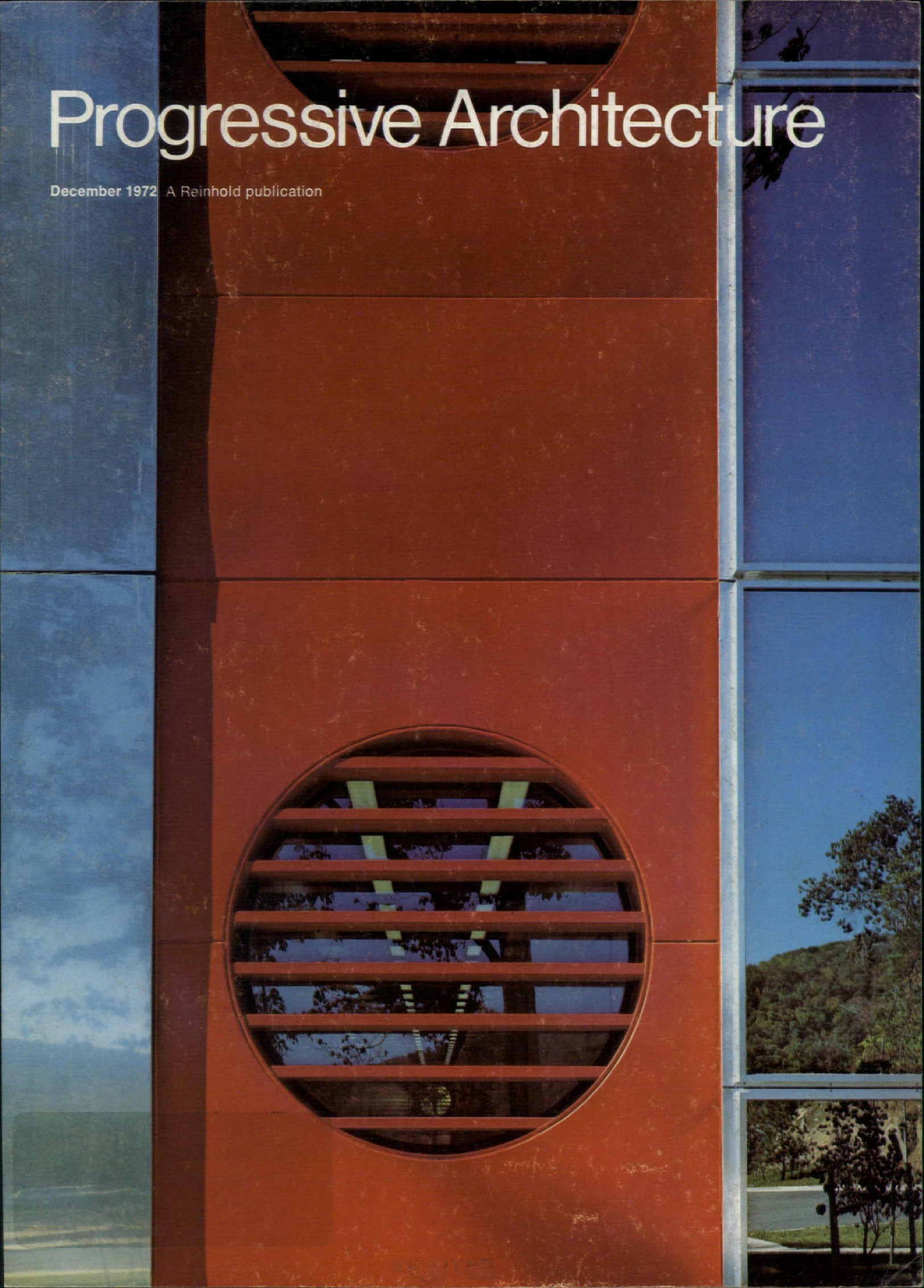
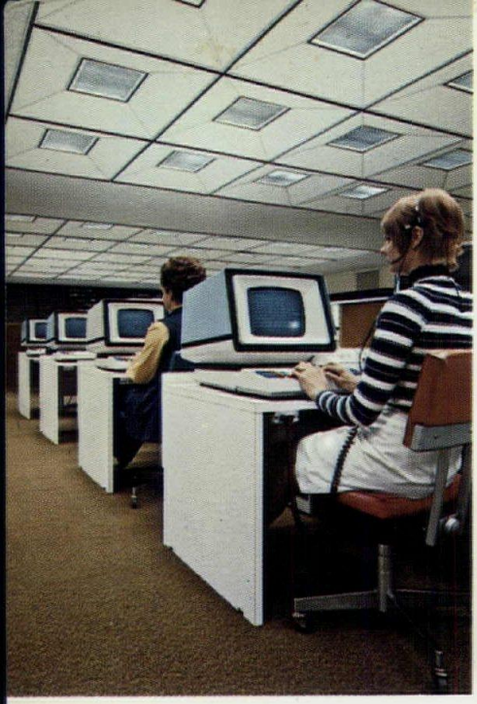
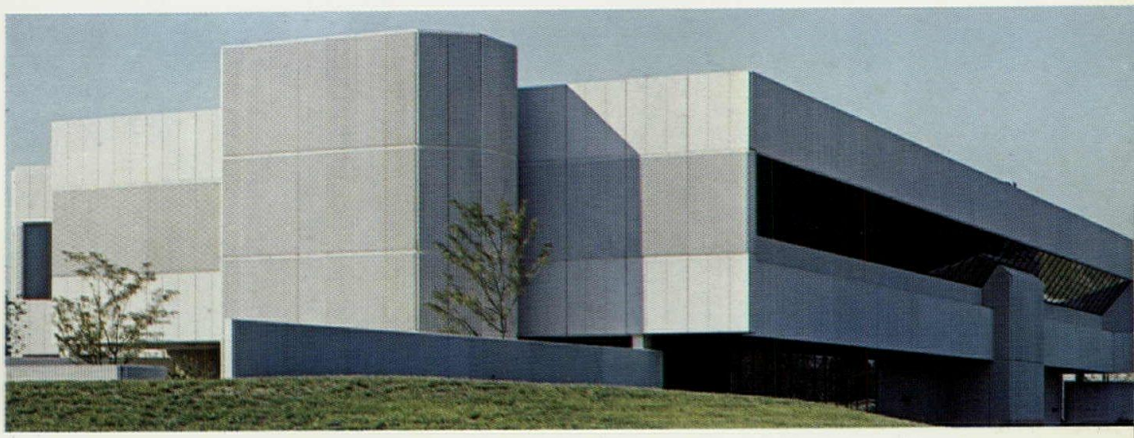
Progressive Architecture

December 1972 A Reinhold publication





What makes this ceiling right for this job?



High-level lighting with low glare, high styling at low cost.

Reservations agents reading cathode-ray tubes and rear-projection viewers at United Air Lines' new Dearborn, Michigan, reservations center must have uniform, low-glare light to prevent eyestrain. Overhead glare can make this sophisticated equipment almost illegible.

To provide the pleasant, efficient environment required, the architects selected a coffered Armstrong C-60/60 Luminaire Ceiling System incorporating 2′ x 2′ lighting fixtures with low-brightness lenses. In addition to meeting illumination requirements, this ceiling provided for uniform air diffusion through Supply-Air Linear Diffusers (SALD) integrated into the grid system.

Because the lobby area and lower floor of the building have different requirements, Armstrong's unique Accessible Tile System is used with attractive Sanserra Travertone™ tiles. Any ceiling tile can be easily removed for 100% accessibility to hidden wires, pipes, and ducts.

Both of these ceilings were designed to solve specific problems. Why not bring your ceiling problems to us? Write Armstrong, 4212 Watson Street, Lancaster, Pennsylvania 17604.

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OWNER: Ford Motor Land Development Co., Dearborn, Michigan
ARCHITECT: Rossetti/Associates, Inc., Detroit, Michigan
GENERAL CONTRACTOR: H. F. Campbell Co., Detroit, Michigan
MECHANICAL/ELECTRICAL/CIVIL ENGINEER: Hoyem Associates, Inc., Bloomfield Hills, Michigan
STRUCTURAL ENGINEER: McClurg & Associates, Inc., Bloomfield Hills, Michigan
CEILING SYSTEMS CONTRACTOR: R. E. Leggette Co., Dearborn, Michigan

Armstrong / CEILING SYSTEMS THAT WORK

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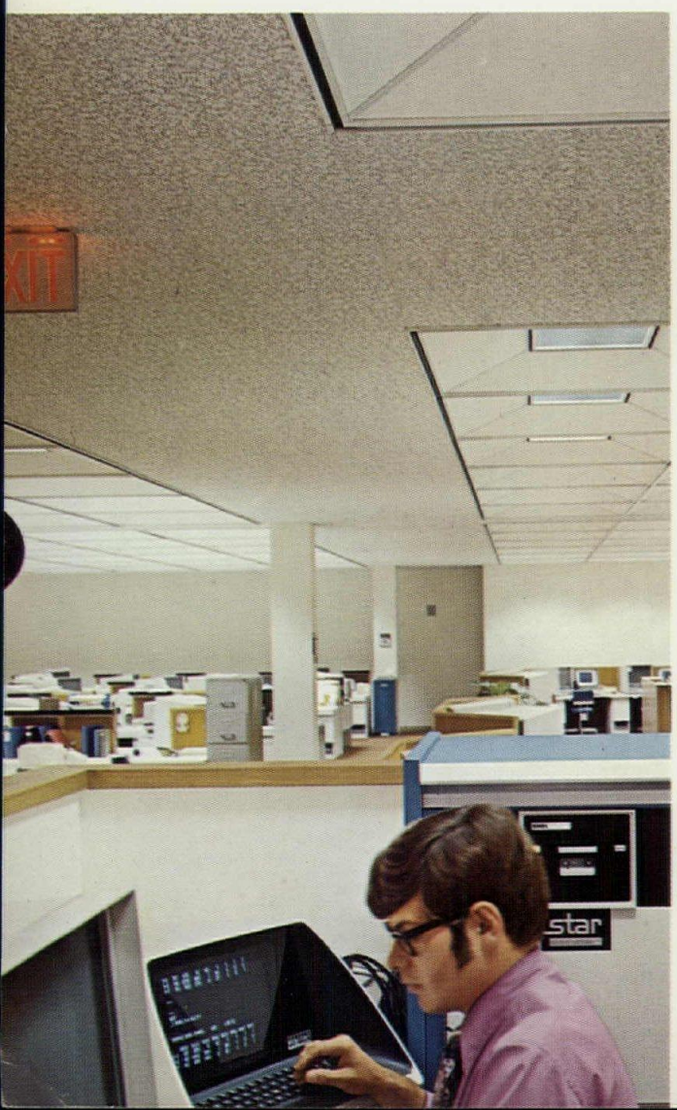

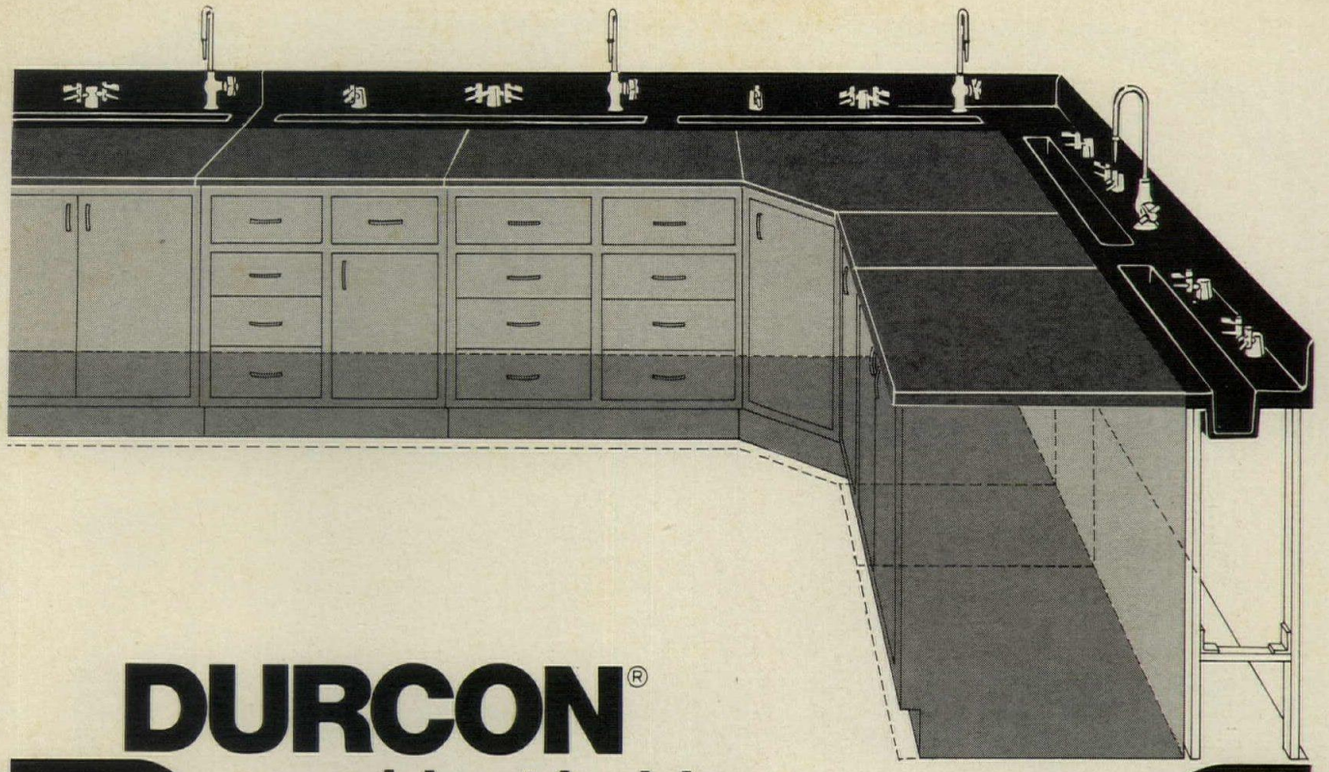

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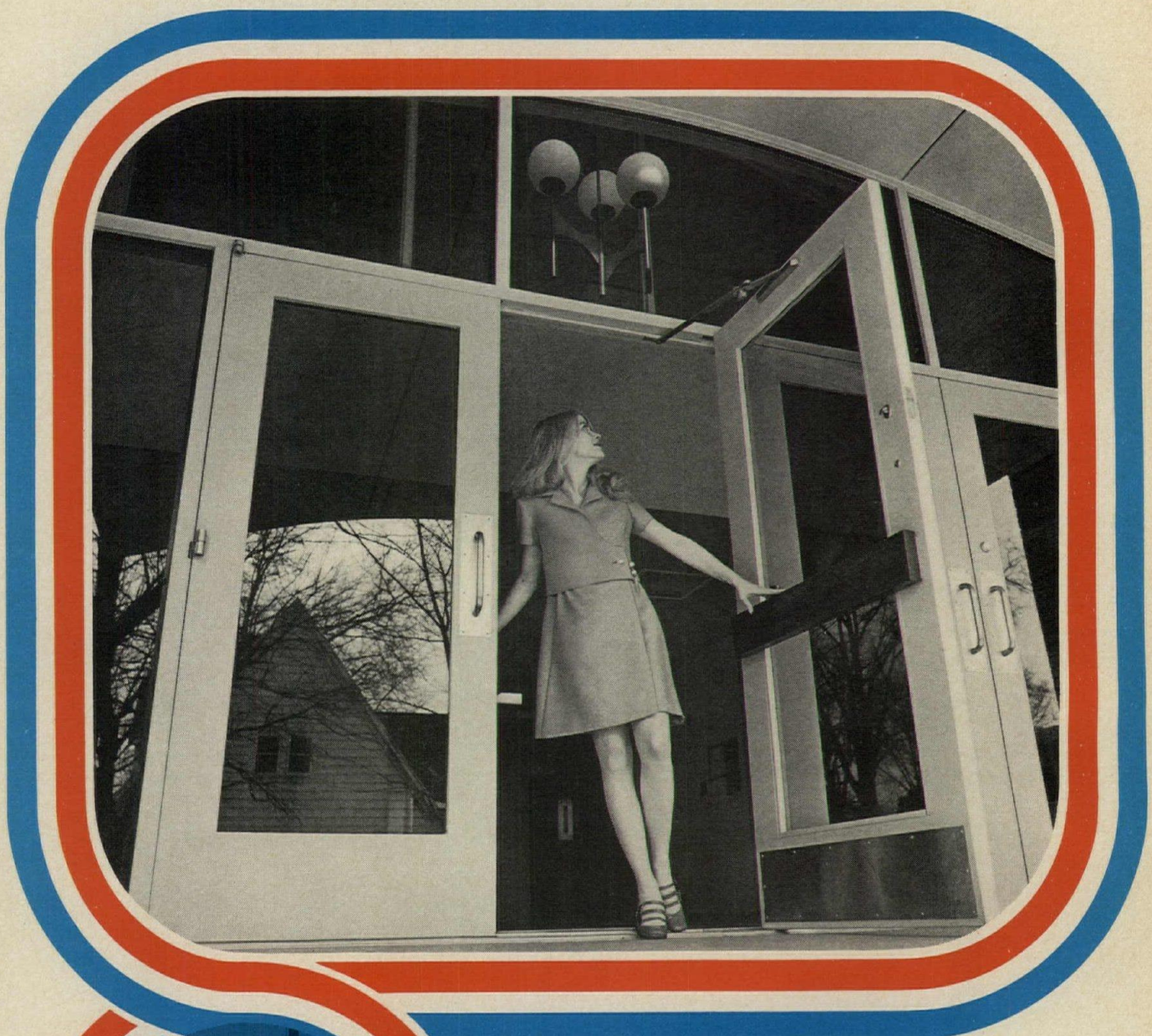

top to bottom

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December 1972

Progressive Architecture

Cover: IBM Information Center, Sterling Forest, N.Y. (p. 50), Gunnar Birkerts & Associates, architects. Balthazar Korab photo.

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(Michael L. Benedum Hall). ARCHITECTS: Deeter Ritchey Sippel Associates.
BUILDER: General State Authority, Commonwealth of Pennsylvania.
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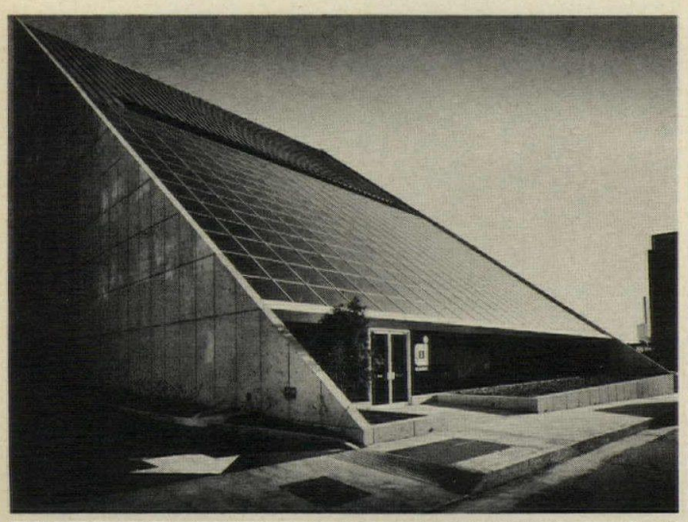

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Letters from readers

Views

Editorial excellence

We would like to compliment you on the October issue of P/A. It was excellent throughout. Beginning with Esther McCoy's "Architecture west" in which she described the profession's loss of enchantment with systems methodology, through to the article, "Alternatives to fear" based on Oscar Newman's book, *Defensible Space,"* every article was to the point.

Forrest Wilson, AIA
Director, School of Architecture
Ohio University College of Fine Arts
Athens, Ohio

Canada replies

Your September 1972 issue dedicated to Canadian architectural efforts was very well received. All members of your publication are to be commended for the thorough and accurate presentation, from the introduction by Prime Minister Trudeau to the choice and layout of projects. It is unfortunate that Canadians are yet unable to present Canadian architecture. The issue has made many Canadian architects more aware and has made them take greater pride in their work. There are numerous requests for the September issue all across Canada.

Gustavo da Roza
Winnipeg

The quick of architecture?

To the marriage of minds, architectural journalism promotes impediments. The misalliance of notions is irritating. . . .

If I may rephrase to my own ends Esther McCoy's opening lines of "Architecture west" in the Oct. 1972 issue of P/A (p. 56):

Nobody should be surprised at Charles Moore's delight in dancing on graves of

[continued on page 10]

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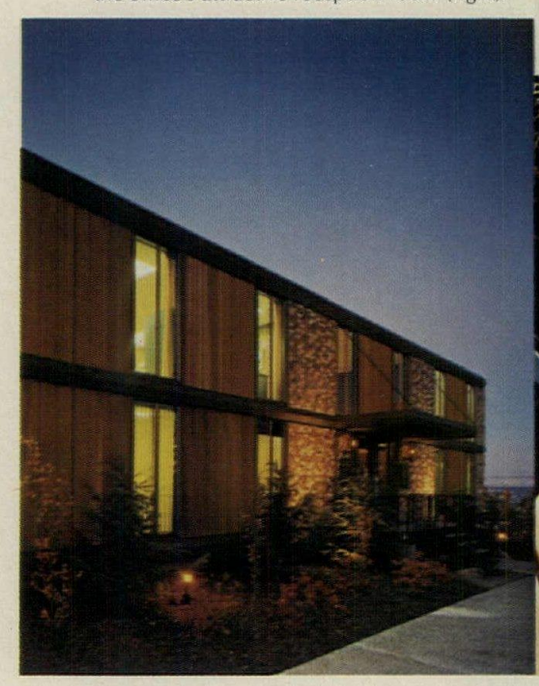
Architectural Consultants: Donald W. McDonald, A.I.A., San Francisco, CA; Harris, Reed and Litzenburger, A.I.A., Tacoma, WA; Person and Person, Inc., Sumner, WA.
Builder: Person and Person, Inc.

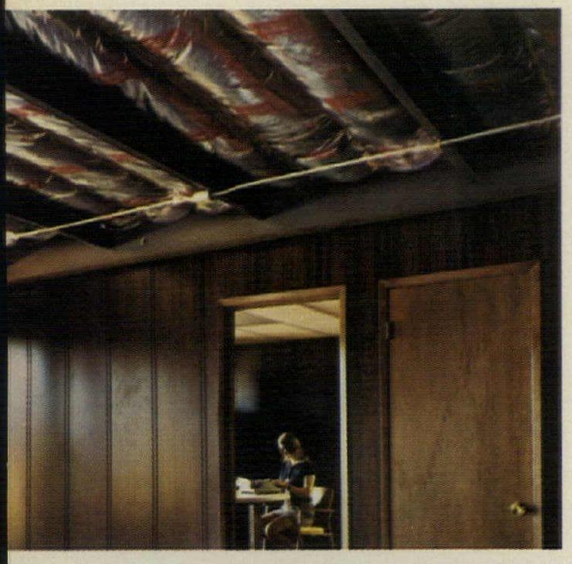
Erected in 7 days, this 2-story law office consists of 14 steel-framed modules, seven on the first floor and seven on top. Each module is 12 ft wide and 40 ft long. A high degree of interior flexibility is indicated by the office's attractive reception room (right).

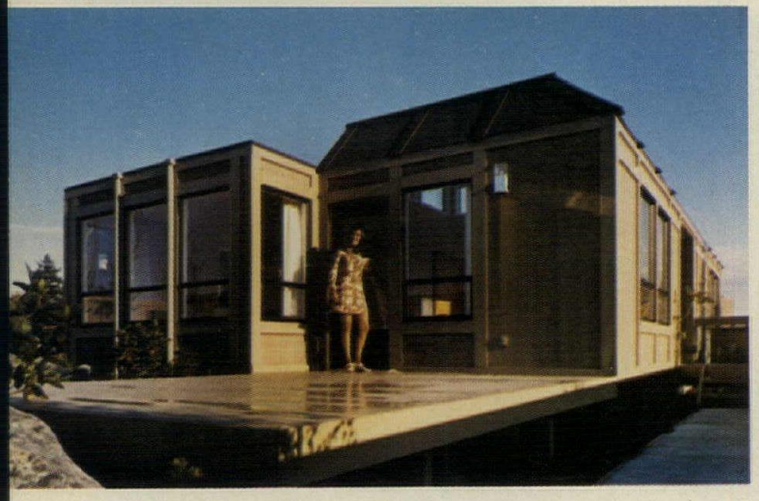


This savings and loan building employs the same basic module as the 2-story law office. Steel framing permits the structure to be picked up and moved with relative ease to another location.

Steel framing proves advantageous for modular construction

Twelve-inch steel channels, visible from an unfinished portion of an office floor, serve as the unit's primary framing members.





An attractive exterior siding and roofline transform the same basic module into a contemporary home. In this case, three 12-ft-wide by 44- to 48-ft-long units were attached to form the single-story residence.

Design adaptability, high strength, and the ability to maintain close field tolerances are several of the key reasons why the use of steel framing is increasing in commercial and residential modular construction.

The load resisting capacity of structural steel enables the modular units to be stacked atop one another. Design flexibility and versatility are almost unlimited.

Steel speeds erection

The ability to maintain good field tolerances, up to ⅛ in. over a 60-ft span, is one reason why steel is so well suited to the modular concept. Virtually eliminated are erection delays due to misalignment of units.

Investors are able to save almost 10 per cent in construction and interim costs through the economies of factory construction and rapid field erection.

All of the buildings shown here were ready for occupancy within 45 to 60 days after contract signing . . . about a four month lead over conventional construction.

Steel improves portability of units

The strength and rigidity of steel framing enables the individual units to be moved with relative ease, both on the assembly line and in the field. The portability of this type construction is of particular advantage to the owner who wishes to relocate the building at a later date.

Concept adaptable to variety of structures

Steel-frame modular construction is well suited for office buildings, banks, schools, motels, retirement centers, apartment complexes, dormitories, and private residences.

The steel-frame concept in modular construction cuts costs. It also makes possible close tolerance controls not available with other materials. Unit costs range between $12 and $20 per sq ft for the buildings illustrated.

If you would like more information, get in touch with the Bethlehem Sales Engineer at your nearest Bethlehem sales office. Or, if you prefer, write: Bethlehem Steel Corporation, Bethlehem, PA 18016.

BETHLEHEM STEEL

Views continued from page 6

systems building and scientism—he truly never seems to have embraced the conceptual and institutional changes which their development has fostered. On the other hand, everyone can truly appreciate his natural appreciation of the rich imagery and painterly allusion emerging under the tutelage of Michael Graves at Princeton. Similarly, it is not necessary to bury design method because Christopher Alexander has become more adept at formulating it for practice and for people.

Architecture is a single discipline but one with a great many richly interacting developments. Won't you at P/A please stop promoting the "true" mind of the moment and accept the adaptive pluralism of many? If not, it is likely that the values of systems and science will remain "imperceptible" and students will be "taught to see" without ever getting a chance to touch "the quick of architecture."

Charles H. Burnette, PhD, AIA
Executive Director
Philadelphia Chapter/AIA

Decisions, decisions

The May 1969 edition of P/A, "The New Master Builders Crowd the Architects' Domain," still sits on my shelf as one of the most important issues that has ever come out on the profession of architecture.

It has been over three years since P/A has really gotten its teeth into such matters and I think that it is about time to, again, analyze the state of the profession and where it is going or where it has gone.

I am looking forward to that edition, hopefully before I graduate, so I can choose between becoming an architect or going into my father's business.

Dick Zyne
Brooklyn, N.Y.

Preservation participation

The Lockport Workshop process in your superb Nov. issue (p. 78) is one that Lawrence Halprin & Associates has been developing for some time. We would like to mention that many people worked hard on Lockport. They include Neil Dixon of our office; Bill Schwartz, Frank Edwards, Toshiko Mori, Arthur Rubenstein, Ernie Wortheim and Tim Flannigan of Cooper Union; Mike Garz and Sandy Levine of the University of Buffalo.

Malcolm Holzman
Hardy Holzman Pfeiffer Associates
New York City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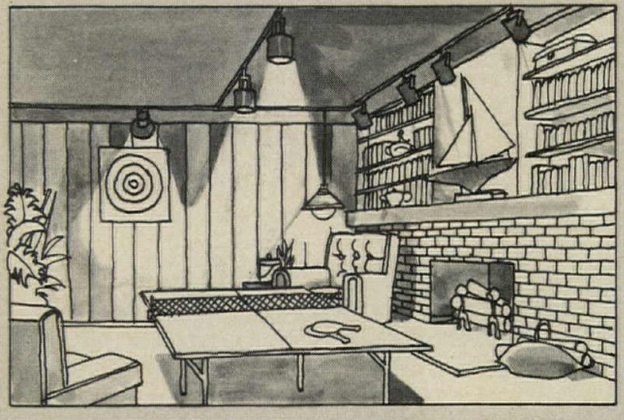

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Professional critics have been virtually unanimous in regarding Harry Weese's Arena Stage as a major landmark in American architecture. Wholly original in concept, superbly functional, and elegant in detailing, it has "an ambiance which suggests that magic is made, after all, in a working place," as one commentator remarked. Among other significant developments which were foreshadowed in this exciting structure was the utilization of roof perimeters as an important element in contemporary design, particularly when executed in metal.

Our initial gratification when Mr. Weese and his associates selected Follansbee Terne for these roof areas has thus merely been enhanced with the passage of time. And we were therefore doubly gratified, nearly a decade later, when Terne was again specified on the adjacent Kreeger Theater, a building of comparable distinction.

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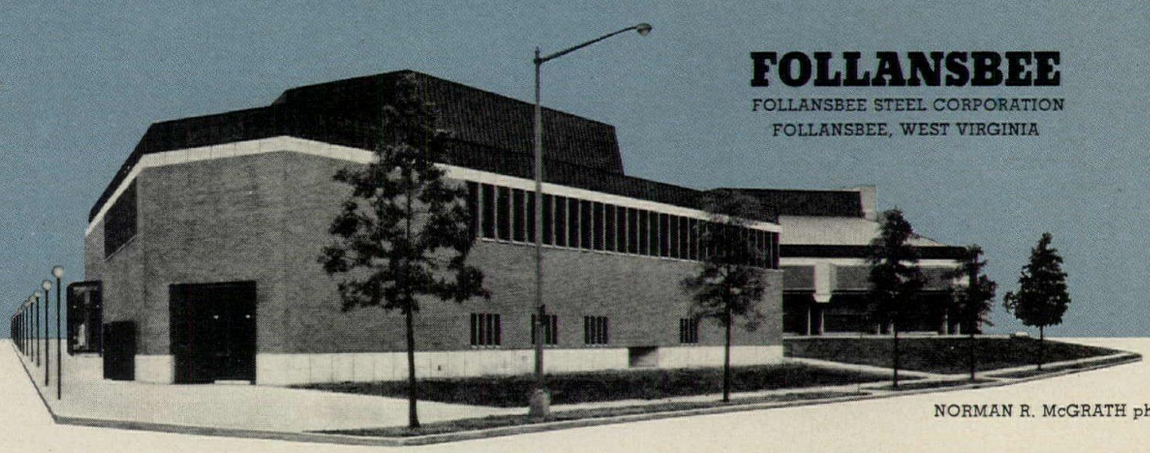

NORMAN R. McGRATH photo

KREEGER THEATER, WASHINGTON, D.C. WITH ARENA STAGE IN BACKGROUND.
ARCHITECT: HARRY WEESE AND ASSOCIATES, CHICAGO, ILLINOIS, WASHINGTON, D.C.
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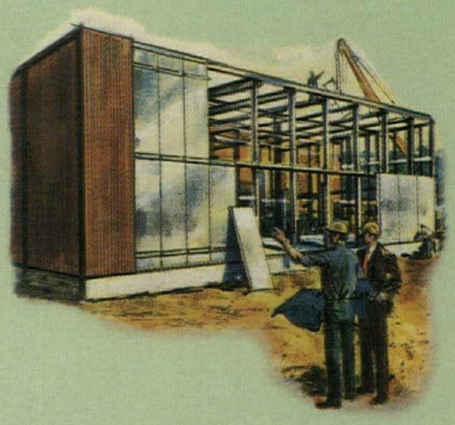

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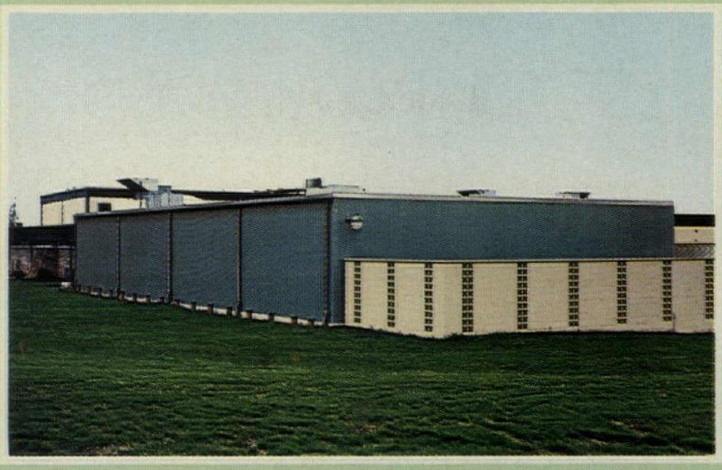

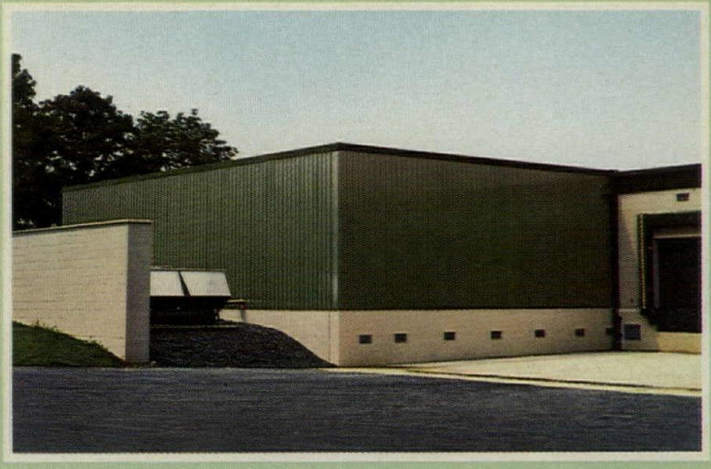

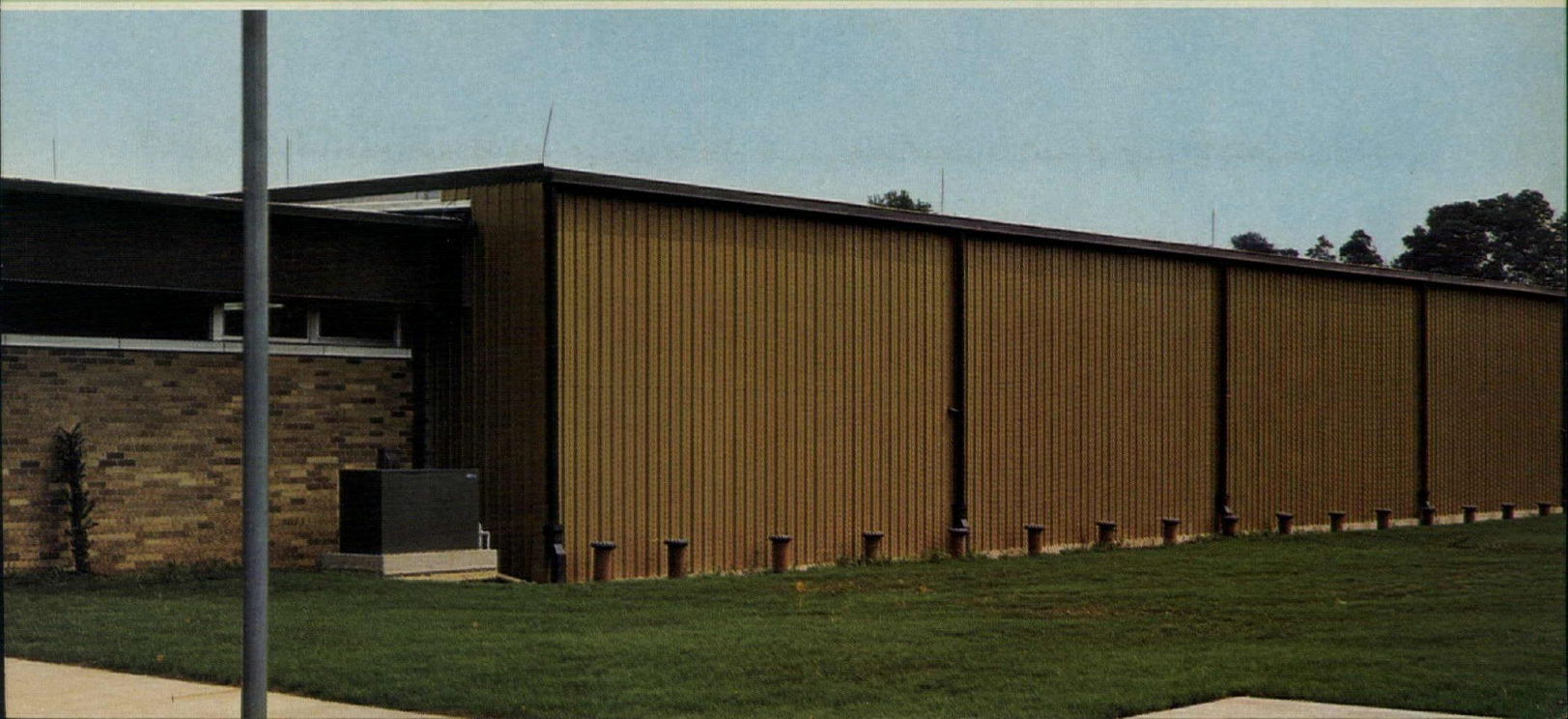


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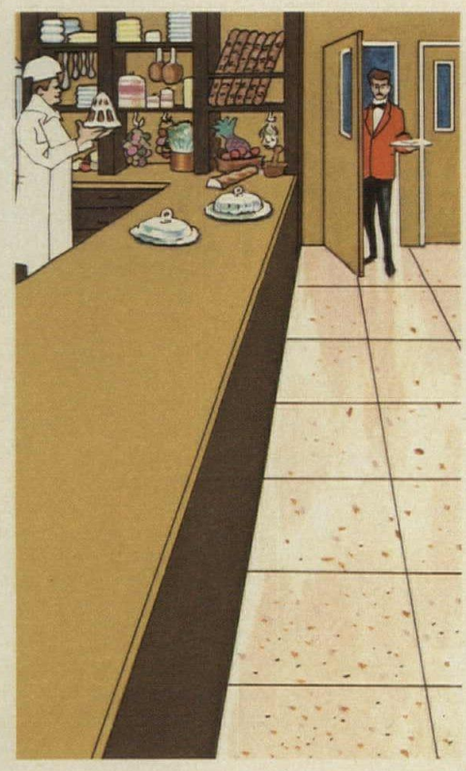

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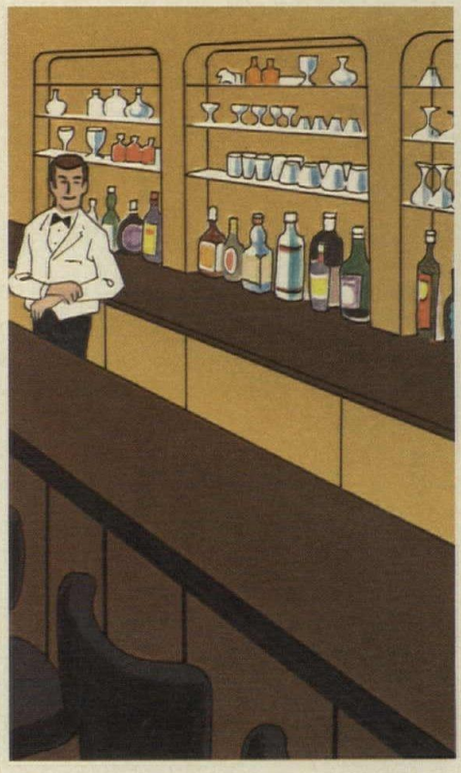

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Contents

News report

Satellite city proposed for Canberra

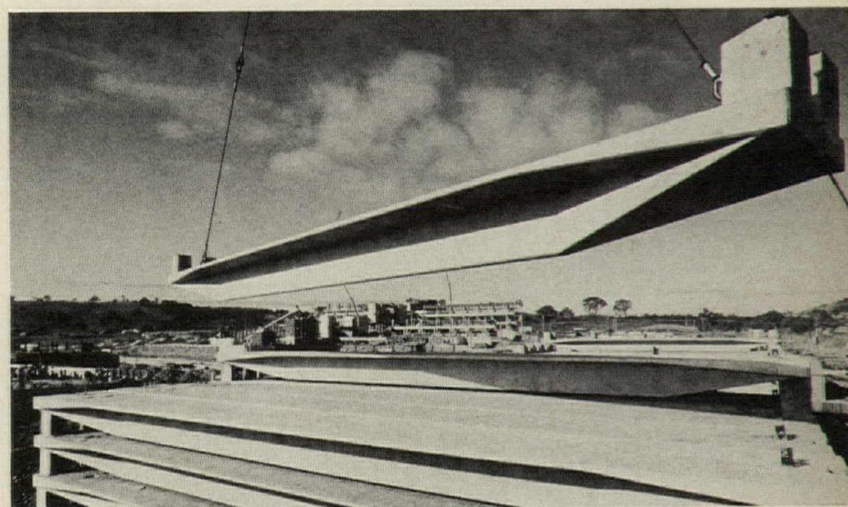
By 1975, Australia's National Capital Development Commission projects there will be 30,000 people in its proposed second satellite city outside Canberra; its eventual population is put at 120,000 people. At the heart of the new city, which is planned for Belconnen, some 11 miles outside Canberra, would be the town center, designed around a pedestrian spine linking malls, squares and spaces for business, shopping, eating and entertainment.

The first phase of the project, for which John Andrews' office is the architect, will be a government office project to accommodate about 3000 employees, along with a computer center, housing, transportation and commercial areas. Work began in 1968, and so far one and a half wings of the office complex are nearing completion.

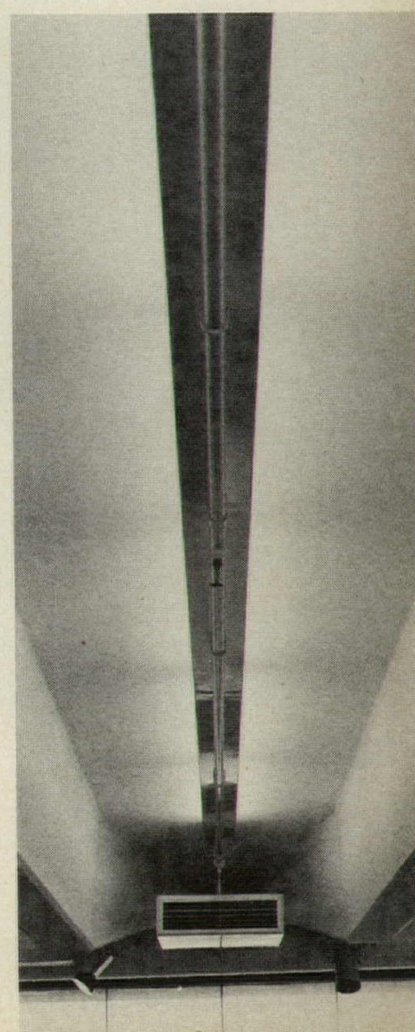
The office structures are based on 50' x 150' modules; two of them laid roughly end to end make up one of the three floors in each office wing. There are seven wings. The three floors are stepped as they rise, with pedestrian circulation at the half-level mark; the seven wings step down the slightly sloping site.

Structure for the office wings is based on a precast concrete tee beam shaped at each end to allow room for the mechanical and electrical system. Using peripheral trunks and lateral distribution runs, the systems will not have to penetrate the structure. The tees are supported by cantilever beams tied back by a weight on one side and columns on the other. In most cases the adjacent office wing provides the weight needed to tie back the cantilever arm. Thus, the structural frames are located between the actual buildings; they can be erected independently from the floors, and the tees are slung between them.

When completed the office complex will contain 952,766 sq ft for a total cost of $19,887,919 (Australian). The $21.08 cost per sq ft compares very well with other offices in Canberra, according to Roger du Toit of Andrews' office. The project will be fully landscaped, including roofs covered with sod.



Mechanical, electrical systems fit into ceiling structure

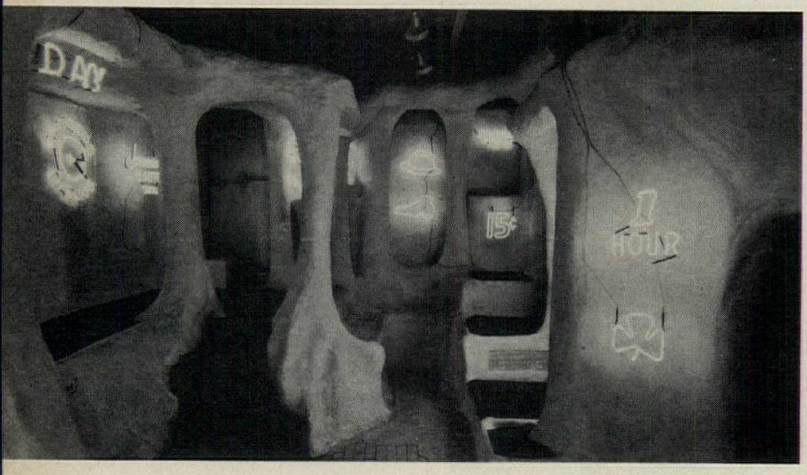


Architecture joins social work at Washington University

This fall the schools of Architecture and Social Work at Washington University in St. Louis began a joint program to train a new kind of community planner. The six students in the

[Continued on page 22]

Neon nostalgia



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program will receive master's degrees in each field, and the schools feel the program will produce socially oriented architects who can offer alternative solutions to the special building needs of many communities.

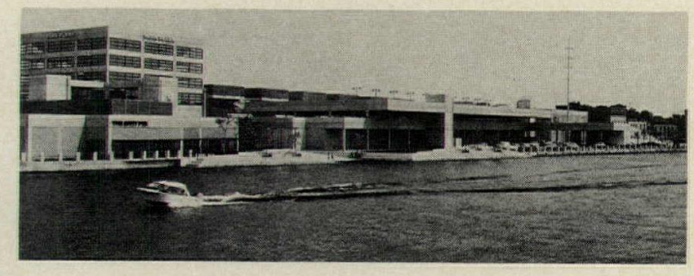
The two-pronged program is funded by a $67,193 grant from the experimental and special training branch of the National Institute of Mental Health. It is the outgrowth of earlier cooperative efforts of the two schools; they have collaborated on studies of rural housing needs and the design of alcoholic treatment and day care centers.

Signs of the times

On September 23 there was neon. That was the day Let There Be Neon—a new gallery, consultation and design service involved in the architectural and interior design application of neon—opened in New York's SoHo district. Organized and operated by artists Rudi Stern and Mel Romanoff at 451 Broadway, the gallery is the first anywhere devoted to this dying craft. Pieces on display include salvaged old movie marquees and kosher meat signs, and new potted flowers and red-hot lips.

"There were once hundreds of neon sign shops in New York," says Rudi Stern, "but now there are only eight." There are several reasons for its demise, he says. One is that people associate it with an older, '40s look they want to avoid. Another is that throughout its history, neon has benefited from almost no artistic input; sign shops have rarely employed artists or graphic designers, and artists who might have revived interest in the craft have shown little enthusiasm. In addition, the initial labor cost that goes into a neon sign has skyrocketed in recent years. Yet with all of this, there are certain advantages to neon. It has a minimum life of 75 years, and requires no maintenance except to change the transformer every seven years or so. It produces no heat and it uses no more wattage than a normal reading light. But most important, it has a fluidity inherent in no other light source. It is for these reasons the organizers of the gallery want to explore the medium and develop installations in collaboration with architects and interior designers. To them, neon is one of the genuine art forms of the 20th Century whose vast, untapped potential has never been realized.

Park Plaza: not in the catalog



Mail order plaza

They didn't name it that, of course, even though the developer, Miles Kimball Co., is one of the country's biggest mail order houses. Instead, the recently opened $16 million shopping and office complex on the Oshkosh, Wis. waterfront goes by the name of Park Plaza.

The complex includes two major department stores and a

grocery, linked by 800 ft of climate-controlled L-shaped mall; above the mall are two parking levels with room for 1200 cars. A 500-seat restaurant overlooks the Fox River and a terraced promenade. Where the two legs of the mall intersect is an 80-ft-high glass enclosed court 100 ft on a side; it provides space for meetings, exhibits, shows and public events. A second phase of the project will add a high rise office building, a motor hotel and a movie theater, according to architects Welton Becket & Associates.

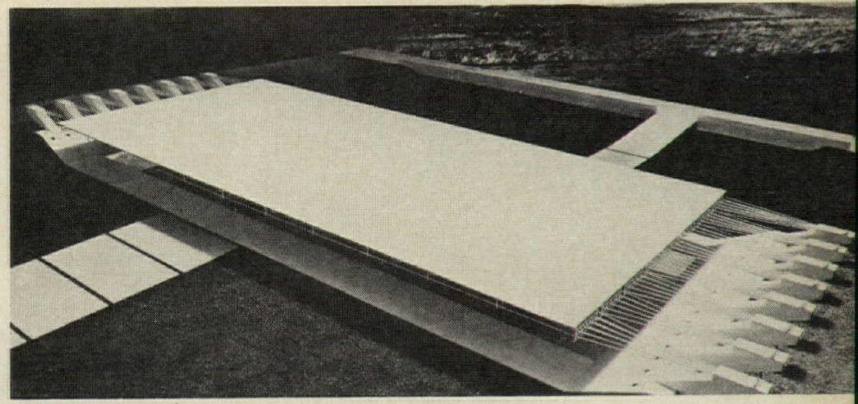
The 18-acre site was once filled with deteriorating industrial buildings that were razed to make way for the complex. Zoning was changed from light and heavy industrial to commercial, railroad tracks were moved, a street closed, and a drawbridge replaced to make room for the project and ease traffic problems. There is another way to beat the traffic: visitors can come by boat and tie up at piers opposite the esplanade.

This trampoline's not for bouncing

If Konrad Wachsmann will pardon the image, his concept for the California City, Calif. Civic Center is akin to a gigantic trampoline. The 14,000-sq-ft structure consists of a flat roof stretched over subterranean offices.

The roof support system is a series of 1¼ in. diameter cables, tensioned at 94,000 lb each; they are arranged on 2-ft centers horizontally and 18-in. centers vertically and are strung between abutments and vertical tie-downs 192 ft apart. The 80-ft-wide floating roof is made up of stressed skin fiberglass panels 16′ x 80′ with a neoprene expansion joint.

The project was approved in the spring of 1971, and is now almost ready for construction. Structural engineers Kariotis & Kesler completed the plans, which were recently turned over to architects James Ronald Fetridge & Associates for review and construction management. Fetridge feels the $1 million project could be completed by 1974.



Not for bouncing

Former hunting ground gets mammoth renewal

Woolloomooloo is a neglected inner suburb of Sydney, Australia and a former Aboriginal hunting ground (it takes its name from the Aboriginal word for young kangaroos); now it is slated to be the site of the country's largest privately funded urban renewal scheme. And at an estimated $475 million in U.S. funds, it is a big project by anybody's standards.

The 13-acre site will be broken into six distinct but integrated sectors linked by landscaped multilevel pedestrian ways and plazas and an elevated monorail system. Planned for the site are nine high rise office towers, three hotels, more than a million sq ft of retail space (including two major department stores), two movie houses and a theater, a convention and exhibition center and a recreational plaza something like Copenhagen's Tivoli Gardens. Parking for 3300 cars will be provided, but commercial traffic serving the project will be routed underground to reduce street congestion.

Developer of the mammoth project is a consortium of companies headed by Gateway Development Pty. Ltd., and the planners and architects are 4D Planning and Design Pty. Ltd.

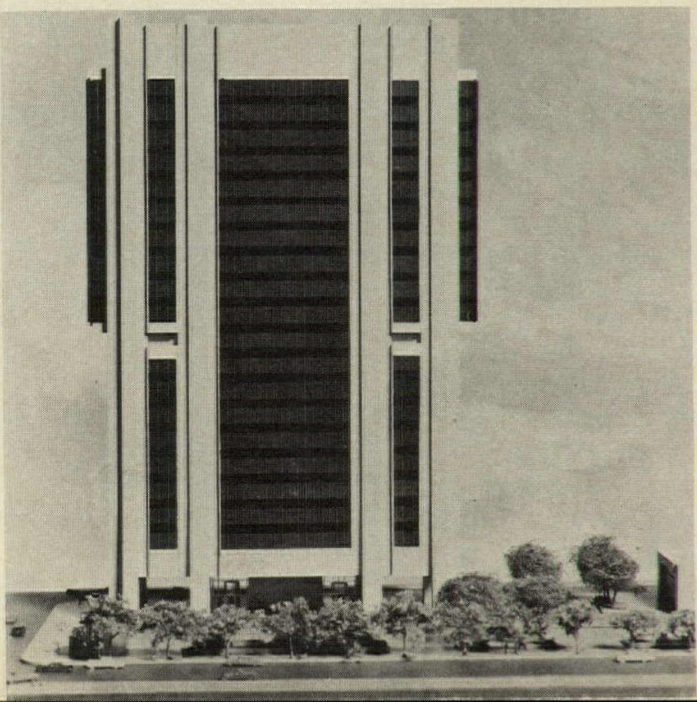
No more kangaroos in Woolloomooloo

NYC to have first all electric building

Sometime during the middle of next year, New York City, which has been getting more and more electric power conscious, will get its first building heated by an all-electric system. In the New York State Office Building, now under con-

[Continued on page 32]

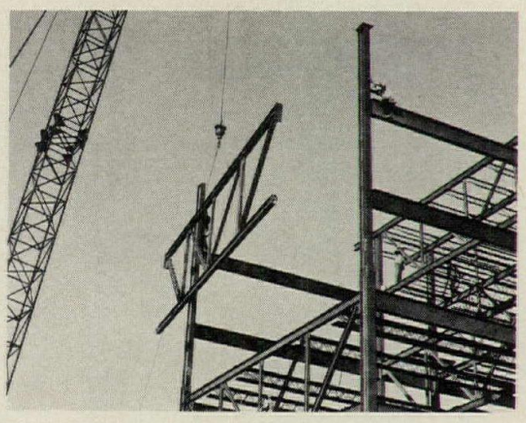
All electric

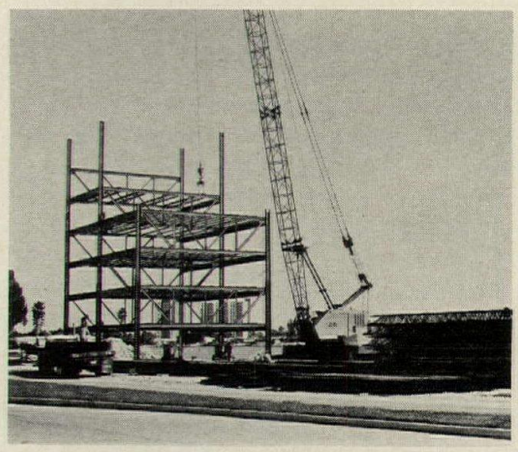


Treasure Island, Florida: another builder cuts costs in today's competitive market with Staggered Steel Truss.

Staggered Steel Truss is a new structural design concept for multi-story structures. It's been proven across the country to compete with and often beat other framing systems. And it can compete on a number of counts.

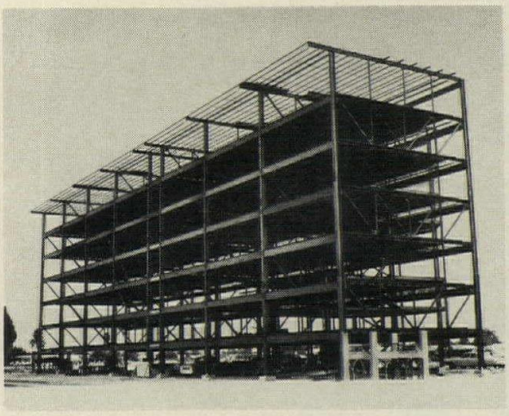
For instance, Green Feathers, Inc., owner and builder of St. James Apartments, Treasure Island, Florida, chose Staggered Truss for construction speed. They wanted faster occupancy for a quicker return on their investment. The main body of the building, which utilizes the Staggered Truss design is a rectangle, 207 ft. x 40 ft. and 7 stories high. It was erected in just 5 working days. (a 68 ft. x 46 ft. wing in the rear of the structure was erected with the conventional braced steel frame method.)





The Staggered Truss design also provided an ideal solution to off-street parking requirements by making possible a column-free 207 ft. x 40 ft. ground level parking area under the building. Additional benefits were realized in a relatively light weight steel frame and less costly foundations.

Essentially, the Staggered Steel Truss system is made up of one-story high trusses that span transversely between exterior steel columns and occur in a staggered pattern from floor to floor. Trusses at a given floor are placed midway between those of the floors below and above. Each floor rests on the top chord of the trusses below and is supported, alternately, from the bottom chord of the adjacent trusses.



Staggered Truss concept was developed for U. S. Steel by the Massachusetts Institute of Technology. The St. James Apartments is just the latest of many buildings around the country to use it effectively—and profitably.

We'll gladly send you a complete structural report (ADUSS 27-5588-01), which describes how Staggered Truss was used on this building. Also a free 26-page booklet on Staggered Truss, that shows a design for a typical 20-story apartment building in full detail. Write U. S. Steel, P. O. Box 86, Pittsburgh, Pa. 15230.

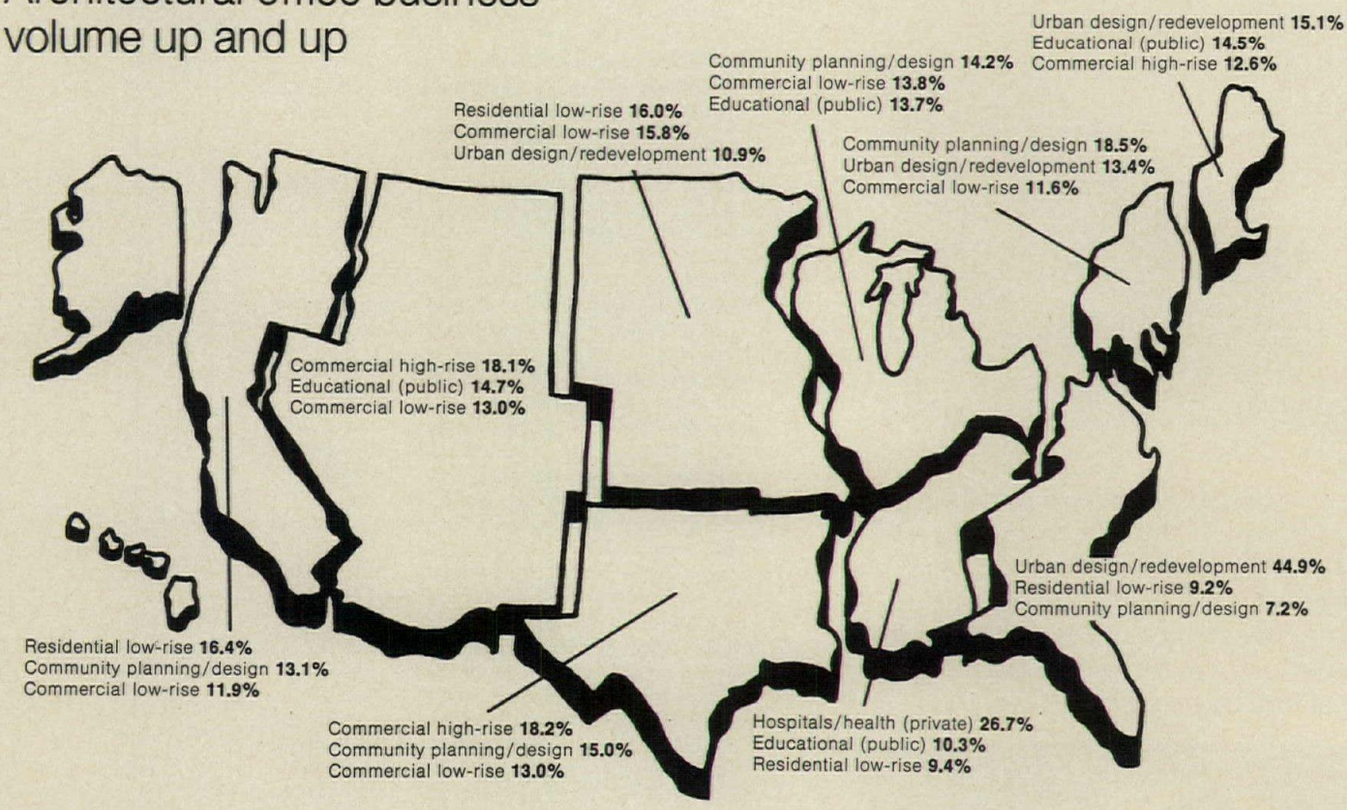
Construction Details

Description: A 7-story apartment building with penthouse atop. The main unit is a rectangle 207 ft. x 40 ft., to which a short wing 68 ft. x 46 ft. is appended. The latter is conventionally steel framed and cross-braced. 53 apartments, of which 8 are one-bedroom, 40 two-bedroom, and 5 three-bedroom. The entire main unit is set on pedestals, providing a 207 ft. x 40 ft. column-free parking space on the ground floor.
Design live loads: 40# psf in apartments/100# psf in corridors/20# psf on roof/Wind loading as per code.
Applicable Code: Southern Standard Building Code, Coastal Region.
Structural Steel: Total steel frame weight, 206 tons. Weight of other structural steel, 121 tons. Field connections are high-strength bolts.
Floor System: 16" joists on 2'6" centers. 9/16" formed metal deck with 2½" poured concrete.
Roof Construction: 28 gage galvanized steel formed decking; 3" lightweight concrete slab; built-up roofing with tar and gravel.
Foundations: augered caissons.
Interior Walls and Partitions: Partitions ½" drywall on 3⅝" metal studs. Party walls without truss: ⅝" Fireguard X Gypsum wallboard plus 1" soundboard on each side of 8" lightweight concrete blocks. Party walls with truss: ⅝" Fireguard X Gypsum wallboard plus 1" soundboard on 1⅝" steel studs.
Exterior Wall: 8" concrete block, sprayed with stucco.
Elevators: 1 bank, 2 elevators.
Fire Resistance: 1 hour for floor/ceiling. 2 hours for columns, spandrels & trusses (dry-wall).
Steel Erection Time: For the main unit of the building, 5 working days. Total steel erection time: 12 working days.
Gross Area: 90,098
Floor-to-Floor Height: 9'8"
Floor-to-Ceiling Height: 8' (7' in bathrooms and corridors).

Owner: Green Feathers, Inc., Treasure Island, Florida
Architects: Edward W. Hanson, Architect, Inc., Clearwater, Florida
Structural Engineers: O. E. Olsen & Associates, St. Petersburg, Florida
General Contractor: Green Feathers, Inc., Treasure Island, Florida
Structural Fabricator: Musselman Steel Fabricators, Inc., Tampa, Florida
Structural Erector: West Coast Steel Erectors, Inc., Tampa, Florida

United States Steel USS TRADEMARK

Architectural office business volume up and up



Architectural offices did business totaling $176.8 billion in construction dollars in 1972 and expect a 1973 volume of $192.5 billion, says Walter Benz, Reinhold's research director, who surveyed 1305 firms across the country

Based on the statistics, there should be some optimistic smiles around architectural offices these days. Last year's business increase indicated a recovery from the doldrums of 1969–70, although there was some uncertainty about what the future might bring. But this year's P/A business survey should erase any lingering doubts: there was an increase, although not a great one, in business volume in 1972 over that of 1971 (investors were no doubt hesitant about the general economy during the first part of the year), and 1973 is expected to bring significant improvements. Architectural offices anticipate an increase in 1973 that will amount to 8.9 percent over 1972's average volume (which was $15.4 million per office, about double the 1970 volume). For 1973, the average volume is expected to run to $16.6 million.

Business was not only up in 1972, it was broader—offices were engaged in a wider variety of work than they were two years ago. This is not, as it might appear at first glance, largely the result of more work being available. The number of firms doing industrial work in 1972, for example, was up 5.1 percent over 1970, while the proportion of business volume represented by industrial projects dropped 0.4 percent.

The number of offices engaged in some types of work (including public and private educational buildings and publicly owned hospitals and health facilities) declined as the volume of business decreased. The sharpest changes in the proportion of offices sharing in the work were in privately owned single-family houses, up 19.0 percent; low rise residential, up 15.4 percent; and low rise commercial, up 13.7 percent.

These changes may reflect a need for most firms to take on whatever work comes along as much as any tendency to improve quality in these everyday areas. The greatest change in the proportion of business volume for any single type of work was in the area of urban design and redevelopment, which has tripled since 1970. Non-government community planning and design has doubled in the same period.

This year's survey was conducted at the close of the third quarter of 1972, and the findings indicate an encouraging business stability among the country's architectural offices. At the end of the third quarter, the offices reported that 76 percent of their 1972 work was on the boards. Of that work, very nearly the same amount was in preliminary design as was in working drawings and specifications. In a small majority of offices, slightly more work was at the latter stage. In 1970, at the same time of the year, there was somewhat more work in preliminary design, reflecting business momentum in starting recovery from the recession.

Over the past three years, offices in each size category

Annual business volume per office
(construction $-millions)

	Size of office				
Year	1-5	6-16	17-29	30-69	70, over
1972	**$5.2**	**$17.3**	**$41.2**	**$56.9**	**$235.3**
1971	5.9	11.9	35.1	51.9	173.5
1970	3.2	10.4	28.8	36.9	152.9

Changes over 3-year period

Type of work	Proportion of total business volume 1970	1972	Change	Proportion of offices doing this type of work 1970	1972	Change
Commercial, low-rise (1-3 stories)	7.7%	10.5%	**+ 2.8%**	54.9%	68.6%	**+13.7%**
Commercial, high-rise (4 stories, up)	17.3	8.0	**− 9.3**	13.6	17.1	**+ 3.5**
Industrial	3.7	3.3	**− 0.4**	29.2	34.3	**+ 5.1**
Community planning & design, non-government	6.4	12.0	**+ 5.6**	9.1	14.2	**+ 5.1**
Urban design & redevelopment, including public housing	5.5	17.0	**+11.5**	12.7	19.1	**+ 6.4**
Federal government:						
Office and service	1.7	0.9	**− 0.8**	4.5	5.3	**+ 0.8**
Hospitals/health	2.1	0.6	**− 1.5**	3.2	2.5	**− 0.7**
Defense and space	0.4	0.4	**Same**	0.4	3.9	**+ 3.5**
Other (not including housing)	1.0	1.3	**+ 0.3**	1.0	3.7	**+ 2.7**
State and local government:						
Office and service	3.3	1.6	**− 1.7**	12.4	16.8	**+ 4.4**
Educational	13.3	8.3	**− 5.0**	35.8	30.8	**− 0.5**
Hospitals/health	3.2	2.4	**− 0.8**	10.1	10.0	**− 0.1**
Other (not including housing)	2.6	1.5	**− 1.1**	9.1	12.6	**+ 3.5**
Educational, private (not including government)	3.5	1.9	**− 1.6**	18.0	17.4	**− 0.6**
Hospitals/health, private (not including government)	7.0	6.6	**− 0.4**	7.0	23.6	**+16.6**
Residential, private, single	1.4	2.1	**+ 0.7**	37.0	56.0	**+19.0**
Residential, low-rise (1-3 stories) not including public housing	8.7	9.8	**+ 1.1**	27.5	42.9	**+15.4**
Residential, high-rise (4 stories, up) not including public housing	4.4	6.0	**+ 1.6**	8.8	14.3	**+ 5.5**

Types of work by office size

Type of work	Size of office 1-5	6-16	17-29	30, over
Commercial, low-rise (1-3 stories)	49%	58%	48%	43%
Commercial, high-rise (4 stories, up)	5	12	19	23
Industrial	21	28	40	28
Community planning and design, non-government	5	8	19	27
Urban design and redevelopment, including public housing	5	15	17	28
Federal government:				
Office and service	3	6	8	10
Hospitals/health	1	2	9	8
Defense and space	1	4	12	2
Other (not including housing)	1	3	3	10
State and local government:				
Office and service	7	14	12	12
Educational	17	6	43	48
Hospitals/health	3	8	22	15
Other (not including housing)	5	9	12	3
Educational, private (not including government)	8	18	23	8
Hospitals/health, private (not including government)	10	21	28	25
Residential, private, single	49	32	26	15
Residential, low-rise (1-3 stories) not including public housing	27	30	29	22
Residential, high-rise (4 stories, up) not including public housing	58	8	15	17
Other	18	25	23	27

Average volume (construction $-millions) per office by types of work (1972)

Type of building	Size of office (total professionals) 1-5	6-16	17-29	30-69	70, over
Commercial, low-rise (1-3 stories)	**$0.70**	$1.91	$3.33	**$5.89**	**$19.94**
Commercial, high-rise (4 stories, up)	0.34	1.14	3.88	**8.42**	**16.58**
Industrial	0.26	0.53	1.16	1.65	6.45
Community planning and design non-government	**0.67**	**2.60**	**6.02**	4.76	15.80
Urban design & redevelopment (including public housing)	0.45	1.15	3.89	4.93	**125.16**
Federal government:					
Office and service	0.01	0.17	0.98	0.13	2.18
Hospitals/health	0.01	0.20	0.26	0.27	0.71
Defense and space	0.01	0.08	0.30	0.33	0.45
Other (not including housing)	0.03	0.08	0.23	1.82	6.22
State and local government:					
Office and service	0.07	0.31	0.82	0.96	2.66
Educational	0.30	**2.13**	**4.93**	3.84	6.86
Hospitals/health	0.02	0.56	0.75	1.93	3.48
Other (not including housing)	0.07	0.31	0.71	0.26	3.42
Educational, private (not including government)	0.11	0.27	0.80	2.89	0.44
Hospitals/health, private (not including government)	0.18	1.35	2.58	**8.14**	8.71
Residential, private, single	0.33	0.34	0.30	0.30	0.02
Residential, low-rise (1-3 stories) (not including public housing)	**0.88**	**2.15**	**4.41**	3.22	1.63
Residential, high-rise (4 stories, up) (not including public housing)	0.30	1.21	4.32	2.81	5.98
Other	0.49	0.85	1.50	4.30	8.61

Volume of work by geographic regions

Range in average volume of work (Construction $-millions)	Proportion of offices within geographic region								
	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
$80-million and over	6.5%	3.7%	0.6%	1.1%	2.4%	4.1%	4.2%	2.5%	2.3%
70-79.9-million	3.9	3.1	5.7	2.2	4.1	*	2.5	*	0.8
35-49.9-million	1.3	6.5	3.4	3.3	3.5	4.1	0.8	1.3	3.4
20-34.9-million	11.7	8.2	6.8	4.4	10.0	8.2	7.6	11.4	6.4
12-19.9-million	14.3	9.8	12.5	8.8	17.1	22.4	6.7	5.1	8.3
7-11.9-million	14.3	14.7	15.9	15.4	12.4	10.2	15.1	22.8	12.8
3- 6.9-million	18.2	18.8	18.8	29.7	23.5	20.4	31.1	24.1	22.3
Under $3-million	29.8	34.2	36.3	35.1	27.0	30.6	32.0	32.8	43.7
Average volume per office	**$19.2**	**$17.9**	**$12.4**	**$ 9.3**	**$27.4**	**$14.4**	**$14.1**	**$10.7**	**$10.7**

* Fewer than 0.1%

News report: P/A's annual business survey

have registered considerable increases in their annual volumes. Size categories are based on the total number of architectural professionals on the staff, including owners and partners. Only the offices in the smallest category (1 to 5 professionals) have experienced any decline since 1970, and for even these, the 1972 average business volume is 62.5 percent ahead of the 1970 volume, a proportionately greater increase than for offices in any other size category.

The type of work tends to vary according to office size, although a major portion of the work done by offices of all sizes is in low rise commercial buildings. Offices with staffs numbering from 1 to 16 professionals tend to do most of the single-family houses. Firms with 17 or more professionals show the major shares of their work in public educational buildings and industrial structures.

There is less contrast in the proportionate volume of work done by offices of different sizes. Offices with 1 to 29 staff professionals have a major proportion of their business volume in low rise residential work, while those with 30 or more professionals have commercial work, low rise and high rise, in greatest proportions. By far the largest proportion of business volume among offices with 70 or more professionals is in urban design and redevelopment.

An appreciable amount of the work reported is listed as 'other.' This represents 5.6 percent of the total volume of business, and the average volume per office is $800,654. 'Other' work, in this report, consists of 18.3 percent recreational and sports facilities; 11.7 percent housing not identifiable as private or government financed; 11.2 percent religious and fraternal buildings; 8.9 percent shopping plazas, warehouses, fire stations; 8.8 percent hotels/motels, libraries, club houses. The remaining 41.1 percent of 'other' includes transportation facilities, historic preservation and other structures.

Business volume to continue growing

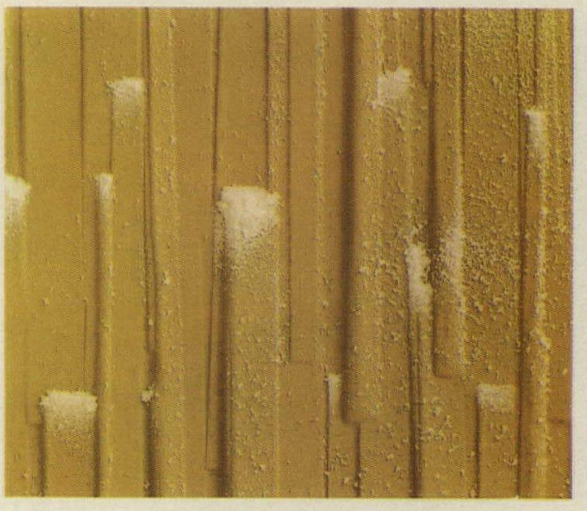
In 1973, the volume of business conducted by architectural firms is expected to keep on growing; next year's increase is projected at 8.9 percent. Residential buildings are expected to be the largest area of growth: high rise residential projects are expected to rise by 46.7 percent over 1972 and private single houses and low rise residential construction should each go up 24.3 percent. The only decreases anticipated are for some government and private educational buildings.

Overall, most offices (ranging from two-out-of-five to three-out-of-five) expect a change in the volume of business for every type of work. An increase is expected in 20 to 42 percent of the offices, making 1973 look like a very good year.

The change in 1973

Type of work	Average volume offices doing this type of work (Construction $-million)	Change from 1972
Commercial, low-rise (1-3 stories)	$ 2.65	**+11.4%**
Commercial, high-rise (4 stories, up)	7.83	**+ 6.8**
Industrial	1.55	**+ 2.2**
Community planning & design, non-government	13.62	**+ 3.8**
Urban design and redevelopment including public housing	14.56	**+ 9.4**
Federal government:		
Office and service	2.34	**−11.0**
Hospitals/health	3.24	**−12.5**
Defense and space	1.56	**+ 0.6**
Other (not including housing)	4.40	**−19.7**
State and local government:		
Office and service	1.47	**+ 0.8**
Educational	4.29	**+ 2.7**
Hospitals/health	3.18	**−15.8**
Other (not including housing)	1.48	**−17.9**
Educational, private (not including government	1.48	**−12.4**
Hospitals/health, private (not including government)	4.50	**+ 3.5**
Residential, private, single	0.74	**+24.3**
Residential, low-rise (1-3 stories) not including public housing	4.43	**+24.3**
Residential, high-rise (4 stories, up) not including public housing	9.56	**+46.7**
Other	3.03	**+ 7.2**

What's going on outside?



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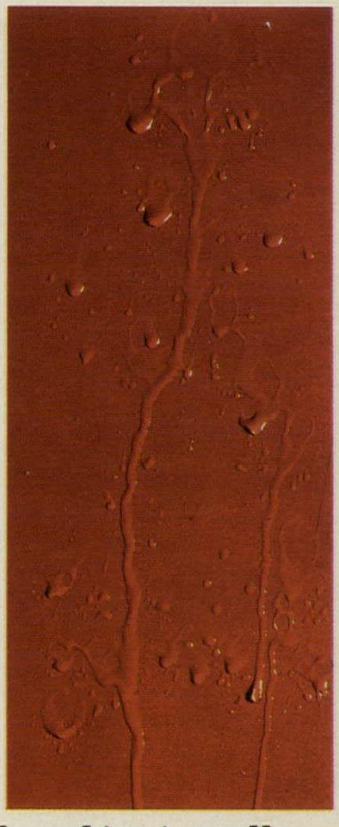
Color



Our Glasweld® is a panel of a different color. Twenty-six different colors, both smooth and slightly textured. (Like Guard Red shown here.) Inorganic colors that keep their integrity for years and years – in all kinds of weather. Waterproof, incombustible Glasweld can be cut, drilled and installed with ordinary power tools. Easily cleaned. Used anywhere there's a call for color.

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*TRADEMARK

News report continued from page 23

struction in Harlem, the heating system will recover heat from the building's lights and occupants.

The mechanical engineers, Meyer, Strong & Jones, put the maximum heat that will be generated in the building at 7.5 million Btuh. A chilled water circuit will pick up the heat, which will then be collected by a heat reclamation system and, its heat boosted to 115 F., transferred to the perimeter hot water circuit. Once the building's heat requirements are met, excess heat will be stored in a 100,000 gal water tank to provide heating at night and on weekends. In summer, heat generated in the building will be discharged through four cooling towers, except for what is needed to reheat primary air and provide domestic hot water.

The decision to use a heat recovery system was greatly influenced by the fact that no street steam from Consolidated Edison nor any high pressure gas was available at the site. Using the recovered heat will, of course, reduce the amount of electricity needed to run the building, thus lowering operating costs.

The 19-story, 385,000-sq-ft building will have an exterior that is a bit more than half glass, the rest being precast concrete panels. Architects are Ifill & Johnson & Hanchard, and the Carrier Corp. manufactured the mechanical equipment.

Montessori School to be a teaching tool itself

While their new school is being built, students at Atlanta's First International Montessori School will have a chance to learn about how buildings are put together. They will take field trips to the site, and they will learn about trusses and columns, drains and windows and just how their school buildings will work.

The project, designed by Finch, Alexander, Barnes, Rothschild & Paschal, will include three wood buildings, looking more like houses than schools, on a wooded four-acre lot. The first building, to be completed sometime next spring, will be the main classroom building. In it will be seven open classrooms, a library, two labs and wet areas for painting and other messy activities. To the rear and the front will be covered play areas. Two smaller buildings, to be put up later, will provide a multipurpose area, storage space, administrative and faculty space and a lobby exhibit space. All three buildings will be linked by a covered walkway.

Theater seminar held at Gropius exhibit

Walter Gropius would have liked the enchanting model of his 1927 egg-shaped Total Theater that was on display in the lobby of Columbia University's School of International Affairs as part of a retrospective show of his work last month. Everything worked: press a button and the proscenium stage swings down and under and you have a theater in the round; stage and spectators were movable in Charles Forberg's model built with money from the Graham Foundation.

A panel discussion on Oct. 24, early in the run of the show, did not uncover much information on what influence Gropius' multiform theater had on theaters designed by panelists Edward L. Barnes, Ulrich Franzen and John Johansen. It's not surprising: an architect who can step back from his work and see it with historical detachment is ready to detach himself

[Continued on page 34]

News report continued from page 32

from practice. Time is more objective in settling such accounts, although panelist James Marsten Fitch, the Gropius authority, is equipped for the task.

The discussion, chaired by former P/A senior editor C. Ray Smith and sponsored jointly by the U.S. Institute of Theater Technology and Columbia's School of Architecture, turned out to be a seminar in praise of Gropius and settled finally into a critique of the multipurpose theater. Stage designer Jo Mielziner offered the best line describing the client for such a theater: "He wants to buy a violin that sounds like a trumpet and a flute."

Steel design to be honored

Residential, commercial, industrial and institutional structures are among the types of buildings eligible for awards in the 1972–73 Design in Steel Award Program of the American Iron and Steel Institute. The biennial program, now in its twelfth year, will have four categories for structures, with two awards—one for design and one for engineering—given in each category.

Housing includes residential buildings from single family houses to apartment buildings as well as prefab or modular buildings and their components. High rise construction includes buildings above four stories; low rise, those four stories or less. Public works construction includes structures or components (except buildings) erected primarily for governmental or public use.

Entries must be received by January 26, 1973; submissions are limited to structures completed after January 1, 1970. Entry forms and information are available from: Design in Steel Award Program, 201 E. 42 St., New York, N.Y. 10017.

Cooling it (and heating it) with conservation in mind

A variety of energy-conserving mechanical systems are employed in the three buildings that took top honors in the first Energy Awards program sponsored by Owens-Corning Fiberglas Corp. The top award for commercial buildings went to the Westinghouse Nuclear Center, Monroeville, Pa.; tops in the institutional category was Mercy Hospital II, Coon Rapids, Minn.; and the winner in the industrial category was the Energy Center, Mount Sinai Medical Center, Miami Beach, Fla. Honorable mentions were given to Children's Hospital of Philadelphia and an office building for Drain Properties, Phoenix, Ariz.

The Westinghouse Nuclear Center, designed by Deeter Ritchey Sippel Associates, features a heat-of-light recovery system and lots of insulation, thus eliminating the need for a heating plant. Reflective glass was used to reduce air conditioning requirements. Mechanical engineers for the project were DRS, Inc. and Peter F. Loftus Corp. were electrical engineers.

For the Mercy Hospital expansion project, architects and engineers S.C. Smiley & Associates and Dunham Associates, Inc. provided radiant heating-cooling ceilings to allow rooms to be kept a bit cooler than the normal comfort zone without making occupants uncomfortable, thus reducing energy needs. Mechanical and boiler equipment was located inside the building, on the top floor, rather than on the roof, isolating

[Continued on page 38]

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Gen. Contractor: Glenwall Construction Co., Hawthorne, N. J.
Curtain Wall by Cupples Products, St. Louis, Mo.; glazing by American Paterson Glass Co., Paterson, N. J.

LOF helps Ramapo College change

As the wooded countryside around Ramapo College changes colors, so does Ramapo College. With Vari-Tran® reflective glass, the building shown here presents an ever-changing mural that depicts the varied hues of the four seasons. The mural changes each day, often each hour.

Ramapo College is located on a spacious, wooded tract in Mahwah, New Jersey, and it was the intention of the school officials and their architects to preserve and even complement this environment as much as possible. To accomplish this end, Vari-Tran was selected.

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Making progress in architecture

LOF

News report continued from page 34

the floor below from outside conditions; normal building relief air is used to preheat incoming air for the mechanical system. Quick response hot water heat exchangers are used to reduce the amount of energy usually needed to provide large amounts of stored hot water. The design of the building provides a low ratio of exterior wall to volume, reducing equipment needs and energy consumption.

Mount Sinai's Energy Center was designed to meet goals of low operating and owning costs through the use of efficient equipment. The plant, designed by The Smith Korach Hayet Haynie Partnership and Block McGibony & Associates, Inc. provides heating and cooling for the hospital's current building program and for future expansion; more expensive, but more efficient equipment was used for long term economy and energy conservation.

Children's Hospital of Philadelphia, according to architects Harbeson Hough Livingston & Larson and engineers Leonard Weger Associates, Inc., will be the first major hospital in the country to be heated and cooled by an energy reclamation system using heat given off by occupants, lighting and equipment. The system transfers the heat generated in interior spaces to spaces along the exterior walls or to spaces requiring reheating. At the Drain Properties office building, an ice making machine is the key to energy conservation. The ice is frozen at night and used to cool the building during the day. The system uses a small compressor during off-peak periods, rather than a large system intermittently during peak periods. The lighting system also works in conjunction with the heating and cooling system; lights are thermostatically controlled for heat, with a separate manual over-ride for lighting as required. Architects are Walser-Krause Architects; Drain-Snyder & Associates are mechanical engineers, and James Evans & Associates are electrical engineers.

Plywood design awards program

A top award of $500 plus three citations will be given in each of five categories in the 1973 Plywood Design Awards program of the American Plywood Association. The five categories are residential single family, multi-family residential, vacation homes, commercial/institutional, and a special category for any plywood innovation not covered by the other four categories (such as toys, fences, furniture, room additions or art objects). Projects must have been completed after Jan. 1, 1969, and entries must be postmarked no later than January 31, 1973. Each entry must be accompanied by an entry form available from American Plywood Association, 1119 A Street, Tacoma, Wash. 98401.

Breuer exhibit at New York's Metropolitan

During this month and the first half of next, visitors to the Metropolitan Museum of Art in New York City can view a major exhibit covering the career of Marcel Breuer. Highlights from his work include large scale models of the monumental columns from the IBM Research Center at La Gaude, Var, France and one of the famous tree columns from St. John's Abbey and University, Collegeville, Minn.

The exhibit is largely made up of photo murals, photographs, models and large scale mock-ups, but it also includes examples of furniture design and tapestries.

Awards

Eight winners were named in the Thirteenth Annual Competition for steel framed buildings sponsored by the American Institute of Steel Construction. Honored were: **Daniel, Mann, Johnson & Mendenhall** (Naval Air Rework Facility, Naval Air Station, North Island, San Diego); **Ewing Miller Partnerships** (Boiler Plant addition, Indiana State University, Terre Haute); **C.F. Murphy Associates** (McCormick Place On-The-Lake, Chicago); **George Nelson & Gordon Chadwick** (Peoples Trust Company Mini Bank, Fort Wayne, Ind.); **Joseph Roth & Associates** (Picnic Shelter, Cook Field, Yonkers, N.Y.); **RTKL Inc.** (Calvert County Vocational-Technical Center, Prince Frederick, Md); **Eberle M. Smith Associates, Inc.** (Monguagon School, Trenton, Mich.); **Southern California Edison Co.** (Pardee Substation, Valencia, Calif.).

Personalities

R. Buckminster Fuller is now a "World Fellow in Residence" at the University City Science Center, Philadelphia, as arranged by Bryn Mawr, Haverford and Swarthmore Colleges and the University of Pennsylvania in cooperation with the Center.

Wallace K. Harrison has received a citation from the United Nations Association of the United States of America in recognition of his role as chairman of the Board of Design and the director of planning for the permanent headquarters of the United Nations.

Sol King, FAIA, of Albert Kahn Associates, Detroit, was named to the Michigan State Board of Registration for Architects and the State Board of Registration for Professional Engineers.

Paul J. Lougeay has been appointed associate professor of interior design in the School of Home Economics at Southern Illinois University, Carbondale.

The University of Miami School of Engineering and Environmental Design has appointed the following associate professors: **Harold Lewis Malt**, architectural design; **Philip S. Steel**, AIA, architecture; **Ronald E. Frazier**, architecture and planning.

Edward M. Kolbe, Jr., AIA, Cherry Hill, has been elected president of the New Jersey Society of Architects.

Muriel Burns has been appointed to the board of directors of the Architectural Precast Association.

H.A. Roberts has been named executive vice president of Western Wood Products Association, Portland, Ore.

Kenneth E. Schwartz has been reappointed to the Ad Hoc Committee on Architecture of the California Articulation Conference.

Joseph A. Lacerenza, Combustion Engineering, was named a fellow in the American Society of Mechanical Engineers.

Calendar

Dec. 13–14. First national annual foamed plastics conference, sponsored by New York University's Division of Business and Management at the Barbizon-Plaza Hotel, New York City.

Dec. 15–16. Institute on designing environments for the elderly, sponsored by the Gerontological Society, at the Caribe Hilton, San Juan, Puerto Rico.

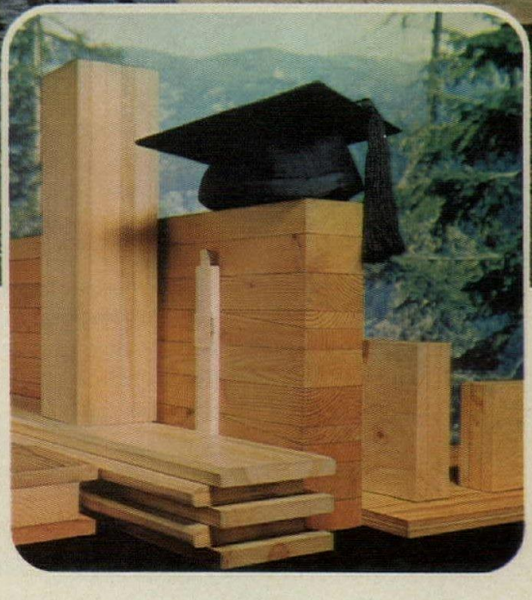
Jan. 7–11. Twenty-ninth annual convention and exposition of the National Association of Home Builders, Houston, Tex.

Jan 21–Feb. 18. Exhibit of the Italian Art & Landscape Foundation Inc., Toledo Museum of Art, Toledo, Ohio.

Jan. 25–27. Second annual forum of the American Institute of Constructors, Holiday Inn-Rivermont, Memphis, Tenn.

Jan. 29–Feb. 1. International Air-Conditioning, Heating, Refrigerating Exposition, McCormick Place, Chicago. The event is co-sponsored by the American Society of Heating, Refrigerating and [Continued on page 40]

Architects: Bulkley & Sazevich, San Francisco



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News report continued from page 38

Air-Conditioning Engineers, Inc. and the Air-Conditioning and Refrigeration Institute.
Feb. 6–9. Twenty-eighth conference of the Reinforced Plastics/Composites Institute, Shoreham Hotel, Washington, D.C.
Feb. 20–22. International Building Exhibition, Automotive Building, Exhibition Park, Toronto, Canada.
Mar. 30–Apr. 29. Exhibit of the Italian Art & Landscape Foundation Inc., Seattle Art Museum, Seattle, Wash.

Washington report

Bid ban finally gets through Congress

The almost unnoticed passage—in the dying days of the 92nd Congress—of a long-sought bill to exempt architects and engineers from bidding on federal projects had to be the highlight for professionals out of a long and often bitter congressional session. The A-E procurement matter (actually, it went through as HR 12807, an amendment to the Federal Property and Administrative Services Act) was the result of probably the most effective effort, in bringing pressure on legislators, that U.S. professionals have ever managed to put together. In an unusual show of unity, they managed to convince 44 of the 52 Senators present during the last minute rush the A-E's shouldn't have to bid to obtain professional contracts, that the selection methods followed for many years insure the best results for the government. Only two Senators (Proxmire of Wisconsin, who had blocked efforts on the same bill a year ago, and Chiles of Florida) expressed any opposition on the Senate floor.

The bill is an outgrowth of action nearly five years ago, when the Comptroller General objected to selection methods on the ground that federal procurement laws require bids on contracts of $2500 or more, regardless of the type of contract involved or services procured. Congress has struggled with the problem ever since—making some halfway answers (such as provisions in military procurement bills calling for continuation of "accepted practices") but never actually meeting the situation head on.

Now, with the amendment a matter of law, all professionals (including landscape architects) involved in construction are covered and exempted from bidding requirements. The measure has two key restrictions that lawmakers saw as strengthening the selection process: 1) it requires public announcements of all requirements for A-E services; 2) it provides that discussions must be held with at least three firms before contracts are awarded.

Just what effect, if any, the new law would have on recent Justice Department actions against professional societies for "ethics" requirements forbidding bids wasn't clear. Several of the major societies—AID, ASCE among them—have already signed "consent decrees" under which they have removed strictures against bidding from their codes; several others have been awaiting further legal action. It should be remembered, however, that Justice attacked the codes on the grounds of violations of antitrust laws (as combinations in restraint of trade), so the law may not affect these actions.

Much of the rest of Congress' actions, in one of the most contentious sessions of recent years, had to be counted as minus for the construction industry; though there were some significant pluses as well.

Among the pluses: the $33.5 billion Revenue Sharing bill, which will see federal tax collections to that amount doled out to states and localities for use for public purposes (including public works) with relatively few strings attached; passage of a huge Rural Development Act aimed at "keeping 'em down on the farm" by providing funds for facilities and amenities in small towns and rural areas; approval of appropriations bills (of which two were quickly vetoed, including Labor-HEW) totaling about $220 billion, plus authorization measures for another $40 billion or so; a whole swatch of environmentally oriented measures to aid stream and air cleanup (including a noise-pollution law that is specifically pointed at the construction industry); authorization for the Atomic Energy Commission to issue temporary licenses for reactor operations to help ease a growing shortage of power. The $24.6 billion stream-pollution bill, passed over a Presidential veto, couldn't quite be called a plus—without qualifications. The White House has indicated it won't spend nearly that much money, anyway.

Most disturbing, on the minus side of the ledger, was failure to pass any sort of a highway bill at all. That means that there's no authority now for obligating funds for the upcoming fiscal year (1973-74), despite moneys flowing into the Highway Trust Fund at the rate of $4 billion or so each year. In turn, that means that at least 15 of the larger states—well up-to-date on highway contracts—will be virtually shut down as to new work by January; other states even with newly promised authority to switch funds from one activity to another (from rural-urban roads to Interstate, for example) will also be hard hit. A major dip in road work (which amounts to maybe $16 billion a year, including everything) thus seems inevitable.

Even if Congress gets right to work on highway legislation when it comes back to Washington in January, there's no good prospect of any action soon—other than a possible "continuing resolution" which would simply permit the program to continue at last year's rate. The basic argument on which the legislation foundered this year—debate over whether money should be diverted from the Fund for urban mass transit projects—is expected to continue just as bitterly into a new congressional session.

On a somewhat broader scale, the failure to approve any meaningful labor legislation, make any substantial changes in requirements or procedures under the Occupational Safety and Health Act, to adopt a federal "land use" policy (AIA, incidentally, was much miffed at a report from the National Academy of Sciences-National Academy of Engineering which recommended that no such policy should be adopted), approve any of the President's elaborate reorganization plans, and the massive failure of an attempt to reorganize the whole federal housing program (though Congress did appropriate a total of $450 million for use in flood-stricken areas)—may be counted as pluses or minuses, depending on the viewpoint of the observer.

Meanwhile, the construction industry rocked along almost without fluctuation—running at an adjusted annual rate of some $120 billion, with surprisingly little change from month to month, through the early fall. This was taken, by some economists, as evidence that controls on runaway inflation in the industry were working—thus more work was being bought for the dollar. Worry was that with a major break in highway work, totals for next year could be affected. [E.E. Halmos]

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News report

Architecture west

With the Central City plan stalled in committee in Los Angeles City Hall, with the chances for a large Santa Monica Mountains park dimming, with Mayor Yorty vetoing an ordinance which would have banned surface oil drilling in the beach areas, with the hopes pretty well dashed for getting the Police Academy out of Elysian Park where it has been for 47 years, one affirmative note has been struck with an engineering breakthrough.

Three troops of boy scouts and 30 employes of Farrell's Ice Cream Products built the longest banana split in the world. The previous record was 350 ft in Hawaii, 50 ft short of the Farrell project.

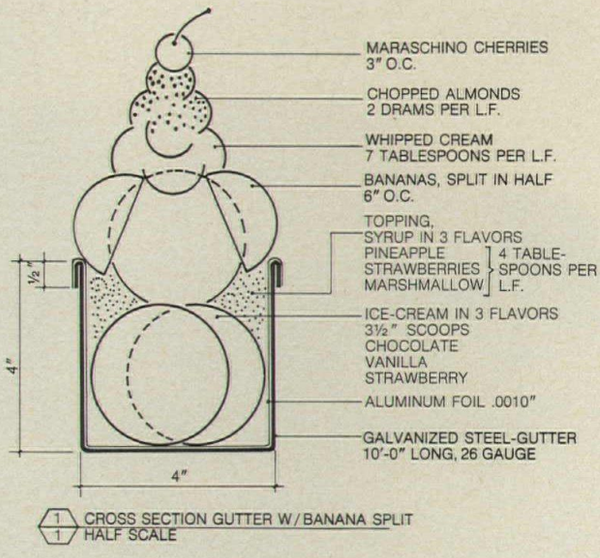
The site was the parking lot of the new Los Cerritos shopping center in Cerritos (on the way to Disneyland). The length of the site imposed a J-shaped plan. "The Hawaii job was linear while ours was complicated by four 30-degree turns, and if not handled properly this could have resulted in spillage of the infill," said Bill Johnson of Arden Farms, of which Farrell's is a subsidiary.

"It was a matter of logistics," said Tom Egan of Farrell's. "We wanted minimal handling so we conceived the idea of making transportation an integral part of the operation. Because of the momentum of the material, we were working with a time/space factor. We therefore combined mechanization with hand labor. The system we used was developed to take care of such unknowns as consumption time and the temperature on the day of the procedure, which, if unfavorable, would affect the stability of the split. Efforts to apply the Hatfield short-time creep test proved unscientific because of the difference in coefficients of the materials employed."

The program to produce a three-hinged shell ran into a cost problem, but this was imaginatively solved when the team came up with the idea for adapting standard rain gutters to the purpose. The section selected was 4 in. deep by 4 in. wide. The 40 standard 10-ft lengths required could be accommodated on existing racks in the freezer truck.

No decimal tolerance was anticipated because the 3.500-in. diameter ice cream scoop allowed .500-in. tolerance for overload while allowing for the substance to be injected in the interstices. This was marshmallow and pineapple topping, which incidentally served to stabilize the mass.

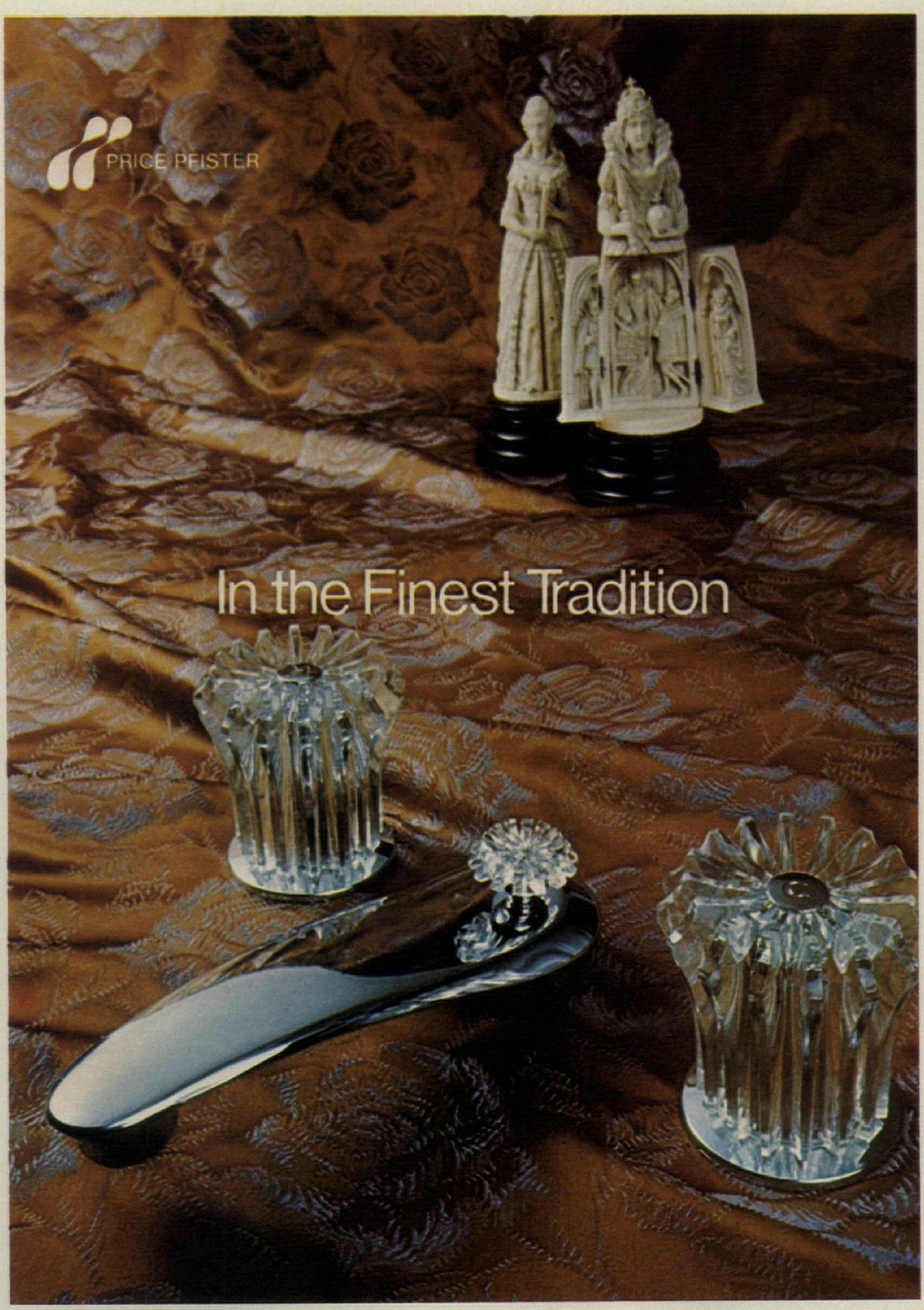
There was an increasing increment of load with the application of the split bananas (.750 ± R) and the movement under load was noted. For the superstructure of foam, almonds and cherries the moment of inertia was determined by the formula $f = \frac{M}{D}$, with f as the stress, M as the bending moment and D as distance between supports.



The off-site preparation consisted of lining the gutters with an .0010-in. aluminum foil membrane and filling them with scoops of ice cream; the gutters were stored overnight in the freezer truck. The following morning 40 standard wooden road blocks were set up at 10-ft intervals in a J configuration. Stationed at each road block were two scouts and a Farrell man. Then the truck rolled from station to station unloading the gutters onto the road blocks. One gutter was inserted into the next to the depth of 1 in. to form a lock.

Then the scouts positioned the 1200 bananas along the 65 gals of scooped ice cream, poured 45 qts of topping, sprayed 14 gals of whipped cream, spackled on 20 lbs of chopped almonds and balanced 15 lb of cherries 3-in. o.c. The on-site operation took exactly 9½ minutes.

The biggest banana split in the world was eaten in 15 minutes by 3000 people. [Esther McCoy]



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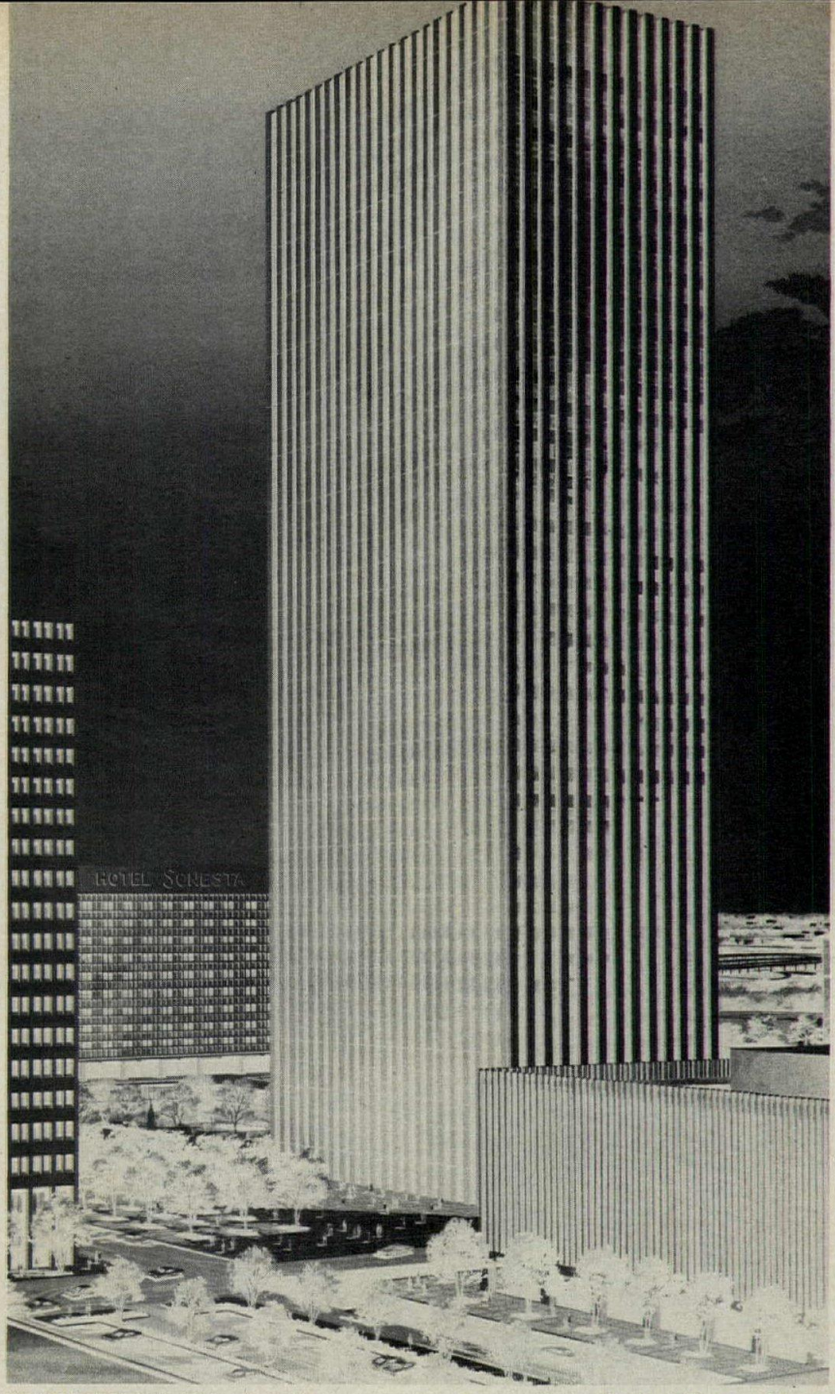

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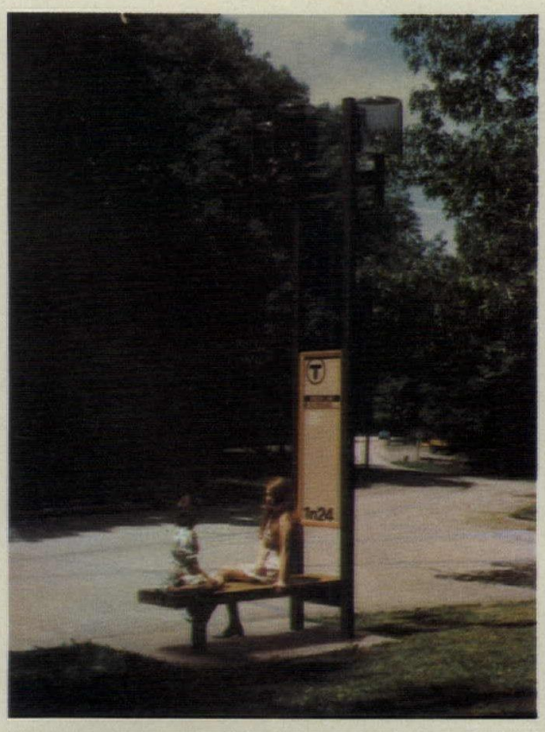
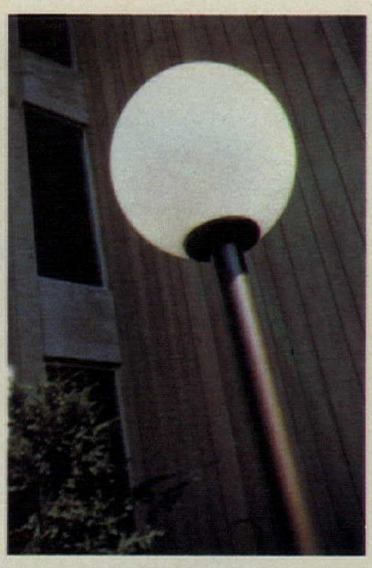
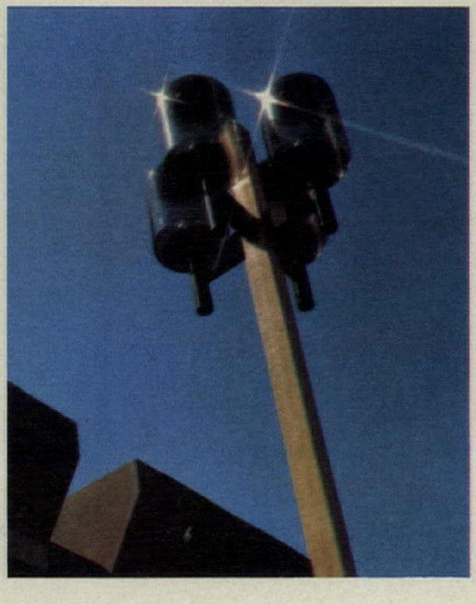
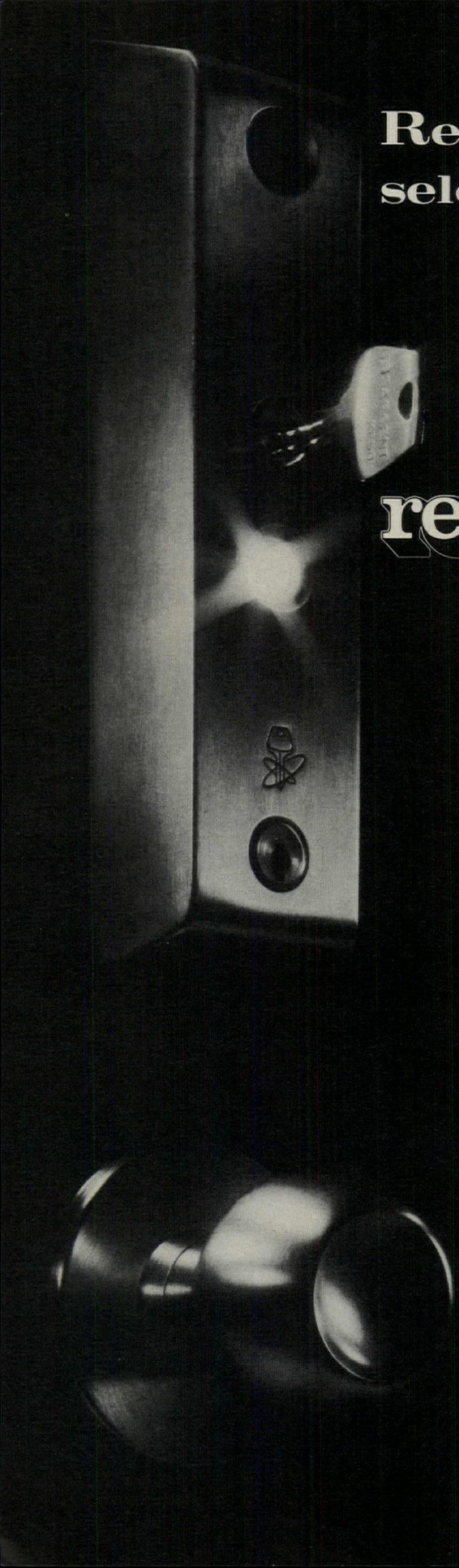




designer group





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Progressive Architecture

December 1972

Who sets a good example for today's architects to follow? More specifically, "What individual, firm, or school of thought do you think offers the most promising pattern for your own practice?" That was one of the opinion questions included in this year's questionnaire for the P/A Business Survey (see News report). Every year such questions help us in our program of measuring interests and attitudes—and gives readers who supply our statistics a chance to express themselves on issues.

On this year's form we asked about changing roles in architectural decision-making (junior staff members getting stronger voices; clients growing more knowledgeable; cost an ever more critical factor) and we asked what kinds of information the reader had the greatest need for (evaluation of new products and processes; methods of office management, job procurement and cost control). Then we asked who, in effect, already seems to have it all together—who "offers the most promising pattern." We have just finished reviewing roughly 1000 replies.

All answers to this questionnaire were influenced, of course, by the fact that they were part of a business survey, so that most of them went to the principals in charge of business matters. Answers to the final question were slanted even further away from the area of design by the words "pattern for your *practice.*" We were clearly inviting answers referring to the processes of architecture rather than the product, but readers who were strictly design-oriented (or assumed that we were) could answer in those terms.

Among the minority of answers that apparently did refer to design, rather than practice, the names most frequently mentioned, by far, were Frank Lloyd Wright and Louis Kahn. No other masters of design got more than a half dozen mentions, but almost everyone from Michelangelo to Maybeck to Richard Meier was somebody's favorite. An encouraging number of answers concentrated on meeting clients' needs or called for "clean and functional" design. Along these lines, several readers made references to the approach taught at Cal Poly at San Luis Obispo (June 1971 P/A, p. 47).

A few respondents saw that there were several possible aspects to the question and answered accordingly (sample: "philosophy, Louis Kahn; design, Kevin Roche; business, John Portman"). And a few others cited figures from outside the field—Richard Nixon, for instance, and J. Paul Getty.

A steadfast minority reported that they could follow only their own experience ("pattern evolving from within"; "we do our own thing"). Some readers even became belligerent on this point ("The day I have to follow someone else I'll quit architecture"). Still others reacted against an answer they thought we were expecting ("If you're asking about CRS, you're out of luck").

Whether we expected it or not (and we didn't *consciously*) the largest bloc of answers, almost a third of the total, referred to innovative approaches to practice—"team approach," "construction management," "design build," "participate in development team," or some combination of these. The firm most frequently mentioned was, in fact, CRS of Houston, closely followed by John Portman & Associates of Atlanta. These two names (often mentioned together) turned up twice as often as any others, and were clearly meant to stand for methods of practice.

Another bloc of respondents, about half as large, defended traditional methods as the only way they would operate. This attitude of this group is summed up in one response "Let us leave non-architectural functions to others. Who but a fool can be all things to all people." (Not surprisingly, someone else actually recommended that "architects be all things to all people.")

The most encouraging aspect of the current recession-recovery transition is that architects are likely to emerge with a range of options as diverse as the opinions expressed here. The range of problems presented to architects has never been broader, and firms that prosper now are likely to be those that develop some kind of specialization—not necessarily by building type, but by scale and scope of commissions or by types of working arrangement with clients, contractors, consultants and society as a whole. There seems to be no danger that all architectural practice will have to conform to one business-oriented, highly automated prototype. In the practice of architecture, nothing is really inevitable except diversity.

John Morris Dixon

IBM Information Center

Machines in Sterling Forest

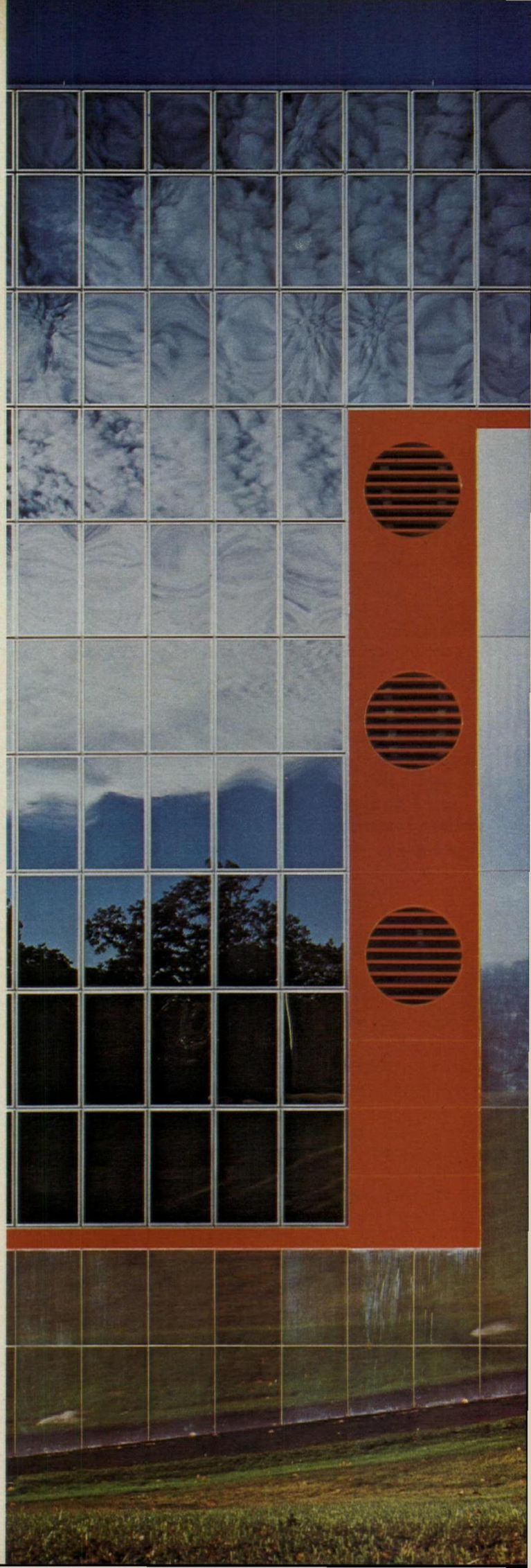
A commission to plant computers in the woods produces real contradictions for an architect. An IBM computer center in Sterling Forest, N.Y. expresses client's machine technology with an assertive, yet respectful, object among the trees

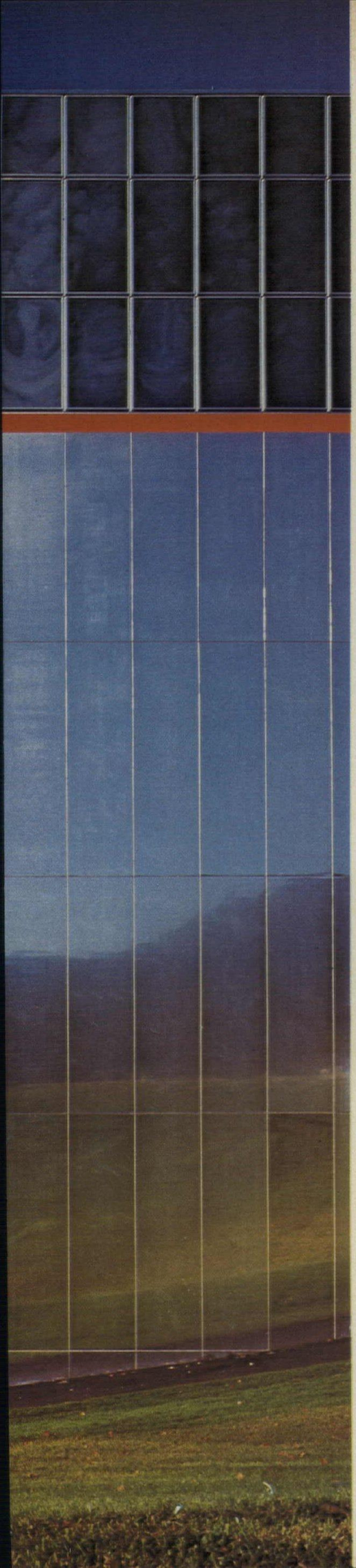
IBM is, among other things, in the machine business. Gunnar Birkerts practices architecture. With the completion last month of the IBM Sterling Forest Information Systems Center, a P/A Design Awards Citation winner in 1971, Gunnar Birkerts & Associates have made a machine for IBM. Of course it is more than that—it is a combination of sculpture and graphics, function and concept—a "dumb box," but not really. The building, headquarters for IBM internal operations control and planning, is a statement.

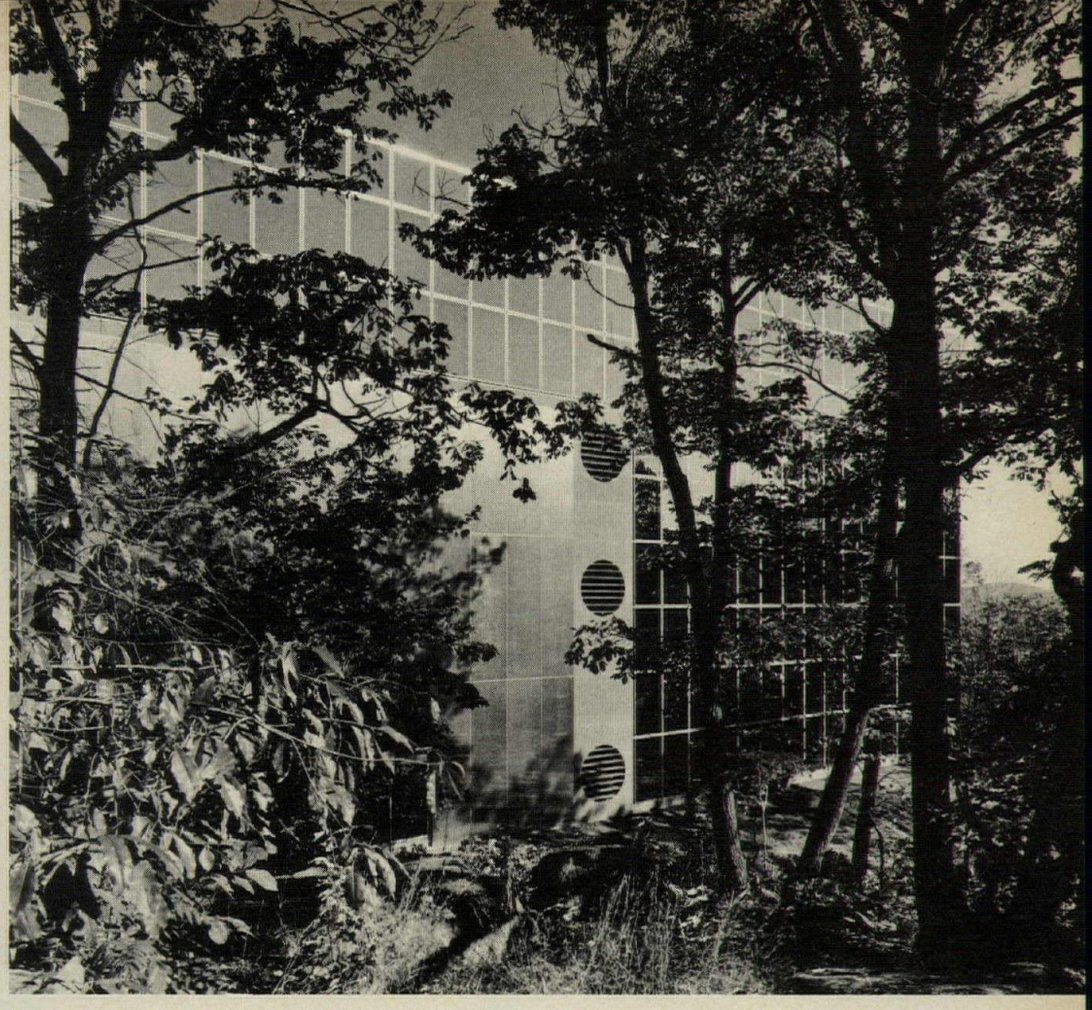
From the beginning sketches, Birkerts knew that to express such a function on any site as part of the indigenous surroundings would be a lie. Sterling Forest is a hilly, heavily wooded corporate enclave in New York State, and the IBM site is a high promontory with lake views on three sides. The client, although recovering somewhat from the IBM "austerity image" era, did not want a lot of design costs or gymnastics. In early studies, Birkerts proposed a building form on "legs," even farther removed from the land, still more expressive of the contrasts between computers and trees. Although not proved prohibitive, cost (and certain mechanical/structural) inhibitions stopped development on that scheme. The problem then became one of making an assertive form to fit a sylvan site and a cautious client.

Birkerts felt that the building should slice cleanly into the trees, disturbing or displacing as few as possible. The great Finnish architects have always inspired him, he says, partly because of their skill at inserting buildings into their context with minimum disruption. But most of all, this building would have to be an expression, a clearly man-made object to house the machines and personnel responsible for IBM's own computer operations. The image would play up synthetic, technical materials and, in effect, symbolize its function without excessive cost or "style."

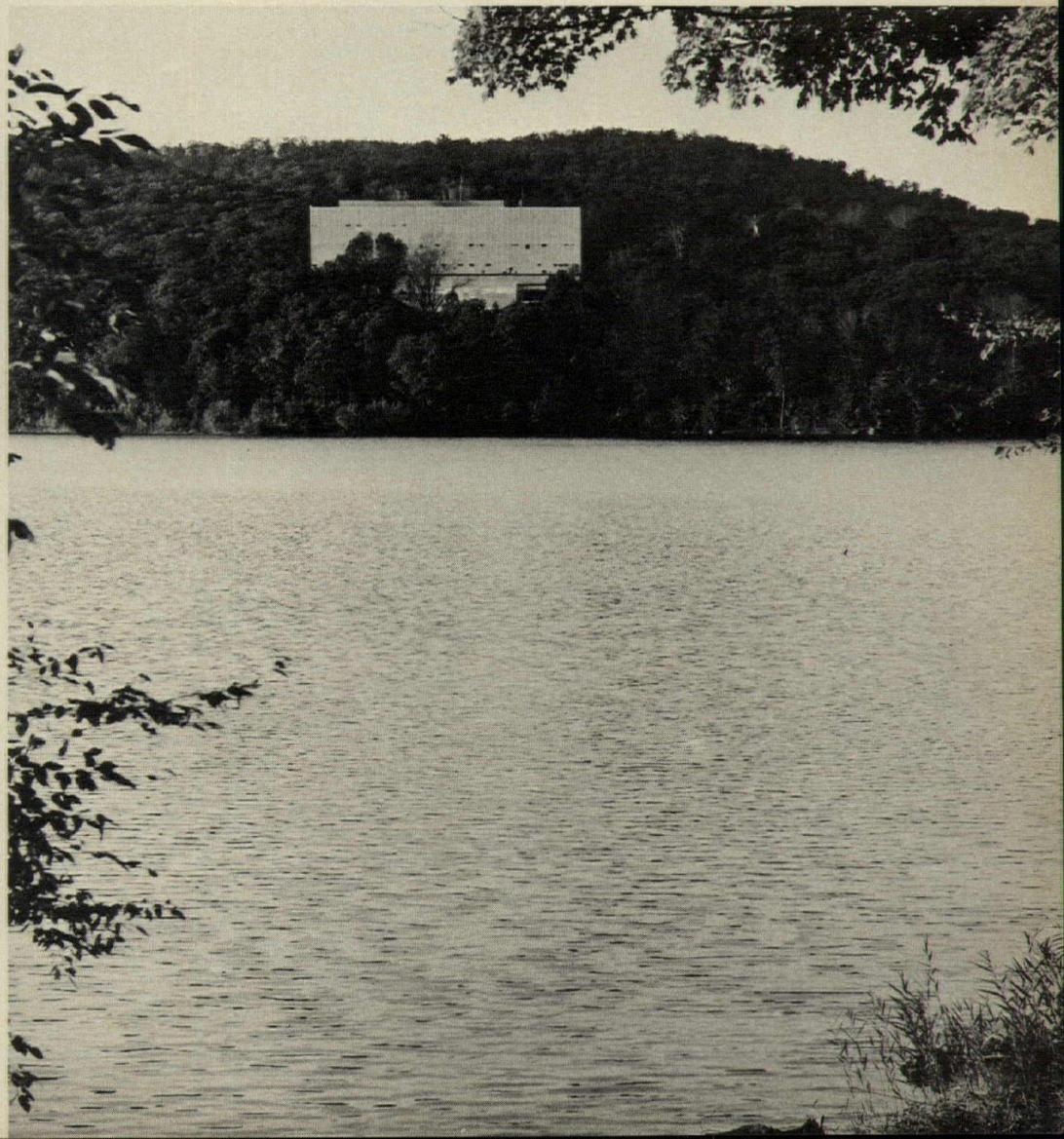
It does all of those things. Trees and rock part just enough to let in the building, which meets the grade around it cleanly and abruptly. It is also the piece of minimal graphic sculpture that Birkerts wanted it to be, with sliced out entry voids and







Graphic expression of the boundary between computer areas and offices, red-orange line (left) has round glazed openings at corridor ends. Trees and site show little disruption on the back elevation of the building (above) or from across a large lake (below), which is shared with other corporations.

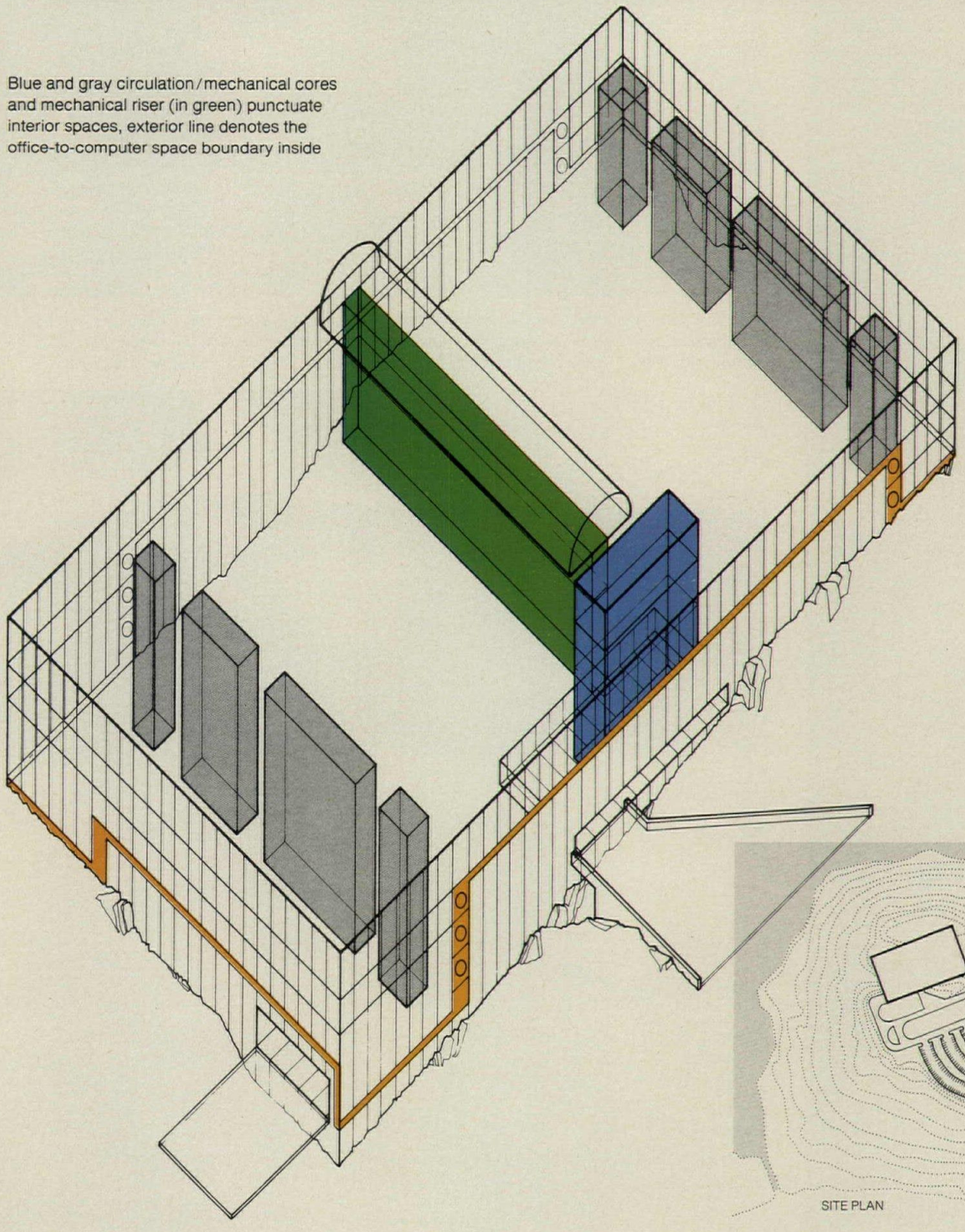


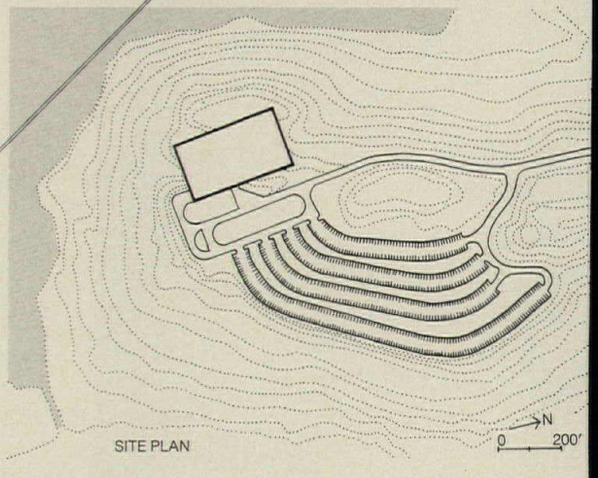
subtle changes of materials. The smooth skin is a combination of polished aluminum panels and glass with 35 percent daylight reflectivity. The red-orange enameled metal band separating the two is another graphic symbol, alternately forming a base line and marking outside the division between office and machine functions inside. Only the entry and cafeteria patio glazing is clear, framed by the cut out voids. Soffits and side walls in these areas continue the "metal box" into the building, as does the metal grating under foot at the entry. That grating, however, may have to be redesigned to prevent heel hangups.

Interior materials are synthetic; in the lobby, molded fiberglass built-in seating, metal ceiling and wall panels surround the reception desk and the "blue" circulation core. The only core visible from the exterior, the blue core punches through the roof, disappears behind the shiny skin and reappears in the entry slot. In that core even the stair and elevator walls have blue graphic panels. The other two cores have painted charcoal gray panels. At the ends of the computer area, red-orange tile on corridor floors and ceilings coincides with the exterior band, and terminates in the circular openings at the corridor ends. A bright green denotes mechanical areas.

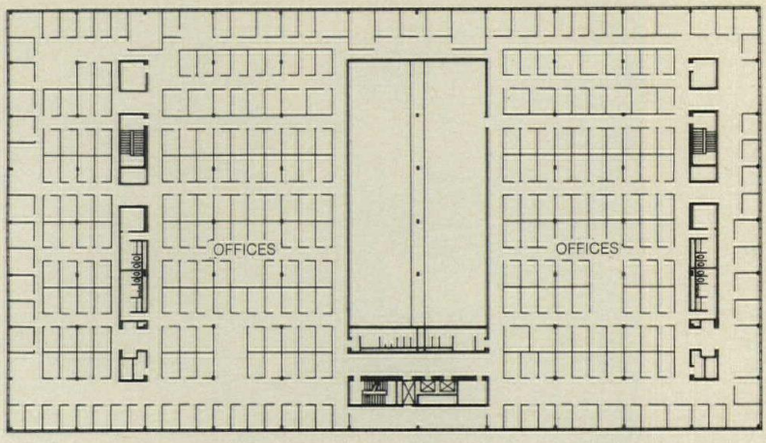
Inside the orange line, a raised floor area houses the computers in large open spaces. Strips of glazing line the corridor

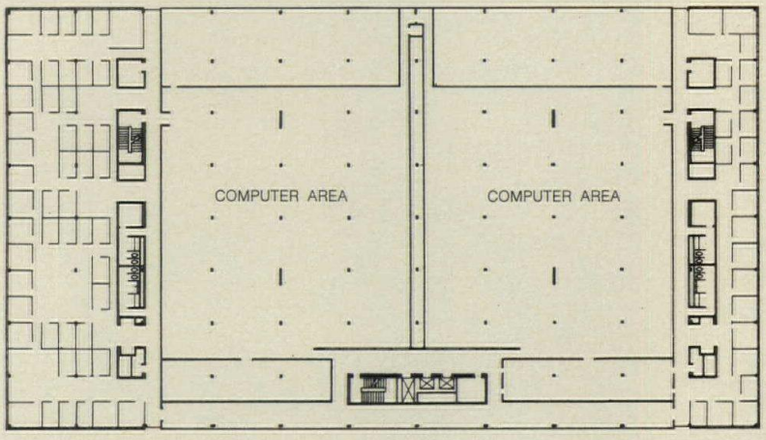
Blue and gray circulation/mechanical cores and mechanical riser (in green) punctuate interior spaces, exterior line denotes the office-to-computer space boundary inside

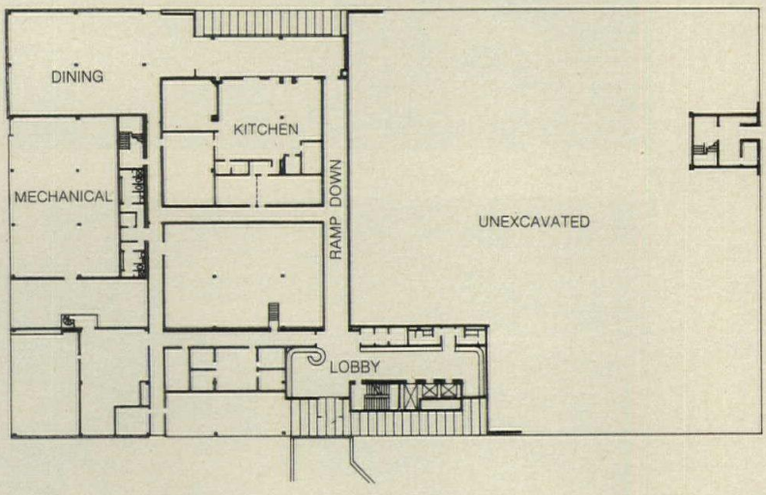


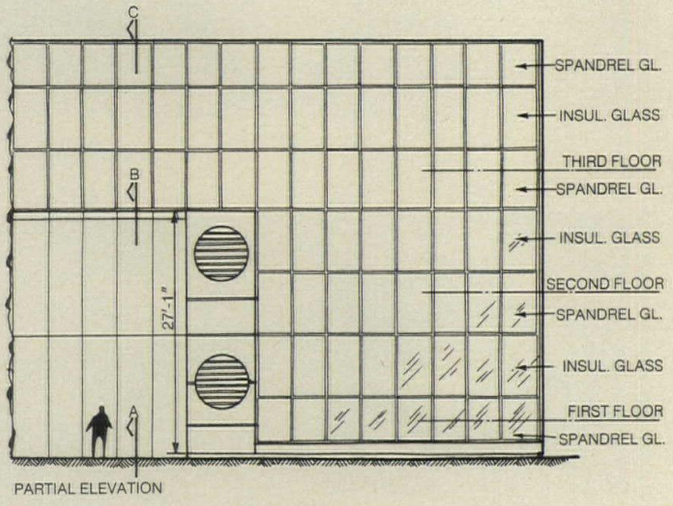


SITE PLAN

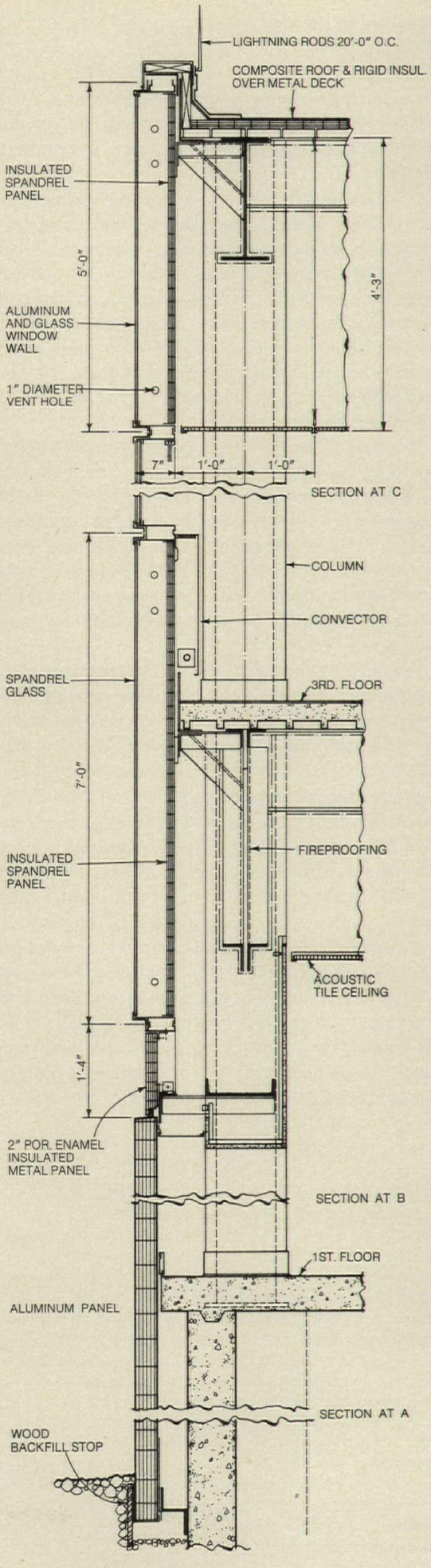








PARTIAL ELEVATION



in the computer rooms, giving visual relief and "2001" glimpses of the machines that help keep IBM running. Outside the orange boundary are the rest of the supporting offices.

Since the continual operation of this impressive array of equipment is imperative, standby systems for standby systems had to be provided, assuring power and environmental control during electrical failures. Despite the heavy costs of the mechanical demands, and even though final construction costs have not been released, the figures are not high. The building is framed in the conventional manner, with steel skeleton and concrete floors on metal deck. The slick skin, double floor computer areas and mechanical requirements did not drive costs out of sight.

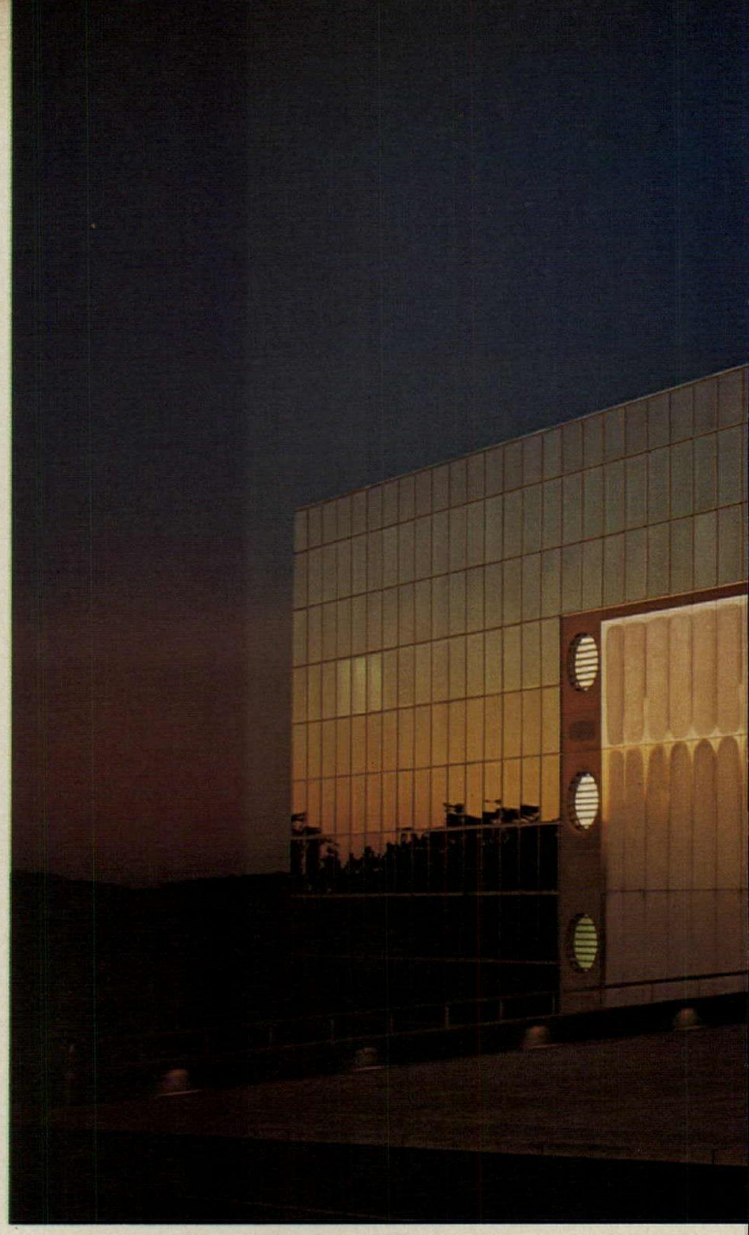
There are three aspects of the facility that Birkerts regrets. First, the abundance of poisonous snakes in the area, is obviously beyond his control. With the discovery of a 52 in. rattlesnake in the parking lot, employees have sharply curtailed their noon walks in the woods. The copperheads, too, will probably leave when they realize that man has come to Sterling Forest. Until then, however, development of the on-site recreation facilities, common to IBM's other installations, has been slowed down.

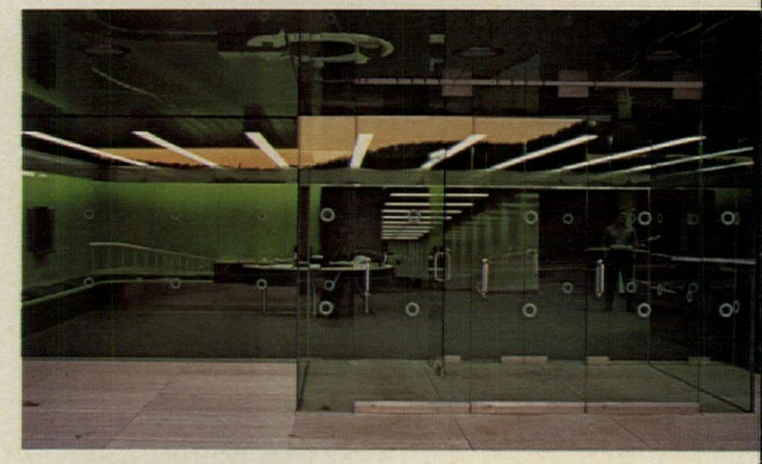
Second, designs for the parking lots were revised from Birkerts' original scheme into a more condensed form. An effort to separate the asphalt from the front door as much as possible, the first proposal was challenged because of employee walking distance. The built compacted version, although split by grade changes, awaits tree growth for final screening.

But the third, and perhaps most noticeable, shortcoming is the manner in which space is subdivided inside the building. Given the beauty of the site and the views available, Birkerts wanted to open the office interiors with a form of office landscaping. With low dividers in place of full height walls, light and views would be extended to the interior work space. The proposal was rejected in favor of IBM's time-tested office-befitting-rank formula. As a result, despite Birkerts' efforts, office space has been parceled out in cubicles that could be in the middle of any building on any site. Glimpses of color coded "landmarks" help with orientation, but only perimeter offices can enjoy Sterling Forest. [JM]

Data

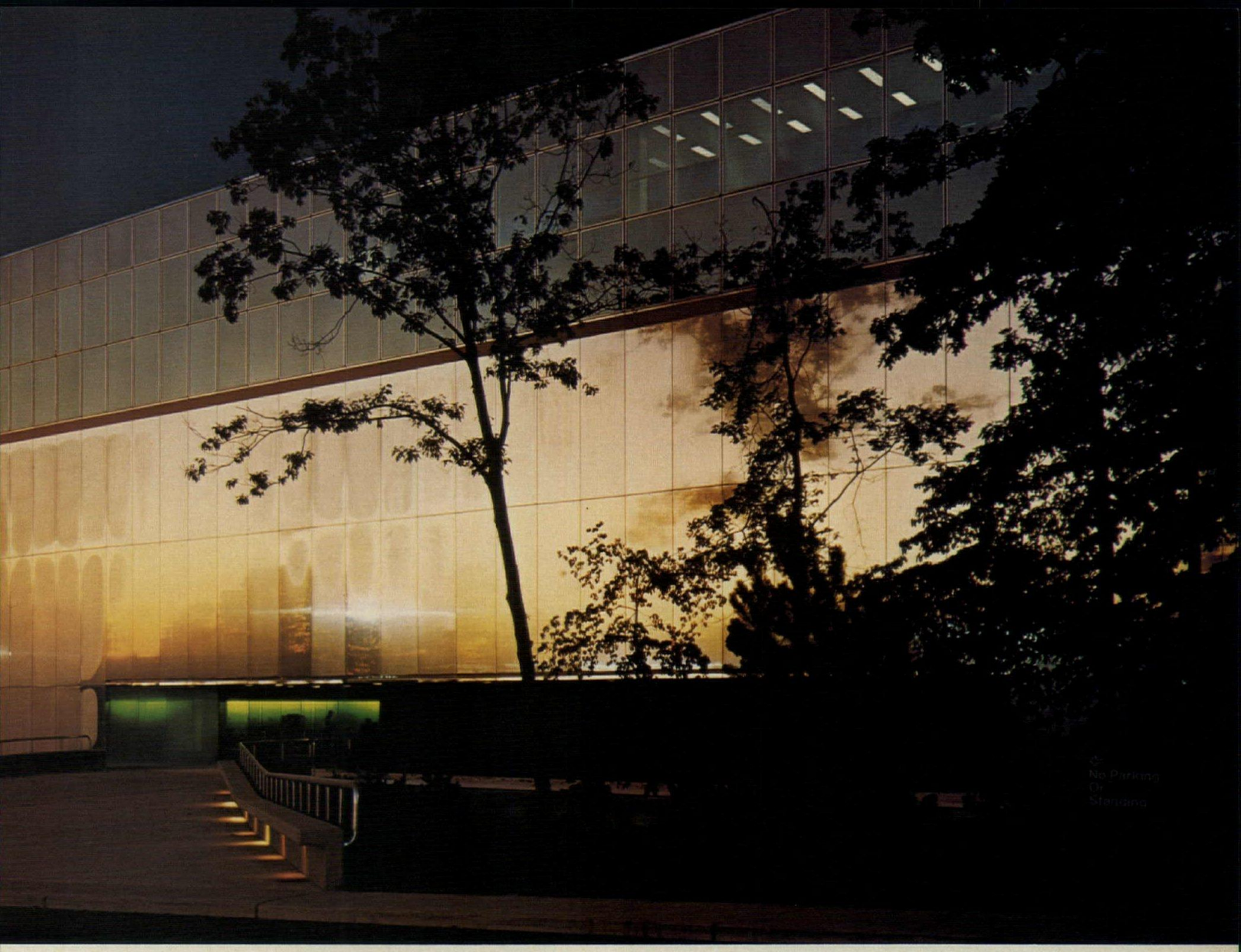
Project: IBM Sterling Forest Information Systems Center.
Architects: Gunnar Birkerts & Associates.
Program: building to house computer operations for internal control and planning of IBM manufacturing operations.
Site: hilly, wooded section of land overlooking a lake, near several corporate facilities for other companies.
Structural system: steel frame, metal deck and concrete floors.
Mechanical system: oil-fired hot water heating with hot water coils and fin tube radiation, central chilled water air conditioning. Several back-up systems for emergency power and air conditioning.
Major materials: exterior, insulated aluminum and enameled metal panels and reflective glass; interior, gypsum board, resilient tile floors, acoustic tile ceilings.
Consultants: structural, Skilling, Helle, Christiansen, Robertson; mechanical and electrical, Hoyem Associates, Inc.; site, Staunton & Freeman; food consultant, Arthur William Dana.
Costs: not available.
Photography: Balthazar Korab.





Main lobby entrance

Outdoor dining area

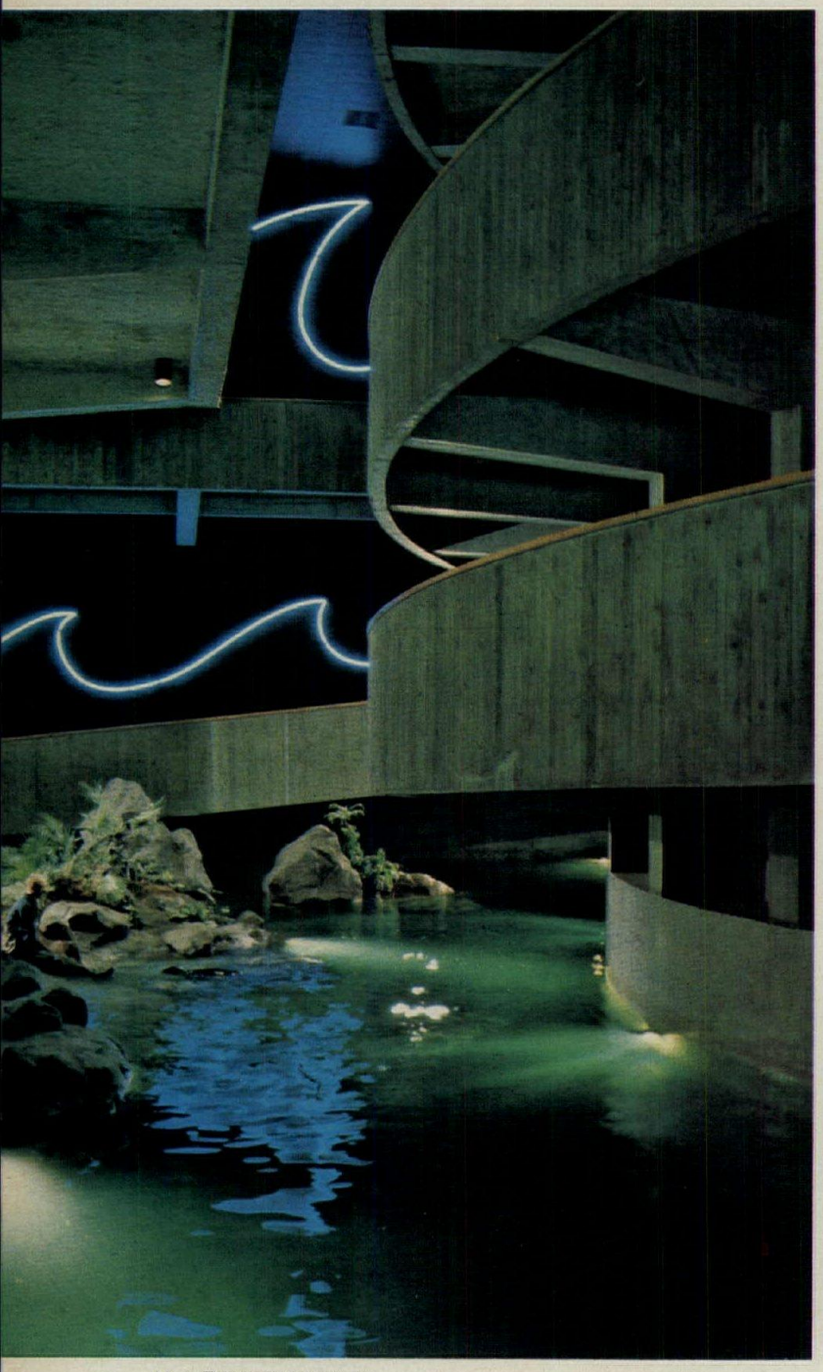


Molded lobby seating

"Blue" core stair

Corridor between computers and offices

Synthesis

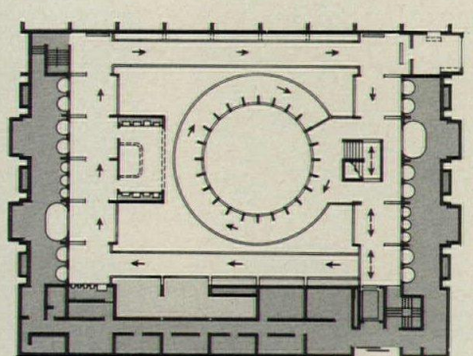


New England Aquarium

While Cambridge Seven Associates may be well known for their work on the Expo '67 dome and the Boston rapid transit system, their attitudes, the scope and diversity of their work go far beyond these well-publicized projects

Bakanowsky, Chermayeff, Chermayeff, Dietrich, Geismar, Rankine and Redmon are more commonly known as the Cambridge Seven Associates (C7A). The firm started some 10 years ago as an impromptu arrangement to prepare a proposal for The New England Aquarium in Boston. Awarded the job and needing a firm name, they chose Cambridge Seven, a name they described as "the most anonymous thing we could think of, since we wanted to function as a group rather than as individuals."

At the time, when most designers were doing buildings or graphics or interiors or industrial design, all of the partners had become dissatisfied with working within a defined discipline; some were architects, one was teaching, one made films and others were doing graphics. The aquarium project acted as a catalyst to bring together these people with diverse skills, since the nature of the building had as much to do with the architecture of exhibition—the process of seeing and learning—as it did with the shelter which enclosed it and its siting. So they designed the aquarium as a way of seeing and learning about marine life, made spaces for this to happen, and put an enclosure around them. A similar approach was the Expo '67 dome, a geodesic ⅝ sphere that they requested of Fuller so that the exhibition would become a dynamic spa-

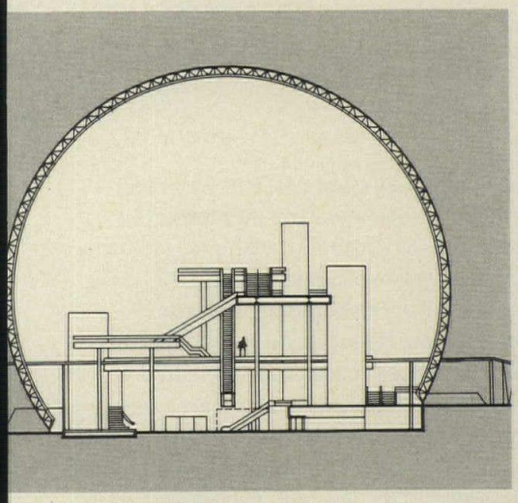


THIRD LEVEL PLAN

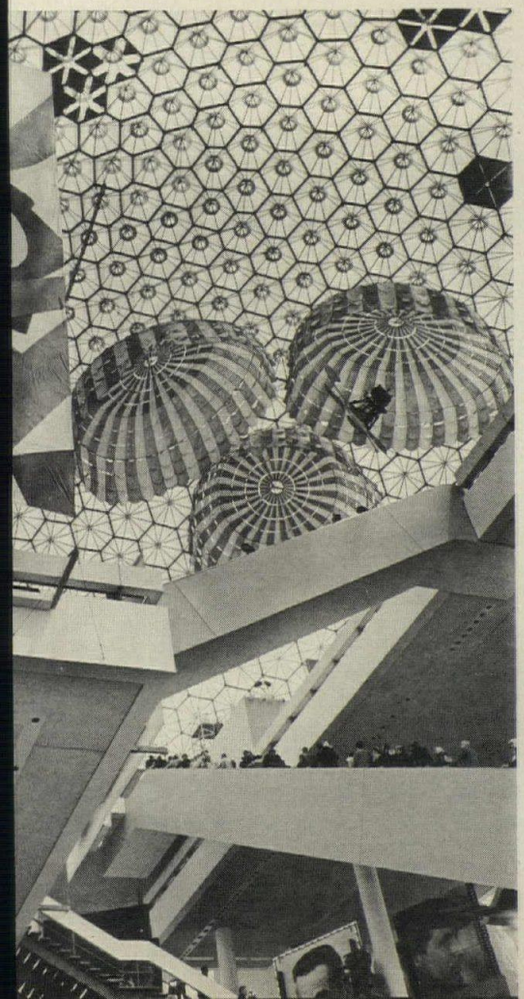
tial experience. An empty volume, the dome is defined only by the platform elements that Cambridge Seven put into it, integrating exhibit, graphics, information, circulation and architectural space to make one comprehensive experience.

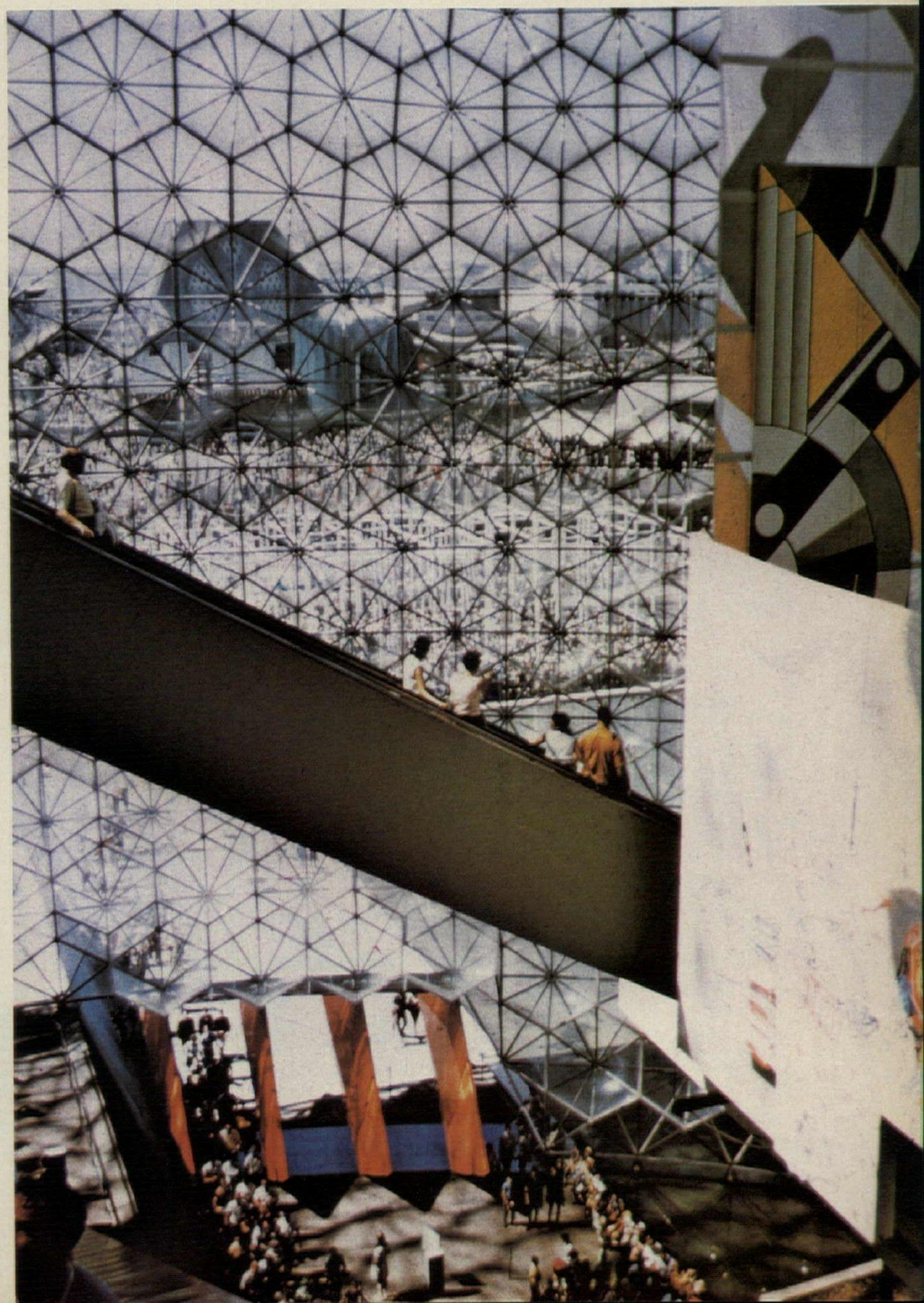
Looking back at the attitudes that prevailed before they began the firm, one partner recalls, "We were all terribly well-mannered, and we sat on our fannies waiting for someone to come along and give us a nice job. We were missing opportunities with tremendous potential to affect the environment." Working in an interdisciplinary way broadened the scope of work the firm could handle. They saw the comprehensive program for upgrading Boston rapid transit stations as more than just modernization and clean-up. It was an opportunity to affect an entire metropolitan region by making understandable, and, therefore, more accessible, a system of connections for a large number of people. The main criterion they established was orientation—where a passenger was and where he wanted to go—both architecturally in station design and graphically with recall images of the local station area, with signs, color coding and maps. The project was done entirely in-house, including architectural planning and circulation guidelines, performance standards for materials and lighting, specific station hardware, controls for revenue advertising, a new transit vehicle, graphic standards for signage, and one prototype station.

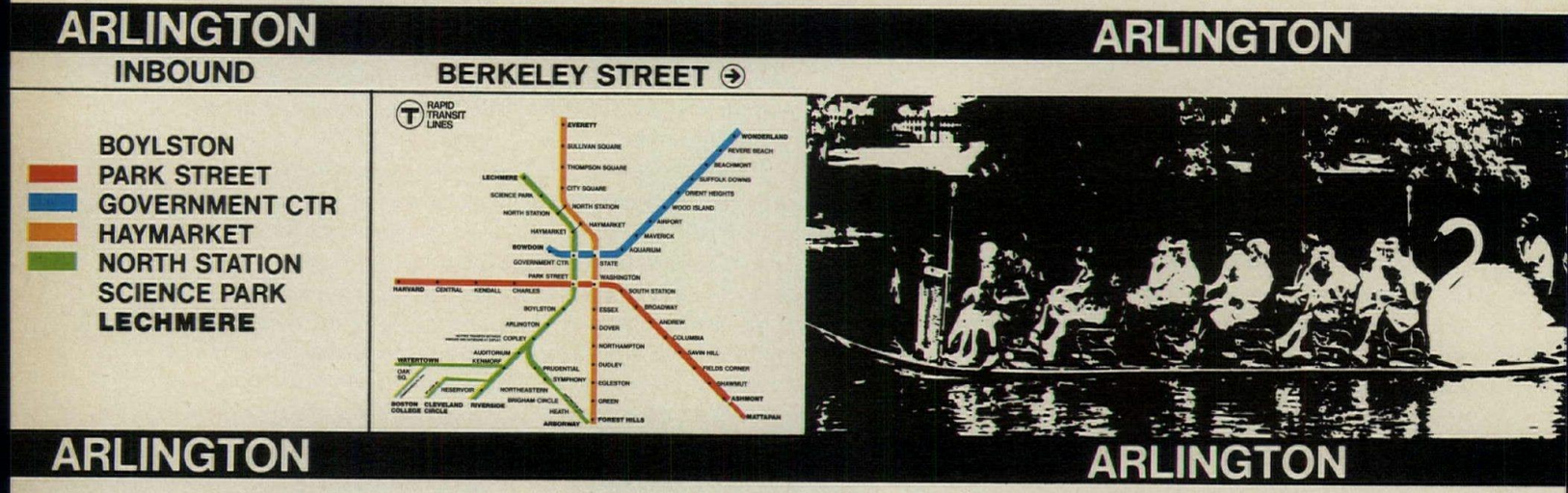
"Since we began, offices, even quite traditional ones, have started hiring graphics and industrial design people," says another partner. "It has become quite commonplace and, I think, therefore, we may have lost a lot of our uniqueness." Commonplace or not, the interdisciplinary approach has become a method of working that has allowed the group to expand its concerns. "One of the things we are looking for now is closer communication with the people we are working for and with." Their working style reinforces this: they draw on each

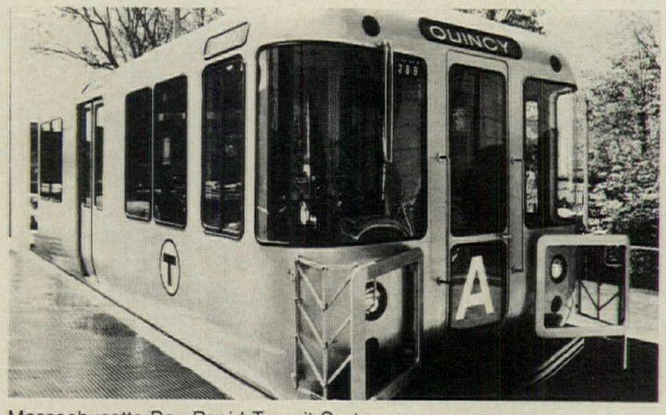


American Pavilion at Expo

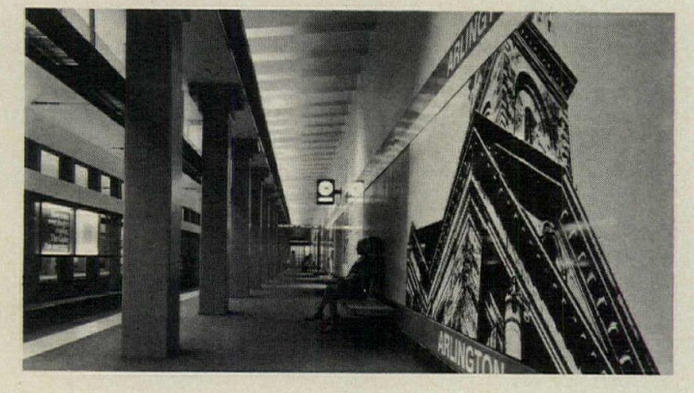








Massachusetts Bay Rapid Transit System



other for ideas and feedback in defining the scope of a project, the direction it will take and its physical design. Having established such a pattern of communication among themselves, they have turned their attention to communicating their ideas to clients, users and other professionals whose ideas they can tie into.

Communication with clients begins with helping them understand what they are and what they are trying to achieve. One of the challenges Cambridge Seven finds is in trying to take a project one step beyond normal solutions to building types—a determination to search for something inherent in the problem. "Otherwise, it's just repetitious and that's a drag. If you can identify the potentials of a situation and build on them, you can achieve a certain uniqueness that comes out of the situation rather from a preconception."

Before doing a project for a new student union at Syracuse University, people from the office spent several months at the University, observing, talking, photographing, trying to understand the lifestyle, how spaces were used and why, what a student facility should be and where it should be located to reinforce natural circulation paths. Responding to the findings, a presentation about the student users was made to the administration (client) in order to dispel any preconceptions and to allow them to understand the reasons behind the proposal. Another client, a school building committee in Weston, Mass., was so involved in planning its new high school that the members themselves made the presentation to the community. The Cambridge Seven feel that by involving the clients in defining their own objectives they don't have to "sell" solutions; by the time the design has evolved, the client already understands the solution.

The Syracuse student union, like much of their other work, attempts to make connections with the larger context, to make places for social opportunities, to make orientations clear and, consequently, to make other places more easily accessible. At a smaller scale, Truc, a group of shops in Harvard Square (P/A, Sept. 1971) is a pedestrian link between two streets. At the largest scale, the Cambridge Seven and others proposed that the Bicentennial Celebration and the Northeast corridor be combined in a single transportation and communication network (Polis '76). The Bicentennial deadline would have expedited the rebirth of the passenger rail and the terminals in each city would have become not only temporary exhibition centers, but permanent gateways—focal points for movement and information. During the Bicentennial year, events and activities—both historical and festive—would occur in all the cities along the corridor, tied together as a single, multi-city celebration. While many people may regard this idea as a fanciful exercise, it was a proposal which gave back more than it took—there were no new buildings proposed, only the reuse of existing resources.

Besides simply suggesting the idea, Cambridge Seven got together with other planners and designers in Boston, New

York and Philadelphia to articulate the concept and its myriad implication in some detail in an effort to gain adequate political and public support.

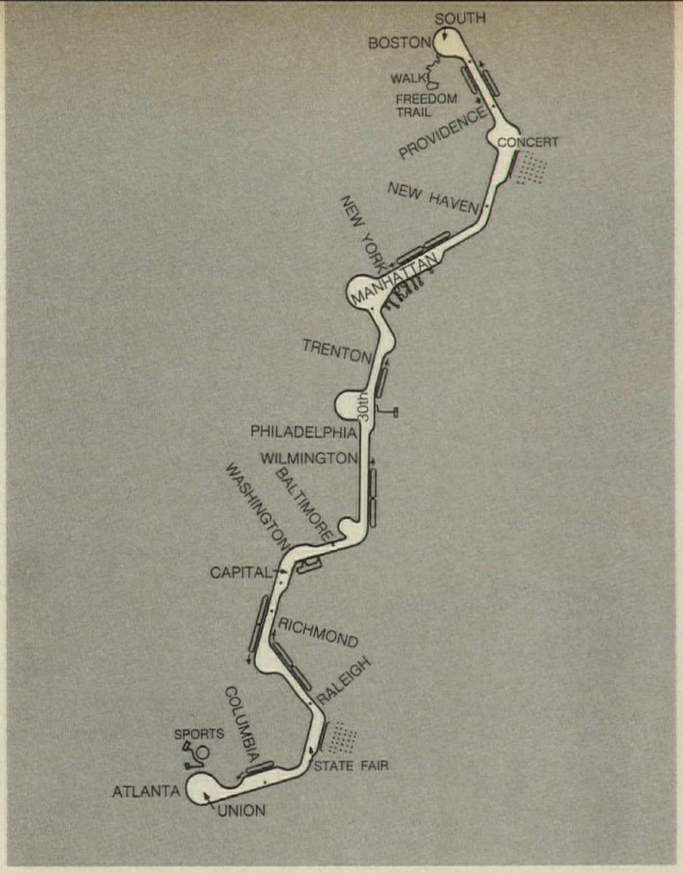
Another recent effort in this direction—at another scale—was a proposal for comprehensive development of Massachusetts Avenue in Cambridge to encourage the kind of street life and activity that was slowly dying out because of speculative building. In a week of furious working together with some Harvard students, Cambridge Seven produced a series of slides and plans that suggested ways, through zoning and design controls, to reinforce the avenue as a pedestrian and vehicular spine. When they presented their ideas to the Cambridge Planning Board, all efforts were rewarded when the mayor asked, "You mean we could eat pizza in the streets again?" The firm often assumes responsibility for raising issues, communicating with the public and private agencies, and proposing solutions, sometimes without compensation. But playing this role—as in the "Mass Ave." project or the Polis proposal—can bring about frustration. They are no longer satisfied knowing that they have raised important urban issues or successfully communicated ideas that seem to be acceptable. Now the question for them is where the architect's role ends in trying to effect these ideas, if those with the power to make the choices only nod their heads yes.

When one university building committee received a program from a consulting firm for a new building, it did not feel that the suggested high rise was appropriate to the site, which lay between two centers of activity. Asked to reevaluate the proposal, Cambridge Seven developed a diagrammatic scheme of modular spaces to accommodate a variety of teaching methods, with a circulation spine between the two centers conceived to make activities visible to anyone walking through. This diagrammatic study was later used by the architects for the building to develop the organization and relationships in the building and on the site.

A project for the Douglas DC-10 aircraft was similarly a conceptual solution. The firm produced a series of design studies for the basic interior shell establishing the layouts of seating, lounges, kitchens and baggage, as well as for location and type of signage. The actual interior—selection of materials and colors—will remain the option of the individual airlines who buy the plane.

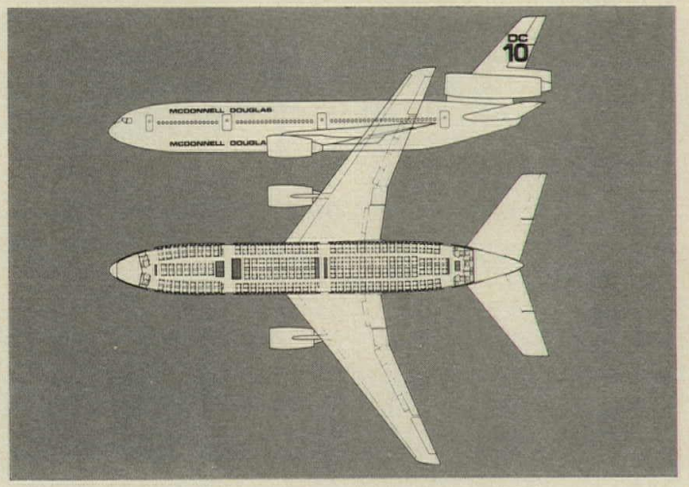
While much of Cambridge Seven's work is initiative or conceptual in nature, the firm is also thoroughly professional—able to design a building within tight time constraints, bring it in on budget and on construction schedule. An $18 million academic building for the new University of Massachusetts campus in Boston is organized around a central circulation space to orient the user, to provide social spaces and to make the parts of the building comprehensible. Designed in 12 months, the building was brought in on budget and schedule.

Among the serious efforts are some lighthearted moments. Asked to design a bus stop for MIT directly across the street from its monumental entrance colonnade, Cambridge Seven spent many hours contemplating appropriate solutions. The result, the brainstorm of someone in the office, was half-a-bus—sawn lengthwise. The following projects, proposals and buildings illustrate their attitudes, the scope and diversity of their work. [SLR]



Polis '76

Interiors for Douglas DC-10

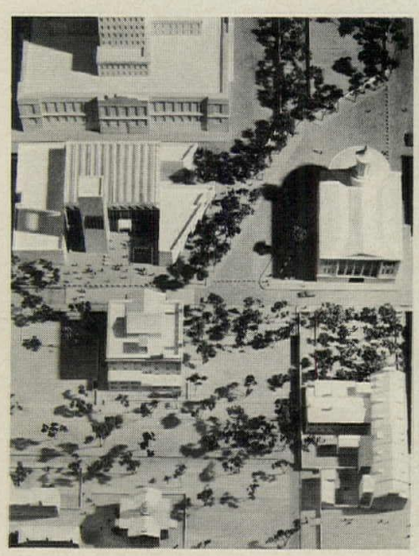


MIT Bus Stop

Profile: Cambridge Seven Associates

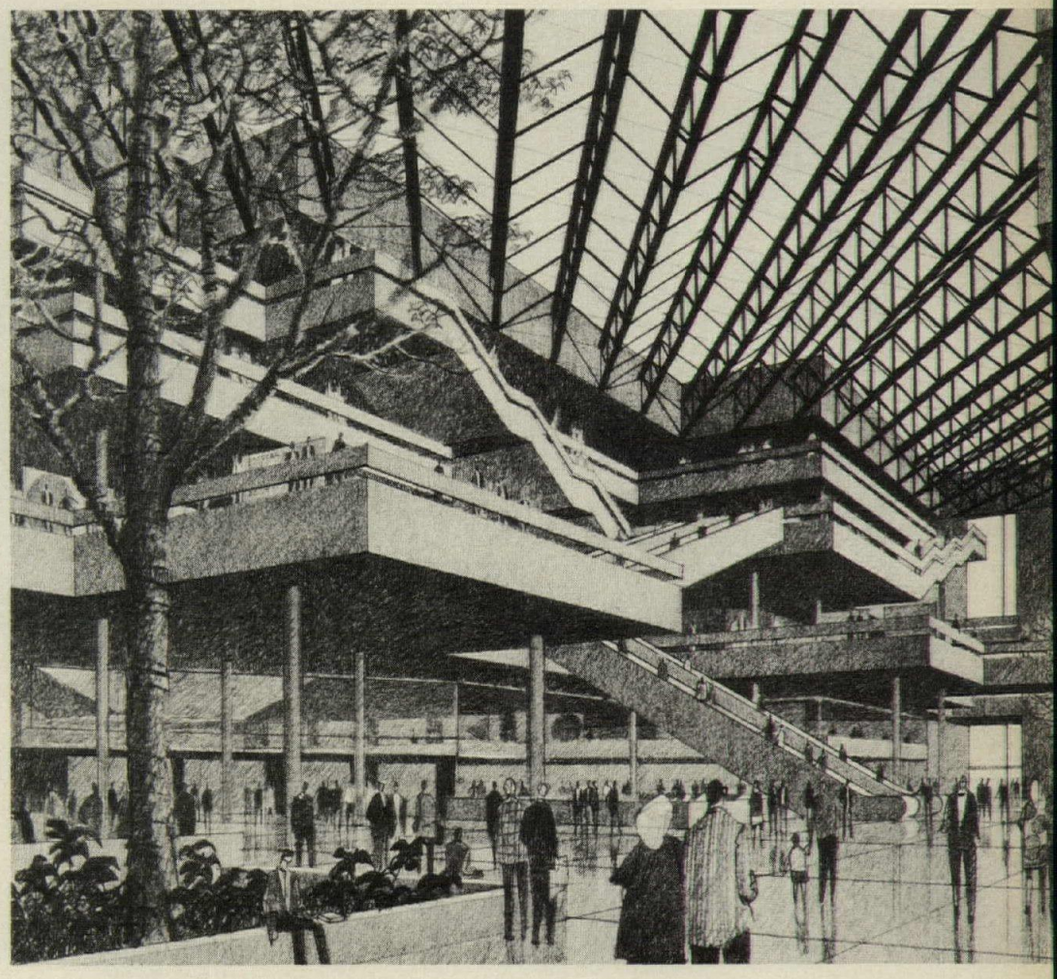
Visitor center

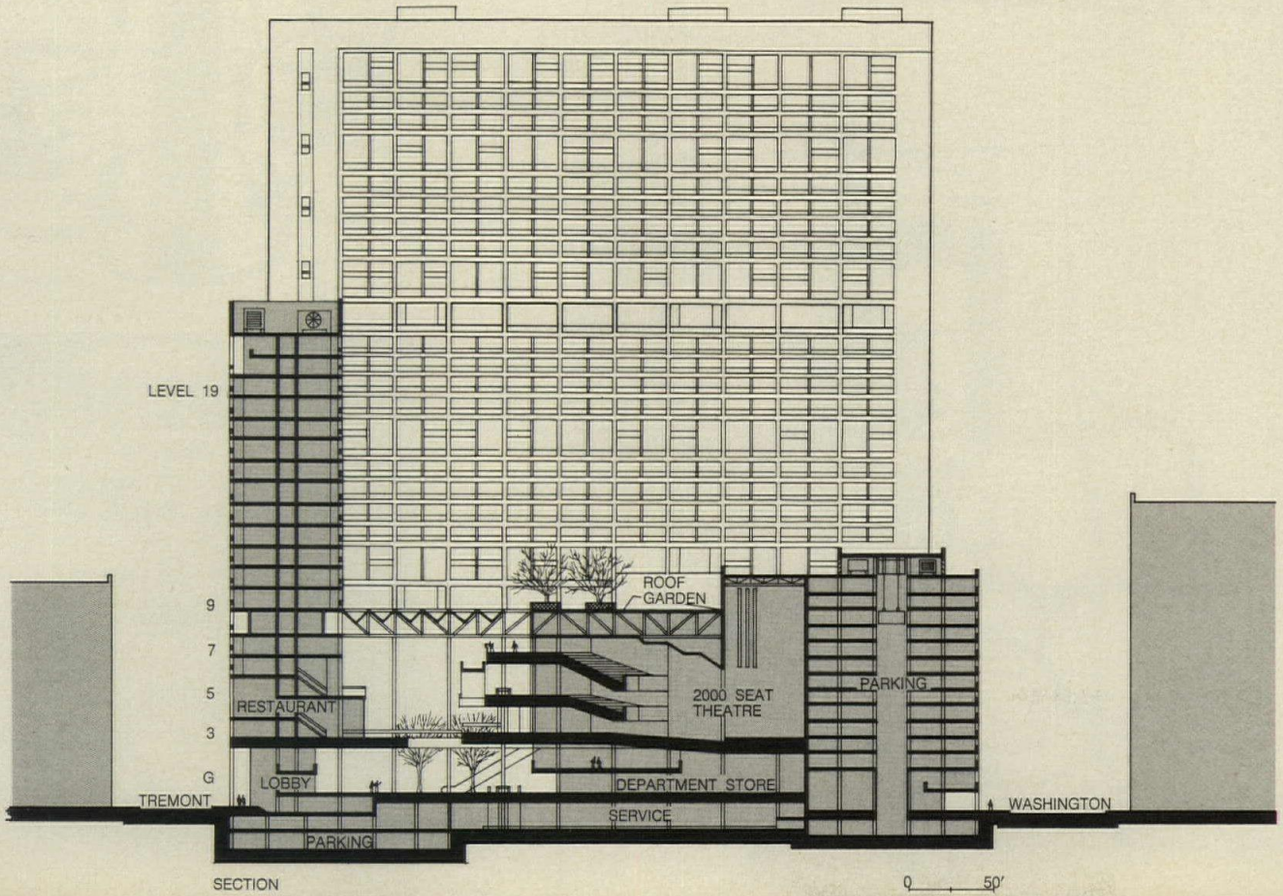
Preparing for 1976, the National Parks Service retained Cambridge Seven to design an arrival and orientation point for visitors to the historic sites of Independence Mall, Philadelphia. The main space contains exhibits on 18th Century Philadelphia life and a lobby area for two cinemas where films will convey a sense of the revolutionary period and of personalities and events prior to the signing of the Declaration. Another major element is the Liberty Bell which is to be moved from its present location to one that can more easily accommodate the crowds expected during the Bicentennial celebration. As designed, the project is a group of low brick masses, punctuated by a brick tower and the transparent, brightly lit exhibition space. Large landscaped plaza areas, resulting from a street closing, add to the capacity to handle large summer crowds.



Hinge block

Working with a group of business and professional men, Cambridge Seven proposed that Boston's problem of accommodating numerous artists' groups would best be solved by building them as secondary parts of large downtown real estate developments rather than as isolated entities. This solution would mix these activities into the daily routine and fabric of the city life. The preliminary design shown here is the first step toward creating a development program to be offered, with the site, to interested developers by the Boston Redevelopment Authority. A single structure would house theaters, restaurants, shops, hotels, galleries, offices and apartments, all sharing a large, skylit central public lobby. Direct adjacencies of all these activities will reinforce the success of the others, with the major income producers—offices, apartments, hotels—acting as the financial backbone of the project.

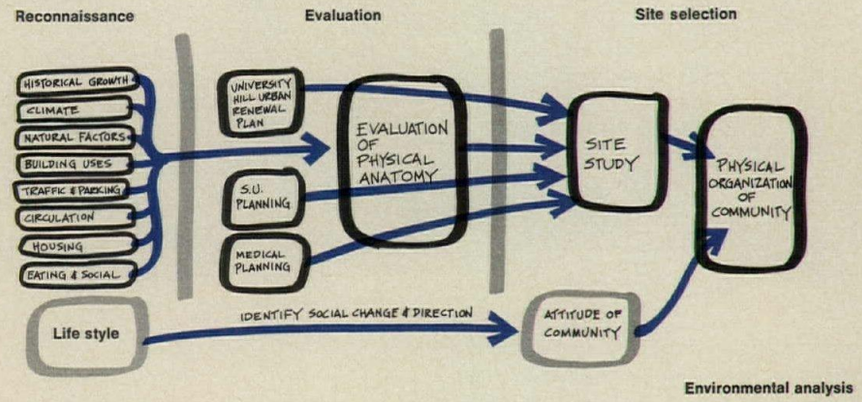




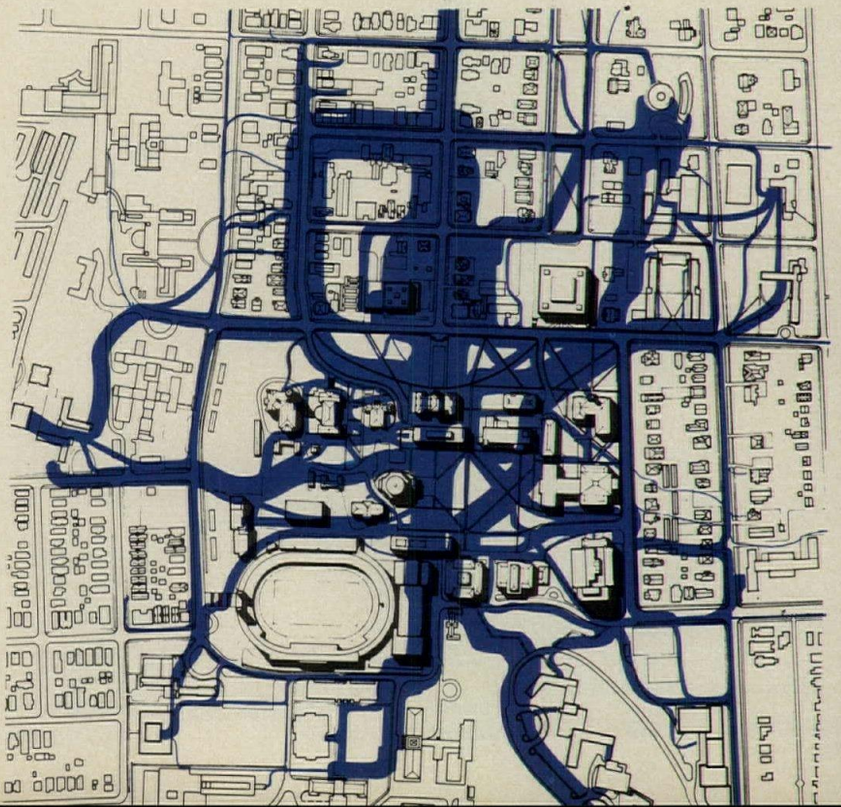
Schools

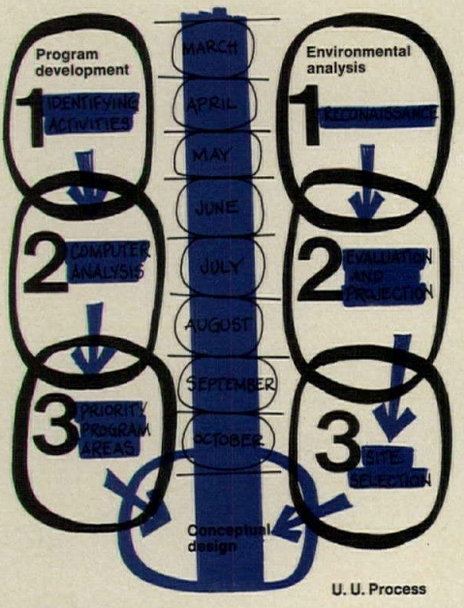
The process leading to both the selection of a site for the University Union at Syracuse University (left) and a spatial program for building involved parallel investigations. The first step in the environmental analysis was an investigation into how existing spaces were used. Program development began with interviews and questionnaires to find out basic community needs. In the final phase, computers helped organize this information into a list of priority activities. The resulting physical building reflects much of the variety of "Main Street" in the patterning of the façade; it reinforces the existing circulation pattern and is a connecting link to future university growth to the south.

The Pomfert School Library and the new academic building for the University of Massachusetts campus (right) in Boston required similar analysis and synthesis of activities in the design process.

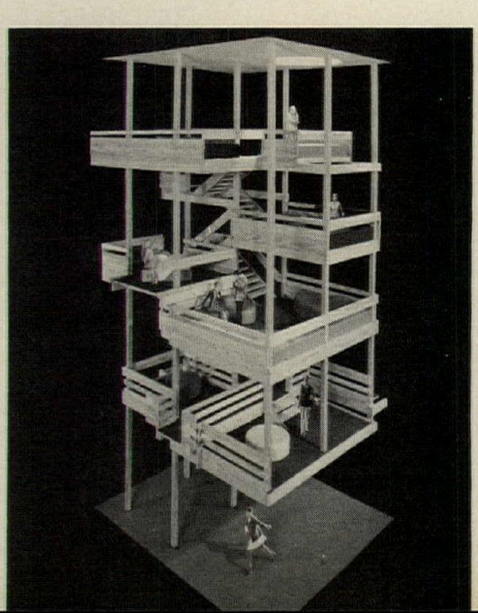


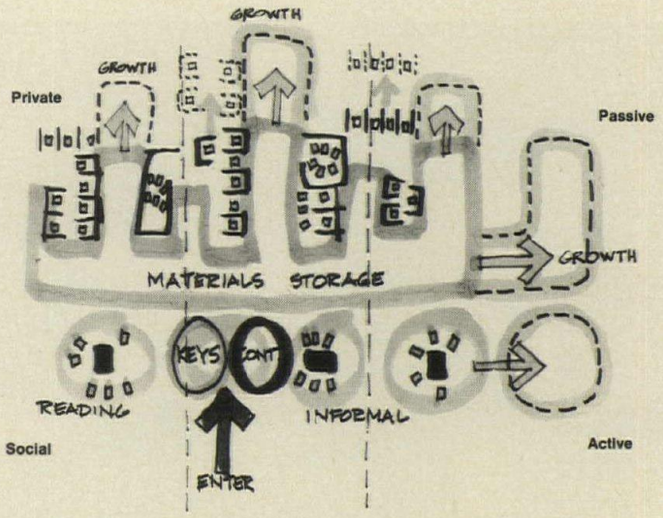
Environmental analysis



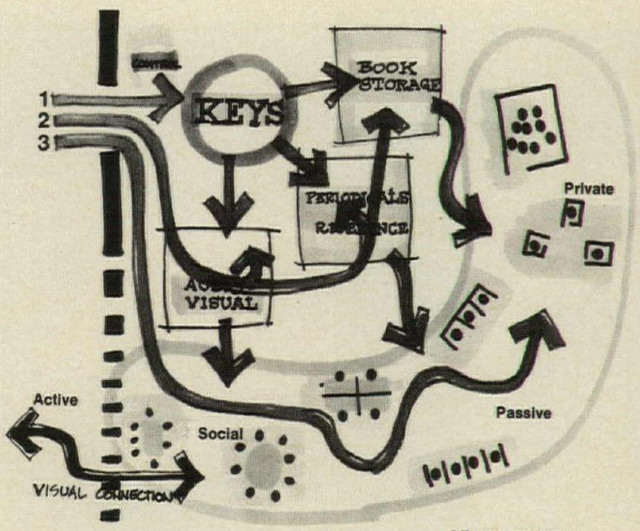


U. U. Process

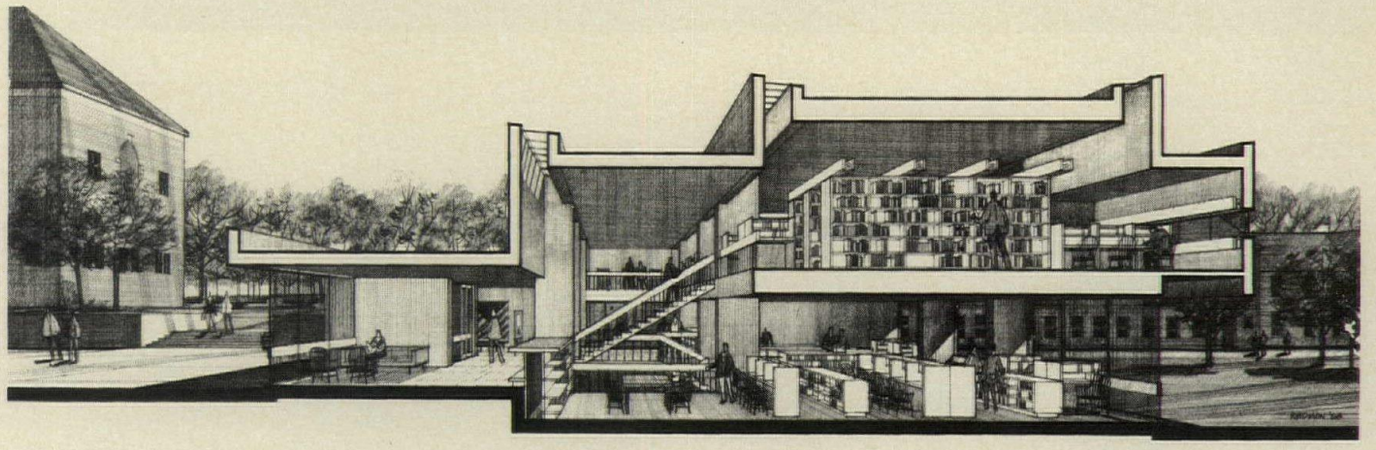


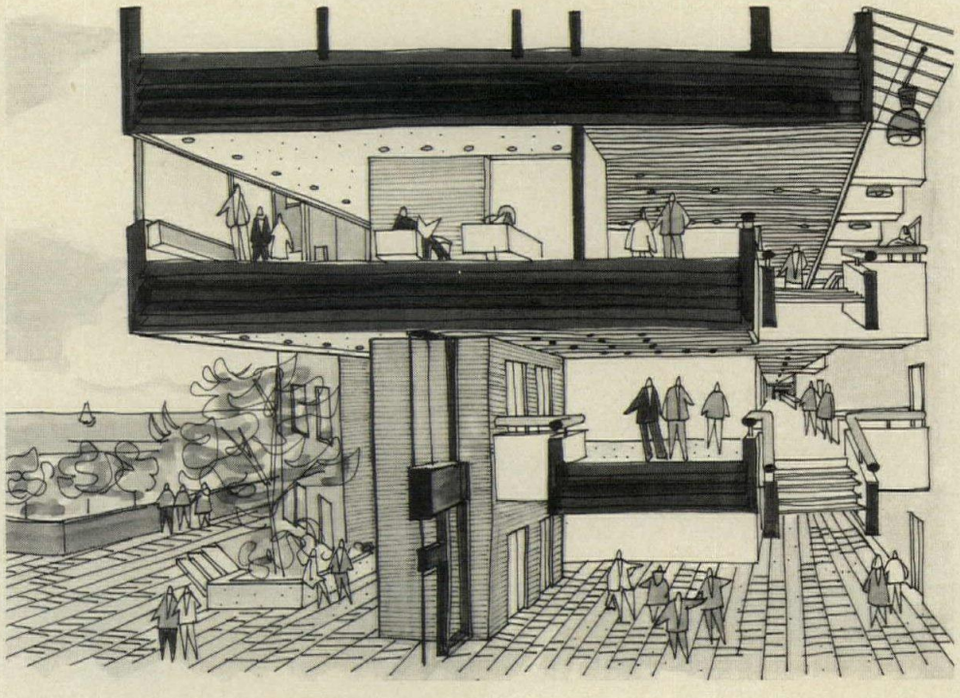


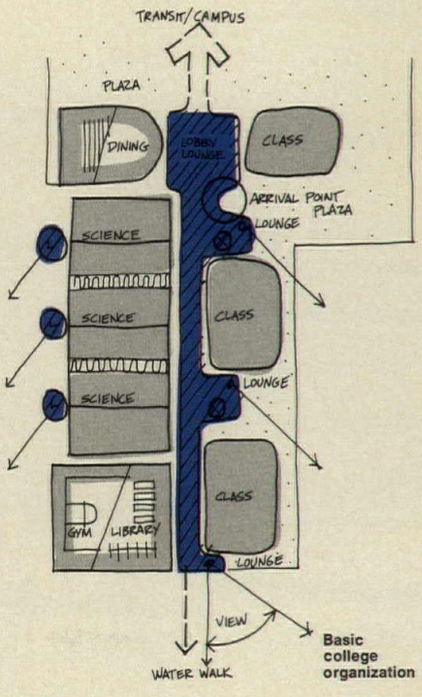
Library Organization



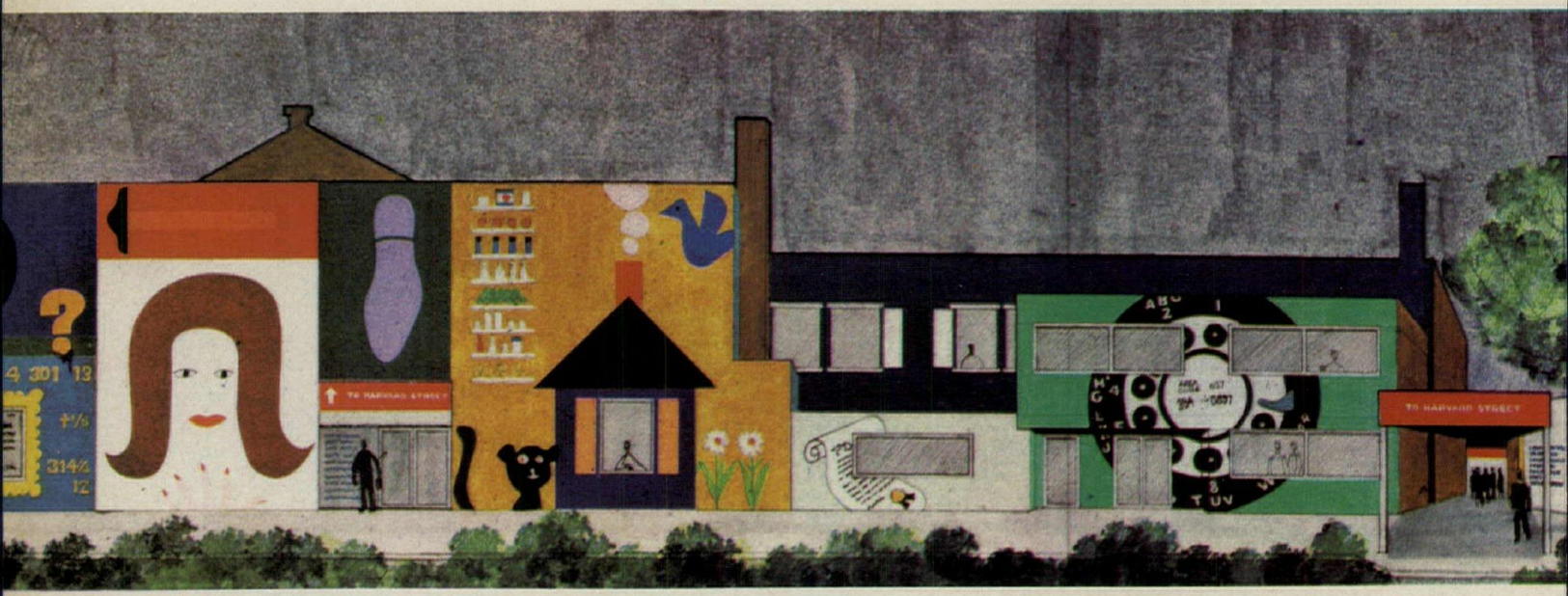
Library anatomy



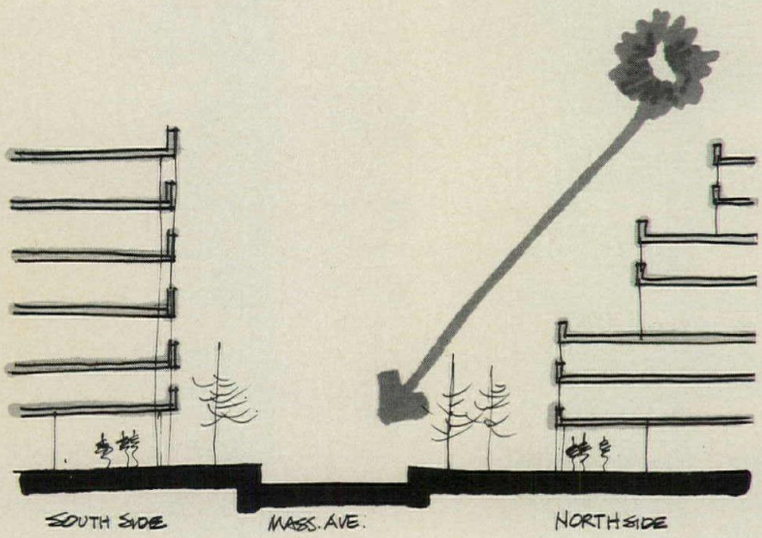


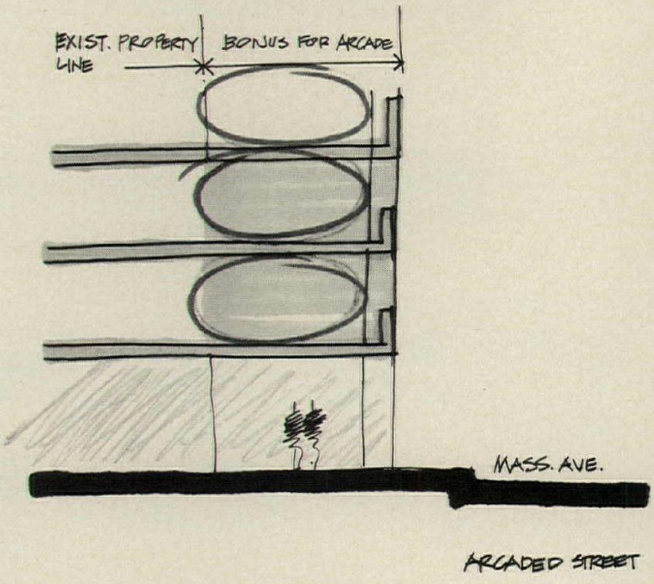


Basic college organization


TO HARVARD STREET
TO HARVARD STREET


ARCADE BUILDING
DIRECT ENTRANCE - HARVARD ST.
SHOPPING AREA

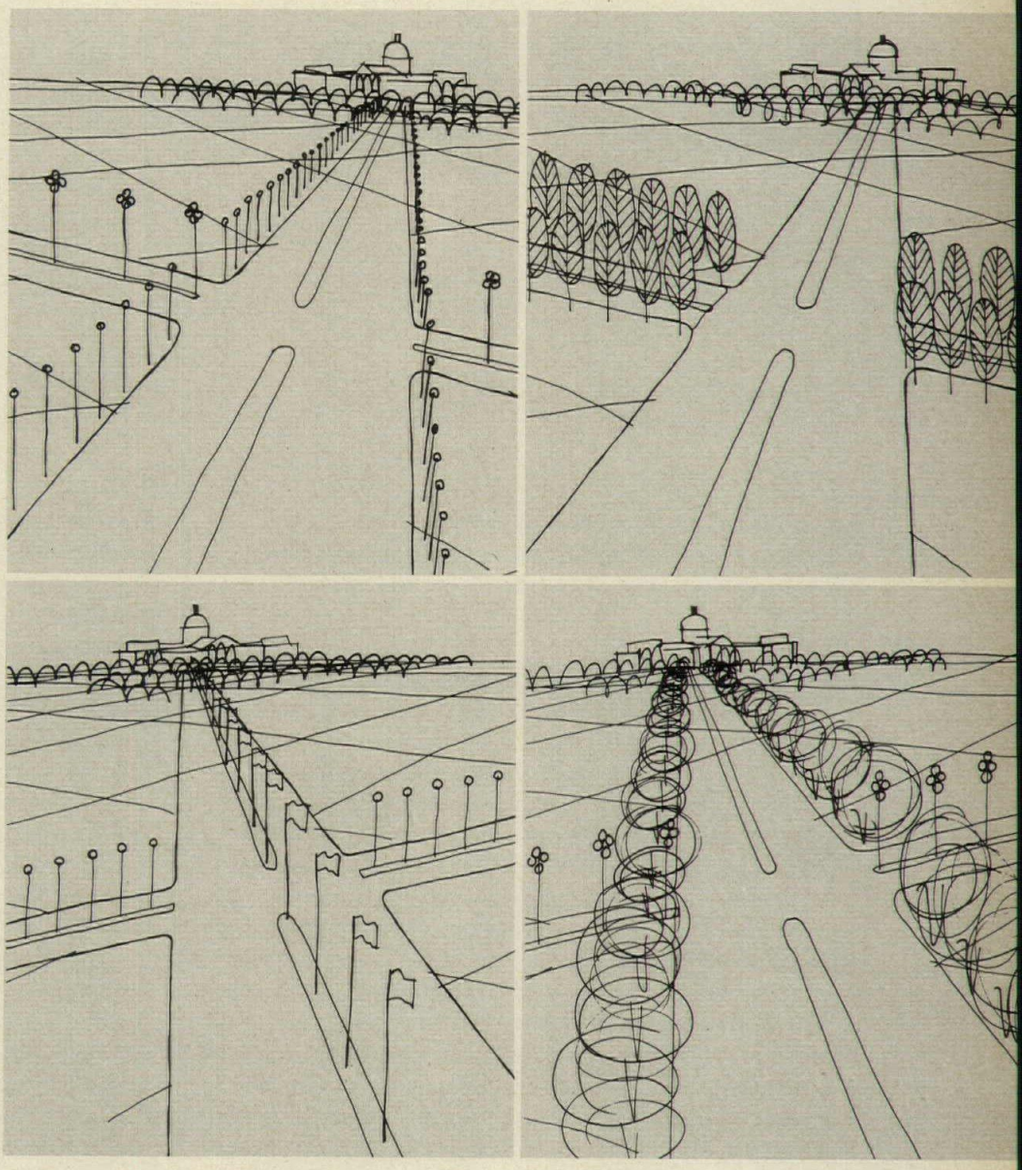

SOUTH SIDE
MASS. AVE.
NORTH SIDE

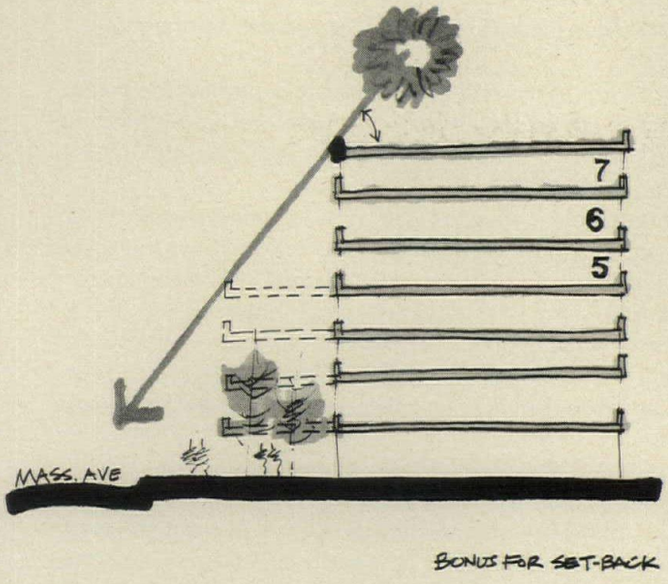

EXIST. PROPERTY LINE
BONUS FOR ARCADE
MASS. AVE.
ARCADED STREET

Streets

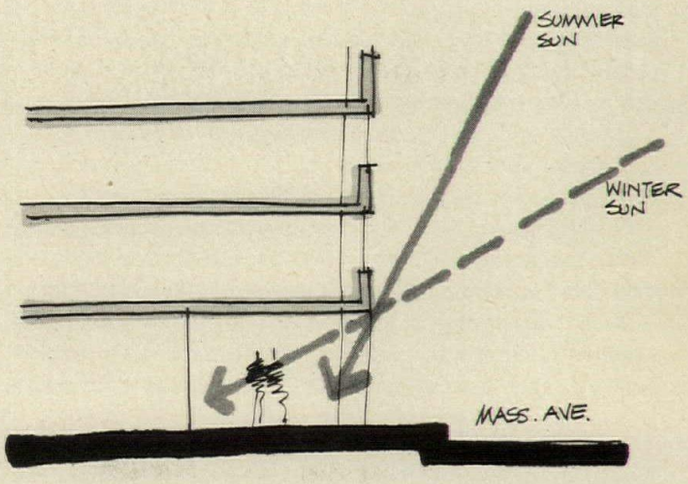
Four ways to delineate a street intersection to clarify differences between major and minor streets are shown (right) in sketches prepared for the Washington D.C. Fine Arts Commission. The sketches below show developmental considerations of massing, sun angle and increased floor area ratio in exchange for pedestrian amenities along Massachusetts Ave. in Cambridge. Before photo and after sketches (left) show what can be done to turn the backside (parking lot) of commercial buildings into a large sign about what goes on in the buildings. Each piece of graphics relates to the specific service of the store.

Another study of street uses for Chestnut St., Philadelphia, outlined ways to separate vehicular and pedestrian traffic with street furniture and plantings to make the street experience pleasanter for the pedestrian.





BONUS FOR SET-BACK



ARCADED STREET

Pre-engineered elevatoring

W.W. Swartz, PE, RA

Application of modular building systems to the design and specifications of elevatoring equipment will produce significant savings in both time and cost

Pre-engineered elevators are now available in an extended range of capacities for low and high rise buildings. For low rise projects, the broader range of pre-engineered hydraulic elevators has recently made it feasible to include elevator service that tight budgets could not otherwise accommodate. For higher rises—up to 30 stories—higher speed, pre-engineered geared traction elevators offer comparable savings.

Progressive architects are now aware of cost and time savings that they can gain for their clients from the application of modular building systems to vertical transportation. With inflation continuing to plague construction, affecting not only labor costs but also interest rates, pre-engineering has proved not only effective as a means of conserving scarce on-site skills, but also of telescoping construction schedules.

Pre-engineered elevators should not be introduced as an afterthought, but planned into a building from the beginning. Hoistway dimensions for pre-engineered elevators are summarized (table 1); machine room sizes (table 2). For greatest economy, building plans must incorporate dimensions specified by the elevator manufacturer.

While the machine room for a pre-engineered traction elevator installation must be directly over the hoistway, considerable flexibility is permissible in locating hydraulic elevator machine rooms. Compact pumping units will fit in small machine rooms on either side of or behind the hoistway, or at a distance from the elevator. Hydraulic elevators permit flat roof lines, impose minimum loads, and require no space-consuming counterweights in the hoistway.

Pre-engineered hydraulic elevators are available for standard capacities from 1500 to 4000 lbs, and traction elevators have rated loads of 2500 lbs for speeds of 200 and 350 fpm.

Recent developments in materials and methods led to redesigned structural elements that eliminate excess weight and bulk, yet retain essential strength. These reduce loads on the drive machinery and permit optimal use of components in elevators of high performance standards. Cab and platform connections in the latest models allow more room for passengers without increasing hoistway dimensions.

Manufactured on an assembly line basis, complete units are stockpiled for "off the shelf" delivery to building sites. Lead time for ordering elevators is reduced, permitting tighter construction schedules. Earlier delivery dates allow more efficient installation of elevator equipment, expediting work by other trades, while improved installation procedures save time in completing the elevator as the building rises. From the signing of a contract to completion of an installation, pre-engineering can cut 15 to 40 percent from the time required by conventional methods.

Manufacturers provide comprehensive literature including standard plan, section and detail drawings and specifications for each model. These layouts and specifications substantially reduce paperwork per elevator, with resultant economies in final cost, while standardized ordering procedures save costly individual engineering for each installation.

Small pre-engineered hydraulic models are generally used in garden apartments; larger ones are found in schools and college buildings, suburban offices and elsewhere. Hospital-size elevators are being installed not only in a variety of institutions but also in senior citizen residences. Pre-engineered geared elevators are going into office as well as apartment buildings.

Both kinds of pre-engineered elevators may find their place in a larger project: hydraulic for "shuttle" service between entrance, garage or other areas in the base of the structure, and geared, for reaching upper levels.

While hydraulic elevators are limited to relatively few floors of travel, one must not assume that those floors are the lowest in the building. An unusual but successful installation in the 15-story First National Pioneer Bank in Lubbock, Tex. uses a pre-engineered hydraulic unit as a private elevator for the Lubbock Club, on the 14th and 15th floors. This is in addition to a complete system of moving stairways and electric elevators for the other floors.

Consider standard elevators

If one of the pre-engineered models now in production will not quite fit a given project, consider a standard elevator. Pre-

Author: W.W. Swartz is General Chief Draftsman, General Construction Manager's Office, Otis Elevator Co., New York.

engineering is actually Phase Two of a program begun earlier by the National Elevator Industry, Inc., in adopting standard elevator specifications to satisfy most requirements while eliminating uneconomic, unnecessary variations.

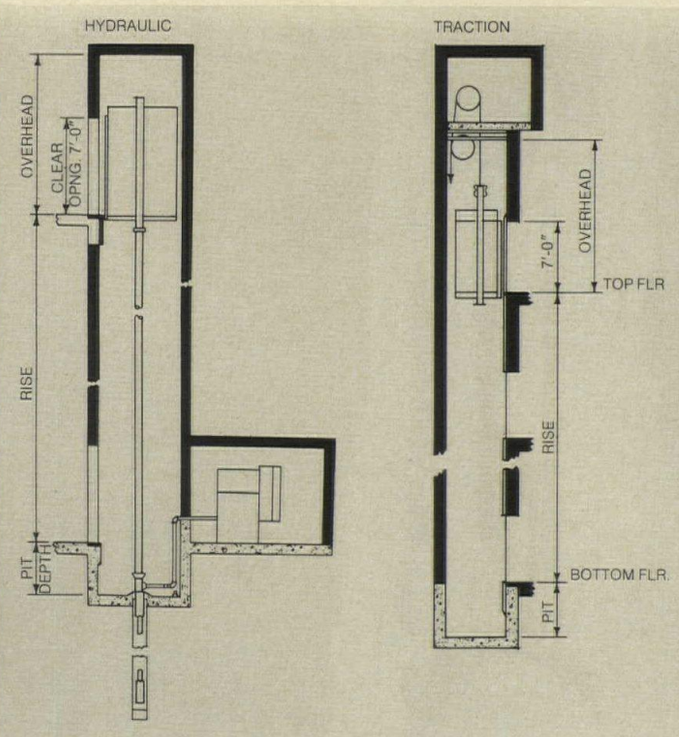
NEII standards cover more than 70 different elevator capacities, sizes and shapes, of which some 10 are pre-engineered. Although a pre-engineered elevator uses pre-manufactured components, a standard elevator is made to order, but according to commonly used specifications based on the industry's experience. (On the other hand, a few unusual elevators, like the glass-bubble installations in recent hotels, are truly custom engineered.)

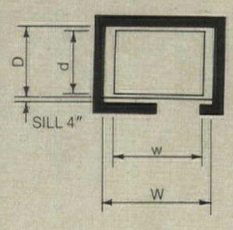
Standard specifications include elevator dimensions—hoistway, pit and machine room—that critically influence building plans. For each standard elevator size and capacity rating, layout sheets show platform and hoistway plans, simplified hoistway sections and machine room sizes with tables of applicable dimensions. (These sheets are available from NEII, 101 Park Ave., New York, N.Y. 10017, or from member companies.)

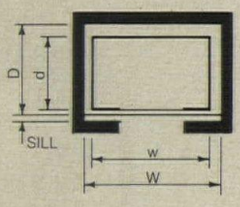
Besides innovative designs for standardized equipment and more efficient methods of in-plant production, systems engineers are also working to improve on-site installation efficiency. With improved procedures and tooling, the process of erecting a pre-engineered elevator in the building can proceed as smoothly as its manufacture in the plant.

Recognizing that uniform building codes can aid the success of standardization, local, state and national authorities are beginning to move in this direction. As conditions permit, leading elevator manufacturers are ready to introduce more productive procedures. In Europe, where building systems have been in use longest, the possibilities of pallet-assembled hoistway and machine room equipment and even prebuilt hoistways are being actively developed.

Standard dimensions and specifications are making the elevator catalog an increasingly valuable tool for the architect. But computerization could replace the product catalog in its traditional form. That may come to pass as architects and manufacturers store more equipment data in computers and develop programs for selection and system design.







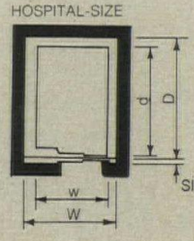


Table 1 Hoistway dimensions

Capacity	Speed	Passengers	Clear Hoistway W (width)	Clear Hoistway D (depth)	Doors clear opening	Pit	Overhead	Max. rise	Max. stops
Hydraulic									
1500 lbs.	75 fpm	10	6′-8″	4′-11″	2′-8″	4′-0″	11′-2″	39′	5
2000	125	13	7′-8″	4′-10″	3′-0″	4′-0″	11′-2″	41′	5
2500	125	16	8′-4″	5′-5″	3′-6″	4′-0″	11′-2″	42′	5
3000	125	20	8′-4″	5′-11″	3′-6″	4′-0″	11′-2″	42′	5
3500	125	23	8′-4″	6′-7″	3′-6″	4′-0″	11′-2″	42′	5
4000	125	26	9′-4″	6′-7″	4′-0″	4′-0″	11′-2″	42′	5
Hospital size 4000 lbs.	80	26	7′-3″	9′-1″	4′-0″	4′-0″	11′-0″	36′	5
Geared									
2500 lbs.	200 fpm	16	8′-4″	6′-2½″	3′-6″	5′-0″	14′-8″	160′	16
2500	350	16	8′-4″	6′-2½″	3′-6″	5′-0″	15′-2″	300′	30

Table 2 Machine room plan dimensions

Capacity or speed	1 Car	2 Car
Hydraulic	(Machine room at rear of hoistway)	
1500 lbs.	6′-8″ x 7′-6″	13′-8″ x 7′-6″
2000 lbs.	7′-8″ x 8′-0″	15′-8″ x 8′-0″
2500 lbs.	8′-4″ x 9′-0″	17′-0″ x 9′-0″
3000 lbs.	8′-4″ x 9′-0″	17′-0″ x 9′-0″
3500 lbs.	8′-4″ x 9′-0″	17′-0″ x 9′-0″
4000 lbs.	9′-4″ x 9′-0″	19′-0″ x 9′-0″
Hospital size 4000 lbs.	7′-3″ x 8′-0″	14′-10″ x 8′-0″
Geared	(Machine room directly over hoistway)	
200 fpm	9′-0″ x 14′-0″	17′-8″ x 14′-0″
350 fpm*	9′-0″ x 14′-0″	17′-8″ x 14′-0″

*Also for 3 car groups, with machine rooms 26′-4″ x 14′-0″

Cathedral Church of St. Peter and St. Paul

What's progressive about a Gothic cathedral?

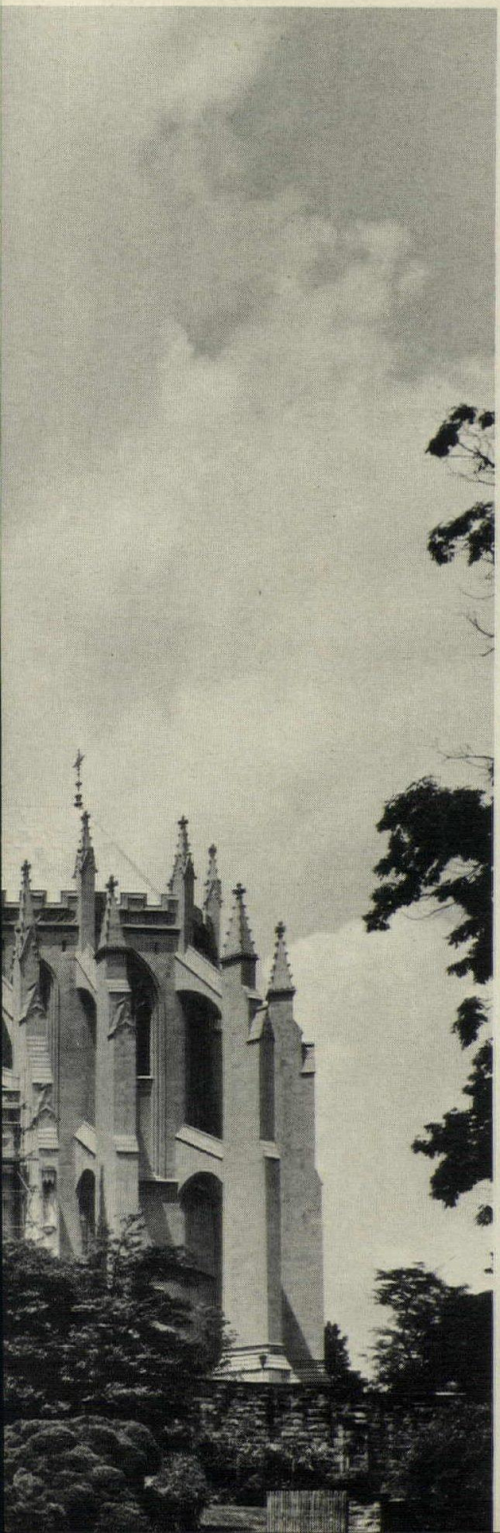
Looming over Washington, D.C. is the last true Gothic structure still under construction. Ancient crafts and new techniques form a surprisingly modern building

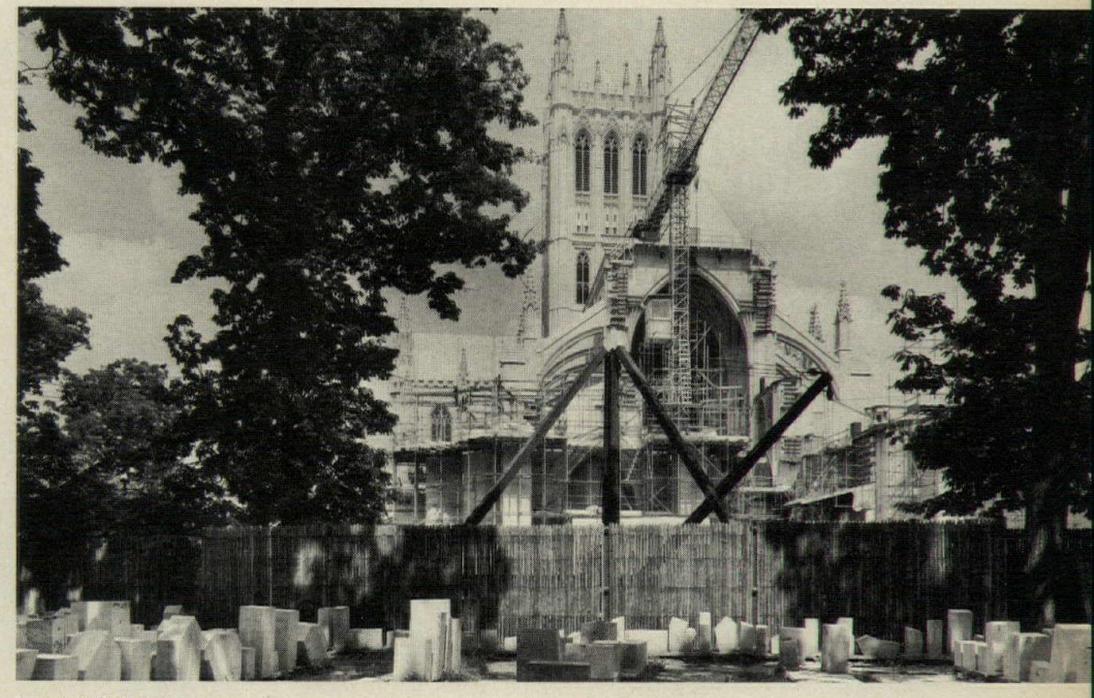
In an era when architects are seriously proposing "disposable" buildings, the Cathedral Church of St. Peter and St. Paul is being built for a 1000-year design life. While some architects are making news with commission-to-occupancy schedules compressed into months, the Cathedral is now nearing its completion date of 1982. And while certain governmental agencies allow 1 percent for art almost as an afterthought, carvers of stone and wood, artists in stained glass, mosaics, metals and other media have for 60 years contributed directly to the fabric of the Cathedral.

The Washington Cathedral, as it is more commonly known, is more than the country's last true Gothic structure (New York's St. John's seems destined to remain incomplete). It is more than the seat of two Episcopal bishops. It is the nation's church, chartered for that purpose, paid for entirely by individual gifts and at times housing several congregations of different denominations and even different faiths.

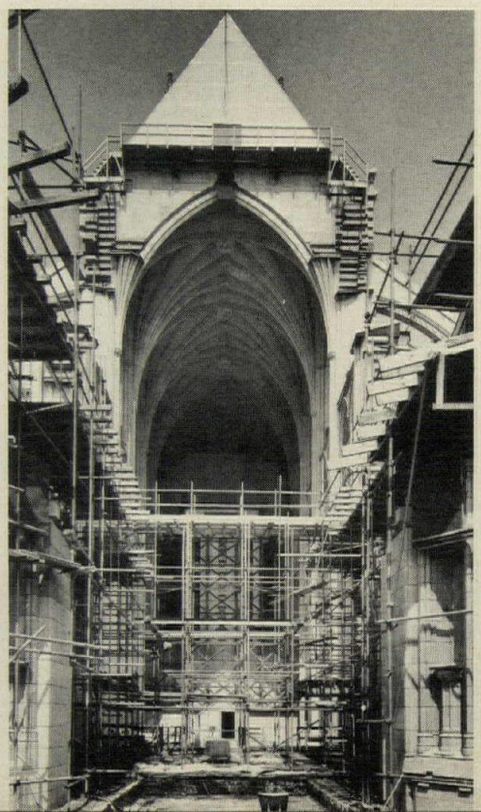
It is more than a history lesson in medieval architecture, although at this time the section of the nave is clearly visible in stone. Its construction techniques are as old as 14th Century England, and as new as any other systems building.

Richard T. Feller, Clerk of the Works, confirms the systems analogy. "In many ways," he says, "it is similar to the newest systems structures. The limestone blocks are pretrimmed and arrive at our yard numbered from the shop drawings so there is no doubt about which goes where. We use construction management and precise delivery schedules. We have room for only eight or nine loads of stone, and it has to keep moving because every time something has to be rehandled, it

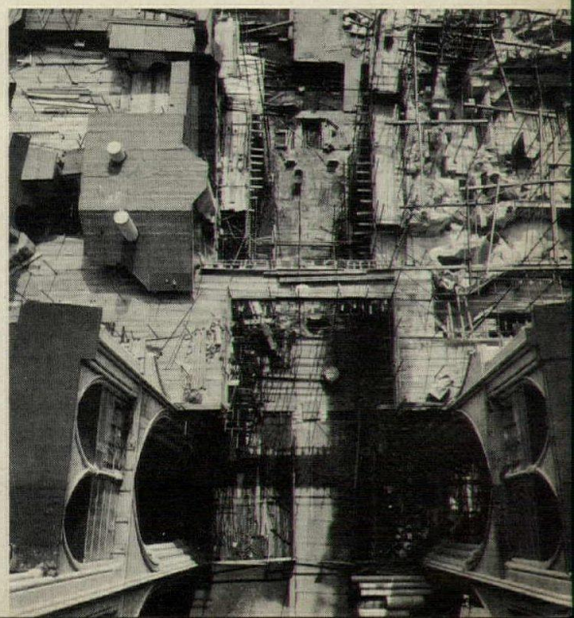




Norman McGrath photos



Pilgrim Steps, 40 ft wide, lead to the south transept entrance (far left). Precut stones arrive on the site (above) numbered for exact placing; construction now nears west end of the nave (below), from where its section can clearly be seen in stone (left).



costs extra money. And the contractor works on a cost plus fixed fee."

Feller, who has acted as construction manager for the Cathedral Foundation since before the term was coined, adds that electrical and mechanical work must be scheduled to fit in with other trades as the work proceeds west. He has some problems not faced by other managers: where to procure chairs that will meet Cathedral needs (wood, movable, stackable) and fire codes (ganged)—the quest took seven years; what material can be used for underfloor radiant heating that will last 1000 years?

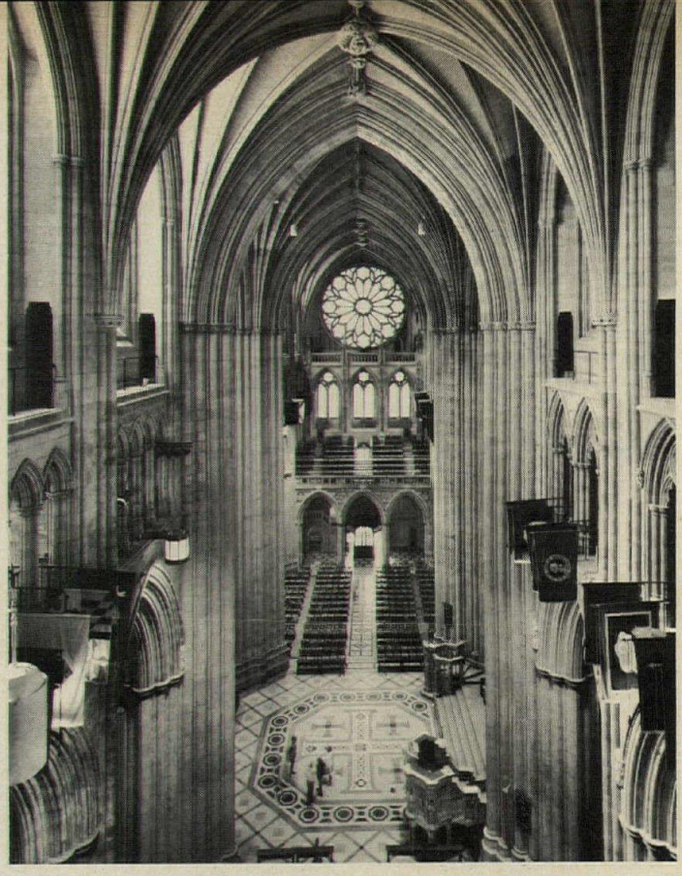
Interior lighting is a major problem. "Americans go to Chatres and fall over the furniture in the dark," says Feller, "but here they would be likely to sue. So we really have too much artificial light during the day, which prevents our windows from showing up as well as the European ones." To compromise between safety and traditional viewing conditions, the Cathedral has been equipped with a complicated dimmer system that adjusts the artificial lighting in various areas according to sunlight patterns; the object is to use as little light as possible. As the gray wire glass in the nave windows is replaced by stained glass, the interior will become generally darker and the dimmers will become more efficient.

The mechanical system is as modern as any in the U.S. Underfloor radiant heating was pioneered there after 1945, and is supplemented by warm ventilation air which eventually will be cooled in summer. It was the first nonstudio building to include television lighting set to network newscasting standards; for special services the TV crews bring in supplementary lighting. The country's first overhead sound system, installed in the late 1930s, has now been replaced with a dual system, one for voice, one for music. The console, according to Feller, "has 1200 gadgets and dials, and is delicate enough so that television broadcasters can plug into it. The main problem was to make the equipment inconspicuous."

In the west end the electrical and mechanical work is fairly well integrated into the structure. But earlier, fitting in such equipment without disturbing the Gothic forms was an ad hoc problem for each item. Lights are hidden in triforiums; fire protection devices are planted among the carvings of the wood Choir; sound speakers are camouflaged by matching colors to backgrounds. One elevator was installed in the south transept and another is planned for one of the west towers in a core now occupied by a Linden crane. The west front will include a TV control room, conduit for telephones and television installations such as closed circuit and security TV, and electronic bulletin boards similar to those at airports. Planned for the future are extensive outdoor lighting and a modified *son et lumière*.

Feller makes other distinctions between a medieval and this modern cathedral. "The distinction is that many medieval ones were built as objects of imagery, as museum pieces of visual beauty. Here, the Dean [Francis B. Sayre, Jr.] maintains that a cathedral must be more than a museum; it must be used for music, liturgy, drama, state funerals, marriages and baptisms. Especially the drama, as we have an extensive program here."

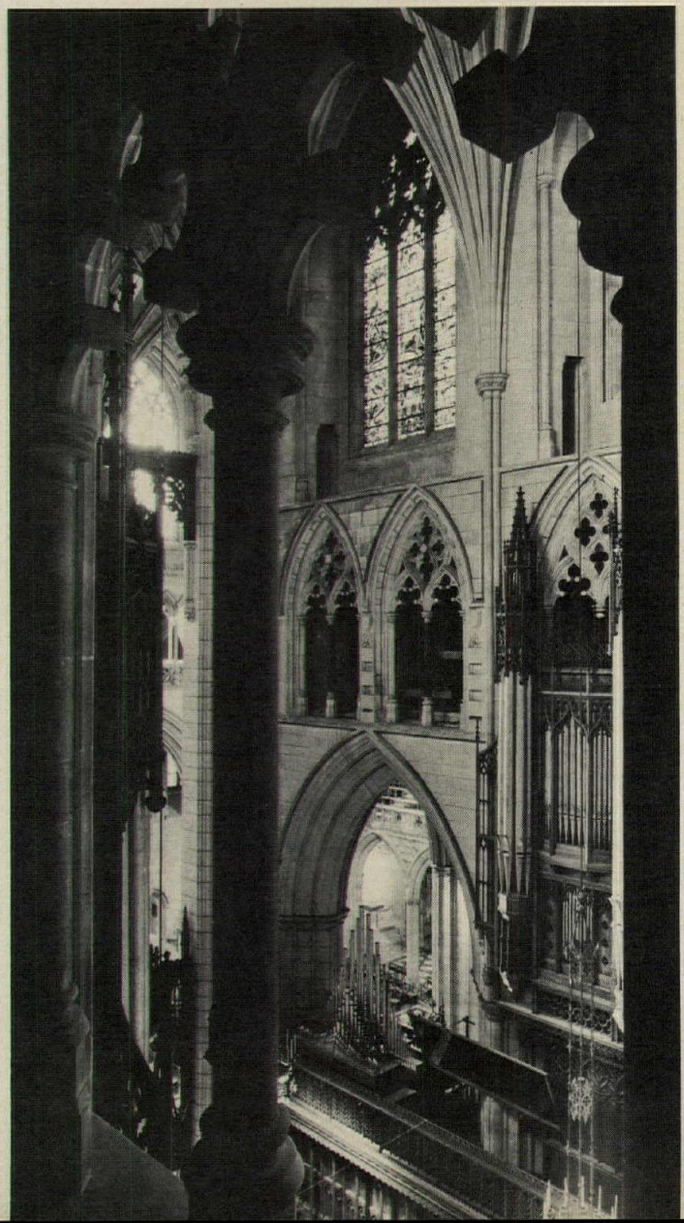
Feller acknowledges that while most visitors do pay attention to and appreciate the finer points of the Gothic structure

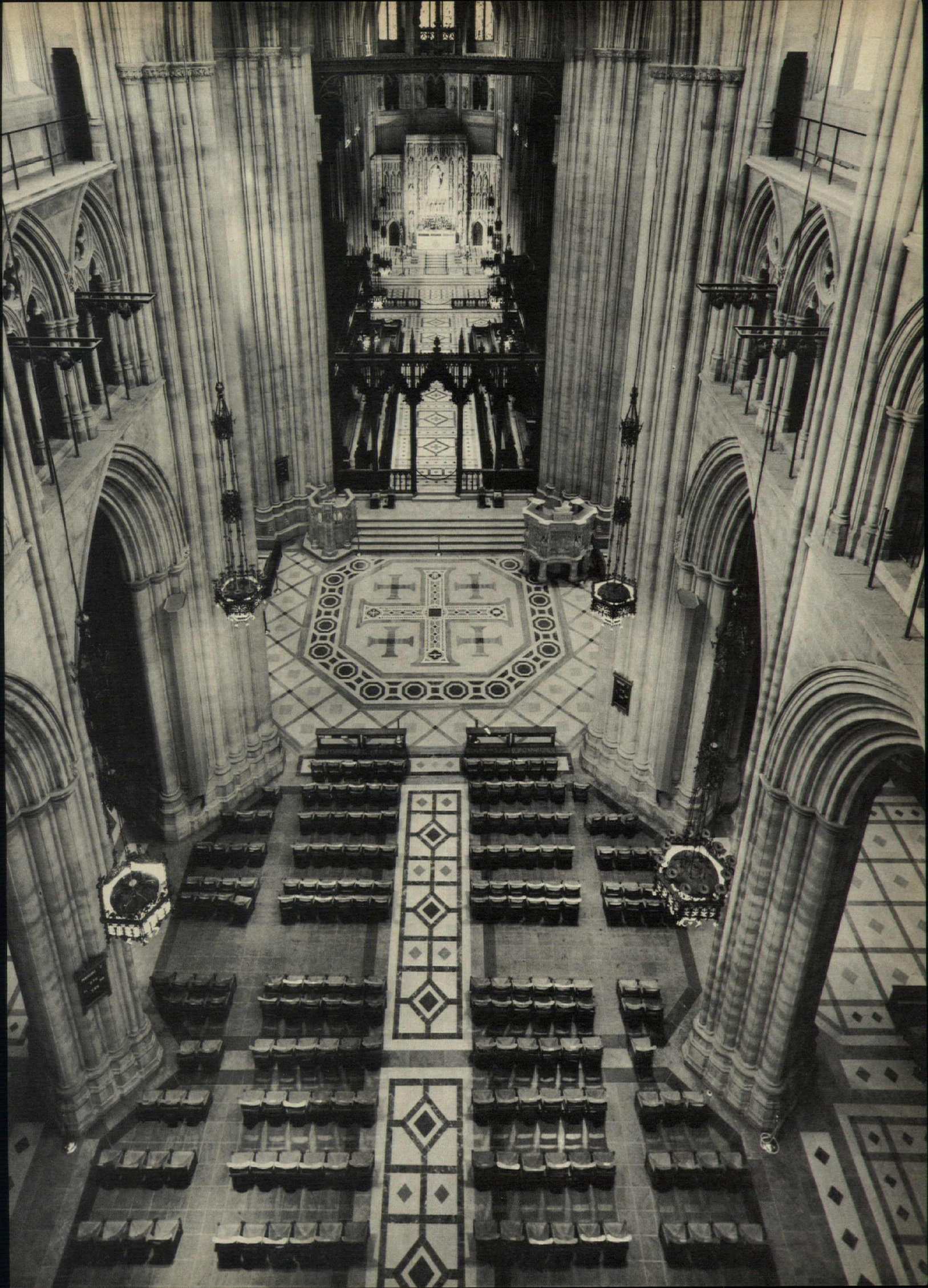


Norman McGrath photo, also opposite page

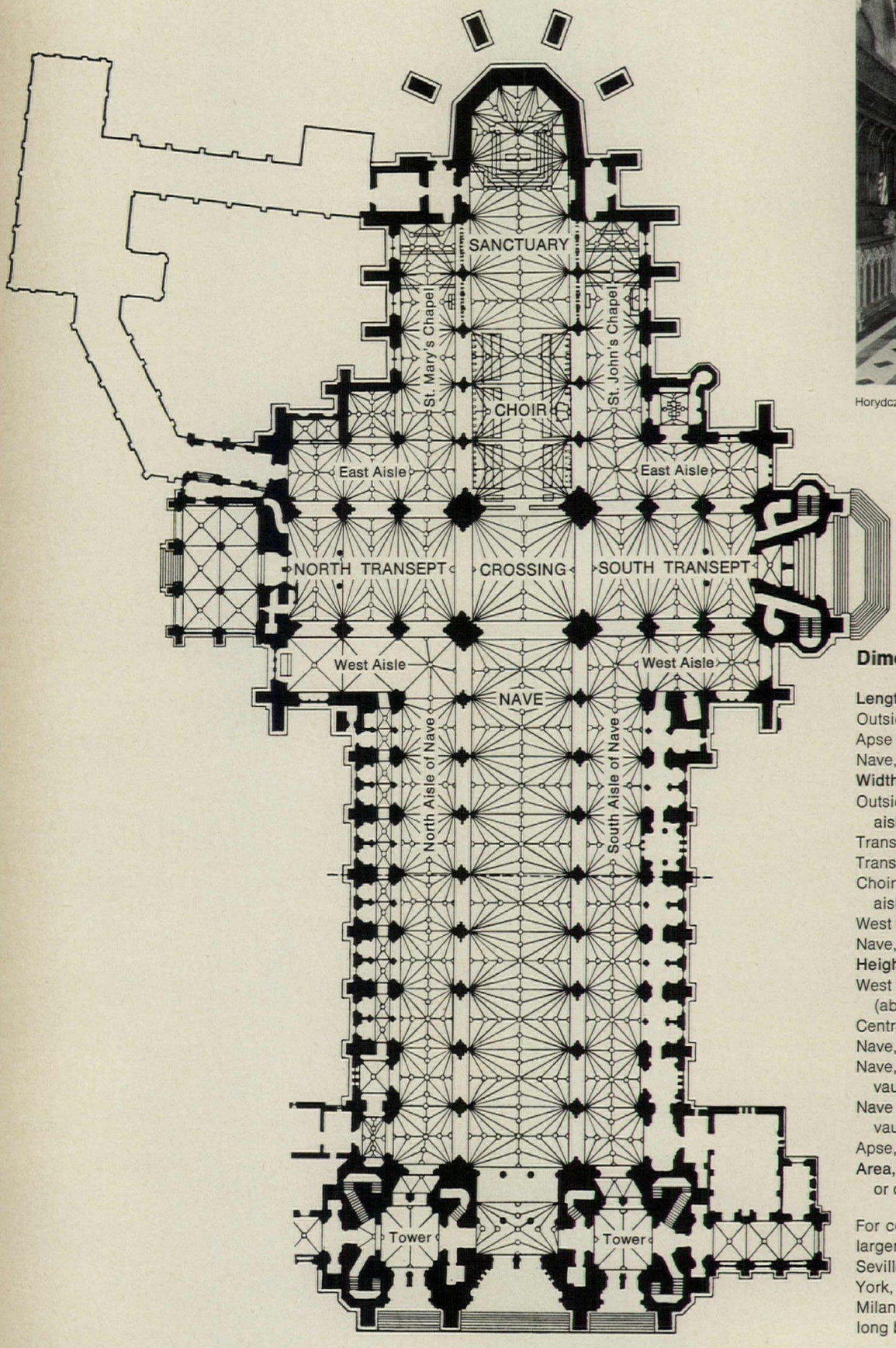
North transept (above) was completed in 1932. Only a few of the 8882 organ pipes are visible in the galleries that surround the choir (below). Photo at right shows the nave, crossing (with a Jerusalem Cross inlaid in the marble floor), chancel and choir, and the sanctuary.

Robert C. Lautman photo





What's progressive about a Gothic cathedral?

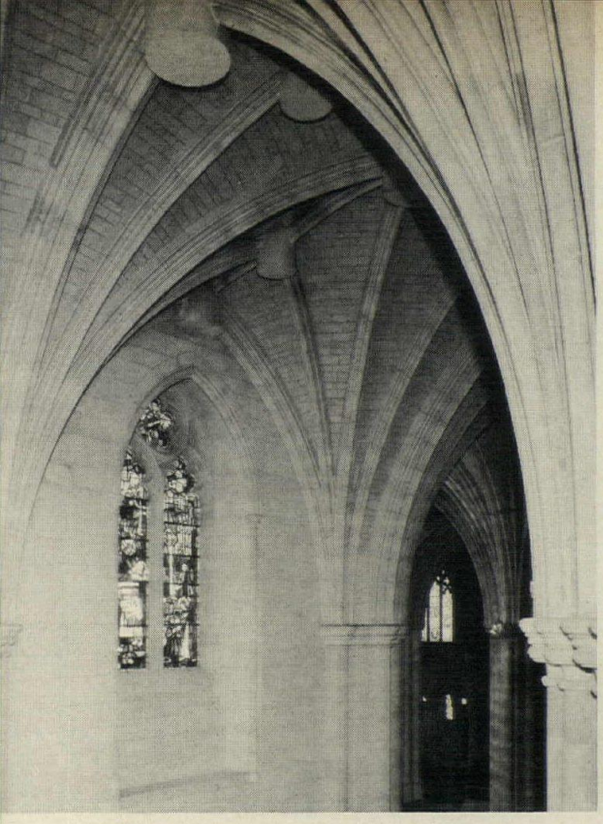


Horydczak photo

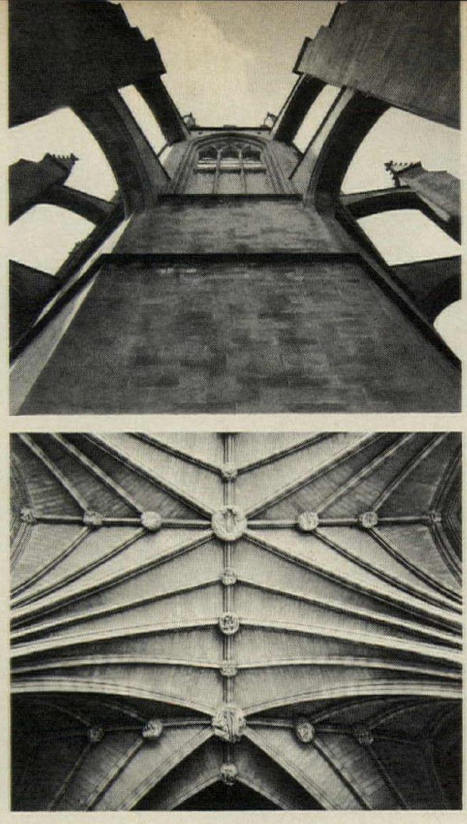
Dimensions

Lengths	
Outside measure	517′-8″
Apse wall to choir arch	165′-4″
Nave, excluding west towers	207′-4″
Widths	
Outside measure, nave and aisles	142′-6″
Transepts, outside measure	289′-9″
Transepts, inside rose to rose	196′-0″
Choir, outside measure across aisles	128′-6″
West front and towers	158′-10″
Nave, inside at clerestory level	41′-0″
Heights	
West towers (above finished grade)	234′-0″
Central tower	301′-0″
Nave, above grade	150′3″
Nave, marble floor to vaulting ribs	102′-6″
Nave aisles, floor to vaulting ribs	45′-0″
Apse, nave floor to vaulting ribs	93′-0″
Area, not including crypts or crypt chapels	83,012 sq. ft.

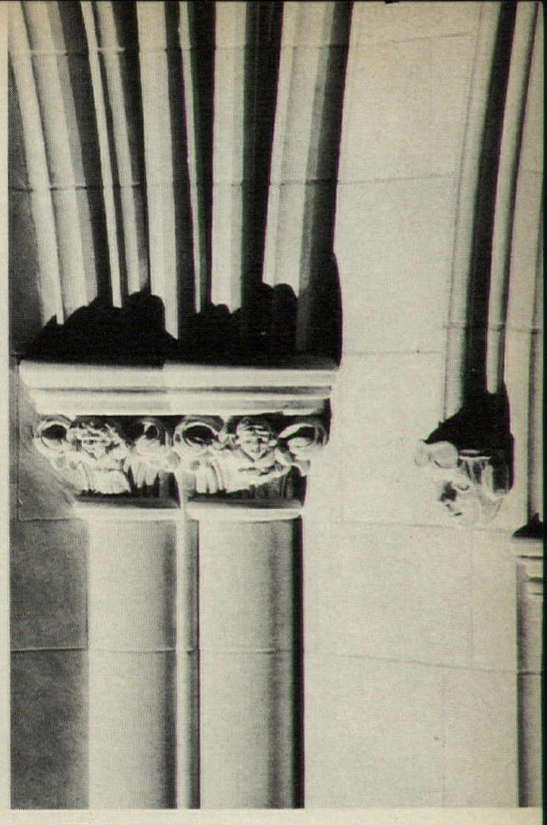
For comparison, only the following are larger: St. Peter's, Rome, 718 ft long; Seville, 430 ft long; St. John's, New York, 601 ft long; Liverpool, 619 ft long; Milan, 475 ft long. Winchester is 530 ft long but only 53,480 sq ft.



Stewart Bros. photo



Norman McGrath photos



James C. Dunlop, Inc. photo

Oaks on the site yielded wood for the carved choir stalls; the reredos bears 96 carved figures and the boss over the altar weighs five tons. Bosses at intersections of ribs must be carved in place; each is a distinct symbol. Buttresses are freestanding, as shown at apse wall. The Architect's Mistake shows Frohman tearing his hair at left, then smiling after solving a measuring error with the design of this stone.

and its embellishments, few grasp the fact that it is genuine Gothic, rather than Gothic-style. "Because there has been so much bastard Gothic built, people are conditioned to think that one cannot build a true Gothic cathedral. It is construction as well as style. Pure Gothic is simply held together with gravity. We do have steel vertical reinforcing rods in the walls and buttresses that were built after the atomic bomb was developed, but they will not help the building stand one day longer; they will act only in case of a bombing, helping the walls stand against a sudden lateral thrust. This, plus the fallout protection of the thick stone, makes it the safest building in Washington." Another improvement upon medieval design is that this building has floors above the vaulting to provide extra rooms.

An old dream fulfilled

The decision to build a cathedral in the federal capital dates back to 1791, when Pierre Charles l'Enfant and members of the newly created Congress agreed that the new city should include a church of no particular denomination or sect that would be put to "national purposes." Local Episcopalians were interested, but it was not until 1850 that a parishioner bequeathed $40 in gold as the first contribution "for a free church on Alban Hill." By 1891 committees were formed and in 1893 Congress granted a charter to the Protestant Episcopal Cathedral Foundation of the District of Columbia, empowering it to establish a cathedral and educational institutions. Land was acquired on Mt. St. Alban's when nobody really knew where the money was to come from, and the first service on the grounds was to dedicate not a building but a Peace Cross at the close of the Spanish American War. A small wooden church and a school were built.

In 1900, 20 carved stones were sent as a gift from Glastonbury, England; these were later shaped into a bishop's chair. Altar stones were shipped from Solomon's quarries in Jerusalem for the high altar and a "little sanctuary" was built to house these and other treasures. Landscaping also preceded construction of the Cathedral. Women of the Cathedral Park Board developed the grounds, or Close, under direction of landscape gardener Beatrix Jones. A second school was designed by Robert W. Gibson in classical Italian Renaissance "to harmonize with the future cathedral."

Contributions from all over the nation cleared the original land mortgage by 1906, a turning point marked by erection of the Cathedral Landmark. With great ceremony and an address by President Theodore Roosevelt, the cornerstone was laid Sept. 29, 1907. It is a large block of American granite in which is embedded a stone brought over from Bethlehem.

The architects had been chosen only months before, after a bitter debate over the style—Classical, Renaissance or Gothic. One early suggestion showed a white marble building with long colonnades, but the presiding bishop, Henry Yates Satterlee, took matters into his own hands and set out for England to find the best possible Gothic architect.

He chose George Frederick Bodley, who was to work with Henry Vaughan of Boston. They designed a structure modeled on 14th Century English Gothic, 476 ft long and 132 ft wide. While this plan has been modified, their choice of certain Indiana oolitic limestone quarries still stands.

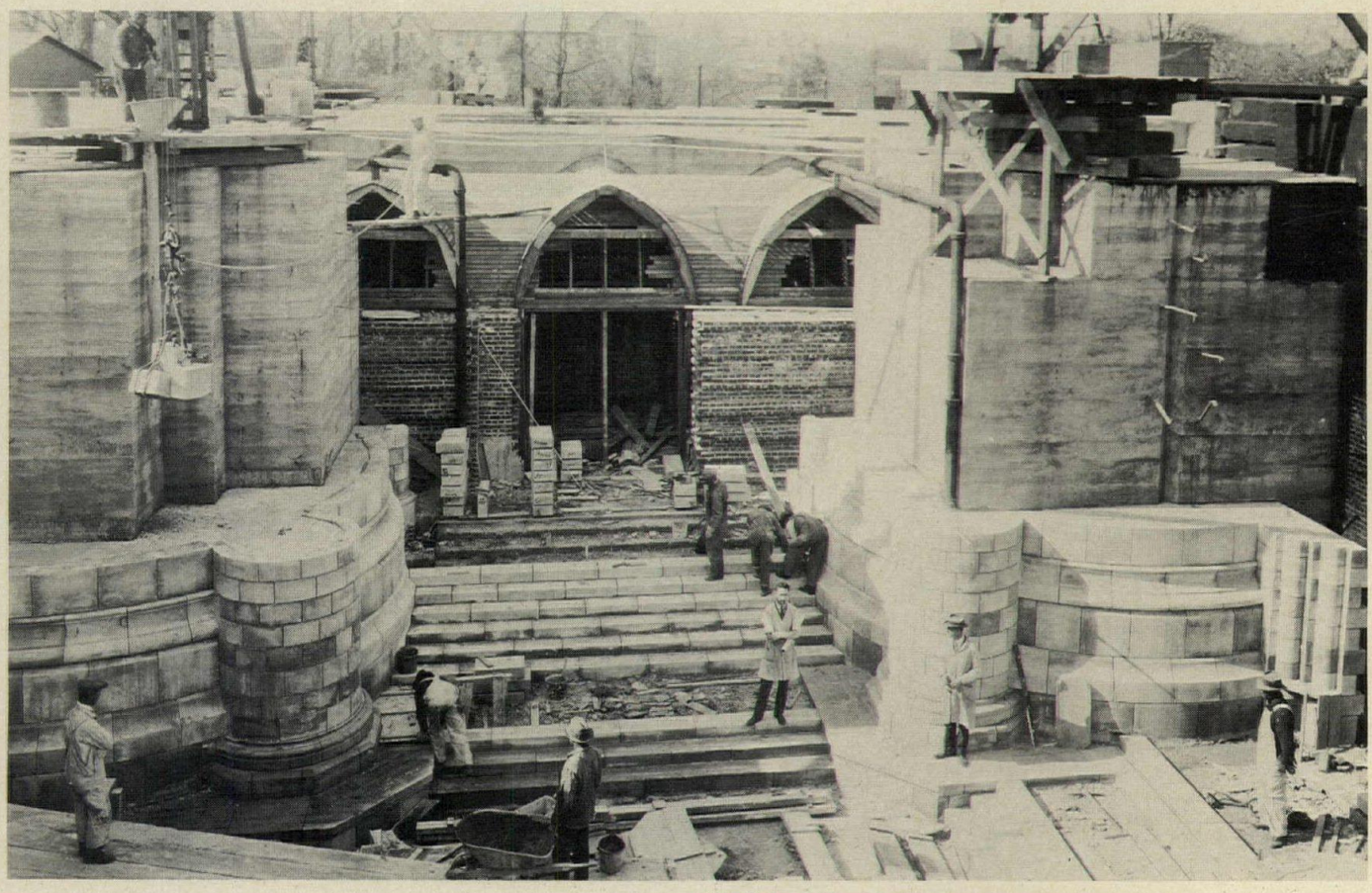
Another choice is still in effect: selection in 1910 of the

George A. Fuller Co. as contractor. "We can't praise them highly enough," says Feller. "They've given us their best attention all these years." In 1912 the Bethlehem Chapel, below what is now the choir, was opened for worship, and the apse and sanctuary were completed in 1919.

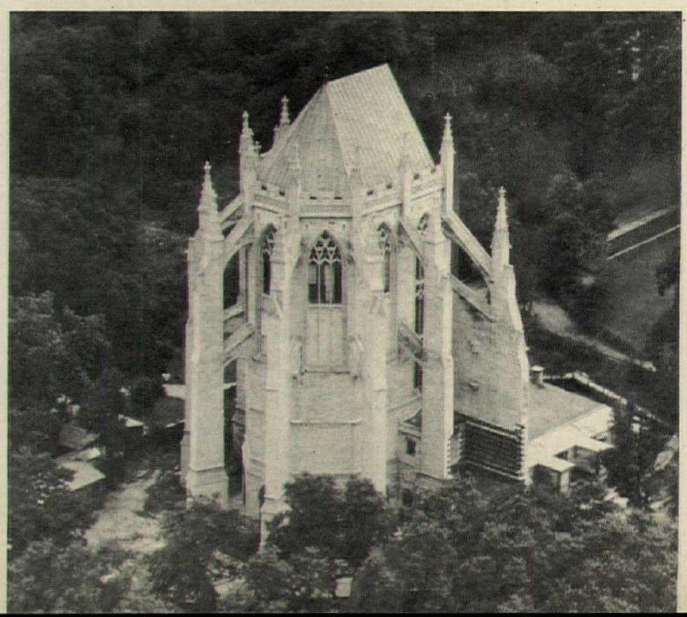
After the deaths of Bodley and Vaughan, Philip Hubert Frohman and his firm, Frohman, Robb & Little, were designated Cathedral Architects. With Frohman's retirement in 1971, that title was also retired, and James Godwin of Godwin & Beckett was retained as "superintending architect."

Frohman revised the original plans to include more chapels and crypts, also enlarging the nave and tower. He redesigned the west front four times. His dedication and attention to detail is legendary. He refused to employ more than four or six draftsmen at any one time so that he would be sure to do most of the designing himself. It is said that he could spot a $\frac{1}{64}$ in. deviation at some distance, and at one time paid for replacing a too-small stone himself, having it carved with two figures. One depicts the architect tearing his hair after discovering his mistake and the other is the architect saying, "Ah, here is the solution." Frohman's devotion has been rewarded not only by seeing the structure rising at an accelerated pace, but by a pension from the Foundation, perhaps unique in architect-client relationships.

The work has proceeded in phases dictated by available funds. Foundations for the entire nave were laid and crypts built during the 1920s, as were the choir and two chapels. The great crossing piers, 27 ft in diameter at their bases, rose



Stewart Bros. photo



A 1926 photo shows pouring of the solid concrete cores of massive piers (27 ft in diameter at this level) that rose to carry the central tower. This area is now the Chapel of St. Joseph of Arimathea. The apse is shown in the first aerial photo, taken about 1920.

to nave level in 1928, but the north and south transepts, begun just before the depression, were not completed until after World War II. Services were held, starting in 1932, in the enclosed choir and sanctuary.

By the time the Gloria in Excelsis Tower was dedicated in 1964, more than a quarter million donors of all denominations and faiths had been counted. More than 500 individuals have contributed memorials, while others have come from groups as large as "the people of Kansas" who gave one bell to the 10-bell ring. Not all gifts have been small: the clerestory on the south transept and the central tower were given by a brother and sister, and the 53-bell Kibbey Carillon is named for its donor (the tower is the only one in the world with both a carillon and a ring of bells).

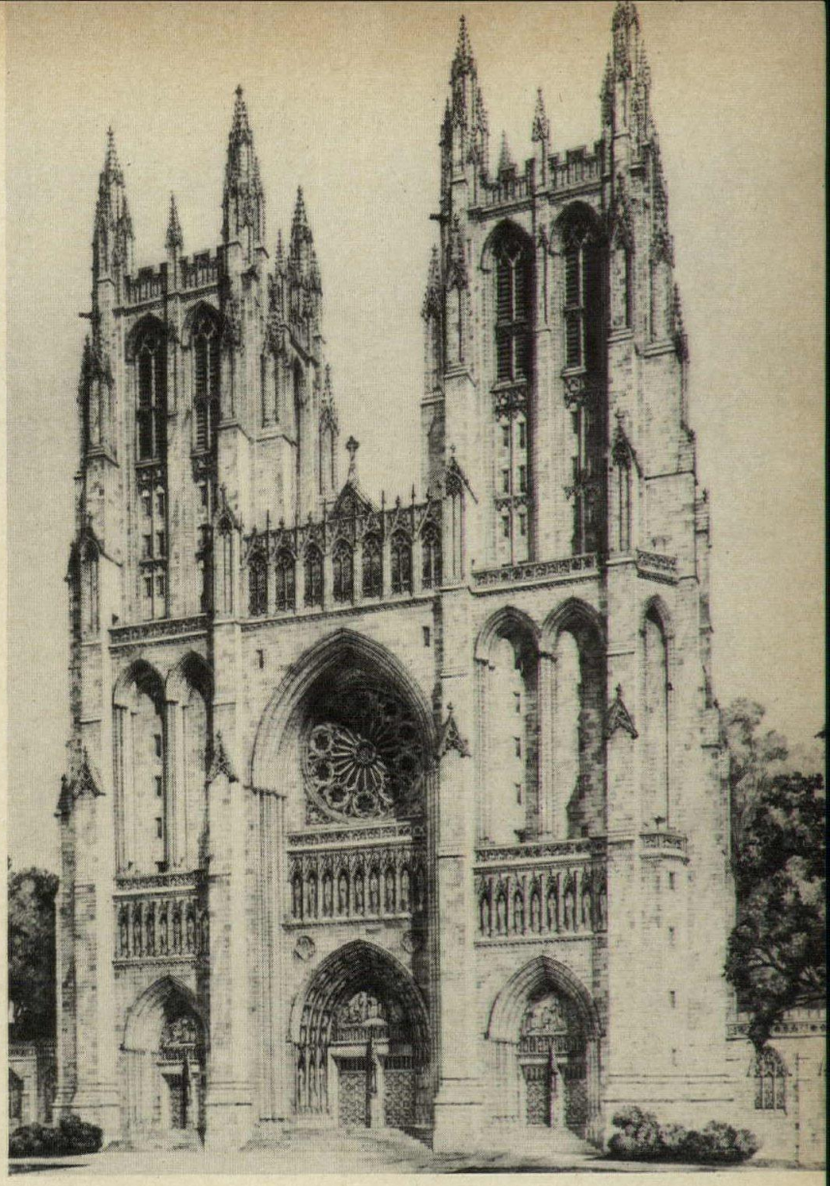
Because the Cathedral has been built over such a long period, its history serves as a catalog of construction methods and interior systems. Horses furnished the power for excavation and placing the foundation stone. Steam was available for excavating the crypt foundations in 1922; steel was substituted for traditional wood timbers to support the steeply pitched choir roof (late 1920s) while reinforced concrete was more practical for the roof of the north transept (early 1930s).

Construction is now proceeding faster than ever before. Completion dates have been moved up—Feller talks of luring every mason he can find to Washington—in what might seem a great burst of enthusiasm. There are more pragmatic reasons, however. A recent gift, while not providing all funds for completion, brought the end in sight, and there is the sad but simple fact that the world is running out of craftsmen. Young men no longer learn stonecarving, much less the finer points of erecting stone arches. Few men care to carve bosses in place. When artists and artisans retire, there are few qualified replacements.

Feller himself is an example of what it takes to build a cathedral these days. A construction man, he located his present job at a time when he was "searching for something real to do for God." Building a cathedral to last 1000 years is, to him, the perfect career. On one hand he fights "to keep costs down every nickle of the way." On the other, he makes no compromises on quality. Any stone not trimmed correctly goes back. Every carving must be perfect. His two major cost-cutting items are the Linden crane, which is the first brought to the Washington area and which saved an estimated $200,000 on the Tower, and the purchase of the Cathedral's own scaffolding.

Infill between the ribs of the arches is the most expensive item in the construction budget. These stones must be trimmed on the site because there is no way to calculate their size in advance. At times there is a ratio of one stone trimmer to one mason. Early cathedral builders avoided this problem with plaster infill, but the limestone infill helps keep the ribs from twisting.

God and masons willing, there will be one more major celebration between now and 1982. As a Bicentennial gesture, a great service will be held on Easter 1976 in the full nave, enclosed but not necessarily completed. Heading the list of worshippers will be the President, the Cabinet and the Congress. Announcing this in 1972 is nothing more nor less than a great leap of faith. [RR]



Stewart Bros. photo

Frohman's final rendering of the west front, which will rise to rose window level by 1976 to enclose the nave, and be completed in 1982.

Philip H. Frohman, 1887–1972

Philip H. Frohman, who had served as Cathedral Architect from 1921 to 1971, died in Washington on Oct. 30. He had been struck by a car in August and had been hospitalized since. He was 84.

Frohman, an authority on Gothic and Romanesque architecture, designed some 50 other cathedrals and churches during his long career, including the Episcopal Cathedral in Baltimore, the Roman Catholic Cathedral in Los Angeles, Trinity College Chapel in Hartford, and Wesley Methodist Church and St. Paul's Lutheran Church, both in Washington. He had received the Medal Pro Ecclesia and Pontifice from Pope John XXIII.

A funeral mass was offered at the Roman Catholic Church of the Annunciation, which he had also designed. Interment, by special dispensation, was in the Chapel of St. Joseph of Arimathea at the Washington Cathedral.

Room at the top: the rise of the professional manager

As the business of architecture gets more and more complex, good management is increasingly important; so important, in fact, that it is fast becoming a full time responsibility

Someone new is showing up on the organizational charts of design firms, very near the top. He is usually responsible for the business operations of the firm, and often takes a hand in making policy, setting directions and guiding the firm's future. He is one of the new specialists in the firm—an executive, a professional manager.

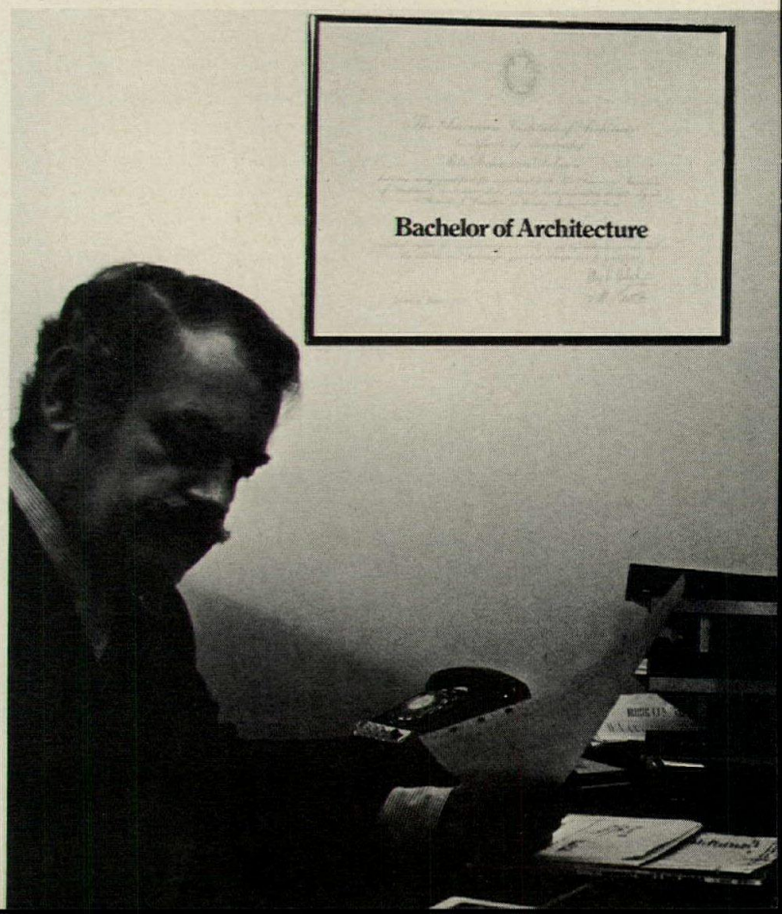
Just about every architectural firm employs someone in a purely administrative position. Secretaries and bookkeepers are probably the most common administrative employees and among the first to be added to the staff. As a firm grows larger, the list can be extended to include a number of jobs dealing with more specific areas of the operation—comptroller, personnel manager, public relations manager. These jobs are certainly part of management, but they represent only one side of it; there is still the matter of top level management, the sort that helps guide the future of a firm. That is high level management indeed, and there is a growing corps of these professional managers in offices across the country.

Professional managers come in two basic varieties: architects who have become managers, or management types who have moved into architecture. Though their backgrounds might be different, they must, in order to do what they have to do, share some common concerns and characteristics. Certainly their value to the profession is the same in either case: the design principals get back to designing buildings.

"It is the manager's task to create an environment in which the design professionals can be the most productive. He should lighten their load in every way possible and see that they are left free to pursue those areas of the practice which they enjoy and at which they excel." So says Jack Rains, who came to management via law practice. He is an excellent example of the professional manager who has entered architecture from the outside. He came out of college in 1960 with a degree in business administration and a major in insurance, worked for an insurance firm while attending law school and then joined a firm which had among its clients the Houston-based architectural firm of Neuhaus & Taylor. It was a natural step for him to join Neuhaus & Taylor as business manager in 1969; the next year he was named managing partner of the firm. Now Rains is vice president and treasurer of Diversified Design Disciplines, a holding company that owns three other firms besides Neuhaus & Taylor.

Rains is convinced of the benefit of professional management in a professional firm. Most architectural and engineering firms, he points out, are managed by architects and engineers, trained primarily to deal with the professional aspects of their practice. Not many architectural and engineering curricula include business courses, and graduates don't come in contact with the business side of the practice until they have been in the firm a good while. As a result, Rains observes, management chores are either in the hands of a principal who has developed business skills, outside consultants who counsel the principals, or an in-house professional manager.

The first two alternatives are the most common and, in Rains' view, each has its own problems. Despite a wealth of published material, seminars, workshops and other efforts,

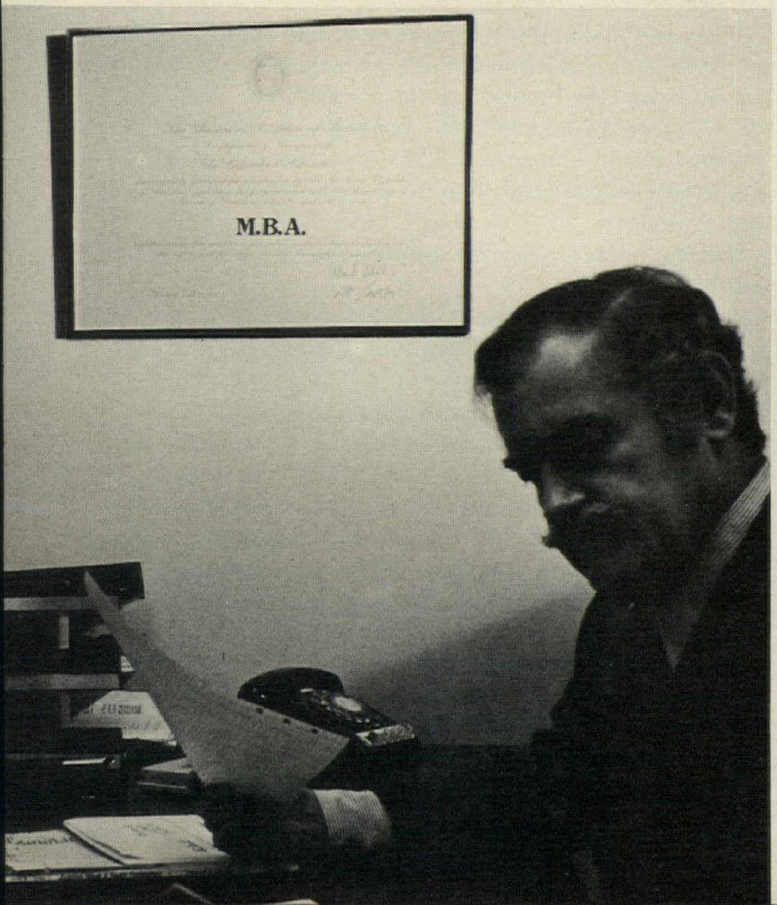


the do-it-yourself approach, he says, "is at best acceptable only in a small firm," and then only because "it is probably the only realistic" alternative. "At the risk of being accused of lack of perspective and of over-amplifying the role of the professional manager, I believe it's analagous to someone learning first aid in his spare time and then believing he is capable of handling all his personal medical problems. That's not to belittle these efforts, for they are extremely important. The design professional must be familiar enough with law, accounting, finance and other business matter to speak the language in order to evaluate the professional advice he receives."

The other popular alternative, hiring outside consultants to shoulder all or a majority of the responsibility, also has definite disadvantages, according to Rains. It is difficult, he says, for any outsider ever to become totally familiar with the firm because it is difficult for the design professional to properly frame the issue and give the consultant proper direction. "When I was practicing law and representing Neuhaus & Taylor, and then during the time immediately after I joined them, that point became very clear. I had given advice based upon what I had been told and what I was able to learn through my own investigations. Although the advice was technically correct, the fact situation was wrong. The principals would inadvertently omit facts which totally changed the issue involved in the problem."

Another problem that crops up when outside management counsel is used is that lawyers, accountants and others don't come cheap. "As a result," says Rains, "the consultant is very conscious of the time he spends with the problem. This of course handicaps his effectiveness in rendering his services. The point is, it takes someone who not only possesses a certain degree of technical skill but, even more important, the person providing business advice, or who has the responsibility to see that it is provided, must totally understand the design professional as an individual and a group, and certainly the personality of that particular firm."

The third alternative, the professional manager, is the "basic solution," Rains feels. At Neuhaus & Taylor, Rains was responsible for the business aspect of the practice, and advised the firm on professional aspects of the practice where he had particular qualifications. "It is perhaps easiest to define my job in the negative, to tell you what I didn't do than to explain how I actually spent my time." What he didn't do was architecture or engineering. What he did: Line responsibility for finance, legal, accounting, insurance, personnel, compensation, policy, procedures, systems or more generally, those things lumped into a business administration curriculum. "The manager's real job is to bring balance to the team."



Balancing act

It takes a particular kind of person to bring that balance, and Rains sees several vital qualifications. One is "partner potential. Design professionals should never put a man in the management slot who doesn't have it because to really be effective he must stand at parity with the other principals of the team." Finding clients is important, and so is providing service of the highest quality; no one disagrees with those two points, says Rains, but "the important aspect that is sometimes ignored is that it is necessary to ensure the practice as a business success. I don't mean just a financial reward for the principals, but for all the employees and their families. It is also important to the client: projects today last many years, and the firm which is not on a sound business footing may not be around to finish what it started. The business aspects, and their affect on the people who make up the firm, are just as important as finishing and producing the work."

Besides possessing partner potential, the professional manager has to be people-oriented and he must possess some particular technical expertise and experience. Rains, who admits that he is probably prejudiced, feels that law, because it touches on so many aspects of business, is a helpful background; accounting is also useful. It isn't necessary, he adds, not even desirable, that the manager try to solve everything—legal, financial or other problems—singlehandedly. "What is important is that he have enough knowledge of these areas to recognize problems, and then coordinate highly specialized outside consultants in the prompt and efficient solution of these problems."

The architect manager

Jerry Loving, who was an architect first and then moved into management, echoes Rains's view of management importance. Loving, vice president, administration, of Charles W. Delk & Associates, Inc., Walnut Creek, Calif., sees the role of an administrator or managing partner as "an enabler, one who sees and feels the talents of his people and enables them to pursue the direction of the firm."

It's a necessary role, he feels, especially as a firm grows larger. "The owner of a firm can do it all to a point in size (seven people or so), but thereafter the management role *per se* evolves. In a small multipartner firm I see an even more distinct need for administrative overview." Eventually, says Loving, most firms will include a strictly administrative or managerial position. "The bureaucratic world we live in, the demands of employees, the necessity of sound financial management alone—demand, I believe, someone full-time with his head above the daily design operations level."

Loving ended up where he is because of his own need to have "the overview of the total situation." He came to the position, actually returning to the firm, from a stint as an assist-

ant professor in the School of Art and Architecture at Yale; before that he had been a designer with Delk. "Before," he says, "I had to scratch and claw for what I felt was vital information. But I am here only because of the company's need for a full-time person in this capacity—this position was a perfect fit for my propensity for the big picture and organization."

As vice president, administration, Loving is deeply involved in everything the firm does. "It is frightening the influence I have over our future and policies. Much, by virtue of the position, is filtered through me. Interviewing, fiscal control, quality control, assignment of personnel to jobs—all begin or end with me. So great is this influence, that I make great efforts to consult broadly on each issue. We have regular policy conferences with all key people to ensure that broad-based representation is instituted. However, the pressures of snap decisions, the intangibles in decision making, lifestyle, etc., mean that I, probably in a year's time, will greatly influence our firm's direction.

"This therefore is the key: the simple arrangement of an organizational structure can, despite all checks and balances, influence the firm's direction. The game (good design and environment) is often won or lost in the conference room, in that first meeting with the client, in that decision to hire a new man. Management then requires our best efforts and best people."

Loving also has a definite view of the qualifications for the management slot. "For a real gut level understanding of a firm, its philosophy, the nature of its mission and personnel, it takes someone who *is* an architect." That doesn't necessarily mean he has to have a diploma in architecture, or have spent most of his career designing buildings: "We shouldn't quibble about labels. Often other environmental professionals can be ideally equipped for creative management."

Like any good executive, the architect-manager should delegate authority: legal problems to lawyers, financial problems to accountants, employee relations to personnel managers, Loving feels. "But it is in the hands of the design sensitive person, not in the hands of a business manager, accountant or systems analyst that policy control should remain. The old military saying, 'Sooner or later a unit reflects its leadership,' is too true to entrust a design firm to a nonprofessional." One exception: the very large firm, over 150 people, for example. "A businessman may be the best suited to manage this firm; specialization in design and professional matters could be left to others."

Preparing to be an architect manager isn't easy, although Loving's capsule summary makes it sound like fun: "Mechanically, training in business, accounting and law, along with some good tennis and sailing experience will greatly enhance a standard architectural background."

Can they be schooled for management?

What really has to happen, Loving says, is for the profession and its education process to "give intellectual credence and blessings" to the business of management. "We have sanctified the designer so much that all other roles so essential to the process of making good environment are held in disdain. If a young professional could ascertain earlier some of the hybrids of the designer, he might direct himself more intelligently in his training. He'll see with different eyes and hear with different ears if he can understand the *acceptability* of the management role."

It is a role that many older successful architects are well aware of, through experience, and one that is becoming more attractive to younger architects. It is a role that David Foote specifically prepared for, which makes him a bit of a rare bird. Foote is Director of Management at David Crane's office in Philadelphia, and one of the first graduates of a double degree program set up by the Graduate School of Design and the Business School at Harvard.

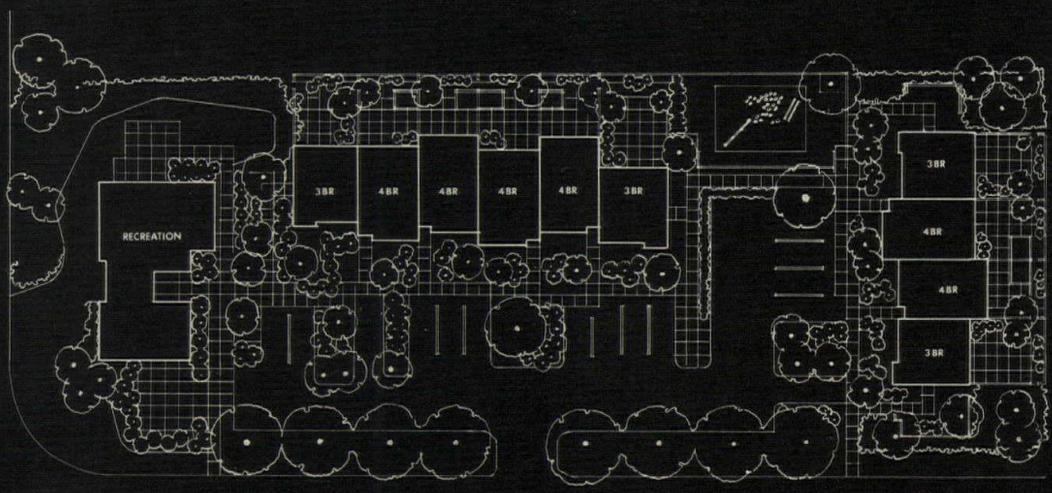
"Most of my friends who graduated in the same program went to work for developers," Foote says. "They thought I was crazy to work for an architectural firm." But before he enrolled at Harvard he studied architecture in Arizona, coordinated a land reform program in South America as a Peace Corps volunteer, worked for a year in Phoenix, and had come to the conclusion that the management side of architecture was where he wanted to be. "That's where the major problems of the profession must be solved. The tools for implementing processes are in management, not in the professional side of architecture."

As Director of Management, Foote is responsible for the day-to-day operations of the firm and reports to one of the partners. He's not that deeply involved in policy making, at least not yet; he has been with the firm only about a year.

Like his more experienced colleagues Rains and Loving, Foote speaks convincingly of the role of management in professional firms. "There is no other answer in terms of making them pay off. The architectural firms, in fact, the whole building industry, are at the most volatile end of the whole economy; that's reflected in housing starts, investment in new buildings and the like. We have to structure ourselves to minimize the volatility; we have to diversify. Internally, we have to know how to restructure the work process, how to manage the creative process."

That, says Foote, takes different tools than would be used to run a factory, although some of the largest firms may be run that way. The professional firm should be run within on self-imposed limits: constraints imposed by the professionals themselves and monitored by themselves. Some internal management systems are needed however. "Budgets, manpower requests, schedules are generated at the project level, but they must be assimilated at the management level to be dealt with."

"It's at that level, sooner or later, that just about everything must be dealt with, which is why the need for first-rate managerial talent in architectural firms is so great. Of course, there is management and then there is management. There are plenty of people who can handle bookkeeping, office administration and personnel matters; it is the other sense of management, the sense that includes a direct involvement in the way a firm grows and the policies by which it operates, that is the demanding one. And whether the man who gets the job comes from within the profession or from the world of business, he'll combine partner potential or design sensitivity with considerable business acumen. The job will take all he's got, because it's a challenging one—management in the very fullest sense of the word. [CP]



Turnkey Townhouses, Sedro Woolley, Washington. Certi-Split No. 1 Handsplit/Resawn Shakes, 24" x ¾" to 1¼". Architects: Ron Thompson & Associates. Builder: Dujardin Construction.

Red cedar shakes take a Turnkey apartment out of the ordinary.

You might expect a housing project for low-income families to be drab. Don't. Imaginative design and sensitive selection of materials can achieve wonders. This Turnkey apartment development in Washington State proves it.

Contributing to the success of the design are the natural wood exteriors, especially the richly textured roofs of red cedar shakes. Handsplit cedar shakes are warm-looking, inviting. They retain their beauty for decades without maintenance. And they help the apartment blend naturally with its residential environment.

For your next apartment project, specify the real thing: red cedar Certi-Split handsplit shakes or Certigrade shingles. They're worth it. For details and money-saving application tips, write: 5510 White Building, Seattle, Washington 98101. (In Canada: 1055 West Hastings Street, Vancouver 1, B.C.)

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Air diffusers

Wolfgang Kretschmann

A guide to the selection of supply air outlets whose function is to distribute air uniformly, includes types, the number needed and how they operate best

The function of supply outlets and diffusing equipment is to distribute air uniformly and provide adequate air motion. The correct types of outlets, properly sized and located, control the air pattern within the space and provide proper air motion and temperature equalization in the occupied zone. Incorrect outlets result in poor air distribution and therefore unsatisfactory conditions.

Three types of supply air outlets are commonly used: grilles, slot diffusers and ceiling diffusers. Each has different construction features, physical configurations and performance characteristics, varying widely in the manner in which they diffuse or disperse the supply air.

Grilles operate satisfactorily from high side wall locations and from perimeter locations in a sill, such as induction units, curbs or floors. Ceiling mounted grilles which discharge the air downward are generally not acceptable in comfort air conditioning since they tend to be drafty. The slot diffuser, an elongated outlet consisting of a single or multiple number of slots, is usually installed where clean straight lines are desired, for example along side walls or sills. Slot diffusers have been successfully used as combination air/light fixtures.

Multipassage round, square and rectangular ceiling diffusers are the most common type used. They consist of a series of concentric air passages, come in sizes 5 in. to 36 in., and should be mounted in the center of a space so that they discharge the supply air in all directions. Half round diffusers are designed to be installed adjacent to partitions or in similar locations where round diffusers cannot be installed in the center. Multipattern diffusers can be used in the center of the space or adjacent to partitions, depending on the discharge pattern. By using different inner assemblies, their air pattern can be changed to suit particular requirements.

The objective of each type is to induce or entrain room air into the primary air stream, which is the air being delivered from the air conditioning system to the diffuser outlet. Mixing of room air with primary air is achieved by induction, where the room air is drawn into an outlet by the primary air stream and then mixed outside the zone of occupancy so that air motion and temperature differences will be reduced to acceptable limits before air enters the occupied zone.

Outlet types which have a high induction rate result in a short throw and rapid temperature equalization in the space. Ceiling diffusers with a radial pattern have a shorter throw and obtain more rapid temperature equalization than slot diffusers. Grilles, which have a long throw, have the lowest diffusion and induction rate. Therefore, round or square ceiling diffusers will deliver more air to a given space than grilles and slot diffusers.

The number of ceiling diffusers for a given space is determined by the amount of air which has to be distributed, the noise criteria to be maintained inside the space, the physical size of the space and the pattern of the reflected ceiling plan. Round or square diffusers, which are the most economical, are limited to a one to two throw ratio; for instance a 40′x10′ room should have a minimum of two diffusers and preferably four since a one to one throw ratio is ideal.

An air stream from an air device moving adjacent to or in contact with a wall or ceiling surface creates a low pressure area immediately adjacent to that surface. Part of the stream is diverted into this low pressure area, remaining in contact with the surface substantially throughout the length of throw. This surface effect counteracts the drop of horizontally projected air streams making it essential to have a minimum of obstructions, for example, lights, projecting into the air stream. Ceiling diffusers show the surface effect to a very high degree because the circular air pattern blankets the entire ceiling area surrounding the outlet. Slot diffusers, which discharge the air stream across the ceiling, exhibit surface effect only if they are sufficiently long to blanket the ceiling area. Grilles exhibit varying degrees of surface effect depending upon the spread of the air pattern.

Smudging of ceilings around diffusers is a problem in areas with a high secondary dirt content in the room air, generally where there is high pedestrian traffic. Anti-smudging rings are sometimes used to reduce discoloration around the diffuser but their effectiveness depends on the type of ceiling used. Smooth plaster and mineral tile will not highlight smudging as much as ceiling textures such as rough plaster or exposed concrete. Using a number of smaller diffusers instead of one large one reduces smudging.

Author: Wolfgang Kretschmann is an Associate with Syska & Hennessy, Engineers, New York City

New insulation possibilities open up with 25 flame-spread rated Pluragard® 601 urethane spray-foam

Architects and builders: If you want a practical insulating medium combining the superior K-factor of urethane with a 25 flame-spread rating that meets most building codes, look to Pluragard 601 . . . a new urethane spray-foam system developed by BASF Wyandotte.

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Contractor Quality Control, II

Harold J. Rosen, PE, FCSI

The contractor's responsibilities in relation to staff, testing, inspection and reports are covered in this article, the second in a two-part series

Last month's Specification clinic article outlined the need for a Contractor Quality Control program and provided specification language for on-site and off-site inspection. The following is a continuation of language to be included in the General Conditions to achieve this result. (November's article, p. 108, covered: A. General conditions; B. Control of on-site construction; C. Control of off-site operations.)

D. *Quality Control Organization:* This staff shall function completely independently of the contractor's job-supervisory staff and shall be composed of the following members:

1 *Architect:* Minimum five years' experience in supervising and inspecting equivalent construction. He shall be in charge of the quality control staff and program during the life of the project and inspect all contract operations.

2 *Electrical engineer:* Minimum five years' experience in installing, testing and operating equipment and services equivalent to that required on this project. He shall prepare, supervise, monitor and record all data on electrical, electronic and other types of tests required during the project.

3 *Mechanical engineer:* Minimum five years' experience in installing, testing and operating equipment and services equivalent to that required on this project. He shall inspect all mechanical equipment and systems required during the life of the project.

4 *Mechanical engineering technician:* Minimum three years' experience in inspecting and testing installation of mechanical equipment and systems similar to those required on this project. He shall be on duty at all times during the installation and testing of elevators, plumbing systems, refrigeration and air conditioning systems under this contract. He shall personally supervise and certify to the correctness of balancing of water, balancing of heating systems, balancing of air conditioning systems and performance testing of mechanical installations. He shall be on duty after completion of installation and through final acceptance and inspection tests on the balancing operation and performance of all these systems.

5 *Electrical engineering technician:* Minimum three years' experience in inspection of electrical equipment and systems similar to those required on this project. He shall be on duty at all times during the installation and testing of radio and television systems until they are finally accepted.

6 *Civil engineer:* Minimum three years' experience in the inspection and testing of concrete and precast concrete equivalent to that required on this project. He shall be on duty at all times during the production of concrete and precast concrete to supervise and inspect concrete operations and perform the following: a) Sampling and testing of concreting materials and concrete, b) Storage of materials, c) Batching, d) Placement, e) Formwork and, f) Curing.

7 *Technicians:* Provide specialists to ensure capability of complying with CQC as specified.

E. *Testing Laboratory:* The contractor may arrange for a testing laboratory to provide on-site services required in lieu of direct employment of personnel. The tests shall be documented and certified. All compliance inspections shall record both conforming and defective items with an explanation for the cause of rejection, proposed remedial action and corrective action taken. Individual daily reports will be required of each inspector and technician covering the feature which each is assigned and a consolidated daily report signed by the person in charge of the quality control staff.

F. *Schedule of CQC plan:* Furnish a schedule outlining the procedures, instructions and reports to be used as follows:

1 Quality control organization
2 Qualifications of personnel
3 Authority and responsibility of personnel
4 Schedule of inspection personnel
5 Test methods
6 Methods of performing and documenting quality control operations.

G. *Reports:* All inspection shall be recorded and submitted daily on approved forms certifying to items correctly installed and items found to be defective with a statement on corrective measures taken.

H. *Testing and inspection devices:* Either the contractor or his testing laboratory shall provide and maintain all measuring and testing devices, laboratory equipment, instruments and supplies necessary to accomplish the required testing and inspection. All measuring and testing devices shall be calibrated periodically against certified standards.

I. *Testing and inspection requirements:* Where technical sections of the specifications require inspection and testing by a testing laboratory, engage a reputable, recognized testing laboratory, experienced in the type of work to be performed. The representative of the testing laboratory shall be on the work site as necessary for sampling, inspection and testing in accordance with the contract provisions. Submit written reports of results within three days after completion of tests.

J. *Latest documents:* The Contractors Quality Control system shall provide for procedures which will assure that the latest drawings, shop drawings, specifications, modifications, change orders and instructions required by the contract are used for fabrication, testing and inspection.

Author: Harold J. Rosen is Chief Specifications Writer of Skidmore, Owings & Merrill, New York City.

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Constitutional rights

Bernard Tomson and Norman Coplan

The constitutional privilege against self-incrimination was used by a group of architects in refusing to testify and to waive immunity in this significant case

An architect who refuses to testify before a Grand Jury and to sign a waiver of immunity against subsequent criminal prosecution may, in certain jurisdictions, be barred from accepting a commission for a state, municipal or other public project. In New York, for example, it is provided by law that in all contracts made or awarded by a municipal corporation or public agency for work or services performed or to be performed, there shall be included a provision that refusal of a person, when called before a Grand Jury, to testify and to sign a waiver of immunity against subsequent criminal prosecution, will cause in that person, or any firm of which he is a member, to be disqualified from thereafter receiving any award for a public contract for a period of five years. The constitutionality of that statute was recently challenged.

The architects' suit arose out of a demand that they testify before a County Grand Jury and waive immunity against future criminal prosecution in a Grand Jury investigation concerning transactions and contracts that these architects had had with the county. Despite the fact that the architects' contract provided that they would forfeit any public contract for a period of five years if they so refused to testify, the architects, relying upon their privilege against self-incrimination as set forth in the Fifth Amendment, refused to sign the waiver of immunity and were excused from testifying.

When the public authorities threatened to cancel their then pending architectural contract and to deny these architects any public commission for a period of five years, the architects instituted the suit requesting an injunction against the enforcement of the statute. The suit was heard by a three-judge panel of the Federal District Court.

In determining the issue of constitutionality, the Federal Court concluded that the primary issue before it was whether the testimony sought to be obtained and be presented to the Grand Jury was for the purpose of securing evidence to prosecute the testifying parties or whether it was for the purpose of securing an accounting of their performance of their public trust. The court stated the applicable rule as follows:

"While a state may not discharge a public employee for refusing to waive a right which the Constitution guarantees to him, such a discharge would be without constitutional prohibition if, without being required to waive his immunity, the public employee fails to answer questions relevant to the performance of his official duties."

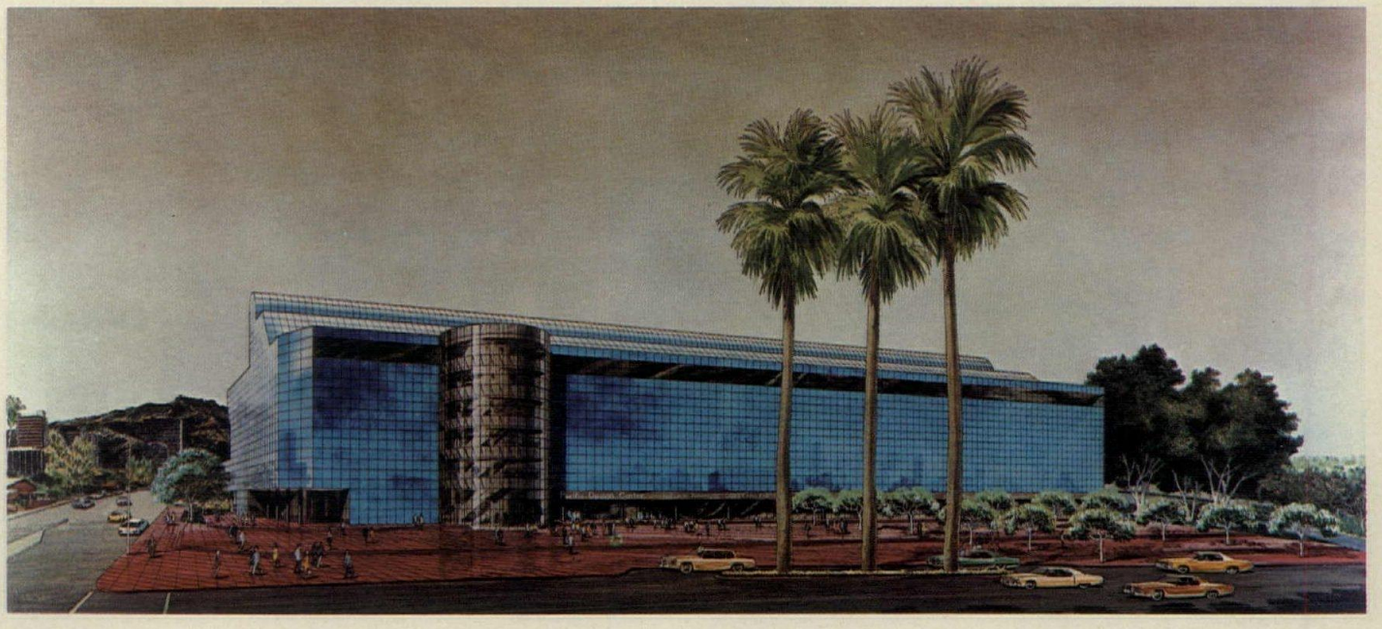
In considering the application of the foregoing rule, the Federal Court reviewed some of the determinations of the United States Supreme Court on this subject. They referred to the case of *Garrity* vs. *New Jersey,* 385 U.S. 493, in which the Supreme Court held that statements made by police officers during an investigation into the alleged fixing of traffic violations were inadmissible in evidence, since the choice given to the officers, either to forfeit their jobs or incriminate themselves, violated their constitutional privilege against self-incrimination. The court also referred to the case of *Sperack* vs. *Klein,* 385 U.S. 511, in which the Supreme Court determined that a lawyer cannot be disbarred solely for refusing, on the basis of the privilege against self-incrimination, to produce financial reports and to testify at a judicial inquiry.

The Federal Court, however, put its major reliance upon the decision of the United States Supreme Court in *Uniformed Sanitation Men* vs. *Commissioner,* 392 U.S. 280, in which that court said:

"... if New York had demanded that petitioners answer questions specifically, directly and narrowly relating to the performance of their official duties on pain of dismissal from public employment without requiring relinquishment of the benefits of the constitutional privilege, and if they had refused to do so, this case would be entirely different. In such a case, the employee's right to immunity as a result of his compelled testimony would not be at stake. But here the precise and plain impact of the proceedings against petitioners ... was to present them with a choice between surrendering their constitutional rights or their jobs. Petitioners as public employees are entitled, like all other persons, to the benefit of the Constitution, including the privilege against self-incrimination.... At the same time, petitioners, being public employees, subject themselves to dismissal if they refuse to account for their performance of their public trust, after proper proceedings, which do not involve an attempt to coerce them to relinquish their constitutional rights."

The Federal Court concluded that the disqualification of the architects from public contracts for five years as a penalty for asserting a constitutional privilege was violative of their constitutional rights. The court stated that within proper limits, public employees are not immune from being compelled to account for their official actions in order to keep their jobs. However, until the statutory provisions on this subject are rewritten by the State of New York to comply with constitutional standards, the state and county would be enjoined from their further enforcement.

Authors: Bernard Tomson is a County Court Judge, Nassau County, N.Y., Hon. AIA. Norman Coplan, Attorney, is Counsel to the New York State Association of Architects Inc./AIA.



Pacific Design Center is happening Now!

November 9, 1972 marked the beginning of demolition on the twenty acre site of Pacific Design Center. This 700,000 square foot showroom and exhibit mart is the new center of the Contract, Interior Design, Decoration and Furnishings Trades in the Western United States. Situated at the intersection of Melrose Ave. and San Vicente Blvd., it is in the heart of the well established trade center at Beverly-Robertson in Los Angeles.

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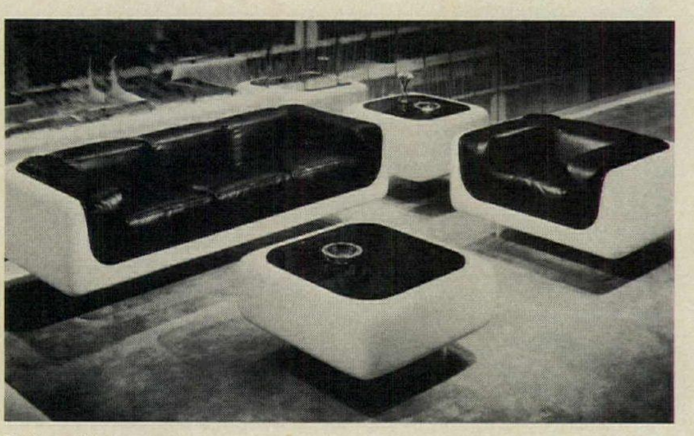
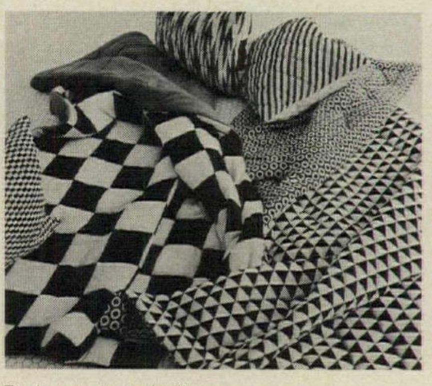
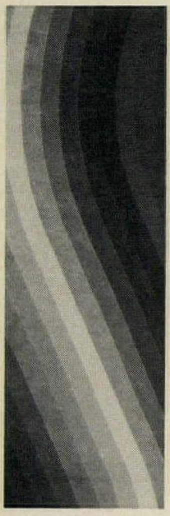


Soft seating

Hand tufted



Bedspreads and pillows



Aalto's scroll chair

Herewith, some of the winners in the Second Annual Product Design Awards Program sponsored by the Resources Council, the national association of interior furnishing manufacturers. Awards and honorable mentions were presented to interior furnishings designers and manufacturers for outstanding creative achievements and for significant contributions to the total environment in both traditional and contemporary design.

Soft seating. Described as offering a feeling of "mass floating space," this furniture is made of molded fiberglass shells mounted on clear acrylic bases, mirrored bronze tops and soft leather or coated urethane upholstery. Steelcase, Inc.
Circle 101 on reader service card

Tubular office collection. An honorable mention award for institutional furniture was given to this office group, consisting of a desk, credenza and storage unit. Rich red or brown molded plywood veneer and chrome are combined for units that can be used singly or clamped together to form more complex arrangements. Herman Miller, Inc.
Circle 102 on reader service card

Hand-tufted rugs. The award-winning rugs, hand-tufted in all wool, include "Strata," which can look like anything from layers of clouds to layers of sand depending on the viewer, and "Northern Lights," which uses a stream of color 2'8" x 14'8". Fully sheared, the design is incised between tones, making a sharp delineation of the colors. V'Soske.
Circle 103 on reader service card

Carpet stripes. Winning the award for soft surface floor-coverings, all wool carpet combines empire stripes with solid color carpeting. The Magee Carpet Co.
Circle 104 on reader service card

Bedspreads and pillows. Fashion designer Rudi Gernreich, designed this collection of bedspreads and pillows which won honorable mention. Made of double wool knits originally used for quilted jackets and coats, in bold geometric patterns, the quilts were first shown in Paris as part of an exhibit of 19th Century quilts. Knoll International.
Circle 105 on reader service card

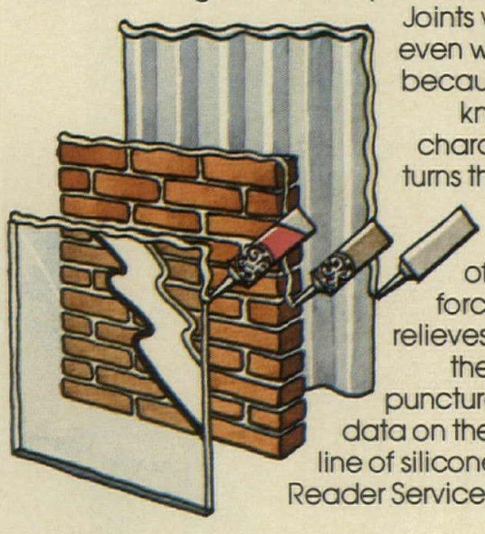
Carpet tiles. 12 in. squares made of polypropylene with a self-adhesive all-weather foam rubber cushion backing won honorable mention for versatility, appearance and economical price. Ozite Corp.
Circle 106 on reader service card

From Designer's Saturday, the annual showing of 25 contract furniture companies, a few of the features.

Aalto's scroll chair. Re-introduced, after being out of production for many years. The mold for the original scroll chair was destroyed in a fire, stopping production. Aalto's factory in Finland has remade the mold and a limited edition is now available. On exhibit in the permanent collection of the Museum of Modern Art. ICF.
Circle 107 on reader service card
[continued on page 92]

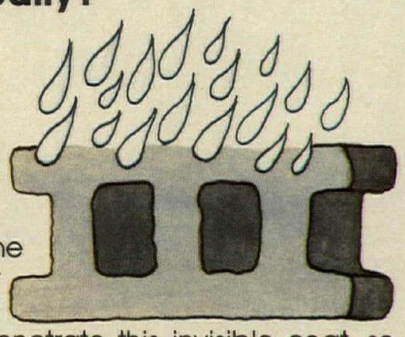
Q.1 **What's the closest thing to a truly permanent sealant?**
Q.2 **What? Real weather protection for masonry?**
Q.3 **Outdoor finishes that last 10 years? Really?**

A1 Any of General Electric's 12 silicone construction sealants can qualify. You see, they don't compromise anything. They're the most age and weather resistant sealants ever invented. They bond well to a wide range of materials, but some are especially tenacious on glass and metal, while others excel on concrete. Some are one-part silicones; others, two-part. And some are even cost competitive with polysulfide. Our two-part Silicone Sealant 1600, for example, is based on a technological breakthrough that puts it in the two-part polysulfide price range without sacrificing silicone's advantages. It needs no primer on concrete and other substrates. Applies easily at any temperature without sagging. Cures to a flexible seal that can expand 8 to 10 times its contracted size. (Which is at least twice as good as competitive sealants.)



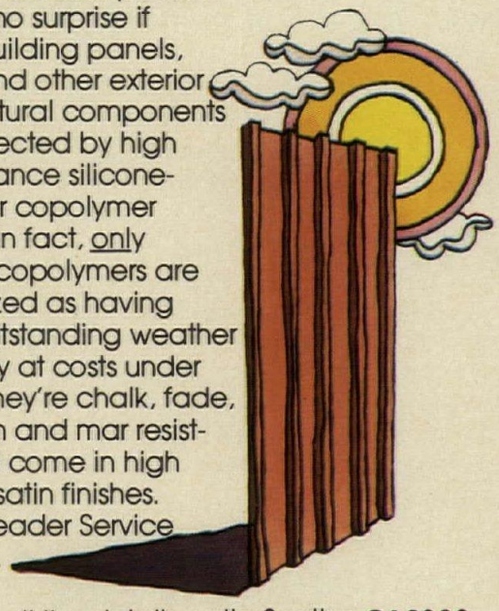
Joints won't fail even when cut, because 1600's knotty tear characteristic turns the tear in the direction of exerted force, which relieves stress at the point of puncture. For full data on the only full line of silicones, circle Reader Service No. 374.

A2 Sure. If it's above-grade masonry, just coat the exterior with GE Dri-Film® silicone masonry water repellent.



Water can't penetrate this invisible coat, so powdery, salty-looking efflorescence can't get started. And freeze-thaw cycles can't cause spalling and cracking. Which means exteriors stay clean and new-looking for years and years. Circle Reader Service No. 375.

A3 Definitely. A decade of maintenance-free, weather-durable performance is no surprise if metal building panels, siding and other exterior architectural components are protected by high performance silicone-polyester copolymer finishes. In fact, only silicone copolymers are recognized as having really outstanding weather durability at costs under 2¢/ft². They're chalk, fade, corrosion and mar resistant. And come in high gloss or satin finishes. Circle Reader Service No. 376.



For all the details, write Section Q1 2380, Silicone Products Dept., General Electric Co., Waterford, N.Y. 12188.

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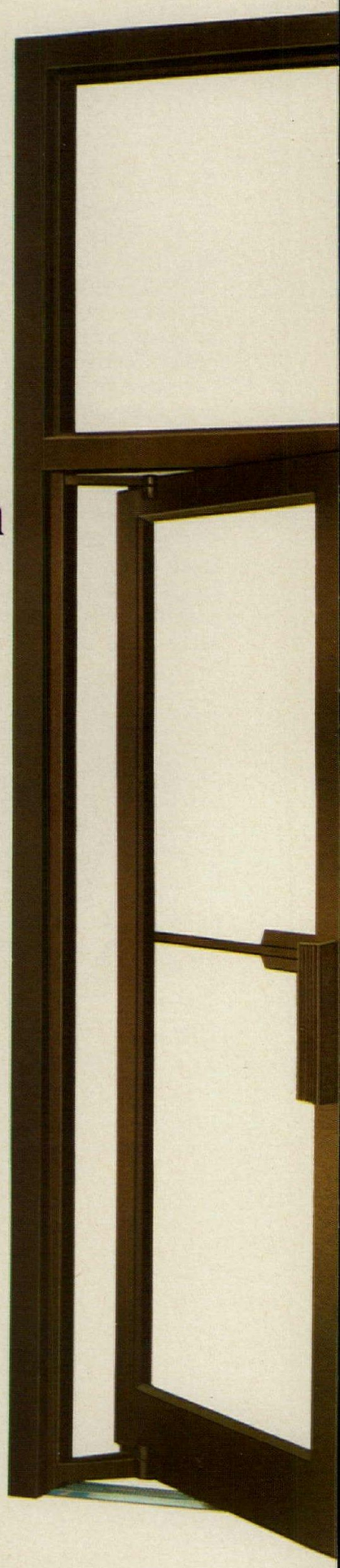

A versatile new entrance program

that adds design flexibility to the practical benefits of the Balanced Door Principle

Design options featuring exclusive 4½" frame depth

Kawneer's Manual Balanced Aluminum Entrances provide design versatility for those jobs which require maximum door control without sacrificing ease of operation. Narrow, medium and wide door styles can be installed in a narrow 4½" as well as a standard 5½" depth framing system. Now you can specify a manual balanced door and still maintain consistent mullion depth throughout your design . . . whether the desired look is an extremely slim or monumental profile.

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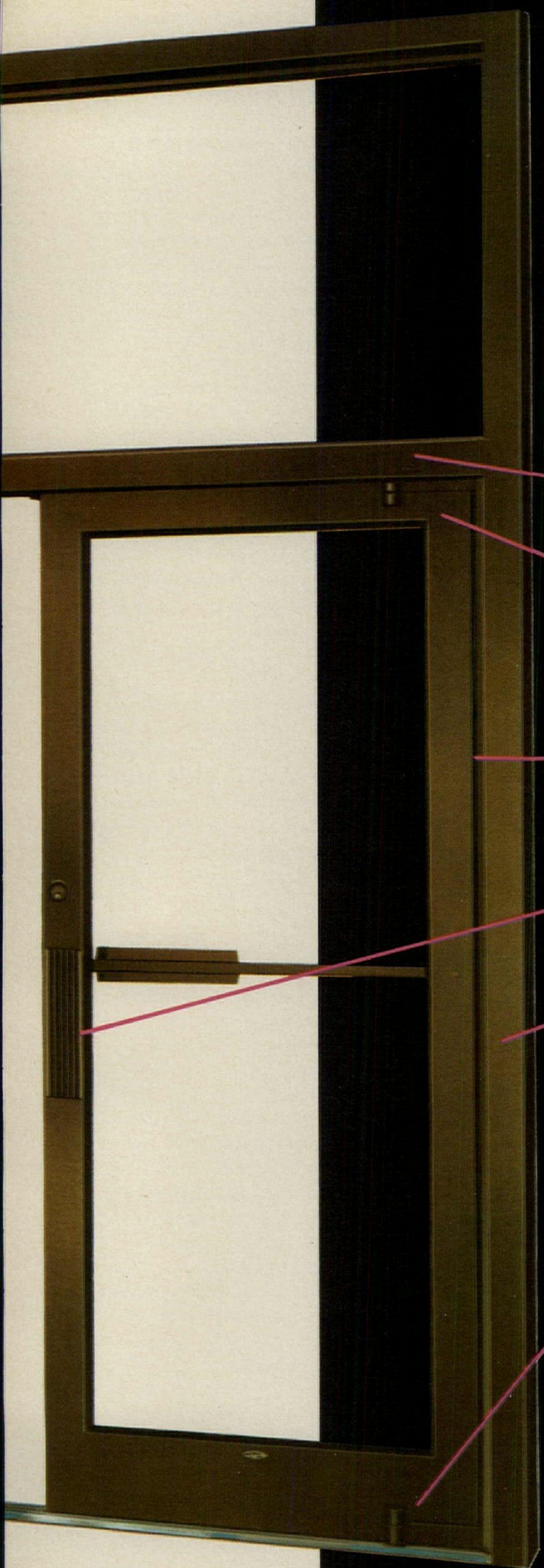
Each entrance is engineered for maximum strength and durability. Doors feature rugged dual-moment corner construction, self-aligning pivots with spring-cushion backstop, and adjustable pile weathering on all four sides. Frame joinery is specially engineered to withstand abusive traffic and heavy winds. Pivot nearer door center nearly equalizes wind and stack pressures on either side—so the door requires less force to be opened, less pressure to stay closed.

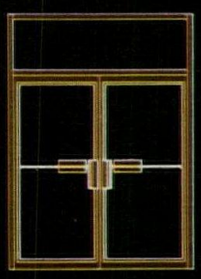
Economical installation

Factory fabrication and assembly of the total entrance unit insures precise alignment of moving parts and quality workmanship throughout. Elimination of time-consuming and costly jobsite fabrication and assembly holds installation costs to a minimum.

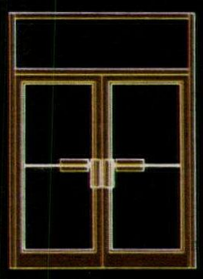


Design flexibility

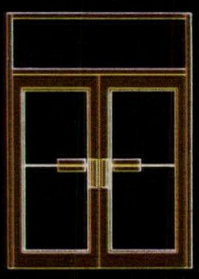
The Manual Balanced Entrance Program allows choice of any of these three basic door types. Each can be combined with 1¾" x 4½" standard framing for the slimmest appearance in the architectural aluminum industry. Or with 2¾" x 5½" framing to achieve maximum structural qualities.



'190' Narrow Stile Door



'350' Medium Stile Door



'500' Wide Stile Door

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Adjustable Pile Weathering

A perfect fit can be obtained on all four sides of the door to assure maximum resistance to air and water infiltration under the most severe conditions.

Hardware Options

Various designs and color combinations of push-pull hardware are available to complement the entrance design.

Available in Permanodic® Hard Colors and Clear Finish

Entrances are available in hardcoat PERMANODIC® finishes of medium bronze, dark bronze, and black or in Alumilite clear finish. Extruded aluminum balance arms and pivots can be anodized to match the entrance finish. Stainless steel pivots and arms are optional.

Balanced Pivoting Mechanism

Self-aligning pivots at all points of rotation and a spring-cushion backstop insure years of trouble-free operation.

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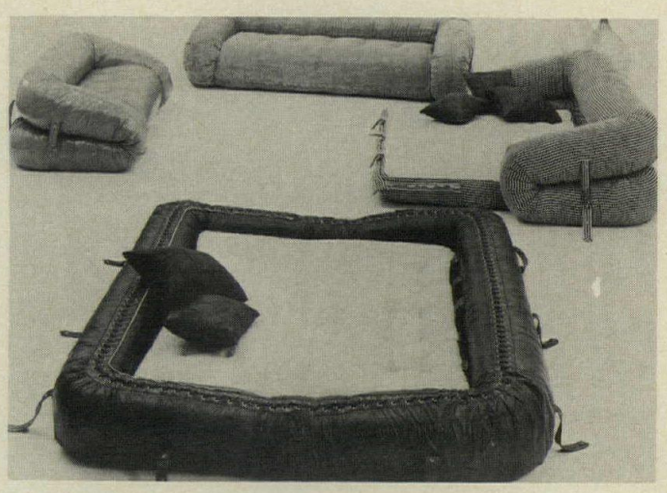
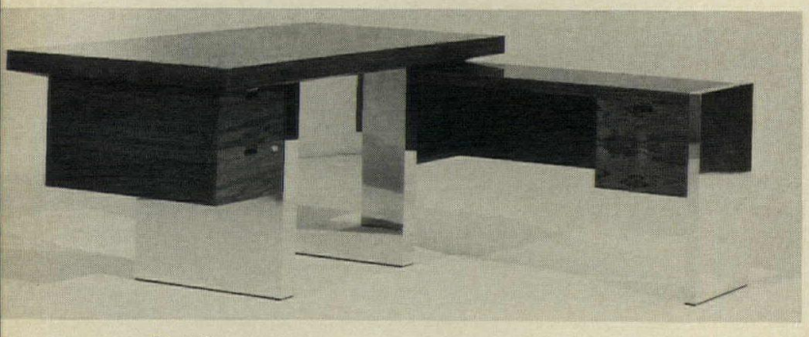
Products continued from page 88



Anfibio

Multi-level seating



Desk for secretaries

The Eames chair

Anfibio. Part of the Italian show at the Museum of Modern Art, this multifunctional furniture is first a sofa-bed without the usual hardware, allowing it to be unusually soft. In leather with a sheepskin mattress cover, striped wool that looks like mattress ticking or wet-look vinyls, it zips open and snaps closed. Zippered pocket underneath for linen storage. ICF.
Circle 108 on reader service card

Multi-level seating. Chrome-finished steel wire seating and wire storage modules are basic elements of this collection. The three-level seating tower is described as unique! Both designed by Verner Panton. The wool fabrics by Miralastic come in 13 bold or neutral colors. Fritz Hansen.
Circle 109 on reader service card

Desk for secretaries. Now the secretary's desk can coordinate with the executive suite. In rosewood with polished stainless steel or antique bronze plinths. Optional box or file drawers. Dunbar.
Circle 110 on reader service card

The Eames chair. A foam-in-place technology is used for a variation of the famed chair; the process bonds the chair's cover, the core of injected urethane foam and the shell. Available in combinations of leather, hopsak, nilo and vinyl coverings. Herman Miller, Inc.
Circle 111 on reader service card

Porcelain on steel. Vitriform 90 is a new type of porcelain steel that can be formed to a 90-degree angle without spalling. This eliminates the need for moldings, resulting in labor and materials savings. The nonporous, glass-smooth surface is treated to eliminate breeding areas for bacteria. Available in 15 colors, plus 9 chalkboard colors—it takes chalk and erases easily. Color samples offered. AllianceWall Corp.
Circle 112 on reader service card

Literature

Seminars. Study program in preparation for the winter NCARB examinations is available. It includes home study courses covering all seven examination subjects. Architectural License Seminars.
Circle 113 on reader service card

Jute-backed carpets. Architectural guide specifications for direct glue-down installations of double jute-back carpets are offered in this brief guide. The fibrous characteristics of the jute backing assure full retention of adhesive and offer a strong, permanent bond to the subfloor. Initial cost is said to be lower than for the same carpet plus separate underlayment or cushion-backed carpet with equal pile specifications. Recommended for remodeling projects as well as new construction. Jute Carpet Backing Council, Inc.
Circle 114 on reader service card

Parking gate. Such problems as gate arm forcing, vandalism, collision and operation of parking gates in extreme weather are discussed in a short brochure. Design solutions to obviate these problems are described. Cardkey Systems.
Circle 115 on reader service card

Efficient building idea: Recent report tells how to solve the acoustical problems of open offices.

Good news for architects who like the design freedom of open offices—but don't like the acoustics.

Tests by Geiger & Hamme, an independent acoustical testing agency, show you can get excellent open office acoustics by using these three things (with the help of an acoustical consultant):

1) An acoustically non-reflective ceiling—so the sound won't bounce off to other areas. (Of all the ceilings tested—including expensive coffered and baffled systems—the best, they say, is Owens-Corning's NubbyⅡFiberglas* Ceiling Board in a standard grid suspension system.)

2) Sound-controlling screens—to stop the sound from going directly from one work area to another. (Either directly or by reflection.)

3) A masking sound system—technically designed to fill the sound voids without increasing the overall ambient noise level. This makes it possible to hold personal conversations in a normal voice—without being overheard.

If you'd like the whole story, send for our free design guide, "Achieving Acoustical Privacy in the Open Office." Write to Mr. P. A. Meeks, Owens-Corning Fiberglas Corporation, Fiberglas Tower, Toledo, Ohio 43659.

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

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PPG's Solarban® 575 Twindow® insulating glass and matching spandrel: a unique display of unity.

The developer of Denver's Greenwood Plaza had two thoughts in mind when design planning began for his three-building office complex: Design to give occupants full advantage of the view; but design so that the building will not intrude into the beautiful, natural setting.

The architects concurred. They chose PPG's *Solarban* 575 *Twindow* reflective insulating glass and the new matching *Solarban* spandrel units to complement the earthy tones of the aggregate structurals. The matching appearance of the *Solarban* glass units and the spandrel units (a new glass-metal type) combine to give the impres-

sion of solid glass walls, with uniform reflectivity of the naturalized surroundings.

This total glass approach helps settle the development into its site, and also preserves the natural feeling of spaciousness.

A great deal of practicality enters the picture, too, since the high thermal performance of the *Solarban* 575 units contributes significantly to occupant comfort. And the matching, reflective *Solarban* spandrel units outperform conventional single-glazed spandrel products in both U-value and shading coefficient. *Solarban* spandrel units are opaque and need no backup material for visual purposes. And because of the low U-values, field installation of backup insulation material is not required.

See PPG about *Solarban Twindow* units—and the new matching spandrel units—for your next building. Early in the design stages. Write PPG Industries, Inc., One Gateway Center, Pittsburgh, Pa. 15222.

Developer: The John Madden Company, Denver, Colorado
Architect: Kirkham-Michael & Associates, Omaha, Nebraska

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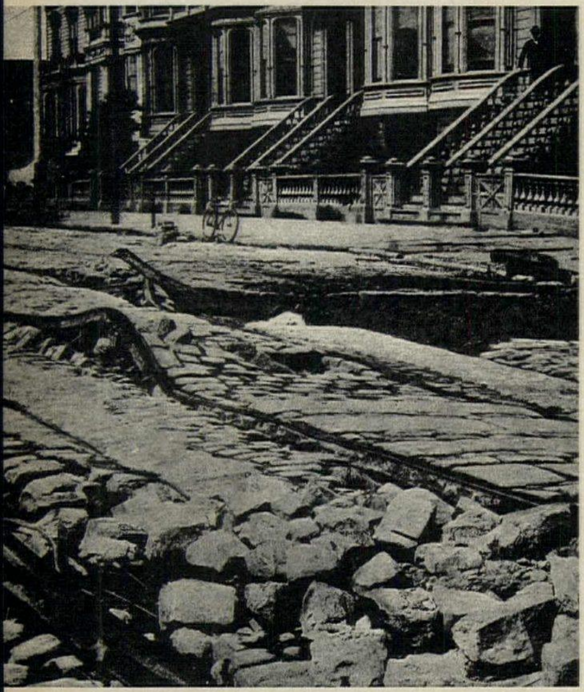
PPG INDUSTRIES

Earthquakes: From 1906 to 1971



The San Francisco Earthquake and Fire of April 18, 1906 *by U.S. Geological Survey. Government Printing Office 1907, 170 pp. and 107 plates. Reprinted by San Francisco Historical Publishing Co., 1972. 240 pp. $4.95 paperback.*
"Earthquake Risk" Conference Proceedings *by the Joint Committee on Seismic Safety to the California Legislature, 1971, 152 pp. $5 paperback.*

Reviewed by William Zuk, Professor of Architecture in charge of structural engineering at the School of Architecture, University of Virginia, Charlottesville.

Some 413,000 people have been killed by earthquakes around the world this century. Of this total figure, only 1056 were killed in the United States; and of this, only 356 perished since the 1906 San Francisco quake. Thus it seems that insofar as America is concerned, subsequent to the 1906 disaster, we either have been very lucky or have been doing something right. Perhaps it is a combination of both factors, as suggested by these two books.

The *San Francisco Earthquake and Fire of April 18, 1906 and Their Effects on Structures and Structural Materials* was originally published by the Government Printing Office in 1907, but it is being currently reprinted by the San Francisco Historical Publishing Company. The document is basically a collection of four separate investigation reports by G.K. Gilbert of the U.S. Geological Survey, R.L. Humphrey also of the Geological Survey, J.S. Sewell of the Corps of Engineers, and F. Soule of the University of California College of Civil Engineering.

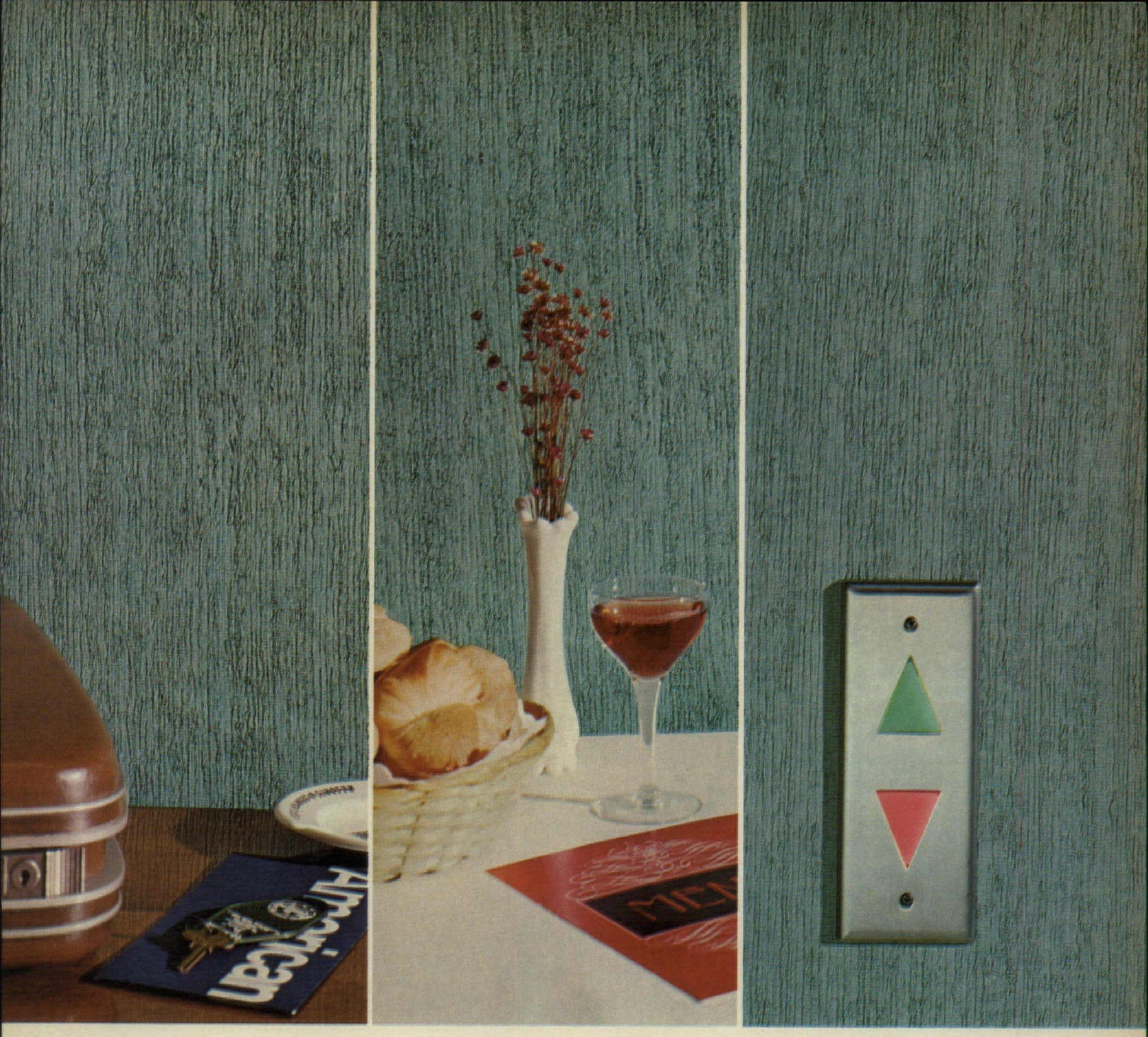
The reports are factually well presented, with 105 interesting and dramatic photographs of the results of the quake and the fire that followed. It is not a document that busy architects or engineers need read as construction practice and building codes have changed extensively since that era, although it is to be noted that the intuitive perceptions of the four investigators were generally quite good, even in the light of contemporary analytical hindsight. However, earthquake buffs (if there are such) and those inclined toward the fascination of historical cataclysms might find the descriptions interesting. Certainly the many photographs will hold anyone's attention, especially plate LIV which shows a view from Telegraph Hill recalling to mind the scenes of Hiroshima after the bomb.

More up to date are the proceedings of the September 22–24, 1971 conference on Earthquake Risk; held not long after the San Fernando, Calif. quake of February 9, 1971. This volume brings us fairly well up to date on current thinking on the subject. Like so many other aspects of technology these days, the root question is not how to do something, but whether we should do it. Engineers are still plugging away at better ways of designing structures to resist seismic forces; if given enough money we now have the capability of constructing a building to withstand just about any Mercalli scale intensity we want. So the question is how much money should we spend on structures for resistance against seismic forces—and that bluntly is what the conference proceedings are all about.

Once again this is not a document that busy architects or engineers need read, particularly if they are looking for direct answers. Rather, the volume provokes deeper philosophical and ethical thoughts on the value structure of our society, such as how much is a human life worth. Only a few of the 23 authors are engineers or scientists; the remainder coming from government, economics, business and law.

Perhaps the best overview of the subject comes from Dr. Tapan Mukerjee, an economist, who looks beyond the direct and obvious factor of modifying structures in themselves. Included in his paper are the considerations of earthquake prediction and prevention, warning systems, zoning, land use changes, relief efforts, rehabilitation and insurance programs. Touching also on human attitudes toward earthquakes ranging from the optimism of "It can't happen here" to the fatalism of "It's in the hands of God," he points out that easy answers are hard to come by. The fact is there is no real commensurability between lives and dollars.

However, authors such as Dr. Chauncey Starr (Dean of the School of Engineer-
[continued on page 98]



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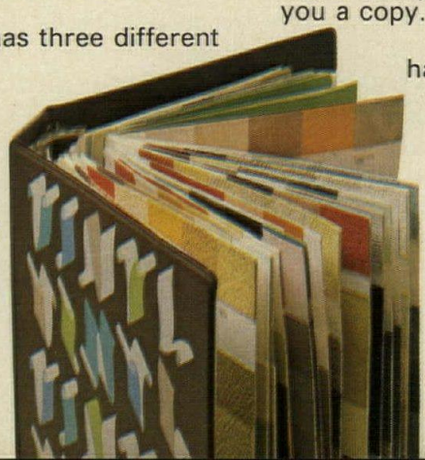

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Books continued from page 96

ing and Applied Sciences at the University of California at Los Angeles) and Dr. John Blune (head of a consulting engineering firm in San Francisco) have tried to grip this elusive risk problem both analytically and realistically. The essence of their position is that the risk level of death by earthquakes should not exceed that of death by natural diseases. In effect, this principle is but a determinate of social acceptability or policy. Citing an example, the unit of fatalities per person hour of exposure by disease in the U.S. is 1×10^{-6}. Interestingly, 1×10^{-6} is also the unit per person hour of exposure for fatalities by motor vehicles and by commercial aviation. As evidenced by the millions of people on the highways and in the air, on average, our society seems willing to live with these odds.

That no wholesale exodus from southern California has taken place suggests that people there also consider the likelihood of their personal fatality by earthquake rather small. Apparently people will not voluntarily spend money to reduce a risk which they consider low.

This is not to say that hazardous conditions created and controlled by man should not be improved upon, even at added expense. Indeed witness to this concern is seen in governmental action to improve highways, upgrade air safety standards and, in part, thanks to Nader and his raiders, to improve the vehicles.

But to return to earthquakes and architecture, the unit of fatality tossed out at the conference as a target for design is 1×10^{-12}; which is one millionth that of natural disease. For comparison, the unit of fatality of the 1971 San Fernando quake (where 65 people died) is estimated as 8×10^{-11}, which means that the target value should be 80 times safer than that currently existing (wherein only one life would be lost).

Implementation and enforcement of more stringent building codes needed to meet this figure (if indeed this is the proper figure) lies of course in the political arena, as few clients would voluntarily spend the added sums for stronger buildings and utilities unless required to do so by law. However, even if such codes were imposed, it is still a far cry from the ancient Babylonian law of Hammurabi (circa 1950 B.C.) which states, "If the contractor builds a house for a man and does not build it strong enough, and the house which he builds collapses and causes the death of the house owner, then the contractor shall be put to death."

Innovation in New Communities. MIT. Report No. 23 *by Brown Miller, Neil J. Pinney and William S. Saslow. Cambridge: The MIT Press, 1972, 301 pp. plus appendices. $15.*

The result of a four-month research project supported by Boise Cascade Housing Development, the Joint Center for Urban Studies of MIT and Harvard University and the MIT Urban Systems Laboratory, this book explores opportunities for incorporating technological and programmatic innovation in new community projects. A secondary object was to provide facts and analysis useful to design professionals and others involved in such development.

The central premise of the study is that "new communities can be planned and developed in a manner which accommodates changing technologies and social requirements more efficiently than existing communities." In pursuing this thesis the characteristics of new communities are determined, along with the "technological and programmatic innovations which determine the feasibility of applying advanced technologies and/or social programs to large-scale development projects."

The book provides a resumé of the fundamental opportunities in new communities, a summary of pertinent social trends and a list of innovations. It also addresses issues of population distribution and growth, goals of new communities and possible future ways of life. Transportation, communications, energy and waste management systems and such public service programs as health, education and institutional control are examined.

Architects involved in planning new communities and in working to alleviate existing city problems will find this study illuminating both sociologically and in relation to design possibilities.

The Modern Metropolis: Its Origins, Growth, Characteristics and Planning. *Selected essays by Hans Blumenfeld; edited by Paul D. Spreiregen. Cambridge: The MIT Press, 1972. 379 pp. $3.95.*

The preface to the paperback edition of this book refers to the "remarkable change [that] has occurred in public attitudes toward the problems of metropolitan areas since the first paper included in this collection was written thirty years ago, and even in the five years since the first edition of this book was published." Attributing urban problems more to the social, economic and political structure of our society than to the city itself, Hans Blumenfeld feels that some of the thoughts presented in these papers which "at the time were regarded as odd ball opinions, have now become dogma."

There are 33 papers, several of them illustrated, ranging in content from the origin, growth and form of the modern metropolis, to regional planning, transportation, residential areas, urban design and methodology of planning. As the author states, some will appear "like we've heard it all before," but it is an interesting book historically, and particularly in view of what has and has not taken place in the cities to make them more habitable.

Documents

[The documents listed below are available from the associations and agencies cited. Request for such documents should be directed accordingly.]

CRSI Statistical Report—Rebar Usage. *Concrete Reinforcing Steel Institute, 228 N. La Salle St., Chicago, Ill. 60601. $60, prepaid.*

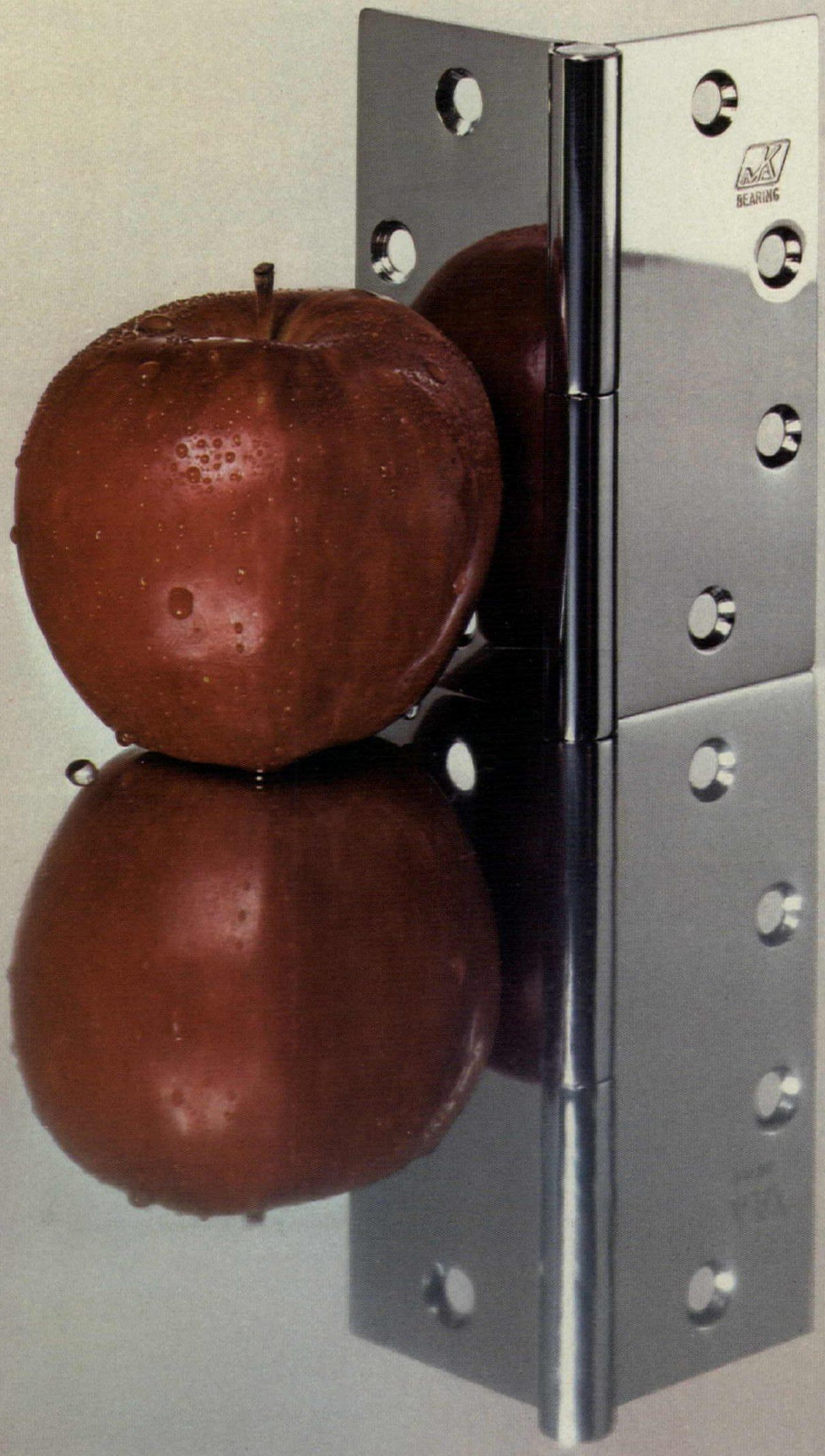
Developed under the direction of the CRSI Committee on Marketing and Statistics, this report is a six-year summary of reinforcing steel usage in eight categories of construction for the eight F.W. Dodge statistical regions.

The report covers domestic consumption of reinforcing bars in tons for the years 1966-1971. Categories of construction include: apartments, hotels and motels; heavy construction; pavements (broken down by a) continuously reinforced concrete pavement, and b) all other pavement usage); bridges and miscellaneous highway; public buildings; industrial and commercial buildings; and other uses.

Uniform Construction Index. *316 pp. The Construction Specifications Institute. 1150 Seventeenth St., N. W., Washington, D. C. 20036. $6.50, members; $8, nonmembers.*

The Joint Industry Conference in the United States and Canada has issued this index offering a coordinated construction communications vehicle which includes a system of formats for specifications, data filing, cost analysis and project filing. It uses an expanded system for filing and retrieving technical literature and other data and relates directly to the elements of specifications writing and cost estimating.

The project filing format was developed from Canada's Building Construction Index and provides filing standards for correspondence, agreements, modifications and meeting records.



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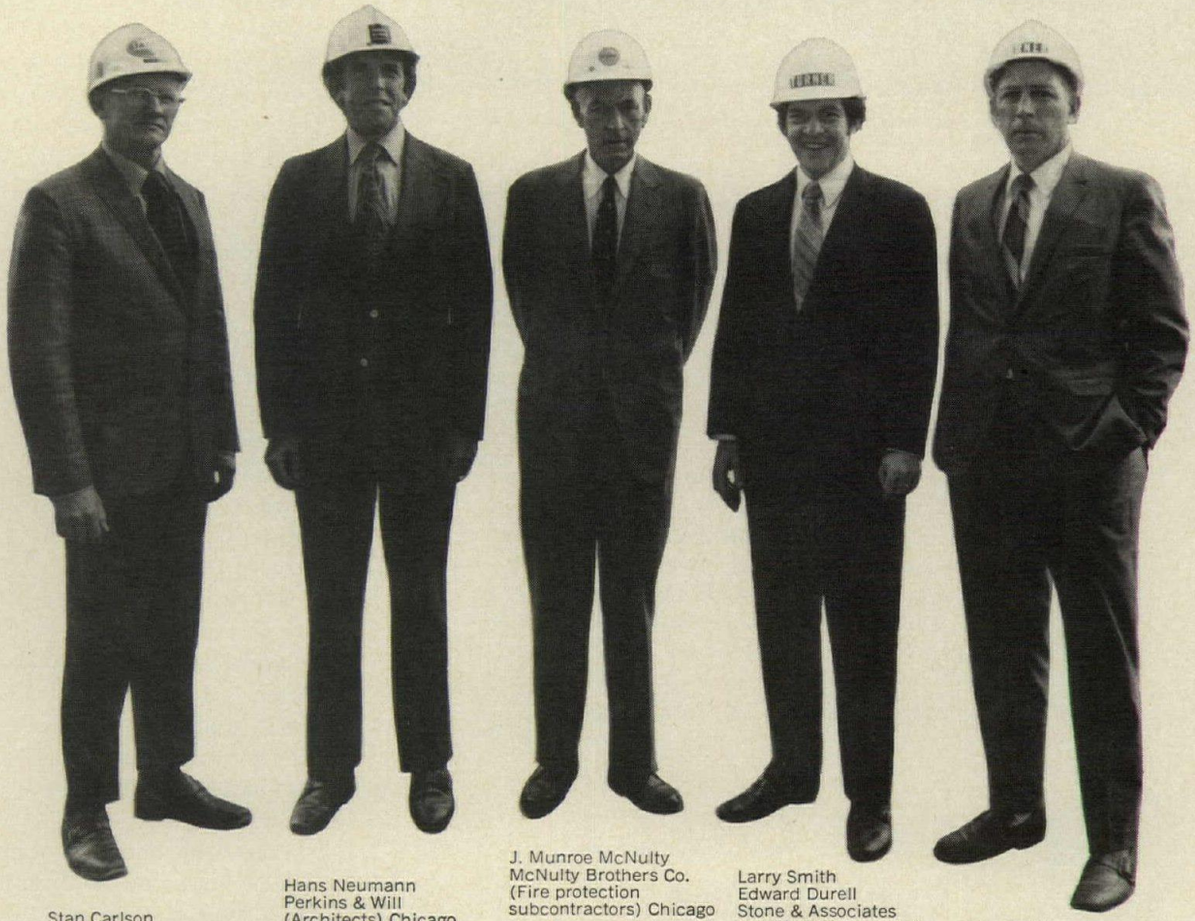

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Standard Oil Company
(Indiana) Chicago

Hans Neumann
Perkins & Will
(Architects) Chicago

J. Munroe McNulty
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subcontractors) Chicago

Larry Smith
Edward Durell
Stone & Associates
(Architects) New York
and Chicago

Bernie Newton
Turner Construction Company
(General contractors)
Chicago

Notices

Appointments

Walter A. Rutes, AIA, has joined John Carl Warnecke & Associates, New York City, as vice president.

The following have been made associate partners in the Portland, Ore. office of Skidmore, Owings & Merrill: **Bertis Rasco, AIA; Thomas Frey, AIA; Max Bolte, AIA.**

Robert H. Liles has rejoined Albert Kahn Associates, Detroit, Mich., as chief architectural draftsman.

Edwin B. Woodrich, AIA, has been named executive vice president and general manager of Bodrell Joer'dan Smith & Associates, Los Angeles.

George Hole, CBE, has joined J.E. Greiner Company, Ltd., Edinburgh, Scotland, as director, and special consultant on airports.

Andrew Alpern, AIA, has been appointed vice president and director of architecture for Environmental Research & Development Inc., New York City.

John F. Schonder, AIA, has joined Ross & Associates, Pittsburgh, Pa., formerly John J. Ross, Architect.

William E. Gates has joined Dames & Moore, Los Angeles, as an associate.

Bruce W. Moore has been named vice president in charge of production and an associate in Walter Richardson Associates, AIA, Costa Mesa, Calif.

New firms

William K. Quinter, AIA, 156 Congressional Lane, Rockville, Md. 20852.

Joseph Lombardo, AIA Architect, 200 California Ave., Palo Alto, Calif. 94306.

Creative Interior Designs, headed by Ivan R. BeRossy, 1351 Washington Blvd., Stamford, Conn. 06904.

Interior Architects, Inc., 625 N. Michigan Ave., Chicago, Ill. 60611. Arnold Blair Kominsky is president.

R. Edward Marrs, AIA, and J. Perrin Lawson, Jr., AIA, CSI, have formed **Marrs & Lawson Architects Inc.,** 1700 Oak St., Myrtle Beach, S.C. 29577.

Sal Fili and Rocco De Leonardis have formed **Fili & De Leonardis Design Associates Inc.,** 222 E. 31 St., New York City 10016.

The Architectural Planners Group, Suite 1212, Commerce Bank Bldg., Kansas City, Mo., headed by Thomas O. Lance, AIA.

Subhash V. Paranjpe, Architect, 4130 W. Leland St., Chevy Chase, Md. 20015.

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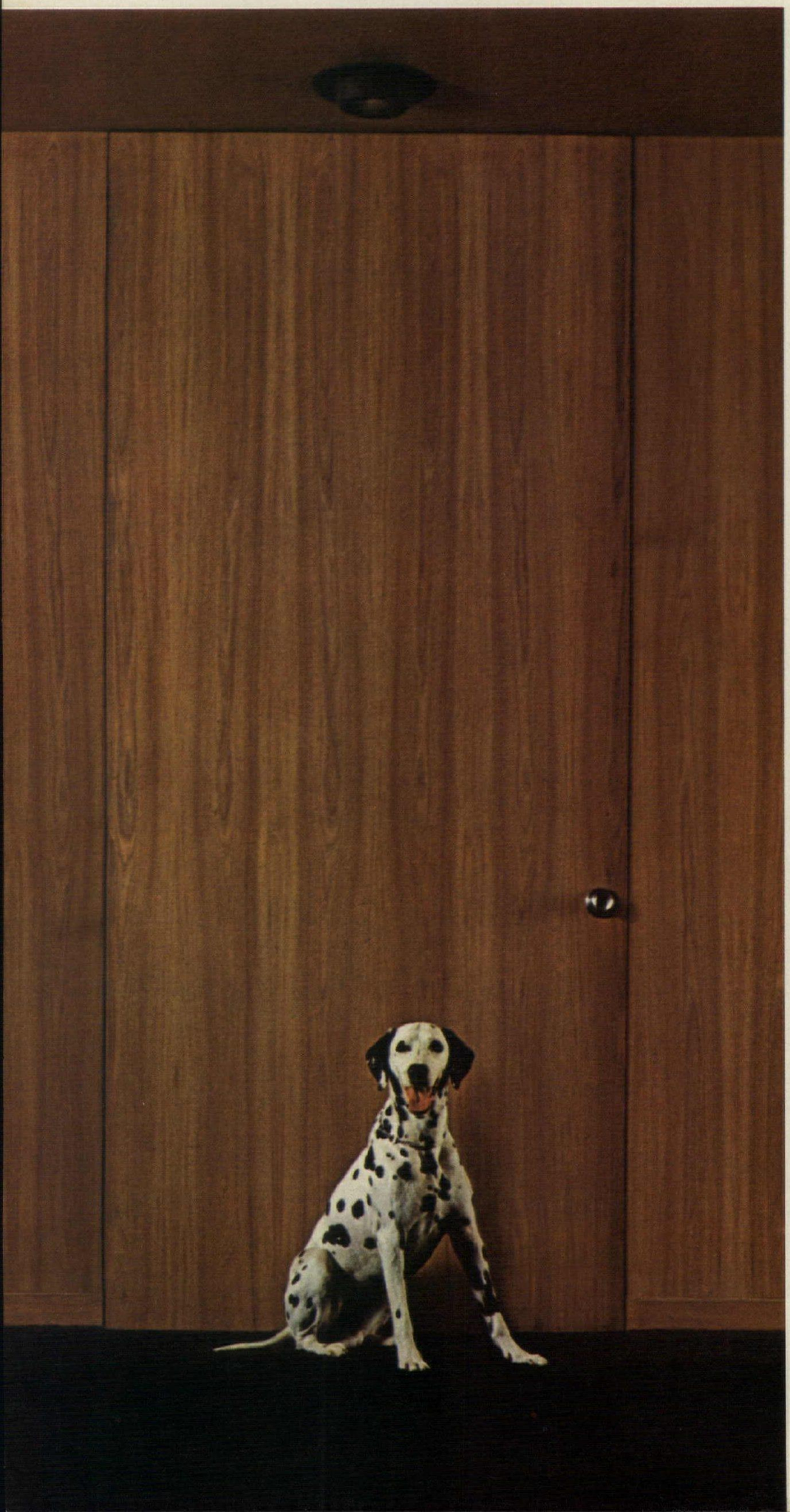

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Annual index January-December 1972

[continued on page 110]

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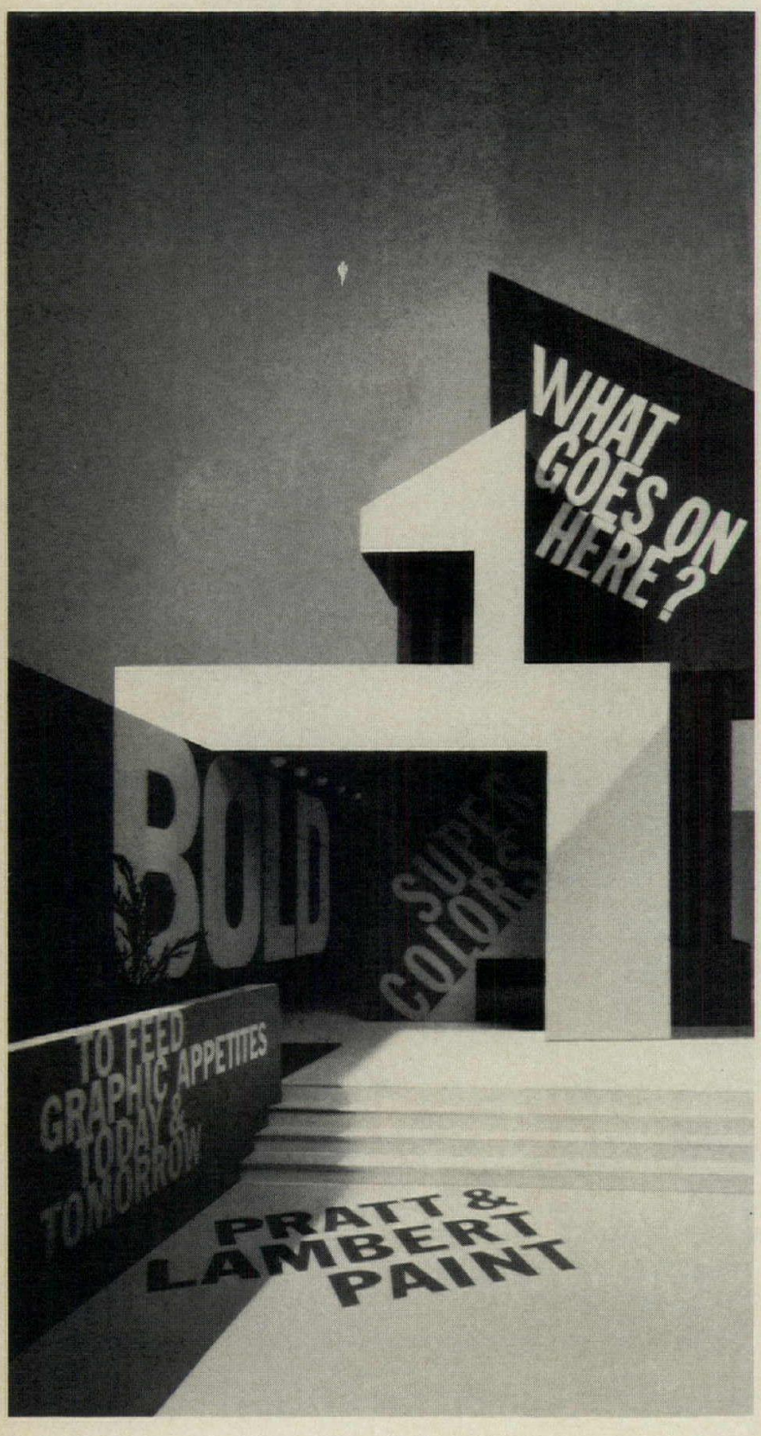

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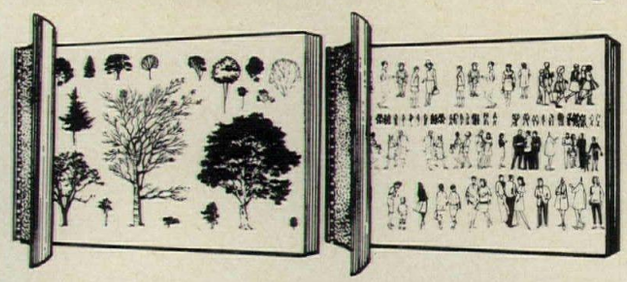

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☐ Enclosed is my check for $3.00 to cover cost of one sample kit.
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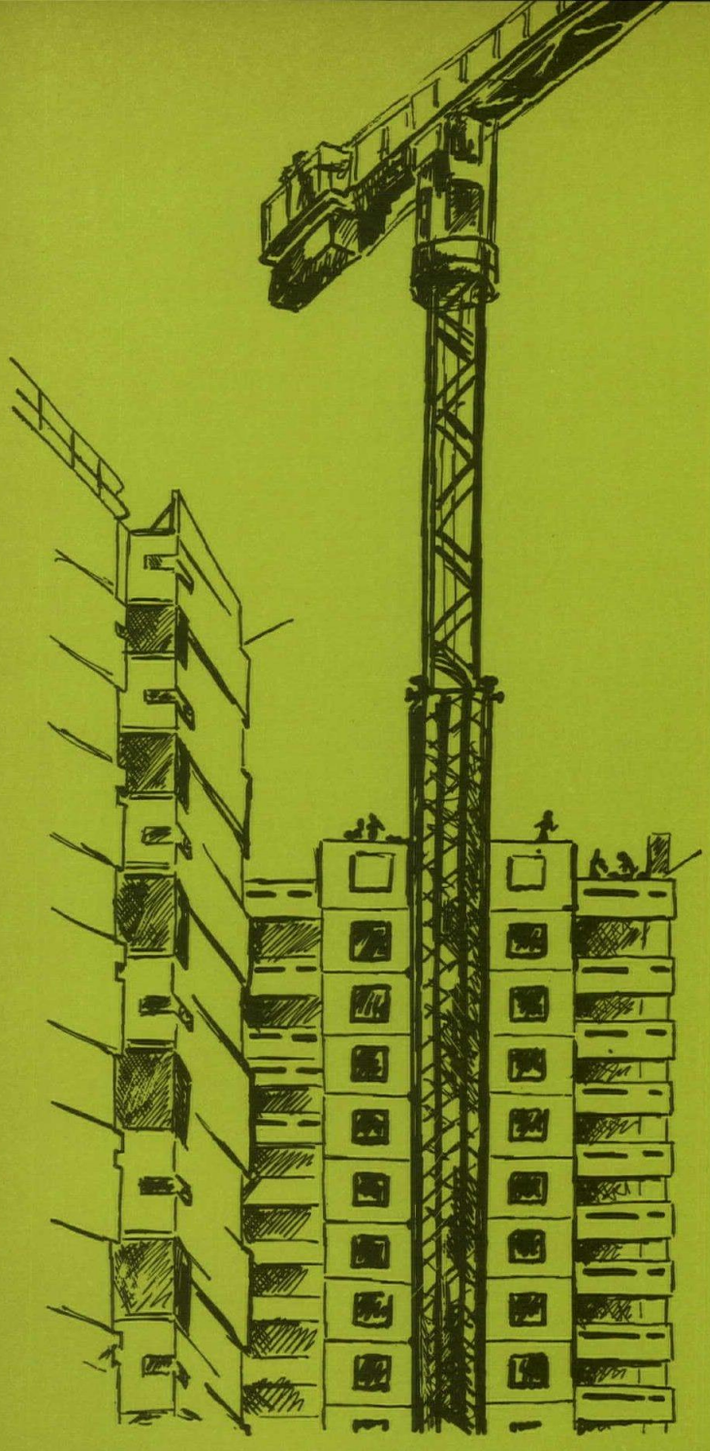

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Permalite Pk • combines the exceptional dimensional stability and fire protection properties* of famous Permalite Sealskin with the unmatched insulation qualities of urethane foam and a high-strength water repellent laminate.

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Permalite Pk*
RIGID ROOF INSULATION

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Annual index continued from page 106

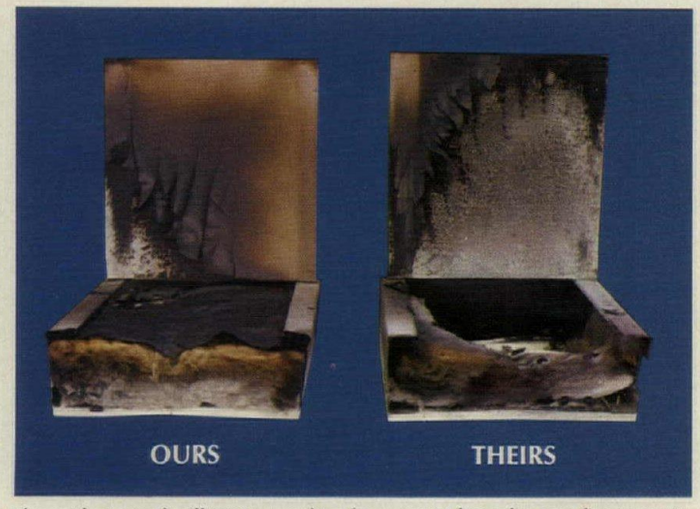
[continued on page 112]

AURATONE* 5/8" x 24" x 48" Acoustical Ceiling Panels in suspended exposed grid system continuous over partition. Double layer 1½" THERMAFIBER Sound Attenuation Blankets above ceiling extending 4' on both sides of partition.

USG® Metal Stud Partition employs ½" SHEETROCK* FIRECODE* "C" Gypsum Panels; 2½" studs 24" o.c.; single layer panels each side, applied vertically and screw-attached; 1½" THERMAFIBER Sound Attenuation Blankets one side; joints finished, perimeter caulked.

*Reg. U.S. Pat. Off.

THERMAFIBER® Insulation: the 3-in-1 blanket that has no "or equal" for systems performance



These photographs illustrate results of a recent 1-hour furnace fire test witnessed and certified by independent consulting engineers. Temperatures were controlled to follow the ASTM E-119 standard time-temperature curve. THERMAFIBER (left) and a glass fiber insulation (right) were tested in two identical partition panels for one hour. The result proved that THERMAFIBER adds an extra margin of fire safety to an assembly.

Before you specify, evaluate THERMAFIBER Products for all types of construction on 3 important counts:

1. SOUND ATTENUATION. THERMAFIBER used as shown here achieved 45 to 48 STC ratings in single layer wall partitions, 45 to 49 STC ratings in ceilings.

2. THERMAL EFFICIENCY. THERMAFIBER Insulation is used by leading curtain wall manufacturers in such buildings as the 109-story Sears Tower in Chicago, Diamond Shamrock in Cleveland, Detroit Edison, and 154 Wisconsin Center, Milwaukee.

3. FIRE RESISTANCE. THERMAFIBER offers a 50% greater safety factor than glass fiber insulation which melts and loses flame resistance at about two-thirds the temperature required for THERMAFIBER. (See recent fire test results at left.) THERMAFIBER Insulation won't burn, disintegrate or support combustion under fire conditions as defined in ASTM E-119. Now THERMAFIBER can be used as safing (fire-stop) in all urban high rise construction markets where fire resistance is critical.

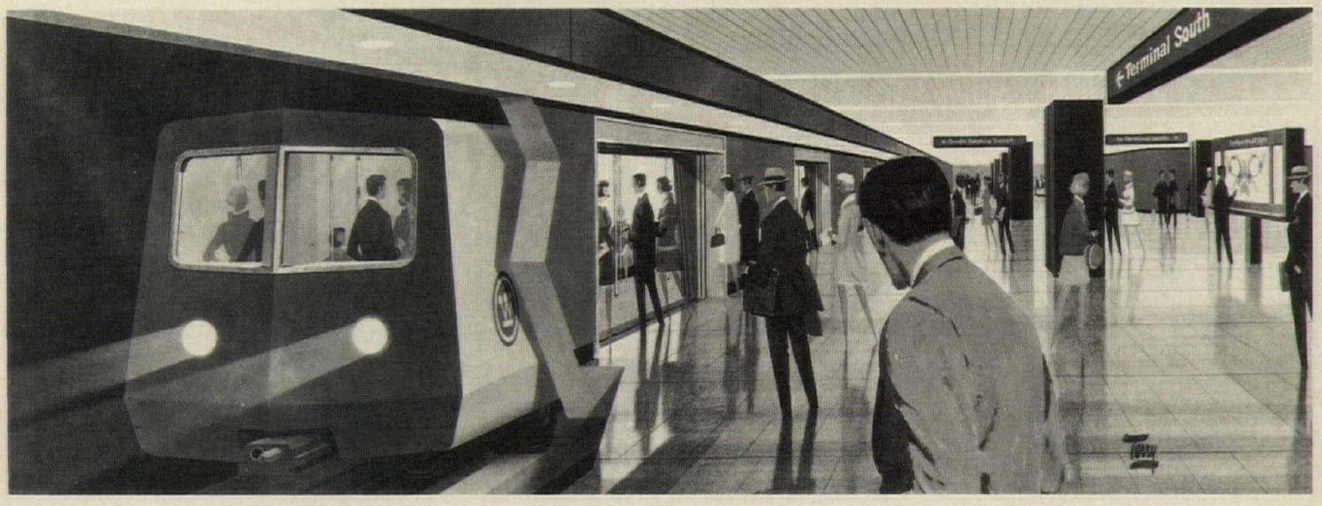
Specify THERMAFIBER Products with *all* the features you need in commercial as well as residential assemblies. See your U.S.G. representative. Or write to us at 101 S. Wacker Dr., Chicago, Ill. 60606, Dept. PA-122.

UNITED STATES GYPSUM
BUILDING AMERICA

Annual index continued from page 110

Mayumi Miyawaki, Architect & Associates: The Blue Box house (Hayasaki house) Tokyo (May)
Minsos Vaitkunas Jamieson: library addition, University of Alberta, Canada (Sept.)
Charles W. Moore Associates: Church Street South housing, New Haven, Conn. (May)
Herbert S. Newman: Dixwell Community House/Neighborhood Facilities Building, Dixwell Ave., New Haven, Conn. (Apr.)
The Nolen & Swinburne Partnership: Hall of Science, Moravian College, Bethlehem, Pa. (June)
The Number Ten Architectural Group, Associates: Winnipeg Art Gallery, Canada (Sept.)
Ralph Rapson & Associates, Inc.: Performing Arts Center, University of Calif., Santa Cruz (Oct.); P/A First Design Award: Humanities Building for the University of Minnesota, Morris, Minn. (Jan.)
Richard & Berretti: Central Academic Building, University of Alberta, Edmonton (Sept.)
Richard and Su Rogers: Rogers house, Wimbledon, England (May)
Martha L. Rothman, Elliot Paul Rothman and inmates of Billerica House of Correction, Middlesex County, Mass.: P/A Design Citation (Jan.)
San Francisco Urban Design Staff, Dept. of City Planning: Urban Design Plan for San Francisco (Jan.)
Louis Sauer Associates: Harmony House and Canterbury Gardens housing projects, New Haven, Conn. (May)
Schatz Associates: Music Hall, Cincinnati (Nov.)
Frank Schlesinger: Genesee Crossroads Plaza, Rochester, N.Y. (Mar.); P/A Design Citation: tubular steel residence, Norristown, Pa. (Jan.)
Schofield & Colgan: Wilton Senior High School, Wilton, Conn. (Feb.)
Smith & Gardner: Burroughs Corp., Detroit (Nov.)
Rolf Stumpf & Helmut Coulon: Olympic Bicycle Stadium, tennis courts (Aug.)
Sullam, Smith & Associates: Captain Stephen E. Sanislo Elementary School, Seattle, Wash. (Feb.)
William Tapley: Superpainting (May)
Benjamin Thompson & Associates: St. Paul Academy and Summit School Upper School, St. Paul, Minn. (Mar.)
Uniplan: East Orange (N.J.) Middle School, (Feb.)
Max O. Urbahn Associates: Lincoln Medical & Mental Health Center, Bronx, N.Y. (July)
Kenneth Walker: Robert Lewis Showroom, New York City (Nov.)
Walter Hall & Associates: P/A Design Award: Alternate North Cascades Complex, Ross Lake, Wash. (Jan.)
Weiner Gran Associates: P/A Design Citation: Field House, Brandeis University, Waltham, Mass. (Jan.)
Whitley-Whitley: P/A Design Award: JFK Recreational Center, Cleveland, Ohio (Jan.)
Clifford Wiens: St. Mark's Shop, Lumsden, Sask. and the central heating and cooling plant, University of Saskatchewan, Regina (Sept.)
R.L. Wilkin: Students' Union Housing, University of Alberta, Edmonton (Sept.)
Williams/Trebilcock/Whitehead: Old North Side Post Office Museum: Pittsburgh (Nov.)
Wolff Zimmer Gunsul Frasca Ritter: The expandable hospital (Oct.)
Works (East): P/A Design Citation: An Early Learning Facility, Brooklyn, N.Y. (Jan.)
Works (West): P/A First Design Award: 00:00 A Mobile Theater (Jan.)

Graphics courtesy of The Richardson Associates, Architects — Engineers — Planners.



IN THE SEATTLE-TACOMA INTERNATIONAL AIRPORT

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NO DUST, NO WATER, NO MESS! No less than 44 separate filters keep terrazzo dust out of the atmosphere. And because no water is used, there's no pacherino to haul, no damage to other materials, no dams to be built. Grindings are deposited in the portable 55-gallon drum for later disposal.

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Job mart

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Architect: Seeking experienced, imaginative, registered architect capable of leadership in all phases educational and institutional projects. Must be willing to grow with small Bucks County architectural and construction management firm. Create your own future. Salary commensurate with qualifications and experience. Send detailed resume to: P. O. Box 811, Doylestown, Pa. 18901.

Architect: Architect wanted. Salary open. Architect with minimum of five years experience and excellent design ability to be project architect in firm of 20 employees: Contact: Little & Associates, 4000 Park Road, Charlotte, N. C. Tel: 525-6350.

Architect: Architect with top design ability and confidence that he can develop clientele and demonstrate same to head architectural section and provide architectural expertise for team projects of Iowa based multidisciplinary firm. Reply to Box #1361-445, *Progressive Architecture.*

Architect/designer: Potential ownership position available for architect/designer, with 5-10 years experience, as Design Coordinator for aggresive, midwest, 25 man design oriented office. Responsibility to include client liaison and design leadership to project designers. Respond with resume to: Robert J. Schaefer, Schaefer, Schirmer & Associates, P. A., 200 South Hillside, Wichita, Kansas 67211. An equal opportunity employer.

Architect or senior architectural draftsmen: Degree helpful but not necessary. Young expanding firm; residential, multi family dwellings, medical and commercial. Please send resume and drawings to: Gary Guy Wilson, A.I.A., 4055 South Spencer, Suite 128, Las Vegas, Nevada 89109. Telephone 702-732-2477.

Architects: Outstanding opportunity for the project architects who have 5 years plus experience with medical, educational and commercial projects. This experience should include all phases of project programming, design development, construction document preparation and substantial client contact. You will be exposed to a variety of projects in an established firm with a team of highly capable professionals. Your benefit program will include: life, hospitalization and disability insurances, profit sharing, retirement program, regular salary reviews, merit bonuses and a four day work week. Please send a resume of your professional experience to: Cliff Schroeder, Ellerbe, Architects/Engineers/Planners, 333 Sibley Street, St. Paul, Minn. 55101. An equal opportunity employer.

Architects, architectural designers & draftsmen: Rapidly growing design-construct firm performing work throughout the Southeastern U. S. seeks experienced designers and draftsmen. Projects include manufacturing plants, warehouses, shopping centers, high-rise office and apartment buildings. Salary will be more than competitive with comprehensive benefits and outstanding growth prospects for energetic individuals. Reply to: David E. Clarke, Vice President, Preston H. Haskell Company, 1061 Riverside Avenue, Jacksonville, Florida 32204.

Architectural artists: Full or part time illustrators and model builders are needed at anyone of our 6 studios, located throughout the nation. $30,000 potential. Our organization has nine service departments—Rendering Service A, Budget Rendering Service B, Presentation Service C, Detail Model Service A, Budget Graphic Model Service B, Photocopy Service A, Photo Display Service B, Promational Service A, and Advertising Product Service B. Send approximately seven 8x10 color and/or black and white prints of your samples. Prompt return of photographs with details. Write our home office sales manager. Nationwide Architectural Arts, Inc., P. O. Box 217, Belleville, Mich. 48111.

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Architectural photography: Architects are artists and rely heavily on photography to convey their ideas to prospective clients. Architectural photography shows not only how the entire building looks, but the details of its construction, the materials, and the way various design elements relate to and enhance its function. Our practice and direction in Architectural Photography is sensitive to the message the architect wishes to communicate. May we be of service? Bob Geller/Visual Communications, P. O. Box 56384, Atlanta, Georgia 30343, Phone: 404/875-0594.

Manufacturers reps: Manufacturers reps wanted by long established aluminum metal pan acoustical ceiling tile manufacturer with new and proven items to merchandise. Looking for agents who call on architects for our "Spec" items; and general contractors, acoustical contractors, lumber yards, building supply houses, etc. for our "Direct Sale" items. Many territories open. Commission basis. Flexible agency policy. No stock to carry. Write to Simplex Ceiling Corp., 663 Fifth Avenue, New York, N. Y. 10022.

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Senior architectural draftsman-designer: Central Florida location. Must be experienced for permanent position in expanding architectural office. Hospitalization, profit-sharing plan. Please send samples of work, salary requirements and resume to: Alan Berman/Architect, Inc., 723 East Colonial Drive, Orlando, Florida 32803.

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Urban designer: Urban design and planning firm seeks recently graduated architect/planner. Applicant should have at least a year's experience and be capable of taking on project responsibilities. Salary commensurate with ability. Equal opportunity employer. Send resume and salary requirements [continued on page 116]

Why steel joists were the right answer to this building need

STEEL JOISTS PRESCRIBED FOR HOSPITAL CONSTRUCTION SPEED AND ECONOMY

Modern design, functional efficiency, building speed and economy were all blended in the planning and construction of Warminster General Hospital in Warminster, Pa.

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Job mart continued from page 114

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Architect: AIA, owner of 18 year old successful practice in midwest, desires an affiliation with architectural firm, developer, etc. in South or Southeast. Intends to keep present interest and will invest. Reply to Box #1361-458, *Progressive Architecture.*

Architect: AIA, registered New York, Massachusetts, Maryland, NCARB. Twelve years professional experience in all phases of contemporary practice including principal in own firm and management position with modular building systems producer. Desire responsible position with organization attempting to provide for the critical needs of our society. Reply to Box #1361-452, *Progressive Architecture.*

Architect: American architect (31) currently proj. mgr. in Belgium for important int'l project with Danish firm, multilingual with good knowledge of European architectural practice, seeks contact U. S. firm with job in Europe or plans for European expansion. Reply to Box #1361-462, *Progressive Architecture.*

Architect: American architect seeking responsible position with architectural/design/development firm with overseas office or requiring professional liaison in western Europe. Two years in Switzerland, currently with German architect. 20 years experience all phases design, construction, management including 12 years private practice. Available immediately, free to travel. Reply to Box #1361-457, *Progressive Architecture.*

Architect: American architect registered in Italy practising in Florence wishes contact with American architects and/or developers interested in possibilities outside USA. Reply to Box #1361-448, *Progressive Architecture.*

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Architect: NCARB, top officer A.I.A. local & state. Own practice 10 years has developed excellent capability to handle/direct any or all phases, on or off the board. Recognized leadership and design, but stifled by size and growth of area. Willing to relocate anywhere, but no large cities. Reply to Box #1361-450, *Progressive Architecture.*

Architect: NCARB certificate, Wisconsin registration. Experienced in industrial, commercial and institutional projects from client contact to field supervision. Seeking challenging responsible position leading to association/partnership with progressive firm. All relocations considered. Resume available. Reply to Box# 1361-454, *Progressive Architecture.*

Architect: Registered, M. Arch., B. Arch., AIA, 12 years extensive executive experience with international and national firms in new business, client contact, program development, and field and working drawings supervision. Special emphasis in design. Project experience includes medical, college, secondary and elementary schools, commercial, private and federal housing, religious, museum, planning, interiors, and residential. National, state, and local design awards. Pres-
[continued on page 118]

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Job mart continued from page 116

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Architect: NCARB, AIA, age 35, with 14 years experience in design and project management seeks highly responsible position with partnership possibilities with moderate or small firm requiring competent design orientation. Corporate, educational, housing and diversified experience. Northeast to midwest area preferred, others considered. Reply to Box #1361-460, *Progressive Architecture.*

Architect/designer: NCARB, Illinois registration. 14 years diverse experience with educational & institutional building. Organizational ability & initiative. Capable of rational design, experienced in directing a team toward this end. Would like to establish an enduring partnership, prefer medium to large diversified firm committed to contemporary design. Reply to Box #1361-459, *Progressive Architecture.*

Architect/designer: 35, Minnesota graduate, B. A. and B. Arch. registered, NCARB, twelve years of comprehensive experience. Ability to handle all phases of architectural work with emphasis on design. Desire responsible position with design-oriented firm. Resume on request. Reply to Box#1361-449, *Progressive Architecture.*

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Registered architect: NCARB certificate age 35, desires to relocate to Ohio/Pennsylvania area. Seeking responsible position with medium to small size design oriented firm. Diversified work experience with quality firms in all phases of practice. Reply to Box #1361-456, *Progressive Architecture.*

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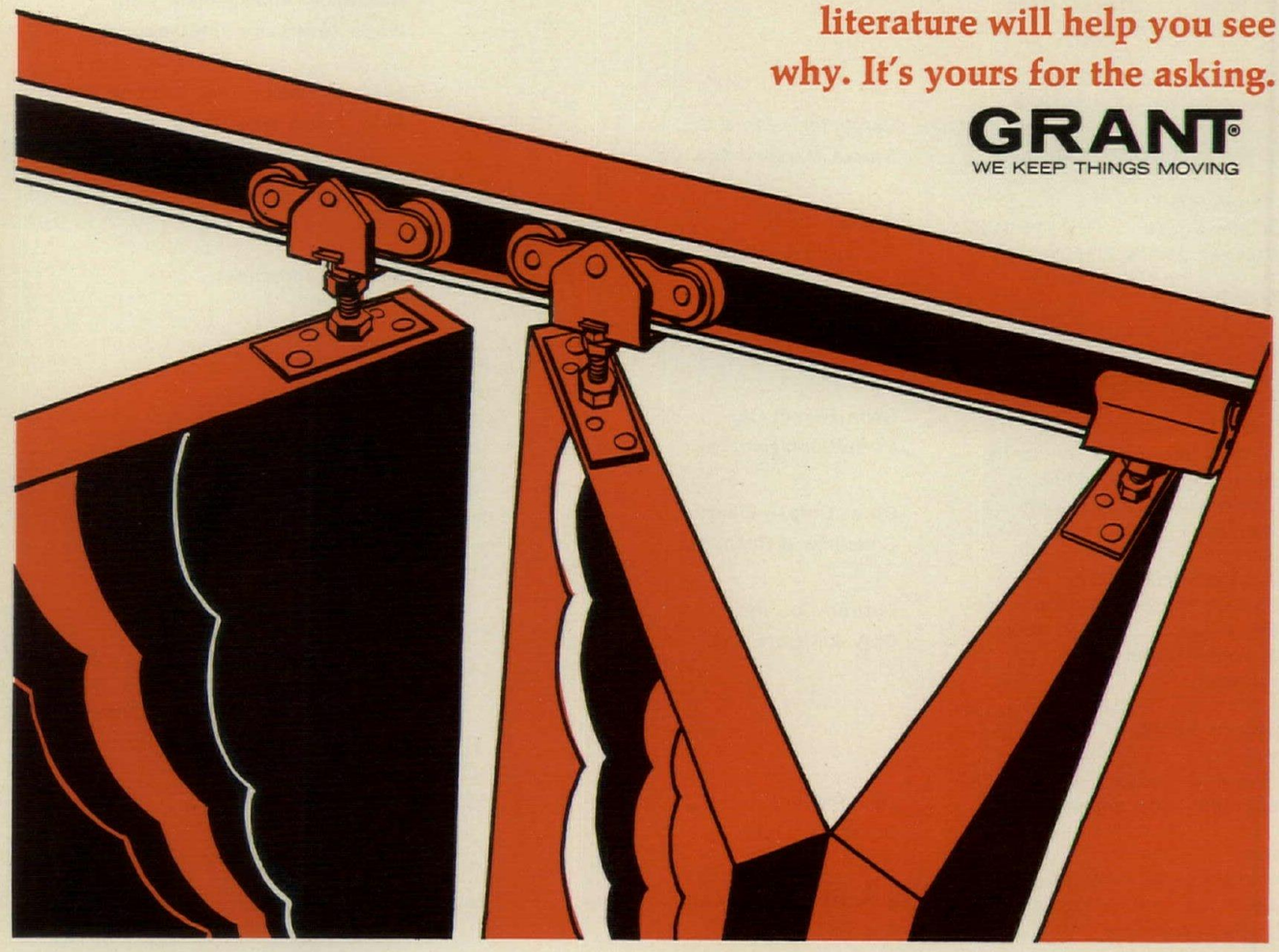

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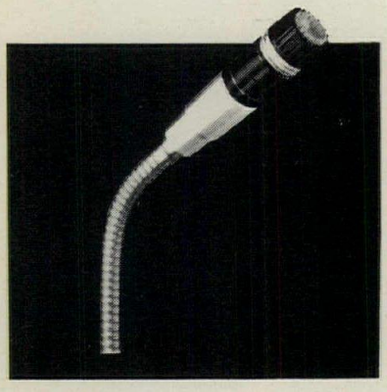
Con-Con to Congress



Nowadays, history isn't written, it's spoken . . . and verbal clarity is essential wherever people meet to discuss the issues of the day. From coast to coast, from town halls to the halls of Congress, you'll find Shure microphones in the really critical, prestigious sound reinforcement installations. Case in point: when the Illinois Constitutional Convention ("Con-Con"—see photo above) met to create the first new state constitution since 1870, a total of 65 Shure Unidyne III microphones were at hand to assure a clear, intelligible voice for each delegate. The Unidyne III was right for Con-Con, and there's a Shure problem-solving microphone right for every installation.

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