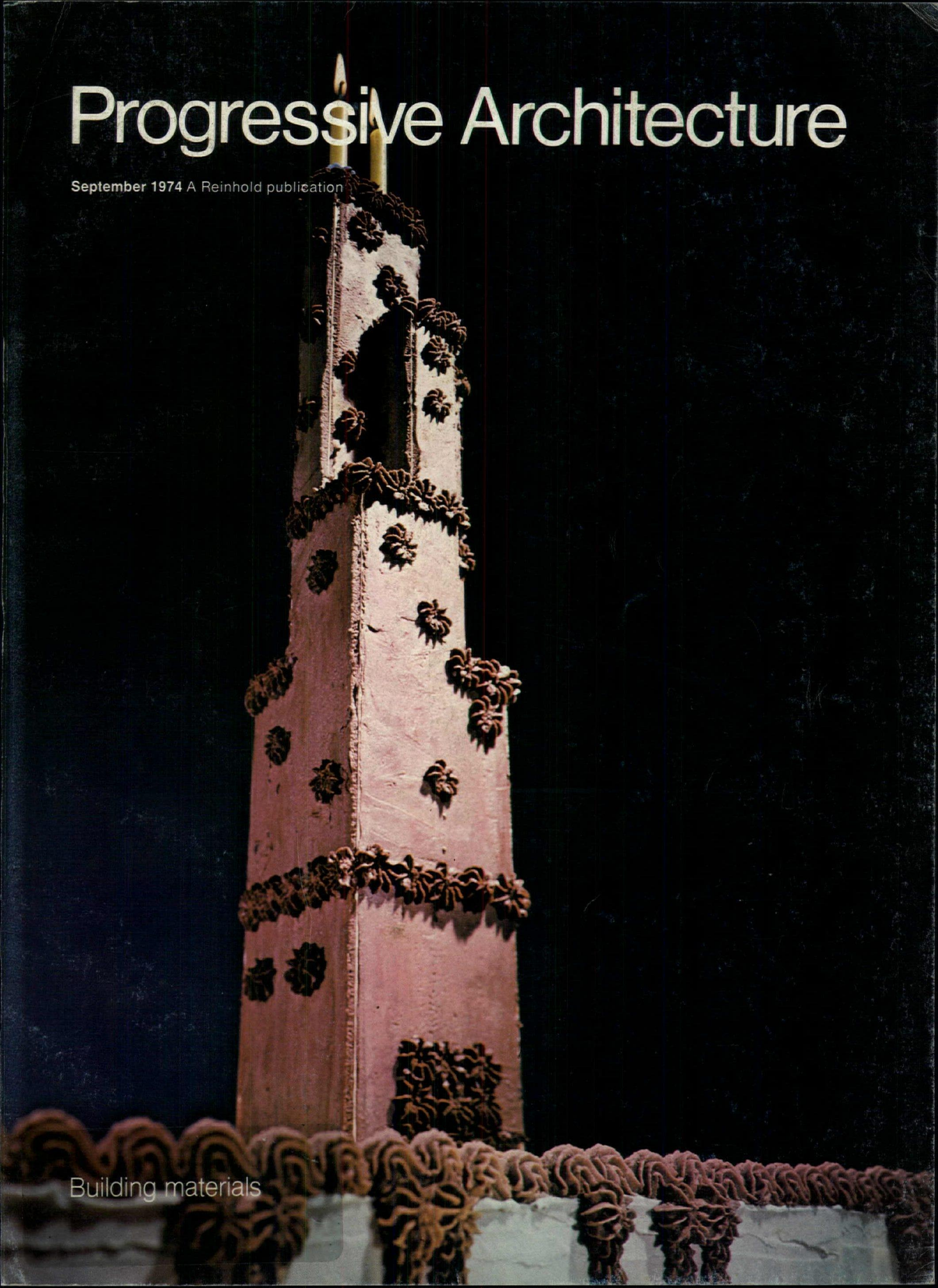
Progressive Architecture

September 1974 A Reinhold publication



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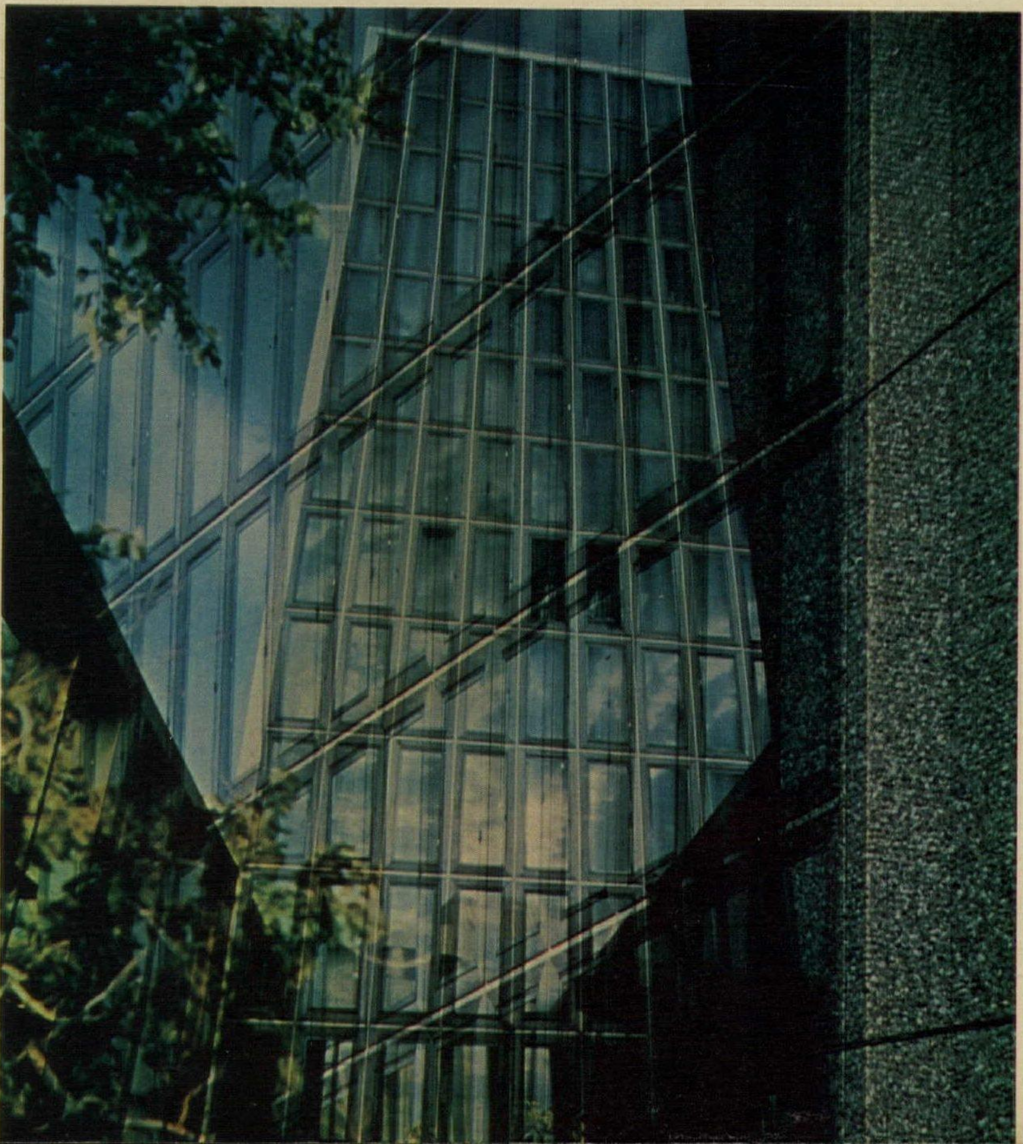

Which couple works in a sprinklered building?

It's hard to believe, but most mannequins are better protected against fire than man. Department stores are sprinkler protected. So are warehouse and manufacturing facilities. But most high rise buildings—where more and more of our population work and live—are not.

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Whether you're a building owner or developer, an architect or specifying engineer, you should be aware of this growing trend toward life safety. Facing the future *now* and learning all you can about sprinklering properly could save you money in the future when you come face to face with one of these tough new codes.

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ABP

September 1974

Progressive Architecture

Building materials

Technics

Departments

Cover: Sears Tower, SOM, 1973, Chicago. An interpretation in chocolate fudge by Mario Cappabianca and Dorothy Keane.

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Letters from readers

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 Minimal 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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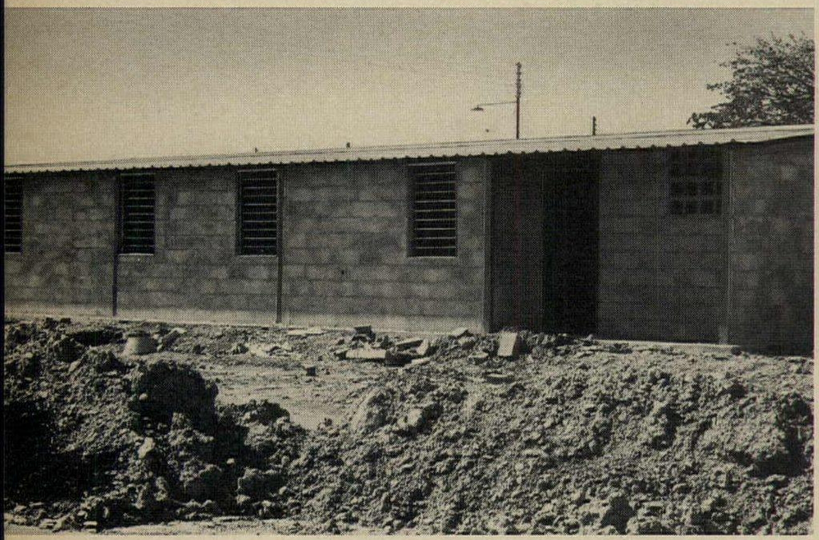

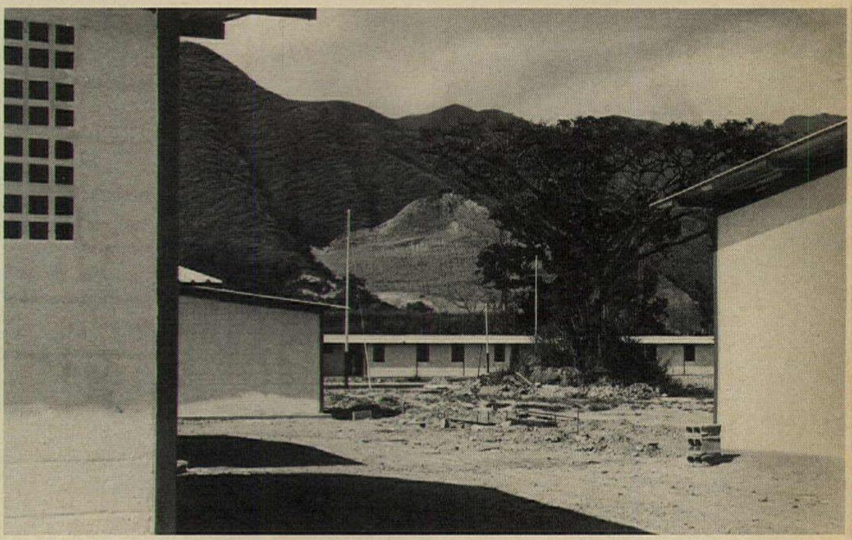

Venezuela Housing Project   Developers: Banco Obrero, the Housing Authority of Venezuela

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IS THIS THE FUTURE OF GLASS BUILDINGS?

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

In the search for a scapegoat the recurring theme has become: get rid of glass.

Glass, we're told, wastes energy.

Glass buildings have been labeled "energy sieves."

Glass vision area has come to be thought of as a necessary evil (if, indeed, all that necessary).

Rash solutions are a dime a dozen.

And virtually all these solutions are just arbitrary proscriptions against the amount of glass used.

The fact of the matter is that compared to marble, steel, aluminum or wood, only wood insulates better than glass. Even so, since insulated backing can equalize them all, the argument against glass in nonvision areas becomes moot.

But of the five, only glass is transparent. So for vision areas there's not much choice.

Another fact is that in a typical 10- to 20-story building a mere 15% of the energy consumed goes to compensate for heat gained or lost through the walls and ceiling.

And that's using basic ¼" single-glazed clear glass.

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PPG Solarban Twindow reflective insulating glass fits in so perfectly with the demands created by the energy crisis that you might think it was designed specifically to meet them.

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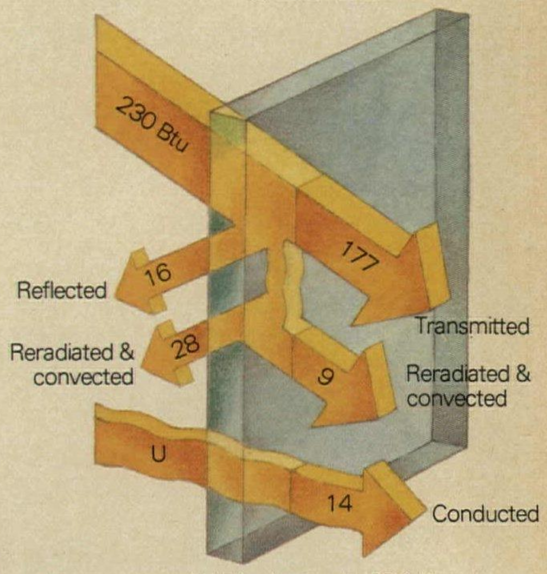
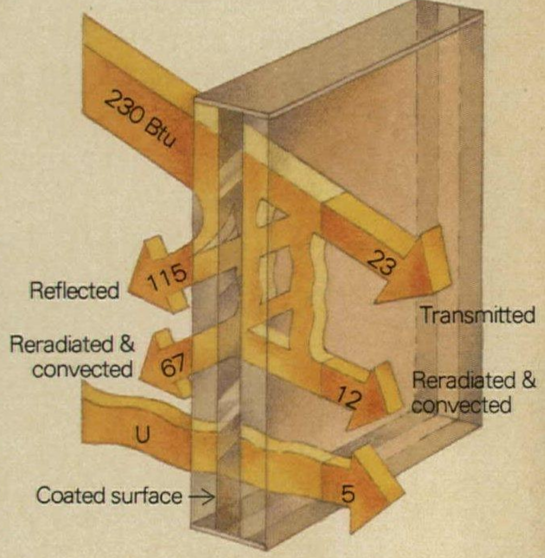


Relative heat gain, 200 Btu

Solarban® 575-20 Twindow® Unit



Relative heat gain, 40 Btu

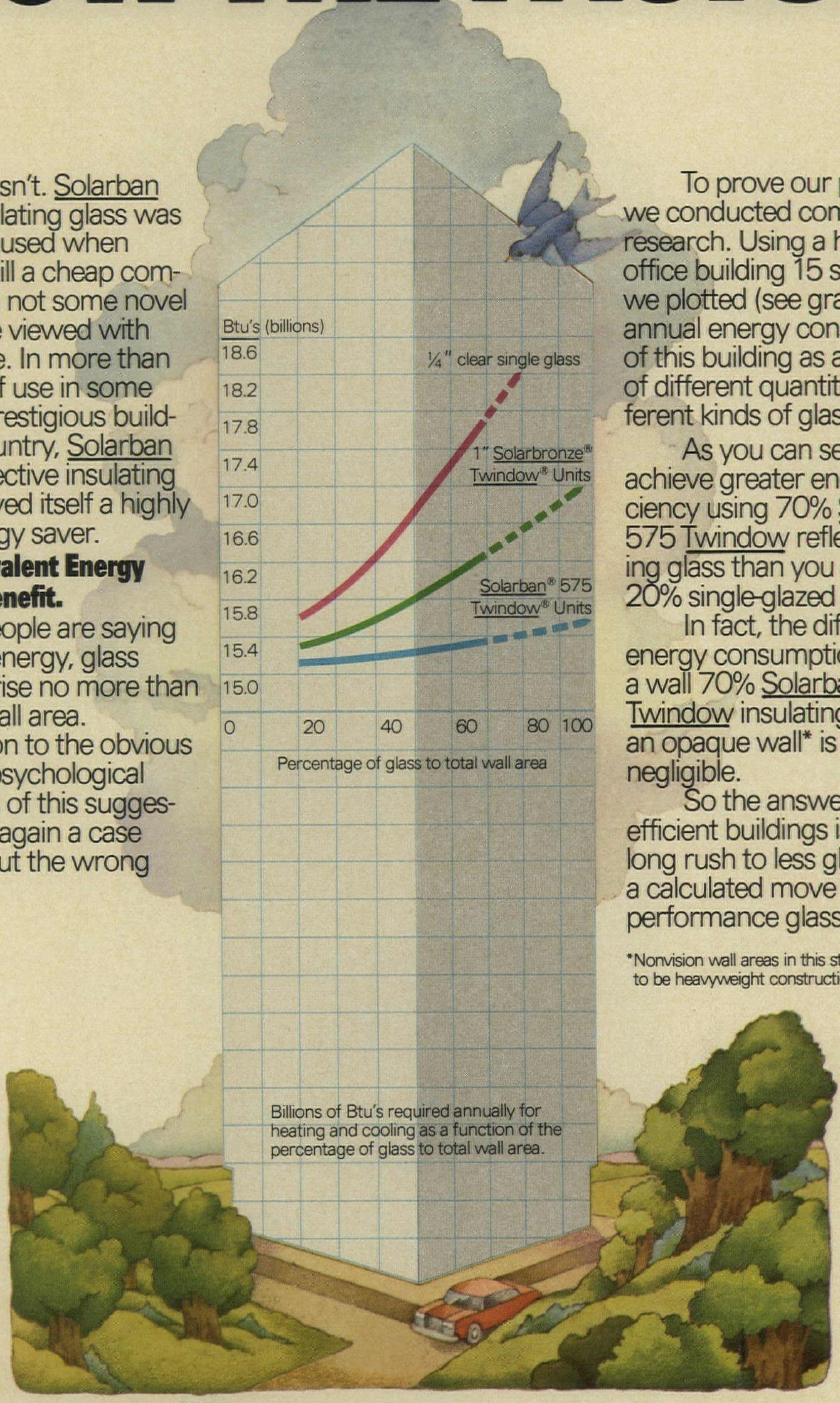
KNOW THE FACTS.

But it wasn't. Solarban Twindow insulating glass was already being used when energy was still a cheap commodity. So it's not some novel curiosity to be viewed with a skeptical eye. In more than seven years of use in some of the most prestigious buildings in the country, Solarban Twindow reflective insulating glass has proved itself a highly effective energy saver.

The Equivalent Energy Benefit.

Some people are saying that, to save energy, glass should comprise no more than 20% of the wall area.

In addition to the obvious esthetic and psychological shortcomings of this suggestion, it's once again a case of talking about the wrong kind of glass.



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.

As you can see, you can achieve greater energy efficiency using 70% Solarban 575 Twindow reflective insulating glass than you can with 20% single-glazed clear glass.

In fact, the difference in energy consumption between a wall 70% Solarban 575 Twindow insulating glass and an opaque wall* is virtually negligible.

So the answer to more efficient buildings is not a headlong rush to less glass, but a calculated move to high-performance glass.

*Nonvision wall areas in this study are presumed to be heavyweight construction (U=0.09).

Part of The Celotex Team, geared to deliver. From top left clockwise: Brasher, Rissmiller, Waine, Hasselbach, Riley.

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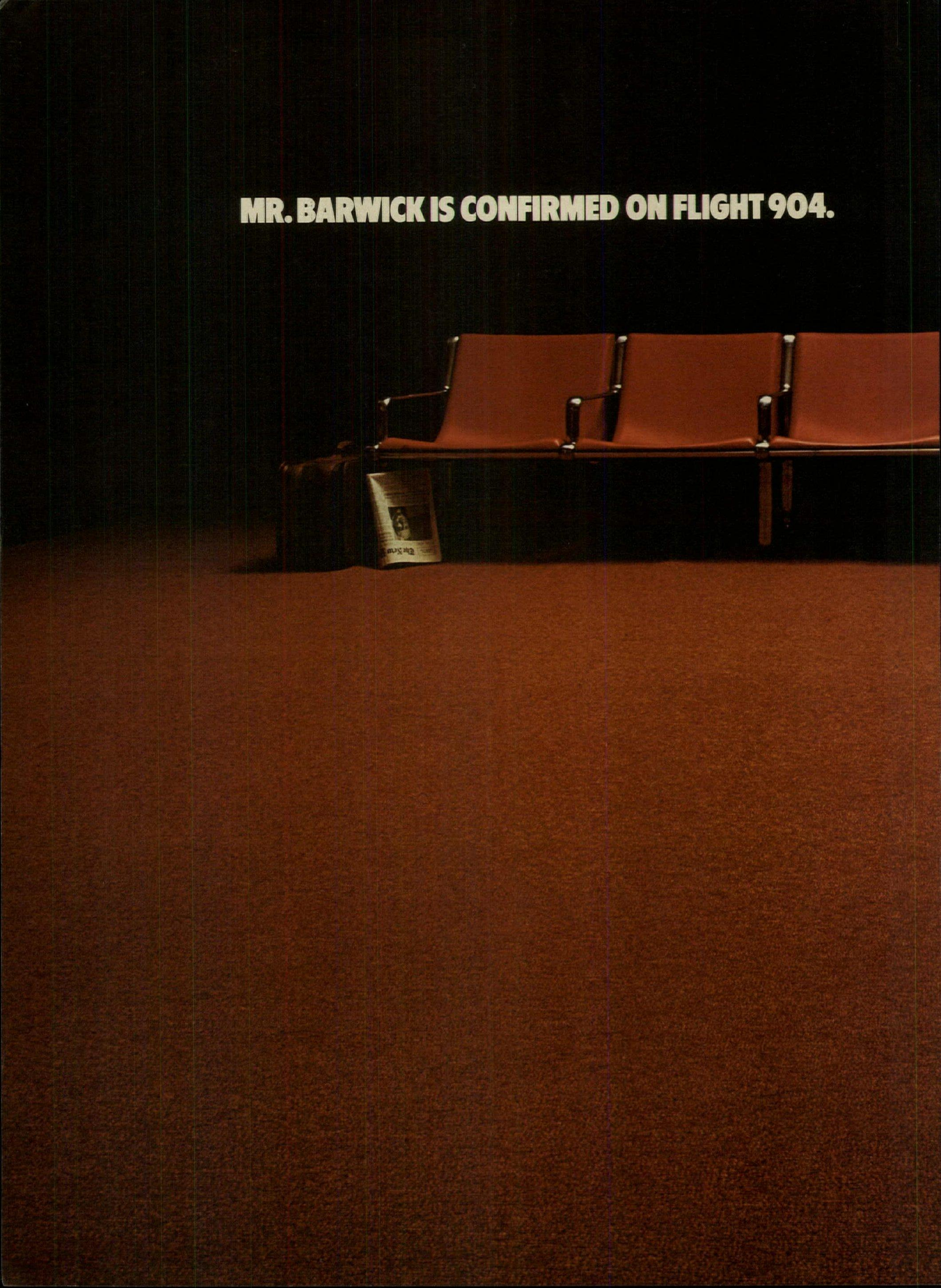
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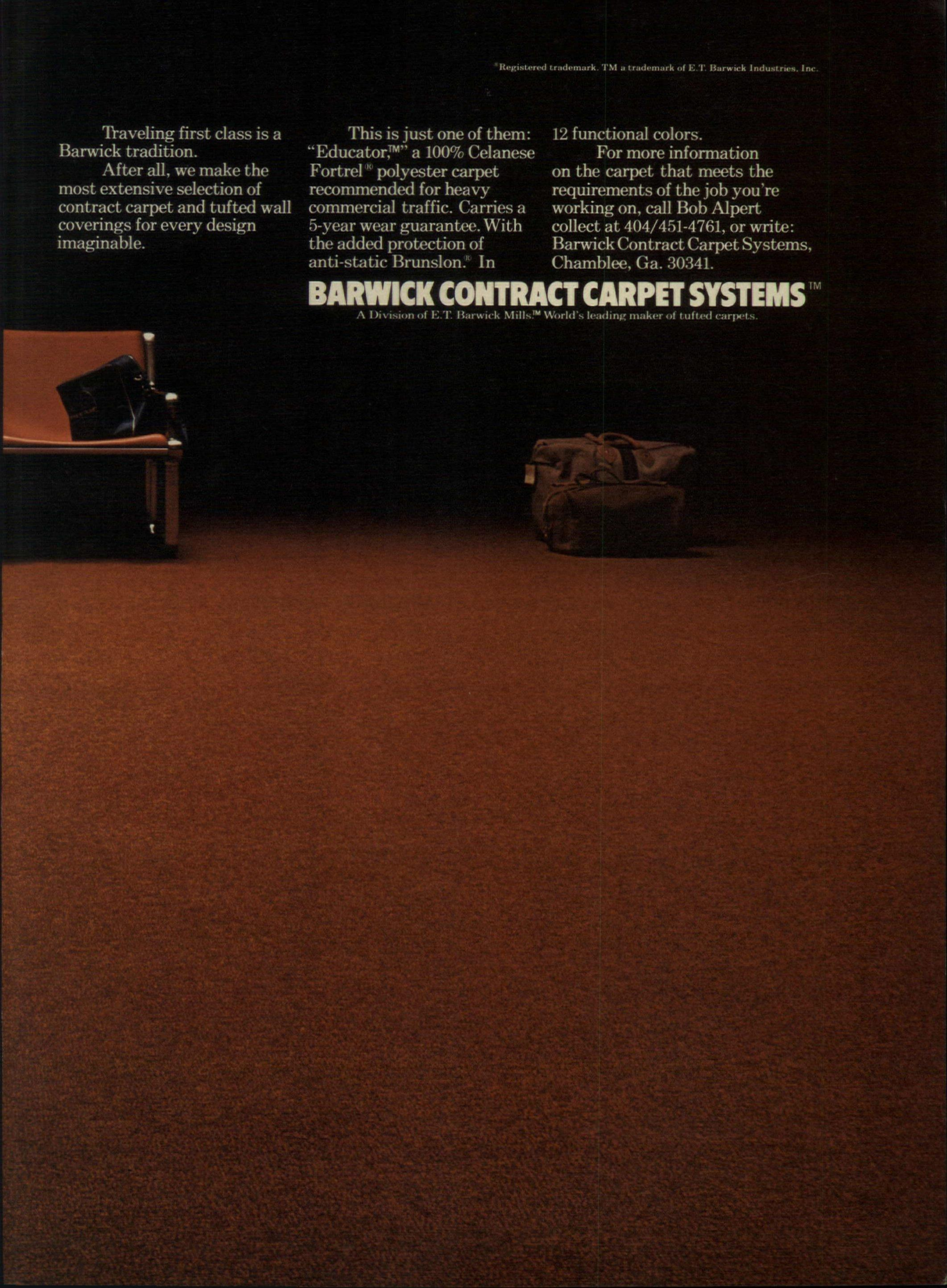
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News report

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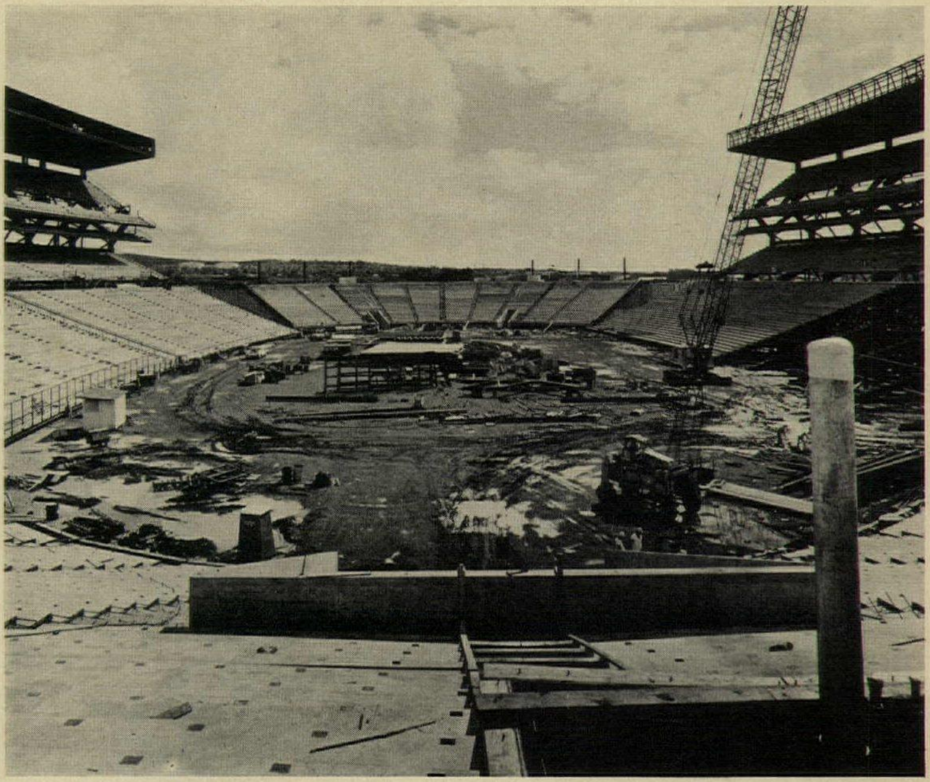


Oahu Stadium nearing completion in Honolulu

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.

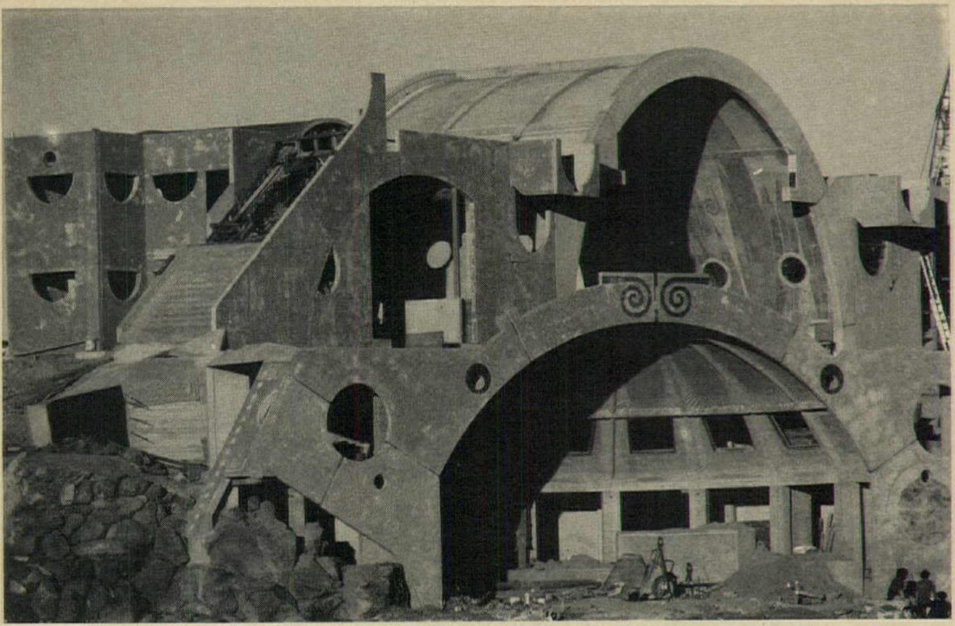
The HD & C suit, filed in Federal District Court, Honolulu, is seeking punitive damages of $1 million and actual damages in excess of $10,000. Luckman is suing for $5 million in damages. Of primary concern is the malfunction of a seating mechanism that would move four grandstands 140 feet to convert 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.

New look for News report

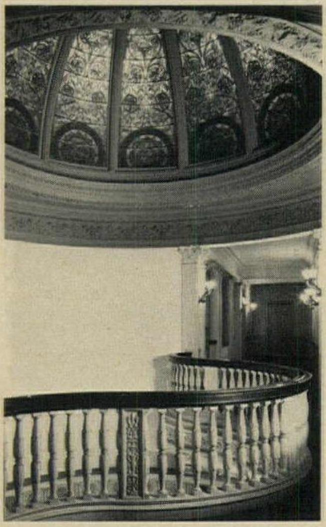
Beginning with this issue, P/A's News report will appear in a three-column format with larger headlines to give its readers a faster-paced news section and to further emphasize the distinction between news and editorial features. At the same time, News report has changed the title of "Buildings on the 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.

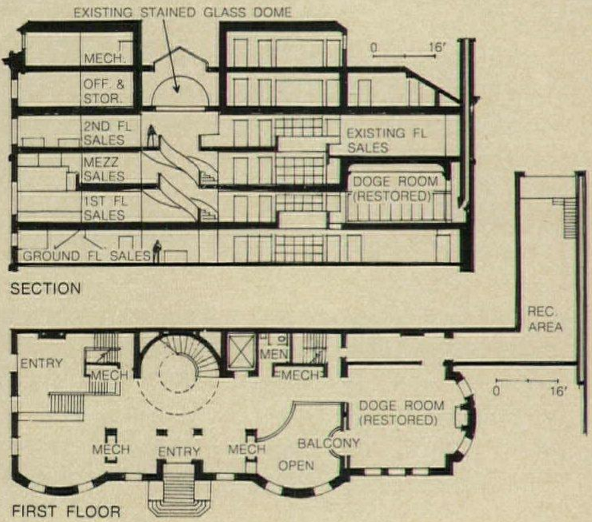
"Architecture west" was renamed



Arcosanti and workers. Photo: Ivan Pintas

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





News report

"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.

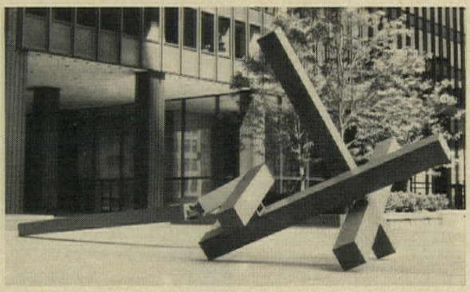
"Naturally when you go into a building of that type you want to save everything," said Colin Smith of Architectural Resources. As planned, however, the first three floors substantially will be gutted and a mezzanine added. Among the more outstanding items in the path of renovation are a stained glass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

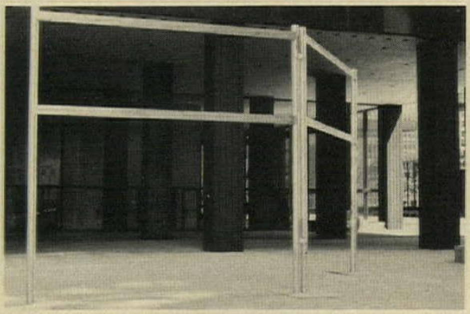
AID and NSID vote to merge

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.

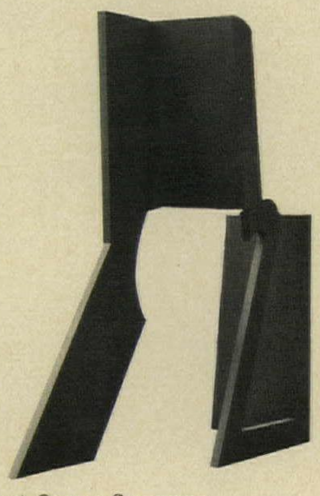
"Burlap Man," William King



"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.

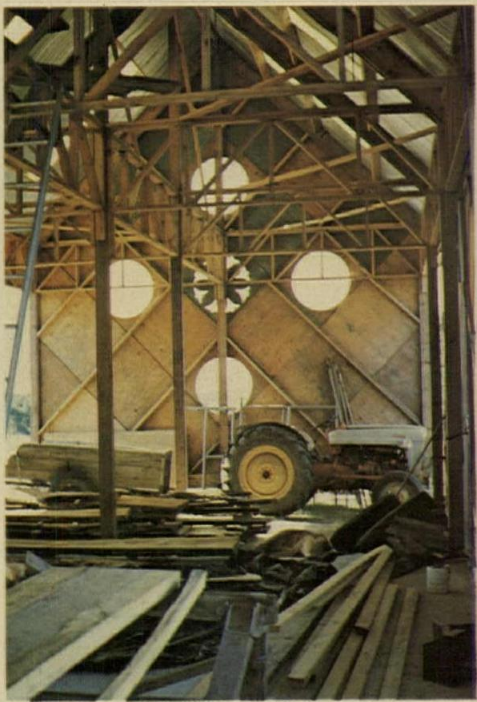
De facto ban against plastics

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.

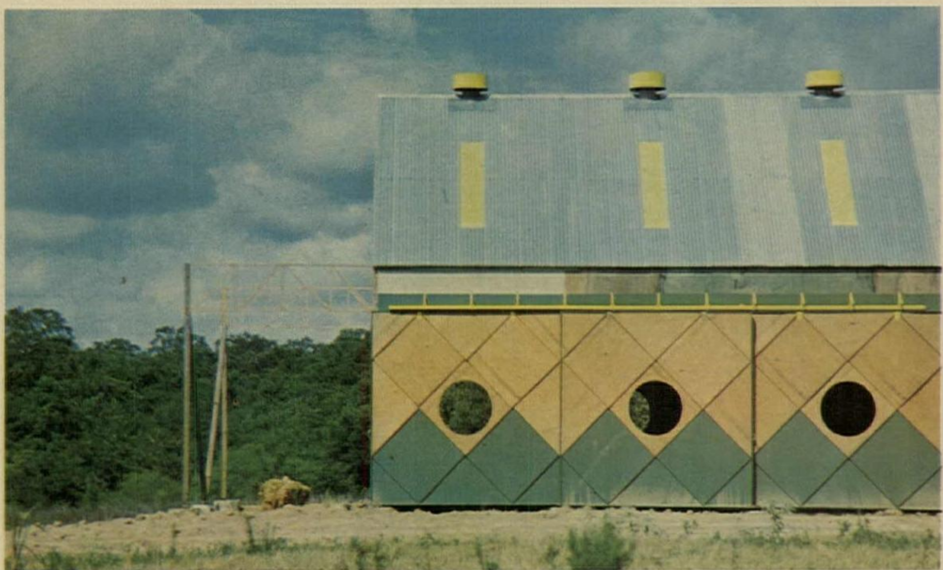
The FTC, after nearly two years of investigation into fire characteristics of the plastics, has obtained "consent decrees" from 25 manufacturers that will: 1) Prohibit use of words such as "nonburning," "self-extinguishing," and "noncombustible" in advertising or sales literature concerning these materials 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

News report

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.

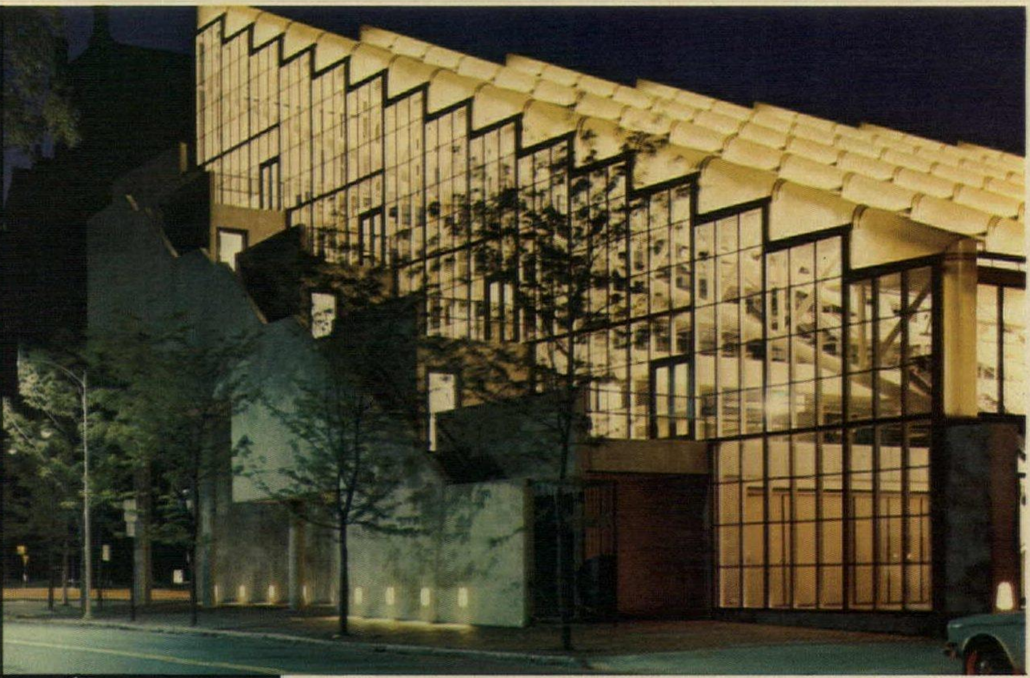
The barn is two-stories high and serves as a workshop, garage, apartment, and parking space for assorted vehicles including a road grader which the community, called Peaceable Kingdom School, bought from a retiring contractor. The project, near Houston, Texas, is by Architects Incahoots & Associates 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.

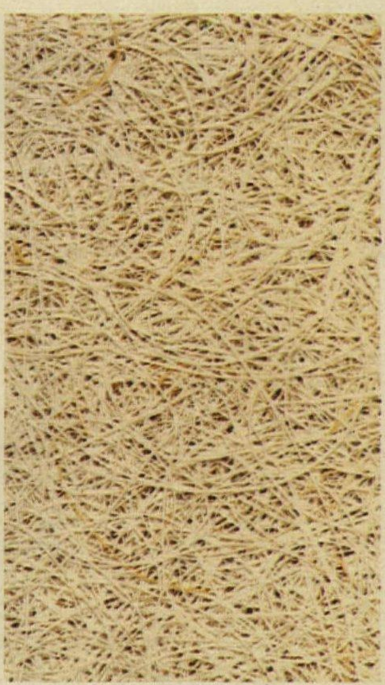
Incahoots is a two-year-old design and planning firm of four partners who first collaborated on a senior project at Rice University designing an inner-city shopping mall. Since then they have worked on two houses, several office extensions, a small bank, loft houses—which won't be built—and a men's store.

[News continued on page 28]

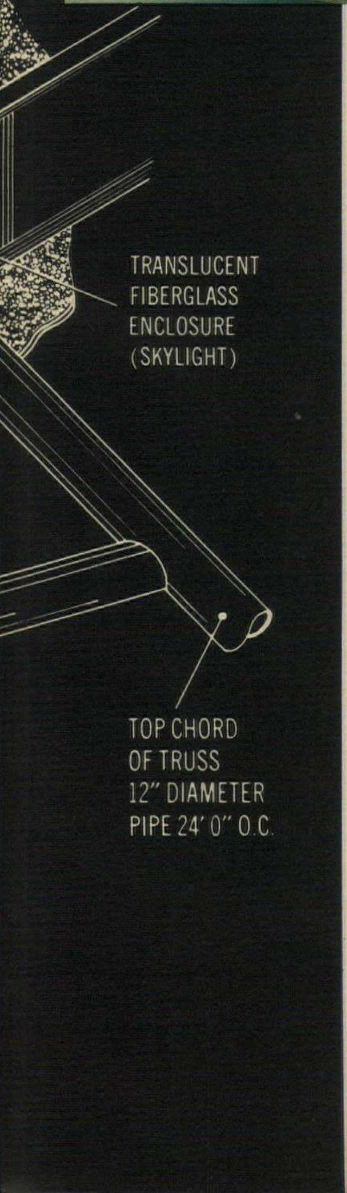
structural, acoustical.



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.

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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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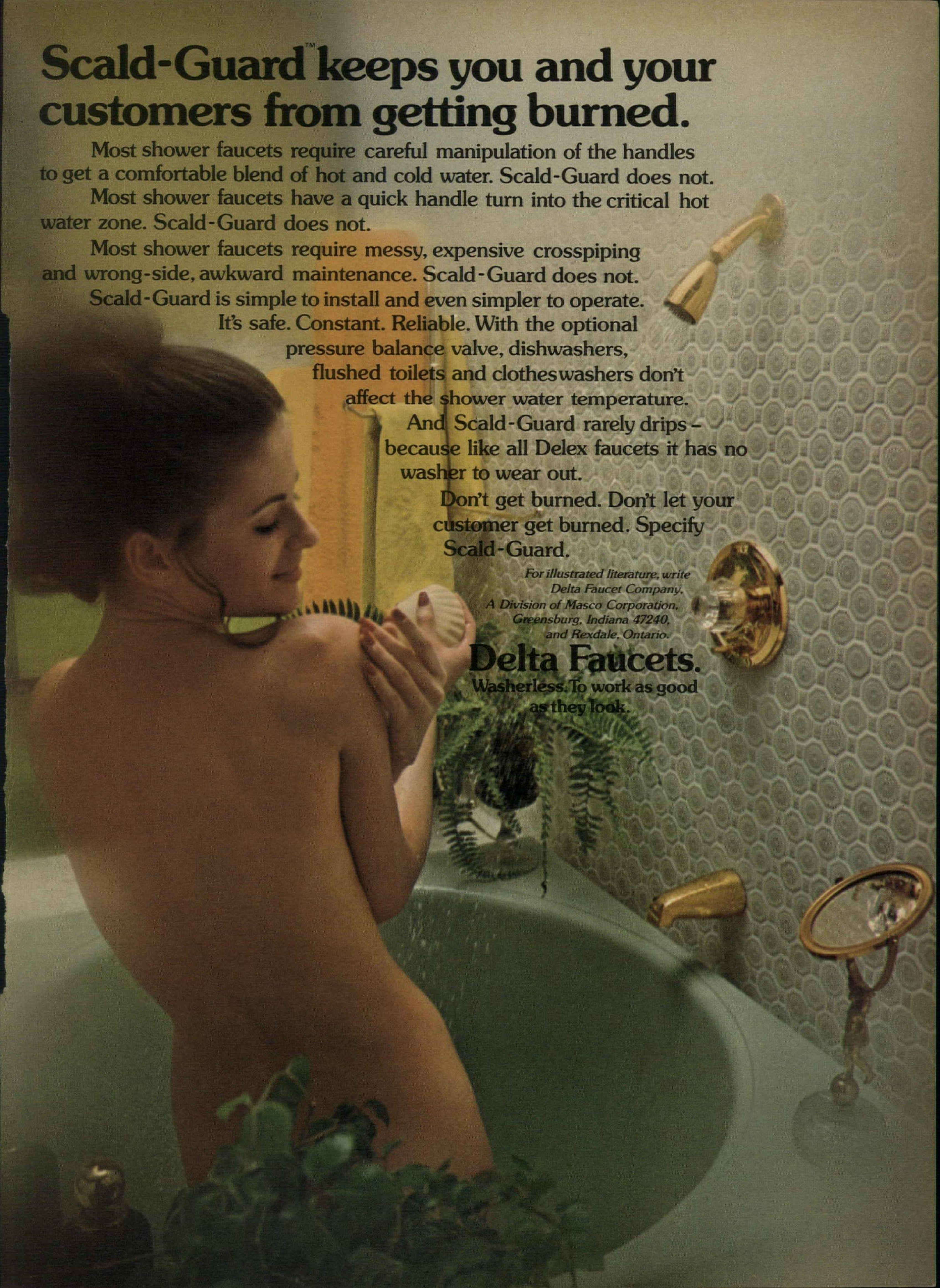
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News report continued from page 28

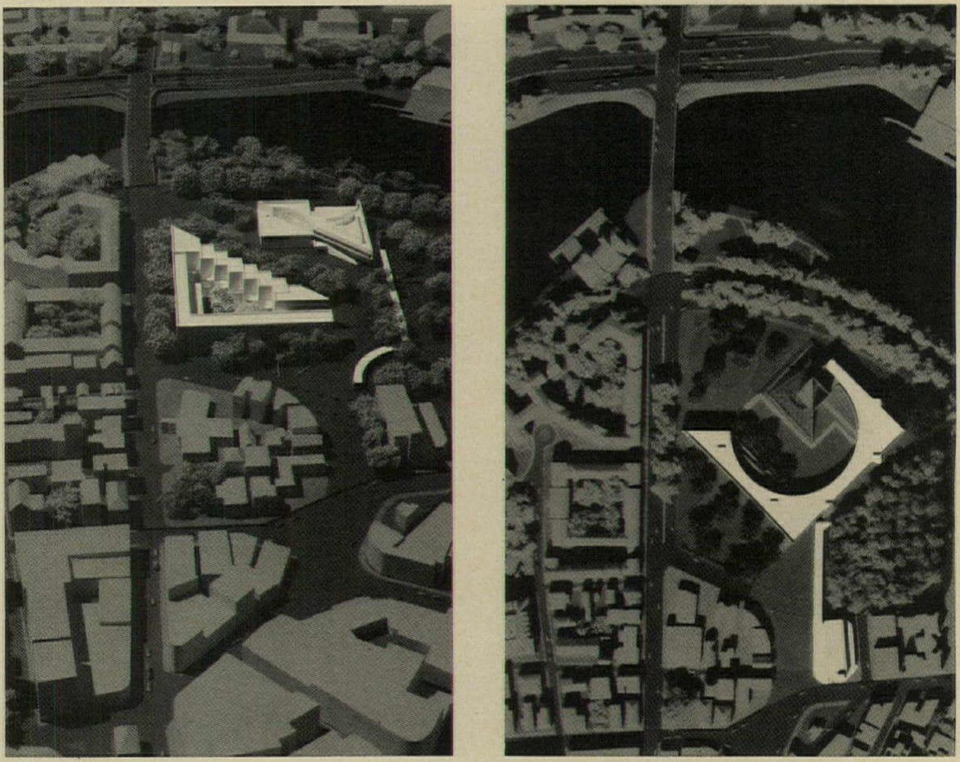
JFK Library: still facing objections

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.

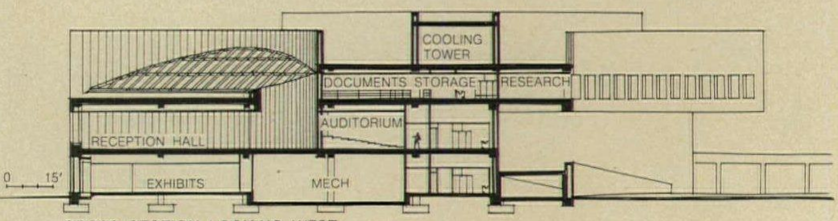
The new plan has abandoned several key design elements of the first proposal. Now the library and a companion academic building belonging to Harvard no longer are joined forming a protective enclosure for the future Commonwealth Park to be located on the site. The two buildings are separated so as to 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

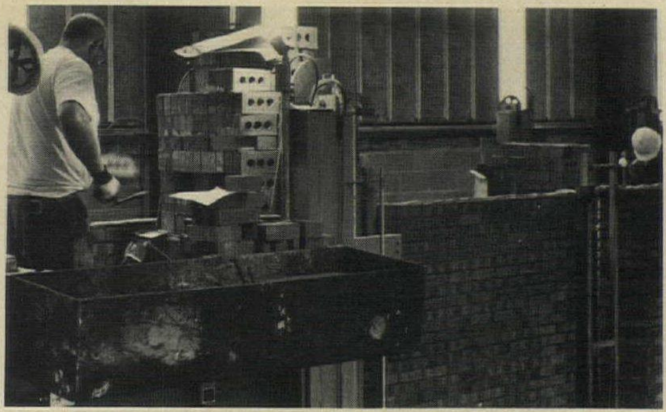
News report continued from page 32

Personalities

Richard Bender has been appointed chairman of the Department of Architecture, College of Environmental Design, at the University of California, Berkeley.
Don P. Schlegel, AIA is the new president of the Association of Collegiate Schools of Architecture, Inc., Washington, D.C.
Hubert B. Owens, dean emeritus of the School of Environmental Design at the University of Georgia, has been named president of the International Federation of Landscape Architects.
O. Jack Mitchell has been appointed director of the School of Architecture, Rice University, Houston, Tex.
Ellis K. Waterhouse has been named Samuel H. Kress Professor in Residence at the National Gallery of Art, Wash., D.C.
Theodore T. Bartley, Jr. of Bartley, Long, Mirenda & Reynolds has been appointed to the architectural advisory committee to the Philadelphia Historical Commission.
Fred J. Davis, Building Department Superintendent and Assessor of Garden City, N.Y., has been elected president of Building Officials and Code Administrators International, Chicago.
Joseph G. Sprague has been named director of the division of design and construction for the American Hospital Association, Chicago.
Robert Martin Engelbrecht, Princeton, N.J., has been elected to the executive committee of the National Academy of Science's Building Research Advisory Board.

Calendar

Through Sept. 30. Visionary Projects for Buildings and Cities exhibition by Reginald Malcolmson, University of Michigan Museum of Art, Ann Arbor.
Sept. 18–22. Convention of the National Association of Women in Construction, Fairmont Roosevelt Hotel, New Orleans.
Sept. 27. Conference on construction management sponsored by Washington University, St. Louis, Mo.
Sept. 29–Oct. 3. Conference of the National Association of Housing and Redevelopment Officials, Boston.
Sept. 30–Oct. 2. Inter-Noise 74, International Noise Control Engineering Con-
[continued on page 39]



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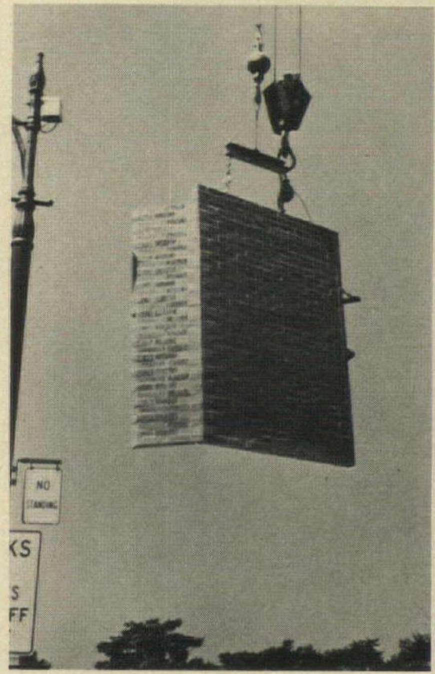

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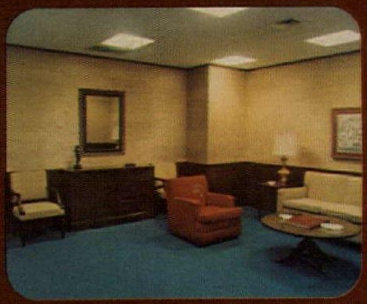

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News report continued from page 35

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]

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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

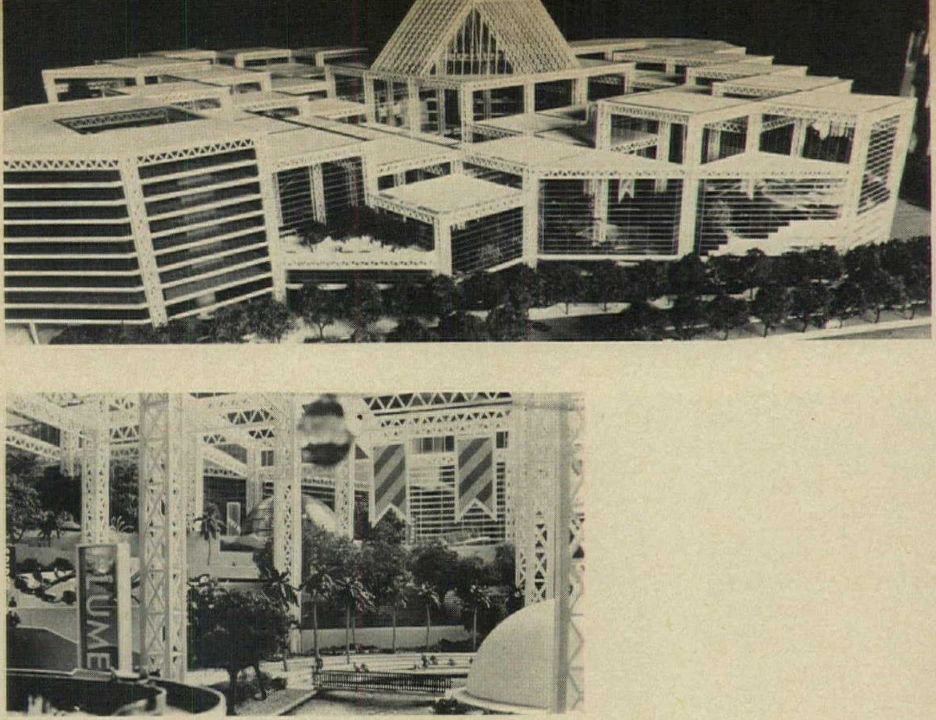
Representatives of 18 major construction industry organizations—including AIA, ASCE, landscape architects, and most leading contractor groups—met in Washington in early August looking for "one voice" to speak for the construction industry. The meeting was called by the Associated General Contractors 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]

News report

In progress



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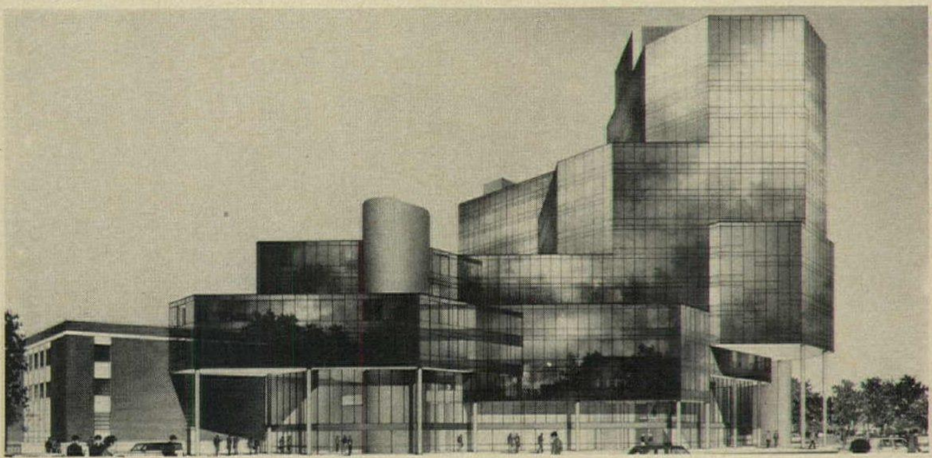
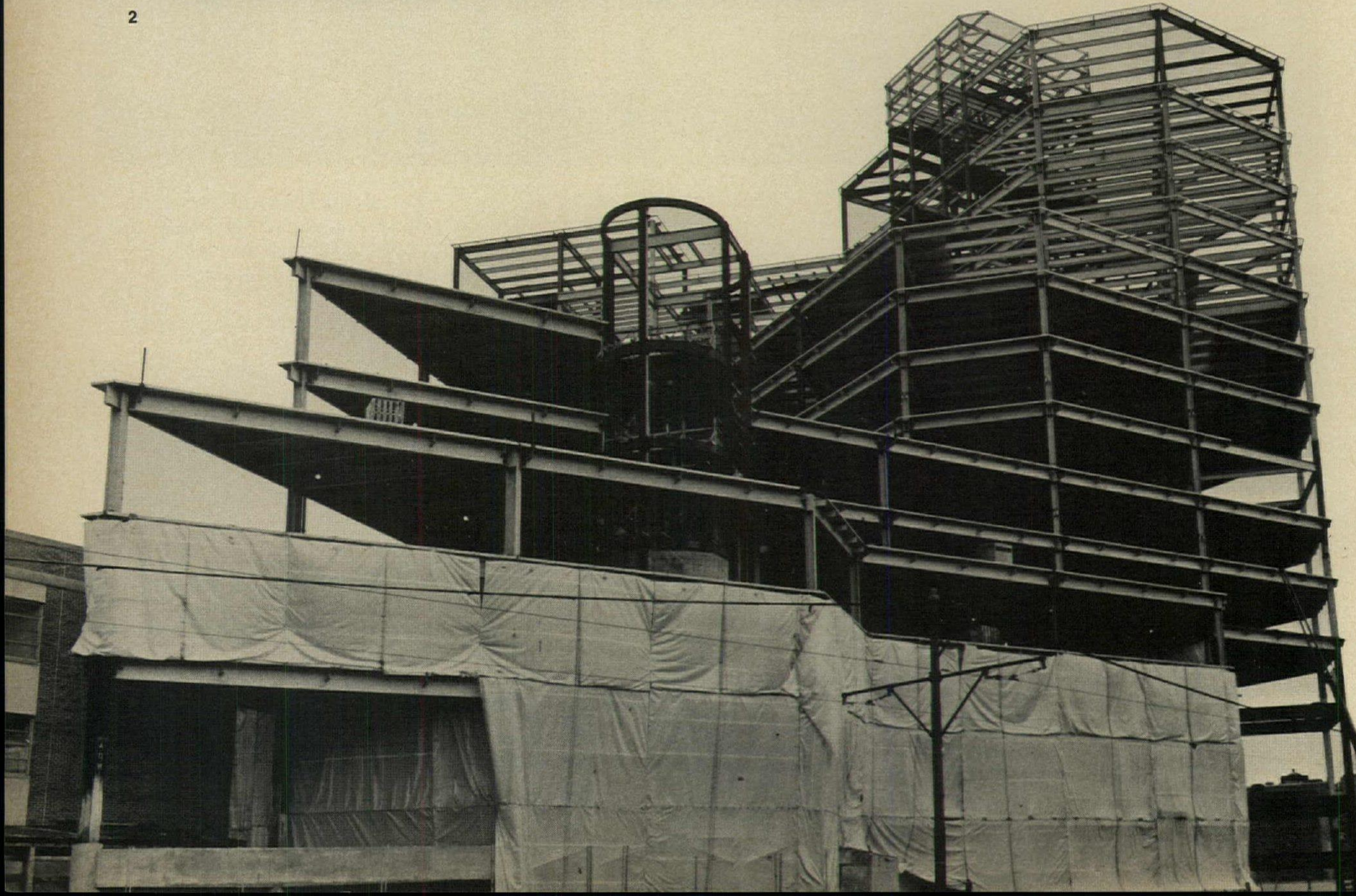


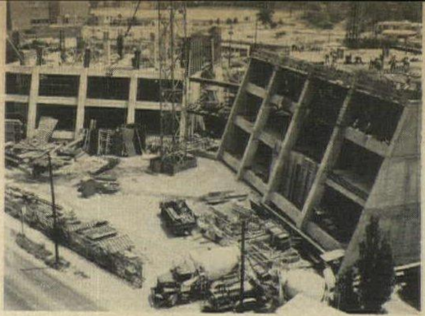
2

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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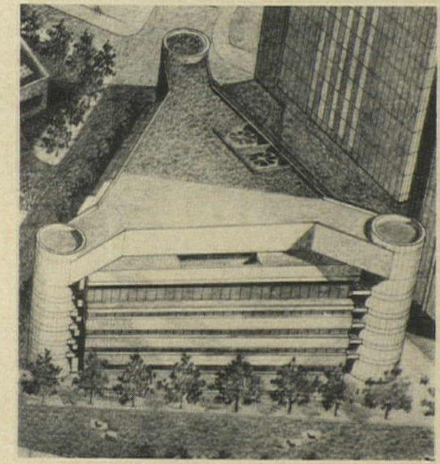

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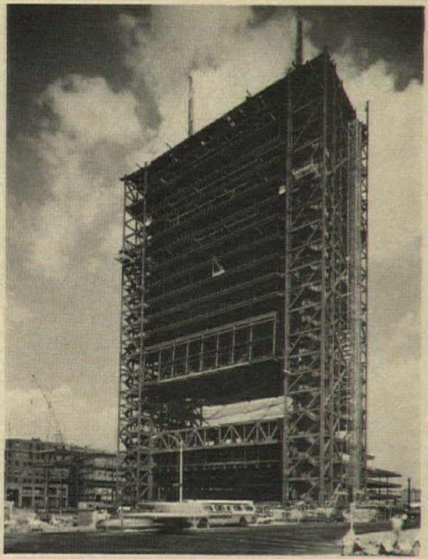
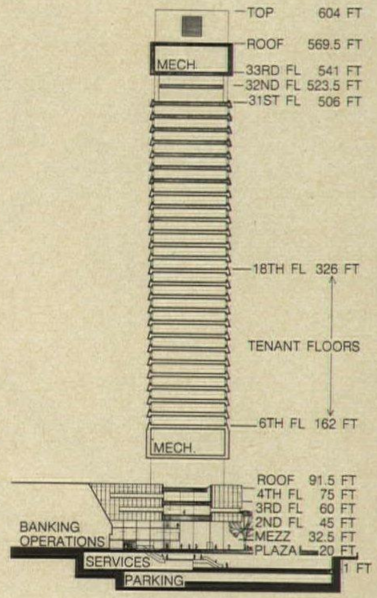
4 Murray Bergtraum High School—The dark brown brick finish of a six-story high school in downtown Manhattan near Wall Street is just about complete, and within a year the building will be ready for occupancy by 2600 students preparing for business careers. Designed by Gruzen & Partners, New York, the 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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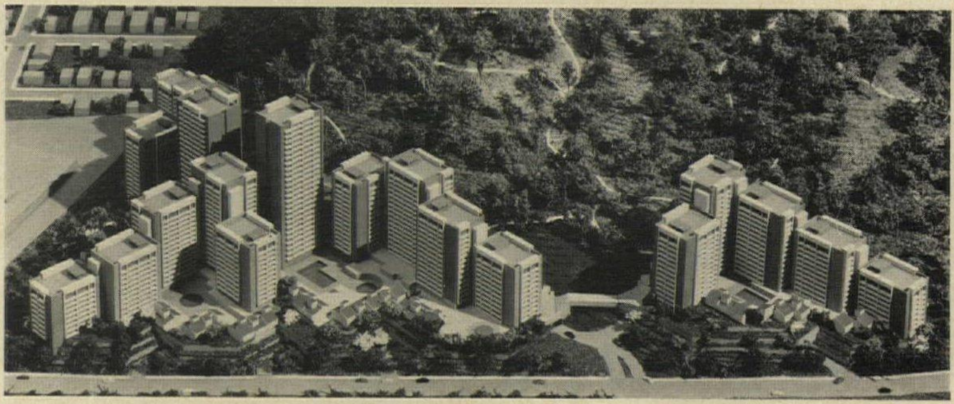
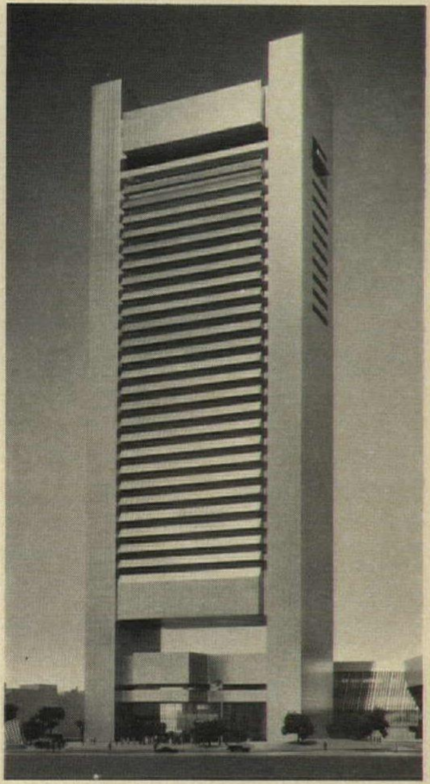
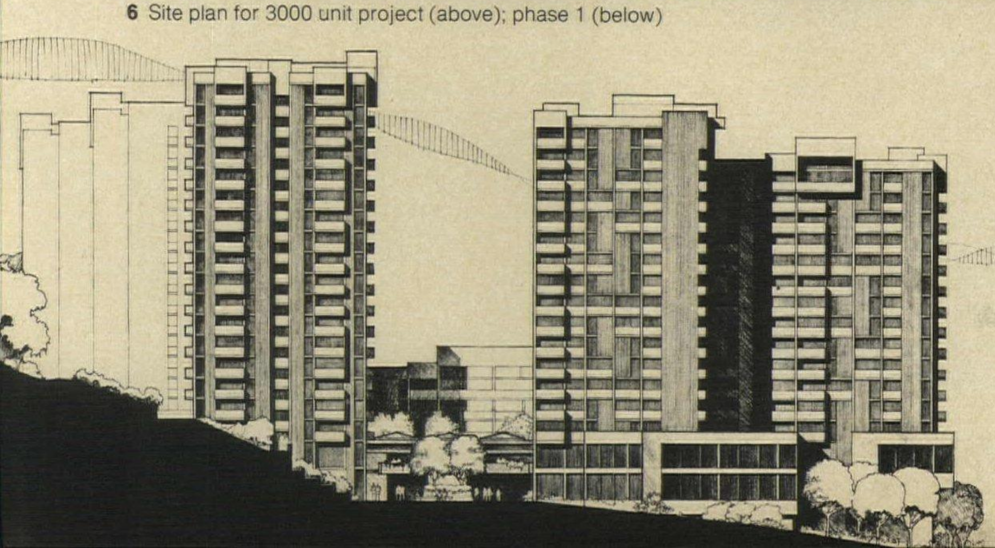
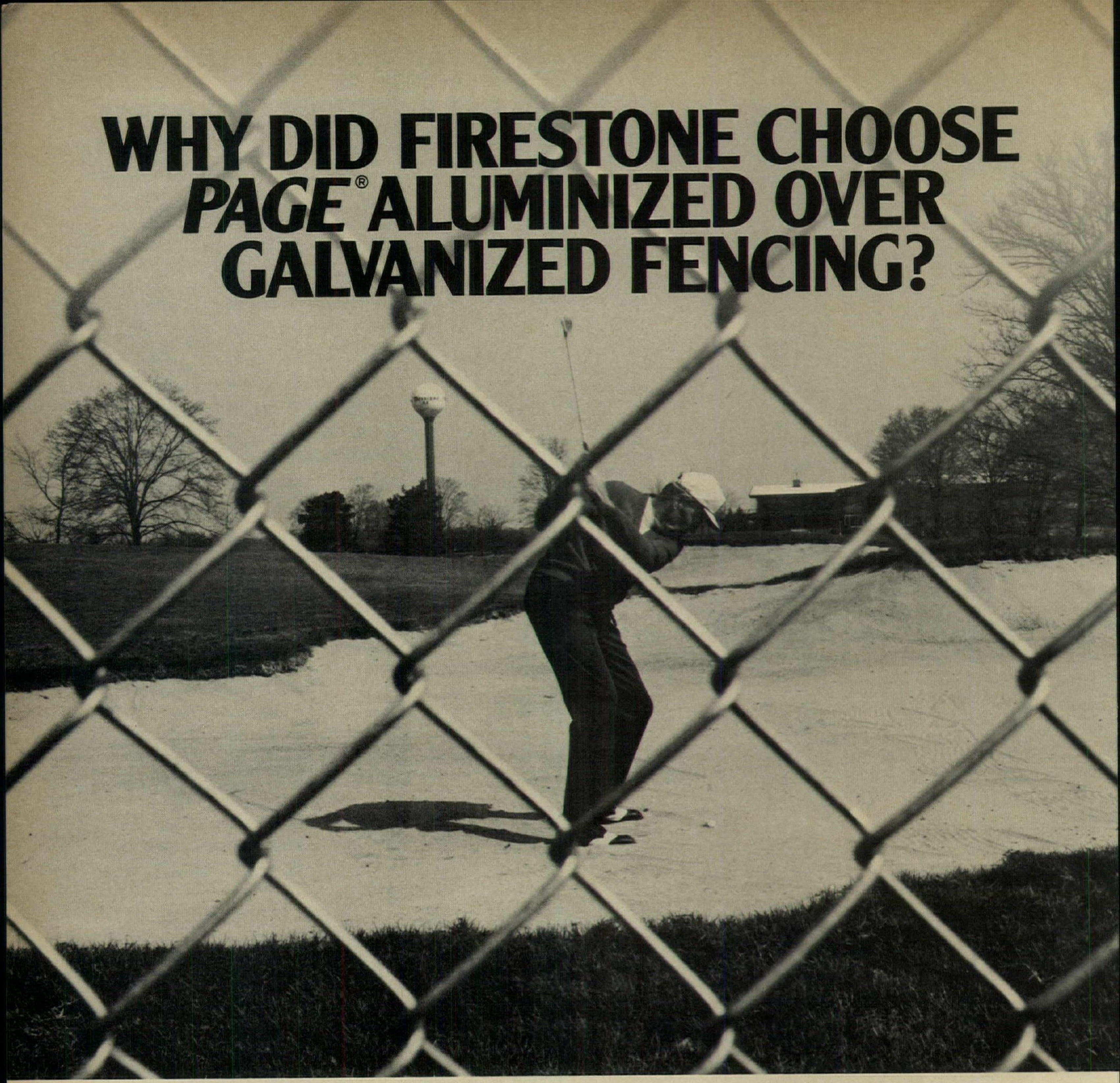




6 Site plan for 3000 unit project (above); phase 1 (below)





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.

ACCO | **Page Fence Division**

40DB.4.2

Circle No. 320, on Reader Service Card

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.

The Kling Design and Production team for the Fidelity Building

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Eric Chung, AIA
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Joseph Steinmetz, CSI
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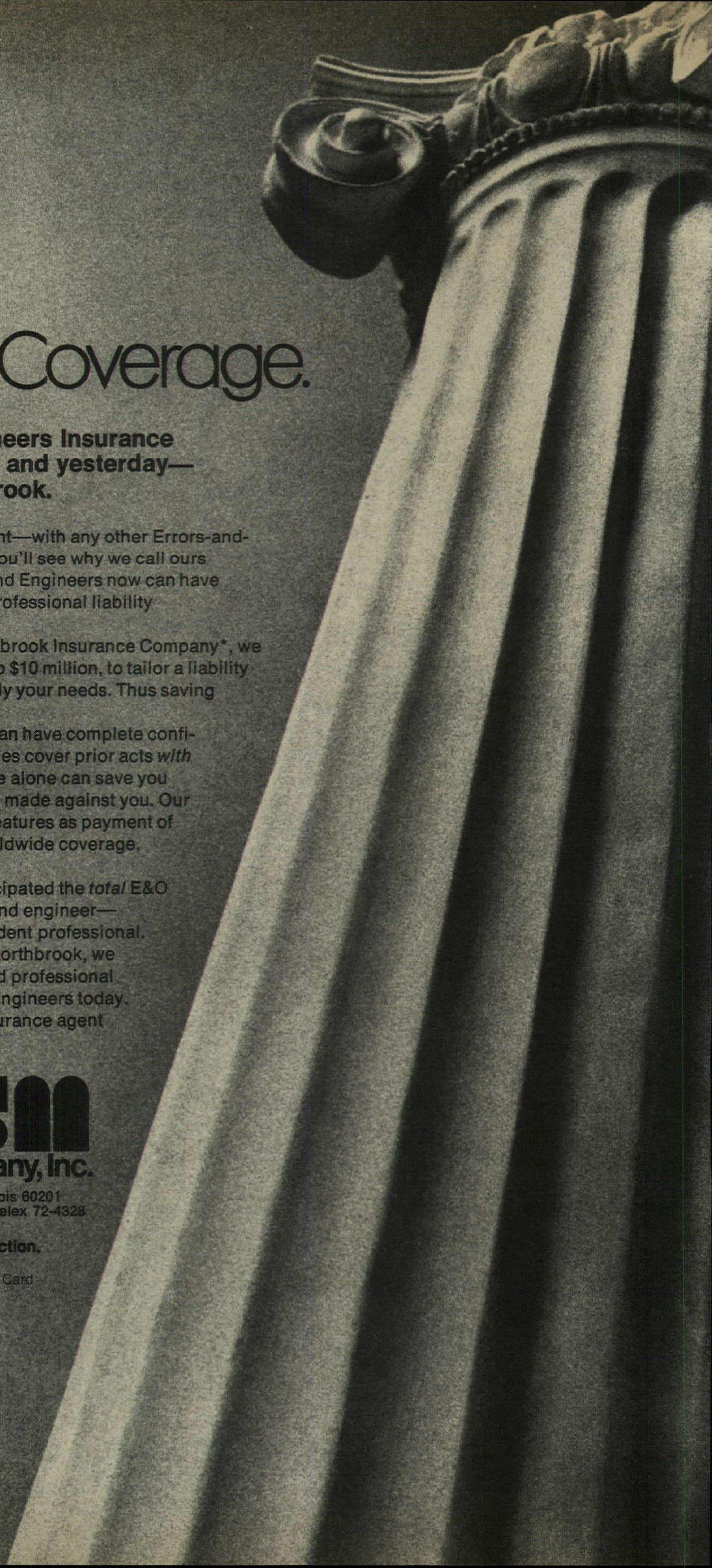
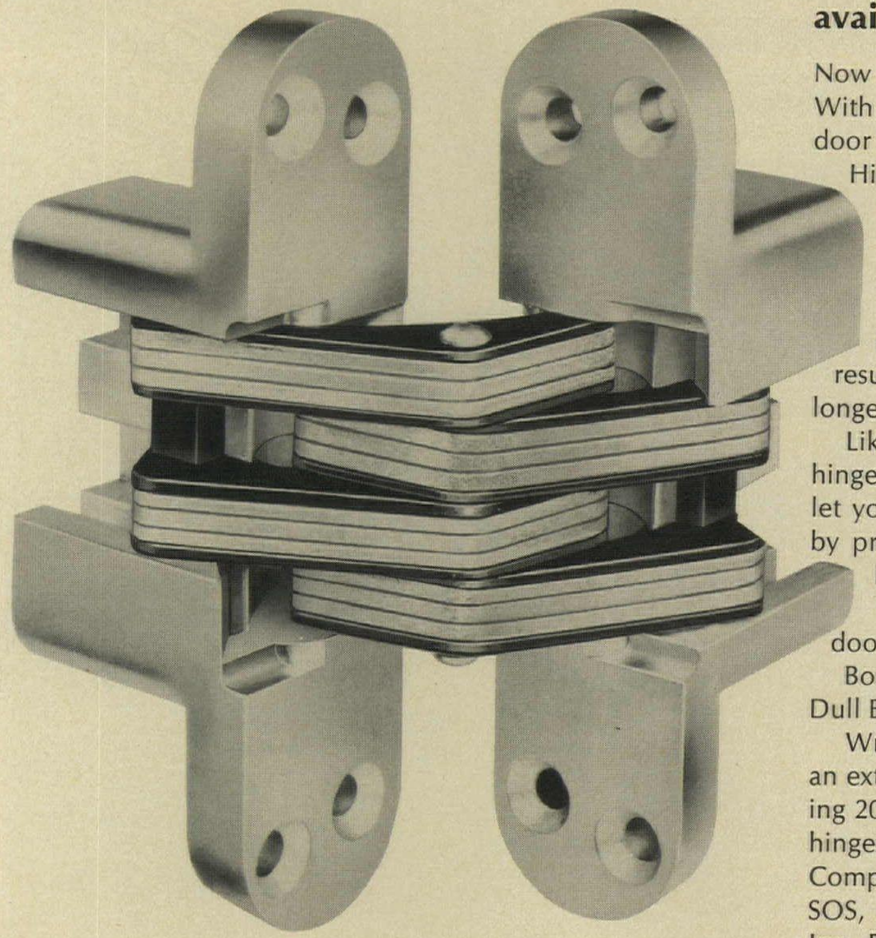


NEW! Hinges that hide... a lot longer



Extended-life invisible hinges now available for high frequency doors

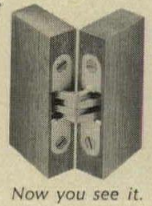
Now you can expand your hinge hiding horizons. With two new, extended-life, large commercial door hinges from the invisible hinge company.

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.

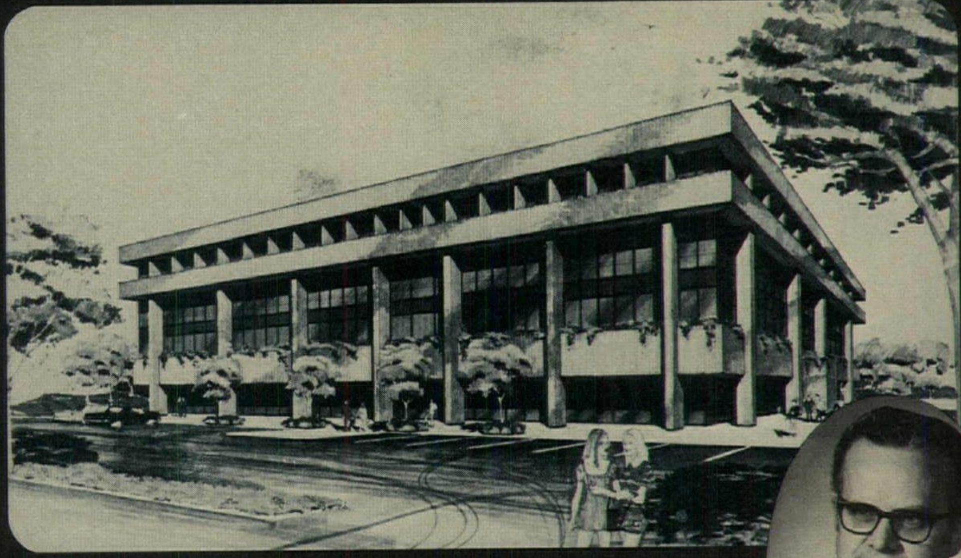
Write for all the details. We'll also include an extra copy of our catalog in Sweet's, featuring 20 styles and models of the tamper-proof hinges that hide. All from Soss Manufacturing Company, Division of SOS, Consolidated Inc., P.O. Box 8200, Detroit, Michigan 48031.

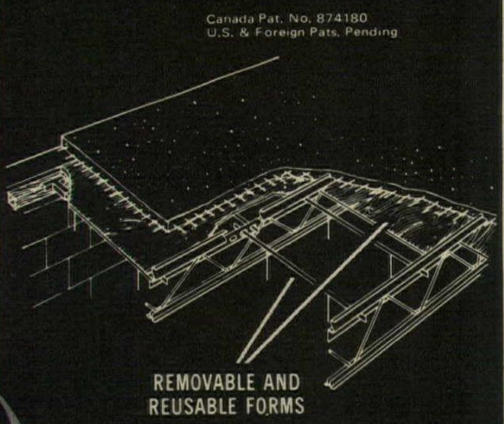


Now you see it.

Now you don't!

the SOSS Invisibles





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

"We Chose Hambro"

REVOLUTIONIZING THE CONSTRUCTION INDUSTRY
The Power Behind
Hambro D-500

This is the powerful Z-shaped top chord configuration of cold rolled steel — a continuous shear mechanism — that combines with a 2½" thickness of concrete to form a composite floor of unprecedented strength.

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.

For further information or Dealer Inquiries, please write or call Canam Hambro Systems, Inc. or its service company, Canam Systems, Inc.

UNITED STATES Executive Office, 114 E. 25th Street, Baltimore, Md. 21218 (301) 338-0800, with dealers throughout the U.S. Offices in Calif., Florida, Atlanta, New York; Mississaugi, Ontario; Montreal, Quebec; Cheshire, England.

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A winning combination of stimulating stripes and tantalizing textures.
Our new Fashon collection offers an impressive array of original, harmonized striped and textured patterns for contract use. 112 items, 122 colorways, in all. A perfect teammate and extension of our popular Fashon "Stripes & Textures" line.
Team-Up stars "Syncopation" (shown). This versatile pattern presents a unique spectrum of limitless combinations. Adds refreshing sequential eye appeal to otherwise monotonous expanses. Perfect for long hallways, stairs and secondary corridors. Particularly effective in blending new additions into existing motifs.
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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).

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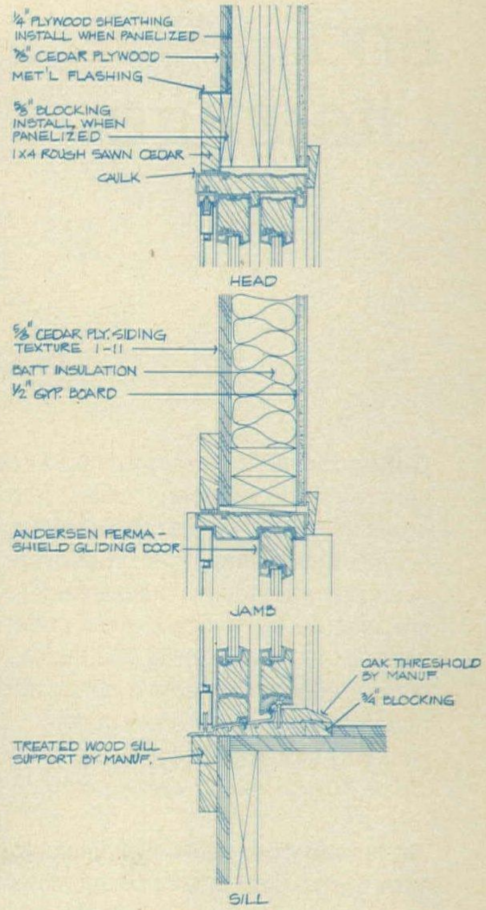
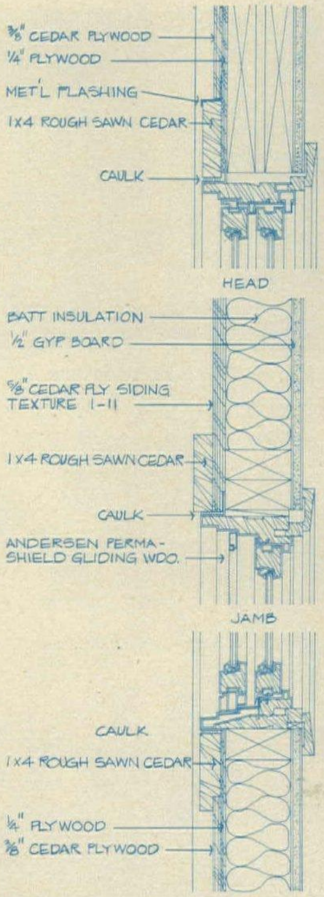
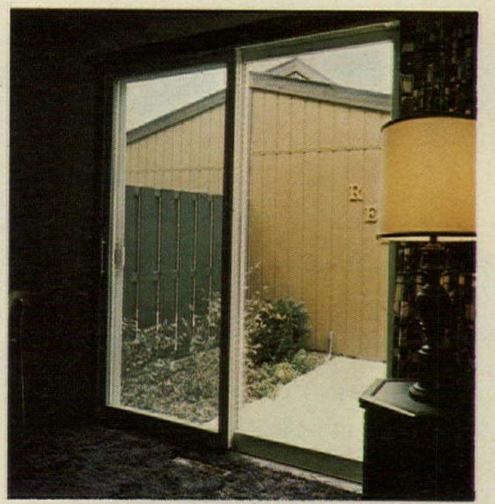
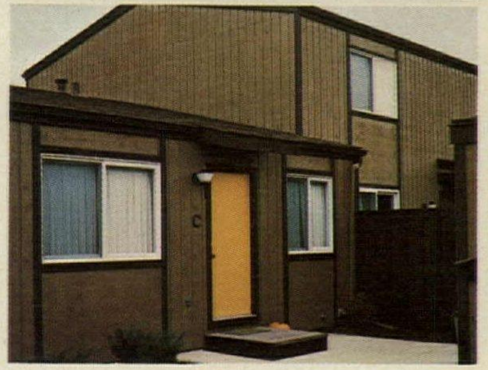








The Meadows, Rochester, Minnesota
Owner: The Kruse Co., Rochester, Minnesota
Architect: Architectural Design Group, Inc., Rochester, Minnesota.

Products and Literature

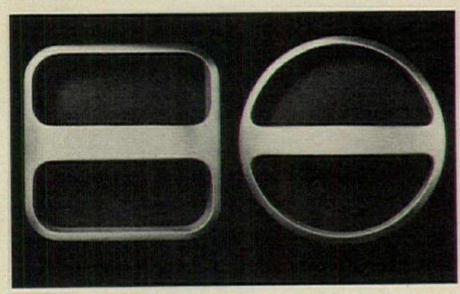
Coffer doors. For finishing off poured concrete exposed beam ceilings, the doors fit inside cavities formed by the beams, hiding lamps and other overhead appurtenances. In sizes and shapes to accommodate given coffer dimensions, they consist of diffuser glass framed in dipped aluminum and have spring-loaded 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 ¼-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.
Circle 102 on reader service card

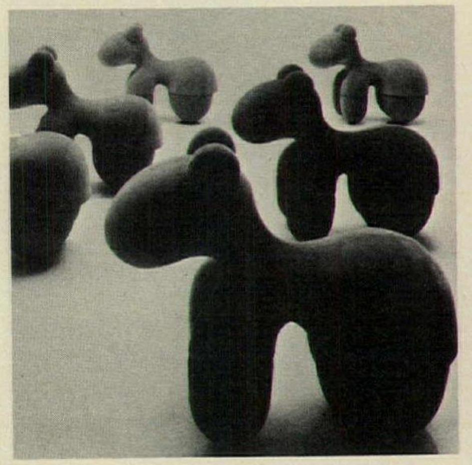
Porcelain finished back-up sheets for use with maker's veneer and insulated panels. Vit-Kote panels are in eggshell white which can be used without painting, or finish acts as prime coat and can be painted, states maker. AllianceWall Corporation.
Circle 103 on reader service card

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

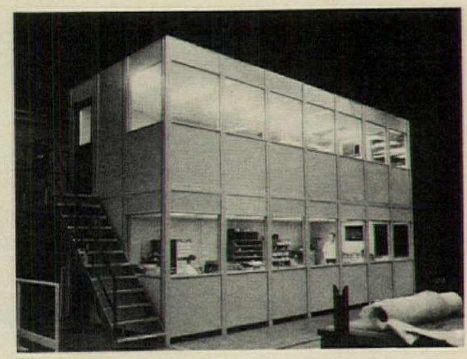
Coffer doors



Recessed door pulls

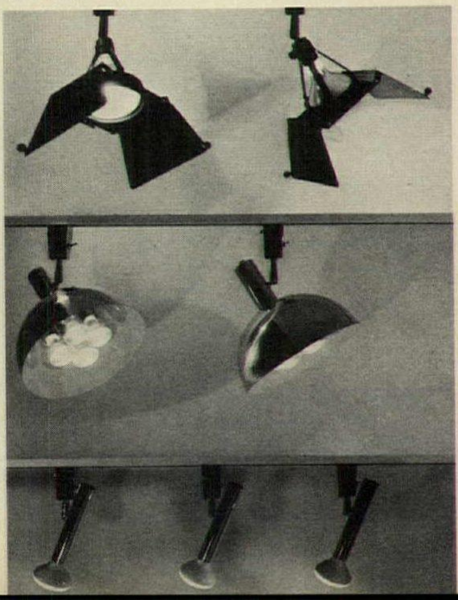


Pony



Two-story modular building system

Track lighting



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

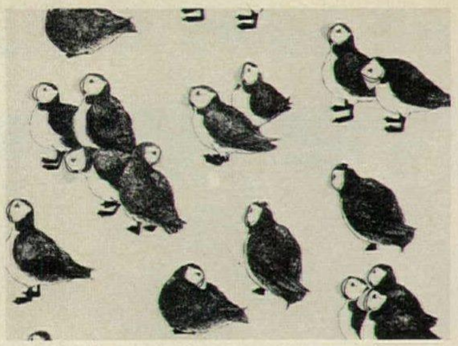
Track lighting. Shapes include spheres, mushrooms, domes, and cylinders; lights may be suspended from pendants, making many configurations possible. Available in chrome, black, or white finish, and in many sizes. Tsao Designs.
Circle 109 on reader service card
[continued on page 58]

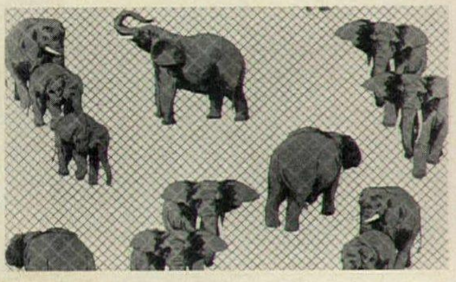
Products continued from page 56

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

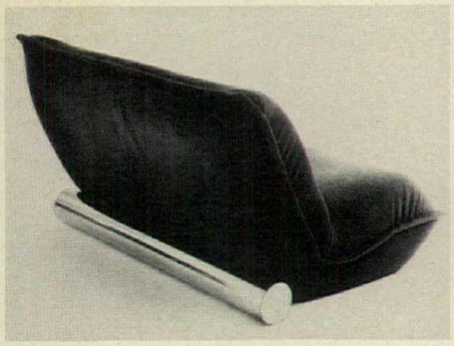
Moldings. Vinyl shield PVC molding saws and miters easily, nails within ¼ in. of the edge and the surface is impact resistant, states maker. Comes in off-white and seven woodgrain patterns and solid colors. Georgia-Pacific.
Circle 111 on reader service card

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

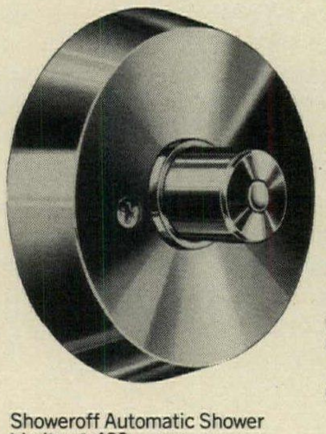
Carpet. Multicolor cut pile is a blend of acrylic, nylon, and other fibers for anti-static control. Carpet is available in 12-ft-widths and 10 color combinations. J. P. Stevens & Co.
Circle 114 on reader service card

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.
Circle 115 on reader service card
[continued on page 118]

It takes guts to stand up to the gang.

When your plan or contract calls for water saving and water limiting shower valves, the system you decide on had better have guts. Because the chances are it's going into a gang shower at a school gym, public swimming pool or prison. And it's going to take abuse. Not just once in a while. But day in and day out, month after month.

Here's the unit that's got the guts to take it. Symmons Showeroff. It's vandal-proof. There's no way it can be ripped from the wall. It's kid proof. Symmons design and construction sees to that. It conserves energy. It saves water, fuel, and operating costs. Press the button and it will deliver a regulated cycle of water and shut itself off. If the button's pushed a dozen times during the shower, Showeroff will still just deliver its cycle and stop. And working in combination with a Symmons Temptrol central water controller, it will deliver just the temperature you select, too.



Showeroff Automatic Shower Limiter 4-420

Get in touch with the Symmons rep near you. Or call us direct at (617) 848-2250. Or write us: Symmons Industries, Inc., 31 Brooks Drive, Braintree, Mass. 02184. We've got the guts to handle the roughest customers.

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We've got the guts to be better.

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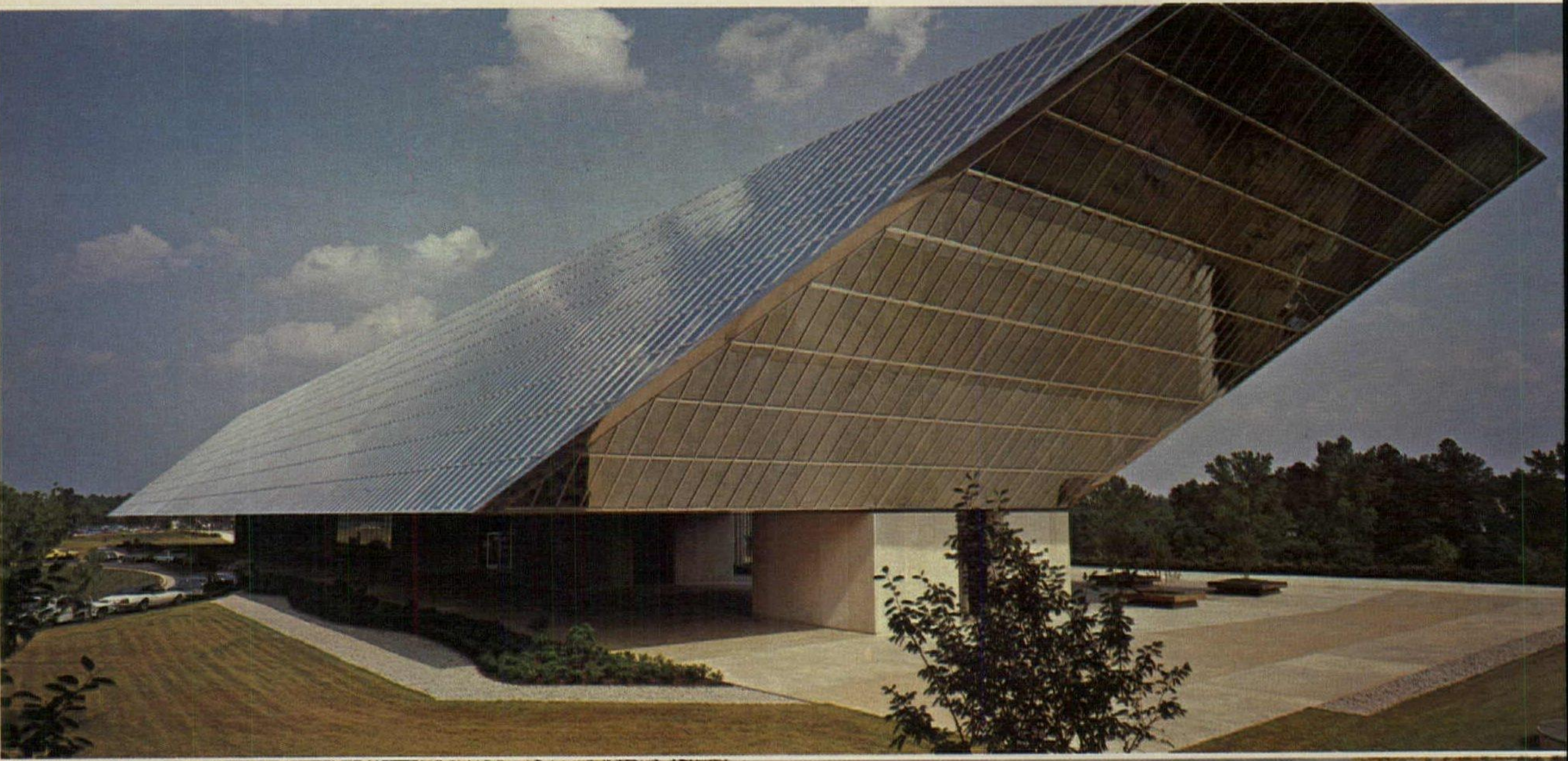


Blue Cross and Blue Shield of North Carolina's Service Center, Durham, N. C. Architect: Odell Associates Inc.

N YOU CAN H, FROM LOF.

HIGH-PERFORMANCE GLASS REFLECTS SAVINGS IN ENERGY.

Blue Cross and Blue Shield of North Carolina's new Service Center does more than reflect and complement a beautiful setting—it's a comfortable and energy-efficient structure as well.

LOF's Vari-Tran® 1-108 reflective glass in Thermopane® insulating units in combination with slanted walls resulted in a substantial reduction in needed cooling equipment.

If the building had been designed with traditional vertical walls of 50% clear glass and 50% masonry cavity, it would have resulted in a solar heat gain through the walls of 3,300,000 Btu per hour. Clear ¼" plate used in 100% glass vertical walls would have resulted in 6,000,000 Btu per hour solar heat gain. The final design, combining Vari-Tran with slanted walls, reduced solar heat gain to only 2,400,000 Btu per hour —a 60% reduction in energy load compared to the latter figure.

The use of Vari-Tran in Thermopane insulating units reduces heat loss in cold weather as well.

With Vari-Tran and Thermopane, annual fuel savings are precisely calculable and convincingly impressive.

In these days of high energy costs, a total energy concept of design must consider all construction materials.

Our highly qualified architectural representatives will be glad to help you save energy dollars with our high-performance glass. Write Dan Hall, Libbey-Owens-Ford, 811 Madison Ave., Toledo, Ohio 43695.

LOF

Progressive Architecture: Editorial

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.

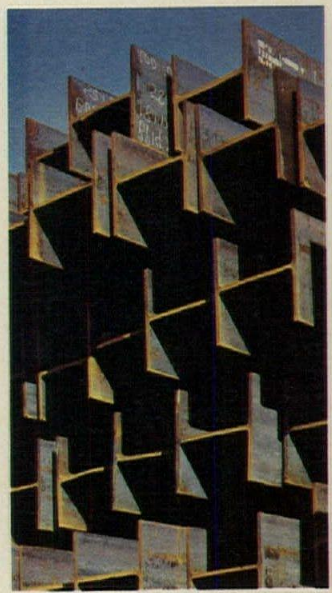
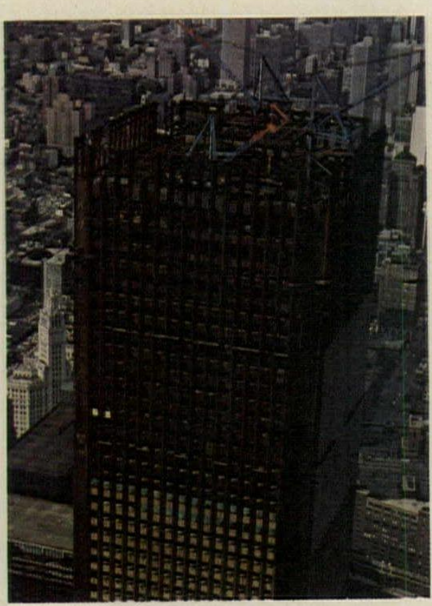


Photo: Shostal Associates.



Chicago: Standard Oil, E.D. Stone, Perkins & Will, 1973. Photo: Hedrich-Blessing.

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

Building materials shortage

Let us eat cake

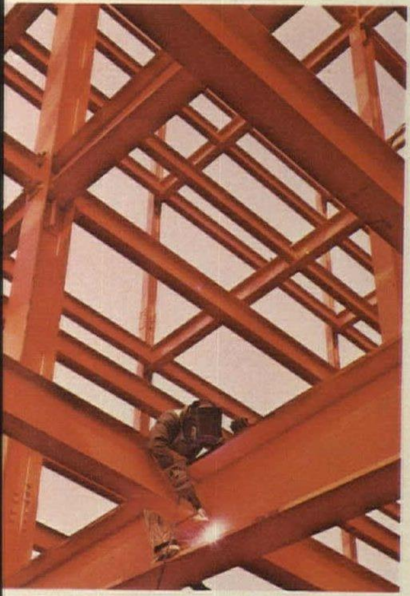
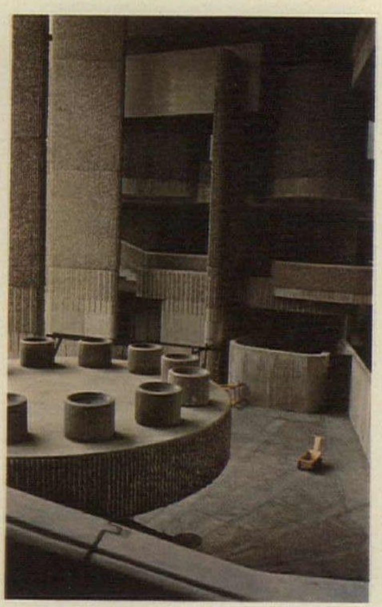


Photo: Shostal Associates.



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.

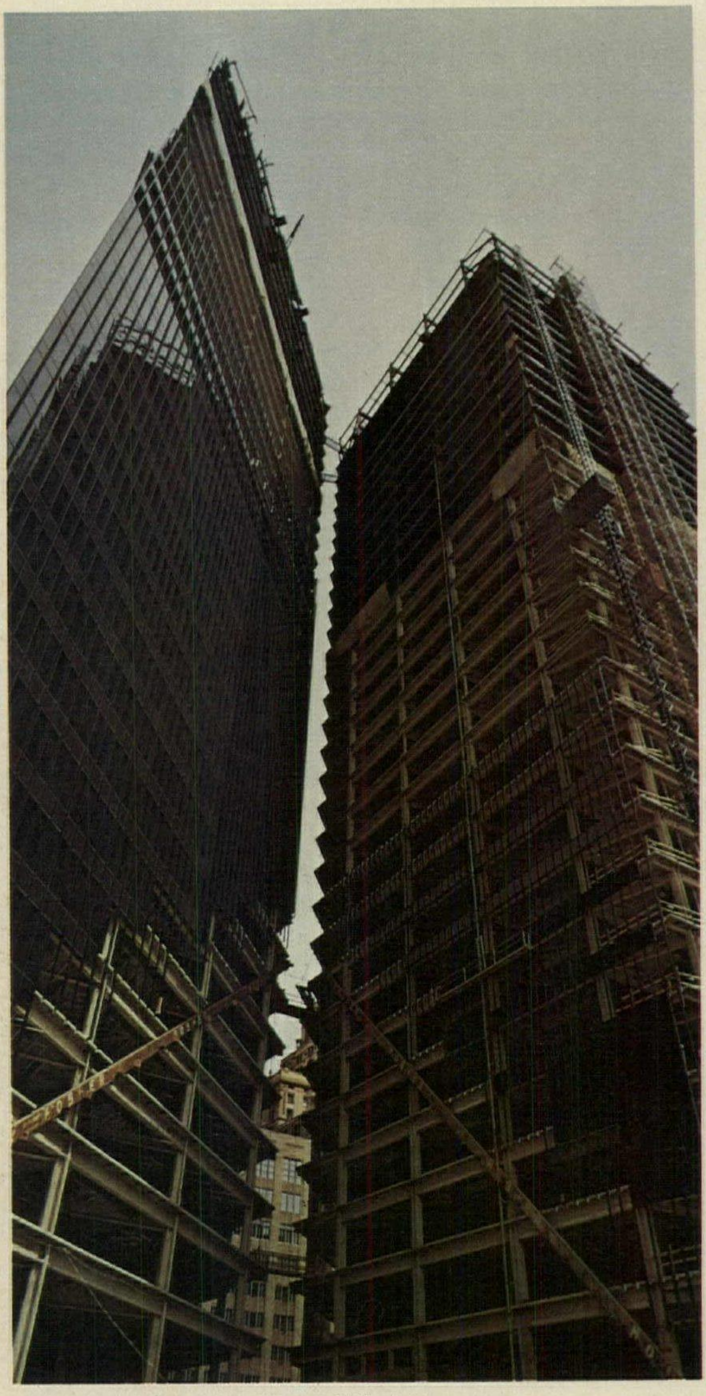
And then. An energy crisis, raw materials shortages, and world-wide political, economic, and social instability became part of everyday life. Architects learned that no amount of money would assure them building materials on demand. Firm price commitments, adequate supplies, and prompt deliveries seemed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

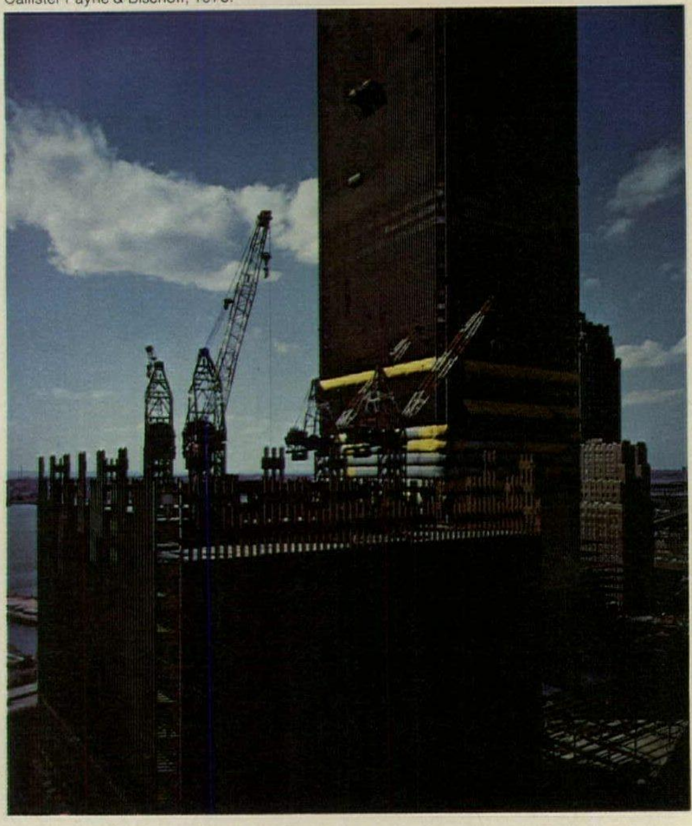
Let us eat cake



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.

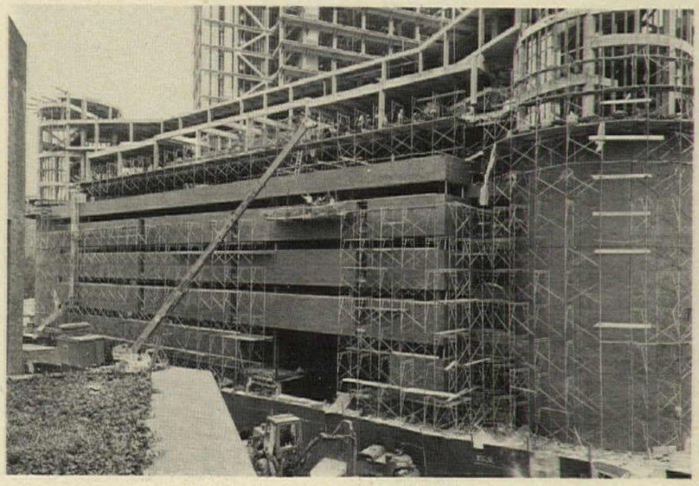
Wage-price controls did nothing to encourage capital investment, and the industry's profitability was soured by the energy crunch. As an industry source describes, "Cement is one of the most energy intensive manufacturing businesses in the U.S., and therefore, the current crisis has had a substantial 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.

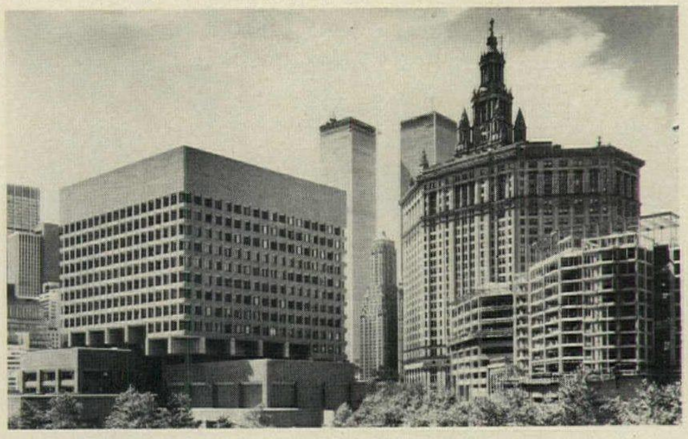
Cement costs rose 10 to 15 percent in January and again in July. Deliveries range from a few days to a few months, with the southeastern U.S. feeling the most pain. The industry forecasts perhaps 10 to 15 percent per year price increases to 1980. Demand will remain strong as an increase in construction 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.

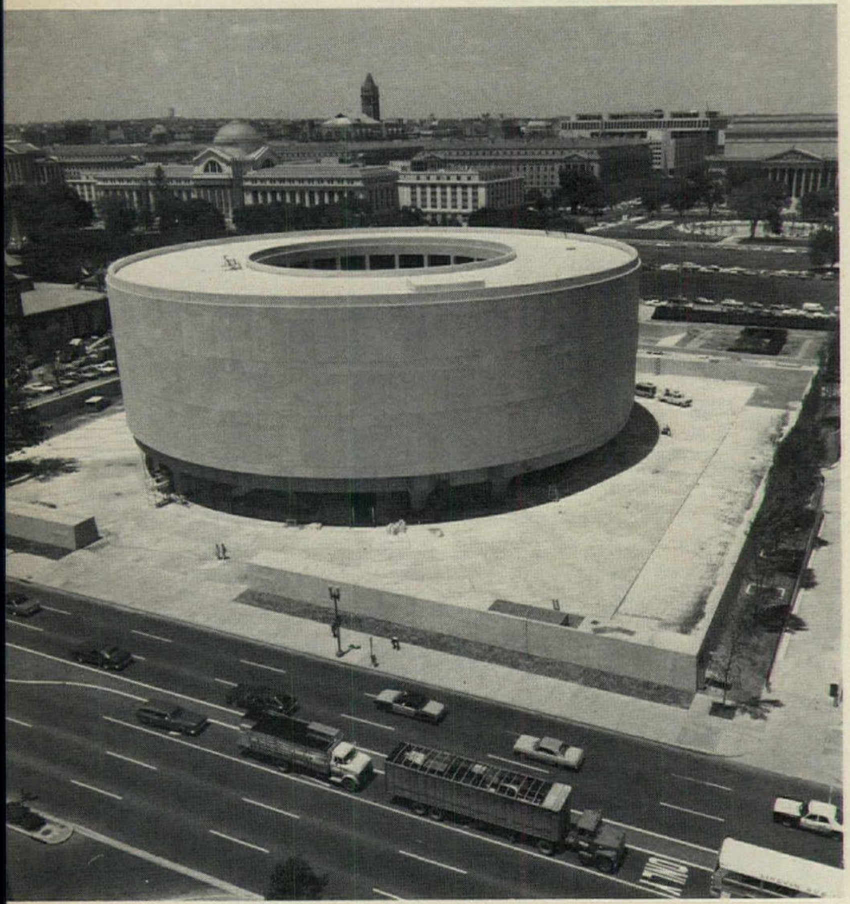
San Francisco: Levi Strauss Bldg., John Portman, 1974.



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.

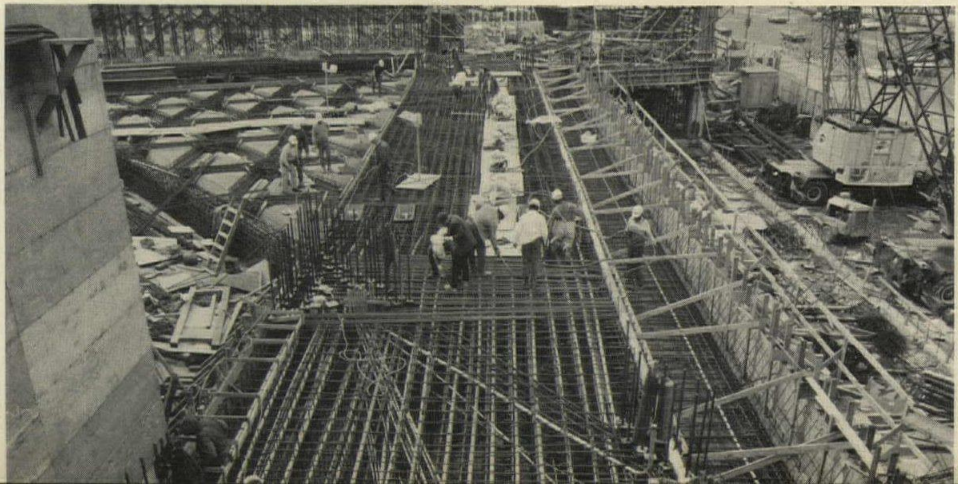
There will be no additional resin capacity until late 1976 or early 1977, say industry sources. The intervening years will see plant modernization and upgrading. In the words of a trade association representative, "the economics of our industry have drastically and permanently changed. It is inconceivable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

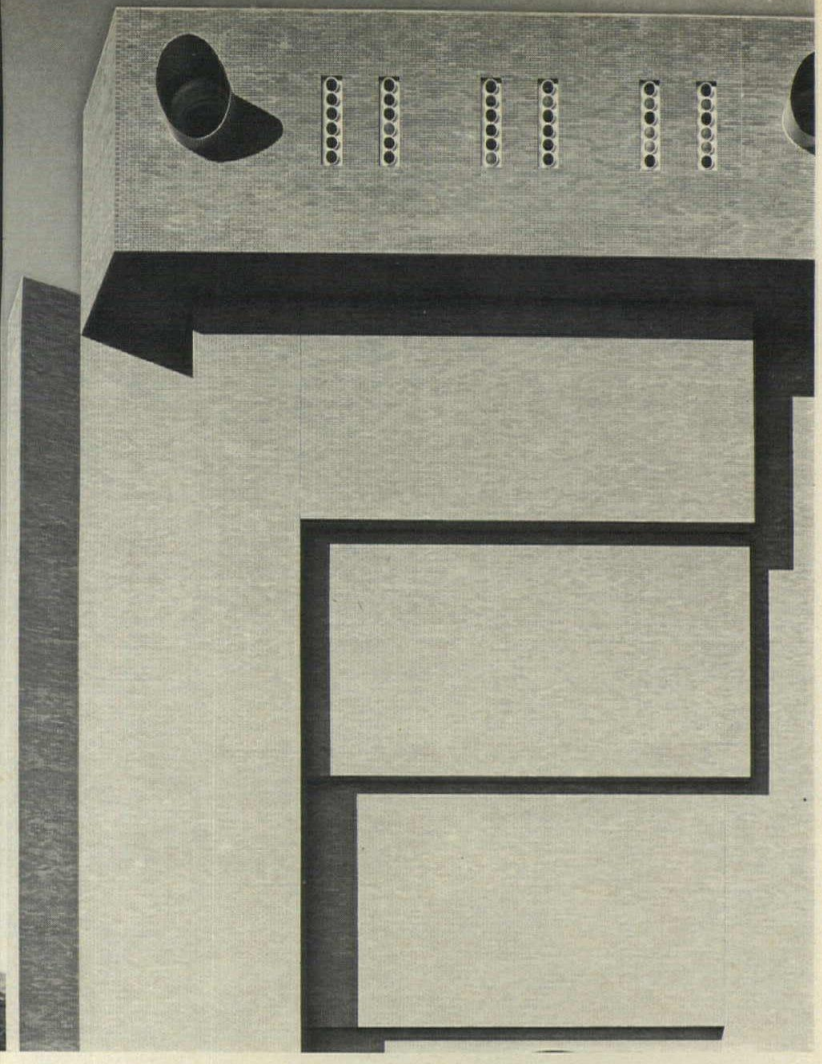
Over the last 10 or 15 years, architect Ulrich Franzen has done any number of brick buildings which have appeared in the glossy pages of one or another of the architectural journals. When asked why he uses this material, he says that it was never a conscious choice, since he never had any well-to-do 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.

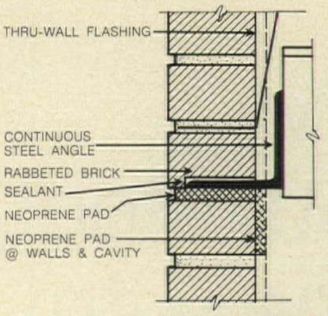
While brick is a very regional material with varying characteristics according to local clay composition, Franzen prefers a very dense, gray/brown brick, made in Ohio, that can be used without siliconing. He describes the gray/brown color as being "discreet," making a softer contrast with the sky than 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.

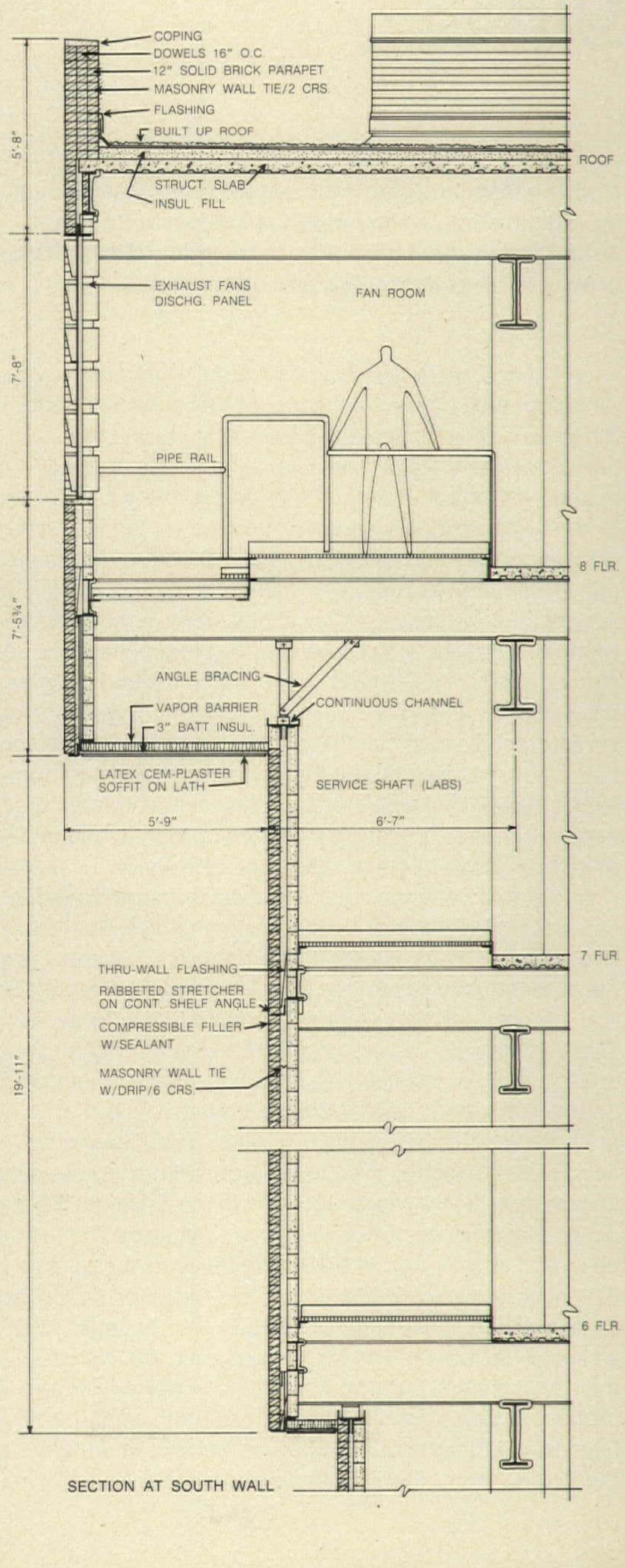
Further, in the philosophic realm, the forms which Franzen chooses to give his buildings imply an inherent contradiction; the "touchability" of brick as an essentially humanistic material, used to make forms which Franzen describes as brave new world images. Whether or not the intent is achieved, the 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

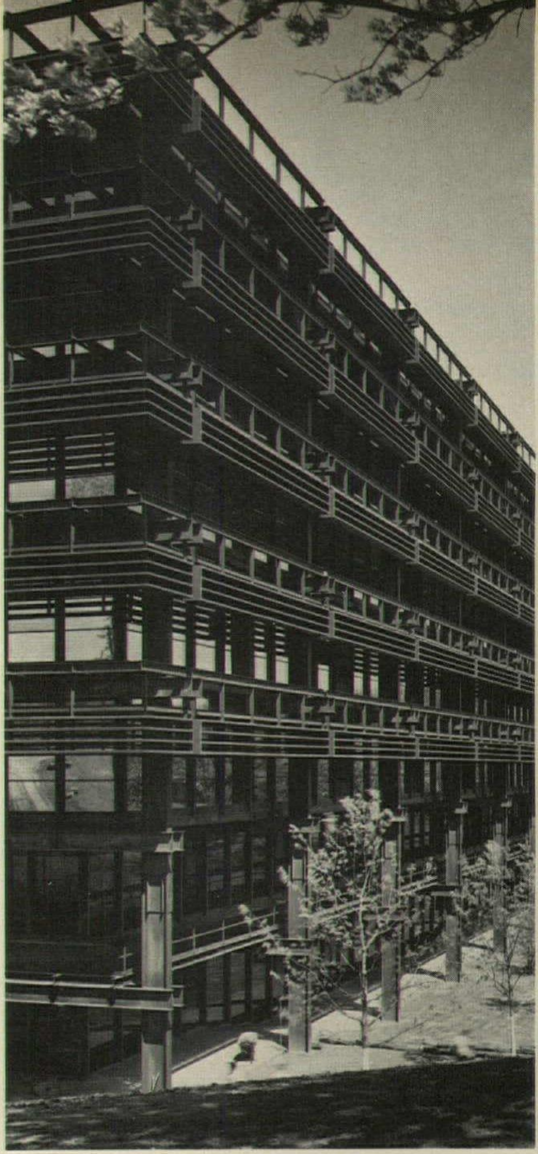
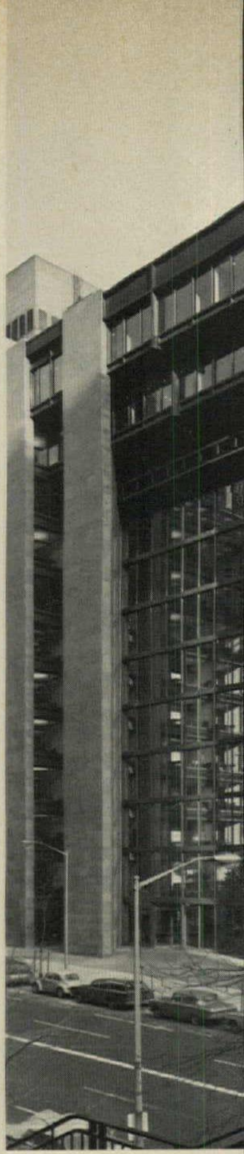

John Dinkeloo

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.

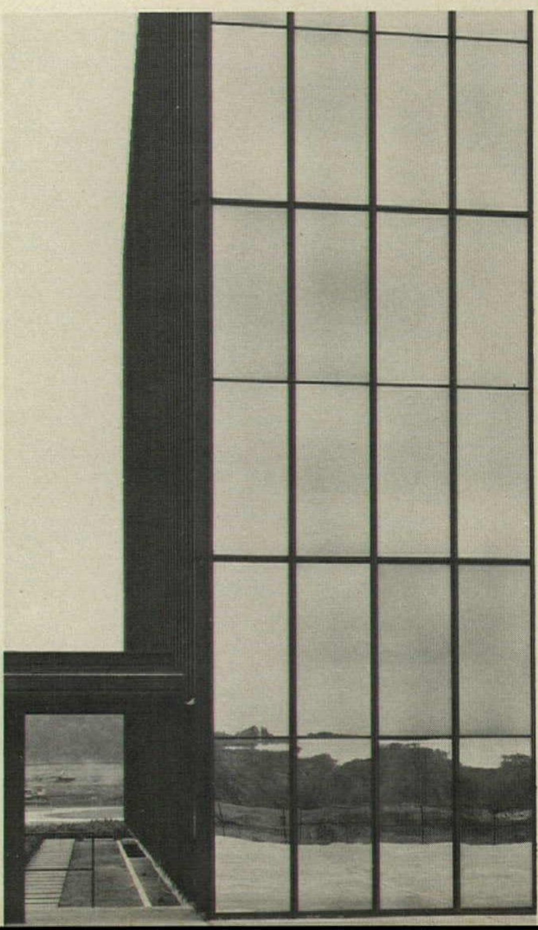
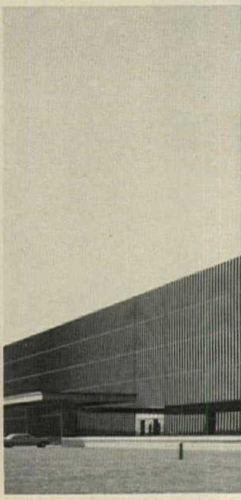
In one sense, materials shortages are nothing new to John Dinkeloo. As a partner in the firm of Kevin Roche, John Dinkeloo & Associates (and before that, its predecessor, Eero Saarinen & Associates) he has often operated as if a materials shortage were at hand. And in many cases it was, in terms of the 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.

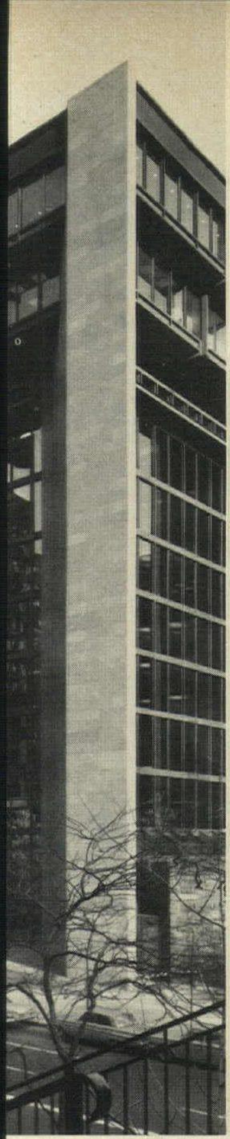
As head of Saarinen's technical department, Dinkeloo can claim credit for many other such technical applications and advancements. He borrowed neoprene gaskets from the auto industry to seal the curtain wall system of the General Motors Technical Center, Warren, Mich. (1948–1954). The porcelain panels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

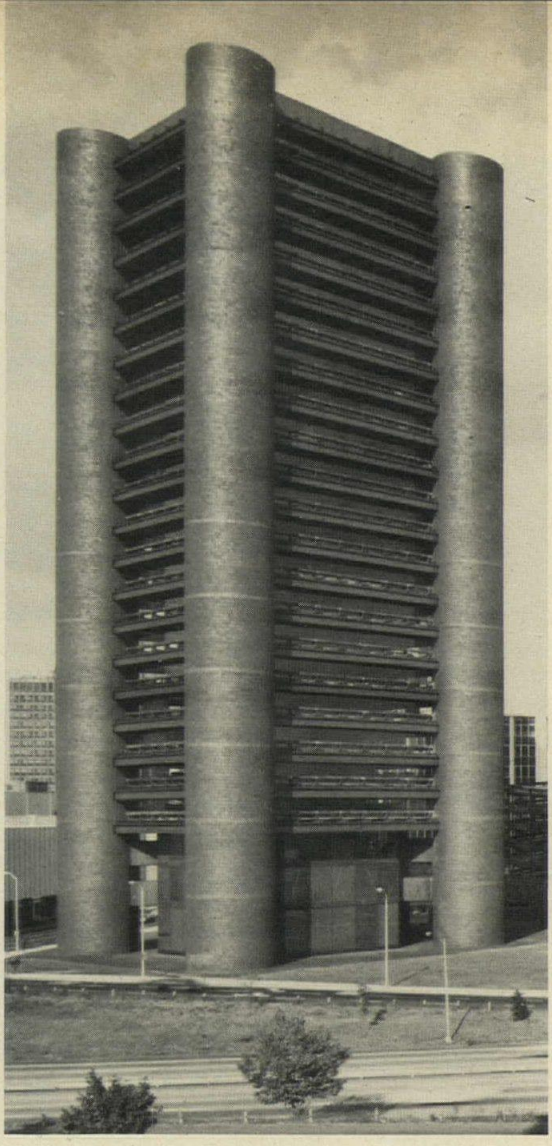
These accomplishments, historically significant even now, were acclaimed then in the architectural press as bold innovations. But Dinkeloo remains modest. He quickly explains that he does not create "new" materials so much as he improves old ones. His decision 20 years ago to explore new materials or 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

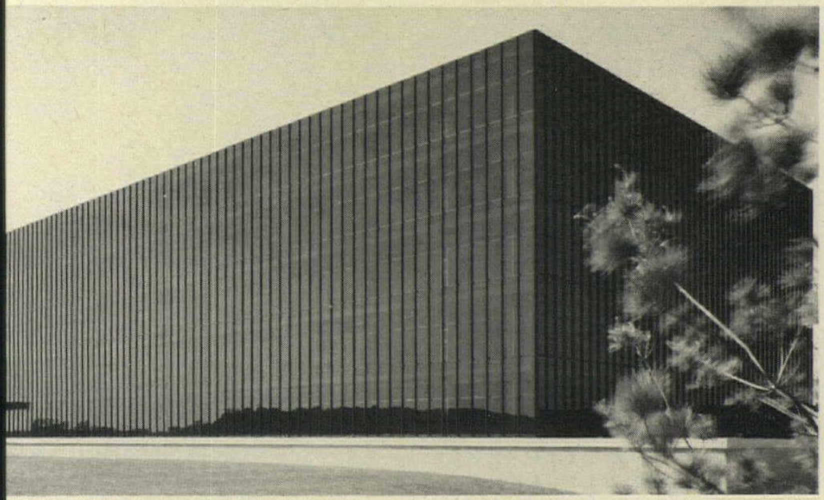
Since weathering steel received its first architectural application in the Deere & Co. Administrative Center in 1964 (above, left), it has been used in the Ford Foundation building (above, middle), the Knights of Columbus tower (above, right), and the adjoining Veteran's Memorial Coliseum (not shown).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

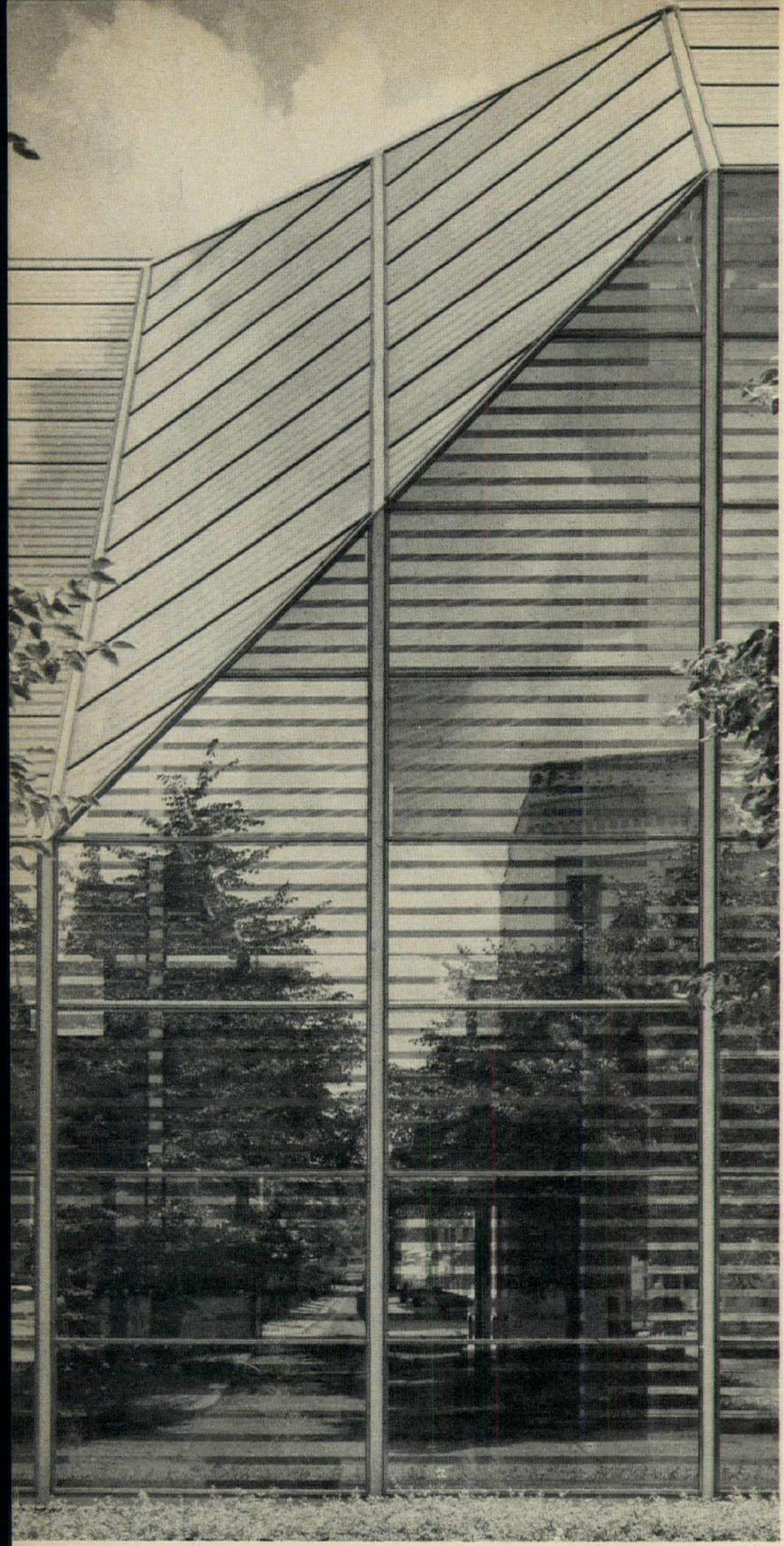
So Dinkeloo began looking at corrosion curves in different kinds of steel. He found a high tension steel that corroded for a period of time and then leveled off. This kind of steel, containing more manganese, copper, and nickel than higher corroding types, had been developed in the 1930s for coal hopper 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.

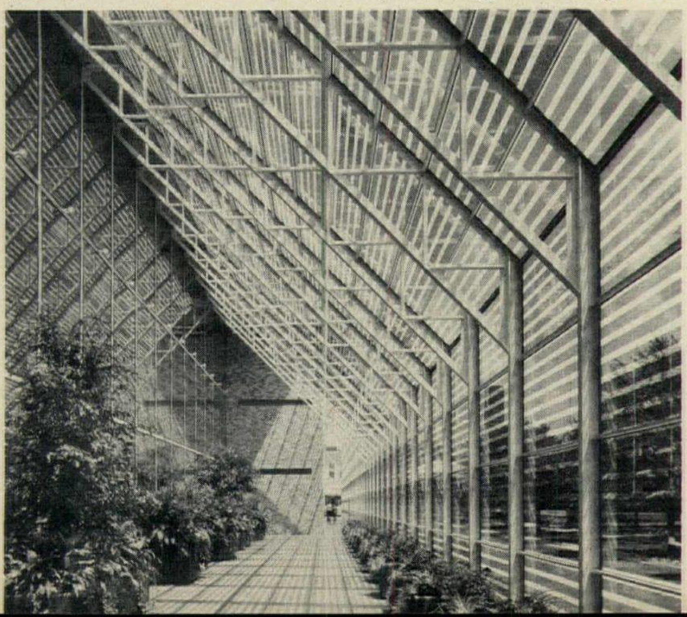
Dinkeloo states that the firm handles the fire-proofing according to the circumstance. Because the Deere building—only five stories high—was situated outside the fire district in a rural area, the architects primarily needed to make the perimeter accessible to firefighting equipment. The Ford Foundation 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.

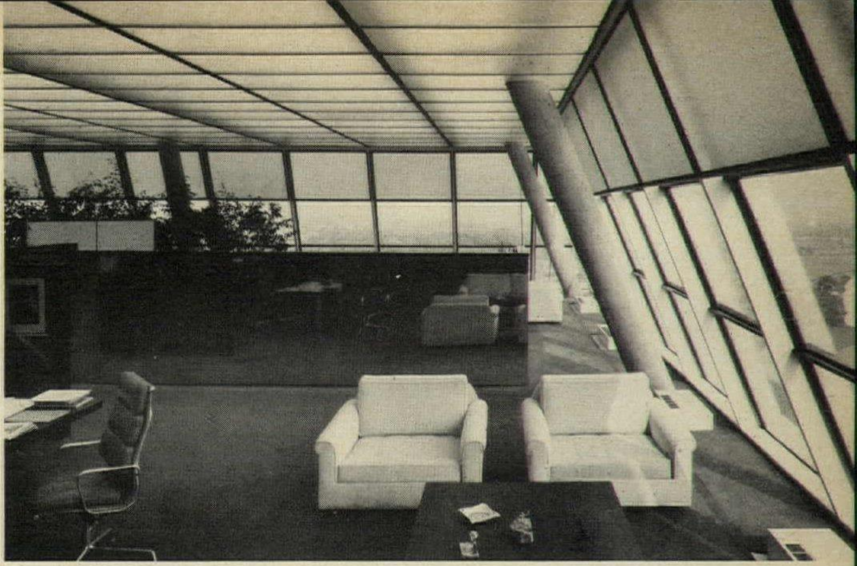
Energy and exposure

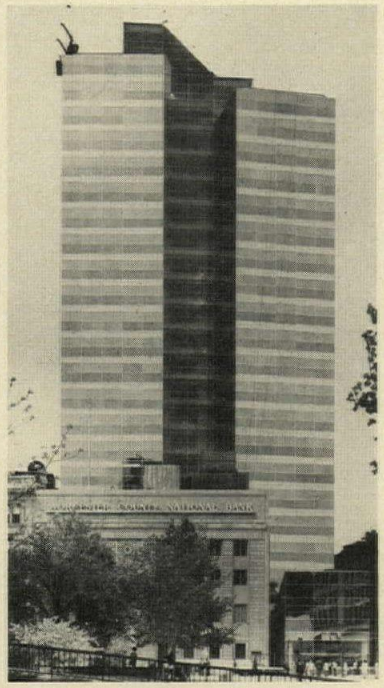
When it comes down to it, energy concerns, more than a materials shortage, could trim Roche-Dinkeloo's robust appetite for glass. Hopefully their "greenhouse architecture"—the schemes that receive quantities of natural light through glass shed or ridge and furrow roofs—won't suffer. However the architects 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.

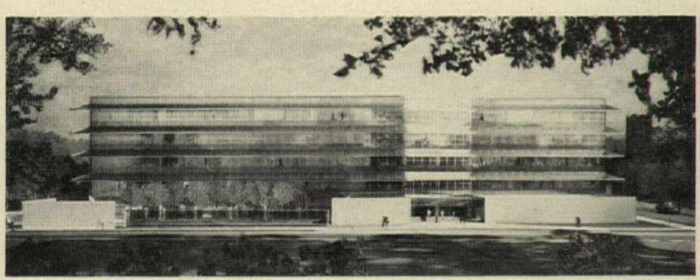
Both energy considerations and rising prices for sheet metal work generated a change in the mechanical system planned for New York's Federal Reserve building project. The original scheme called for a central mechanical system to be dropped into the space where the beams carrying the tower span the 160-ft-high 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

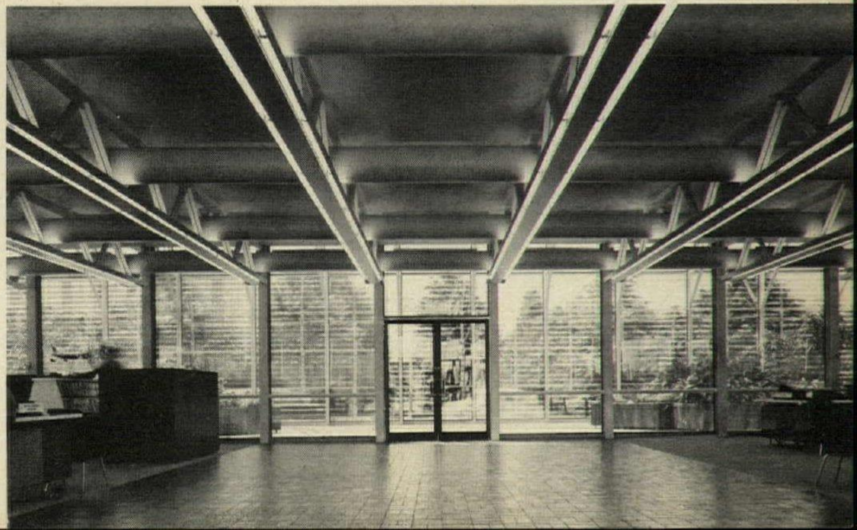
Aside from the generalized notion of a "materials shortage"—the absence of the right materials for specific needs that led John Dinkeloo to engage in product development—the question of the real materials shortage remains. Higher prices, slower deliveries, and nonsupply do exist for what-







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.

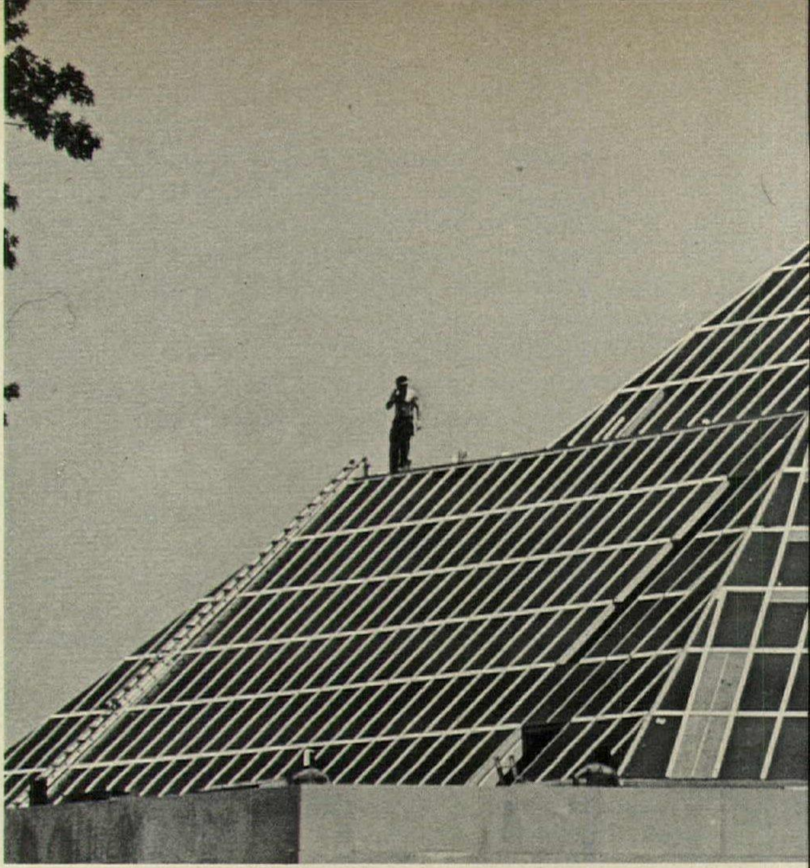
Shortages, price escalations, and slow delivery require keen anticipatory responses. Dinkeloo, like other architects, must keep the firm's materials options open and analyze the implications for structural and design decisions. For example, faced with the specter of rising steel prices, he speculates 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.

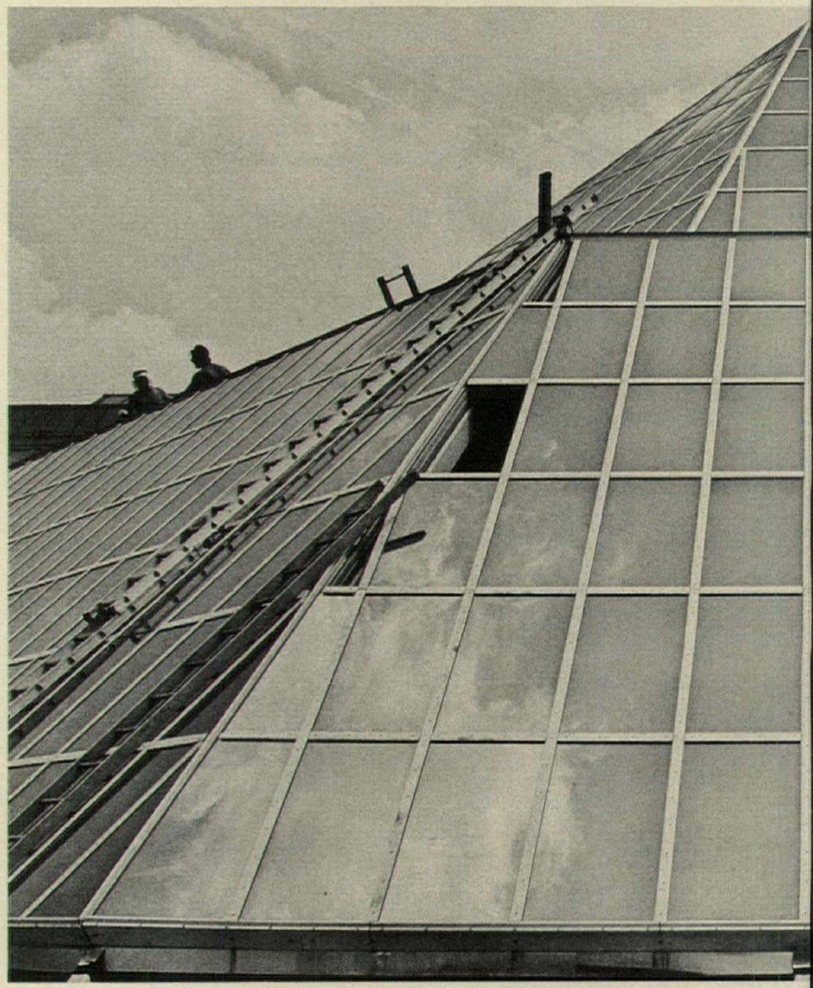
The inside word

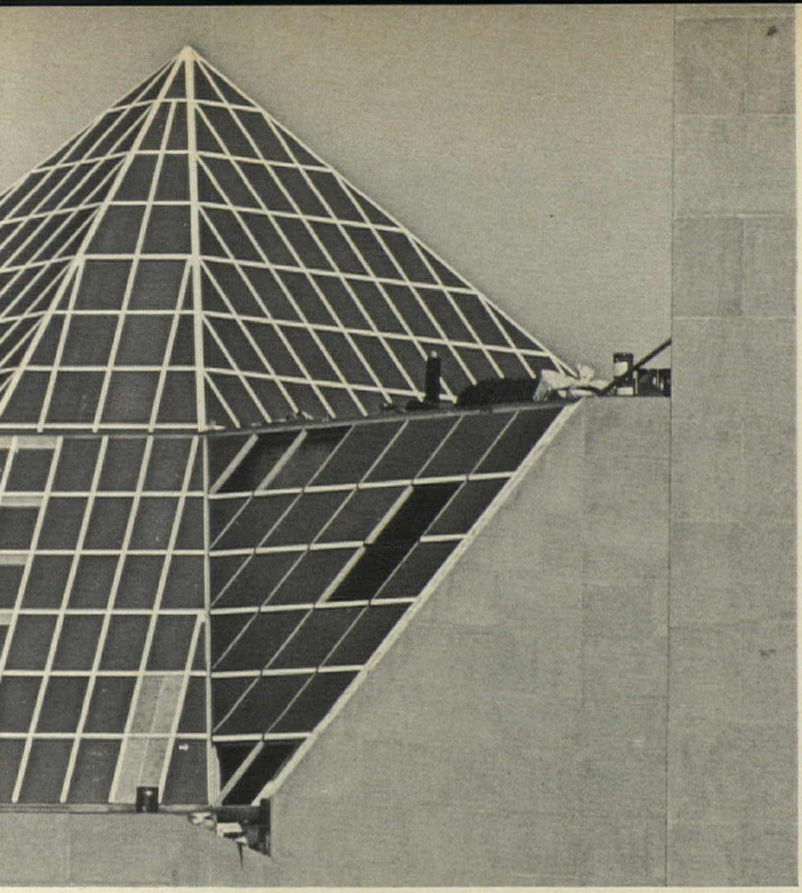
Dinkeloo also stays up with the materials market to know when and where to buy. In keeping abreast, he doesn't rely on any systematic technique. Instead, intuition, information gleaned here and there from sources like *The Wall Street Journal*, or tips from friends in the construction business supply 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

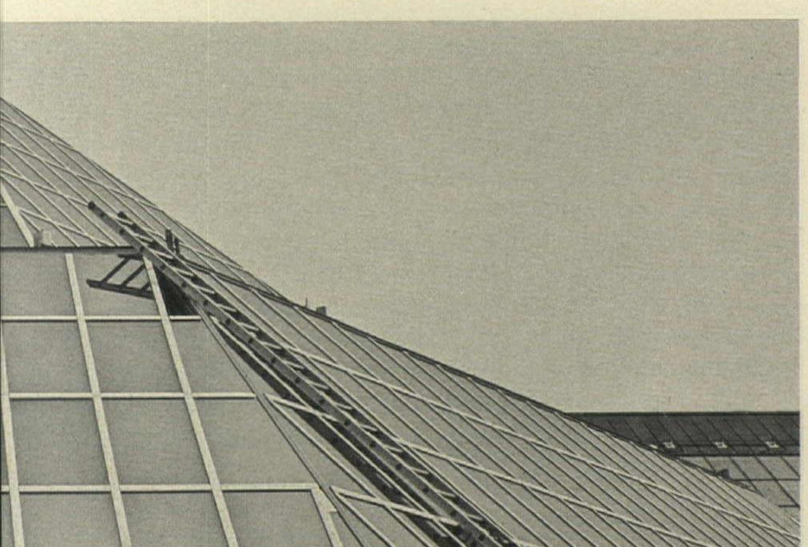
In dealing with materials suppliers, it is not surprising that the architect must resort to those tactics developed to a fine art in the garment business: maneuvering, bargaining, cajoling, threatening. Dinkeloo admits to all of the above. His flexibility in materials choices doesn't mean that the







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.

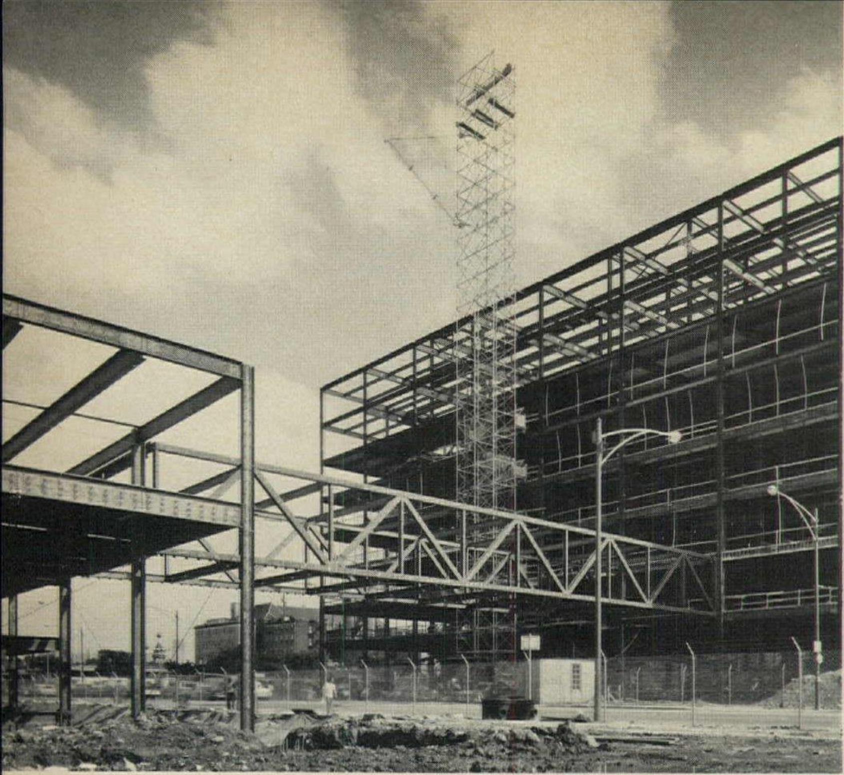
Steel delivery time is an even bigger problem, however. With standard delays reported to run delivery times up to 7–9 weeks, the Mies office has had to rethink the beginning, if not the main, phases of several projects. (Fujikawa estimates that it can take three-quarters of a year to get steel delivered 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.

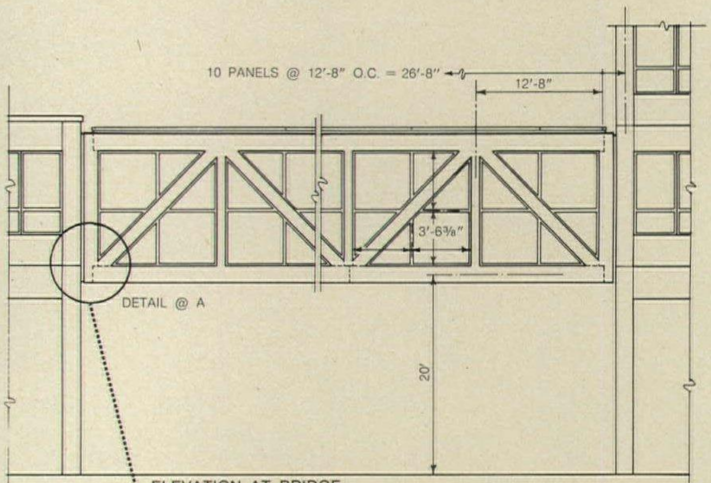
Availability of glass is no problem. According to Fujikawa, delivery times are good, and price escalation is not excessive. Again, however, it is the steel or aluminum *housing* the glass that causes problems.

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]

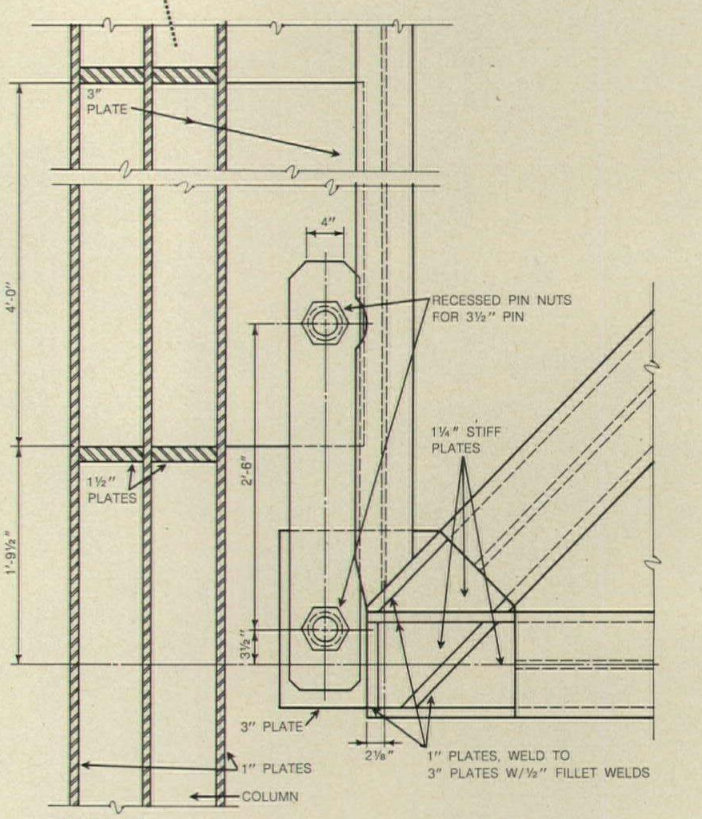


Roberto Clemente High School; photo, Hedrich-Blessing; structural engineer, Nelson, Ostrom, Baskin, Berman & Associates.

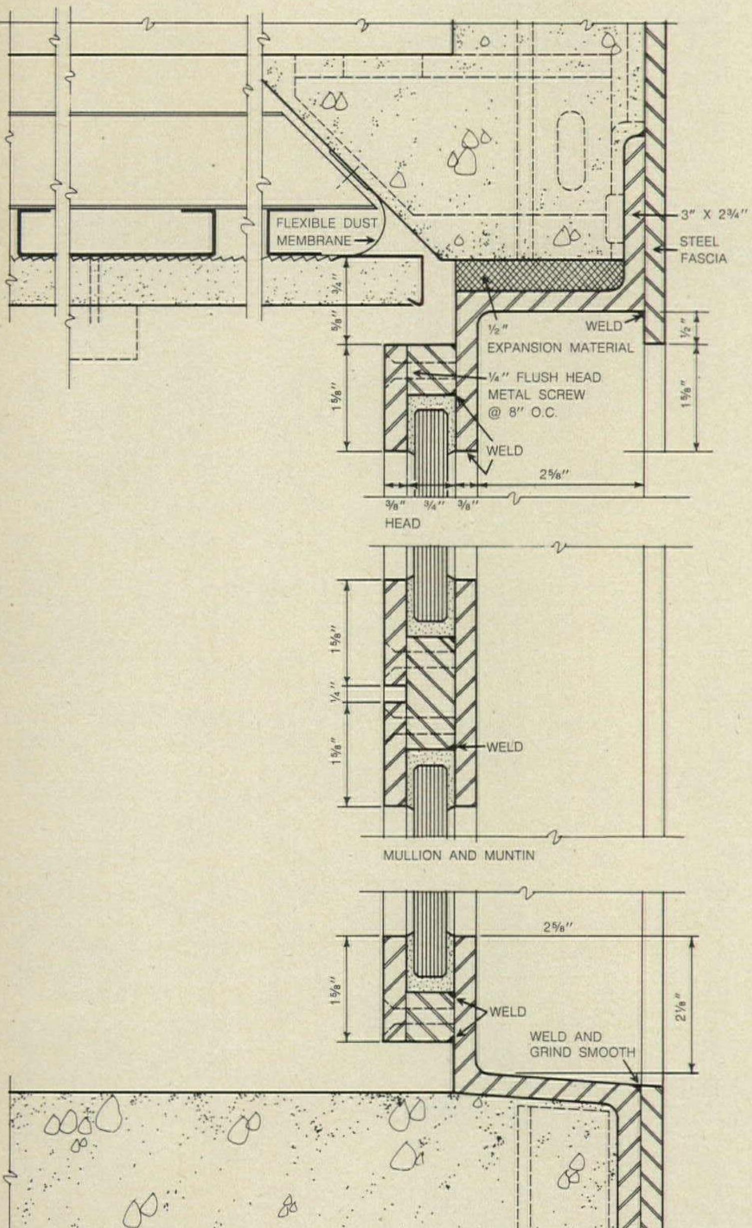
Steel stands, girding glass



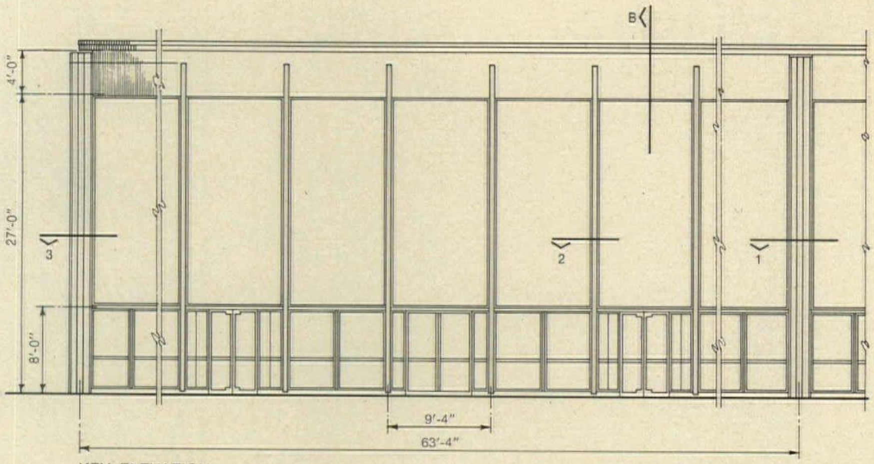
ELEVATION AT BRIDGE



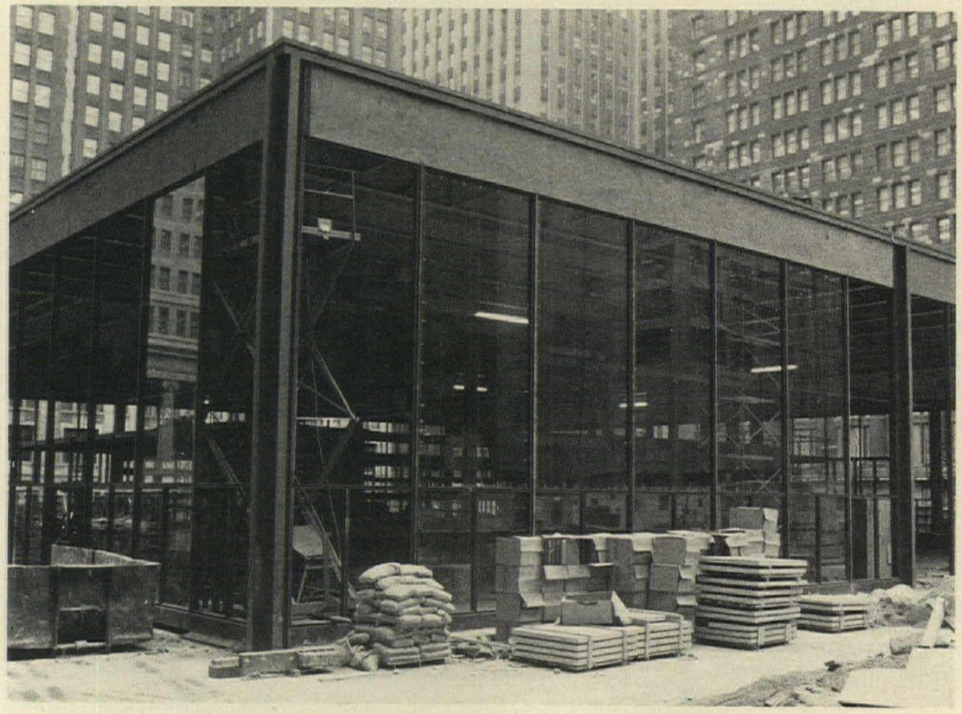
DETAIL A



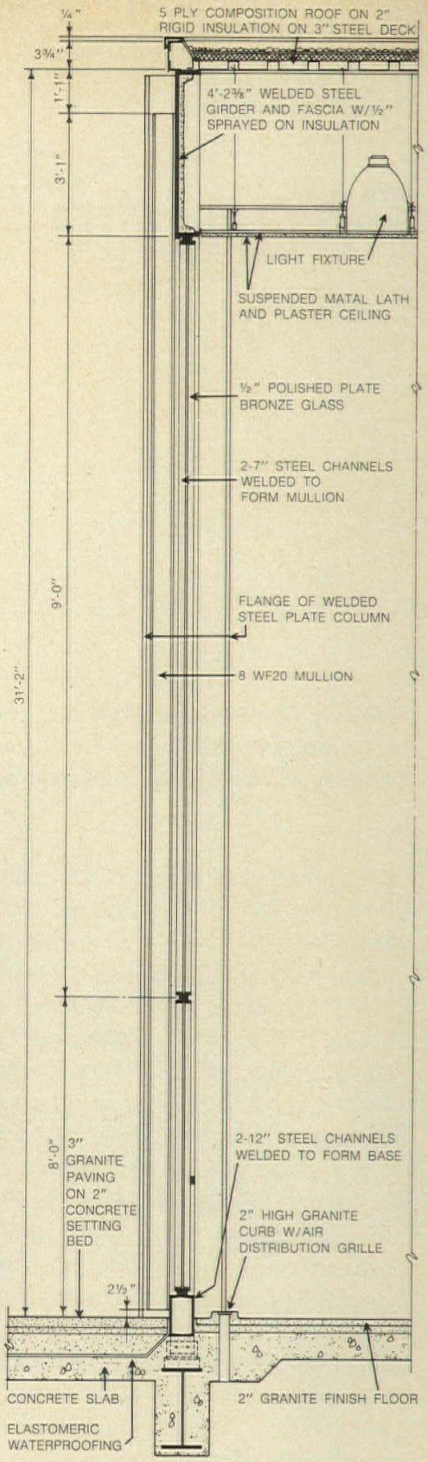
TYPICAL WINDOW DETAILS



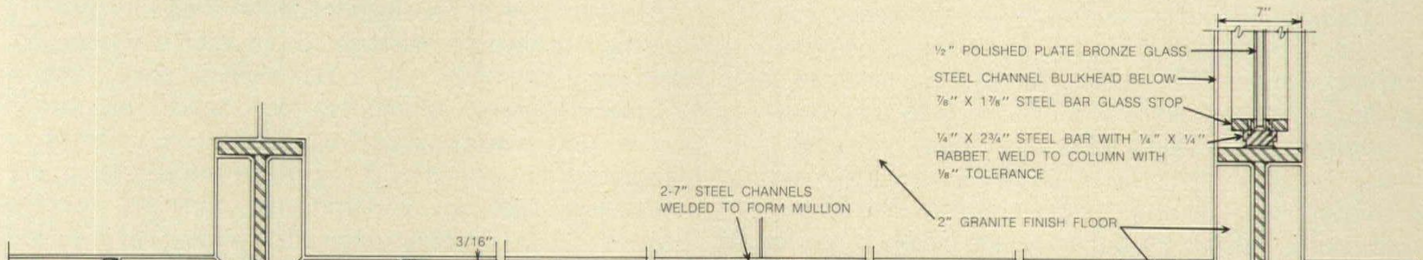
KEY ELEVATION



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



EXTERIOR WALL SECTION AT B



CURTAIN WALL DETAILS

Designing in panels

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."

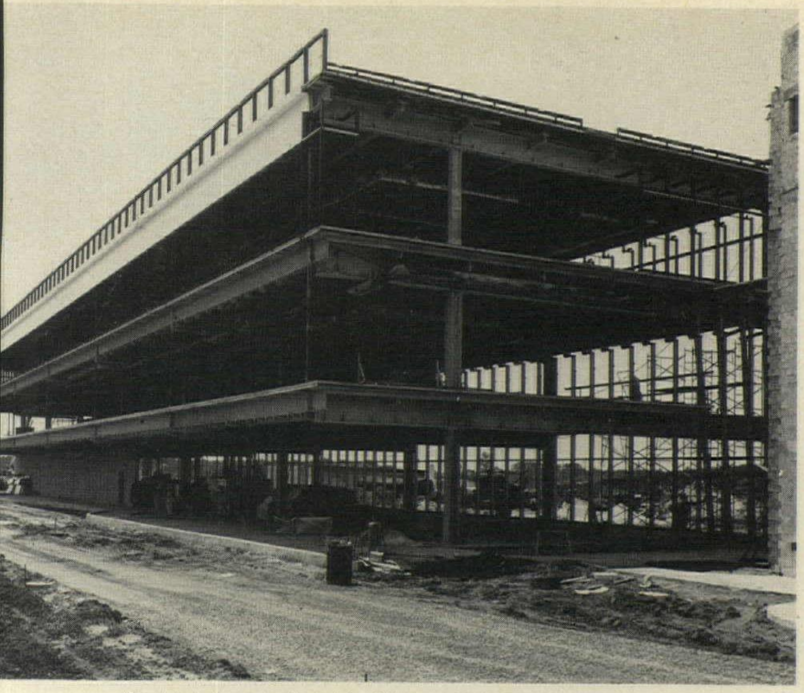
Harle agrees. "There can be a great deal of excess cost in translating a new design into actual fabrication." Savoir faire in detailing materials comes as much from a practical working knowledge of how construction labor is actually performed as from formal education. "Here is where the problem starts," 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."

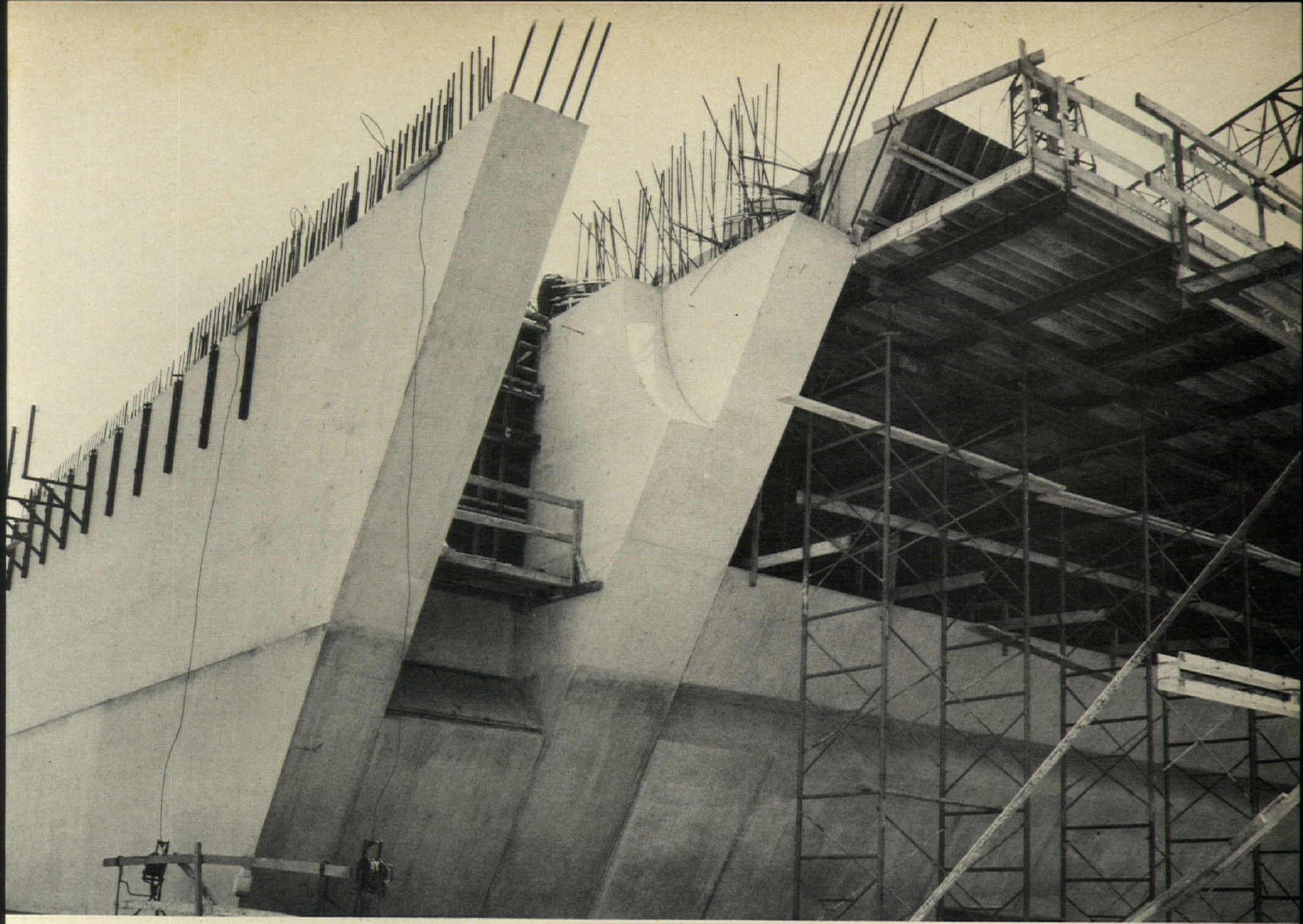
Manifestly monolithic

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.

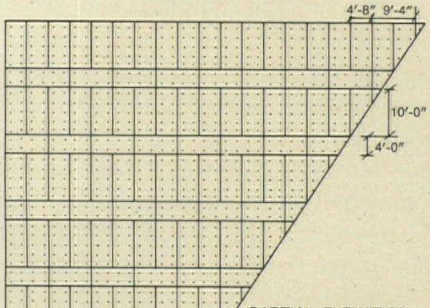
Designed for downtown Dallas, where widely spaced office towers dominate the scene, Pei's medium-rise government building relies for its impact on its audacious cantilevered form. The long front of the building will project 70 ft out over its 5-acre plaza, as if to draw the public into its shelter. It 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.

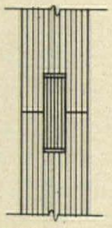
In order to eliminate shrinkage cracking on these undivided wall surfaces, the architects and the structural engineers (Terry-Rosenlund & Co.) worked for two years with Texas Testing Laboratories and cement producers on specifications for a dependable shrinkage-compensating concrete. In use for many 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



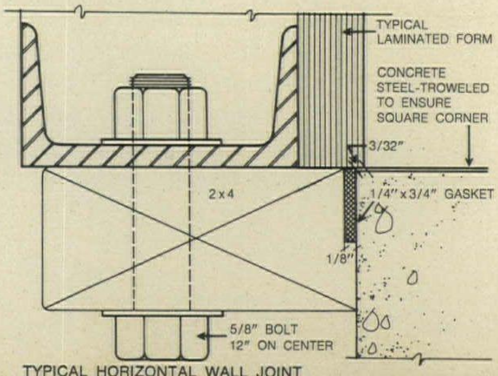
End wall of Dallas Municipal Center shows smooth surface produced by using shrinkage-compensating concrete in laminated wood forms. Splined form joints and gaskets at base of each pour (drawings below) leave virtually unbroken planes. Slight offset at the base of each pour was arrived at empirically, 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.



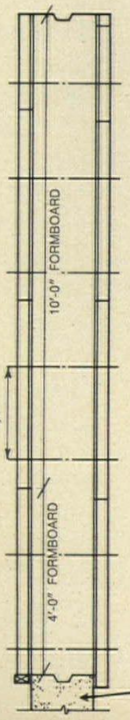
PARTIAL ELEVATION
EXTERIOR WALL



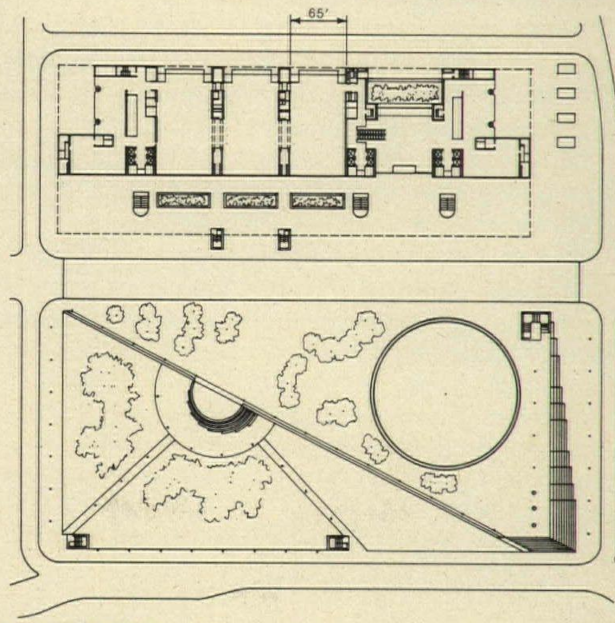
TYPICAL
SPLINE JOINT
VERTICAL OR
HORIZONTAL



TYPICAL HORIZONTAL WALL JOINT



TYPICAL FORM SYSTEM



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.

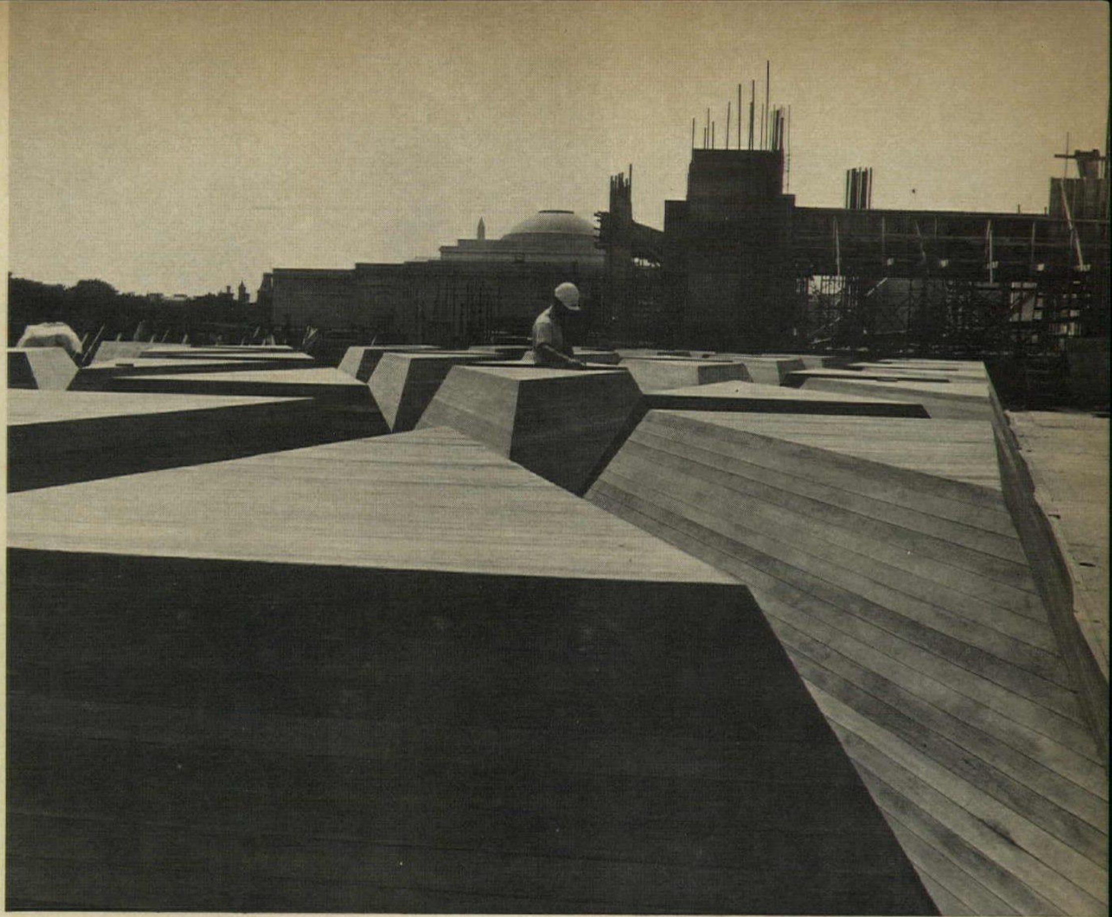
The use of glass here is not innovative in principal, but the design does call for high performance in terms of insulation, strength, and size of individual panes—up to 14 ft long and 105 sq ft in area to avoid "forests of mullions." The panes specified are nominally clear, 1⅝-in. thick, with a ½-in. 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.

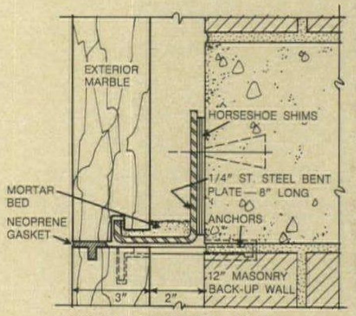
The concrete portions of the building, similarly, are basically conventional, but highly exacting requirements called for materials that were hard to obtain. To begin with, the top quality, clear-grained fir that the Pei office had customarily specified for fine formwork was assembled only through a 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.

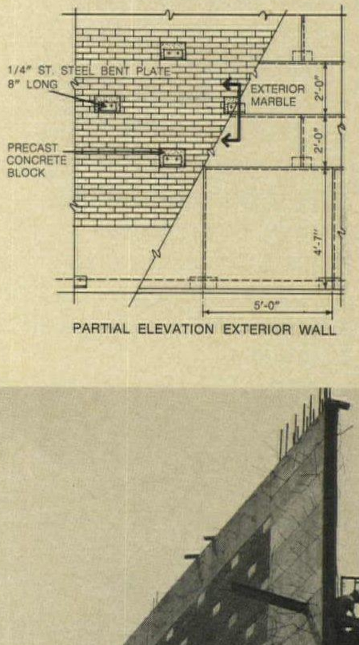
A unique commission, even for the Pei office, the National Gallery addition shows to what lengths these architects can press technical and material resources—given client support—to meet a predetermined design solution. Although all this virtuoso manipulation of concrete, marble, and glass is obviously 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]

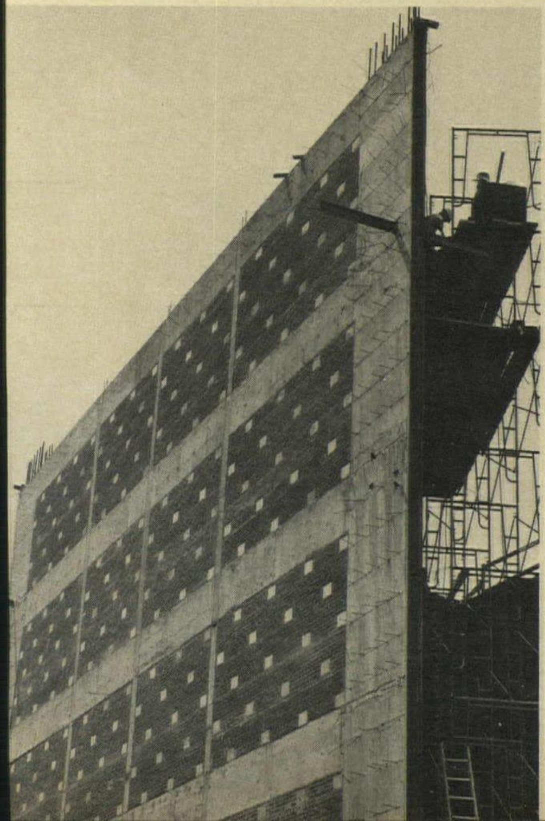


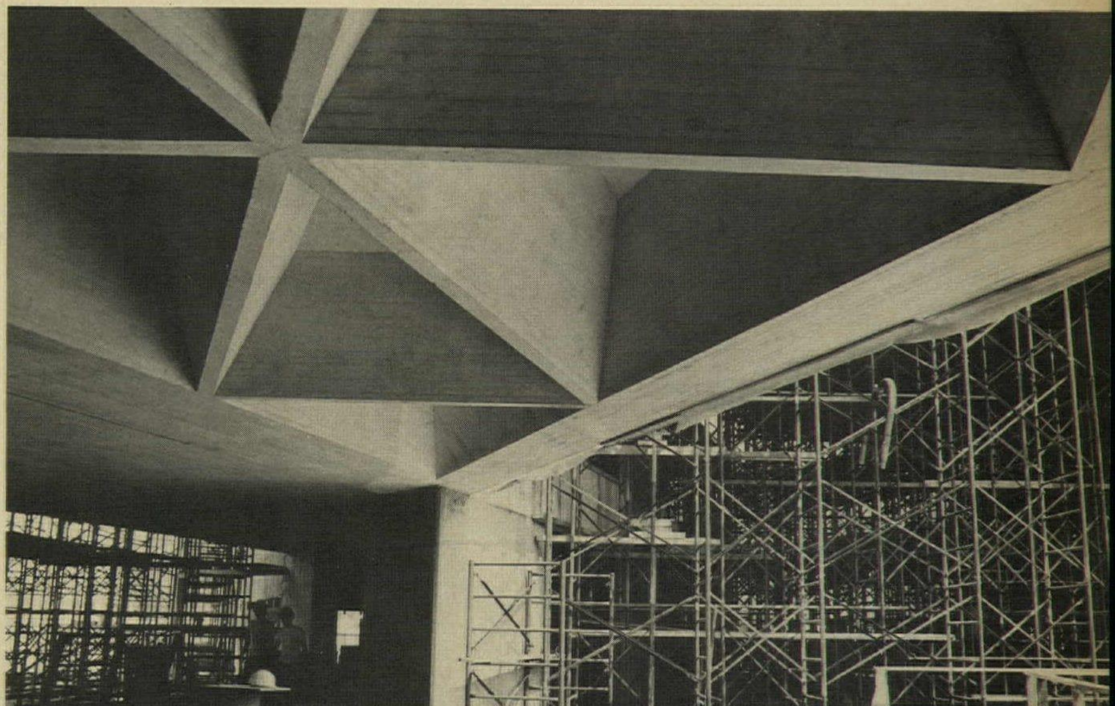


TYPICAL HORIZONTAL JOINT



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.

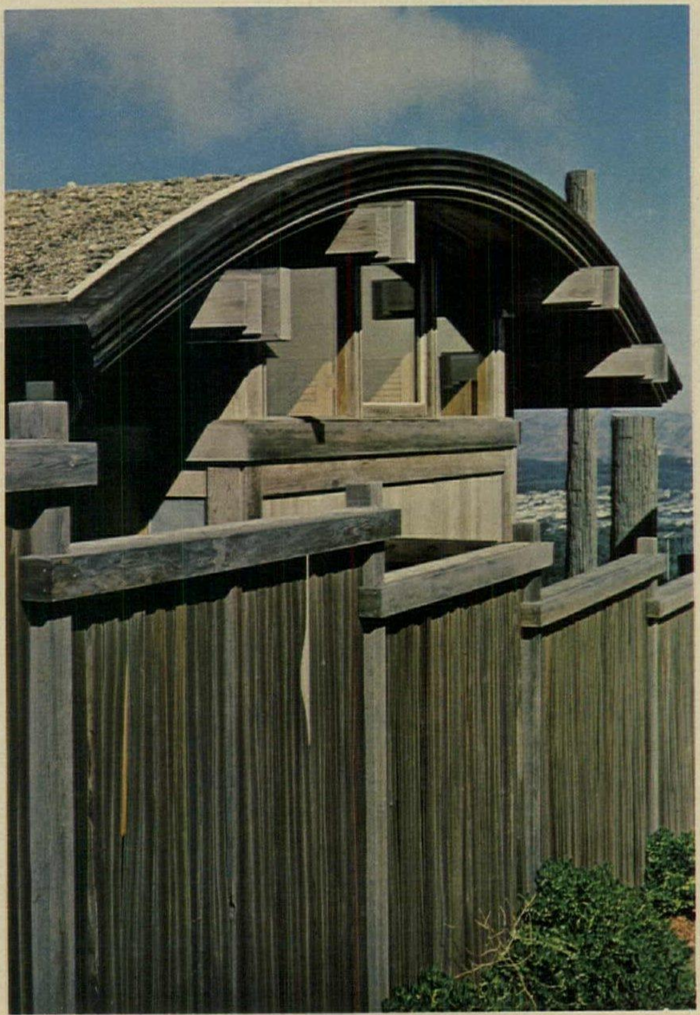
Wild about wood

C.W. Callister

John Payne

James Bischoff

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



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

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.

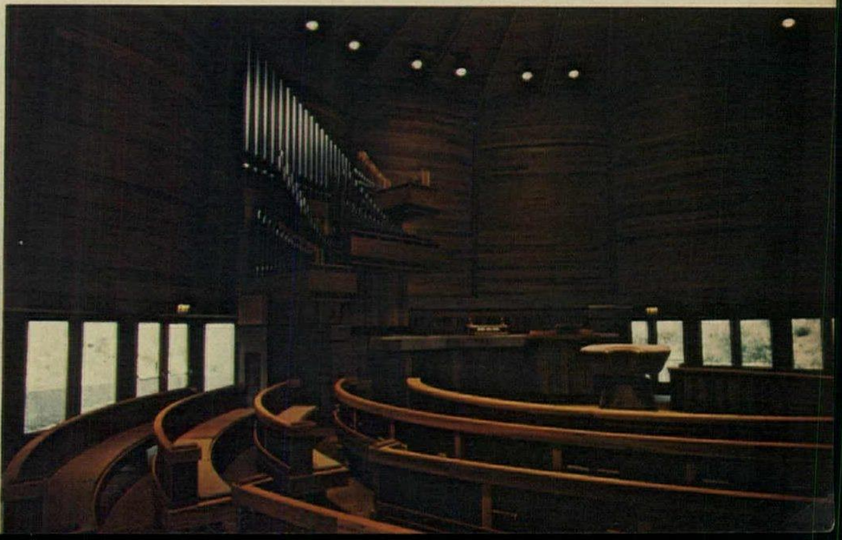
Satirist Jules Feiffer reminds us that technological advancement is independent of aesthetic growth. Transforming handcrafted art into mechanized industry is a delicate operation, as the firm of Calister, Payne & Bischoff of Tiburon, Calif. and Amherst, Mass. is well aware. In 1946, Charles Warren Callister 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.*

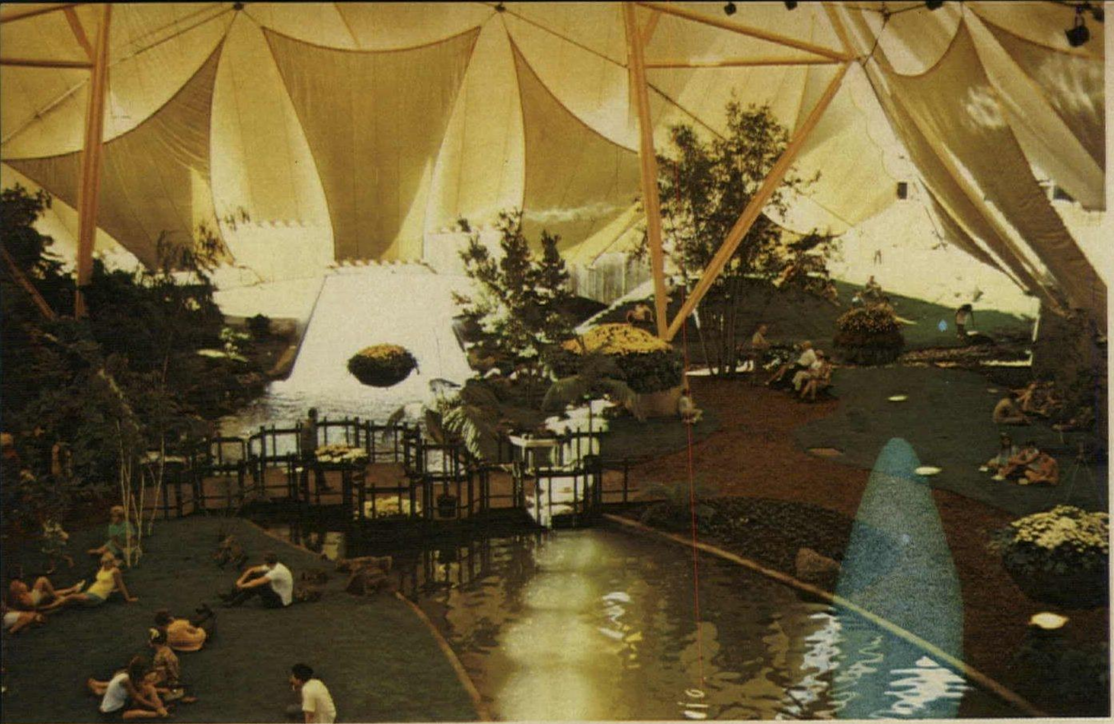
The practice was extended in 1955 to include schools, churches, university projects, and large-scale community planning and housing. Commissions like the retirement community Rossmoor Leisure World (1962–64 Walnut Creek, Calif.), caused fundamental changes in the firm's modus operandi. For unlike many 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.

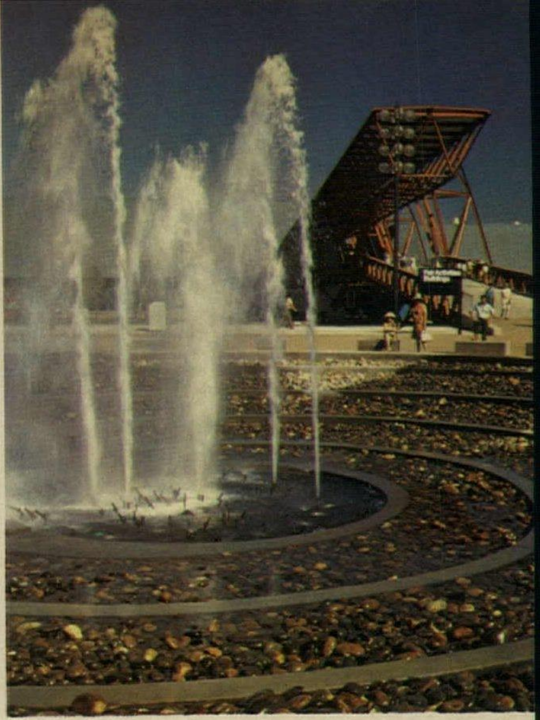
Whatever else was buffeted during the transition, a reverence for wood endured. CP&B specifications have ventured into concrete, stone, and steel with handsome results, but the firm has returned again and again to wood to create its communities, and many commercial projects.

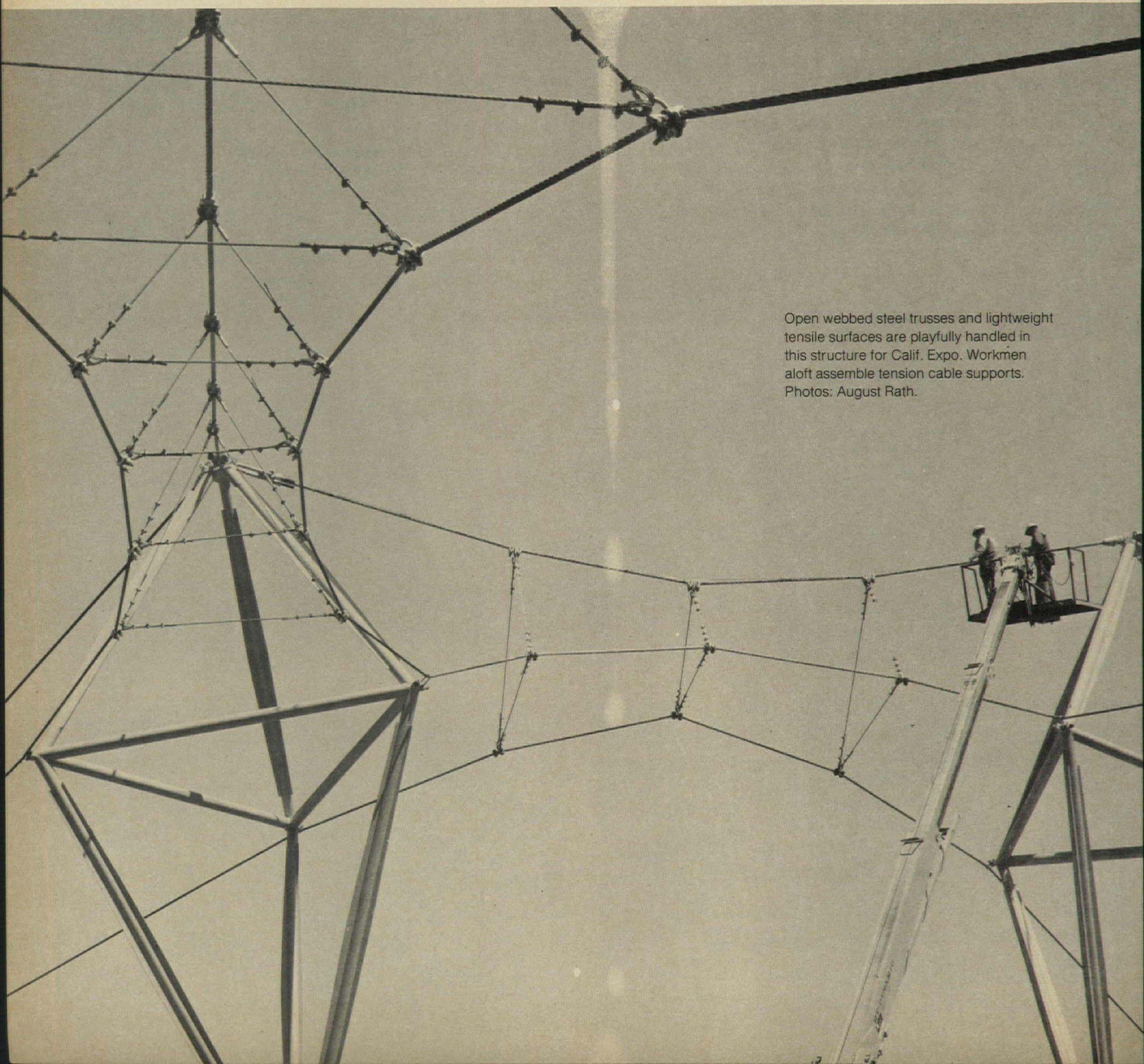
"Wood has a history," says Warren Callister. "It reflects its construction and use. Just as marble looks fine or even better when scratched, wood ages gracefully." Its renewable surface tolerates most cosmetic and surgical alterations by man. "You can carve it, work it up, and give it form which you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

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 liv ? 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."

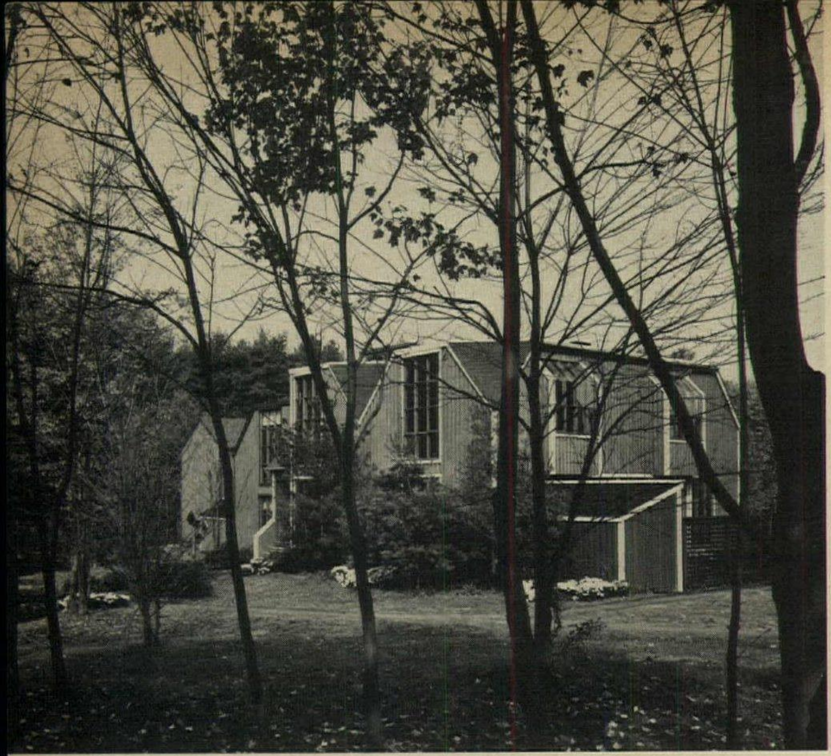
To the woods, to the woods

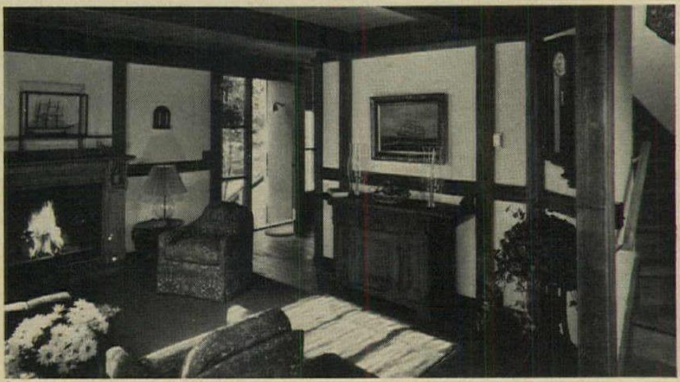
A wood-framed house invariably suggests wooden floors, partitions, and skin. CP&B has always conceived of its structures as organisms whose flesh and bone are tightly intertwined. Rather than conceal or overshadow structural members, the firm believes in assigning them major esthetic work. This attitude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

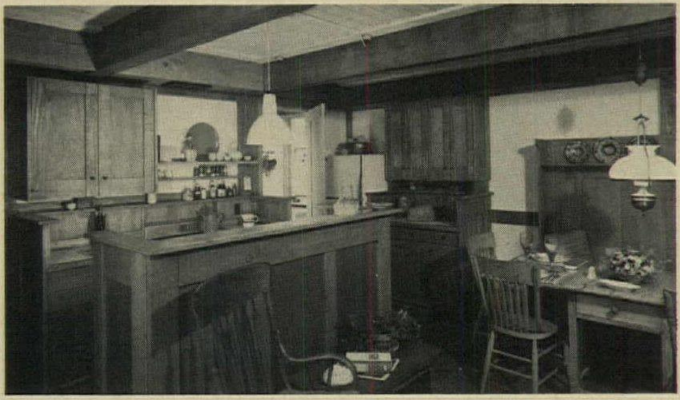
"You could say we are more involved in the technology of planning than of construction," Callister remarks. That is, the firm's portfolio displays no structural surprises. What CP&B does say about structure can be refreshing and literate. The Duncan House (1962, San Francisco), generates a very civilized 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.

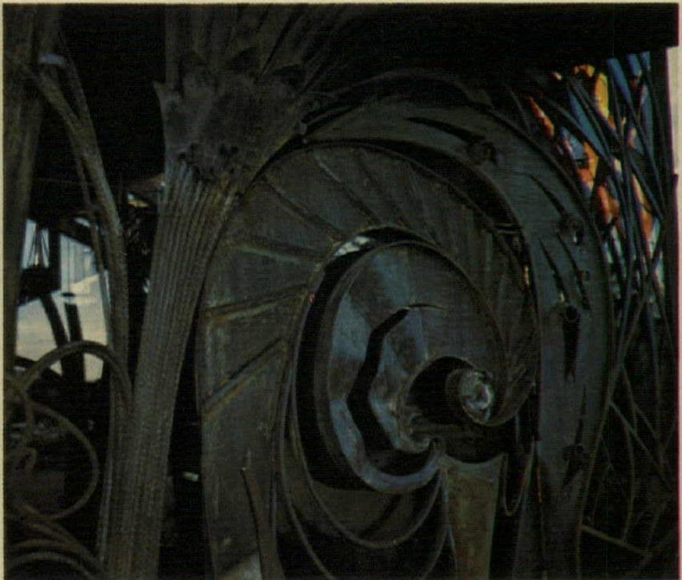
Look closer and you find the familiar affection for materials. The post-and-beam framework gives scale to each room. There are reveals at the ceiling. Flashing is discretely finished. While the custom millwork is summarily detailed, it is harmonious with the structural spacings. Skylights, clerestories,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

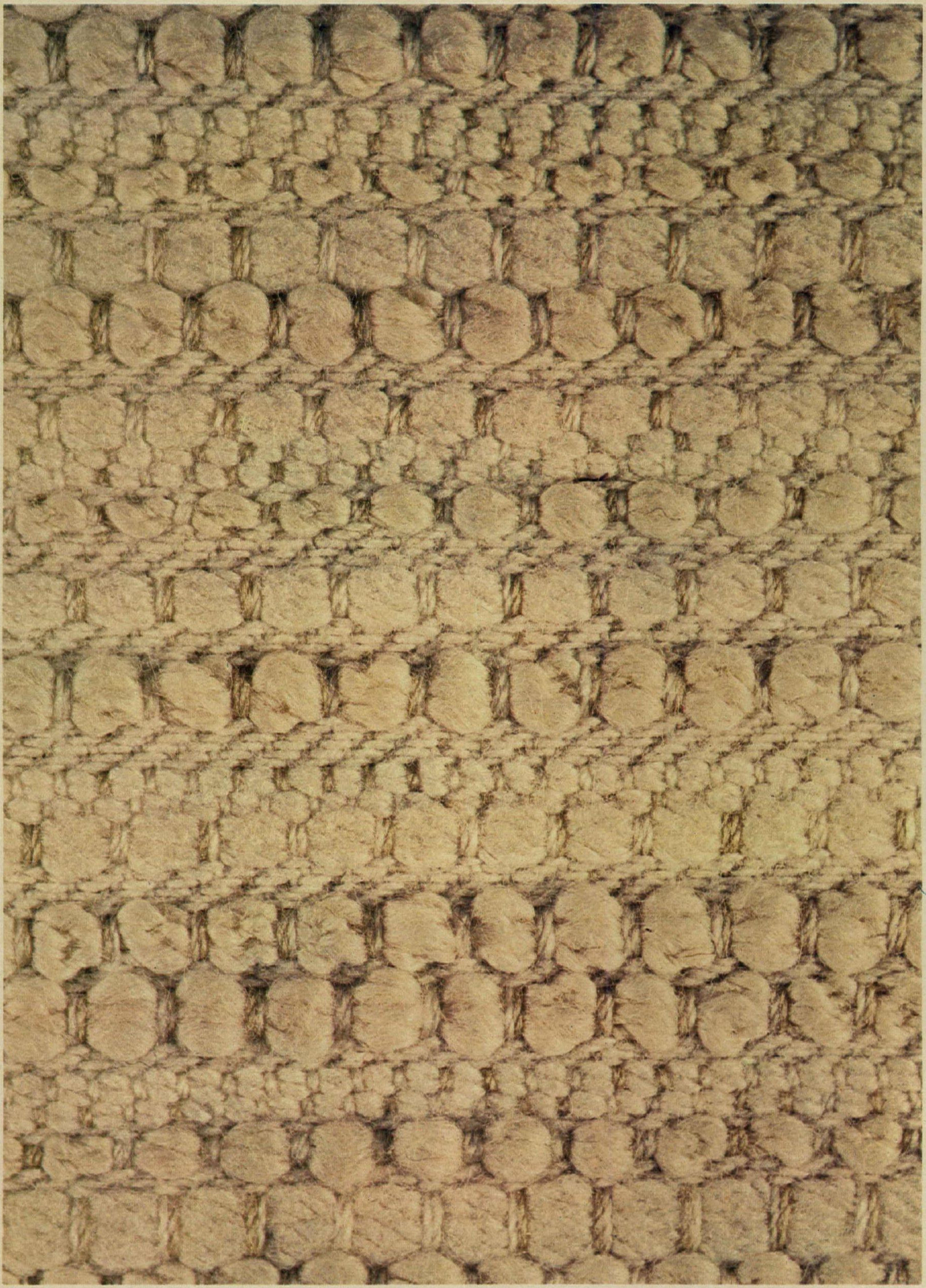
Structure is still handled as a pragmatic art. Steel brackets and tension rods appear where they are needed to create "floating" balconies and wide pitched roofs. Expanded to what seems a generic limit in the large commercial developments like Village Green (140,000 sq ft) or more recently, The Exchange (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.

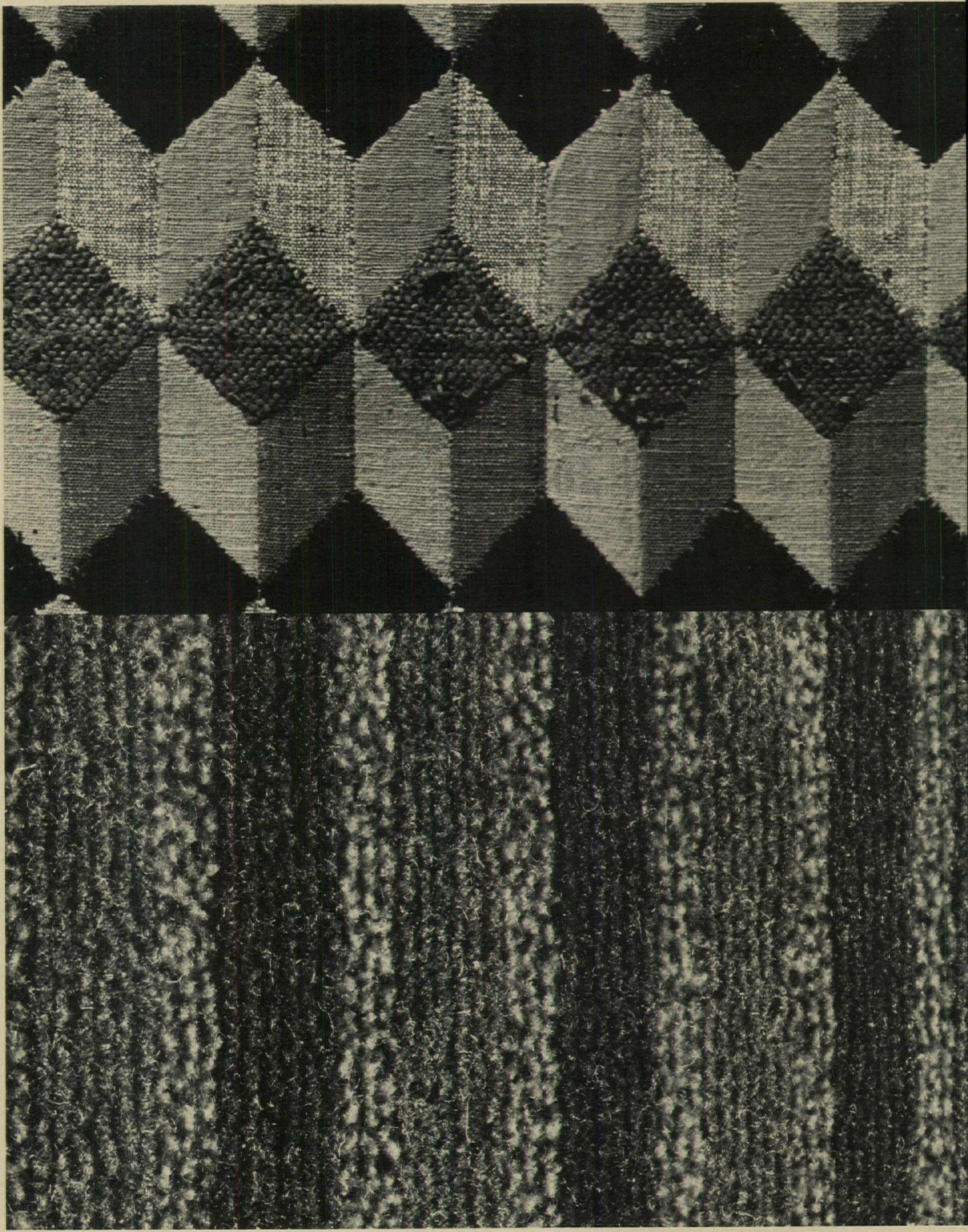
The shortages and attendant difficulties of allocating materials, while causing problems for some, were capitalized on by others. But the not-quite-so-black market which developed earlier this year, was described by a spokesman from the carpet industry as not quite so blatant as its European counterpart. 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.

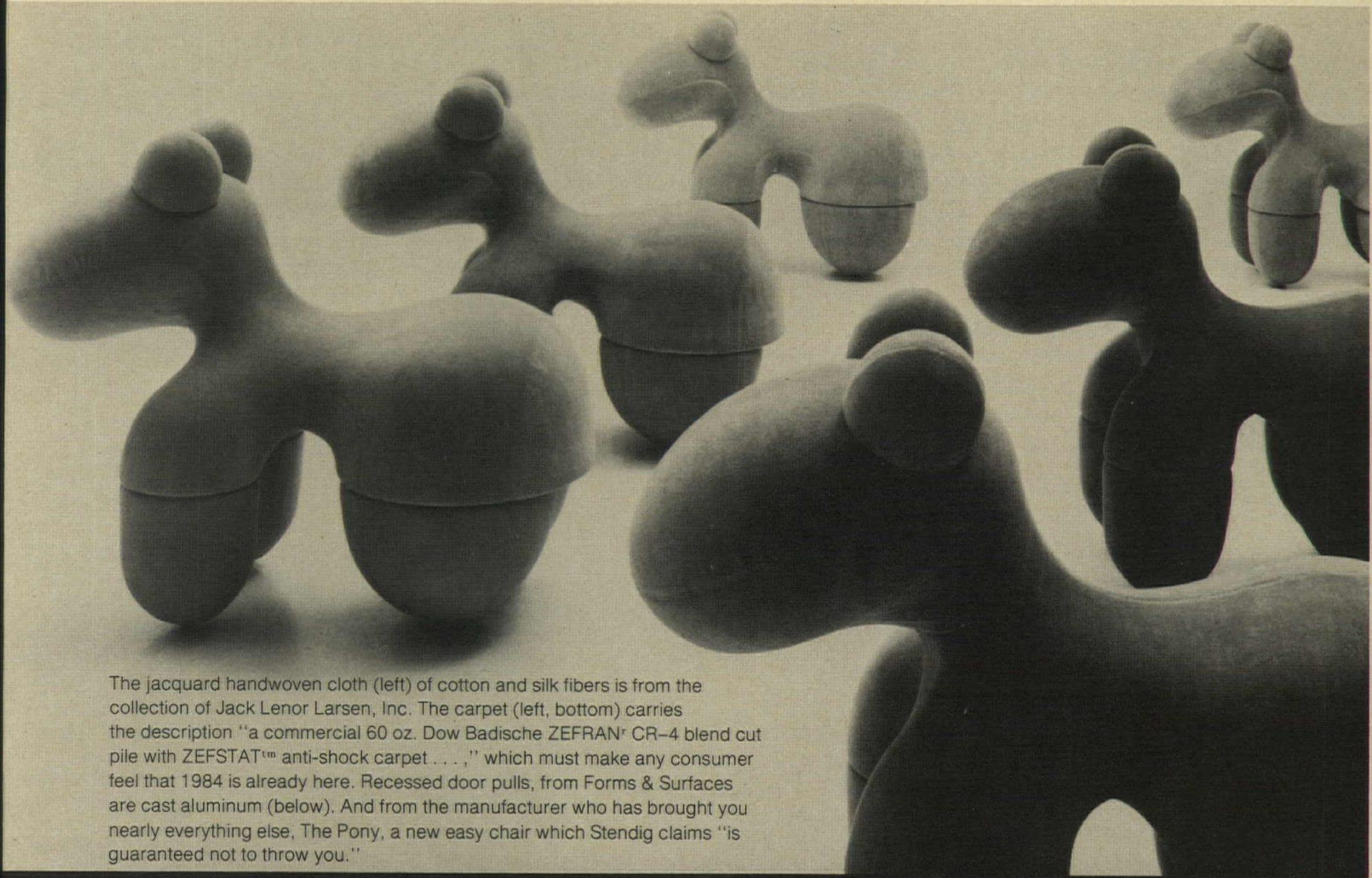
This kind of left-handed bargaining seems to be most prevalent in the chemicals and plastics industries where, lacking one of four crucial ingredients, the remaining three become surplus and wend their way into the market as barter for the missing item.

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.

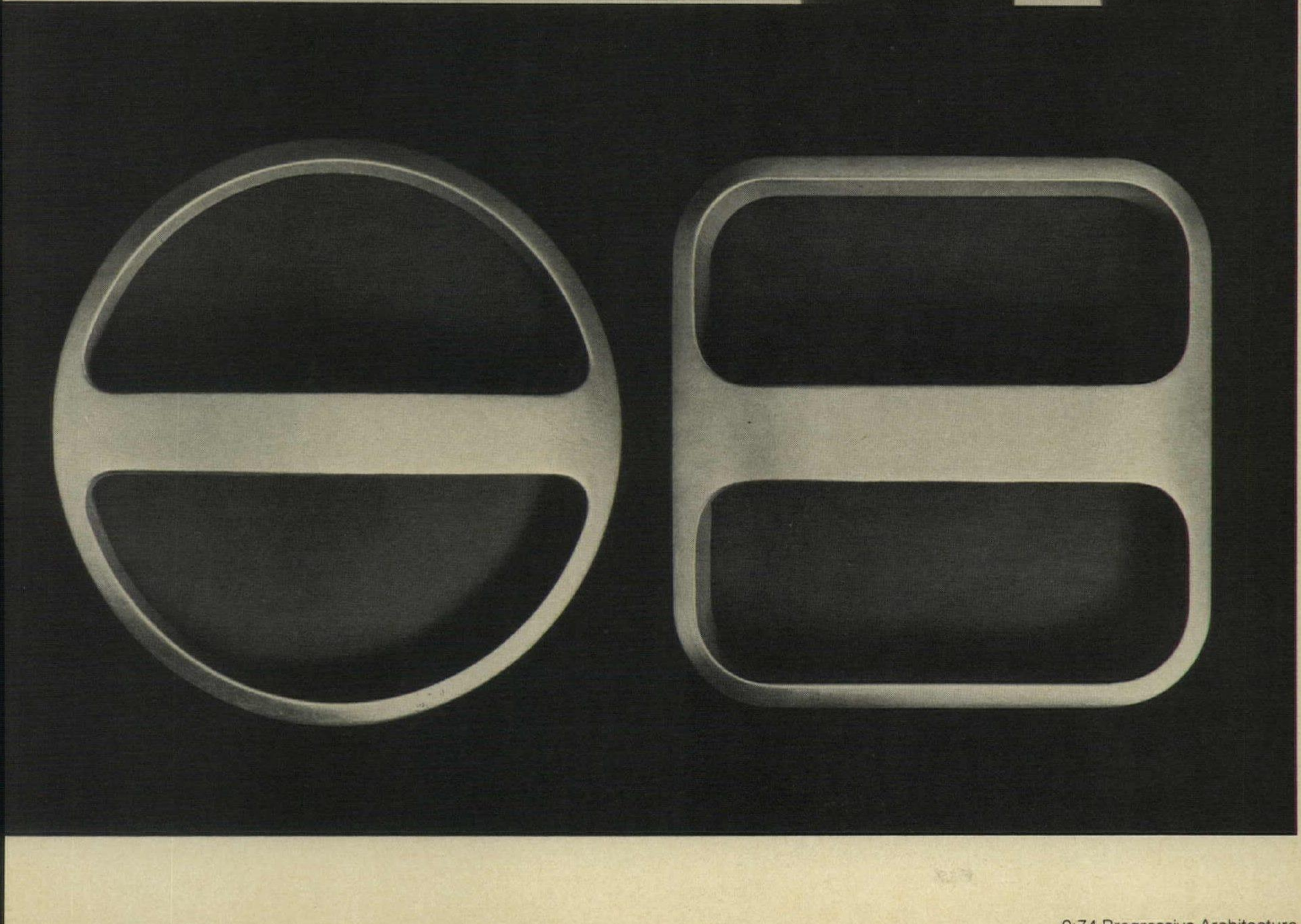
But it is not just the price increases that are being passed on to the consumer. Production delays have lengthened

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."

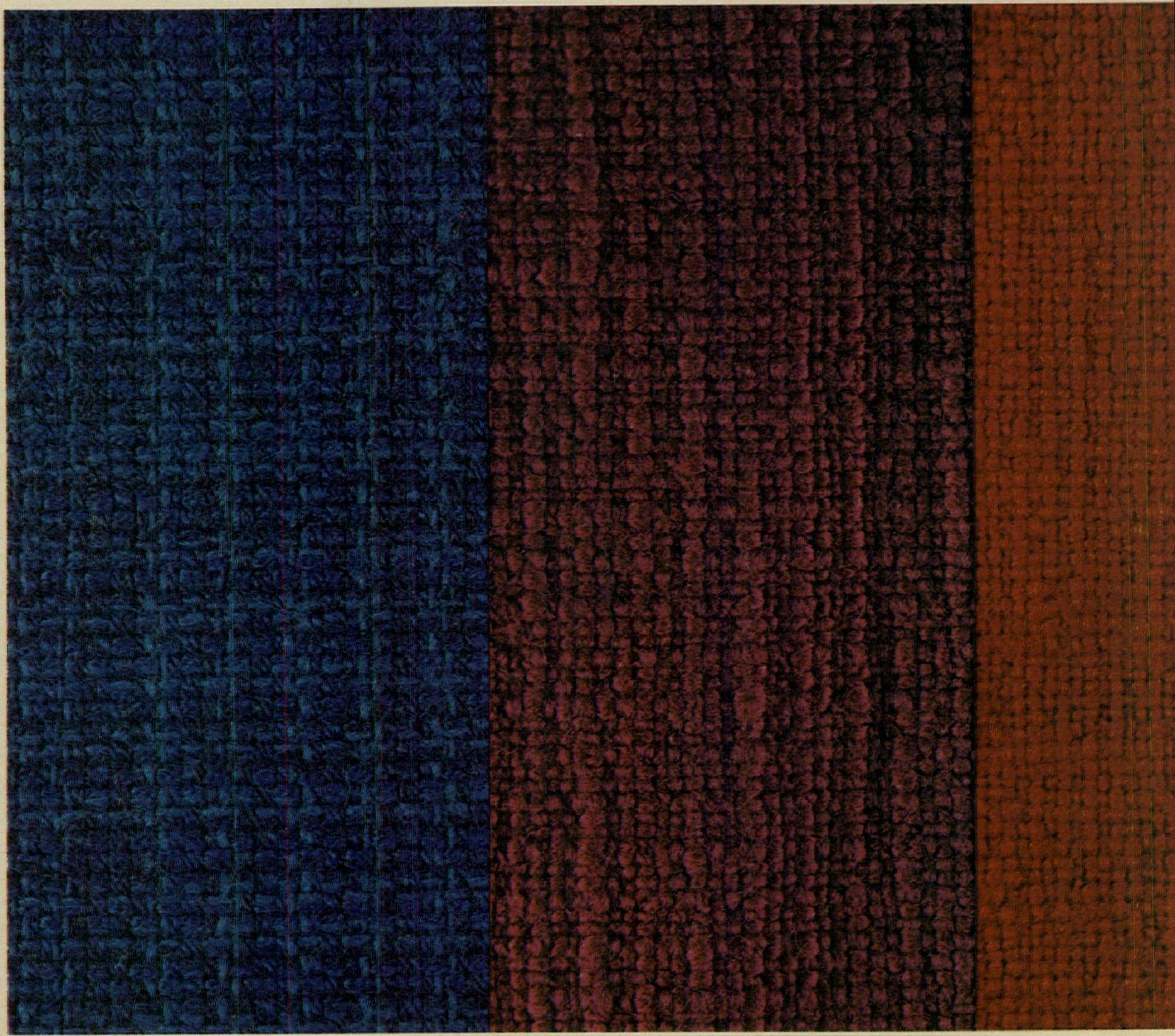


the usual 18-week delivery to nothing short of 26 weeks and, because of this increased time span between order and delivery, most manufacturers won't make a price commitment or negotiate a contract without an escalation clause. Price lists, once good for two years, are now obsolete as soon as they are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

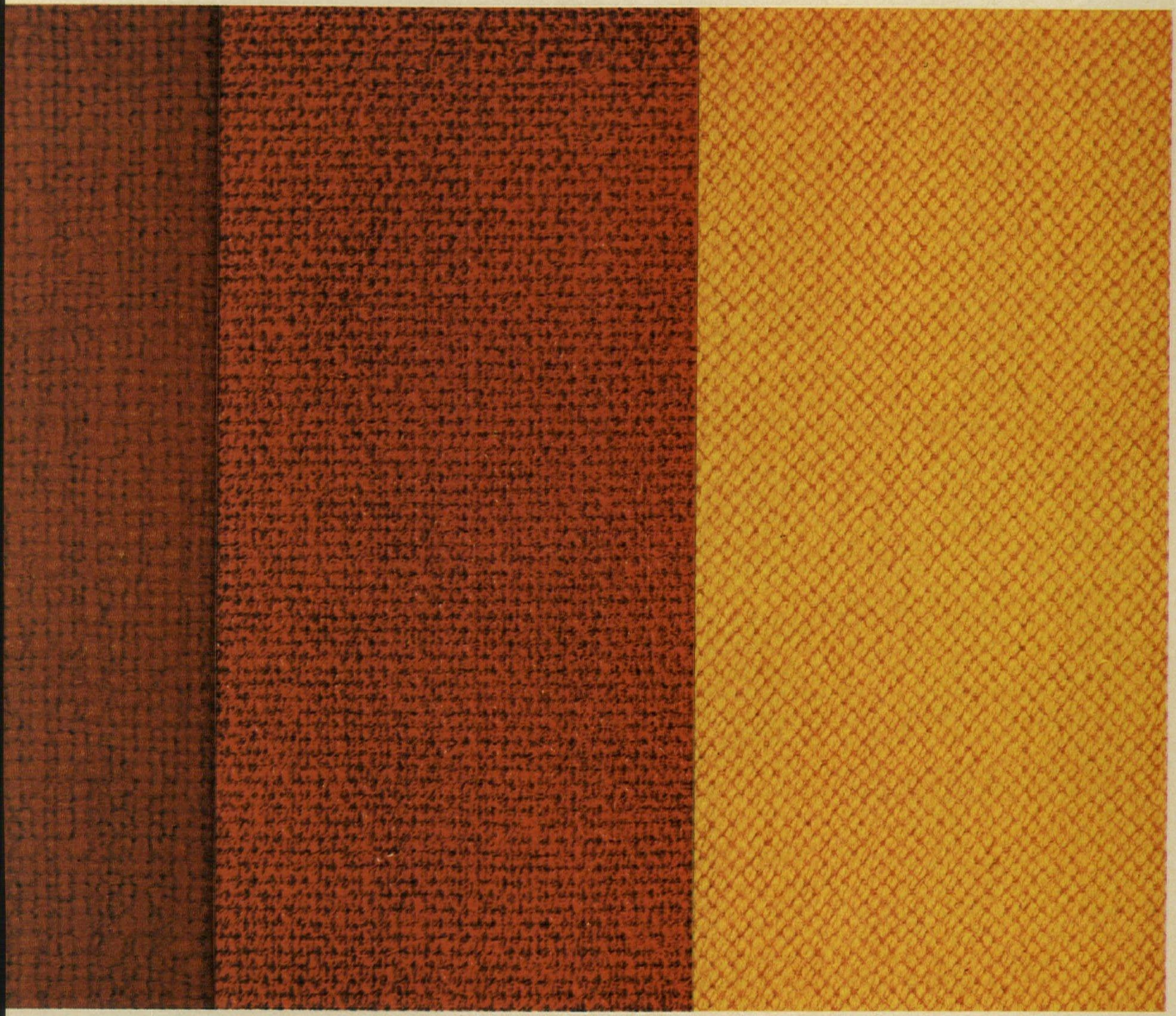
While one can have some sympathy with the manufacturers' and suppliers' position because of the materials



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.



Conclusions

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

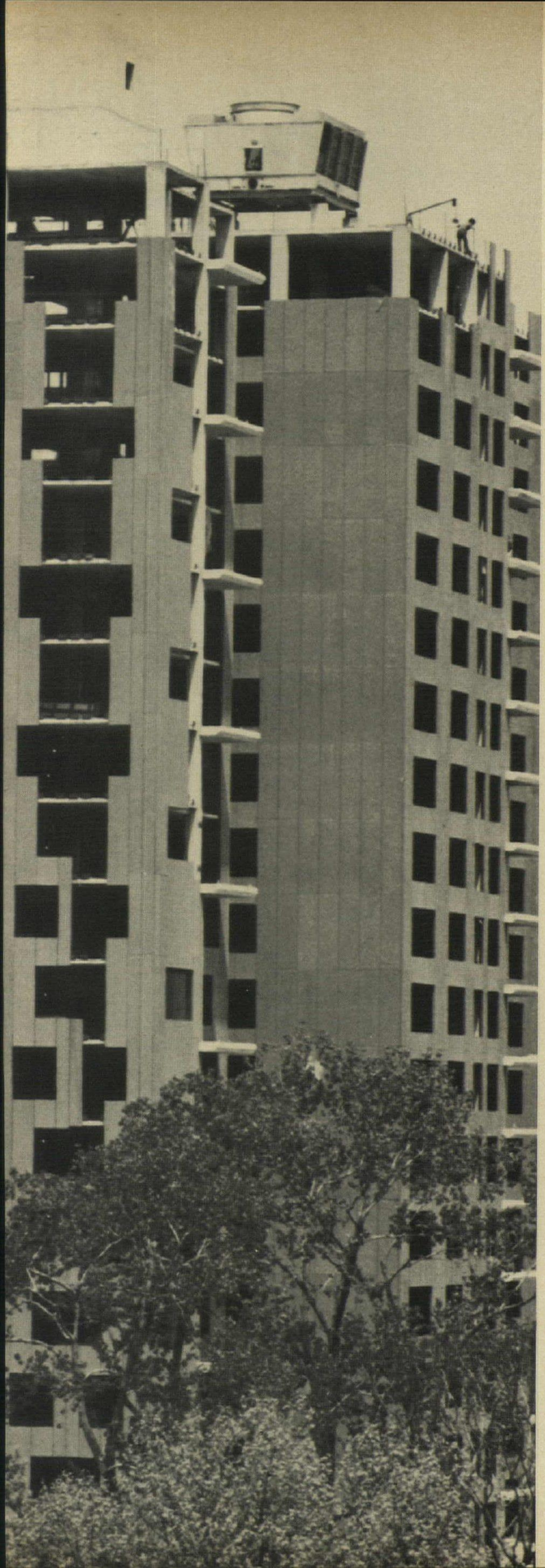
Technology is called upon to assist in finding answers to materials problems by 1) improving and innovating in materials, 2) finding better ways of designing buildings to reduce the amounts of materials needed, and 3) finding new materials or combinations of materials that are more efficient than conventional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

Author: Albert G.H. Dietz is Professor of Building Engineering in the Department of Architecture, Massachusetts Institute of Technology, Cambridge, Mass.



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

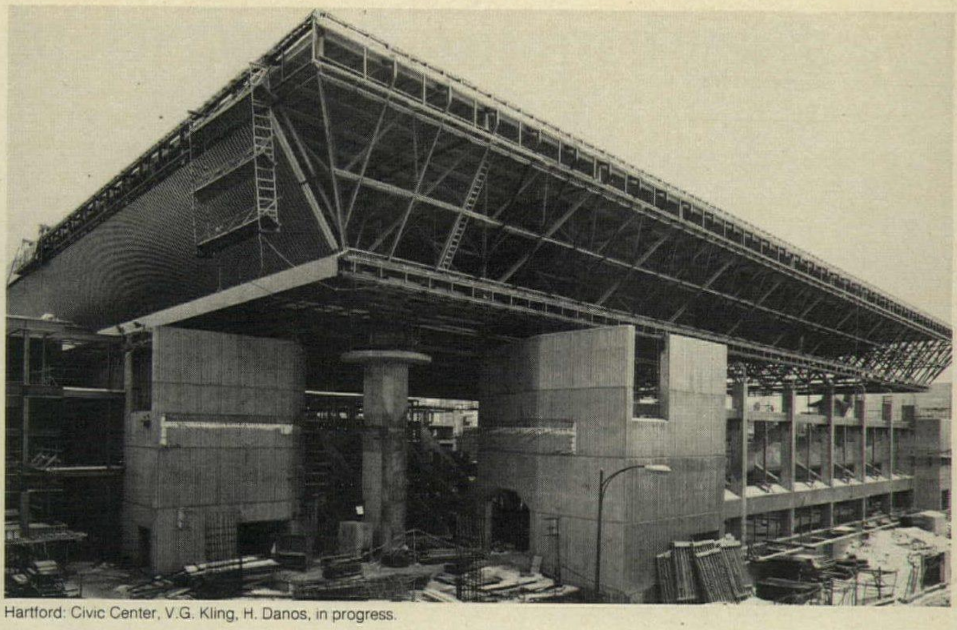
All of these factors interact in choosing and using materials, and lead to problems and issues that must be faced. The performance concept demands careful consideration of the statement of performance requirements. The final product, even if it conforms fully to those requirements, must truly meet the 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.

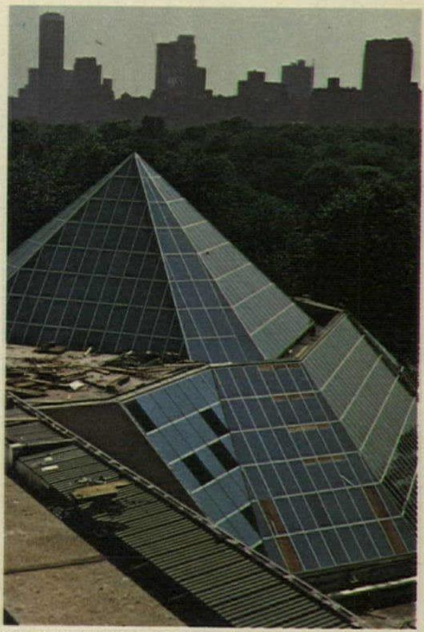
To summarize

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. ☐

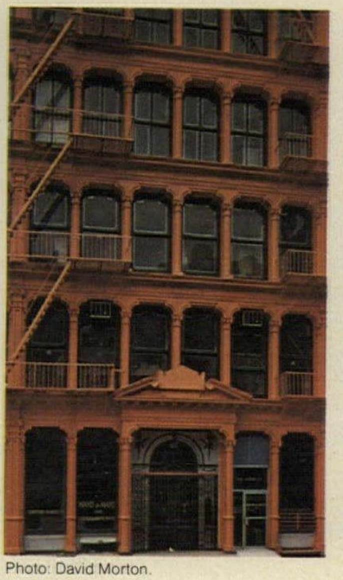

New York: Galleria, D.K. Specter, P.A. Birnbaum, in progress. Photo: Nathaniel Lieberman


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.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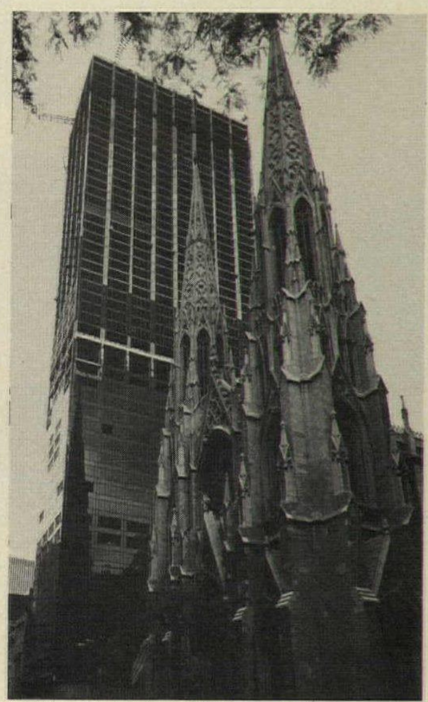
New York: Olympic Tower, SOM, in progress.
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The beauty of them, aside from the obvious, is that they travel light, arrive on the job chip free (and stay that way while you're installing them). And once installed their high performance continues: they're stain resistant and rust proof.

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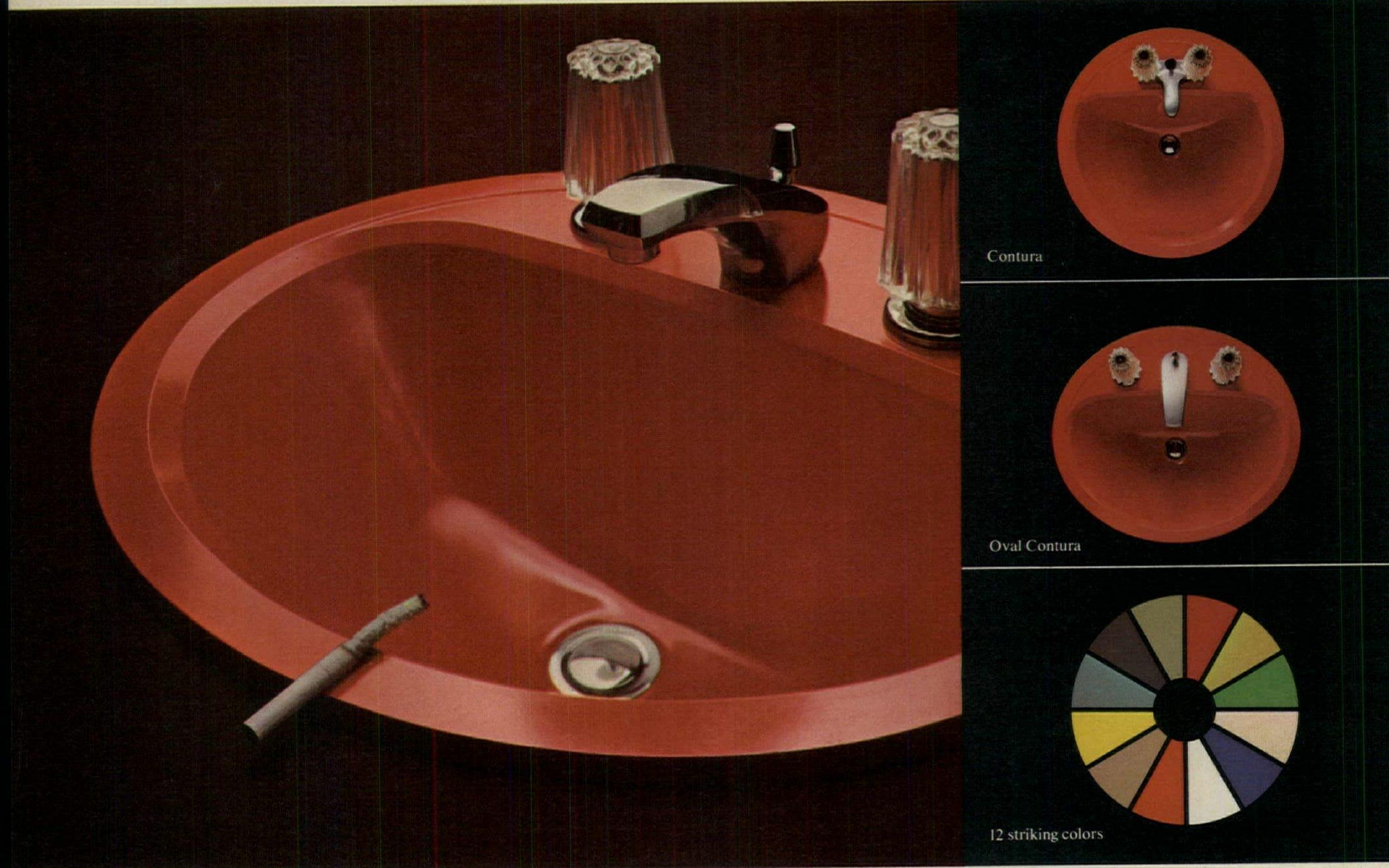

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Oval Contura

12 striking colors

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THIS IS THE HEADRAIL WE HANG OUR BLIND ON. AS YOU CAN SEE, YOU CAN HARDLY SEE IT.

THIS IS OUR BLIND. AS YOU CAN SEE, IT'S WORTH SEEING.

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

ALCAN

Circle No. 321, on Reader Service Card

Technics: Specifications clinic

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.

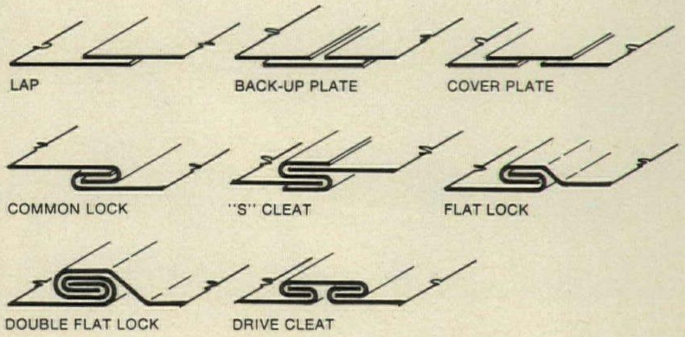
Zinc alloys are of recent vintage as compared to the other metals. Its high coefficient of thermal expansion must be appropriately detailed.

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:



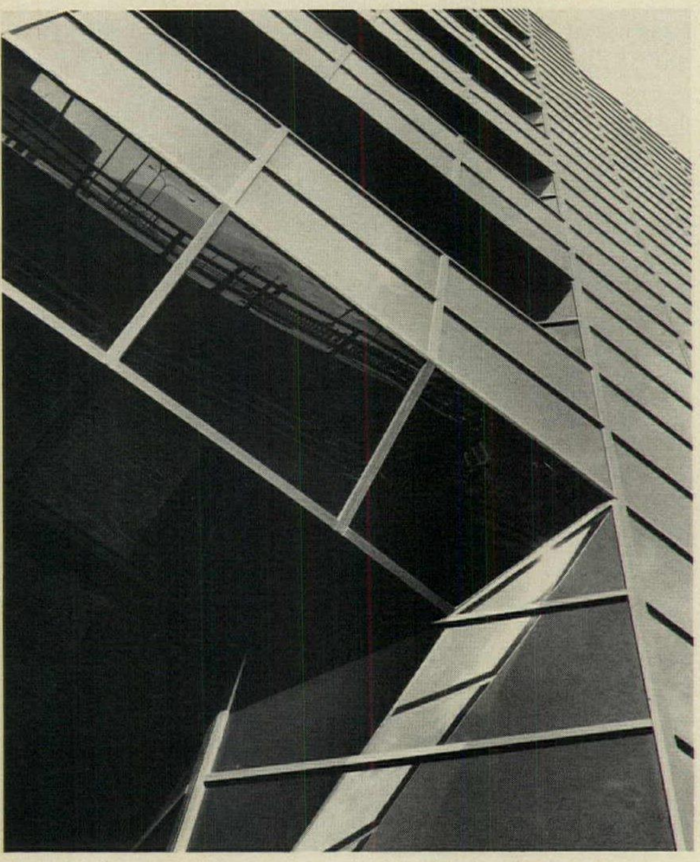
The appropriate specification references for metals, solders, and fluxes used for roofing and sheet metal are as follows: Aluminum, Fed. Spec. QQ–A–250. Copper, Fed. Spec. QQ–C–576 and ASTM B370. Lead Coated Copper, ASTM B101, Type 1 or II, Class A. Monel, Fed. Spec. QQ–N–00281 and ASTM B127. Stainless 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.

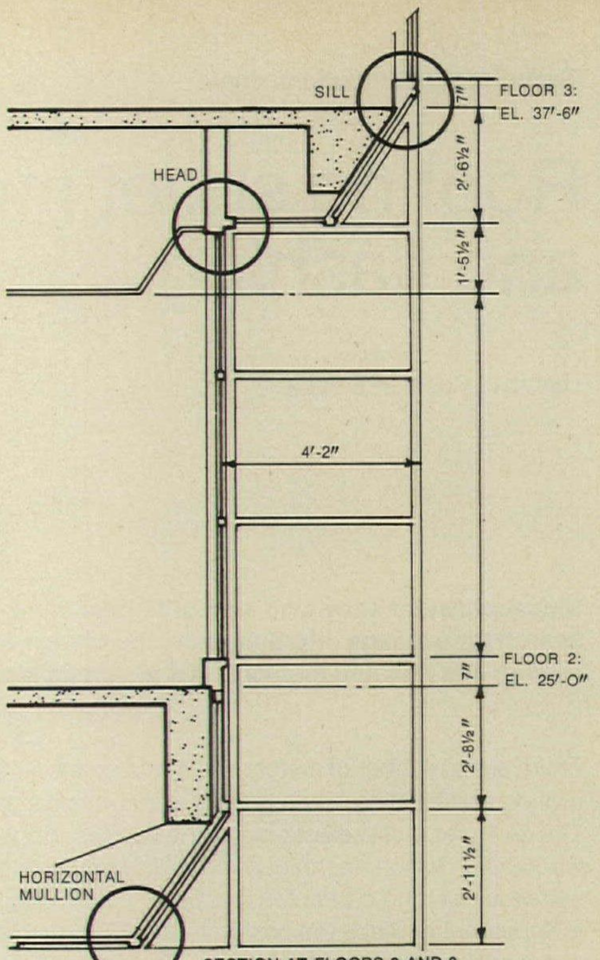
Author: Harold J. Rosen is an independent construction specifications consultant in Merrick, New York.

Technics: Selected details

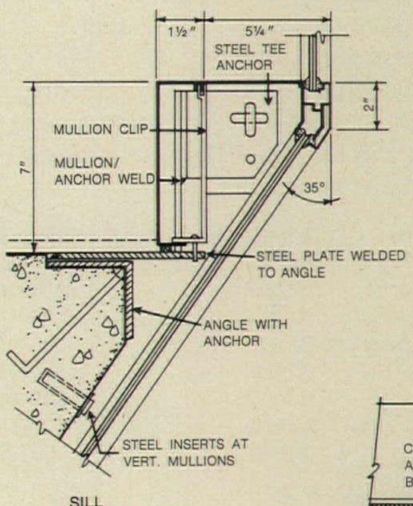
Inside the looking glass

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.

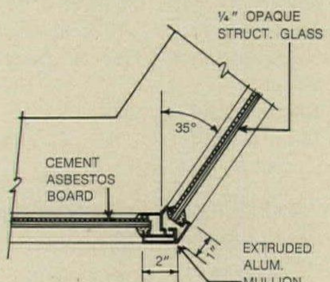




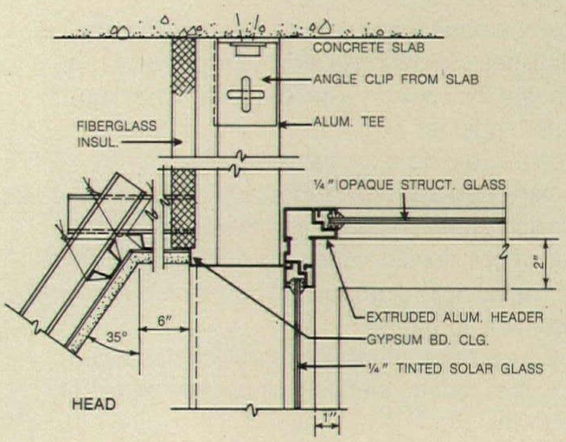
SECTION AT FLOORS 2 AND 3



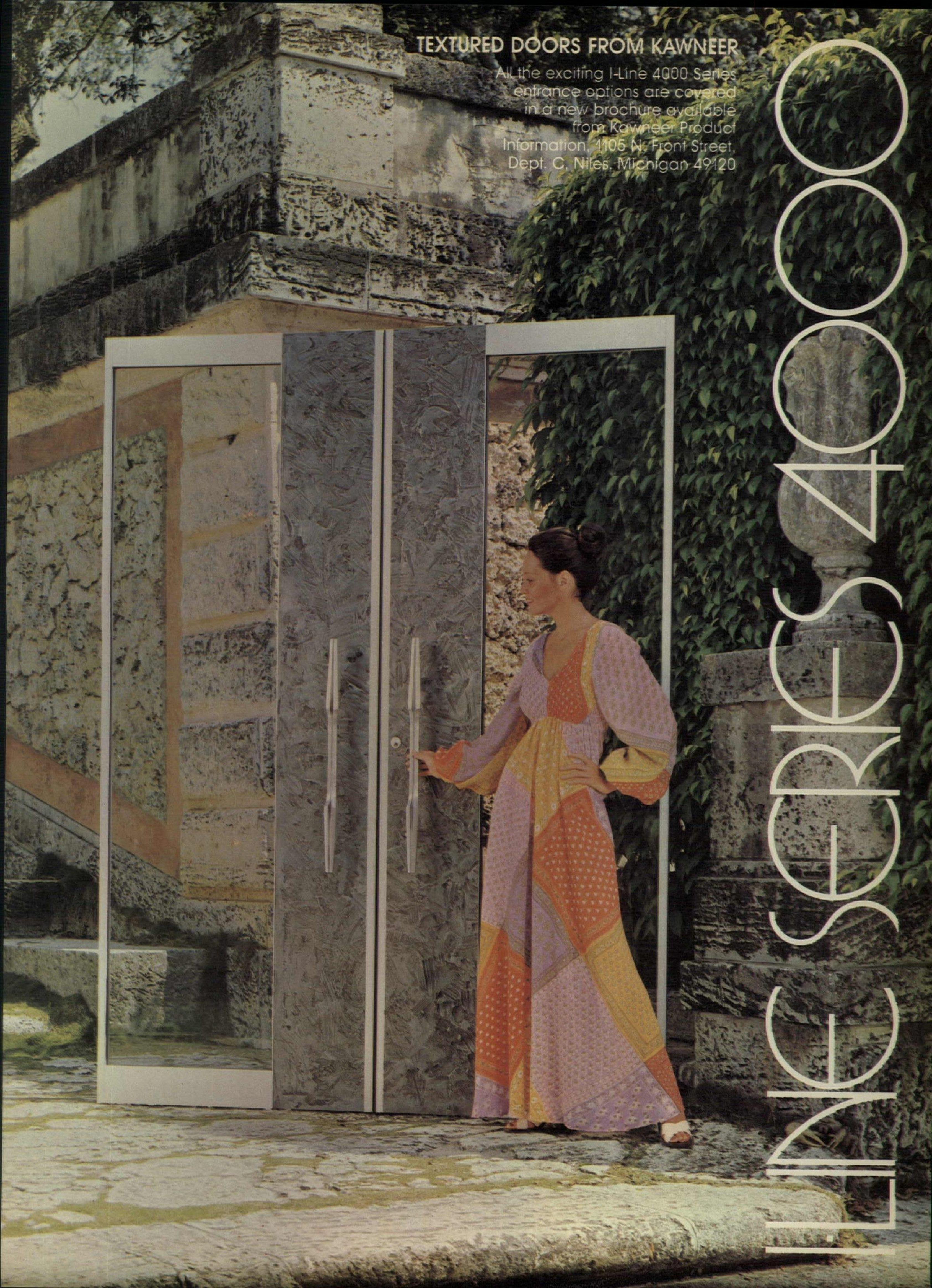
SILL



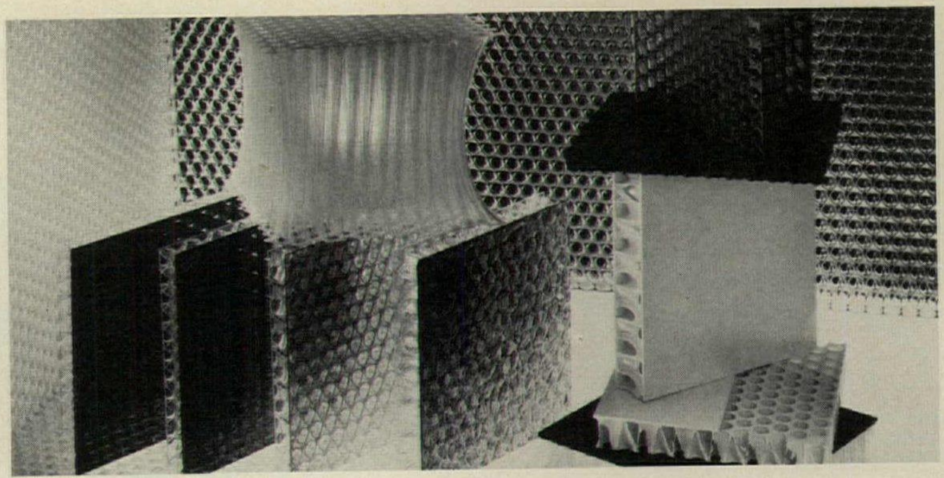
HORIZONTAL MULLION



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

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

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.

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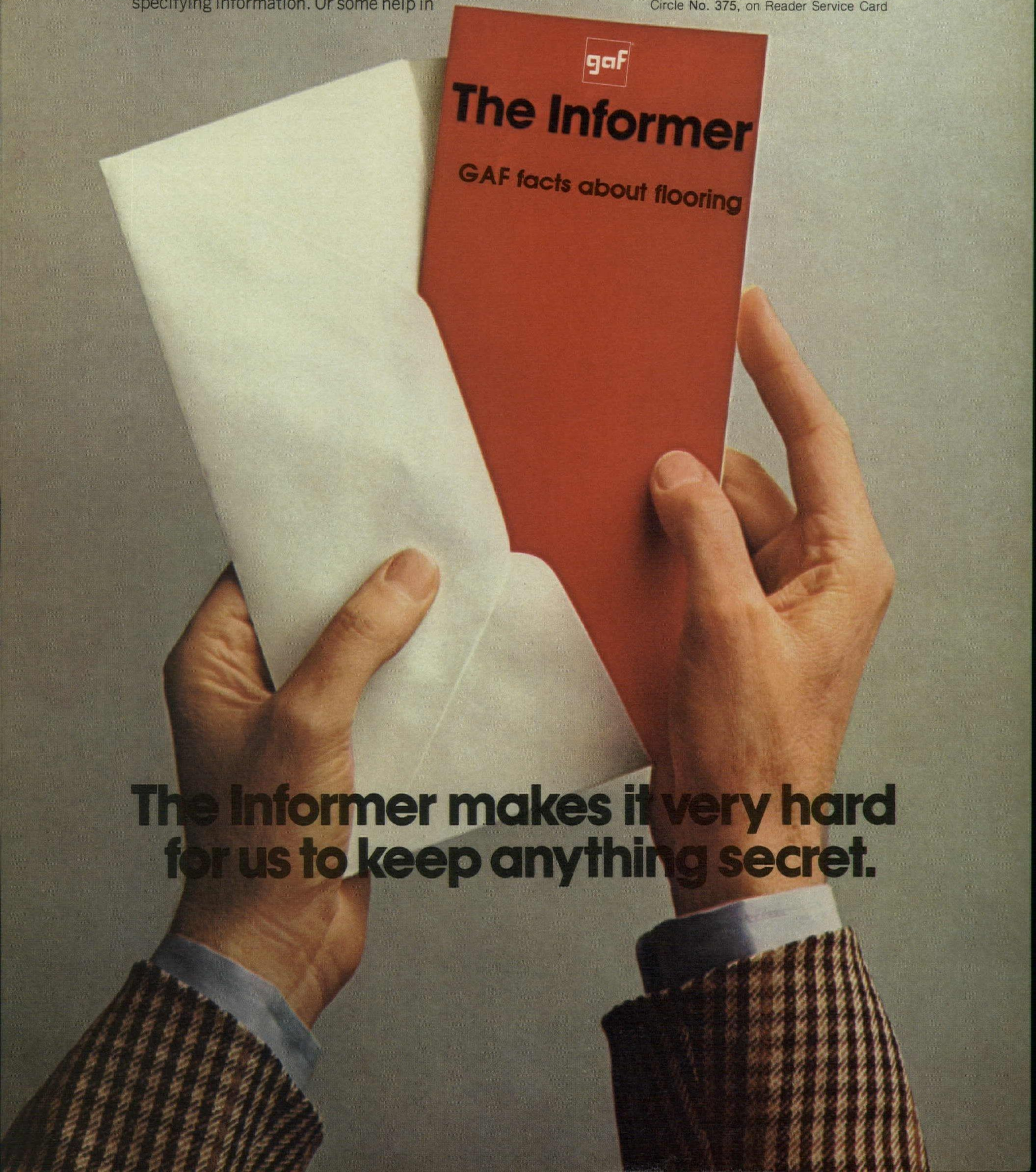
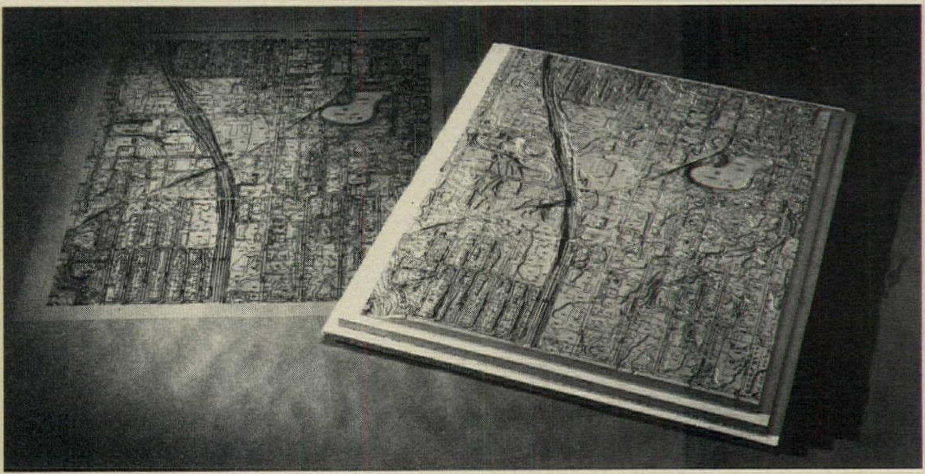


Products continued from page 118

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.

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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

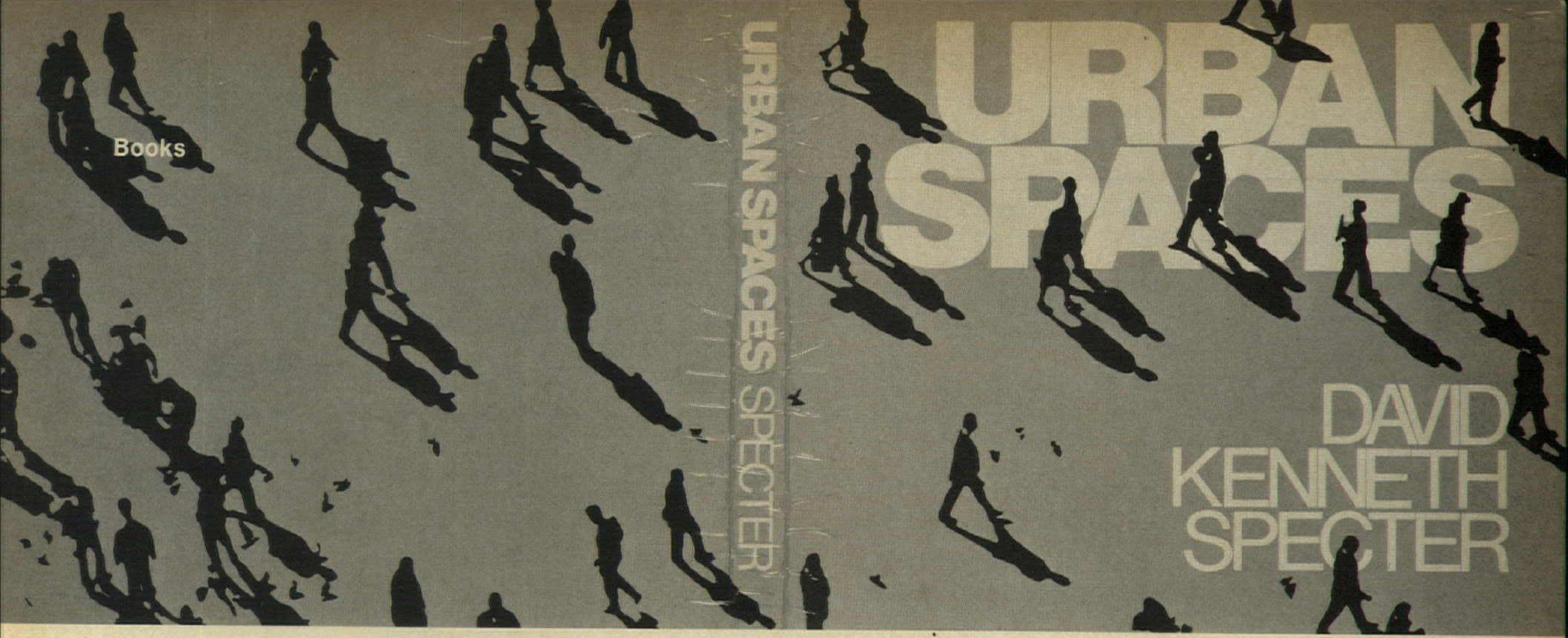
Drafting furniture/equipment. Catalog covers complete equipment line, including flat, vertical, and roll filing systems, single and coordinate group drafting tables, tracing units, art and student tables, and miscellaneous furniture and equipment. Stacor Corp.
Circle 208 on reader service card

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



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.

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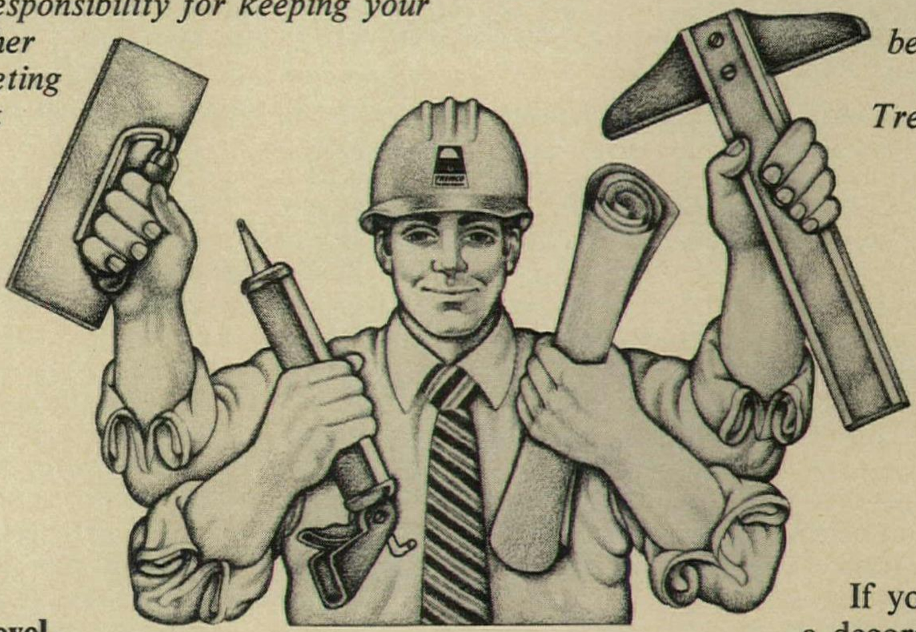

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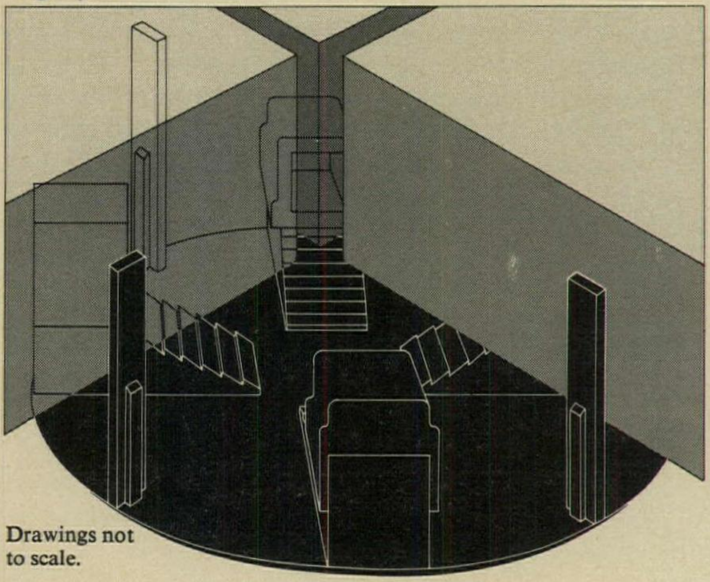
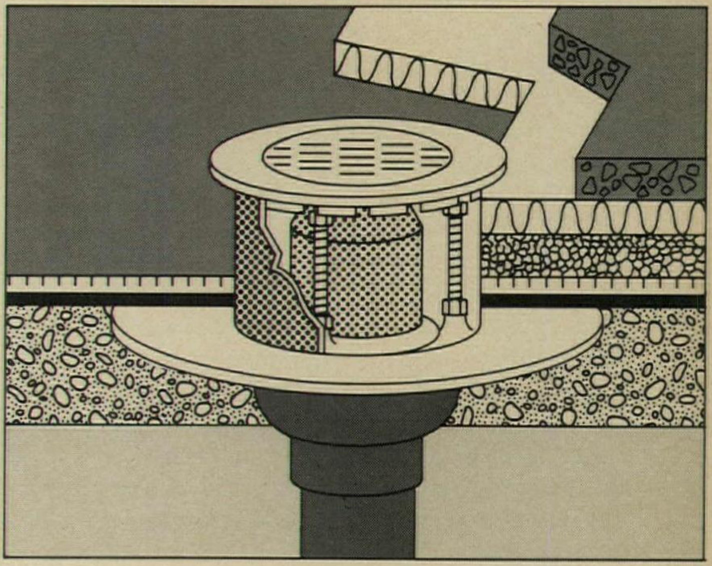
TREMproof™ liquid polymers form a monolithic seamless blanket. They are adaptable to insulated or non-insulated applications, exhibit excellent cold weather flexibility and elongation properties, and will withstand continuous water immersion. These properties make them perfect for use with either of the following waterproofing systems.

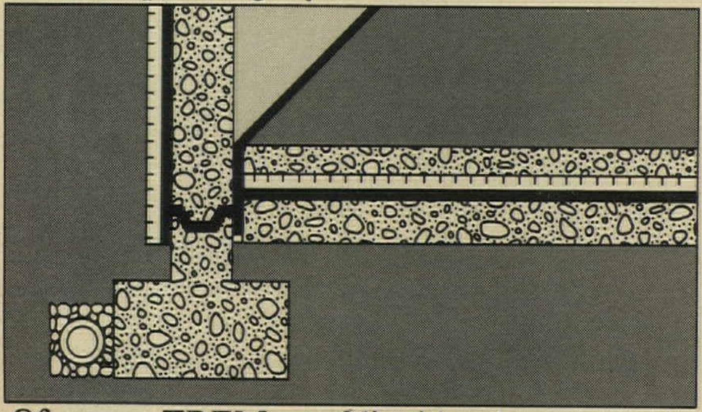
If you're considering a decorative plaza, deck or terrace, you should consider pavers. Our KingPin™ pedestal gives you design freedom, a level paver surface and uniform open joints between pavers. The KingPin supports the paver surface above the structural slab waterproofed with TREMproof. Water runs through the open joints in the paver surface and down the drains at the structural slab level.



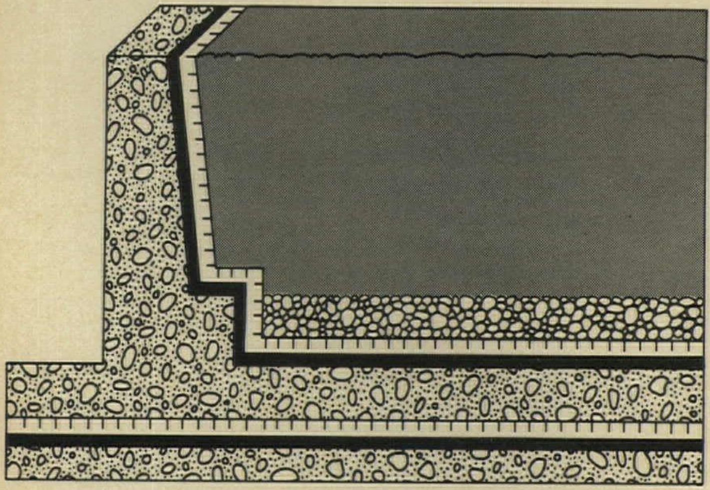
Drawings not to scale.



If you're designing a poured concrete wearing slab, our unique All-Level Drain used with TREMproof assures positive drainage on all levels. Water is taken off the traffic surfaces, the insulation layer, the percolation layer, and the waterproofing layer itself.



Of course TREMproof liquid polymers can be used for the waterproofing of foundations, planters, reflecting pools, etc. They're self-adhering and become an integral part of the



structure. Their superior adhesive quality prevents any lateral movement of water between the substrate and waterproofing blanket.

Systems to waterproof traffic-bearing surfaces.

TREMproof Systems also come in a decorative, moisture-curing liquid polymer for the traffic-bearing surface of plazas, balconies, terraces, interior floors, etc. It cures to a flexible, seamless blanket and becomes an integral part of the structure. It's easy to use and has excellent resistance to abrasion, chemical spillage and ponded water.

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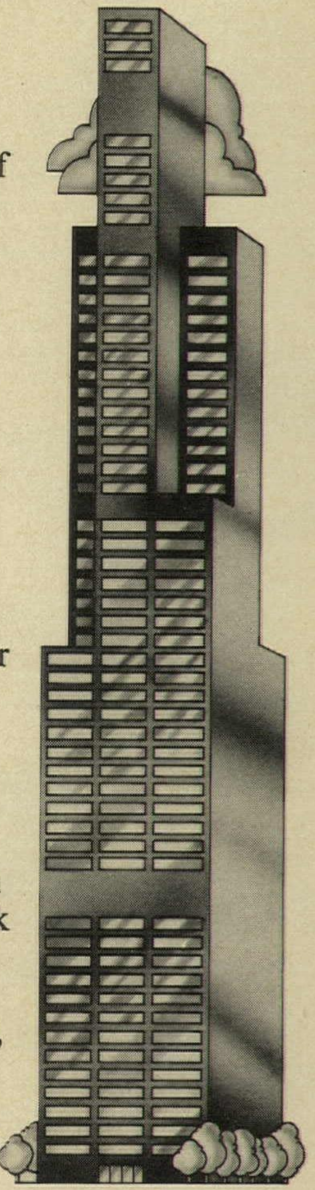

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Notices

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.

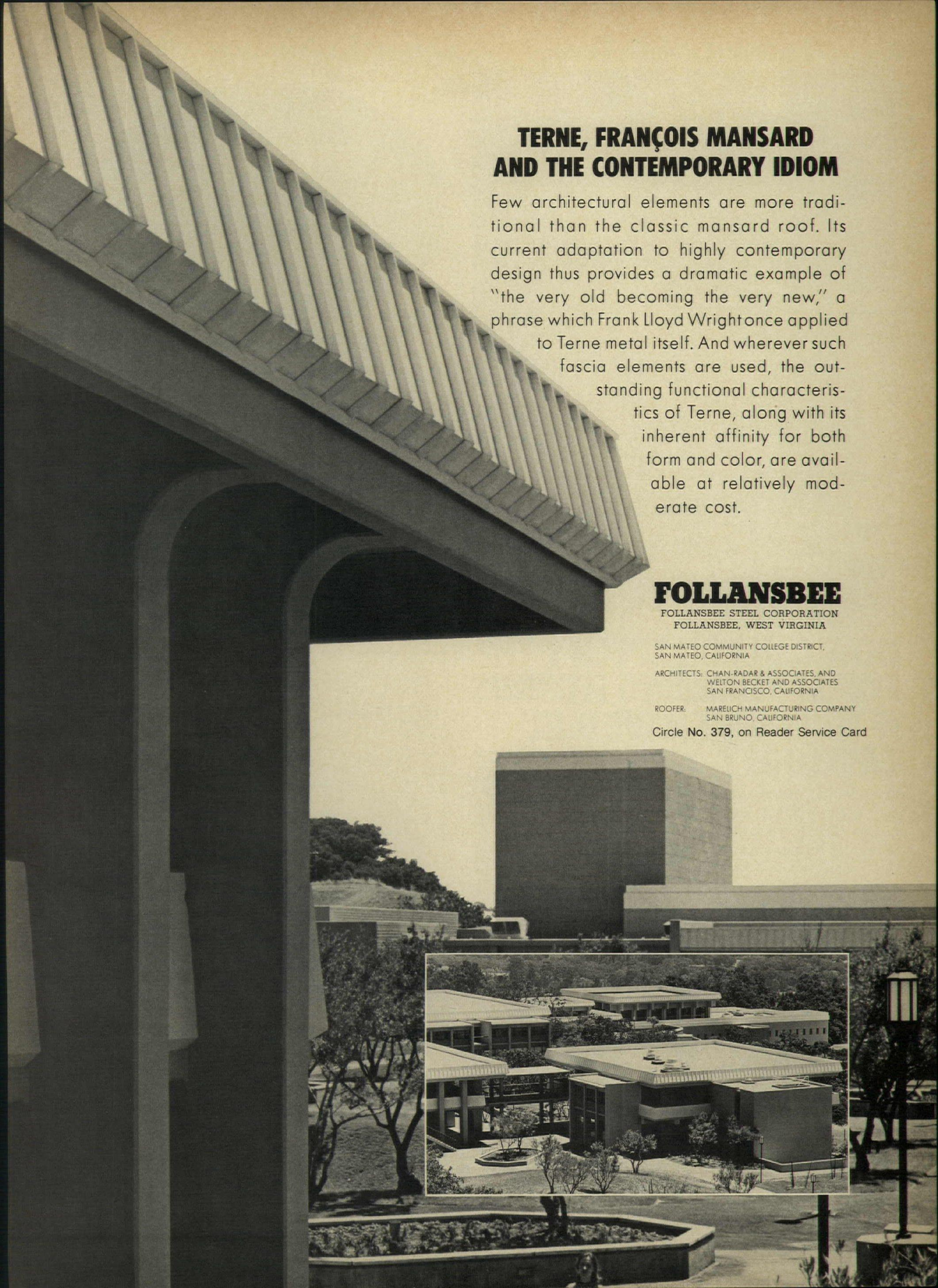
Peter P. Bolles has been elected president of John S. Bolles Associates, San Francisco.

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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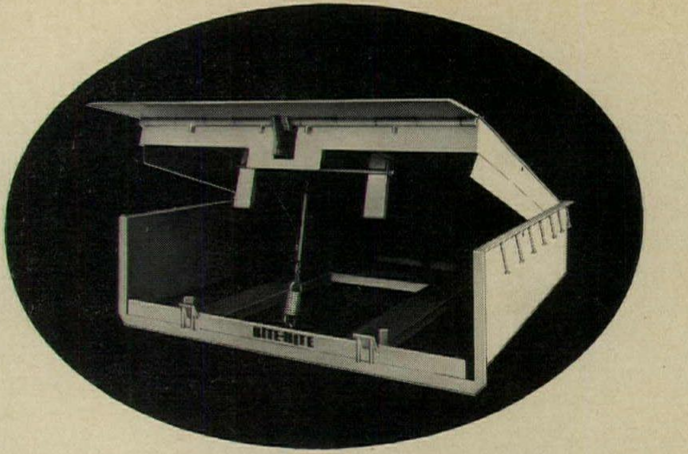

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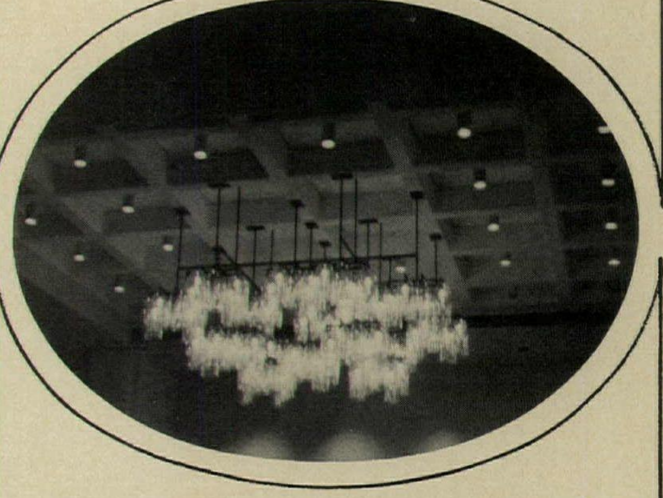

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84300. TIGHT SPACES: Hard Architecture and How to Humanize it. *Robert Sommer.* Windowless office buildings; barren, cheerless campuses; sterile, uncomfortable public parks and airports—we have become so used to the New Brutalism that it scarcely shocks us any more. Robert Sommer analyzes the assumptions behind hard architecture, their alienating effects on occupants, and what can be done to humanize them. **$6.95**

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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**

(Retail prices shown)

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 the firm.

Craig W. Lindelow has been named associate vice president of Reynolds, Smith & Hills, Architects-Engineers-Planners, Inc., Jacksonville, Fla.

Jack DeBartolo, Jr., AIA has been elected general manager of William Wilde & Associates, Inc., Tucson, Ariz.

New addresses

Hans L. Stutz Architect, 30 Cartier St., Ottawa, Ontario K2P1J3, Canada.

John F. Steffen Associates, Consulting Engineers, 2333 Grissom Dr., St. Louis, Mo. 63141.

Curtis & Davis Architects and Planners has opened an office at 2574 Seagate Dr., Tallahassee, Fla. 32301.

Warren & Van Praag, Inc., has a new office at 330 Brady St., Davenport, Iowa 52801.

Eaton W. Tarbell & Associates Inc. AIA, One Merchants Plaza, Bangor, Me. 04401.

Charles Kober Associates, 643 Front St., San Francisco 94111.

New firms

David Travers & Associates, business development and management consultant 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 J. Hallowell, Jr., PE have formed **Creative Design Associates Inc.,** 530 W. Street Rd., Warminster, Pa. 18974.

Decker/Barnes Architects and Planners, 747 Bellevue Ave. East, Seattle, Wash. 98102.

Anthony C. Belluschi, AIA and Emmanuel P. Daskalakis, AIA have formed **Belluschi/Daskalakis Inc., Architects,** 286 Summer St., Boston, Mass. 02210.

R. Landon Doggett AIA, 324 Twelfth 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 construction management, 403 Massachusetts Ave. and 3 Bulette Rd., Acton, Mass.

Nelson W. Aldrich & Associates, Architects, 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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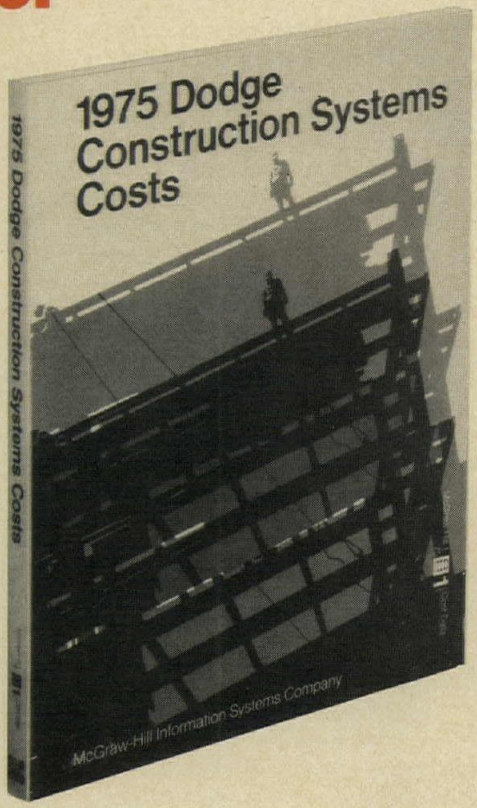

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Published specifically for architects—with emphasis on the data architects use and need most.

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Unit cost books, which give thousands of detailed labor and material rates for everything that goes into a structure, serve a different purpose. They do not help when you're trying to quickly understand the cost implications of different structural systems.

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Architects: For positions in working drawings, project management and design. Many challenging projects in an office with highly qualified personnel in architecture and engineering. Location excellent in community of 300,000. Send resume or call Greg Slaybaugh, Daverman Associates, Architects and Engineers, 200 Monroe NW, Grand Rapids, Michigan 49502, (616) 451-3525.

Architects: Detroit based A/E/P firm has positions for architectural designers with minimum 5 years experience. Must be capable of leading design team for major projects, of developing building programs, of conducting client meetings, of following projects through construction documents and construction. Write in confidence to: James M. Leefe, AIA, Giffels Associates, Inc., 243 W. Congress, Detroit, MI. 48226 or Call Collect (313) 961-2084, An Equal Opportunity Employer, M/F.

Architects: Design oriented graduates of strong program interested in team approach to environmentally oriented projects. One individual with 3-5 years experience in project management and one individual with 3-5 years of creative design involvement. Outstanding opportunity for advancement and growth as key member of interdisciplinary design team for individuals with demonstratable leadership capability. Full benefit package. Outstanding community with University environment. Submit complete resume and brochure in confidence to Hansen Lind Meyer, 116 South Linn Street, Iowa City, Iowa 52240. An Equal Opportunity Employer.

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Assistant Professor of Architecture: The Department of Architecture, University of California at Berkeley, is seeking candidates for positions as Assistant Professor of Architecture to begin academic year 1975-76. The appointments will be made from candidates qualified to teach in one or more of the following areas: visual design, architectural design and practice, building technology, management science and economics, architectural history and urbanism, behavioral responses and physical environment. Candidates should have teaching experience and must be prepared to teach at the undergraduate and graduate levels. Interested candidates may obtain application form by writing to: Chairman, Department of Architecture, The University of California, Berkeley, California 94720. Applications should be received no later than October 31, 1974. Applications received after that date cannot be assured consideration. An Equal Opportunity/Affirmative Action Employer.

Assistant Professor of Urban Planning (Urban Design): Available January 1975. Salary open. Qualifications: Background in architecture or landscape architecture, and urban planning. The position involves teaching courses in the areas of land use planning, physical planning and urban design. Send resumes to: Chairman, Urban Planning Program, College of Architecture and Urban Planning, The University of Michigan, 2000 Bonisteel, Ann Arbor, Michigan 48105. A non-discriminatory affirmative action employer. The deadline for receipt of applications is October 1, 1974.

Dean-School of Architecture and Fine Arts: The University of Southern California is seeking to fill the position of Dean of Architecture and Fine Arts. The University of Southern California is a private university with a total enrollment of 20,000. Approximately 500 undergraduate and graduate students are enrolled in the Architecture and Fine Arts Department. The school has 50 faculty members and a number of visiting professional personnel and is located in the Los Angeles Metropolitan area. The candidate for Dean should have academic and administrative experience, or equivalent professional experience, should have demonstrated outstanding achievement, and should be prepared to take leadership of a School of Architecture and Fine Arts which has an international reputation of excellence. Resumes or nominations of qualified persons should be sent to: Dr. V. I. Weingarten, Co-Chairman, Search Committee for the Dean of the School of Architecture and Fine Arts, Vivian Hall of Engineering #402, University Park, Los Angeles, CA. 90007 (an equal opportunity employer).

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!

Medical Facilities Architect: The Florida Division of Health, Bureau of Health Facilities, has a position open for a Medical Facilities Architect. The position entails architectural consultation, plans and construction review. Florida registration or NCARB certification required. Write in confidence to: Mr. Richard C. Rosenvold, A.I.A., Bureau of Health Facilities, Florida Division of Health, Post Office Box 210, Jacksonville, Florida 32201, or call Area Code 904-354-3961.

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.

Registered Architect: For approximately one year assignment in France. Must have thorough knowledge of U.S. codes and construction practices and must be capable of handling concepts and supervision of working drawings for major industrial projects ranging from heavy manufacturing buildings to offices, laboratories and research facilities. French desirable, but not essential. Following this challenging assignment, a permanent
[continued on page 136]

/A in
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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.

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.

Situations wanted

Architect: NCARB, currently principle, design oriented multi-disciplined firm. 17 years experience all phases practice and building types. Heavy experience in real estate development. Strong consultant trouble shooter. Seek responsible position with A/E firm or real estate developer. Relocation considered. Resume, samples, references upon request. Reply to Box #1361-735, *Progressive Architecture.*

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.*

Architect: Graduate, registered, NCARB, with nearly 20 years varied and international experience; associate, designer, project architect in charge of many important projects in public, educational and commercial fields, desires responsible position with potential and permanence. Reply to Box #1361-739, *Progressive Architecture.*

Architect/Planner: A.I.A., NCARB, licensed in three states, 15 years in-depth experience with past 7 years in own office. Wish to associate with national or international organization with a responsible challenging position. Will consider any location including foreign countries. Reply to Box #1361-740, *Progressive Architecture.*

Architectural Gerontologist: Designer/intermediate draftsman trained in architecture and gerontology seeks permanent, challenging position with architectural firm specializing in geriatric institutions. B.A. in Fine Arts, B.Arch with special emphasis in gerontology, and graduate of Syracuse University's All-University Gerontology Center. Two years experience with architectural firm, able to relocate. Reply to Box #1361-741, *Progressive Architecture.*

Director of Architecture: A.I.A., NCARB, with A/E & development corp.; B. Arch.; Wisconsin, Michigan, Minnesota registrations; designer; 30, married; 7 years experience in commercial, residential, institutional, recreational projects. Seeking comparable position with firm in Florida, Caribbean, or similar mild climate area. Resume/portfolio available. Reply to Box #1361-742, *Progressive Architecure.*

Graduate Architect: D.G.S.A. Age 28, single, diversified experience including project in four years, very interested in American architecture. Low price agreed. Arrival U.S.A. supplied by himself. Address: Nezih Ayiran, Istasyon Cadd. 38/2 D.5 Goztepe, Istanbul, Turkey.

Historic Restoration Assistant: Seeking project employment with architect or group. Male, 40s, presently home manufacturer draftsman. Experienced construction, supervision, estimating, sub-contracting. Familiar with historic design, construction, research. Prefer rural residential project, west half U.S. Will consider any project, phase, location. Referrals rewarded. Lehman, Box 1914, Flagstaff, Az. 86001.

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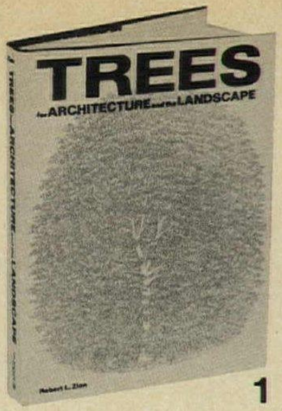

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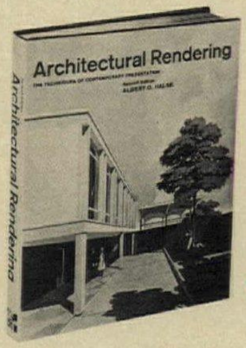

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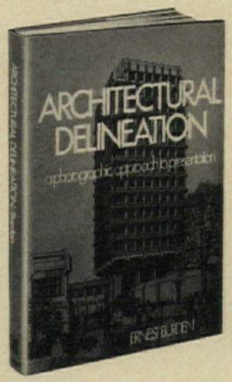

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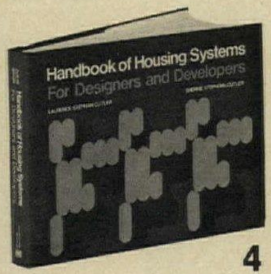

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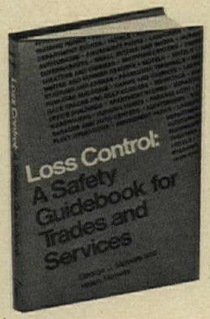

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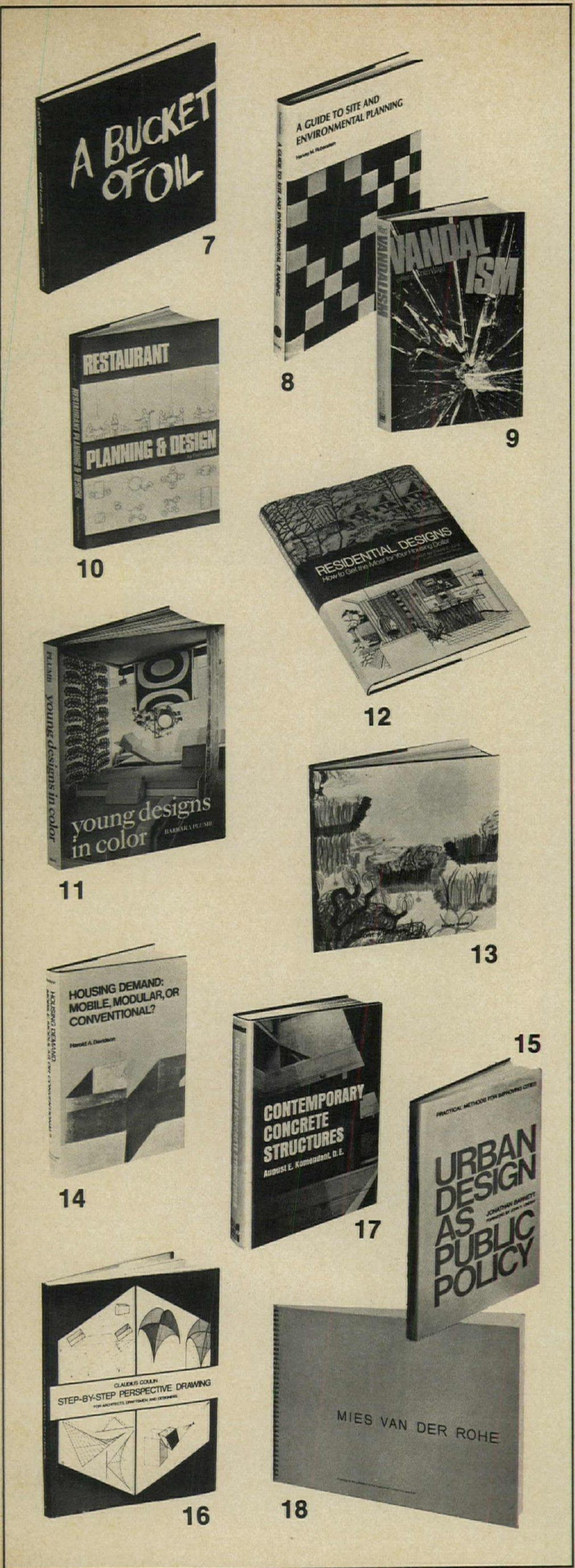

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