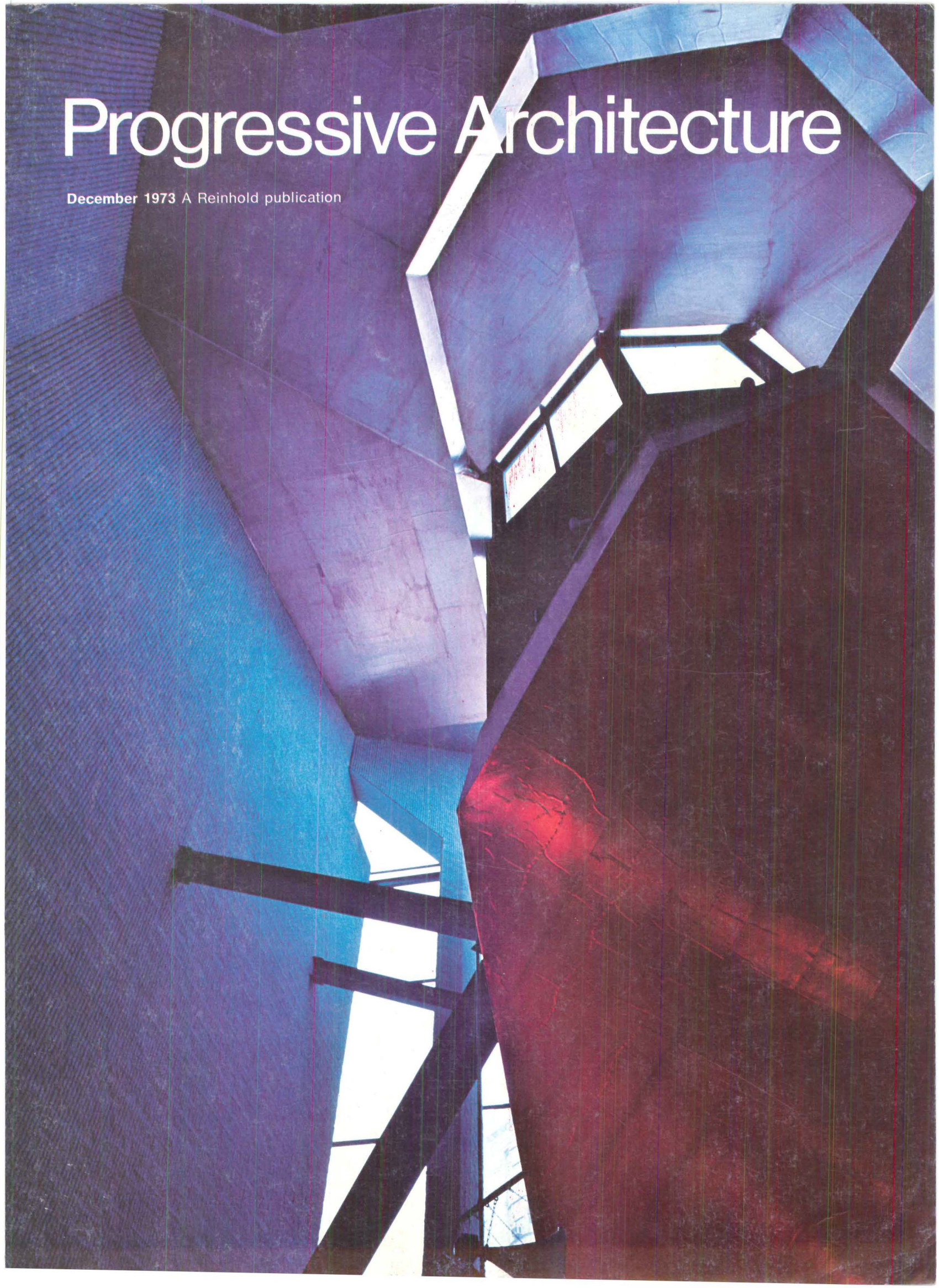
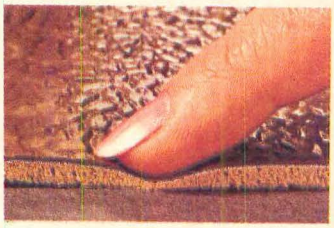
Progressive Architecture

December 1973 A Reinhold publication



You know how important a floor is. The right one complements design and adds to the total look of a room.

Grand Central, Armstrong's newest design in Quiet Zone Vinyl Corlon®, is that kind of floor for commercial interiors—a floor with style, durability, and quiet comfort.



What makes Quiet Zone quiet is an exclusive backing of foam vinyl called Cushioncord® that helps muffle noises—the kinds of noises that can create a din in an office. And it's as gentle on your feet as on your ears. You see, the name Cushioncord tells the story because it literally cushions pressure (see insert), making standing and walking a pleasure.

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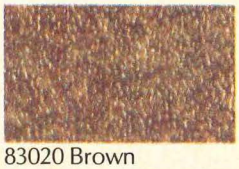
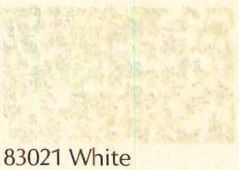
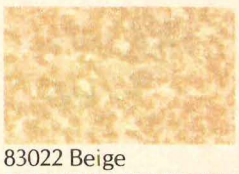
For more information, just write to Armstrong, 308 Watson Street, Lancaster, Pennsylvania 17604.

Shh. Quiet Zone™ at work, looking good.

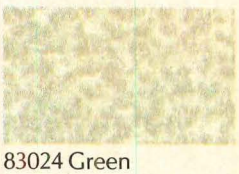
Quiet Zone™ VINYL CORLON®

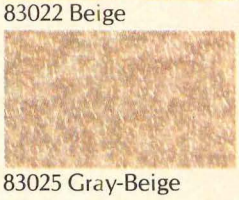

83020 Brown


83021 White


83022 Beige


83023 Gold


83024 Green


83025 Gray-Beige

The Quiet Zone pattern illustrated here is called Grand Central. It comes in a choice of these six colors to complement your color scheme.

FROM THE INDOOR WORLD® OF

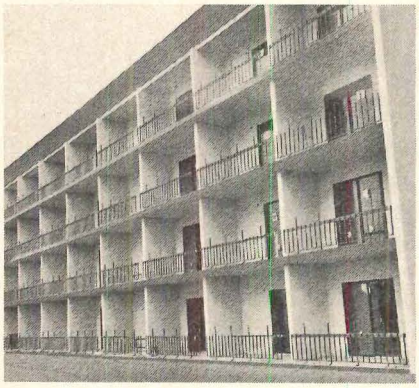
Armstrong

Circle No. 323, on Reader Service Card

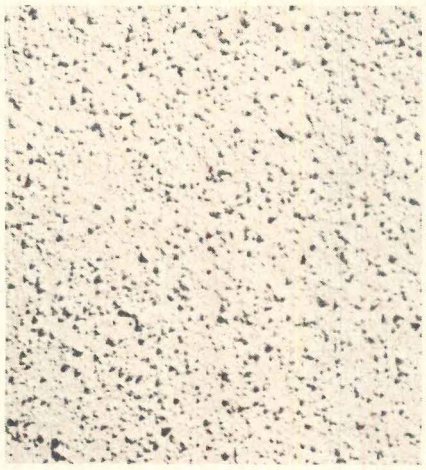
"GLID-TEX® gave us a stucco-like finish, inside and outside, and cost us one-fifth as much."

PAUL McDONOUGH, Construction Manager, Scotsland Complex, Milwaukee

"Our architects specified interior and exterior stucco texture throughout the entire complex to enhance the casual atmosphere Investors Real Estate Corporation sought to achieve," says McDonough.



"We compared costs of conventional stucco and chose to do it all with Glidden GLID-TEX, the spray-on stucco-like finish that's really like stucco.



"One coat of water reducible GLID-TEX gave our plywood and masonry substrates a beautiful, all-weather texture finish with a thick, flexible film that covers minor cracks, pinholes, and surface imperfections.

"There's a lot of square feet to texture in a complex as big as Scotsland, and GLID-TEX saved us thousands of dollars."

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Scotsland, on Milwaukee's northern perimeter, is a new world of residential living blended with its own shopping mall and exciting recreational facilities: indoor and outdoor tennis courts, plus an on-premise ski slope—complete with Lodge and man-made "mountain."

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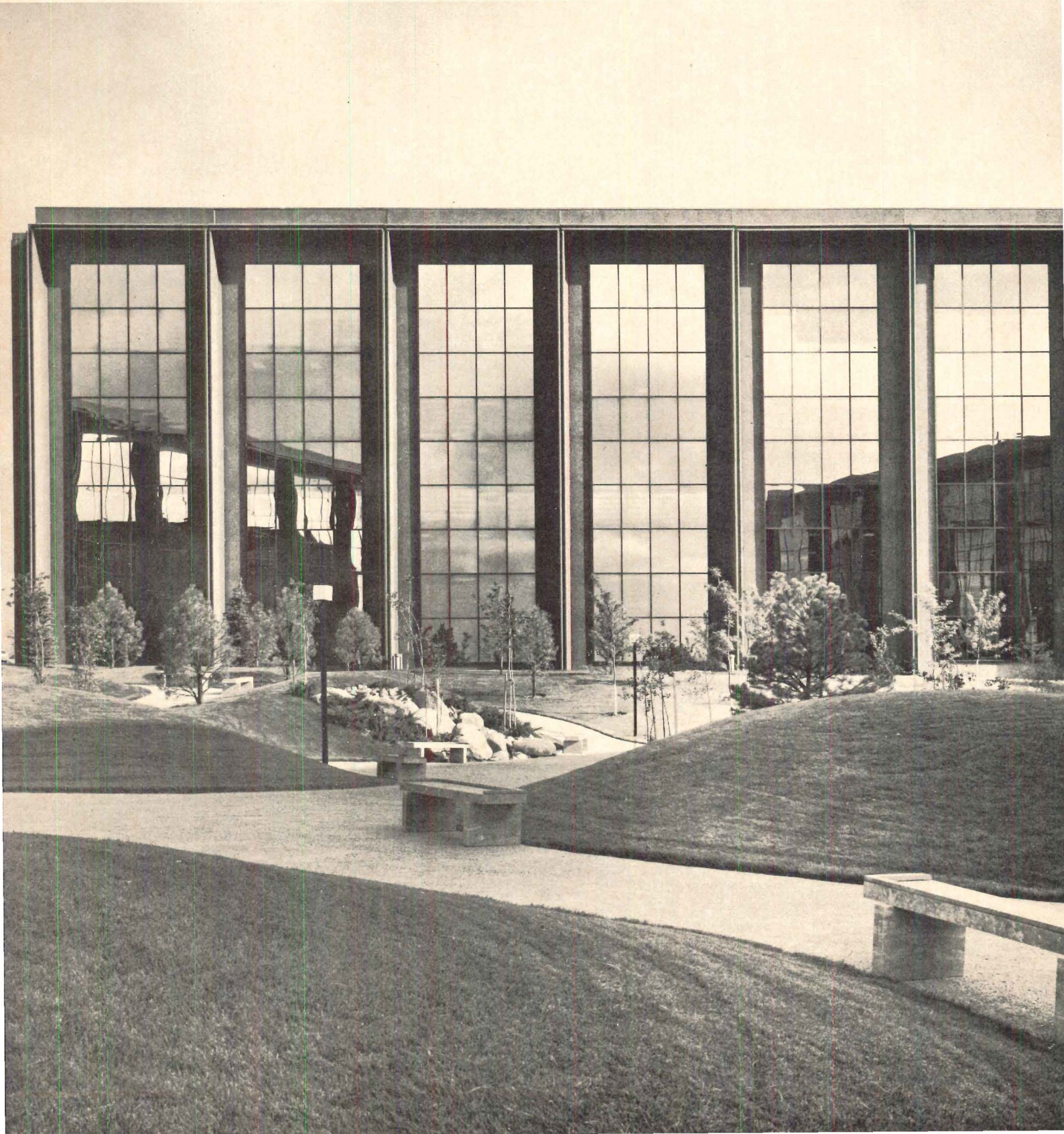
December 1973

Progressive Architecture

Cover: The First and Second Church in Boston (p.44) by Paul Rudolph. Photo: John Veltri.

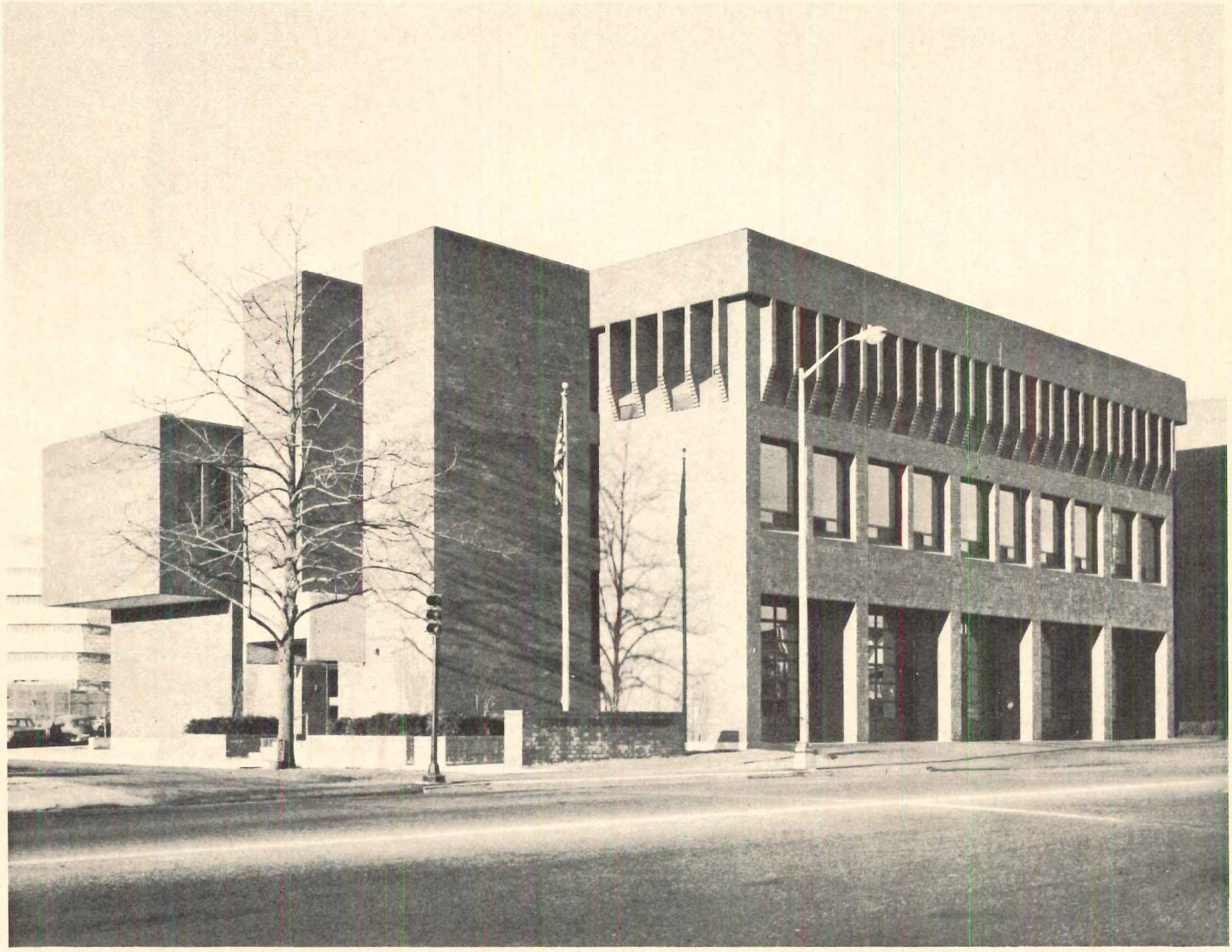
AN OFFICE PARK NEAR DENVER

GREENWOOD PLAZA, Englewood, Colo.—This is one of three main buildings of similar design that set the esthetic level of this campus-like office park. The 134-acre site also includes four other buildings completed three more under construction for a diversity of tenants. Dover Elevators are used exclusively. DEVELOPER: The John Madden Company, Denver. ARCHITECTS: Kirkham-Michael & Associates, Omaha. Elevators and dumbwaiters installed by Dover Elevator Company, Denver.



A FIRE HEADQUARTERS IN STAMFORD

CENTRAL FIRE HEADQUARTERS, Stamford, Conn.—The feeling of stability appropriate to an essential public service is strongly stated in the design of this building. Serving as a combination headquarters and fire station, it is an exciting architectural addition to downtown Stamford. Administrative offices are served by an economical Dover pre-engineered elevator. OWNER: City of Stamford. ARCHITECTS: Weinreich & Masciarelli, Stamford. GENERAL CONTRACTOR: A. F. Conte & Co., Inc. Dover Elevator installed by Eastern Elevator Co., New Haven, Conn.



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Views

Parkitecture pro and con

It appears from your October 1973 issue that you are purposefully working at a concept of exclusion of landscape architects from the design professions.

It is incredible to believe and impossible to understand how you could have possibly excluded the mention of landscape architects in dealing with a subject in which their contributions have been both substantial and noteworthy. Yet, you do so.

You give credit to Frederick Law Olmsted as a "landscape designer" when he, in fact, was and continues to be referred to as a landscape architect. You deprecate a profession which has established a continuum in the field of park design that indeed outdistances that of architects. And outdistances it rather handily, I might add.

Is it not the responsibility of professional magazines such as yours to demonstrate the contributions of all professionals, particularly on a topic in which so many diverse talents are frequently involved? I for one am tired of being told that architects and/or engineers are the leaders in the creative environmental process. If there was less time given to ego-tripping and rampant verbalizing and more to a team approach, we would all be far better for it.

Your articles on parks certainly do not suggest such a team approach. They are very architect-oriented.

Get it together!

Ted Baker, ASLA
Coral Gables, Fla.

[*One of our main purposes was to call attention to expanding participation of (and opportunities for) architects in park planning; "exclusion" of landscape architects was by no means our intent. It may have been demeaning to call Olmsted a "landscape designer" in "The Architect in the Park" but we corrected this in the third paragraph by giving him his proper title—before going on to concede that parks have customarily been the turf of the landscape architect. In the issue as a whole, and in particular in the coverage of National Park Service activities, we treated the landscape architect's role fully and stressed collaboration between the professions—as the letters below tend to confirm.—Ed.*]

I am often enlightened by your consistent efforts to reinforce among the design disciplines the role of collaboration. Your most recent issue highlighting "Parkitecture" is worth a comment.

As a youthful landscape architect who has had a long yet valuable education in sociology, architecture and landscape architecture (in that order), my route of travel indicates my greater understanding of people's needs and a profession that can play a larger role in helping to alleviate those needs. Although there have been shifts in project design over the years. I fear that the new celebrated fad will be park design.

If park design becomes the next blue chip project design, it cannot be the ego trip which typified earlier trips such as campus design, which received much national attention a couple of years ago. The beauty of being involved in landscape architecture is the innate awareness by those who are sensitive to design criteria that park design in the wilderness cannot be an ego trip centering around architecture on the landscape. What makes the natural environment bold and exciting is evolved over time and when tipped for the sake of new stage props will often result in a visual and ecological disaster.

The inference in your article entitled "Parkitecture" that L.A.'s are often specifying equal quantities of concrete and topsoil may very well be true. It is disappointing! It is equally alarming to hear about "file drawn" solutions to park design by some of our colleagues. In reference to the article, it is important to note that my limited length of time in the field has led me to find few people-oriented solutions by other disciplines showing a consistent interest between concrete and topsoil. Furthermore, file drawn design has often resulted in the sterile urban environs that have helped to create some of our most critical human problems in the cities.

The point is not to throw darts. If the purpose of our professional expertise is to create dialogue, designs and finished products for people, my suggestion is to get down to work with the realization that collaboration is a must. The recipients of the goods—people—will be the benefactors if the planning, engineering, landscape architectural and architectural disciplines will respond to the needs of the people. The leadership of such a collaboration should come from the situation and the critical design parameters of the program If landscape architects do not realize the importance of their role in such a team ar pursue it accordingly, often what are labeled people spaces will continue to be created with a sterile setting for architectural edifices.

William L. Burbank
Suffield, Conn.

The architectural press has always been responsive to avant-garde proposals and solutions for urban open spaces in New York and on the West Coast, but I was pleasantly surprised to see the comprehensive national scope of the "Parkitecture" feature in the October P/A. This burgeoning area of practice is worthy of recognition and, hopefully, ongoing coverage. The projects you described, while excellent, reveal only the tip of the iceber P/A Design Awards have lionized park de signers lately, as your readers know. The 5th Biennial HUD Awards for Design Exc lence is another barometer—over 25 percent of the awards went to parks, not to mention the parklike open spaces in the dozen housing projects so honored. You dissection of NPS was singularly appropr ate and timely—over half of current gradu ates in landscape architecture enter government service.

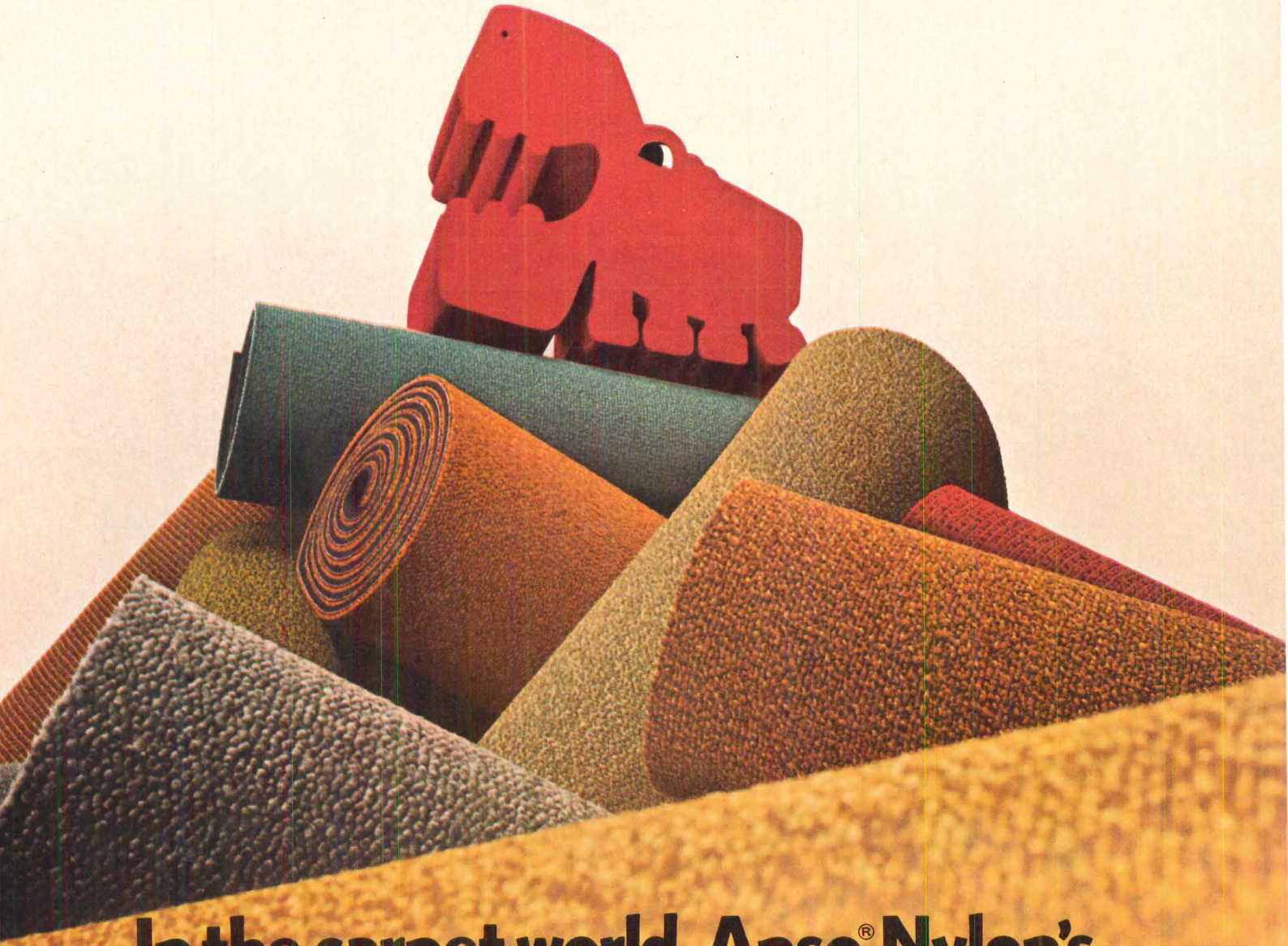
Under separate cover, I am forwarding copy of "Olmsted in Chicago" published by the Open Lands Project, a local advocacy group devoted to preservation and sensible development of open space in th region. I'm sure OLP board member Harr Weese would agree that you should enlarge your perspective on Olmsted's wor

It is gratifying to see your appreciation the role that landscape architects, both i house and as consultants to architects, have played in creating "Parkitecture." W all hope your awareness continues beyo the October issue.

David B. Linstrum, ASLA
Chicago

In the article entitled, "What General Gra didn't know," in your October 1973 issue you neglected to credit the designer of th mosaic section illustrated in your cover photo. This design, following the theme "Stars and Stripes," was executed unde the direction of Phillip I. Danzig, project artist, with the help and assistance of me bers of the Riverside community.

Pedro Silva, Project Director
General Grant's Memorial Plaza
Centennial Project
New York, N.Y.



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Two Shell Plaza, Houston, Texas/35,000 yds. "TXR-10"/Commercial Carpet Corp.

BERLIN STEEL WAS IN BUSINESS SEVENTY THREE YEARS BEFORE THEY SPECIFIED JOIST GIRDERS FOR THE FIRST TIME. ELEVEN DAYS LATER, THEY DID IT AGAIN.

Girders. The advantages they over I-beams were more than gh for Berlin Steel to specify n for the Sage-Allen Department e they were building in West ford, Connecticut. So much

oist girders have a simple span design. Which ns why ponding calculations are easier. And esign time is shortened.

e, that eleven days later they ified them again. Only this time National Plastics and Plating ply Co. in Plymouth, Connecticut. Where did Berlin Steel learn about e advantages? From meeting with craft. The people who knew as

oist girders need fewer foundations and ns. Which means less work for you and larger eas for your clients.

h about joist girders as Berlin about steel fabricating.
nd the first thing the Vulcraft neers did was show Berlin Steel why joist girders are easier to specify and erect. By explaining that the simple span design of joist girders make ponding calculations easy. And shorten design time.

By telling them about the larger bay areas possible with joist girders. And by talking about the fewer foundations and columns needed with joist girders than with I-beams.

Then came the subject of the advantages joist girders offer after they're erected.

And to explain that topic Vulcraft talked about the modified Warren truss configuration used in joist girders. And that it gave joist girders a high strength to weight ratio.

Joist girders have a modified Warren truss configuration using hot rolled double angle sections for top and bottom chords and single and double angle sections for web members. What that means is a high strength to weight ratio.

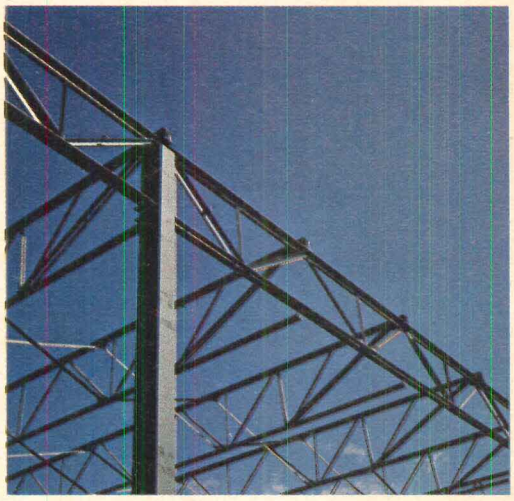
They mentioned further, that bar joist erection was faster. Because top chord panel points show joist location, eliminating a lot of measuring.

Finally, the matter of ducts, pipes and conduits came up. And Vulcraft explained how these things go right through a joist girder. Something no one can say about an I-beam.

What it all added up to for Berlin Steel was a change. A change from I-beams to another roof-framing system. A roof-framing system that was more economical and easier to erect for anything over 10,000 square feet.

Joist girders have top chord panel points that show joist location. Which makes a lot of measuring unnecessary.

It wasn't surprising to Vulcraft, though. Because architects and engineers all over the country are discovering the advantages joist girders have over I-beams.



Joist girders already have spaces for pipes, conduits, and ducts to run through. So you don't have to cut them yourself.

If you'd like more information about how joist girders can work for you, send for Vulcraft's Joist Girder Specification Guide. Just contact your local Vulcraft sales office. Or write P.O. Box 17656, Charlotte, N.C. 28211. Or call (704) 366-7000. You'll find a few things even Berlin Steel didn't know. Until they asked.

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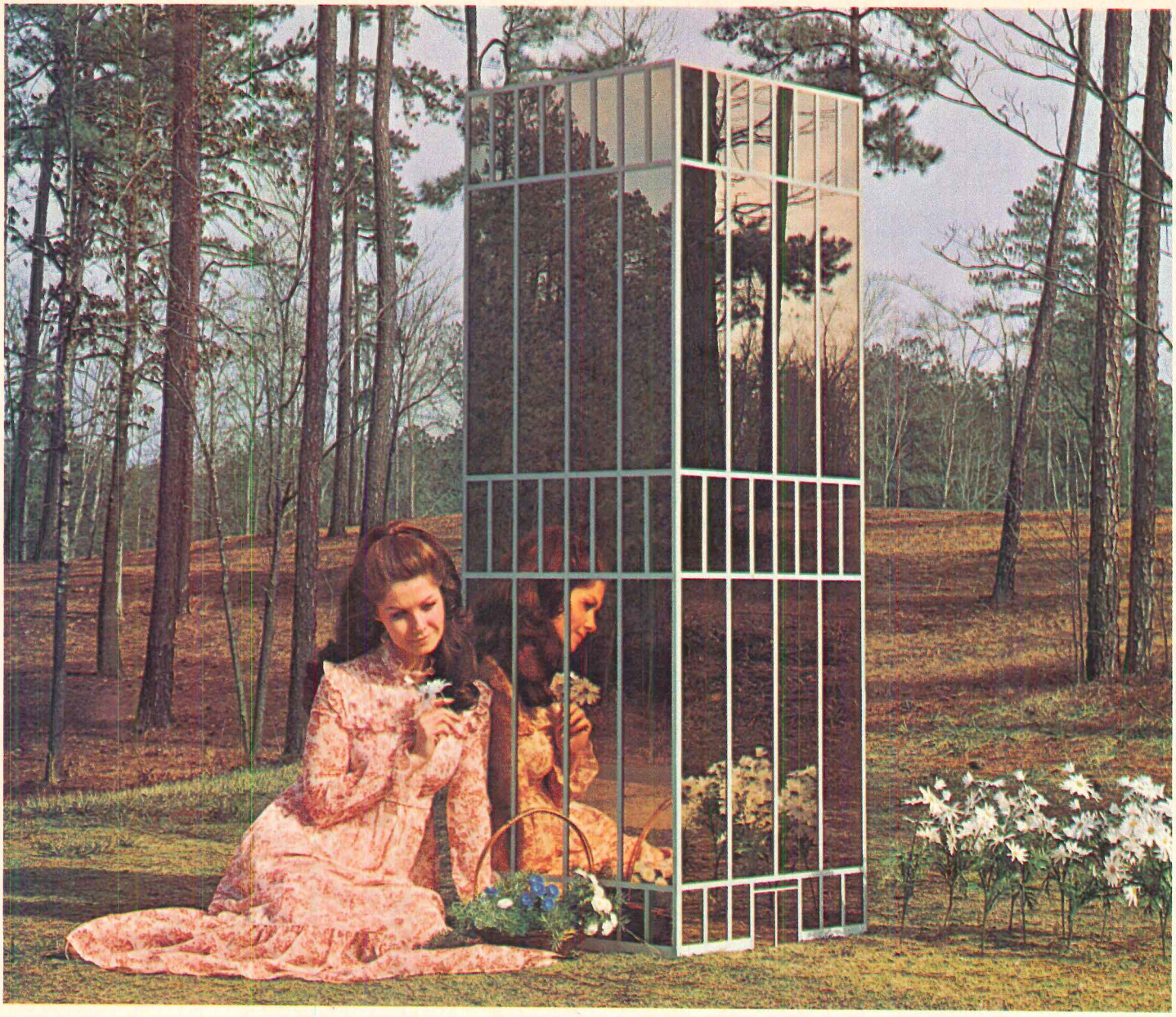
Allen Department Store, West Hartford, Connecticut; Architect: Associated Architects, Farmington, Connecticut / General Contractor: Bartlett-Brainard & t, Inc., Bloomfield, Connecticut / Consulting Engineer: Hallisey Engineering Associates, Inc., Hartford / Steel Fabricator: Berlin Steel Construction Com- Inc., Berlin, Connecticut. National Plastics and Plating Supply Co., Plymouth, Connecticut: Architect: Andrew C. Rossetti, Bristol, Connecticut / General ractor: S. Carpenter Construction Co., Bristol / Consulting Engineer: Hallisey Engineering Associates, Inc. / Steel Fabricator: Berlin Steel Construction Co., Inc.



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Open web steel joists were used as structural mem- ers throughout the building. "Using open web steel ists gave us highly desirable economy and speed of ection," the architects stated.

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Wood framing lets you retain design control with the newest building techniques

Architects for the Larwin Group, Inc., one of the country's largest residential builders, used the 24-inch framing system in three successful prototype homes. Now Larwin uses the system wherever possible: it lets architects retain the same design control they enjoy with conventional framing. And it saves money, too. As Larwin explains: "Cost savings on a 1,500 square foot single-family home are significant."

The three test homes in Cypress, California, convinced Larwin that 24-inch framing was "the way to go." Two hundred identical homes were then built in two successful developments. As a result, the firm now plans to use 24-inch wood framing and pre-cut Western Wood in much of its production this year.

Larwin investigated a variety of building materials and settled on one as the most economical and most attractive: pre-cut Western Wood. Larwin homes bear a distinctive "wood look" throughout, with large structural wood members left exposed for appearance.

Architects for Kaufman & Broad and other leading single-family homebuilders save money at the design stage by specifying 24-inch wood framing: 24-inch framing lets them retain maximum design flexibility while reducing materials and labor cost. In addition, wood is familiar to available labor everywhere assuring adherence to specifications and a finished product of quality construction and appearance.

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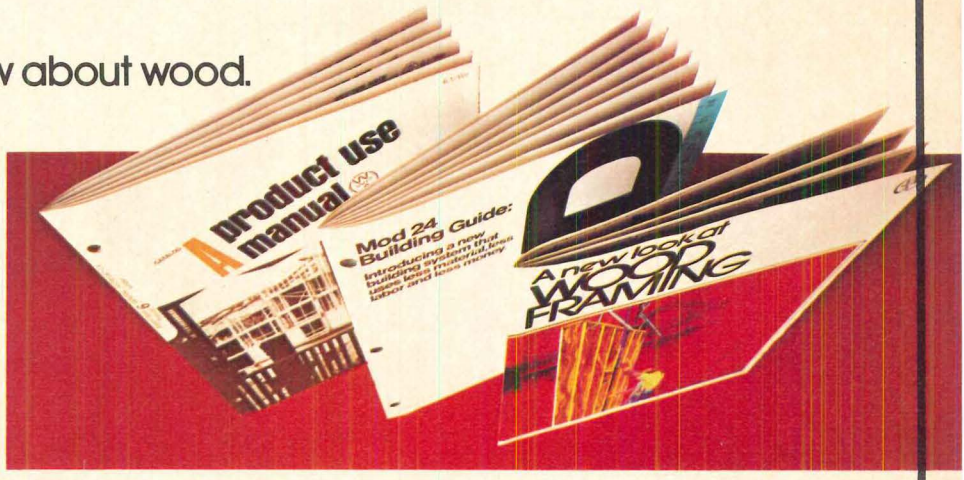
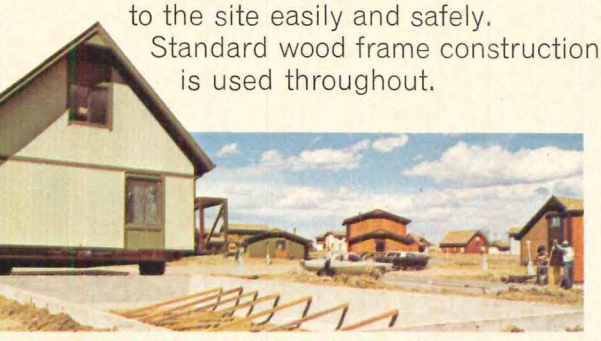


Imaginative design and Western Wood make it possible for Trend Homes in Colorado to build complete two-story homes in-plant. A specially engineered wood and plywood floor joist system allows the homes to be moved to the site easily and safely. Standard wood frame construction is used throughout.



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◀ Phipp's Plaza Theatre, Atlanta, Ga.
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Architects and Engineers:
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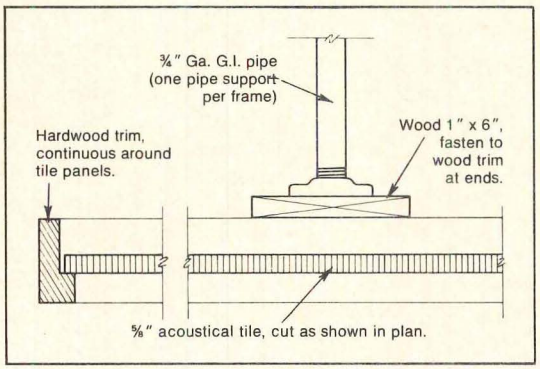
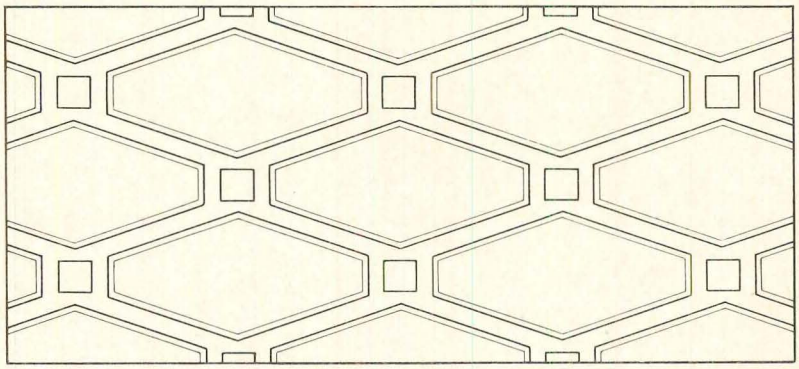


Section of lobby ceiling shows how ⅝" acoustical tiles, cut as shown in plan, were installed in continuous hardwood trim and supported by ¾" pipe.



Standard Gold Bond 2' x 4' acoustical Solitude Panels were custom cut on the job to create a distinctive mosaic for Phipp's Plaza Theatre in Atlanta.

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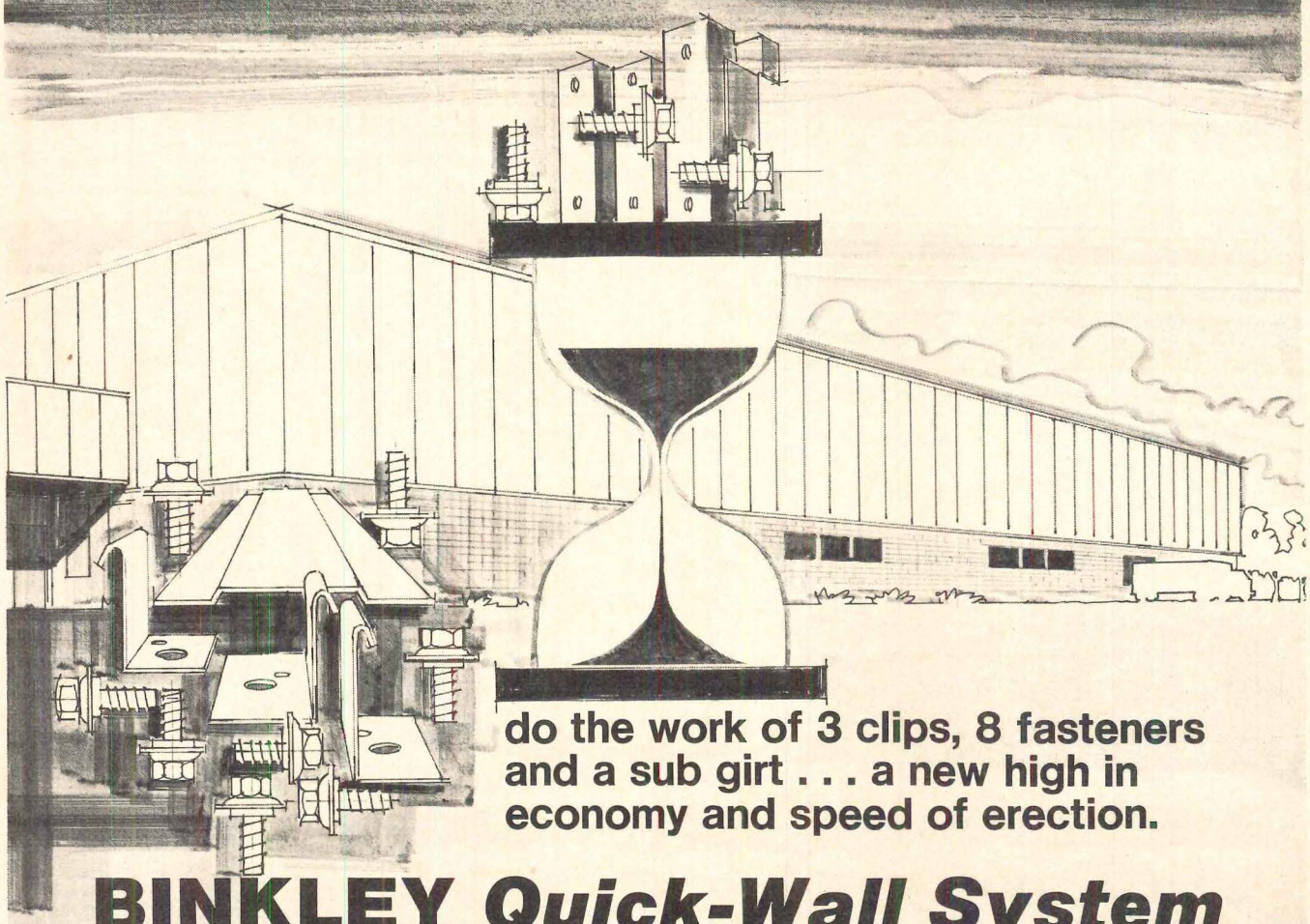

do the work of 3 clips, 8 fasteners and a sub girt . . . a new high in economy and speed of erection.

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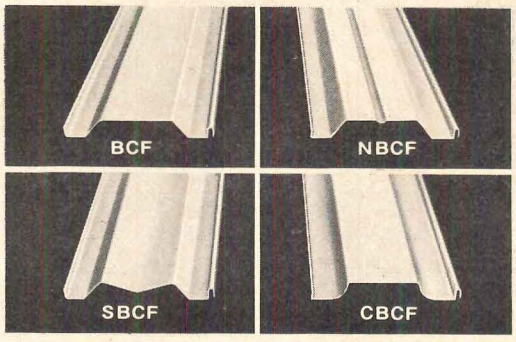

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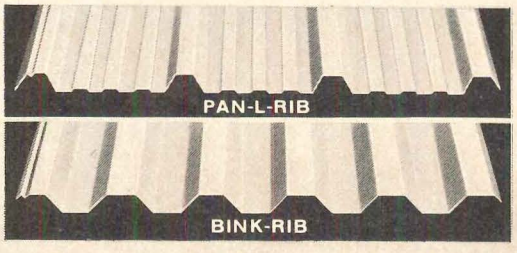

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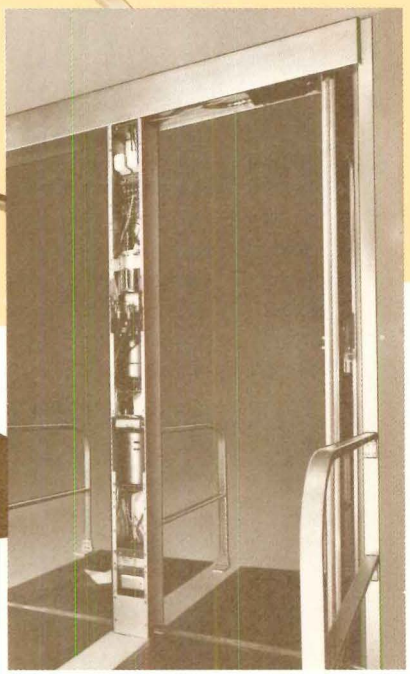
Exterior



Interior

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Illustration at right shows independent swinging door operation. Other models actuate simultaneous-swing doors and single or bi-parting Slide-N-Swing sliding doors by DOR-O-MATIC. Available in clear or Dor-Cote* DC-13 Dark Bronze. Other colors on special order. (Also available as HEAD-R-PAK for horizontal installation.)

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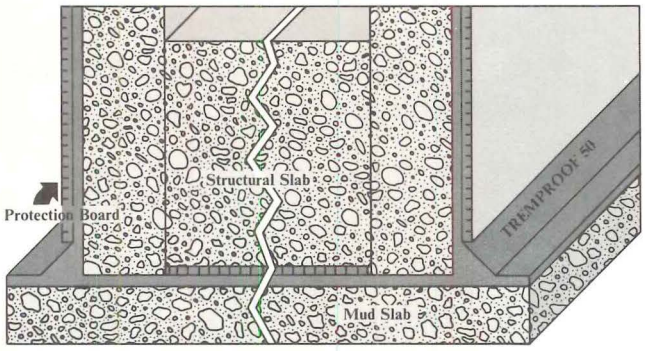
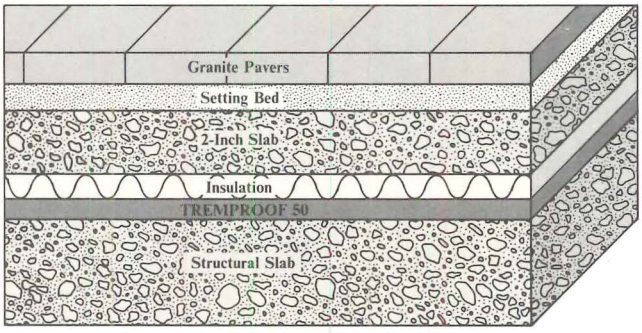
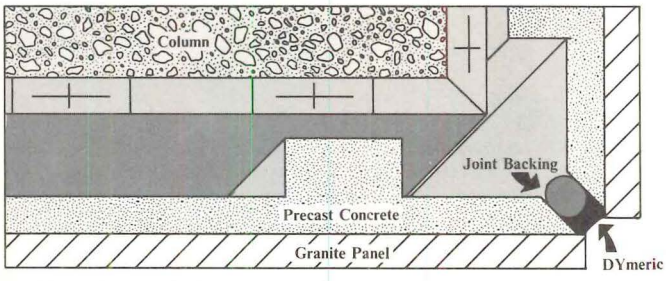
FROM 40 FEET BELOW GRADE TO 40 STORIES ABOVE, TREMCO KEEPS BALTIMORE'S NEW U.S.F.&G. BUILDING DRY.



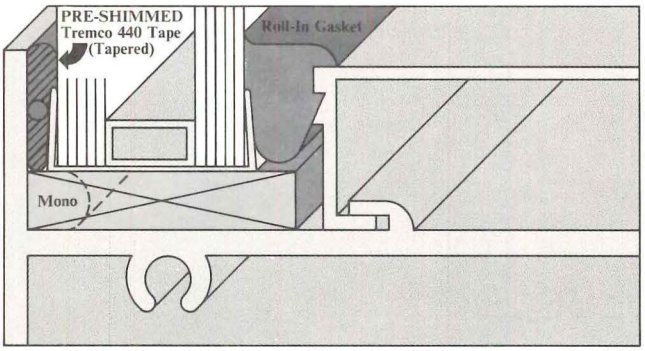
An entire city block was wrapped in a seamless blanket to keep out the saline water of the Chesapeake Bay. A 6-inch concrete working slab and 12-inch foundation walls sealed with a monolithic membrane of Tremproof 50 liquid polymer did the job. The result — no leakage problems whatsoever.



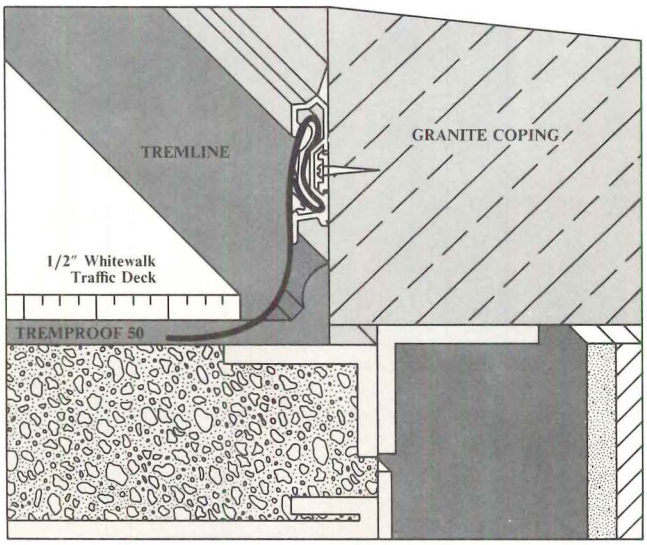
Dry plaza decks used granite pavers and Tremproof 50. There was no compromise between aesthetics and efficiency.



180,000 linear feet of precast concrete panel were caulked with Tremco polymer sealant DYmeric.



Ten miles of window glazing were done by the Tremco system. Not even the high winds off the harbor will prevent them from being watertight.



Parapet walls were no problem for the Tremline flashing system. The rest of the roof was made watertight with Tremproof 50 liquid polymer.

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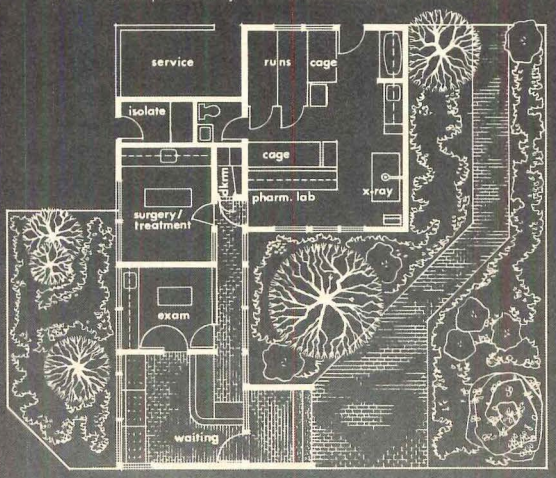

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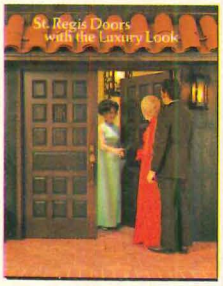

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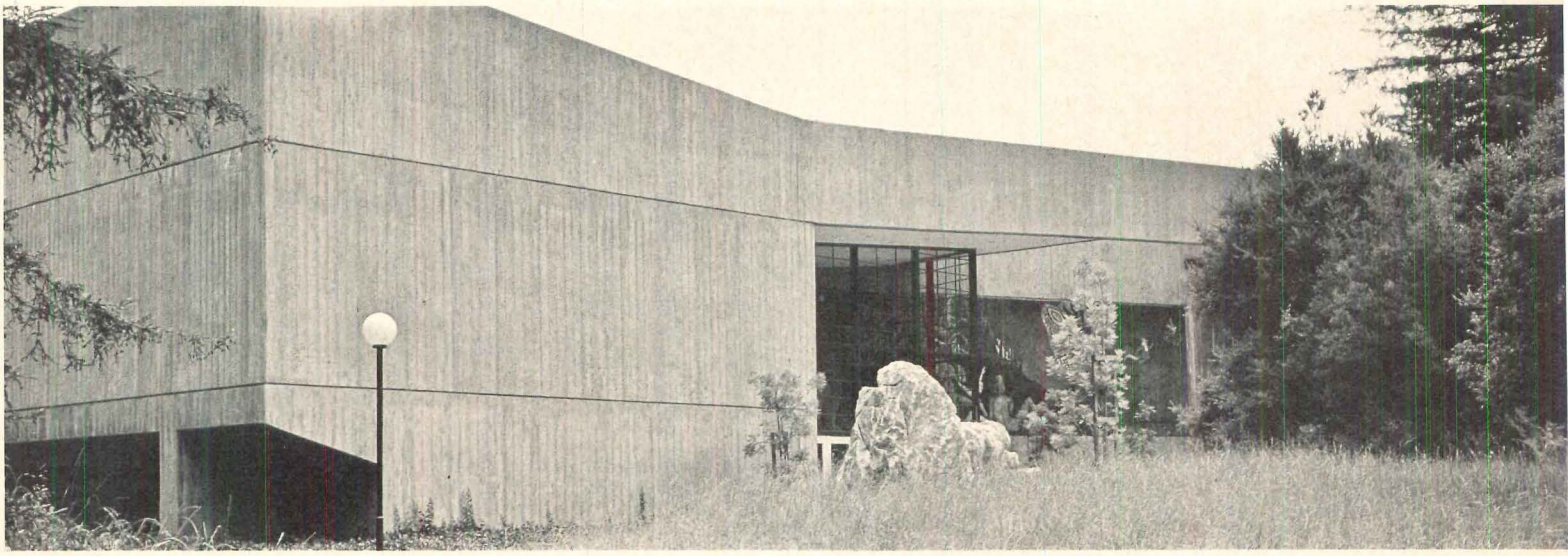
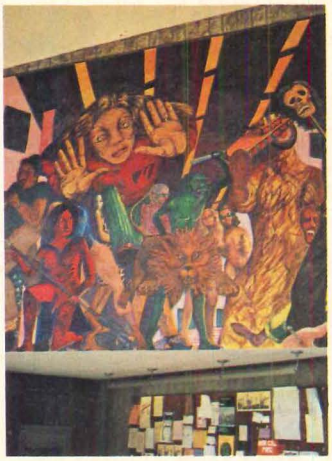
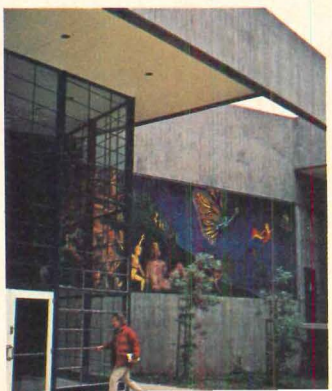
News report







Students paint on walls—for credit

When students at College Seven, one of the cluster colleges of the University of California at Santa Cruz decided to produce a mural for a new lecture hall, they wanted to paint the entire building. Conferences with the buildings' architects, Marquis & Stoller, led to a change of plan, resulting in a 12-ft-high, 60-ft-wide mural that starts in the lobby and continues along an outside wall.

The mural was actually a project done for credit by 18 students under the direction of assistant professor of art Eduardo Carrillo. It took them several months to design and execute the 720-sq-ft painting. Meaning may be in the eye of the beholder, but the painting starts at one end by showing groups of people in various states of agitation, according to the university, many of them frustrated by what might be seen as bureaucratic red tape. Even the colors of the school's registration form—green and pink—are given emphasis in one spot. As it moves past the lobby's glass wall and out of doors, the mural presents a mood of peace and calm.

[continued on page 30]

Celotex: ceilings tha

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Architectural office business growth will be moderate

Benz National Surveys

Viewed in its entirety in consideration of the general economic conditions as we entered the last quarter of 1973, there is substantial reason to expect architectural business in 1974 to remain at least relatively stable

In 1973, the nature of the work in architectural offices changed somewhat from '72 in the volume of business conducted for the various types of buildings designed. For example, the volume of business for community planning in 1973 dropped 3.6% from 1972 (table 1). For 1974, architectural offices expect this to increase by 10.5% (table 6). The volume of work for residential low-rise buildings increased during 1973 by 5.3%, and another increase of 2.3% is expected for 1974. Such changes, of course, reflect the interest among investors in what they see as profit potential. Changes also reflect availability of money, particularly as related to government work. Federal government work in 1973 showed little overall change from 1972. However, heavy increase is expected for this work in 1974. Work for state and local governments showed an overall increase in 1973, but is expected to decline appreciably in 1974. The total volume of architectural work for all types of buildings is expected to increase by 3.5% in 1974.

The types of work done by offices throughout the United States are generally comparable within the various geographic regions. There are differences, however, which are sometimes significant. In state and local educational buildings, for example, half of the offices in the East South Central region conducted this type of work, while only a quarter of the offices in New England did (table 6).

Another example is found in the number of offices doing private, single, residential work. A little over a quarter of the offices in the Mid-Atlantic region conducted this type of work,
[continued on page 26]

Note: For the purposes of this survey, all references to dollar volume are in measures of construction dollars. The survey, by Walter Benz of Benz National Surveys, was compiled on the basis of a selected mailing, yielding 1112 responses. After eliminating those that were inadequately filled out for computation, 921 were used for this forcast.

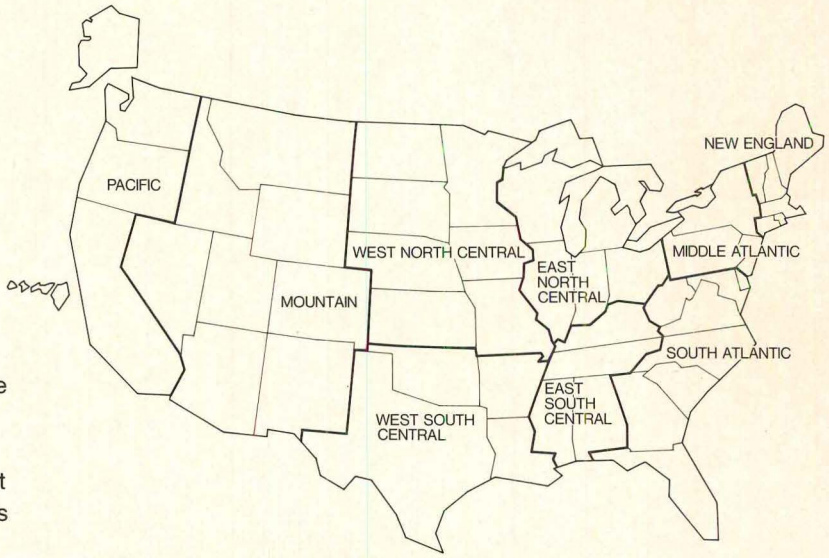

Table 1: Proportion of volume among all architectural offices in 1973, by building type

		Change from 1972	Offices doing this work	Average $ volume in these offices ($-thousands)
Commercial low-rise (1-3 st)	11.4%	+0.9%	66.9%	$ 2,044
Commercial high-rise (4 st, up)	6.8	−1.2	15.1	6,555
Industrial	6.3	+3.0	34.2	2,520
Community planning/design (non-government)	8.4	−3.6	11.5	11,076
Urban design/redevelopment (inc. public housing)	6.4	−10.6	13.8	3,587
Federal government				
Office and service	0.6	−0.3	4.4	8,056
Hospitals, health	1.2	+0.6	2.5	15,832
Defense/space	2.5	+2.1	3.6	13,491
Other (excl. housing)	0.8	−0.5	3.5	6,603
State and local government				
Office and service	1.3	−0.3	17.2	1,057
Educational	10.9	+2.6	29.0	4,145
Hospitals, health	4.8	+2.4	9.3	4,320
Other (excl. housing)	1.5	n.c.	13.4	2,479
Educational, private	2.0	+0.1	15.1	1,990
Hospitals, health (private)	5.6	−1.0	18.8	3,847
Residential, (éxcl. public housing)				
Private, single	3.7	+1.6	55.2	758
Low-rise (1-3 st)	14.6	+5.3	37.1	4,641
High-rise (4 st, up)	4.3	−1.7	10.2	6,296
Other buildings	6.8	+1.2	24.9	3,262

Table 2: Type of work by office size

	1-5		6-16		17-29		30-69		70, over	
	Offices doing this work	Average $-vol. in these offices ($-thous.)	Offices doing this work	Average $-vol. in these offices ($-thous.)	Offices doing this work	Average $-vol. in these offices ($-thous.)	Offices doing this work	Average $-vol. in these offices ($-thous.)	Offices doing this work	Average $-vol. in these offices ($-thous.)
Commercial low-rise (1-3 st)	66.2%	$1,173	12.3%	$ 3,549	53.3%	$ 5,067	68.2%	$ 5,020	57.1%	$ 3,025
Commercial high-rise (4 st, up)	9.2	3,171	24.8	5,810	28.9	7,592	40.9	6,856	42.9	41,767
Industrial	29.4	1,530	42.7	1,855	40.0	3,939	54.5	5,642	64.3	21,600
Community planning/design (non-government)	8.3	7,318	18.0	10,478	15.6	16,143	18.2	2,025	35.7	53,220
Urban design/redevelopment (inc. public housing)	10.1	2,970	21.4	3,523	24.4	6,464	22.7	5,260	14.3	3,800
Federal government										
Office and service	2.1	608	5.3	800	15.6	23,357	18.2	2,500	28.6	31,000
Hospitals, health	1.3	500	2.4	5,160	4.4	6,400	18.2	2,425	21.4	98,667
Defense/space	2.0	1,050	5.8	1,833	8.9	9,450	1.0	2,750	28.6	89,825
Other (excl. housing)	2.3	871	3.4	5,743	2.2	1,000	27.3	3,817	21.4	42,800
State and local government										
Office and service	13.7	645	21.8	1,249	24.4	2,164	40.9	2,278	42.9	1,467
Educational	22.3	1,810	41.3	4,996	42.2	8,047	59.1	10,408	50.0	16,614
Hospitals, health	6.6	1,375	11.7	2,200	20.0	22,422	18.2	1,000	42.9	7,500
Other (excl. housing)	12.2	859	13.6	2,793	17.8	5,988	27.3	8,200	28.6	14,650
Educational, private	12.0	655	19.9	2,100	24.4	7,209	22.7	1,660	35.7	9,440
Hospitals, health, private	16.0	957	21.4	4,118	37.8	15,347	27.3	13,700	28.6	7,300
Residential (excl. public housing)										
Private, single	63.7	580	43.7	1,307	31.1	2,264	4.5	200	14.3	200
Low-rise (1-3 st)	36.5	3,290	41.3	7,462	33.3	9,360	18.2	3,775	42.9	3,217
High-rise (4 st, up)	6.4	6,423	18.4	6,824	22.2	5,060	9.1	2,500	14.3	3,750
Other buildings	25.6	1,061	22.8	3,060	20.0	3,400	31.8	4,743	28.6	88,000

while nearly half of the New England offices did. Further comparing these latter two regions, we find nearly 20% of the New England offices doing residential high-rise work, while only 6.7% of offices in the Mid-Atlantic region did. Some other differences are due to the nature of conditions within geographic regions, as industrial work being generally conducted by offices in industrial areas of the United States.

There appears to have been a slight overall slow-up in the volume of business at the end of 1973. In a perfectly even flow of work, at the end of the third quarter of the year, 75% of the work would be on the boards, with 25% anticipated for the fourth quarter. At the three-quarter mark in 1971, 35% of the volume for the year was anticipated. In 1972, it was 24%. This year, without work anticipated from the federal government, it is 23%. This slow-up cannot be considered significant at this time, as it most likely is part of the general cooling off of what many economists saw as an overheated economy.

Table 1: Proportions in the total volume of business conducted by architectural offices during 1973 shifted in 18 out of 19 types of work. The proportion increased in 10 and decreased in 8. Greatest shifts were an increase of 5.3% in residential low-rise work and a decrease of 10.6% in urban design/redevelopment. The average volume of business per office, for all types of work, was $13.16 million.

Table 4: Some sharp changes have been reported in the average volume of work done in 1973, as compared with the two preceding years, by offices having 30 or more architectural professionals. The marked declines are reflected largely by work in community planning/design (nongovernment) and urban design/redevelopment (including public housing.) The volume of work in offices having less than 30 professionals held fairly stable. In offices having 70 or more professionals, for instance, the average volume of business in urban design/redevelopment (including public housing) dropped from $125.16 million in 1972 to $.54 million in 1973. Community planning/design (nongovernment), however, rose from $15.8 million in 1972 to $19.01 million in 1973 for the same office-size group. In offices with 30–69 professionals, sharp drops both in community planning and in urban design were felt. Community planning volume declined from $4.76 million in '72 to $.37 million in '73, while urban design showed a corresponding drop from $4.93 million to $1.2 million. The table shows averages among all offices in the various size classifications.

Of the volume of all work reported for the full year 1973, 24.9% is identified as work not yet on the boards, but which the offices are reasonably certain of getting during the last quarter of this year. This reflects anticipation of a generally even flow of work into the architectural offices. Exception to this is work for the federal government, and to lesser extent state government. From half to nearly two-thirds of work on federal government office/service buildings and hospitals/health buildings is expected during the fourth quarter of 1973. A negligible amount of other federal government building work is expected. During the third quarter of 1973, less than the average amount of work is anticipated for state and local hospitals/health buildings and miscellaneous buildings.

In consideration of the amount of work on the boards in the

working drawing/specification stage in relation to work in the preliminary stage and, further, considering the amount of work in the preliminary stage among offices of various sizes, architectural work is seen as continuing strong through 1973 and into 1974. Responses indicate that 35.3% of the offices with staffs of 1–5 professionals have over 50% of their work in preliminaries. Offices of other sizes with similar percentages in early stages are: 6–16 professionals, 35.4%; 17–29 professionals, 30.5%; 30–69 professionals, 13.5% and over 70 professionals, 42.9%.

While work classified as "other" covers a broad range of types, from heliports to mausoleums, 11.5% is represented by religious and recreational design. Both types of work are expected to increase during 1974. Of the 9.3% of offices that did religious work in 1973, expectations show a 9.4% increase in 1974. Also, responses from the 3.3% of offices doing recreational work anticipate a 23.6% increase in 1974.

Table 5: Nearly one out of every five (18.9%) of all architectural offices engage in complete design/construction business. In 10.5% of these offices, 100% of their design work is for this purpose.

Table 6: Architectural offices expect an overall increase of 3.5% in work in 1974. Marked decline, however, is seen in state/local government projects. Greatest optimism is for federal government office/service buildings, for which an increase of nearly 50% is expected. A 10% decline is expected in urban design/redevelopment, including public housing. In private housing, a decline is seen in single homes, but increases are expected in both low-rise and (to a lesser extent) high-rise buildings. About a third to a half of the offices expect no change in types of work done in 1974.

Table 3: Range in the volume of business among offices of different sizes

	Number of offices (By size according to the number of professionals)				
Dollar volume	1-5	6-16	17-29	30-69	70, OVER
Less than $3-million	55.3%	11.7%	2.2%	*	*
$3-6.9 million	25.9	24.9	6.7	13.6%	*
7-11.9 million	8.9	18.4	15.6	*	14.1%
12-19.9 million	4.8	17.0	20.0	36.4	*
$20-34.9 million	4.0	15.5	22.2	18.2	*
35-49.9 million	*	5.3	13.3	22.7	7.1
50-79.9 million	*	5.3	6.7	4.5	21.4
$80- million, more	*	1.9	13.3	4.5	57.1

**Less than 1% reported.*

Table 4: Changes in volume of business, 1971 to 1973, among offices of different size

Size of office (Total number of architectural professionals)	Average volume of business ($-millions)		
	1973	1972	1971
70, over	$166.78	$235.30	$173.40
30-69	28.85	56.85	51.90
17-29	38.01	41.17	35.10
6-16	17.78	17.34	11.90
1-5	5.66	5.23	5.90

Table 5: Complete design/construction in architectural offices

Size of office	Proportion of offices engaged	Average volume of design/-construct. ($-thous.)	Proportion of all design work in these offices
70, Over	28.6%	$69,025	19.3%
30-69	22.7	8,260	32.4
17-29	15.2	8,943	25.5
6-16	25.7	2,886	18.1
1-5	16.6	1,489	6.3

Table 6: Volume of business in U.S. geographic regions

	New England	Mid Atlantic	East-North Central	West-North Central	South Atlantic	East-South Central	West-South Central	Mountain	Pacific	Expected amount of change in 1974
Average volume of 1973 business ($-million)	$14.5	$26.0	$10.9	$ 7.1	$15.9	$ 8.3	$ 9.1	$ 8.1	$ 8.6	
Commercial low-rise (1-3 st)	11.6%	5.6%	9.7%	16.2%	11.2%	11.6%	21.3%	13.7%	10.9%	+7.7%
Commercial high-rise (4 st, up)	19.2	3.0	5.7	8.7	5.5	7.7	13.3	3.7	10.7	−4.8
Industrial	2.8	3.4	15.7	6.7	9.2	6.1	6.5	2.7	3.9	+11.3
Community planning/design (non-government)	5.3	15.8	3.8	1.8	11.3	2.8	1.6	20.2	7.0	+10.5
Urban design/redevelopment (inc. public housing)	8.3	2.5	1.5	6.8	4.4	5.7	3.7	1.3	5.5	−10.1
Federal government										
Office and service	0.2	7.8	0.6	0.8	0.5	0.4	0.1	0.2	1.0	+47.4
Hospitals, health	2.3	8.1	0.1	1.5	0.1	3.2	*	*	1.7	+5.5
Defense/space	0.1	10.8	0.1	*	0.5	4.2	1.2	0.1	1.5	+1.0
Other (excl. housing)	*	3.9	0.1	0.4	1.9	1.1	0.9	0.1	1.1	+5.2
State and local government										
Office and service	1.5	1.0	1.6	1.0	1.3	1.8	1.8	0.2	2.2	−2.1
Educational	11.4	7.8	9.7	7.4	8.8	21.6	10.3	12.6	7.4	−2.1
Hospitals, health	0.5	5.5	3.2	6.7	1.7	0.4	1.2	0.9	2.1	−5.9
Other (excl. housing)	6.9	0.8	0.6	8.2	2.6	2.0	7.8	1.4	1.7	−16.8
Educational, private	3.1	2.5	1.9	2.5	0.8	4.0	2.1	1.5	3.6	+3.4
Hospitals, health, private	1.3	4.1	4.0	5.2	10.5	2.6	5.4	4.2	7.9	+0.7
Residential (excl. public housing)										
Private, single	1.4	1.1	1.4	11.9	4.8	1.9	8.3	4.1	3.5	−8.9
Low-rise (1-3 st)	10.8	8.5	23.5	8.7	13.3	18.1	10.7	25.0	10.8	+2.3
High-rise (4 st, up)	13.0	1.8	5.6	3.3	8.9	1.7	1.6	5.1	3.2	+0.8
Other buildings	0.3	6.0	11.3	2.3	2.8	3.3	2.4	3.2	14.3	+14.7
									(all work)	+3.5%

**Negligible*

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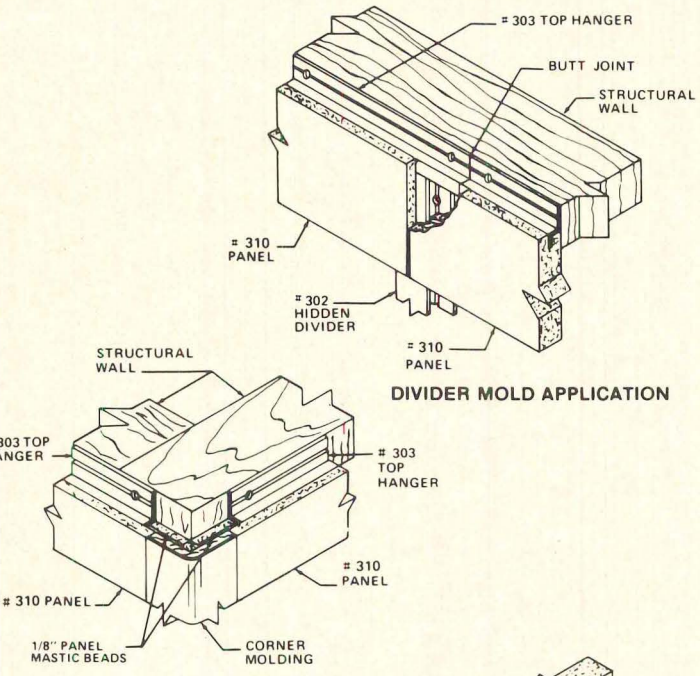
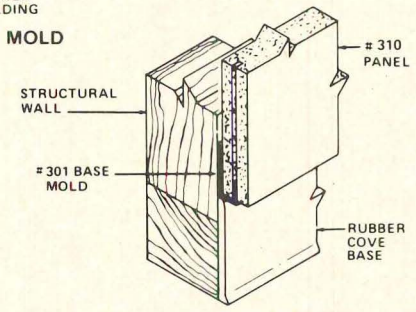
Wilsonwall System 310 Installation Detail



DIVIDER MOLD APPLICATION

OUTSIDE CORNER MOLD



BASE HANGER MOLD

Wilsonwall System 310 Specifications

Panels:

hickness: 7/16"

urfacing: 1/32" Wilson Art laminated plastic, Velvet inish, all Wilson Art woodgrains, solids.

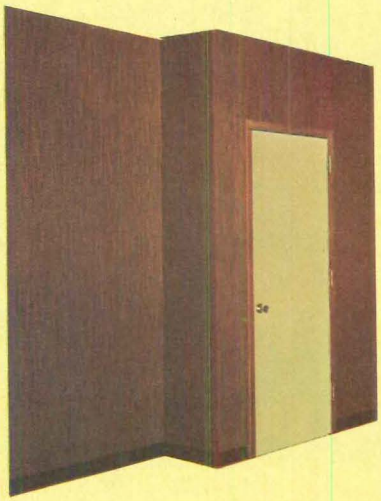
ore: 3/8" particle board

izes: 48" x 96" and 48" x 120" (other sizes quoted on equest)

noldings: mill finished extruded aluminum moldings not visible after installation of panels)

System 610

A Class 1A fire hazard classification system, featuring acrylic-coated extruded aluminum moldings. Mineral core.



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Featuring a standard V-Groove joint system . . . allows continuity of woodgrain where desired.

System 110

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Wilson Art® LAMINATED PLASTICS

RALPH WILSON PLASTICS COMPANY
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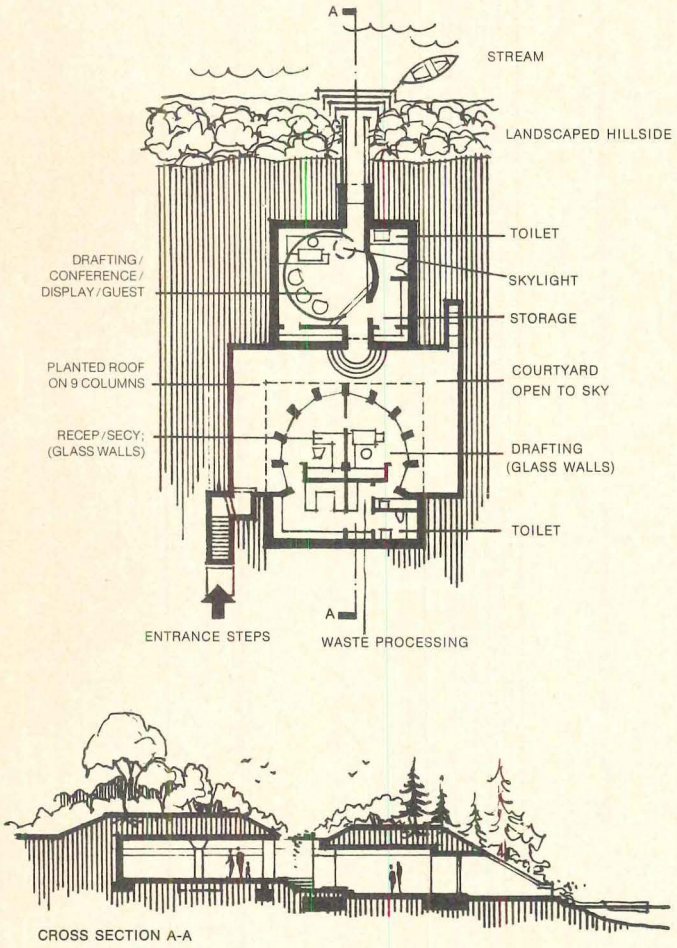
News report continued from page 21



Building underground: more than an experiment

Practicing for himself what he has been preaching for others, Malcolm Wells, the outspoken advocate of underground buildings (Nowhere to go but down, P/A Feb. 1965, p. 174) and heightened environmental awareness (The absolutely constant . . . value scale, P/A Mar. 1971, p. 92), has been hard at work on an underground office for his Cherry Hill, N.J. firm. It is only half finished, he reports, and there is no landscaping, no solar collector and no waste-pulper—yet.

Besides providing space for his office, Wells sees the project as an experiment. It is, he says, "based on the best of present day know-how, but it has been designed for the purpose of testing many of the unknowns still connected with this kind of architecture." The 500 lb/sq ft roof loading will be tested and waterproofing systems checked; temperature and humidity monitored at various levels, power use will be observed and a variety of plants will be tested in the soil that covers the roof. On his own architecture value scale, says Wells, the building scores 225.

Washington report

Failure of the House to approve a bill (HR 8346) that would have established a "National Institute of Building Standards" was a bitter blow to proponents, and forecast a similar fate for several parallel bills also in the hoppers. It was also a reflection of disenchantment with Washington as the center of all knowledge, and of fear of further federal encroachment into local affairs. More, it showed lack of understanding that in itself reflected an uncoordinated "lobbying" effort.

The bill was touted as an answer to rising construction costs, and to the multiplicity of standards and specifications used by the design professions and builders. It would have created the "Institute" as a quasi-governmental agency (with federal appropriations for its first five years of existence, then to become self-supporting) with labor, management, design professions, business and "public" members as its Board of Directors. Its objective, in general, would have been to coordinate activities of the many governmental and private standards-setting groups. Specifically, powers would include 1) development and maintenance of nationally recognized performance criteria and standards; 2) evaluation and prequalification of new building technologies; 3) money for grants to initiate original research and development studies.

Part of the reason for failure was stated clearly enough by Iowa's budget-conscious Rep. H.R. Gross: ". . . the bill would create a Rooty-Toot-Toot institute . . . on which would be spent about $18 million . . . I do not understand the necessity for an institute in a field where there is already so much expertise . . . I do not know how it is proposed to get more housing through the creation of another institute. . . ."

Perhaps as deeply at the bottom of the opposition was another fear, expressed by several congressmen during debate: that creation of such an agency and the grant of powers to it could be an opening wedge for later establishment of some type of national building code or standard that would be compulsory. That's an interference with local powers most feared by local constituencies—and no amount of denial by sponsors, or emphasis on the word "voluntary" in the pending legislation could overcome the fears. The result was a nearly two-to-one vote against the bill.

The increasing dislike for overall direction from Washington has certainly been fostered by the "new federalism" declarations of the Administration, and such actions as revenue sharing, aimed at putting more control in local hands with fewer strings attached. There is no doubt that there is heavier emphasis on professional and other organizational concentration at state and local levels.

The need to concentrate on relations with lower levels of government is very clear in another way—results of the apparently ever-widening investigations of improprieties in handling architect/engineer and other non-bid contracts. As reports of further charges spread out from the original source in Maryland (resulting in the seeming apex, the resignation of the Vice President) to other states, the need became ever stronger to convince state officials and the public that professional ethics can be effective and that professionals should not be required to bid on a price basis. Reaction to charges that political "contributions" have been, in effect, purchases of state design contracts is certainly pushing state and local legislators in the direction of demanding bids on everything. Professional groups found themselves fighting a somewhat desperate rearguard action to preserve their status.

Congress, nevertheless, went right ahead with efforts to impose national solutions. A particular example was a bill (HR 9234) which would set up a class of "accredited concrete constructors," who would be solely eligible to receive con-

[continued on page 34]

The Pine Line. A lounge group with nothing between you and the honesty of its natural wood. Elemental. Adaptable. And most comfortable. The random width pine planks enclose plump urethane cubes. Chair, two and three seaters in your choice of fabrics. Complementary tables also available. See it at the Thonet Center of Design. New York. Chicago. Los Angeles. Dallas. Or write Thonet Industries Inc., 491 East Princess Street, York, Pa. 17405. Telephone (717) 845-6666.

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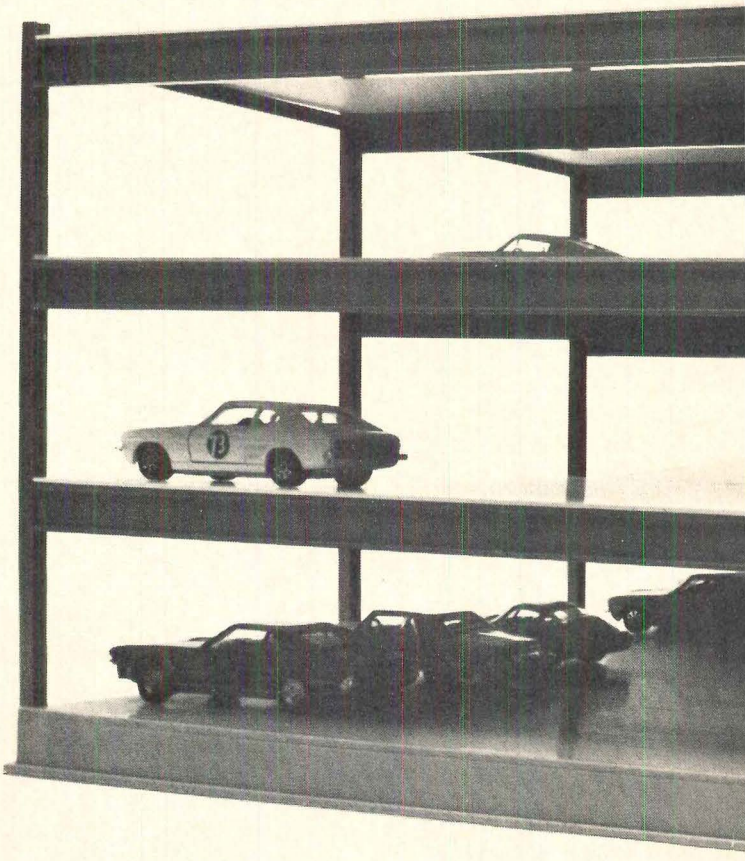
The future of parking garages is wide open!

(Because the steel-framed, long-span concept gives you more usable space at lower cost.)

Right now, an increasing number of long-span, open-type parking garages conceived in exposed steel are on the drawing boards—and many have already been constructed. For very good reasons.

Steel means fewer interior columns! Long-span, steel-framed structures are lighter, reduce the number of interior columns and need fewer footings. This means more wide open spaces. So, self-parking is easier and attendant-parking more efficient. And with steel, you're not tightly locked-in to a structural plan—you can rearrange the parking layout, and even add more levels at a later date.



Steel parking structures have low fire risk! A recent extensive survey showed that losses resulting from fire in open-type parking garages were insignificant. Realizing this, many cities are permitting code deviations in allowable heights and areas of unprotected steel parking structures. Also, a recent fire test conducted in an actual parking structure in Scranton, Pa., showed no damage to bare steel structured members exposed to the fire. Naturally, with little or no fireproofing necessary, construction costs can be cut considerably.

Just how much can you save? Perhaps as much as $1 per square foot!

Steel goes up faster! Erection of structures with steel can be faster than other systems. Recently, in Detroit, a three-level, open-deck parking struc-

ture with a total supported frame area of 156,800 sq. ft. was finished in just five and a half months. So, you can lower costs by lessening the time it takes to build!

Steel is more economical! Faster construction also means that you can generate cash flow much sooner. With this factor and all others considered, steel framing often turns out to be the most economical system. And with the benefit of more usable space, it is proving to be the most practical and desirable system, too.

Consider erecting your next parking garage with exposed steel... and take advantage of the wide open spaces!

For a copy of our Brochure "Technical Report on Steel-Framed Parking Structures" (ADUSS 27-5264-01) and to find out how we can help you program your next garage, call our nearest sales office and ask for a USS Construction Marketing Representative. Or write to U.S. Steel, Box 86, Pittsburgh, Pa. 15230.

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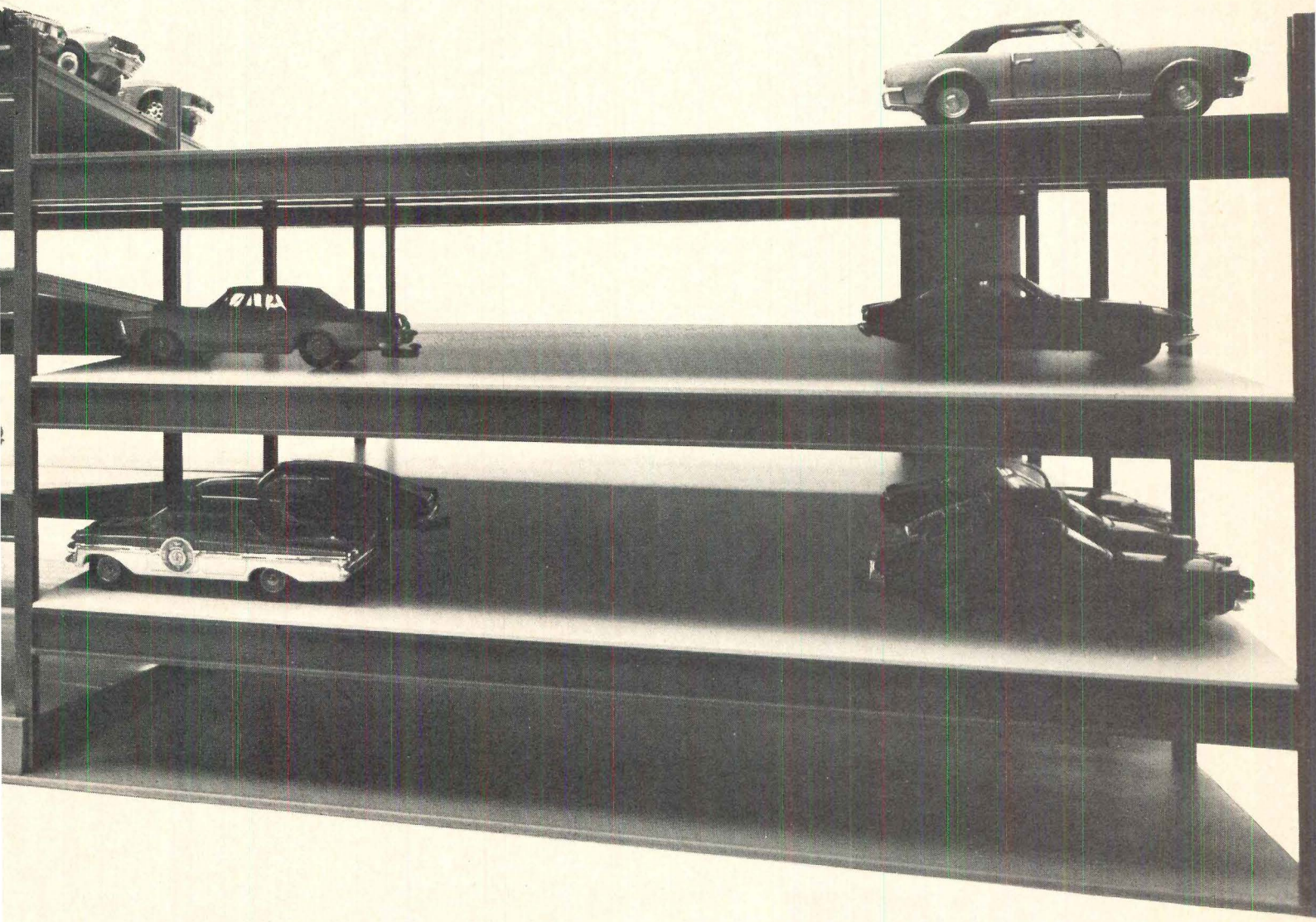

News report continued from page 30

tracts for reinforced concrete work on federal or federally a sisted projects. Under terms of the bill, these contractors would be accredited by a "National Board of Accreditation Concrete Construction." Among other things, they would b required to employ at least one professional architect or en neer, "knowledgeable in concrete," to be on the jobsite at times during concreting operations. Even the bill's author (Rep. Hamilton Fish, R. N.Y.) doesn't expect passage. Wha he's looking for, though, is a full investigation of reinforced concrete practices by the House Public Works Committee. The spur was the collapse, some months ago, of a high-rise reinforced concrete structure in nearby Virginia, which tool the lives of 14 workmen.

With high-level government seemingly bemused by such things as political scandal, tensions between nations and a impending energy shortage, other activities went on rather quietly. Among these, and of special interest, was the appa ent inclination of the relatively new National Academy of En neering to continue in a sort of "troika" relationship with th National Academy of Sciences and the National Research Council, rather than splitting off to pursue its own way as ar independent. Possibility of a split-off was raised in NAE's spring meeting, but a decision was put off until autumn. A p of the more than 1400 NAE members indicated a sentiment remain. An element in the decision was an offer from NRC t establish a fourth "assembly" on engineering, which would provide a meeting ground for all engineering disciplines. (Three other "assemblies" have already been established b NAS–NRC: on behavioral and social sciences, physics and mathematics, and life sciences.) Relationships between the three groups are hard to outline. NAE, for example, was org nized under the NAS congressional charter, but NAE is in fact an equal, not a subsidiary, of NAS, its governing body meeting with NAS on an equal status. The organizations make some joint use of staff and physical facilities, though they pursue sometimes divergent activities.

Of special concern was the economic health of the construction industry—the subject of the usual annual forecast at this time of the year. (Most of the economic seers, incidentally, thought 1974 would be a healthy, but no-gain, yea in construction dollar volume.) The housing segment of the industry (beset by high money costs, sewer "moratoriums" and other problems) showed a steady drop in "starts" through the fall, and apparently would wind up the year sub stantially below the 2.4 million mark set the previous year. Overall volume was still running at a healthy $137 billion or so, but had registered little growth for the past several months. Nobody was looking for any serious downturn, onl slowing of the pace.

Also, Congress seemed to be favorably disposed toward tablishing a "Fire Prevention and Control Administration" a a "National Fire Academy" (S.1789) within the Commerce D partment, as an outcome of intensive studies of fire problen over the past several years (particularly in high-rise structures). The "Administration," to be headed by an Assistant Secretary of Commerce, would be of special interest to arc tects, since its functions would include development of crit ria for design of buildings to minimize fire damage.

[continued on page 39]

Static-tician

At Dow Badische, he'll guarantee that any carpet carrying our Zefstat™ anti-shock carpet label won't generate a shock for the useful life of the carpet or for 5 years, whichever is sooner.

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News report continued from page 34

Finally, hoping to counter adverse publicity, two of the major engineering societies took what amounted to drastic action as October ended. In specially called meetings of their top governing boards, both the American Society of Civil Engineers and the American Consulting Engineers Council called for disciplining members caught in any political hanky-panky, and for placing far greater emphasis on the provisions of ethical codes.

By far the most positive action was that of ACEC, with its board of trustees issuing a virtual "shape up or ship out" order to member chapters. It ordered that chapters to establish their own guidelines for conduct and for discipline, with a requirement that they report back to the parent organization in Washington by December 31. Meanwhile, ACEC's top command prepared its own version of general disciplinary procedures for ratification. At a mid-November meeting of the board of directors, the trustees reserved the right to "investigate and initiate" disciplinary action against members, despite any chapter action or inaction.

ASCE's proposal was slightly less drastic. In the same manner, the society called on local and state sections to re-emphasize ethical practices and discipline members. However, it didn't require a report on progress or provide for direct intervention from the top. The National Society of Professional Engineers, meanwhile, held a press conference in Washington early in November to announce a very similar series of actions. [E.E. Halmos]

Calendar

Dec. 12–14. Seminar on bicycle/pedestrian planning and design, Dutch Inn, Disney World, Fla.

Dec. 15–16. Workshop in applied Gestalt principles for architects and designers, Gestalt Institute of Cleveland.

Dec. 17–24. Third World Congress of Engineers and Architects in Tel Aviv, Israel.

Dec. 26. Deadline for nominations for R.S. Reynolds Memorial Award sponsored by Reynolds Metal Company and administered by the American Institute of Architects.

Through Dec. 31. Application forms available for Brunner Scholarship competition sponsored by New York Chapter AIA.

Through Jan. 1. Portable World exhibition, Museum of Contemporary Crafts of the American Crafts Council, New York City.

Dec. 1. Nomination forms available for LeBrun Traveling Fellowship competition sponsored by New York Chapter AIA.

Jan. 10–12. Nineteenth annual educational conference and seminar of the Ceramic Tile Institute, Anaheim, Calif.

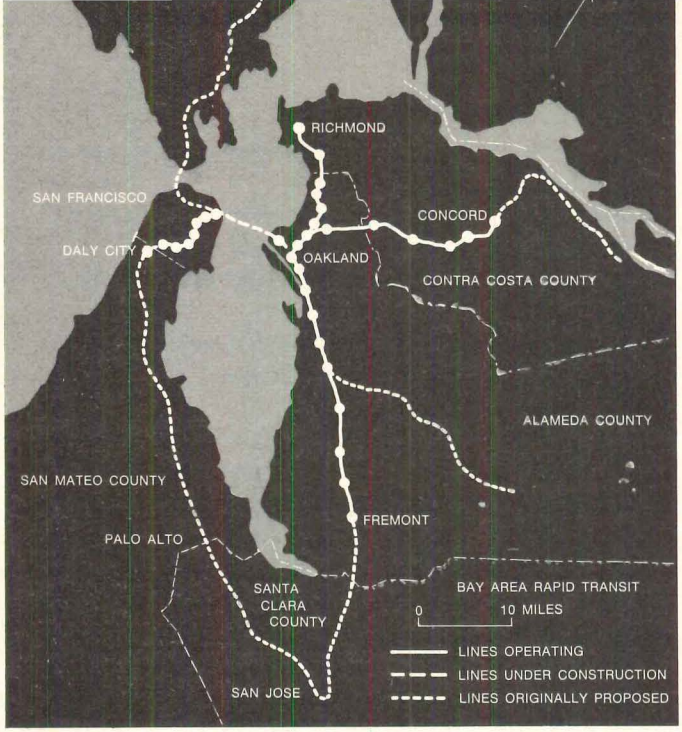
Jan. 15. Deadline for proposals for Brunner Scholarship competition sponsored by New York Chapter AIA.

Jan. 15. Deadline for entries to competition of student design work combining energy conservation and design, sponsored by the Association of Student Chapters of the AIA, Washington, D.C.

Jan. 18. Deadline for mailing of programs for LeBrun Traveling Fellowship competition sponsored by New York Chapter AIA.

Jan. 20–24. Thirtieth annual convention and exposition of the National Association of Home Builders, Houston.

Jan. 22. Deadline for submissions to R.S. Reynolds Memorial Award Program sponsored by Reynolds Metal Company and administered by the American Institute of Architects.



News report

Architecture west

Despite the country's most commodious transit cars, despite a glassy smooth roadbed, much of it on a fine-looking elevated structure, despite a collection of richly varied station designs, San Francisco's new Bay Area Rapid Transit has so far disappointed even its ardent supporters. BART's design strengths and some of its operating problems were taken up in last month's column; this month I want to turn to the urban planning aspects of BART and its impact on the region.

To understand the plan and its effects, one needs some local geography. The San Francisco metropolitan area, somewhat surprisingly, covers an area as big as Los Angeles but holds only a fraction of the population—about 4½ million people spread out over an area some 60 by 120 miles. The much-filled but still enormous Bay and a surrounding ring of hills force settlement into a thin loop from which a few fingers poke out into the hinterland. Historically one major node, San Francisco, and a lesser one across the Bay at Oakland have dominated employment and commerce. After World War II, explosive population growth, technological change, congestion and new money threatened to disperse this pattern.

Given this situation, a band of leaders and planners began to agitate for a railroad around the loop, which would convert selected bands of sprawl into high-density corridors with development nucleated at the stations. Less openly, planners and businessmen with a stake in power of the San Francisco and Oakland central business districts urged the rail line to maintain the accessibility of those centers.

After a definitive plan had been drawn up, three counties, Marin on the North, San Mateo on the Peninsula, and Santa Clara to the South, withdrew from the system. In the remaining three counties, two lines were planned and built—one running east-west from Concord through downtown San Francisco to the far side of the City; the other going north-south from Richmond to Fremont. The lines cross in Oakland so that traffic on all East Bay branches can merge for the run underwater to the City. Regional plans still show the unbuilt parts of the original loop in dotted lines, a kind of omen that some day they may be built. In the meantime a 75-mile-long commuter railway exists.

In strict adherence to 1950 transportation planning, the routes derive from minimizing right-of-way acquisition costs while serving the demands predicted by crude origin/destination data. The result is a system that follows established commuter rail and freeway corridors. But in contrast to the single in-town terminal of traditional commuter lines, BART offers three underground stops in downtown Oakland and four in San Francisco. That should save commuters many steps or pesky mode changes to buses or trolleys.

At best BART represents a sort of Maginot Line of transportation planning. Even this judgment may be too charitable. its failure to connect the homes and workplaces of low-income people combined with the system's intensely regressive financing, produce a tragic situation in which the poor, the pensioners, the unemployed subsidize the commute of middle-level bank managers from Walnut Creek. The one slim hope for now is that BART's enormous operating deficit (now covered out of property and sales taxes) will be balanced by far higher fares. But talk of free rides on BART suggests even further subsidies to the upper middle class.

BART's troubles go beyond matters of regional layout and regressive financing. Incredible time and cost overruns, along with expensive-to-fix technical bugs, suggest mismanagement and questionable engineering on a Pentagon-weapons-system scale. In 1962 pro-BART bond campaigners (many of them future BART contractors as it turned out) promised the first trains would run in 1966. They ran in 1972. With luck the whole system will work in a year or so. Capital costs have doubled to approach $2 billion. Operating expenses, once to be covered by fares, now promise a $100 million deficit over the next two years. Engineering fees skyrocketed from an initial $47 million to more than three times that amount. Hardly any of the fancy equipment seems to work right, including such minor items as the automatic ticket dispensers; electronically gifted teenagers have found they can baffle them for free rides.

The fixed rail system that is BART has failed even on some of its most plausible promises. The high-density corridor idea, for instance, has fostered wasteful land speculation around some stations, resulting in property priced too high for development. In other places neighbors have risen righteously to prevent any upzoning of their single-family districts along the BART alignments.

The planning lessons seem clear enough in hindsight. Incremental systems built in small, digestible pieces seem clearly preferable to monster lumps of high-risk public works. Two billion dollars of limited bus rights-of-way and low pollution powerplant experiments, for example, would long ago have gone into action. And such a system could have been modified in midstream to carry more poor people or connect people to real, new job locations.

Yet through it all the architecture somehow shines. In these purposes architecture has collaborated splendidly. As public works design, the stations and right-of-way structures seem just rich enough for affluent California, costly but not extravagant, somewhere between Moscow's opulence and New York's squalor. Overall, Bay Area Rapid Transit demonstrates with an unfortunate conclusiveness how little relationship there is between architecture and transit system performance. [Roger Montgomery]

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Circle No. 343, on Reader Service Card

Preserving the essence

December 1973

Have you seen the lobby of Louis Sullivan's Guaranty Building in Buffalo? Or the interior of his Carson, Pirie, Scott store in Chicago? Don't bother to look, for behind their superb façades you will find virtually nothing of Sullivan's intact. (When will they install suspended ceilings in Hagia Sofia?)

On last month's editorial page I wrote about defensive strategies in the process of interior design—about the need to design spaces that accept reasonable alterations and discourage capricious ones. Some of you are already at work on that. What can we all do meanwhile to preserve vulnerable interiors that we would hate to lose?

Since last month's issue went to press, a notable step has been taken to protect outstanding interiors by law: a bill has been put before the New York City Council to cover interiors under an extension of the city's landmark preservation laws (already the most comprehensive of any major city). True, the new regulations would cover only interiors that are "customarily open or accessible to the public" and exempt all religious buildings (a serious sacrifice, but public interference there would surely be resisted). And, in line with the existing law, protection could be extended only to interiors 30 years old or older—an age many of our finest interiors never reach.

Even with these limitations, the proposal is a significant advance for preservation—and a genuinely controversial one. The community has clear justifications for seeking control over exterior forms and surfaces, since they form the backdrop of public open spaces. Interiors, of course, have no direct impact on public open space or neighboring properties; except for some recent transparent cages, they can be considered only as self-contained public amenities. But the best of candidates for landmarks designation—I would nominate the Grand Central Terminal concourse, Scribner's bookshop, and the Palm Court of the Plaza Hotel—have close links, involving style and activity, with the public streets and spaces outside them. The save-at-all-cost interiors of Rockefeller Center—the Radio City Music Hall and the Rainbow Room—epitomize the 1930s' style and energy of the whole complex.

Given the desirability of interior preservation, how can it possibly be administered? How can you preserve an environment so dependent for its character on high-turnover elements—on furnishings, signs, and merchandise?

Preserving the mere envelope of a space is hardly preservation. By that standard, the Grand Central concourse remains intact, though poorly maintained; yet its character is shattered by the tournament of advertising inside it. Even if the signs could be eradicated, is it really possible to *restore* this monumental entrance to the city, now that so few travelers arrive from points beyond Westport, Conn.?

An interior remains truly intact only when it still serves its original purpose (examples: Locke-Ober Cafe in Boston; Bradbury Building in L.A.; Rookery in Chicago; Taliesin West). Even slight changes in policy can undo a fine interior (i.e., the cavelike darkness of Richardson's Trinity Church in Boston, imposed by later generations of Episcopalians). For buildings that have lost their original function, adaptive reuse is an admirable preservation strategy, but it almost always involves some loss of interior integrity (among the exceptions: Pittsburgh's North Side Post Office turned museum, Nov. 19, '72 P/A, p. 100).

We seem to have ethical doubts about preserving buildings merely as historic shrines (while the Russians enthusiastically restore their churches, the French their chateaux, the Japanese their castles). Yet we must be grateful to those who enshrined Jefferson's Monticello, the several Shaker Villages, and the Greene brothers' Gamble House. We can only hope that threatened landmarks with irreplaceable interiors—Wright's Oak Park house and studio, for instance—can get the preserved-for-posterity treatment.

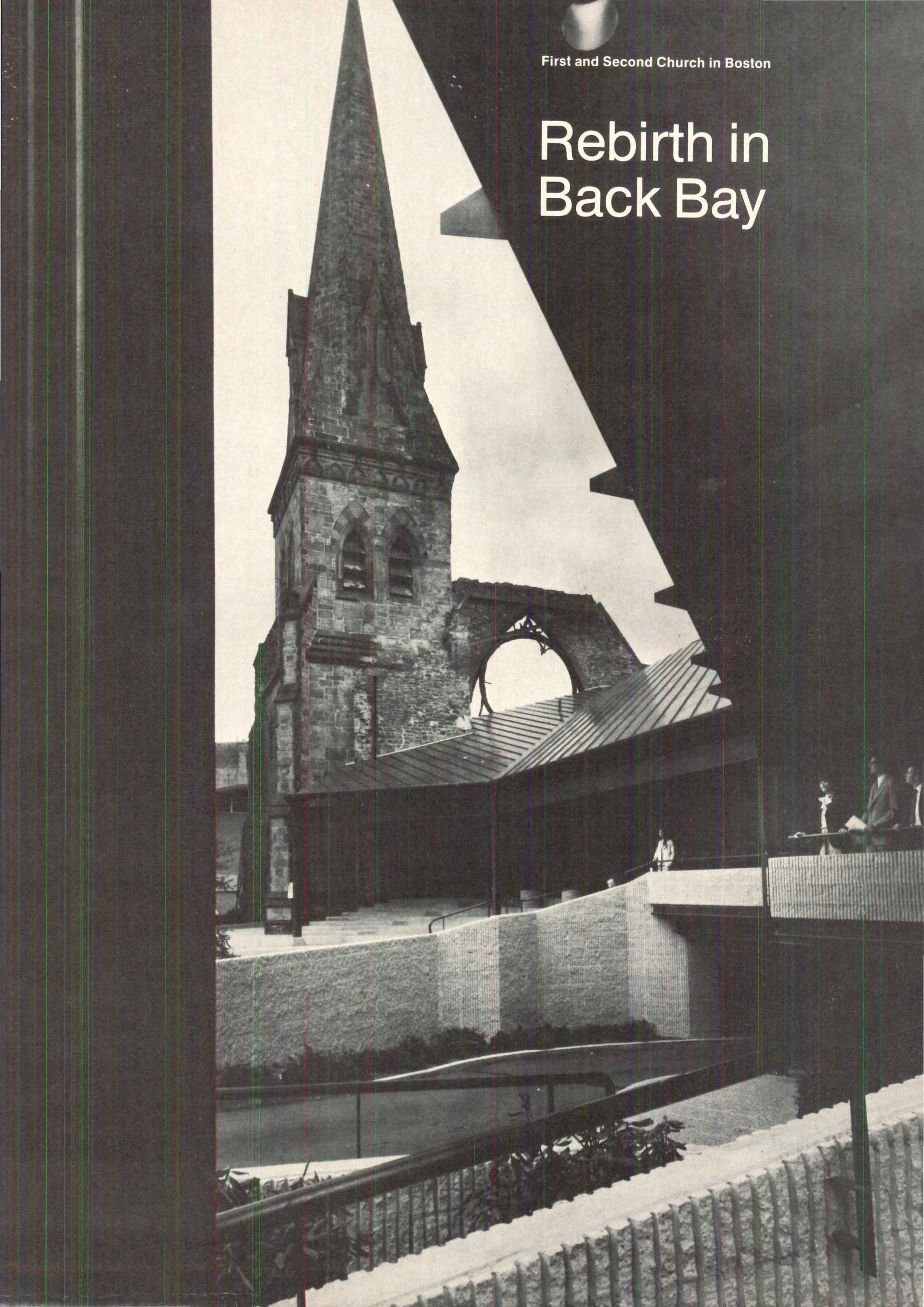
No workable preservation strategy can be discounted when we realize that our legacy of interiors is disappearing as fast as a paint roller can cover a mural. Some whole categories—railroad stations and movie palaces, for instance—tend to disappear completely. But other types—urban hotels, department stores, churches and synagogues—too often undergo internal surgery in a fight for survival.

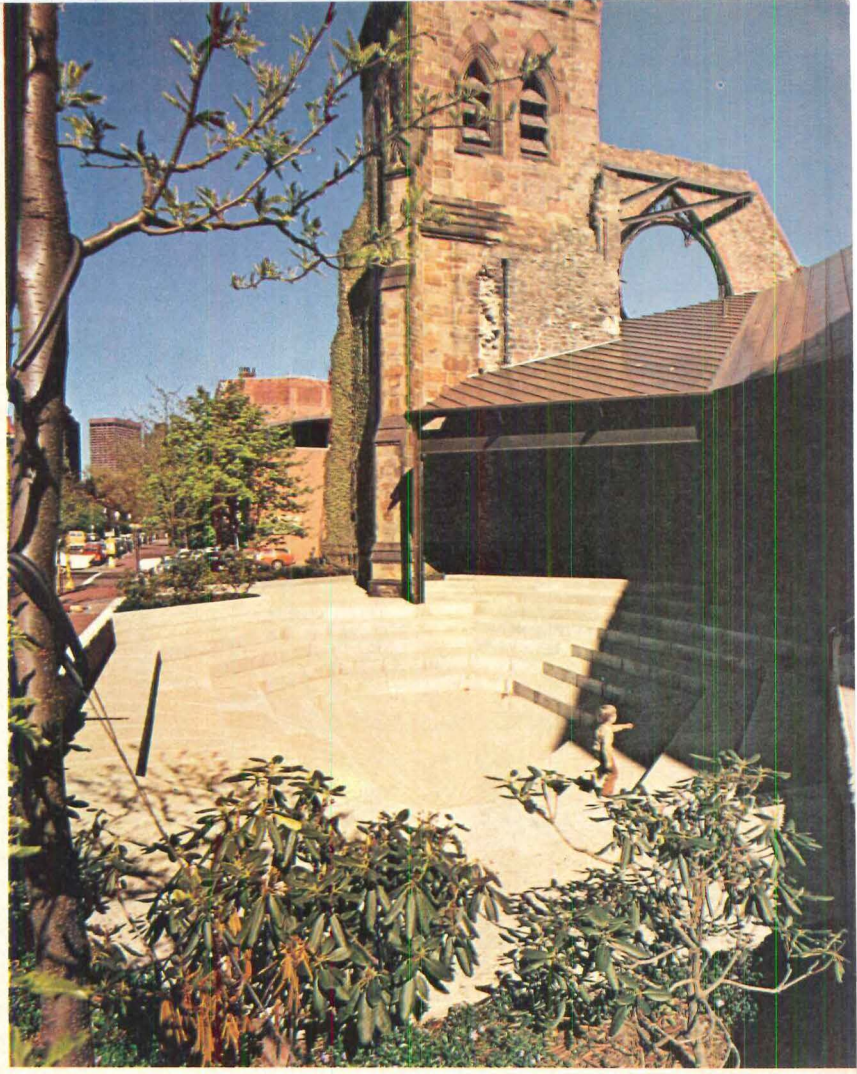
Interiors worth saving are far too numerous and diverse to be saved, except in a fragmentary way, by laws alone; and the strategies of adaptive reuse and historic enshrinement can salvage only a few more pieces. Preserving a large portion of this heritage—really intact—is a matter of broader public policy; it demands maintaining the circumstances that keep such spaces active and raising public awareness of their quality.

John Morris Dixon

First and Second Church in Boston

Rebirth in Back Bay





Rudolph points out that the sense of semi-enclosure in the court might have been more successful had the existing tower been nearer the street corner (above) and had the porch overhang extended further over the amphitheater. Protruding gutter supports, in retrospect, would not be handled the same way again, because of their inadvertent "California ranch" look.

Rebuilding a burned-out church in Boston, Paul Rudolph was confronted with the challenges of scale and character and of changing church priorities toward the community.

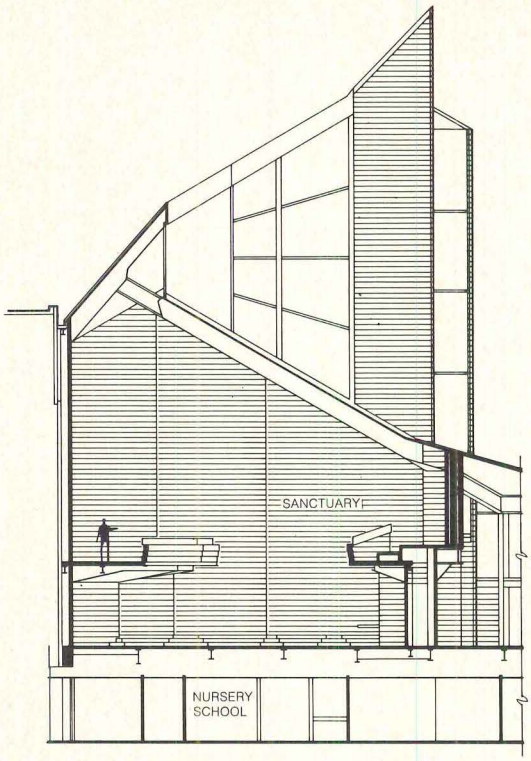
It was a commission fraught with seeming contradictions, paradoxes and, yes, controversies. When the Back Bay home of The First Church in Boston burned in 1968, who should be selected to design its replacement? During the interviews with architects, minister Rhys Williams recalls Paul Rudolph's warnings to the building committee, "I am considered a controversial architect." But then, neither Rudolph *nor* the First and Second Churches were unacquainted with controversy.

Consider a few historical notes. Founded in 1630 by colonists just arrived from England, the First Church grew until, in 1649, its quarters were outgrown and The Second Church was formed in the North end of Boston. In 1776, that "Old North Church" was torn down by the British for harboring political "traitors." The Second Church subsequently went through a progression of seven buildings, eventually coming to rest in Brookline, to the west. Meanwhile, under people like William Emerson, father of Ralph Waldo Emerson, The First Church was led to Unitarianism. The Second Church roster reads like a history book, with names like Paul Revere (trustee for 23 years), Increase, Cotton and Samuel Mather and Ralph Waldo Emerson. So when The First and Second Churches again came together on Marlborough Street, the notion of facing controversy in rebuilding was a small problem indeed. Rudolph was selected.

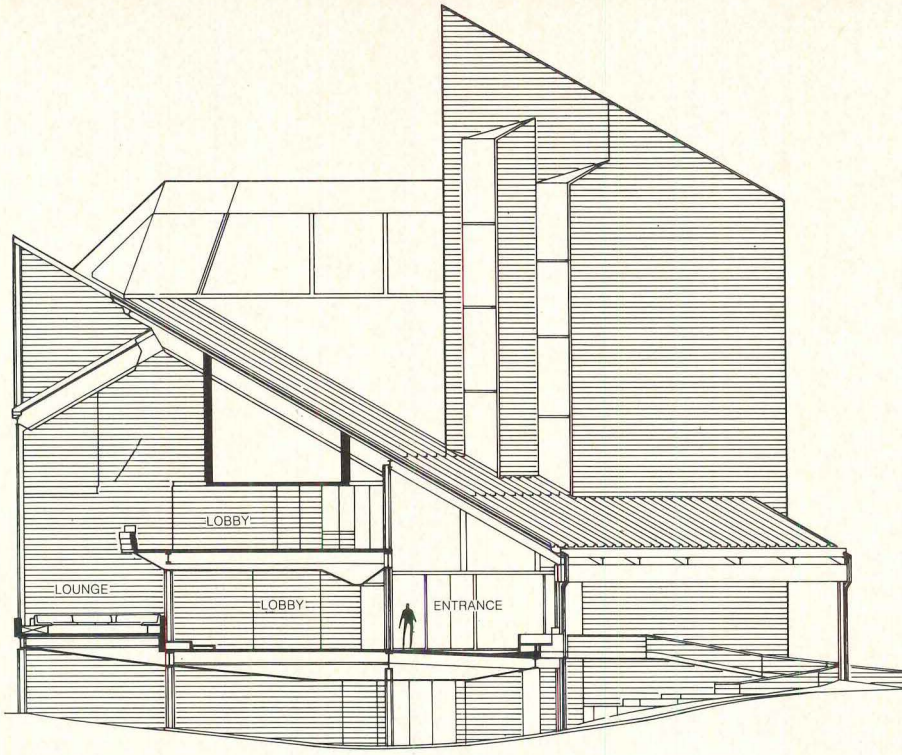
Among other things, the commission posed questions of Back Bay scale and necessitated responses to changing church philosophies. The streetscape, only a few blocks from the Boston Common, is made up of characteristic rowhouses along the Marlborough side; on Berkeley Street, however, the scale of adjacent apartments is larger. Rudolph was fully aware that scale and character would be at issue.

A still larger challenge followed from shifting priorities within the church as increased emphasis was placed on community services. The facilities were to invite use by people other than the congregation. The previous building, with its large sanctuary and typical ancillary spaces, limited that invitation. The worship service, albeit important, was not to be the sole use of the new church.

Several premises were to lead Rudolph to what he describes as "the nearest thing to a non-building that I've ever done." First, he recommended preserving the remaining tower and front wall. "It is very beautiful," he says, "and it would be impossible to rebuild that feeling." Second, he wanted to open the building to Marlborough Street, lessening the separation of community and church—making a physical statement of invitation. Third, the secular, social and religious aspects of church philosophies would be housed in ways that

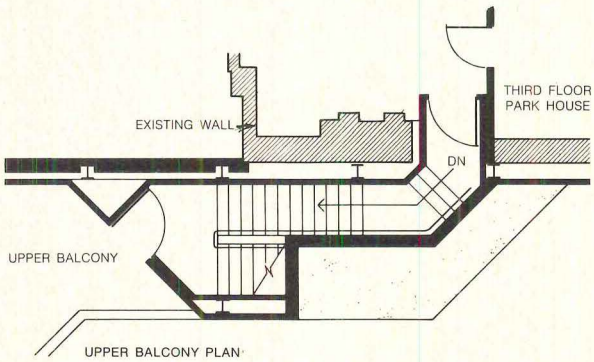


SECTION A

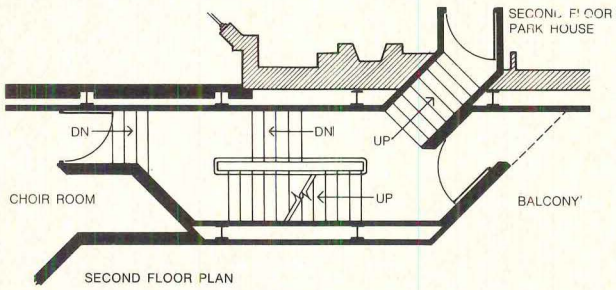


SECTION B

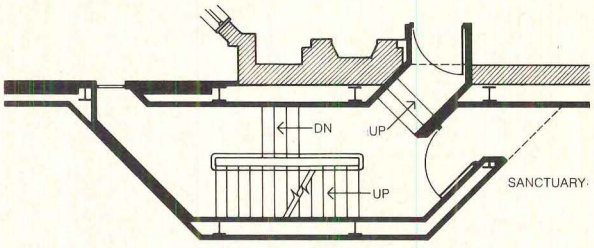
Connecting stair—new to existing buildings



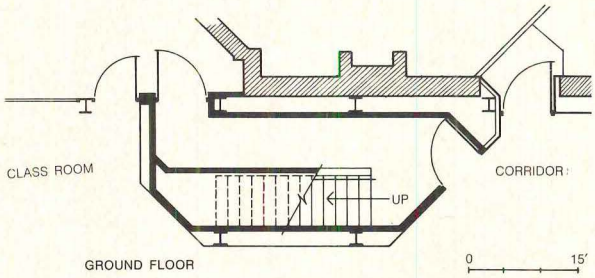
UPPER BALCONY PLAN



SECOND FLOOR PLAN

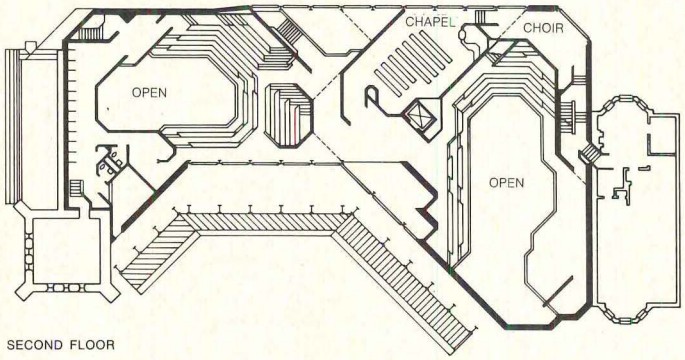


FIRST FLOOR PLAN



GROUND FLOOR

0 15'



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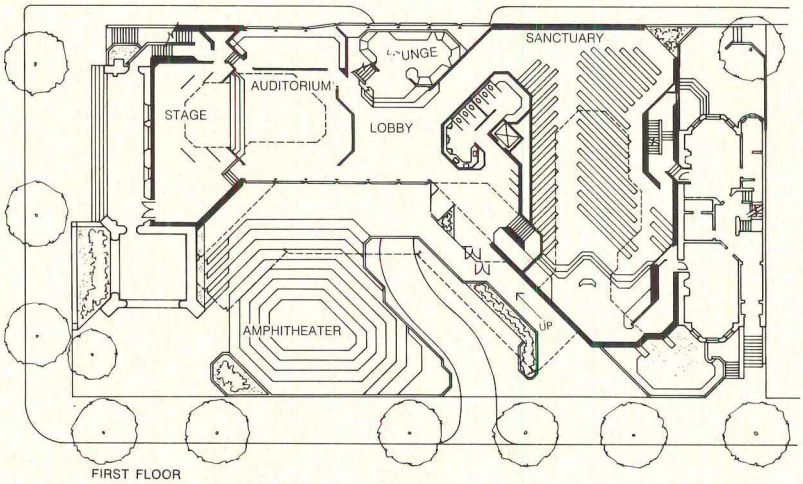
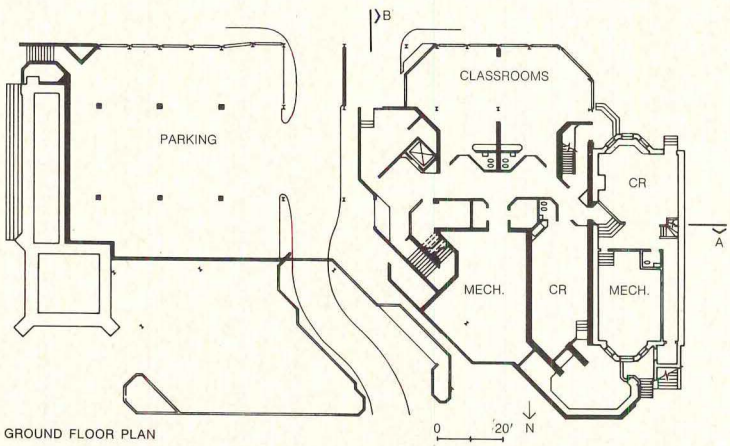
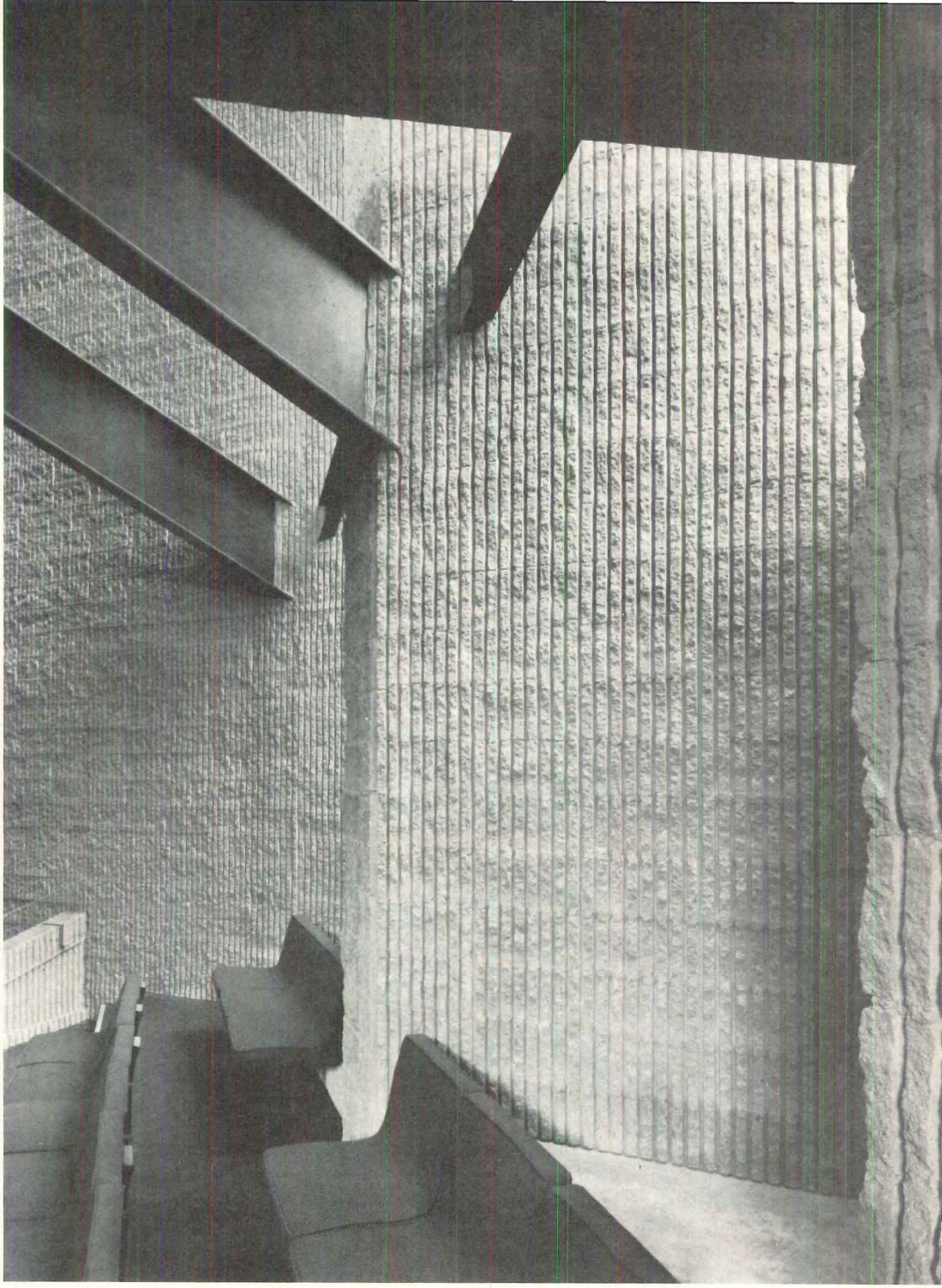
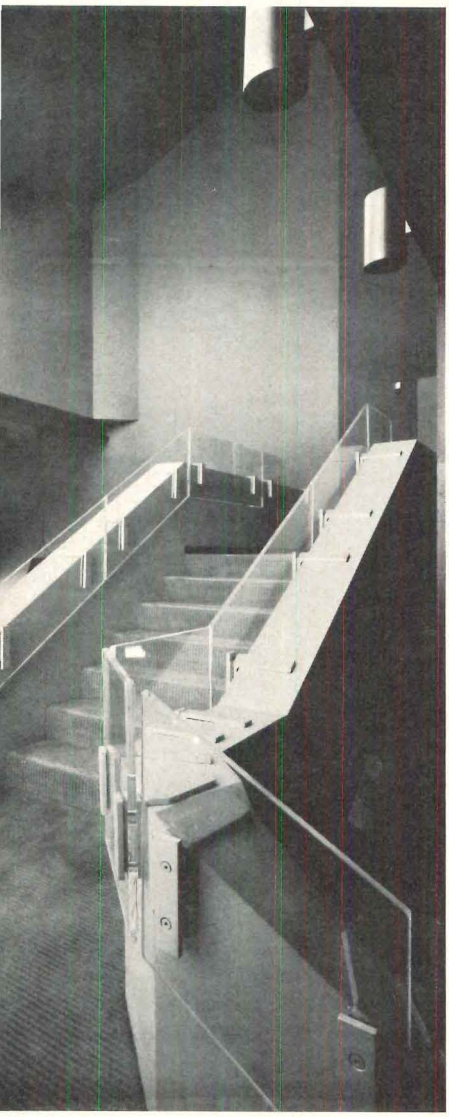


FIRST FLOOR

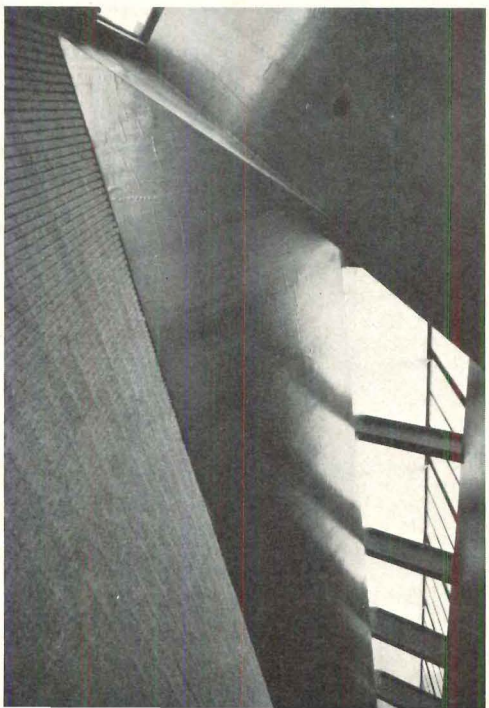


GROUND FLOOR PLAN

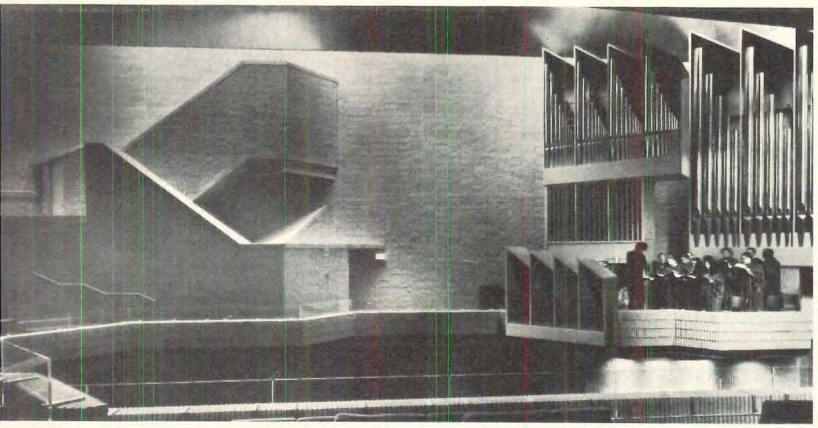




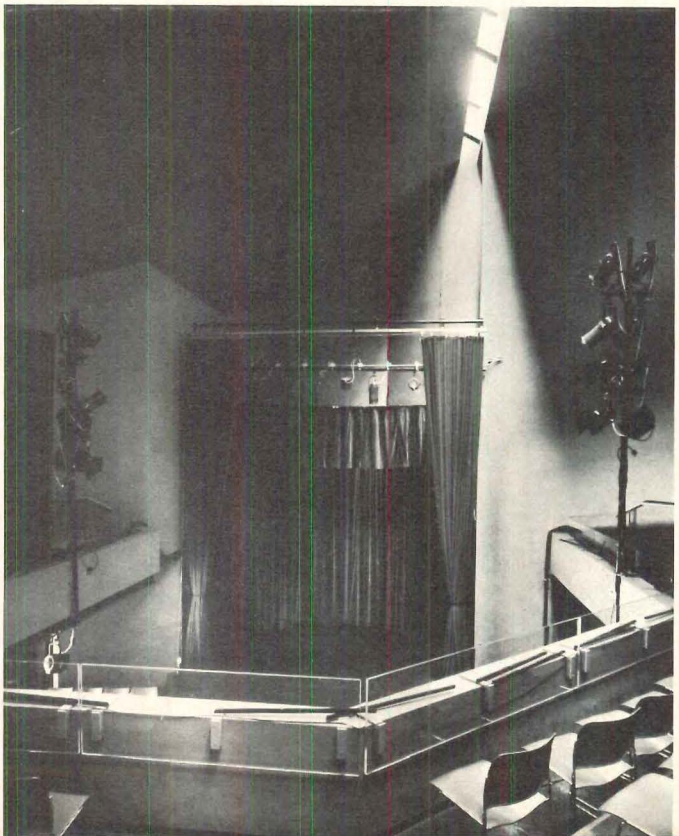
ylic plates line stair and balcony railings,
familiar Rudolph striated wall surfaces are
dominant in major spaces. Structural members
ume aspects of abstract art in the sanctuary.



Sanctuary (above and below) is sometimes used for dramatic events.



Auditorium (below) is used by a college theater group on a regular basis.



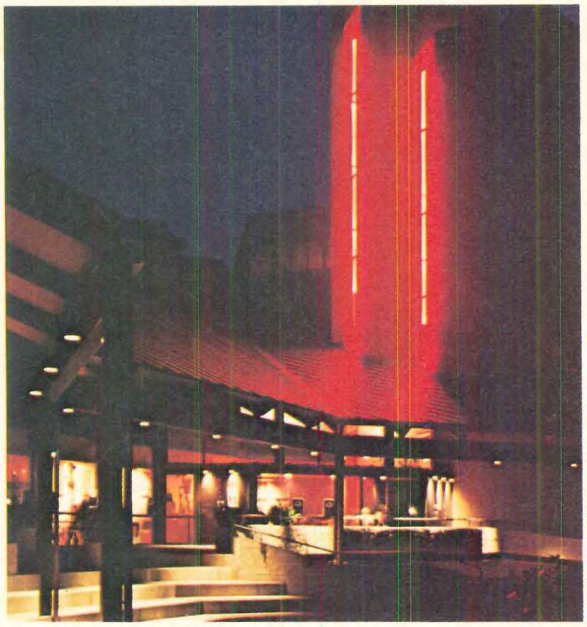
best reflected their relationships to the outside world.

There really is no structural system in the ordinary sense, although the building is framed in steel. "The psychology of space and lighting are the important things," Rudolph says, "clarity of structural form is *not* important." A courtyard hollowed out in front of the structure, framed by the existing tower, the wide church porch and the angled sanctuary wall, does the welcoming. It is hoped that the community will use the court as an amphitheater; string concerts and street fairs are welcomed and have begun to happen.

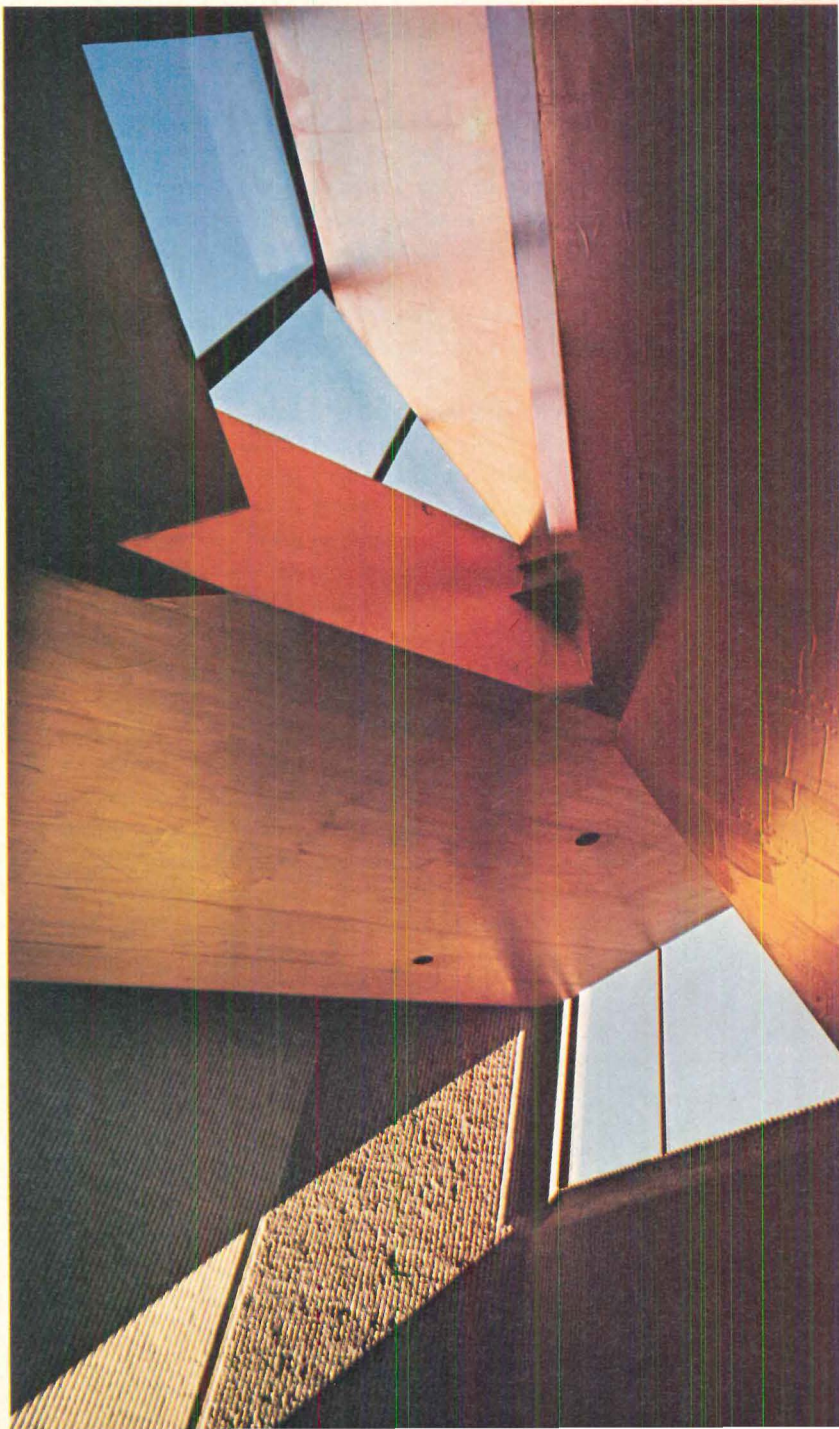
Since the church owns the house adjacent to the site, and since Rudolph wanted to "bookend" the continuous street façade at this transition point, the largest element, the sanctuary, was placed next to the house. Worshippers enter this religious space, the most secluded from the street, by a spiral route. From the street they are compressed through the low porch space, pass through the larger social area into another low passage and finally emerge in the large sanctuary. From that point, the spiral takes on vertical, spatial characteristics as the ceiling climbs up to the skylights and finally back around to the main light source—large windows out of the congregation's view. "The space," says Rudolph, "was designed as a great kaleidoscope for light," with the large windows oriented southeast for maximum effect at Sunday morning worship hours. Colored strip lighting in the window openings, to suggest a stained glass effect at night, is used less than it might have been; it is again, controversial.

The center social area is glazed and open to the porch. It turns out to be a natural place for small art exhibits, although Rudolph admits not having anticipated that use. Off the socia area, and also glazed on the court side, is a small auditorium with a stage behind the concrete-reinforced original wall. It is used regularly for theater presentations by a local college group, and represents the secular interests in the program. Below the main level are parking spaces and nursery/classroom areas, which also serve as a weekday nursery school for the community.

For all of the program's ambition, the church is very restrained in expression—not subdued enough, of course, to satisfy those advocates of Back Bay traditionalism or of nonbuilding for churches. The majority of the congregation, however, are pleased with the way the building works, mixing its own brand of humility with the formal aspects demanded of a place of worship. [JM]



Colored strip lighting represents stained glass at night.



Data

Project: The First and Second Church in Boston.
Architect: Paul Rudolph.
Program: new church replacing previous building that was destroyed by fire. New facilities to provide for community use.
Site: corner of Marlborough and Berkeley Sts in Boston.
Structural system: wood piles with reinforced concrete pile caps and foundation walls, structural steel framing.
Mechanical system: oil fired boiler, forced air with supplementary fin radiation. Air conditioning by air cooled packaged water chiller.
Major materials: exterior, copper roofing with battens, ribbed concrete block; interior, ribbed concrete block, carpet and tile floors.
Consultants: structural, Nichols, Norton & Zaldastani; mechanical, McCarron, Hufnagle & Vegkley; plumbing, R.W. Sullivan.
Photography: John Veltri.

Breaking out of the box

In their building renovations, architects Stern and Hagmann restructure space into three-dimensional volumes and organize it by using large-scale, architectural furniture

To make something of an 8- or 10-ft-high horizontal band of space of undistinguished character and rather predictable layout is not an easy task. Fortunately for Robert Stern and John Hagmann, most of the New York apartments they have renovated are in older buildings and have higher ceilings, more light and usually more interesting details. But the lifestyles prevailing at the time these buildings were built have little to do with the way people want to live now.

All of the apartments shown here presented the same challenge: take the boxlike spaces and open them up, making large, open, light-filled flowing spaces and getting rid of the closeted lifestyles of the past. By giving new form to the spaces, the architects were able to achieve an atmosphere of formality and one of casualness as well. Two of the apartments shown were duplexes that gave the architects the opportunity to create three-dimensional, double-height living space by breaking through one floor to another. In redesigning the spaces, the architects eliminated some of the normal clutter by using large-scale architectural furniture that, historically, derives from the idea of the *immeuble.* These large-scale furniture elements usually serve several functions: storage to replace various chests of drawers, shelving, seating, lavatories, painting or sculpture display and even children's bunkbeds. Architecturally, they act as large organizing and unifying elements, simplifying the space and allowing the people and important objects to stand out.

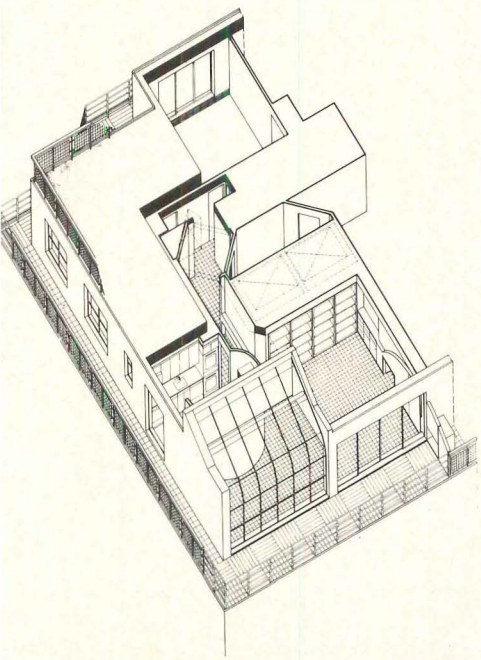
For their own offices in an old apartment building, Stern and Hagmann used the same idea of large-scale furniture to divide the space, provide all the necessary storage and desk space for other members of the firm. Two large units, detached from the walls, accomplish all this, leaving room at the periphery for a conference area and circulation.

For his own house in East Hampton, Stern made no changes in the architectural spaces, but chose instead to place new objects in the old setting, contrasting the architectural detail of the old against the clean lines of the new. The new furniture, although made of synthetic materials, recalls images of bulky upholstered pieces and sticklike chairs of past eras, while the interior spaces, still with their original detail, have been treated to a coating of color that transports them out of their original context. The only change made to the house was replacing a porch, which had been a later addition to the house, with a new porch in the shingle style vernacular. Its scale and materials are consistent with the existing structure, while its mannerisms make its recent addition apparent.

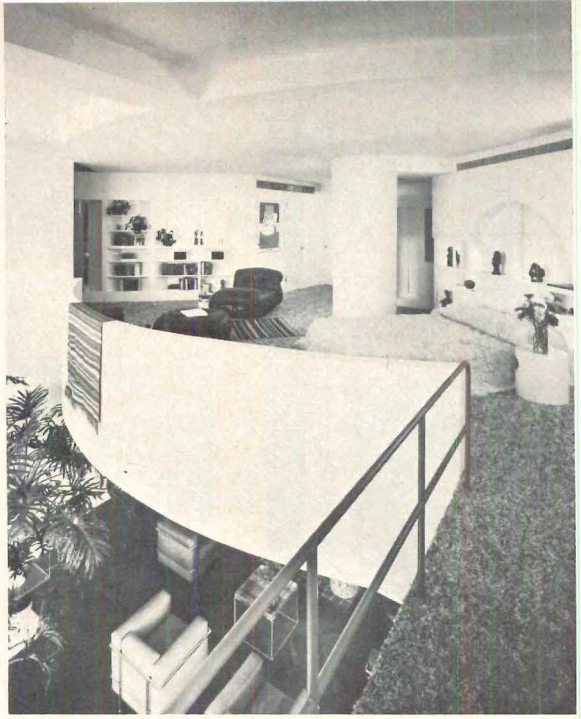
As most of their work is residential, the architects must acknowledge the personal tastes and styles of the people who will live in the apartments. The question is always raised about the client's own furniture. What happens to it? How does it fit into the new scheme? Often architects seem embarrassed by the possessions their clients bring with them into the new space. But Stern and Hagmann accept that as part of what must be accommodated in the design. In the end it doesn't matter what anyone thinks about good or bad design. What really matters about a house or an apartment is that the people who live there are comfortable with it. [SLR]

Penthouse (above and below) gave the architects the opportunity to break through the roof, opening up the room to the south. Blinds operate electrically for sun control. Living room has some of client's favorite overstuffed furniture.

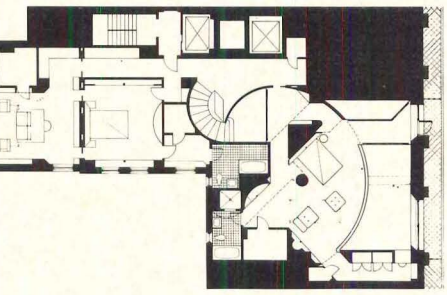
Photos: Ed Stoecklein



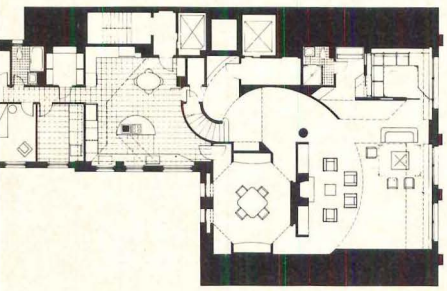
The only architectural change in Stern's own house was the addition of a porch (top, left and right). Living room (above, middle), a bathroom (above) and bath (right) play with color and ornament. Photos: John T. Hill.



Photos: Maris/Semel, courtesy of House Beautiful. Copyright © 1972 by the Hearst Corporation



SECOND FLOOR



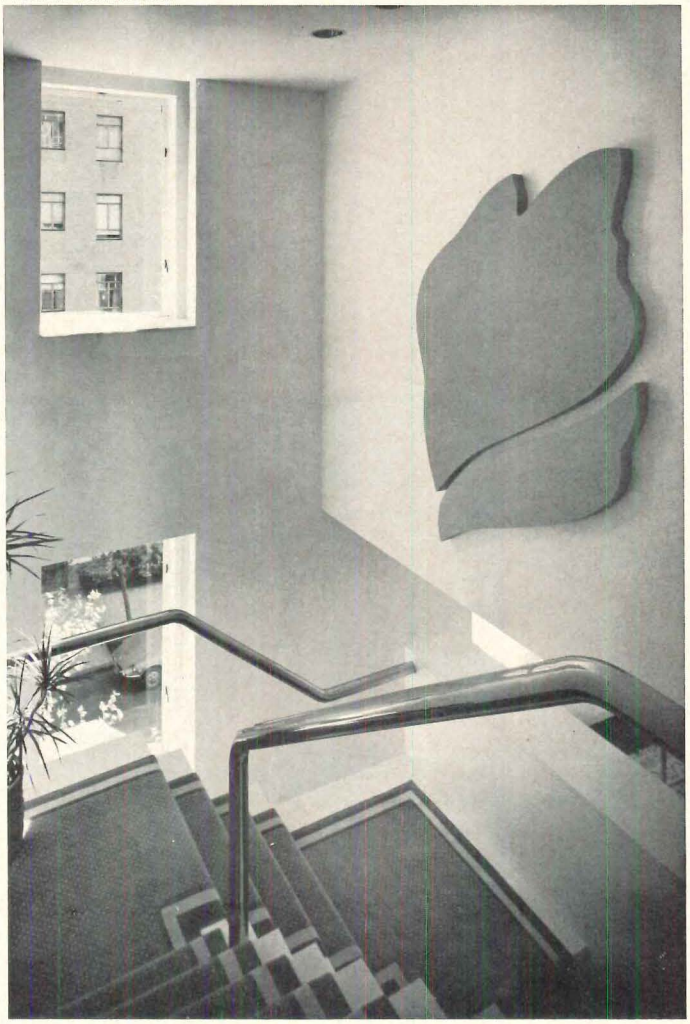
FIRST FLOOR

For a duplex apartment on Central Park, the ceiling breaks back, making sculptural forms within the volume of the space. Upper level is a sleeping balcony. Plans (above) show the molding of the space and the inclusion of different functions all within one large, single shape.

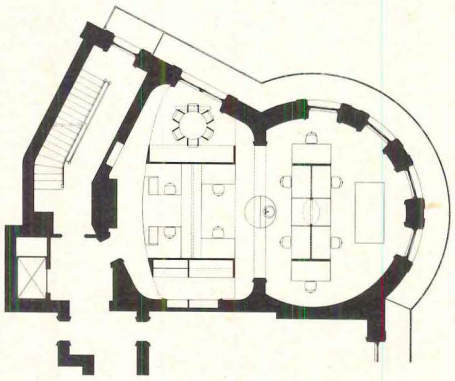
Breaking out of the box

Photo: Maris/Semel. Copyright © 1972 by Condé Nast Publications Inc.

Photo: Norman McGrath



Imitation jukebox style storage (above) is for a children's dormitory, a long narrow room with bunk beds built in opposite the storage wall. The plan and photo (below) of the Stern and Hagmann office show the insertion of large-scaled furniture into the ornamental space.



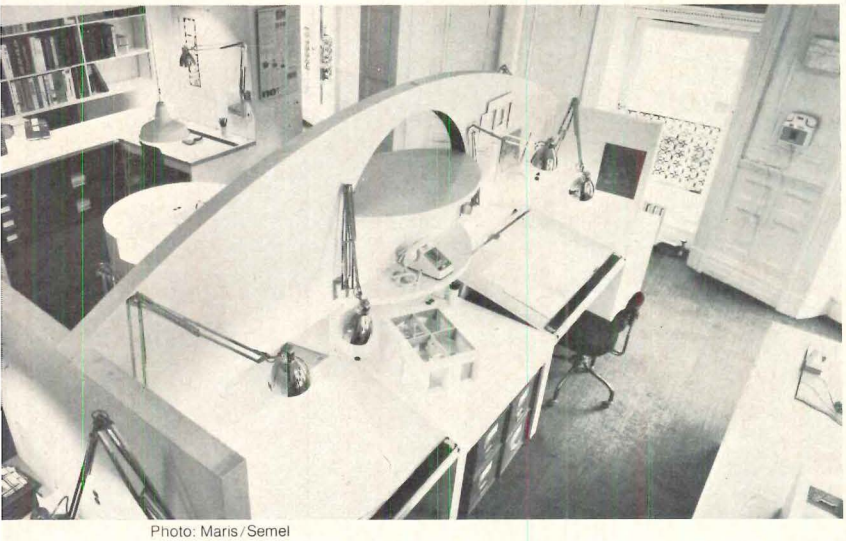
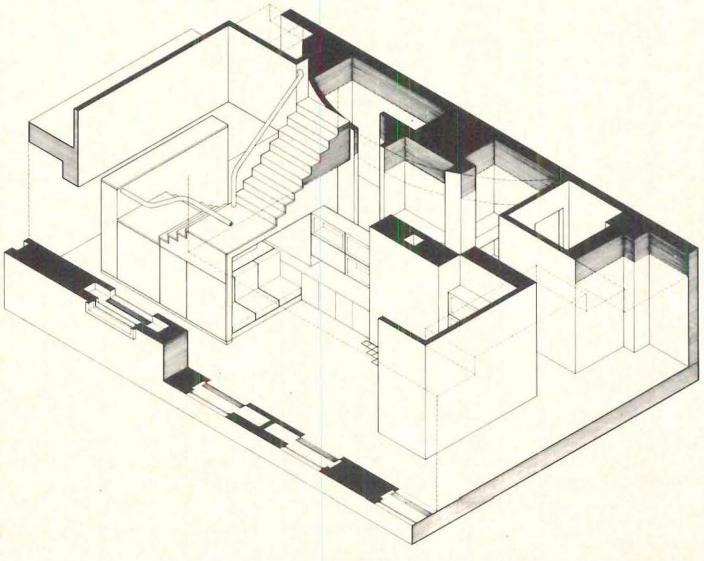


Photo: Maris/Semel

Photo: Ed Stoecklein

Photo: Ed Stoecklein



In another duplex apartment, the stairwell is a large-scale enclosure, creating a small library with built-in seating and storage areas (above and left, top and bottom). Space flows in and around the stair providing continually changing vistas of the spaces to either side.

Low-rise, high-density

Alternative ideas for urban and suburban living have been developed by the New York State Urban Development Corporation and the Institute for Architecture and Urban Studies. An application of the new low-rise high-density prototype is under construction in Brooklyn, and a suburban plan is being studied for a Staten Island site

Since the end of World War II, public housing in the U. S. has generally followed—more often parodied—the example of the residential "tower in the park" established by Le Corbusier 50 years ago. Advanced building technologies had made it economically sound to stack repetitive floor upon repetitive floor, so the appeal of light, air and open space fostered this relatively inexpensive means of housing masses of people. But few could have foreseen the consequences of the large-scale application of this kind of housing. The projects offered little or no services or amenities of their own and seriously overburdened those that did exist. Out of scale and unrelated to everything around them, they did nothing to reinforce a community's physical, social and economic fabric; in fact, they became one of the most effective ways of destroying it.

What happened inside the projects is perhaps even more serious. Drawing on records opened to him by the New York City Housing Authority Police, Oscar Newman has shown in his book *Defensible Space* (excerpted in P/A, Oct. 1972, pp. 92-105) that there is a direct relationship between the height of public housing buildings and the amount of crime and vandalism they engender. As the buildings go higher, the amount of crime occurring in lobbies, public corridors and stairs, and especially in elevators, increases proportionately. Everybody loses, and the picture of the high-rise ghetto that can be found in most American cities is complete.

An alternative

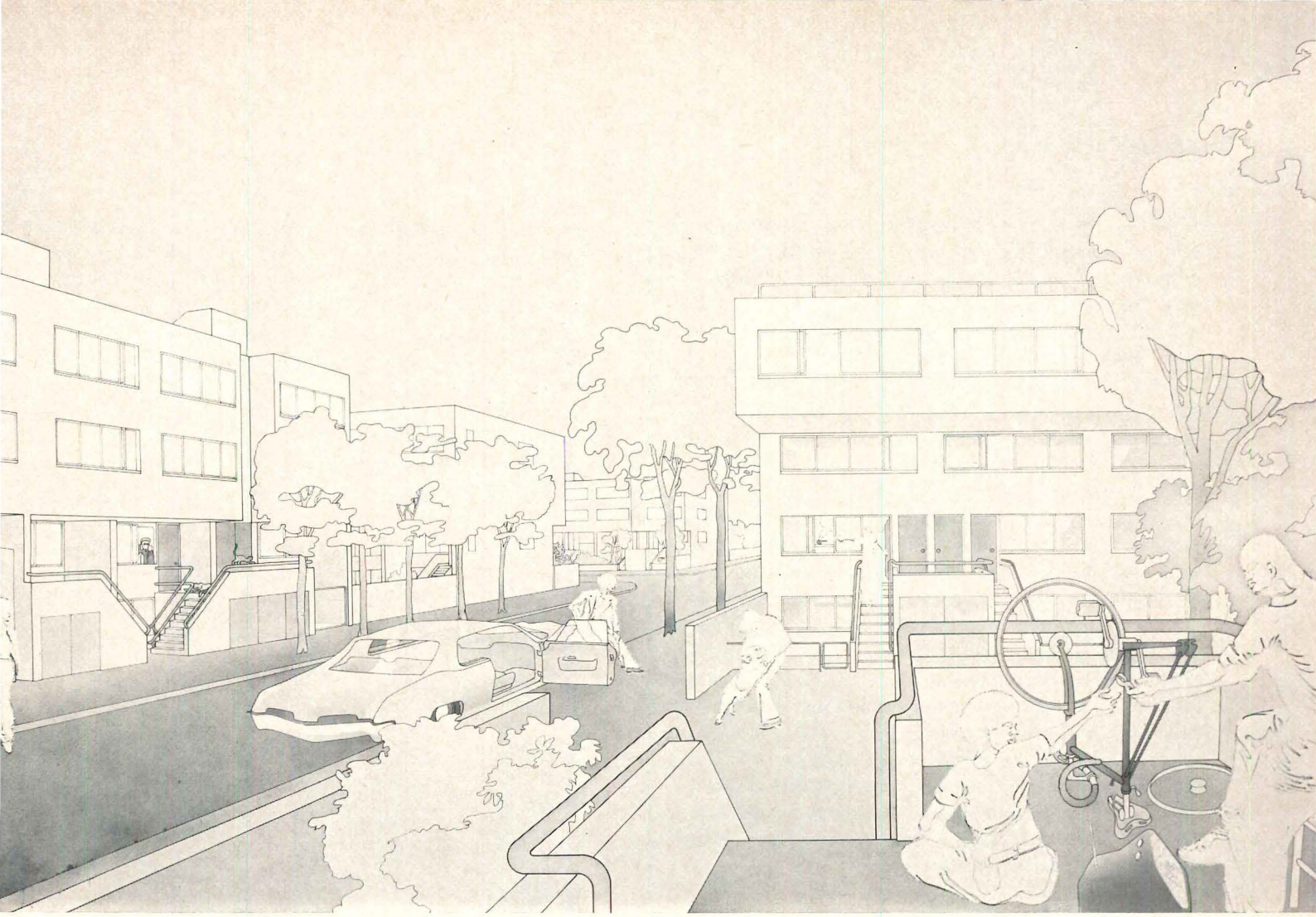
Recognizing the seriousness of these problems, the New York State Urban Development Corporation almost two years ago initiated an ongoing program to analyze their own projects after occupancy. One invaluable step was to have UDC staff members, including top echelon, live for periods in their own and other projects. Drawing on this experience, along with other studies dealing with the psychological, economic, legal and social aspects of housing and extensive user-need studies, UDC established its own criteria for housing.

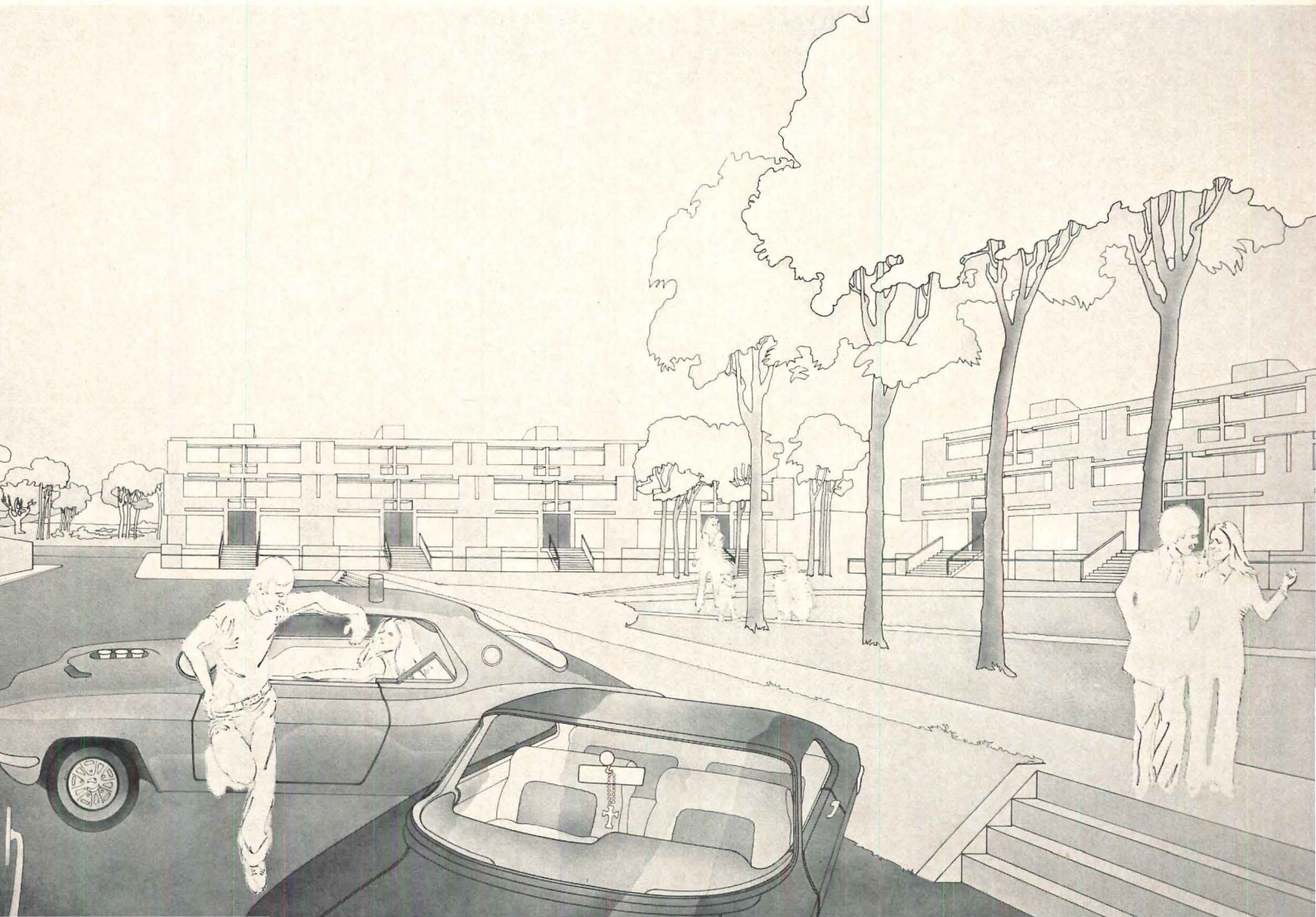
UDC's *Criteria for Housing* outlines requirements for the size (usually larger than FHA minimum), organization, arrangement and use of rooms. One section, for example, details the criteria for entry and exit to accommodate activities such as entering with groceries or wearing overclothes, children returning from school or going out to play, guests arriving or a stranger knocking. Another section considers the dining space, setting up guidelines for its size and location and discussing how and when it can be used for other or simultaneous uses.

In matters of site planning, the *Criteria for Housing* spells out not only the need, but the type, amount and appropriate locations of public facilities and amenities—things too often ignored or overlooked in public housing. One of the most important concepts it deals with, however, is that of Defined Territoriality, which is concerned with the problems inherent in large public housing projects: anonymous grounds belong to everyone and to no one; hundreds of people living along public corridors do not know their neighbors and fear anyone they encounter in halls; elevators become entrapments; stair wells become the haven of derelicts, addicts and pushers; mothers are afraid to allow their young children outside.

"What is needed in most site planning instances," the report notes, "is an unambiguous allocation of space for various activities and users. When clarity is lacking, conflicts occur." The report then defines four types of space: private, semi-private, semi-public and public, and shows how the idea of defined territoriality can be applied not only to exterior grounds, but to the interiors of building as well. It notes that "the problem in general is the improvement in clarity between public and private categories and the development of a more continuous gradation toward the privacy of the individual dwelling unit," and continues with the observation that "an objective of a successful design is the extension of the sphere

Working from an original prototype, IAUS designed applications of the low- and moderate-income family housing, as shown in Craig Hodgetts rendering (facing page). The dense, urban scheme designed for Brooklyn's Marcus Garvey Park Village (top) is under construction, while a suburban plan is currently under study for the Fox Hills section of Staten Island (bottom).





of safe feeling from the apartment out into the halls, lobbies and grounds of the development." Another important aspect of defined territoriality is that tenants are not considered passive. The concept assumes they will take an active part in maintaining space they feel proprietary toward, and also to assume an active role in protecting that space.

The UDC's housing criteria are now being applied to all of their multi-family high-rise building. Early indications from their five projects in Twin Parks section of the Bronx suggest promising results. Nevertheless, the UDC is now firmly convinced that even the most successful high-rise housing is simply not the best place for families. Parents still have no supervision over children playing outside, and although crime and vandalism may have been reduced, they can remain serious threats; and a large housing development can still overburden the facilities of a community that is unprepared for it. Consequently, the UDC has recently decided that whenever possible it would avoid building high-rise multi-family housing; it would direct its attention toward seeking a viable low-rise alternative to the problem of public family housing.

In pursuit of this alternative, the UDC entered into association with the Institute of Architecture and Urban Studies (IAUS), an independent, nonprofit research and educational institution in New York established six years ago to study the problems of urbanization and housing.

The prototype

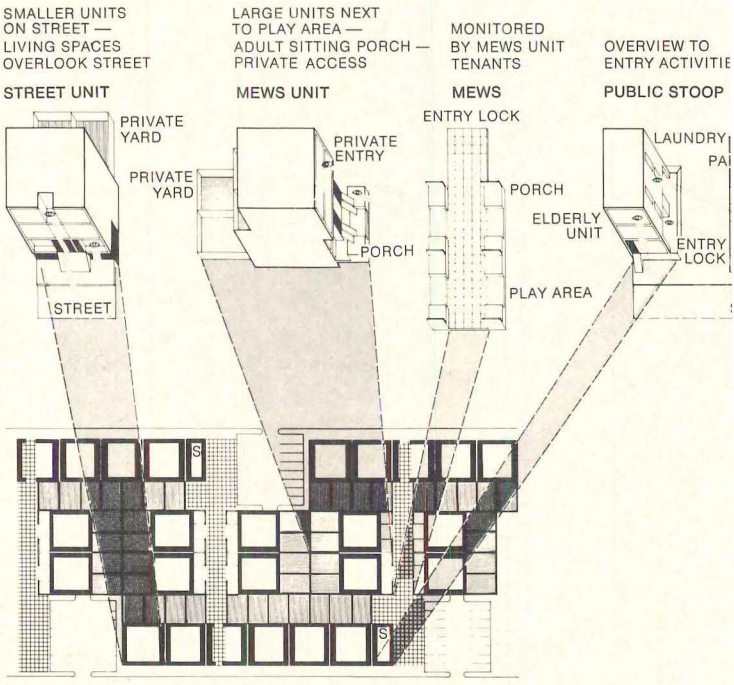
In defining the critical issues significant to public family housing, the UDC and the IAUS acknowledged that family housing must respond to, and visually project, a sense of privacy and territoriality, with special priority given to restoring a strong sense of identity to each family unit. At the same time, however, it was essential that the prototype be capable of organizations that could create and enhance a strong feeling of community and family life. And above all, it would have to be economically feasible, and not just another housing study to sit on the shelves.

The prototypical units that resulted are not the first low-rise high-density housing to be designed, but they do represent one of the first attempts at public housing in the U.S. where the main consideration has been directed toward housing families economically and humanely in a densely organized community free of fear. And it may turn out to be the first publicly assisted housing which, as UDC's Chief of Architecture Ted Liebman notes, will "demonstrate that the housing for low and moderate income families can be shown to be a community asset."

The prototypical units

An important consideration in designing the four-story prototypes was that all spaces and structures be clearly identified as private, semi-private, semi-public or public. Almost all units are given a private outdoor space, either a garden or a balcony. Outdoor public areas and porches are organized to provide control over who may and may not enter. Semi-public through-block passages are guarded by stoops and laundries at their entrances. In addition, each family dwelling is oriented so that a living space, either the living or dining space, is given a view to the street or to the private garden. This not only reinforces surveillance over the street, but it also ensures proper supervision of children and brings sunlight and cross ventilation to each dwelling. All entrances are private or semi-private and located directly on the street, clustered around a clearly identified semi-private porch, which provides a sense of privacy at that important junction.

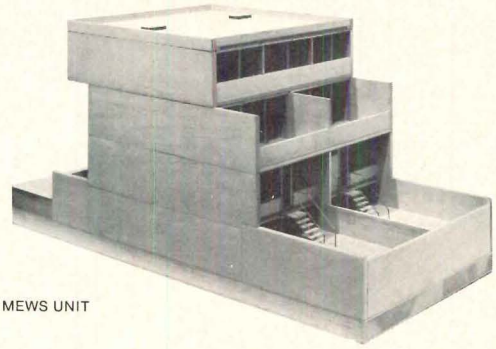
In plan, the units are organized to give much more flexibility of use than is often found in public housing. More than one completely separated living space is provided in most apartments, and where possible, bedrooms have been acoustically separated as much as possible from living areas by halls or



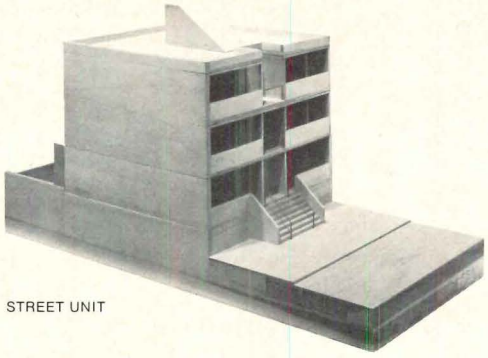
baths or by their location on another level.

There are two basic unit types: a mews unit and a street unit, each 39 feet square. In a typical block, street units line up on the perimeter, while mews units in the block center are reached by controlled access, semi-public passages. Each unit is depressed four feet into the ground so there is only a two-and-a-half level rise to the top floor apartments. Having all units depressed and all entrances on the street limits the number and height of interior stairs and completely eliminates interior corridors.

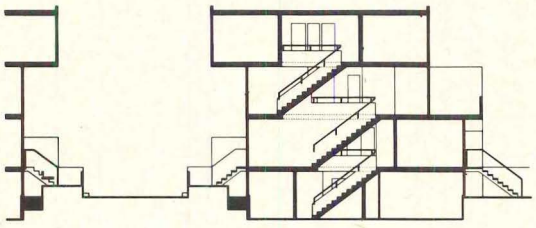
Each mews unit consists of three three-bedroom duplexes and one four-bedroom duplex, while the street units typically consist of a two- and a three-bedroom duplex, with two two-bedroom flats and two one-bedroom flats on the upper two floors. The flats are reached by a central semi-private stair that works on a scissor principle to provide an alternative means of escape to the street. Because the emphasis is placed on large families, 80 percent of the apartments contain two or more bedrooms. Another important aspect of the design is that with only minor adjustments, the prototypes can be applied with equal ease to both urban and suburban situations. At present, an urban application is under construction in Ocean-Hill-Brownsville, Brooklyn, and a suburban application is being studied for Staten Island.



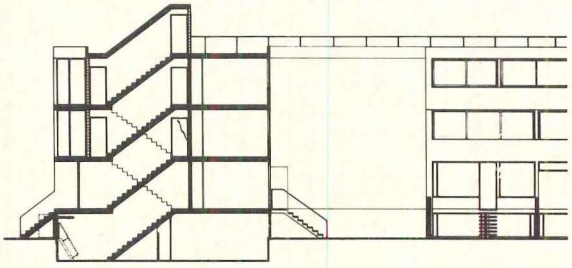
MEWS UNIT

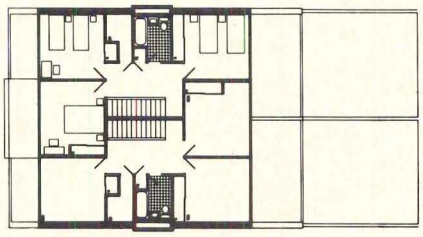


STREET UNIT

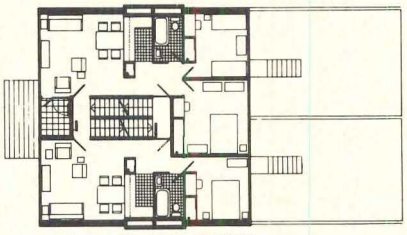


SECTION

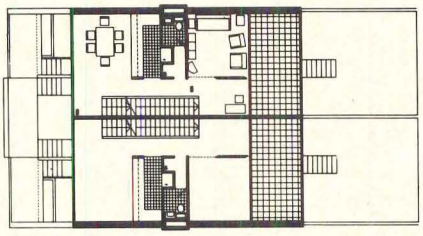




THIRD FLOOR

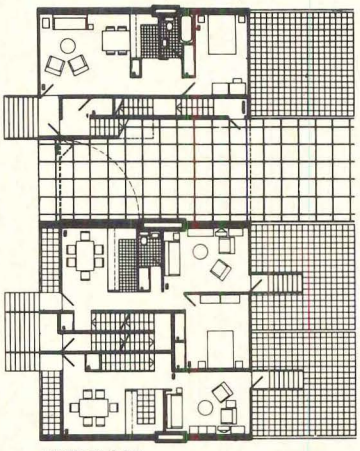


SECOND AND THIRD FLOORS

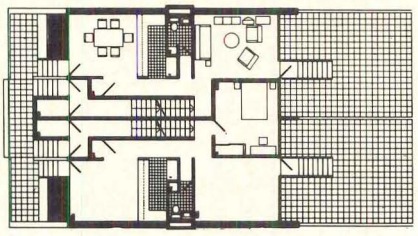


SECOND FLOOR

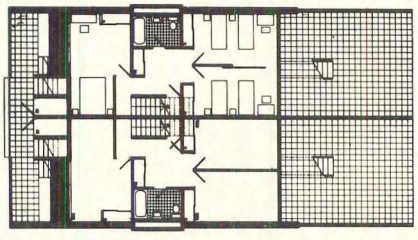
ATYPICAL FIRST FLOOR 1-BR APT



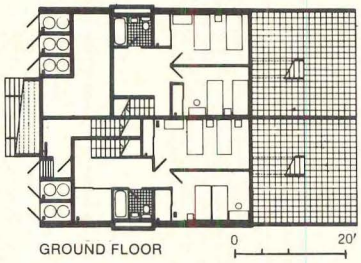
FIRST FLOOR



FIRST FLOOR



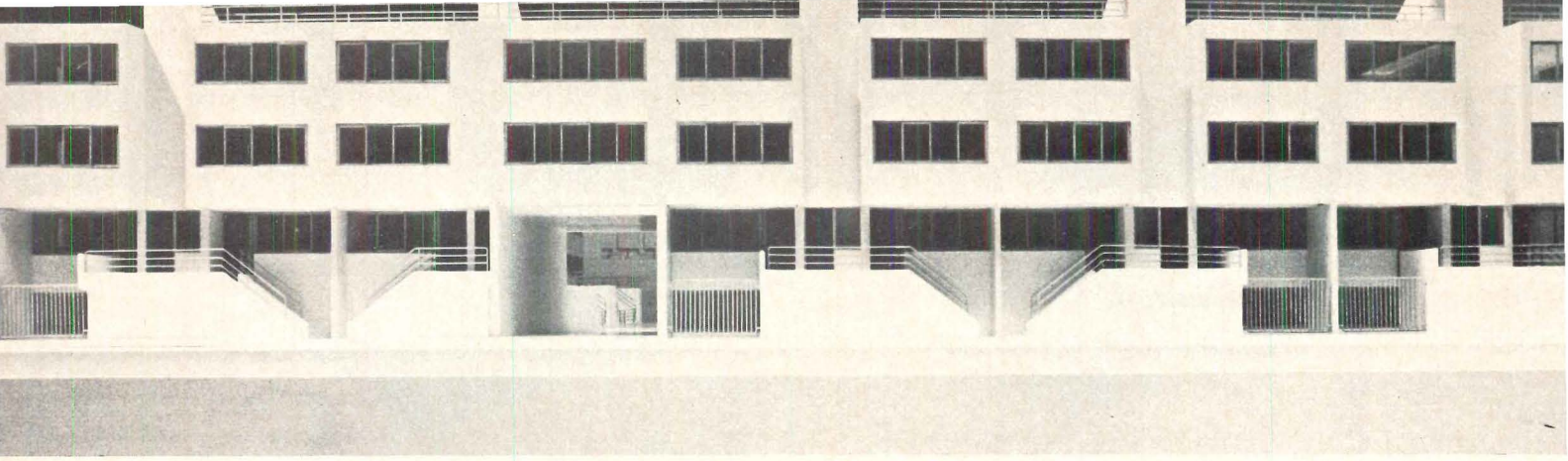
GROUND FLOOR



GROUND FLOOR

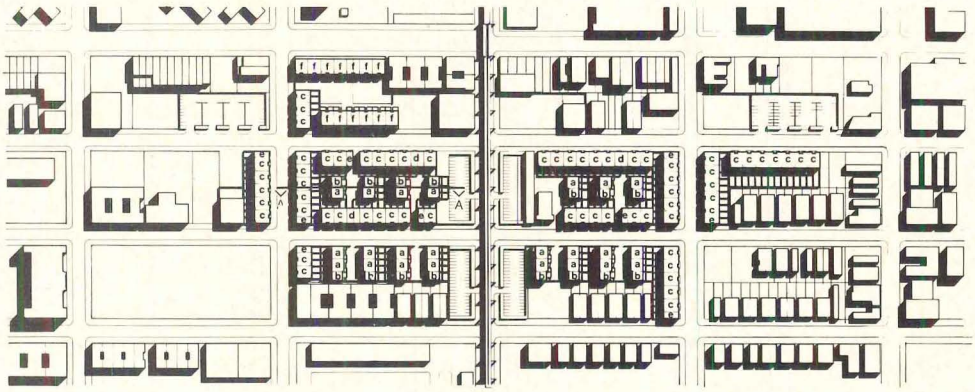
0 20'

The four main units of the prototype consist of the street unit, the mews unit, the mews itself and the public stoop in relation to the inset parking (facing page). Plans (above) show that each mews unit contains two upper and two lower duplexes, giving a total of three three-bedroom apartments and one four-bedroom apartment; street unit contains a two- and a three-bedroom duplex on lower floors, two one-bedroom apartments and two two-bedroom apartments on the upper floors. For purposes of security, all apartments have private or semi-private entrances at street level.



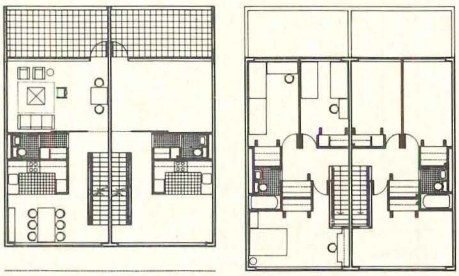
Street units showing through-block entry to mews units.

Low-rise, high-density



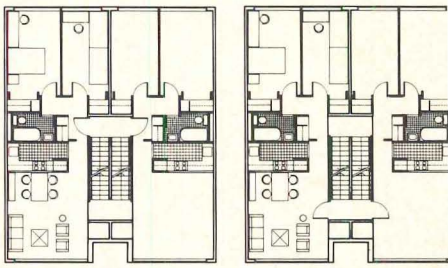
SITE PLAN, INDICATING
TYPICAL BLOCK SECTION A A

0 300′



SECOND FLOOR

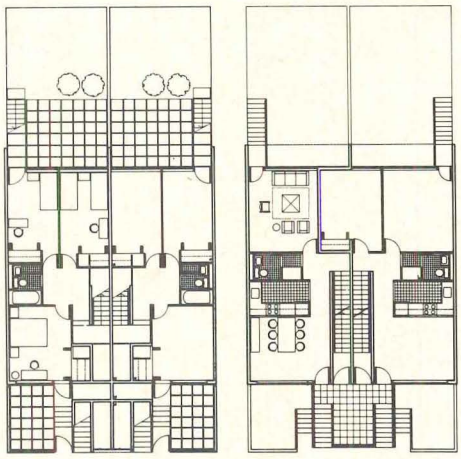
THIRD FLOOR



SECOND FLOOR

THIRD FLOOR

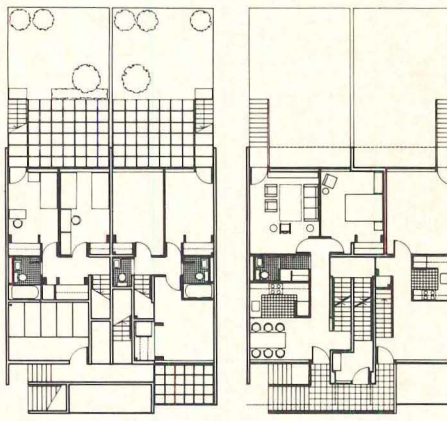
For Marcus Garvey Park Village in Brooklyn, two types of mews units and four types of street units were designed; the most common of each unit type is shown. In actual application the arrangement of units was modified to accommodate site characteristics, which forced a tighter arrangement. Minimal outdoor play area is compensated for by a park adjacent to site.



GROUND FLOOR

FIRST FLOOR

A-TYPE MEWS UNIT PLANS

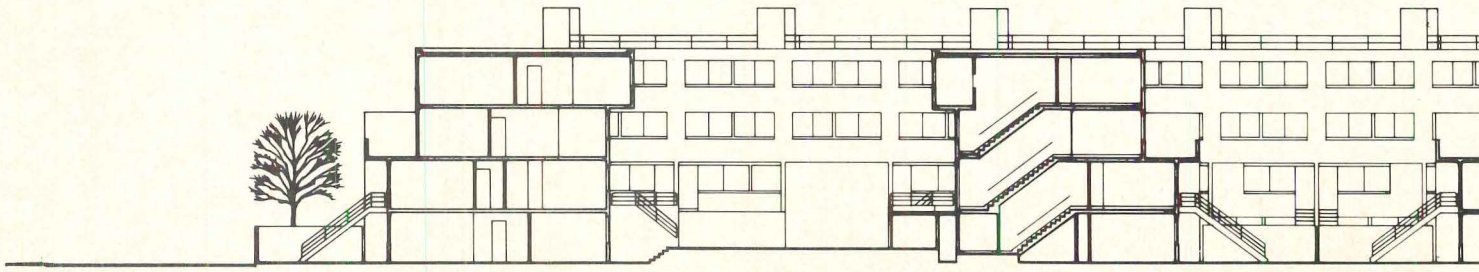


GROUND FLOOR

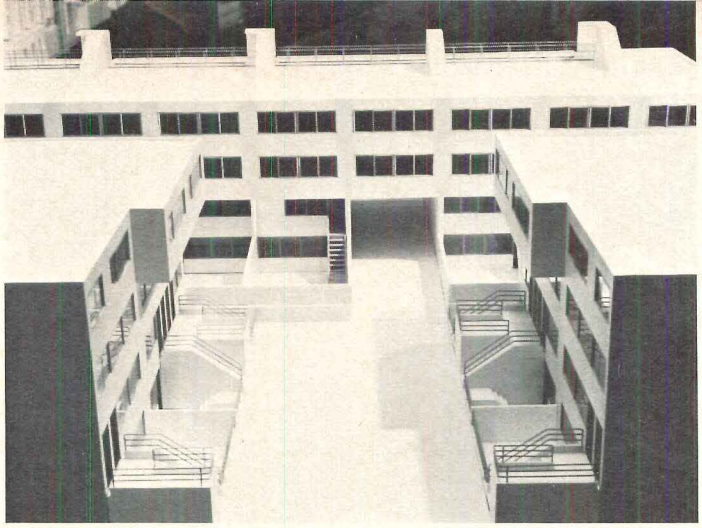
FIRST FLOOR

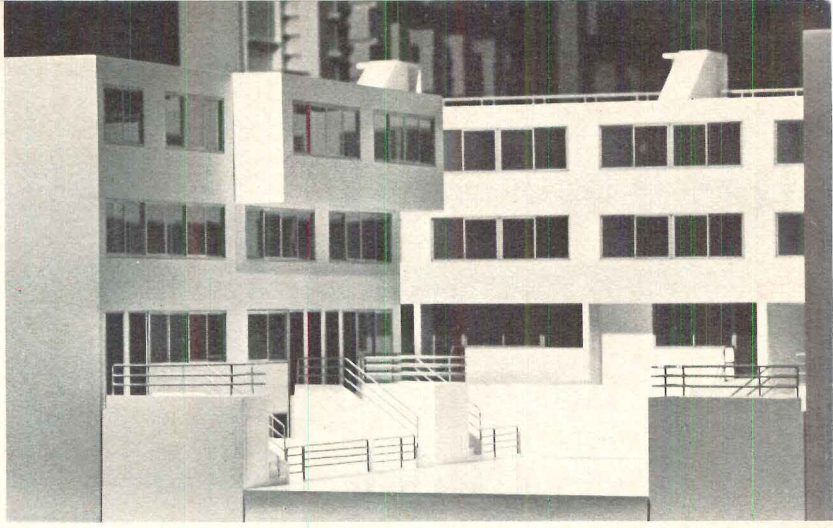
C-TYPE STREET UNIT PLANS

0 20′



TYPICAL BLOCK SECTION A A





Mews spaces looking toward the back of street units.

Marcus Garvey Park Village, Brooklyn

The Brooklyn site, in one of New York's most troubled urban areas, comprises roughly 12 acres within the Marcus Garvey Park Village, a Title 1 Urban Renewal project. The land is flat and largely vacant, but some existing housing and other facilities had to be taken into account in applying the prototype to the site.

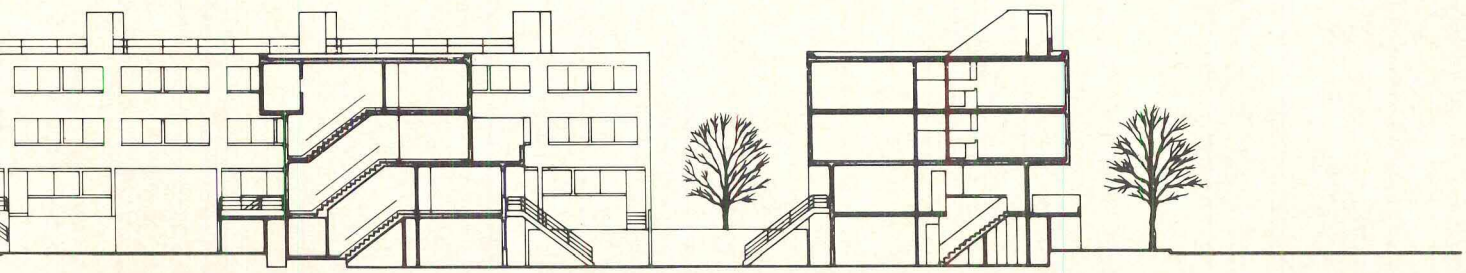
The site-planning principle whereby street units form an enclosure around the private yards and mews units could not be strictly followed because of existing structures on halves of some blocks. In these cases, the most economical arrangement was to organize rows of mews units, flanking protected off-street cul-de-sacs, perpendicular to the street. In addition, an elevated subway track that divides the site had a serious effect on the parking arrangement. In the prototype plan, parking was either clustered throughout the blocks or given a chevron arrangement on through-block streets so that it was never more than 100 ft from the dwelling units. But in Brooklyn, the renewal plan required housing to be 100 ft away from the tracks on each side, so this otherwise unusable 200-ft-wide strip was developed for parking. Areas that normally would have been for parking are now occupied by housing, causing a tighter arrangement than preferred.

There is a total of 626 units, yielding an overall density of about 50 per acre; 540 have two bedrooms or more, while 248 (almost 40 percent) are larger family units of three, four or five bedrooms, the latter especially developed to meet the needs of this particular site. All of these larger units are either only a half or one-and-a-half floors above grade, with private gardens or balconies and private entrances directly on the street. The remaining 86 apartments are one-bedroom or one-room units, some of which are at grade for use by the handicapped. The development also includes a 5000-sq-ft community center, a 12,000-sq-ft day care center, 8000 sq ft of commercial space on a perimeter shopping street, 300 parking spaces.

In addition to altering the configuration of the units to fit the site, some changes were necessary in the units themselves. The continuous bands of windows shown in the prototypes were not permitted by the New York State fire codes and the windows are now smaller. Exterior stairs of the street units could not, in all cases, project onto the street, so they were turned parallel to the units. The budget eliminated balconies on the smaller family apartments occupying the upper levels of the street units. But the major change affected half of all the units, and it is an experimental change that will be monitored after occupancy to learn more about living preferences.

In the prototypical units all sleeping areas in the larger family duplexes are on the ground floor. This arrangement required one to go up only half a flight from the sleeping areas or down half a flight from the living areas to the garden. But in the Brooklyn application, 50 percent of these larger duplexes were altered to put the sleeping areas upstairs. In these units, the depressed living areas proved to be too deep into the ground, so all of the units in the entire development were brought out of the ground and are now depressed only a third of a level. To bring adequate light to the lower level, all of the gardens have been excavated to the same level. Now the lower level, whether for sleeping or living, is at garden grade, but the upper level is a full flight away.

In the actual application of the prototype, changes caused by site conditions, stringent economic controls (the units will cost a low, by New York standards, $31,200 each), building and fire codes somewhat weaken the scheme in terms of its overall organization, as well as in some specific architectural treatments. But the prototype is, after all, just that—a prototype representing the ideal possible within a prescribed, although generalized context. Brooklyn is real, though, and the success of the scheme might most accurately be judged by the capability of the prototype to accommodate itself easily to real situations. And because of the experimental nature of the development, judgment of it probably should be deferred until after it has been completed and occupied, when critical analysis could be of greater value.



MEWS UNIT STREET UNIT

Low-rise, high-density

Fox Hills, Staten Island

Because the prototype must also be capable of application to suburban situations, the UDC and IAUS are studying a site on Staten Island. Fox Hills was once a large estate and country club, but its 61 acres have become caught up in the pressures of urbanization. Large residential towers and uncontrolled single-family housing developments have spread over the island, overburdening its facilities while adding few new ones, resulting in an overall deterioration in the quality of life.

On 9.8 acres of the Fox Hills site, a proposed plan is basically organized around the same criteria as those of the Brooklyn scheme. It calls for the development of a strong sense of community, for the identification of individual dwellings, and for a hierarchy of space that would lend itself to adequate surveillance, protection and maintenance. At a density of just over 31 units per acre (which *is* dense by suburban standards, and which could easily be increased by 25 percent through a different arrangement of units and in the reduction of the more than 100 percent on-site parking), this plan attempts to give all the satisfactions of surburban living at a substantial density, while also providing amenities not possible in typical high-rise construction.

Two types of four-story buildings, called cluster units and stepped-row units, share an "open cluster" arrangement where dwellings, open green spaces and parking areas are integrated, each reinforcing the other for the benefit of the whole community. Dwellings are arranged to overlook, and in a way to embrace, the public greens and the off-street parking areas so that anonymous or unassigned space is brought to an absolute minimum.

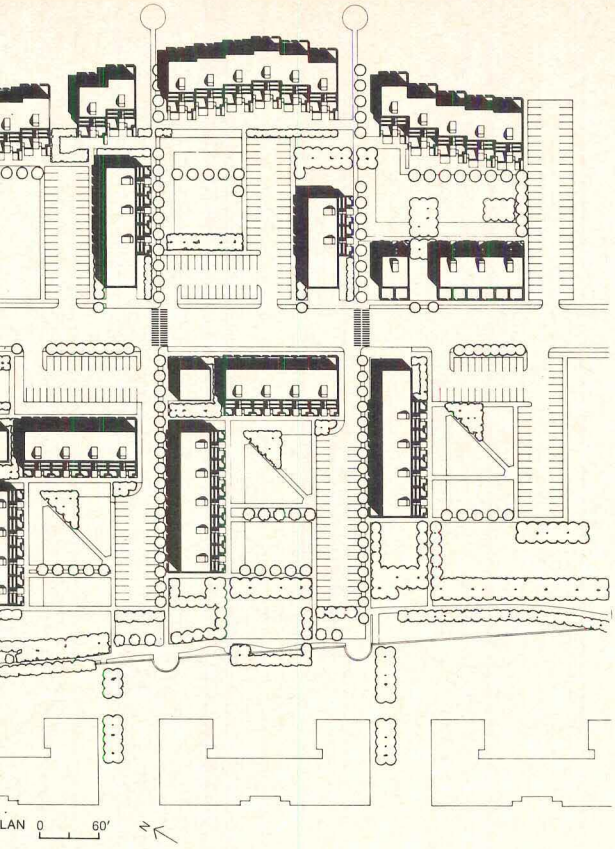
In this scheme, every unit has some private open space. All ground floor apartments and duplexes have private gardens in the rear, while all other apartments have private terraces facing the public green. Throughout the development, all entrances, which, as in the Brooklyn plan, are either private or semi-private, are on a front stoop facing the public green. A specially landscaped children's play area is between the stoop and the green. Out of the total 324 units, which are planned to be either sold as cooperatives, purchased or rented, there are 92 one-bedroom units, 188 two-bedroom units and 44 three-bedroom units, working out almost exactly to the desired 25-60-15 percent mix.

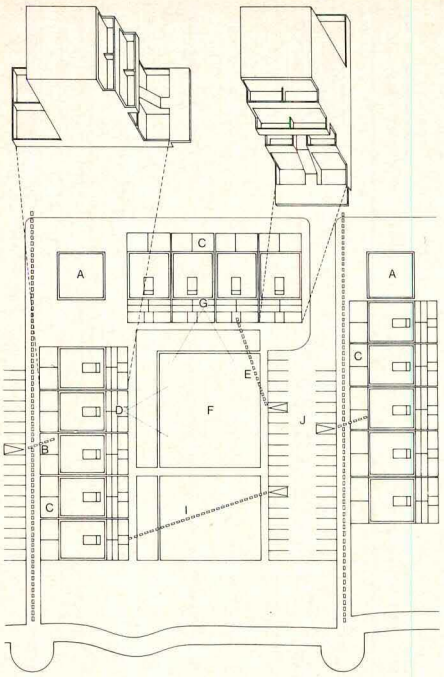
Because Fox Hills is being studied as a means of reinforcing the suburban character of an area where public transportation hardly exists or is likely to in the the near future, the automobile has not only been acknowledged, but its accommodation has become an integral aspect of the overall scheme. No unit is more than 200 feet from its parking space, and tenants, who must traverse the green to go from one to the other, bring an important level of activity to the green to ensure its continuous monitoring.

While the plan is still only in the study stage, its future possible application could illustrate a viable alternative to the more common, haphazard suburban development. It could point a direction toward variety and diversity of suburban living. While recognizing the realities of that lifestyle, its organization around controlled, public open spaces could provide valuable insight into the means of establishing an important sense of community and identity for suburban life. [DM]

Credits

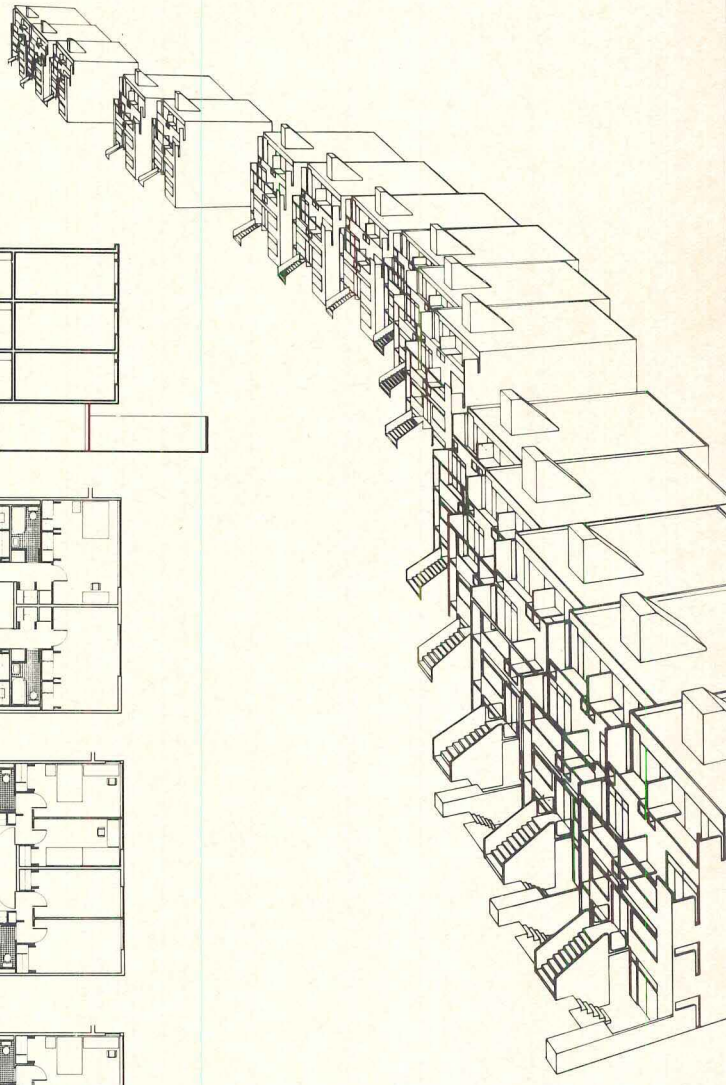
Low-rise high-density prototype.
Architects and planners: The Institute for Architecture and Urban Studies, Kenneth Frampton, Peter Wolf; The New York State Urban Development Corporation, Theodore Liebman, Anthony Pangaro, J. M. Kirkland.
Marcus Garvey Park Village, Brooklyn, New York.
Architects: The Institute for Architecture and Urban Studies, Arthur Baker, Kenneth Frampton and Peter Wolf, with assistants George Snead, Richard Dean and Richard Wolkowitz.
Consultants: David Todd & Associates, associate architect; Lehr Associates, mechanical engineer; Lev Zetlin & Associates, structural engineer; Finley & Madison Associates, associate structural engineer; Falk Associates, cost consultant; Peter G. Rolland & Associates, landscape consultant.
Fox Hills, Staten Island, New York.
Architects: The Institute for Architecture and Urban Studies, Arthur Baker, Peter Eisenman and Peter Wolf, with assistants Robert J. Serry, Margaret Deamer and Randall Korman.
Photos: George Cserna; except pp 60 and 61, Dorothy Alexander.

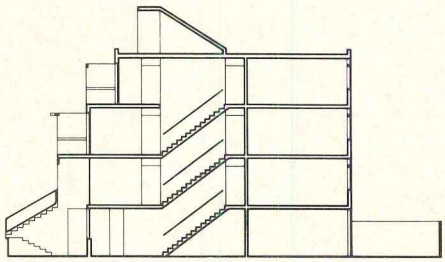




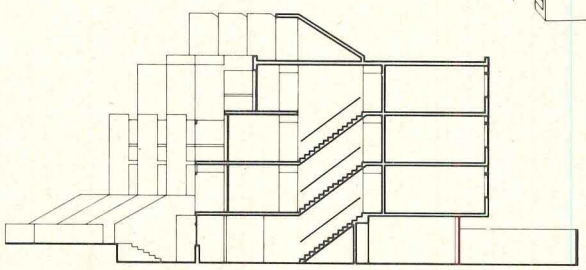
Legend

A Day care and community facility
B Rear access to ground floor duplex
C Private open space
D Stoop, monitoring green and tot log
E Easy access to parking, view of car
F Public green
G Private open space balcony
H Access to pedestrian greenway
I Access to dwelling, activates public green
J Parking lot serves both clusters

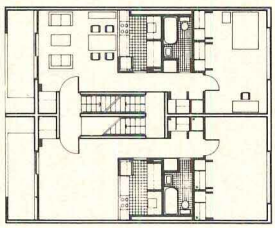




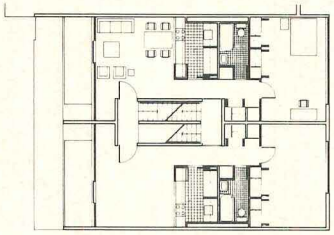
CLUSTER UNIT



STEPPED ROW UNIT



THIRD FLOOR



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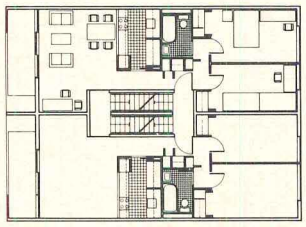
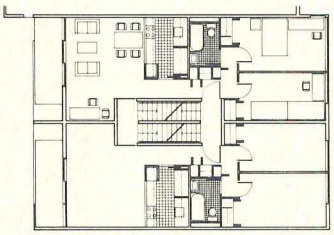


SECOND FLOOR



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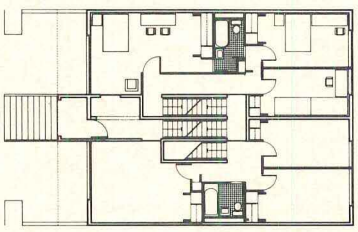
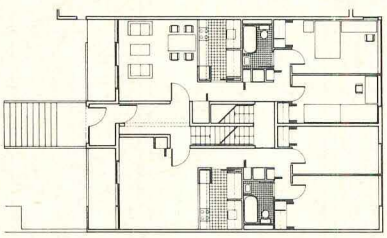
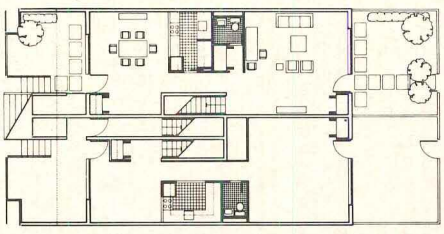
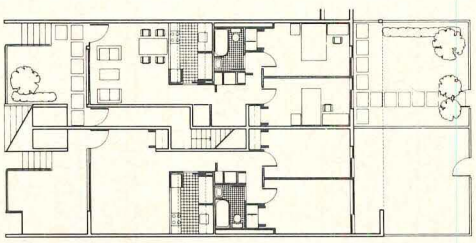


FIRST FLOOR

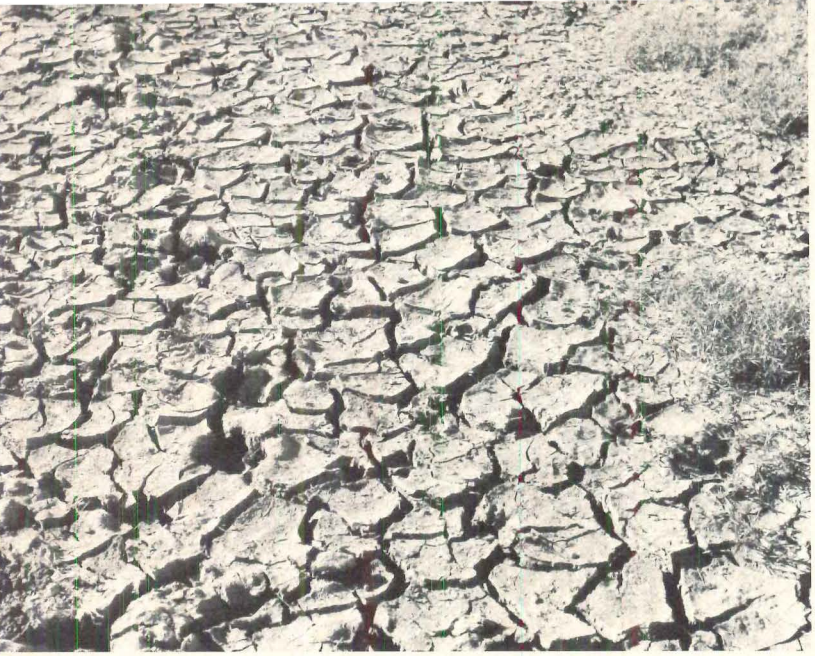


FIRST FLOOR





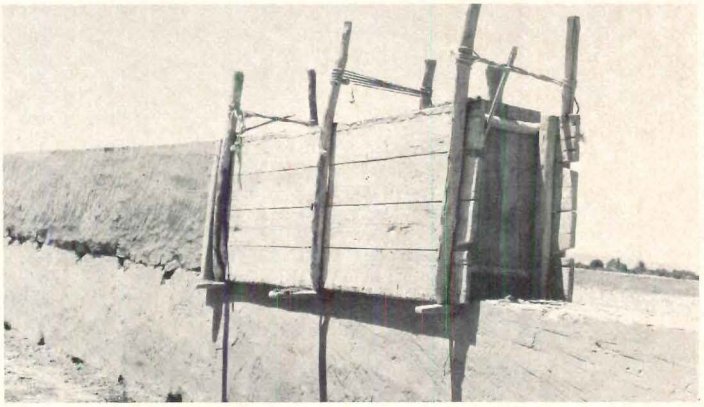
In the suburban Staten Island plan, the prototype is developed into cluster and stepped-row units which are disposed in a less dense arrangement than at Brooklyn; here, the automobile is necessarily taken into account, and becomes an integral part of the overall scheme.



The ultimate system

Dust to dust

Richard Bender



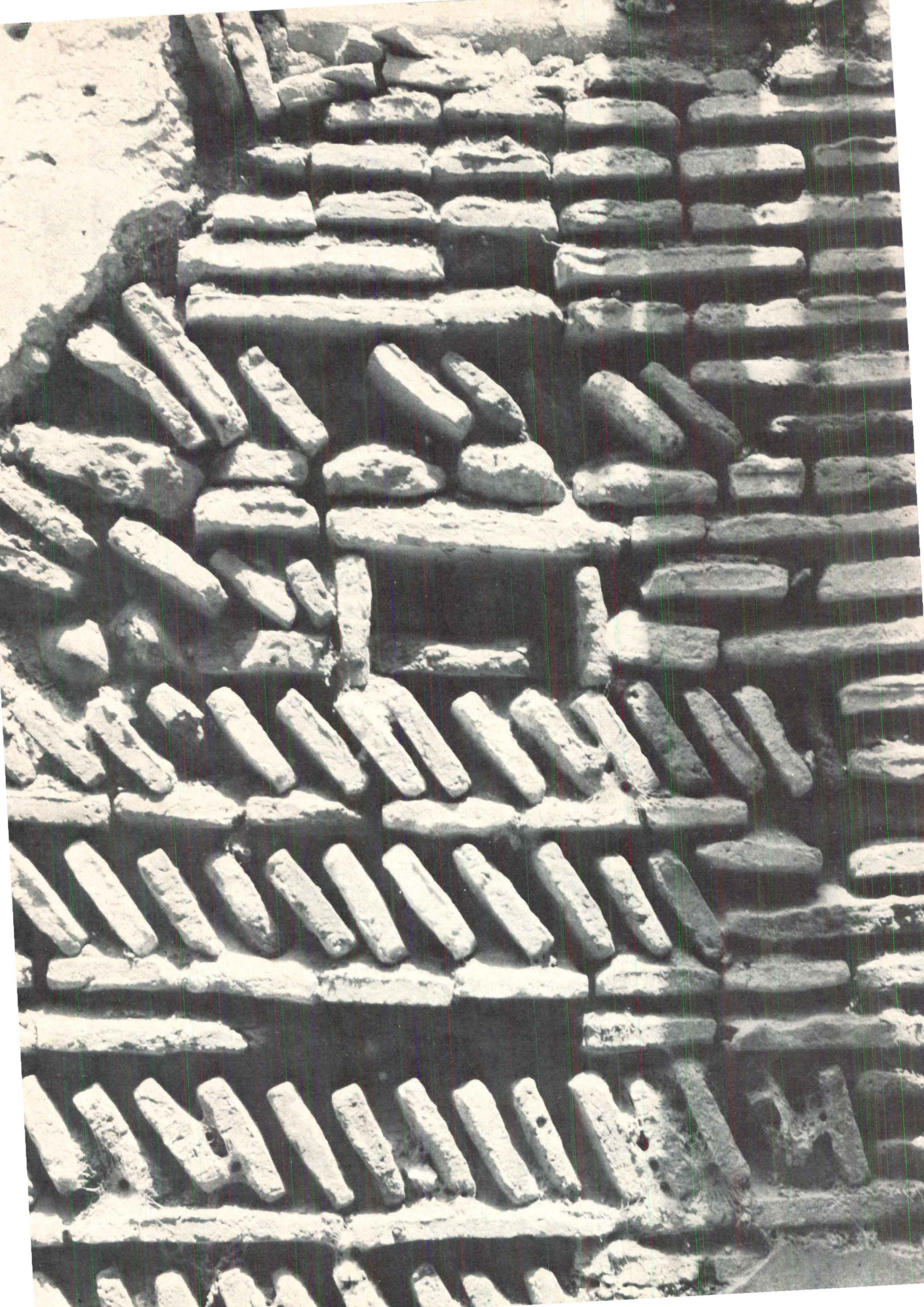
Visiting Morocco, the author saw traditional village buildings and construction methods, not as curious relics, but as a system that suggests performance characteristics for the next stage in the industrialization of building.

In most of the world today, building has moved from the harmony and richness of village forms to the rigid forms produced by a "building industry." Two major problems have appeared. Specialists have come between people and the buildings they want, and the building process has become increasingly wasteful of material resources and human energy. Perhaps the weakness of our planning for a future building industry lies in the acceptance of these forces as necessary elements of an advanced technology. But specialization and waste are not the elements of a truly advanced technology. They represent a narrow, linear phase we must pass through on our way from one cycle of diversity to the next.

What is an alternative to the present, popular image of an industrialized building process? Consider the techniques used to construct the houses, kasbahs and ksars of Morocco's pre-Sahara oases.

This traditional building process is a model of a system in

Author: Richard Bender is a professor of architecture at the University of California, Berkeley. A juror for the 1972 P/A design Awards program, he is also principal in a consulting practice in architecture, engineering and building technology.



balance. It uses inexpensive, widely available materials in techniques easily manipulated by anyone interested in building. It produces homes and communities which grow, change and answer the demands of an extreme climate.

The key ingredient is mud. In some areas, mud bricks are formed, set out in the sun to dry, and then laid up into walls. In others, a boxlike wooden form is fixed on the wall, filled with clay and tamped until it is set. The form is then moved to the next location, leaving a massive section of wall in place. The characteristic series of holes are formed by the cross-ties set across the bottom of the form. Straw is often used to provide tensile strength, tree limbs and an occasional board are used as lintels over the narrow, deep openings and the finished construction is almost always plastered with mud.

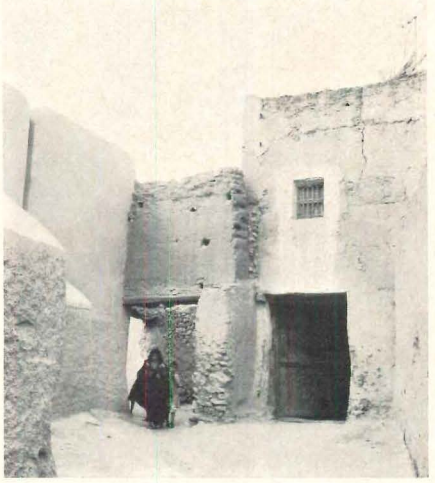
The forms are massive but gentle; roughly textured but often softly rounded. The walls weather and wear quickly as the desert sun scorches the mud and dries it to dust. The structures fit the land, seeming to have been a part of it since the creation. Their rich and rambling forms suggest abandoned cities of some ancient empire. So it comes as a surprise to the casual visitor to find that these are living communities, not ancient ruins. One reason for this feeling is a sense of emptiness, as Moslem tradition keeps the women inside the home for most of the day. As the sun heats the walls, domestic life moves into the cool interiors. At night, as the desert air quickly cools, the walls give back their heat, warming the houses on cold nights and bringing life out onto the flat roofs on warm ones.

But the most forceful impression is one of age. The new construction weathers quickly to match the parched look of the old. As with other complex living organisms, the lives of the parts are shorter than that of the whole. Maintenance is a steady job. When the walls of a house dry and crack, the occupants mix a batch of mud and patch it. As the family grows, new rooms are added. Rectilinear forms and flat roofs invite addition. Houses grow out or up, within the framework of the community. Materials, techniques and tradition form broad limits for individual expression. These frameworks lead to quite different forms in Berber villages, kasbahs and ksars.

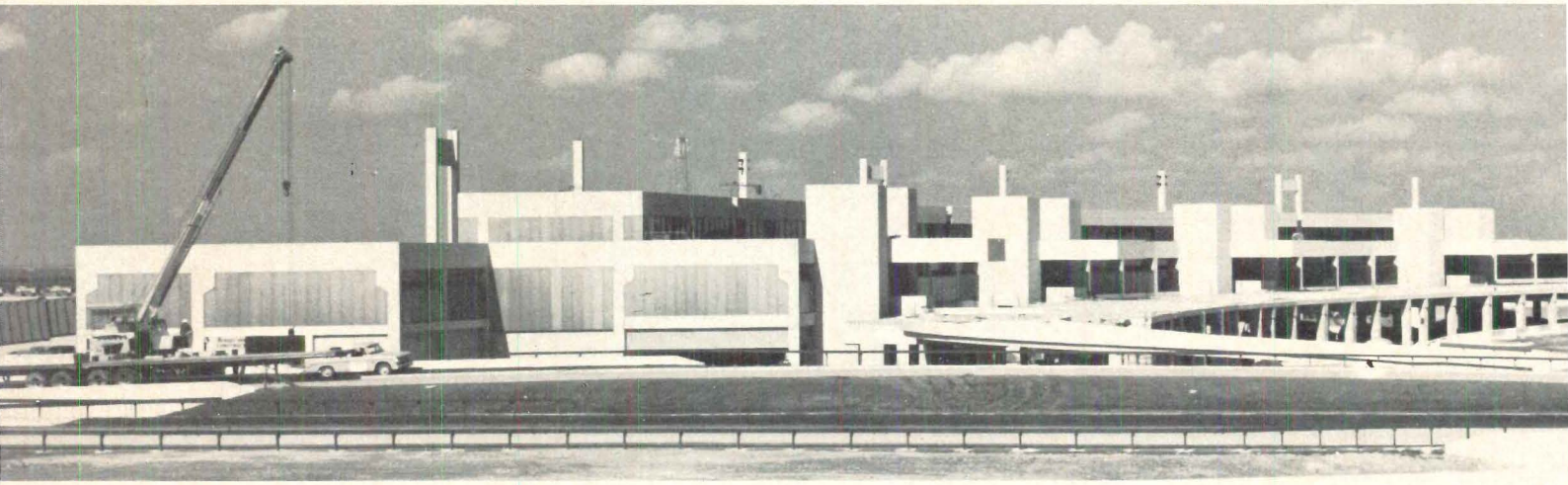
Without constant use and regular maintenance, the unused structure quickly crumbles. As its crust falls away, the sun, dry desert winds and occasional rain reshape the wall. Gradually it is pulled back to the land. As the living village grows out of the land, so abandoned structures return to it. The raw material for each generation of buildings is the dust of the last.

The traditional mud building technology of Morocco suggests a set of performance characteristics for the ultimate stage in the industrialization of building in our western world. There is a palette of inexpensive and widely available materials that can be recycled and re-used without creating junk, pollution or great quantities of energy loss. Available tools and techniques allow the user a role in creating, renovating and maintaining his community. A set of rules, some formal and others simply understood, fix limits, control scale and help to resolve the inevitable conflicts at the interface. Together, these form a framework of materials, techniques, support and service systems and procedures which bring harmony out of the richness and diversity of a large number of individual decisions. If there is a rub, it is felt and removed. Communication is direct, there is no need to develop construction documents, make user surveys or feedback mechanisms. The system is in balance.

Can a modern technology serve communities as well? Certainly mass production, the factory-built house and the housing project do not. We need a system which will help us to use new tools and techniques with sensitivity and sophistication. What form will it take? The answer to this question remains the major challenge for the next generation of architects.



A thrust towards 2001



What can be said about an airport already described as planned for 2001, biggest (larger than Manhattan), most automated, with the shortest walking distances, that promises to spur economic development of an entire region?

The world's newest air transportation colossus, the Dallas/Fort Worth Airport, was launched on the first day of autumn in lavish dedication ceremonies highlighted by the first U.S. appearance of the British-French Concorde SST. Opening the airport to passenger and freight operations, however, is being delayed until mid-January so that the airlines can properly finish their terminal interiors.

Heralded as the product of unprecedented cooperative effort between longtime municipal combatants Dallas and Fort Worth, the new superport is, in fact, an air transportation probe into the 21st Century. Initial cost of planning, design, construction and acquisition of the facility's 17,520 acres approaches a billion dollars. Some $700 million has probably been spent so far, and planned expansions reaching to the year 2001 will increase that amount severalfold. Another impressive statistic: passenger volume is expected to reach 16 million by 1975 and 30 million by 1985. Ultimately, 13 terminal buildings will handle more than two million travelers monthly.

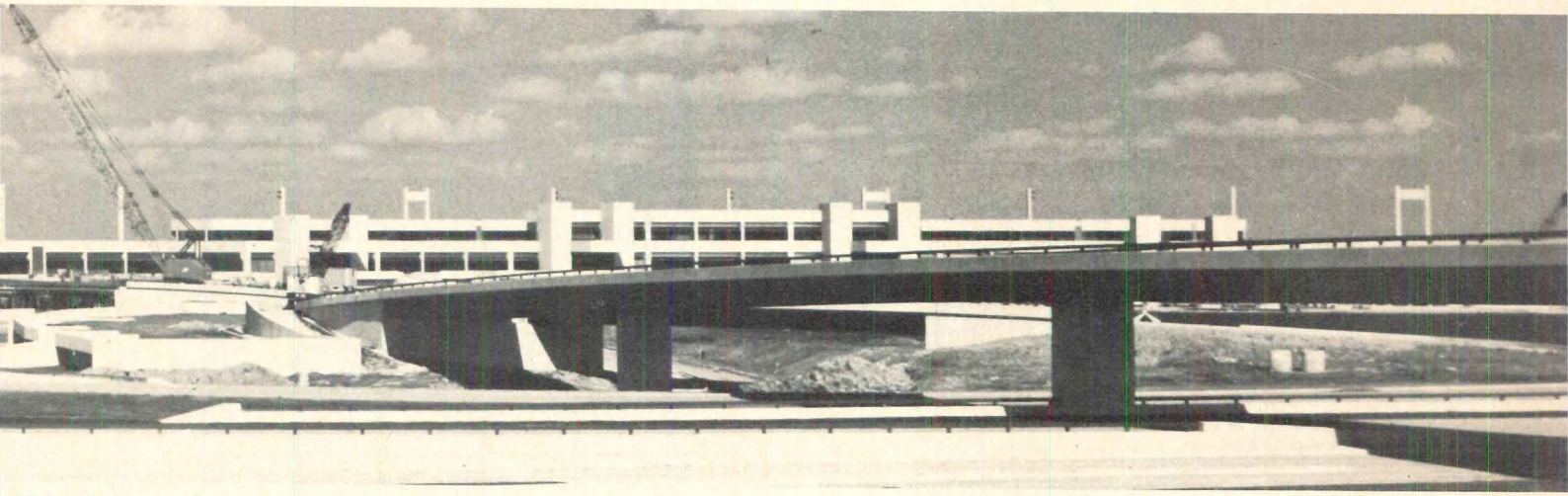
Architectural and engineering innovations were considered from the very outset, when Tippetts-Abbett-McCarthy-Stratton won the prime contract from the Airport Board. The list extends through 25 major systems and nearly 250 major subsystems for which TAMS, as planner, engineer and general consultant, was responsible. TAM's first approach was to plan a megastructure containing terminals along both sides and over a high-speed access road. Parking was to have been on the roofs and a shuttle train would move people and baggage from one end to another.

When the architects for the terminal itself were chosen—Hellmuth, Obata & Kassabaum and Brodsky, Hopf & Adler—Gyo Obata revamped the original scheme into a series of semi-circular terminals arranged on either side of the road. Parking is in the center of each terminal loop and an AIRTRANS people mover system is part of the road spine.

Conceived, planned, designed and placed under construction as the U.S. aerospace effort peaked, the DFW Airport is inextricably tied to the future of domestic and international air transport. Present runways are capable of handling two-million-pound aircraft—nearly three times the size of existing 747's—and are designed to be strengthened when aircraft not yet on the drawing boards reach 5 million pound loads.

First in the long list of DFW innovations is the large scale of the plan itself. Although begun in the 1960s, it was aimed directly at the 21st Century and manages to provide environmental compatability, airspace, airport, access highway and utilities capacities, plus design flexibility to accommodate

Photos (above and below): Alexandre Georges



Elaborate system of access roads at DFW brings passengers close to gates.
Supersonic British-French Concorde SST flew in for dedication ceremonies Sept. 22.

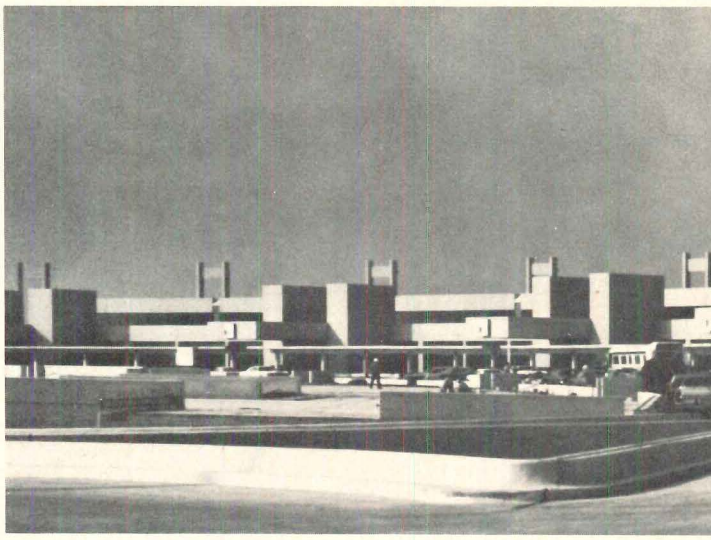
projected air traffic demand 30 years hence. Noise, for instance, was taken into account from the very first, and the size and shape of DFW, together with rigid zoning in nearby communities, will protect residents from objectionable airport noises. Gyo Obata's design concept—breaking up the terminals into semicircular, 18-gate units, yet keeping them linked as one super terminal—is another innovation. The high-speed transit system is not the first, nor is the automated baggage system, but these and other ideas have been carried further at DFW than anywhere else.

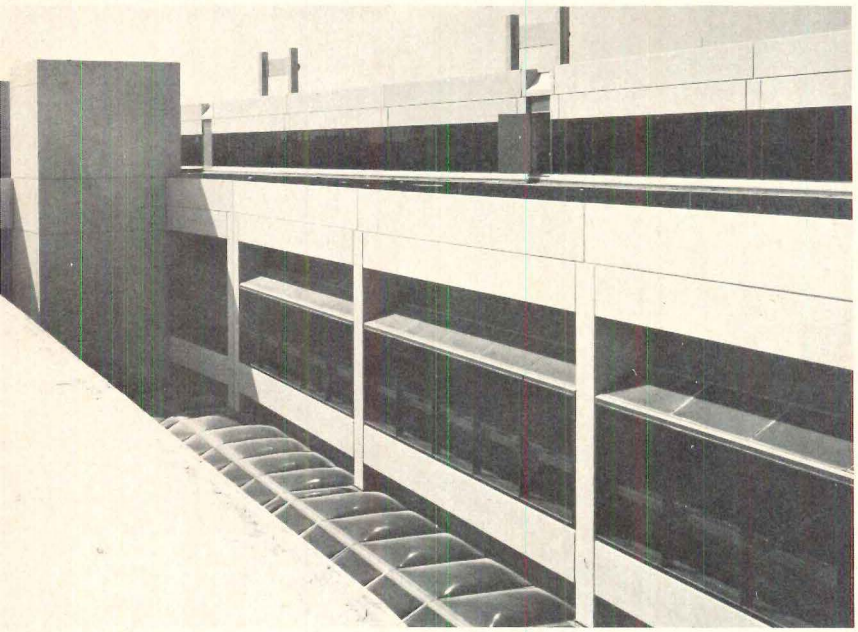
While passenger comfort and convenience have been major considerations in overall design, even more effort has gone into planning for long-term operation and expansion. Airport spokesmen illustrate this by citing the corrosion control and monitoring system instituted to assure uniformity for all construction contracts. The corrosion control criteria cover all airport facilities and include guidelines for paints and other protective coatings, cathodic protection systems, mechanical equipment, utilities, material selection, non-metallic materials, machine components and structural steel. The criteria, they say, will ensure operational continuity and safety, cut future expenses resulting from material deterioration, and help guarantee the design life of the facilities.

Another preoccupation with overall environmental considerations shows up in the emphasis placed on positive separation of fuel spillage from other effluent such as storm water and sanitary discharge. A separate system handles and treats the liquid waste from aircraft aprons before passing it into the regional sanitary sewage system, which in turn requires all waste to be biodegradable.

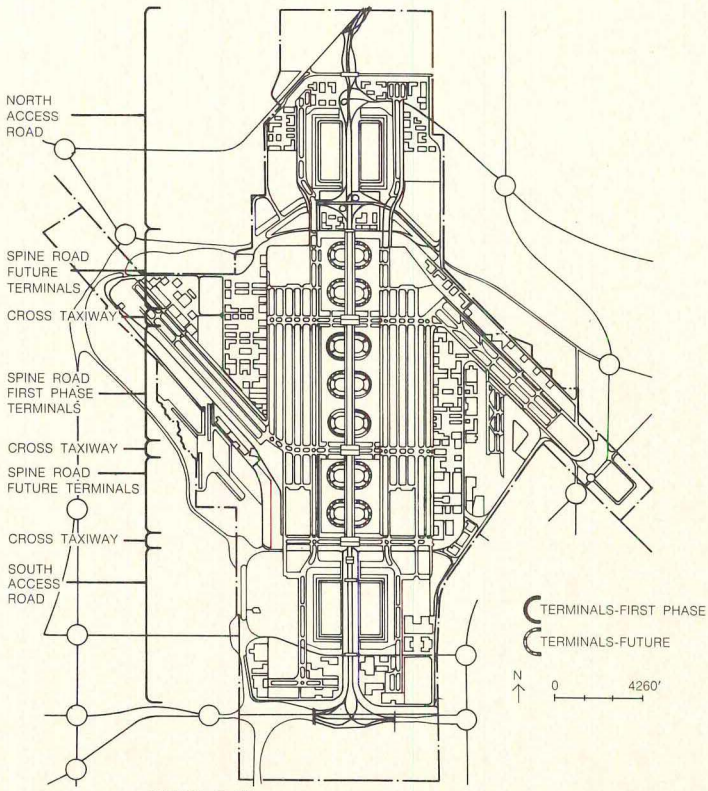
Impressive as the airport's immense materials quantities and general statistics are, the really significant architectural and engineering achievement is the successful coordination of frequently simultaneous activities of its 24 major consulting firms. Charged with overall responsibility, TAMS set up a computerized systems control program that cut 20 percent from the time usually needed to complete a project of this size.

Speaking for TAMS, Raymond J. Hodge, partner-in-charge, describes the airport as capable of "doing for Dallas/Fort Worth what the railroads did for Chicago." Even more important than the projected passenger statistics is the inclusion of 200 freight gates in the ultimate master plan. The freight, generated by what the officials predict as fast industrial development in the 1500-mile-diameter region, will be the indicator of such socioeconomic change. The most visible development so far, at least in newspaper advertising, are the residential developments springing up throughout the Dallas-Fort Worth-Denton triangle—every type from the comprehensive new town of Flower Mound to the townhouse-in-the-cow-pasture





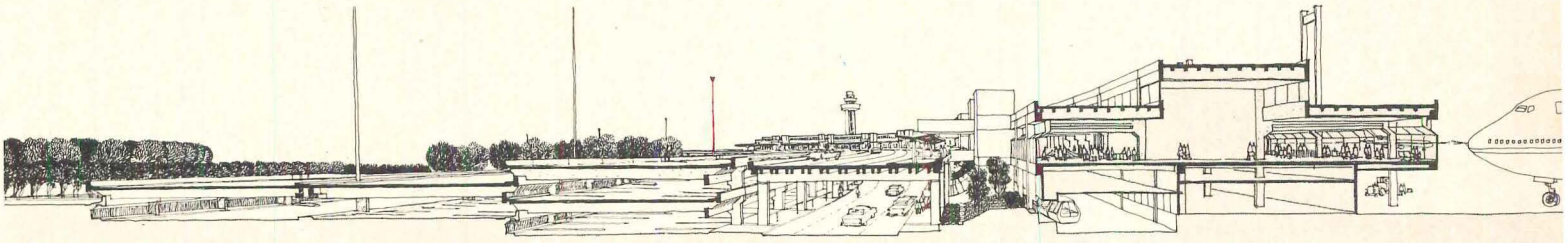
Plastic skylight (above) lets light into an AIRTRANS people mover station, one of many throughout the precast concrete complex. DFW won't be complete until 2001 (right) but terminals will be built to the same modular design. Plan and section on opposite page are typical.



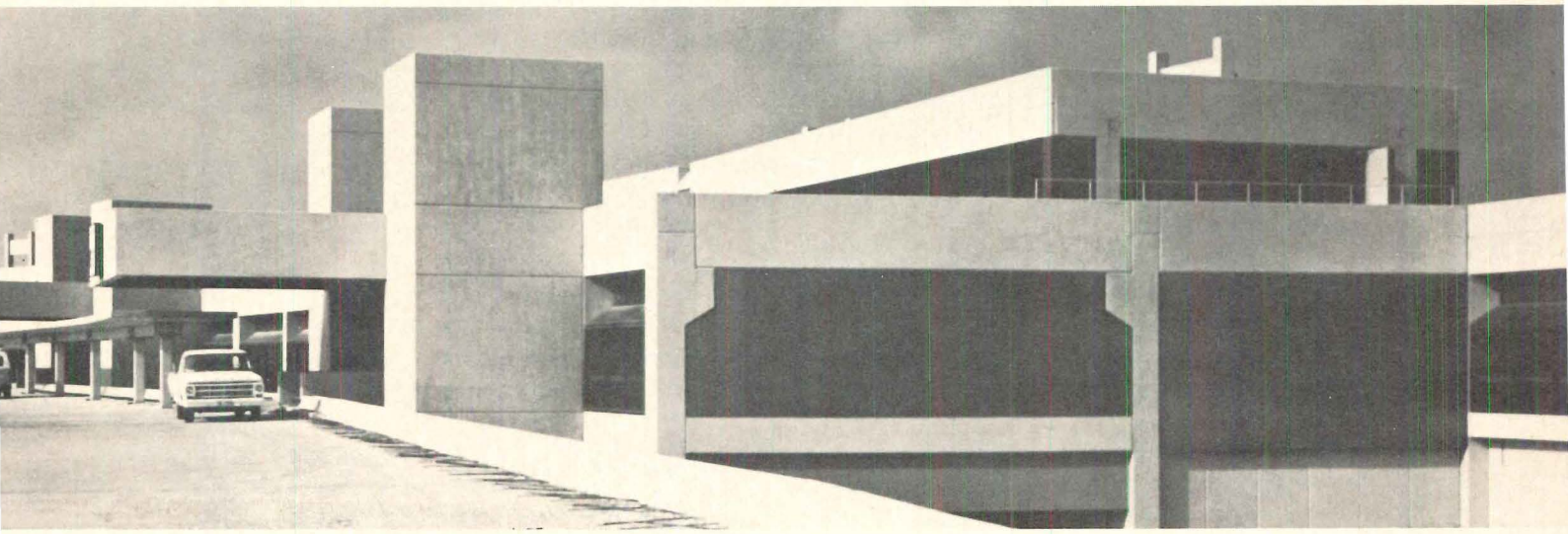
OVERALL PLAN

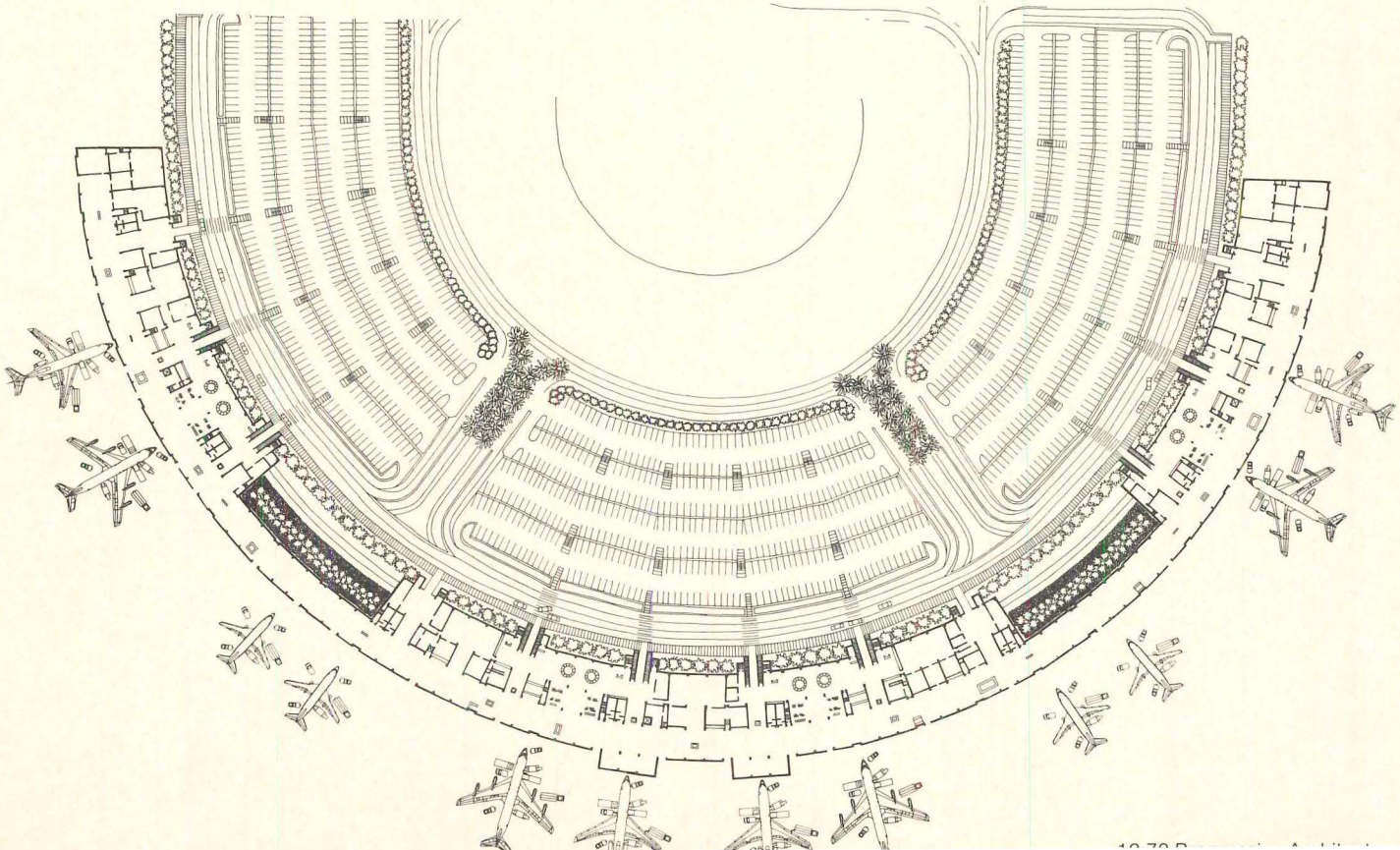
subdivision. Businessmen in the area, having designated it a "Metroplex," are out stumping the country, if not the world, to lure business and industry, offering the promise of direct air transport to anywhere.

This long-term development of DFW as the central force in a cooperative effort to alter the socioeconomic base of an entire region was the prime mandate handed veteran air transportation expert Thomas L. Sullivan, executive director of the Airport Board. He had built airports before—LaGuardia and Kennedy's International Terminal City—and had been supervisor of preliminary design for the new Newark Airport. But this was different—more like a script for the white-hatted stranger in the Technicolor epics, who is called upon to settle the wars between cattlemen and sheepmen while seeing to it



Photos: Barbara Martin, except where noted.





that the Town gets a new school, the Reverend, a new church and the Doctor, a new dispensary, but whose main task is helping the daughters of two prominent ranchers get their men. Translate that into cities, towns, local residents, businessmen, air-age enthusiasts and planners, architects, engineers, and contractors—local opinion is that Sullivan is indeed the Man in the White Hat.

It is, of course, too soon to predict how DFW is actually going to work. There are two potential weak spots: security checkpoints and at-terminal parking. When the airport was planned, highest priority was given to quick and open access to the planes; now the airlines must fit security checkpoints—not too much of a problem at finger-type airports—into their much more open-plan terminals. The second is the close-in parking itself, as the airlines cannot give much advance notice nor guarantee that a certain flight will depart from or arrive at a certain gate. In addition, the ramp lanes are very narrow; busses fill them curb to curb, and precision driving is required even in small cars. The narrow width, say the designers, was meant as a safety device to control speed, but will probably cause traffic problems such as those which developed during the opening ceremonies, when even the VIP's were stranded for hours at curbside, waiting for their cars to be brought around. Future passengers, however, won't have to cope with valet parking.

Even so, these seem to be minor matters to be solved, compared to the immense planning and engineering problems that have already been overcome. The eyes of Texas, as they say, are firmly fixed on the greener pastures of a busy and profitable expanded air age.

The airport and the architecture

In the burst of publicity surrounding the dedication of DFW, architecture almost takes a back seat. More important to the planners, airline passenger representatives and the freight dispatchers are the basic issues of devising and bringing into operational status an airport that is not only the largest (to date) but is designed to concepts that were far out in 1965 but now rate, at most, a "what else is new" comment.

When Tippetts-Abbett-McCarthy-Stratton (TAMS) first began designing DFW, they could envision millions of passengers, millions of pounds of baggage. They foresaw a 10-lane-highway bringing people within reasonable walking distance of their planes; they envisioned flying boxcars loaded with prepacked, freight-car-sized loads, perhaps brought in by train. But they never predicted the horrendous traffic jams brought on by professional football fans arriving at or leaving a Dallas Cowboys game, or the need for checking out each and every traveler as a possible hijacker.

The traffic was left to local authorities, who are still arguing whether limousines are to service the airport from the two (somehow the word "twin" is never used) cities, and who still have not come up with the assumed rapid transit system that would link Dallas, the airport and Fort Worth, to the obvious advantage of air and non-air travelers alike.

So DFW opened with travelers paying $13 to $17 cabfares from the cities, a bus schedule locally known as the unknowable, nuisance charges for everyone (25¢ just to get through the main entrance gate; 25¢ minimum for a cup of coffee at any one of the numerous shops; 25¢ phone charge to either Dallas or Fort Worth; pay stalls in restrooms) long after most other airports have abandoned such charges. But the real test hasn't come, as no paying passengers have yet used DFW. Dedication ceremonies in September were highlighted by the news that full-scale operations would begin in mid-January—leaving the airlines plenty of time to complete the interiors of their terminals and also time to polish up their operations (no one, including airlines, said one news report, likes to put the finishing touches on a new venture during the holiday season, a period of peak travel).

Yet the architecture was basically finished when the airport was dedicated. It had assumed its final stamp when Gyo Obata translated the original TAMS scheme of terminals linked by a highway into a series of half-loop terminals built along both sides of the same highway. Airlines have the option of renting as much or as little of a half-loop as they need, and these loops have been designed to be expanded if necessary. Four have been completed as the first stage, a total of 13 will have been built by 2001. Each will have "distinctive" interiors, but all are built to the basic module, a semi-circular design with plane gates on the outside, parking on the ground inside. The architects chose a precast, post-tensioned, beam and column system for the entire complex. This meant that off-site casting and repetitive forms could cut both time and costs; delivery and construction could be scheduled with less-than-normal interference between various contractors and trades; the beams and columns, while essentially similar in design for all buildings, could be easily modified to meet special conditions. Adding wedge-shaped sections every 90 feet or so permitted the semicircular buildings to be constructed entirely of straight components. Some of these wedges serve as elevator cores, stair wells or other utility spaces, but many are left as open floor space.

On the exterior, the modules are punctuated by pylons that give a regularity to the overall design while breaking up what could have become a monotonous pattern; other recurring components are solar bronze glazing in bronze-colored aluminum frames, weathering steel and a uniform warm beige concrete, the result of a specially colored cement used throughout. Individuality of terminals will be provided by each airline designing its own signs and interiors. Tying it all together is the AIRTRANS people mover system which, with the spine highway, promises a "10-minute minimum trip from one terminal to another."

Unseen, it is hoped, is the tremendous service system—paving, mechanical and electrical facilities, sewage and water systems, the automatic baggage handling and garbage disposal methods which are part of the people mover system, the general supply system and the security provisions— including everything from bomb-trained dogs to personnel check-ins.

When everything has settled down, perhaps the clean design of the terminals will become more obvious. Right now, the architecture seems incidental to the huge scale of the planning and the intimate scale of the individual terminals, restaurants, lounges and services for the passenger. Recognition may take months or years, but the quality is there—a superb architectural design that fits the superb planning. The only question: how will it work?

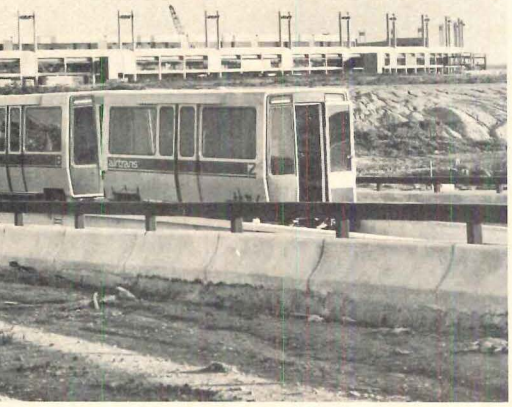
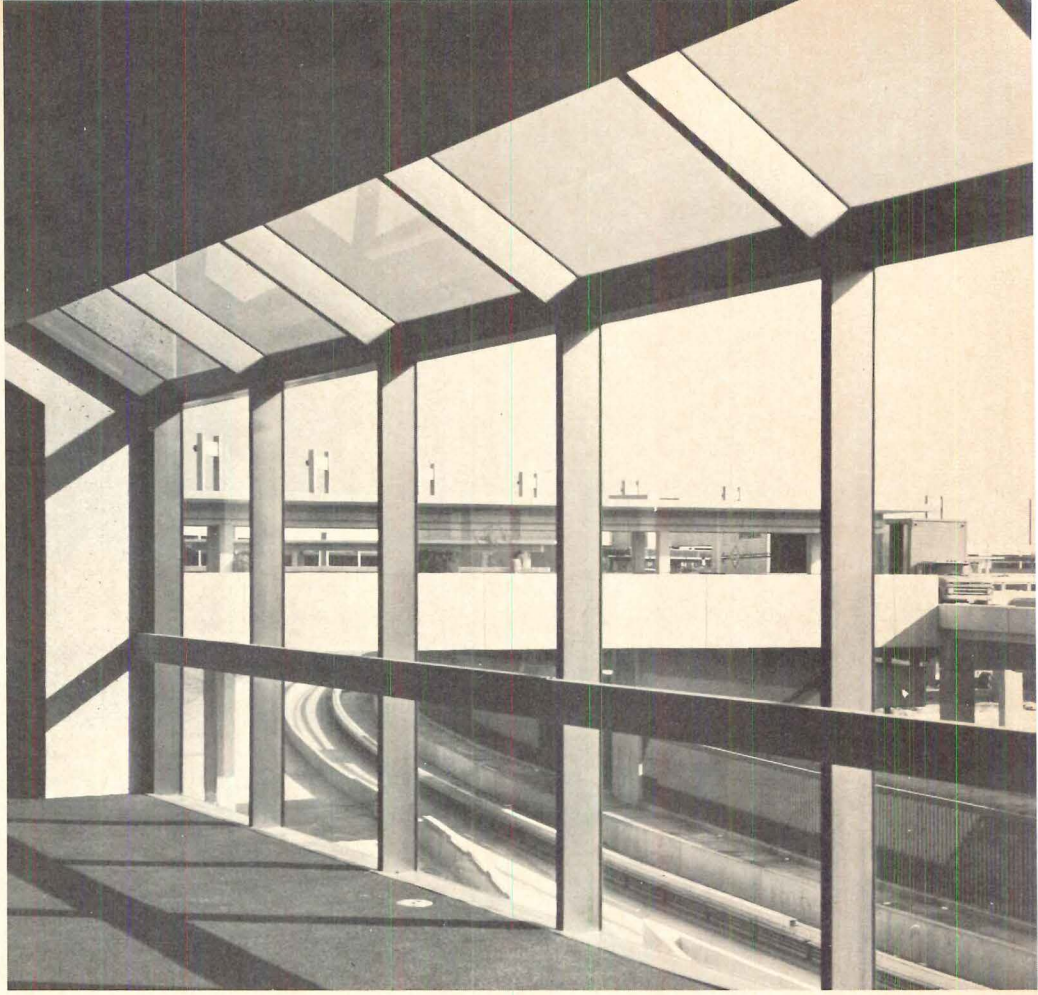


Photo: Alexandre Georges

AIRTRANS system moves baggage and waste as well as people. Bronze glass is used extensively, design of interiors is the responsibility of each airline. Braniff is shown at right.

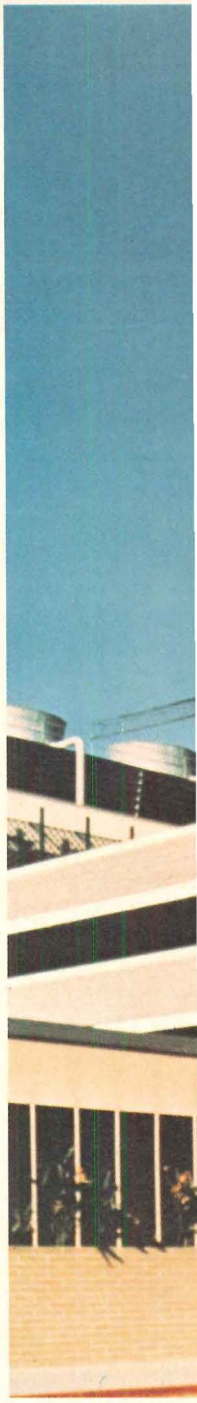


Credit: Dallas/Fort Worth Airport
Airport planner, engineer, general consultant: Tippetts-Abbett-McCarthy-Stratton.
Associates of the general consultants: Forrest & Cotton, Inc.; Carter & Burgess; Freese & Nichols; Mason-Johnston & Associates, Inc.; The Hinchman Company; Bovay Engineers, Inc.; Harwood K. Smith, Architects; Consulting Communications Engineers; Southwestern Laboratories; Lane, Gamble, Huddleston & Smith.) Also involved are the Battelle Memorial Institute (transit, communications) and Lawrence D. White & Associates (medical clinic and air mail facility designers).

Credits: Terminal complex
Client: Dallas/Fort Worth Airport Board; Thomas M. Sullivan, Executive Director.
Architects: Hellmuth, Obata & Kassabaum, Inc./Brodsky, Hopf & Adler; Gyo Obata, principal in charge of design; Richard Adler, principal in charge of administration.
Associate architects: Preston M. Geren, Jr., Architect; Harrell & Hamilton, Architects.
Structural engineers: LeMessurier Associates, Inc.; Terry-Rosenlund & Co.
Mechanical and electrical engineers: Herman Blum Consulting Engineers; Cowan, Love & Jackson, Inc.
Civil engineers: Carter & Burgess, Inc.; Forrest & Cotton, Inc.
Acoustical consultants: Joiner-Pelton-Rose, Inc.; McCandles Consultants, Inc.
Lighting consultants: Jules G. Horton Lighting Design, Inc.
Landscape architects: Richard B. Myrick & Associates.
Construction management: Parsons-McKee.
Transportation system: AIRTRANS by LTV Aerospace Corporation, Ground Transportation Division; guideway design: ABAM Engineers.

Author: This article was written by Rita Robison, former managing editor of P/A, in collaboration with John L. Murphy, who has both practiced and written about construction for many years. He is affiliated with Industrial Communications Group, International, of Fort Worth, Texas.

Photographs, courtesy of Warnel Corporation, South El Monte, California.



Prepainted sheet steel as an aesthetic medium

Contoured column covers, mullions, spandrel panels, and other architectural components can be designed in wide variety. Textured finishes are also possible for an added dimension of depth.

An excellent substrate for a prepainted surface is 1.25-oz (Class G-90) galvanized steel sheet. Modern painting methods assure a finish that is tightly adherent, color-fast, and easy to clean. Prepainted sheet steel panels are economical, too.

Bethlehem's coil-coating facilities embody the most modern and efficient painting techniques in the industry. Our prepainted sheet can endure considerable forming and fabricating stress without damage to the coating. A Bethlehem Sales Engineer will be glad to assist you in designing with precoated sheet steel.

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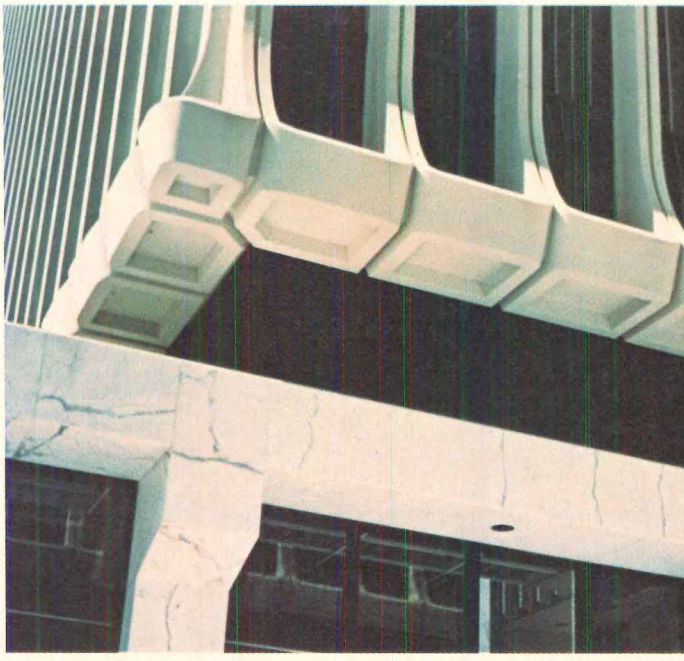
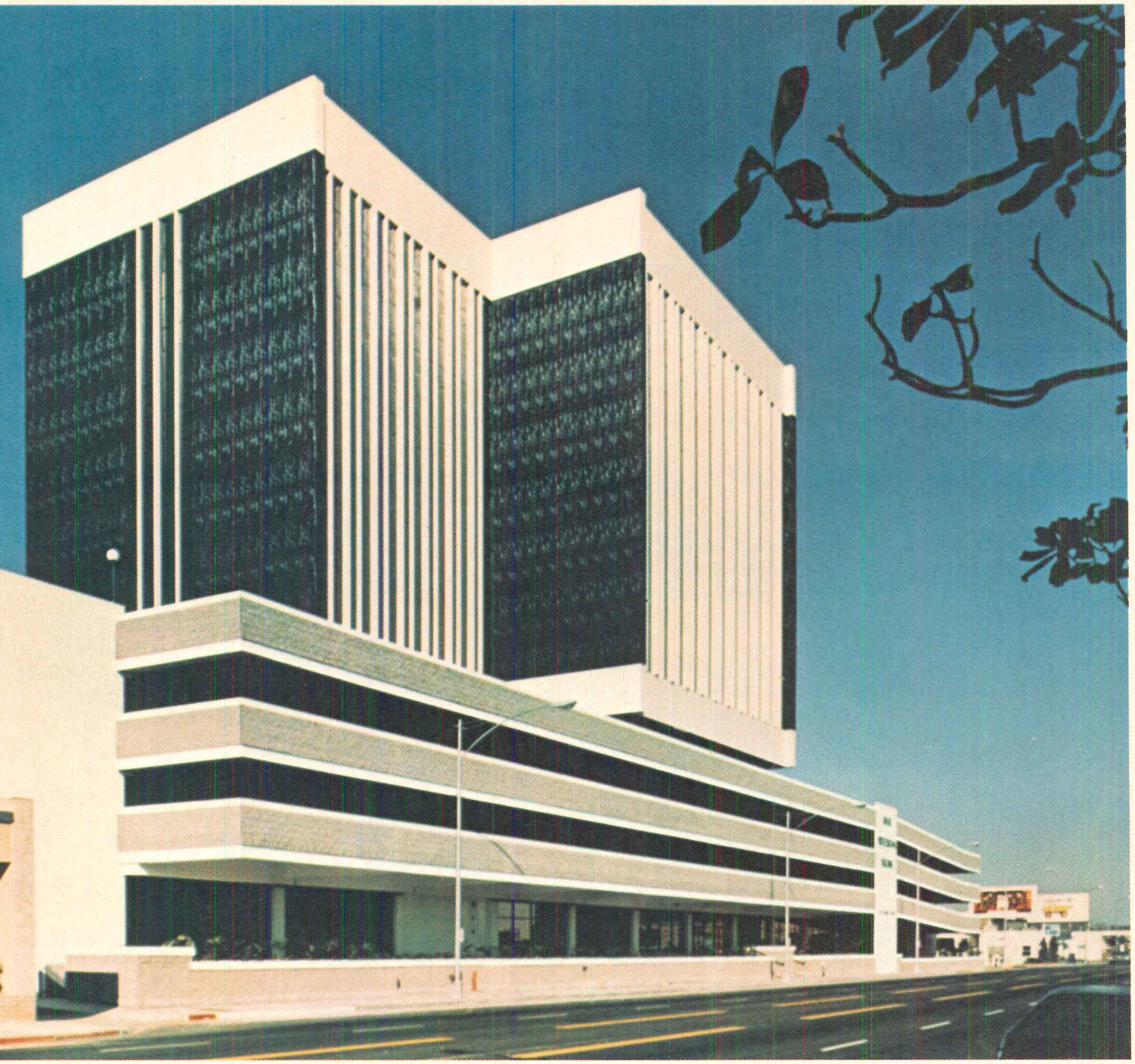
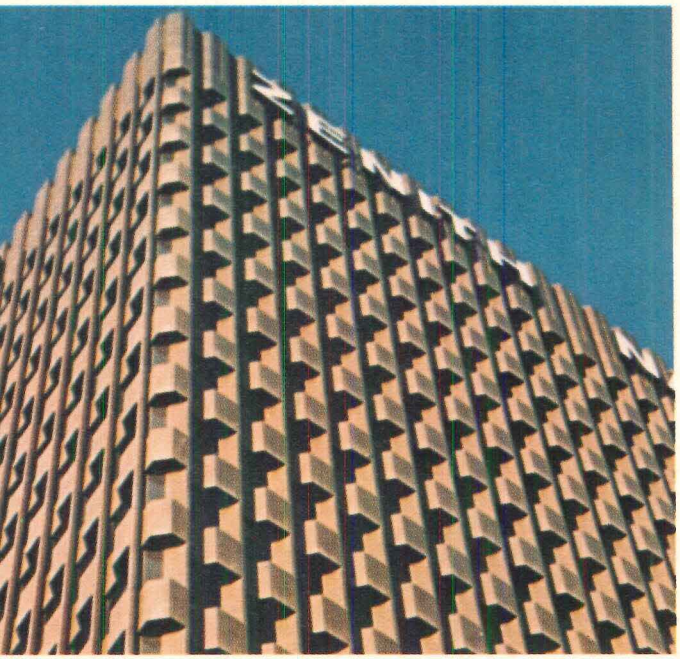
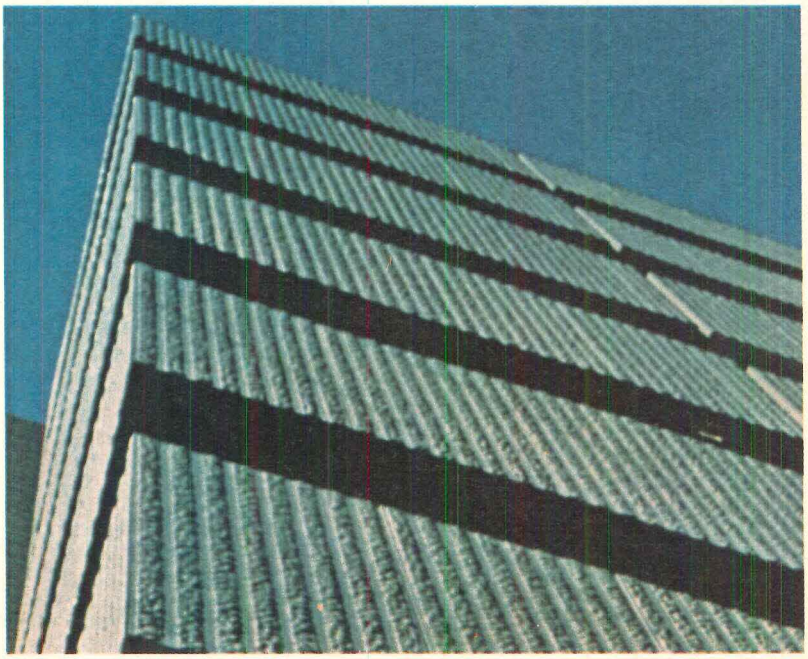








Energy crisis and materials

Harold J. Rosen, PE, FSCI

A look at what the future holds in terms of imposed government controls and criteria, and effective measures available to conserve our natural resources

The increasing demands placed upon the specifications writer as a result of the materials explosion, systems building, performance concepts, computerization and information retrieval systems are changing the role of the once lowly back-office glue-pot-and-scissors wielder to that of materials expert of the future with stature and prominence in the design profession. However, even these demands will seem insignificant when measured in terms of the new set of problems the materials expert will be expected to solve as our energy crisis deepens and the world's finite supply of raw materials is steadily depleted.

As the energy crisis unfolds, government may impose specific criteria or controls on building design. This follows from the fact that building services use one-third of U.S. energy consumption and 40 percent of this energy could be conserved with improved thermal design and construction practices. It is not beyond the realm of possibility that restrictions on design may take the following forms: The government in the interest of conserving energy fuels may dictate that structures are to be designed with limitations on the amount of electrical power a building may require in any given period; that the materials used in a structure be limited according to the amount of energy needed to produce them.

Let us examine these criteria and see what effect they can have on building design and what the specifier or materials expert will face in order to implement the design in terms of these criteria. Structures may be classified on the basis of type of occupancy and climatic zone with a specific KW electrical load allocated on a cubic foot basis to provide for lighting, power, air conditioning and heating. The designer and the materials expert must then solve the equation of heat gain and heat loss through the building's exteriors, and select wall and roof enclosures so that the structure can be designed within the permissible parameters. Lighting levels must be examined to determine if mounting heights, arrangement, lenses or even paint colors contribute to lighting loads. Elevators, escalators, fans, pumps must be re-examined to ascertain if reduction in scope or size can be permitted.

Pursuing this fantasy a bit further, the government may decree that materials used in the design of structures of varying types will be limited insofar as the total amount of energy consumed in the production of these products.

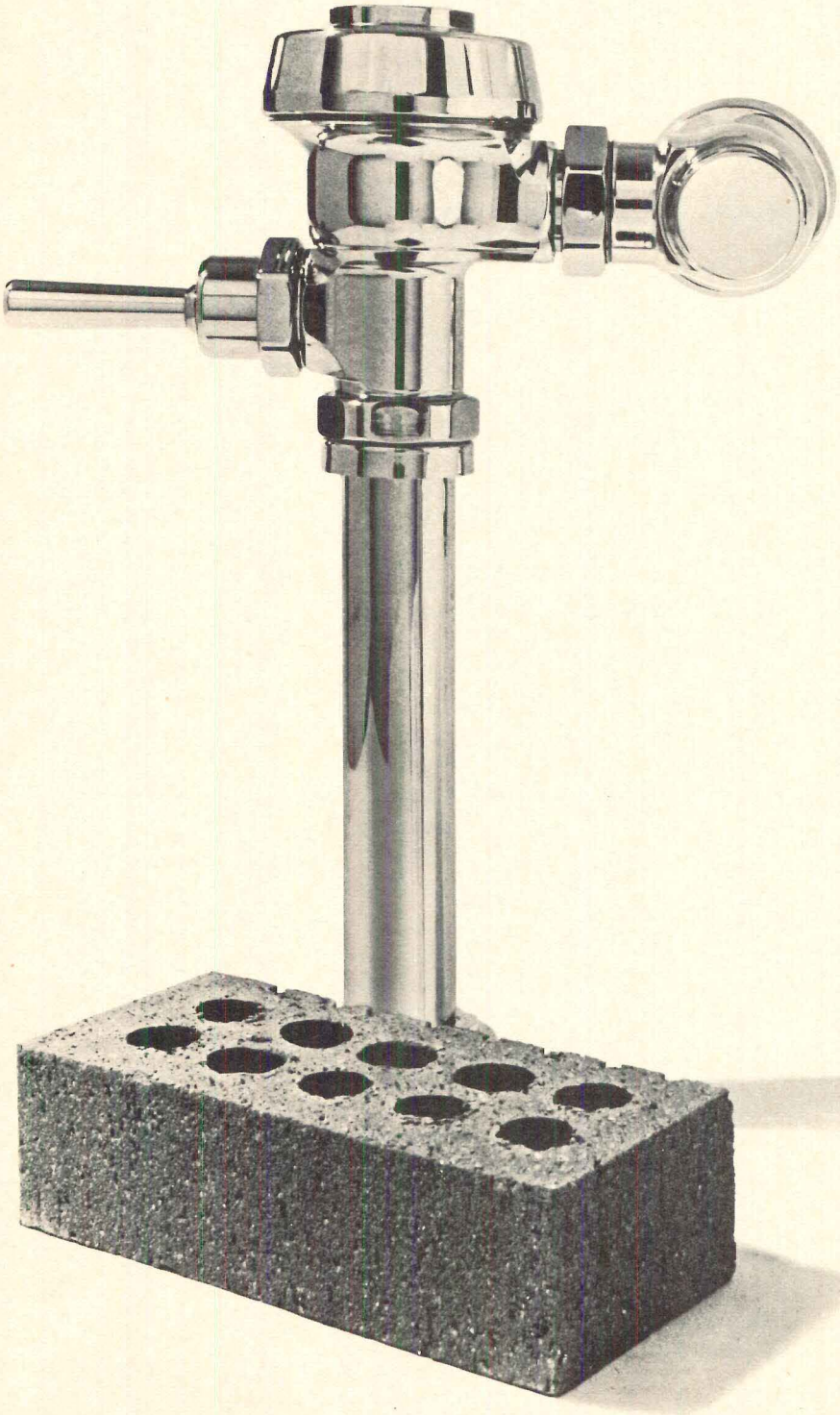
Materials may be classified on the basis of the amount of energy required to produce them and compared with others on a per-pound basis or on an in-place basis. Steel, aluminum, masonry, glass, cement, plaster, drywall, etc. will each be identified with its energy production quotient and the designer and specifier will have to make evaluations and determinations in order to select the materials with the least amount of energy consumed in production in order to meet the restrictions imposed on the design of the structure. With trees deriving their growth from solar energy, one can see where lumber might be on the low end of the energy quotient whereas aluminum, which must be unlocked from bauxite by electrical energy, would be on the high end of the energy equation. The foregoing sounds like an Orwellian nightmare but stranger happenings mark the history of mankind.

On the subject of materials conservation, a National Commission on Materials Policy has submitted a report to the President and the Congress on a comprehensive resource policy. It should be recognized that essentially we can only rely on raw materials that are indigenous to our political boundaries. Our economy cannot be predicated on the use of raw materials imported from foreign lands, since wars, balance of payment problems, and noncooperative foreign governments may suddenly close off these supplies. The building product manufacturer, as well as the specifier-materials expert, will have to develop products based on our own natural resources. In addition, where some of these resources are in short supply, materials and products that can be recycled will have to be developed—such as the built-up roofing felts made of recycled material that are now approved by the General Services Administration.

The challenge is not hopeless. In each age man has been faced with similar complex problems and has overcome them with imagination, daring and discipline. The specifier and the building product manufacturer must now face up to these new challenges.

Author: Harold J. Rosen is an independent construction specifications consultant in Merrick, New York.

The sure way to save water- without a brick



People have been putting bricks in toilet tanks for years.

It's an old trick that shuts the water off sooner than normal after operation and one which has received a lot of recent publicity.

You save one brick's worth of water—the brick's displacement volume. But you still may be losing many bricks of water due to leaks.

These days there's a better way for saving water and eliminating leaks,

The Sloan Flush Valve.

The Sloan Flush Valve positively prevents water waste.

It meters out water, automatically shutting off after delivering a sufficient amount to satisfy the requirements of the fixture.

You can't hold a Sloan Flush Valve open. It won't let you. Each flush uses the same minimal amount of water every time and does so for the life of the building.

So if you really want to save water, use flush valves—Sloan Flush Valves.

Sloan Flush Valves save water. Lots of it.

SLOAN VALVE COMPANY
10500 SEYMOUR • FRANKLIN PARK, ILL. 60131

Minimum fees

Bernard Tomson and Norman Coplan

Do recommended fee schedules by professional groups constitute price-fixing and violate Federal Anti-Trust Laws? That question is now before the courts

Several state and local chapters of the American Institute of Architects have issued recommended fee schedules for use by the profession in negotiating or determining fees to be included in an architectural contract. The question of whether such schedules (as well as recommended or minimum fee schedules of other professional groups) violate the Federal Anti-Trust Laws has become of particular concern as a consequence of a decision by a Federal Court in Virginia, rendered early in 1973, holding that the promulgation by a county bar association of a minimum fee schedule did in fact constitute a violation of the Sherman Anti-Trust Act (*Goldfarb* v. *Virginia State Bar,* 355 F. Supp. 491).

In the Goldfarb case, the Court was first called upon to determine whether the members of a county bar association practicing in Fairfax County, Virginia, were engaged in a trade affecting interstate commerce so as to subject the association to Federal Anti-Trust Laws. It was argued that professionals are exempt from the Sherman Act because they perform personal services and, in any event, interstate commerce was not affected by their activities. In response to this contention, the Court pointed out that although the United States Supreme Court had never expressly ruled that attorneys were exempt from Federal Anti-Trust Laws because they perform professional services, it was of the opinion that the sale of personal services constituted a "trade" within the meaning of the Federal Anti-Trust Statutes. Further, the Court concluded that since financing for many of the real estate projects for which attorneys render legal services came from outside the State of Virginia, this alone warranted the conclusion that interstate commerce was sufficiently affected to sustain jurisdiction under the Sherman Anti-Trust Act.

The Court then dealt with the primary issue of whether a minimum fee schedule constituted price fixing. The Court compared minimum fee schedules with price fixing agreements by commercial companies. stating:

"There is no distinction between the benefits ascribed to the minimum fee schedule by its advocates and those existing in a minimum sales price if, for example, the latter were to be adopted by General Motors and Ford Motor Company as to suggested sales prices for comparable automobiles. In each instance, a new dealer and a new lawyer, both unfamiliar with the customary charges in the field, would find such a minimum fee or sales price schedule helpful in setting charges. In each instance, an adequate fee or price would insure a margin of profit adequate to assure further research and development or continued legal education. In each instance the public would be assured, by an examination of such schedule, that what was being charged was in line with what was generally charged in the field. Yet in none of these instances would a member of the public have any better idea that the fee or price was reasonable after he had seen the schedule than he did before. The minimum fee schedule for real estate settlements, based as it is on a percentage of the purchase price, is particularly hard to justify as having any relation to the labor involved."

The Court concluded by finding that the minimum fee schedule of the Bar Association constituted a price fixing agreement in violation of Federal law. The Court stated:

"Price fixing is per se *an unreasonable restraint of trade. It is not for the courts to determine whether in particular settings price-fixing serves an honorable or worthy end. An agreement, shown either by adherence to a price schedule or by proof of consensual action fixing the uniform or minimum price, is itself illegal under the Sherman Act, no matter what end it was designed to serve.*

"The minimum fee schedule proposes a floor upon which professional fees should be set. This type of price-fixing has been held under other circumstances to be repugnant to the philosophy of the Sherman Act. . . . It is contrary to the spirit of competition which sustains a free enterprise system in that it prevents competitors from using their own judgment in determining the value of their own services."

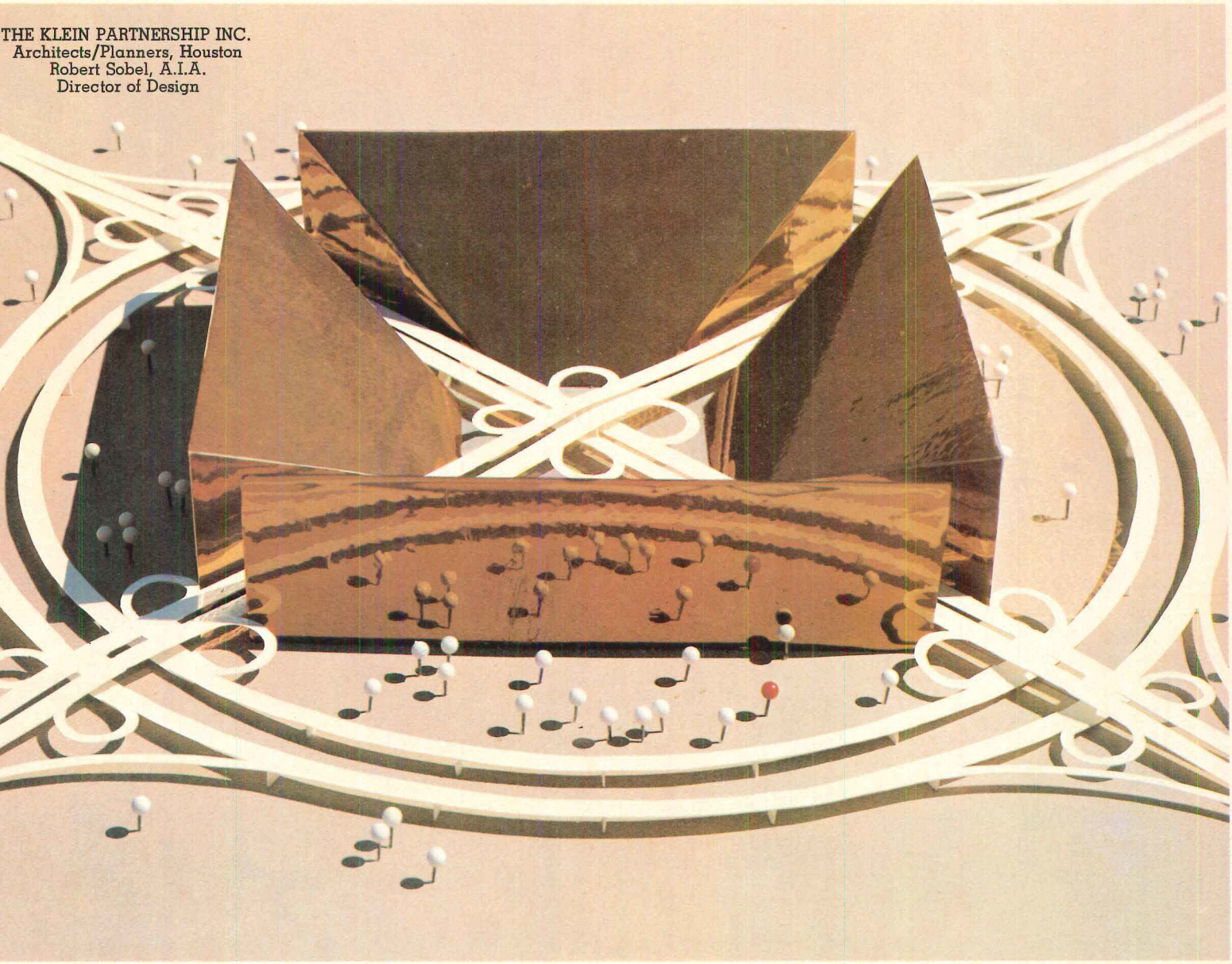
Although a mandatory minimum fee schedule carrying sanction in the event of nonconformance has been generally considered to violate the Federal Anti-Trust Laws, the Goldfarb case is of particular significance in that the Court held that an illegal price-fixing agreement could be established by the showing of general "adherence to such fee schedule." Although failure of members of the bar association to adhere to the minimum fee schedule could subject them to a charge of unethical practice, the Court did not place its decision on this ground. Rather, it appeared that the Court was saying that if a professional association issued recommended or minimum fee schedules and these schedules were generally accepted and adhered to by members of the profession, the result was price-fixing and the association would, therefore, be in violation of the Anti-Trust Laws even if the schedule was not mandatory and carried no penalty or sanction.

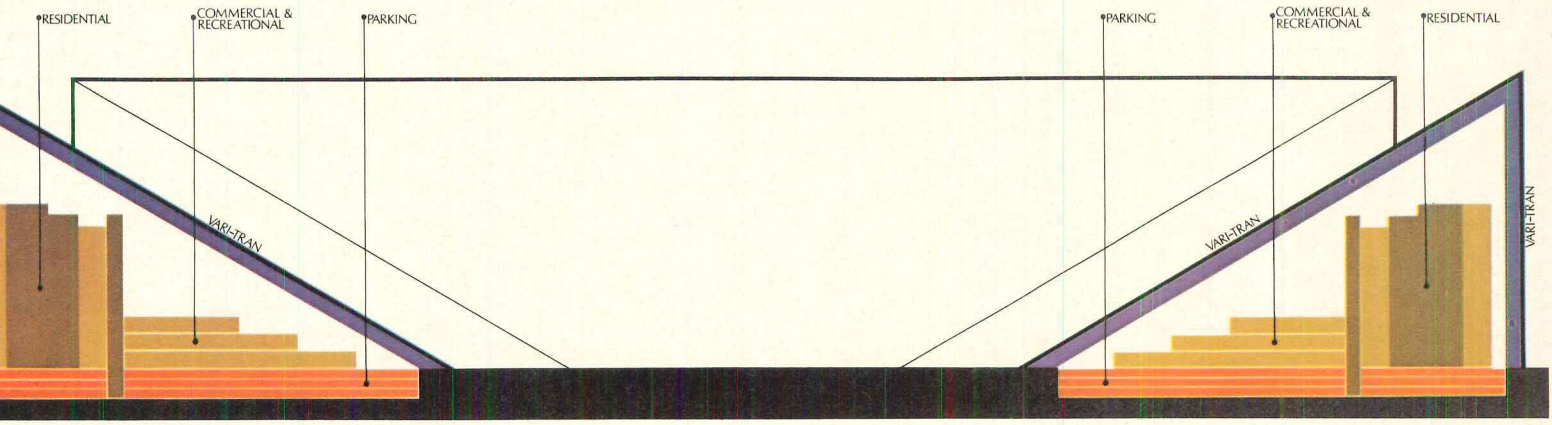
An appeal from this decision is presently pending and a determination on appeal may furnish a more substantial guideline for future action on the part of professional associations. We will report on the result of that appeal.

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

CRYSTAL PALACE 2000 REFLECTS TOMORROW'S ENERGY SAVINGS

THE KLEIN PARTNERSHIP INC.
Architects/Planners, Houston
Robert Sobel, A.I.A.
Director of Design

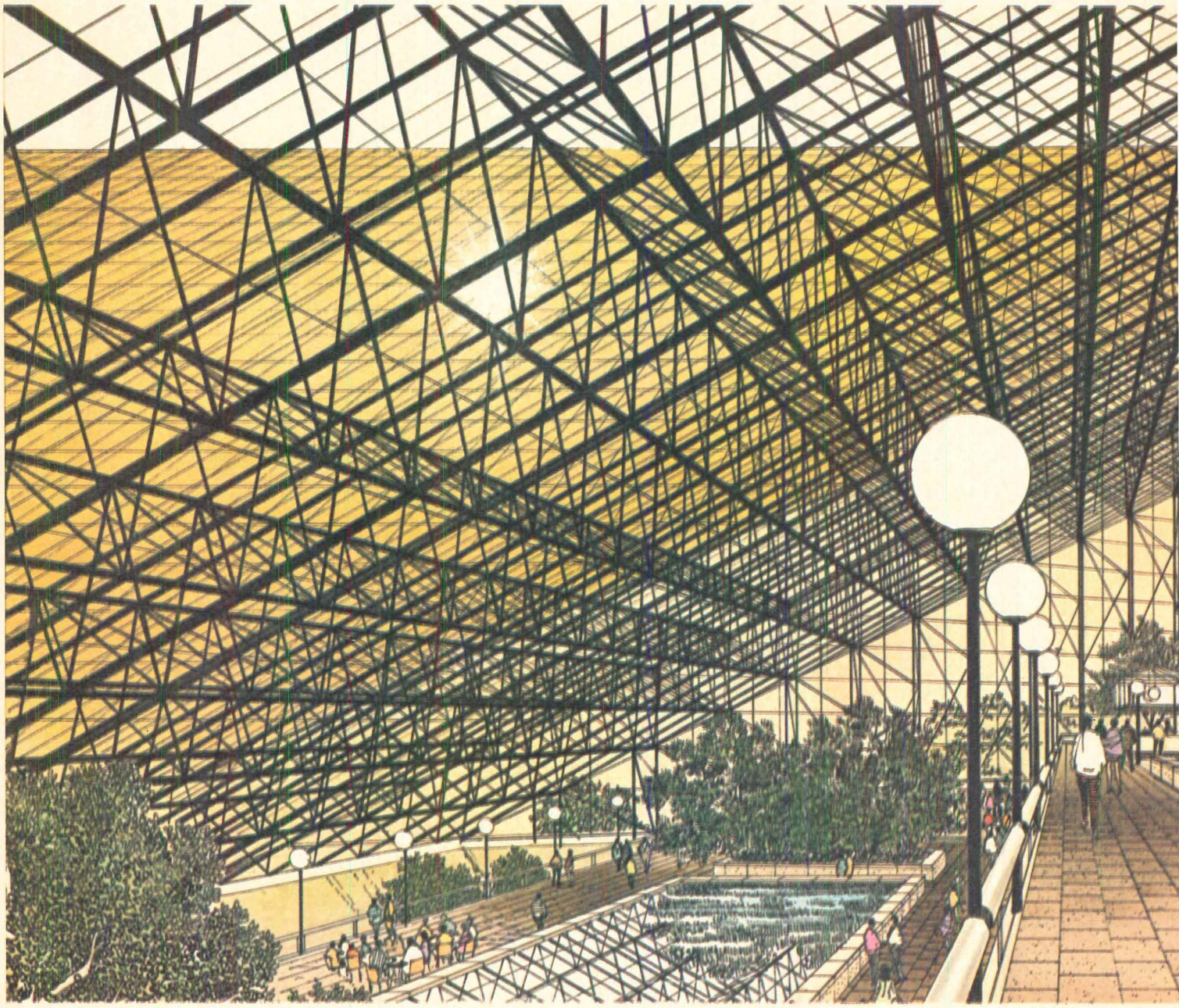




Town Module Section

LOF

A PRIVATE SKY CONCEIVE



NEARLY FOUR MILLION SQUARE FEET OF GLASS.

The vision of the architects is a complete year-round community under glass. Crystal Palace 2000 is designed in four quadrants within an interchange at the intersection of two transcontinental highways.

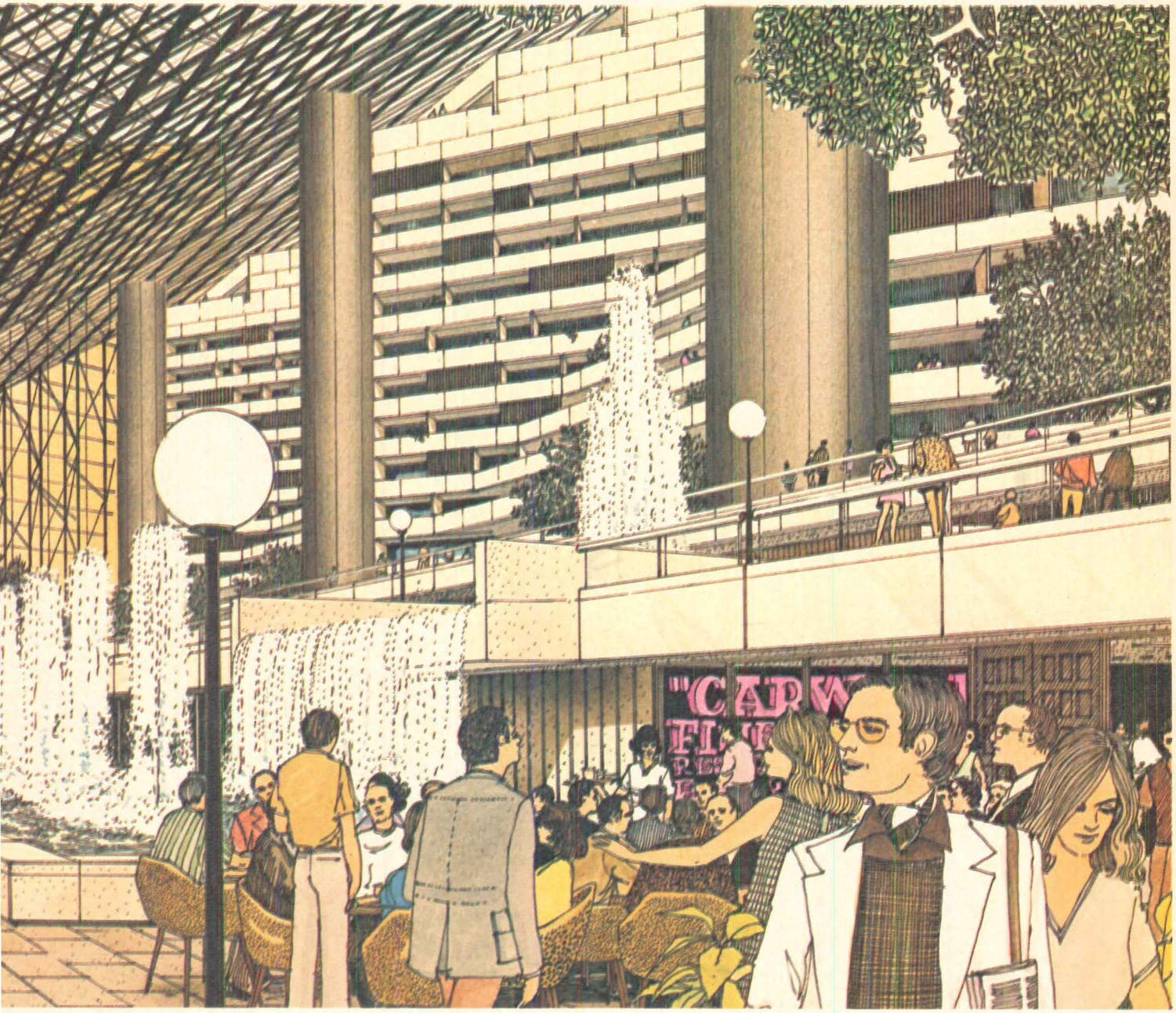
The light of the sun is always the friend of architecture; the heat of the sun, even in northern latitudes, can be its enemy. Vari-Tran gives the architect almost total freedom to choose. Without Vari-Tran, Crystal Palace 2000 would be difficult even to conceive.

Today, with Vari-Tran, up to 86% of the solar energy falling on Crystal Palace 2000 can be rejected back into the atmosphere. And an unprecedented environment for human life can be created.

Most of the technology of Crystal Palace 2000 was available to Joseph Paxton when he built the Crystal Palace of 1851. The great exception is Vari-Tran. Whereas the conventional glass available to Paxton made poss the building of a magnifi greenhouse, the reflective p erties of Vari-Tran make poss the creation of a totally contro human environment for y round living.

This is not to say that inhabitants of Crystal Pal 2000 will never go out of d It is to say, rather, that inhabitants of Crystal Pal 2000 will always have the op of an environment that brings outdoors in—and on the r desirable terms.

OF GOLDEN VARI-TRAN®



It is interesting to speculate
he implications of Crystal
ıce 2000 as a 21st century
machine. In this case, the use
eflective glass plays a major
. Since it's anticipated that
he year 2000 there will be
nomically viable ways of
ctly harnessing solar energy,
ems reasonable to project the
of sun-catchers as an energy
ce for the building.
These sun-catchers would be
nted above the Vari-Tran skin
Crystal Palace where they
ld receive solar radiation two ways, directly from the sun and by reflection from the skin of the building. Here, more than ever, Vari-Tran would contribute a property totally unavailable in conventional glass.

Yet in the most conventional terms, whether in the year 2000 or now, Vari-Tran would contribute to a more economical project in the following ways: by rejecting the major percentage of the sun's energy, Vari-Tran could substantially reduce the heat load of the building. This, in turn, would lead to a saving in the initial cost of air-conditioning equipment and a continuing saving in terms of reduced operating costs.

Architects will always search for new materials and technology. Vari-Tran is one of the rare examples of a material that is truly and totally right for its time.

LOF

DESIGNS FOR PEOPLE. GLASS FROM LOF.

PLATE/FLOAT GLASS
Parallel-O-Plate®/Float , ⅛", 3/16", ¼"
Parallel-O-Grey®, 3/16", ¼"
Parallel-O-Bronze®, 3/16", ¼"
Heat-Absorbing Float, 3/16", ¼"

HEAVY-DUTY PLATE/FLOAT GLASS
Parallel-O-Plate®, 5/16" to ⅞"
Parallel-O-Grey®, ⅜", ½"
Parallel-O-Bronze®, ⅜", ½"

LAMINATED SAFETY PLATE/FLOAT GLASS
with Vari-Tran® Coating

INSULATING GLASS—Thermopane®
Regular, tinted or with Vari-Tran Coating

VIGILPANE®—Safety Plate/Float Glass

ROUGH PLATE, Regular or Tinted
(Rough 2 Surfaces)
(Polished 1 Surface, Rough 1 Surface)

SPANDREL GLASS—Vitrolux®
Vitreous colors fused to back of heat-strengthened glass

FULL-TEMPERED GLASS—Tuf-flex®
Windows, Doors and Sidelights

WINDOW GLASS

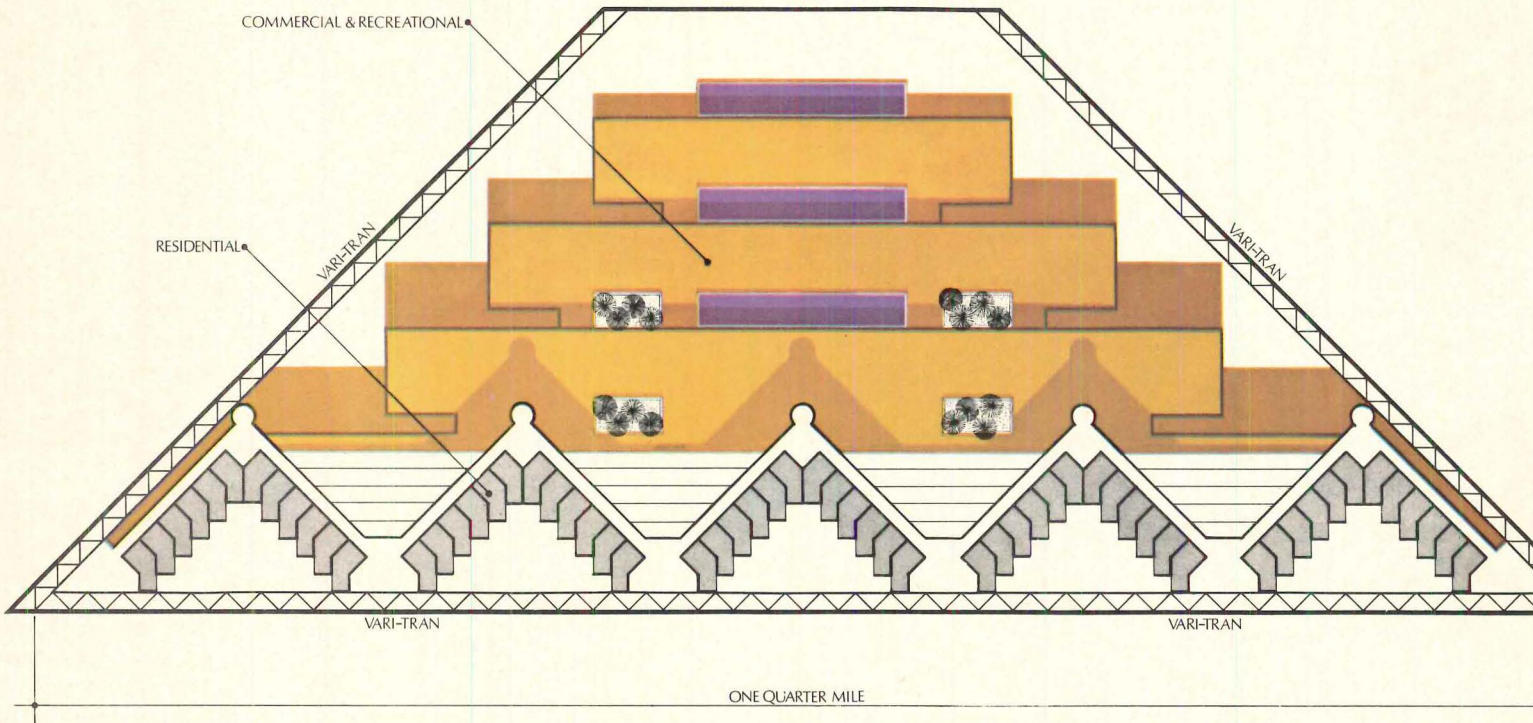
PATTERNED & WIRED GLASS

MIRROPANE®
One-Way vision glass

Listed above are many of the LOF types of glass for construction.

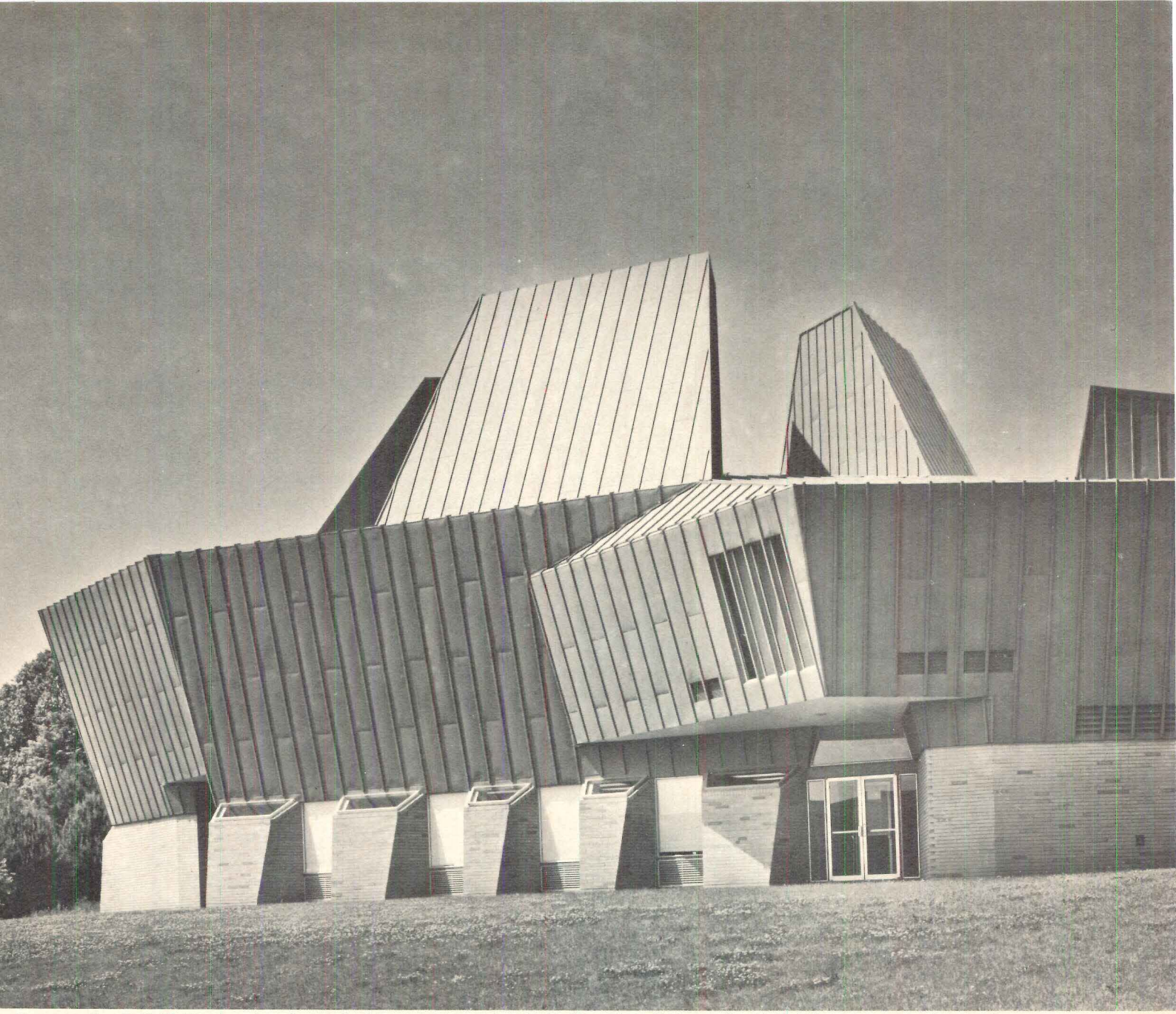
In addition, we have an informative brochure complete with pictures of installations utilizing Vari-Tran across the country. Product data and specifications are, of course, included too. The brochure is entitled, "Reach for a Rainbow." We'd be pleased to answer your request.

Phone (419) 242-5781, or write Libbey-Owens-Ford Company, 811 Madison Avenue, Toledo, Ohio 43695.



Town Module Plan
Crystal Palace 2000

LOF



Congregation Beth El, New London, Conn.; Architect: Paul Rudolph, FAIA, New York, N.Y.; Roofer: H. R. Hillery Company, Groton, Conn.

THE ARCHITECT, METALS AND IMAGINATION

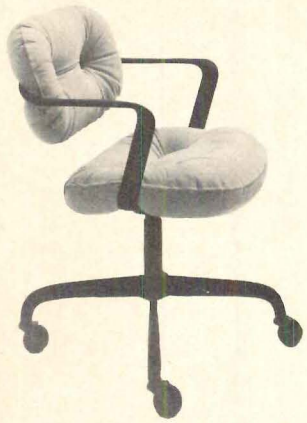
Many critics regard Paul Rudolph as one of the logical heirs to the late Frank Lloyd Wright's professional mantle, and his major projects have clearly influenced the whole range and dynamics of contemporary architecture. As Sibyl Moholy-Nagy once wrote, he has "great courage, comprehensiveness of talent, profound faith in the integrity of the architect's mission."

In conceptual felicity and strength of execution, Congregation Beth El is a notable example of Mr. Rudolph's recent work, and we are indeed gratified that in selecting a metal to sheathe and roof this distinguished building, he chose Follansbee Terne.

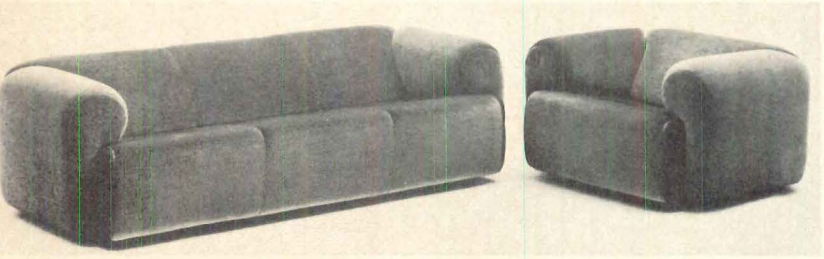
FOLLANSBEE

FOLLANSBEE STEEL CORPORATION • FOLLANSBEE, WEST VIRGINIA

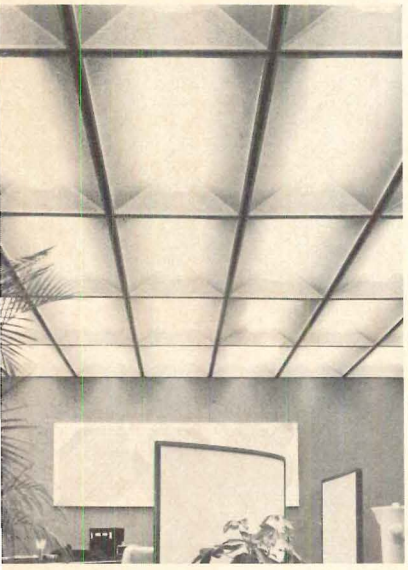
Products and literature



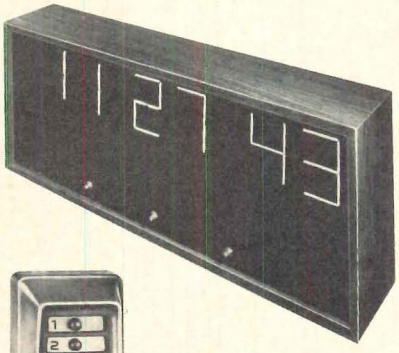
Swivel arm chair



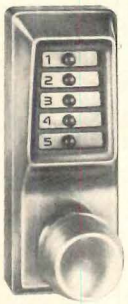
Three-seat sofa, club chair



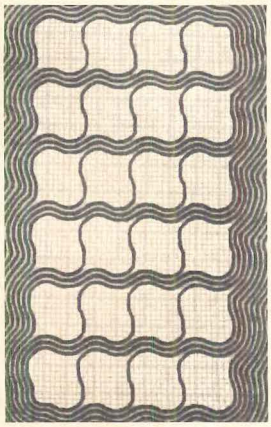
Integrated ceiling



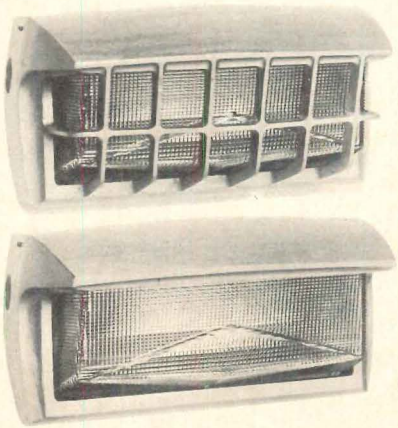
Digital clock



Pushbutton lock



Hand-tufted rug



Wall mounted luminaires

Swivel arm chair consists of a base, a continuous arm frame and upholstery cushions. Aluminum die cast frames come in either bright polished or a powder-coated finish; upholstery, in a wide variety of colors. Knoll International.
Circle 101 on reader service card

Two- and three-seat sofa, club chair and ottoman are available in this seating series. Foam over wood frame, selection of fabrics. leathers, suedes and vinyls or C.O.M. Stendig Inc.
Circle 102 on reader service card

Open plan office design package consists of fully integrated ceiling, acoustical wall panels and screens, resilient flooring and carpeting and a sound-masking system. According to this maker, the luminaire system can be used either vaulted or in combinations of flat and vaulted modules; the supply air linear diffuser ensures draft-free air distribution in large open spaces; wall and space divider screens control horizontal and reflected sound, provide privacy. Armstrong Cork Company.
Circle 103 on reader service card

Hand-tufted rug. One-directional worsted yarn background with a cross weave overlayed by a serpentine stria striped design. Background is off-white, with variations of bronze and green. V'Soske, Inc.
Circle 104 on reader service card

Digital clock. Six-digit computer-type display shows exact time in hours, minutes and seconds and is suitable for locations where precise time must be visible to large numbers of people or over large areas. It has no moving parts, is completely silent and requires no lubrication or maintenance. According to maker, it can be read from 150 ft or more with normal eyesight. Overall size approx. 20″x7½″x5″. Requires 117 VAC, 60 Hz, 10 Watts. Aries, Inc.
Circle 105 on reader service card

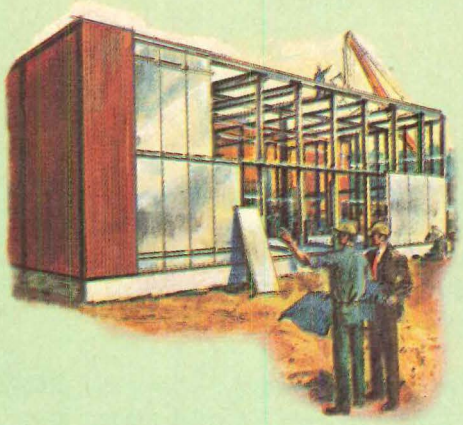
Pushbutton combination access control for either new construction or replacement of existing cylindrical key sets is said to eliminate key control problem and improve door security. Combination is changeable within 30 seconds. Unican Security Systems Ltd.
Circle 106 on reader service card

Desk accessories. Square-round forms made of $\frac{3}{16}$″-thick polished aluminum, the line includes everything from the smallest paper clip cup to larger vases, bookends, desk pads, letter trays and calendars. Coated with a clear epoxy synthetic for protection; inside surfaces are coated with black epoxy. Smith Metal Arts. Company, Inc.
Circle 107 on reader service card

Wall mounted luminaire. Cast aluminum fixture may be mounted directly to circuit box or bolted to the wall. High-intensity mercury vapor luminaire is suitable for lighting walkways, building fronts, parks, indoor parking areas. Will withstand any weather condition and will operate in temperatures to —20 F maker states. Available with or without cast aluminum protective guard. Light sensitized photoelectric cell automatically turns light off and on. Lightron Corporation.
Circle 108 on reader service card
[continued on page 86]

Bally belongs.

When a project calls for a Refrigerated Building Bally has experience that will be most helpful.



Unusual and complex requirements specifically associated with refrigerated buildings are part of our everyday business. They may involve the design of a low temperature foundation slab . . . computing the refrigeration load requirements . . . determining the best use of power and manually operated doors . . . design and placement of conveyors or the need of vestibules and partitions. Whatever the question, our three decades of experience qualifies us to provide the answers. Bally Buildings are prefabricated modular systems that can be assembled in any length and width up to 36′ high from standard urethane insulated panels, UL and Factory Mutual approved. Refrigeration systems are available for every storage or processing need and for temperatures as low as minus 40°F. Bally's architectural metal facade in a choice of six colors can be installed on any portion of the exterior where colorfully styled appearance is important. Write for literature and wall sample. **Bally Case and Cooler, Inc., Bally, Pennsylvania 19503. Address all correspondence to Dept. PA-12**

Bally®

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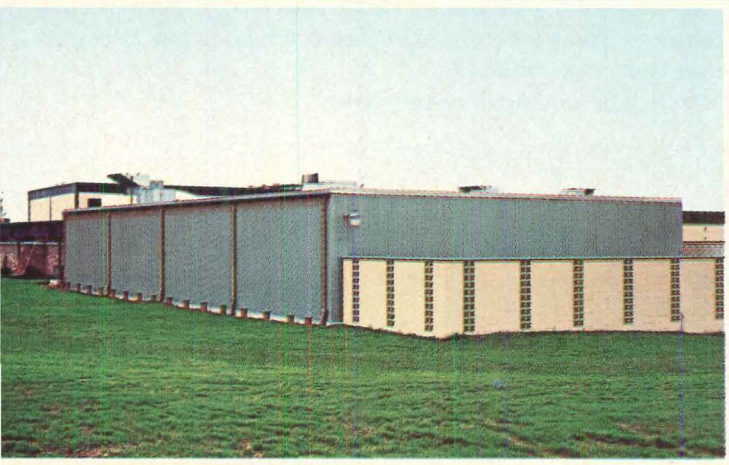
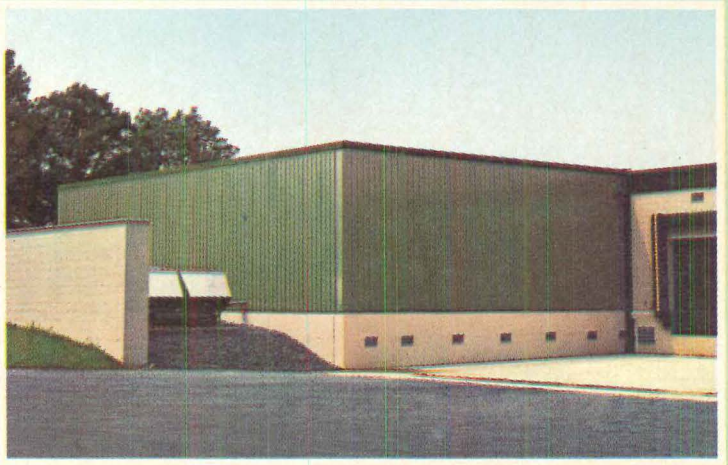
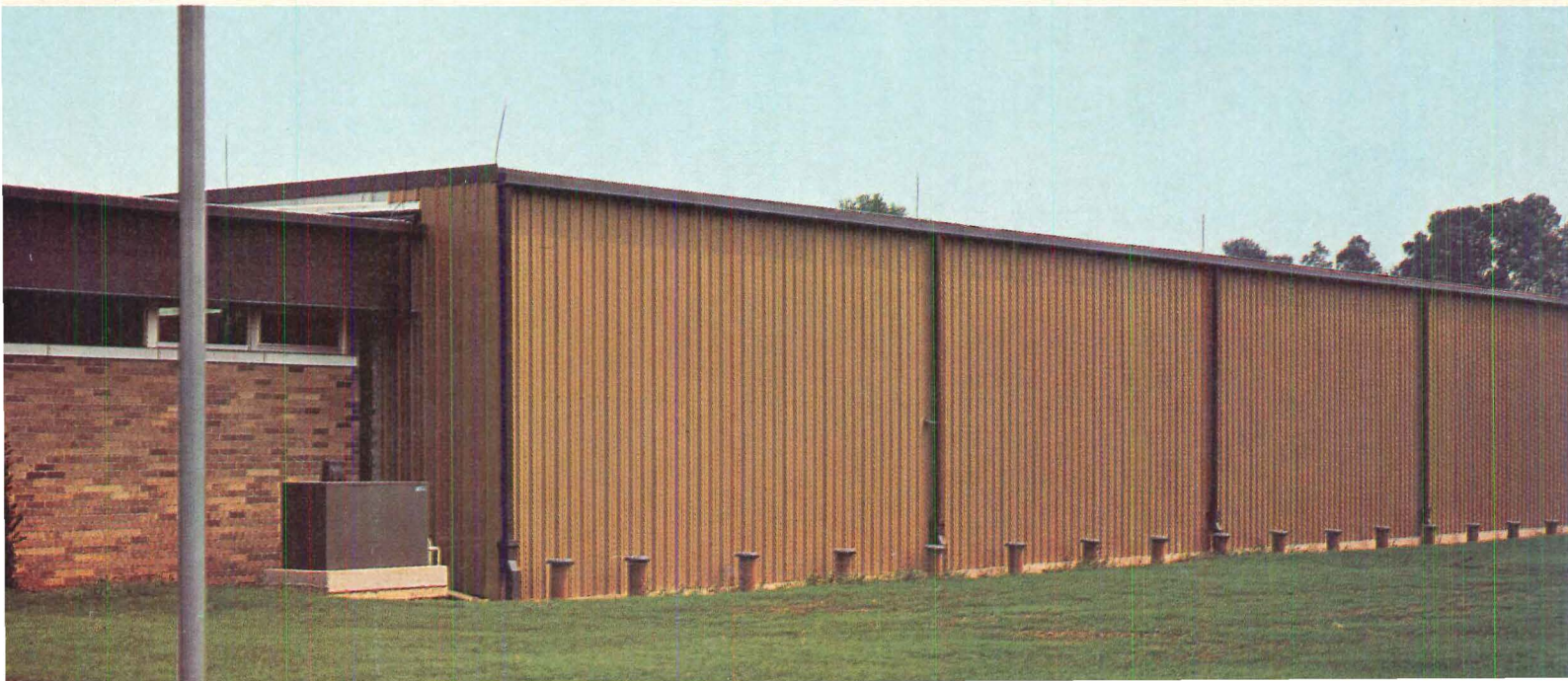
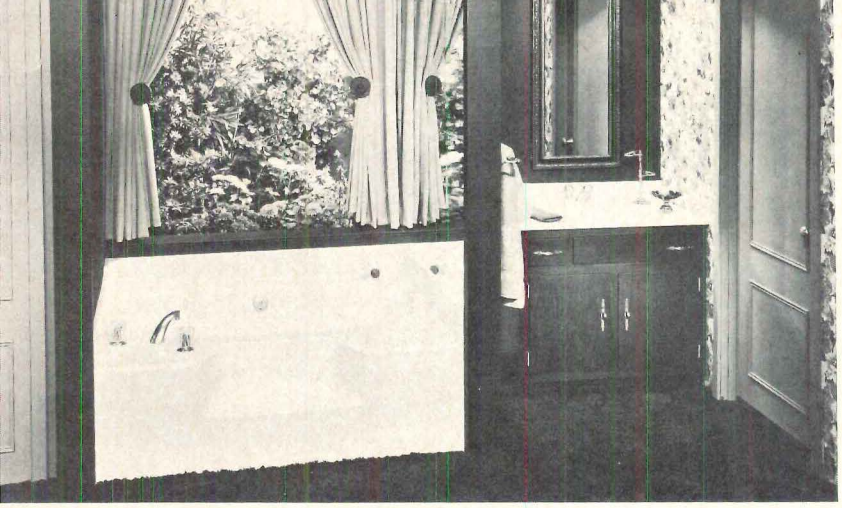






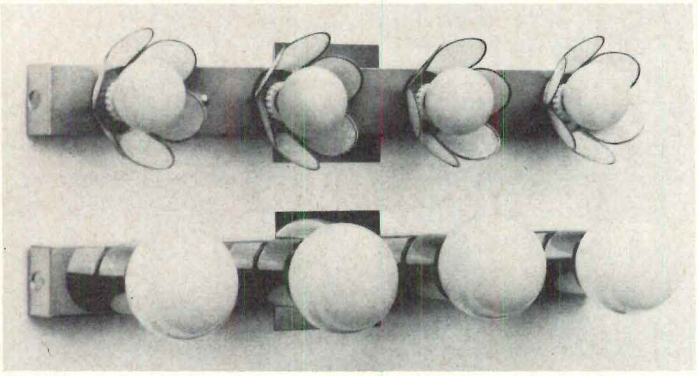
Products and literature continued from page 84



bathtub

Bathtub. Molded of one-piece fiberglass and measuring 60″x49″x24″, it has a built-in center step. Center drain and backwall overflow allow for either left or right hand fixture installation. In six colors. Corl Corporation.
Circle 109 on reader service card

Lighting system. Linear or wrap-around wall lighting suitable for home, office or commercial use. Available in candelabra base or standard-medium based sockets. Finishes include satin brass, satin chrome, polished chrome, or oxidized bronze. Interchangeable components. The Feldman Co.
Circle 110 on reader service card



lighting system

Literature

Glazing. Plastic thermal and security glazing units and acoustical glazing units provide freedom from breakage, are readily installed, are light weight and handle easily, states maker. Charts, tables and line drawings are included in leaflet. Commercial Plastics and Supply Corp.
Circle 201 on reader service card

Prefinished interior panels have uniform 2 in. and 4 in. planks on teak, hickory and walnut veneers. Random-spaced, oak, cherry and walnut veneers feature highlight and shadow effect. Comes in 4′x8′ and 4′x10′ modular sizes, ¼-in. thick and carry an Underwriters' Class C flame spread rating. Literature available. U.S. Plywood.
Circle 202 on reader service card

Waterproofing systems. Illustrated brochure contains detailed cross-sectional drawings showing recommended treatments and designs for both single- and twin-slab construction. Detail drawings cover expansion joints, drains, wall and deck junctures, and treatment of projections, cracks and joints. The Tremco Manufacturing Company.
Circle 203 on reader service card

Study carrels. Complete line of carrels, mobile audiovisual centers, listening tables and accessories are shown in illustrated color guide. Diagrams showing the many configurations that exist for the modularized units are included. Howe Furniture Corporation.
Circle 204 on reader service card

Flush doors. Complete descriptions, specifications and illustrations are included in brochure for each type of door plus full color of the vinyl veneer doors that completely wrap around the door surface. Paine Lumber Company Inc.
Circle 205 on reader service card

Vinyl wallcoverings. Service brochure completely documents facts on tearing, cleanability, mildew resistance, fire ratings. Color illustrations. L.E. Carpenter & Company.
Circle 206 on reader service card

Building systems. Four are described in detail. Includes drawings and dimensions for most used building spans, details on design and engineering capabilities to produce buildings for particular requirements. Accessories and optional components are fully illustrated and described. Pascoe Steel Corporation.
Circle 207 on reader service card

Fabric collection. 46 contemporary print patterns which are available in cotton, linen and fire-retardant fibers, plus complete line of warp-printed Korean silks and 25 Marimekko supergraphics are featured in brochure. Isabel Scott Fabrics.
Circle 208 on reader service card

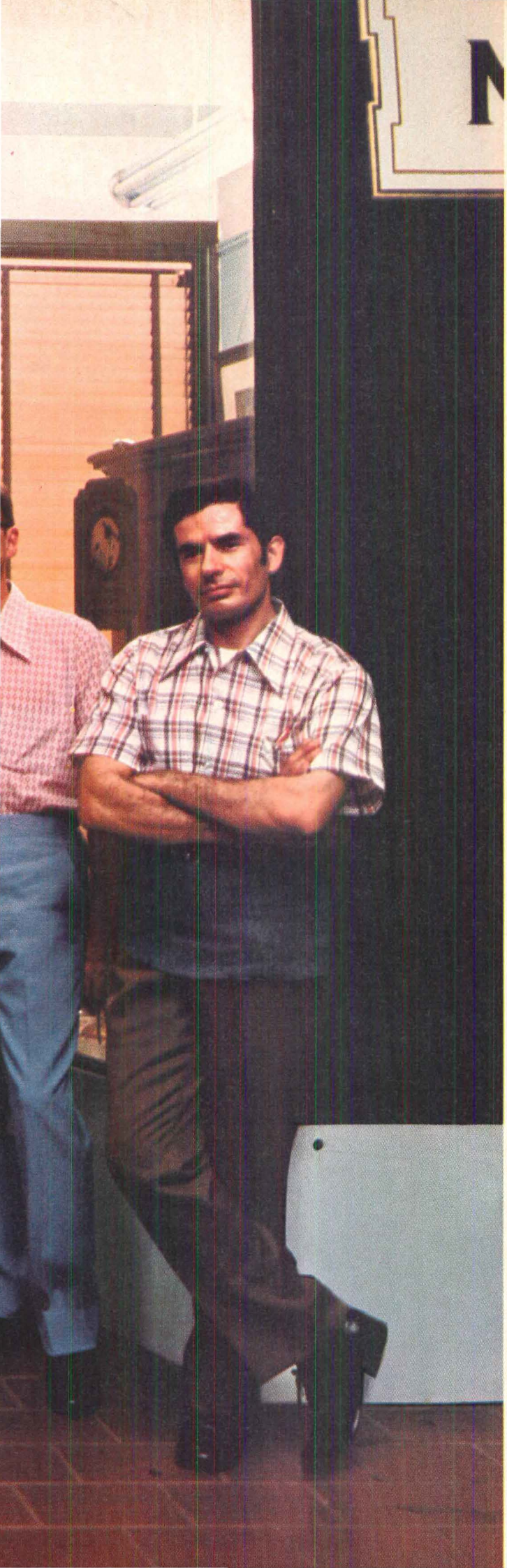
Curtain wall. Brochure contains 12 pages of details of basic design concepts for non-load-bearing exterior walls. Also included are tables detailing physical properties and limiting heights of studs, truss stud assembly for exterior masonry veneer concrete frame. United States Gypsum.
Circle 209 on reader service card

Built-up roofing brochure covers recommended specifications and procedures. Illustrated with detailed diagrams, it contains a section of flashings. Koppers Company, Inc.
Circle 210 on reader service card

Dining room/conference tables. Curved triangular steel columns of polished chrome or matte black support round, rectangular or square tops in a variety of colors and patterns. Color brochure lists size and color specifications that permit custom designed tables. American Seating Company.
Circle 211 on reader service card

Automated office file. A small rectangular enclosure ranging from 7 to 10 feet high and occupying floor space from as little as 7 ft wide 8 ft deep, it expands to accommodate increased filing needs. Cards, microfiche records, checks, vouchers, stocks, and bonds, data processing tape reels and discs can be stored. Of interest to office space planners, architects and interior designers. Supreme Equipment & Systems Corp.
Circle 212 on reader service card


NEIDER
2032

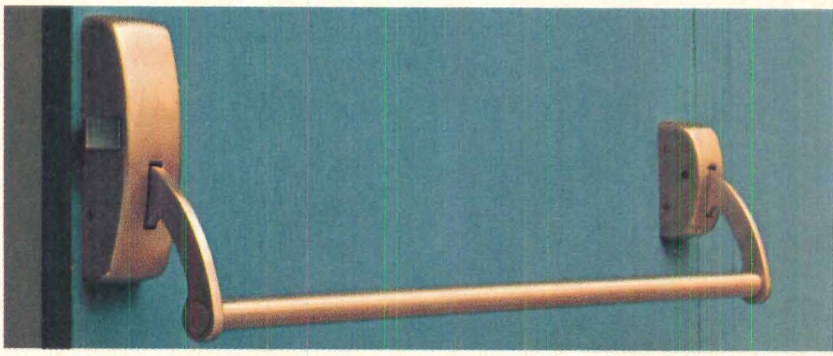


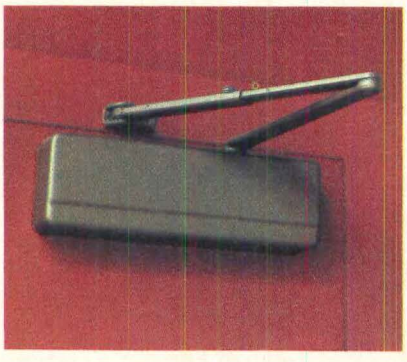
The Jenkins Arcade, an historic landmark on Pittsburgh's Liberty Avenue, was designed in 1908 by architect Olaf M. Topp. To meet its rigid quality specifications, the building's 1300-odd doors were all equipped with Sargent hardware. Today, some 1,100 doors still have their original Sargent hardware. No wonder so many of its original tenants, like custom tailor Karl Scheblein, appreciate what so often was taken for granted.

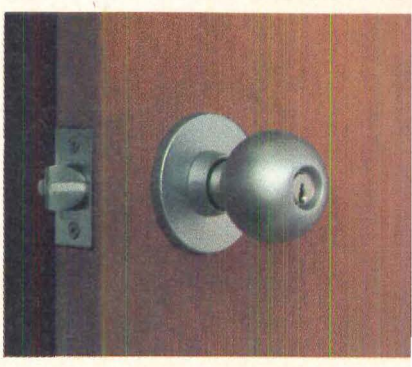
Contemporary versions of Sargent quality hardware are featured below.

Consider the doors equipped with Sargent hardware.

Still proud doors. Still proud hardware.







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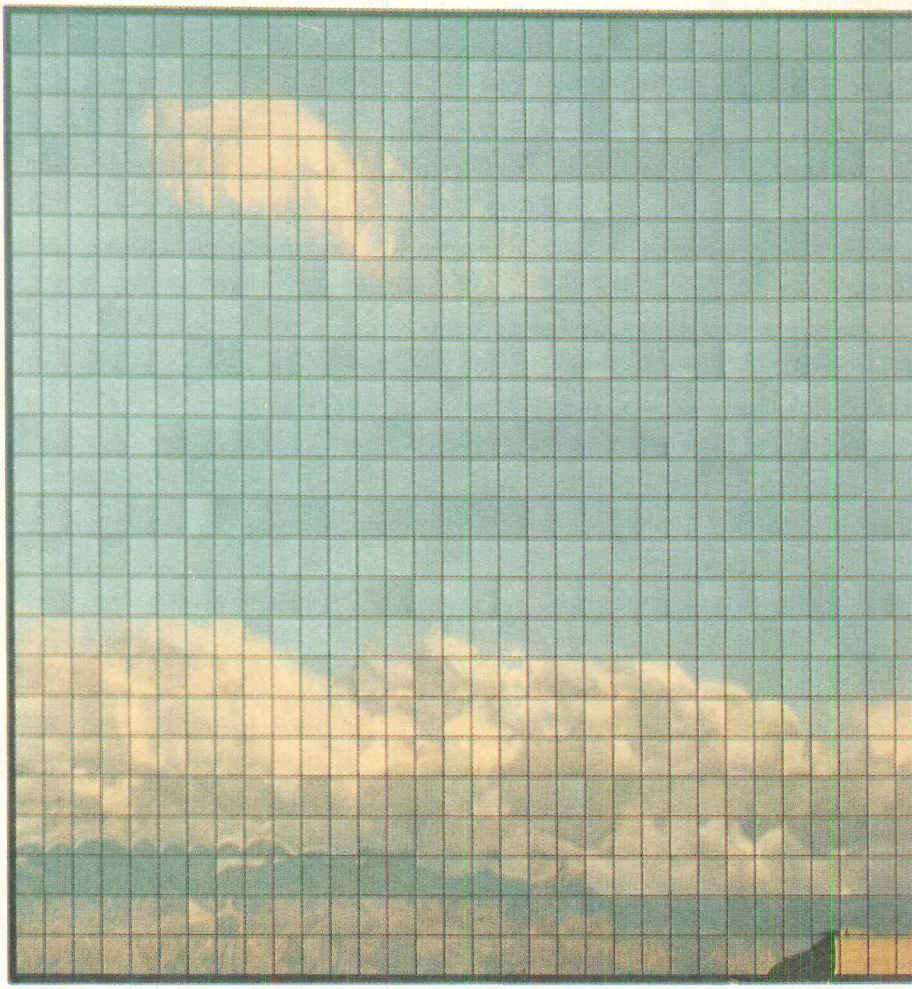

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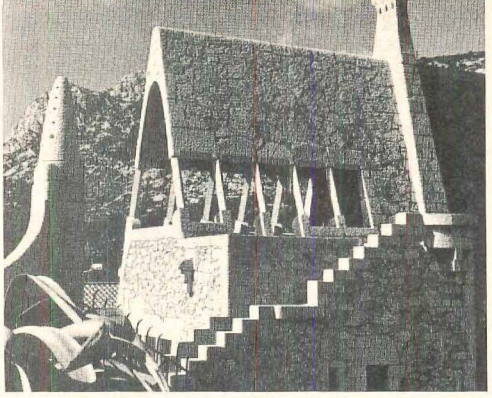
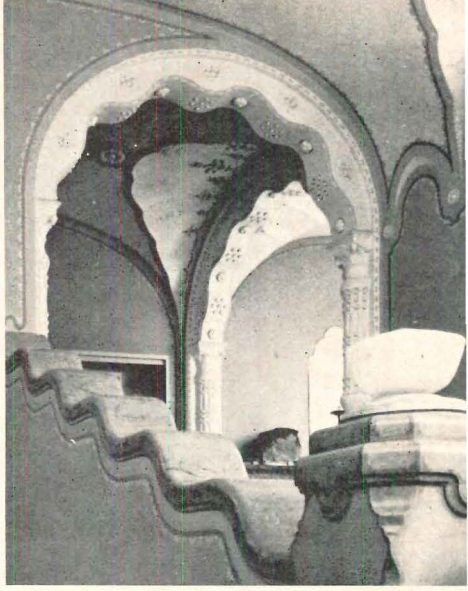


Berenguer, wine cellars and chapel, 1888.

Watts, Black Friar Pub, 1905.



Lechner, Museum of Decorative Art, 1891.

Books

The Anti-rationalists

The Anti-rationalists, *edited by Nikolaus Pevsner and J. M. Richards. London; The Architectural Press Ltd. Distributed in North America by The University of Toronto Press. 1973, 210 pp., illustrated, $17.50.*

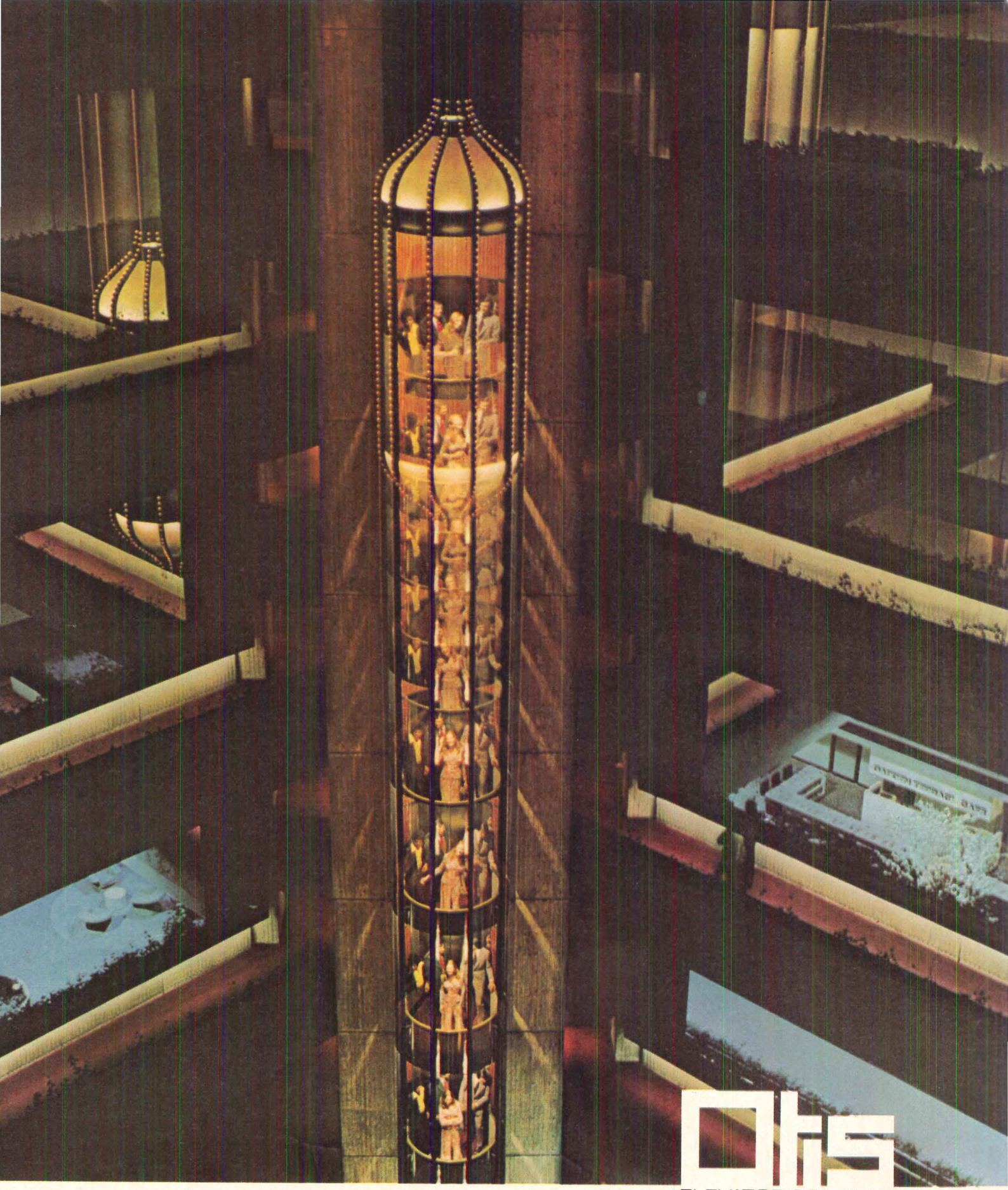
Reviewed by Leonard K. Eaton, professor of architecture at the University of Michigan, Ann Arbor.

In recent years certain European cities, notably Glasgow and Barcelona, have become pilgrimage objectives for American historians and architects interested in the extraordinary efflorescence in architecture and the decorative arts which occurred about 1900. Gaudi and Mackintosh are well-known figures in this country, and there is a substantial literature on both men. This interest is natural, since in many respects they appear as precursors of some extremely contemporary tendencies in design. Both are at odds with The International School, to which there is much objection from many quarters. Now Sir Nikolaus Pevsner and Sir James Richards have brought together in this volume a series of essays, mostly culled from that mine of curious learning, *The Architectural Review,* on the lesser known figures of the period and the problematical aspects of its major creative personalities. Some of these, like David Walker's excellent "The Early Works of Mackintosh," will be of interest primarily to scholars, but several others will bring some most unusual monuments to the notice of architecturally minded travelers.

To take the most obvious case, everyon has heard of Gaudi, but how many are aware of his talented collaborator Frances Berenguer or of his almost equally gifted contemporary Luis Domenech? We may b grateful to David Mackay and Oriol Bohigas for bringing these men to our attention. Berenguer was obviously a first class architect in his own right, and Mackay rightly notes his disciplined decoration, hi exploitation of the parabolic arch, and his superb brickwork. Domenech's masterpiece was the Palace of Catalan Music (1905–08), and the writer can testify that attendance at a concert there is an unforgettable experience. One is surrounded b a magnificent fantasy of ceramic tiles and colored glass and at the same time, as Bohigas notes, is aware that the building is "on the road to structural rationalism."

Parallel to Berenguer and Domenech ar such central European designers as Odon Lechner in Budapest and Josef Gocar in Prague. While not many American architects visit these cities today, those who do should certainly look closely at Lechner's Museum of Decorative Art of 1891–96 and Gocar's strangely cubistic flats in Celetna

[continued on page 98]



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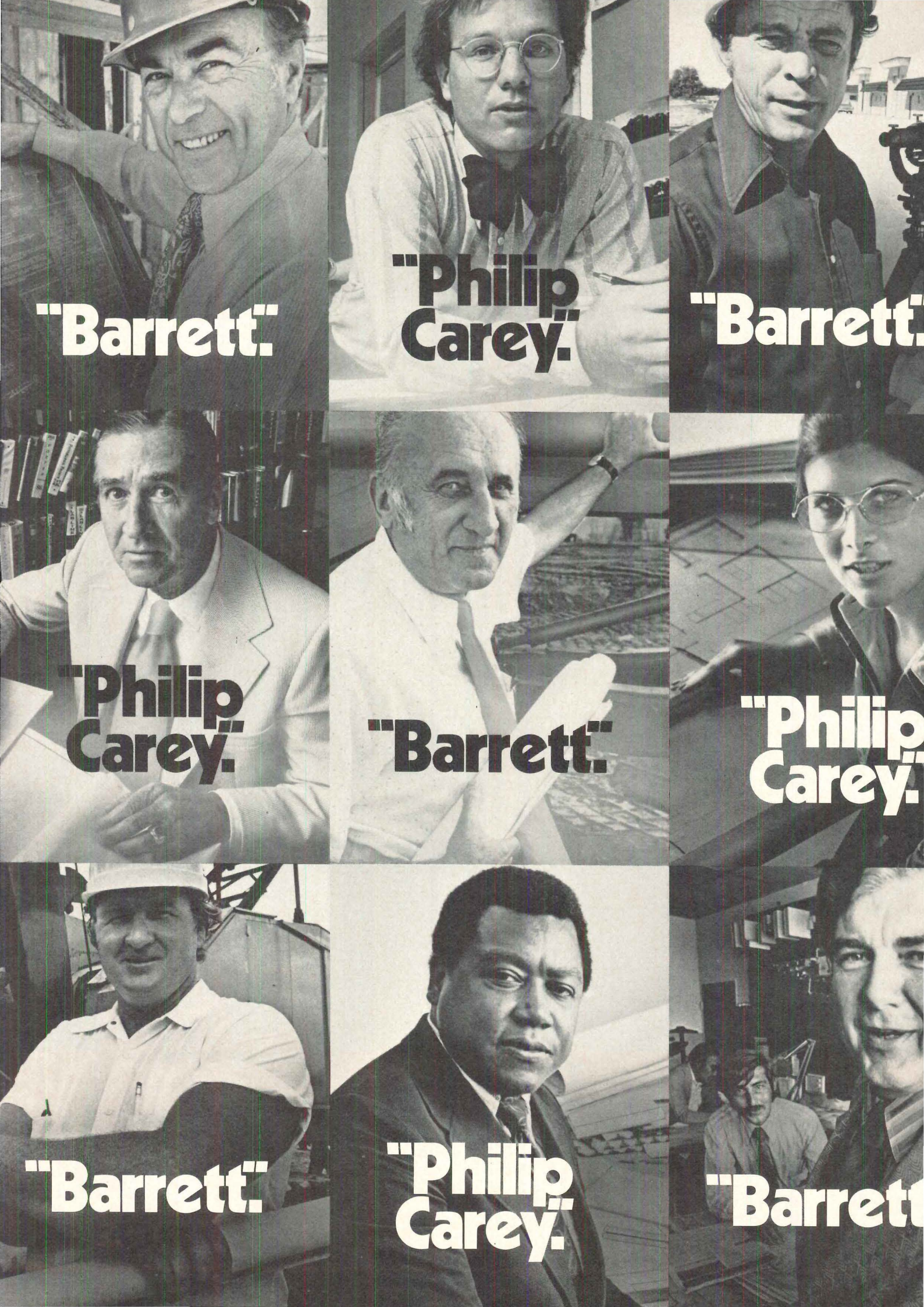
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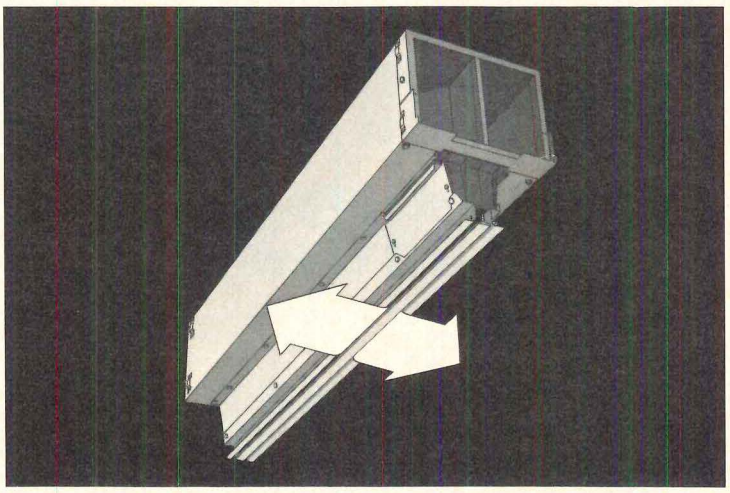
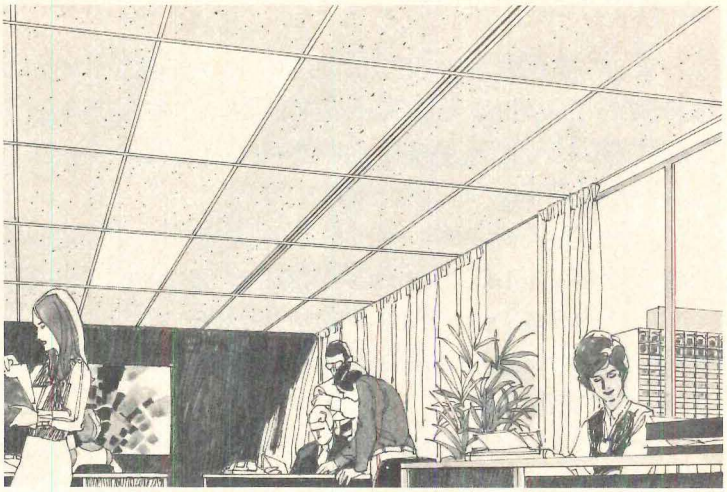


and hides.



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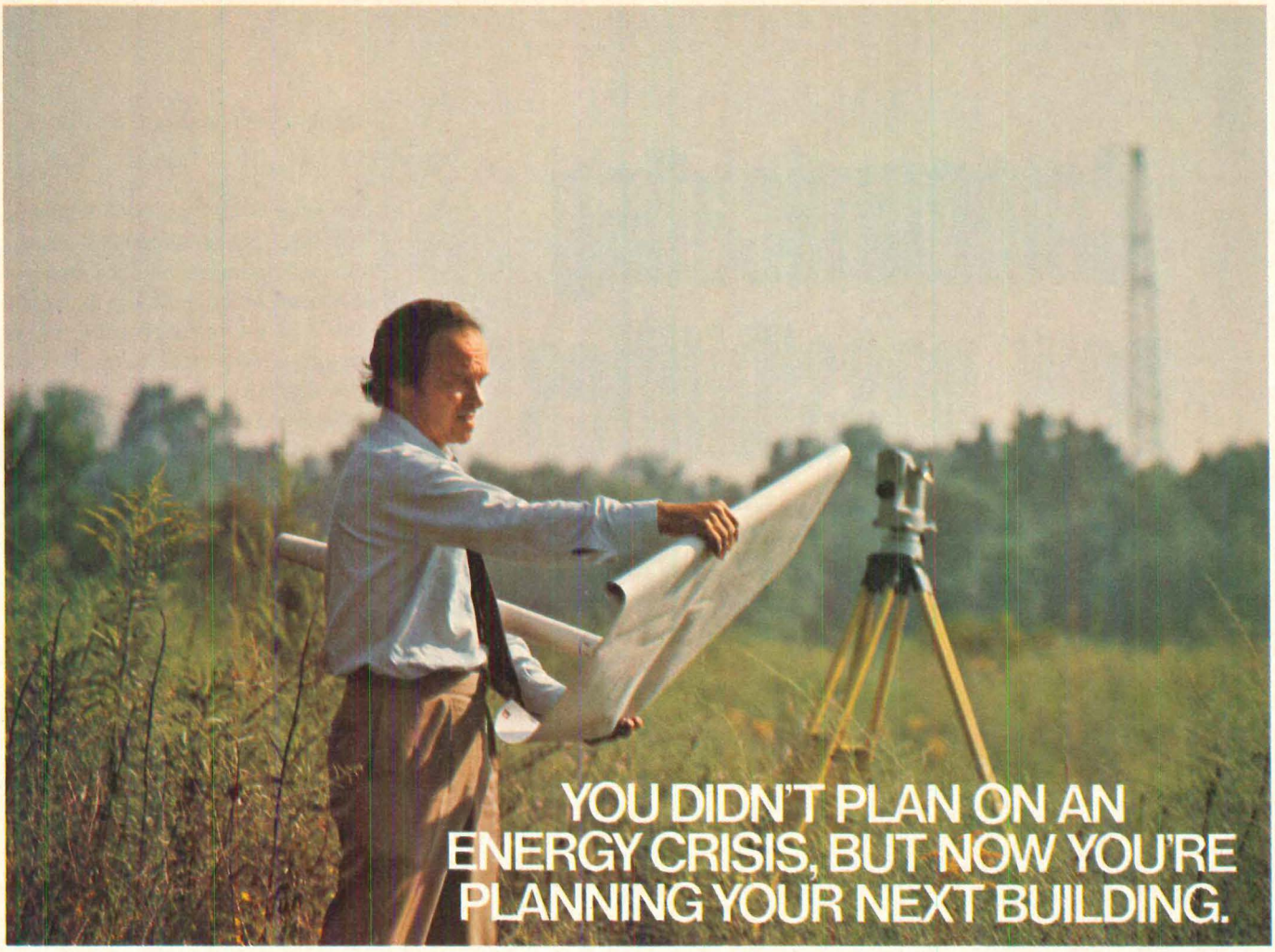

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An analysis of a typical 10-story building shows that over its useful life, the air-conditioning cost for a square foot of our masonry wall will be about 23 cents. For the double-plate glass wall, it will be $7.60.

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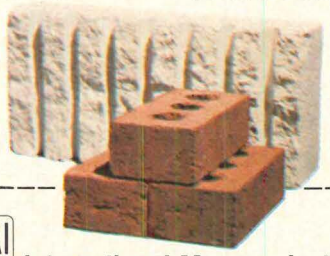

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Books continued from page 92

Street of 1912; Lechner's Postal Savings Bank at Kecskemet (1901) is likely to be a bit more inaccessible. The Czechs were evidently much attracted to cubism. All of this is, of course, a bit out of the way. It is equally unlikely that many of us will get down to the remarkable Arts and Crafts chapel at Brentford in Surrey designed by Mary Watts, but there is no reason why we should not stop for refreshment at the Black Friar Pub of 1905 on Queen Square in London, described by Nicholas Taylor as "genuine pop art of its time." There were, unquestionably, a number of remarkable things done at the turn of the century.

The rationalization for grouping these fantastic architects and buildings together is, as Professor Pevsner frankly avows in his fine introduction, the feeling that he did less than justice to the tendencies represented here in his important *Pioneers of Modern Design from William Morris to Walter Gropius* (1936). This volume established a kind of canonical interpretation, parallel to the one presented by Sigfried Giedion in his, *Space Time, and Architecture of 1941.* Pevsner's outline was not as rigorous as Giedion's, but now a generation of scholarship has intervened, and it is clear that Niemeyer, the late work of Le Corbusier and Kenzo Tange have very little to do with Gropius and the rationalistic international modern of the 1930s. Hence Pevsner, a truly generous scholar, is intent on stressing a greater complexity than was envisioned in his first interpretation. It is in the grand tradition of European historiography that one of the essays—"The Glass Paradise"—which most clearly undermines Pevsner's position, is by his own pupil, Reyner Banham.

What meaning does all this have for Americans? Do we have here an anti-rational tradition of the kind presented by Pevsner and Richards? Certainly it would be hard to find an American equivalent for Guimard or Domenech. Louis Tiffany and Will Bradley are quite possibly the only real art nouveau designers we possess. The range of Frank Lloyd Wright's early work is, however, so great that some of it might easily be termed "anti-rational," and the same might very well be true of some of his Chicago contemporaries. More recently Bruce Goff and Herb Greene easily fit into the same category. In short, Pevsner and Richards have given us a thought-provoking volume which might very well be emulated on this side of the Atlantic.

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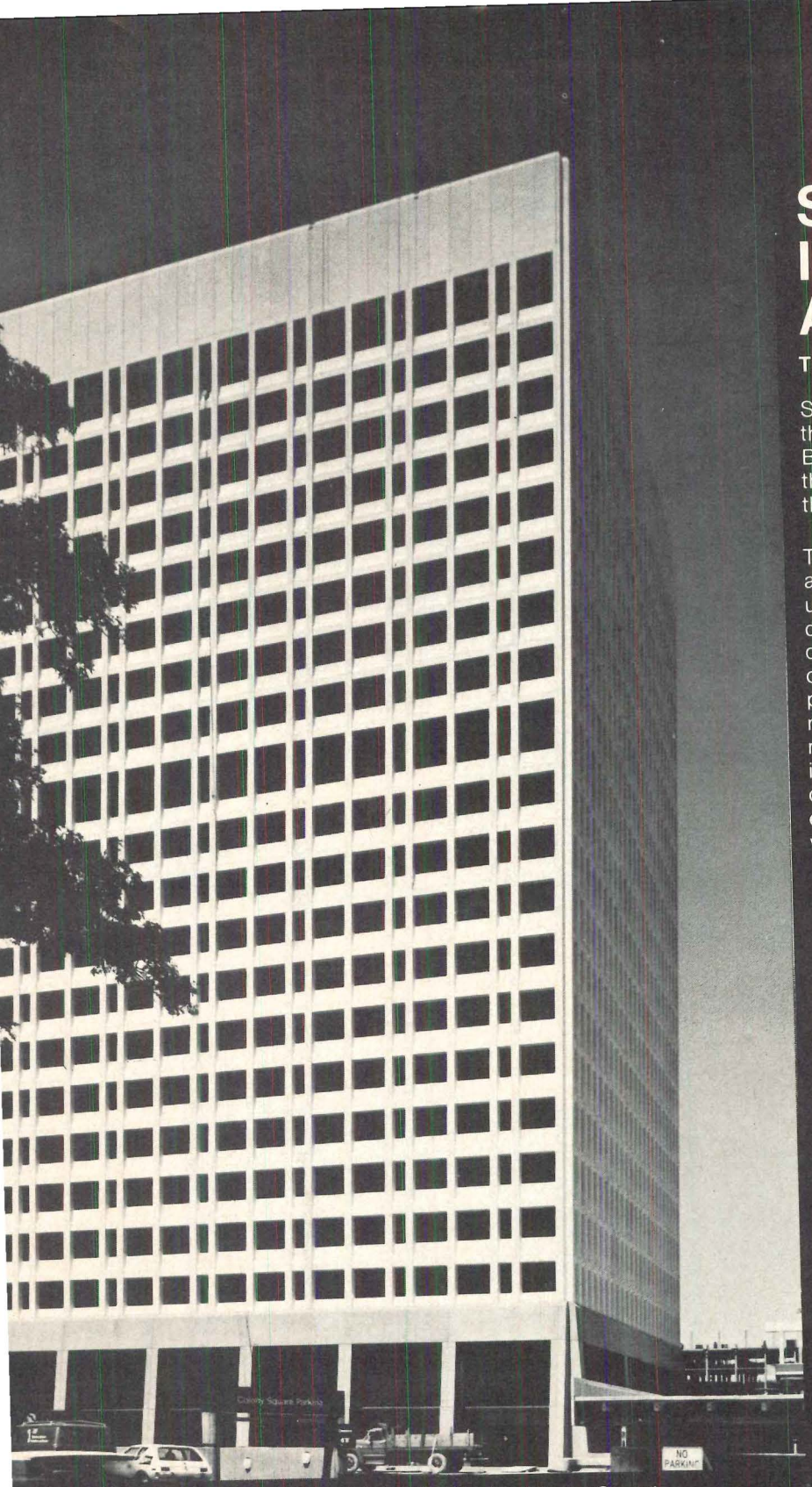

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Milton R. Edelin, AIP has been named principal officer and director of planning services, McCue Boone Tomsick, San Francisco.

Raul F. Garduno has joined R.M. Thomas AIA & Associates, Newport Beach, Calif., as an associate.

Bernard J. Cywinski was made a partner in UNIPLAN, Princeton and Somerville, N.J.

Peter C. Darin has been appointed director of professional construction services of Smith, Hinchman & Grylls Associates Inc., Detroit.

Henry H. Brennan has been named director of the New York office of Welton Becket & Associates.

Steven Bloomfield has been appointed project director of O'Malley & Associates, Inc., Baltimore.

Rudolph N. Pistacchio has been appointed vice president in charge of project coordination for R. Wendell Phillips & Associates, Boston.

Marvin D. Suer, FAIA has joined the staff of Ballinger, Philadelphia, as manager of the architectural department.

New addresses

Smith & Smith Architects Inc., 9001 Braddock Rd., Springfield, Va. 22151.

McFarland-Johnson-Gibbons Engineers, Inc., 1822 Drew St., Clearwater, Fla. 33515.

Sanders & Thomas, Inc., consulting engineers, Kossman Bldg., 400 Stanwix St., Pittsburgh, Pa. 15222.

New firms

Williard E. Gwilliam, AIA, 9 Winding Way, Plymouth, Mass.

James E. Moorhead, Architects-Planners, 203 Huskin Bldg., Greenwood Plaza, 5600 S. Syracuse St., Denver, Colo. 80110.

Darryl C. McMillen and Frank W. Hayes have formed **McMillen & Hayes, Architects**, Willow Bldg., Sun Valley Mall, Sun Valley, Id.

Dana J. Florestano, AIA, 2110-B Amerherst Dr., Indianapolis, Ind. 46260.

Van Dell & Associates Inc., Civil Engineering and Land Planning, 2212 Du Pont St., Irvine, Calif.

Joseph M. Marrow, AIA, 41 Roundabend Rd., Tarrytown, N.Y. 10591.

Annual Index January-December 1973

[continued on page 106]

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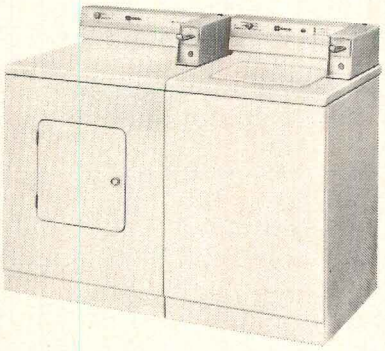

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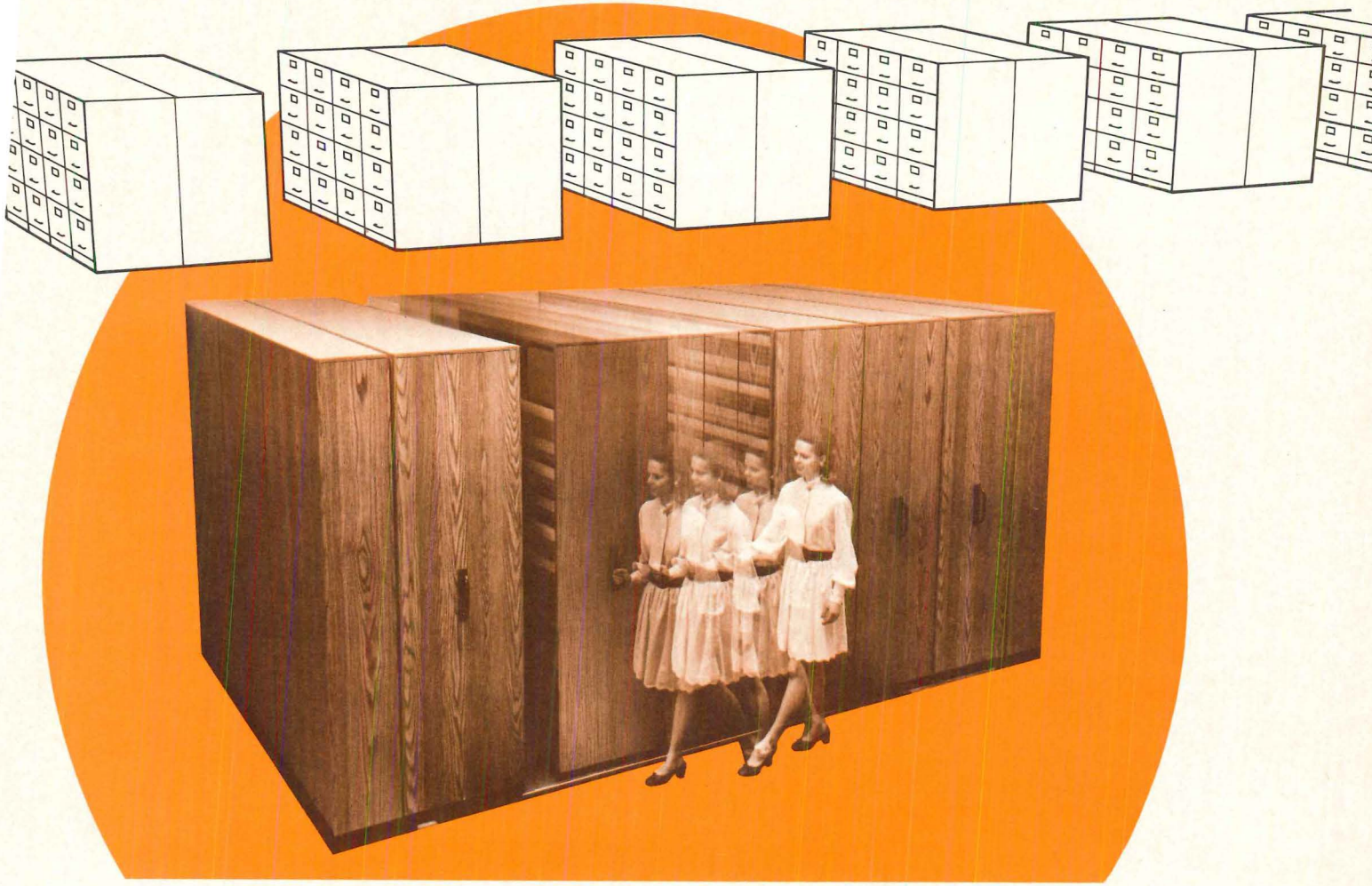

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Architects: One qualified architectural specification writer and one designer-project coordinator. Interested in team approach and building systems. Experience in construction management helpful but not mandatory. Send confidential resume and earning history to Carkin & Sherman Architects and Planners, 570 Liberty St. S. E, Salem, Oregon 97301.

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[continued on page 110]

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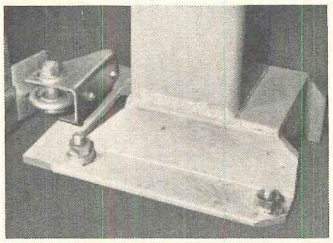

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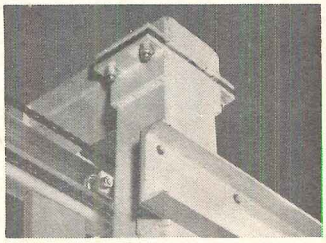

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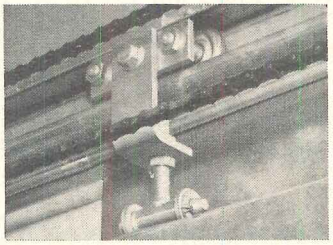

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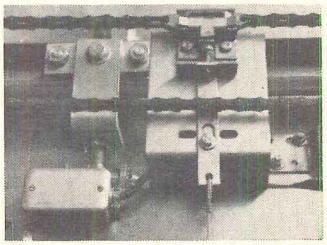

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Job mart continued from page 108

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[continued on page 112]

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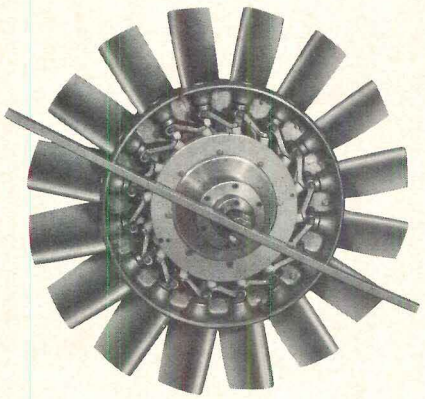

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Job mart continued from page 110

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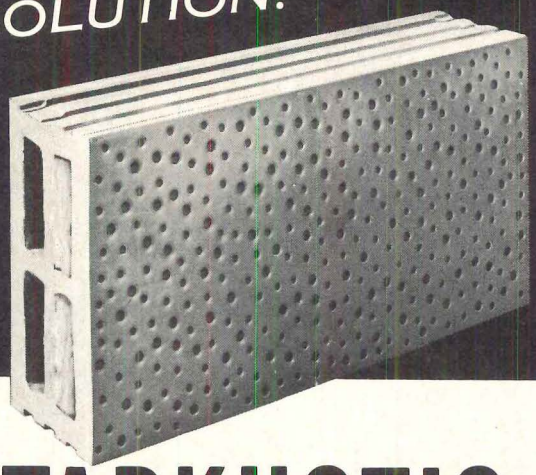

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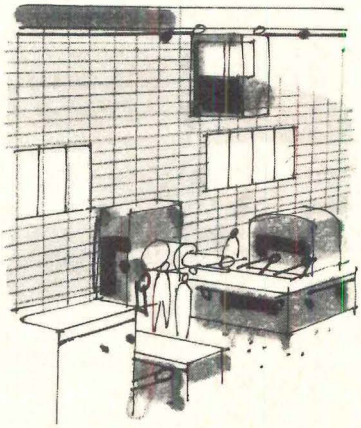

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Material	125 CPS	250 CPS	500 CPS	1000 CPS	2000 CPS	4000 CPS	Noise Level
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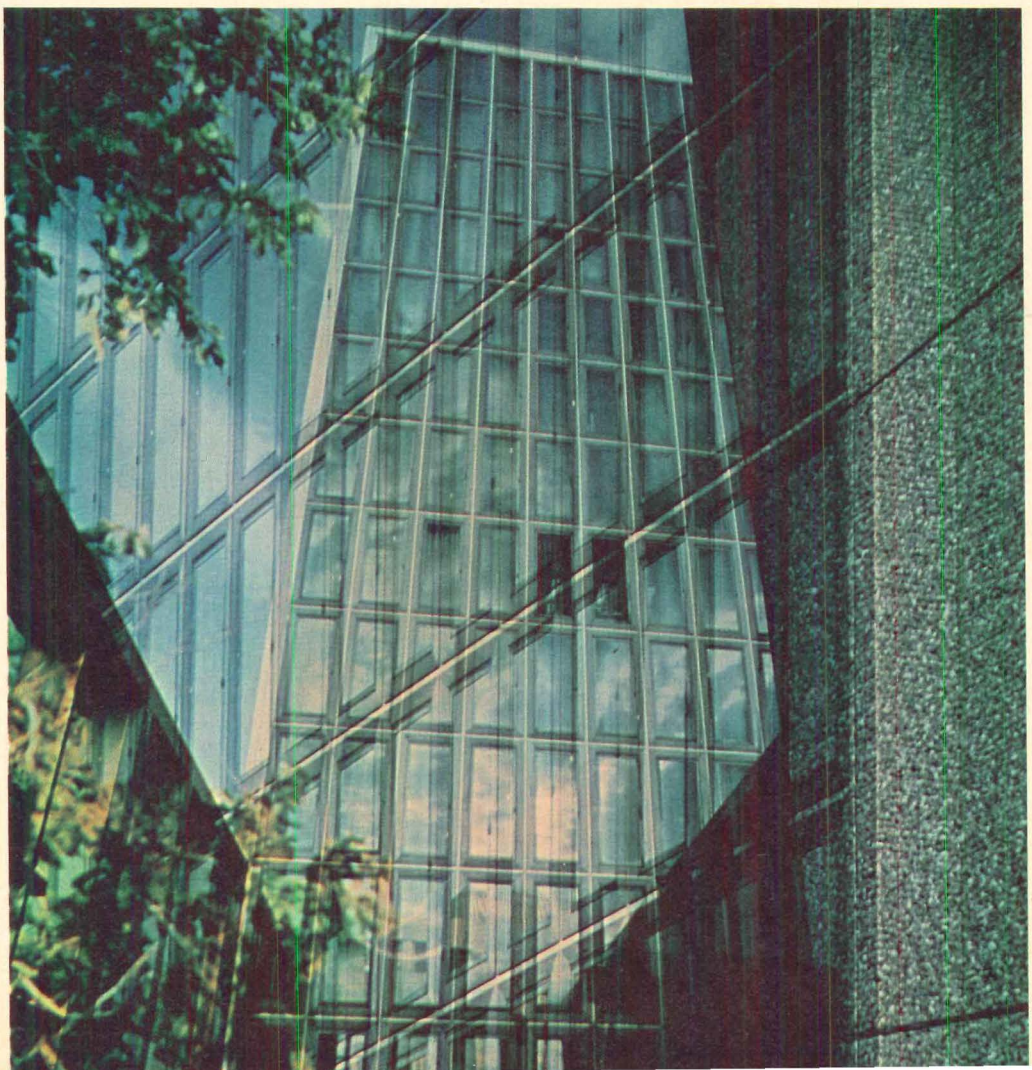

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September 1974

Progressive Architecture

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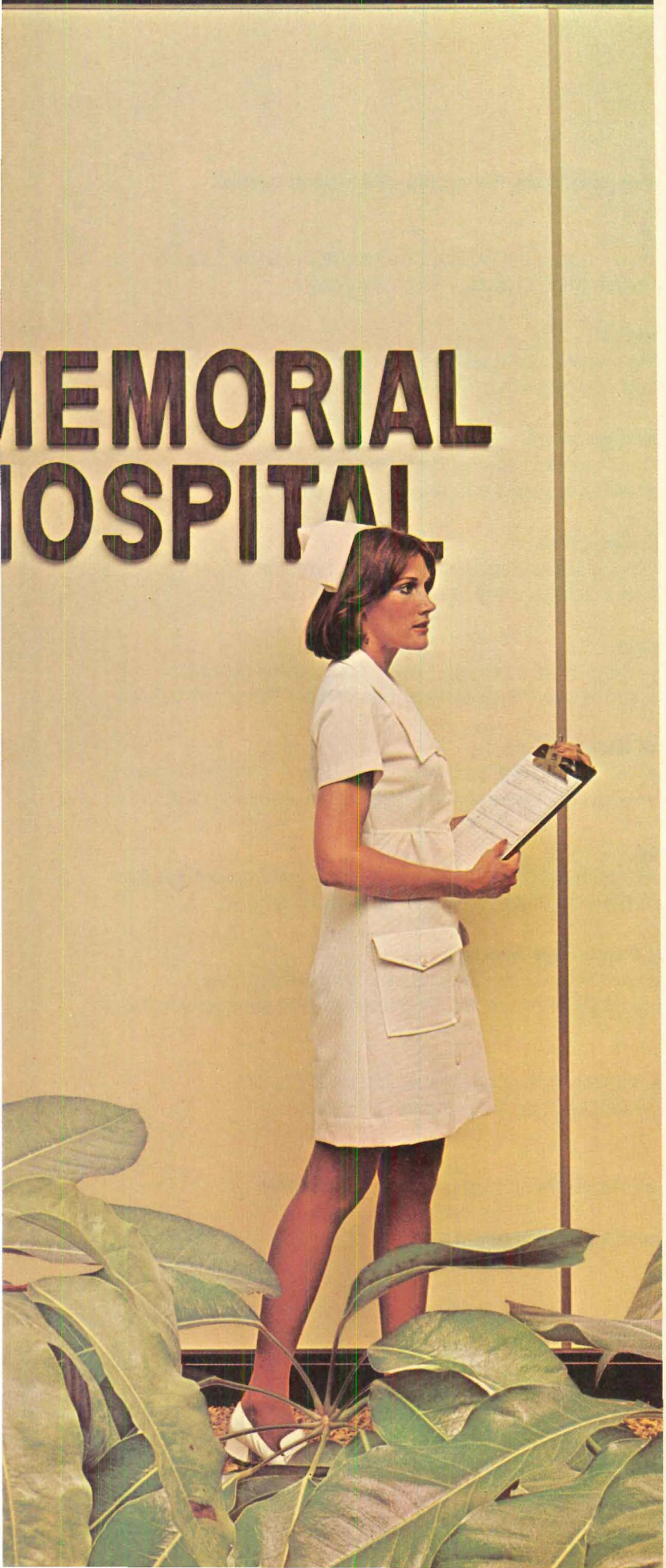

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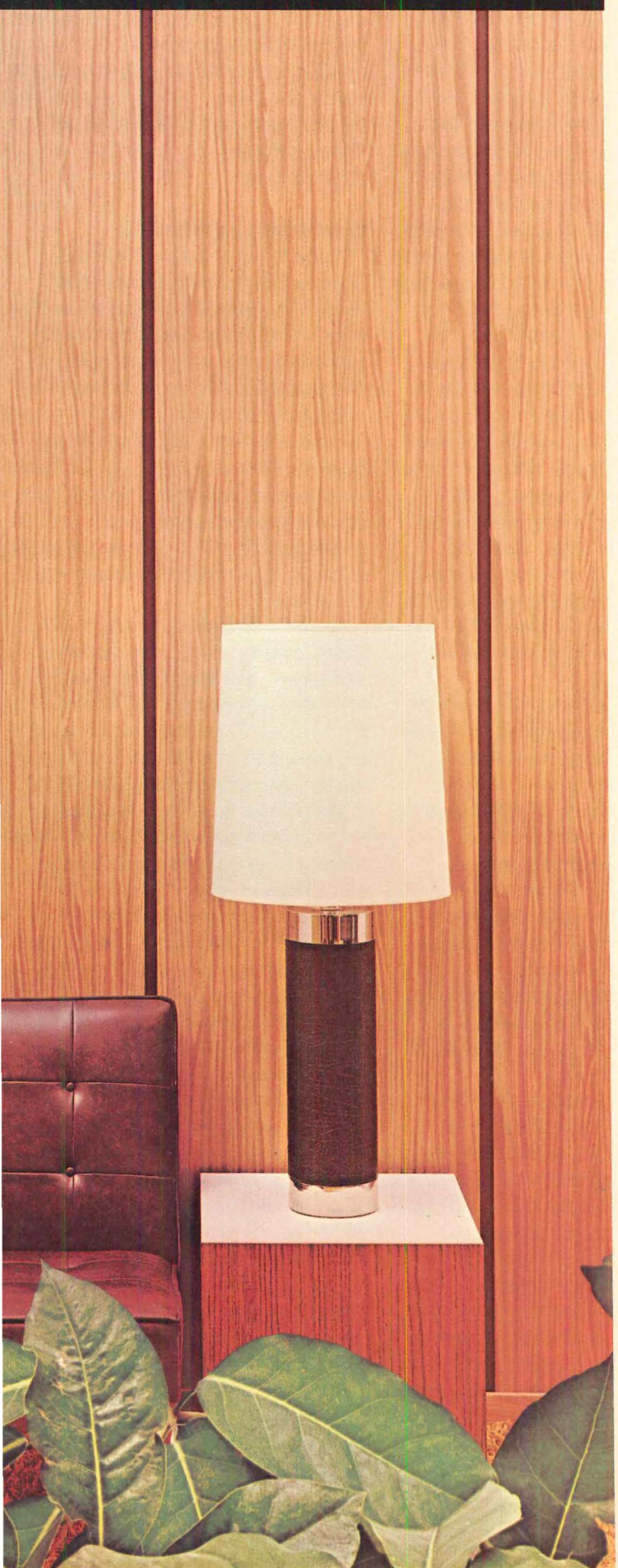

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Views

Eisenman's expression

Peter Eisenman has had things too much his own way. His intelligence and seriousness are sufficiently rare in architects that his ideas go unchallenged. The usual reaction is dumbness, i.e., silence—I don't exclude myself. This letter won't attempt a closely reasoned rebuttal, but only suggests certain areas of doubt.

As Eisenman has explained, the shallowness of current architectural discourse drove him to an examination of other disciplines in search of a more rigorous critical framework. He found what he wanted in linguistics, specifically in the transformational grammar of Noam Chomsky. According to Chomsky, the structure of language is the best model for the structure of mental processes. Chomsky has postulated a universal grammar for all languages at the level of what he calls "deep structure." He believes that language ability depends on, or reflects, innate mental structures, that it is this innateness of linguistic ability which accounts for the ability of children to learn a language so easily and for what Chomsky calls our creative use of language, the ability to understand and construct sentences which cannot be accounted for on the basis of learning or analogy. Chomsky rejects the stimulus/response mechanism suggested by psychology as able to account for human use of language.

What I understand Peter Eisenman to be arguing is that there may be a similar innate level of response to form, to what he calls the structure of form. The difficult aspect of Chomsky's theory is the exact manner of the transformations from the universal deep structure to the specific grammar of individual languages. This is a very complex process, which luckily we each carry out unconsciously, and it is this complexity, which he carries over, that accounts for the difficulty of Eisenman's writing, but I want to speak of what seem to be contradictions in his thesis.

The basic difficulty I see in Eisenman's use of Chomsky's theory lies in the indifference of linguistics to *quality* of language use. The deep structure of Shakespeare or Joyce or Celine is the same as that of Spiro Agnew or myself. Linguistics is absolutely indifferent to the aesthetic quality. In Chomsky's use of the term, Agnew and Joyce are equally creative. What Chomsky is attempting to show is how *everybody* makes sentences, to describe in part the mental processes of *everyone;* art criticism must deal with differing abilities. Thus, I think one could agree with Eisenman that there may be an innate deep level response to the structure of form, but so what? Furthermore, it doesn't necessarily follow that an increase of complexity to the formal structure contributes to an increase of quality or of meaning.

The second area of error to me in Eisenman's argument is unrelated to linguistics. What I want to suggest is that his use of the word "expression" is mere laziness, a holdover from conventional architectural writing. Architects are always *expressing* something: they express structure, mechanical systems, function, regional qualities, even themselves. This is baloney. The word expression is so hackneyed, so indefinite, that it means nothing. If Peter Eisenman were to review his use of this word and to attempt to explain what he means by it, he would never use it again.

And this is my suggestion: that the word "expression" be banned for 50 years. My idea of why "expression" is harmful is too complicated and hazy for complete discussion here, but one thing is clear, that is the meaninglessness of the current use, all current uses, of the term. Furthermore, since expression is so important to so many architects, it is also obvious that some other idea is needed. I would guess that this is what Peter Eisenman is looking for. As I have already written to him, I think "information" may be a more useful word than "expression." We need something more exact. Rosalind Krause seems to me to be getting at a similar point in her discussion of Minima Art in the latest OPPOSITIONS (# 2).

Again and again it becomes clear that the lack of any dialogue between architecture and the art world is damaging—especially for architecture. For example Sol LeWitt's *Paragraphs and Sentences on Conceptual Art* quoted in Lucy Lippard's *Six Years: . . .* may be as useful for architects as for LeWitt himself.

Thomas Killian
New York, N.Y.

Eisenman's experiment

"House III" is an excellent article, about an important piece of architecture in a very interesting issue (P/A, May 1974). Peter Eisenman's work represents one of the most serious and uncompromising searches in architecture. By closing the architectural system and exploring its immanent qualities he takes a difficult (yet, full of implications) path that is different and somewhat opposed to more accepted investigations which take architecture as a support of extrinsic values and meanings.

His work has been grossly misinterpreted by many, and negative "criticism" has missed the point by addressing systematically nonpertinent issues. P/A does a remarkable job presenting his House III in a format that avoids a simple vulgarization and at the same time it helps to dispel some widespread misjudgments. However this was not enough to clarify some readers' views, who are now caught in their own arguments. It is probably Mr. Miller's vivid account of his experience in House III that they cannot accept. (Peter Eisenman's writings require some sound knowledge of architecture to be commented upon.) Here it is, a client of Peter Eisenman's house who is quite happy with it ("I guess you win, Peter . . .). Now that this imputed "problem" has dissipated, what matters is to consider and evaluate Eisenman's approach and search in architecture together with its theoretical implications: this I find extremely relevant. In this respect, Bruno Zevi's recent praise of Eisenman's work (among others) in *"L'Architettura"* (May 1974) is reassuring.

Jorge Silvetti
Carnegie-Mellon University
Pittsburgh, Pa.

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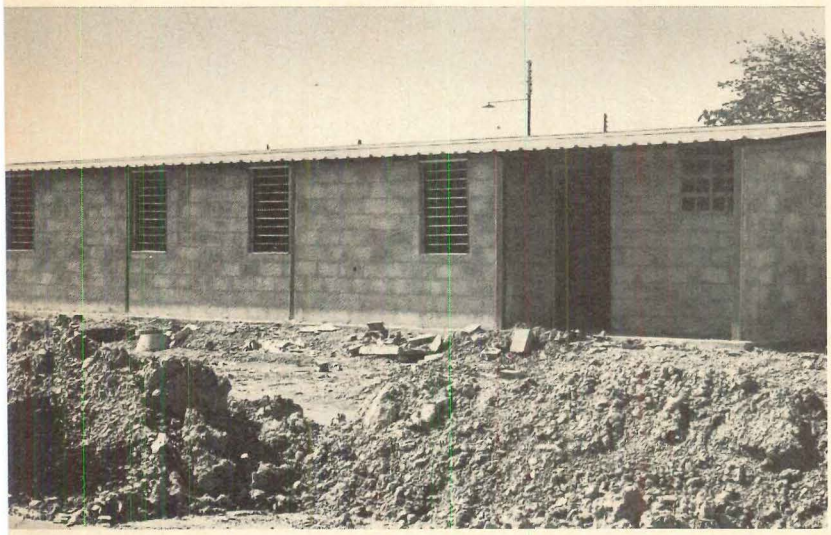

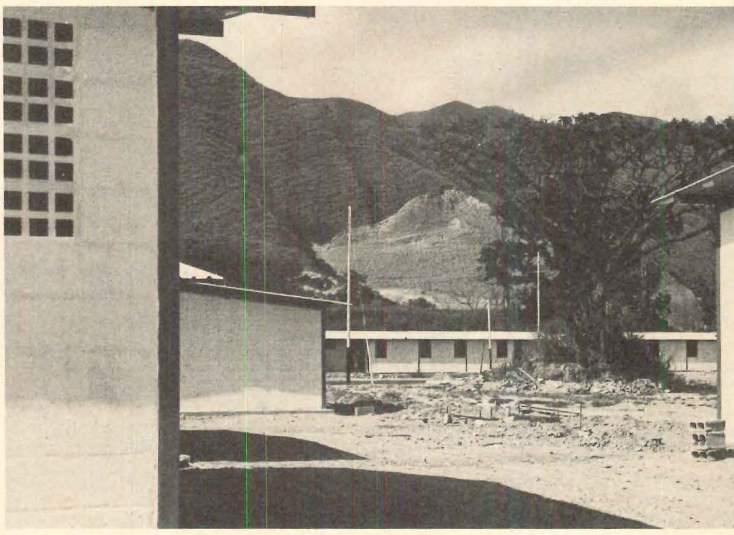

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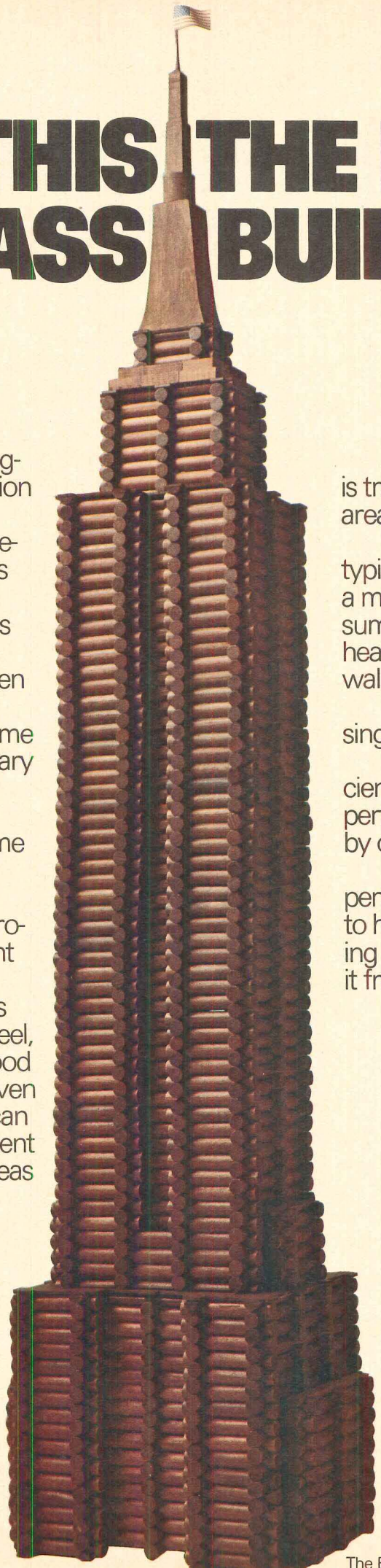

The Empire State Cabin

The energy crisis has triggered a ground swell of opinion against glass.

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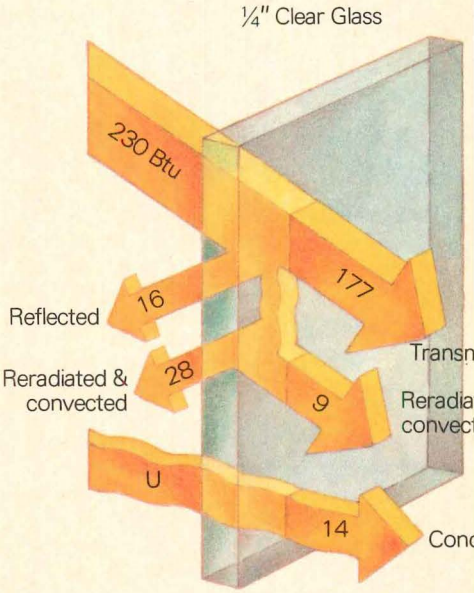

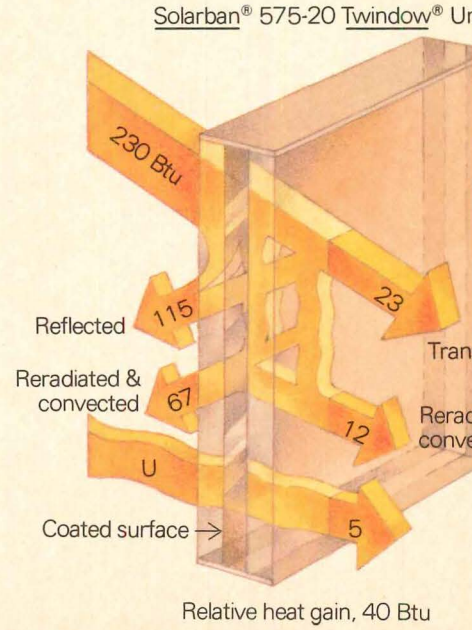

KNOW THE FACTS.

But it wasn't. Solarban vindow insulating glass was eady being used when ergy was still a cheap com- odity. So it's not some novel riosity to be viewed with skeptical eye. In more than ven years of use in some the most prestigious build- gs in the country, Solarban vindow reflective insulating ass has proved itself a highly fective energy saver.

The Equivalent Energy Benefit.

Some people are saying at, to save energy, glass ould comprise no more than 0% of the wall area.

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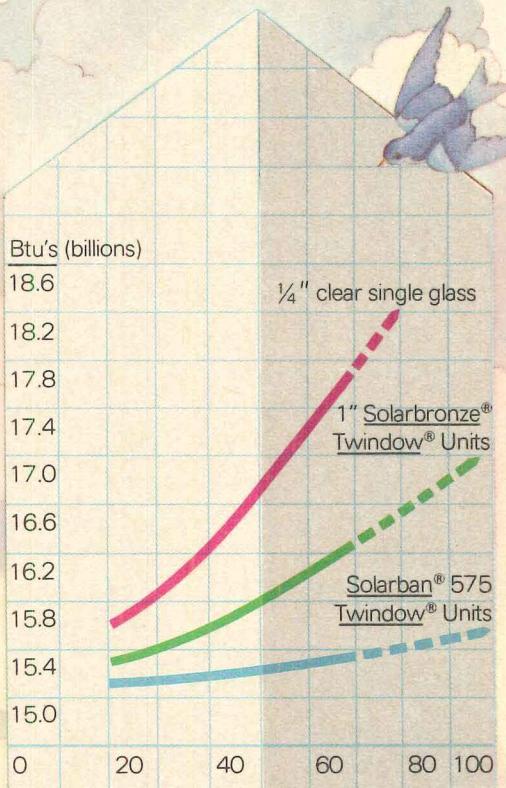

Billions of Btu's required annually for heating and cooling as a function of the percentage of glass to total wall area.

To prove our point we conducted computerized research. Using a hypothetical office building 15 stories high, we plotted (see graph) the annual energy consumption of this building as a function of different quantities of different kinds of glass.

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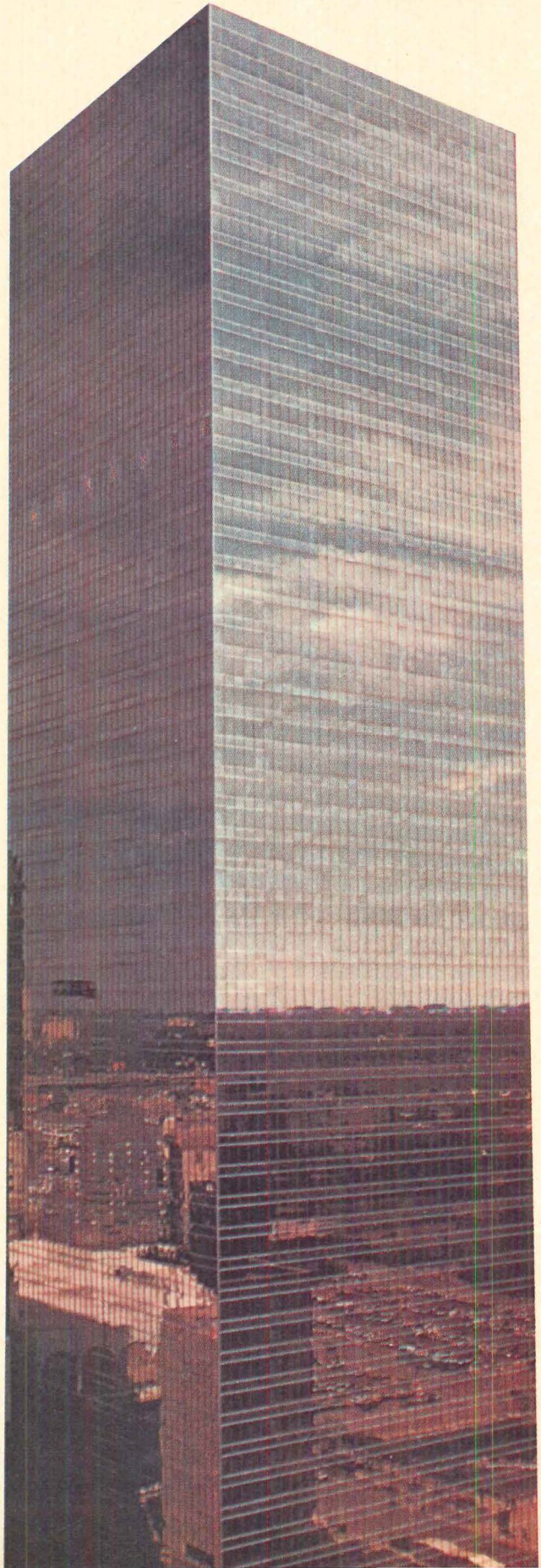

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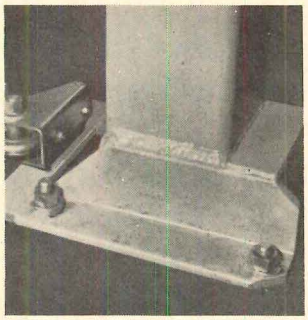

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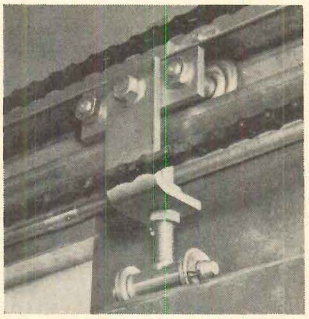

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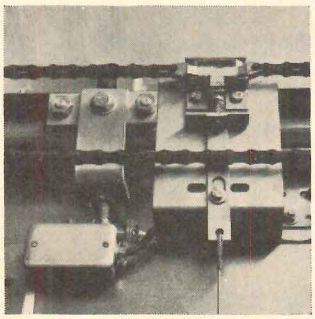

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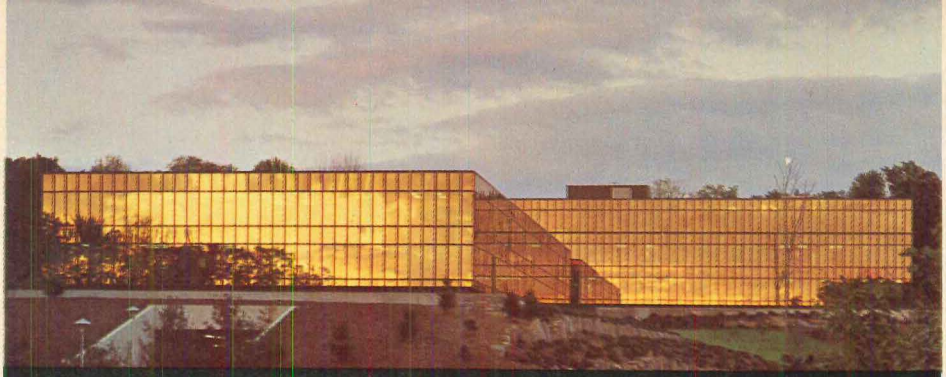

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News report

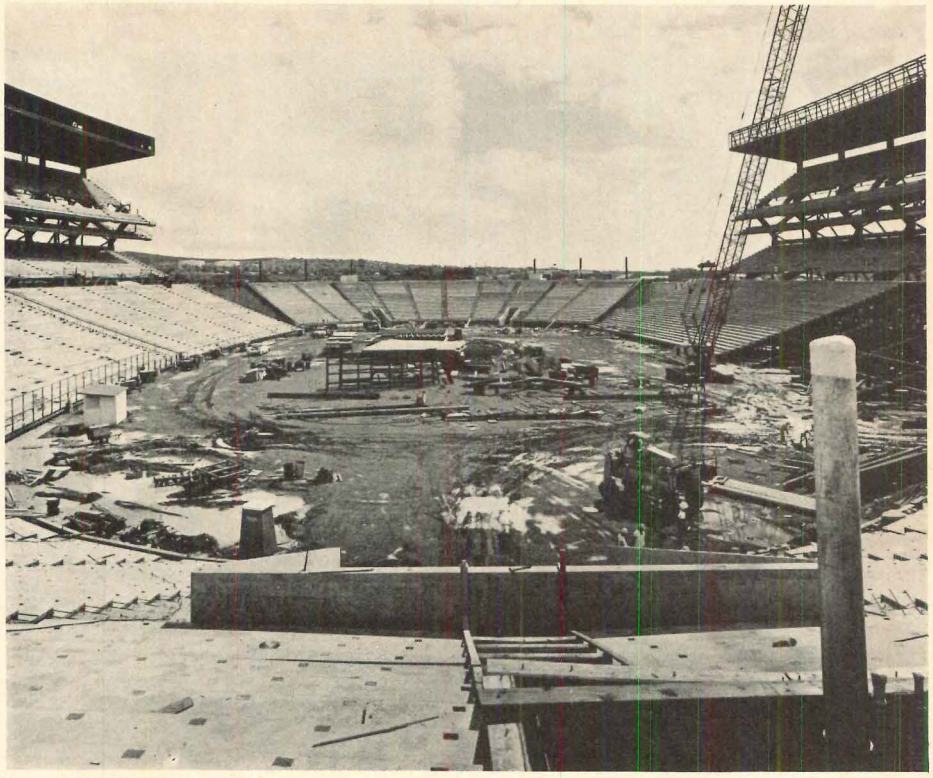
Contents

Lawsuits surface over Hawaiian stadium

A suit and countersuit concerning professional services and contractor's performance have arisen over the 50,000-seat Oahu Stadium scheduled for completion in January. Hawaiian Dredging & Construction Company, a subsidiary of the Dillingham Corporation, initiated the suits by charging architects Charles Luckman Associates of Los Angeles with negligence in preparing plans and specifications. Luckman has entered a countersuit against the Dillingham Corporation on charges that the construction division, HD & C, concealed bad workmanship and tried to place the blame on others.

The HD & C suit, filed in Federal District Court, Honolulu, is seeking punitive damages of $1 million and actual damages in excess of $10,000. Luckman is suing for $5 million in damages. Of primary concern is the malfunction of a seating mechanism that would move four grandstands 140 feet to convert the field from football to baseball. Due to existing conditions, the system, supplied by RolAir, is not working. HD & C claims that Luckman failed "to show or properly take into account the true subsurface conditions of the stadium site" when designing the concrete pads on which the seating rests, and that the specifications call for a porosity of concrete which is "impossible to measure or construct."

Luckman denied the charges and further indicated that HD & C poured the runways with excessive variations and repeatedly failed to take corrective action when deficiencies were pointed out. The stadium is being built for the State of Hawaii; associate architect is Michael T. Suzuki & Associates, Honolulu.

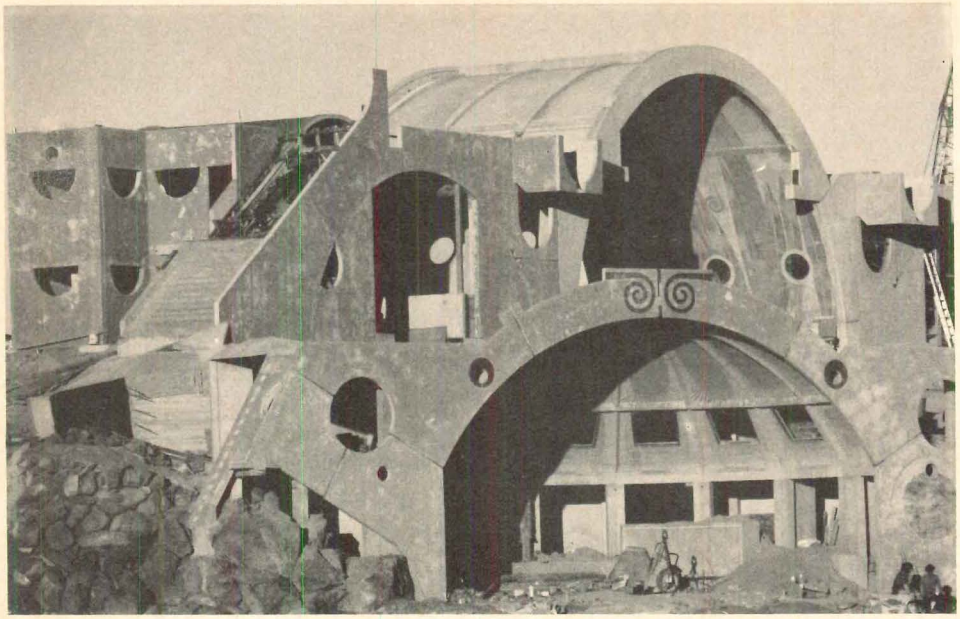


Oahu Stadium nearing completion in Honolulu

New look for News report

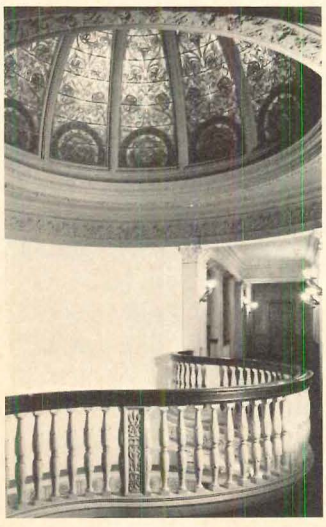
Beginning with this issue, P/A's News report will appear in a three-column format with larger headlines to give its readers a faster-paced news section and to further emphasize the distinction between news and editorial features. At the same time, News report has changed the title of "Buildings on the way up" to "In progress" allowing a wider choice of subjects, and has added a new column, "In perspective," which will cover in greater depth newsworthy projects.

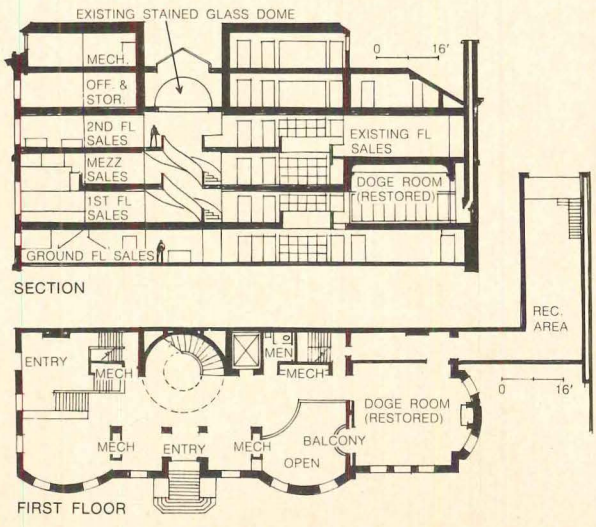
"Architecture west" was renamed



Arcosanti and workers. Photo: Ivan Pintas

Existing mansion entry, dome, balcony. Proposed renovations, lower right. Photos: George Thomas





"Report from" with a changing dateline to expand the possibilities of coverage by P/A's regular West Coast correspondents—Esther McCoy, Sally Woodbridge, and Roger Montgomery —as well as by other contributors.

Soleri workshop accepting participants

Paolo Soleri's six-week workshop at Arcosanti, his arcology prototype under construction on the Arizona mesa, is open for participants for the fall session, which will bring to a close this year's series. Workshops will resume in March. Those accepted will help construct the precast concrete megastructure and receive room and board. Inquiries may be sent to Soleri at the Cosanti Foundation, Doubletree Road, Scottsdale, Ariz. 85253.

Brotherly love

Few areas in design these days arouse as much controversy as preservation, and the battlefront can come even into the ranks of the profession itself. In Philadelphia, architects as well as increasing members from the public are outspokenly against the changes which Design Research, a prominent retailer of contemporary products based in Cambridge, Mass., has proposed for the 19th-Century Van Rensselaer mansion on Rittenhouse Square. Concern centers not around the exterior, which essentially will be preserved, but on the opulent interiors that would be enlarged and significantly modified by the plan given Design Research by its architects Architectural Resources Cambridge Inc.

"Naturally when you go into a building of that type you want to save everything," said Colin Smith of Architectural Resources. As planned, however, the first three floors substantially will be gutted and a mezzanine added Among the more outstanding items in the path of renovation are a stained glass dome, which would be retained although in a different setting, a

fireplace in the entrance hall, a curved balcony, and the dining room called the Doge Room, which will be restored. But Smith said the store absolutely needs unobstructed floor space—and more of it—to make the venture successful economically. Moreover, added Design Research president Philip Doub, renovation is the lesser of evils in view of the landlord's feeling: "Wouldn't it make a nice parking lot?" Indeed, that is just what faced the Philadelphia Historical Commission when it approved plans several months ago. "The alternative was possible demolition," said the commission's historian, Richard Tyler. Anyway, the commission gets another opportunity to crack down on the plans when a building permit, yet unapplied for, comes up for approval. Meanwhile the AIA's Philadelphia chapter has formed a temporary task force to establish minimum standards of preservation for the house.

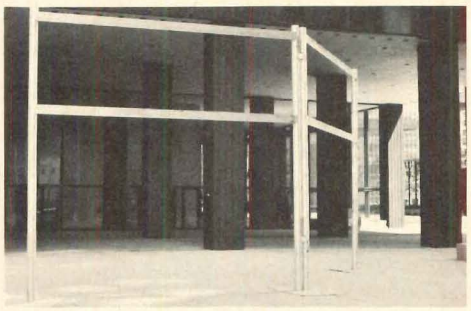
This isn't Philadelphia's only brush with situations like this: last year Caldwell's, a prominent jewelry store, began modernizing by painting walnut architectural woodwork a pale blue whereupon scores of customers dropped charge accounts and boycotted the store. The painting ceased, and the store restored the woodwork. But even this tale appears not to impress Design Research. Said Daub, "The building's been on the market three years, and it took us a year to figure out what to do." He won't abandon plans now.

AID and NSID vote to merge

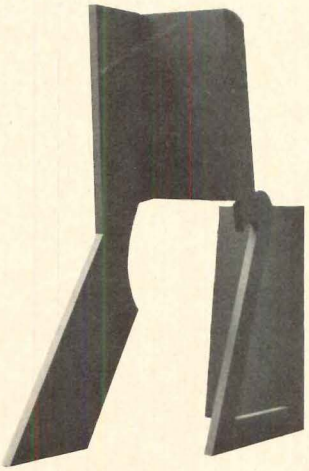
After nearly 20 years of separation, the American Institute of Interior Designers and the National Society of Interior Designers have voted to merge, and the new organization, to be known as the American Society of Interior Designers, is expected to appear Jan. 1, 1975. National officers for ASID will be elected from among the combined 9000 membership on Oct. 9, 1974, at a special board meeting in Portland, Ore. The consolidation makes the new society the largest organization of professional interior designers in the world. The vote to merge came in July. AID was formed in 1931; its New York chapter broke away in 1957 leading to the formation of NSID.

"Burlap Man," William King

"Sun Targ," John Henry



"Raintree," Michael Hall



Untitled, George Sugarman
"Snowplow," Mark Di Suvero

Chicago sculpture exhibit

Sculpture by five well-known Americans will be exhibited in Chicago through Sept. 14 in the courts and lobbies of One and Two Illinois Center, 111 E. Wacker Drive, buildings designed by the Office of Mies van der Rohe. The exhibit is the second of this scope sponsored by the Center and Metropolitan Structures; the first was in 1968. George Sugarman, William King, Mark Di Suvero, John Henry, and Michael Hall are the sculptors.

Where the money is

A seminar on how design professionals may obtain grants from numerous sources now available will be held Oct. 4 and 5 in Washington, D.C. under sponsorship of the American Society of Landscape Architects Foundation. The seminar is based on the assumption that designers lack the same expertise in obtaining grants as that possessed by their colleagues in other fields such as education or medicine. Further information on the seminar is available by writing the ASLA Foundation, 1750 Old Meadow Road, McLean, Va. 22101.

De facto ban against plastics

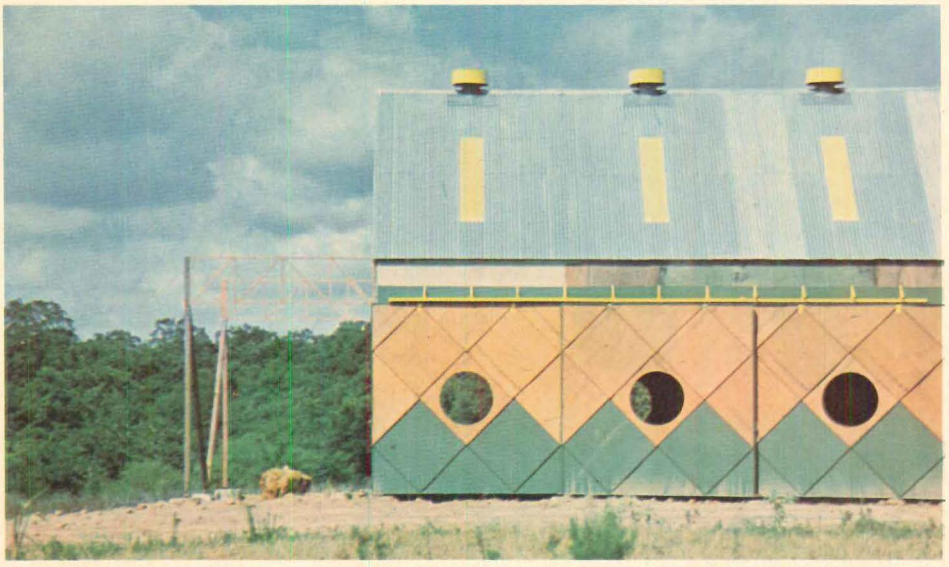
Action by the Federal Trade Commission, which has the effect of banning the use of foamed (cellular) plastics for insulation and other purposes, may have a major impact on construction costs and design considerations.

The FTC, after nearly two years of investigation into fire characteristics of the plastics, has obtained "consent decrees" from 25 manufacturers that will: 1) Prohibit use of words such as "nonburning," "self-extinguishing," and "noncombustible" in advertising or sales literature concerning these materials and further prohibit reference to flame-spread tests of the ASTM; 2) Require the manufacturers to notify all major customers since 1968 of the danger of fire and toxic gases from such materials and require ASTM to notify all of its 13,000 members as well; 3) Require companies to establish a $5 million research program to produce better testing methods.

Thirty working days to erect. Photo: John Bentliff

Wood from Watkins Glen
Photo: Gerald Moorhead

Peaceable Kingdom's "barn"



Color coded for the environment. Photo above and center right: Danny Samuels

In perspective: Modern barn raising

It took 10 minutes to design and 30 working days to erect—save for such finishing touches as hanging the doors and windows. Moreover, it only cost $4000 and a few *alfresco* suppers for the builders—members and friends of the artists community for which the structure was built.

The barn is two-stories high and serves as a workshop, garage, apartment, and parking space for assorted vehicles including a road grader which the community, called Peaceable Kingdom School, bought from a retiring contractor. The project, near Houston, Texas, is by Architects Incahoots & Associates of Houston; partner in charge was Danny Samuels. The major construction material was plywood surplus from the stage at the Watkins Glen, N.Y., concert which was brought to Texas for another concert then sold for $1200. The fir columns and 46 trusses, made on a jig by workers who never had built anything before, were erected in a day-long barn raising climaxed by a wedding celebration and square dance.

Because the natural landscape in Navasota, Texas, is rolling hills and trees, the barn is nestled into a dip making it less obtrusive. To reduce the impact of its great bulk, 4′ x 4′ diagonal shingles are laid in a sawtooth pattern and painted green at the bottom of the barn to ground the structure; the top is stained a natural color picking up the tree line; and the corrugated galvanized tin roof is a brilliant silver reflecting the sky. Bright yellow vents provide contrast. Perhaps even more striking is the cost: $2 per sq ft, not including electricity.

Incahoots is a two-year-old design and planning firm of four partners who first collaborated on a senior project at Rice University designing an inner-city shopping mall. Since then they have worked on two houses, several office extensions, a small bank, loft houses—which won't be built—and a men's store.

[News continued on page 28]

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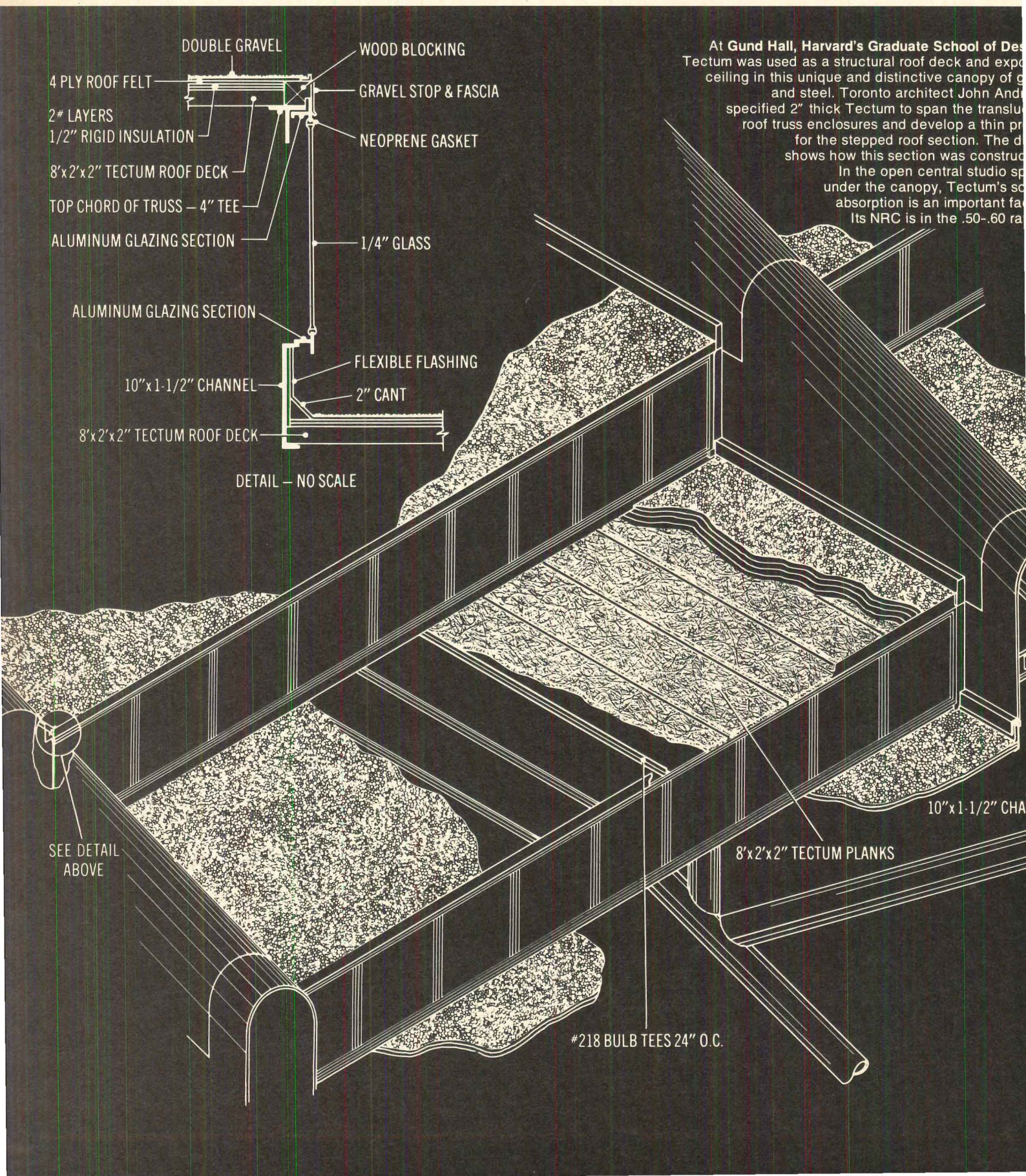
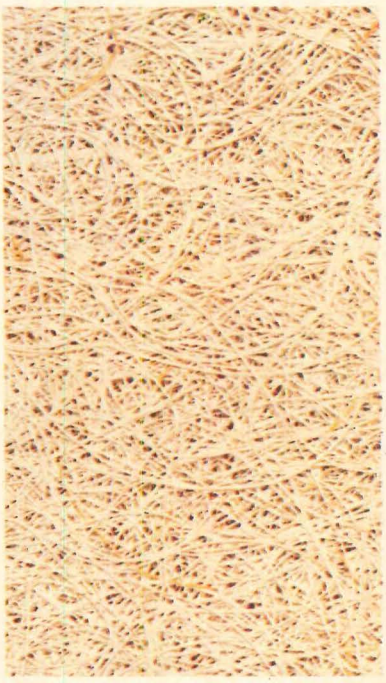


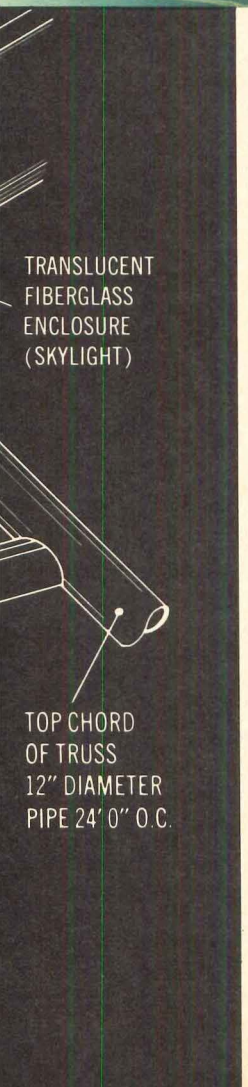
At **Gund Hall, Harvard's Graduate School of Des**
Tectum was used as a structural roof deck and expo
ceiling in this unique and distinctive canopy of g
and steel. Toronto architect John And
specified 2" thick Tectum to span the translu
roof truss enclosures and develop a thin pr
for the stepped roof section. The d
shows how this section was construc
In the open central studio sp
under the canopy, Tectum's so
absorption is an important fa
Its NRC is in the .50-.60 ra

:ructural, acoustical.

Gund Hall Graduate School of Design, Harvard University, Cambridge, Mass.
Architects: John Andrews, Edward R. Baldwin and John Simpson, Toronto.
Structural Engineers: Le Messurier Associates, Boston.
Tectum Contractor: Bay State Structural Specialties, Boston.



Texture is the thing about Tectum, but not the only thing.



There's no end to the ways you can be constructive with Tectum® Roof Deck. Look at the way it was used in Gund Hall, shown at left. As a structural material, Tectum gives the roof a thin, efficient section, and demonstrates impressive insulating values as well. In the two-inch thickness, resistance to heat transmission is 3.50. With its Noise Reduction Coefficient in the .50-.60 range, it soaks up sound. And with its rugged finish, Tectum looks good exposed.

The reason Tectum is so constructive is because of the way it's put together. An exclusive inorganic binder bonds long wood fibers into a compact sheet under heat and pressure. Like wood, it's easy to cut, shape and install. Tectum has been given an uplift rating of Class 90.

Long Span Tectum Roof Deck
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Like other Tectum Roof Deck, Long Span Tectum has factory-applied asphalt felt membrane, and is applicable to flat or pitched roofs with steel, wood or concrete framing.

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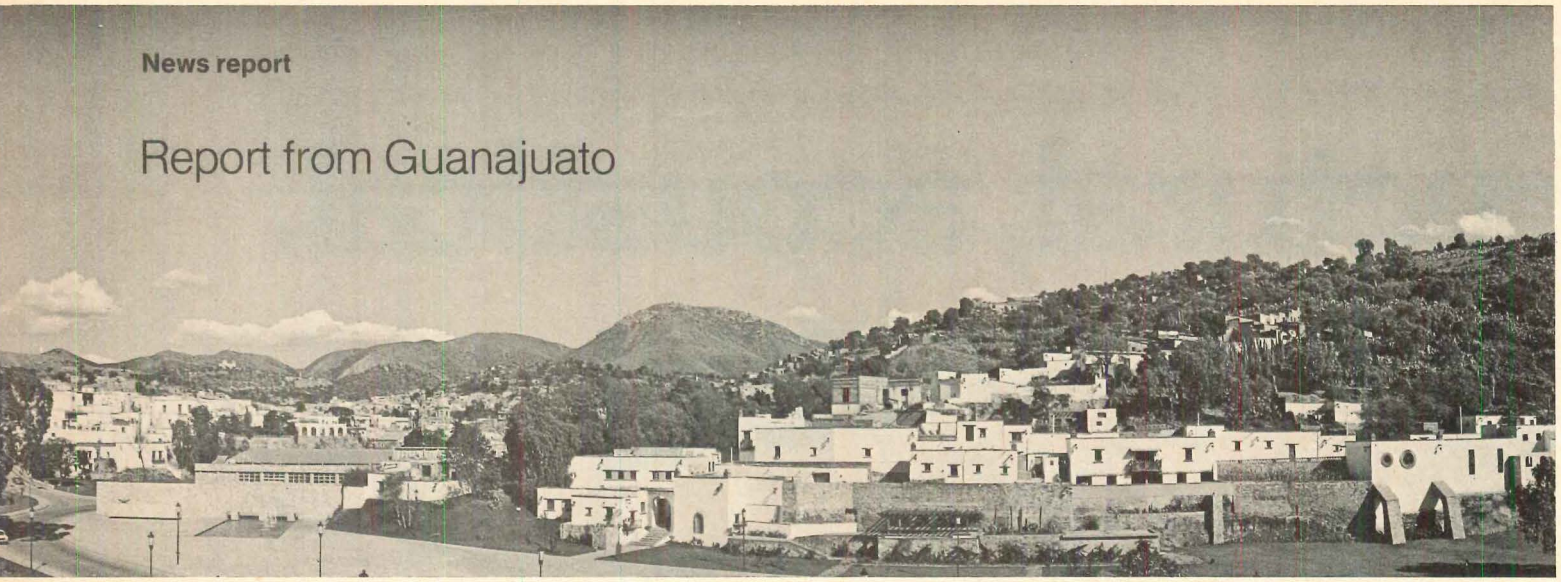
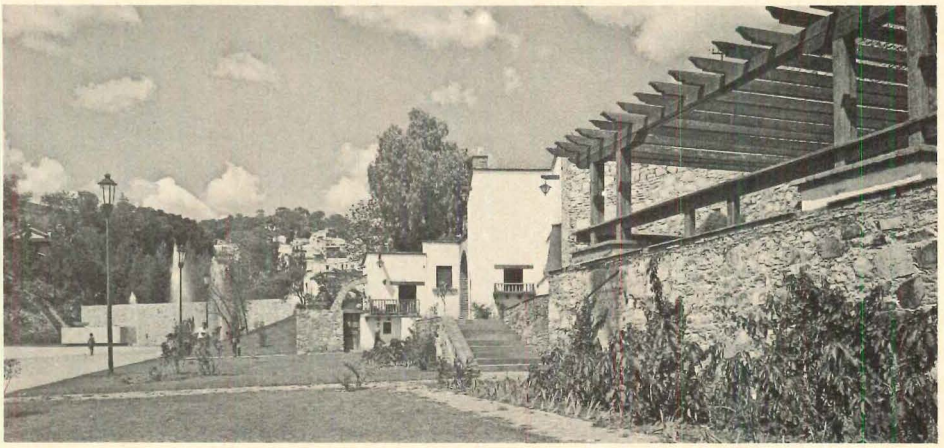
Report from Guanajuato



Entrance to renewed Colonial city: once it was a dump



Mellowed buildings offer subtle colors. Photos: Luna

The Mexican silver mining city of Guanajuato, winding along narrow steep streets, has what critic Oscar Urrutia describes as urban spaces which make themselves tangible and acquire solidity. Architecture, he adds, is at the service of form and color.

The entrance to the city was once a dump yard with open sewers and squatters huts; on the upslope were deteriorating Spanish Colonial buildings without water or electricity. This became the site of an extraordinary renewal project planned by Mexico City architect Francisco Artigas.

He already had opened up a central plaza for the city, planned two smaller ones, and advised on a scheme for lowering the bed of the river coursing through the city while using the old bed for vehicular traffic. Given a free hand in the design of the entrance to Guanajuato, Artigas used his authority with imagination and delicacy. He cleaned out the huts, broadened the road (perhaps too much), and lined both sides with a continuous park. There he stopped.

Buildings on the slope were retained so as not to displace the owners. Artigas liked the Colonial forms spilling down the slope; the continuous descent of buildings reflected every contour change of the land. And he also wanted to preserve the tiny cobblestone lanes onto which the dwellings and artisans' shops emptied.

Recalling his decision, Artigas explained: "Slum clearance levels too many Colonial communities, and then inappropriate buildings are substituted for ones that belonged. All of us have felt under our feet the beautiful plan of a Colonial plaza or village and marveled at the correctness of the forms for our climate and our way of life. By sheer chance in Guanajuato I discovered the small-scale projects in urban renewal can be accomplished without disrupting the economy or destroying the ambience—and in a short time with immediate benefits."

Affected in the renewal was a 600-meter-long stretch of buildings enclosing 5500 sq m. The 183 dwellings and six artisan's shops housed some 1300 people. The budget of four million pesos (about $365,000) was to cover gardens, buildings, and the recobbling of lanes. Such improvements as the wiring of buildings, installation of sewers and water pipes to kitchens, painting, and the retiling of roofs remain.

Moreover, Artigas wanted a restaurant to attract tourists entering the city. He also planned a music pavilion for the young serenaders who stroll the streets on nice evenings. But the budget was too slim. Rather than sacrifice anything, Artigas went to the owners and asked their help with the wall mending and painting. He got it and proceeded to teach them how—and he got his restaurant and pavilion.

Now the community grows out of the hill like an outcropping of rock, so subtle and right that it almost escapes notice. It asserts itself modestly in the variation of roof levels and weight of masses. Architecture, as Urrutia says, does serve form. Color, too. The once-white walls which contrasted sharply with the green hill and luxuriant greensward are becoming stained, and the walls facing the cobbled lanes are rubbed to a polychrome by the people who brush past them. A hydrant left (symbolically?) at the intersection of three lanes is the hub of walls whose colors are witnesses to the social life.

The Artigas office now has in various stages of design and construction 114 renewal jobs in towns in the valley of Mexico. In the meantime, Artigas is designing a new Mexican Embassy for Washington. [Esther McCoy]

[News continued on page 32]

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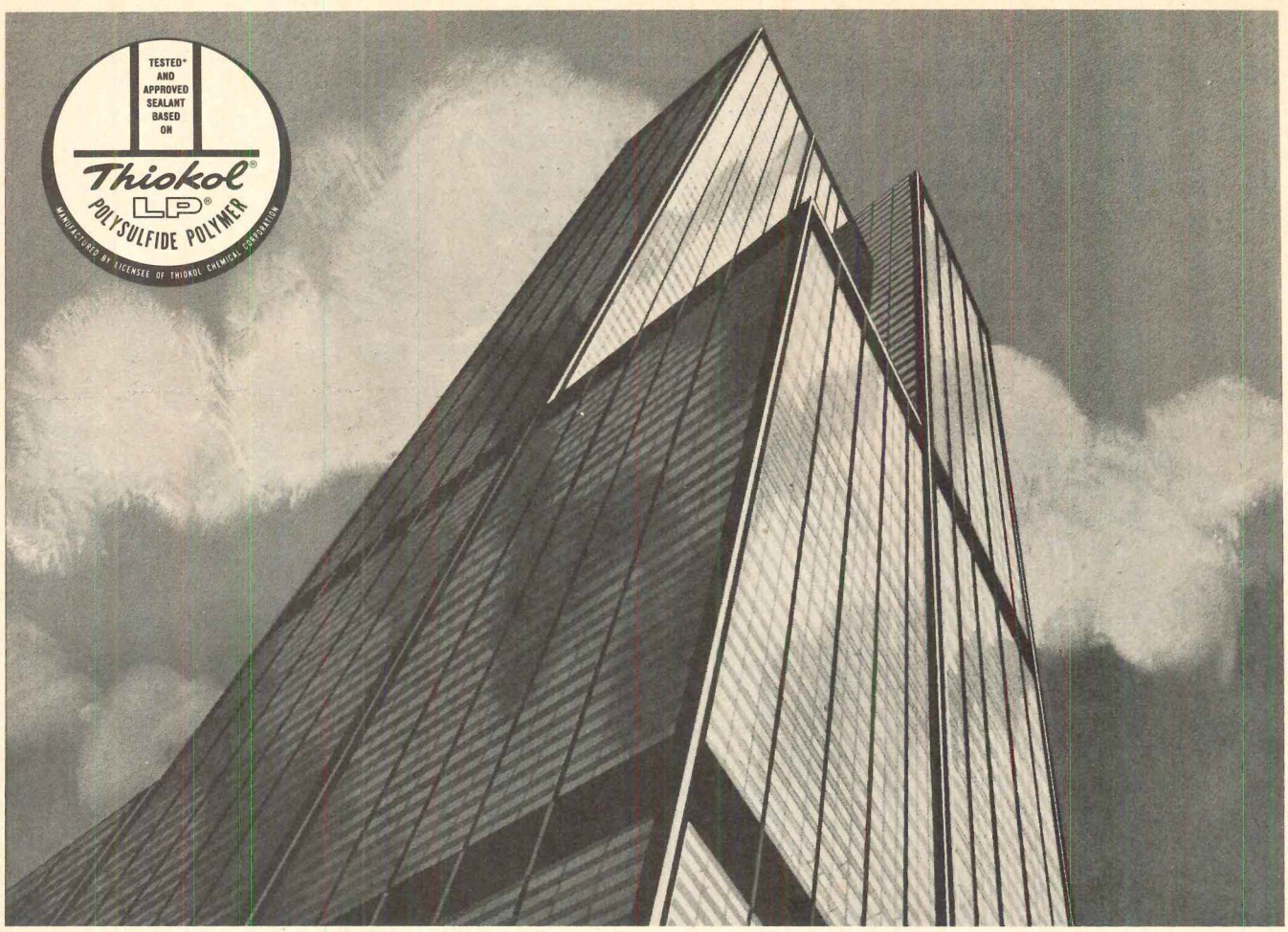

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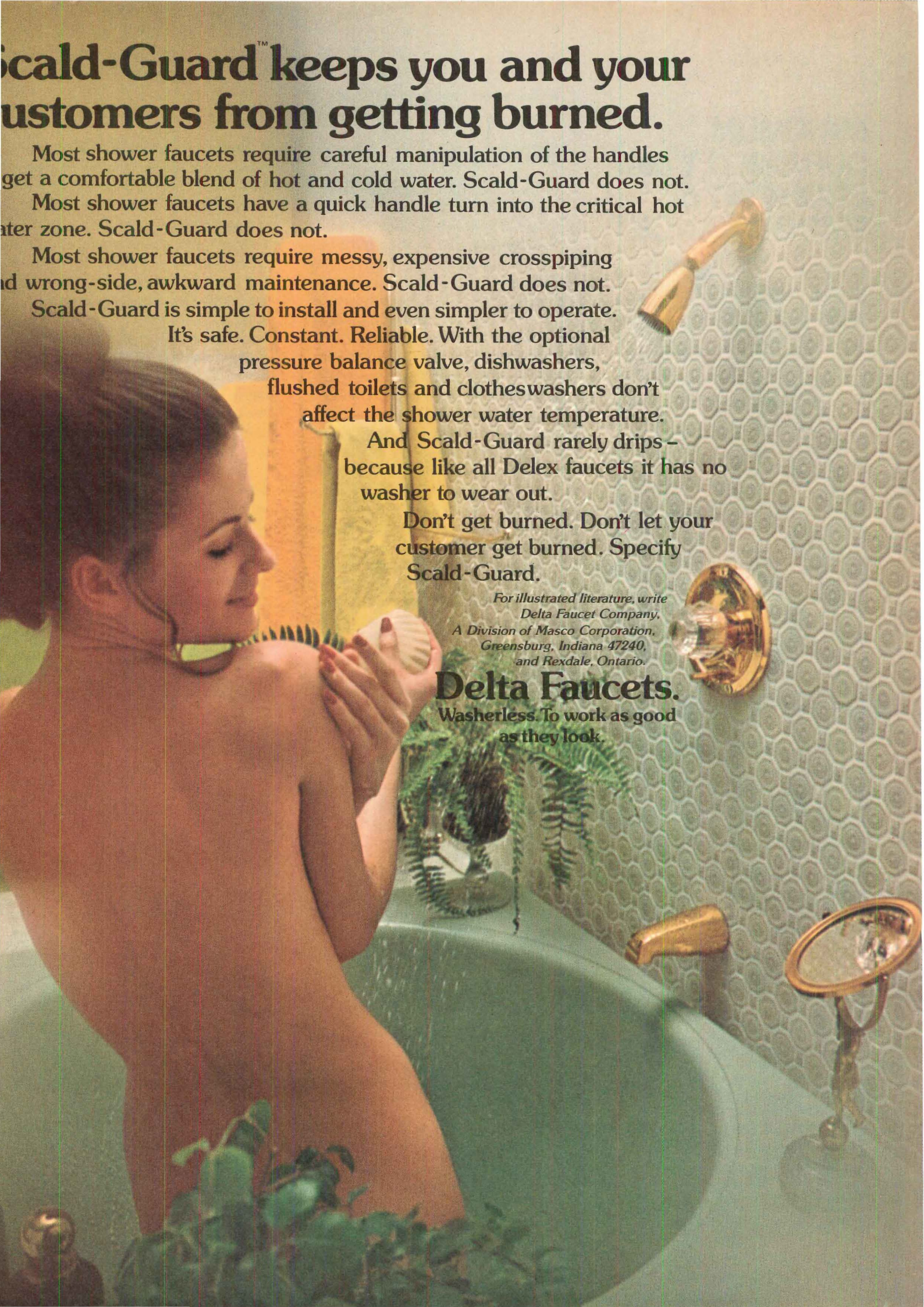
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News report continued from page 28

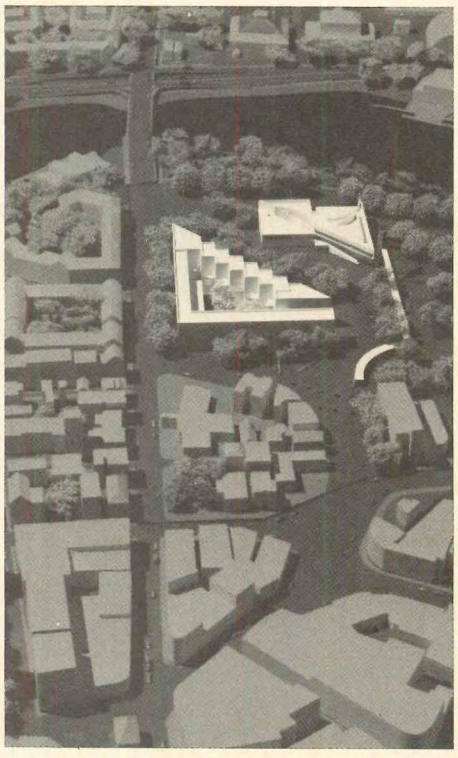
JFK Library: still facing objections

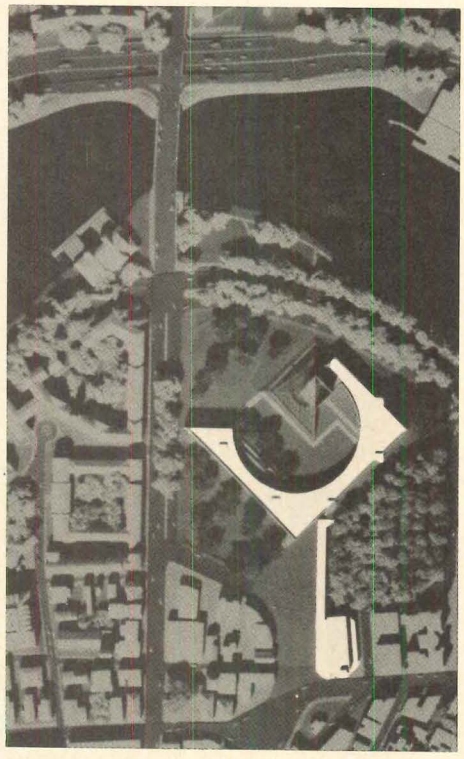
I.M. Pei & Partners, New York, and the John F. Kennedy Library Corporation have disclosed revised plans for the JFK Library in Cambridge, but not without evoking a rebuttal from the influential neighborhood groups which sacked the original proposal. Scarcely two weeks after the big announcement, Neighborhoods Ten and Nine published a brochure with the already familiar theme that the library will be a tourist attraction over-running the Harvard Square area dear to both the university community and its increasingly vocal blue-collar neighbors. The main hope of the citizen groups is the Environmental Impact Statement, which must face a public hearing before final approval is granted.

The new plan has abandoned several key design elements of the first proposal. Now the library and a companion academic building belonging to Harvard no longer are joined forming a protective enclosure for the future Commonwealth Park to be located on the site. The two buildings are separated so as to open a clear passage, and a brick arcade will serve as the boundary on one side. The original large, 85-ft-high glass pyramid of the library has been replaced by a smaller, horizontally triangular brick volume—brick, to match surrounding Harvard dormitories. The interior public spaces containing exhibits will be designed by Chermayeff & Geismar Associates, New York, which has planned sequential displays of documents, artifacts, and audiovisuals.

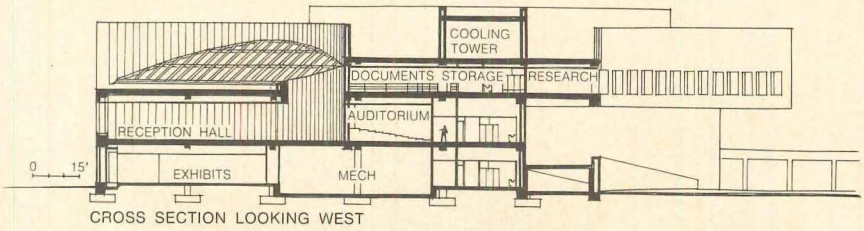
Even if the building goes up as planned, the site, formerly a swamp, combined with a building height restriction of less than 100 ft will pose serious technical and economic problems. But for a project already 10 years in the planning, time will surely open some solutions.

[News continued on page 35]





Kennedy complex (above left) and previous proposal.



CROSS SECTION LOOKING WEST

s report continued from page 32

rsonalities

ıard Bender has been appointed rman of the Department of Archi- ure, College of Environmental De- , at the University of California, keley.

ı P. Schlegel, AIA is the new presi- t of the Association of Collegiate ools of Architecture, Inc., Wash- on, D.C.

ert B. Owens, dean emeritus of the ool of Environmental Design at the versity of Georgia, has been named sident of the International Federation andscape Architects.

Jack Mitchell has been appointed di- or of the School of Architecture, Rice versity, Houston, Tex.

s K. Waterhouse has been named nuel H. Kress Professor in Residence ne National Gallery of Art, Wash., D.C.

eodore T. Bartley, Jr. of Bartley, g, Mirenda & Reynolds has been ap- nted to the architectural advisory mmittee to the Philadelphia Historical mmission.

d J. Davis, Building Department Su- intendent and Assessor of Garden , N.Y., has been elected president of lding Officials and Code Adminis- ors International, Chicago.

seph G. Sprague has been named di- tor of the division of design and con- uction for the American Hospital Asso- ion, Chicago.

ert Martin Engelbrecht, Princeton, ., has been elected to the executive mmittee of the National Academy of ence's Building Research Advisory ard.

alendar

rough Sept. 30. Visionary Projects for ldings and Cities exhibition by Regi- d Malcolmson, University of Michigan seum of Art, Ann Arbor.

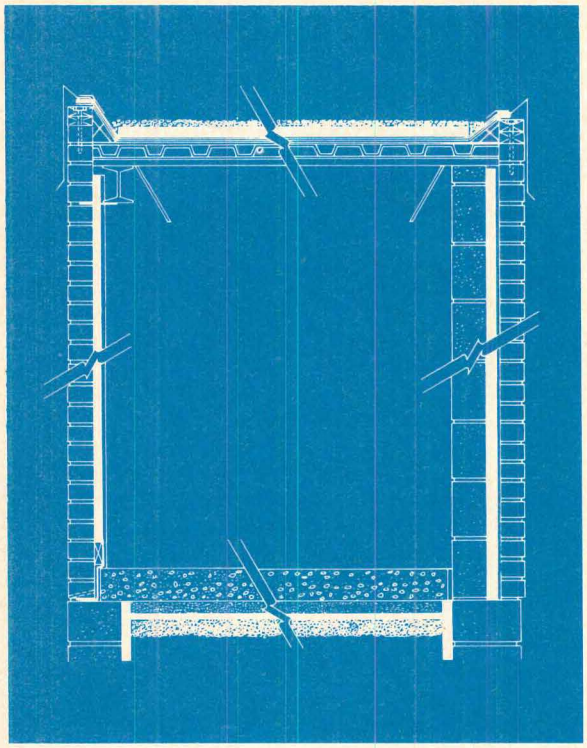
pt. 18–22. Convention of the National sociation of Women in Construction, rmont Roosevelt Hotel, New Orleans.

pt. 27. Conference on construction nagement sponsored by Washington iversity, St. Louis, Mo.

pt. 29–Oct. 3. Conference of the Na- nal Association of Housing and Rede- opment Officials, Boston.

pt. 30–Oct. 2. Inter-Noise 74, Inter- tional Noise Control Engineering Con-

ntinued on page 39]



Another effective building system from Amspec Inc.

Single-wythe brick walls pre-fabricated with SARABOND* brand mortar additive allow new freedom in masonry design

Pre-fabrication of brick panels was a dream just a few years ago. A dream because it seemed a good idea, a way to open up new avenues of design and structural expression as well as an excellent means of reducing construction time and cost. And the development of high-bond mortar additives in the past decade has opened these avenues, helped to make this dream of panelization a reality.

SARABOND* brand mortar additive is one of those high-bond products. SARABOND is designed specifically to improve the strength properties of portland cement mortar, helping to make pre-fabricated brick panels a distinct factor in today's building design.

In-plant fabrication of panels with SARABOND creates economies never seriously considered before the advent of this unique product:

- cold or otherwise inclement weather doesn't hamper construction
- scaffolding is eliminated on construction sites
- pre-fabricated panels shorten construction schedules
- the best masonry quality control is possible
- building occupancy is quicker

Since its introduction a few years ago, SARABOND has found its way into commercial structures of all sizes, shapes and design, all over the country. It is accepted by masonry contractors as far superior to conventional mortar, and because of its particular properties it allows design freedom which can take full advantage of the beauty, practicality and economy of brick masonry construction. And SARABOND mortar additive further enhances the long-term appearan of the structure.

SARABOND gives portland cement mortar

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- longer lasting beauty

SARABOND brand mortar additive increases the te sile and bond strengths of portland cement mortar equal or approach the strength of the masonry ur themselves. This, generally, allows walls one-half t thickness of conventional walls; and this add strength allows the fabrication of load-bearing a non-load-bearing brick panels . . . single-wythe pan that need no steel reinforcement, can be prefabricat in plants regardless of weather, are easily shipp to the job site, effectively speed construction, redu the total weight of the building, reduce material co and because they require no block back-up, prov more usable area.

SARABOND added to mortar has been utilized buildings ranging up to 30 stories. The widening u and acceptance of brick panelization, made possi and practical by SARABOND brand mortar additi can open new design and construction routes for m any kind of structure.

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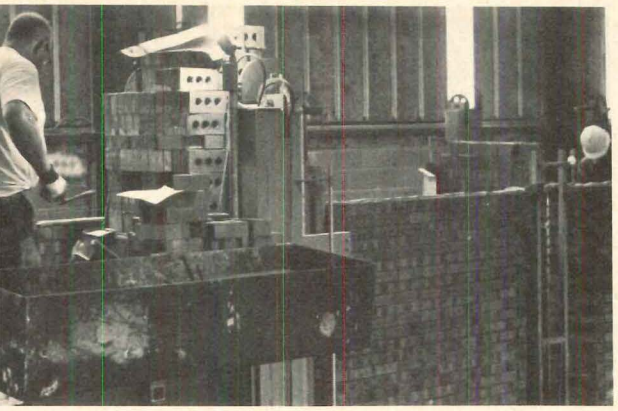
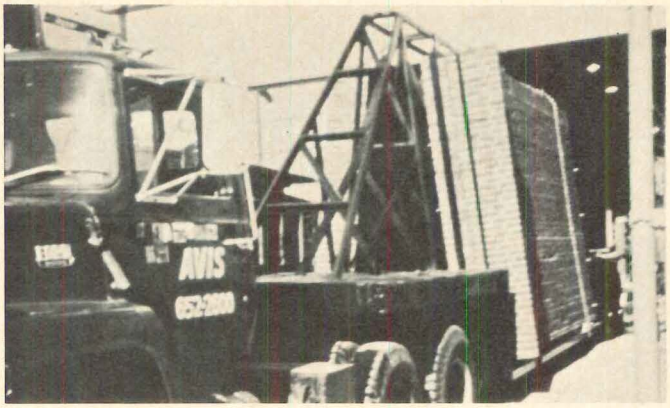
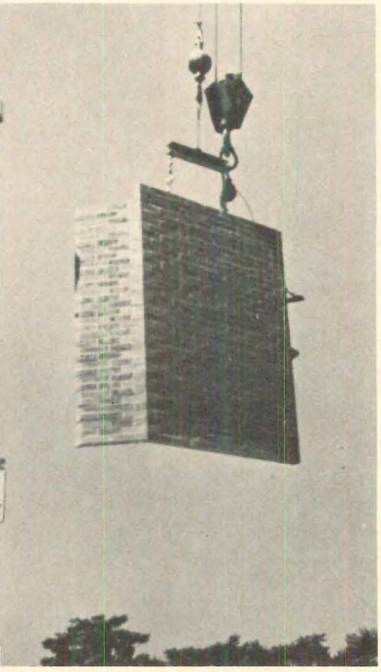


ant pre-fabrication allows panel production in any weather, its tight quality control.



Pre-fabricated panels are easily loaded and shipped on flat-bed trucks to job-site.



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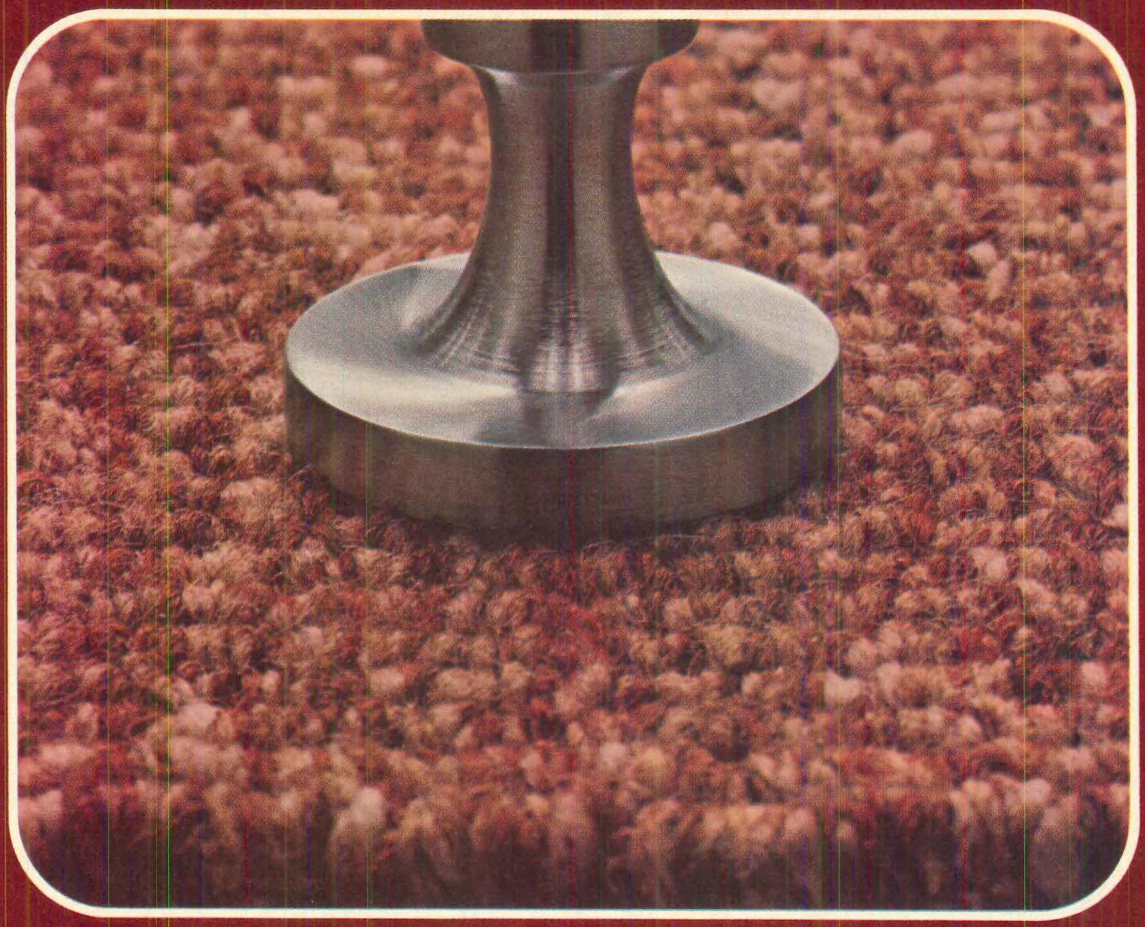

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PERFORMANCE CERTIFICATION

News report continued from page 35

ference, Shoreham-Americana Hotel, Washington, D.C.
Sept. 30–Oct. 3. Fifty-first annual conference of the Council of Educational Facility Planners, Atlanta, Ga.
Oct. 1. Deadline for abstracts for the U.S. National Conference on Earthquake Engineering, the University of Michigan, Ann Arbor, June 1975.
Oct. 1–3. Annual meeting of the Industrial Designers Society of America, Copley Plaza Hotel, Boston.
Oct. 3–10. Sixth Congress of the International Council for Building Research Studies and Documentation, Budapest, Hungary.
Oct. 3–12. First international seminar of the International Union of Architects, Belgrade, Yugoslavia.
Oct. 7–8. Conference on improving efficiency in HVAC equipment and components for residential and small commercial buildings, Purdue University, West Lafayette, Ind.
Oct. 7–9. Third annual Architects in Industry seminar, sponsored by AIA Architects in Industry Committee, Palm Beach, Florida.
Oct. 15–17. National member conference of the Producers' Council, Inc., Antlers Plaza Hotel, Colorado Springs.
Oct. 18–19. Conference on recycling old buildings, Boston Architectural Center.
Oct. 19–22. Annual convention and exhibit of the National Office Products Association, Chicago.
Oct. 21. Deadline for submissions to AIA Honor Awards Program, Washington, D.C.
Oct. 27–30. Annual meeting of the American Institute of Planners, Denver Hilton, Denver, Colo.
Oct. 28–29. Annual Joint Engineering Management Conference, co-sponsored by the American Society of Civil Engineers, Camino Real Hotel, Mexico City.
Nov. 14–15. Conference on tall buildings: planning, design, and construction, Vanderbilt University, Nashville, Tenn.
Nov. 20–22. Ninth annual meeting of the Automated Procedures for Engineering Consultants, Inc., Regency Hyatt House, Atlanta, Ga.
Nov. 22. Conference on architectural fees, Washington University, St. Louis, Missouri.
Nov. 23–25. 1974 School Building Architectural Exhibit, sponsored by the Illinois Council of the AIA and the Illinois Association of School Boards, Palmer House, Chicago.
Nov. 30. Deadline for entries to the 1974 Concrete Reinforcing Steel Institute Design Awards Competition, Chicago.
Dec. 10–12. International Building Exposition (INBEX), Chicago.
Jan. 19–23. Thirty-first annual convention and exposition of the National Association of Home Builders, Dallas, Tex.

ASA elects officers

New officers and their respective chapters of the Architectural Secretaries Association are Virginia Hansen, Seattle, president; Maryann Damari, Colorado, vice president elect; Carol Hitchcock, Houston, vice president; Rose Marie Baker, Southern California, recording secretary; Patricia Cleveland, Dallas, corresponding secretary; and Mary Helen Gallagher, Columbus, Ohio, treasurer.
[News continued on page 42]

Negotiating Contracts?

When you get together a team of building owners, architect, contractors, and engineers, you've got a lot of smarts in one place. But no one man or one team can be expected to know every detail of every product and system going into a building.

We can give you a lift.

When you get around to talking water coolers, call in your Halsey Taylor Water Systems Engineer.

Why, specifically, the Halsey Taylor man?

Because he has the engineering capability to analyze the chilled water requirements of any building and to help meet those requirements at the lowest possible cost.

Because Halsey Taylor has more drinking water experts, nationally, than any other manufacturer.

Because your Halsey Taylor man is nearby, ready to assist you on a moment's notice.

And because he's backed up by the most extensive field inventory in the business — for prompt delivery.

A product you can depend on

For pure product excellence and dependability, Halsey Taylor water coolers have the best reputation in the business. This means lower life cycle cost, due to extra features like heavy duty regulating valves, start capacitors, cast iron fan motors, and spot welded, unitized cabinet construction.

And with Halsey Taylor, installation cost is minimal because we assemble every cooler at the factory. No panels to assemble, no bubbler to install.

Let your Halsey Taylor Water Systems Engineer help you iron out specification details. Then let the performance of Halsey Taylor water coolers protect your good name and keep your client satisfied—for a long time to come.

Get in touch with your local Halsey Taylor man. Or write for more information to: Chuck Thompson, Sales Manager, Halsey Taylor Division, 1554 Thomas Rd., Warren, Ohio 44481.

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News report continued from page 39

'Portable' pensions for architects

Ending nearly three months of squabbling among themselves, House-Senate conferees finally emerged with a compromise pension reform bill (HR 2 and others) that is of special interest to professionals who change jobs frequently. Key provisions include: employees 25 years of age or older can participate after completing one year of work, as can seasonal and part-time employees who work more than 1000 hours; employees become "vested" (gain the right of ownership of funds deposited in their name) in just 5 years and be entitled to the full amount after 10 years.

Employers would be required to fund normal costs as they arise under penalty of a 5 percent excise tax on any funding deficiency. Significantly, employees would be entitled to tax-free transfers of their account to a new employer, thus making retirement plans "portable."

Kerr's winning interior. Photo: Barbara Martin

AID–NSID announces awards

Charles Kerr of St. Louis, Mo., won first place in the first AID–NSID Photo Competition for interior designs with Don Stevenson of Portland, Ore., taking second place, and Jack Lowery of New York, N.Y., third. Honorable mentions were presented to Penny Goldwasser of Atlanta, Ga., Robert Hogue of Dallas, Texas, and Richard Ecock of Washington, D.C.

Olga Gueft, editorial director of *Interiors* magazine was unanimously selected to receive the first AID–NSID Press Award. She was cited for her contributions to the design profession and industry having been involved for nearly three decades as designer, editor, photographer, writer, and lecturer.

One voice for construction industry

Representatives of 18 major construction industry organizations—including AIA, ASCE, landscape architects, and most leading contractor groups—met in Washington in early August looking for "one voice" to speak for the construction industry. The meeting was called by the Associated General Contractors and attracted high-level officers of the societies. It was not intended, however, to be more than an exploratory session, and the consensus seemed to be that several such conferences annually might be a better answer than formation of some super association as was suggested by some speakers.

Consumers wanted

The U.S. Consumer Product Safety Commission is looking for consumers with technical training who are willing to serve on standards development committees. Those interested may write the Consumer Product Safety Commission, Washington, D.C. 20207.

[News continued on page 44]

Many new roofs waste a lot of energy. Here's how to cut that loss by 50 percent-without spending an extra dime.

It may sound amazing, but you can do it.

The only thing you have to do is specify thicker 2¼-inch Fiberglas* roof insulation instead of the thinner 15/16th-inch size.

This dramatically reduces heat loss through your roof. And it actually brings the total cost of your building *down!*

The reason: the improved thermal performance of your roof enables you to get along with less elaborate, *less expensive* heating and cooling equipment.

In general, every dollar you spend on thicker 2¼-inch roof insulation vs. 15/16th-inch size cuts up to *two* dollars off original equipment costs. So you come out considerably *ahead.*

On a suburban office building in northern climates, for example, thicker roof insulation could save as much as $27,000 in equipment costs for every 60,000 square feet of roof.

And, of course, the thicker Fiberglas roof insulation goes on slashing the loss of fuel energy through the roof of your building by 50 percent—and the fuel *bills* by roughly 10 percent—year after year after year.

The exact savings vary according to climate zone, the size and type of roof deck, "U" improvement, and the added cost of the thicker insulation.

We've worked up all the figures and charts in a handy booklet called "Roof Raiser's Guide to Cost Reduction." For a free copy, write: I. Y. Meeks, Architectural Products Division, Owens-Corning Fiberglas Corp., Fiberglas Tower, Toledo, Ohio 43659.

More details: See our section in Sweets Catalog, Roof Insulation Systems 7.15/Ow, or contact your Owens-Corning representative.

. T.M. O.-C. F.

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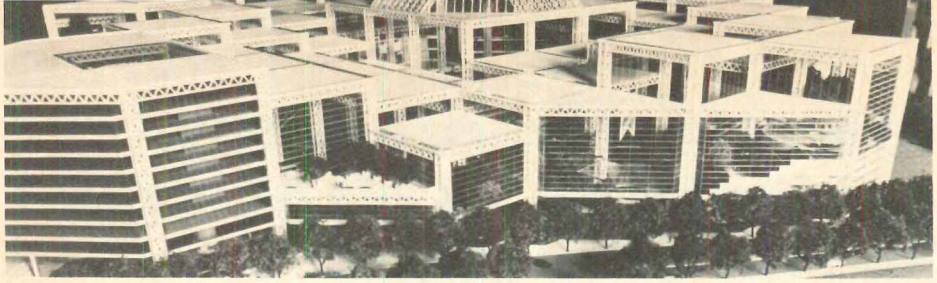
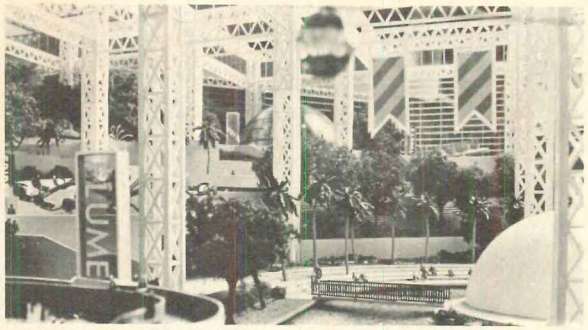
In progress





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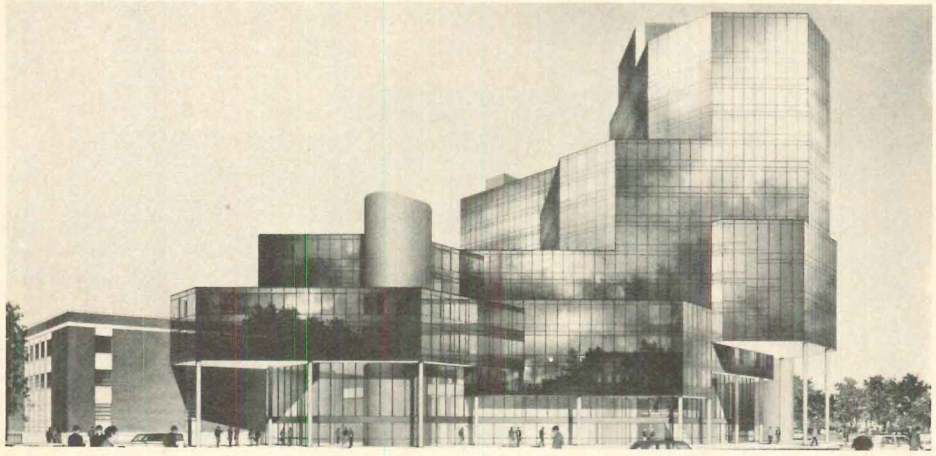

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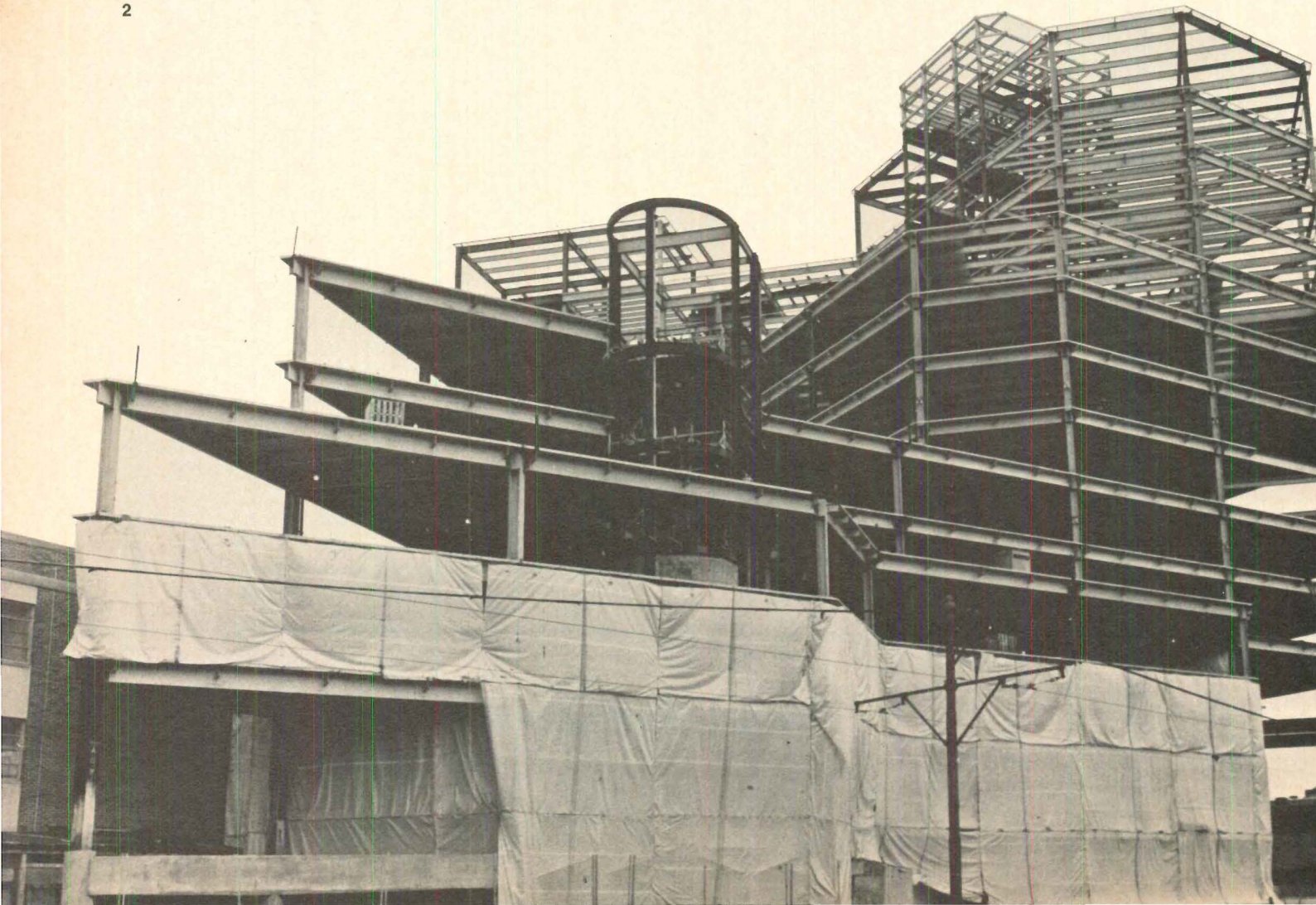
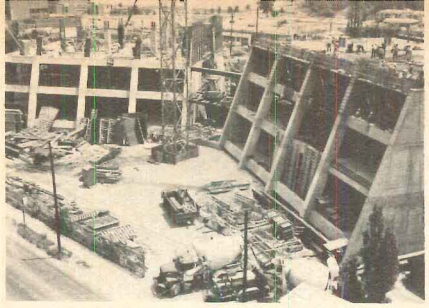
1 Norfolk Gardens—What developers anticipate to be the largest urban commercial structure is being designed for downtown Norfolk, Va. The 20-story-high glass enclosure will cover 17 acres and join perimeter buildings with its multi-level roof. As a retail-amusement center, it will include horticultural gardens and a band shell plus an overhead people mover. International City Corporation of Atlanta is developing the project; Toombs, Amisano & Wells of Atlanta are the architects.

2 Boston State College Library—With nearly a third of the design completed, new seismic code requirements forced a change from concrete to steel for the 14-story college library designed by C.E. Maguire of Waltham, Mass. Now the building approaches a September 1975 completion date. Its exterior will be bronze-tinted glass accented by reddish-brown brick stairwells. The site is triangular, affording a design of five roof levels, and, in addition to housing 300,000 books, the library includes a cafeteria, classrooms, and a theater.

3 Atlanta Center Ltd.—The initial phase of a 2-million-sq-ft hotel, office, and shopping structure near downtown Atlanta will be completed in early 1975. Architect of the $100 million Atlanta Center is Wong & Tung Associates of Hong Kong. The office tower will rise 20 stories; the shopping mall will be a 3-level arcade.





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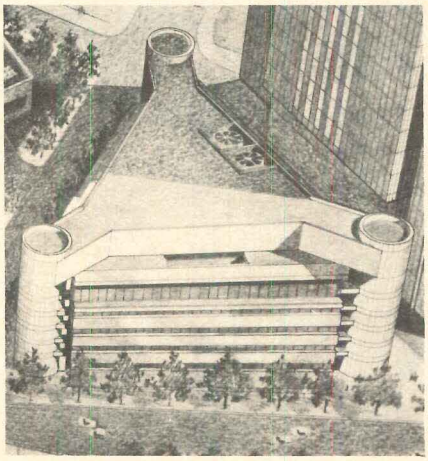

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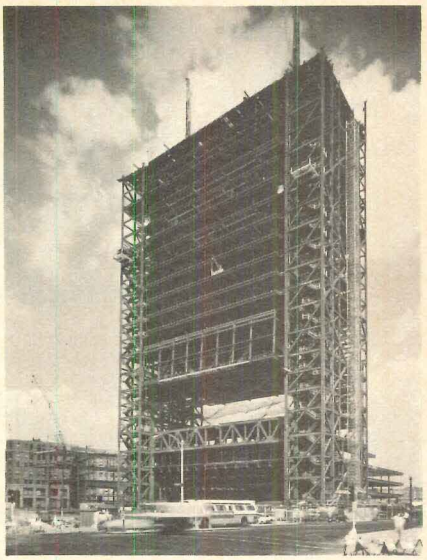
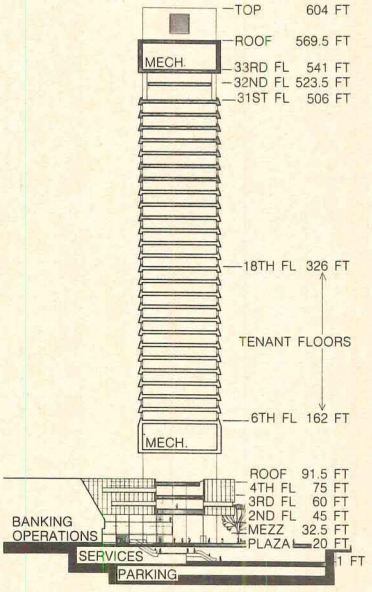
4 Murray Bergtraum High School—The dark brown brick finish of a six-story high school in downtown Manhattan near Wall Street is just about complete, and within a year the building will be ready for occupancy by 2600 students preparing for business careers. Designed by Gruzen & Partners, New York, the school stands on a 100-year-old landfill site which precluded a lower level mechanical floor. All mechanical systems are on the top floor, and the vertical elements of the environmental system are housed in three towers at the apices of the triangular plan.

5 Federal Reserve Plaza—An aluminum and glass, 33-story structure is rising in Boston to be ready in 1975 for the Federal Reserve Bank. The segments of the building, by Hugh Stubbins & Associates of Cambridge, were designed to clearly separate functions: the tower for offices; four-story low rise for banking operations; glassed-in lobby; and underground mechanical.

6 San Francisco high rise—Phase I of a 3000-unit residential project by Goetz, Hallenbeck & Goetze, Inc., of Alameda, Calif., is under construction at Albany on the east shore of the Bay, just opposite the Golden Gate Bridge. The overall site plan by the same firm emphasizes building clusters of 9 to 25 stories arranged for maximum view orientation with a high number of corner views and unit exposures.





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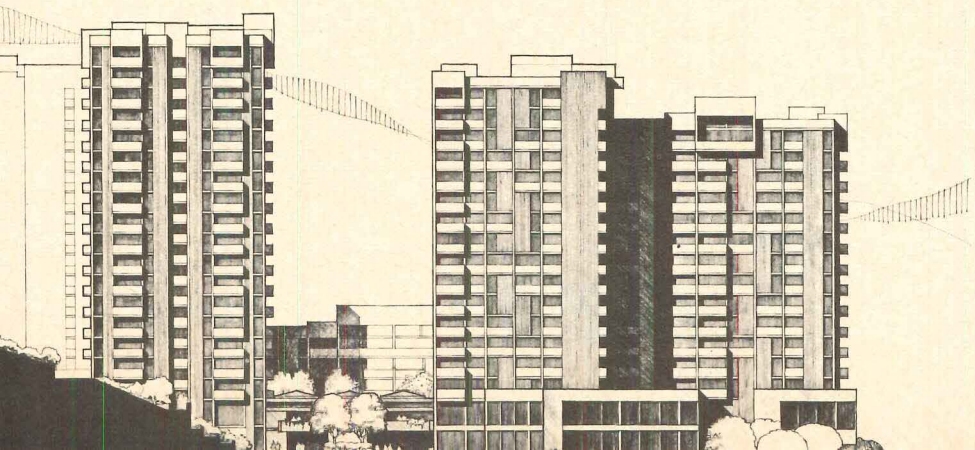
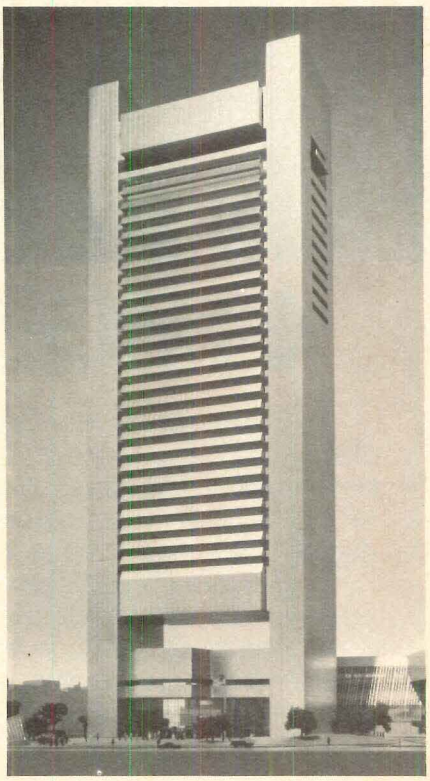
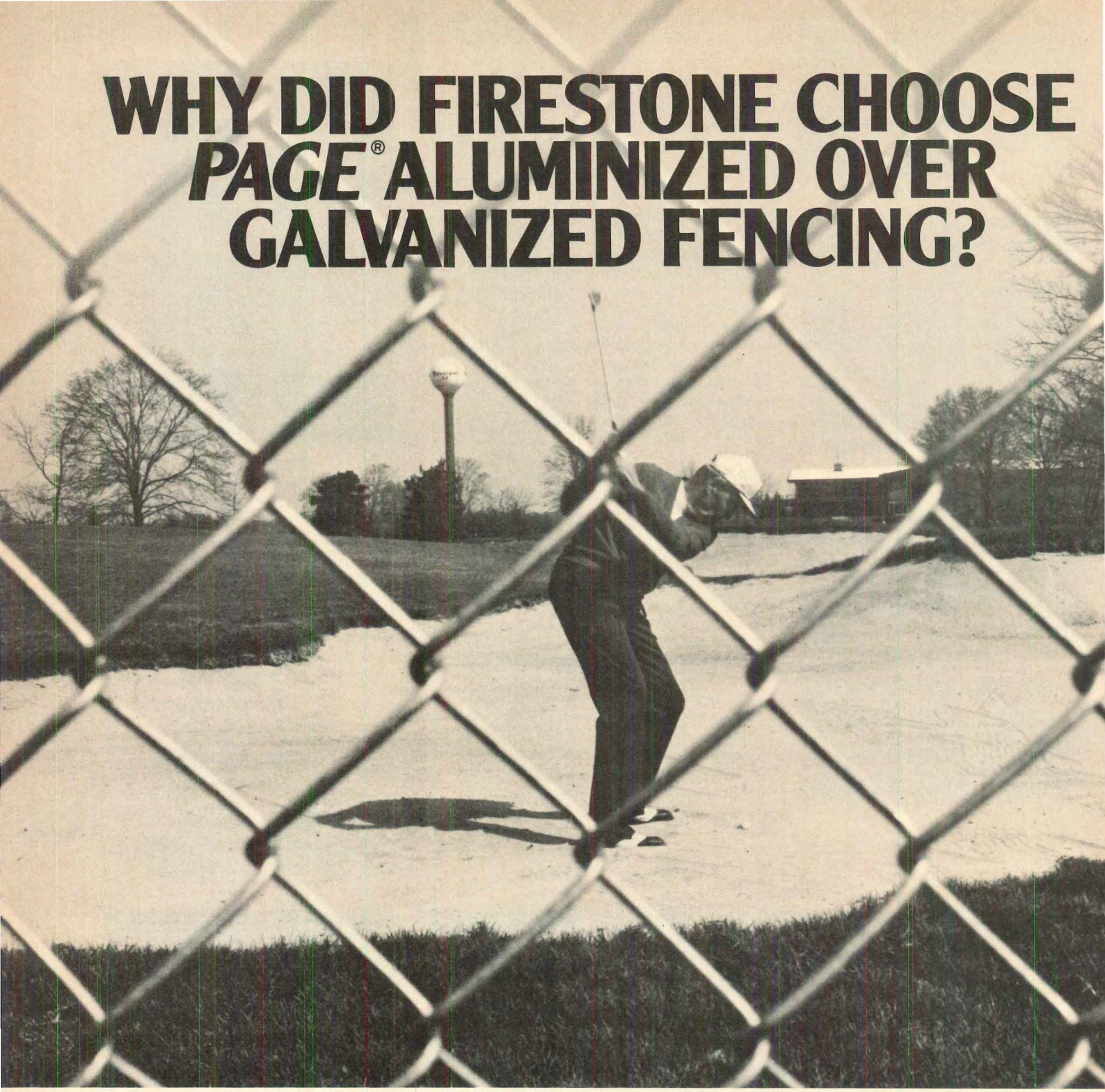
6 Site plan for 3000 unit project (above); phase 1 (below)





WHY DID FIRESTONE CHOOSE *PAGE*® ALUMINIZED OVER GALVANIZED FENCING?



4 MILES OF ZERO UPKEEP.

Firestone Country Club, is home of one of the most celebrated golf courses in the world. But snowmobiling, horseback riding, even drag racing, all unauthorized, were doing a lot of damage. So it had to be fenced in.

Firestone's engineering department considered both galvanized and aluminized fence fabric. The decision: *Page* aluminized fabric. One important reason was that aluminized fabric lasts three to five times longer than galvanized. The other reasons: there was little possibility of rust, and absolute minimal long range maintenance. In other words, zero upkeep. All of which makes a pretty good case for *Page* aluminized fence fabric. Makes sense, doesn't it?

For more information and a free fence spec kit, write Acco, Page Fence Division, First and River Sts., Monessen, Pa. 15062.

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40DB.

Did the architects who designed this building see your advertising?

This is the Fidelity Mutual Life Building, Three Girard Plaza in Philadelphia. It was a $30 million project designed by one of the Design and Production teams of Vincent G. Kling & Partners, also of Philadelphia. Like their counterpart in architectural firms everywhere, the Kling team specified both type and brand of building products for the building envelope, the mechanical systems (with the help of an engineering consultant) and the interiors. And in over 90% of instances, their specifications held through to purchase and construction.

If you are an advertiser in P/A, you are reaching design and production professionals like the members of the Kling team. That's because P/A reaches more individuals who practice architecture than any other magazine in the world.

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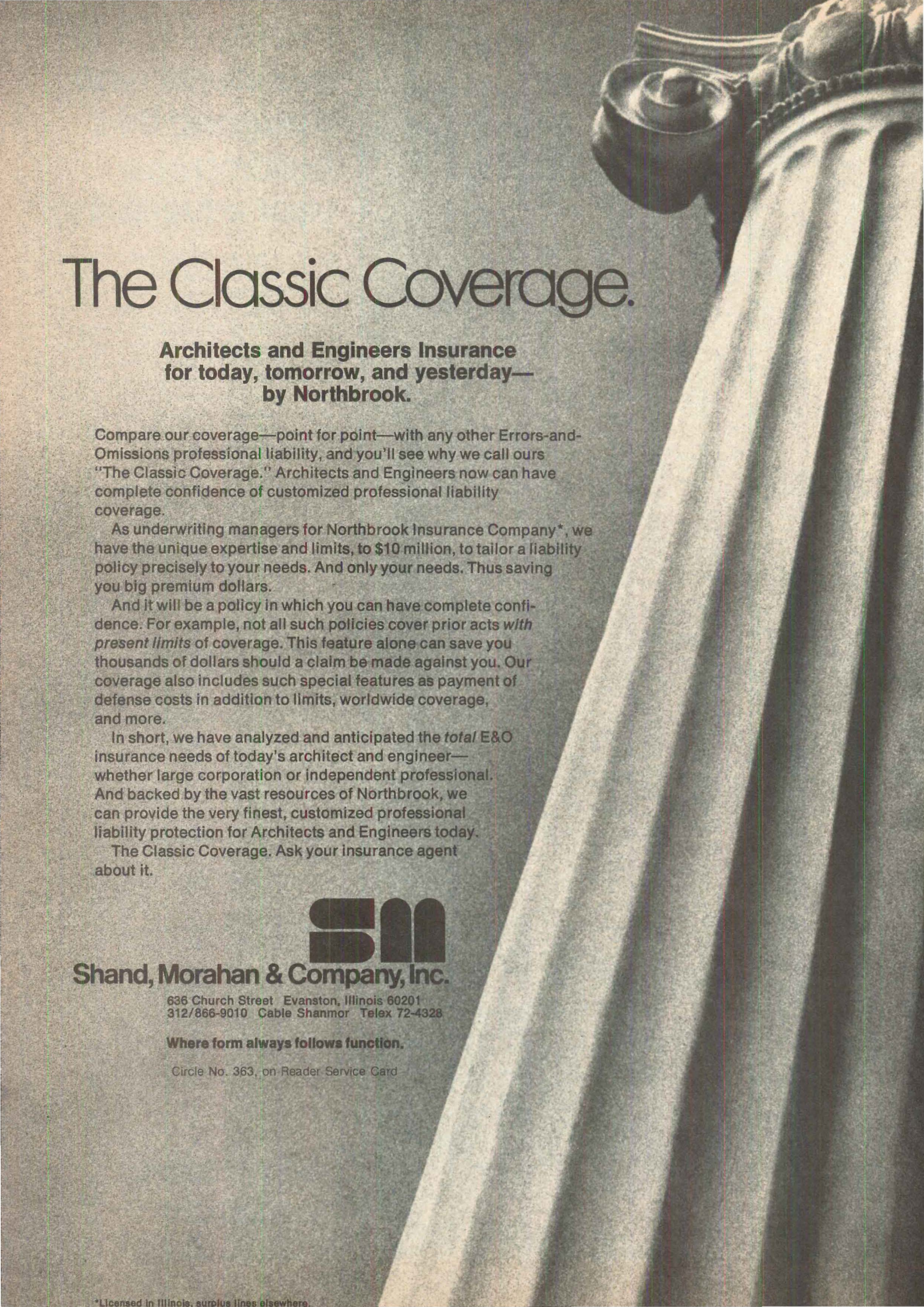

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As underwriting managers for Northbrook Insurance Company*, we have the unique expertise and limits, to $10 million, to tailor a liability policy precisely to your needs. And only your needs. Thus saving you big premium dollars.

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Where form always follows function.

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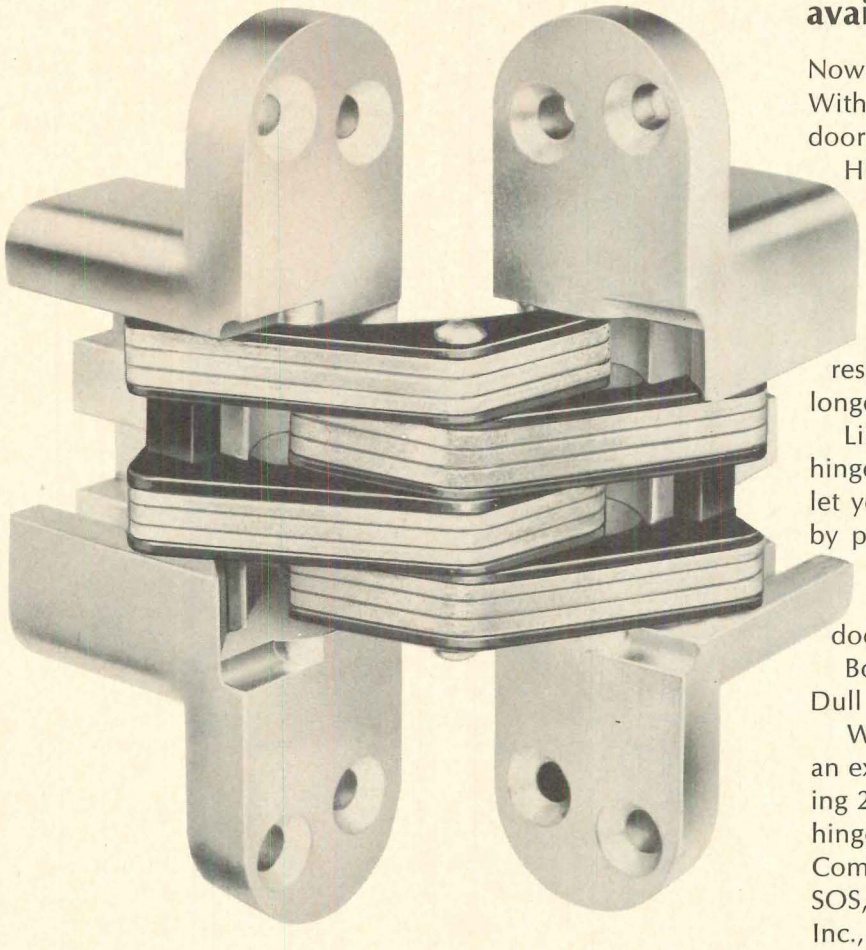
NEW! Hinges that hide... a lot longer



Extended-life invisible hinges now available for high frequency doors

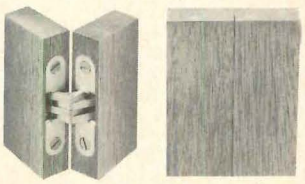
Now you can expand your hinge hiding horizons. With two new, extended-life, large commercial door hinges from the invisible hinge company.

Hinge Models 218 and 220 now have nylon links and bushings at all wear points (Patent Pending). The molybdenum disulfide-reinforced nylon is visible in the black areas in the open hinge shown at left. But when the hinge is closed, the nylon results in just one more invisible feature: longer life.

Like every Soss Invisible, these rugged new hinges are completely hidden when closed. They let you create clean architectural lines unbroken by protruding hinges. And their longer life lets you add this invisible beauty on high frequency doors and on doors with automatic closing mechanisms.

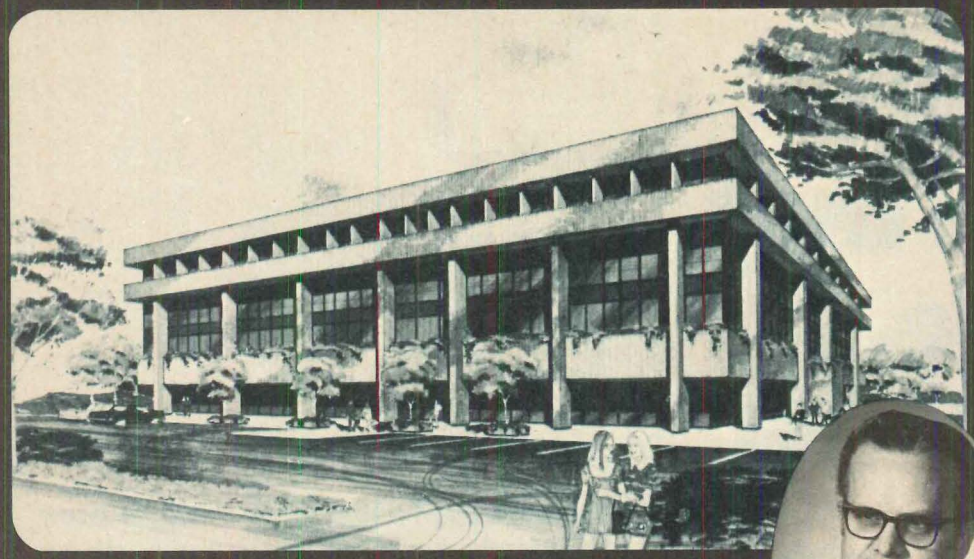
Both hinges are available in Dull Brass US 4, Dull Bronze US 10, and Dull Chrome US 26D.

Write for all the details. We'll also include an extra copy of our catalog in Sweet's, featuring 20 styles and models of the tamper-proof hinges that hide. All from Soss Manufacturing Company, Division of SOS, Consolidated Inc., P.O. Box 8200, Detroit, Michigan 48031.



Now you see it. *Now you don't!*

the SOSS Invisibles



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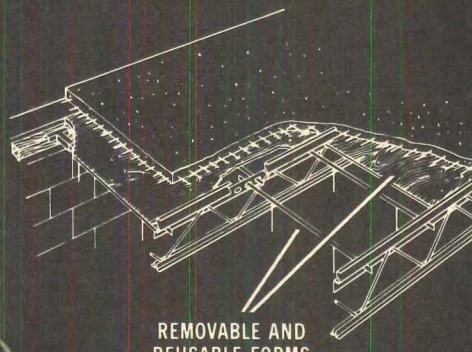

REMOVABLE AND REUSABLE FORMS

R. Evan Kennedy, Structural Engineer, V. P. of DMJM, Says:

"We Chose Hambro"

How would you like to make delivery 25% earlier?

Daniel, Mann, Johnson and Mendenhall, International Architects/Engineers & Planners, and owner-developer, N. E. Sommers, had a problem: to build the Alyeska Pipeline's headquarters building in Anchorage, Alaska in 5 months.

What could make such an improbable delivery possible? The selection of the Canam Hambro composite concrete floor system!

SPEEDY & STEP-SAVING SYSTEM. Because the Hambro D-500 System gains its workable strength within 24 hours of being poured on site, it enables the interior trades to keep pace with each level of construction. At top out, the building will be nearly completed instead of just beginning!

SOUND & VIBRATION CONTROL. By eliminating metal pans, on-site welding and bridging, and by encasing steel members in concrete, our system creates an effective sound barrier — which, in **independent and government tests, rates an STC of 57 on the bare concrete.***

MR. KENNEDY explains why he, R. C. Cloud, Architect in Charge, and A. Gaylord, Detail Engineer of DMJM's Northwest Office, selected the Hambro System:

(1) "We required a seismic-resistant building." (2) "We needed speed of delivery and erection, especially because of 'Alaska's short season'." (3) "We wanted long, clear spans, if economical, to provide office layout flexibility." (4) "The stiffness of Hambro's composite constuction significantly reduces bounce and noise transmission."

And, though selection of Hambro D-500 for the Alyeska Pipeline building seemed to revolve around factors other than economy per se, the **30-40% less steel** and **50% less concrete** the system requires represents a sizeable saving in building costs. Isn't that important to you?

* Also new U.L. Fire Ratings for 2 and 3 hours designs. BOCA, ICBO, Southern Builders Conference Research Reports issues, FHA MR810, for the Hambro D-500 floor-ceiling assembly.

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National Geographic Society Building

Architect: Edward Durell Stone, AIA

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THE MEADOWS

Andersen™ Perma-Shield® Gliding Windows... Open beauty for the not-so-open budget.

The Meadows is a rustic townhouse community catering to middle income families.

Consequently, an attractive price is as important as beauty to The Meadows' sales appeal.

That's why the architect specified Andersen™ Perma-Shield® Gliding Windows.

He liked the way these glide-open "picture windows" contributed to the beauty and openness of a country-living atmosphere.

And he liked the way Perma-Shield's long-term savings benefits fit right into budget/profit requirements.

Perma-Shield Gliding Windows help hold maintenance costs down. Their rigid vinyl exterior won't rust, pit or corrode. Won't need painting.

And Perma-Shield Gliding Windows are designed to cut homeowner fuel bills, too.

Beneath their protective vinyl sheath lies a wood core, one of nature's best insulators.

And Perma-Shield Gliding Windows are built two times more weathertight than industry standards.

With double-pane insulating glass, they eliminate the bother of storm panels. Cut conducted heat loss through the glass by up to 35% (compared to single-glazing).

So, if you're looking for glide-open beauty for a not-so-open budget, specify Andersen Perma-Shield Gliding Windows.

For more information, see Sweets, File 8P. Or call your Andersen Dealer or Distributor. He's in the Yellow Pages under "Windows, Wood." Or write us direct.

The beautiful, carefree way to save fuel.

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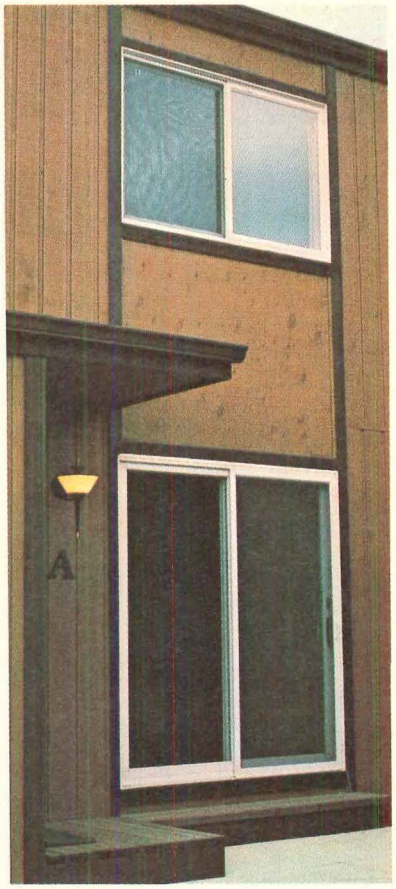
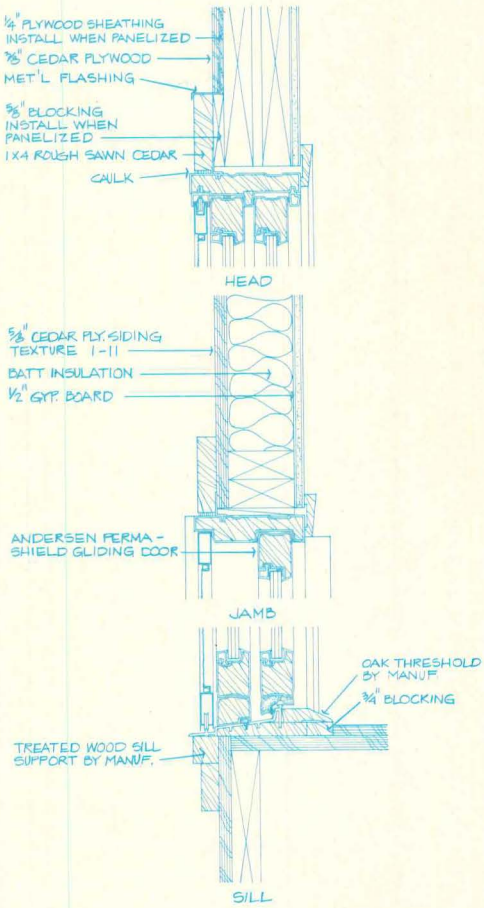
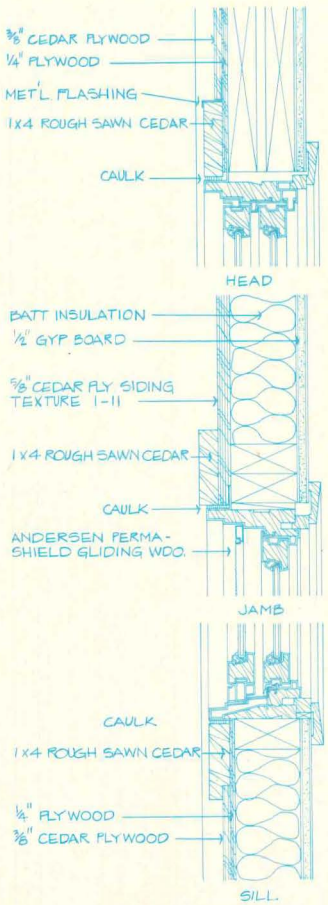
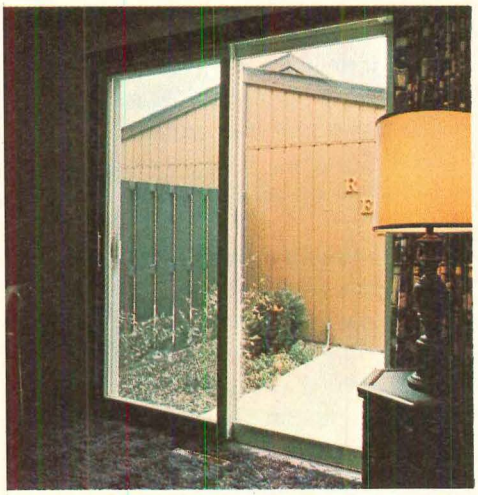




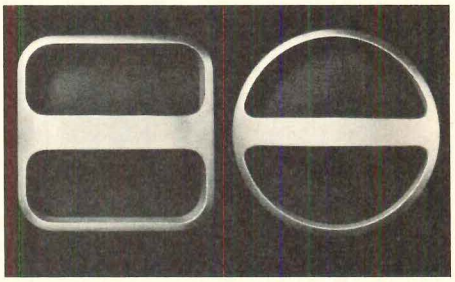




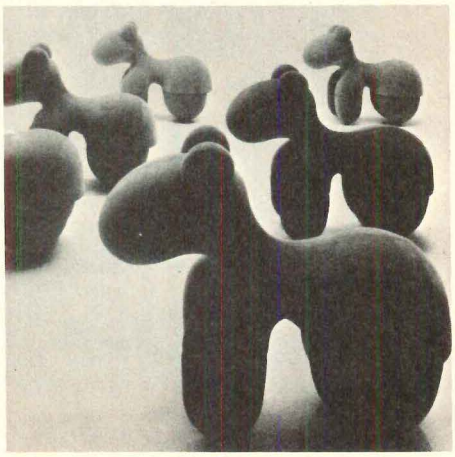
The Meadows, Rochester, Minnesota
Owner: The Kruse Co., Rochester, Minnesota
Architect: Architectural Design Group, Inc., Rochester, Minnesota.

Products and Literature

Coffer doors



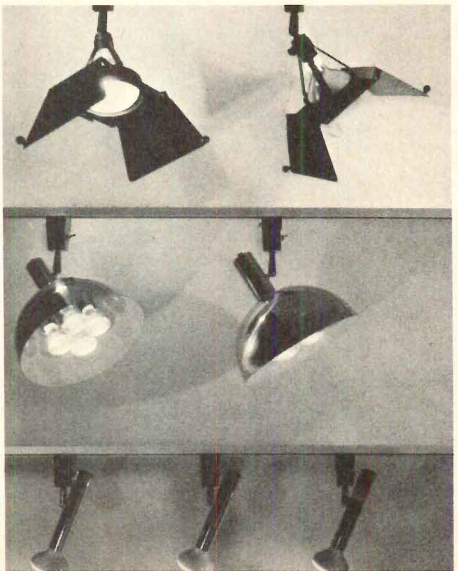
Recessed door pulls



Pony

Two-story modular building system

Track lighting



Coffer doors. For finishing off poured concrete exposed beam ceilings, the doors fit inside cavities formed by the beams, hiding lamps and other overhead appurtenances. In sizes and shapes to accommodate given coffer dimensions, they consist of diffuser glass framed in dipped aluminum and have spring-loaded corner bolts. Neo-Ray Lighting Systems, Inc.
Circle 101 on reader service card

Recessed door pulls. Simple sculptural forms. Cast in bronze, aluminum, or nickel silver. Pulls are attached with epoxy in a ¾-in.-deep recess, permitting back-to-back mounting on a 1¾-in.-thick door. Two styles are available with matching pushplates: 8 in. diameter round and 8 in. square. Forms & Surfaces.
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Porcelain finished back-up sheets for use with maker's veneer and insulated panels. Vit-Kote panels are in eggshell white which can be used without painting, or finish acts as prime coat and can be painted, states maker. AllianceWall Corporation.
Circle 103 on reader service card

Reflective sun control films. Gold, smoke, and bronze colors have been added to company's line of aluminized polyester films, which apply to the inside of windows. The gold film repels up to 75 percent of the sun's heat, the smoke and bronze tints repel up to 64 percent; none interfere with visual properties of glass, states maker. 3M Company.
Circle 104 on reader service card

Interior finishing material. Steeliner is a nestable corrugated steel sheet designed as a noncombustible interior finishing material for either Steelox or ARW–IV wall systems. Modular 32-in.-wide trapezoidal faced sheets may be used between girts or other supports in metal buildings, has Class 1 fire hazard rating. Color coating is approved by USDA for use in food handling and manufacturing facilities. Armco Steel Corporation.
Circle 105 on reader service card

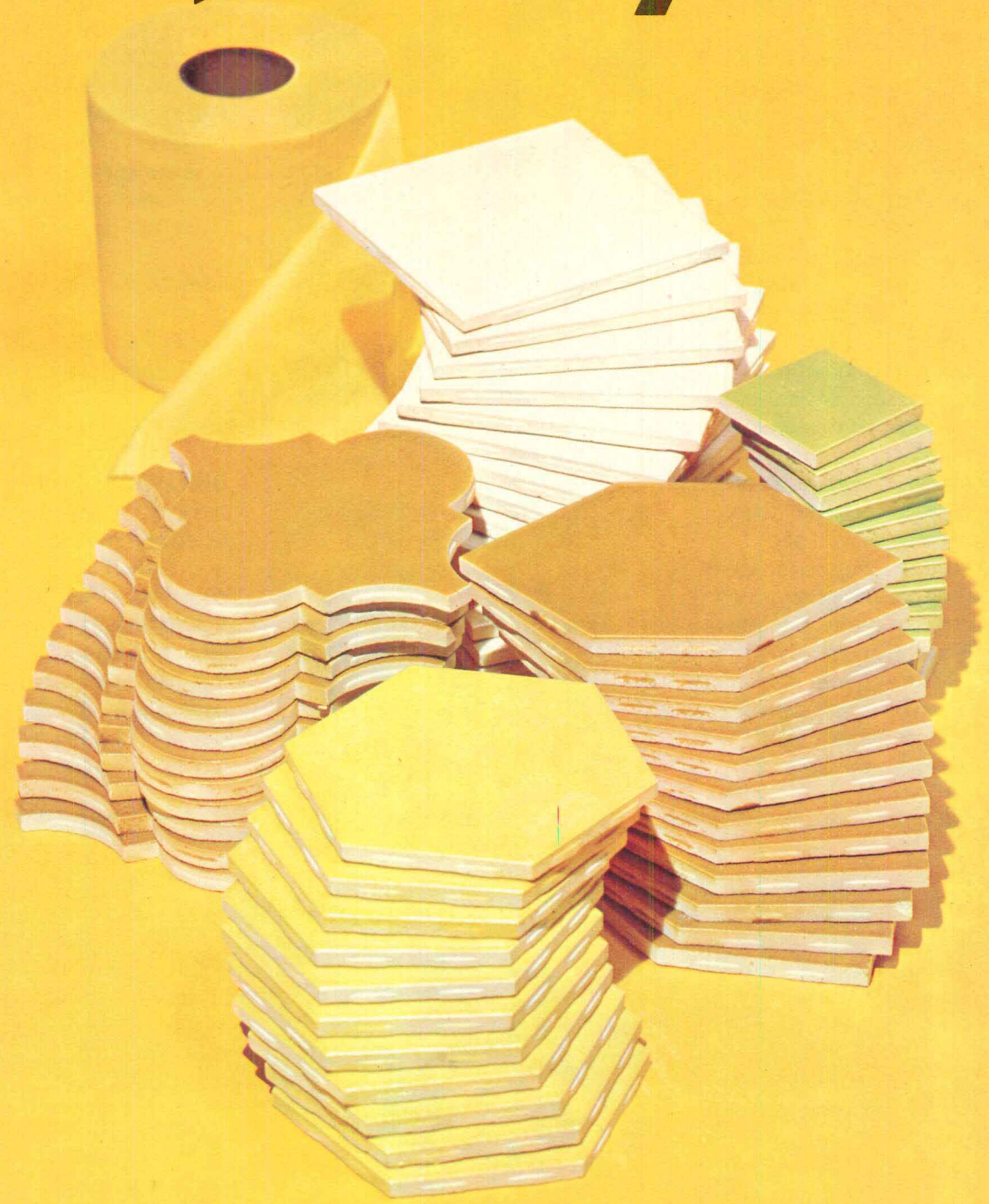
Vinyl wallcovering. Featuring a drill backing, the vinyl can be applied directly to concrete blocks as well as to textured plaster, poured concrete, metal partitions, and structural glazed tile. UL approved and produced in accordance with Fed. Spec. CCC-W-408a, it meets all Class A flame spread classifications and contains mildew and microbiological growth inhibitors. Said to be scrubbable and strippable, it comes in 54-in.-wide rolls. The General Tire & Rubber Company.
Circle 106 on reader service card

Pony. An easy chair from Finland is available in a variety of stretch velours or C.O.M. stretch fabric. Chair is comfortable to sit on or straddle, states maker. Stendig, Inc.
Circle 107 on reader service card

Two-story modular building system permits two offices to be erected one on top of the other, using a 10-ft-high common post system. Steel stairways lead upstairs. Steel support system, concealed above the ceiling and in wall posts, supports an integrated floor system. Available in standard sizes from 8′x8′ up to 20′x40′. The offices come complete with vinyl wall panels, acoustical ceilings, pre-hung doors, indirect lighting and an electrical kit. Stock components are fabricated at the factory and shipped to the site in crates. National Partitions.
Circle 108 on reader service card

Track lighting. Shapes include spheres, mushrooms, domes, and cylinders; lights may be suspended from pendants, making many configurations possible. Available in chrome, black, or white finish, and in many sizes. Tsao Designs.
Circle 109 on reader service card
[continued on page 58]

Fight bathroom blahs five ways.



Count them — five shapes — five exciting ways to chase the blahs from bathroom floors, as well as walls. Florida Tile's richly textured Crystal Glaze offers ready answers to a variety of needs. Its stunning, yet tough, glazed surface and wide choice of size and color gives the designer expansive creative possibilities. And you can count on Florida Tile's excellent distribution for immediate availability.

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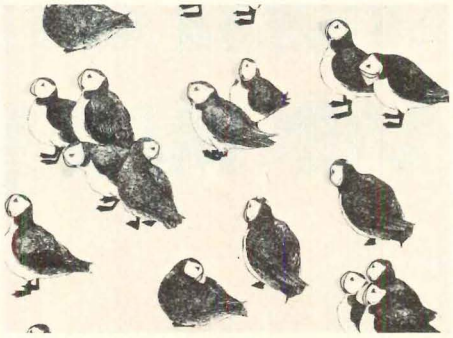
Product catalog in Sweets Architectural File.

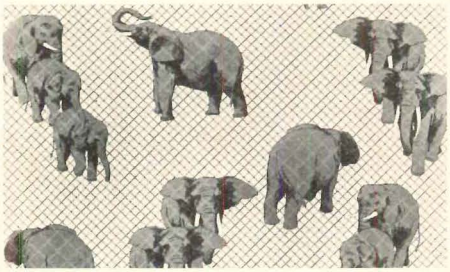
Products continued from page 56

Custom wall coverings and coordinated fabrics. The "Endangered Species Collection" consists of seven designs—line drawings of animals, plants, and birds—27" wide in solid background or to custom order; coordinated fabrics are 47" wide in cotton, linen, twill, and textures. Allume' Handprints, Inc.
Circle 110 on reader service card

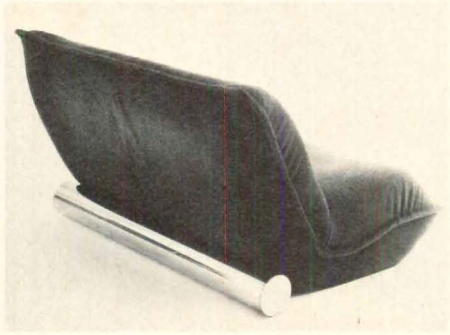
Moldings. Vinyl shield PVC molding saws and miters easily, nails within ¼ in. of the edge and the surface is impact resistant, states maker. Comes in off-white and seven woodgrain patterns and solid colors. Georgia-Pacific.
Circle 111 on reader service card

Structural fabric. Sheerfill is an architectural material composed of fabric woven from fiberglass yarn and coated with fluorocarbon resin, and is designed to serve as an exterior skin for air-supported or cable-supported structures. It is incombustible according to NFPA 101 standards, is weather resistant and can be translucent or opaque. Chemical Fabrics Corp.
Circle 112 on reader service card





Custom wall coverings



Soft seating

Student training carrel has 48'x30' desk top which is cut out for flush-mounting tape player, and the shelf provides support for a monitor with a space for books. Teak laminate sides and back panels extend 24" above the desk top and are edged in black vinyl molding; both desk top and shelf are finished in non-reflective white leather plastic. Power is provided through a power column; an on-off switch controls the entire electrical system. Howe Furniture Corporation.
Circle 113 on reader service card

Carpet. Multicolor cut pile is a blend of acrylic, nylon, and other fibers for anti-static control. Carpet is available in 12-ft-widths and 10 color combinations. J. P. Stevens & Co.
Circle 114 on reader service card

Soft seating. Pillowlike seat and back are joined by a large dimension polished chrome tube at the base of the unit. Shown upholstered in 100 percent natural Alpaca, but is also available in leather, suedes, vinyls, woods, stretch velour or C.O.M. Available as a lounge chair, a two- or three-seat sofa or as a pouf. Stendig, Inc.
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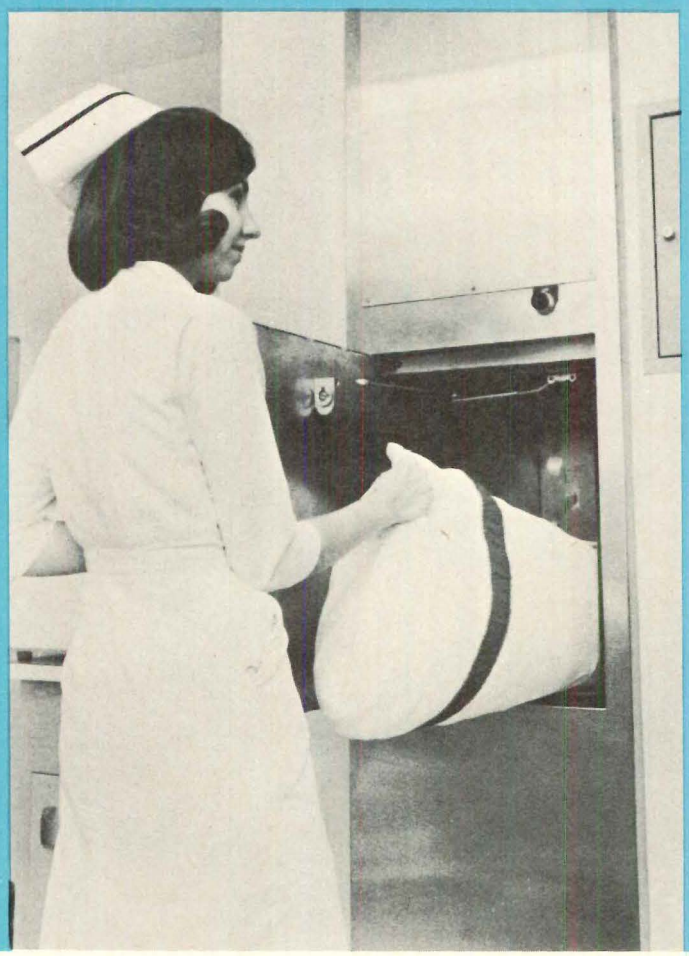
[continued on page 118]



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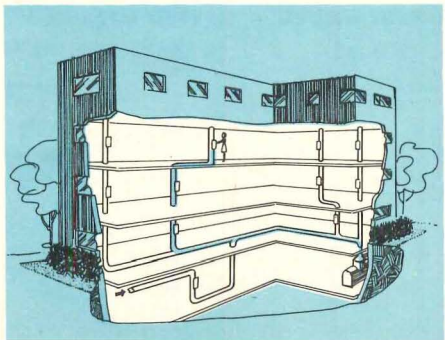
For safety, economy, efficiency and simplicity, there's simply no better way to collect trash and linen than the Air-Flyte way. Ask your ECI representative for the whole story today.



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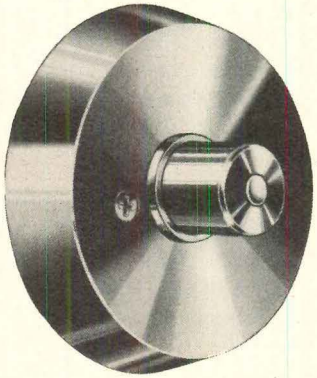

Showeroff Automatic Shower Limiter 4-420

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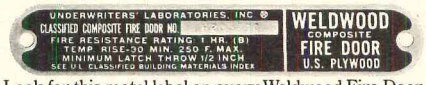

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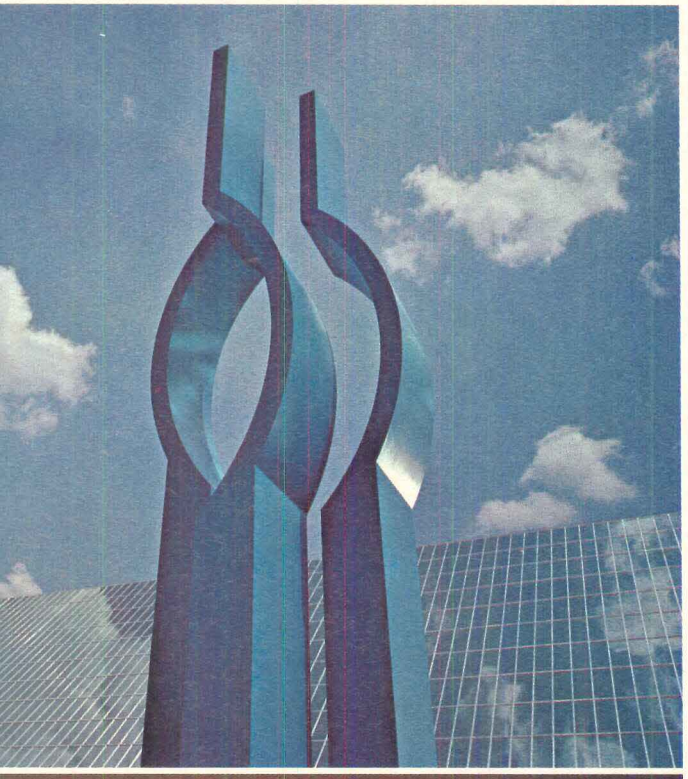

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Material resources: the architect's market basket

September 1974

"Oh, I see. You're going to do an issue on Materials shortages." We heard this over and over as our editors worked on this special issue. "Well, no," we would have to say. "We are doing an issue on what's happening to the cost and availability of key structural and architectural materials." We are also talking about tradeoffs to be made among materials and about how architects with recognized expertise in certain materials are now changing their ways.

At first, we ourselves were tempted to call this a *Materials shortage* issue, or even *Materials crisis.* We heard from architects about the impossibility of getting clear-grained fir for formwork, about six-month delivery schedules for light steel sections and for some well-known chairs. We read in the New York papers about the theft of bronze balustrades from local bridges and overpasses; we read that components of the world's first cast-iron curtain walls (1849; designed by James Bogardus) were heisted from the vacant lot where they were stored awaiting reverent reassembly in New York's Washington Market urban renewal area—most of them sold for scrap before the thieves were caught. We overheard an Amtrak passenger telling how the copper gutters had been stolen right off the front of his suburban Connecticut office buildings. We have learned to accept the mining of *abandoned* buildings for scrap, but stripping of occupied ones has been rare except in war-torn places.

Severe as the current crunch may be, we are not facing an absolute, worldwide shortage, but simply an immediate market situation. There may be a gradual worldwide tightening of supplies, but the immediate problem is that current production capacity is outpaced by current demand. And demand for building materials can swing widely. It could plummet here in the U.S. in the near future, in fact, if interest rates and government policies continue to discourage construction, producers now struggling to fill backlogged orders could soon find themselves fighting for customers.

But the cost and availability of materials will also depend on factors outside the U.S.—on whether the Japanese are competing strongly for wood supplies, for instance—or outside the building industry—on how much aluminum, for instance, is going into throw-away beverage cans. Some of New York's missing architectural bronze eventually turned up in a buckle factory.

Some of these dovetailed influences are identified in Roger Yee's introductory article to this issue (next page). Roger canvassed over 100 representatives of materials producers, architects, and contractors all over the country to piece together the current cost/availability picture and determine what market forces will be affecting it in the near future. Our warmest thanks to these helpful sources of industry wisdom, most of whom remain anonymous in his composite report.

Some characteristics of market behavior became very clear. There is a tendency, for instance, especially in "commodity" lines such as framing lumber or reinforcing bars, for producers to drop uncommon types or sizes. Instead of tightening uniformly across a whole line of products, supplies drop to zero for the least popular or profitable items. The producer reacts very much like an airline: it would rather eliminate its Chicago-Oshkosh service completely than cut into its share of Chicago-New York traffic.

You'll find out more on the following pages about how producers are reacting in the current situation. But what can architects do, besides keeping the market outlook in perspective when they specify? They can keep prompting development of new building components and inventing new uses for available materials. Our reports here on the work of specific firms are full of cases in point—Dinkeloo's introduction of weathering steel to architecture, for instance, or recent efforts by I.M. Pei & Partners to tame shrinkage-compensating cements for architectural use. The producer may foresee the architectural potential of a material, or the architect may take the lead. Either way, it will take committed collaboration between them to validate new material options.

John Morris Dixon

Chicago: Sears Tower, SOM, 1973. Photo: Hedrich-Blessing.

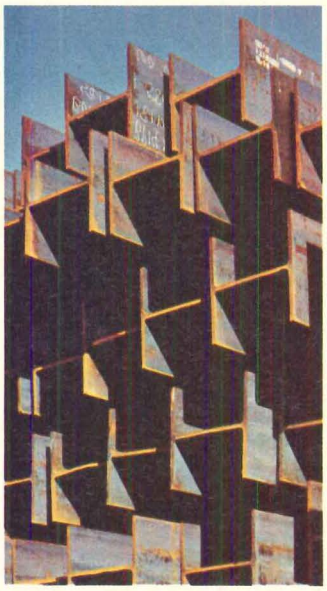


Photo: Shostal Associates.

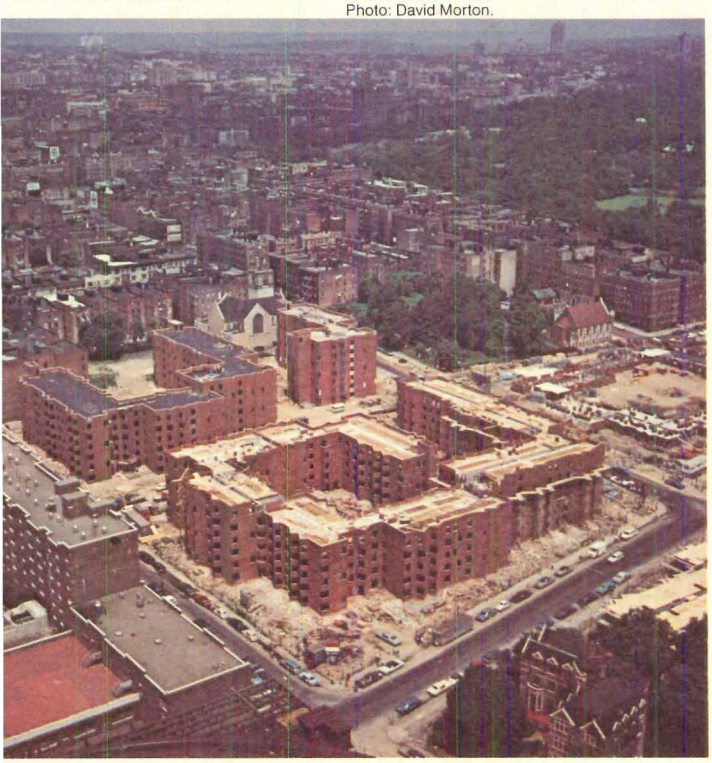
Chicago: Standard Oil, E.D. Stone, Perkins & Wil
Photo: Hedrich-Blessing.

Virginia: Greek Revival House, 1974. Photo: David Morton.

Let us eat cake

Photo: Shostal Associates.

Boston: State Service Center, Paul Rudolph, 1973. Photo: David Morton.



New York: Lambert Houses, Davis & Brody, 1974. Photo: Robert Gray.

Only recently, architects were awaiting a flood of new building materials. The wave has become a trickle in 1974. And the drought of materials is worldwide.

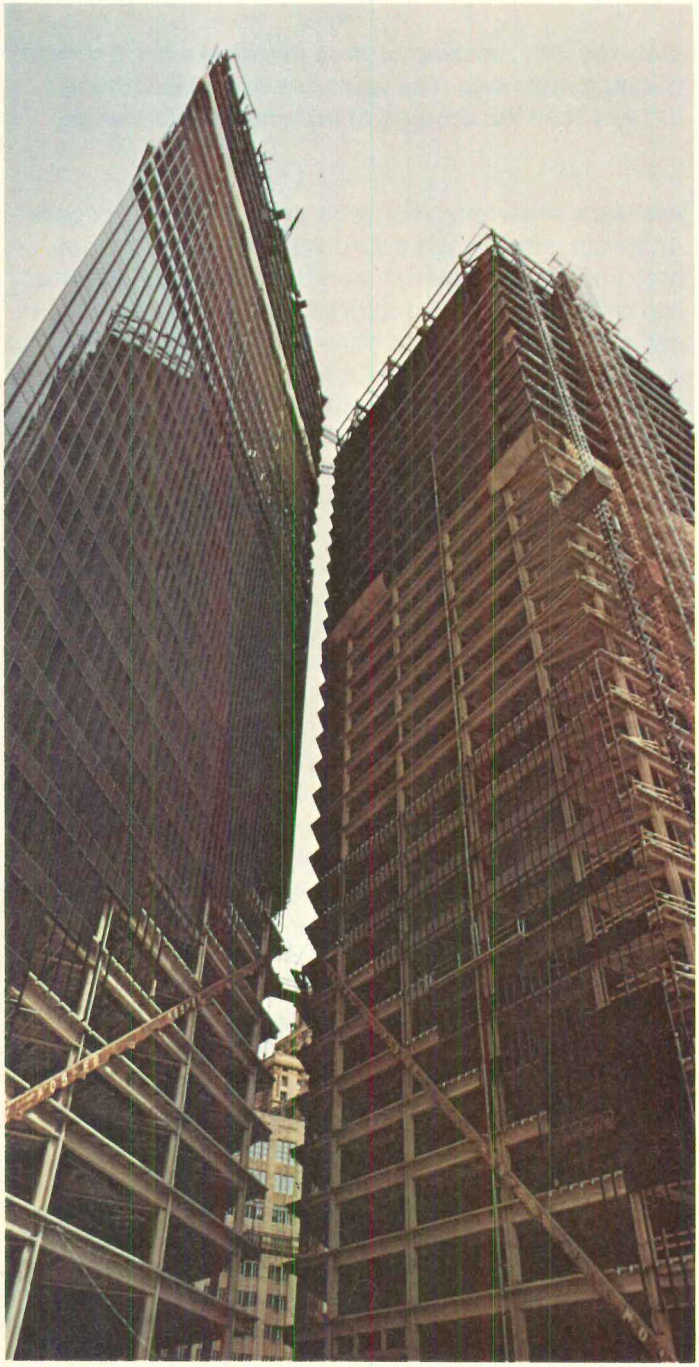
Ask Marie Antoinette. Architects approached this decade dizzy with technology's boundless promise. Exotic, unheard-of building materials would revolutionize specification writing. True, prices were rising daily. Clients did not panic. Then, prices began to rise very rapidly, followed by a wage-price freeze. As expected, materials prices stabilized. On the other hand, materials were scarcer.

And then. An energy crisis, raw materials shortages, and world-wide political, economic, and social instability became part of everyday life. Architects learned that no amount of money would assure them building materials on demand. Firm price commitments, adequate supplies, and prompt deliveries seemed to vanish.

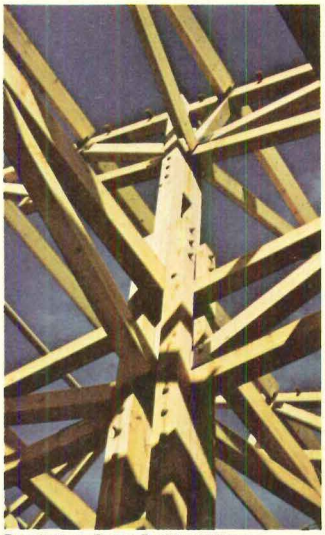
Curiouser and curiouser: a shortage of building materials at the height of a building boom would be comprehensible, if annoying. But we are in the doldrums of a building *slump.* Simultaneously, the overheated economies of Europe and Japan can no longer supply us with plentiful, cheap finished goods since their own raw materials, energy, and labor are no longer plentiful or cheap. American manufacturers of basic materials had endured years of controlled low profit margins by foregoing capital formation, abandoning aging industrial plants, and discontinuing unprofitable items. Now the competition cannot fill our orders. The basic industries of America are in a frenzy to invest.

New plant capacity requires heavy infusions of capital. The angels to make it possible are nowhere in sight, for traditional money channels have been drained by inflation and fear. Commercial bank prime lending rates are climbing unbelievable heights. Investors are wary of plummeting stock prices and lengthy equity commitments. Ignoring high yields from 1973 U.S. corporate profits, they are steering vital funds from the nation's stock markets to short-term bank notes offering instant liquidity. To raise capital, manufacturers of basic materials are raising prices.

Some economists find solace in this peculiar recession. We should shift from consumer spending to capital invest-

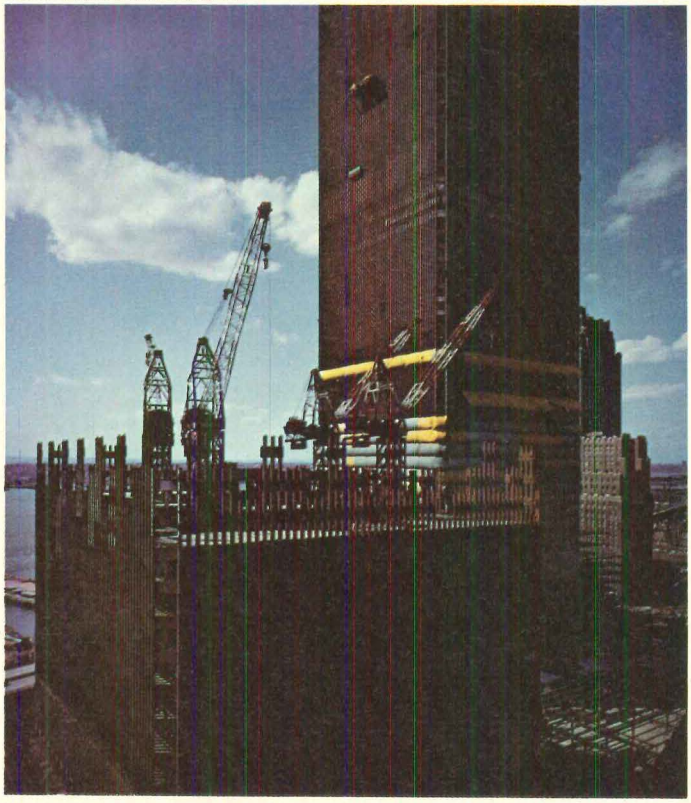


Houston: Pennzoil Place, Johnson & Burgee, S.I. Morris, in progress.
Photo: Balthazar Korab.



Farmington, Conn: Exchange Place,
Callister Payne & Bischoff, 1973.

Photo: David Morton.



New York: World Trade Center, Minoru Yamasaki, Emory Roth, 1973.
Photo: Shostal Associates.

ment, they say. For the architect, competing with industry at home and abroad for scarce basic raw materials, the work of design, specification, and supervision can resemble *Waiting for Godot.* As he struggles to maintain project schedules, his relationships with all members of the building team have changed. Moreover, he is reshaping the very process by which he creates architecture.

We know the traditional liturgy: conceptual design, design development, production, specification, bidding, and construction supervision and inspection. Rising material costs and erratic shortages have upset the ceremony, perhaps for good. P/A has asked scores of architects, contractors, and manufacturers to assess their situations, and the following story is told by them.

Out of vanilla, chocolate, or strawberry

When your supplier's metal stock is fully committed—so you can't have the custom curtain wall extrusions that took dozens of design studies to develop—what do you do? The unthinkable is better than the unbuildable: create an architecture of mass produced parts. This is the ironic hour of the Bauhaus. Says CRS, Houston, "We are encouraging designing around 'off-the-shelf' materials that we know are available, rather than custom-made components. [We receive] fewer requests for substitutions of products which are inferior in quality." And in-stock items are only one alternative, as the Omaha office of Leo Daly suggests. "Simplify materials and methods. [Use] any material or its application which will result in a shorter construction time and decrease the impact of inflation."

It is all very good to design with simpler and more available materials. But needed technical data to make intelligent choices from an array of materials may be nonexistent. There is no national clearing house on building material specifications, market conditions, research, and development. Standard format data printouts are being sought by concerned groups like the Construction Specifications Institute, but a host of overlapping private and public jurisdictions concerned with building materials has yet to adopt universal standards for the industry.

The office of Charles Luckman, New York, urges caution on new products. "Too many new materials and assemblies have come on the market without enough available information to ensure proper use. Architects must be wary of such systems." Communications still randomly filter through contractors, manufacturers, advertisements, engineers, and the professional journals.

Trade offs are inevitable, and are now frequently anticipated in the earliest search for materials. The problem goes deeper than money and system effectiveness. The Los Angeles office of William Pereira asks, "What do you have to spend? You can make trade offs between items, yet there are other variables besides costs. Speculative buildings give you little margin. So you must be a little smarter than the developers. That's getting harder."

Trade offs are also complicated by environmental concerns. Former watchwords for crusaders have become performance specifications: energy conservation, life cycle cost, and even salvage value. A careful selection of a building material is often accompanied by equally well chosen specific alternates—*not* "or equal" clauses. The firm of Hugh Stubbins, Cambridge, Mass., typifies this flexible approach. "Except for lead and copper, we specify desired materials and are prepared to shift swiftly to an alternate during construction."

Deciding which materials to specify readies the architect and his contractor for the next stage: finding what materials are actually available and how they will consume precious delivery time and building budget. Architects are becoming quite pragmatic. They are experimenting with construction management (CM), prepurchasing, phased construction/fast track, and negotiated contracts.

Prices and supplies are often impossible to fix for any extended time. "Quoted prices aren't worth a dime," says the Seattle firm of Naramore, Bain, Brady & Johansen. "Contractors are understandably uneasy about holding prices for any extended length of time beyond a month." But enlisting CM services to gain more control has had mixed results. This stems from confusion about *who* is a CM. In Denver, the office of Muchow Associates reports, "We have worked with general contractors as CMs and they have much to contribute." The Detroit office of Smith, Hinchman & Grylls believes it has used the CM method for years. "We manage a job with design responsibility. Contractors like to call themselves CMs because they see the role as an extension of supervision. As architects, we provide management as a professional service." Whatever a CM is, his employment is increasing. SOM, Chicago: "CM procedures are on an upswing in the office. This doesn't mean shopping around, but getting the job out faster. Manufacturers raise prices during design refinement."

Prepurchasing and storage of critical materials are usually coordinated with phased construction. Yet an opportunity to get *any* supplies at all may not be missed. The procedure is not novel to Reynolds, Smith & Hills, Jacksonville, who "take what we can get. We have prepurchased steel for several years."

Many architects, contractors, and manufacturers are working together much earlier than before. Each participant has important reasons for associating in a project from its early stages. Aside from the architect's plight, there are the contractor's considerable risks in trying to guarantee a maximum price. (Unofficially he may "pad" with contingencies to absorb inflation.) The contractor's line between success and failure can be uncomfortably thin these days, and careful auditing is indispensable for his survival. Says William Crow Construction, New York, "Every two weeks we analyze our job costs and progress reports thoroughly." The owner's understanding is also needed. Loeffler, Johnson, Lundberg, Pittsburgh architects, explain that "Our clients are well aware that many contractors won't guarantee prices beyond certain dates."

Of course, the regions of the U.S. are not equally affected by materials shortages. "New Orleans is somewhat late in inheriting national problems," says the office of August Perez. "We can still fire shots in the dark and wait to see what comes back. But we move quickly on long lead items to save when we can." And some architects have never found specifying easy. Haines, Jones, Farrell, White & Gima in Honolulu claims "There are always problems in ordering from the mainland." With many unresolved issues in mind, P/A examines the market for building materials.

Insulation and acoustical products

Among the family of insulating and acoustical materials, no general bill of health emerges. Fill or poured insulation, rigid insulation, and batt or blanket insulation ride independent carts to the market place. Still, much of the nation reports considerable delays in obtaining adequate quantities of insulation and acoustical products.

Insulation and acoustical products difficulties are a sobering lesson in how well knit our technological economy has become. The energy crisis is implicated, to be sure. Energy for materials processing has become costlier to buy. However, many raw materials used to produce insulation and acoustical end products exist in insufficient quantity and quality. There are world-wide shortages in hydrocarbon feedstocks for petrochemicals and their derivatives; in natural feedstocks like lumber for paper and pulp; and in other chemicals and minerals. Raw material prices are surging capriciously as a result. Higher overseas prices further aggravate the U.S. market by withholding imports and encouraging exports, a malfunctioning which in part America artlessly contrived through wage-price controls.

It may be irreverent to suggest that the nation's economic future is uneasy as it lurches towards its bicentennial. But chemical manufacturers, like other industries, are deserting low profit items for more profitable lines in grim anticipation. What is called "upgrading" of feedstocks can spell shortages for building materials markets abandoned in the stampede. Thus we see styrene dropped for polystyrene, and kraft paper capacity converted to linear board production. These transformations are not confined to insulation and acoustical product manufacture.

Supplies have been tight, deliveries have been protracted from three to six months, and prices have risen steadily this year from 10 to 25 percent. Demand has been firm and will likely remain so well into 1975. Manufacturers differ on when relief can be expected. For such materials as vermiculite, styrene foam, and glass fiber, we may expect punctual delivery schedules by 1975 while other insulators and acoustical materials may balance their supply and demand by 1976. Prices will follow the cost of living as the latter climbs in pursuit of scarcer raw materials, energy, and higher operating costs. If we are fortunate, says an industry spokesman, there may be price stability by 1980.

Sealants

A little donnybrook is enlivening the sealants industry. Polysulfide-based and other two-part sealants are yielding their market shares to high performance one-part silicone sealants, which are easy to work, enjoy respectable shelf life, and are moderately priced. Sealants derived from petrochemical feedstocks, those based on polysulfides and urethanes, have suffered from the energy crisis. Given the current preference for silicone sealants, this may not prevent the supply of two-part sealants from outpacing demand, with reduced delivery time and stable prices this year. Though the outcome of industry competition is not yet clear, specifiers and owners are insisting on long term reliability from products that will last the life of the building.

Demand for quality sealants will apparently be met by industrial capacity. Industry sources say prices will rise perhaps 10 to 15 percent this year, 25 percent within the next five years. Delivery time will be approximately what it now is, two to four weeks.

Brick and building stone

The producers of building stone face a paradox: inadequate production from ample raw supply. Granite, limestone, marble, crushed stone, and terrazzo compositions are plentiful. Granite is "practically inexhaustible" in the words of a supplier; so seems demand.

Similarly, a brick industry source states that "clay is one of the most abundant and available of raw materials." But brick is troubled by slack in demand. Some architects complain of discouraging attempts to achieve color matching. Stricter pollution controls effected the closing of older facilities which some architects favored for certain distinctive brick styles. Generally, demand has been hurt by the decelerating construction industry. Decorative brick, used extensively in homes, has been buffeted hard. Still, brick has remained a popular building skin and bearing wall. Its production is highly energy efficient and its U-factor is good.

Brick prices rose six percent in 1973 due to labor and production. The 1974 increment will probably reflect growing price stability, according to industry sources. Orders can be filled immediately in some cases, though a four-week wait is more reasonable. Prices will most likely advance at a slower pace through 1980.

Granite, limestone, and marble are in great demand. Their assured supply, low energy input, low maintenance, insulating value, and rich appearance have stimulated recent activity in the quarries. Opening or expanding mining facilities has not been easy, however. Court rulings on environmental objections to mining operations have necessitated a careful search for new sources and new extraction techniques. New machinery has increased worker productivity in the quarries, offsetting higher labor costs.

Granite has risen about 10 percent this year with diminishing price increases predicted to 1980. Small jobs have 60- to 90-day delivery lead times, large jobs, 180 or more days. Delivery should improve in the next five years.

Limestone's five percent cost increase in 1974 is largely due to shipping. Augmented demand exceeding production may alter this rosy prospectus. One source suggested that the remainder of the year will see a 12 percent price increase and delivery stretched from one month to six or seven weeks after approval of shop drawings.

Marble price hikes have been moderate, perhaps gaining by 10 percent from 1970. Lead time has been 6 to 18 months. With increased demand, the industry foresees six to eight percent per year price boosts to 1980 and delivery lengthened by three to six months, then stabilizing.

Production of crushed stone is also increasing. This comes in the face of adverse environmental rulings on land use and reclamation. In addition, rising shipping costs have added to the selling price.

Some 30 percent of terrazzo's total volume uses epoxy and polyester resins, which are petrochemical derivatives. The oil shortage has left its mark. But an industry spokesman believes the difficulty is manifested primarily in shipping delays.

The outlook for crushed stone and terrazzo is good. If crushed stone can find political sympathy for its operations and stability in its freight charges it should enjoy only small price changes. Terrazzo users might use systems other than epoxy and polyester resins.

Cement and concrete products

Aldous Huxley's future senior citizen masquerades in a youthful shell unto death. At a cursory glance, the cement industry would not face an imminent demise. Shipments are vigorous and current over much of the nation. What is disturbing are indications that the industry will require heavy investments in the immediate future for upgrading, replacing, and expanding facilities. Otherwise, we will face a genuine shortage of cement and cement products as the industry shows its age. One industry survey forecasts that almost 30 percent of total U.S. cement capacity will be in marginal or poor condition by 1975, even considering new projects. How did this happen?

Good profits in the 1950s created excess manufacturing capacity in the following decade despite a growing U.S. appetite for cement. Pollution control installation in the late 1960s was costly enough to close marginal cement plants. Total capacity saw a net decline from 1968 to 1972.

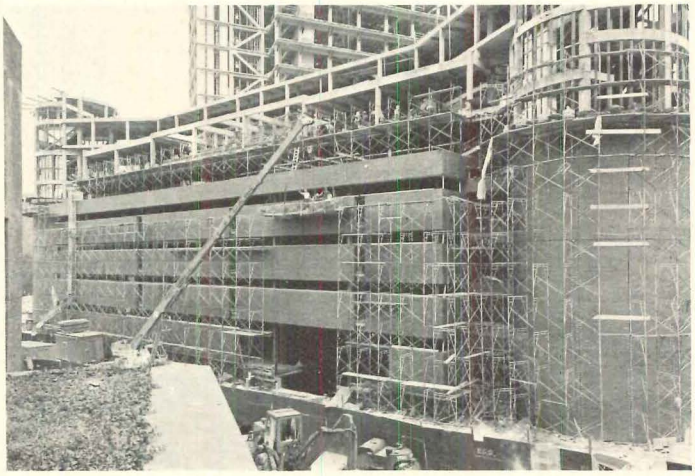
Wage-price controls did nothing to encourage capital investment, and the industry's profitability was soured by the energy crunch. As an industry source describes, "Cement is one of the most energy intensive manufacturing businesses in the U.S., and therefore, the current crisis has had a substantial impact on us." Nearly one-third of cement's production costs are for energy. Kilns are fired with fuel oil, gas, and coal. Crushing, grinding, and handling of material are by electricity. Quarries are worked with diesel oil.

For the past two years, producers have been operating at near effective capacity, but the nation took hefty bites of industry inventories in 1973. Imports closed the gap between supply and demand. If a dearth of investment in cement facilities for the past nine years is to be overcome, the industry must improve its ability to attract capital. An average new plant costs $60 million to $90 million and is two and one-half years in planning and construction. In so many words, cement and concrete product prices will rise.

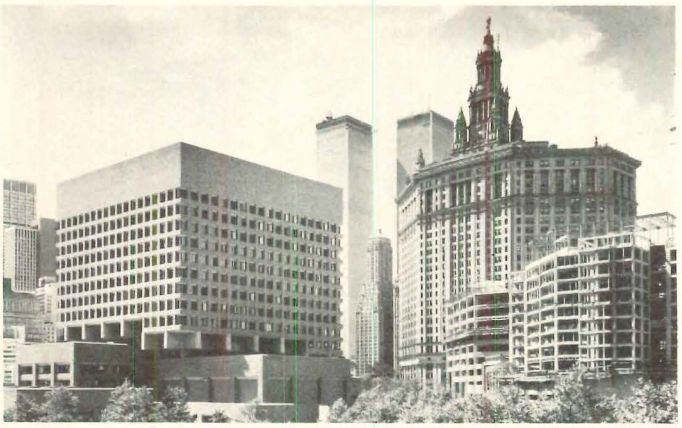
Cement costs rose 10 to 15 percent in January and again in July. Deliveries range from a few days to a few months, with the southeastern U.S. feeling the most pain. The industry forecasts perhaps 10 to 15 percent per year price increases to 1980. Demand will remain strong as an increase in construction activities using cement in ready-mix, precast, and terrazzo picks up the housing slack.

We must not forget a few other variables. If the present liquidity crisis prevents cement industry expansion, foreign suppliers may not be able to meet our needs. If the northern U.S. winter of 1974–75 is severe, we will probably feel the energy pinch through fewer bags of cement. And absurd as it sounds, there is a shortage of paper for bagging.

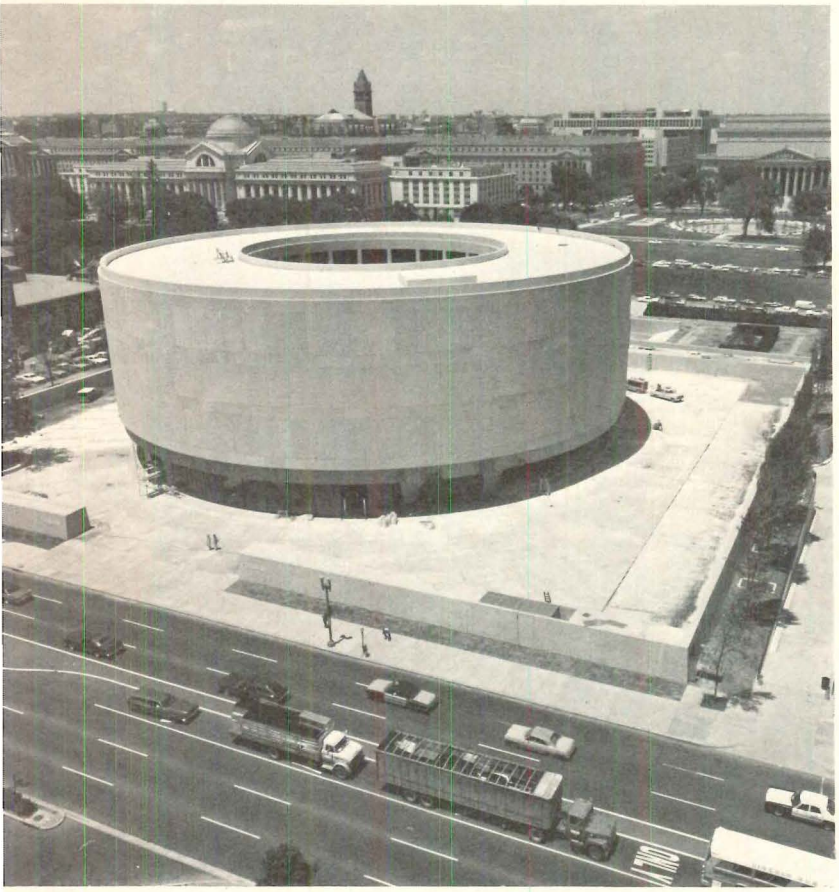
San Francisco: Levi Strauss Bldg., John Portman, 1974.



New York: Murray Bergtraum H.S., Gruzen, in progress.



New York: Fed. Metro. Correctional Ctr., Gruzen, in progress.



Washington, D.C.: Hirschhorn Museum, SOM, 1974.

Aluminum

America is having a love affair with aluminum. Demands for its commercial, industrial, monumental (office buildings and the like), and residential use are strong despite the overall weakness of the building industry. As affairs now stand, there is not enough aluminum for everyone. Some of us must wait, and everyone must pay more.

Aluminum has historically been a low profit industry. As its expenses for energy—it is an energy intensive product—environmental controls, freight, and labor eroded its profits, aluminum manufacturers were unable to amass sufficient capital to expand capacity. Increased production costs and a price freeze on aluminum met head on. The result: a squeeze on users, who now face three- to four-month lead times for many specialty items.

Architects are competing with traditional and new users of aluminum. Home owner remodelers, eschewing new larger homes and devastating mortgage payments, are enlarging their space, using aluminum siding. Farmers unable to get galvanized steel for their barns are switching to aluminum. The beverage can is a new user, as is the automobile, which is struggling to lose weight gained from safety, pollution, and luxury equipment. Even the traditional copper drains and downspouts are now often aluminum.

Aluminum's alloying agents, copper and magnesium, have soared in price. As for aluminum ore, chiefly bauxite, it has become the gambit of ore-producing nations like Jamaica, the Dominican Republic, Surinam, South Africa, Guinea, and Australia. Jamaica has set a fast pace with a combined 800 percent increase in royalties and taxes.

Aluminum prices are continuing to rise and no one is quite certain when the ceiling will be reached. New capacity takes two and one-half to three years to activate from plans to finished smelting plant, and money has been hard to find for the purpose. Meanwhile, the last tonnage from the nation's strategic stockpiles was sold out this summer and users face a tight last quarter in 1974. All that anyone can do under these conditions is to order early.

There is some cheer in future tidings. New smelting capacity will be available by 1976, but supply will not match demand until 1978, according to industry sources. Manufacturers are investigating new smelting processes that could cut energy requirements by 30 percent. And there may be new raw supplies if we learn to extract from aluminum-bearing ores such as anorthosite, alunite, and laterite.

Glass

Soda ash, an important raw material in glass production, is in short supply across the world. U.S. demand for glass, on the other hand, is at best stable due to the cooling of the automotive and construction industries and the enlargement of U.S. float glass capacity.

Continuing increases in capacity this year will be accompanied by a relatively unchanging demand and a continued delivery period of three to four weeks, according to industry sources. Prices will rise, due to inflated costs. This trend, with a slowly recovering demand and modest gains in capacity, could take us to 1980.

Architects have turned the industry's output askew. In response to the energy crisis, they have strained to capacity

the manufacturers' ability to make various types of insulated and reflective glass. And so, the industry asks designers to learn the full implications of life-cycle costing to "precipitate a better mix of glass demand." It is also concerned that vision glass has become the environment's scapegoat.

Resilient tile flooring

Vinyl asbestos tile (VAT) and other similar resilient tile floorings use vinyl resins derived from petrochemical feedstocks. Oil problems and freight, power, and packaging costs have affected prices. Therefore, the industry is beseiged by the brisk commercial construction market. Customers are urged to select from in-stock items.

Supplies will regain normalcy as oil supplies improve. The same holds for delivery time, presently ranging from 30 to 120 days depending on item ordered, with lesser intervals for contract sheet vinyl flooring. Prices will respond to inflationary pressures in the expected manner.

Steel

1973 was a fat year for steel. The 150 million tons produced by the U.S. reaffirmed the nation's world leadership in steel manufacturing. Common sense suggests we should have all the shapes, sheets, bars, and mesh we desire. Consider the second guessing that is besetting corporate and government building project directors. Instead, architects are fighting for whatever steel there is.

The steel industry has not been a profitable giant of late. U.S. steel consumption grew an average annual rate of over two percent in the last 15 years. The U.S. steel industry could not claim the bounty wholly for itself, however. A flood of lower priced steel from Europe and Japan, buoyed by lower labor costs, rapid plant modernization and expansion which increased productivity, direct and indirect government incentives in the form of subsidies, credit guarantees, and tax benefits, plus a favorable currency exchange rate vis-a-vis the U.S. dollar, absorbed more than half the increase in domestic consumption. World access to steel has been equalized by discoveries of high-grade ore deposits in Australia, Canada, and South America, and the development of giant bulk cargo ships to transport them.

Even so, U.S. manufacturers continued to make heavy investments in basic steel R&D, and perfected new technical processes such as vacuum melted steel, vacuum degassed steel, argon-oxygen process steel, electron beam refining, continuous casting, and the bottom blown converter or Q-BOP. Billions of dollars were invested in pollution control. These *wunderkinder* have replaced older equipment. Yet total U.S. capacity was frozen from 1965 to 1972.

Certain product lines actually lost capacity in those years. Low profitability and slow demand at home yielded to aggressive foreign sales campaigns for items like plates, baling wire, drilling pipe, and reinforcing bars. American producers converted to more profitable work and closed marginal plants (e.g., rebars were dropped for angles and bar joists). As long as overseas suppliers could furnish what we would not make here, Americans were delighted.

A storm on the steel mills was incubating long before the Arab-Israeli war. As the world sensed an impending money shortage, industrialists rushed their expansion plans forward to secure available credit. This induced a prodigious worldwide order for steel which has reduced our supply of imports. Add to this inflationary pressures which awarded wage boosts to labor in Europe and Japan which outstrip their U.S. counterparts, and the long overdue devaluation of the U.S. dollar against European and Japanese currencies, and it is not hard to see why America cannot rely on bargain priced imports. Imports are down in 1974, and industry spokesman estimate that desperate buyers are paying from 25 to over 100 percent over the domestic price.

Wage-price controls helped send steel and scrap iron overseas to appreciate higher prices. As for the ubiquitous energy crisis, it increased fuel and transportation costs for steelmakers, though America is fortunate that its coal delivers more than 65 percent of steel's energy needs. Fuel oil yields less than 9 percent.

The steel industry estimates it will need to increase capacity between 20 and 25 million tons by 1980 to meet at least 85 percent of domestic demand. This will entail a hefty $10 billion to $13 billion investment on top of $10 billion for replacement and $3 billion for environmental controls. These funds will be raised, for steel demand continues to grow. Auto steel has been absorbed elsewhere.

To make investment enticing, prices for steel have risen up to 40 percent this year. Prices will continue to rise. Delivery times of three months and more will be sustained for some time and might worsen in the event of a much dreaded coal miners' strike. Until capital expansion is under way, we face hard times ahead. Architects might rush their orders for structural steel as soon as building schedules permit. Steel will be tight to 1980 across the world, and temporary surpluses in certain countries will be offered for sale in steel hungry markets where, in the words of a steel economist, they will "evaporate like a desert rainstorm."

Gypsum board

Like a wave of religiosity in the shadow of the millenium, developers and builders hoarded gypsum board inventories against the threat of a major strike in the industry. With plants in line now supplies are plentiful, prices are stable, and deliveries are prompt; all look good to 1980. Gypsum is "one of the most abundant rocks on earth," and list prices for its products have been stagnant for 10 years. Because gypsum board is heavily patronized by homebuilders, it shares their slow pace of sales.

Paints and other coatings

Shortages of pigments, vehicles, and containers for paint could make supplies tight. Prices have risen, and worried contractors prefer to avoid bid quotations.

Many high performance coatings such as the fluorocarbons have not been injuried by oil. Since these products are profitable for manufacturers, solvents needed in their production—while supplied at a premium—have not been diverted. Only unusual colors requested out-of-stock might encounter difficulties. Prices have been stable. Supplies are

generally available, and should cover demand, according to industry sources. Prices will reflect rising costs, with delivery time remaining normal. Still, the spectre of real shortages lingers on; architects are advised to accept cost-plus or open-ended contracts for some time to come.

Roofing and waterproofing

Simple wants fared better in supposedly simpler times. Diogenes told an astonished Alexander the Great that his only request would be that the ruler step aside, "You are blocking my path to the sun." Today architects ask roofing contractors to install a favorite, time-tested roofing system, and it frequently cannot be done for love or money. Asphalt, coal tar pitch, paper, rag, and certain chemicals essential to standard roofing details are in short supply.

Asphalt is literally and figuratively "at the bottom of the barrel of crude oil," an industry source states. Existing government controls on production of crude-oil-based commodities have applied pressure on the availability of asphalt producing material. It is a low profit item which only higher prices could invigorate.

Coal tar pitch is derived from coal tar. Coal tar is an excellent substitute for petroleum fuel in industry, and has been partly siphoned off for this purpose. While producers search for new supply sources, specifiers find their old standard very hard to obtain.

The shortage of paper and the exporting of rag have hurt roofing felt and shingle manufacture. Demand for paper products outside the construction business has proliferated and choices in shingle colors have narrowed.

Shortages will persist as long as petroleum, paper, and rag remain in uncertain supply. Prices will continue to rise. Spokesmen believe such conditions could persist to 1980.

Wood and wood products

The singing telegram died in 1974. And what of homebuilding? Homebuilders have not disappeared, but their activities have receded from 2.1 million starts in 1973 to an estimated 1.6 million starts for 1974. As wood and wood products have been closely associated with homebuilding, they too show signs of "anticyclical" business behavior.

Current residential and manufacturing demand levels for wood have caused some shipments to exceed orders, with subsequent retreats in production. There has been a dip in prices for some items. In May of this year an industry spokesman referred to generous mill inventories of softwood plywood as a "bargain buy." Though there were local bottlenecks in wood deliveries due to railroad boxcar shortages, this has been a minor problem. In fact, the industry believes it can make deliveries "virtually immediately" on most products.

Redwood takes exception to this appraisal. Heavy use of it for custom housing and commercial building has kept supplies tight. Redwood mills are approaching their sustained yield. Boxcar shortages and the catch-up time between an accelerated demand and a lengthy one-year kiln drying period have pushed delivery dates to two or three months for upper grades, and somewhat less for common.

The timber companies and manufacturers of wood doors, windows, and other products are praying for a housing boom. No one can predict the twilight of the single-family house yet, so any resurgence of the homebuilding could mean tight wood supplies, if housing starts exceed more than two million per year for several consecutive years. If starts fail to break this number, industry observers foresee no major problems in supply, demand, price, and delivery.

Redwood will stay "hot" and scarce for some time to come. The industry advises architects to take advantage of improving supplies of common grades where they are appropriate: decks, fences, trellises, and multi-unit and commercial work. Upper grades need time to expand.

Plywood and plywood siding should increase their supplies to 1980 as new plants and equipment are installed. Price increases due to labor can be expected, while delivery time remains at present schedules. One possibly discordant note is a potential problem with plywood exterior glue. If benzine shortages recur, phenol formaldehyde resins used in glue manufacture may be short.

What seems to preoccupy the industry's long-range planning is a fear of *inadequate* timber simply. Towards the expansion of logging rights in the National Forests, the industry is emphasizing timber as an agricultural crop. Through "forest management" it believes it can meet U.S. Forest Service estimates of a demand for wood in the year 2000 which doubles that of 1972. The industry's future course in the National Forests awaits a government ruling.

Plastics

The prima donna of technology is suffering growing pains. Plastics celebrated a record year of production in 1973, turning out 27 billion pounds of plastics—an increase of three billion pounds above its 1972 efforts. This year, demand is estimated to exceed 30 billion pounds, and industry sources say only 27 to 30 billion pounds are coming.

Plastics production was at full capacity in 1973, oblivious of how tight oil and natural gas supplies were and how tenuous were the sources of petrochemical feedstock. Price controls rattled the euphoria by channeling feedstock from plastic resins to more profitable uses at home and abroad. One direct outcome was the growth of feedstock exports in the last quarter of 1973. Early difficulties in natural gas and petroleum distribution had already appeared as spot shortages in different parts of the U.S. by summer.

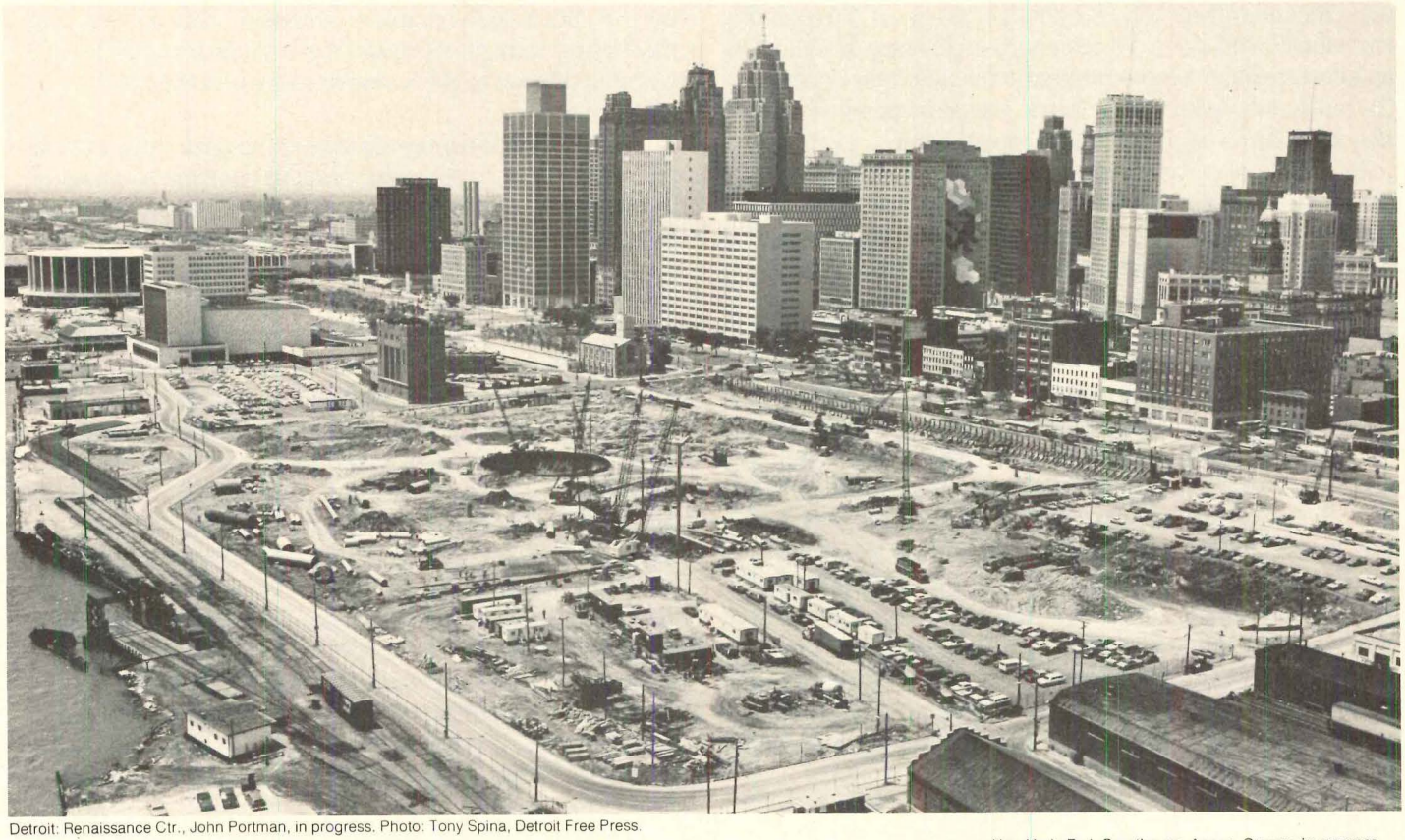
Business was too good for plastics to heed the portents. The total amount of petrochemical feedstock available for plastics was severely reduced. The startled industry rushed to Washington to fight for its allocations when the Federal Energy Office favored agriculture, food processing, utilities and others—but failed to list plastics as a primary customer. Construction, which uses perhaps 25 to 30 percent of plastics production, has felt this loss in diverse painful ways. VAT, sealants, and window gaskets can be elusive.

There will be no additional resin capacity until late 1976 or early 1977, say industry sources. The intervening years will see plant modernization and upgrading. In the words of a trade association representative, "the economics of our industry have drastically and permanently changed. It is inconceivable that prices can ever go back to pre-1973 lev-

els." Future growth in plastics is very unpredictable. New resin capacity rests lightly on a pyramid of ifs: if new feedstock is made available, if new refineries are built, and if more gas and oil are made available to the U.S. market. One ultimate consolation: plastics are fundamentally hydrocarbons. As the industry envisions, the world is rich in carbon atoms eager to become polymers when the oil runs dry. The research will be costly. Yet—a life without *plastics*?

The party's over

A careful re-evaluation of how architectural designs become buildings is in progress in many architectural offices. Earlier participation by the full "building team" and a more profound knowledge of materials than architects now exercise seem inevitable for the continuing survival of the profession. The gravy days of materials seem permanently over. Even if the world economy plunges into full depression, and the world has its Jeremiahs, building materials may never be as plentiful as they once appeared. We may even see new construction which is planned for longer amortization periods—buildings designed to last.
[Roger Yee]



Detroit: Renaissance Ctr., John Portman, in progress. Photo: Tony Spina, Detroit Free Press.

Washington, D.C.: National Gallery East Bldg., I.M. Pei, in progress.

New York: Fed. Courthouse Annex, Gruzen, in progress.

Bravado with brick

Ulrich Franzen

Ulrich Franzen, well-known for his compositions in brick, tells what little there is to know about the material and a lot about how and why he uses it.

Why does any architect use any building material? The primary reason, most likely, is because he likes it. But reasoning usually would avoid such unarguable issus as "like," in an effort to make a more rational justification for choice. Curiously, however, these "other" reasons become explicit only after some experience with the material.

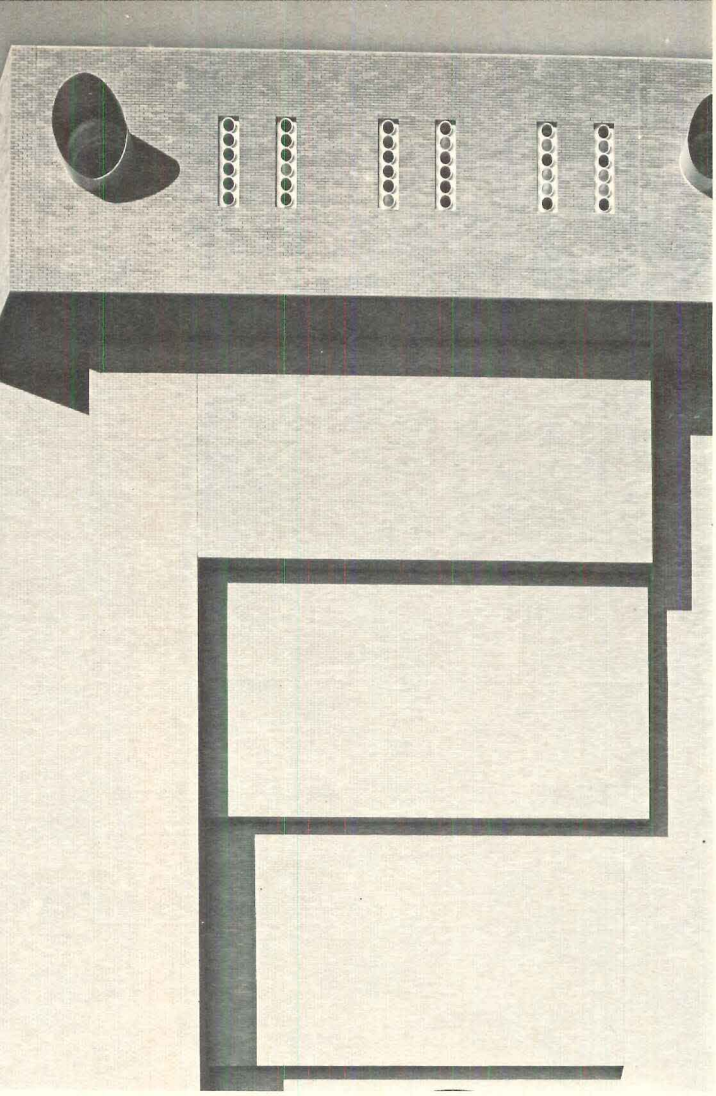
Over the last 10 or 15 years, architect Ulrich Franzen has done any number of brick buildings which have appeared in the glossy pages of one or another of the architectural journals. When asked why he uses this material, he says that it was never a conscious choice, since he never had any well-to-do clients. Brick is one of the least expensive exterior finishes and is virtually self-maintaining—two reasons architects as well as clients find it very acceptable.

Brick is also one of the most versatile of building materials, having appeared in almost every style of architecture since the time of the Romans. Its technologies have altered little since then and, for this reason, Franzen considers it a non-innovative material which avoids innovative design problems. Steel has replaced masonry for lintels and one of the more urgent questions of detailing may be whether or not to use a rabbetted lip stretcher in a lintel detail. The only nominal change in the use of the material followed labor union agreements to limit the number of bricks laid per day; in order to maintain the construction tempo, someone invented the all-American answer—the jumbo brick.

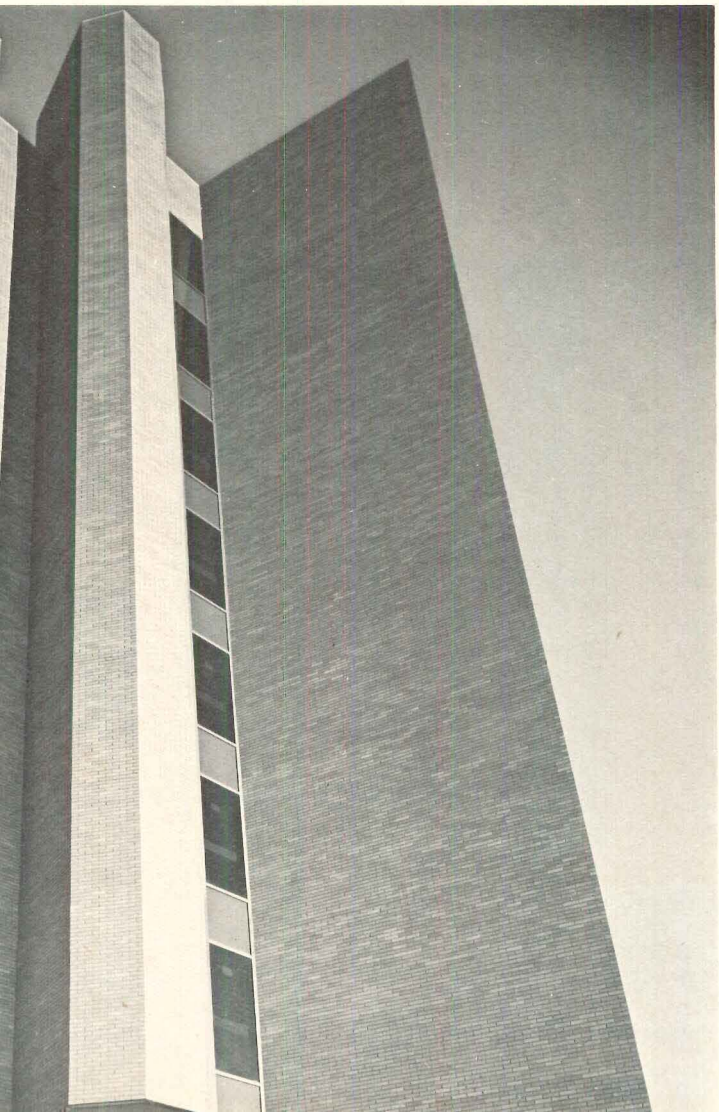
While brick is a very regional material with varying characteristics according to local clay composition, Franzen prefers a very dense, gray/brown brick, made in Ohio, that can be used without siliconing. He describes the gray/brown color as being "discreet," making a softer contrast with the sky than red brick and blending with almost any setting. The mortar used for laying the brick is dark charcoal color with the joints raked back to create a shadow effect, a trick he learned from the skillful hands of Frank Lloyd Wright. As in Wright's detail too, Franzen prefers the joint to be a minimum dimension. But although he may spec a ⅜ in. joint (Wright's was a mere ¼ in.), he says it is often difficult to get a mason to lay less than a ½ in. mortar joint.

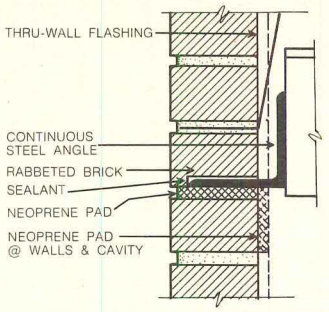
Here is where the pragmatics and the aesthetics of a material are difficult to separate, and the question is raised of how much the characteristics of a material are expressed, as opposed to the willful imposition of form. Brick lends itself to a variety of treatments in the handling of details: coursing, expansion and construction joints, reveals and corners. Franzen regards brick basically as a disciplining material whose modular characteristics and built-in proportioning system must be respected in organizing forms. One problem, he feels, is overcoming the quality of brick-as-veneer by giving a sense of volume and enclosure to the mass of the building, and by giving depth to its surface. The ability of the material to perform in this way is well illustrated by his recent laboratory building at Cornell. Essentially a two-faced structure, the north side is a glass curtain wall that reads as surface only; the south side is a windowless brick wall that reads as volume, whose surfaces are modulated in scale with the volume of the building.

Further, in the philosophic realm, the forms which Franzen chooses to give his buildings imply an inherent contradiction; the "touchability" of brick as an essentially humanistic material, used to make forms which Franzen describes as brave new world images. Whether or not the intent is achieved, the attitude clearly governs the choice and use of this material. [Sharon Lee Ryder]

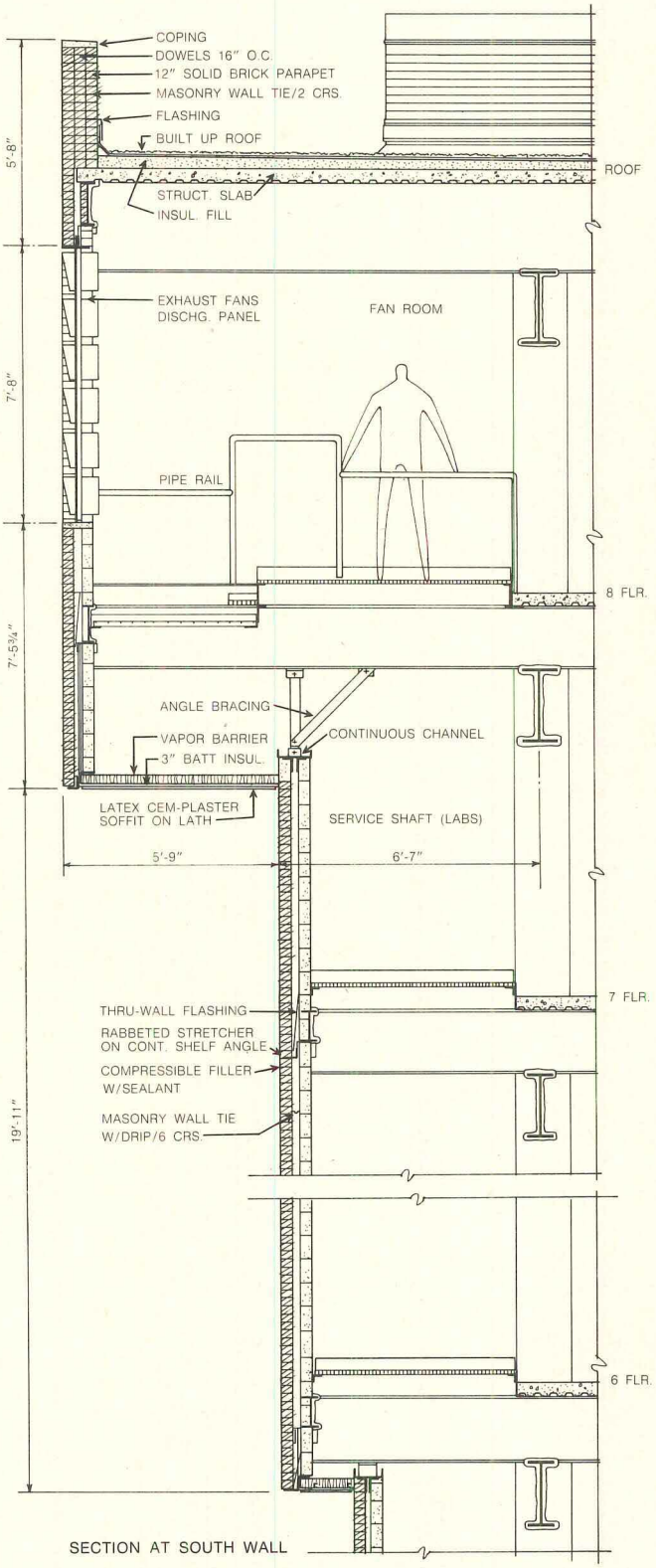


Photos: David Franzen





RABBETED BRICK AT TYPICAL LINTEL



SECTION AT SOUTH WALL

Designing in steel and glass

Savvy about steel, game with glass

Kevin Roche

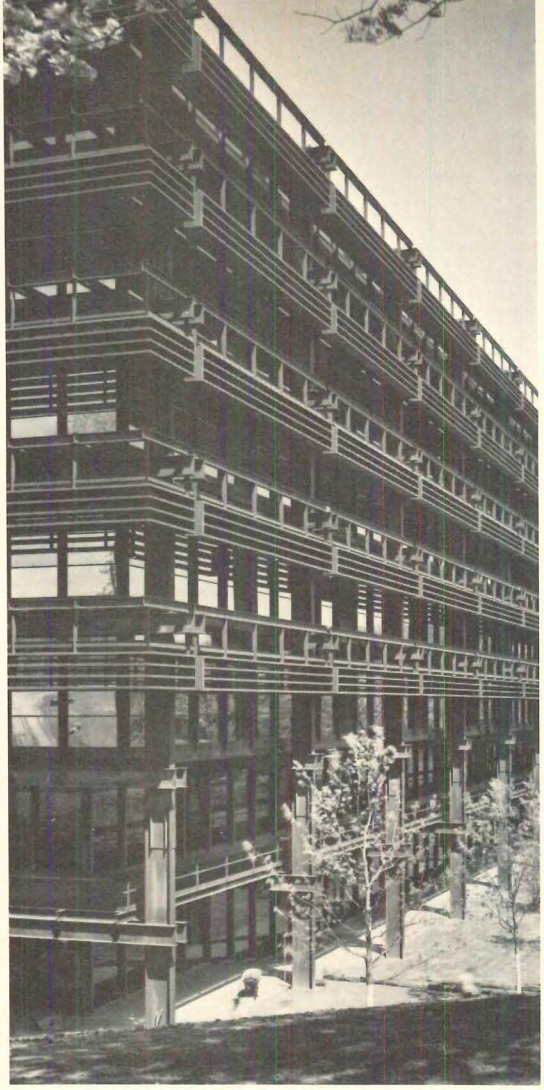
John Dinkeloo

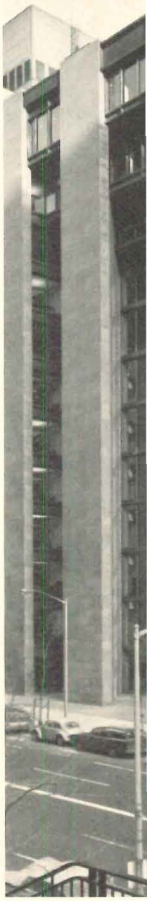
Coming from architects known for technical innovations as well as design, the responses of Kevin Roche, John Dinkeloo & Associates to the materials shortage proves to be enlightening and often surprising.

In one sense, materials shortages are nothing new to John Dinkeloo. As a partner in the firm of Kevin Roche, John Dinkeloo & Associates (and before that, its predecessor, Eero Saarinen & Associates) he has often operated as if a materials shortage were at hand. And in many cases it was, in terms of the right materials or finishes for the job. When Saarinen's firm was designing the Deere & Co. Administrative Center in Moline, Ill. in 1957 (completed 1964), they sought to exploit exposed structural steel. In those days, weathering steel had not been applied to architectural construction, and John Dinkeloo felt compelled to do something about it. In the late 1950s when the firm was looking for the right glass to clad the exterior of the Bell Telephone Laboratories Development Center in Holmdel, N.J. (completed 1962), Dinkeloo stepped outside the architectural materials field to find and adapt the appropriate material—reflective glass—to the building's curtain walls.

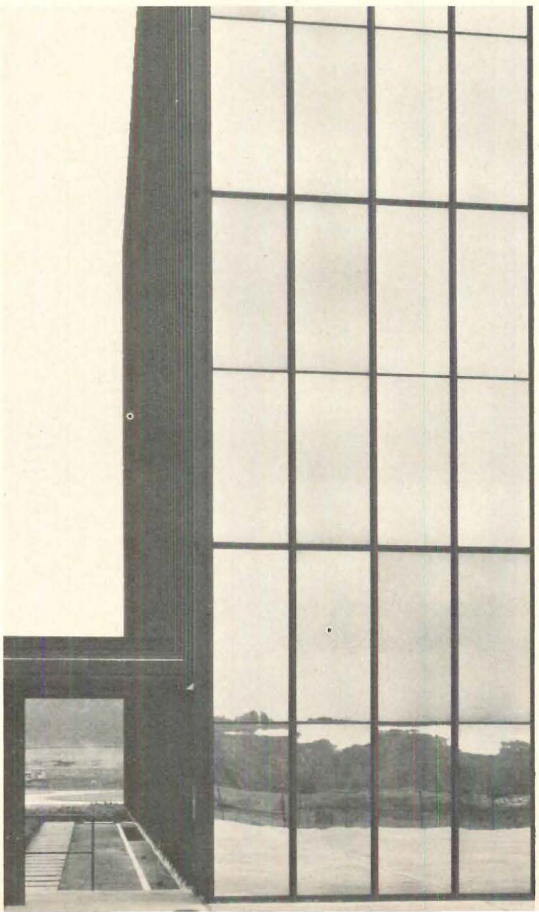
As head of Saarinen's technical department, Dinkeloo can claim credit for many other such technical applications and advancements. He borrowed neoprene gaskets from the auto industry to seal the curtain wall system of the General Motors Technical Center, Warren, Mich. (1948–1954). The porcelain panels prevalent at GM had previously been found mostly in gas stations; Dinkeloo's department developed a laminated panel and continued to refine it.

These accomplishments, historically significant even now, were acclaimed then in the architectural press as bold innovations. But Dinkeloo remains modest. He quickly explains that he does not create "new" materials so much as he improves old ones. His decision 20 years ago to explore new materials or products was in fact triggered by the lack of research in construction materials. He continues to do so simply as the need arises for a specific job. Nevertheless, the leap Dinkeloo was willing to make from old product to new turned out to be a quantum jump, particularly since manufacturers lingered behind. In retrospect, the introduction of two materials in particular, weathering

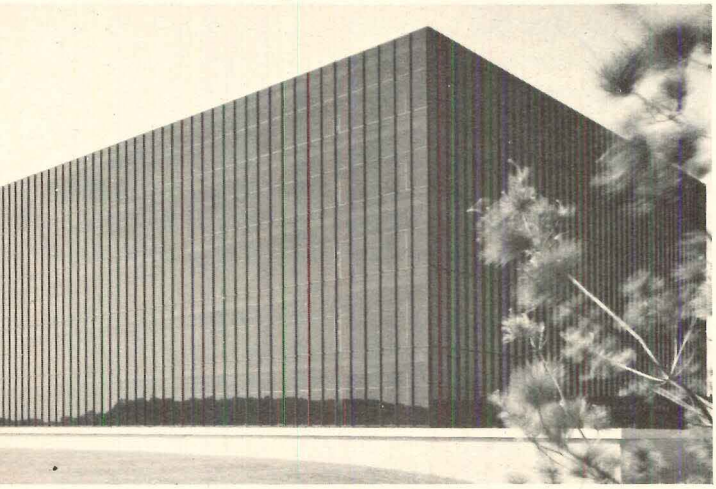




Since weathering steel received its first architectural application in the Deere & Co. Administrative Center in 1964 (above, left), it has been used in the Ford Foundation building (above, middle), the Knights of Columbus tower (above, right), and the adjoining Veteran's Memorial Coliseum (not shown). Photos: Ezra Stoller © ESTO, above left, and middle.



Reflective glass was first used in the Bell Telephone Laboratories Development Center of 1962. The entrance elevation was originally tinted glass (below, right), while the rear elevation was fitted with reflective glass as an experiment (bottom). The glass proved to be so successful in its reflective quality (left) that eventually the entire building was sheathed in mirror glass. Photos: Ezra Stoller © ESTO, below right; George Cserna, bottom and left.



steel and reflective glass has changed the face—or at least a few wrinkles—of architecture in the last decade.

Riveting on rust

Originally the Saarinen office intended to build the John Deere offices in concrete. But steel seemed to be more appropriate to the wooded site and to the product identified with the firm (farm equipment). The architects desired an economical metal that could express the structure—without the obligatory protective coatings.

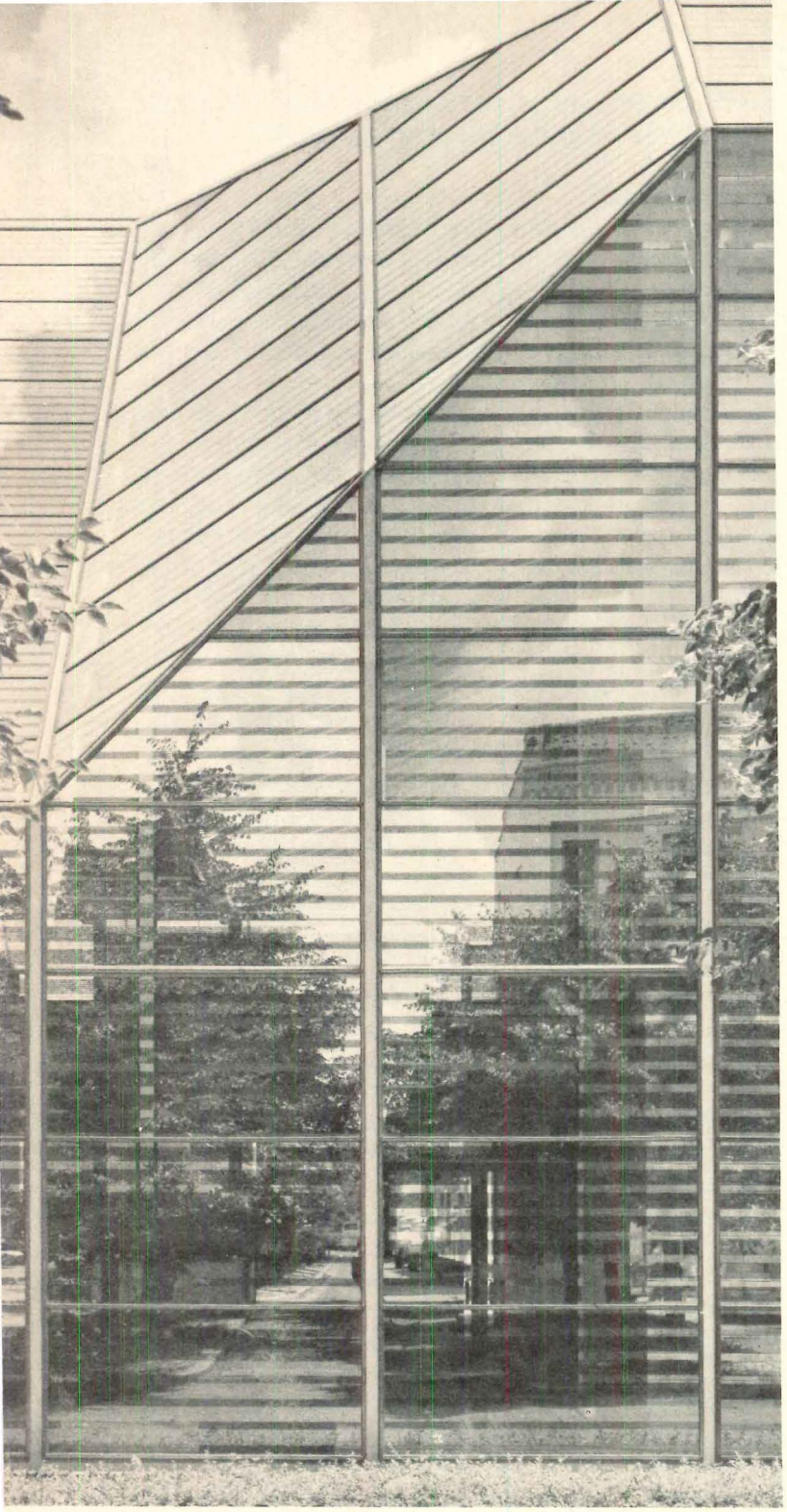
So Dinkeloo began looking at corrosion curves in different kinds of steel. He found a high tension steel that corroded for a period of time and then leveled off. This kind of steel, containing more manganese, copper, and nickel than higher corroding types, had been developed in the 1930s for coal hopper cars. Since carrying coal took the paint off normal metal cars, paving the way for heavy rust, the coal industry required a steel that could form a dense oxide protective coating. When Dinkeloo approached manufacturers about structural applications, however, they were less than excited. This kind of steel took more time to produce and was difficult to weld due to its thickness. But Dinkeloo undertook more elaborate tests, including a two-story mock-up on site, to erase any apprehensions on the part of the steel manufacturers. He not only determined the weld patterns, but how weathering steel would react with neoprene gaskets. No glazing expansion joints were employed at the Deere building; only structural neoprene gaskets sealed the glass and allowed for expansion.

After weathering steel's debut in the Deere building, it became famous overnight. Since then Roche-Dinkeloo has used it for the Ford Foundation building in New York (1967), the Knights of Columbus office building in New Haven (1970) and the adjoining Veterans' Memorial Coliseum (1972), and the Richardson Merrell office building under construction in Wilton, Conn.

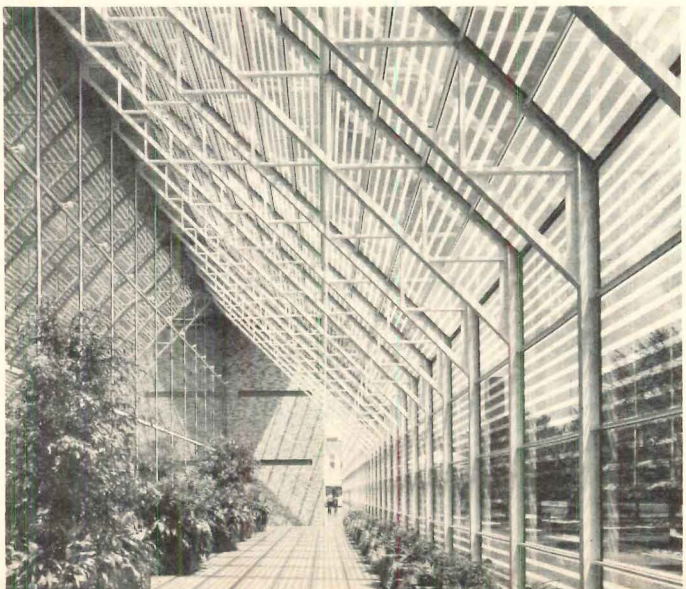
Dinkeloo states that the firm handles the fire-proofing according to the circumstance. Because the Deere building—only five stories high—was situated outside the fire district in a rural area, the architects primarily needed to make the perimeter accessible to firefighting equipment. The Ford Foundation building was located in an urban center, so Roche-Dinkeloo turned to conventionally insulated beams with weathering steel cover plates. Knights of Columbus structure is unique in that a tall office building (23 stories) with exposed structural steel rarely satisfies tough urban fire codes. In this case, steel beams rest on fireproof concrete corner towers so each floor could be considered, in effect, a one-story building. A sprinkler system also protects offices. With the Coliseum and the Richardson Merrell building, Roche-Dinkeloo summoned evidence that fire protection sprayed only on the inside surfaces of the weathering steel structure would be sufficient to meet fire codes. Two different fireproofings were applied in each building: Richardson Merrell was sprayed with the conventional 1½-in.-thick fireproofing; the Coliseum, however, was painted with a ¼-in.-thick intumescent paint that foams when hit by fire, creating an air cushion around the steel.

Risks of rust

Like any material, weathering steel has limitations of which architects must be acutely aware, Dinkeloo warns.



With the Irwin Union Bank and Trust addition, Roche-Dinkeloo worked with a manfucturer on a striped metalized and tinted laminate glass (above) for the enclosed terrace (below). Photos: © Yukio Futagawa.



Savvy about steel, game with glass

First, the oxidation may creep along for more than the hypothetical two-year period. Second, the materials around the steel must be sympathetic to it. For example, where weathering steel touches the earth it will continue to corrode. Another snag occurs with nuts and bolts; if they are also formed of weathering steel they tend to hold moisture and continue to corrode, weakening and changing shape. Stainless steel nuts and bolts provide the most sensible substitute, according to Dinkeloo. He also prefers silicone sealants to any other when setting glass into a weathering steel frame, due to their endurance and expandability.

Of the two principal types of weathering steel, one oxidizes more tightly but tends to stay red-orange longer; the other turns a brown-purple more quickly, but flakes off. Therefore Dinkeloo saves this second type for secluded sites where flaking will not stain other buildings. If the steel is chosen for application on an urban site, however, he advises pre-weathering it—literally leaving it out in the rain where sulfur and moisture will speed oxidation. This process was employed at the Ford Foundation building but time and budget didn't allow for pre-weathering at the Knights of Columbus building. As a consequence, a reddish tinge can be seen gracing the exterior walls of the department store across the street.

A gleam to glass

Dinkeloo has been studying the problems of glass curtain walls since the construction of the GM Technical Center. Then the largest window wall application in the U.S., heat gain limitations, however, soon became apparent. Meanwhile, Dinkeloo noticed the growing prevalence of one-way mirrors, glazing that reflects light from one surface but allows visibility through the other.

He began investigating this mirror glass to see how it was made (metal particles were deposited on it in a vacuum chamber). Also at that time (late 1950s), the space industry, and especially Bell Laboratories, was using an extra thin metallized polyester film for air balloons. Dinkeloo then found someone laminating the film between two pieces of glass. But he wasn't satisfied yet. Since the metallized film wasn't applied in a vacuum, the glass tended to stripe. However, by combining the two processes of coating glass with the metallized solution and then laminating the two panes of glass, a reflective glass pane with the properties of safety glass was created.

Appropriately, Dinkeloo first installed the glass in the Bell Laboratories in Holmdel. Tooling up could hardly be called a big-time operation. Just two men—one representing the Kinney Vacuum Division of New York Air Brake Co. and the other, the Laminated Glass Corp. of Detroit—collaborated on the process. Only one elevation initially received the reflective glass. However the new product was so successful that Bell eventually replaced the tinted thermal glass on the other three elevations with the mirror glass. Afterwards, with the Deere building, Dinkeloo jazzed up the process a bit—by adding bronze metal spray to get a gold-tinted reflective surface.

Today several manufacturers make reflective glass, laminated or double-glazed, baked in porcelain, or sprayed in a

vacuum process. Dinkeloo still finds the vacuum-laminate combination best prevents uneven color and striation.

Dinkeloo's experiments with glass didn't stop with these early solutions. As recently as 1972 the firm pioneered the development of a special glass for the enclosed plaza of the Irwin Union Bank and Trust addition in Columbus, Ind. Visualizing a glass with the light patterns and sun protection of venetian blinds, Roche-Dinkeloo worked out a process with a manufacturer whereby strips of clear glass were sprayed with a metal film, while other strips were masked, to be left clear. Then the panel was laminated to a green tinted pane. When asked whether this process wasn't rather expensive, Dinkeloo replied that like many products, the first time around is the *least* expensive—for the architect. However, high production losses for an experimental product can reduce the manufacturer's profits. Thus, next time, he imagines, they will find prices higher.

Roche-Dinkeloo's extension of the capabilities of more commonly available glass merits attention too. To cut glare in the sloping reflective glass walls of the College Life Insurance Company of America Headquarters in Indianapolis (1973), the architects hung a skirt of opaque stipple glass from the ceiling, around the inside walls. For Worcester County Bank in Worcester, Mass. (1974), they went a step further; three horizontal panels of reflective glass with differing degrees of visibility and light transmission alternate on each floor. In another application, reflective or tinted glass awnings will shade the offices of the American Electric Power Company in Ashland, Ky. The 4- or 5-ft-long sunshades will be attached to the southeast and southwest glass walls of the building at every floor. Details for the connection are being fleshed out now.

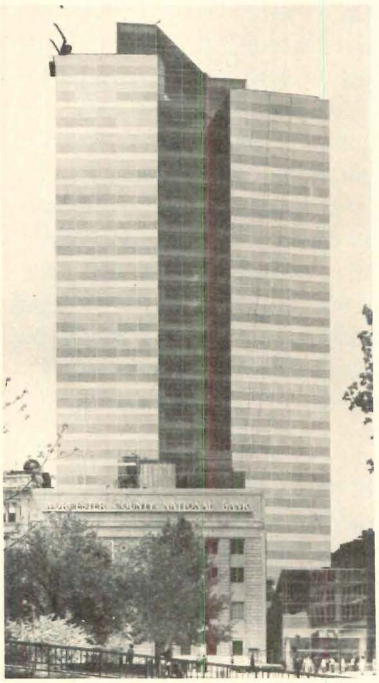
Energy and exposure

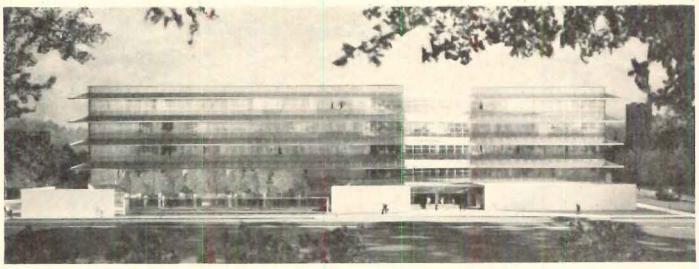
When it comes down to it, energy concerns, more than a materials shortage, could trim Roche-Dinkeloo's robust appetite for glass. Hopefully their "greenhouse architecture"—the schemes that receive quantities of natural light through glass shed or ridge and furrow roofs—won't suffer. However the architects have begun investigating methods for using less glass, while still admitting the same amount of natural light to a building's interior, in an effort to shave energy requirements.

Both energy considerations and rising prices for sheet metal work generated a change in the mechanical system planned for New York's Federal Reserve building project. The original scheme called for a central mechanical system to be dropped into the space where the beams carrying the tower span the 160-ft-high ground floor court. Now the building is being designed to have separate floor-by-floor mechanical systems with no continuous ducts. Not only can the floors operate independently in off-hour use, but fire hazards common to skyscrapers should be diminished. While these separate packages generally cost more than a central system, sheet metal costs reverse the rule.

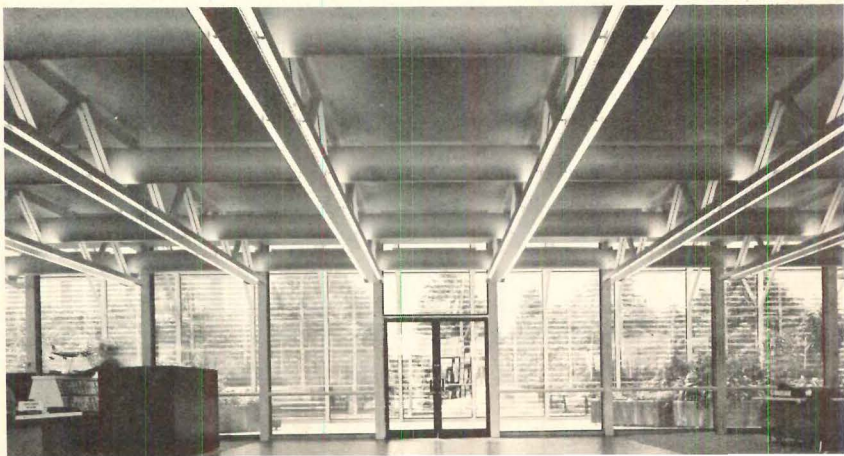
The real thing

Aside from the generalized notion of a "materials shortage"—the absence of the right materials for specific needs that led John Dinkeloo to engage in product development—the question of the real materials shortage remains. Higher prices, slower deliveries, and nonsupply do exist for what-



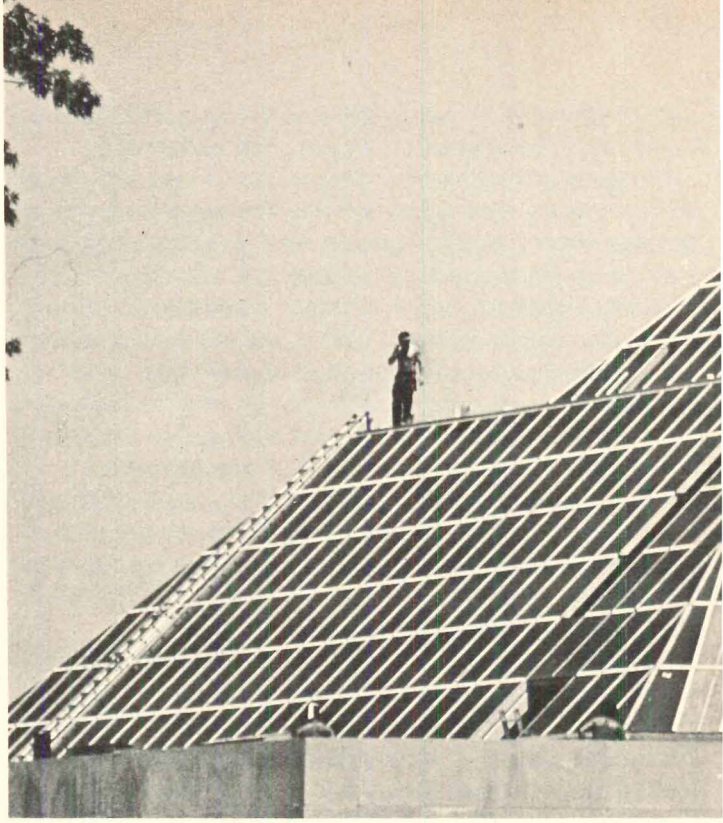


A skirt of opaque stipple glass cuts glare in the College Life offices (top); the Worcester County Bank (middle) combines three kinds of reflective glass on every floor. Glass sunshades will screen the curtain walls of the American Electric Company building (above). Architects cut costs in the Irwin Union bank addition with skillful use of fluorescent fixtures (below). Photos: © Yukio Futagawa, top, middle, below.



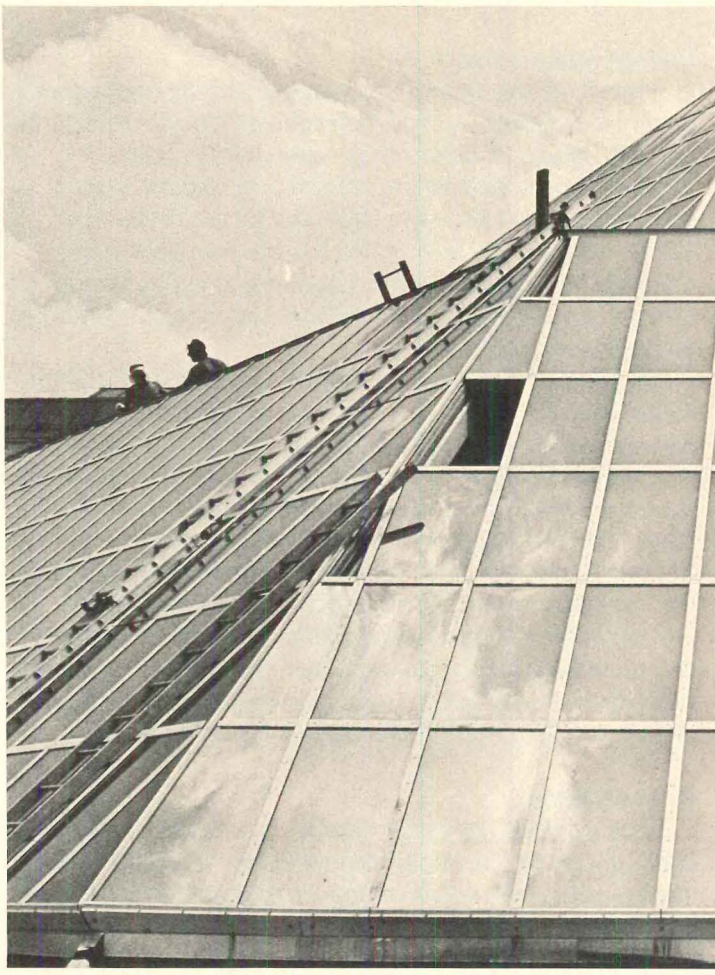
ever reason. Ironically the mirror glass that he helped launch is in such high demand (due to energy savings and its dramatic visual properties) that even he has trouble getting delivery. As for weathering steel, like the rest of the steel manufactured, shortages occur for small items. (One steel company admits to temporary limited supply, owing to the time-consuming process of manufacturing this kind of steel). If you want any kind of metal in bulk, Dinkeloo points out, there's no problem. However the real materials shortage, he postulates, will spur him on to look for new materials to apply to architectural construction. Whereas other architects may play it safe in specifying, Dinkeloo thinks the occasion warrants an opposite response.

Shortages, price escalations, and slow delivery require keen anticipatory responses. Dinkeloo, like other architects, must keep the firm's materials options open and analyze the implications for structural and design decisions. For example, faced with the specter of rising steel prices, he speculates that future work by the firm might depend more on concrete, as it did 10 to 15 years ago when concrete was cheaper. Going back to concrete has advantages in terms of a shortage; for example, if #13 steel reinforcing rods are not available, then at least the designer can run two smaller numbers together. Not so with a steel frame.



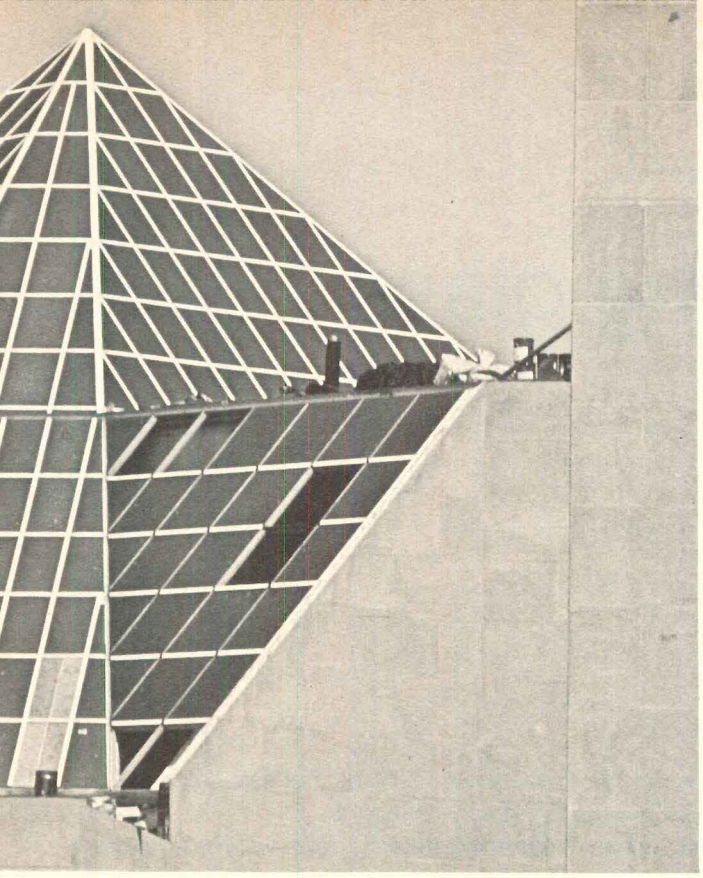
The inside word

Dinkeloo also stays up with the materials market to know when and where to buy. In keeping abreast, he doesn't rely on any systematic technique. Instead, intuition, information gleaned here and there from sources like *The Wall Street Journal,* or tips from friends in the construction business supply background. As a result, he has been able to prepurchase steel for the United Nations Development Corporation hotel/office project in New York at the unheard of price of $485 per ton—rock bottom compared with today's prices of $900 to $1000 per ton. (Of course the unexpected can catch you short: because the UNDC building is financed through the quasi-public corporation, the steel arrived before the money to build). Believing that steel prices are now peaking, Dinkeloo is waiting until the end of the year before letting bids for the 16,000-ton steel order required for a large New York office building. Contending that steel prices have climbed to an artificial high, he suggests that the slack in the construction industry now being felt by the architects around New York will begin to affect the materials market in early 1975. Since prices depend on the owner's willingness to pay, they will stay at those rarified heights as long as purchasing power remains. Once clients refuse, steel mills and erectors will have to back down. Furthermore, he postulates, labor costs should drop off with the slump in construction in the New York area. Contractors, faced with little work, might reduce profits.

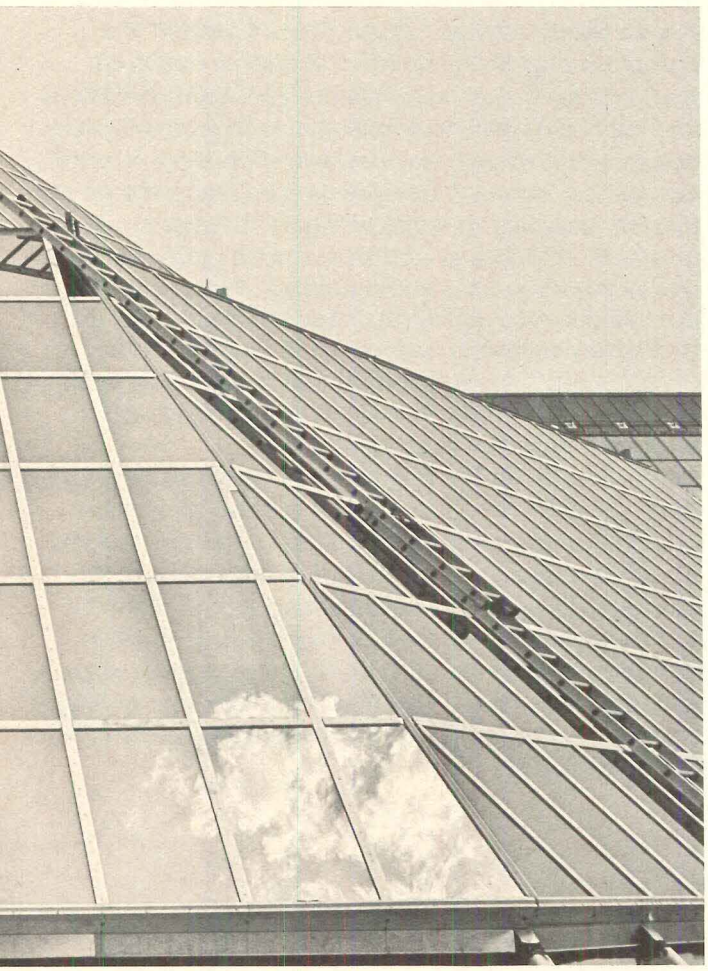


The manner and methods

In dealing with materials suppliers, it is not surprising that the architect must resort to those tactics developed to a fine art in the garment business: maneuvering, bargaining, cajoling, threatening. Dinkeloo admits to all of the above. His flexibility in materials choices doesn't mean that the



Even with current works now in construction, Roche-Dinkeloo has been using glass and steel extensively despite materials shortages (see text). Reflective double-glazed panels sheath the Lehman Pavilion of the Metropolitan Museum in New York (above and below). Metallized double-glazed green tinted panels, giving off a bluish cast, wrap around the steel frame of the office-hotel tower for the United Nations (right). Photos: Cheryl Rossum, above and below; Nathaniel Leiberman, right.



firm easily shifts materials once the building is underway.

Another device Dinkeloo resorts to is the simple old trade-off; cut corners where they don't show, and save the quality materials for visual impact. The axiom may be common knowledge, but Roche-Dinkeloo applies it more cleverly than do many architects. Take lighting, for example. Few architects handle standard fluorescent fixtures as seductively as they. In the Irwin Union Bank and Trust addition, they left the steel beams and trusses exposed and attached open fluorescent light fixtures to the bottom chord of the trusses so that light would diffuse both upward and downward. All components were painted white, producing an unexpectedly dramatic effect (photo p. 81).

Call it by any other name

Much of Dinkeloo's role in arriving at the most efficient and economical materials and structural members could be called "value engineering." But he considers labels like "value engineering" only fancy terms for a process any competent architect goes through. "The only difference between value engineering and what we normally do, is that our client doesn't necessarily know about it." His antipathy toward fancy titles extends to "construction management" as well. Reluctant to call it by that name, Dinkeloo nevertheless dons this hat frequently in keeping prices down and schedules met.

His kind of informal approach to assorted roles also typifies his relationship with Kevin Roche. Working closely, the two take on separate creative tasks but equally share ideas and opinions on all aspects of the architectural solution. Final design decisions, both agree, evolve in a non-explicit way, almost through "osmosis."

Despite the impromptu methods of product testing, construction management, value engineering, and other functions, the process obviously has worked for the firm. Sure, there are flaws, mistakes, or unforeseen occurrences here and there, but the level of managerial and technical proficiency (not to mention design) is uncommon. All of it is "architecture." [Suzanne Stephens]

Steel stands, girding glass


Joseph Fujikawa


Bruno Conterato


Dirk Lohan

How do acknowledged masters of detailing for steel and glass view the materials future? In an interview with the Mies office, those materials are still favored.

No student of architecture would have difficulty identifying the palette of materials favored by the Office of Mies van der Rohe. Steel, says partner Joseph Fujikawa, is always their choice, because of the flexibility it gives a building. For example, whole floor areas can be removed, if future demands require it, without loss of structural integrity. In areas where skilled tradesmen are limited, Fujikawa notes that it is easier to find erectors for steel—essentially factory-produced elements—than concrete mechanics. Steel makes possible the precision which has always been the trademark of the Mies office, he feels, because of in-the-shop cutting and fabrication procedures. Delivery time and price were not obstacles.

While not planning to change its priorities, the firm *has* had to adjust its thinking about some aspects of steel construction. Price and time have now changed. The price is up, especially on lighter sections; Fujikawa feels that steel companies are eager for the profit benefits of heavy sections. Similarly, however, larger concrete reinforcing bars produce more revenue for the same effort, so steel structures are not the only subjects of the pinch. "Number four rebars are impossible," Fujikawa reports.

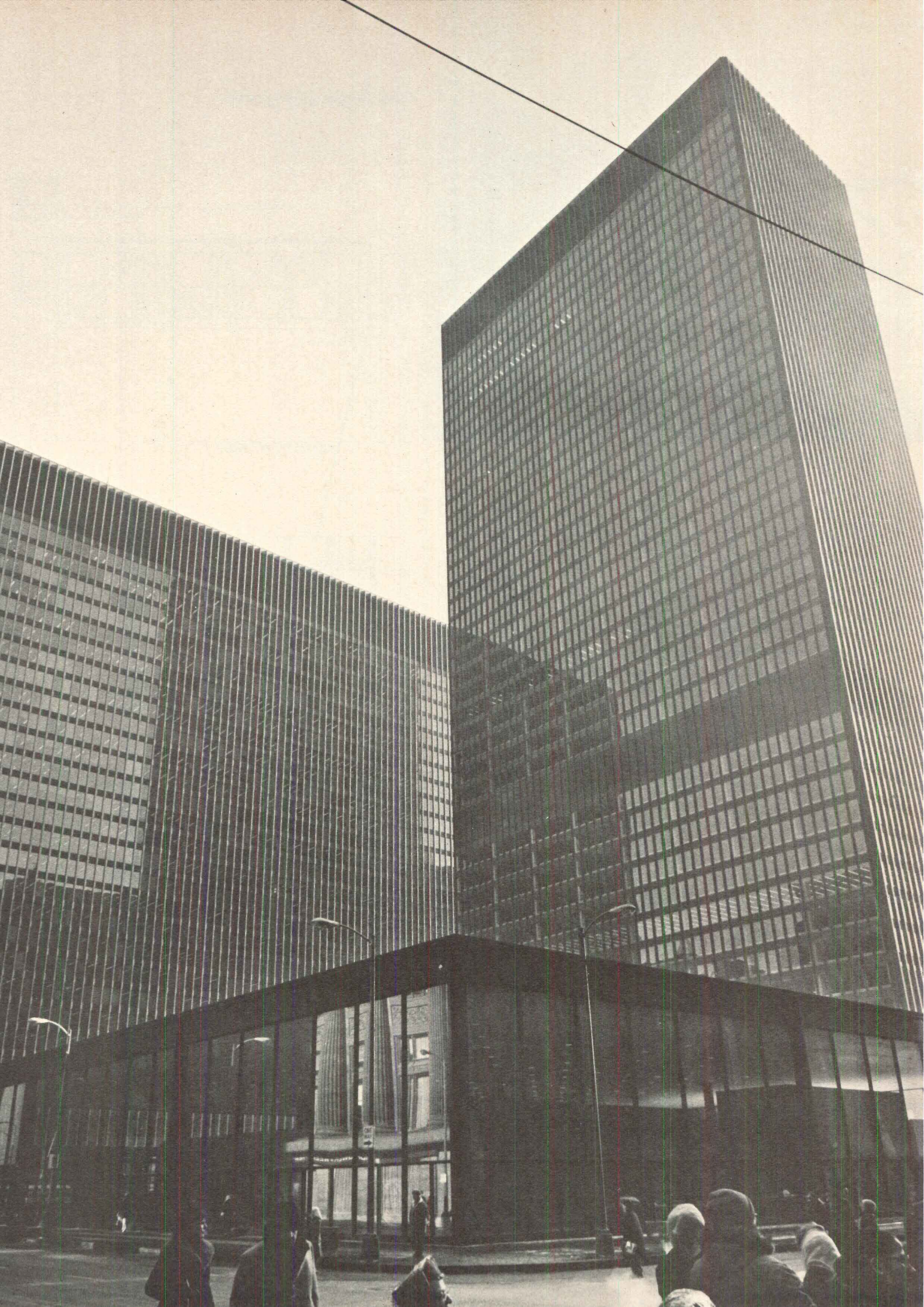
Steel delivery time is an even bigger problem, however. With standard delays reported to run delivery times up to 7–9 weeks, the Mies office has had to rethink the beginning, if not the main, phases of several projects. (Fujikawa estimates that it can take three-quarters of a year to get steel delivered and erected.) One job, a Burlington, Vt. multi-use project, required some last minute gymnastics to avoid the costly delay. Working with the contractor to expedite the job, the architects agreed to change the base to allow concrete construction up to the plaza level. Steel orders for the upper levels could be processed while the contractor proceeded with the job.

Fujikawa declined to project future prospects for steel construction, due to obvious uncertainties of a complex market. He did say that subsequent developments of higher strength or more corrosion-resistant steels, if they occur, would be observed carefully to see how best to apply them. Steel is not on its way out for the Mies office.

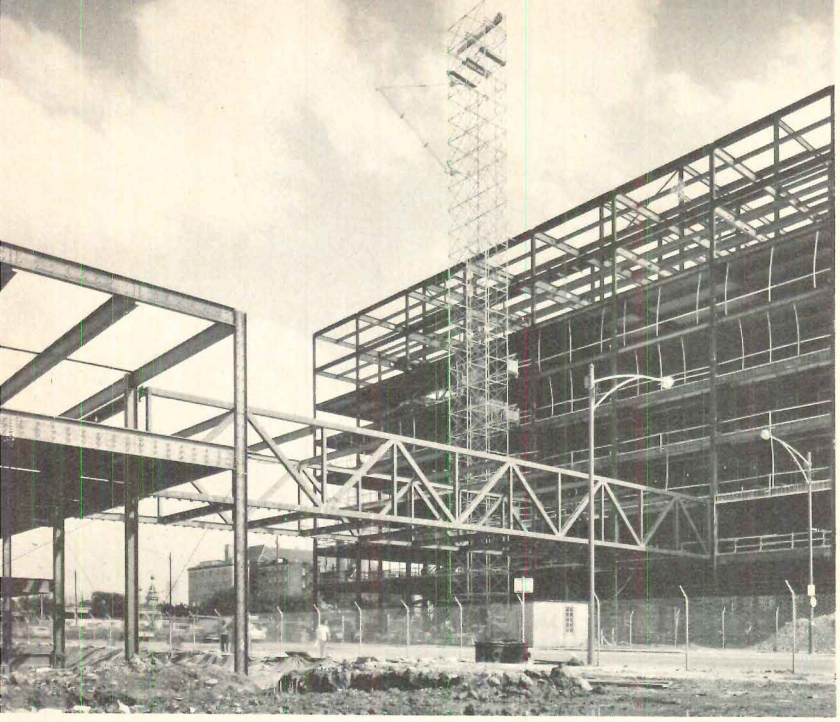
Neither is glass. The "new" emphasis on energy-use analysis is not new to the Mies office. Their preference, however, is still the dark glazing materials as opposed to the reflective ones. While recognizing that heat gain/loss through the exterior wall is *an* important consideration, Fujikawa points out that it affects only 25 percent of a building's energy consumption. It should be noted, he feels, that even though Mies' famous 860–880 Lake Shore Drive apartments gain heat faster than buildings with more mass, they also release the heat faster. Therefore, in order to assess their energy requirements adequately, the shorter period of necessary air conditioning has to enter the equation. Ideally, Fujikawa would like to see the glass manufacturers step up interest in photosensitive glazing materials—those that darken or lighten as the light intensity changes.

Availability of glass is no problem. According to Fujikawa, delivery times are good, and price escalation is not excessive. Again, however, it is the steel or aluminum *housing* the glass that causes problems.

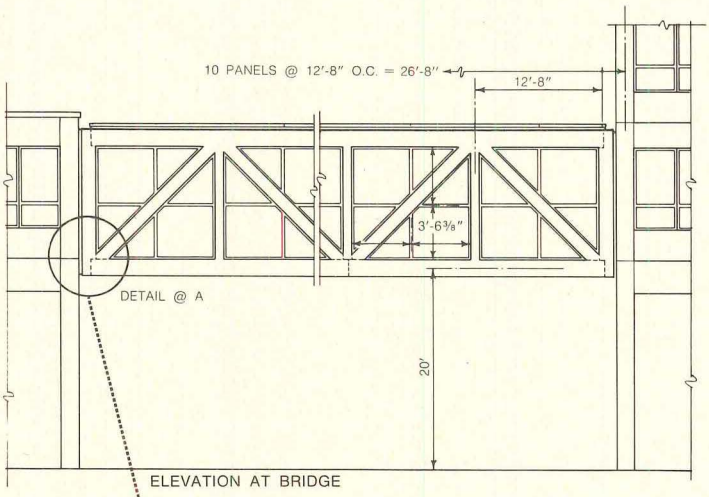
Given the precise detailing and care for which the Office of Mies van der Rohe is famous, it might seem inevitable that buildings designed there would be expensive. But it is not a prima donna firm. Fujikawa points out that a large portion of their work is for developers, a type of client that will not buy extravagance, either in goods or in services. "We'd love to dispel the myth that our fees, our buildings, or both, are expensive," Fujikawa says. "The real art is in knowing *where* to spend." That art is still serving the firm well. [Jim Murphy]

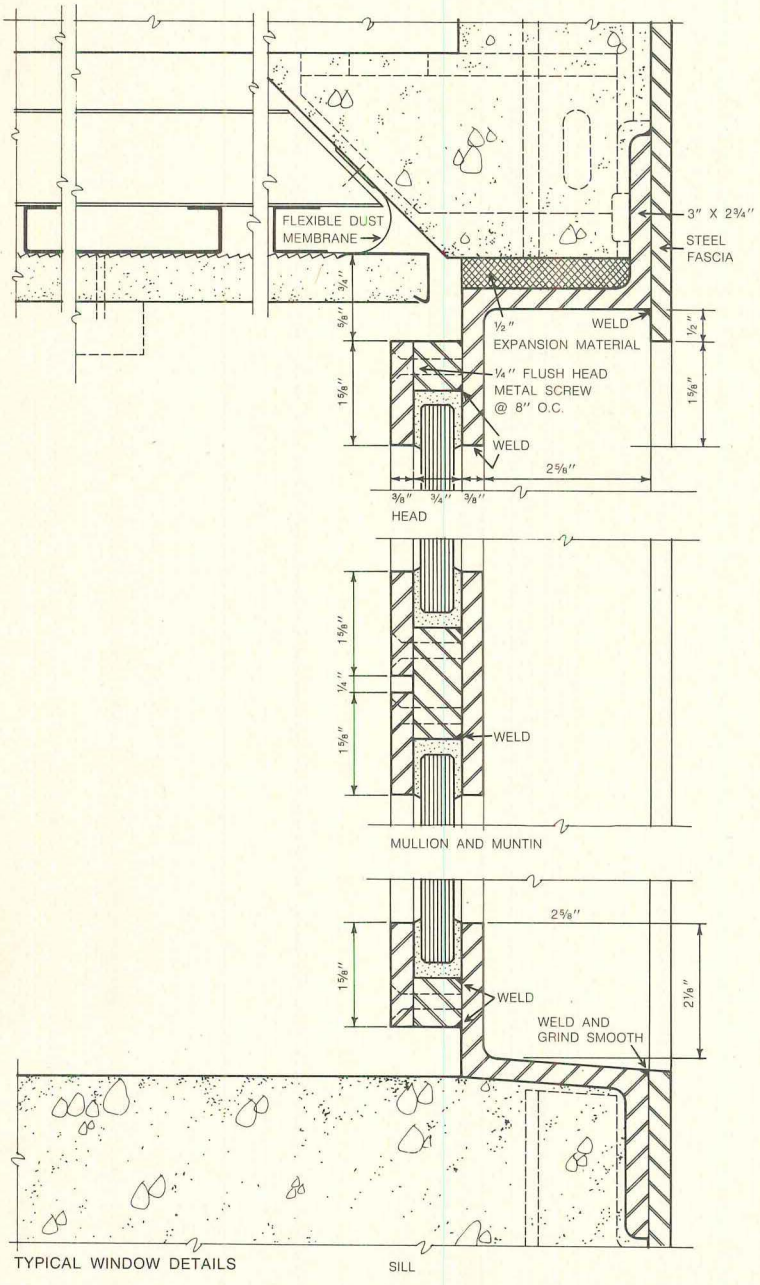


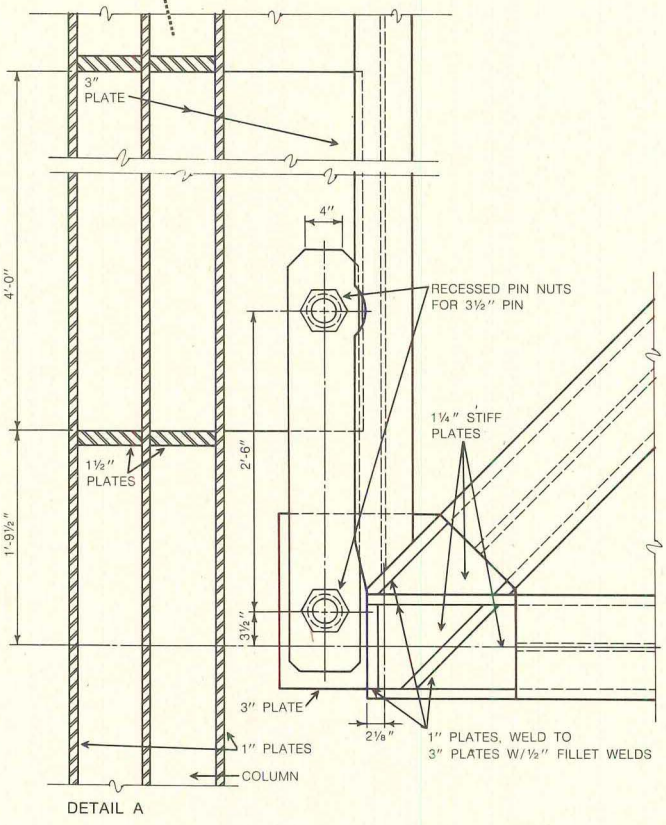
Steel stands, girding glass

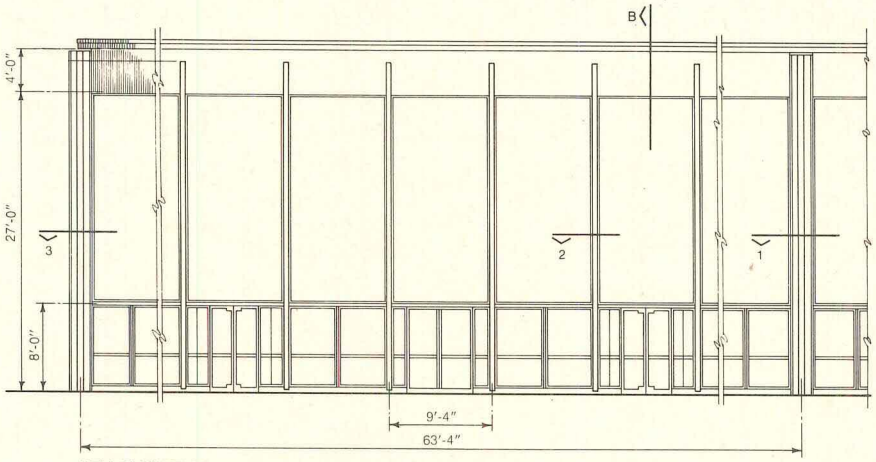


Roberto Clemente High School; photo, Hedrich-Blessing; structural engineer, Nelson, Ostrom, Baskin, Berman & Associates.

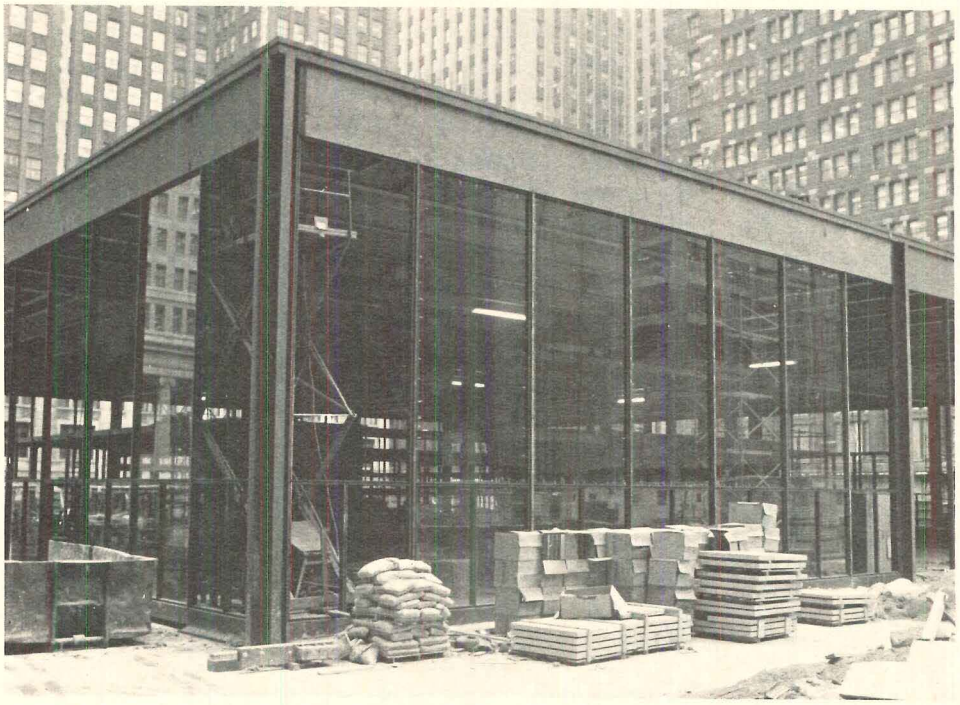




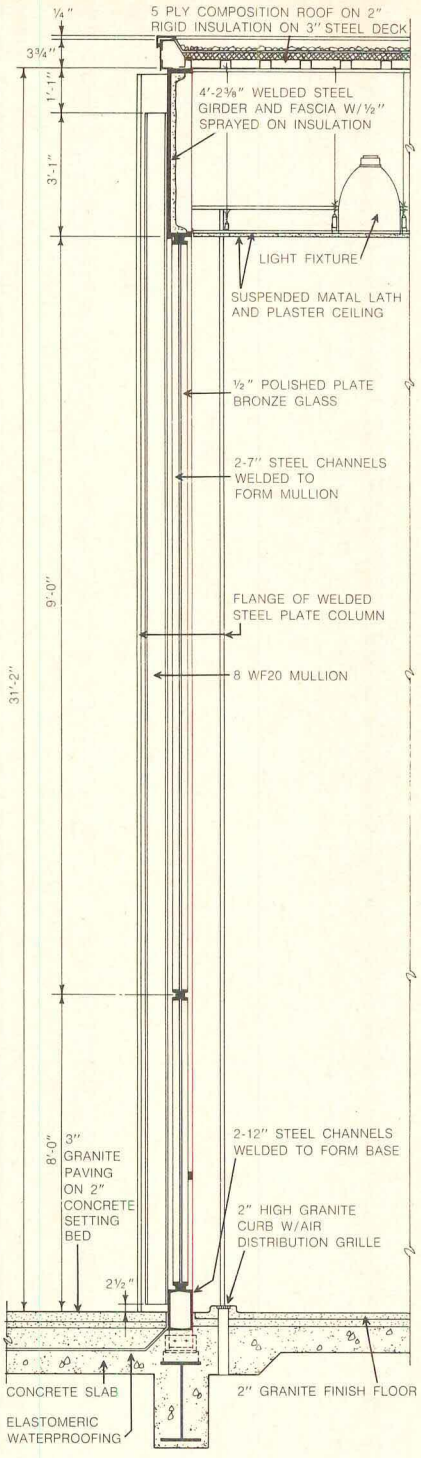




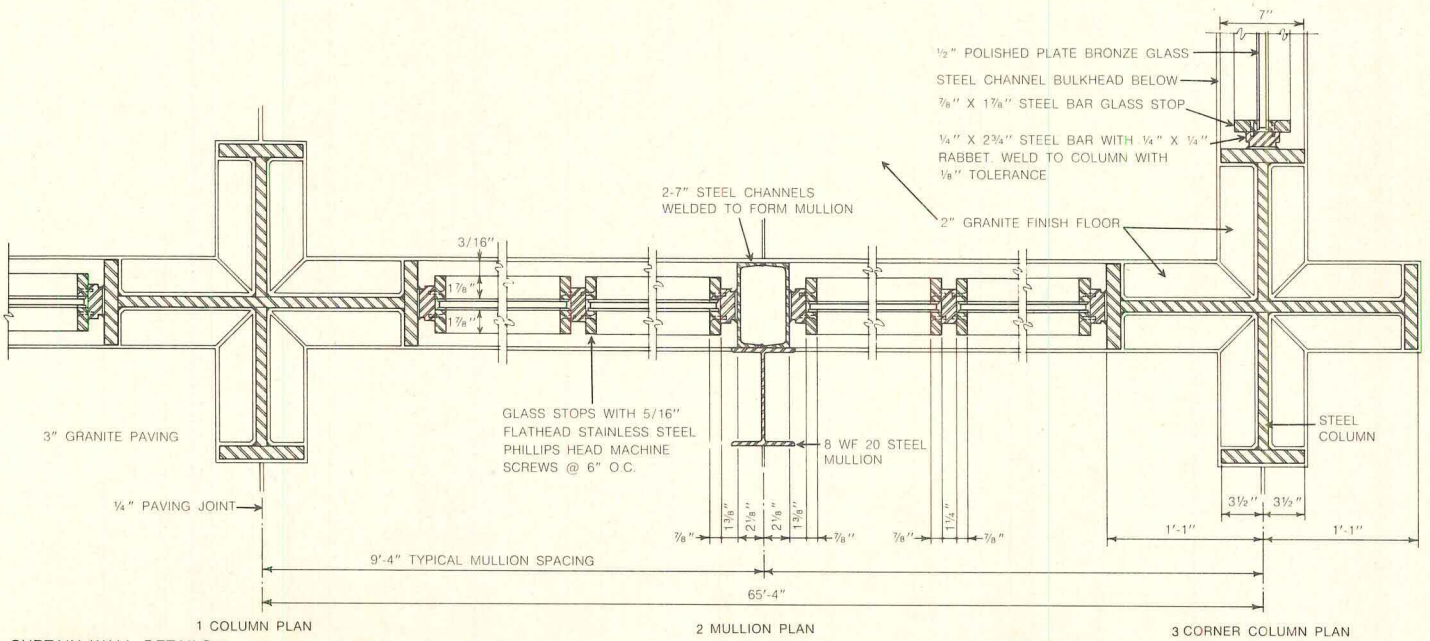
KEY ELEVATION



U.S. Post Office Loop Station, Chicago Federal Center



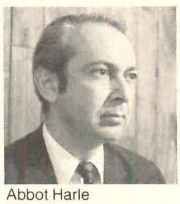
EXTERIOR WALL SECTION AT B



CURTAIN WALL DETAILS

Panache in panels


Cesar Pelli


Abbot Harle


Beda Zwicker

Smooth, finished surfaces suggesting sophisticated technology identify work by Gruen Associates. Yet they are still a blend of new and old techniques.

"If we could assemble a building entirely in a factory and by some means of osmosis transport it to the field, we would," says Abbot Harle, in charge of construction for Gruen Associates, New York. If this recalls the bold polemics of the young Le Corbusier in *Towards A New Architecture,* it should not surprise students of the firm. Buildings characterized by strong, simple massing enclosed by smooth, tight, highly machined skins, the so-called "high technology" aesthetic, have become synonymous with the work of Gruen designers. These include Cesar Pelli in Los Angeles and Beda Zwicker in New York.

Pelli conceives architectural form as an "expression of enclosure, of volume more than shape. My current interest is in building surfaces that respond to reflections. Le Corbusier's concept of architecture was of 'objects under the sun.' This is the traditional view, and it still prevails."

"A building is the product of industrialized processes," says Zwicker. "If it is a machine, it should look like a machine." Which brings the reasoning full circle. Human beings are not machines, and their labor—especially under field conditions—varies enormously in consistency. As architects know, construction labor skills are not being replenished at their rate of loss. "There were once three generations of stone masons on a job," Harle recalls. "You probably won't find them even in Italy today." He advocates building systems, by which he means factory made and coordinated building components. "We literally try to fabricate as much of the building in the factory as we can."

Furbishing "hi-tech" buildings for large commercial and corporate concerns is not unlike preparing haute cuisine with studied haste. Gruen designers think aloud of materials in the conceptual design stage, and selected contractors and suppliers are invited to listen. "There are two or three key materials that determine the character of building," Pelli says. Contractors have been "enormously helpful" in selecting materials, and Pelli works closely with them on what are frequently negotiated contracts. Together with his "pre-detailers," designers who solve many production problems prior to completion of design development, Pelli's contractors help "shed my illusions quickly."

Almost inevitably, the Gruen office has embraced fast-track, both for reduced project time and added control over materials and costs. Zwicker refers to phased construction with quiet amusement. "It makes me nervous. But the client knows that the sooner his shopping center is completed, the sooner his cash flow begins." Months later, the client may have forgotten about alterations needed to refine the design. "So, he complains anyway," Zwicker laughs.

To streamline the selection of materials, he will specify stock items, listing specific alternates. "We work with hard-nosed businessmen, and we must take this attitude," Zwicker says. "While it takes much more ingenuity to use standard components in a creative way, we reduce the risk inherent in new, untested things."

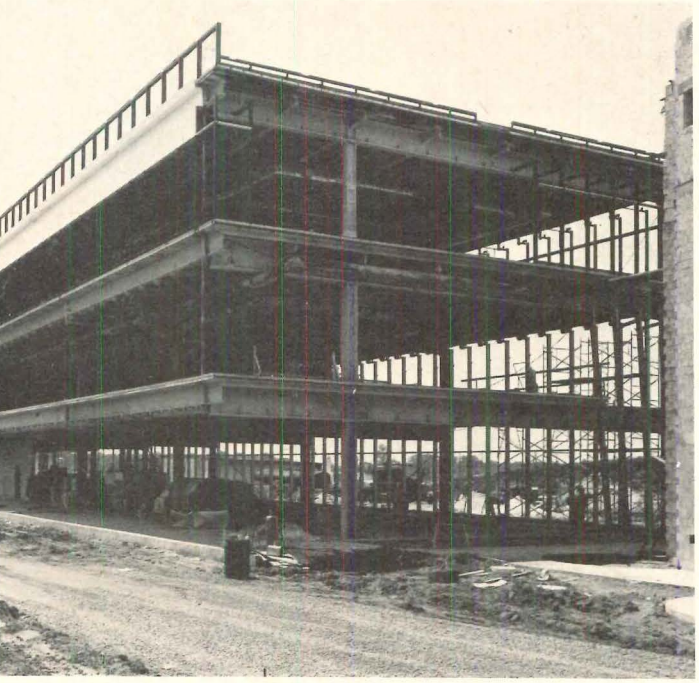
Harle agrees. "There can be a great deal of excess cost in translating a new design into actual fabrication." Savoir faire in detailing materials comes as much from a practical working knowledge of how construction labor is actually performed as from formal education. "Here is where the problem starts," Zwicker believes. "Europe requires architects to have a year's experience in construction before certification (the diploma). Not here, where there can be lengthy negotiations between design and production."

Some components are seldom off-the-shelf. "It costs little more to have the rollers set for a mullion extrusion, for most jobs," says Pelli. "Our mullions are not stock items."

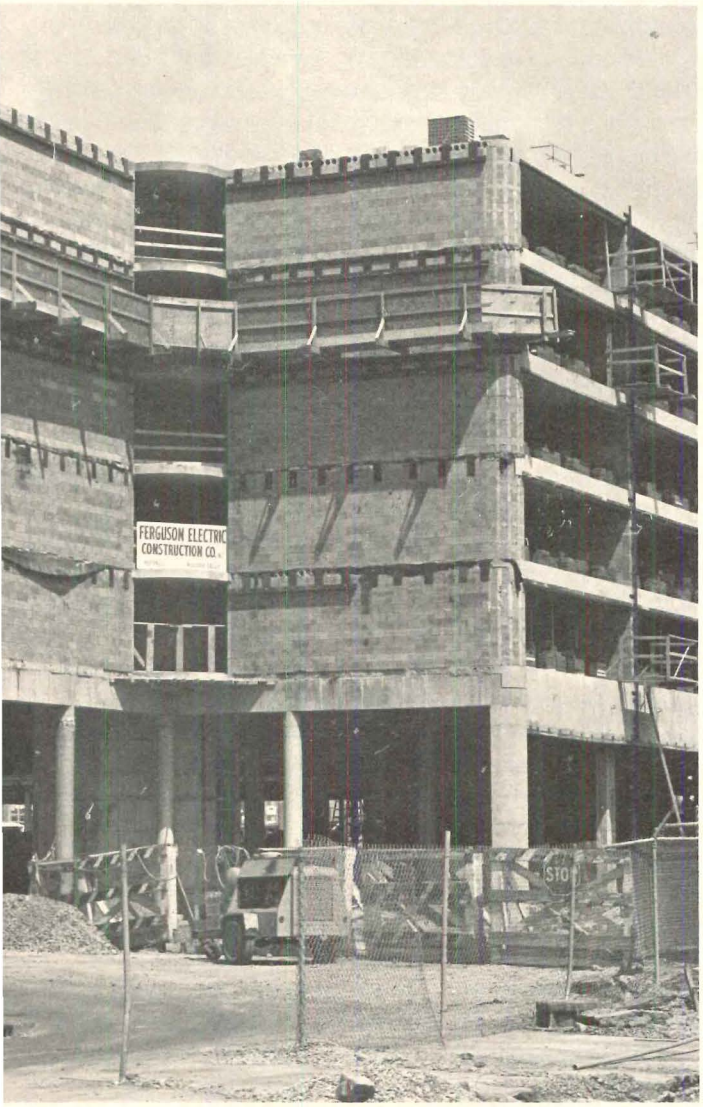
Gruen designers feel relatively free to specify any building skin once a proper structure is determined. Whereas structure is determined by building type and size, labor and materials available, and environmental conditions, its expression can be discretely phrased by a variety of surfacing materials. "Structure is purely a skeleton," Harle states.

"Some buildings have an integral structure and skin," says Pelli. "There is *always* a relationship, but it is sometimes tenuous. A Miesian steel structure requires a steel wall. But a true modular structure erected as a concrete framework will permit anything to happen."

He is currently fascinated by glass as a surface material. "Glass is our most highly finished material. It always looks new, and can be easily replaced when broken. It can be transparent or opaque." By comparison, Pelli observes that



Work in progress: hotel for Niagara Falls Rainbow Plaza is masonry bearing on concrete column and beam faced with conventional brick. Beda Zwicker, partner in charge; Thomas Loosbrock, project architect.



Zurich America Life Insurance uses high performance fluorocarbon coated aluminum fascia. In construction. Beda Zwicker, partner in charge; Jaros Burbello, project architect.

brick effloresces, stone crumbles, and treated metal dents and scratches. This reasoning, however does not deter the Gruen office from specifying these materials on occasion. But Pelli correctly contends that "we no longer have the financial resources to create buildings requiring a high level of maintenance. Today, architecture must care for itself."

An ideal surfacing material for exterior walls would be a completely industrialized, self-contained (structure, mechanicals, insulation, glazing, and skin) panel. If Pelli, Zwicker, and Harle have been eager to attain this high technical level, the building materials industry has been less anxious to formulate response.

Say it with panels

One promising prototype of the panel system that all Gruen forms seem to imply is the recently completed Western Electric office building in the Gateway Urban Renewal Project, Newark, N.J.

"We began with the structure," Harle describes. "The building was to reflect its use by engineers and technicians. Cesar suggested a wall system he had previously applied which looked highly technical but was not." This time the panel really originated on an assembly line. The architects and engineers, the client's technical staff, the curtain wall fabricators, and representatives of a manufacturer of aluminum construction products adapted an existing panel system, purely skin, into a self-contained unit with operable windows, urethane core within finished interior and exterior walls, internal tubular structure, and HVAC and power connections. The heat pump in every other panel provided sensitive peripheral HVAC control. Panels were lifted into place, bolted at the floor, and "zippered up" with an exterior neoprene lock seam.

New products and processes are welcomed by the Gruen office. Zwicker is placing brick panels bonded with high strength epoxy mortar in ten Eyck Place, Albany, N.Y. He is also specifying a high performance fluorocarbon coating on the metal panels of an office building for Zurich Ameria Insurance in Moorestown, N.J. Pelli is covering an office building in Oakland, Calif. with a fluorocarbon coated stamped steel sheet panel.

Such forays into technology's wonderland can be fraught with uncertainty, and Zwicker, Harle, and Pelli say they rely heavily on the construction industry as well as manufacturers for counsel. The case for a new application must be strong indeed. For the insurance company, there was a European preference for unpainted aluminum skins to be reconciled. Painted *aluminum?* A hot dog stand?

There is constant updating of materials data in the Gruen office. Prices for materials are "amazing" but since their clients trade heavily on time, there isn't the chance to await better prices. A careful study of European labor costs led to the fabrication of Swedish emerald pearl granite for the shopping complex, Queens Center, New York City, in Italy instead of costlier Sweden. As Harle says, "Our commercial developer clients seek maximum income from our buildings. We have always studied issues like energy."

By coaxing the materials industry to develop sophisticated industrialized products and processes, the firm advances its goals in a slow but determined march. A completely manufactured architecture may be possible someday. Meanwhile Zwicker advises users of new technology: pray. [Roger Yee]

Connoisseurs of cast-in-place

I.M. Pei with staff members
Photo: Dorothy Alexander

I.M. Pei & Partners, a firm that has set standards of quality for cast-in-place concrete, continues to refine its use of materials, pitting improved techniques against obstacles of supply and cost.

Most of I.M. Pei & Partners' far-flung landmarks owe their elegance of contour and surface to the firm's meticulous control over cast-in-place concrete. With concrete, the difference between crudeness and virtuosity depends on subtle adjustments in mix, in timing, and in construction and condition of forms. Back in the late 1950s, just after the Pei office emerged as an independent firm (rather than an arm of real estate developer William Zeckendorf), it began setting new standards for the control of cast-in-place exposed concrete that others could hope, at best, to equal.

At first, some others were skeptical. When I was examining the newly completed Earth Sciences building at MIT back in 1964, a prominent architect on a sight-seeing circuit came along, looked up at the 20-story all-concrete end wall of the tower and predicted that it would be spalling badly in a year. It hasn't spalled yet, and Pei's third cast-in-place building for MIT is now going up in its shadow.

The Pei firm is still extending its mastery over this least predictable of architectural materials. Yet associate partner Leonard Jacobson observes, with resignation, that the labor costs of cast-in-place are driving it toward extinction: "You're building a high-quality wood structure, using high-cost field labor, and tearing it down; then you have the added costs of protecting those concrete surfaces through all the later phases of construction."

Manifestly monolithic

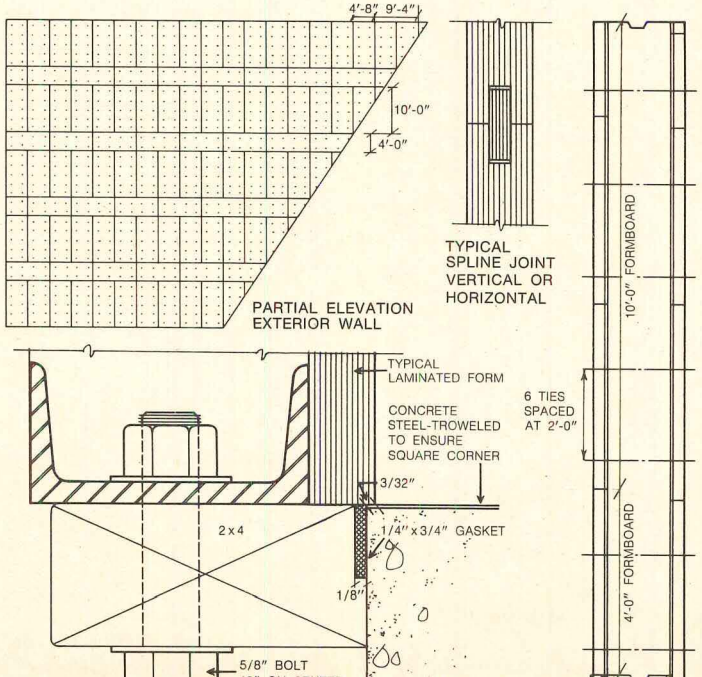
At the Dallas Municipal Center, now under construction, the Pei firm is solving some of the most demanding structural problems it has yet set for itself, and is doing it without some of the mainstays behind its earlier successes. Fine fir form boards, for instance, were unobtainable for a job of this scale; bush-hammering of the surface was too expensive even for the proud city of Dallas. Despite current handicaps, the architects are achieving concrete surfaces of unparalleled precision through the introduction of shrinkage-compensating cement, in its first large-scale use for architectural concrete in the U.S. And the whole project is economically feasible only because pumping of concrete has improved to the point where, for the first time, the firm can accept it for exposed elements.

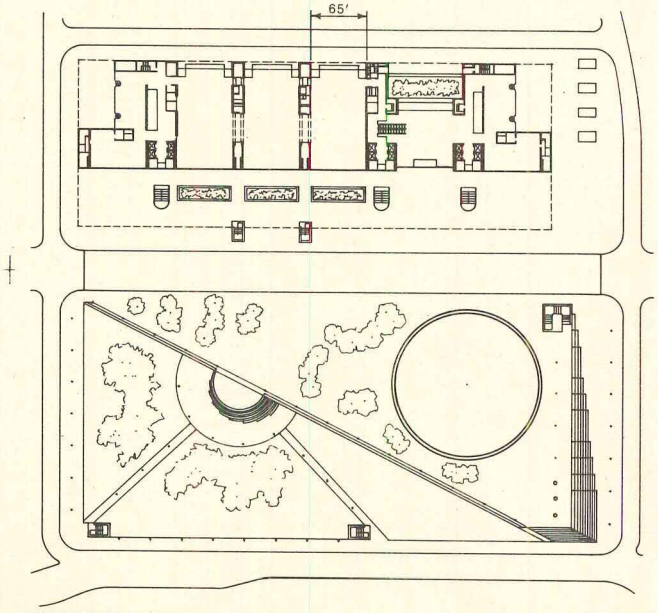
Designed for downtown Dallas, where widely spaced office towers dominate the scene, Pei's medium-rise government building relies for its impact on its audacious cantilevered form. The long front of the building will project 70 ft out over its 5-acre plaza, as if to draw the public into its shelter. It is a bold symbolic gesture, which depends on the convincing monolithic character of transverse walls, which extend as they rise to support the cantilevered upper floors. Structurally, these walls are given integrity by post-tensioning from footings to roof. Visually, it was critical that the walls' surfaces—most of which are exposed, either inside or outside—appear undivided.

Since any pattern of reveals would, it was thought, look like an assembly of panels rather than a monolithic wall, the architects ruled out reveals—leaving themselves no place to hide pour lines or shrinkage cracks. A smooth transition between pours was made possible by neoprene gaskets recessed into the formwork (details, opposite), which must all be aligned with great precision at the base of each pour to avoid leakage flaws. The form material is ¾ in., 14-ply laminate, imported from Finland, used regularly by the contractor for its durability, but never before specified by the architects for exposed surfaces.

In order to eliminate shrinkage cracking on these undivided wall surfaces, the architects and the structural engineers (Terry-Rosenlund & Co.) worked for two years with Texas Testing Laboratories and cement producers on specifications for a dependable shrinkage-compensating concrete. In use for many years, more widely in Europe, shrinkage-compensating cements induce a slight expansion in the concrete during the first few days of curing to eliminate cracking during the shrinking process that inevitably sets in later. But the behavior of most of these cements has been so erratic—affecting both the appearance and the strength of the concrete—that applications in this country have been limited mainly to airport runways and garage floors, where casting procedures are simple, and crack-free surfaces yield critical maintenance advantages. Of no small concern to the architects here was the dismal

End wall of Dallas Municipal Center shows smooth surface produced by using shrinkage-compensating concrete in laminated wood forms. Splined form joints and gaskets at base of each pour (drawings below) leave virtually unbroken planes. Slight offset at the base of each pour was arrived at empirically, to allow for inevitable distortion under surcharge of concrete. Pairs of transverse walls, with 65-ft clear spans between them, will support projecting front of structure (model photo and plan, right). Architects: I.M. Pei & Partners (team: I.M. Pei, Eason H. Leonard, Theodore J. Musho, Theodore A. Amberg, George Woo, Harry Barone) and Harper & Kemp. Structural engineers: Terry-Rosenlund & Co. General contractor: Robert E. McKee, Inc. Photo above: Mel Armand Associates.





MAIN FLOOR PLAN

color range of available shrinkage-compensating cements. Working with Texas Industries Inc., a cement producer, the architects were able to obtain a satisfactory buff-colored cement, which then went to the testing labs, where concrete specifications were hammered out. A delay of a year, between an over-budget round of bidding and a successful rebidding under more favorable conditions, allowed for further refinement of specified procedures.

An added advantage of the shrinkage-compensating cement is that it allows the contractor to proceed with larger individual pours for exposed elements than the Pei offices had permitted before—up to 70 ft long by 14 ft high. Contributing further to the speed and economy of placing concrete is the pumping, permissible only because the contractor is equipped to do it without altering the proportion of ingredients in the mix or introducing foreign matter (such as metal particles scraped from the inside of pipes). The contractor may choose—under the watchful eyes of representatives for the architects and the testing lab—either pumping or buckets for any pour. According to Theodore Amberg, Pei senior associate on-site in Dallas, it is impossible, after the forms are stripped, to tell the difference.

Matching marbles

The addition to the National Gallery in Washington called for exceptionally refined details, even by Pei standards. The firm was challenged to match the meticulous quality of John Russell Pope's Neoclassical Revival landmark of 1938. Pei associate partner Leonard Jacobson, who has made a careful survey of the original building, calls its detailing "unbelievable." Its cladding of rose-colored marble (10 to 12 inches thick, with deeper bond stones penetrating brick bearing walls behind) is set with ⅛ in. mortar joints; in the 700-ft length of the building it is possible to spot only two artfully concealed expansion joints.

In this prominently sited addition, the Pei firm was determined to maintain identity with the original structure, avoiding visible concessions to changing times. It was possible to obtain the same marble, by reopening the Tennessee quarries. But it took more ingenuity to duplicate the thin joints between slabs and to avoid obvious expansion joints on unbroken planes as long as 380 ft.

The Pei solution depends on materials not available to John Russell Pope. Slabs of 3-in.-thick marble, typically 2′ x 5′ in size, are fixed individually to the brick back-up walls; ⅛-in. neoprene gaskets between slabs (see details) form a weathertight barrier and allow each slab to expand independently. Where marble surfaces pass through to the interior, the slabs are reduced to 1¼-in. thickness.

The widely admired gradation in color of marble on the original Gallery, from darkest at the ground to lightest at the cornice, is being repeated on the addition. As Jacobson points out, calculated gradation is the only way to avoid a patchwork effect, using stone with inevitable color variation. The process requires painstaking mapping of the quarries and predetermining the source of each slab; architect Malcolm Rice, who coordinated this effort for Pope back in the 1930s, working with Thomas Schmitt and Owren Aftreth, is handling it again as a consultant for the addition.

Beneath its marble mantle, the new wing is pure present-day Pei. Essential to its overall effect are the concrete lintels that carry the marble across vast openings and the concrete slabs that span portions of the central court; extensive areas of glass enclose the central court at the perimeter and at the roof.

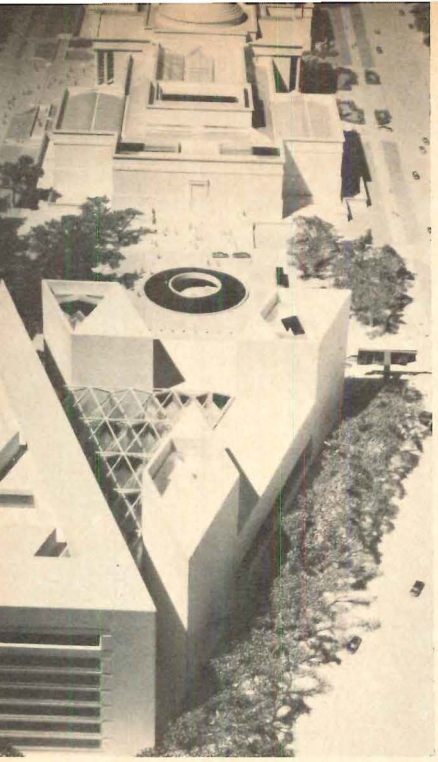
The use of glass here is not innovative in principal, but the design does call for high performance in terms of insulation, strength, and size of individual panes—up to 14 ft long and 105 sq ft in area to avoid "forests of mullions." The panes specified are nominally clear, 1⅝-in. thick, with a ½-in. internal air space; although this type of glass is a standard type in the U.S., only European producers would supply it, fully guaranteed, in the sizes required.

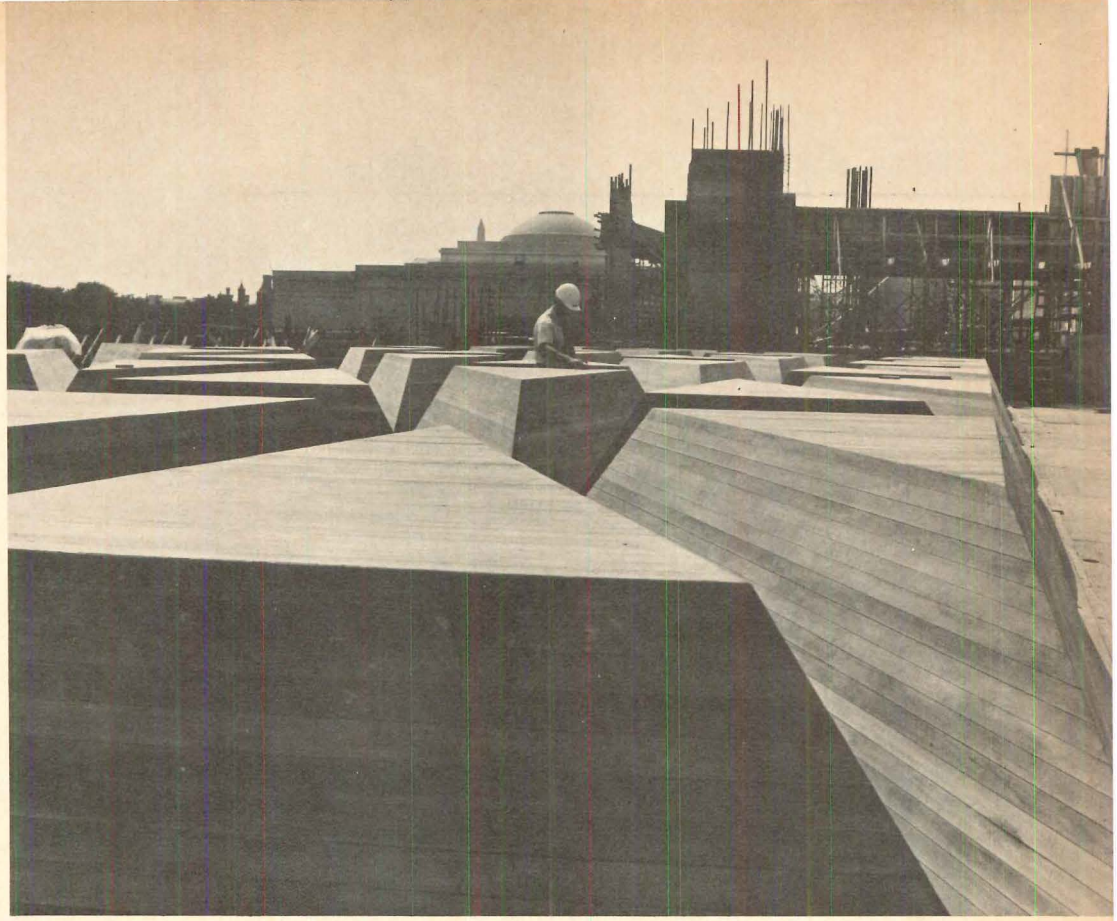
The concrete portions of the building, similarly, are basically conventional, but highly exacting requirements called for materials that were hard to obtain. To begin with, the top quality, clear-grained fir that the Pei office had customarily specified for fine formwork was assembled only through a nationwide search; once obtained, it was fashioned by local cabinetmakers into forms carefully joined and reinforced to ensure not only precise surfaces, but adequate re-use of the precious wood. Structurally, some of the floor slabs are required to span as far as 130 ft—never deviating from a uniform depth of 4 ft (two courses of marble slabs). In order to place enough steel at some points, with adequate clearance for concrete, the engineers (Weiskopf & Pickworth) had to call for #18 reinforcing bars (over 2 in. thick), which were difficult to obtain. To assure continuity, some of this reinforcing had to be welded into lengths of up to 90 ft on the ground (welding such large elements in place might have charred the formwork) then hoisted in place by crane.

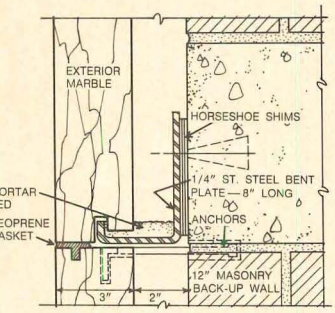
Because the concrete is seen adjoining the marble—in the same plane as the lintels—its color had to be carefully adjusted. The mix adopted uses white cement, a pinkish coarse aggregate, with marble dust from the quarries added in precise proportions to a white fine aggregate.

A unique commission, even for the Pei office, the National Gallery addition shows to what lengths these architects can press technical and material resources—given client support—to meet a predetermined design solution. Although all this virtuoso manipulation of concrete, marble, and glass is obviously costly, it does not, as Jacobson points out, represent a disproportionate part of the budget for this building. It occurs only in the visible half of a building with extensive underground areas, a building provided throughout with the finest mechanical systems, lighting, and interior finishes.

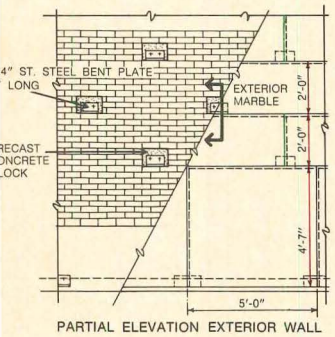
One has to marvel, nevertheless, at the determination behind those floor slabs that will hover above the central court, their uniform thickness revealing nothing about the radical variations of stress from point to point or the intricate meshing of reinforcement inside them. They will testify mutely—by what they do not express—to the technical skill of everyone involved. [John Morris Dixon]



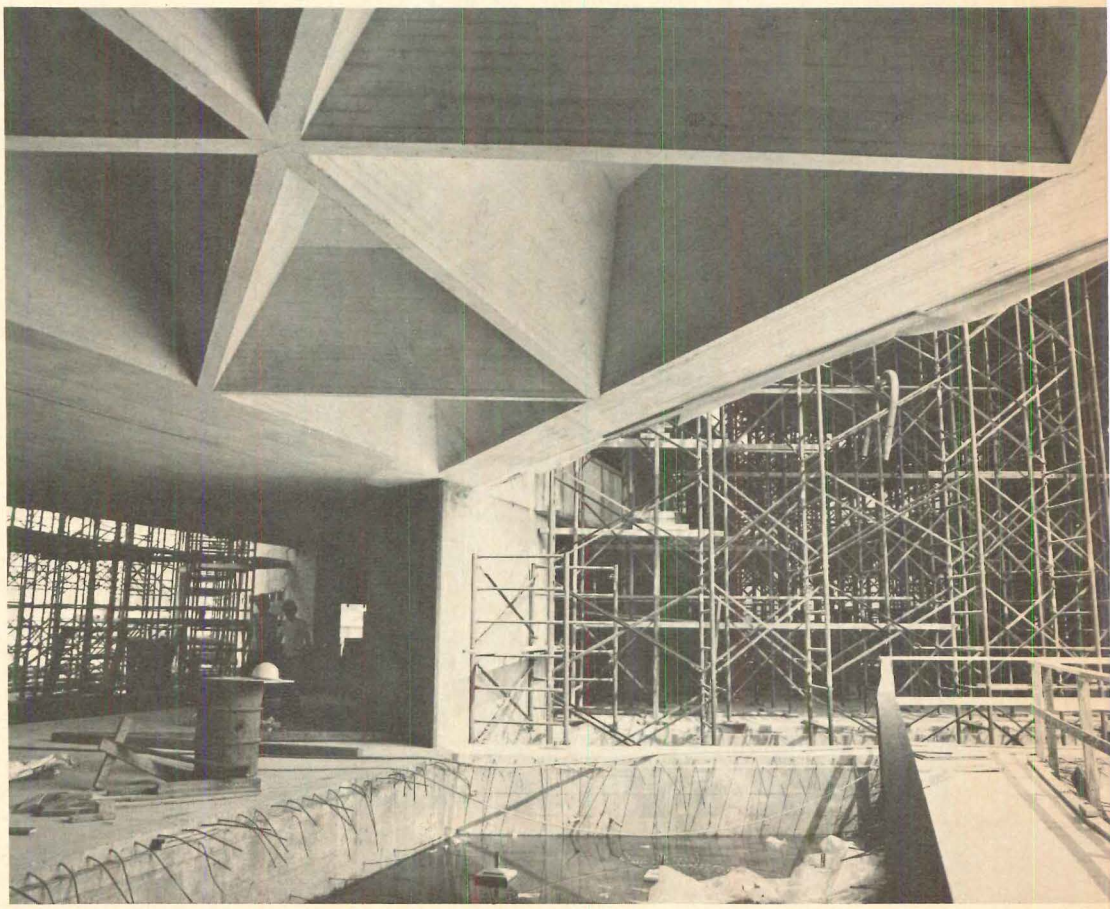


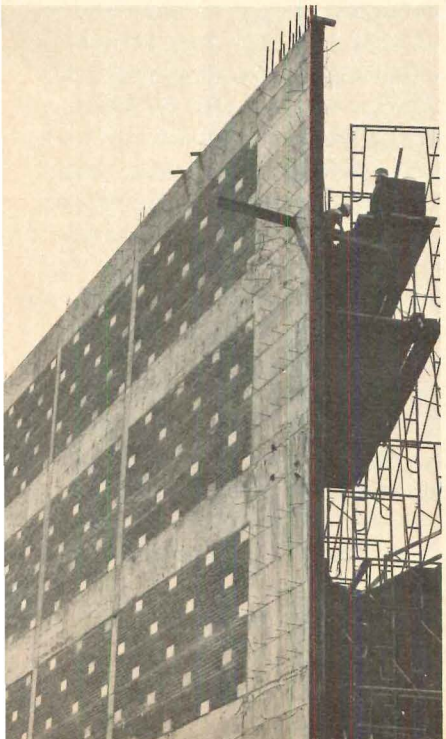


TYPICAL HORIZONTAL JOINT



PARTIAL ELEVATION EXTERIOR WALL



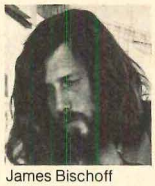


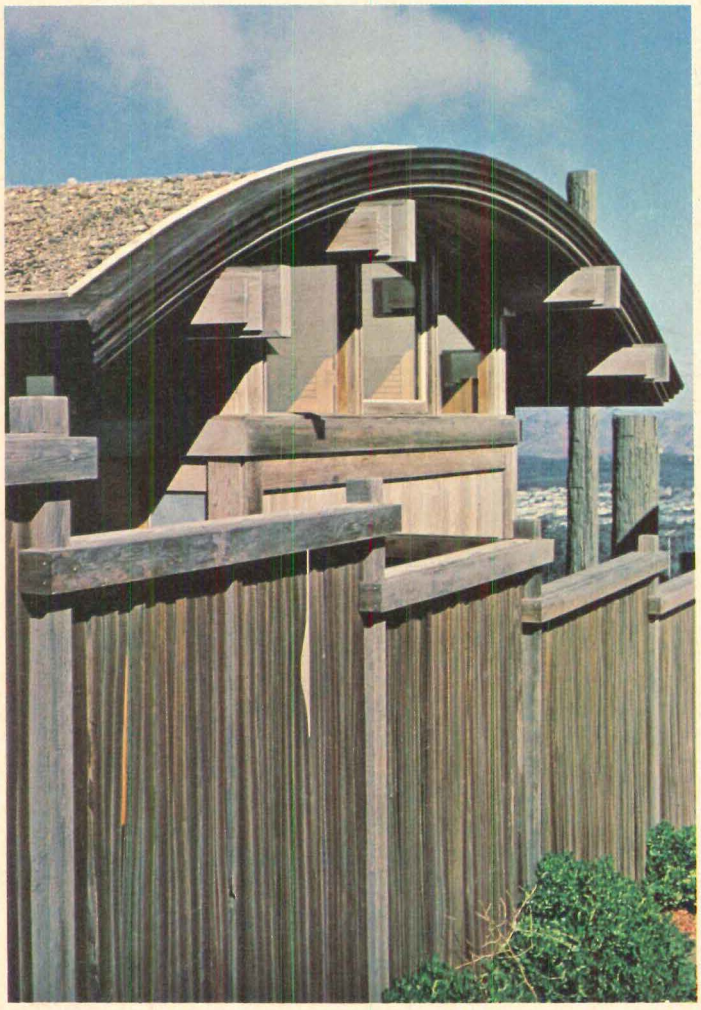
The East Building of the National Gallery of Art in Washington is rising at a prominent intersection along Pennsylvania Avenue at the Mall (model photo above). Precision carpentry of pyramidal forms produces elegant coffered slabs for public areas (photos right). Slabs of marble cladding matched to that of original building will be individually attached (details left) to precast blocks in masonry wall (bottom photo). Architects: I.M. Pei & Partners (team: I.M. Pei, Leonard Jacobson, Thomas Schmitt, William Jakabek, Yann Weymouth, William Pederson, Steve Wood, Owren Aftreth, Michael Flynn, Fritz Sulzer, Robert Bates). Structural engineers: Weiskopf & Pickworth. General contractor: Chas. H. Tompkins Co. Construction photos: Robert Lautman.

Wild about wood


CW. Callister


John Payne


James Bischoff


In Duncan House finely detailed wood structure is lean and flexed like a drawn bow. One of 150 private residences designed by CP&B.

Callister, Payne & Bischoff, a firm noted for its handsome private residences, now serves real estate developers, designing as before, in wood.

A spaceship lands. Archeologists from a distant galaxy discover themselves in an American city full of architectural curiosities. Lapsing into the universal fallacy of social evolution, they induce a history of American architecture which begins with the austere glass office tower and ends with the richly articulated brownstone.

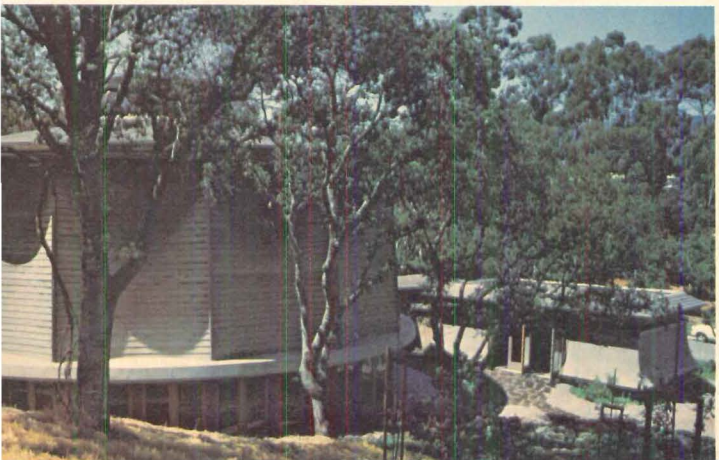
Satirist Jules Feiffer reminds us that technological advancement is independent of aesthetic growth. Transforming handcrafted art into mechanized industry is a delicate operation, as the firm of Calister, Payne & Bischoff of Tiburon, Calif. and Amherst, Mass. is well aware. In 1946, Charles Warren Callister established a practice designing private residences in the San Francisco area. His houses won professional acclaim for exquisite form and detail. While not intended for mass markets, their picturesque regional motifs from the Bay, New England, and Japan, and their intuitive understanding of wood reached the pages of *Life, House Beautiful,* and *House & Home.*

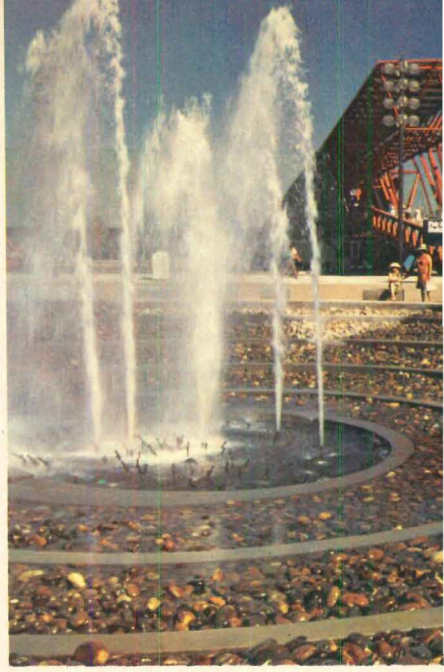
The practice was extended in 1955 to include schools, churches, university projects, and large-scale community planning and housing. Commissions like the retirement community Rossmoor Leisure World (1962–64 Walnut Creek, Calif.), caused fundamental changes in the firm's modus operandi. For unlike many earlier projects, Rossmoor was designed for a wide audience whose lifestyles and personal preferences could never be known in advance. Nor did they have the money to lavish as before.

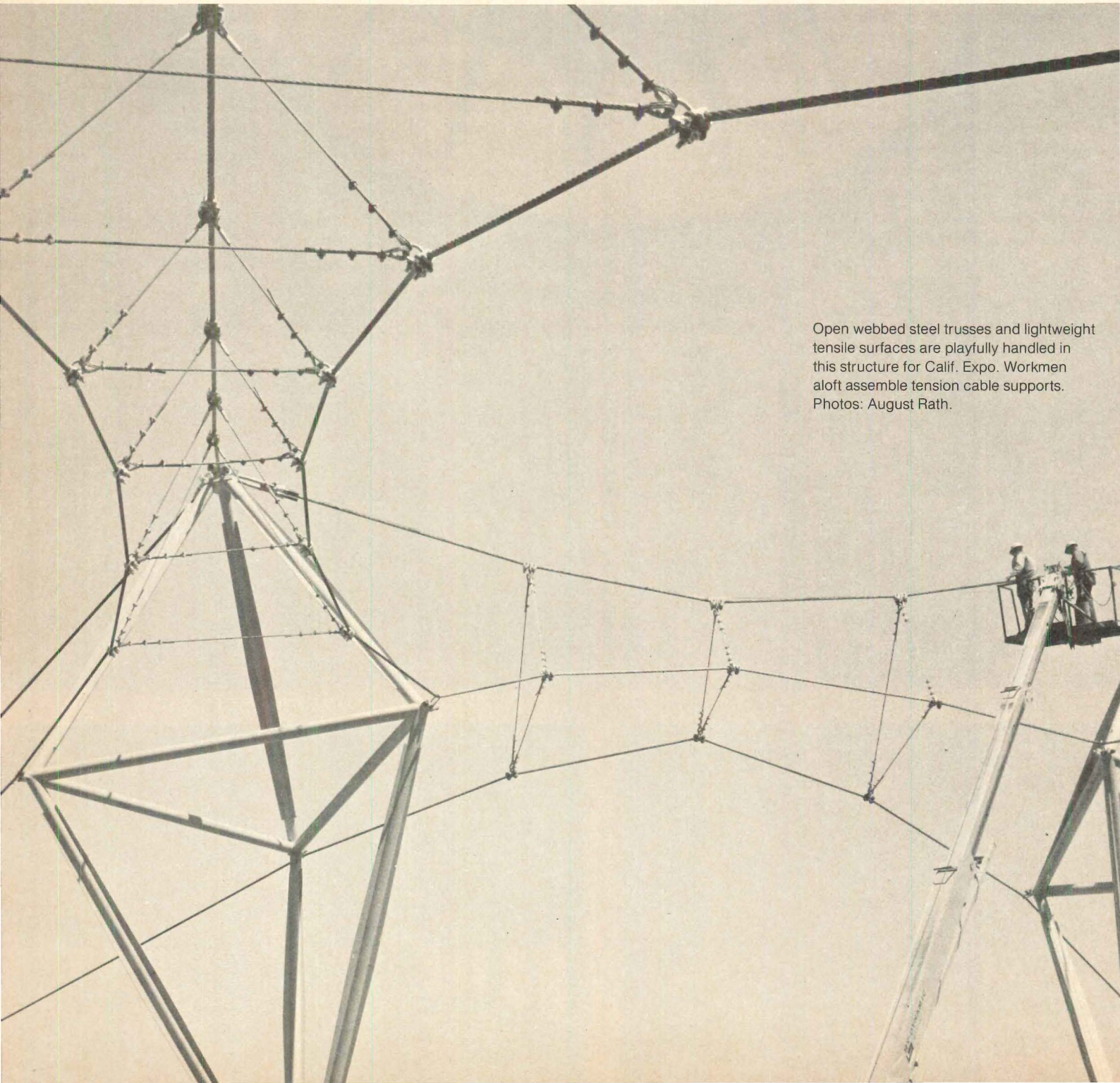
Whatever else was buffeted during the transition, a reverence for wood endured. CP&B specifications have ventured into concrete, stone, and steel with handsome results, but the firm has returned again and again to wood to create its communities, and many commercial projects.

"Wood has a history," says Warren Callister. "It reflects its construction and use. Just as marble looks fine or even better when scratched, wood ages gracefully." Its renewable surface tolerates most cosmetic and surgical alterations by man. "You can carve it, work it up, and give it form which you can alter later," explains John Payne. "It offers

Mills College Chapel is composite design, concrete in compression, wood in tension.







Open webbed steel trusses and lightweight tensile surfaces are playfully handled in this structure for Calif. Expo. Workmen aloft assemble tension cable supports. Photos: August Rath.

Wild about wood

Talcott Village, 1968 Farmington, Conn. typifies CP&B's conception of community planning: clustered and differentiated housing at an intimate community scale. Landscaping fully exploits existing terrain. Photo: C.W. Callister Jr.

a rich variety of colors and textures."

Likewise compelling are wood's structural properties. Callister refers to its "fudge factor," the ease of designing with a material which performs well within a wide margin of error. For developer builder clients working with skilled and unskilled labor, this allowance is vital to financial control. "Wood engineering is relatively simple," Payne notes. "Even an architect can design wood columns and beams!" "Drilling a hole through a wood beam isn't the trauma that penetrating steel is," adds Callister.

Wood's vulnerability to fire, pests, and water are well known. CP&B does not consider them serious handicaps, given pressurized chemical impregnation techniques now available for wood. In Callister's words, "Any building can burn. But heavy timber construction has good thermal properties which protect it during combustion. Plastics can be more dangerous." The lifespan of wood is not discouraging either. "Time is just not essential in wood design," he insists. "How long should a building live? There are standing wood structures centures old which have been replaced entirely over time. And why not? Wood forests replenish themselves. There is an abundant supply available."

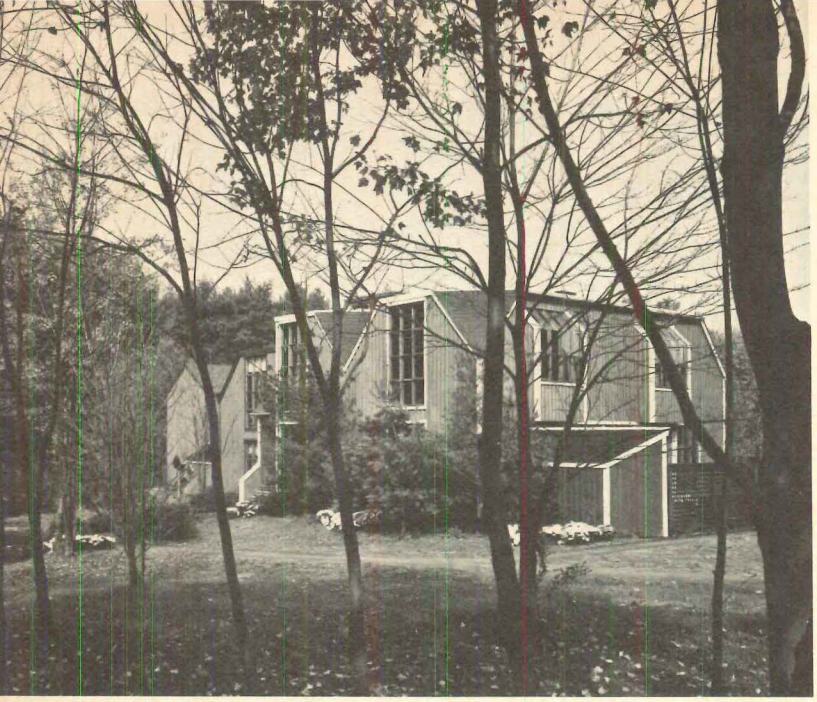
To the woods, to the woods

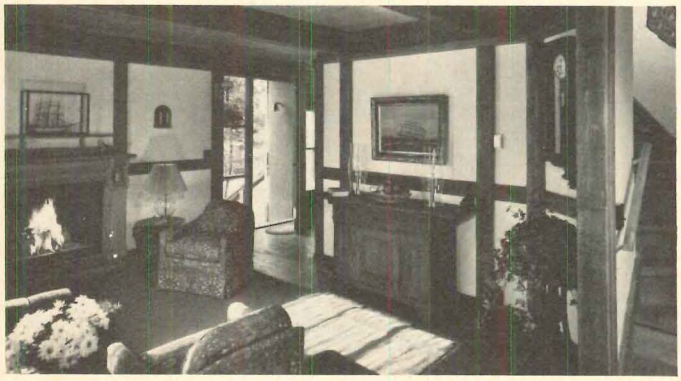
A wood-framed house invariably suggests wooden floors, partitions, and skin. CP&B has always conceived of its structures as organisms whose flesh and bone are tightly intertwined. Rather than conceal or overshadow structural members, the firm believes in assigning them major aesthetic work. This attitude places it firmly in the Northwest regional constellation, which is not displeasing.

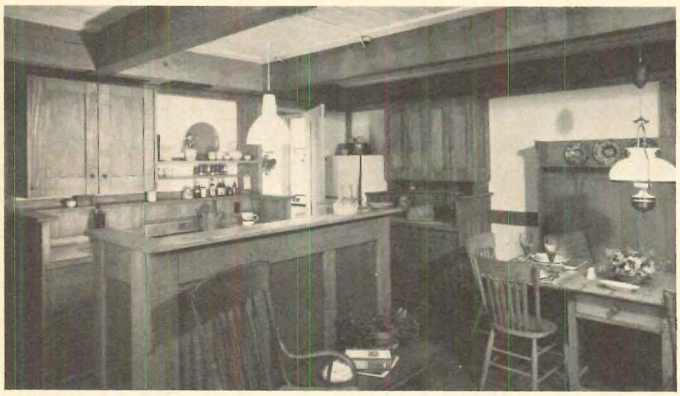
"You could say we are more involved in the technology of planning than of construction," Callister remarks. That is, the firm's portfolio displays no structural surprises. What CP&B does say about structure can be refreshing and literate. The Duncan House (1962, San Francisco), generates a very civilized tension in its skeleton of post and beam, which a gentle arched roof relieves. At Mills College Chapel (1967, Oakland), a dark and ponderous ground floor structure draws worshippers through a solemn vestibule to a circular nave and compression ring, above which springs a taut, intricate, and expansive wood vaulting. The weightlessness and dynamism of open-web trussing is exploited profitably in a Field House (1964–65, Univ. of Calif. at Santa Cruz), the Fair Activities Complex for the Calif. Exposition (1966–68, Sacramento), and the First Unitarian Church (1968, San Francisco, with J. Martin Rosse).

The refinement of form so intrinsic to these projects could not be fulfilled on a mass market level. Concessions were made; a sensibility survived. The continuing relationship with real estate developers has produced such well-received projects as the retirement community, Heritage Village (1965 to date, Southbury, Conn.) and its commercial facility, Village Green, both for the Paparazzo organization.

What is now apparent is a drive for simplification in structure and overall fabrication. There are fewer but stronger elements present. Yet the growing contribution of factory made, prefab, and modular parts is skillfully understated.







Severe exterior of largely prefabricated Amherst Fields housing conceals wealth of interior configurations. Post and beam framing is strong context for interior design. Photos: Ezra Stoller © ESTO.

Wild about wood

Amherst Fields (1970 to date, Amherst, Mass.) shows how far and yet how near the firm's designs are with regard to works like Duncan House. Amherst Fields is a 2000-unit condominium development and commercial/recreational center on 640 acres. A typical living unit is nestled among trees, shrubs, and grass—a traditional CP&B setting. It is decidedly thick skinned. Unlike Duncan's smooth finishes, Amherst is constructed of wood resawn rough to be an appropriate vocabulary for a sound but unceremonious assemblage. Its skin is a factory made sandwich: a 2-ft-wide plywood panel, a 2-in. foamed polystyrene insulation core, and an all-weather gypsum board panel. Decorative battens are nailed to the plywood for exterior trim; the gypsum board serves as the interior finished surface. Panels are nailed to a pre-cut heavy post-and-beam frame with wainscot-height cross members, and vertical panel seams are closed with additional battens. The flat roof is a 2-ft-wide sandwich of two plywood panels, a 2½ in. foamed polystyrene core, and a gypsum board panel, all topped with conventional felt, tar, and gravel. The floor is a simple plywood panel on 3 x 6 in. decking with a finished floor of wide plank. Where it occurs, a bay window is formed from prefab fins framing a stock window, attached to the house with lug bolts as an integral unit.

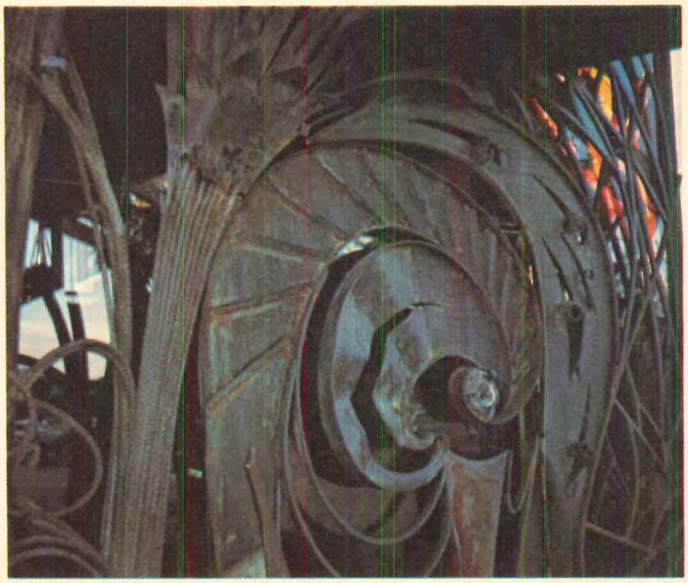
Look closer and you find the familiar affection for materials. The post-and-beam framework gives scale to each room. There are reveals at the ceiling. Flashing is discretely finished. While the custom millwork is summarily detailed, it is harmonious with the structural spacings. Skylights, clerestories, and level changes provide constant surprise. Where possible, the characteristic lighting fixtures designed by CP&B are installed.

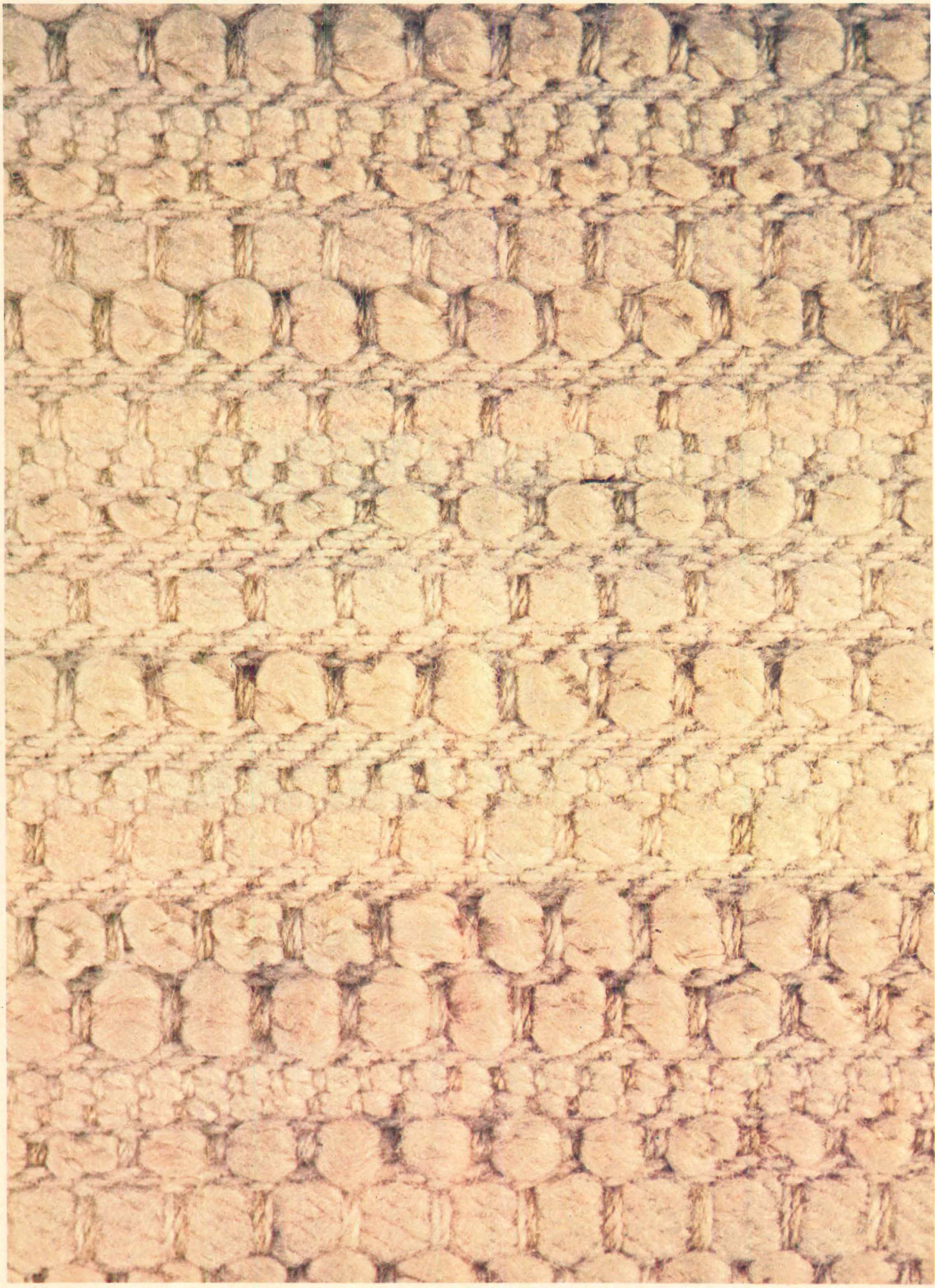
Structure is still handled as a pragmatic art. Steel brackets and tension rods appear where they are needed to create "floating" balconies and wide pitched roofs. Expanded to what seems a generic limit in the large commercial developments like Village Green (140,000 sq ft) or more recently, The Exchange (220,000 sq ft), 1971–73 Farmington, Conn. or Glenlochen (65,000 sq ft), 1973–74 Glastonbury, Conn., wood and steel composite structures achieve a form of surreal unity.

Time will weather wood-stain and sealant, hardening and bleaching the rough surfaces of CP&B's latest works. The firm's vision of small, clustered communities nestled in lush landscape and designed for village life, will survive. Working with developers fosters special anxieties, however. "You have to be on site to control design," explains James Bischoff. "The developer will say, 'Hey Jim, I've just closed a great deal on some windows for our project,' and you will use them. Frequently you detail a building whose final form is certain only when it's built."

Since the client often "controls the market," CP&B does not design for a particular species of wood. (Getting wood supplies has not been a problem.) In effect the firm is altering the traditional definition of practice. It may also expand our concepts of wood design. The Solarium Restaurant, now opening in Tucson, is an explosion frozen in time, a latticework in wood that spirals into the Arizona desert like a stranded chambered nautilus. [Roger Yee]

Inexperienced but enthusiastic young contractors worked closely with CP&B to create the Solarium Restaurant. The complexity of its structure is fulfilled by the intricacy of its details, which include stained glass windows, wrought iron doors.





Fabrics from the Designer's Collection of Boris Kroll, Inc. Photos: courtesy of the manufacturer

A view from inside

Although the recent shortages of materials have eased somewhat, the past year's crisis has left its mark on the contract interiors industry.

Much of the current crisis in the contract interiors' marketplace was triggered by the same petroleum shortage that caused most of us to curse our automobiles, pay outrageous prices, and wait endlessly in lines, grateful for our $3 limit. But while 48 percent of every barrel of oil is allocated to transportation needs, only 5 percent is allocated to petrochemicals—essential to the manufacture of plastics, paints, and man-made fibers.

Suppliers of fibers, such as Du Pont, have keenly felt the past year's shortages. Production of some of their major products, including nylon and polyester fibers, was cut back when they were unable to obtain necessary ingredients. Robert Blair, of Du Pont's Textile Fibers Division, feels that while effective conservation measures and the subsequent lifting of the oil embargo have eased some problems of supply, ingredients for nylon are still scarce. Although most shortages proved temporary, the cutbacks meant rationing or allocation to manufacturers and, as a result, the contract carpet and fabric industries were affected. Yarn manufacturers like Wadsworth/Greenwood have experienced real shortages, since their production is based almost entirely on petrochemicals. Board Chairman Neil Wadsworth feels that, in the past, the carpet industry has been too heavily dependent on nylon. The tendency now, says Wadsworth, is to diversify the materials in yarn production away from nylon into other man-made fibers such as polyester and acrylics. According to a spokesman for J.P. Stevens Contract Carpet Division, another difficulty was that the rapid growth in petrochemicals had resulted in too many product lines and, when raw materials became scarce, they were allocated to the higher priced lines.

But petrochemical shortages, the predominant news subject because of the gasoline crisis, are only part of the real materials shortages in the contract industry. More basic, perhaps, is the scarcity of materials such as hardwoods, aluminum, and steel used in furniture manufacturing. Don Richardson of Knoll states that they continue to have difficulty obtaining hardwoods in both the quantity and quality required for their products, as quality hardwoods are not being reforested quickly enough.

For Knoll and other furniture manufacturers, steel is not as difficult to obtain in standard sizes as nonstandard, special application steel, such as the high-strength stainless steel for the Barcelona chair, which is not readily available. Difficulty in buying wide steel, manufactured to their specifications, has forced Hauserman to restructure their product lines around what is available. Stendig's problems have included the shortage of everything from metal casters to screws and they, like many other manufacturers, prefer to discontinue an item temporarily rather than alter its construction and quality.

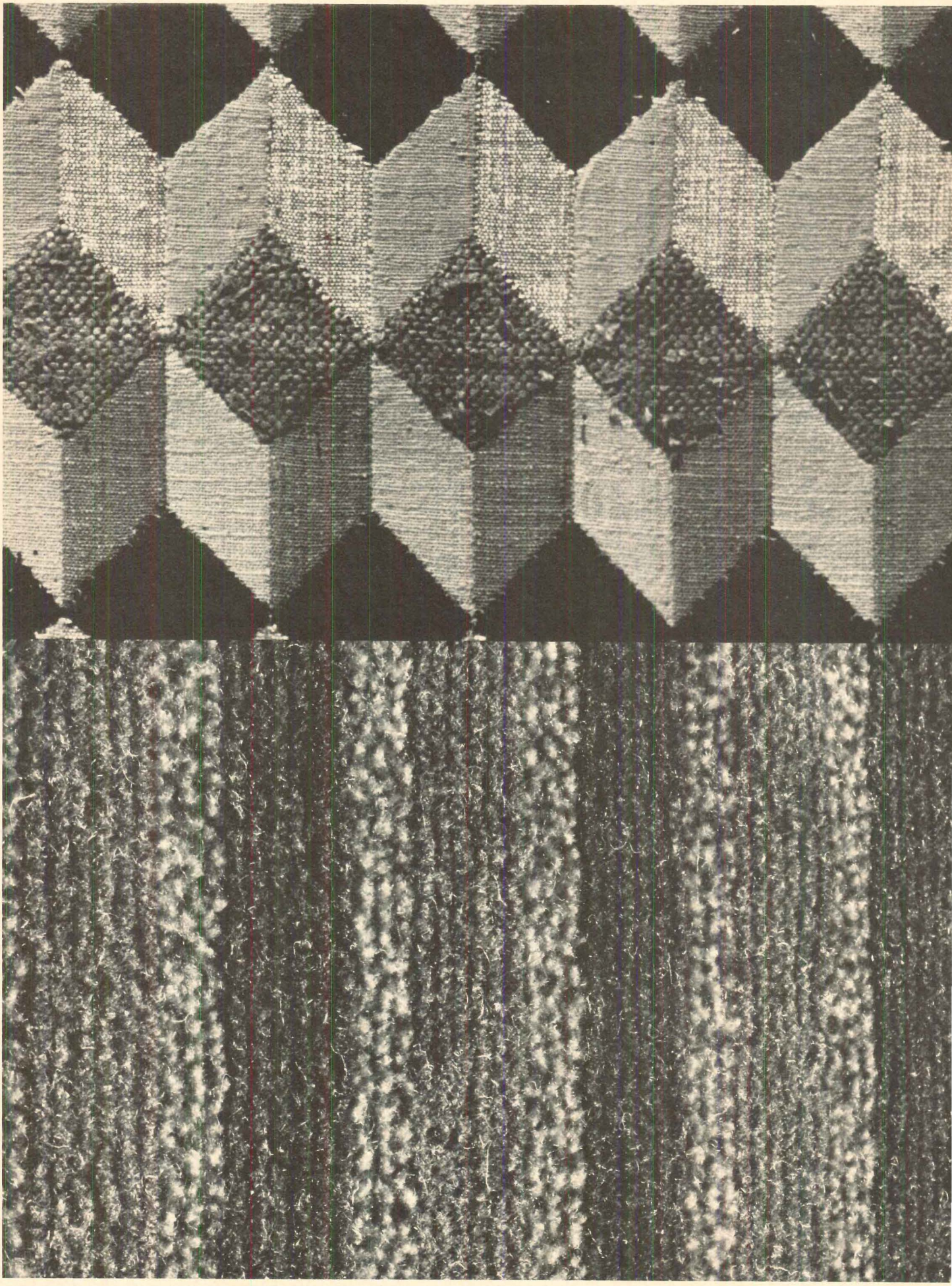
The shortages and attendant difficulties of allocating materials, while causing problems for some, were capitalized on by others. But the not-quite-so-black market which developed earlier this year, was described by a spokesman from the carpet industry as not quite so blatant as its European counterpart. Here, a broker may call, offering a certain amount of material he ought not to have available. It's always "no questions asked"—if the particular material is needed to continue production or meet delivery schedules. Sometimes, reports one furniture manufacturer, it's only a phone call saying that a certain quantity of "X" goods is available at a price—usually double that asked on the open market. Other reports of black market activity have the flavor of clandestine, cloak and dagger mysteries with elaborate meeting arrangements to transfer materials.

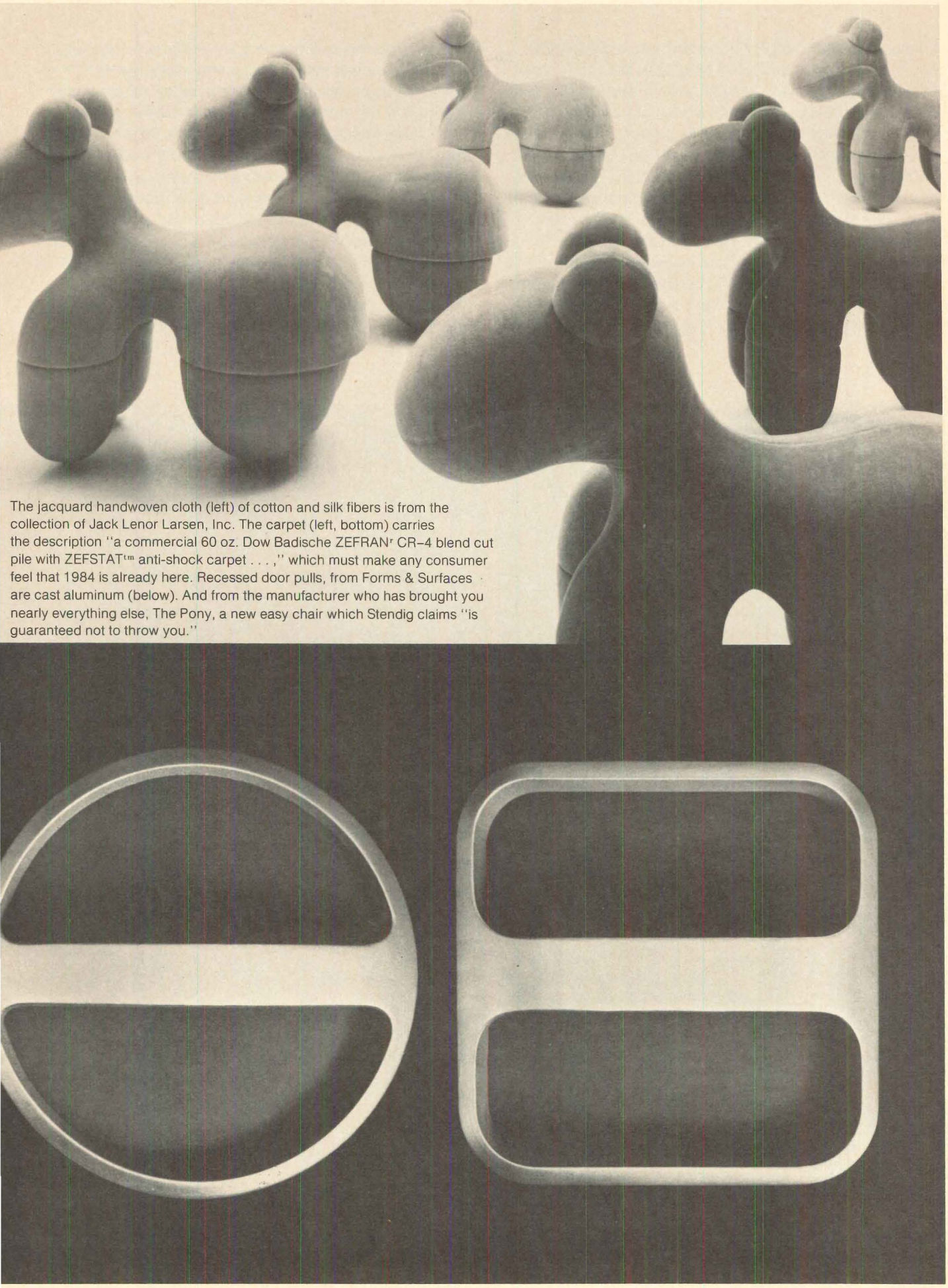
This kind of left-handed bargaining seems to be most prevalent in the chemicals and plastics industries where, lacking one of four crucial ingredients, the remaining three become surplus and wend their way into the market as barter for the missing item.

The ultimate result of both the shortages and the black market activity has been an enormous escalation in the cost of materials. Petrochemicals are escalating at the rate of 1.5 percent a month; Benzine, 24¢ a gallon in late 1972 is as high as $1.75; nylon has increased 50 percent; carpet yarns 30–40 percent in the past year. Outside the petrochemical field, steel is up nearly 40 percent since last fall and hardwood prices have risen 50–80 percent.

But it is not just the price increases that are being passed on to the consumer. Production delays have lengthened

A view from inside





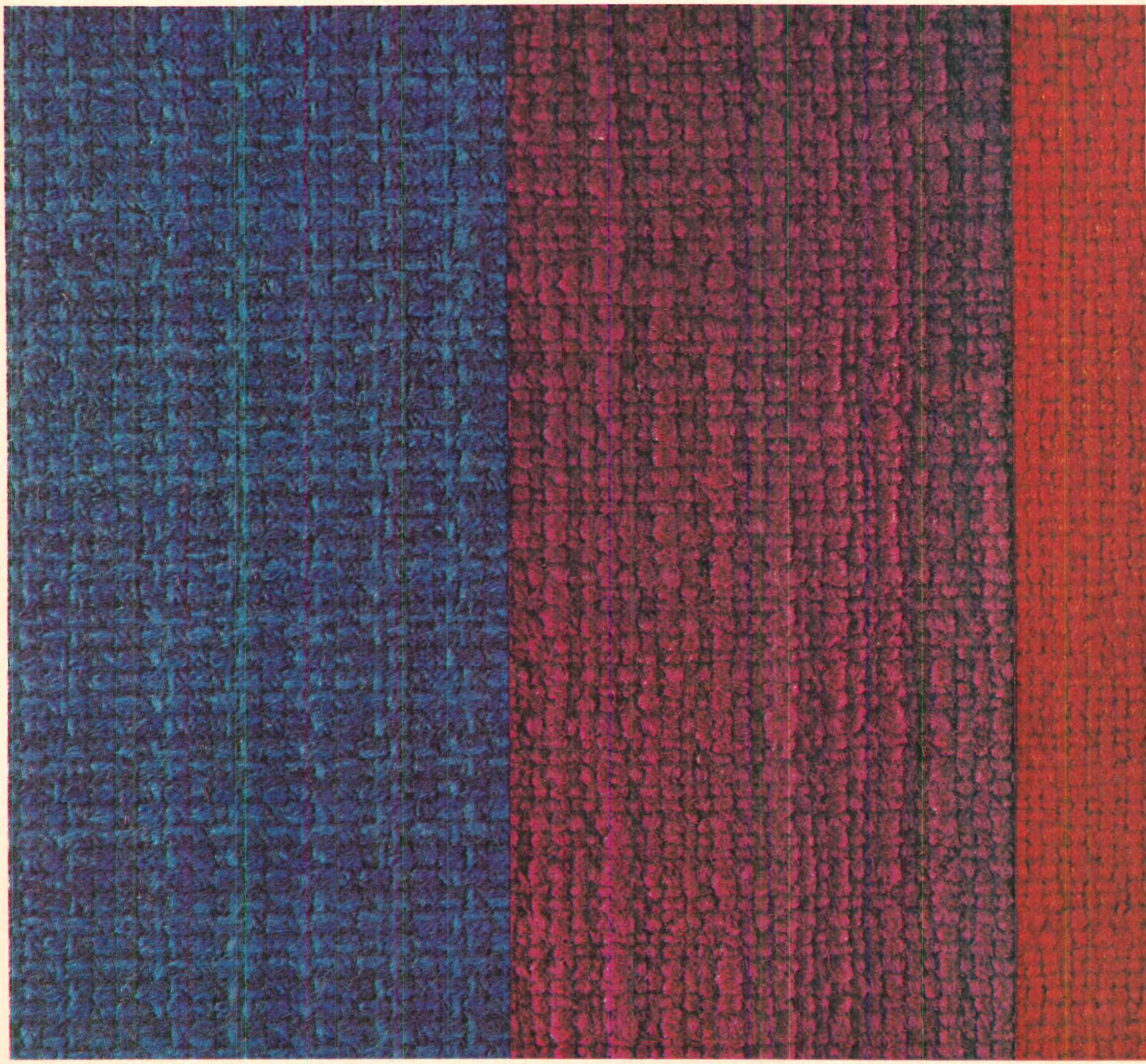
The jacquard handwoven cloth (left) of cotton and silk fibers is from the collection of Jack Lenor Larsen, Inc. The carpet (left, bottom) carries the description "a commercial 60 oz. Dow Badische ZEFRAN[r] CR–4 blend cut pile with ZEFSTAT[tm] anti-shock carpet . . . ," which must make any consumer feel that 1984 is already here. Recessed door pulls, from Forms & Surfaces are cast aluminum (below). And from the manufacturer who has brought you nearly everything else, The Pony, a new easy chair which Stendig claims "is guaranteed not to throw you."

the usual 18-week delivery to nothing short of 26 weeks and, because of this increased time span between order and delivery, most manufacturers won't make a price commitment or negotiate a contract without an escalation clause. Price lists, once good for two years, are now obsolete as soon as they are issued, states one manufacturer.

What are suppliers and manufacturers doing about the crisis? Some suppliers are cutting down on product lines; manufacturers use allocated materials for their higher priced items. Knoll says they limit the use of plastics to products in which it is the most appropriate material. Carpet yarn manufacturers seem to be diversifying their yarn, but predominantly into other man-made fibers. Georgia-Pacific plants "super seedling" trees that now make it possible to grow two or three crops in the time it once took to grow one. Lynn Brown of Hauserman suggests that a dialogue between manufacturer and designer or consumer might allow the manufacturer to provide alternatives.

Although the cost of man-made materials is escalating, the price of wool is down 40 percent from a year ago, and an expected surplus cotton crop has already forced down the price of cotton. Yet there is no great stampede to use these renewable resources although they would provide alternatives, not only in materials, but presumably in price. The attitude, rather, seems to be one of making do just for the duration of the crisis.

While one can have some sympathy with the manufacturers' and suppliers' position because of the materials

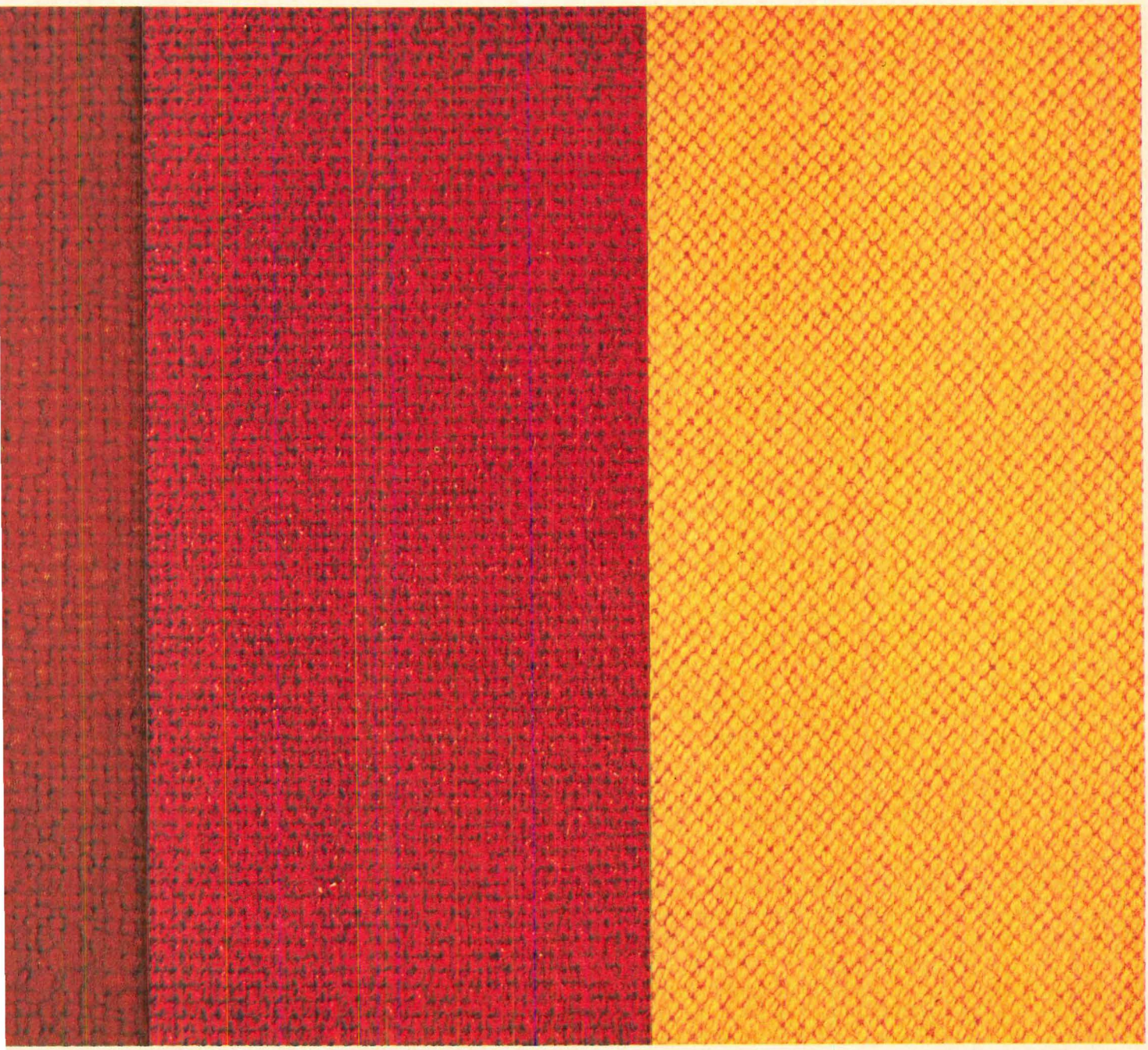


Fabric from the Designer's Collection of Boris Kroll, Inc. Photo: courtesy of the manufacturer

shortages, their responses seem expedient, at best. Their own self-interest is served first and their market—the designers and consumers—bears the consequences of increased prices, long deliveries, and less choice.

The consumer is not without fault, however, for how we use our resources and our technologies are basic American problems, a complex, but integral part of our economy. During the fuel crisis this past winter, there was a small sign posted in the lobby of a New York City office building which read "Please bear with us through the present energy crisis . . ." It didn't matter what followed, the message was clear: our hardships would only be temporary; the United States still sees itself as the land of plenty. [Sharon Lee Ryder]

Research for this article was done by Elizabeth Christy, a personal assistant and researcher for the late architect Robert Weinberg.



Building materials


Albert Dietz

Albert G.H. Dietz

Many building materials are strangers to the architects who use them. Education in materials in the usual architectural, engineering, and construction curricula cannot be said to be outstanding, particularly as preparation for the innovative uses of materials possible today. Many such curricula do not require even such elementary science as chemistry, without which a real understanding of materials is impossible. The result too often is a confused picture of materials and excessive reliance on manufacturers' literature, which tends to reflect current practice rather than innovative applications, Furthermore, the building fraternity is notoriously absent from the development of the very standards that largely govern its use of materials.

Materials cannot be considered alone, divorced from their position as an integral part of the building process, the use of the buildings, and their place in the community. The success of a building is largely dictated by the ability of its materials to meet the building's objectives.

The building process is constantly undergoing change, possibly more rapid today than at any previous time. Change, however, is strongly influenced by past history, the status of the industry as the inheritor of that past, and the traditions, preferences, and prejudices of the community, often crystallized into law respecting both materials and the processes by which they are incorporated into buildings. These constraints must be kept in mind.

Among the important factors that influence the use and development of materials are scarcity and shortages of materials and skilled labor, advances and changes in materials technology, industrialization of the building process, the growing awareness of the importance of life-cycle costing of buildings, the increasing importance of energy, the growth of the performance concept in design and in legal controls, and interactions among these influences.

Shortages

Shortages of materials are developing partly because of the growing demand of a growing national and international population, partly by the increases expected in the quality and functions of buildings, and partly because of the general national and worldwide shortages of materials, of which building materials are a substantial part. A few examples are wood and wood derivatives, metals, and even aggregates for concrete. Perhaps the most striking recent example is the reduction in petrochemical feed stocks brought about by the growing shortages of petroleum, sharply intensified by the oil embargo. This has affected the supply of plastics and other polymers, although it must be pointed out that if sources of fuel other than oil and natural gas were to be developed, there would be plentiful domestic sources for petrochemicals. (Furthermore, coal can be substituted at least in part for oil and gas.) Nevertheless, actual and potential materials shortages are serious, and building materials are consequently affected.

Technology

Technology is called upon to assist in finding answers to materials problems by 1) improving and innovating in materials, 2) finding better ways of designing buildings to reduce the amounts of materials needed, and 3) finding new materials or combinations of materials that are more efficient than conventional uses.

Improvements in materials

A few examples of improvements in materials as such will illustrate. The addition of polymeric latices to standard mortars can increase the strength of the mortar and the bond between mortar and unit, e.g., brick, to the point that 4-in. or single-withe thickness can often be substituted for 8-in. Furthermore, panels can be laid up conveniently on the ground and hoisted into place. Still stronger bonds are achieved with adhesives such as epoxies, but these are best when detailing minimum joint thickness.

Construction and structural grades of lumber are customarily graded by eye as they pass expert graders. This tends to be conservative. The demonstrated correspondence between strength and stiffness makes possible machine grading by simply bending and measuring stiffness of wood members. Machine-graded lumber has been used in house construction with an appreciable saving in the amount of lumber required.

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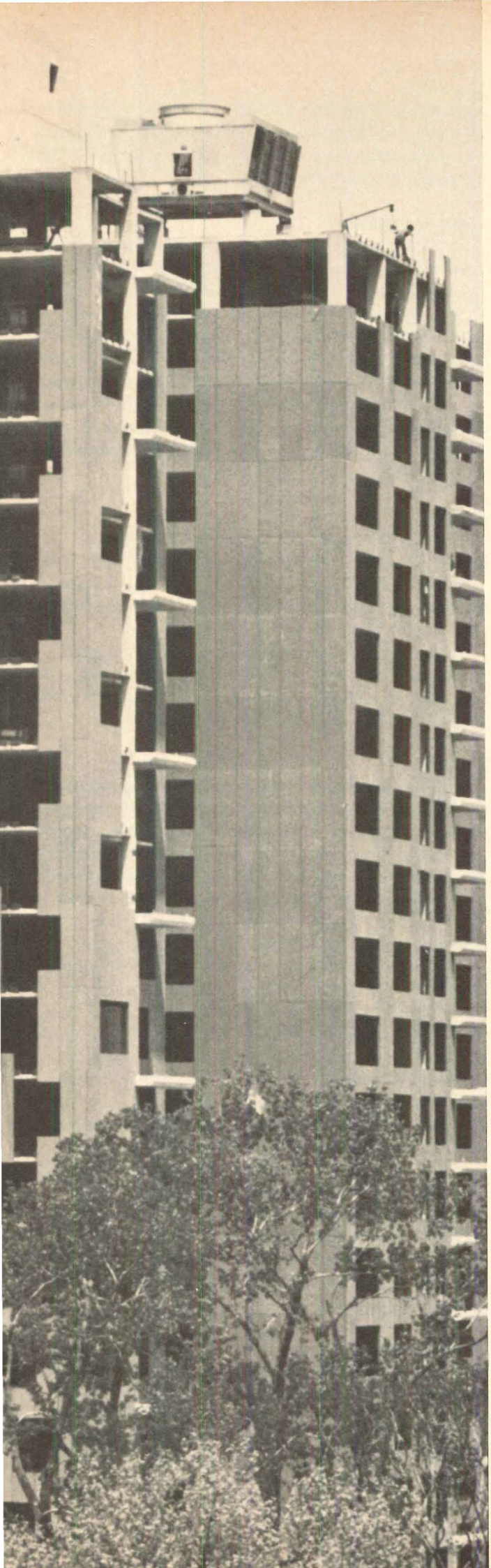


The advent of steels whose surface rust, when fully developed, tenaciously clings to and protects the steel below makes possible exposed steel structures that require no protective paint or other coatings.

High-strength steels reduce the amount of steel needed in buildings. This can result in columns of uniform outside dimensions from bottom to top of a building, thereby making the framing of all floors essentially identical and simplifying construction.

Building design

Examples of building designs that reduce materials requirements include the following: when floors and roofs of wall-bearing masonry building have been designed as diaphragms to distribute lateral loads to outside walls and cross partitions, so that the building acts as a unit in resisting these loads, such buildings 16 to 20 stories high have been built with bearing walls only 12 in. thick. This contrasts with the Monadnock Building, 16 stories high, built with walls at ground level 6 ft thick.

In medium-rise to high-rise apartments, steel can be saved and framing simplified if floor-height trusses span the full distance between columns placed only in outside walls, and if those trusses are staggered, that is, on a given floor trusses are placed only on every second pair of columns, and on the adjacent floor, trusses are placed on the intermediate columns. Short economical floor spans go from bottom chord of one truss to top chord of the next truss, but the space available for planning on a given floor is two bays (from truss to truss). Appreciable savings in steel and simplification of joints are achieved.

In high-rise office buildings the controlling structural factor is often stiffness, or resistance to sidesway caused by wind. A high moment of inertia is required. By concentrating the structural support in the outside walls, making it essentially a tube, and spanning floors to an inner tubular support, as around elevator, stair, and utility cores, the weight of structural steel per square foot can be reduced significantly. Similarly, X and K bracing in outside walls lead to simplicity and economy.

New materials and combinations

Materials technology has come up with many new materials, but the most recent and widespread is the family of polymeric materials including synthetic rubbers and plastics. These are far too numerous to mention in detail. Although the tonnage of these materials compared with traditional materials is small, the total number of different uses in building is probably as large as that of any other class of materials. One way of classifying them is as 1) nonstructural, 2) auxiliaries to other materials, and 3) structural and semi-structural. Examples of the first group are flooring, wall covering, natural and artificial lighting, piping, foam insulation, vapor barriers, hardware parts, and many others. Examples of the second group are protective and decorative coatings (a considerable revolution), adhesives, sealants and the additives to mortar and other materials already mentioned. It is in the third or structural and semi-structural group that some of the most innovative developments are occurring. These are the composite materials.

As used here, the term composite materials means a combination of materials whose properties transcend those

New York: Roosevelt Island Housing, Johansen & Bhavnani, in progress. Photo: James Karales for New York State Urban Development Corporation.

of the individual materials acting alone. One classification of composite is into particulate, fibrous, and laminar. In particulate composites, particles are embedded in and bonded together by a continuous matrix. Concrete is, of course, the outstanding example, but others include the new polyester concretes in which the matrix is polyester rather than portland or other inorganic cement, and the particle boards in which wood chips, flakes, and other particles are bonded together by matrices as urea and phenol formaldehyde.

In many ways the fibrous composites, in which fibers are embedded in a continuous matrix, afford some of the most promising composites. Many fibers can be and are used, but in building applications the most common is glass. Similarly, many matrices can be employed, but in building the most common is unsaturated polyester. Epoxies, phenolics, and others are employed where their properties are needed. Unmodified plastics have good but not outstanding strength properties, but their stiffness, or elastic modulus, is generally low, When high strength, higher modulus fibers such as glass are incorporated, the strength can be markedly increased, and the stiffness also enhanced. The fibers by themselves would fall into a heap, but the plastic matrix supports and holds them in position to develop their strength under load. Many different molding methods allow them to be formed into desired shapes. Strength-to-weight ratios can be high, and inherently stiff shapes such as shells can be achieved. Building applications are constantly increasing.

Industrialization

The term industrialization, as used in building, unfortunately has so many different meanings as to be almost meaningless. As used here, it simply designates the shop production by industrialized processes of components designed for ready assembly in the field. Components may be small, or they may be as large as mobile homes or furnished big-box hotel suites or apartments.

The requirements of industrialization processes strongly influence the selection of materials employed in components so produced. They must lend themselves to such processes in the shop, and it must subsequently be possible to transport and assemble them into the finished building at the site without undue difficulty.

Performance

The idea of the performance concept setting forth the requirements for building is gaining ground. Instead of prescribing what materials are to be employed for a given application, the conditions to be met—the performance expected—are specified. The selection of the materials is left to the producer, who must meet those requirements. This approach allows great latitude and freedom in the selection and combination of materials, and is particularly conducive to the development of composites. In one example, performance requirements for wind loads, thermal transmission, acoustical attenuation, fire spread and penetration, weight, thickness, and maintenance, led to a lightweight sandwich combination of molded fibrous composite outer shells with baked-on finish, filled with concrete foam bonded to the shell with a flexible adhesive, and provided with reinforced gypsum inner facing bonded to the core with a bituminous vapor barrier. It met all the specified performance requirements.

Life-cycle costing

Sophisticated owners, especially those who expect to operate and maintain a building for a long time, are increasingly aware of the importance of life-cycle costing. This encompasses the total cost of the building during its expected life rather than only the cost of construction. If a greater investment at the outset reduces the lifetime cost, it pays to make that investment. The implications for materials are obvious. Low initial cost materials may easily lead to high maintenance and operating costs. Furthermore, life-cycle costing leads to a close evaluation of the expected lives of different parts of the building.

Energy

As costs of energy increase and sources become scarcer, the need to reduce the energy requirements of buildings imposes demands on materials, and calls for close consideration of those materials that most efficiently contribute to reduced energy demands.

If solar energy is a resource rather than a scourge, it poses challenges for the use of materials for energy collection, storage, and use—particularly if cooling and heating are both to draw upon solar energy efficiently.

Interactions

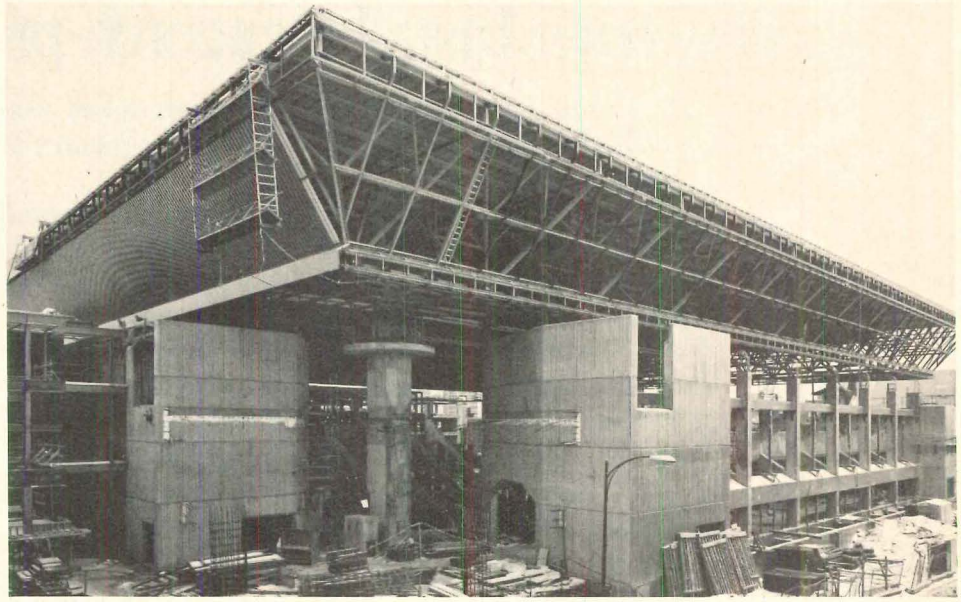
All of these factors interact in choosing and using materials, and lead to problems and issues that must be faced. The performance concept demands careful consideration of the statement of performance requirements. The final product, even if it conforms fully to those requirements, must truly meet the users' needs. A performance requirement is meaningless if it cannot be tested. Testing for performance is far different from conventional materials testing, and such tests frequently do not exist. Testing of composite materials, especially nondestructively, is a much more formidable problem than testing simple materials. Prediction of long-time behavior on the basis of short-time tests is at best doubtful, particularly for new materials, which do not have a long history of actual use. Professionals who want the freedom to innovate that may be permitted by performance specifications must be prepared to accept the responsibility that such freedom implies.

Just as the concept of performance is beginning to take hold in specifications, so performance rather than prescription is becoming increasingly important in code writing. This not only rewards superior competence and encourages imaginative innovation in materials use, but it also poses the above-mentioned problems of testing and evaluation for the code-enforcing authorities.

To summarize

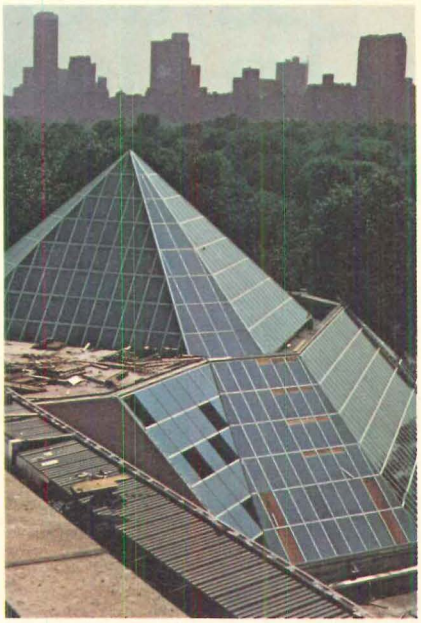
In spite of *and* because of the traditions, constraints, shortages, and changes occurring in buildings, materials are undergoing more rapid evolution and development than ever before. They offer difficult but exciting challenges for the building practitioner with the imagination and ability to see the opportunity. □

New York: Galleria, D.K. Specter, P.A. Birnbaum, in progress. Photo: Nathaniel Lieberman



Hartford: Civic Center, V.G. Kling, H. Danos, in progress.

New York: Waterside Housing. Davis & Brody, 1973. Photo: Robert Gray.



New York: Additions to Metropolitan Museum of Art, Roche-Dinkeloo, in progress. Photo: Cheryl Rossum.

New York: 1199 Plaza, Hodne-Stageberg, 1974.
Photo: Nathanial Lieberman.

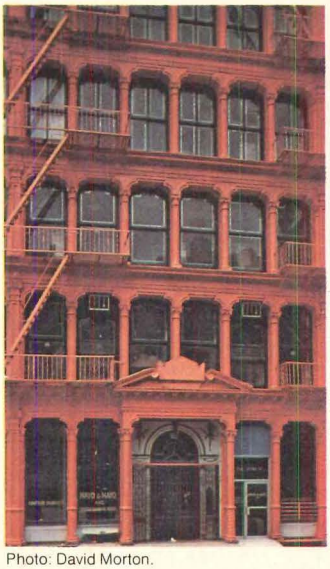


Photo: David Morton.

New York: Olympic Tower, SOM, in progress.
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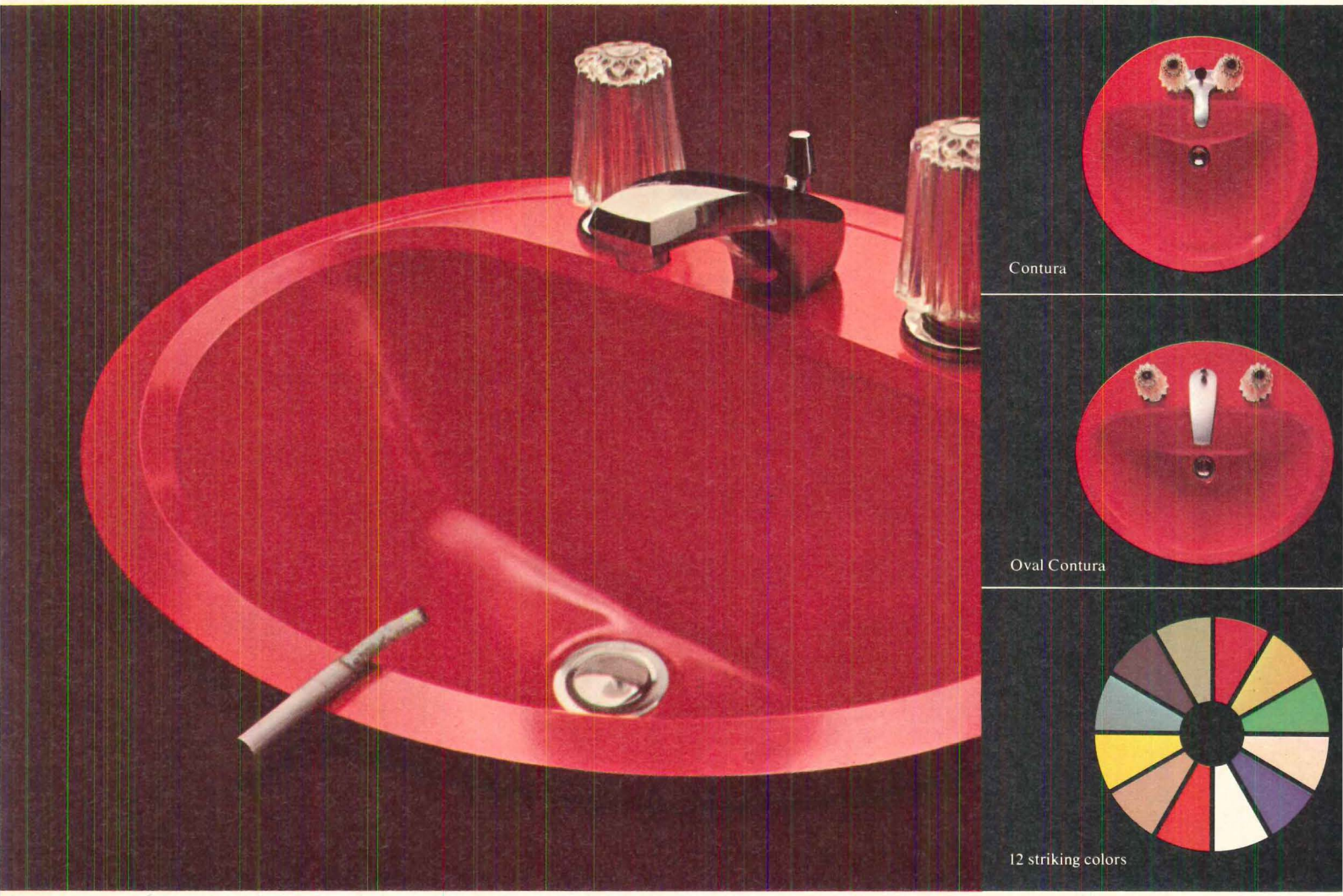

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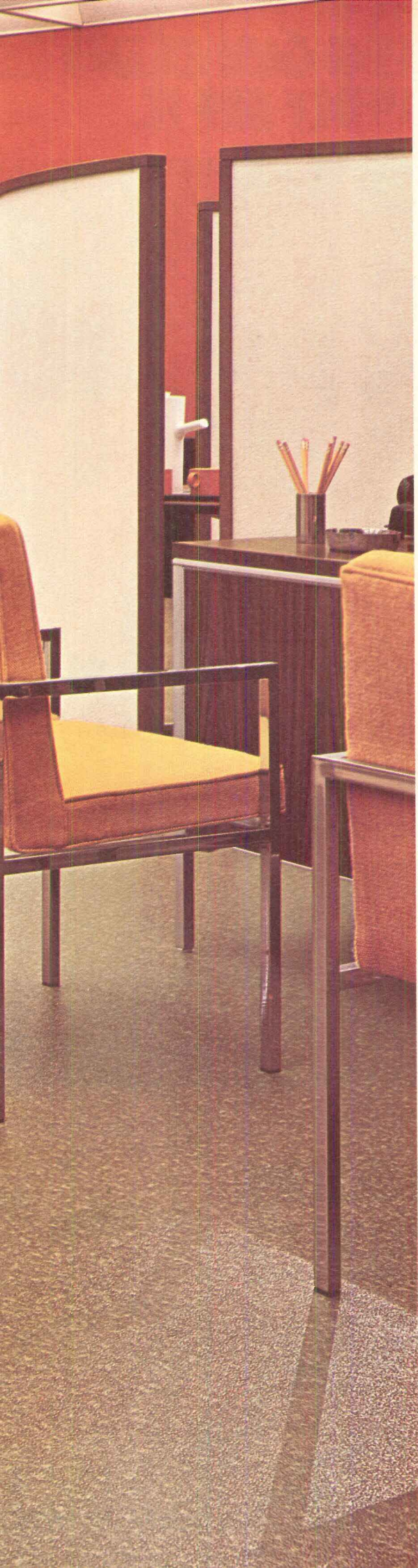

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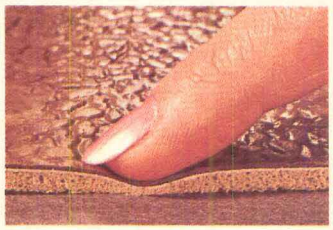

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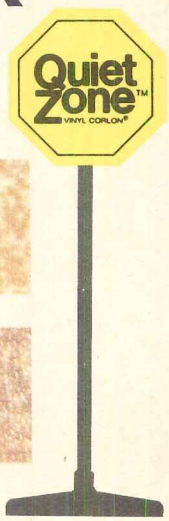

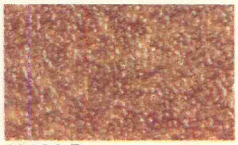
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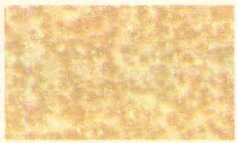
83023 Gold

83024 Green


83025 Gray-Beige

The Quiet Zone pattern illustrated here is called Grand Central.

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Try as they might, until now nobody could make a one-inch blind that was beautiful all over.

The headrail, unfortunately, hurt the overall effect. It looked a little horsey, stuck out, didn't fit in everywhere.

Enter Alcan.

The headrail on our new Mark II Blind is skinnier. Only one inch square instead of the usual one by one and a half.

Not a lot less, but enough to fit almost every window frame ever made no matter how shallow.

There's more, of course. Features you can't find on any other blind.

Like a bottomrail to match. Hardly noticeable. A very light lock-seam tube so strong it keeps the slats perfectly straight, even part way up.

The rest is looks. As pretty as the picture, in any color—or combination—under the sun. But why not see for yourself, in our 16-page book of possibilities called Window Shopping. It's yours for the asking.

The Mark II Blind. As you can see, it's a nice thing to do for a window.

ALCAN ALUMINUM

Roofing sheet metal and flashing

Harold J. Rosen, PE FCSI

Since rainwater shows no sign of fatigue in its search for passage into buildings, the choice of roofing and flashing metals is not aesthetic alone.

There are a number of metals that are used for architectural roofing and flashing. Each has different physical properties. The designer must select one on the basis of longevity, workability, joinery techniques, compatibility with adjacent surfaces, staining characteristics, economics, and aesthetic appearance. Since the cost of these different metals is constantly changing and since weight and thickness for various applications are a function of strength and corrosion resistance, an understanding of their comparative properties is prerequisite to their selection.

The metals used for roofing, flashing, coping, guttering, and fascias are aluminum, copper and lead coated copper, galvanized steel, monel, stainless steel, terne and zinc alloys. Some important characteristics are:

Material	Basic alloy	Tensile strength PSI	Thermal coefficient
Aluminum	3003–H14	22,000	.0000128
Copper	110, cold rolled	36,000	.0000093
Galvanized steel	Commercial grade	50,000	.0000065
Monel	1	80,000	.0000075
Stainless steel	304	85,000	.0000096
Terne	2	45,000	.0000065
Zinc alloy	3	30,000	.0000128

[1] Monel for roofing application is an alloy, about 67 percent nickel and 33 percent copper.

[2] Terne is a copper bearing sheet steel coated on both sides with a lead-tin alloy.

[3] Zinc alloy is a zinc-copper-titanium alloy.

Aluminum can be obtained in various anodized finishes as well as mill finishes. Soldering is difficult and should be avoided. Lap and lock seams should not be riveted or otherwise fastened together unless it is desired to transfer such movement to a different location.

Copper is very workable. It is especially useful for roofing on which the rich greenish patina that develops over the years is an aesthetic consideration. Since staining can develop, proper detailing or lead coated copper are essential to protect adjacent surfaces.

Galvanized steel has a relatively short life span when compared to other roofing metals. It should be painted to increase longevity.

Monel is a long enduring, corrosion-resistant metal with high reflectivity and low glare. Since it is an alloy composed of costly metals it is used primarily for monumental buildings with long life expectancies.

Stainless steel of the 300 Series types are long lasting, corrosion-resistant metals. Since they are strong and durable, the weights and thickness employed are generally less than for other roofing metals.

Terne metal has been used on buildings for some time. Witness the Smithsonian Building (James Renwick, 1849 Washington, D.C.) and Andrew Jackson's Hermitage (Joseph Rieff, 1835 Nashville, Tenn.). Terne requires painting to function properly.

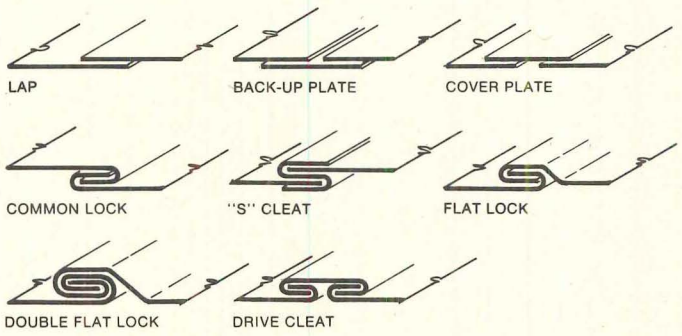
Zinc alloys are of recent vintage as compared to the other metals. Its high coefficient of thermal expansion must be appropriately detailed.

Some metals are easily soldered. On the other hand, soldering is not recommended for aluminum. Soldering bonds metals at joints at temperatures below 800 F so that the base metal is not melted. Three things are needed to solder: 1) heat source: the soldering iron used to bring metals to the proper temperature so solder can melt and flow into the joint. 2) flux: removes oxide film from metal surfaces to permit solder flow. 3) solder: bonds with base metal surfaces.

Soldered joints usually have low strength when compared to the base metal. Usually a 50 percent tin 50 percent lead solder is used. On stainless steel and monel metal, "60–40" solder is used.

These are four basic flux types: 1) corrosive acid, 2) intermediate organic-base fluxes, 3) activated rosin fluxes and 4) pure rosin fluxes. Rosin fluxes are used when soldering copper, galvanized steel, terne and zinc. Acid type fluxes are used on stainless steel and monel metal.

The most common seams used for sheet metal work are:



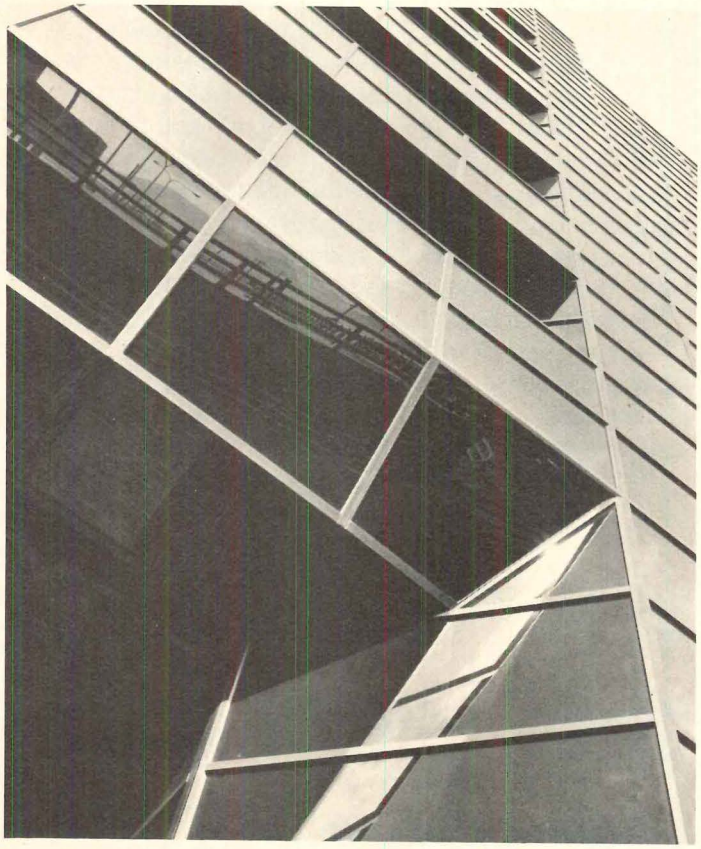
The appropriate specification references for metals, solders, and fluxes used for roofing and sheet metal are as follows: Aluminum, Fed. Spec. QQ–A–250. Copper, Fed. Spec. QQ–C–576 and ASTM B370. Lead Coated Copper, ASTM B101, Type 1 or II, Class A. Monel, Fed. Spec. QQ–N–00281 and ASTM B127. Stainless Steel, Fed. Spec QQ–S–766 and ASTM A167, Types 302, 304. Galvanized Steel, Fed. Spec QQ–S–775, Type 1, Class D and ASTM A525, Class 1.25. Solder, Fed. Spec QQ–S–571 and ASTM B32. Soldering Flux, Fed. Spec 0–F–506.

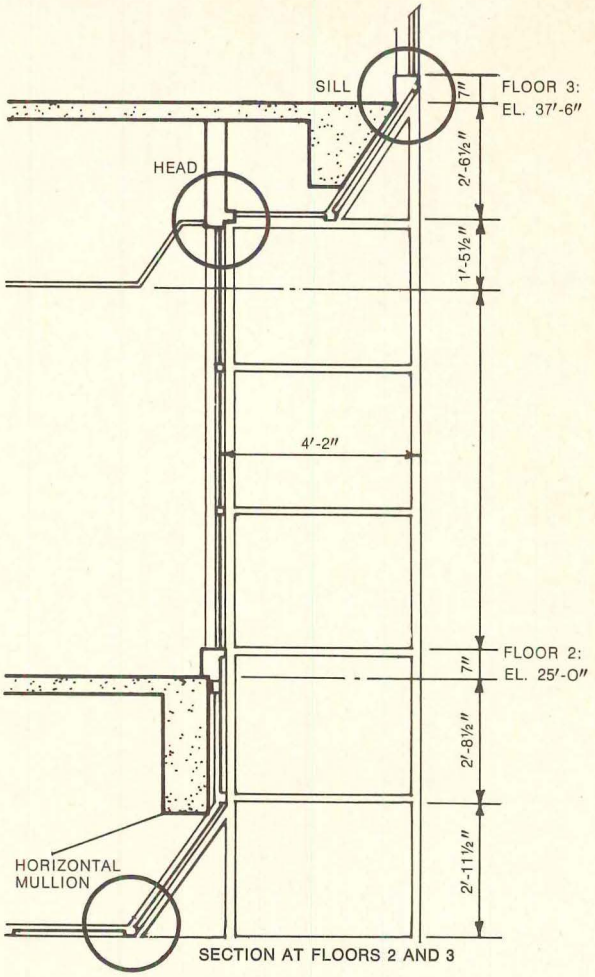
Author: Harold J. Rosen is an independent construction specifications consultant in Merrick, New York.

Technics: Selected details

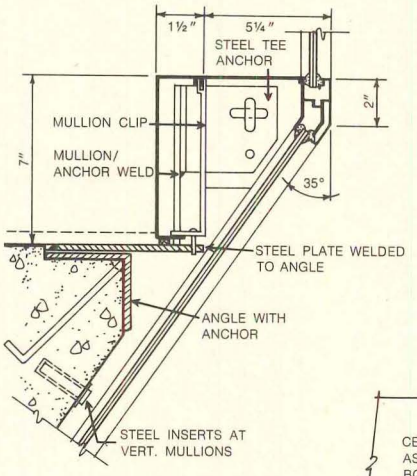
Inside the looking glass

Like a glistening dew drop in the desert, the San Bernardino City Hall (P/A, Feb. 1974, p. 66) is an enigma clad in glass. Cesar Pelli, partner for design for Gruen Associates, uses glass as an elegant skin which covers solid wall and void alike. The reflectivity of his glass walls can momentarily unify vision and spandrel glass, but nightfall and the following architectural section re-establish the distinction. Photos: Balthazar Korab.

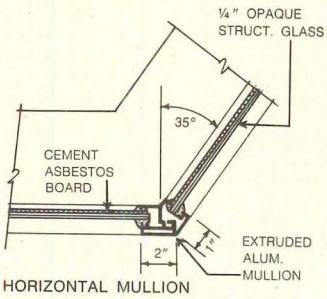




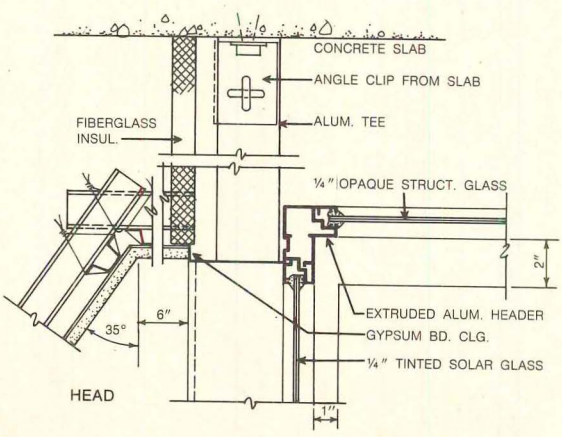
SECTION AT FLOORS 2 AND 3



SILL



HORIZONTAL MULLION



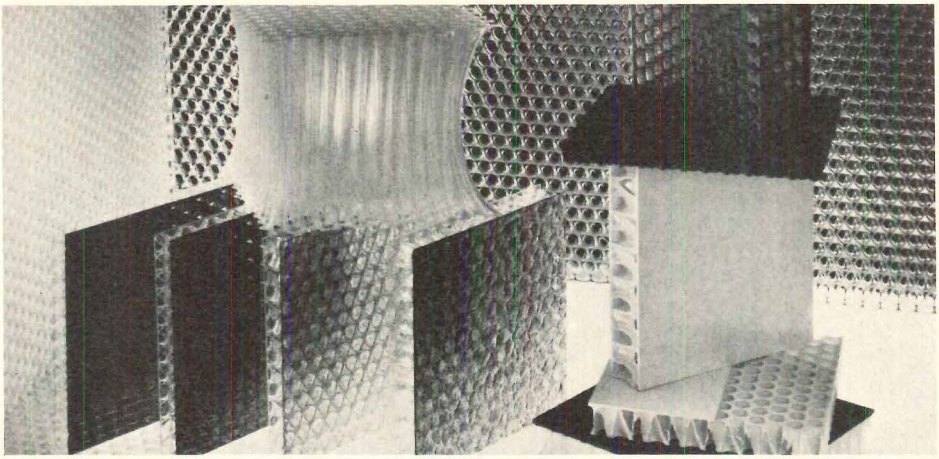
HEAD


TEXTURED DOORS FROM KAWNEER
All the exciting I-Line 4000 Series entrance options are covered in a new brochure available from Kawneer Product Information, 1105 N. Front Street, Dept. C, Niles, Michigan 49120
I-LINE SERIES 4000

Products continued from page 58

Cellular material. Flat sheet thermoplastic is converted to honeycomb-like cores and comes in sheets up to 4′x10′; thicknesses from ¼ in. up to 4 in. According to the manufacturer, it is lightweight, will absorb impact and energy vibration, and provide thermal insulation; it can be pigmented, dyed, flocked, plated, and coated. Some suggested applications include wall partition systems, glazing, temporary shelters, solar energy curtains. Norfield Corporation.
Circle 116 on reader service card

Tote Rack. Storing as many as eight tote compartments or tote desks, it can be joined side-by-side, back-to-back, or can be hung on a wall. For open plan schools, individual or multiple units are mobile because of sled base design. Finished in matching bronze. Peabody.
Circle 117 on reader service card



Cellular material

Retractable bed. Features touch controls in safety sides with International graphic symbols. Restricted patient controls such as trendelenburg, reverse trendelenburg, lockouts, and an instant electrical safety check are combined in a single unit at the foot of the bed. Has caster steering and braking, plus stretcher height and a narrow 36 in. width. Hill-Rom Company, Inc.
Circle 118 on reader service card

Carpet cushion. A .125″ gauge latex foam rubber cushion is designed for use in corridors where heavy rolling traffic, such as in hospitals, is used. Intended for commercial and contract applications, it is available in rolls of 6′x120′. Conforms to the nonflammability requirements of the pill and Steiner tunnel tests. Dayco Corporation.
Circle 119 on reader service card
[continued on page 120]

At GAF we have an informer in our midst. It's our newsletter. And six times a year, it will tell you everything we're doing.

For instance, you'll know about drops before they happen. And about new Federal Specifications as they happen.

The Informer also includes a special number you can call if you need additional specifying information. Or some help in choosing what's just right for your needs.

If you have not been receiving The Informer, write to GAF Corporation, Floor Products Division, Dept. V94, Box 1121, Radio City Station, New York, N.Y. 10019. After all, it's very important. Because The Informer will give you the answers before you can even think of the questions.

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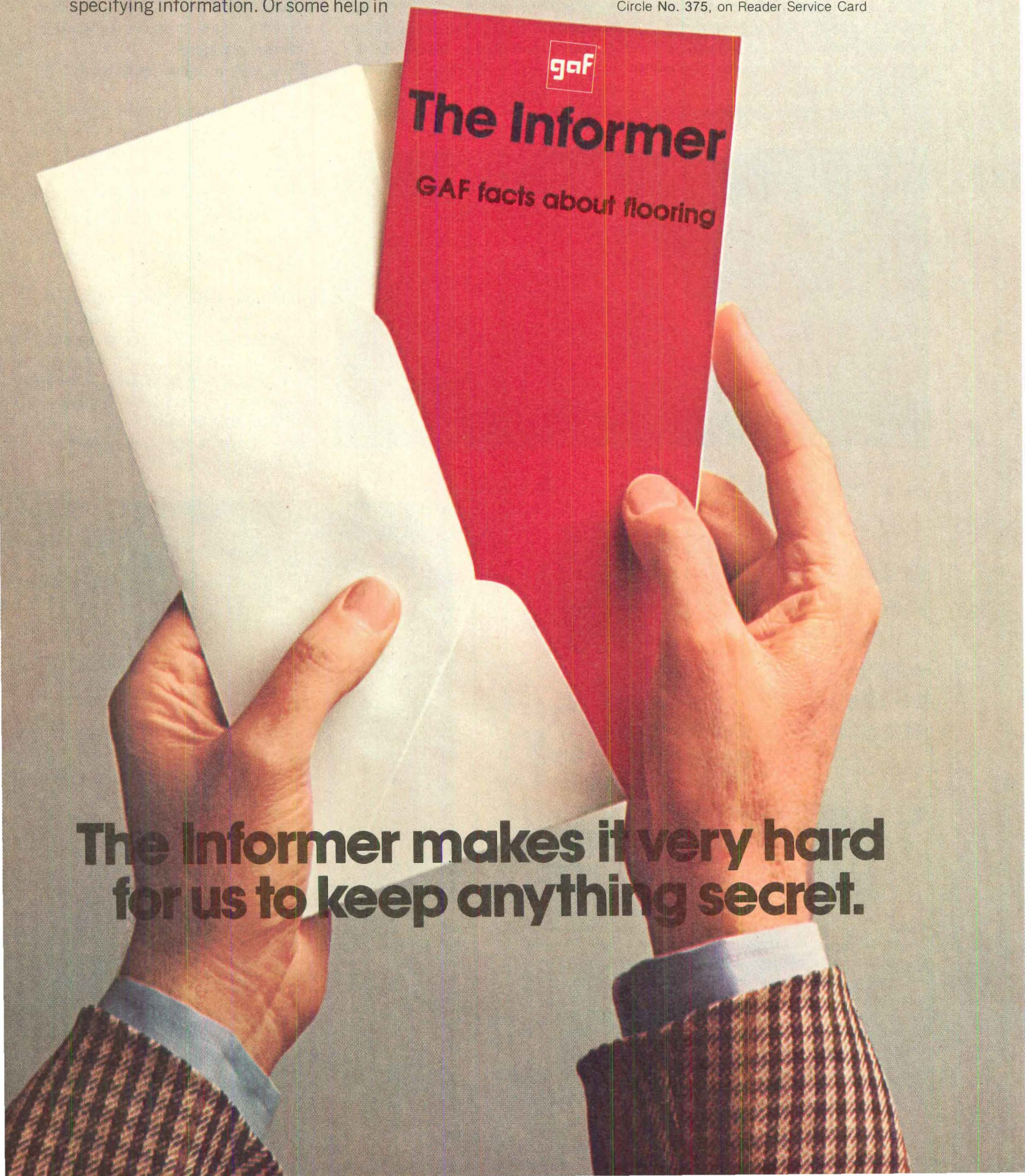
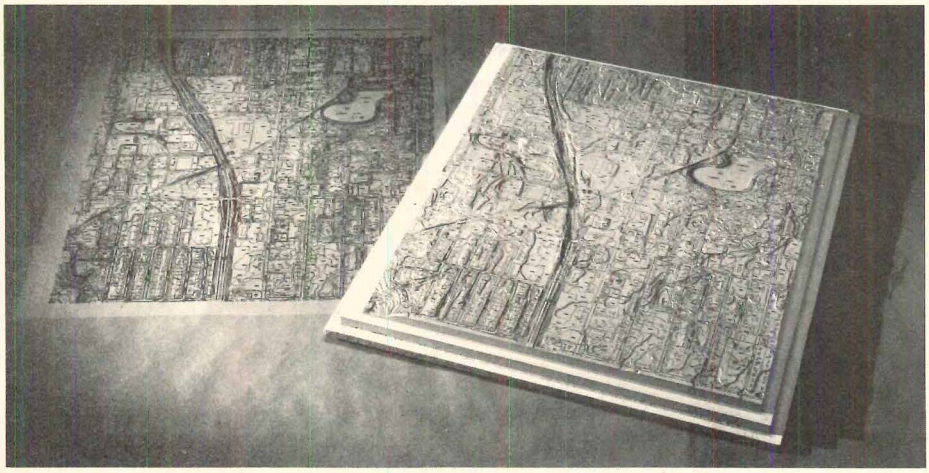


The Informer makes it very hard for us to keep anything secret.

Products continued from page 118

Photographic images. A contour map or an aerial photograph can be applied to sculptured model surface in complete and accurate detail, according to maker, and should be of special value to planners and landscape architects working with large areas of land. Image may be applied over any color. Manufacturer provides complete service. Contours, Inc.
Circle 120 on reader service card

Glazing material. A translucent, rigid PVC glazing material for commercial and industrial building application. According to maker, it is lightweight, weather and corrosion resistant with a translucent appearance of frosted polycarbonates and glass, cannot break or shatter. Sheets are 48 in. wide and have double walls with integral ribbing. Suggested applications include greenhouses, shower enclosures, temporary shelters. Alco Plastics Company.
Circle 121 on reader service card



Photographic images

Literature

Pneumatic collection systems. For handling soiled linen and/or trash and solid waste disposal, systems are said to be especially suited for use in hospitals, office buildings, industrial plants, hotels, schools and are custom designed for each structure. Brochure. Trans-vac systems.
Circle 200 on reader service card

Seating. Environ One series consists of eight basic seat and back units with which numerous combinations can be created. Illustrated booklet also has line drawings and is available to architects, designers and the contract trade. Stendig, Inc.
Circle 201 on reader service card

Handsplit cedar shakes. Manual includes history of Western Red Cedar, recommended methods and material for application, tells how to achieve novel and distinctive effects, illustrates product in use. Red Cedar Shingle and Handsplit Shake Bureau.
Circle 202 on reader service card
[continued on page 122]

color for the new washroom:

"Designer Series"

ADDS COLOR TO WASHROOM ACCESSORIES

Bobrick combines its quality stainless steel washroom accessory cabinets with heavy duty laminated plastic doors... in a wide choice of colors and wood grains. The result is bold color and clean functional styling... to create a new look for today's washroom.

With the new "Designer Series," Washroom Accessories can be color coordinated with Bobrick's Laminated Plastic Toilet Compartments, Countertops, and Washroom Vanity Centers. You can now plan a total design concept, in color, for all washrooms in new construction and renovation.

Send for our catalogs. Bobrick, Architectural Service Dept., 101 Park Ave., New York 10017. Bobrick products are available internationally.

bobrick SINCE 1906

Literature continued from page 120

Ceramic tile brochure illustrates line of 44 unglazed colors and 8 glazed accent colors, shows 5-in.-high back-mounted built-up base and system of 2′x2′ sheets of tile pregrouted with polyurethane. Shows stock patterns, designer patterns, and trim shapes, describes swimming pool and mural design service. American Olean Tile Company.
Circle 203 on reader service card

Patient-service wall systems. Color catalog describes basic to full-service models with illustrations of each system design, identifies individual features such as electrical, air, vacuum, medical gas, lighting, and communications services. Catalog also illustrates furniture accessories. American Sterilizer Company.
Circle 204 on reader service card

Metals. Brushed aluminum and embossed copper are described in color brochure which illustrates their uses in interiors. The Diller Corporation.
Circle 205 on reader service card

Luminaires. Series designed for linear metal ceilings are illustrated in brochure. Litecontrol Corporation.
Circle 206 on reader service card

Plywood. Product Standard PS 1-74 reflects changes in plywood for construction and industrial uses which are included in design and construction publications. American Plywood Assn.
Circle 207 on reader service card

Drafting furniture/equipment. Catalog covers complete equipment line, including flat, vertical, and roll filing systems, single and coordinate group drafting tables, tracing units, art and student tables, and miscellaneous furniture and equipment. Stacor Corp.
Circle 208 on reader service card

Curved metal sheets for industrial and architectural applications are shown in eight-page catalog which includes specifications and data on the various configurations and metals available. Limitation and reference tables give sheet widths and lengths, gauges, minimum radius possible, and type of curve. Elwin G. Smith.
Circle 209 on reader service card

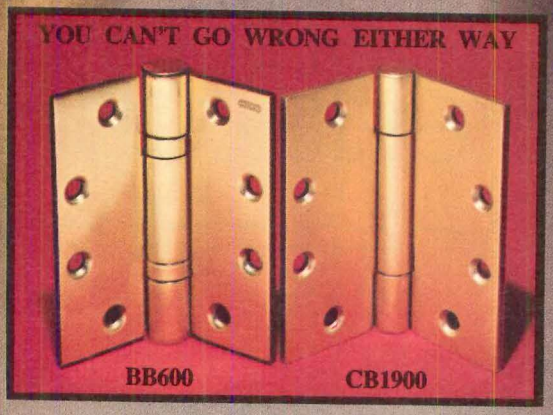
Steel doors and frames. Brochure provides door selection guide, cost comparison figures, construction features, dimensions, specifications, handling details, frames and anchors offered, types of labeled doors and frames available. Suggested procedure for the selection of fire doors are included. Republic Steel Corp.
Circle 210 on reader service card

Window catalog. Commercial, industrial and institutional aluminum replacement windows are shown with short form specifications and detail drawings. Louisiana Pacific.
Circle 211 on reader service card

Interior Sanitary Paneling system combining sanitary protection (USDA approved) with insulation is subject of brochure. System consists of 4′x8′ panels laminated of a 3/32 in. white fiberglass reinforced plastic facing, a urethane foam core, and an aluminum foil vapor barrier backer. For interior walls, ceilings, and wall/ceiling linings where sanitation and/or cooling and freezing are prime environment requirements. W. H. Porter, Inc.
Circle 212 on reader service card

Number one?

Or number one?



Ask which is really the Number One hinge, and we'd be hard pressed to tell you.

There, on the left, is our famous BB600 Slimline – the first three-knuckle ball bearing hinge ever made. On the right is our CB1900 LifeSpan™ hinge – the slimmest, longest life, concealed bearing hinge on the market – a hinge we're so proud of, we guarantee it for the life of the building.

Both beautiful – both priced the same – the choice has to be yours. But isn't it nice to know that, as long as it's a Stanley hinge, you're bound to be right?

For a load of information, write Stanley Hardware, Division of The Stanley Works, New Britain, Conn. 06050. In Canada: The Stanley Works of Canada, Ltd.

STANLEY®
helps you do things right

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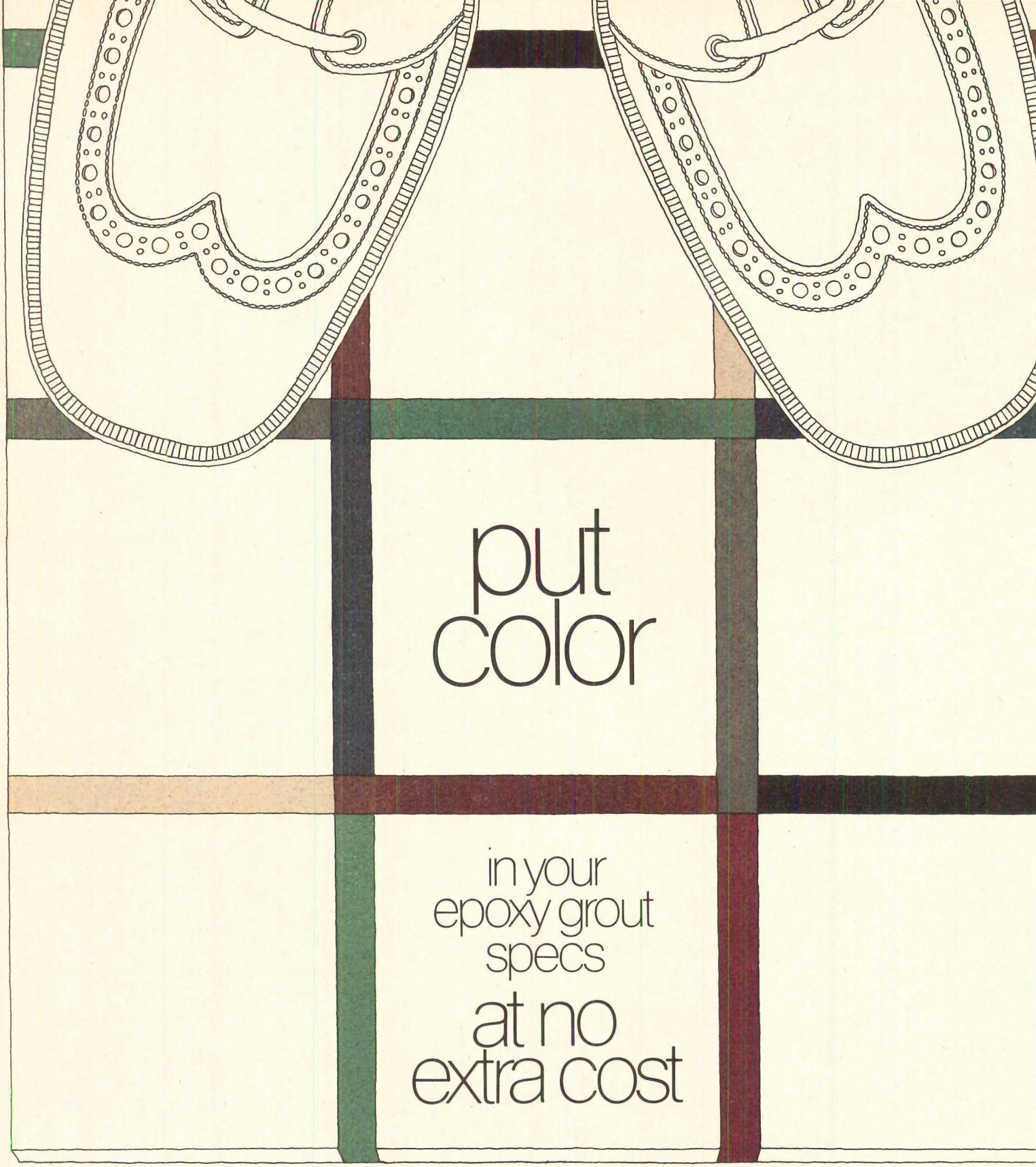

Rezklad® Epoxy Grouts are available in colors to enhance the beauty of any tile floor or wall. Choose quarry red, seaway blue, maple brown, slate gray, meadow green, limestone white or anthracite black.

In any color, Rezklad epoxy grouts resist acids, alkalies, cleaning agents, salts, greases and exhibit low absorption and resistance to freeze-thaw cycles. For consistent high-strength quality that lasts . . . and extra beauty at no extra cost . . . specify Atlas epoxy grouts.

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Circle No. 328, on Reader Service Card

Urban Spaces *by David K. Specter. New York Graphic Society, Ltd., Greenwich, Conn., 1974. 275 pp, $15. Reviewed by A.E. Bye, principal in the firm of A.E. Bye & Assoc., Landscape Architects & Site Planners.*

The author of *Urban Spaces,* David K. Specter, challenges the idea that in order to sell books on art and architecture, they must be either textbooks or picture-books. In attempting to set up an equal balance between words and pictures as his vehicle of expression, however, Specter encounters several difficulties. Much of the meat of the book—that which gives the picture structure and pulls together his message—consists of text and drawings buried on the last 15 pages of the book. This, combined with Specter's own excellence as a photographer, makes the pictures become the focal point; the reader scans the book and the text remains unread.

Specter tells the urban designer of his responsibility to be humane in designing public spaces. In a particularly significant passage, he writes of the difficulty inherent in the task of the designer—the problem of resolving the immediate analytical and technical demands of the design problem, while at the same time controlling (in his mind's eye) the types of experiences and emotional responses which the design will generate in the future.

In a very real sense it is a shame that this book had to be written in the first place. For Specter is concerned with the most obvious, elementary, and basic things that a city must do and be. He reminds us yet one more time that a city should be designed for people, not cars; that to sever the fiber of a city from its water edges is an act of madness; that a city can only survive if its people find it both *worthwhile* and *emotionally satisfying* to be in. But the point is that we are stuck with what we have: the city structured by the rectangular street grid and choked by the car. Specter is emphatic and quite successful in his demonstration that the processes and human constraints that generated the beautiful, humane urban spaces of history can and must be applied by designers to the cityscapes of the future. But he is less successful in demonstrating how these processes can be applied to existing conditions, and how we can create the synthesis between vehicular and pedestrian spaces which must tide us over until we outlaw the automobile.

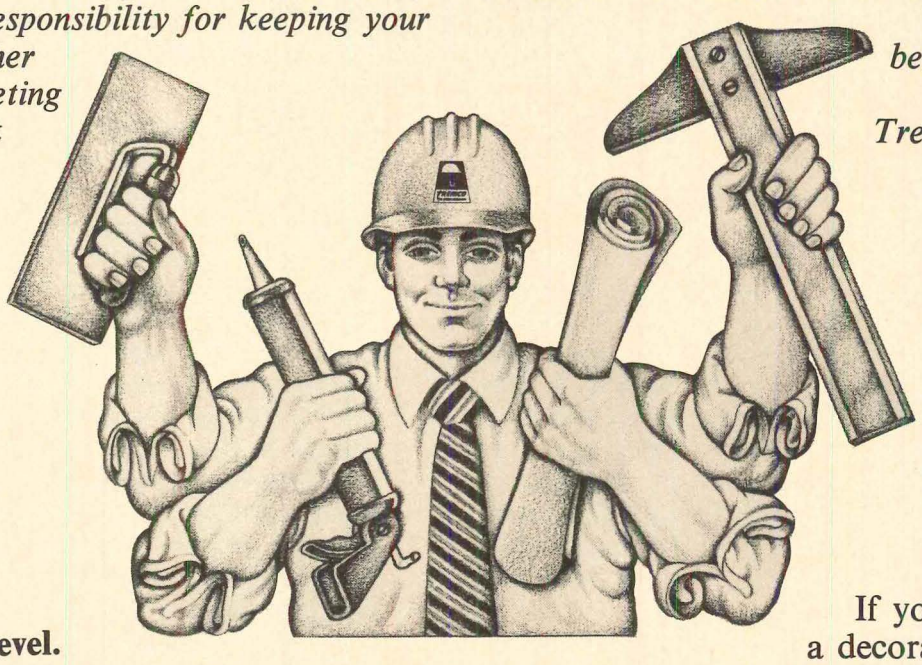
My favorite chapter in the book—"The Floor of the City, a Paving Anthology"—shows some ideas and processes that have immediate applications to present-day situations. Personally, though, I would have liked to have seen photographs included of some of the vast range of other types of paving and ground cover, such as stabilized earth, wood walks, catch basin covers, and looser aggregates such as gravel, grasses, wood chips, bark, and even straw. And although I realize the author's concern is with processes, and not specifics, I would have preferred to see captions with photos, not a back-of-book list. But these are small points. Above all, Specter brings us back to the historical idea that the basic urban design module has got to be the set of dimensions generated by the individual pedestrian as he moves through his city. Can he negotiate steps, curbs, and gutters; is there a comfortable place to sit and watch a fountain or sunset; is that large plaza an inviting and restful place to be; in short, can the pedestrian participate visually or tactically in elements of his cityscape; are the multitudes of hard surfaces beneath him and around him sympathetic to his shape, his responses, his movements?

Specter shows us his central character—the urban pedestrian—on the book's frontispiece in an evocative, almost surrealistic photograph. He devotes much of his energies to photographs and discussions of the ultimate pedestrian-shaped city, Venice, and to the peculiar natural circumstances which forced its development, "according to human rather than vehicular needs." He also uses Venice to demonstrate just how completely the elements of our own cities have been shaped by vehicles; he points out that most sidewalks are really leftover vehicular edges, which rarely respond in shape or size to the human activity they contain.

The type of orientation given the book by its treatment of the pedestrian, however, creates a dilemma. With few exceptions, the book is divided into two parts: treatment of successful pedestrian spaces and environments which are built or evolved in historical periods before the automobile, and a discussion of some projected pedestrian-oriented future cityscapes which, from the looks of the drawings, will occur after the age of the automobile. But much must be omitted in a book in which the author tries to be artist, philosopher, photographer, and writer all at once. For *Urban Spaces* is a beautifully designed, wise, exceptionally humane, and very timely exercise. If we really are able to shake off the car and return the city to the foot walker, then we will need books such as this to tell us how.

You can talk to a lot of different people about a lot of different waterproofing systems. Or you can talk to us about it all

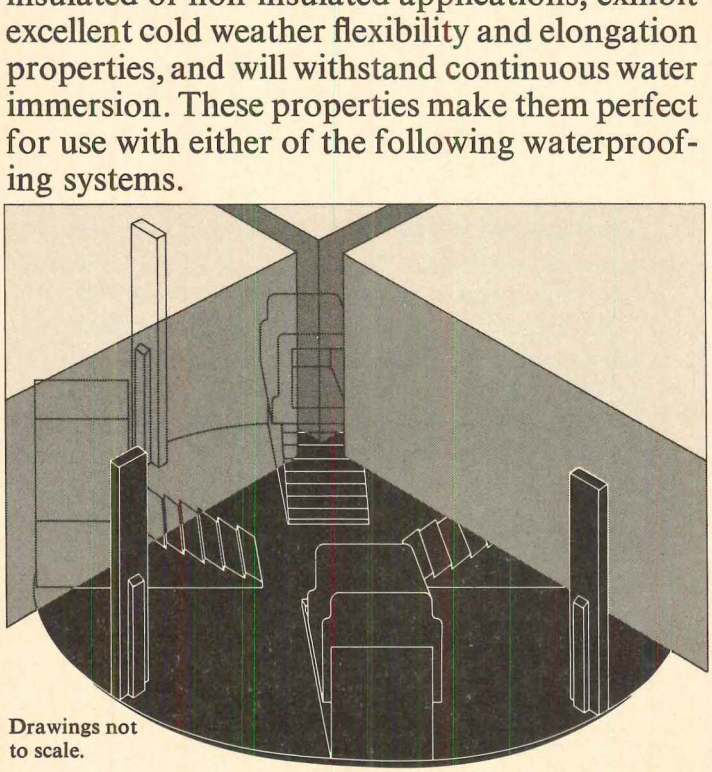
Think of all the advantages there are to having one source for all your waterproofing needs —convenience, assured system compatibility and one overall responsibility for keeping your building dry. Rather than 3 or 4 competing sources, you work with just one. Tremco's representative assists you with specificatio information and service from drawing boa to job site instruction. And wherever you ne waterproofing below, on or abo grade—there's Tremco system th will do the j effective



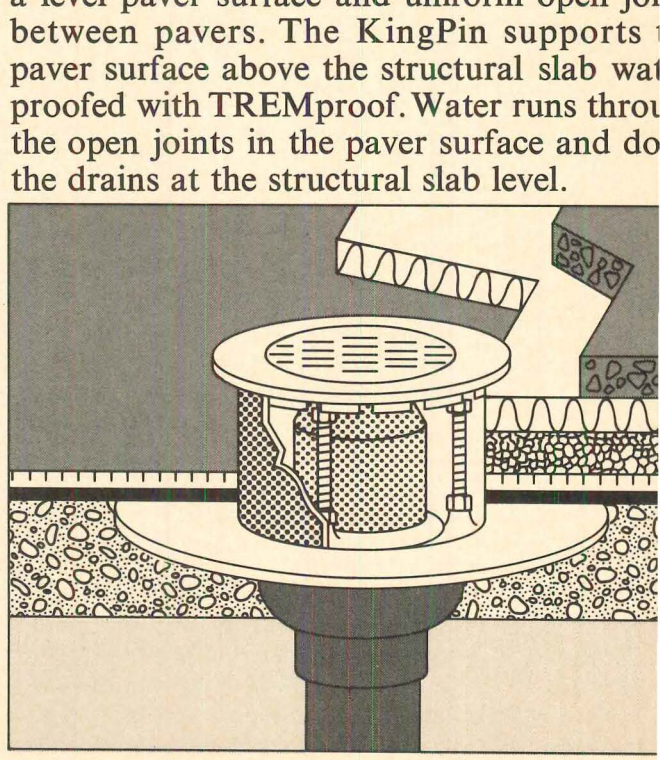
Two systems for keeping water out at the ground level.

TREMproof™ liquid polymers form a monolithic seamless blanket. They are adaptable to insulated or non-insulated applications, exhibit excellent cold weather flexibility and elongation properties, and will withstand continuous water immersion. These properties make them perfect for use with either of the following waterproofing systems.

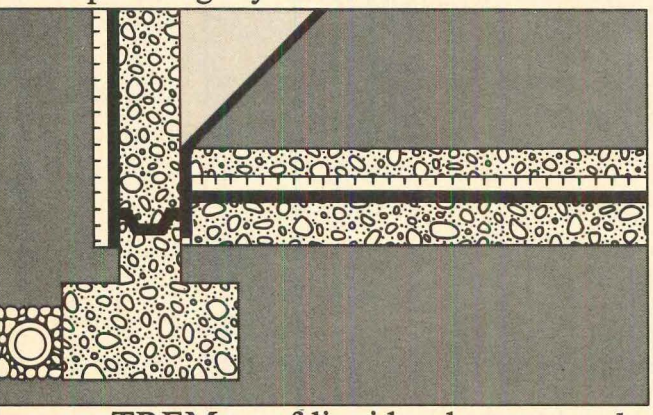
If you're consideri a decorative plaza, de or terrace, you should consider pavers. C KingPin™ pedestal gives you design freedo a level paver surface and uniform open joi between pavers. The KingPin supports t paver surface above the structural slab wat proofed with TREMproof. Water runs throu the open joints in the paver surface and do the drains at the structural slab level.



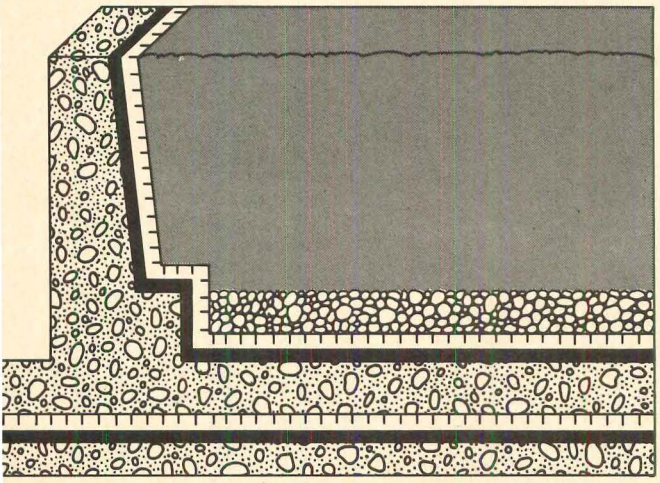
Drawings not to scale.



ou're designing a poured concrete wearing , our unique All-Level Drain used with EMproof assures positive drainage on all ls. Water is taken off the traffic surfaces, insulation layer, the percolation layer, and waterproofing layer itself.



course TREMproof liquid polymers can be d for the waterproofing of foundations, nters, reflecting pools, etc. They're self- nering and become an integral part of the



ucture. Their superior adhesive quality pre- ts any lateral movement of water between substrate and waterproofing blanket.

stems to waterproof traffic-bearing surfaces. EMproof Systems also come in a decora- , moisture-curing liquid polymer for the ffic-bearing surface of plazas, balconies, aces, interior floors, etc. It cures to a flexible, mless blanket and becomes an integral part he structure. It's easy to use and has excel- lent resistance to abrasion, chemical spillage and ponded water.

Systems for interior waterproofing.
For those difficult interior waterproofing jobs such as washrooms, and mechanical equipment rooms, TREMproof Systems make for easy, labor saving application in single- or twin-slab construction.

A variety of masonry preservatives.
To complete the water-proofing job, Tremco can provide you with a wide variety of preserva-tives to keep water out of masonry walls. You can select from heavy-bodied decorative preservatives available in architectural colors. Or, choose from our clear, transparent preservatives that retain the natural beauty of the masonry.

A complete system, one source.
Is there any reason why Tremco shouldn't be your one source for water-proofing?

We've waterproofed some of the world's largest buildings. For over 45 years, we've been providing top quality leak proof systems and prod-ucts, such as our job proven sealants MONO®, DYmeric® and Lasto-Meric®, and our roof-edging system, Tremline™.

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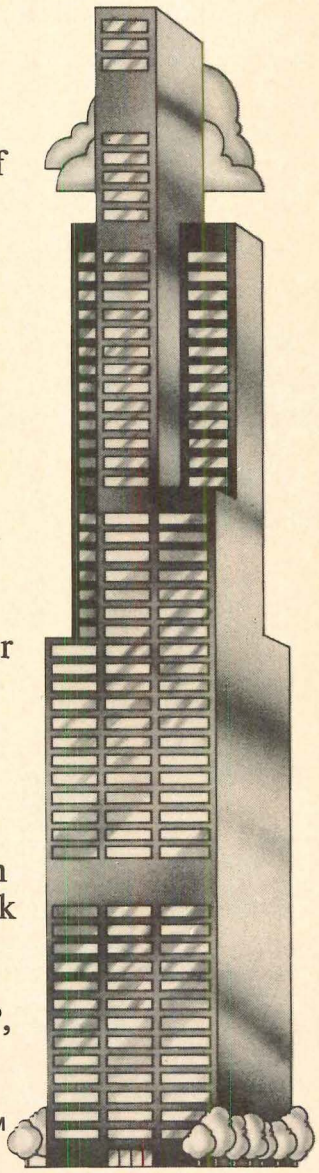

TREMCO®

Notices

Appointments

Anthony J. Lumsden, AIA has been named principal for design of Daniel, Mann, Johnson & Mendenhall, Los Angeles. **Robert H. Hartman, AIA** has been appointed an associate vice president, and **Leonard A. Ehrig, CPA**, a vice president of the firm.

E.C. Kobs has joined Caudill Rowlett Scott, Houston, Tex., as senior vice president and operations manager of the business development division.

Peter Wilson has been named an associate of Hardy Holzman Pfeiffer Associates, New York City.

Arnold N. Zwibel has been appointed design director of Roe Associates, Hempstead, N.Y.

Charles B. Blacklock has been named project manager for Alden B. Dow Associates, Inc., Midland, Mich.

Roy W. Johnson, AIA, Michael K. Warner, AIA and **J.J. Kim, AIA** are new associates of Odell Associates Inc., Charlotte and Greensboro, N.C.

John Buehler has been appointed corporate vice president-technology of Jacobs Engineering Co., Pasadena, Calif.

Robert Formanek and **Dennis Wyckoff** are new associates of J. Robert Hillier Architects & Planners, P.A., Princeton, N.J.

Peter P. Bolles has been elected president of John S. Bolles Associates, San Francisco.

John B. Beasley, Jr. has been named an associate of James P. Chapman Architect, AIA, Dunwoody, Ga.

Seymour R. Frolichstein and **Arthur H. Kaeppel** have been admitted as partners in Finck, Stowell & Associates, Inc., Chicago.

James E. Kinville, AIA has joined Ellis/Naeyaert Associates, Inc., Detroit,
[continued on page 132]

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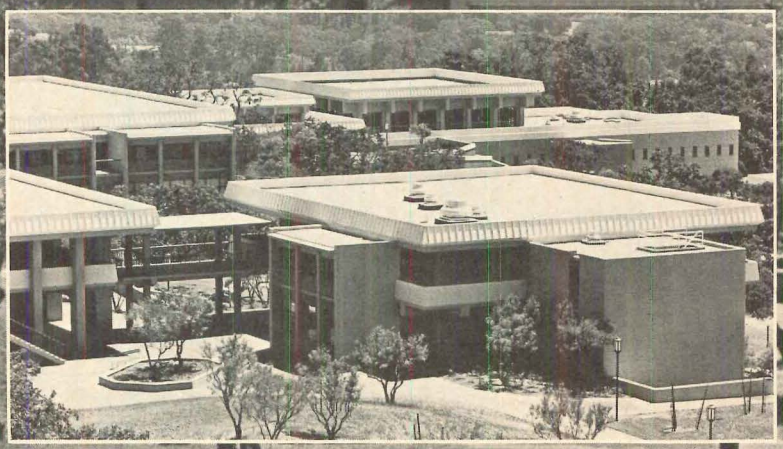

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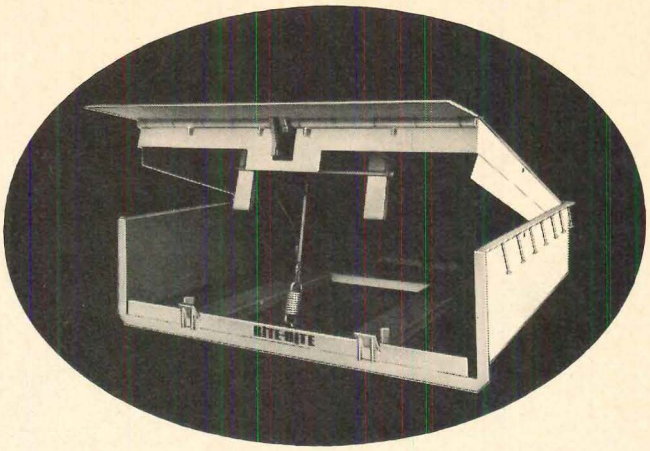

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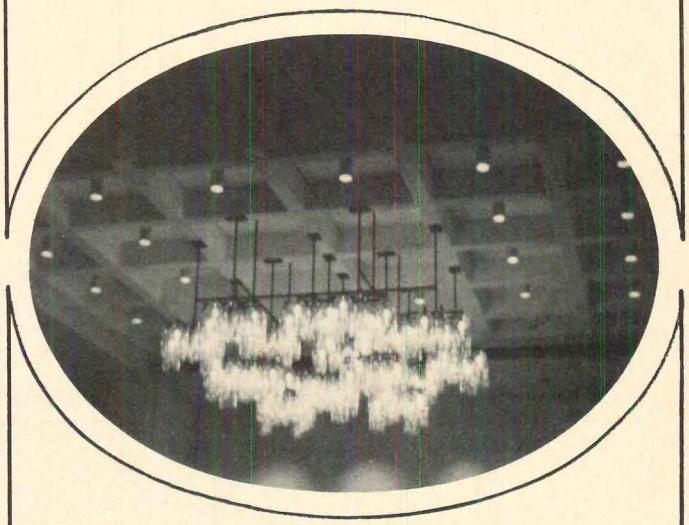

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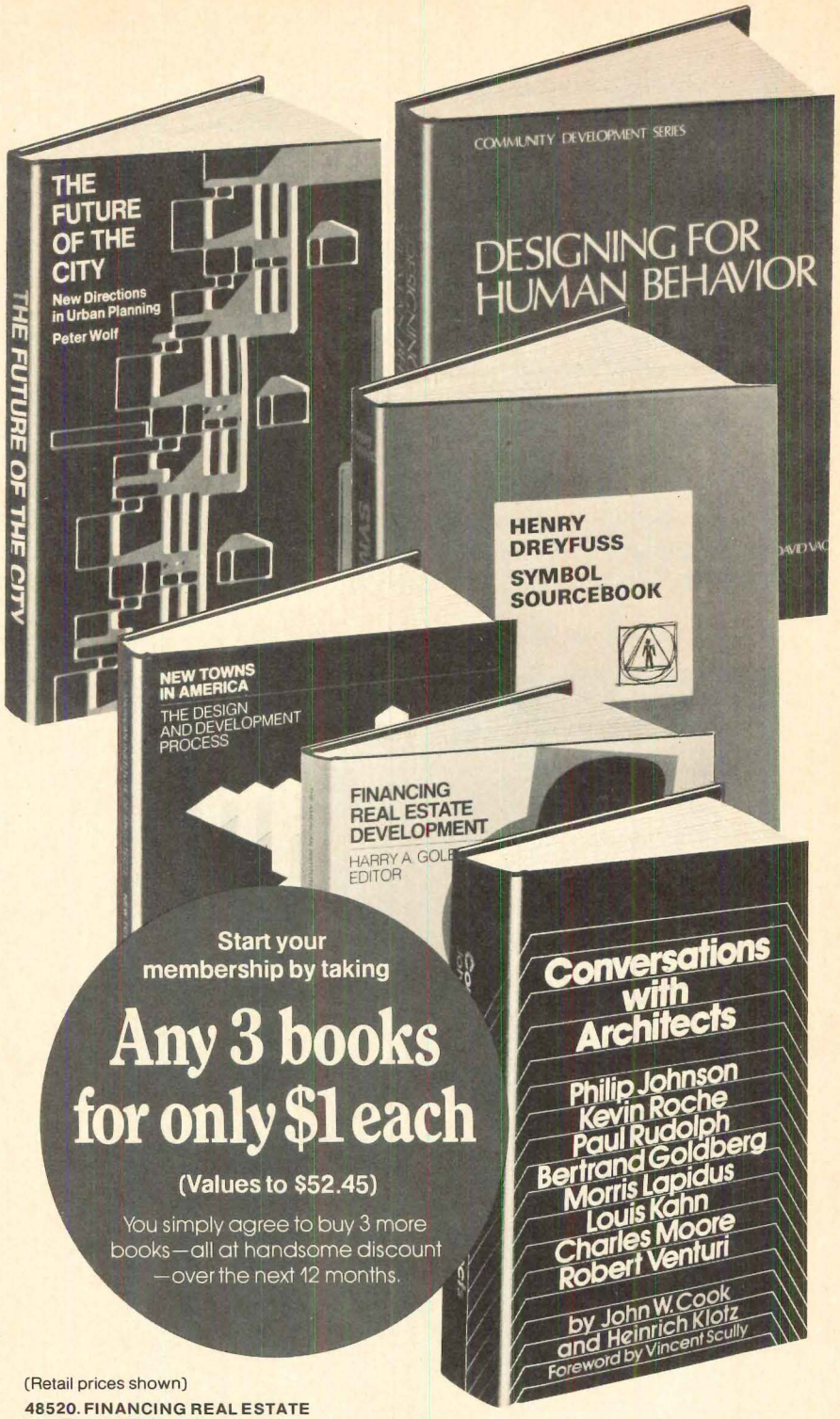

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67720. PEOPLE AND BUILDINGS. *Edited by Robert Gutman.* Thirty-four contributors detail new practical evidence on everything from how office layouts affect workers' morale to the relation of building form to family unity to the design flaws in American student dorms. **$12.50**

50000. THE FUTURE OF THE CITY. *Peter Wolf.* What will be the shape of the urban future? Here is the first comprehensive survey of city planning, and the complex of social, economic, administrative and design issues that critically affect it. Dozens of plans and photographs. *Counts as 2 of your 3 books.* **$20.50**

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48520. FINANCING REAL ESTATE DEVELOPMENT. *Edited by Harry Golemon, AIA.* As more architects move into roles as developers, this AIA-sponsored guide can help avoid any number of hazards. *Counts as 2 of your 3 books.* **$21.50**

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Notices continued from page 128

as manager of the construction service department.

Robert D. Peterson, AIA has been promoted to vice president of William L. Pereira Associates and managing director of the San Francisco project center.

Wolff Zimmer Gunsul Frasca, Portland, Ore., has named the following associate partners: **Raymond A. Boucher, Prescott W. Coleman, Jack Cornwall, Brainard Joy Gannett, Gary H. Larson.** The following are new associates: **Arthur DeRungs, Don Hart, PE, Lee F. Kilbourn, Robert M. Mickelson, John S. Walling, Wallace W. Roeder** and **John A. Moll.**

Ernest E. Kirwan, AIA is a new partner and director of architecture and planning of Keyes Associates, formerly Fenton G. Keyes Associates, Waltham, Mass.

Elias N. Canelos, PE has been appointed a partner of Farkas, Barron & Partners, New York City.

Michael R. Hahn has been named associate in charge of project design for Renshaw & Taylor, North Little Rock, Ark.

Richard B. Warfel is the new head of Chicago operations for Herman Blum Consulting Engineers, Inc.

Alan Schoenegge has been appointed an associate of Childs Bertman Tseckares Associates, Inc., Boston. **Edward C. Hartranft, ASLA** has joined th firm.

Craig W. Lindelow has been named associate vice president of Reynolds, Smith & Hills, Architects-Engineers-Pla ners, Inc., Jacksonville, Fla.

Jack DeBartolo, Jr., AIA has been elected general manager of William Wil & Associates, Inc., Tucson, Ariz.

New addresses

Hans L. Stutz Architect, 30 Cartier St., Ottawa, Ontario K2P1J3, Canada.

John F. Steffen Associates, Consu ing Engineers, 2333 Grissom Dr., St. Louis, Mo. 63141.

Curtis & Davis Architects and Plan ners has opened an office at 2574 Sea gate Dr., Tallahassee, Fla. 32301.

Warren & Van Praag, Inc., has a ne office at 330 Brady St., Davenport, Iow 52801.

Eaton W. Tarbell & Associates Inc AIA, One Merchants Plaza, Bangor, M 04401.

Charles Kober Associates, 643 Fro St., San Francisco 94111.

New firms

David Travers & Associates, busine development and management consul tant firm, 1936 La Mesa Dr., Santa Monica, Calif. 90402.

Philip Carnes & Associates, Inc., 1376 Church St., Decatur, Ga. 30030.

George J. Donovan, RA and Richard Hallowell, Jr., PE have formed **Creativ Design Associates Inc.,** 530 W. Stree Rd., Warminster, Pa. 18974.

Decker/Barnes Architects and Pla ners, 747 Bellevue Ave. East, Seattle, Wash. 98102.

Anthony C. Belluschi, AIA and Em manuel P. Daskalakis, AIA have forme **Belluschi/Daskalakis Inc., Architects** 286 Summer St., Boston, Mass. 02210

R. Landon Doggett AIA, 324 Twelft St., Huntington, W. Va. 25701.

Daniel W. Louis and Edgar C. Haag have formed **Louis-Haag, Landscape Architecture,** Atlas Bldg., 604 Mission St., San Francisco 94105.

INTERACT, Inc., architecture and con struction management, 403 Massachu setts Ave. and 3 Bulette Rd., Acton, M

Nelson W. Aldrich & Associates, A chitects, 100 Boylston St., Boston, Mass. 02167.

Robert L. Nichol, NSID and Jack L Hillman have formed **Design Group,** 6560 Singletree Dr., Columbus, Ohio 43229.

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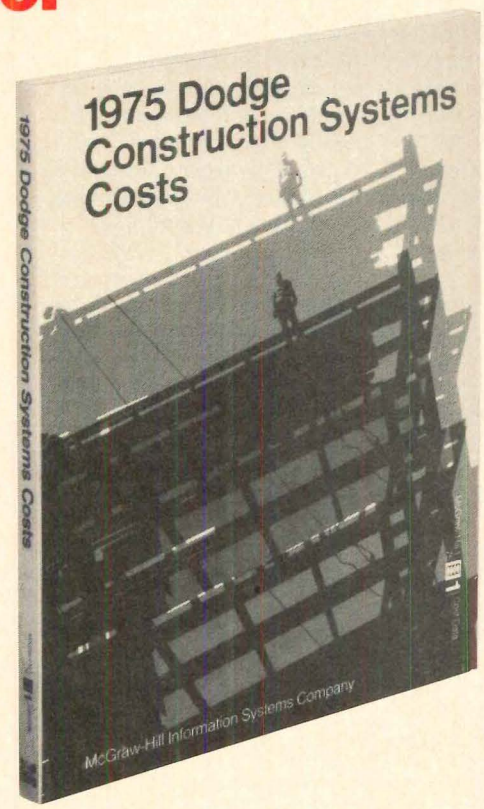

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Design Architect and Job Captains: Western Canada—Wanted—imaginative design architect and job captains. A clean environment and an excellent opportunity for stimulating involvement in a number of exciting major projects is available. Do yourself a favor and write for an interview to: A. Dale & Associates, Architects, Engineers, Town Planners, Suite 1010, 125 Ninth Avenue, S. E., Calgary T2G OP6, Alberta. Phone (403) 265-4781.

Faculty Position: Open for September 1974. Architect wanted to teach fundamentals of design, architectural graphics and Introduction to Architecture and Planning Concepts (literary course). Minimum requirements: M. Architecture degree and two years teaching experience. Professional experience desired. Salary and rank comensurate with qualifications. Send resume and three letters of reference to: John H. Spencer, Chairman, Department of Architecture, Hampton Institute, Hampton, Virginia 23668. Hampton Institute is an equal opportunity employer!

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Position Available—Education: AIA approved program in architectural technology is accepting applications for faculty position available Fall 1974. AIA registration and/or master's degree desirable. Areas of instruction in curriculum include drafting, graphics, history, working drawings, design, engineering, estimating and specifications. Send resume to: Assistant Dean Donald Harbert, School of Technical Careers, Southern Illinois University at Carbondale 62901.

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[continued on page 136]

in October P/A in October P/A in October P/A in

A major portion of the October P/A is devoted to the subject of **Housing,** an area where needs remain great though activity is at a low — where sound models for the future are rare.

Low-rise housing at Kingston, N.Y. by architects Wells/Koetter/Dennis represents the latest evolutionary step for the state's precedent-setting Urban Development Corporation. Included will be a critique by architect Werner Seligmann and a P/A cost analysis.

A follow-up study, ten years after, will extract lessons from the Peabody Terrace Married Students Housing at Harvard, by Sert, Jackson & Gourley.

A modular housing scheme by architect **Paul Rudolph** was the basis for an exciting single-family house. Both the custom-made prototype and the long-range objectives will be discussed.

Architecture in Cuba will be the subject of a thoughtful analysis by architect Suzanna Torre, who has recently toured Cuban cities and countryside. Her knowledgeable observations cover re-use and "annotation" of older buildings, as well as current policy and design.

Interior design for October will explore the potential of loft space for housing to suit a variety of lifestyles.

Technics will take up the use of the **computer for spec writing** and available techniques for **applied fireproofing.** Specifications clinic will take up codes and testing for **fire hazards.**

in November

An entire issue of P/A will deal with **Interiors,** from some unaccustomed — and critically important — viewpoints. First-hand reports will cover research on space needs and criteria, development of interior planning and design methods now being carried out by independent groups such as REDE and BOSTI, by agencies such as New York's UDC, and by major interiors manufacturers.

Job mart continued from page 134

position will be available in either the Utica, New York or Greenville, South Carolina office of the firm. Submit resume and representative portfolio material to The Stetson Partnership, 185 Genesee St., Utica, New York 13501.

Sales Representative: Representative architectural model firm seeks western states sales representation to contact architectural and engineering firms as manufacturers representative. Attractive commission arrangements available. Reply: Architectural Models, Inc., 361 Brannan Street, San Francisco, California 94107.

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Architect: AIA, NCARB, young athletic 50 desires position in Tampa Bay area, Caribbean, or Overseas, 24 years comprehensive experience University buildings, schools, housing, hospitals, and general practice. Phasing out 7 year private practice. Strong in construction supervision, contract negotiation, administration and project followup. Own home in Georgia and condominium in St. Pete. Former V.P. of one of South's largest A & E firms. Desire responsibility and travel. Housing for wife and self required overseas. Only executive salary accepted. Resume on request, Sterling E. Wilhoit, Jr., P. O. Box 5899, Athens, Ga. 30604, Tel. 404-769-6389.

Architect: Corporation executive, five billion industrial and commercial expertise. Retired. Available for advanced planning, consultation, analytical work and/or management assistance. Service offered to business and/or developing countries on short term basis. Reply to Box #1361-737, *Progressive Architecture.*

Architect: Pakistani registered architect with 5 years diversified experience in Pakistan and U.S.A. seeks position with architectural/engineering offices working in Middle-east countries or preferably in Pakistan. Capable of rational design, experienced in directing a team toward this end. Would like long term association with full design responsibility. Reply to Box #1361-738, *Progressive Architecture.*

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