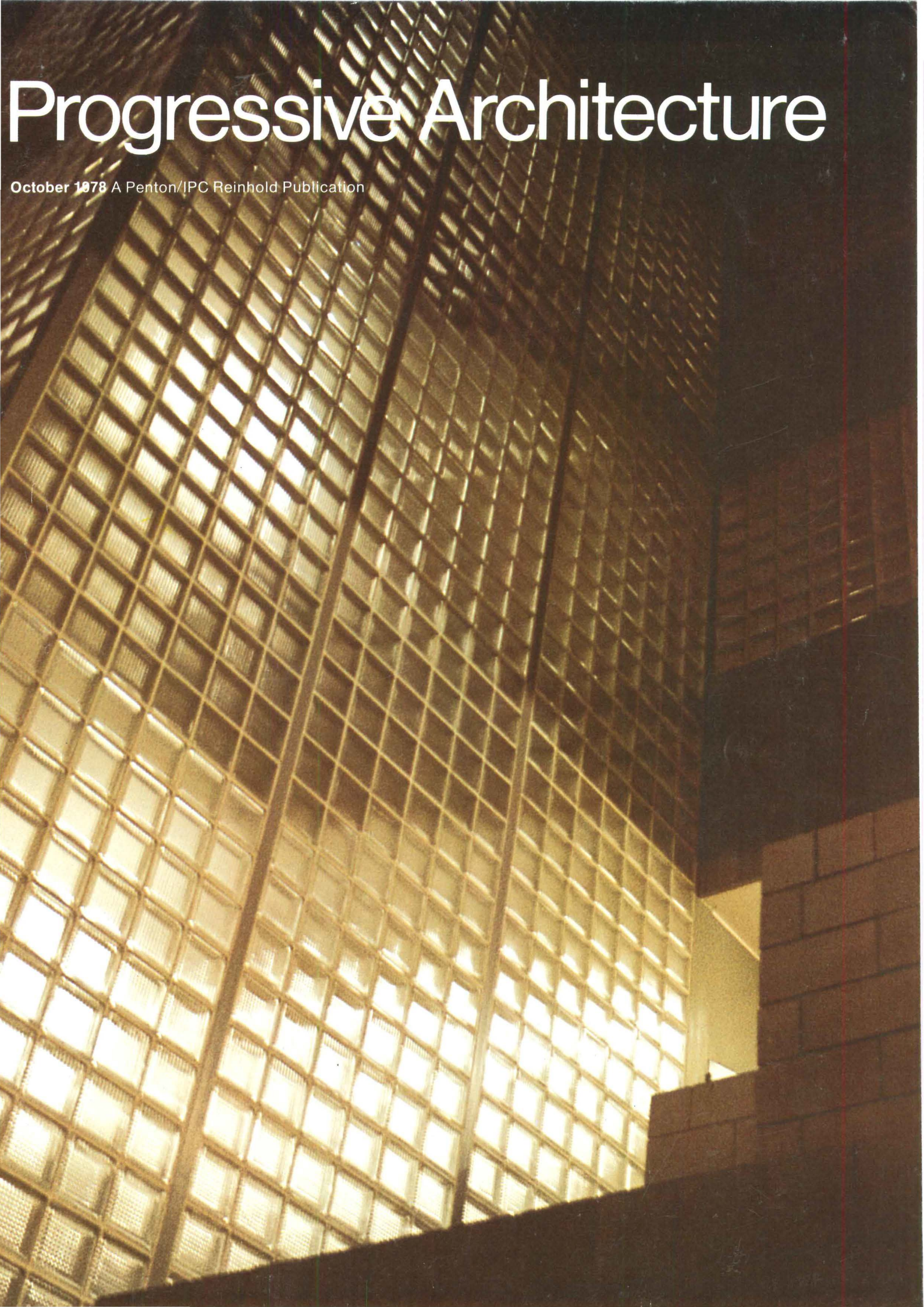
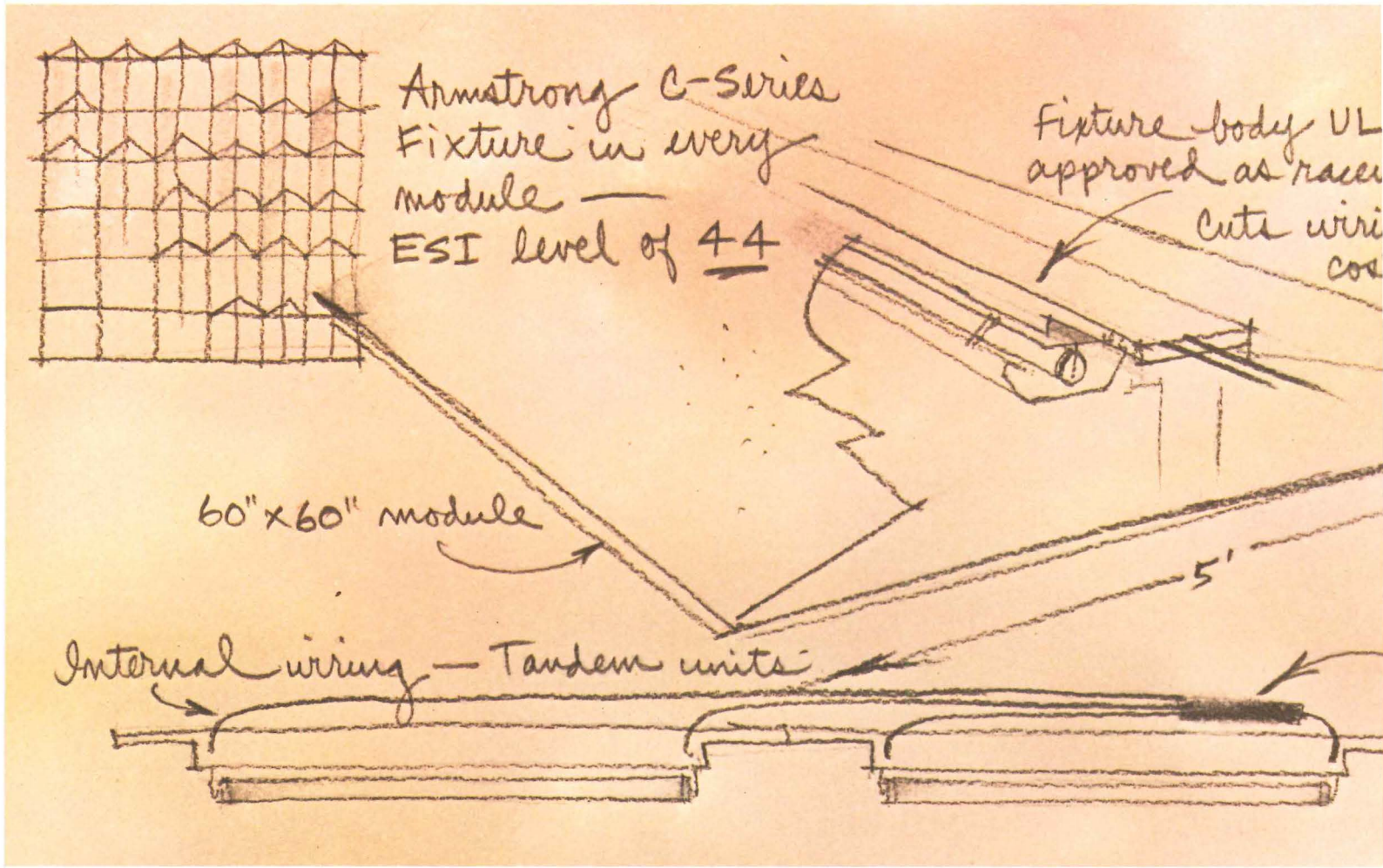
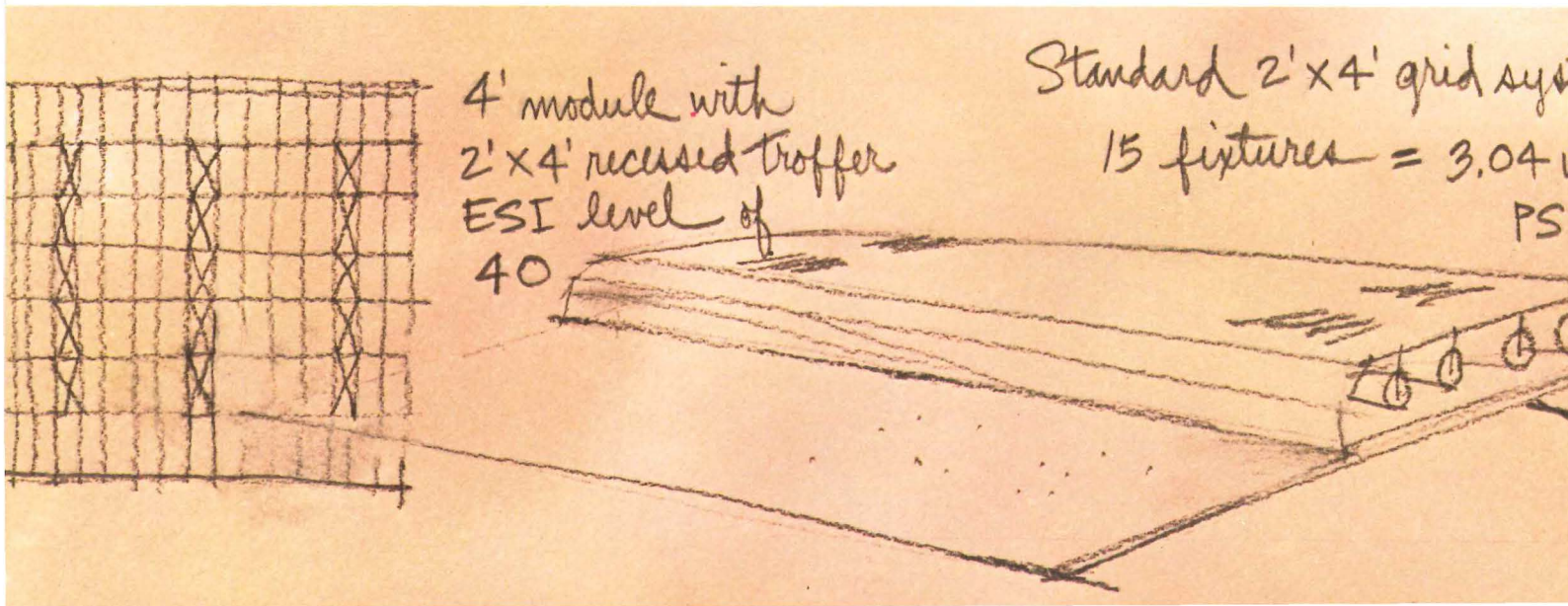
Progressive Architecture

October 1978 A Penton/IPC Reinhold Publication



How can 100,000 square feet of one ceiling system save as much as $29,000 a year over another?





Less energy consumption is the obvious answer. And the fact is, the Armstrong C-60 Ceiling System will use 40% less energy than the layout with the 4-lamp recessed troffers sketched below. That's because the Armstrong system operates at only 1.84 watts per square foot versus 3.07 for its less-energy-efficient competitor, even though both layouts are designed to provide lighting of close to equal quality.

In this comparison, the measure of lighting quality goes beyond classical footcandles. Because raw footcandles don't indicate how much light reaching a given point is useful light. That's why today many determinations of lighting quality are being made by a method known as Equivalent Sphere Illumination (ESI). ESI measures more precisely how well a viewer can see what he is doing in every square foot of a specific room.

Measured by the sophisticated ESI method, the Armstrong C-60 really shines—providing levels significantly higher than the conventional 4-lamp troffer layout. With just one lamp per five-foot-square module, with far less wattage, and at far less lighting and air-conditioning cost. So much less that a 100,000-square-foot installation could save as much as $29,000 a year, long term, at today's energy prices.

To learn more about ESI and the C-60 Ceiling System, see Sweet's Architectural File—9.1/Arm—or write Armstrong, Dept. 8CNPA, Lancaster, Pa. 17604.

FROM THE INDOOR WORLD® OF Armstrong

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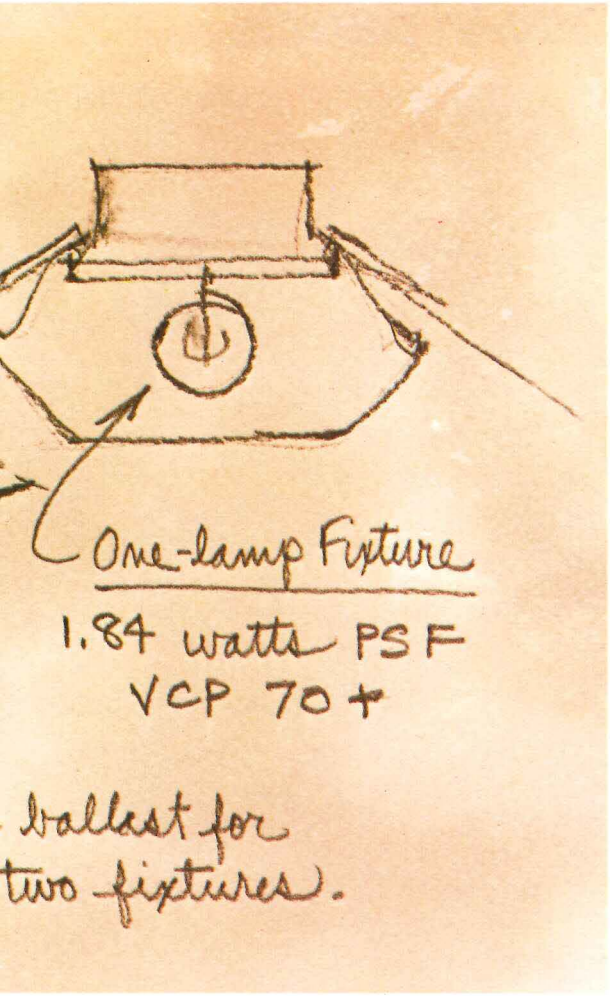
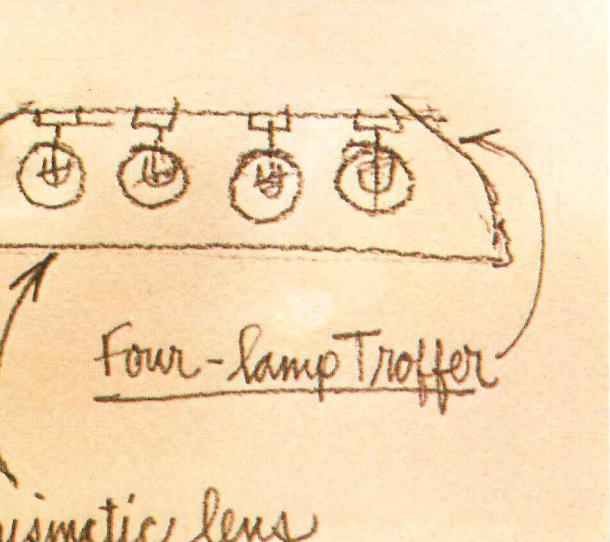
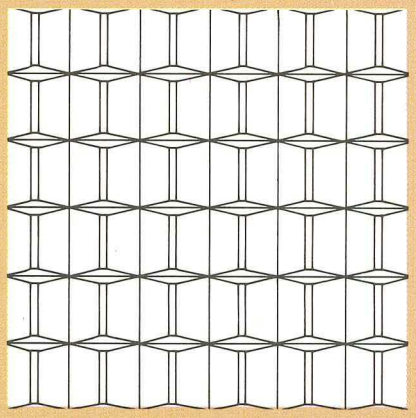
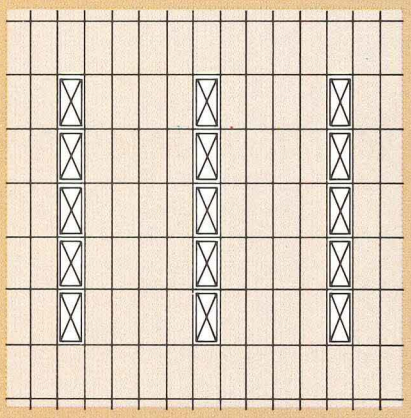




Systems Performance Comparison*



Armstrong C-60 Luminaire



2'x4' Recessed Troffer

Prismatic	Fixture	Prismatic
1	lamps/fixture	4
36	no. of fixtures	15
	classical footcandles	
90	initial	127
70	maintained	95
44	ESI level	40
1.84	watts/sq. ft.	3.07

*30'x30'x9' room; task—ESI pencil. All test data was supplied by independent laboratories; complete information available on request.

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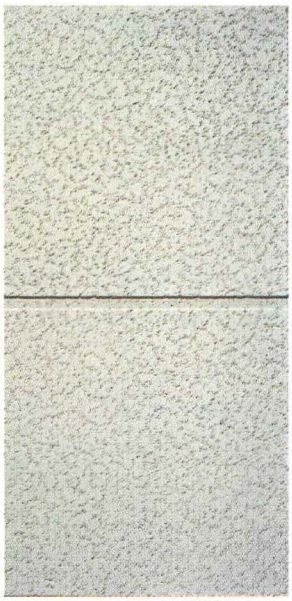
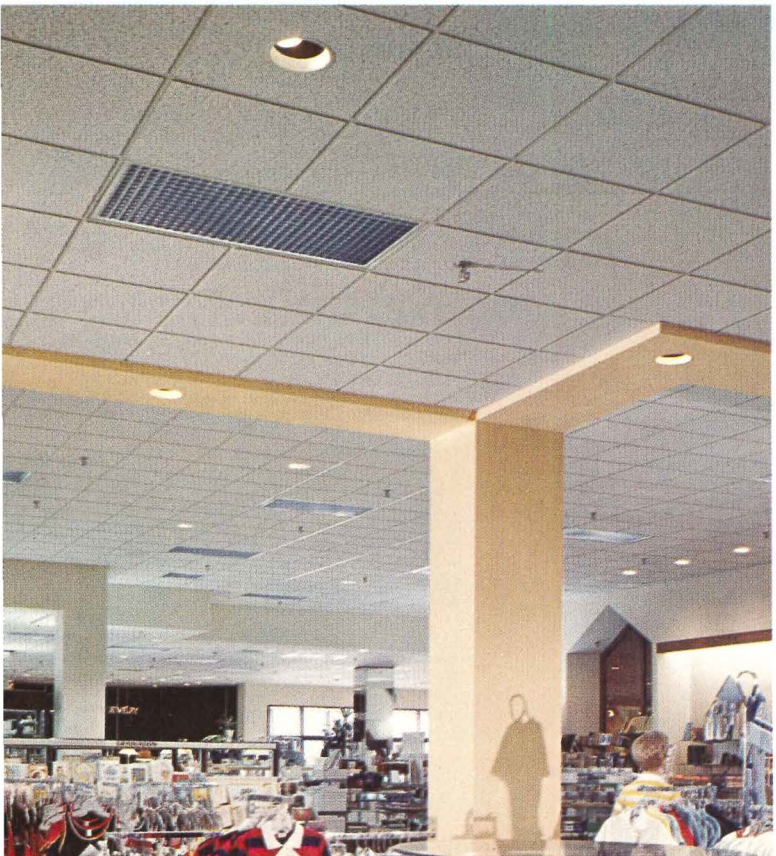
In the case of Bold Look I, each handsome rough-textured 24″ x 48″ panel is scored in both directions with one-inch-wide routings that divide the surface into eight tilelike sections. Second Look I, with its smoother surface, is also divided to simulate 12″ x 12″ tile, while Second Look II provides the broader look of a 24″ x 24″ tegular-edge panel.

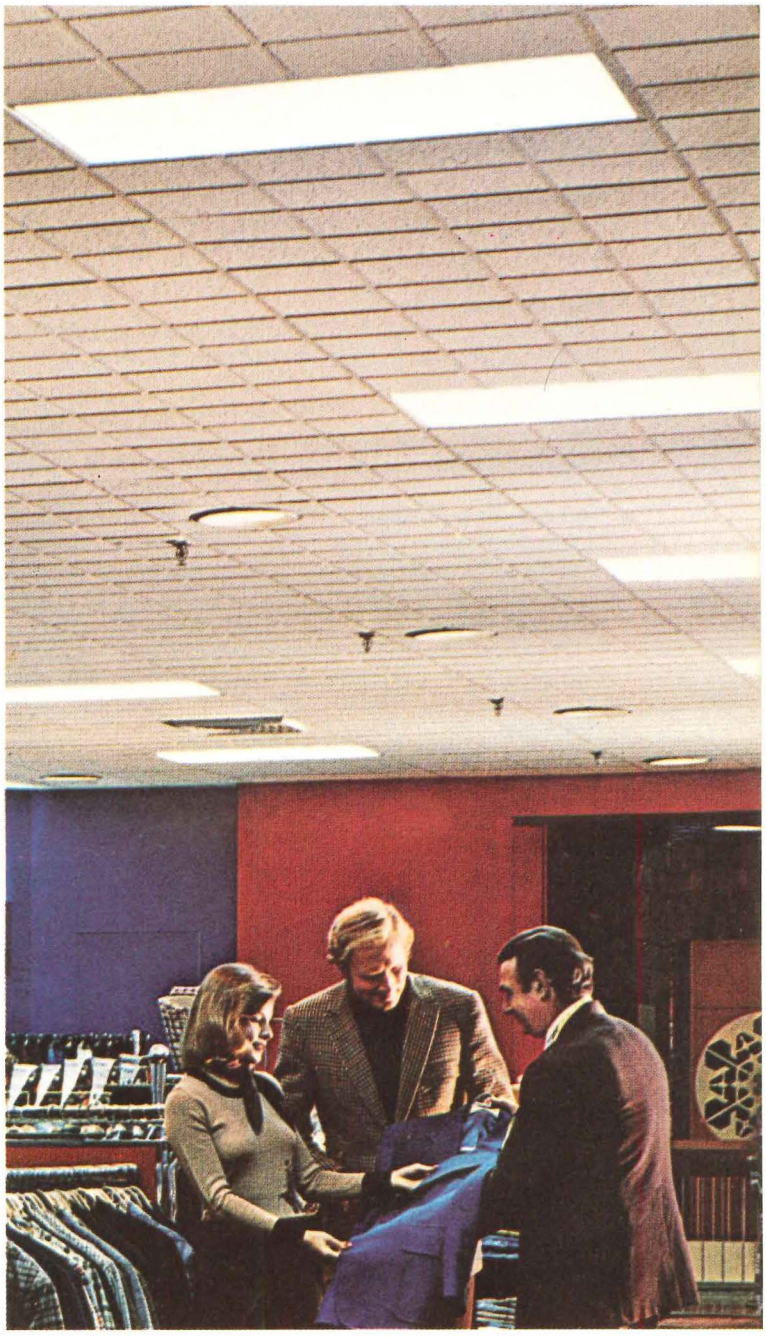
So what you end up with is a ceiling that combines the beautiful efficiency of a tilelike look with the cost efficiency of an exposed-grid system—a combination you can't beat for good looks or good sense. To learn more, write Armstrong, Dept. 88NPA, Lancaster, Pa. 17604.



Second Look II

Second Look I





FROM THE INDOOR WORLD® OF

Armstrong

October 1978

Progressive Architecture

Cover: A perfume factory in Barcelona, Spain, uses inexpensive but durable materials yet still achieves a high level of architectural quality. Photo: Elias Torres.

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que surface design of the
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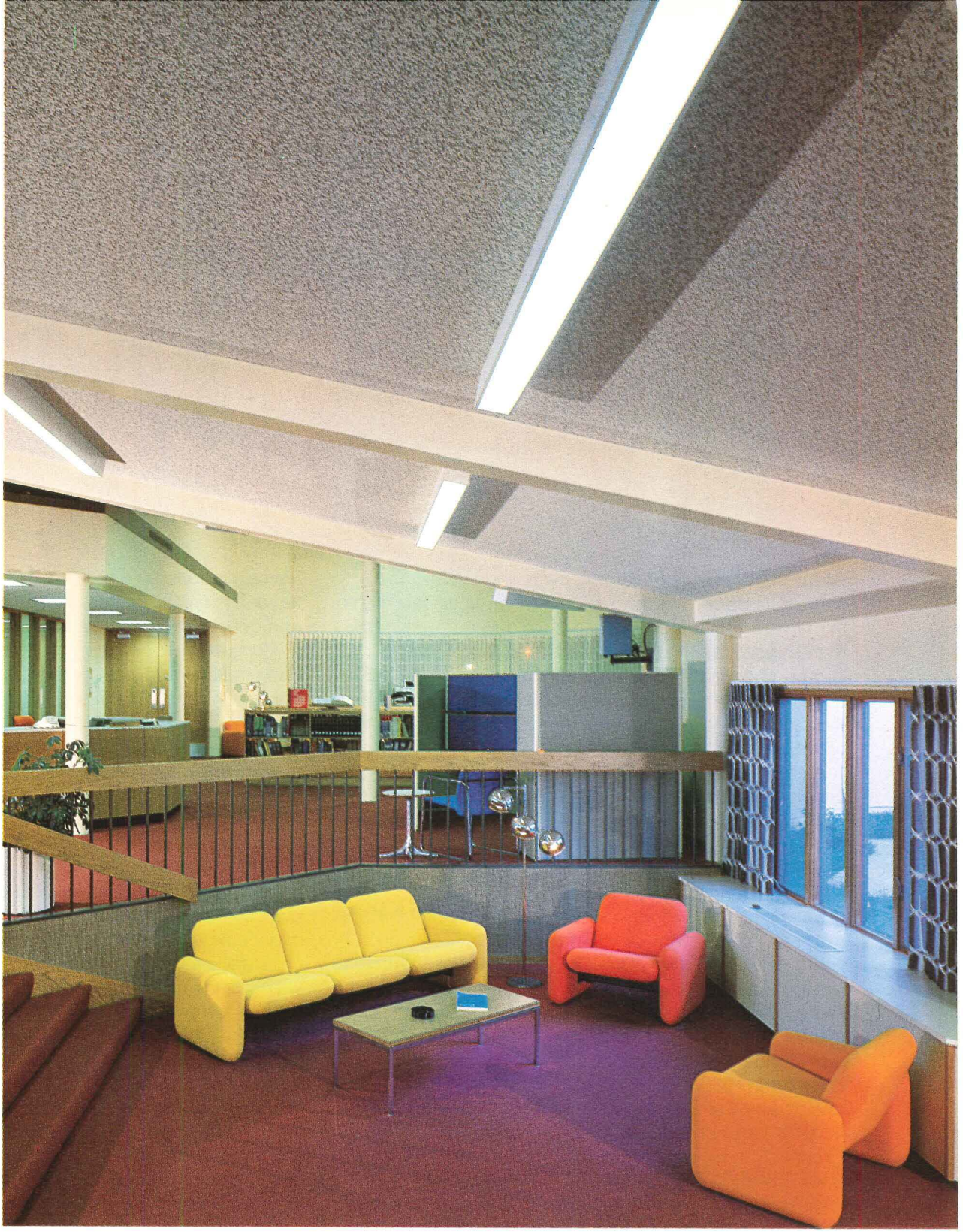
combines with snug-fitting
o create a monolithic look.



Architect: Leo A. Daly, Omaha • Ceiling Contractor: The Simpson Company, Omaha

When it comes to complementing striking architecture, nothing tops the monolithic look of the Sanserra Travertone™ ceiling from Armstrong.

The proof is fully evident here at the new Center for the Study of Youth Development in Boys Town, Nebraska, where a luxury-look ceiling was critical to the sculpted, naturally toned interior spaces. And where the deeply etched surface of Sanserra Travertone adds a final drama to the distinctive design. One of the top-of-the-line Travertone acoustical products from Armstrong, Sanserra is a fire-retardant mineral-fiber ceiling available in 12″ x 12″ tile and 24″ x 24″ tegular-edged panels. The square-edged tile shown here in a concealed grid system visually minimizes joints, resulting in a clean sweep of overhead elegance. One more reason why Sanserra helps make the Travertone family first choice with architects for their first-class buildings. To learn more, write Armstrong, Dept. 8CNPA, Lancaster, Pa. 17604.

FROM THE INDOOR WORLD® OF
Armstrong

Boston: reflections on regeneration

October 1978

Boston was home to me during my college years, and I have gone back there frequently. Visiting again last month, this time to take one of my children to college, I inevitably found myself reappraising the place after a quarter-century of considerable change, much of it planned change. Personal associations aside, Boston does represent some of the boldest, best-informed architectural and urban design efforts of that period.

At the risk of losing face among fellow critics, I can only conclude that all those earnest professionals have left Boston a better place than it was in the early 1950s—and incalculably better than it would have been without their intervention. The city itself remains as strong a reason as any for going to school in that area.

Boston has, admittedly, suffered serious damage in the name of progress. The destruction in the 1950s of the tight-knit West End for a crop of urban renewal apartments was quickly and rightly denounced by sociologist Herbert Gans, but even this misguided effort served to discredit the bulldozer approach and spare other areas.

Surrender to the voracious automobile was evident even in the early 1950s, when the tranquil riverfront park was ravaged by a speedway; then downtown was severed from the harbor by an unspeakable elevated expressway. Eventually the Turnpike Extension cut a trench between Back Bay and the renewable neighborhoods south of it, knocking off a corner of Copley Square as it swerved by. And parking lots or garages, depending on property values, have intruded in all but the most sacred locations. To be fair, however, the pedestrian in this walking city is no longer subjected to traffic jams of trailer trucks.

The most visible area of planned public intervention—the showcase of the Boston Redevelopment Authority—is the large central tract composed of Government Center, Faneuil Hall Markets, and the harbor waterfront. Granted, City Hall Plaza is a bit too large, but is neither dull nor deserted. Its very success, however, has attracted private office towers to the edge of the redeveloped zone, which violate the historical scale prevalent inside it.

Critics of the rehabilitated Faneuil Hall Markets bemoan its transformation from a crusty wholesale district to a retail bazaar, which some denounce as "suburban." But the wholesalers had long since moved out—for better or worse—before the developer came along, and I challenge anyone to find in the surburbs a place with the diversity and density of activity that now goes on there.

Along the harbor, fishing piers and warehouses have been transformed into charming shops and apartments—one urban asset supplanting another. Perhaps if the area had remained economically depressed the fishing fleets could have afforded to stay. They are missed.

Redevelopment, of course, drove out all of the low-rent activities that used to occupy—or partially occupy—this part of the city. Would piecemeal private efforts have served better to reverse the dilapidation so evident in the 1950s? I doubt that it could have worked at all. Without public effort to reorganize streets and open spaces and plant some catalytic new buildings, the whole district might now look like downtown Detroit. (I realize there was urban renewal there, too, but either the treatment was wrong or the situation beyond help.)

The most prominent private efforts have been the towers along the officially established high-rise spine of Back Bay. Prudential Center, the disastrously clumsy offspring of the visionary Back Bay Center scheme (winner of a P/A first award in 1954) retains only its desirable mix of uses. The Pei firm's Christian Science Center and John Hancock tower (no longer visibly self-destructing) offer huge, abstract volumes—beautifully detailed—which show little sympathy at all for users or for urban context.

But so much of that wonderful context does remain, with excellent examples of renovation and compatible new construction scattered through it. Survival of the critical areas has been made possible, I am convinced, by that redevelopment and those roads—plus innumerable more modest improvements in the public schools, for instance, and the transit system. The economic establishment required these changes as a price for saving Boston, and the political structure recognized their needs. The professionals they brought in knew how to deal with those needs and leave for us, a generation later, a vital, recognizable Boston.

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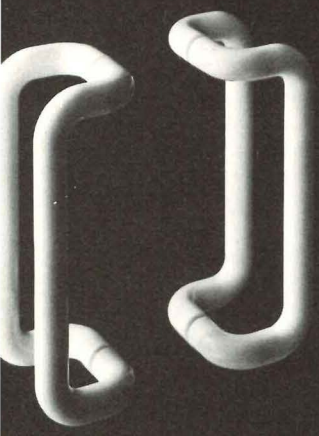
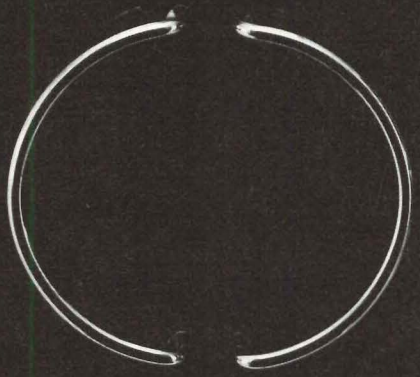


4¼" x 10"



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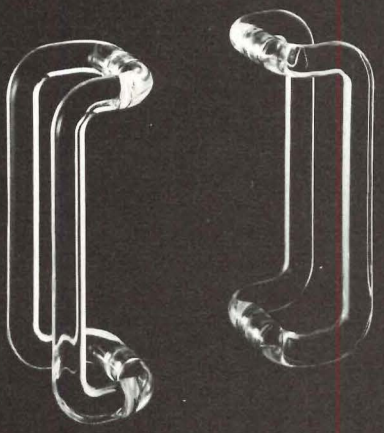

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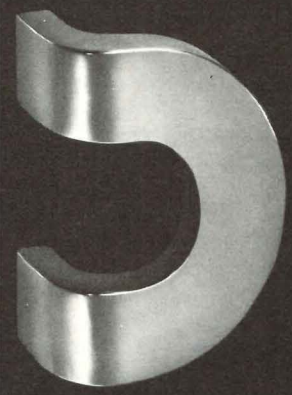
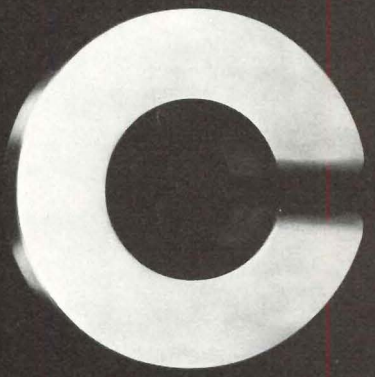
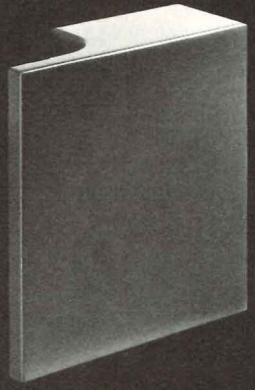


6" x 8¼"

3⅜" x 10½"



8½" dia.



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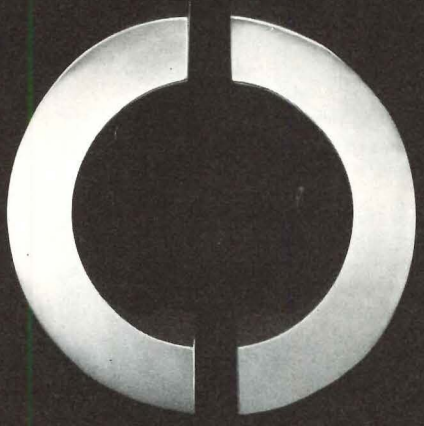

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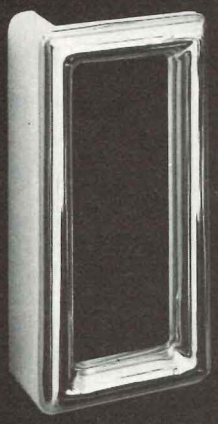

6¼" x 12"

Views

Library inquiries

The appearance of the Auraria Library, with kudos, in the July issue of P.A. . . . a project almost universally reviled and excoriated by the public, students, faculty, and local design professionals, certainly only serves to damage P.A.'s credibility here.

Permit me to clarify certain points.

a. the Library was not designed as a prototype for the campus. Three other buildings were already under construction at the time the Library architect was selected.

b. the use of brick on all other buildings was the result of urging by local design professionals and others who know and understand the parameters of our hot, sunny climate. That these other buildings turned out the way they did was the direct result of dictates from the overall project coordinator.

c. sunshades are *not* on the south and west, they are on the southwest and northwest . . . a small adjustment perhaps, but enough to point out that the building positively broils in the early morning thru the midafternoon. Perhaps P.A. should have shown pictures of the hastily applied aluminum foil over the windows on these exposures, and made mention that microfilm and other valuable printed materials have had to be moved from the building because of heat and radiation damage! Need I mention the reaction of faculty and students who were to work there?

d. insulated wall panels *do* help . . . but not nearly as effectively as the thermal mass provided by the more knowledgeable local architects.

e. mechanical equipment savings were not a result of the building design. At the time of design of the entire campus, the Governor of Colorado specifically mandated that no air conditioning be provided in *any* building on the campus. Thus, all buildings have effected similar savings. . . . P.S. because the Library has proved to be uninhabitable much of the time, that so-called savings is now in the process of being spent retrofitting that building. The masonry walled buildings to my knowledge, are functioning as originally contemplated.

f. the building *should have been* the main focus of the new campus. Unfortunately, massing, color and proportion of the building in relation to other buildings, clear pedestrian patterns of the master plan and the climate of Denver, Colorado were not adequately considered to make this so.

"High Tech" it may be Mr. Editor . . . an inviting, responsible design solution it most certainly isn't!

Theodor A. Grossman AIA
Chairman, Public Relations
Colorado Central Chapter AIA
Denver, Co

I have read with interest your recent article on C.F. Murphy's work in "factory familiar" architecture in the July 1978 issue of Progressive Architecture. While these buildings are applauded for their honest attack on building technology imagery, they certainly cannot be credited with the kind of attentive support you have given them. Having worked, personally, on the Auraria project in Denver for a couple of years, I know for a fact that the Auraria Library was not a prototype for the campus, but rather an "exception" after a number of buildings were well into planning stage. A number of points should be made in reference to responsibility, both from the standpoint of inappropriate architecture and uncritical journalistic support of it.

The highly efficient surface area to volume enclosed is something of a sham since the cost of the skin on this building is probably 50% greater than on any other building on the campus and works far less efficiently than the "dim" brick walls, which, for all their modesty, are in fact more honest supporters of the human environment. Once again, the "symbolic" use of industrialized systems gets confused with appropriate use. The U-Value of the wall system is double that of the other buildings on campus. Sun shades had to be used because there was so much glass. The sun shades, however, completely obscure the views which look out to the Rocky Mountains. If surface areas were so important, why the mean, useless courts in the center of the building which glare into the inte-

[continued on page 12]

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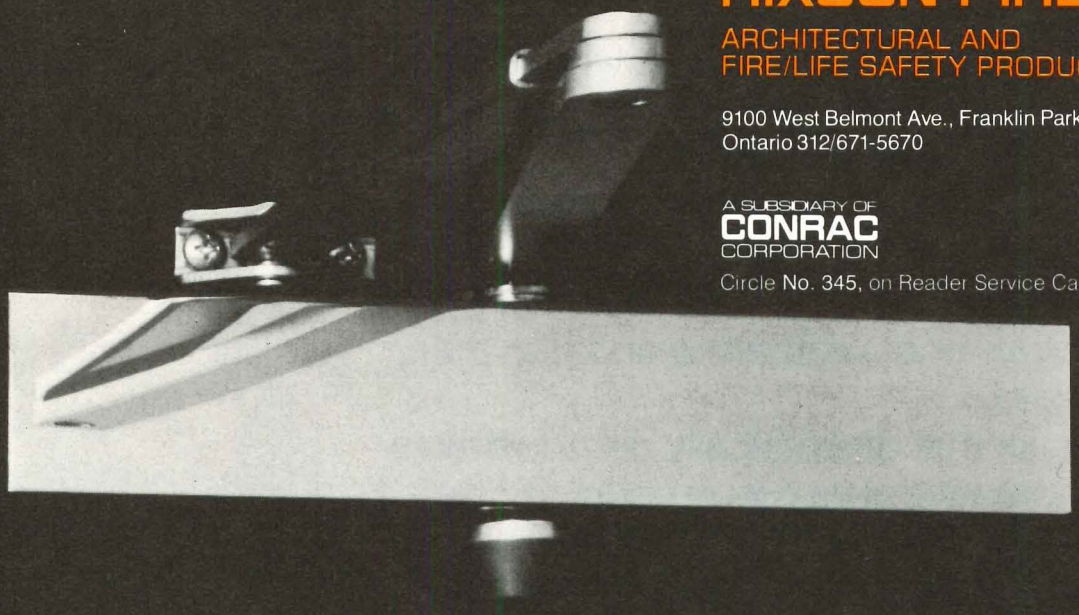

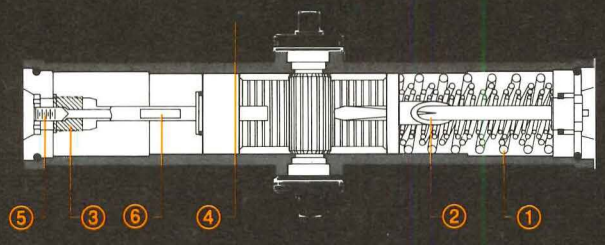

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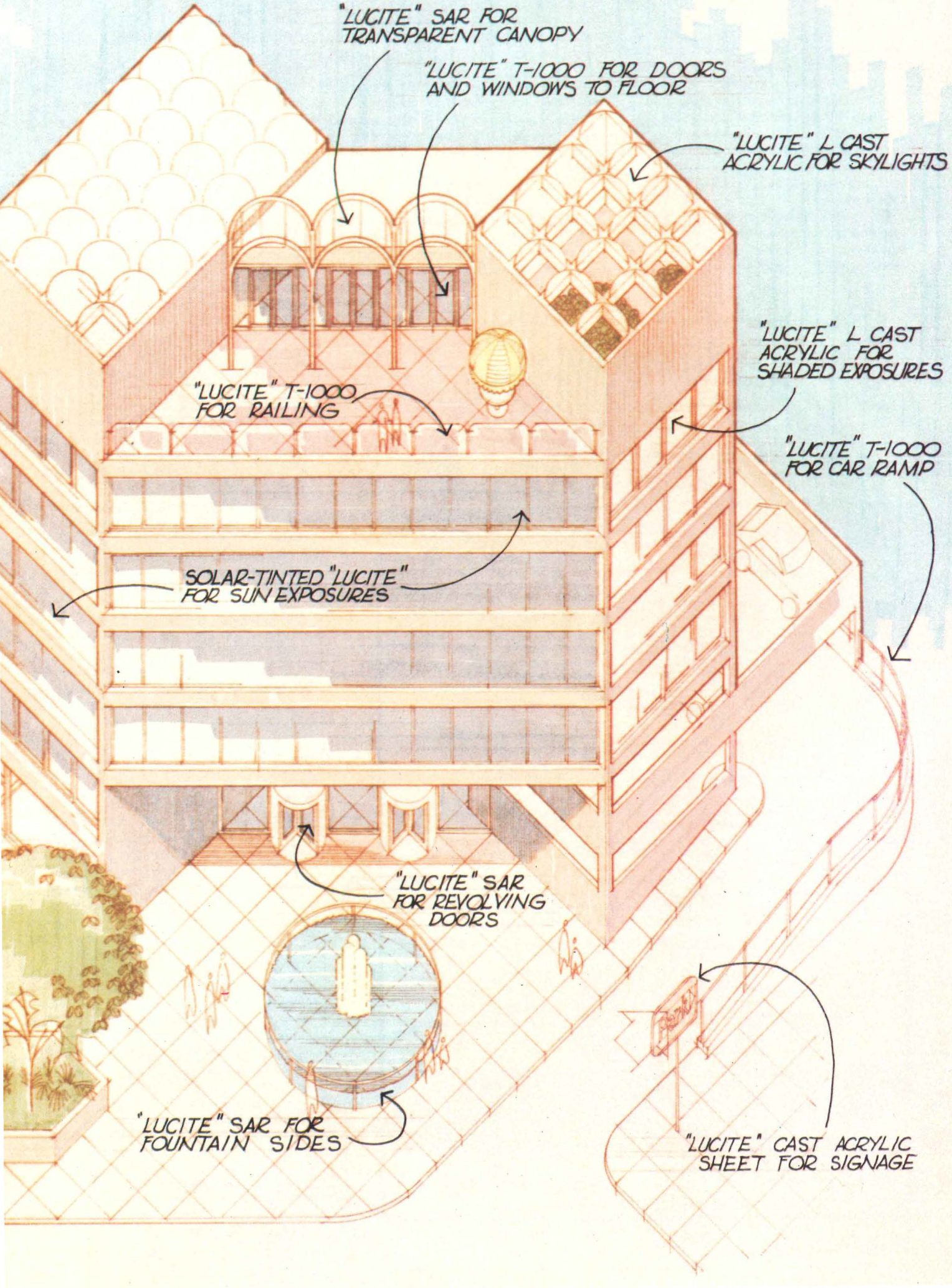
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Views continued from page 10

riors like some kind of after-thought gesture to introduce "nature" into an inhuman space? Why is it that temperatures in a number of spaces get up to 120°? And why, even though natural daylight provides 50 percent of reading light, are the lights left on all day? How then, are we saving energy? Is it a fact that "natural light" is good for reading? It is both uncontrolled and harsh, producing more light at the periphery of vision than on the object. I would think this causes eye strain.

This building shows innovation in nothing but inappropriate symbolism. Visibility into buildings has nothing to do with factory design and is readily available all over the country in any type of construction style. The contrived emphasis on packaging human activity in boxes lined with mink skins is doing more to benefit architect's portfolios than the human user. What innovation there is has been lost on the general public and the city of Denver, most of whom look on the structure as an eyesore. To set such a structure in a resplendent and lavish country-side with softness all around, might have merit, but set as it is, on downtown streets, next to one of the oldest and most attractive churches in Denver is nothing more than utter disrespect for the environment. I am certain that a more critical appraisal of these structures would lead any rational man to a far different conclusion than what was indicated by this article. Hopefully, no one will take it too seriously, but then, what is the point of making statements if they are not taken seriously? So much for illuminating the general public.

Philip D. Goiran
Dominick Associates, Architects
Denver, Co

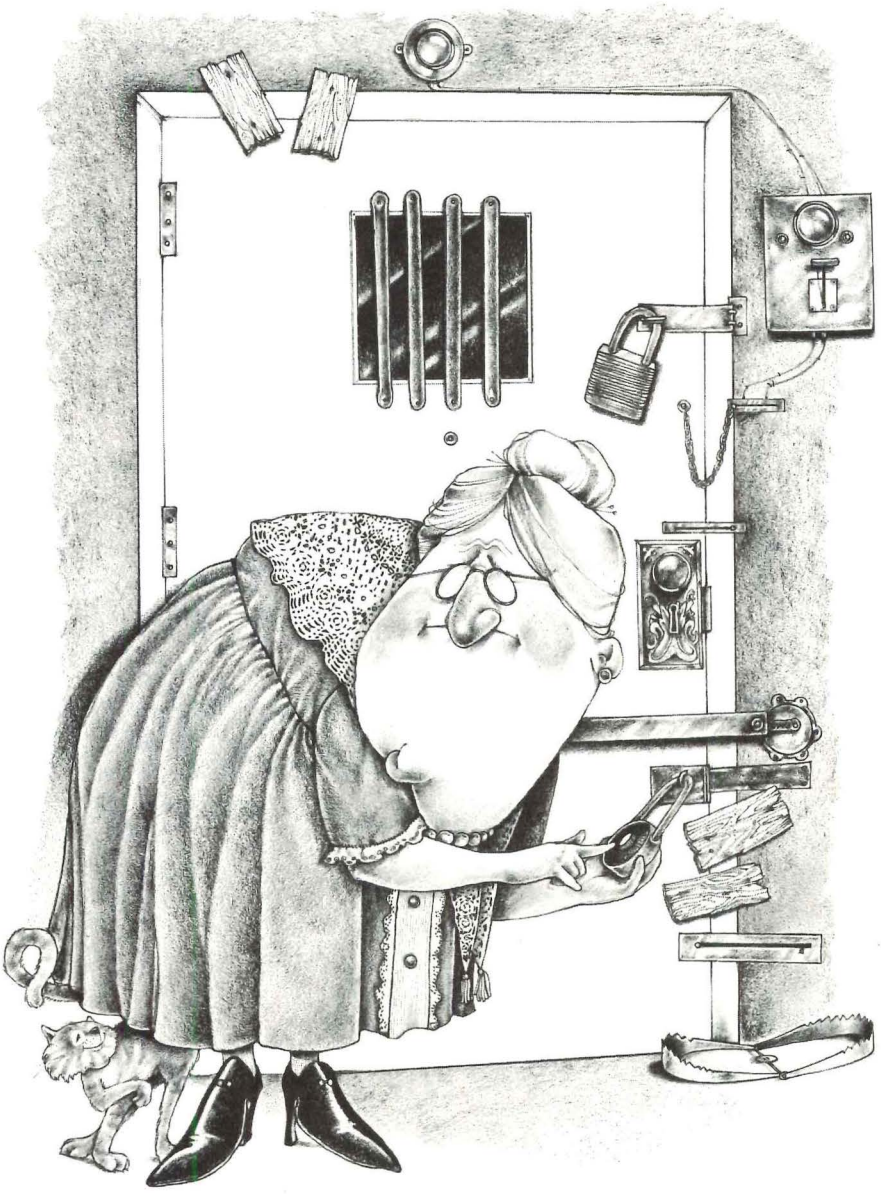
[Helmut Jahn has recently informed P/A that the 1973 master plan for Auraria Higher Education Center called for flexibility to accommodate future change in size and use of space, as well as standardized prefabricated components to obtain maximum quality at the lowest cost. The library was, and remains, he notes, the only building that meets those requirements and others concerning the planning grid and module. Jahn further states that the 0.1 U-value of the exterior wall is superior to that of brick construction, and because of the wall's factory prefabrication it is of higher quality than brick. The architects proposed adding sunshades to the northeast and northwest façades, but this was not done, Jahn notes, since additional money had to be spent on other buildings. He also states that the initial environmental concept was to use as much natural light and ventilation as possible, with future upgrading to air conditioning. Mechanical units originally installed were used only for ventilation due to lack of central chilled water plant, but units are air conditioners, and to operate as such need only connections and controls. Using lights when there is sufficient daylight adds to energy waste, but this practice is beyond the architects' control. Finally, Jahn notes that the $13.90-per-sq-ft cost of the skin, including shades and finish, is competitive with masonry, and that the $28.55-per-sq-ft total cost of the library is the lowest of any campus building.—Editors]

Corrections: restaurant structure

Certain statements in the article on Hiram's Restaurant, Seattle ("Fighting the System," P/A, Aug. 1978, p. 62) require corrections and clarifications. The structural system was not a Butler building system, as stated in the Data block; as both the text and the Building Materials list (p. 106) indicated, Butler components were not actually used. (The exception is the silo portion, supplied by the Agricultural Division of Butler Manufacturing Co.) The great increase in cost between initial quotations and final price was not—it should be made clear—due to any initial inaccuracy or to escalation in price by producers, but to design revisions and upgrading of standards for materials, equipment, etc. Purchase of components was not based on competitive bidding, as the article implied, but on estimates obtained by the contractor, in line with the design intent. Delays in the project were due in large part to the local design review and adjustments in the design. The proprietary name Butler was used erroneously to refer to pre-engineered buildings generally ("pure . . . Butler was unacceptable to the community"). P/A regrets any misapprehensions this article may have caused regarding Butler Manufacturing Co. or any other parties involved in this project. [Editors]

Credit misspelled

In the news item entitled "Parks, plazas and playgrounds" (P/A, Aug. 1978, p. 34), the name of Jerry Braude, who created Participation Pond, was misspelled. The editors of P/A regret the error.



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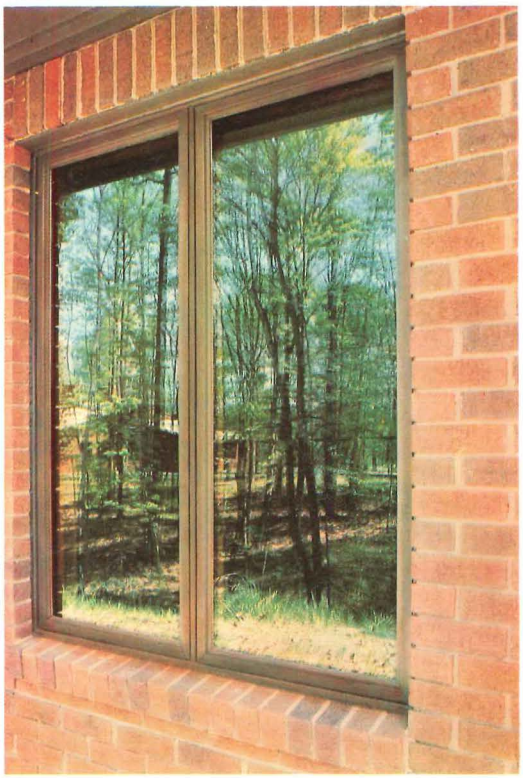
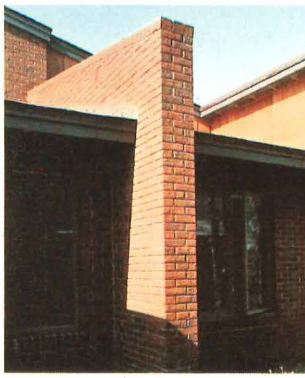
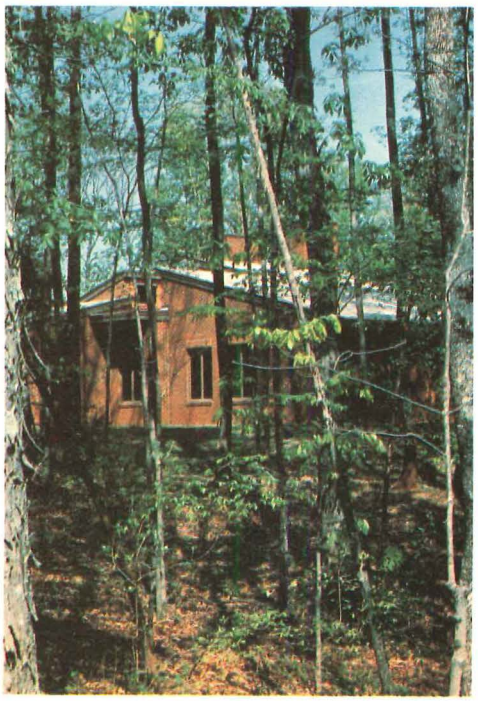
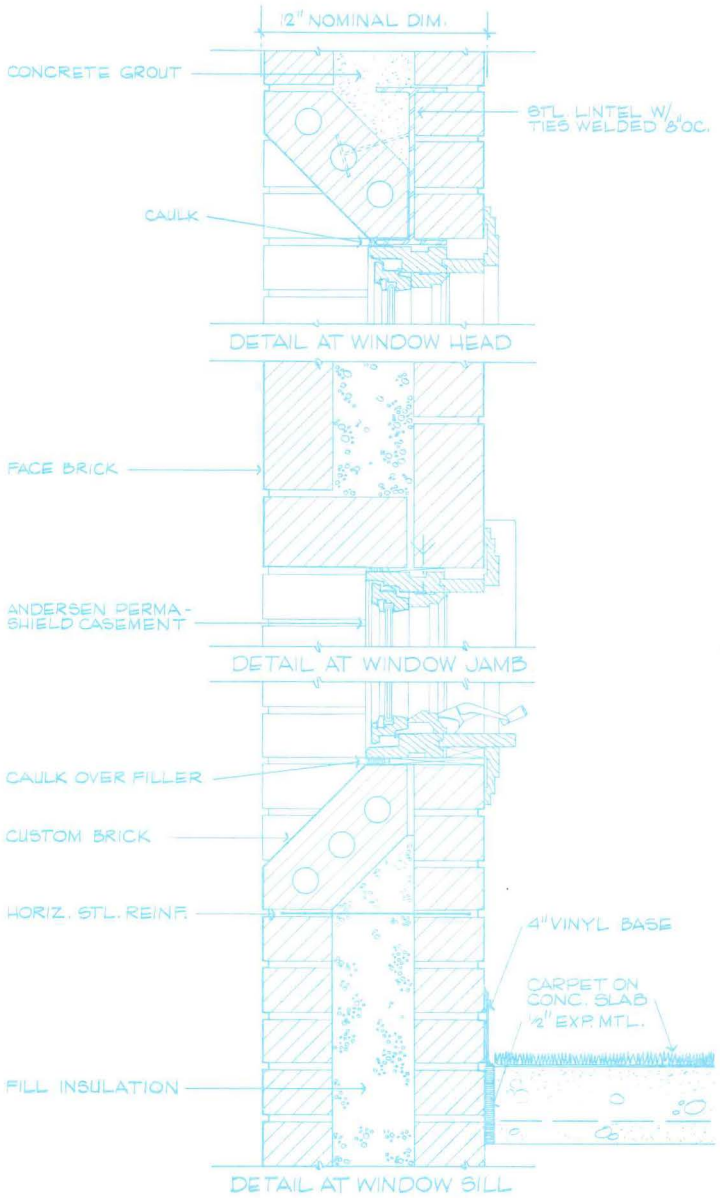






At a mental health center...
Andersen institutes warmth and harmony.



Windows can be a critical element in the livability of an institutional project.

That's why, when designing these extended care units for the Mecklenburg Mental Health Center, the architect specified Andersen® Perma-Shield® casement windows in Terratone color.

They knew the beautiful look, feel and charm of their inside wood trim would establish a warm, comfortable atmosphere.

They knew these windows in Terratone color would create harmony, too. Thanks to their deep, dramatic earth-tone hue—it blended beautifully with both the brick exteriors of the buildings and the landscape.

And they knew Andersen windows would match the County's desire to save on operating costs. The tough, long-lasting Perma-Shield vinyl sheath virtually eliminates maintenance—it's designed not to rust, pit or corrode. Won't chip, flake, peel or blister.

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For more details, see Sweet's File 8.16 or your Andersen Dealer or Distributor. He's in the Yellow Pages under "Windows." Or write us direct — Andersen Corporation, Bayport, Minnesota 55003.

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In-patient Addition
Charlotte, North Carolina
Architect:
Henningson, Durham & Richardson
Charlotte, North Carolina

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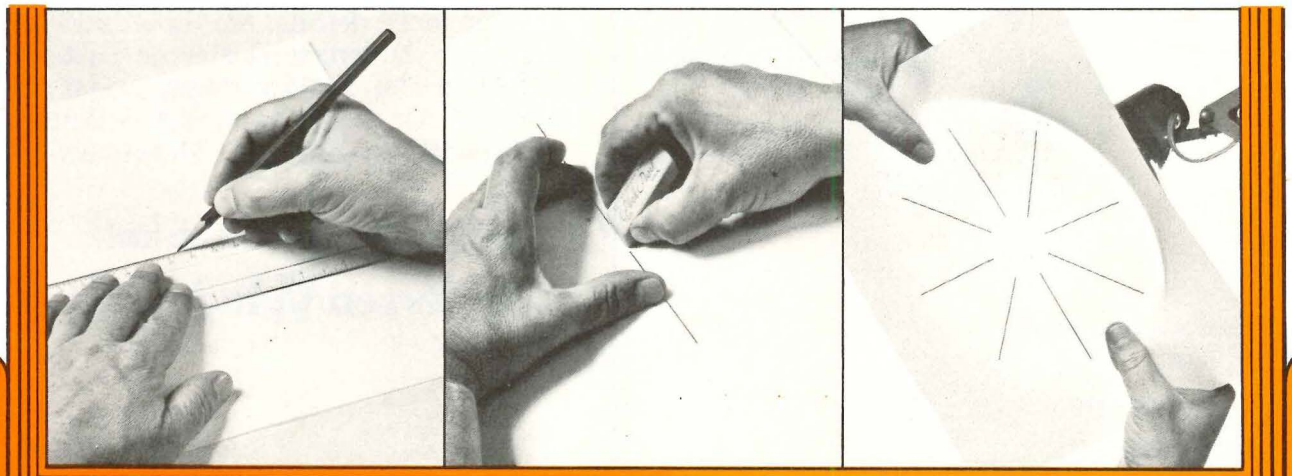
2. Erase and redraw the same line in the same place several times.

3. If you see a ghost, the paper isn't Clearprint.



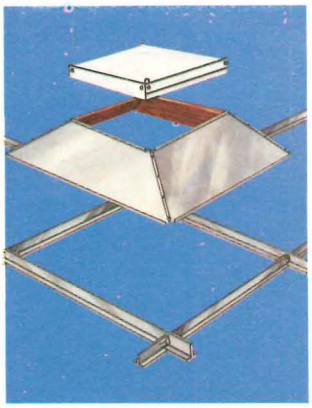
General Electric, the company that's made a science out of energy efficiency, gives you a fresh look at integrated ceilings.

Only Lok Ceilings wrap performance and energy efficient system.

Let's face it. An integrated ceiling can be defined in many ways. But unless it coordinates air distribution, modular design and a range of lighting capabilities, it's not a truly integrated system.

The people behind General Electric/Lok Ceilings have not only assembled these interlocking functions in one ceiling, they have also refined the performance of each so the total system provides the kind of energy saving efficiency you've come to expect from GE.

Compatible with any environment—old or new.



The secret to Lok's integrated system is modular construction. Over 300 styles of steel and extruded aluminum grid members are available so you can design your ceiling to match the room (instead of designing the room to match the ceiling). This versatility is particularly important when you're renovating an existing structure. Moreover, the range of functional and aesthetic options offered can bring a new dimension to any interior arrangement. And, if you wish, we'll support you with engineering expertise.

Two "Misers" that pinch every watt.

GE/Lok makes fluorescent fixtures available in a number of luminaire families (regressed, recessed, semi-recessed or surface mounted). Furthermore, we can team Watt-Miser™ II lamps and Maxi-Miser™ II ballasts to provide you with what we believe is the most efficient

fluorescent system commercially available today. Compared to standard light-ballast systems, two four-foot Watt-Miser I lamps and a Maxi-Miser II ballast will typically deliver equal light output, while using fewer watts.

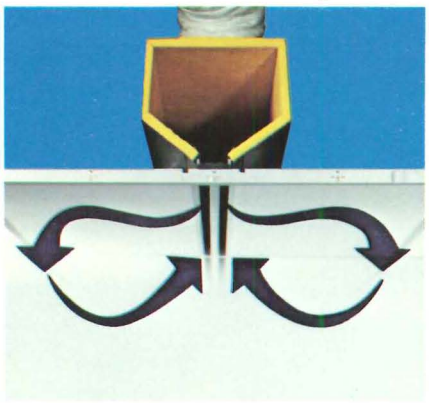
Lucalox® lamps substantially cut energy costs.

Considering High Intensity Discharg (HID) for brighter light levels? Specify t golden-white light of Lucalox lighting systems. At higher mounting heights, Lucalox lamps can cut your energy requirements up to 22 percent, achieve better light control than fluorescent, an provide a life span of 24,000 hours.

rom General Electric aesthetics into a totally

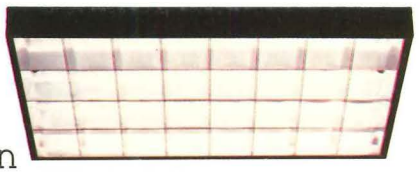
ffficient air distribution control.

Large volumes of air delivered to single utlets can result in drafts and imbalances. ı contrast, GE/Lok's air distribution system venly diffuses upplied air roughout .e working nvironment r greater omfort. It effi- ently handles w, normal or gh volume equirements, hile attractively interfacing with the ceiling uspension system.



Better light utilization.

Achieving adequate foot candles doesn't necessarily mean the best light is reaching the subject. With parabolic louvers from GE/Lok, you can control the quality of light as well as the quantity. Deep louvering cuts the incidence of glare, and introduces high visual comfort to offices, educational facilities and general merchandising areas.



Why limit your options?

With GE/Lok, good looks, comfort values and system efficiency come together under one roof. And, because it's General Electric, the lighting you choose offers energy-saving advantages that add up to real savings. We stand behind this promise with 100 years of energy management experience.

Lok Ceilings from General Electric. Find out more about them today by calling this toll-free number: 800-854-0180 (in California, 714-871-9500). Or write, and we'll send detailed literature to help you put a totally integrated, totally efficient ceiling in your next interior. Lok Ceiling Systems, General Electric Company, Dept. A, 801 South Acacia Avenue, Fullerton, California 92634.

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you are concerned with color, design and dimensionality. Consider Wilsonart Brand laminated plastic.

Wilsonart Brand Design Group I offers you a superb collection of woodgrains, solid colors, designs, marbles, leathers and slates from the finest craftsmen in the world.

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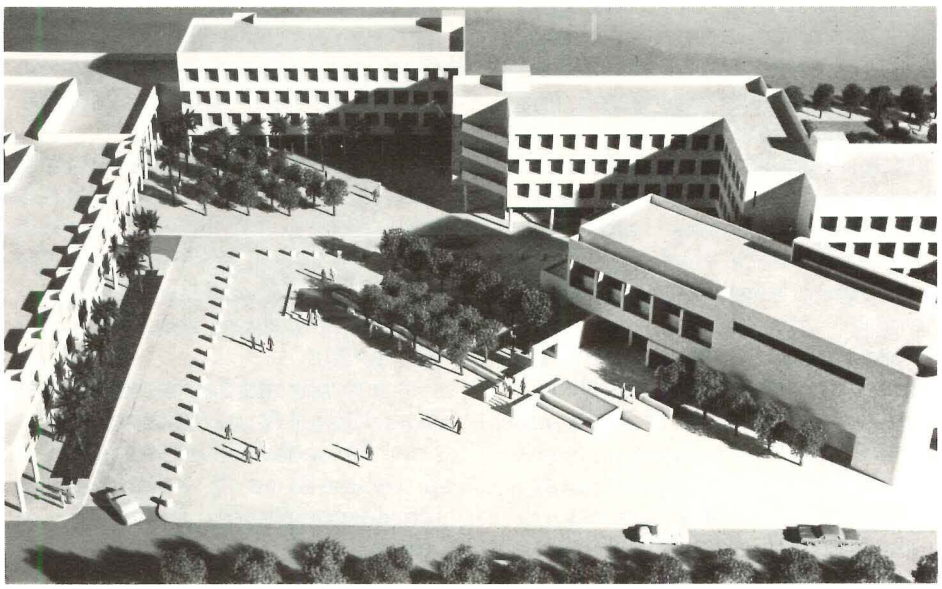
News report

GSA presents 10 design awards

The General Services Administration has awarded 10 prizes in its third Design Awards Program. Administrator Jay Solomon said the purpose of the program is to "encourage humane and responsible designs by the architectural community and the construction industry."

Projects receiving commendations are the Pioneer Courthouse restoration, Portland, Or, by Allen, McMath, Hawkins; Megastructure: a new concept in federal office buildings design (P/A, Feb. 1976, p. 24), a joint venture of Building Sciences Inc. of Towson, Md, Cambridge Seven Architects, and Davis Brody Associates of New York; Batcolumn, a sculpture in Chicago by Claes Oldenburg (P/A, July 1977, p. 23); Moonlight on the Great Pee Dee, a mural in the John L. McMillan Federal Building, Florence, SC, by artist Blue Sky; Landscape of Time, a sculpture by Isamu Noguchi at the Seattle Federal Building; the Metropolitan Correctional Center and US Attorney's Office, New York, by architects Gruzen & Partners, New York (P/A, July 1976, p. 60); the Federal Office Building and Post Office, Santa Rosa, Ca, by Roland/Miller/Associates of Santa Rosa and Frank L. Hope Associates of San Diego; the San Diego Federal Courthouse and Office Building by Wheeler/Hope of San Diego; the Federal Home Loan Bank Board Building, Washington, DC, by Max O. Urbahn of New York; and the Federal Building and US Courthouse, Ft. Lauderdale, Fl, by William Morgan of Jacksonville.

Jurors were James Chaffers, Maria Geisey, Jerome Cooper, Sital Daryanani, Joseph Irwin Miller, James Franklin, and Ehrman Mitchell.



Jack Horner

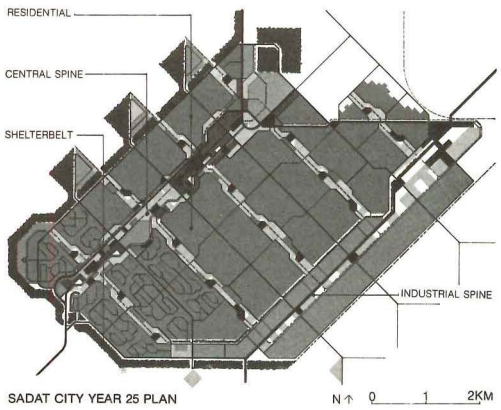
Sadat City Central Services Complex by Marcel Breuer Associates.

GSA winner: Federal Home Loan Bank Board.

Sadat City close to reality in desert

Sadat City is a new town conceived for a site in the desert midway between Cairo and Alexandria. The need for a new town is critical since existing cities are growing at such a rate that urban development is taking over needed—and scarce—agricultural land. Planners of Sadat City, the first of three new towns, are David A. Crane & Partners, Sabbour Associates, Marcel Breuer Associates, Parsons Brinckerhoff International, Warner Burns Toan Lunde, and Peat, Marwick, Mitchell & Co. Crane is the current project director supervising a staff of 45 in Egypt; first phase project director was James Nelson Kise, a partner of the Crane firm.

Though dependent on a variety of



Plan of first of three new towns in Egypt.

outside sources for funds, the Egyptian government is proceeding with its new town plans. The infrastructure for Sadat City is being engineered, and Marcel Breuer Associates, New York, has designed the first buildings to house the Ministry of Development and New Communities and Ministry of Land Reclamation, the first government agencies to be relocated in the new city.

The plan is a double-loaded linear spine which has a green belt with a sawtooth configuration on three sides; growth is planned to occur on the remaining end to the northeast, away from climatic elements. The major spine will be a rapid transit system flanked by office and commercial buildings; parallel to this, to the south and downwind, will be a secondary spine of heavy industrial activity. Between the two will be housing, primarily low-rise, high-density, designed to be constructed of sand block and concrete roof planks—materials which can be carried by two individuals so that the homeowner as well as contractor could build the structure.

The first five-year phase will support a population of 60,000. The target population in 25 years is 500,000.

Edward Durell Stone 1902–1978

Edward Durell Stone, architect of the Kennedy Center in Washington, DC, the U.S. Embassy, New Delhi, and the Museum of Modern Art, New York, died Aug. 6 after a brief illness.

Stone was born on March 9, 1902, in Fayetteville, Ar. He studied at the University of Arkansas, Harvard, and Massachusetts Institute of Technology. In 1927 he received the Rotch traveling fellowship in architecture which enabled him to study abroad. He entered practice in 1923 in Boston in the office of Henry R. Shepley. After his return from Europe he entered practice in New York and participated in the design of Rockefeller Center, including Radio City Music Hall.

Among his early works are the Mandel residence, Mount Kisco, NY; the Luce residence, Charleston, SC; and the Goodyear residence, Long Island.

He taught as instructor, faculty member, or visiting lecturer at a number of schools including Yale, Princeton, Cornell, M.I.T., Columbia, and New York University. His published works include *The Evolution of an Architect* (1962) and *Architecture: Recent and Future* (1967).

Among recent works of his firm are the North Carolina Museum of Art (P/A, March 1975, p. 35); the masterplan for the Florida State Capitol complex (P/A, June 1976, p. 44); and a multi-use complex for Mashad, Iran (P/A, Oct. 1976, p. 60).

His firm was reorganized in 1974 as Edward Durell Stone & Associates, under the leadership of his son, Edward Durell Stone, Jr., a landscape architect and planner, and Peter Capone.

Addition to TWA Flight Center

A roadway-island cover, 330 ft long and 22 ft wide, has been designed for the Trans World Airlines Flight Center at Kennedy Airport in New York. The structure of precast concrete columns and reinforced concrete edge beams supports a curved clear-acrylic barrel vault canopy; the design is by Witthoefft & Rudolph Architects of New York. The addition was completed in July along with major traffic adjustments necessitated by the increased passenger travel which has quadrupled since the Flight Center opened in the late 1950s. The center was designed by Eero Saarinen and was completed just prior to his death.

WSPA theme is social change

The third session of the Women's School of Planning & Architecture was held this year in Bristol, RI, where 80 participants from the United States and Canada shared an overall mood of exhilaration in belonging to a woman's network fostering social change through planning and architecture.

This conference differed from the first two in salient ways which speak encouragingly of progress for women. This year there was less emphasis on consciousness raising and career counseling and more on what WSPA calls "a mutual consultancy" of information exchange. Among such activities were presentations by the Woman's Policy and Program Division of the US Department of Housing and Urban Development (HUD) and by the National Trust for Historic Preservation. Representatives from these two organizations were sent to obtain feedback in the form of criticism and new ideas as well as to stimulate participation in the development of national policies and programs.

The first function of WSPA is to bring together women who are isolated in offices or classrooms where they are in

[News report continued on page 26]

Canopy for Saarinen's Trans World Airlines Flight Center, New York.

Bill Rothschild

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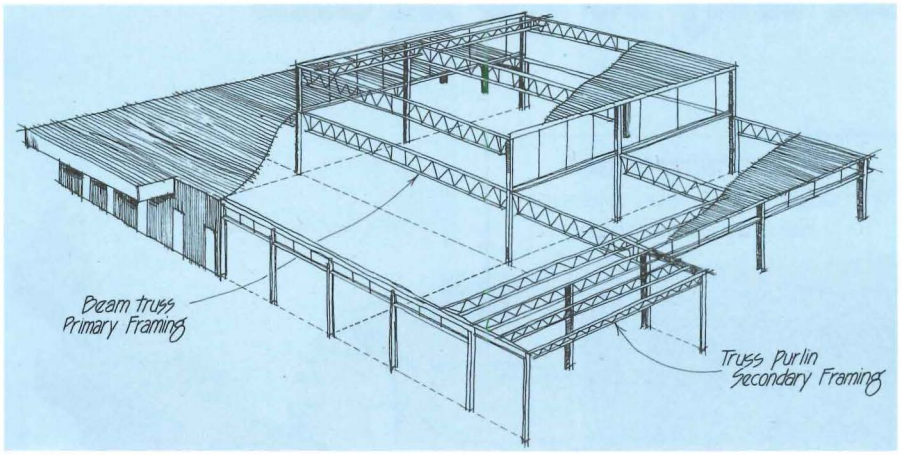


We know you're not thrilled at the prospect of working within the strict confines of most pre-engineered structural systems.

But, at Butler, we have some systems that might just change your mind about systems.

Landmark, for example.

Coca-Cola Bottling Co.,
Charlotte, North Carolina
Architect: Odell Associates, Charlotte, North Carolina

It's a flexible system combining a flat roof look with all the inherent advantages of systems construction. Large, open bays, straight columns and open web trusses for utility access are Landmark characteristics.

The basic system consists of columns and open web trusses.

The columns are available in one-foot increments from 13 feet through 29 feet. Bays of up to 50 feet are standard, as are single slope spans of up to 80 feet. And multiple stories are possible.

Components are factory engineered and delivered to the site for immediate erection. Parts bolt together. Field labor costs are cut to a minimum.

Landmark also features an exclusive, machine applied double-lock, standing seam roof that acts like a single membrane covering the entire building. It's designed to allow for expansion and contraction and carries a U.L. Class 90 wind uplift rating. It can be fully insulated.

Designing with our system gives you a definite time advantage, too. Not only is construction simpler and, thus, faster but pre-engineered parts have predictable costs. So you can figure in-place costs from preliminary drawings and take advantage of fast track construction.

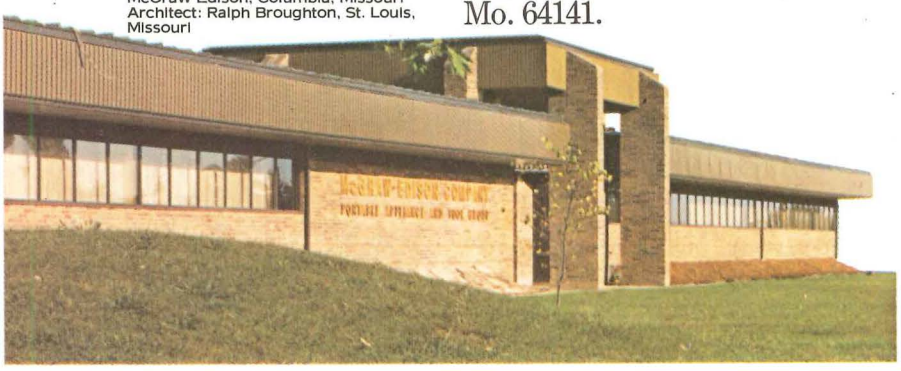
The Landmark system is not wishful thinking. It's here. Right now. Some of its exciting applications are shown in this ad. But what you can do with it is limited only by your imagination.

For more information about Landmark, see Sweets Catalog, Pre-engineered Buildings 13.6/Bu.

We also have some other architectural systems that should interest you. We invite you to send for our free book, "Architectural Building Systems." Write: Butler Mfg. Co., BMA Tower, Dept. B-646, Kansas City, Mo. 64141.

Send for our free book.

McGraw Edison, Columbia, Missouri
Architect: Ralph Broughton, St. Louis, Missouri



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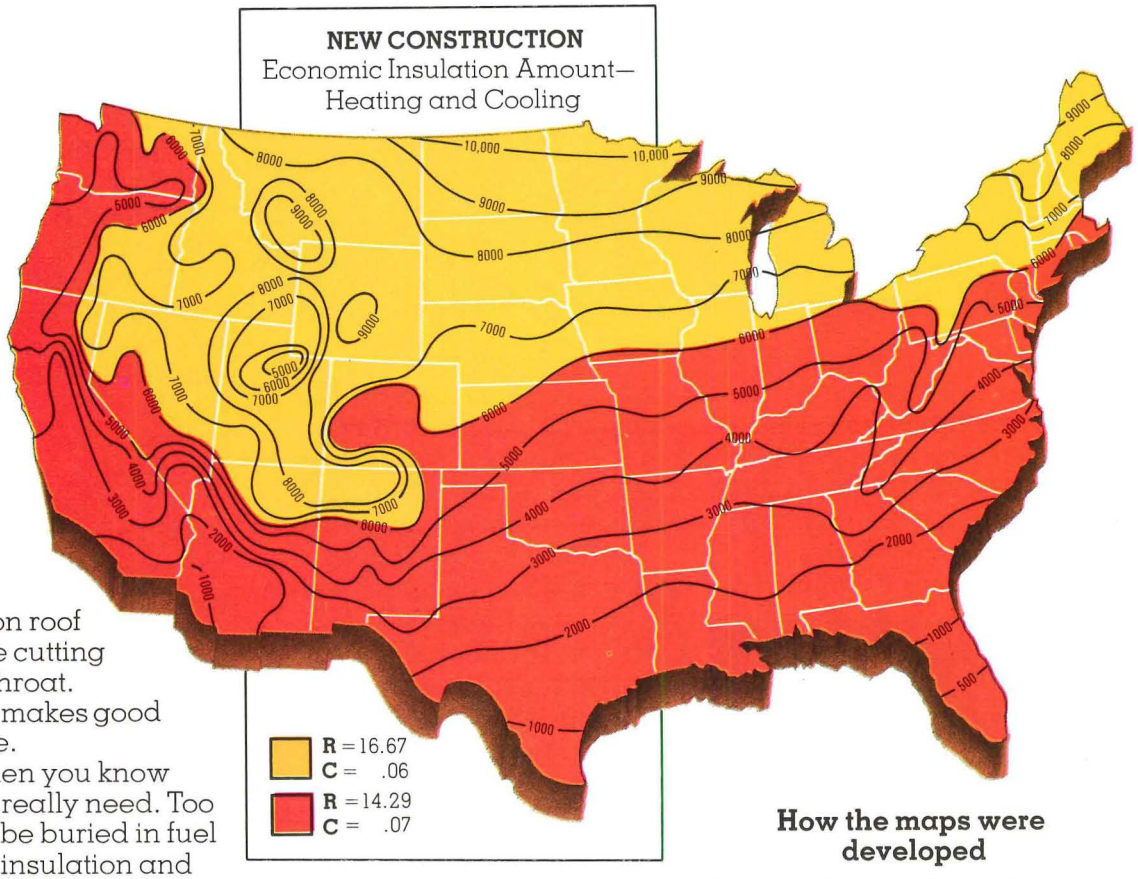
68108

How saving money on roof insulation is a quick way to go broke



Cutting down on roof insulation is like cutting your financial throat. Roof insulation makes good economic sense.

But only when you know how much you really need. Too little and you'll be buried in fuel cost. Too much insulation and it'll seem like forever before you recover the cost.

Here's a not too farfetched example to show you what we mean: A million-square-foot (1,000,000) plant with a minimum amount of roof insulation "R" 2.77 ("C"—0.36) in the northern part of the country with 7,000 degree-days and 500 cooling hours. It can cost you $129,700 per year to heat and cool.

Assuming a 5% annual inflation in fuel costs, seven years from now the same building will conservatively cost you a whopping $208,250 to heat and cool per year.

But there's more to come. The original equipment cost for heating and cooling our not so farfetched example could run as high as $1,900,000. How's that for a quick way to go broke!

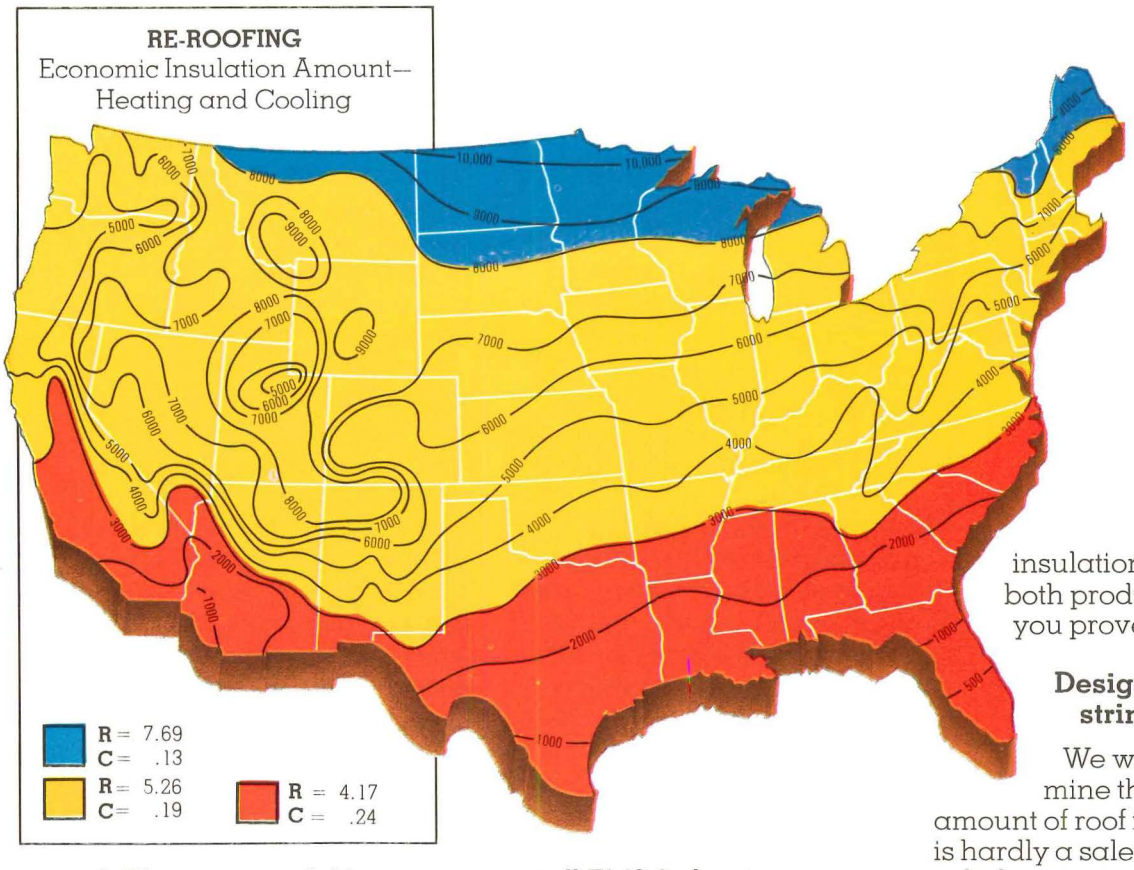
How to avoid going broke

Take a hard look at these two "Economic Insulation" maps. Using 7,000 degree-days, 500 cooling hours and 80°F temp. difference. The map for a new roof recommends an "R" of 16.67 ("C" of .06). Translated into energy costs a year, that's only $25,000 to heat and cool this building. A savings of $104,700 the first year and a possible reduction in equipment cost of $1,500,000.

How the maps were developed

Owens-Corning has taken twenty years of energy management experience and put it into a computer.

We used a metal-deck commercial or industrial building, with gas heat and electric cooling, as our base. We did thorough calculations for degree zones throughout the country. Then we factored in a 15-year building life. A 5% annual fuel inflation estimate. We put corporate income taxes at 48%. Electric costs at $0.03kwh, $1.80/M cu. ft. (1 million btu) for gas. Equipment costs were pegged at $1000/ton—cooling. $35/1 M btu—heating. Plus 5% equipment maintenance cost. Roof resist-



ance: 1.50—summer, 1.11—winter. Insulation ¾" fiber glass.

For equipment design an 80°F temp. diff. and deck ETD of 62°F were used. Allowed for 10% roof insulation cost adjustment and 75% heating system efficiency. The maps are the result.

If you're designing a new roof or replacing an old one, you can tell at a glance the economic amount of insulation you should be using for your project. Pure and simple.

Talk to our computer about your special requirements

Our "economic insulation" maps should cover most of new roofing and re-roofing projects. If your roof is a special case, you can talk to our EMS 3 computer by using a touchtone telephone or computer terminal. Give EMS 3 the basic information about your project and EMS 3 will tell you the economic insulation amount based on your input. It will also give your projected first-year heating and cooling savings, equipment savings on new construction, and added insulation cost. We'll send you full details so you can call EMS 3 about your special requirements.

Ask us about our roof insulation

We've got Fiberglas* Roof Insulation and Fiberglas Urethane Roof Insulation (FURI). Depending on your design and insulation requirements, both products will give you proven performance.

Fiberglas Roof Insulation Thermal Values

"R"	"C"	Nominal Thickness
9.09	.11	2-1/4"
7.69	.13	1-7/8"
6.67	.15	1-5/8"
5.26	.19	1-5/16"
4.17	.24	1-1/16"
3.70	.27	15/16"
2.78	.36	3/4"

FURI Insulation Thermal Values

"R"	"C"	Nominal Thickness
20.00	.05	3-3/4"
16.67	.06	3-3/16"
14.29	.07	2-5/8"
12.50	.08	2-3/8"
11.11	.09	2"
10.00	.10	1-13/16"
9.09	.11	1-11/16"

Design help with no strings attached

We will help you determine the economic amount of roof insulation. EMS 3 is hardly a salesman. It's there to help owners, engineers and architects obtain energy-efficient roofs.

Of course we want to sell you our insulation. We believe if we help you find the economic amount of roof insulation you'll probably come to us for the right insulation for your roof.

What you should do now

Planning a new building or replacing an old roof? Incorporate the "economic insulation" amount from the maps into your specifications. If you're not directly involved in specifications, pass them along to the person who is. If there is anything that you don't understand about insulation, call your local Owens-Corning representative. That phone call might keep you from going broke.

Want more information on our roof "economic insulation" amount maps, or how to talk to our computer, drop us a line. Write to Q.I. Meeks, Owens-Corning Fiberglas Corporation, Fiberglas Tower, Toledo, Ohio 43659.

OWENS/CORNING FIBERGLAS

*T.M. Reg. O.-C.F. Corp.

News report continued from page 22

Ann Carter

WSPA session: Jennie Bull, Preservation Press (left) and architect Katrin Adam of New York.

the minority, if not the only woman.

Out of the conference emerged an awareness that women particularly are alert to the imperative of maintaining a consciousness of the real lives behind statistics and visual images. Dr. Jean Baker Miller, a psychiatrist and author of the book, *Towards a New Psychology of Women,* presented a paper addressed to this issue. Dr. Miller postulated that those traits for which women are frequently criticized—emotionalism, sense of vulnerability, weakness—are, in fact, precisely the characteristics which, seen from another viewpoint, are women's greatest strengths and of great necessity to the culture. She points out that women are not "more emotional" but rather are more attuned to the emotional content in experience. Such emotion traditionally has been seen as an impediment to rational thinking when it is, she said, key to the meaning of events, or—in the area of architecture and planning—to the built environment.

In addition, WSPA provides a forum where specific questions may be answered: how to deal with work problems, such as the traditional demand for total commitment of time and energy; how to alter the curriculum of design schools to bring about more social consciousness; how to build environments for alternative life styles.

Throughout the various projects and presentations of the school, one theme seemed evident: that an inseparable connection exists between the social and physical environment, and that planning and architecture have failed to address the issue successfully. Women at the school presented a spirit of cooperation towards creating a design profession which responds to this need. The completely uncompetitive nature of the group's interaction, standing in such sharp contrast to the familiar hostile-competitive atmosphere of many design schools and offices, instilled a joyousness and sense of inspiration which should last until next year's session.

[Elizabeth Roper Marcus]

Marcus is an architect and writes a guest column on architecture for "The Boston Herald American."

'Poets' strike angry chord at RISD meet

For the past three years, Friedrich St. Florian, chairman of the division of architectural studies at the Rhode Island School of Design, has organized a symposium called "Positions in Architecture." Although the guest lists were never drawn with temperament in mind, an attempt to do so this year might have avoided the brew that resulted when Aldo Rossi, John Hejduk, Raimond Abraham, and Rodolfo Machado presented their papers. It was volatile, if not downright nasty.

From left: Hejduk, Frampton, Rossi, Abraham, Machado, St. Florian.

The proceedings began amicably enough with St. Florian's introducing the speakers as "poets" of architecture. Abraham made the first presentation, outlining the course of his career from an elegant Futurism in the 1960s to his present concern with archetypal and often dreamlike images. He provided a key to the very private world of his drawings by introducing the idea of "element" and the multiple definitions possible of this word.

While showing his slides, Hejduk read from a critical essay by Kenneth Frampton (moderator for the symposium) which contrasted the urbanism of Rossi's work with the "suburban" topology of Hejduk's. As Hejduk read, his voice seemed angry, and the audience got its first hint that a storm might be gathering on stage.

Rossi's talk was simple and direct; it was limited by his shaky command of English, but lucid nevertheless. With an unsettling juxtaposition of modesty and daring, he declared that form is stronger and more persistent than function. He illustrated his point with a space in Lucca that survives as a piazza in the configuration it first acquired as a Roman circus. His own work demonstrated his pursuit of the fundamental elements and typologies of urban fabric, presented with frightening austerity and force.

Machado's difficulties were threefold: he had to follow Rossi's commanding performance; he was the only representative of a younger generation of architects; and he was presenting himself not only as a panelist but also as the man who would head RISD's architecture department starting July 1. What advantage he might have had as the "home team" player was undermined by the antagonism his appointment created within the department. Machado, like the others, documented his development and then concentrated on recent work. Like Rossi, he dealt in terms like "typology" and "language," and not unlike Abraham, he introduced a house in which four architectural bits he called "attributes" were made to stand in the corner of four square, empty rooms imparting to each its particular identity. His approach was dry and rapid-fire; even before Machado finished, Abraham was muttering and groaning. Still, the audience had only a vague sense of the feelings boiling up in front of them.

Hejduk became ill and left Providence early. Frampton did nothing to break the polarization that had formed. Abraham recommended that the question and answer period be closed without another word spoken. After a few attempts to continue in spite of Abraham, the audience was finally squelched by Rossi, who decided to second Abraham's motion. RISD might have wanted a festive event to launch its new building; instead it was host to a group of architectural *agents provocateurs* who sabotaged the didactic intention of the symposium, but provided instead a vivid sort of theater.

[Judith Wolin]

Wolin is an assistant professor, RISD department of architecture.

[News report continued on page 30]

Sun Oil's headquarters in a rural setting.

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On the green meadows of Radnor Corporate Center in suburban Philadelphia, Sun Oil Company located their world-wide headquarters. Two other buildings of this $25 million, 450,000 sq. ft. office campus house the national corporate headquarters of six additional companies. The 72-acre setting, distinguished for its natural landscaping that includes a wildlife preserve, blends graciously with the gently rolling Pennsylvania countryside. Ten Dover Oildraulic® Elevators serve the three buildings, carrying employees and visitors to their destinations smoothly and efficiently.
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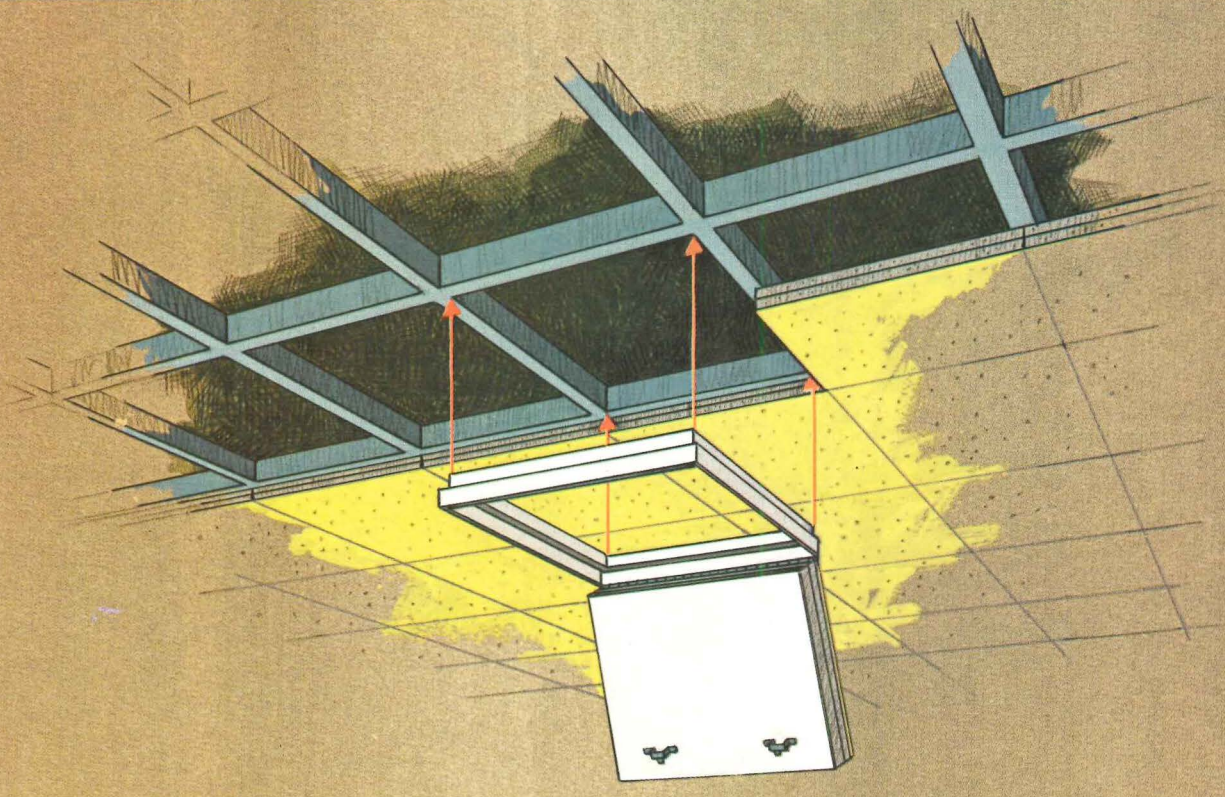

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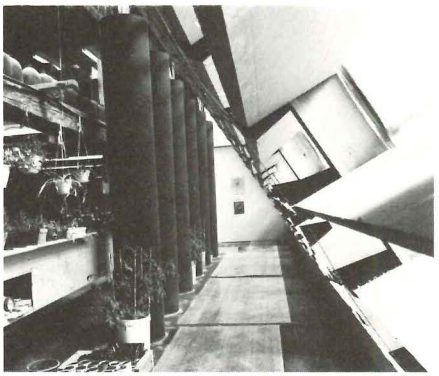
Energy update

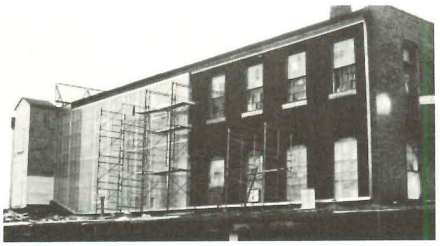
Solar retrofit

The Kalwall Corporation, Manchester, NH, has designed two systems to help retrofit buildings for solar energy use. One, trade-named Sunwall, is described as a highly insulating "solar window" that will transmit solar energy to act with either passive or active solar systems. The insulated panel system permanently bonded to an aluminum grid core was applied to the factory of Keller Products in Manchester, a masonry building of 1920s vintage. The outside wall of the building was converted into a Trombe wall by painting it black, and then the Sunwall system installed outside, three inches away from the brick wall. Sunlight heats the inner space, and is absorbed by the brick wall which radiates heat into the interior. The heated air can also be drawn mechanically into the interior of the building. This experimental application will be monitored by sensors in the wall.

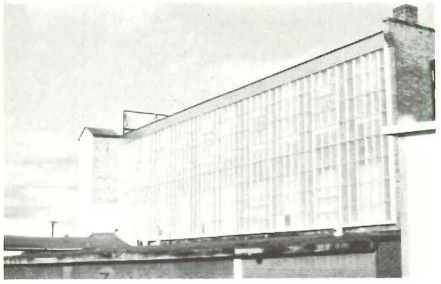
The Sunwall also may be used to create what Kalwall calls a "Solar Furnace," a room intensely heated by the sun, with fluid-filled columns that retain the heat and thus heat air in the room. The heated air then is distributed throughout the building. This was the application to the wood-frame factory building of Bozeman-Gibson, musical instrument manufacturers in Deerfield, NH. A lean-to solar greenhouse was added to the building's south wall, and water-filled storage tubes, 10 ft high, 18 in. in diameter were installed. A small fan circulates the air from the greenhouse to the interior spaces—even to the most remote parts of the building.



'Solar furnace' installed at Bozeman-Gibson.



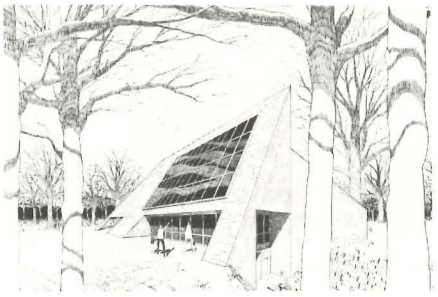
Retrofit at Keller Products, before and after.



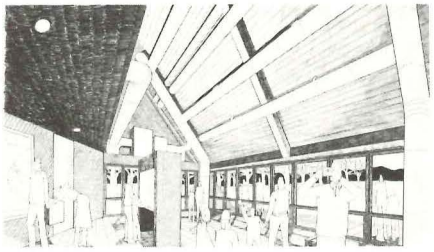
Minnesota ASHRAE awards

The office of Smiley Glotter Associates, Minneapolis, has won the first award in Minnesota ASHRAE chapter Energy Conservation Award program. The winning project was a pair of rest stops on Interstate 35 south of Owatonna, Mn; one of the pair will be equipped with a solar system to provide heat and hot water, and the other will be traditionally equipped. The Minnesota Energy Agency will monitor them to compare the effectiveness of the two systems on identical buildings in the same climate. The solar system will be used also as an educational display for the 60,000 annual visitors. The buildings are wood with cedar siding and have a space reaching 34 ft high; they were scheduled for completion in October. The cost for each is $150,000; a $40,000 grant from the Energy Research and Development Administration paid for the solar installation—a hot air collector and heat exchanger.

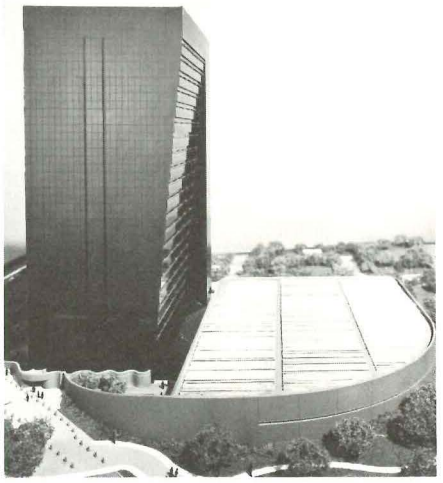
Other winners are Michaud, Cooley, Hallberg, Erickson & Associates, Minneapolis, second place, for an office building in St. Paul designed to use solar energy, and to conserve and recover heat; Ellerbe Architects & Engineers, Bloomington, honorable mention, for remodeling a children's hospital, also to conserve and recover heat; Ryan Co., Minneapolis, honorable mention, for a school heating system which has a boiler furnace that works solely on waste wood in the form of chips and sawdust; and to John Rupert, Minneapolis, honorable mention, for an expanded styrene insulation technique.



ASHRAE winner: I-35 rest stop by Smiley Glotter.



Georgia Power Co. (below) by Heery & Heery.



Paul Beswick

Georgia Power's solar building

Atlanta architects Heery & Heery have designed a 24-story office tower headquarters for the Georgia Power Company, Atlanta, which will consume 55 percent less energy than other Atlanta office buildings, a company official said. The energy-saving features will not add to construction costs. A three-story building next to the tower will contain 67,000 sq ft of medium temperature parabolic solar collectors to provide energy for space heating and cooling, and hot water. The south wall is set back and uses sunscreens to shade the windows in the summer. East and west walls contain unconditioned spaces, such as elevator banks and fire stairs. Other energy-saving measures include lighting systems that reduce the energy consumed by half. Departments operating 24 hours a day are grouped in one location so they may be conditioned apart from the entire building.

[News report continued on page 34]

The Coleman Residence, Arlington, Tx; Architect: David Sprague, Dallas; Installation: Coleman Metal Products, Arlington.

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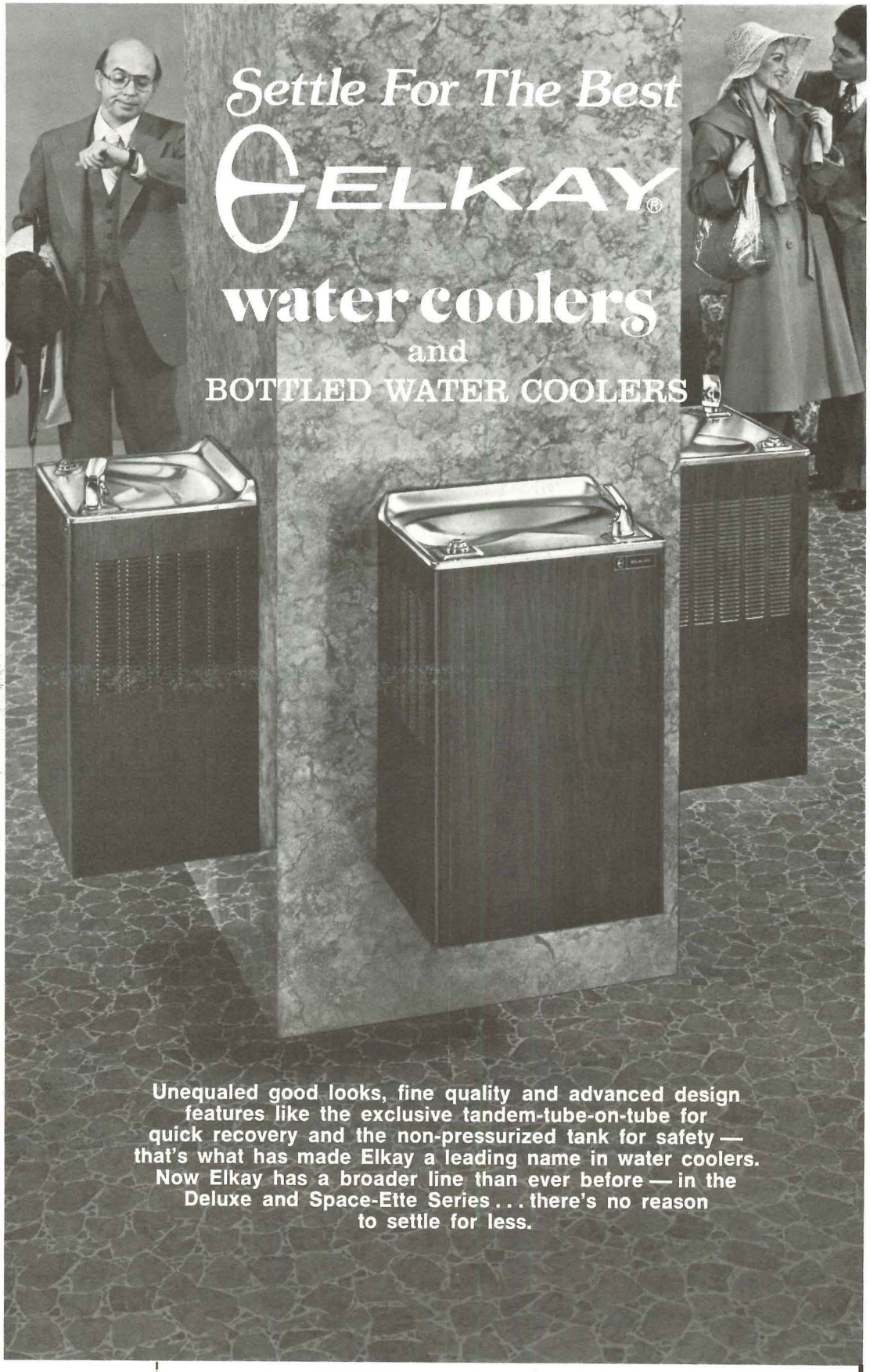

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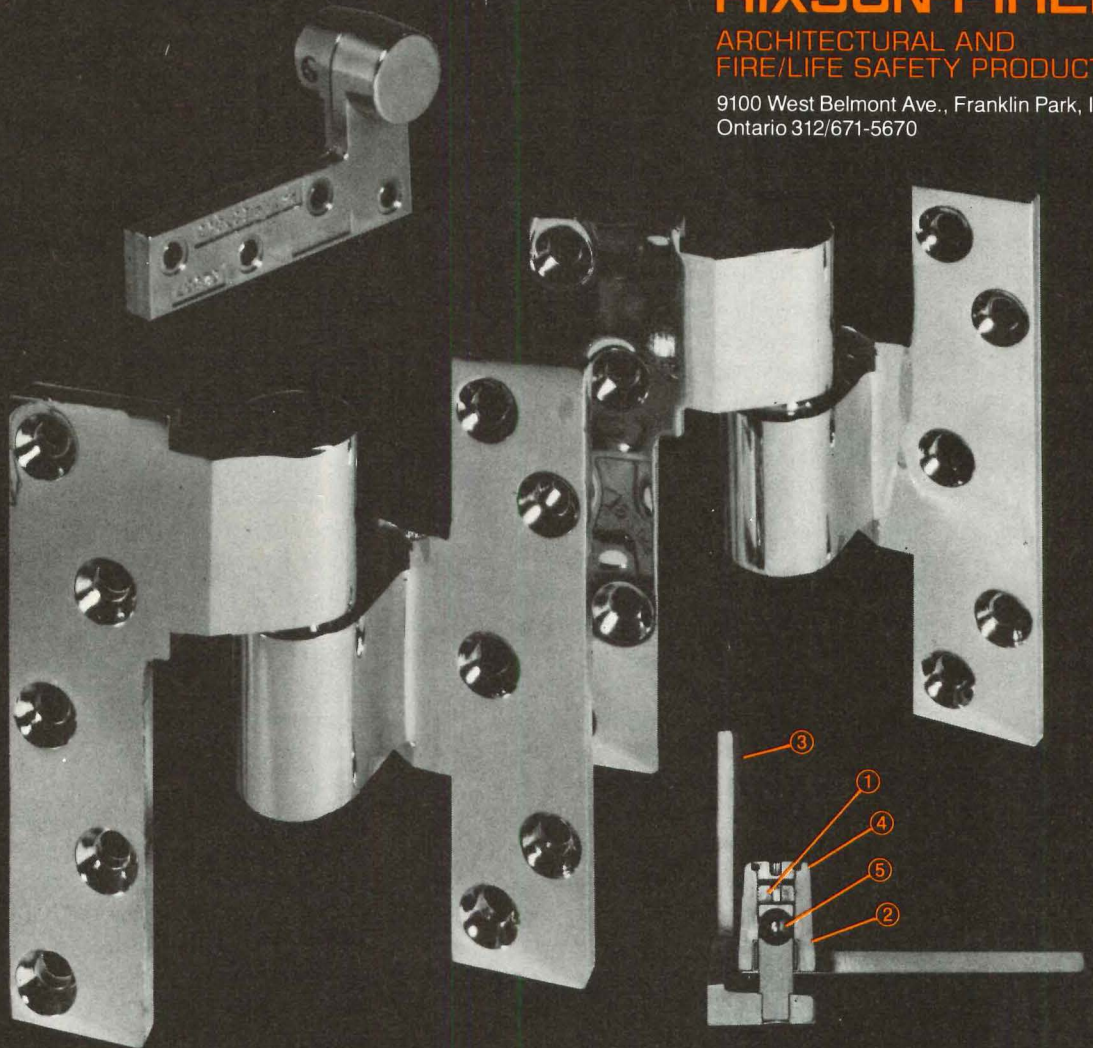

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News report continued from page 30

Ince named head of AIA Research

Charles Ince, vice-president of the AIA Research Corporation, has been appointed president to succeed John Eberhard, who has resigned.

Ince joined the AIA/RC in 1976 as executive administrator of energy programs; he became vice-president in May this year. Prior to working with AIA/RC, he was assistant administrator for energy conservation, building program, Federal Energy Administration. He has served as vice president of John Carl Warnecke & Associates, was a project director of Daniel Mann Johnson & Mendenhall, and was a senior planner at Stanford University. Ince is an architecture graduate of Stanford.

Eberhard, who was appointed to the AIA College of Fellows in 1977, became the first president of the AIA/RC in 1973, and initiated major architectural research programs in both energy research and seismic safety design.

SARA 1978 convention

The Society of American Registered Architects will hold its 22nd annual convention Nov. 1–5 at the Philadelphia Sheraton Hotel. The theme is "How to make money—even though you're an architect." Activities will include tours of historic Philadelphia, Bucks County, and Atlantic City, NJ. Advance registration deadline is Oct. 10; write Arnold Schaffner, convention chairman, 5804 N. Western Ave., Chicago, Il 60659.

UIA World Congress in Mexico Oct. 23–27

The 13th World Congress of the Union Internationale des Architectes will be held in Mexico City Oct. 23–27. All architects and institutions connected with architecture may take part. The theme is "Architecture and National Development," to be discussed in five sub-sessions dealing with economic, socio-cultural, and technological development; architecture and the development of human settlements; and the role of architects in national development. Among the principal speakers will be Kenzo Tange. Information is available by writing the Secretaria General del XIII Congresso de la UIA, Melchor Ocampo 463-104, Mexico 5, D.F.

Plywood design contest deadline

Entries must be postmarked by Dec. 1 for the annual American Plywood Association/*Professional Builder* Plywood Design Awards program. Jurors will be Robert Durham of Seattle; John Bloodgood of Des Moines; and Richard Bertman of Boston. Details are available: Plywood Design Awards, P.O. Box 2277, Tacoma, Wa 98401.

Building exposition Oct. 16–18

The keynote address of the third annual Building & Construction Exposition & Conference will be given Oct. 16 by Jay Janis, Under Secretary of the U.S. Department of Housing and Urban Development. The conference will be held Oct. 16–18 at McCormick Place, Chicago, and is expected to attract some 10,000 individuals in the building industry. The sponsors are the Producers' Council and other building associations.

Calendar

Through Nov. 26. "The Mouse Museum/The Ray Gun Wing: Two Collections/Two Buildings," Whitney Museum of American Art, New York City. Two structures designed by Claes Oldenburg house the artist's collection of more than 600 three-dimensional sketches, fragments of art processes, and small objects.
Through Jan. 7, 1979. Exhibition of the work of architect Sir Edwin Landseer Lutyens (1869–1944), The Museum of Modern Art, New York City.
Oct. 16. Deadline for submitting registration form of intent to submit entries in "Excellence in Masonry '78" awards program of Metropolitan Chicago Masonry Council, with materials to be submitted by Nov. 10.
Oct. 23–25. Annual conference, National Fire Prevention and Control Administration, Olympic Hotel, Seattle.
Oct. 23–25. Solar Energy seminar, Los Angeles, Ca., sponsored by New York University's School of Continuing Education. Subsequent date: **Nov. 13–15.** New York, NY.
Oct. 31–Nov. 2. World Energy Engineering Congress of The Association of Energy Engineers, Atlanta.
Nov. 5–8. International Hotel/Motel & Restaurant Show, New York Coliseum, New York City.
Nov. 6–8. Lighting Conference for Contract Interior Designers, GE's Lighting Institute, Cleveland, Oh.
Nov. 7–8. Passive Solar Systems workshop, Denver, conducted by Passive Solar Associates, Santa Fe. Subsequent date: **March 15–16, 1979,** San Francisco.
Nov. 9–10. COFPAES Architect/Engineer Contracting course, Hyatt Regency, San Francisco.
Nov. 9–10. Preventing Building Design and Construction Failures institute University of Wisconsin-Madison.
Nov. 12–15. National Council for Urban Economic Development annual conference, Mayflower Hotel, Washington, DC.
Nov. 13–15. Building Investment Analysis (Life Cycle Costing) for Architects and Engineers; short course, University of Texas at Austin.
Nov. 13–15. How to Succeed in Rebuilding Downtown conference, New York City, sponsored by Downtown Research & Development Center.
Nov. 15. Deadline for completed applications, Rome Prize Fellowships for American citizens. For information write to the American Academy in Rome, Rome Prize Fellowships, 41 E. 65 St., New York, NY 10021.
Nov. 16–17. Automated Procedures for Engineering Consultants annual meeting exploring computer-aided design vs government-specified energy standards, San Diego, Ca.
Nov. 18–Jan. 13, 1979. "Visionary Drawings: Architecture and Planning," The Drawing Center, New York City.
Jan. 20–23, 1979. National Association of Home Builders annual convention & exposition, Las Vegas Convention Center.

[News report continued on page 38]

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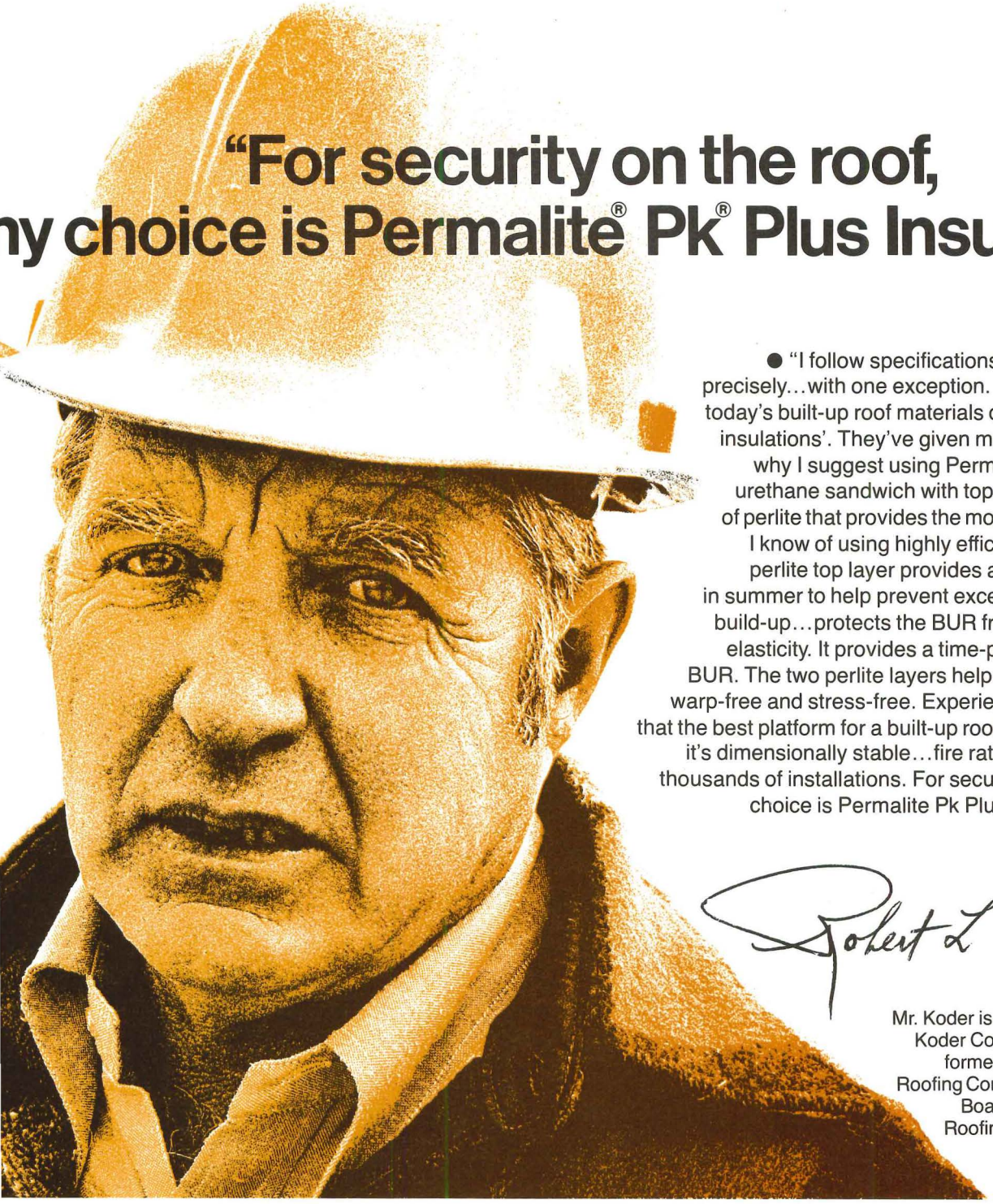

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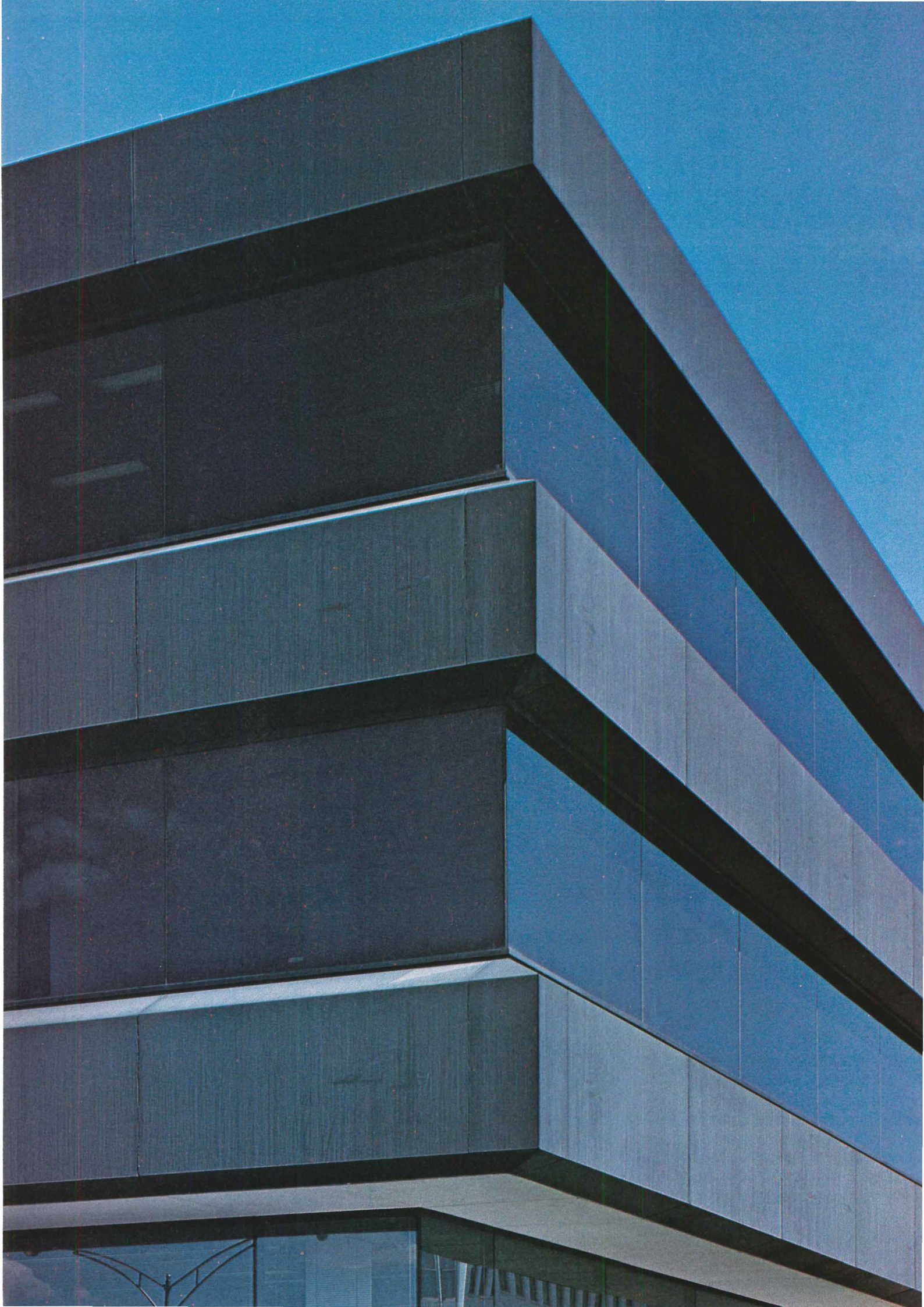

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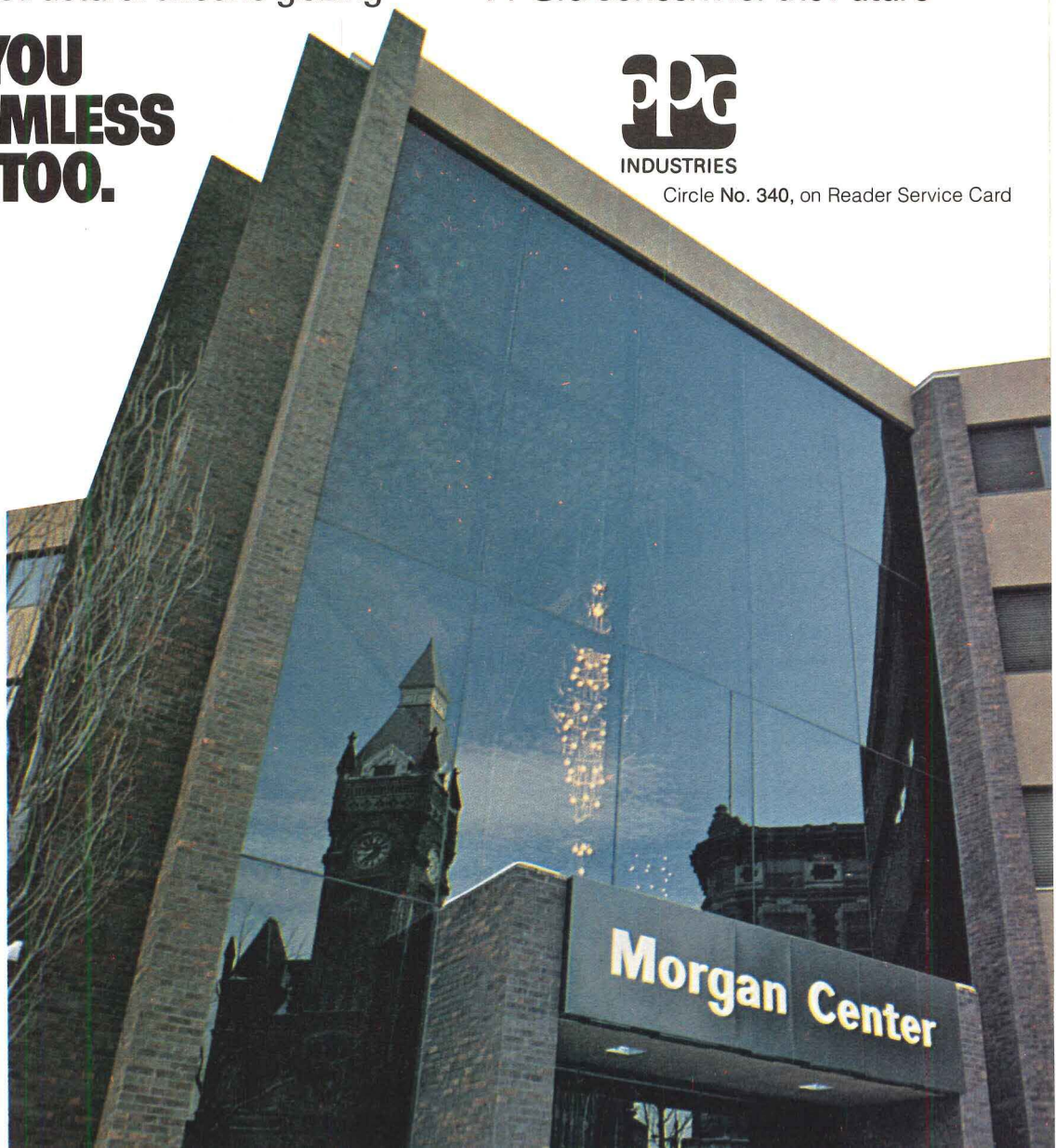

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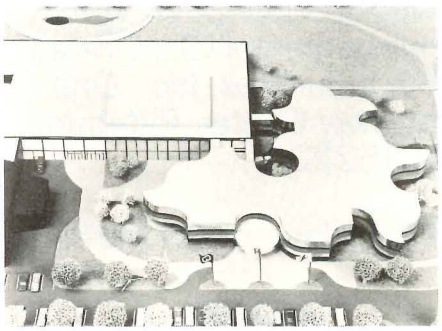

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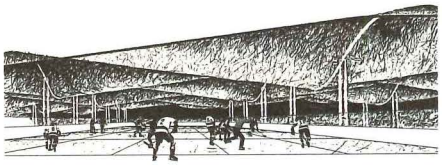

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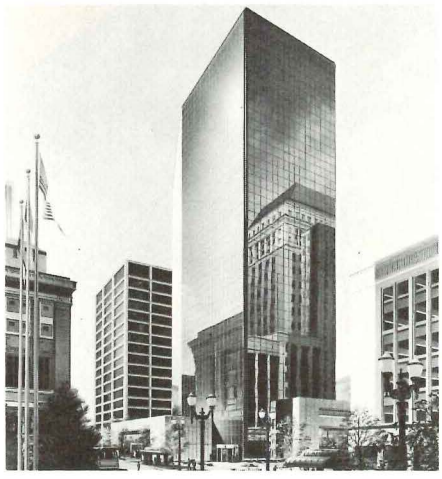

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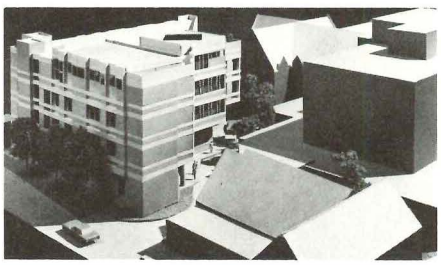

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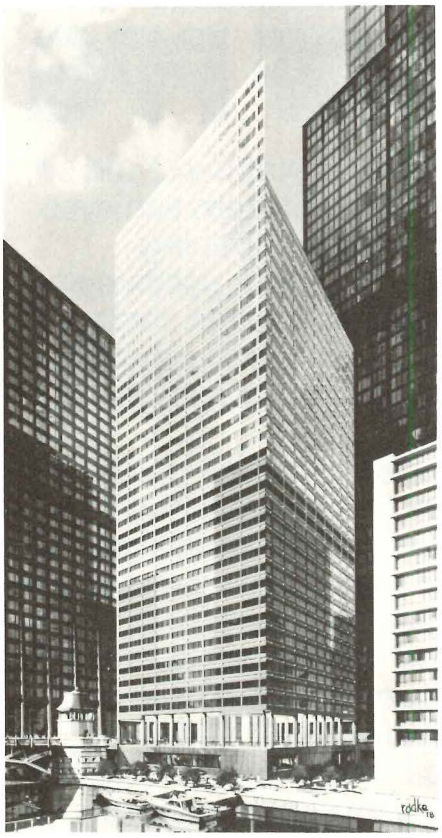

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1 Corning Museum of Glass—Gunnar Birkerts & Associates, Birmingham, Mi, has designed the new Corning Museum of Glass under construction adjacent to the Corning Glass Center, Corning, NY. The building will curve to the rear of the existing structure and will connect with the Glass Center at the second-floor level, southwest corner. The new $6 million facility will contain triple the amount of exhibition space currently available. It is planned around a circular time tunnel, 200 ft long, which will display in chronological fashion the museum's masterpieces; other galleries will open off the tunnel. Exhibition designer is Paul Seiz of Tenafly, NJ. Completion of the museum is scheduled for late 1979; funding is from the Corning Glass Works.

2 Sportshaven, Toronto—Chrysalis East, Architects, has prepared a design and study for an athletic training center in Toronto, Canada, expected to enter construction in 1979. The first phase of the complex would be a hockey arena housed in an undulating shell structure. For economy, materials would be limited to steel deck, a Teflon-coated fiberglass fabric, and a vinyl-coated polyester fabric. The various structures, to be built in stages, are conceived not as buildings but as a "blanket" over a series of human activities.

3 Orbanco Building, Portland—Demolition began in downtown Portland on New Year's Day to clear the site for the 23-story Orbanco Building, designed by Skidmore, Owings & Merrill. The tower will be headquarters for Orbanco, Inc., a financial services company, and two of its subsidiaries. The six-sided building will have a reflective glass skin, and will be the first new office building in the Portland Mall project. Occupancy is anticipated for late 1979.

6

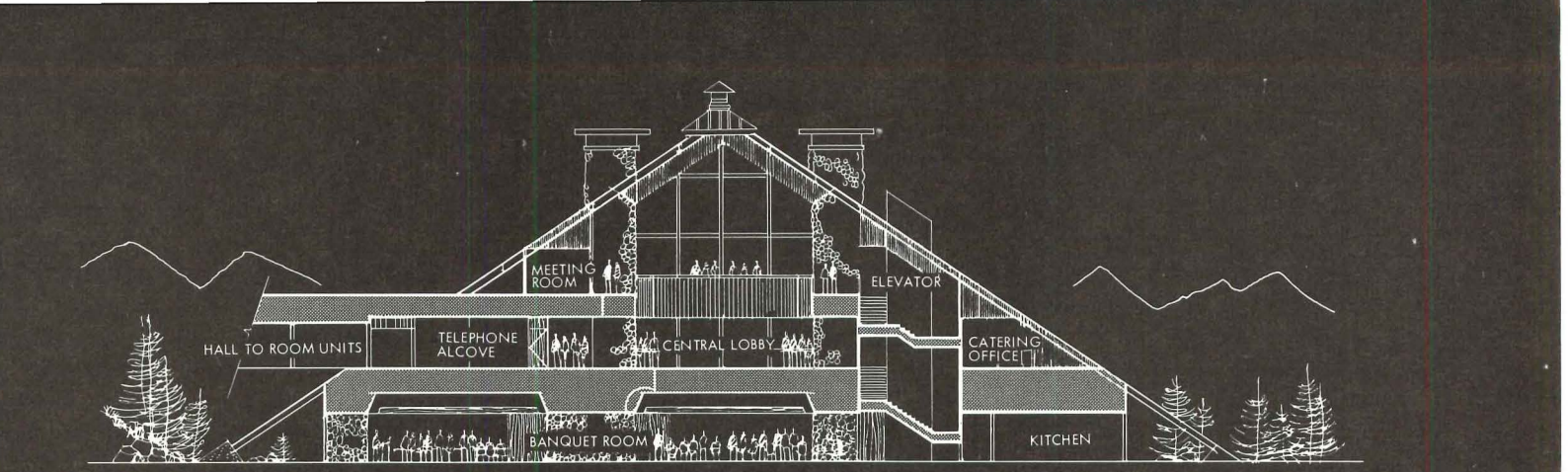
7

4 Art Centre Hospital-Osteopathic—Kaplan/McLaughlin Architects/Planners of San Francisco has designed a 56-bed hospital in Detroit to provide psychiatric services. The four-story facility is next to the Detroit Central City Community Mental Health Center, which will lease some of the beds in the new hospital. All rehabilitative services will be located on the top floor for access to outdoor deck space and to benefit from sun through the skylights—both a premium at the compact, urban site.

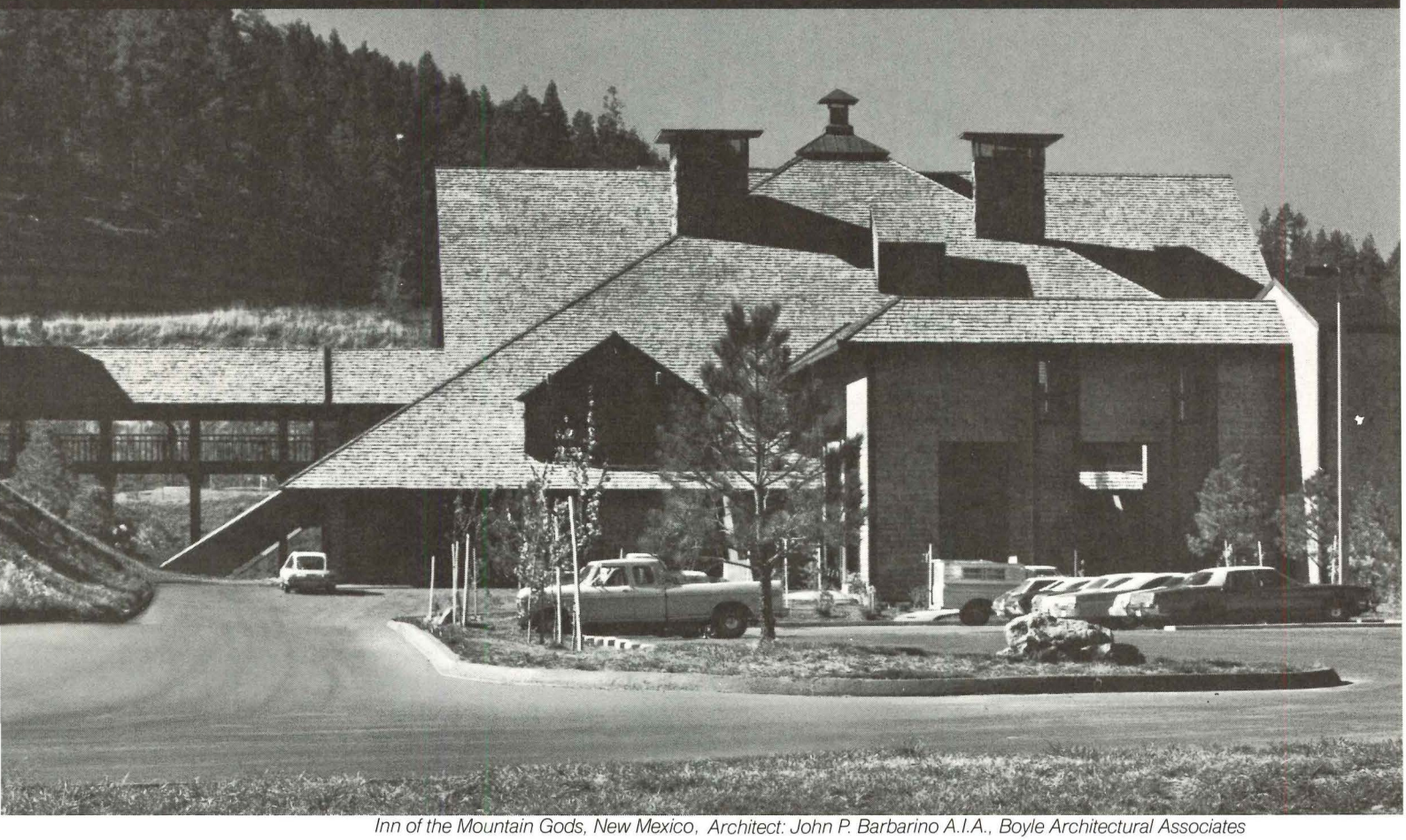
5 Chicago tower—A 40-story trapezoidal office tower is planned for the east bank of the Chicago River across from Sears Tower. Designed by Harry Weese & Associates, the building is two in one, one triangular section taller than the other. A triangular atrium will be located on floors 31 through 33 in addition to the 32-ft-high street-level lobby. The building will have a curtain wall of white aluminum panels and bronze-tinted insulating glass. Completion is scheduled for the summer of 1980. The $63 million development is a joint venture of several Chicago investors headed by two officers of Cushman & Wakefield of Illinois, a real estate firm, and Citibank International of Chicago.

6 Westbridge, Washington, DC—Overlooking the Potomac River in the new district zoned for mixed use near Georgetown, Washington, DC, is Westbridge, a nine-story office and ten-story condominium project with retail shops. The $25 million complex is designed by Weihe, Black, Jeffries & Strassman. Completion is scheduled for mid-1979.

7 Yamaha Motor Corporation, USA—Completion of the new $12 million headquarters for Yamaha Motor Corporation, USA, Cypress, Ca, is anticipated for mid-1979. Architect William L. Pereira Associates of Los Angeles has designed the buildings along an enclosed pedestrian spine. The office building will be a two-story, white metal panel structure with the upper floor projecting over the lower to shield windows from the sun. Roofs have been designed to hold future solar panels. The complex will include a research building and warehouse; landscaping contains such employee amenities as a patio, and rest and recreation areas.



Red Cedar helps a resort mirror its mountain setting.



Inn of the Mountain Gods, New Mexico, Architect: John P. Barbarino A.I.A., Boyle Architectural Associates

At this resort near the Sierra Blanca mountains in New Mexico, the massive main lodge is connected by covered corridor-bridges to a series of separate guest buildings.

The architect's challenge was "to design an architecture that would complement and blend with the natural environment. Buildings were literally threaded through existing trees and land forms, then sheathed with red cedar shake roofs and shingle sidewalls to create an architecture most consistent with the surroundings."

Naturally at home with nature, richly textured red cedar shingles and shakes also create a strong unity among all structures on the site, insuring continuity for future guest-room additions.

On the practical side, red cedar is highly insulative, and retains its natural good looks for years with minimum upkeep.

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These labels under the bandstick of red cedar shingle and shake bundles are your guarantee of Bureau-graded quality. Insist on them.

Insulative ("R") values of roofing products shown below. Source: ASHRAE Handbook, and California Energy Design Manual.

Cedar Shakes (Heavy)	1.69
Cedar Shakes (Medium)	1.15
Cedar Shingles	.87
Built-Up Roofing, Slag	.78
Asphalt Shingles	.44
Built-Up Roofing, Smooth	.33
Asbestos Cement Shingles	.21
Slate	.05

Red Cedar Shingle & Handsplit Shake Bureau

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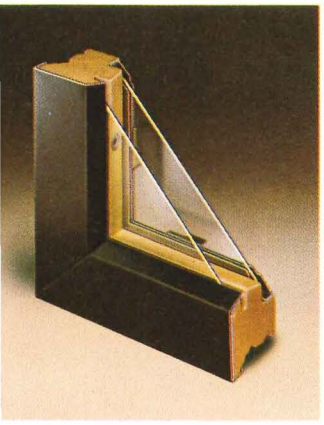
When all of the various window requirements for this project were taken into consideration...

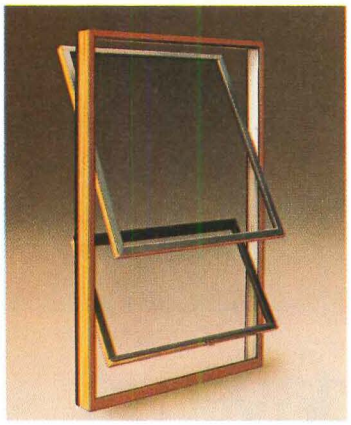
a Pella package was the only logical choice

hen this student housing facility for Hahnemann Medical ollege was built, Pella windows were specified for some ry sound, practical reasons. For example, a complete clad stem was needed because the architect wanted matching ad panels below the clad windows. This allowed him to nfine the masonry panels to vertical shapes, thus achiev- g the desired visual effect.

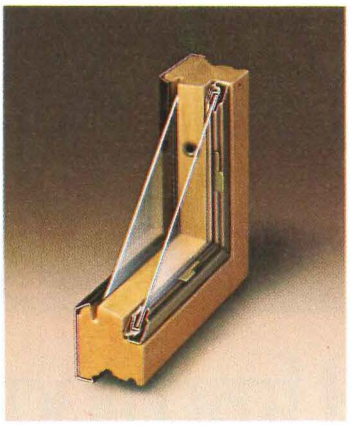
The need to keep maintenance costs at an absolute min- um called for windows that could be washed easily from inside. Further, they had to be equipped with locks to prevent them from being opened during the air conditioning season. Pella Contemporary Double-Hungs with optional keylocks met these requirements beautifully, while their all-wood interiors provided a warm, home-like environment for the student apartments. Pella's Double Glass Insulation System was chosen for its superior insulating value. Add it all up and you have a package of features and options that are exclusive with Pella.



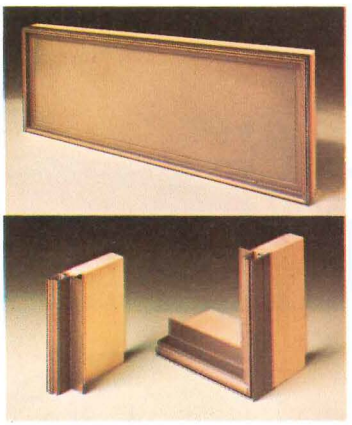
lla's tough aluminum exterior dding is first cleaned and etched, en coated with a baked-on acrylic lymer. It won't chip, crack or el. Available in three standard lors, and 8 extra-cost optional lors.



Pella's Contemporary Double-Hung Window pivots for quick, easy washing of outside glass surfaces from inside the building. Can be equipped with optional keylocks to prevent unauthorized opening.



Pella's Double Glass Insulation System actually outperforms welded insulating glass, yet costs less. It has a full 13/16" air space between the panes. Precision wood construction and snug weatherstripping make it Energy-Tight.



Pella's Clad System includes clad frames which will accept single glass, insulating glass, or matching clad panels. They offer outstanding flexibility and freedom for your design concepts.

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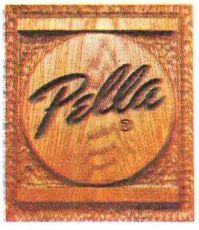

"Steel framing gave us the best column arrangement for interior flexibility."

Anthony A. Albanese, Owner
Garden City Center Associates
Garden City, New York

Composite design and steel frame construction enabled the owner of this six-level Long Island, N.Y., office building to obtain maximum interior space flexibility and economy.

"Even after the building is occupied, we can provide inter-office stairways between floors and increase the floor-load capacity to satisfy the particular needs of tenants," reports Mr. Albanese.

"And the selection of steel framing resulted in an added bonus. During one of the severest winters on record, we lost a minimum amount of construction time. We anticipate completion and occupancy as scheduled."

Preliminary frame analysis

Bethlehem Sales Engineers conducted a preliminary frame analysis early in the design phase to help the owner and designers select the most efficient structural frame. More than a dozen alternative steel framing designs were submitted for consideration.

"After several meetings with Bethlehem, we, along with our architect and structural engineer, were able to select the steel frame best suited to our needs," says Mr. Albanese. The frame chosen uses ASTM A572 Grade 50 high-strength steel, composite beam-slab construction with a 5¼-in.-thick reinforced concrete slab supported on 1½-in.-deep perma nent steel form. The combination pro vides the desired floor load capacity a the lowest cost. Electrification and com munication wiring is dropped throug the ceiling.

Typical bays measure 30 ft 4 in. 34 ft 4 in. The steel columns are pro tected for a four-hour fire rating; th composite steel beam-slab on steel cer tering has a three-hour rating. All beam and girders are protected with spray-o fireproofing. Floor live load capacity designed for 70 psf.

1050 Franklin Avenue Building's impressive front entrance is accessible from the adjoining parking lot. The 6-level structure contains 69,600 sq ft of rentable space. Bethlehem's preliminary frame analysis indicated that high-strength steel and composite construction would best satisfy the owner's requirements.

Owners: Garden City Center Associates, Garden City, New York, N.Y.
Architect: Edwards & Malone, Garden City, N.Y.
Structural Engineer: Purdy & Henderson, New York, N.Y.
Fabricator and Erector: STEELCO, New York, N.Y.
General Contractor: E. W. Howell Co., Babylon, N.Y.

depend on Bethlehem

BETHLEHEM STEEL

Bethlehem's Sales Engineering Division offers a wide variety of technical and advisory services. Our preliminary frame analysis is just one example.

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And they're backed up by a Buildings Group that can provide budget cost information for the total "system package" of a structure under study.

You and your design team can get in touch with a Bethlehem Sales Engineer through the Bethlehem Sales Office nearest you. Phone numbers are listed at right. Bethlehem Steel Corporation, Bethlehem, PA 18016.

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Cleveland (216) 696-1881
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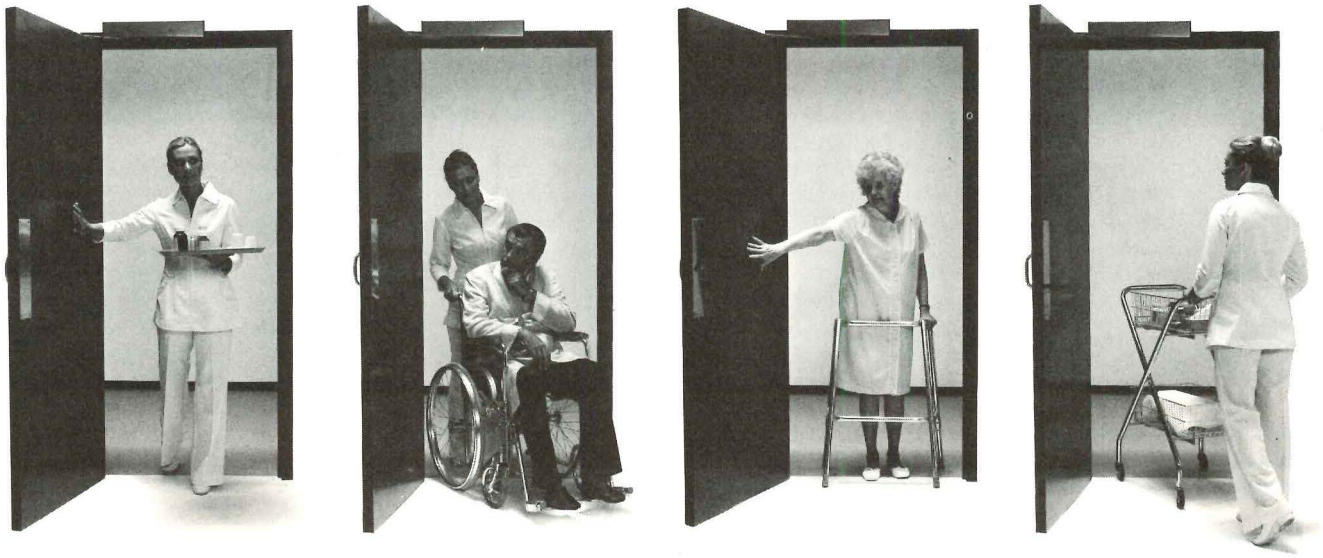
plus the convenience of a door that opens and remains open without spring pressure



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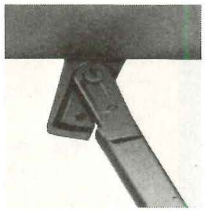

Should the fire detection system go into alarm, the Swing Free Arm is engaged by MED or ME Sentronic closers (see illustration), and automatically closes the door from its hold open position. The swing free function is easily reset by simply pushing open the door. Send for information.

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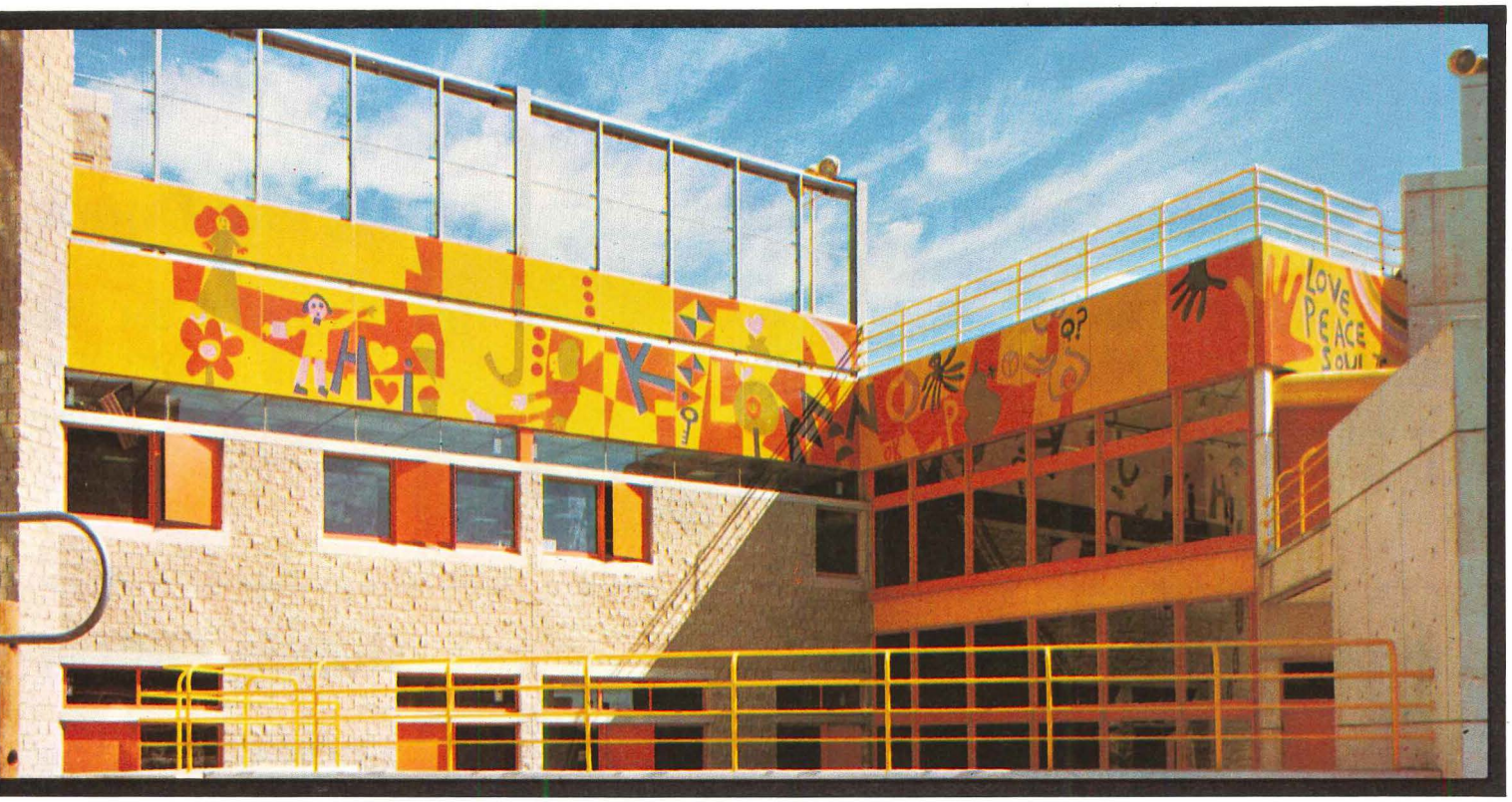

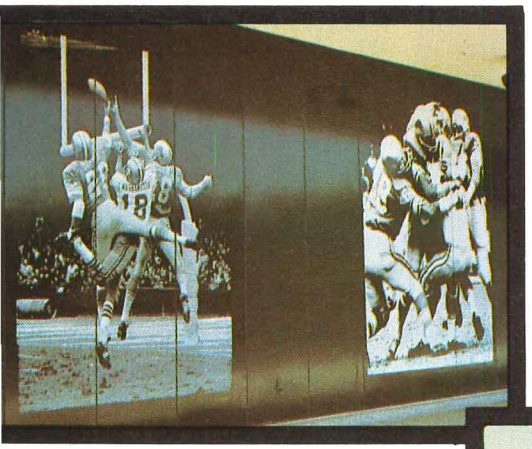

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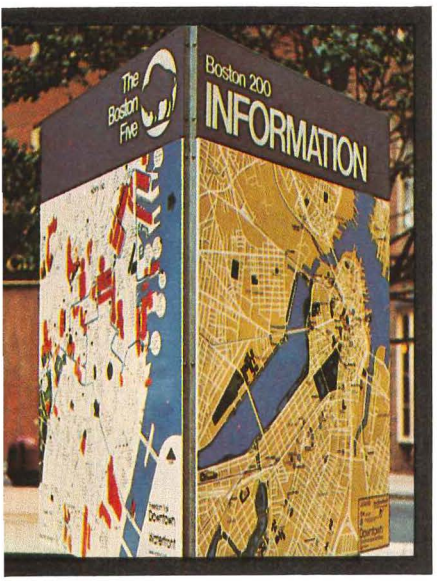

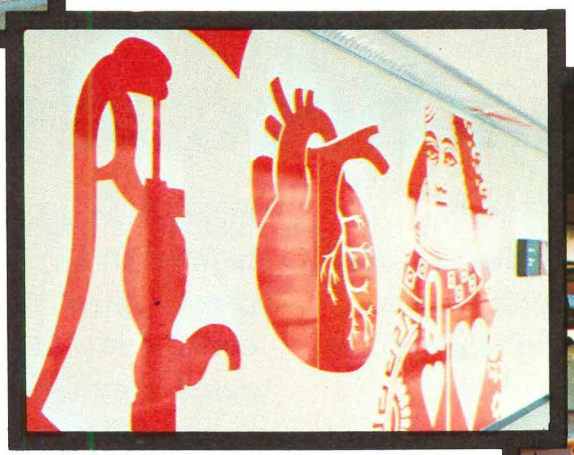

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Rank of Preference*

(Highest four mentions)

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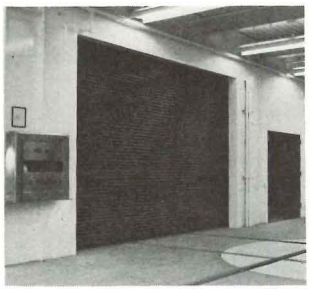
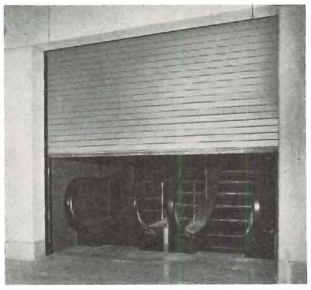
Mfr. B	29.0%
Mfr. C	22.6%
Mfr. D	14.5%



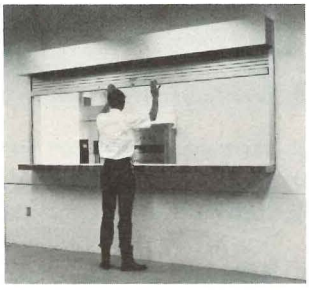
Steel Rolling Fire Doors



COOKSON	32.1%
Mfr. B	26.8%
Mfr. C	21.4%
Mfr. D	14.3%

Aluminum Rolling Doors

COOKSON	43.9%
Mfr. B	22.0%
Mfr. C	22.0%
Mfr. D	9.8%



Rolling Grilles

COOKSON	48.8%
Mfr. B	19.5%
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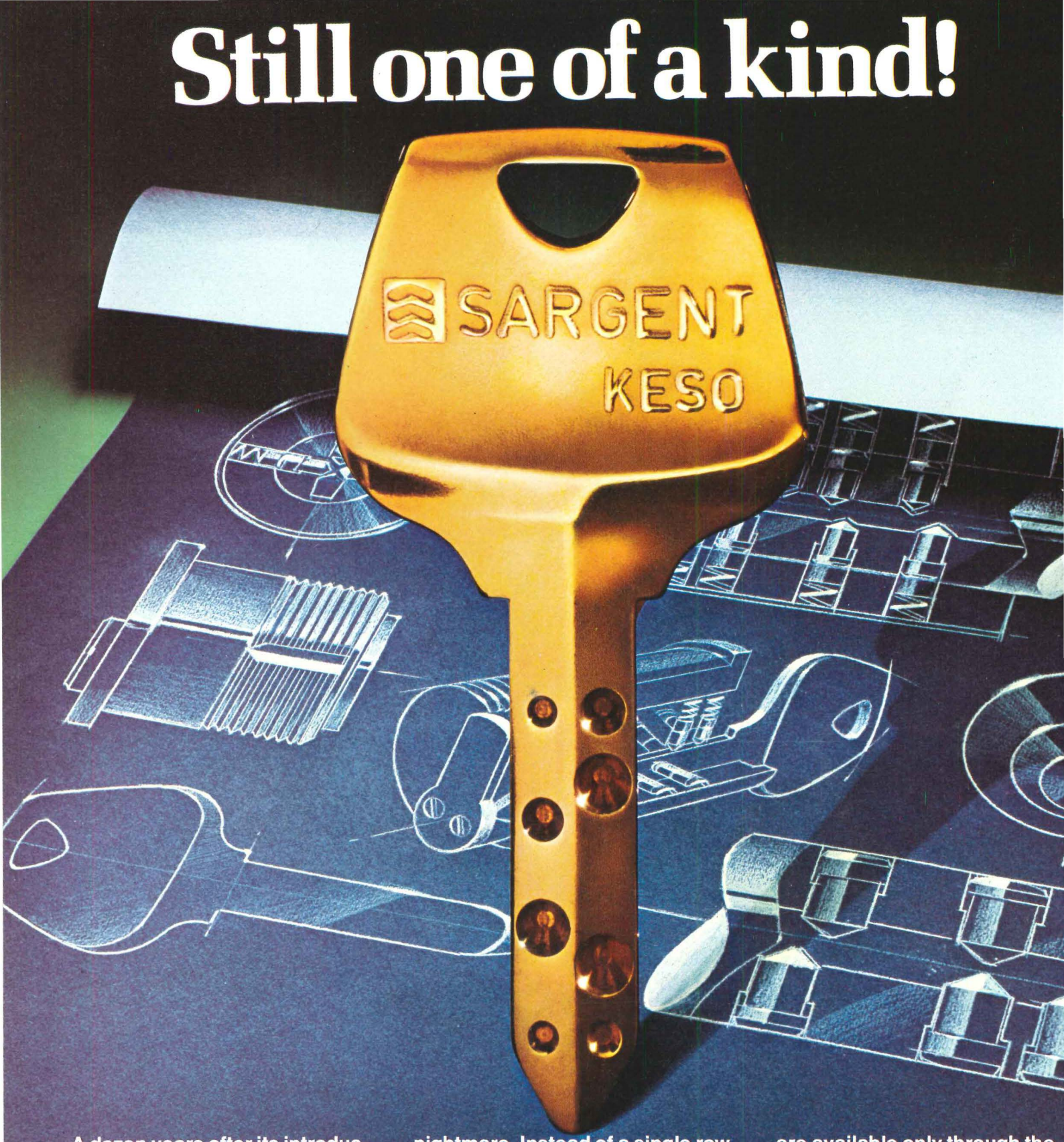

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It has a key that can't be duplicated on "corner store" key cutting machines... a little inconvenient if a key is lost or misplaced, but a feature that is big on security. The keys are not cut as are conventional keys. They are milled to within precise tolerances... and are available only through the Sargent factory.

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Circle No. 349, on Reader Service Card

East Building, National Gallery of Art, Washington DC

P/A on Pei: Roundtable on a trapezoid

Concourse level of East Building.

Robert Lautman

Because of the East Building's site, size, and public role, the architecture stands for a lot. What does it state about "architecture"? P/A's editorial roundtable investigates these issues.

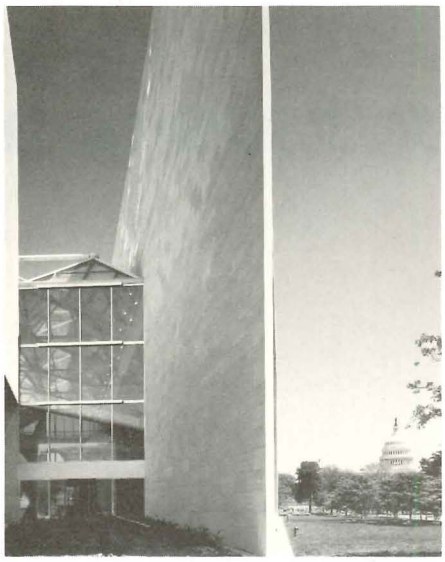
Dixon: It is impossible to discuss the East Building except in the light of the extravagant press coverage—virtually all favorable—that has already been inspired by it. When we are told, as one journal put it, that the quality of architecture here is "inarguable," we inevitably scrutinize the building more sharply. But then careful scrutiny should be in order, anyway, considering the eminence of its architects, its prominent location, its cost, and its general superiority to other Modern architectural monuments in Washington.

Murphy: I hope we haven't taken the position where we see ourselves as having to combat all the positive commentary that has gone before this article. I would hate to be seen as a publication that feels it needs to kill the giant just because it has received a number of good comments in the press. This building has much to commend it.

Stephens: It is interesting, at a time when architects are refuting the modernist legacy—arguing that its architecture has yielded so little in meaning and delight to the public—that the major cultural statement of recent years is not only modernist, but is greeted enthusiastically by the public and almost orgiastically by the press.

The East Building has all the "modernist" trappings supposedly anathema to the public—monster scale, large expanses of undifferentiated marble interrupted only by anonymous curtain walls and an ordering based on a geometry that has little to do with museum activities. The basic difference between the work of I.M. Pei & Associates here and the rest of the mainstream megaliths (some of which are on the adjacent capitol Mall) is that Pei's choice of materials, details, and craftsmanship do stand out. On that level perhaps the modernist code has been pushed to a point where the public seems able to react to the physicality of the mate-

Photos: Norman McGrath



From the museum entrance on Fourth Street (left), one walks past the smaller entrance to the center, then on past the Mall elevation (right).

rials in a sensuous way, as well as to the visceral excitement of knife-edge corners and engulfing voids.

Context and form

Dixon: The architects faced inherent contradictions between a highly prominent site and a program that called for an *addition* to another building. The only logical, or even practical, place for its entrance was on the least prominent side, facing the old building. At the same time, donor and institution wanted expressly to avoid the suggestion that the original building had merely "had a pup." The architects' reaction to the site difficulty—the endlessly discussed geometry of the structure—is a kind of exaggerated contextualism.

Stephens: With regard to the physical context, the response is best understood by seeing the plan. Only from this "aerial view" vantage point can one apprehend how the configuration of the site generated the form. But this notion isn't really about "contextualism": it's about using the shape of a site to suggest a formal schema.

Filler: The building conforms with such precision to the perceived requirements of site configuration, height requirements, and material that Pei's solution—like it or not—can seem at first to be inevitable. Yet even as the careful choices are enumerated we can see that the results are a great deal less than the sum of the building's parts.

The fallacy of the diagrammatic approach to architectural design could be definitively illustrated by this building alone. That the pattern created by the East Building's plan might be more suited to a pair of argyle socks could be seen as simply a matter of taste if it did not interfere so noticeably with the architect's strict sense of formal organization, especially on the exterior. For even with all of Pei's care as to site, massing, and material, his intentions are victimized by a plan that subverts the possibility of a harmonious composition. The acute angles of the design make the massive exterior walls seem at places to be no more substantial than stage flats, the vast expanses of stone appearing oddly unsupported when seen from several points around the site.

Dixon: Some of the ungainly angles of L'Enfant's plan have been brought into the structure, where they become dictatorial.

Murphy: I find the geometric composition on the exterior generally pleasing. There are aspects that are formal and not contextual, but these formal devices are called for in a building of this type. Pei has faithfully followed the parameters he established in the design of the building. His reasons for the design solution including the "insistent" geometry are rather clear. I'm not sure the geometry is as insistent as it might have been in the hands of others.

Dixon: In conversations with professionals involved and in models displayed at the museum, much is made of the cornice lines—higher on Pennsylvania Avenue and lower along the Mall—that had to be respected. But perversely it is along the Mall that the structure presents a phalanx of forms rising to the higher level, with only the line of a parapet acknowledging the Mall cornice height.

Stephens: The East Building falls into the old trap shared by much modernist architecture: it ignores a prime communicating device of architecture—the elevation. Since most people experiencing the building will be viewing it by foot instead of by air, this element is crucial.

The elevations neither tell us about the configuration of the site that generated the juxtaposition of two triangles in the building's plan, nor indicate, except in the most schematically conventional way, possible uses that might go on behind the walls. In terms of their formal qualities, the elevations are abstracted, geometrical, anonymous expanses without the articulation and detail of familiar architectural elements that relate the scale of the physical construction to the human body.

The most striking failing in the handling of the elevations concerns the nature of the four-sided site. Each side has equal prominence visually. The elevations do not live up to this role: while each elevation is treated differently, none is designed as a "façade." Each reads as part-of-something-else, without, however, giving the vaguest clue about what comes around the next corner.

Dixon: The minimal angular volumes, faced in such pale translucent marble, are highly abstract, scaleless, and ephemeral; seen from certain key angles they form a fine minimal composition. From other, unplanned angles—across the Mall, for instance—the angular towers cluster into a clumsy and rather aggressive-looking silhouette.

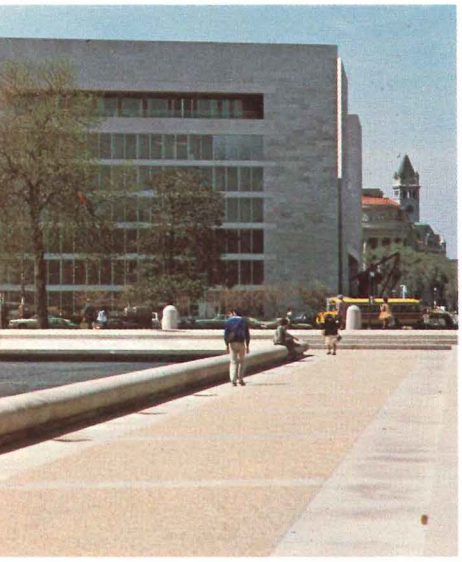
Filler: It eventually becomes apparent that as a composition the building reads most satisfactorily as a pattern on paper.

Murphy: I feel that the East Building's response to the city plan could hardly be better thought out. While its response to the Mall might be a little bland, it does a good job of keeping the scale down to a point where it does not become overwhelming. Planar aspects of solid blocks alternating with voids are quite striking.

Dixon: The other strong context element, of course, was the presence of John Russell Pope's original National Gallery. Despite the radical formal differences between the new and old structures, a real compatibility has been attained through the use of the same distinctive marble on large, blank planes. Pei's utterly featureless surfaces are, after all, only a few subtle steps removed from the sparsely detailed, low-relief surfaces of Pope's vast, windowless wings. Those who do not make fine distinctions among varieties of Classical Revival styles might overlook this point.

Stephens: Granted Pope's surfaces have a monumental, almost bland character, but Pope—and Eggers and Higgins, after his death—nevertheless approached the elevations as vertical planes worthy of articulation by compositional scale devices such as belt courses, cornices, even blank windows, as opposed to something that looks as if it has resulted purely from a plan being raised six stories in the air. Paradoxically, when the National Gallery opened, Lorimer Rich, writing in P/A (then *Pencil Points,* August 1941), commented that "Most of the vocabulary of neoclassic ar-

Photos: Ezra Stoller @ ESTO



Robert Lautman

On the elevation facing Third Street one sees the study center floors (above); on the Pennsylvania Ave. side the museum comes into view (right and below).

chitecture has been assembled on this one building."

Dixon: Though I would defend these minimal white forms as sculpture, they make no coherent statement about the organization or purpose of the building. The positioning and proportions of the "tower" portions strongly suggest that they house peripheral, "servant" functions—as in fact they do in the study center portion. There is a strong suggestion that the spaces *between* the towers are the important spaces for occupancy. The architects have tempered this reading of the building, however, by pointedly unifying the tower portions with the connecting links—all under one taut skin. In fact, a good deal of complexity and ambiguity is at play here.

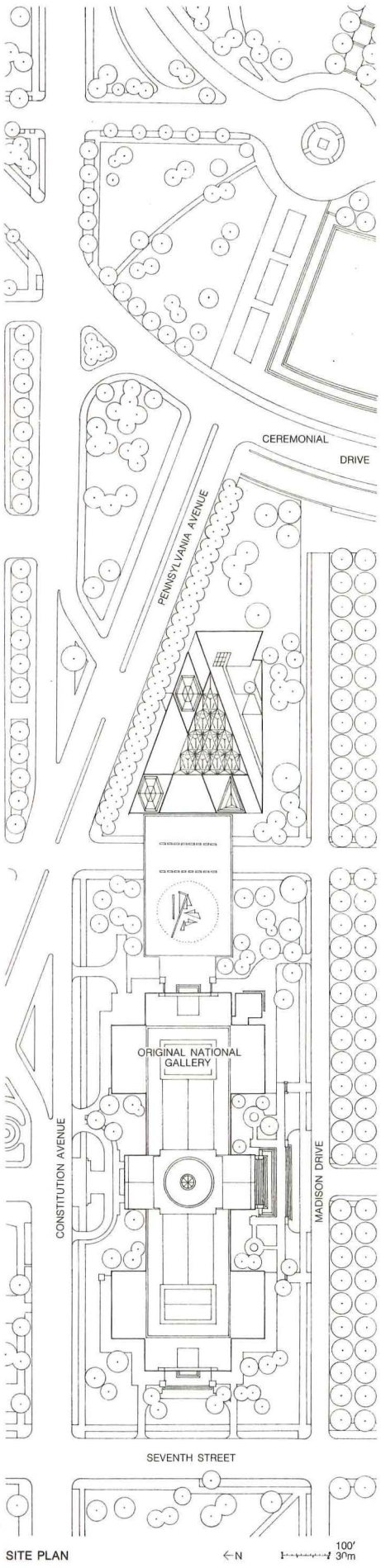
Stephens: I would use "confusing" and "ambivalent" rather than "complex" and "ambiguous." Enshrouding different forms and functions under sheets of marble, no matter how taut, may unify but at the sacrifice of any kind of architectural communication.

Murphy: The East Building doesn't need to make allusions to adjacent buildings, because they are not all that great; this is the finest piece of architecture of them all. Relationship between the East Building and the old National Gallery hardly exists; they do not appear to be part of the same institution by any means. That could be construed a weakness. But Pei's refusal to join the movement away from Modernist tenets is consistent with this pluralist era. I haven't felt adrift without some of the familiar "code" features on other monumental structures, and I don't here, either.

Stephens: What about its communicative role as an "addition"? On one hand it shouldn't be a "pup"; on the other, the two buildings speak not of a *continuity* of cultural attitudes and ideals but of a *schism* between one era and another. This becomes even more apparent when you compare the highly active spaces of the East Building interior with the controlled, sedate ones of the older building.

Dixon: For a building so staunchly Modernist in most respects, the East Building contains some remarkable ambiguities.

East Building



Photos: Ezra Stoller @ ESTO

East Building and 1941 building (above); museum lobby at ground level (opposite).

The most effective instance—and one that is clearly intentional rather than just circumstantial—is in the handling of the principal front, facing the old gallery. Here is a composition that clearly takes symmetry as a premise—in deference to the old building and the entrance—yet subtly distorts it to accommodate the secondary entry to the study center. In so doing, it expresses with great refinement the nature of the real asymmetry behind it, the differences between the Mall side and the Pennsylvania Avenue side, etc. It reminds me of the kind of deliberate near-symmetry seen in elevations by Richardson and his followers.

Stephens: The secondary asymmetrical entry isn't called out enough to create the tension or dialogue seen in Richardson.

Inside architecture

Dixon: Once the architects had adopted the triangular coordinates from the site, they were obviously forced to follow them. It surely was a severely limiting factor in organizing interior space—though the architects skillfully made the whole seem less constricted than the obsessive organization one would expect from the plans.

Filler: If trapezoidal and triangular spaces could be organized into a successful interior composition, it seems to me that architects—in their often misguided but never-ending quest for novelty—surely would have done so by now. The irregularly shaped galleries of the East Building are confusing and disorienting, making orderly progress through them difficult, and ascertaining one's location after passing through them no less so.

Dixon: The location and direction of the street-level entrance is admirably clear, but beyond that the organization of galleries, auditorium, etc., around that space is something of a three-dimensional maze.

Murphy: I think the experience of the museum atrium is absolutely exciting. I do not feel the space is too large, since it is usually filled with people. It is a rather joyful place. It functions as a terrific orienting space for the spaces around it, and by itself this indoor piazza provides its own kind of special experience, entirely appropriate as a setting for art. The skylight might seem overwhelming in its massiveness, but the experience of the interior is an absolute delight.

Stephens: The space inside the East Building excites; especially dazzling is the natural light illuminating this void carved out of such solid mass. While I would argue the space provides a certain orienting framework at every level because of the singularity of certain physical elements, one still cannot tell much about the building's *form* from this inner room. The polygonal shape reads as amorphous: the fact that the building comprises two triangles is not *legible*. As if to make up for this major failing in the spatial legibility of the triangle, the triangle motif appears elsewhere—in the shape of the skylight above the museum court, in the configuration of the coffers of the concrete ceilings, in the paving. The triangle forms the basic "module" for the lozenge-shape galleries and columns and even parallelogram offices throughout. Everywhere it appears in *plan*, that is *horizontally* describing the rooms you walk through whether you look down or up. Thus a realm of formal dimension is unexplored; and what happens is an overreliance on secondary motifs.

Filler: The sad little composition created by the triangular skylights on the plaza is the worst example of the triangular leitmotif at the East Building. The endless restatement of a single theme throughout one building is tiresome enough: it becomes distasteful when it is passed off as "total design."

Dixon: As Pei has pointed out, the triangular motif in plan ceases to be a *choice*, once the geometry starts to work. That was a problem for Wright, with both triangles and circles, and is clearly a problem here.

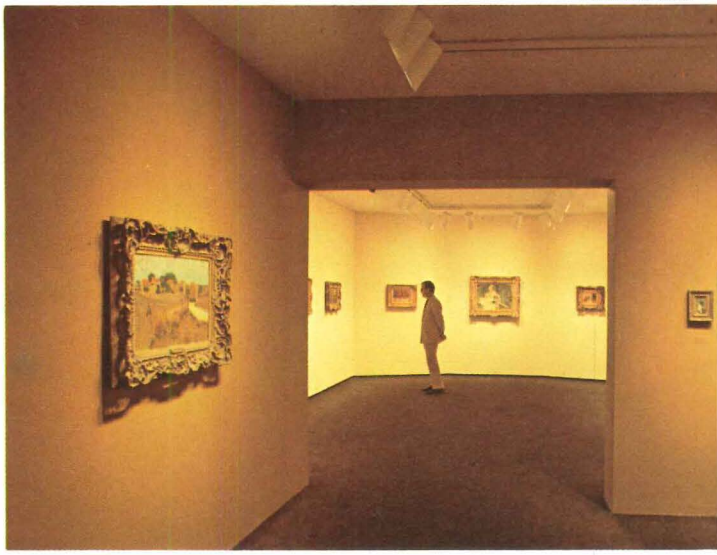
Filler: The interior of the East Building is both a biting critique of the difficulty architects have nowadays in dealing with monumental space and an unintentionally appropriate expression of the art ritual as consumer event. For in resembling nothing quite so much as the poshest of suburban

East Building

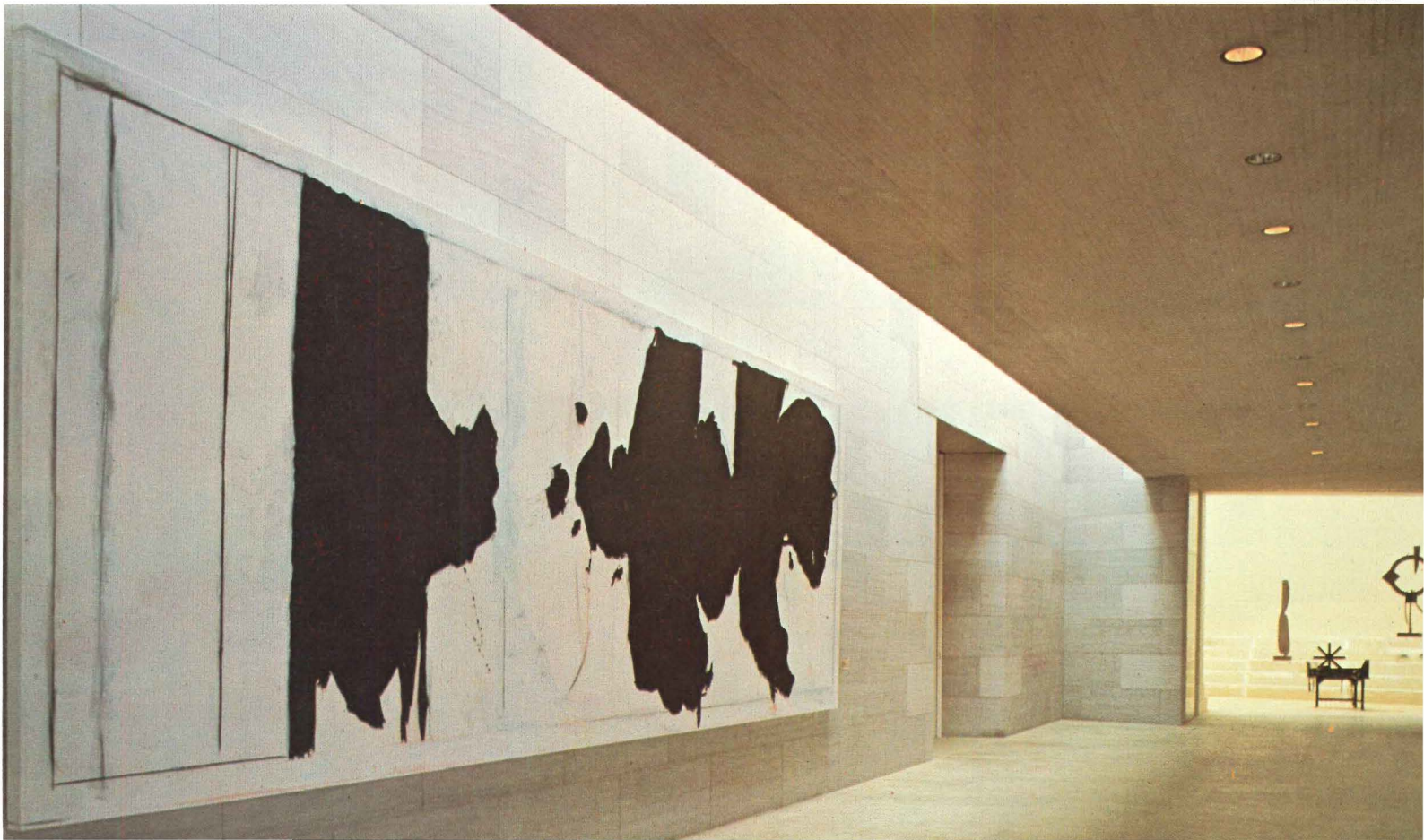
Ezra Stoller @ ESTO

Norman McGrath

Robert Lautman



Norman McGrath



Sculpture terrace atop study center adjoins offices for top administration (above); in the gallery portion, one of the tower rooms is devoted to David Smith sculpture (above, right) and receives natural light; elsewhere incandescent lighting supplements lighting of galleries. Marble facing of the exterior is brought into major spaces (below), smaller galleries have gypsum-board walls. Temperature and humidity in galleries is monitored centrally but can be controlled locally; security is monitored centrally with an array of devices such as closed-circuit television, laser beams, etc.

shopping malls, the atrium of the East Building meets its visitors more than halfway in providing an experience that supplants the purported one of the building, much as the Pompidou Center, and not the art within it, has become the real tourist attraction.

Stephens: Pei explains he was concerned about *volume,* and looking at the inner core of this building one wouldn't argue. Its size, the natural light, the movement of visitors, and visibility from all angles activate space. The only real difference between this museum and commercial building types is that this is done better with more money, better materials.

Filler: This building represents the apotheosis of Portman: the enshrinement on the Mall of the atrium idea, the first resort of the architect who wishes to create "excitement" among the public.

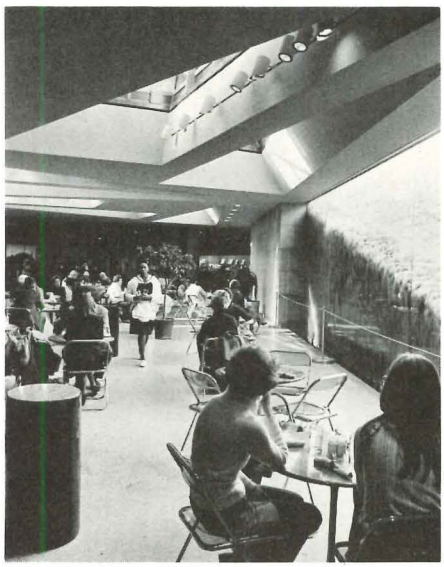
Murphy: Some of these comments vaguely hint that galleries are only for the sober-faced elite, and not for the kind of public that Washington and the Mall attract. I don't feel the need to imply guilt by association with Portman. He didn't *invent* grand volumes, and excitement isn't limited to shopping malls. Indeed, art needn't be housed only in monastic surroundings to be appreciated. There is room in museums for joy as well as studious contemplation.

Dixon: Pei used a similar atrium scheme at smaller scale for the Everson Museum in Syracuse, which he designed back in 1962. The serious question here is whether the exhibition spaces are made to seem incidental.

Filler: The question of image is central to our comprehension of architecture: the fact that the gallery spaces of the East Building read as ancillary to the atrium space is thus significant. Pushed away as they are from the commanding central space of the museum, the galleries manage to appear in sum smaller than the courtyard. Even if the gallery and public space apportionment is about 60–40, the perception remains, nonetheless.

Stephens: In the East Building, the spatial experience diverges from the static but awesome 19th-Century spatial experience of the major halls next door in the older National Gallery. Pei has explained it is because the classical kind of space is conceived with one vantage point, versus the three vantage points offered by the East Building's triangular scheme. Yet what Pei doesn't acknowledge and what Patrick Pinnell recognizes (*Skyline Magazine,* August 1, 1978) is that the triangular construction is conceptually closed because of converging planes at each angle, while the orthogonal type of construction can be open-ended, with an infinite recession of framed spaces.

I sense we are getting away from a valuable part of the museum experience—contemplation and repose. The older building's majestic entrance rotunda and the serenely beautiful garden courts communicate that intention. The East Building, by adopting the kind of spaces associated with shopping and entertainment, says



Courtesy NGA

Skylit café under plaza.

"keep moving to the next event."

Dixon: There are pleasing elements of surprise in this highly irregular organization: rest areas at intermediate levels that overlook the milling crowd below; the café terrace which offers a refreshing—and totally surprising—view to the south across the Mall, otherwise not visible from public areas.

Murphy: The views of the Capitol and oblique views out to the landscape reflect well the architect's planning and should be recognized for their successes.

Stephens: The building does have wonderful surprises such as the skylit spiral concrete stairs. I don't think that many of the dramatic vistas have been brought effectively into play—except from the penthouse offices. Also I find the movement through the galleries in the East Building occurs without logical spatial progression. Discreet signs indicate that there are galleries here and there and upstairs worth seeing.

Certain spaces or links between spaces don't really seem to fit formally: the escalator that leads from the grand stair to the third level is arbitrary in terms of the expression of circulation by the grand stair; the sensuously curved tunnel for the people-mover taking visitors to the cafeteria has little relation to the type of spaces at either end.

Murphy: Despite the fact that there may not be a very clear flow pattern, the internal areas do a good job of allowing observers to see where they are headed and allowing them to get there with little impediment. The smaller enclosed spaces, away from the excitement of the main space, allow the visitor to give his attention to smaller works of art.

As a machine for viewing

Stephens: Form and program have made interesting compromises. It is almost madness that a triangular motif was even considered for a museum building, and it is to Pei's credit that it is solved as well as it was. Having a mammoth court in the center of one triangle, and a smaller one in the study center helps resolve some dilemmas of plan. Not having to use every square inch of space also helps. Thus many left-over corners and recesses are closed off, hidden from view, so we don't have to know about them. Galleries are endowed mostly with obtuse angles so no problem about art placed in acutely angled spots occurs.

The polygonal configuration of the galleries also allows intimate contact and carries a certain solidity with it (a nice relief after too many flexible museums which seem like so many trade-show installations). But flexibility in arrangement obviously has been sacrificed.

Murphy: I still think there is enough flexibility in the smaller spaces to make them useful in terms of rearranging or redesigning spaces for different exhibits, even if there are clearly other ways of doing this in an art gallery.

Dixon: The architects and gallery staff claim the exhibit spaces are flexible. The spaces have flexibility to the extent that they are large enough to allow varied subdivision of space, changes in ceiling height, lighting, etc., but exhibitions are still limited to a set of solidly walled in spaces, with prescribed entrances, arranged quite idiosyncratically on several levels. The continuity of a show installation such as the opening one, "American Art at Mid-Century," is obviously being resisted by bearing walls in unsympathetic locations. It is noteworthy that the initial Dresden show has preempted areas designed for lower lobby space. The sheer amount of space assigned to lobbies seems excessive, and it is no surprise that the gallery administration is reclaiming some of it for art.

Stephens: Although large areas were left undivided, like the concourse area housing the Dresden art show, progression ultimately is determined by the configuration of the building. Since the East Building is catering to large extravaganzas and wants to attract hordes of people, the lobby space outside obviously works better than the convoluted gallery spaces. *Queuing* space seems more adequate than *viewing* space.

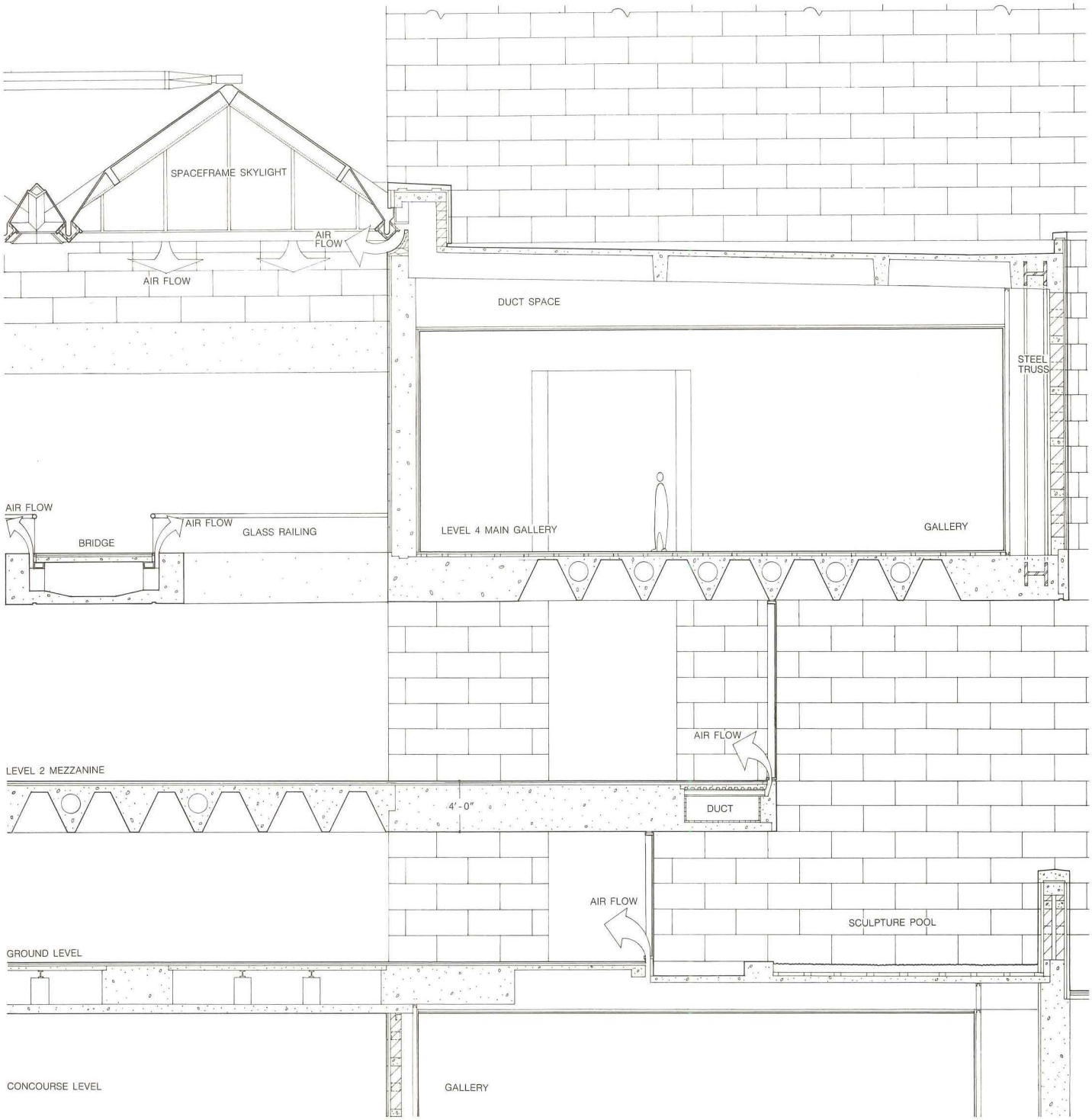
Murphy: But as Pei has said, his intention was to design the building to house large traveling shows.

Filler: Current notions of the role of the museum in society might well be to blame for the inadequacies of this building. Among them is the desire to make the appreciation of art a mass experience. The endemic desire of museum directors to increase attendance figures at whatever the cost does neither the public nor the cause of art any good. As we enter the atrium of the East Building, we are given signs of warning as we see the most predictable icons of "modern" art trotted out: the Calder mobile, the Miro tapestry, and what must be the ten-thousandth Motherwell *Elegy to the Spanish Republic.*

Dixon: I found all the commissioned art disappointing, except for the Moore sculpture just outside the entrance, a magnificent piece in itself that also enhances the balancing act of that east front.

Filler: Carter Brown has been quoted as believing that the maximum time span people can tolerate in a museum is no more than 45 minutes. If that is indeed the case—as one seriously doubts—I find that architecturally the new building becomes a very unpleasant place in which to be in much less than three-quarters of an hour. If one survives the aural onslaught of the atrium—when crowded it has some of the worst acoustics one has experienced in a public space—then the lighting of the galleries, harsh and overwhelming, does the trick.

Stephens: The cafeteria space itself is naturally gloomy—and brightly lit to make up for that. The paltry number of



SCHEMATIC SECTION, GALLERY PORTION

Legend
Ramp
Truck dock
Garage ramp
Art storage, services
Lobby
Sales
Café
Cafeteria
Kitchen
Staff dining
Moving walkway
Auditoriums
Galleries
Photo archive storage
Photo archive dept.
Photo reading room
17 Fountain/waterfall
18 Fourth Street
19 East Building entrance
20 Information desk
21 Sculpture pool
22 Study Center entrance
23 Reading room
24 Call desk
25 Editorial offices
26 Library offices
27 Graphic arts study
28 Stacks
29 Kitchen
30 Terrace café
31 Study Center offices
32 Gallery offices
33 Roof terraces

skylights, and the waterfall crashing down at the butt-jointed glazing create visual drama, but don't improve it enough.

Filler: The unpleasantness of the concourse and cafeteria results from an interior design scheme so anomalous that one can scarcely believe it came from the Pei office—all the more surprising when one thinks of the "total design" approach that prevails so strongly elsewhere.

Dixon: Having decided to place a major cafeteria/restaurant here—at a very logical point in terms of circulation and service—I think the architects have shown great ingenuity in lighting it through those prisms on the plaza and giving it a view of the sunken cascade. Aside from the decision to use an undulating, reflective ceiling to counter claustrophobia, the interior design of this space seems to have no strong organization or character—but I actually find that an appropriate relief from all that meticulous geometry and joinery.

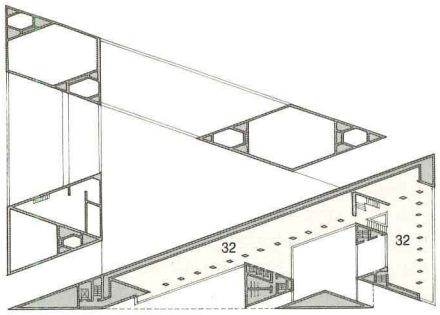
Murphy: The waterfall's effect on the cafeteria below is absolutely delightful. It bounces light in just the appropriate way to make the interior seem alive and lighter than it otherwise would. It is a nice touch. The skylights on the plaza are nicely handled outside, though not from the inside, where the detailing is much too heavy.

Dixon: By placing these prismatic cafeteria skylights in the center of their new plaza, the architects have effectively preempted what would otherwise have been a prime site for a sculpture.

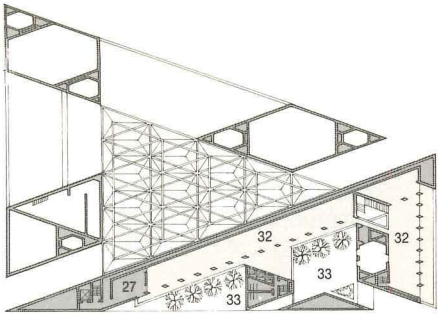
Technical feats

Murphy: In materials details and execution the building is clearly a masterpiece, with the exception of some glazing details. It is extremely well thought out in the way it was executed. The way the cladding is attached, the way it is protected from joint failure, even the way the paving was laid show considerable expertise. The love and care given to the concrete work is exceptional.

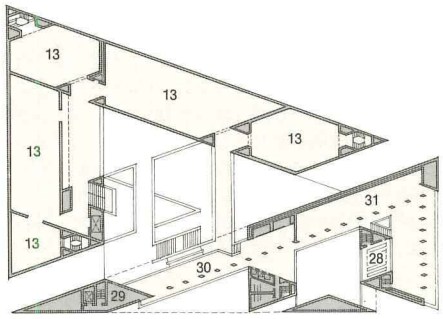
The major exterior flaw I find is the severe and uninteresting window treatment in the study center office areas and in the south and east walls. They could have been more minimal in detailing, much like Pei's previous work with butt glazing.



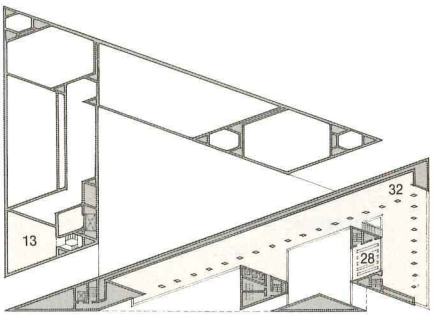
LEVEL 6



LEVEL 7



LEVEL 4 MAIN GALLERY



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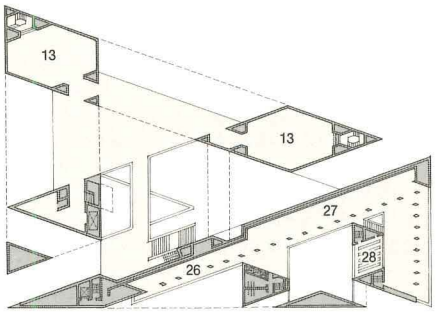
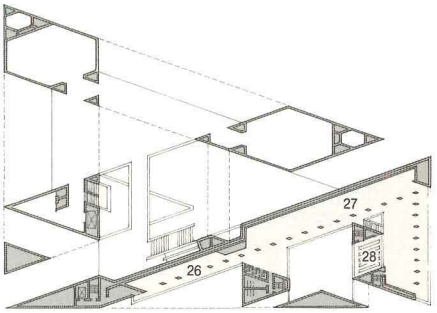
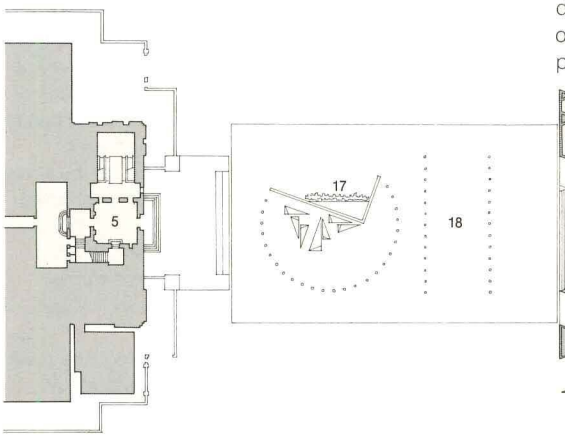


LEVEL 2 MEZZANINE

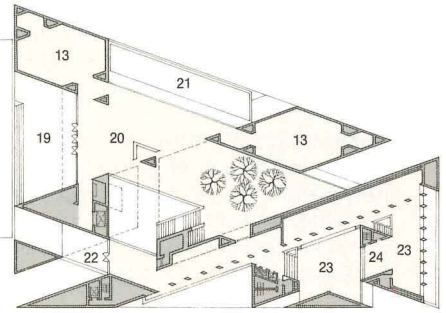


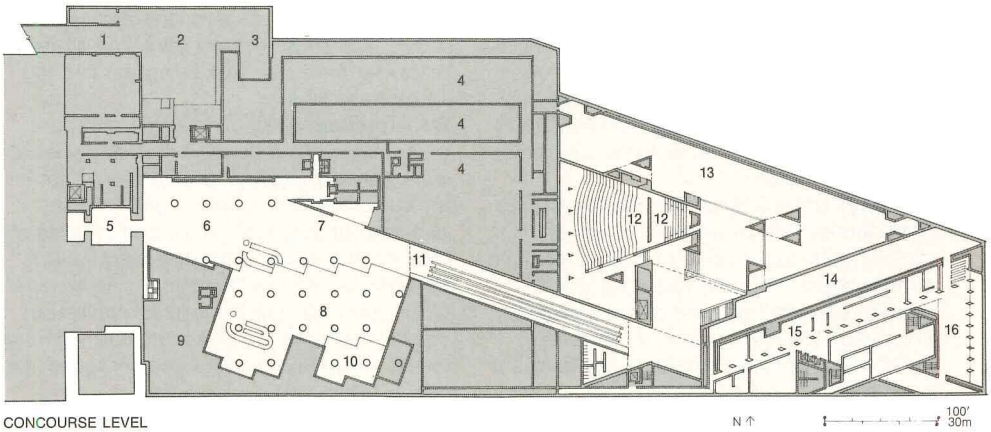
LEVEL 3

Gray tones on plans indicate indoor floor areas —light tone for areas accessible to the public, dark tone for staff and service. A basement level of connecting link (not shown) houses parking, production, storage facilities.



GROUND LEVEL





CONCOURSE LEVEL

N ↑ 100' 30m

East Building

Dixon: The gallery addition has been justly praised for the meticulous detailing and sumptuous materials. The extent to which all details have been coordinated is certainly admirable. There are elements—in particular that vast, ponderous skylight over the central space—that may simply be the wrong thing done well.

The concrete structural system is a tour de force: its spans of widely divergent dimensions all fit into a uniform depth—scrupulously lined up with masonry courses—regardless of actual stresses. It is a feat of concrete reinforcing technique pressed (literally) into the service of a preconceived formal concept.

Murphy: The limitation of the structural members to two- and four-foot depths is quite acceptable, given the fact that Pei does not intend either for the structure or for the triangular system to express the structure at the cost of spatial excitement.

Filler: The quality of the materials and the skill with which they were assembled are as apparent as they are undeniable. While we are spared the gross juxtapositions and obvious economies so apparent in buildings elsewhere, the materials and finishes here always impress, but rarely delight. But stone in such vast quantities needs some ornament to keep it from seeming cold, heavy, and bleak, which the marble here certainly does in places. What a pleasure it is to find at least a beautiful wood plank floor in the tower gallery after all that stone underfoot on the floors below! One is not suggesting a return to specific instances of detailing as it was carried out in the Neo-Classical structure. Once again, the old National Gallery building provides indications of how such materials were used more successfully in the past.

Dixon: Pope was able to avoid taking that bright, pinkish marble into his interior; he chose a more neutral stone, more sympathetic to art works.

Filler: Ultimately, the numerous technical and structural accomplishments of the new building are diminished as a result of the weakness of the basic design. The contrast is great between the success of the small things and the failure of the large ones.

Stephens: The building emphasizes structural aspects but masks structure for visual uniformity; it bows to the modernist notion of function by emphasizing circulation as an event without having provided a necessarily logical circulation. It accedes to the modernist notion of simplicity of form by letting form follow the (site) plan, but then stuffs the building program into the corset-like configuration.

Murphy: The building was intended to be a monument. While we tend to talk of monuments negatively this one is definitely a monument. It has been so designed, conceived—and desired by the patrons. They were willing to spend excessive numbers of dollars to make sure that it is a monument. Is that inappropriate?

Data

Project: East Building, National Gallery of Art, Washington, DC.

Site: 8.88 acres adjacent to the National Gallery of Art bounded by Fourth St., the Mall, Pennsylvania Ave., and Third St.

Program: Space for large temporary exhibits, to show collection (30,000 art works), and to expand scholarship functions with a Center for Advanced Study in the Visual Arts. Also house administrative offices, shops, cafés, auditoriums, waiting areas, and delivery areas.

Design solution: a total of 604,000 sq ft: 450,000 sq ft for the East Building, 154,000 sq ft for the underground connecting link to the old building, plus 76,000 sq ft for plaza on top of the connecting link. Of the square footage in the East Building, 110,000 sq ft was reserved for exhibit areas and public spaces of which roughly 60 percent of volume is devoted exclusively to exhibition galleries; 112,000 sq ft for the Center for Advanced Study in the Visual Arts (61,000 sq ft) and Gallery offices (51,000 sq ft). In the connecting link, 32,000 sq ft is reserved for café and buffet areas, 43,000 sq ft for parking, truck service, and storage. A moving walkway, 172 ft long, links to the East Building.

Taking as constraints the trapezoidal site and the National Capitol Planning Commission's guidelines for height of building not to exceed 111-ft height of upper cornice of National Gallery, plus setback regulations (50 feet from Pennsylvania Ave., 445 ft from center line of Mall), I.M. Pei & Partners devised a scheme that would relate to both the intersecting coordinates of L'Enfant's plan (where Pennsylvania Ave. and the Mall meet at a 19-degree angle) and the perpendicular axes of the National Gallery itself. The resulting trapezoidal form was subdivided into two triangles—a larger isosceles triangle for the exhibition galleries, its base facing the old National Gallery building, and a right triangle for the study center and offices, its base facing the Capitol. The isosceles triangle is composed of three towers of galleries—one tower at each of the triangle's points axially aligned to old building. The 110-ft-high towers are organized around a central atrium 80 ft high over the concourse (lower) level and topped by a tetrahedronal skylight spanning 16,000 sq ft. The triangular skylight, 150 ft at the base and 225 ft along the legs, comprises 25 space-frame modules 30′ x 45′. Ceiling heights in the galleries range from 10 ft to 35 ft.

Whereas the gallery has four levels, the study center wing is eight stories with a triangular court extending 72 ft high in the six-story reading room. Designed for about 600 scholars and 350,000 books, center provides reading carrels, desks, and private offices on the various levels, with 10-ft ceilings. Above it, the administration offices will have their own dining facilities and sculpture terraces.

Construction: a heavy foundation mat, six ft thick, along with tie-down anchors and special waterproofing, supports post-tensioned concrete structure with the two large concrete beams extending about 200 ft to form soffits on the north and south sides of the building. Coffered slabs not exceeding four ft in depth were made from clear-grained fir forms crafted by cabinetmakers, to ensure accurate, smooth surfaces. Three major steel trusses were used; the largest (along the Pennsylvania Ave. side) is 180 ft long and weighs 242 tons.

Cladding on exterior walls is Tennessee pink marble blocks 3 in. thick, 2′ x 5′ in size, hung on stainless steel supports from concrete and brick core wall, averaging 12 in. thick, with Neoprene strips for expansion and contraction.

The main skylight is a 500-ton welded steel frame with double insulating glass, laminated for safety, with special ultraviolet filters and aluminum louver sunscreens. Built-in overhead electrical outlets are provided, along with a Neoprene gutter system carrying water off, while electrical heating melts snow. The skylights in the towers span a total of 8600 ft, and are also fitted with double insulating glass with ultraviolet filters. Skylights in the plaza, comprising seven tetrahedrons, range in height from 11′ 3″ to 6′ 3″ and are clad with reflective safety glass. Natural light is supplemented by artificial incandescent lights arranged along a modular grid (see Building materials, p. 118).

Mechanical system: steam heating is provided by city system with automated computerized heating and air systems. A/C system consists of air filters, preheat coils, high efficiency air washers (water spray), and reheat coils. Air outlets and intake registers are carefully placed in atrium: air is brought in through sides of lights in ceiling, slits in bridges and floors, and returned through reveals in stair treads and tree planters.

Client: although technically a bureau of the Smithsonian Institution, the National Gallery of Art is governed autonomously by its own board of trustees. The trustees retained Pietro Belluschi as advisor. J. Carter Brown, Director of the National Gallery, worked with the building committee and the chosen architects, I.M. Pei & Partners. The building itself was a gift of Paul Mellon, the late Ailsa Mellon Bruce and The Andrew W. Mellon Foundation. (Andrew Mellon had donated the funds for the older building in 1939.)

Cost: $95.4 million.

Credits:

Architects: I.M. Pei & Partners, I.M. Pei, partner-in-charge; Leonard Jacobson, project architect; F. Thomas Schmitt, Yann Weymouth, William Pederson, general designers; William Jakabek, job captain; Owren J. Aftreth, in charge of marble and air-electric floor; Robert Bates, concrete and field architect; Michael Flynn, space frame; Fritz Sulzer, skylights, window wall, architectural metal; Richard Cutter, design, field coordination; and C.C. Pei, Stephen Wood, Martin Daum, Carl Weinbroer, Klaus Vogel, Clinton Scheerr, J. Woodson Rainey, Mark Forster, Richard Smith, John Gewalt, staff team.

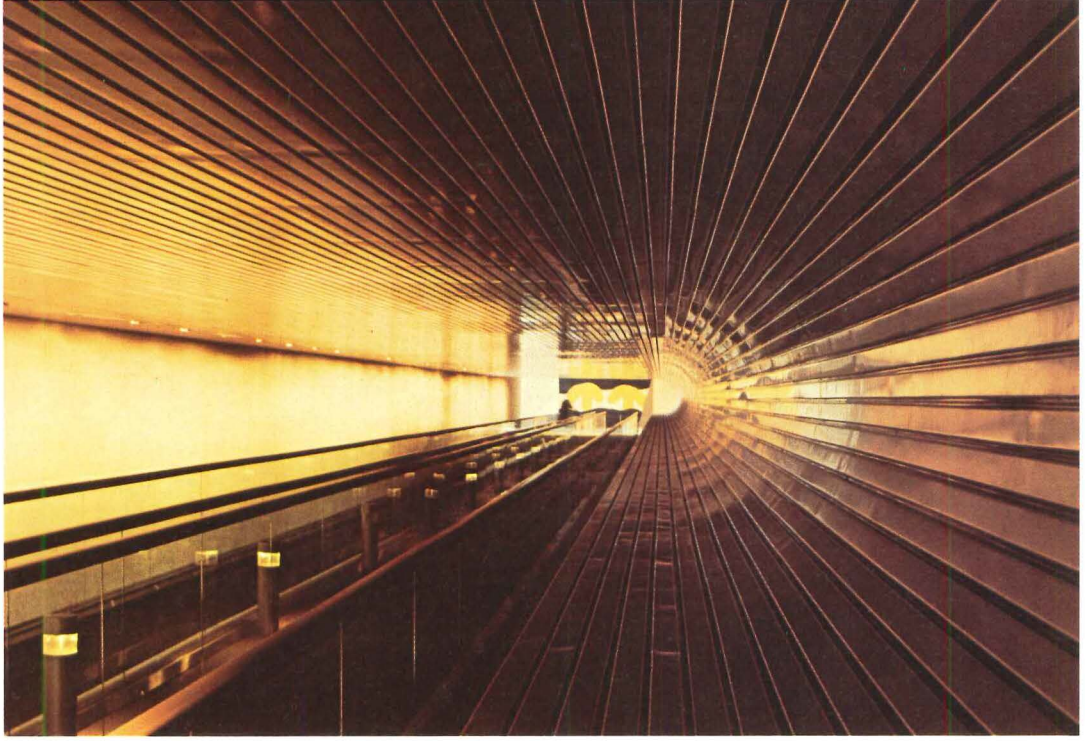
Consultants: Weiskopf & Pickworth, structural; Mueser, Rutledge, Johnston & DeSimone, foundation; Syska & Hennessy, mechanical and electrical; Cerami & Associates, Inc., acoustical; Claude R. Engle, lighting; Malcolm Rice, marble; Antoine-Heitmann & Associates, skylight/window wall; Will Szabo Associates, Ltd., audio-visual; Herman & Lees Associates, graphics; Kiley-Tyndall-Walker, landscape; Travers Associates, traffic; Dr. David Scott, gallery planning.

Owner's construction consultant: Morse/Diesel, Inc.

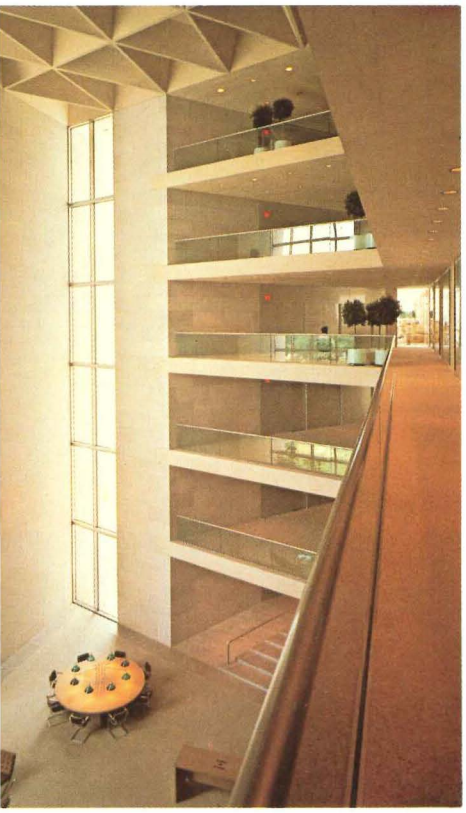
Construction manager: Hurley Offenbacher

General contractor: Charles H. Thomkins Co.

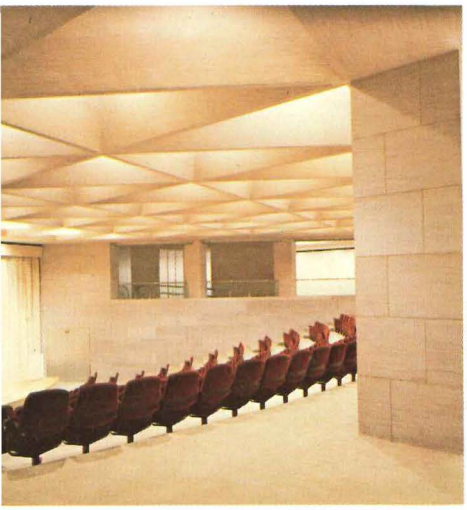
Carved into atrium wall is profile of escalator (above) connecting second-level galleries to third. In study center reading room (below) offices and stacks ring 72-ft-high space lit naturally by glazed side walls. Metal pan ceiling system wraps walkway (right).

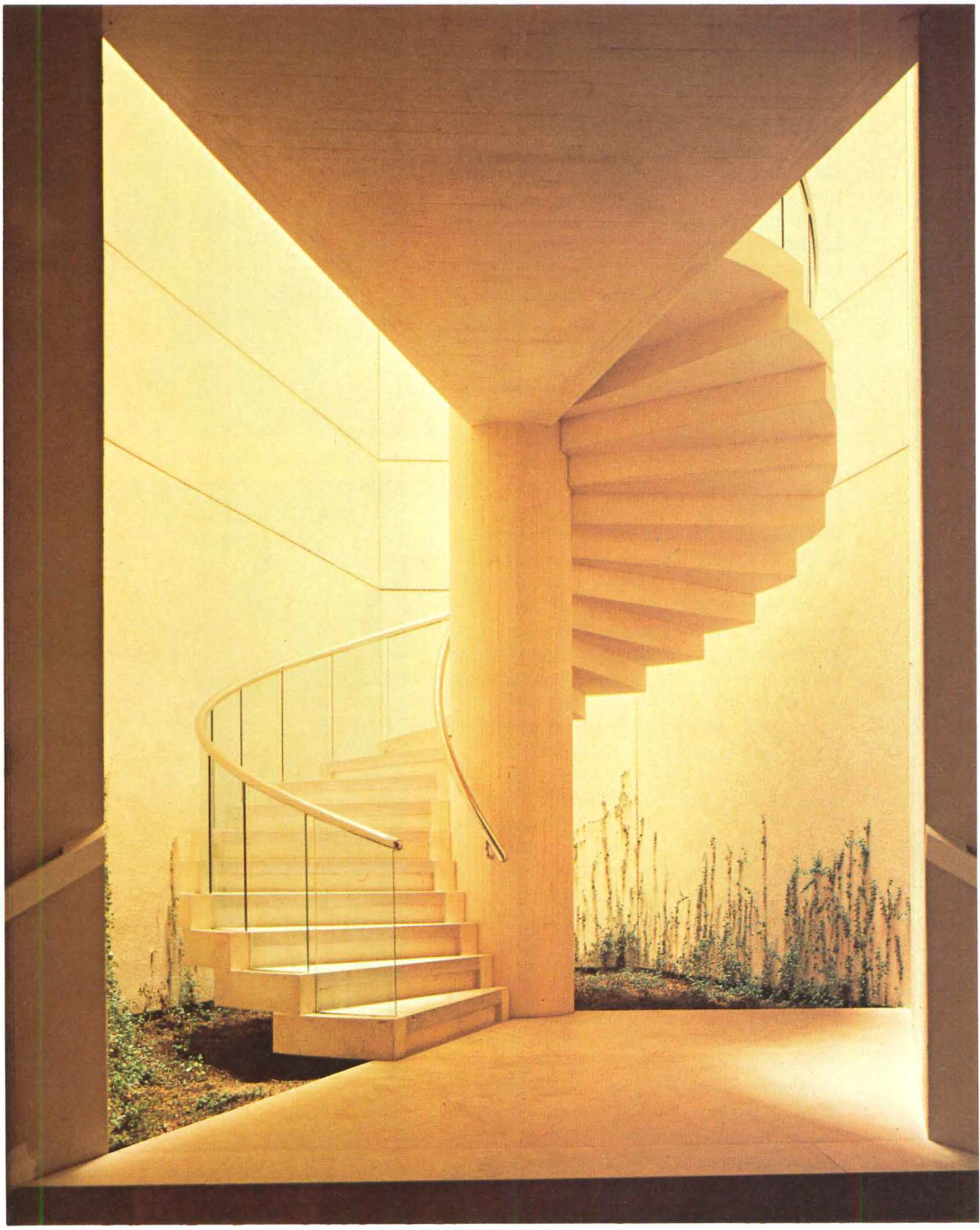


Concrete spiral stairs topped by skylights dramatize the tower corners of galleries (below).



Auditorium on concourse is triangular.





Photos: Ezra Stoller @ ESTO

Icart Building, Barcelona, Spain

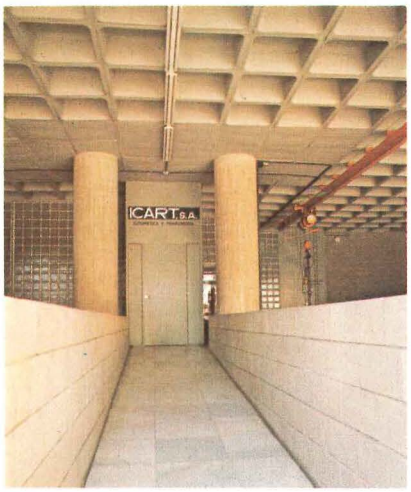
It makes scents

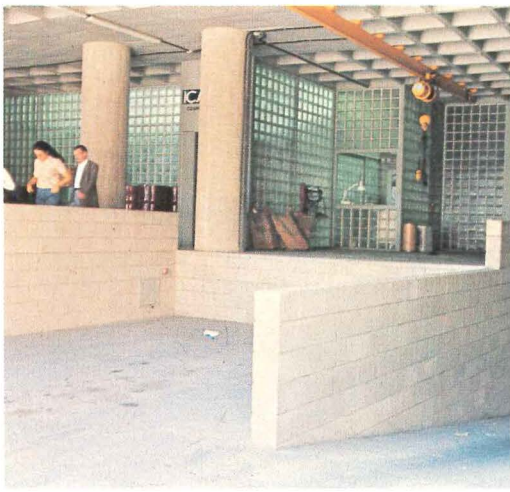
A perfume factory in Spain shows that even simple buildings for industry can have high architectural quality.

In the industrial section of Barcelona where the new Icart Perfume Factory is located, a zoning ordinance requires that buildings be no higher than ten floors, including basement parking, and that each be constructed to allow attachment of other buildings to the sides, where appropriate. While these are not excessively demanding constraints, their combination with a building program for a 100,000-sq-ft structure for light industry would not usually provide the most conducive parameters for architecture. Nevertheless, the team of young Spanish architects Luis Cantallops, José Antonio Martinez, and Elias Torres has produced a building that not only intelligently solves its programmatic demands, but also exhibits striking architectural qualities at the same time.

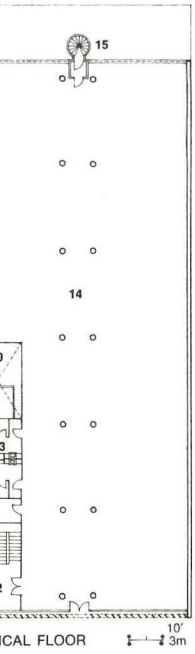
Because there could be no windows on the sides, the architects had to rely on the front and back façades of the building as sources for natural light. Consequently, the front, south façade has been clad with adjustable aluminum brise-soleil and the back has been detailed with banded, operable windows. To keep these two façades free as light sources, the architects have placed all circulation and services, except at the ground-floor entry, to the sides of the building. An additional light source comes from the roof, however, where a skylight protects a vertical stair-core "patio" that runs from the top to the bottom of the building, emitting light, to each floor on its way down, through its glass-block enclosure.

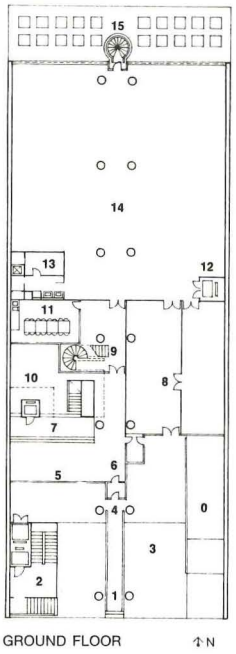
Although the building is designed for light manufacturing, the program for the simple concrete-frame structure was somewhat complicated by the fact that the perfume factory needed only four floors of space. This allowed the client to lease the upper five floors, but it also meant that two completely separate entrance and circulation systems were required: one for the client and one for the tenants.





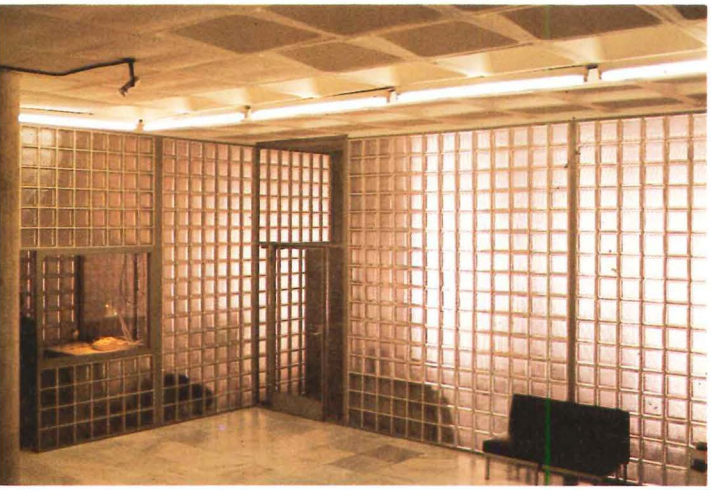
Entry ramp to factory is flanked by loading docks (above) between tenants' lobby and garage ramp.

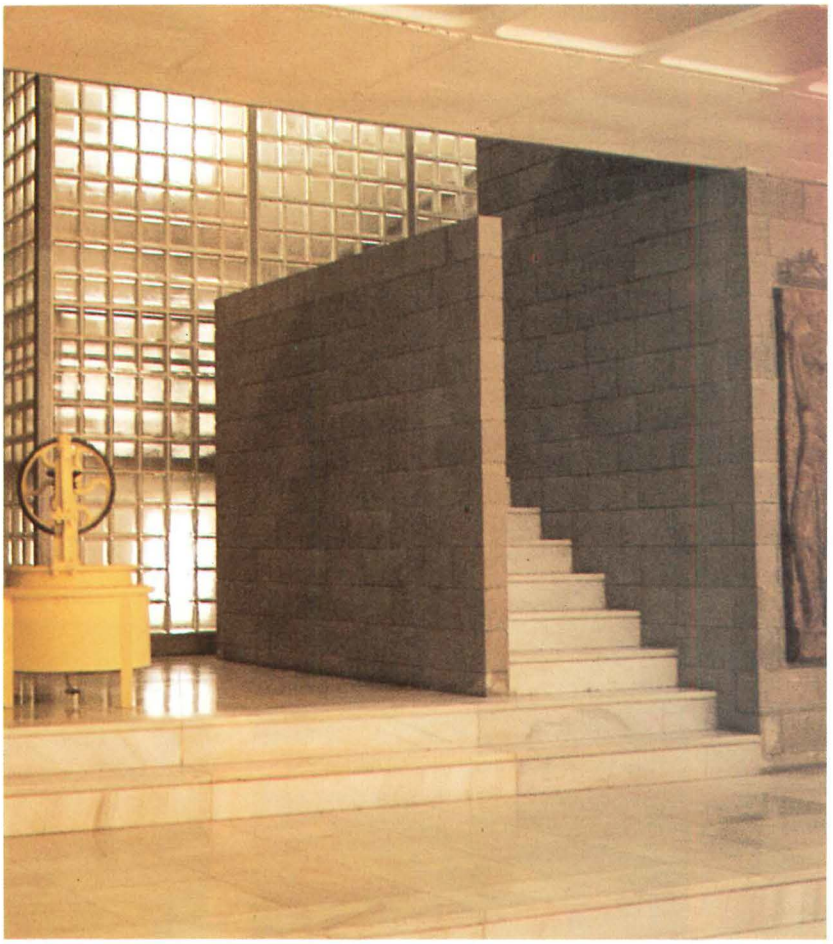




Legend

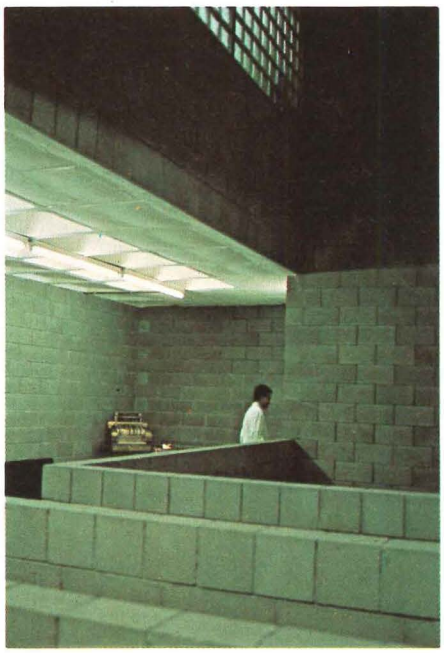
0 Garage ramp
1 Entry ramp
2 Tenants' lobby
3 Truck dock
4 Perfume factory entry
5 Glass block wall
6 Perfume factory lobby
7 Stair to factory offices
8 Storage
9 Employees stair
10 Skylight patio
11 Dining room
12 Factory elevator
13 Rest rooms
14 Factory
15 Fire stair



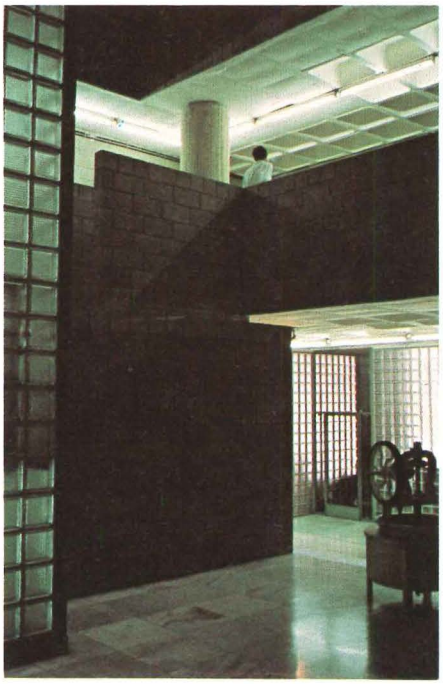


Lobby for the perfume factory (this page) is at end of the long entry ramp. Because the building was designed to be attached, it has no side windows. Natural light is brought into the perfume factory lobby and to all other floors via a vertical light shaft from which spaces deep within the building can borrow light. The monumental concrete-block and marble forms of the lobby appear silhouetted against glass-block walls.

Icart Building, Barcelona, Spain



Offices look into "patio" behind main lobby.



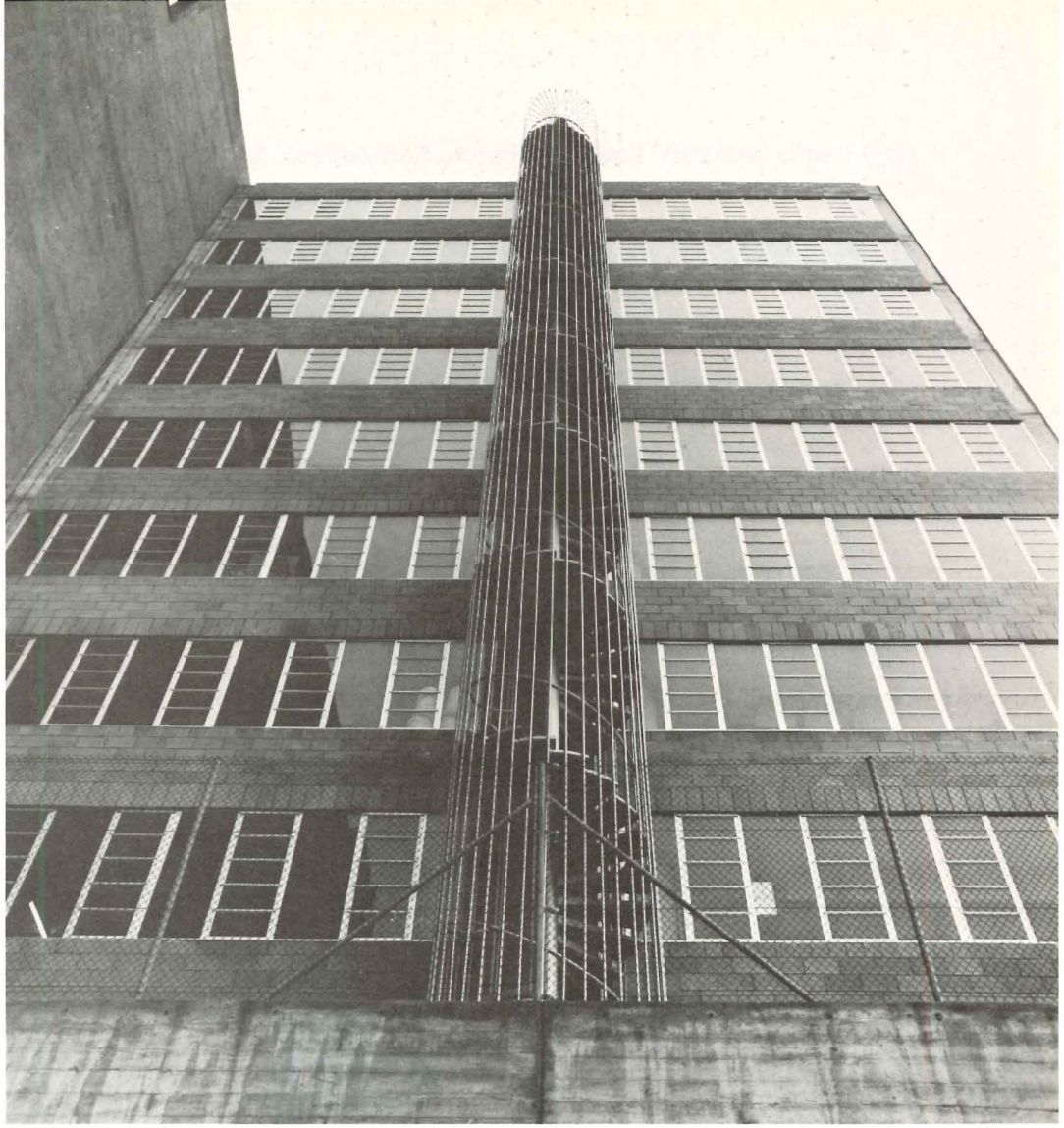
Perfume factory offices are on second floor.

Glass-block stairwell in nine-story-high light shaft connects four floors of perfume factory.

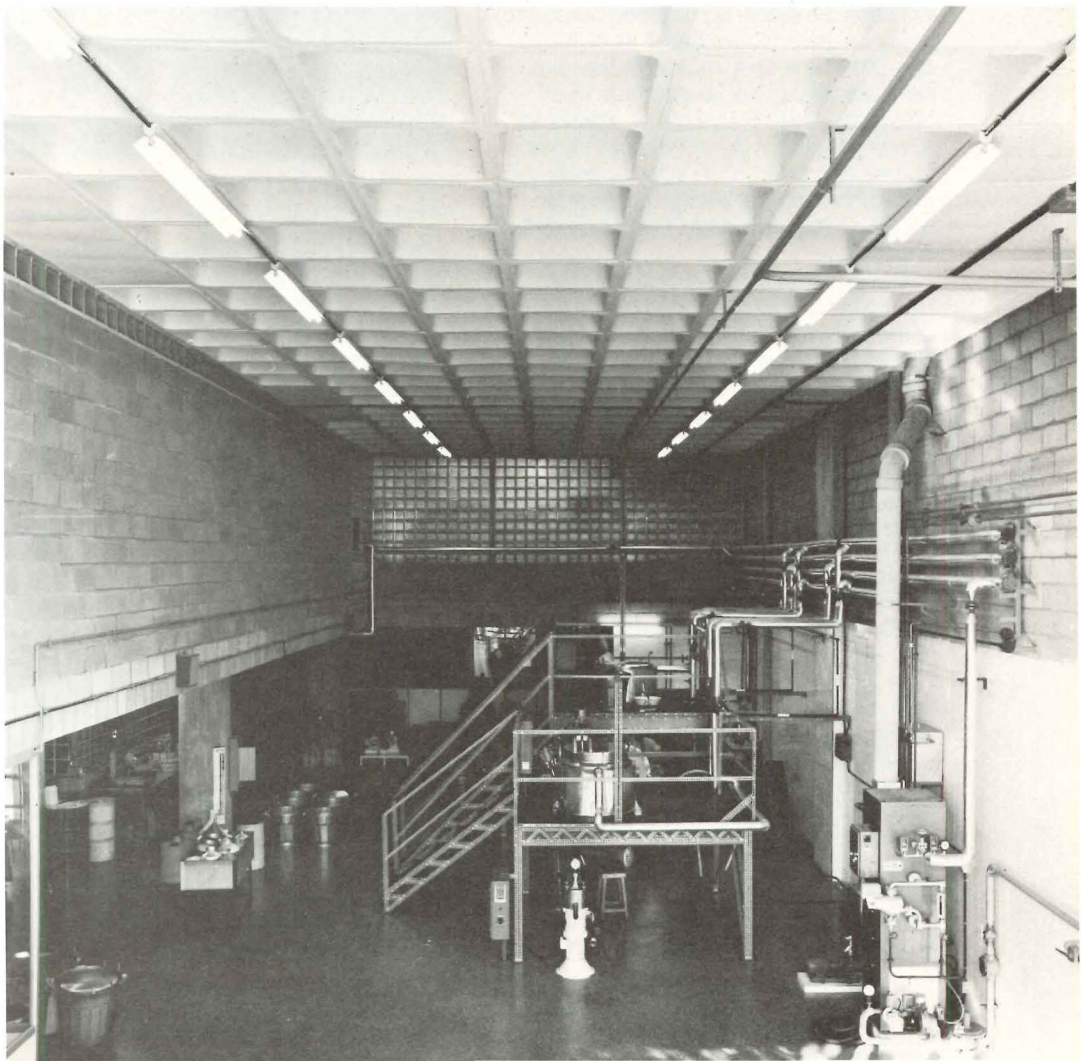
At street level, a protected ramp at the front of the building leads through two loading docks to the Icart Company entrance, where a solid door that is set into a glass-block wall is flanked by two massive concrete columns immediately in front of it. Beyond the door, the Icart lobby, offices, and private circulation zones are treated as massive solids of cubistic sculpture, where the various elements are articulated in glass block, concrete block, and marble. At this level, the forms and surfaces somewhat obscure the basically simple, open plan of the building, which is nothing more than a rectangle with two closely spaced rows of columns through the middle of the structure. At each level, the space between the columns clearly defines a path that leads to a fire escape at the rear, and to an opening behind movable brise-soleil at the front, which is used when hoisting heavy machinery into the building.

The entrance to the top five rental floors is at the southwest corner of the building, next to a loading dock. Throughout these floors, the circulation and service areas are confined to the west wall to keep the spaces open and light. Otherwise, the plan follows the same basic industrial-loft scheme as the lower floors.

At the Icart building a simple, straightforward structure houses rather pedestrian functions. Yet the interior spaces are articulated in a simple, powerful manner; this, with the dramatic juxtaposition of materials, results in some spaces of undeniable force, even of monumentality. The materials, however, are ordinary and were chosen primarily for their durability. For ease of maintenance, all of the concrete and concrete-block surfaces have been left exposed. Nevertheless, the building shows that even when dealing with an uninspiring program and "serviceable" materials, it is still possible to achieve high quality. The client is fortunate who asks for a factory and gets architecture too. [David Morton]



Fire escape is at rear of building (above); perfume manufacturing area (below) is double height.



Data

Project: Fabrica Traci (Icart Building), Barcelona, Spain.
Architects: Luis Cantallops, José Antonio Martinez, Elias Torres; Miguel Simon Espar, associate.
Program: 10-story, 100,000-sq-ft building for light manufacturing.
Site: urban, high-density industrial area.
Structural system: cast-in-place concrete pilings, cast-in-place reinforced concrete frame.
Mechanical system: oil-fired boilers, hot-water radiators.
Major materials: concrete, concrete block, glass block, marble, terrazzo, aluminum windows and brise-soleil.
Consultants: Montajes Electricos Salvador, electrical; Pycesca, structural.
General contractor: Sala Amat.
Client: José Icart.
Costs: $1,400,000; $11.20 per sq ft.
Photography: Elias Torres.

Holy Trinity Ukrainian Catholic Church, Kerhonkson, NY

Faithful geometries

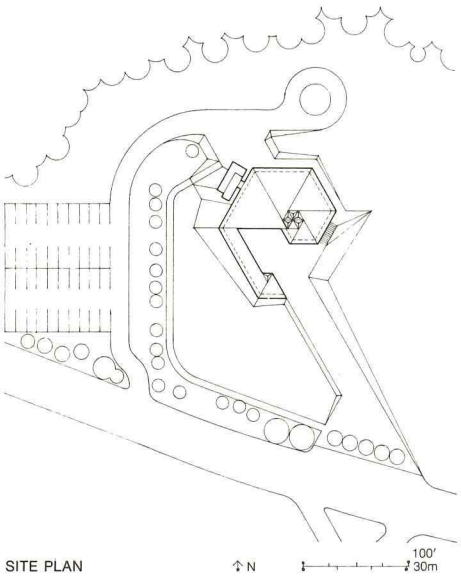
A small church for a Ukrainian Catholic community follows rigid geometric rules with rather refreshing consequences.

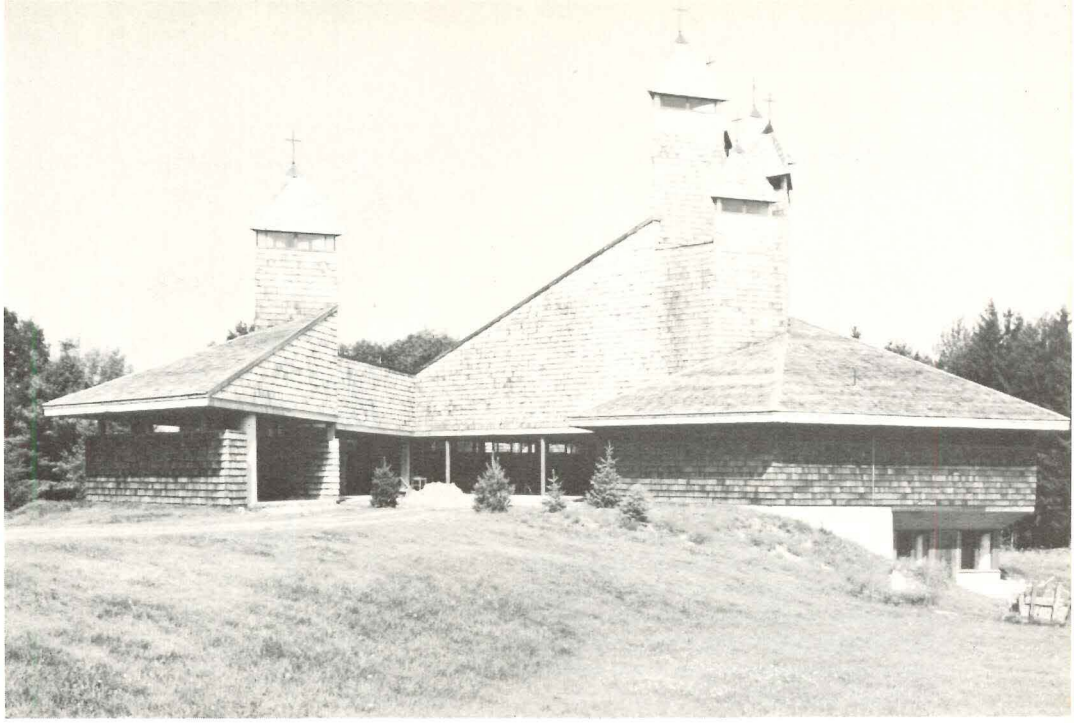
In the past 15 years, between teaching duties primarily at McGill University in Montreal, Radoslav Zuk has completed six Ukrainian Catholic churches in Canada. As designer, in association with the Montreal firm of Gorman, Mixon & Blood, he has recently finished a seventh in Upstate New York. Although all of the churches share a common functional purpose, they differ from one another in size and in the particular affinities of the different congregations. By tradition or requirement, however, the altars of all of the churches face east, the sanctuary and nave are always separated from each other, and three or five spires always rise above the sanctuary. A freestanding or attached bell tower often accompanies the ensemble, and the whole composition usually forms a dramatic outline against the sky.

The problem of these churches for Radoslav Zuk, as illustrated by the Church of the Holy Trinity in Kerhonkson, NY, shown here, was basically that of maintaining the traditional images and meanings of a specific cultural group while also designing a structure that is contemporary and responsive to its surroundings.

The simplest means of accomplishing these ends, and the method that is still the most common with such churches in North America, Zuk notes, "is to imitate a historical prototype in a distorted way, or to apply isolated known architectural elements to an otherwise meaningless structure." But, he adds, even though such methods may result in recognizably "Ukrainian" structures, they may still say nothing about the essential nature of the churches, which have exhibited a particularly strong character within a number of different styles during their 1000-year period of development. That particular essence, he says, comes not simply from stylistic elements but from the more abstract and less precisely definable for-

Radoslav Zuk's six Ukranianian Catholic churches done before Holy Trinity (facing page) include St. Michael in Tyndall, Manitoba, 1963 (above), and Holy Cross, Thunder Bay, Ontario (below), 1968.





All activities of Holy Trinity Church spiral from five-spire tower rising above the sanctuary.

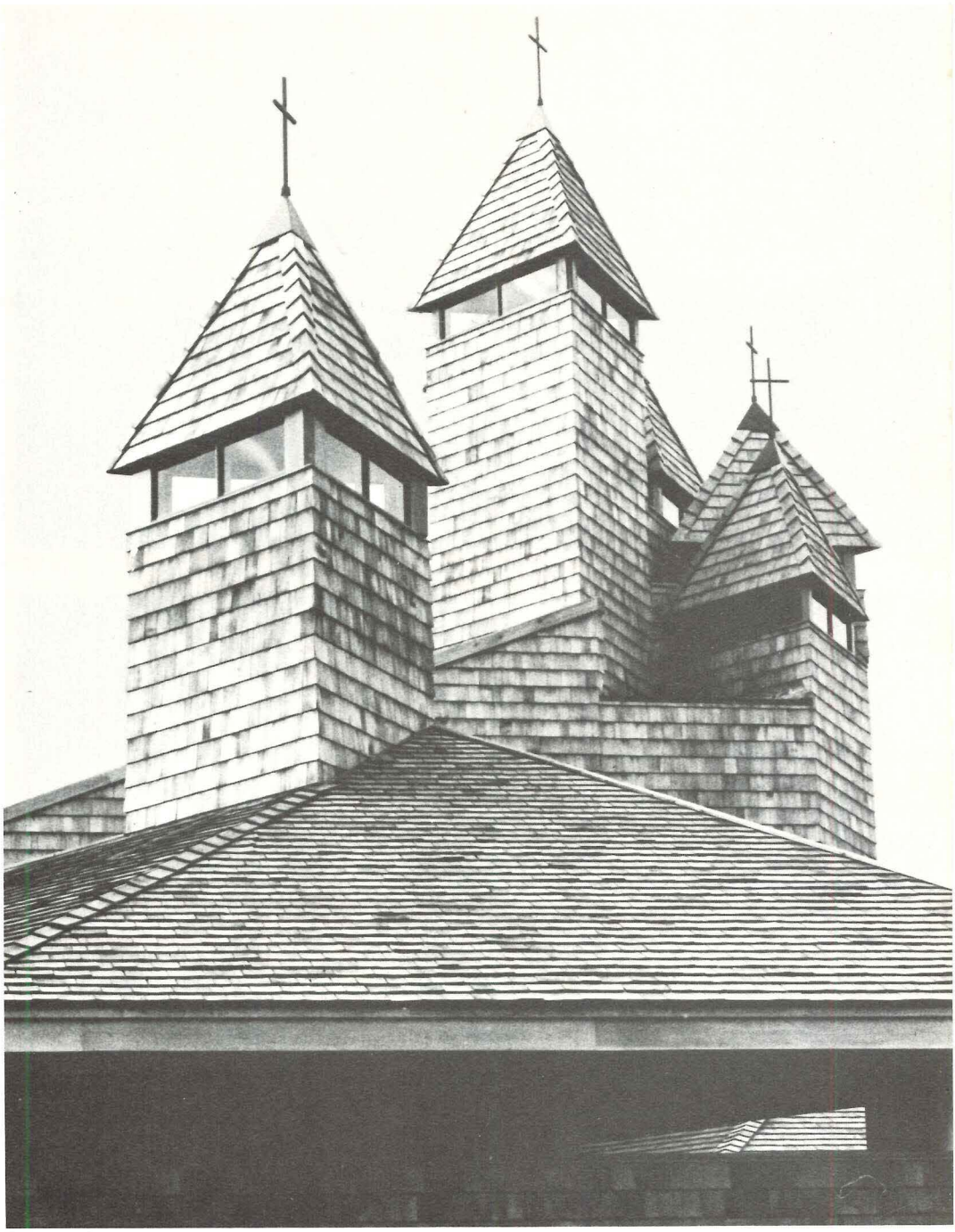
mal attributes such as rhythm, proportion, scale, texture and color of component spaces, masses, and planes. It is through the particular integration of these elements that the most intangible, but Zuk says perhaps the most important, attribute of the churches is revealed: its "presence"—"that which implies those architectural values which transcend meaning, function, fashion, and time."

To achieve this quality of presence, perhaps the most important method for Zuk is that of a controlling geometry—not a static but a dynamic geometry. Although various geometrical systems have been used in the different churches, for the one in New York, the architect combined a regular equilateral-triangle system (see site plan) with a spiral off-center-focused plan, and a rising spiral section. Six attached triangles of the grid spiral outward, increasing in size by equal increments, from a hexagonal tower, which itself terminates in five triangular spires of different heights above the sanctuary. In continuing the spiral of the plan's geometry, a seventh attached triangle (the largest) is incomplete. A void is cut into it to form a courtyard; the base portion, left intact, forms a cloister which, along with a smaller terminating triangle, encloses one side of the courtyard. Another side of the courtyard is enclosed by sliding glass partitions of the nave, and the third side is left open to form an entrance facing the street.

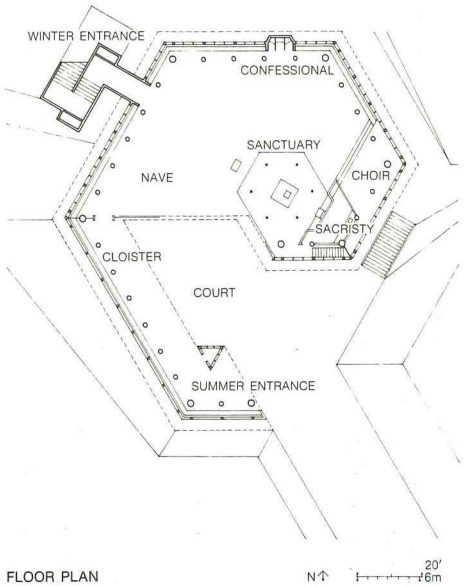
Inside the spiral

Inside, concrete columns surround the perimeter of the wood-frame enclosure. As the roof gradually spirals to a peak around the central spire, it is supported by steel columns that define a required "screen" around the sanctuary at ground level.

The idea of the spiraling triangles could be seen as nothing more than a formal conceit were it not for the fact that this device gives an organization to the plan that both supports functional requirements and maintains local traditions. Because the church is in the Catskill Mountain summer-resort area, its interior is designed to accommodate a maximum of only 225

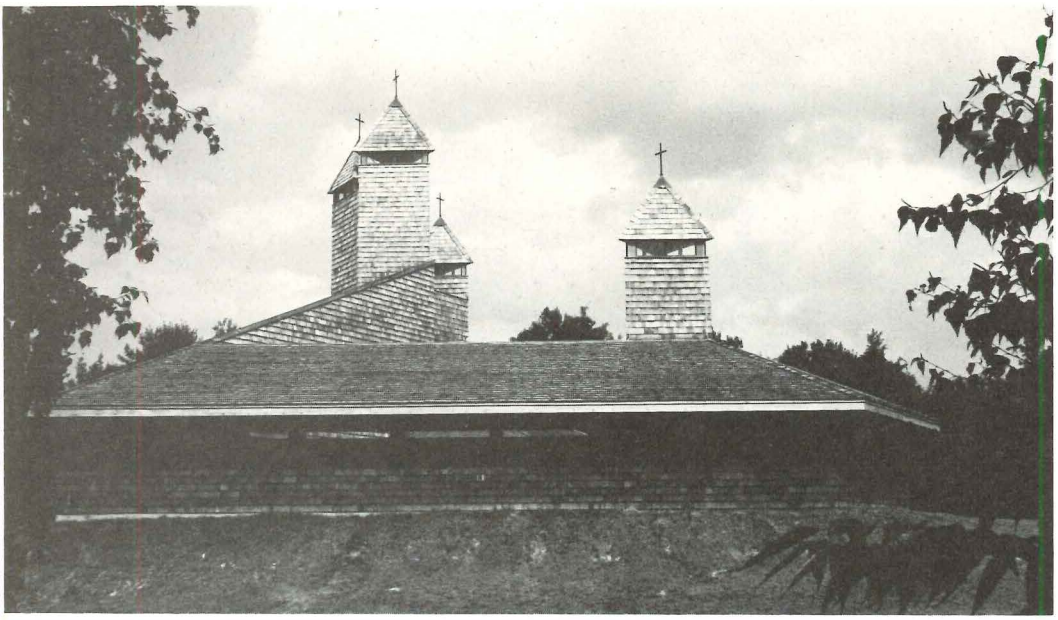


Holy Trinity Church

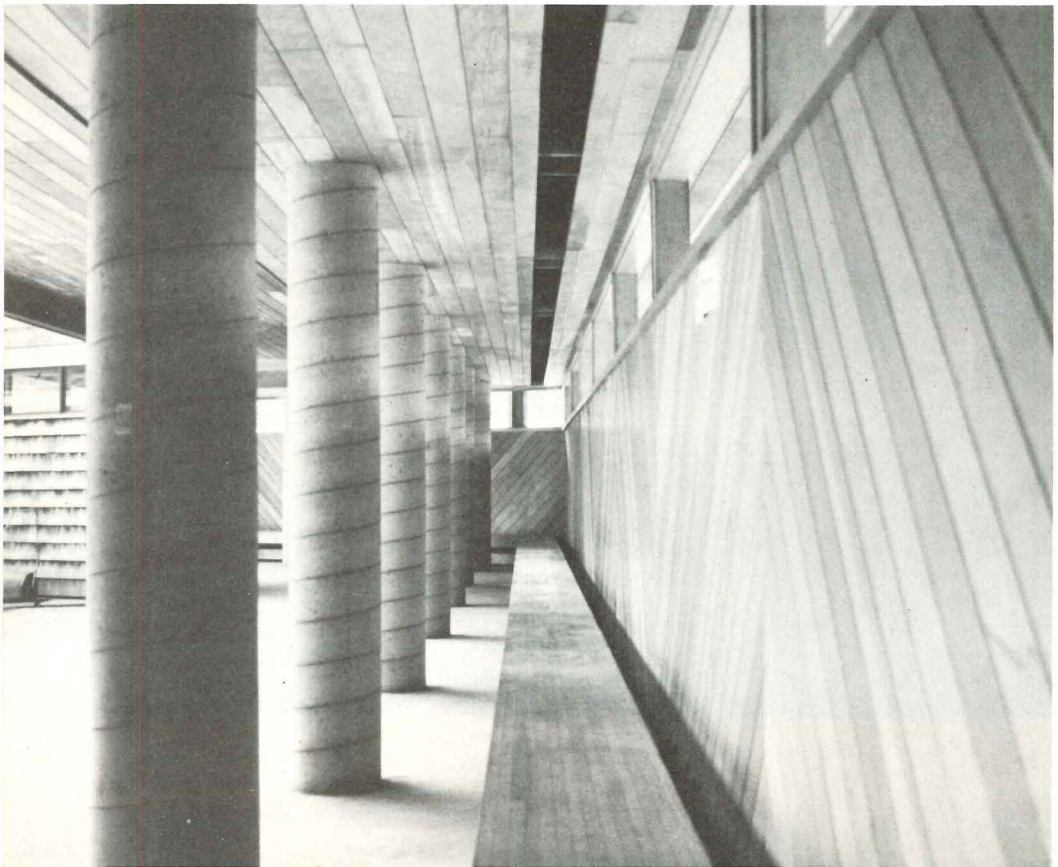


FLOOR PLAN

Functional areas of the church spiral around the central tower, increasing in size in equal increments. All areas, however, focus on the sanctuary. Banded windows under the eaves (at rear of church, below) illuminate the nave (facing page bottom left) and also help balance light in the cloister facing courtyard (bottom). The lower tower (below) is the bell tower.



The cloister (below) faces the court and sanctuary and provides extra seating during the summer.



people who might attend services during the colder months. The plan is organized, however, so that when the congregation swells to 800 or 900 during the summer, the glass doors facing the courtyard can be opened to give those standing there and in the cloister full visual and aural access to the sanctuary. (The idea of standing is not a problem to the parishioners. Since it is a tradition to stand during services in Ukrainian churches, folding chairs are used inside in case the congregation ever decides to return to the old custom.) The spiral organization of the plan serves more than just functional needs, though. It also recalls a tradition of outdoor worship before the congregation had a church building, when they gathered under trees in a spiral that originated from a small open chapel in the woods.

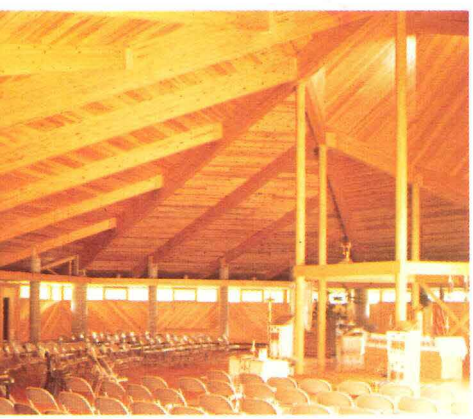
In addition to following customs of the Ukrainian church and of this particular congregation, Holy Trinity also reflects the building traditions of its mountain location, where wood frame construction with exterior shingle cladding has existed for years. Like the older buildings of the area, the church is also self-ventilating, in this case with continuous bands of operable windows under the eaves.

Holy Trinity is a church that lives up to its name. Not only is its plan formed of triangles, but so are some of its walls, all of its roofs, its towers and their turrets. The final result, however, is not as obsessive as a verbal description of it might sound. In fact, it is not obsessive at all; it illustrates one of the rare examples where geometry is used consistently, with refinement and skill, not for its own sake but in the service of tradition, meaning, and accommodation. [David Morton]

Data

Project: Holy Trinity Ukrainian Catholic Church, Kerhonkson, NY.
Architects: Radoslav Zuk, designer; Gorman, Mixon & Blood, architects, Montreal.
Program: church building for a congregation that ranges from about 225 in the winter to 800 or 900 during the summer months, with a lower partial-basement floor for Sunday school and community meetings.
Site: a raised clearing in the woods, in a large Ukrainian summer-resort area in the Catskill Mountains.
Mechanical systems: electric forced hot air; no air conditioning; electric humidity control.
Structural system: cast-in-place concrete foundation and columns, steel columns, laminated wood beams.
Major materials: fire-retardant cedar shingles; clear pine interior wall surfacing; pine mill deck roofing.
Consultants: Langlois, Crossey, Cote, LeClair, Inc., mechanical and electrical; D.A. Selby, structural.
General contractor: Roy C. Knapp & Sons, Inc.
Client: Holy Trinity Ukrainian Catholic Church.
Costs: $302,683; $30.00 per sq ft; including unfinished lower floor but not landscaping.
Photography: Radoslav Zuk; except top, p. 65, bottom, p. 66, middle and bottom, p. 67, David Morton.

Five turrets rising from the central tower (below) bring natural light down into the sanctuary.

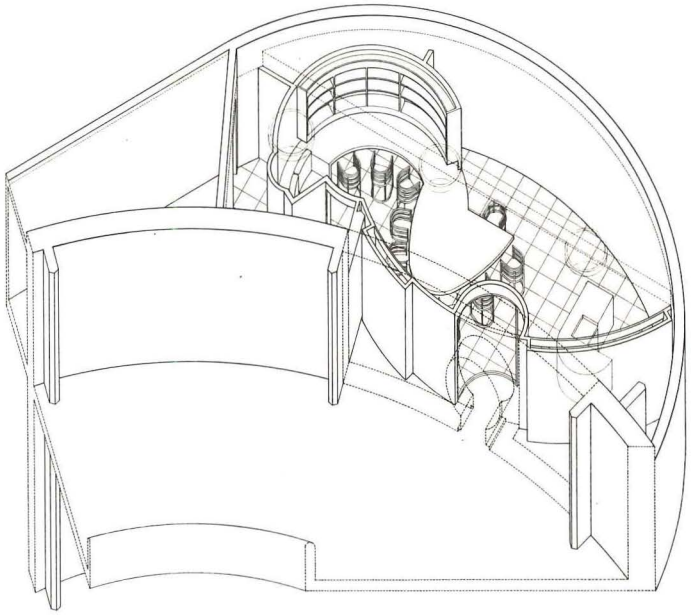


Splendid spinoff

Richard Meier's new reading room at the Guggenheim surpasses recent work there by Wright's disciples, and convincingly shows that the letter killeth, but the spirit giveth life. Wright is to this fine new work as Corbu is to Meier's earlier efforts: inspiration for imaginative composition and innovative design.

The Guggenheim Museum was the last public work of Frank Lloyd Wright known with certainty to have come from the hand of the master himself. This paradoxical building has been interpreted variously as Wright's ultimate act of defiance against the International Style, or his arrogant gesture toward a city which had largely ignored him and his teachings, or the culmination of his life-long struggle to make architecture "break out of the box," or the fitting evocation of the works of art (largely paintings by Wassily Kandinsky) that it was built to contain, or even (in Vincent Scully's words) "like the pulsing sanctuary of a primitive cult drumming on Fifth Avenue." Twenty years after its completion, 35 years after its initial design, the Guggenheim still provokes controversy among architectural cognoscenti, still evokes stares from untutored passersby. An undoubtedly flawed work, it still resists classification with such highly questionable late Wright works as the Marin County Courthouse or Beth Sholom Synagogue. Far from the masterpiece some deemed it two decades ago ("the most beautiful building in America," burbled critic Emily Genauer), it is at once disappointing and provocative, a great failure and a great success.

Though this is a building that is easy to dislike (every visitor to it seems to become an instant authority on "form follows function"), one's true feelings for it, not untinged with affection, could be gauged when two alterations to the original structure were made within the last decade. The first, and less destructive, of these additions was completed in 1968 by the Taliesin Fellowship under the direction of William Wesley Peters. Armed with evidence of Wright's intention that the Guggenheim was indeed meant to be expanded, the Taliesin Fellowship appended a four-story annex (appearing to be two stories on the exterior) at the back of the museum site on 89th Street. The results turned out, perhaps because of the caution of true disciples, to be quite a bit more reticent than some of the flamboyant designs bearing Wright's name in his late period, or by the successor firm when working entirely on its own (P/A, May 1977, p. 82).



AXONOMETRIC

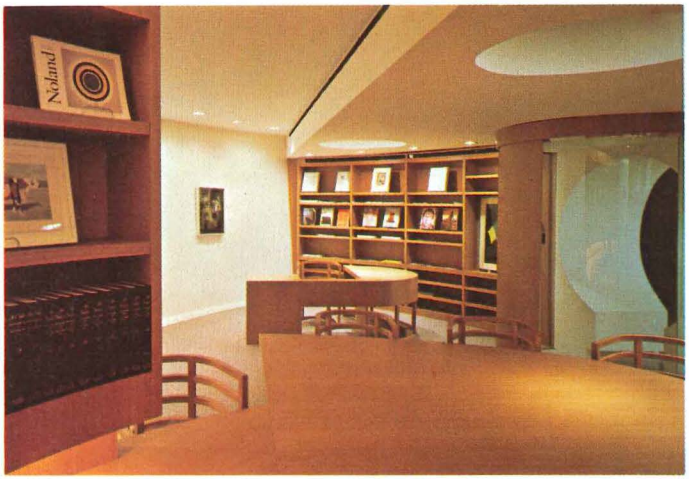
Far more destructive to the spirit of the Guggenheim were the alterations completed in 1974 by Donald E. Freed, amounting to no less than cultural barbarism. Most serious of the changes was the elimination of the curving driveway that separated the two major elements of the building—the large rotunda and the smaller monitor—this in order to form a new bookstore and cafeteria. The original open space (closed from above by the Taliesin addition) was essential to a visual resolution of the swirling masses that it separated. Glassing it in quite wrecks not only the base of the museum, but our understanding of the exterior of the whole building as well.

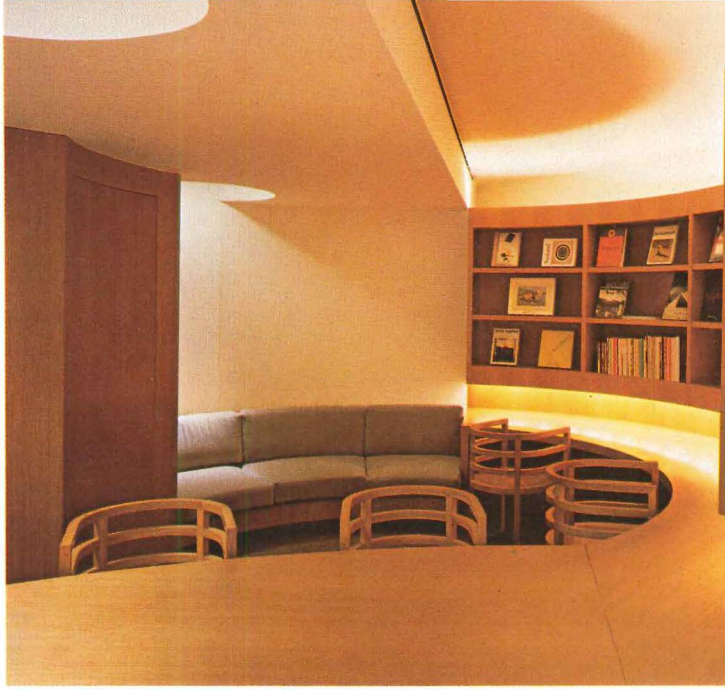
Right man at the Wright place at the right time

Luckily for the Guggenheim, for its third alteration the museum's officials turned to an architect free from the

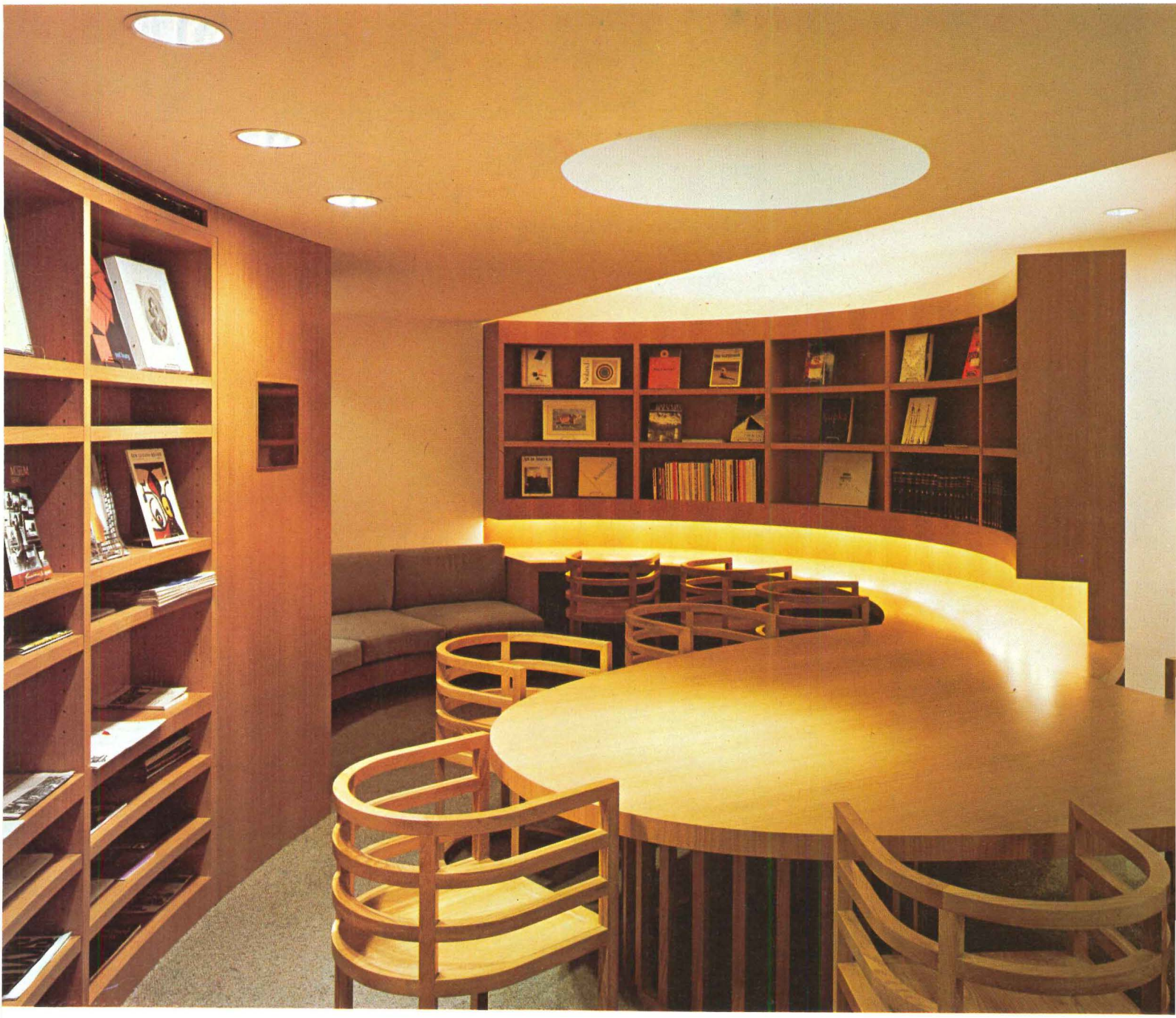
Portal of the reading room is the first expression of the circular motif that predominates throughout. Juan Gris oil hangs above reception desk.

Aye Simon Reading Room, Guggenheim Museum





Three views of the reading room (above and below) show the organization of major areas of activity under three existing skylights.

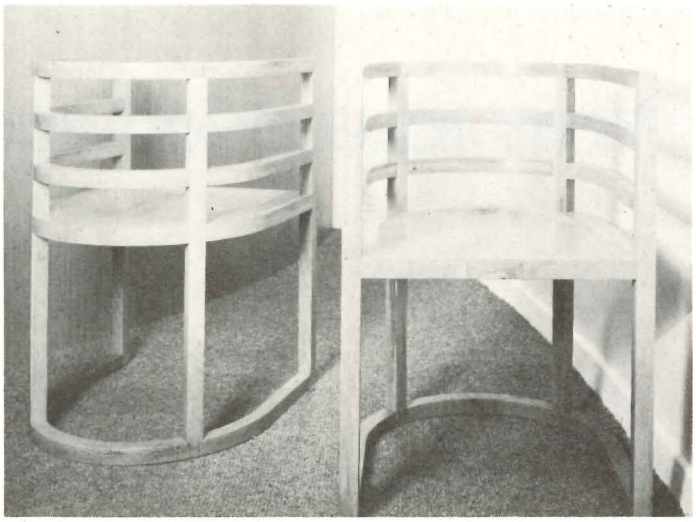


shadow of Frank Lloyd Wright, yet respectful of his intentions there. Richard Meier, autonomous yet accommodating, has proved to be an ideal choice for this difficult assignment. The measure of his success is that, in addition to producing a work that enhances our comprehension of and appreciation for Wright's controversial design, it adds new understanding to Meier's own work, throwing considerable light on his relationship to (and place in) the history of modern architecture. Meier's early residential work gained him the facile label of "Neo-Corbusian," and though that glib assessment misses much of what Meier is about, it is true that he himself would not forswear his debt to the 20th Century's most influential architect. Thus it is a particularly piquant turn of events that Meier has been invited into the Pantheon of Wright, the self-proclaimed worst enemy of Le Corbusier's architecture.

The space given to Meier for the construction of a small reading room is in the windowless "frieze" that runs along the length of the museum, in the portion that protrudes out toward Fifth Avenue directly underneath the giant coils of the rotunda. Originally intended by Wright to house his drawings and models of the museum (and labeled "architectural archive" in his plans), this space was used variously over the years as a storage room and an employees' lunch room. In setting about his task, Meier took his major cues from the restrictions and opportunities presented by the extremely inflexible existing space. One of his first considerations was the entrance into the space from the second level of the building's famous sloping ramp. The difficulty of leading from a tilted surface into a flat one was further complicated by the canted, load-bearing interior wall and its curving plane. Given these three divergences from normal floor and wall configurations, Meier knew that a conventional orthogonal doorway would read as nothing but a rhomboid. Therefore he adopted a shape that is part superscale keyhole, part moon gate, its curving outlines masking the ambiguities that an orthogonal opening would only have accentuated. And, in an odd way, the vaguely oriental feeling that the doorway imparts seems absolutely correct in a building designed by an architect with such affinity for things Eastern.

Three-part invention

Immediately within this portal Meier placed a small, curving vestibule, reflecting the arc of the doorway itself, and restating the circular motif that is the dominant, Wright-inspired theme of the reading room. This tiny anteroom performs the unnoticed task of mediating between the differing levels of the ramp and the reading room, and further allows an emphatic transition, while not imposing a disruptive presence on the curving corridor outside. The actual doorway into the room is deflected to one side of the concave glass surface (on which the name of the room is inscribed in a characteristic FLLW typeface), and one passes through it to one far end of the small, mandorla-shaped reading room. Immediately to one's right upon entering is a Meier-designed reception desk (he designed all the furniture there), set beneath one of the three original skylights that were Wright's most important legacy to the space. Meier used this trio of round apertures as his primary organizational cue, centering under each a major area of activity: the reception desk, the reading desk and



Chairs designed by Meier for the reading room (above) are reminiscent of FLLW designs, but are far more comfortable than Wright's seating.

card catalogue, the built-in banquette. The arrangement of those three focuses of activity is deceptively simple, for this complex interplay of arcs and curves is highly sophisticated, ranking among the best of Meier's spatial compositions to date, regardless of its small size.

For an architect whose previous interior design work sometimes has seemed willful and forbidding, this is a room of surprising warmth and engagement. Its restraint and refinement are characteristically Meier's, but the use of curving forms and expanses of light-finished wood are a dramatic departure from this architect's usual stylistic vocabulary. Commenting on this obvious about-face, Meier observes, "Just as Wright changed his role in this building, moving away from organic materials and familiar forms, so it is appropriate for me to change the way one thinks of my work." The wonderful thing about the Aye Simon Reading Room is the way in which Richard Meier has constructed a loving homage to Frank Lloyd Wright, while at the same time creating a highly original, perhaps even a breakthrough, addition to his own oeuvre. Meier, in consciously engaging in a dialogue with Wright, has succeeded in doing what no disciple of Wright has ever really accomplished: a work that comprehends Wright by carrying his ideas a step further, a step that Wright himself would have seen, one suspects, as the difference between a follower and a creator. [Martin Filler]

Data

Project: Aye Simon Reading Room, Solomon R. Guggenheim Museum, New York.
Architect: Richard Meier & Associates Architects.
Program: remodeling of existing storage area into a reading room for a small urban museum.
Major materials: oak walls, carpeted floors, plaster ceilings (see Building materials, p. 113).
Consultants: Flack & Kurtz, mechanical; Evans and Hillman, lighting; George Sadek and Peter Katz, graphics.
General contractor: Scorcia and Diana Associates.
Cost: withheld at request of client.
Client: Solomon R. Guggenheim Museum.
Photography: Wolfgang Hoyt © ESTO.

Prime square-footage

Corporate offices offer their owners varied benefits, but developer buildings must yield a fair return. The economies that assure this profitable operation can have a salutary effect on architectural design.

All office buildings can be divided into two separate and unequal categories. The advantaged group includes the corporate and governmental buildings, which are investments in employee morale and public image, among other things; their payback occurs over an indefinitely long period and is not measured in dollars alone. The less advantaged type is the office building intended to yield a profit in itself. Since the developer usually borrows capital for this purpose, both the economics and the design of such buildings must be reassuring to lenders. And the space inside, offered to the public at large, must accord with prevailing expectations; any competitive advantage must be readily appreciated and not too costly.

There have been times—notably during the heyday of the Chicago School—when such stringent constraints have produced architecture of the first rank. There have been other instances of advance beyond prevailing standards of developer office structures, in New York's Rockefeller Center and Montreal's Place Ville Marie, for instance. But most developer office buildings—especially outside the rarefied market of the metropolitan core—have exhibited a least-effort-for-the-buck attitude implicit in the term "speculative office building."

Design leaders among architects tended to avoid such commissions, since fees were low and other satisfactions few. When firms such as SOM designed spec office buildings, the developers wanted the image—if not quite the substance—of the firm's corporate work.

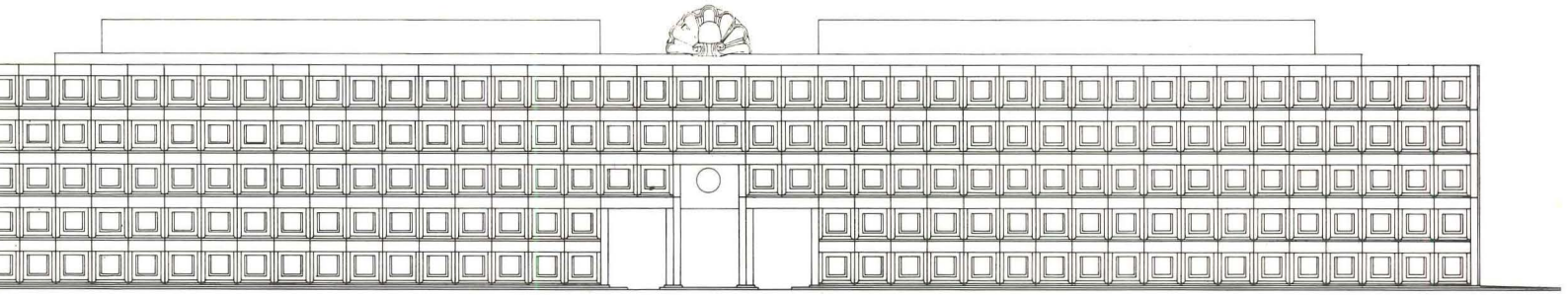
There has recently been a change, however, in attitudes toward developer office buildings. It was signaled most notably by Philip Johnson's commissions for a series of office buildings for developer Gerald Hines of Houston (Pennzoil Plaza, P/A, Aug. 1977, p. 66; Post Oak Central, P/A, Jan. 1977, p. 32). Hines had previously tapped the services of SOM, but developer clients were new to Johnson, and he treated them as new challenges. His example was a timely one for architects at a point when corporate and institutional commissions were scarce. Developers, too, were re-examining their ways in a market that had gotten more competitive.

Today, we find architects of international reputation working on modest-scale suburban office buildings. Here in Stamford, Ct, for instance, a building by Mitchell/Giurgola (P/A, March 1978, p. 50) is now going up beside some rather brazenly gift-wrapped earlier structures by the same developer.

Because the developer office building must generally be produced at an agreed-upon cost and date, the conventional design-bid-build sequence is rarely applied. The variety of alternative arrangements that can be used is indicated by the projects on the following pages. In Philadelphia, the client invited proposals from general contracting firms, which invited the architects to join them in seeking the job and work under contract to them. In Illinois, the owner-occupant selected a developer to handle financing, design, and construction; then they jointly selected a team of architect and construction manager, both reporting to the developer—all four parties contributing to a remarkably smooth checks-and-balances act. For the Houston project, the developer went straight to the architect, working first on a proposal to secure the prime tenant, then executing the job with a general contractor, on a negotiated, fast-track basis.

Knowing the territory

All of these varied working arrangements take into account the cumulative expertise of the developer as a repeat client. "What separates us principally from the institutional owner," says developer John Hansen of Houston, "is that we have to come back to the marketplace, and each time we have to determine the lease rates with the market and how to achieve them." According to Eugene Aubry of S.I. Morris Associates, architects for Hansen's Allied Chemical tower (p. 78), "You're constantly monitoring back and forth, and the rules change from day to day depending on availability of materials." The market expertise of developer or construction manager— and their "clout" with suppliers and subcontractors—can bring in major building systems below estimates, freeing funds for improvements in materials and equipment.



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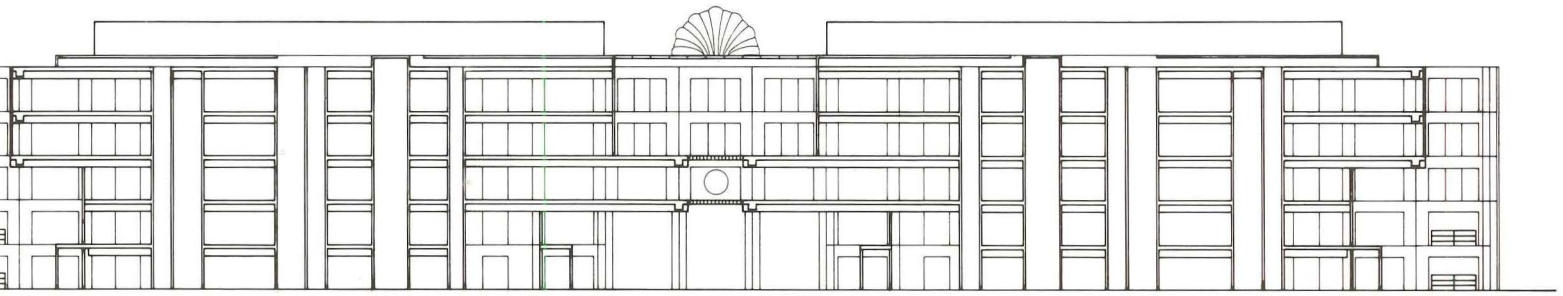


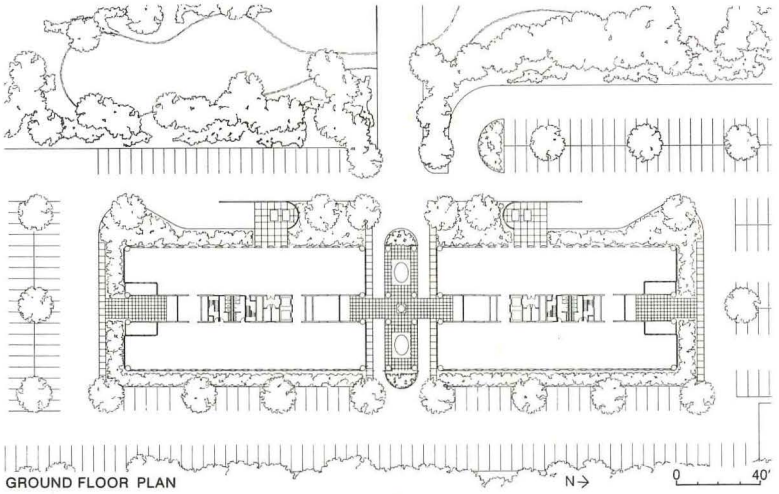
ON

There is also a valuable continuity developed out of repeated association. In two of the examples here, the architect had worked previously for the same developer; in the other case, the architects were selected by a contractor with whom they had worked effectively. Two of the three cases involve phased projects, offering opportunities to fine-tune programs and building standards the next time around. Thomas Gerlach of Turner Construction places high economic value on continuity in the Philadelphia project: "We used the design concept—with some modifications—again and as a result got great efficiency in the use of time and subcontractor services." Key personnel in every firm involved become familiar with the guidelines they work under and with each other.

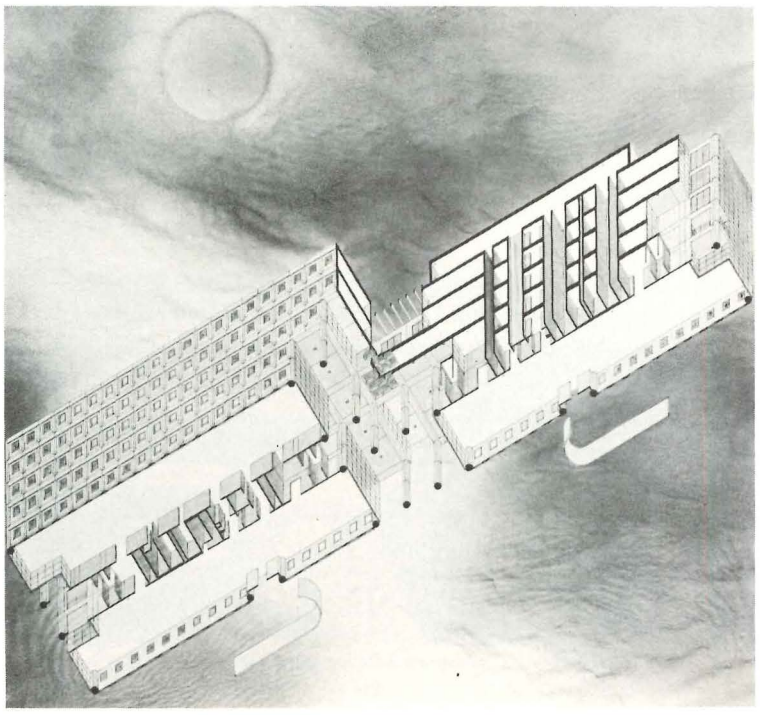
Having completed the Hewitt building (p. 76), architects Hammond, Beeby & Babka are now working with the same developer and the same CM on another project, the Tri-State Office Building (right). Tom Beeby, of the architectural firm, observes that the CM's marketplace knowledge can be a great design asset; the architects have been able to work at refining the concrete wall without fear of economic reversals later on.

The users of rental office space these days also bring with them some accumulated expertise. "They have been in office space before," says Gerlach. "They know that some space works, and that, generally speaking, the more straightforward it is, the easier it is to use and the easier it is to get the quality/cost relationship they want." Architect Eugene Aubry stresses that architects must do prototypical interior layouts in any case, to determine whether proposed floor areas can work efficiently for any tenancy. (His firm was, in fact, able to design some office interiors in their Houston tower—an uncommon occurrence.)

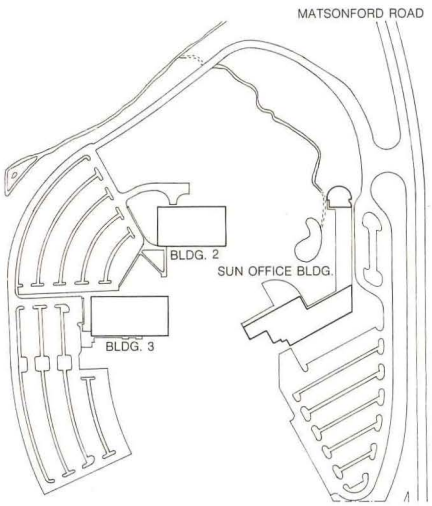
"The simpler, more direct building needs of society, like the small suburban office building," Gerlach observes, "represent an opportunity for architects established in the world of design to try new methods of achieving architectural excellence and a way of developing younger, talented staff." Doing this, of course, requires a commitment to quality among all parties involved, including the one that pays the bills. As Aubry says, "It takes a good client to get a good building." [John Morris Dixon]



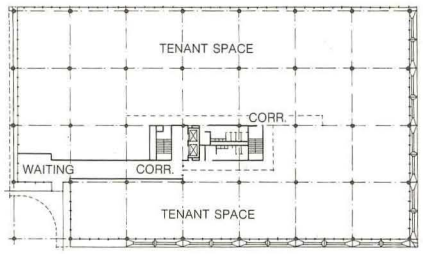
Proposed Tri-State Center, Phase I, designed by architects Hammond, Beeby & Babka for developer Equity Associates, Inc. will have 160,000 rentable sq ft behind precast walls of NeoClassical modeling, with less than 25 percent glass. Axial main portal will have intricate toplighting arrangement.



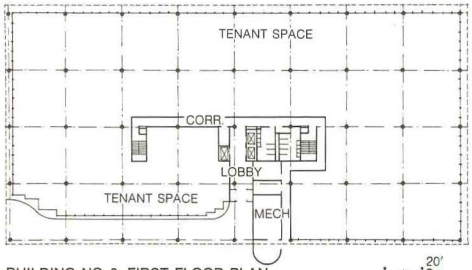
Developer office buildings



SITE PLAN ← N 100' 30m



BUILDING 2, FIRST FLOOR PLAN



BUILDING NO. 3, FIRST FLOOR PLAN 20' 6m

Philadelphia tailoring

Call it successive refinement or simply adaptation to the marketplace, but these two meticulously economical office buildings demonstrate subtle evolution based on experience with tenants. The client, the development arm of Sun Company, wanted to build rental office space on the 80-acre site of Sun's recent headquarters building, designed by John Carl Warnecke & Associates. For the first building, they invited proposals at guaranteed price from a number of contractors, and Turner asked Geddes Brecher Qualls Cunningham to work with them at a $30-per-sq-ft budget.

An earlier master plan for a continuous, phased building turned out to be visionary; lenders would consider only separate buildings, and the locality required 150-ft

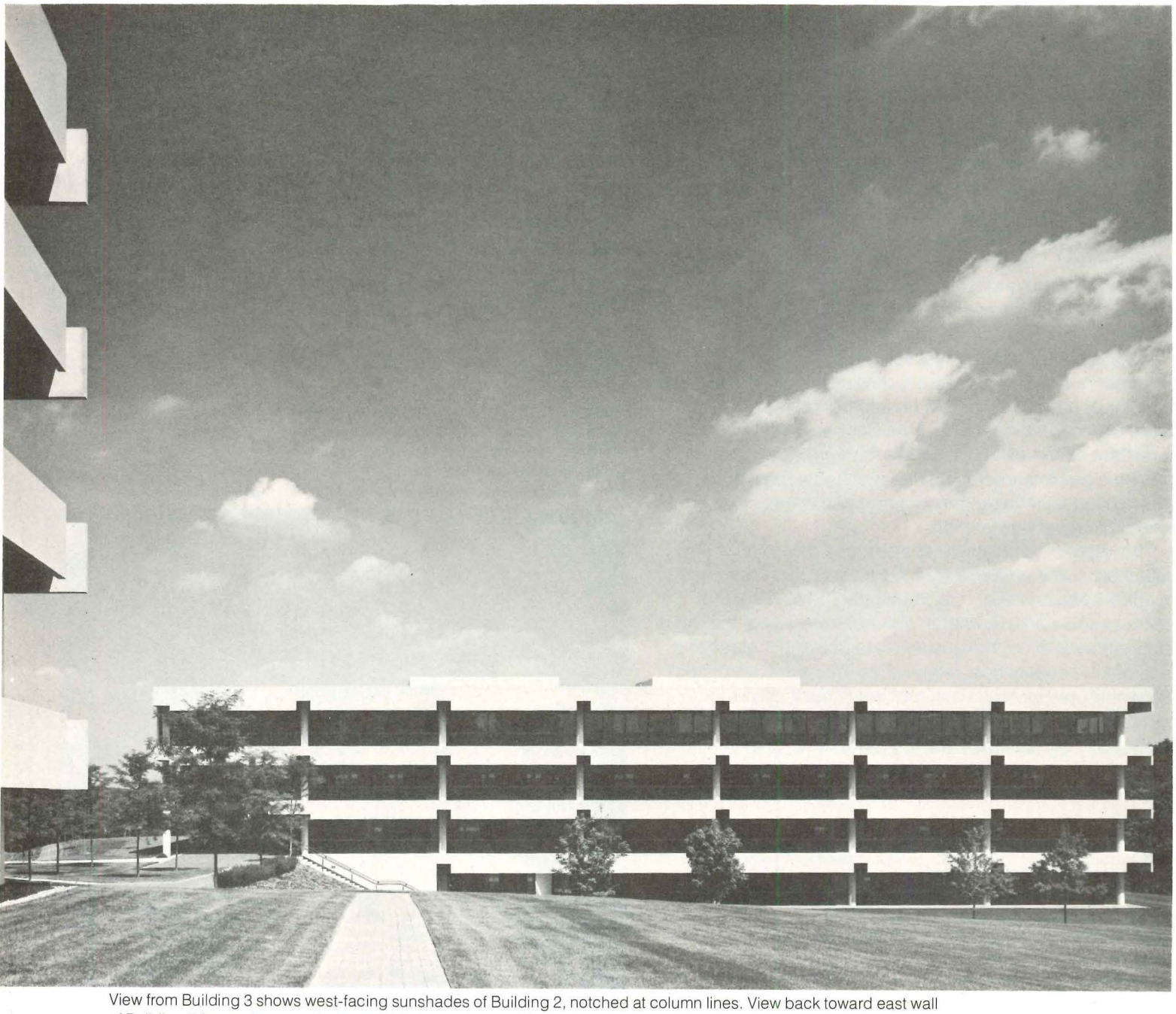


Photo: © 1978 Mark Cohn

View from Building 3 shows west-facing sunshades of Building 2, notched at column lines. View back toward east wall of Building 3 (opposite page, bottom right) shows different sunshades, expressing ends of flat girder system.

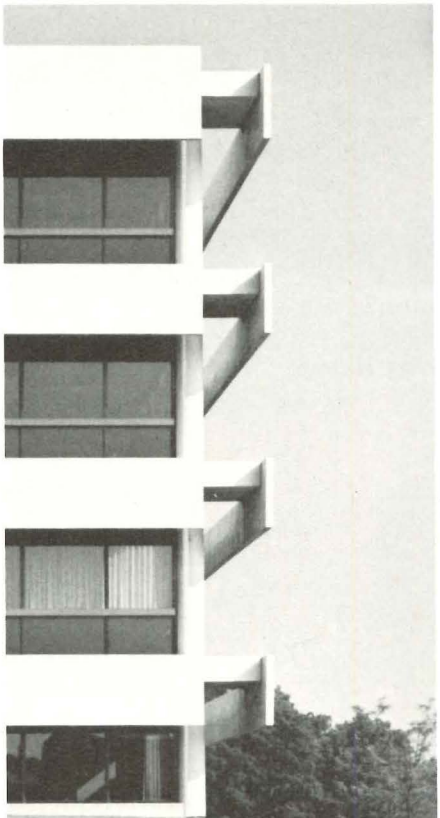
spaces between them. The new buildings had to be essentially boxes with minimum ratio of wall to floor area and maximum net square footage (measured to the glass line). Yet they had to complement the headquarters building, which has a meandering plan, a stepped silhouette, and an external concrete frame. This formidable set of objectives was met using a "Filagree" concrete girder-and-deck system with circular columns and concrete sunshades that relate to the original building (shown—coincidentally—in ad, p. 27).

GBQC and Turner were able to produce a second rental building 18 months later at almost the same price, using the same basic systems and the same subcontractors. But there were some design changes. The partially buried floors and solid wall areas of Building 2 were not repeated in Building 3, where tenants got the continuous windows they want on rental floors. Both buildings have corner entrances—for reasons of terrain, views, and parking layout—but Building 3 replaces a snaking corridor to the elevator with a gracious recessed colonnade. There are deliberate changes in the form of sunshades (see photos) and in the color of the enameled aluminum stripe on the curtain walls; for Building 4—to go up as the market demands—the choice is between green and orange. [JMD]

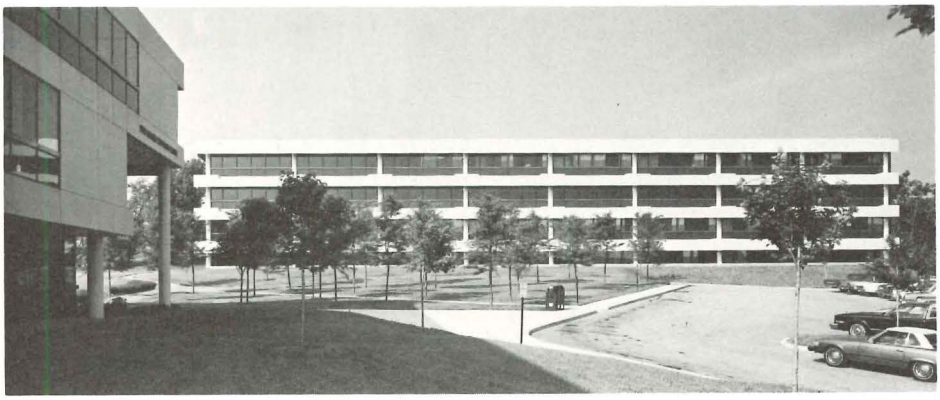
Data

Project: Radnor Corporate Center, Buildings 2 and 3, Radnor, Pa (suburban Philadelphia).
Architects: Geddes Brecher Qualls Cunningham, Philadelphia (project team: George Qualls, Robert Brown, Michael Kihn, Wesley Heilman III, Steven Gatschet).
Client: Radnor Development Corporation.
Site: two developable parcels on 80-acre suburban tract already occupied by corporate headquarters building; long view to east.
Program: leasable office space—85,000 sq ft in Building 2, 100,000 sq ft in Building 3.
Structural system: "Filagree" girder-and-deck system, using precast "lost forms" on cast-in-place circular columns.
Major materials: precast wall panels, gray-tinted glass in dark-anodized frames (see Building materials, p. 113).
Mechanical system: roof-top packaged, multi-zone forced-air heating and cooling.
Consultants: Henry Arnold, landscape; Delaware Valley Design & Consultants, mechanical; E. Fred Brecher (GBQC), structural; Morris Newmark & Bro., electrical; Eberlin & Eberlin, civil engineers.
Construction manager: Turner Construction Co.
Cost: building 2, $30.00 per sq ft; Building 3, $30.10 per sq ft (guaranteed maximum prices).

Solid walls frame Building 2 entrance (above).



Building 3 entrance (above), east wall (below), and south end (left).



Chicago middle-tech

Streamlined wings slicing through the woods suggest an Early Modern dream of technology confronting unspoiled nature. At the Hewitt Associates building in suburban Chicago, that image is underlined with swooping strips of metal-banded windows and punctuated with pipe-rail balconies. But the use of natural cedar boards is a surprise at this scale, juxtaposed to sleek factory components.

Architects Hammond, Beeby & Babka point to the simple horse-sense of this application. The wood satisfied the local review board of a locality facing its first wave of urbanization. It was as inexpensive, as maintenance-free, and as easy to install as any curtain wall. (The wood was actually mounted on aluminum panels to allow

Guests approach along pond (above); curved wing (below) has typical corner stair treatment.

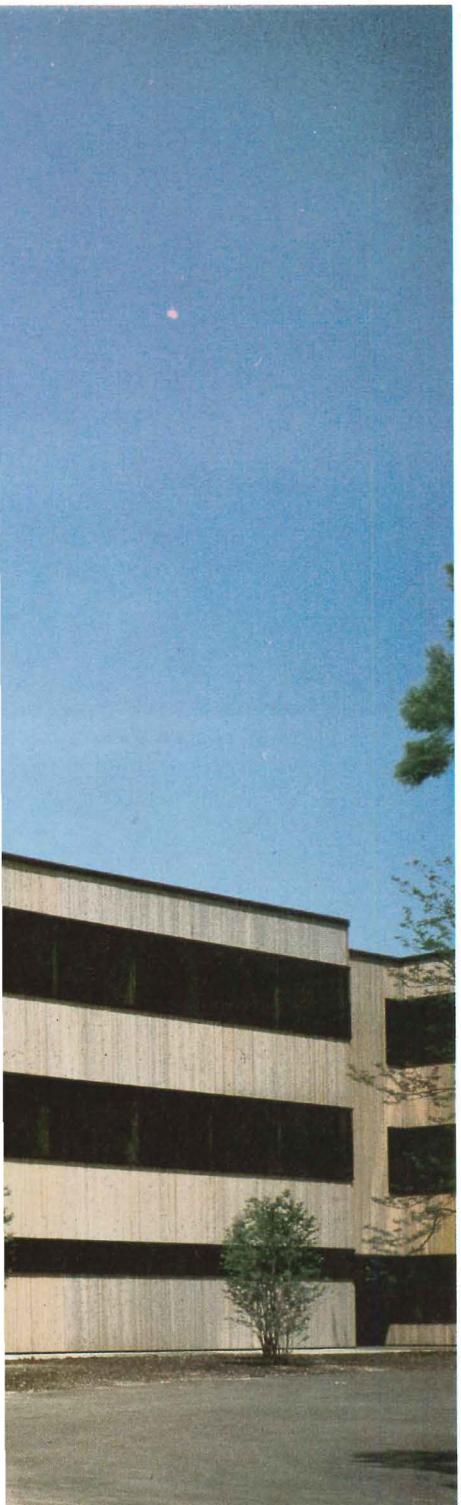
standard curtain wall assembly.) And the combination conveys some desirable messages about the owners: they are up to date and efficient, but not devoid of traditional warmth—like the chromium-plated chair with the leather seat.

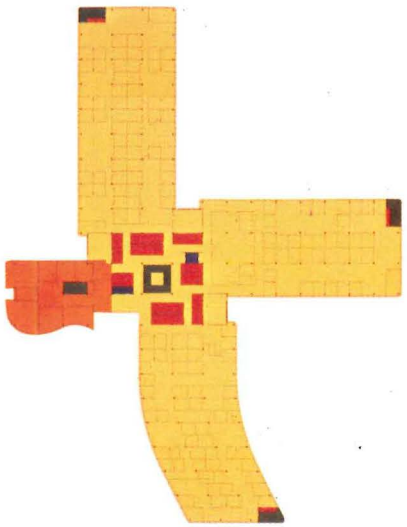
The creation of this building involved a team client—the owner working with a developer—which jointly selected another team: architects plus construction manager. The owner's program called for an up-front wing, with conference rooms, for meeting clients, distinct from larger working wings. The developer's financing arrangements, however, required that the complex be rentable, in parts if necessary, to satisfy the lender. Even the visitors' wing is basically adaptable space. And the curve of one long wing respects the modularity of steel framing and office interiors.

The achievement of distinctive architecture at spec-building prices is attributed by the architects in part to the "astute construction manager," who brought in a unique curtain wall at $11.50 per sq ft, glazed, and a "sympathetic developer" with whom they are now at work on another convention-defying project (p. 73). Not to mention a sensitive client and, of course, the architects themselves. [JMD]

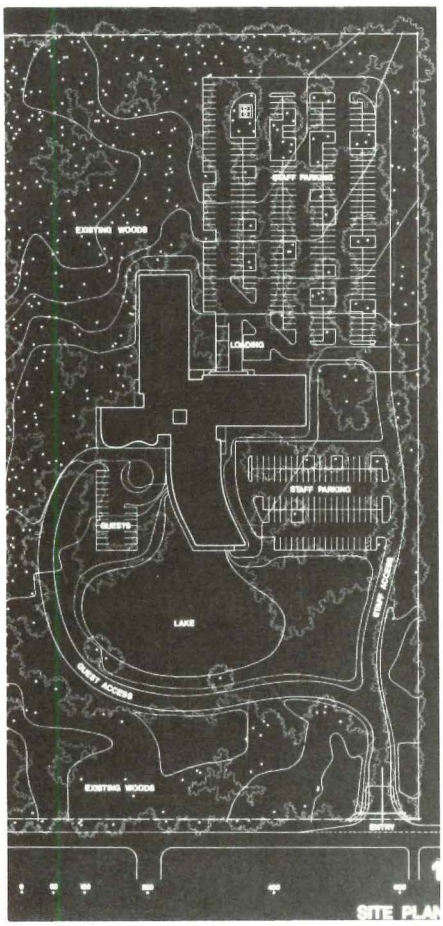
Data

Project: Hewitt Associates General Offices, Lincolnshire, Il.
Architects: Hammond, Beeby & Babka, Chicago (project team: John Arnold, Bernard Babka, Thomas Beeby, Philip Castillo, Kenneth Hazlett, James Hammond, Carl Hoglund, Cora O'Fallon, Keith Olsen, Stephen O'Malley).
Client: Hewitt Associates (owner); Equity Associates, Inc. (development consultant), affiliate of La Salle Partners.
Site: 18-acre tract on suburban fringe, wooded, high water table; retention pond required.
Program: office building of about 152,000 sq ft to meet specific requirements of owner, an actuarial firm, yet meet the developer's requirement for adaptable rental space.
Structural system: steel frame on concrete foundations; composite floor decks.
Major materials: natural-finished cedar curtain wall; black-anodized aluminum window frames; round plaster interior column enclosures (see Building materials, p. 113).
Mechanical system: HVAC system centralized in partial basement; cooling tower isolated.
Consultants: Theodore Brickman, landscape; Marshall Field & Co., interior; Hadji & Assocs., mechanical; Gullaksen & Getty, structural.
Construction manager: Schal Associates, Inc.
Cost: $6,070,000, excluding sitework, landscaping, and furnishings; $38 per sq ft
Photography: Ruell Ho.



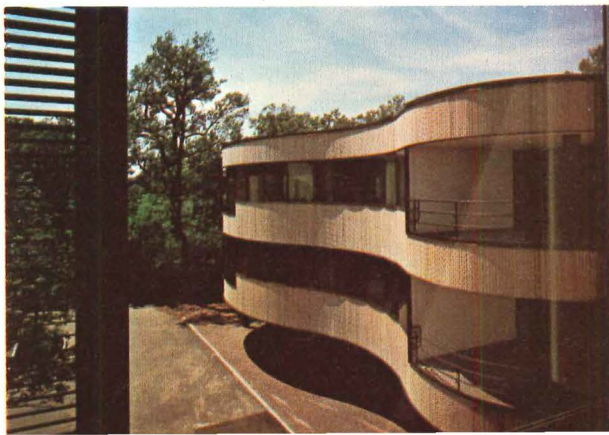


Typical plan relates to pond and parking.



Skylighted atrium (above) joins wings.

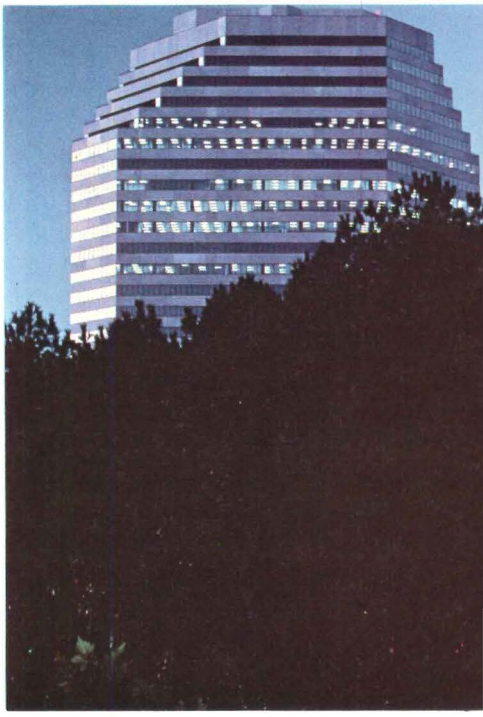
Typical interior (above); meeting wing (below).



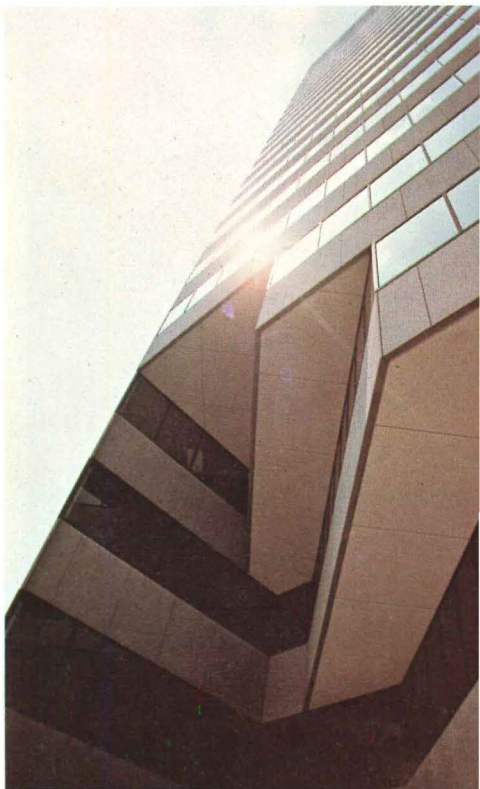
Houston high style

In the city without zoning, office structures of all shapes and sizes cluster about freeway nodes. Along the busy West Loop, within sight of Johnson/Burgee's streamlined Post Oak Central (P/A, Jan. 1977, p. 32), a ziggurat-topped tower has recently risen like a 1930s mirage.

The new landmark is the first phase of developer John Hansen's plan for a choice 28-acre tract—formerly a private estate—which is buffered along its edges by public park and bayou. Calling upon Houston architects S.I. Morris Associates to draw up a master plan for the site, plus a concept for this 500,000-sq-ft building, Hansen was able to sign on Allied Chemical to lease 45 percent of the structure that now bears their name. The Morris firm had



Setback motif reappears, inverted, over entrances.



previously designed smaller structures for Hansen and several office buildings for other developers, besides collaborating with Johnson/Burgee on Pennzoil Place (P/A, Aug. 1977).

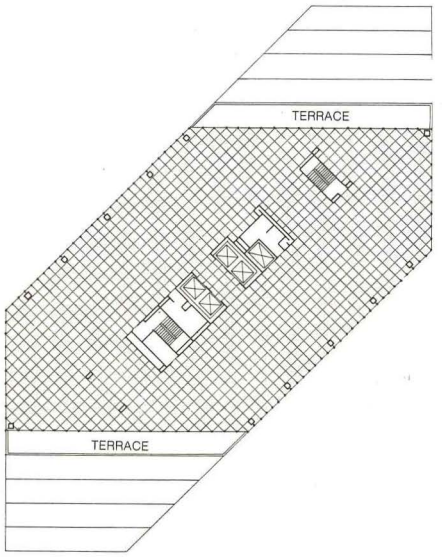
For this site, Hansen wanted an "image building" in both form and materials. An initial proposal for granite cladding was quickly ruled out as too costly, but the executed version—with granite at entry level and granite-aggregate precast above—is hard to tell from the real thing. The sharp-edged panels, alternating with bands of gray glass, delineate lower-floor cutouts and upper-floor setbacks.

The setbacks here are not merely formal flourishes, but tiers of usable balconies. The climate 20 stories up is more pleasant than at bayou level, and there are no nearby towers to generate wind problems. Hansen has found the balconies invaluable in leasing the remainder of the tower—which houses one tenant with only 560 sq ft. And he enjoys the balcony outside his own upper-floor office.

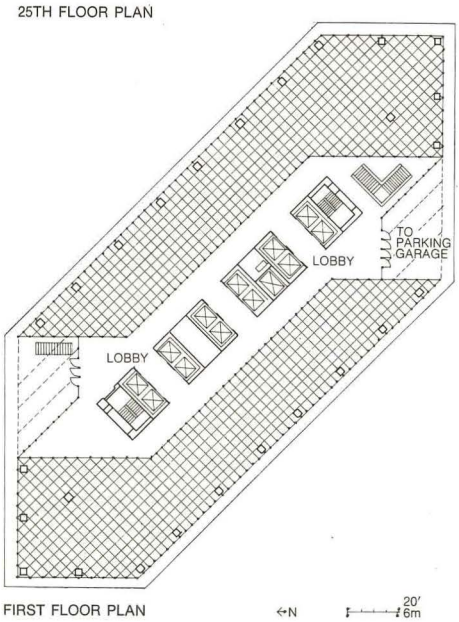
Hansen has sold part of the tract to IBM, which is planning a compatible complex that developer and architect have both reviewed with great satisfaction. Construction is soon to start on the second—and last—tower for Hansen here. This 20-story, 400,000-sq-ft structure will be detailed like the first tower, appearing to continue the cascade of balconies down its east front. Balconies at middle and lower levels reflect Hansen's finding that tenants would appreciate identifiable executive floors nearer the ground. [JMD]

Data

Project: Allied Chemical Building, Houston, Tx.
Architects: S.I. Morris Associates, Houston.
Client: John Hansen, investment builder.
Program: 500,000-sq-ft office building, with 1935-car parking garage adjoining.
Site: portion of 28-acre tract, formerly family estate, including lake and bayou frontage, along major freeway at edge of city; planned for varied commercial development (see site plan).
Structural system: concrete frame, as most economical adaptation to geometry of plans.
Major materials: precast, granite-aggregate spandrel panels, gray glass, granite paving and walls at entry level.
Mechanical system: one air-conditioning unit per floor, core and perimeter supply; electric duct heaters.
Consultants: Ellisor Engineers, structural; Timmerman Engineers, mechanical.
General contractors: H.A. Lott, Inc. and T.H. McGregor (joint venture).
Cost: about $30 per sq ft (office building only).
Photographs: Marc St. Gil.



25TH FLOOR PLAN

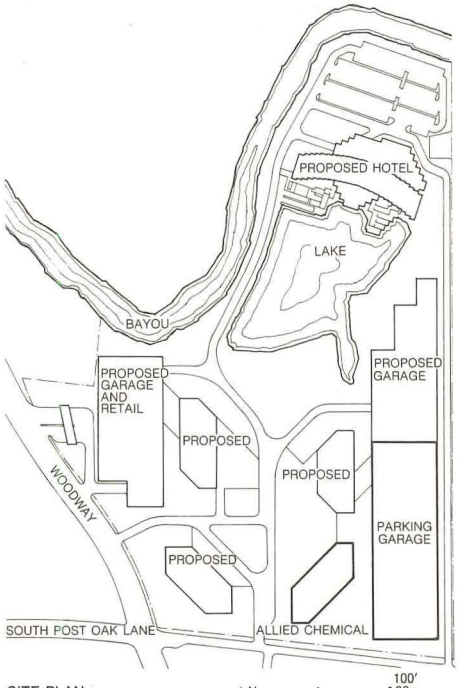


FIRST FLOOR PLAN ←N 20' 6m

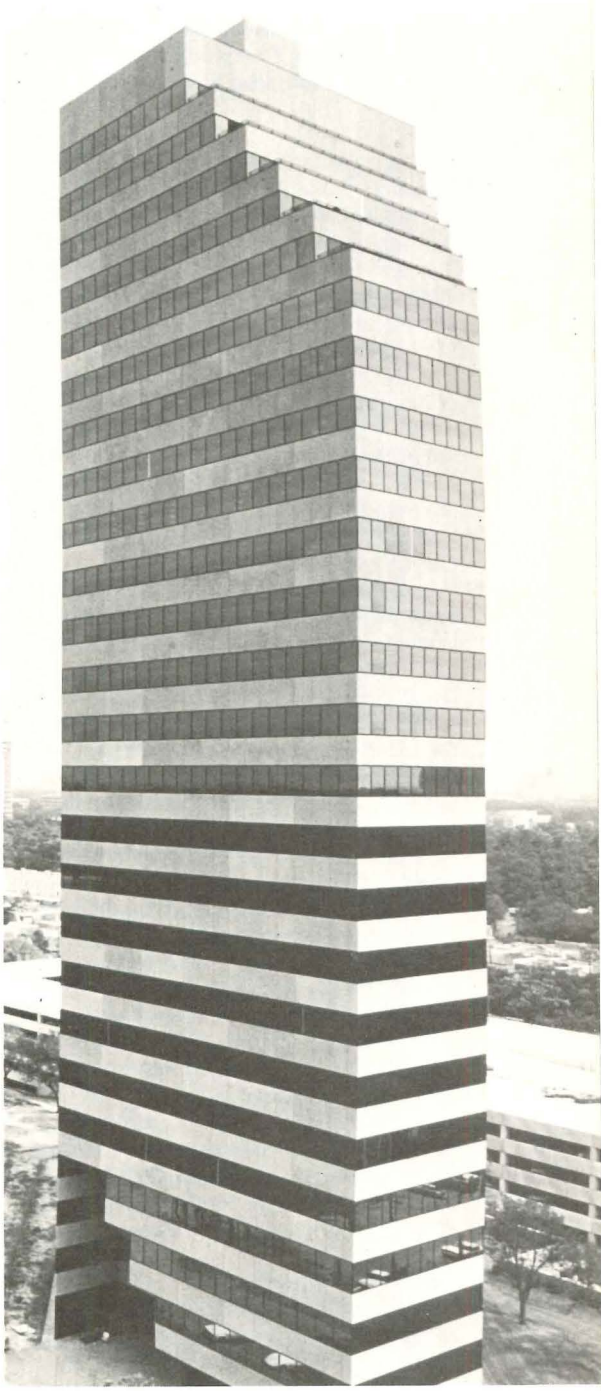
Master plan for site (right) shows hotel at end of lake, for which planning is still tentative. Purchase by IBM of land originally earmarked for two office towers will result in some reduction of overall building density, since the corporate client need not generate developers' return on investment.


Office interiors (these by S.I. Morris Associates) pick up on angular geometry.


Lobby has granite-clad core walls.



SITE PLAN ←N 100' 30m



State University College Library, Plattsburgh, NY

Unmessy vitality

A college library by Mitchell/Giurgola in upstate New York shows the clean side of historical allusion and contextualism.

With completion of Mitchell/Giurgola's Benjamin F. Feinberg Library at State University College in Plattsburgh, NY, the partially open side of a long, rectangular academic core mall is now enclosed. The effort began over ten years ago when the architects were commissioned by the State University Construction Fund to design the school's student union, which was completed four years ago (P/A, Apr. 1975, p. 66). Part of the way through that project the architects were asked to design the 133,000-sq-ft library, but construction on that reinforced concrete brick-faced structure was halted for over two years delaying completion until August of 1977.

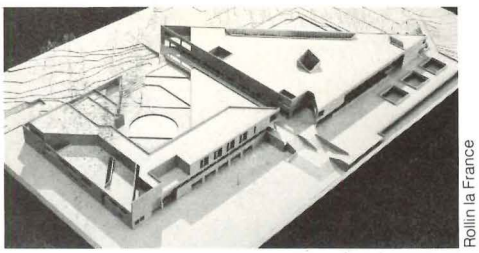
Like the student union, the library also establishes clear and very direct relations to its surroundings, and in this respect it continues an attitude for which the Mitchell/Giurgola office has become well known. Because all buildings are fragments of a larger whole, or episodes, Romaldo Giurgola says, each must respond to its individual context. As a consequence of this belief and a conviction in the equal importance of programmatic demands, Giurgola believes that every building should be a unique reflection of those forces as the instruments of its generation. His opposition to the notion of form derived mainly from the dictates of formal concerns places him in league with those architects who are now well known as "inclusivists," as opposed to the "exclusivists." This does not mean, however, that Giurgola is not concerned with formal problems, any more than it means the exclusivists are not concerned with contextual relations. The two positions differ mainly in areas of emphasis.

Contextual responses

The Plattsburgh campus is a triangular shape that is set into the established, conventional grid pattern of the city. All of the buildings of the 5000-student campus are oriented not to the one side of the site that conforms to the town grid, but away from that and toward a side diagonal to it. Mitchell/Giurgola's student union and library, however, are unique to the campus in the gestures each makes to the city and its grid. The student union is a square form oriented orthogonally to the campus building plan, but at its rear corner where it "points" toward the city, a deep rectangular courtyard has been cut diagonally into the structure in alignment with the city grid. The new library, which is next to the student union, has been designed as a right-angled triangle that corresponds to the campus site plan. Consequently, one side of the building—its rear side—conforms to the town's grid.

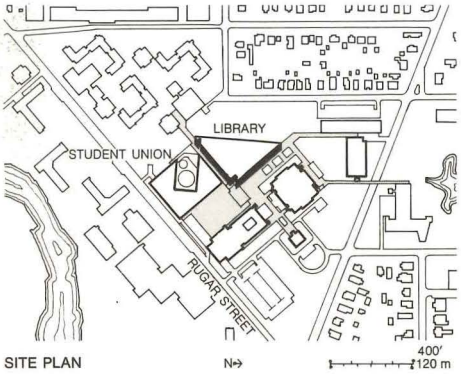
Since it is a later building than the student union, the library also takes cues from its neighboring predecessor. Although it extends further than the student union into the concrete academic commons, the library's main entrance, at the corner closest to the front of the student union, has been cut back as a square portico to a depth corresponding to the front façade of the union building. Throughout the interior and at a rear, triangular loggia, diagonals parallel those of the union. The major interior circulation stairwells of both buildings are placed near the primary corners; this provides a strong organizational device and also gives users the opportunity to "read" the entire building upon entering it.

In addition to the cut-away main entrance, other incursions have been made throughout the three sides of the library, but in these cases some device, which is often a screen wall, is used to maintain the datum plane of the triangular form. At the front of the building, for instance, where the existing plaza was raised one level to allow parking below, natural light is brought into the lower level of the library and into the parking area by a long curtain wall deeply recessed into the building. But a cornice line maintains the integrity of the façade. This large window, however, serves a dual purpose in that it also exposes the interior of the library and its activity to an otherwise relatively static plaza.



Rollin la France

Model: student union (left), library (right).



SITE PLAN

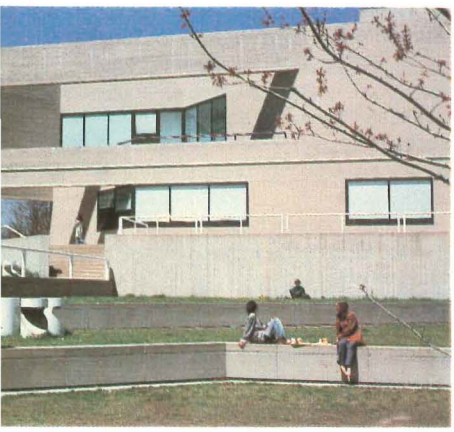
Interior inclusions

This front window was a smart move on the architects' part, not only because it enlivens the plaza, but also because the interiors of this building are too good not to be shared with as many people as possible. The inside of the three-story building is basically white, with dark brown carpeting and reflective silver metal acoustical ceiling tile (which also serves as an air plenum). Concrete is left exposed, and in some of the staff offices scored concrete blocks form divisions. Each of the three levels is unified by accent colors on handrails, soffits, light fixtures, and other objects. These colors, which are used with great discretion, are "pungent but milked," project architect Michael Rubenstein says, explaining that they are strong colors that have been liberally laced with white pigment. Except in special cases, furniture throughout is black upholstered or oak.

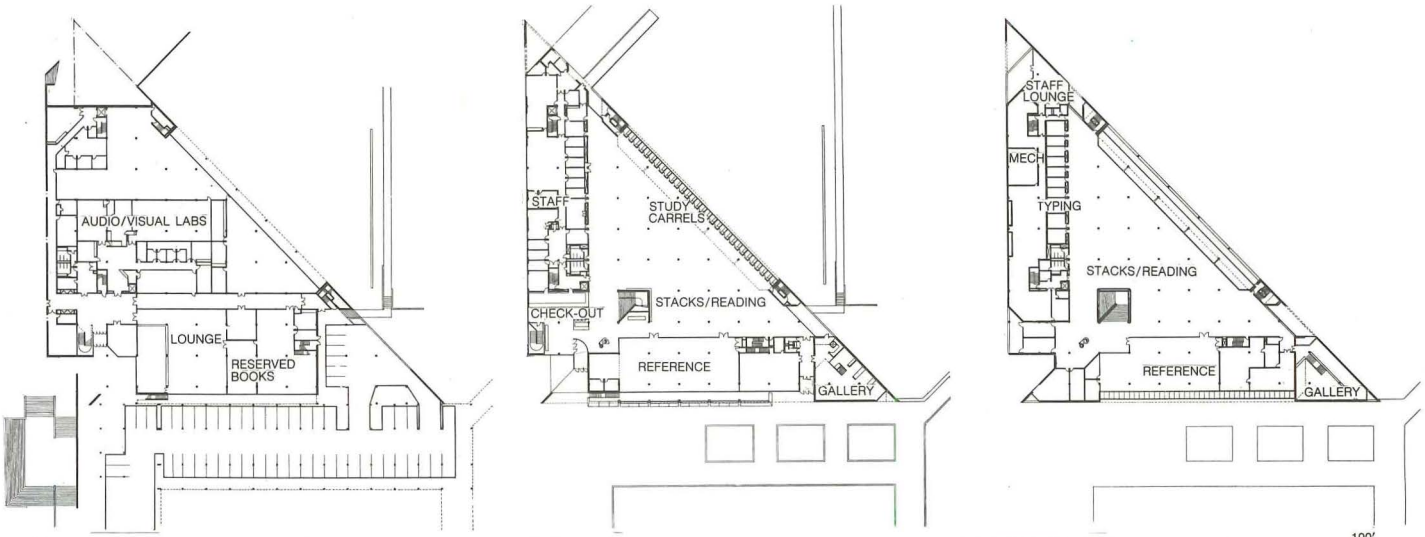
The 250,000-volume library has been designed without reading rooms in the traditional sense. On the upper two levels the stacks with white metal shelving and the

Photos: George Cserna, except as noted

The new library shares a pedestrian street with Mitchell/Giurgola's earlier student union (see model photo, left). Both buildings face central academic mall and are oriented to the campus grid, but both also acknowledge the grid pattern of Plattsburgh (see site plan, left). The new library (this page) is entered from its south end (above) closest to the student union. Rear, west side faces city (bottom right); south angle of library seen from union's court (below).



State University College Library, Plattsburgh, NY



FIRST FLOOR PLAN N→ SECOND FLOOR PLAN THIRD FLOOR PLAN

reading areas are intermixed with each other. Larger reading areas are confined to the perimeters of the two sides of the building opposite the staff offices. Rubenstein acknowledges that this homogenization of activities is not an ideal solution for a library, but says the librarian at the time of the building's design insisted on such an arrangement for reasons of security and noise—so everything would be visible and no large, boisterous groups could congregate. The only enclosed public spaces on these upper levels are the reference rooms, which are also separated for security and acoustical reasons by a glass wall that allows light penetration deep into the stacks. The ground level houses audio-visual laboratories, reserved books, and lounges that connect to the student union.

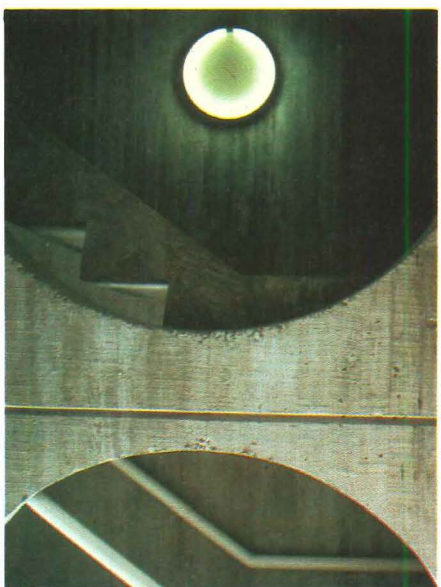
As with most buildings of the inclusivist architects, there are also allusions here to other works of architecture. Certainly, an appreciation of Aalto can be seen in the delicate manipulation and control of natural light, which always enters softly through angled skylights, or screened façade recesses, or by being borrowed from other sources. The suspended metal halide light fixtures also were not custom designed in the Mitchell/Giurgola office without a fondness for Aalto's lighting, nor were the cast-in-place concrete circle-in-the-square firestairs made without a gesture to the forms of Louis Kahn. There is one reference Rubenstein acknowledges as coming from painting, and that is the color combination sometimes found of silver, black, and "milked" red which was inspired by the silver sheet metal, pink chiffon, and black paint collages of the 1920s by the American Arthur Dove.

But if that motif was inspired by collages, it is the only recognition of that art in the building, and this points up an essential difference between Mitchell/Giurgola's work and that of other inclusivists. Often when historical or other references are expressed in a building they seem simply to be pasted on. While they may contribute to a valid function or to a formal compositional element, they may still be seen only as additive devices that have little to do with the underlying conception of the architectural space of which they are a part. This circumstance, however, never occurs in the Plattsburgh library. Although elements of allusion and reference may play an important role, they never dominate or assume a presence that in any way obscures one's perception of the basic, purely architectural quality of the space. In this respect, Mitchell/Giurgola's use of allusion may be the most literate, but certainly not the most literal, that could be found today. No referential device is ever used for its own sake, but is employed only in the subtlest way as something contributing to the integration of an overall vision. This is an architecture that refers to other sources and expresses contextual conditions, but which remains purist, even with the abundance of riches it has to offer.

The Kent Gallery

Nowhere in the building are its riches more elegantly revealed than in the jewellike, triangular Rockwell Kent Gallery at the north angle of the library. This room, which was designed as a "ceremonial" space and was called the Kennedy/Nehru Room before it was assigned the function of housing the recent Kent bequest, is one of the most refined small gallery spaces to be seen anywhere. The walls of the room are paneled in quarter-sliced West African satinwood applied in a diagonal pattern recalling the veneered wall of Le Corbusier's conference room in the Headquarters of the Mill Owners' Association in Ahmedabad. (In storage for 40 years by a wood specialty company, the library's wood comes from a tree logged in 1937.) The warm, angled walls form a striking counterpoint to the white, skylit ceiling and the seamless black polished terrazzo floor. The Kent paintings, for which the room was not designed, work beautifully in the space even though the diagonal wall paneling presents a more active surface than that which paintings are normally viewed against. But here, as in the rest of the building, a condition that might otherwise have been jarring is not, because of the artful orchestration of every element that forms the architectural space. [David Morton]

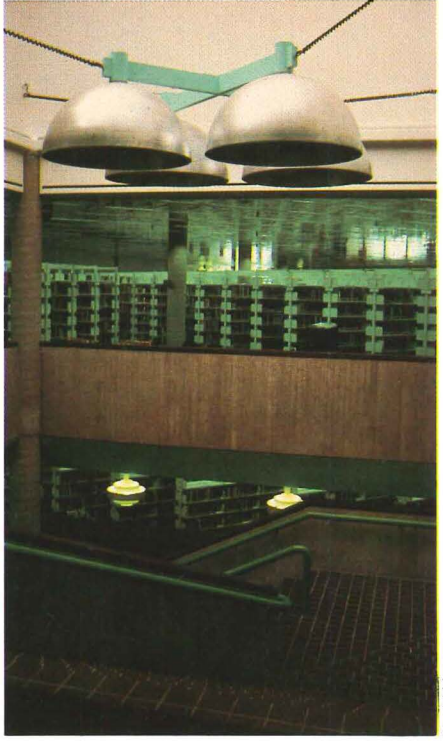
Firestairs recall the forms of Louis Kahn.



David Morton

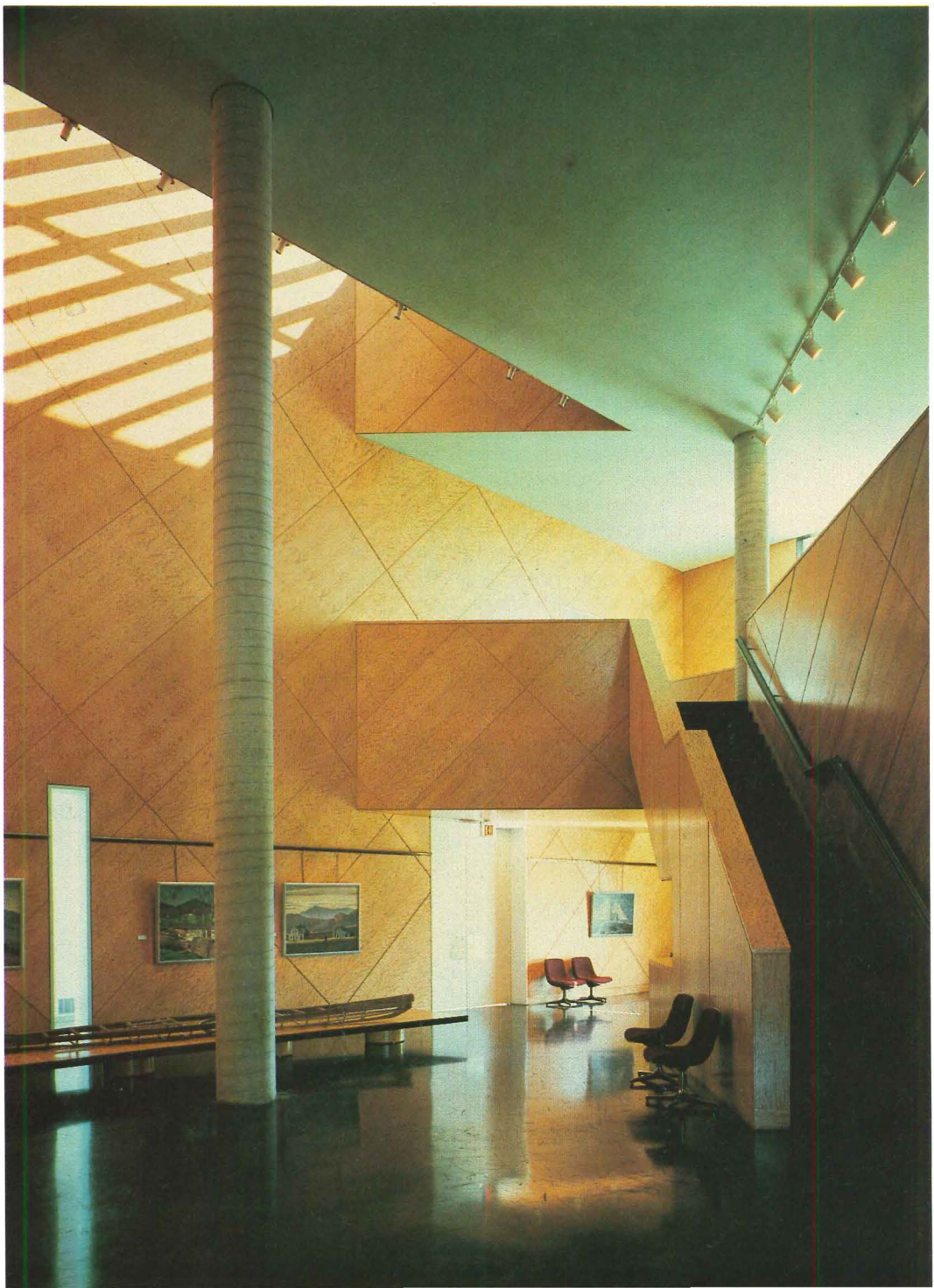
Data

Project: Benjamin F. Feinberg Library, State University College, Plattsburgh, NY.
Architects: Mitchell/Giurgola Architects; Michael A. Rubenstein, John Kurtz, project architects.
Program: 133,000-sq-ft library for 250,000 volumes of 5000-student four-year college.
Site: triangular, flat eight-acre campus set into conventional town grid pattern.
Structural system: cast-in-place reinforced concrete columns, unexposed waffle slabs, masonry walls.
Mechanical system: high-temperature hot water supplied by campus to operate heating and air conditioning.
Major materials: Exterior brick; plaster and scored concrete block walls inside; quarry tile, carpet, and vinyl asbestos tile floors; ceilings of plaster, acoustic plaster, metal acoustic tile; metal frame windows and metal doors (see Building materials p. 115).
Consultants: Lois Sheer, landscape; Hanne Marstrand (with the architects), interiors; Flack & Kurtz, mechanical; Robert Silman Assocs., structural.
General contractor: Murray Walter, Inc.
Client: State University Construction Fund, NY.
Cost: $6,073,000; $45.66 sq ft incl. site work.



David Morton

Main circulation stair (above and top) is placed to give students overall view of entire interior immediately upon entering building. Stacks and reading areas (below, top right) are intermixed with each other in area with silver reflecting acoustical ceiling tile. At north end of the building, Rockwell Kent Gallery (right) is paneled with West African satinwood from 1937.



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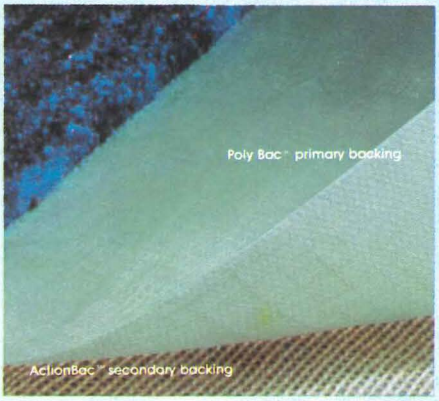

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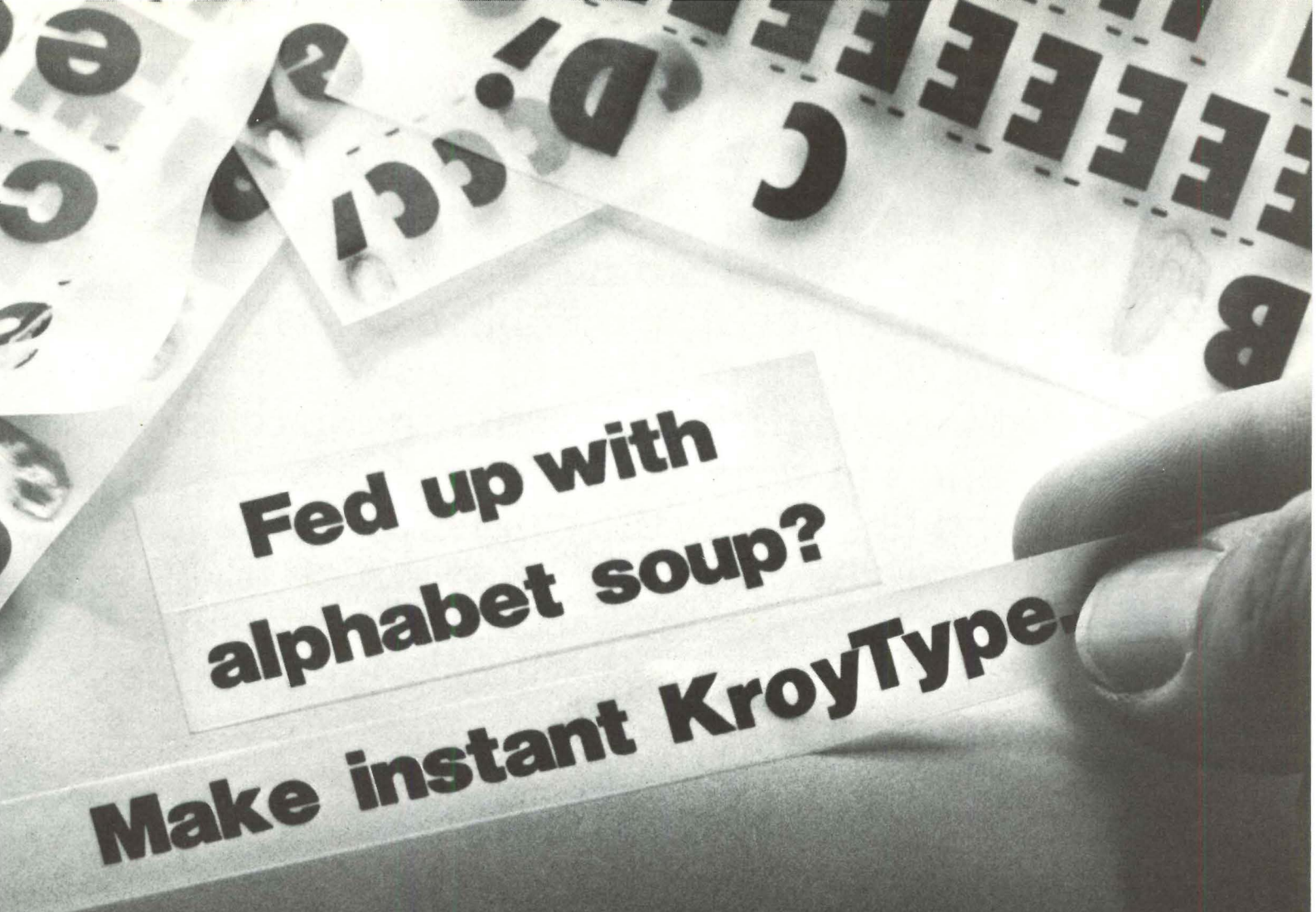

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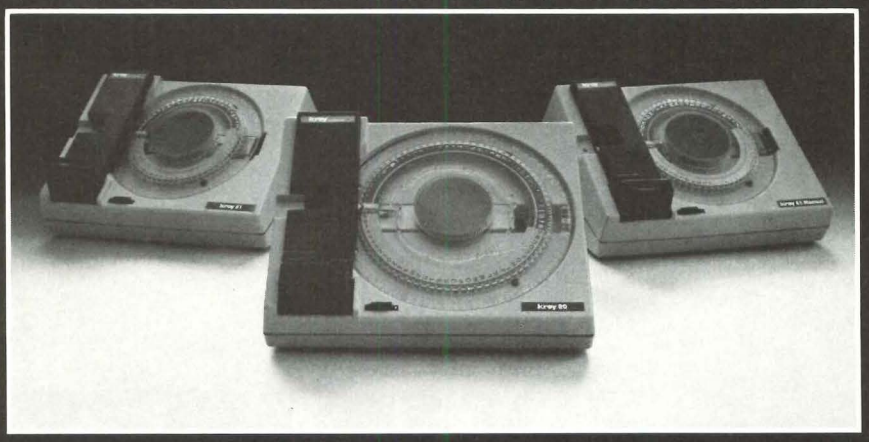

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Protecting buildings from people

The security products we choose for our buildings might compose a vast network united by a computer or rely upon a device as simple as the door lock. Increasing our awareness of its vulnerability aids in defending our architecture and sharpens our wits.

It is not reassuring to know that a team of specialized people is just as determined to get into our buildings as we are to keep them out; they can "undesign" our buildings as fast as we design them. Nor are we comfortable with the knowledge that security is more often an afterthought than a design issue. Detective Jim Wegman of the crime prevention section of the New York Police Department states the problem clearly: "You wouldn't build a building without a roof and shouldn't be building one without a thought to security."

People who undesign buildings are often expertly trained and equipped. Manuals used in time of war to train men to defeat the country's enemies can make effective tools in peacetime to defeat our buildings. The fire department invents tools for entering buildings which can save lives; these same machines can be purchased with criminal intent. Devices intended for use only by locksmiths can also be sold without discretion.

Basic weaknesses in the security of the building can come from the coordination of the various products. Because so many trades and producers are involved with security products, they can all blame each other. The lock producer can point to the weakness in the door, the door producer points to the frame, and the frame maker can blame the lock. Poor installation, moreover, can ruin the efficacy of the most impenetrable combination of products.

Security also has some natural adversaries within the building program. Life safety requires that exits be clear and quick; security entry is designed to confuse and delay. A system which protects against intruders might also disrupt the use of the building by its intended occupants. A product located for ease of maintenance is also easily accessible to the criminal. Entrances located to provide parking ease and barrier-free design also provide a place for the getaway vehicle. Aesthetics might demand that products be consistent with architectural trim and frown on muscular locks. The ideal is a security solution which is invisible when you don't want it and obvious when you do!

People who attack buildings must balance their risks with their rewards. People who guard buildings have the opposite task. John Cosenza helps to protect New York's huge Citibank complex. For him the task is to "provide security consistent with risk and threat." In this country it is estimated that one out of every 100 citizens is paid to protect the other 99, yet 70 percent of the security systems are installed after the buildings are built.

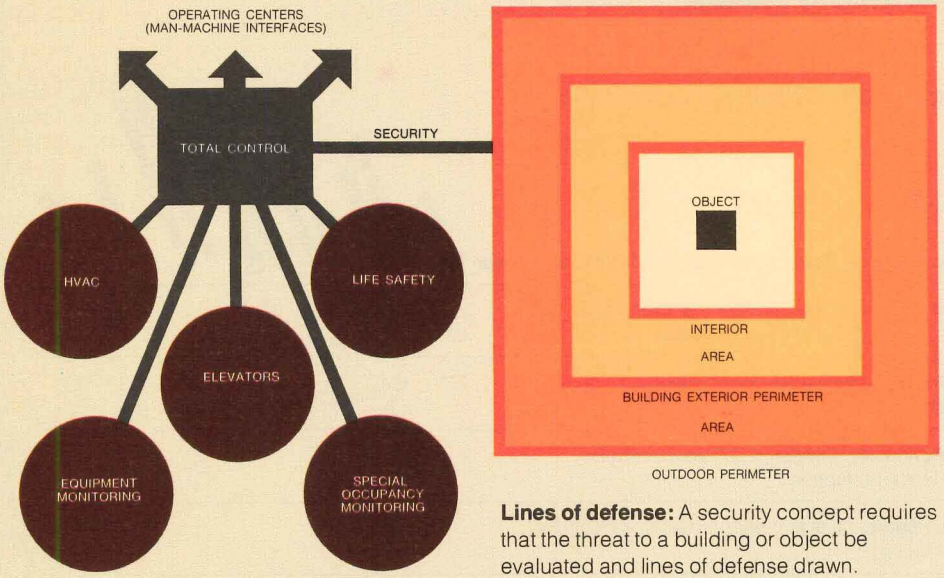
The designer versus the undesigner

Designers of security networks must evaluate a long list of parameters. System choice varies with the population, location, size and type of building, materials of construction, and the risk involved. There are painfully few cities that have a security code governing these variables. A security-rated wall and opening system is long overdue. At present, insurance companies provide the most restrictive standards. Insurance is, however, no deterrent to crime. Detective Guy Capolupo of the crime prevention section of the NYPD asserts, "If we didn't have insurance, we would reduce crime tremendously." Building owners would be forced to think about protection instead of who has to pay the bill.

Detective Capolupo cautions that the criminal "takes advantage of the lack of concern for security." Most of the time the criminal defeats the building with information, not skill. Capolupo also cautions against the elaborate opposite extreme. "The architect should not be fooled by the apparent sophistication of the security system." Woe to the red-faced system designer whose expensive electronic device is skirted by a simple screwdriver or a can of hairspray!

The security field is a demanding and an exciting one. The question is never whether the particular device can be defeated, but how long it will take. The security designer must stay abreast of the changes in the field. The manufacturer must constantly improve his product. The building owner must periodically reevaluate his building security and the architect must consider security an important design criterion prior to construction. In a nutshell, we must all spend more time "thinking like a thief."

Honeywell



Lines of defense: A security concept requires that the threat to a building or object be evaluated and lines of defense drawn.

Security is part of the total design

Criminal intent should be thought of as an environmental force acting on a building. It must be clearly dealt with through both "passive" and "active" means. Architect Oscar Newman's book, *Defensible Space* (Macmillan, 1972; also P/A, Oct. 1972), defined and illustrated the "passive" non-mechanical aspects of urban-dwelling security. Studying the behavioral characteristics of criminals, victims, and buildings led to very simple organizational concepts for the building which can reduce crime and greatly affect the selection of costly mechanical or electrical systems. Newman has more recently written a book, *Design Guidelines for Creating Defensible Space* (see Literature, p. 103), which expands his ideas and design concepts. Understanding criminal behavior is invaluable to us. As one industry spokesman put it: "You can spend a dollar on the physical construction and save $1000 on the alarm system."

The complex interrelationships and functions within the building make designing solely from a security or even a life safety point of view an impossibility. The more accurate overriding concept is traffic control. The growth rate of the "active" traffic control products industry, 20 percent to 30 percent per year, demonstrates our expanding concern and understanding. Upwards of 250 manufacturers are involved with such products.

The industry can be said to be constructed in two tiers. The smaller scale end of the business, at a security budget of less than $5000, consists of product salesmen and retailers who install products in small numbers or on an individual basis. A defective product is returned and replaced by mail. In this aspect of the market, new products appear and disappear rapidly.

A manned central-control unit for security alone can cost $20,000. At this scale, equipment needs large numbers to justify its cost. Cost of insurance, vandalism, pilferage, and theft are balanced against the system price tag. A manned guard post is calculated as costing $100,000 per year (for 24-hour service, seven days a week). If a machine costing $50,000 can replace a guard post, the economics are obvious. Personal injury, fear, and bodily harm are not transferable into monetary gain or loss, but it helps if the cost of the system is also painless.

Total control: The extent of total control is governed, of course, by the scale of the problem. A single station can be created that will monitor and control life safety, heating, ventilating, and air conditioning, and security. In the event of fire, the elevators can be brought to the ground floor, ventilating shafts opened, sprinklers activated, audio tapes explaining evacuation procedures engaged, fire alarms set off, the fire department called, and the doors of the building unlocked.

A central console could justify itself solely from the viewpoint of energy savings. The temperature outside the building, in the walls, and within the space can be monitored, and equipment usage optimized. Hospitals, hotels, and factories may desire monitors and controls of specific equipment. The control of the security aspects of the building might even generate attendance data and pay cards based upon access information.

The fact is that if a central control system can be justified for these other reasons, the control hardware need not be duplicated. The client need not be convinced to invest in an expensive, independent security system.

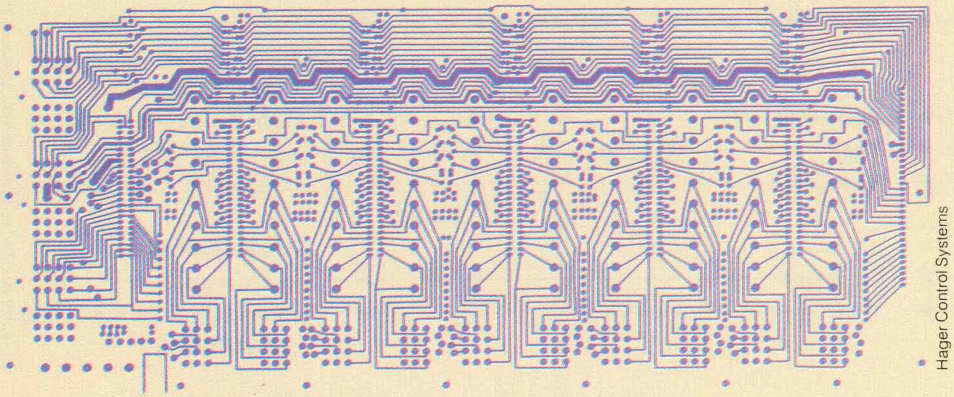
Even greater economy can be realized in very large and complicated buildings. Chicago's Water Tower Place uses a central control system which is computerized. HVAC, life safety, and security systems are controlled as well as documented.

Eat your heart out, James Bond

The modern methods of security which span between the central computer control and the mortise lock are as technologically impressive as they are numerous. To mention them all would demand an encyclopedia. Fortunately, for the moment, most buildings do not need the level of sophistication it is possible to achieve. A survey of these products, however, is appropriate to appreciate their potential and variety.

Lines of defense: A security system is established by creating lines of defense. The

Modular circuitry: Solid state electronics relies upon modular panels or circuit boards. These boards reduce a mass of wiring to a wafer-thin board. This board can be likened to the floor plan of an office building. It is constructed to accommodate a great variety of modular circuits, much like an office floor is prepared with electrical outlets. We recognize, in offices, that economy originates in maintaining a five-ft module with furnishings. The same is true with circuit boards. If the men who engineer and custom design the consoles are given enough notice, they can maintain modular characteristics, and save us money.



Hager Control Systems

Building Security: Problems and Products

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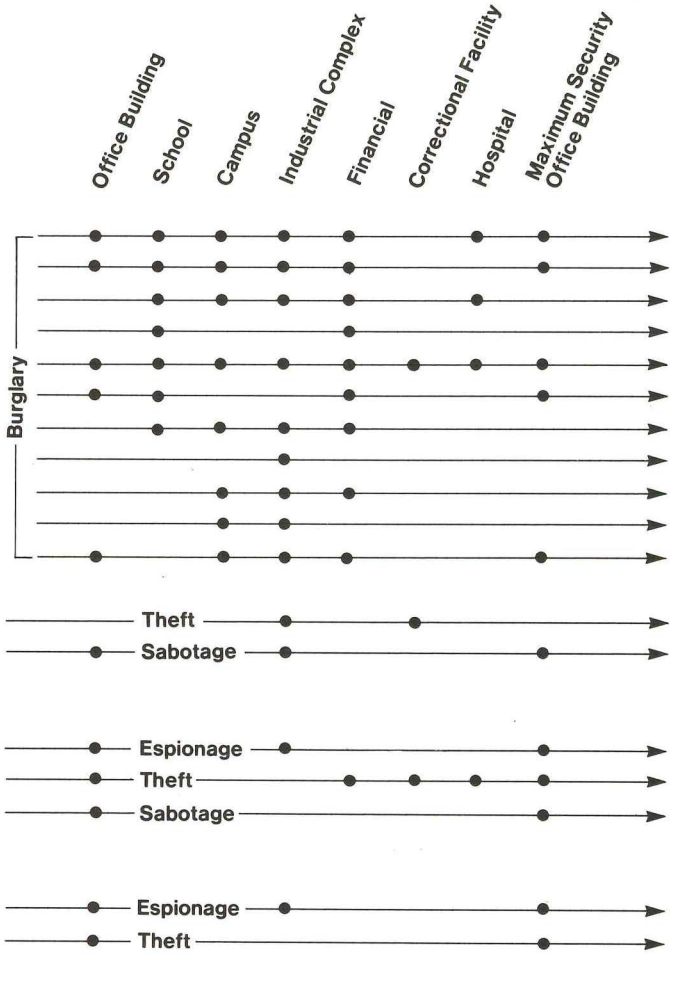
Monitored CCTV: Cameras, monitors, switchers, videotape, motion detectors, accessories.	△ ○	△ ○	△ ○	△ ○	△ ○	△	△ ○
Access Control: Mechanical locks, electrical locks and access techniques, personal human identification.	○*	△ ○	△ ○	○	○*	△ ○	○*
Outdoor Perimeter: Fences, microwave, infrared, electrified fence protection.			△ ○		△ ○		△ ○
Indoor Perimeter: Magnetic door contacts, window foil, vibration detectors.			△		△		△
Indoor Area: Ultrasonic, infrared, microwave.			△		△		△
Object Protection: Capacitance (electric field)		△	△		△		△
Supervised Guard Tour: In house guards, contract guard service, on foot or mobilized, fixed or variable tours.	△ ○	○	△ ○	○	△ ○	△	△ ○
Auditory Detection System: Concealed microphones				△	△		△
Personal Wireless Transmitters: Electronic signal, one or two way.	△			△		△	
Protective Lighting: Visible or invisible (infrared)	○		○	○	○		○

*Access control is generally a solution to identification and access. Alarms, however, commonly supplement these devices.

Prepared by P/A in cooperation with Honeywell and Johnson Controls



Security Devices

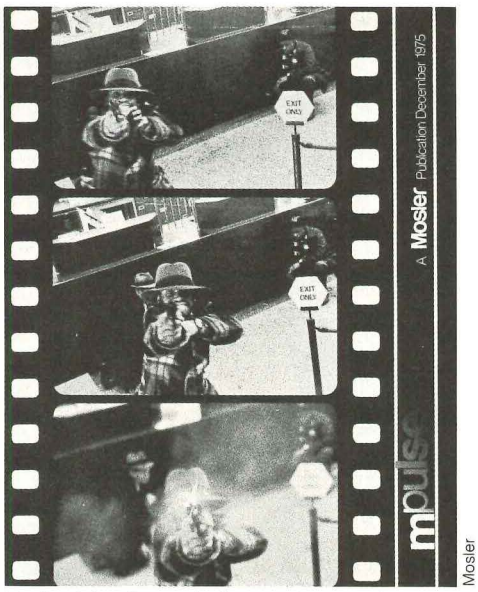
Monitoring Devices
Control Units
Door Switches
Hold-Up Devices
Object Protection
Communication Devices
Power Supplies, Printers
Outdoor Perimeter Protection
Documentation
Watch Tour
Computerized Systems

X-Ray
Metal Detector

Closed Circuit TV
Cameras, Lenses, Monitors, Pan and Tilt, Videotape Units, Switches and Mounts

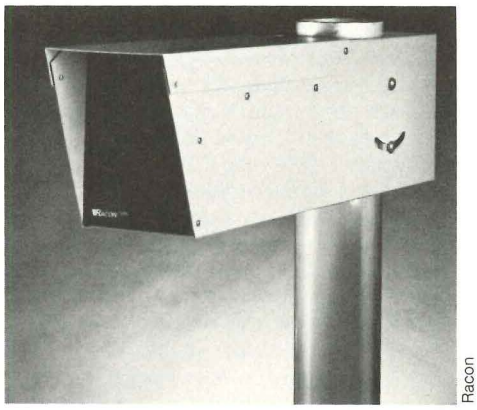
Access Control
Identification, Electric Locking & Access, Mechanical Locking Devices.

Prepared by P/A in cooperation with Johnson Controls



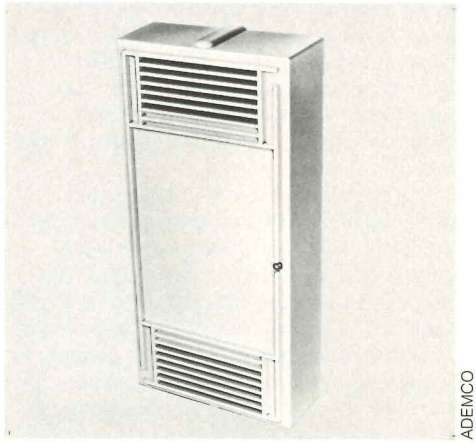
Mosler

Bank robber fires at bulletproof camera lens.



Racon

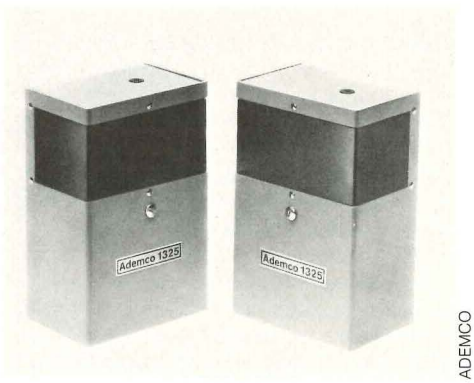
Indoor/outdoor microwave intrusion detector.



ADEMCO

Ultrasonic motion detector mounted vertically.

6-volt DC photoelectric intrusion detectors.



ADEMCO

building and site set up barriers for the potential villain, and his progress through them is monitored.

Today's exterior perimeter protection varies from a chain-link fence capped with barbed wire to sensitive vibration detectors that can be set off by a bird landing on the wire. Electronic motion detectors can be buried in the ground, or photoelectric receivers can be used as invisible barriers. In fact, the biggest problem with exterior perimeter devices is that weather and animals can trigger them.

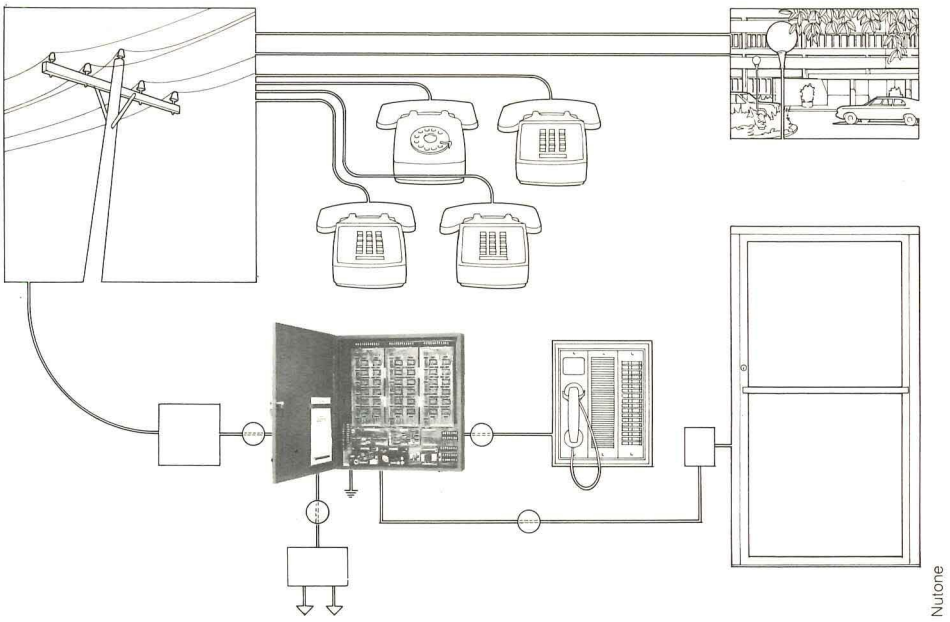
Once the exterior line of defense is penetrated, the area between the building and the perimeter defense needs a detection device. Sound may be used in the form of ultrasonic or microwave intrusion detectors. Photoelectric cells are used as light sensors. Motion within the area sounds the alarm to the control unit, which alerts guards. Unfed German shepherds still perform this service handsomely.

If the invader has deftly skirted the area protection, he has reached the building. Most of our common security systems begin here. It is the perimeter of the building which establishes passive control most effectively. A lighted entrance and grounds can serve us well. Landscaping which obscures doors and windows, however, provides cover and time for the potential thief. An unthinking architect may locate the power lines so that the expensive electronic protection device is rendered useless in seconds. He may even place an exterior power outlet, a power-tool potential, convenient to the front door! It is also at the exterior of the building where our first clash of program values occurs. If the window of a building is to be used effectively for escape, it must be wide enough to pass through and close enough to the ground to escape and avoid injury. A thief can reverse this sequence.

Windows and doors are not the only points of weakness. The architect must give equal consideration to walls, doors, windows, and roof.

The most important consideration is time. New York City stores commonly use metal folding curtains which cover the entire exterior of the show windows. The windows themselves may be lined with alarm foil. These buildings have the appearance of being secure. In actual fact, such systems have been defeated by wrenching the fence off its hinges with chains attached to a truck bumper. The window is broken and the thieves help themselves for the five minutes or so that they have before the police arrive. Detective Capolupo of the NYPD explains how much more effective the metal curtain would be inside the store! The alarm would sound as the thieves enter the window and five minutes would be insufficient to defeat the metal curtain.

High-risk buildings—banks, jewelry stores, and furriers—are always concerned about security. Magnetic door contacts, window foils, and vibration detectors traditionally augment access control. Seventy-five percent of our buildings are not classically high-risk, but the list is changing all of the time. Hospitals must control access to their drug-storage cabinets. Schools in recent years need protection from their own cleaning staff as well as students. Revolving doors in public buildings can now be equipped with an explosive sensing device which will stop a potential bomber and lock him in the pie-shaped wedge of the door.



Nutone

The access system diagrammed above allows the use of conventional home telephone equipment in identifying visitors and restricting building entry.

An access device can take advantage of (1) digital coding, (2) a card coding combination, or (3) a unique hidden element triggered by card proximity alone.

Interior protection: Once the criminal is inside the building, invisible sound, light, or heat sensors can send a silent alarm to a guard station. Infrared devices can tell a guard that a sudden change in heat level has occurred in the space. The thief may cut across an electric trip cord. Successive lines of defense are drawn, doors locked, alarms set, and areas monitored.

Closed circuit television is often used to monitor interior areas or placed on the roof to monitor public space. The existence of a TV camera is itself an effective deterrent to crime if the potential criminal can spot it. The more sophisticated units can pan and tilt, as well as zoom, and can be linked to a video tape recorder. A problem with TV guard monitoring is boredom. A single night guard who has nothing else to do but watch 20 or 30 television screens must be spelled or he soon dozes off. Six screens are generally the maximum number for human effectiveness without fatigue. Lenses can be made bullet proof, but spray paint, if the cameras are accessible, can still defeat them.

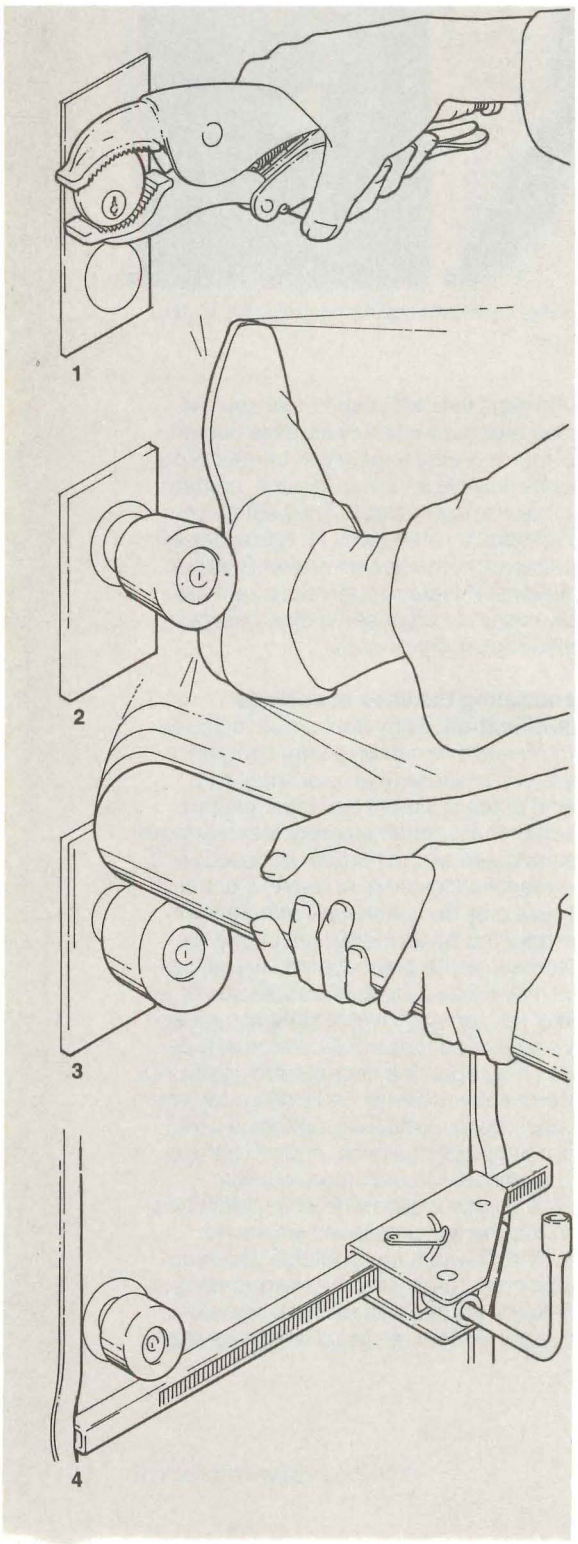
Perhaps the oldest and most sophisticated area protection of all is the human being. He is also expensive. Large corporations, like New York's Citibank, employ their own security force. They establish a set of security standards for hardware and participate in the design of new Citibank buildings. Private security firms rent their services and can observe their charges with remote control units.

Penetrating the lines of defense

Identification: Entry from a public space to a private one can be a very complex problem. Identifying an individual as a friend or foe is simple between any two people, but it becomes progressively more complicated as the number of people and the identification time increase. Control of access may be maintained remote from the opening by an individual, or may be automatic at the point of entry. Identification may be as simple as possession of a metal key, or may involve several successive steps and types of ID. Automatic devices may open the door electronically, but restrict entry to certain individuals by time of day. Ideally, whatever system is used will not disrupt business, and will be usable by those with restricted mobility.

The sophistication with which identification may be accomplished knows no bounds. Devices are available which automatically identify the outline geometry of the hand, fingerprints (all ten), signature, or voice. Of course, visual ID can be used.

A burglar is an opportunist. His methods are direct. Those shown here commonly defeat our door locking devices. (1) A vise-grip pliers shears the setscrew which holds a cylinder lock in place. The cylinder is then unscrewed and the lock operated manually. (2) A swift kick in the right place on the door will defeat the wrong lock. (3) A key-in-knob lock should never be used on an exterior door. Most can be defeated by breaking the knob as shown. (4) Spreading the door frame, as with a car jack, quietly defeats a short dead bolt or latch bolt.



A magnetic card with a photograph may be placed over a TV lens, enabling a guard at a remote location to compare the face on the card with a visual record.

Recent developments in magnetic-card design have opened a new world. A plastic card with no physical impressions may serve as ID. The card is inserted into a slot where a magnetic strip is "read." Card systems also exist which enable us to pass the card over a sensitive electrified disk hidden within the wall itself and require no slot at all.

The new Citicorp building in New York has a simple digital code system. Each office has its own code known only to its work force. The employee enters by simply punching the correct code number on the keyboard and opening the door.

Another unique identification system uses the house phone of the apartment dweller. The guest enters the vestibule, surveys a directory, and presses the appropriate button on a console. The normal telephone within the apartment rings. The apartment dweller then picks up the phone and dials a prespecified number to speak with the caller. If he is convinced of the caller's good intent, he signals entry.

Defeat: All of the products mentioned so far can be combined and organized, and all can be defeated. Their defeat takes time, and it is a crime. Some crimes are easy to thwart, others nearly impossible. Ninety-five percent of terrorist attempts are successful. In most actual bombings there is no warning given. We cannot prevent them, we can only minimize the risk. Robbing a clothing store, in contrast, can be controlled by simply making sure the hangers are alternated in opposite directions.

"Most multifamily buildings in this country are built without a decent lock on the front door."—Oscar Newman.

Most people, architects included, feel that their buildings are secure. They feel that way because they have not been robbed or worse. Men who spend their lives investigating crimes relating to buildings know otherwise.

The door lock threat: A traditional mechanical door-locking device is found in one of three places: mounted on the door (a rim lock), mounted in the door (a mortise lock), or constructed integral with the doorknob (key in knob). A bolt is thrown between the door and its frame. It is designed either to allow the door to close itself and lock (a latch bolt) or to be thrown and retracted every time the door is opened (a dead bolt). We will discuss further important variations later.

Rim lock: A rim lock is rarely mounted on a new door. It is added frequently to beef up door defense. A rim lock used by itself is one of the easiest locks to defeat. Because the lock is not integral with the door, pressure applied to the door is translated to the screws holding the lock in place. Such a lock can be kicked or shouldered open, a noisy approach. A simpler solution would be to clamp a pair of vise grip pliers (or a pipe wrench) to the lock's brass cylinder through the thin metal collar and rotate it. The two long screws which hold the cylinder in place must be sheared. The cylinder is then pulled from the door, and a screwdriver is used to reach in and unlatch the door. More elaborate means are possible but usually not necessary.

A key-in-knob lock should never be used on an exterior door. Such locks are commonly defeated with a swift kick near the knob. Other methods attack the doorknob itself. Leverage from a wrench will break a weak knob. A hammer or heavy pipe used like a baseball bat can also defeat cheap versions. Once the knob is broken, a flat screw driver can turn the mechanism to permit entry. A dead bolt is not usually part of this lock, and the strike is therefore short and weak in wood construction.

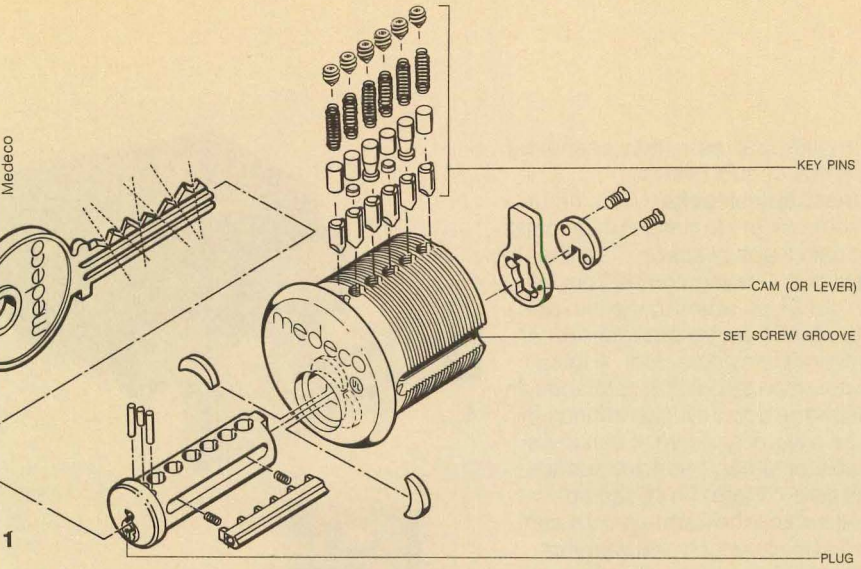
The mortise lock is the strongest of the three traditional types. The lock is integrated into the structure of the door, and is difficult to shoulder or kick open. Three attack methods are the most common in New York: picking, spreading the frame, and removing the cylinder. All methods are relatively fast, quiet, and require no elaborate tools.

Locks are picked in a number of ways. The lock-picker is taking advantage of the cylinder construction. When you insert your key into a cylinder lock, you are placing it into a metal plug. Until you put your key into the lock, the plug is not free to rotate. A set of pins extend from the cylinder itself, acting as tiny bolts, and drop into holes in the plug. At the other end of the plug there is a simple lever. When the plug is free to rotate, the lever can be moved into a position where it triggers the mechanism to retract the bolt from the frame. Inserting the key raises the pins out of their holes to a point where they no longer restrict the movement of the plug within the cylinder. When you turn your key, you are rotating the lever on the plug end and retracting the bolt.

A person who picks a lock therefore must raise the pins and rotate the plug. Brass is used in cylinders because it doesn't rust and allows fine tolerances. The more accurately the plug fits the cylinder, the harder it is to pick. A small, usually hooked tool is used to raise each pin. The picker listens for the sound of the pin pulling from its hole and rotates the plug slightly to one side keeping the pin up. He then proceeds with each successive pin until he is able to rotate the plug freely.

Spreading the frame takes a lot less skill than picking. The crudest device is a car jack applied across the frame and spread. Crowbars and screwdrivers are easier to conceal. The time it takes depends on whether the frame is reinforced or not, on the length of the bolt impeding the opening of the door, and, if a latch bolt is used, on whether a knife or credit card can be slipped in to "jimmy" back the bolt.

The favorite method of the unskilled burglar is to wrench the cylinder from the lock. He attaches a vise grip pliers to



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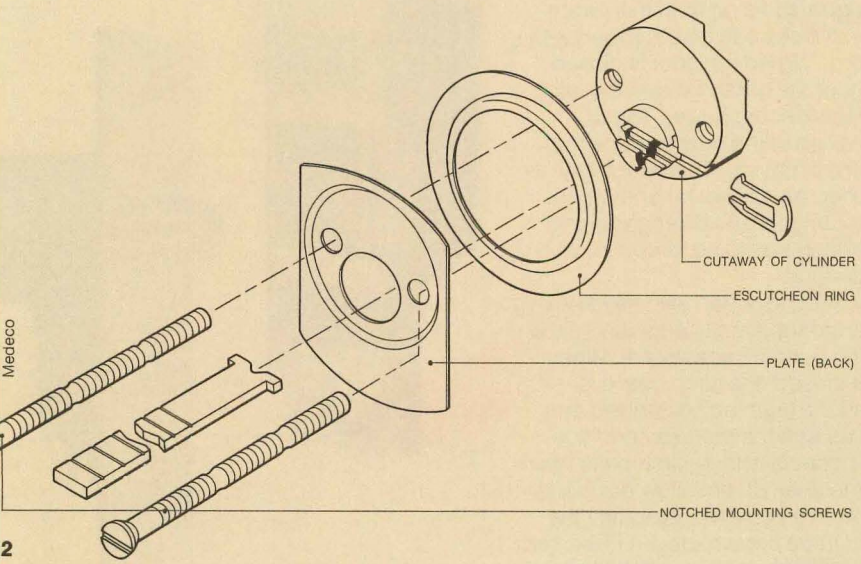

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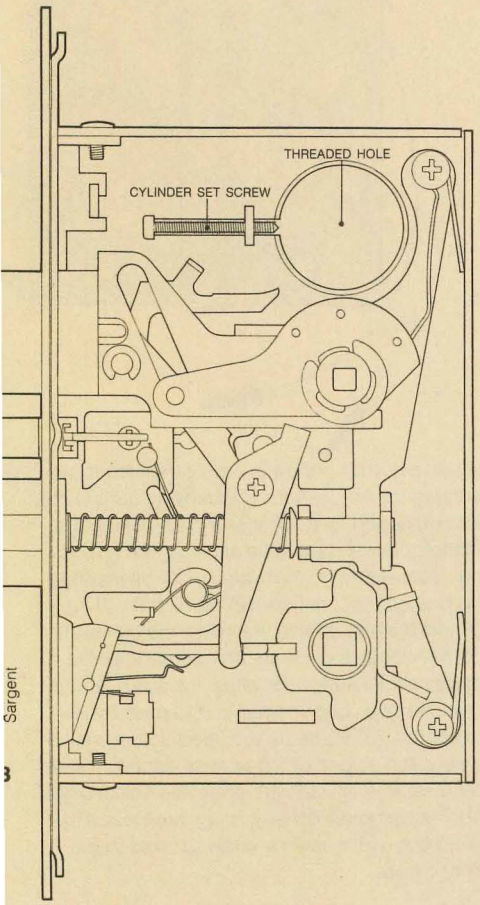

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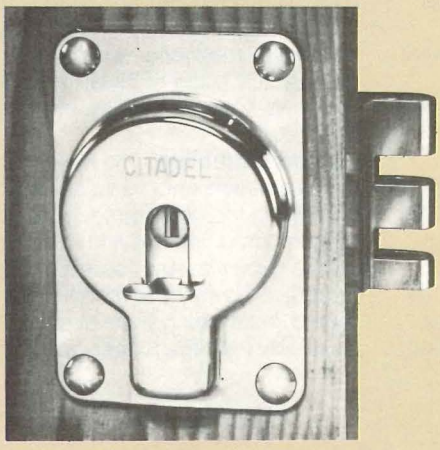

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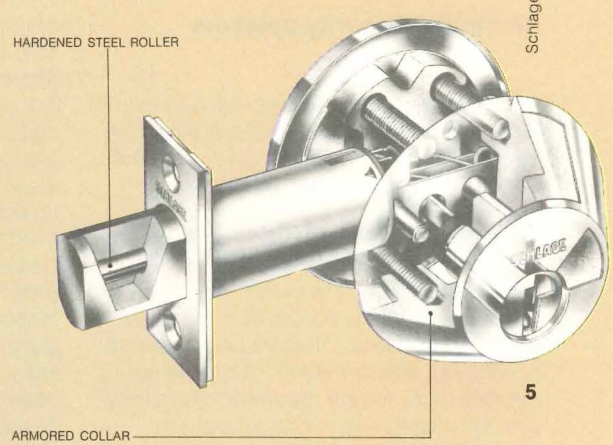

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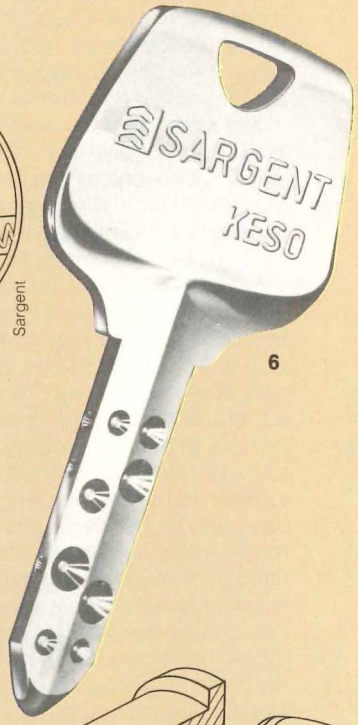

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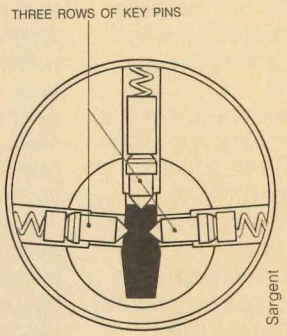
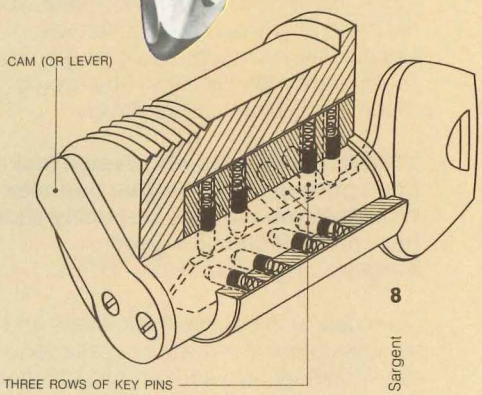


7

The great percentage of locks which are installed in new buildings are mortise locks. (1) The cylinder for such locks is threaded to screw into (3) the lock case. A hardened setscrew may be used to keep the lock from turning by lodging in the groove on the cylinder side. If the screw is not sheared off, a groove is cut in the brass which does not permit the lock to be screwed out. (2) A rim lock uses a cylinder as well, but the long notched screws hold the cylinder in place. When they are sheared, the lock can be pulled out. (5) Locks can use a solid metal "armored" collar to protect the cylinder and a hardened steel roller lodged in the dead bolt to resist attack by hacksaw. (7)(8) Adding two rows of pins makes a lock pick-resistant and (6) the key difficult to reproduce. (8) The lever at the rear of the key plug must rotate to operate the lock bolt. (4) This lock boasts that it has never been picked! It can be used with a standard drop bolt rim lock (9).



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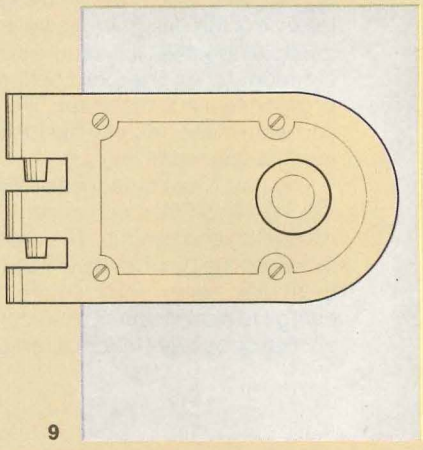


9

the perimeter of the cylinder as with the rim lock, and rotates it in the hole. A setscrew keeps the lock from turning. If it is too soft, the crook simply shears past it, and unscrews the lock.

Detective Capolupo is a 17-year veteran of the force and a master locksmith. He can defeat most locks in minutes, many in seconds. "There is no doubt in my mind," says the detective, "that we could reduce burglary by 60 percent if our simple recommendations were followed." Here they are: 1) Understand the basic ways in which door locks are defeated. 2) Prevent the defeat of the device by: a) using a dead bolt at least one inch in length; b) using a pick-resistant lock; c) using an armored collar on the cylinder; 3) installing doors and frames correctly, eliminating "play" between the door and frame, and reinforcing the door frame.

The essence of his recommendations is lodged in his belief that "a lock in and of itself is not the end all; we must add something to the lock. No single piece of hardware will ever keep a burglar out. You must protect your protection."

Most locks as they are ordered and arrive for installation do not have the characteristics recommended by Detective Capolupo. The dead bolt, or latch bolt, is typically 5/8" to 3/4" long. The collar which surrounds the cylinder on the door exterior is made of thin brass easily removed or deformed. The architect must therefore specify that a one-inch length of bolt be used and that a solid metal collar, or armored collar, be added. The quality manufacturers all make pick-resistant locks. Hardened setscrews will cut grooves in the cylinder causing it to rotate in place rather than screw out. A heat-treated spindle in the doorknob construction will significantly increase knob strength. Additional hinge protection can be ordered which will eliminate pin removal.

"The MIT graduates who design locks don't grasp how the burglar operates. What they [manufacturers] really should have on their staff is a good burglar."—Guy Capolupo, NYPD.

Obviously crime prevention officers and manufacturers do not always see eye to eye. Monetary gain and product competition do not always yield the ultimate security tool. Manufacturers do make secure locks; it is the designer, however, who must put together the secure combination of products. As one lock customer expressed to a manufacturer: "I didn't know you were in the security business, I thought you made locks."

The four basic categories of locking mechanisms are: mechanical, pneumatic, magnetic, and electric. The mechanical locks are the basic ones which we have been discussing. They require no outside energy to operate them, and conversely cannot be operated from a remote station. This also implies that, as is, they cannot be part of a central control system.

More on mechanical locks: Manufacturers go to some length to defend their locks against certain types of attack. "Loiding" is a prominent one. Loiding comes from the word celluloid which refers to the thin plastic material which was the predecessor of credit cards for jimmying a door. A latch bolt is the common target. The latch bolt, in order to allow the door to close without unlocking, has a bevel or curve. It can pivot out and back, or spring back and retract like a dead bolt. If there is a space between the door and the frame, a card can be inserted above the bolt and wiggled carefully "walking" the bolt out of the way.

The latch guard: To combat this procedure mortise locks can be equipped with a latch "guard." When the door is closed, the latch guard is retracted and the latch is extended (see facing page). The retracted position of the guard keeps the latch bolt from moving. The door frame itself must then be spread far enough to allow the latch guard to disengage and permit the latch bolt to be forced in, unlocking the door.

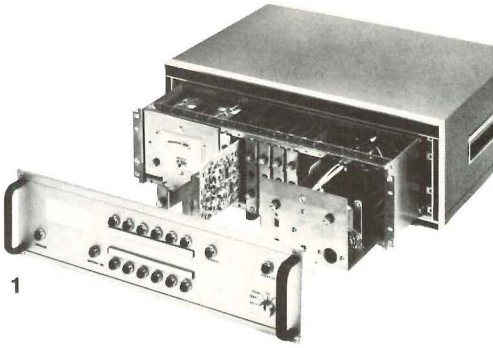
A key-in-knob lock can also have a latch guard. It appears directly adjacent to the latch bolt (in front or in back of it). When the door is closed, the latch guard is retracted and the latch bolt extended and protected as with the mortise condition.

The dog: Especially long latch bolts themselves sometimes do not allow easy closing of a door. To solve this problem, the latch bolt can be constructed in three sections; the middle portion is inverted and is called the "dog." When the latch bolt engages the strike, the dog immediately begins the latch retraction. It does not itself add to the protection of the door but permits the use of a longer, safer latch bolt.

Stop works: The door lock may also contain "stop works" to change the function of the lock. This may commonly take the form of two separate buttons or simply a toggle switch (see facing page). When the switch is thrown, the door may be opened from the exterior without a key. Most locks are constructed, however, so that if the dead bolt is thrown, the stop works cannot be activated. If this were not the case, the frame would obviously need to be spread only wide enough to use the stop works and open the door.

Saw protection: Dead bolts can be used as a single locking element. When this is the design, it is especially necessary to have a sufficient length. Dead bolts can also be protected from hack saws. A hardened-steel roller is installed inside the dead bolt in order to thwart the saw. Continued sawing will have no effect on the dead bolt.

Spread protection: The locking mechanism can itself limit the vulnerability to spreading the door frame. In rim locks, the bolt can drop vertically through hingelike projections, a system called a "drop bolt." Recent innovations in the field have produced locks which drive dead bolts simultaneously from the four edges of the door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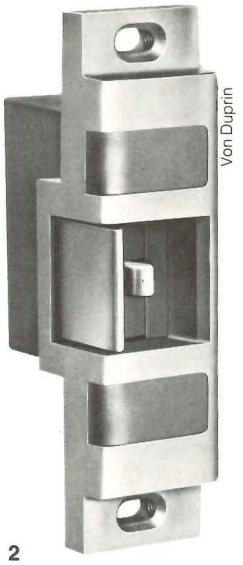
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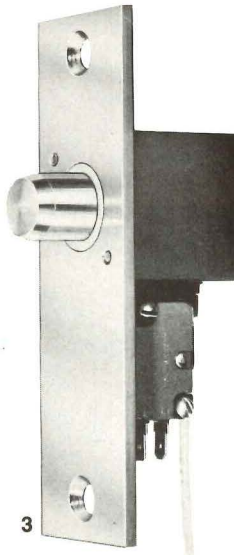
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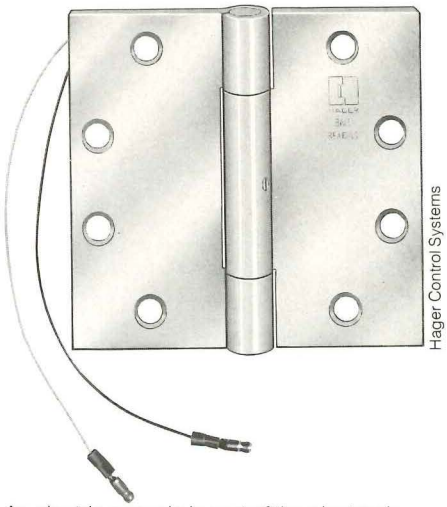
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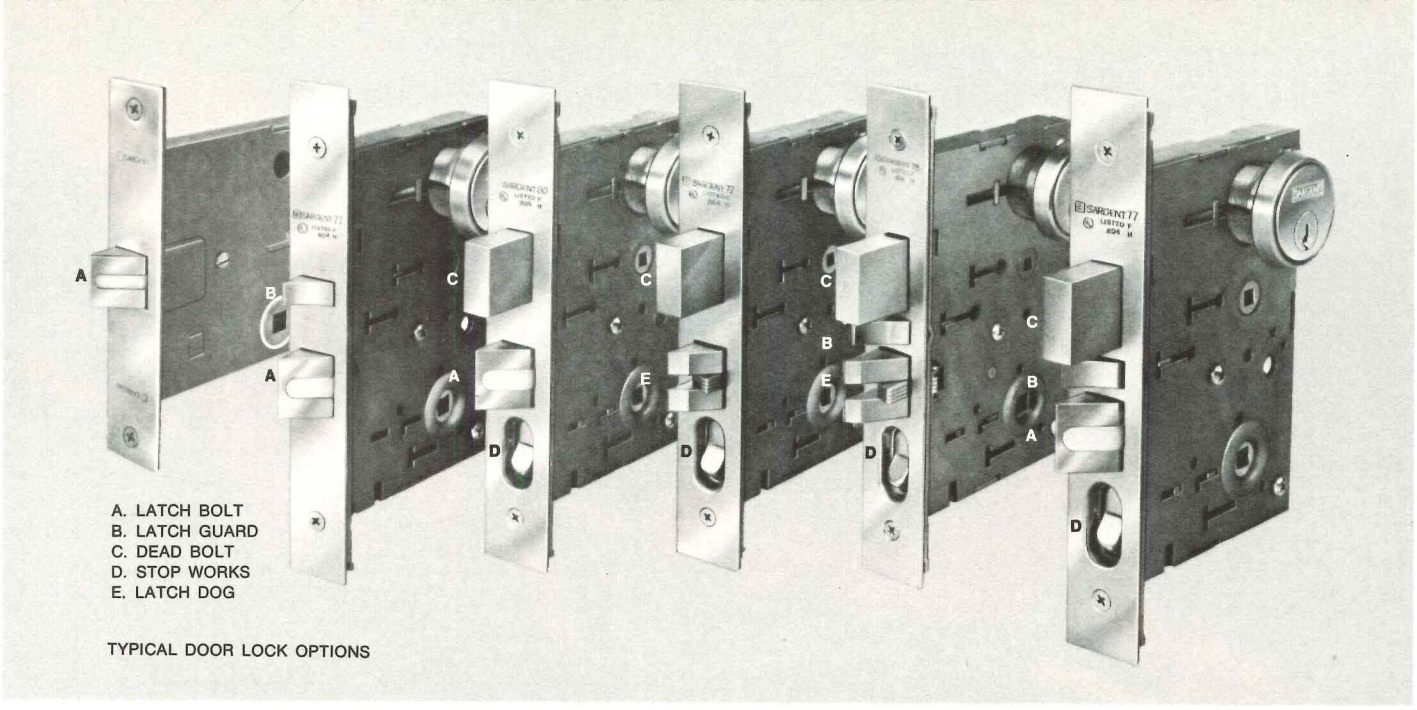
Hager Control Systems

(1) An electric console is part of the electronic access control system. The console can be custom designed for a particular job by using premanufactured solid-state circuitry. Each function demanded by the system may be inserted into the control console. (2) An electric strike is a simple electric device that takes the place of a conventional door strike. An electric impulse opens a miniature door within the strike, and allows the latch bolt or dead bolt to pass by unrestricted. (3) A pneumatic dead bolt may also be chosen as part of the access-control system. A pressure of 80 psi can lodge this bolt in place. (4) The compressed air supply must reach the dead bolt in the door by snaking through the door hinge.



Sargent

A simple latch bolt is vulnerable to "jimmying." A guard may be added which will not permit the latch bolt to retract when the door is closed. A dead bolt can be used instead of the latch guard, and "stop works" alters the function of the lock. A "dog" helps retract a long latch bolt.

perimeter. If the frame is spread horizontally, the door is still locked vertically.

Another innovation in recent years has been the use of stamped lock cases instead of cast ones. The old cast cases were found to be vulnerable to cracking on impact, exposing the cylinder.

Pick resistance: To make a lock "pick resistant," several approaches are possible. The pins can be designed so that they will not raise to the proper height unless they are rotated as well. Increasing the number of pins increases the time it takes to pick, but may introduce other problems. More pins mean a longer cylinder, and perhaps allow the cylinder to protrude further out from the door giving the vise-grip pliers more gripping surface. Part of the pickability of the lock is due to the ease with which a key may be reproduced. Locks are now being made with as many as three separate rows of pins. Keys for such locks are reproduced only by the manufacturer, eliminating the reproduction problem.

Electrification: In order for a lock to operate with an electronic identification device, or from a remote control point, it must be electrically (or pneumatically) controlled. There are a number of choices, most of them involving modification of a standard mechanical locking device. An electric knob set, for example, electronically freezes the knob on the door (or its thumbpiece). An electronic dead bolt uses a solenoid to extend or retract the standard dead bolt. It can also electronically retract the latch bolt.

The trick when electronically wiring the door is providing sufficient access for the wiring. Special wired hinges are available for this purpose. A middle hinge is normally used. The size of the wire which can snake through the hinge restricts the possible current available.

The electric strike: On the frame side of the lock an electric strike can be used. The electric strike is simply a tiny door itself which is electrically opened and closed. When it is open, the extended dead bolt or latch bolt can pass by unrestrained. Retrofitting a door with an electric strike requires no change in the door-locking mechanism itself.

The pneumatic dead bolt: The bolts on the door can be controlled electromagnetically and pneumatically as well. In the case of the pneumatic dead bolt, for example, a small plastic tube carries compressed air from a central station. An advantage to this system is its bolted strength. A pressure of 80 psi can be applied to the pneumatic dead bolt as compared to a few ounces of pressure by an electric dead bolt. Pneumatic dead-bolt systems can take longer to activate. Electricity moves faster than air.

Electrification, generally speaking, does not necessarily add strength to the lock. A poorly constructed electric strike can be defeated by a good swift kick, according to Detective Capolupo. As a security device, electricity does add the potential of identification devices as well as the addition of door-opening monitor devices and alarms.

It is important to understand that electric or pneumatic devices must always be complemented by mechanical ones. If a burglar sees that a cylinder-type mortise lock is being used with an electric lock, he can attack it like any other mortise lock. Even if the door does not have a doorknob on the exterior, he can guess the type of lock used.

Fail safe or fail secure: Electric locks can be designed as either "fail safe" or "fail secure." In the event of a power failure, a lock which opens is called fail safe. If the lock remains locked, it is fail secure. Electric strikes, for example, are not commonly used for fire egress into a stairwell. If the fire on a floor kills the power, the lock opens. When the smoke builds up pressure, it can force the door aside, and fill the escape route with smoke.

In conclusion

Industry spokesmen and securities experts alike predict a future which could possibly include terrorism in this country. They are trying to shake people, architects included, out of their lethargy. In reference to the attitude of the design-oriented architects, Oscar Newman is most direct: "The God he is serving is the God of high design, *haute couture,* and that God does not permit him to consider the needs of people." We need security a lot more than the security industry needs us. There is a cliché in the security field: The easiest time to sell security is the day after the crime. [Richard Rush]

Acknowledgements

We wish to thank the following security professionals, manufacturers, and organizations for their help in preparing this article: ADEMCO; American District Telegraph; American Security Fence Corp.; American Tube Company; BRK Electronics; Cardkey Systems; Citibank, John A. Cosenza, Joseph Rossi; Compuguard; Detex Corp.; Double J Systems Corp.; Douglas Randall Div. of Walter Kidde; Eaton Corp.; Emhart Corp., Corbin Div.; Emhart Corp., Kwikset Sales; Emhart Corp., Russwin Div.; Fire Lite Alarms; Greer Hydraulics Inc.; GTE Sylvania Security Systems; Hager Control Systems; Hager Hinge; Honeywell Inc.; International Visual Products; Johnson Controls; Kaba Security Locks; Kane Manufacturing Corp.; Locknetics; Long Environment Systems; McKee Door Co.; MEDECO; Mosler; Mountain West Alarm Supply Co.; Mul-T-Lock; Oscar Newman; New York Institute of Public Safety, Thomas Ward, Dir.; The New York Police Department, Crime Prevention Section, Detectives Guy Capolupo and James Wegman; Nor-Lake Inc.; NuTone Div., Scoville; Pease; Racon Inc.; Raytek; REDCO Inc.; Thomas F. Ruane Jr., P.I.; Rusco Electronic Systems; Sargent; Schlage Electronics; Schlage Lock; *Security World magazine;* SenDEC Corp; The Silent Watchman Corp.; Simplex Security Systems; Southco Inc.; Spider Lock of America; Thad Weber; Weiser Lock Div. of Norris Industry; Von Duprin.

For security systems product and literature information, see page 103.

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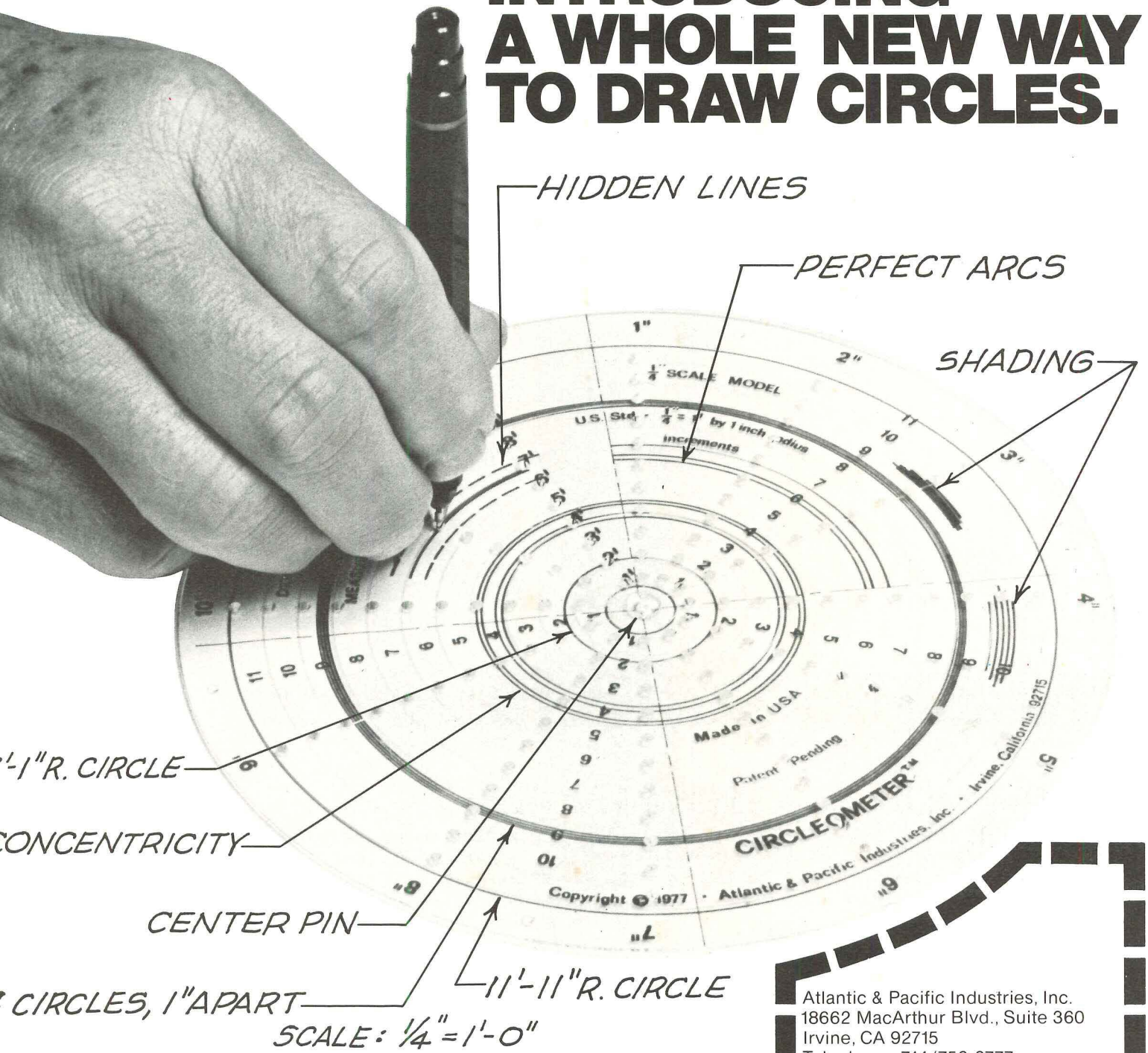

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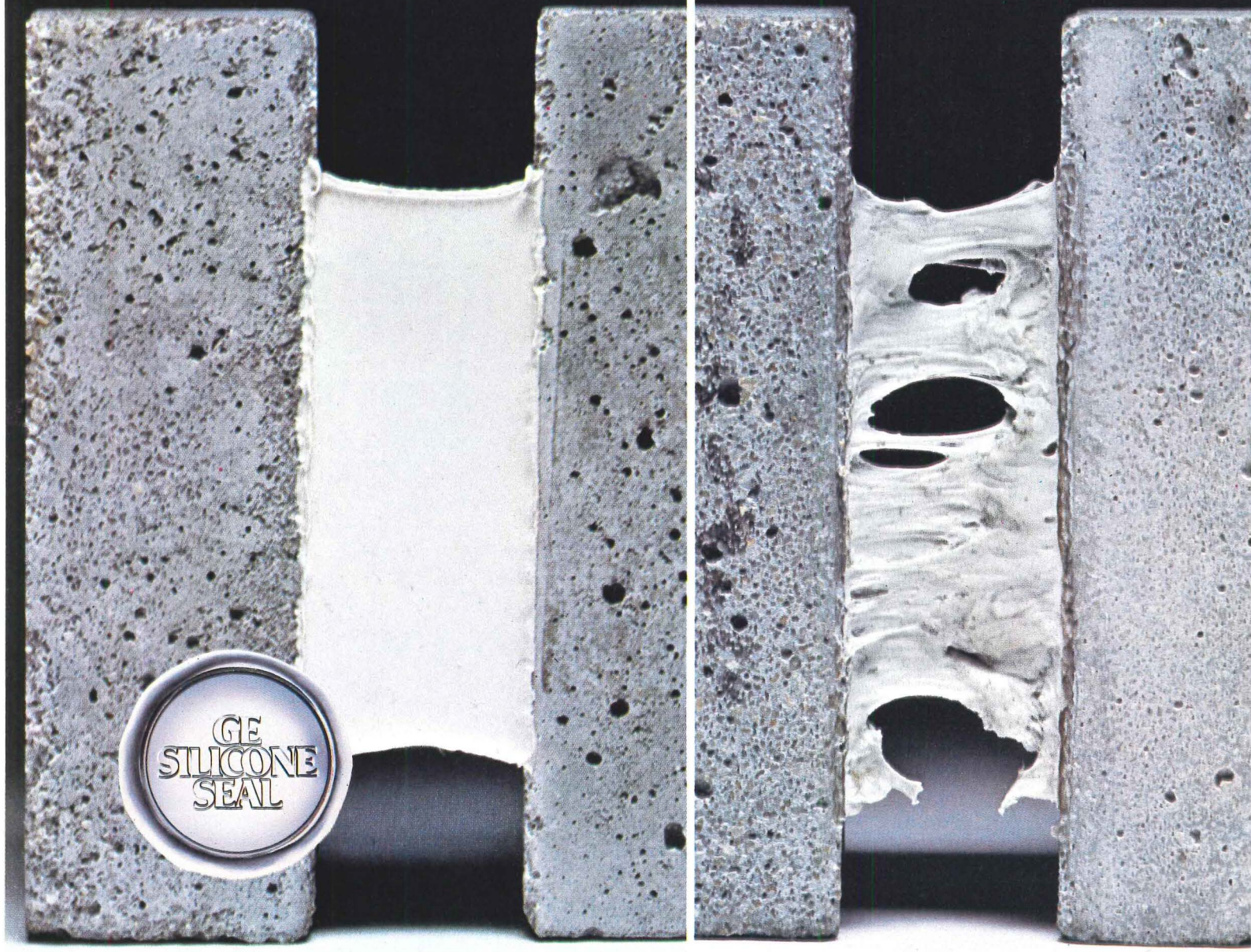
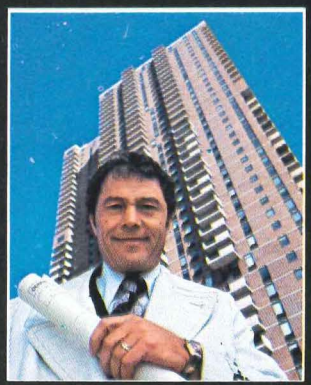
The GE Silicone Seal. The difference between a weathertight seal and a call-back.



Silpruf™silicone sealant and non-silicone high-performance sealant samples in GE lab test.



Architect: David Todd Associates, New York.
General Contractor: HRH Construction Co., New York.
Waterproofing: Jobin Waterproofing Corp., Farmingdale, N.Y.

General Electric silicones make quality performance sealants that virtually eliminate costly call-backs.

Just ask Robert J. Capazzi, President of Jobin Waterproofing Corp., who used GE silicone sealants for New York's new 1,700 unit Manhattan Plaza: "GE silicone sealants deliver reliability that reduces call-backs to just about zero. With other types of sealant, call-backs have cost me as much as $2,000."

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Manhattan Plaza required over 200,000 linear feet of sealant, including masonry-to-masonry, metal-to-masonry and metal-to-metal. Bob said, "In each instance, GE silicone sealants performed beautifully, and that meant more profit at the bottom line. Period."

For full information, contact: Section 444, Silicone Products Dept., General Electric Co., Waterford, N.Y. 12188.

GENERAL ELECTRIC

Circle No. 363, on Reader Service Card

Products and literature

Security systems

The items below specifically relate to the security-systems technics article beginning on page 88 in this issue. They are grouped here for the reader's convenience.

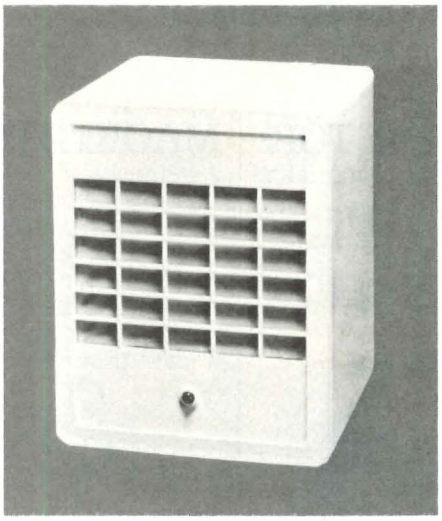
Products

Electronic alarm system. The VP-700 alarm system for protecting vaults, safes, and premises, or a combination of the three, is suitable for medium- and high-risk applications, says manufacturer. Vault protection comprises a sound accumulator, a high-security vault door contact, a heat sensor, and an optional smoke detector. Safes are protected by door contacts, heat sensors, and electrical linings. To protect premises, the system monitors magnetic door contacts and sonic, infrared, and microwave detectors. Light Emitting Diode (LED) displays show the status of various circuits and conditions. An optional police alarm connection is operated by foot, hand, or knee. Diebold, Inc.
Circle 100 on reader service card

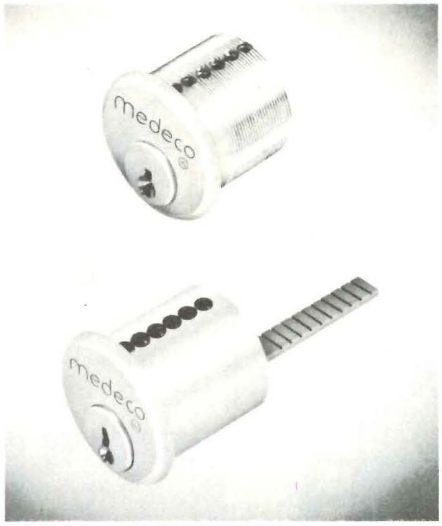
Passive infrared detectors sense intrusions by emitted thermal radiation, as well as movement. Thermalarm PIRS 75 has a range of approximately 50 ft, and, since units do not interfere with each other, multiple sensors may be installed within an area. RFI shielding protects against false alarms caused by radio frequency interference. PIRS 10 is intended for protection of narrow areas, and PIRS 5B is for perimeter protection. Fire-Lite Alarms, Inc.
Circle 101 on reader service card

Security lock cylinders. Replacement high-security cylinders are available to fit locks produced by many companies. Double-locking pin tumblers require a combination of correct elevation and rotation of pin tumblers to open the lock. Replacement cylinders are produced for cylindrical locksets, padlocks, and tubular deadlocks. The company also produces cam locks, inner cylinders, and switch locks for alarm circuits, electric door strikes, and electrical controls. Medeco Security Locks, Inc.
Circle 102 on reader service card

Electronic alarm system.

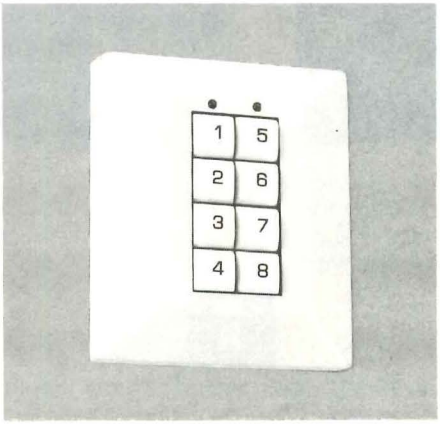


Passive infrared detectors.



Security lock cylinders.

An electronic keyboard.



An electronic keyboard operated by code is a keyless means of controlling access. It is activated by a four-digit code and will directly operate dead bolts and door strikes. The unit locks automatically when the wrong code is used or in the event of tampering. It is environmentally sealed and weather-resistant for outdoor use. Sen-DEC Corp.
Circle 103 on reader service card

Electronic access control systems consist of an electronically coded card called a Command Key, a sensor that transmits the code to a control unit, a transformer, and the control unit that validates the code to open the door. An unrecognized code bars access and may cause an alarm to be sounded, if required. Models are available for one door or as many as ten doors, gates, or turnstiles. Schlage Electronics.
Circle 104 on reader service card

Access control. The all-electronic Interrogator 770 access control is capable of monitoring, controlling, and documenting the movement of 1500 cardholders at 16 separate locations. Circuits within a 1.5-mile radius are connected directly to the unit; across town or across the country, modems operating over telephone circuits allow connection to the central controller. Each entry card is programmed with an identification number which is read electronically to determine the level of access. A built-in printer provides a record of all transactions. Greer Hydraulics, Inc., Cardkey Systems Div.
Circle 105 on reader service card

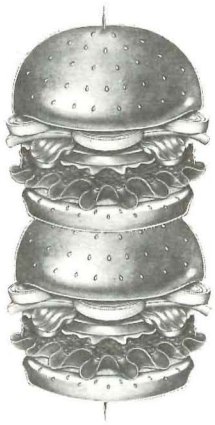
Mul-T-Lock security systems have a network of key-operated dead bolts that penetrate four sides of the door frame. They can be installed in residential, commercial, and institutional doors, as well as steel lockers and cabinets. Lectrilock systems are available that permit remote, keyless operation. Mul-T-Lock Corp.
Circle 106 on reader service card

A computerized long-range security system for airplane, boat, car, home, office, etc., consists of three basic parts: sensors, transmitter, and receiver. More than 50 sensors available range from simple magnetic contacts to radar, and include those for power failure, fire and toxic gas, and flood, as well as unauthorized entry. When a sensor is activated, the transmitter sends a message to the receiver, at a marina office for example, where a blinking light identifies the problem. A radio pager permits monitoring up to five miles away. Where guards are not on duty, the unit can alert police. Seaboard Electronics Company.
Circle 107 on reader service card

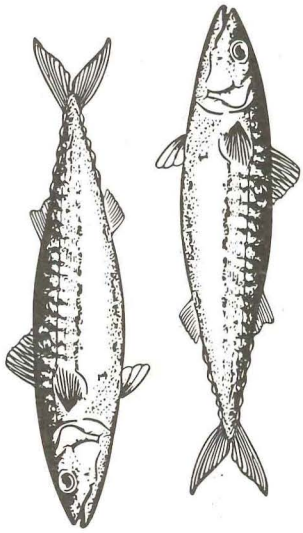
Multizone fire management system. Functions of this hard-wired, fully integrated central control for commercial buildings are: fire detection with automatic notification of the fire department; public address system to notify occupants; phone communication with firemen on site; and control of elevators, heating, ventilating, and air-conditioning equipment for fire and smoke control. According to the company, the system has UL approval for Code 72 of the National Fire Protection Association. Honeywell.
Circle 108 on reader service card
[continued on page 106]

(măks)

MACS
For snacks.

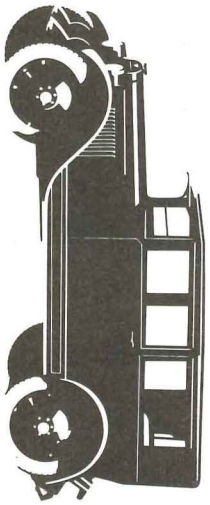


MACS
For snacks. (For sharks)



MAX FACTOR
A famous Max who fabricated everything from blusher to baby blue eyeshadow. All of which seems to have more to do with illusion than factor.

MAXWELL
Mr. Benny's famous road car. Overall a very fine machine. Its only problem was a cheap Jack.



MACKINTOSH
A raincoat of the variety invented by Sir Charles Mackintosh in the early 1800's. Originally designed for protection from the elements, it is now used for other types of exposure as well.

STRAITS OF MACKINAC
Neither here nor there. A channel between Michigan's upper and lower peninsulas.

McCOYS

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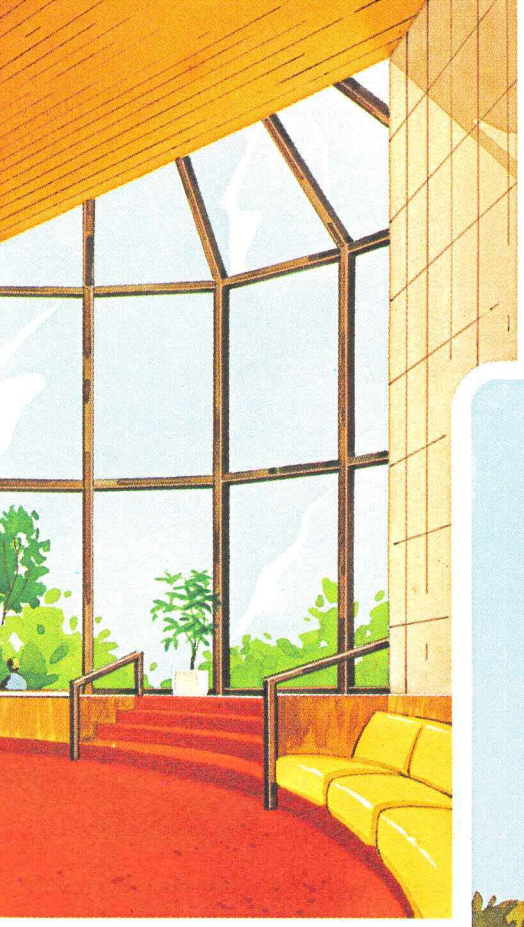
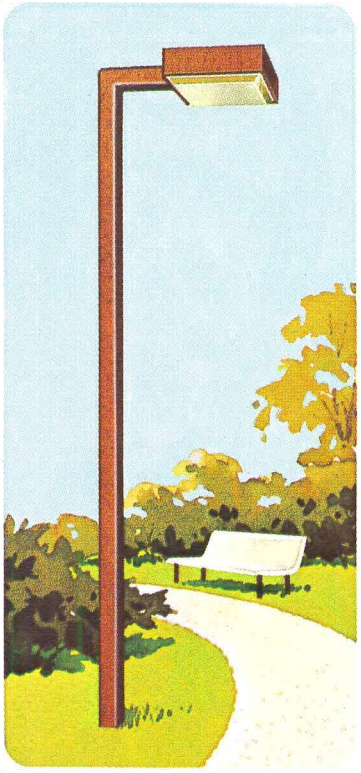
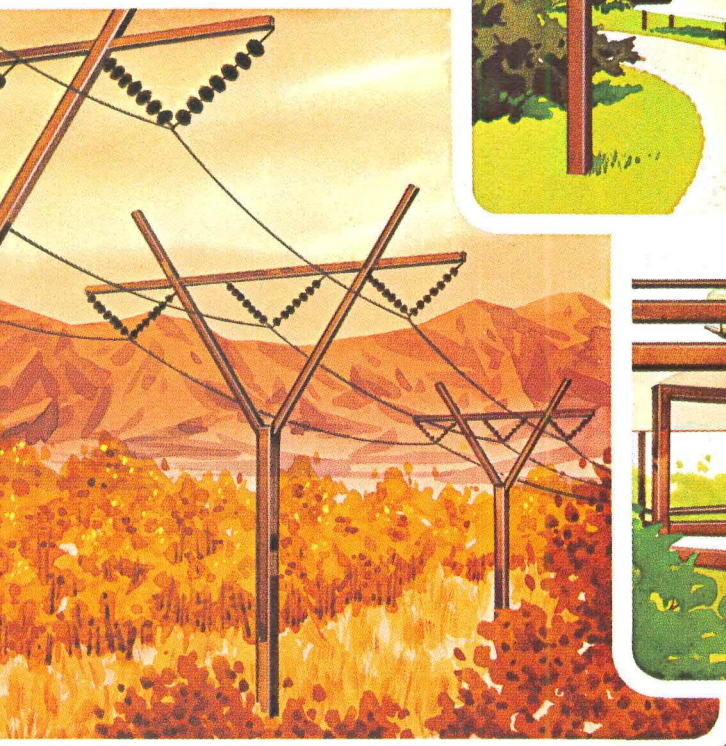


New Regal earth tube™



Now Regal offers you structural steel tubing with a beautiful yet tough weathering surface. The warm earth tones of its durable surface mature with age and blend naturally into any environment. Painting is never required. Available in square and rectangular shapes, dozens of perimeters and wall thicknesses for scores of uses. Earth tube. We think you'll agree its well named.



The Copperweld Tubemakers
REGAL TUBE COMPANY
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Chicago, Illinois 60638 • 312/458-4820

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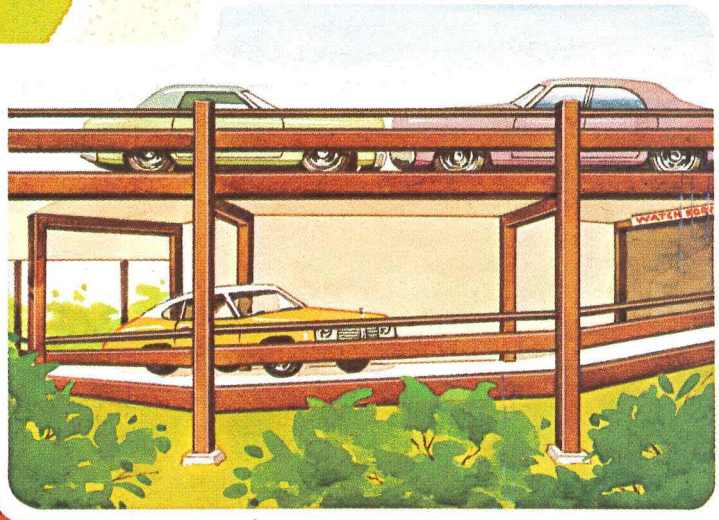
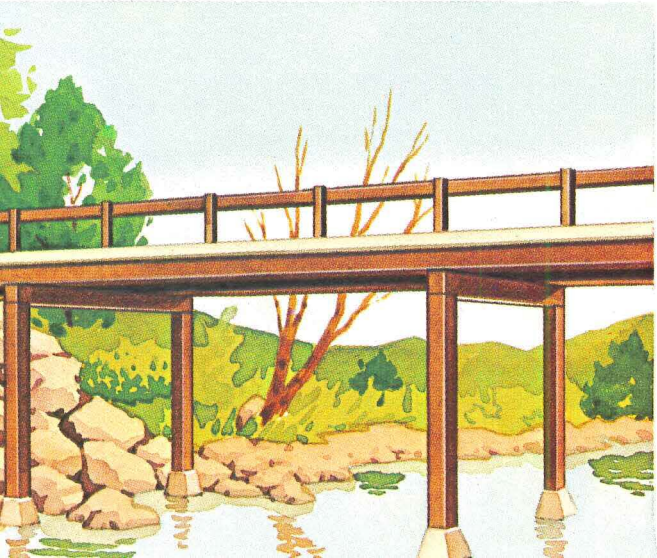
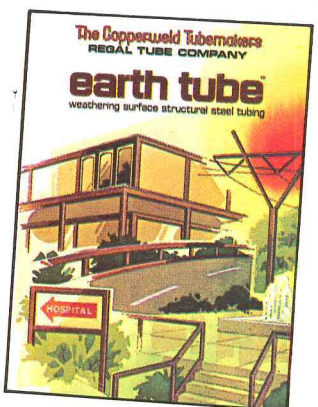




We invite you to send for our earth tube catalog.



Products continued from page 103

Razor ribbon is a helical topping for chain-link fences that provides additional security against intrusion. The ribbon is 1 in. wide, 0.025 in. thick, and has approximately 1700 1-in. barbs for every 50 ft of ribbon. The company recommends that it be used on fences that are at least 7 ft high, installed in such a way as to avoid pedestrian contact. Its purpose is to delay access long enough for intrusion detection and apprehension by electronic or other means. American Security Fence Corp.
Circle 109 on reader service card

Smoke detectors. Multi-station smoke detectors, designed primarily for new construction, may have up to six units interconnected with low-cost, low-voltage Class 2 wire. According to the manufacturer, the wire does not have to be run in BX cable or conduit unless specified by local code. Plug-in two-wire connectors are supplied with each unit to simplify interconnection. Models 77T and 77TR meet UL Standard 217 for sensitivity, and can detect both visible and invisible products of combustion. They operate in a temperature range of 30 to 120 F at 20 to 95 percent relative humidity. BRK Electronics Div. of Pittway Corp.
Circle 110 on reader service card

Lexan® sheet glazing products. Brochure discusses the use of Lexan polycarbonate sheet for security glazing. Included are Lexgard bullet-resistant laminate; Lexan MP-4000 for windows that are subject to frequent handling and washing; and Protect-A-Glaze sheet which has a textured surface that diffuses light while obscuring vision, recommended by the manufacturer for industrial plants and factories. General Electric Co.
Circle 111 on reader service card

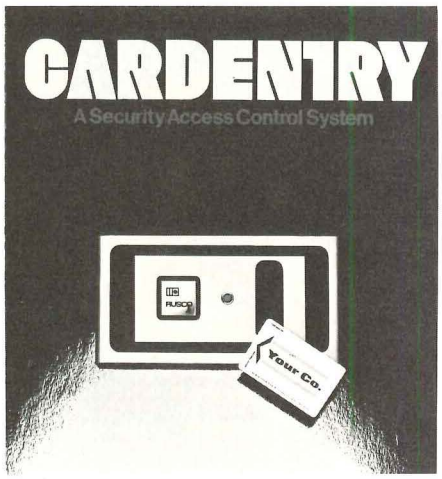
A microwave motion sensor to detect indoor intrusion operates on a.c. power, with a back-up battery to provide coverage if there is a power failure. The mounting bracket can be mounted in corners, on walls, or on ceilings. The sensor is shielded from RFI or other electrical interference. Racon, Inc.
Circle 112 on reader service card

Literature

Automatic doors. Sliding, swinging, and revolving doors, automatically actuated, are fully described in a 20-page brochure that has color illustrations. It covers the methods of actuation, housings available, operator mechanisms, and safety egress devices. Other products manufactured by this Australian company, with U.S. distributors, include garage door operators and remote-control gate operators. B.W.N. Automatic Doors.
Circle 200 on reader service card

Cardentry—A Security Access Control System. The computer-software control system for entry permits easy changes in times and areas of access by changing the programming, unlike lock-and-key systems that must have both units changed to alter accessibility. Some of the options suggested in the 12-page brochure are: one access within a time period (to a cafeteria at lunch time, for example); barring two successive entries without an exit, to prevent passing a card to another person; and monitoring watchmen's tours. Rusco Electronic Systems.
Circle 201 on reader service card

Automatic doors.



Cardentry—Security Access Control.

The Security-3 Door System is an insulated steel door incorporating three dead bolts (top, middle, and bottom) that are operated by a single key. Steel plates are built into the wooden frame at each bolt location, or an all-steel frame is available. The hinges are self-locking, and there is a 200-degree viewer. Shown in the 4-page brochure, in addition to these features, are six hardware styles available. Pease Company, Ever-Strait Div.
Circle 202 on reader service card

Architectural hardware. Security systems having highly pick-resistant cylinders, special keys that can be duplicated only at the factory, and removable cylinders for quick keying change are included in this 20-page catalog. Other security systems offered are electro-mechanical locks, and key- and card-controlled access locks. Illustrations show locks and latches; tabular material suggests lock models from four lines for specific areas of application. Door closers panic hardware, and a fireguard closer also shown. Sargent and Company.
Circle 203 on reader service card

Electronic security systems include point p tection alarms and photo surveillance; infrare intrusion detection for area protection; and perimeter monitoring. Information about thes systems and card access and control units a included in a 12-page brochure. Also includ is a complete security console, Moduplex 40 that monitors fire detection, building controls surveillance cameras, security, and vaults. Mosler Security & Transaction Systems.
Circle 204 on reader service card

Fire-pump flow meter. A 4-page catalog co ers the Eagle Eye system for monitoring sprinkler-system water flow in gallons per mi ute. Included is information about how it worl its use in various systems, how to order and specify the equipment, installation cost surve and NFPA requirements for water-measuring devices. Dieterich Standard Corp.
Circle 205 on reader service card

Fire protection sprinklers, devices, and ac cessories. Catalog has information about sprinklers, nozzles, valves, and accessories automatic sprinkler systems. Photographs sh major components for which descriptions, sp ification data, approvals, and metric convers information are provided. Grinnell Fire Protec tion Systems Co., Inc.
Circle 206 on reader service card

X-ray screening system for large parcels. Dynafluor V X-ray security screening system used for checking luggage or cargo. Data sh details construction, operator control, and d size, with dimensions given in both English a metric units. Philips Instruments, Inc.
Circle 207 on reader service card

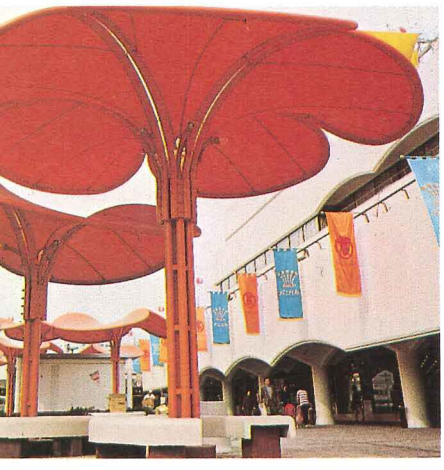
Electrical security hardware. Catalog cove items that help provide building security and traffic control. These include electric and monitor strikes that unlock and relock doors motely; mullions for electric monitor strikes; magnetic switches; and consoles for contro the devices. Accessories shown are transfo ers, sequencers, vibrating horns, intercom speakers, and light panels. Von Duprin, Inc
Circle 208 on reader service card

Access Control and Alarm Monitoring sys tem, Model 514, controls up to 256 entrance and 500 employees. The sensor can be con cealed so that there is nothing visible to be v dalized. A computer printout shows date, tim and nature of access attempts. Components major features, and a diagram of a typical in lation of this card-activated electronic syste are covered in a 4-page brochure. Schlage Electronics.
Circle 209 on reader service card

Communications and Lock Control Syste Architectural specification guidelines are pr vided for: Securicom®, a system that uses te ants' telephones to communicate and to rele the door; System 4 speakers and modular c
[continued on page 110]

NATURE'S FORMS

'Spectacular' nsion Structures Helios.



The logic of a tensioned membrane structure is as exciting as its design. What could be more practical than these dramatic shelters for an outdoor music amphitheater? Or more graceful than this white tensioned structure at the Aspen Design Conference in Colorado? Or more eye-catching than these unique sunshades?

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If you have a project where a membrane structure may be the answer, or if you'd just like more information for future reference, write and tell us: Dept. P-10. Helios Tension Products, Inc., 1602 Tacoma Way, Redwood City, CA 94063. Telephone: (415) 364-1770, Telex 345590.

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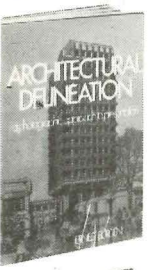
by J. H. Callender
Pub. price, $39.95
Club price, $29.95

162/182
TIME-SAVER STANDARDS FOR BUILDING TYPES, 2/e
by J. De Chiara and J. H. Callender
Pub. price, $42.50
Club price, $29.95



089/248
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by E. E. Burden
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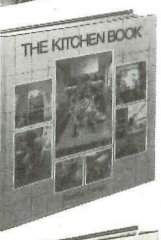

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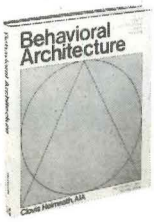

278/903
BEHAVIORAL ARCHITECTURE: Toward an Accountable Design Process
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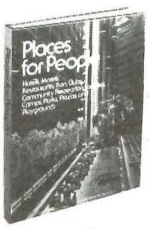
Pub. price, $17.50
Club price, $12.95



022/011
PLACES FOR PEOPLE: Hotels, Motels, Restaurants, Bars, Clubs, Community Recreation Facilities, Camps, Parks, Plazas and Playgrounds, 3/e
by J. M. Davern
Pub. price, $23.95
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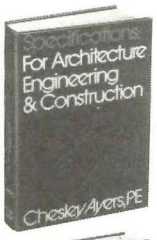

026/386
SPECIFICATIONS: FOR ARCHITECTURE, ENGINEERING, & CONSTRUCTION
by C. Ayers
Pub. price, $18.00
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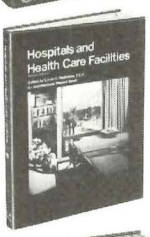

023/387
HOSPITALS AND HEALTH CARE FACILITIES, 2/e
by L. G. Redstone
Pub. price, $24.50
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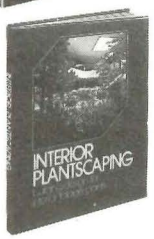
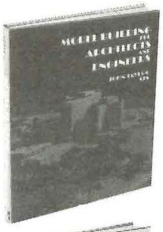


226/784
INTERIOR PLANTSCAPING: Building Design for Interior Foliage Plants
by L. R. Gaines
Pub. price, $22.95
Club price, $17.95

256/284
ARCHITECTURAL RENDERING: The Techniques of Contemporary Presentation, 2/e
by A. O. Halse
Pub. price, $32.50
Club price, $21.95



629/382
MODEL BUILDING FOR ARCHITECTS AND ENGINEERS
by J. R. Taylor
Pub. price, $22.95
Club price, $15.95

772/428
SOLAR ENERGY & BUILDING, 2/e
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A36213

Literature continued from page 106

trol unit for apartments; and entrance directories that are tamper-resistant, weather-resistant, and easy to install. Diagrams show representative wiring systems for different types of installation. NuTone Div., Scoville.
Circle 210 on reader service card

Design Guidelines for Creating Defensible Space. Prepared by Oscar Newman for architects, developers, housing agencies, and community groups, this is a comprehensive outline for designing housing to reduce vulnerability to crime. It presents alternative plans for housing that can be built for the same or lower cost and offers greater security than existing housing. It is based on information obtained from research sponsored by the National Institute of Law Enforcement and Criminal Justice and the Department of Housing and Urban Development. Copies are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock number is 027-000-00395-8 and the price is $2.95.

Security systems. Over 900 burglar- and fire-alarm products are listed in this 72-page catalog. Equipment ranges from magnetic door switches, control and bell systems, to radar, ultrasonic, and infrared detectors. Descriptions include use, principle of operation, specifications, and connection diagrams where needed. Mountain West Alarm Supply Co.
Circle 211 on reader service card

Loss prevention products. Alarm equipment, monitoring devices for burglary, fire, and other emergencies, and locking devices with built-in recorders are shown in this 8-page catalog. Heat sensors, passive infrared detectors, door contacts, digital/telephone communicators, closed circuit TV, bells, horns, strobe lights, and beacons are also listed. Silent Watchman Corp.
Circle 212 on reader service card

Intrusion detector. Data sheet describes BiSpy, a passive infrared intrusion detector that can be mounted out of sight in walls, in partitions, or behind louvered panels. It operates by sensing heat energy transmitted by an intruder. Two sensing elements and two signal processing circuits, which must transmit a signal simultaneously, prevent false alarms. One model provides a single detection zone; another divides the protected area into five zones. A specification chart is included. Raytek Div., Optical Coating Laboratory, Inc.
Circle 213 on reader service card

Project Update describes twelve representative installations of building automation systems. Information about each installation includes installed value, size, number of points of monitoring/control, functions, configuration, and special requirements. A general configuration guide explains system capabilities and software functions of the company's eight compatible systems. Compuguard Corporation.
Circle 214 on reader service card

A computerized alarm and control system to monitor fire alarms, sprinklers, audio communications, patrol tours, access control, equipment functions, and closed-circuit TV is described in a 12-page brochure. A schematic diagram of the basic system, sample printer record, and examples of operation are included. Douglas Randall Div. of Walter Kidde & Co., Inc.
Circle 215 on reader service card

Automated building management. Application of the Delta system of sensors, detectors, data gathering panels, control processor, and operator terminal is discussed in a 16-page brochure. According to the manufacturer, the systems offer savings because of more effective energy management, more efficient manpower utilization, and better building protection. Honeywell Commercial Div.
Circle 216 on reader service card

Burglar and fire alarms. Products and accessories for security systems are described in this updated 194-page catalog. Includes control instruments, sounding devices, power supplies, monitors, space protection, various contact methods, central station equipment, and fire alarm equipment. Also discusses training programs and seminars that are conducted periodically. For a copy of Catalog 78, write on firm letterhead to: Alarm Device Manufacturing Co.,
[continued on page 113]

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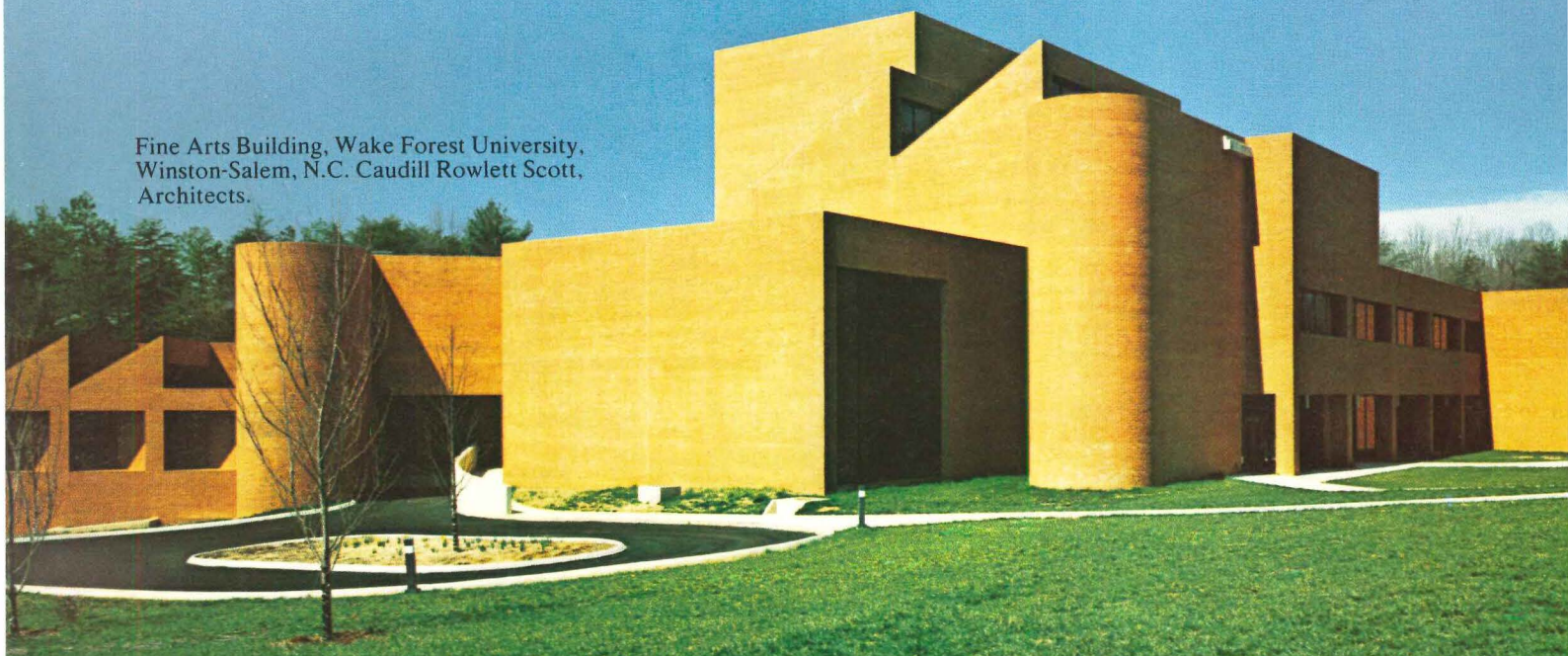


Fine Arts Building, Wake Forest University, Winston-Salem, N.C. Caudill Rowlett Scott, Architects.

A Design This Bold Needs Brick, Not Compromise

Brick Institute of America
1750 Old Meadow Road / McLean, Virginia 22102

Literature continued from page 110

Div. of Pittway Corp., 165 Eileen Way, Syosset, NY 11791.

High-security locking system. Descriptions and illustrations provide information about a pin-tumbler cylinder that resists tampering. Hardened-steel armor rods and protective shield are drill-resistant. Key duplication is also protected. The cylinders are designed for mortise locksets, rim locks, and key-in-knob locksets. Hardware Div., Emhart Corp.
Circle 217 on reader service card

Keyless locks. Various combinations of five digits, pushed in sequence or simultaneously with other buttons, limit access to protected areas. Several installations of these push-button locks are described and illustrated in 4-page folder. Simplex Security Systems, Inc.
Circle 218 on reader service card

The airbolt is a chromium-plated brass dead bolt with a hardened steel insert, supported by a stainless steel spring. It is held in the locked position by pneumatic force. A 4-page brochure gives the results of pressure tests, and lists typical applications. Specifications and technical data include a diagram of the system. Hager Control Systems.
Circle 219 on reader service card

Security systems. A single console, the J/C/80, monitors and controls all building systems: security, energy management, fire, and communications. With the basic console installed for one type of control, programs can be added as desired to broaden coverage. Eight-page brochure discusses the use of the system for security control. Johnson Controls, Inc.
Circle 220 on reader service card

Other products

Jax crisscross design carpet, in eight colorways, is the ninth pattern in the Royalax group of woven axminster broadlooms. The 12-ft-wide carpeting is power-loomed in Ireland of 80 percent wool and 20 percent nylon. It can be used for both residential and contract applications. Couristan.
Circle 113 on reader service card

Cushioned sheet-vinyl flooring in patterns, available for the first time in the US for commercial use, is offered in a wide range of colors and patterns. The flooring, called Futur, maintains a just-waxed look, and stands up to scuffs and scratches, according to the manufacturer, because the surface is reinforced with polyurethane. A chemical welding applicator fuses sheets to keep dirt and moisture from entering seams. Futur is guaranteed for five years. Tarco Eastern, Inc.
Circle 114 on reader service card

The Professional drafting table has a smooth, warp-free drawing surface laminated to honeycomb coring and framed in tubular steel. A half turn of the handle permits changes of position from flat to vertical. Work surface is adjustable to any height between 32 in. and 46 in. Top sizes are 24" x 36", 31" x 42", and 36" x 48". Plan Hold Corp.
Circle 115 on reader service card

Automatic door opener. The Model 4300 door opener is operable with a variety of sensors: wall-mounted switches, floor-mat switches, and radio control. It can be installed in homes, schools, clinics, nursing homes, motels, banks, and other locations where automatic door operation is desirable. The door can still be operated manually. Installation is said to be simple, requiring no special equipment. Power Access Corp.
Circle 116 on reader service card

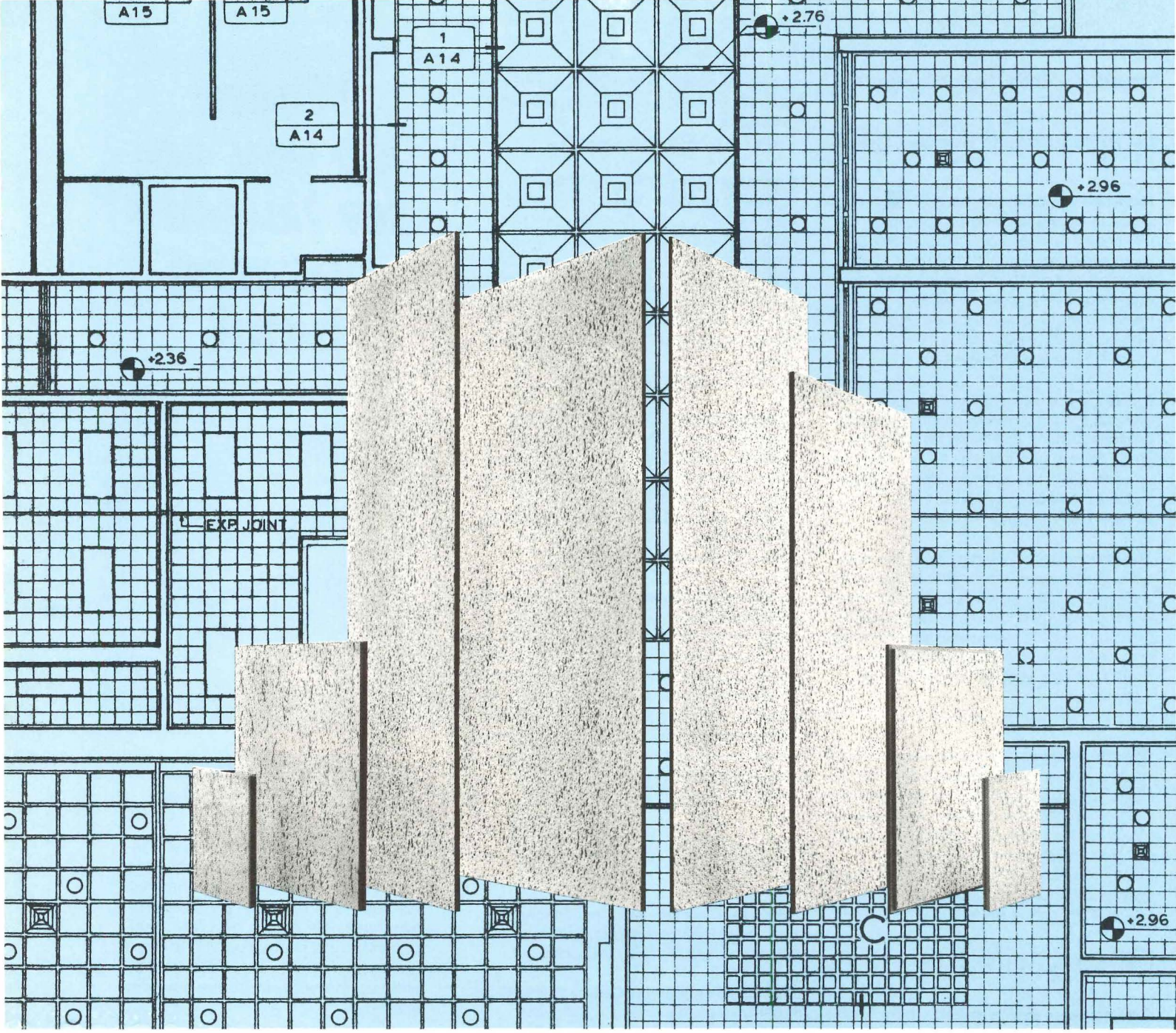
SolarWall Panels. Translucent insulating panels consisting of two flat fiberglass-reinforced acrylic polyester sheets enclosing dead air space let in light but insulate against solar heat. The inch-thick panels block ultraviolet rays and reduce sound transmission. Solartron Corp.
Circle 117 on reader service card

Av-Com multi-media audio-visual communication system can be installed in existing space, in new construction, or as a freestanding unit. The patented optical system shows single or dual images of slides, sound motion pictures, or overhead transparencies. There is front access to all components, making it easy to load and control all elements. Compact units can be housed in cabinets as shallow as 33 in. The Jerome Menell Co., Inc.
Circle 118 on reader service card

Building materials

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

East Building, National Gallery of Art, Washington, DC (p. 49). *Architects: I.M. Pei & Partners, New York.* Concrete foundation mat: Marquette Cement Co. Post-tensioned mat anchors: Raymond International. Reinforced concrete: Marquette Cement. Architectural concrete: Medusa Cement Co. Rebars, steel framing, girders: U.S. Steel, Bethlehem Steel. Post-tensioning: VSL Corp. Metal deck: Inland Steel. Tennessee marble: Candoro Marble Co., Tennessee Marble Co. Gypsum wallboard: National Gypsum, U.S. Gypsum. Stretched fabric for auditorium: Homecraft Drapery & Upholstery Co. Vinyl in cafeteria: Stouffer Chemical Co. Ceramic tile floors: Romany-Spartan. Quarry tile: American Olean. "Gothicized Oak" wood flooring in gallery: Wood Mosaic Co. Resilient vinyl asbestos: Flintkote. Terrazzo flooring: Boatman & Magnani. Marble flooring: Candoro Marble Co. Rubber flooring: Pirelli Rubber. Carpeting: Bloomsburg Carpet Industries. Aluminum ceiling surfacing in cafeteria: Simplex. Metal pan ceiling in walkway: Alcan. Gypsum wallboard ceiling: U.S. Gypsum, National Gypsum. Liquid membrane roof surfacing and styrene insulation: Tremco, Dow Chemical. Cement waterproofing: Prospect Industries.
[continued on page 115]



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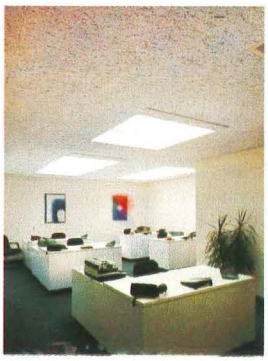

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Materials continued from page 113

Liquid waterproofing: Tremco Industries. Thermal batt insulation: Owens-Corning Fiberglas. Insulating styrene board: Dow Chemical. Gypsum wallboard partitions: National Gypsum, U.S. Gypsum. Folding partitions: National Folding Wall Corp. Aluminum mullions: Seattle Bronze Corp. (Flour City Architectural Metal). Insulating glass: Pilkington Brothers Ltd., PPG Industries. Hollow metal and steel doors: Williamsburg Steel. Wood doors: Haggerty Millwork Corp. Revolving doors: International Steel. Rolling doors: Kinnear, J.G. Wilson. Entrance door frames: Seattle Bronze Corp. Tempered glass doors: LOF, Falconer, American Patterson. Locksets and door closers: Corbin, Rixson. Hinges: Hager Hinge Co. Panic exit: Von Duprin. Interior paint, "Awlgrip" urethane: U.S. Paint & Lacquer. Oil and latex paint: Bruning Paint Co. Refrigerators: Dunham-Bush. Dishwashers: Hobart Manufacturing Co. Ovens and ranges: General Electric. Waste disposers: Colerain Metal Products. Marble counters: Candoro Marble. Stainless steel counters: Carter-Gibson Co. Auditorium seating: JG Furniture Co. Café seating: Castelli (Plia chairs). Cafeteria seating: Beylerian. Dock boards: Autoquip Corp. Bookshelves and stacks: Library Bureau Inc. Traction and hydraulic elevators: Otis Elevator. Elevator cabs: E.C. Architectural Products. Moving stair: Otis. Moving walkway: Goodyear Tire & Rubber Co. Exterior wallwash lighting: Rambusch Decorating Co. Fountain lighting: Hydrel. Plug-in track lighting: Edison Price, Inc. Air-handling/downlighting: Major Corp., Edison Price. Dimmers: Kleigl, Lutron. Fluorescent: Continental Lighting, Columbia Lighting. Electric distribution: ITE (panel boards). Arrow-Hart, H&H, P&S (wiring devices), Cell Co. (underfloor distribution), ASCO (transfer switches). Lavatories and water closets: American Standard. Pipes: Johns-Manville. Sprinklers: Viking Corp. Carbon dioxide system: Walter Kidde Co. Automatic heating controls: Barber-Colman Co. Centrifugal water chillers: Borg-Warner (York Div.). Centrifugal pump: Worthington Pump, Inc. Condensate pump: ITT Domestic Pump. Duct insulators: Johns-Manville. Interior a/c sound insulation: Owens-Corning Fiberglas Co.

Aye Simon Reading Room, Solomon R. Guggenheim Museum, New York (p. 68). *Interior design: Richard Meier and Associates Architects.* Carpet: Cloden. Downlights: Lightolier. Oak paneling: Loosen and Brautigam. Furniture (custom design): Mazza.

Radnor Corporate Center, Buildings 2 and 3, Radnor, Pa (p. 74). *Architects: Geddes Brecher Qualls Cunningham, Philadelphia.* Spread footings, frame, and walls: General Concrete Co. Filagree wide-slab beam system: J&M Structural Systems Corp. Exterior walls: Kurtz Precast Corp., PPG Industries, Inc. Roof: "IRMA" (Dow Chemical copyright for inverted roof membrane assembly). Water-proofing and damp-proofing: Toch. Hollow metal and wood interior doors: Acme Steel Corp. Door closers: Beck-Guttman, Inc. Toilet-room accessories: Material Distributors, Inc., of Accessory Specialties, Inc. Hydraulic elevators: Dover Elevators. Package rooftop HVAC units: McQuay-Perfex, Inc.

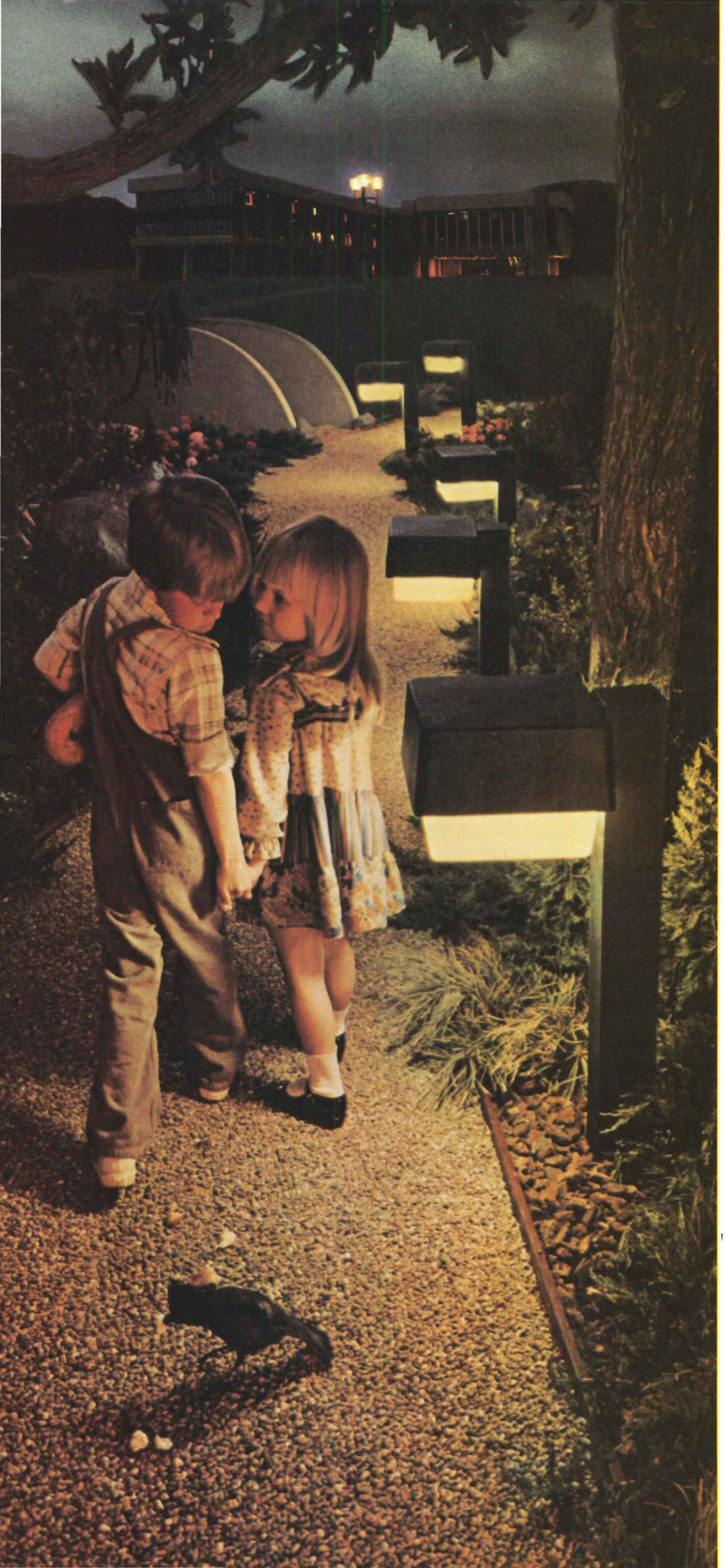
Hewitt Associates building, Lincolnshire, Il (p. 76). *Architects: Hammond Beeby & Babka, Chicago.* Cast-in-place foundation: US Steel reinforcing bars. Steel frame: US Steel. Composite floor deck: Elwin G. Smith Co. Metal roof deck: Epic Taler Corp. Wood-faced aluminum exterior wall panels: Crescent Corp. Carpet: Lees, Stanton. Vinyl-asbestos tile: Armstrong. Acoustic ceiling tile, metal grid system: United States Gypsum, National Rolling Mills. Built-up roof: Barrett. Fluid waterproofing on decks: Toch Div. of Carboline Co. Damp-proofing on basement walls: Union Chemical Oil Co. Perimeter foundation insulation: Dow Corning. Thermal and sound insulation: United States Gypsum. Roof insulation: Celotex. Roof drains: J.R. Smith. Aluminum windows: Marmet. Hollow metal interior doors: Williamsburg Co., La Force, Inc. Garage doors: Amarlite Anaconda. Locksets: Schlage. Surface-mounted door closers: Russwin. Floor-mounted closers: Rixson-Firemark. Ball-bearing hinges: Stanley. Exit hardware: Adams-Rite. Exterior bleaching stain: Cabot, Inc. Misc. interior and exterior paint: Sherwin Williams. Kitchen equipment and [continued on page 116]

Materials continued from page 115

counters: Illinois Range Co. Walk-in cooler and freezer: Tafco. Kitchen hoods: Molitron. Computer room raised floor: Donn-Severn. Elevator equipment and controls: Westinghouse. Elevator cabs: Williamsburg Steel Co. Lighting, interior and exterior: Lightolier. Transformers and switch gear: General Electric. Special computer transformers: Topaz. Emergency Power Generation: Dunn. Toilets and lavatories: Kohler. Faucets: Delta. Flush valves: Sloan. Sprinkler heads: Central Sprinkler. Heating, hot water boilers: Precision. Fin-tube radiators: Sterling. Air-conditioning chillers: York, Bohn. Cooling tower: Baltimore Air Coil. Fan units: York.

Allied Chemical Building, Houston, Tx (p. 78). *Architects: S.I. Morris Associates, Houston.* Concrete foundation: Lone Star Cement. Tilt-up concrete basement walls: Armco reinforcing. Precast granite-chip-aggregate spandrel panels: Txl Structural Products. Window wall, dark bronze anodized aluminum frames: James Gavin Inc. Window glass: PPG Twindow. Level 1 core walls and paving, frame-finished granite: Capitol Marble and Granite. Level 1 ceiling, cement plaster: Keene. Tenant ceilings, 12″ x 12″ bevel-edge, concealed-spline tiles: Armstrong Cork Co., Cortega Minatone. Balcony surfaces: 3M Co., "Plaza Rock" granite-chip-aggregate system. Waterproofing: American Colloid Co., 3M Co. Interior partition insulation: Owens-Corning Fiberglas 2½″ batts. Cast iron roof drains: J.R. Smith Mfg. Co. Tenant partitions: metal stud and gypsum board. Flat-sliced red oak doors: Vauter Door Co. Elevators: Westinghouse. Revolving doors: Crane Fullview Glass Door Co. Locksets and door closers: Corbin. Hinges: Stanley Hardware. Rolling doors, shipping and receiving: Wilson Corp. Interior paint: Pratt & Lambert. Speakers in lobbies and fire stairs: Soundolier. Master control panel: Rauland-Borg Corp. Raised floor systems: Donn Access Floors. Tenant light fixtures, 2′ x 4′ fluorescent: Lithonia. Recessed, incandescent stair lights: Versa Tech Corp. Water closets and lavatories: American-Standard. Flush valves: Sloan. Sprinklers, elevator hoistways: Texas Automatic Sprinklers, Inc. Electric duct heaters: Brasch Mfg. Co. Air-conditioning system: The Trane Co. Supply grilles: Metal Industries, Inc. Exterior-zone slot diffusers: Aeronca, Inc.

Benjamin F. Feinberg Library, State University College, Plattsburgh, NY (p. 80). *Architects: Mitchell/Giurgola Architects.* Concrete: Coplay Cement. Concrete reinforcement: Whitacre Construction Specialties. Brick: Darlington. Plaster: National Gypsum Co. Satinwood veneer panel backing: U.S. Plywood. Quarry tile: American Olean. Vinyl asbestos tile: Armstrong. Metal acoustical ceiling tile: Simplex Ceiling Corp. Built-up roof: Celotex. Scored concrete block: Concrete Building Supply Co. Custom bent steel: Contractors Ornamental Steel Co. Steel window wall: William Bayley Co. Hollow metal doors: Superior Fireproof Door Co. Rolling doors: Overhead Door. Entrance door: Ellison Bronze Co. Hardware: Russwin; McKinney. Paint: Glidden. Hydraulic elevators: Montgomery. Custom designed lighting: Contemporary Ceilings. Plumbing: Kohler; Sloan.



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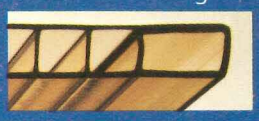

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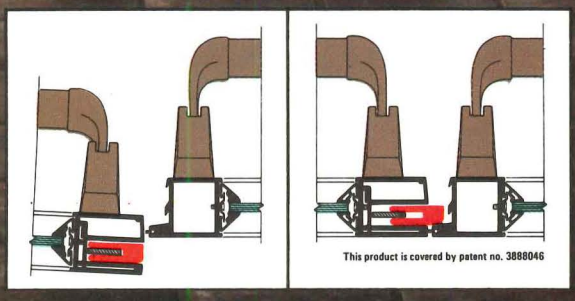

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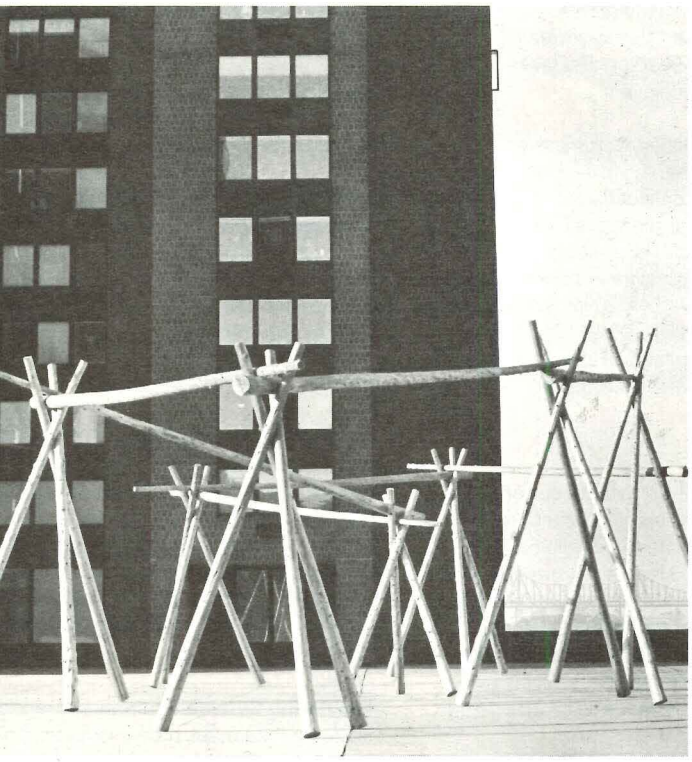

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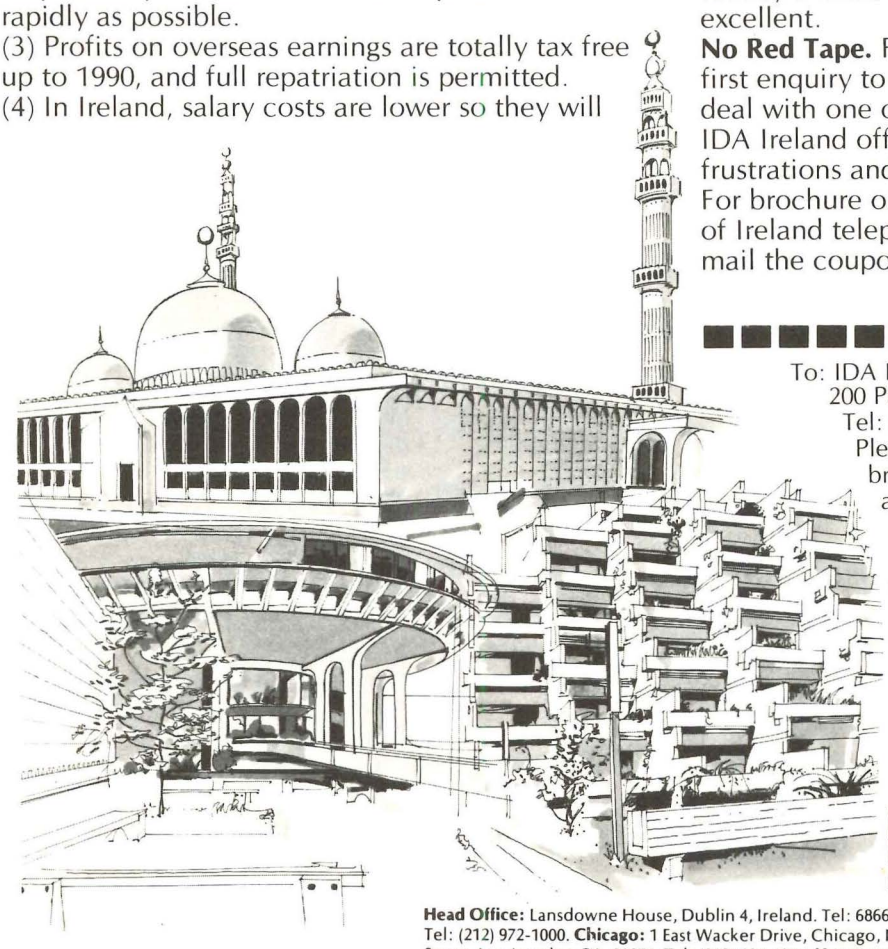

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