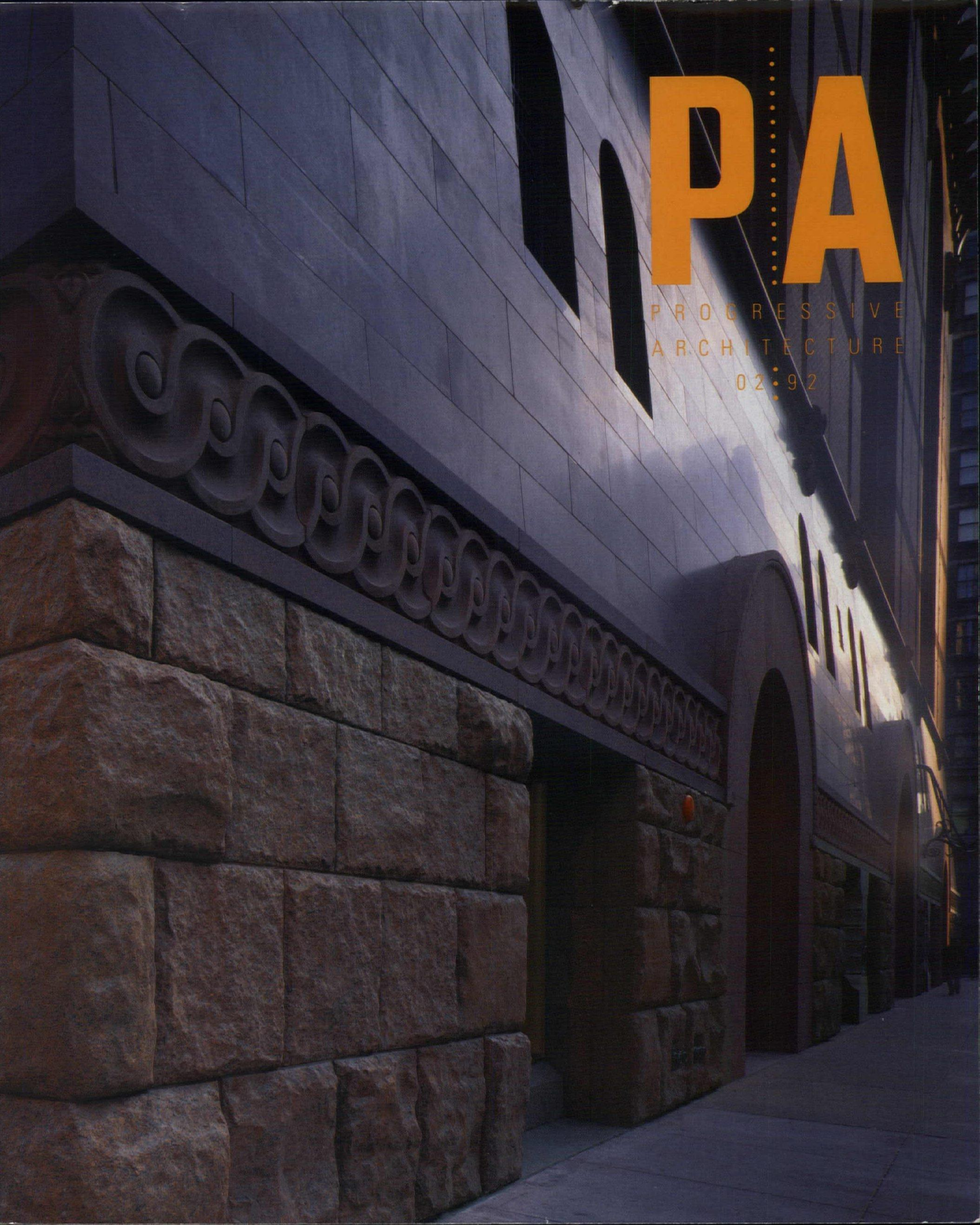

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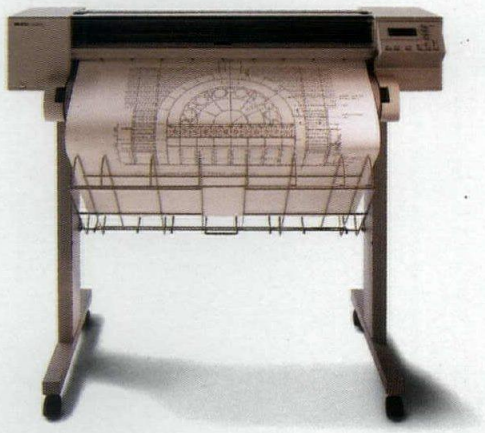

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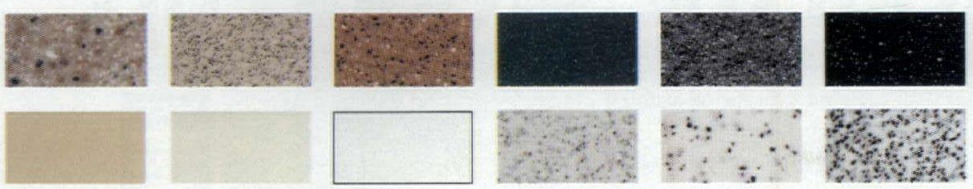

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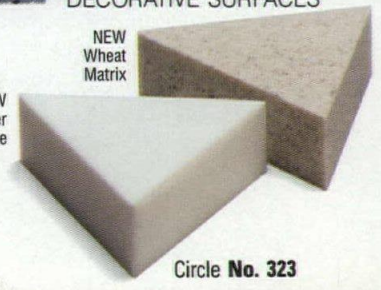

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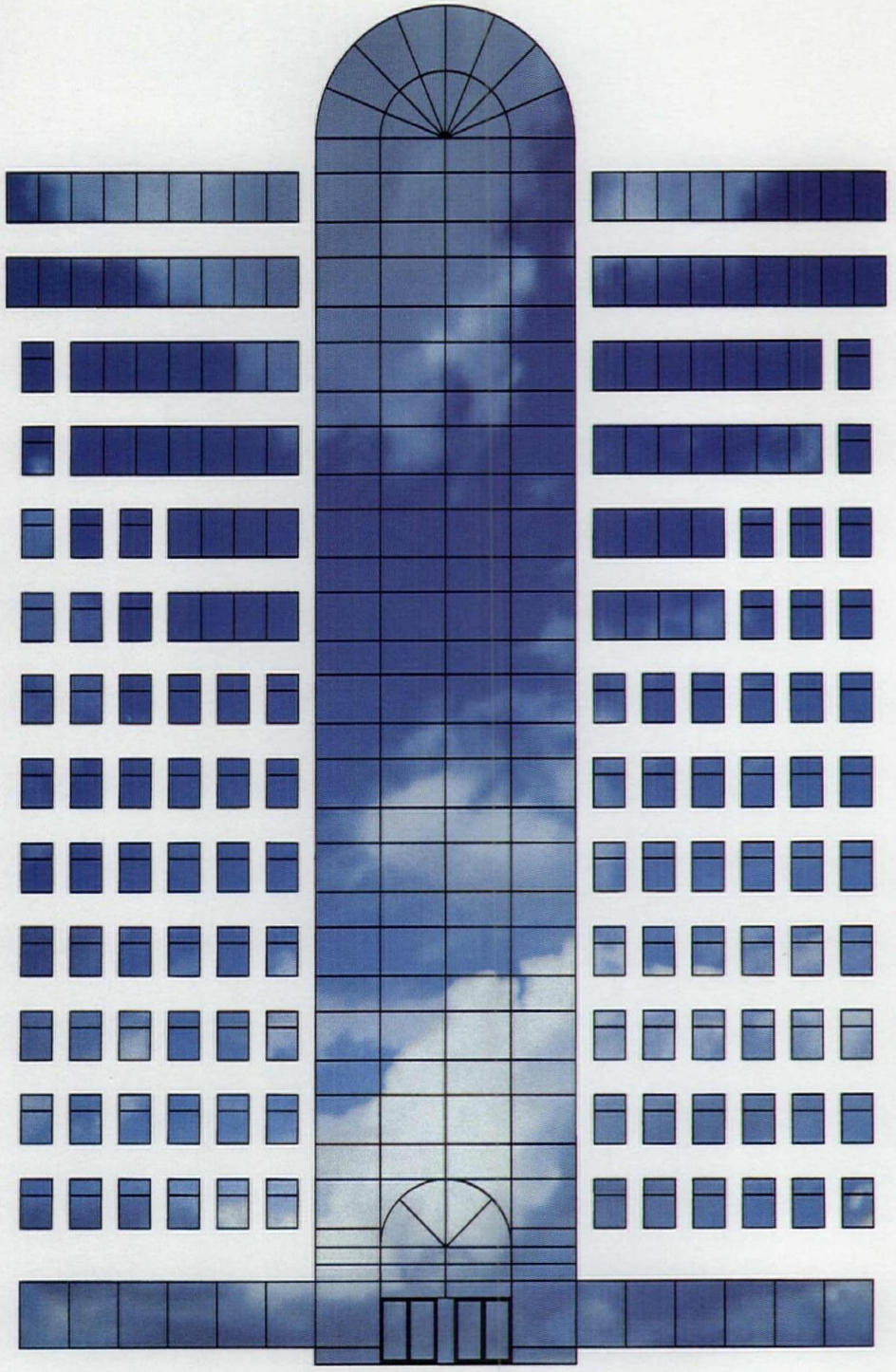

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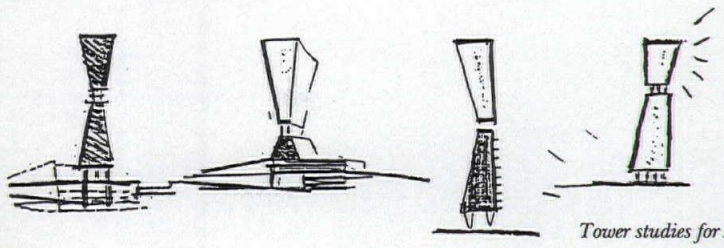
Cover: *Harold Washington Library Center, Chicago, by SEBUS Group, (p. 60).*
Photo by Timothy Hursley (The Arkansas Office).

Progressive Architecture February 1992

P/A

Design

Editor in charge: Thomas Fisher



Tower studies for Euralille by OMA, p. 100.

Technics

Technics Focus: Building Envelope Renovation

Practice

Departments

Penton Publishing P/A Progressive Architecture (ISSN 0033-0752) is published monthly, except semimonthly in October, by Reinhold Publishing, A Division of Penton Publishing, 1100 Superior Ave., Cleveland, OH 44114-2543. Philip H. Hubbard, Jr., President; Robert J. Osborn, Vice President. Penton Publishing: Sal F. Marino, Chairman and CEO; Daniel J. Ramella, President and COO; Philip H. Hubbard, Jr., President, Eastern Operations Group.
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Editorial
Star Gazing

There are good reasons why a star system exists in architecture and equally good reasons why it should change.

At a recent Yale symposium entitled "People of Color in Architecture" (see News Report, January 1992, p. 22), several participants expressed frustration with the star system, where relatively few architects repeatedly get the best clients and the choicest commissions, the most press coverage, and the greatest attention within the schools and the profession. Frustration among minority architects with this system is understandable because it perpetuates the old-boy network, which is particularly discriminatory against minorities, who often lack the right connections. But the star system should concern every architect, including the stars themselves. And it should be changed, although doing so will not be easy, given its inextricable ties to the clients who patronize it and the institutions – the schools, magazines, museums, book publishers, and awards programs – which promote it.

The evolution of the star system reflects a number of cultural and economic forces. As we will discuss in a series of articles entitled "Architects and Power" beginning in this issue (p. 47), one of the most important of these is the intense pressure on every firm today to differentiate itself from growing numbers of competitors. Questions of talent aside, you could argue that star architects have simply been the most successful in distinguishing themselves in the marketplace. This, in turn, has helped building clients differentiate themselves, whether they are homeowners staking a claim to a cultural or economic elite, corporations and institutions seeking an image commensurate with their status, or building owners and developers trying to attract tenants or buyers.

This is said not to justify the star system, but to indicate the complex and powerful support for it that must be addressed if the system is to change. It is a reasonable question, of course, to ask: Why alter the system? It obviously serves the needs of some clients and of the institutions of culture – the schools, museums, and media. The star system also motivates many young people within the profession who sometimes tolerate outrageous exploitation with the hope of one day becoming stars themselves.

Still, there remains a very good reason to change it: the system works against the production of the best architecture. That claim depends on our making a distinction between two types of stars. There are architects who are well regarded within the profession, but relatively unknown outside of it, who are producing work of the highest quality. This diverse group deserves – and often needs – whatever recognition and support it can get from peers. But there is another group, almost all of whom were once noted only within the profession, who have become public personalities and household names among clients, and it is this group of architects whose work often declines in quality in proportion to its rise in popularity. (This is not inevitable, however. LeCorbusier and Wright are two examples of stars who started over several times in their careers when their work became too popular or too predictable.) What seems to drive this decline is either the burden of running a large office or the temptation simply to repeat a successful formula. The fruits of stardom, in other words, carry the seeds of declining quality.

More important, the entire profession is affected by the star system because it tends to foster a view among clients and the public at large that architecture is a commodity rather than an act of discipline, a salable product rather than a generative process. Thus, the star system not only destroys the very stars it creates, but it can distort the entire field. Changing a system so closely tied to popular culture's fascination with personality and insatiable appetite for consumable images will be difficult. The market will no doubt continue to create star architects, as it will rock stars or movie stars. But the profession need not follow suit. Every discipline has its successful popularizers, commodity producers, and package dealers, but few reward them, promote them, or envy them as much as this one. The role of this profession – and every profession – should be to argue for values other than success in the market, to advocate positions that may not be in demand or even popular, but are nevertheless important. We at P/A recognize our responsibility here, and have set for ourselves the goal of seeking out people, places, and positions that might otherwise be eclipsed by the stars. Whether it be through features on emerging talent (the first of which appears in this issue, p. 78), visits to less-traveled places, competitions involving socially relevant problems, interviews with some of the profession's neglected elders, or coverage of positions that have gone out of favor, our intent is to foster powerful ideas and worthy ideals, not just star architects. **Thomas Fisher** ■

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Views

Twenty-Year Review

I very much enjoyed your memoir of the past 20 years (Dec. 1991, p. 79). Under [John Morris Dixon's] leadership P/A has surely been a vehicle for ideas – a magazine in the best sense, one that presents many points of view leaving the readers the ultimate burden of commitment. I hope your next 20 years will continue down the same, long, open road.

Robert A.M. Stern
Robert A.M. Stern Architects
New York

Architects as Capitalists

Thank you for writing on the most fundamental issue of our profession – its very survival (Editorial, December 1991, p. 7).

As you noted in your editorial, capitalization of architecture produced a "standing reserve army" of architects, who became traveling mercenaries, sort of seasonal architectural workers. It is also true that capitalism produces a "standing reserve army" of all professionals and all workers. But I don't think we can decree architecture to step away from capitalism. Instead we can try to change capitalism within the profession.

There are as many kinds of capitalism as of socialism. For example, Japanese capitalism provides its workers with a lifetime employment. German capitalism pays its architects for working on competitions.

Instead of returning to guilds, as William Morris proposed, or going up to the skies, as Karl Marx suggested, we should go forward to find a more advanced form of capitalism. And it's not the government that should do it, but ourselves.

As at the time of any critical situation our rules must become more rigid and our appetites must become more modest. Instead of AIA General Conditions, which is read only by architects themselves, we must include some of those condititions in the building codes. We must simplify and reduce the number of the codes themselves.

We must restrict the number of students in architecture schools, instead of tantalizing them with the glorious aspirations of our profession and then letting reality hit them on the head. We must demand more responsibility from the schools in terms of professional preparation of the students, unless we want architecture to befall the fate of philosophy or philology.

We must create a much stronger professional union than the existing American Institute of Architects. Let us face it – AIA is a self-serving bureaucratic organization, which feeds upon taxing the successful architects.

It does not attempt to retain its members in time of economic hardship. It does not protect its members against various abuses either by employers or by clients. It does not provide an adequate representation of the profession within the United States government. It does not provide adequate job services even for those who can afford the expensive membership. It does not provide an adequate education of American people about architecture, etc.

We must realize that as long as we have registered architects outside of the architects' union, they will continue to lower the professional fees and standards. An architect should automatically become a member of the AIA if he or she passes the license examination.

We should provide those members with better assistance in job searching, perhaps even with a guarantee of minimal employment. At the same time we should create stricter rules for the members.

In other words we must consolidate the profession in order to make it stronger. It is not finding a "middle ground" for architecture but bringing it to a foreground of new reality that may be called: "people's capitalism."

Anatol Zukerman, Architect
Newton, Massachusetts.

[P/A does not endorse the writer's views on AIA's effectiveness. His organizational proposals would require extensive changes in state and Federal law involving licensing, anti-trust safeguards, etc. – Editor]

Manufacturing Housing

Your December 1991 P/A item "The Pitfalls of Manufactured Housing" (Practice, p. 47) caught my attention. Perhaps it, should have been titled the pitfalls of architectural juries.

It's unfortunate that P/A didn't have someone on the architectural jury for the affordable housing competition who was very knowledgeable and experienced in industrialized housing. As an architect who has submitted a design which can be factory built, delivered to the site, and unloaded for under $55,000, I felt it was all a waste of time when your jury failed to apply the program criteria. Having designed and built industrialized housing, I believe I understand some of the constraints. Therefore, I viewed the awards with dismay and disappointment: the design jury apparently ignored the last 50 years of industrialized housing experience. Even the statement on page 47, "...and the modules, typically no more than 14 feet wide and 11 feet high...", may be misleading; more accurately, the dimensions are 13'-8" wide and 11' high including the truck bed, which means that in actuality, the module height is only 9'-6". Greater heights are possible, but in most states it becomes very expensive.

I would like to comment further on the winning design. Anyone who has designed affordable or rental housing with a fixed budget knows that is is unrealistic to build extensive porches and raised decks at the expense of interior space. Unfortunately, exterior accessories have to be eliminated when you come to grips with the budget. Designing a terrace on grade is much more sensible and less expensive. The winning design has a porch almost one-quarter its entire floor area and corridors accounting for over 15 percent of its design; this would be viewed as poor design even by first-year architectural students.

After you have built this project and learned from its lessons, perhaps you should have another competition which would be of real value for the advancement of industrialized housing design and technology.

G. Peter Jennewein, AIA
New Canaan, Connecticut

[We should have clarified the dimension limitations of industrialized housing, as the writer does here. As for the P/A Affordable Housing Initiative as a whole, it was not conceived as limited to industrialized housing. That was the type of solution chosen by the jury, which had broad expertise in housing. – Editor]

The Age of Aalto

The correct life span for Alvar Aalto (Dec. 1991, p. 81) is 1898–1976. Few architects live to the age of 123.

P/A Awards Credit

The model photographer for the Interim Bridges project by Kennedy/Violich (Jan., p. 92) is Bruce Martin.

Whittle Credits

The Whittle Communications headquarters in Knoxville, Tennessee, were credited in the P/A News Report (Oct. 1991, p. 18) to architects Peter Marino & Associates. A subsequent amplification (Dec. 1991, p. 9) credited landscape architects Zion & Breen. Also among the members of the team that produced this building are the implementation architects, Barber & Murray, and the local landscape architects, Kendall-Verson, both of Knoxville.

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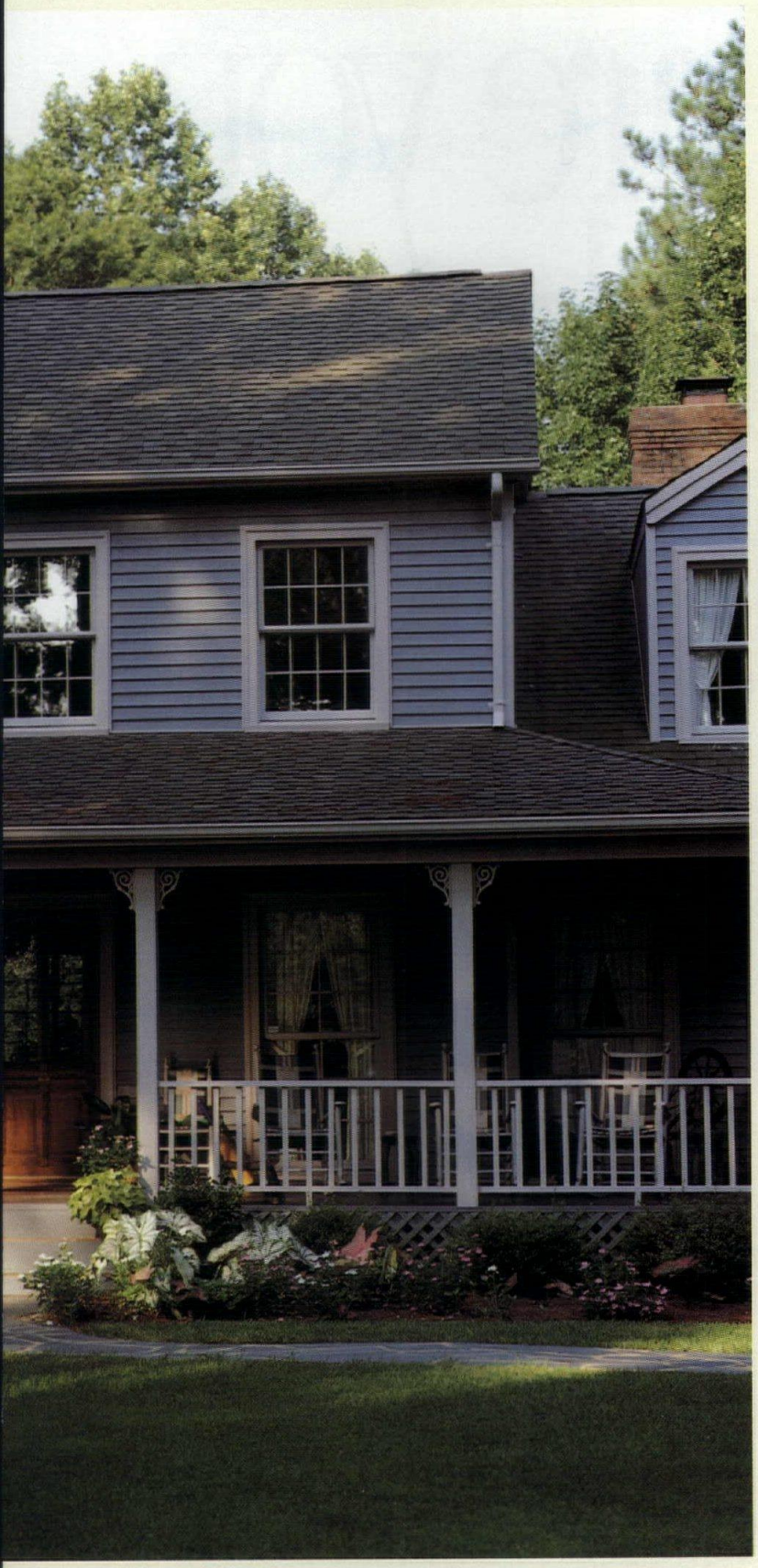

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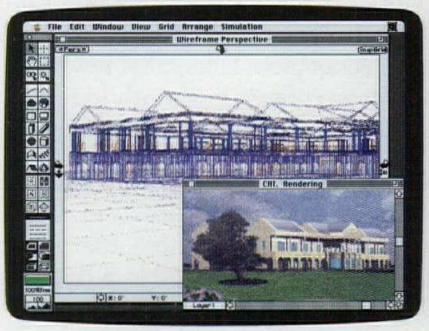

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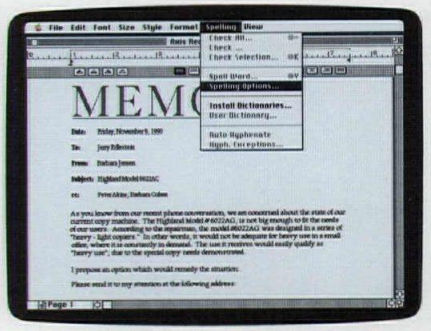

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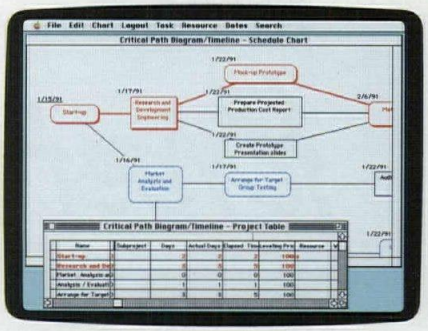

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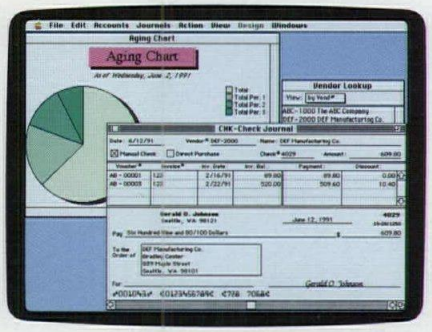

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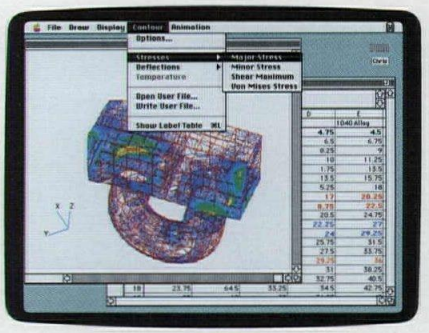

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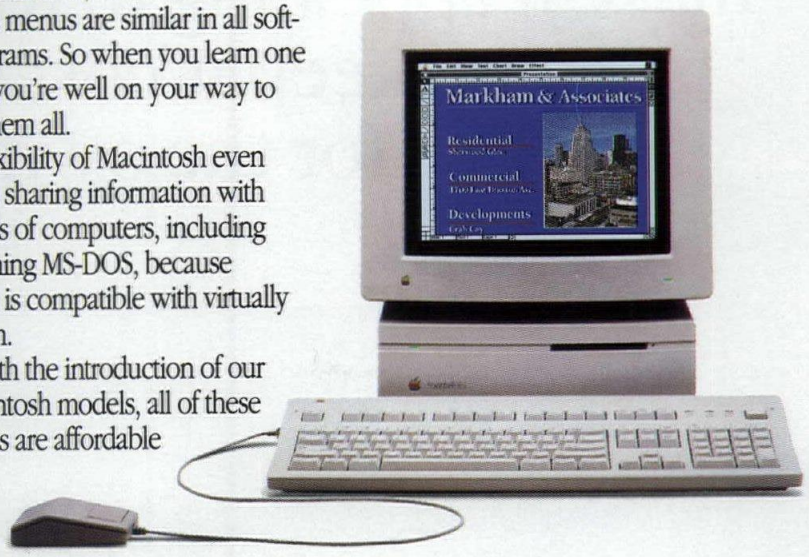

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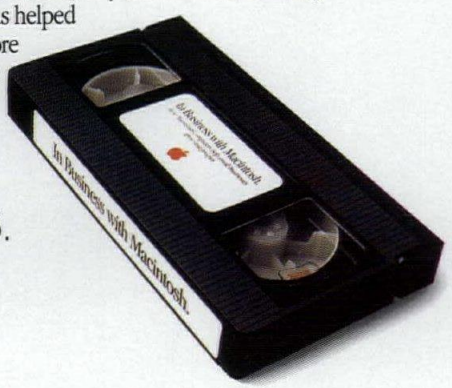

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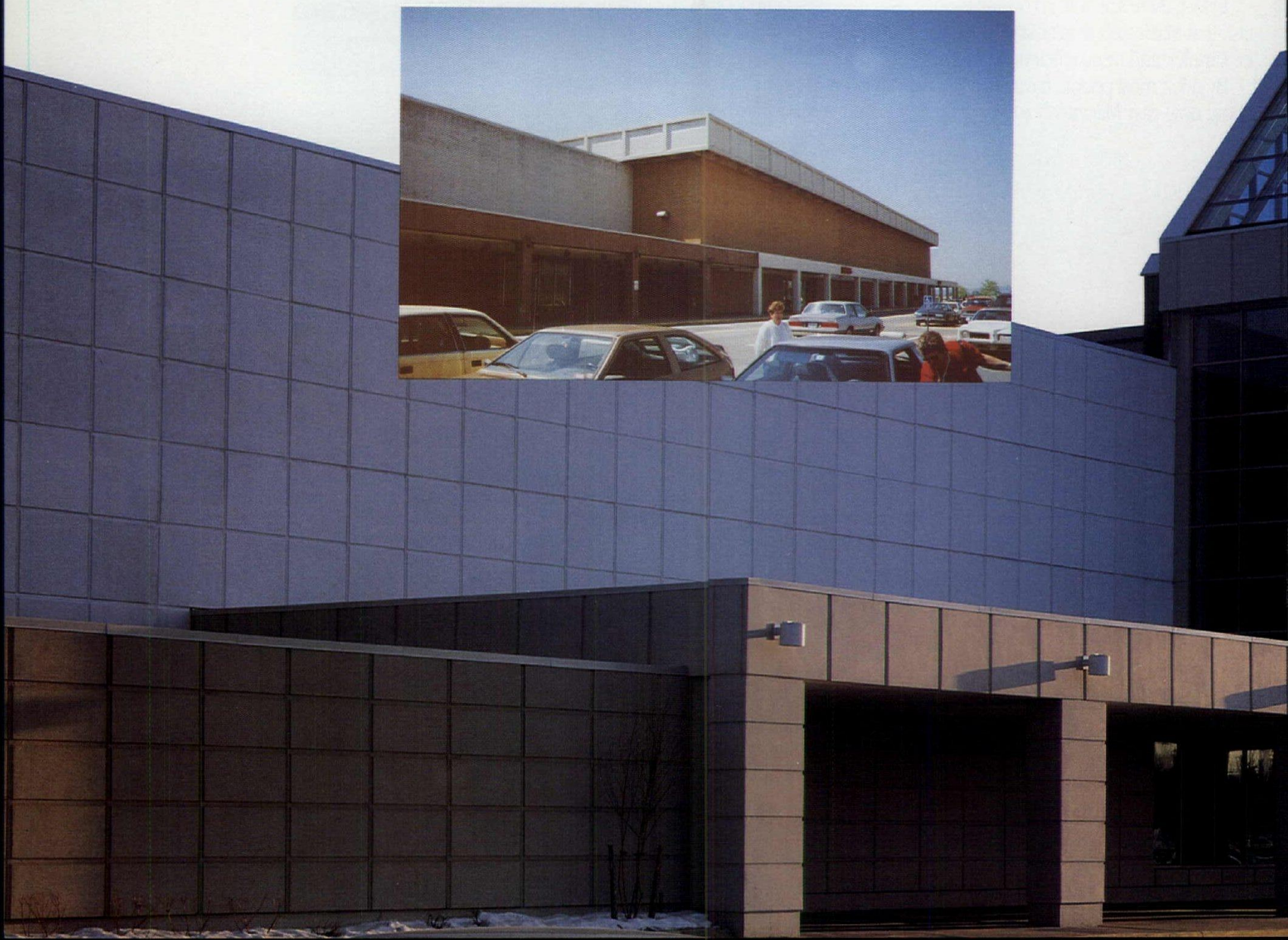

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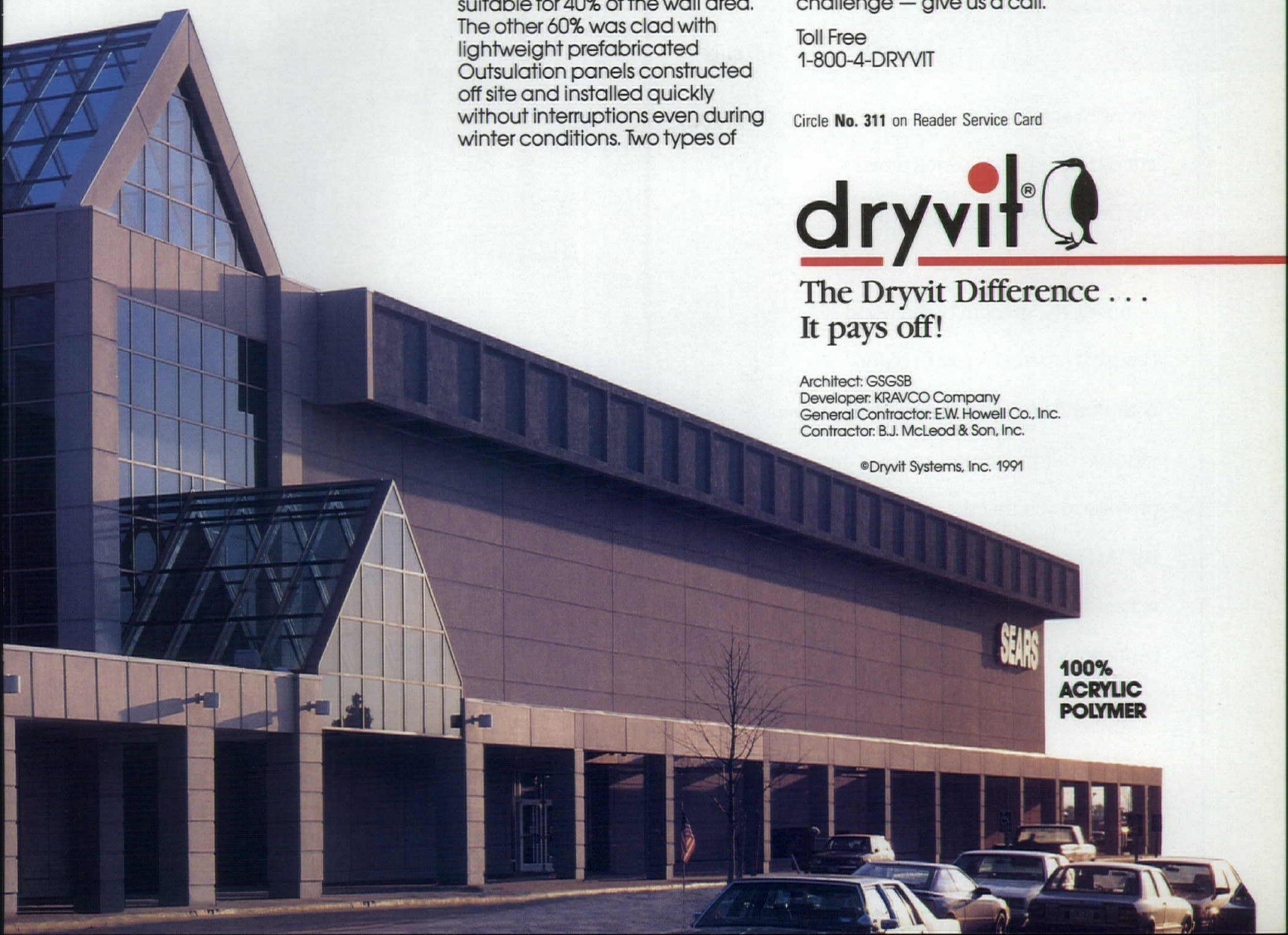

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Susan Dirk

Seattle Art Museum by Venturi, Scott Brown & Associates, seen from First Avenue.

Feeling powerless? This month, a new practice series called "Architects and Power" examines power relationships in the profession (page 47).

New VSBA Museum Opens in Seattle

Seattle is agog over its recently (and only partially) completed downtown art museum by Venturi, Scott Brown & Associates. More than 10,000 people visited the museum on opening day, a newspaper editorial proclaimed it 'magnificent,' and the city's preeminent art critic called it the most significant museum since Louis Kahn's Kimbell in Fort Worth.

The comparison is inappropriate. The Seattle Art Museum has little of the strength or unity of the Kimbell, nor its ingenious blend of natural and artificial light. (The program required windowless galleries.) Its major significance is as a regional cultural institution, with collections recently expanded by gifts from local collectors and handsomely displayed in serenely spacious galleries.

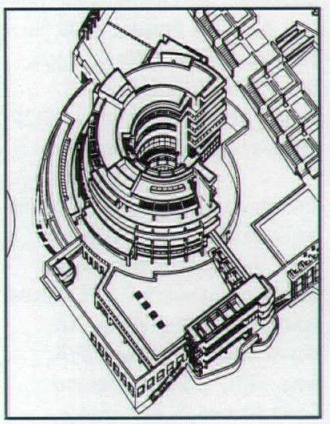
The building itself is a box with a rounded corner, clad in drab striated limestone. Far smaller than its high-rise neighbors up the hill, it tries to achieve civic importance through various Venturiesque gestures: the legend "Seattle Art Museum" is cut into the limestone façade in huge letters, and a band of red, yellow, and white terra cotta enlivens the base.

Both these gestures are found on the building's south elevation, a virtual billboard facing steep University Street. At first, VSBA wanted to take this wall to the sidewalk line, so that the street-level windows would display the museum's attractions, but Seattle's system of downtown view corridors forced the building to set back. Happily, the setback gave the "billboard" more visibility and allowed the architects to create an outdoor stairway between the sidewalk and the building.

The other elevations got short shrift. The north is a blank concrete wall. The west, on First Avenue, bears the tall glazed corner entry but then fades out without interest or decoration. The east, on Second Avenue, has another entrance beneath an elaborate arch but otherwise is a jumbled composition of decorative fragments, windows, and service doors. Some of this is explained by the fact that the museum owns the entire block and is sure to expand northward some day. The north wall has popout panels to facilitate this, and the fact that the avenue elevations do not come to a definite terminus will make it easier to recompose them when expansion occurs.

The principal interior gesture is a grand stairway that rises between the avenues, paralleling the outdoor stairs. It bears a set of heroic Chinese concrete sculptures, and overhead are angular arches, yellow on one side, burnt orange on the other, echoing the exterior decoration.

The stairway is an impressive public space, but the art does not appear until the second floor, where the temporary exhibits gallery is located, making the Second Avenue entrance more convenient for visitors who come to see exhibits. The grand stairway is still an impressive sight from this entrance, but the sculpture in it all faces down-



In Perspectives (page 102), P/A's editors critique Richard Meier's design for the Getty Center.

Pencil Points

W. Cecil Steward, the first educator to be elected president of the AIA, took office last December. "Educators and practitioners must realize we're all part of the same community of professionals," says Steward, Dean and Professor of Architecture and Planning at the University of Nebraska College of Architecture, Lincoln, Nebraska.

Phyllis Lambert, founder and director of the Canadian Centre for Architecture (P/A, Aug. 1989, p. 68), has been awarded the Royal Architectural Institute of Canada's Gold Medal. The award, presented "from time to time," is for outstanding contributions to the profession, be they through practice, education, research, or creative achievements.

The AIA has announced the publication of its Environmental Resource Guide (ERG) Subscription. The quarterly will include materials analyses, case studies, bibliographical listings, and AIA task group reports developed by the Committee on the Environment. Contact AIA/ERG Project, 1735 New York Ave., N.W., Washington, D.C. 20006 (800) 356-ARCH. Yearly subscription rates: $125 members, $200 nonmembers.

Architectural projects included in *Time* magazine's "Best of 1991" roundup in the design category (January 6, 1992 issue) were: Sainsbury Wing, National Gallery, London (P/A, Aug. 1991, p. 80) by Venturi Scott Brown & Associates, Philadelphia; Ohrstrom Library at St. Paul's School in Concord, New Hampshire, by Robert A.M. Stern Architects, New York; Seaman's Institute in New York by James Stewart Polshek & Partners, New York; Team Disney Building (P/A, Apr. 1991, p. 70) in Lake Buena Vista, Florida, by Arata Isozaki & Associates, Japan; and Kentlands, Maryland, a new town by Andres Duany & Elizabeth Plater-Zyberk, Miami.

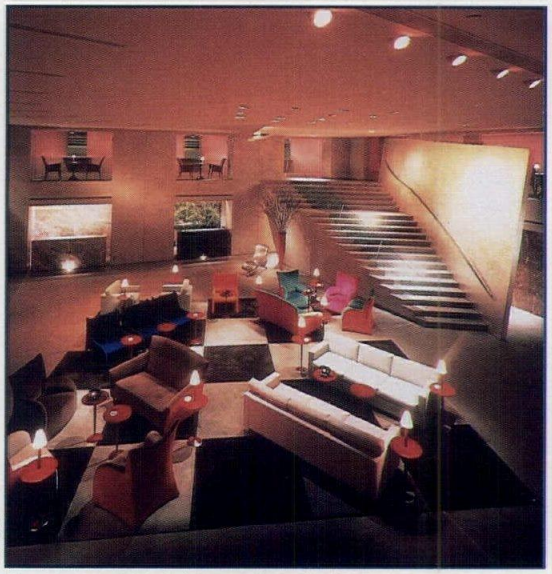
ward toward First Avenue, and the lobby is much smaller here than on the first floor. The Second Avenue entrance thus seems something of a back door, although it faces a transit station and nearby office towers.

The museum was beset by construction delays, so only the galleries on the north side of the third and fourth floors opened on the first day. On the third floor they are enormously varied in color, configuration, and display tehniques, dominated by dramatic Native American and African collections. On the fourth, they are largely lofts housing Modern works, neutral in color with handsome oak floors and trim.

The south galleries, which are to open in stages as the new year begins, are more formal chambers with Neo-Classical details. Gallery design was a collaboration between VSBA, the local associated architects, Olson/Sundberg, and the museum's own curators and exhibit designers. The latter, by all accounts, played a key role. Also still to come is Joseph Borofsky's 48-foot steel and aluminum "Hammering Man," which will stand outside of the First Avenue entrance. Its presence will further emphasize this entrance – and the museum's overall deference to its art. **Donald Canty** ■

AIA Announces Major Awards

The AIA released the results of most of its major awards programs – the Honor Awards, Architecture Firm Award, and 25-Year Award – this December in anticipation of the Accent on Architecture dinner to be held on January 22. The AIA Gold Medal, awarded this year to Cambridge, Massachusetts, architect Benjamin Thompson (P/A, Jan. 1992, p. 21), is also to be presented at the Accent dinner.



Tom Vack

Paramount Hotel, Honor Award winner.

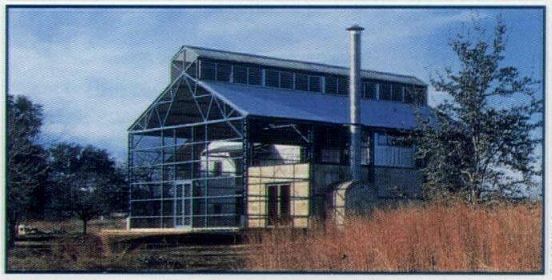
This year's Architecture Firm Award goes to James Stewart Polshek & Partners, New York, for its "high level of craft in the execution of its projects do not mimic the surrounding built environment, transcend and transform the urban fabric." The award, established in 1962, recognizes "distinguished architecture" produced consistently by a firm for ten years or more.

The Salk Institute for Biological Studies, La Jolla, California (1961), one of the masterworks of the late Louis I. Kahn, has won the 25-Year Award, which honors a building "of enduring significance" completed between 25 and 35 years ago. The timing of the award, which is chosen by the Honor Awards jury, is significant: an addition to the Institute (P/A, June 1991, p. 28) has been approved by local regulatory bodies.

As for the Honor Awards, this year's group is smaller than in recent years, but every bit as pluralistic, with winners ranging from Peter Rose's reserved Canadian Centre for Architecture to Frank Gehry's brashly composed Vitra Museum.

The winning projects are, in alphabetical order by architect:

- Croffead House, Charleston, South Carolina, by Clark & Menefee Architects, Charlottesville, Virginia
- Vitra International Furniture Manufacturing Facility and Design Museum, Weil Am Rhein, Germany, by Frank O. Gehry & Associates, Santa Monica, California, and Frei Architekten Gunter Pfeifer & Assoziierte Roland Mayer, Lorrach, Germany (P/A, May 1990, p. 94)
- The Newark Museum, Newark, New Jersey, by Michael Graves Architect, Princeton, New Jersey (P/A, March 1990, p. 88)
- Paramount Hotel, New York, by Haigh Architects, Greenwich, Connecticut, with Philippe Starck, France
- Team Disney Building, Lake Buena Vista, Florida, by Arata Isozaki & Associates, Tokyo, and Hunton Brady Pryor Maso, Orlando (P/A, April 1991, p. 70)
- Firestone Library expansion, Princeton University, Princeton, New Jersey, by Koetter, Kim & Associates, Boston
- Carraro House, Kyle, Texas, by Lake/Flato Architects, San Antonio, Texas



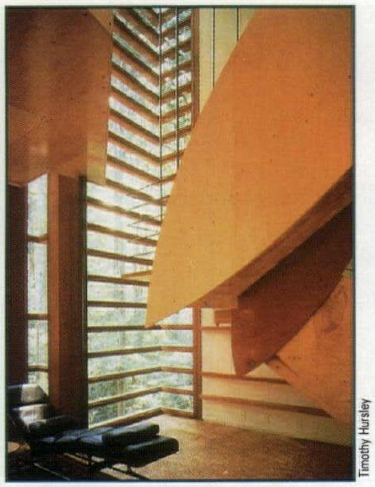
Paul Hester

Lake/Flato's winning Carraro House.

- Canadian Centre for Architecture, Montreal, by Peter Rose Architect, Montreal, and Erol Argun Architect, Montreal (P/A, Aug. 1989, p. 68)
- House Chmar, Atlanta, by Scogin Elam & Bray Architects, Atlanta

- The National Gallery Sainsbury Wing, London, by Venturi, Scott Brown & Associates, Philadelphia, and Sheppard Robson Architects, London (P/A, Aug. 1991, p. 80).

Jury chairman was James I. Freed of Pei Cobb Freed & Partners, New York. Other jurors were Alan Chimacoff of The Hillier Group, Princeton, New Jersey; Peter Forbes of Peter Forbes & Associates, Boston; Bobbie Sue Hood of Hood Miller Associates, San Francisco; Philip A. Morris, editor of *Southern Living* magazine, Birmingham, Alabama; Kenneth Schroeder of Schroeder Murchie Laya Associates, Chicago; Gail Thomas, director of the Dallas Institute of Humanities and Culture, Dallas; associate AIA member Laura J. Miller, Ames, Iowa; and student member Robert Raasch, Seattle. ■



Timothy Hursley

House Chmar, award winner for Scogin, Elam & Bray.

Threat to Wilshire Boulevard Landmark

Developers and preservationists are squaring off in Los Angeles over the fate of one of the city's most visible landmarks, the streamlined Moderne-style May Company Building. Local government, which may have the final say in the matter, appears undecided.

The May Company Building, built in 1940, occupies the important Wilshire-Fairfax intersection. Designed by a local firm, Albert C. Martin & Associates, the four-story building has smooth, Modernist elevations, except at the Wilshire-Fairfax corner, where the building breaks out in an Art Deco extravagance of gold tile and a three-story frame of black glass.

The developers – Forest City Development of Cleveland and May Centers of St. Louis – are proposing the demolition of the building, as part of a 10-acre project sprawling over four noncontiguous sites. Existing protections for the building appear weak. The May Company Building is eligible to be listed on the National Register of Historic Places and as a Cultural Historical Monument of the City of Los Angeles, yet neither designation can prevent demolition; local landmark status, for example, could delay demolition only for a year after enactment, and the Los Angeles City Council has yet to approve the designation.

Some hope is coming from local preservationists, including the Los Angeles Conservancy. The group recently met with the developers and their architects, armed with massing studies to demonstrate how the development program could fit the site and still spare the May Company Building. Although the local city councilman was undecided at last report whether to fight for the preservation of the streamlined department store building, he is putting pressure on the developers to scale down the project, to lower the number of new automobile trips on Los Angeles's already congested streets. Possibly the best chance for survival rests with the city council, which is expected to vote on the project later this year. The question remains whether council members will send a message to the developers and architects that approval for the larger project hinges on the preservation of the May Company Building. **Morris Newman** ■

Albert C. Martin & Associates

May Company building, slated for demolition.

Restoration for Sullivan Bank

When Louis Sullivan's Peoples Savings Bank was completed in 1911, it was hailed as a model for the modern bank: unassuming and people-oriented. Purchased in 1988 by Norwest Bank Iowa, the Cedar Rapids, Iowa, building recently emerged from a ten-month restoration project to refurbish the façade, recreate the original interior, and integrate Sullivan's public banking hall with later additions to the building.

The second of eight Midwestern banks designed by Sullivan late in his career, this building was enlarged several times, most notably in 1966, when an adjacent four-story building was demolished and replaced with a two-story bank, and in 1979, when a third and a fourth story were added to this wing, overwhelming Sullivan's building. The original building gained landmark status only in 1978, after successive remodeling efforts had compromised its façade and destroyed or displaced most of the Sullivan fittings and furniture.

Restoration architects Hasbrouck Peterson Zimoch Sirirattumrong, Chicago, located Sullivan's

(continued on next page)

Washington Report

To understand where a profession is and where it may be heading, surveys can help. No exception is the AIA's recently issued *1991 AIA Firm Survey Report.* Yet, despite its impressive array of statistics, the report offers scant interpretation and raises many questions. Some highlights:

- *The average salary in 1990 for sole practitioners, who formed the large and growing majority of architects, was $43,600 for an average 42-hour work week.*

This amounts to a little more than $19 an hour. Was that an adequate income? How does an average architect respond to this comment from one survey reader: "Don't plumbers get a lot more than that?"

- *Net* billings *per architect (not to be confused with net* profits *) for sole practitioners averaged $65,000 in 1990.*

Was the cost of doing business (net billings minus salary), therefore, about $1700 per month for the average practitioner? If so, solo practice remained a relatively low-overhead proposition, despite frequent predictions and some claims to the contrary.

- *Firms owned by members of the AIA employed 137,000 people full-time in 1988; that figure dropped to 130,000 in 1990.*

Young people bore the brunt. Most jobs lost had been held by the most recently hired; about 3600 positions – more than half the total lost – were internships.

In each of the seven years leading up to 1990, about 3000 graduates received bachelor of architecture degrees; 1500 received master of architecture degrees. The bottom line: almost as many entry-level jobs were lost in 1990 as there were new graduates entering the marketplace.

- *Firms owned by AIA members designed an estimated 84 percent of the $160.2 billion worth of construction in 1990.*

Maybe, say some critics, but such estimates (drawn from local building permit applications) can confuse designing with merely affixing license stamps. "Most buildings aren't designed, they're just drawn," says one architecture professor. "If that figure were accurate, it would be

(continued on next page)

Washington Report

(continued from previous page)

an appalling indictment of the profession's design abilities."

- *Firms with 30 or more employees (seven percent of all firms) amassed 56 percent of the year's billings and employed more than half of all employees.*

And the bigger they come, the harder they fall: large firms also had the greatest drops in revenues and employees. With a decline in new building projects, which tend to go to bigger firms, the market share held by smaller firms tends to rise.

- *Half of all firms operating in 1990 were established during the preceding decade.*

That makes 8500 new firms in ten years, an average of 850 new firms annually. Might this trend move in the opposite direction during lean times? No, says the report: architects leaving large firms tend to go to work on their own, creating more new "firms."

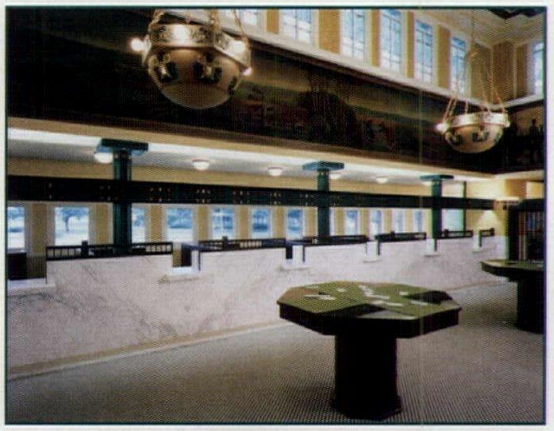
A major downside of this trend is that small firms are far less likely than large firms to provide medical insurance (40 percent had none at all in 1990), sick leave, retirement plans, and other basic benefits.

- *State, local, and federal governments were the largest client group for architectural services, accounting for nearly a quarter of all billings.*

Government agencies were much more important to large firms, and this dependence is likely to grow as private sector work continues to stall. But how long can strapped governments remain a main source of work?

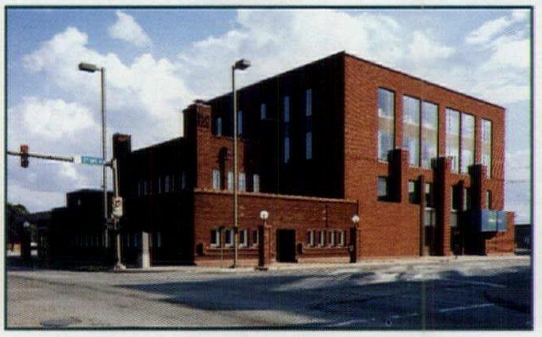
Even what at first blush seems to be the survey's good news is dampened by study. While "over 60 percent of the firms surveyed expected no change in staff" through 1993, further reading reveals that more than half of all firms are sole proprietorships, and that more than 60 percent have only one architect. As an architect here quipped when asked how things were going in his one-person practice, "Well, as I told my staff the other day, if we get any smaller, we'll disappear." **Thomas Vonier** ■

The 1991 Firm Survey Report *($95) is available from the AIA, 1735 New York Ave. NW, Washington, D.C. 20006.*



Norwest

Restored Sullivan bank interior . . .



Norwest

. . . and exterior, with earlier additions at right.

Sullivan *(continued from previous page)*

original drawings; along with period photographs from the Library of Congress, these provided a clear picture of the bank's original state. True to Sullivan's dictum, the building's exterior form addresses its internal functions. Its rectangular double-height center, whose corners are marked by tall ventilation chimneys, contains the banking hall. A lower perimeter volume contains teller stations, the vault, and the former bank officers' area, now a transitional space that connects the Sullivan building with the later additions.

Working closely with OPN Architects of Cedar Rapids, Norwest management, and general contractor Rinderknecht Associates, Wilbert Hasbrouck located, and had copied, original interior elements that had been dispersed around the Midwest, removed and recast surviving plaster column jackets and ornamented capitals, and analyzed plaster chips to determine paint colors. The removal of a dropped ceiling inside the banking hall revealed clerestory stained glass windows that light a well-preserved period mural by Chicago artist Allen Philbrick. Functioning much as it did in 1911, the bank stands today as enduring testimony to Sullivan's vision. **Andrea Truppin** ■

The author, formerly a senior editor of Interiors *magazine, is a freelance writer and filmmaker in Iowa City.*

Visions of Japan: A Cultural Exploration

While Japan's economic might is omnipresent, the driving force behind Japanese culture is less tangible. "Visions of Japan," an exhibition held at London's Victoria & Albert Museum last fall, was designed to comment on the country's past, present, and future. Organizer Arata Isozaki chose "Life as a Game" for his theme: every act undertaken by a Japanese person – be it economic, social, or political – is made within a set of rules, says Isozaki. The magnitude of this unspoken liturgy was expressed in the form of three exquisitely designed environments.

Room One, "Cosmos," designed by architect Kazuhiro Ishii, presented a spiritual journey into Japan's past. Three wooden pillars and a teahouse were reconstructed following Medieval designs. Each element was mechanized and set on a timer: As the pillars revolved, the room was bathed in a yellow glow, music played, and the teahouse walls disengaged from one another, moving slowing downward until they were parallel with the floor. Here, the game pits man against nature; the challenge of this ancient world was to create a heaven on earth through the perfection of a craft or skill.

In Room Two, "Chaos," designed by Osamu Ishiyama, the sanctity of the past has been displaced by present-day Tokyo and its orgy of consumption. Domination of technology is the objective: a cityscape of computer-chip buildings destroyed by monsters straight out of a Japanese horror film was followed by a maze of perversely colored vending machines; a karaoke booth sat amidst a row of video games; the Shrine of Sound, a techno-tectonic structure, oozed incoherent

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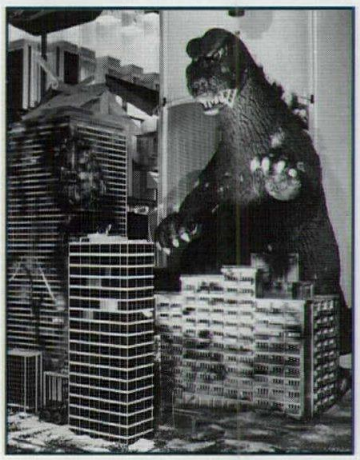
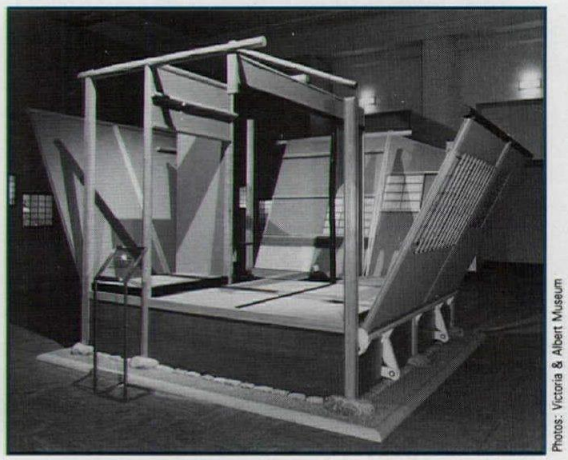
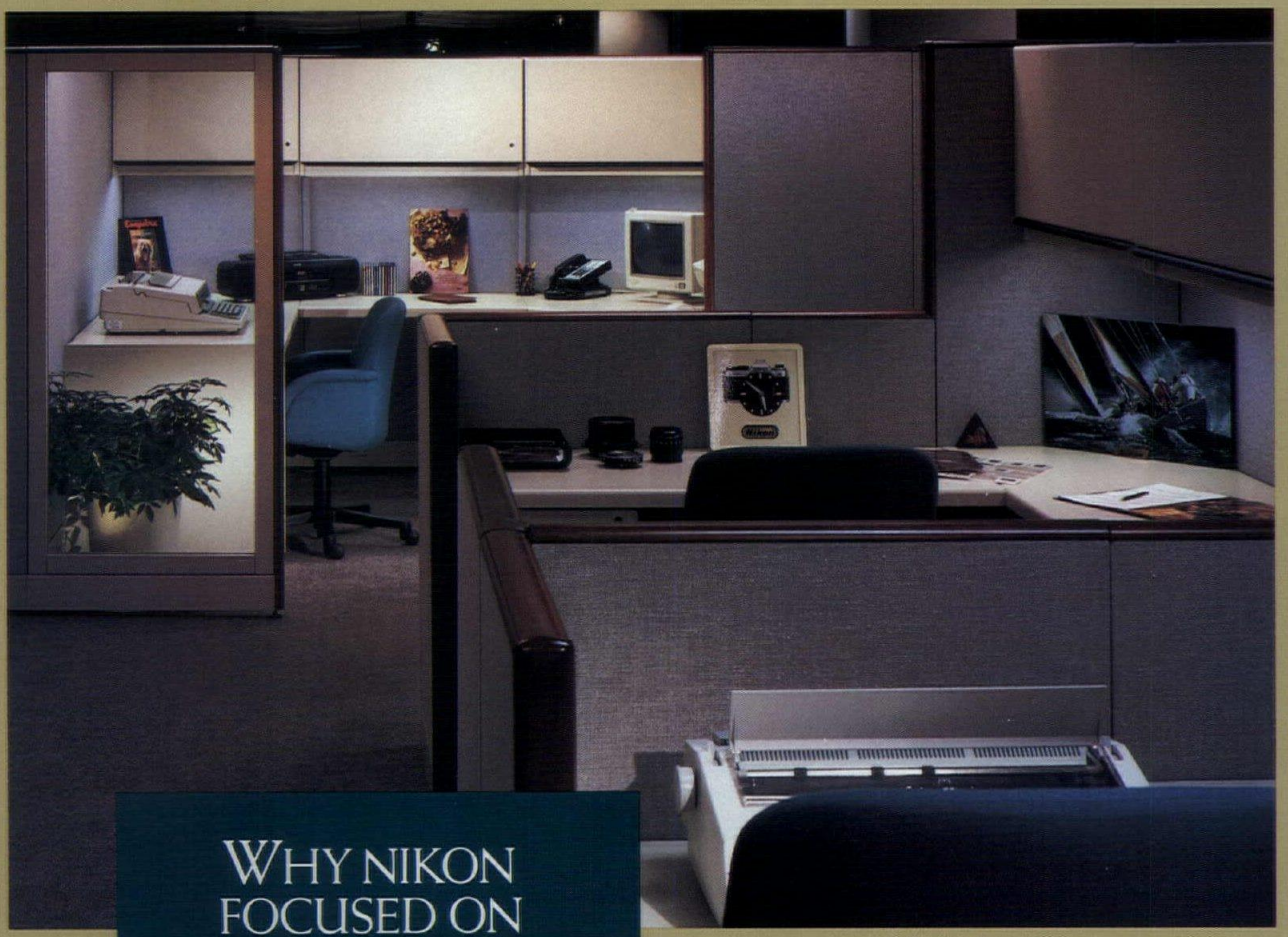




Photos: Victoria & Albert Museum

Visions of Japan: in Room Two (right), Godzilla dines on Tokyo; in Room One (far right), a mechanical tea house.



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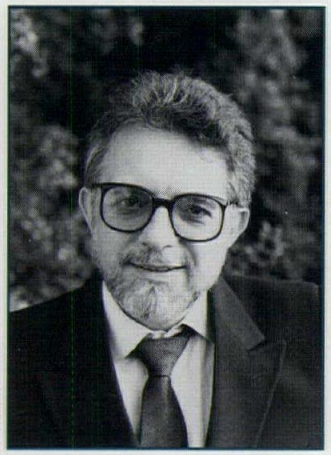
CETRA GOES EVERYWHERE

Visions *(continued from page 22)*

noise; the Seven Gods of Good Fortune offered paper oracles in English and Japanese.

Technology's seductive grip was prophesied by architect Toyo Ito in Room Three, "Dreams." Arguing that the information explosion shows more fascination with the messenger (the electronic gadgetry) than with the message (information), Ito submerged visitors in a seemingly zero-gravity netherworld: a semitransparent polycarbonate screen held continuously changing images generated by computer-linked liquid crystal projectors; a semitransparent acrylic floor was swathed with more computer imagery from overhead. Ultimately, Ito reversed the rules of the game; technology had taken control.

By skillfully appropriating the very elements that fuel the culture, the architects constructed the uniquely Japanese concept of "Life as a Game" with profound effect. Visitors were transported, mind and body, deep into the Japanese psyche and beyond: With "Visions of Japan," Isozaki and his colleagues captured the human condition with frightening precision. **Abby Bussel** ■



UC/Berkeley

Spiro Kostof.

Spiro Kostof 1936–1991

Architectural historian and educator Spiro Kostof died of lymphoma on December 7. He was 55.

Kostof's brand of architectural history reached beyond the chronology of styles to contextual interpretations and analyses; social, political, economic, and geographical conditions were intrinsic to his scholarship. As an educator, he sought to teach both lay people and students about the built environment. In 1987, he hosted "America By Design," a five-part public television series created to position architecture as an art of the people, integral to the shaping of the American landscape. Kostof was born in Istanbul. He came to the United States in 1957 to attend Yale University as a drama major, but soon turned his attention to art history. He taught at Yale from 1961 to 1965 and then moved to Berkeley to teach architectural history at the College of Environmental Design at the University of California, where he taught until his death. He was a visiting professor at MIT (1970), Columbia University (1976), and Rice University (1986–1987).

He wrote several books, including: *The Caves of God; The Third Rome; A History of Architecture: Settings and Rituals;* and *The City Shaped*, the first of a two-volume study of urban form published last fall. (The second, *The City Assembled*, is due out this year.) In 1986, Kostof received an Excellence in Education Award from the California Council/AIA, and in 1988 he received Institute Honors from the AIA. ■

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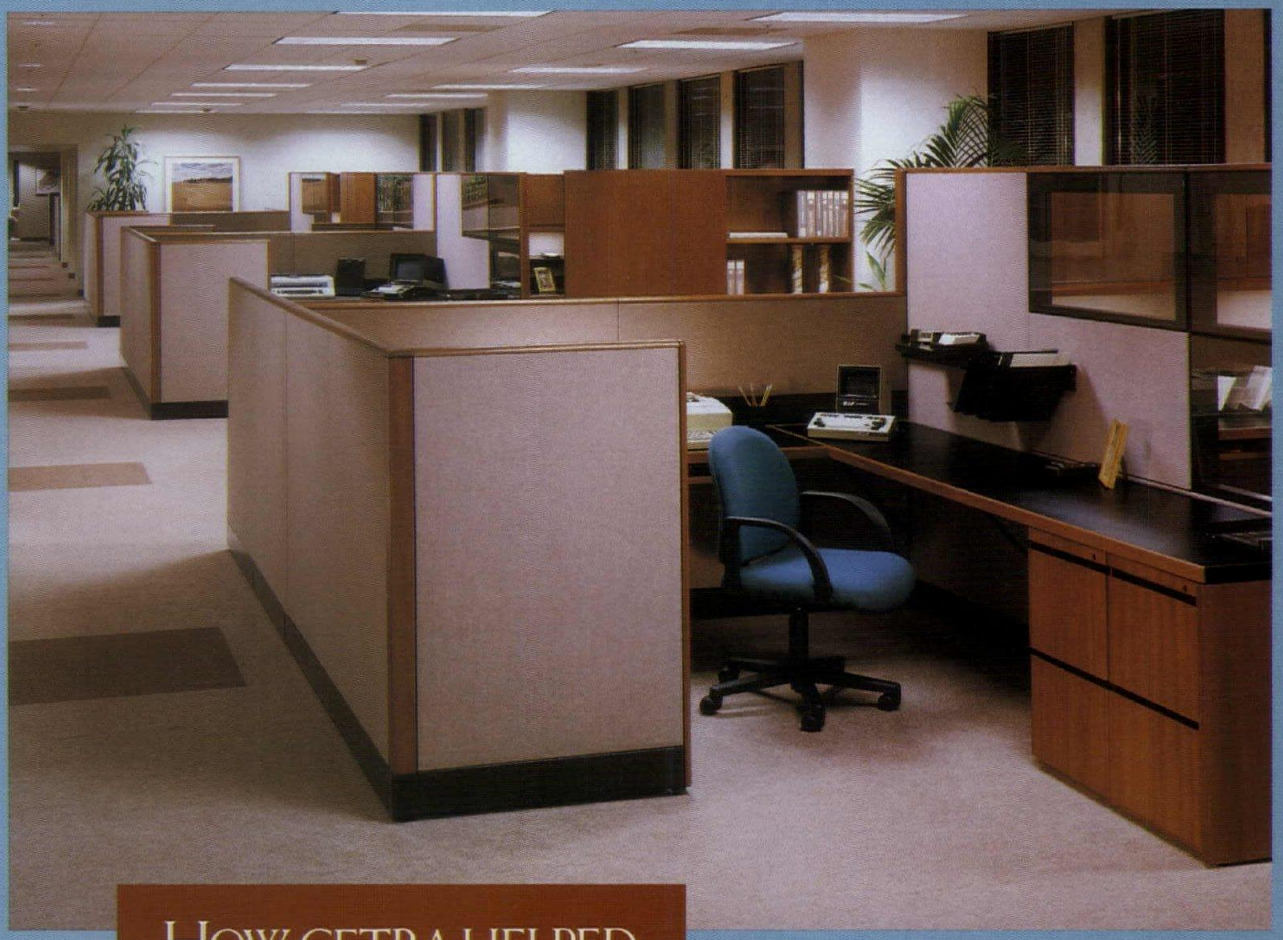

HOW CETRA HELPED SECURITY PACIFIC MAKE THE CORRECT CHANGE.

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C E T R A G O E S E V E R Y W H E R E

Calendar

Exhibitions

Potential Architecture
Through March 8

Montreal. Construction toys produced between 1850 and 1950 – in the second annual exhibition devoted to the subject – consist of components that can be assembled in a variety of configurations. Canadian Centre for Architecture.

Houston's Main Street
Through April 12

Houston. Main Street, Houston, is symbolic of the polarization of American urban centers, where poverty and wealth, gentrification and erosion exist side by side; photographs document current conditions in Houston, and models and drawings offer "visionary" solutions. Museum of Fine Arts.

Lutah Maria Riggs
February 11–March 30

Santa Barbara, California. Work by Lutah Maria Riggs (1921–1980), a leading advocate of the Spanish Colonial Revival style, is documented with archival material and current photography. Museum of Art.

Anthropomorphism
March 3–May 4

Chicago. "Metaphors of Biological Structure/Architectural Construction" is a review of architect/theorists – Vitruvius, Ledoux, Le Corbusier, etc. – who used the proportions of the human body as the mathematical and aesthetic module for architecture. Art Institute.

Competitions

***ID* Annual Design Review**
Entry deadline February 18

New York. *International Design* magazine invites entries in its 1992 Annual Design Review. Categories include: concepts, consumer products, environments, equipment, furniture, graphics, packaging, surfaces, and student work. Contact Design Review Editor, *ID* Magazine, 250 West 57th Street, New York, NY 10107 (212) 956-0535 or FAX (212) 246-3891.

Project Grants
Application deadline March 1

New York. The Architecture, Planning, and Design Program of the New York State Council on the Arts invites architects, designers, and scholars to apply for Independent Projects grants. Proposals for the realization of specific projects "which advance the field and contribute to the public's understanding of the designed environment" are requested. Preference will be given to residents of New York State and to projects which directly benefit State residents. Contact NYSCA (212) 387-7013.

Barcelona '92 International Prizes
Entry deadline March 31

Barcelona. Established by the City of Barcelona on the occasion of this year's Summer Olympic Games, the Barcelona '92 International Prizes is a multidisciplinary arts program. The Antoni Gaudí International Architecture and Town Planning Prize honors a work "carried out within an innovative philosophy and which has contributed to the improvement of the urban space in which it is located." Work completed (or nearing completion) between October 1988 and March 31, 1992 is eligible. Contact Premis Internacionals Barcelona '92, Olimpiada Cultural, COOB'92, Travessera de les Corts, 131-159, 08028 Barcelona, Spain.

AIAS Bay Area Challenge
Registration deadline April 3

Washington, D.C. "Defining the Edge: The City and the Bay" is an AIAS-sponsored competition open to students and interns (the latter, out of school three years or fewer). The challenge is to reactivate public use of the post-Embarcadero Freeway San Francisco waterfront. Contact AIAS, 1735 New York Ave., N.W., Washington, D.C. 20006 (202) 626-7455 or FAX (202) 626-7421.

RIBA Student Competition
Entry deadline April 22

London. "Hybrid and Superimposition" is the theme of the Royal Institute of British Architects's 10th annual international student design competition. The brief is "to challenge the preciousness with which existing or historical conditions have been treated in the past...to challenge and violate the old orders to varying degrees...." Full- and part-time students who will not have graduated by July are eligible. Contact RIBA, 66 Portland Street, London W1N 4AD (44) 71 580-5533.

Van Alen Student Competition
Submission deadline May 8

New York. The National Institute for Architectural Education has announced this year's Van Alen student competition. "Continuum and Evolution: A Competition to Complete Gaudí's Church of the Sagrada Familia" is the theme. Entrants must complete their design within an eight-week period. Contact NIAE, Van Alen International Student Design Competition, 30 West 22nd Street, 6th Floor, New York, NY 10010. (212) 924-7000 or FAX (212) 366-5836.

Hetero-Cultural Architecture
Submission deadline May 12

Tokyo. The NARA/TOTO World Architecture Triennale (Open Division) held in conjunction with an international conference, calls for the design of any structure or urban space that expresses a "new culture." The theme is the "Coexistence of History and the Future – Architecture that has hetero-cultural fusion as its goal." Entrants must register and submissions must be postmarked before the deadline date. Contact TOTO Ltd., Communication Dept., NARA/TOTO World Architecture Triennale (Open Division), 1992, 3-37, Akasaka 7-chome, Minato-ku, Tokyo 107, Japan (81) 3 5410-2912 or FAX (81) 3 5410-1036.

Conferences

Project Implementation
February 28–29

San Antonio, Texas. An AIA membership conference, "Implementation of Complex Projects: New Professional Directions," is sponsored by the Corporate Architects Committee in cooperation with the AIA's Young Architects Forum. Contact Marc Gravallese (202) 626-7539.

1960s Design Legacies
March 7

New York. Panelists and participants at "Rethinking Designs of the 60s" will look to the social and technological aspirations and achievements of the 1960s for insight into current design issues; the ADPSR and *Perspecta: The Yale Architecture Journal* are hosts. Contact ADPSR, 225 Lafayette Street, New York, NY 10012 or (212) 344-8104 or FAX (212) 941-9679.

WestWeek 92
March 18–20

Los Angeles. "Counterforce/Counterbalance: Emerging Attitudes and Aesthetics in a Changing World" is the theme of the 17th annual WestWeek contract furniture market (see page 131). Contact Pacific Design Center, 8687 Melrose Avenue, Los Angeles, CA 90069 (310) 657-0800 or FAX (310) 652-8576.

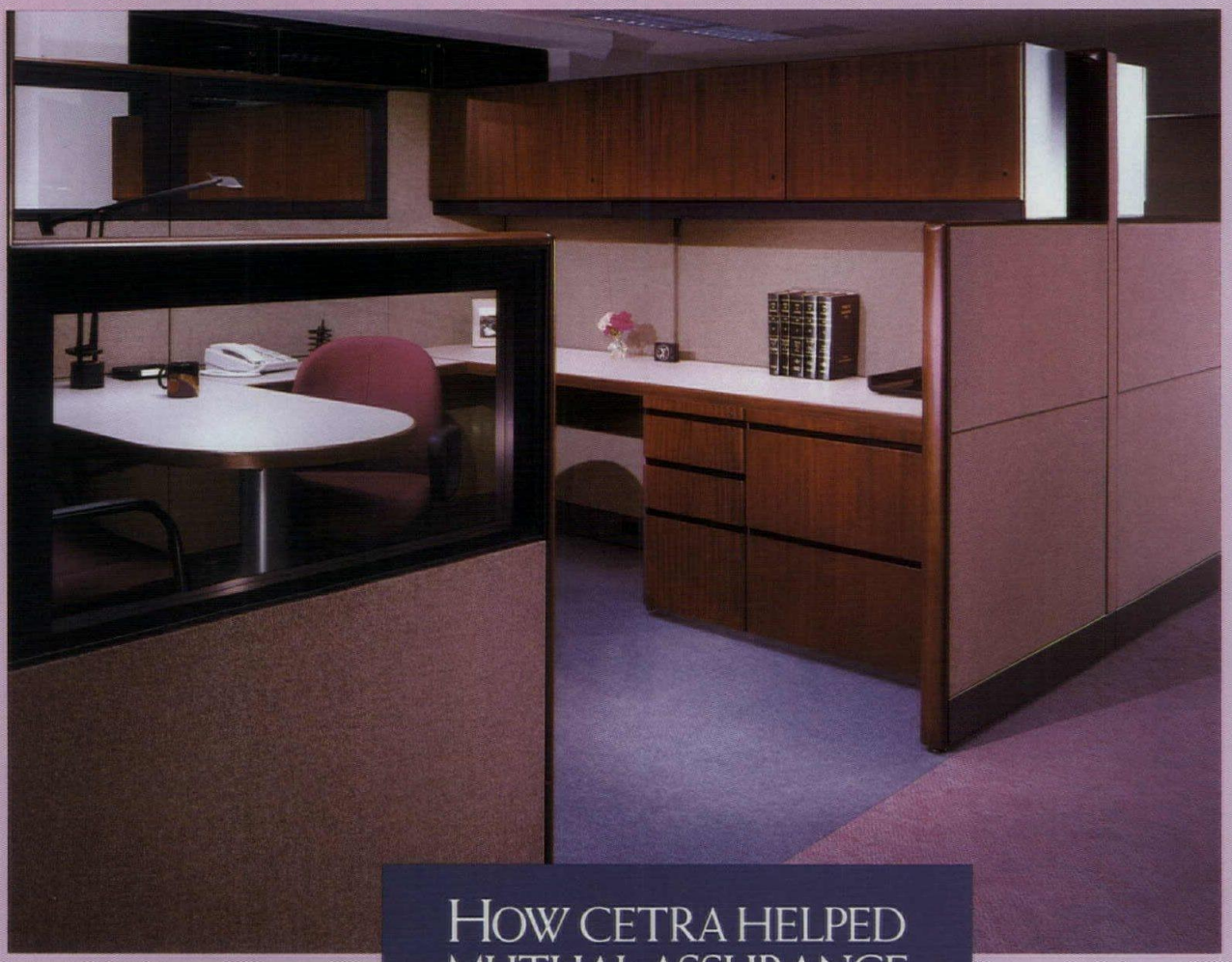
Historic Buildings as Museums
March 23–27

Honolulu. "Blueprint for Adaptive Use/Restoration Success: Historic Buildings as Museums" is a conference on the rehabilitation and restoration of historic structures. The American Architectural Foundation and the Pacific Preservation Consortium of the University of Hawaii are sponsors. Contact Lonnie Hovey, AIA, Preservation Coordinator, The Octagon (202) 638-3221. ■

Notice

We strongly encourage readers to contact exhibition venues and competition and conference sponsors to confirm dates, request competition briefs, etc. To provide timely Calendar listings, we need information one and one-half months prior to publication (February 15 for the April issue, for example). For possible inclusion, please send relevant material to Abby Bussel, P/A, 600 Summer St., Stamford, CT 06904 or FAX (203) 348-4023.

Garikes Wilson Atkinson, Inc.
Birmingham, Alabama



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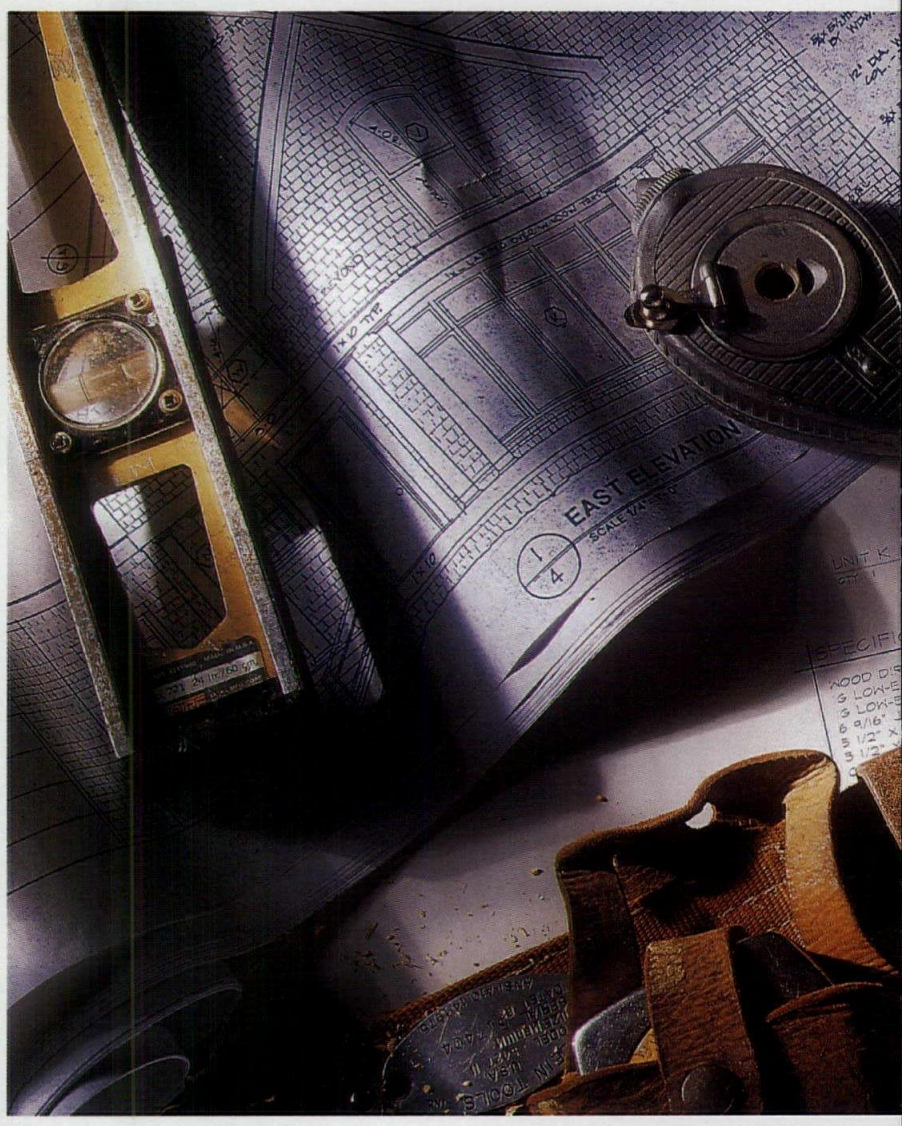

As the 1991 Parade of Homes approached, builders/architects Waters & Bonner Inc. felt they had a showstopper. Naturally, windows were a critical element in their plans. So early on in the project, Keith Waters contacted Marvin Windows.

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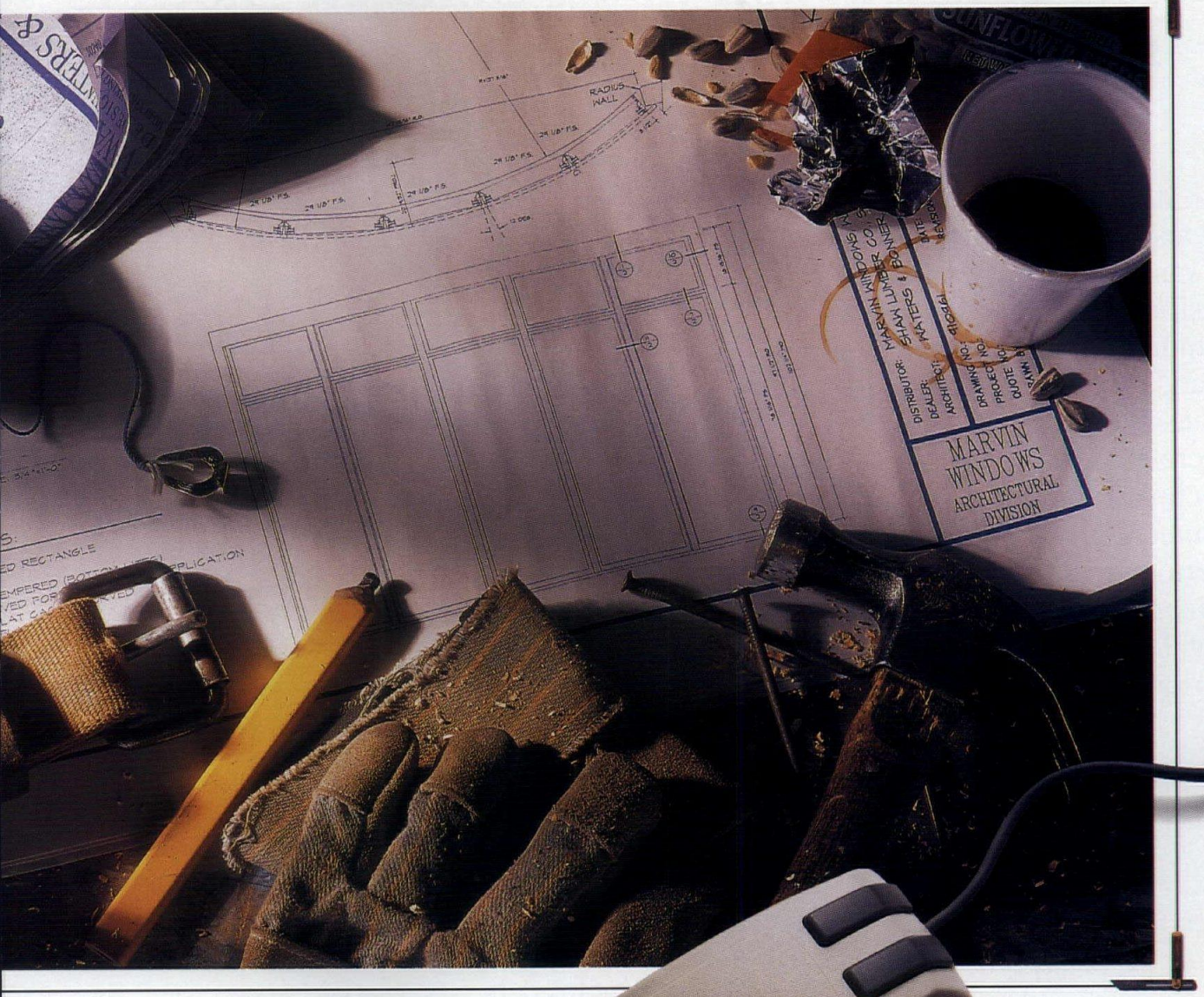

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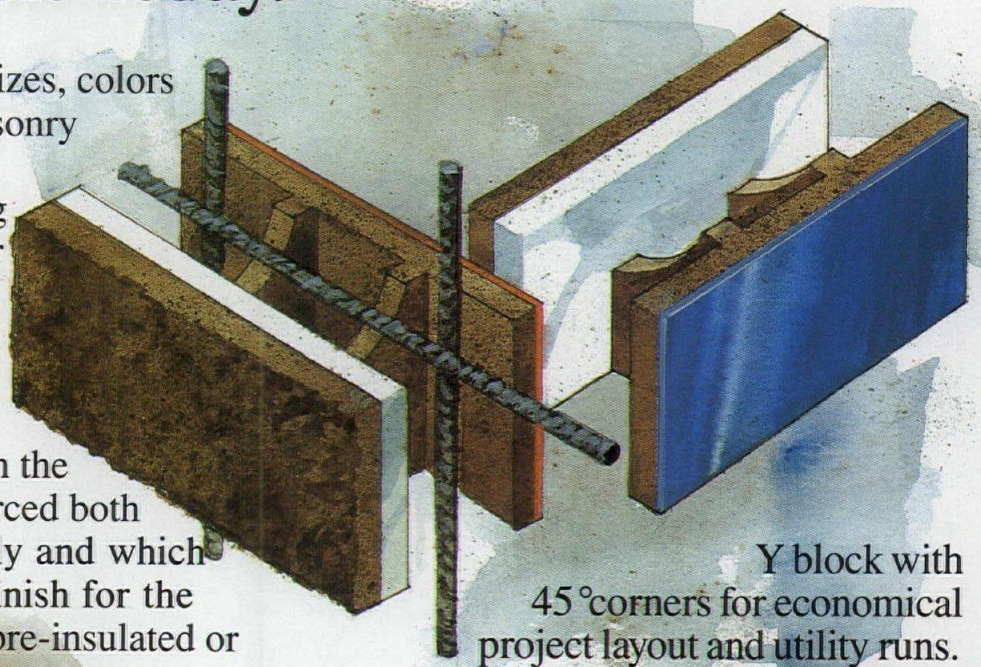
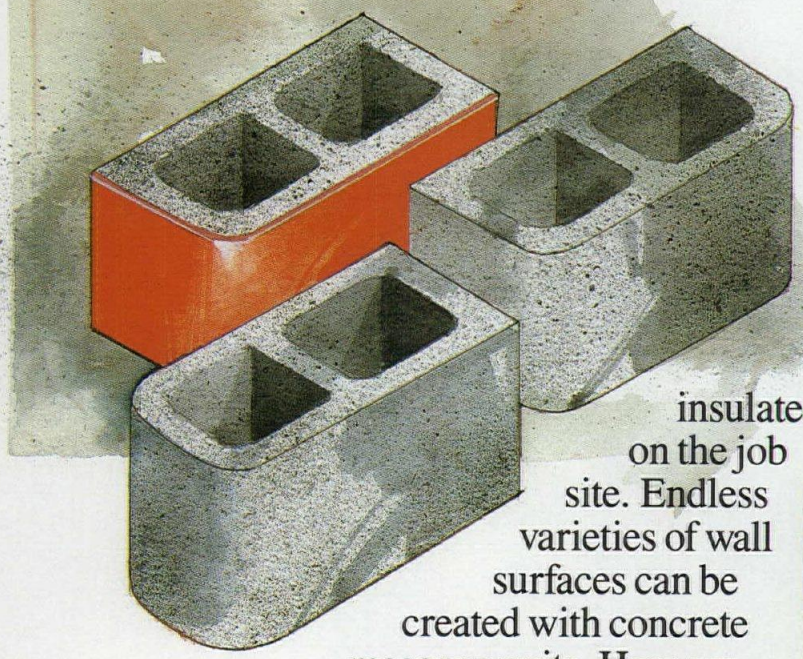
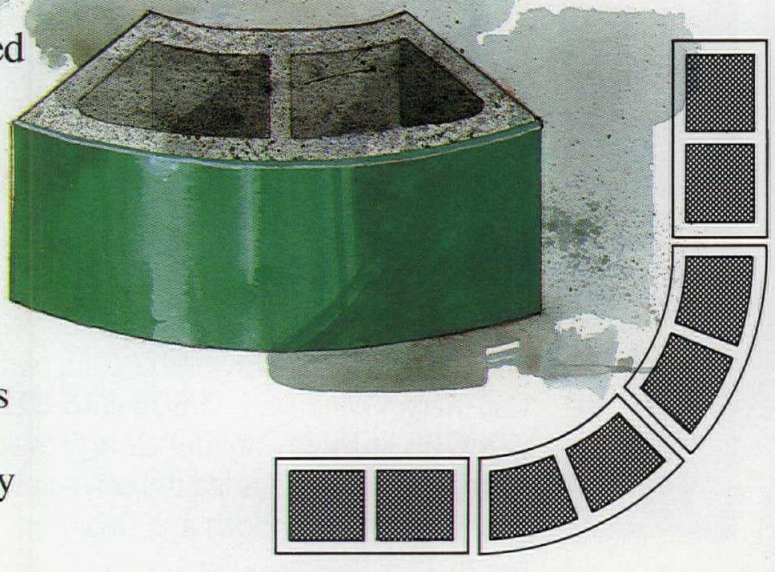
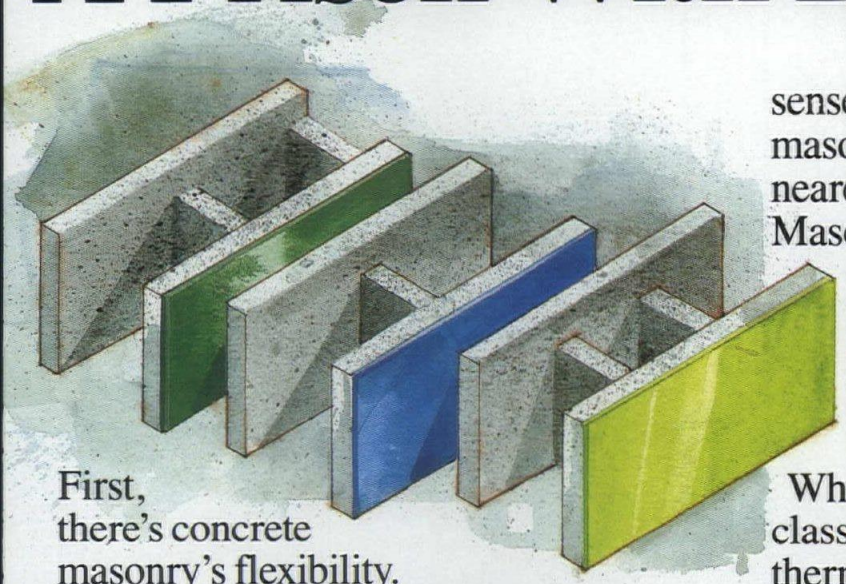


With its diverse shapes, sizes, colors and textures concrete masonry can out-perform any new construction system being promoted today. Consider a standard exterior wall: A mason can lay-up a concrete masonry wall which is colored and architecturally textured on the exterior, insulated, reinforced both horizontally and vertically and which provides a sanitary pre-finish for the interior. The wall can be pre-insulated or insulated on the job site. Endless varieties of wall surfaces can be created with concrete masonry units. Here are some of the most popular: Bullnose and half-bullnose block; glazed on both sides for softer, safer corners; A and H block, where vertical steel reinforcing is already in place; and Y block with 45°corners for economical project layout and utility runs. Most units are available glazed, polished, scored, split or ribbed. All plain units are ready to paint, plaster or drywall. Consider two more important reasons for designing and building correctional facilities with concrete masonry. Both have an impact on construction and life cycle costs.

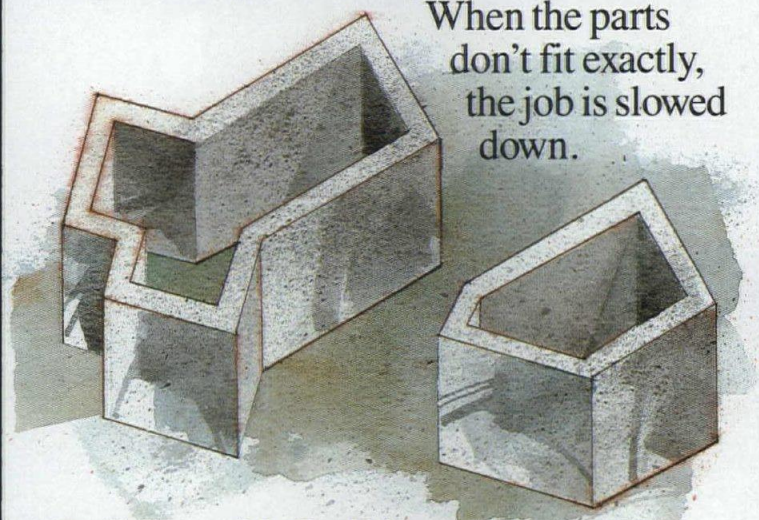




A Prison With Block

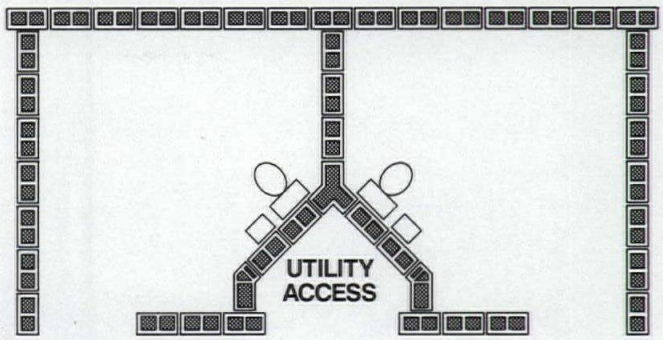


First, there's concrete masonry's flexibility. Alignment of elements in large construction projects can easily be off by an inch or two. That's not supposed to happen in a well built structure, but it does. Construction with concrete masonry allows the masons to make minor adjustments right on the job site. Inflexible systems are just that, inflexible. When the parts don't fit exactly, the job is slowed down.



Building with flexible concrete masonry saves money. Second, building with concrete masonry is important to tax payers. Prisons built with concrete masonry use products made by a local company which employs local tax paying people. The job is built by local masons, employing local helpers. This means local taxes stay in the community. It makes sense to build with versatile concrete masonry. Let us send you the name of the nearest member of the National Concrete Masonry Association (NCMA). NCMA members can provide you with all the facts necessary to consider concrete masonry for your next prison project. Require product certification to ensure quality concrete masonry.

When specification of sound transmission class (STC), fire resistance rating or thermal properties is required, request a SAFE certificate. The SAFE program certifies properties based on Standards for Acoustical, Fire and Energy performance of concrete masonry.



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Technics
The Meaning of ASHRAE 90.1

Architect **John Holton** of Burt Hill Kosar Rittlemann discusses some of the implications of and what can be learned from ASHRAE's energy efficiency standard for nonresidential buildings.

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) issued its Standard 90.1 Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings, *in 1989.* Standard 90.1 *is an important and ambitious attempt to quantify the trade-offs between different design, material, and equipment alternatives for improving the energy performance of buildings. It replaces the older* Standards 90-1975 *and* 90A-1980, *both of which have entered the mainstream of building regulation through various model building codes. Architects interested in energy efficiency and design flexibility should welcome the newest version of* Standard 90, *and especially the computer program ENVSTD supplied with it, since it makes it easy to test different envelope designs and features for compliance. P/A asked the past chairman of* Standard 90.1's *Envelope Subcommittee to discuss some of what* 90.1 *means to architects. He, in turn, invited architect and former committee member Joseph Deringer to illustrate the differences between the different compliance paths offered in the* Standard. *(See Technics Topics, p. 40.)* *Copies of the* Standard *are available from ASHRAE publication sales, Atlanta (404) 636-8400.* **Kenneth Labs**

Most of us have lived or worked in buildings that were either uncomfortably cold in the winter or uncomfortably hot in the summer. In some instances this may have been all or in part due to the unsatisfactory performance of the building's HVAC system. But in many cases, thermal discomfort in a building is a direct result of the building envelope; usually the problem is with the wall design.

The new version of the ASHRAE energy conservation standard for commercial buildings, *ASHRAE/IES 90.1-1989*, has established a set of performance standards for the energy consumption aspects of buildings. The requirements are relatively modest and demand much lower levels of performance than state-of-the-art technology can provide. Current technology can, in fact, usually offer a number of possible building design solutions that will meet the 90.1 requirements. The net result of the uniform application of 90.1 across the United States should be a broad and equitable improvement of the energy performance of the U.S. building stock. The payback in energy cost, building comfort, and occupant productivity is likely to be so universal that first cost increases – where they occur – will be inconsequential.

Scope of Article

Standard 90.1 is a building energy conservation standard and thus deals with all the energy-use-influencing elements of a building. This article will address only Section 8, "Building Envelope," though other sections are equally important.

For the design of the building envelope, the *90.1 Standard* represents a major advancement over its predecessors, *90-75* and *90A-80*. These earlier *Standards* reflected the state of general building technology of their time and were primarily opaque wall and roof insulation standards. High performance glazing assemblies and building mass effects were technologies and knowledge bases that simply had not been developed sufficiently to allow their inclusion in a standard for the general practitioner.

In the 1980s this changed as major research efforts and technology development were mounted. We now have the basis to set out a performance standard that covers these and many other energy-consumption-influencing attributes of buildings. Equally important, building technology has advanced to the point where it can provide a number of ways of meeting the performance levels set by the *Standard*. The designer should be minimally constrained in aesthetic expression if he or she applies creatively the range of available high performance building systems to meet the performance criteria of *90.1*.

Examples of Benefits

Three case studies that I conducted while with the General Services Agency's Energy Conservation Division illustrate the tremendous productivity benefits that are likely with the application of *90.1*. In the first case, a high-rise Federal office building in Chicago was glazed from floor to ceiling, and from wall to wall, with single-pane tinted glass. Under typical Chicago winter conditions of 10 F and lower, radiant loss via the glass was so severe that many workers in outside zones were forced to bundle up in heavy clothing or to spend significant time in warmer interior zones away from their desks. The *90.1* requirements for that amount of glass, coupled with the glass thermal properties, would have largely eliminated these problems.

In a second case, a Federal office building on the Mall in Washington, D.C., was glazed with single-pane, nearly clear glass (a slight tint). During summer months, occupants on the south and west elevations particularly, often experienced overheat-

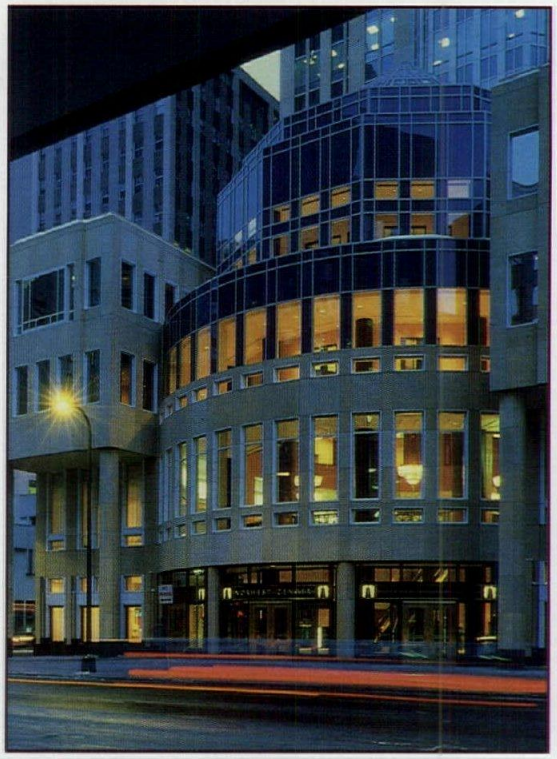
Tech Notes

Building Air Quality: A Guide for Building Owners and Facilities Managers **is a valuable reference from the Environmental Protection Agency for all building professionals. Order #S/N 055-000-00390-4, U.S. Government Printing Office, Superintendent of Documents, Box 371954, Pittsburgh, PA 15250-7954, 229 pp., $24.**

The National Building Envelope Symposium will be held April 13–16 in Plano, Texas. Sessions will cover roofing, curtain walls, flashings, EIF systems, sealants, and waterproofing. National Building Symposiums Institute, Houston (713) 440-8284, $200 before March 13.

The Metric Guide for Federal Construction **describes metric usage and the preparation of metric construction documents, which may be required for all federal construction by January 1, 1994. By September, 1992, all federal agencies will be required to use metric measurements in all procurements, grants, and business-related activities. The guide is available from the National Institute of Building Sciences, Washington, D.C. (202) 289-7800, 34 pp., $15.**

The updated Ceramic Tile Institute's *Tile Manual* includes all relevant ASTM tests, ANSI standards and specifications, and a copy of the 1990 Tile Council of America Installation Manual, in addition to a compilation of CTI's own field reports, a glossary, inspector's check list, and more. CTI, Los Angeles (213) 660-1913, 1991, 510 pp., $74.50.



Balthazar and Christian Korab

Minneapolis Office Building Internal load between 1.5 and 3 Watts/ft^2		**Minneapolis Apartment Building** Internal load of 1.5 Watts/ft^2	
U-value	**Shading Coefficient**	**U-value**	**Shading Coefficient**
Heavily glazed (50 percent glass)		Heavily glazed (50 percent glass):	
0.3 or lower	0.25 or lower (fairly dark window)	0.3 or lower	0.38 or lower
Moderately glazed (30 percent glass):		Moderately glazed (30 percent glass):	
0.3 or lower (lowest required)	0.6 or lower (relatively high transmission)	0.3 or lower	0.7 or lower
0.4 or lower (intermediate)	0.5 or lower	0.4 or lower	0.6 or lower
0.52 (highest allowable)	0.38 or lower (moderate tint)	0.52 or lower	0.5 or lower
Sparingly glazed (20 percent glass):		Sparingly glazed (20 percent glass):	
0.4 or lower	Up to 1.0 (clearglass)	0.52 or lower	1.0 (clear glass)
0.52	0.7 or lower (very light tint)		

ing, even when blinds were adjusted to block direct solar radiation. Again, staff frequently went to other locations in the building to escape the insufferable heat, causing a great loss in productivity. A retrofit reflective film was installed to help alleviate the problem. Had the *90.1* requirements for the amount of glass coupled with the glass shading (if any) and shading coefficient been employed during the design of the building, the solar gain problems would have been dealt with from the beginning of the building's use.

In a final example of thermal performance inadequacies, the offices of a very high level military R & D group were on the perimeter of the second floor of a Washington, D.C., office building, above an open colonnade. The underside of the floor of all the offices was exposed to outdoor temperatures. There was no insulation other than the carpet on the floor and the ceiling soffit beneath. During cold winter days, occupants' feet were freezing, so they bundled up and/or moved about to other locations. Again, this thermal problem resulted in major productivity loss. The application of the *90.1* requirements for the insulation of floor slabs over non-conditioned spaces (a trivial few inches of insulation) would have eliminated the problem.

All of these buildings, though acceptable to conventional building practice, were significantly deficient in thermal performance, and poor in energy consumption. We experience deficiencies in thermal performance during weather extremes. The extremes that result in discomfort and productivity loss may amount to one to four weeks' time in the winter and/or one to four weeks' time in the summer. The value of the productivity gain that results from the elimination of discomfort periods in a building quickly pays for the cost of these measures. Add to this the energy cost benefits, and the *90.1* thermal performance improvements make a great deal of sense.

Envelope Design

To look specifically at the impact of the *90.1* provisions on the design of the building envelope, we must examine the *Standard* in several ways. It is by nature somewhat complex, in order to provide enough specificity to treat equitably most commercial building types in all climate zones of the fifty states. Six hypothetical case studies (see boxed examples) will show the factors that must be considered when designing the envelope of two buildings

types – an office building and an apartment building – in three climate zones – Minneapolis, Miami, and Washington, D.C. For each of the six examples, we will also look at three representative glazing percentages (or window/wall ratios): 50 percent glazing, which – when the wall area covering the edge of the floor slabs is considered – represents a very high fraction of glass; 30 percent glazing, a mid-range; and 20 percent glazing, representing a sparingly glazed building. The trade-offs in these case studies are based on the compliance path that uses the Alternate Component Packages (ACP) tables. This is the simplest, but most restrictive, application of the *Standard*. It is possible to exceed the 50 percent glazing area set as a maximum in these examples, but to do so, the designer would often need to develop and analyze the building design using either the ENVSTD computer program (supplied with the Standard) or the Energy Cost Budget method (chapter 13).

Minneapolis

Minneapolis is a cold climate, but for an office with substantial internal heat generation from lights, computers, and people, cooling in the summer is also significant. Thus, the *Standard* sets out criteria that influence design choices in relation to both heating and cooling.

Understandably, Minneapolis buildings make some of the most stringent demands on window insulating capacity. To get a 50 percent glazing area, for example, the standard requires a high level of window thermal performance (U-value) typically represented by double glazing with a plastic film suspended between the glass and low emissivity coating on one of the internal surfaces. Depending on the extent of glazing desired in the building, different combinations of glass light transmission (shading coefficient) may be matched to window construction type to provide the desired performance. The range of shading coefficient (SC) gives the designer wide choice in glass color, visible light transmission, and reflectivity.

Wall insulation is substantial and does not vary with the amount of glass in this climate and is the same for the office building or the apartment. In wall construction, a trade-off is available between insulation and mass. The effectiveness of the mass in lowering energy use depends upon the location of the insulation: external insulation of mass walls is more effective than internal. The wall insulation requirements are as follows:

	Internal Insulation	External Insulation
Light-weight wall	R = 15.5	R = 15.5
Light-mass wall (heat capacity = 5)	R = 15	R = 11
Medium-mass wall (heat capacity = 10)	R = 14	R = 10
Heavy-mass wall (heat capacity = 15)	R = 13	R = 9

Thus, the mass of the wall can replace insulation values varying from R-0.5 to R-16.5. The actual thickness of insulation replaced depends on the specifics of the wall construction.

The overall roof insulation value must be R-22 or better. Other insulation requirements include:

Walls adjacent to Unconditioned spaces	R-9 or better
Floors over unconditioned spaces	R-25 or better
Walls below grade	R-12 or better
Slab edge insulation	R-6-R-20, depending on configuration and extent

Miami

In Miami, the driving factor in window wall design is solar performance; the insulating quality of the window assembly is of no value. In fact, in some cases, insulating glass would reduce the allowable window area because it would prevent beneficial loss of internally generated heat overnight and in the cooler months.

Use of external shading to cut solar load, represented in the Standard as the projection factor (PF), can raise the required shading coefficient (SC) for any particular combination of glass area and glazing U-value. This may allow a greater latitude in glass selection or in glazing. Even with only a moderate amount of shading in this climate, it is still possible to get a nearly clear glass appearance using some of the new high performance, high-visibility light-transmission glass. Alternatively, if the designer does not change glazing area and SC, a higher U-value glazing assembly may be acceptable, thus offering a lower cost solution.

In Miami, daylighting the perimeter spaces of an office building also is beneficial. If daylighting is employed using automatic lighting controls, trade-offs may be made for glass area or glass shading coefficient. For example, the 50 percent glazed building (with O projection factor and a SC of 0.25), if daylighted, could have up to 62 percent glass and could go to a glass with SC = 0.38. This

90.1 Standard Criteria

For any given location in the United States, the Standard sets out the following criteria for building envelope design:

Internal load density range (watts/sq. ft.) – a measure used to distinguish among various building types.

Interrelated glazing characteristics:

- Window/wall ratio (percent glazing)
- Window assembly U value
- Window assembly shading coefficient (SC), including the effect of blinds, shades, etc.
- Shading device projection factor (PF), a ratio of the horizontal projection to the height of the window

Interrelated wall insulation/mass/window characteristics:

- Window/wall ratio
- Wall heat capacity
- Position of insulation in mass wall (internal, integral or external)
- U-value for a light weight wall
- U-value for a massive wall

Singular values for other insulation criteria:

- U-value of the roof
- U-value for walls adjacent to unconditioned spaces
- R-value for walls below grade
- R-value for edge of slab insulation

Miami Office Building With an internal load of 1.5–3 Watts/ft^2		**Miami Apartment Building** With an internal load of less than 1.5 Watts/ft^2	
Projection Factor	**Shading Coefficient**	**Projection Factor**	**Shading Coefficient**
Heavily glazed (50 percent glass)		Heavily glazed building (50 percent glass):	
0–0.25	0.25 or lower (reflective coating of some type)	0-0.25	0.25 or lower
0.25–0.5	0.38 or lower	0.25–0.5	0.38 or lower
More than 0.5	Up to 0.5	More than 0.5	0.6 or lower
Moderately glazed building (30 percent glass):		Moderately glazed building (30 percent glass):	
0–0.25	0.38 or lower	0–0.25	0.5 or lower
0.25–0.5	0.6 or lower	0.25-0.5	0.6 or lower
0.75	0.7 or lower	More than 0.5	1.0 or lower
Sparingly glazed building (20 percent glass):		Sparingly glazed building (20 percent glass):	
0–0.25	0.6 or lower	0–0.25	0.7 or lower
0.25-0.5	0.7 or lower	0.25–0.5	1.0 or lower
More than 0.5	Up to 1.0	More than 0.5	1.0

opens up a much wider selection of glass types as well as envelope designs.

Other than window wall design, the only thermal requirement of note in Miami is roof insulation. The overall roof insulation value must be R-13.5 or better, and although not specified in the Standard, roof color is also an important factor in good thermal performance, with light color roofs showing appreciably lower heat gains than dark roofs.

There are no wall insulation requirements for buildings in this climate, so there are no thermally based trade-offs between lightweight or massive walls. There also are no insulation requirements for walls below grade, walls adjacent to unconditioned spaces, or slab edges. Only floors over non-conditioned spaces must have an insulation value of at least R-2.5.

Washington DC

Washington, D.C., climatically represents a large number of U.S. cities ranging from Boston to Kansas City. This region probably offers the greatest variety of trade-off opportunities because the envelope design must respond to both heating and cooling. It is not dominated by one or the other, as is the case with the cold or hot climate. In this region it is not difficult to get highly glazed buildings using the range of high performance glazing systems now available.

The daylighting of perimeter spaces of office buildings is beneficial in this climate. If daylighting is employed using automatic lighting controls, trade-offs may be made for glass area, glazing U-value, SC, and visible light transmission (VLT). This is a large number of variables to work with, but they may be summarized by noting that, with window construction held constant (U, SC, and VLT), providing daylighting in the building will allow glass areas to be increased. Conversely, if the area of windows has been fixed in the design, providing daylighting may make it possible to use less expensive windows by reducing the requirements for U-value or SC. It is possible to increase these daylighting benefits even further by employing the new forms of glass that provide visible light transmission that is higher than the shading coefficient. These high performance glasses offer good daylighting without the traditional penalty of high solar heat gain.

Wall insulation requirements are essentially the same for office buildings and apartment buildings in this climate. For a light-weight wall, insulation

does not vary with window area, but it does for massive walls. More important, wall insulation requirements for massive walls vary substantially, based on whether the insulation is located on the inside, either internally to or integrally with the wall, or on the outside of the wall. The wall insulation requirements are as follows:

	Internal Insulation	External Insulation
Light-weight wall	R = 11.2	R = 11.2
Light-mass wall (heat capacity = 5)	R = 10.4	R = 7.7
Medium-mass wall (heat capacity = 10)	R = 10	R = 7.1
Heavy-mass wall (heat capacity = 15)	R = 9	R = 6.6

As a result, the mass of the wall can replace insulation values varying from R-0.8 to R-4.6. The actual thickness replaced depends on the specifics of the wall construction.

The overall roof insulation must be R-17 or better, and other insulation requirements follows:

Walls adjacent to Unconditioned spaces	R-7 or better
Floors over unconditioned Spaces	R-18.5 or better
Walls below grade	R-9 or better
Slab edge insulation	R-4 to R-16, depending on configuration and extent

Skylights

Usually, skylights have higher heat loss and heat gain than the opaque portion of a roof. To meet the overall roof insulation requirement, a roof with skylights would have to have a greater thickness of insulation than a roof without skylights to compensate for this thermal degradation. *Standard 90.1*, however, recognizes that skylights can have an overall benefit if the areas beneath them are served by lights with automatic daylight controls. In this case, the design of the skylights is regulated by certain criteria covering percent of roof area, visible light transmission, and floor area beneath the skylight that must have automatic lighting controls.

For the example Minneapolis office building, assuming a design light level of 50 fc and a skylight visible light transmittance of 75 percent, a maximum of 4 percent of the roof area could be in skylights. If the skylighted visible light transmission (VLT) was only 50 percent, this maximum area would rise to 6 percent. In Miami, under the same conditions, the maximum skylight areas would be 4.3 percent and 6.6 percent. A range of variation in skylight area is given in the Standard.

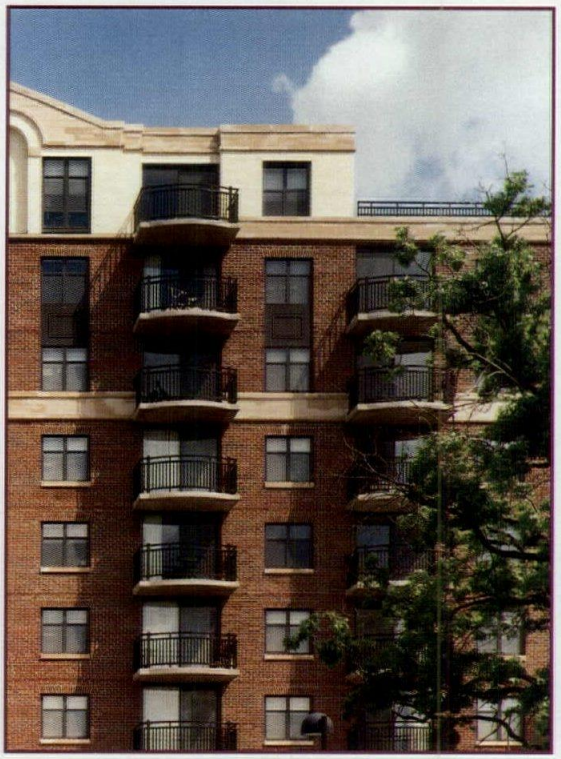
Thermal Bridges

During the research phase of the development of 90.1, the importance of a recognized but usually unquantified thermal performance factor was acknowledged. In some forms of wall and roof construction, thermal bridging or thermal short circuiting can severely degrade the overall insulating value of an assembly. Many of these construction forms are quite common and include steel stud, brick and block, concrete masonry units, precast panels with stud backup and metal roof on purlins.

Procedures for calculating the impact of thermal short circuits are specified and require an overall wall U-value calculation to be made that takes into account the conductivity of the bridging elements. An example calculation for precast panel wall with steel stud backup illustrates the kind of degradation in R-value that thermal bridging causes. It is important to note that the steel studs have a very significant degrading effect and typically can reduce the wall insulation value by as much as 30–40 percent. After assessing wall construction a few times using these methods, a designer will develop a menu of design details that effectively remedy the situation for his or her climate zone. It is hoped that tabular values of typical construction configurations will be made available to make this assessment easier.

Conclusion

The assessments just presented were based on the use of one set of performance criteria from *90.1*, the ACP tables (Alternate Component Packages). These are perhaps the most obvious form of the criteria in the Standard and were chosen for use in order that readers might readily identify the examples with the tabular data in the Standard. Two other forms of the same criteria are provided in *90.1*, the ENVSTD computer program and the Building Energy Cost Budget method. Each of these provides greater flexibility in tuning a building design to the requirements. The ENVSTD program, once set up, is, in fact, a very quick method for analyzing any number of alternative



Washington, D.C., Office Building Internal load of 1.5–3 Watts/ft^2 Projection Factor of 0 (no exterior shading)		**Washington, D.C., Apartment Building** Internal load of 0 –1.5 Watts/ft^2 Projection Factor of 0 (no exterior shading)	
U-value	**Shading Coefficient**	**U-value**	**Shading Coefficient**
Heavily glazed building (50 percent glass):		Heavily glazed building (50 percent glass):	
0.4 or lower	0.25 or lower	0.4 or lower	0.25 or lower
Moderately glazed buildings (30 percent glass):		Moderately glazed buildings (30 percent glass):	
0.4 or lower	0.5 or lower	0.4 or lower	0.6 or lower
0.6 or lower	0.38 or lower	0.6 or lower	0.5 or lower
Sparingly glazed buildings (20 percent glass)		Sparingly glazed buildings (20 percent glass)	
0.6 or lower	0.7 or lower	0.6 or lower	Up to 1.0

envelope configurations. The Building Energy Cost Budget method employs a full building energy use simulation and allows the greatest flexibility of application, where trade-offs may be made between all energy use influencing elements of the building, including envelope, lighting, and HVAC systems. It should be noted that it is through the astute use of trade-offs in the energy cost budget method that zero first cost, or even first cost savings, may be achieved in designing a building that complies with *Standard 90.1*.

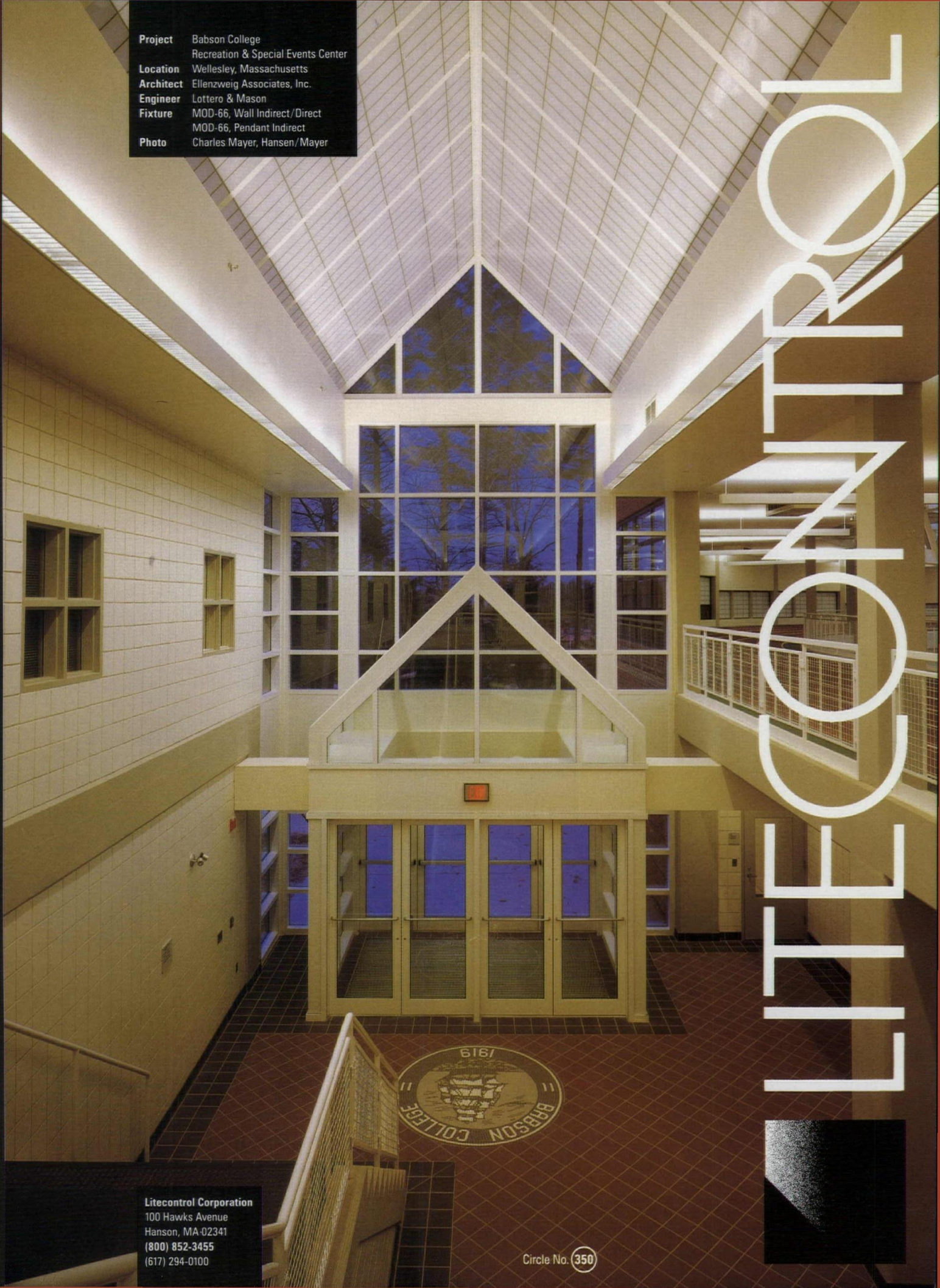
One of the benefits of the use of *90.1* is that it is a comprehensive checklist of virtually all of the significant elements of the building that may influence the thermal comfort of the occupants. Employing the *Standard* assures the architect (and engineer) that the building, as designed, should provide quite a reasonable level of thermal comfort. In particular, it provides a comprehensive assessment of the glazing system for thermal and lighting performance in the context of the full building design.

Another benefit of the improved level of thermal performance provided by *90.1* is that it makes the job of the HVAC system easier and, thus, its performance can be more stable and reliable. This is because external thermal loads are substantially moderated by the insulation, screening, and shading provided by a properly designed envelope. A good *90.1* building should have fewer hot spots, cold spots or drafts than a building constructed to earlier standards.

Standard 90.1 requires that designers pay more attention to the thermal and lighting performance of the buildings they design. There will often be cost implications to this more thorough design, but the net effect is that buildings will receive the comprehensiveness of design – including thermal and lighting considerations – that they truly deserve in this era of high performance structures.

John K. Holton, AIA, PE ■

The author is a Manager of the Houston office of Burt Hill Kosar Rittlemann Architects (BHKRA). He is the past Envelope Subcommittee chairman of the ASHRAE Standard 90.1 Committee, and was principal researcher and principal author of the Small Office Building Handbook: Design for Reducing First Costs and Energy Costs *(Van Nostrand Reinhold, 1985), prepared by BHKRA with support of the U.S. Department of Energy.*



Project	Babson College Recreation & Special Events Center
Location	Wellesley, Massachusetts
Architect	Ellenzweig Associates, Inc.
Engineer	Lottero & Mason
Fixture	MOD-66, Wall Indirect/Direct MOD-66, Pendant Indirect
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Technics Topics
Standard 90.1: The System Performance Path

Architect **Joseph Deringer** discusses the computerized System Performance method of analysis in *Standard 90.1.*

Base Building

For these parametric studies, a hypothetical office building with 30-percent fenestration is used. The building has an aspect ratio of 2:1, with the longer elevations facing east and west. This is done for consistency, since it mirrors the "worst case" building form and orientation that were used to generate the ACP tables. The parametrics compare the same set of measures in Minneapolis, Miami, and Washington, D.C. In each city, a "base case" has been defined that meets the system performance criteria.

BASE CASE PARAMETERS

Envelope Element	Minneapolis	Miami	D.C.
Total Wall Area			
	100 N-S	100 N-S	100 N-S
	200 E-W	200 E-W	200 E-W
Fenestration Area			
	30 N-S	30 N-S	30 N-S
	60 E-W	60 E-W	60 E-W
Shading			
	0.43	0.49	0.60
Coefficient Projection Factor			
	0.0	0.0	0.0
Fenestration U-Value			
	1.23	0.63	0.52
Opaque Wall U-Value			
	1.00	0.10	0.065
Opaque Wall Heat Capacity			
	1.00	1.00	1.00
Equipment Power			
	1.4	1.4	1.4
Watts/Sq Ft Lighting Power			
	1.6	1.6	1.6

The parametric analyses permit an assessment of the relative impact of each feature on the annual energy flux through the building envelope. For each city, the following evelope features are examined:

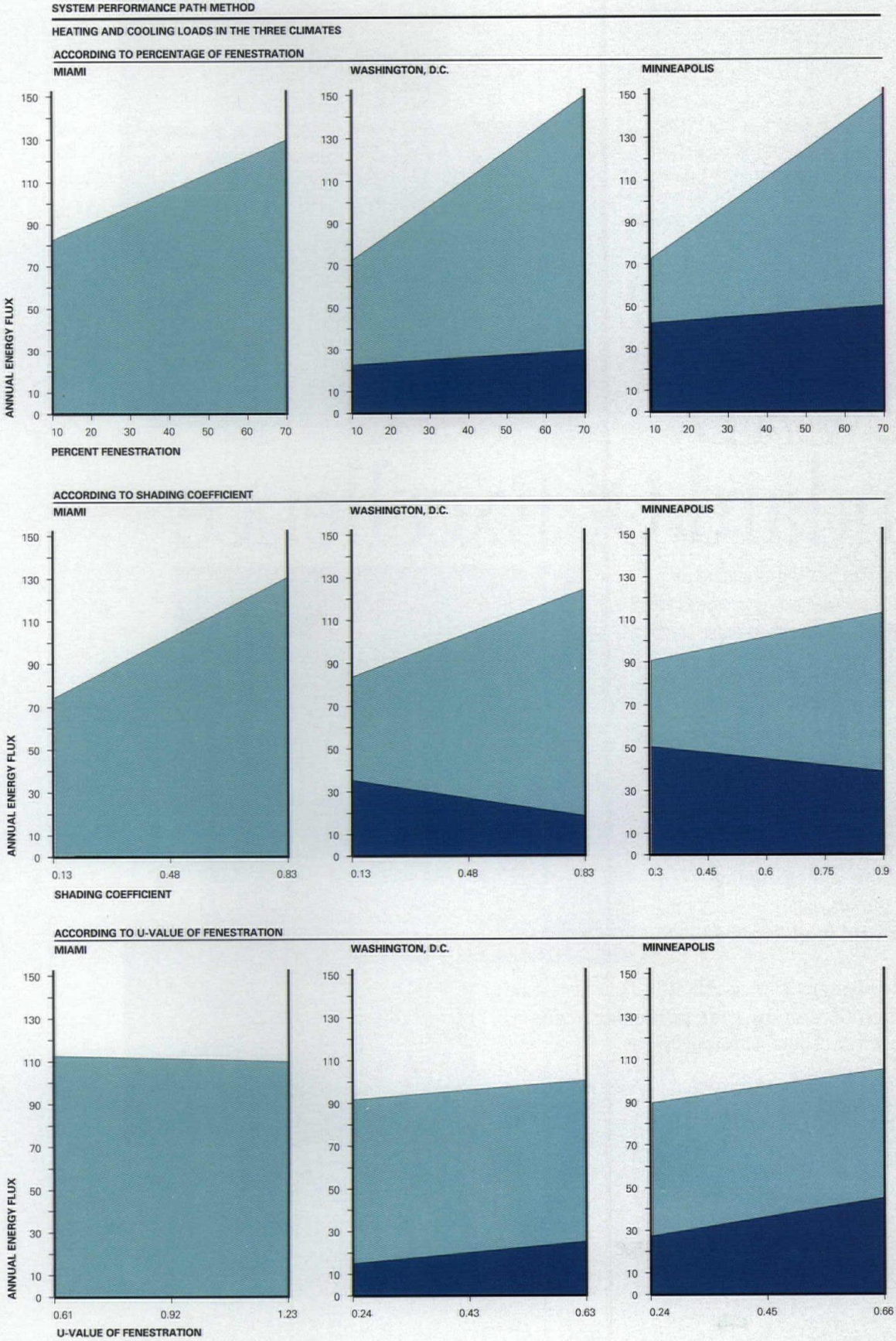
- Percent of Fenestration (from 10 to 70 percent)
- Shading Coefficient (combined impact of glass and interior shades)
- External Shading Projection Factor
- Fenestration U-Value
- Opaque Wall U-Value

The examples in the preceding article comply with the prescriptive requirements of the Alternate Component Packages (ACP) tables in *Standard 90.1.* The System Performance path, using computer software, may also be used and has some distinct advantages over the use of the ACP tables. First, the System Performance requirements are not as stringent as the prescriptive ACP requirements. Second, the System Performance method is much more flexible. And third, the computer program is very easy and quick to use and can be used to examine "what if" options for the building envelope.

Parametric studies of key envelope features – fenestration, wall U-values, and daylight controls – for a hypothetical office building in three climates – Minneapolis, Miami, Washington, D.C. – using this computerized method. The following are general observations based on the findings of these studies.

- Importance of fenestration: if any significant amount of glass is present in an office building, then changes to the fenestration features have much more impact on annual energy flux than do changes to the opaque wall features.
- Percent of fenestration: without daylighting controls on the lighting system, increasing amounts of glass increase annual energy flux. The percent of glass is one of the strongest determinants of annual energy flux through the envelope.
- Shading coefficient: in general, a lower shading coefficient, from glass and interior shades combined, will reduce annual energy flux. The shading coefficient has declining relative impact in colder climates.
- Exterior shading: overhangs can have a significant impact on heat gain through the glass. In Miami, overhangs that are about half the height of windows, giving them a projection factor of 0.5, can reduce annual energy flux by about 15 percent. The relative impact declines somewhat in the North, and overall impact is about a 10-percent reduction.
- Fenestration U-value: changing fenestration U-values over reasonable ranges for each city have relatively small effects compared with the shading coefficient or exterior shading changes. The impacts of lowering the fenestration U-values are very slightly negative in Miami, and result in less than a 10-percent change in Washington, D.C. Only in Minneapolis does the magnitude of U-value changes approach the magnitude of shading coefficient changes.
- Opaque wall U-values: changing opaque values over reasonable ranges in each c relatively small impacts – less than 10 per each city – on the overall annual ener through the envelope.
- Heat capacity (HC) of the opaque wa opaque wall U-values, varying heat capacit a lightweight frame wall (HC = 1) to a very mass wall (HC = 20) had relatively small e The relative amount of benefit from inc mass was greatest in Miami (about an 8-p reduction) and declined in colder cl (about 4-percent reduction in Minneapoli
- Thermal credit for daylighting controls: *S 90.1* provides an envelope credit if aut controls are used to reduce electricity lights when adequate daylight is preser credit is from the decrease in air conditio requirements from the reduced lightin minus the increase in heating load in col mates. This credit for "thermal" load rec is about 12 percent in Miami, 8 percent in but almost insignificant in Minneapolis be there, the decrease in cooling load is entirely offset by the increase in heating lo There is a separate and parallel credit lighting section of the *Standard* for the tion in electric energy for lights as a re automatic controls. This is 30 percent for uous dimming, 20 percent for multiple ste ming, and 10 percent for on/off swit These credits permit increased lighting po be installed as a result of using automat trols. However, there is currently no pr for applying these credits to reduce the b envelope requirements.
- Solar absorbtivity: a few features are r included in *Standard 90.1.* One of these wall and roof color or solar absorptivity. light colors or materials with low solar abs ty can be effective and low-cost strateg reduce envelope solar cooling loads in wa mates. For an uninsulated masonry w Miami, the order of magnitude of swi from a very dark color to a light color is a tion in annual cooling energy flux of ab percent. **Joseph Deringer**

The author is the president of the Berkeley, California, co firm, The Deringer Group, which specializes in energy stu computer-based design-tool applications, energy codes and dards development, and training and technical assistanc



- Heat Capacity of the Opaque Wall Thermal Mass
- Solar Absorptivity

Each of the above features is examined one at a time, while holding all other features constant. Also, while all parametrics shown are changed uniformly for all orientation, the System Performance method permits changing each feature independently for each of eight orientations (N, NE, E, SE, S, SW, W, NW).

All results have been "normalized" by conversion to a percentage of the "base case" condition, and the scales on all figures are identical to facilitate comparison of relative annual energy flux through the building envelope as the value of each envelope parameter is systematically changed for each city.

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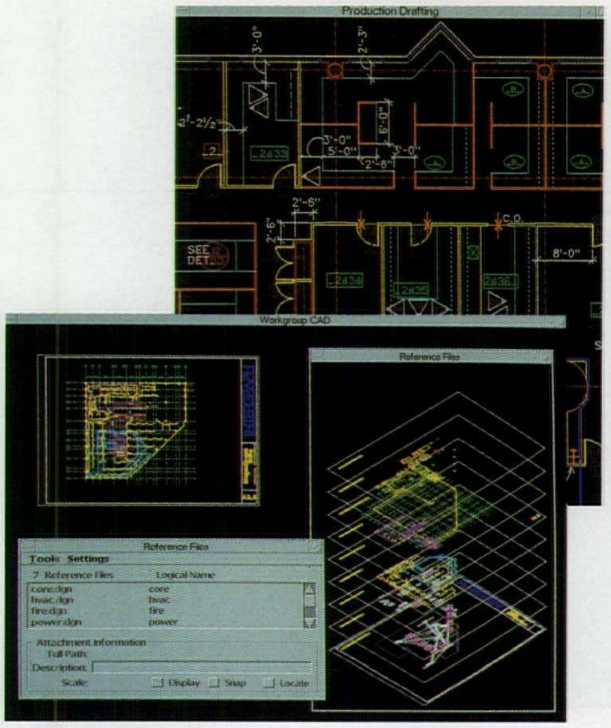

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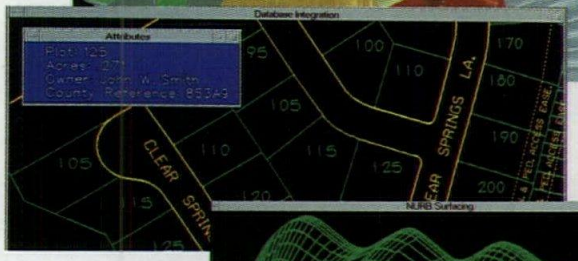

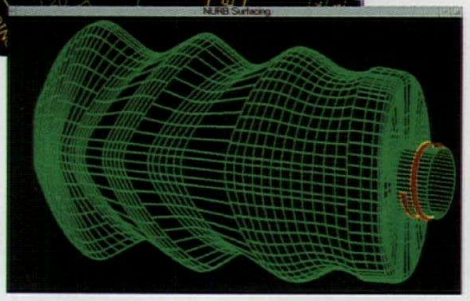

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Shattering PVC Roof Membranes

The shattering of unreinforced polyvinyl chloride (PVC) roof membranes has been reported from every part of the country. The membranes that have shattered range in age from 4 to 13 years, with a median age of 8½ years. Most of the shattered membranes were ballasted, although a few were mechanically fastened, and most shattered during cold weather.

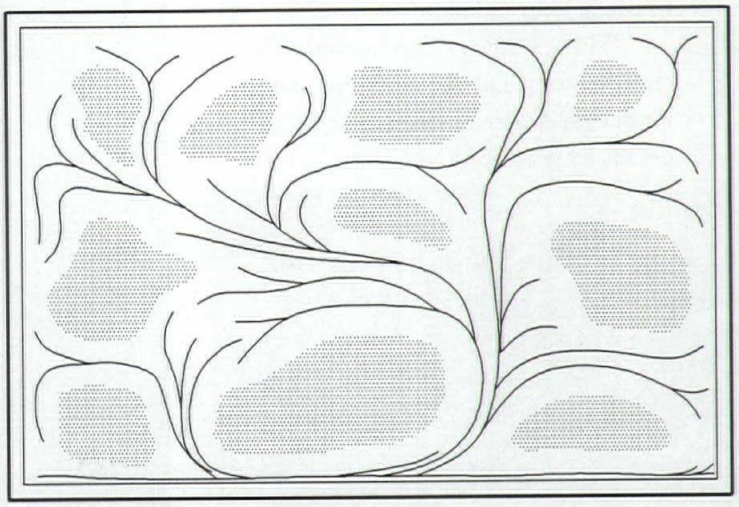
These roofs are typically composed of PVC resins, plasticizers, fillers, pigments, anti-oxidants, and ultra-violet absorbers. When PVC resins are used alone, as in PVC pipe, they are quite strong and brittle, so plasticizers must be added to make the mixture flexible enough to be used as a roof membrane. As the PVC membrane weathers, the plasticizer is lost by exudation and evaporation, and is leached out by ponding water or other materials. This loss of plasticizer results in embrittlement, loss in the volume, loss in thickness, and lateral shrinkage of the membrane. The lateral shrinkage induces a strain in the membrane at the same time that the loss of plasticizer increases the membrane's thermal expansion and contraction coefficient and its low temperature brittleness. Thus, in colder weather, an aged unreinforced PVC membrane can be in substantial tension, shattering with the slightest additional load.

In January, 1991, a 42,000-square-foot mechanically fastened unreinforced PVC membrane shattered (2). The splits originated in a single tensile failure above the edge flashing, where the membrane was bonded to the perimeter metal. The unadhered edge of the membrane was displaced 1" toward the center of the roof. This split ran along the edge of the roof, branched and branched again, until almost the entire roof surface had ruptured (1). The splits curved around ponds on the roof, with some of the splits stopping at the ponds' edges. (The ponds were probably frozen when the membrane shattered.)

In September, 1991, the National Roofing Contractors Association and the Single Ply Roofing Institute issued a joint document entitled *Shattering of Aged Unreinforced PVC Roof Membranes.* This document tends to minimize the problem, but it points out, correctly, that roof investigations should not be performed on unreinforced PVC roofs during cold weather, and that every owner of such a roof should be aware of the potential for a shattering-type failure.

Currently, little can be done to predict when shattering will occur, but a prudent owner with an aging unreinforced PVC roof should have it inspected for embrittlement, plasticizer loss, and shrinkage or displacement, any one of which can be the harbinger of shattering. In this event the owner should budget for roof replacement. The decision to replace a roof is a business decision, depending on the owner's needs, the availability of funds, and the consequences of leakage. Owners of properties in which the consequences would be severe should consider replacing the unreinforced membrane during the next roofing season.

Most PVC membrane manufacturers either do not offer unreinforced PVC membranes, or no longer recommend their use. In any event, designers should not specify unreinforced PVC roofing systems. PVC membranes that are reinforced have not been known to shatter. ■



Evan I. Goldberg

1 *Diagram of splits in the roofing membrane.*

2 *View of the shattered membrane.*

Carl Cash

The author is a principal of the consulting engineering firm of Simpson Gumpertz & Heger, which has offices in Arlington, Massachusetts, and in San Francisco.

Recommended Reading

Shattering of Aged Unreinforced PVC Membranes, joint document of the National Roofing Contractors Association and the Single Ply Roofing Institute, NRCA, Chicago (708) 299-9070, September 1990, 2 pp.

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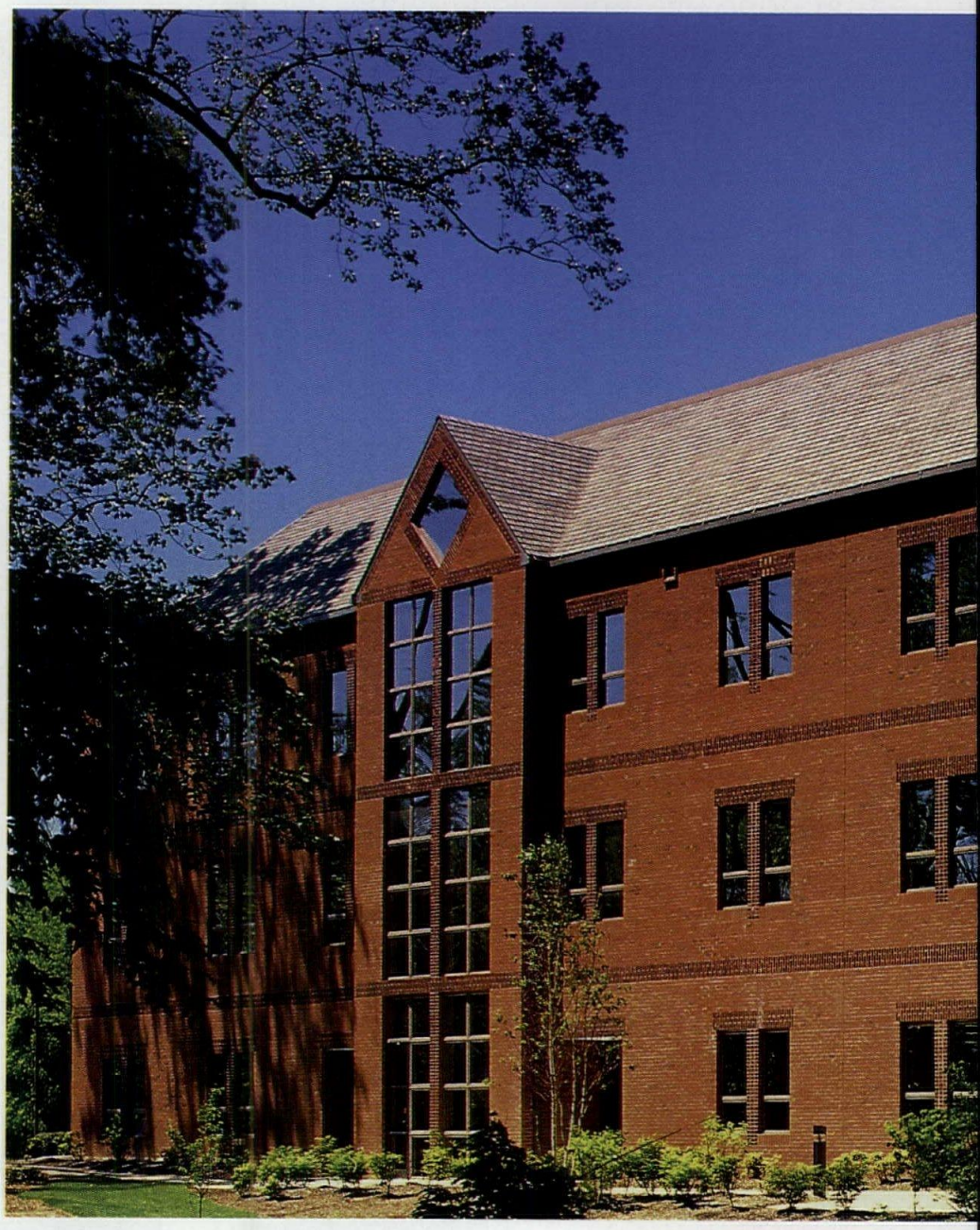

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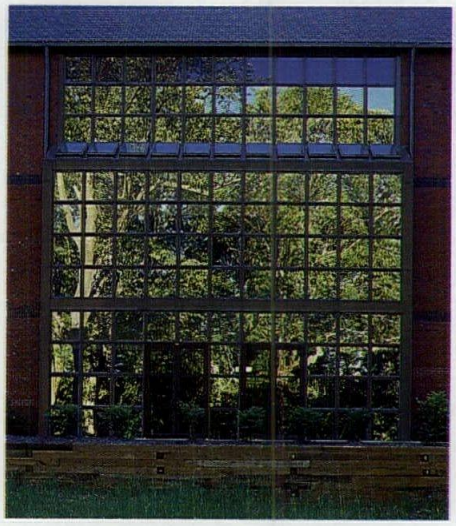

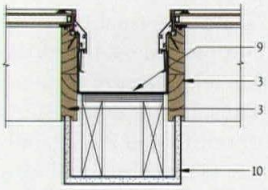

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OPTIONAL

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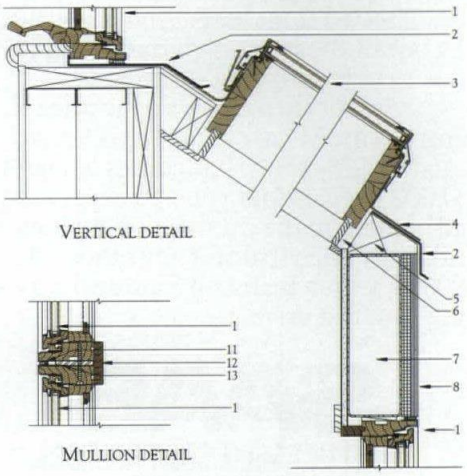

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Practice

In this, the first of a series on architects and power, we present a range of written opinions, with the hope of provoking an overdue debate.

Architects and Power

> Architecture is the will to power by means of form. –Friedrich Nietzsche, *Twilight of the Idols*

Recessions have always been a time when the profession takes stock of itself, and the current recession is no exception. This time, though, the focus of the self-examination differs. So much of what architects are talking about deals not with style or even theory (which seemed to be the case with the emergence of Post-Modernism in the 1970s recession) but with the most basic question of any profession: its power. What power does the architect have and how is that power changing?

There is no simple answer to such questions. Those who see considerable power in the architect's position can point to the tremendous growth in architectural employment during the 1980s, peaking at 157,000 in 1989, and to the enormous power in what architects do: bringing together people and materials to make a building. But those who see the power of the architect eroding also have evidence on their side: the growing percentage of construction fees going to engineers, for example, or the trend in the courts to hold architects to ever stricter liability.

Other measures of power, such as compensation levels or the amount of work, are equally inconclusive. For every architect who is underpaid or underemployed, it is possible to find another who is relatively well paid and busy (which, in the midst of this current recession, often means that they have overseas commissions or are working in a still-prosperous area such as healthcare). The same could be said for measures of architecture's popularity. We have never had a time when there have been so many architecture books published, so many architecture students enrolled, and so many architectural firms formed.

You could argue that those are signs of a vast increase in the cultural power of architecture. But those same facts can be seen as portents, not of the good, but the bad: signs of the number of architects who are writing instead of building, of the excessive competition for jobs (and the potential for exploitation) that will come with so many students graduating, and of the widespread layoffs that have forced so many architects to go into (often precarious) business for themselves.

Nor does history offer many conclusive answers. It is true that, since the Renaissance in the West, the architect has had a clearly distinct role from that of the contractor or engineer, roles that are embodied today in our licensing laws. But can those often adversarial roles remain distinct with the rapid growth of design/build, construction management, and developer- or contractor-led teams? And is the preservation of those distinctions necessary for the making of good architecture? What about the Medieval cathedrals created by master builders or the high-quality Japanese architecture today produced by design/build firms?

Further complicating these questions are the power shifts that seem to be occurring within the profession itself. Architects, in recent years, have become much more involved in reviewing and approving the work of their peers as they serve, for example, on zoning or design review boards or as employees of corporations, developers, or product manufacturers. Is the power of the architect eroding or is the profession itself just fragmenting, and its internal power shifting? Does the loss of power that one architect may feel seem like a gain to another?

These are not easy questions, but they are among the questions we plan to address in this series on architects and power. Every three months in the Practice section of P/A, we will publish essays that address some aspect of the profession's power and that argue for some sort of change. The introduction to each piece will frame a question or series of related questions that we hope you, our readers, will respond to in the form of letters. To begin the discussion, we have reprinted here a variety of published opinions on the subject along with some commentary.

Architects and Politics

Unlike European architects, who often take political stands, American architects have tended to eschew politics and, instead, to ally themselves with consumer culture and its preoccupation with image and style. What effect has this avoidance of political power had on the profession? Historian Mary McLeod of Columbia offers one view.

"That contemporary architecture has become so much about surface, image, and play, and that its content has become so ephemeral, so readily transformable and consumable, is (sic) partially a product of the neglect of the material dimen-

(continued on page 49)

Practice Points

What is the best way to calculate monthly payments to building contractors without overpaying? Architect Theodore Wendland has devised an equation based on his research of the construction process:

$$Y = [\sin (^{90}/_{N} \cdot \Delta N)]^2;$$

where Y = monthly costs, N = total months in contract, and ΔN = months of construction completed. Phone (818) 879-9656, or FAX (818) 879-8401 Wendland-Nahmias AIA & Associates for more information.

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"The public's trust in the fidelity of the profession is being undermined."

(continued from page 47)
sions of architecture - program, production, financing, and so forth - that more directly involve questions of power.... By precluding issues of gender, race, ecology, and poverty, post-modernism and deconstructivism have... forsaken the development of a more vital and sustained heterogeneity." (Mary McLeod, "Architecture and Politics in the Reagan Era: From Post-modernism to Deconstructivism," *Assemblage 8*, MIT Press, February 1989, p. 55.)

Architects and Clients

Who benefits from this transformation of architecture into a kind of consumer product, devoid of political content? Professor Sharon Zukin of NYU suggests that the real winners may be clients, who add value to their buildings by using "name-brand" architects. Los Angeles-based critic Diane Ghirardo says the same is true of developers, who use their support of "good" architecture to defuse other questionable practices.

"Signature or 'trophy' buildings link the cultural value of architecture with the economic value of land and buildings.... An emphasis on individualized products that can be identified with individual cultural producers is inseparable from intensified market competition in an age of mass consumption.... In architecture, as labor costs have increased and craft skills have atrophied, the burden of social differentiation has passed to the use of expensive materials and the ingenuity of the design itself. And, like Hollywood directors, architects assume and even become commercial properties." (Sharon Zukin, *Landscapes of Power, From Detroit to Disney World*, University of California Press, 1991, p. 45.)

[In supporting high-style architecture] "developers and real estate interests, in their wildest dreams, could not have come up with such an intellectually respectable and viable means of diverting attention away from the toughest issues in land development and the building process toward trivial matters of surface. But not only that: the work of the big name 'art' architect not only masks but legitimates the project by virtue of the power of art, rendering any other questions pointless." (Diane Ghirardo, "Introduction," *Out of Site, A Social Criticism of Architecture*, Bay Press, 1991, p. 15.)

Architects and the Public

Some architects, too, have benefited from this association with powerful corporations and developers. But has that come at a price: the loss of the public's trust in the profession? Princeton professor Robert Gutman thinks so.

"The public's trust in the fidelity of the profession is being undermined.... [What is necessary] for the continuation of respect is the belief that architects will apply their skill not only for the benefit of persons who pay their fees but also in response to the interest of persons, groups, and communities beyond the purview of the immediate client. [The public's] conviction that the architect is indeed committed to the professional ideal is a fundamental source of the demand for the services of architectural firms." (Robert Gutman, *Architectural Practice, A Critical View*, Princeton Architectural Press, 1988, p. 21.)

Architects and Building Users

This loss of public trust can produce a backlash against the profession, leading people to argue that architects have too much power, not too little. As the advocacy planner Robert Goodman has argued, this belief in the excessive power of architects is heightened by the sense that the profession is inwardly focused and unconcerned about non-expert opinion.

"By debating among ourselves, studying among ourselves and rewarding ourselves, we have come to have less and less tolerance for what we define as non-expert opinions.... [The public must then] adapt their needs to professionals who have trained themselves to pass judgment on what other people's environments should be like." (Robert Goodman, *After the Planners*, Simon & Schuster, 1971, pp. 115–116.)

Architects and Contractors

Another type of backlash has come from contractors, who seem locked in a power play with architects, even as the two groups are drawn together in more joint practices. Is the growth of construction management and design/build practices good for architects or, as this English newspaper account argues, does it spell the end of the architect's independence?

"Now the building contractors [in England] are making a quiet, but determined effort to topple the architects even from nominal control. Several leading members of the Chartered Institute of Building have come together in a pressure group called the Project Management Forum, with the aim of encouraging the gathering trend in the building industry towards the use of contractor-led design-and-build contracts. These come in many variations, but all use the architect either as an outside practitioner hired by the contractor or as an addition to the salaried staff on the contractor's payroll. The architect as a result gets less money, far less status, and next to no control over the quality of the finished building." (*The Economist*, London, August 31, 1991.)

Architects and Engineers

If contractors are pushing on architects from one side, engineers are pushing from the other by garnering an ever larger percentage of construction fees. Is this pressure from engineers the result of architects' sloughing off responsibilities, or of their not clearly defining their expertise, or both, as professor Dana Cuff of UC San Diego suggests?

"One of architecture's peculiarities is that, unlike other fields, it has failed to develop a set of hypotheses that can be advanced or refuted, escalating the indeterminacy/technicality ratio for architecture. High indeterminacy is partially the result of architectural problems themselves, which defy clear definition and solution. Another component of architecture's high indeterminacy is the profession's unusual tendency to slough off constitutive skill areas, which subsequently become professions in their own right – for example, civil engineering, structural engineering, interior design, site planning, and urban design. These related professions then compete with architecture. According to some analyses, engi-

(continued on page 51)

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"A small but powerful group of architects at the peak of the hierarchical pyramid take for themselves what they consider the most rewarding work."

(continued from page 49)
neers are claiming a larger share of the building design and construction fees, while the architect's portion shrinks." (Dana Cuff, *Architecture, The Story of Practice*, MIT Press, 1991, p. 39.)

Architects and Manufacturers

One measure of a group's power in our culture is how it consumes and thus how important it is to advertisers. What is the implication, then, of the precipitous drop in advertising by building product manufacturers in the architectural press, down 35 percent since 1988? Is it related or not to the fact that non-residential building activity, measured in square feet, is down 32 percent over the same period?

Architecture and the Media

Advertising is down, yet the number of architectural journals and critics continues to increase. NYU professor Sharon Zukin suggests that this has to do with architecture's role as an economic tool. But why has this power in the culture, enhancing the economic position of clients, had so little effect on the economic power of architects, whose personal income is nowhere near that of most doctors or lawyers?

"Architects' designs become more useful economic tools to speculative real estate developers when they are published, theorized about, and disseminated within the architectural profession. Plenty of magazines and reviews have been founded in the last few years for this sort of intra-professional publicity.... Publicity expands the cultural value of designers' ideas, and in the process, enhances the market value of both the architects and the buildings." (Sharon Zukin, *Landscapes of Power, From Detroit to Disney World*, UC Press, 1991, p. 261.)

Architects and Education

There has been a lot of theorizing about issues of power, especially the political power of architecture, by people in the schools such as professor Anthony Ward. But how much can those in the schools question hegemonic power within the profession when they, themselves, are becoming the exclusive means by which a person can become an architect?

"Architectural education, like architecture, is a socially mediated phenomenon. Just as there are dominant and subordinate cultures and forms of knowledge, so also are there dominant and subordinate theories of architecture, and these theories cannot be separated from issues of power and class. A transformative architectural education will therefore seek to make and understand these connections between the power structures in the larger society and the form of architectural theory.... The charge that political and architectural domains are mutually exclusive grows from within the dominant culture. It is another form of political ideology, aimed at maintaining the power status quo within the profession and hence the larger world within which it operates through the attempt to hegemonically define the domain of architecture itself." (Anthony Ward, "Biculturalism and Community Design: A Model for Critical Design Education," *Voices in Architectural Education, Cultural Politics and Pedagogy*, Bergin & Garvey, 1991, pp. 203–204.)

Architects and Employees

This need to question our own internal power relations extends beyond the schools to the profession itself, where there continue to be major power differences within firms between partners and employees, architects and interns. Have specialization and job competition widened that power gap, as professor Dana Cuff suggests?

"With specialization comes the 'dequalification' of labor, which entails breaking tasks into smaller and smaller components that require less and less expertise. In addition, the large supply of architects has served to downgrade work responsibilities. When asked, two-thirds of all architects corroborate these trends, saying they were unhappy with the noncreative assignments they were given early in their careers. The jobs of most architectural workers are less meaningful and more alienating (than in the past); a small but powerful group of architects at the peak of the hierarchical pyramid take for themselves what they consider the most rewarding work." (Dana Cuff, *Architecture, The Story of Practice*, MIT Press, 1991, p. 49.)

Women in Architecture

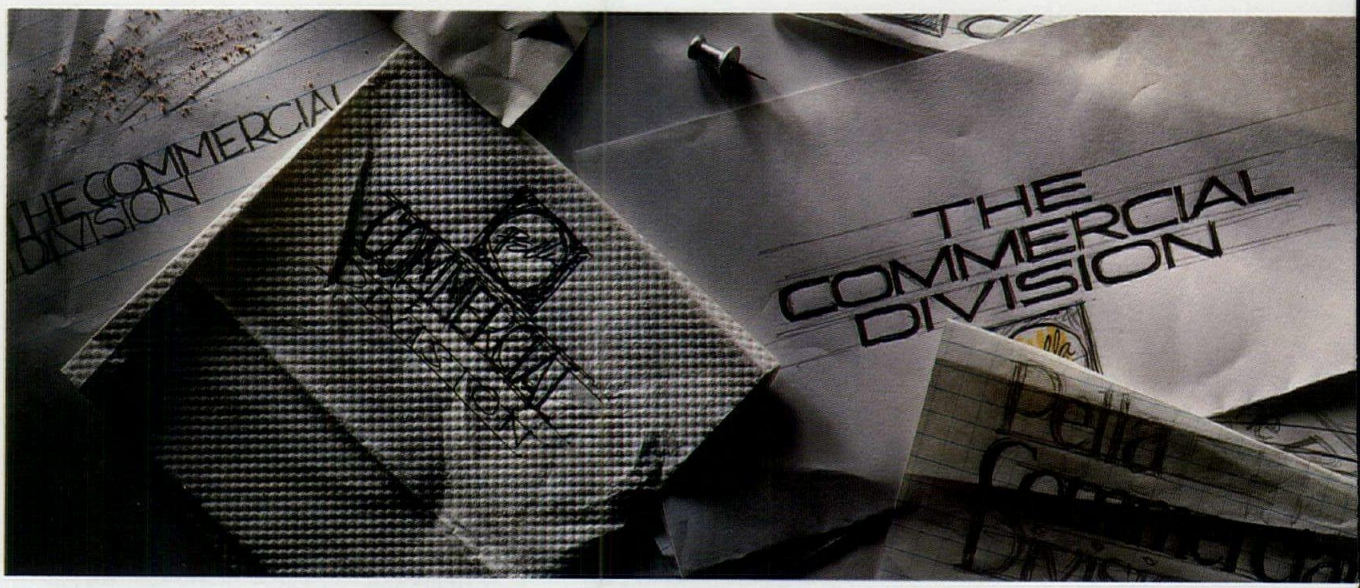
Another power difference internal to the profession is that between men and women. How can this profession continue to attract the best women when a poll of P/A readers revealed that, compared to men, women in architectural firms are much less likely to be given management opportunities, peer recognition, and equal pay for equal work? Women, more than men, according to our poll, felt also that having a child greatly reduces their chances of becoming a principal or project manager in a firm.

Minorities in Architecture

Another measure of a profession's power is how well it competes in attracting disadvantaged people. Should it not concern everyone in this profession, then, that both medicine and law have higher percentages of minority members? African Americans, Hispanics, and Native Americans, for example, constitute only about 6 percent of full members in the AIA, and African American architects, only about 1 percent of that membership.

We would like to hear your thoughts on these subjects. For the next installment in this series, let us know, in a letter, what you think about the general subject of power and architecture: is it important or not to the profession and what power do architects have in shaping the built environment?

We encourage you to share your own experience and any data you may have on the subject. Please address letters to the "Practice Editor" so they do not become confused with other letters to the Editor. Also feel free to fax your responses: (203) 348-4023. **Thomas Fisher** ■



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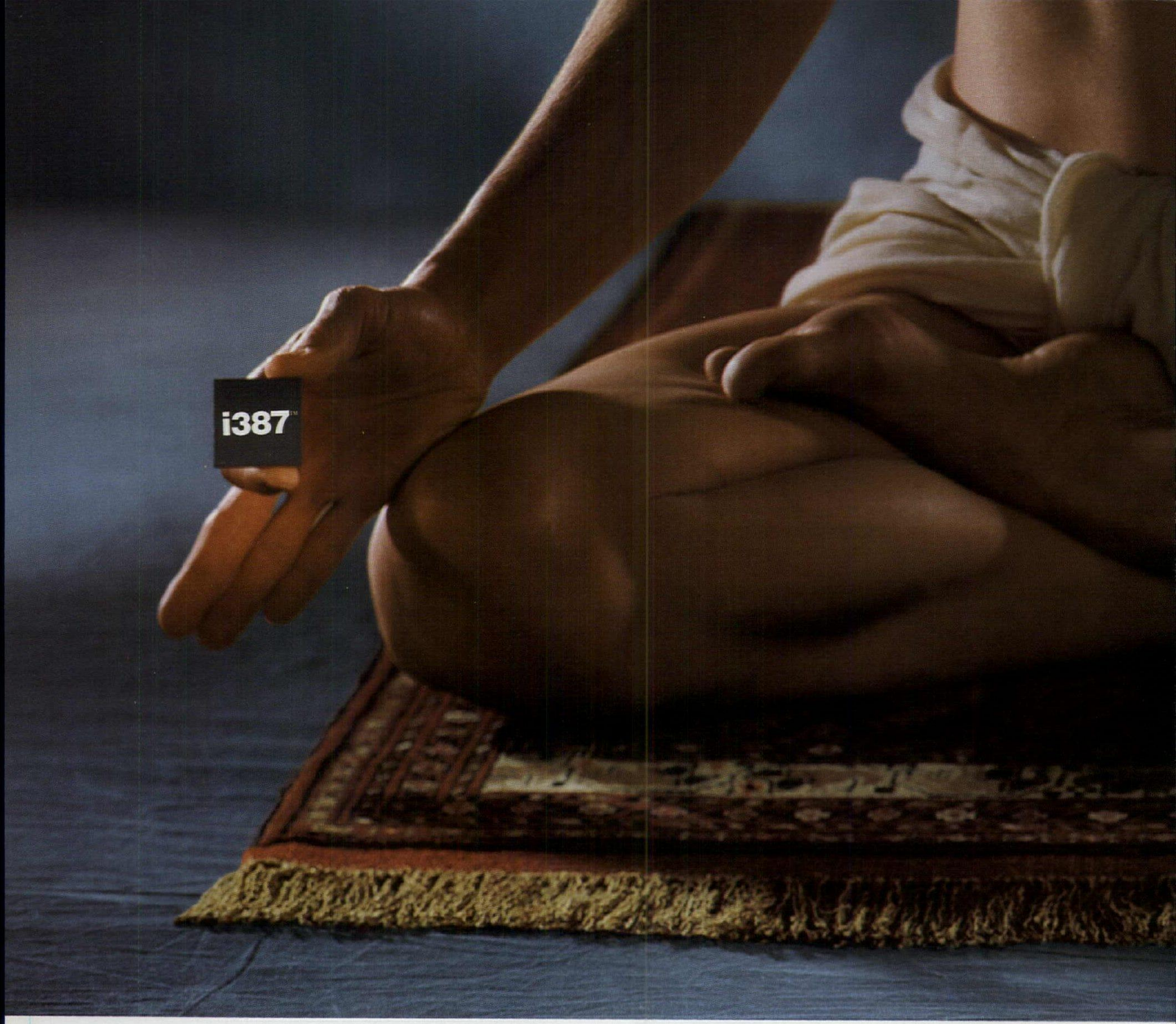

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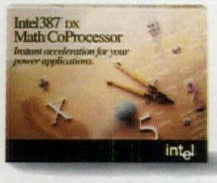

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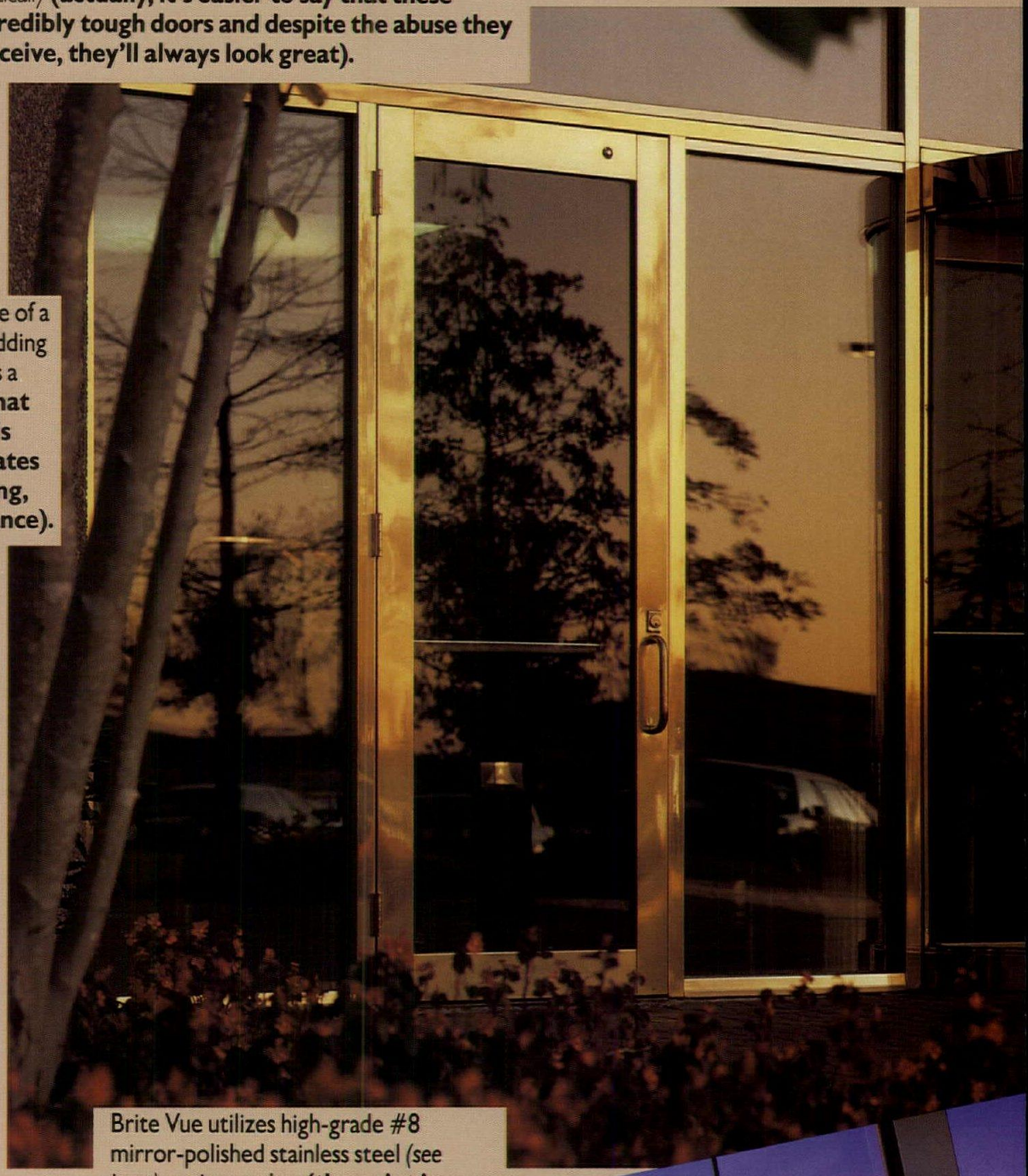

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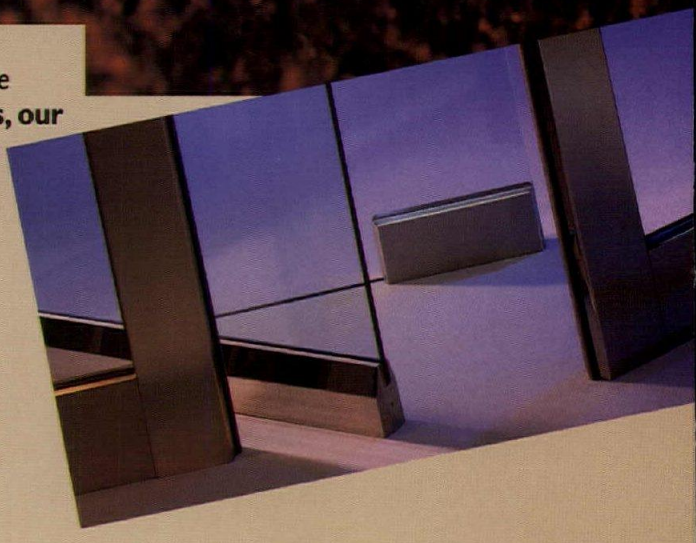

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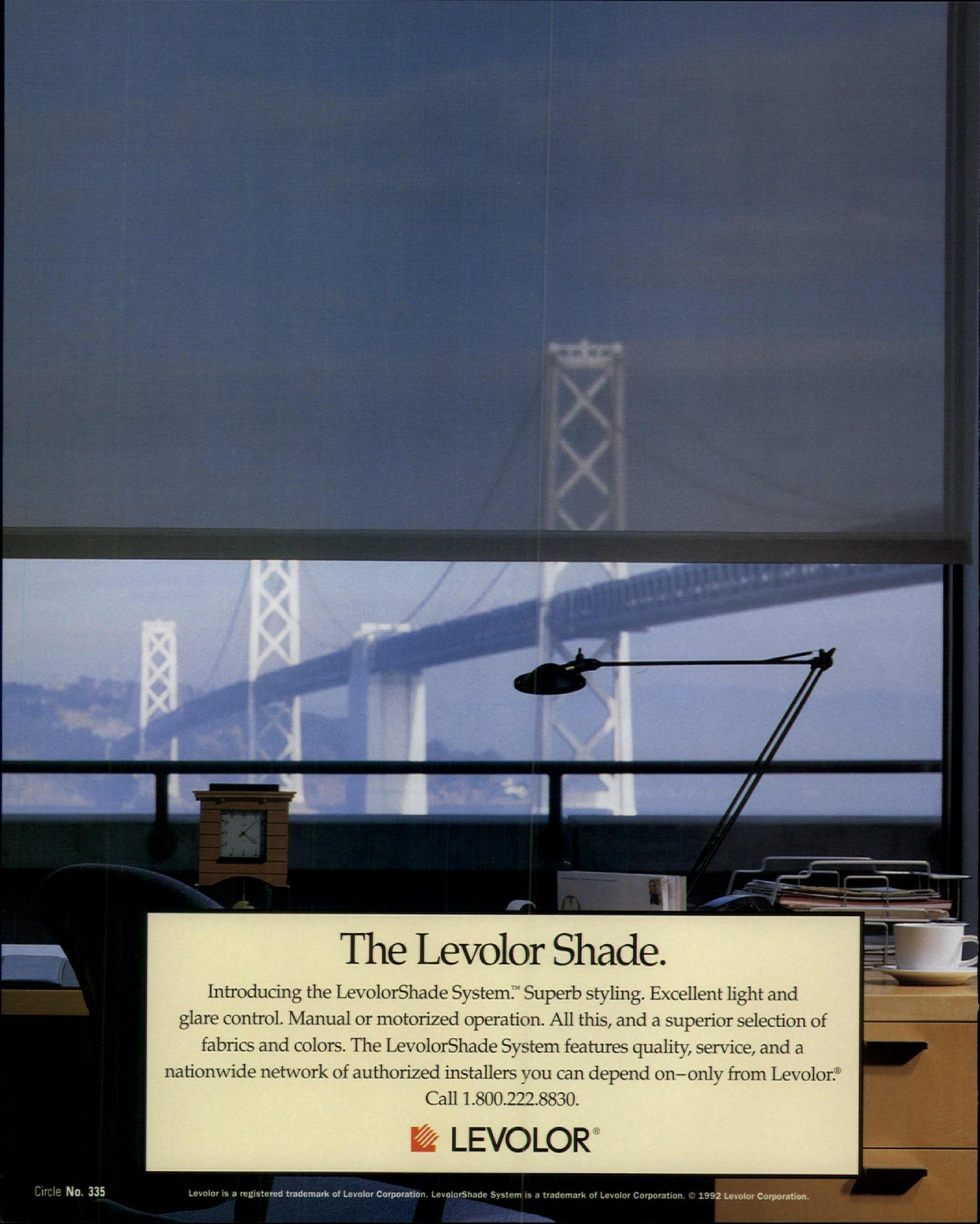

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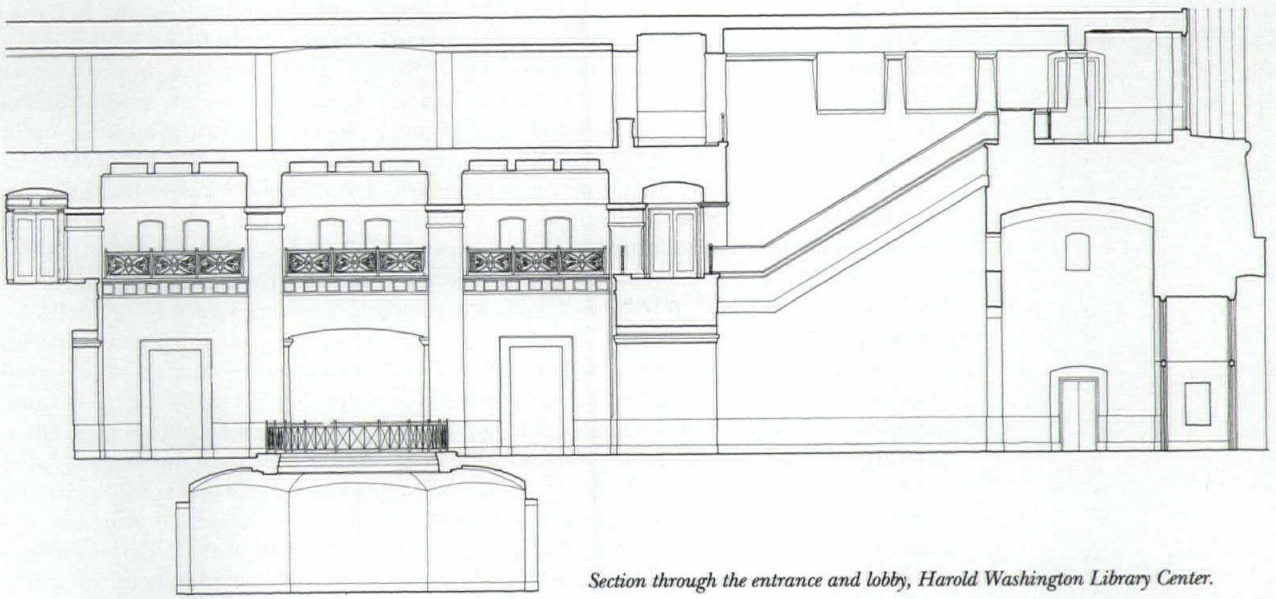

Section through the entrance and lobby, Harold Washington Library Center.

Updates of former winners of the P/A Awards program – The Harold Washington Library Center in Chicago, Colton Palms in Colton, California, and University Park in Cambridge, Massachusetts – are featured in this issue. Also included are the first in a new series of articles on emerging talent, an editors' roundtable discussion of the Getty Center, and a critical examination of recent urban design projects.

Washington's Monument

Chicago's new Harold Washington Library Center suggests that rumors of the death of Post-Modernism are greatly exaggerated.

The library occupies a full block at the south end of the Chicago Loop. The competition brief called for major entrances on both Congress Parkway (1) and State Street. The building's Napoleon red granite base – rusticated at street level, smooth in the slanting second story – recalls the language of proto-Modern Chicago buildings. The ornamental acroteria planned for the top of the building (see page 64) have yet to be installed.

P/A announced the winner of the Harold Washington Library Center competition – a historicist entry by the SEBUS Group – in the August 1988 News Report. That same News Report contained a review of the Museum of Modern Art's now notorious "Deconstructivist Architecture" exhibition. The backlash against Decon notwithstanding, it would seem that just as the library was getting started, Post-Modern historicism was on its way out, killed by its all-too-cynical incarnations in shopping centers and speculative office buildings. The P/A Awards jury that gave the Library Center a citation in 1989 was the last P/A Architectural Design jury to date to reward any historicist work.

But a visit to the Library Center, which opened last October, suggests that historicism, used intelligently on an appropriate program, deserves another chance. The library combines democratic accessibility with a nobility rarely seen in contemporary public buildings.

What is most curious – especially in light of the current fractious debate in intellectual circles over multiculturalism – is that this Eurocentric building is Chicago's memorial to its first African-American mayor, the late Harold Washington. Whether the library's Western iconography is a valid tribute to Washington (and to Chicago's African-American community) is a question worth asking. But this debate loses resonance when one watches groups of African-American schoolchildren spill into the library's grand marble lobby, as a guide points out to them the enormous mosaic entitled "Events in the life of Harold Washington." (The mosaic, along with other art installations chosen by library officials, attempts to balance the Eurocentrism and make the building more inclusive, as Catherine Ingraham points out in an essay on page 70.) The building speaks a heroic language that all Americans understand; to see that language used to celebrate an African-American leader is to see claims of the oppressive nature of Classicism blunted.

The story of the library began on a controversial note: a number of local architects – and the Chicago AIA chapter – objected to the city's decision to hold a design-build competition for the library, arguing that the design-build process would favor large firms with existing ties to developers, and that the competition structure would not lead to good design. The site was a full block at the low-rent south end of the Chicago Loop, with an additional parcel to the north across Van Buren Street and the El tracks. Five architect-developer teams entered the competition, submitting designs that reflected the pluralism of their time much as the Chicago Tribune competition did in 1922. Murphy/Jahn and Lohan & Associates offered sleek schemes in the Chicago Modernist tradition, Arthur Erickson produced a curvilinear concrete design (which was favored by the public in a straw poll), and Hammond, Beeby & Babka and Skidmore, Owings & Merrill each offered historicist designs.

HBB's winning proposal, as part of the development team known as SEBUS, contained the entire building within the block, unlike other schemes that spanned the El tracks. The SEBUS scheme incorporated many ideas from a much smaller HBB library, the Conrad Sulzer Regional Library on Chicago's north side (P/A, Dec. 1985, p. 51), most notably the use of a ground floor made up of figural rooms and open, loftlike upper floors (in Sulzer's case, only one). Aside from its strong civic image, the scheme's most significant feature was the flexible planning of its working floors. Using the poché-like perimeter walls for fire stairs and reading alcoves, and a glass-walled corridor on the west wall for back-office circulation, the scheme provided largely uninterrupted loft spaces with a 21' column grid. The modular arrangement of these floors reminds us of HBB's Miesian roots: all of the principals are graduates of Illinois Institute of Technology.

Like a Classical column, the building was designed both inside and out with a base (the lobby and bottom floors, which house special library functions), a shaft (the six middle floors that house the bulk of the collection), and a top (the Winter Garden and administrative offices). Circulation through most of the building is easy and intuitive. Visitors are drawn from the lobby up escalators to the third floor, where the main collection begins. Above the third floor, escalators are in the same place – next to a staffed circulation desk – on every floor. Most of the books are in open stacks, and each floor has a perimeter corridor with access to the small, ascetic reading alcoves.

Unfortunately, the clarity of circulation – which in this library seems to represent equal access and thus equal opportunity – breaks down at what should have been the most accessible place in the library, the much-discussed Winter Garden. At the time of the competition, the Winter Garden was

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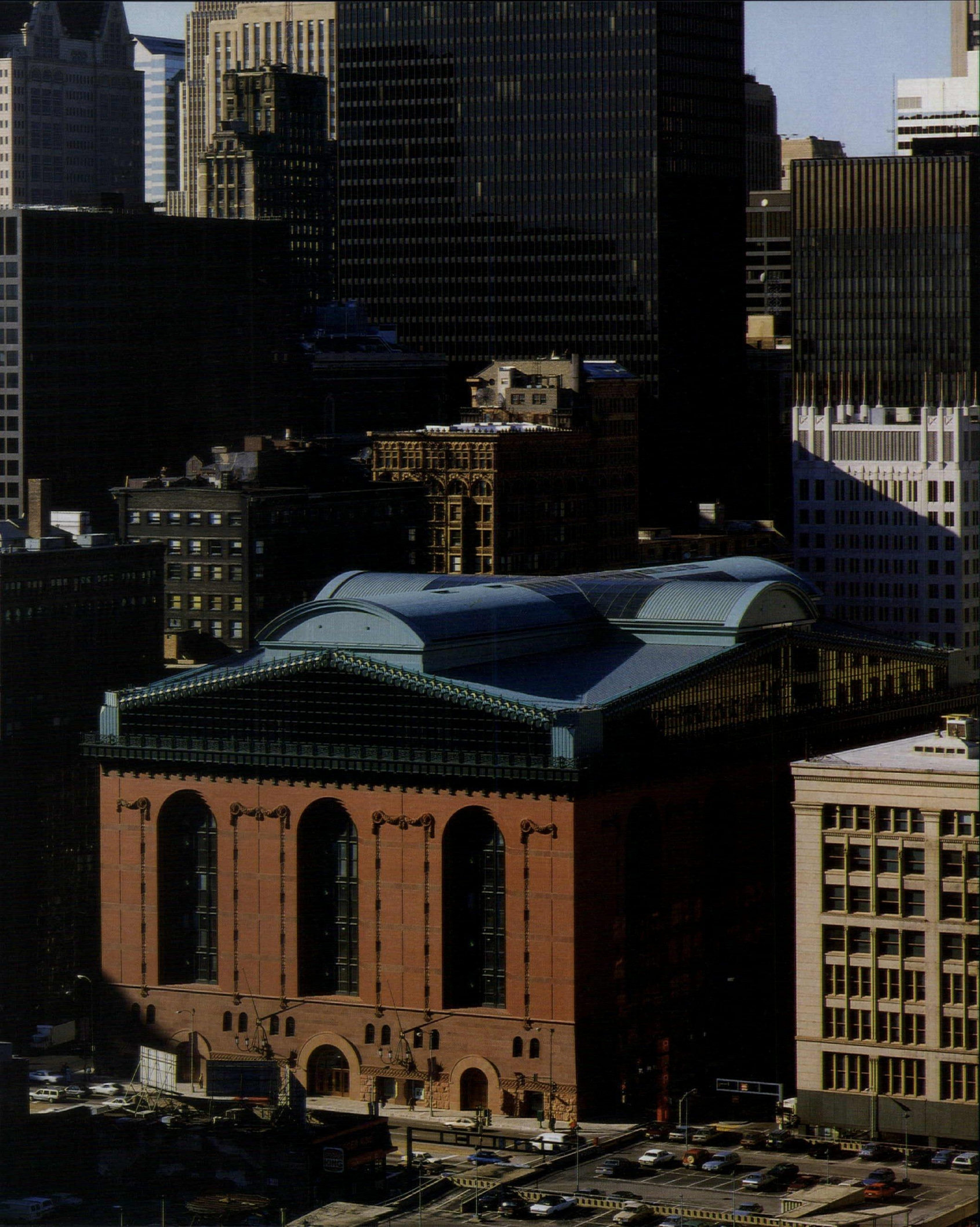

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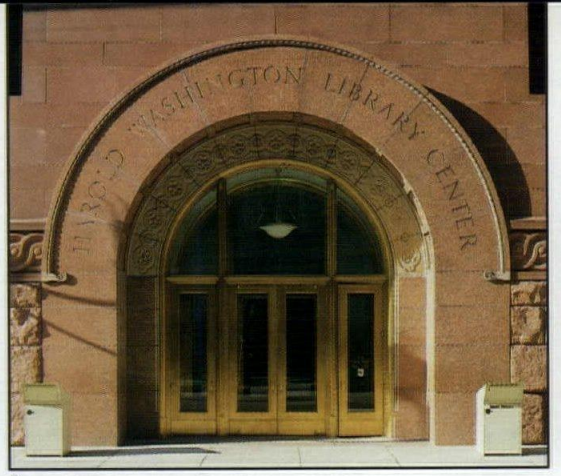

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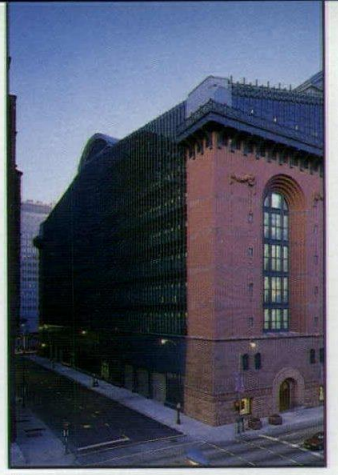

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(continued from page 60)

considered to be an all-weather alternative to the outdoor, street-level public spaces proposed in other schemes. As built, the space is grand and inspiring, but not inviting. It is reached via an escalator hidden around the corner from the well-established circulation route, and it contains only a couple of meager benches for public use. Cut off from the working library below, the Winter Garden's main functions seem to be as a courtyard for the administrative offices that overlook it and as a rentable space for parties. (On one recent visit during library hours, the Winter Garden was closed to the public, a security guard explained, "for a librarians' meeting.") Beeby says he would like to see the space become a reading room, filled with long tables and chairs; such a move might help restore this room to the people for whom it was intended.

As for the building's exterior, it is a more convincing essay in historicism than models and drawings (and Post-Modernism's track record) would lead us to expect. The deep red color and the attention to the sculptural possibilities of stone and brick give the building a solidity and monumentality that is difficult to assert within the non-hierarchical confines of the city grid. Part of this monumentality is achieved by association with other Chicago landmarks: the heavy, rusticated granite of the base recalls that of the Rookery and the Auditorium Building, and the sloping walls above, with their deep-set windows, are a nod to the Monadnock Building.

The building's ornament plays it rather straight compared to that of ironists like Venturi and Moore; a bit more humor might have made the building less forbidding to those who see it that way, and the huge acroteria (p. 64), which had yet to be installed at press time, may serve that purpose. The most ironic gesture is the glass curtain wall of the west elevation. The architects used the curtain wall to bring secondary light into the offices and to denote that this façade is not a public entrance. But it is also a kind of subversive wink at the viewer, poking fun at the apparent thickness of the other walls.

In the end, the most valid reasons for not liking this building are polemical ones – if you don't belive in high historicism, the debate is closed. But this building makes a good case for judicious use of the imagery of the past. It is inspiring, inviting, and a tribute to all of Chicago. **Mark Alden Branch** ■

The "front" of the building, although the Congress Parkway façade is more visible, is on State Street (2). At right are the elevated tracks and a plot of land across the street that was part of the available land for the competition, now being developed as a "temporary" park until it is sold for development. The west elevation (4) is a Modern curtain wall; its large expanses of glass provide secondary light to offices beyond corridors that run the length of the building. The other walls, faced in brick, have an apparent thickness achieved by carving deep recesses at the windows and at entrances (3).

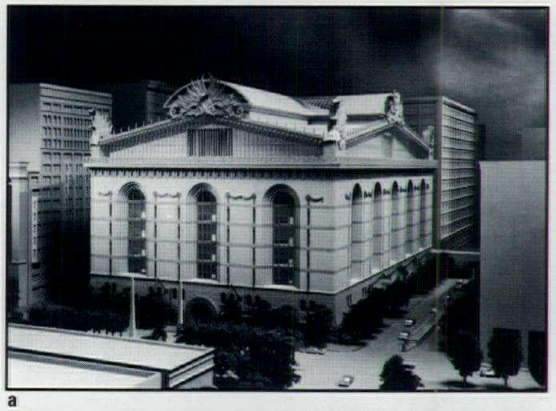
Ornament: Owls, Corn, and the Windy City

The ornamental program for the library, developed by Baltimore artist Raymond Kaskey and Yale architecture professor Kent Bloomer using ideas from the competition entry, comes from both Classical and popular sources. Kaskey was responsible for the cast stone elements and the owls that will top the building; Bloomer designed the aluminum pieces in the steel and glass pediment.

At street level, a chain-patterned band (called a guilloche) in cast stone binds the building's base together (e, f). The festoons (c) between the arched windows help to break up the façade, and the vertical spandrels, which contain cast stone corn stalks, draw the small reading alcove windows into a vertical line. At the top of the spandrels are medallions with a personified "Windy City" icon (c); where they meet the stone base are figures of Ceres (d), the goddess of agriculture, who is also depicted atop Chicago's Board of Trade tower. The ribbon beneath Ceres's head displays Chicago's motto, "Urbs et Hortis" (Garden City).

At the pediment level, Bloomer designed a railing (c) using the railing inside the lobby (facing page) as a model – but with its solid/void relationship exaggerated so as to be read from the street. In the pediment is a swords-and-shields pattern that wittily plays on the verticality of the mullions of the curtain wall behind it. In Classical architecture, the swords and shields represent soldiers defending the building – a kind of gargoyle.

The most visible ornament, at the rooftop, is still in fabrication well after the library's opening. The aluminum acroteria (b) will stand at the corners of the building (pitched outward to be visible from the street), and the antefixes will top the pediments (a). The antefixes are descended from the five-leaved Greek palmette motif; those on the sides of the building will have single seed pods at their center (Bloomer's tribute to Louis Sullivan, whose ornament often grew from such pods), while the one on the front will contain a cast-aluminum horned owl clutching a book. The acroteria, which have similar botanical motifs, will contain barn owls.



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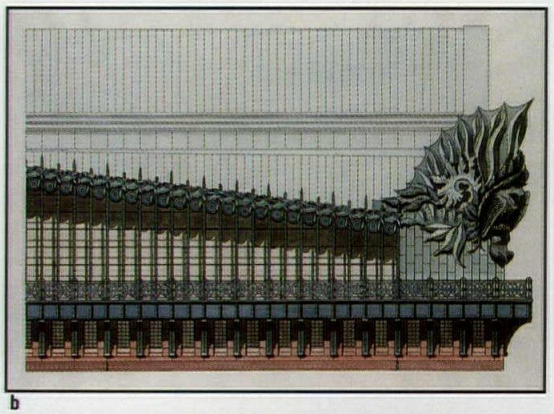

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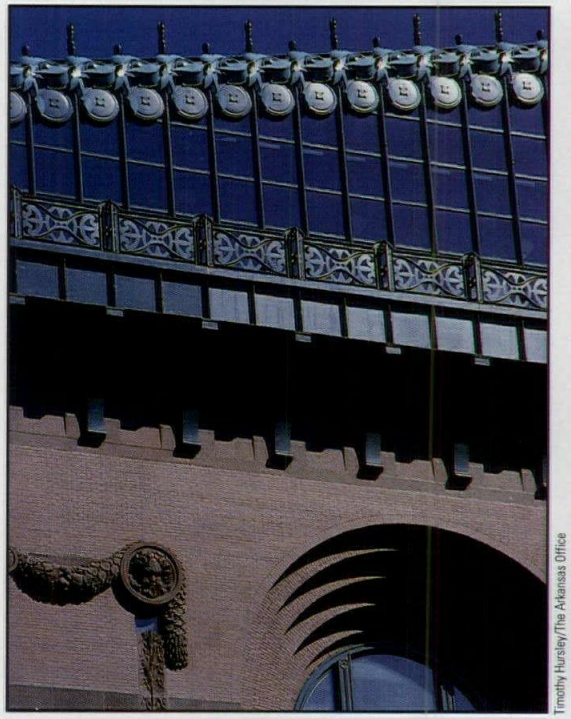

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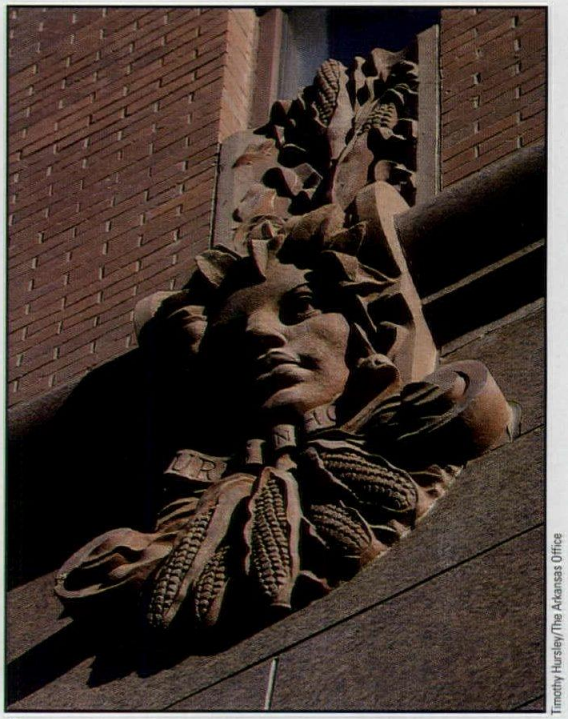

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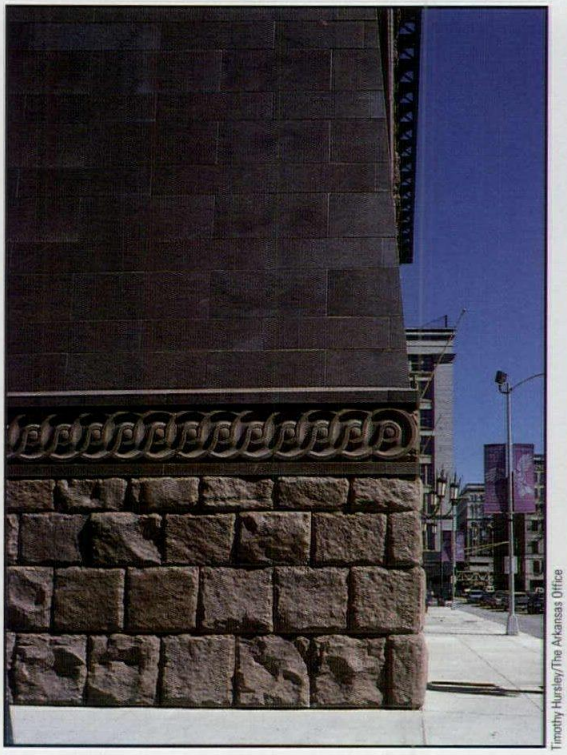

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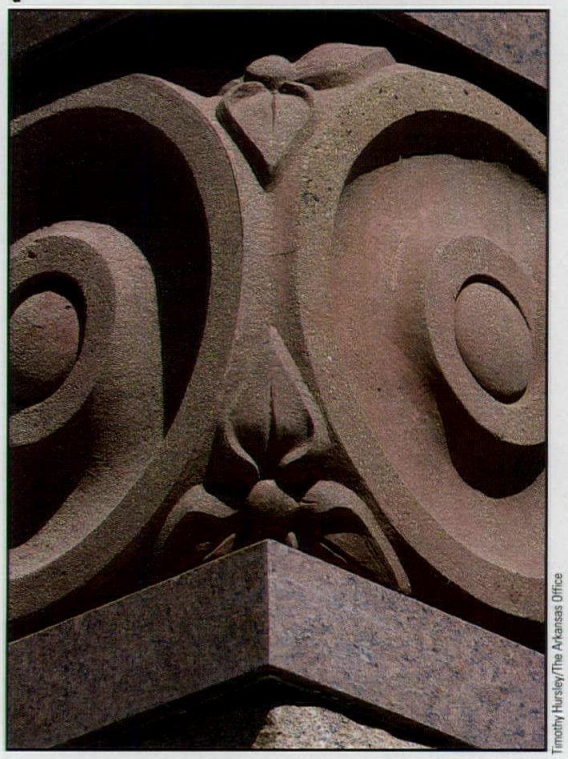

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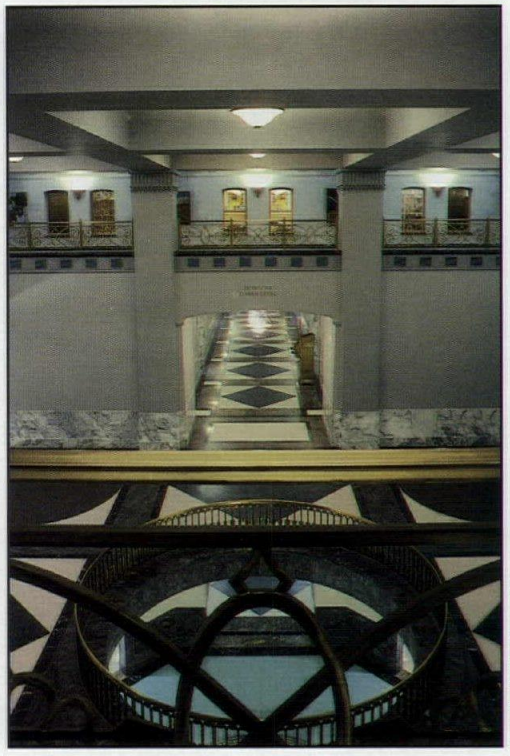
Timothy Hursley/The Arkansas Office

5

The main lobby, entered from State Street (5) and, through a corridor (7), from Congress Parkway, is one of the two monumental spaces within the library, and functions as a kind of memorial to the late Harold Washington. The north wall holds a mural of events in Washington's life (not shown), and an oculus cut into the floor reveals an art installation entitled "DuSable's Journey" (page 70), which includes text from the mayor's inaugural address. Patrons take escalators to the upper floors.

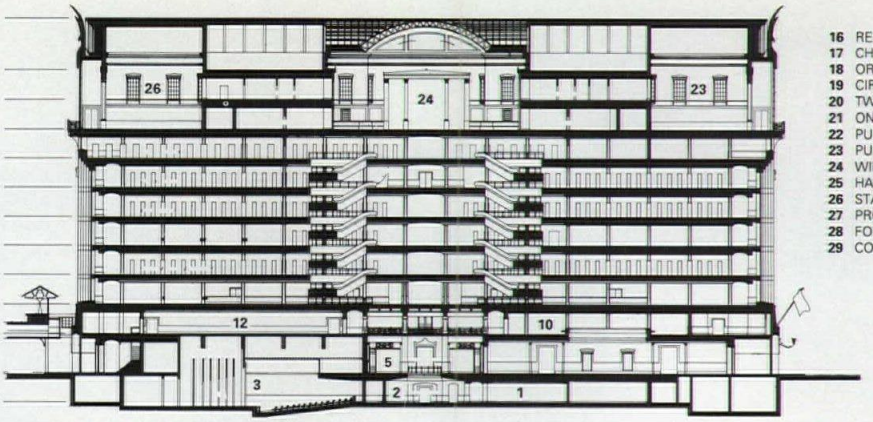
6



7

Timothy Hursley/The Arkansas Office

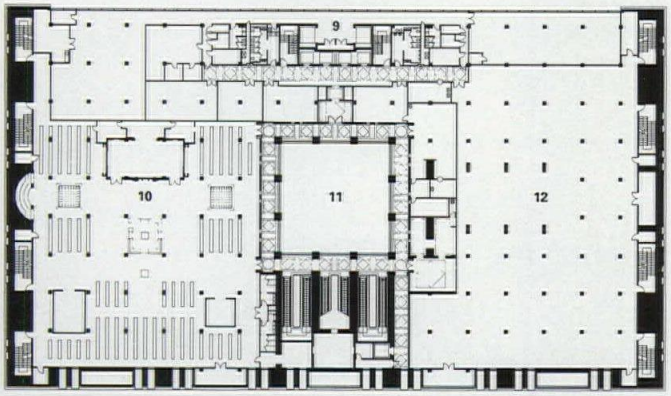
1 EXHIBIT HALL
2 LOWER LOBBY
3 AUDITORIUM
4 VIDEO THEATER
5 MAIN LOBBY
6 FILM/VIDEO CENTER
7 GIFT SHOP
8 BOOKSTORE
9 STAFF CORRIDOR
10 CHILDRENS LIBRARY
11 OPEN TO BELOW
12 COMPACT SHELVING
13 MICROFORM
14 GENERAL OFFICE
15 MEETING ROOMS



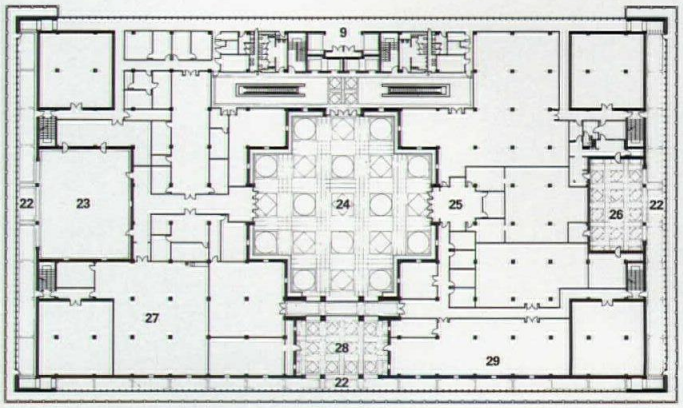
16 REFERENCE DESK
17 CHECKOUT
18 ORIENTATION THEATER
19 CIRCULATING STACKS
20 TWO-STORY READING ALCOVE
21 ONE-STORY READING ALCOVE
22 PUBLIC CORRIDOR
23 PUBLIC RESTAURANT
24 WINTER GARDEN
25 HAROLD WASHINGTON ARCHIVES
26 STAFF LUNCHROOM
27 PROFESSIONAL LIBRARY
28 FORECOURT
29 CONSERVATION LABORATORY

SECTION A-A

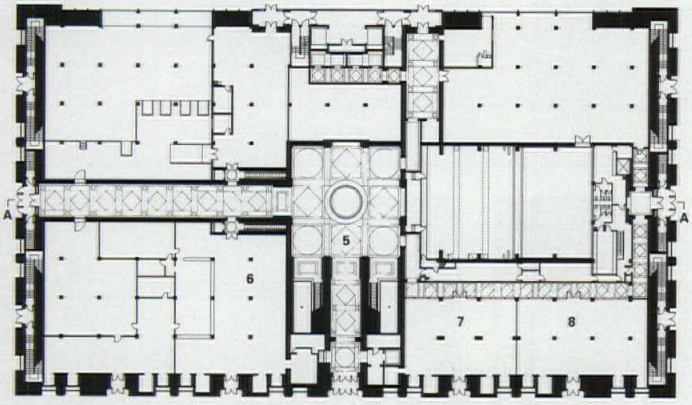
40'/12m



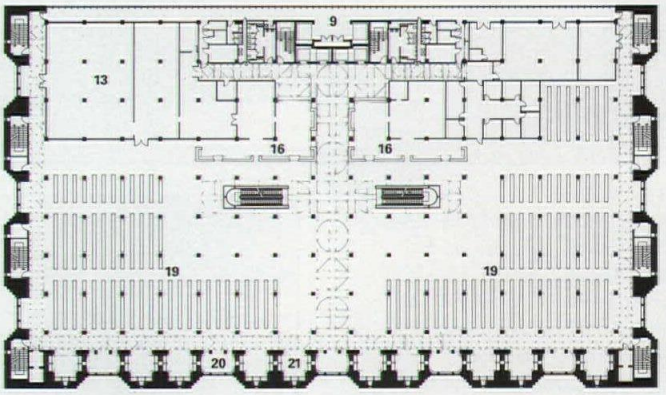
SECOND FLOOR PLAN



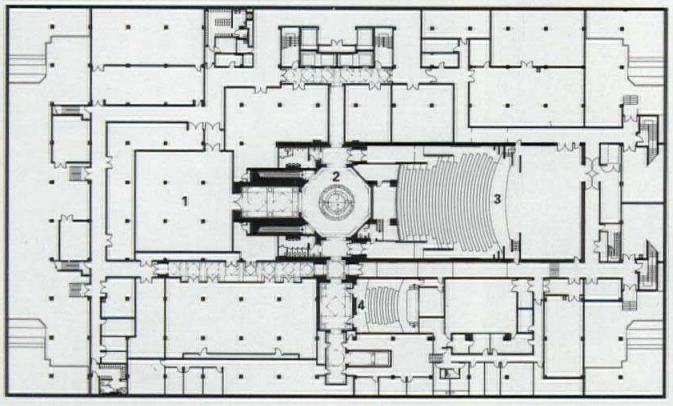
NINTH FLOOR PLAN



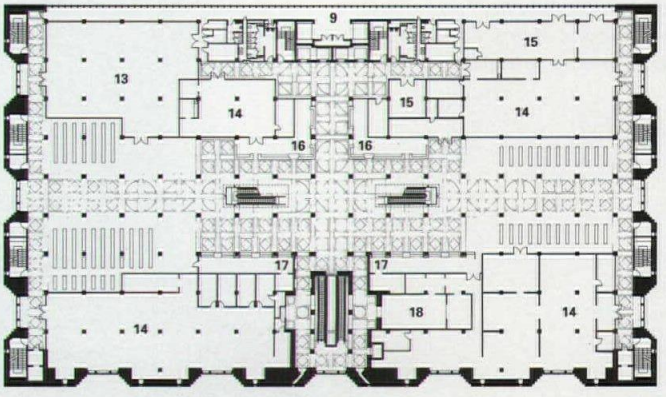
FIRST FLOOR PLAN



FOURTH FLOOR PLAN



LOWER LEVEL PLAN



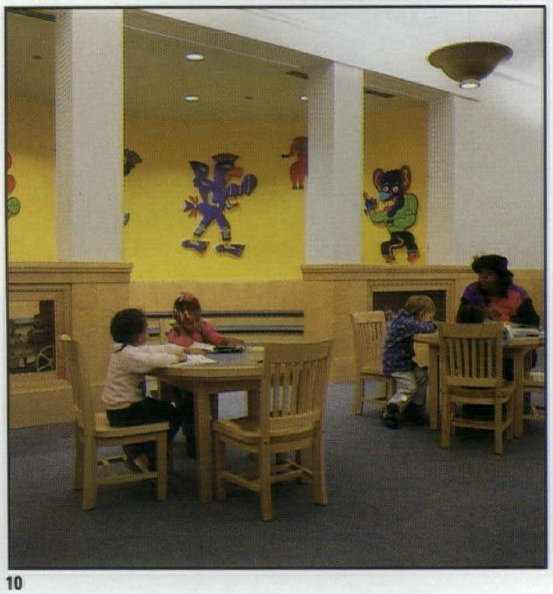
THIRD FLOOR PLAN

N →

40'/12m

8

9



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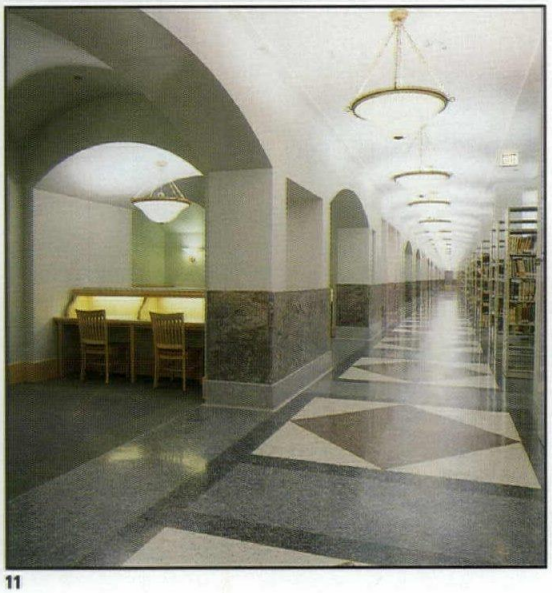


11

On the second floor is a children's library with, among other things, an apse for reading aloud (10). Floors four through eight contain open stacks, with a central reference desk on each floor (8) near the escalators. In lieu of large reading rooms, these floors also have an open reading area (9), and alcoves set off a perimeter circulation route (11). Terrazzo is used to mark circulation; the stack areas have carpeted floors. The concrete columns with beveled corners (9) are cast in place. The cool interior color palette was selected to achieve higher light levels with less artificial lighting.

The Winter Garden uses architectural elements to create the illusion of an urban courtyard (14); it serves the administrative offices on the top two floors. The glass pediments at this level provide exceptional views, unlike most of the building, where views out are constricted as a consequence of efforts to control sunlight. A staff restaurant (12) occupies the north end of the top levels; a similar restaurant for the public will open soon at the south end. A corridor that runs the length of the State Street façade (13) will be used for exhibitions.

Project: *Harold Washington Library Center, Chicago.*
Design-build team: *SEBUS Group (Schal Associates Partnership, A. Epstein & Sons International, Hammond Beeby & Babka, U.S. Equities Realty).*
Architects: *Hammond Beeby & Babka, Chicago, design architects (Thomas H. Beeby, director of design; Bernard F. Babka, director of technical services; Charles G. Young, Dennis E. Rupert, competition design architects; Charles G. Young, Robin Ann Johnson, execution design architects; Robin Ann Johnson, David J. Pickert, Kirsten P. Beeby, Hans Baldauf, Aric Lasher, Baker Goodwin, competition project team; Dennis E. Rupert, Philip J. Liederbach, James Gayley, Kirk R. Stevens, Peter James Harlan, Lynn Batsch, Hsuan-ying Chou, Thomas Ciesielski, John C. Kennedy, Burgess Wilson, execution project team). A. Epstein & Sons International, Chicago, architect of record (Sidney Epstein, chairman; Mickey Kupperman, president; Theodore Amberg, officer in charge; Maurice Spang, director of engineering; James Stefanski, project manager; Richard Mailloux, lighting designer; George Thompson, Michael Jacques, Elizabeth Michalska, Michael Paluga, architectureal team). Dubin Dubin & Moutoussamy, Chicago.*
Client: *Department of Public Works, City of Chicago; Chicago Public Library (John B. Duff, commissioner).*
Site: *a city block in Chicago's South Loop.*
Program: *756,640 sq ft main library facility housing 2,000,000 circulating books, a staff of 600, and seating for 2337 patrons.*
Structural system: *caisson foundation, flat-slab and cast-in-place concrete (to 9th floor); steel frame with composite slab construction (above 9th floor).*
Major materials: *see Building Materials, page 139.*
Mechanical systems: *central air system (eight fan rooms); perimeter electric baseboard heating system; fan boxes for interior zoned heating and cooling.*
Consultants: *A. Epstein & Sons International, structural; M/E/P, environmental systems design; Avila & Associates, civil engineer; Schirmer Engineering, life safety; Colin St. John Wilson & Partners, library consultant; Architectural Interiors, Inc., interiors; Gage-Babcock & Associates, security; Shiner & Associates, acoustical; Rolf Campbell & Associates, landscape.*
Artists: *Kent Bloomer, ornamenter; Raymond Kaskey, sculptor; Houston Conwill, artist, Estella Conwill Majozo, poet, and Joseph DePace, architect, collaborators on terrazzo and inlaid brass floor seal, Chicago Percent for Art Program.*
Builder: *Schal Mortenson; Louis Jones Enterprises.*
Associated contractor: *Avila & Associates.*
Costs: *$144,000,000.*
Photos: *Judith Bromley, except as noted.*

12

13

Tom, Dick, (Jane) and Harry

Catherine Ingraham considers the subtext of the Harold Washington Library's Classical and anti-Classical moments.

> Everything is there: the minute history of the future, the autobiographies of the archangels, the faithful catalogue of the Library, thousands and thousands of false catalogues, a demonstration of the fallacy of these catalogues, the Gnostic gospel of Basilides, the commentary on this gospel, the commentary on the commentary of this gospel, the veridical account of your death, a version of each book in all languages, the interpolations of every book in all books.
> – Jorge Luis Borges, "The Library of Babel," in *Ficciones*

Books and library buildings are competing artifacts, different in scale, spatial claim, and political stake, and it is always interesting to look at library projects in order to measure, in a way, the book against the building. It is the book, not the text, that poses a formal problem for library design, although the text is worrying the edges of book and library both. The rows of books that the library houses, even in the electronic age, are a massive, repetitive, and linear structure that the library building, in most cases, ironically attempts to dissimulate – ironically, because architecture is itself masterful in disciplining the linear, the orthogonal.

These book stacks, which in contemporary library design consist of thousands of linear feet of open metal shelves, are the difficult inhabitants of the library, more architecturally demanding than the readers, the staff, or other functions and programs. The shelves are prosthetic structures – metallic props and devices that provide a surrogate system of order in the midst of the rampant signification of both the written and the architectural text(s). The shelves make possible the kind of spatial circulation of books and people through turnstiles and electronic sensors that we associate with the "lending library." All this seems to me to be especially true of the Chicago Public Library, where the book stacks seem particularly relentless in the organization of the interior space. There is a starkness to the fact of these shelves that suggests a serious underestimation of their spatial force. What seems to be missing is both a theory of the linear and a theory of books (which may be a theory of reading or of the object), but this is tricky.

Someone once asked me what I would look for in the design of a contemporary art museum. I could only say that I thought that the design (any design) of a museum (any museum) would, and should, in some way embody the theory of art formulated, however obliquely, by the architect. A museum that was built as a "neutral ground" for art would be a failure. There are many complications with this response, not least of which is the assumption that there is always a theory of art – or in the case of the library, a theory of reading – operating in the architecture, even if it is suppressed. In spite of, or rather precisely because of these complications, I want to speculate on what Thomas Beeby's (whose views I take to be standing for the design team's) theory of reading might be in the design of the Harold Washington Library Center in Chicago. Does his theory of reading in some way instruct us in the structural competition between book and building that I proposed above as the library problem?

First, it seems to me that Beeby offers us a curious relationship between wood – the blond wood used in the paneling, benches, reading tables, chairs, and escalator core – and the "book spaces" (reading, lending, storing). The wood is used as a cue that we are in the Neo-Classical space of the book – "neo" because the wood is not dark, not able to be darkened. The classical darkness of the library, which consists of a ripening or curing of wood shelves, leather bindings, work tables, is only achieved after many years of library use. Classicism is most alien to itself at its inaugural moment. Beeby's use of wood pays homage to a certain classical association of wood with books (an association that could be verified throughout library history), but is not anticipatory in this way. We do not see before us, in this wood, centuries of "book handling," classical scholarship, or close reading. What we see is the American schoolroom. The blond color of the wood is the blond of the American primary school desk and chair, the place from which I believe this library ideologically, and architecturally, springs. The users of this library are, in a sense, returned to the educational institutions of their childhood. And they are returned with a clunkiness that belongs to the awkward time machine of an architecture that evokes the past without, simultaneously, reflecting on that evocation or that past.

Judith Bromley

"Du Sable's Journey," art installation in the lower lobby floor.

The book – as we were handed it in our schools, or found it in the public library, or were repulsed by it as a discipline and punishment – has always been laden. If the book, and a theory of reading, are framed in this library by the wood of the tables and chairs of American educational institutions, then we can be sure that there is an attendant ideology. This ideology most certainly has to do with the general advancement of Western culture signified by the "Dick and Jane" epic histories of our childhood that every Tom, Dick, and Harry read, perhaps most particularly "Tom." It is, by now, of course, clear that the educational acts associated with our "white" learning tended to exclude the satiric, non-classical (non-Greek) moment when the "Tom," say, of Tom Sawyer became the "Tom" of Uncle Tom's Cabin – one of the more telling anti-wood moments in our history. This

Judith Bromley

Entrance to the Winter Garden.

moment is not absolutely absent from the Harold Washington Library (nor from Tom Sawyer), but it is muffled by the architectural iconography of the "grand schoolroom."

Perhaps we can locate each kind of moment, the satiric (or almost satiric) and the sober, in, on the one hand, the cosmological map installed on the lower level of the entry rotunda and, on the other hand, the very large, non-reading space, at the top of the library called the "Winter Garden."

There is a series of installations in this library that were commissioned by the library for this new structure. One of these is a piece by a group of artists, Estella Conwill Majozo (a poet), Joseph DePace (an architect) and Houston Conwill (a sculptor). In their proposal these three artists offered a piece that "focused on the celebration of the African-American cultural legacy with special emphasis on History, Memory, and Ecology." The piece commissioned is entitled "DuSable's Journey" and it is installed as a terrazzo floor with embedded brass text that is read from above through the oculus in the library's entrance. Jean Baptiste DuSable's father was a Quebec merchant, his mother a black slave, and he was the first permanent resident of Chicago. The map of his journey from Haiti is interlaced in this map with a symbolic diagram that "traces the Civil Rights Struggle as perceived from the African-American perspective." Circumscribing this map are quotes from Harold Washington's inaugural speech. Thus we can read, at the entrance to the library, a kind of counter-proposal to the cosmology, our own, advanced by the architecture of wood paneling, classical detailing, vernacular American flourishes, and linear book stacks. Instead of the sense of specious "progressiveness" that we habitually associate with Western learning, we have the great recursive circle of being, like a mandala. Running from side to side of the circle is the "King Line" that divides "cultures" into quadrants of sensibility: Seeing, Tasting, Breathing, Sounding. And while this map is benign, even gentle, in a way that the civil rights struggle was not (Chicago was the city of "Medium Cool" and profound racial violence) – and in a way that Harold Washington's short political career was not – it is nevertheless an extremely strange introduction, formally, to this most traditional of buildings. One might suspect that the careful divisions of knowledge we encounter on each level of this library – social science, literature, government, etc. – would be somewhat different in this other cosmology.

There are many such cosmologies, major and minor ("autobiographies of the archangels," "the minute history of the future"), that live inside the books of the library, but this one has escaped and inhabited this ornamental moment beneath the oculus that we commonly associate with state seals or other signs of civic identity.

Nine stories above, in the Winter Garden, all traces of blond wood and cosmological inscriptions vanish and we have a very large enclosed courtyard with planters and benches. Natural light filtering through glass roof "washes" this space in a way that is meant, I presume, to evoke the grand reading rooms of 19th-Century libraries. But there is no reading here: this space is primarily a reception area for civic functions. It is, therefore, an empty space that is waiting for the episodic events that circulate through and around a public institution. The benches are too wide to be comfortable for reading – they are benches from which one views the room as one views works of art on the walls of a museum. Columns and interior windows (behind which are administrative offices) surround the courtyard with the strange eclectic mix of references in which Beeby specializes.

However, on the entry wall to this large atrium, are, again, words from elsewhere: an art installation with quotes from Franz Kafka about the oppressiveness of power. What interests me here is not so much the political contradiction between colonialist architecture, which is magisterial and regressive, and the voices of those who inscribe Kafka on walls in the name of Harold Washington's progressive vision for Chicago – although this contradiction permeates this library and is rehearsed from bottom to top. What interests me here is how deeply both parties in this equation seem to subscribe ultimately to a common image of culture (American, Chicago, urban, public) as ascendant – capable of overcoming (the lack, the inequality, the stigmata of otherness) through the exercise of collective or individual will. The mandala, equally with the Winter Garden, proposes itself as a structure of cultural zeniths, although the order of knowledge is different. This is partly why the unintended eclecticisms of this library – Harold Washington's words, community art, political slogans, Neo-Classical architecture – can coexist without violence. The siting/citing of these different moments, and these moments of difference, is all the same, all clean and clear and straight and marble and wood and brass. Or perhaps it is that the opportunity for the difference (between Beeby's cosmology and other possible "structures" of the library) was foregone in favor of easing the cultural anxiety of a city that had lived for a number of years without a central library.

Thus we might attend, on another level, to one of the Kafka quotes in particular: "If it had been possible to build the Tower of Babel without ascending it, the work would have been permitted," by which Kafka poses the puzzle and oxymoron of a tower (or a civic structure, which is how Bruegel rendered the Tower of Babel) that is not about ascendency, or, conversely, how easily ideas of ascendency will reduce the Tower of Babel to a permissible structure. **Catherine Ingraham** ■

The author teaches architecture at the University of Illinois in Chicago. She has been a visiting critic at Columbia University and at the Harvard Graduate School of Design.

Graceful Landing

In the shadow of two lumbering towers, Adèle Naudé Santos's Institute of Contemporary Art mends a neglected corner at the University of Pennsylvania.

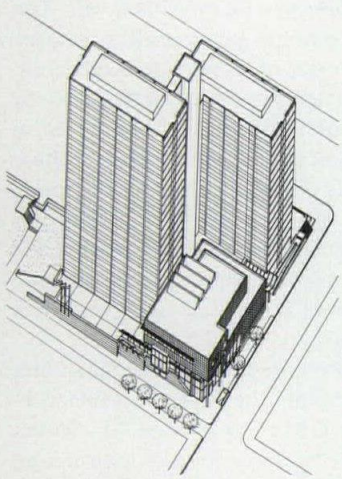
1

"Location, location, location," the developer's incantation, could be an ironic antiphon in accounts of the Institute of Contemporary Arts (ICA): its building lot was both its best asset and its greatest challenge. Chosen by the board of directors for its visibility, the parcel flanks the designated site of Penn's student center. But the ICA's lot was an awkward remnant of land beneath a looming pair of dormitory towers by Richard Neutra, occupied by an access ramp for the handicapped. Nevertheless, Santos Associates and Jacobs/Wyper Architects, who executed this fast-track building in tandem, used these constrictions to advantage. They recognized how the site determined the building's plan, and kept their simple *parti* clear; there was neither space nor money for anything superfluous. Their building is a foil to its massive neighbors, a smooth exercise in urban infill that is largely successful as a gallery.

Santos designed the ICA along experiential lines of thought, starting with a series of sketches that explore the ways one might proceed through the galleries (see sidebar on p. 76). Given her penchant for section-driven solutions (see P/A, Nov. 1990, p. 102), Santos has a knack for opening tiers of space within an understated architectural enclosure, a strategy amenable to curators wary of architecture that overwhelms the art on display. Santos gave primacy to the social nature of the gallery visit (as do many art critics), and rendered the lobby and circulation ramp the main features of the ICA façades.

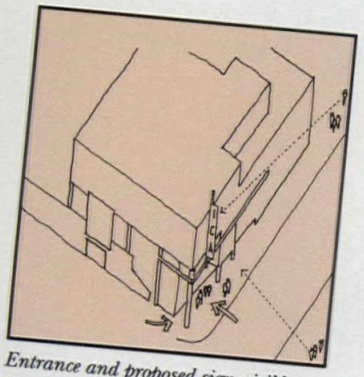
Two floors of galleries are nested between these circulation zones and the dormitory towers. A broad, windowless space with exposed beams and ductwork, the exhibit area is a counterpoint to the glazed lobby, where the sheetrock walls and curved mezzanines render architecture, rather than works of art, the focus of attention. The structural grid of the galleries implies a division into four quadrants, centered around a massive column that supports a cruciform of girders. This structure renders intermediary walls an option, rather than a prerequisite in the 10,000-square-foot space: during the past year, the galleries have been divided into rooms and left open, with equal success. The skylighted quadrant on the second floor is the most impressive space in the building, a 30-foot-high volume large enough to contain a small building, but perhaps overwhelming for conventionally sized works of art. This loft is open to a comparably proportioned space on the first level, enabling visitors to study

(continued on page 76)

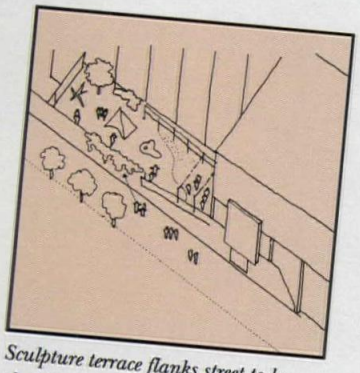


The ICA (1) fills its site with an openness that belies the building's bulk. The three-story structure is 50 feet tall, with administrative offices above the double-height lobby. Here, stepped glazing implies a flow of space from the street to the lobby and to a sculpture terrace (in the far left of the photograph). The axonometric above depicts the ICA's infill function: it corrects an unsuccessful plaza-cum-tower parti, *designed 24 years ago.*

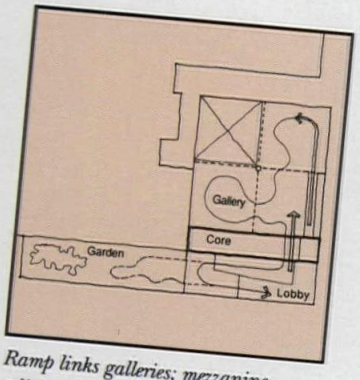
Design Sketches: Views and Sequences



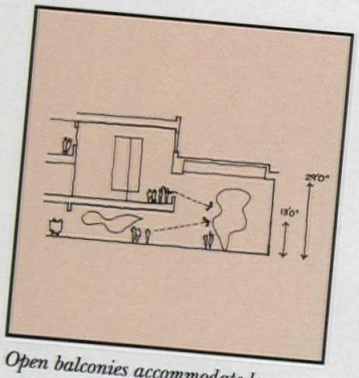
Entrance and proposed sign visible from multiple viewpoints.



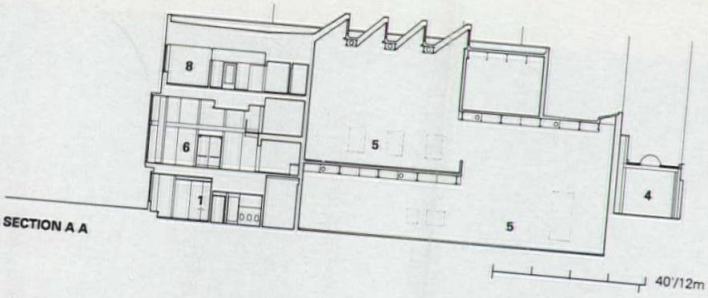
Sculpture terrace flanks street to be closed to traffic.



Ramp links galleries; mezzanine adjoins sculpture terrace.



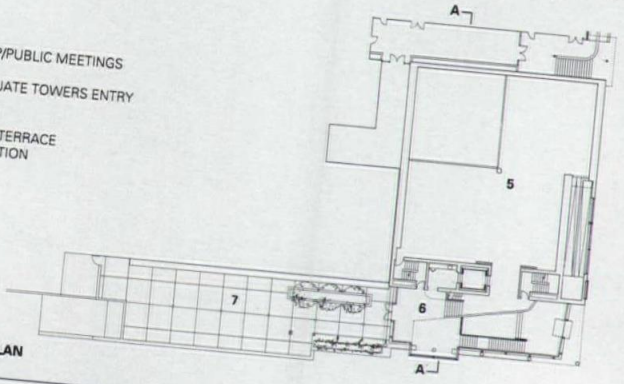
Open balconies accommodate large and small works of art.



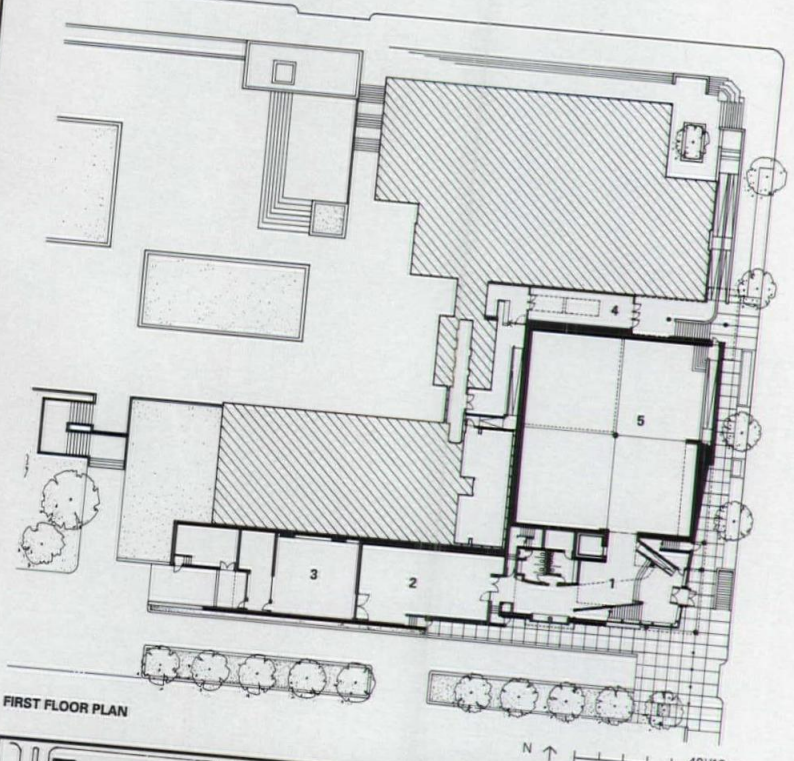
SECTION A A

40'/12m

1 LOBBY
2 WORKSHOP/PUBLIC MEETINGS
3 STORAGE
4 NEW GRADUATE TOWERS ENTRY
5 GALLERY
6 MEZZANINE
7 SCULPTURE TERRACE
8 ADMINISTRATION

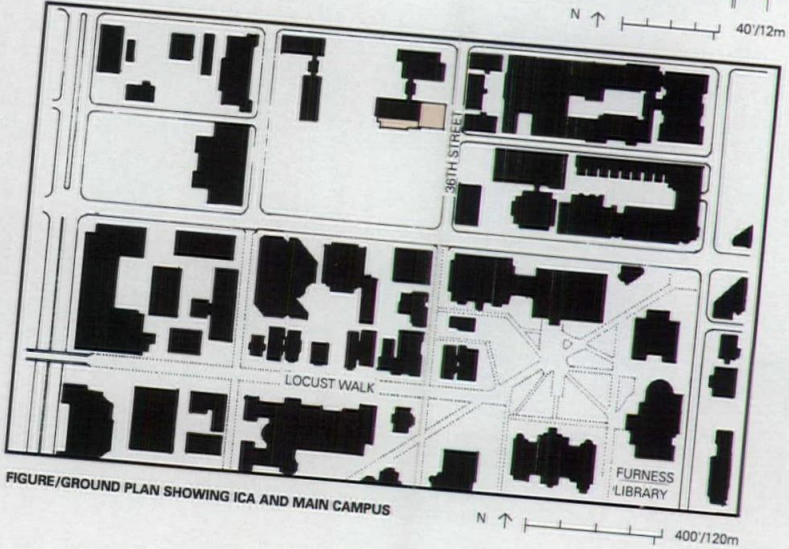


SECOND FLOOR PLAN



FIRST FLOOR PLAN

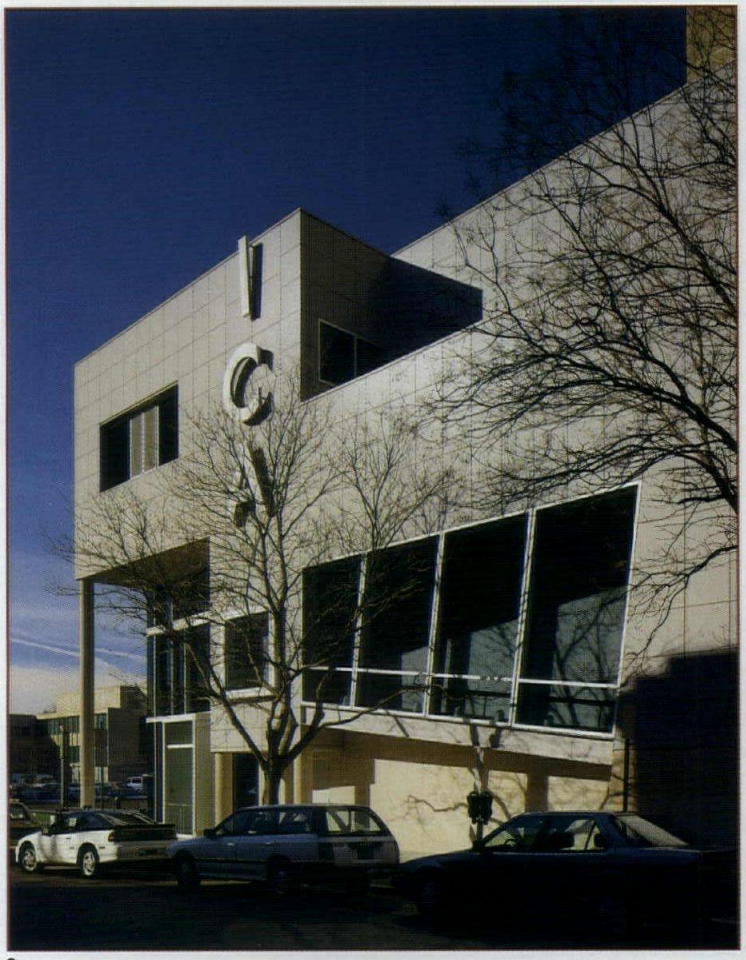
N ↑ 40'/12m



FIGURE/GROUND PLAN SHOWING ICA AND MAIN CAMPUS

N ↑ 400'/120m

The east façade's (2) bold sign and the visible incline of the glazed ramp inside are hints of the gallery's program. By night, the letters are backlighted and the ramp provides an illuminated exhibit wall for passersby. Likewise, the glazed front wall (4) becomes a picture frame for the lobby when it glows at twilight. Seen obliquely, this side of the building (3) reveals its multi-ply composition, with a sculpture terrace set atop a massive limestone retaining wall. The red columns that support the signage double as interior bracing for the curtain wall.



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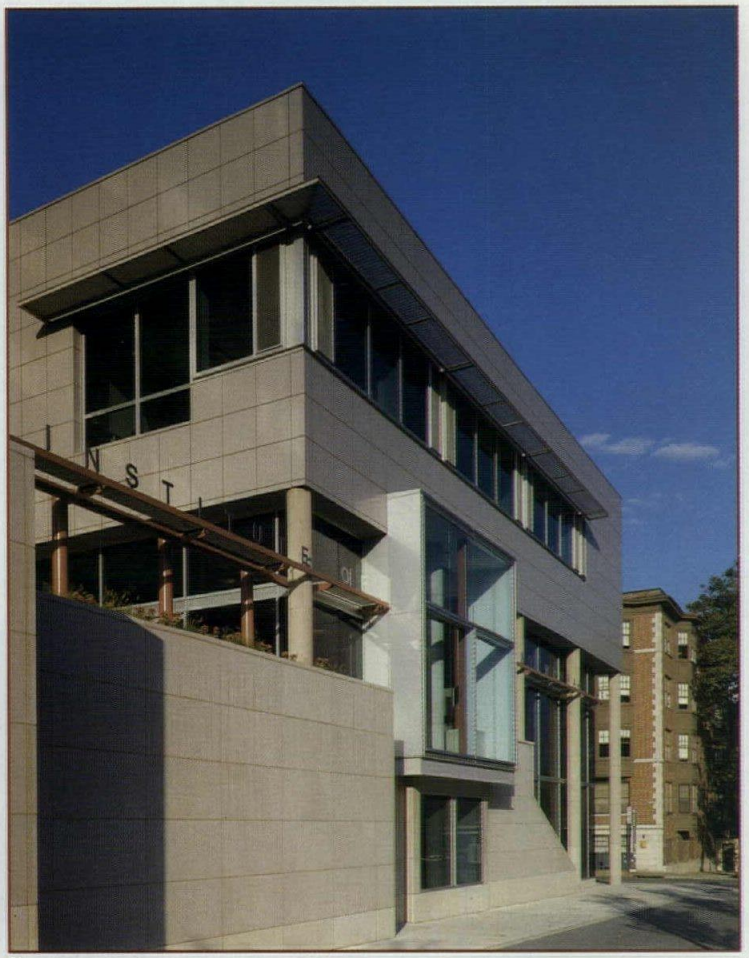

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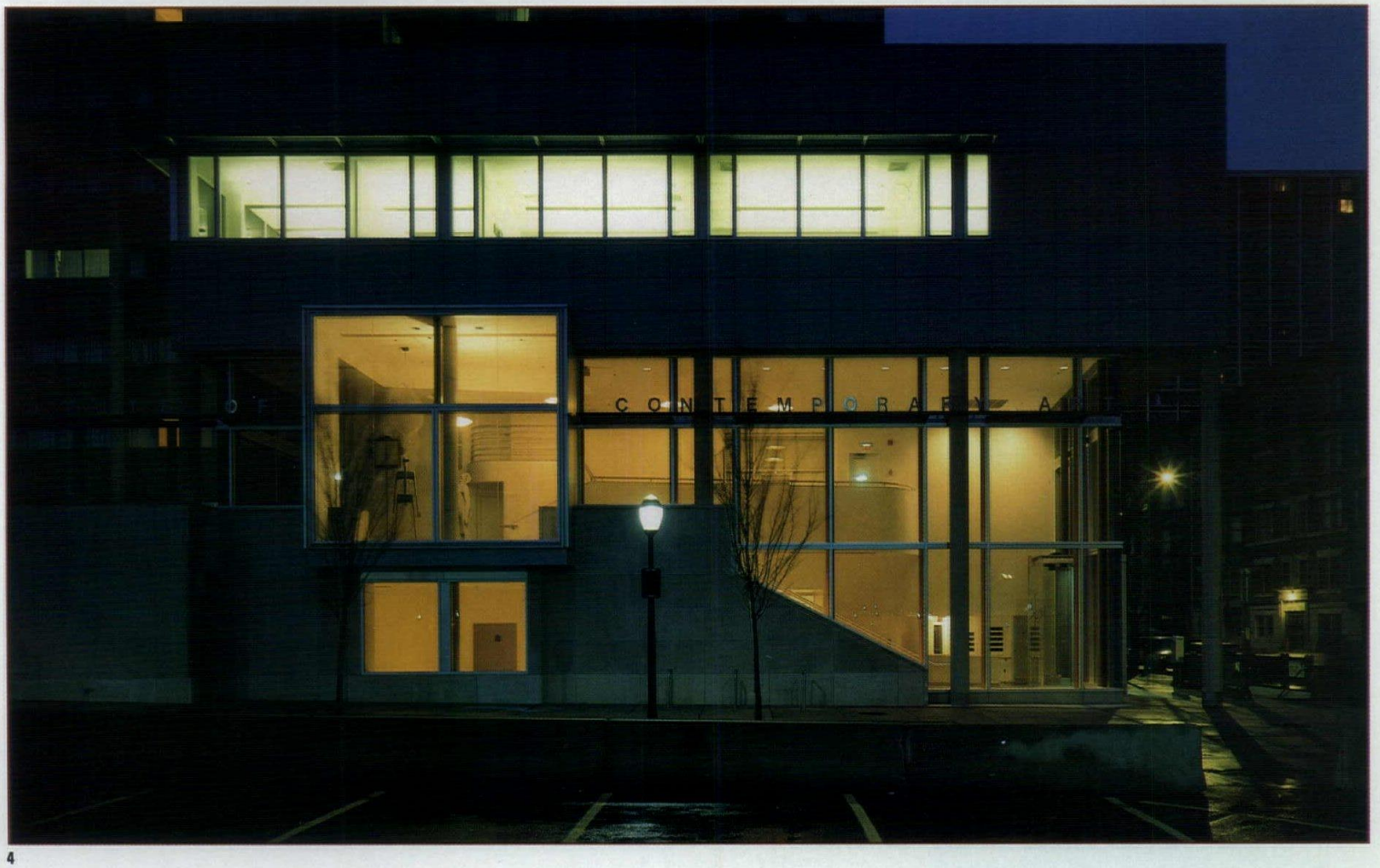
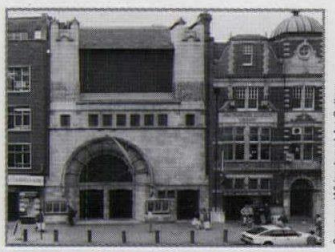


4

Curating the Avant-garde

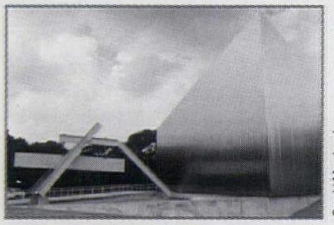
Neither a museum nor a commercial gallery, the ICA is a *Kunsthalle*, an art institution without an archive or a profit motive. In the words of Patrick Murphy, Director of the ICA, this "art hall" is "an R&D facility of visual culture, or a magazine of art...the mission is propositional and exploratory, intended to raise questions, not to give answers."



Courtesy Whitechapel Art Gallery

Whitechapel Art Gallery, London, by Charles Harrison Townsend, 1901.

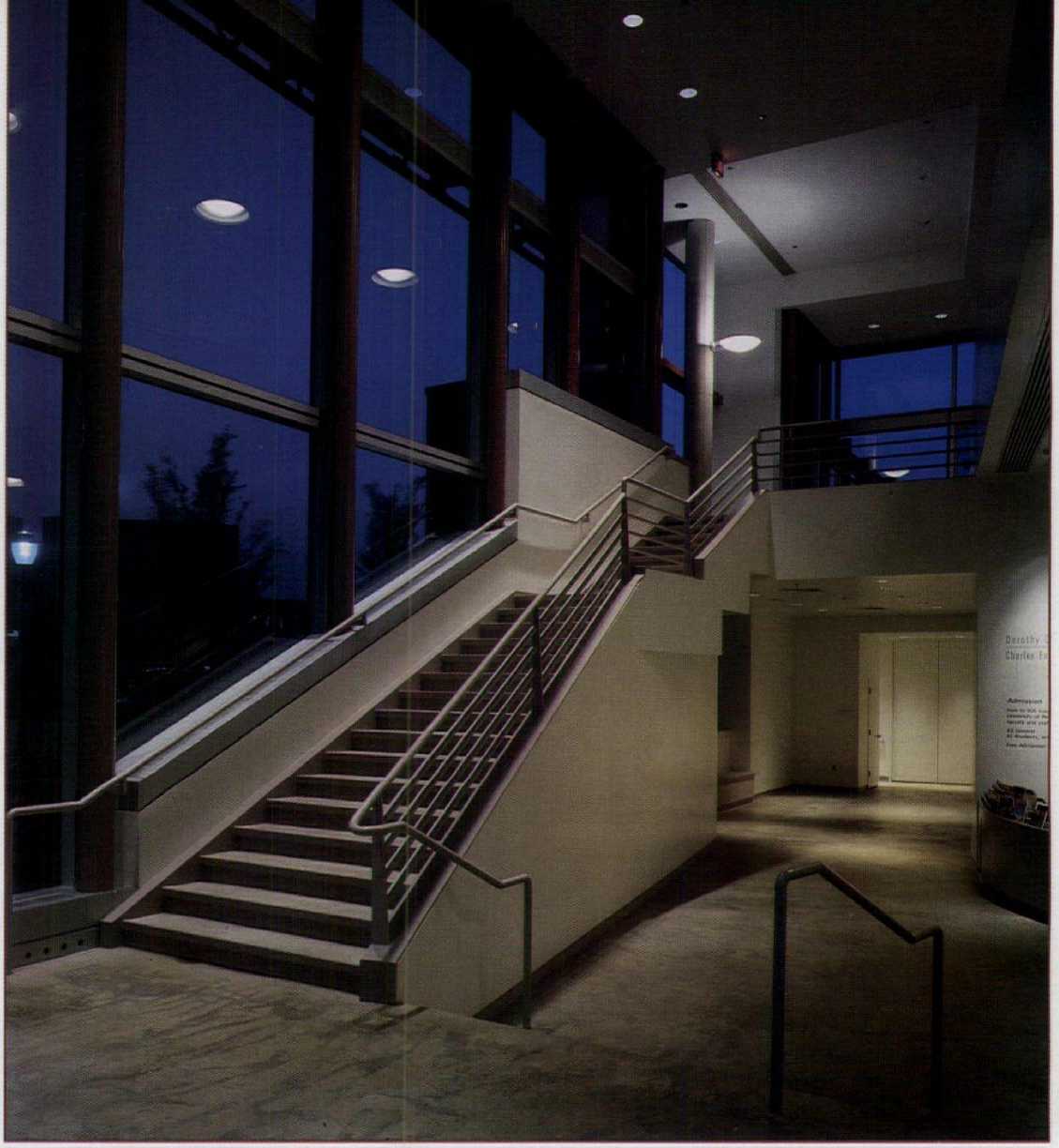
In Europe, if not in the United States, *Kunsthallen* like London's Whitechapel Gallery have a well-established position on the art scene. Houston's Contemporary Arts Museum (CAM) is an American counterpart – its name notwithstanding – a complement to the city's Museum of Fine Arts, where curatorship implies a more authoritative and conclusive voice in the arts, sustained by a focus on historical collections.



Gerald Moorhead

Contemporary Arts Museum, Houston, by Gunnar Birkerts, 1972.

As the façades of these contrastive *Kunsthallen* suggest, their program is not identified with any typological model. Charles Harrison Townsend blended the Whitechapel Gallery into London's urban fabric, while Gunnar Birkerts made the CAM an enigmatic trapezoid, with galvanized metal façades that hint of the stripped-down aesthetic within. Santos's ICA occupies a median between these extremes; it is both an object-building and an infill structure.



5

(continued from page 72)

works of art from a variety of viewpoints.

While the tiered spaces of the gallery are richer than the generic "black box" space that the ICA had expected, they are a compromise solution. In earlier schemes the lobby was open to three tiers of galleries with an auditorium. But caissons for the dormitory towers and the flanking subway tunnels impinged on the site, and a simpler strategy was executed. As built, the transition from lobby to gallery is rather abrupt, and the ramp, part of a one-way circulation loop through both floors, is more tunnel-like than inviting. It is little used; most visitors reach the upper gallery via the lobby steps.

The exterior of the ICA is forthrightly Modern. It sports no fragments culled from famous buildings of the past, and bespeaks Santos's determination to steer clear of anything that might look "trendy" in a few years. One might best describe the ICA's building as a vessel, a serviceable container for delivering an array of art works to the public. Le Corbusier's "Five Points of a New Architecture" seem to be Santos's primary reference, given the ICA's ribbon windows, *pilotis*, and aluminum cladding that implies curtain wall construction (in fact, the façades and structure are integral, because of budgetary and space constraints). Santos adapted Le Corbusier's formulas as the site mandated: a large bay window marks a shifted center on the main façade, and the *pilotis*' cladding matches the staggered limestone walls that flank the ICA. These provide a base that Neutra's complex lacked, and render the ICA a sibling (with a more accessible persona) to its older brothers next door.

The ICA's façades do double duty: they add a note of urbanity to a once-ignored corner, while insulating the warehouse-like gallery space within. Santos chose not to make the galleries legible on the façades, a strategy that contravenes the Kahnian "served and service" paradigm popular with many museum architects. Instead, Santos presents the ICA as a place of congregation, with the lobby its focal point. Her strategy is well chosen – it provides the university with one of its few buildings that opens to the city, rather than to the introverted campus. The ICA could become a threshold between academia and the city, its lobby a front room shared by students and Philadelphians alike.

Philip Arcidi ■

6

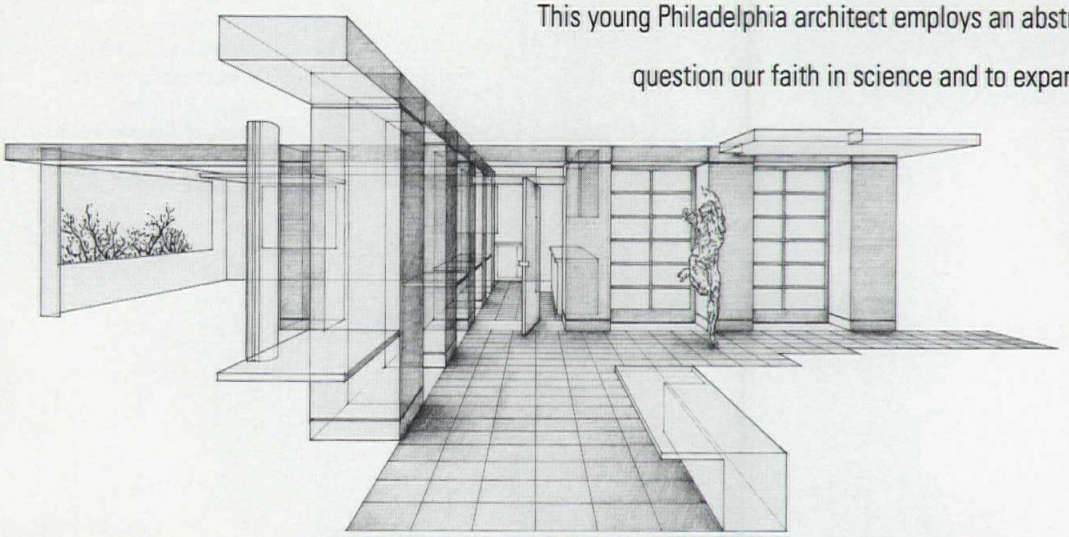
7

Upon entering the lobby (5), visitors can descend a short flight of stairs, flanked by a ramp, to the first floor gallery (7), or ascend to the sculpture terrace and the second floor gallery (6). Contoured surfaces in the lobby contrast with the rectilinearity of the exhibit areas. There the steel structure, HVAC ducts, sprinkler system, and track lighting are exposed – an architectural display mandated by a limited budget. They provide architectural interest without impinging on the art exhibits.

Project: *Institute of Contemporary Art at the University of Pennsylvania, Philadelphia.*
Associated Architects: *Adèle Naudé Santos & Associates, Philadelphia & San Diego, California (Adèle Naudé Santos, principal-in-charge; Bruce C. Prescott, project coordinator; Robert Jager, project support); Jacobs/Wyper Architects, Philadelphia (George Carr, principal-in-charge; Muscoe Martin, Paul Macht, Evelyn Rousseau, David Murray, project team).*
Clients: *Institute of Contemporary Art and University of Pennsylvania.*
Site: *a corner lot flanked by graduate student dormitory towers; a parking lot in front of the site will become the campus center, and the street between will be closed to vehicular traffic.*
Program: *gallery spaces, a multipurpose room, a workshop, a lobby, administrative spaces (18,800 sq ft total), and a new entrance for the graduate towers.*
Structural system: *concrete caissons and grade beams, slabs on compacted fill, structural steel frame, concrete floors on metal deck.*
Major materials: *cast stone, limestone, aluminum panels, gypsum board, exposed structure and metal deck (see Building Materials, p. 139).*
Mechanical system: *zoned forced-air units, air-cooled chillers, central steam heat, perimeter hot water radiation.*
Consultants: *Kamariotis & Associates, structural; The Sigel Group, mechanical; Tigue Lighting.*
Construction manager: *Barclay White.*
Photos: *Barry Halkin.*

Emerging Talent: Wesley Wei, Architect

This young Philadelphia architect employs an abstract, minimalist vocabulary to question our faith in science and to expand our concept of programming.



PARTIAL PERSPECTIVE OF THE RITTENHOUSE SQUARE APARTMENT

The Rittenhouse Square apartment has a free plan ordered around two perpendicular zones of full-height, fixed cabinets that divide the space into public and private quadrants (drawing above). Filling in the spaces between each pair of cabinets are translucent glass panels, pivoting doors, and white-painted partitions. The cabinets serve not only as a way of ordering the plan and as a place for storage, but as containers of sculpture built by the architect. These fixed sculptural pieces, made of painted wood and various types of metal plates and bars, provide a symbolic program based on the Bible or Classical myths. For example, the Adam and Eve sculptures flanking the entry to the living room (1) represent the couple who own the apartment. Adam, made of metal plate, is taut and spare; Eve, made of painted wood, is curved and voluptuous. The two pieces, like man and woman, have essentially the same parts – a heart, a face, an eye – differently configured (drawing, facing page top). As Wei describes them, the "hinged panels and metallic articulations were worked through an aleatory method of inquiry, to produce 'body images' that are fragmented and incomplete."

The scientific model so dominates the programming of buildings that it is hard to imagine doing it any other way. Even as architecture has moved away from the pretense of being "scientific," we continue to think of building programs almost solely in quantifiable terms: square footages, room adjacencies, net-to-gross ratios. But what other kinds of programming are there and what purpose might they serve? The 38-year-old Philadelphia architect, Wesley Wei, has pursued those questions both in his studio teaching at Penn State (his alma mater), RISD, and Temple, and in his own work, most of which consists of small interior renovations.

Wei's complete revision of an apartment overlooking Philadelphia's Rittenhouse Square shows the extent to which he has explored the idea of multiple programs. Winner of a merit award from the Philadelphia AIA, the project occupies the space of two former units in a 1950s apartment building. It grew out of a fairly conventional program: a couple with grown children wanted a master bedroom, a study, two baths, a kitchen, and an ample living/dining room for entertaining.

Rather than work with the existing unit plans, Wei removed almost all of the nonstructural elements and reorganized the apartment around two perpendicular zones of full-height cabinets, with a minimum number of partitions and doors dividing the space. The cabinets have the pragmatic function of encasing various columns and mechanical chases, providing storage in the bedroom and study, and, when their doors are open, creating visual privacy between the kitchen and the dining room.

But the cabinets serve many other roles as well, both spatial and conceptual. As you move through the apartment, the cabinets, which march through the space in a regular rhythm, also have a dynamic quality, constantly realigning. More unexpected are the apparently temporal shifts that occur. The minimal detail and monochromatic layering of the apartment's white walls, gray cabinets, and translucent glass screens recall early Modernist interiors. And yet the space also has a pre-Modern, archaic quality; the solidness and the lack of hardware or apparent function of the cabinets make them seem like pieces of a found structure, fragments of some larger ruin. It is as if Piranesi had been asked to design a free plan.

The Conceptual Program

It is not Piranesi, however, but another 16th-Century Italian – Giovanni Battista Vico – whose influence is apparent in the conception of this apartment, and indeed, in most of Wei's work. Vico was one of the first proponents of social science, making the rather daring argument that, because we can much better understand our own creations than those of God, this "new science" of society has greater validity than the traditional natural sciences. Of greater relevance here, however, is Vico's belief that we can best understand society, not through the observation of people's activities in space – the very foundation of modern behavioral science – but through study of the artifacts of culture over time, such things as art, language, and myth. Vico did not believe in progress or the primacy of reason, either. If anything, he thought the poetic work of the ancients in the Age of Gods and the Age of Heroes, as he put it, offers more insight into human culture than the prosaic work of this, the Age of Men.

Drawing from Vico's ideas, Wei has layered onto the pragmatic, architectural program of the apartment a narrative program that draws from Classical myth and the Bible. (Wei minored in religious studies in college). This narrative program is most evi-

(continued on p. 82)

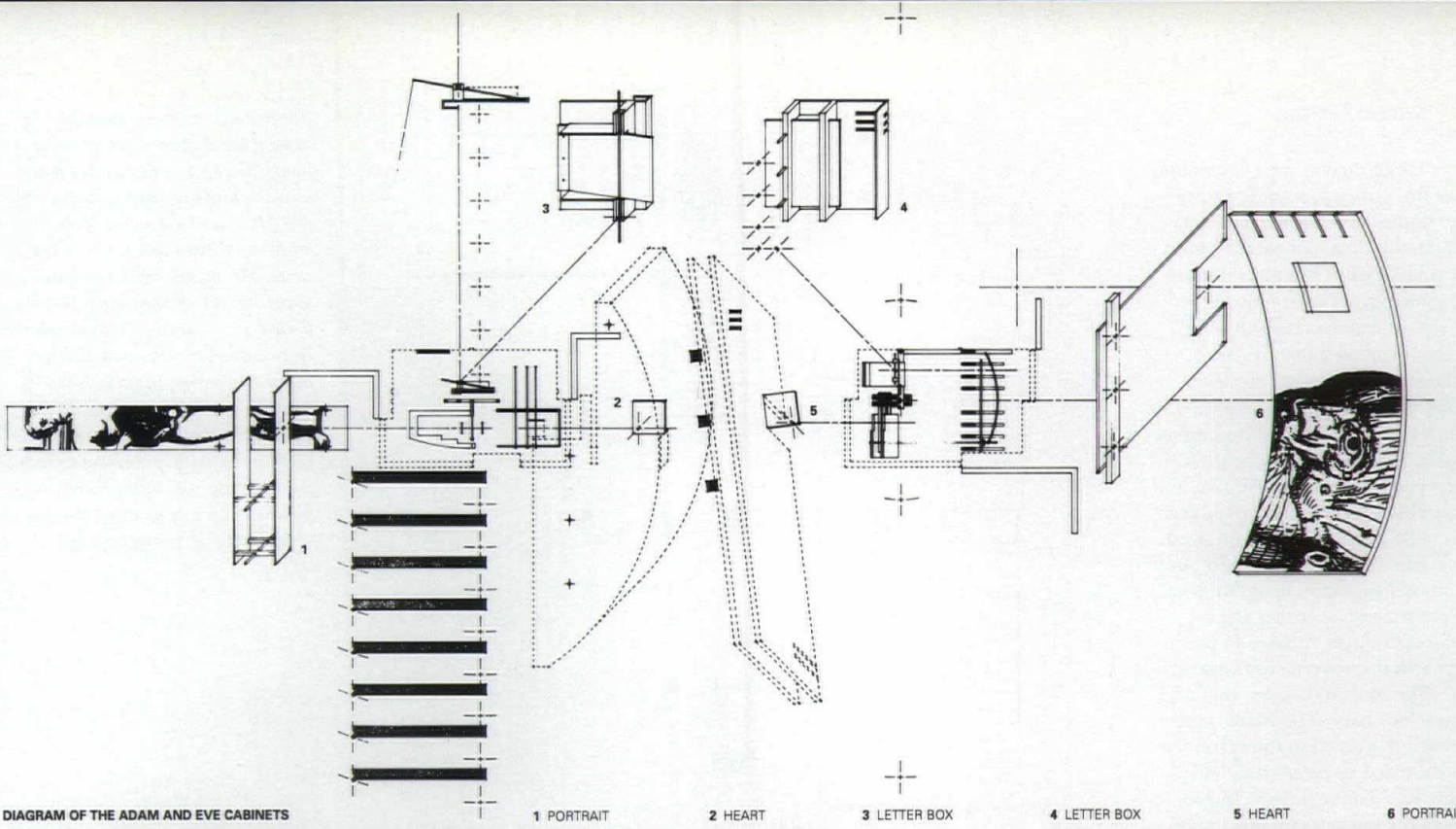


DIAGRAM OF THE ADAM AND EVE CABINETS **1** PORTRAIT **2** HEART **3** LETTER BOX **4** LETTER BOX **5** HEART **6** PORTRAIT

1

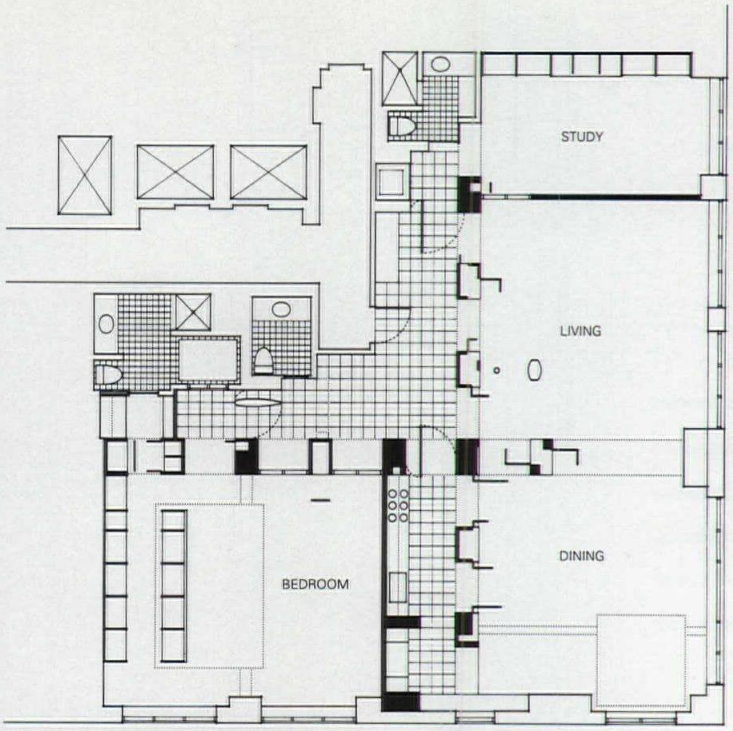
Cabinet Themes

Three themes are evident and useful in interpreting the strategy undertaken in each cabinet. First, the theme of mortification. Using Vesalius's famous treatise on anatomy, the *De Humani Corporis Fabrica* (1543) (the first mass-produced picture-book showing the internal organization of the human body) Wei developed the idea of the cabinet as an anatomic demonstration. Hinged panels, webs, fabrics, and metallic articulations can be read as body parts reworked through a poetic fever. Wei has used our sometimes fearful imaginings of what's inside us rather than objectified descriptions to produce limbs, tissues, and organs.

The second theme is that of inverted space. The Renaissance program existed in the exteriority afforded by large villas and gardens. The reality of city life, even the poshest city life, forced an inversion of the relationship between container and contained. The room's function is given over to the object within the room... This modification has several implications. The use of vision is radicalized. No image is presented to the wondering spectator, but vision itself imaginarily cuts into a space conventionally prohibited – the poché of wall and structure that only in hallucinations such as (the movie) *Brazil* do we realize to be the stuff of nightmares. Vision, here, works to penetrate a prohibited zone. It denudes the surface. Inspection is tempered by a certain speleological horror of tunnels.

The third theme is also speleological: the function of columns as vertical supports creating the cave or sandwich of space we nowadays accept as adequate to define even the most luxurious spaces, reduced to real-estate mentality's concept of a plan. In such terms, we value space for its spatial extent, measured horizontally. Any recovery of the meaning lost in this process involves a poetic assessment of the vertical dimension. **Donald Kunze** ■

The author teaches in the Department of Architecture, Pennsylvania State University. This excerpt is from a paper entitled "Visuality, Anatomy and Program: An Architecture Book of the Dead."



PLAN OF RITTENHOUSE SQUARE APARTMENT

The cabinets at times act as columns around which space flows, as in the living/dining area (2), and at times as walls, directing movement down the hall (3) or blocking a view of the kitchen (4). Mute and somber when closed, the cabinets have a delicate, sparkling quality when open. Between the living and dining rooms stands the "hermaphrodite" cabinet, with a masculine and a feminine face (left in 4). The three cabinets separating the kitchen and dining areas (right in 4) contain sculptural pieces that represent the three Fates and their connection to the determinism of time and the stages of life (drawing, facing page top).

2

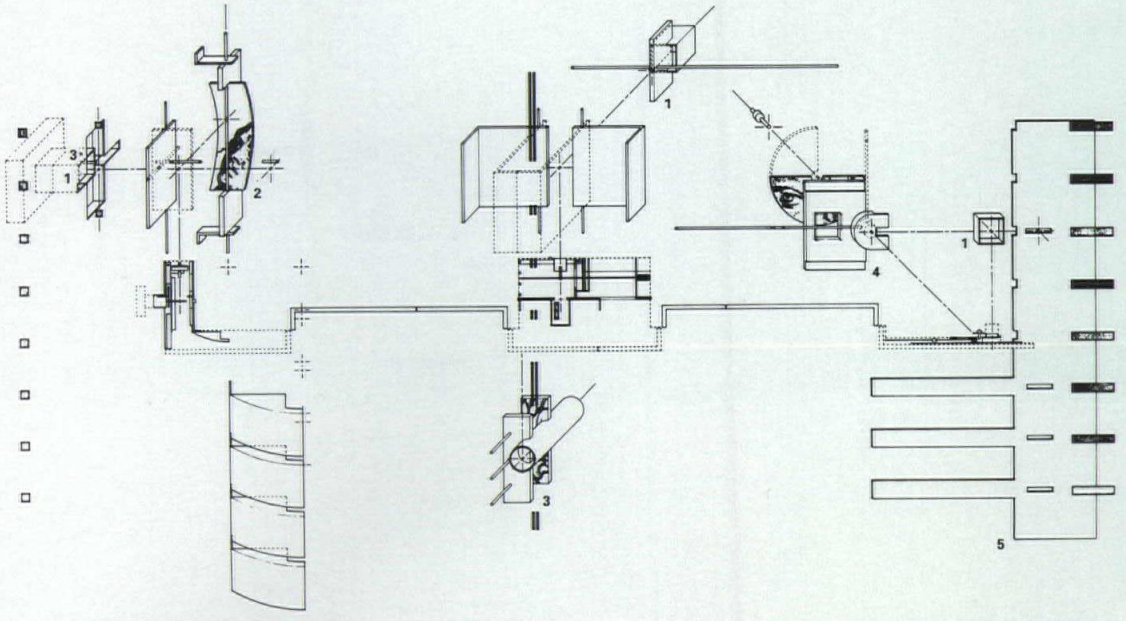


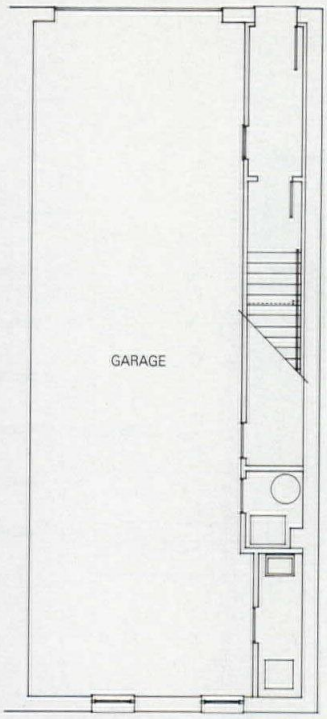
DIAGRAM OF THE CABINETS OF THE THREE FATES **1** HEART **2** LOOKING GLASS **3** WOMB **4** TIMEPIECE **5** VEIL

Project: *private residence, Rittenhouse Square, Philadelphia.*
Architects: *Wesley Wei Architects, Philadelphia (Wesley Wei, Andrew Phillips, Steven Turk, Daniel Magno, Barry Ginder, Hua Tran, Suzanne Brandt, Alice Chun, Patrick McGranaghan, Christopher Dardis).*
Client: *names withheld upon request.*
Site: *sixth-floor corner unit overlooking Rittenhouse Square in a 1950s apartment building.*
Program: *conversion of two former units into one 3,000-square-foot apartment for a couple with grown children.*
Major materials: *oak, marble, and concrete flooring; plaster walls, painted wood and metal cabinets (see Building Materials, p. 139).*
General contractor: *M. Kowalchick & Associates.*
Costs: *withheld upon request.*
Photos: *Cathy Bogert.*

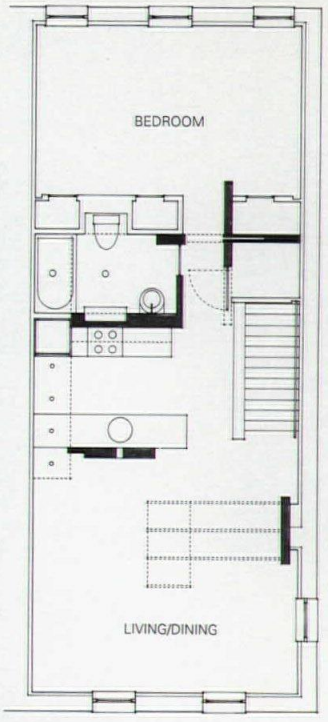
3

4

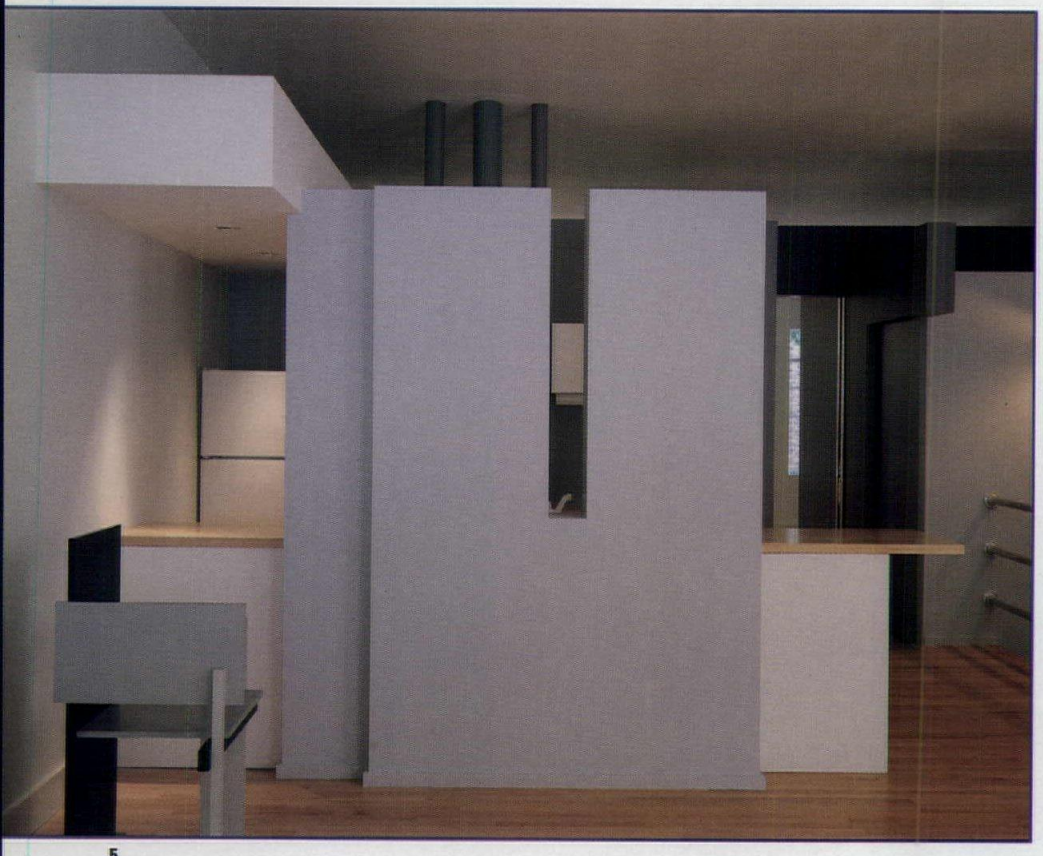
Project: *carriage house residence, Philadelphia.*
Architects: *Wesley Wei Architects, Philadelphia (Wesley Wei, Andrew Phillips).*
Client: *Walter Rich.*
Site: *the second floor of an 1860s carriage house.*
Program: *a 1,000-square-foot, one-bedroom apartment.*
Structural system: *brick party walls, wood framing throughout.*
Major materials: *oak floors, aluminum and wood trim, ceramic tile bathroom.*
Mechanical system: *gas-fired forced air heating, electric forced-air cooling.*
General contractor: *Evan Elliot, Petersen & Turner Construction.*
Photos: *Cathy Bogert.*



FIRST FLOOR PLAN



SECOND FLOOR PLAN N 10'/3m



5

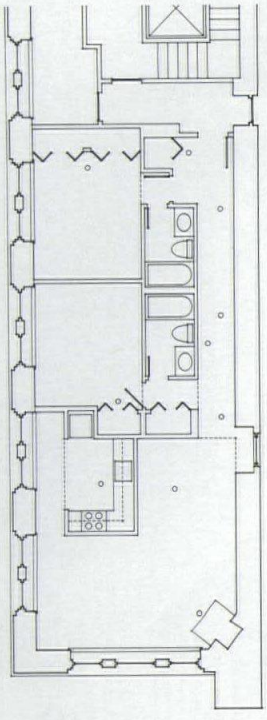
These two low-budget apartment renovations involved the insertion of figural elements, such as the wall separating the kitchen and living space in the carriage house (5, plans top), or planar surfaces that embrace or grasp the existing building shell of this Washington Square apartment (6, plans, facing page top). In both cases, Wei likens architecture to the body, as something that moves, embraces, and grasps.

(continued from p. 78)

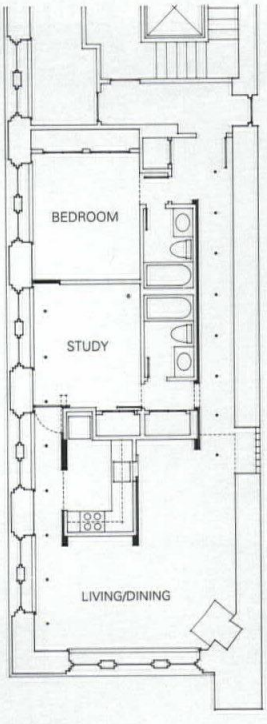
dent in the cabinets in the living and dining room. Inside their smooth wooden shells stand intricate sculptural pieces, made of wood, aluminum, bronze, and zinc, that were fabricated by Wei (who worked in a metal fabrication shop to help pay his way through college) and by others in his office. Highly abstract constructions of lines and planes, these metaphoric sculptures grew out of discussions with the clients. The two cabinets flanking the entry to the living area, for example, were first conceived of as sentinels, but as the design developed and the clients became more interested in their possible interpretation, the cabinets evolved into "Adam" and "Eve," the one strong and lithe, the other elegantly voluptuous. Wei conceived of the single cabinet between the living and dining area as a "hermaphrodite." It opens up on opposite sides to reveal masculine and feminine faces. And in the three cabinets separating the dining area from the kitchen, Wei refers to the three Fates: "Clotho," symbolizing youth; "Lachesis," maturity; and "Atropos," old age. Vico, who like Hegel seemed to find tripartite divisions in almost everything, would have felt right at home with these three Fates.

The Humanistic Program

Not that feeling "at home" is a priority in Wei's highly intellectual architecture. Indeed, his work is anything but comfortable in the conventional sense of the word, although it does accommodate the human form in many subtle ways. Custom-designed metal pulls on the pivoting doors, for example, are shaped to fit the grasp of the hand or the tug of a finger, recalling the idiosyncratic yet humane detailing of Carlo Scarpa (whom Wei greatly admires). References to the body also exist on a larger scale in Wei's work. The cabinets in the Rittenhouse Square



EXISTING PLAN



NEW PLAN

N ← 10'/3m

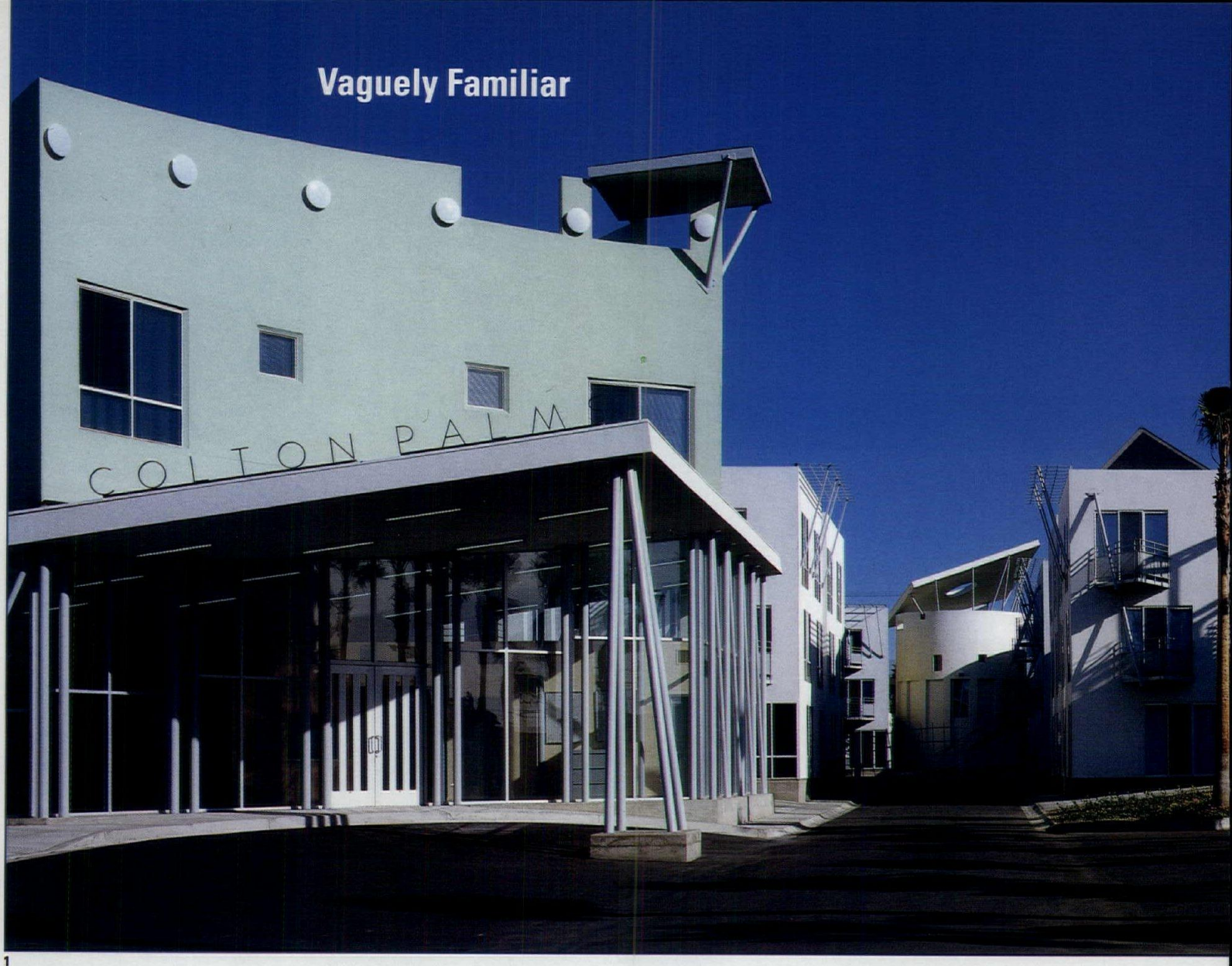
Project: *Kirkwood residence, Washington Square, Philadelphia.*
Architects: *Wesley Wei Architects, Philadelphia (Wesley Wei, Andrew Phillips).*
Client: *Niall Kirkwood.*
Site: *second-floor, 1,000-square-foot unit in an 1890s office building converted into an apartment building in the 1970s.*
Program: *renovation of the apartment to be sympathetic to the owner's appreciation of minimalist detail.*
Structural system: *existing brick party walls, concrete slabs.*
Major materials: *pine floors, painted wallboard and wood trim, structural steel lintel.*
Mechanical system: *existing forced air system.*
General contractor: *Benjamin Taylor Construction Company.*
Photos: *Cathy Bogert.*

apartment, with their smooth skin and complex innards, are like dissected bodies. In two other small interior renovations in Philadelphia, Wei pursues that idea further, holding new walls away from the existing shells of buildings, like "figures inserted into the...cavity of a body," he writes. Wei also refers, in all three projects, to the body in motion, as new walls slip past old, surfaces penetrate one another, and doors bulge as if flexing their muscles. This work, for all its austerity, is deeply humanistic, attempting not to represent the body, as in Classical architecture, nor to accommodate bodily needs, as in functional Modernism, nor to displace the body, as in Deconstructivism. Instead Wei attempts to make artifacts that, like the ruins that inspired Vico, lead us to reflect upon the human condition.

It is true that Wei's work, although extremely well made and quite beautiful in both form and detail, has such a high level of abstraction that it usually requires an explanation or a text to be understood. As such, it (like the writing of Vico) teeters on the edge of being not evocative, but simply obscure. The work is relevant nevertheless, for Wei reminds us how impoverished our scientific notion of program has become and how much architectural richness we have lost since the Classical and Medieval periods, when public buildings were replete with symbolic programs of sculpture, painting, and glasswork at least as important as their functional requirements. Wei has also shown how a symbolic program in architecture might be accomplished in a Modern, abstract vocabulary. He thus avoids the trap of assuming that references to history make you a historicist, or that symbolism must always be representational. Wei claims to be "not interested in postulating a theory of architecture." But as is evident here, he has begun to build one. **Thomas Fisher** ■

6

Vaguely Familiar



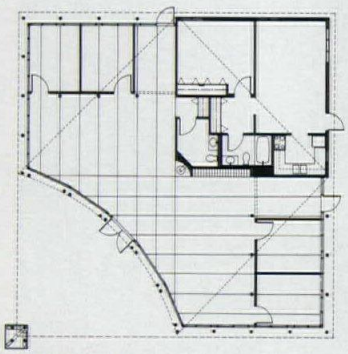
1

Low-cost housing in Colton, California, by Valerio Associates provides for older residents, the democratic way.

It is popular in some circles to say that P/A Awards program winners are seldom built, a notion that defies actual fact. Case in point: Colton Palms, in the small town of Colton, California, near Riverside and San Bernardino. Having received a P/A Citation just over a year ago (P/A, Jan, 1991, p. 102), this exemplary proposal for low-cost senior citizen housing never paused on its path to completion in October 1991. It had been the winning entry in a 1989 national competition, a status the clients held inviolable. Architect Joseph Valerio confirms that very little was altered in the rapid design development-to-construction period, and he praises those involved for maintaining their belief in the design. The most noticeable changes, to the reception building and what is now the belvedere tower, were the results of a program change that combined previously separate reception and administration functions into one building.

Colton Palms embodies considerable amounts of community participation and of cooperative effort between the architects and the clients. The project was done under the joint auspices of the Redevelopment Agency for the City of Colton and Cooperative Services, Inc., a not-for-profit developer. It is to provide low-cost, fully accessible housing for citizens of Colton 55 years of age or older. It has a graduated rent structure, with four income brackets; rents are 25 percent of the occupant's income. Like CSI developments elsewhere, it is operating as a cooperative.

As an organization familiar with cooperatives, CSI will supply administrative guidance to Colton Palms, but the board of directors – whose members are elected by and made up of the residents – will



2

manage every aspect of the project. Although the architects couldn't have access to the end users in the early design process, they did get valuable input from local residents, a number of them senior, and some of them on the initial award jury. Of the nine judging members, four were design professionals and five were citizens. The same spirit carried through from the jury process to the steering committee of town residents, with whom the few recommended changes from the competition drawings were discussed.

It was the architects' intent to respect the scale of the largely residential neighborhood. While they wanted to create a fresh image, they also sought a "vaguely familiar" appearance, to make "innocent buildings." The new complex also addresses the urban implications of the only major open space in the Colton historic district, positioning the entry to Colton Palms opposite Fleming Park.

A further goal of the design process was to allow the self-determination incorporated in the early steps to continue through the overall planning, the activity planning, and finally the interior furnishings of each apartment. The apartments, of which there are a wide array of types, were seen as neutral containers for the things the residents want there to say "home." Each was to be "a blank canvas," with the obvious exceptions arising from the need to locate such things as windows, doors, or plumbing/kitchen fixtures. In most unit types, though not in all, kitchen sinks have been placed at windows. Living rooms are well-lighted and cheerful because of generous glazing. Apartments, in short, are bright, comfortable, and eminently livable.

There are 16 variations of apartment themes, with outdoor space of some kind and front door arrangements, among other elements, being standard. Some apartments face out to the community, while others look onto center courtyard spaces. In total, there are 98 one-bedroom apartments and three two-bedrom units, with an average apartment floor area of 700 square feet.

The more "public" buildings – the Reception Building, Community Hall, Craft Workshop, and Library/Laundry – all take on distinct shapes. Like the Library, the smaller Chapel and Belvedere are

Facing the Palm Court (1), the Reception Building (left) has a view of the Belvedere from the lobby (2).

(continued on page 89)

A Resident's View

P/A was given the name of Hilda Garcia, a representative resident, as a good spokesperson for an interview; a juror in the 1989 design competition, Ms. Garcia, then interim president of the governing board, spoke with us in mid-December. The following is based on that talk.

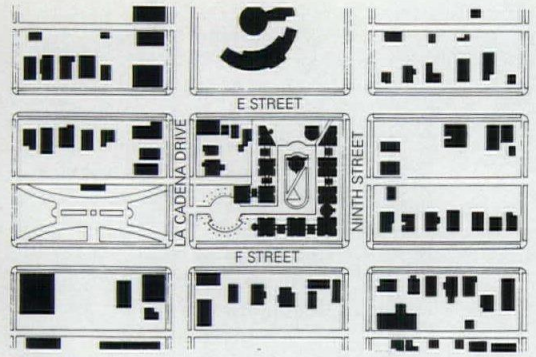
There are obvious social benefits of living here and interacting with others. She comments, "I enjoy the fact that I've gotten to know some very fine people; we interview people who are prospective members, and also see members of the public who come in and want to know what we're doing and what we have here. I think that the rapport we have with the community certainly is of the highest quality."

Social events of various other types, ranging from theater outings to bingo and other games, are also under way at Colton Palms. Commenting on how events are arranged, Ms. Garcia told us, "We have a social chairman and her committee. We also have coffees every Saturday in the community room, and periodic potluck meals."

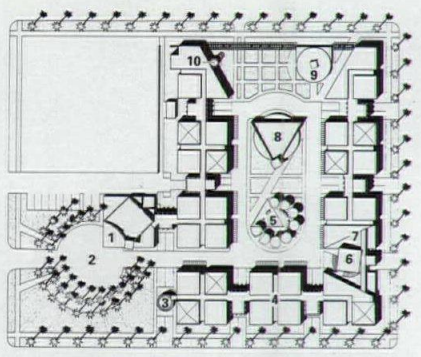
When we asked her about the use of the chapel, she said, "We still have not furnished that, we are thinking of putting a bench in there so people can sit. We also thought for the various religions we would put something representative of each one – a crucifix, a Celtic cross, and a menorah or something like that."

Asked about the crafts shop, she replied, "About the beginning of the year we have one lady who is going to start a ceramics class, one who is going to be doing liquid embroidery on sports clothes, and one tentative member who is an artist who paints on china, one of my hobbies."

Returning to her own feelings about life at Colton Palms, Hilda Garcia is more than a little enthusiastic. "I really do like everything about this place," she says; "I like my apartment; it's a corner unit that has a full floor-to-ceiling window in the kitchen. I have a large patio outside my door, and I'm right next to the library and the beauty shop. We're close to shopping, and across from the park. We had concerts in the park every Monday through September."



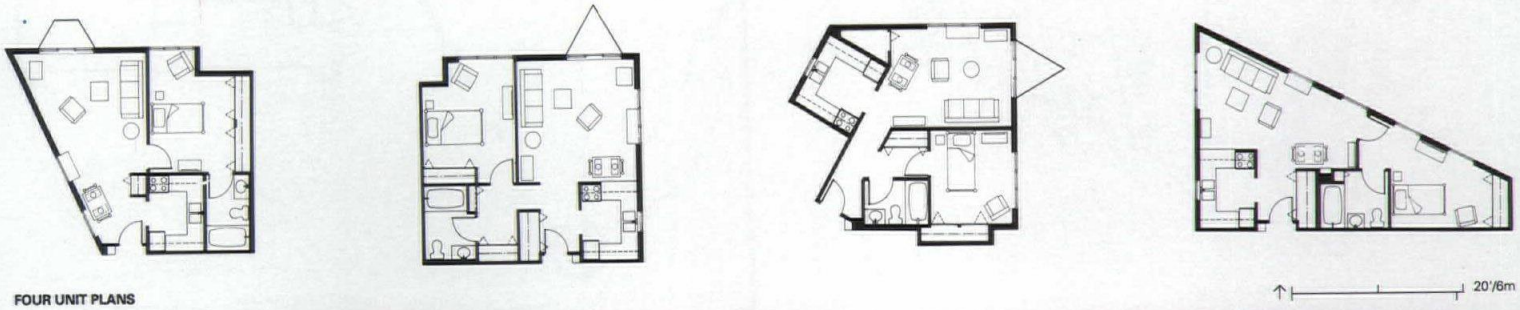
AREA PLAN



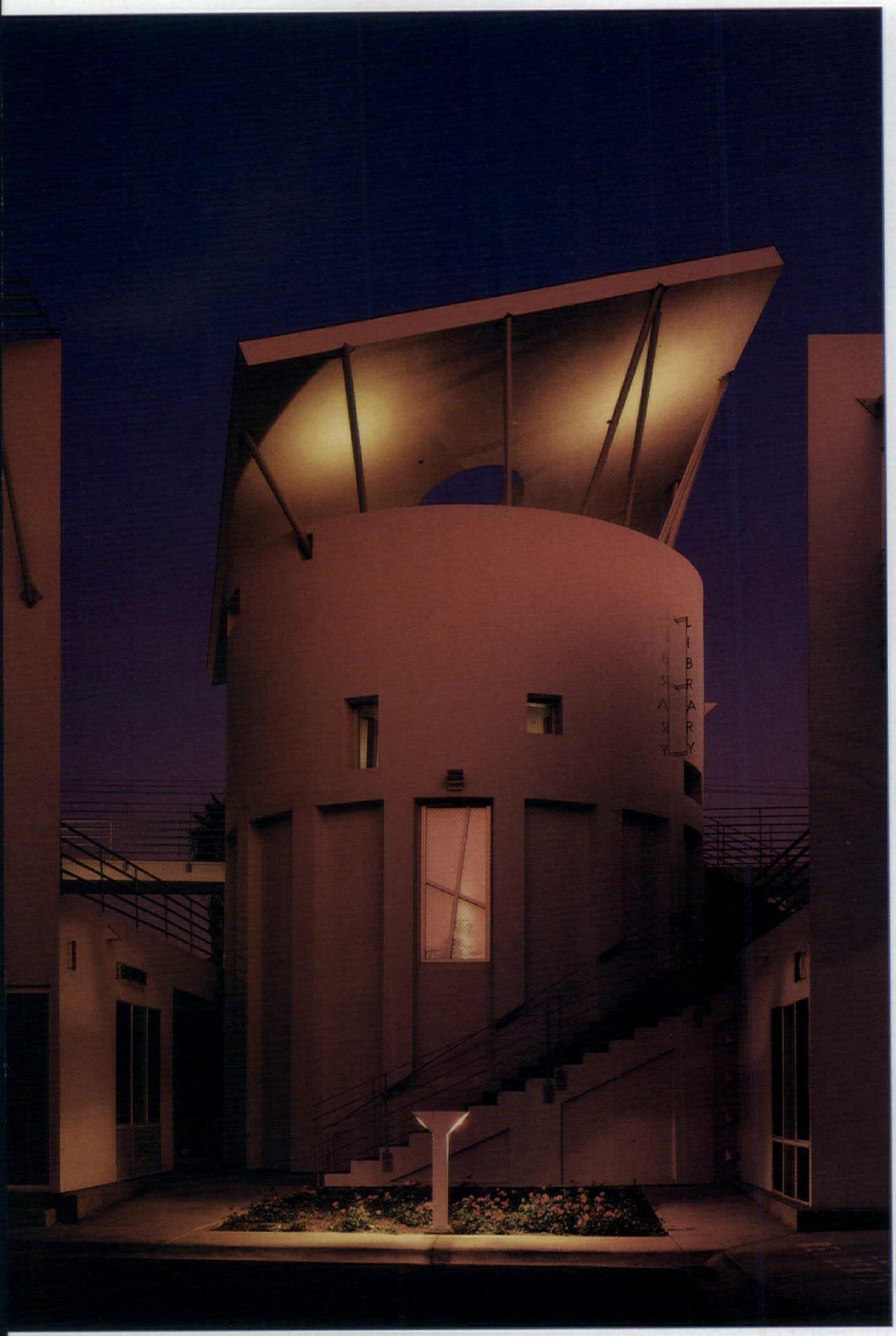
SITE PLAN

1 RECEPTION
2 PALM COURT
3 BELVEDERE
4 HOUSING BLOCK
5 FOUNTAIN/GREEN
6 LIBRARY/LAUNDRY
7 DECK
8 COMMUNITY HALL
9 CRAFTS SHOP
10 CHAPEL

Along the Ninth Street perimeter (3), the elevator enclosure and the back of the cylindrical library provide accents. The library (4) is reached from a winding stair (5); since the photography, the wood shelves (6) have been lined with books. Second floor decks flank the library on either side.



FOUR UNIT PLANS



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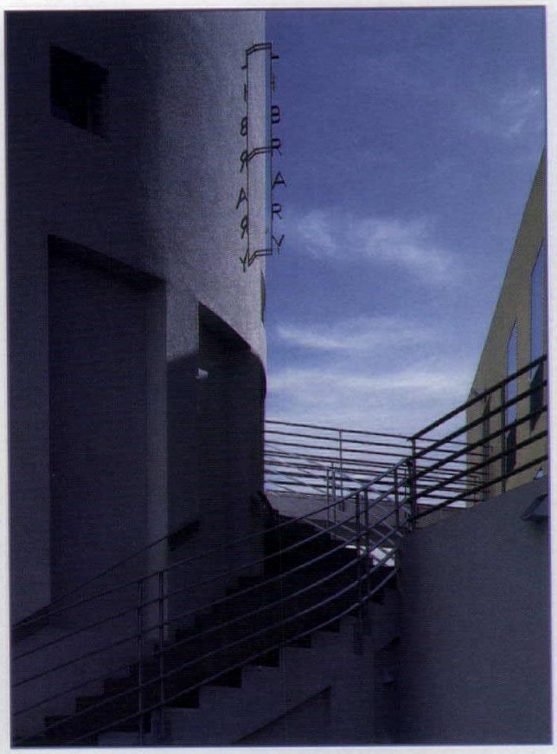

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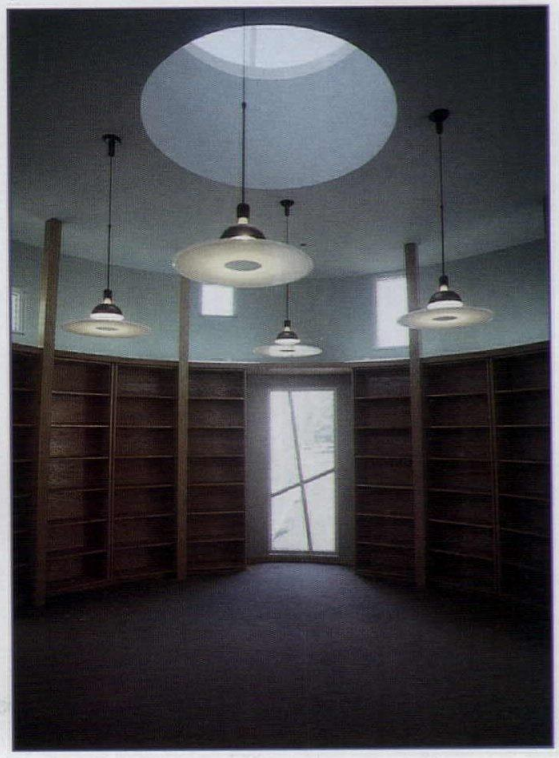

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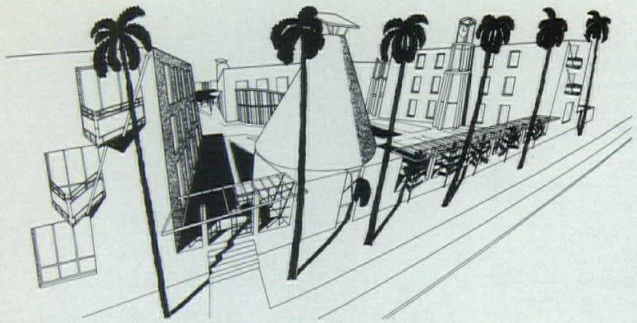
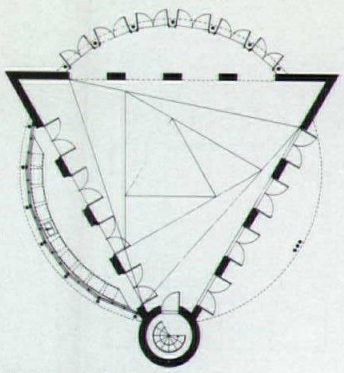
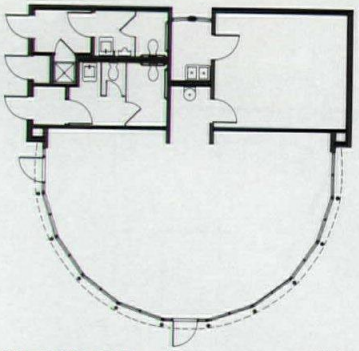
Joseph Valerio



ORIGINAL COMPETITION DRAWING, CRAFTS SHOP



COMMUNITY HALL PLAN



CRAFTS SHOP PLAN

8

9

Centerpiece of the main courtyard, the Community Hall (7, 8, 9) provides space for all business and social events in the complex.

(continued from page 85)

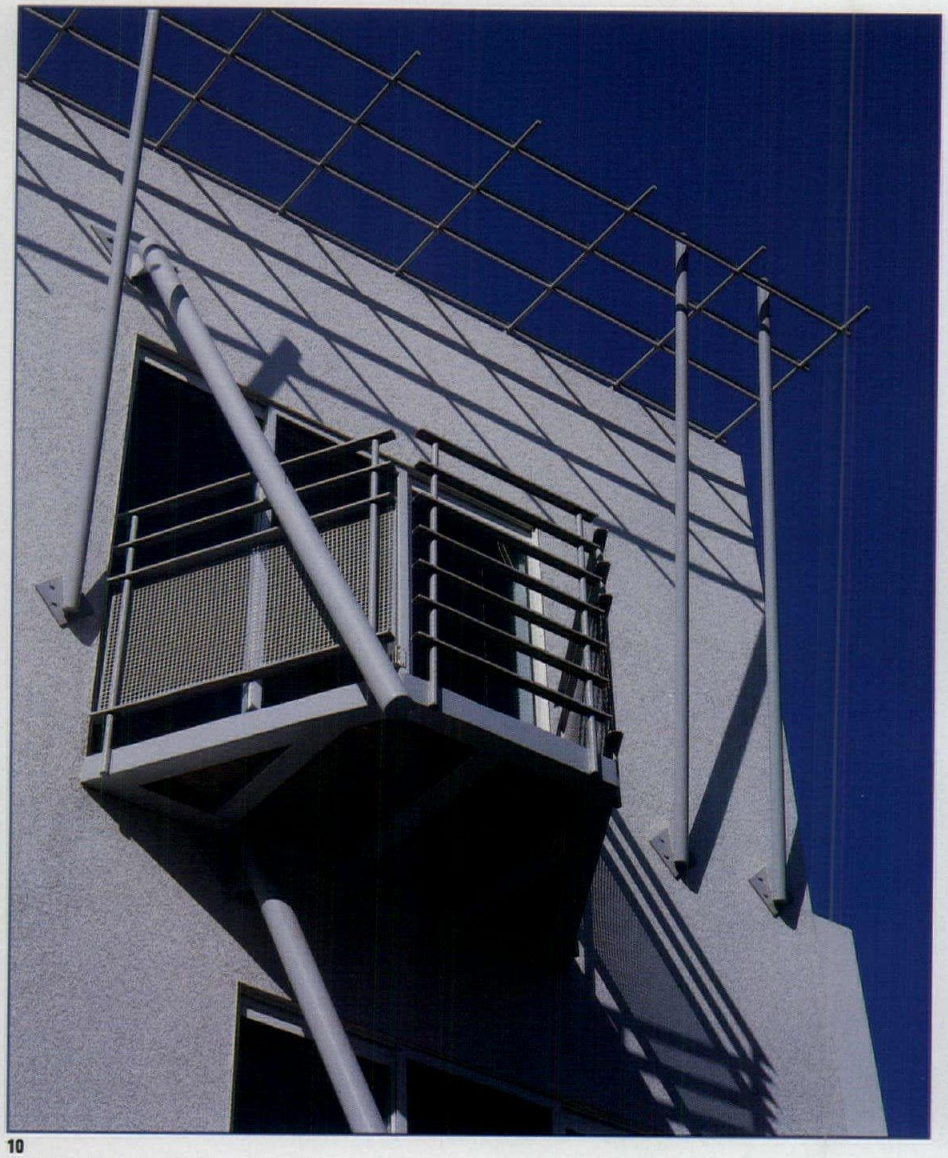
cylindrical, and more ceremonial than essential. However, the Belvedere, a remnant of the original design in which it was part of the separate reception function, still houses a required stair. The larger ones have tilted square planes above the roofs as accents; in the library and the crafts building, they cap skylights. These planes are not positioned by function but by visual appearance in the design model, and although that could be thought of as arbitrary, they do act as effective devices to accentuate the "special" buildings.

Located on the Palm Court, the main entry to Colton Palms, the Reception (and administration) facility includes offices, a living unit for the doorkeeper, who monitors phones and emergency calls at night, and two one-bedroom apartments on the second floor. The combination laundry room and library building is directly ahead on axis as a visitor passes between the reception building and the belvedere on the way into the main court. By diagonally cutting away the upper levels of the housing blocks on both sides, the design provides outside decks and a visual notch for the library. An interesting combination of functions, this facility allows residents the desirable option of spending washer and dryer time in the company of books and periodicals.

Centered toward the northern end of the main court is the Community Hall, the main meeting space for the complex. It is a building with a triangular plan, to which are appended a semicircular warming kitchen and a vestibule. It can be used for general meetings of the membership, and it provides space for any other large function. The roof over the warming kitchen and vestibule is a canted disk that visually intersects the triangle.

The Craft Workshop, the only other major common-use building, anchors the north end of the campus, across from the chapel. This area, across E Street from the low Colton Civic Center municipal complex, is considered the second of two major entries to the site. The shop will permit classes to be held and ongoing individual crafts to be pursued; the court area nearest the shop will be used for individual gardens. Picking up on the diagonal form suggested by the Community Hall's plan geometry, the residential building walls that lead out to E Street are splayed in a gesture of openness to civic activities, security fencing notwithstanding.

Returning to other P/A Awards jury comments,



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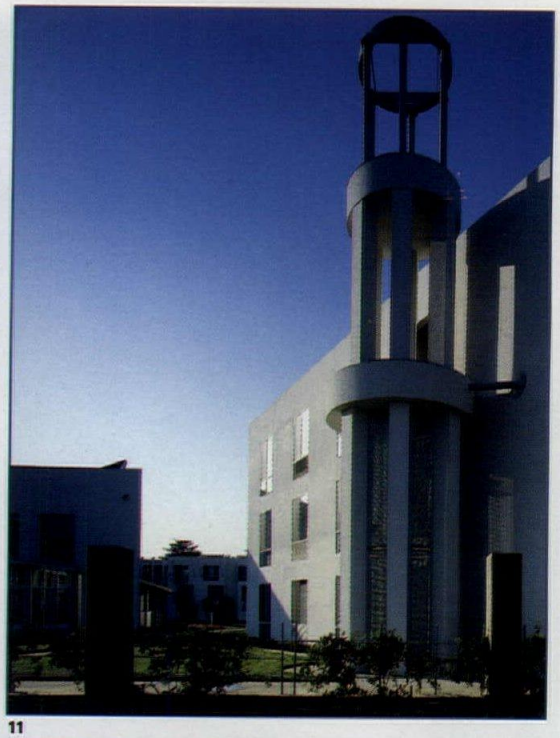

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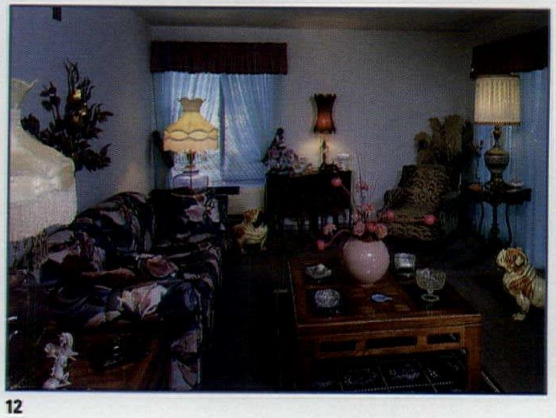


12

Balcony and trellis ironwork (10, 13) provides detail and contrasts with the simple planes of the buildings themselves. The chapel (11), with room for one or two people, is enclosed with expanded metal screening. Apartment interiors (12) are intended to be "home" to any tenant.

of a bit more hesitant nature, some jurors were concerned by the stylized presentation drawings they saw – drawn as if taken through a lens with no parallax correction (see example, p. 88); characterizing them as "nervous" or "overwrought" in their effect, they speculated that perhaps actual construction would have a calming effect on the buildings. Combined with the elements that actually do tilt, the slanted walls in the drawings indicated a distorted condition throughout. In choosing to trust actuality to bring calm restraint to the design, they couldn't have been more correct. As built, the building corners are vertical.

Although the number of "special" buildings – four larger and two minor – may seem high for the size of the Colton project, they do provide orientation landmarks, as intended; they are designated by function, and serve as anchors at appropriate strategic points throughout the grounds. Another set of features, the balconies, trellis assemblies, pipe columns, and struts could be seen as continuing the condition the jurors called "nervous." But because the buildings containing the housing units were purposely made to look simple and "vaguely familiar," their forms and massing provide a perfect setting for the metal activity, and, in fact, for the accent buildings. In the composition of the present campus, there is a fine balance of stark plane and bold detail. Just what the function of the trelliswork is might be the only quietly nagging query.

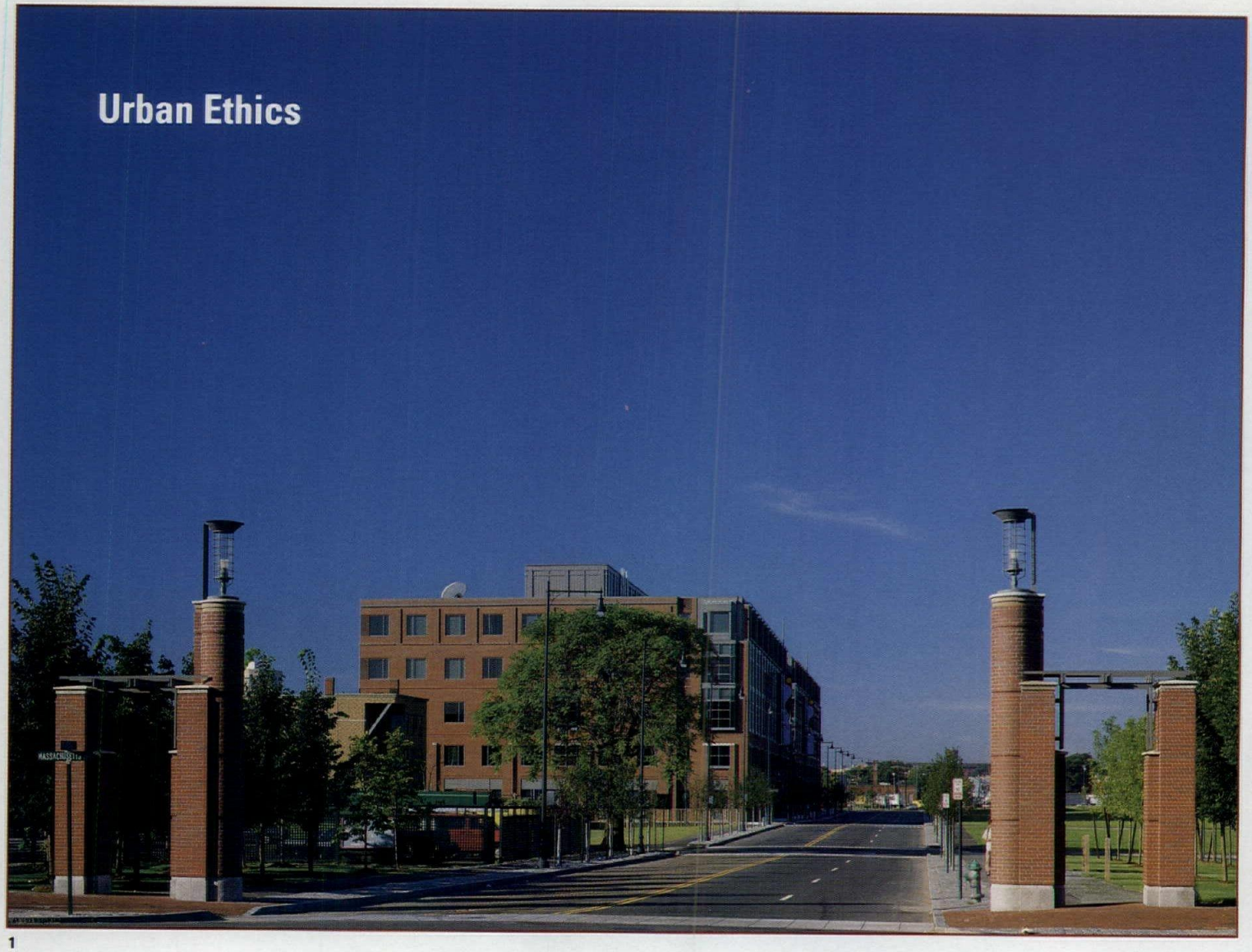
This is a very special project. First, in a time when housing with any trace of social significance is exceedingly rare, it is very heartening to see joint venture clients such as the City of Colton and CSI do what they have done.

Second, the commitment to democratic process, and Valerio Associates' continued involvement with the client and community members in the evolution of Colton Palms seem, from all indications, to have produced an admirable solution through a smooth, amicable professionalism. The buildings and the compound are fresh and exciting, and yet still "innocent," perhaps.

Colton Palms should be a role model for other such social action; it is a really good design facilitated in no small measure by equally fine clients and program. It fills a tall order admirably, with considerable grace. **Jim Murphy** ■

Project: *Colton Palms, Colton, California.*
Architects: *Valerio Associates, Inc., Chicago (Joseph M. Valerio, principal; David Jennerjahn, project architect; Randall Mattheis, designer; Mark Klancic, Brad Pausha, and Daniel Ikeda, project team).*
Client: *Cooperative Services, Inc. (Fred Wood, General Manager), and the Redevelopment Agency for the City of Colton.*
Site: *most of a city block, 2.5 acres in the center of Colton, surrounded by single-family residences, a historic district, and a public park.*
Program: *housing, 101-unit residential complex with shared open spaces and meeting, crafts, library, and laundry facilities, for older citizens of Colton.*
Structural system: *concrete foundations, structural steel columns, bracing, and tension and compression rings, wood platform framing, and glued laminated beams.*
Major materials: *stucco system on gypsum sheathing, aluminum storefront and windows, gypsum board interior walls (see Building Materials, p. 139).*
Mechanical system: *electric package terminal through-wall heat pumps, apartments; packaged rooftop heat pumps with exposed duct distribution, public buildings.*
Consultants: *Robert Darvas Associates, structural; WMA Consulting Engineers, Ltd., mechanical; EWI Engineering Associates, Inc., civil; Midori Landscape, landscape; Nancy Willert, interiors.*
General contractor: *Turner Construction Company - Orange County.*
Costs: *not available.*
Photos: *Barbara Karant, Karant + Associates, except as noted.*

Urban Ethics



1

Koetter Kim & Associates show, in this mixed-use development, how urban order is inseparable from political order.

PERSPECTIVE OF UNIVERSITY PARK FROM MASSACHUSETTS AVENUE

Urban design is, fundamentally, a political act. And we can judge urban design according to its political implications – to the way in which it brings people together or keeps them apart. In this century, the politics of urban design has varied widely. At one extreme, we embraced in the 1950s and 1960s a kind of absolutism, seeking to change the city entirely through urban renewal. At the other extreme, we have given in more recently to a kind of relativism, letting every self-interested party have a say in the design of every major project, often discouraging any change at all. Such extremism makes neither good politics nor good cities.

Implicit in the urban design work of Koetter Kim & Associates is a more pragmatic politics, one that attends to the consequences of design rather than to some set ideology. Fred Koetter is perhaps best known as the coauthor with Colin Rowe of *Collage City*, one of the founding texts of what has come to be called Post-Modern urbanism. Critics of the work have claimed that it views the city too much as a compositional problem, as simply a matter of placing buildings and shaping space. But Fred Koetter makes a convincing argument that the book, and his firm's subsequent urban design work, offer not

2

3

The view of University Park from Massachusetts Avenue (1) shows that only a fraction of the 30-acre project has been completed (drawing, facing page, from the same vantage point). Still, what has been built and what will be built, once market conditions improve, show the urbanity of the original design guidelines prepared by Koetter Kim & Associates. The first two new buildings (2) hold to the mandated five-story cornice height, hug the sidewalk, and have highly articulated front walls that express the structural frame. The off-center entrances are marked with canopies, poles, and banners. The inwardly curving rear corner of one of the buildings (3) provides one segment of a future circular space.

just formal solutions for cities, but a strategy for dealing with political complexity.

"Contemporary urban development springs from an increasingly complex base," writes Koetter; "...sources that could be coherently identified as 'clients' are increasingly giving way to more complex combinations of private and public interests." Amidst such a collage of interests, he continues, "The architect/urbanist must be an active participant in this process and have an understanding of the many, often contradictory, motives that affect the project and help determine its fate. At the same time, the architect/urbanist must also act as a kind of 'guiding intermediary' in the urban transaction...the only real advocate of the city in its most general sense.... In this respect, the architect/urbanist tends to exist, perhaps by default, as an ethical agent."

University Park, in the heart of Cambridge, Massachusetts, exemplifies this approach to urbanism. The complex of laboratories, offices, shops, and housing on 30 acres of cleared land owned by MIT and once occupied by industrial buildings, was hotly contested by the community as soon as the development rights were awarded to Forest City Development. Shop owners in nearby Central Square feared that University Park's retail operations would drain away their customers, while homeowners in the adjacent residential area expressed concern about increased traffic and competition for housing. A blue-ribbon panel was convened to suggest changes to the site's zoning, resulting in limitations on the amount of retail space, the heights of buildings, the number of housing units, and the total square footage of the development.

The urban design guidelines prepared by Koetter Kim & Associates that won them an award in the 1986 P/A Awards Program responded to these numerous constraints, expanding the number of housing units along Brookline Street, limiting building heights to five stories (except in a few designated places), and reducing the square footage to 2.3 million from an original 2.7 million. And yet, despite the complex politics behind it, Koetter Kim managed to give the project an identity and coherence through a few simple design strategies: layering the buildings in elevation and organizing the development around a series of axially-related outdoor spaces.

The layering of the buildings reflects the disjunc-

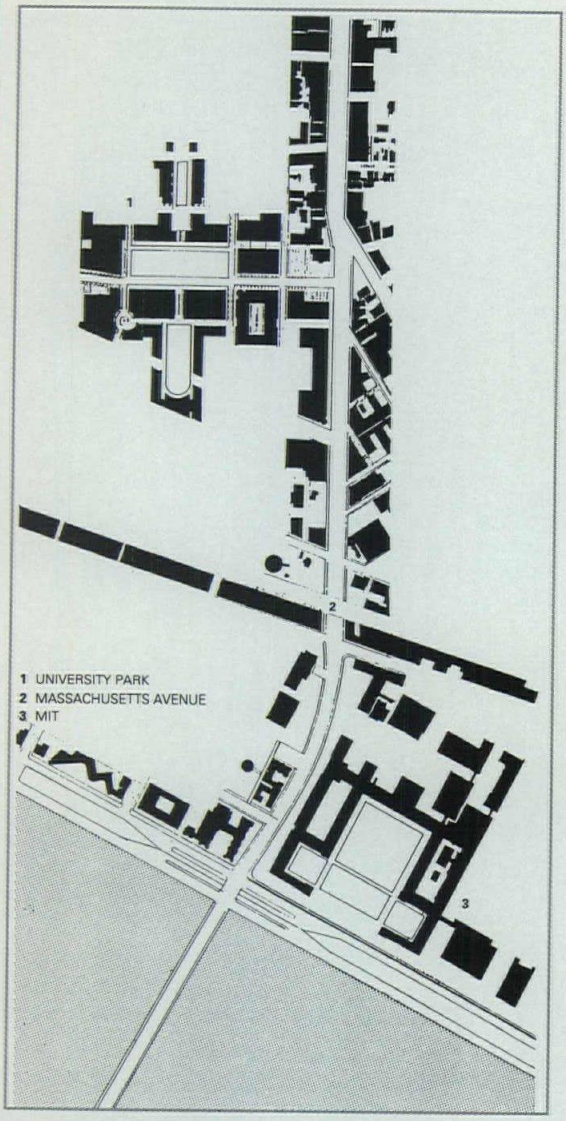
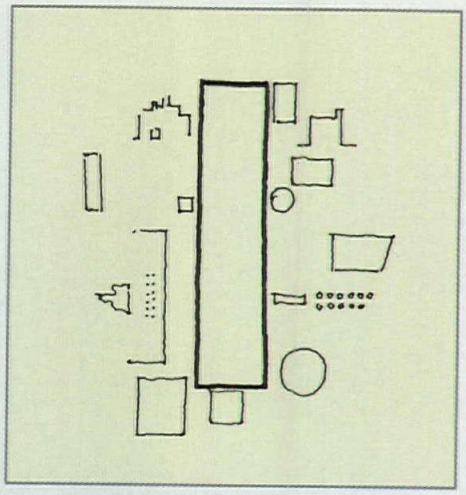
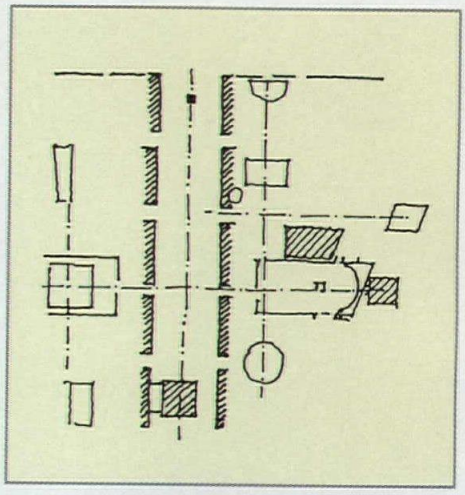


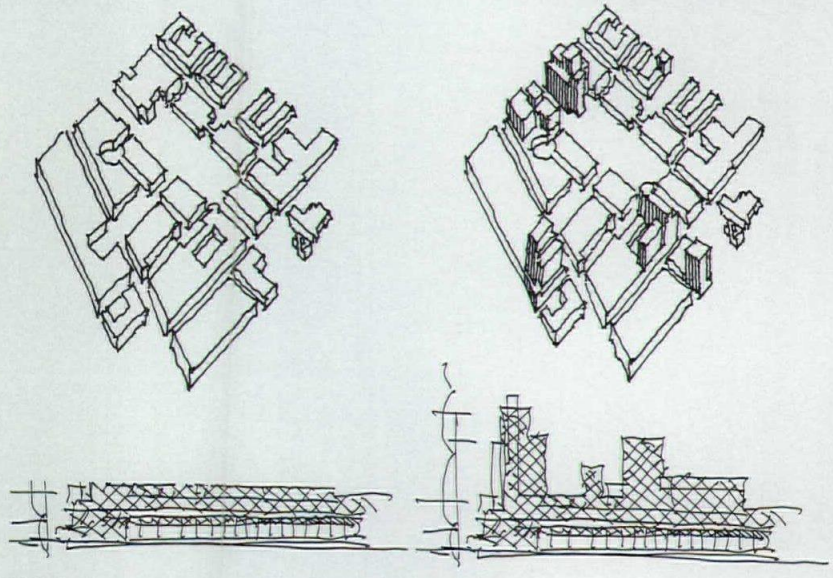
FIGURE-GROUND PLAN OF UNIVERSITY PARK AND MIT



OPEN SPACE AS ORGANIZING ELEMENT



AXIAL ORGANIZATION OF OPEN SPACE

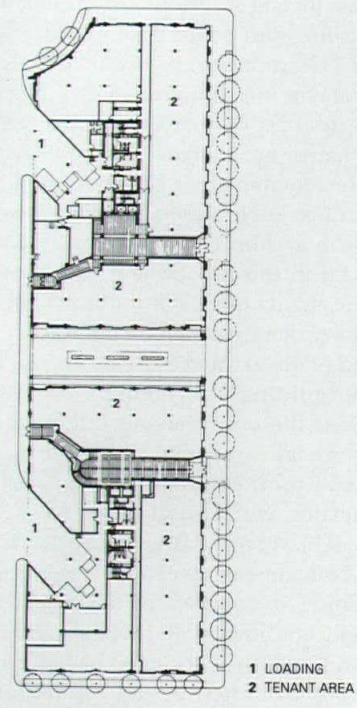


HORIZONTAL LAYERS OF SPACE-DEFINING AND SPACE-OCCUPYING BUILDINGS

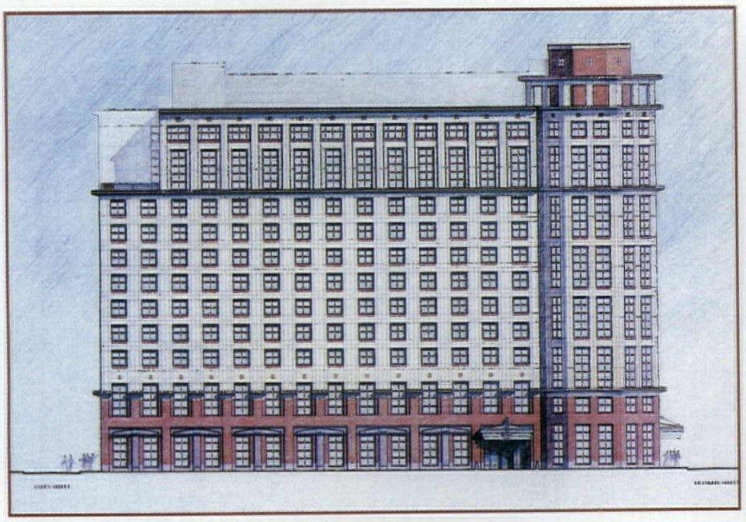
tion Rowe and Koetter talk about in their book between the traditional, space-defining city and the modern city of objects in space. But rather than resolve that difference in plan, as is suggested in the book, Koetter Kim have addressed it here in elevation, calling for a space-defining mat of buildings up to the fifth floor and object-like towers above that. This allows the public street and the private office-with-a-view to coexist. Also, by making the outdoor spaces clearly figural – circles, squares, and rectangles with flat or apsidal ends – Koetter Kim have set up a spatial order that can easily accommodate unpredictable future change or unknown designs.

It is difficult to evaluate the results of this urban design since only two new structures have been built, both designed by Koetter Kim and both looking rather forlorn in the middle of the large, open site. Still those two buildings, along with a few others that have been designed, at least show that the urban design guidelines do not inhibit good work. The Koetter Kim buildings emphasize the structural frame, with vertical bands of glazing culminating in a glazed penthouse. For developer buildings, they are well detailed and subtly articulated. The buildings designed to face them, by Kallmann, McKinnell & Wood, emphasize the wall instead of the structure, with traditional framed windows and projecting cornice. But here too, elements unlike those in most speculative buildings, such as the semicircular corners or the exposed steel lintels, transcend the ordinary.

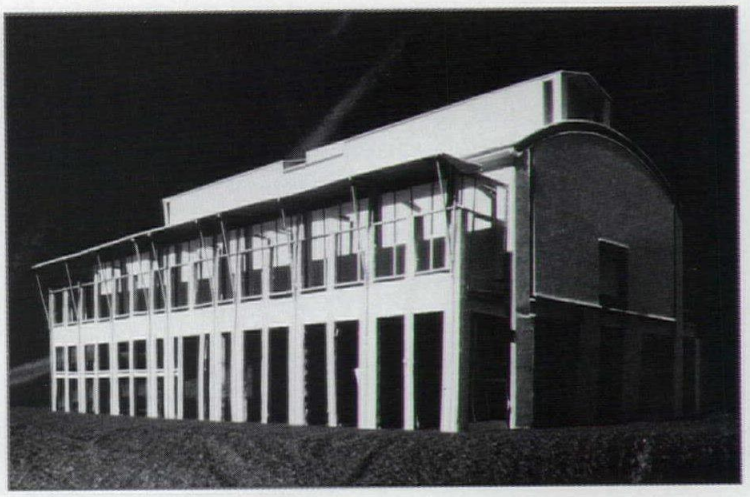
The University Park plan is eminently pragmatic: its success does not depend upon controlling every building nor upon completing the entire development. More important, this project suggests how the architect/urbanist can serve as an "ethical agent" in the city. The ordering devices of the project all benefit the community: open spaces for public use, height limits to maximize light and air, a continuation of the neighborhood's street grid. At a time when we have come to believe that reality follows our specialized, fragmented view of it, this work shows one way in which architecture, politics, and ethics can join. **Thomas Fisher** ■



FIRST FLOOR PLANS



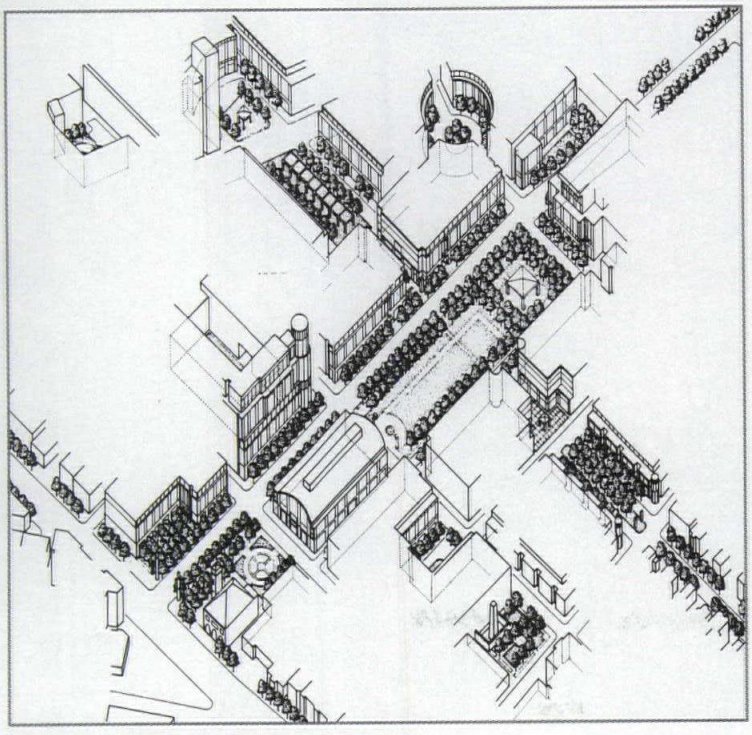
HOTEL BY CARL MEINHARDT OF SWANKE HAYDEN CONNELL



MARKET BUILDING BY KOETTER KIM & ASSOCIATES

OFFICE/LAB BUILDINGS BY KALLMANN McKINNELL & WOOD

Koetter Kim have used axially-related open space (axonometric right) to integrate University Park with the rest of Cambridge (figure-ground plan, facing page) and to accommodate a wide variety of building types and forms (drawings, top of facing page). Stratifying buildings into a constant five-story base with occasional towers (drawings, middle of facing page) also resolves the divergent needs of the public streets and the private office. The same spatial form is carried into the buildings themselves, with their figural lobbies (plans, bottom of facing page). Proposed buildings include a hotel by Carl Meinhardt, now with Swanke Hayden Connell (top left), a market structure by Koetter Kim (top right), and two office/labs by Kallmann, McKinnell & Wood (above).



AXONOMETRIC SHOWING OPEN SPACES AND STREET WALLS

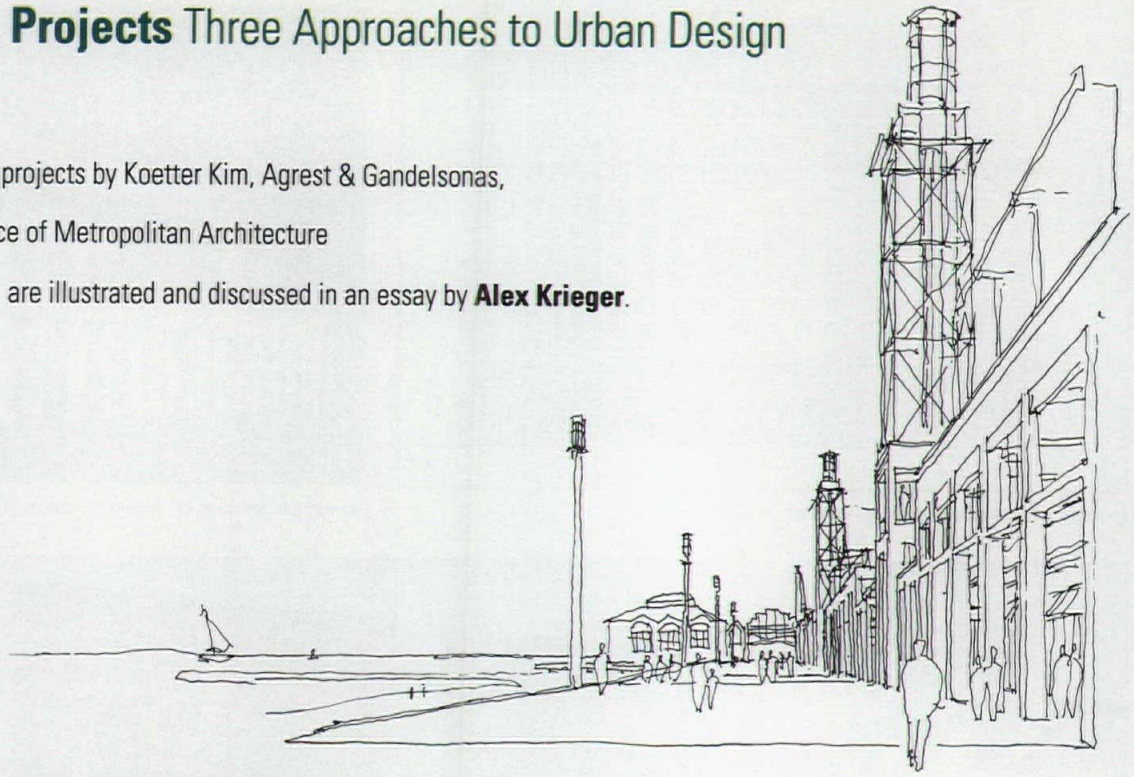
Project: *University Park, Cambridge, Massachusetts.*
Master planners: *Koetter Kim & Associates, Boston (Fred Koetter, principal-in-charge; Susie Kim, principal; Mark Chen, project designer; Jack Dobson, project manager; Rob Tullis, project architect).*
Architects (Richards Building): *Koetter Kim & Associates (Susie Kim, principal-in-charge; Fred Koetter, principal; Myles Katz, project architect; Paul Mortensen, job captain; Jay Valgora, Judah Organic, Mario Dumont, project team).*
Architects-of-record (Clark Building): *Symmes, Maini & McKee Associates, Cambridge (Tom Vogel, principal-in-charge; Gordon Brewster, project manager; Promod Handa, project architect).*
Design architects (Clark Building): *Koetter Kim & Associates (Fred Koetter, principal-in-charge; Mark Chen, project designer; Peter Ching, job captain).*
Client: *Forest City Development (Gary Ceepo, Melvin Roebuck).*
Site: *30-acre site owned by MIT in a mixed residential, commercial, and industrial area.*
Program: *Urban design guidelines for office, retail, and residential development and the design of two 26,000-sq-ft R&D buildings: the Richards and Clark Buildings.*
Consultants: *Urban Design: Burck-Ryan Associates, landscape; Fay, Spofford & Thorndike, civil. Richards Building: Burck-Ryan Associates, landscape; Lim Consultants, structural; Cosentini Associates, mechanical; Todisco Associates, specifications, Fay, Spofford & Thorndike, civil. Clark Building: Symmes, Maini & McKee, landscape, structural, mechanical.*
General contractor: *Vappi & Company.*
Costs (Richards & Clark Buildings): *$8,800,000 each ($68 per sq ft).*
Photos: *Edward Hueber.*

Projects Three Approaches to Urban Design

Recent urban design projects by Koetter Kim, Agrest & Gandelsonas,

and the Office of Metropolitan Architecture

are illustrated and discussed in an essay by **Alex Krieger**.



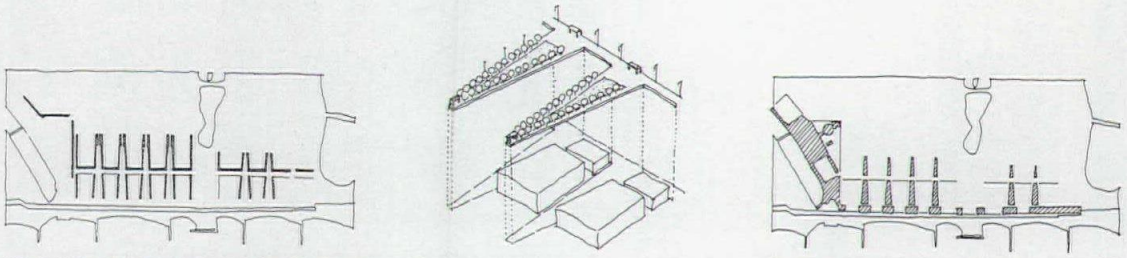
VIEW ALONG BOARDWALK SHOWING LIGHT TOWERS

Asbury Park, New Jersey,
Waterfront Development Plan

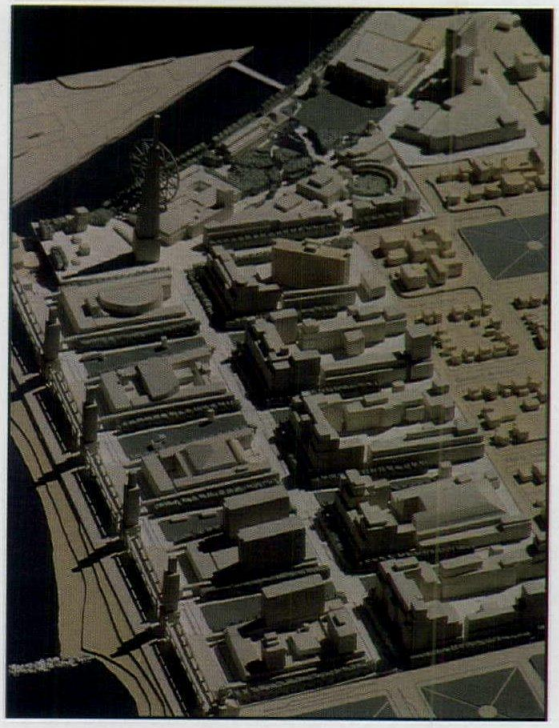
Architects: *Koetter Kim & Associates*

Fred Koetter believes in the street, in using urban design to reinforce street life and to integrate new development into existing street patterns. This is evident in his firm's plan to revitalize the waterfront of Asbury Park, once a major seaside resort. The city has a grid of streets, with avenues that splay out toward the ocean (plan, bottom). Koetter Kim have strengthened the street pattern with buildings that hold the street edges and have reinforced the former resort functions of Asbury Park, calling for new entertainment pavilions, an arcade, and light towers along a rebuilt boardwalk (perspective, top). These pavilions, which will contain thematic exhibits on such topics as popular music and oceanography, span Ocean Avenue and extend back to the commercial and residential uses along Kingsley Street, one block in from the shore. A series of new midrise hotel and residential buildings along that street will form a new edge between town and ocean front (model, bottom). At the southern end of the 59-acre site, there will be a new amusement area and public garden around which will stand performance buildings and exhibition space. What is notable about this scheme is the way in which it knits the city and the waterfront together. Functionally, the pavilions, for example, bring commercial activities out to the boardwalk and draw tourists into the city. This is reinforced in the form of the pavilions, integrated into the street grid and yet standing as objects set in front of the new commercial edge to the city.

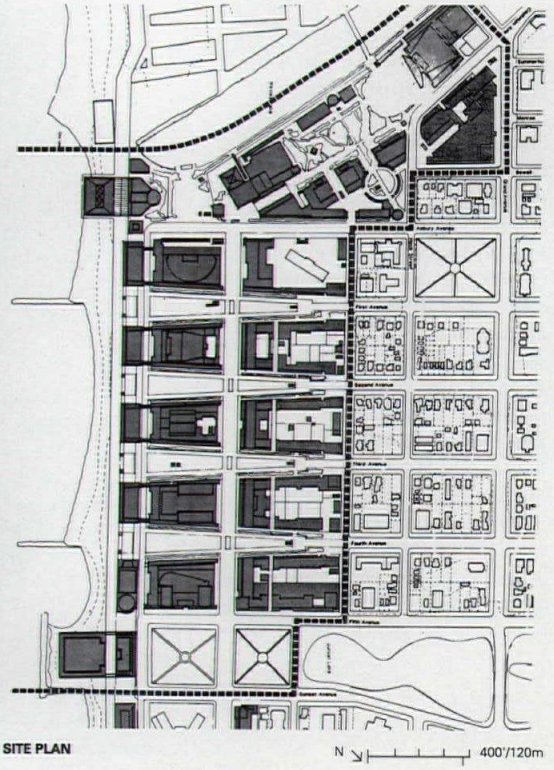
Thomas Fisher ■



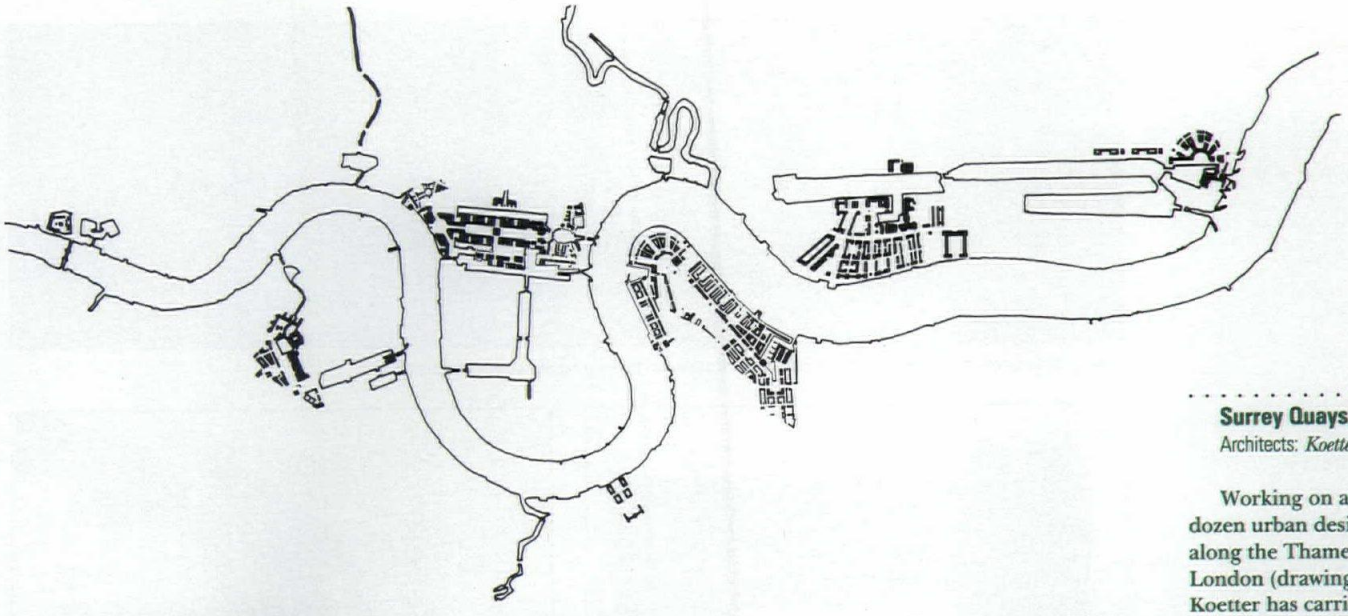
DIAGRAMS SHOWING STREET EDGES AND PUBLIC SPACE



MODEL OF COMPLETED PROJECT

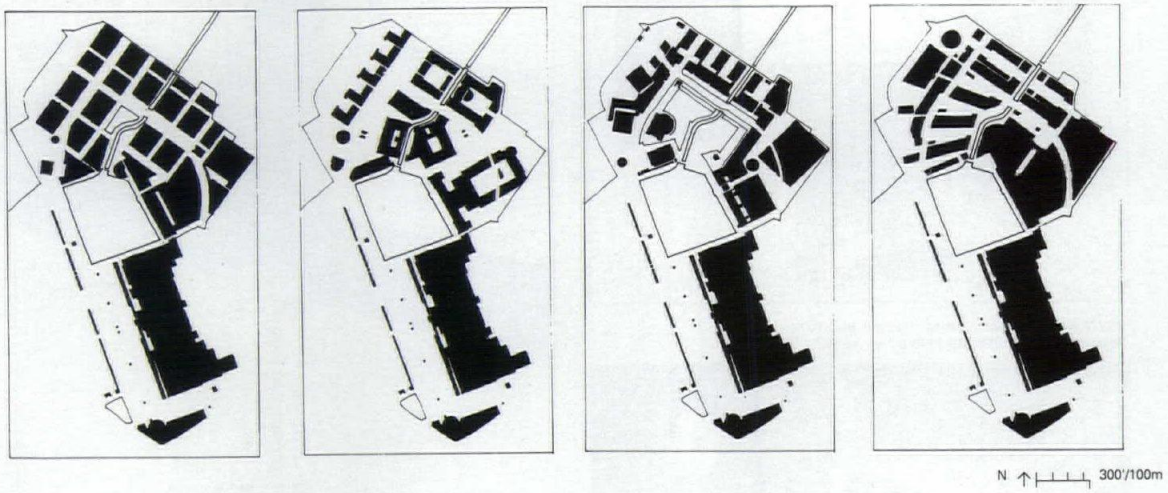


SITE PLAN

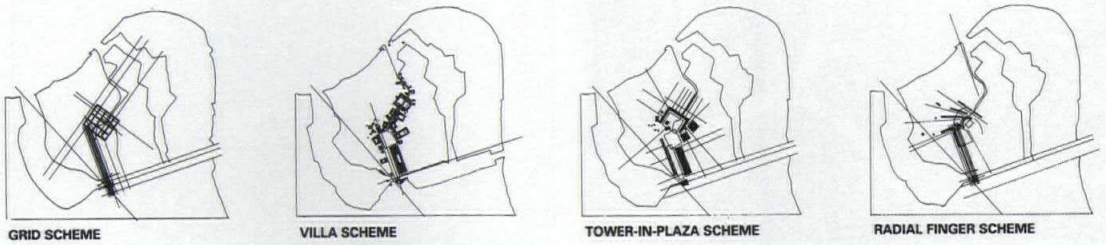


URBAN DESIGN WORK ALONG THE THAMES RIVER BY KOETTER KIM & ASSOCIATES

N 4000'/1200m



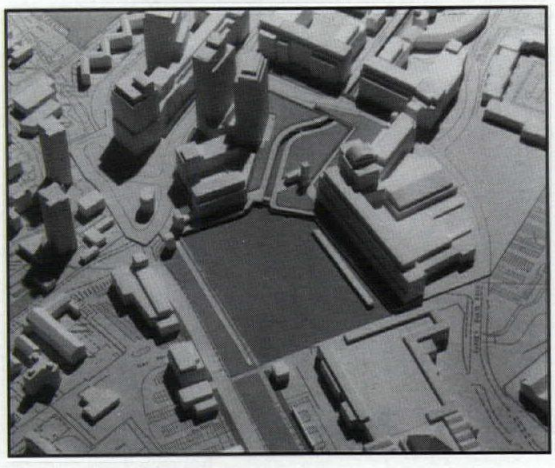
N 300'/100m



GRID SCHEME | VILLA SCHEME | TOWER-IN-PLAZA SCHEME | RADIAL FINGER SCHEME

SURREY QUAYS PLAN IN ITS CONTEXT

N 300'/100m

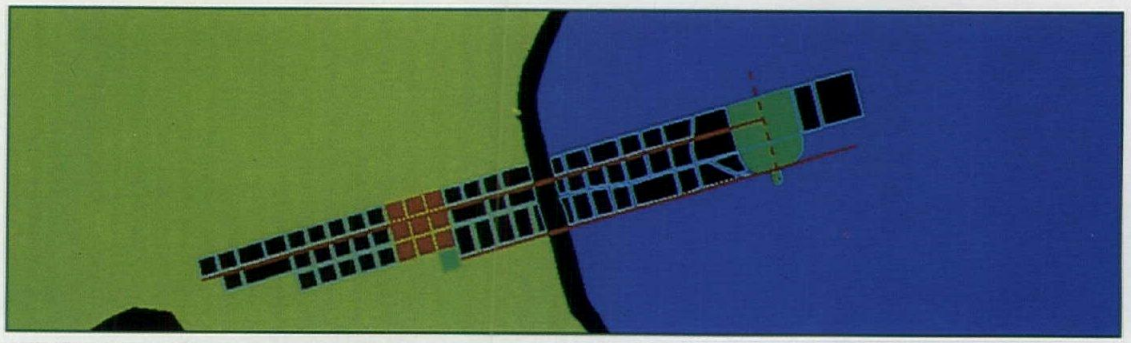


MODEL OF THE PREFERRED SCHEME

Surrey Quays, London

Architects: *Koetter Kim & Associates*

Working on at least half a dozen urban design projects along the Thames River east of London (drawing, top), Fred Koetter has carried on the "polycentric" development of London, where growth has taken place by absorbing once independent, inwardly focused neighborhoods. Amidst the chaotic industrial and residential development east of the city, Koetter Kim have created a series of centers – figural public open spaces – that order the seemingly unplanned growth around them. One of the clearest models of this is the Surrey Quays project south of the river. Among a sprawl of recent residential development, adjacent to an American-style shopping center, this new commercial center straddles the remnant of a canal system that once served the area's factories. The planners have sought to bring order through a few simple moves (drawings, middle). In one scheme, the commercial buildings are conceived of as villas along the canal (as in Venice); in another, as a series of radiating fingers (as in Asplund's Chancellery); in a third, as a uniformly high grid (as in Burnham's Chicago plan); and in a fourth, as towers wrapped by a wall of buildings (as in Le Corbusier's Plan Voisin). Koetter Kim study these alternatives in plan and model (drawing and model, bottom), and test the feasibility of each in accommodating the project requirements. This work is not historicist so much as it is pragmatic, concerned with the consequences of every scheme. And its advantage is that it attempts to derive the greatest benefit with the smallest number of moves. **Thomas Fisher** ■



COMPUTER GRAPHIC OF AXIS THAT LINKS THE CAPITOL WITH BUSINESS DISTRICT TO WEST OF DES MOINES RIVER

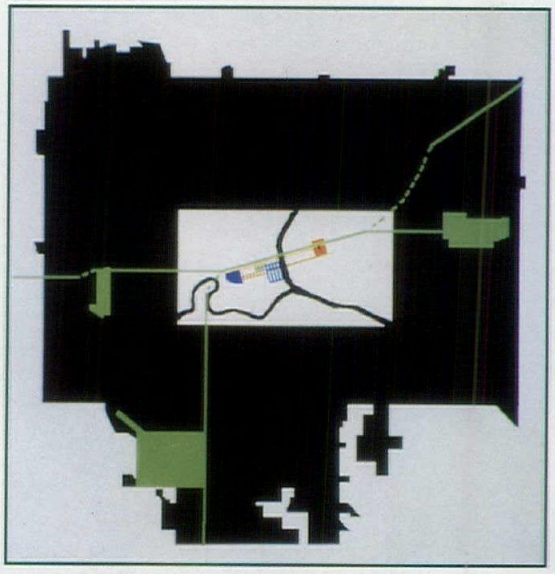
N ↑

Vision Plan, Des Moines, Iowa
Architects: *Agrest & Gandelsonas*

Des Moines' gridiron is a record of urban promise and dissolution, from the Classical aspirations of the City Beautiful Movement to the hemorrhaging inflicted by the automobile. Now Des Moines is a proving ground for the urban theories that Diana Agrest and Mario Gandelsonas, a New York architectural partnership, have been developing for two decades. They have been contracted by a coalition of civic and governmental leaders to design schemes that will make downtown a place to live, and not just an urban office park.

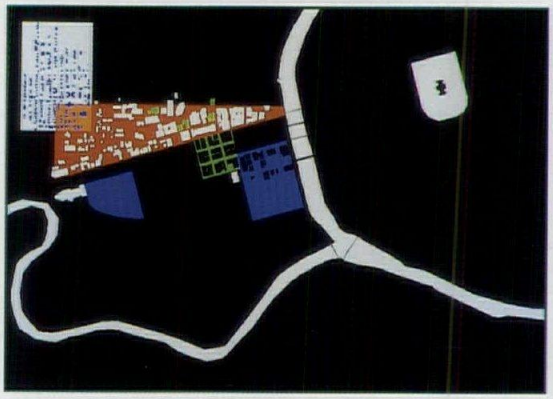
The Vision Plan for Des Moines is a product of Agrest & Gandelsonas's scholarly writings on semiotics and architecture that began in the 1970s. Their adaptation of linguistic theory to city-building is illuminating, but bears the risk of detachment from the way we see and move through the city. (In Gandelsonas's own words, his approach is "about 'seeing' configurations not perceivable in reality.") On the other hand, Agrest & Gandelsonas could be considered positivists who work with the city and all its flaws, rather than starting with models from the historical past or an imagined future.

Their plan is both an avant-garde proposition and a remedial strategy, based on the premise that the American city is the Modern city. It is guided by a belief that streets are the city's primary resource. While most architects study the street in a figure/ground context, Agrest & Gandelsonas start with exhaustive studies of the gridiron without buildings. They consider the grid a service network for traffic flow, as well as a neutral structure, free of the cultural and functional values that Classical



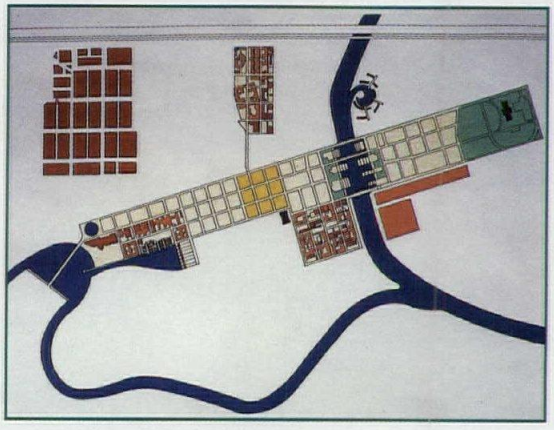
CENTRAL DES MOINES (WHITE) AND METROPOLITAN AREA, WITH PRIMARY ROUTES TO PARKS AND AIRPORT (GREEN)

N ↑



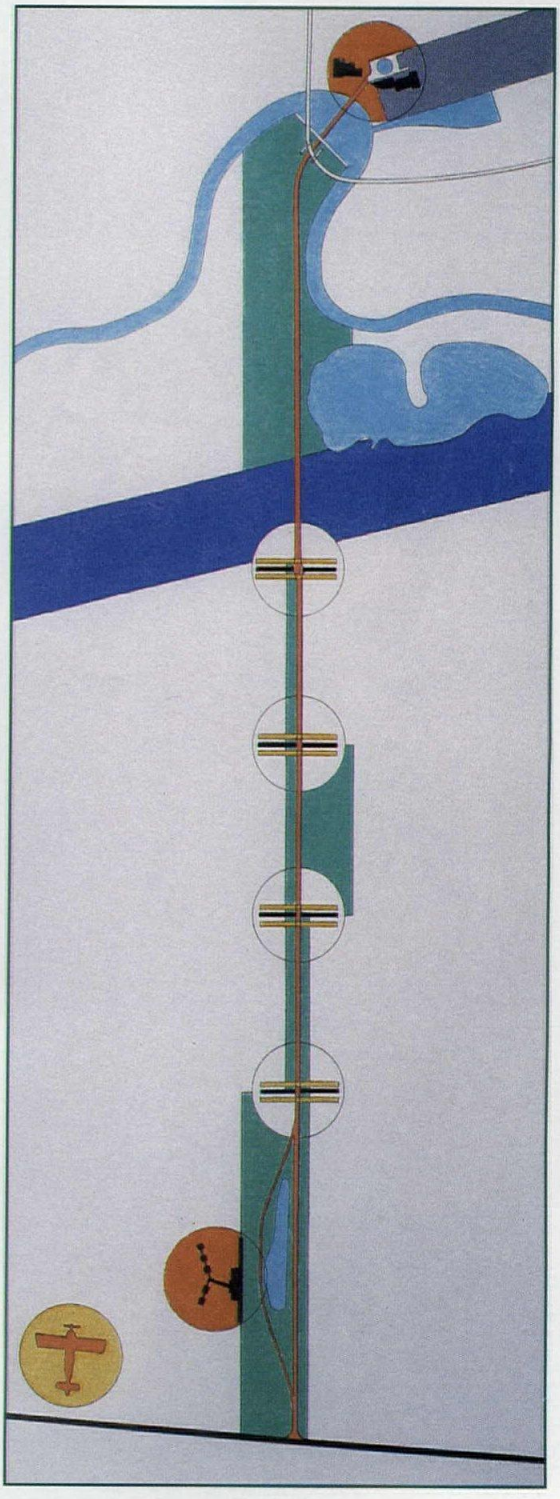
WEDGE IN PLAN MARKS SHIFT BETWEEN DES MOINES' TWO GRIDS

N ↑



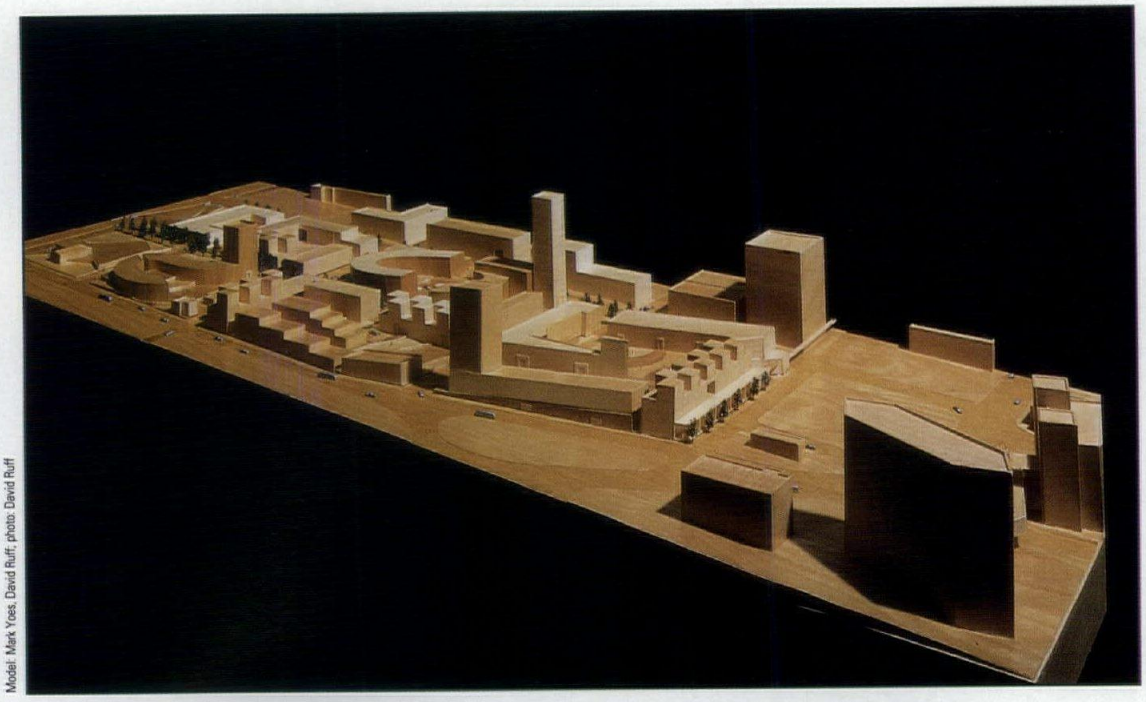
PROPOSED RESIDENTIAL NEIGHBORHOODS DEPICTED IN FIGURE/GROUND

N ↑ 1/2 mi. /800m



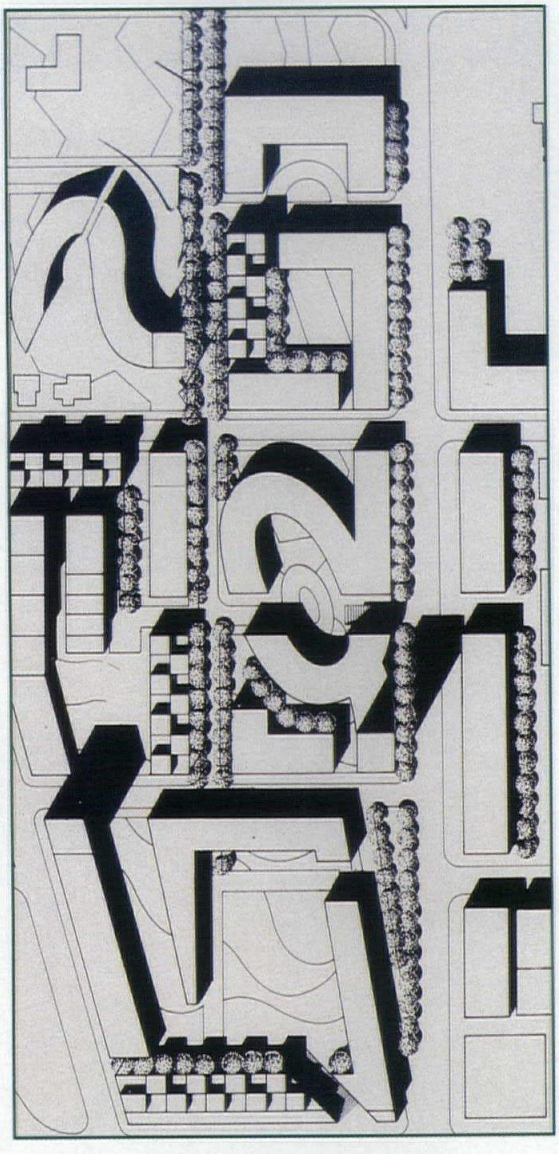
NEW LANDSCAPING AND INTERSECTIONS TO LINK AIRPORT AND PROPOSED CITY ENTRY AT RIVERBEND

N ↑

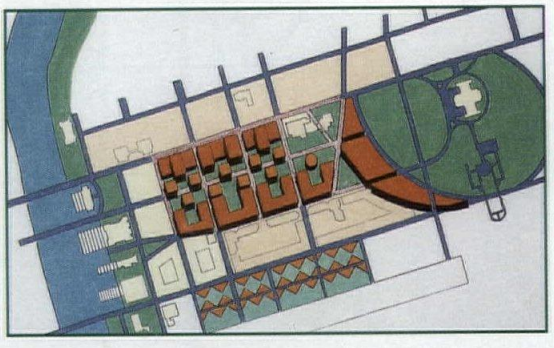


Model: Mark Yoes, David Ruff; photo: David Ruff

SCHEMATIC MODEL, HILLSIDE NEIGHBORHOOD; MASSING AND PROGRAM TO CONFORM WITH DESIGN GUIDELINES BY AGREST & GANDELSONAS

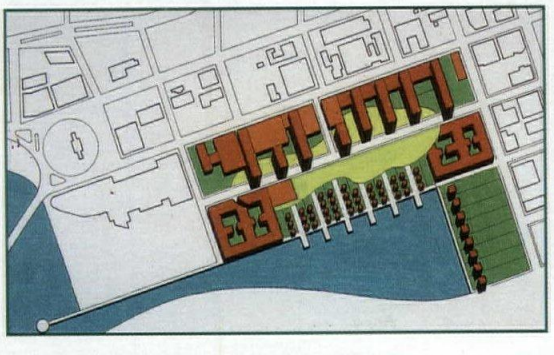


PLAN, HILLSIDE NEIGHBORHOOD, DEPICTING MASSING AND TREES N ↑



PLAN, MIXED USE DEVELOPMENT BETWEEN RIVER AND CAPITOL N ↑

PLAN, HISTORIC NEIGHBORHOOD DISTRICT WITH MODIFIED GRID N ↑



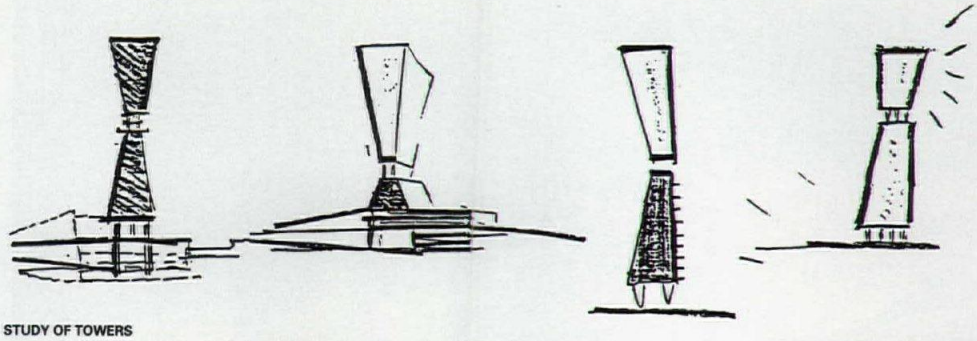
PLAN, WATERFRONT NEIGHBORHOOD WITH MODIFIED GRID AND PROPOSED RIVER BAY N ↑

and Modern architects assigned to buildings. As Agrest has written, the grid belongs to the realm of "non-design," the urban setting in which the "design" realm of the architect is built. Agrest & Gandelsonas see the city as "the unconscious of architecture"; their gridded interventions acknowledge that architects are not authorities who assign meaning to our built environment. This is a more diffuse process, realized over generations.

In Gandelsonas's first computer-generated analytical drawings of Des Moines (a "delayering" of the city), he saw that a shift in the downtown street grid defines an axis between the state capitol and the business district to the west of the Des Moines river. Agrest and Gandelsonas propose a variety of links within and beyond this central axis. The Civic Center planned in 1909 for both sides of the Des Moines River will be updated, with monumental terraces linking riverfront institutions to the water. The connections from the downtown axis to the parks and airport in the outer reaches of the metropolitan area are to be reconfigured on a scale appropriate to the automobile. On Fleur Drive, the route to the airport, landscaping will be designed for the view from a moving car, major street intersections will be modulated, and a turn of the Raccoon river will be flooded to make a lake – an automotive threshold to central Des Moines and a landmark visible from airplanes.

Agrest & Gandelsonas propose three residential neighborhoods near the downtown axis, enclaves with the green spaces of suburbia as well as street grids that integrate these districts with the surrounding city. The Hillside Neighborhood proposal is the most developed, with a detailed "workbook" of guidelines for massing 1500 living units and parking for 4000 cars. Traditional contrasts between urban fabric and object will become more ambiguous. The project's bold massing is a counterproposal to the serial housing stock of the traditional city, a Corbusian scheme grafted to the gridiron. **Philip Arcidi** ■

Project team: Claire Weisz, Maurice Harwell, Nick Arn.



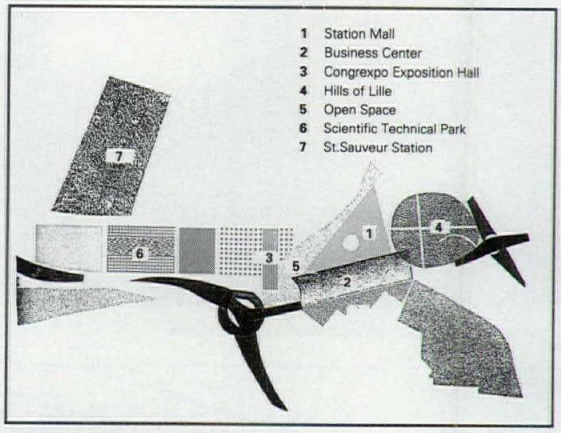
STUDY OF TOWERS

Euralille, Lille, France

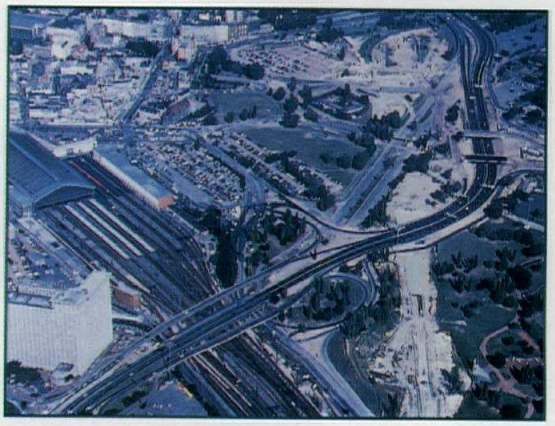
Architects: *Office of Metropolitan Architecture*

Euralille, a new transportation and commercial center at the edge of Lille's historic center, will be a stop for the high-speed train – the TGV – connecting England and Europe. In a limited competition, Rem Koolhaas and the Office of Metropolitan Architecture won the commission to prepare the urban design guidelines for the complex. It is, in many ways, a perfect forum for Koolhaas and his interests in the congestion, compression, and juxtaposition of functions and values that characterize modern culture. The high-speed train, like so many other devices in this century, will hurl people together, juxtaposing nationalities and conflating values. As such, the TGV is not just a transportation system, but a transmitter of international culture.

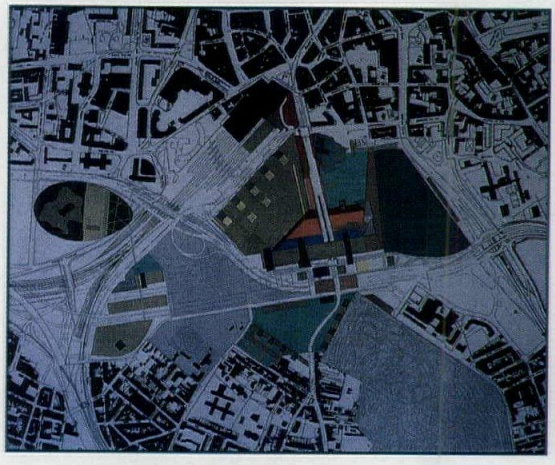
And it is this sense of Modernism – as a cultural condition rather than an architectural style – that characterizes Koolhaas's work and has guided his urban design efforts in Lille. The complex creates compressed bands of transportation, commercial, exhibition, and office space in both plan and section. Along the outer, eastern edge of the site stands a train-like string of towers (including a hotel designed by Kazuo Shinohara, a central tower by Christian de Portzamparc, and a world trade center by Claude Vasconi) that straddle a linear podium of support facilities – shops, lobbies, restaurants, parking – below which run the tracks of the TGV. A sloping park with a basin of water along the tracks brings light and views down to the level of the tracks and allows the various functional layers of the complex to be exposed as a kind of archeology of the building.



SCHEMATIC PLAN OF SECTORS



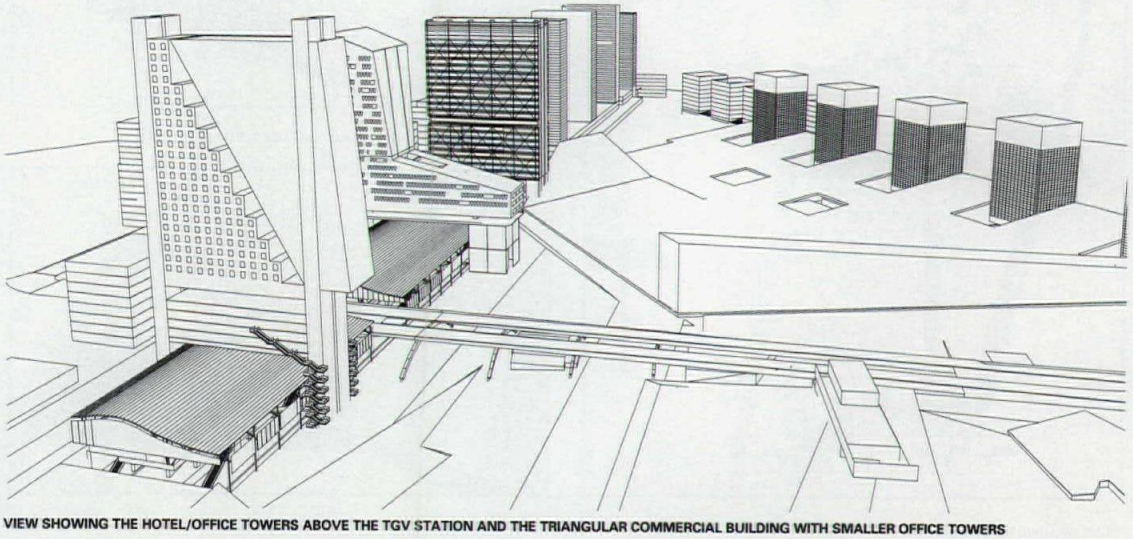
SITE AS IT EXISTS



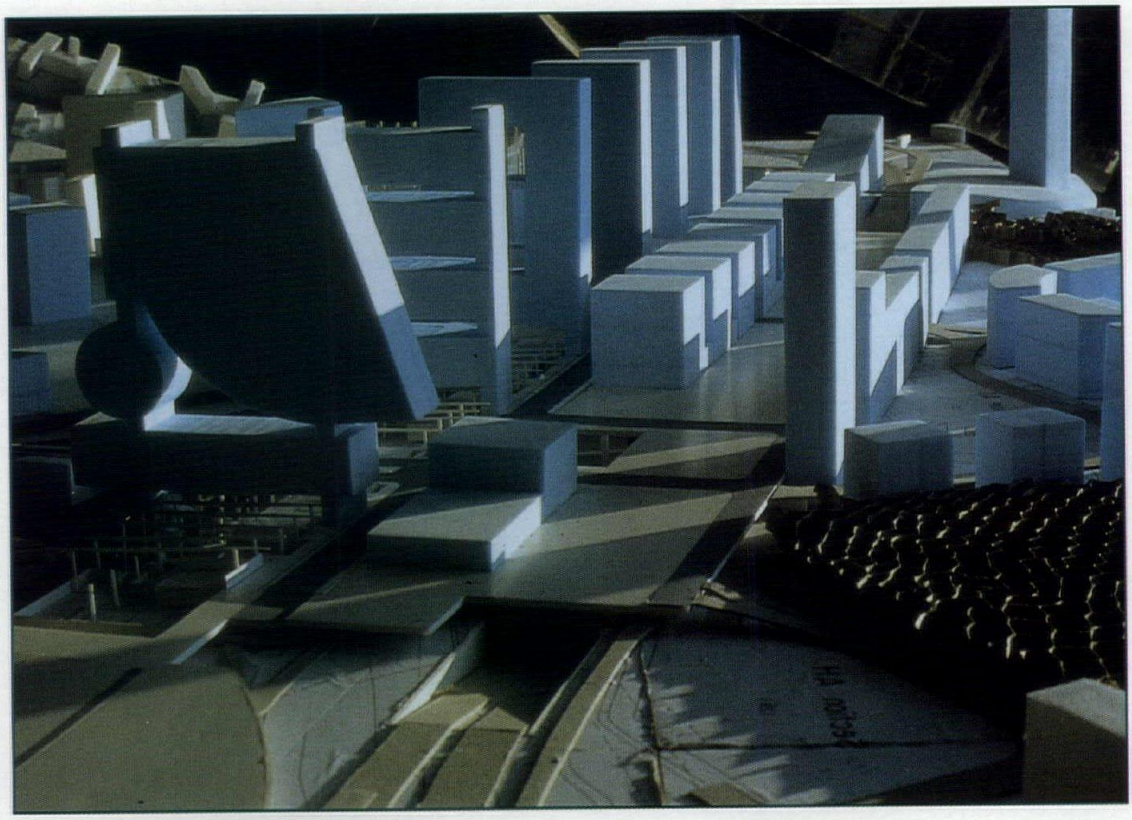
FIRST STAGE OF PROJECT

COMPLETE BUILD-OUT

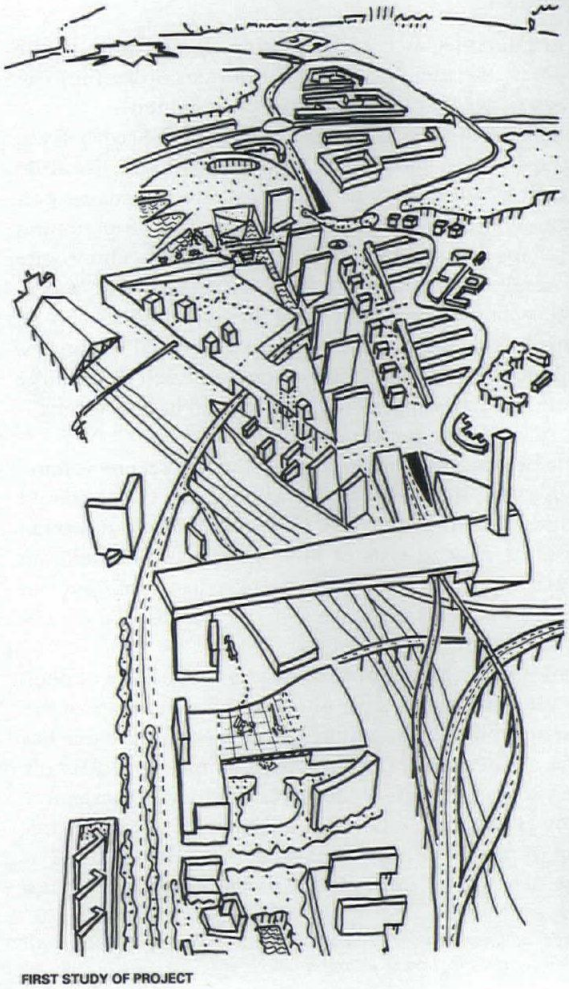
N 400'/120m



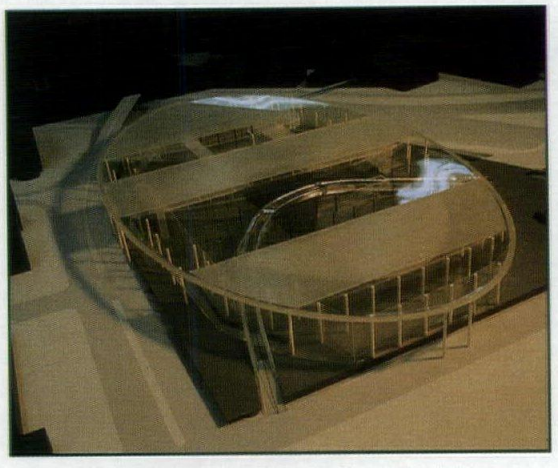
VIEW SHOWING THE HOTEL/OFFICE TOWERS ABOVE THE TGV STATION AND THE TRIANGULAR COMMERCIAL BUILDING WITH SMALLER OFFICE TOWERS



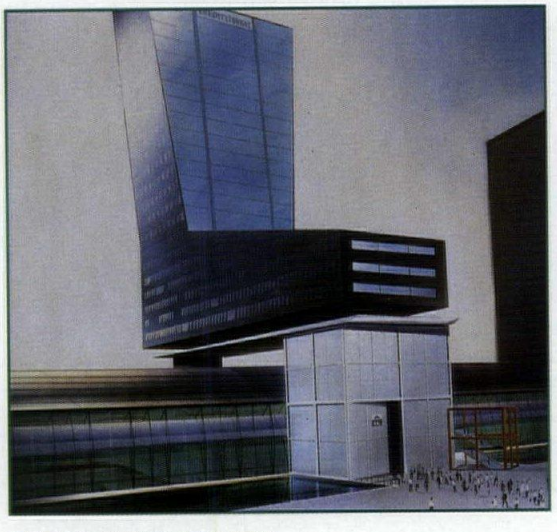
MODEL, LOOKING ALONG THE SPINE OF TOWERS STRADDLING THE STATION



FIRST STUDY OF PROJECT



EGG-SHAPED CONGRESS HALL



MODEL OF TOWER ABOVE TGV STATION

A similar compression of functions occurs in the wedge-shaped structure that stands between the bar of towers and the historic center of Lille. Designed by Jean Nouvel, this "Triangle des Gares" encloses commercial space and pedestrian passages beneath an enormous sloping roof, through which project a regular series of towers that are square in plan. The tilted plane of Nouvel's roof was mandated to allow passengers on the TGV to see the Lille skyline. This gridded roof plane, however, with its series of office buildings set in front of an artificial horizon line, creates its own abstract landscape and skyline.

At the southern end of the site, Koolhaas's office has designed a congress/exposition hall. Originally conceived of as a bridge-like structure that spanned the train tracks, the "Congrexpo" has evolved into an egg-shaped building with a vast, dish-shaped roof supported along its edges by columns. A portion of the building pokes through the roof, allowing people to walk out onto that artificial bowled landscape with its own horizon line.

There is an element of the fantastic in much of this work, and appropriately so. It relates not to the adjacent street pattern of Lille's historic center, but to the scale of the peripheral highway and train tracks that skirt the site and to the international culture and commerce that will use this as a market for the exchange of information, ideas, and goods. The playful forms and disjunction of scales are efforts to find an apt expression of this new type of city, a modern equivalent of the ancient bazaar. If it appears exotic or strange, that is as it should be. **Thomas Fisher** ■

Projects Essay

Alex Krieger concludes our urban design portfolio, observing that both "traditional" and "radical" urban designers face a common foe: the amorphous city.

The Eye as an Instrument (Again) of Urban Design

Perhaps architects of the first half of the 20th Century, compelled by the prospect of a modern age, too readily shed the conventions of city building. We, who experienced the consequences of this abdication of precedent, have reciprocated: redeploying time-honored civic traditions has become increasingly tempting. Estranged from the new city, we seek comfort in convention. When conventions fail to solve contemporary needs, we place faith once more in radical innovation. The strokes of this pendulum have shortened considerably as we approach the end of this century. Parc de la Villette and Seaside tempt us equally, not because we are intellectual chameleons, but because the essential nature of urbanity remains so elusive – especially in the face of the immensity and amorphousness of contemporary human settlement.

The four urban projects on the preceding pages are responses to this predicament. Their authors seek, without a common theory, a method to counter the amorphousness of the modern city. Each project strives to again assign form to urbanity, to find a new authority for the eye as a tool of city planning.

A dozen or so years ago, the task seemed clearer. The bulldozers of reconstruction and of urban renewal convinced many that the culprit had been our faith in the city of Modern architecture. For many, the most important mission for Post-Modernism became the reform of Modern planning: to strip away its abstractions, universalisms and apparent disregard for the places which the modern world inherited.

Two consequences, however, not entirely unforeseen or without irony, severely compromised the urbanistic aims of Post-Modernism. First, the acknowledgment of history, which was to enrich meaning and achieve greater humanity in building, often led instead to the usurpation of architectural language for status-building. As used by increasingly sophisticated commercial interests or private institutions, associations with history became a means to market lifestyles rather than to link society with its antecedents.

Second, while we dreamt of recapturing the ancient clarities of town and country, street and square, of homogeneous fabric, purposefully sited monuments and broadly understood civic iconography, many of our cities ceased to resemble, behave like, or make use of territory in the manner of the cities of our memories. In other words, as the city of the second half of the 20th Century began to acquire the radical physical contours predicted for it during the first half of the century, the tools of precedent seemed applicable to fewer and fewer conditions of urbanization.

Furthermore, the culprit may not have been Modern architecture or the *Ville Radieuse* alone. The unprecedented concentrations of population and capital coupled with easy mobility, electronic communication, heterogeneous social mores, availability of choice, decentralized land ownership, and economies dependent on replacement of facilities rather than on the stewardship of places, all had impact on the transformation of urban life. Indeed, in light of the social and economic forces that shape the modern city, the *Ville Radieuse* might have been regarded as an act of clairvoyance rather than as an instigator.

But our ongoing fascination with the city in history has recaptured an important insight. While the most complex of systems, the city is also an artifact, the design of which requires the laws of form and perception to be tapped. It is here that the work of Koetter & Kim, of Agrest & Gandelsonas, and of Koolhaas conjoin. If not a theory, they share a conjecture about urbanism: to aim for urbanity means to combat formlessness.

In this light, Fred Koetter is less concerned with latent orders than with establishing legibility as he maintains the ideology of his mentor and occasional collaborator, Colin Rowe. He remains committed to the idea of the potent urban fragment, an aggregation of buildings and space functioning as a microcosm of (desired) urbanity. Under his guidance East London is evolving as a slightly unruly collection of some half-dozen public centers, coherent parts in the manner of Piranesi's famous engraving of the Campo Marzo. "Ordered spots and erratic interstices" is what he calls the result of "combining overt legible order with opportunistic chaos." The "spots" may recall canonical urban place-making, but Koetter's overall compositional strategy is one of collage.

In a parallel manner, Mario Gandelsonas speaks of "delayering the city," of seeking out its latent forms. Only after they are decoded can the layers be implanted in the "collective consciousness" of a place, and begin to sustain pressure on subsequent development. One can hear the echo of Daniel Burnham cajoling Chicagoans in 1909 to respond to a noble logical diagram which, once received, he claimed, would not die. In Des Moines, the diagrams carry the exactitude of the computer. Their graphic elegance and precision demonstrate to the citizens of Des Moines that their city has an order: an order they can *see* and, therefore, an order that they can insist be sustained.

"In light of the social and economic forces which shape the modern city, the *Ville Radieuse* might have been regarded as an act of clairvoyance rather than as an instigator."

Rem Koolhaas also employs collage, though he borrows from Modern choreography even more. The choreography at Euralille involves what he calls a "vocabulary of instability" – emblematic, perhaps, of an environment which needs no points of stasis, functioning largely as an interchange, a junction point. Like modern choreography in which the overall dance may seem far less coherent than specific sequences of steps or postures, Koolhaas's environments can be comprehended only by splicing partial, though vivid, visual memories. This seems appropriate to a contemporary enterprise such as Euralille which is sized beyond human capacity to comprehend in its entirety.

All of this work reasserts the importance of vision.

Richard Sennett begins *The Conscience of the Eye*, his recent volume on the social life of cities, by asserting that the ancient Greeks could see the complexities of life in their cities. Our own cities do not seem so transparent, offering instead veils of homogeneity which belie an underlying complexity. Can this be because we have lost confidence in the ability of our eyes to penetrate these veils, or because we do not use our optical sense to plan?

At some moment during this century, the "systemic" nature of planning and the "art" of building became understood as separate activities. From this disengagement, the enterprise of designing cities has yet to recover. The greatest sin of Modernism, its most problematic abstraction, may have been its insistence that the city was fundamentally a planned entity, to be examined as an amalgam of systems rather than as a collection of places. Our eyes – if we allow them – will tell us otherwise. It is time to empower our eyes again. **Alex Krieger** ■

The author is a principal of Chan Krieger & Associates in Cambridge, Massachusetts and Director of the Urban Design Program at Harvard University.

Perspectives

Why is **Richard Meier's Getty Center** so disappointing?

P/A's editors evaluate the design.

Editors' Roundtable: The Getty Center

Last October, The Getty Center unveiled the design for its new $360-million complex in Los Angeles. The project, awarded to Richard Meier & Partners in 1984, provides a central home for the Getty's varied arts activities, including the J. Paul Getty Museum. After meeting with Richard Meier to discuss the project, a group of P/A editors recorded the following roundtable.

Mark Alden Branch: This building has received a lot of attention because of the amount of time and money involved. We seemed to think we had reason to expect a masterpiece. What do we have here?

John Morris Dixon: You might say it's the plum commission of the last half of the 20th Century. But when we talked to Meier, he stressed the complexity and the limitations of this job. The arduous review process and the community pressures, we knew, were extremely limiting factors.

Branch: What I didn't know about was the internal charge from the Getty to avoid a kind of monolithic statement.

Thomas Fisher: Here, as always, architecture is a very true reflection of the conditions under which it's done, and the Getty seems to have been rather leaderless in the design process. There were these five pieces that each wanted its own identity, its own turf, and it seems that there was nobody arbitrating.

Branch: Meier said, for example, that they didn't want the museum to dominate the rest of the complex, even though the museum is the most public part of the institution. They wanted the other portions to be equally visible.

Philip Arcidi: I believe that another consequence of working with this client was an incredible amount of time to refine and revise the design. The work is painstaking, but its fine adjustments are still in search of a terrific direction.

Fisher: He talked about how he gridded the site, which is an appropriate response in a city like L.A., which is itself a vast grid that holds lots of particularized elements, but when you really look at this design, the grid disappears. That's why I asked him about this early sketch (p. 105), because it had this idea that the grid was still a very dominant element. But in the final design, it's very hard to find the grid. The other way of organizing buildings is the traditional urban Beaux-Arts notion of creating figures, either a figure with the building or a figure in the negative space. But here, neither the buildings

MODEL LOOKING SOUTH

Tom Bonner

or the negative space are clearly figural enough.

Arcidi: Meier says that the terraced garden between the circular building and the museum is to be the outdoor space that knits the project together, but that isn't very obvious.

Dixon: The garden isn't very figural. The terracing may give it a strong identity, but the edges are scraggly.

Fisher: And look at the museum. It neither encloses figural space, nor is a very clear figure.

Dixon: But you sense that there's a courtyard within it.

Jim Murphy: And that's the only section of the project that really does hold a gridlike pattern.

Fisher: A gridlike pattern, I agree, but it becomes so diffused, with so many particular incidents. Meier defended it by saying that this project is very experiential, and you really won't know what it's like until it's built.

Murphy: I think there's a validity to that, actually.

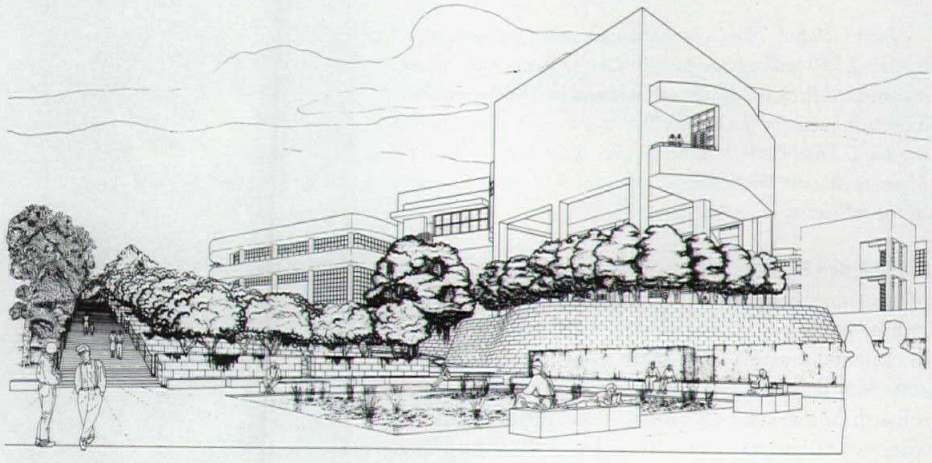
Dixon: But I'm not encouraged. I mean, I'd be delighted if it's really wonderful as built, and I believe in experiential architecture, as in, say, Moore and Turnbull's Kresge College at Santa Cruz, which has cranky experiential things happening against the natural landscape. But the curious thing is that Meier has developed what seems like a very carefully geometricized bowl outside the walls, which will reduce the contrast between the cultivation within and the natural landscape.

Fisher: Another aspect of all this that I find disturbing – and this gets back to this question of nonhierarchical arrangements – is that there's a kind of lie going on here. This is the most powerful art institution in the world, and they can totally dominate the art world if they choose, and it seems to me that the dissembling of the forms is a political act on their part, an attempt to create an unassuming architectural image that goes against the reality of the institution.

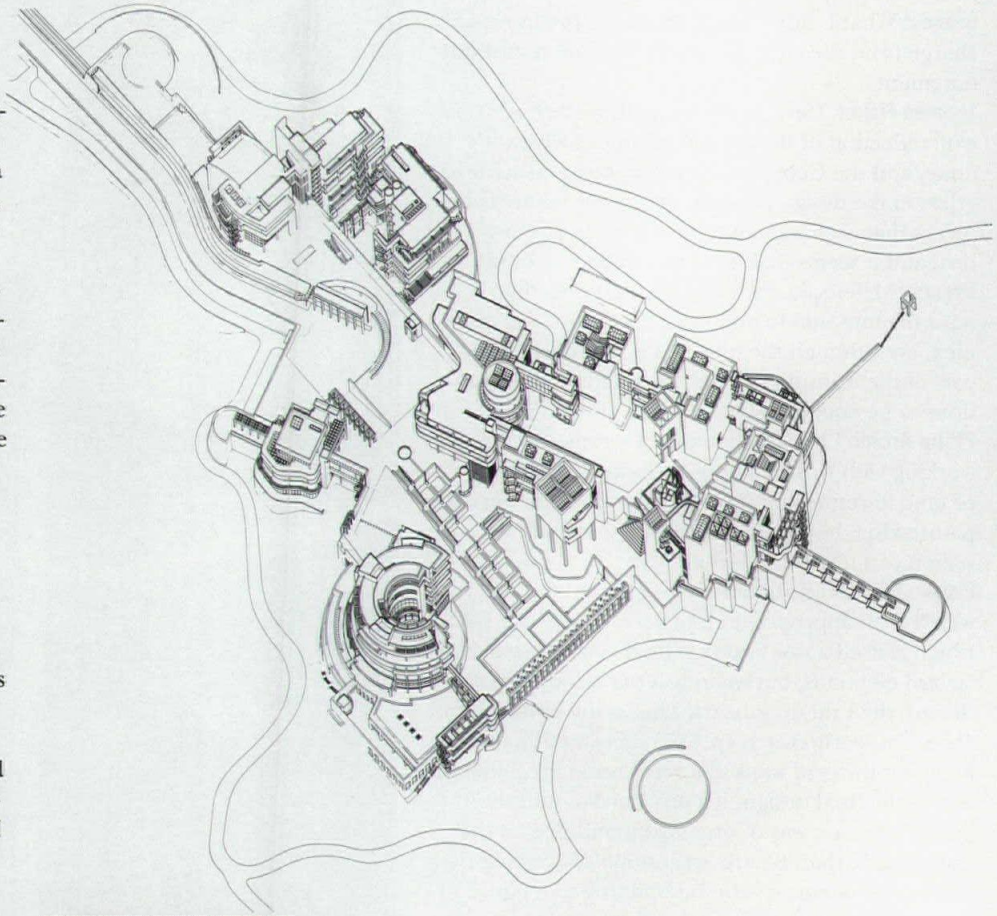
Branch: But why do you consider that a lie? I don't know that much about the Getty, but the way I understand it, they've been reticent about exercising the power that their money gives them, and this seems consistent with that philosophy.

Fisher: It's just interesting to me how you can use architecture as a kind of public relations effort, and I see this as a ploy to make the Getty appear friendly, make it appear accessible. I bring it up because I think it creates problems for Meier.

Dixon: Not only does the institution not want anything central or monumental, but neither did this



PERSPECTIVE, TERRACED GARDEN AND MUSEUM

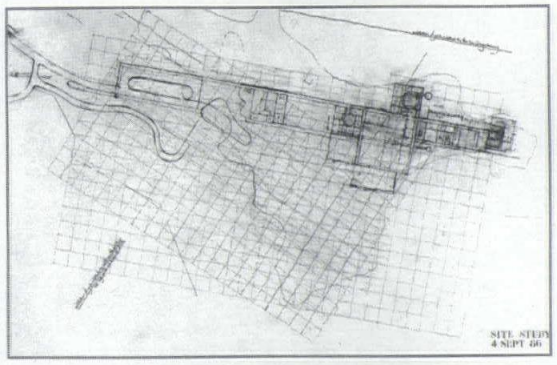


AXONOMETRIC LOOKING NORTHEAST

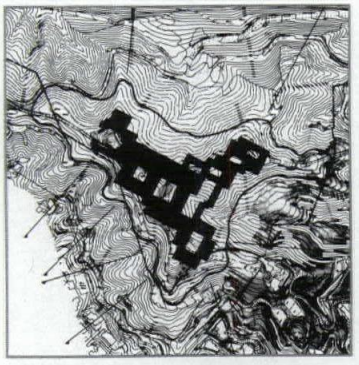
"As the architect, Meier should have demanded that there be some kind of imposed order."

Tom Bonner

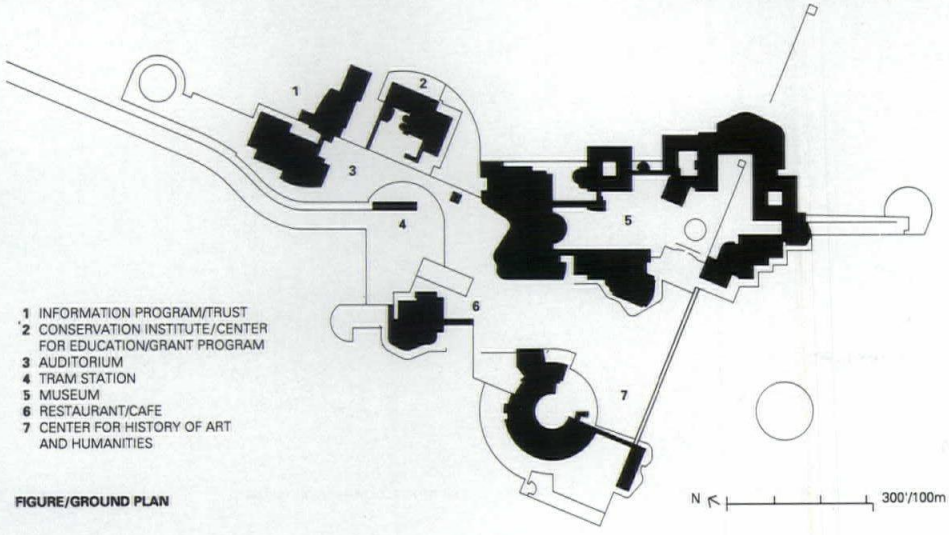
MODEL LOOKING WEST



1986 GRIDDED SITE PLAN SKETCH



ALLOWABLE BUILDING ENVELOPE ACCORDING TO CONDITIONAL USE PERMIT



1 INFORMATION PROGRAM/TRUST
2 CONSERVATION INSTITUTE/CENTER FOR EDUCATION/GRANT PROGRAM
3 AUDITORIUM
4 TRAM STATION
5 MUSEUM
6 RESTAURANT/CAFE
7 CENTER FOR HISTORY OF ART AND HUMANITIES

FIGURE/GROUND PLAN

community. They didn't want anything to be prominent, or anything to be larger in scale than neighboring structures. You can see these two forces pressing him into a kind of equivocation.

Fisher: As the architect, Meier should have demanded that there be some kind of imposed order or convinced them that it needed it. I think that there's a great reliance on the architectural vocabulary of the buildings to hold it all together.

Arcidi: Meier mentioned that he is trying to have the landscape and the buildings work in concert, but I don't think it's working yet.

Dixon: He stresses gardens and outdoor space as being part of the image of California. One parallel that came to my mind is the anthropological museum in Mexico City, which is around a garden court. It doesn't have a monumental image from the outside, but the geometry of the court and the central fountain is strong. It's probably similar in scale to this one, and it's a parti that you can grasp in an instant.

Murphy: It seems to me to be a contradiction in terms to have Richard Meier do a California-type building. Southern California is a pretty loose place, and Richard is not known to be exactly loose. Some of the problem may lie in trying to be informal but not quite getting there.

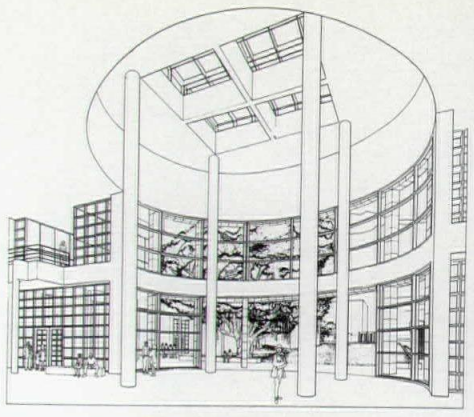
Dixon: Another comparison would be Gehry's Loyola Law School (P/A, Feb. 1985, p. 67). On a more modest scale, Gehry handled that beautifully, right there in L.A. The buildings are set around at angles and are somewhat disparate, and there's one strong bounding building that contains it all. It's all beautifully resolved using a lot of the same strategies.

Arcidi: When one thinks of Richard Meier's other buildings – museums, public buildings – they're glistening objects, beautiful because they are foreign pieces set in the fabric. Here he is providing his own context. What you see is elevation after elevation with wonderful moments – *brise-soleil*, stairs outside, porches, curves attached to corners – but it ends up being rather homogeneous in the end, like a lot of – I hate to say it – office parks.

Murphy: It will be tough to tell until we see what materials are where.

Fisher: But it is true that strip windows inevitably recall that kind of image.

Dixon: One problem with the process may have been that the parti became institutionalized very early, and then there was a long period of time for refinement during which the parti couldn't be chal-



PERSPECTIVE, MUSEUM ENTRY ROTUNDA

lenged. So we find all the evolution is basically fiddling with things.

Branch: Could anyone have done something cohesive and clear within the envelope, within the limits he had? Was it an impossible dream?

Dixon: You have to concede that he was somewhat hobbled. But Stirling's Stuttgart gallery isn't high or monumental, seen from outside.

Fisher: We can talk all we want about how the client or the community hobbled him, but what the architect brings to a project is some kind of a coherent strategy, be it an ordering system or even a disordering system.

Dixon: One can imagine what Zaha Hadid would propose here – they wouldn't accept it, probably – what Stirling would propose here, what Venturi would propose. Venturi's building in London was also rather hobbled by all kinds of controversy and review. Meier talks about the number of community meetings and the number of design restrictions.

Arcidi: Which went from 107 to 200-plus.

Dixon: And the client, in line with the image they're trying to build, seems to have wanted to concede every one of these two hundred points. They don't seem to have ever stood up and said "The hell with this. Any more requirements and we're going to pick this whole thing up and take it to Denver or some place."

Arcidi: But there's no denying it's a chunky, massive complex. All of this almost overweaning courtesy to the neighbors is really rather curious with a patron who's going to have quite a presence, a citadel on the hill.

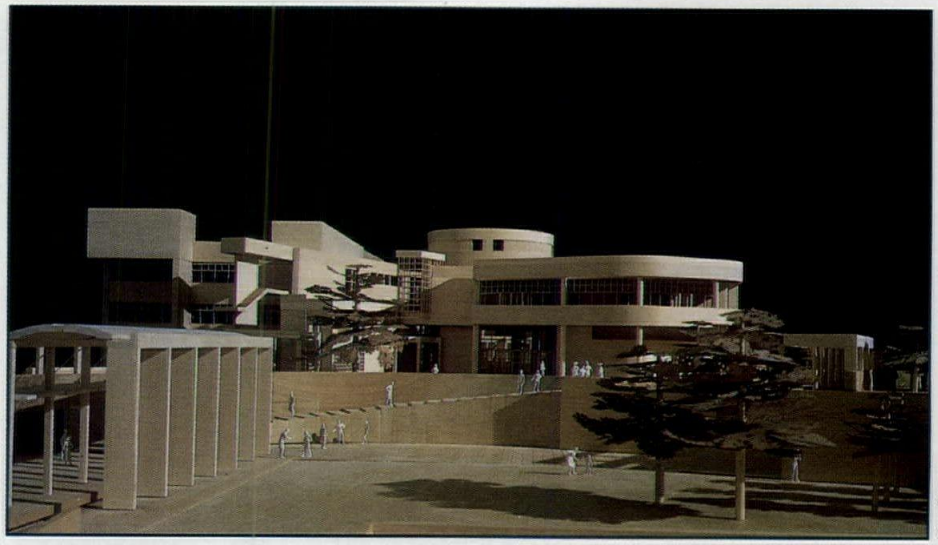
Fisher: And however open it is to the public, there is still this notion that art is removed from life, that art is somehow a pure experience .

Dixon: Well, they have this community of scholars they want up there too, and that's a major force in there.

Fisher: It's ironic that an institution that does not collect Modern art has hired a Modernist architect. Modern art was an attack on the traditional notion of the cloistered art world. And yet here, Modernism, at least in the hands of somebody like Meier, has become a high art activity. The building itself is a "collectible."

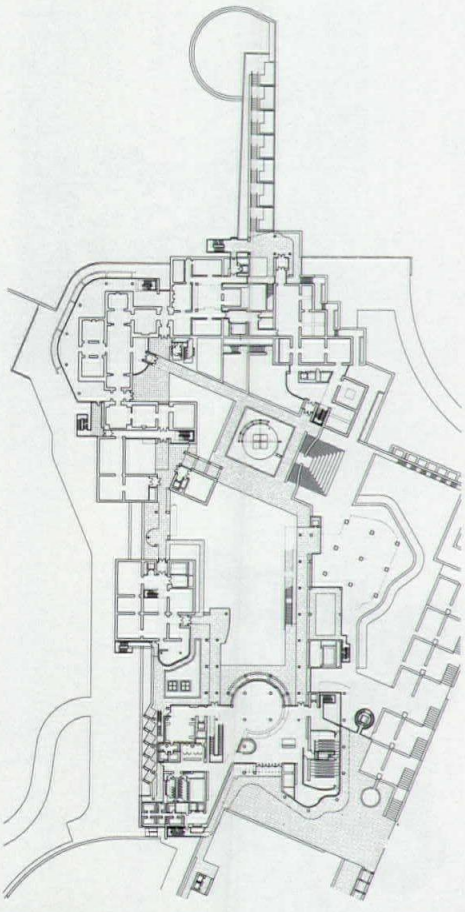
Arcidi: Any institution wants to make sure its money is well spent, and Meier is a safe bet. If they want to go with something Modern, Meier is one of the most durable.

Dixon: I'd like to bring up another point. Another



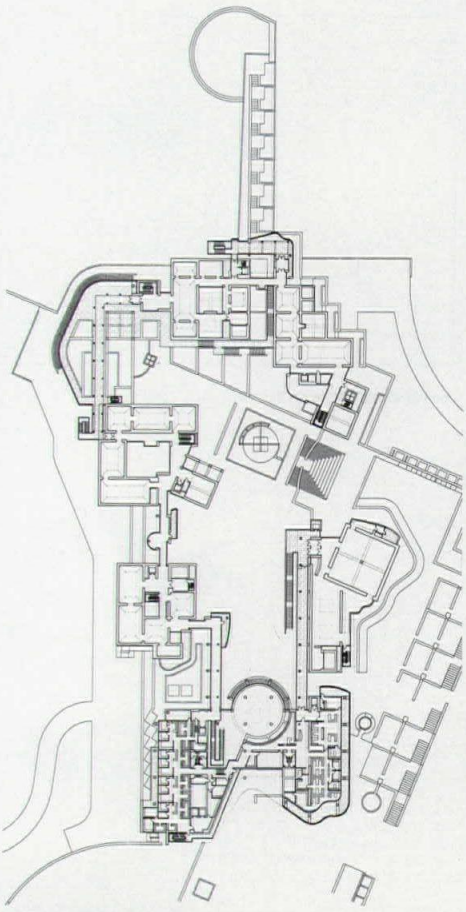
MODEL, MUSEUM ENTRANCE

Tom Bonner



FIRST FLOOR PLAN, MUSEUM

N 100'/30m

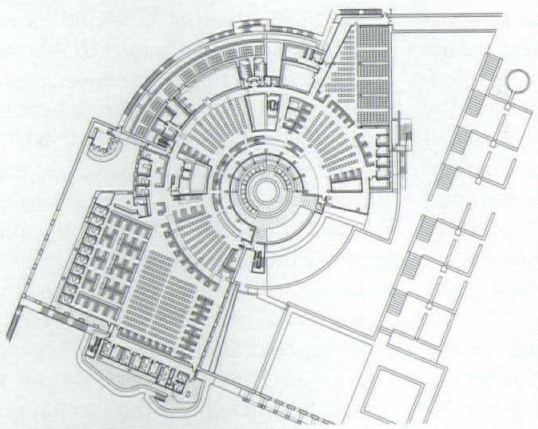


SECOND FLOOR PLAN, MUSEUM

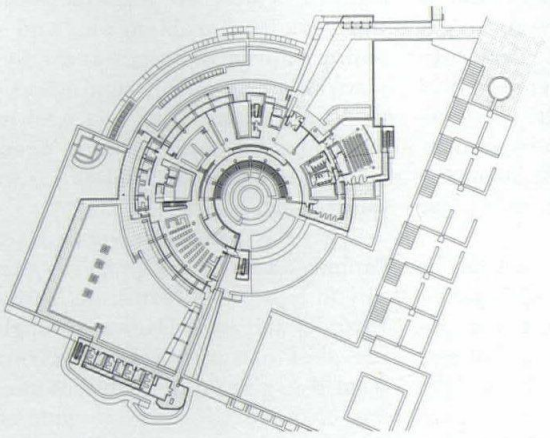
"Some of the problem may lie in trying to be informal but not quite getting there."

Tom Bonner

MODEL, CENTER FOR THE HISTORY OF ART AND HUMANITIES



FIRST LOWER LEVEL FLOOR PLAN



FIRST FLOOR PLAN

N 100'/30m

plum commission over the last half of the century was the Parliament House in Canberra, Australia (P/A, Aug. 1988, p. 65). It is another expensive, enormously complicated project, but it was awarded through an open competition. When a design wins a competition, the architect and the design are given a lot of stature, and the client has to basically accept the design. In the kind of selection process here, although there's much talk about how it allows the architect to work with the client in developing the design, the architect starts out in a more subservient position than somebody who has won a competition.

Fisher: That's a very interesting point. As Meier talked about this, he sounded like a service-oriented architect. Instead of starting with a strong design idea, he was put in the position of accommodating and reconciling these complex functions.

Murphy: That was one of the great things about Canberra; the parti sketch was so simple, so clear, and they maintained it very well.

Fisher: You know, this project is similar in a way to Disneyland in that they are probably the only institutions in this city where people will check their car and make a kind of pilgrimage. And what is Disneyland but a series of fragments, a series of clearly dissimilar pieces. I wonder if we are so imbued with certain kinds of architectural notions of what order should be that we are missing something here. Is there a kind of order that the public may understand, simply by this being a series of unrelated fragments, of Tomorrowland next to Adventureland?

Branch: You mean Meier's gone over our heads to the public?

Fisher: As I said, it's a possibility. He never let on to that. I was actually listening for some kind of analogy to aspects of pop culture that are inherently nonarchitectural, nonspatial, but could conceivably be the starting point to making a work of architecture.

Dixon: We should concede that this cannot be a definitive critical judgment. We're looking at a complicated building that's not communicated well by two-dimensional drawings. The vignettes we've seen are not encouraging. They don't support the design very well. But it may succeed by the accumulation of effective vignettes. It may be much more successful than we imagine. ■

Books

The Failure and Success of Walter Gropius

Prompted by an authorized biography, **Jonathan Hale** assesses the benefits Gropius promised with the Modern Movement.

Books of Note

Arata Isozaki: Architecture 1960–1990, *preface by Richard Koshalek, Rizzoli, New York, 1991, illus., 304 pp., $50 cloth, $30 paper.*
Published to coincide with a retrospective at the Museum of Contemporary Art, Los Angeles, this monograph presents Isozaki's uniquely animated Modernism.

Community Design and the Culture of Cities *by Eduardo E. Lozano, Cambridge University Press, Cambridge, Massachusetts, 1991, illus., 340 pp., $65 cloth, $24.95 paper.*
In this interdisciplinary study Lozano argues for a closer alliance between design and culture in the shaping of cities and smaller communities.

Precisions: On the Present State of Architecture and City Planning *by Le Corbusier, translated by Edith Schreiber Aujame, MIT Press, Cambridge, Mass., 1991, illus., 267 pp., $29.95 cloth.*
This new translation of Le Corbusier's writings, with transcripts of his lectures delivered in Buenos Aires in 1929, holds many of the architect's most incisive thoughts on the Modern Movement.

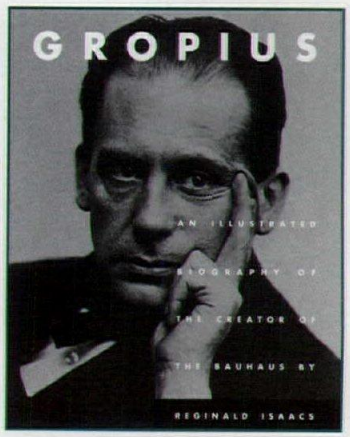
In the Footsteps of Le Corbusier *edited by Carlo Palazzolo and Riccardo Vio, Rizzoli, New York, 1991, illus., 270 pp., $29.95 paper.*
Reprinted and newly-commissioned essays by contemporary architects and academics parallel Le Corbusier's multifaceted ideology.

Walter Gropius always said Modernism was not just a style. But these days Modernism is nothing but another box in the architectural grab-bag, and the pedestal Walter Gropius used to occupy has long been empty. Still, there lurks a sense that in the process of demoting Modernism, architecture has pushed aside something important. The movement Gropius came to personify broke its promise to make the world beautiful; but it is worth noting that the vision Gropius pursued went beyond Modernism or Post-Modernism or the other current isms. Architecture is again looking for principles. That is what Gropius was looking for. This is a good time to reappraise his successes, as well as his failures.

Reginald Isaacs' *Walter Gropius: An Illustrated Biography of the Creator of the Bauhaus* is not such a reappraisal, but it is a stimulation to one. Indeed, the book is almost an incitement to a reconsideration, for it is so complete, so authoritative, yet so maddeningly uncritical. Although the biography is newly published, by Bulfinch Press, much of it was written during the subject's lifetime (Gropius himself wrote the Foreword before his death in 1969). Isaacs himself died in 1986, having published the biography in a 1300-page German edition, which Gerard Van der Leun edited into this accessible version. To read Isaacs' book is to look at Gropius and Modernism across a divide, to the era when Modernism was the answer, and Gropius was yet to topple. It reads as if the last 25 years had never happened.

This is not to belittle the book. It belongs on the shelf of anyone who cares about the history of Modernism. It is thorough, readable, and beautifully produced. When covering Gropius's personal life, it is exhaustive; the affair with Alma Mahler is recounted to the last love note. We begin to get some idea what sort of person Gropius was: charismatic, lovable, brilliant, visionary, enamoured of the powerful, capable of real cruelty. It says something of Gropius that he permitted his biographer to reveal so much. But all the frankness about the personal life merely underlines the book's great unasked questions about his work.

When Walter Gropius summed up his goals in *The Scope of Total Architecture* (1954), he said that he had aimed to get back to the harmony that was routinely available to design before the industrial era, and to integrate that quality into the Machine Age. In a way, Gropius himself admitted the possibility that something might be going wrong. He wrote in



Walter Gropius: An Illustrated Biography of the Creator of the Bauhaus *by Reginald Isaacs, Bulfinch Press, New York, 1991, 368 pp., illus., $40.*

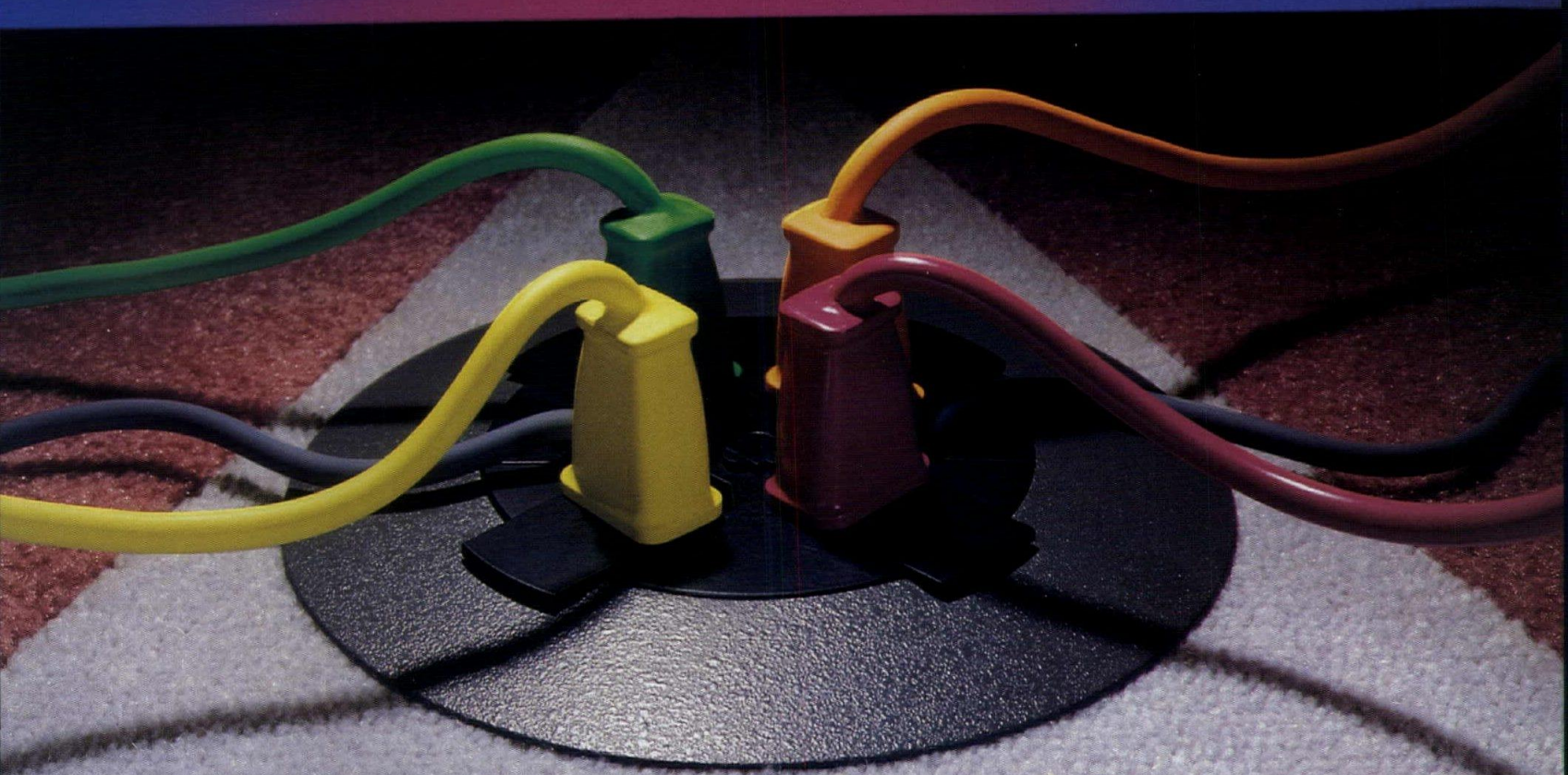
Scope: "A 'Bauhaus Style' would have been a confession of failure and a return to that devitalizing inertia, that stagnating academism which I had called [the Bauhaus] into being to combat.... There is no such thing as an 'International Style'."

But there was a Bauhaus style. It was the style of the century, and it was Gropius's baby, like it or not. Just as Gropius knew he couldn't pursue his vision through the replication of old styles, he knew there must not be a Bauhaus Style. This is why Gropius so disingenuously denied the existence of the International Style, but it is also why Gropius still counts. The International Style did solve the problem of how to express the machine in architecture, at least as machines were in 1925. But, as Gropius said, to express the machine wasn't the central problem. The problem was, and still is, how to express life in buildings and cities in an age of machines. The quality that makes Gropius's best buildings come alive has nothing to do with machines. Gropius's belief in deeper principle – and the buildings themselves – is what makes him valuable today.

There is a strange sort of self-betrayal in Gropius's story. Although we was given the opportunity to build his dreams, his designs after about 1940 became stale. Halfway through his career, at the peak of success, he declared victory, and seemed to give up the fight unwittingly. The buildings of his last 30 years have little of the energy of

(continued on page 141)

FOUR ON THE FLOOR AND MORE...



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Technics Focus
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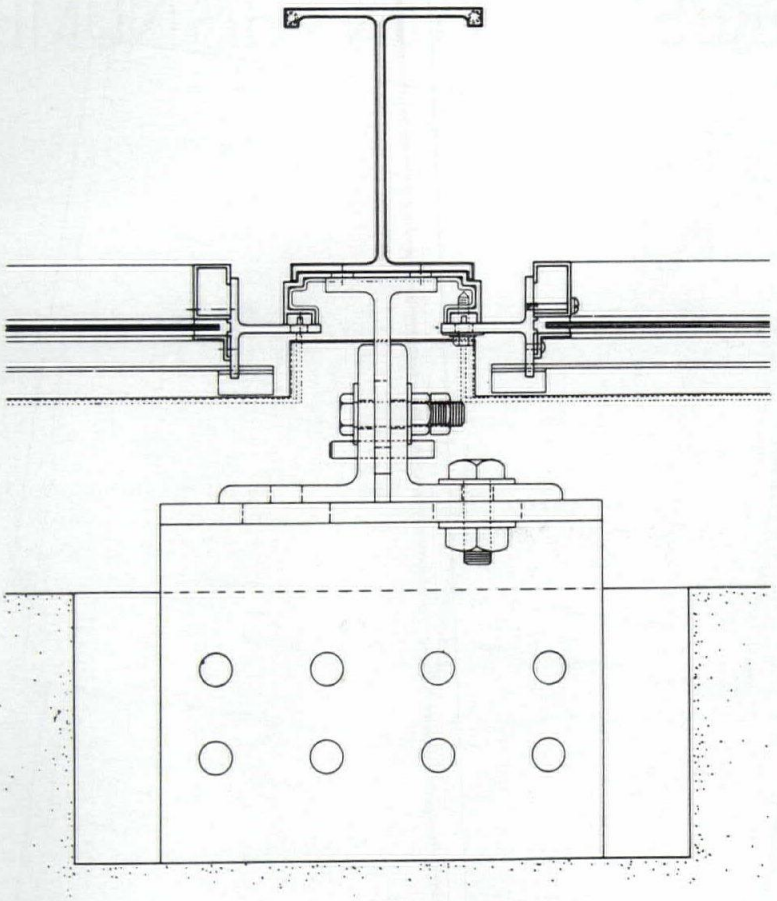

Plan through mullion at top of spandrel, the Seagram Building, New York, by Mies van der Rohe and Philip Johnson, Architects.

Drawings pp. 114–118, 124, 126: Evan I. Goldenberg

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In a follow-up to our November Focus on new exterior cladding, this month's Technics Focus looks at the maintenance and repair of cladding, including the updating of early curtain walls, the restoration of historic stucco, and the analysis and repair of steel stud/brick veneer walls.

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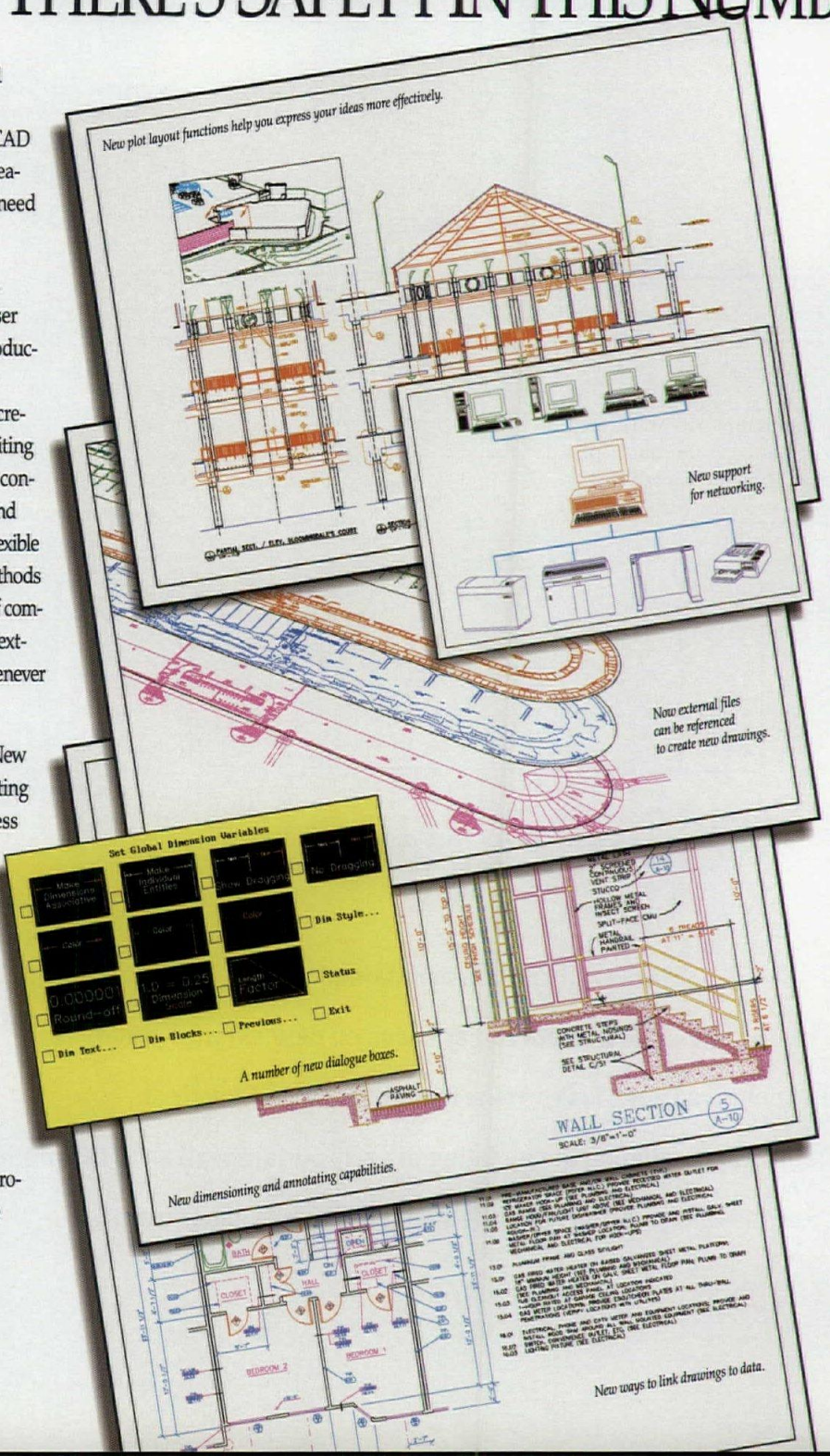

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Technics
Steel Stud/Brick Veneer Walls

Tom Trestain, structural engineer, and **Jacques Rousseau** of the Canada Mortgage and Housing Corporation

discuss the controversy and research findings regarding steel stud/brick veneer walls.

Steel stud/brick veneer walls have been widely used in North America as an economical wall system that combines the pleasing appearance and durability of brick with the structural reliability of steel. This system, however, has been the center of much controversy. Its rapid adoption by the building industry has, until recently, preceded the development of adequate standards. In fact, designers considering using it have been faced with a bewildering array of opinions about even the most fundamental design issues.

The Metal Lath/Steel Framing Association, for example, endorses the system and has historically claimed that a deflection limit of $L/360$ will adequately guard against the onset of flexural cracking in the brick.[1] But the system has been condemned by others who argue that a design deflection limit of $L/2000$ is required to avoid ultimate structural failure and that the system is so apt to corrode that it ought to be rejected outright.[2] Another recent article concluded that,[3] "The system should be used in new construction only with the understanding that its behavior is not well understood, its experience life is limited, and the life of the walls may be limited." In the face of such controversy and uncertainty, the Canada Mortgage and Housing Corporation (CMHC), the Canadian Government's housing agency, commissioned a number of laboratory and field studies of the design and construction of this wall system (see Research and Development sidebar).

Behavior of the System

To engineer a steel stud/brick veneer wall, the distribution of forces should be considered both before and after the flexural cracking of the brick face. The maximum load on the brick ties occurs before cracking; the maximum load on the steel stud backup occurs after cracking.

With uncracked brick veneer, the distribution of loads between the brick and the stud backup is a highly indeterminate problem that depends on 1 the relative stiffness of the studs, the brick, the brick ties, and the top and bottom tracks, 2 the type of restraint at the top of the brick veneer, 3 the wind loads on the veneer, on the backup wall, or both, and 4 the presence of openings in the wall. All these factors need to be taken into account to predict load distribution accurately. Nevertheless, some useful understanding can be gained from an approximate analysis, leading to a reasonable estimate of the maximum load on the brick ties and the tensile stresses in the brick that causes cracking (see Load Analysis sidebar and reference 1).

Common Misconceptions

Critics of steel stud/brick veneer wall systems have historically equated structural failure of the walls with the onset of flexural cracking in the brick veneer, and have argued that steel studs are not sufficiently stiff to prevent this cracking.[2,13,14,18] Although flexural cracking of the brick veneer should be anticipated in the design of these wall systems, it is not correct to equate flexural cracking with structural failure. In steel stud/brick veneer construction, the flexural cracking of the veneer represents a serviceability limit rather than ultimate structural failure. The width of flexural cracks can be controlled through the selection of the appropriate deflection criterion for the steel studs.

Crack control is not a new concept; it has been used in reinforced concrete design for decades. Calculations, for example, that are based on a deflection limit of $L/720$ hold the average crack width midway through the brick face to approximately .01" (0.25 mm) at working loads. This crack width is consistent with the limits imposed on crack size in reinforced concrete standards.

Opponents of these wall systems also argue that flexural cracks let in wind-driven rain.[2,18] A series of full-scale steel stud/brick veneer wall tests done at McMaster University included simultaneous application of air pressure and simulated rain.[11] There was no significant increase in water penetration through flexural cracks, provided that the wall behaved as an open rain screen (see P/A, Aug. 1990, pp. 47–52 for a discussion of the rainscreen principle) with the cavity pressurized. The researchers concluded that "...increased vulnerability of the system to excessive leakage and moisture damage as a direct result of flexural cracking has not been demonstrated."

Critics have claimed, as well, that the steel studs are much more vulnerable to moisture damage than the alternative backup material, concrete masonry. There is some merit to this argument, but with the proper design, detailing, and construction, corrosion problems can be avoided. For example, in environmental studies simulating winter conditions,[10] rusting was detected on a self-drilling sheet metal screw and the burr that formed around the screw because the cold side of the stud fell below

Research and Development

The Canada Mortgage and Housing Corporation (CMHC) has sponsored research into steel stud/brick veneer wall systems that has built upon earlier work[12–15] and has taken five years to complete. This research is documented in eight reports on various aspects of the system's performance.[4–11] CMHC has also funded a comprehensive advisory document *Exterior Wall Construction in High Rise Buildings: Brick Veneer on Concrete Masonry or Steel Stud Wall Systems*[16] that reviews the critical design, construction, and inspection issues that affect long-term performance. Wanting to get more information into the hands of building designers, the Canadian Sheet Steel Building Institute, with the assistance of the American Iron and Steel Institute, has also funded the *Lightweight Steel Framing Design Manual*,[17] which concentrates on the structural aspects of steel stud backup, but includes a section on the structural, building science, and construction issues pertinent to these systems.

Load Analysis

To simplify the analysis of the loads on a steel stud/brick veneer wall system, the following assumptions can be made:

- The stud backup and the uncracked brick veneer are separate flexural members, each capable of carrying loads. The studs span from bottom to top track and the brick from the shelf angle to the top tie.
- The brick and stud span lengths are equal.
- The brick and stud wind-load deflections are equal.
- The end supports for the brick and the studs do not move under wind loads.

Based on these assumptions and by equating deflections, a load-sharing formula can be derived:

$$W_{brick} = W_{total} / [1+(EI)_{stud} / (EI)_{brick}]$$

$$W_{stud} = W_{total} - W_{brick}$$

Where W_{stud} and W_{brick} = wind load carried by the brick and stud respectively acting as simply supported beams.

For 3 ⅝" x .048" steel studs at 16" o.c. and a 3 ½" thick brick veneer, the brick carries 88 percent of the wind load and the studs, the remaining 12 percent. This is derived as follows:

$$E_{brick} = 2{,}900 \text{ ksi}$$
$$I_{brick} = (1/12)(12)(3.5)^3 \} = 42.9 \text{ in}^4/\text{ft}$$
$$E_{stud} = 29{,}500 \text{ ksi}$$
$$I_{stud} = 0.732(12/16) = 0.549 \text{ in}^4/\text{ft}$$

Substituting:

$$W_{brick} = W_{total} / 1+29{,}500(0.549) / 2{,}900(42.9)$$

$$W_{brick} = 0.88\ W_{total}$$

$$W_{stud} = (1 - 0.88)\ W_{total} = 0.12\ W_{total}$$

From this approximate analysis, taken before the veneer cracks, the top brick tie acting as an end support carries a load of :

$$(0.88\ W_{total}) \times \tfrac{1}{2} = 0.44\ W_{total}$$

This agrees with the results of an indeterminate analysis [5] with the wind load applied to the veneer only. The indeterminate analysis also indicates that after

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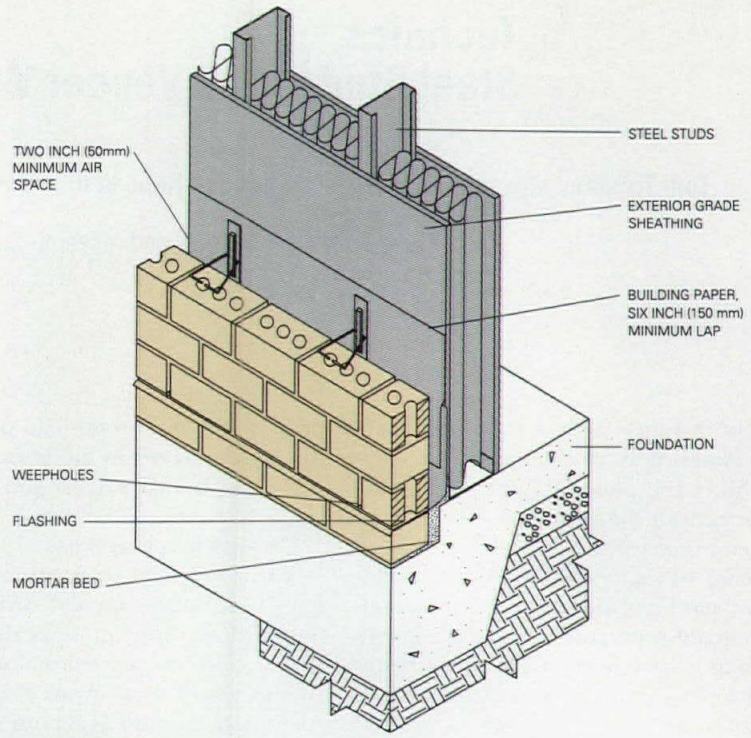


CUTAWAY OF AXONOMETRIC OF STEEL STUD/BRICK VENEER WALL

the dew point temperature in tests with no exterior insulation. In subsequent tests with the addition of one inch of rigid exterior insulation, stud temperatures were kept above the dew point and no corrosion was observed. Proper insulation is only one aspect of corrosion protection.[10] For other important considerations refer to the design and construction recommendations.

Finally, opponents of steel stud/brick veneer systems have stated that commercial brick ties are inadequate. It is true that there are a number of inadequate brick ties on the market, but this is not a problem peculiar to these wall systems. Research has focused on the load and resistance requirements for ties in these systems and has found that a number of commercially available ties do not meet the proposed performance criteria, but that some do.[5,6] The wrap-around style of tie and its bayonet-style cousin are among the better ties that meet the proposed criteria. Also, thermal bridging with the wrap-around ties was found to be minimal.[10]

Design and Construction Recommendations

The following recommendations are intended to provide a robust steel stud/brick veneer wall system with an emphasis on redundancy. This "belt and braces" approach results in a wall resistant to long-term loads, both environmental and structural.[23]

Brick Ties

- Connect the ties directly to the steel studs without relying on the compressive strength of the exterior sheathing to transfer positive wind pressure to the studs. Exterior sheathings such as drywall and rigid insulation do not, in general, have adequate long-term compressive strength and stiffness.
- When connecting the tie to the stud, do not depend on sheet metal screws that penetrate the outside flange of the stud. This type of "pull-out" connection is susceptible to failure through corrosion of the screw and the hole surface.
- Provide ties with corrosion resistance conforming to the minimum requirements of CAN3-A370-M84 20 or better. This standard requires, at a minimum, hot-dipped galvanizing after fabrication.
- Ties should be adjustable and retain adequate strength and stiffness when at the outer limits of adjustment.
- Limit mechanical play to a maximum of 0.031" (0.8 mm) and deformation to a maximum of 0.047" (1.2 mm) at 112 pounds (0.5 kN) of load in either tension or compression.
- Minimize the projected horizontal area that can act as a platform for the accumulation of mortar droppings.

Steel Studs and Tracks

- Design the backup steel studs for the full wind load, with a deflection limit of $L/720$.
- Use a minimum steel thickness of 0.048".
- Design, select, and specify steel studs without relying on sheathing to resist torsion and weak axis buckling.
- Provide bridging at a maximum spacing of 48" on center.
- Provide a minimum G90 galvanized or equivalent metallic coating.

Control of Water Penetration

- Design the wall system as an open rain screen (see Rain Screen sidebar).
- Provide a tight air barrier on the warm side of the insulation and preferably on the warm side of the stud. The warm side is preferred because the air barrier will not be subject to the deleteri-

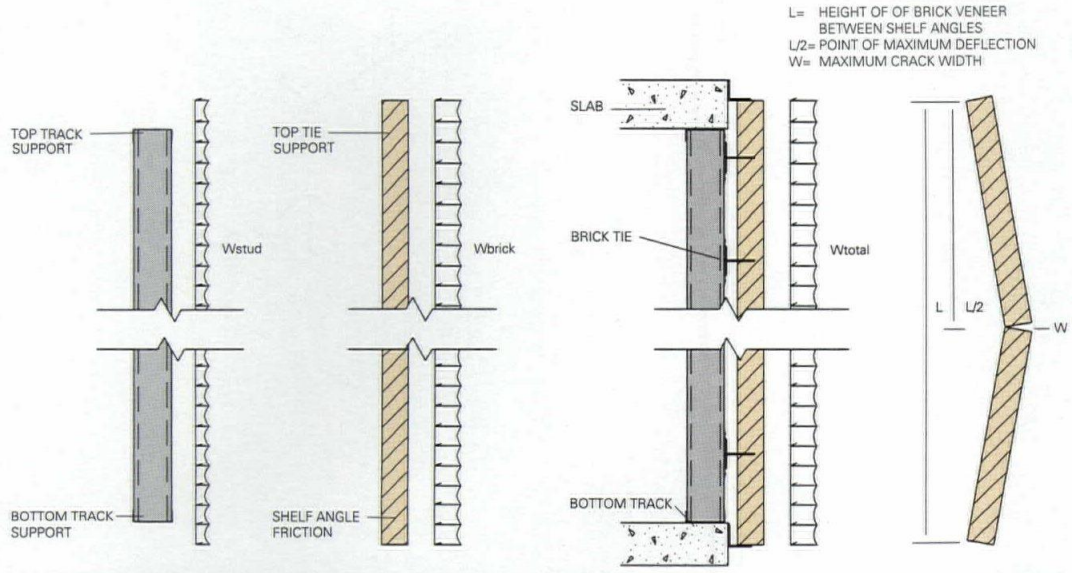


DIAGRAM OF HORIZONTAL FORCES ACTING ON THE WALL, WITH THE TOTAL (Wtotal) AS THE SUM OF THE FORCES ON THE STUD (Wstud) AND THE FORCES ON THE BRICK (Wbrick)

DIAGRAM OF BRICK DEFLECTION

ous effects of moisture, and the air barrier can be maintained over the life of the wall. The inner layer of drywall is suitable for this purpose provided it is adequately attached to the supporting studs and service openings, such as electrical boxes are sealed (see P/A, Sept. 1991, pp. 45–51).

- Provide sealant between perimeter members that support the air barrier and the building structure (top and bottom tracks and the last studs that abut columns or shearwalls).
- Provide vertical partitioning of the cavity at least at building corners.
- Provide standard weepholes and vents at standard spacings. These openings are sufficient for cavity pressurization.
- Provide brickwork that conforms to the requirements of good masonry practice, including filled, well-tooled mortar joints, flashings, functioning weepholes, and caulked movement joints.
- Provide a two-inch air space to minimize potential bridging of the cavity by mortar fins and droppings.
- Provide a water-resistant barrier on the exterior of the stud backup to prevent any water that has breached the other defenses from entering the stud wall.
- Do not place air barriers, either intentionally or unintentionally, on both sides of the insulation in the stud space.
- Provide drain holes in the bottom track.

Insulation

- Provide a minimum of 1" of rigid insulation on the cold (exterior) side of the steel stud backup.
- Provide insulation in the stud space in combination with rigid exterior insulation to attain the required R-value. It is best to proportion the insulation so that the dew point falls in the rigid exterior insulation. The dew point can be determined using conventional through-the-wall thermal calculations, ignoring the presence of the studs.

Shop Drawings and Field Review

- Require shop drawings for the steel stud backup to be stamped and signed by a qualified professional engineer.
- Require field review during construction by the steel stud design engineer responsible for the production of the shop drawings.
- Require inspection of the complete wall assembly by a qualified independent inspection agency.

With the research done to date, the information is at hand to properly design and build steel stud/brick veneer wall systems. Designers can now choose these systems with the confidence that they are providing building owners with an economical, well-researched, robust, modern building technology.

Tom Trestain, P. Eng., and Jacques Rousseau ■

Tom Trestain is a structural engineer in Toronto who was commissioned by the Canada Mortgage and Housing Corporation to write this article.

Jacques Rousseau is a project manager with the Project Implementation Division of Canada Mortgage and Housing Corporation (CMHC). He is involved in the performance of the building envelope: researching air barrier systems, rain screen wall systems, and different wall assemblies systems such as brick veneer/steel stud and exterior insulated finish systems.

References and Recommended Readings

(For information about work sponsored by the CMHC, contact the Canadian Housing Information Centre, Canada Mortgage and Housing Corporation, Ottawa (613) 748-2367.)

(continued from previous page)

cracking, again with wind loads applied to the veneer, the load on the mid-height tie will approach the same value. Thus, for this example, the brick ties should be designed for a tributary area of 0.44 x height of one storey x stud spacing. Obviously the old notion of designing for a tributary area equal to the horizontal x the vertical tie spacing is inadequate.

The flexural tensile stress, f_t, in a 8'6" high, brick veneer wall can be calculated as follows:

Wall height = 8'6"

W_{total} = 25 psf

Brick thickness = 3½"

From the approximate analysis:

$W_{brick} = 0.88\ W_{total}$

$= 0.88\ (25) = 22$ psf

For a one-foot section of brick:

$S_x = (\frac{1}{6})(12)(3.5)^2$

$= 24.5\ in^2$

$M_x = (W_{brick} \times H^2) / 8$

$= 22\ (8.5)^2\ (12) / 8$

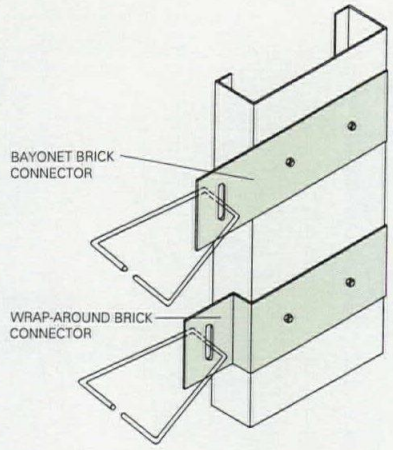
$= 2380$ in.lbs

$f_t = M_x / S_x$

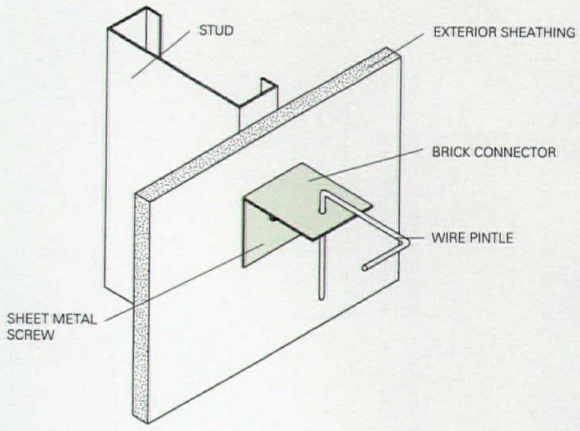
$= 2380 / 24.5$

$= 97$ psi

The ultimate value for the flexural tensile stress in brick ranges from 30 to 130 psi.[5] Therefore, with an actual stress of 97 psi, veneer cracking is likely, but not certain. After the brick veneer cracks, the brick is assumed to form a hinge at midspan and lose its ability to span from floor to floor. Testing and computer studies[5,11] have indicated that, in fact, the cracked brick retains a portion of its initial flexural strength and stiffness but this is typically ignored in design and the full wind load is applied to the steel stud back-up.



RECOMMENDED BRICK CONNECTIONS



DETAIL SHOWING MECHANICAL ATTACHMENT OF BRICK CONNECTOR TO STEEL STUD

Rain Screen

The open rain screen design approach is essential to the successful performance of steel stud/brick veneer walls. The following is taken from a research report published by the National Research Council of Canada: [21]

"An open rain screen wall consists of two wall layers separated by a cavity. The cavity is vented to the outside by openings in the outer layer (brick veneer) to allow rapid equalization of cavity and external pressures (due to wind). Most of the pressure difference across the building envelope is thereby transferred to the inner layer (the steel stud/air barrier assembly), so that when the rain screen is exposed to wind and rain there should be little or no pressure drop to carry the rain across the rain screen and into the cavity. The wall cavity provides a break in the path of any water that may cross the rain screen. The water is compelled to run down the inside of the rain screen and drain out. The air barrier assembly remains mostly dry. In addition to intercepting rain drops (and other impacting particles or objects), the rain screen shields sensitive components in the air barrer assembly (joints, sealants, and insulation) from the deleterious effects of ultraviolet radiation from the sun."

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18 "The Failure of Steel Studs," J.W.Cowie, *ENCON Loss Control Bulletin #89*, ENCON Insurance Managers, Ottawa, (613) 238-6373 (ext. 281), September 1990.
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20 "CAN3-A370-M84, Connectors for Masonry," Canadian Standards Association, Toronto, (416) 747-4044, 1984, 55 pp.
21 *Wind Pressures on Open Rain Screen Walls: Place Air Canada*, U. Ganguli, W.A. Dalgleish, NRCC 28859, National Research Council of Canada, Ottawa (613) 993-2463, July 1987.
22 "Technical Notes on Brick Construction," 28B Revised II, Brick Institute of America, February 1987.
23 These recommendations were taken from from references 4–11, 16, 17. The recommendations are not necessarily the conclusions and recommendations proposed by the researchers.

Brick Institute Recommendations

Brian Trimble of the Brick Institute of America offers further advice on steel stud/brick veneer construction.

Steel stud/brick veneer wall assemblies have been widely used since the mid-1960s. Initially, problems were encountered with them because of a lack of understanding of this type of construction, although many papers and articles have been written on ways of improving the performance of the system. Since then, technology has been introduced to make the steel stud/brick veneer system viable. Based on this history and analysis of the system, the Brick Institute of America (BIA) has provided designers with information on how correctly to design and detail this system, from which the following suggestions were drawn.* Note that many of these suggestions apply to all types of brick walls, not just steel stud/brick veneer systems.

Structural Behavior

Veneer is defined as a nonstructural facing attached to a backing for ornamentation, protection, or insulation. Yet despite its definition as being nonstructural, brick veneer does indeed resist loads. The model building codes, for example, require that the steel stud backing resist all loads except the weight of the veneer. Deflection of the steel stud backing system at full lateral design load should be less than stud span length divided by 600.

- Disregard any contribution of gypsum sheathing in determining stiffness of the backing.
- Lateral bracing of the studs is necessary for torsional stiffness. Internal bridging attached to the studs by clip angles or a rigid sheathing may be used to brace the studs.
- Additional studs may be necessary at openings to carry the additional loads. The double studs should be fastened together.
- A minimum 18-gauge steel stud with corrosion protection equal to ASTM G-90 should be used.

Ties

Metal ties used between veneer and backing transfer loads in a non-uniform manner. Ties at the top and bottom of the brick panel take the most load.

- Corrugated metal strip ties should not be used.
- Adjustable metal ties should be spaced at one tie for every 2 square feet of wall area and spaced a maximum of 24" o.c. horizontally and 18" vertically.
- Additional ties should be placed within 8" to 12" inches of openings or edges of the brick panel.
- Ties should be hot-dipped galvanized in accordance with ASTM A153, Class B-2.
- Screws used to attach ties to the studs should be coated to resist corrosion.
- Ties, screws, and studs should be selected to limit galvanic action between differing materials.

Shelf Angles

The brick veneer should be supported on shelf angles at every floor. An expansion joint (soft joint) should be located directly beneath the shelf angle and only compressible materials should be used in this joint, not mortar.

- Do not weld shelf angles directly to the steel studs. Structural hangers or heavy gauge studs which are shop-welded could be used if necessary.
- In ribbon window structures where the shelf angle does not coincide with a spandrel or beam, kickers may be necessary to reduce rotation of the masonry support.
- Shelf angles should not be installed as one member. Provide spaces at intervals to permit thermal expansion of the steel.

Expansion Joints

Expansion joints in the brick veneer must be properly sized and located. Horizontal expansion joints should be placed at shelf angles; vertical expansion joints should be placed to accommodate horizontal expansion of the brickwork.

- The expansion joint (not control joint) should comprise highly compressible materials, usually a foam backer rod and elastomeric sealant.
- Typical placement of expansion joints include long runs of wall, corners,offsets, parapets, openings, and wall junctions. See BIA Technical Notes 18 Series for more information.

Water Penetration Resistance

Brick veneer walls are drainage-type walls that rely on a clear open cavity, flashing, and weepholes to provide water penetration resistance. A minimum 2" air space is recommended between the brick veneer and exterior sheathing. The air space must be kept free of mortar and other debris. Proper flashing and weepholes are necessary to direct back to the exterior water that has penetrated the wall.

- Flashing should be located at all discontinuities in the air space, including shelf angles, window heads, foundations, top of walls, and parapets.
- Flashing should extend all the way through the

brick veneer and form a drip. Flashing held back from the face will not allow proper drainage of water.

- Flashing ends should be lapped at least 6" and sealed with proper materials to avoid water penetrating the flashing.
- Flashing should be turned up at discontinuous ends to form a dam.
- Weepholes should be placed directly above flashing. The spacing of open head joints or weeptubes should be 24" o.c. Rope wicks should be spaced 16" o.c.
- A moisture-resistant membrane should cover the exterior sheathing and be lapped at least 6" or a moisture-resistant sheathing with joints taped may be used.
- A condensation analysis should be run to determine if and where condensation will occur. If necessary, a vapor retarder should be placed on the warm side of the wall (at the inside of studs in northern climates and outside of studs in humid climates).

Parapets

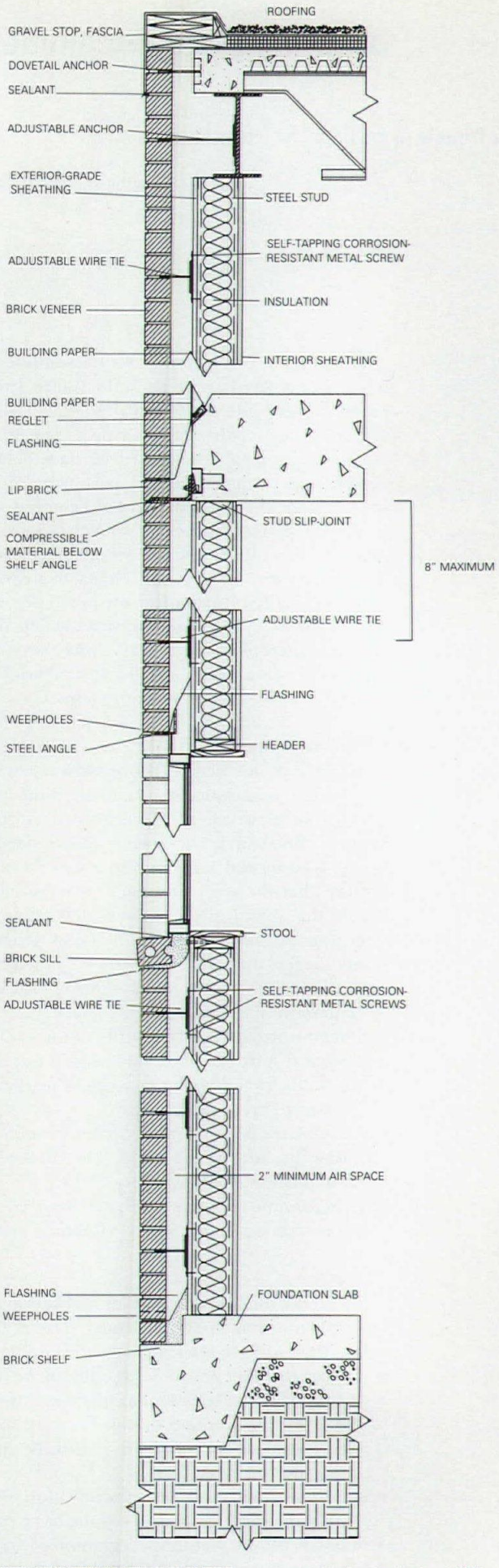
Parapets are vulnerable to the elements. Steel studs should not be used as a backing in the parapet because of the differential movement of the brick and steel studs and the flexibility of the stud.

Construction

Although a project may be designed and detailed adequately, proper performance is achieved only with proper construction. Full mortar joints and a clear air space do more to reduce water penetration than many design details. A preconstruction conference or good inspection may be required to achieve proper construction. With these suggestions and those found in BIA Technical Notes 28B, a designer has the tools to design and detail properly a steel stud/brick veneer wall system. Such a system is not without its faults, but it is one that can perform adequately when these recommendations are followed. **Brian Trimble** ■

The author is a senior engineer in the Engineering and Research section of the Brick Institute of America.

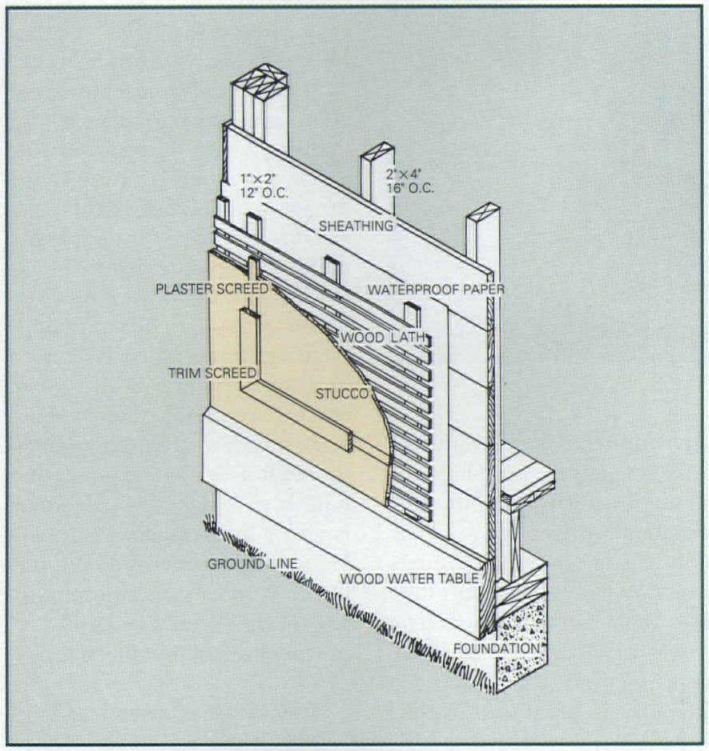
* These recommendations are found in *BIA Technical Note on Brick Construction 28B, Rev II* (Feb. 1987), "Brick Veneer Steel Stud Panel Walls." Since *Technical Note 28B Rev. II* was published, BIA has gathered additional information on the steel stud/brick veneer system, which is reflected in these recommendations.



STEEL STUD/BRICK VENEER WALL SECTION 1"/.3m

Repairing Historic Stucco

Anne Grimmer of the National Park Service's Preservation Assistance Division describes the analysis, repair, and replacement of historic stucco.



CUTAWAY AXONOMETRIC OF A WOOD-FRAMED STUCCO WALL

Stucco has been used since ancient times. Still widely employed throughout the world, it is one of the most common of traditional building materials. Stucco can be defined as a type of exterior plaster, applied as a two- or three-part coating directly to masonry or over wood or metal lath to a wooden structure. Up to the late 1800s, stucco, like mortar, was primarily lime-based, but the popularization of portland cement changed the composition of both, making them much harder materials.

Stucco is employed as both a decorative and a protective coating primarily on residential buildings and on relatively small-scale commercial structures. It is an inexpensive material that, when "scored" or "lined" in the European tradition, can successfully imitate finely dressed stonework. A stucco coating over a substrate such as fieldstone, rubble, brick, log, or wood frame, can give a building the appearance of a more important and substantial structure. Yet now such stucco is too often removed to reveal stone or brick that historically was not exposed. As a weather-repellent coating, stucco also prevented penetration of wind and rain and helped safeguard the building from fire.

Regular Maintenance

Although stucco is a protective coating, it is also somewhat fragile and is not particularly permanent or long-lasting. Regular maintenance is required to keep it in good condition. Historically, lime-based whitewash was used to protect, stabilize, and help harden stucco. Most important, it filled hairline cracks before they could enlarge and let in moisture. Unfor-tunately, like most old buildings, many stucco buildings have not been well maintained. The guidance that follows is provided for the architect who is rehabilitating a historic stuccoed building. But it is important to remember that most stucco repairs will require the skill and expertise of a plasterer.

Assessing the Condition

Most stucco deteriorates as a result of water infiltration, either through the roof, around chimneys or window and door openings, or from excessive ground water or moisture penetrating through – or splashing up from – the foundation. Potential causes of deterioration include ground settlement, lintel and door frame settlement, inadequate or leaking gutters and downspouts, intrusive vegetation, moisture migration within walls because of interior condensation and humidity, rising damp resulting from excessive ground water and poor drainage around the foundation, and vapor drive problems caused by furnace, bathroom, and kitchen vents. Previous repairs done with portland cement, which tends to be very rigid, may be incompatible with early, more "flexible" lime-based stuccos, and may have produced cracking. Building settlement or external vibration caused by traffic or construction can also result in cracks that permit the entrance of water and cause stucco to fail. Water infiltration will cause wood lath to rot and metal lath and nails to rust, which eventually will cause stucco to lose its bond and pull away from its substrate.

After identifying problem areas, building repairs should be made to prevent further damage. These may involve replacing roof, gutters, downspouts and flashing, improving drainage, or redirecting rainwater runoff and splash-back away from the building. Horizontal areas such as the top of parapet walls or chimneys are particularly vulnerable to water infiltration, and may require modifications to their original design, such as the addition of flashing, to correct the problem.

Next, an assessment of the stucco itself should be undertaken to determine the extent of damage, and how much must be repaired or replaced. Testing should be carried out systematically on all elevations of the building to determine the overall condition of the surface. Some areas in need of repair will be missing sections or layers of stucco. Bulging or cracked areas are obvious places to begin. Unsound, punky, or soft areas that have lost their key will sound hollow when tapped gently with a wooden or acrylic mallet.

Planning the Repair

Once the condition of the stucco is known, a number of repair options may be considered. Small hairline cracks usually are not serious and may be sealed with a thin slurry coat consisting of the finish coat ingredients, or even with a coat of paint or whitewash. Commercially available caulking compounds are not suitable for patching hairline cracks. Because the consistency and texture of such compounds are unlike those of stucco, they tend to weather differently, and to attract more dirt; as a result, repairs made with caulking compounds may be highly visible and

Anne Grimmer

THE EFFECT OF CAULKING STUCCO CRACKS

unsightly. Larger cracks will have to be cut out in preparation for more extensive repair.

In the interest of saving or preserving as much as possible of the historic stucco, patching rather than wholesale replacement is preferable. When repairing heavily textured surfaces it is not usually necessary to replace an entire wall section, as the textured finish, if well executed, tends to conceal patches and helps them to blend in with the existing work. Because of the nature of smooth-finished stucco, however, patching a number of small areas scattered over one elevation may not be successful unless the stucco has been previously painted or is to be painted following the repair work. On unpainted stucco such patches are hard to conceal because they may not match exactly or blend in with the rest of the historic stucco surface. For this reason it is recommended that, if possible, stucco repair be carried out in a contained or well-defined area, or if the stucco is scored, the repair patch be "squared-off" in such a way as to follow existing scoring. In some cases, especially in a highly visible location, it may be preferable to restucco an entire wall section or feature, so that any differences between the patched area and the historic surface will not be apparent.

Preparing the Surface

Repair of historic stucco generally follows most of the same principles used in plaster repair. First, all deteriorated, severely cracked, and loose stucco should be removed down to the lath (assuming that the lath is securely attached to the substrate), or down to the masonry if the stucco is applied directly to masonry. To obtain a good bond between the stucco and the substrate, the areas to be patched should be cleaned of all debris with a bristle brush; and all plant growth, dirt, loose paint, oil, or grease should be removed. If necessary, brick or stone mortar joints should be raked out to a depth of approximately ⅜" to ensure a good bond between the substrate and the new stucco.

A neat repair requires that the area to be patched be squared off with a butt joint, using a cold chisel, a hatchet, a diamond-blade saw, or a masonry bit. Sometimes it may be preferable to leave the area to be patched in an irregular shape, which may result in a less conspicuous patch. Proper preparation of the area to be patched requires very sharp tools, and care not to break keys of surrounding good stucco by "oversounding" when removing deteriorated stucco. To ensure a firm bond, the new patch must not overlap the old stucco. If the stucco has lost its bond or key with wood lath, or if the lath has deteriorated or come loose from the substrate, a decision must be made whether to try to reattach the old lath, to replace deteriorated lath with new wood lath, or to leave the historic wood lath in place and supplement it with modern expanded metal lath. Unless authenticity is important, it is generally preferable (and easier) to nail new metal lath over the old wood lath to support the patch. Metal lath that is no longer securely fastened to the substrate may be removed and replaced in kind, or left in place and supplemented with new wire lath.

When lime-based stucco applied directly to masonry is repaired, the new stucco should be applied in the same manner, directly to the stone or brick. The stucco will bond to the masonry itself without the addition of lath because of the irregularities in the masonry or mortar joints, or because its surface has been scratched, scored, or otherwise roughened to provide an additional key. Cutting out the old stucco at a diagonal angle may also help secure the bond between the new and the old stucco. It is generally not advisable to insert metal lath when restuccoing historic masonry as it can hasten deterioration of the repair work. Not only will attachment of lath damage the masonry, but the slightest moisture penetration can cause metal lath to rust. This will cause metal to expand, eventually resulting in spalling of the stucco and possibly the masonry substrate, too.

A good mechanical bond is always preferable to reliance on bonding agents. If the area to be patched is properly cleaned and prepared, a bonding agent is usually not necessary; one may be useful for repairing hairline cracks, however, or with substrates that do not offer a good bonding surface, such as dense stone or brick, previously painted or stuccoed masonry, or spalling brick substrates. Bonding agents should not be used on a wall that is likely to remain damp or where large amounts of salts are present. Many bonding agents do not survive well under such conditions, and their use could jeopardize the longevity of the stucco repair.

Matching the Stucco Type

Before the mid to late 19th Century, stucco consisted primarily of hydrated or slaked lime, water, and sand, with straw or animal hair included as a binder. Natural cements were frequently used in stucco mixes after their discovery in the U.S. in the 1820s. Portland cement was first manufactured in the United States in 1871 and gradually replaced natural cement. After about 1900, most stucco consisted of portland cement mixed with some lime. Today, gypsum, which is hydrated calcium sulfate or sulfate of lime, has replaced lime to a great extent, and lime is used only in the finish coat. The composition of early stuccos varied according to local custom and available materials, and often contained not only straw or animal hair as a binder, but mud or clay, marble or brick dust to provide color, and other additives.

Analysis of the existing historic stucco will provide informa-

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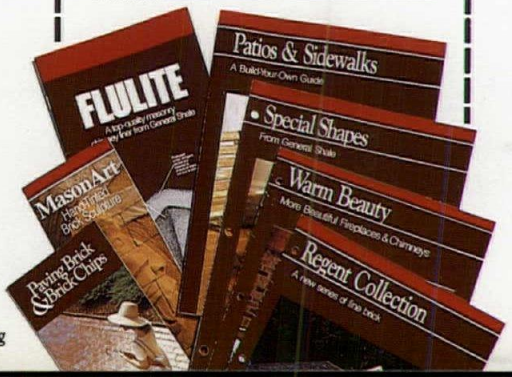

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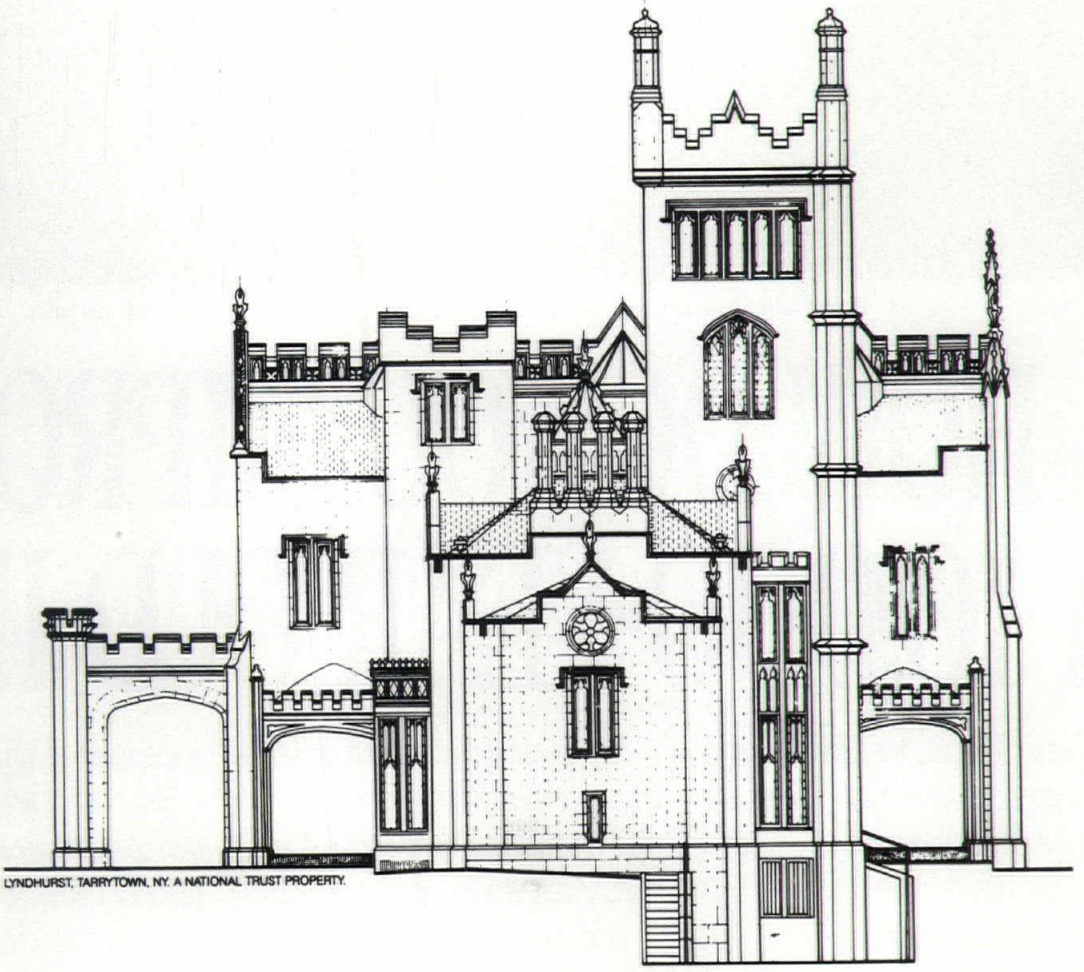

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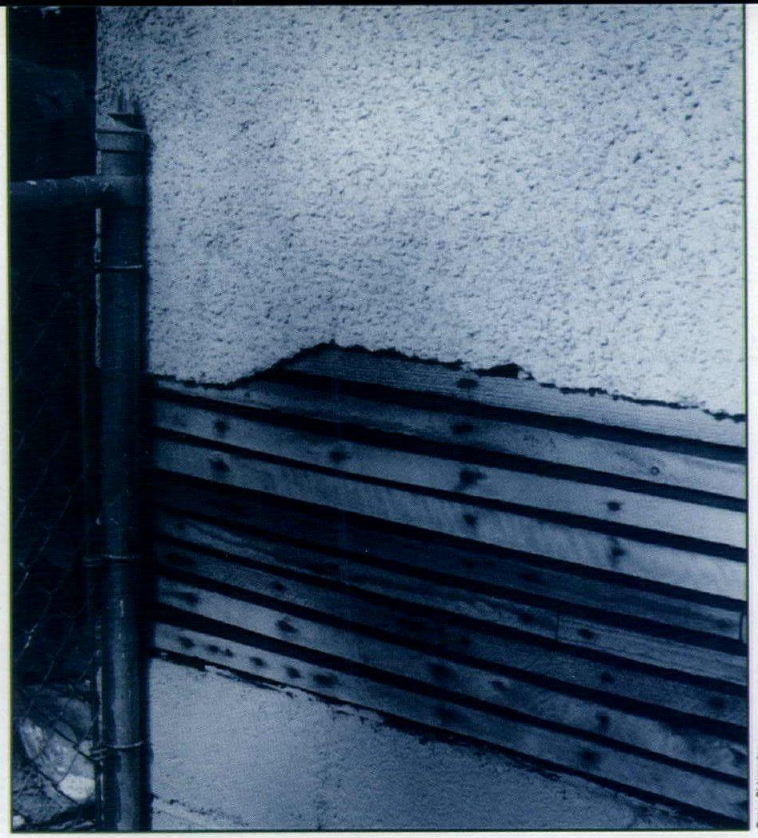

Betsy Chittenden

REMOVAL OF DAMAGED STUCCO PRIOR TO REPAIR

tion about its primary ingredients and their proportions, and will help to ensure that the new replacement stucco duplicates as closely as possible the old in strength, composition, color, and texture. Unless authentic, period restoration is required, however, it may not be worthwhile – nor in many instances possible – to attempt to duplicate all of the ingredients in the new stucco mortar. Some items are no longer available, and others, notably sand and lime (the major components of traditional stucco) have changed radically over time. For example, most of the sand used in current masonry work is manufactured sand because river sand, which was used historically, is difficult to obtain in many parts of the country. Manufactured sand has visual and physical qualities that differ significantly from those of river sand; the type of sand used, therefore, affects the way stucco works and how it looks.

There are, however, simple tests that can be carried out on a small piece of stucco to determine its basic make-up. A dilute solution of hydrochloric (muriatic) acid will dissolve lime-based stucco, but not portland cement. Although the use of portland cement became common after 1900, there are no precise cut-off dates, as stuccoing practices varied among plasterers (and from region to region). Some plasterers began using portland cement in the 1880s, but others may have continued to favor lime stucco well into the early 20th Century. While it is safe to assume that a late 18th- or early 19th-Century stucco is lime-based, late 19th- or turn-of-the-Century stucco may be based on either lime or portland cement. Another important factor to remember is that an early lime-stucco building may have been repaired many times over the years, and at least some of the patches probably consist of portland cement.

A stucco mix compatible with the historic stucco can be adapted from a standard mix of the period after analysis of the existing stucco. Stucco consisting mostly of portland cement generally will not be physically compatible with the softer, more flexible lime-rich historic stuccos used throughout the 18th and 19th Centuries. The differing expansion and contraction rates of lime stucco and portland cement stucco will normally cause the stucco to crack. Choosing a stucco mix that is durable and compatible with the historic stucco may require a number of test samples. It is best to let the test samples weather as long as possible – ideally one year, or at least through a change of seasons, in order to study the durability of the mix and its compatibility with the color, texture and composition of the existing stucco.

Executing the Repair

After thoroughly dampening the masonry or wood lath, the plasterer should apply the first scratch coat to the masonry substrate or wood or metal lath, in a thickness that corresponds to the original, if extant, or generally about ¼" to ⅜". The scratch coat should be scratched or cross hatched with a comb to provide a key to hold the second coat. It usually takes 24 to 72 hours, and longer in cold weather, for each coat to dry before the next coat can be applied. The second coat should be about the same thickness as the first, and the total thickness of the first two coats should generally not exceed about ⅝". This second or leveling coat should be roughened using a wood float with a nail protruding to provide a key for the final or finish coat. The finish coat, about ¼" thick, is applied after the previous coat has initially set. If this is not feasible, the base coat should be thoroughly dampened when the finish coat is applied later. The finish coat should be worked to match the texture of the original stucco.

Colors and Tints for Historic Stucco Repair

The color of most early stucco was supplied by the aggregate included in the mix – usually the sand. Sometimes natural pigments were added to the mix, and 18th- and 19th-Century scored stucco was often marbleized or painted to imitate marble or granite. Stucco was frequently whitewashed, colorwashed, or painted. Most of the early colors tended to be earth-toned until the advent of brightly colored stucco in the early 20th Century. California Stucco or "Jazz Plaster" was revolutionary as the first stucco/plaster to contain colored pigment in its prepackaged factory mix.

Analysis of the historic stucco may have revealed whether the source of the coloring is sand, cement, or pigment. Although some pigments or aggregates are no longer available, a sufficiently close color-match can generally be approximated using sand, natural, or mineral pigments, or a combination of these. Successfully combining pigments in the dry stucco mix of the finish coat requires skill, as the amount of pigment must be exactly the same for each batch of stucco. Overworking the mix can make the pigment separate from the lime, and changing the amount of water added to the mix, or using water to apply the tinted finish coat, will also affect the stucco color when it dries.

Generally, the color obtained by hand-mixing these ingredients will provide a match close enough to the rest of the structure that any color differences will not be obvious. This is especially true if the element being restuccoed is separated from other rendered walls. Patches on a prominent elevation may not be easy to conceal, and sometimes it may be necessary to paint the entire wall, or even the whole building.

Many stucco buildings are painted and will have to be

Betsy Chittenden

SCRATCH COAT PRIOR TO FINAL TEXTURED COAT

repainted after repairs have been made. Depending on the situation, limewash or cement-based paint, latex paint, or oil-based paint may all be appropriate coatings for stucco buildings. Latex paint, for example, may be applied to slightly damp walls or where there is an excess of moisture, but it will not stick to chalky or powdery areas. Oil-based or alkyd paints must be applied only to dry walls; new stucco must cure up to a year before it can be painted with oil-based paint. Modern, commercially available premixed masonry and mineral-based paints may also be used on historic stucco buildings. The most important factor to consider when repainting a previously painted or coated surface is that the new paint be compatible with any coating already on the surface. In preparation for repainting, all loose or peeling paint or other coating material not firmly adhering to the stucco must be removed by hand-scraping or natural bristle brushes and the surface must be cleaned.

Contemporary Stucco Products

A variety of stucco products is on the market today. Many of them are not compatible with early 18th- and 19th-Century historic stucco buildings; however, some of these products, such as prepackaged tinted stucco coatings, may be suitable for use on stucco buildings that date from the late 19th- or early 20th-Century, as long as the color and texture are appropriate for the period and style of the building. While some masonry contractors may suggest that a water-repellent coating be applied after repairing old stucco, this should generally not be necessary, since colorwashes and paints serve the same purpose, and stucco itself is a protective coating.

When Total Replacement is Necessary

Complete replacement of historic stucco with new stucco of either a traditional or modern mix will probably be necessary only in cases of extreme deterioration – that is, a loss of bond on over 40–50 percent of the stucco surface. Another reason for total removal might be that the physical and visual integrity of the historic stucco has been so compromised by previous repairs that patching would not be successful. When replacing stucco on a building where it no longer exists, there is more flexibility in choosing a suitable replacement mix. A relatively strong cement-based stucco would be appropriate for many late 19th- and early 20th-Century buildings, and also compatible for some stone substrates even if the original mortar would have been weaker, as long as the historic visual qualities are replicated. A good rule of thumb is that the stucco mix for a masonry building should be somewhat weaker than the masonry to which it is applied, in order not to damage the substrate. Since compatibility of old and new stucco is not an issue, the most important factors to consider are durability, color, texture, and finish. **Anne Grimmer** ■

The author is an architectural historian for the Preservation Assistance Division, National Park Service, Washington, D.C. She has written a number of technical publications relating to historic masonry including: Preservation Brief 22: "The Preservation and Repair of Historic Stucco"; Keeping it Clean: Removing Exterior Dirt, Paint, Stains and Graffiti from Historic Masonry Buildings; and A Glossary of Historic Masonry Deterioration Problems and Preservation Treatments.

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Repairing Early Curtain Walls

Architect **Theodore H.M. Prudon** of Swanke Hayden Connell discusses considerations for repairing 1950s and 1960s curtain walls.

The American office building after World War II is probably best characterized by the metal-and-glass curtain wall, just as pre-war high-rises can be distinguished by masonry claddings supported on the structural frame. Curtain walls brought a reduction of the weight of the cladding and eased its installation. When compared with earlier claddings, the curtain wall also was claimed to add at least half a foot to the outside perimeter of the building, resulting in a net increase in (rentable) floor area. Another advantage was the elimination of the so-called "wet trades" involved in masonry, which made the construction less dependent on the weather and the coordination of the different trades, reducing construction time and costs.

For all their benefits, however, early curtain walls were not very sophisticated and can often be characterized as one-story-high aluminum storefronts stacked on a building. This initial technology recalls that of the early masonry claddings, which were reminiscent of masonry buildings inserted into a structural steel frame.

Structural Systems

Curtain wall systems are divided into two basic types: the stick and the unit system. Other solutions are usually hybrids of the two. In a stick-built wall, rails and mullions are mounted directly to the structural steel or reinforced concrete frame with clips and angles. Slotted holes allow for adjustments during installation and movement induced by outside forces such as temperature changes. Glazing and opaque spandrel panels are then installed in the frame. Because the parts arrive at the job site in bundles of standard sections, a stick system can be more easily installed and adjusted in the field. The unit system, in contrast, uses shop-fabricated panels, allowing for better quality control, reducing the number of joints, and providing a speedier erection in the field. Transportation, fitting, and installation, however, are more critical and costly. This system was generally used for custom designs.

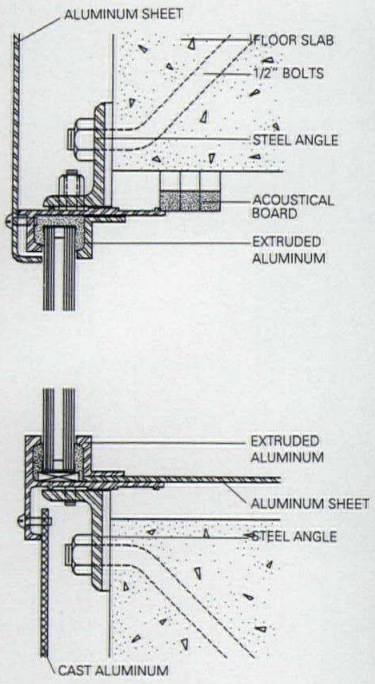
Different technical concepts have been used in the design of the curtain wall over the years. Early systems were essentially face sealed, with the outer surface excluding all moisture from the interior. The pioneering Equitable Building in Portland (p. 124) is a good example of this concept: to remove water and condensation that accidentally entered, particularly in the spandrel area, weepholes and interior flashings were added, and baffles were included to prevent water from being blown from outside. Other early curtain wall buildings like Lever House (p. 126) and Chase Manhattan Plaza in New York, designed by Skidmore Owings & Merrill, are good examples of stick-built, face-sealed systems with interior flashings.

At the end of the 1960s the idea of pressure equalization was introduced. By eliminating the pressure differential between the exterior and the interior of the curtain wall, architects could generally prevent water from being forced in or, if it entered, allow it to drain out. The interior of the wall was sealed and airtight. The curtain wall of the World Trade Center is the best known example of this concept. More recently the idea of the "rain screen" (P/A, Aug. 1990, pp. 47–52) further expands that idea with two separate barriers. In most instances, however, an elaborate system of weepholes placed in the different components that make up the wall, is used.

Materials

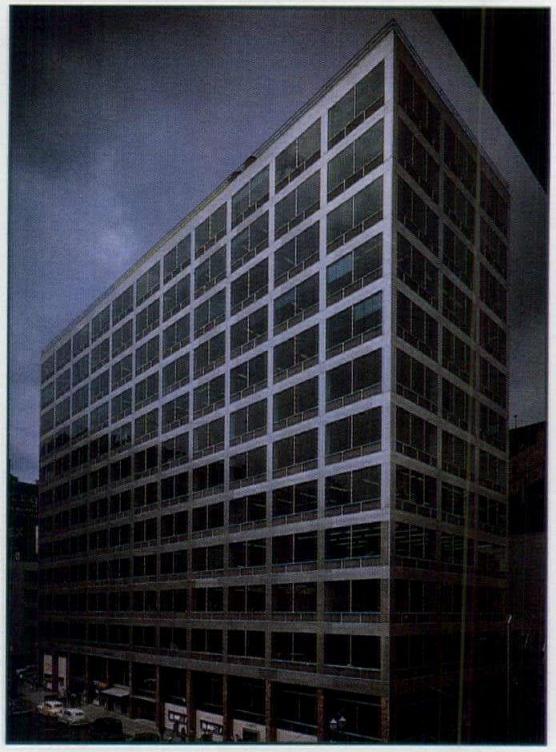
The curtain walls of the 1950s and 1960s used such metals as aluminum, stainless steel, and bronze, which were extruded, bent, formed, and occasionally cast. The most significant material advance, however, was in the sealants and gaskets, made possible by another postwar industrial development, the petrochemical industry. Earlier caulking and sealants, such as mastics and putties, were not adequate because they did not have enough flexibility and they hardened with exposure. The first generation of the new sealants, introduced around 1950, were the polysulfides, best known under the trade name Thiokol.™ They were followed in the early 1960s by the solvent-based acrylics and subsequently by the urethanes and silicones. The earlier polysulfides were found to become hard and brittle. Gaskets made of neoprene and vinyl were introduced at the end of the 1960s. Eero Saarinen, obviously deriving his inspiration from the automobile industry, is generally credited with the first use of gaskets in the design of the General Motors Technical Center in Warren, Michigan.

Frames constructed from the various metals were filled with panels and sheets made of different metals. Glass was used not only for the transparent sections, but also for the opaque spandrel panels. Spandrel glass, like "Spandralite," was a tempered glass used in Lever House. Tempered glass was also



CURTAINWALL HEAD AND SILL

The Equitable Building in Portland, Oregon, designed by Pietro Belluschi in 1948, is an early example of an aluminum curtain wall. The wall is connected and anchored to the structural reinforced frame with carbon steel angles. The curtain wall is made up of extruded aluminum profiles, cast aluminum panels, and sheet aluminum covers.



ESTO

recommended at that time for the transparent sections; however, spontaneous breakage has been a continuing problem. Porcelain enamel panels, stone, and other materials were also used.

Investigation

The repair of early curtain walls demands an initial investigation of the existing conditions. This can be divided into several distinct phases.

Document Review. The review of the remaining documentation is an important task to complete before proceeding with the field investigation. The original contract documentation, such as design and as-built drawings, specifications, shop drawings, and any correspondence related to the production of the installation of the wall should be examined. It also helps to review previous maintenance and repair efforts. Most curtain walls from the 1950s and 1960s have seen substantial work, particularly glass and sealant replacement. The early sealants such as polysulfides probably failed and the original tempered glass may have been replaced because of spontaneous breakage.

Field Investigation: Interior. The investigation of the interior involves noting not only the condition of the wall materials, but also any evidence of water infiltration, condensation, and changes in interior layouts that may have affected the performance of the wall. Investigate as well the performance and subsequent changes to the HVAC system.

Field Investigation: Exterior. When visually inspecting the exterior, look for 1 damage or changes to the wall, 2 changes to or failures of the sealants, glass, and glazing, 3 the application of exterior coatings and reflective coatings, 4 and modifications of the framing. One of the most important aspects to consider in the field investigation is the impact of movement on the curtain wall. The movement experienced by the wall as a result of thermal expansion and contraction, wind loading, or the movement of the building itself can significantly affect the structural condition and water-tightness of the curtain wall. Building movement caused by the creep of the reinforced concrete frame, for example, or deflection of the structural members, can lead to curtain wall failure if the joints were insufficiently sized or partly blocked during construction (P/A, Nov. 1991, pp. 121–125). The effect of this movement may be visible as premature or excessive failure of joints, deformation of the framing members, or the deformation of attachments. Opening the wall and examining the attachment clips will reveal such a failure.

The structural integrity of the wall is also an important consideration. Many early curtain walls utilized carbon steel, concealed in aluminum or stainless steel cladding, to provide the necessary stiffness to the curtain wall assembly. Although this allowed the mullions to be small, the concealed steel may have corroded. Removal of the cover panels may be necessary to determine the condition of the mullions.

On-Site Testing

An integral part of the field examination is the on-site testing of the existing assembly. While a battery of tests is available for determining the performance of the wall during design and construction, the tests available once the wall is completed and in service are limited. One can test the air and water infiltration of the existing wall, disassemble a representative section of the wall, and remove typical materials for further laboratory evaluation. Other tests are possible, such as a lateral load test, but the expense of such a test is usually prohibitive, especially since structural deficiencies will already have manifested themselves in other ways.

Water Infiltration. The on-site testing of the curtain wall is usually conducted by a simple nozzle or hose test. Water is sprayed against the wall and the path of the water is monitored to determine where it enters and leaves the assembly either on the outside or the inside. The test can be expanded by using more nozzles to cover a larger area and to use more nozzles, but the general principal remains the same. The introduction of a pressure differential between the inside and the outside may further determine the path of entry.

Disassembly. As is the case with the evaluation of

water infiltration test, the disassembly of the wall demands a careful selection of the area to be tested. The test area has to represent typical construction and actual physical problems encountered in the wall. Disassembling the wall permits study of its actual construction to determine what changes, if any, occurred during its installation and to assess how the wall has performed. The condition of the seals can be studied and the condition and location of flashing can be determined. The condition of the fasteners and the clip angles and their attachment to the main structural frame will also be apparent. Where carbon steel was used to stiffen the mullions on the wall, the steel may have corroded substantially. Similarly, where provision for expansion was insufficient the clip angles may have deformed or the attachment may be at an extreme position within the slotted holes. Extensive documentation of these conditions is important as a record. When severe deterioration is found, it may be necessary to make additional openings may be to verify the extent of the damage.

The interpretation of the results is an important part of the testing. In the process of evaluating test results and determining where the water entered, you should consider the possibility that damage was caused by earlier water entry or condensation.

Sample Removal. Together with the testing of the assembly, samples of typical materials may have to be removed. Of particular concern are caulking, sealant, or gaskets that have been used to provide the seal between the panels, frame, and glazing units. Testing allows you to determine the composition of these compounds, changes that may have been made during repairs, and the life span, if any, remaining in them. Establishing the composition of these sealants is also important in determining what contemporary sealants will be compatible with the existing installation. This testing should be conducted by a qualified laboratory.

Repair Approaches

Once the problems with wall assembly have been identified a repair program can be designed. Such a program will have to take several issues into account, ranging from aesthetics to cost and ease of installation. Several repair options will be available, and the selection generally will require careful evaluation of the pros and cons. The impact of the repairs on the existing conditions must also be considered, including: what the visual impact will be both on the inside and the outside, and whether the technical changes will be compatible both in performance and in chemical composition with the existing materials. For instance, the new installation should not contribute to increased condensation or cause excessive interior disruption, particularly if the building is to be occupied during the repairs.

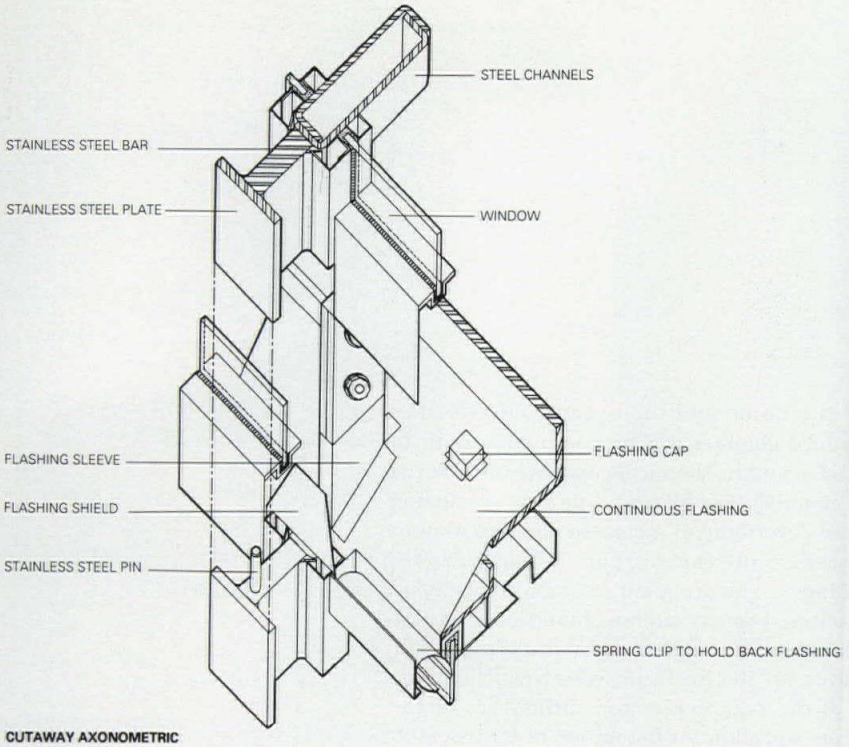
The selected repair models should be field tested. This is best accomplished by installing a full-scale mock-up in the field, which will provide insight to the complexity and difficulties of the installation, will allow for the testing of the assembly to determine if the repairs are adequate, will allow for a further evaluation of the costs involved, and will give the owner or client the opportunity to assess the visual impact of the selected option. As in any construction mock-up, it also may be used as a standard for the remainder of the work.

Typical Problems and Repairs

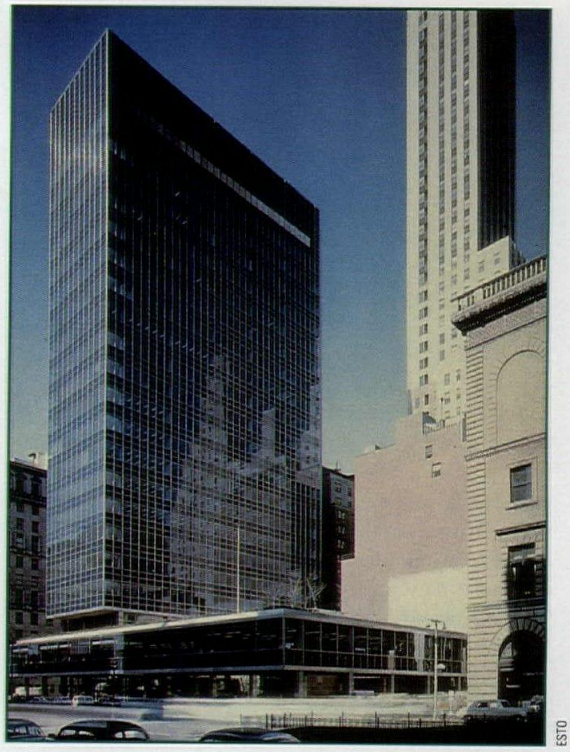
In existing curtain walls, typical problems encountered involve both the design and the seals of the joints. Frequently the lack of provision for movement will have caused severe internal stresses. Where gaskets were used, subsequent sealants may have been added. Sealants like polysulfides will also have hardened and will no longer have the ability to provide a proper seal. Removal will be difficult and will require cutting with a hot knife, sawing, or other removal techniques. Where the gaskets are failing, the only option will be to create a surface or face seal that covers the original installation.

The use of carbon steel units in the curtain wall may present a serious problem. Where the vertical mullions have been reinforced with steel angles to provide the necessary rigidity, these angles and, to a lesser degree, the attachments of the curtain wall to the structural system, may be severely corroded. The accidental penetration of the water and the likely presence of condensation will have contributed to this corrosion. Replacement of these items will be essential.

Glass and glazing also present a problem. Where tempered glass was used either for the transparent or the opaque spandrel sections, this glass has most likely already been replaced. If not, its replacement should be considered. Glass breakage resulting from corrosion of framing members constructed of carbon steel will require repair or replacement of the steel and the glazing.



CUTAWAY AXONOMETRIC



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Exploded detail of the curtain wall of Lever House, designed by Skidmore, Owings and Merrill in 1952, shows the internal flashing which is weeped through the aluminum profile at the head of the window. The weepholes are baffled to prevent the water from being blown into the cavity. The vertical mullion is reinforced with carbon steel angles concealed behind the stainless steel covers. This steel, as found in many curtain walls of that period and intended to stiffen the curtain wall, is subject to corrosion.

Other Design Considerations

The above outline has addressed only the changes and modifications necessary to bring the wall and its components back to good working order. In considering substantial work on these early curtain walls several other issues are likely to arise. The one most often encountered is the desire to change the visual appearance of the building. Often the original curtain wall's appearance may be considered outmoded, and if the repairs are related to a program of re-leasing the building the exterior image may be an important consideration. In general visual changes to the outside are limited only by the costs involved. If a curtain wall is fabricated from aluminum, for example, refinishing the material may be desirable, since the original surface finish or coating is likely to have deteriorated or pitted. This refinishing is particularly necessary for most of the anodized finishes, although early lacquers or other applied finishes should also be stripped before the new application can be made. Where the building wall is made of stainless steel the refinishing can be limited to a simple polishing and rebuffing. For metals like bronze, a thorough cleaning and the application of a lacquer-type clear coating or an oil-based wipe is not uncommon.

The issue of shading may also arise. Although tinted or gold-toned glass was sometimes used in early curtain walls, most had limited shading. The application of filter-type coatings therefore offers the opportunity to modify the appearance of the building.

The heat transmission of these early walls also will generally be poor. Most are likely to have single glazing, although the spandrel panels may have been insulated to prevent condensation in the wall interior. Changing to insulated or double glazing is not likely to be possible except at great expense, with significant implications for the construction of the wall.

The problems encountered in early curtain walls are most frequently related to the performance of the wall with regard to air and water infiltration. Where structural conditions are sound and no major design or installation flaws are encountered, a good performance of the curtain wall can be assured by regular inspections and a thorough maintenance program. **Theodore H.M. Prudon** ■

The author is a principal at Swanke Hayden Connell in New York City and teaches at Columbia University and Pratt Institute.

Acknowledgment

I am very grateful for the assistance of Katherine Chia of Swanke Hayden Connell Architects who conducted the necessary research. The curtain wall consultant Gordon Smith and Robert Baker of AMS both provided me with valuable insight and knowledge based on their extensive experience in the design, testing, and rehabilitation of early curtain walls.

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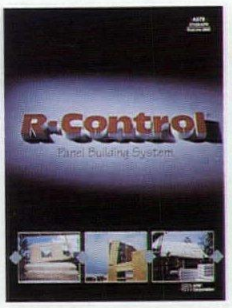

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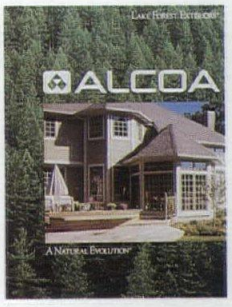

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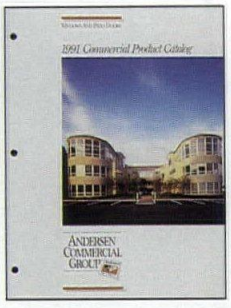

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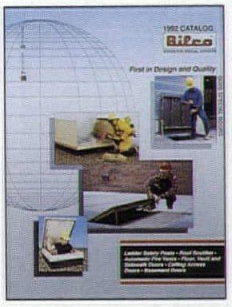

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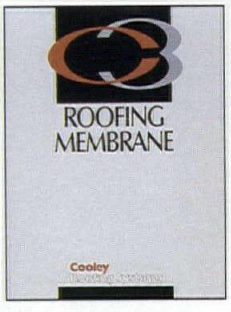

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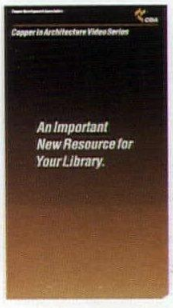

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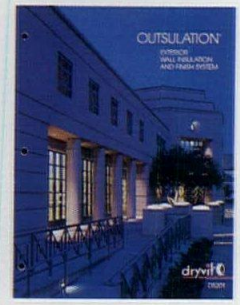
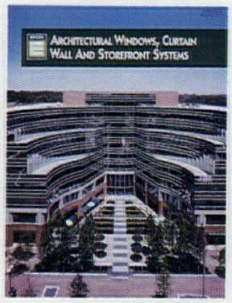
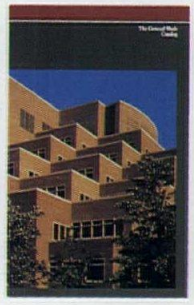


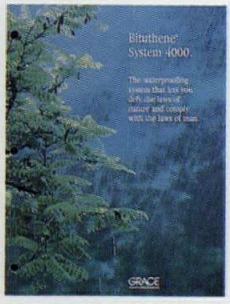
Dryvit Systems, Inc., has published a 16-page, four-color catalog of its Dryvit® Outsulation® System. The system is energy efficient, cost-effective, and can be used on all types of buildings. It can be field-applied or installed in one of three panelization methods. **Dryvit Systems, Inc.** Circle No. 366



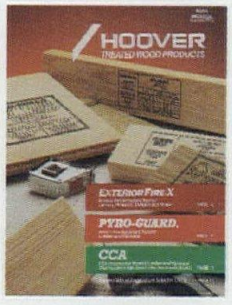
The EFCO 1992 Sweet's Catalog presents a topline of design, engineering, and production capabilities that enables EFCO to produce window and framing systems for all architectural glazing needs. The catalog also provides a listing of the company's current window and framing configurations and specifications.
EFCO Corporation. Circle No. 367



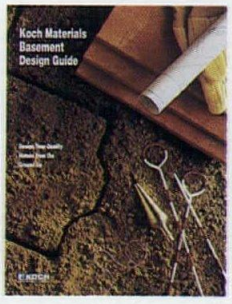
With 17 brick plants, General Shale has become the nation's second largest manufacturer, producing 92 varieties of face brick as well as special shapes and concrete blocks. This catalog displays the wide variety of brick hues and textures for multiple building applications along with cleaning recommendations.
General Shale Products Corp. Circle No. 368



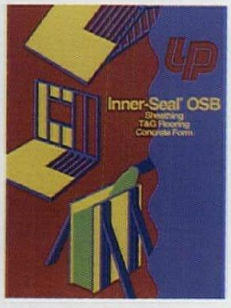
This brochure from Grace Construction Products describes the Bituthene® System 4000 Waterproofing System which eliminates the use of solvent-based primers and complies with all current and anticipated VOC regulations. The brochure includes product information and long form specifications.
Grace Construction Products. Circle No. 369



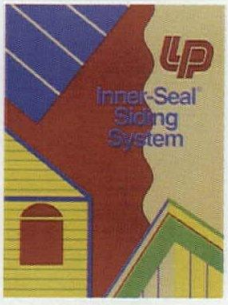
Hoover Treated Wood Products' new 12-page Sweet's Catalog features: Pyro-Guard third generation interior fire retardant lumber and plywood for roof sheathing and other structural uses; Exterior Fire-X FRT lumber and plywood for decks, balconies, siding, and other outside uses; and CCA preservative-treated lumber and plywood that's kiln-dried after treatment. **Hoover Treated Wood Products.** Circle No. 370



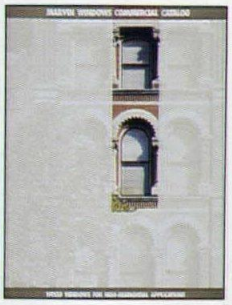
This brochure highlights construction techniques and design considerations that help make the basement into a livable space. By using these recommendations and Koch Materials' Tuff-N-Dri Exterior Foundation Waterproofing System, leaky basement walls can be eliminated. The system comes with a 10-year limited warranty.
KOCH Materials. Circle No. 371



This non-veneer, fire-rated panel can be used for sheathing, flooring, lap and panel siding, and concrete forms. These easy-to-install inner-seal oriented strand board panels are available in a range of sizes and thicknesses for residential and commercial use.
Louisiana-Pacific Corp. Circle No. 373

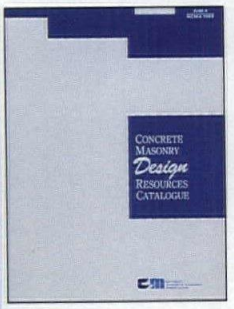


Lap and panel sidings, soffit panel, trim, and fascia board are made from Inner Seal OSB with a protective overlay that is pre-primed to hold paint and stain longer. The Inner Seal Siding System has a consistent composition for consistent strength throughout; its exceptional moisture resistance prevents warping, splitting, and buckling.
Louisiana-Pacific Corp. Circle No. 372

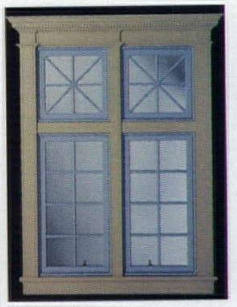


Marvin manufactures a line of made-to-order wood and wood-clad windows for non-residential applications.. Graphs emphasize thermal and structural performance, and tables provide energy data. Double-hung, casement, awning, gliding, and bay models are a few of the options available.
Marvin Windows. Circle No. 374

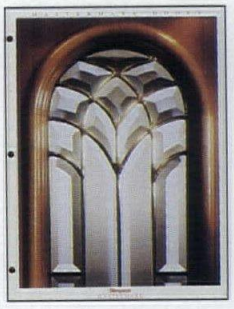
Metropolitan Ceramics' vitreous (less than three percent absorption) ceramic tile is a natural for a wide variety of indoor and outdoor applications. A new, six-page brochure features exciting installation photos, color swatches, performance specifications, trim shapes, and suggested uses.
Metropolitan Ceramics. Circle No. 375



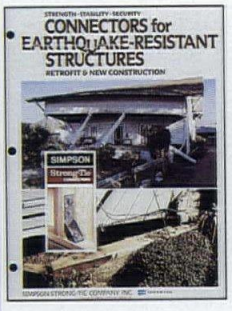
The National Concrete Masonry Association develops and disseminates product standards, information, design concepts, and innovative uses for concrete masonry to assist the specifier and architect in designing with concrete. A 60-page catalog represents all of the material available.
NCMA. Circle No. 376



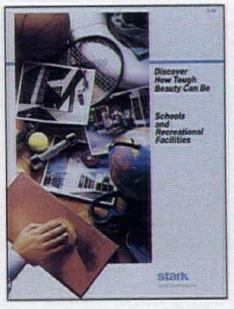
Because of its architecturally accurate and authentic detailing, the Architect Series product line is the elegant choice for the discerning architect who appreciates the importance of renovating existing structures according to well-known historical styles.
Rolscreen/Pella. Circle No. 377



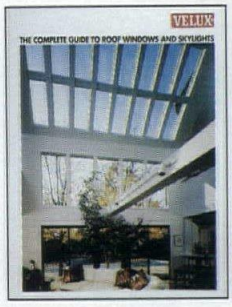
This extensive collection of exterior and interior doors, sidelights, and transoms combines over 80 years of craftsmanship and exquisite design sensitivity. Available nationally, Simpson doors are made from selected Douglas Fir or Western Hemlock. Glasswork is cut, assembled, and soldered by hand.
Simpson Mastermark Doors. Circle No. 378



Connectors for Earthquake-Resistant Construction describes Simpson Strong-Tie connectors to strengthen existing or new wood structures and increase earthquake safety. Applications include: foundation connectors; pier systems; foundation-to-stud connections; floor girders; masonry and tilt-up buildings; building shearwalls; retrofit anchors; and rafter ties.
Simpson Strong-Tie. Circle No. 379



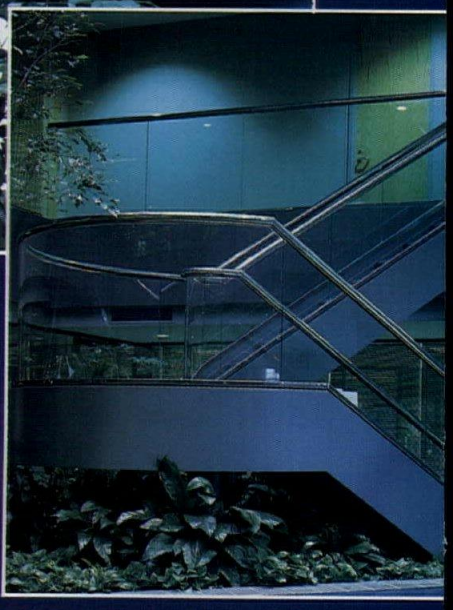
Structural-glazed facing tile (SGFT) and the Millenium Collection by Stark Ceramics Inc., provide the durability schools and recreation facilities demand in structural wall systems, without sacrificing aesthetics. Interior and exterior materials offer competitive life-cycle costs, a diverse color palette, low installation cost, and resistance to graffiti, staining, and harsh disinfectants.
Stark Ceramics. Circle No. 359



New 1992 full-color brochure features information and design ideas for the complete line of VELUX roof windows, skylights, sunscreening accessories and controls. New products include the Round Top Accent Roof Window and hand-held Infrared Remote Controls for operating out-of-reach skylights, roof windows, and venetian blinds. Pricing and dealer list also included. Free.
Velux-America Inc. Circle No. 358

This 200-page catalog illustrates a full range of wood doors, windows, and skylights. Technical information is instructive and comprehensive and includes performance options available for each line.
Weather Shield. Circle No. 357

THE CHOICE IS CLEAR: JB® GLASS RAILING



Julius Blum is the nation's most complete source for architectural metal products.

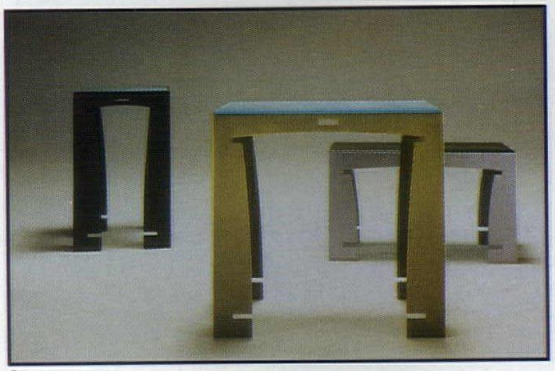
Since its introduction, JB® Glass Railing has become a favorite among architects, engineers and industry professionals alike. Why? Because when it comes to design integrity, efficiency, specification ease, and simplicity of assembly, the choice is clear.

Designed for use with ½" or ¾" tempered glass as structural balusters, this economical system of metal components is available with handrails in aluminum, bronze, stainless steel and acrylic wood. For more information and details on all our stock components, call or write for your free copy of our new bulletin, No. 3011.

Julius Blum & Co., Inc.
P.O. Box 816, Carlstadt, New Jersey 07072
800-526-6293 • 201-438-4600 • FAX: 201-438-6003
Circle **No. 328** on Reader Service Card

New Products and Literature

1



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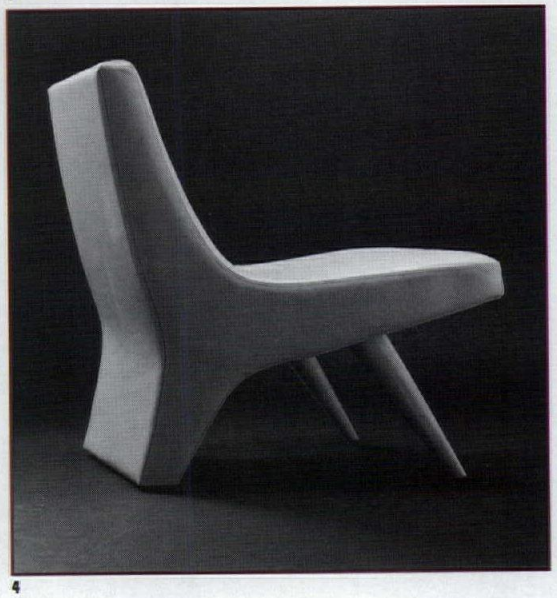


4

1 Robert Stern Textile
"Empire" is a 100 percent cotton damask with ribbon stripe accent designed by architect Robert A.M. Stern. It is 54 inches wide and is available in six colorways. HBF.
Circle 100 on reader service card

2 Occasional Table
The "Halli" table group is available in several sizes. Aluminum legs may be finished in a choice of anodized colors; tops are clear, bronze, or gray translucent or sandblasted glass, stone, or wood. Brueton.
Circle 101 on reader service card

3 Elliptical Sofa
"Segnale," designed by Anna Castelli Ferrieri for Artflex, is an elliptically shaped sofa with a metal frame and molded polyurethane foam fill covered with polyester fiber sheets. Massini.
Circle 102 on reader service card

4 Leather and Wood Chair
The "Corfu Chair," designed by Thomas Schlesser, is 30 inches wide, 30 inches deep, and 30 inches high. Niedermaier.
Circle 103 on reader service card

Preview: WestWeek 92

"Counterforce/Counterbalance: Emerging Attitudes and Aesthetics in a Changing World" is the theme of the annual WestWeek contract furniture market. All events will be held at the Pacific Design Center in Los Angeles, March 18–20.

Among the scheduled panel discussions are: "Metropolis Metamorphosis: The Changing Nature and Needs of American Cities" moderated by Allan Temko, architecture critic, *The San Francisco Chronicle* (March 18, 9:30–11:00 a.m., Center Green Theater, second floor); "Venice Biennale: Italy and Beyond, A Dialogue Between Peter Eisenman and Frank O. Gehry" moderated by Jeffrey Kipnis, Assistant Professor of architecture, Ohio State University (March 18, 2:30–4:00 p.m., Center Green Theater, second floor); "Industrial Elegance: From Machine Art to Today" moderated by Stanley Abercrombie, Editor, *Interior Design* (March 18, 5:00–6:30 p.m., Center Green Theater, second floor); "Editorial Directions: Five Opinions on Design" (March 19, 4:00–5:00 p.m., Center Blue Conference Center, second floor).

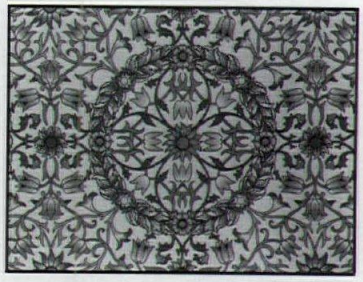
Among scheduled exhibitions are: "In the Modernist Tradition: Frank Gehry Explores Bentwood" (Murray Feldman Gallery); "Design Explorations: 2001" (Center Blue Galleria, fifth floor); and "Parisian Furniture and Decorative Design: The Artisans and Their Art" (Center Green, fifth floor). ■

(continued on page 132)

Circle **No. 337** on Reader Service Card

(continued from page 131)

WestWeek 92 Products



William Morris Wallpaper

"Morris Ceiling" is an exact duplicate of a documentary wallpaper designed by William Morris, circa 1877. It is 21 inches wide with a 21 inch repeat. Scalamandré.

Circle 104 on reader service card

Multipurpose Chair

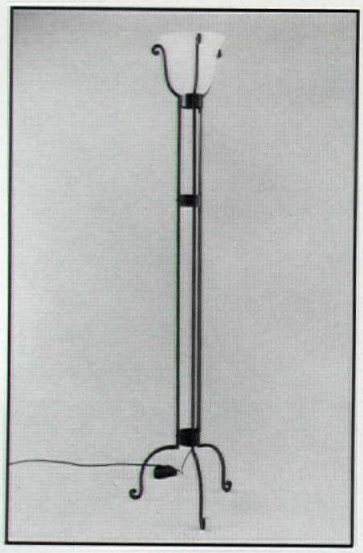
The wood-framed "Ancora" chair, designed by Werther Toffoloni, may be specified with a woven straw, wood, or upholstered seat, with or without arms. ICF.

Circle 105 on reader service card

Wood-Front Files

The new "Wood-Front File Line," part of the Stackable Storage System™, has a steel frame and wood veneer tops and drawer fronts. Many finishes, drawer pulls, drawer-pull configurations, drawer lengths, and depths are available. Meridian.

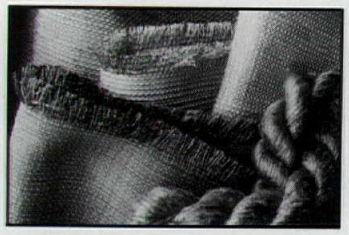
Circle 106 on reader service card



Wrought Iron Torchière

The hand-bent and welded "Aries Torchière," designed by Marina McDonald Rezek, is available in powder-coated finishes and hand-painted patinas. The hand-blown opal satin bell shade houses an incandescent light source. JAZZ Furniture & Lighting.

Circle 107 on reader service card



Silk Upholstery

"Thai Texture," part of the Silk Textures Collection, has a multi-colored warp that crosses a heavier silk weft in a rib weave. It is suitable for contract or residential use. Pollack & Associates.

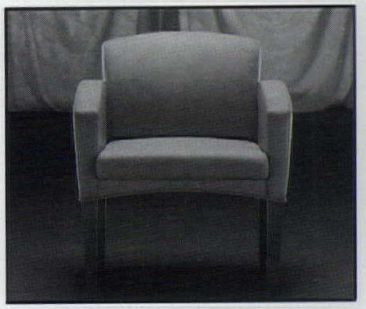
Circle 108 on reader service card

Mid-Management Casegoods

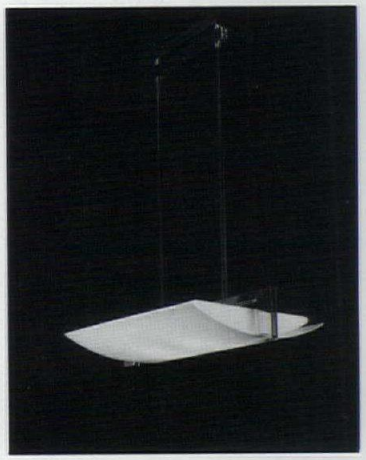
The "Eco Group" of casegoods has solid-wood construction, hand-matched veneers, dovetailed joints, and countersunk wood screws. Twenty-nine stains and 20 "Tintacoat®" solid and metallicized paint finishes are available.
Geiger International.

Circle 109 on reader service card

Upscale Kitchen
The "9009PR" has rounded polyester cabinets, stainless steel cooking center, stainless steel countertops with backsplash rack system, and integrated halogen lamps. SieMatic®.
Circle 110 on reader service card

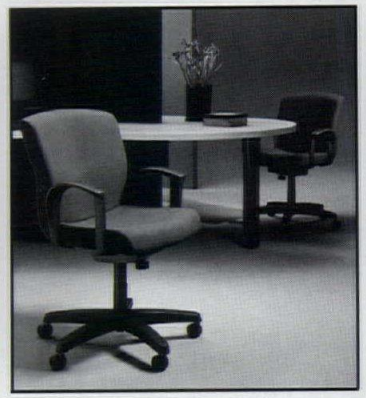


Small-scale Side Chair
Designer David Allan Pesso's "Montana Chair" has an upholstered seat and back, with maple or walnut legs. Davis.
Circle 111 on reader service card



Meier Ceiling Pendant
Architect Richard Meier has designed the "Joseph" ceiling pendant for commercial and residential applications. The diffuser may be white opal or clear frosted glass or white or black perforated metal. Baldinger.
Circle 112 on reader service card

Children's Healthcare Fabric
"Zoo Plaid," constructed of 100-percent Trevira and nylon, is a stain-resistant fabric for children's healthcare environments. It is 72 inches wide and is available in six colorways. DesignTex.
Circle 113 on reader service card



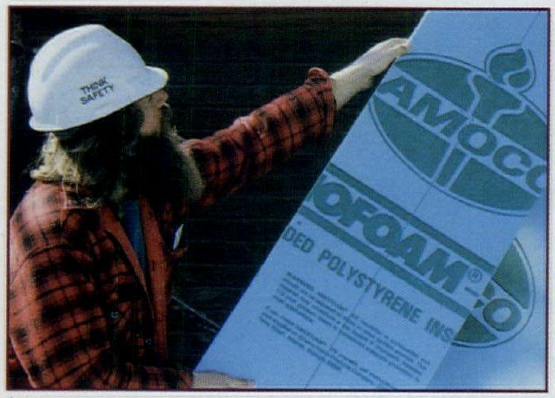
Desk Seating
The "Gentry" seating line, designed by Arnie Dammermann, includes manager, professional, and guest models; arm and base options and a variety of surface materials may be ordered. Multiple tilt controls and other adjustment functions are available. Steelcase.
Circle 114 on reader service card

New Mexico-inspired Fabric
The "Santa Fe Collection" includes three prints ("Mesa," "Navajo Stripe," and "Pueblo") and one woven fabric ("Rio Grande"). Colors are teal, eggyolk, and putty. Brunschwig & Fils.
Circle 115 on reader service card

Gridded Tile
The "Cross-Colors" line of colored porcelain tile is now available with a "Cross-Tread" finish; this raised-grid pattern was designed for improved slip-resistance and low maintenance. Crossville Ceramics®.
Circle 116 on reader service card

(continued on page 134)

Building Products



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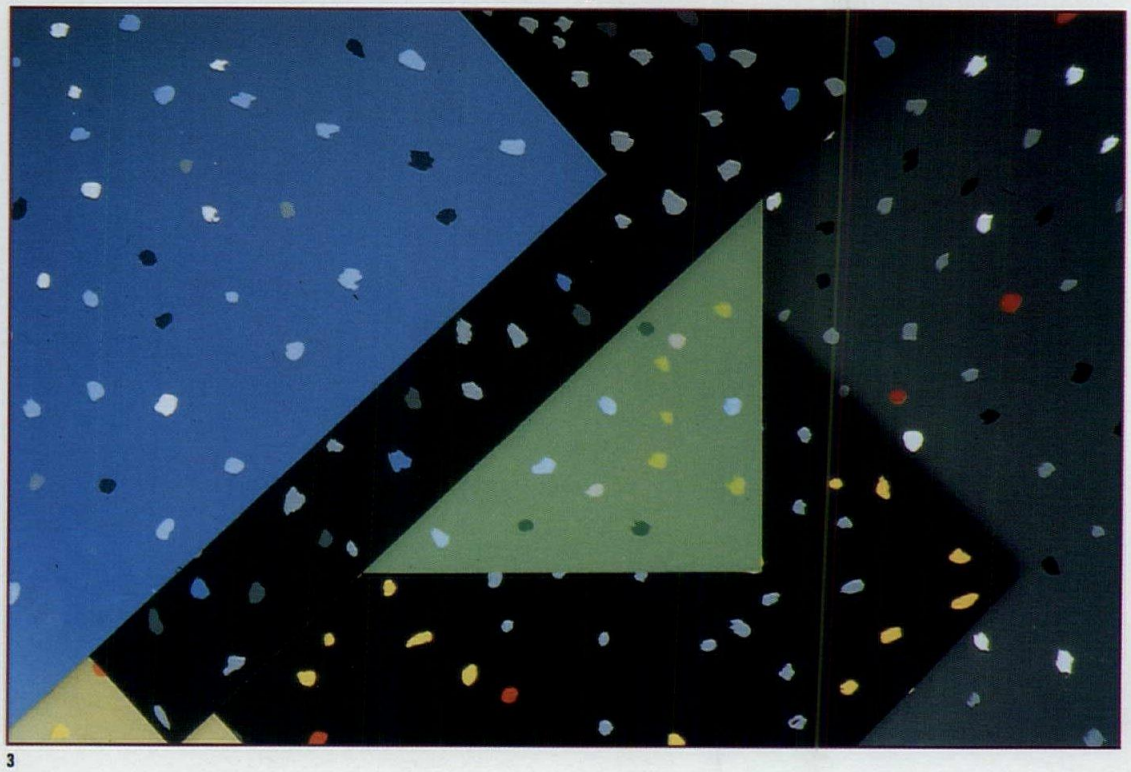
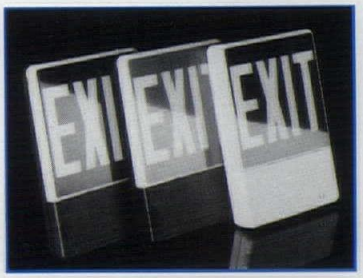


3

1 Insulation Board from Recycled Polystyrene
"AMOFOAM-RCY," a new insulation board product for commercial and residential use, is produced with a "minimum of fifty percent recycled polystyrene resin" (produced from consumer and industrial sources). The board "meets all R-value and fire characteristic requirements of the model building codes" and may be ordered in 2′ × 8′ and 4′ × 8′ sheets in thicknesses of one, one and one-half, and two inches. Amoco Foam Products.
Circle 117 on reader service card

2 Patterned Handrails, Guards
The new "Acrovyn Pattern Collection" includes integrated stone and wood-inspired patterned surfaces for handrails, corner and bumper guards, and crash rails. The patterns, available in 53 colorways, are produced through the transfer of special inks directly to Acrovyn's integrally colored base material; a molecular bond is formed with the curves and contours of exposed surfaces. C/S Group.
Circle 118 on reader service card

3 New Rubber Flooring
Produced in Standard, Antistatic, and Conductive versions, "Spotfloor"™ rubber flooring has a wear-resistant upper layer and an underside designed for adhesive bonding. Seven color combinations in tiles and rolls may be specified. Pirelli.
Circle 119 on reader service card



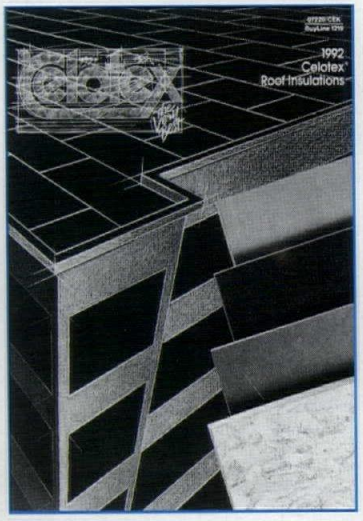
Exit Signs
The "Practica Bella Exit" is an emergency or standard energy-saving unit with a patented plug-in connection system. The fixture body comes in black, burgundy, or light gray; custom silk-screened lenses are also available. Beghelli.
Circle 120 on reader service card

Expansion Joint System
"TREM-Span" is a continuous expansion joint seal designed to seal major expansion joints of horizontal deck surfaces. This "durable, watertight seal" is recommended for use in parking structures, plaza decks, and pedestrian walkways. Tremco®.
Circle 121 on reader service card

Commercial Flooring Guide
This 1992 specifier's guide to commercial sheet vinyl flooring includes colors, patterns, and technical data for "Marathon"® and "Flor-Ever"® products. Congoleum.
Circle 200 on reader service card

Steel Waste Receptacles
New 14-guage perforated steel waste containers, designed by Eric Chan, are available in 53-, 41-, and 27-gallon versions. Three top styles are available. RPI Designs.
Circle 122 on reader service card

Fiberglass Lampposts
Ornamental fiberglass posts and accessories are based on turn-of-the-century designs. Posts are approximately one-tenth the weight of cast iron products and are corrosion-free. W.J. Whatley.
Circle 123 on reader service card

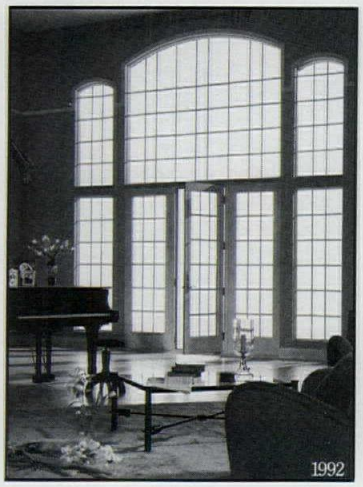


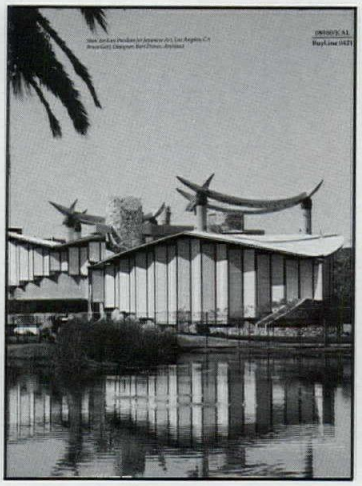
Roof Insulation Manual
The *1992 Roof Insulations Manual* includes size availability, compliance, and specific features for "Hy-Therm"™ roof insulation products and specialty fiberboard products. Celotex Corporation.
Circle 201 on reader service card

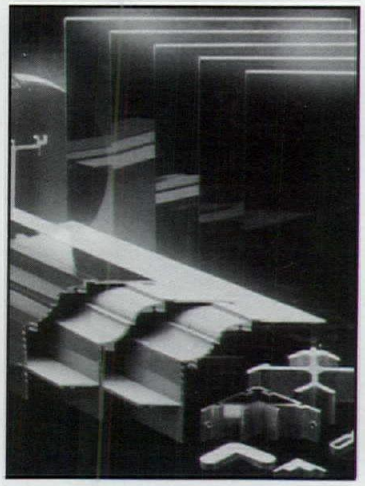
(continued on page 136)

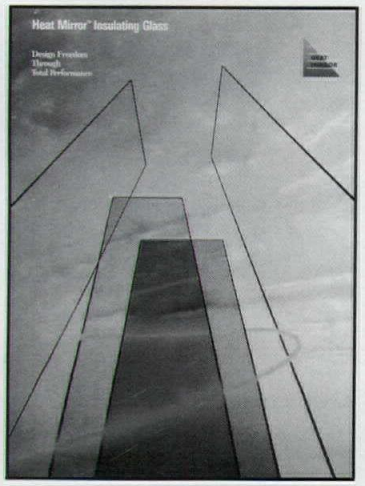
Technics-Related Products

New literature from manufacturers provides useful information on the energy ratings of commercial glazing products.









New Catalog
A 1992 catalog offers updated product offerings and provides detailed specifications, compliance, and energy performance data for a full line of commercial windows. Technical tables describe the efficiency of a line of products. Andersen Commercial Group.
Circle 202 on reader service card

Southern Climate Glazing
"Southern Low E" low emissivity coating is formulated especially for buildings in warm climates. The glazing was "developed specifically to help prevent indoor heat build up" and "allows 46 percent fewer heat-causing infrared rays into a room than an uncoated window." This glazing is available in most of the manufacturer's insulated glass windows and doors. Marvin.
Circle 203 on reader service card

Items in this section complement the Technics article on energy standards for glazing (p. 33).

Translucent Glazing
Kalwall translucent panels are made of a composite material that offers high energy performance, with U-values ranging from .40 to .06. A brochure provides technical data. Kalwall.
Circle 204 on reader service card

Case Studies
"Visionwall" window systems with an R-8 insulating value are now available in the U.S. market for commercial, residential, industrial, and institutional buildings. Computer-generated case studies that compare energy comsumption of clear, tinted, and reflective "Visionwall" curtain wall systems in typical ten-story office buildings are available for 13 North American cities. The "Case Study Fact Files" include data showing the differences in energy consumption, energy demand, cooling plant size, capital costs, and energy costs. Visionwall.
Circle 205 on reader service card

Architectural Windows
A new 23-page color brochure shows glazing in a variety of commercial applications. A "Product Selection Guide" describes performance test results and custom capabilities available this year. Peerless.
Circle 206 on reader service card

Energy Brochure
An illustrated brochure summarizes energy conerns for metal windows and provides definitions of terms used to describe the energy rating of the company's aluminum- and steel-framed windows. Hope.
Circle 207 on reader service card

Energy Saving Windows
The "Envirometric System" of glazing products offers wood windows with energy conserving glazing, such as "Insul-Shield" and between-pane energy-saving features such as "slimshade" blinds and shades, and argon-filled insulating glass. Pella.
Circle 208 on reader service card

Insulating Glass
"Heat Mirror™ Insulating Glass" is available in a range of clear non-reflective glazing, tinted "solar control" glazing in 28 colors, and clear "high transmittance, high insulation" glazing. An 11-page brochure describes performance and recommended specifications for each system. Southwall Technologies.
Circle 209 on reader service card

Energy Glazing
A brochure describes the performance capabilities of "Energy Advantage Low-E" and "EverGreen" tinted glass. This line of glazing offers a "high level of daylight transmittance, low shading coefficient, and excellent year-round U-values." LOF.
Circle 210 on reader service card

Curtainwall Literature
"1600 Curtainwall" is a color brochure that demonstrates a wide variety of applications for a curtain wall system that supports glazing widths from ¼- to 1-inch. Kawneer.
Circle 211 on reader service card

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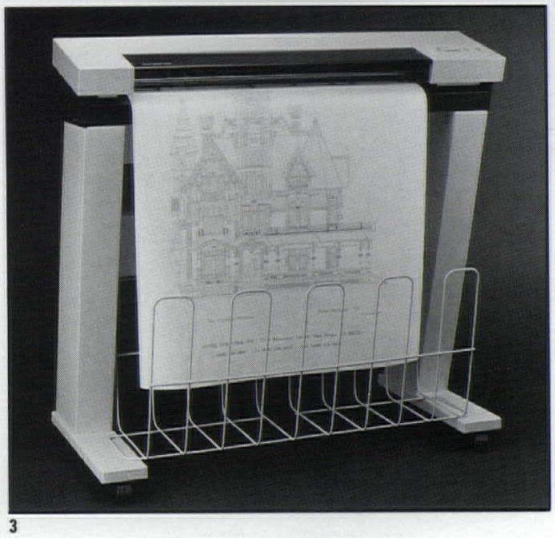

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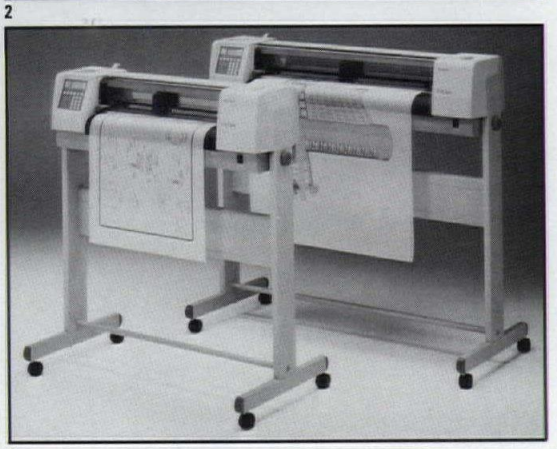


4

Output Devices

1 Plotter/Copier

The HCS 536-XL Plotter/Duplicator offers a print speed of "up to 10 inches/second (10 E-size prints/minute)" on plain paper and offers a resolution of 400 dpi. Other features include multiple prints, continuous scaling, rotation and mirror-imaging, paper cutting, and collation. HCS/Savin.

Circle 124 on reader service card

2 New Brochure

An eight-page color brochure describes a recently released line of "high-resolution high-speed" monochrome and color electrostatic plotters. The brochure describes line and color quality, new features, and provides reproductions of sample plots. CalComp.

Circle 125 on reader service card

3 Color Ink Jet

The 300 dpi resolution wide-format "NovaJET" features four separate inkjet heads (cyan, magenta, yellow, and black) to provide 256 plot colors and 15 line widths. Enter Computer.

Circle 126 on reader service card

4 Intelligent Plotters

New XP-500 series D- and E-sized pen and pencil plotters employ "fuzzy logic" to increase speed; the plotter can "look ahead" from 21 to 41 vectors to determine the quickest plotting path, resulting in "fewer and smoother" pen movements. Mutoh.

Circle 127 on reader service card

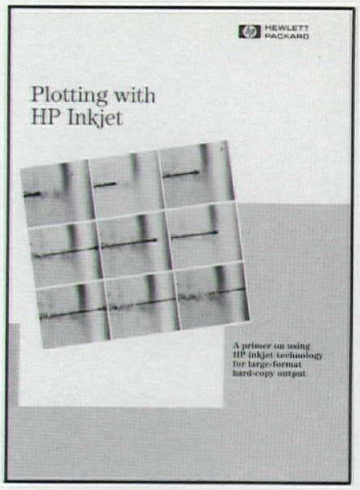
(continued on page 138)

(continued from page 137)

Computer Products
Output Devices

Color Printers
New A- and B-size color printers for CAD provide both vector and raster imaging output for modeling, rendering, and visualization applications. The printers can also print video-capture format and come with PostScript imaging software. Océ.
Circle 128 on reader service card

Bubble Jet
The BP3670 Bubble Jet printer can produce "laser-quality" A-,B-, and C-size plots on plain paper for CAD applications. The printer features automatic capping and head-cleaning and an SCSI interface. Bezier.
Circle 129 on reader service card



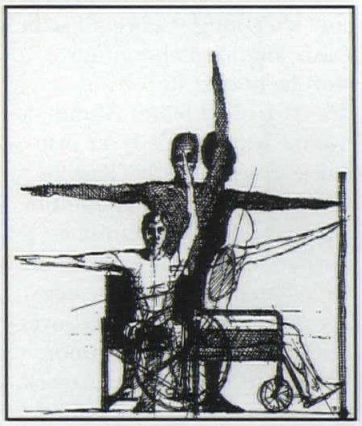
Large Ink Jet
The HP DesignJet Plotter accommodates up to 36-inch plotting media rolls as well as non-standard paper, vellum, and translucent media. Line widths of 0.2 to 12mm and 300-dpi resolution allow for fine differentiation and shading. A brochure describes the printer technology. Hewlett Packard.
Circle 130 on reader service card

Office Software

Door Specifications
The "WayneTec™ software system" for PCs allows users to specify sectional overhead doors, steel rolling doors, sheet steel doors, grilles, counter shutters, fire-rated doors, and accessories in AutoCAD. Wayne Dalton.
Circle 131 on reader service card

Roofing Specifications
The "TROCAL CAD Library" provides full-scale drawings for mechanically fastened, ballasted, and adhered roofing systems as well as guide specifications prepared in WordPerfect 5.1, on two floppy diskettes. TROCAL Roofing.
Circle 132 on reader service card
(continued on page 139)

(continued from page 138)



ADA on Diskette

The entire text of the Americans with Disabilities Act, the ADA Accessibility Guidelines (developed by the Architectural and the Transportation Barriers Compliance Board), and other related regulations are included in "autoBOOK™: ADA" available for IBM PC-compatible systems. The software provides an electronic indexing system for easy information retrieval. Intermedia Design Systems.

Circle 133 on reader service card

Color Separation Software

"Hijaak ColorSep 2.1" allows users to create 4-color separated images for publication from graphics and desktop publishing software. Hijaak.

Circle 134 on reader service card

Brick and Concrete Details

The "Interlocking Concrete and Grid Pavements Reference CADalog" from the Concrete Paver Institute and the "Brick Construction Reference CADalog" from the Brick Institute of America are now available on floppy diskettes. Both include detail drawings, specifications, and technical information. Vertex.

Circle 135 on reader service card

Cost Estimation

"COSTIE (Construction COST Initial Estimate)" is cost-estimating software for architects and consulting engineers. A demo disk for IBM-compatible machines is available. Micro Mode.

Circle 136 on reader service card

Building Materials

Major materials suppliers as they were furnished to P/A by the architects for buildings featured this month.

Project: Harold Washington Library Center, Chicago (p. 60). *Architects: Hammond Beeby & Babka; A. Epstein & Sons International; Dubin Dubin & Moutoussamy, Chicago.* Reinforced concrete foundation, structure, and floors: Tribco. Steel frame: Zalk Josephs. Standing seam aluminum roof: Mansfield. Brick: Acme Brick/Larsen Precision. Napoleon red granite: Campolonghi Italia. Curtain wall and windows: Columbia Metals. Glass: Viracon Glass. Cast Stone: Larsen Precision. Gypsum lathe and plaster interior walls: McNulty. Skylights: Supersky. Bronze entrance doors: International Steel.. Solid core wood doors: Algoma. Hollow metal doors: Fenestra; Kreiger. Aluminum overhead doors: Cookson. Stone floors: Milwaukee Marble. Carpet tile: Interface. Broadloom carpet: Lees/Harbinger/Interface. Sand set terrazzo: Metropolitan. Curved gypsum board ceiling: McNulty. Acoustic tile ceiling: Armstrong. Regressed ultraline ceiling grid: Chicago Metallic. Office workstations: Allsteel. Movable partitions: Modernfold. Exterior paint: Sherwin-Williams. Interior paint and stain: Glidden. Mortise hinges: Hager. Special hardware: Soss. Mortise and overhead closer: Yale. Floor hardware: Rixson. Exit hardware: Von Duprin. Door pulls: Brookline/Trimco. Kitchen appliances: General Electric. Raised access floor: Tate. Painted metal lockers: Pemko. Auditorium seating: Irwin Seating/ Maraham Fabrics. Custom wood aisle standards and arm rests: Baranti

(continued on page 140)

(continued from page 139)

Woodwork. Dock equipment: Kelly. Elevator cabs with bird's-eye maple interior: Mid-America. Stainless steel escalators: Montgomery. Painted steel stair system: Anderson Industries. Bronze auditorium handrails: Blum. Pendant and wall sconce interior lighting: SPI/Lam Lighting. Fluorescent undercounter strips: Alcko. Fluorescent escalator lighting: SPI. ELectric distribution system: Walker. Sinks and toilet: Eljer. Terrazzo floor basins: Crane Plumbing/Fiat Products. Foto sensor chrome plumbing fittings: Optima/T & S Brass and Bronzeworks. Toilet stalls: Accurate Partitions. Hand dryers: McKinney Parker/World Dryer. Water fountains: Oasis. Sprinklers: Star Sprinkler. File cabinets: Storwall. Standard and compact shelving: Bradford Spacesaver. Custom library furniture: Lombard/Parenti & Rafelli. Metal blinds: Levelor. Blackout shades: Mecho Shade Systems. Drapes: Maharam.

Project: Institute of Contemporary Art at the University of Pennsylvania, Philadelphia (p. 72). *Architects: Adèle Naudé Santos & Associates, Philadelphia; Jacobs/Wyper Architects, Philadelphia.* Lightweight steel framing: Marino. Exterior aluminum panels: Alucobond. Aluminum glazing: Kawneer. Aluminum windows: EFCO. Safety glass doors: Falconer. Acoustic tile ceiling: Armstrong. Single ply roof: Carlisle. Fiberglass batt insulation: Owens/Corning. Rigid board insulation: UCI. Tapered insulation: Celotex. Paint: M.A. Bruder. Fire alarm: FCI. Security: Radionics. Passenger Elevator: Dover. Track lighting: LSI. Recessed lighting: Lightolier. Air handlers/fan coils, chillers: McQuay. Motorized blinds: Faber.

Project: Colton Palms, Colton, California (p. 84). *Architects: Valerio Associates, Inc., Chicago.* Concrete: Rancho Ready Mix. Structural steel, balconies, and trellises: West Coast Iron. "Stolit" stucco system: STO Industries. Dens Glass Gold gypsum sheathing: Georgia-Pacific. Clear anodized aluminum storefront and storefront doors: United States Aluminum. Clear double layer insulating glass: Apostle Glass. Clear acrylic dome, aluminum frame: Lane-Aire Manufacturing. Apartment entry doors: Ceco. Apartment doors: Legacy. Flush insulated wood overhead doors: Overhead Door. Vinyl composition tile: Azrock, Armstrong, Kentile. Public room carpet: Bigelow. Apartment carpet: Pacific-Crest. Built-up roofing: Manville. Asphalt roll roofing: Firestone. Sealants: Tremco. Fiberglass batt insulation: Owens/Corning Fiberglas. Deck coating: Neo-Gard. Flat and semi-gloss paint: Dunn-Edwards. Locks: Schlage. Electric cooktop (*): Thermador. Icemaker (*): U-Line. Dishwasher (*): Tappan. Coin-operated washer and dryer (*): Whirlpool Commercial. (* All in public buildings.) Apartment refrigerators (handicapped): Amana. Drop-in range, refrigerator: Frigidaire. Emergency call system: MirTone. Exterior metal signage: A2Z Products. Door and apartment signage: Vomar. Access control system: Door King. Postal equipment: Florence Corporation. Spiral stair: Stairways. Metal handrails and guard rails: Badger Railing. Fiberglass tubs and surrounds: Lasco. Enameled steel countertop lavatories and vitreous china water closets: American Standard. Showers (handicapped): Kimstock. Shower, lavatory and sink faucets: Moen. Overhead braced steel partitions: All-American Metal. Medicine cabinets: Jensen. Towel bars, shower rods, and paper holders: Franklin Brass. Soap dispensers and grab bars: Tubular Specialties Manufacturing. Barrier-free water coolers: Haws. Outdoor furniture: Windsor Designs. Horizontal window blinds: Levolor.

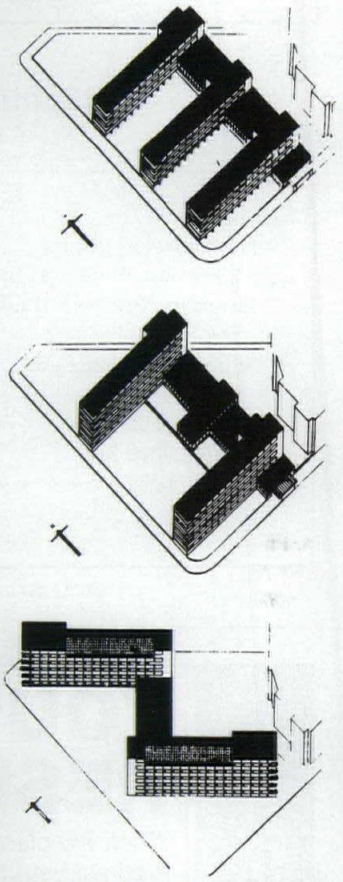
Books *(continued from page 108)*

the previous work. Even James Marston Fitch, in the glowing appreciation he wrote in *Walter Gropius*, a 1960 monograph, worried a little about the decline. But Isaacs is complacent. He trots out one drab project after another for us to admire, as if each had the sparkle and vivacity of the early works. Of the Pan Am Building he writes: "Time has come to the defense of the design." Well, perhaps Time has had the last laugh: the building is still there and Pan Am isn't. Yes, there is room for another look at Gropius, a look with a cold eye at where he went wrong, that also

"Modernism was no weaker in the 1950s than in the 1920s – think of the Seagram Building, think of Ronchamp – yet the work of Gropius lacked its previous fire. Was Gropius just a minor talent?"

takes in, without the old adulation, what he did right.

However serious the incipient weaknesses of Modernism may have been, they were not the immediate cause of Gropius's problem as a designer. Modernism was no weaker in the 1950s than in the 1920s – think of the Seagram Building, think of Ronchamp – yet the work of Gropius lacked its previous fire. Was Gropius just a minor talent? The Faguswerk (1911), the Werkbund buildings (1914), the Jena Theater (1921), and the house in Lincoln, Massachusetts (1937) say he was not. He has been accused (not, of course, by Isaacs) of relying too much on co-designers. But a Gropius building is no less fine because it came out of collaboration with Adolf Meyer or Marcel Breuer. If Gropius brought in people to help, wasn't that in line with the old Medieval craft spirit he was trying to revive through the Bauhaus? At the house in Lincoln, one wall of the deck is painted a magical pink, the color of reflected evening light. There is a story that the pink wasn't coming out right, so Gropius asked Lionel Feininger to mix it. It's that kind of pink and that kind of house: collaboration, not the noble single artist on a pinnacle, was Gropius's method. He demonstrated again and again his ability to lead a committee to come up with a horse and not a camel. Why, then, did Gropius produce, with his later collaborators, not just the occasional camel of his earlier career, but a regular caravan? It is an open question, and the answer is worth waiting for, because what happened to Gropius has its parallel in what happened to Modernism itself.



Courtesy Little, Brown, and Company

Gropius's designs, Aschrott Home for the Aged, Kassel, Germany; competition, 1929.

The relevance of Gropius today is the priority he put on expressing age-old principles in ways that would work for our time. Our time is a little different from his time – the Bauhaus goes back 70 years now – but we could do no better than to pursue his goal. **Jonathan Hale** ■

The author is an architect in Watertown, Massachusetts. Portions of this article are from his book, The Old Way of Seeing, *which will be published by Houghton Mifflin.*

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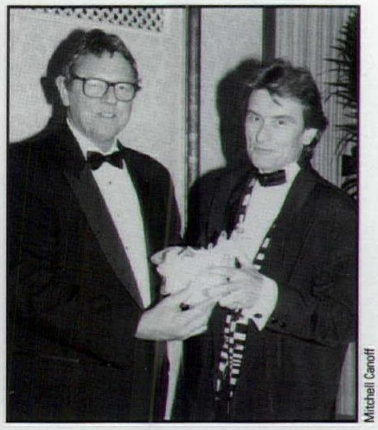
POSTMASTER: Send address changes to PROGRESSIVE ARCHITECTURE, 1100 Superior Avenue, Cleveland OH 44114-2543.

Furthermore ...

Helmut Jahn Fashion Update II

Back in February, 1990 (page 159), we noted a similarity between what Helmut Jahn designs and what he wears – a consistency rare among architects. A couple of recent press-release photographs confirm the phenomenon: at far right, stripes, as seen in his 120 N. LaSalle building; right, a plaid strongly reminiscent of his Kurfurstendamm 70 project in Berlin (P/A, March 1990, p. 107).



Mitchell Canoff

Best dressed architect? Helmut Jahn in business (left) and formal wear (right).

A Trivia Windfall

A fun fact gleaned from our research for the story on the Harold Washington Library Center (page 60): Chicago is called the "Windy City" not because of the gusts from Lake Michigan, but as a tribute to the city's reputation for verbose political discourse. The "Windy City" medallions on the side of the library, then, are especially appropriate, given the building's politician namesake and the politics that surrounded its genesis.

If You Mount It, They Will Come

By now, the AIA's strategy for attracting big-name speakers to their annual Accent on Architecture gala – scheduled this year for January 22 – has become abundantly clear: build a concurrent Octagon exhibition around the chosen VIP. In 1990, they mounted an exhibition on St. Paul's Cathedral, and Prince Charles showed up to open it. In 1991, they offered "The Grand Louvre: Entering a New Century," and were *this close* to getting French President François Mitterrand until the Gulf War got in the way.

This year, there can be no doubt who they had in mind when they announced plans for "The White House: Image in Architecture 1792 – 1992." And sure enough, at press time, Barbara Bush was scheduled to open the exhibition, while the President was to present the Gold Medal at the gala.

But how do they top this one? Here are our own suggestions for future Accent exhibitions:

1993: "Treasures of the Kremlin" ... oops, better make that "The Russian Parliament Building: Bastion of Freedom."

1994: "The Michael Jackson Ranch: A Retrospective."

1995: "St. Peter's Basilica: Jewel of the Vatican."

1996: "Heartbreak Hotel: The Architecture of Graceland."

Alternate Power Sources

Our series on Architects and Power (p. 47) has raised a debate on the P/A staff about whether or not the power of architects has substantially changed in this century. What certainly haven't changed, though, are the creative ways in which architects find new ways of working. The number of unemployed architects these days who are starting alternative businesses, offering new services, and essentially redefining themselves reminded one of our editors of his architect grandfather – who found himself out of work with a family to feed during the Great Depression. He convinced the owner of a new and largely empty office tower to hire him as the building manager if he could fill it with tenants. He then researched the expiration dates of all the major leases in the neighboring buildings and approached those tenants about to renew with an offer to provide free interior design services if they moved into the new tower. In a matter of months, the new building was fully leased and he was hired as the building manager and rode out the depression doing the occasional office interior. If there is a kind of power in inventiveness, then architects have always had it in abundance. ■

P/A in March...

London, Paris, and Venice (California) are among the locations of our featured projects next month. Features will include:

... the Venice, California, headquarters of advertising agency Chiat/Day/Mojo, designed by Frank O. Gehry & Associates with an art installation by Claes Oldenburg and Coosje van Bruggen.

... Peterborough Court, the Fleet Street headquarters of Goldman Sachs, by Kohn Pedersen Fox.

... a pair of housing projects by architect Jonathan Levi.

... two office buildings in suburban Paris by Odile Decq & Benoît Cornette, Paris.

... a P/A Inquiry on hospitals.

In Technics will be a discussion of the new design guidelines for building envelopes released by the General Services Administration. A Technics Topics article considers issues architects should address in the design of custom lighting fixtures.

A new Market Overview feature in Practice will review various building types as opportunities for commissions.

Also, March will mark the debut of *P/A Plans*, a separately bound supplement examining building types. The first issue, covering schools, will include more than 50 plans.