advantages of his window, including its watertightness, I poured a little water from a cup into the window sill track. Midway through his talk, water began seeping from the frame corner joint onto the table, much to the sales rep's amazement. Despite the dripping water, he insisted that he could produce watertight windows and that sill flashings were not needed.



A lead-coated copper window sill flashing with upturned ends and an upstanding inboard leg in a remedial installation.

Purpose of a Sill Flashing

Window installations contain several potential avenues for water penetration, including the joints within the window framing and the joints between the window and the adjacent wall construction. These joints typically rely on sealants to resist water penetration. Despite the best efforts of designers, manufacturers, and installers, this method of resisting water entry is not always effective.

Some common paths of water penetration include:

- metal to metal joints between the sill and jamb extrusions at the window frame corners;
- perimeter sealant joints; and
- joints in the perimeter panning extrusions used to mate the window with the adjacent wall construction.

There are myriad causes for water entry through these joints. Frame corner seals split due to frame deformation during handling. Manufacturers inadvertently omit sealant on corner joints of the window frame or panning. Sealants debond due to lack of a sufficiently deep return edge and bonding surface on the window perimeter framing or from poor surface preparation. Water bypasses the perimeter sealant at cracks or voids in an abutting concrete or brick masonry wall. Sealant materials deteriorate with time and often are not readily accessible for repair, for example, at frame corners. And the list goes on.

Prudence in wall design requires recognition of the difficulty of achieving and maintaining consistently watertight sealant joints. This translates into providing a means to collect the water that inevitably enters the system through vulnerable joints and providing a means to direct the water back outside. This article focuses on one such means to achieve greater reliability for wall waterproofing, namely, window sill flashing.

The purpose and constraints for the flashing vary with each building. The following discussion highlights some key features that I try to incorporate in sill flashing designs, as well as some examples of solutions that I have used to meet the requirements of specific projects. This is not an exhaustive guide to detailing flashings but can serve as a starting point for evaluation of flashing designs.

Materials

Sill flashing materials fall into three general categories: solderable sheet metals, nonsolderable sheet metals (such as aluminum), and polymeric sheets (such as rubber). If there are no other limitations, which is seldom the case, I prefer solderable sheet metals such as lead-coated copper or stainless steel. They have excellent resistance to jobsite abuse and weathering and can be exposed and formed to provide drip edges. The soldered joints are very reliable over the long term.

Aluminum is sometimes necessary where the color of the exposed flashing is critical. However, it requires careful and time-consuming detailing – especially at joints and corners – since it cannot be soldered. Avoid using caulk to seal these critical areas; instead, use fully adhered rubber flashing sheets (with decorative aluminum cover plates).

Polymeric sheets, such as neoprene and EPDM rubber, cannot be formed easily into drip edges. They are an alternative where project requirements preclude exposed flashings, since the sheets can be fully adhered. Concealed flashings generally contribute to leakage problems, however, and should be avoided. Unreinforced plastic sheet formulated from polyvinyl chloride (PVC) tends to shrink and embrittle with age and is prone to job site damage; it, too, should be avoided.

Drainage

Water may pond on the flash-

(continued on page 43)

Tech Notes

AHSRAE's proposed Standard 90.2P, *Energy Efficient Design of New Low-Rise Residential Buildings*, has begun its public review period. Architects interested in commenting on the standard, which covers the building envelope, HVAC, and DHW systems, should obtain the draft immediately: Closing date is July 14 (but may be extended). ASHRAE Manager of Standards (404) 636-8400, $15.

***Voluntary Specification for Field Testing of Windows and Sliding Glass Doors* (502-90) and *Voluntary Specification for Skylights* (1600-90) are new and revised publications from the American Architectural Manufacturers Association. Tony Coorlim, AAMA (312) 699-7310.**

The IES *Recommended Practice for the Lumen Method of Daylight Calculations* updates and enhances methods of figuring both sidelighting and toplighting, using a set of coefficient of utilization tables. Illuminating Engineering Society of North America (212) 705-7926.

***Dampproofing* (07150), *Water Repellents* (07180), and *Insulating Concrete Decks* (03520) are new SpecGUIDES providing background information, resources, definitions, references, selection criteria, and considerations for design and field inspection. CSI (703) 684-0300.**

***Building Failures* by Lyall Addleson discusses roofs, walls, floors, windows, and claddings in crisp photos, details, and point-by-point analyses. The only drawback is that it's British – so most references cited are not available in the U.S. Nonetheless, it is a valuable guide to principles and procedures of diagnostics. Butterworth Publishers (800) 366-2665, 167 pp., $39.95.**

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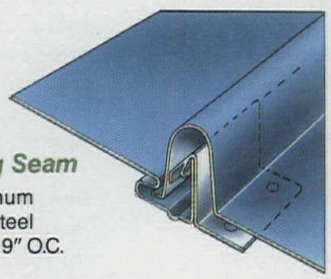

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PAC-CLAD Metal Roofing Panels figure prominently in the construction of the recently completed Olde Schaumburg Medical Center.

The owner, Alexian Brothers Health Systems, Inc., contracted the architect/developer, Marshall Erdman and Associates, Inc., to design a satellite primary care facility. Because the site was situated in an historic district, the building had to conform strictly to established building guidelines.

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An aluminum sill flashing with an exterior drip edge that is integrated with the adjoining masonry at the jamb. Sealant work was not completed at the time the photo was taken.

Clip angles installed inboard of sill flashing provides anchorage for the window frame without puncturing the flashing below.

(continued from page 41)

ing, either from unintentional inward slope due to construction tolerances or from the surface tension of the water alone. Providing a slight outward slope to the horizontal part of the sill flashing improves reliability and durability; it reduces the amount of time that water is on the flashing, and it reduces lateral flow to the vulnerable joints. A continuous quickset mortar bed is an easy way to provide this slope to the horizontal portion of a metal flashing. The use of mortar may introduce a new building trade to the project and create coordination problems; in such cases, an alternative is to use closely spaced plastic wedge shims set into adhesive.

Weep holes are needed in the sill perimeter sealant to allow the water on the flashing to exit. A good approach is to gap the sealant and its backer rod. Recess an open-cell foam rod into the gap to prevent insects from entering. The inboard edge of the flashing should turn upward to contain water. Seal the top edge or adhere the upstanding leg of the flashing to the window frame to reduce air leakage through the system.

Window Attachment

Do not fasten the sill of the window down through the horizontal portion of the flashing, since such a penetration is difficult to seal reliably and is vulnerable to leakage. Instead, use a clip-angle and fasten the vertical leg of the angle through the inboard vertical leg of the flashing into the window. This penetrates the flashing in an area of minor exposure to water. The angle and fasteners need to be designed for the prying action that takes place under wind load. Tapered shims placed above the flashing to support the window should be set in adhesive to prevent "walking."

Exterior Terminations

One of the most reliable ways to terminate the outboard edge of the flashing is to extend it beyond the face of the wall and turn it downward at 45 degrees to form a drip edge. This drip edge prevents water that is draining off the front of the flashing from running back under it. Prevent wind-driven water from bypassing this front edge by using a continuous hook strip or similar anchorage and seals.

Sometimes project requirements preclude exposed flashing terminations. With cavity wall construction, it may be possible to drain the sill flashing into the cavity and onto the through-wall flashing, thereby hiding the sill flashing behind the outer wythe of the wall. Adding water to the wall cavity drainage system requires careful detailing and construction of the wall to accommodate this water. This approach is not suitable for all buildings. Where there is no cavity – such as on a poured-in-place exposed concrete façade – it is risky to conceal the flashing. If this is done, an adhered, durable polymeric sheet flashing must be used. The sheet stops at the face of the sill perimeter sealant. The risk is that water may run back under the front edge of the flashing, since the flashing relies entirely on its adhesion to the substrate. It is better to rely on a positive drip edge and gravity than adhesives and the workmanship necessary to secure a good bond.

Terminations at Ends

Turn up the ends of the sill flashing to form watertight corners at the jambs. This prevents any water that collects on the sill flashing from running off its ends and into the building. To collect water that may enter along the window jamb through perimeter joints (due to sealant failures) or by drainage from an adjoining wall cavity, a flashing can be installed along the jamb. This jamb flashing should lap over and integrate with the upturned end of the sill flashing. Where jamb flashings are not used, adhere or seal the upturned ends of the sill flashing against the adjacent wall at the jambs so as to direct water that is traveling down the jambs onto the sill flashing. In the absence of jamb and head flashings, use double-sealed perimeter joints that deliver water to the sill flashing.

In Summary

Window-sill flashings help produce reliable and durable window installations. Detailing the flashing for each project requires a careful review of the constraints on the flashing and understanding of the limitations and capabilities of the flashing materials. Where possible, use solderable metal sill flashings with exterior drip edges, provide outward slope to the flashing, avoid fastening the window down through the flashing, and integrate the upturned ends of the flashing with adjacent construction at the jambs. **James C. Myers** ■

The author is a professional engineer with the Building Technology Division of Simpson Gumpertz & Heger, Inc., Consulting Engineers, Arlington, Massachusetts. He is an active member of the Executive Subcommittee of ASTM C24, Building Seals and Sealants, and specializes in the design and investigation of wall, window, and roof systems.

Recommended Reading

"Techniques." Jack M. Roehm, *Glass Digest,* September 15, 1984, p. 30 (212) 682-7681.

Window Selection Guide, American Architectural Manufacturers Association, Des Plaines, IL (312) 699-7310, 1988, p. 52.

Copper and Common Sense, Revere Copper Products, Inc., Rome, NY (315) 338-2022, 1982, 103 pp.

Architectural Sheet Metal Manual, Sheet Metal and Airconditioning Contractors National Association, Vienna, VA (703) 790-9890, 1987, 358 pp.

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Building Science Brief 6/90:

A Thermal Performance Factor for Comparing Glazing Alternatives

Windows gain and lose heat through a set of interactions that depend on local climate, latitude, and compass orientation of the installed unit. Because U-values do not account for solar gains, they are useful only for comparing nighttime thermal performance of different glazing options. Recognizing this, researchers Steven Harrison and Sherif Barakat have described a method of calculating a numerical factor expressly for comparing the energy performance of glazings at any moment in time or averaged over a day, month, or season at a particular location and orientation. A positive value indicates that the glazing is a net energy collector; a negative value indicates that it is an energy loser. Because the factor rates the glazing independently of the rest of the building, it does not offer insight into the annual energy cost performance of the glazing. But, within the purview of either heating or cooling conditions alone, the factor can be used to rank glazings against one another for their solar thermal performance.

Harrison and Barakat define the thermal performance factor P by the relation,

$$P = 0.86SC - [24U(T_i-T_o)]/I$$

where P is a dimensionless factor (all the units cancel out), SC is the shading coefficient of the glazing, U is the U-value of the glazing (Btu/ft^2(hr)F), I is the mean daily insolation on the window, averaged over the desired period of time (Btu/(ft^2)day), and T_i and T_o are the indoor and outdoor temperatures, respectively, averaged over the same period of time as I. SC and U can be obtained from manufacturers' literature. T_i, T_o, and I may represent a day, week, month, or season, but they must be consistent with one another. The "24" stands for 24-hours-per-day, and reconciles I in Btu/(ft^2)day with U-values in Btu/ft^2(hr)F.

Uses of the factor are best explained by example. The average temperature during the months of December, January, and February in Cleveland, Ohio, is 29 F. The average daily insolation on a south-facing surface during this period is 721 Btu/(ft^2)day. If the indoor temperature is maintained at an average of 68 F (including night setbacks), then $P = 0.86SC - 24U(68\text{-}29)/721$. P is given for SC and U-values of a variety of glazings in the table. Center-of-glass U-values are used here to compare glazing materials; when comparing window products, the overall window-unit U-value can be used, with a correction factor to account for the ratio of vision panel to window unit area. U-values for the desired window size should be used. The table also reports P for other compass orientations.

The glazing performance P is a function of the climate characteristic $24(T_i-T_o)/I$. Graphing P for any pair of U-values and SC produces a unique straight line, as shown in the figure. The slope of the line represents the U-value; high U-values (single glazing) have steep slopes, while lower ones have flatter slopes. As the U-value approaches 0, P loses sensitivity to climate and approaches a limiting value equal to 0.86 times the shading coefficient.

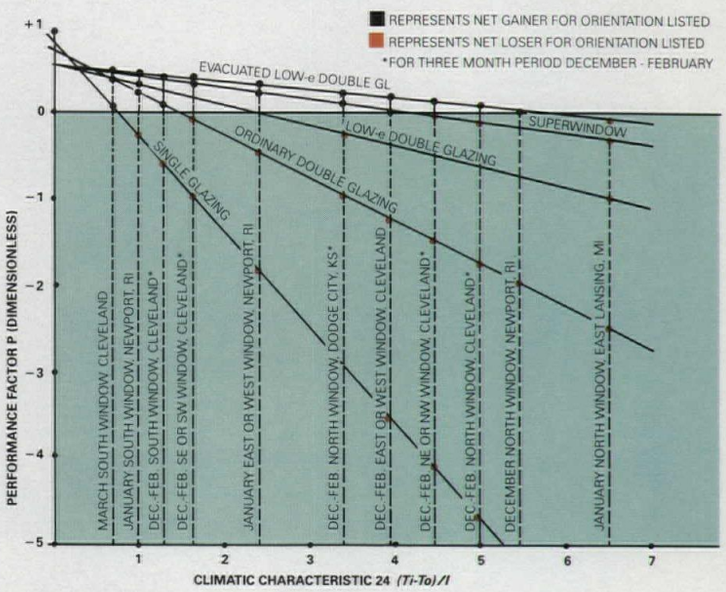
Because the insolation received varies with solar aspect, every wall orientation can be represented as a vertical line, each with its own position on the $(T_i-T_o)/U$ axis. If the sloping line that represents a particular glazing crosses the wall orientation line above the x-axis, then the glazing is a net energy gainer for that orientation; if it crosses the wall orientation line below, it is a loser for that orientation. Other climates, time periods, and orientations can be represented as reference lines on the graph. For instance, a north window in East Lansing, Michigan during January has T_o = 24 F and I = 161 Btu/(ft^2)day. This gives $24(T_i-T_o)/I$ = 6.55.

By setting P equal to zero, pairs of SC and U-values can be found in any climate and orientation for which there is no net heat gain or loss through the window. This exercise determines the threshold at which a window outperforms an insulated wall of any R-value; such glazings do not necessarily exist for all design conditions.

Performance factors P for different glazings and orientations in Cleveland, Ohio for the three month period December - February

Glazing	U_{cg}	SC	Performance factor P			
			S	SE/SW	NE/NW	N
Single	1.11	1.00	−0.58	−0.94	−4.31	−4.70
Double, 1/2" air	0.49	0.89	+0.13	−0.03	−1.52	−1.69
Double, 1/2" air, low-e	0.32	0.69	+0.18	+0.075	−0.90	−1.01
Double, 1/2" Ar, low-e	0.26	0.69	+0.26	+0.17	−0.62	−0.71
Double, 3/8" Kr, low-e	0.24	0.69	+0.28	+0.20	−0.52	−0.61
Triple, 3/8" Kr, 2 low-e[1]	0.19	0.67	+0.33	+0.27	−0.31	−0.37
Quad, 3/8" Kr, 2 low-e[1]	0.11	0.53	+0.31	+0.28	−0.056	−0.095
Double, evacuated, low-e[2]	0.10	0.70	+0.47	+0.44	+0.14	+0.10

[1] Third and fourth glazing layers are high transmittance films to which low-e coating is applied.
[2] Not a commercial product.
General note: climatic conditions assumed are T_i = 68 F, T_o = 29 F, I for south, southeast or southwest, northeast or northwest, and north orientations are 721, 578, 201, and 187 Btu/(ft^2) day, respectively.



The beauty of the performance factor is that one simple expression reveals the relationship between U-values and shading coefficients in service. It explains how measures that reduce heat loss can impair winter performance, if these measures (such as adding glazing layers and low-e coatings, as opposed to using less conductive gas fills) also reduce the SC. And it points up what these glazing characteristics mean in the context of local climate and compass orientation. It is a tool for understanding, as well as a tool for use.

Kenneth Labs ■

References

S.J. Harrison and S.A. Barakat, "A Method for Comparing the Thermal Performance of Windows," ASHRAE *Transactions*, vol. 89, Part 1A, 1983.

T. Kusuda and K. Ishii, Hourly Solar Radiation Data for *Vertical and Horizontal Surfaces on Average Days in the U.S. and Canada*, NBS Building Science Series 96, 1977. NTIS (703) 487-4650, #PB 265-551, 416 pp.

P/A would like to thank Sherif A. Barakat, Head, Building Performance Section, Institute for Research in Construction, National Research Council Canada, for reviewing this BSB in draft.

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Technics: Windows to the Future

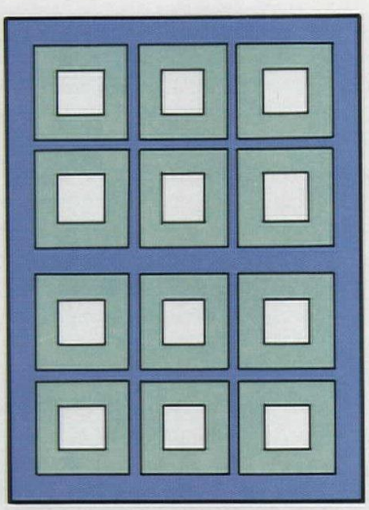
New standards and research efforts are redefining the performance of high-performance windows – and preparing the way for a coming generation of superwindows.

In the days before high-performance glass products, the conductance of sash and frame materials and glazings were so nearly the same (see Table 1) that a single U-value for the glazing could adequately represent the entire window, with a small correction to account for the different conductance of the frame. The U-values of the best of today's glazings are an order of magnitude lower than conventional sashes and frames, however, and this means that the heat transfer characteristics of both frame and glazing have to be considered. Moreover, because the frame acts as a heat sink around the perimeter of the glazing, the frame can significantly reduce the glazing unit's overall resistance to heat flow. The degradation of (increase in) U-value due to edge and frame losses is directly related to the ratio of perimeter to glazing area; small window units are compromised by edge effects much more than are large ones.

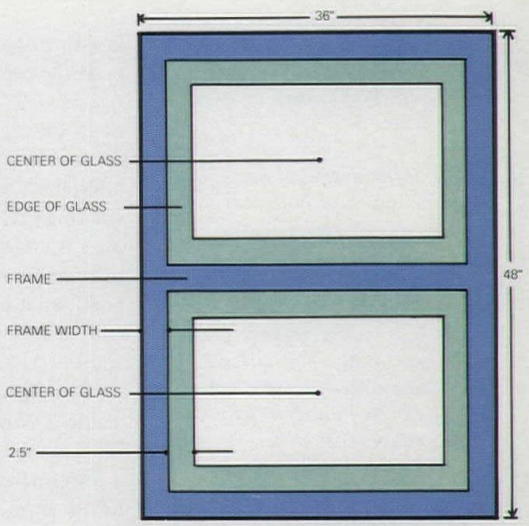
Although architects don't evaluate these effects, the U-values presented in manufacturers' catalogs either do or do not, and it is necessary to understand what each manufacturer is reporting in order to compare products and to evaluate advertising claims. The 1989 edition of the ASHRAE *Fundamentals Handbook* describes a new industry procedure for calculating overall window U-values; those calculated under the new method can be significantly higher than those calculated by previous procedures.

The language of the new ASHRAE method is illustrated in Figure 1. The most important aspect of the new vocabulary is that there are now five different U-values that may be referred to in catalogs and window literature. The "center of glass" U_{cg} represents the glazing devoid of any edge effects; the "edge of glass" U_{eg} applies to a 2½-inch band around the (visible) perimeter, and it accounts for the increased heat transfer through the edge spacer and seal. The weighted average of U_{cg} and U_{eg} yields an "insulated glazing unit" U_{ig} that represents the overall conductance of the vision area of the window. Finally, the weighted average of U_{cg}, U_{eg}, and that of the frame (U_f) give an overall "window unit U-value," U_o, which is the one of greatest interest for most purposes.

Condensation and frost patterns on the indoor surface of windows in the winter evidence the increased heat loss around the perimeter of the glazing (surface temperature and heat loss rate are inextricably re-



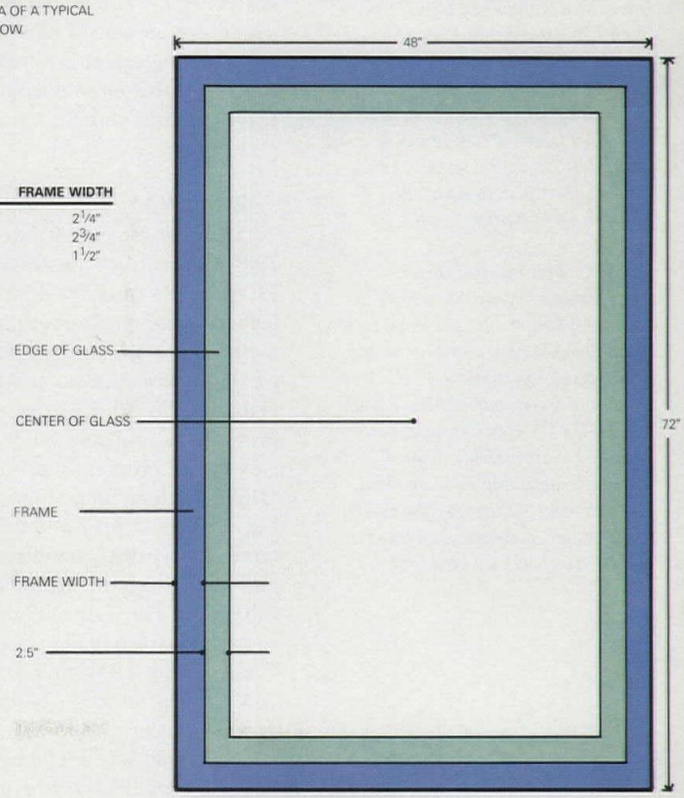
"RESIDENTIAL" WINDOW WITH TRULY-DIVIDED LIGHTS
EDGE-OF-GLASS AREA (SHADED) ACCOUNTS FOR 78.5 PERCENT OF TOTAL VISION AREA OF A TYPICAL 36" x 48" TRULY-DIVIDED LIGHT WINDOW



ASHRAE "RESIDENTIAL" WINDOW

Figure 1.

WINDOW TYPE	FRAME WIDTH
OPERABLE ALUMINUM	2 1/4"
OPERABLE WOOD, VINYL	2 3/4"
NON-OPERABLE	1 1/2"



ASHRAE "COMMERCIAL" WINDOW

Window component	Overall R-value ft²(hr)F/Btu	U-value or C Btu/ft²(hr)F
"Superwindow" glazing[1]	6-10	0.1-0.17
"High performance" glazing[2]	2.5-4.0	0.25-0.4
Wood frame (clad or unclad)	2.5	0.4
Insulating glass (air fill)	2.15	0.49
Al. frame w/thermal break	1.0	1.0
Single glass	0.9	1.11
Al. frame, no thermal break	0.52	1.9
Super Spacer® silicone foam[3,5]	0.41	2.4[6]
Fiberglass edge spacer[5]	0.24	4.2[6]
Swiggle Strip®[4,5]	0.10	9.8[6]
Al. edge spacer and sealant[5]	0.04-0.045	22-25[6]

[1]Three or four layers, two low-e coatings, krypton fill.
[2]Double glazing, one low-e coating, argon fill.
[3]Includes sealant; Edgetech Division of Lauren Corp.
[4]Tremco Corp.
[5]From tests conducted by J.L. Wright and H.F. Sullivan, "Thermal Resistance measurement of Glazing System Edge-Seals and Seal Materials," ASHRAE *Transactions*, vol. 95, part 2, 1989.
[6]Conductance values; film coefficients not included (R-values and C are for one-dimensional heat transfer through the component, which does not strictly represent service conditions).

Table 1. Thermal characteristics of window components

Spacer Type	Center-of-Glass U-value	Aluminum		Al w/break		Wood	
		Res	Com	Res	Com	Res	Com
Double Glazing							
Aluminum	0.50	0.88	0.73	0.65	0.59	0.50	0.50
Steel	0.50	0.86	0.72	0.65	0.59	0.49	0.49
Wood	0.50	—	—	—	—	0.48	0.49
Glass	0.50	0.85	0.71	0.63	0.57	0.47	0.48
Double Glazing, low-e, argon filled							
Aluminum	0.27	0.72	0.54	0.50	0.41	0.35	0.32
Steel	0.27	0.71	0.53	0.49	0.40	0.34	0.31
Butyl	0.27	0.70	0.53	0.48	0.39	0.33	0.31
Glass	0.27	0.69	0.52	0.46	0.39	0.31	0.30
Triple Glazing, two low-e (e = 0.05), krypton filled							
Aluminum	0.10	0.61	0.40	0.38	0.27	0.24	0.19
Steel	0.10	0.59	0.39	0.37	0.26	0.23	0.18
Fiberglass	0.10	0.57	0.38	0.35	0.24	0.21	0.17
Insulated*	0.10	0.56	0.38	0.34	0.24	0.20	0.16

*"Insulated spacer" is a hypothetical material with a conductivity of 0.017 Btu/ft (hr) F, or R-2.45 for a ½ inch thickness.

Table 2. Complete Window U-values for Aluminum frames; Aluminum frames with a thermal break (Al w/break) and for Wood frames for typical Residential Sized (Res) and Commercial Sized (Com) Windows

Table 1. Center-of-glass R-values and the thermal resistance of edge spacers differ by more than an order of magnitude.

Table 2. Different types of spacers and frames significantly degrade (increase) overall window unit U-values, and the ratio of perimeter to glazing area (window size, shape, and whether truly-divided or not) governs how much this matters overall. A window with a high-performance glazing (center-of-glass U-value of 0.27) can have unit U-values ranging between 0.30 and 0.72, depending on the details.

Table 3. The center-of-glass U-value depends on the number of glazing layers, spacing between layers, type of gas fill, and number and type of low-e coatings. Different options can be studied in more detail, with glazing products by trade name, using WINDOW 3.1, a free PC program developed by Lawrence Berkeley Laboratory under sponsorship of the Department of Energy.

Figure 2. This infrared thermographic image from a Bonneville Power Administration test house in Montana shows an interior view of a prototypical superwindow on the right, and a conventional low-e window on the left, during a cold winter night. The superwindow is much warmer (yellow), but increased heat loss at the edge – where the aluminum spacer creates a thermal bridge – is indicated by lower temperatures.

lated). Because the edge-of-glass surface area can exceed the center-of-glass area in glazing units of about two square feet or less (they are equal for a vision area of 14 x 22½ inches), the U-value of the center-of-glass means very little for small windows. In the case of "Colonial" windows with truly divided lights of insulating glass, the overwhelming majority of the vision area is edge-of-glass area. Recognizing the influence of window size, ASHRAE has defined standard size residential and commercial reference windows (Figure 1) as a common basis for representing overall window U-values.

The significance of edge losses is demonstrated in Table 2, which reveals how an R-3.7, low-e, argon-filled double glazing in a residential wood frame has a lower U-value than an R-10 superwindow glazing in an aluminum frame with a thermal break. The table also reveals the influence of the type of edge spacer. In the residential wood window category, the difference between a standard aluminum spacer and an insulating spacer can make the difference between R-4.2 and R-5 as an overall unit, for the dual low-e, triple glazing – a long way from the R-10 center-of-glass value.

WINDOW 3.1

The U-value calculation procedures of ASHRAE *1989 Fundamentals* are embodied in WINDOW 3.1, a PC computer program developed by Lawrence Berkeley Laboratory (LBL), with sponsorship of the Department of Energy. (In fact, it is the other way around: the *Fundamentals Handbook* has adopted the methods embodied in 3.1 and the work supporting it.) The program is available on 5¼-inch floppy disk. This easy-to-use program not only calculates the new ASHRAE method, but automatically computes the shading coefficient, solar and visible transmittance, reflectance, absorptance, temperatures of all glass surfaces, and indoor relative humidity at which condensation will occur. The user assembles a window system with components from libraries contained on the disk. These include clear, tinted, heat absorbing, reflective, and low-e products – by manufacturer – as well as generic spacer and frame parts and gas fills. The screen is split into separate input and output tables, which makes it easy to explore the ramifications of different glazing assemblies.

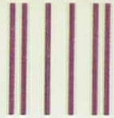
WINDOW 3.1 is a powerful and convenient tool for designers of curtain-wall systems and is a useful educational and reference aid for specifiers of manufactured windows. In fact, since the Window Standards Committee of the National Wood Window and Door Association and many leading manufacturers have adopted 3.1 to figure U-values for use in window catalogs, this floppy disk can put architects on an equal footing with the supply side of the industry, in terms of understanding what is real and available on the shelf, as well as what is possible.

The Art of the Possible

While new calculation methodology is the major news for the mainstream window industry, more compelling news is the coming of the "superwindow." In 1985, LBL researchers Robert Sullivan and Stephen Selkowitz reported, on the basis of computer simulations, that a north window with a U-value of 0.09 and a shading coefficient *(SC)* greater than 0.4 – a hypothetical combination – could provide a net energy gain during the heating season in Madison, Wisconsin (the relationship between U-value, *SC*, and climate is explained in this month's Building Science Brief on p. 45). LBL began to pursue the implications of this analysis by exploring what was theoretically possible with different combinations of existing glazing materials, low-e coatings, and low conductivity gas fills. Their results showed that U-values less than 0.15 (R-6.7) were possible with either three or four glazing layers and two low-e coatings (Table 3). A window of three layers with two low-e coatings and krypton or krypton and argon fill was designed and a patent applied for on behalf of the Department of Energy.

Three major window manufacturers were then involved in fabricating prototypes of the LBL design by upgrading their existing high-performance products. Over 50 such windows were produced, and most have been installed in houses in Montana as part of the Bonneville Power Administration's Residential Construction Demonstration Program (see Figure 2). Some of the windows were measured in laboratories as having U_o-values ranging between 0.15 and 0.27. In-wall service U_o-values measured in LBL's own Mobile Windows Thermal Test Facility (MoWiTT) in Reno, Nevada (Figure 3) range between 0.22 and 0.25 (R-4.0 to R-4.5). Calculated center-of-glass U-values

Subscription Dept



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Window Design*	Gas Fill	Gap Width	
		¼"	½"
Double Glazing G – G	Air Ar	0.58 0.52	0.50 0.47
$GE_h - E_hG$ e = 0.35	Air Ar	0.47 0.39	0.36 0.31
$G - E_sG$ e = 0.15	Air Ar	0.45 0.37	0.34 0.29
$G - E_sGE_h$ e = 0.15 e = 0.35	Ar Kr	0.32 0.24	0.25 0.24
$G - E_sG - G$ e = 0.15	Ar Kr	0.27 0.20	0.21 0.20
$G - E_sG - E_sG$ e = 0.15	Ar Kr	0.22 0.15	0.15 0.14
$G - E_sG - E_sG - G$ e = 0.15	Ar Kr	0.18 0.13	0.13 0.11

*G denotes a glazing layer; E_h, a low-E "hard" coat (e = .35), or E_s, a low-E "soft" coat (e = .15), on one side of the glazing. IR transmittance of all glazing layers are taken to be 0.

Table 3: U-Values of Highly Insulating Windows at Standard Winter Design Conditions in Btu/hr-ft²-F (W/m² – K)

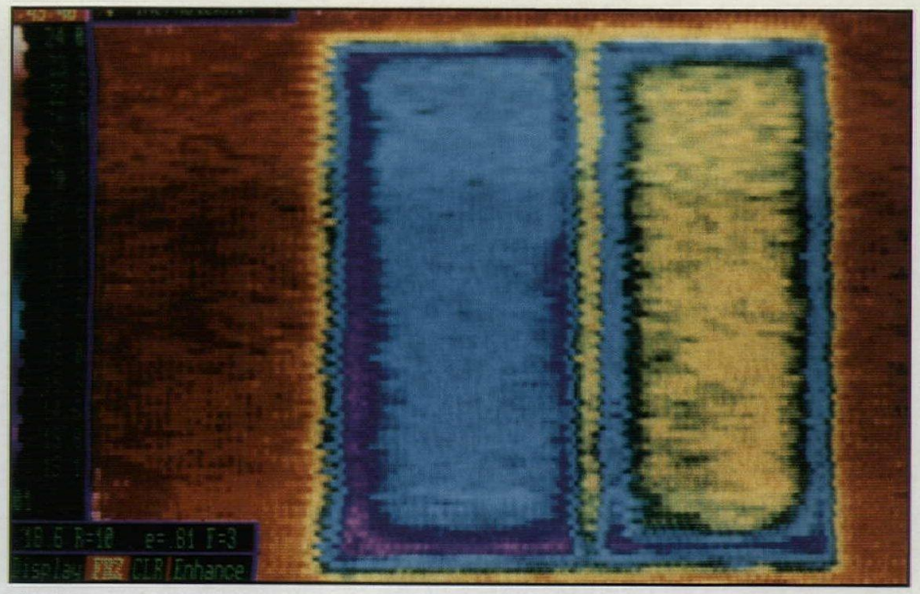


Figure 2.

range between 0.12 and 0.17 (R-5.9 to R-8.3). LBL researchers have told P/A that as-yet-unpublished studies in the MoWiTT show that one of the prototypes in a north exposure, during a three-day cold and cloudy test period in January, had a lower heating requirement than an insulated wall.

From Superglazing to Superwindows

U-values for any combination of off-the-shelf glazings and other components can be analyzed by WINDOW 3.1 and other programs, whether these assemblies are commercially available or not. While windows having center-of-glass R-values of six or more (U-value less than 0.16) are being called "superwindows," "superglazing" is more apropos. The present generation of high-performance windows contains a double-glazed, low-e, argon-filled unit, usually with an aluminum spacer. Residential windows using these glazings have overall R-values of only 1.8 to 2.8, even though center-of-glass R-values range between 2.5 and 4.0. Putting the next generation of superglazings into today's frame and aluminum spacers produces the same result: As shown in Table 2, an R-10 glazing yields an overall R-value between R-4.5 and R-5 in a wood residential window. The one superglazing material that is available today (Figure 4) yields an R-4.6 wood residential window, even though its center-of-glass rating is R-8. It yields R-5.5 in a commercial window.

While glass and coatings manufacturers have been pushing low-e glazing technology forward (see Technics Topics, p. 52), researchers within and outside the manufacturing industry have watched the relative thermal efficiency of window frames and edge seals decrease significantly. Some have seized upon this as an opportunity. Owens-Corning Fiberglas is now entering the window market with a unit made with a hollow fiberglass Fibron frame that is stuffed with batt insulation (Figure 5). The manufacturer claims a unit thermal resistance of R-3.39 (U_o = 0.3) for a 36" x 48" double-hung window with a low-e, gas filled glazing. The unit is rated at R-2.34 when it contains ordinary R-2 glazing.

At the smaller end of the industry, Edgetech Division of Lauren Manufacturing was created to produce an insulating edge spacer of silicone foam (Figure 6). Edgetech has been active in Canada in promoting superwindows with multiple low-e coated glazings, especially for custom retrofit applications in historic buildings. Edgetech's Super Spacer has, in combination with its more conductive butyl backup sealant, a thermal resistance of R-0.41. While this is on the order of ten times less than that of a high-performance glazing, it is still ten times greater than a typical aluminum edge spacer (see Table 1). According to tests conducted at the National Research Council Canada, replacing metal spacers with the silicone foam in a 44" x 49" thermally-broken metal frame containing a superglazing increased the overall R-value from R-3.3 to R-3.9 and reduced the overall heat loss between 18 and 19 percent.

Thermal Design

The most desirable set of thermal and optical or solar properties for any window depends on a complex set of climatic, programmatic, and building characteristics, in addition to the compass orientation of the installed unit. This month's Building Science Brief (p. 45) explains a simple method for determining if a window is a net gainer or loser of heat over a specified time period and other design conditions, taking into account solar gains, as well as the U-value of the glazing. While this method is useful for comparing glazing materials, it cannot select optimal U-values and shading coefficients or – more important – the optimal areas of glazing for different orientations around the building.

In the case of house design, a number of inexpensive PC programs have made it possible to determine desirable window areas, thermal and optical properties of the glass in relation to the thermal properties of the rest of the building envelope, the heat storage properties of the interior, cost, and other factors. The more sophisticated (and usually expensive) programs allow the user to customize all features of the building and will calculate cost-optimized solutions for specified conditions. The less expensive programs require trial-and-error studies on the part of the user to compare different alternatives and are generally limited to buildings that don't stray too far in design from boxy, builder-variety styles. Some free and inexpensive PC programs are listed in this month's Technics Focus (p. 168).

Terminology

When light strikes a glazing, some of the energy is reflected from the surface, some is transmitted through the material, and the remainder is absorbed. The fractions of reflected, transmitted, and absorbed energy are represented, respectively, by the letters *r*, *t*, and *a*. These may be expressed as decimals or percentages, but their sum is always 1 (or 100 percent).

Insolation is the total solar energy falling on a surface; it is represented by the symbol *I* and has units of Btu/ft² per hour or per day. The total amount of energy transmitted through a glazing is *tI*, and *aI* represents the amount of energy absorbed by the glazing. The absorbed energy raises the glazing's temperature, which then releases some of its heat to the indoors; the rest is dissipated to the outdoors. For clear glazings, the amount of absorbed solar radiation that makes its way indoors is small; for tinted and heat-absorbing glazings, however, this can be the dominant mechanism of heat transfer, especially in the South. The sum of the energy transmitted through the glazing and of that released to the indoors due to absorption (that is, all the solar heat that enters the interior) is called the *solar heat gain* (*SHG*). The ratio of the solar heat gain to the insolation on the glazing is called the *solar heat gain coefficient* (*F*). The two are related simply:

$SHG = I(F)$.

The proportionment of energy absorbed by single pane glass is a function of its U-value and the outside film coefficient, h_o. The amount of solar heat delivered to the interior via ab-

Figure 3a.

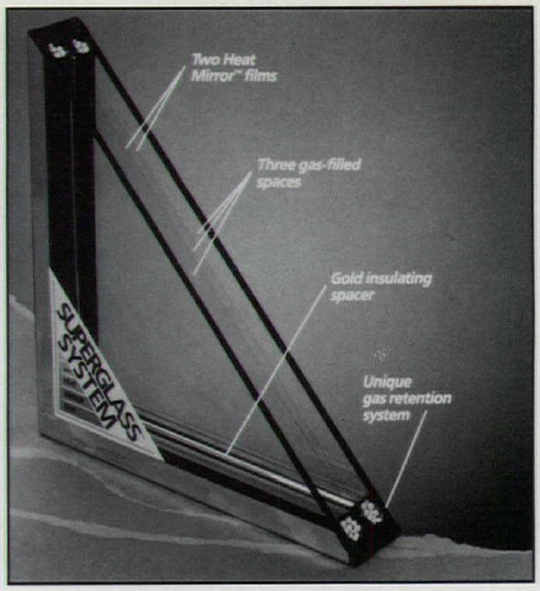


Figure 4.

Figure 3a and 3b. Lawrence Berkeley Laboratory's "Mobile Window Thermal Test Facility" (MoWiTT) is stationed in Reno, Nevada. The performance of a pair of windows can be studied side-by-side in any orientation, and then the laboratory can be rotated to continue the test in any other orientation. Studies have shown that a north-facing prototypical superwindow outperformed an insulated wall during cold and cloudy days in January.

Figure 4. Southwall Technology's Superglass™ contains two thin films with low-e coatings suspended within a krypton-filled insulating glass unit. Although the glazing is unequalled with its center-of-glass resistance of R-8, the overall window unit resistance is R-4.6 in a wood residential frame and R-5.5 in a wood commercial frame.

Figure 5. Owens-Corning is now introducing a new Fibron™ fiberglass frame window line. Overall thermal resistance is R-3.39 for a residential unit with a low-e, gas-filled glazing, or R-2.34 when glazed with ordinary R-2 insulating glass.

Figure 6. Edge spacers are the Achilles' Heel of superglazings. Aluminum spacers (left) are ten times more conductive than Edgetech's silicone foam Super Spacer™ and its hot-melt butyl sealant (right). Fiberglass spacers (center), while more conductive than the foam, are still five to six times less conductive than aluminum. Highly conductive spacers are responsible for condensation at the perimeter of glazings that are otherwise free from it.

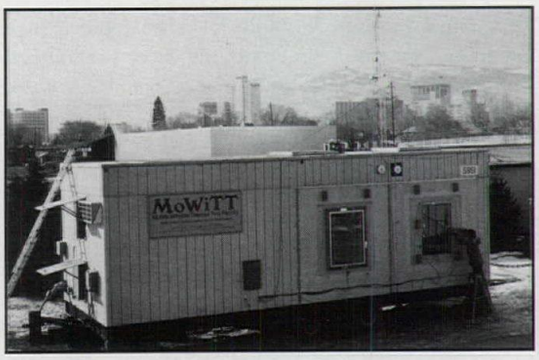


Figure 3b.

Window Futures

For the mainstream window manufacturing industry, the immediate task is to catch up with recent developments in low-e coatings (see Technics Topics, p. 52) and to address the thermal inefficiencies of frames and edge seals that make high performance glazings into medium performance windows. Research, meanwhile, goes on in the quest for even better glazings and windows, and while much of this exploratory work is still a long way from realization in product offerings, some are in prototypical stages.

Air flow windows. Air flow windows draw either indoor or outdoor air between the panes of a multipane window unit and discharge it either to the indoors or the outdoors, depending on the climate, season, and operating strategy of the window design. The idea is not new, but while many previous air flow designs were conceived as solar collectors, the most recent variant has been developed as a heat recovery system. Called the Laminar Air Flow System Window (LAFSW), the unit consists of a sealed, double-glazed panel and a separate single glazing in the position normally occupied by storm sash. Outdoor air is admitted to the bottom of the cavity between the single and double glazings, flows through the space and exits to the indoors through the top of the window. The concept has been researched by G.K. Yuill and Associates, Ltd., Engineers, with support from Energy, Mines and Resources Canada, and Manitoba Hydro. Willmar Windows, Winnipeg, Manitoba, who manufactured the test prototypes, will custom produce the LAFSW in a vinyl frame.

In theory, if the incoming air recovers all the heat going out through the double glazing, the U-value of the vision portion of the window should approach zero. According to Yuill's research, the effective thermal resistance of the window in operation is as high as R-14. This is only an *effective* R-value, however: The same volume of air that enters through the LAFSW's in a house must simultaneously be exhausted, and if the exhaust stage lacks a heat recovery system, the unit's "effective" R-14 is meaningless. In their demonstration house test, a whole house exhaust fan running at 100 cfm affected an hourly air change rate of 0.4, in compliance with a proposed Canadian draft standard. The key to air flow window performance is management, and this means that the architect must understand the air movement behavior of the building very well or work closely with a mechanical engineer to design and tune the system.

Evacuated glazings. When a low-e coating is applied to one of the internal surfaces of a double glazing, most of the radiant transfer of heat from one side to the other is eliminated, and conduction (and convection) through the air or gas fill becomes the major vehicle of heat transfer through the assembly. If the window could be assembled and sealed to sustain a vacuum, a U-value at the center of the glass as low as 0.083 (R-12) is possible with a low-e (e = 0.05) double glazing, according to investigations conducted at the Solar Energy Research Institute. Equally important to this extraordinarily low U-value is that the glazing would retain a shading coefficient no lower than currently available high performance glazing – around 0.7. Such a glazing would have extraordinary performance in service, providing a net winter seasonal heat gain for even north windows in all but the gloomiest climates (see Building Science Brief, p. 45).

There are problems with evacuated glazings: (1) the seal must be absolute in order to maintain the vacuum; (2) the exceptionally low heat transfer across the glazing demands that special attention be given to insulating the glazing unit from the frame; (3) the inside pane will maintain a much lower temperature than the outside pane, producing large differential thermal movements that could overstress rigid edge seals; and (4) spacers are needed in the evacuated cavity to keep the glass layers from collapsing under atmospheric pressure. The first three items are interrelated in that SERI researchers feel the only accept-

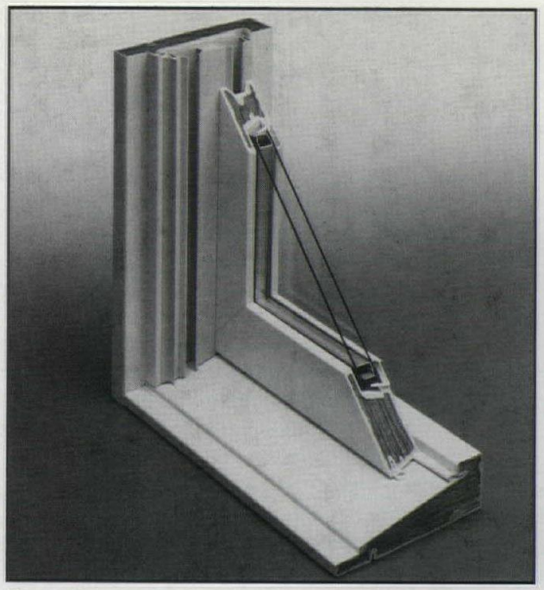
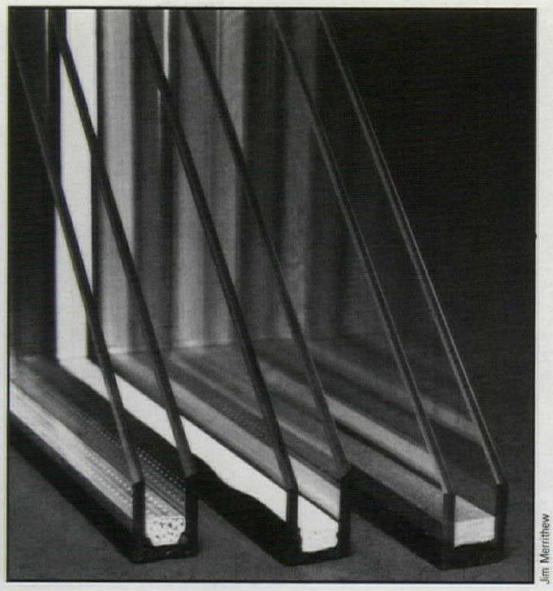


Figure 5.



Jim Merithew

Figure 6.

able seal is a glass weld; this creates both a rigid seal and a thermal bridge at the perimeter. The necessary spacers also create pinpoint thermal bridges across the glazing, although with small (3 mm) spherical glass spacers on two-inch centers, the glazing retains a thermal resistance of R-10.

SERI researchers have fabricated small, laser-sealed, partial vacuum prototypes with glass spacers as small as 0.5 mm (the thickness of a typical mechanical pencil lead) in diameter. Such small spacers are said to be almost invisible. More work is needed to optimize, test, and develop manufacturing processes to commercialize the concept. Federal budget cuts for SERI halted work on evacuated glazing in the mid-1980s, however, so the idea now lies fallow.

Window labeling. Growing interest in energy efficiency of window products has led ASHRAE, the window industry, and governmental agencies to seek a common basis to evaluate and rate the performance of windows in service. The fact that Canada has already started an effort to label windows has contributed to a U.S. effort in anticipation of expanded trade across the border. Through a series of meetings attended by interested parties, the National Fenestration Rating Council was organized during 1989. It is a voluntary, nonprofit group whose mission is to work with the fenestration and building industry to establish a rating system that will enable specifiers and purchasers to make more informed decisions based on the potential energy performance of windows and fenestration systems. The board of directors is structured to represent the manufacturing industry, the building industry, design professionals and specifiers, state energy agencies, utilities, and the public. The firm of D&R International of Silver Spring, Maryland, is administering communications of the Council and can provide more information about it.

The Council's technical committee is now discussing various performance criteria and label formats. No proposals have yet been made, since the process is only a few months old. The Council's work is, however, being hurried along by a labeling program already underway in California. That state intends to have a window labeling system on the shelf and in force by January 1991.

Conclusion

The past year has been an active one in the window industry, and with new products and product claims appearing in the marketplace, it is both a rapidly advancing and potentially confusing field for designers and specifiers. The NFRC's labeling program has the opportunity to clear the air of misleading product promotions; in the meantime, Lawrence Berkeley Laboratory is to be commended – and also the Department of Energy for supporting their work – for taking the lead in the U.S. in evaluating, advancing, demonstrating, and developing tools for analyzing the performance of new window materials and technology. **Kenneth Labs** ■

Recommended Reading

"Fenestration," Chapter 27, ASHRAE *Handbook, 1989 Fundamentals Volume,* American Society of Heating, Refrigerating and Air Conditioning Engineers, Atlanta (404) 636-8400.

Window Performance and New Technology, NRCC 29348, Proceedings of Building Science Insight '88, National Research Council Canada, Ottawa (613) 993-2463, 69 pp.

WINDOW 3.1, a PC Program for Analyzing Window Thermal Performance, Lawrence Berkeley Laboratory; free from Bostik Construction Products, Huntingdon Valley, Pa. (800) 523-5600.

A list of publications produced by and available from Lawrence Berkeley Laboratory's Windows and Daylighting Group may be obtained from LBL, Berkeley, California (415) 486-6845.

Acknowledgments

P/A would like to thank the following people for their help during the preparation of this article: Stephen Selkowitz, Joseph Klems, and Dariush Arasteh, Lawrence Berkeley Laboratory, University of California; Anthony Giometti, ASHRAE; Todd Sitrin, Southwall Technologies; Michael Glover, Edgetech Division of Lauren Manufacturing; Gordon Comeau, G.K. Yuill and Associates Ltd., Professor Timothy Johnson, School of Architecture, MIT; Cynthia Witty, D&R International; Dr. Henry F. Sullivan, University of Waterloo.

sorption and release by the glazing is aIU/h_o. The outside film coefficient chiefly depends on wind speed; according to recent work at Lawrence Berkeley Laboratory's MoWiTT facility, it can be approximated by the relation,

$h_o = 1.28 + 0.56W$,

where W is wind speed in mph, and h_o, like U, has units of Btu/ft^2(hr)F. The disposition of the energy flow in insulated glazing is more complicated, since energy is absorbed by both layers, and the inward flowing fraction depends on the thermal characteristics of the subcomponents and their order within the glazing assembly – not just on the overall U-value.

The working definition of the solar heat gain coefficient is

$F = t + aU/h_o$,

and that of the solar heat gain is

$SHG = I(t + aU/h_o)$.

The coefficient F is a property of the glazing material, although it varies by season as a result of different wind speeds assumed for winter and summer design conditions. The standard reference material is ⅛-inch-double-strength sheet (DSA) glass. It has a transmittance of 84 percent and reflectance and absorptance of 7 and 9 percent, respectively (some references list these as 86, 8, and 6 percent). Under standard winter conditions, DSA glass has a U-value of 1.11, and h_o is taken as 5.1, so $F_{DSA} = 0.84 + 1.11(0.09)/5.1 = 0.86$.

The shading coefficient (SC) is the ratio of the solar heat gain through a glazing to the solar heat gain through DSA glass:

SC = (F of glazing)/0.86,

where F is measured and published by the manufacturer. The SC of DSA glass, by definition, is 1.0. Some glazings have SC greater than 1.0, but as a general rule, SC is generally less than unity.

The *solar heat gain factor* ($SHGF$) is the total heat gain through sunlit DSA glass, and is defined,

$SHGF = I(F_{DSA})$.

Solar heat gain factors for different latitudes and times of the year are published in the ASHRAE *Fundamentals Handbook* as average clear-day values. They are useful and convenient because the total heat gain (or loss) through the glazing is the sum,

$Q = SC(SHGF) + U(T_i - T_o)$,

where T_i and T_o are the indoor and outdoor temperatures, respectively, and the heat flux Q has units of Btu/ft^2(hr)F.

Technics Topics

MIT Professor **Timothy E. Johnson** surveys the pros and cons of low-e glazing products on the market today.

Four Types of Low-e Glass

The current generation of (R-3.2 to R-5) high performance glazings and the coming generation of (R-6 to R-10) superglazings all rely on low-emissivity coatings to boost their R-values above the R-2 of standard insulating glass. Low-e products are available in four different forms, as (1) thin depositions (sputtered on, as a "soft coat") on glass; (2) thin depositions on plastic films that are applied – normally, in retrofit applications – to an exposed surface of glazing; (3) a pyrolytic coating (baked on as a "hard coat") on glass, and (4) thin depositions on retrofit plastic films.

Thin depositions on glass. These are recognizable by the coating's blue reflections.

Pros.

Glass coaters can easily create a variety of silver based coatings for different window applications since the thin film's composition is easily controlled during the vacuum deposition process. Thin depositions on glass have the following advantages:

- They can sustain operating temperatures as high as 392 F (suitable for solar collectors or industrial uses such as windows for high-temperature manufacturing areas);
- They have the lowest emissivity, as low as 3 percent (This produces the lowest double glazed U-values, typically 0.21 (R-4.8) with argon gas fills);
- They have two-thirds less UV transmission than ordinary double glazing due to the high UV reflection (which lengthens the life of fabrics and art);
- They handle and glaze like non-coated glass;
- They are the second least expensive low-e product;
- They can have the lowest shading coefficient (0.38), although some also produce the second highest;
- Some are warranted up to 20 years.

Cons.

The drawbacks of the so-called "soft coat" films derive from the need to package the coating as a double-glazed unit to prevent the film from corroding. This adds to the cost of a window, unless double glazing is required. The disadvantages are:

- The coating has a limited (six months to a year) shelf life when unsealed, depending on storage conditions;
- Proper sealing requires stripping the coating back from the glass edges;
- The glass cannot be tempered after coating is applied.

Thin depositions on suspended plastic film. These carry the "Heat Mirror" stamp.

Pros.

The coating is the same as discussed above. The extra gas space(s) formed by the suspended film(s) produces a lower U-value than any of the other approaches. Advantages of glazing using low-e films are:

- They have the lightest weight for the lowest U-value at normal dimensions;
- The extra air space(s) give better noise control;
- They possess the lowest U-value (0.125 or R-8) when using two suspended films and krypton gas fills;
- They have the lowest UV transmission (0.5 percent) due to the high UV reflection of the multiple low-e coatings and moderate UV absorption within the plastic films (which lengthen the life of fabrics and art);
- They have the second lowest shading coefficient, due to the high transmittance of the suspended plastic;
- The coating composition can be varied at the factory for different applications and climates.

Cons.

The drawbacks derive from the need to protect the suspended film in a sealed unit to prevent the low-e coating from corroding. The plastic film mounting system adds significantly to the cost of the window, so the cost advantage of roll-coated plastic is more than negated. Specific limitations of suspended film low-e systems are:

- They are limited to moderate temperature applications, of less than 150 F;
- Distorted light reflections are produced at the suspended plastic in very hot climates due to plastic creeping;
- The suspended plastic reduces daylight transmission.

Pyrolytic Coatings. These are colorless glass coatings that are fused to the glass during production, while it is still hot.

Pros.

The latest process produces a stable, hard, surface without iridescence. The principal advantages of the pyrolytic-coated glass products are:

- They tolerate high – over 572 F – operating temperatures (suitable for solar collectors or industrial uses such as windows that overlook high temperature manufacturing areas);
- They have the highest shading coefficient at 0.78 (desirable for solar heating applications), with the same daylight transmission as thin films;
- Theoretically, they are the most economical low-e product;
- The coatings are corrosion-proof (This is necessary for single glazing and vented, double glazed units.);
- The coatings are abrasion proof (This is desirable for easy cleaning and long life.);
- They handle and glaze like non- coated glass;
- The glass can be tempered after coating is applied.

Cons.

The so-called hard coat offers inherently less variety, since the deposition process gives less control over the coating's thermal and optical characteristics than the vacuum sputtering process used for thin films. Disadvantages of the pyrolytic coatings are:

- Intermediate emissivities of 14 percent to 19 percent produce slightly higher U-values than the thin films;
- Bright sunlight shows some haze on the coated glass.

Thin depositions on retrofit plastic films. These are produced by 3M and others.

Pros.

The coating is protected by a lamination of polypropylene film. Any window retrofitted with the film sandwich adopts the low-e characteristics of the film. The film reduces the U-value for single glazing by 35 percent and double glazing by 22 percent. Other advantages include:

- They reduce U-values with no increase in weight or volume;
- There is no need for seals or special construction;
- They are inexpensive and cost-effective over the product's lifetime.

Cons.

The drawbacks derive from the need to replace the exposed film every 9–15 years (for interior mounts) because of corrosion and ultraviolet attack. Other disadvantages are:

- They are limited to moderate temperature applications of less than 150 F;
- The daylight transmission is reduced due to the adhered plastic film;
- Emissivities as high as 25 percent gives the highest U-values of all the low-e approaches.

Conclusion

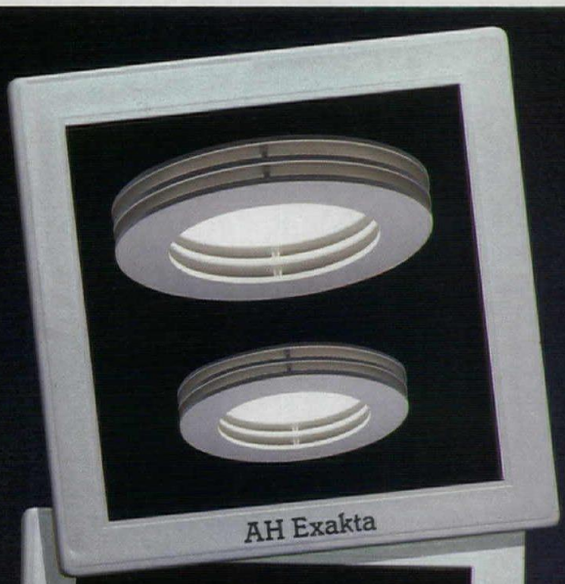
While advances in low-e production technology may not yet have reached its limits, the real work now is for window manufacturers to better exploit the new developments that have occurred.

Timothy E. Johnson ■

The author is a principal research associate at MIT's Department of Architecture. *This article is drawn from Johnson's forthcoming book,* Architecture Applications and Uses of Low-e Glazings, *to be published by Butterworth Publishers, Stoneham, Massachusetts.*

Light and Design


Step by Step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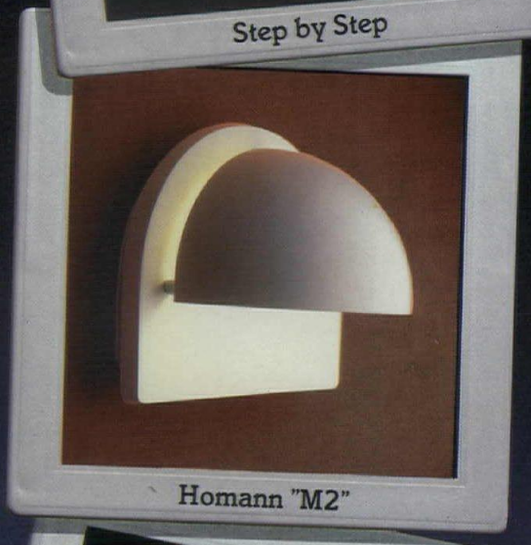
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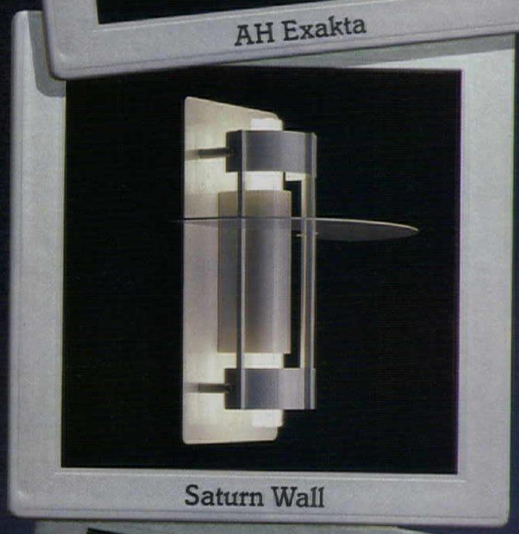
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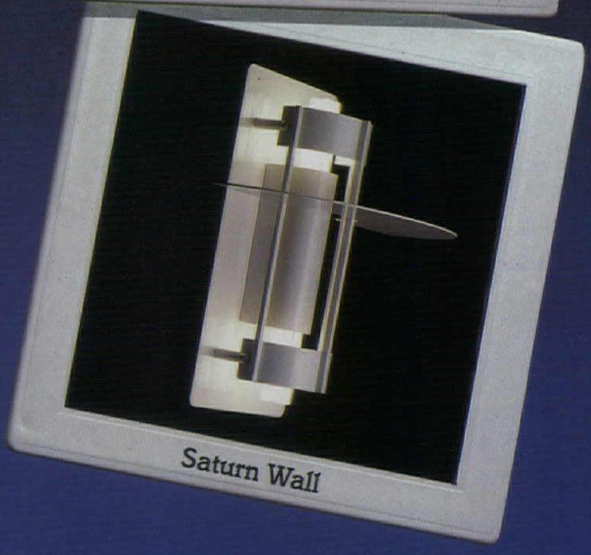
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Practice

Robert Greenstreet suggests ways of ensuring the payment of fees.

Law: Getting Paid

The question of compensation has always been a sensitive issue with members of the architectural profession. In two separate surveys (P/A, October 1986 and November 1987) readers agreed overwhelmingly that compensation was inadequate and that professional fees were, in the face of increasing competition, far too low. Low levels of compensation are compounded by the relative fragility of practice, as there is a high turnover rate for architectural firms in America, many of which "peter out" after a couple of years. There is always a need for a readily accessible cash flow, and yet architectural practices are plagued by an alarmingly high rate of nonpayment of fees. In a recent study,[1] it was discovered that over one-fifth of all lawsuits involving architects in one state were initiated by members of the profession in pursuit of fee collection. Furthermore, it is estimated that as much as $70 million a year in architectural fees remain uncollected in the United States.[2] The purpose of this article is to examine the reasons for late payments or refusal of payment and to suggest several strategies that can help ensure prompt receipt of accounts due.

Problems in Payment

The reticence of clients to pay for services rendered may stem from an unhappiness with the quality of the services provided by the architect or from a reluctance to part with money for what has become redundant work – for example, if a project is abandoned prior to construction because of a lack of funds. A congenial architect/client relationship can be maintained by ensuring that all contract requirements are met in full and that client expectations are adequately met. Unwritten or ambiguous contracts are a common source of problems and often stem from a lack of pre-contract discussions with the client. The client should be fully apprised of the realities of the building process by the architect, particularly regarding the overall project budget. If the base bids greatly exceed the architect's estimates, the client may abandon the project and refuse to pay the architect. If the architect has a contractual duty to prepare "preliminary estimates of Construction cost" (B141), such costs should not be grossly exceeded unless the owner is regularly notified of any likely increases. However, a recent case[3] indicates that where there is no express contractual obligation to design within a budget, a final project cost which is greater than anticipated by the owner may not be an acceptable reason for nonpayment of architectural fees.

The case of the abandoned project may be more difficult to resolve, as it involves variables often beyond the architect's control, such as a downturn in the economy or client bankruptcy. In addition to ensuring that all contractual obligations are carried out adequately, the architect may wish to take extra precautions to ensure that there are no technical reasons that may be used to justify nonpayment. For example, if the work is out-of-state, licensing requirements should be strictly adhered to. Existing cases indicate that clients have tried to evade fee payment because the architect was not registered in the state at the time of contract signing (reciprocity was being sought) or because partnership laws were infringed by a practice having a nonarchitect as a partner, acceptable in some states but not in others. Fees may be successfully reclaimed if the courts feel that the client has become unjustly enriched by the architect's work.[4] However, the costs of the suit may outweigh the fees involved, and a little more initial caution may remove any potential "justification" for nonpayment.

In both instances, clear communication with the client prior to and during the design phase is essential. A number of cases between architects and their clients show that miscommunication of the relative roles and responsibilities of the two parties is a prime source of misunderstanding. While misunderstanding can never be fully eradicated, the architect as the expert, whose contractual duty is to "advise and consult" with the owner, should endeavor to minimize potential problems wherever possible and create a clear, unambiguous relationship.

Strong Architect/Client Relationships

Beginning in the pre-contract phase, this process, if carried through effectively, can reduce chances of a breakdown in the relationship and thus enhance the likelihood of prompt fee payment. The relative roles of the client and architect should be clearly articulated and the realities of building construction carefully explained before signing the contract, and the architect should not gloss over any of the potential problems. As a basis for these discussions, some architects introduce their prospective clients to the contents of AIA Documents B141 "Standard Form of Agreement between Architect & Owner" or "Working with your Architect," a 16-page booklet developed by a group of architects, lawyers, owners, and insurance risk managers. While much has been written on the importance of contractual language, the need for written, preferably standardized, contracts cannot be overly stressed. Without documented evidence of the agreement for services, seeking redress through the courts will be vastly more difficult and may result in an award for "reasonable value" instead of the full claimed value of the work.[5] While a letter can encapsulate the approximate scope of services and amount of payment, it is unlikely to encompass broader issues, such as ownership of copyright, arbitration agreements, or finite scope of services, which may be of importance. In

(continued on page 57)

Practice Points

Managing construction of low-income housing? The Enterprise Foundation has made available three low-income housing production manuals for single- and multi-family housing rehabilitation and new construction. The manuals cover the details of conducting feasibility studies, property evaluation, design, bidding, and construction management. For ordering information call Cecilia Cassidy (301) 964-1230.

The demand for long-term care for the elderly is expected to increase dramatically as the population requiring care triples by the year 2024 (from 6.6 million to 19 million). "Long Term Care: Who's Responsible?" is a report produced by the American Society of Aging on the issues surrounding the housing and care of the elderly in the coming decades. Call (415) 543-2617 for information on this and other reports on the shifting elderly population.

A mix of personality types creates a healthy, well-rounded office. When hiring new personnel, the Professional Design Practices Newsletter suggests cultivating a mix of innovative-entrepreneurial types, client-cultivating administrative types, specialist/technical types, and production-oriented types. For information on the newsletter contact Olden/Associates at (813) 573-0908.

According to a U.S. Department of Commerce Survey, California has more than twice as many architectural and engineering firms (9579) than any state in the union. Texas is second with 4658, and Florida and New York are third and fourth with 3876 and 3657 firms respectively. Which is the state with the the fewest firms? South Dakota supports only 96.

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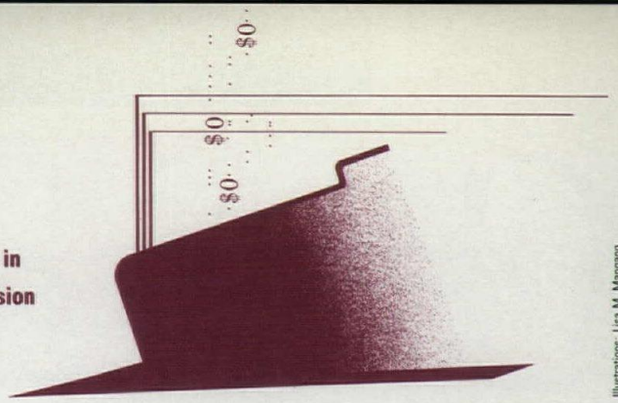
"Over one-fifth of all lawsuits involving architects in one state were initiated by members of the profession in pursuit of fee collection."



Illustrations: Lisa M. Mangano

(continued from page 55)

the case of copyright, for example, an absence of language claiming ownership of drawings for the architect may mean that it passes to the client. Similarly, important timing issues may be missed. While payment may be specified, the schedule for payment may not. In the absence of stipulated installment periods, some jurisdictions may hold that payment may not be forthcoming until the completion of services.[6] Standard contracts, on the other hand, provide clearly for an initial payment (B141.11.1) and regular interim payments to the architect.

Several recent cases reveal that care should also be taken in checking out the client's contractability. While this presents little problem with a private client (although the prudent architect may wish to test out financial soundness and earnestness by the requirement of a retainer fee), a representative of a larger corporation or public body may not have the authority to bind that organization, which could endanger the validity of the contract and, therefore, the design professional's ability to file a claim on it.[7]

Once the contractual period has commenced, clear communication of financial matters is essential. Regular invoicing and prompt statements of service create a professional atmosphere that helps to generate payment. As with all matters affecting finances, the architect should keep clients apprised of spending implications, letting them know when the meter starts running, whether additional services are necessary (and their cost), and when projects are coming close to any pre-established cost ceilings. Careful monitoring and communication of the fees payable prevents any unexpected surprises that may cause the client to balk at payment. Similarly, any changes to project costs should be communicated to the owner. If the changes are instigated by the architect, the client's written approval should be sought before they are effected. In a recent case, an architect was not entitled to extra fees for work undertaken, which was not considered an "act of volunteerism," even though it was carried out in the owner's best interests.[8]

When All Else Fails – Going After Unpaid Fees

Ideally, a harmonious architect/client relationship, a well articulated contract and a regular invoicing system will ensure a smooth flow of fees into the practice. However, there are always exceptions. When faced with the nonreceipt of fees, the architect must decide on an appropriate course of action.

Some practices are reticent to take legal action to recover fees, either because they do not wish to receive any negative publicity or because attorney's fees and the time and trouble involved may dissuade them. Also, recent data indicates that a claim for fees invariably leads to a counterclaim for negligence.[9] Encouragement can be drawn from a recent study that indicates that architects win over 75 percent of the cases where they have had to sue for unpaid fees.[10] However, prior to any legal action, the architect should ensure, through carefully written correspondence, that the client is clearly informed of the work completed, the expectation of payment, the time limitations and, ultimately, the architect's intentions to take legal action. This paper trail will ideally generate payment or, at worst, present a reasonable, professional approach on the part of the architect, which may impress a court of law at a later date.

Other options are available. Collection agencies specialize in recovering unpaid monies, although architects may eschew their services as appearing either unprofessional or too expensive. At present, a survey reveals that 74 percent of AIA firms attempt to collect fees without such assistance.[11] Arbitration or mediation has proved highly effective in settling disputes both quickly and inexpensively, although without a contractual clause binding the parties to arbitrate or mediate, the procedure may be difficult to initiate after a dispute has occurred.

One particular tool that has been heralded as a valuable weapon in the architect's effort to collect fees is the mechanic's lien. This is a legal device that creates a hold on the property, forcing its sale to pay for outstanding fees or preventing the client from selling until the lien is lifted. While appealing as a means of forcing a recalcitrant client to pay bills, the mechanic's lien is a complex legal device that varies considerably in each state and may not be available for design services. Some states will only allow liens to be filled for supervisory work during the construction phase, while others will only permit liens to attach to property where visible improvement or commencement of construction can be detected. State law needs to be checked carefully to ensure that lien coverage is appropriate to a particular claim before any action is taken.

Whatever the particular character of the liens, it is extremely important that procedures are followed closely. This usually involves filing within specific time periods and telling the owner beforehand of the intent to file. Failure to complete the procedures properly has led to accusations of slander, so if a lien is considered (preferably as a last resort rather than a first line of attack),[12] legal counsel is advisable.

While there are no guaranteed methods that can ensure payment of fees, standardized procedures for billing of clients and collecting unpaid accounts are advisable. The process begins with an appropriate education of potential clients as to the methods and anticipated amounts of payments, followed up by prompt invoicing and careful record-keeping. Should problems of nonpayment arise, standard letters requesting payment and a consistent office policy regarding the collection of fees should become a part of every office manual.

The combination of the two strategies will mean less time and anxiety spent dwelling upon and dealing with fee collection and allow more opportunities to concentrate on increasing practice productivity. **Robert Greenstreet** ■

The author is a chair of the School of Architecture, University of Wisconsin, Milwaukee.

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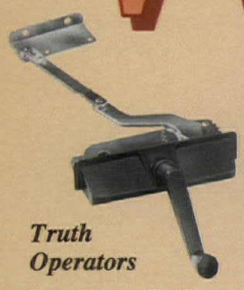
CASEMENT WINDOWS



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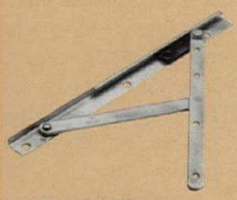

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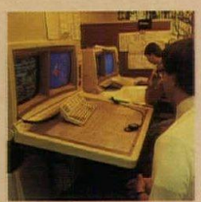

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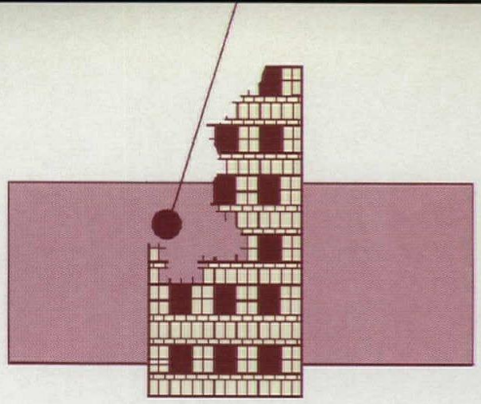
Circle **No. 396**

Walter Rosenfeld discusses the considerations when specifying demolition work.



Specifications: Breaking Away

Since work in existing buildings continues to be an important part of most architects' practices, and since it almost always requires removal of existing work to make the new configuration possible, specifiers frequently find themselves preparing sections on demolition before they can begin sections on new construction. Whether for renovation, remodeling, rehabilitation, alteration, or adaptive use, demolition sections always need careful tailoring to the project's special conditions and involve decisions not usually encountered in new construction.

Commonly (and in CSI's "Masterformat" as well), the term "demolition" is used to indicate total removal of an existing structure (Section 02060). Images of bulldozers and the wrecker's ball come easily to mind. The more complex and more usual architectural situation involves "removal of existing work" or "selective demolition" (Section 02070) to prepare the building for alterations and new work to be done under the contract. While both types may be required in different parts of the same project, selective demolition demands more careful coordination and detailed specifications.

Whatever conditions exist at the building site, any specifications for removal of work must deal with three main issues: protection of persons and property; handling of existing mechanical and electrical installations, and disposal of the items removed. Each has its special demands and accompanying pitfalls.

Protection

Masterspec and *Spectext* master sections on removal of work include good examples of provisions for protection of the public during demolition. Not only are sidewalk sheds and rubbish chutes needed, but materials in transit should be covered to avoid spillage. It's usually necessary to explicitly forbid methods that cause shock to adjacent occupanies and burning debris on the premises.

Protection of existing work to remain is of concern to the architect and the owner as well. Frequently dust-proof partitions will be needed between occupied parts of the building and those undergoing renovation. Phased occupancy, which involves shifting the owner's operations as the work progresses, is sometimes necessary, too. Where the owner continues to use part of the building, special attention will have to be given to maintenance of safe access and continuity of mechanical and electrical services.

Existing utilities must be disconnected – at main panels or meters in the building where possible – before work proceeds. Though demolition is almost always the general contractor's responsibility, disconnecting and capping existing utilities in the building should be done by electricians and plumbers.

It is the general contractor, too, who should obtain and pay for licenses and permits, as well as insurance that includes demolition work in its coverage. The contractor's insurance should also include XCU (explosion, collapse, and undermining of utilities) coverage for the owner's additional protection. Removal of asbestos-containing materials poses special problems usually best left to specialists. Since the architect's liability insurance seldom includes coverage for involvement in this hazardous work, the owner should be encouraged to handle it directly.

Coordination

It's all very well for the general contractor's laborers to break up major portions of the buildings, but not all parts should get the sledgehammer treatment. A distinction usually needs to be made between rough and fine demolition here. The latter should be assigned to the appropriate trade. Example: A concrete block partition can be removed by the wrecking crew, but a window opening in an existing brick wall should probably be cut out by masons to allow salvage of hard-to-match bricks and to permit inconspicuous "toothing-in" and proper finishing of the new opening.

Roofing removal, partial or total, is another special case. Where alterations to the roof are required, removal work should be done by the roofer to maintain any warranties involved. Also, responsibility for keeping the building tight is more easily assigned if the roofer removes materials with protection in mind.

Disposition

In most cases, the major effort in writing demolition specifications, even using standard master sections, has to do with determining what eventually will happen to the items being removed. While the drawings usually indicate which materials go and which are to remain, what becomes of removed materials is generally left to the specifications, except for showing the relocation of materials to be reused on the work. But along with relocated items, the specifier also needs to consider two other categories of parts removed from the building: salvage and discards.

Reuse

Though the AIA general conditions (A-201) assume that all materials used for construction will be "new and of recent manufacture," it often makes sense to rehang some doors in new frames, to relocate windows, and to move fire-extinguisher cabinets and the like when they are in good condition. In this case, the distinction between new and reused materials must be clear both on the drawings and in the specifications. Where reworking of existing materials before reuse (frequently the case) is required, it should be specified in the appropriate trade sections.

Salvage

There may be items from the building that cannot be reused on this project but which the owner may be able to use elsewhere. Particularly if the owner is an institution that maintains several buildings – or if the unaltered portions of this building will continue to need replacement – it may be convenient and economically attractive to save doors, finish hardware, plumbing, lighting fixtures, and the like. The difficulty at a future date of matching manufactured items in the existing building often outweighs the cost of salvage and storage, particularly where consistency and character of materials are important. Such items to be salvaged should be identified in the specifications and direction given to the contractor as to where and how the owner will receive them.

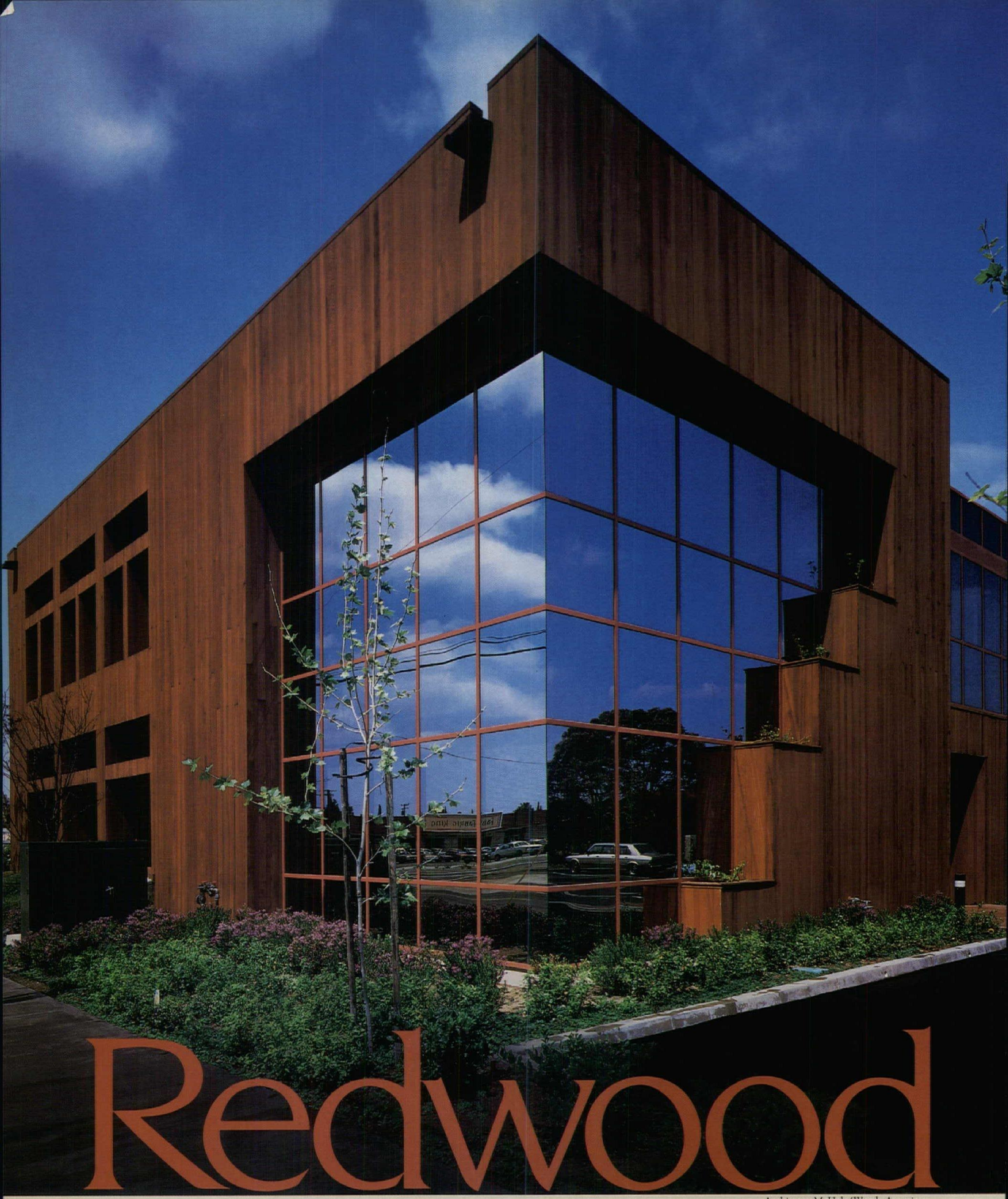
Discards

Generally, the specifications should say that all removed items not reused and not turned over to the owner will become the contractor's property and shall be legally disposed of off the site. In some cases, masonry and similar harmless nondegradable material will be allowed to be buried on site to reduce disposal costs. Hazardous materials that must be removed from the site may constitute the contractor's most serious problem and can often involve significant costs. To offset this, some of the items removed may have considerable market value, which the contractor will calculate in bidding the removal work. The owner and the architect should be alert to such value and decide who will cash in.

Selective demolition is often a somewhat delicate operation, requiring thorough inspection of existing conditions, careful documentation of the results intended, both on drawings and in specifications, and full coordination with the architect's consultants who are writing sections for specialized trades. Only with attention and effort can such planned surgery be carried out successfully.

Walter Rosenfeld ■

The author is an architect and specifications consultant in Newton, Mass.



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William Malpas explores those areas of construction that lead contractors to carry large contingencies.

Management: Minimizing Construction Risks

The contractor's cost of the construction phase of a project has four components: the actual cost of materials and labor, overhead, profit, and risk contingency.

Assessing a risk contingency is assigning a dollar value to the unknown, and this contingency is the most variable factor in bidding construction work. One way to control construction costs is to reduce the factors for which the contractor carries contingencies.

Minimizing risk and controlling costs are not the same as reducing costs. Real risks exist. Many contracts contain clauses that spell out the method for handling identifiable risks. For instance, excavation contracts often contain a "rock clause," which assigns an hourly rate, over and above the contract price, to excavate in rock. Other typical identifiable risks are for asbestos, delays caused by the permit process, and dryrot.

The question is: Who should control the contingencies or reserves? It may appear to make sense to have the contractor calculate the risks and carry the contingencies on a project because an integral part of the construction business is taking risks. In reality, contractors should be selected based on their ability to deliver the finished project, not on their ability or willingness to underwrite risk.

Consider the ways a contractor's risk contingency is spent: 1) The anticipated condition materializes and the contingency is adequate, 2) The anticipated condition doesn't materialize and the contractor makes excess profits, 3) The contractor starts losing money, and quality suffers. The odds are two to one against the owner's best interest if the contractor carries the contingency. It is appropriate, therefore, for the owner to control the contingencies for the real risks. If an anticipated condition never occurs, the owner can spend the money elsewhere.

Apart from the obvious risks mentioned above, there are other, more subjective unknowns that a contractor faces. What are they, and how do they affect costs? What can the architect do to make a project less risky?

1) Technical aspects of the design and construction may pose a risk. Long lead times on key items, unfamiliar materials, zero-tolerance detailing, and scheduling the trades in an unusual sequence contribute to the likelihood of a project going awry. To cover the potential cost of technical difficulties, the contractor will carry a contingency for additional management time.

The simplest way for the architect to deal with fears about unfamiliar technology is to find out who sells and installs the products, and include this information and tear-sheets as part of the specs. In terms of close-tolerance detailing and sequencing, the architect should draw the finished product, not the process. Let the contractor and subcontractors work out the actual method for achieving the desired result.

2) The availability of the architect and the owner to make timely decisions (finishes, submittals, samples, etc.) affects construction efficiency. The contractor will determine the contingency for delays based on the owner's and architect's reputations.

The architect should work out a timetable for making decisions with the owner. In the bid documents, a series of dates should be established for shop drawing and sample submittals so that they all don't pour in at once. Enough resources should be available to turn the submittals around quickly.

The possibility of delayed or capricious decisions from an unknown owner is probably the most difficult situation for the contractor to anticipate. By the time the plans go to bid, the architect should have a fairly clear idea of how the owner makes decisions. It should be made clear to the owner that the pace of decision-making picks up once construction starts.

3) The project may be undercapitalized, causing delays in payments. The contractor, anticipating this, may include a contingency for borrowed money.

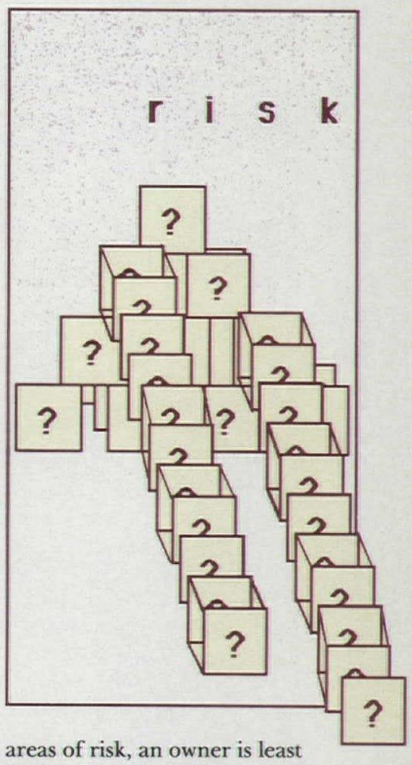
The architect should work out a preliminary cash flow projection during design development. The contract documents should require the contractor to submit, and periodically update, cash flow projections based on the estimate and the schedule.

The architect also should send invoices for regular progress payments during the schematic and design development phases so that the owner gets accustomed to monthly transfers of funds. An owner's history of prompt payment will reduce both the contractor's anxiety and the contingency.

4) The biggest risk a contractor faces is trying to attach a firm number to incomplete plans and specs. The whole point of drawings and specifications is to minimize misunderstanding and minimize risk. The architect should devote time and energy to the drawings and specs before construction starts. There are often compelling reasons to release the documents too early, but once crews are mobilized, contractors can ask questions faster than architects can answer them.

If the main contract is competitively bid based on incomplete plans and specs, the contractor is tempted to submit a low bid, perhaps without any contingencies, with the intention of making it up on change orders. Not only will contractors price each change order so that it is risk free, but they will also include amounts to build contingencies up to normal levels. If for no other reason than risk contingencies, changes to competitively bid contracts will always be more expensive than changes to negotiated contracts.

Of these four, more subjective

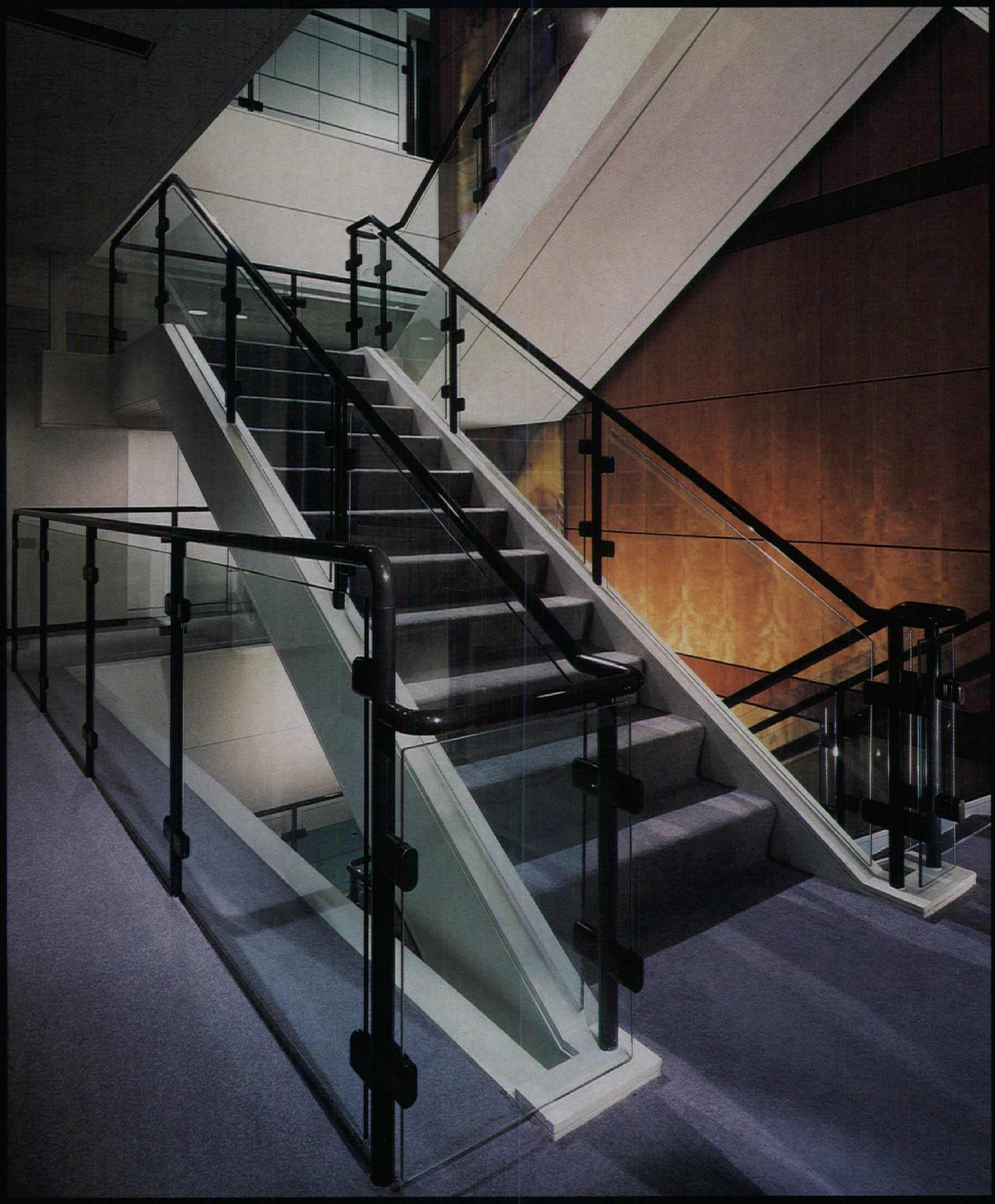


areas of risk, an owner is least equipped to determine an appropriate contingency for incomplete plans and specs. If the project must proceed with incomplete contract documents (in phases, for example), a negotiated contract with agreed-on allowances or contingencies for the undefined scope is the safest course.

The risks mentioned above are difficult to quantify, but the contractor will carry lower risk contingencies in areas where the architect has reduced the subjective risk. Real, identifiable risks exist despite the architect's best efforts, and in those areas the owner should control the contingencies. He who benefits from the risk should take the risk.

William Malpas ■

The author is a project manager with Ryan Associates, a design/build construction company in San Francisco, California.



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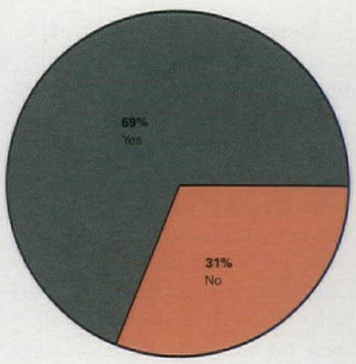
Reader Poll: Architects' Lifestyles

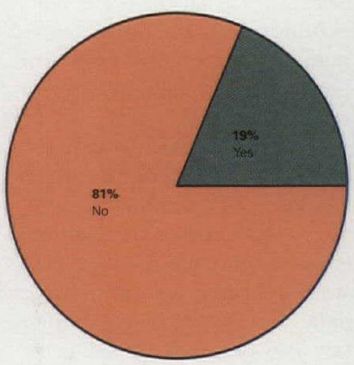
In this poll on architects' lifestyles, P/A readers appear to be more liberal and generally less satisfied than the general public.

If a generalization can be made about architects' lifestyles from the 1400 responses to this P/A Reader Poll, it is that the profession is more liberal and more satisfied with work than the general population and less content with income, standard of living, and current housing.

1 Are you married?



2 Have you ever been divorced?



Marital Status (Figs. 1, 2)

It is commonly thought that architects, because of the time demands of the profession, are frequently divorced, but that seems not to be true. Almost 70 percent of the respondents to this poll are married, and over 80 percent have never been divorced.

It also is thought to be typical in the profession for spouses to be involved in one's architectural work, but that, too, does not accord with reality. While 59 percent of those who are married have spouses who work full time and 23 percent part time, 59 percent also report that their spouses are not involved in their work. Only 12 percent indicate the considerable involvement of spouses.

Gender Differences (Figs. 3–5)

As previous polls have recorded, the number of females in the profession is still very low; only 13 percent of the repondents to this poll were female. Because women are increasingly entering the profession, their average age is less than males. "Over 80 percent of female respondents were aged 40 or less," note Morrison & Morrison, consultants for this poll, "compared to only 57 percent of males within that age range."

More significantly, the values and lifestyles of female architects appear to be somewhat different from those of males, suggesting the existence of a gender gap within the profession. Females, for example, are quite a bit more likely than males to participate in sports, less likely to attend religious services, more likely to smoke, less likely to have a home computer or car phone, and more likely to read, dine out, attend movies or theater, or visit friends in the evenings. The greater youthfulness of female respondents and the higher percentage of females who consider themselves liberal may explain some of these differences, but not all.

Age Differences (Fig. 6)

Whether male or female, our readers are split on a number of topics according to their ages. Those under 40 years of age, for example, find it much harder than those over 50 affording their desired lifestyle or finding time for personal relationships.

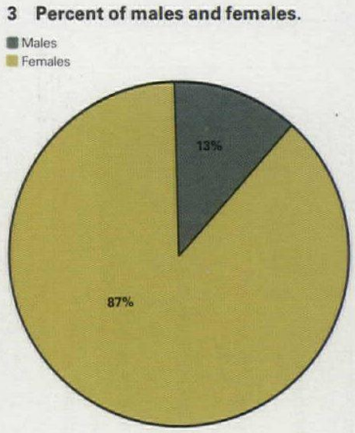
Age also affects free-time activities. For example, those in the 41- to 50-year age range are much more likely to have a home computer than those either older or younger. Those over 50 seem to prefer more sedentary activities in the evening such as reading (49 percent) or television watching (28 percent), while those under 30 take the lead in such things as visiting friends in the evenings (29 percent).

Value Differences (Figs. 7–10)

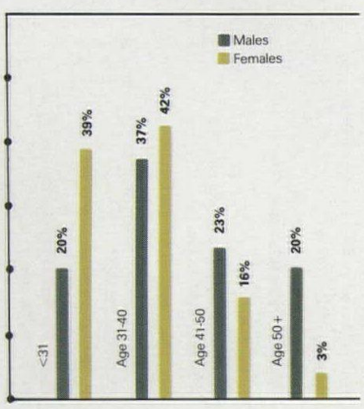
Some of the questions in this P/A poll matched those of previous Gallup Polls, allowing a comparison of architects to the general public. One such question asked readers to rate their values on a scale of 1 to 7 with 1 being the most conservative and 7 the most liberal. The results show the design professions to be considerably more liberal than the general public who responded to a 1986 Gallup Poll (33 percent rating themselves 6 or 7 versus 11 percent for Gallup). Females, as mentioned above, rate themselves more liberal than males (37 versus 32 percent), unmarried people more liberal than those married (51 versus 25 percent), and people under 30 years of age much more liberal than those over 50 (41 versus 20 percent). Also, those in design firms see themselves as somewhat more liberal than those in architectural firms (40 versus 31 percent).

Indeed, differences of values affected how our readers responded to a number of other questions. For example, liberals are more likely than conservatives to see their free time as an extension of their professional life (66

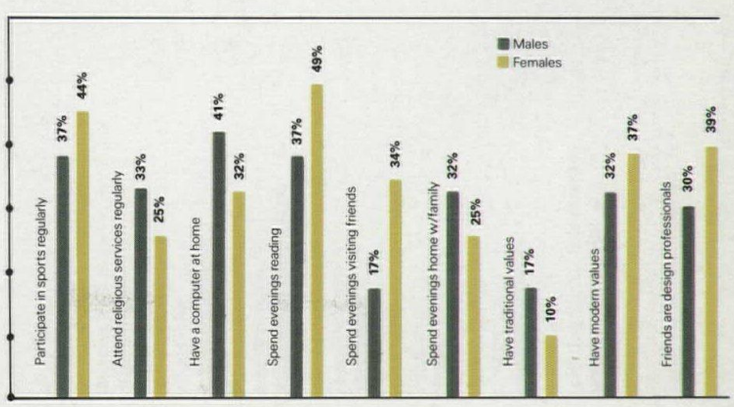
3 Percent of males and females.



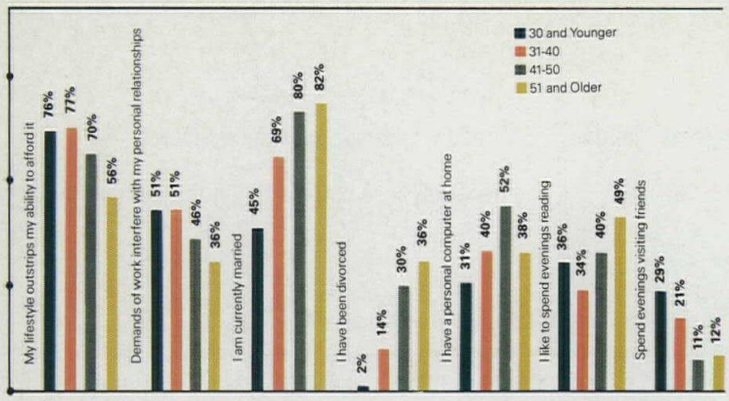
4 Percent are males and females in various age groups.



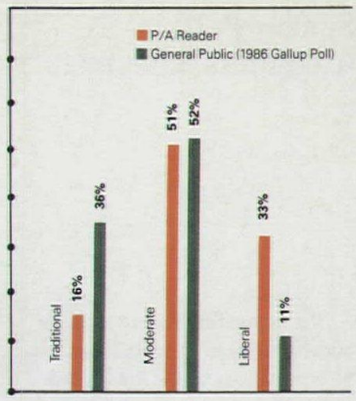
5 The gender gap.



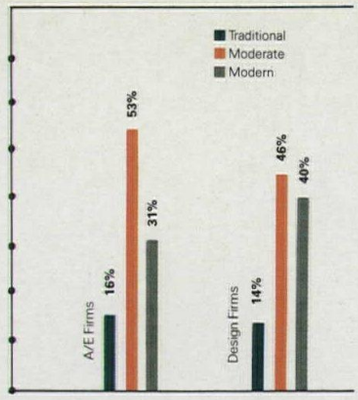
6 The age gap.



7 Values



8 Values by type of firm



versus 43 percent), to have a lifestyle that outstrips their ability to pay (79 versus 61 percent), to drink alcohol (80 versus 56 percent), and to prefer living in cities (67 versus 41 percent). Conservatives, in contrast, are more likely than liberals to attend religious services regularly (72 versus 13 percent), to be married (81 versus 52 percent), to prefer living in towns (26 percent versus 16 percent) or rural areas (33 percent versus 17 percent), and to be satisfied with their current standard of living (73 percent versus 51 percent).

The age of respondents has an important effect on their values as well. The poll shows a slow but steady increase with age in conservative and moderate values and a decrease in liberal sentiments.

Location Preferences (Fig. 11)

Compared to the general public responding to a 1985 Gallup Poll, far more of P/A readers prefer living in cities (56 versus 38 percent). The public prefers smaller towns (36 versus 20 percent) and are about even with our readers in preference for rural areas (26 versus 23 percent). The preferences for urban or suburban living also vary widely. The public was almost twice as likely to prefer living in a suburb as opposed to the city itself (64 versus 34 percent). P/A readers, in contrast, are almost twice as likely to prefer city living.

Architecture as a Lifestyle (Figs. 12–17)

This poll clearly shows that our readers view architecture and design as a way of life as much as a profession. A full 86 percent agreed to some degree with that sentiment, and differences in gender, age, and values have very little effect on the assessment. A lesser number (55 percent) agreed to some extent with the statement that most of their free-time activities are an extension of their professional life. Here, there were some differences, depending upon the respondent's age (61 percent of those under 30 agreed versus 54 percent of those over 50) and values (66 percent of the liberals agreed versus 43 percent of the conservatives).

The downside of architecture as a lifestyle is the personal time it takes. A majority of readers seem able to balance the demands of their personal relationships with that of the profession, although the margin is close, with 47 percent agreeing that work interferes with their personal relationships and 53 percent disagreeing. This seems to be a particular concern of respondents under 40 years of age (51 percent agreed versus 36 percent of those over 50 years old) and of liberal respondents (50 percent agreed versus 34 percent of conservatives).

A far greater number (69 percent) agreed with the statement that the demands of work interfere with the pursuit of other pastimes. There was considerable unanimity on this point despite differences of gender, age, values, and marital status. Such interference with free time and leisure activities might not be so bad if design professionals felt that they were being adequately compensated, but they do not. In a Reader Poll published in the October 1986 P/A, 95 percent of respondents agreed that architectural professionals are not adequately compensated for their services. When asked in this poll whether their desired lifestyle outstrips their ability to pay for it, 71 percent of the respondents said yes. This was especially true of younger, unmarried, and more liberal readers.

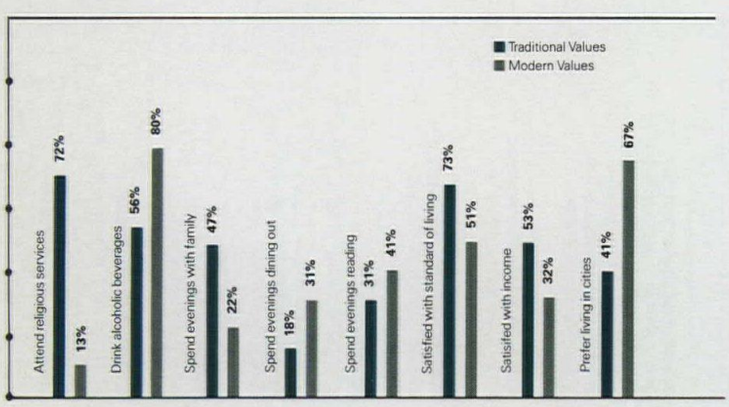
Readers split 50–50 over the statement that architects' lifestyles reflect a disdain for popular taste, with the same division occurring in all age groups and among those with different values and job roles. Clearly, many readers see their lifestyle preferences as being different from and perhaps superior to that of the general public. But countering that is the Post-Modern acceptance of popular taste as a source of design ideas or at least a factor designers must reckon with. Here, personal preference and professional ideology collide.

Evening Entertainment (Fig. 18)

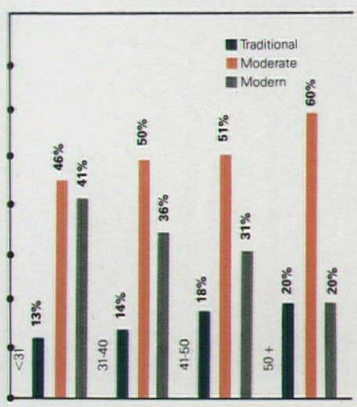
Yet, when comparing how design professionals and the general public prefer to spend their evenings, the differences are startling. Reading is the most preferred evening activity of P/A readers (38 percent) and it was tied in a 1986 Gallup Poll for a distant second among the general public (14 percent). This difference is due, at least in part, to the higher average educational level of architects and designers. It also tends to counter those who claim that design professionals don't read. Television, in contrast, is by far the preferred evening activity among the general public (33 percent) and seventh on the list with architects and designers (18 percent).

Evening activities, as already mentioned, are affected by the age and values of a respondent, with the younger or more liberal engaged in more physical activities, such as dancing, and the older or more conservative in more sedentary activities, such as reading or dining out. Meanwhile, "those in

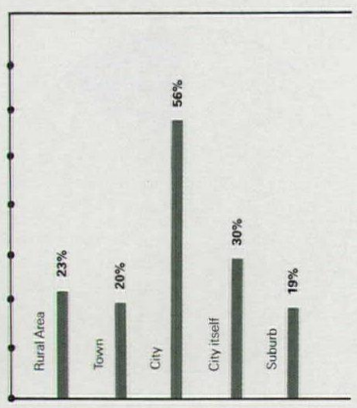
9 The values gap.



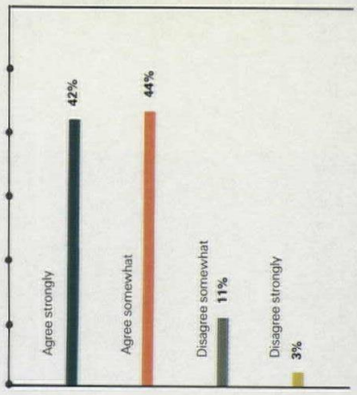
10 Values of different age groups.



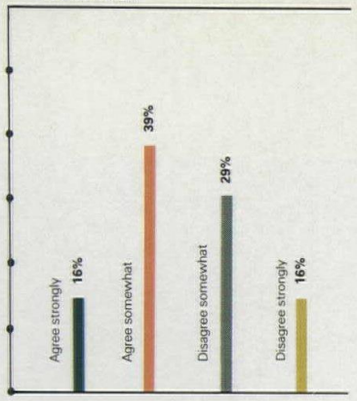
11 Ideal living environment.



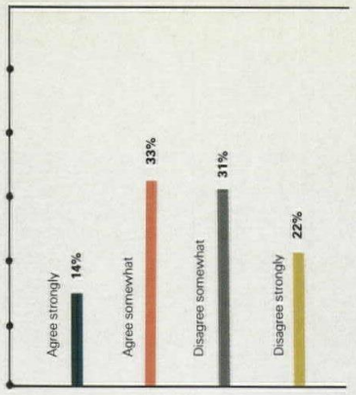
12 **Architecture and design are as much a way of living as they are professions.**



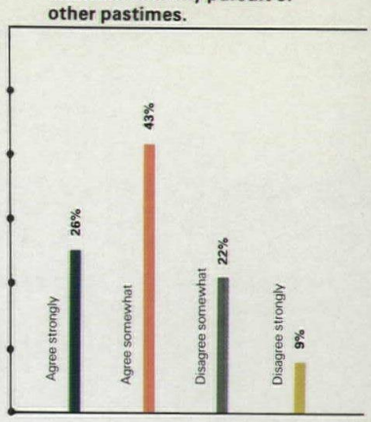
13 **Most of my free time activities are an extension of my professional activities.**



14 **The demands of my work interfere with my personal relationships.**



15 **The demands of my work interfere with my pursuit of other pastimes.**



the child-raising years (aged 31–50)," note the Morrisons, "are less likely to dine out, listen to music, or play card games than older or younger participants."

Lifestyle Practices (Fig. 19)

Large majorities of our readers report taking annual vacations (79 percent), drinking alcohol at least occasionally (72 percent), and exercising (62 percent). For other lifestyle items, the percentages drop steeply, with between 30 and 40 percent of our readers owning home computers, playing sports, belonging to clubs, and attending religious services regularly.

"Younger respondents," observe the Morrisons, "are more likely to report drinking alcohol and playing sports, while older ones cite exercise more often and ownership of a second home, a boat, and a car phone." Differences of values also affect this. "The more traditional respondents," add the Morrisons, "are somewhat more likely to own a boat or a second home and are less likely to drink . . . or to smoke."

The degree of drinking and smoking among design professionals also is in marked contrast to the general public. In a 1985 Gallup Poll, 63 percent of the public reported drinking alcohol, compared to 72 percent of P/A readers. And, in a 1988 Gallup Poll, 32 percent of the general public admitted to smoking, compared to only 9 percent of the profession.

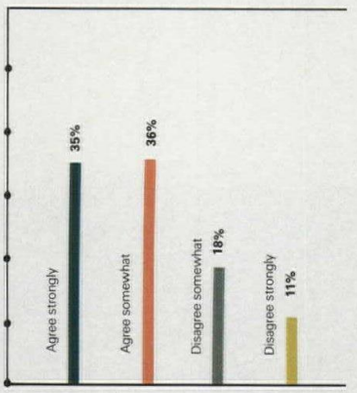
Lifestyle Satisfaction (Fig. 20)

In the end, what matters is not what our lifestyle is but how satisfied we are with it. When our readers are compared to those who responded to a 1984 Gallup Poll, there are some significant but disturbing results. Design professionals are about as satisfied as the public with their health, their work, and their personal relationships. But professionals show much less satisfaction than the public with their housing, standard of living, free time, and income.

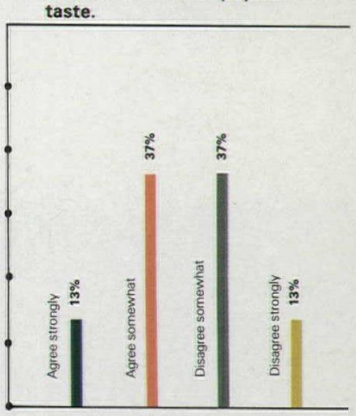
In a nation witnessing a general decline in the standard of living, the design professions emerge from this poll as a kind of bellwether of what may come. We can have our health, our work, and our friends and family. We can even have tokens of prosperity – second homes, boats, sports cars. But for that, we must work harder and longer hours and face a decreasing purchasing power and growing scarcity of such basic commodities as affordable housing. Addressing those lifestyle problems will take all the creativity the design community can muster.

Thomas Fisher ■

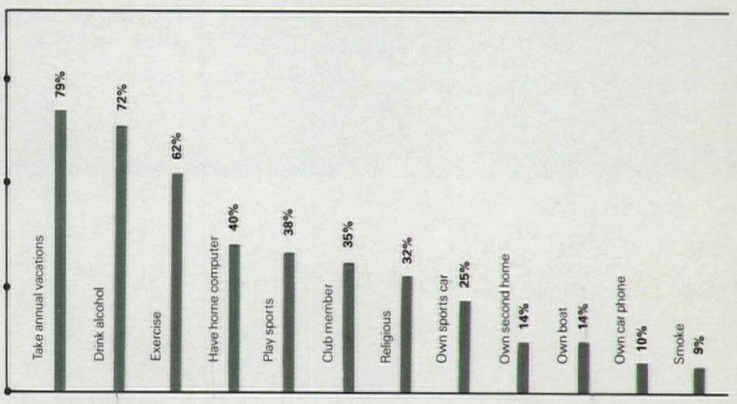
16 **My desired lifestyle outstrips my ability to pay for it.**



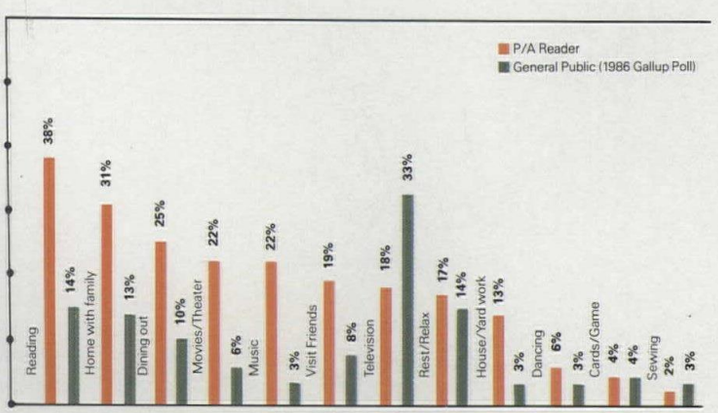
17 **The lifestyles of most architects reflect a disdain for popular taste.**



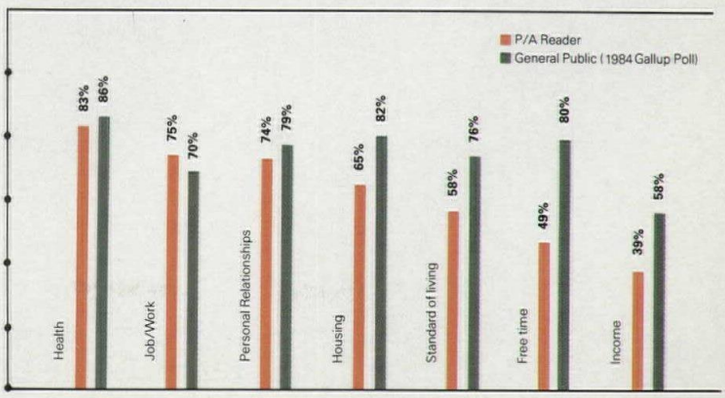
18 **Lifestyle practices.**



19 **Evening entertainment.**



20 **Satisfaction with lifestyle.**



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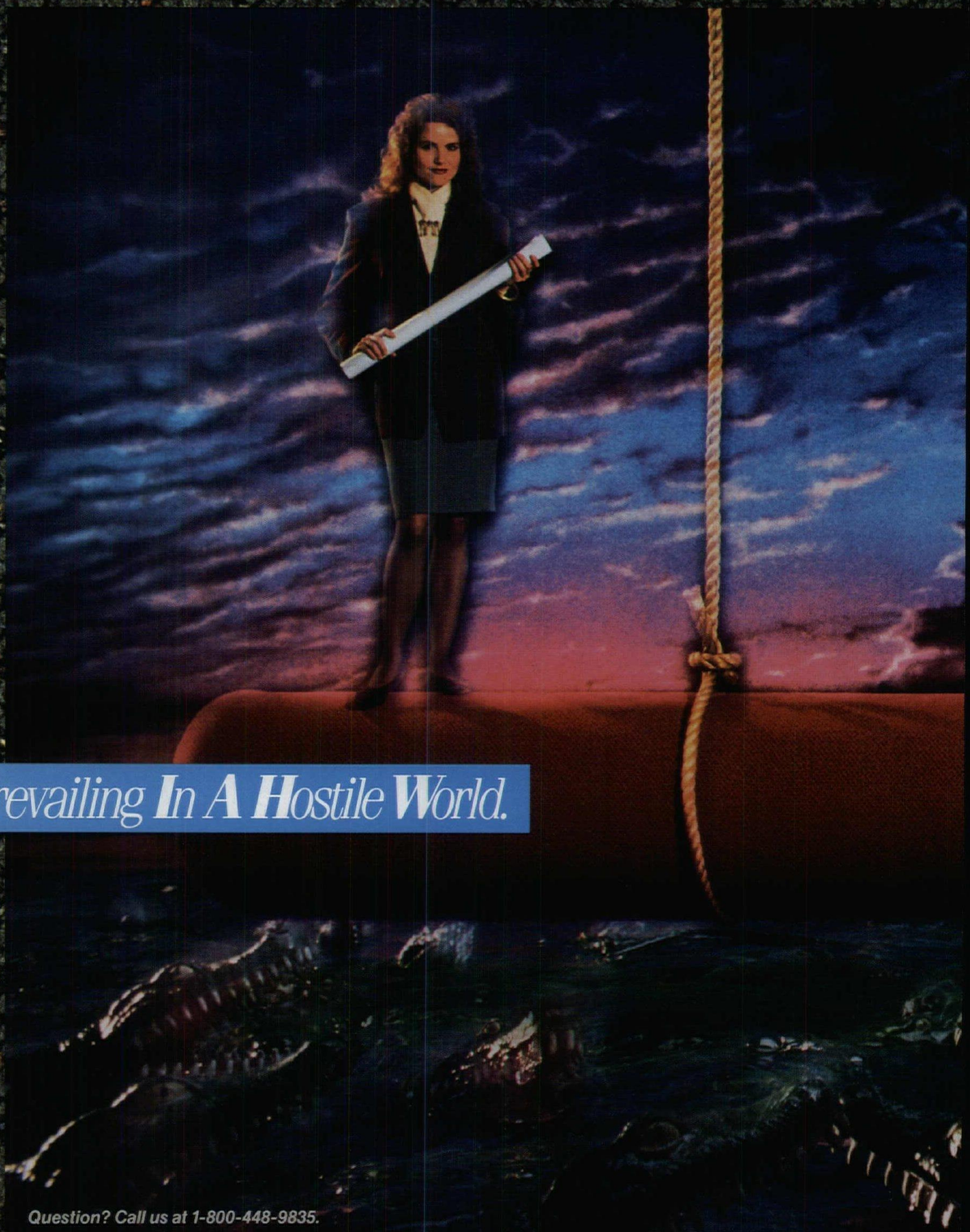
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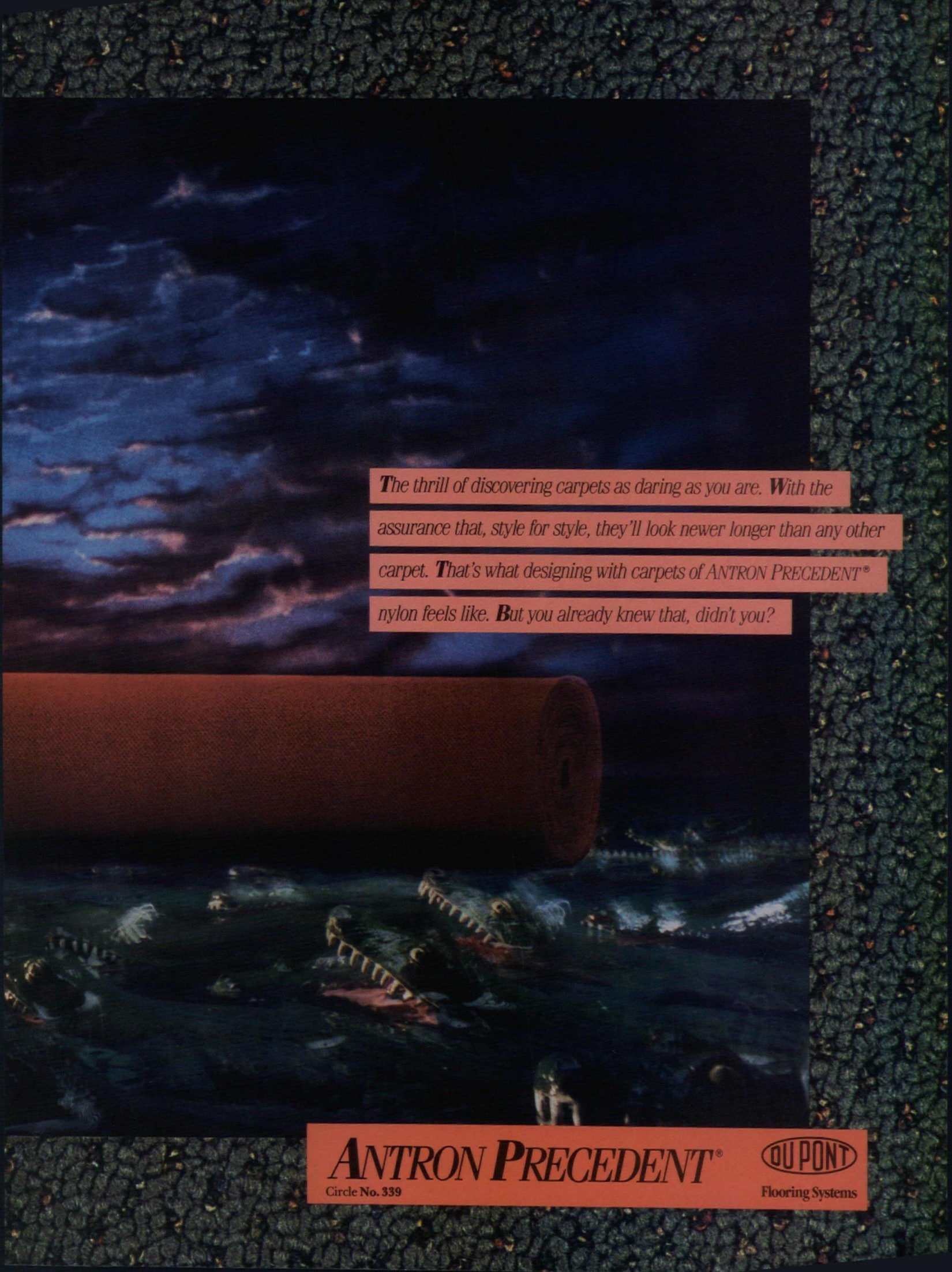
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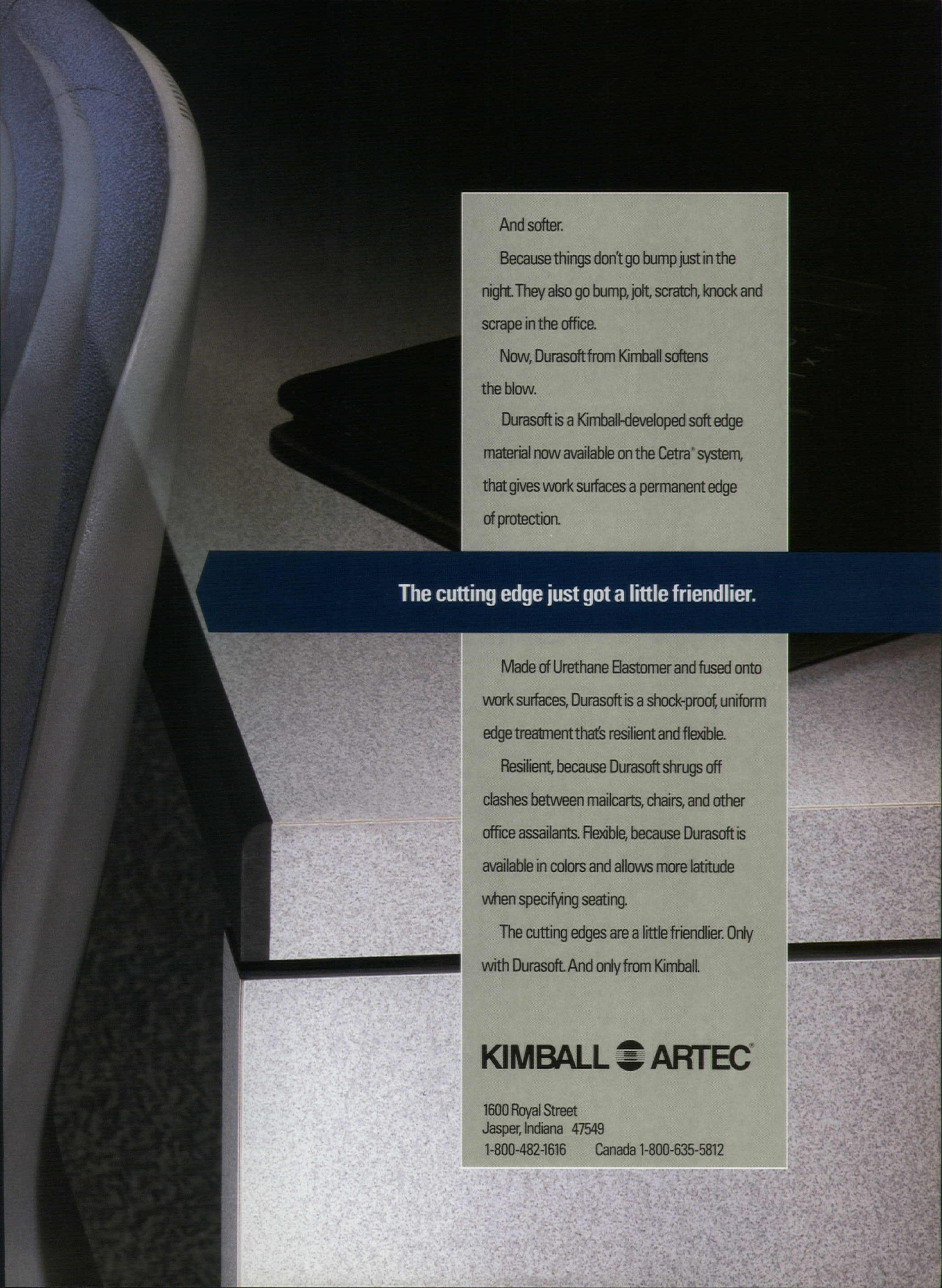

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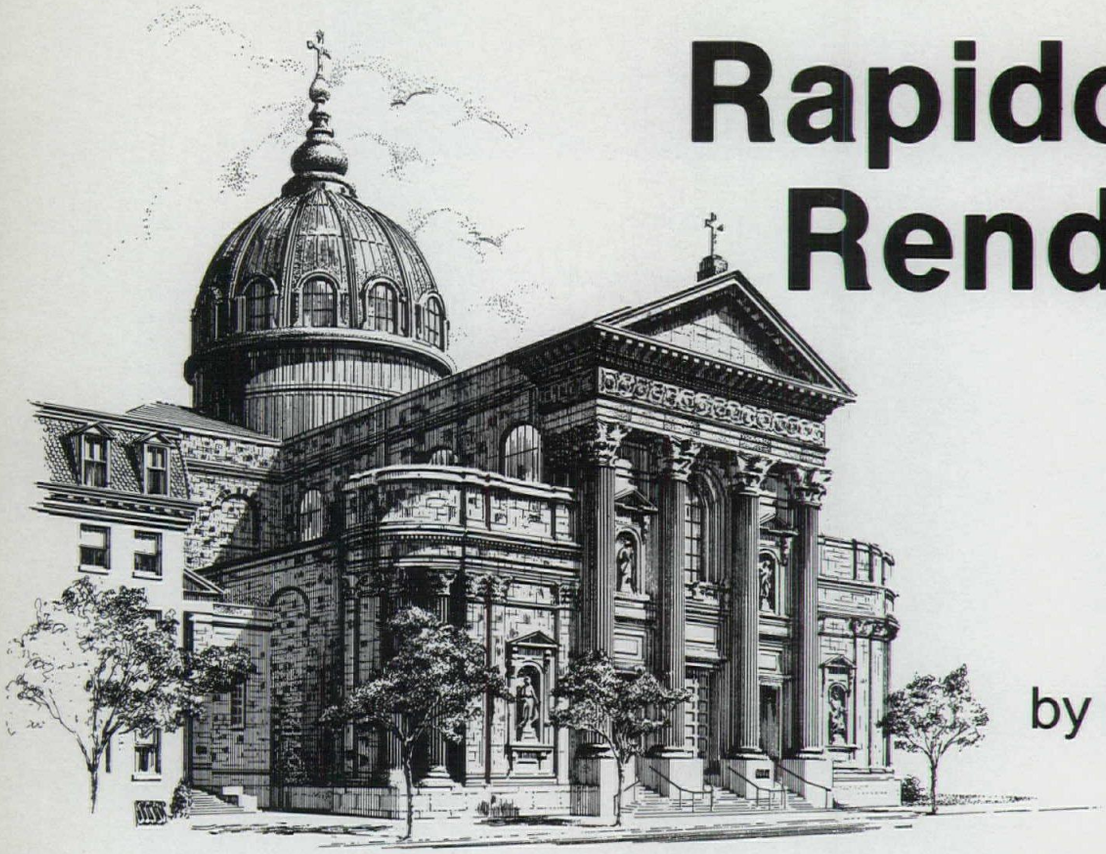

by Pennsylvania artist

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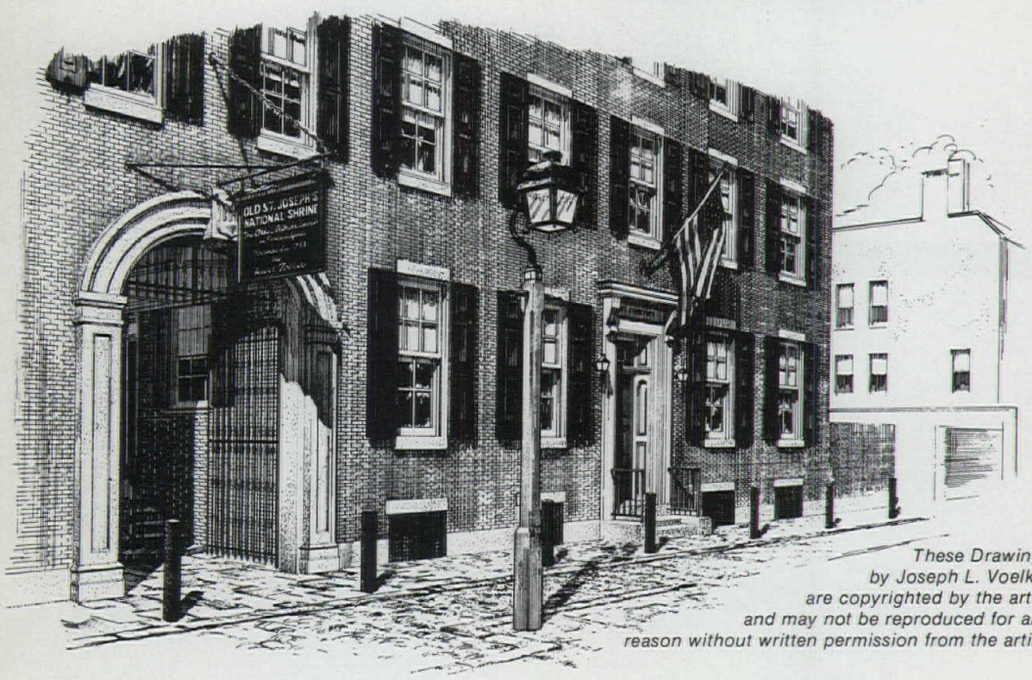

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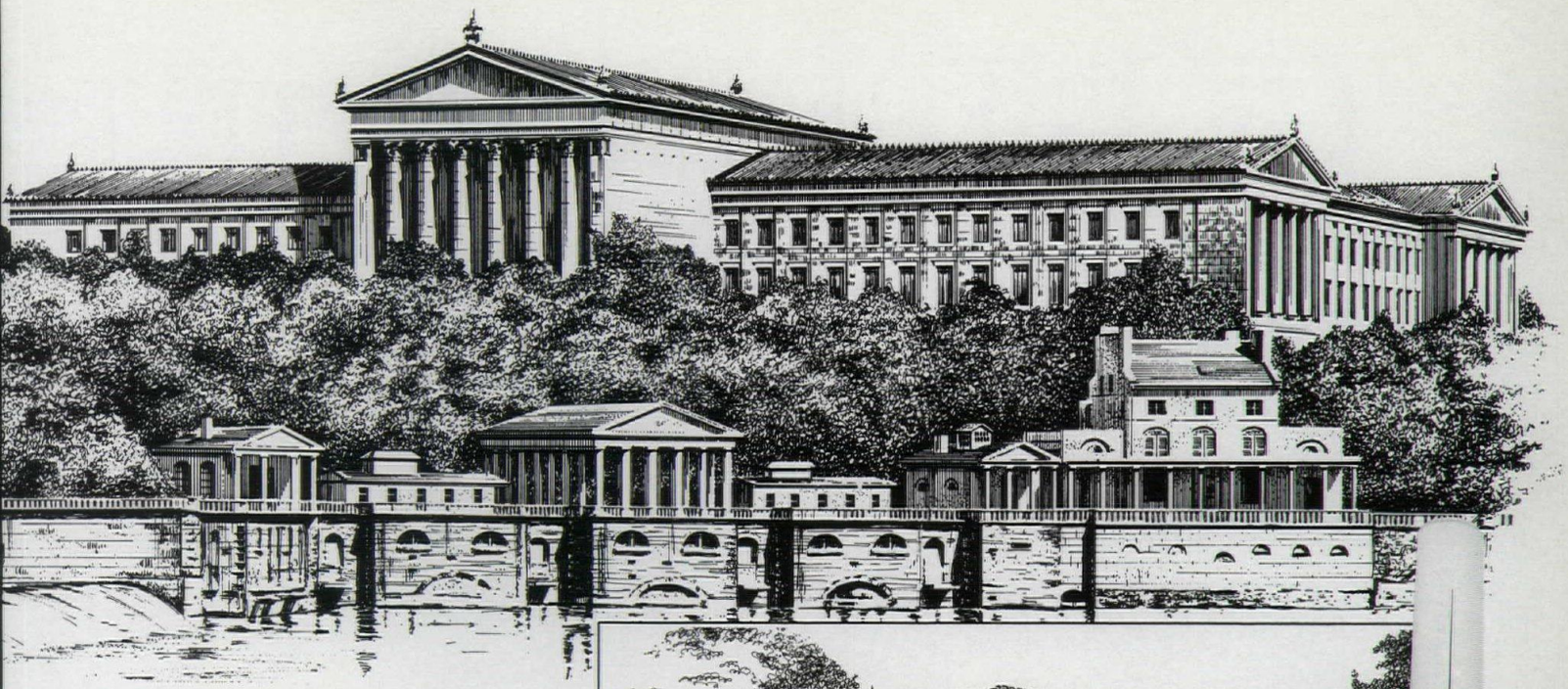
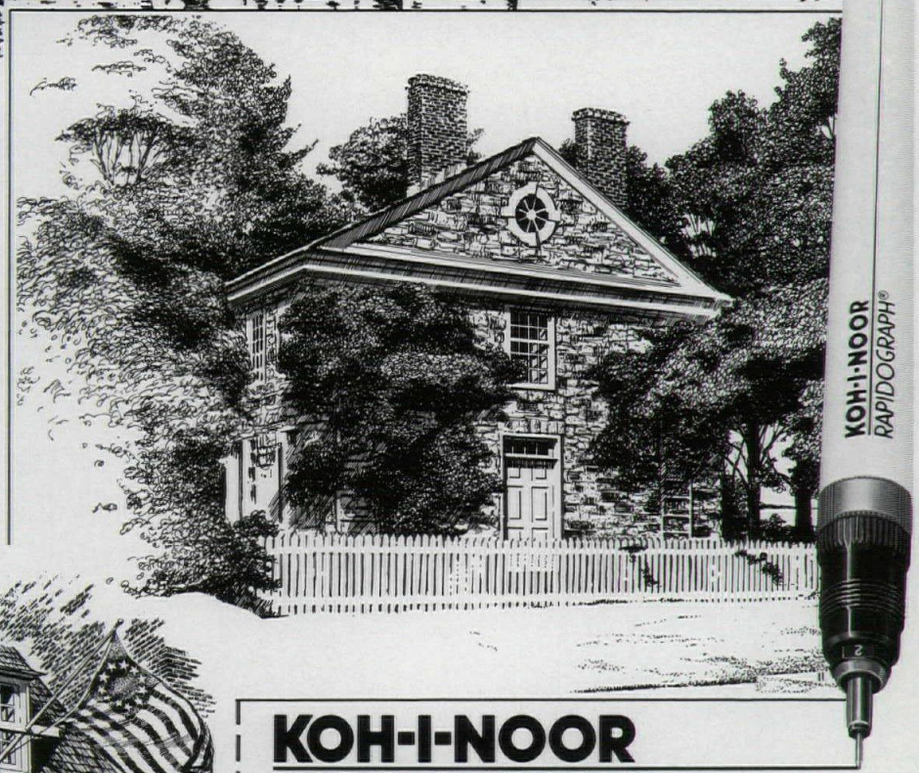


Joseph L. Voelker



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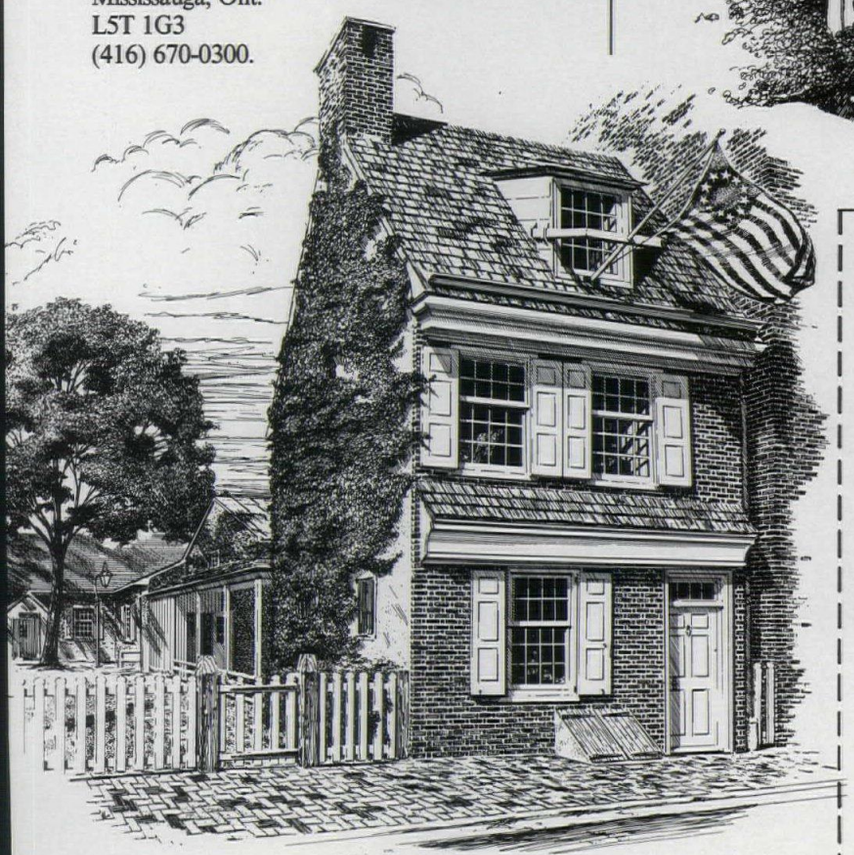

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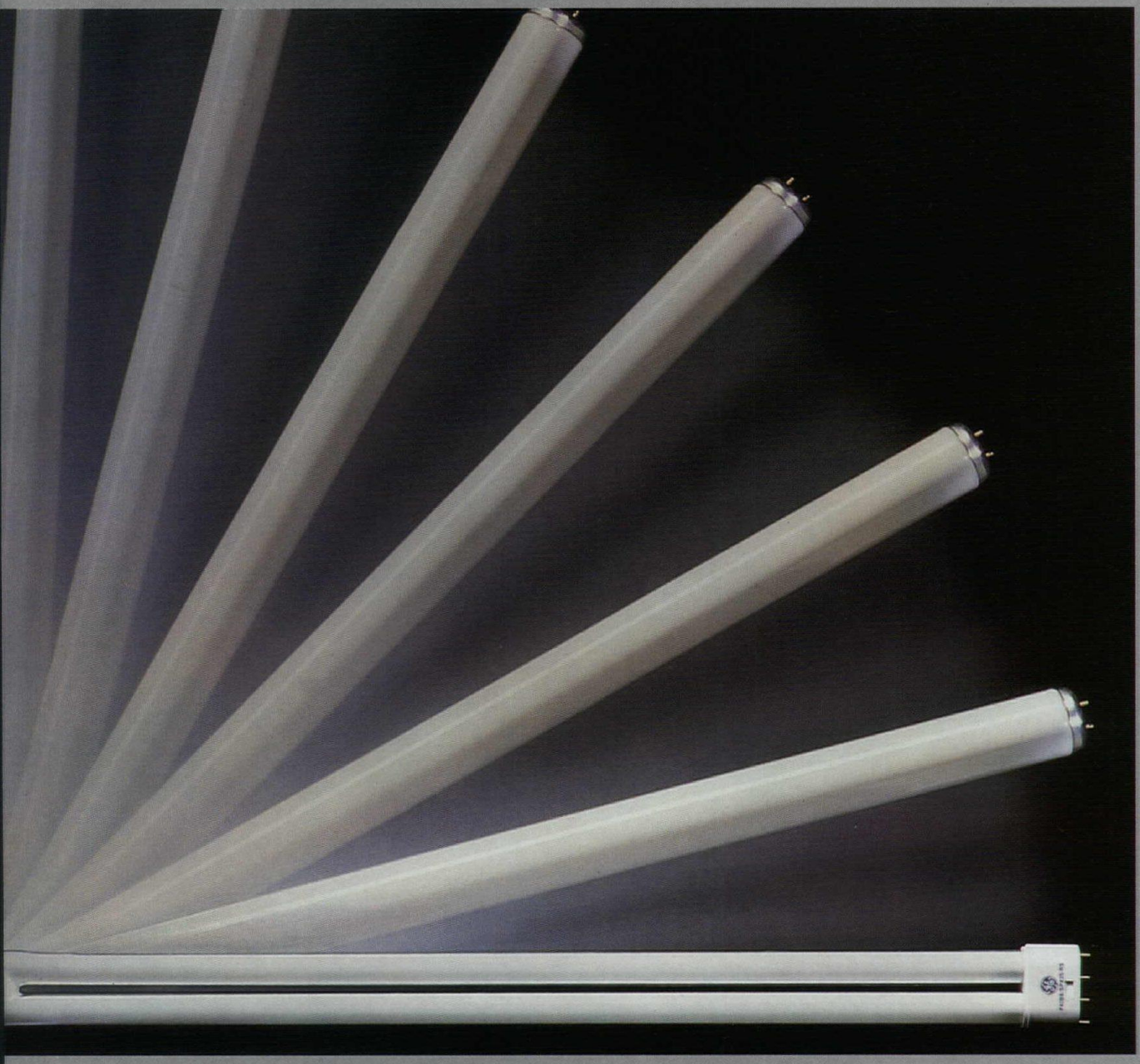

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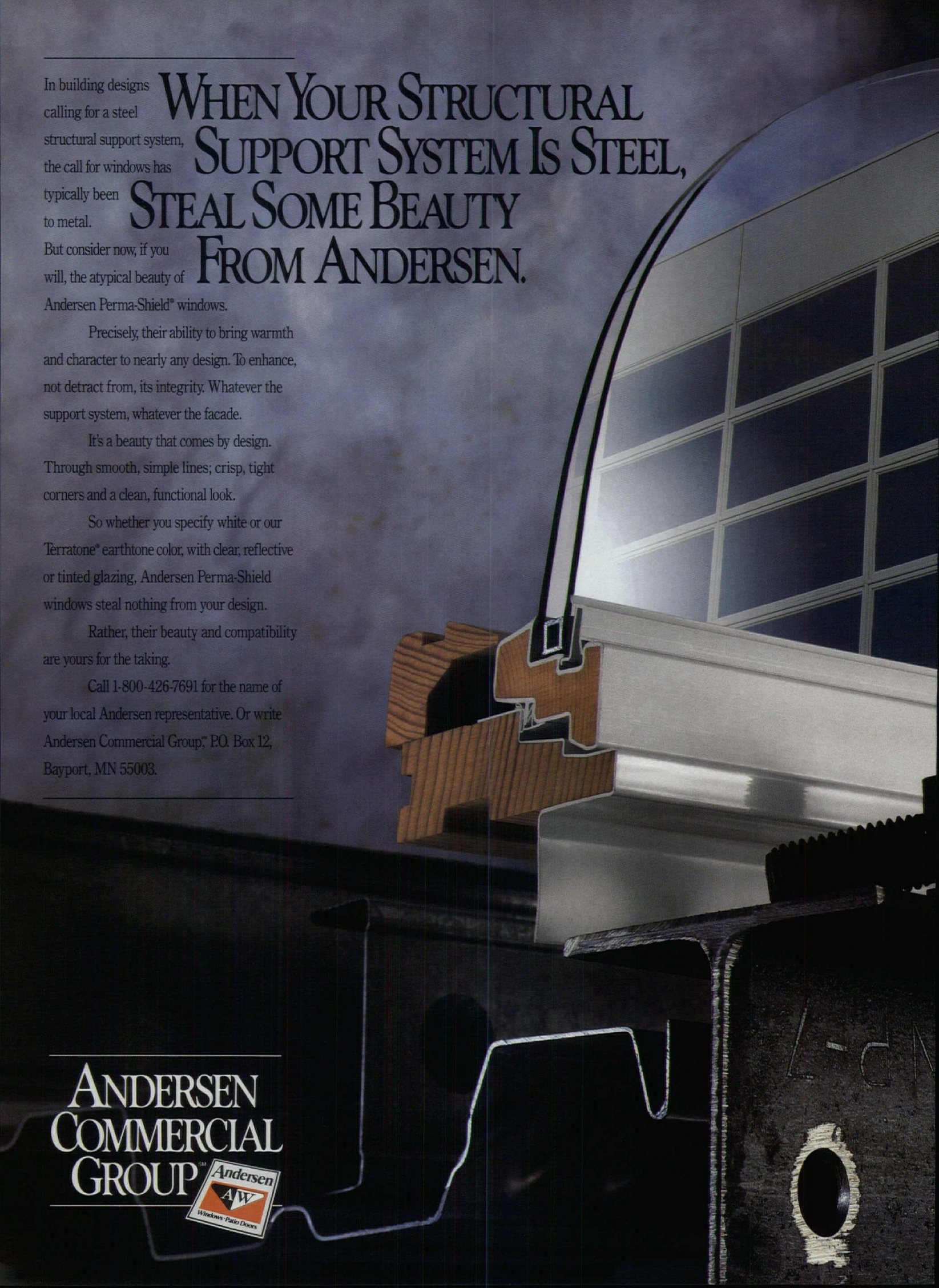

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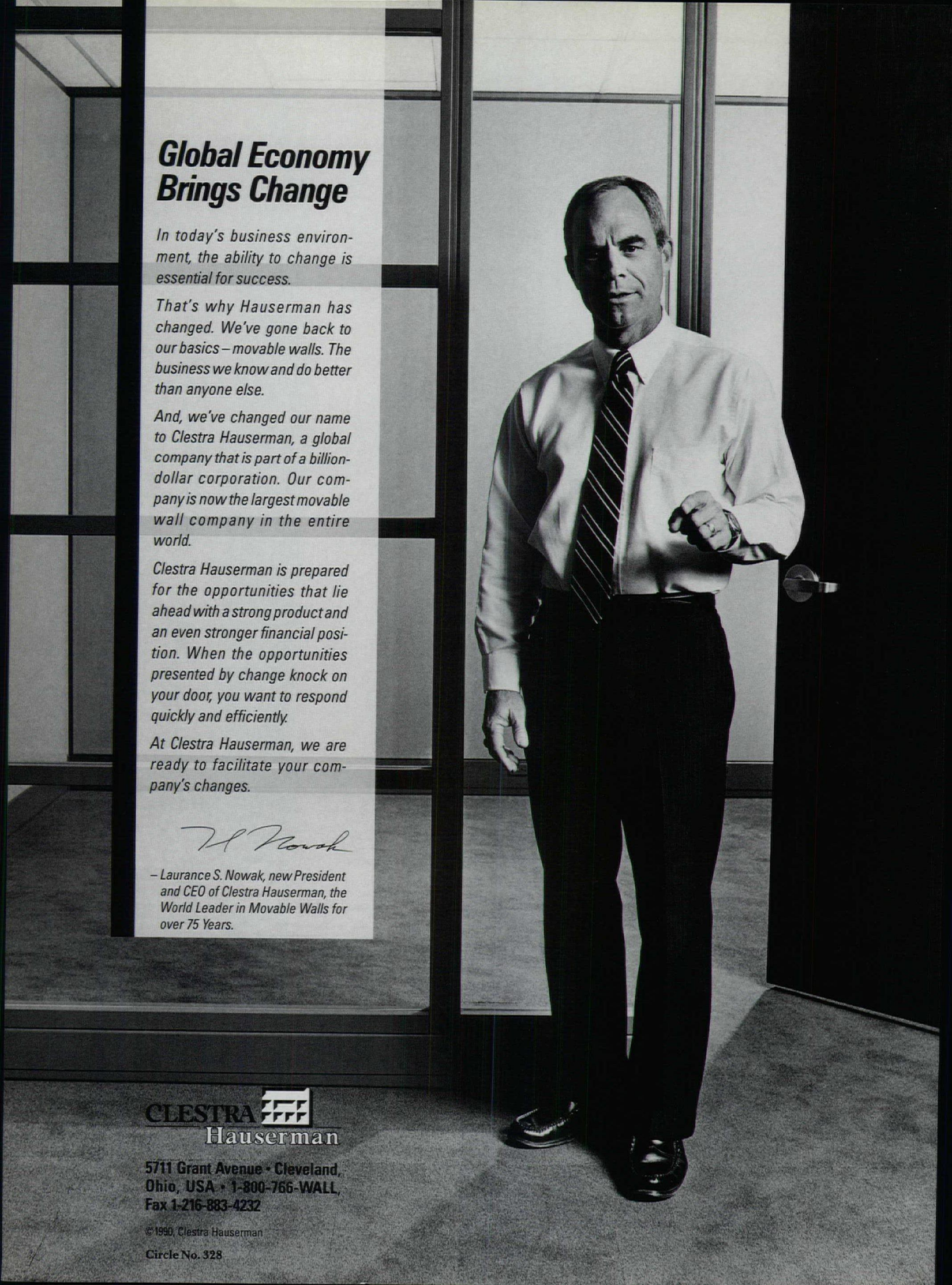

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TRIM SHAPES

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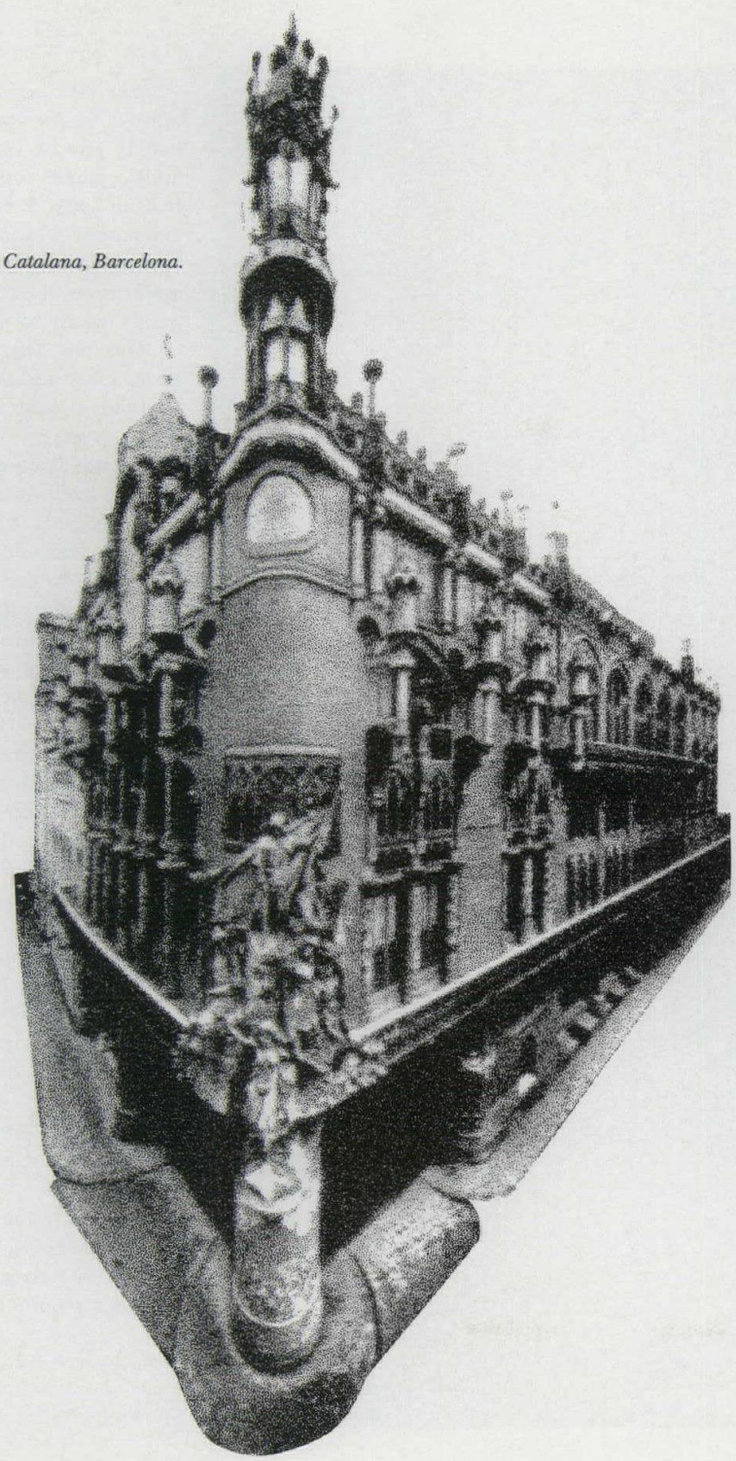
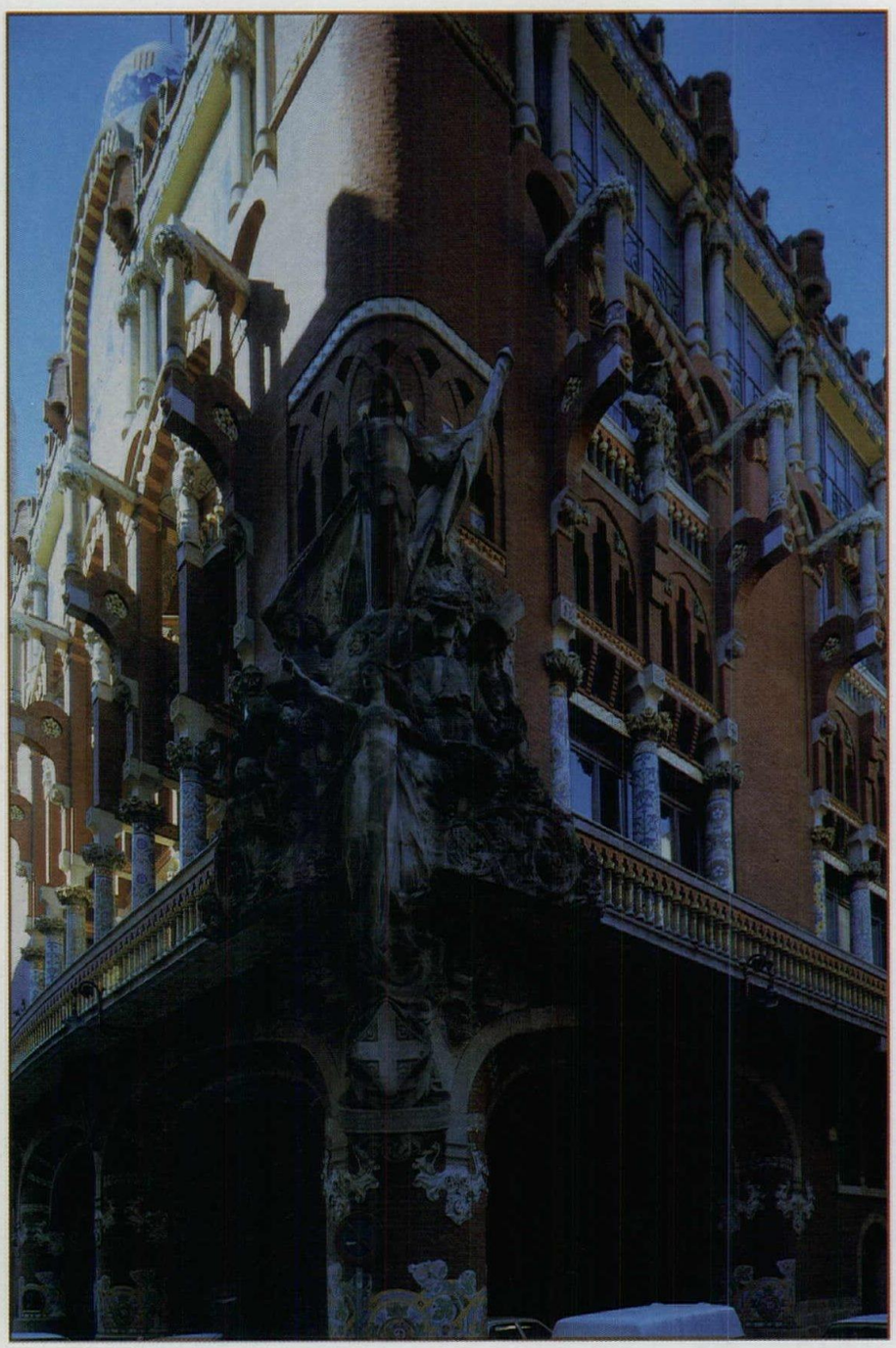
Features in this issue include the updating of a landmark concert hall, the reuse of some choice movie palaces, and a review of preservation planning efforts in five communities.



Early photo of the Palau de Musica Catalana, Barcelona.

Modernismo Modernized

The Barcelona firm of Tusquets, Diaz & Associates has remodeled a music hall that is one of the city's turn-of-the-century masterpieces.



When the private choral society, Orfeo Catalá, first approached architect Oscar Tusquets in 1982, they had in mind building a completely new, up-to-date auditorium to replace the Palau de Musica Catalana, built in 1905–1908 by the Modernista architect Lluis Domenech. Tusquets convinced them through his design proposals, however, that the advantages of a new auditorium could be attained within their extravagantly ornate turn-of-the-century landmark theater.

Tusquets, Diaz & Associates' efforts here involve restoration, additions, and subtle transformations of circulation patterns and space use. The work fits into a 20-year career of post-functionalist design, of work that avoids shallow functional determinism but never sticks to fixed forms or styles. For Tusquets, architectural design is a problem-solving activity in which form is determined not only by program requirements, but by site constraints, as well. In this project, more than any other, he has explored the connection of building to urban context.

The total project can be discussed as a series of problems with the architecture firm's solutions.

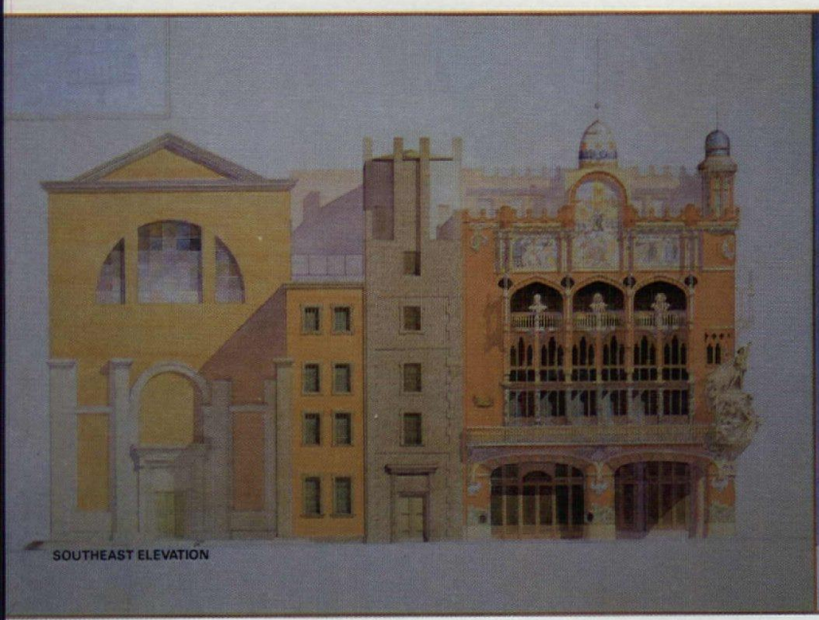
Problem 1. Most drawbacks of the old building were caused by the small, oddly shaped original site.

Solution. Space for a new entrance and foyer was borrowed from the adjoining 17th-Century Church of San Francisco. The church had suffered damage during the Spanish Civil War of the 1930s and subsequent overly monumental rebuilding, never finished. By reducing the church's length and building a new apse, Tusquets was able to develop a new plaza and a new side entrance for the concert hall. The new plaza provides a new circulation and activity node and exposes a third side of the hall to view.

Problem 2. Life safety factors had to be improved; there were not enough stairways and exits to meet current codes.

Solution. In the narrow lightwell that had separated the concert hall from the church (a strip that had been filled with restrooms at the ground level), Tusquets placed a monumental stair, enclosed by an all-glass

Sculpture bursts out above the porte-cochère at the concert hall's main entrance (left). Inside (right) related sculpture provides operatic framing for the newly expanded stage.



SOUTHEAST ELEVATION

SECTION LOOKING NORTHWEST

Preliminary renderings and as-built plans show the critical interdependence of the concert hall and its neighboring buildings in a crowded quarter of Barcelona. Note how the front portion of Domenech's original building notched around older dependencies of the church; to compensate, his front elevation (above) presents a compressed and offset interpretation of the hall's actual section (above right). Tusquets' remodeling/expansion scheme gave the hall much needed auxiliary facilities and a new entrance through a plaza to the southwest, made possible by truncating the neighboring church. On the ground floor of the hall, the partitions of the former music school were cleared out to create a large lobby entered from both southeast and southwest; the original rehearsal hall was left in place. The linear light court along the south side of the old hall was glassed in to house a new cascading stair. A turreted addition at the rear corner of the hall houses new performers' facilities, music school, and library. In the hall itself, the principal changes were the extension of the stage beyond its original apsidal space, never really adequate for orchestra and chorus; rows of seats were also removed in other parts of the hall to improve acoustics.

curtain wall fronting the new plaza and topped by a skylight. The second layer of glazing adds a slick-looking layer to the old side wall, with its stained-glass windows. The newly enclosed space serves as a dramatic high vestibule, an excellent transition to the newly expanded foyer under the auditorium.

Problem 3. The old ground-floor foyer was uncomfortably crowded during intermissions, and services such as coffee bars, toilets, and cloakrooms were crammed into inappropriate spaces; access from here to upper-floor seating was impossible for wheelchair users and very difficult for the elderly.

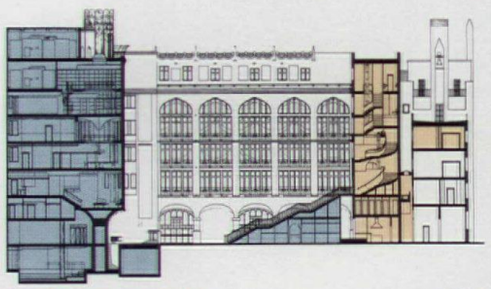
Solution. Partition walls have been removed from the ground floor to open up a much-enlarged foyer. Activities formerly housed here – rehearsal rooms, classrooms, library, offices, etc. – have been housed in an addition to the rear of the old building. Cloakroom, bar, and coffee areas are now set in and around the extensive new foyer. The transparency of this space makes clear the expanded choice of entrances and exits, receives natural light from different directions, and facilitates emergency evacuation. Most important, it enhances the entire complex as a cultural gathering place.

Problem 4. Lack of air conditioning, coupled with the heat gain through the stained-glass windows, ruled out performances during the warm months.

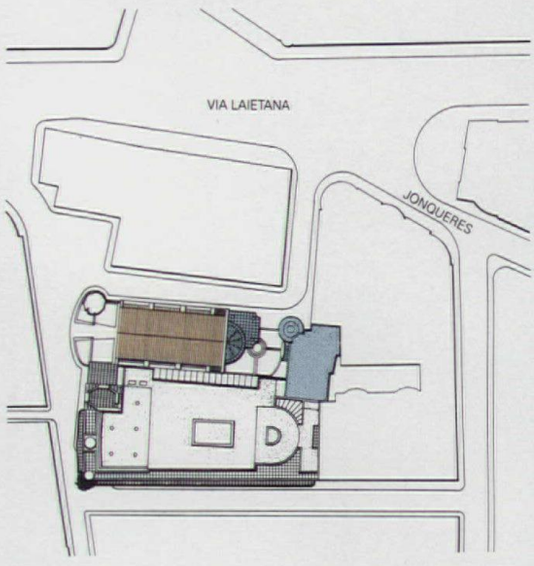
Solution. Air conditioning equipment has been installed on the top floor of the old building, where the founder of the choral society used to have an apartment. (An opening above the stage allowed him to observe rehearsals or performances below, much as King Philip II used to take part in the mass at the chapel of the Escorial Palace through an opening from his bedroom above.) The refrigeration machinery has been placed on the flat, vibration-proof roof of the adjoining new building.

Problem 5. The original hall totally lacked some auxiliary spaces, such as dressing rooms, and facilities such as offices, rehearsal rooms, music school, and library were squeezed in on the ground floor and the level below.

Solution. Most of these facilities have been housed in the new tower at the rear of the hall, fronting on



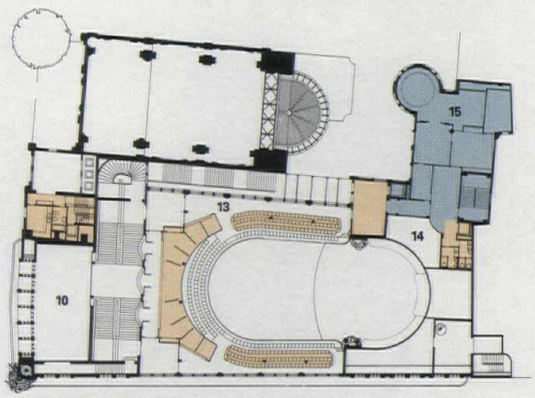
SECTION LOOKING NORTHEAST 40'/12m



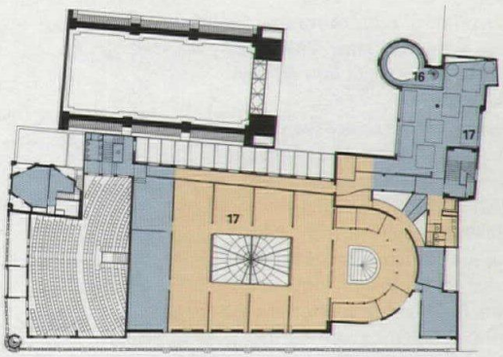
SITE PLAN N 100'/30m

SECTION LOOKING NORTHEAST

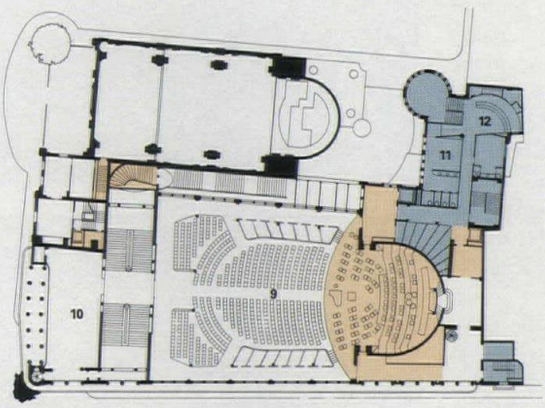
SECTION LOOKING SOUTHEAST



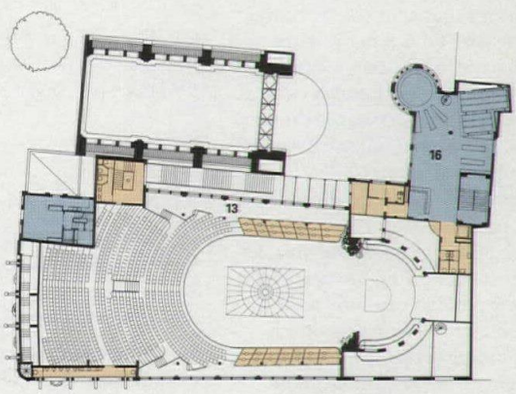
THIRD FLOOR PLAN



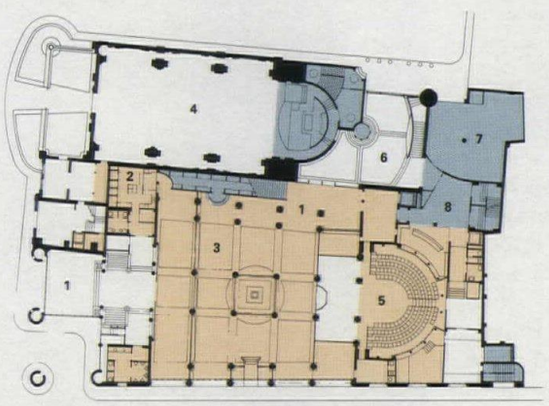
SIXTH FLOOR PLAN



SECOND FLOOR PLAN



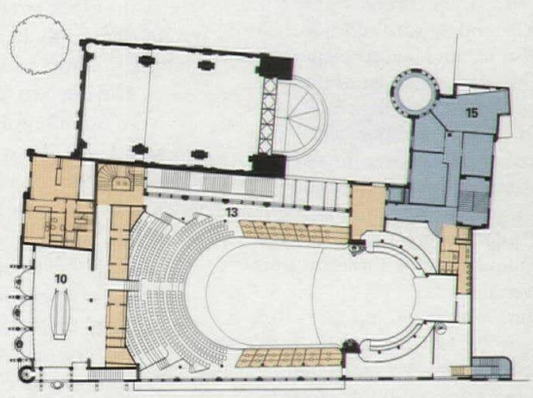
FIFTH FLOOR PLAN



GROUND FLOOR PLAN

RESTORED
REMODELED
NEW ADDITION

1 ENTRY
2 KITCHEN
3 LOBBY
4 CHURCH
5 REHEARSAL
6 PLAZA
7 PARKING
8 RECEPTION
9 CONCERT HALL
10 FOYER
11 DRESSING
12 ARTISTS' LOUNGE
13 BALCONY
14 OPEN
15 MUSIC SCHOOL
16 LIBRARY
17 MECHANICAL



FOURTH FLOOR PLAN

N ↘ 40'/12m

The new entry plaza (right) is given distinctive shape by the convex forms of the church's new apse and the hall's new wing. Seen from a block away (below right), the turret of Tusquet's new wing displays a sculptured pedestal and a glassy crown. The entrance to this wing (bottom right) presents a sculptured tympanum. At the new entry to the hall (facing page) a huge plane of mullionless glass forms a toplighted exhibition case for the richly ornamented original wall.

Tusquets Interview

Author Magda Saura interviews architect Oscar Tusquets on this concert hall and related subjects.

Saura: It seems to me the efforts you started in 1982 have been successfully realized. Are you satisfied with the results?

Tusquets: Yes, but I will never accept a similar kind of project. Never again! It took eight years to finish since unexpected conservation problems arose during construction.

Saura: Can you repeat what you said in a lecture on the main reasons that kept you working?

Tusquets: I did it because the Palau de la Musica is a significant landmark of our Catalan culture.

Saura: When you started the project, can you tell me what was your artistic impulse?

Tusquets: I did not want to work by contrast. Most remodelings of old buildings have used this device, which I find too brutalist. I prefer to add carefully to older architecture, with transitions that might create ambiguity.

Saura: What do you mean by ambiguity?

Tusquets: A will to create ambiguous spaces between the old buildings and the new addition. Notice that urban open space penetrates into the private lot of the new courtyard, and, in turn, the tower of my new addition cantilevers out and takes over the street.

Saura: Local literature has praised the old building for its Proto-Modernism. Do you think Domenech was aiming at functionalism?

Tusquets: To project one's own views of Modern architecture into the past is to miss the Catalanist and historicist messages of Domenech's iconog-

the new plaza. The tower's three double-height spaces include, from bottom to top, dressing rooms, music school, and library. The entrance to this addition is through a small, triangular patio. A hitherto wasted space, this triangle has been roofed with a skylight, and in it is displayed the five-story back wall of the main hall, with its stained glass windows and scratchwork ornament. Glass walls allow light from above into the rehearsal room below the main stage and provide views into this room for those waiting at the reception desk.

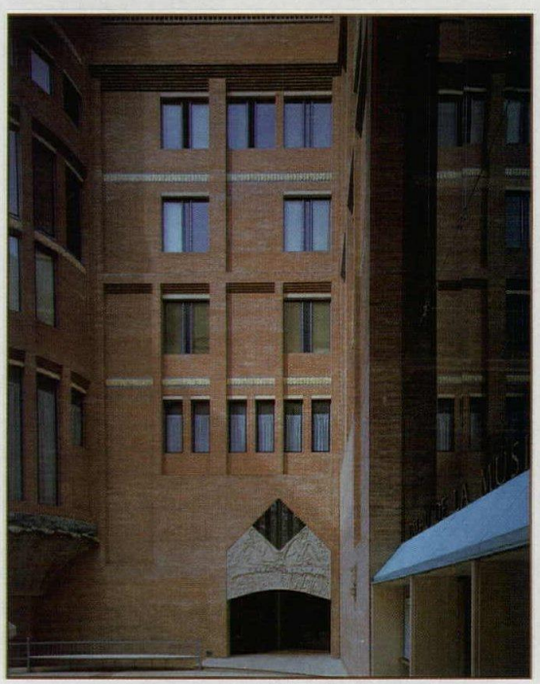
Problem 6. The main stage was too small, and its tiered design, originally for choral singing only, did not work for symphonic ensembles.

Solution. The stage has been extended forward, replacing the first four rows of seating and some of the boxes. With violins brought forward, the strings can be heard better, and access of instruments to the stage is much improved.

Problem 7. Complaints about acoustics before the remodeling included excessive outside noise and a short reverberation time for symphonic music. Insufficient sound insulation made it impossible to use the rehearsal room simultaneously with the stage in the main hall.

Solution. To reduce sound absorption, the third row of side seats in the main hall has been removed; curtain walls and box partitions have been removed, and the opening above the stage (to the original director's apartment) has been capped with a glass ceiling. Seating has been replaced with a new type, designed by Tusquets to provide the same sound absorption when empty as when occupied.

During actual construction, problems arose that were not identified in the earlier problem-solving design stage. Most urgent of these problems were the damage to the remarkable stained-glass ceiling of the main hall – a vast skylight-luminaire combination – which had been caused by leaks. Elsewhere, leaks had caused deterioration of cast iron concealed within brickwork, causing the masonry to crack. Nineteenth-Century theater architecture shows different attitudes toward the exposure or concealment of iron structure; Domenech's decision to conceal it in brick resulted in serious problems.



raphy. This building is propaganda, an artistic display of Catalan nationalism. We are constantly reminded of this even in the minutest detail of the mosaics: Everywhere there are pieces of broken tiles with the red and yellow stripes of the Catalan flag. My remodeling philosophy has made things work better without adding new images that might disturb or confuse the reading of his rich musical and political imagery.

Saura: I agree that this building presents a true display of Romantic Catalan nationalism. Do you think it also portrays 19th-Century architectural theory?

Tusquets: Definitely yes. Ruskin had said that ornamentation is the principal part of architecture. And the concert hall displays Pugin's principle that all ornament should enrich the essential construction of the building. Voluptuous ornament was typical of the turn-of-the-century Catalan architecture known as Modernismo, a very specific blend of Victorian and Art Nouveau.

Saura: I am sure you must have been able to detect Domenech's revival of Rococo pendentives in the arches that spring from the supporting columns in his concert hall aisles. Has this revival influenced your designs for your restaurants in the Parc de la Villette in Paris?

Tusquets: Perhaps. Besides working on the Paris project, I am just finishing a winery, a housing project in Japan, and a house in Minorca. My furniture design also keeps me very busy. Since leaving my former partnership with Estudio Per, I have begun building a new office, where we hope to move soon.

Saura: Good luck with your new firm.

Cleared of partitions to form a large, daylighted lobby (right), the ground floor of the hall displays some of Domenech's Gothic-inspired ornament. In the new southwest entry space (facing page), the original wall sprouts dozens of steel struts that brace the new mullionless glass enclosure; a new long stair greatly eases circulation for the hall above. Among facilities in Tusquets' added wing are a performing artists' lounge (below right) and a two-story library/archive.

Project: *extension, remodeling, and restoration, Palau de la Musica Catalana, Barcelona.*
Original Architect: *Lluis Domenech i Montaner.*
Remodeling architects: *Tusquets, Diaz & Associates, Barcelona (Oscar Tusquets, Carlos Diaz, Lluis Clotet, Ignacio Paricio, Enric Torrent, Eduard Permanyer, Pep Palain).*
Client: *Consorci del (Association of the) Palau de Musica Catalana, Barcelona.*
Site: *constricted, L-shaped plot in the old section of the city. Deteriorating surrounding buildings are scheduled for restoration in a follow-up project.*
Program: *restoration of the 1905–1908 concert hall: modernization of circulation, mechanical systems, etc.; addition of library, dressing rooms, and other service spaces.*
New construction: *2664 sq m (28,670 sq ft).*
Remodeled: *6273 sq m. (67,520 sq ft).*
Structural systems: *old building, steel frame and brick; new construction, reinforced concrete columns and slabs.*
Major materials: *brick, artificial stone, glazing.*
Mechanical system: *central air conditioning served by heat pump with circulating air and water; silencing system for mechanism.*
Consultants: *Oscar Tusquets, interiors; Enric Torrent, structural; Ignacio Paricio, restoration; Modest Cuixart & J.G. Gallostral, mechanical; Lothar Cremer & Higini Arau, acoustics; Juan Bordes, sculpture.*
General contractor: *Gestion de Proyectos y Obras.*
Costs: *1,830,000,000 Pts (about $17,500,000), actual cost, 1989, including interior finishing, furnishings, and fees) – approx. 200,000 Pts per sq m. (about $180 per sq ft).*
Photos: *Hisao Suzuki, Barcelona.*

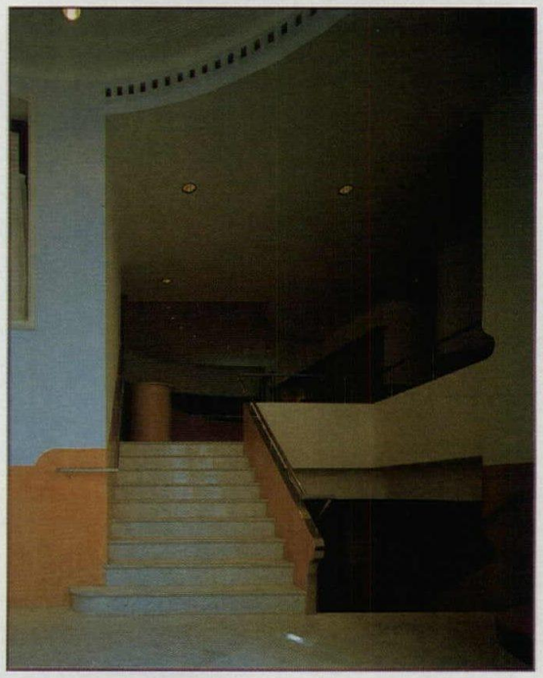
Domenech and Tusquets

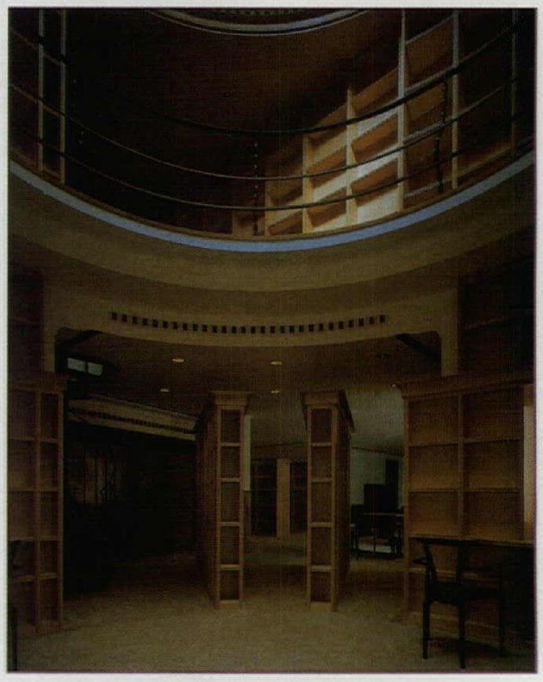
Successful remodeling here necessarily involves a full understanding of the original architect's design, and Tusquets has been able to interpret it for us more convincingly than any of the local literature of Catalan Modernismo. In Domenech's design, the façade is in perfect agreement with the three-bay organization of the interior. Tusquets notes the survival of Baroque impulses in the apse-like forms at the rear of civic theaters; here he has added a composition of convex forms shaping his new entrance plaza. And, with his new, enlarged foyer, Tusquets has introduced the Modern Movement idea of the multifunctional open plan.

In his interior treatment of the hall, Domenech's ambition was, like that of the Romantics, to create "a total work of art" involving music, poetry, and the plastic arts. Like Richard Wagner, he tried for a synthesis that involved all of the senses. The apparently bizarre imagery of the hall's interior, in fact, includes images of Wagner's Valkyrie and their horses, along with a portrait of Wagner himself, in a huge sculptural group above the right corner of the stage. On the other side, sources of Catalan nationalism, associated with music, center on a portrait of Anselm Clave, a leader of the first Catalan Democratic party and founder of a workers' choral ensemble. Domenech himself was a politician, one of the founders of the right-wing Catalanist League. Thus, myth and history were made the frame of performances. On the opening day, February 9, 1908, when Richard Strauss conducted the Berlin Philharmonic in Wagner's Valkyrie, Domenech's flying horses were part of the total artistic experience. Tusquets' appreciation of the origins of the choral society, as well as the building's architecture, is apparent in this sensitive remodeling.

Magda Saura ■

The author, who has written previously for P/A, holds a Ph.D. in architecture from the University of California, Berkeley, and teaches at the architecture school in Barcelona.





Restoring Dreams

Communities are discovering the reasons –

and the means –

to restore their lavish movie palaces.

To most of the public, American movie palaces have become beloved icons; for many of us in the design profession, they're guilty pleasures, like the lavish, feather-light movies they were designed to enhance. Regardless of their architectural integrity, though, these theaters are proving to be popular venues for entertainment and cornerstones for urban revitalization. "Urban toôls" they have been called by theater restorer Ray Shepardson of Detroit, who has been involved in a number of restorations, including the Majestic and Fox on these pages. Says Shepardson: "A restored theater is the most effective change you can make in the urban environment." Successes have led to a boom in theater restoration: Debbie Mikula, executive director of Washington's League of Historic Theaters, reports an increase in membership from 150 to 500 theaters over the last four years.

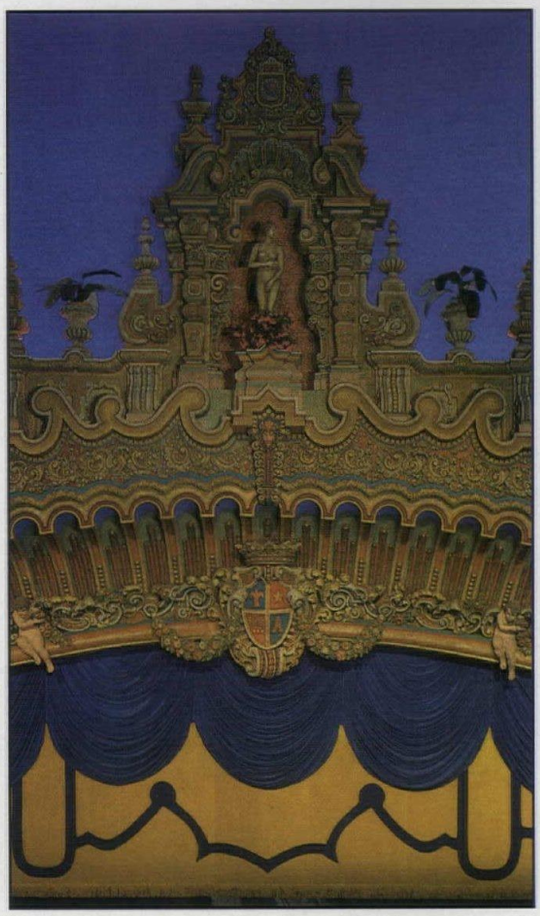
While every community seems to want to see its local theater restored, finding the appropriate use is the trick. Very few historic theaters were designed for the elaborate sets and casts of touring Broadway shows, and there is not always room to expand stagehouses and backstage facilities. Where possible, though, Mikula says her group "encourages theaters to start with the backstage areas. You can't have a Broadway show without proper dressing room space, a proper fly system, and up-to-date equipment." Touring shows aren't the only option, though. Most of these theaters are used for all kinds of entertainment, including classic movies, dance, classical and popular music, community theater, and assemblies.

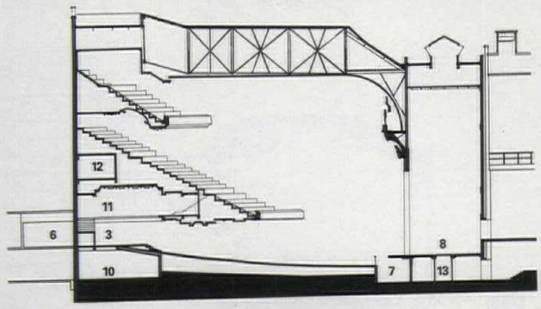
Historic theaters are typically restored by civic groups, then turned over to a private, for-profit management company. The Elgin and Winter Garden (page 98) had extensive financial support from the Canadian government, but "angels" from the private sector are usually necessary to fund the restoration.

As for the restoration process itself, the most successful theaters accomplish whatever modernization is necessary without compromising the character of the space. Shepardson, for one, is adamant about using original finishes where possible: "I get so upset with people that restore things by spraying them out and repainting them. I love to make my buildings look like finely maintained antiques."

It's hard to say whether the action on the stage or the plaster on the walls is responsible for the commercial success of these restored theaters, but the architecture certainly plays a part, as Kevin Harper, a researcher on the Elgin and Winter Garden, found out: "Marcus Loew [the theaters' builder] used to say, 'We sell tickets to theaters, not shows.' "

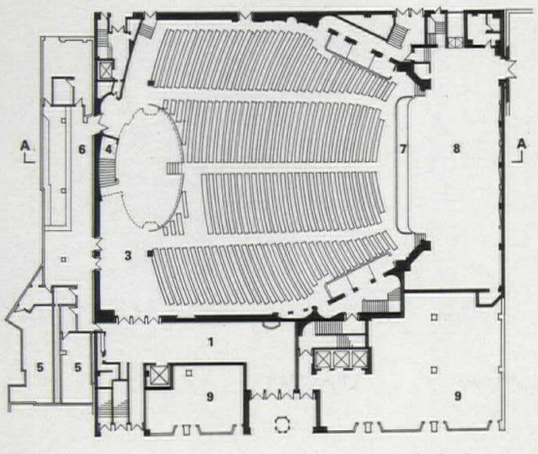
Mark Alden Branch, Abby Bussel ■





SECTION A-A

1 LOBBY
2 ELEVATOR
3 FOYER
4 STAIRS TO BALCONY
5 RESTROOMS
6 LOUNGE
7 ORCHESTRA PIT
8 STAGE
9 RETAIL
10 OFFICES
11 BALCONY FOYER
12 THIRD LEVEL FOYER
13 DRESSING ROOMS



FIRST FLOOR PLAN

N 40'/12m

Majestic Theater

San Antonio's Majestic Theater sprang from the fertile imagination of architect John Eberson, who created a number of "atmospheric" movie palaces around the country. The 1929 Majestic employs a Mediterranean motif and a nighttime sky scene enhanced with projected clouds that waft across the ceiling (facing page). The theater closed in 1974, reopened in 1981 as a venue for road companies and concerts and finally was purchased by the City of San Antonio, which leased it to the Las Casas Foundation. The foundation commissioned this restoration and rehabilitation for the San Antonio Symphony.

Turning the wide, shallow theater into a concert hall required acoustical work by Christopher Jaffe, who proposed a removable acoustical shell (not shown) for the stage and a network of electronic sound enhancement devices that compensate for the hall's shape. One issue still not resolved is that of the theater's rear wall – or lack thereof. Eberson left only a chest-high rail separating the theater foyer (top left) from the auditorium. Consequently, noise intrusion from the lobby is a problem; a solution is still being negotiated.

Another issue in theater reuse projects is lighting: Some have criticized the raising of the light level in the Majestic, saying it has the effect of flattening the ornament, but greater light levels are necessary for reading programs.

Restoring Eberson's work involved vacuuming and dusting the painted plaster. (Since tempera paint was used originally, water was out of the question.) Painters then went over the colors lightly to brighten them.

Project: *Majestic Theater, San Antonio.*
Original architect: *John Eberson.*
Restoration architect: *Milton Babbitt, Inc., San Antonio.*
Restoration managers: *Ray Shepardson/ Sonia Winner.*
Client: *Las Casas Foundation.*
Program: *restoration of 2400-seat movie theater built in 1929 as venue for symphony and live theater.*
Consultants: *Danysh-Lundy & Associates (structural); Barry Engineering, Inc. (mechanical); Jaffe Acoustics, Inc. (acoustical); Rick Southern (production sound system); William Counter (technical); Heinsbergen Studios (decorative painting).*
Contractor: *Davis Constructors, Inc.*
Costs: *$4,400,000.*
Photos: *© John Dyer 1989.*

Fox Theater

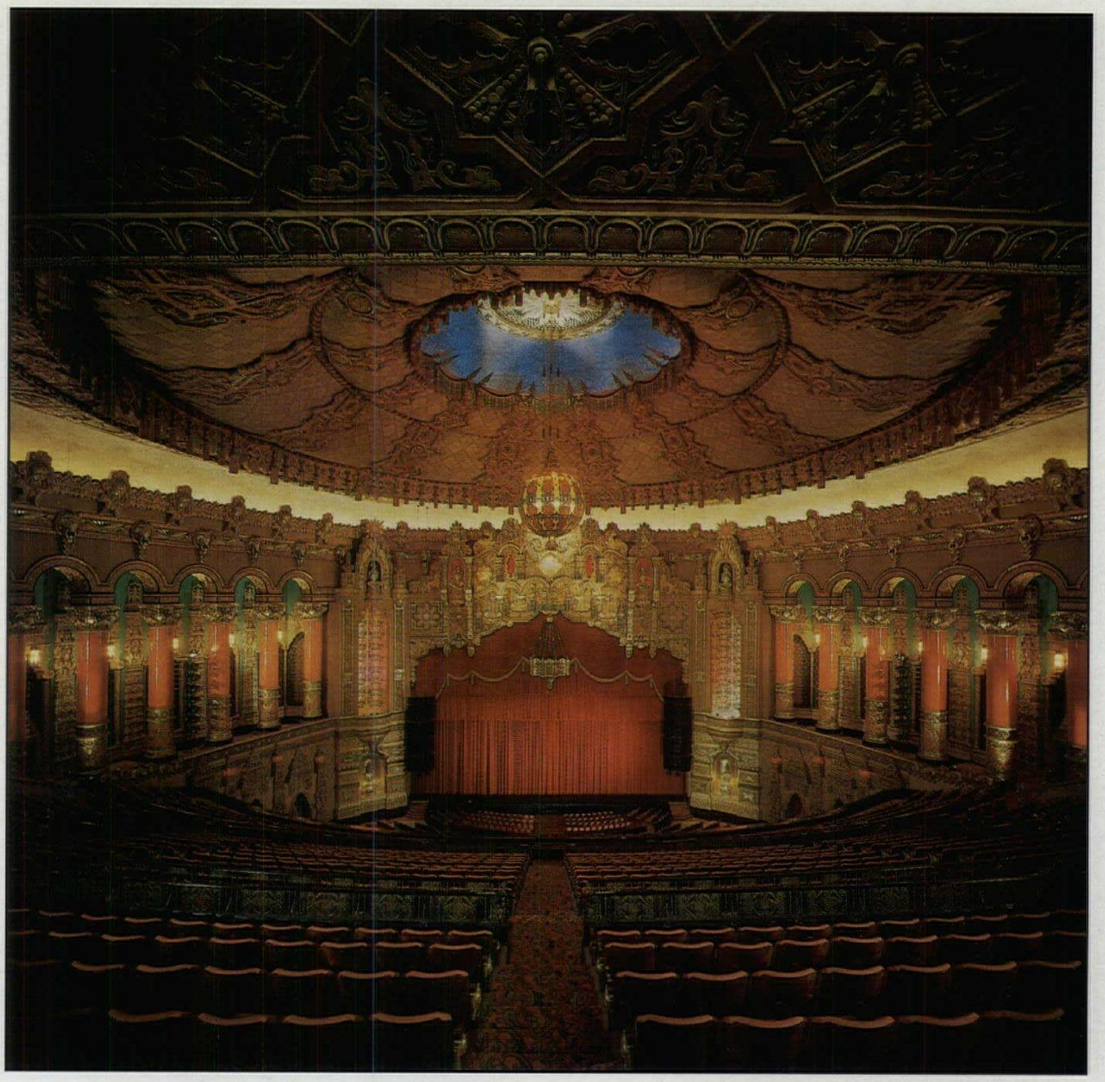
The Fox Theater in Detroit was the first of six nearly identical theaters planned by the Fox chain in the late 1920s; a second one was built in St. Louis before the Depression halted the program. C. Howard Crane was responsible for the frenetic decor, most often described as "Siamese-Byzantine." The Fox's dimensions are remarkable: 4804 seats, 105 feet high, and yet no seat is more than 150 feet from the stage.

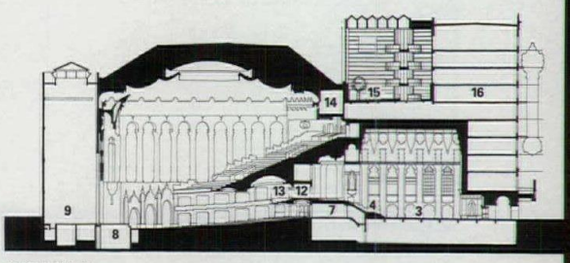
Michael Ilitch, founder and president of pizza chain Little Caesar International, purchased the dilapidated (but still operating) Fox in 1987 and announced his intention to move Little Caesar's offices into the building's ten-story office block. His in-house design team, along with architects-of-record William Kessler & Associates, created a new atrium in the office building's light well (see section) and provided new concession areas.

Restoration managers Ray Shepardson and Sonya Winner were able to save 80 percent of the interior finishes through extensive cleaning. Seven thousand yards of new carpeting was woven in the original pattern, and new aluminum leaf was used to restore the shine of the "gilded" ornament. The floor of the lobby (facing page) had been covered with carpet, undisturbed for 60 years. Corporate boxes with sofas were installed at the loge level (lower right).

The Fox has proven to be a successful location for concerts and touring theatrical productions: In 1989, it was the top-grossing theater in the country.

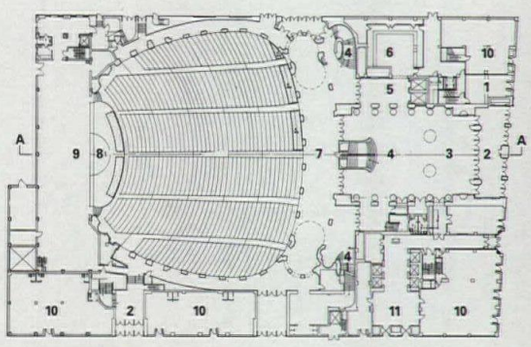
Project: *Fox Theater, Detroit.*
Original architect: *C. Howard Crane.*
Restoration architects: *William Kessler & Associates, Detroit (Edward Francis, principal-in-charge; Edward Skahan, project manager; Jacob Guter, Marlene Imirzian, project architects); Little Caesar International, Detroit (Dennis Evoe, project manager; Carmine Martone, designer).*
Client: *Michael and Marian Ilitch, Little Caesar International, Detroit.*
Program: *restoration of 1928 movie palace (part of an office building also restored as Little Caesar offices).*
Consultants: *McClurg & Associates (structural); Design Build (mechanical); Ray Shepardson/Sonya Winner (theater restoration); A.T. Heinsbergen & Co. (decorative painting); William Counter (sound and lighting); Elizabeth Knibbe (historical).*
Contractor: *Parliament Company.*
Costs: *not available.*
Photos: *Gary Quesada/Korab, Ltd.*





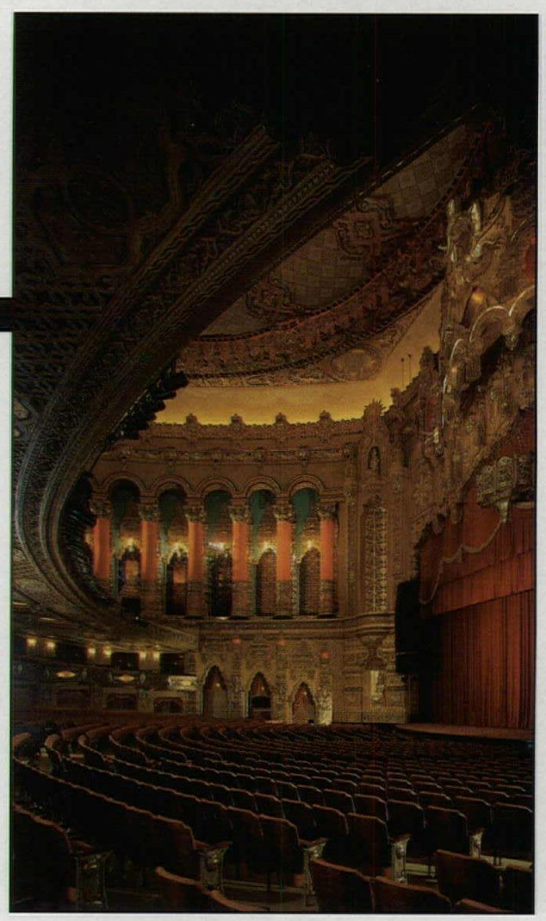
SECTION A-A

1 BOX OFFICE
2 VESTIBULE
3 GRAND LOBBY
4 STAIRS TO BALCONY
5 ELEVATOR LOBBY
6 CONCESSIONS
7 GRAND FOYER
8 ORCHESTRA PIT
9 STAGE
10 RETAIL
11 OFFICE LOBBY
12 LOGE PROMENADE
13 CORPORATE BOXES
14 PROJECTION BOOTH
15 ATRIUM OFFICE LOBBY
16 OFFICE SPACE



FIRST FLOOR PLAN

N ↑ 40'/12m



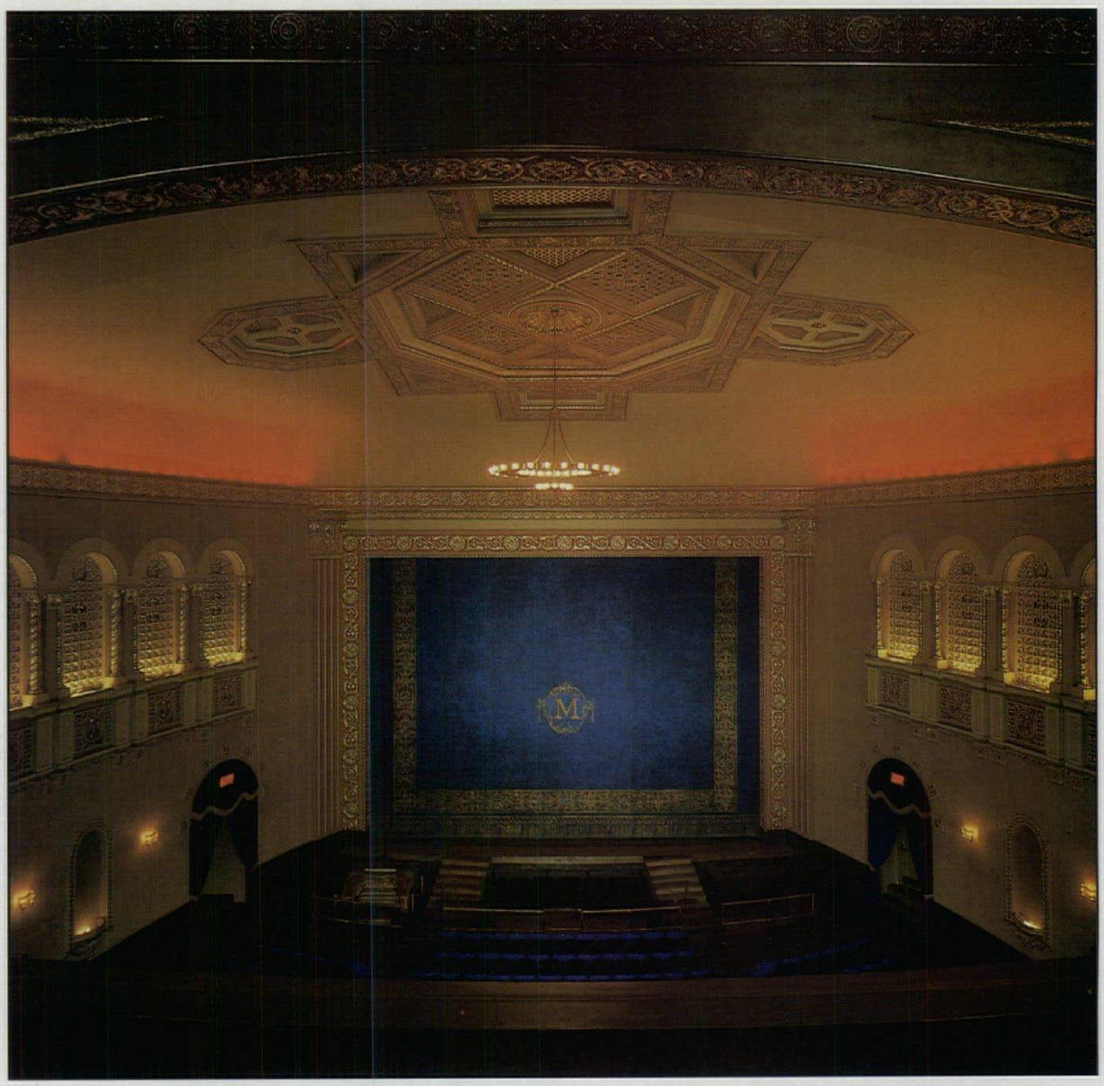
Michigan Theater

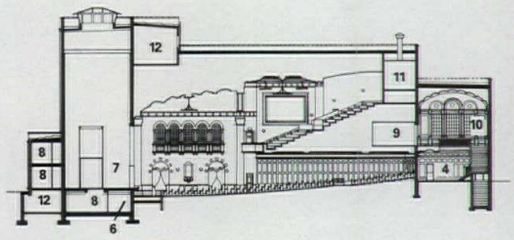
The Michigan Theater in Ann Arbor, Michigan, a movie palace designed by Detroit architect Maurice H. Finkel in 1928, is a stylistic hybrid of Moorish, Rococo, and Byzantine elements. A 1956 "modernization" involved the removal of much of the decorative plaster work in the 1700-seat theater. The Michigan Theater Foundation raised awareness of the theater's state; in 1982 the City of Ann Arbor bought the theater, and a series of fund-raising drives followed. The 1987 restoration of the theater as a venue for live events and films was a joint venture by Osler Milling/Architects and Quinn/Evans Architects, both of Ann Arbor.

Meeting present-day code requirements was a legal and programmatic priority. The pouring of a new concrete floor 19 inches above the original produced a greater pitch and thus higher sight lines. A spine two-thirds of the way back in the orchestra was devised for wheelchair seating and sound and lighting equipment. Carpeting in the lobby (below right) is a recreation of the original, made through computer generation of the pattern from a remnant.

Acoustically, the removal of decorative plaster on the gently curving walls of the house effectively robbed it of sound in some areas and concentrated it in others. Plaster was reapplied, creating a more complex surface and dispersing sound more evenly. The arched recesses (above right) were recreated from illustrations, photographs, and remnants of ornament that had fallen into the organ chamber during the 1956 remodeling.

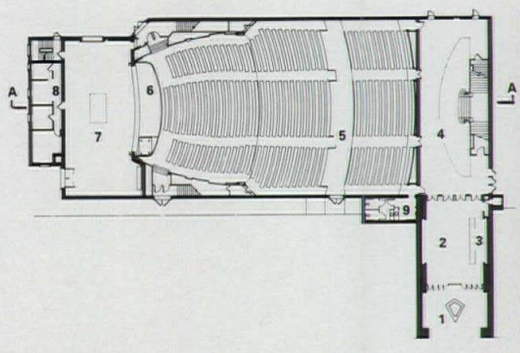
Project: *Michigan Theater, Ann Arbor, Michigan.*
Original Architect: *Maurice H. Finkel.*
Restoration Architects: *Osler/Milling Architects, Ann Arbor, Michigan (Scott K. Van Sweringen, project architect; David W. Osler); and Quinn Evans/Architects, Ann Arbor, Michigan (David S. Evans, principal-in-charge; Jefferson J. Schierbeck, project architect; Michael L. Quinn).*
Client: *Michigan Theater Foundation.*
Program: *rehabilitation of a 1928 movie palace as a performing arts center.*
Consultants: *Lyndon Welch (structural); Professional Consultants (mechanical); Neil Adams (electrical); Jaffe Acoustics (acoustical); Roger Morgan Studio (theater); Conrad Schmitt Studios (plaster and decorative painting).*
Contractor: *O'Neal Construction.*
Costs: *$1,181,000.*
Photos: *Gary Quesada, Korab Ltd.*





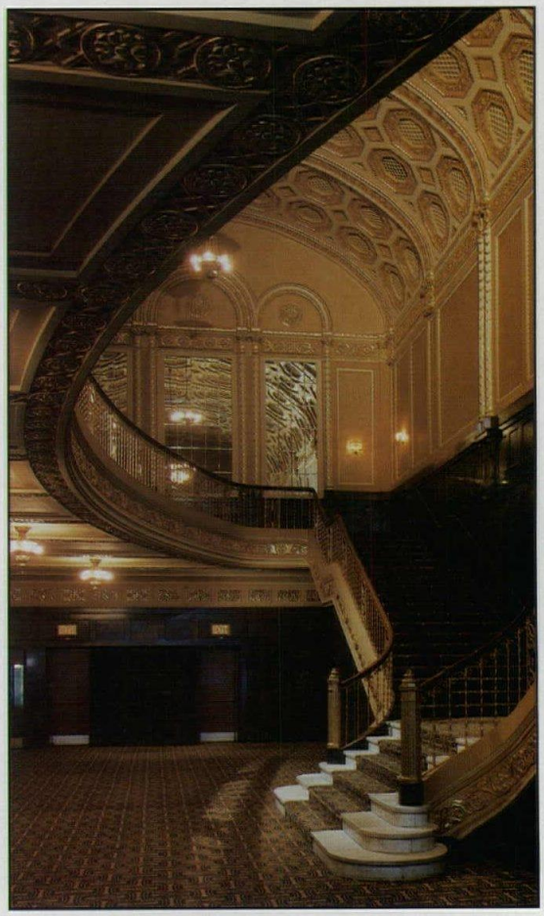
SECTION A-A

1 VESTIBULE
2 LOBBY
3 CONCESSIONS
4 FOYER
5 BARRIER FREE SEATING
6 ORCHESTRA PIT
7 STAGE
8 DRESSING ROOMS
9 RESTROOMS
10 FOYER PROMENADE
11 PROJECTION BOOTH
12 MECHANICAL

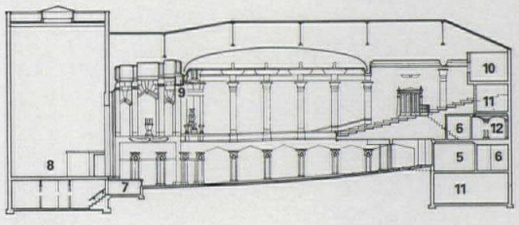


FIRST FLOOR PLAN

N ↑ 40'/12m

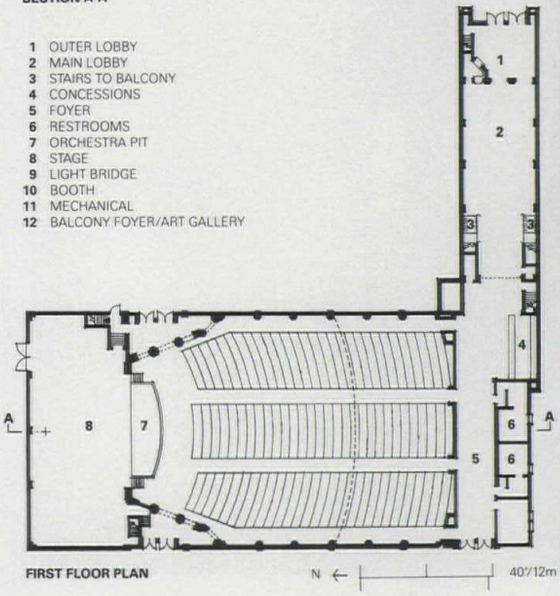


Photos: Sadin Photo Group Ltd., Don Dubroff



SECTION A-A

1 OUTER LOBBY
2 MAIN LOBBY
3 STAIRS TO BALCONY
4 CONCESSIONS
5 FOYER
6 RESTROOMS
7 ORCHESTRA PIT
8 STAGE
9 LIGHT BRIDGE
10 BOOTH
11 MECHANICAL
12 BALCONY FOYER/ART GALLERY



FIRST FLOOR PLAN

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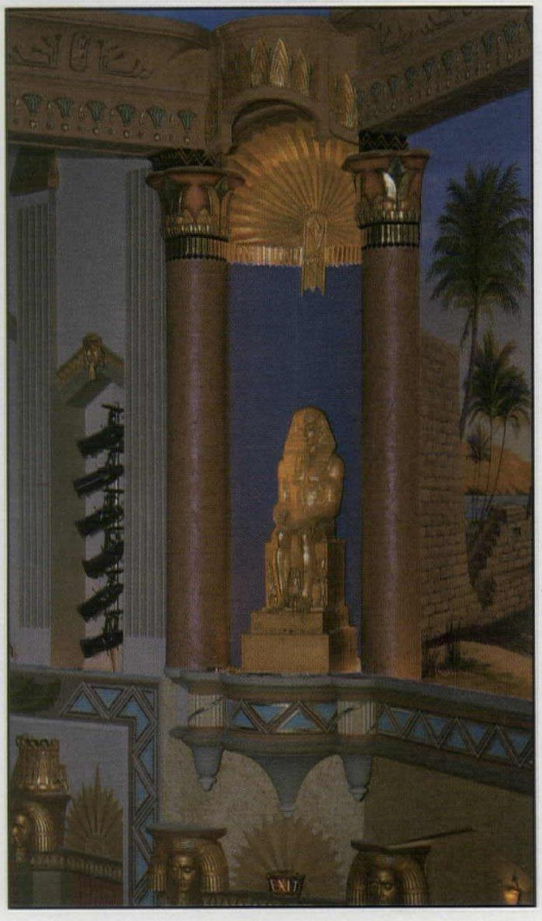


Egyptian Theater

From the pylon-inspired façade to the larger-than-life statues of Rameses II within (below left), the 1928 Egyptian Theater in DeKalb, Illinois, glories in the exotic kitsch of Egyptian revivalism. Originally designed as a vaudeville/movie house, the 1500-seat theater by Chicago architect Elmer F. Behrns was saved by Preservation of the Egyptian Theater, a not-for-profit organization. PET spearheaded the theater's comeback as a performing arts center in 1978, and in 1983 a full restoration was completed. The Egyptian, deeded over to the DeKalb County Authority in 1982 to receive restoration funding, is managed by PET volunteers.

Much of the 14 months of restoration work by A-E-C Group, Springfield, Illinois, involved piecing together original decorative elements and adapting existing spaces to present-day needs. "These theaters should not be made into museums," says project architect Roland Killian, and the Egyptian has, with this kind of thinking, been rehabilitated to accommodate live performances and large-scale traveling shows.

Several physical changes have been made to the theater: An empty space above the outer lobby has been converted into theater offices; dressing room space below the stage has been expanded; and an adjustable orchestra pit cover brings performers closer to the audience.

Auditorium walls hold the theater's most unique feature: Ten murals, each 9 feet wide and 16 feet high, on the east and west walls depict scenes of ancient Egypt (above left). Deemed unrestorable, the murals were removed, analyzed, and replicated off-site by Conrad Schmitt Studios, New Berlin, Wisconsin.

Project: *Egyptian Theater, DeKalb, Illinois.*
Original Architect: *Elmer F. Behrns.*
Restoration Architects: *A-E-C Group, Springfield, Illinois (Roland Killian, project architect).*
Client: *DeKalb County Authority.*
Program: *restoration of 1928 vaudeville/movie house as performing arts center.*
Consultants: *Buchanan, Bellows and Associates, (engineering); Conrad Schmitt Studios (stained glass window, murals); Luczak Brothers (ornamental plaster); Art Drapery Studios (stage rigging, curtains, and drops); Walter Dewey (theater technical consultant).*
Contractor: *Irving Construction Co.*
Costs: *$2,114,000.*

Elgin and Winter Garden Theaters

This unusual pair of stacked theaters in Toronto, unlike the other theaters in this portfolio, was built primarily as a vaudeville house, although the Elgin (top right) was later converted into a movie theater. The more flamboyant Winter Garden (facing page), which was seven stories up, was abandoned altogether in 1927 due to poor accessibility. In 1981, after a stint of B-movies, the Elgin, too, closed its doors.

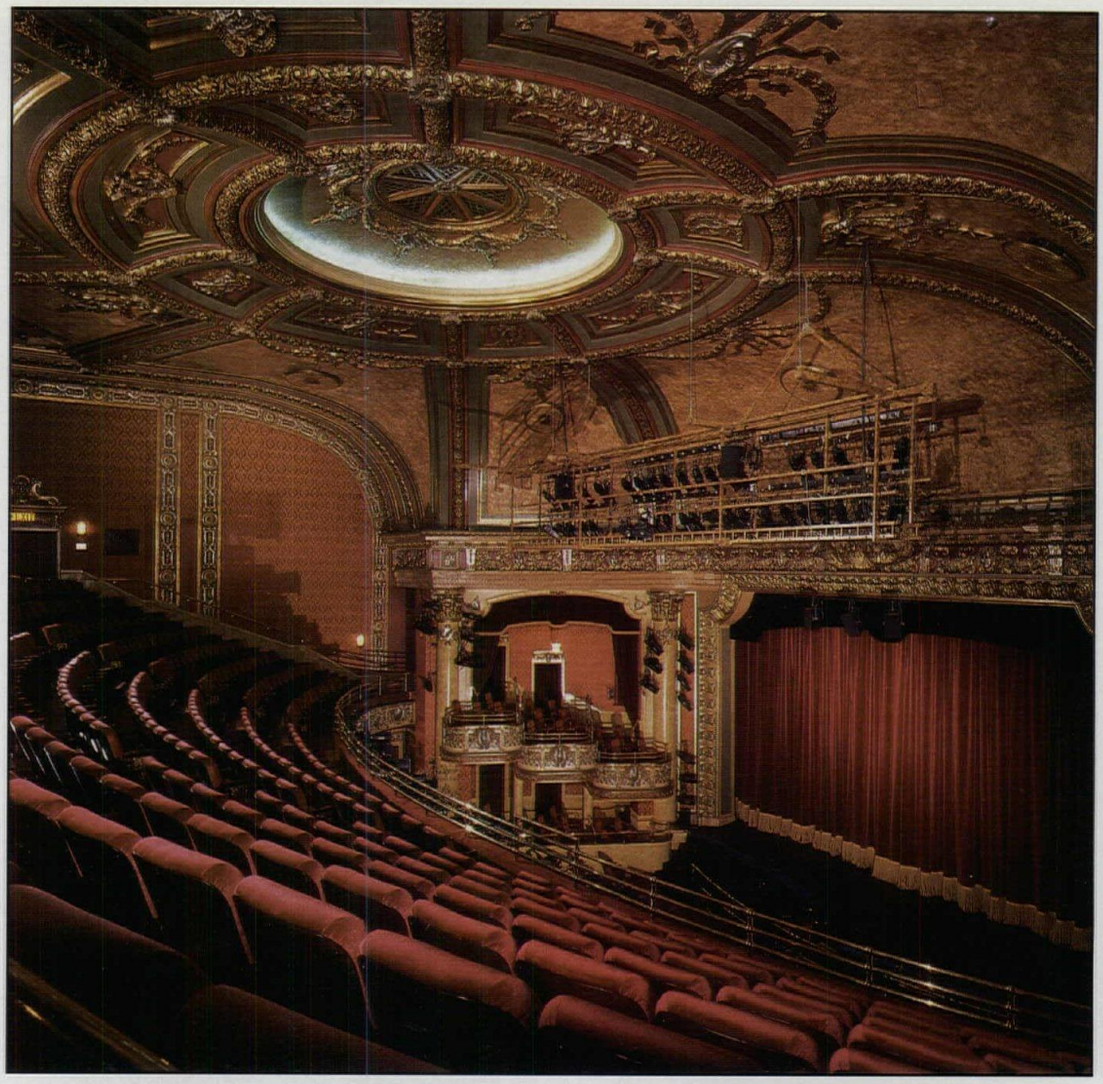
The need for mid-sized theaters in Toronto dovetailed with the Ontario Heritage Foundation's desire to save the building. The quasi-public foundation bought the theaters, using proceeds from a provincial lottery, and set about restoring and rehabilitating it with money from the sale of air rights and from private and government sources.

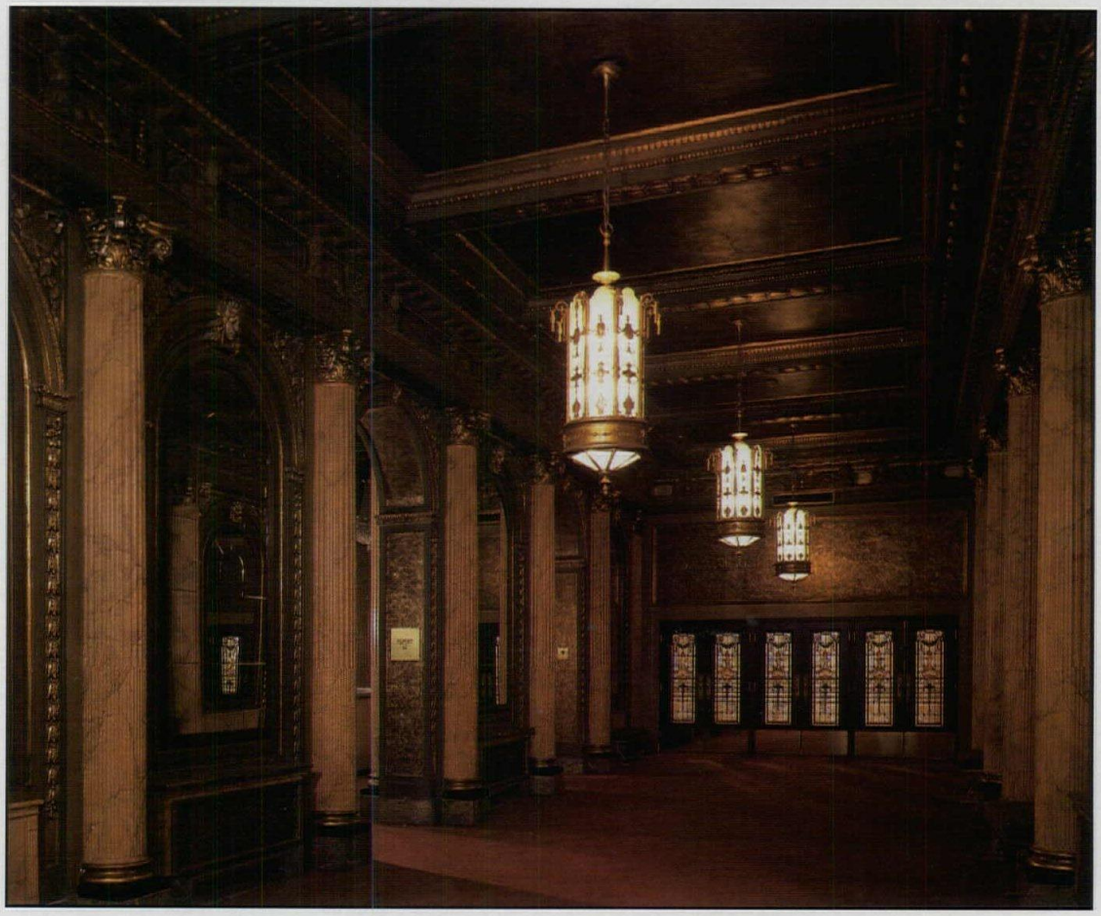
To make both theaters viable for commercial theater, a new building housing backstage facilities was added (far left in section), and new lobbies and escalators (above the entrance lobby) were built leading to the Winter Garden. In addition, new, wider seats were installed and removable theatrical lighting was hung.

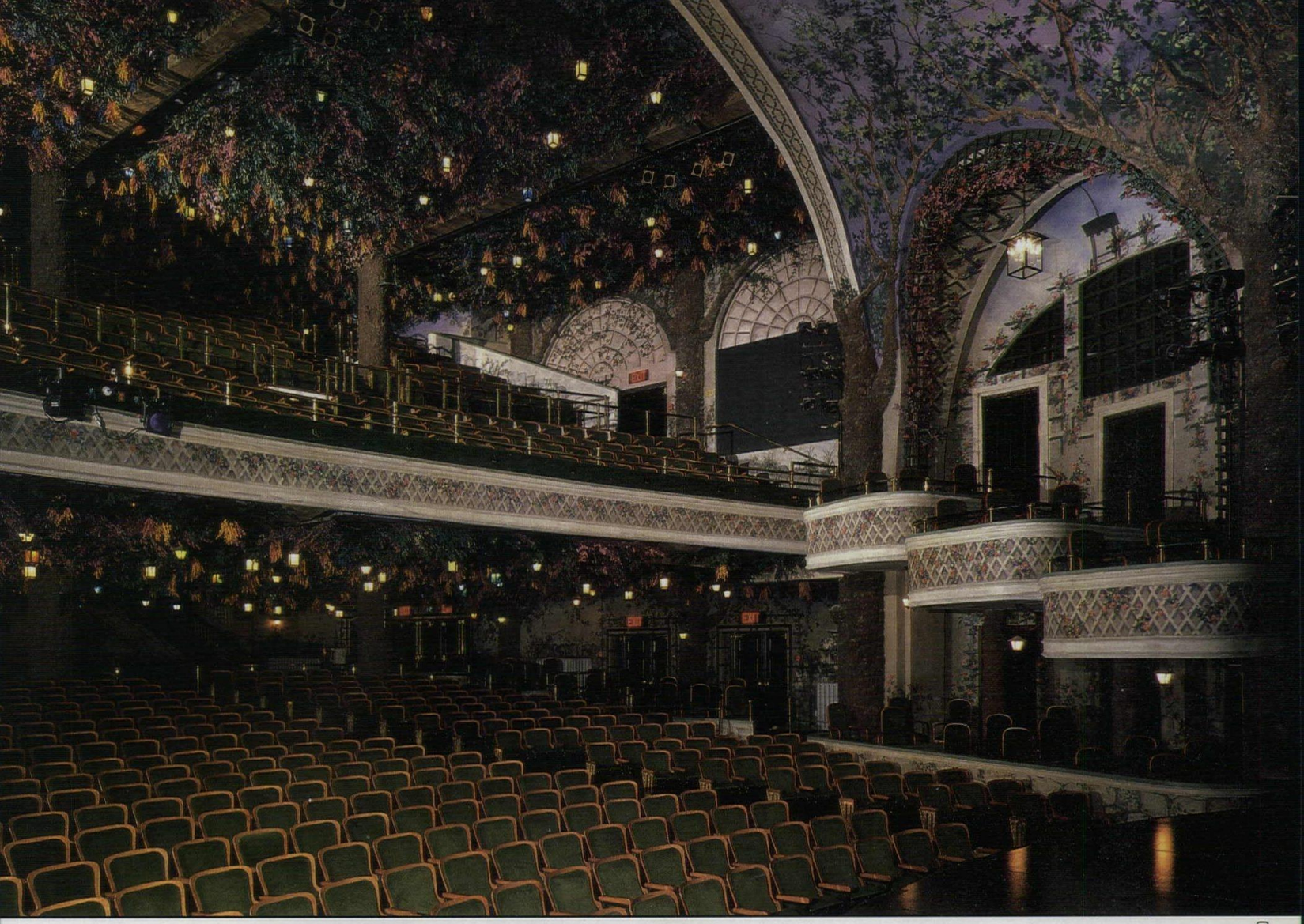
Much of the plaster ornament in the Elgin had been removed over the years and was reconstructed from photographs. Decorative surfaces in the theaters and lobby (bottom right) had been painted over repeatedly.

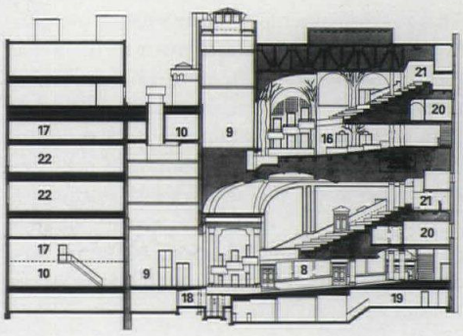
The murals in the Winter Garden were cleaned by rolling bread dough over them. The leafy canopy above, though, was beyond repair; in replacing it, 5000 beech branches were dried, painted, fireproofed, and suspended from the ceiling.

Project: *Elgin and Winter Garden Theaters, Toronto.*
Original architect: *Thomas W. Lamb.*
Restoration architect: *Mandel Sprachman, Toronto.*
Client: *Ontario Heritage Foundation (Janis Barlow, project manager).*
Program: *restoration of 1564-seat Elgin Theater and 985-seat Winter Garden Theater seven stories above; addition of basement, new lobbies leading to Winter Garden, eight-story backstage pavilion.*
Consultants: *Dowdell, Pal, Ellis & Associates (structural); Crossey Engineering (mechanical); David Hannivan & Co. (restoration); Richard Smerdon (theater); Robert Tanner (acoustical).*
General Contractor: *Grant Construction.*
Costs: *$29,000,000 Canadian.*
Photos: *Hill Peppard.*



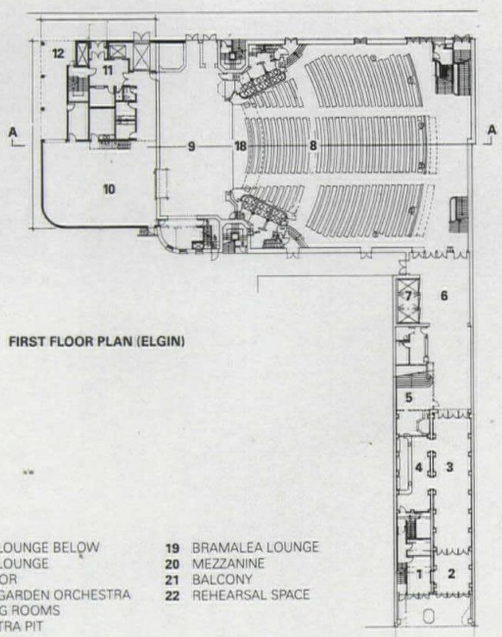




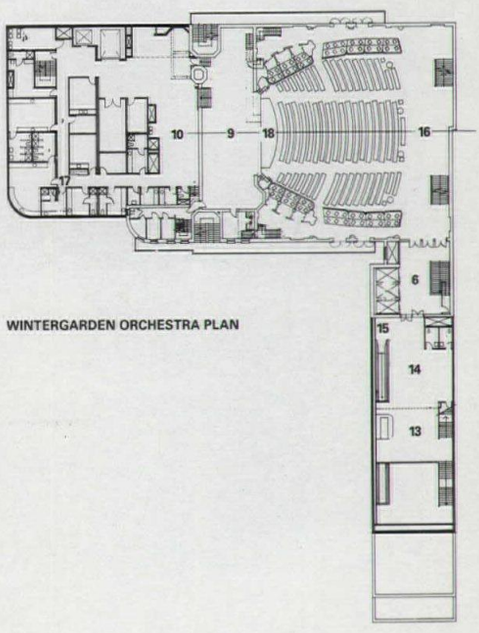


SECTION A-A

N 40'/12m



FIRST FLOOR PLAN (ELGIN)

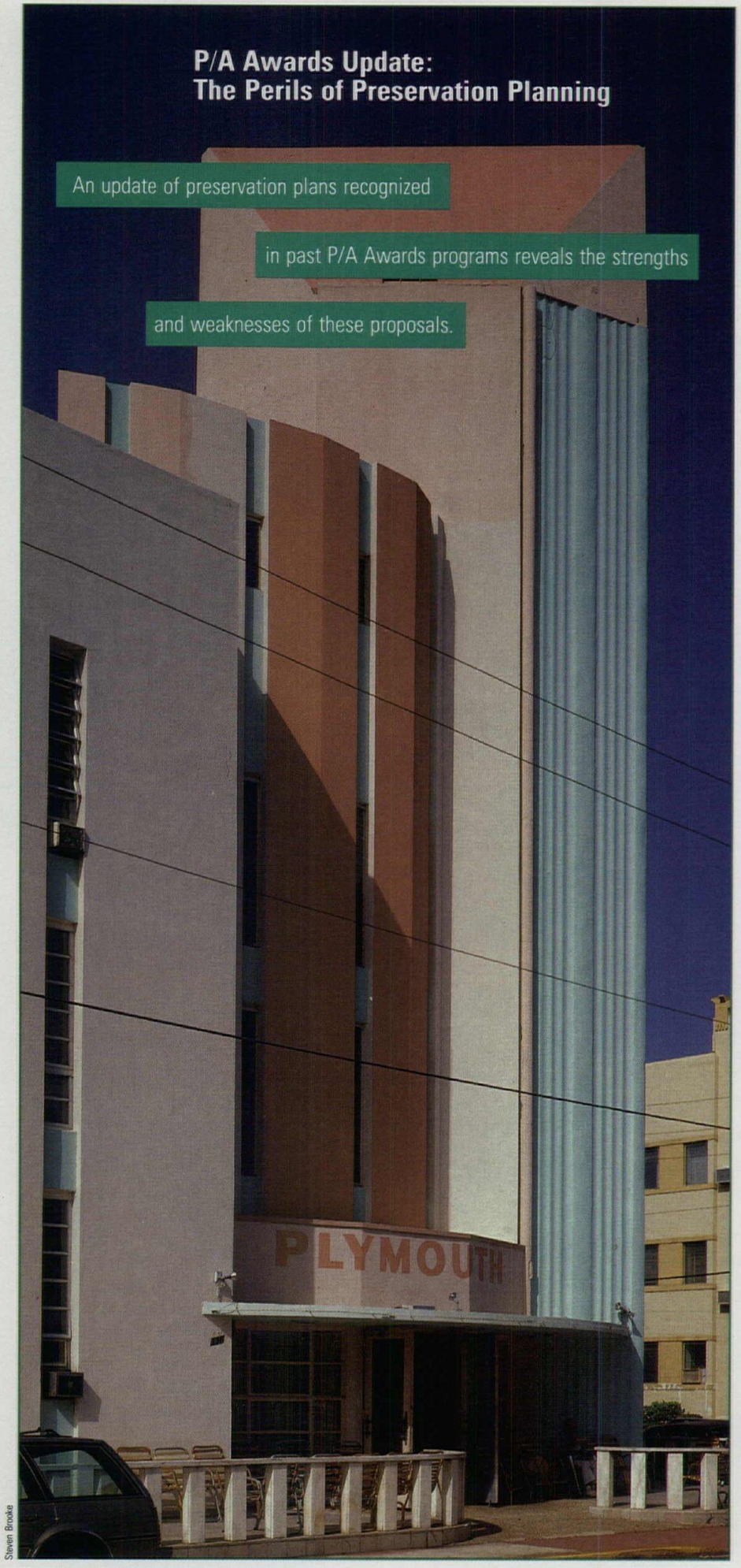


WINTERGARDEN ORCHESTRA PLAN

1 BOX OFFICE
2 VESTIBULE
3 THOMAS LAMB LOBBY
4 LOUNGE
5 GRAND STAIRCASE
6 LOBBY
7 PASSENGER ELEVATORS
8 ELGIN ORCHESTRA
9 STAGE
10 BACKSTAGE ASSEMBLY
11 BACKSTAGE ENTRY
12 LOADING AREA
13 LEVEL 4 LOUNGE BELOW
14 LEVEL 5 LOUNGE
15 ESCALATOR
16 WINTER GARDEN ORCHESTRA
17 DRESSING ROOMS
18 ORCHESTRA PIT
19 BRAMALEA LOUNGE
20 MEZZANINE
21 BALCONY
22 REHEARSAL SPACE

P/A Awards Update: The Perils of Preservation Planning

An update of preservation plans recognized in past P/A Awards programs reveals the strengths and weaknesses of these proposals.



Steven Brooke

The Plymouth (1940) on 21st Street.

In silent movie series "The Perils of Pauline," the heroine seemed always in mortal danger and, through some heroic intervention, saved just in time. Such is frequently the story in community preservation. The heroine is sometimes a group of buildings but more commonly the character and vitality of a place. The peril is usually either too much growth and development or too little. And the hero, assuming there's a happy ending, is often a combination of careful planning, considerable citizen effort, and sheer luck.

The following pages tell of the perils of five preservation plans cited in past P/A Awards programs. While all vary in their details, some general comments can be made about them. One obvious point is that the preservation of a physical place and the preservation of its character are two very different tasks. While all of these plans have resulted in the saving of buildings, one or two of them fell prey, at least in part, to the cuteness that often stalks historic districts. Retaining a sense of a real community, especially when a place becomes a tourist destination, is no easy task.

The most effective of these plans also paid close attention not only to what a community might become, but how it might get there. When a plan creates a vision of the future without discussing the necessary steps in its implementation, it tends to get put on a shelf, as happened with one of these projects.

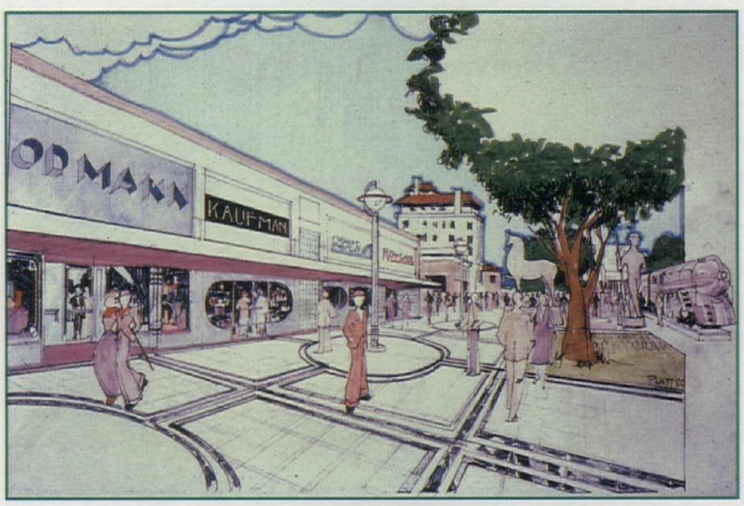
Likewise, plans seem hollow when they focus mainly on the physical form of a place, with little attention given to political, social, or economic conditions. It is an all too common sight in historic districts to see façade improvements on vacant storefronts or pedestrian malls without people. The best of the following plans gave careful study to the economic and social issues to create a vital community that, in turn, generated a lasting physical renewal.

A related problem arises when plans count too heavily upon some outside event or agency to make preservation happen. In at least one of the following cases, a major governmental windfall did occur, spurring extensive public and private investment. But in another, an expected government-funded event has yet to materialize, slowing the community's preservation and stalling the plan that depended upon outside intervention. If a generalization about these preservation plans can be made, it is the desirability of incremental, self-generated, moderate growth that is adapted to the unique political, social, economic, and physical traits of a community. As the following stories show, that is easier said than done.

One final point has to do with the monies available to do such preservation planning. With the widespread decline in federal and state funding for preservation planning and with an increase in the number of architects who, says Denise Scott Brown, "will do cosmetic plans for small fees," it has become increasingly difficult to find communities willing or able to pay the fees required for studies that are sufficiently thorough. It is not just our communities, but preservation planning itself that is threatened by a shrinking public sector. The only hero capable of saving this imperiled discipline is the architectural and planning community, which needs to define the necessary components of a preservation plan and then advocate its long-term value to public and private sector alike.

Thomas Fisher ■

Venturi, Rauch & Scott Brown's depiction of Washington Avenue.



Drawing from the Anderson, Notter & Finegold plan.

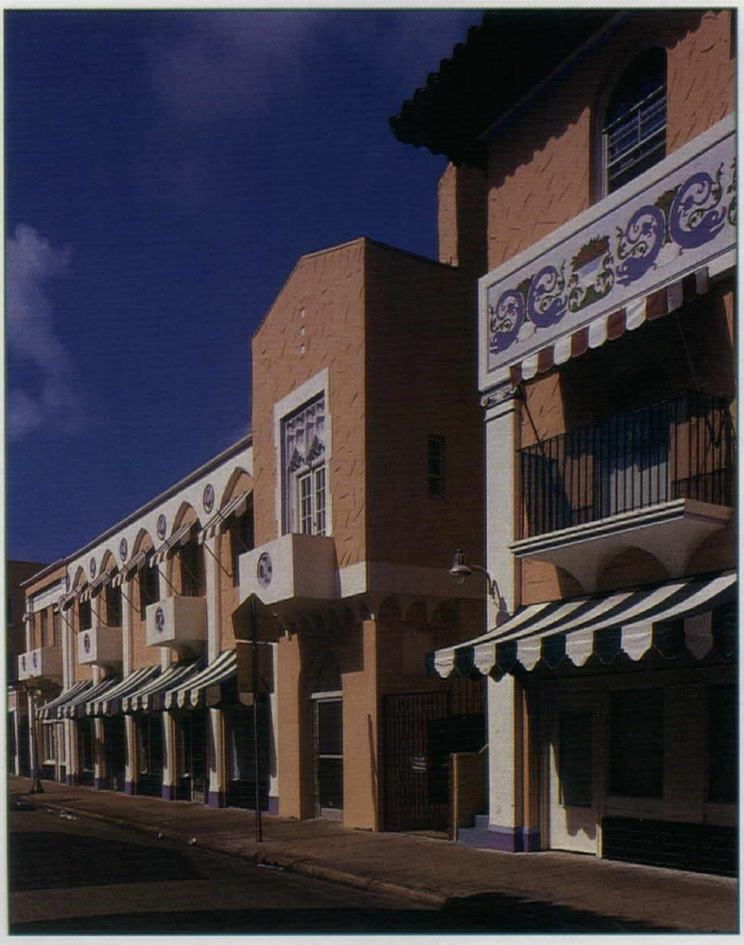
Miami Beach, Florida

Preservation plans for the Art Deco district of Miami Beach have been recognized twice by consecutive P/A Awards juries. Anderson, Notter & Finegold won an award for their plan of the entire district (P/A, Jan. 1982, pp. 174–177), and the year after, Venturi, Rauch & Scott Brown won a citation for their plan of Miami Beach's main commercial street, Washington Avenue (P/A, Jan. 1983, pp. 122–123). Both plans were implemented, although not without compromises and preservation battles.

One battle occurred over the city's resistance to preservation. "Anderson Notter's plan called for the establishment of a historic district ordinance," says Nancy Liebman, executive director of Miami Design Preservation League. "Mandated by Dade County, the city implemented a law that required 100 percent owner consent, so the county sued, and the ordinance was rewritten."

The Anderson Notter plan went to great lengths to address the needs of the elderly population. But the Mariel Boat Lift in 1980 brought many refugees into or just south of the district, and rising crime greatly reduced the influx of elderly people. "Now," says Maurice Finegold, "the remaining elderly and the growing Hispanic populations are both under pressure from gentrification. The good news is that we haven't seen much demolition or intrusive new construction in the district since our plan. But if I would have done anything differently, I would have worked harder to diminish the lines of adversity between the city and the preservationists."

Venturi, Rauch & Scott Brown's plan for revitalizing Washington Avenue was commissioned by the city and was compromised right from the beginning. "They didn't want social or procedural planning," recalls Denise Scott Brown. "They wanted images. Which was a shame, for the elderly population, many of whom were union members from the Garment District, was as historically interesting as the buildings. The city reneged on our design guidelines, giving the street landscaping to someone who put flower beds at foot level in the sidewalks . . . The city just didn't run things very well."



View along Espanola Way.

Waldorf Towers (1937) on Ocean Drive.

The Leslie (1937) on Ocean Drive.

Photos: Steven Brooke

Rugby, Tennessee

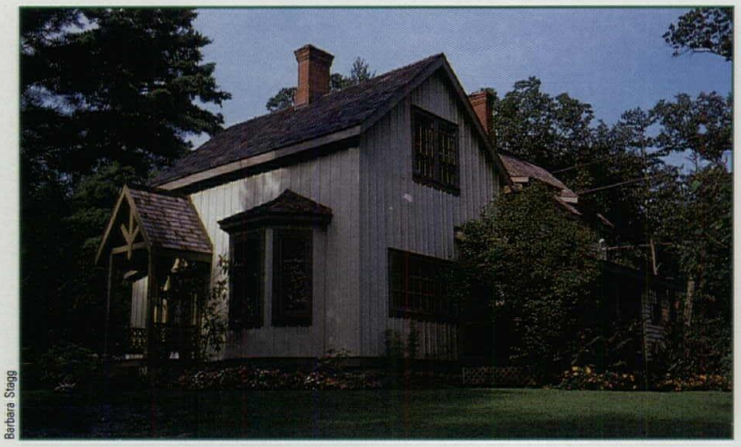
The preservation plan produced by the Ehrenkrantz Group/Building Conservation Technology for the former utopian colony of Rugby, won a First Award in the 1986 P/A Awards program (P/A, Jan. 1986, pp. 108–113). What impressed the jurors and what has served the community well since 1986, was the thoroughness of the plan, incorporating a history of the place, a physical analysis, design guidelines, a management plan, recommendations on incorporation, even a newsletter.

"Tourism has greatly increased," says architect Michael Emrick, "and the design guidelines are being implemented and easements established. We have reconstructed the Board of Aid, the original office of the colony, and the Commissary, and are beginning to work on the reconstruction of the boarding house." A new restaurant, in keeping with the town's 19th Century architecture, has also been built.

"But we have gone as far as we can go with visitor services," says Barbara Stagg, director of Historic Rugby, "without getting the truck traffic out of town. There was a highway bypass around Rugby planned 13 years ago by the state and the Army Corps of Engineers. The Corps, however, says that it no longer has the funding, and the state is faced with doing it itself. The bypass was a foundation of the master plan; without it, there is so much that we can't do." The state is balking, adds Emrick, "because of the money it will take to build the necessary road and bridge." If there is a shortcoming in the preservation plan for the town, it is this dependence upon the bypass.

Historic Rugby is unusual in its entrepreneurial approach. The non profit organization runs a bookshop, restaurant, lodging, and craft commissary. The group also plans to start selling lots on land it owns for the construction of houses, which would have to meet the plan's design guidelines. One such house has already been built that is remarkably compatible with the historic structures. "What we are doing here," says Stagg, "the rest of the museum world has come to slowly." The advantages of entrepreneurism, in an era of declining public funding for museums, is clear.

Ehrenkrantz/BCT plan of Rugby's center.



Barbara Stagg

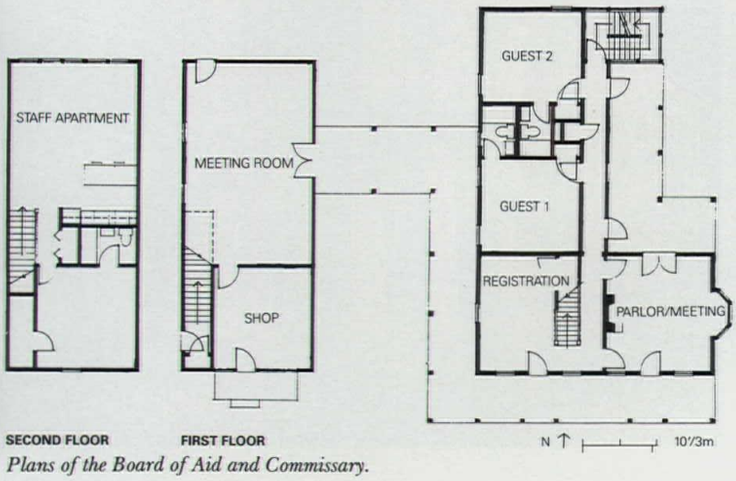
Newly constructed private house.

Barbara Stagg

The reconstructed Board of Aid and Commissary.

Michael Emrick

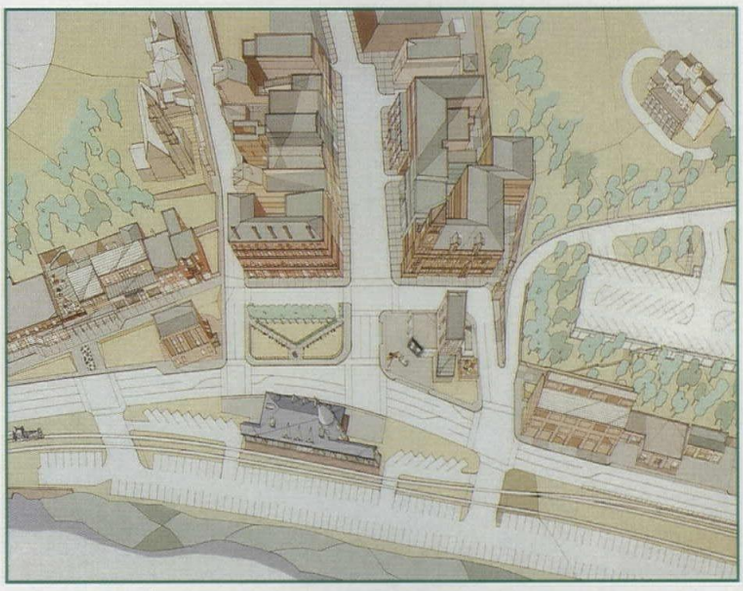
Newly constructed restaurant.



Plans of the Board of Aid and Commissary.

Jim Thorpe, Pennsylvania

Storefront suggestions from the plan.



Perspective from Venturi, Rauch & Scott Brown plan. N 100'/30m

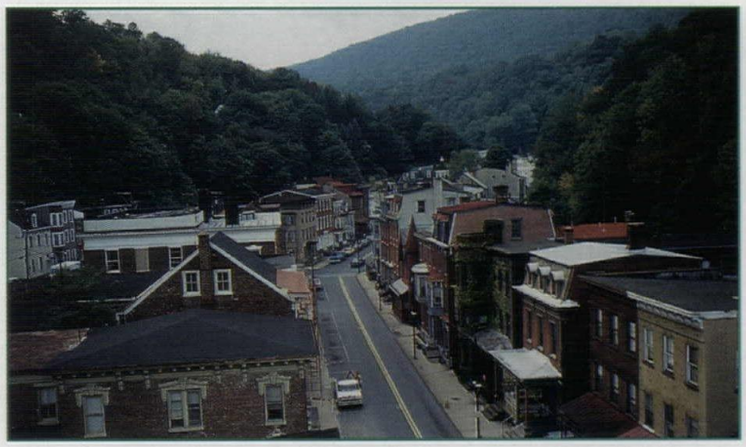
Venturi, Rauch & Scott Brown's plan for Jim Thorpe (P/A, Jan. 1981, p. 98–99) "sparked a major revitalization effort," reports Bruce Conrad, director of the town's office of planning and development. "After five years of intensive government involvement," he adds, "the community is going on like gangbusters."

What is impressive about the plan and what makes it "still a viable document," says Conrad, is the depth of its analysis. Venturi, Rauch & Scott Brown not only recommended detailed improvements to historic buildings and storefronts, but made many nonarchitectural suggestions, such as the timing of lights at major intersections, the type and mix of retail, and the relocation of parking spaces. The report also examined ways of implementing the changes with the goal of achieving moderate, self-sustaining growth.

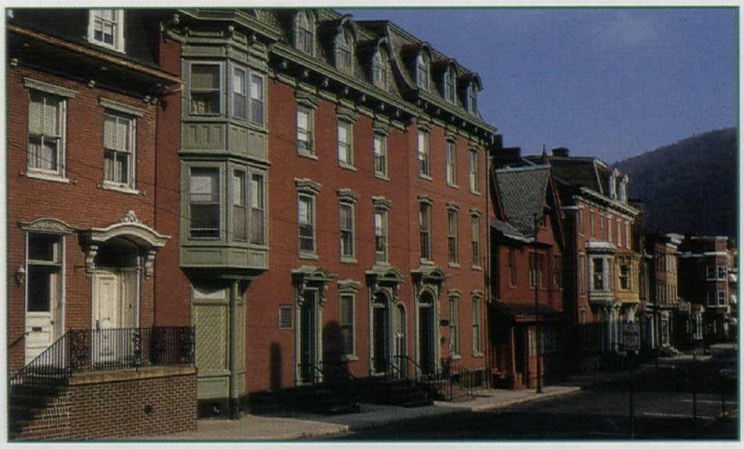
This was, of course, very deliberate. "Physical planning," argues Denise Scott Brown, "is not sufficient. Social and economic analysis is essential, especially in towns such as Jim Thorpe, which had become an economic backwater." Scott Brown also admits that "it takes a strong individual, such as Bruce Conrad, using all of his talents" to make a plan work well.

And this plan has clearly worked well. The historic district of Jim Thorpe now has a thriving retail section, having grown "from 10 or 12 to 75 stores in the downtown," says Conrad. The stores, he adds, "do not offer kitsch, but specialty products; there is, for example, an Irish textile shop, local craft shops, a fresh herb shop." In a town where there was once nothing to do at night, there is now an active opera house and a major fine arts festival every year. Most of all, Jim Thorpe has an authentic quality about it. "We did not want to become too cute," says Conrad.

Robert Venturi and Denise Scott Brown have stayed involved in the town. "They offered advice on the restoration of the opera house," says Conrad, "and, when our Victorian library burned down in 1981, they helped us get NEH funding for its reconstruction." Such caring about Jim Thorpe, by all parties, is no doubt a big part of its success.



Jim Thorpe's historic district.



Restored housing.

Photos: Bruce Conrad

Restored commercial blocks.

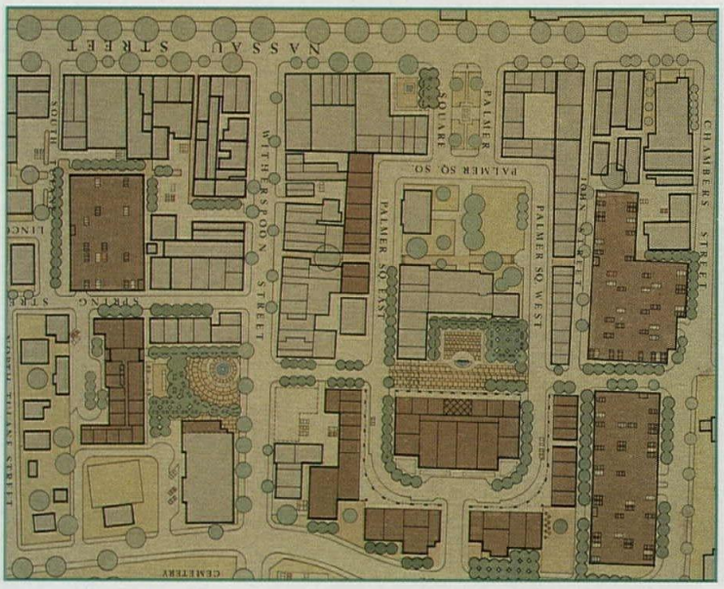
Princeton, New Jersey

The ideal in any preservation plan is to achieve a balance between public and private involvement and between growth that is too rapid or too slow. Princeton's Palmer Square is an example of what happens when that balance is upset.

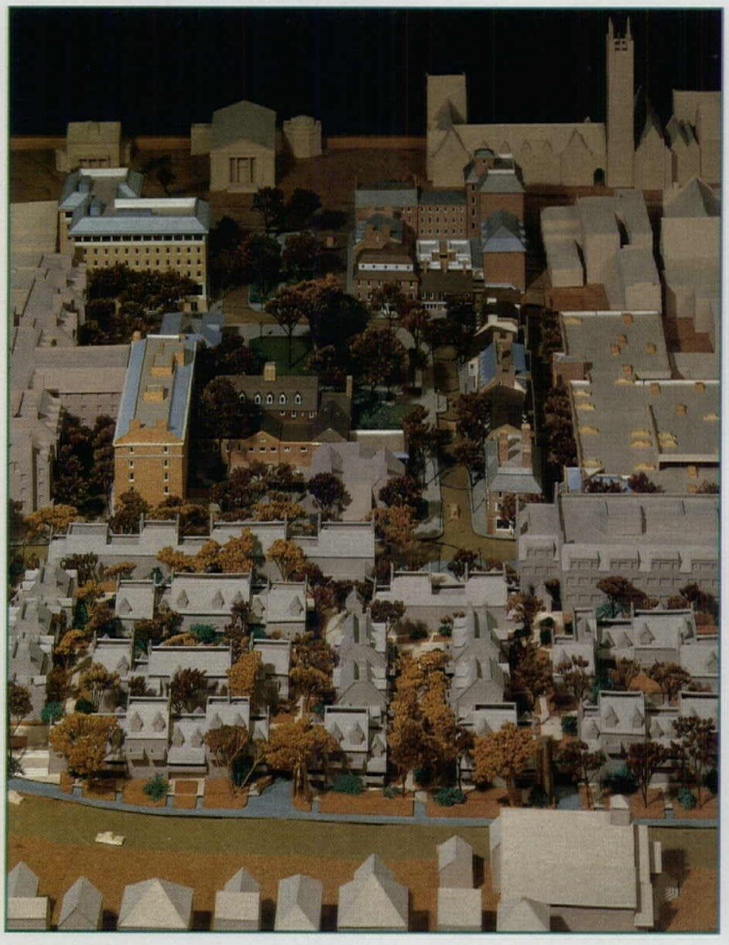
Venturi, Rauch & Scott Brown won a citation for their plan of the Palmer Square area in 1982 (P/A, Jan. 1982, pp. 186–189). They had been hired by the Borough of Princeton to study the area because of concerns within the community about the density of development proposed for the area. The plan was exhaustive in its study of such unglamorous things as parking, traffic, and retail mixes. The plan also suggested ways in which the area could be expanded north, into existing parking lots, without greatly increasing the bulk of the buildings. Another important element was the siting of a building for the elderly just off the square in a quiet location.

Although there was community involvement in the plan, some residents apparently continued to protest any development. So the land, much of it owned by the university, was sold to a private developer, Collins Development. "The rug got pulled out from under us," says Scott Brown, "and many things, such as the elderly housing, never happened." Collins proceeded to build at a much higher density than what the earlier plan had called for. A new multistory addition to the inn and a new multistory office and retail building, designed by Do Chung & Partners, were constructed on the east side of Palmer Square, at one point bridging over the road. RTKL was involved in the design of an office building to the north of the inn, and The Hillier Group has planned an extensive market-rate housing development along the north end of the site. Although the quality of the architecture built by Collins varies widely, it has gotten better as time goes on. But the density of development far exceeds that called for in the Venturi, Rauch & Scott Brown plan, showing what can happen when the public sector relinquishes some of its control over preservation planning and how overheated land values, such as those in Princeton, can work against the best interests of a community.

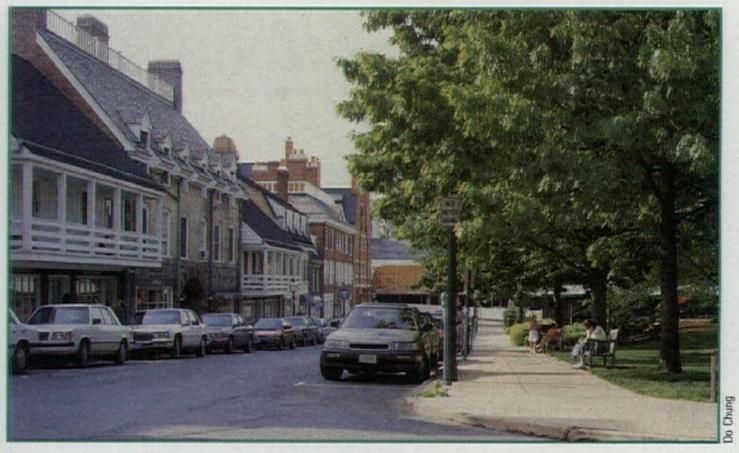
Palmer Square in Venturi, Rauch & Scott Brown plan.



Venturi, Rauch & Scott Brown site plan.

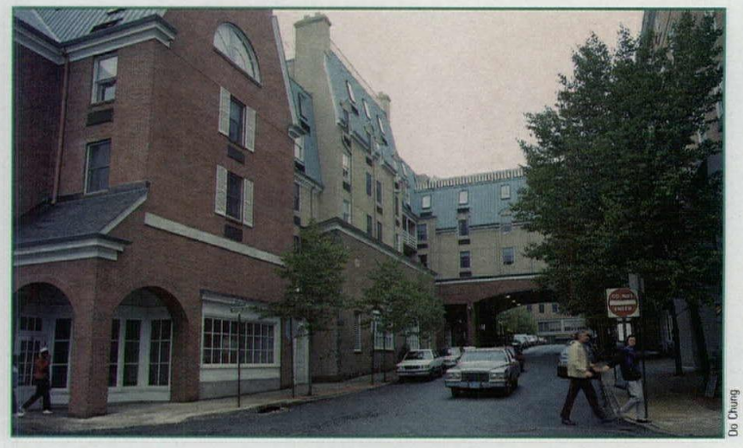


Model of current and proposed development.



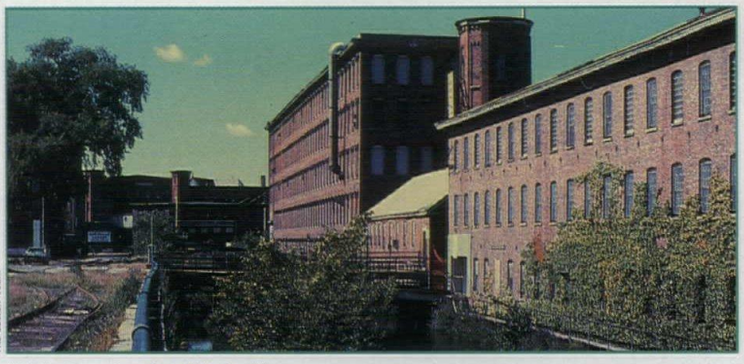
Do Chung

Palmer Square West.



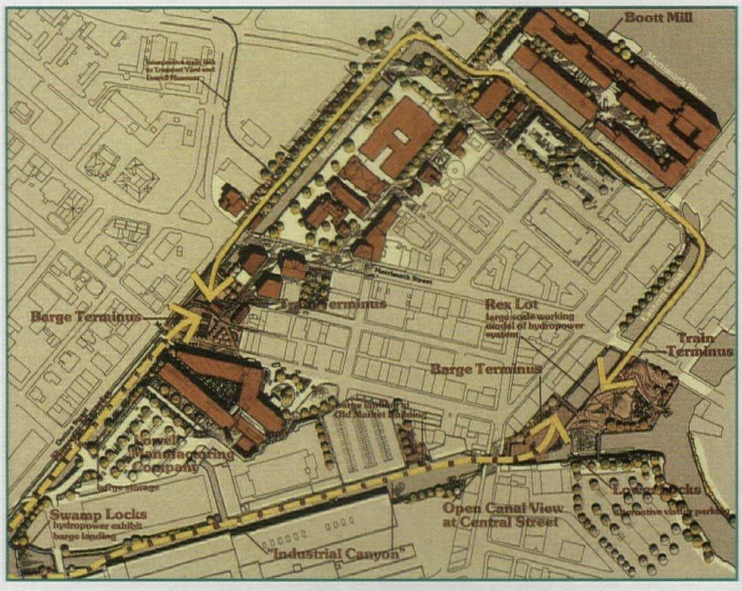
Do Chung

Palmer Square East.



The Lowell Team

1978 view of underutilized mills.



The Lowell Team's original plan.

Lowell, Massachusetts

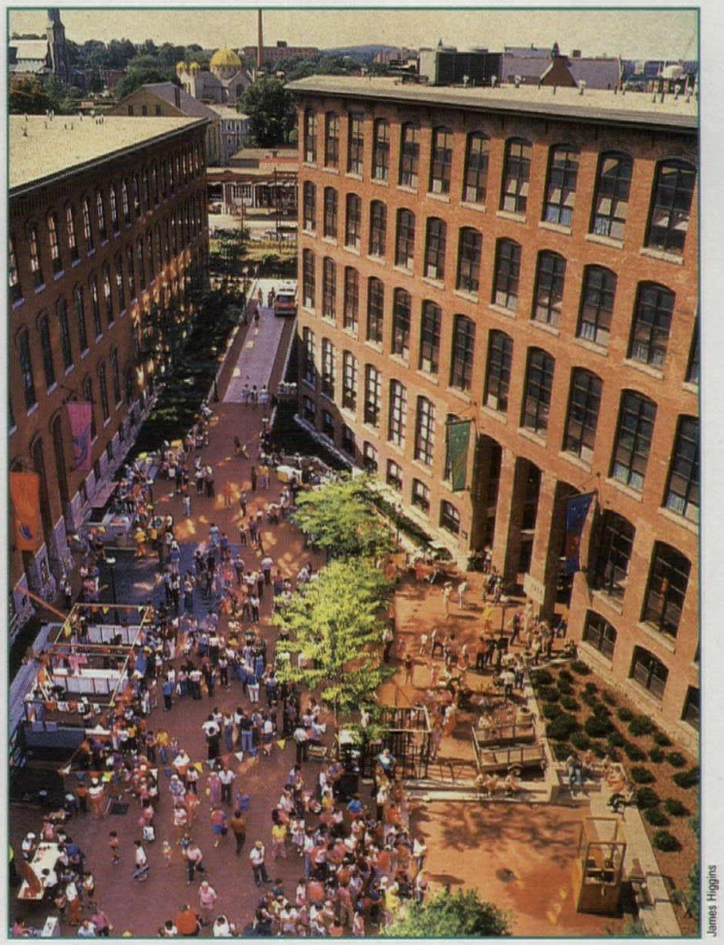
Lowell projects have done well in the P/A Awards program. Michael and Susan Southworth won awards for their Lowell Discovery Network plan (P/A, Jan. 1973, p. 104) and for their plan to reuse Lowell's Boott Mill (P/A, Jan. 1974, pp. 56–57). The Lowell Team, a joint venture of several firms, later won a citation for its plans to create a national park in the city (P/A, Jan. 1978, pp. 100–101). If Lowell has been one of the most studied historic communities, so too has it been one of the most successful.

That success has not come easily or quickly, however. The Southworths, although ahead of their time in their emphasis on the reuse of buildings, provided a vision of what might be without a lot of detail about how that might be achieved. As a result, their plans were largely forgotten. "Most people here," says Peter Aucella, executive director of the Lowell Historic Preservation Commission, "have never heard of the Southworths or their Discovery Network."

Their work, in part, was eclipsed by that of The Lowell Team four or five years later. This plan, which helped convince Congress to establish the country's first urban national park, was far more pragmatic and specific. It not only contained a detailed physical plan, but offered an implementation process, proposed a strategy for managing the park, and even suggested federal actions.

The plan reaped an ample harvest. "In 1979, before the National Park Service came to Lowell," says Aucella, "there were almost no visitors to Lowell. Now we get 800,000 a year." Since 1975, the city has attracted almost $1 billion dollars in investment, of which $170 million has been in state and federal grants. There also has been ample private investment, including a new Hilton hotel and a $60 million rehabilitation of mills for use as research and development space. And the 700,000-square-foot Boott Mill, which, despite the Southworths' grand vision, remained little used until 1986, is finally undergoing rehabilitation by Congress Group Properties, with Huygens DiMella Shaffer as architects.

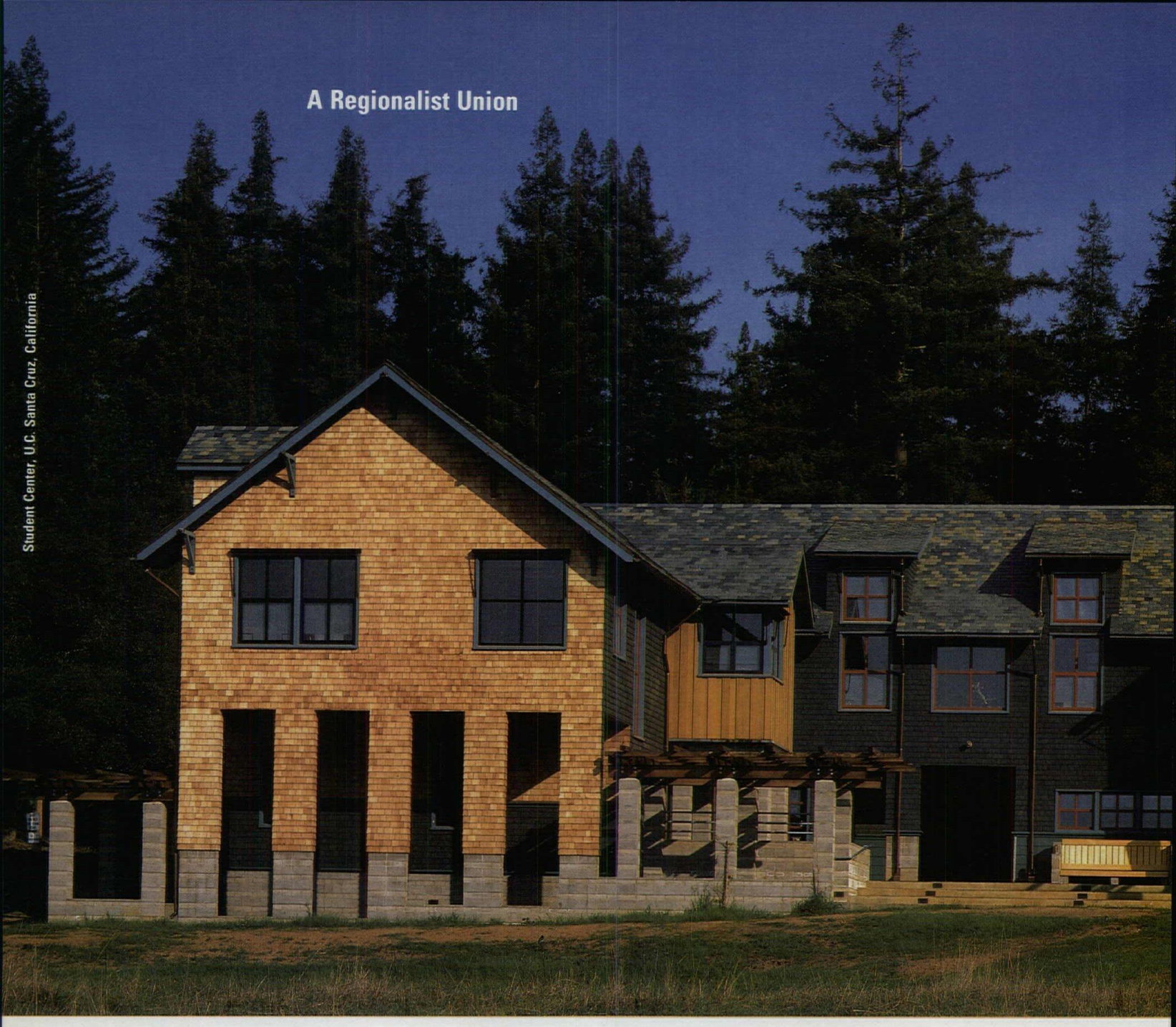
Rendering of Boott Mill rehabilitation.



James Higgins

Rehabilitated mill complex.

A Regionalist Union



Student Center, U.C. Santa Cruz, California

Fernau & Hartman explore their idea of conceptual regionalism in this new student center for U.C. Santa Cruz.

If future generations of students at the University of California Santa Cruz have difficulty dating the new student union, architects Richard Fernau and Laura Hartman will be pleased. This latest building on the U.C. Santa Cruz campus looks as though it could have been the first.

This achievement does not come from an overt use of historicism; the student center is not a sentimental design. Although from across the open meadow, the brown-shingled, gable-roofed complex recalls the bay region works of Bernard Maybeck and John Galen Howard, the close-up view reveals no direct quotations from the old masters. Instead, the architects have followed the earlier generation's practice of combining traditional and new materials in forms that are familiar but adapted to new uses. It was and is regionalism at its best.

The student center stands as a gateway to the great meadow, which spreads southward from the edge of the forest. The architects hope that this courtyard building, with its arms stretched out to the meadow, will inspire the students to become the field's stewards and thus preserve the campus's largest remaining open space.

The university's intentions for the meadow were defined when the campus was planned in the early 1960s (see P/A, May 1988, p. 92–93), but were compromised by later projects. In 1985, when Fernau & Hartman were hired to prepare a master plan for a student center, the meadow was its proposed site. The assumed location followed the suburban planning model of the rest of the campus in distancing the building from a road between the forest and the upper edge of the meadow. To preserve the open space and add a certain density, the architects, instead, located the student center near the road, a strategy that they thought would strengthen the meadow's edge.

Since U.C. Santa Cruz has no formal entrance (the visitor arriving by car passes a series of rehabilitated barns and sheds that belonged to the Cowell Ranch, the original owner of the land), the student center at

Student Center, U.C. Santa Cruz

the top of the meadow introduces the main part of the campus. That a modest, low-profile building embedded in the landscape should become the hearth of this collegiate university is fitting. The five colleges hidden in the woods make five different architectural statements, each expressive of its time. In the design of the student center, the latent images of the ranchland have finally reappeared.

The site called for a residentially scaled building with a public presence that would command the meadow without dominating it. From the beginning, the architects envisioned a building entered from the forest side through an open passageway that would frame the sweeping view out to the Monterey Bay. The surviving ranch buildings provided prototypes.

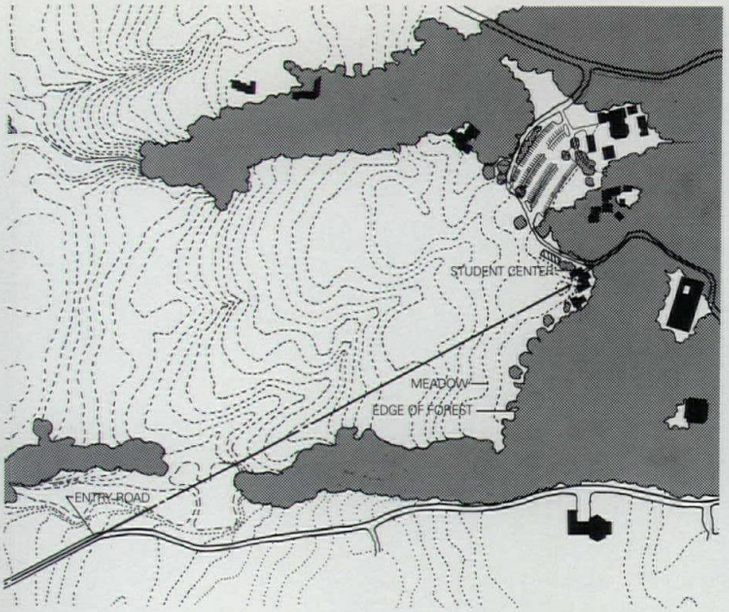
Two buildings, one with offices, conference rooms, and a café, and the other a multipurpose room, compose the student center. They are linked by a pergola, and they enclose a court that is the prime social space. The students, who paid for the building, wanted it to be well built, even to the point of voting funds for a slate roof and copper gutters. Still, the architects had to cope with a very tight budget. Through subtle variations in color and materials, they have given the building a richness appropriate to its use.

The shingled entryside of the complex at the edge of the woods is sober and solid; the south-facing court is playful and broken up. Greatly to their credit, the architects did not simply set up an order for the court side and compose its elements accordingly. They attempted, as Fernau said, "to put a spin" on the elements, to tinker with the dynamics of the order by creating asymmetries and varying the composition of windows, doors, bays, and piers in response to the topography of the site. Yet the success of this effort is a bit marred by an effect of capriciousness in the composition of elements such as the central bay which, though small, has two different kinds of supports. These idiosyncratic pieces pop out at the viewer and disrupt the rhythmic flow of the rest.

On the interior, the varying forms, materials, and orientations of the conference rooms and social spaces add spice without sacrificing legibility in the plan. As a whole, the complex has that quintessential element of delight that lifts it from the memorable to the immemorial. **Sally Woodbridge** ■

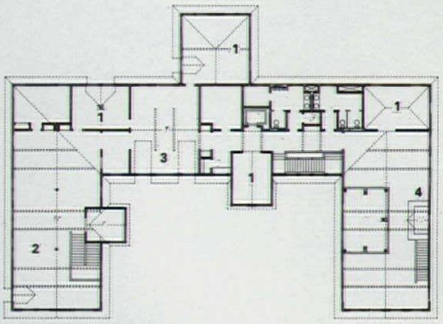
The south face of the student center (above) reveals the play of order and disorder, symmetry and asymmetry, set up by Fernau & Hartman. Within the overall symmetry of the form, with its two wings embracing a courtyard, there is an asymmetrical placement of the entrance under the projecting yellow bay and a local symmetry of shed-roof wall dormers over the penetration through the building to the campus beyond. Even within elements of the façade, such as the wings' end walls or the gabled projection over the entrance, there are asymmetrical window and column placements.

© Mark Darley/Esto



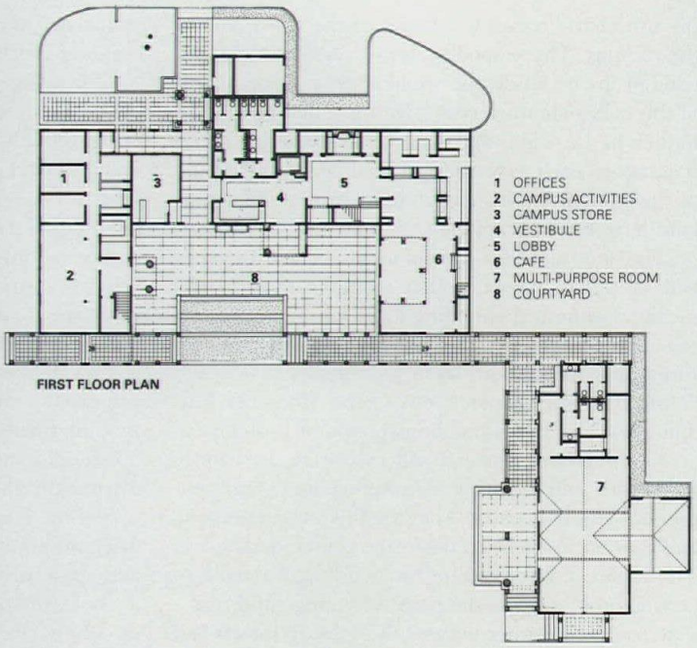
SITE PLAN

N → 400'/120m



1 CONFERENCE
2 STUDENT OFFICES
3 LOUNGE
4 BAR

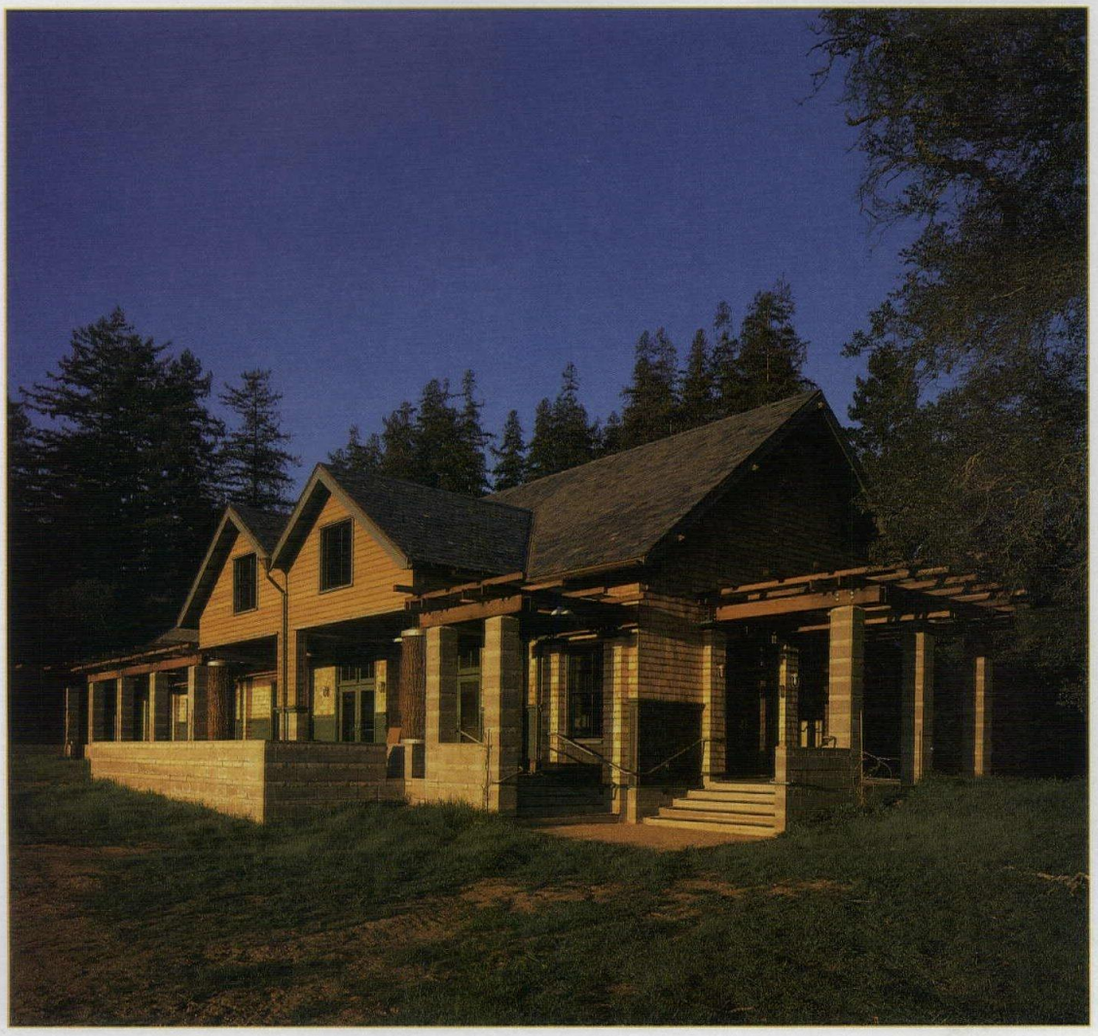
SECOND FLOOR PLAN



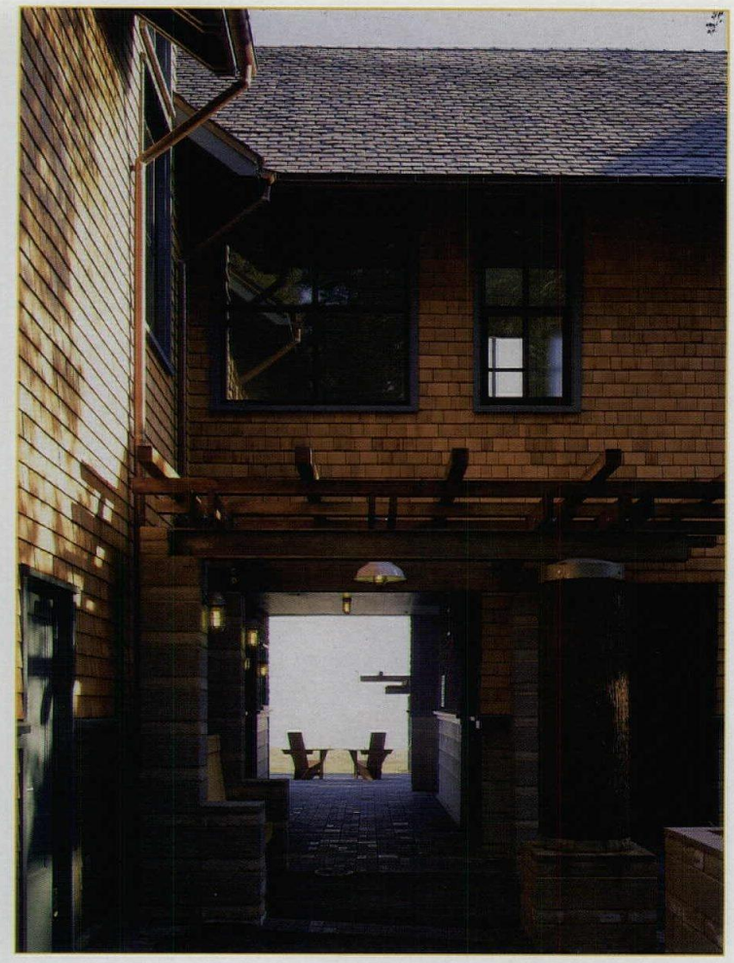
1 OFFICES
2 CAMPUS ACTIVITIES
3 CAMPUS STORE
4 VESTIBULE
5 LOBBY
6 CAFE
7 MULTI-PURPOSE ROOM
8 COURTYARD

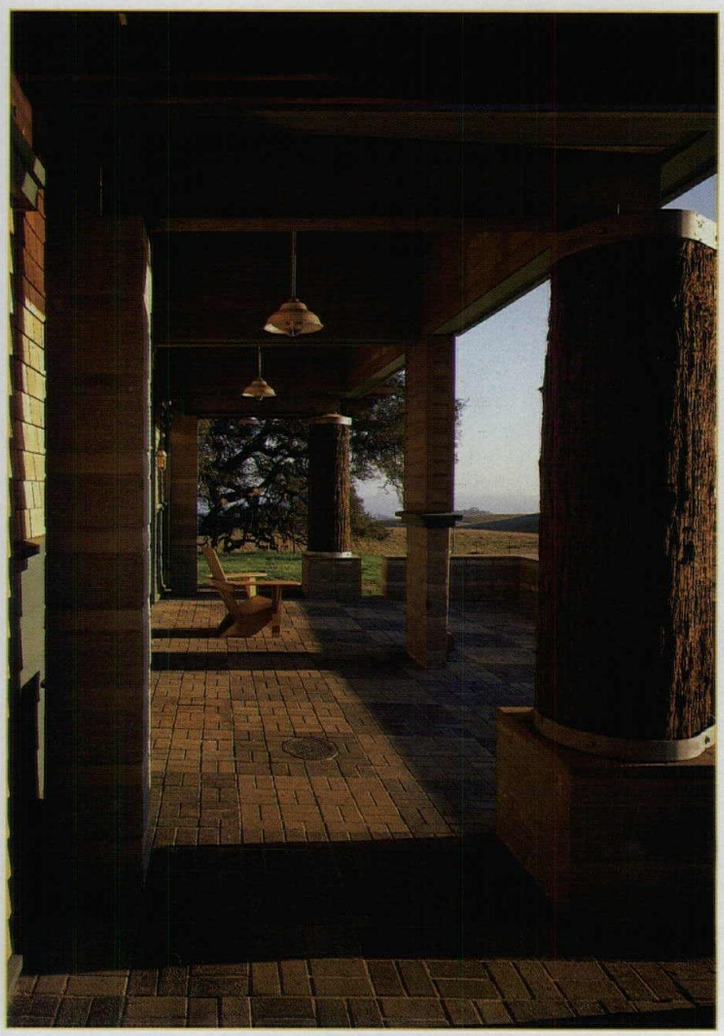
FIRST FLOOR PLAN

N → 40'/12m



Riding like a ship between the meadow's undulating sea of grass and the campus's cliff of trees (facing page, far left), the student center greets the visitor to the campus on axis with the entry road (site plan, facing page, top). To spare the meadow, the U-shaped building hugs the trees and the road (above) and seems to gesture out to the open space with the extension of its multipurpose room (plan, facing page, bottom). That side building (left) shows how the student center extends into the landscape with its trellised porches and becomes a part of nature with its unstained wood shingles and tree-trunk columns.





While the outside walls of the building have a natural quality, the inner walls of the courtyard are more vibrant and more varied (left and above). The shingles are darkly stained; the aluminum windows are a bright red; the projecting bays over the front and side entrances are a shocking yellow; the paving blocks form a bold checkerboard pattern. All of this provides a reference to the activity of students embraced within the courtyard's arms. The building also serves as a framing device. It frames the view out to Monterey Bay as students enter the courtyard from the rest of the campus (facing page, top) or as they move along the edge of the meadow into the multipurpose room (facing page, bottom). The building also frames itself (facing page, far left). In this case, the trellised walkway that runs along the south side of the student center frames the gabled entrance bay. Note that bay's idiosyncratic supports, with one corner held up by a piece of the wall and the other by a round concrete column.

Confessions of a Regionalist

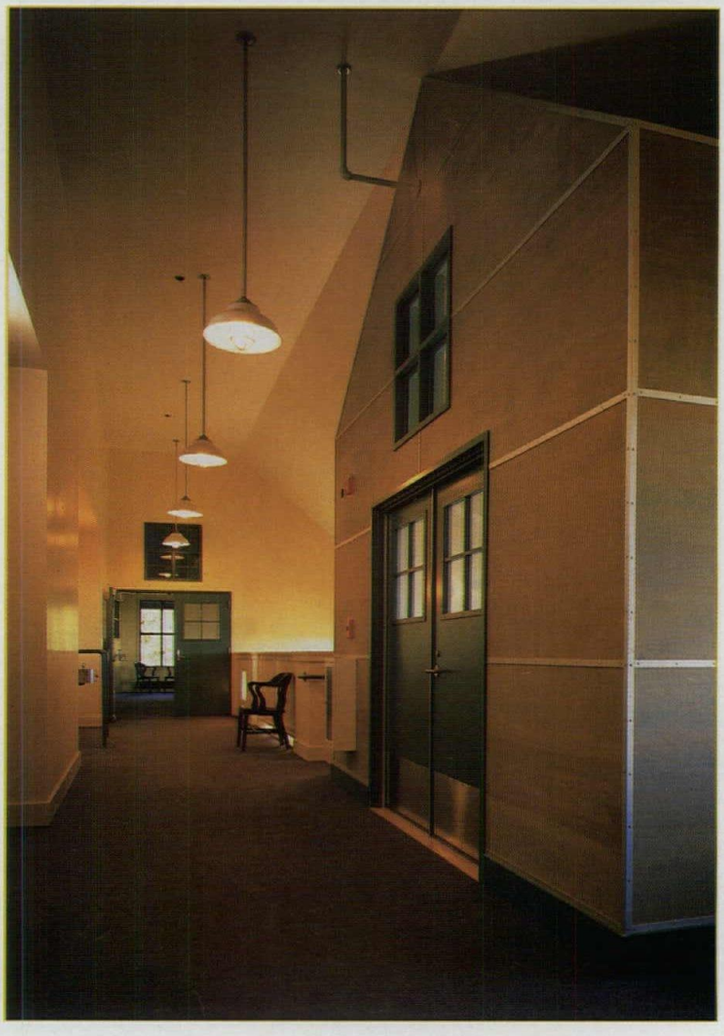
Richard Fernau calls himself a reluctant regionalist. "The Bay Region architecture of Maybeck and Wurster," says Fernau, "has been cannibalized for its imagery rather than its intellectual content." It is this conceptual side of regionalism, which Fernau defines as "a certain sensibility toward materials, toward the land, toward climate," that he hopes to revive in his work.

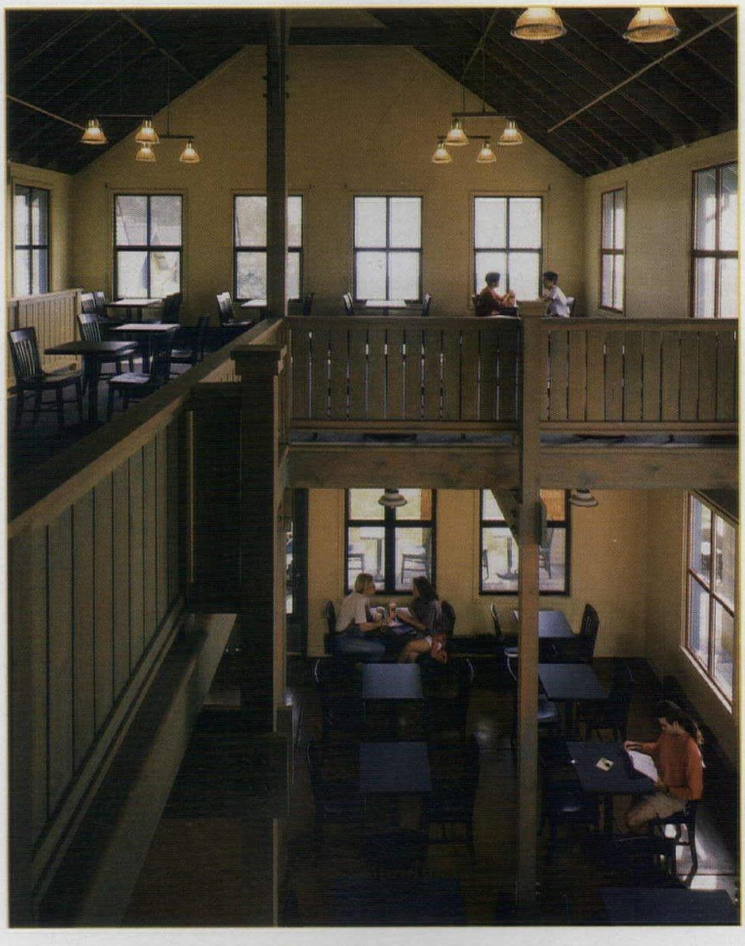
Fernau has ready answers for the two most common questions regionalists face. Can a regionalist work effectively in other parts of the country? Yes, says Fernau. "Regionalism can travel. Specific materials might change but not the sensibility or the attitude about place." How about skyscrapers and other structures less tied to the land? Is a regionalist tower a contradiction? No, says Fernau. "There have been regionalist skyscrapers such as Schweinfurth's San Francisco Examiner tower, with its loggias and outdoor room at the top. Regionalism is not infinitely adaptable," adds Fernau, "but it is more than we usually give it credit for."

When the conversation turns to questions of the mass media and mass culture, both of which corrode regional identity, the answers come more slowly. Should regionalists resist the national media lest their work be appropriated or turned into a style? Fernau admits to a dilemma. "A firm often has to get published nationally to get jobs locally," he says, so regionalists, "to survive, may have to compromise some of the reasons for their survival." Fernau suggests a "Trojan Horse" approach to the problem, where some aspects of a building are obvious to the national media and that other, more regional or circumstantial aspects are not.

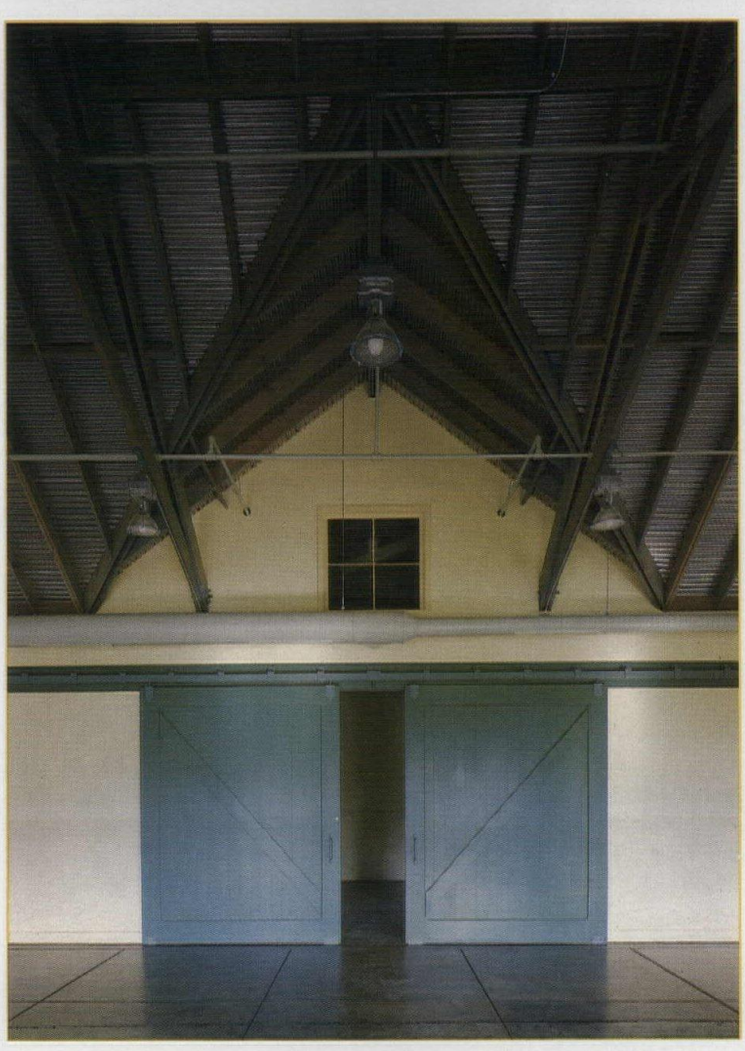
Also, should a regionalist use only local materials, avoiding mass-produced products shipped from one part of the world to another? Here, Fernau is more certain. "Regionalism is an attitude toward materials," he says, "not a concern with what kind of materials or where they come from." Still, "it's a difficult question," he admits. "If we have a world culture, why try to resist it?" The answer to that may be the most paradoxical of all. It is because we have a world culture that we need regionalism as a place of resistance, a refuge for what Fernau calls "outsiders." Which is why regionalism, properly understood, is far more than a style. It defines, at least in part, that which is "marginal," says Fernau, that which "has not yet been co-opted," by the many forces in our culture working against it. **Thomas Fisher** ■

"Regionalism is an attitude toward materials, not a concern with what kind of materials or where they come from."





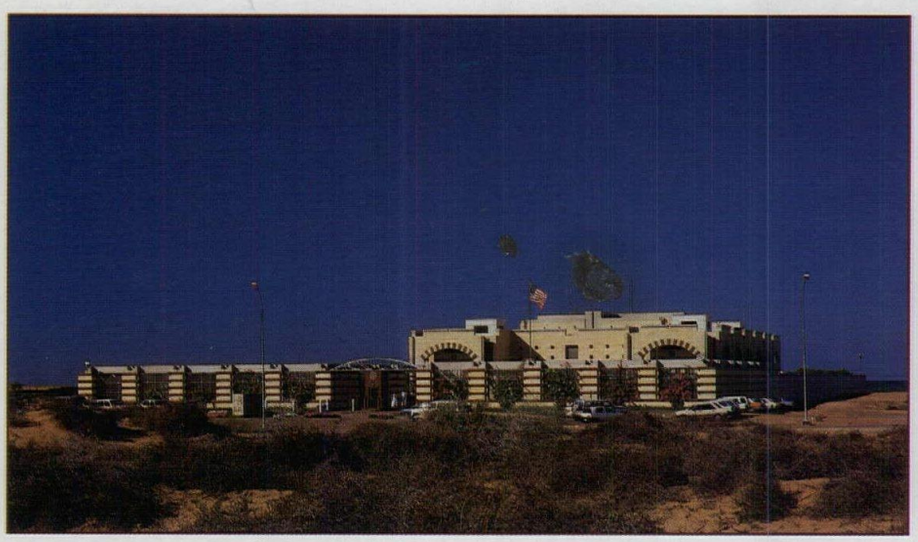
The interiors have a cooler, almost barnlike feel. The most dramatic space is the two-story volume of the café (left) with its timber-framed mezzanine and its gabled ceiling featuring exposed rafters and perforated aluminum cladding. In the opposite arm of the student center, where the student offices are located, the airy gabled ceiling is repeated in the wood-framed gabled form of a student lounge (facing page, top). This unclad "house" continues the gabled form of the projecting bay over the side entrance. The other projecting bay over the main entrance encloses a meeting room, which also is treated as a small building inserted into the mass of the student center (facing page, bottom). The sparest and most powerful part of the building is the multipurpose room, with its rolling doors and lofty gabled interior space, which, as in so much of Fernau & Hartman's work, manages to be both welcoming and tough (below left).

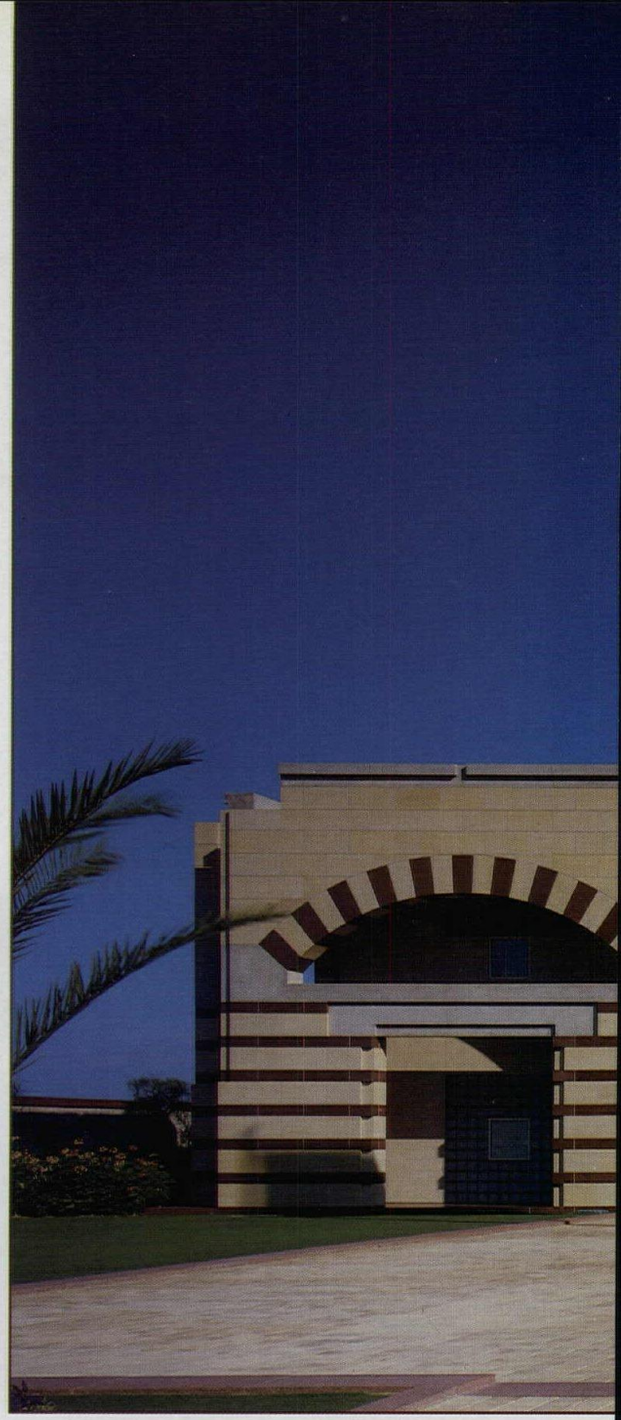


Project: *Student Center, University of California at Santa Cruz, Santa Cruz, California.*
Architects: *Fernau & Hartman Architects, Berkeley, California (Richard Fernau, Laura Hartman, partners in charge; Mark Macy, Beth Piatnitza, Jim Goring, Lisa Harris, Gary Parsons, Maria McVarish, project team; Alan Mountjoy, Heather Schatz, William Rose, modelmakers; Chris Macy, Mark Macy, presentation drawings).*
Client: *University of California, Santa Cruz. Frank Zwart, Vice Chancellor, Office of Campus Facilities.*
Site: *on the university campus, at the edge of a redwood forest, facing an undulating meadow and the Pacific Ocean.*
Program: *a student center containing student offices, conference rooms, campus activity offices, student lounge and café, convenience store, and multipurpose room.*
Structural system: *concrete slab foundation, concrete block retaining walls, wood frame walls and ceilings, with some steel beams and glu-lams.*
Major materials: *redwood siding, cedar and redwood shingles, concrete block, slate roof, copper gutters and leaders (see Building Materials, p. 203).*
Mechanical system: *hydronic baseboard heaters and forced-air gas-fired furnace.*
Consultants: *MPA Design, landscape; Steven Tipping & Associates, structural; Ted Jacob Engineering Group, mechanical and electrical; Joseph Yarnell, civil; Charles Salter Associates, acoustical; MacCullough-Brown Associates, food service; Gary Beach, cost estimating; Richard Peters, lighting.*
General Contractor: *Shaw Construction.*
Cost: *$2,400,000.*
Photos: *Richard Barnes except as noted.*

P/A Awards Update: A Two-fold Solution

A layered façade exemplifies Polshek & Partners' search for a literate Modernism, enriched by both history and technology.





When poets write about a part that represents a whole, they use a specific literary device – the synecdoche. The bays that enclose the U.S. Embassy in Oman work the same way; they reveal the logic of the entire building. Their function is both associative and architectonic, with arches that evoke Islamic precedent, and columns and beams that are part of the building's reinforced concrete structure.

Here, as in all their commissions, James Stewart Polshek & Partners began the design, a P/A award winner (Jan. 1986, pp. 92–95), with few preconceptions about the ultimate form of the building; instead, they focused on its constituent parts. The embassy's bureaucratic program led to a straightforward plan: Rooms around the entry hall accommodate visitors, and foreign service staff members occupy two floors of modular office bays that surround an atrium. The façade proved to be a more complex issue: The architects wanted a wall that seemed massive, while allowing the independent structural frame to remain legible.

Polshek & Partners' initial scheme for the embassy, drawn in 1980, featured a screen wall with fiberglass-reinforced concrete screens and terra-cotta tile infill. Both a sunscreen and a security buffer, this outer wall was inscribed with grids whose intricate geometry evoked the abstract ornament of Islamic elevations. Essentially a detached façade, it provided an institutional stature and a scale strong enough for the desert site, a nascent diplomatic compound just outside the city of Muscat.

In 1985, the State Department asked Polshek & Partners for a revised design that would meet new security guidelines for blast-resistant walls. (A commentary on federal security standards appears on pages 118–119.) In response, the architects converted the outer façade into stone-clad, reinforced concrete walls. A request from the Sultan of Oman also influenced the redesign. Hoping to sustain Islamic architectural traditions, he issued guidelines for specific historical forms on new buildings. Polshek & Partners, unwilling to embellish the embassy with replicated motifs, instead abstracted the concepts behind Islamic architecture. In this way, they sustained the region's indigenous spirit, without trivializing its built legacy. Segmental arches and square apertures seemed ap-

The embassy site, outside the city of Muscat, resembles the southern California desert: It is a sparse, dry plain, where a curious mix of modern embassies and consulates are being built. A secure parking pavilion, integral to the U.S. Embassy compound (facing page), provides an initial screening station and modulates the spatial sequence of the central axis. An automobile court, square in plan, separates the parking pavilion from the embassy building. On the front (above), bands of granite and dolomite integrate the flanking bays with the entry, where cantilivered roofs lead to a recessed vestibule.

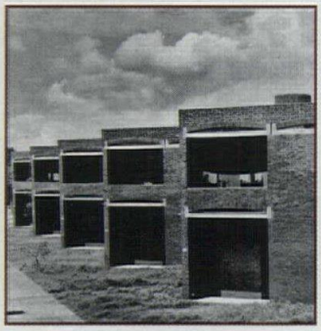
propriate for the new bays; they are Islamic in character, and their deep jambs accentuate the thickness of the wall. James G. Garrison, the design principal for the embassy, observed that the arches also cast broad shadows, themselves a fundamental part of the composition; they take advantage of the white sunlight of Oman, which sharpens the edges and color contrasts.

Freestanding corners and an interstitial arcade reveal columns on the inner façade that mark the structural grid. Garrison found a precedent for this in Kahn's library at Phillips Exeter Academy (1973), where the building's corners are set behind freestanding edges of the façades. The building sections at Oman and Exeter merit comparison; both have a two-layered pier and wall structure on the periphery, set around an internal grid that surrounds an atrium.

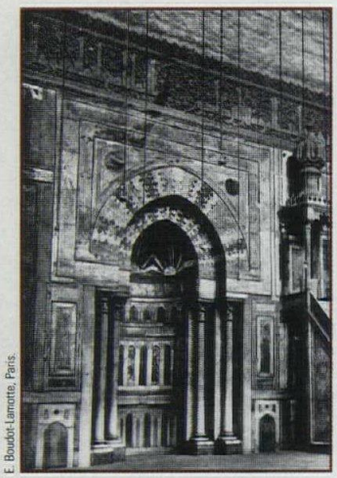
Garrison explained that conventionally supported segmental arches, while historically correct, would have been out of place on the reinforced concrete bays. The arch's structural integrity is predicated on a load-bearing wall, and it exerts a lateral load that must be buttressed on the sides. To maintain the embassy's open corners and reveals, while resolving the load transferred by the arch, Polshek & Partners nested each one in a reinforced tie beam, whose tensile strength resists the lateral thrust of the arch.

Kahn employed arches and tie beams at the Indian Institute of Management in Ahmedabad, in façades that are governed by a strict vertical organization. There, adjacent bays remain distinct, both visually and structurally. At Oman, however, the façade affords a variety of readings. The bichromatic banding of the piers implies that the lower half of the wall is a continuous surface, interrupted by square voids. Likewise, the striped voussoirs lead one's line of sight horizontally from one bay to the next. In effect, the façade looks like a tautly stretched screen. The receding planes on the face of the tie beams and the incised corners of the piers imply another reading; they suggest that the wall is a series of overlaid planes, an abstraction of the chiseled niches common to Islamic buildings. In the embassy, these planar references complement the elevations' structural references and give the surface its own integrity.

As in Kahn's buildings, the wall bays of the embassy were designed before the entrance, which is marked

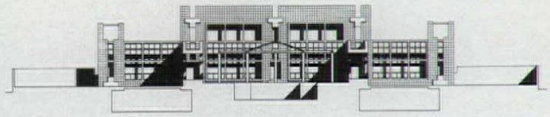


Louis Kahn, Residential Quarters, Indian Institute of Management, Ahmedabad. Photograph copyright 1977 Louis I. Kahn Collection, University of Pennsylvania and Pennsylvania Historical and Museum Commission.

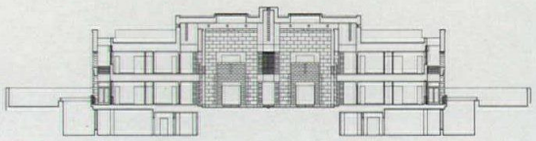


E. Boudot-Lamotte, Paris.

Interior of the Mosque and Madrassa of Sultan Hassan, Cairo, 1356–1363.

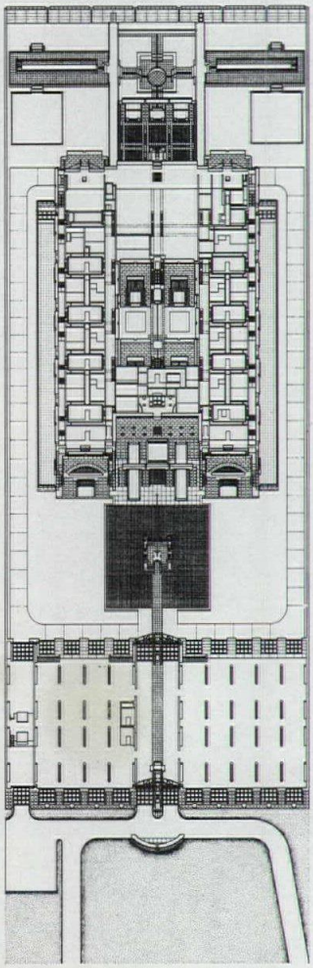


ELEVATION OF AMBASSADOR'S RESIDENCE, FIRST DESIGN SCHEME

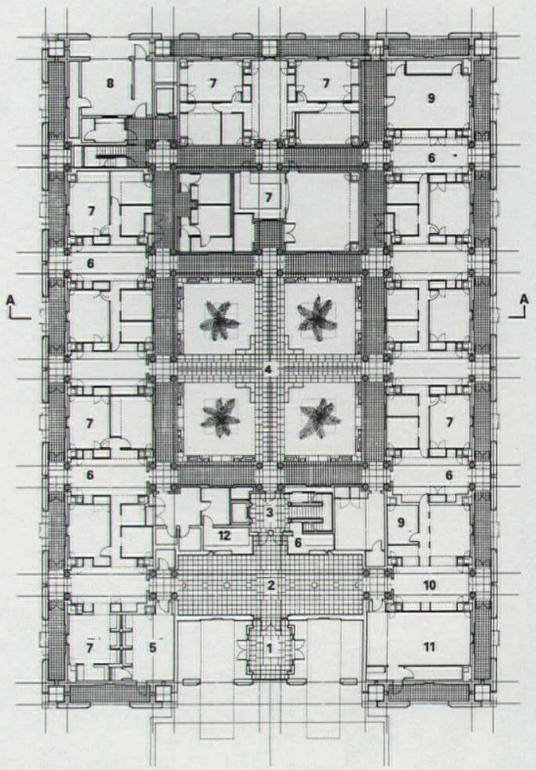


SECTION A-A

40'/12m



AXONOMETRIC, FINAL SCHEME



PLAN, FINAL SCHEME

N

40'/12m

1 VESTIBULE
2 ENTRY HALL
3 ELEVATOR LOBBY
4 ATRIUM
5 WAITING ROOM
6 SECRETARY/RECEPTION
7 OFFICES
8 LOADING AND RECEIVING
9 CONFERENCE
10 LIBRARY
11 MULTI-PURPOSE ROOM
12 SECURITY

Design Precedents

Louis Kahn and Islamic architecture were complementary inspirations for Polshek & Partners. Kahn showed how to evoke the massive, deep façades of the past without obscuring today's concrete structural technology. He set relieving arches (first used in Ancient Rome) in reinforced tie beams and used shadows to distinguish load-bearing piers from infill brick panels.

The Islamic architectural tradition, on the other hand, emphasizes the planarity of the wall. The niche shown here is lined with patterns of visual rather than structural interest.

Observations on the way Polshek & Partners interpreted these sources can be found in the main text of this article.

by a recess in the middle of the front elevation; consequently the flanking bays seem more important than the central axis. Polshek & Partners, like most Modernists, produced a front façade that lacks a figural centerpiece.

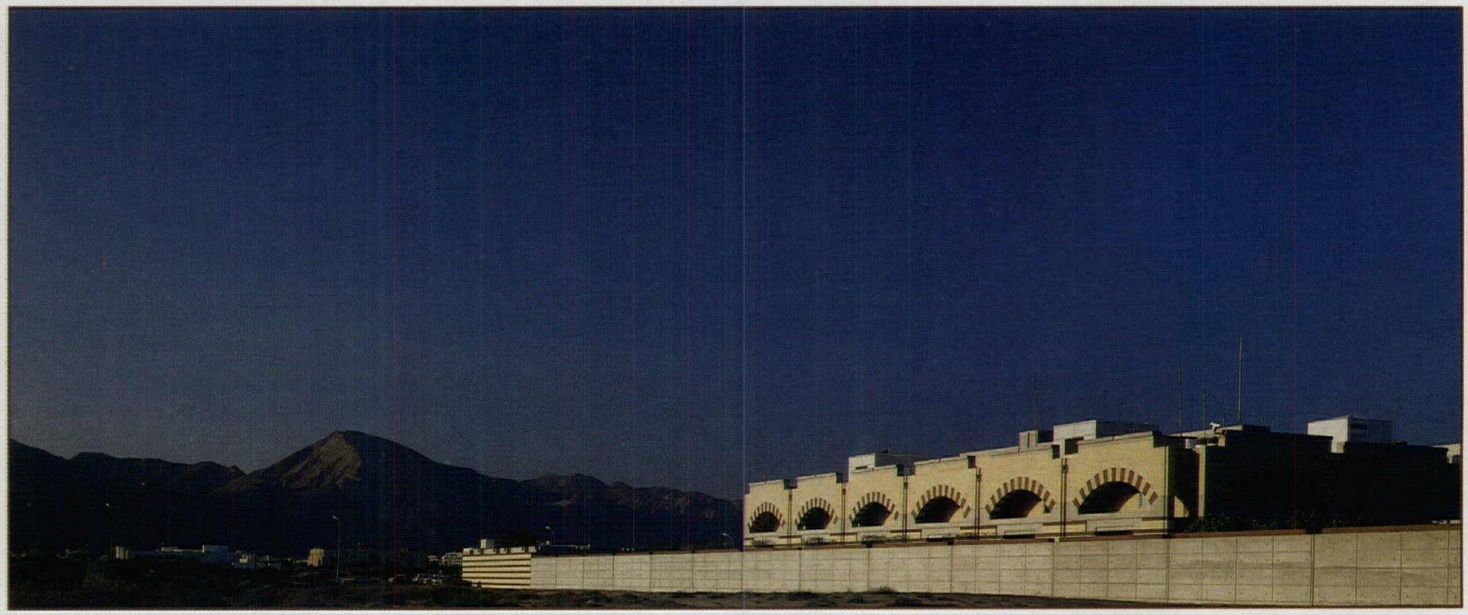
Nevertheless, the prominence of the corner bays in elevation corresponds with the embassy's plan: The offices form a C-shaped band around an atrium. The axis does not terminate in a ceremonial focal point but instead leads through the atrium to offices similar to those on the perimeter. Rather than giving priority to any of the offices in the 11 x 11 meter bays, the architects set them within a neutral grid of hallways, with intersections marked by quadrangular groups of columns. Garrison observed that mosques are likewise modulated by clusters of four columns; they seldom delineate a processional axis and contrast with our Western architectural tradition, where axial plans imply a spatial and programmatic structure. Paradoxically, the neutral grid of the mosque turned out to be appropriate for the serial plan of the offices.

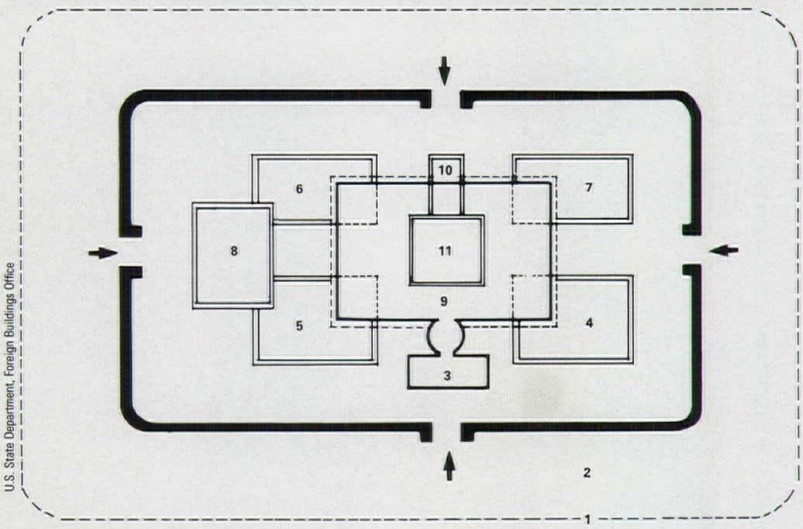
The atrium, with its austere cubic forms, evokes the pylon temples of ancient Egypt's Middle Kingdom. The detailing here is understated, and thus the seams that cross the floor, walls, and ceiling become exceptionally prominent. They sustain an Islamic sensibility for gridded surfaces, while revealing the architects' adroit layering of space and structure. Here, and throughout the entire embassy, we find a mature balance of restraint and rigor.

Stylistically, this building seems an anomaly in the work of Polshek & Partners, but therein lies its strength. It does not follow any trademark formula and broadens the scope of Modernism. Here we can discern an agenda for our generation: to approach the past with humility, while continuing to explore the options offered by today's building techniques.

Philip Arcidi ■

On the side façade (facing page), modulated shadows accentuate the 1½-meter (nearly 5 feet) separation between the outer and inner walls. Bichromatic patterns and incised corners emphasize the wall's surface texture.

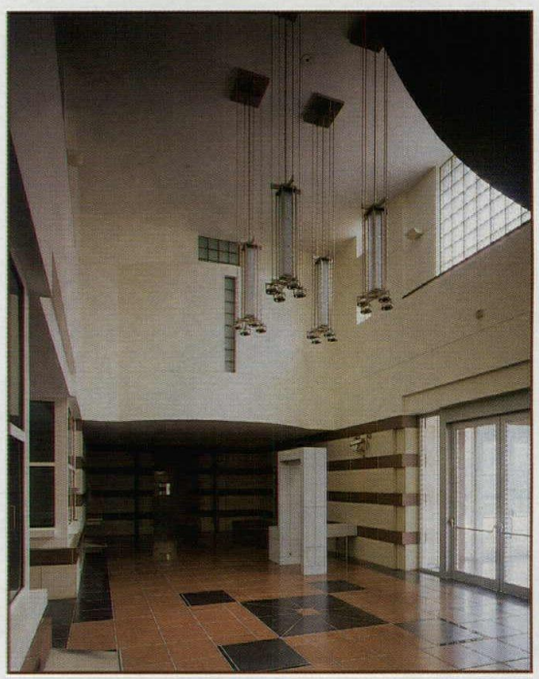




U.S. State Department, Foreign Buildings Office

PLAN DIAGRAM OF EMBASSY PROGRAM

1 SITE BOUNDARY
2 PARKING
3 LOBBY
4 LIBRARY
5 ADMINISTRATION
6 INFORMATION SERVICES
7 CAFETERIA & RECREATION
8 MILITARY LIAISON
9 OFFICES
10 UTILITIES
11 SECURE AREA



Defensive Designs: Building a Secure Embassy

The State Department takes the design of its embassies seriously – and not solely for their aesthetic value. The threat of violence has made security their chief concern: Embassies are frequently the targets of terrorists and angry mobs. Muscat, Oman, the location of Polshek & Partners' embassy, is not an especially dangerous place, but, given terrorism's inherent unpredictability, the State Department's Office of Foreign Buildings Operations (FBO) asked the architects to comply with security guidelines for the design of embassies. They inexorably lead to opaque buildings that are densely layered and pose a challenge to architects who value design integrity as much as safety.

The Oman Embassy addressed many of the FBO requirements with remarkable ingenuity; Polshek & Partners turned the restrictions on perimeter windows and the need for concentrically layered walls to advantage: The outer walls define the embassy's architectural character (and moderate the relentless sun, too) and the atrium (whose roof has tempered glass panels) provides daylight and an oasis for the staff.

This embassy approximates the plan diagram for a secure embassy. Illustrated above, it subdivides an embassy by degrees of permeability. Following are five of the FBO's requirements for security design:

- A continuous buffer zone is enclosed by a perimeter wall, designed to resist breach by vehicles, as well as defeat by climbing, prying, hammering, and sawing.
- Visitors and staff park their cars outside of the walled perimeter, and access to the building is channeled through a minimum number of controlled entrances. Upon entry to the compound, people and vehicles may be searched while detained in sallyports and "mantraps," which can be insulated by massive barriers.
- Functions of a public nature (such as libraries, trade offices, and postal services that serve the American expatriate community, among others) are placed toward the outer edge of the embassy. Inside, Marine security guards control access to the most secure sections of the building.

- A "hardline," intended to protect against ballistic weapons and forced entry, separates public areas of the building from sections where employee safety could be compromised. Visa officials, for example, who may become objects of a rejected applicant's wrath, are frequently positioned at teller-style stations behind a hardline.
- Building service systems are often divided into parallel networks, and utilities that serve secure areas are made accessible only to U.S. personnel with security clearances.

Stringent standards for construction and security apply to virtually every building element, and the required number of working drawings can be staggering. Few guidelines are more challenging to architects than safeguards against bombings; they apply to all embassies, as insurance against potential problems. To mitigate damage from car bomb attacks (like those that struck Beirut and Kuwait), there are new requirements for structural design.

As one countermeasure, each FBO building façade must be built of concrete. Bay spacing is limited and ductile structural connections are required to help prevent a progressive structural collapse should a terrorist bomb attack occur.

The FBO's blast protection criteria permits a glazed area that is no greater than 15 percent of otherwise solid exterior walls, which are to be thick in section and heavily reinforced. The glazing allowance is calculated within each structural bay (that is, within an area defined from floor to floor and from column to column); introverted embassies become an inevitable result.

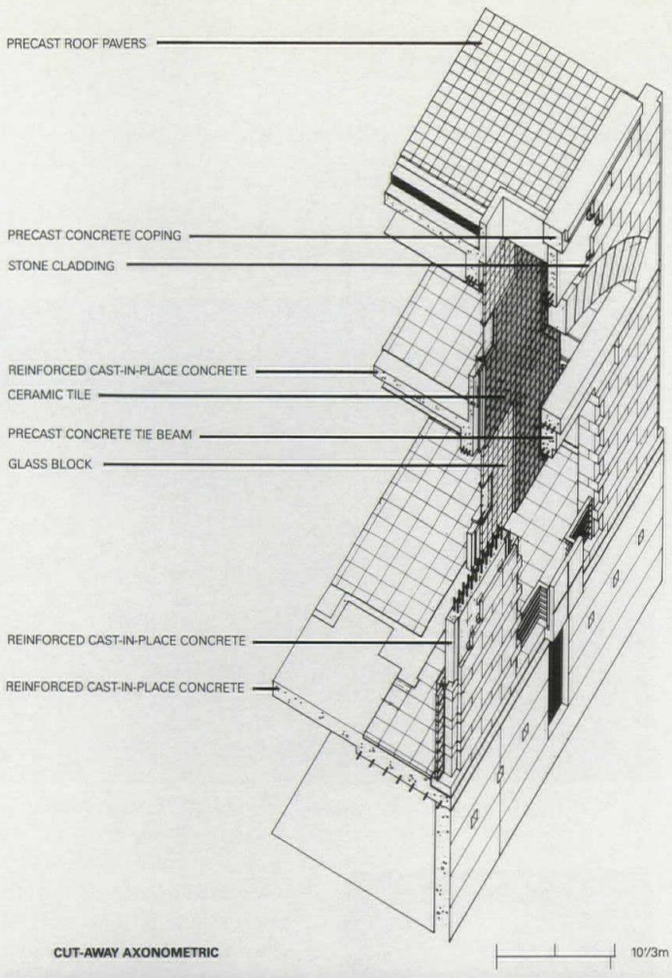
But, as Polshek & Partners' work indicates, talented designers can turn these impositions to advantage. In Oman, an open desert site, quality detailing, and a mature design sensibility have yielded an impressive (not to say secure) building. It transforms severity into elegance. **Thomas Vonier** ■

The author, Washington correspondent for P/A, is an architect and consultant to the State Department on security precautions for embassy design.

A 2½-meter-high (about 8 feet) security wall encloses the embassy compound (facing page, top), where sharp color contrasts in the architecture balance those of the rugged terrain. The penthouses on top of the embassy were added after construction began, as a mandatory security requirement. The entry hall (facing page, bottom) is surrounded by a library and conference rooms; a reception area, to the left, leads to the offices and atrium (above). Here, pylon-like wall bays complement those of the façade, and banded columns mark the channels of space that alternate with the office bays.

Project: *The United States Embassy, Sultanate of Oman.*
Architects: *James Stewart Polshek & Partners, New York (James S. Polshek and James G. Garrison, design principals; Joseph L. Fleischer, managing principal; James R. Gainfort, Damu Radheshwar, and Sara Elizabeth Caples, project managers; Young Lee and James Sinks, project architects; Charmian Place, director of interiors; Mark Lowe Fisher, interiors; Glen DaCosta, F. Greg Doench, Jane Duff, Michael Harrington, Arthur Jay Hibbs, Michael Kelso, Adrian Panaitescu, Elizabeth Post, Lori Sacco, Simona Scarlat, Carolyn Senft, Marianne Shin, Dale Turner, design team).*
Client: *U.S. Department of State, Office of Foreign Buildings.*
Site: *a 76 x 197-yard plot in the diplomatic compound near the city of Muscat; the building is enclosed by security walls required by the State Department.*
Program: *a 27,000-sq-ft pavilion provides secure parking, and an 81,000-sq-ft building houses a public admission area, medium-security administration areas, high-security communication and administration areas.*
Structural system: *cast-in-place concrete, with four-column clusters on an 11-meter matrix supporting flat band beams; walls clad in stone or ceramic tile.*
Mechanical system: *a central refrigeration unit pipes chilled water to remote fan coil units.*
Consultants: *Quennel Rothschild, landscape; Tor and Partners, structural; Thomas A. Polise, consulting engineer, structural; Howard Brandston, lighting.*
General contractor: *Brown & Root, with Taylor Woodrow Torell.*
Costs: *bid at $21.5 million in 1984; completed in 1989; actual costs not available.*
Photos: © *Jeff Goldberg/Esto, except as noted.*

Offices on both floors are lined with arcades on the east and west sides, which offer views of the Bay of Oman (top). The gridded garden terrace (bottom), a counterpart to the atrium, is covered by fabric canopies. Here the piers and columns that organize the embassy appear in a more compact setting, without walls.



CUT-AWAY AXONOMETRIC

Outer and Inner Walls, U.S. Embassy, Muscat, Oman

The two-layered façade of the U.S. Embassy in Oman looks both archaic and modern: The thick, stone-clad walls, incised by segmental arches, have the ashlar bond of masonry construction. At the same time, the open corners and the tie beams that hold the arches in tension manifest a structure of reinforced cast-in-place concrete. In the photograph to the left, one can see the beams that link the façade to the building itself, whose frame, walls, floors, and roof are likewise built of reinforced concrete.

The outer wall is blast resistant: It is exceptionally thick (.6m – almost 2 ft) and reinforced by granite and dolomite cladding. Polshek & Partners intended to make the stone on the top half truly load bearing, so that the segmental arches would be structurally integral with the wall. However, the State Department mandated that all masonry be stabilized by a concrete core; blocks of dolomite, then, would have been infeasible (and prohibitively expensive). Instead, the architects hung stone panels from the core. The concrete tie beams could be engineered to withstand much more lateral stress than is actually present in the arches.

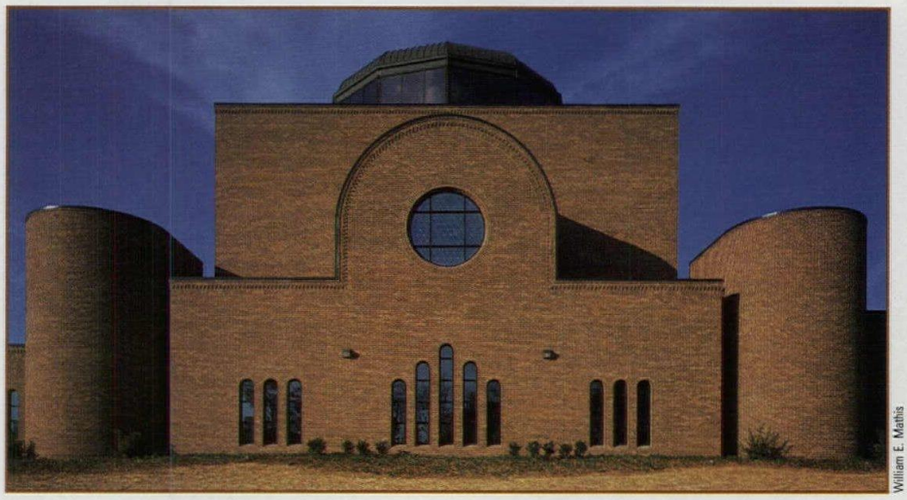
The corners were resolved with noteworthy elegance. The beams that brace the outer façades rest on a banded column set within a notched recess. The column's isolation gives it iconic stature, but its position was not premeditated; it conforms to the 11 x 11 meter bays that organize the entire building. The design has the discipline of Miesian architecture, where façade solutions are inherent in the structural system. Islamic references and all, these walls were designed as rigorously as those on any modern building. ■

Perspectives

Pietro Belluschi shares some personal thoughts about the profession and his career.

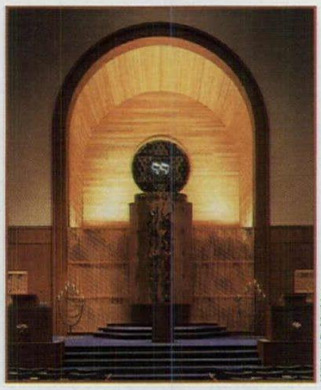
Interview: Pietro Belluschi

Born in 1899 in Ancona, Italy, Pietro Belluschi served in World War I, after which he earned a degree in engineering from the University of Rome. In 1923 he came to Cornell for his second degree. He joined the A.E. Doyle architectural firm in Portland, Oregon after a brief time as a mining engineer in Idaho. After Doyle's death, he became head of the firm, which went on to do numerous widely known buildings. From 1951 (when he sold the firm to SOM) to 1965, he served as Dean of Architecture at MIT and as consultant on major architectural commissions. He was awarded the AIA Gold Medal in 1972. At age 90, Belluschi is working on several religious and residential commissions. Jim Murphy spoke with him at his home overlooking Portland.



William E. Mathis

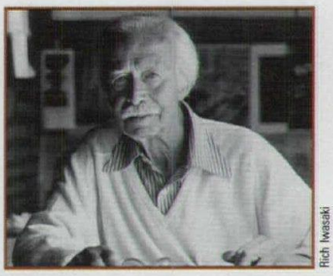
United Hebrew Congregation Synagogue, St. Louis (1989); Stone, Marraccini & Patterson with Pietro Belluschi, above and below.



William E. Mathis

P/A: You were trained as an engineer, were you not?
Belluschi: That's right, very poorly. I was in the First World War, and I came back and they felt sorry for the poor lieutenant, and I passed courses that I knew nothing about, including calculus and all the technical stuff. So I was a very poor engineer, but when I was given [an] opportunity, I fiercely took it and took chances . . . [For example,] many people were wondering what was to happen to [aluminum] after the war; so I said it was good for a lot of things, including structural members in an office building [the Equitable, P/A, April 1989, p. 90], and windows. We also used the double glass, which had a greenish cast that Corbusier said produced "cadaverous light," but I liked it; this assembly was very experimental. But all of these elements of innovation, the desire of the client to have the most innovative building, and the availability of the materials, all came from the same engineering thinking and source that produced the other work. If I were a Philip Johnson or a Michael Graves, I would start with the aesthetic side and make decisions from that, and therefore I would be much freer. But I never did that, and I still don't do it now . . . I had an argument with Philip Johnson some 45 or 50 years ago, when I said that an airplane flies, and it's very beautiful; it's beautiful also because it's so designed that it will fly. If you start putting extra things on it, and you make the tail different, and make the wing different because it looks "better" aesthetically, it won't fly. Then I think that's false beauty.
P/A: How did you develop the facility for design? That isn't normally associated with engineering training.
Belluschi: I'd say that it was the fact that I lived my first quarter century in Rome. There has always been this difficulty for me in accepting something that had no obvious truth in it. St. Thomas Aquinas said that the mind must rejoice, as well as the senses.
P/A: How did you get into the consulting role, which is such a large part of your professional life?
Belluschi: Let me go back to when Mr. Doyle died, and the office lost people, and we were surviving by the skin of our teeth. I actually went back to live in Italy with my parents in Rome in 1933–34. When the first jobs started to come in, the office called me back, and we grew little by little until we were about 30 people, which for me was big. I had the strong desire to have an organized office, like an SOM in miniature. So I was doing everything, dealing with the client, designing, going over working drawings. [It] was more of a rat-race than I wanted, so when the offer came to go to MIT . . . [I decided] that I'd had enough of this "business" of architecture. So, when I retired 15 years later, I had no intention of starting over again. By that time I had already done several consulting commissions, so I made a profession of that, and I worked with 100 to 150 architects.

"I don't think that [architects] have as much impact on the environment, and on the real life of cities and urban areas as they should have or can have."

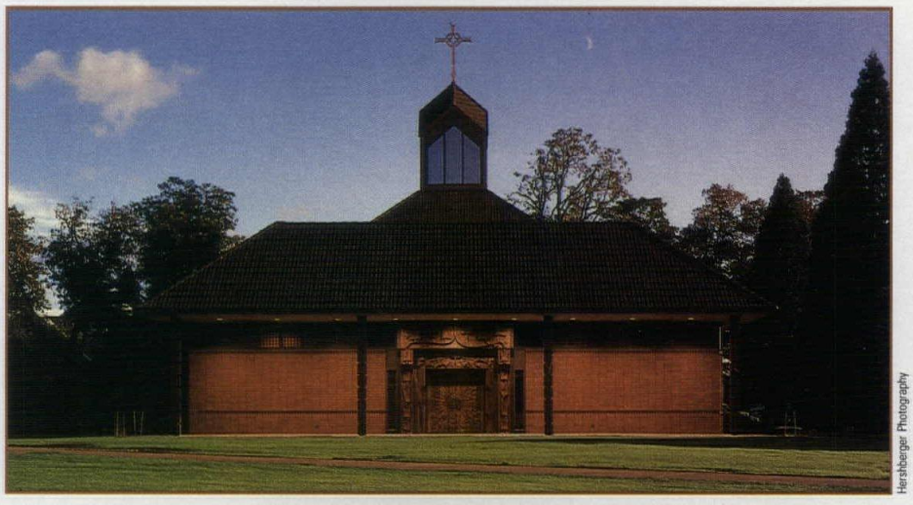


Rich Iwasaki

Pietro Belluschi

P/A: How did these architects feel about your role?
Belluschi: It's always tough, because we are very sensitive about these things, and you have to accept failures and triumphs in the proper spirit. But I am designing two churches with two different architects, and I always put their name first. After that, it is "PB, design architect or consultant."
P/A: Would you say that commissions like these churches are more successful consultation situations than one like the Pan Am Building?
Belluschi: Oh, yes, the Pan Am Building was a very difficult thing, because first of all you have such a visible project, and you have many objections. You have an owner who's going to invest hundreds of millions of dollars, and you have a tremendously technically difficult thing, so you have to make compromises which are not quite of the same kind. Of course, for the office building, even one involving Gropius, there will always be opposition to it, [on the grounds that] it is going to produce winds, or shadows, or whatever.
P/A: How did the Pan Am collaboration come about?
Belluschi: The developer was very much interested in having help to overcome problems with what he knew was a difficult project to defend; there were a whole lot of objections that weren't true, such as that the

"If I were a Philip Johnson or a Michael Graves, I would start with the aesthetic side and make decisions from that, and therefore I would be much freer."



Hershberger Photography

University of Portland Chapel (1986); Yost Grube Hall architects with Pietro Belluschi, above and middle.

building took the view away from Park Avenue – there was no view. And the Grand Central Building by Warren & Wetmore that was so lauded and praised, when I first came from Italy I thought it was terrible. And of course the building across the street, the Chrysler Building, was really quite imaginative, and both became quite terribly important landmarks . . . It was intrinsically an impossible job aesthetically. On the other hand, it was on the most valuable piece of land, and people don't realize how much it improved the circulation at ground level. It had to handle 500,000 people, and it had to go through three levels of railroad tunnels – it was a nightmare. It had to have 80 elevators, so it took the form that was most logical, it was fat in the center to handle the large elevator banks. I never was very proud to have worked on the project, but I look at it as something that you take and make the best of it.

P/A: What are your current feelings about the Beaux Arts architecture you first worked on, and the transition to what has happened since?

Belluschi: I took a course at Cornell when I was getting a degree in engineering, and I remember doing a library very much in a Beaux-Arts system, because it was the easiest – I could sketch it out in no time; I was familiar with what had been done in Italy. But that system is something you develop an aversion to very early. It is like having porridge every morning, you know all the answers, and the problem of doing an Orangerie, or whatever, is not dealing with the problems of real life. In a sense, you were aware that a new world was coming, and you could hardly wait to slice right into it.

P/A: And what of more recent developments, such as what has been called Post-Modernism?

Belluschi: I have commented on the example we have in Portland, what I call our "beribboned Christmas package." But I think the idea died a quick natural death, which was to be expected. You see, there is always this tendency, this eagerness, particularly with the bourgeoisie, to make a splash, to be known. Like trying to become President of the United States, you use all kinds of systems that have nothing to do with government, but they have to do with making a noise, with making people listen to you. I think that will always be part of the profession, always the search for notoriety. It's a danger; I don't like it. But I would be foolish to say that it should be eliminated or forbidden; let it take its course. What I dislike are bureaucrats, like in San Francisco, who impose on an architect what is to be done at the top of a building [that is] anything but flat. Sure, it might be boring to be flat, but it is not up to the bureaucrat to tell us that it should be a pyramid. Let it happen as a consequence of thinking, and evolution, and taste.

P/A: How about the Portland Building now?

Belluschi: I think it deserves all that I've said, and now I keep my mouth shut. But I don't blame Graves too much because he didn't have enough money. Erickson and Giurgola had much better schemes, particularly Erickson; but this one was selected because it was $800,000 cheaper – which is silly, because they spent more than that by putting tiles on it. But I must say that the Humana Building in Louisville, that is full of elegance, and you can't fault it. Of course, it cost twice as much per square foot. I think it is one of the best [Graves] has done.

P/A: Do you think that the architect is understood, is appreciated in America today?

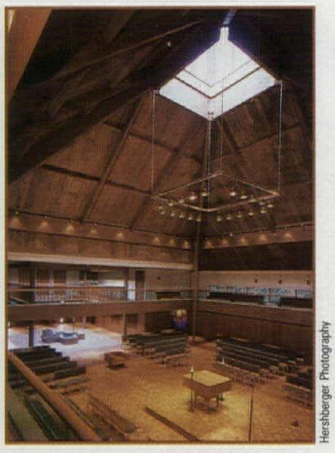
Belluschi: Yes, I think they are appreciated, but I think that they don't have as much impact on the environment, and on the real life of cities and urban areas as they should have or can have. They are still simply the tailor of fancy clothes for pretty ladies. I'm also concerned that there hasn't been much done on housing, and I think that that is terribly important.

P/A: Do you still approach the design process the same way you always have?

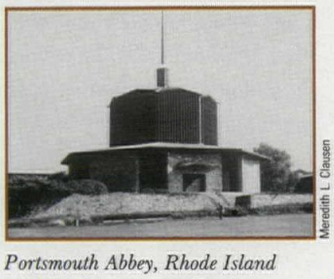
Belluschi: Yes. I've found one thing, though: when I'm satisfied that a design works to satisfy the program as well as it can, the spirit, the sense of adventure, the poetic thing has been sacrificed too much. It gets dull, and I grieve for the fact that it gets symmetrical, or has no power to move, no mistakes to be defended. I attribute that to the fact that, at 90, you don't fall in love with a beautiful woman; maybe that's a sign of maturity, that you find you're no longer up to those things that stir the spirit.

P/A: Do you have any thoughts you'd like to convey to a young person entering the profession today?

Belluschi: I think that you should rejoice in the combination of having all the flaws of being in love, with all of its shortcomings, and of finding the spirit that moves . . . Your feet have to be on the ground, always, but do not suppress the desire to be different, to explore, to test. ■



Hershberger Photography



Meredith L. Clausen

Portsmouth Abbey, Rhode Island (1958–61); Pietro Belluschi in association with Anderson, Beckwith & Haible.

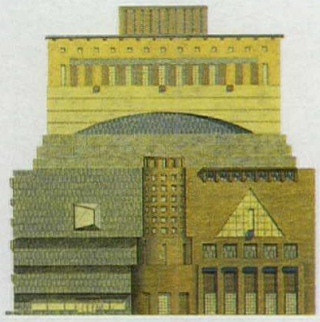
Valuable assistance was provided P/A by University of Washington Associate Professor Meredith L. Clausen, author of Pietro Belluschi: Architect of the Twentieth Century *(M.I.T. Press) and* Religious Architecture of Pietro Belluschi *(University of Washington Press), both to be published in 1991.*

Ross Miller examines the issue of authenticity as it relates to recent museum-expansion controversies.

Commentary: Adding to Icons

We haven't yet returned to the dark time before landmarks preservation when a building of the stature of New York's Pennsylvania Station was demolished, only to be replaced with a banal tower and an arena in the shape of a trash can, which now themselves are threatened with demolition. But that is no cause for celebration. The violence done to architecture that cannot be replaced continues to shadow current discussions about how to save or renew great buildings.

After a prolonged period of historical rummaging in the 1980s, it is ironic that the decade should end with impassioned debate about the sanctity of Modern



Rendering of the first scheme for the Whitney Museum expansion, top, by Michael Graves. Left, a model of Graves's third and latest revision of the design.

monuments threatened not with extinction, but with "architectural" improvement. Frank Lloyd Wright's Guggenheim (1959), Marcel Breuer's Whitney (1967), and Louis Kahn's Kimbell (1974) museums have all recently been the focus of attention because of their demonstrated need to expand. While the stylistic merits of each of these new projects have been debated and more often derided, what has been lost in the process is a thorough reexamination of the ways we regard the few great works of our own period and our particular hostility towards the highest examples of the Modern.

Unfortunately, because of strained resources and limited public attention, preservationist arguments have tended to center around the old, classic works that have managed to achieve a general consensus about their worth. As we have observed with these three museums, it is dramatically more difficult to establish the value of contemporary architecture, particularly when its existence is not actually threatened. All three of the current proposals for expansion are offered by serious architects with strong credentials as artists. Their position is basically that they are sensitively meeting the museums' proven need for more space.

Michael Graves, whose planned addition to the Whitney is currently on hold, told *Time* (January 15, 1990), "The idea that one can't add or subtract to any building, whether museum or any institution, is ridiculous." Romaldo Giurgola, a colleague of Kahn's at the University of Pennsylvania, was invited to New York's Architectural League last January. There he was vigorously criticized for his proposal to add more bays of cycloid vaults to Fort Worth's Kimbell Museum, which, opponents said, would bloat its width by 250 feet and crowd its pristine lawn. Giurgola, who genuinely admires Kahn, seemed perplexed by the attacks on his proposal. He argued that the Kimbell had achieved "a sense of the sublime" and that all he wished to do was extend what was already there.

Of the three firms, Gwathmey/Siegel, who have chosen not to enter the larger debate, have been the most successful in getting their work underway. At this time, only the Guggenheim is going ahead with a much revised multistory structure that attempts to hide itself as unobtrusively as possible behind Wright's distinctive spirals. The steel frame is going into place, like great sticks in a giant's eye. It is significant that Wright, who in his lifetime was an outsider to the profession of architecture, would be the first to succumb to the renovators and that leading the assault would be Charles Gwathmey, who with his contemporary Richard Meier, were thought to be the most effective defenders of the unadulterated Modernist position.

What should we make of all this? I think Romaldo Giurgola might have inadvertently gone right to the core of things when he tried to defend himself at the League against the stacked house of recent converts to Purity like Philip Johnson and Robert Stern. He explained the ill-advised mimicry of his scheme by suggesting that it would merely multiply the sublimity of the original. But can we multiply the sublime? Or is the notion of authenticity that drives the Modern to create new forms locked into an obsession with the original and finite?

"Can we multiply the sublime? Or is the notion of authenticity . . . locked into an obsession with the original and finite?"

The authentic, or original, has always provoked two reactions, often in the same observer: reverence and violence. Jack Nicholson as the Joker in the movie *Batman* plays on both in the museum scene when, after gassing all the patrons, he goes from painting to painting desecrating or "correcting" each in turn with a flourish. He stops in front of a gory Francis Bacon canvas, declares his approval and moves on without needing to do a thing. Even the Joker can recognize something immutable. The joke here goes quite deep. David Freedberg in *The Power of Images* (1989) gives a good deal of attention to the phenomenon of attacks on art. Paintings are routinely slashed or assaulted in various ways, often with irreparable damage. Early in April this year, an assailant burned Rembrandt's monumental "Nightwatch" with acid. The authentic, one-of-a-kind object, which in most knowing audiences inspires reverence, collaterally also inspires violence.

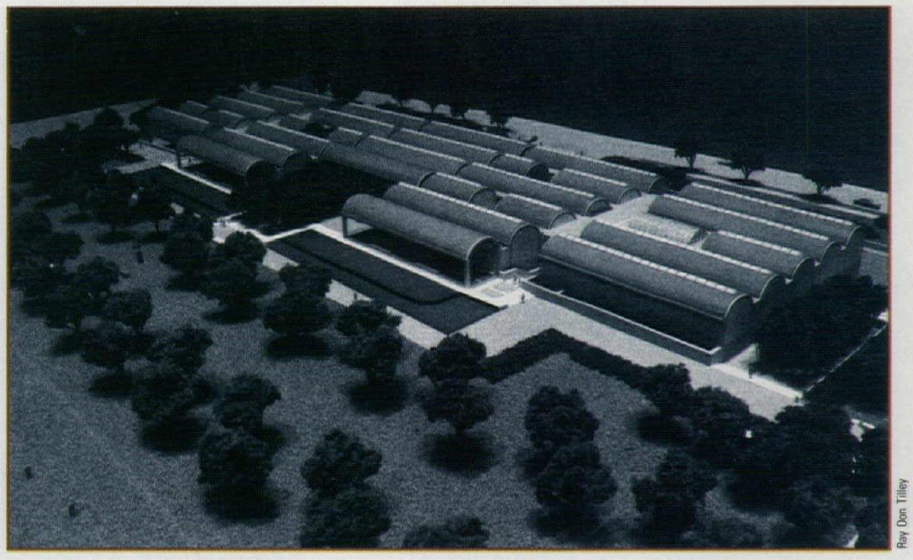
With Modern architecture under a prolonged assault from the various proponents of Post-Modernism, from Charles Jencks through Tom Wolfe, the disordered twin response towards authentic master-

pieces has again surfaced. The Joker understands the thrill of defacement. His actions, and those of the psychopath who tears at a painting for instant release, imply a changing attitude toward authenticity. Love for the original, which had been the rarified province of the connoisseur and critic, has now been quantified by the international art market. Paintings by Van Gogh, Renoir, and Matisse have become simply another commodity, traded vigorously over fax and phone. A $40-million painting by one artist is indistinguishable in cash value from a $40-million painting by another. The frequent "flipping" of fine art and real estate has been applied to custom architecture as well. Its one-of-a-kindness becomes part of its market appeal. Houses by Richard Meier are advertised in the same slick magazines that offer Biedermeier.

As a result of the commercialization and hyping of art, we have become suspicious of any claim to originality. In an environment where everything is traded, why should we be especially reverential to architecture of our own time? As long as authenticity is worshipped, we will continue, as Giurgola innocently offered, to try to multiply it. Yet, the most powerful aspect of an authentic piece of art lies in its finiteness. In architecture, where it has rarely happened in the last 50 years, authenticity depends on the seemingly absolute appropriateness of site and completeness of form. The Guggenheim's tight spiral against the grid, the Whitney's brutalist cyclopian command of a commercial street, and the Kimbell's stately vaults on a Texas lawn are all right as they are for reasons that go beyond the more utilitarian concerns of architecture and the pressing demands of their institutions' success. These were all works of masters in their last days. Louis Kahn unknowingly anticipated this current debate when he offered these observations on monumentality, as noted in *The Art Museums of Louis I. Kahn*, by Patricia Cummings Loud (Duke University Press, 1989). "The images that we have before us of monumental structures of the past cannot live again with the same intensity and meaning," Kahn said. "Their faithful duplication is unreconcilable. But we dare not discard the lessons these buildings teach for they have the common characteristic of greatness upon which the buildings of our future must, in one sense or another, rely."

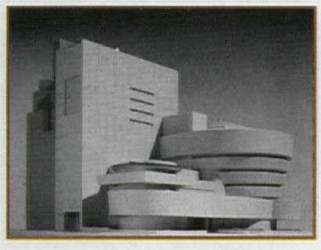
The architectural masterpiece achieves autonomy in context. It is both apart from and a part of the environment in which it exists. That is a balance rarely achieved. These most recent schemes under debate all tamper with that balance through banal additions, crushing contrasts in style, and dutiful multiplications. All have succumbed to the seduction of connecting to a masterpiece, while claiming to improve it. It's the Joker's prerogative without any of the manic fun.

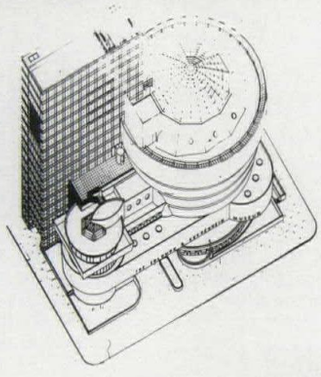
Twenty years ago, when Lionel Trilling celebrated authenticity over sincerity, he was attempting to distinguish between great works of the past and those lesser efforts that have also achieved considerable



Ray Don Tilley

Model of Romaldo Giurgola's proposal for the expansion of the Kimbell Museum.





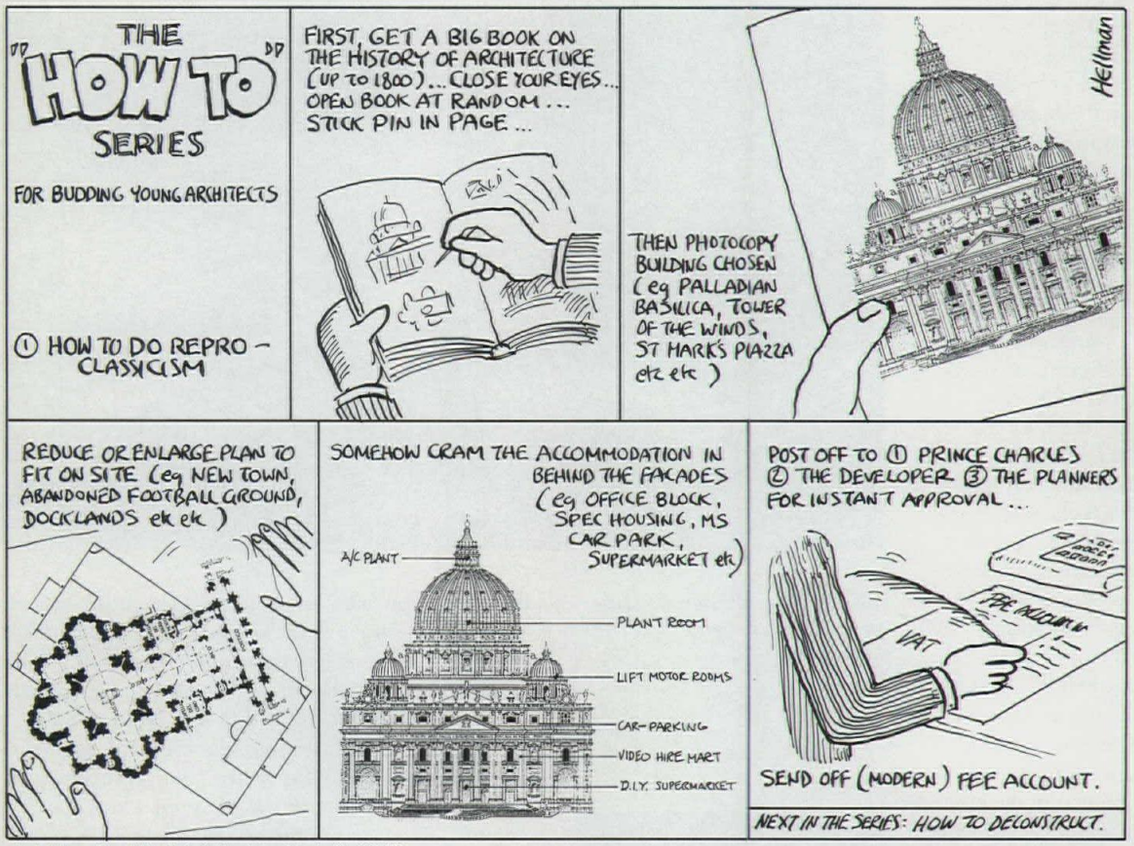
Model of Gwathmey/Siegel's addition to the Guggenheim Museum, top. The axonometric above reveals how the new structure connects to the existing building.

reputation. Such an assessment is even more difficult with contemporary work. Trilling implies that authenticity is "a more exigent conception of the self, . . . a wider reference to the universe and man's place in it, and a less acceptant and genial view of the social circumstances of life . . . [the authentic] implies the downward movement through all the cultural superstructures to some place where all movement ends, and begins,"(*Sincerity and Authenticity*, Harvard University Press, 1973). Architecture's communication of authenticity rests in its immutable sense of completeness and soothing aura of inevitability. The challenge for each generation is to determine the authentic and then defend it.

Public debate over the fate of these three museums has been healthy. However, it would be a mistake to focus all our attention on the question of style, which has dominated much of the discussion of all these projects, particularly Michael Graves's Whitney addition. Kahn's widow, Esther I. Kahn, in a letter to the *New York Times* (November 26, 1990) observed, "Lou rarely spoke of his finished works, but he truly loved the Kimbell for he felt he had created something which was perfect in itself." If we believe this, as many on both sides of the debate have testified they do, it is important to keep the building whole. The variety of reactions to the work over time, like differences of interpretations of Shakespeare and Mozart, make it live and change enough. The masterpiece is not always the work that is sheltered by time or retrospectively revered, but also the rare great work of our own contemporaries. This is particularly true of public architecture that is always fragile and too often vulnerable to the market. **Ross Miller** ■

The author is an architectural critic who has recently published American Apocalypse: The Great Fire and the Myth of Chicago *(University of Chicago Press, 1990) and is at work on a new book on the urban effects of the skyscraper.*

Funnies: With healthy rigor, sublime demeanor, and an unabashed desire to make sense of the profession, British architect and cartoonist **Louis Hellman** sends his salvos across the pond.



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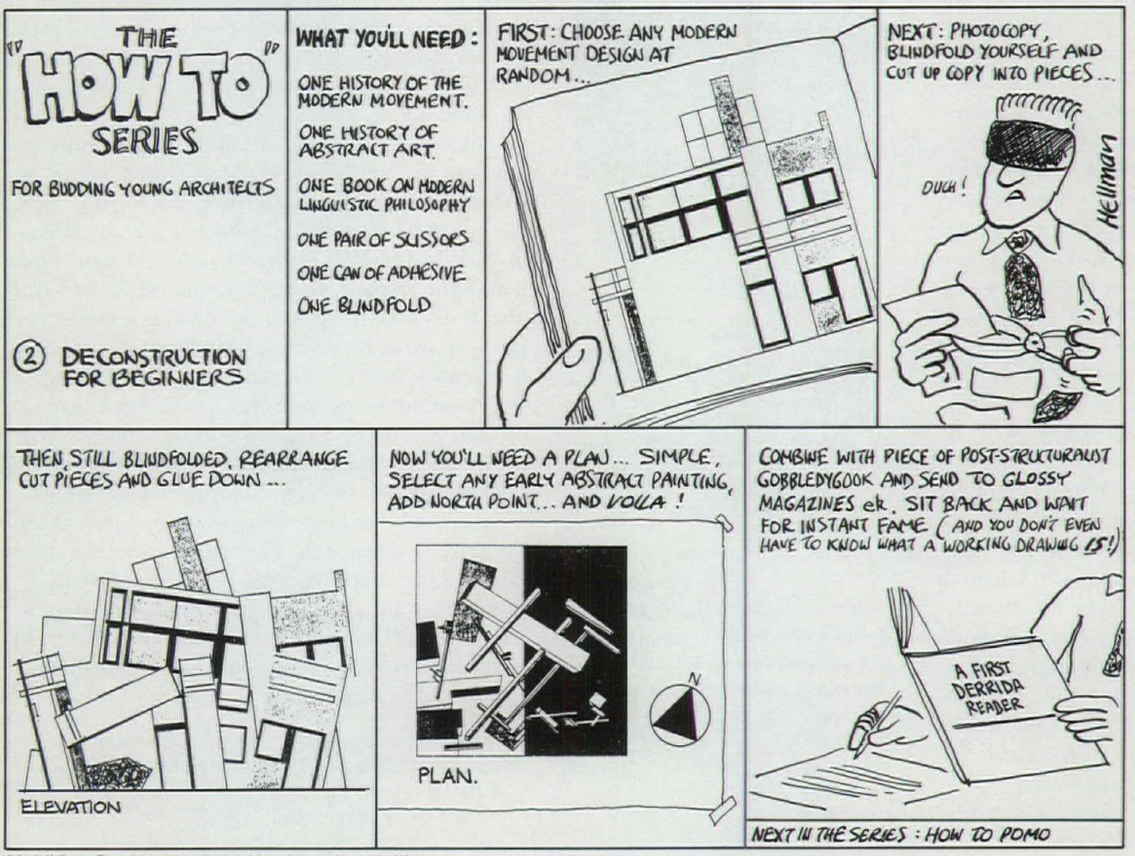

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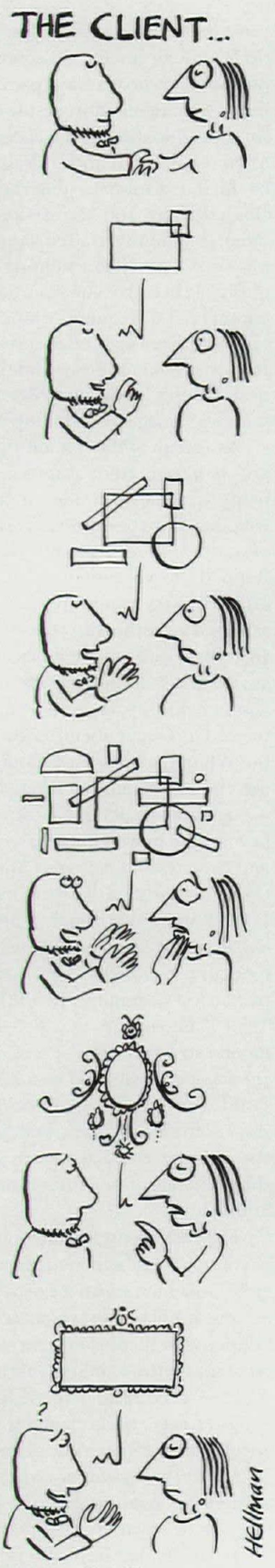

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Books

John Blatteau discusses the Classical vision that both sustained and circumscribed the career of Philip Trammell Shutze.

Tracing the Rome-Atlanta Axis

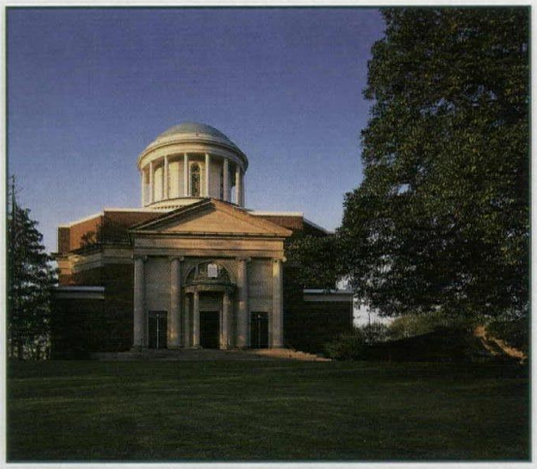
American Classicist: The Architecture of Philip Trammel Shutze *by Elizabeth Meredith Dowling, Rizzoli, New York, 1989, 256 pp., illus., hardcover $45.00, paper $29.95.*

This monograph is an exceptional introduction to the work of Philip Trammel Shutze (1890–1982). Architecture is a visual art, and this handsome book convincingly presents the beauty, richness, and authenticity of Shutze's wonderful creations. Illustrated with the architect's own exquisite drawings, period photographs, and the best contemporary photography one could hope for, it is a book that will be a welcome addition to any library. Elizabeth Dowling's commendable book (with photography by Timothy Hursley) builds on the work of Henry Hope Reed and H. Stafford Bryant, who brought Shutze to national attention with a 1977 volume of *Classical America* and a 1979 exhibit at Columbia University.

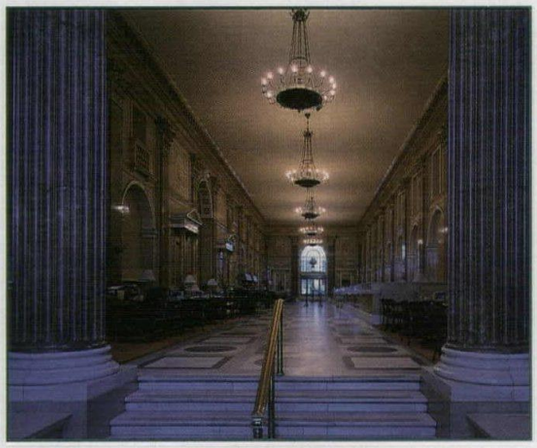
Shutze wrote little and was not interested in architectural theory; accordingly, Dowling presents his architectural work as testimony to his beliefs and attitudes, with extensive cross reference to the European models that influenced the work. She starts the monograph by tracing Shutze's education at Georgia Tech and Columbia University and eventually in Italy as the 1915 winner of the Rome Prize. While Shutze may have railed against the Beaux-Arts in later years, his training in its traditions served him well throughout his career. He was of the last generation to benefit from an educational system that truly prepared students for the practice of architecture. They could draw, they knew history, and they had the training to combine these skills in the production of new and lasting works of architecture. Shutze's ability to create architecture in a wide variety of Classical styles and compositions is the direct result of the Beaux-Arts style training he received. In addition to the obvious Beaux-Arts influence, Shutze was not averse to acknowledging that after five intense years of study in Italy, Tuscan villas of the 17th and 18th Century and the monuments of Ancient Rome became the spiritual resource for his designs. The influence of the Beaux-Arts and Italy proved indelible; Shutze developed an unswerving vision of architecture that was unaffected by the diverse schools of thought that flourished during his 60-year practice. He has left us a mature interpretation of the traditions he admired.

Because the work in the book is so seductively presented and we gain such a comprehensive understanding of the man, I feel a need to point out that Shutze, while undoubtedly the finest Classical architect in Atlanta (and probably Georgia) was not America's only really good Classical architect practicing into the 20th Century. A look through Augusta Owen Patterson's fine book, *American Homes of Today* (1924), will produce an expanded list of architects con-

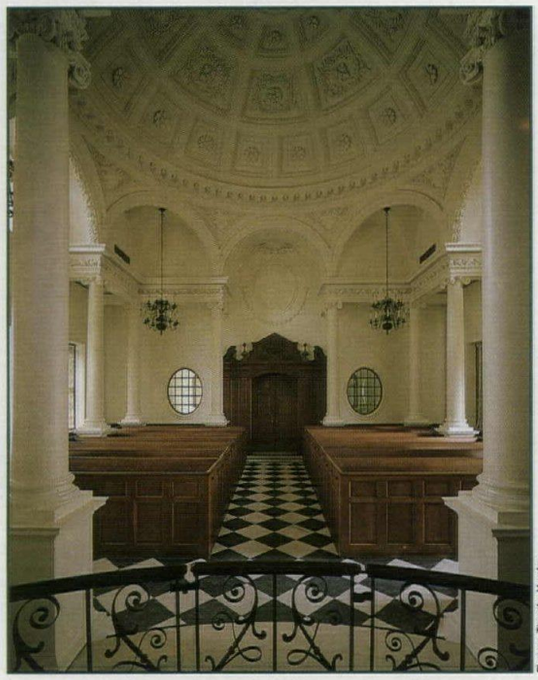
(continued on page 206)



Temple of the Hebrew Benevolent Congregation, Atlanta.



Citizens and Southern National Bank, Atlanta.



Photos: Timothy Hursley

Little Chapel, Education Building, Emory University, Atlanta.

Books of Note

The Modernist City: An Anthropological Critique of Brasilia *by James Holston, University of Chicago Press, 1989, 369 pp., illus., hardcover $50.00, paper $22.50.*
Holston's book, more balanced and scientific than other analyses of Brasilia, reveals the social consequences of the Modernist inversion of traditional urban planning.

Encyclopedia of Architecture: Design, Engineering, Construction, Volume 5, *edited by Joseph A. Wilkes, American Institute of Architects and John Wiley & Sons, New York, 1990, 808 pp., illus., hardcover $200.00, 5-volume set $850.00.*
This book concludes an encyclopedia six years in the making. While it is not comprehensive, its articles are competently written references, furnished with bibliographies.

New British Architecture *by Jonathan Glancey, Thames and Hudson, New York, 1990, 192 pp., illus., hardcover $39.95.*
After acknowledging that Modern architecture has been, at best, tolerated by most Britons, Glancey detects a rapprochement between the profession and the public. Those without access to British magazines might find this survey of the 1980s handy.

Out of Place: Restoring Identity to the Regional Landscape *by Michael Hough, Yale University Press, New Haven, 1990, 230 pp., illus., hardcover $35.00.*
All-encompassing solutions often destroy the "spirit of place" that they're trying to save. Hough writes that our plans should accentuate contrasts and variety, if we are to escape environmental homogenization.

See Tech Notes (p. 41) for listings of other publications of interest.

Projects

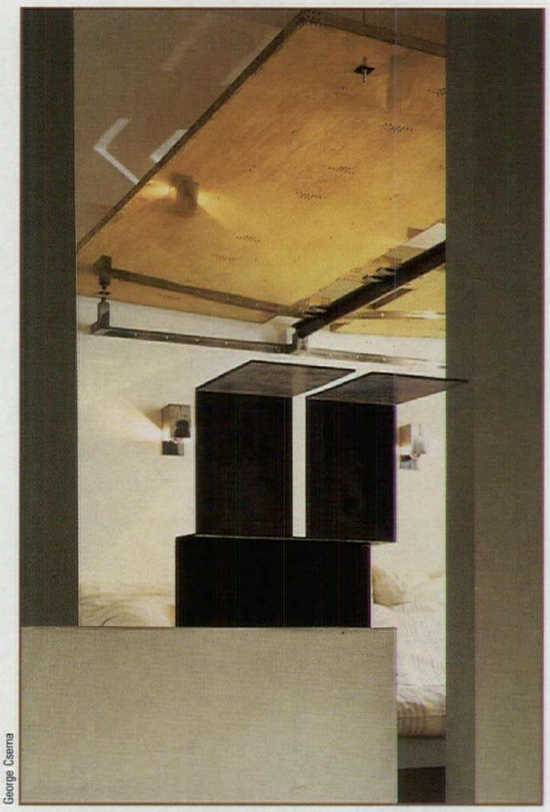
In **George Ranalli's** architecture, private shelter and public image are two sides of the same issue: how to establish the personal domain in the modern city.

City life calls for a delicate balance of the public and private realms. We want to be enclosed in a secure home, yet visible to others; to command a private domain, without cutting ourselves off from society. We want our homes, which harbor our individual preferences, to have a discreet public image, but we find total anonymity disheartening. These dualities are the essence of establishing a personal life in the modern city. They are also a primary concern in the work of New York architect George Ranalli. His structures encapsulate the social layers implicit in urban life.

While his conceptual scope is broad, Ranalli executes his architecture with a narrow range of materials and forms, because of both budget constraints and his design inclinations. Each of his executed structures, typically a building installed within a larger one, is built of folded and incised gypsum board walls with steel plates and extrusions installed on their "façades."

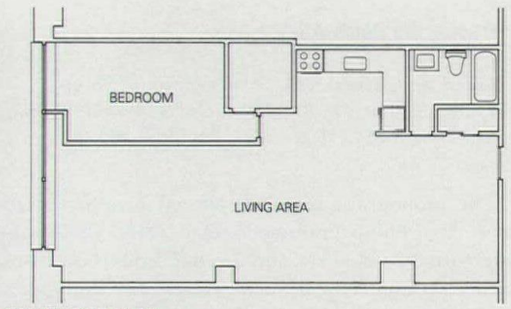
Ranalli's "buildings" are intriguingly reticent, with a reductive character that has weathered shifting currents in architecture. A recent New York loft renovation (this page) is the latest of a series of interiors built over the past 14 years. The apartment has a new structure that overlooks the living area with a "façade" of attenuated voids. Their splayed jambs enhance the sense that the enclosed bedroom and study are an inner sanctum, but they also give the structure a figural presence in the room. On a metaphorical level, the private realm is defined, but not detached; it is a piece inserted within a broader social structure.

The New York loft has finishes more sensuous than in Ranalli's previous interiors. Detailing is more explicit as well: He designed a brass canopy with a dull matte finish that gives an exceptionally warm glow. At one end, this metal plate is hung with tension cables; on the opposite side, it rests on steel wall brackets. The canopy's axis is marked by an extruded T-section that is bracketed by folded plates that hold the canopy. Ranalli's archi-

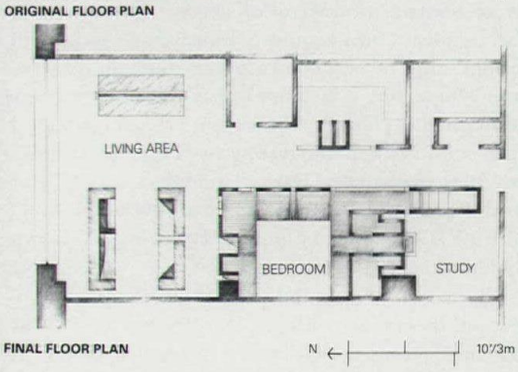


George Cserna

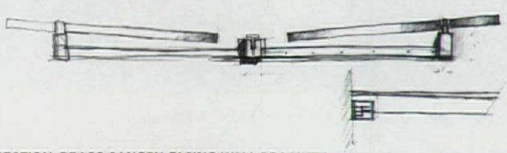
VIEW INTO BEDROOM, NEW YORK LOFT RENOVATION



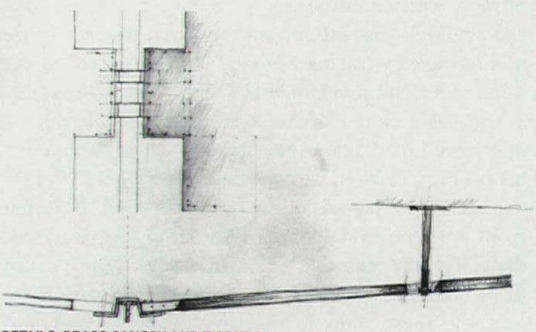
ORIGINAL FLOOR PLAN



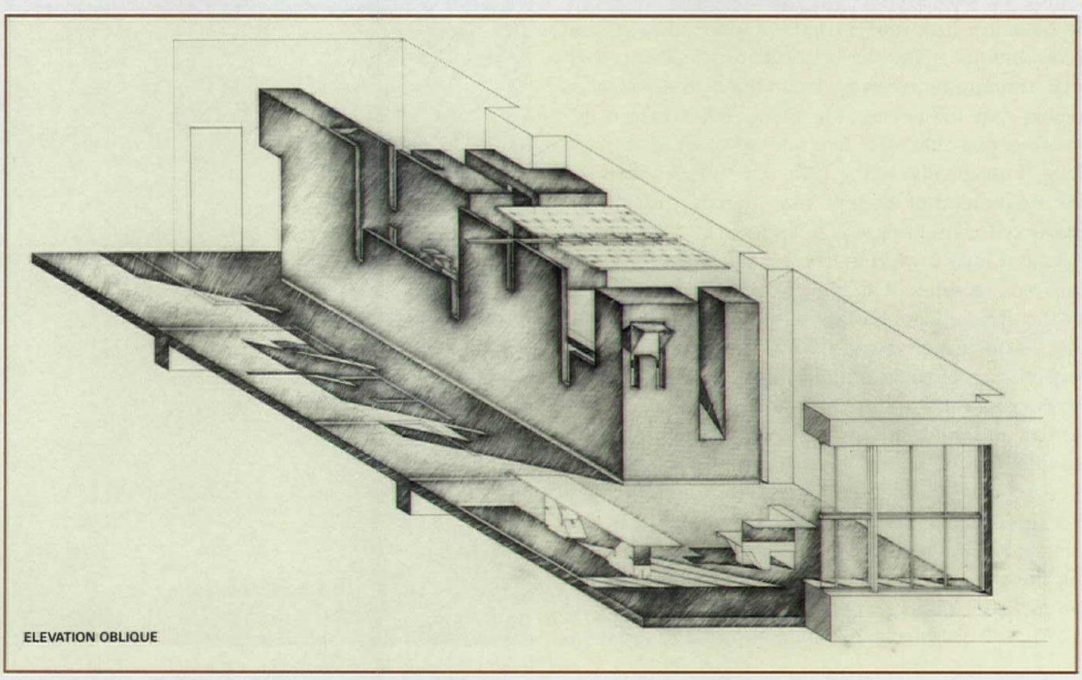
FINAL FLOOR PLAN



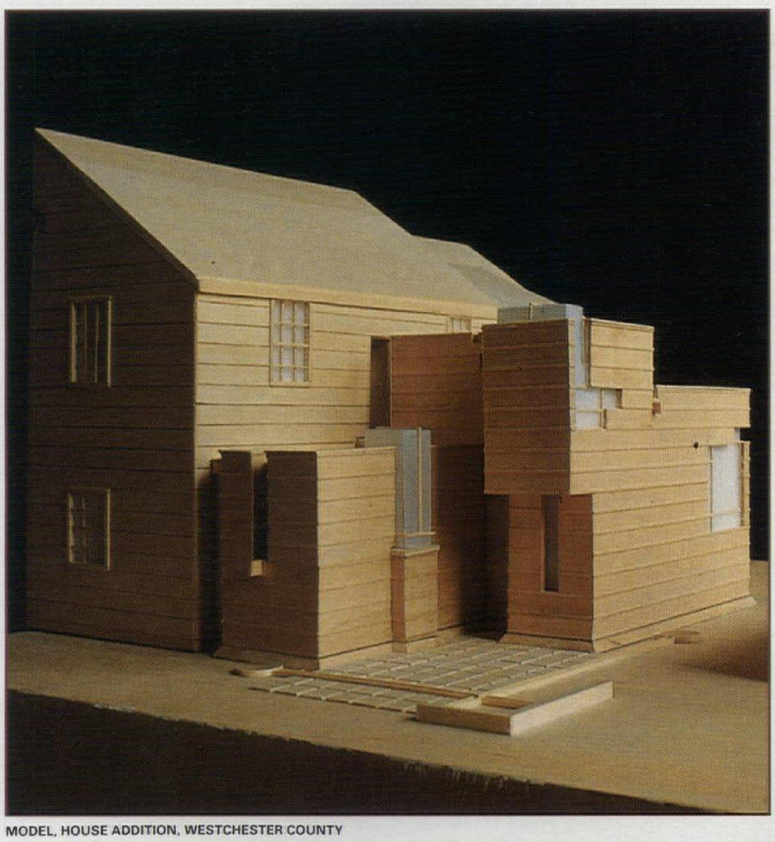
SECTION, BRASS CANOPY, FACING WALL BRACKETS



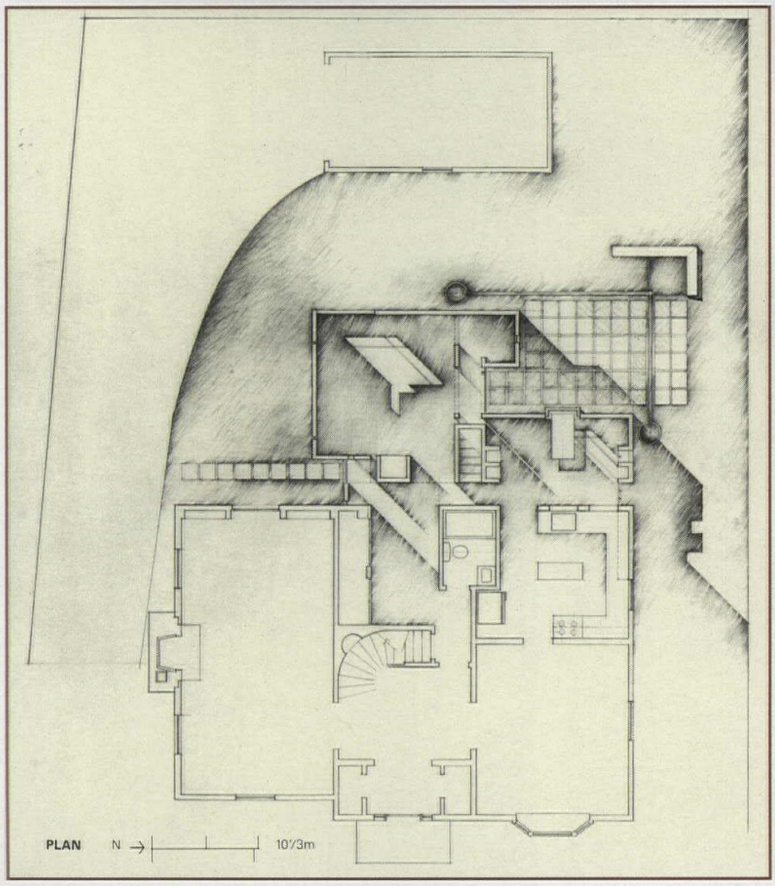
DETAILS, BRASS CANOPY AND T-SECTION

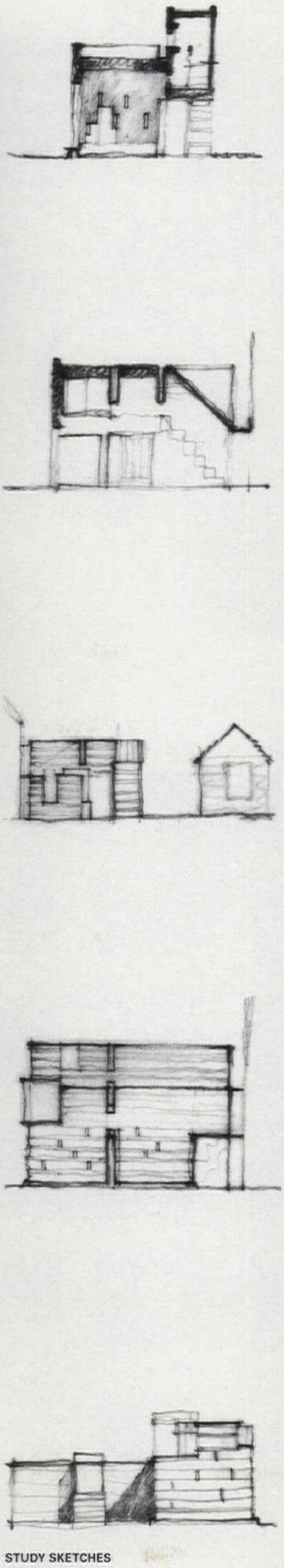


ELEVATION OBLIQUE



MODEL, HOUSE ADDITION, WESTCHESTER COUNTY





STUDY SKETCHES

tectural strategy – setting a building within another – has been consistently clear in all his work, but until now, he has made little distinction between his interior and exterior finishes. In this project, we can see that careful detailing and finish work have become crucial complements to his spatial moves.

Two recent projects introduce broader issues to Ranalli's study of the inside/outside duality. In an addition to a garrison Colonial in Westchester County, New York (this page), he arranges a dining area and living room in a cubic enclosure reminiscent of Carlo Scarpa; it is a board and batten adaptation of his gypsum board interior structures. Here, patterns created by the mullions and window panes align with the horizontal battens and imply that the walls are a tautly stretched surface, wrapped around a variety of volumes.

Exploiting the flexibility inherent in wood-frame construction, Ranalli folds windows around corners and cantilevers a second floor study; some windows are glass-roofed bays that extend above the parapet. While Ranalli's fenestration is unconventional, he continues to favor massive walls and keeps the interior private. In fact, his collage of cubes (a counterpoint to the simple shape of the original house) gives the walls greater presence than one finds in a conventional house.

A contemplative "Tower of Silence" (next page), an invited entry in a 1989 competition, has the presence of a skyscraper on a vastly reduced scale – it is to be constructed in the atrium of a Tokyo office building. Here Ranalli transforms the skyscraper, a building of stacked floors essentially commercial in function, to a compact structure where one goes for private meditation, not for work.

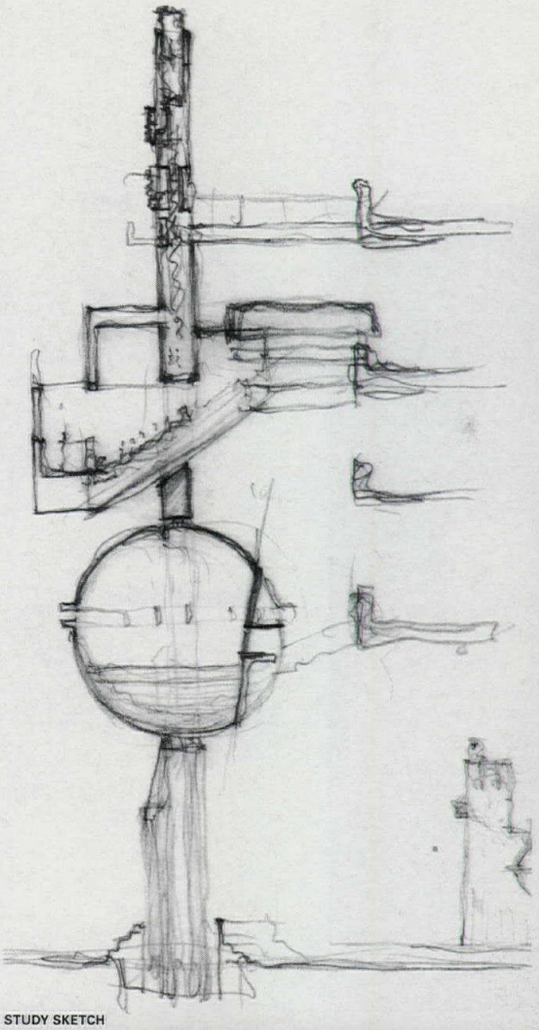
The Dentsu Corporation, which sponsored the competition, did not specify a program, leaving Ranalli free to designate the tower a place of spiritual refuge, where individuals and small groups can find brief respite from the city. He proposes an antidote to Tokyo's noise and

crowds, and offers visitors balconies where they can look over the surrounding showroom and outside to the office buildings that crowd the cityscape. This project is the urban analog to Ranalli's interventions in apartment lofts: Both provide personal havens while doubling as figurative works of architecture that dominate their surroundings. They reflect the reciprocal relationship between the public and private realms.

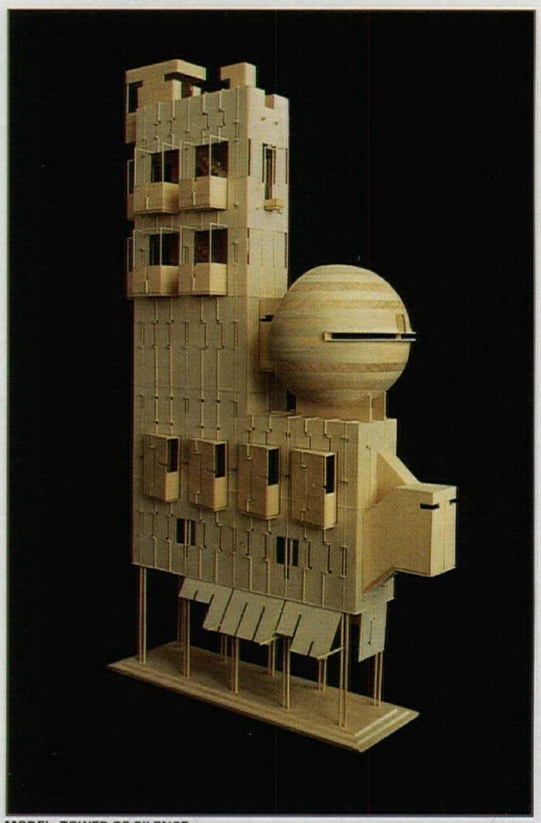
As a native New Yorker, Ranalli recognizes the iconic power inherent in the tall building. Accordingly, his Tower of Silence has an enigmatic image; it is a counterpoint to the gridded elevations of the surrounding building. The meditative chambers within Ranalli's structure are projected on the façades with porches, stairs, and a spherical space for small audiences.

The tower is to be clad in 2000X, a translucent material from Formica Corporation that looks like alabaster. Panels at the bottom are folded like awnings to accentuate the thinness of the curtain wall; the same material is cut into vertical battens above. These details make the building structurally forthright, while its robotic character and slit windows give it a hermetic air.

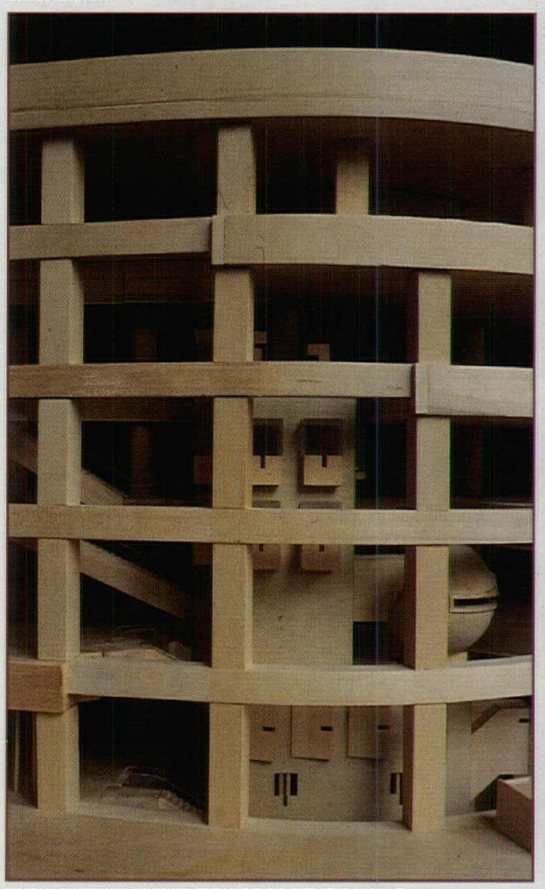
From low budget studio rehabilitations to a competition entry for generous Japanese patrons, Ranalli has focused on the wall's spatial and evocative roles; his built work has been as consistent as his architectural intentions. While Ranalli's steadfast vision bears merit, one hopes to see him push his propositions further. In this discussion of his work, we see three distinct routes for him to follow; might each project be a prelude to further exploration? **Philip Arcidi** ■



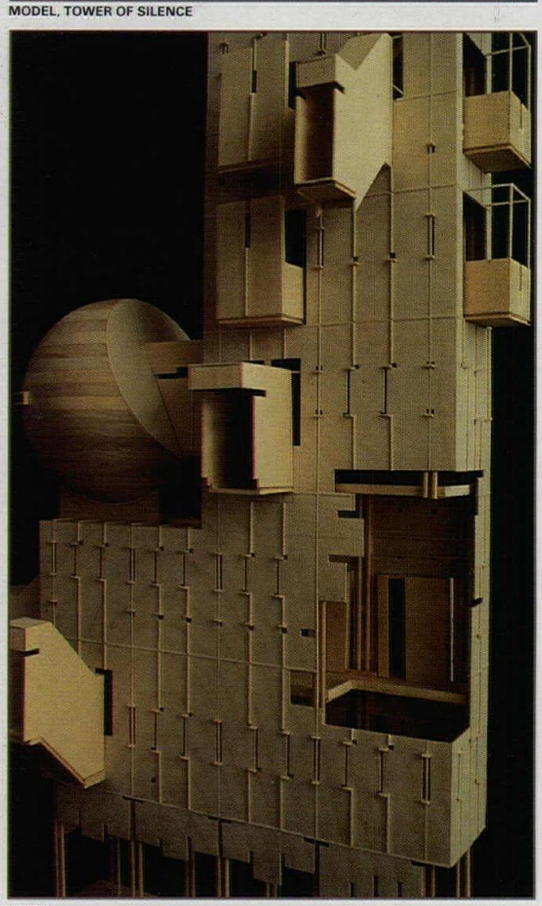
STUDY SKETCH



MODEL, TOWER OF SILENCE



MODEL, TOWER OF SILENCE, SET IN TOKYO OFFICE BUILDING



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Above: Employee entrance lobby. The ceiling diffuser in the foreground is a 24" x 24" TITUS Modu-Bloc, installed in a plaster frame. The center panel of the diffuser consists of the same material as the ceiling.

Right: View near the main entrance.

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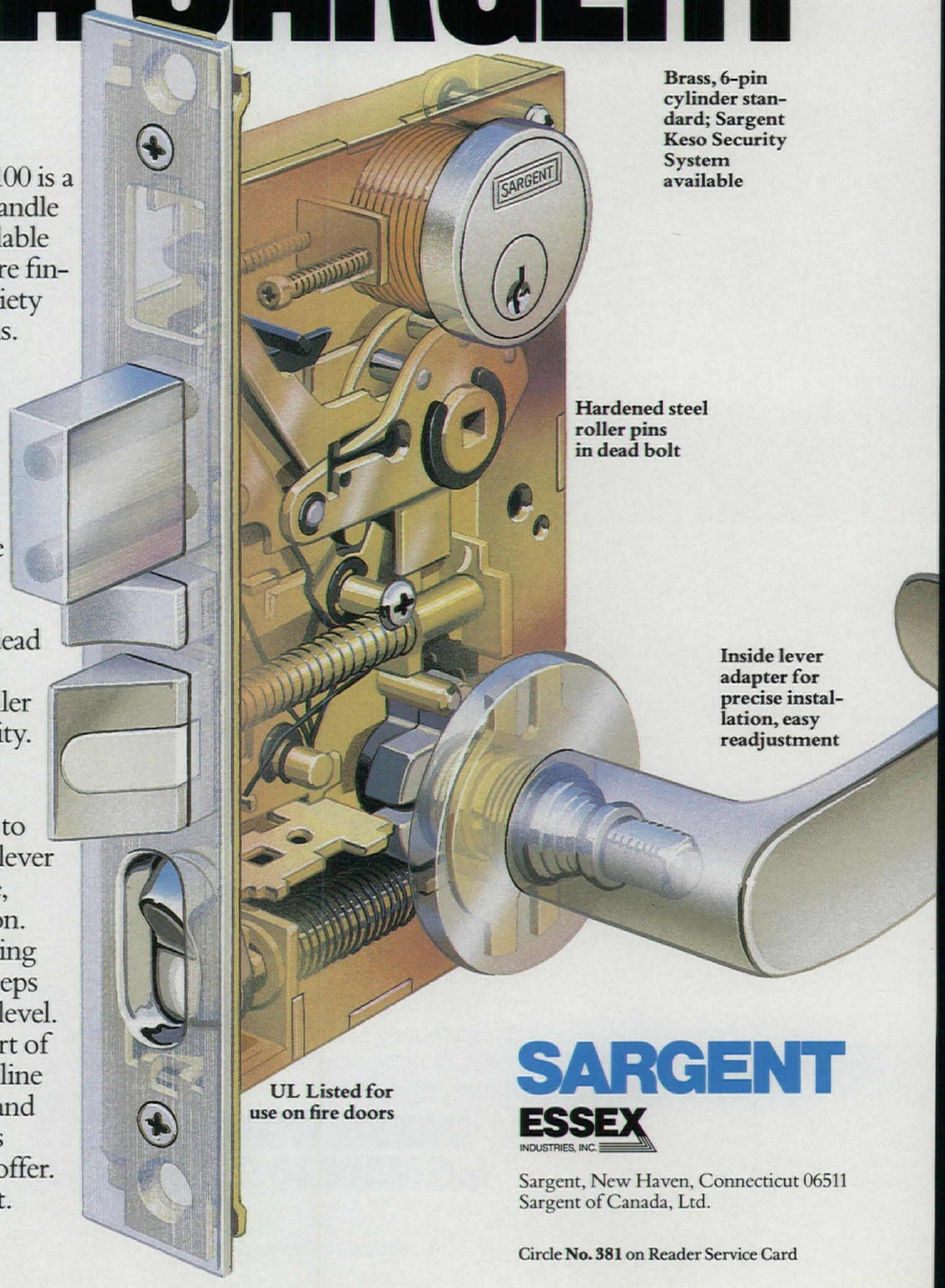

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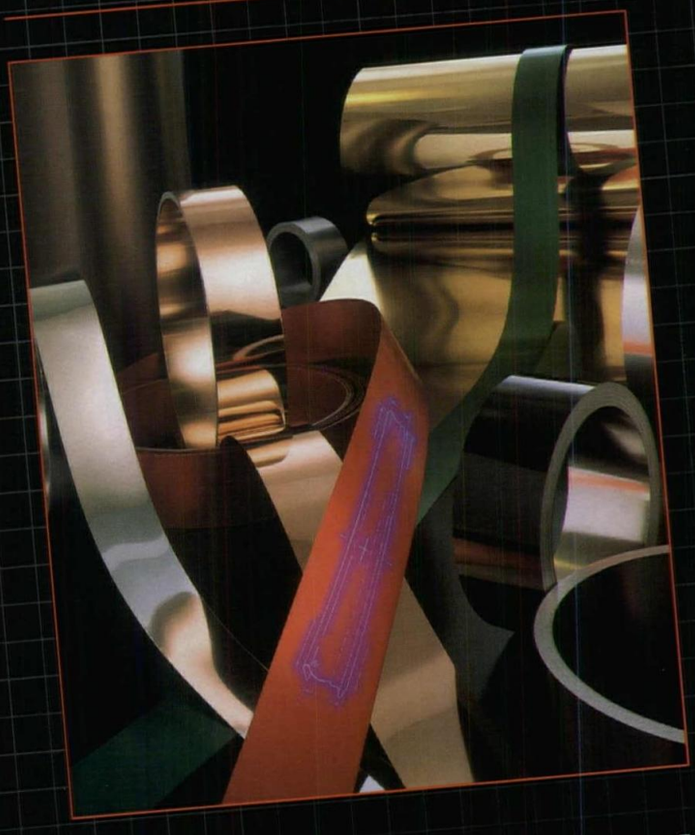

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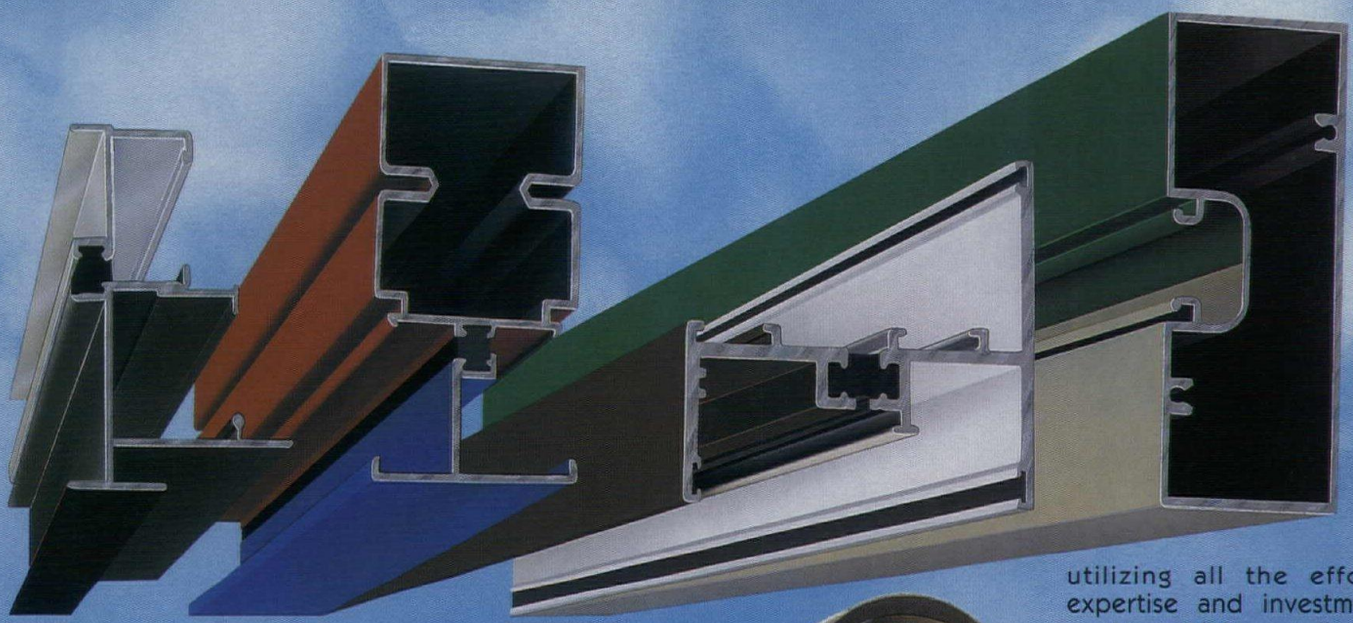

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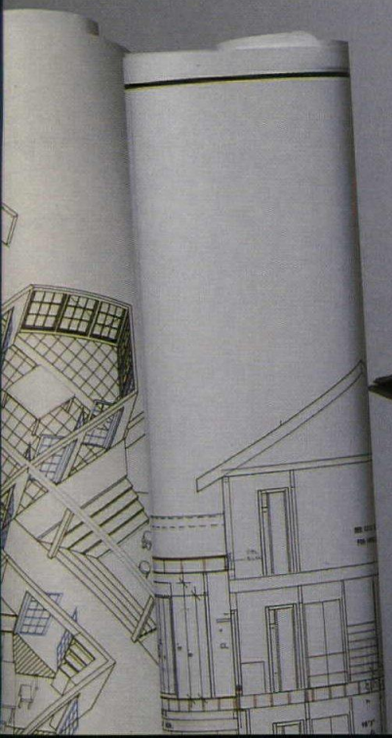

Architectural design courtesy of Elizabeth Vespremi Planning & Architecture.
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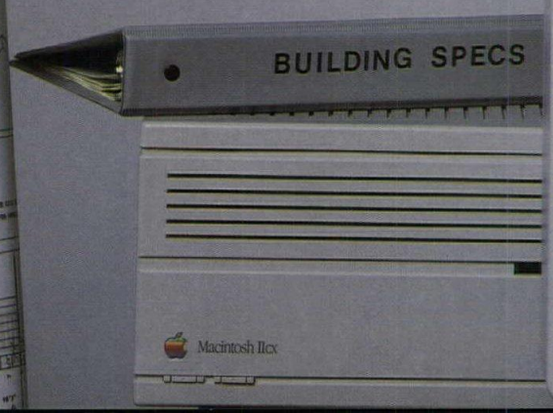


Technics Focus: Computers

Contents

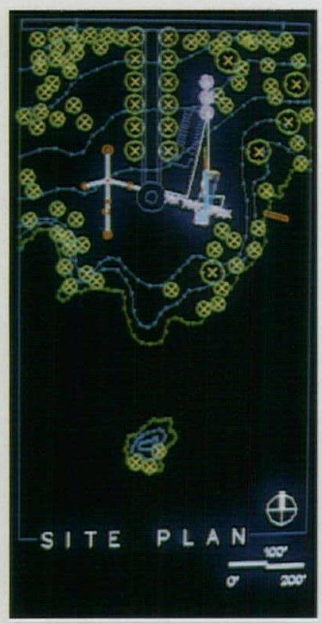
P/A looks at how computers are changing architectural practice –

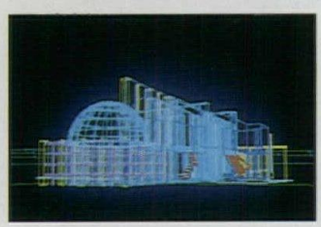
and how computer skills can expand a firm's service offerings.

Computer Chips

A student competition and other news

This special computer focus in the June 1990 issue of P/A was produced using Apple® Macintosh™ computer equipment and Aldus® Pagemaker® software.





Site plan and perspective of Laura Doty's winning entry in the CadKey / AIAS student competition (above). Door detail of a model cut by LaserCAM (right).

Student Projects Win CAD Awards

Five students have been recognized in a CAD competition sponsored by Cadkey, the developers of DataCAD, and the American Institute of Architecture Students. The jurors selected projects not only for the quality of their architecture, but also for their presentation, which had to use DataCAD software. The winning projects were:

- Planetarium by Laura Doty, University of Arkansas School of Architecture;
- U.S. Post Office, Tenleytown Branch, Washington, D.C., by Kyle H. Webb. Catholic University of America;
- The House of Ritual, Memory, and Meaning by Paige Allison Pullins, Catholic University of America;
- Activity Bridge by Brian Ingham, Lawrence Technological University; and
- San Diego residence by Wyatt Hazlett II, Schoolcraft College.

Judging the designs and presentations were Nora R. Klebow, Skidmore, Owings & Merrill; Charles Sappenfield, Ball State University College of Architecture and Planning; Vivian Lee, Washington-Alexandria Center; and P/A contributing editor Eric Teicholz, Graphic Systems, Inc.

New Computer Services

As computer use increases in architectural firms, so do new computer services. Firms and products are being created to allow architects to take advantage of their CAD capabilities. Many of these developments help architects create elaborate presentations previously considered too expensive.

Scale Models Unlimited of Menlo Park, California, is introducing LaserCAM, a turnkey laser cutting system, this spring. The system, which can turn most CAD drawings into preliminary or presentation models, employs a laser aimed with a series of mirrors to cut model materials precisely. While the materials can only be cut in the x- and y-directions, a series of layers can be prepared to provide three-dimensional imagery. The entire hardware system is available to architects, or SMU can produce the models themselves.

Groups who advertise other CAD-based functions are also proliferating. Computer Graphics/Atlanta uses a software system to convert drawings and blueprints to a CAD format. In addition, they can restore — on computer — faded or damaged works. Du Pont offers a similar service called FastTrax that scans drawings onto magnetic optical disks, useful for both long-term storage and frequent access. Users can also purchase equipment that allows them to scan documents themselves. Service bureaus that specialize in converting documents and have the proper equipment at their disposal can often do it more cheaply and quickly than a typical architect's office.

In addition, firms are becoming more common that can take an architects' own CAD documents and use them to create near photorealistic video and computer-animated models. The Corrigan LoVerde Group, a computer graphics consulting firm in New York offers computer animation services to architects, including color prints or animation videos rendered with true materials, textures, lighting, and colors. Other companies, like the Syracuse-based Dinet Associates, have introduced computer animation and graphics to expand their architectural illustration and rendering business.

Disk-Based References

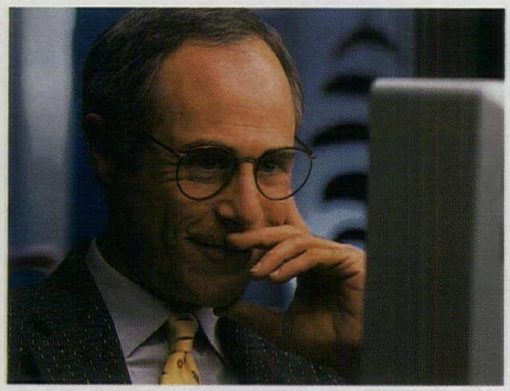
A number of references, some previously available only as hard copy and others only accessible with computer technology, are now being offered to architects. The Building and Remodeling Index is a valuable research aid for architects and builders, with indexed articles from over 40 architectural and related publications. The articles are filed under approximately 70 subjects, such as "climate," "design," and "housing," each with numerous subheads. The disks are available by subscription, with quarterly updates, from BRI, Portland, Maine, (207) 871-706.

Andrea E. Monfried ■

The author, formerly with P/A, is a freelance writer.

There are two kinds of innovations in the computer business. The ones you just talk about. And the ones you actually use.

Introducing 1



Apple was the first to combine the power of computers with the power of humanity. The 53 innovations in the new Macintosh IIfx are designed to make that combination more powerful than ever.

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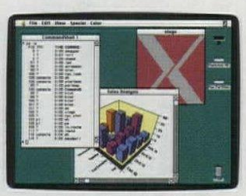

Apple's latest version of the UNIX operating system for Macintosh, A/UX 2.0, lets you run UNIX, UNIX X Window System and off-the-shelf Macintosh personal productivity programs at the same time on a Macintosh IIfx, IIx, IIcx, IIci or SE/30. 32 innovations for Apple, hundreds more choices for you.

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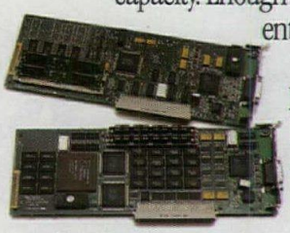

A pair of new video cards turns 18 new ideas from Apple labs into 16,776,960 more colors you can actually see. But only on a Macintosh.

And it has six NuBus™ slots that will let you expand its awesome capabilities even more.

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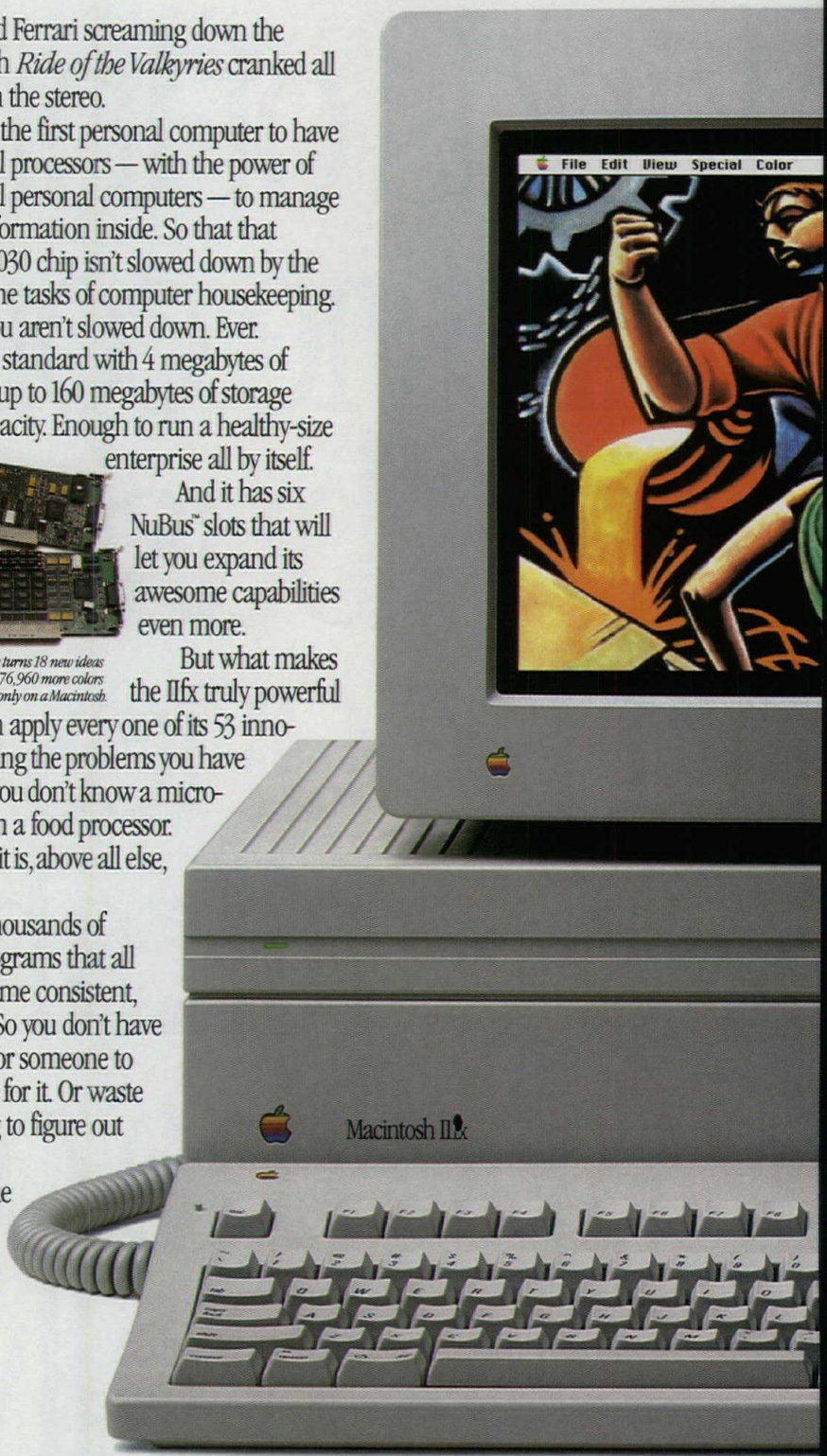

The new Macintosh IIfx. Mea

National Software Testing Laboratories ran benchmarks comparing the Macintosh IIfx with the IBM Model 70/486 running Microsoft Excel, Aldus Pagemaker and Adobe Illustrator. NSTL found the IIfx was 34% to 270% faster running these three popular programs, doing the things you normally do in business. In the same tests, the IIfx was also faster than the Compaq 386/33. The full NSTL test reports are available on request.

03 of the latter.

too. So you can move up to its extraordinary performance level without spending thousands more for a whole new software library.

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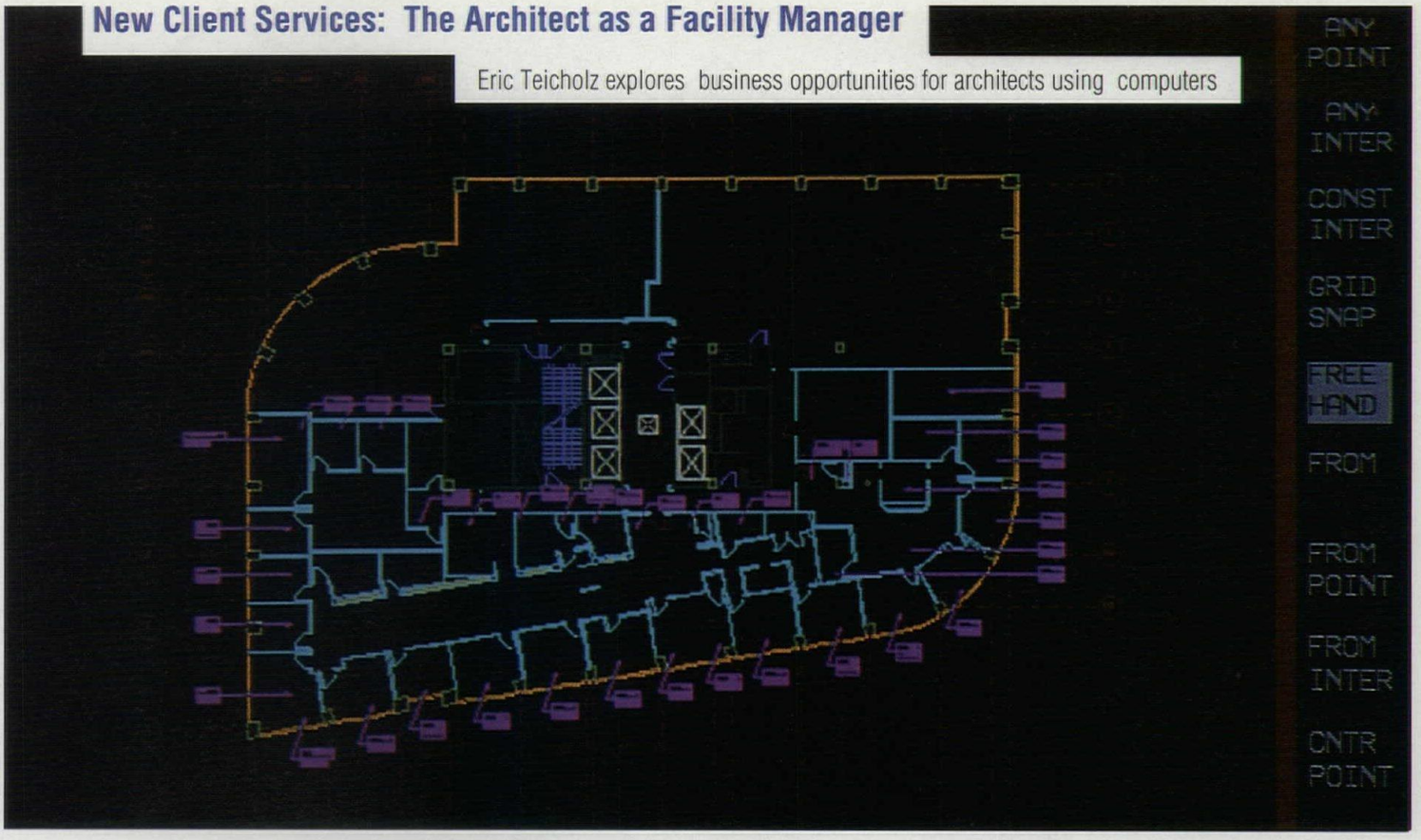
New Client Services: The Architect as a Facility Manager

Eric Teicholz explores business opportunities for architects using computers



This facility plan for 260 Franklin Street, Boston, Massachusetts, was created by Dyer/Brown using DRAWBASE.

Architecture As An Industry

There are over 15,000 architecture firms in the United States that take in total revenues of well over $7 billion, of which architects retain approximately 75 percent -- the remainder going to other consultants. However, these firms are not representative of the industry as a whole. The average architectural firm's annual operating revenues are a little over $400,000, indicative of the relatively small size of design firms. In fact, nearly a third of the AIA's member firms are sole practitioners and another third have two to four employees -- with only 6 percent of the member firms reporting more than 20 employees. Traditionally, the growth of the architectural industry is tied closely to the cycle of new construction. That is, the more new development occurs, the more work there is for architects. At the end of a period of intense real estate development, however, overbuilding occurs, and new construction starts to lag. Such is the current situation in most of the United States. Recent reports produced by the Building Owners and Managers Association (BOMA) indicate vacancy rates in excess of 15 percent in many major cities. The Boston real estate market is especially dramatic. In 1987, for example, the legal industry accounted for over a third of all office space leased in Boston. In 1988, only two of Boston's 20 largest law firms were still looking for space. If anything, the situation has gotten worse since then. Thus firms offering traditional architectural services are experiencing a severe shortage of work.

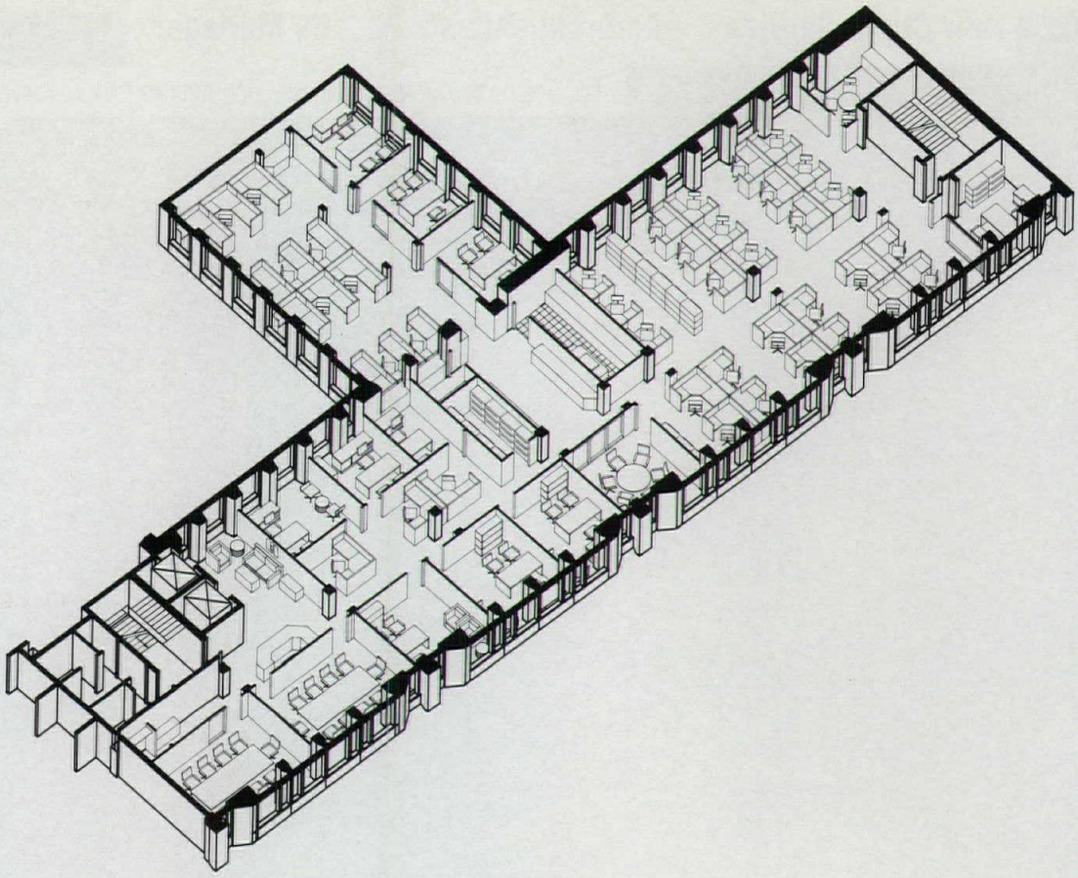
Facility Management Justification

As new construction dwindles, architects must look for new sources of revenue. A natural place to start is with their existing client base. This is an obvious choice since the architect has established professional credibility with the client and is already acquainted with the owner's building.

At the same time that architects are in need of new sources of revenue, there is a trend toward automation in both design firms and in facility management departments within corporations. Facility management for acquisition, refurbishing, maintenance, and operations represents, after personnel, the largest single budget expenditure for corporations. It is, therefore, natural that corporations look to computers to help improve productivity and help manage and maintain space. It is also natural that corporations seek support for these automation procedures from their consulting designers.

A recent market study measured, among other things, various functions performed by facility management staffs, plus the degree to which these functions were automated. The study found that there is still much room for growth in the automation of facility management functions. The chart on page 147 illustrates, for example, that close to 70 percent of the 435 firms that participated in the study perform space planning, but only 40 percent use computers for this function. Similarly, 62 percent of these firms perform architecture and interior planning functions using in-house staff, while only 30 percent of this same group have automated this function through the use of CAD systems. The chart also illustrates that numerous functions performed by facility management staffs depend on an accurate set of as-built drawings. It therefore comes as no surprise that a number of firms that have in-house CAD systems are insisting on electronic as-built databases from their consultants. In fact, recent statistics indicate that over 50 percent of corporations that have in-house CAD systems are insisting on database compatibility between the architect's and the corporation's CAD system.

A second finding of the same market study, cited above, is related to how facility management departments within corporations were using computers. This figure indicates that 45 percent of the companies participating in the study employed data processing services that were performed outside the facility department. These facility automation services were done by other departments within the corporation, by service bureaus, or by consulting design and engineering firms.



Dyer/Brown & Associates, CAD generated orthogonal view (right) of commercial tenant space for the Financial Service group, Boston, Massachusetts.

CityDesign Collaborative, Inc. CAD-generated facility plan (facing page) of the Hewlett Packard manufacturing facility.

Firm Profile: Dyer/Brown

Dyer Brown & Associates, Inc. Architects installed its first two CADworks Arplan CAD systems in 1983. Today its three offices in Boston, London, and New Bedford have nine Drawbase systems interconnected with modems.

The primary use has been for servicing developers and corporate clients in the area of space planning, where efficiency levels have been extremely high. For developers, individual "fit plans" within office buildings are charged at the rate of approximately 12 - 15 cents per square foot depending on the size of the space.

The CAD database is utilized to generate area calculation information for both developer and leasing agent. The initial building area calculation database is charged at 9 cents per square foot, with subsequent tenant area calculation information, billed at a $150 fixed fee per area. A manual is published detailing building area information, which is periodically updated. The tenant area calculation information is transmitted with a printed hard copy of the tenant space along with a written report.

Large-scale interior architecture commissions such as the financial service group, illustrated above, can house over 800 people per square foot. Using the CAD database, extensive component lists for systems furniture are developed.

Facility Services Performed by Architects

A recent survey of architectural facility management client services was performed by the Architects' Office Management & Administration Report. These services, although diverse, were performed with a relatively small number of database, drawing, and office automation software programs. Some of the more interesting services performed by architects for their clients included the following:

1. Work flow analysis: One participating design firm generated a set of CAD drawings that documented the workflow of the client's financial, marketing, and general administration departments. The drawings were used to evaluate office design and layout. Such analyses often resulted in new design projects for the architect.

2. Retail store management: This service involved the development of a specific CAD overlay template for generating drawings of the client's retail stores. The CAD output was used by the corporate client to assist corporate management in determining sales productivity for various store layout configurations. The layouts were changed, using the CAD system, to respond rapidly to new products and sales volumes.

3. Predictive maintenance management: A design firm worked with corporate maintenance engineers to establish a program for determining predictive maintenance schedules, bills of materials, and labor cost estimates. In the future, this list will be tied to a CAD graphic database (showing equipment location) and to construction scheduling and management software.

4. Energy management systems evaluation: This application involves analyzing various energy systems and making recommendations regarding equipment upgrading, applications software, and improvements to existing energy modeling and monitoring systems.

5. Specifications databases: This database management and word processing application involves the development and maintenance of specifications related to products, developer clients, renovations, tenant improvements, and other information of interest to the client.

6. Environmental audits for real estate acquisition: This service involved the performance of automated environmental impact analyses for a client. Tasks included paper searches of various insurance materials, as well as interviews with regulatory agents, on-site observations, and various site-sampling tests. Data was collected and results presented using a variety of database, spreadsheet, CAD, business graphic, and desktop publishing software.

A second survey, performed by the author, resulted in a more generic list of facility management services currently being performed by architects for their clients. The applications described in this market survey included the following:

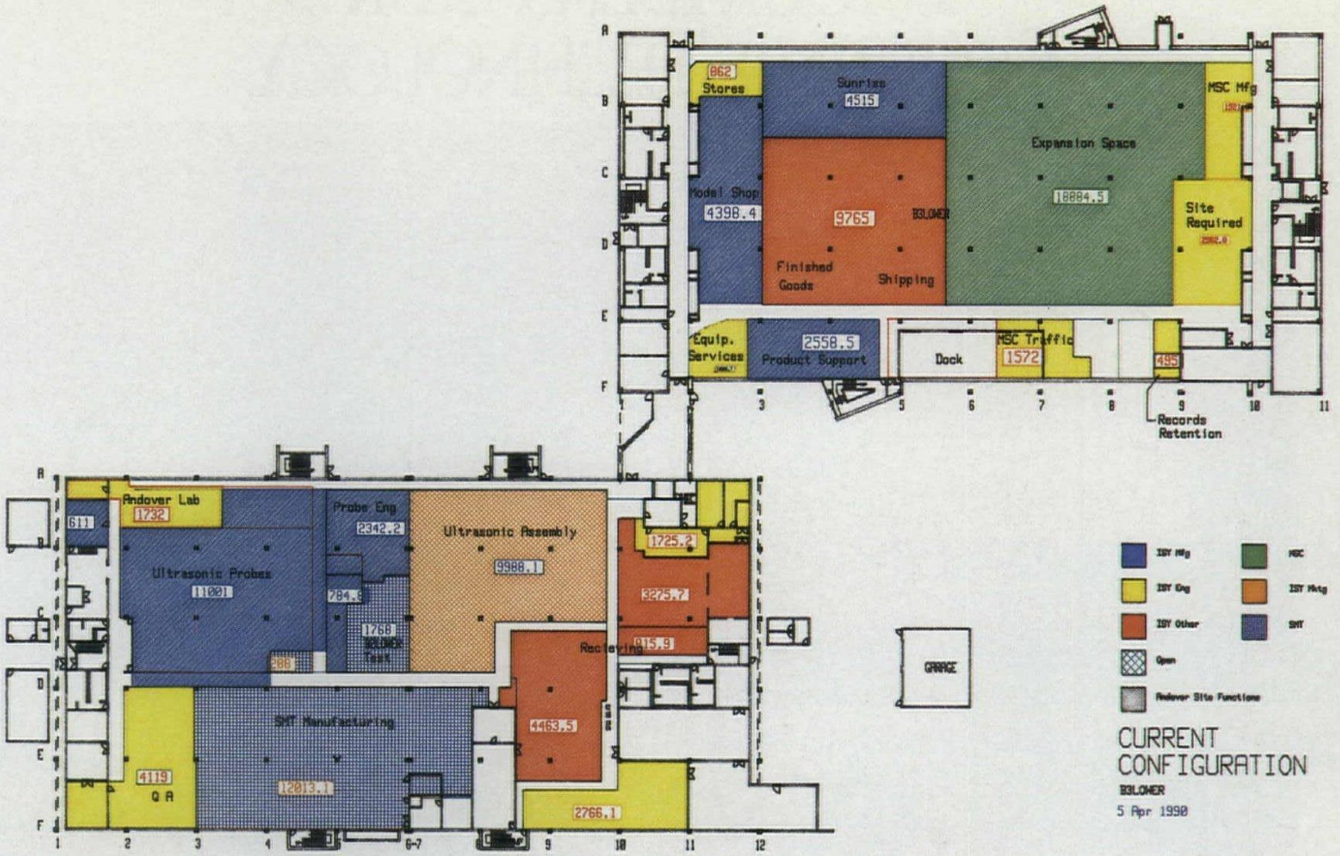
1. Development of space and furniture standards: Most corporate forecasting of space requirements is based on space standards. Architects, because of their design skills, often work with clients on the development of such standards.

2. Long-term planning: Forecasting a corporation's long range space requirements involves modeling the projected growth of the company as well as understanding the spatial implications of various growth or shrinkage scenarios. The spatial analysis of these scenarios is best accomplished by individuals with design skills.

3. Maintaining as-built drawings: Many facility management applications depend upon having access to accurate and current drawings. Area calculations for department chargeback calculations and lists of equipment and furnishings associated with spaces (used for various inventory and space planning applications) are all facilitated by having current, accurate as-built drawings.

4. Determination of space allocations: The analysis of desired spatial adjacencies and the corresponding space planning to accommodate desired adjacencies is a function well suited to architects. The output of this service is usually schematic block plans depicting the graphic delineation of spaces required for specific work groups.

5. Small-scale design. Over 80 percent of corporate renovation is performed on spaces of less than 5000 square feet.



Currently, this work almost never involves the services of an architect. However, if a design firm were involved in facility applications and had access to current electronic drawings, the design firm would probably be involved in these small-scale design applications.

Charging for Facility Automation

All of the facility management services listed above involve a finite set of electronic operations. These include computer plotting, data entry of as-built conditions, general architectural drafting, data conversion of various graphic databases between different computer systems, custom programming and report generation, and general consulting. Listed below are approximate fees being charged by service bureaus specializing in facility management applications. These fee structures are meant as a guide to help architectural firms establish fees for facility related automation services.

Plotting: Existing facility service firms charge either by the hour, sheet, or file size. Plotting is usually performed with an electrostatic plotter and costs range from $7-9 for black and white E size drawings to $14-17 for color.

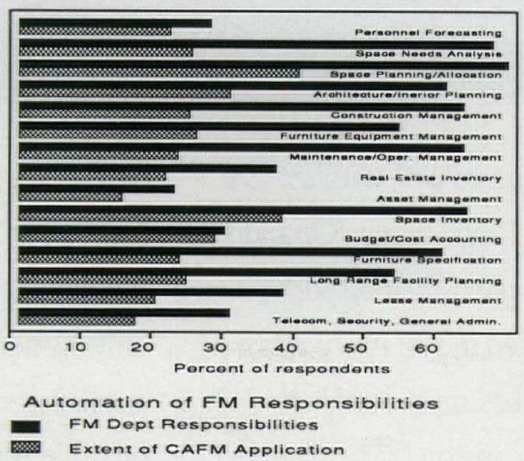
Data entry services: Creating, editing, and maintaining accurate facility data is a complex task that requires the establishment of formal procedures with a great deal of quality control. Some service firms charge by the hour for data entry, and some charge by the amount of area encoded. Representative square footage fees are as follows: core and shell drawings: 2-5 cents; partition drawings:2-5 cents; boundary drawings/area take-off reports: $.02-.04; schematic furniture drawings: 5-10 cents; field visits (verification): 1-4 cents; furniture/equipment inventory reports: 15 cents.

Drafting: Service bureaus are often employed for a corporation's drafting work (e.g., as-builts). Once again, firms charge by the hour (usually in the $20-35 range), by square footage, or by a fixed fee price.

Data conversion: Very few standards exist for graphic database formats. AutoCAD's DXF file format is perhaps the closest to being universally accepted by industry. The National Institute of Standards and Technology's IGES is the second most popular database standard. Likewise, there are no accepted standards that relate to converting layers from one system to another. This lack of standards makes it difficult and labor-intensive to convert both the graphics and attributes from one system to another. Billing is normally done by the hour or by the file size. Typical costs would be $25/hr for PC-based services (machine time) plus media plus client time.

Custom programming and report generation: Most comprehensive software systems have flexible report-writing software that contains the ability to customize output such as departmental boundary plans and reports, area take-off reports, and space accounting and occupancy cost reports. Standard output files can often be transferred to the more popular database, spreadsheet, and desktop publishing systems. Compensation for this service is done on an hourly basis (usually in the $65-90 range).

Consulting: Service bureau consulting can either be general or specific. Consulting fees can be a lump sum fee or based on the level of personnel required. However consulting in facilities management is done, it offers new service opportunities for the computer-literate architect. **Eric Teicholz** ■



Firm Profile: CityDesign

CityDesign Collaborative Inc., a Boston based urban design, landscape architecture, and architecture firm, aids its CAD software vendor in an effort to market CAFM packages to corporations in New England. In support of the system sale, CityDesign provides new buyers a range of service including base facility documentation, field verification, and report organization. This capability often leads to other work. For example, CityDesign currently had personnel in place at a 280,000-square-foot Hewlett Packard manufacturing facility assisting in a wide variety of CAD-oriented space planning and facility design tasks. Service Bureau work of this type requires thoughtful scheduling of personnel, given its usual short, but intense time frame. This work is typically done on a time and materials basis, with hourly rates ranging from $40 to $70.

On a related front, a CityDesign senior associate with extensive medical facility programming and design experience is working with the software vendor on an enhancement to its CAFM base package slanted to the health care/medical market. In addition to participation royalties, this enhancement opens doors to new clients to whom the firm can offer more traditional planning, landscape, and architectural services.

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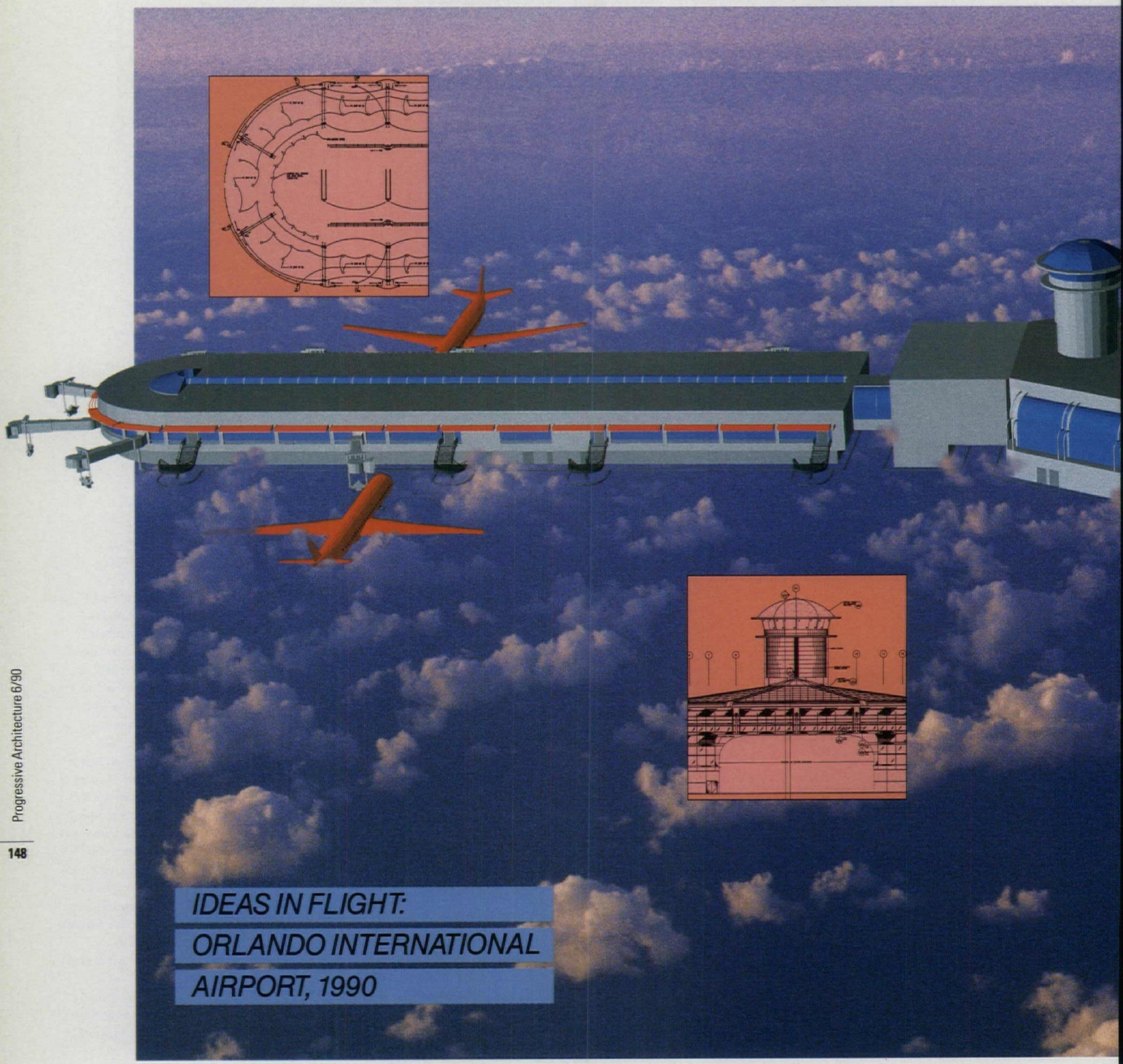

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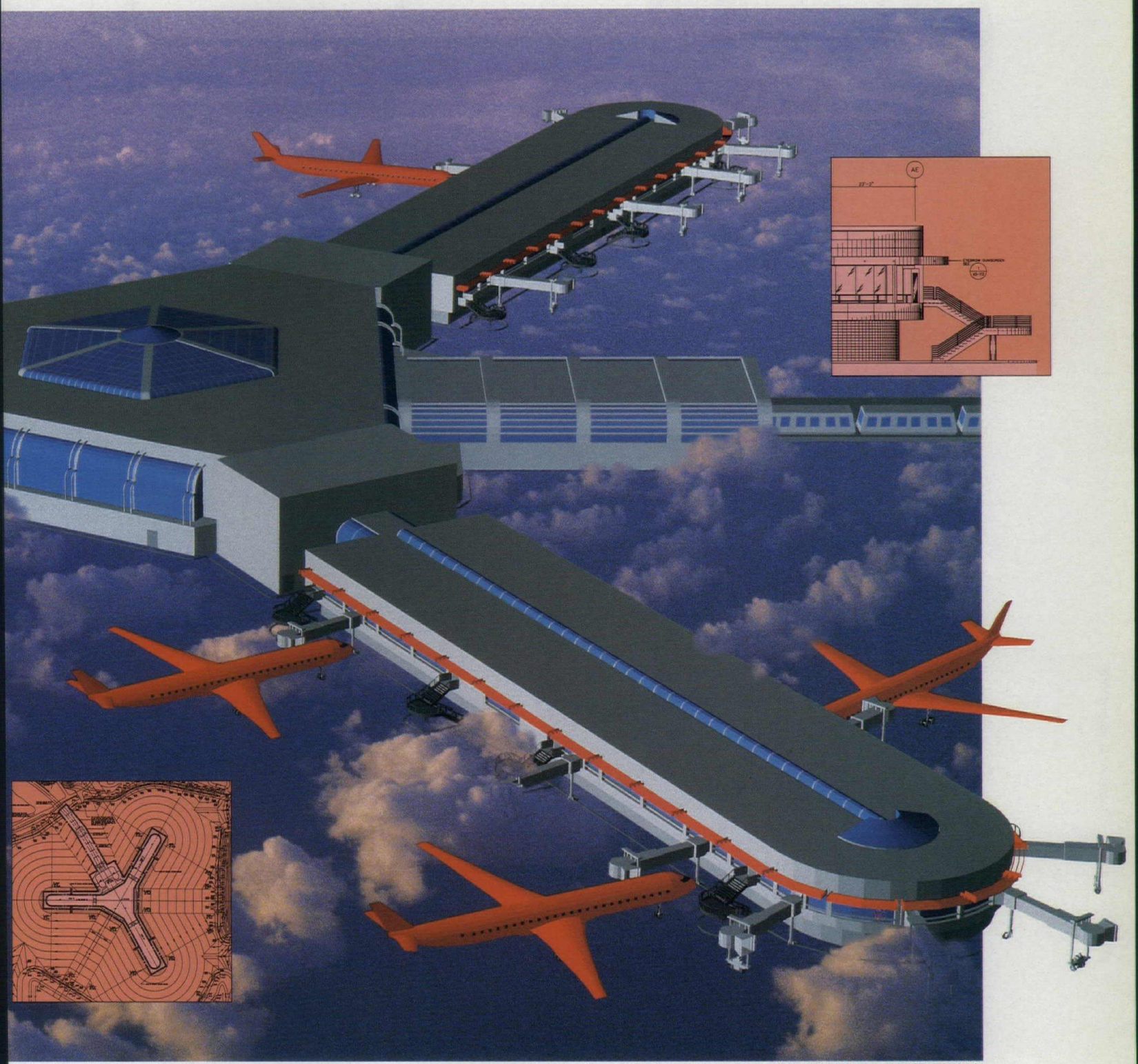

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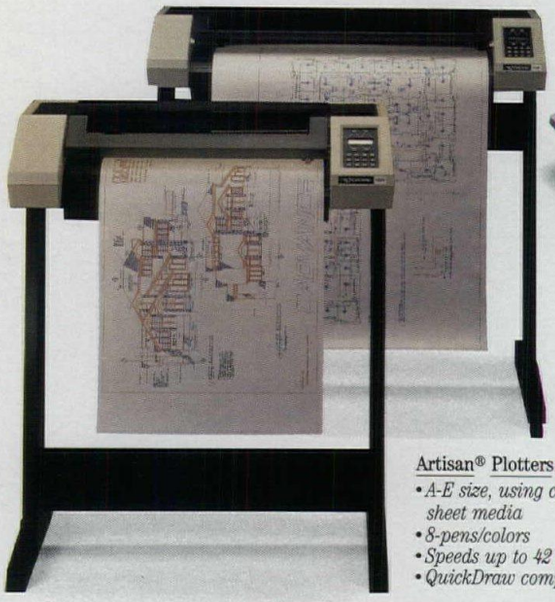

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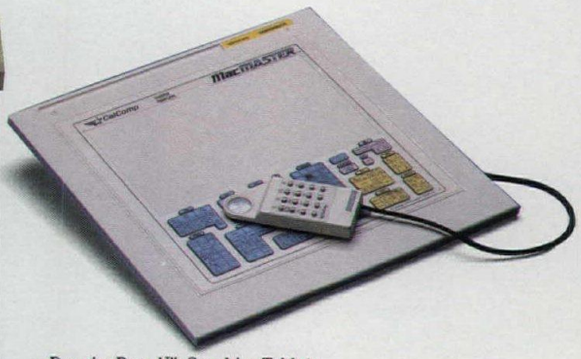

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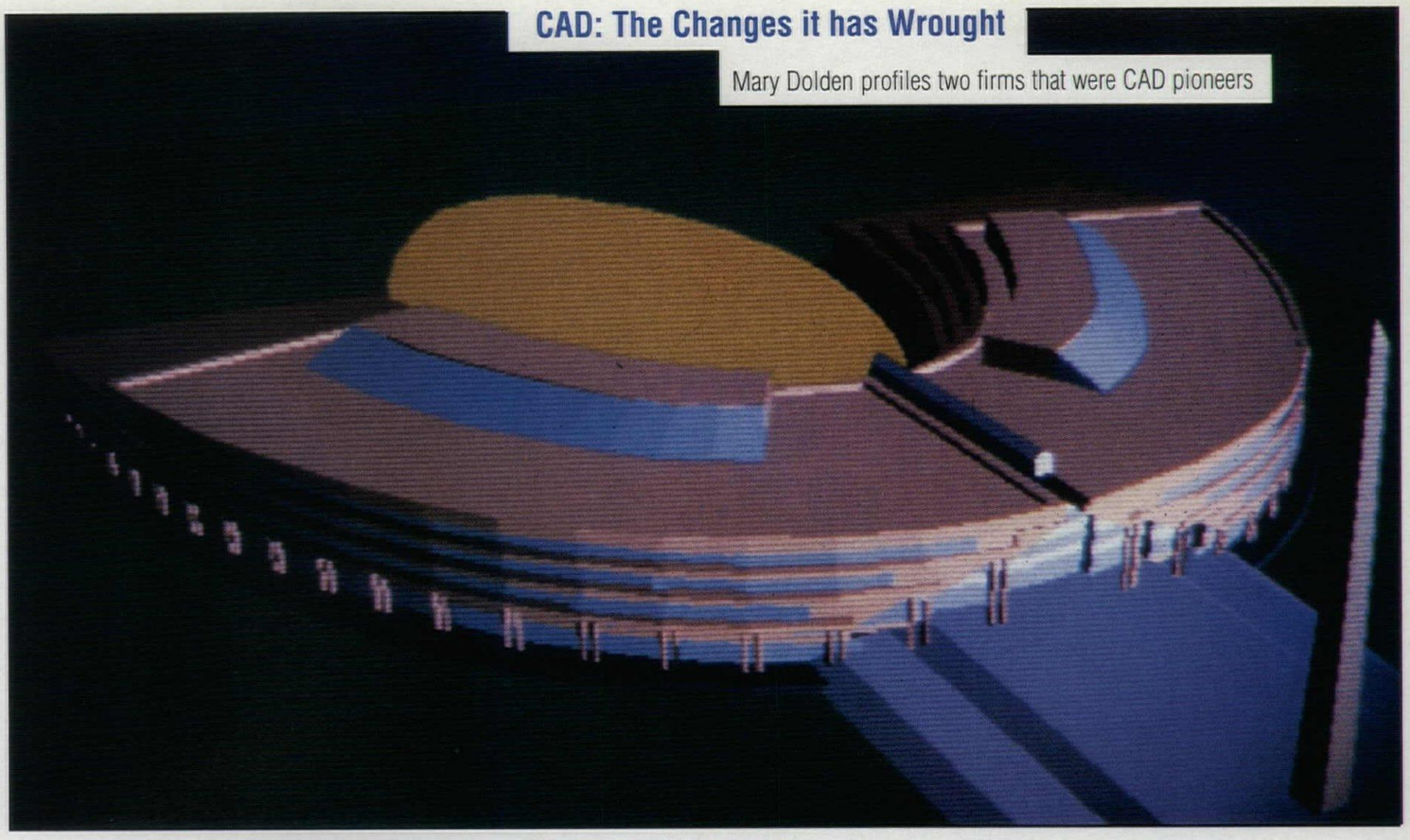
CAD: The Changes it has Wrought

Mary Dolden profiles two firms that were CAD pioneers



Above: Solid-model rendering of the Fairfax, Virginia, Fairfax Government center. This CAD model was generated by RTKL on an Intergraph VAX workstation.

Most principals of design practices that use CAD agree that it has changed the way they run their offices in a major way. While there is a surprising dearth of information on what exactly those changes amount to, the management of those offices where CAD has become an integral part of the design and production process acknowledge that it has had an impact on the organization of their firms. Ted Neiderman, principal of RTKL in Baltimore, describes his firm's 15-year relationship with the technology with a familiar ambivalence. "CAD is a tool, not a reason for being. In terms of this firm, it has had the impact that the automobile had on America — you can no longer imagine what your world would be without it. " That dependence has created both possibilities and problems.

A look at two very different firms that represent a relatively high degree of sophistication in CAD-based systems provides some insight into the potential, and the pitfalls, of integrating these technologies with individual practices. RTKL of Baltimore, Washington, Fort Lauderdale, and Dallas is a multidisciplinary firm of more than 600 people that has been in the business of architecture and engineering since 1946. Dyer/Brown & Associates, Inc. was established in 1969 in Boston's Financial District, has branch offices in New Bedford, Massachusetts, and London, England, and has a total staff of under 45 people. While the two seem almost too different to be helpful in an analysis of management and organization, they share the experience of pioneering in CAD implementation. Both firms were early in their commitment to CAD, both are heavily engaged in its ongoing deployment within their organizations, and both have reached a level of maturity in its use which is perhaps a direct reflection on their firms' having caught up to the technological advances that were made in CAD during the 1980s.

Most professionals acknowledge that once established within a practice, CAD significantly increases the firm's ability to do some things better, more accurately, faster — in short, productivity is increased. How to gauge the size of any such gain is the source of much scholarly debate and centers around the difficulties of measurement. As Dennis Still, Managing Partner of RTKL's Washington office and the partner in charge of that firm's computer operations, explains, RTKL knows that the workload has been increased significantly with the implementation of CAD, and at the same time the firm size has remained fairly stable. He also explains that the increases in direct work product are more easily seen in the engineering fields, where the differences in the transition from manual input to computer are easily detectable, and therefore measurable.

There is less question that CAD changes how certain tasks or procedures within the practice are accomplished, affecting the basic organization of the assigned design team. The alleviation of repetitious tasks and drafting drudgery is accepted. Less is known about what effect the procedures used to operate CAD as a system might have on the endurance and interest of professional staff members. As seen in the recent history of the two firms, as the technology became embedded, the way the firms functioned changed.

Leaps of Faith

RTKL's first effort to implement computer-aided design was in engineering, back in the mid-1970s. By the end of that decade, the firm was searching for greater graphics capabilities and was increasingly involved in the development of CAD systems. In 1981, with the relocation of their offices, came the opportunity to make a major commitment to CAD, and management decided to go for what Dennis Still calls "The Big Pop" — the sizable investment in a portion of the new facility to be fitted with a raised floor and equipped with an Intergraph, VAX-based CAD system that supported five workstations and a plotter. The dedicated-CAD group consisted of architects and engineers of all disciplines — structural, mechanical, electrical, and plumbing—who were trained in-house and worked within the centralized CAD facility. They started out initially working in one shift and then moved to two. At that time CAD was still thought of within the firm as a "limited" resource.

Four years later, with demand steadily increasing, the

dedicated group was dissolved, and a firm-wide training system was implemented and made available to "anyone who would or might use CAD on their projects." According to Still, RTKL currently runs a computer network that consists of three Intergraph VAXs, 25 workstations, and numerous personal computers as well as a DEC MicroVAX II, allowing the sharing of specifications and accounting systems data.

Dyer/Brown & Associates' early exploration into CAD was specifically based in architecture, not adapted from an engineering base. In the early 1980s, John Chouteau Dyer, Chairman and CEO, scrutinized the market and made a decision based on availability, affordability and, he admits, intuition. Dyer wanted a system that was oriented to architects—and found one in the SKOK system, developed by a South African architect, David Skok. The fact that the package would operate on stand-alone units not only meant cost savings, but evoked Dyer's appreciation for the small and portable.

The firm currently operates with nine workstations and uses the Drawbase software that has evolved out of the original SKOK system. The workstations in all three offices are networked and have access to the firm's accounting and time-analysis systems. While the CAD operations have never been physically segregated from the rest of the firm, within the Boston headquarters CAD stations are manned by a discrete group of both CAD operators and draftspeople and are located on a single floor. Only a few of the architects in the firm, including one of the firm's vice-presidents, Ron Swenson, actively work on CAD themselves. Swenson and the Director of Computer Operations, Ted Kelley, have been involved in the management of the CAD operation since it served as a Beta-site for SKOK/Drawbase in the mid-1980s.

Dyer/Brown's smaller operation creates a focused scenario for an evaluation of CAD's effect on its organization and development. The effects on the firm's bottom line directly attributable to the types of work supported by CAD were evaluated to determine what is best accomplished by using it. As a full service architectural firm specializing in commercial renovation and interior architecture and space planning, their experience is less complex than the multidisciplinary experience of RTKL. While the size of the firm and its resources for major investments in new technology may limit some choices, John Dyer believes that it has also allowed a degree of flexibility, executive involvement, and attention not necessarily available in a larger firm.

RTKL, on the other hand, seems to have come this far with a suitable degree of flexibility. The firm's master plan for CAD systems, which was first designed to reflect management goals with a horizon of five years, has been successful in its overall target, defined by Dennis Still, to make CAD available to all projects and disciplines, firm-wide. On a detailed planning level, Still realized that the plans specifying exactly how to accomplish this had to be based on yearly projections in order to keep up with changes in technology, the unpredictability of training and implementation, and available resources.

Maturity, Turn-over and Mucking About

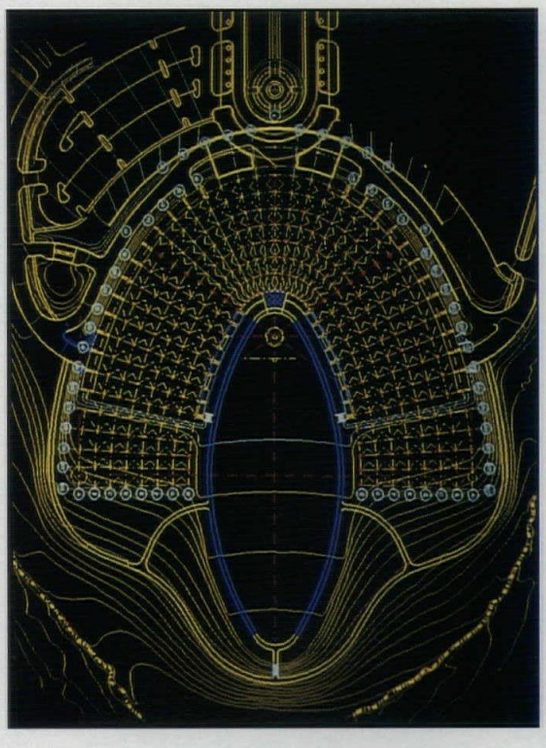
The current situation in each of the two firms shows that the presence of an operationally mature CAD system does not preclude continuing organizational change. Among management concerns affected by CAD are, for example, new job applicants now appearing with varying levels of skill — younger architectural personnel with training in CAD and current CAD-assigned staff who experience burn-out and/or dissatisfaction with CAD work and either complain, ask for a transfer, or leave. These personnel concerns have to be assessed in combination with such external factors as the rapid increase in the expectations and demands from clients for CAD files to be delivered along with conventional documentation at the end of a project. Marketing and business development also play a role in the assessment of value-added services, such as facilities management, that appear as opportunities but have major effects on the firm's capabilities and organization.

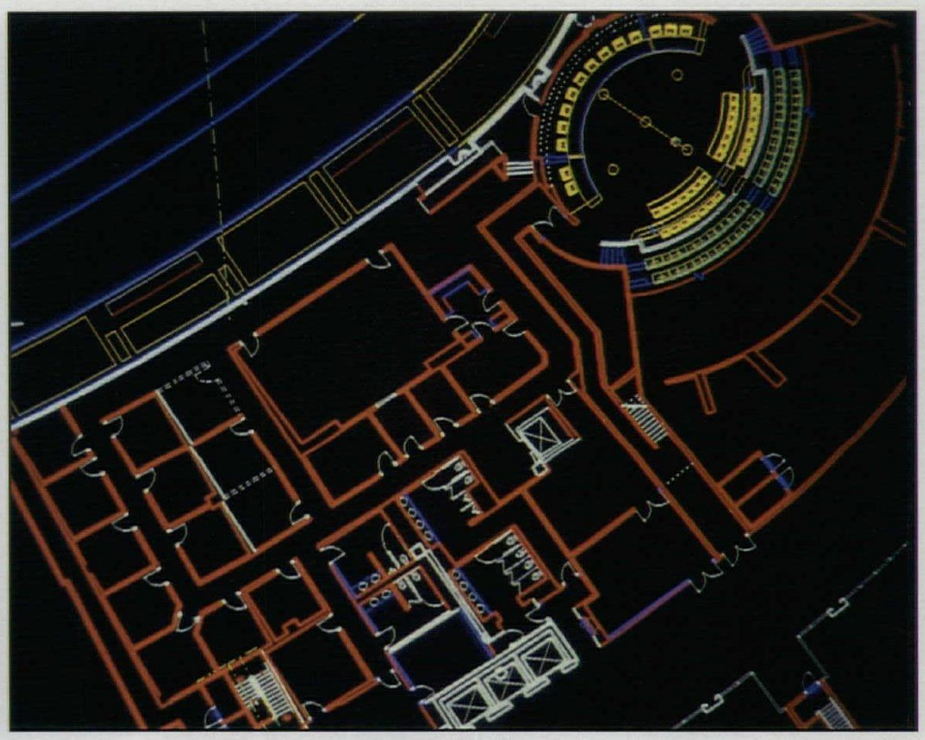
Dennis Still reports that RTKL has progressed to a point today where 100 percent of their structural engineering work, 85 to 90 percent of the mechanical/electrical, and 60 to 70 percent of the architectural is done on CAD. Not all projects are input on CAD, according to Still, because of the limited capacity of the system. But though he says that "If money were no object, we would have a computer on every desk," there remain limits to where CAD works well and effectively, according to both Still and Ted Niederman. Still maintains that efficiency rises along a chronological path of project phasing and that this is a factor in determining the priorities for assignment of a project to CAD. While CAD may be used by the architect to display an array of options during the schematic design phase, it is generally not until design development that CAD comes into play or is considered efficient.

As has been the case to date with most firms, the assignment of these more "efficient" phases to CAD — especially construction documentation — has resulted in project organization in which those assigned to the systems are likely to be working with a narrowly defined set of design tasks. Niederman worries that the people who prove themselves to be "CAD-proficient" tend to be abused by management because they are so much in demand. RTKL tries to keep those assigned to construction drawings on CAD to a maximum period of six months and then move them on to another assignment, where, as Niederman says, "They can deal with people."

The number of architects who have been well trained and who display an aptitude for the speeded-up requirements of CAD seems to be limited. RTKL's 50 to 60 percent of architectural staff working on CAD is a relatively static pool. According to Niederman, while there is some frustration in the knowledge that only a certain segment of the current staff will readily accept CAD training and do well with it, his expectation for the near future is that the percentage will not go much higher. Expensive training time is a use-it-or-lose-it proposition, he says. The real frustration is in training people well, only to lose them . However, with a growing influx of graduates with CAD training, he sees that, over the longer term, the balance of architectural staff may favor CAD-proficiency. This is especially true as the CAD-resistant staff turns over.

Dyer/Brown, too, has taken the approach that in order to use CAD most effectively, the application for it needs to be appropriate -- and where it is not, the firm freely uses traditional methods in combination with those that are supported by the computer. Nowhere has this been more evident than in Dyer/Brown's work with the developers of major downtown Boston office towers, and in the interior and build-out design of tenant space. The firm's approach to developer services included maximizing the efficiencies and accuracy available through CAD in area calculations and construction projections and was, at least in part, made possible by the use of the Drawbase database developed by and for them and made





Right: CAD-generated floorplans of the Fairfax Government Center by RTKL's Washington office. These drawings were generated using an Intergraph VAX workstation.

accessible through a customized spreadsheet program.

The Dyer/Brown London office was opened in early 1989 to take full advantage of the firm's recent experience in downtown Boston. The British market, with an immense curiosity in, but relative naïveté about CAD, has proved favorable to the firm's approach to design supported by computer technology. The Boston office serves as the main computer center, and drawing files are sent back and forth by modem, stretching the working day on both sides of the Atlantic and, again, maximizing the available, but limited, computer resources.

As Dyer describes it, CAD probably imposed a much more formal hierarchy on the firm back in the mid-1980s than it had ever had previously. At that point, he reflects, everyone from design architect to principal was trained in, and did, everything from schematics through working drawings. The old structure was pretty horizontal, as he recalls it. With CAD, the linear progression implicit in information processing is much more evident. "It has forced us to get organized; we can get away from the mundane and do some real work, we deliver a more accurate product, and we are capable of doing that at a scale a firm this size couldn't otherwise manage."

The organization of the firm reflects the orientation and emphasis on CAD capabilities. Where CAD is frequently a major component of any architectural firm's systems, in the case of the administration and operational systems at Dyer/Brown, the CAD system sets the marching orders. Fully networked, the procedures built in simply "do not allow any mucking about" in the vital organization of information stored there, says Dyer.

The Future: Geometry and A Terminal on Every Desk

While not a new concern, the shortcomings of CAD in the area of creative design are still a stumbling block to many. Niederman feels that the presentation capabilities of CAD that are within their grasp today don't quite measure up. Though impressed by a recent CAD rendering technique developed by SOM and IBM and on display in April at the National Building Museum in Washington, Niederman says that his firm tends to spend too much time on CAD-generated perspectives, wire diagrams, and so on, which clients don't respond well to. They are not equivalent in value to a scale model "that a client can walk around, and touch." It appears that CAD still has a ways to go towards capturing the hearts of many of the design-oriented.

John Dyer believes that CAD should be an immediately available, but sacred, resource to the entire design staff in the firm. In a case in which the CAD data base has been developed as a highly ordered and mightily protected source, where "the design architects and the word processing staff are not allowed to go mucking about," he is convinced that the day will come when the architects will be given access to and training to use the tools of CAD. But the actual workings of the systems will remain a "very disciplined base of operations."

Where the cost for RTKL may be simply too high to have a terminal on every desk, it is within the realm of possibility for firms of Dyer/Brown's size. The advantage these two veteran firms seem to have is a foreshortened view of the consequences of implementing CAD as an integral component of the organization of a firm.

RTKL has pushed the use of CAD and effected a change in design management because of its use. Buildings with extremely difficult geometries, such as the horseshoe-shaped Fairfax Government Building in Virginia, could be designed within a prescribed time frame because of the firm's CAD capabilities. On an organizational level, this seems to signal a time which profound change may be in the works.

Mary E. Dolden ■

The author is a writer and independent consultant to design and architecture firms. She is based in Cambridge, Massachusetts.

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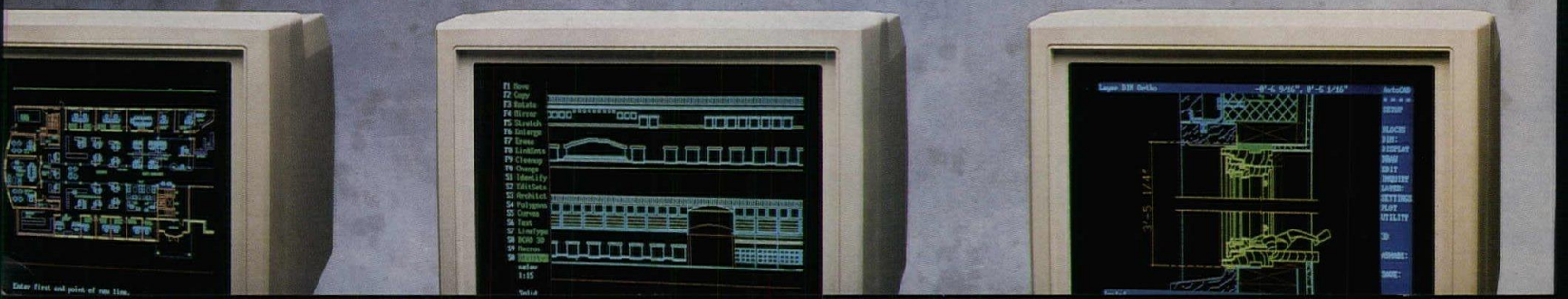

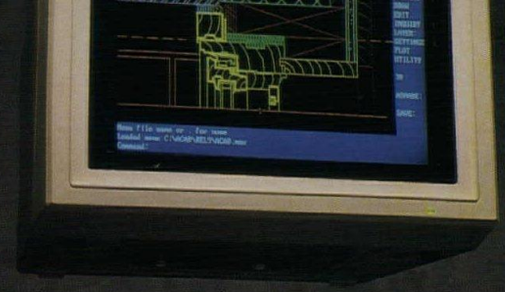
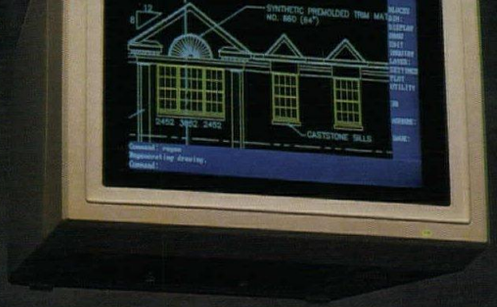
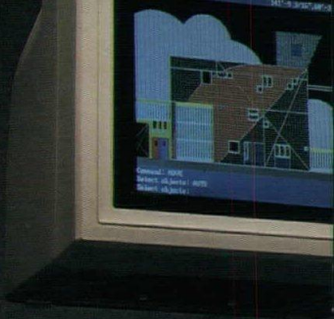
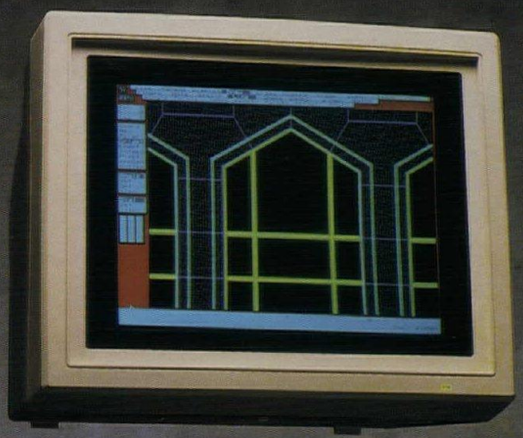

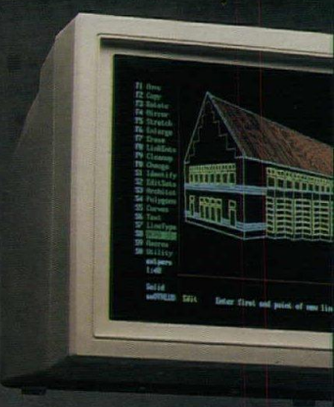
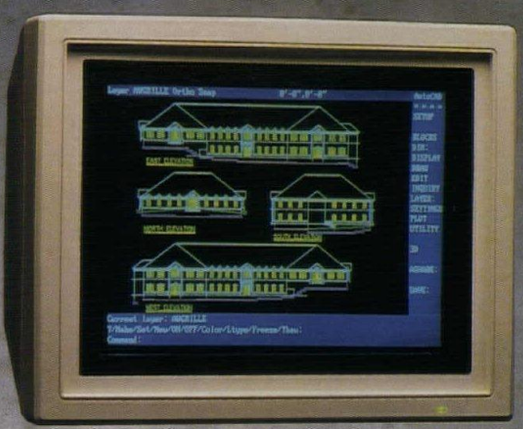


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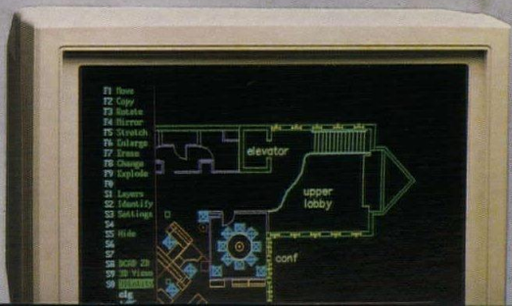

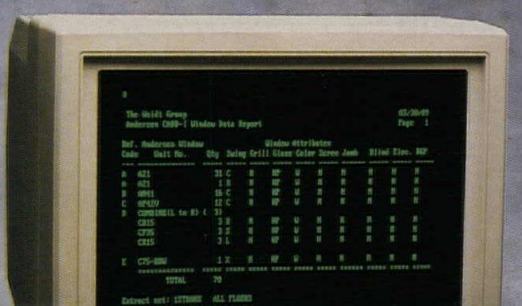


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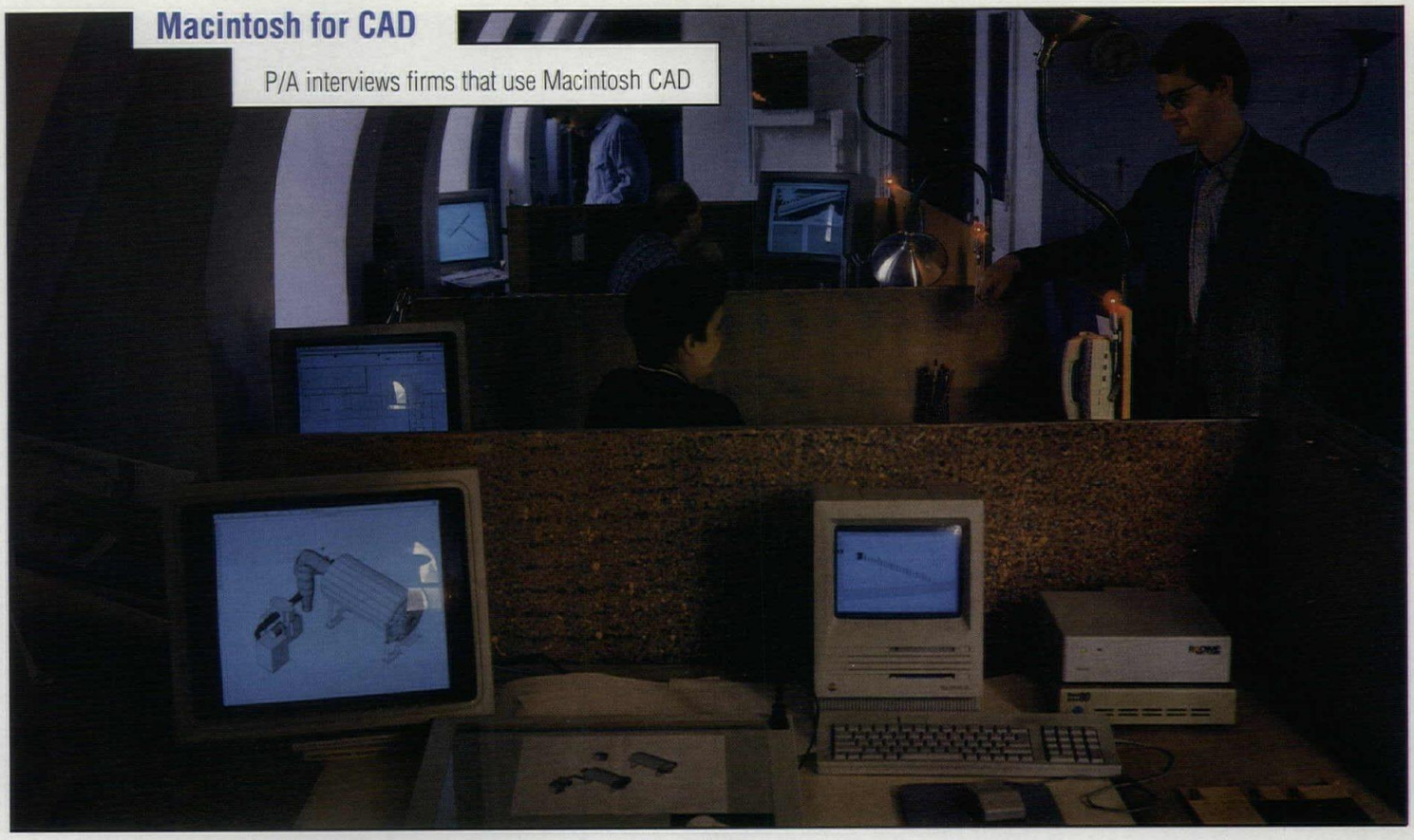
Macintosh for CAD

P/A interviews firms that use Macintosh CAD



New York City firm Kiss, Cathcart & Anders has 11 employees and 11 Macintoshes. They currently produce all drawings on the Macintoshes connected by a Tops network using MiniCAD+.

Apple's Macintosh computers have revolutionized graphic design on desktop computers with desktop publishing, drawing, and painting applications. In the past year, new innovations in architecture-specific CAD software packages for the Macintosh have made it a viable tool for architectural design and drawing production. P/A visited architectural offices ranging in size from 1 to 225 employees that currently use the Macintosh for CAD. These firms design everything from furniture to high-rise office towers; with their Macintoshes they create drawings that range from conceptual sketches to photorealistic renderings and animation. Because the Macintosh interface makes it possible to design a building in one program, render it in another, place it into a desktop-publishing or word-processing document, animate it, or keep it in a database, the range of computer-aided design possibilities with the Macintosh have reached a level of technology that previously cost too much to be attainable bymost offices.

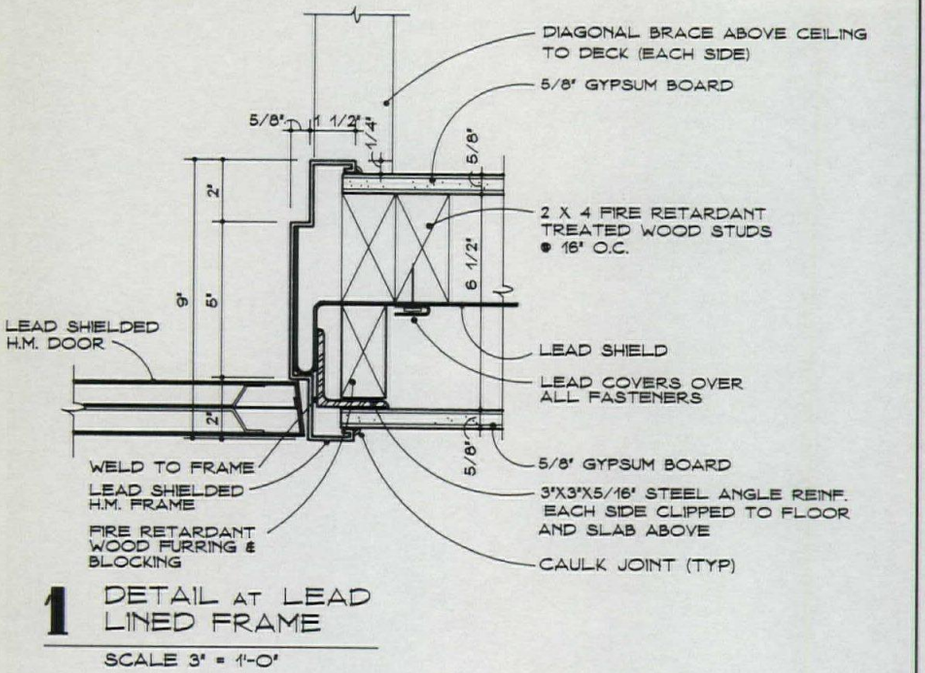
Compared to the cost of these services in the past, Macintosh workstations and software seem cheap (hardware systems suitable for CAD range from about $3000 to more than $10,000, and 2D/3D software can cost as much as $4000), but it is still a hefty capital investment. The people we interviewed were discouraged by the cost but felt that the unique graphic orientation and ease of use made the investment worth it. Peter Shelton, principal of Shelton Mindel, New York City, had the foresight to buy stock in Apple when the Macintosh was introduced. That investment paid for the setup they have today (one Mac II with Architrion II and several SEs).

Why Macintosh?

Of the firms interviewed, most had been using Macintosh CAD less than two years—even the firms that have had Macs in the office since the first version was released in 1984. John Petrarca, principal of the New York City firm Architecture + Furniture, started his firm the same month that the Macintosh was introduced. "It was simple when we were simple," he explains. He thinks that it would be more difficult for a firm starting with the Macintosh today because the applications have become increasingly more complex. A+F has been using Macintoshes to run the business side of the practice for years (all of their stationery, including checks, is laser-printed in the office). Only in the last six months have they begun to use Graphisoft's 2D/3D ArchiCAD for all phases of architectural projects. Although they have been using 2D packages for awhile, ArchiCAD is the first package that they feel is easy and powerful enough for them to use for everything. Many of the firms we talked to purchased Macintoshes for the first time in the past year because the software, particularly the high-end 2D/3D packages ArchiCAD and Architrion II, was available on no other platform. Randy Maxwell of Spencer & Maxwell, a Pensacola, Florida, firm, picked Architrion II for its "design- oriented concept," a feature that he felt no other PC CAD drafting package had. Geoffrey Coleman, principal of Arthur A. Bernadon Associates in Kennett Square, Pennsylvania, had been looking at CAD packages on various platforms since 1982. He narrowed his choice to Architrion II and ArchiCAD because he felt that these two packages were the only competent 2D/3D programs around. Ultimately, he decided that ArchiCAD was easier to use.

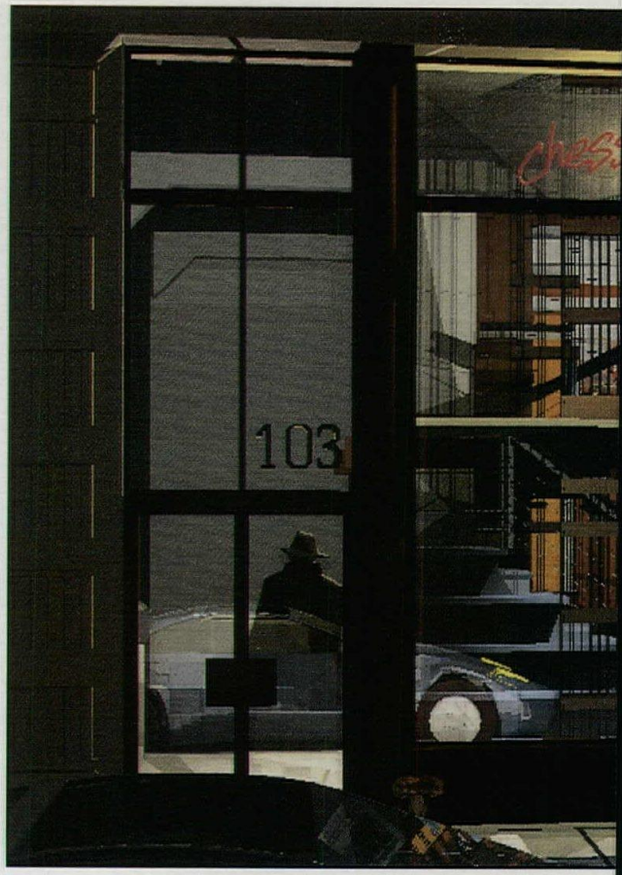
Others, such as William McDonough Architects, New York City, chose the Macintosh first and the software later. Associate Joseph Vance remarks that they wanted a system that would not intimidate the architectural staff, but could take advantage of the latest CAD technology. Even though the office has had a few PCs for several years, they were never fully utilized. Another firm that picked Macintosh for its non-threatening user interface is Fleck and Lewis Architects of Hanover, New Hampshire. The firm felt pressure to buy a CAD system from clients. With ArchiCAD and the Macintosh, the office was able to make the transition to CAD without special training.

Shelton Mindel had Macintoshes, but not CAD, when they were being considered to design the new Ralph Lauren Polo store in Manhattan. When the client asked whether the office had CAD, they replied "of course." When the word came on



1 DETAIL AT LEAD LINED FRAME

SCALE 3" = 1'-0"



Macintosh CAD Architectural Applications

2D Drawing :
Claris: Claris CAD, $899.
Engineered Software: PowerDraw, $795.
Generic CAD: Generic CAD level I, $195; Generic CAD, $595.
Graphsoft: Blueprint, $449.
Innovative Data Design: MacDraft, $269; Dreams, $500.

2D + Spreadsheet:
Aperture Technologies: Aperture Visual Information Manager, $795.
Graphsoft: MiniCAD +, $795. (includes 3D Capabilities)

3D/2D + Bill of Materials:
Gimeor: Archtrion, $3500.
Graphisoft: ArchiCAD, $3950.

CAD from other platforms:
AutoDesk, AutoCAD, $3000
DCA Engineering, AutoArchitect (runs with AutoCAD), $995.
GEOCAD, GEOCAD (runs with AutoCAD), $800.
Intergraph, Microstation Mac, $3,300.

3D Modeling:
Dynaware: DynaPerspective, $1495
ParaComp: Modelshop, $595

See Manufacturer's Listing (page 170) for more information.

a Thursday that the potential client would visit the office the next Tuesday, principal Peter Shelton called the software manufacturer Gimeor and ordered Architrion II, "rush." On Saturday, they had a new Mac II with the software installed, and Shelton was taught the basics in one day. By Tuesday, the firm had existing condition drawings (in 3D), and had begun some preliminary design ideas. They got the job.

The 2D Drawing Packages

2D drawing packages like Claris CAD and PowerDraw adhere to a MacDraw-like interface with graphic "icon" drawing tools. The 2D Macintosh CAD packages designed specifically for architects and designers combine the simplicity of MacDraw with powerful handling of geometry, a wider range of line weights and drawing tools, and architecture-specific symbol libraries. Aperture, a 2D "visual information manager" combines a powerful database with drawings (this makes it ideal for facilities management). Robert Coolidge, architect and Macintosh consultant in Guilford, Connecticut, observes that the 2D programs are cost-effective for most CAD functions. "You can do 90 percent of your drawing on a package that costs less than $1000 — it does not always make sense to spend another $2000-3000 for the extra 3D capability."

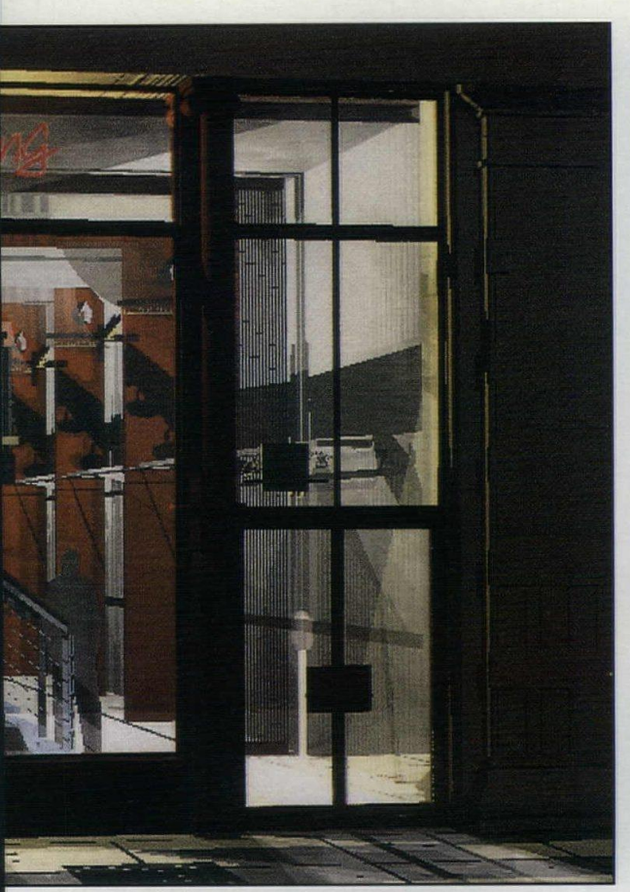
3D/2D Packages Unique to Macintosh

The introduction of both Architrion II and ArchiCAD in the United States have revolutionized CAD uses for architectural design on the Macintosh. Because both packages allow the definition of lines in three dimensions, it is possible to instantaneously generate wire-frame axonometrics or hidden-line perspectives. Both programs offer similar features, and choosing between them is a matter of personal preference. Architrion II/series 5, originally developed in France, has a wider base of United States users than ArchiCAD and offers shade and shadow rendering. Architrion also allows the editing of drawings in section. (In both packages, primary development of spaces is in the plan view). Although it is not possible to edit ArchiCAD drawings while viewing the section, the seamless integration of 2D, 3D, and spreadsheet modules make the program more efficient than Architrion II. The addition of a Geometric Description Language (GDL) to ArchiCAD allows for user customization of drawing modules. Joseph Vance of William McDonough Architects used this feature to design an airport roof in the shape of an aircraft wing (with curved surfaces on both the top and bottom). This would have been a difficult maneuver on any other desktop CAD system. Architrion has recently added a new module to the program: ArchiMovie, which will animate the light source or viewpoint of a perspective. (This creates dynamic shadow studies and walk-arounds.)

One package that falls between the 2D and the 3D packages is MiniCAD+ by Graphsoft. This package can extrude 3D drawings from 2D plans and elevations and can cast perspectives, but the coordination of these views is not instaneous. Priced at $795, it is a bargain compared to the high-end packages. It also offers a spreadsheet, a macro-programming language, and the ability to edit drawings in any view. MiniCAD's link to StrataVision, a photo-realistic rendering package, makes it a stunning presentation tool. The New York City firm of Kiss, Cathcart, & Anders uses MiniCAD+ for all of their architectural work. What MiniCAD+ lacks is an architecture-specific interface; it is a general purpose CAD package like AutoCAD or Intergraph that is used by engineers and industrial designers as well.

Software Developed for Other Platforms

AutoCAD, VersaCAD and Intergraph (Microstation Mac) are now available on the Macintosh platform. They are preferred by architects who want compatibility with software on other systems and those who have become accustomed to the software on another platform. AutoCAD and the third-party applications (such as GEOCAD) work virtually identically to their PC-based counterparts. Intergraph's Microstation Mac, on the other hand, has adopted an entirely new, and very Mac-like, interface for the Macintosh version, while still



Detail of GEOCAD output (left): the variety of line weights, fill patterns, and plotter fonts available with this software package create drawings that appear to be hand drawn.

Rendering of a storefront by Kiss, Cathcart, & Anders (center). The perspective was modeled in MiniCAD+ and then transferred to StrataVision for materials rendering.

Perspective by Randy Maxwell of Spencer & Maxwell (right), Pensacola, Florida, created with Architrion II/series 5.

retaining the powerful networking capabilities of the original system. Steven Sang, principal of Media 5 Architects, Honolulu, Hawaii, claims that Microstation Mac is the best version of Intergraph on any platform. He notes that Intergraph is planning to incorporate its Mac-interface features on other operating systems.

Macintoshes in Practice

Of the firms interviewed, those that use the Macintosh-based 2D/3D packages use them primarily for conceptual design and visualization, whereas users of other platform-based packages and some 2D packages use them primarily as drafting/production tools. Although, technically, the 2D/3D programs can handle all stages of design and production, medium-sized firms find it more cost effective to devote one station with ArchiCAD or Architrion II to 3D design only. John Petrarca laments that ArchiCAD, at $4000 per package, is too capital intensive to use for drafting that can be done with less expensive computer equipment or by hand. Shelton Mindel does all their design work on Architrion and collaborates with another architect who does working drawings on a PC with AutoCAD.

Firms like Hans Knutson Associates, a New Jersey firm which uses AutoCAD and GEOCAD on their Macintoshes, use the system primarily for production drawings. The firm specializes in the design of television broadcasting stations and requires the compatibility with the television industry, which uses AutoCAD as a standard. With a DOS "super drive" installed in his Mac IIci, C. Stanley Ellington, associate of Hans Knutson, converts his drawings to a format that his PC-based engineers can work with.

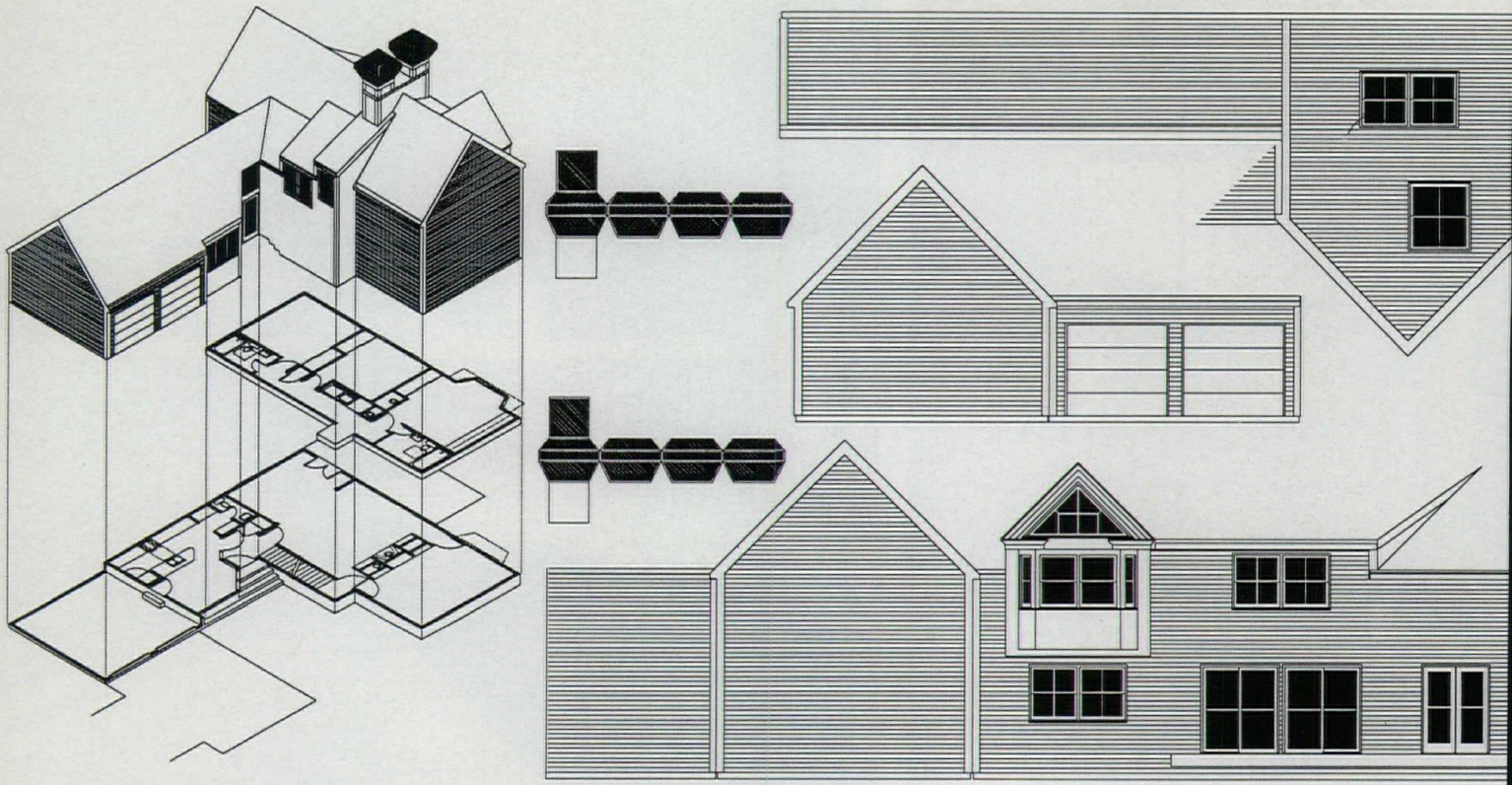
We talked to two firms that use AutoCAD with GEOCAD on the PC's and found that they use their stations in a similar way. Like software for the Macintosh, the GEOCAD interface is simple to learn and operate without computer knowledge. As such, it provides one PC production alternative with the same short learning curve that the Mac offers. Peter Hughes, associate of Perkins Geddis Eastman recalls that one architect in his office taught himself the program on the PC after work. Rudolph Horowitz, architect/developer of GEOCAD, feels that the PC version of the program runs faster than the Macintosh version, but users like Ellington appreciate the Macintosh's ability to run multiple applications.

The firms that used Macintosh in every stage of all projects were small (no more than 12 employees). Douglas Anawalt, in his own office in San Anselmo, California, uses Architrion for everything. He starts with 3D massing studies until he and the client are satisfied and then moves to Architrion's 2D module (ArchiDraw) to do production drawings. He finds ArchiDraw in Architrion II/series V to be "quite powerful and flexible". Other users have favorably compared the program's ability to handle 2D geometry to the PC-based systems. Robert Coolidge's one-man, one-Mac office in Guilford, Connecticut, uses PowerDraw for 90 percent of his CAD needs. Although he sometimes uses Archtrion II for 3D modeling, he often finds clients prefer cardboard models of their projects (mostly single-family residences). He combines 2D views in PowerDraw to create cut-out-and-paste models from his laser printer.

New Abilities

When asked what changes had occurred in their offices' production schedules since the introduction of Macintosh, most said that it hadn't saved them time in the generation of drawings, but it did simplify revisions. More importantly, the Macintosh gave the offices capabilities that they had not previously had, such as the ability to generate multiple perspective views rapidly, to create renderings and animation, and to track building information for facilities management.

The special capabilities of Macintosh software have given firms a competitive edge that helps them win and keep jobs. Architecture + Furniture won one bid when they presented the potential client with their ability to create multiple perspectives in ArchiCAD. John Lin, the office's principal CAD user, remarks that it is easier to sell a client on a project if they can be shown perspectives, rather than plans and elevations,



Robert Coolidge, a Connecticut architect/Macintosh consultant, created these two view s of a house by combining several 2D views into one drawing with PowerDraw. For the exploded axonometric (left) he used the "shear" command on plan and elevation drawings. For the fold-up model (right), Coolidge combined several elevation views; he then prints these "pieces" on colored cardstock that he cuts out, folds-up, and pastes into a cardboard model.

of their proposals. (A+F videotapes a series of perspectives on the computer for their clients.) The firm, which designs and orders furniture as well as designing interiors, collects data generated on a project into a visual database with SuperCard. In addition, they videotape images of furniture, fabrics, and even personnel to create comprehensive electonic facilities files. They have convinced at least one of their clients to buy a Macintosh to run the program they created. A service like this will enable A+F to retain their client for years beyond the initial design and installation.

Kiss, Cathcart, & Anders discovered that the spreadsheet feature of MiniCAD+ enabled them to offer facilities inventory and management services for industrial clients. Once KCA has created a database/drawing for a site, it is possible for them to model a number of proposals quickly to provide optimal solutions for clients. This ability to create and maintain a space database made the office's proposal irresistible to at least one client.

On- and Off-screen

The Macintosh users we talked to raved about the quality of graphics on the screen; most, however, were disappointed in the print-out technology. To date, there is no desktop color-output machine that can reproduce images with the quality of screen images. Most offices are satisfied with plotter output for line images, but a few are looking for alternatives. Kiss, Cathcart, & Anders, unhappy with the look of pen-plotted sheets, prints all of their drawings on letter-size "tiles" and scotch-tapes them together. They argue that laser prints are much crisper than plots and allow them to use any style of lettering. This procedure also simplifies updates by only requiring them to reprint those sections of the drawings that have been altered.

On the Macintosh, it is possible to import most CAD drawings into desktop publishing programs to create client presentations or promotional brochures. Plotmaker, a new software package from Graphisoft (which is included with the purchase of ArchiCAD), creates a "paste-up" board on which architects can design the plotted page, combining any number of drawings (from any Macintosh CAD, paint or drawing program), text, spreadsheet, and data files. This is a truly useful tool for creating presentation boards.

Ronald Lubman, principal of ADL Associates in Woodmere, New York, uses the Macintosh's intra-software exchange of drawings to create elaborate presentations. He first designs in three dimensions with Architrion II. Drawings created in Architrion II are able to convey intricate building geometries quickly. Although Archtrion is able to produce color images with shade and shadow, he transfers drawings to SuperMac Pixelpaint for texture rendering, and finally to an animation program to create a "slide show" of images. Currently, he is experimenting with sound modules (the Macintosh's digital reproduction of sound allows a variety of realistic sound) to add music to his presentations.

Gregory Kiss of KCA uses the link between StrataVision and MiniCAD to give a near-photorealism to 3D images created in CAD. With StrataVision, he defines the surface material and color of each object and all sources of light. The computer calculates the effect of reflection of each ray of light to generate an image. A major drawback to this kind of rendering is that it can take a Macintosh IIci more than six days to calculate an image. For a print of the image, a service bureau is able to make a color ink-jet printout that can be expensive but comes pretty close to the image on the screen.

Flexibility to design in any view, color, or dimension allows the architect to use the desktop computer as a design and production tool in ways that were not considered possible only a few years ago. The Macintosh has brought graphic capabilities to architectural offices that previously took time away from the design of buildings. Without exception, the architects we interviewed were enthusiastic (some bordering on passionate) about their Macintoshes, and are develeoping a Macintosh design culture among themselves.

Julie Meidinger ■

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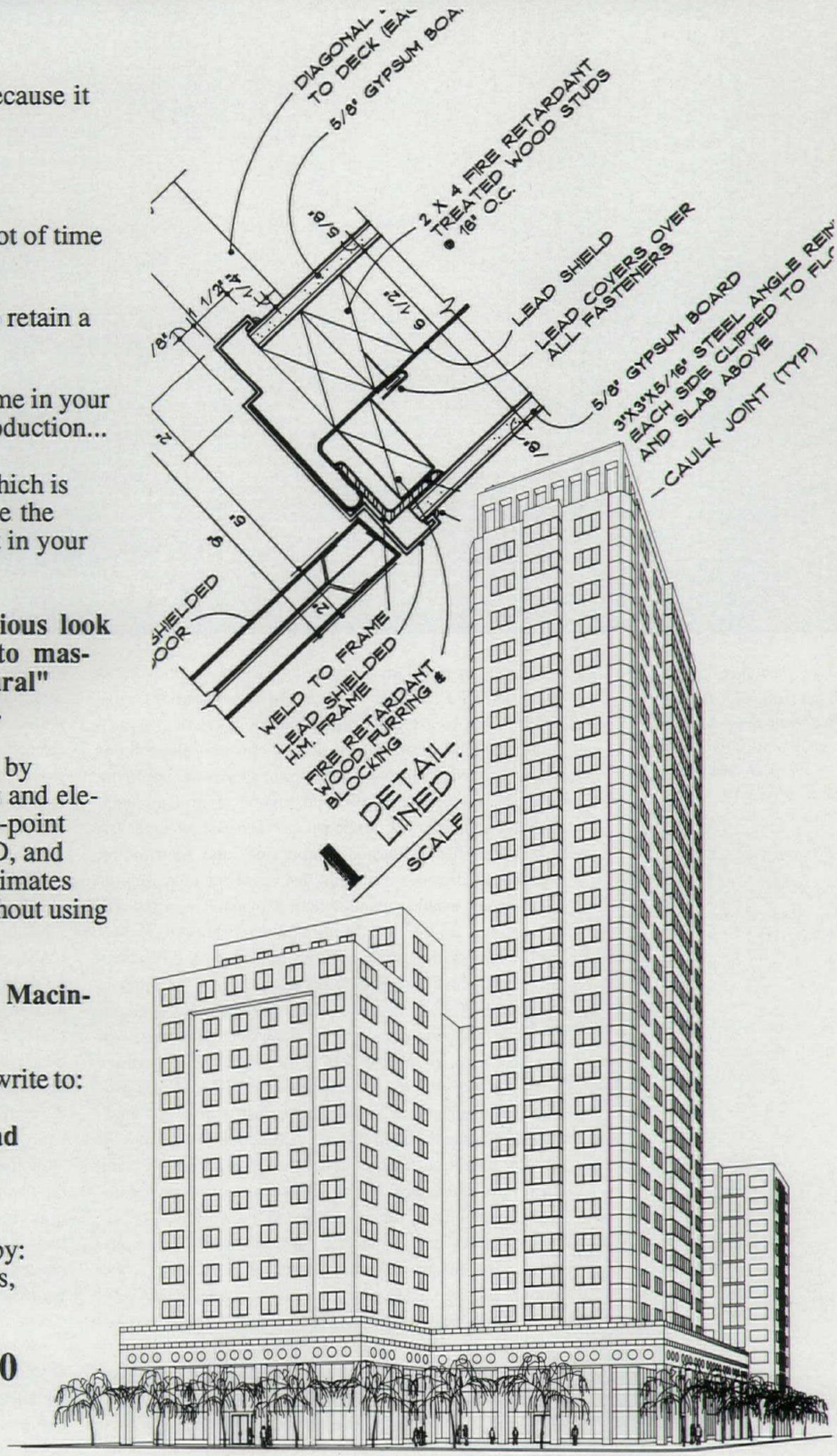

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CAD-CAM

Michael Chusid discusses the potential of computer-aided manufacturing in the building industry

CAD-generated brickwork detail for the Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champagne designed by Smith, Hinchman and Grylls.

Computer-aided manufacturing (CAM) is the use of computerized systems to help manage manufacturing operations. CAM encompasses techniques such as numerically controlled fabrication (in which geometric coordinates control automated cutting tools or other machines similar to the way a CAD plotter works), automated control systems, robotics, and programs for production scheduling, inventory control, quality assurance, accounting, and information management. Proponents claim that CAM can increase productivity and enable a manufacturer to respond more quickly to changing conditions. In an automated factory, for example, information about a firm's resources and products may be stored in a common database. When an order is entered, the CAM system would help the people operating the plant to schedule the flow of materials and resources in coordination with other orders in the shop, notify suppliers when materials or components must be delivered, and provide cutting, batching, or assembly instructions for automated equipment. In addition, CAM could be used to help monitor operations and make necessary adjustments. This "factory-of-the-future" is already operating, to varying degrees, in manufacturing plants around the world.

CAD-CAM is the logical connection between the computer aided design (CAD) system used in the design of a product and the CAM system used in its production. CAD-CAM allows design data to be used directly in the manufacturing process. For example, the same dimensions used to draw a product can be used to drive a numerically controlled machine tool. In addition, CAD-CAM can make it easier for a designer to incorporate manufacturing considerations, such as the availability of critical resources, into design decisions.

There is a widespread assumption, based on the differences between "real estate" and "personal property," that construction is so different from manufacturing that management techniques used in one may not apply to the other. But since the dawn of the industrial revolution, construction has been successfully borrowing ideas from manufacturing. As early as 1851, for example, Joseph Paxton employed basic manufacturing techniques such as standardization and assembly lines to the design and construction of the Crystal Palace. More recently, manufacturing concepts such as critical path scheduling and just-in-time delivery have moved from the shop floor to the job site. The time has come to appraise manufacturing experience with CAD-CAM to apply its benefits to construction.

AEC opportunities for CAD-CAM

The difference in the structure of the construction and manufacturing industries creates the first hurdle for CAD-CAM in the AEC world. In the manufacturing environment, marketing, design, engineering, purchasing, and production all take place within one corporate structure. But in building, separate corporate entities — developers, architects, suppliers, general contractors, sub-contractors, etc. — are each responsible for separate facets of the total process. In reality, the conflicting departmental concerns within many industrial firms are just as hard to coordinate as the fragmented construction process. And like architects trying to coordinate their work with facility managers and consultants, manufacturers must integrate their CAD-CAM systems with those of their customers and suppliers. But before CAD-CAM can reach its potential in architecture and construction, the building industry needs to establish information protocols so data can be freely passed throughout the building team.

A simple first step towards CAD-CAM would be for designers to distribute construction documents to bidders and contractors on electronic media. This could allow contractors and suppliers to extract information from the design documents more efficiently and will become increasingly attractive as architectural drawings evolve into intelligent graphic databases. Unfortunately, liability concerns about claims for erroneous data may prevent most architects from venturing into this area of expanded service. Large building owners, who stand to gain the most from increased construction productivity, may have to take the lead and insist upon the sharing of electronic data.

A seminal example of CAD-CAM communication between a building designer and builder is the new Beckman Institute for Advanced Science and Technology at the University of Illinois at Urbana-Champaign designed by Smith, Hinchmann & Grylls. The building is clad in intricate patterns of colored bricks produced in special sizes and shapes. The architect's CAD drawings went beyond the customary elevation drawings to provide detailed layouts for each brick pattern and special condition. Because of the time and cost to draw brick details manually, in the past an architect may have provided only minimal drawings and left the mason to figure out coursing in the field. CAD-CAM gave the designer better control over the building's appearance and provided the contractor with easy-to-follow installation requirements and more accurate information about quantities and dimensions.

Another area of CAD-CAM innovation has been the sharing of electronic data between architects and building product manufacturers. New computerized tools are being developed that will link an architect's design vision directly to a producer's manufacturing operations.

CAD-CAM will enlarge the size of the architectural palette. Rather than manufacture large quantities of uniform products to be put into inventory, many producers now find it more economical to manufacture on order and are switching to more flexible manufacturing systems. This trend, together with CAD-CAM integration, will enable custom-produced building materials to be more economically manufactured in smaller quantities and with shorter lead times.

Lead time will also be reduced because CAD-CAM systems will simplify project administration. For example, shop drawings are now required for a manufacturer to demonstrate his understanding of the architect's construction documents. But if the construction documents were produced using software supplied by the manufacturer, the need for shop drawings might be reduced or even eliminated. Electronic data exchange between designers and manufacturers will mean simplified order-entry procedures and faster quantity surveys and bidding. A unified database of design and product information can also expedite construction.

The immediate future

Consider the following CAD-CAM examples which are already available or under development:

A pre-engineered building system manufacturer provides its dealers with an interactive design program. The program allows dealers to quickly evaluate design and structural options and takes clients on fully animated video walks through their proposed buildings. The dealer's electronic file is then transferred directly into the manufacturer's production schedule for fabrication.

A floor covering manufacturer is developing a program that can be used by interior designers to design custom patterns and color combinations. In addition to encouraging design experimentation, the software will enable designers to insert their design into a 3D CAD visualization program. The custom design data will then be used by the manufacturer to fabricate actual samples in far less time than is currently required to manually program special production runs.

System furniture manufacturers offer design programs that prepare electronic bills of material for direct order entry. The program also assigns each component in a project an ID number. When components arrive on the job site, they are bar coded to assist the contractor with assembly and the owner with inventory control.

Techniques similar to desk-top publishing are being developed to offer designers unprecedented abilities to create ornamental treatments that can be economically produced by numerically controlled graphic and milling machinery.

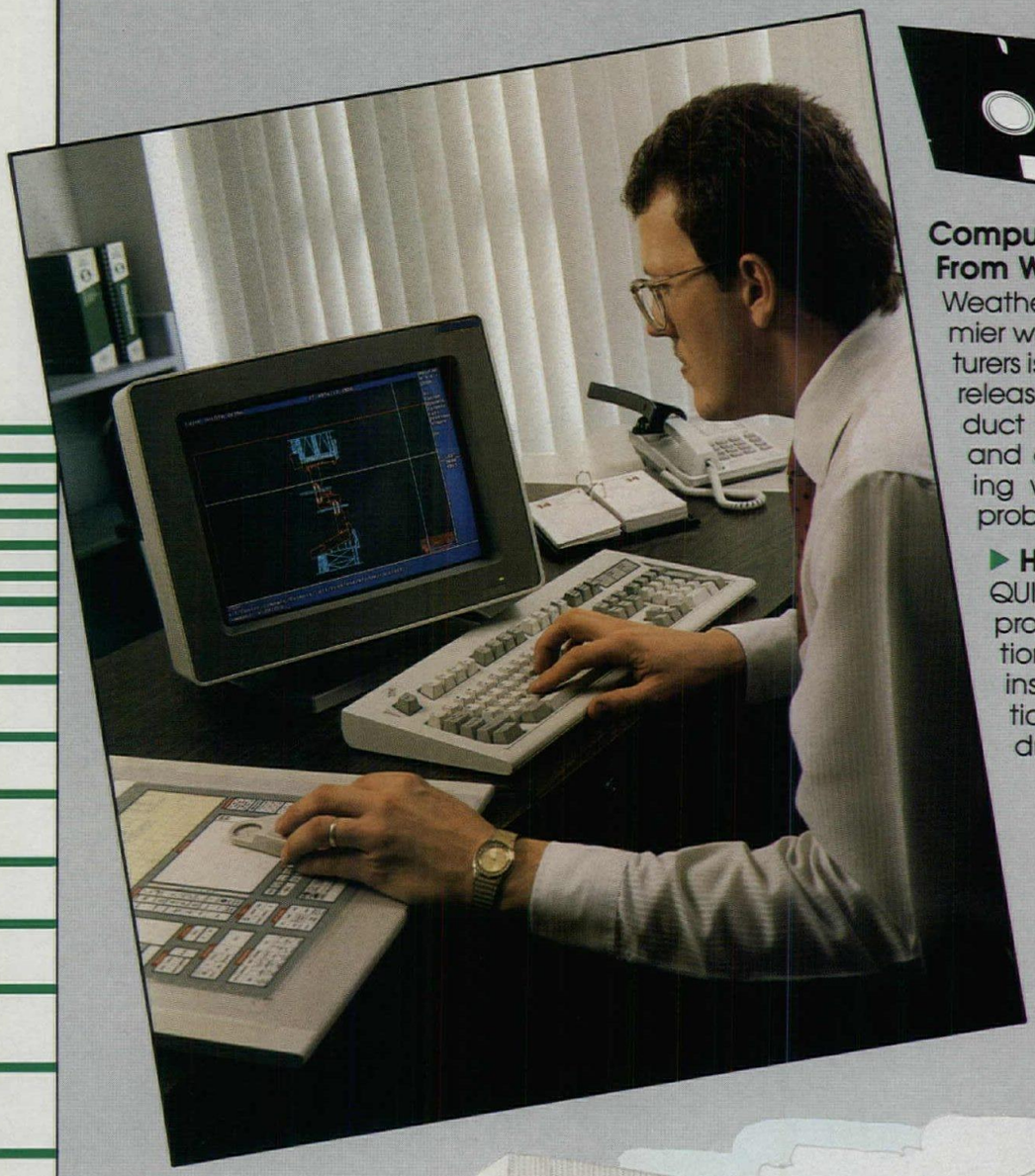
Completed brickwork at the Beckman Institute for Advanced Science and Technology after fabrication by a mason following CAD-CAM-generated instructions.

New techniques for "desktop manufacturing" enable three dimensional prototypes to be constructed directly from computer data. In these systems, a laser "draws" an object onto a photosensitive or heat-fusible polymer. The laser causes a thin film of the polymer to harden, and the three dimensional shape is gradually built up layer by layer. While the initial applications for this equipment will most likely be complex machine tool parts, costs will likely come down to a point where architects can use it to design and manufacture custom ornaments or building accoutrements like door knobs or plumbing trim.

CAD-CAM is part of the trend towards higher levels of integration between computer programs. The building industry is entering unexplored territory in which traditional methods and relationships will be reexamined. While there will be many false starts and other risks, the journey appears worth taking. CAD-CAM is likely to lead to new levels of design and construction productivity and provide new outlets for architectural imagination. **Michael Chusid** ■

The author is president of Chusid Associates, Oklahoma City, marketing consultants for architectural, building, and construction products.

Window Specification ..



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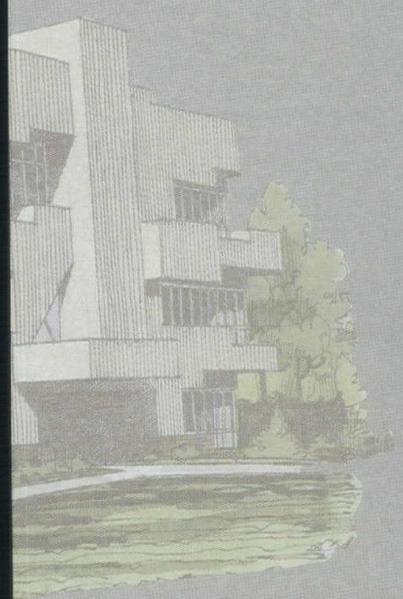

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PEAR 2.1

Lawrence Berkeley Laboratory; 5 1/4-inch disk, 128K, IBM/DOS. Government Printing Office (202) 783-3238, No. 061-000-00729-6, $26.

PEAR (Program for Energy Analysis of Residences) computes and displays on a line at the bottom of the screen the energy and cost implications of changing envelope areas, R-values, surface color, glazing properties, and many other building features instantaneously as they are input by the user. The program is aimed at a nontechnical audience and is best suited for analyzing builder-variety houses (detached, attached, and semi-detached) that don't stray too far from the norm for any geographic region. While PEAR is sophisticated within this realm (it is one of few PC programs that assesses the effect of thermal mass in exterior walls, for example), the conformity to local builder-house norms is a limitation for the custom house designer: PEAR doesn't understand, for example, that a one story house in Connecticut can be built over a crawl space, instead of over a basement.

PEAR draws on a database derived from over 10,000 computer simulations of five different model houses in 45 different regions, using the mainframe program DOE-2.1. This makes it completely different in origin from SUNHOUSE and other analytical programs. It has an energy economics package that calculates simple payback periods and savings-to-investment ratios. Volume 2 of the support documentation is an education in itself and with or without a computer. PEAR was produced by and to support the Department of Energy's Affordable Housing Through Energy Conservation program.

SUNHOUSE

Danny Parker, Precision Environments; 2-5 1/4 inch disks, 256K, IBM/DOS; requires A and B or A and C drives. Available from the author (407) 783-0300, extension 214, or (407) 783-8181, $99.

SUNHOUSE contains optimization routines that enable the designer to specify fuel, insulation, glass, and other construction costs, as well as the tax bracket and financial particulars of the client and building, in order to obtain cost-efficient levels of insulation and the optimal south window area. The program gives monthly and annual heating and cooling loads and fuel consumptions and ranks the benefit/cost ratio of various thermal improvement options for the envelope.

SUNHOUSE is well suited to designers and is more flexible than PEAR or ZIP. The major limitation is that the building cannot be rotated off a north-south axis. The software contains over 100 weather files and the output is formatted in tables that allow the user to fill in the project, client, and user's names. Building description data are typed over default values from a selection of archival building files (ranch house, two story house, townhouse, etc.), and a limited number of new designs can be saved in the archive. The three-ring binder makes an inelegant manual, but it is thorough in its documentation of the algorithms, and there is no mystery about what SUNHOUSE is doing. An architect familiar with the concepts and language of thermal design should be able to obtain useful results from a first session with SUNHOUSE in a single morning or afternoon.

ZIP 1.0

Stephen R. Petersen, National Institute of Standards and Technology; 5 1/4 inch disk, IBM/DOS. MTS Software, St. Louis (314) 441-1022 or PC Software Interest Group, Sunnyvale, CA (408) 730-9291; under $10.

Most architects have seen maps of the U.S. divided into heating and cooling degree day zones with recommended insulation levels for house attics, walls, floors and roofs labeled for each. ZIP was written using algorithms from the proposed ASHRAE 90.2 residential conservation standard for the Department of Energy. It is so simple to use that it requires no manual; but there is a separate ZIPDOC file on the disk that expains a bit about the program and where to get more thorough documentation for those who want it.

ZIP is not a building performance program, and it does not calculate loads, but it is effortless; the user enters with the first three digits of the local zip code and then answers a series of simple questions about energy-related systems in the house. ZIP then reports the most cost-effective envelope R-values (these are figured for a fairly conventional builder-variety house, which is its main limitation). A future ZIP 2.0 will feature cathedral ceilings and duct insulation.

SUNPATCH

James Taylor, California Polytechnic University; 5 1/4-inch disk, IBM PC with color graphics card. Architectural Science, P.O. Box 15423, San Luis Obispo, CA 93406, $25.

This program predicts and illustrates in an isometric view the patch of direct beam sunlight that enters a window or other vertical opening. Up to 32 windows may be viewed simultaneously, and exterior horizontal overhangs can be described to study solar access and shading effects. The user enters the window orientation, latitude, date, the start and stop time for analysis, and room and window configuration. In addition to the isometric visualization of the sun on room surfaces, SUNPATCH reports the time the sun is above the horizon, the time that direct sun is shining through the window and the solar altitude and azimuth for the analysis period. ■

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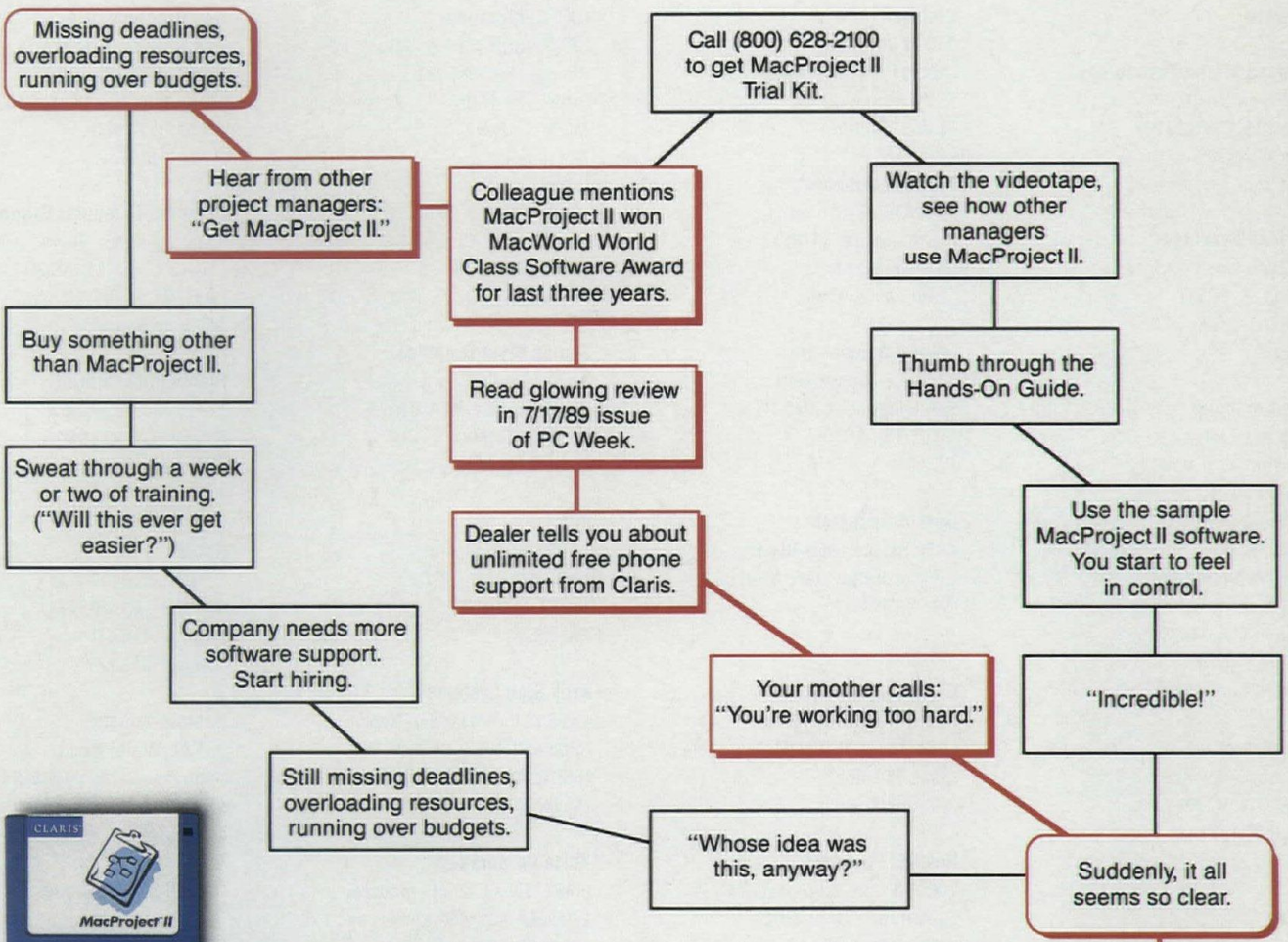
PC's take the tedium out of number crunching, and with increasing emphasis on ease-of-use, a wide variety of software packages now offer architects tools for testing and tuning up the performance of their designs. A floppy disk is no substitute for expertise, but a good program can be a good short course and can -- at minimum -- guide the designer through the schematic and design development phases of a job with realistic assumptions about energy, lighting, acoustical, and materials performance.

Some of these new programs are free or available at nominal charge, having been produced under sponsorship of government agencies and trade associations, or prepared by architectural faculty for teaching and professional use. **P/A** has begun listing low-cost, readily-available software in recent Technics articles as "recommended readings" (see the description of WINDOW 3.1, this month, and Joseph Minor's discussion of Monsanto's glass structural design program in April's Technics Topics).

On this page, we extend the practice with a selection of software that ought to tease architects into exploring new opportunities that the computer offers -- without much risk or effort. We want to continue this feature from time to time and invite our readers to call attention to their favorite design tools for different applications -- lighting, acoustics, structures, and others.

Kenneth Labs ■

Why 9 out of 10 project managers follow this path.



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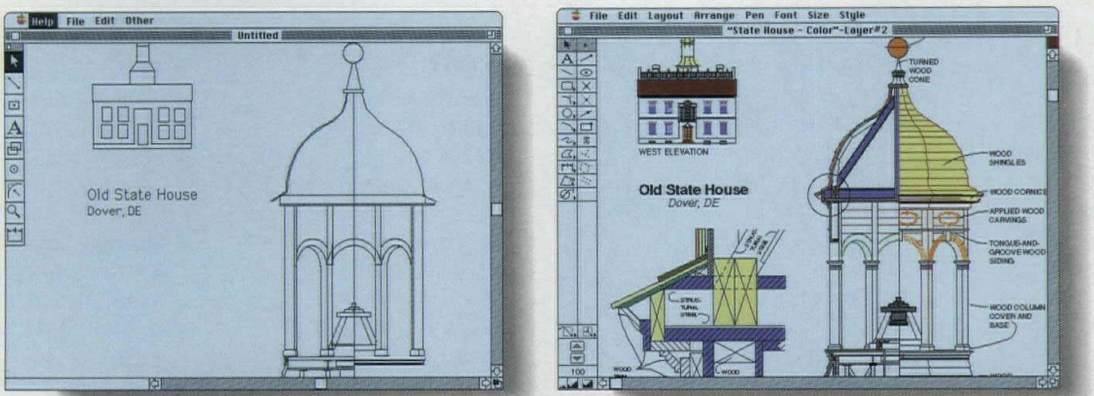

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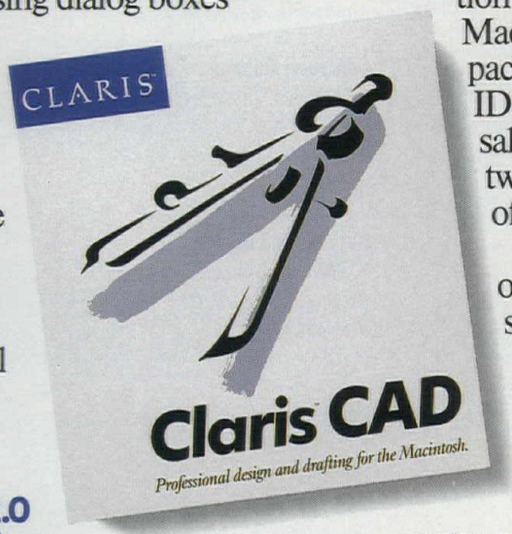

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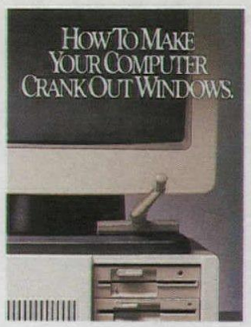
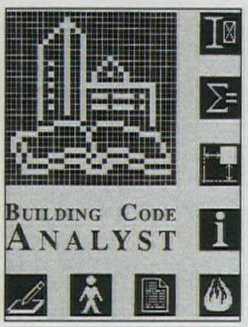
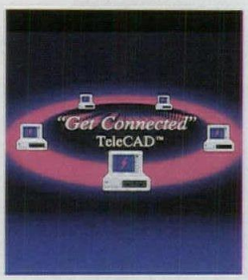
Computer Hardware/Software Literature Digest



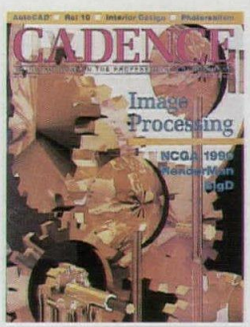
Andersen Helps you Design With Windows. Designed by architects for architects, the Andersen CADD-I™ program allows you to easily draw in either plan or elevation view and generate window details in seconds. Circle the reader service number below to receive this brochure introducing the design possibilities of the Andersen CADD-I™ program. **Andersen Corporation.**
Circle No. 418



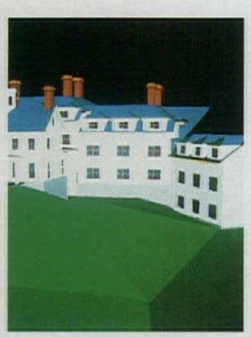
Building Code Analyst™ automatically retrieves and evaluates data for occupancy group, construction type, fire protection and location on property, and indicates a building's compliance with the 1985 or 1988 editions of the Uniform Building Code®. Printed reports include code references by section and page number. Available for Macintosh computers. **Architectronica** (213) 376-7054.
Circle No. 419



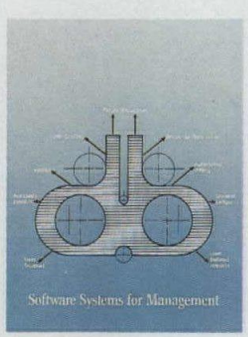
TeleCAD Plus™ is a field-proven, revolutionary new software. It offers CAD users nationwide, instant access to other professionals for file, drawing, Data Transfer, and high speed Plotting. Save project time and money with this CAD enhancing, easy-to-use tool.
C4 Network.
Circle No. 420



Cadence Magazine offers tutorials and general purpose articles about AutoCAD and third party hardware and software; special sections with in-depth articles for A/E/C and ME/CIM professionals; valuable tips for both novice and advanced AutoCAD users – including how to draw, print, and plot drawings; and integrate text for desktop publishing and technical illustrating.
Cadence Magazine.
Circle No. 421

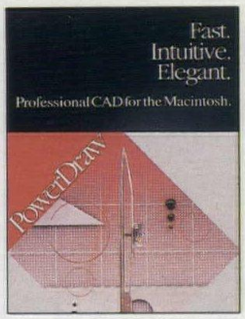


The Auto-Architect is the most complete software program available for architecture and facility management and design operating inside AutoCAD®. The program links to DCA's Facilities Management, HVAC, and Plumbing and Heating modules giving you maximum design and planning capability. DCA Engineering Software is the leading supplier of interactive software solutions for architecture and related professions. **DCA Engineering Software.**
Circle No. 422

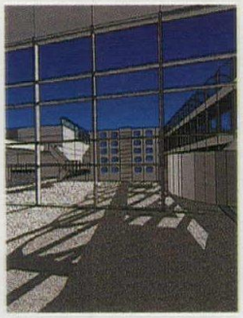


The AEMS Plus integrated job costing and financial management computer software designed for architectural firms, enables architects to complete projects on time and under budget, produce fast and accurate client billing, and decrease non-productive hours. AEMAS Plus handles all firm sizes and runs on a variety of computer systems.
Data Basics.
Circle No. 423

DynaPerspective is a 3D design, presentation, and animation software program. DynaPerspective 2.0 adds fast animation. Version 2.0 runs and displays 8- or 24-bit anti-aliased color images. DynaPerspective supports DXF, PICT, and PICS file format. It requires a MAC II with at least two megabytes and an eight bit color card; or an IBM PC (or compatible), 640K RAM; EGA or VGA graphics.
Dynaware USA.
Circle No. 424

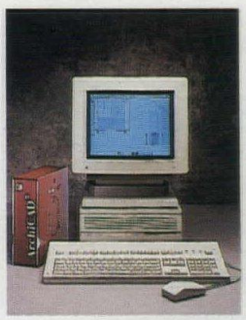


PowerDraw is a computer-aided design and drafting system that takes advantage of the Apple Macintosh. It includes built-in plotting, macro programming language, a double line tool with right/left offset and auto wall healing, unlimited layers and twelve auto-dimensioning features with or without extension lines. Other features: editable arrows, dimension terminators, line weights. **Engineered Software.**
Circle No. 425

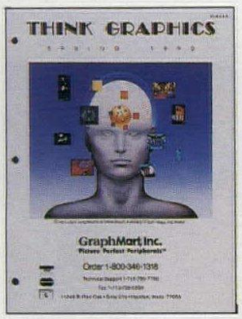


Architrion II is professional integrated CAD software for the Macintosh™. Developed for architects and related professionals, the three modules – ArchiDesign, ArchiDraw, and ArchiList – allow designers to explore, visualize, and quantify designs quickly and accurately, thus maximizing their time and abilities at every stage of the design process, from schematics to working drawings. **Gimeor.**
Circle No. 426

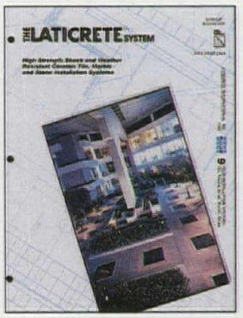
BIG D is a ray tracing software package which creates realistic renderings of AutoCAD DXF files. Rendering features include smooth surface shading, shadow casting, texture mapping, reflectance mapping, transparency mapping with refraction effects, antitaliasing, and unlimited point and directional lights. Images are saved in TARGA or PCX file formats. **Graphics Software.**
Circle No. 427



ArchiCAD is an integrated and easy-to-learn solution that simplifies drafting, allows you to see your plan in 3D views, and provides quantity takeoffs with cost estimation. ArchiCAD provides the capabilities of a dedicated workstation on the Mac II. Call for our new Evaluation Kit: 1-800-344-3468. See us at A/E/C® Systems Booth #2951. **Graphisoft.**
Circle No. 428



Graphmart's 94-page catalogue features a wide variety of high performance PC equipment to configure your CAD station. Graphmart's experienced personnel can answer your technical questions as well as custom tailor a workstation to your specifications. For a copy of our catalogue: **Graphmart**, 11246 S. Post Oak, Suite 316, Houston, Texas 77035.
Circle No. 429



Latricrete Ceramic Tile, Pavers, Brick, Marble, and Natural Stone Installation Specifications are available on floppy disk for micro computers and word processing equipment. Micro disks for Apple Macintosh and floppy disks for IBM PC and other formats are available. Contact Laticrete Technical Services (800) 243-4788 or (203) 393-0010, **Laticrete International**, One Laticrete Park North, Bethany, Connecticut 06525.
Circle No. 430

Marvin Windows' CAD brochure describes our enhanced Computer Aided Design Program, designed to work with CAD Versions 2.52–10.0. The new software lets design professionals draw and detail windows and doors in just a few keystrokes. It includes standard size symbols, elevations, and an architectural detail and specification manual on computer disk. **Marvin Windows.**
Circle No. 431

Presents "nuts and bolts" AutoCAD training and real-world applications. Our instructors each have a minimum of four years AutoCAD experience in various fields which they utilize in teaching students at all levels to meet the needs of each individual application. NOW OFFERING AUTOCAD AEC/ ARCHITECTURAL TRAINING. Call for full course schedule (512) 250-0972. **MicroCad Education Center.**
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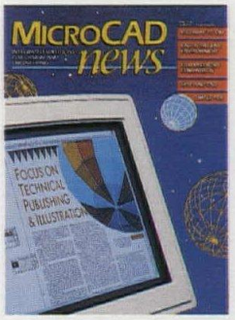

Articles include programming tips, file transfer techniques, networking and workstation oriented issues, standardization issues, and product evaluations. Coverage of hardware includes 286, 386, and 486 based systems, Macintosh, PS/2, Apollo, Sun, DEC, and others running micro CAD. **MicroCAD News Magazine.**
Circle No. 433

Fast, friendly, easy to learn and use PC-based integrated Drafting, Solid Modeling and Presentation Graphics. Built-in video overlaying, DXF and TARGA compatibility, stereoscopic viewing, fly-through animation, and Renderman interface. Complete personal and professional CADD solutions for Progressive Architects.
Point Line Graphics.
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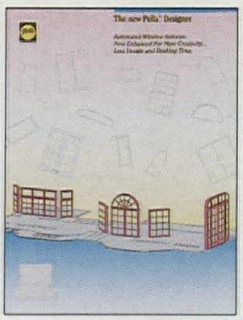

Pella® introduces an enhanced version of the innovative Designer AutoCAD® package. Designer is a user friendly IBM compatible program that works within existing AutoCAD or AutoCAD AEC® systems to detail plan views, elevations, cross-sections, and accessories of Pella Products. Designer puts the Pella product catalogue at your fingertips.
Rolscreen/Pella Windows and Doors.
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LaserCAMM. Add in-house laser cutting to your CAD system! LaserCAMM is a turn-key that integrates fully with many CAD systems. It uses a laser beam to cut and scribe a variety of sheet materials into intricate patterns. Any shape that is drawn on your CAD system can be precisely cut by LaserCAMM. For information contact **Scale Models Unlimited** 1-800-DIAL-SMU.
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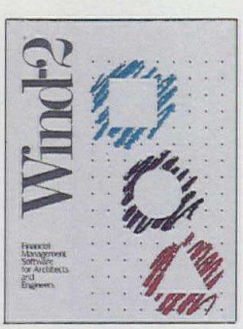
Feel the comfort of TAB's versatile TECH SERIES Computer Support Furniture with fully adjustable workstations. Modular components create just the environment you need. Warm and cool designer colors available for an attractive workplace. Let your TAB representative help you choose the system that best fits your needs. Call (800) 672-3109 Ext. 3579. In California (800) 742-0099 Ext. 3579. **TAB.**
Circle No. 437

QUIK-CAD is a totally new system that provides an easy step-by-step selection process that allows the user to insert window and door specifications, plus elevations, into any CAD drawing. The main benefits are: quick availability of product-specific details and elevations, instant product insertion into plans at the design stage, easy viewing superior quality graphics, and significant reduction within the shop drawing loop.
Weather Shield Manufacturing.
Circle No. 438



Wind-2 Software provides a complete line of financial and marketing management products. The Wind-2® Financial Management system and Total Trak™ offer superior cost, budget, and profit analyses, project invoicing, general accounting, and/or payroll. Also A/E Marketing Manager™, proposal generation, prospect tracking, and reporting. Call 1-800-77WIND2. **Wind-2 Software.**
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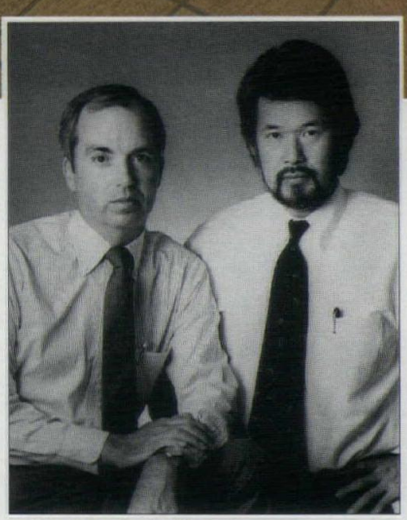

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Kiyoshi Murata, AIA
Murata Outland Associates

"We could have carved our reputation in stone. Instead we chose Avonite.®"

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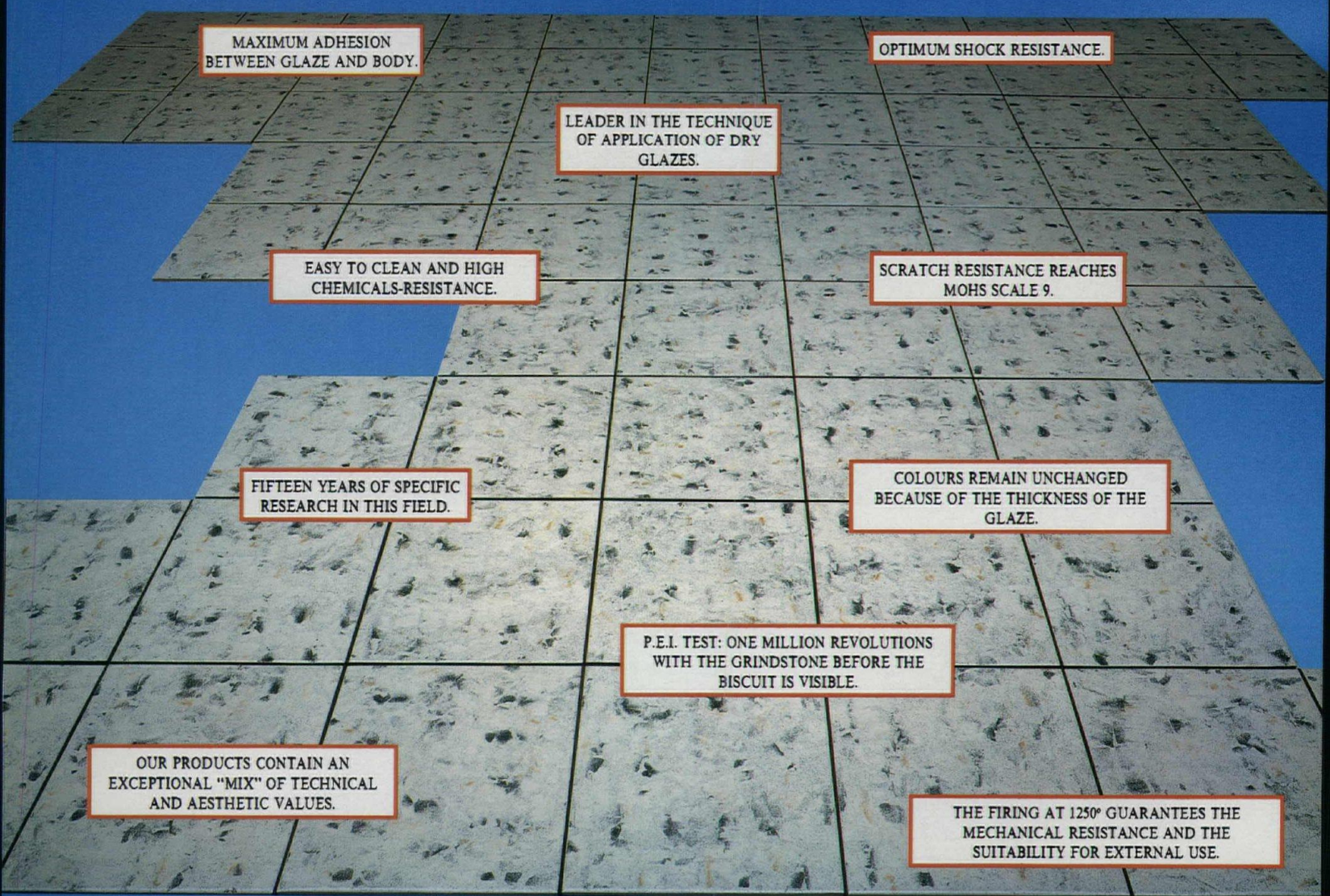

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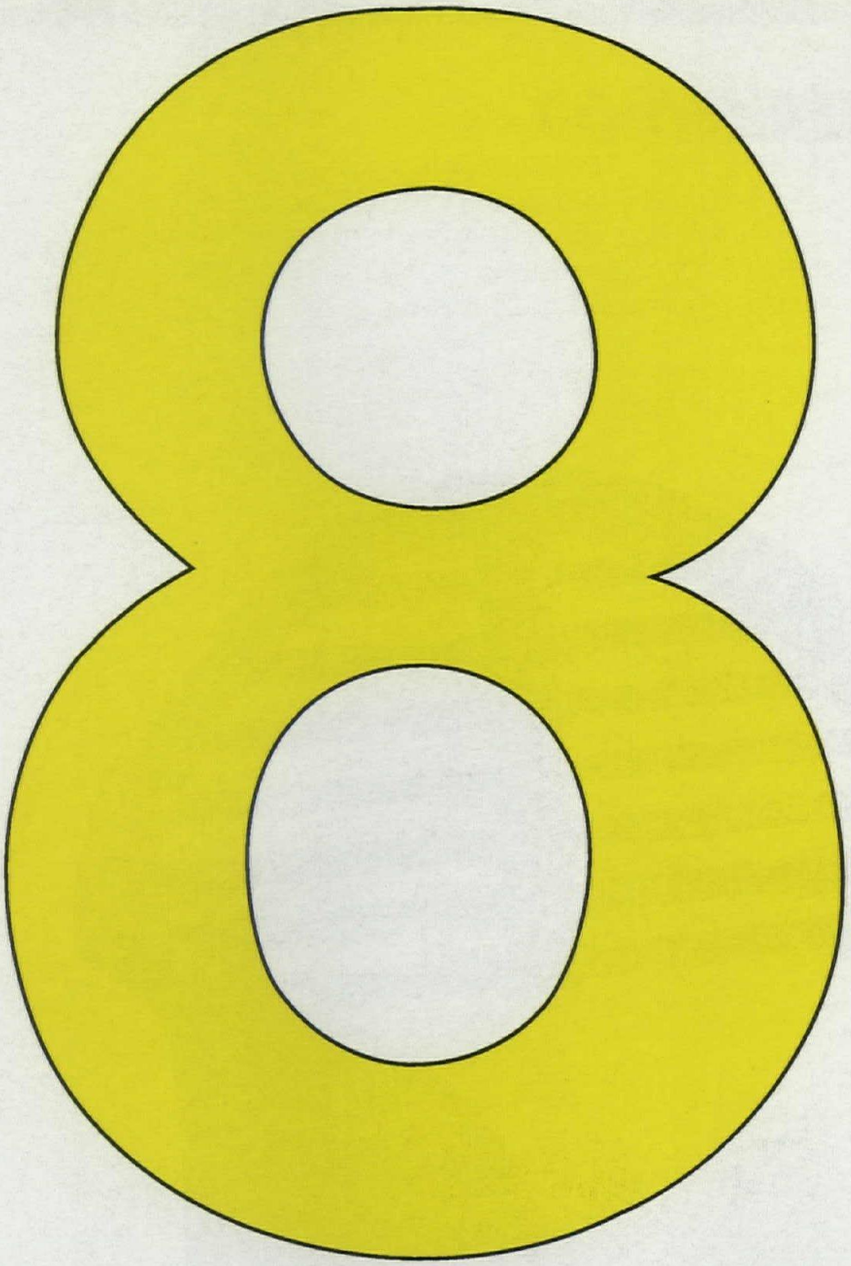

out of 10

The architectural community looks to the P/A and AIA Awards for confirmation of design ability. In the same way, business and trade magazines look to the Neal Awards program, sponsored by the Association of Business Publishers, for confirmation of editorial ability. In the Neal program, P/A has taken an extraordinary number of honors over the last decade.

We have won eight Neal awards or certificates of merit in the last ten years, far more than any competing magazine in the same period. This year we won again: an award for "Reordering the Suburbs" in the May 1989 issue (p. 78-91) as the best single article published by the largest magazines, those with advertising revenues of $5 million or more.

P/A was one of only 13 magazines winning awards this year, selected from 656 entries. The judging, based on the criteria of journalistic enterprise, service to the field, and editorial craftsmanship, is done by a screening board of editors and then a panel of judges consisting of media experts and journalism professors. Rarely have these judges had any expertise in the field of architecture. Yet they have consistently rewarded our editorial efforts, which encourages us as it should you, our reader. Their repeated recognition of articles in P/A suggests that when our profession reaches out to address issues of broader concern, the public will respond.

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KONA. . . a collection of finely crafted TEAKWOOD furniture by Miller Yee Fong, A.I.A. Designed to bring a quality of scale and comfort heretofore unknown in outdoor use as well as at home in the living room. A full complement of pieces, such as chaises and occasional tables, are available in this outstanding group.

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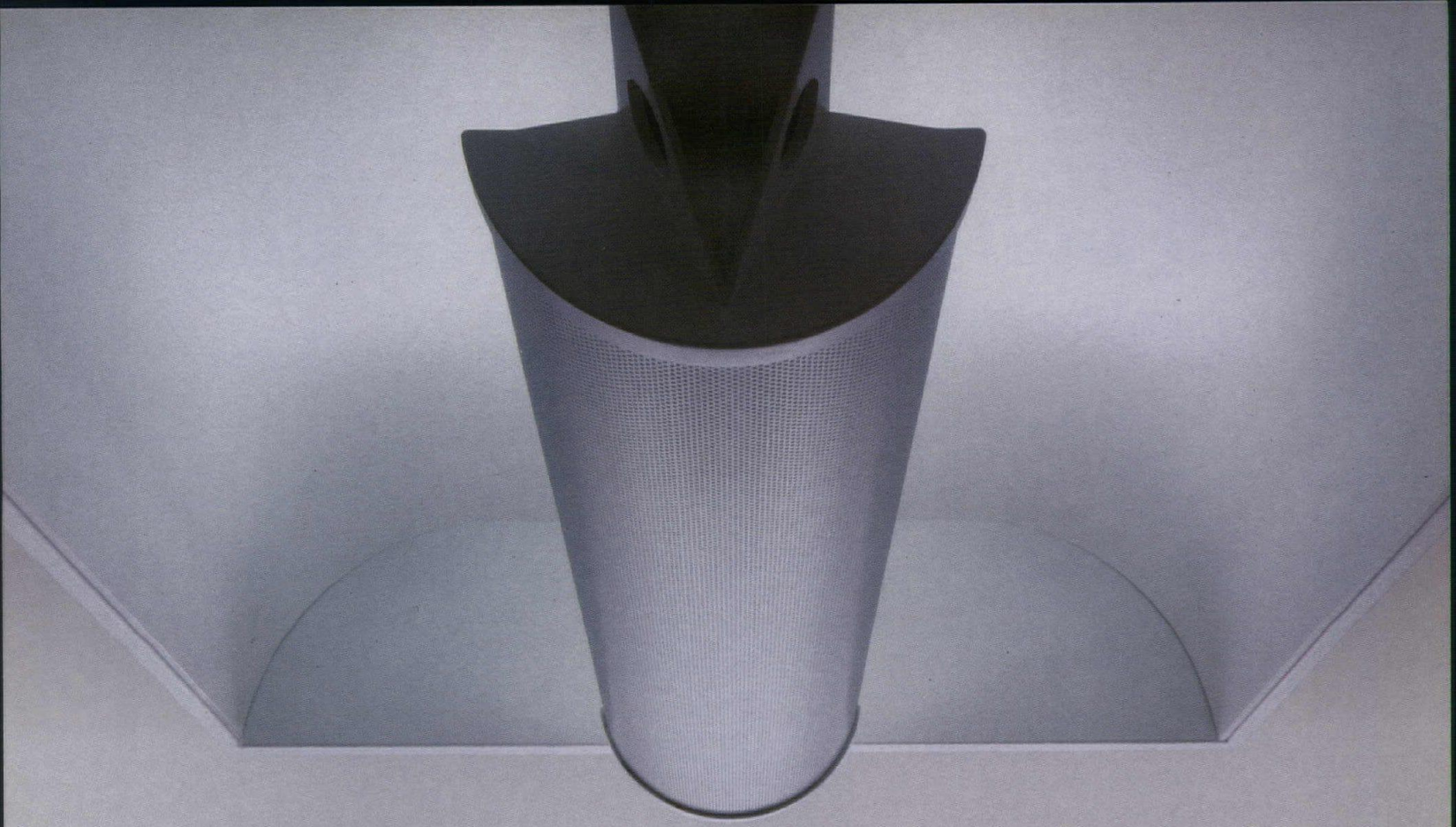
Circle No. 348



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The "Standard" fixture that is anything but standard. Zumtobel's Recessed Comfort RC™ Luminaire combines the sensation of indirect lighting with the performance of direct lighting.

Engineered and designed to satisfy every expectation of the discriminating specifier…the result is harmonious light.

Take a close look at Zumtobel. Innovative lighting solutions. Uncompromising quality and performance. State-of-the-art manufacturing facilities. A worldwide commitment to excellence in lighting.

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The Recessed Comfort RC™ Luminaire Series by Zumtobel. For further information and the name of your local Zumtobel Sales Representative, please contact us at: Zumtobel Lighting, 141 Lanza Avenue, Bldg. 16D, Garfield, NJ 07026 201 340-8900. FAX 201 340-9898.

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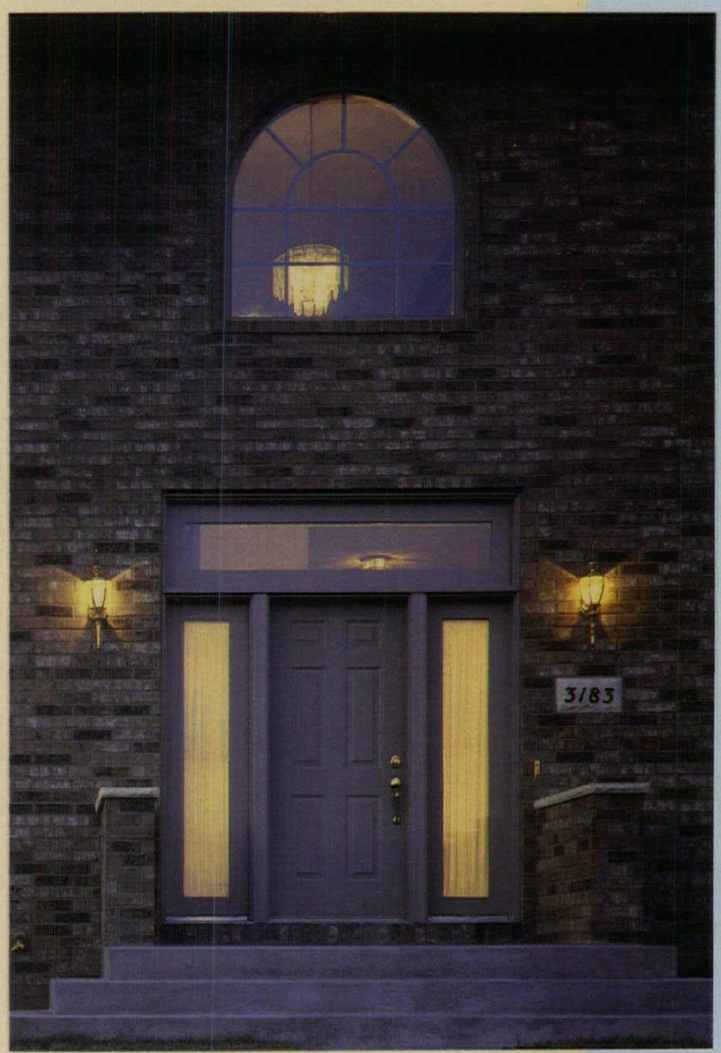
Introducing A Door System Which Passes Window Testing.

Introducing the EAGLE Entry Door System. The system which passes the 8″ of rain per hour with a 50 mile an hour wind test (ANSI/ NWWDA I.S. 2-87 Grade 60). It's a rugged test, but our door system is built to better it!

Not just another entry door, the EAGLE Entry System gives you low-maintenance exteriors, design flexibility, and the utmost energy-efficiency.

The EAGLE Door Frame has warm wood interiors to finish as you like. The exteriors are heavy aluminum extrusions in your choice of Colony White, Sierra Bronze, or Pebble Tan. The Door Frame has an adjustable nailing fin so there's no need for extension jambs.

The EAGLE Entry Door has an adjustable hinge and special sill so it fits snugly into the EAGLE Door Frame. With an efficient insulating polystyrene core (like your refrigerator door), the EAGLE Entry Door has rugged steel construction to prevent warping, and special construction features to insure added security. It's a door which will work in any application.



Open up to the latest in door technology. Low-maintenance and energy-efficient, the EAGLE Entry System matches our entire line of windows. You can tell it's quality engineering—it's the total system you expect from EAGLE.

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Modernfold will do it right, not just get it done. Whether accordion, flatwall, or portable panel, every Modernfold installation reaffirms why we've been the leader in movable wall systems for over 50 years. Today, that leadership has become even stronger, driven by a total commitment to quality and service throughout the company. A promise and commitment that come with every Modernfold product and assure you we stand behind everything we do.

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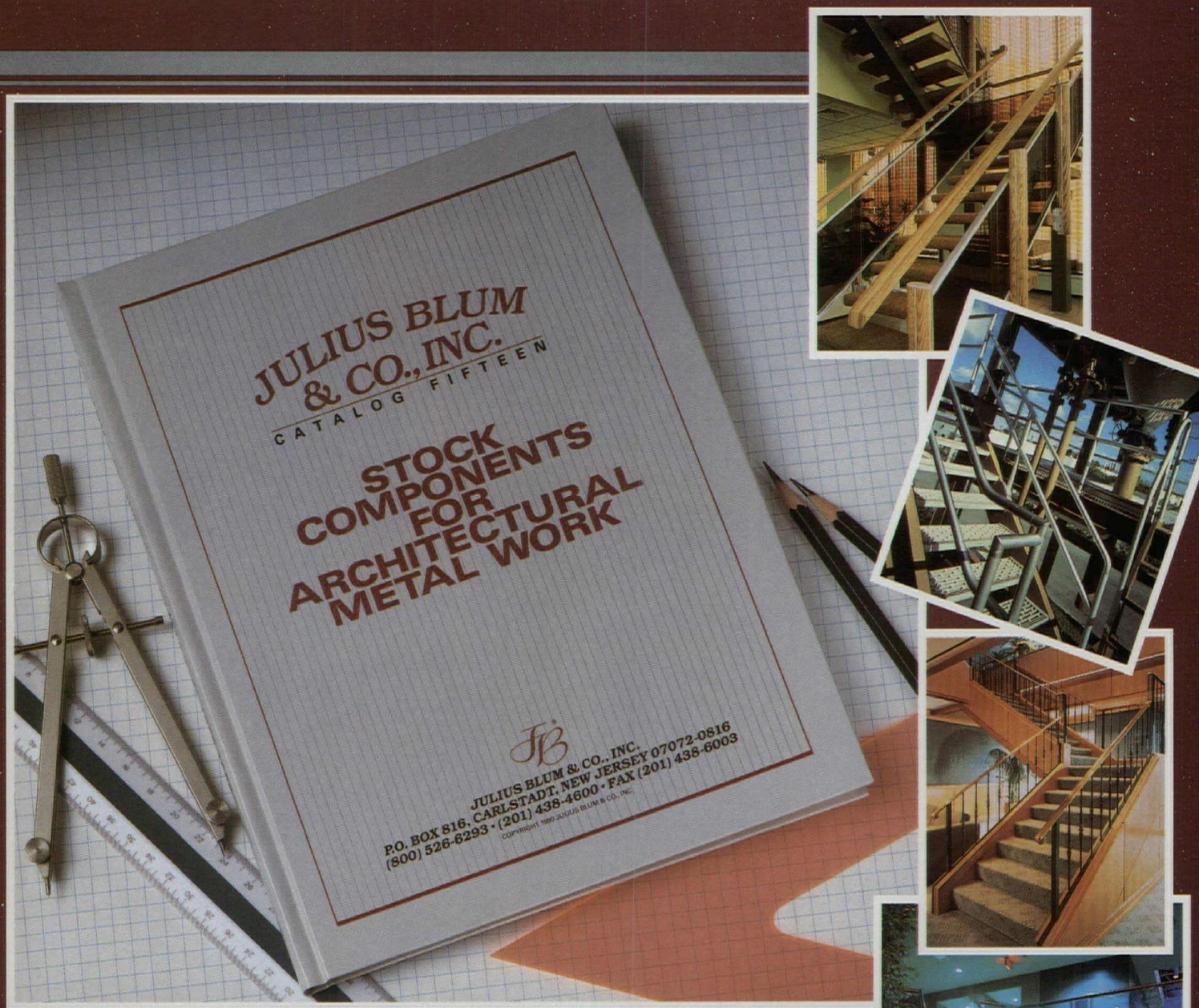
Circle **No. 369**

CATALOG 15
YOUR COMPLETE SOURCE



Since 1910, Julius Blum & Co. has provided ornamental metal components of high quality to the architectural trades. Today, Julius Blum & Co. is the industry's most complete source for architectural metals. Our latest publication, *Catalog 15*, describes our full line of architectural metal components:

JB® Glass Rail — Metal railing components for use with ½" and ¾" tempered glass.

Connectorail® — Non-welded pipe railing system in aluminum, bronze and stainless steel.

Colorail® — Extruded plastic handrail in 12 stock colors and 10 stock shapes.

Carlstadt® Railing Systems — Versatile post and rail systems in aluminum, bronze, stainless steel, and acrylic/wood.

Traditional Railings — Handrail, treillage, fittings, and decorative ornaments in aluminum, bronze, steel, and stainless steel.

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Handrail Brackets — Wall, post and vertical mounting brackets for all handrail types.

Expansion Joints, Thresholds and Mouldings.

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Catalog 15 also includes a complete Engineering Data section to assist in the proper structural design of various handrail systems.

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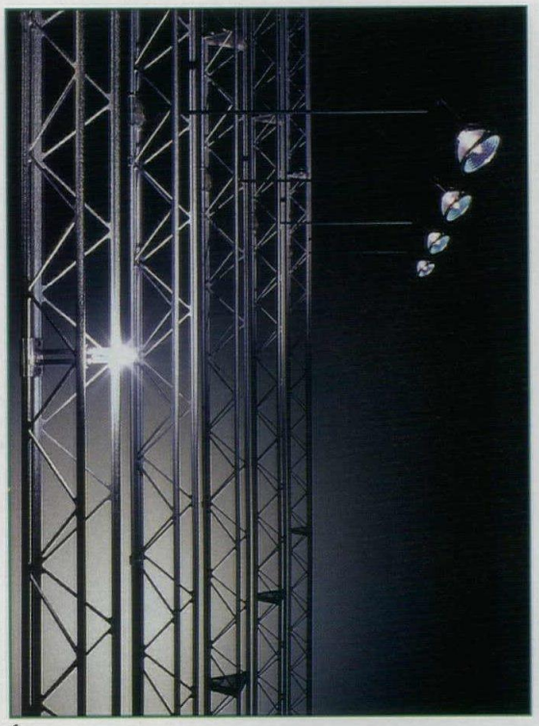
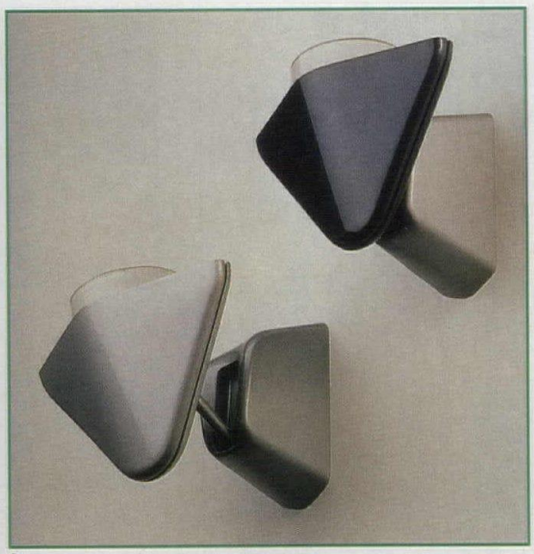
Circle No. 324

New Products and Literature



1



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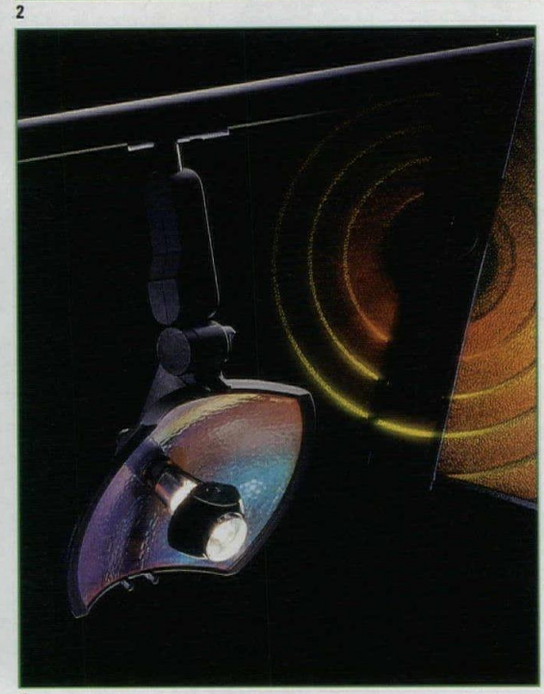


4

1., 4. Low Voltage Lighting
Structurella (1) is constructed of miniature aluminum three-dimensional frames that act as electrical conductors and as supports for halogen spotlights. Toh (4) is available with dichroic spot or flood reflectors and can be mounted on a 95-degree vertical plane. Targetti.
Circle 100 on reader service card

2. Wall Sconce
The Grall Delta Wall Sconce provides direct upward light and can be angled forward and back and pivoted 210 degrees horizontally. Lamp housing and back are in glossy metallic anthracite gray or pearl white baked enamel. Flos.
Circle 101 on reader service card

3. Aluminum and Glass Bollards
Bollards, with 180 or 360-degree light distribution, have die-cast aluminum louvers with etched glass enclosures. They are available only in black. Bega.
Circle 102 on reader service card

Lighting World® Preview

Lighting World® Chicago is to be held June 14–16 at McCormick Place, Chicago.

A series of seminars, workshops, and panel discussions scheduled for the show include: "Implementing a Large Scale Lighting Retrofit," presented by Jeffrey Kessel, Professional Engineer, Department of Facilities Management, University of California at Berkeley (June 14, 10:45 a.m.–11:45 a.m.); "The Impact of Lighting on Restaurant Environments," presented by Mark Knauer, President, Knauer Incorporated, Highland Park, Illinois (June 14, 10:45 a.m.–11:45 a.m.); "Daylighting Design and Analysis," presented by Claude Robbins, President, Environmental Research Groups International, Littleton, Colorado (June 15, 9:45 a.m.–10:45 a.m.); "Planning Applications of Lighting in Healthcare Environments," presented by Lawrence Lammers, President, Lammers + Gershon Associates, Reston, Virginia (June 15, 10:45 a.m.–11:45 a.m.); "Effective Lighting for the Work Space: The Integration of Lighting, Furniture, and the Environment," moderated by Peter Mill, Consultant, Center of Building Diagnostics, Ottawa, Ontario, Canada (June 16, 8:45 a.m.–10:15 a.m.); "Lighting Sources and Their Applications," presented by Ronald N. Helms, Professor of Architectural Engineering, University of Kansas, Lawrence, Kansas (June 16, 10:15 a.m.–12:15 p.m.), and "A Strategic Approach to Lighting Design and Maintenance for Corporate Facilities," moderated by Robert D. Vrancken, Facilities Management Program, Grand Valley State University, Grand Valley, Illinois (June 16, 10:30 a.m.–12:00 p.m.).

Products shown on this page are a small selection of those to be presented at Lighting World® Chicago. ■

Circle **No. 341** on Reader Service Card

New Products and Literature

Folding Glass Wall

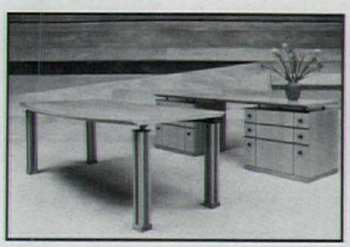
Mirage™ glass wall has a thermally-broken frame and silicone-compatible rubber gasketing; 7 panel widths up to 20 feet can be specified. Skytech Systems.

Circle 103 on reader service card

Silicone for Glass Block

A mortar-free system called KWIK'N EZ Silicone System – for installation of interior and small exterior panels with Regular Series or Thinline Series PC GlassBlock® units – uses plastic channels and spacer strips and TRADEMART™ clear glass block sealant. Pittsburgh Corning.

Circle 104 on reader service card



Compact Office Furniture

The Triuna Collection includes scaled-down table and pedestal desks, credenzas, sideboards, bookcases, occasional and conference tables constructed from "replenishable" wood sources. Geiger International.

Circle 105 on reader service card

Acrylic Texture Weatherproofing

Uni-tex is a high-build acrylic weatherproofing with a "stucco-like" appearance that can be applied over substrates such as plywood, concrete, masonry, and insulation board. United Coatings.

Circle 106 on reader service card

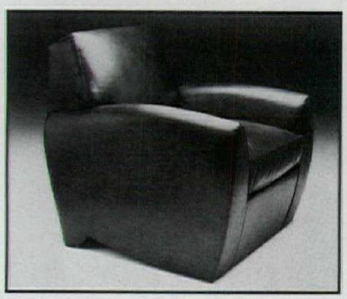
Steel Joist Catalog

The Steel Joist Institute's 1990 Catalog of Specifications and Load Tables has been expanded, with revised sections on fire-resistive assemblies and Joist Extended Ends. The catalog is $8.50. Contact Steel Joist Institute, 1205 48th Avenue North, Suite A, Myrtle Beach, South Carolina 29577.

I-Beam Curtain Walls

The Series 5700 Curtain Wall System is an I-beam system with 2½-inch or 3-inch face dimensions and mullions 5-inch or 6-inch deep. It is dry glazed from the interior or exterior and accommodates ¼-inch or 1-inch glass. EFCO.

Circle 107 on reader service card



Club Chair

The KE-'ZU Club Chair has a hardwood frame and is available fully upholstered in leather or customer's own material. It is 33½" wide x 34½" deep x 30½" high. Dakota Jackson.

Circle 108 on reader service card

New Ceramic Tile Colors

Sierra Colors – Misty Dawn, Vista Blue, Sagebrush, Mesa Blush, and Desert Pink – have been added to the IRONROCK® line of indoor/outdoor tile. Metropolitan Ceramics.

Circle 109 on reader service card

Acoustical Panels

Acoustical wall and ceiling panels, hanging baffles, screens, and banners can be ordered with resined or metal and plastic edges; vinyl, fabric, or custom finishes are available. Decoustics.

Circle 110 on reader service card

(continued on page 190)

Round it... Box it... Circle it... Corner it...

Curve it... Table it... Stuff it... Group it...

Arm it... Rally round it... Avoid it... Deck it...

Sitecraft wood designs make it a site to behold.

Nothing warms up a site (and the people who use it) like the natural beauty of wood furnishings. Especially durable, graceful furnishings from Sitecraft.

You can suit virtually any site from our wide selection of standard benches, planters, planter benches, receptacles and other site accents. And should you have special requirements, we can accommodate you with custom site furnishings. For years we've worked closely with architects, landscape architects and designers satisfying their creative concepts.

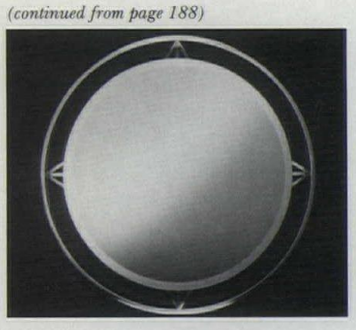
All Sitecraft furnishings are painstakingly built by craftsmen who have been creating fine wood products for over four generations. Woods range from clear all heart California redwood to super-tough "Ipe", Purple Heart, Philippine Mahogany and other select woods.

To discover all the choices available to you, send for our full color catalog. Write or call Sitecraft, 40-25 Crescent Street, Long Island City, NY 11101, (718) 729-4900. Outside NY State call toll-free **800-221-1448**.

sitecraft

Circle No. 385 on Reader Service Card

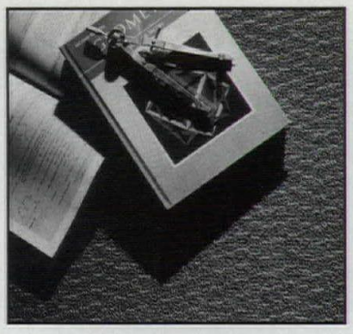
(continued from page 188)



New Mirror
A polished aluminum and stainless steel beveled glass mirror called Etoile is 30 inches in diameter. Prologue 2000.
Circle 111 on reader service card

Flooring Brochure
Photographs, technical information, and color charts in this 1990 brochure describe rubber wall base, floor tile, stair treads, and accessories. Burke.
Circle 200 on reader service card

Lighting Strip
Invizilite uses miniature 7-watt tungsten-halogen bulbs on 4- or 8-inch centers; it is ½-inch wide and comes in lengths up to 20 feet. The dimmable, adhesive-backed strip allows for curves up to 180 degrees and right angle installations. CSL Lighting.
Circle 112 on reader service card

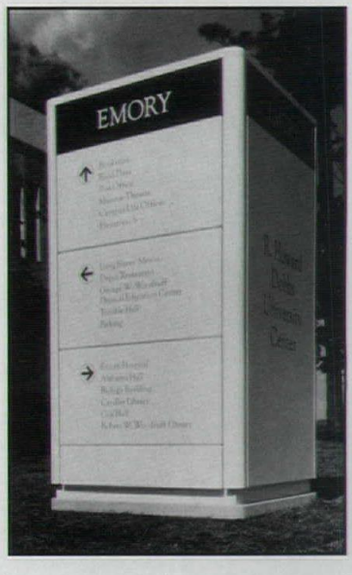


Carpeting
Harley Street is a new floor covering for high traffic commercial spaces; it is available in 16 colors. Patcraft.
Circle 113 on reader service card

Lighting System
Via is an indirect lighting system with 2-lamp T8 pendant and wall fixtures. Options include a neon AccentLine and track lighting applications. Litecontrol.
Circle 114 on reader service card

Acoustical Ceiling Systems Brochure
The 1990 brochure contains information on Celotex Softone™, Celotex Celotone™, and Celotex Hytone™ ceiling systems. A technical data section is included. Celotex.
Circle 201 on reader service card

Roll Roofing
Two new "fire-retardant" commercial roofing products are: Awaplan Premium FR roll roofing and Versa-Cap FR cap sheet. Tamko.
Circle 115 on reader service card

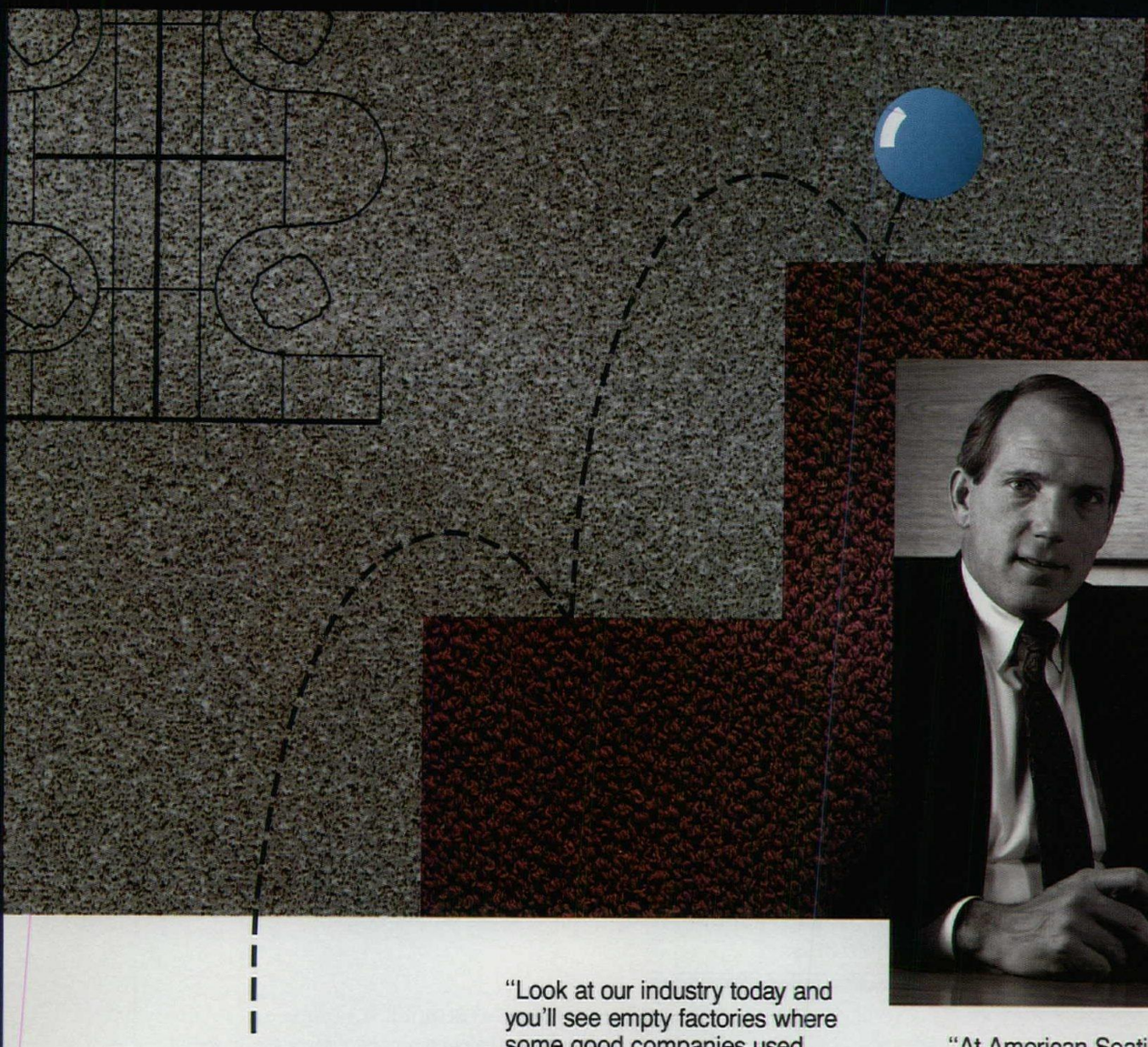


Signage Pylon
PolySign Multisided Pylons, in heights from 3 to 24 feet, use a positive interlocking extrusion to retain each fiberglass sign panel horizontally. Several corner profile, panel size, graphic, and color options can be specified. APCO.
Circle 116 on reader service card

Compact Fluorescent Design Guide
A design guide decribes methods of calculation for many compact fluorescent applications. Edison Price.
Circle 202 on reader service card

Asbestos-Free Roof Shingles
An asbestos-free, fiber-cement roofing shingle called Supra-Slate II has been introduced. Supradur®.
Circle 117 on reader service card
(continued on page 194)

"SUDDENLY, IT'S A BRAND NEW BALLGAME."



Larry Miller, President
Interior Systems Group

"Look at our industry today and you'll see empty factories where some good companies used to be.

"It could be that some of those missing players lost sight of what really matters — the needs and concerns of the customer.

"Or maybe those companies who won't be competing in the 1990's got hung up with hardware and forgot the human side of our business. Suddenly, some important values started dropping from the product mix. Values like teamwork, dedication, cooperation and commitment.

"At American Seating, we believe those values add to the real value of every product we make . . . and that customer satisfaction is still the number one priority. We wouldn't be here after 106 years if it weren't true.

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Contact: American Seating Company, 901 Broadway, N.W., Grand Rapids, MI 49504 or call 1-800-748-0268.

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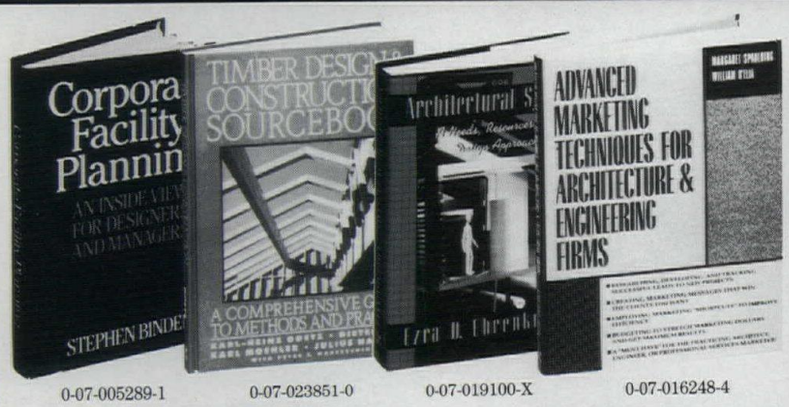
When architects and designers need dependable answers they can trust...they turn to McGraw-Hill



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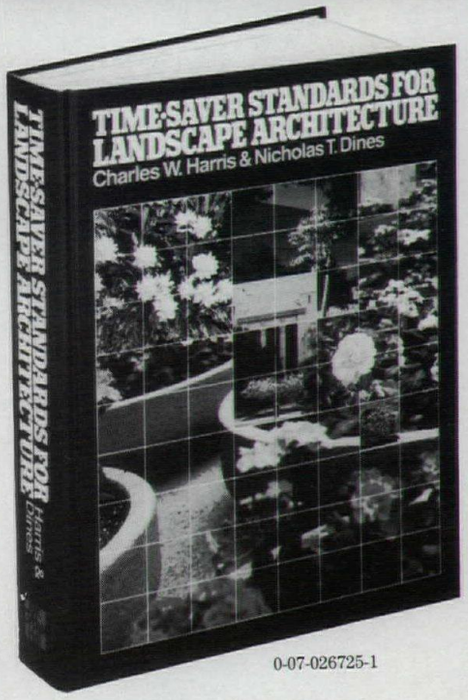

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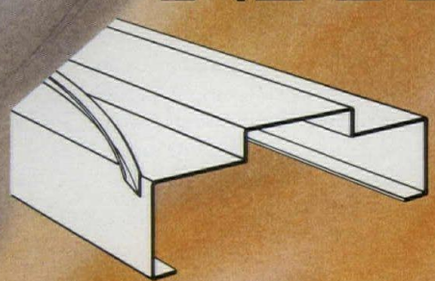
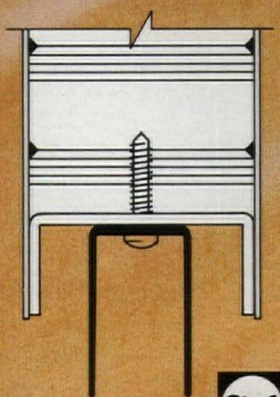
AN INDEPENDENT LABORATORY • UL® • TESTING FOR PUBLIC SAFETY

The First Complete Smoke Control Door System To Meet ALL The Requirements of NFPA 105





PS-074 Smoke Seal and Door Bottom Assembly

Steelcraft®
9017 Blue Ash Road Cincinnati, Ohio 45242
A MASCO COMPANY

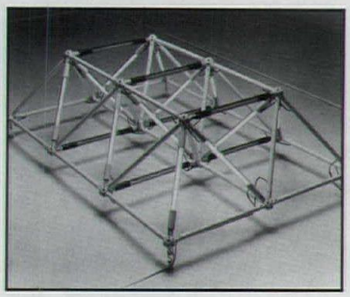
Circle No. 389

(continued from page 190)

Blue-Green Float Glass
A ⅜-inch blue-green float glass has been introduced. It can be used in architectural, interior partition, and furniture applications. Libbey-Owens-Ford.
Circle 118 on reader service card

New Cedar Shingle Designs
Designer Cuts™ are precision-machined and face-sanded shingles; they are available in ten different patterns. Stave Lake Cedar.
Circle 119 on reader service card

Exterior Wall System
QATRA System comes in jointless panels up to 25 feet long with surface areas of 250 square feet. Eternit.
Circle 120 on reader service card

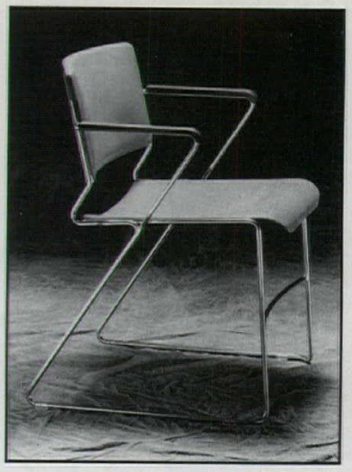


Neon Modular Spaceframe
A neon tube is encased in a high-impact acrylic tube and joined to the system with a jack connection. Three-dimensional systems can be designed for ceilings or vertical graphic displays.
Neon Modular Systems.
Circle 121 on reader service card

Glass Mesh Mortar Panels
Glascrete's Wonder-Board® for interior or exterior use is a glass mesh mortar unit. It is 7/16" thick and is "unaffected by moisture."
Gold Bond Building Products.
Circle 122 on reader service card

Pen Plotter
A new pen plotter automatically cuts and stacks its output, produces up to 50 E-size drawings from a single roll, and monitors and changes pens before they dry.
Océ Graphics.
Circle 123 on reader service card

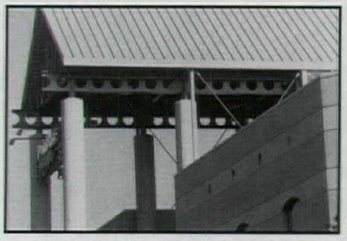
Wheelchair Stair Lift
A fixed, inclined wheelchair lift travels along turning or straight stairways and stops at each floor; it is suitable for indoor or outdoor use. Garaventa.
Circle 124 on reader service card



Stackable Armchair
An armchair has been added to the Ergo/stak line of chairs designed by Bob Eberle.
United Chair.
Circle 125 on reader service card

Air Conditioner
A central air conditioner, the XV 1500, has variable speed ClimaTuff™ compressor and Spine Fin™ coils. Trane.
Circle 126 on reader service card

Outdoor Furniture Catalog
The 1990–91 catalog includes the complete line of planters, benches, and decking. Redwood is standard, but products can be ordered in oak, cedar, or purpleheart.
Sitecraft.
Circle 203 on reader service card

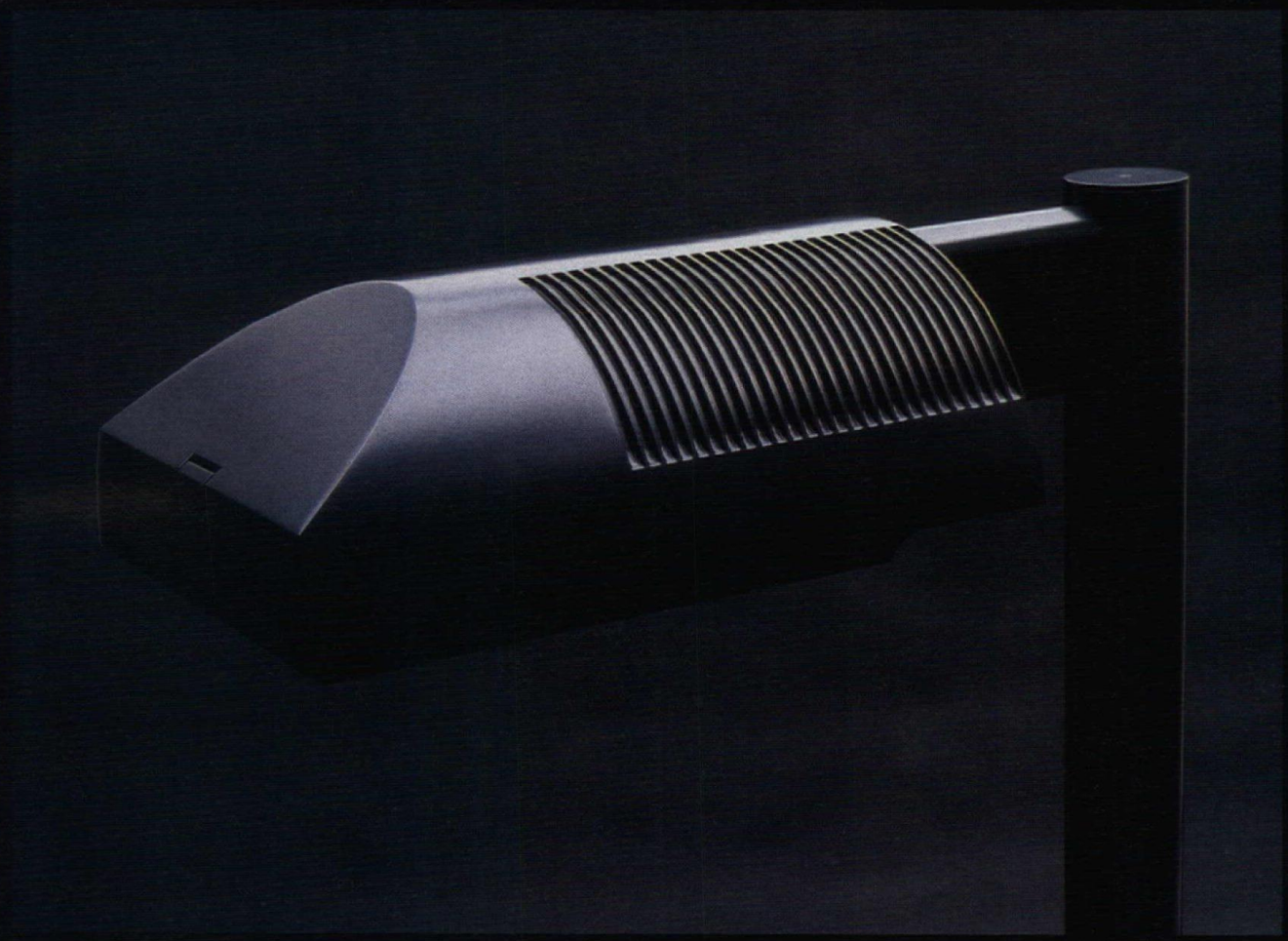


Metal Roofing and Wall Panels
An expanded line of metal roofing products, wall panels, and other specialty products for commercial or residential use is now available.
Widman.
Circle 127 on reader service card

Ceramic Tile Brochure
Architectural specifications, technical information, color selections, and custom borders and patterns for porcelain ceramic mosaic tile are included in this brochure.
Winburn.
Circle 204 on reader service card

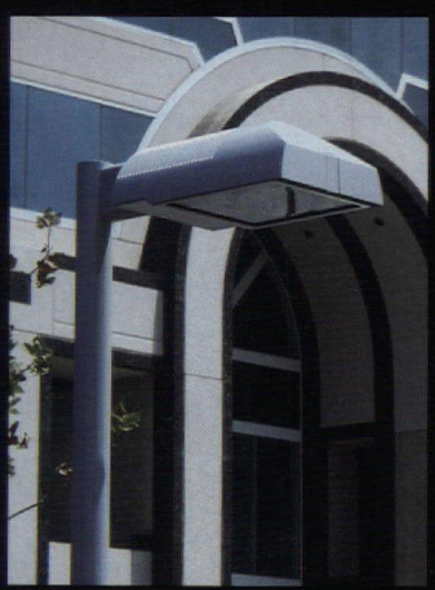
(continued on page 199)

Finally! A Bold New Direction in Outdoor Cutoff Lighting.



The Archetype™

Once every decade or two, a luminaire design is created that totally changes the definition of outdoor lighting. The Archetype will become that new definition. Why? Because it reflects the latest thinking in industrial design, architecture, technology, ergonomics and lighting performance.
The Archetype is a product of design logic. Its function and purpose are clearly stated by its form, while its compatibility with today's architecture is unsurpassed. The housing and lens frame are rugged one piece



die castings with an ingenious latch that is beautifully detailed into the nose. Four light distributions, six mounting configurations and up to 400 Watt lamp sizes provide total project flexibility for street or area lighting. Simply stated, The Archetype is the new state-of-the-art in cutoff lighting. Everything else is history.

KIM LIGHTING

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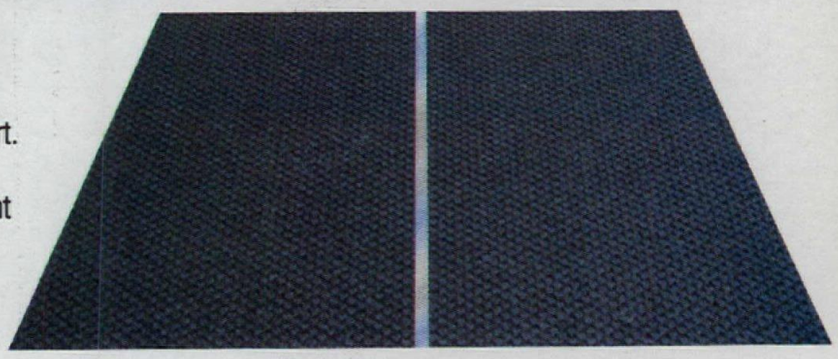
HERE'S ONE JOINT THAT'S HARD TO FIND

HERE'S ANOTHER



Some joints are so hard to find, it's often not worth the effort.

Then again, there is one you really should see.

It's the innovative new Wabo® Allure, the *only* expansion joint that's virtually invisible.

Which makes it appealing for areas where you need a joint but don't necessarily want to see one.

It was developed by Watson Bowman Acme, the world's leader in expansion joints.

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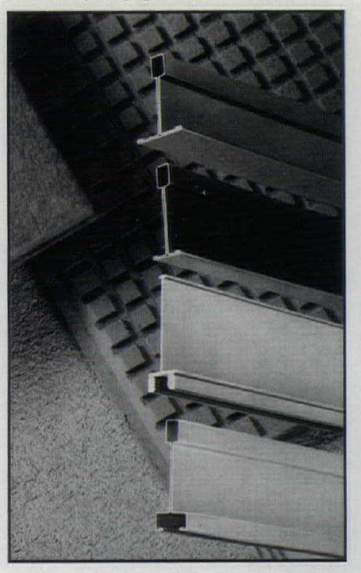
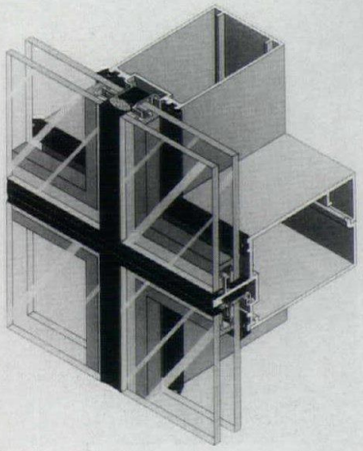
(continued from page 194)



Suspension Systems Catalog
Grid suspension systems and accessories for acoustical ceilings are illustrated and described in a new brochure. Armstrong.
Circle 205 on reader service card

Interior Wall Tile
Galleria is a new line of ceramic tile recommended for interior walls. The 7¾" x 12" white-bodied tile can be used with the Singapur wall and floor tile lines. Interceramic.
Circle 128 on reader service card



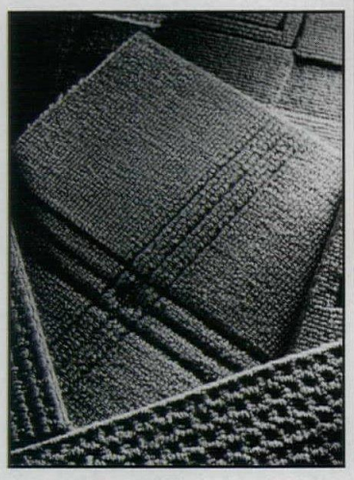
Glazing System
Duratec is a structural spacer glazing system consisting of an insulating glass unit with a recessed aluminum channel around all four sides of glass. The unit can be hooked or clipped into place. H.H. Robertson Company.
Circle 129 on reader service card

Rigid Vinyl Windows
VinylView rigid vinyl windows are available in standard or custom sizes. Thermetic Glass.
Circle 130 on reader service card

Roll Feed for Printer/Plotters
A roll-feed option attaches to AMT printer/plotters and uses the built-in forms tractor to feed the paper. Advanced Matrix Technology.
Circle 131 on reader service card

Single Lever Faucet
The single lever of the "Allegroh" kitchen faucet doubles as a retractable, two-mode handspray. It is available in chrome, satin chrome, and white. Hansgrohe.
Circle 132 on reader service card

Flush Framing System
A flush, glazed framing system, YES 40F-S, for ¼-inch glass will also accept 3/16-inch to ⅜-inch glass and has no exposed fasteners. YKK/Architectural Products Division.
Circle 133 on reader service card



New Carpeting
Broadloom, multilevel woven wool or nylon carpets can be ordered in several pile heights and loops, tweeds or patterns, and is called SculptureWeave.
Prince Street Technologies.
Circle 134 on reader service card

Concrete Protection Guide
"Effects of Substances on Concrete and Guide to Protective Treatments" offers design considerations for protection against acids, salts, and sulfates and describes surface preparation techniques. The guide is $6.50. Contact Portland Cement Association, CSP, 5420 Old Orchard Road, Skokie, Ill. 60077-1083 (708) 966-9559.

Double-Hung Aluminum Windows
Model 605 heavy commercial double-hung aluminum window has an overall frame depth of 4½ inches. Season-all.
Circle 135 on reader service card

(continued on page 201)

The Beckman Institute gets first class security

The Beckman Institute, showpiece of the University of Illinois, went First Class with their security system. According to Bruce Marshall, Beckman's Assistant Director, "the institute chose BEST mortise locks because they meet high standards for aesthetics, quality, versatility, and price. Their innovative interchangeable core and customized masterkey system make it easy to maintain high security."

Join the Beckman Institute and install a First Class system from BEST. For your Best Locking Systems Representative, contact Best Lock Corporation, P.O. Box 50444, Indianapolis, IN 46250. 317-849-2250, FAX 317-845-7650.

At BEST, First Class means top quality locks with a customized keying system.

BEST LOCK CORPORATION

Circle No. 320 on Reader Service Card

(continued from page 199)

Computer Products: Drawing Translation

Translate Raster to CAD
With Vectress and any large format scanner, it is possible to convert paper drawings to electronic vector representation that most CAD programs can read without tracing or redrawing. Winchester.
Circle 136 on reader service card

Utilizing Non-CAD Drawings
LunaSeries software solutions allow PC users of AutoCAD® and VersaCAD® to read and manipulate a scanned (raster) image without translating the drawing to a CAD format. The software contains three modules: One brings an image into CAD, another allows editing and manipulation of the data, and a third provides a graphic database manager for raster, CAD, and combination images. American Imaging.
Circle 137 on reader service card

Managing Paper Drawings in CAD
CAD Overlay allows a scanned drawing to behave like a layer in CAD. Trace the layer with AutoCAD® tools for an active drawing. CAD Overlay ESP brings the image directly into an active CAD file. Both of these software packages work in conjunction with viewBase, a relational database that keeps track of an electronic library of drawings.
Image Systems Technology.
Circle 138 on reader service card

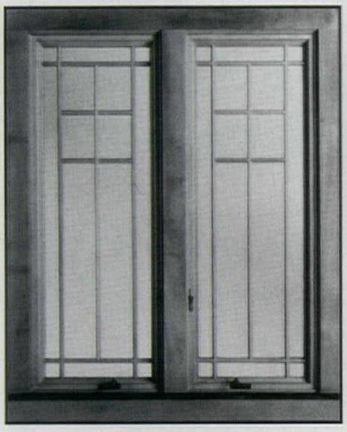
Mainframe to Macintosh® Bridge
CADMOVER™ allows users to download drawing data in almost any format for manipulation on the Macintosh. It can also read, translate, and write between most Macintosh graphic application file formats. Kandu Software.
Circle 139 on reader service card

From Field to PC
Niksoft software creates an electronic link between the Nikon handheld field data collector and PC CAD and surveying packages. Niksoft is free for users of the Nikon Data Collector. Nikon.
Circle 140 on reader service card

Macintosh Integration
PowerDraw™ Translator converts drawings between PowerDraw 3.0, Illustrator, PICT, and DXF file formats. It also reads PowerDraw 2.0, Clipboard, MacDraw, MacDraw II, EPS, Claris CAD, Library and HPGL formats. It can be used in conjunction with virtually every Macintosh® CAD or illustration application. Engineered Software.
Circle 141 on reader service card

AutoCAD® to .DXF
SoftWest 2D2 is an inexpensive CAD conversion program that translates AutoCAD .DRW files to .DXF files that can be read by other CAD packages such as VersaCAD®, FastCAD®, or Generic CAD®. 2D2 operates independently of AutoCAD®. The Great SoftWestern Software Co.
Circle 142 on reader service card

Technics-Related Products



Windows with Style
Pella's Architect Series products are divided-light wood windows and doors that combine narrow-width muntin bars with the thermal performance of insulating glass. The series comes in four styles: the Colonial, the Mission, the Prairie, and the Palladian. Flexibility of manufacturing techniques allows for nearly unlimited custom capabilities to suit both renovation and new construction projects. Pella.
Circle 143 on reader service card
(continued on page 203)

PORCELANOSA

ceramic tile

distinctive

VETRO:
AN EXCITING COMBINATION OF STRIPES IN A REFLECTIVE DESIGN.

Porcelanosa ceramic tile is the tile Architects like to use for areas that call for visual impact and scale.

Vetro Negro, shown here, is a 12-3/8" x 17-1/2" wall tile in one inch black and mirror stripes. (Also in white and rose.) One of many fine quality imported tiles precision crafted by Porcelanosa for excellence and durability.

For a complete look at the selection of styles, sizes, and textures, visit one of our "Idea" Showrooms, or call (714) 772-3183 for information. A brochure and distributor list are available at your request.

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(continued from page 201)

Roof Windows
Allseason-E, a new earthy-gray tint glass coating that reduces glare and improves window shading coefficients is now available on all Roto Sunrise and Hilight roof windows. Allseason-E reduces solar heat gain by 46 percent compared to standard clear low-E glass. Roto Frank of America.
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Heat Mirror™ and Superglass™
Hurd XUV™ Heat Mirror™ windows apply Southwall Heat Mirror technology to wood windows. Windows with Heat Mirror technology protects fabrics from the sun's damaging ultraviolet rays by transmitting 50 times less UV radiation than standard low-E windows. Hurd also manufactures Insol 8™ windows using Southwall Superglass™. Hurd.
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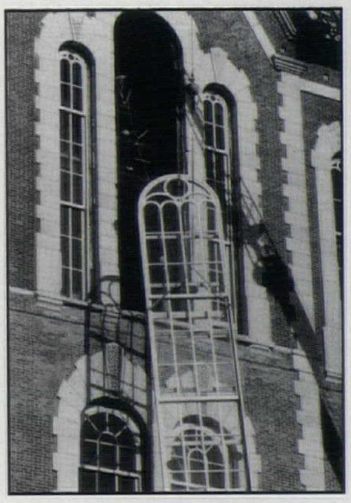

Custom-fit Replacement Windows
Weather Shield HR 175 single-hung replacement windows are designed for applications where it is necessary to duplicate existing windows exactly to retain the architectural integrity of a building. HR 175 Windows can be installed inside existing frames.
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French Doors
Eagle French Doors are an example of the manufacturer's line of decorative windows and doors. Eagle products feature prefinished aluminum exteriors and wood interiors to finish as you prefer. Dual-sealed ¾" insulated glass is standard, but Eagle Maximizer clear low-E glass is also available. Eagle.
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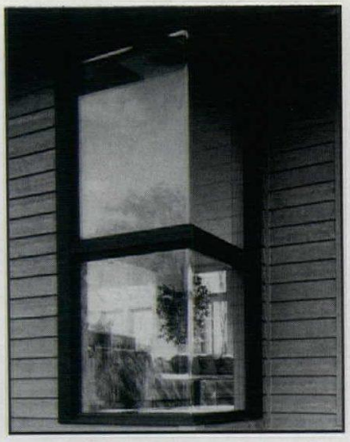

Angled Glass
Marvin Windows creates new design possibilities with their new corner window featuring glass bent at a 90-degree angle. Framed in solid Ponderosa pine, the corner windows are available in seven standard sizes. They can be installed at corners or in flat walls as triangular bays. Marvin.
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Building Materials

Major materials suppliers for buildings that are featured this month as they were furnished to P/A by the architects.

Student Center, University of California, Santa Cruz, Santa Cruz, California (p. 106). *Architects: Fernau & Hartman, Berkeley, California.* Concrete slab, Graniterock; concrete masonry units, Basalite; steel framing and galvanized pipe rails, Dietrich Iron Works; unpeeled redwood logs, Big Creek Lumber; gypsum board, Domtar; aluminum windows, EFCO; wood doors, Liberty; rolling doors, Cookson; concrete pavers, Muller Supply; stained concrete floors, L.M. Scofield; perforated aluminum, Reynolds Aluminum; slate roofing, Eurocal Slate; rigid insulation, Celotex; batt insulation, Owens-Corning; paint, Benjamin Moore, Kelly Moore; stain, Ameritone; interior wall paint, Zolatone; hinges, Stanley; locksets, Schlage; closers, Norton; panic hardware, Von Duprin; rolling
(continued on page 204)

(continued from page 203)

barn doors, Richards-Wilcox; steel lockers, Medart; hydraulic elevators, ESC elevators; handrail fittings, Wagner; enclosed fluorescent fixtures and sconces, Spero; step lights, Custom Lighting; lighting, Holophane/Johns-Manville; lavatories and water closets, Kohler; faucets, Delta; toilet partitions, Accurate; washroom accessories, Bradley; water fountains, Haws; baseboard heating, Sterling; forced air ducts/vents, Titus; carpet, Atlas; entry mats, R.C. Musson; information desk, Fife's Mill & Cabinet; laminate, Nevermar, Wilsonart; sofas/chairs, Charles Webb; stacking chairs, Scan Industries; conference chairs, Jasper Chair; chalkboards, Tri-Adco; café chairs, Crate & Barrel; awnings, Ege System; sofa fabric, Sullivan Awnings; acoustical louvers, Construction Specialties.

United States Embassy, Sultanate of Oman (p. 114). *Architects: James Stewart Polshek & Partners, New York.* Granite cladding on outer façade, entry hall, courtyard, and arcade paving: Sekigahara Stone Co., fabricated by Carlo Campolonghi. Dolomite cladding: Mankato Kasoda Stone, Inc. Ceramic tile, building façade: KCH, USA, Keramics, Inc. Three plaster system on metal lath in entry hall, courtyard, and on ceilings; gypsum wallboard ceilings in typical offices: U.S. Gypsum. Aluminum and glass windows and doors with Kynar finish: Kawneer. Carbon steel and glass security windows: Norshield Corp. Glass block building walls, accent lights, fountains, and eggcrate aluminum suspension system for skylights: Circle Redmont. Hollow metal office doors and custom sandblasted stainless steel doors: Fenestra Corp. Granite arcade paving: LaCroix et Fils Meganpic. Precast concrete landscape pavers: Hanover Paving Co. Glass block pavers: Hastings Pavement Co. Precast roofing pavers: Roofblock, Ltd. Liquid applied membrane roofing and waterproofing: Tremco. Exterior epoxy based paints for ferrous metals: Tnemec. Kynar based paints for aluminum: PPG. Hinges: McKinney. Locksets: Schlage. Door closers: Rixon-Firemark. Panic exit: VonDuprin. Remote fan coil units supplied from central chiller: fan coil units by Trane.

The U.S. Marines sign up 364 recruits from a small town in PA.

That's some news, considering the town is Indiana, Pennsylvania. Lucky for the Marines, a long-time resident is Season-all Industries, the nation's leading manufacturer of Architectural Windows. And the recruits are 364 of Season-all's finest. The names and numbers on their dog tags read: Double-hung heavy commercial 685, Fixed-lite heavy commercial 601, Two-lite slider 542, and Three-lite slider 543. ☐ All 364 measured up to stringent military standards. Notably, the 4″ frame depths on our new high performance heavy architectural double-hungs and fixed lites. Then they were trimmed with true muntins and given their marching orders: report to Little Hall, Quantico Marine Base in Quantico, Virginia for induction ceremonies. ☐ Well, the ceremonies lasted several weeks, and when they were over, Little Hall was ready for an inspection. Which it passed with flying colors. ☐ So the next time you're getting ready to go on window maneuvers, recruit a few good windows from the small town of Indiana, Pennsylvania. We have what it takes to make it in the Marines. ☐ Just call 1-800-999-1947, ext. 219 or stop by booth 1312 at the CSI Show and ask us to report for duty. Season-all. Providing answers with the right windows.

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☐ Little Hall, Quantico Marine Base
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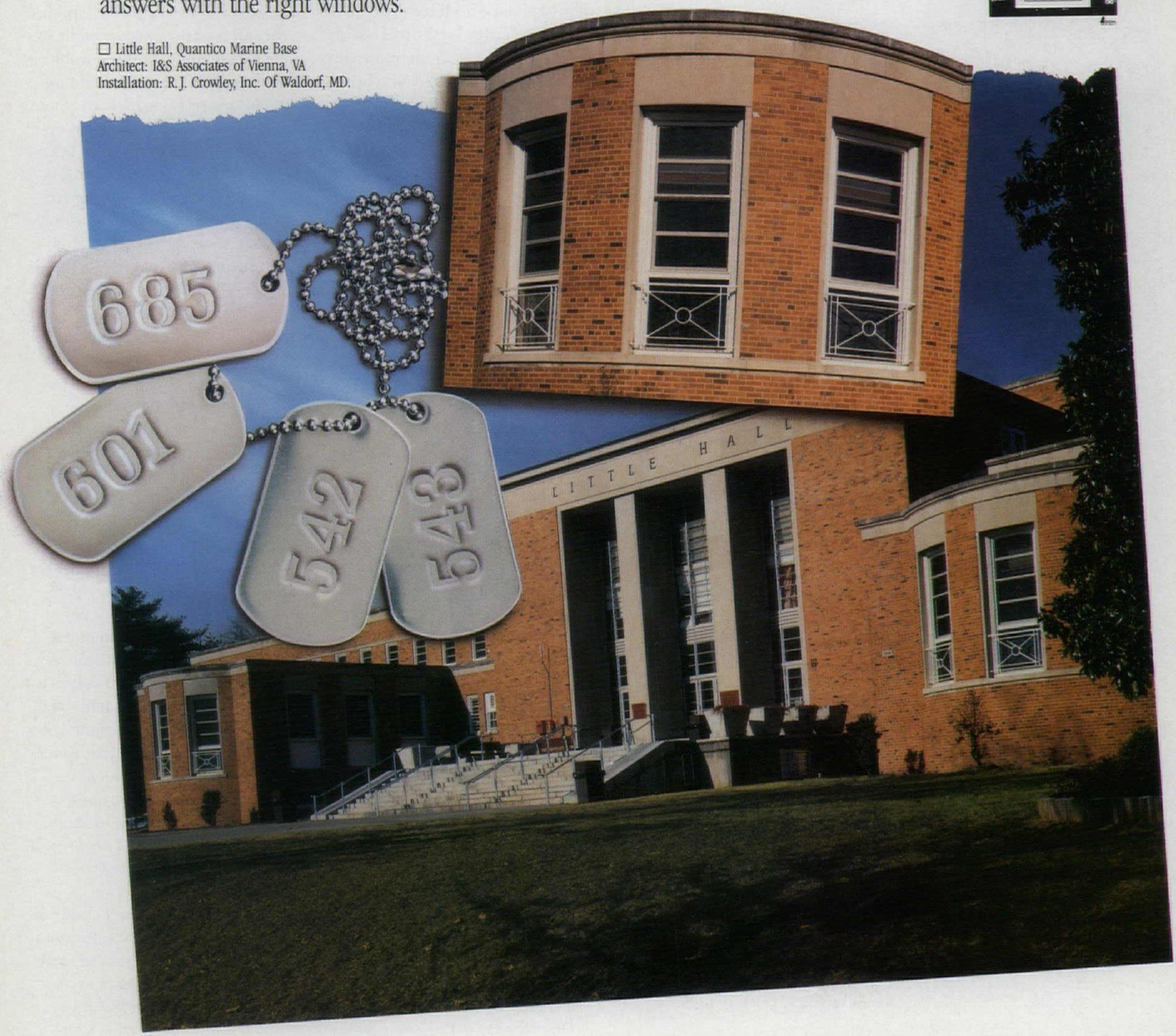

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(continued from page 127)

temporary with Shutze and of comparable talent, including William Lawrence Bottomley, Delano & Aldrich, Dwight James Baum, Charles Platt, Aymar Embury II, David Adler, and Litchfield & Rodgers, in addition to Mott Schmidt, F.B. Hoffman, for whom Shutze worked in New York, and, finally, Neel Reid, Shutze's Atlanta mentor, who is tenderly maligned in Dowling's text and Shutze's reminiscences.

Shutze's work also commands respect, as Dowling points out, for his keen sensitivity and ability to integrate the fine art of landscape design into his architectural compositions. This, too, can be attributed to his Beaux-Arts training. A review of P.H. Elwood's book, *American Landscape Architecture* (1924), will reveal many contemporary landscape architects: Jacques Greber, Charles Wellford Leavitt, and Diego Suarez to mention only a few, who were capable practitioners of the Classical tradition equaling or exceeding Shutze's skills in this area.

By thus placing Shutze in perspective, it is not my intention to play down his considerable talent. The point in mentioning so many other equally capable architects and landscape architects is to remind the readers of this review, and hopefully the many readers of the monograph, that there was a time when first-rate architecture was the norm in America, something to be expected not only from the truly great firms, but from the lesser-known regional architects that practiced before the Great Depression.

A fortuitous distinction in Shutze's career that separates him from his many talented contemporaries is that he was able to practice his brand of Classicism well into the 1950s, beyond the time when this style was even remotely in vogue anywhere north of the Mason-Dixon line. This had little to do with Shutze, his work habits, personality or talent, but seems to be more an accident of geography. However, geography does not explain Shutze's attitude toward the establishment of Classicism as an appropriate modern American style. He had a *laissez-faire* attitude towards the profession, which came to haunt him in his later years when opposition to Classicism came into fashion.

One wishes, as Professor Scully suggests in his introduction to the book, that Shutze, because of his obvious fine talent, had been more of a fighter. Could he have resisted Modernism more vigorously, charming and persuading his clients in order to keep commissions to which he had access? One also wishes that Shutze had made an effort to pass on his great wealth of knowledge and talent to the next generation of architects through teaching, but Shutze, as few other artists of his time, willfully stood apart from the debates and turmoil that surrounded and enlivened his profession; he refused teaching positions offered at both Columbia and Georgia Tech. Dowling asserts that ultimately "his limits were imposed externally, not internally," but other Southern Classicists continued to practice beyond the 1950s, including Edward Vason Jones, who for years after Shutze's retirement was able to contribute immeasurably to the American Classical tradition, with his powerful work at the State Department's Diplomatic Reception Rooms in Washington, D.C.

Undeniably, Shutze's work is impressive. Dowling chooses to emphasize several of his most important domestic projects. However, since Classical architecture is the very foundation of Western public art, special attention should be paid to several of his institutional projects of exceptional quality.

The first, and perhaps the finest, is the Citizens and Southern National Bank in Atlanta of 1929. Here Shutze displays not only the enthusiasm and energy of the student, but also a mastery of the elements of architecture unequalled in his future projects. The Pantheon is ostensibly the model for this *tour de force* performance; however, even in this early stage of his career, Shutze shows a maturity that allows him to use the model and make it his own, utilizing elements such as the columns, capitals, the much admired aediculae, and proportional relationships, in such a way as to make the final project a unique and original creation. This project exemplifies Shutze's mastery of Beaux-Arts methods.

Another project, the Temple of the Hebrew Benevolent Congregation, was on the boards at the same time as the bank; it began as an exercise in the Italian Baroque. While the final product is a bit

(continued on page 209)

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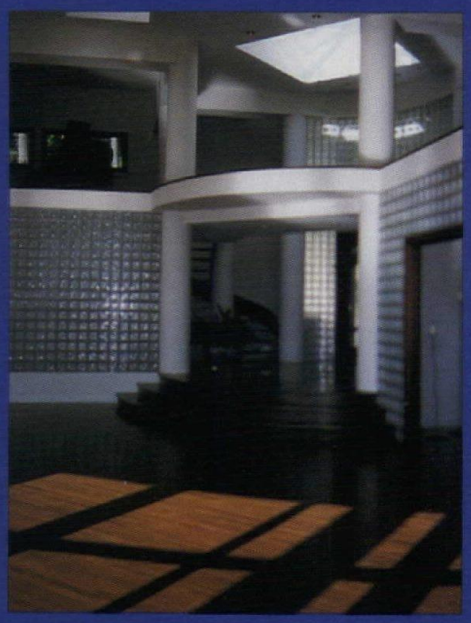

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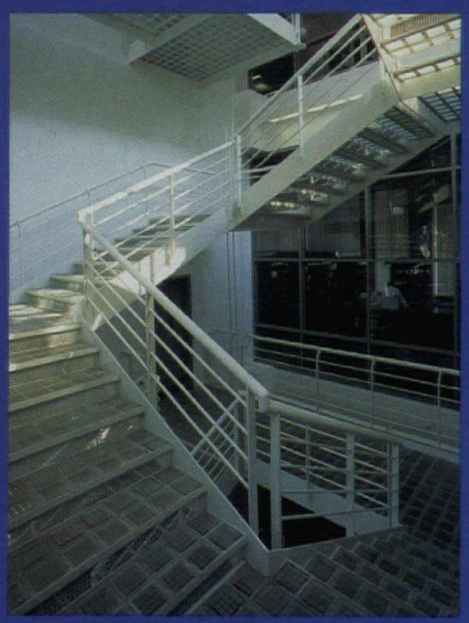

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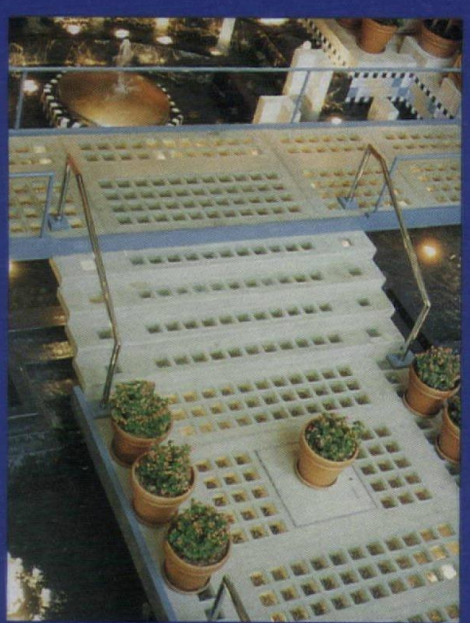

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(continued from page 206)

more modest, it is still a remarkable achievement. Here Shutze was able to infuse Classical details with powerful references to perhaps the earliest beginnings of the Classical, The Temple of Solomon. The Holy Ark created for this temple stands alone as a great work of art, combining both Hebraic and Roman motifs in a hauntingly heroic way. The interior plaster work is at once bold and beautifully scaled to the space.

In 1939, Shutze again had the opportunity to create a religious space, this time within the confines of the Education Building at Emory University. Here is a wonderful example of creative imitation, freely acknowledging its reference, St. Stephen Walbrook by Sir Christopher Wren. Both in plan and elevation, Shutze was able to transform it into something uniquely his own. Like Gabriel's Chapel in the École Militaire, there is no hint of the Little Chapel on the exterior of the Education Building. Once inside, however, one is delighted and amazed to find this space beautifully articulated by 12 freestanding Ionic columns, 8 arches, and a coffered dome remarkably similar to its model. The execution of Shutze's wood details was in the hands of the master carver H.J. Millard. Together they were able to create a room so marvelously enriched it holds its own with its precedent.

Shutze was indeed a master of Classical composition and one may agree, as Professor Scully states, that "Ms. Dowling shows us a Shutze whose best work is far beyond the norm for Classical America. . . ." However, given the content and direction in architectural history, theory, and education during the last 50 years, the uninformed could easily come away from this visually seductive presentation believing, as Dowling seems to, that Philip Trammel Shutze was ". . . perhaps, the finest American Classicist of the twentieth century." In the context of a more comprehensive Classical education, this statement seems naïve and, in the light of the work of several late 20th-Century architects currently involved with the renaissance of American Classicism, slightly premature.

John Blatteau ■

The author is a practicing Classical architect with offices in Philadelphia, New York, and Paris. He also teaches at the University of Pennsylvania.

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Substantial support from private foundations has been committed to the Center which is expected to make an important contribution to land-use decision-making and planning in New York City.

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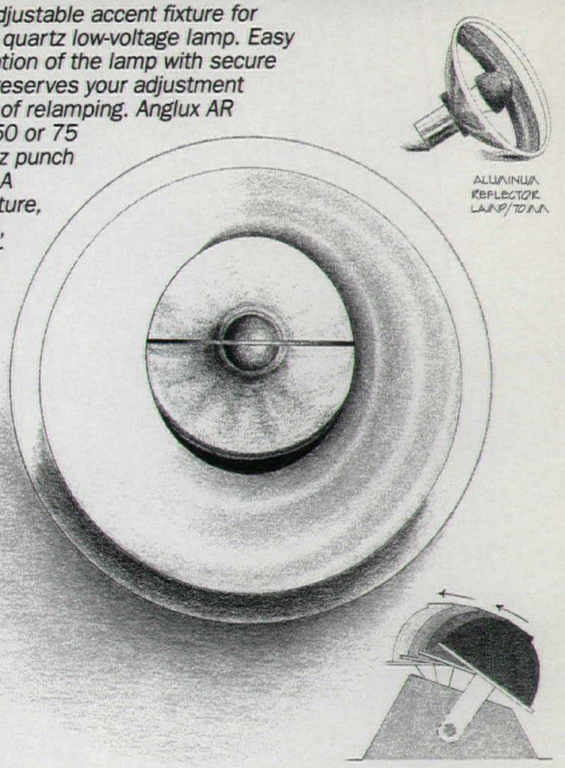

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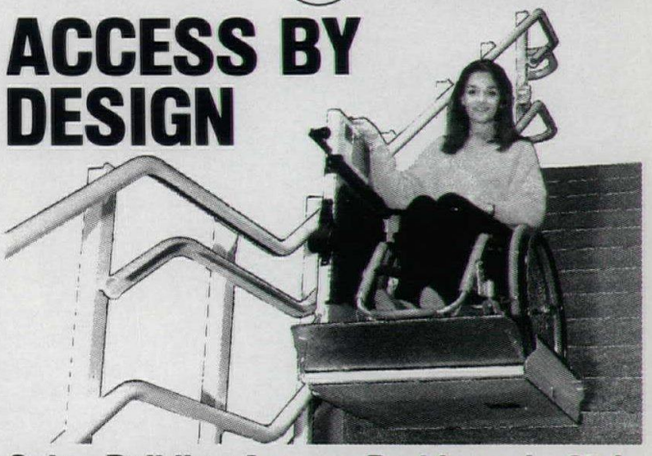

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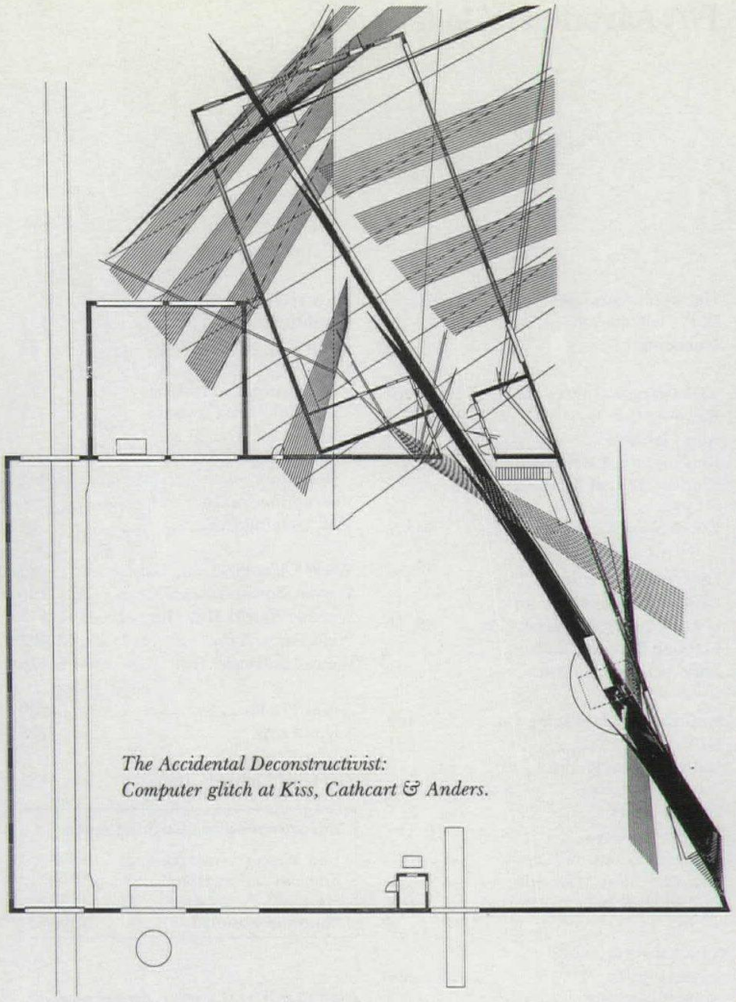
Furthermore . . .

Contributing to this page, we've discovered, is a bit like being a disc jockey with the two-a.m.-to-six-a.m. shift: Sure, not many people notice you, but as a result you're free to play "Stairway to Heaven" 27 times in a row if you feel like it.

And right now we feel like talking about situation comedies. Our Reader Poll on architects' lifestyles (page 63) reveals that architects watch far less television than average Americans. There are a lot of obvious social explanations for this, but one of our editors, who has been interested both in architecture and in television for most of his life, has his own theory: Architects don't like the fact that TV houses aren't the same on the inside as the outside. The situation comedy is the worst offender, as it is shot on videotape on a stage like a play; consequently, the houses in the location shots that open every scene are often wholly unrelated to the layout of the house interior. Our editor missed much of the taboo-busting of *All in the Family* because he was too busy wondering why the characters never acknowledged that they were living in a double house. Similarly, he wonders how *The Cosby Show*'s narrow brownstone got so wide inside and how they put a window in a side wall. Only *The Brady Bunch*—which was shot on film and then laugh-tracked—seems to have achieved any internal/external logic. (But then, Mike Brady was an architect; this also explains their house's contemporary look, unusual in TV's sea of Ethan Allen furniture.) Let's hope some future set designers summon the courage to demand architectural integrity in TV households. Then we can start on the next problem: the enormous apartments that TV characters "just starting out" are able to find.

. . .



The Accidental Deconstructivist: Computer glitch at Kiss, Cathcart & Anders.

When researching the article on Macintosh CAD for this month's computer supplement (page 157), P/A visited the office of Young Architects alumni Kiss Cathcart & Anders (formerly Penthouse K, P/A June 1987, p. 80). The firm, which has as many Macintoshes as employees, considers this "exploded" plan (above) to be its best computer mistake. Principal Peter Anders explains that the plan was drafted in one version of MiniCAD, and when the file was opened months later, after a new beta-copy (test version) supplanted the earlier program, it had been magically transformed. They were amused and inspired by the electronic error, which later led to a staircase design (never built). "After all the horrible and frustrating bombs...it is nice to remember that the computer is only human," says Anders. Occasionally, symbols in the architectural library get mixed up; in one instance, conference room chairs were all replaced with toilets—really BIG toilets, leading Anders to wonder if this wasn't some kind of artificially intelligent criticism of their work. Now that MiniCAD has been refined over the years, and developers have eliminated most of the bugs, accidents are rare. Anders, along with partner Gregory Kiss, is looking for ways to recreate "bombs." Allowing the computer to reconfigure finished buildings could be the ultimate Deconstructivist's tool.

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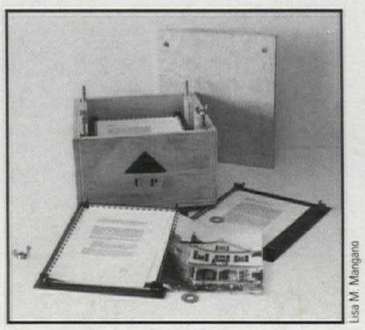
The Herculean—but worthwhile—task of reviewing about 500 submissions for our July issue on young architects allows us to make a couple of generalizations: number one, young architects today are quite inventive; number two, they have a lot of time on their hands. The submitters employed elaborate and often impressive devices to get themselves noticed. (Many must have assumed that our rule "binders... shall not exceed 17 inches in either direction" was merely a hopelessly naive guideline.) One portfolio opened with a mocked-up P/A cover (and a pretty good one, at that) featuring a cryptic detail from one of the architect's buildings. Another architect presented his work on steel plates in what looked like a hungry man's metal lunch box. We saw a number of handsomely bound "books" complete with paisley endpapers, a couple of videos, and a variety of thoughtfully architectonic packages. But the most conspicuous submission, weighing in at 43 pounds, was a plywood box (below), its lid held in place with huge bolts and wing nuts. Inside were eight welded-steel portfolios that unfolded in four directions. Had we not chosen this architect for inclusion in the issue, we would have at least considered the box for a Selected Detail.



Lisa M. Mangano

P/A's heftiest (43 pounds) Young Architects entry.

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Our editors get involved in activities that sometimes go far afield of writing for P/A. One editor, who recently curated a traveling exhibition of architectural drawings and models, recounts his experience racing around New York with a film crew, shooting a video for the show.

"We were like the Keystone Cops, as the van came screeching up to the curb at our various appointments and a tangle of people and equipment came piling out. The crew invaded several architects' offices that day, creating small jungles of cables, booms, and lights, all to capture, in carefully composed scenes, the quiet of a person's comments."

The video is about the act of creating images of three-dimensional buildings on the two-dimensional surfaces of drawings, a process not unlike converting real life onto film. But just as two-dimensional drawings can never really substitute for three-dimensional buildings, that film, unfortunately, will never fully convey the feel of that one, madcap day.

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