BOSTON'S NEW CITY HALL: A COMPETITION-WINNER BUILT

ULRICH FRANZEN: AN ARCHITECTURE THAT MAKES COMMUNITY OF DIVERSITY

TOWARDS THE FUTURE OF THE BUILT ENVIRONMENT, BY RICHARD LLEWELYN-DAVIES

BUILDING TYPES STUDY: SMALL INDUSTRIAL BUILDINGS

FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

FEBRUARY 1969 2 A McGRAW-HILL PUBLICATION TWO DOLLARS PER COPY

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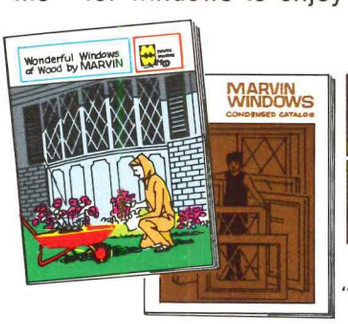

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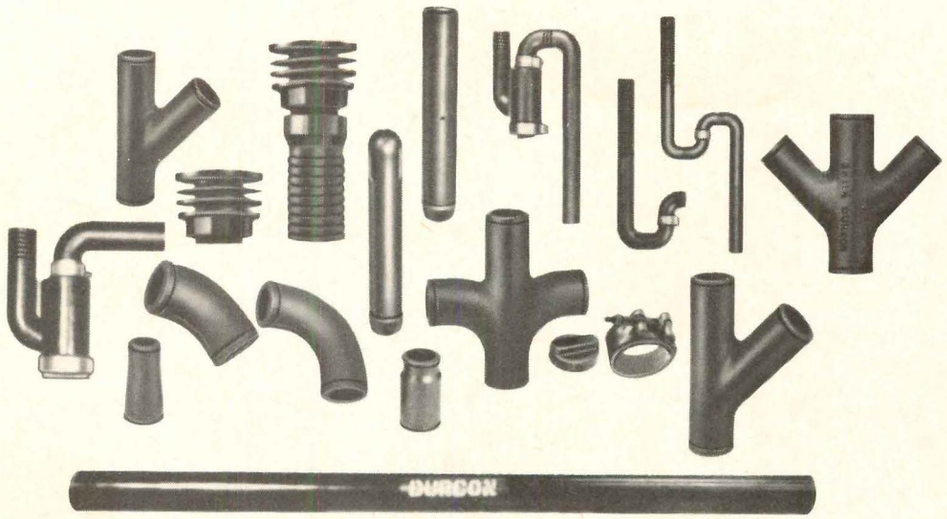

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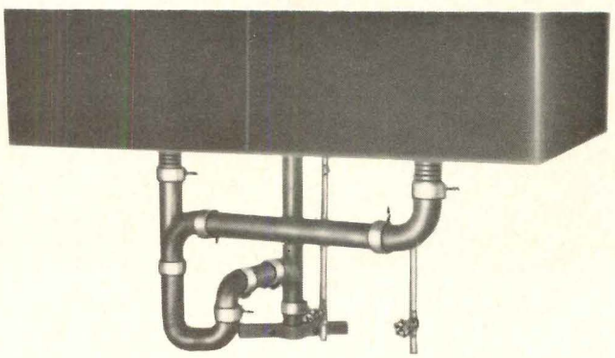

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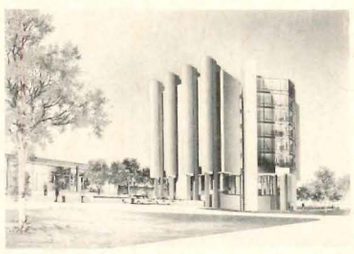

ARCHITECTURAL RECORD

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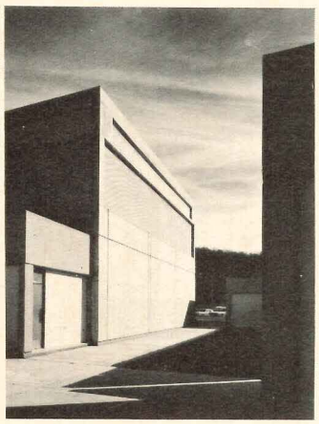

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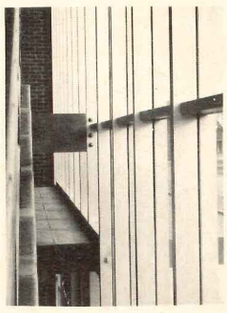

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COMING IN THE RECORD

PLANNING HOSPITALS FOR AUTOMATED SERVICES

Unless the upward trend of costs for hospital services is checked, insurance coverage for care will be curtailed. Blue Cross, for example, may re-examine acceptability of hospitals where costs are out of line and set up awards for hospitals of high efficiency. This means that hospital construction budgets must allow for every aid to operating efficiency both in layout and in component devices. The March Building Types Study will consider means of automation of supplies, records and communication and the effect of these on planning and on construction costs.

AN ARCHITECTURE OF AWARENESS FOR THE PERFORMING ARTS

A presentation of the Robert S. Marx Theater in Cincinnati accompanied by an article on theater design by architect Hugh Hardy.

McGraw-Hill

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Participation and protest: Who sets the goals?

The newspapers are full of protest and counter-protest as citizen groups seek an increasing role in what is happening to their communities. (Item: "Poor win victory in housing suit. Court halts Coast renewal until residents back plan." Item: "Residents reject city compromise: schools remain closed." Item: "Involving the public called a necessary start towards a more responsible planning process for highway construction.")

Well, I find that I'm still young enough and liberal enough to be all for change—for people fighting for what they want and need—even though I'm getting old enough and conservative enough to wish that the change and protest be fairly orderly. I'm all for college students picketing to stir up a backward and buttoned-up administration; but I'm a little upset that they seem to have the power to prevent other students who want to attend classes from enjoying their rights and privileges, and I'm darn sure they ought to be punished for laying a hand on the dean.

As we've seen lately, this kind of participation (i.e. not just noisy but sometimes violent protest) has begun to work pretty well (dean disappears on demand) and some riots have become positively profitable (how many jobs did Urban Coalitions create before downtowns started burning?)

Clearly—among violent and non-violent citizens alike—there is growing public frustration over the accelerating and uncontrollable change in our lives and environment. As then-HUD-Undersecretary Robert C. Wood said in a recent speech: "We do not deal with a slow transformation of the old order and orderly change from country to city. . . . Whatever our yearning, we cannot return to our simpler past when cities were small and students were contented and the poor took their lumps in silence. . . . We deal with an entire continent awash in urban culture . . . more discoveries and inventions occurred between 1900 and 1950 in the natural sciences and engineering than in all previous recorded history. But it took only 10 years—from 1950 to 1960—to match that number again. The great boom in urban population will bring in the next 20 years changes equal to the impact of industrialization, the Civil War, and the California Gold Rush combined."

He cited some of the well-known problems of that urban culture: ". . . migration out as well as migration in; the crisis of too few jobs and too many mouths to feed; the crisis of dirty air and foul water; the crisis of rotting shacks and tenements being asked to shelter their fourth or fifth desperate generation of the poor; the crisis of a declining city tax base and a rising need for services; the crisis of traffic-choked streets and poor public transportation; the crisis of haphazard growth and shoddy commercial strips and cheap developments gouged out of orchards and hillsides, already destined to be the slums of tomorrow."

As these problems have become more and more complex and interrelated, it has become increasingly clear that no simple arrangement of government and/or private agencies can cope with them. To quote Dr. Wood again: "In this context [of problem solving] governmental structure is no longer a pyramid of building blocks, arranged with due respect to a neat and tidy hierarchy. It must be viewed and managed as a system of many parts and many relationships as well. It must be treated not so much in terms of legal prescriptions, authority, rules and regulations, as in terms of the capacity to define and solve problems. . . ."

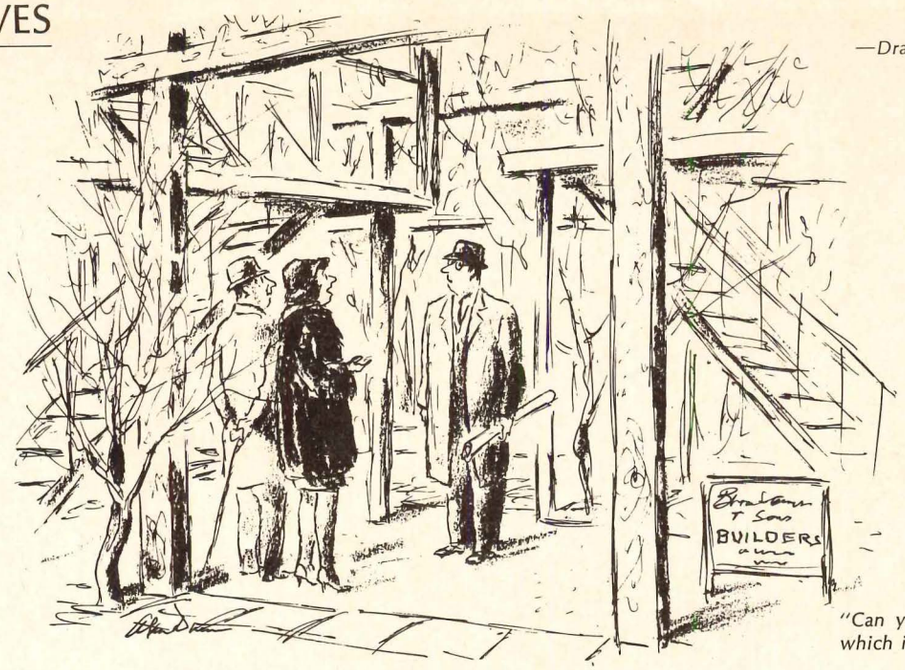
Within the Federal government, the new Administration has, of course, made a major step in this direction, recognizing the complex interrelationship in our environmental problems with the establishment of the Council on Urban Affairs. There is talk as this is written of a "top-level environmental affairs post" being set up within the new government. These new agencies will almost surely result in re-examination and restatement of our environmental goals at the national level—perhaps involving some change in national priorities which in time will filter down (via program funding) to the state and local level.

Thus, the next six months (the next year?) loom as a critically important period for those who care about the quality of our environment to be heard as part of the new government's re-examination process.

One can be sure that the voices of the organized poor will be heard. So will the voices of the investor, the developer, the road builders, the space contractors, the defense contractors, the organized mayors, the state agencies, all of whom want—and in various degrees need and deserve—money for more: more housing, more mortgages, more roads, more space investment, more planes, and more welfare funds.

There can be no more important time for architects and related professionals—either individually or as part of local, state, and national organizations—to make their voices heard as the first really new government in many years examines its priorities and sets its goals for the years ahead. Design professionals need to make as sure as possible that the new government leaders understand the contribution that they can make to create not just quantity but quality, not just good buildings but better neighborhoods and better and better cities—in short, a better life.

—Walter F. Wagner, Jr.



—Drawn for the RECORD by Alan Dunn

"Can you show us which is outdoors and which is in? Just in case of fire, you know."

If there is increasing ugliness, who designed it?

In the November editorial, I argued the case for architects who work hard to "sell themselves, their ideas, their approach, and eventually their design" to clients who—sometimes—"are difficult to work with, have little money, are ignorant of good design and slap down progressive ideas." I had a number of letters accusing me of being "utterly unrealistic" about the possibilities of getting "hard-headed" developers, for example, to build good buildings.

But I had a telephone call one Sunday afternoon from one Mr. Harvey Koizim, who was architect Lew Davis' client for the County Federal Savings & Loan building in Westport, Connecticut (RECORD, October). In the editorial, I had theorized, "I invite you to decide . . . whether the small bank on page 155 of last month's issue was exactly what the owners . . . had in mind when architect Lew Davis walked in to make his presentation." I quote Mr. Koizim: "It was exactly what I had in mind." And architect William B. Morris, a partner in the firm of Morris Dewalt Cullen Whitley and Whitley of Shaker Heights, Ohio, dropped into the office not long ago and talked quite a bit about architect-client relationships. We asked him to write down his thoughts on the subject, and here they are:

"Almost every architect who has graduated from school since 1945 has come forth imbued with a contemporary and fresh outlook towards the architectural scene. They represent well over one-half of the practitioners of today. It is these very men who sit on the architectural review boards, fine arts advisory committees, and zoning boards. It is they who control the designs of almost every office in the country. One and all they complain about the ugliness—yet they are the designers. Where are the clients who design, proportion, and pick materials for buildings? Clients don't design buildings. Architects do. If there is increasing ugliness, it comes from the pencils of the profession, not the public. . . .

"I am designing buildings for clients in a very conservative area. Many live in communities which not only have few if any contemporary buildings, but have few good buildings of any age. Yet clients come to me visually alert and aware that architecture can be an art. How? Malraux talks about it when he speaks of museums without walls. It is through photographs and the printed word that my clients train themselves. They almost always have kept a file for three to five years of clippings from magazines and local newspapers. They are conversant with and informed about the best that is going on in the world. . . . Most clients come to an architect with the hope that he will be able to translate their feelings for what a building can accomplish into reality. The professional inability to achieve this speaks clearly about the architect's lack of design skills.

"The public is ready, willing, and increasingly disappointed."

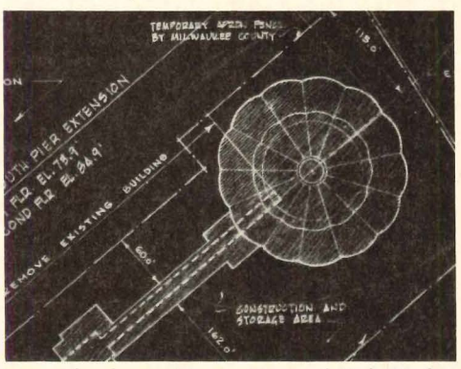
Ever hear anything poetic about mortgage banking?

Now's the time. Here, via Elbert Schenkel of The Bowery Savings Bank, is the first publication of the as-yet little-known poet Stephen Cohn (who is also president of the Greenebaum Mortgage Company):

Skyscrapers soar into our ken,
Of steel and glass a wondrous tissue;
But do poets ever sing the men
Who float the underlying issue?
Yon webs of stone and steelwork staunch
Are founded on the mortgage paper
That men of vision have to launch
Ere spire and tower can soar and taper.
The banker and the broker seem
Like spiders in their hidden holes;
And yet they weave the shining dreams
That stimulate poetic souls.
For ere the architect can plan
Or calculate his stress and strain,
He seeks some big LaSalle Street man
With eagle eye and massive brain.
And, ere the poet sees on high
Slim spire and flying buttress rise,
The thrifty banker has to buy
First liens on mansions in the skies.
The poets toil not, neither spin,
Nor pay for one skyscraping story,
But when the final rivet's in
They brag like Solomon in his glory.
To us, a malcontent and reb,
In poetic circles an outsider;
It seems a shame to sing the web
And give no credit to the spider.
So . . . I sing the men who raise the jack
That builds the scraper of the sky
Whom poets with their facile knack
Will so ignore and stultify.

Drawings in just ten seconds

Most Polaroid pictures are probably of kids. But this is a picture of one detail of a building with a bow-string-truss roof. Bob Fischer of our staff wrote to Automated Building Components of Miami for details on this building and the reply included several Polaroid snaps of details from appropriate drawings. While I doubt this idea will shake the roots of the reproducing machine industry, I bet it could come in handy.—*W. W.*



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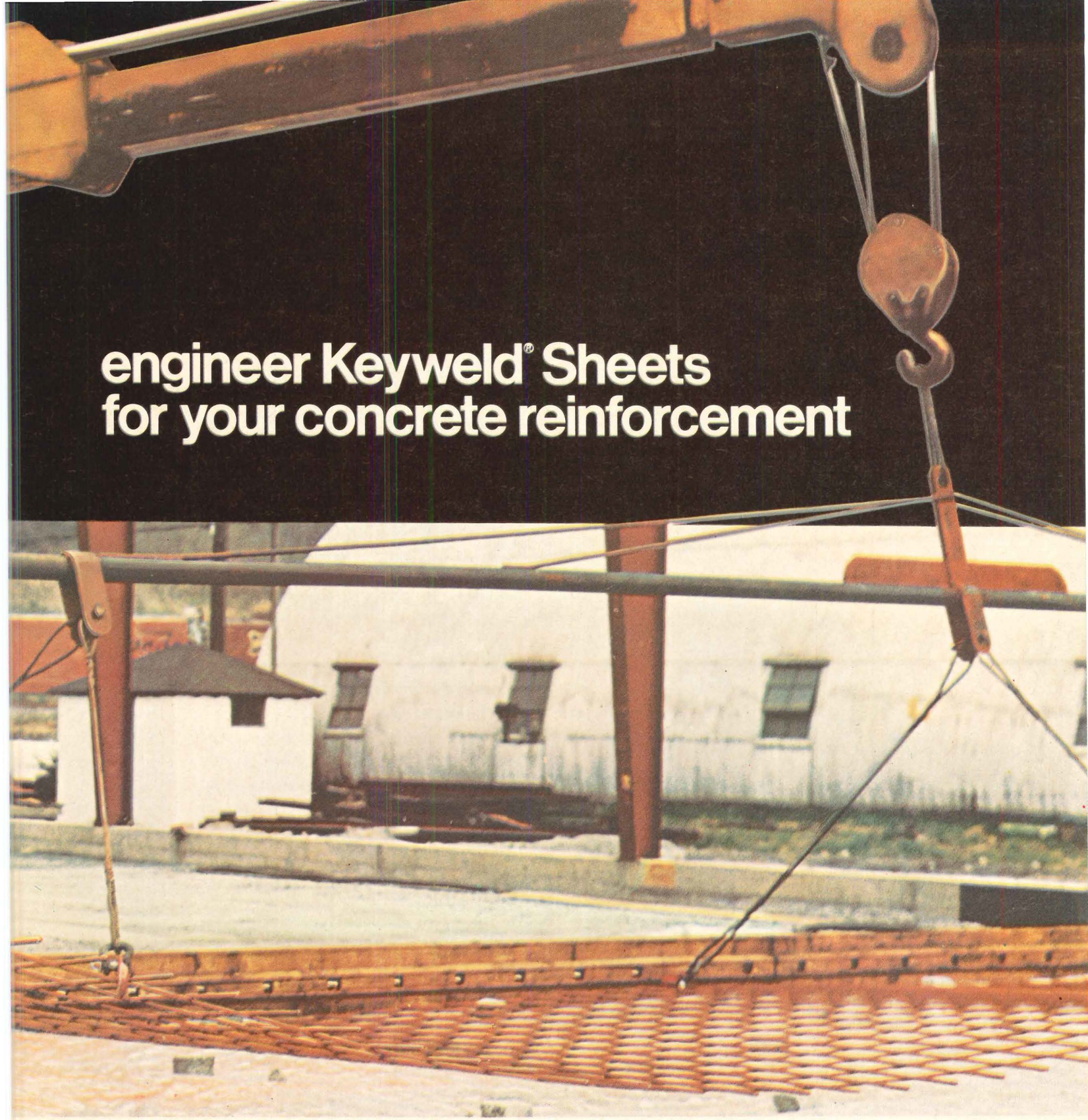

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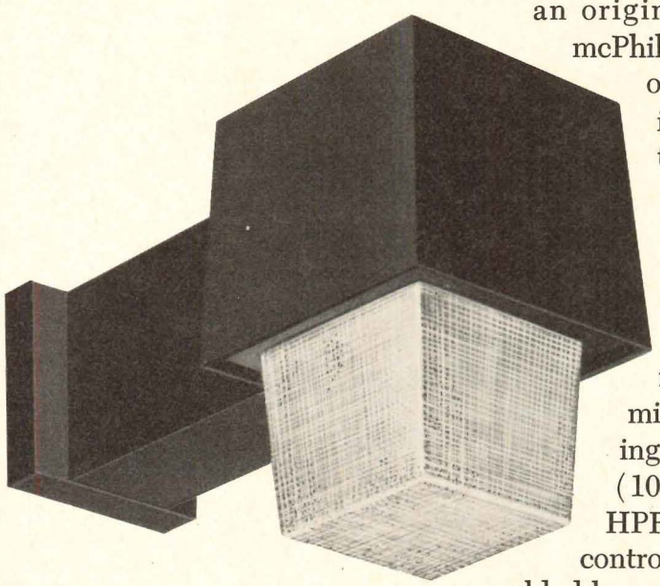

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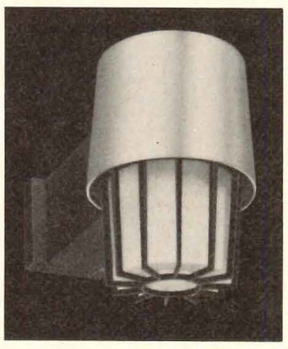

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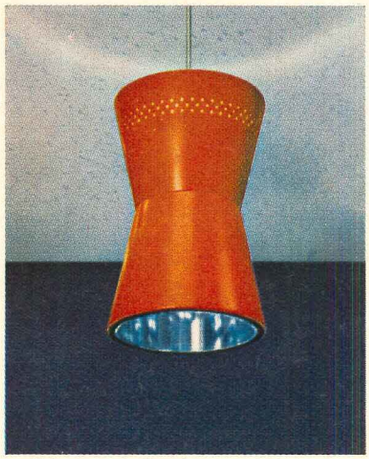

It's true they're expensive, at first. But they quickly start paying for themselves.

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They're beautiful. Not just the way they look, but the way they light. Mercury or Metalarc lamps are used in them. Sylvania's Metalarc, for instance, gives you powerful light and warm colors that help you sell.

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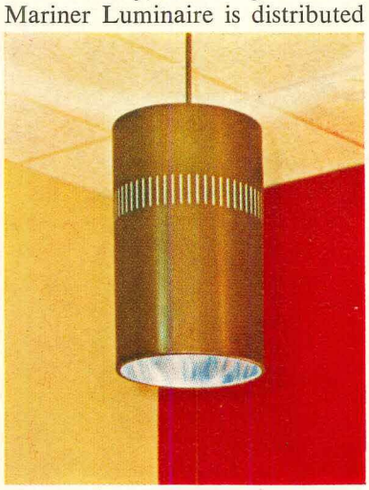

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There are lots of things about them your customers won't see.

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But they'll sure notice what they do for your store.

Mariner Luminaires are just as good for lighting public places such as lobbies, auditoriums and showrooms. We'll be glad to send you the design and architectural details. Write to: Sylvania Lighting Equipment Division, Sylvania Lighting Center, 100 Endicott Street, Danvers, Mass. 01923.

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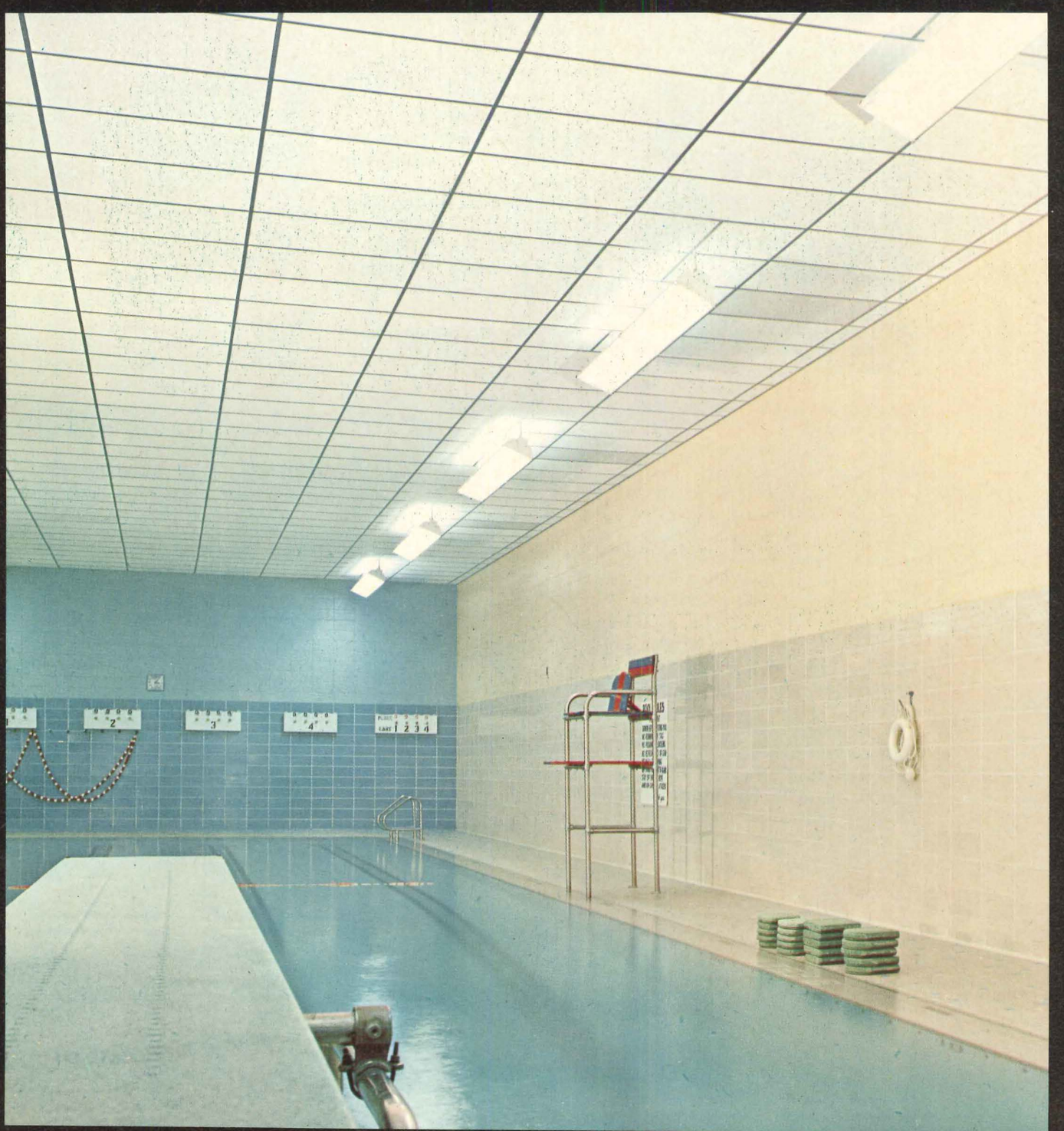

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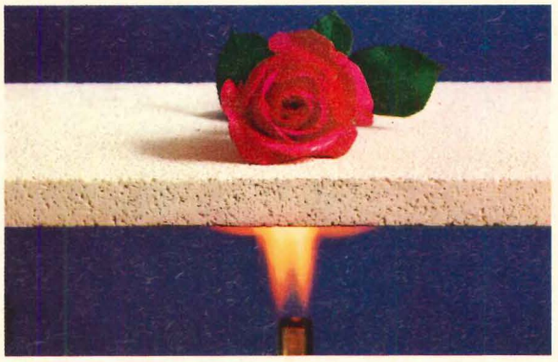

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Should the Glazed Ceramic acoustical products not perform as guaranteed herein, The Celotex Corporation will supply, free of charge, new Ceramic products to replace any that, upon our examination, are found to have proven defective, providing notice of the defect is sent in writing to The Celotex Corporation, 1500 North Dale Mabry Highway, Tampa, Florida 33607, within 60 days of the occurrence of such defect.

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Construction dust is part of construction. Even the most careful sealant mechanic can't keep it out of every joint.

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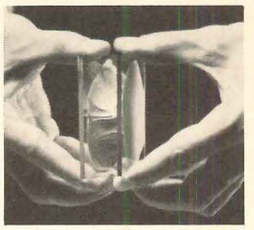
See this minor dirt-eating miracle for yourself. Ask your Tremco representative to show you the MONO demonstration while he fills you in on all the rest of the Tremco sealant family.



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Mono eats dirt (...if it has to.)

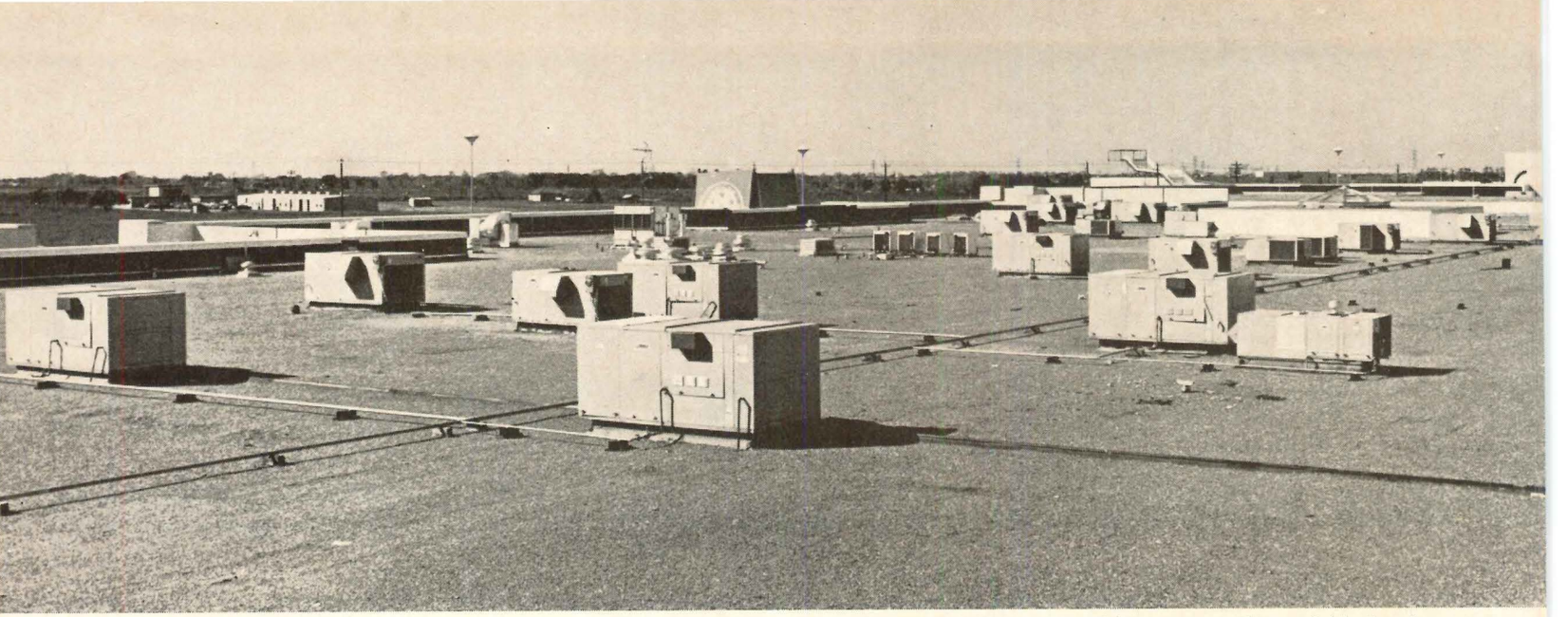
Lennox presents...

year 'round shopping comfort: a case of economics

Today's shoppers go where the comfort is. Not where bargains and convenience are mixed with stale air, summer swelter or wintertime drafts. Year 'round shopping comfort—ducted heating and air conditioning—is good business. And the "micro-climates" of Lennox modular systems make it a case of sound economics – from the very start of your design planning.

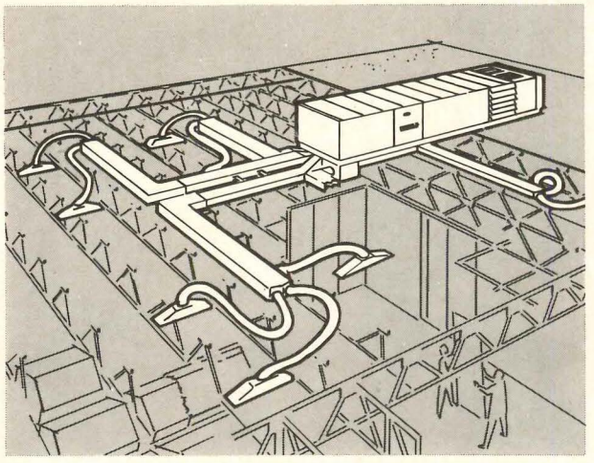
continued . . .

Almeda Mall and Northwest Mall, twin shopping centers in Houston, Texas. Lennox heating/air conditioning equipment hides unobtrusively on rooftop, serves 700,000 of the 1,400,000 sq. ft. total. Architects: Katzman and Associates, New York; Neuhouse and Taylor, Houston. Engineer: Herman Blum. Mechanical contractors: Way Engineering Co., Inc. (Almeda); Kerbow-Simmons, Inc. (Northwest). Developer: The Rouse Company.



Typical installation of Lennox single-zone combination gas heating/electric cooling system for large, undivided spaces. Also available for oil or electric heating. Installs on rooftop—or at grade level.

Year 'round comfort is provided in the 90-odd stores, restaurants and services in the colorful Villa Italia Shopping Center in Denver, Colorado. More than 100 Lennox rooftop units supply 800 tons of cooling, plus heating, required for this 800,000 sq. ft. center. Among these are Direct Multizone Systems with flexible ducts, for individually-controlled comfort zones (below). Architect: James H. Johnson Associates. Engineer: Riley Engineering Co.



continued...

year 'round shopping comfort

Nothing fits a modern shopping center's comfort requirements quite as well as Lennox modular systems. Economy and comfort—wed to freedom of design—are met easily by the unique flexibility of Lennox rooftop systems.

A Lennox modular system holds down initial costs for heating/air conditioning/ventilating. Among factors contributing to this low cost are the time-and-labor-saving roof mounting, with shortened duct runs and easily installed ceiling outlets. Additional savings are realized because Lennox modular systems require no additional assembly, wiring or testing. No expensive space-stealing equipment room is required, and the low-profile units need little or no rooftop enclosure to hide from view.

Another economy example: at Houston's new twin shopping centers, the Lennox mounting frame—flashed in place with roof – plus factory wiring and piping, saved $266 on installation cost of each of project's 218 units! (This figure was estimated by the mechanical, electrical and roofing contractors.)

The cost of air conditioning and heating with a Lennox modular system is predictable. On-site labor and other costs that run high and unpredictable with central systems are reduced to a minimum by the Lennox systems.

People comfort throughout the year is assured by the "micro-climates" of Lennox modular systems: whatever the types and ages of people . . . in any activity . . . and regardless of occupancy. In any weather. In sun or shade, wind or calm. And there are Lennox systems for single-zone control or multiple zones—each

Lacey, Washington's modern South Sound Shopping Center is heated and cooled by Lennox rooftop heat pumps. Stores, bakeries, music shops, drugstores, restaurants and malls are among the areas with high-occupancy problems. Here the simple-to-install, single-package heat pumps provide the "micro-climates" required for the varied comfort control zones. Architect: Robert T. Olson, A.I.A. Engineer: Robert W. Platt.

perfectly compatible with the other.

Lennox systems impose no design restrictions on you. And you can design for future growth with ease. Because these are unitary systems, building additions simply call for extra units.

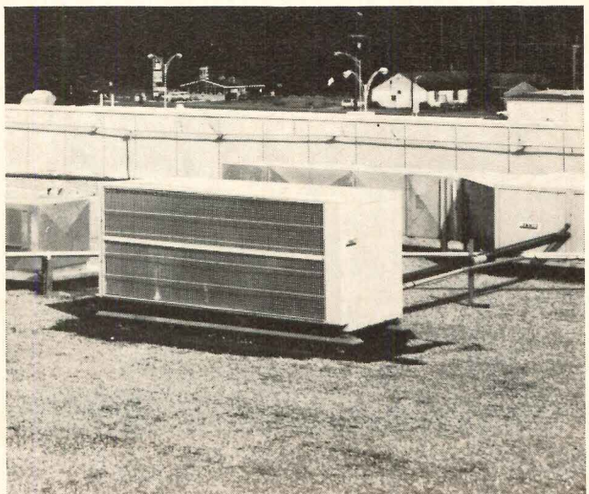
Lennox systems are factory assembled, wired and tested, including controls. This means a single-source responsibility: Lennox.

Before you plan a shopping center – or any other building – investigate the many reasons why Lennox should be your recommended choice. See Sweet's 29a/Le– or write Lennox Industries Inc., 490 South 12th Avenue, Marshalltown, Iowa 50158.

LENNOX
AIR CONDITIONING • HEATING

For more data, circle 16 on inquiry card

At South Sound Shopping Center, the architect provided screen to hide rooftop equipment. Total capacity 185 tons: 155 tons heat pump (with auxiliary duct heaters) plus 30 tons electric air conditioning.



The 21 Club cancelled all reservations. About Fiberglas curtains and draperies.

Two decades ago the famed 21 Club in Manhattan decorated with curtains and draperies woven of Owens-Corning Fiberglas. At that time Fiberglas* was such a new fabric, the 21 Club was New York's first restaurant to decorate with it. The Kriendler brothers, owners of the 21 Club, didn't know how Fiberglas would perform.

Today the 21 Club has absolutely no reservations about Fiberglas. In fact, the original Fiberglas draperies have just been replaced with new ones—also of Owens-Corning Fiberglas.

"When we decided to redecorate, we did not hesitate to specify Fiberglas drapery fabrics," says Robert Kriendler. "Experience had proved to us their ease of maintenance, noise reduction, and lasting beauty. We have every reason to know that our new draperies will give us the same remarkable service for many years to come."

Easy maintenance, insulation properties, and longevity aren't the only reasons your contract draperies should be made of Owens-Corning Fiberglas. Fiberglas is also the only fabric that's absolutely dimensionally stable—it won't stretch or shrink ever. Plus having inherent fire-safety and soil resistance. Not to mention being elegant enough to hang in the exclusive 21 Club.

For more information about contract drapery installations, write to: Owens-Corning Fiberglas Corporation, Decorative and Home Furnishings Division, 717 Fifth Avenue, New York, N.Y. 10022.

*Owens-Corning's trademark

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New Kentile Criterion. A very businesslike tile.

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Contemporary barbershop features floor of new Kentile® Architectural Criterion Vinyl Asbestos Tile. Colors: 8. Wall base: KenCove® Vinyl. Want samples? Call your Kentile Representative.

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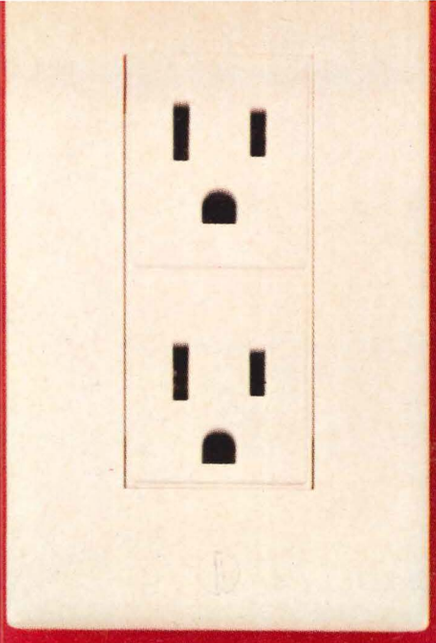
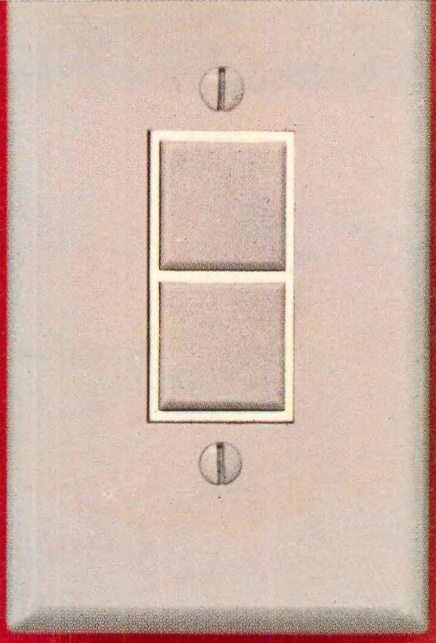
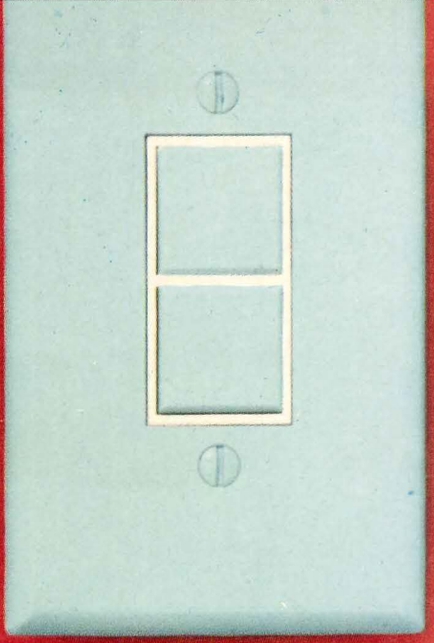
KENTILE FLOORS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There's never been styling like this before. Dynamic. Elegant. With the class and distinction that architects and interior designers revel in.

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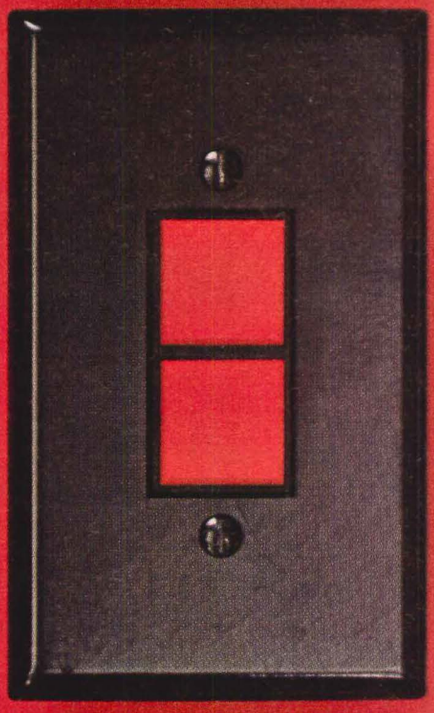


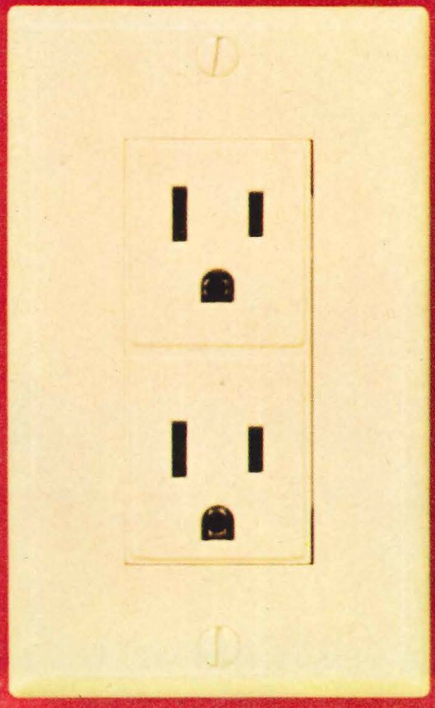
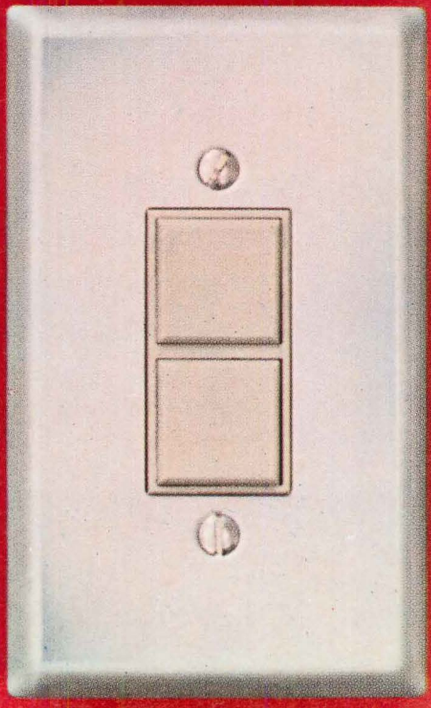
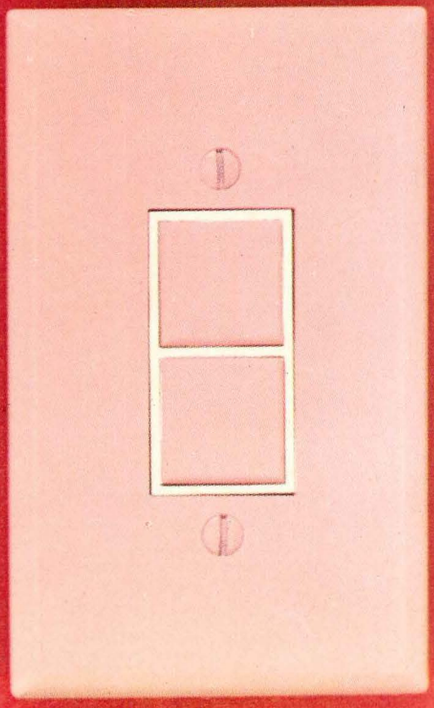


How to plan a computer room that's flexible enough to handle the next generation (and the next and the next and...)

Design with Liskey computer room support materials. Start with Liskey Elaflor, the only elevated flooring offering the total design flexibility of three grid systems, three panel types. No need to substitute or compromise, Liskey gives you free choice to solve your problems best. ■ Then add Liskey-Aire air conditioning, the modular system designed expressly for computer rooms. Use Liskey Spacemaker *movable* partitioning and get ultimate flexibility for enlargement, rearrangement, and modification. And modern Liskey aluminum railing is the finishing touch for platform edges, ramps, or to define work and traffic areas. ■ A complete Liskey support system means complete flexibility to handle growing systems, next-generation computers, and all the changes that are bound to come in this dynamic area. See our section in SWEET'S or write for our AIA file of detailed specifications.

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The secret of the masters

is in every can of Pratt & Lambert Paint

Portrait of a Man in a Tall Hat, Rembrandt van Ryn, National Gallery of Art, Washington, D. C., Widener Collection

Sun Deck, the indoor/outdoor carpet by Beattie has no fear of the elements. This great new carpet is approved for outdoor use by Monsanto and is perfect for commercial and residential installations. Made to withstand the rigors of the outdoors, Sun Deck offers the true luxury and comfort of a densely constructed, tufted carpet with face yarns of soil resistant, 100% Acrilan® acrylic fiber. Beattie makes this carpet in seven beautiful colors including Autumn Gold shown here. For complete specifications and sample write to: The Beattie Manufacturing Co., 242 Main St., Little Falls, N.J. 07424. Showrooms in Atlanta, Chicago, Dallas, Denver, Los Angeles, New York, San Francisco

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Keep your door closer out of sight, out of mind, out of the scrub water

A door closer can be concealed in several different ways. It can be in the header or transom bar. It can be in the door's top rail. It can be in the floor. LCN makes excellent closers for all these locations. There are times when each location is the only logical choice.

When there can be a choice—avoid the floor. A closer is a sophisticated bit of hydraulic machinery that works best where it's clean and dry. The overhead locations are recommended.

When critical decisions on door closer selection are about to be made talk to the LCN man near you. His name is in the LCN catalog in Sweet's. Or write or call: LCN Closers, Princeton, Illinois 61356. Telephone: 815/875-3311.

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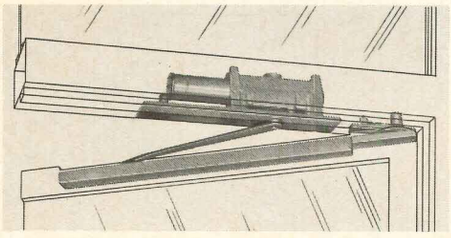


LCN 2010 Series, Overhead Concealed Closer used in the Physics and Astronomy Building, University of Michigan. Albert Kahn Associated Architects and Engineers.

LCN
DOOR CLOSERS

News in Brief

DOT Secretary Volpe may revoke newly-instituted Federal Highway regulations which require public hearings on the route and design of each new Federally-aided road project. See next page.

President Nixon's advisor on the environment, Russell E. Train, (December, 1968, page 35) has made a strong recommendation for naming a Special Assistant for Environmental Affairs to work out of the White House. Such an appointment, it was said, "would give the President for the first time a means of effectively influencing environmental policy across a wide range of agencies". Train himself is reported to be under consideration for Under Secretary of the Interior.

California architect William Wilson Wurster will receive the A.I.A.'s highest honor, the Gold Medal. The medal will be presented at the 1969 convention in Chicago, June 22-26. See next page.

Ludwig Mies van der Rohe announced the formation of a partnership to continue his expanding practice. The new partnership, to be called "The Office of Mies van der Rohe" will include, in addition to Mies, Joseph Fujikawa, Bruno Conterato and Dirk Lohan, all of whom are now associates of Mies.

Architect Kevin Roche was named to a four-year term on the Commission on Fine Arts by President Johnson. The seven-member Federal Commission is responsible for design review in the District of Columbia. The Commission meets twice a month to pass on all design proposals for buildings in Washington, D.C. and Georgetown. Its seven members serve without pay for four-year terms. Roche will be replacing Theodore Roszak, who has completed his term.

The New York Chapter A.I.A. is currently presenting an exhibit of its Environmental Design Awards. H. Dickson McKenna is credited with the idea of an annual awards program "to seek out the good design around us, recognize it and stimulate citizens to build on this foundation."

The New Jersey Housing Finance Agency has increased its maximum fees allowable to architects, builders and developers. NJHFA executive director, Thomas V. Seessel, said that the increase would bring the fees in line with the Federal Housing Administration's program.

A proposed uniform national lumber standard, prepared by the United States Department of Commerce, has been approved by the American Lumber Standards Committee, and now must be approved by an acceptor list of specifiers, users, consumers and industry representatives.

The Consulting Engineers Council is accepting entries for its 1969 Engineering Excellence Awards Competition which is open to consulting engineers in all fields of practice, and may include studies, planning, design, project management, process development, or research substantially completed during 1968. Entries will be accepted at the Washington headquarters until February 15.

A uniform and definite statute of limitations on suits to recover damages for alleged defects in planning and construction of buildings is contained in House Bill 1044, proposed to the Colorado Legislature by Rep. George Fentress. The bill provides that any action against an architect, engineer, or contractor for personal or property damage caused by faulty design, planning, supervision or construction must be brought within two years after the claim arises but no later than six years after completion of the project. The bill is expected to pass.

The Boston Society of Architects is looking for a full-time executive director with ability and experience in legislative affairs and public relations. Professional registration is not required.

West Virginia received a $32,250 planning grant for a "new town" site from the United States Department of Housing and Urban Development. Part of the project will involve an investigation of potential applications of a new HUD program, part of the Housing Act of 1968, which encourages private development of new communities.

Public involvement in planning new Federal roads may be short lived

What may prove to be the Nation's shortest-lived highway regulations were written into the Code of Federal Regulations on January 17 by the Federal Highway Administration. Incoming DOT Secretary John A. Volpe might remove them from the Code soon after taking over.

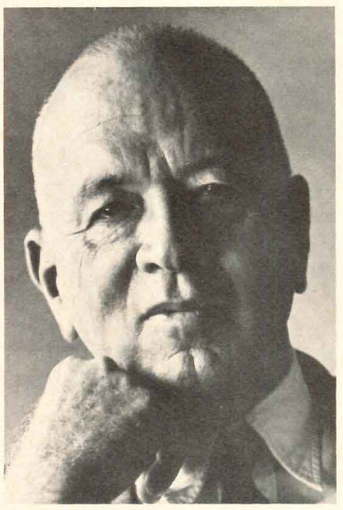
The new regulations require two public hearings on each new Federally-aided road project—one before route approval and the other before design approval. The hearing procedure is designed to allow open public discussions on proposed highways and hopefully to produce roads which will work smoothly into the intensifying urban-suburban fabric. As such, the regulations are acceptable to most interested groups including the A.I.A., A.I.P., conservationists and highway contractors.

But during hearings on the regulations last December a controversy arose out of the provision which allows any interested person to protest the routing or design of any Federally-aided road under an appeals procedure which makes the Federal Highway Administrator the ultimate arbiter. Those opposed to this procedure, mostly members of state highway departments and highway contractors, argued that its adoption would "require a single person, the Federal Highway Administrator, to familiarize himself with, and pass judgment on, every controversial highway problem in the United States. It would allow the Federal Highway Administrator to completely disregard the comprehensive planning process of the states, the proven professional knowledge and experience of competent highway engineers, and to override the authority and function of the state highway departments."

Volpe, on the side of the contractors and highway departments, has said that the provision will cause controversy to "go on ad infinitum," and that "the point comes where you consider, consider, and consider, and you never get a road built."

Even though the now-instituted regulations could not be eliminated or changed without rekindling the original controversy, the way Volpe and his staff interpret them could water them down enough to destroy their essential purposes—to give the public a voice in the highway planning process, and to integrate the designs and routes of new road systems into the overall social, economic and environmental plans of a region.

William Wilson Wurster to receive A.I.A. 1969 Gold Medal



Mr. Wurster's selection for the 1969 Gold Medal recognizes a unique contribution in the development of an American architecture. His early independence of other styles and forms, his nondogmatic approach to design, his simplicity and directness were a break with the past which, when it happened in the late 1920's, was quickly recognized as long overdue.

In breaking with the past, Wurster found more basic sources of architectural design—the people and their ways of living and the land with its particular characteristics. But this regional approach, unlike other regional architectures, produced no style, no personalized forms. It offered principles, broad in concept, universal in application—principles that have had great influence on architects.

As an educator, Dean Wurster provided a fresh view of the future of architectural practice, implementing his ideas and convictions in the establishment of the College of Environmental Design at Berkeley in 1959. His plan for the College recognizes the interdependence of the design professions and the necessity for considering the whole environment as the concern of architecture.

Mr. Wurster has been a member of the National Capitol Park and Planning Commission in Washington, D.C.; the Architectural Advisory Panel of the State Department's Foreign Building Office; and the State of California's Capitol Building and Planning Commission.

He is a Fellow of the American Institute of Architects; the Academy of Arts, Boston; Royal Academy of Fine Arts, Copenhagen; National Academy of Design; and the Berkeley Fellows, University of California.

NAHB Convention Features Official A.I.A. Program

Noteworthy among the "firsts" scored at this year's Silver Anniversary convention (January 13-17) of the National Association of Home Builders are its move of some 40,000 participants from its traditional meeting place in Chicago to warm, equally hospitable Houston, and its presentation of the five members of the A.I.A. Committee on Housing in an offical, jointly-sponsored program.

In a multi-media presentation, the A.I.A. committee (G. Hugh Tsuruoka, Richard R. Leitch, Jack Cohen, Jeh B. Johnson and Clovis Heimsath) had standing room only for a session on developing (including available architectural services) a planned-unit development.

In addition to the A.I.A. Committee members, some ten other architects served on the panels of 12 meetings and eight "Design Workshops," a person-to-person series of critiques of individual builder's plans. The architects participating in these sessions included: Arnold M. Kronstadt, Robert W. Hayes, Byron Ireland, Claude H. Miquelle, John D. Bloodgood, Herman H. York, Walter H. Louis, John L. Schmidt, Harvey L. Gordon and James M. Ingram.

Eugene A. Gulledge was elected NAHB national president for 1969, a year predicted for two million housing starts, "if corrective measures are taken to cool the economy." *H.L.S.*

Twenty architectural firms jointly design a new campus

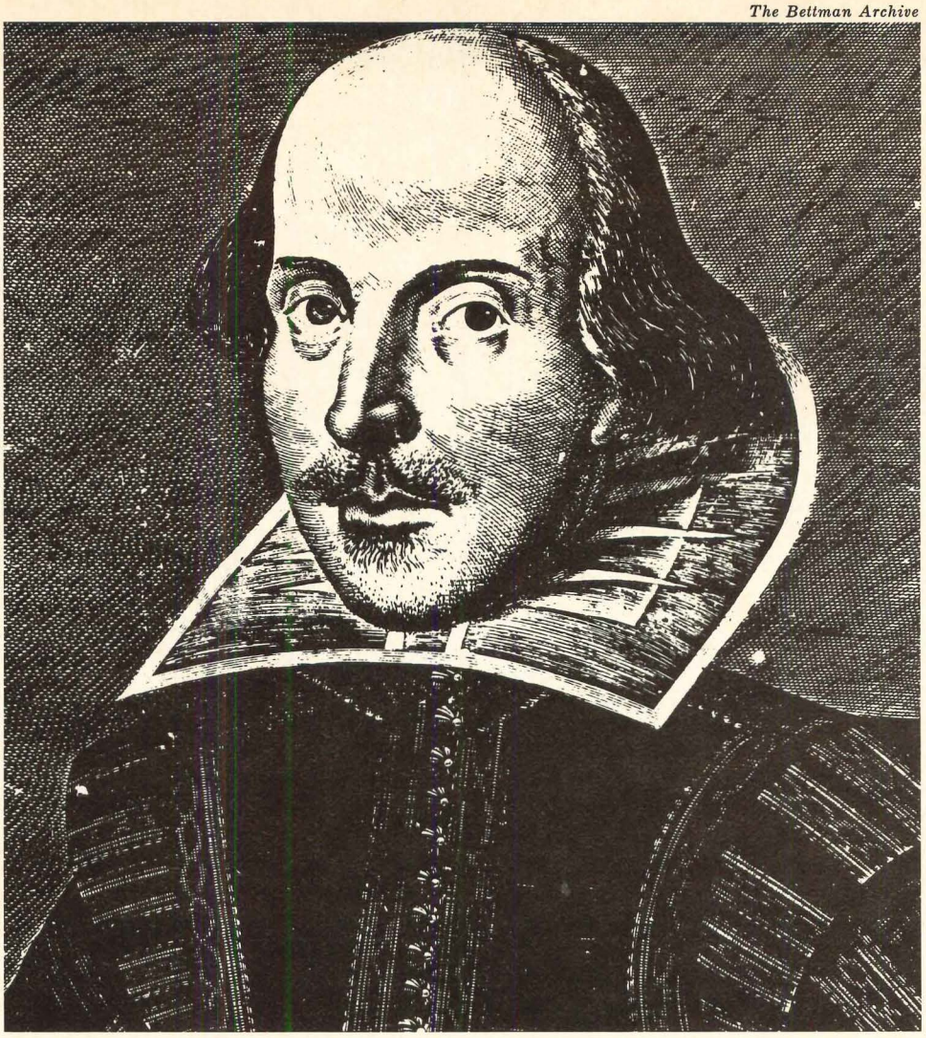
An extremely ambitious project, the construction of an entirely new $650-million-dollar campus for The State University of New York at Amherst, has been announced by the New York State University Construction Fund. The project is unique in the organization of the twenty architectural firms involved in its design as well as the seven years scheduled for its completion.

The use of one architectural firm to design the project was ruled out because the University's President, Martin Meyerson, feels that a university should include a "provocative variety of design within a strong framework of overall concept." Sasaki, Dawson and DeMay were chosen as the master planners to provide that framework. They will also serve as a resource staff to the Construction Fund, which is the client.

Working within the master plan, each of 12 architectural firms will design a "little" master plan for the campus area it has been assigned. Throughout this process Sasaki, Dawson and DeMay will work closely with the individual firms to assure continuity in the total plan.

Among the outside architects associating themselves with local Buffalo firms are included: Ulrich Franzen; Armand Bartos; Marcel Breuer; Harry Weese; Davis, Brody; Helmuth, Obata and Kassabaum; and Fuller and Sadao.

The Bettman Archive



Shakespeare would have loved Dover Stage Lifts

(So would Sophocles, Moliere, Ibsen, and Shaw)

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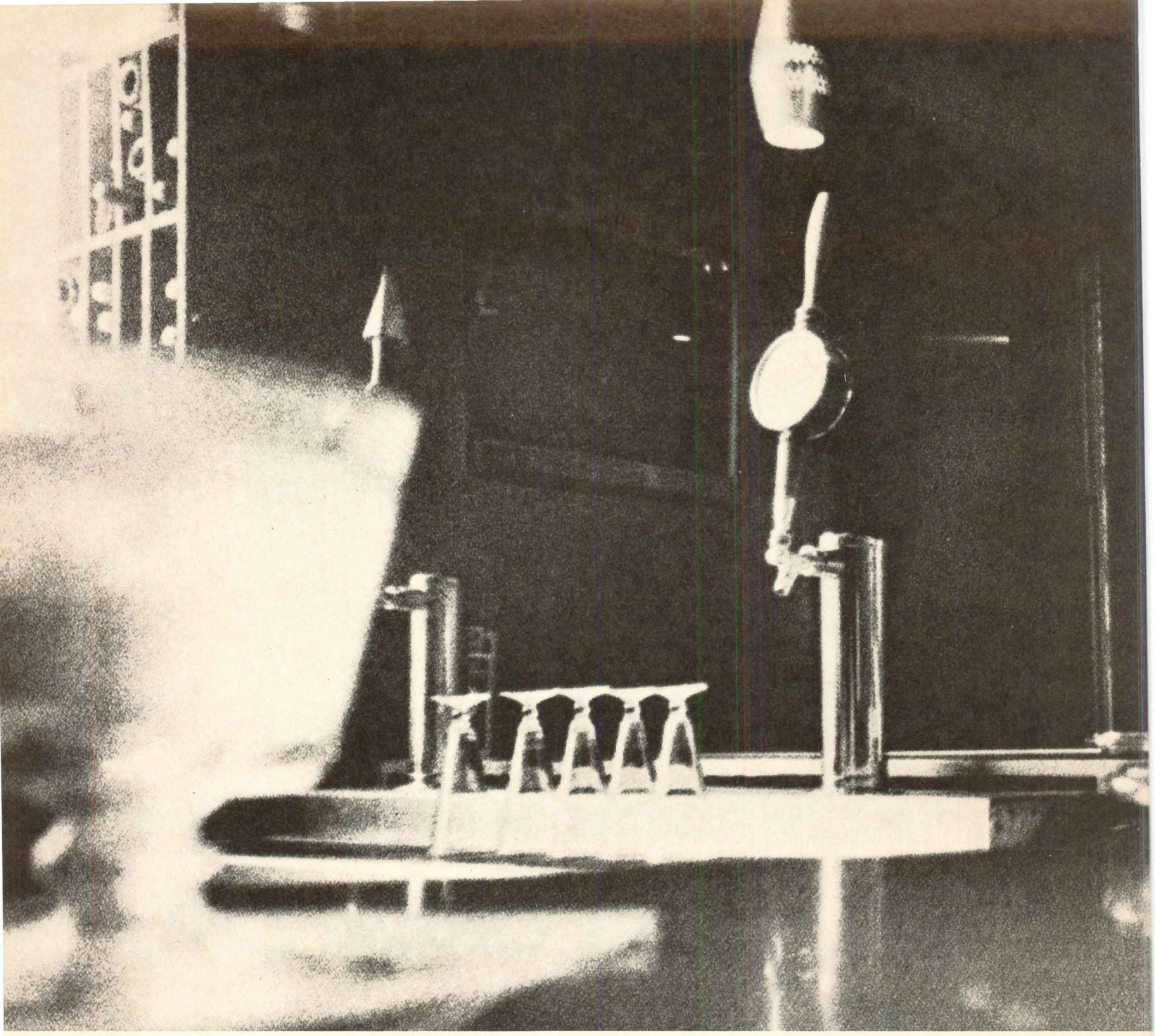

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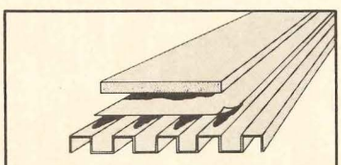

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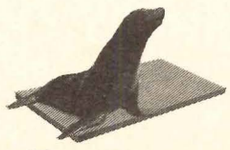

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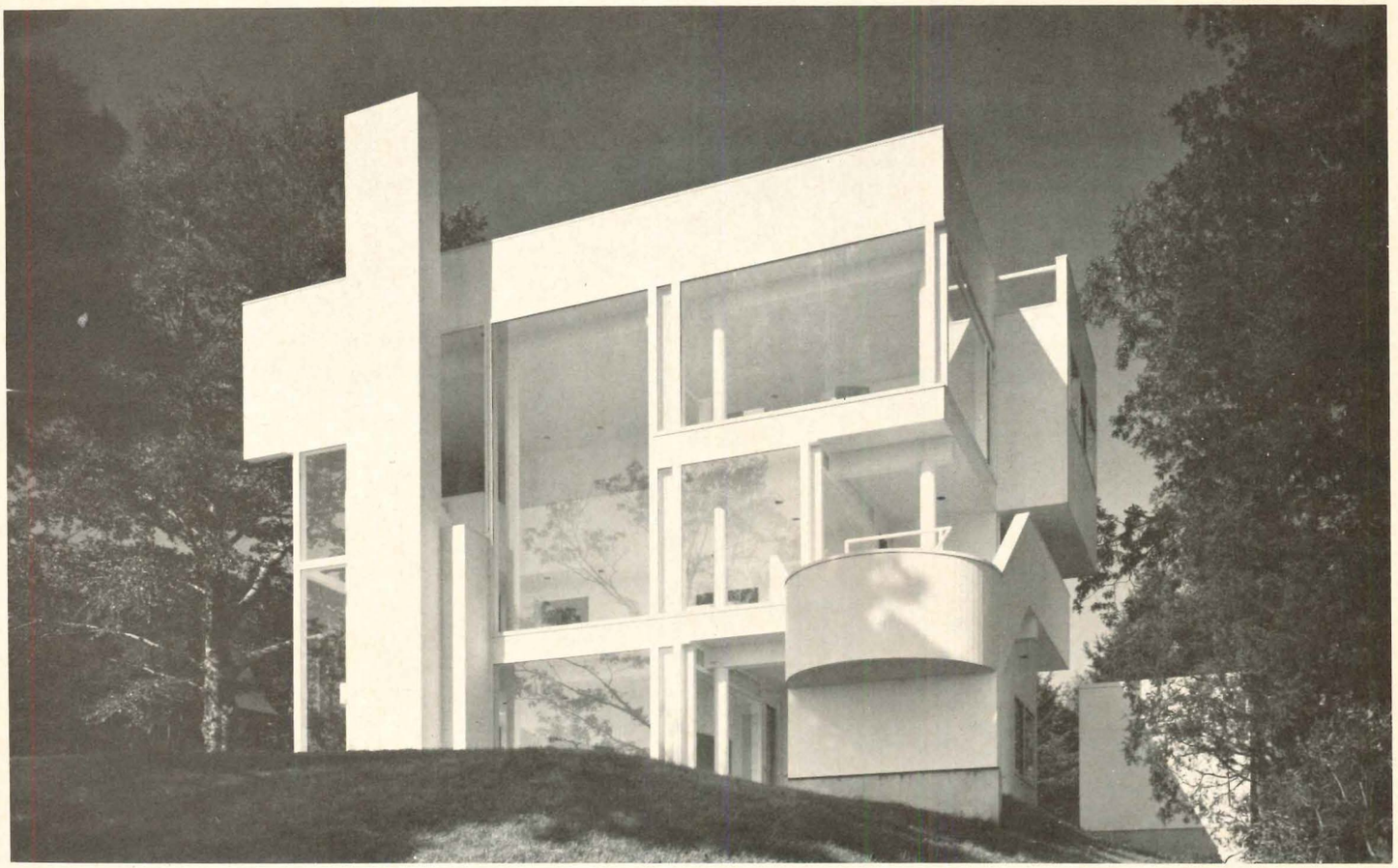


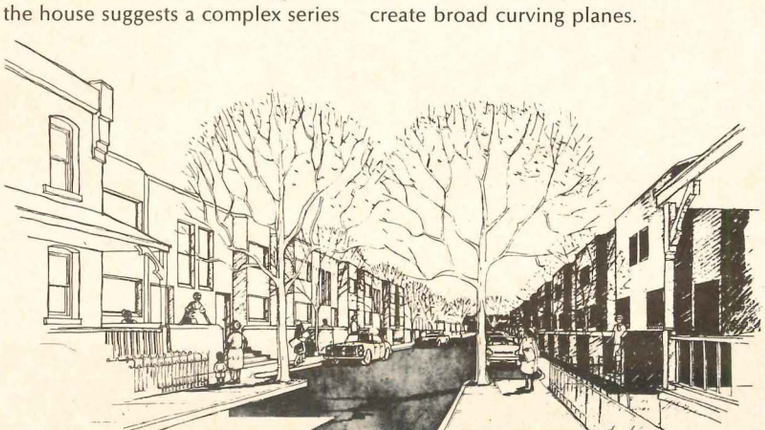
New York Chapter Residential Design Awards

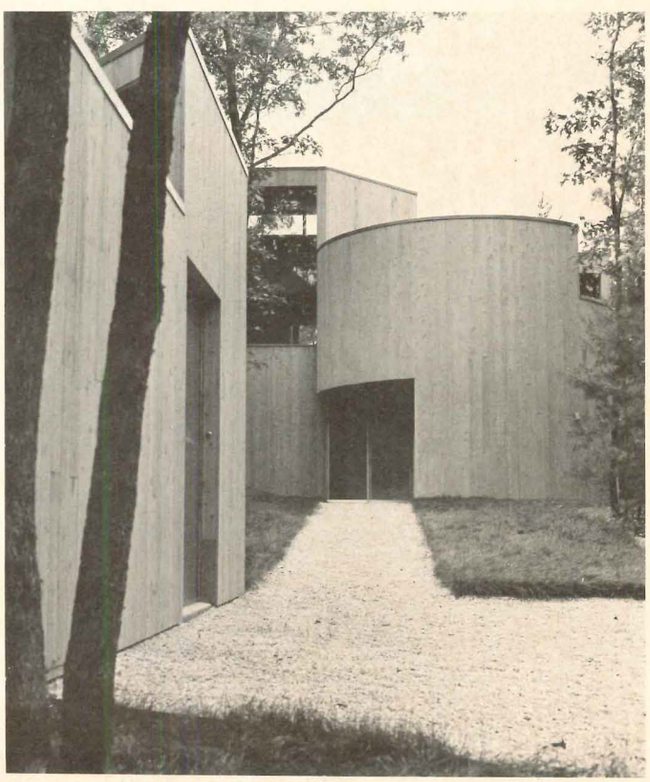
Three entries received awards in the 1968 Residential Design Awards Program sponsored by the New York Chapter of The American Institute of Architects. The jury consisted of architects Ulrich Franzen and George Nemeny and RECORD Editor Walter F. Wagner Jr.

A three-level, freestanding house by Richard Meier (above and RECORD HOUSES OF 1968) was commended for its "totally fresh solution free of current architectural cliches. While at first glance the house suggests a complex series of planes, the design . . . is in fact basically simple and consistent."

Public housing in Philadelphia by Joe J. Jordan (below) proved "a fine solution within a modest budget. These houses relate to the neighborhood in scale and in mood, yet are detailed with a freshness and simplicity . . . worth careful study by others working in this difficult area."

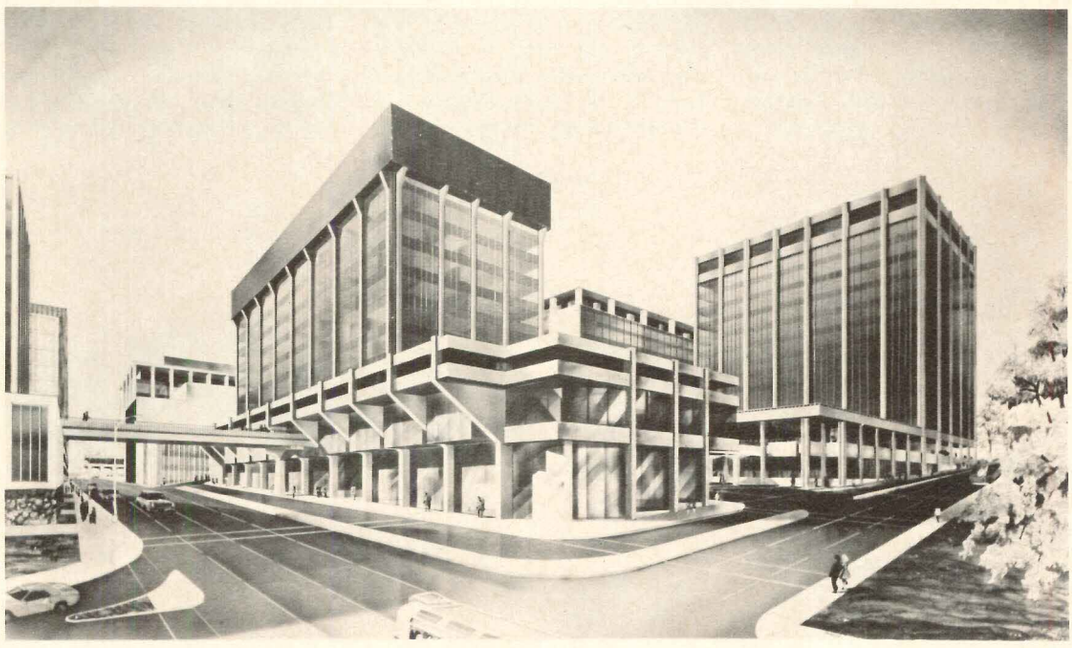
The house by Gwathmey & Henderson (right) was noted for its unusual use of vertical wood to create broad curving planes.





Jay Bee

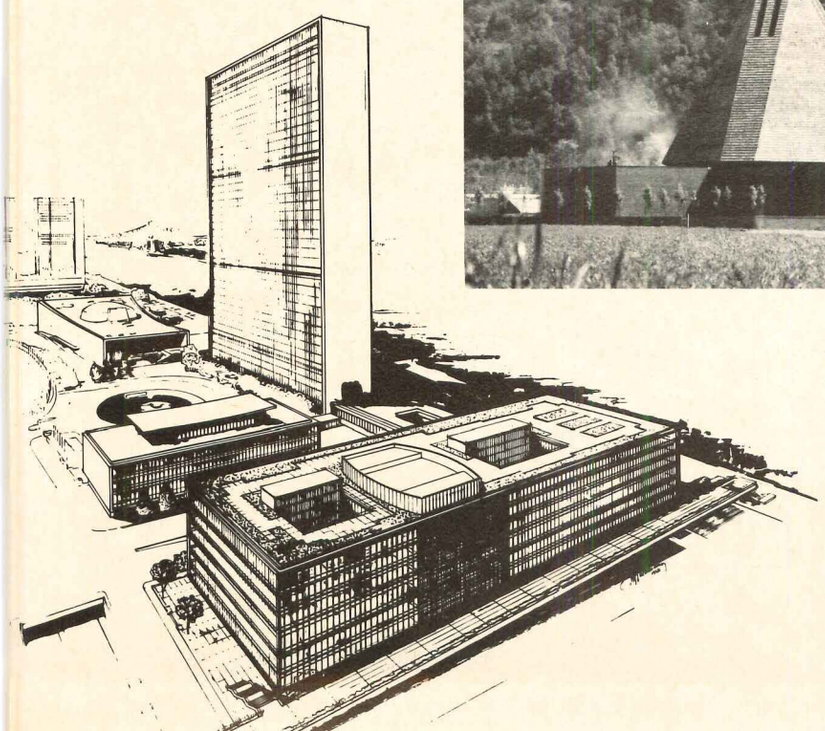
Community College, Allegheny campus expansion, Pittsburgh, will require leveling a wide hill—previously the site of a Civil War Memorial—by moving some 200,000 cubic yards of dirt. The three-phase, multi-million-dollar project is designed by Tasso Katselas on some 15 acres to provide classrooms for 6000 students, in addition to lounge, library, social and parking space.



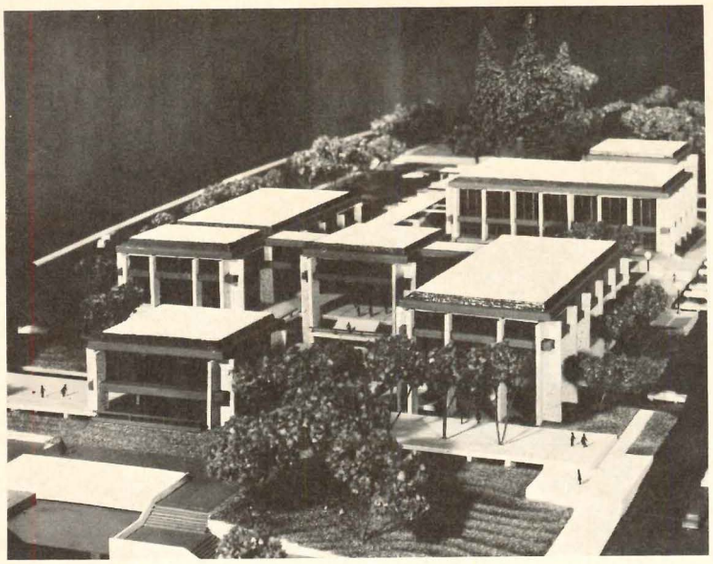
Rosslyn Buildings, Rosslyn, Virginia, will be the first link in a network of "skywalks" that will connect some 35 buildings in this 40-acre, $100-million urban development complex. The plazas, concourses and footbridges, which will be lined with outdoor shops, restaurants, fountains and a theater, will allow pedestrians to walk three stories above motor vehicles. Architects of the buildings shown: Mayne, Oseroff, Van Besien and Associates.

Photo-Art

St. Joseph's Parish Church, Roseburg, Oregon, received one of seven Merit Awards in the 1968 Liturgical Conference Competition. Architects Wolff, Zimmer, Gunsel, Frasca, Ritter, with consultant Pietro Belluschi, designed the church in a residential scale, in keeping with the belief that God should be understood more than feared. Members of the jury: Architects Thomas J. Biggs and George Rafferty, the Rev. Robert Ledogar, M.M., and the Rev. Thomas Phelan.



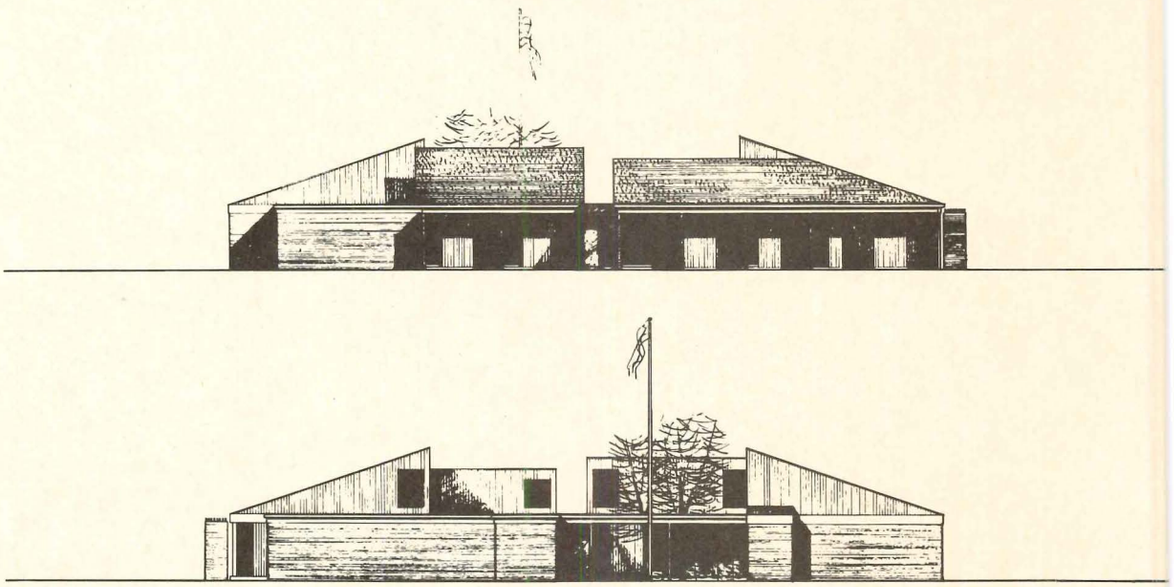
United Nations expansion, New York City, will include a new building to the south of the present U.N. area. The seven-story building, designed by Harrison and Abramovitz, will incorporate an existing tunnel ventilating structure and will provide some 693,946 gross square feet of space. It will be functionally attached to the existing Secretariat and Conference Building, and connecting levels will unify the open space. United Nations officials expect the office building to be completed within three to five years at a cost of $50 million.



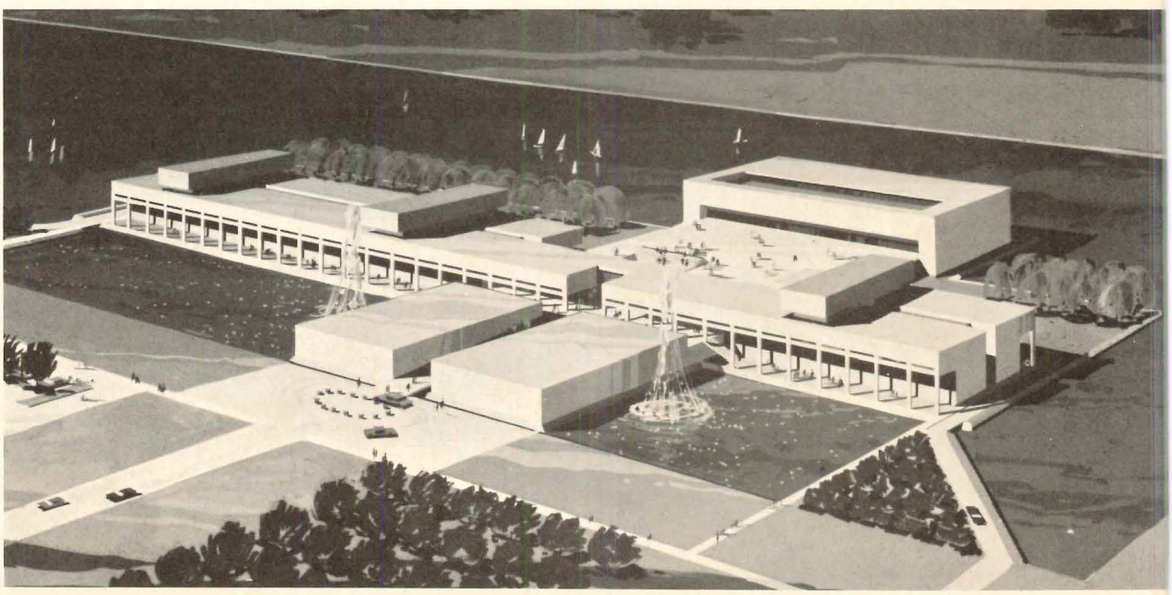
Civic Center, Salem, Oregon, will replace the capitol city's 74-year old city hall and will bring together city administration presently operating from six separate locations. The new complex, consisting of a city hall, library and fire station, will be constructed on a sloping one-block by four-block site overlooking a lake. Architects are Payne and Settecase and Charles Hawkes, with George Rockrise, design consultant.

Philip A. Turner

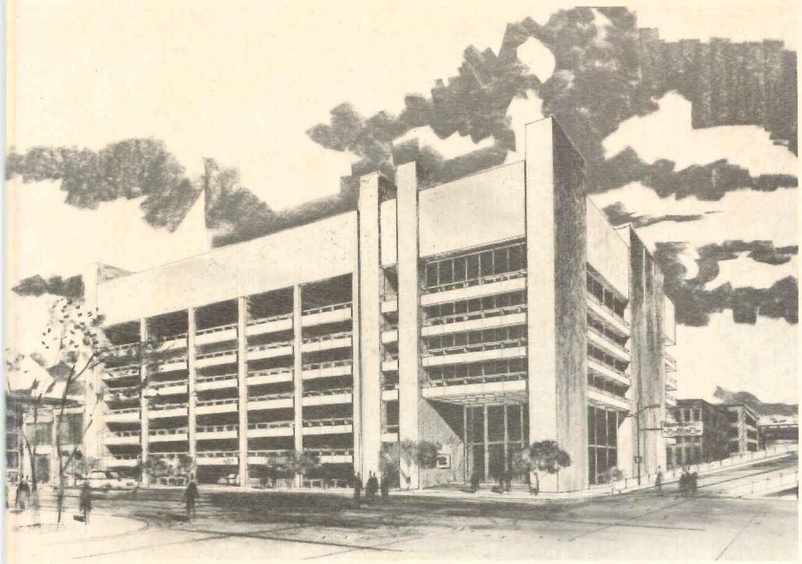
Schmitt Center, DePaul University, Chicago, won the Superior Craftsmanship Award presented by The Concrete Contractors Association of Greater Chicago. The building was cited as "an outstanding example of excellent, total sand-blasted, cast-in-place concrete work . . . the architectural design of the building was very carefully carried out by the execution of the work." Architects: C. F. Murphy & Associates.



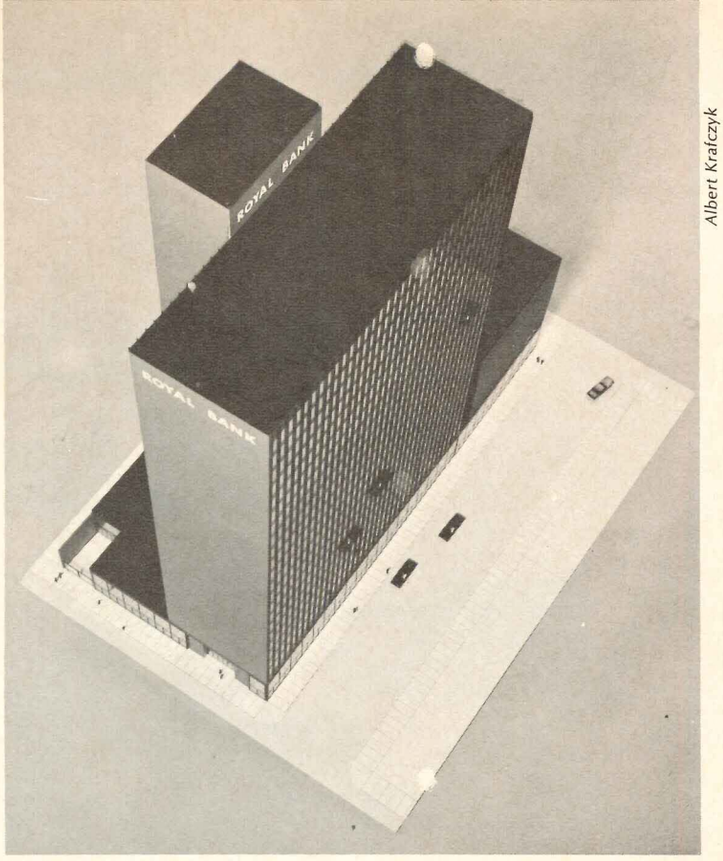
Smyrna Library, Smyrna, Tennessee, is designed to harmonize with the predominant scale and character of the residential area in which it is located. Architects Yearwood and Johnson used the roof forms as an expression of the various major internal functions. Freestanding sun screens keep out direct sunlight, while high windows admit north light. Exterior walls of the major reading areas are non-bearing to permit expansion.



Lake Michigan College, Benton Harbor, is located in the Michigan fruit belt where low-lying sandy soil requires flood control. As a result, the $10-million school is being built on an artificial, spring-fed 18-acre lake, which will provide cooling water as well as all-season recreation. Architects Harry Weese & Associates have incorporated existing orchards into the scheme.



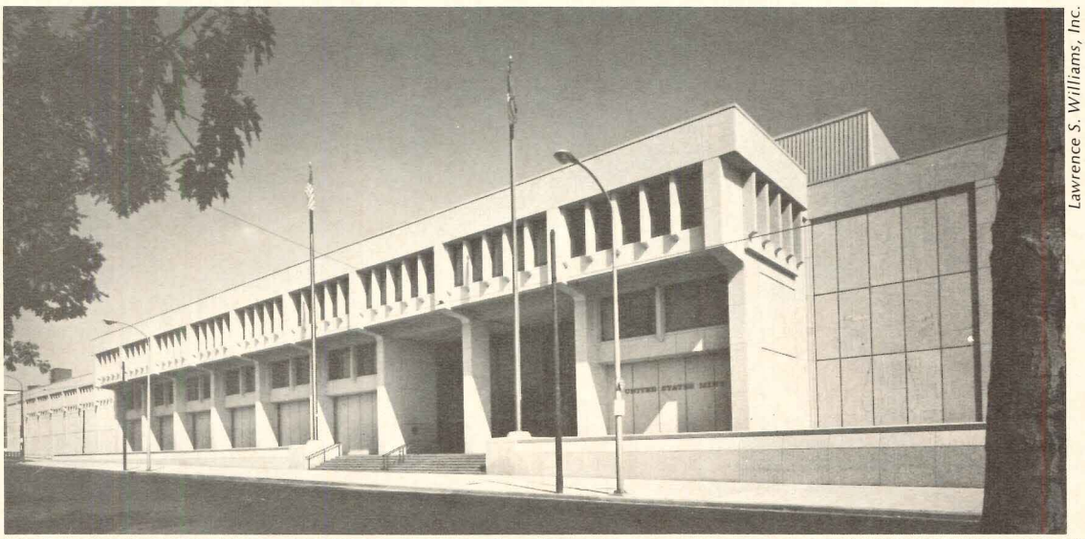
Bank and parking structure, Seattle, is designed for a high density, older section that is being revitalized. Architects Dorman/Munselle Associates used the massing to identify each area, with primary importance given the bank entrance on the corner. Each of the two facilities has separate entries for both pedestrians and automobiles, allowing for their complete independence. In addition to the 504-car parking structure, the bank has parking for 33 cars on the lower level.



Albert Kraftczyk

Royal Bank Building, Calgary, Alberta, is a 22-story building with office floors having two walls of gold coated heat-reflecting glass and black aluminum mullions and spandrels; the remaining walls and elevator tower are veneered in masonry. Architects are H. M. Tolchinsky, with the Office of Dan Kiley, consulting architects, and Cohos, Delasalle, Evamy, associate architects. Estimated completion: late 1969.

United States Mint, Philadelphia, has been called "the world's most efficient coin-production plant." According to Vincent G. Kling and Associates, the consulting architect, it is designed "to translate what is essentially a manufacturing structure into a public landmark which is inviting and accessible to visitors, significant and appropriate to Independence Mall, and fully expressive of its important function." Architect/engineer: Parsons-Jurden Corp.



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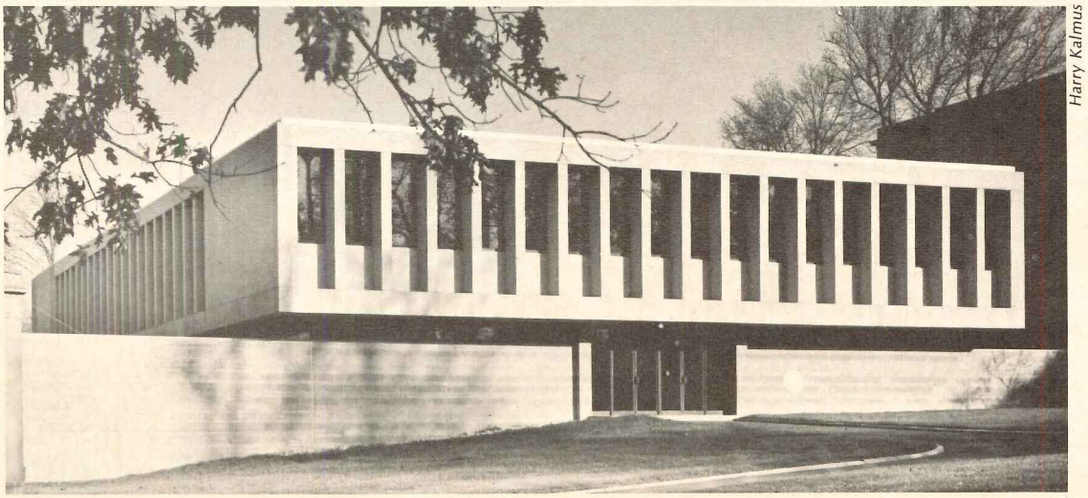

Harry Kalmus

Schuyler Otis Bland Library, U.S. Merchant Marine Academy, Kings Point, New York, has a first floor front wall that extends to two older buildings on each side. The wall, which is of special block in three sizes, relates to the existing buildings in material and color. The second floor, which projects over the first, is faced with precast concrete and has 66 tall windows, with spandrels in deep reveals below. Architects: Eggers and Higgins.

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Salt Lake County Civic Auditorium, Utah: Steel roof deck and Acoustideck® (erected). Steel floor deck. Milcor® metal lath, corner beads, wide flange studs. Milcor steel access doors.

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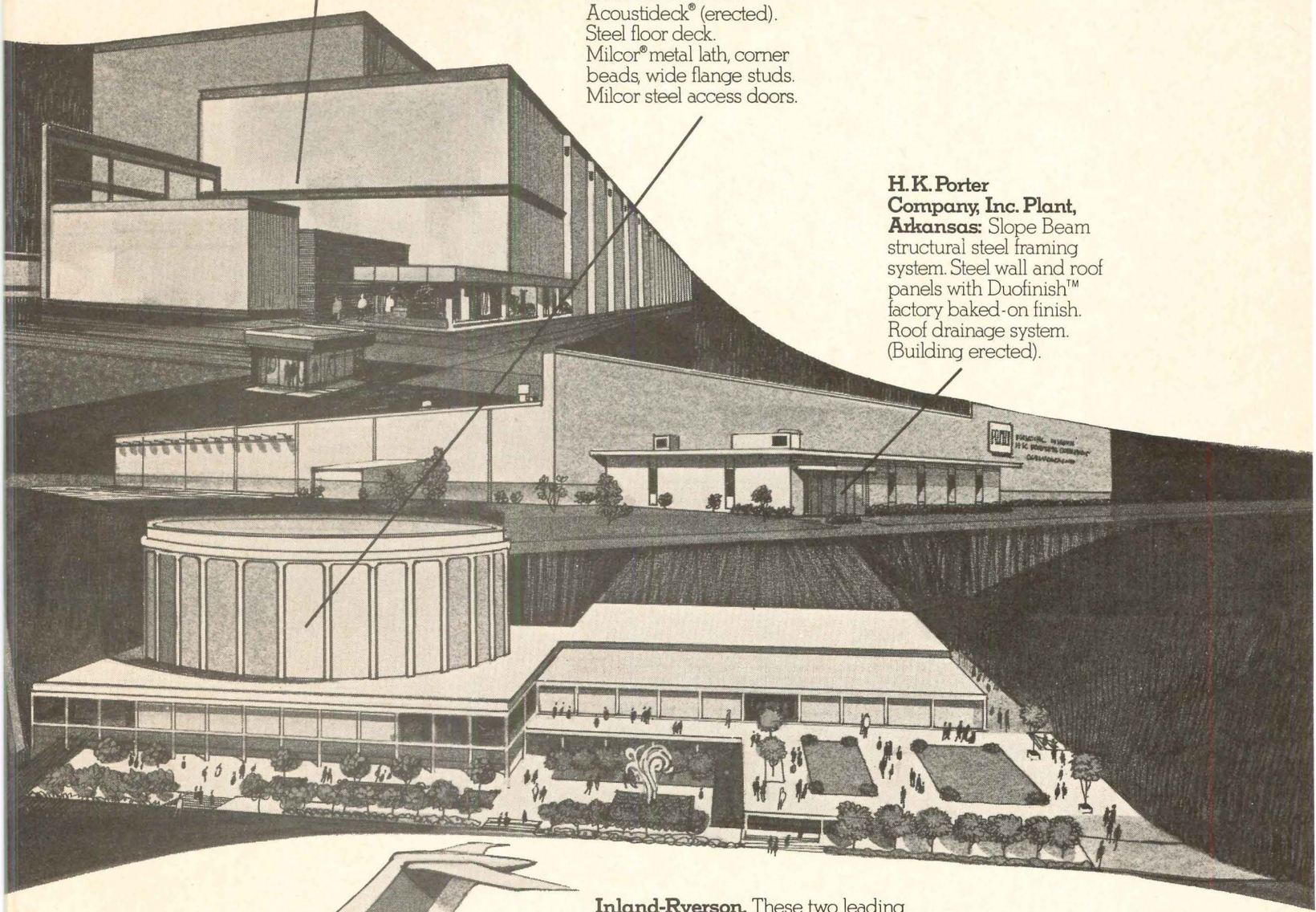

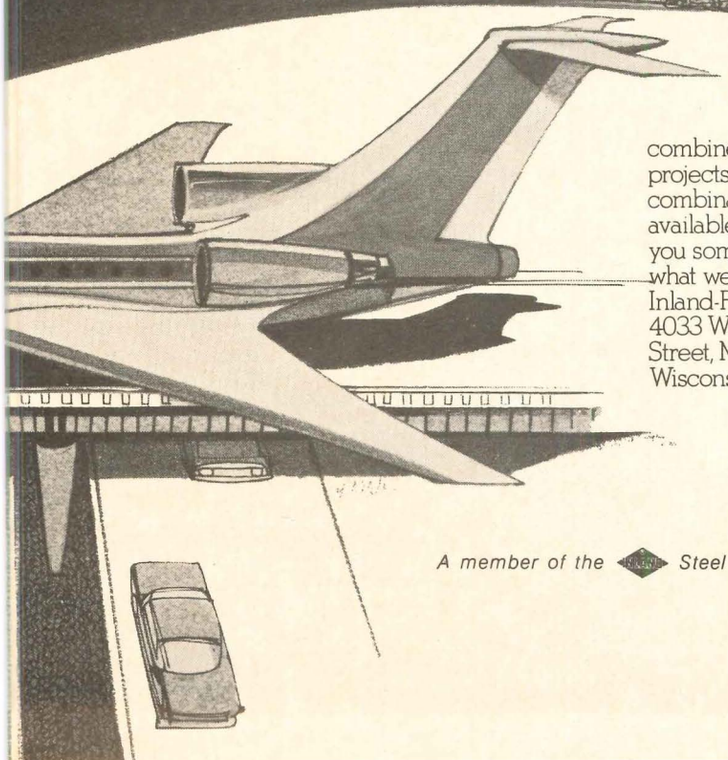

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The Princeton Report: another view

It was most discouraging to read the review by Jonathan Barnett of the A.I.A. report on architectural education in the October 1968 issue. Though I do not agree entirely with the report by Professor Geddes, I thought, at last the architects are beginning to become more human, to become more humane. To read that "the Association of Collegiate Schools of Architecture has passed a resolution at its Portland convention which amounted to a complete rejection of the A.I.A. report" and, "If the A.I.A. takes the concept of environmental design seriously, there is no question that it is proposing something that is profoundly destructive of registration laws and other existing forms of professional protection," is a sad commentary on the state of the profession in the United States and as a Canadian, I must admit that my personal experience suggests that this is reflective of the profession in Canada also.

The profession today is living more in an isolated intimidating "concrete" tower than some of the schools in spite of the rejection by the Collegiate Schools of Architecture and obviously the report appears to shake this tower of jealousies, pride, vanity and arrogance. The world is changing and although there will no doubt be a continued demand for the dilettante, the symbolist to put form to corporate, demogogic and other vain image seekers, the massive problems confronting man today cannot permit waste of talents and the contribution that the profession of architecture can make. It is a sad state of affairs to find that this profession does not or perhaps cannot recognize that the assimilation and synthesis of the ecological or environmental factors is the road to more humane and effective architecture, that the inclusion of Social Art enhances the Fine Art of architecture, and that as an interpretative art, interpreting the needs of other humans, architecture can be the greatest art and profession, if you like, of them all. Perhaps said by yet another member of the profession of architecture, it does sound arrogant.

In any case, it is humanity as a whole that suffers and it will not be too long before the profession will suffer or even disappear if the members individually and collectively do not recognize the challenge that is facing mankind today. The frontiers are not new esthetic concepts, new techniques of construction, producing ever larger pieces of sculpture, producing other Brazilias, Sydney Opera Houses and Habitats. The frontiers are man and his environment, the survival of the person in an impersonal, depersonalizing and dehumanizing world.

For the architect to follow the ecological or environmental model, requires a degree of humility, to recognize that the perception of environment is a unique and personal experience: that people are not created in the image of the architect: that there are other more knowledgeable people in this area of psychological reactions to perceptions: that comfort is the person himself, admittedly not too frequently articulated in language understandable to the architect. It is apparent, that if the review by Jonathan Barnett reflects the true attitude of the profession as a whole, the profession does not have one of the most essential qualities to be accorded society's support and encouragement and deserves an ignominious death.

K. Izumi, Architect-Planner
Associate Professor of Social Science
University of Saskatchewan Regina Campus

The Princeton Report and its critics agree that the architectural profession must change, is in fact changing; and that the direction we must follow is the "environmental approach." Professor Izumi will even find wide-spread support for his thesis that the architectural profession as we have known it "deserves an ignominious death." Of course, each professional assumes that he belongs to the enlightened cadre that will survive after most of his colleagues meet their well-merited demise.

The problem isn't where we are going, but how we are going to get there. An exceptional person like Professor Izumi can master several professions, but most people find it difficult enough to follow one. However wide-ranging the architect's training, however many related professions he works with, what society requires of the architect is his professional ability to design the physical environment. The belief that an architect has a special talent for solving social problems is a dangerous delusion. The alacrity with which architects have embraced "environmentalism" or "advocacy planning" (which was originally put forth as a most anti-architectural idea) is, to some extent, a symptom of the old "form-giving" mentality, looking for new worlds to conquer.

The unsolved problem of architectural education is a curriculum that will give the student the opportunity to acquire expert knowledge in a far wider field than has been required in the past, at the same time training him to apply this knowledge to the design of the physical environment.

—Jonathan Barnett

But what about subsidies?

I think the RECORD should be complimented promptly and graciously for the splendid layout accorded the publication of the work of the Housing and Development Administration under Jason R. Nathan.

Pictorially it is a superb display. It is inspiring and imaginative. Of course I could find faults were I to try to be meticulous.

What does astonish me, however, is that so much should be put forward without meaningful mention of the economic relationships involved. I shudder to think of subsidies that may have been promised.

Arthur C. Holden
Holden Yang Raemsch & Corser
New York City

Richmond Coliseum: Correction

We were pleased to see the Richmond Coliseum on page 43 of the January issue. However, the architects should be listed as Ben R. Johns, Jr. and Vincent G. Kling & Associates, Associated Architects.

Ben R. Johns, Jr.
Richmond

Only Colonial?

Your November editorial is utterly unrealistic and an unjustified rebuff to the "young" architect whose letter you quote. If you were able to sit behind the desks in the small offices and face the clients and their demands you surely could not be deceived by the atmosphere created by a Kevin Roche Production. To even cite the experience proves your unfamiliarity with the problems of the small practitioners. The clientele you describe is, in itself, composed of more knowledgeable and broad-minded individuals than most we have to face. Do you think the trustees of the Rochester Institute of Technology are on the same plane as the hard headed speculative builder who wants a Colonial Office Building because it "rents"?

His attitude, of course, reflects the attitude of the Community. The investors build what the public will buy or rent, not what the critics like. Institutional work is of a different nature, but the individual investor would not even take time to look at "two slide projectors arranged to create overlapping images," let alone pay the fee to cover the costs of such production.

Leon Rosenthal, A.I.A.
Babylon, New York

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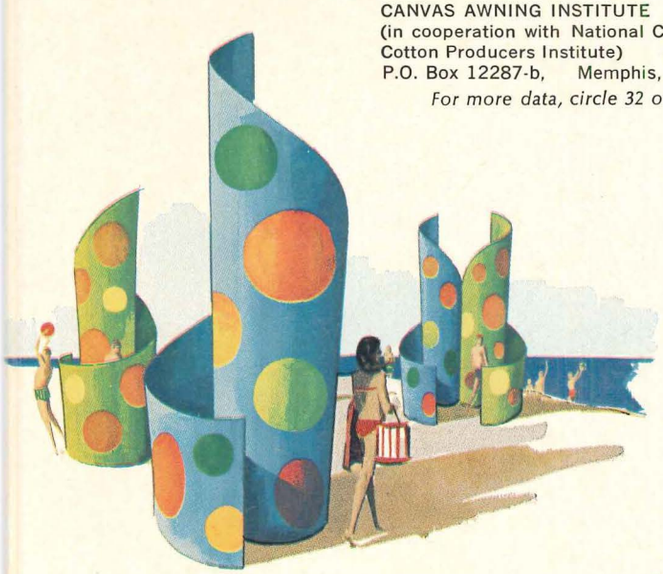

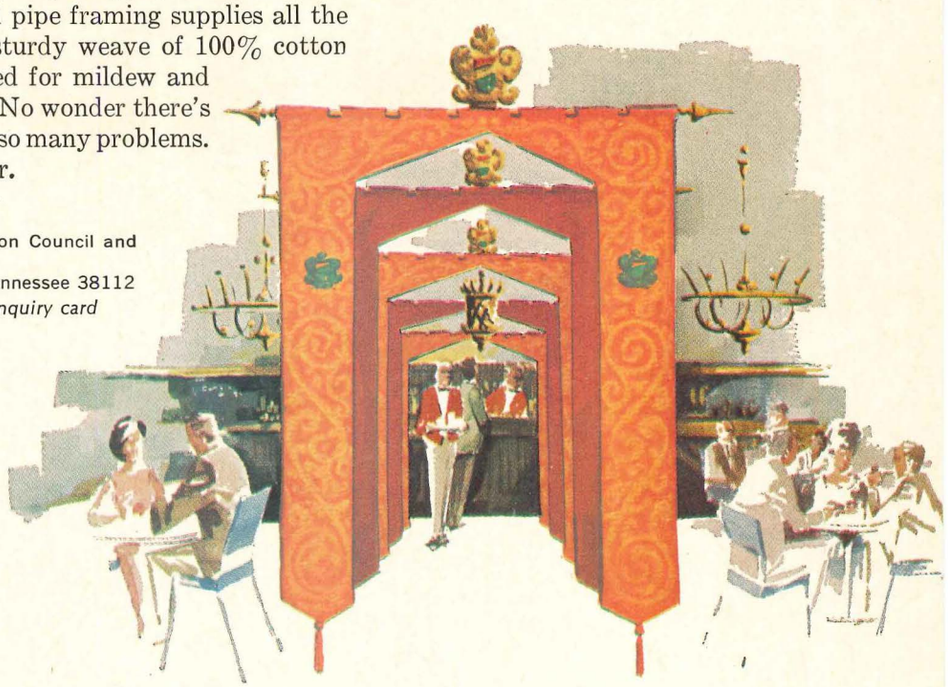

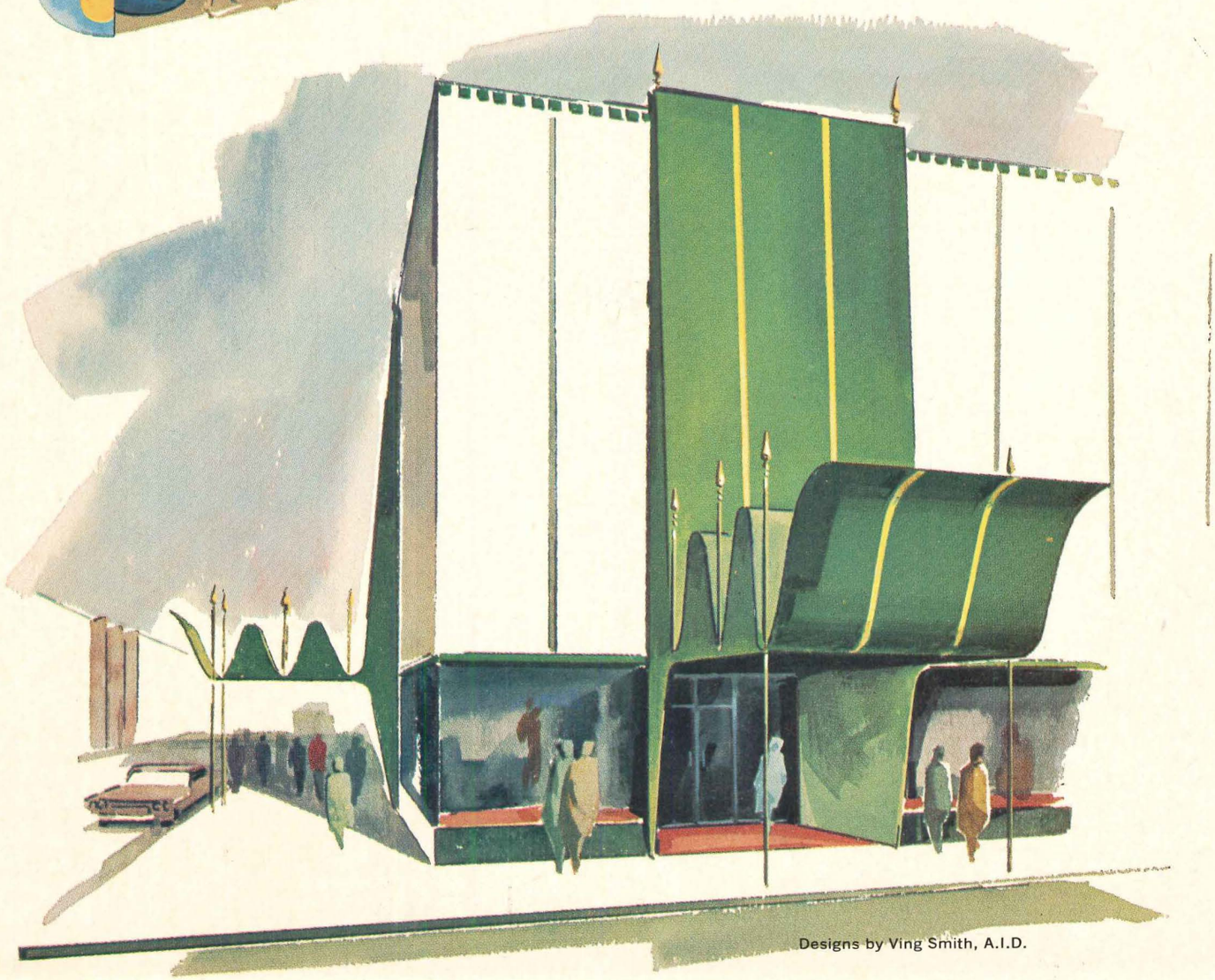

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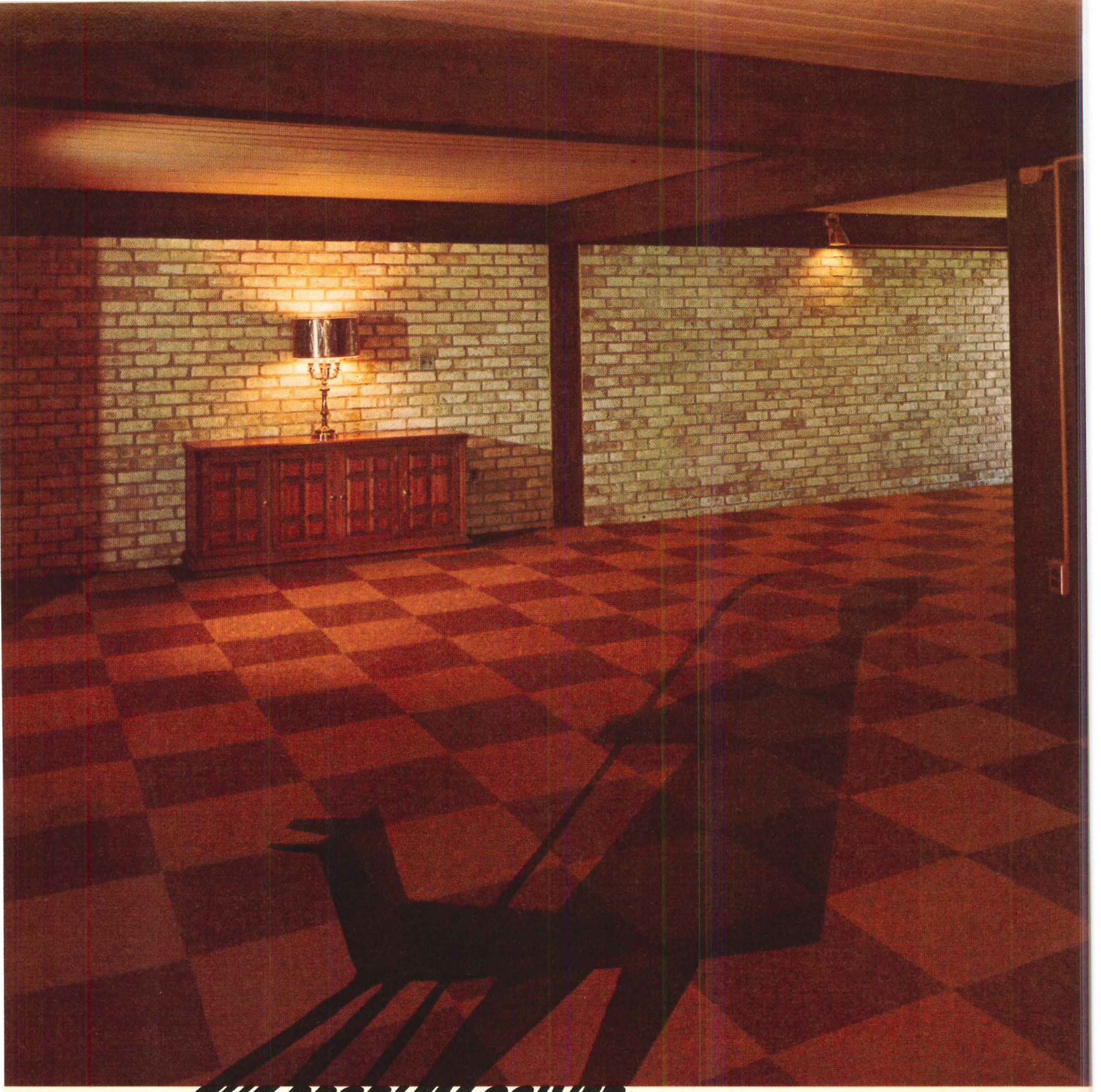

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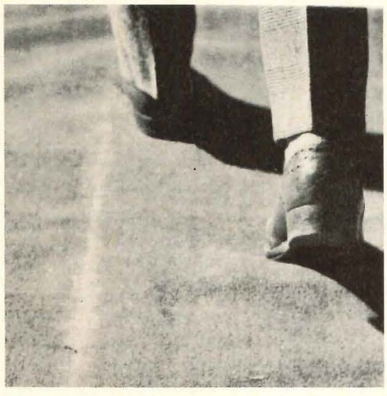
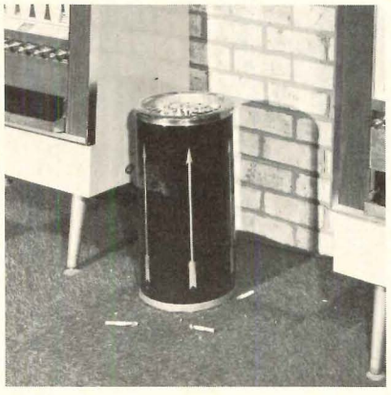
See Heugatile specifications in Sweet's 1969 Architectural and Interior Design Files.



WEAR. This is conventional carpet. But new Heugatile solves this problem. First, Heugatile is longer-wearing by actual tests. Second, Heugatile carpet squares are loose-laid and totally-interchangeable so squares can be rotated—annually, for example—to retard the development of wear patterns.



BURNS. Are cigarette burns ruining your present carpet? Then you need Heugafelt, one of three fine Heugatile carpet products. Heugafelt shrugs off cigarette burns without a trace of scorch! Thus, Heugafelt is ideally suited for installations in hotels, motels, dormitories, retail stores, banks, and offices.

MAINTENANCE. Heugatile's dense pile keeps dirt on the surface for easy removal by occasional vacuuming. Thus, Heugatile drives maintenance costs down! Spill something on Heugatile? Simply pick up the carpet square and wash it off. Permanent damage? Just replace the damaged square in seconds.

HEUGATILE® / *The problem solver*

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Van Heugten U.S.A., Inc., 185 Sumner Ave., Kenilworth, N.J. 07033 • (201) 245-3480
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Van Heugten Canada Ltd., 107 Orfus Rd., Toronto 19, Ontario, Canada • (416) 789-7546

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Los Angeles—516 West 4th St., Santa Ana, Calif. • (714) 547-6413
San Francisco—2555 Nicholson St., San Leandro, Calif. • (415) 483-4720

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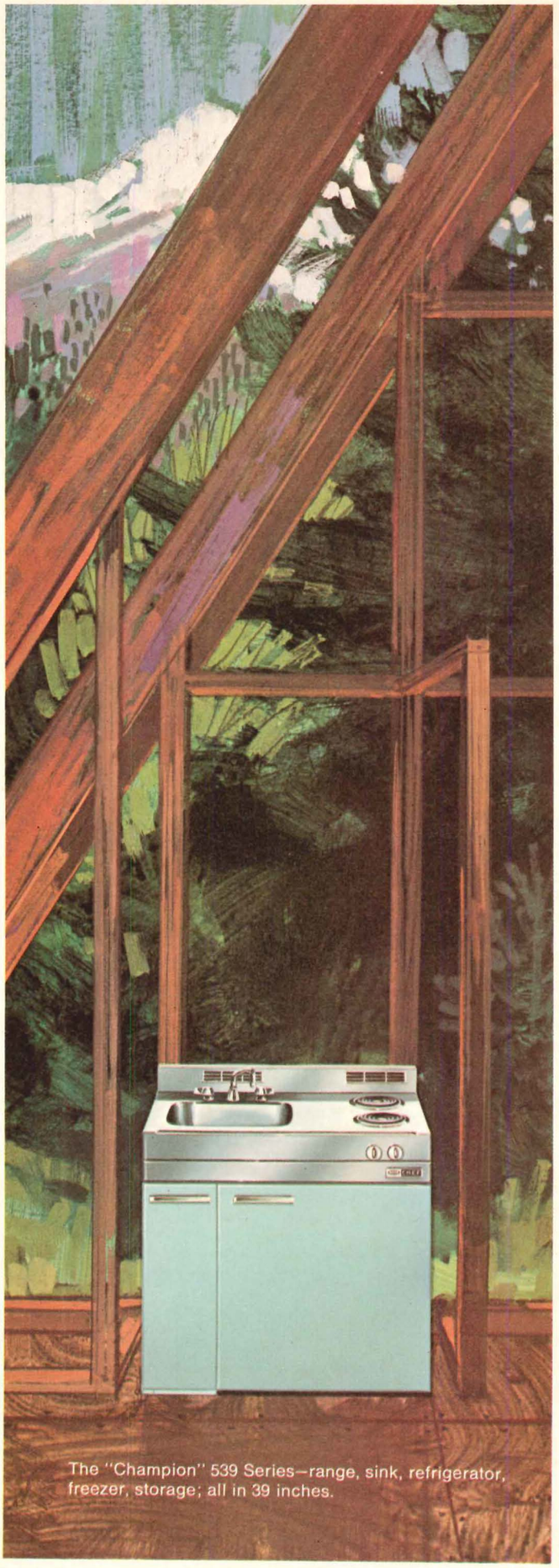

The "Champion" 539 Series—range, sink, refrigerator, freezer, storage; all in 39 inches.

CRANE CHEF:® IF THERE'S ROOM FOR A CLOSET THERE'S ROOM FOR A KITCHEN.

The "President" 300 Series – 48-inch console of selected hardwood finishes only, twin electric cooking units, one-piece, stainless steel countertop with integral recessed sink, refrigerator, freezer, storage plus optional food waste disposer and automatic ice maker.

Elegant wood-finish cabinets offer perfect coordination with woodwork and furniture. Choose from hand finished mahogany, limed oak or walnut.

Space. Function. Beauty. Familiar antagonists with which you do battle daily. And they were the challenges met so successfully by the creative craftsmen of Crane in the designing and engineering of the full line of Chef compact kitchens. Designed for the space conscious generation, the Crane Chef is a complete kitchen in a closet-sized space!

Seven Crane Chef series come in six sizes—29", 39", 48", 54", 63", and 72" in length—51 models in all. The possibilities are intriguing: vacation homes, apartments, hotels, motels, offices, institutional lounges . . . anywhere space is precious.

But architecture is more than a science, it's an art. So, you'll appreciate the handsome contemporary styling, smart decorator colors and hand finished woods . . . and of course, Crane's traditionally flawless workmanship.

An architect needs specifics. For all the idea-sparking specifics, ask for your personal copy of Crane's attractive, full-color brochure — KC-3000. Call or write Crane Co., Dept. 068, 4100 South Kedzie Avenue, Chicago, Illinois 60632.

CRANE

VALVES • PUMPS • FITTINGS • WATER TREATMENT
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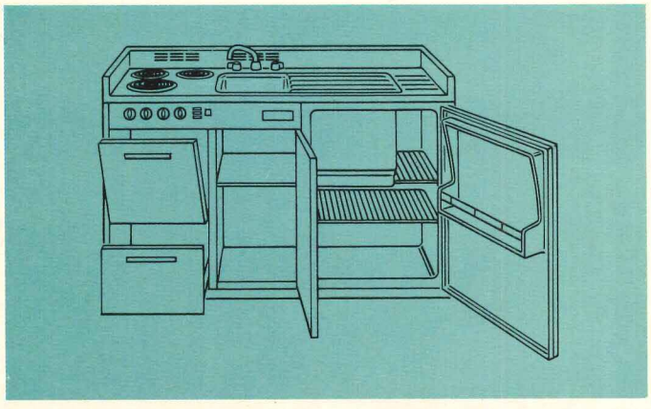
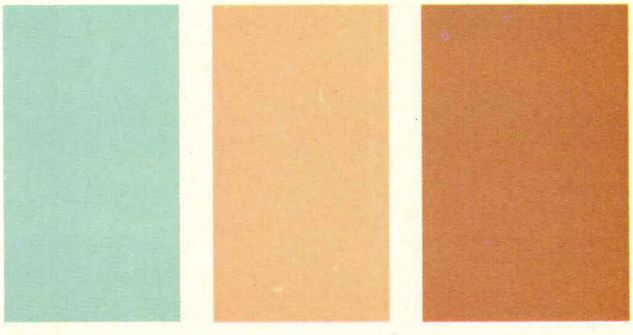
The "Supreme" 872 Series—range, oven, broiler, automatic-defrost refrigerator, full-size sink, storage plus food waste disposer and other optional features. 72 inches.

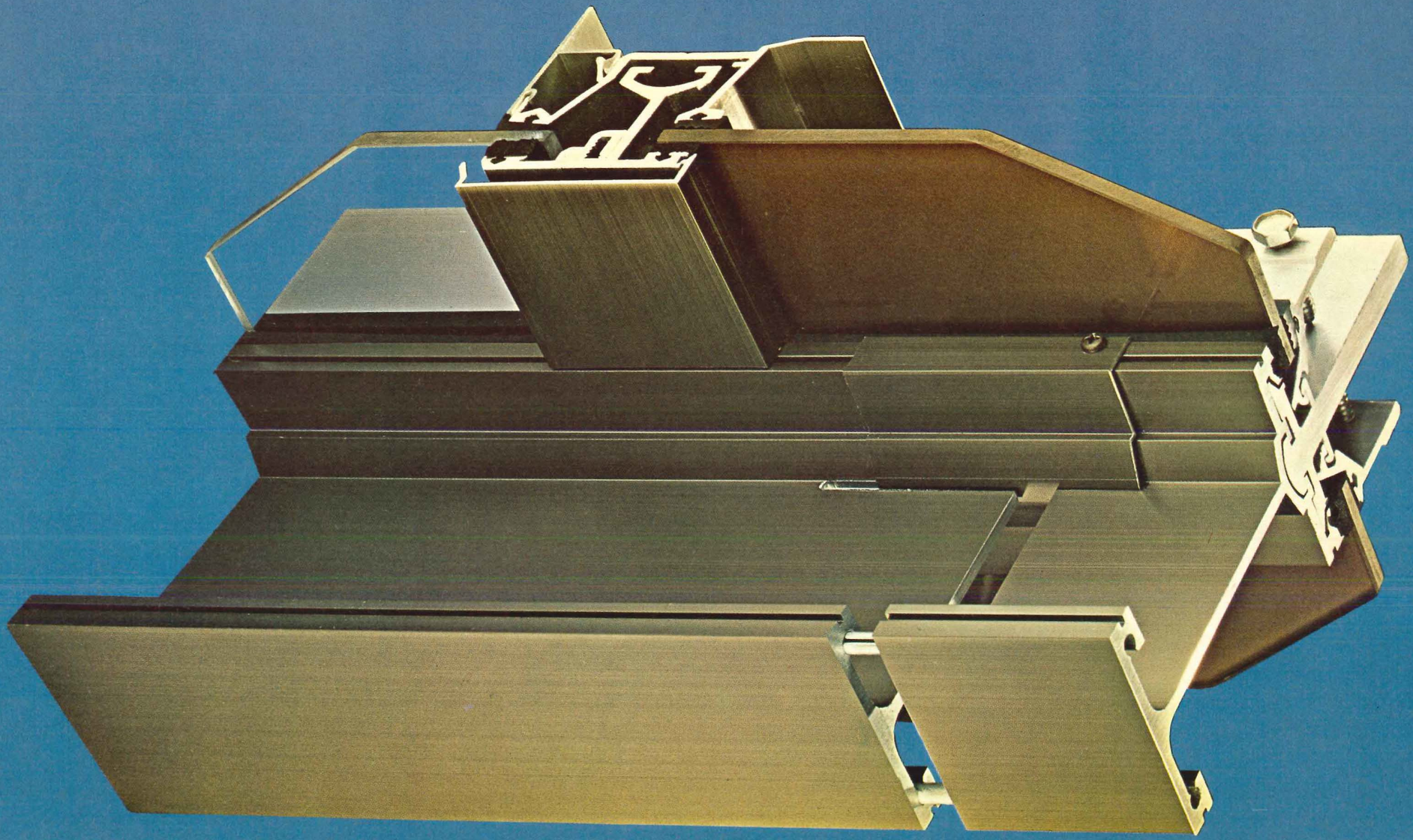
The "Medallion" 529 Series — range, full sink, Crane refrigerator with full length freezer, handy door shelves and push-button defrost, left or right-hand, flush-opening door. 29 inches.





All Crane Chefs except President Series are available in gleaming white, pastel turquoise or tan, or rich coppertone to blend with today's popular decorating trends.

For more data, circle 34 on inquiry card



Unfortunately, we can't tell you exactly how much money you'll save with the new Pittco Seventy-Five Curtain Wall.

Until we know your specifications, we can't even predict how much extra design freedom you'll enjoy, or how many construction days you'll save. Or just how many tenants you'll gain with Seventy-Five Curtain Wall's rainscreen system.

Seventy-Five Curtain Wall's five anodized aluminum colors are coordinated with Pittco® entrance systems and storefront metals. And it accommodates any thickness of glass or spandrel. Lets you build a beautiful building inexpensively, without compromising your design.

It's interior glazed to save you expensive days of glazing and erection. A controlled-pressure glazing system cushions and seals glass tightly between neoprene strips to minimize breakage. It also makes Seventy-Five Curtain Wall foolproof.

We've put Seventy-Five Curtain Wall through a fierce series of performance tests, too. (It's met all the requirements of NAAMM Tests A, B, C-1 and C-2, for example.)

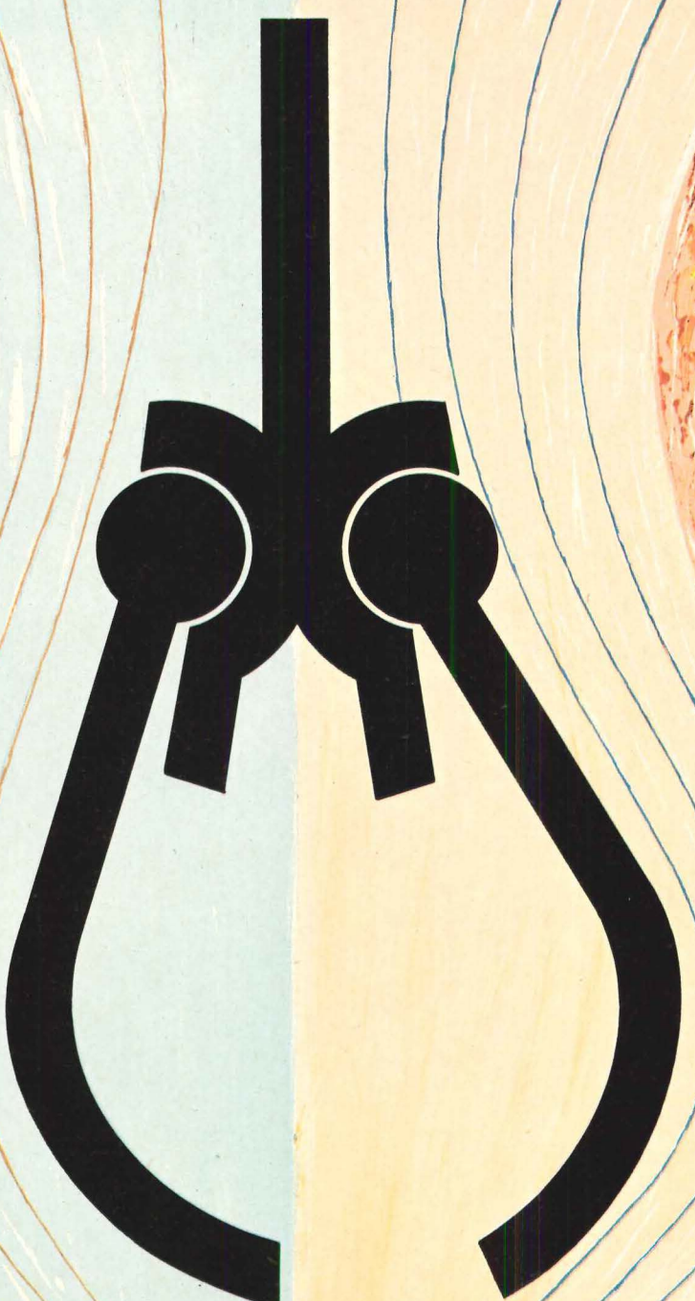
The competitive price is the big surprise. When you give us your specifications, we'll tell you exactly how much money you'll save with the new Pittco Seventy-Five Curtain Wall.

Consult Sweet's File 20a/Pp (see Pittco 7500 Curtain Wall), or write: Pittco Architectural Metals, Box 930, Kokomo, Indiana 46901.

PPG INDUSTRIES

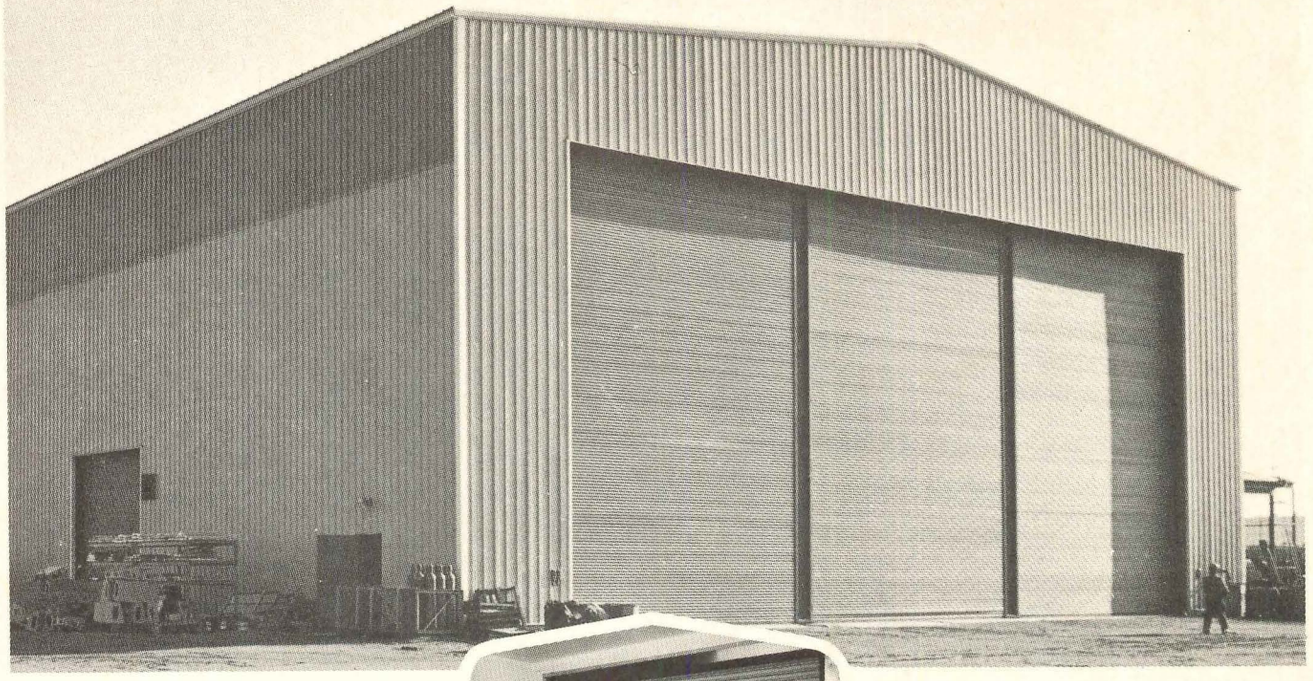
For more data, circle 35 on inquiry card

Q: Why does the Titus T-Line Air Diffusing Ceiling make "LANDSCAPED" OFFICES 50% more functional?



Calgehl

KINNEAR
ROLLING DOORS



Planning BIG?

Planning Small?

Plan them all to have this
EXTRA SECURITY, DURABILITY & EFFICIENCY!

Whether your plans call for doors to fill literally the end of a building or a counter shutter to protect a hospital pharmaceutical department Kinnear Rolling Doors can fulfill the need most effectively on every score. The Varco-Pruden, Inc., metal building designed and erected for Marinette Marine Corp., Marinette, Wisconsin, shown above, has an unobstructed opening of approximately 82 ft. wide by 36 ft. high. This is closed by three Kinnear Motor-operated Steel Doors (each 26′ x 36′) with two sliding mullions.* To save floor and wall space by **rolling up** such a wall of steel is no small engineering feat. But, no more uncommon a job for experienced Kinnear Door Engineers than the small counter shutter also shown.

The basic interlocking slat design, originated by Kinnear over 70 years ago, has never been surpassed for door efficiency; economy of floor, wall and overhead crane space; and rugged protection against man or elements — a closure that has proven to withstand years of hard usage with the minimum maintenance cost.

Let Kinnear consult with you on any of your building closure needs. With Kinnear's nationwide sales, installation and service organization, there's a Representative nearby to work with you. Call or write. There's no obligation.

**Also installed on the Marinette building are two doors 20′ x 36′ with sliding mullion and three doors at the side of the building 16′ x 16′. All, of course, operated by Kinnear Electric Power Operators.*

Also manufacturers of Rolling Fire Doors and Shutters, Rolling Counter Shutters, Overhead Type Doors and Electric Door Operators.

KINNEAR® ROLLING DOORS

Saving Ways in Doorways Since 1895

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and Subsidiaries
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Offices and Representatives in all Principal Cities — Listed in Yellow Pages Under "Doors." Also Sweet's!

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For more data, circle 38 on inquiry card ➧

Integration of all environmental comforts. Quiet Modu-Flo® air distribution. Precision, customized illumination. Almost endless modular flexibility. Plus, Sunbeam ceiling systems offer more interior design possibilities. They are as varied as your architectural objectives.

Sunbeam was an innovator of the totally coordinated architectural ceiling system... a comforting thought for your next project.

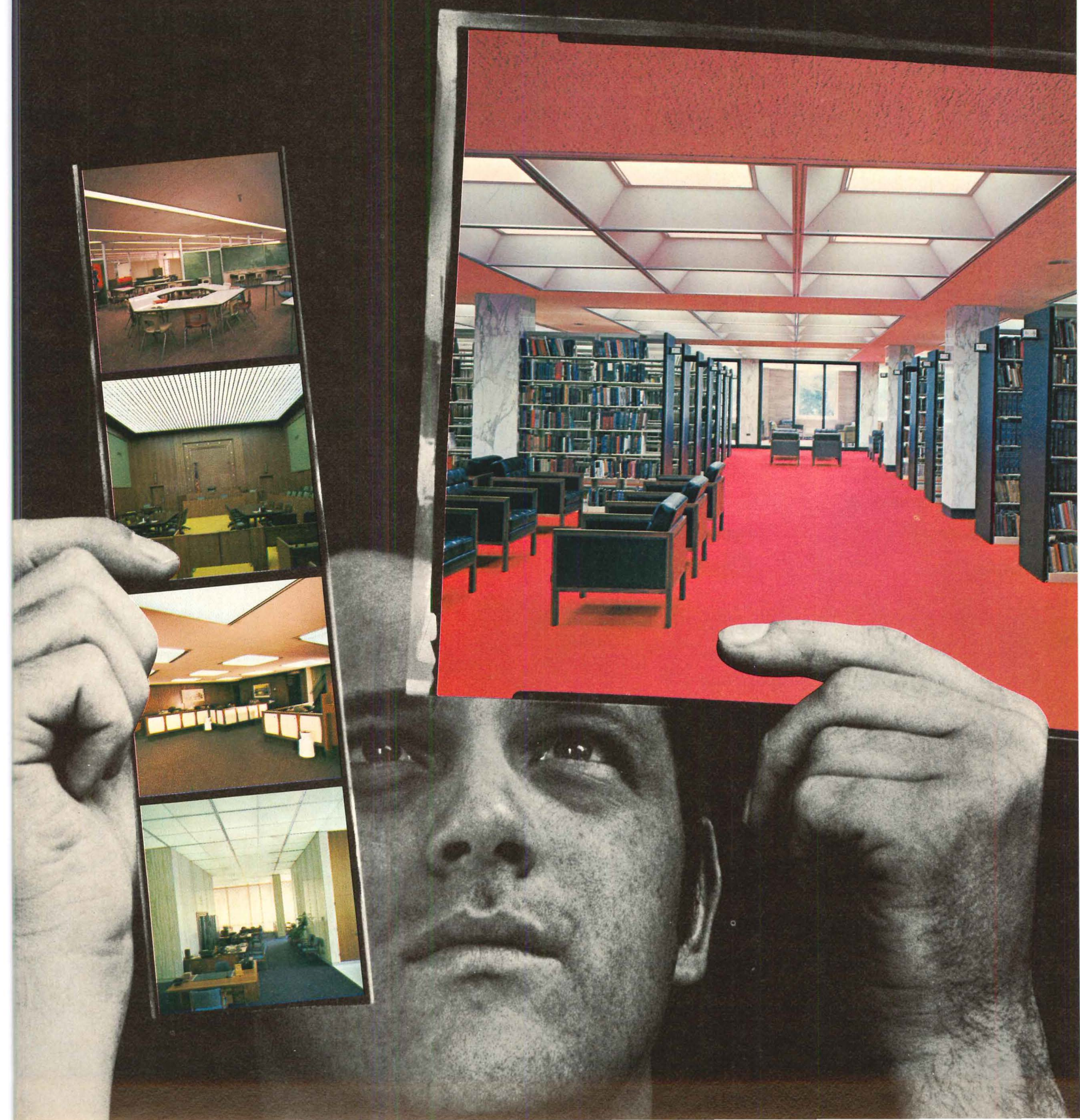
The big picture shows Dagit Associates' (architecture) and Joseph Greyson's, MS (MS in ME), College of Engineering, V.U. Villanova University Library in Pennsylvania. The smaller pictures (in order from top) illustrate a few more installations: Unidirection #IS4000 system; Modulette luminous ceiling; Modu-Flo framed luminaire #IS3000 system; and architectural luminous ceiling #IS6000 system.

Your Sunbeam representative can be of enormous assistance. Write Interior Systems Division, Sunbeam Lighting Company, 777 E. 14th Pl., Los Angeles, Calif. 90021 for your copy of "Concepts on the Interior Environment."

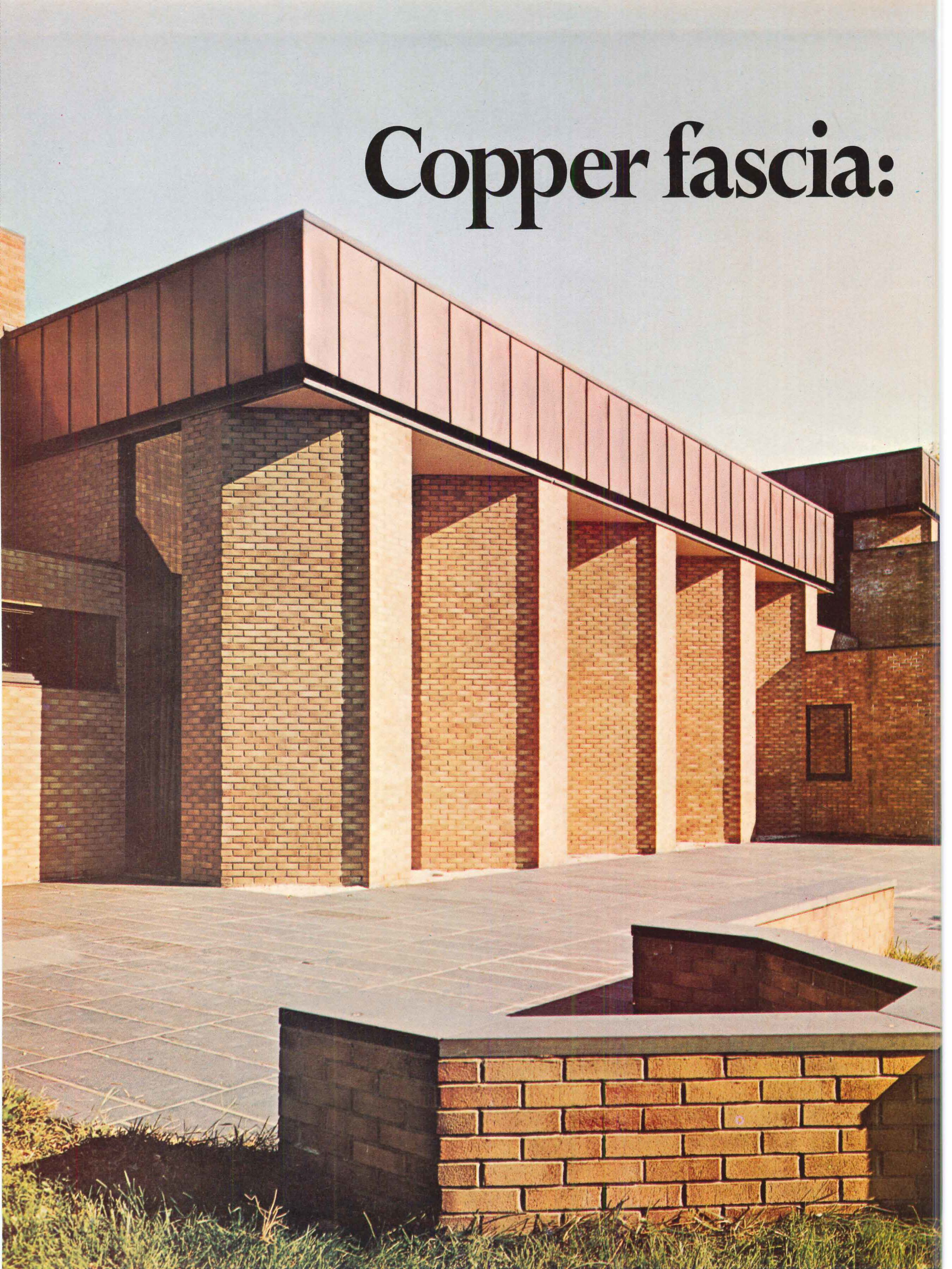
It tells the big ceiling system story like it is.

Sunbeam Lighting Company

You rely on Sunbeam because they're a giant in the ceiling system business.



Copper fascia:



permanently aesthetic

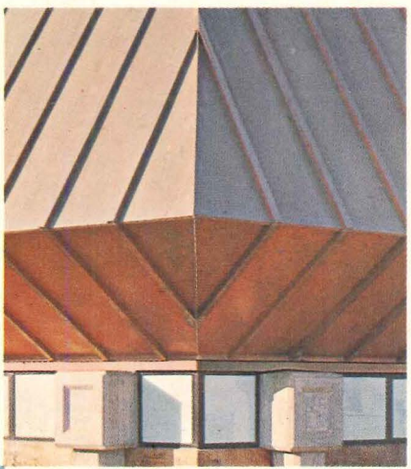
Copper fascias will last as long as any building.

That's only one reason for specifying this timeless metal. In workability, copper leads the field—no metal is as easy to apply. Its natural warmth and beauty harmonize with other construction materials in both traditional and contemporary designs.

Now, new development work in the lamination of copper to other materials adds extra potential to its versatility, with the promise of economy added to many other reasons for your profession's long-standing reliance on this basic building material.

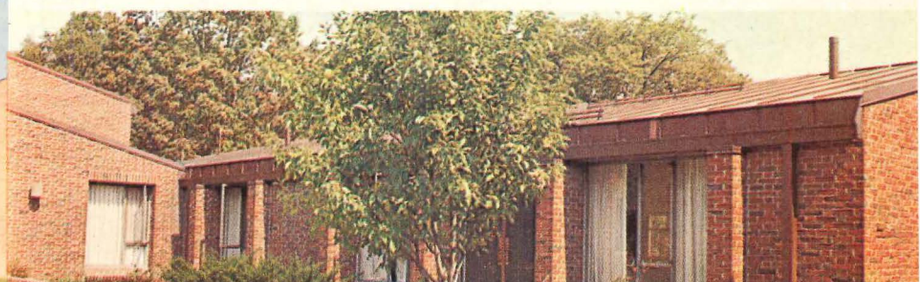
You are invited to write for your copy of "Copper Fascias," first in a series of quarterly brochures entitled "Creative Design in Architecture" which describe the effective use and proper installation of copper in a wide variety of building types.

Copper Development Association Inc.
405 Lexington Avenue, New York, New York 10017



Copper's workability and light weight, plus its affinity for redwood, commended it to Callister, Payne and Rosse for both roof and fascia on the University of California's Field House at Santa Cruz.

The functional and highly decorative band which terminates Agudath Sholom Synagogue (left and above) in Stamford, Conn., is an excellent example of a typical copper fascia. Architects: Davis, Brody & Associates.



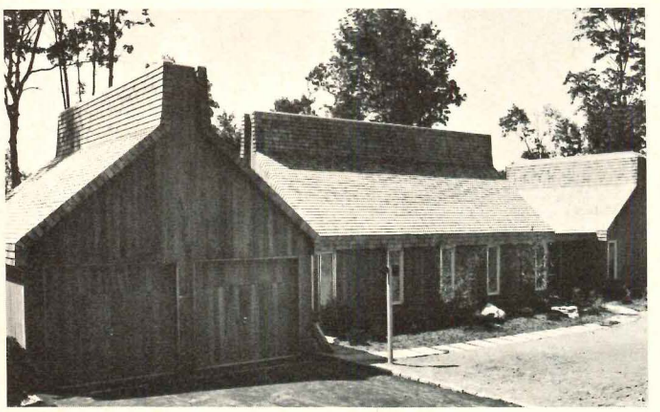
Hugh Stubbins & Associates counterpoint the smooth, uniform surface of copper roof and fascia against the rugged texture of brick on the Dana Hall School's Senior Residence, Wellesley, Massachusetts.

COUNT ON COPPER

For more data, circle 39 on inquiry card

Architect: Delnoce Whitney Goubert Builder: Frank H. Taylor and Son, Inc.

POWER OF ATTRACTION.....



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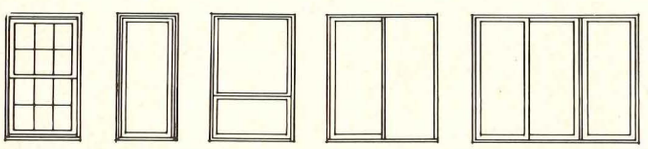
CARADCO Patio Doors and C 200′ Casements are powerfully attractive because their wood construction appeals to sight and touch, insulates best, decorates beautifully. More C 200′ Casement attractions are: double weatherstripping; insulating glass with maintenance-free, leak-proof, vinyl glazing; removable vinyl grilles for easy cleaning.

CARADCO Patio Doors feature 7/8″ insulating glass; nylon rollers for quiet, easy operation; thermal barrier sills; complete weatherstripping including dense, woven pile weatherstrip at sill and hidden reinforcers for great strength.
For good looks, for comfort, for client satisfaction . . . specify CARADCO: the best in windows and doors.



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Caradco Windows and Patio Door products are further detailed in Sweets Light Construction 6B/Ca, Arch. File 19c/Ca or write direct to factory

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Stuff the block, quiet the building.

Pouring Zonolite® Masonry Fill Insulation into masonry walls reduces sound transmission to a murmur.

Increases fire ratings of two-hour rated block to four—count them—four hours.

Doubles the insulating value of the wall to prevent chills and sweats of the occupants, while inducing a state of euphoria over low heating and air conditioning bills.

What more do you want for as little as a dime per square foot?

Remember. When you specify a block, specify Zonolite Masonry Fill for quiet's sake, safety's sake and comfort's sake.

Also remember to mail coupon right now for complete info.

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Gentlemen: Please send me complete information on your comforting, quieting, saving, fire-resisting Zonolite Masonry Fill Insulation, with complete technical data and specifications.

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CONTEMPRA ends the era of the drab lab. Fisher's new Contempra™ line of laboratory furniture has caught the imagination of the scientific world—just as our "unitized" concept revolutionized the look of labs 20 years ago. Contempra is a modular line; exciting, modern and functional. Bases are shell white. Doors a contrasting slate gray. You customize and code the airtight drawers by choosing from six Contempra colors. Then pick from among the three available work-top materials. (They come in unbelievably tough, believably tough, and tough.) Contempra is easy to install, break down and reassemble. (Your lab will never outgrow it. Neither will you.) There are nearly a hundred units in the line—base cabinets, sinks, fume hoods, wall cases, refrigerators. All heavy steel. All epoxy-acrylic finishes. All *guaranteed* by Fisher. And, most important, all available from stock. Available *now*. See what the world's coming to: see Contempra. Write or call for The Contempra Furniture Catalog. Fisher Scientific Company, 2391 Fisher Building, Pittsburgh, Pa. 15219. Fisher . . . first.

F-730

INSTRUMENT DIVISION
FISHER SCIENTIFIC CO.

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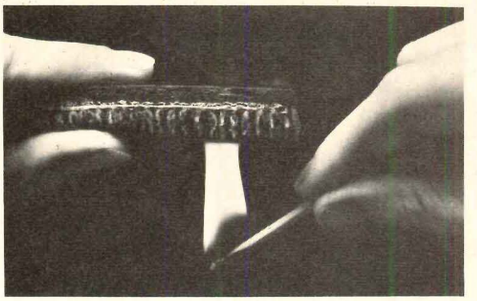
Before we called our new carpet "Accomplishment" we made sure it was.

Lees created the first
high-density foam-backed carpet
to pass all flammability tests.
(Then for the first time in the industry
we set realistic standards
for static protection.)



The tunnel test

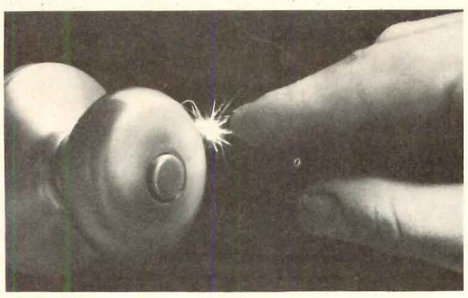
It may seem like a pretty funny test, but our carpet was cemented to the ceiling of a 25-foot-long tunnel (20"w x 20"h). At the mouth of the tunnel were two burners whose 1700° F flames reached up towards the carpet. To make matters worse, a three-knot draft helped move the flames as far along the tunnel as possible in ten minutes. The result? "Accomplishment" is the first and only foam-backed carpet to pass this test. The rating was less than 75. (The lower the rating the better.) And 75 or less is required by government standards for hospitals and nursing homes using Hill-Burton funds. More importantly, our foam back (we call it Lees Safety-Bac) even passed the test by itself. Without the three-ply wool facing.

Two tests for aviation use

In these tests, a Bunsen burner is applied to a carpet held both horizontally (Horizontal Test Method 5906) and vertically (Vertical Test Method 5902). Both methods test the burning rate of the carpet and the flame resistance of the carpet. "Accomplishment" passed both tests required for aviation use with (pardon the expression) flying colors.

The pill test

A highly flammable methenamine tablet was placed on our carpet. It was ignited and burst into flames. But the carpet refused to burn by itself. The flames died out as soon as the tablet did. The charred area was less than 2 inches in diameter, which is the passing point for the carpet industry pill test. Success again.



Our standards for static-protection

After "Accomplishment" had passed all those flame tests, we began worrying about protecting people from all the annoying little shocks that a carpet can give.
Back to the testing lab.
This time we used people instead of flames. We set conditions of extremely low relative humidity because the lower the humidity, the greater the chance of static. Our conditions were 10% humidity at 70°F. (These conditions are often common in modern buildings.) People were asked to shuffle across our carpet and grab a voltage meter on the other side. (This is called the Shuffle Test.) To satisfy us, the meter had to register less than 2.5 kilovolts. That's an amount of static that almost no one objects to. Other carpets have gotten the same kilovolt results (2.5), but in conditions of much higher (20% to 35%) relative humidity. (And they call themselves "shockproof"!)

How we did it

We threaded our carpet with thousands of tiny little loops of continuous stainless steel wire. These wire loops "ground" the electricity generated by shuffling feet so that the electricity disappears instead of leaping through your body to the nearest doorknob.
This is one kind of static protection that isn't going to wear off in the cleaning.
One other thing that won't wear off in the cleaning is the fire protection.
Now isn't it nice that you can offer your customers a foam-backed carpet that's permanantly fire and static protected?
We think it's quite an Accomplishment.

LEES
CARPETS

For more data, circle 43 on inquiry card

You'll be surprised how fast VIP-260 service is.

Stay on your toes.

With the new Otis VIP-260 system, you'll be at your floor before you know it.

Because a computer controls and coordinates every movement the elevator makes. Starts and stops are swifter and smoother than ever. Our fast, gentle arrivals could catch you offguard.

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VIP-260 is the most advanced elevatoring system ever devised. Our engineers spent years on it.

To save you a few moments every day.

Otis®

The Elevator Company

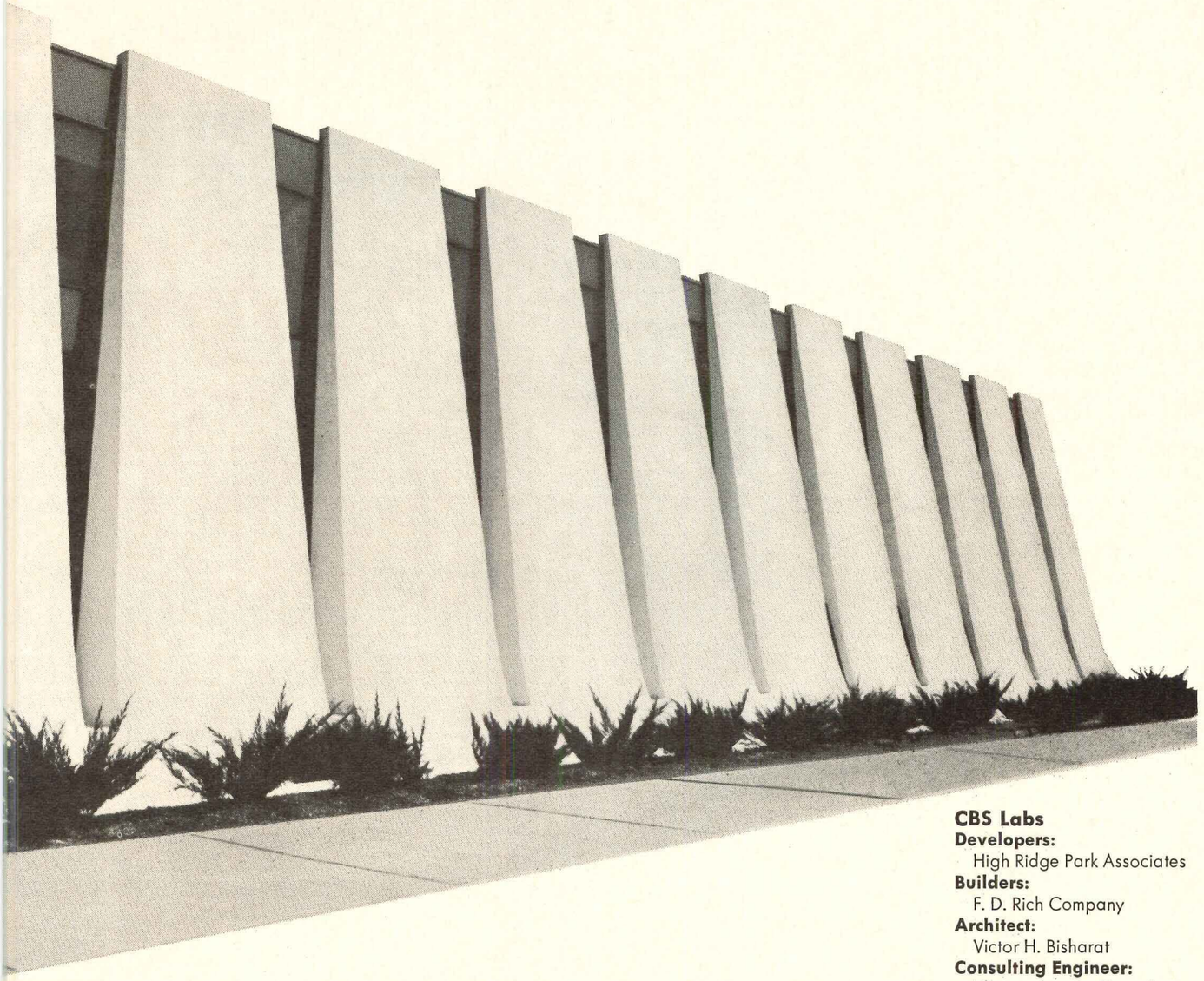
CBS LABS: Free-flowing design. Engineered for savings with heat-by-light.

Start with a striking architectural design. Add one of the most practical environmental control systems available today, and what do you have? The new CBS Laboratories research and development center in Stamford, Connecticut. A 2.75 million dollar structure, containing 80,000 square feet of floor space. Engineering cost analyses proved heat-by-light to be the most economical system for the CBS project.

The heat-by-light concept utilizes modern heat-transfer fixtures to capture up to 85% of light-generated heat. Some of this heat is used to maintain desired temperature in interior areas, with the rest channeled to offset heat loss at building perimeters. So it's almost like getting heat free.

All-Electric systems eliminate the need for boiler rooms, flues, fuel storage and handling. Result: greater design freedom for architects; substantial savings for owners. And that's not all! Because an All-Electric system requires less supervision, maintenance costs are significantly lowered.

The ultimate in design flexibility. At practical cost. You can be sure of both with All-Electric design. For information on heat-by-light, or any other All-Electric system, contact your electric light and power company. They'll be happy to shed more light on the matter.



CBS Labs
Developers:
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Builders:
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Architect:
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All-Electric design

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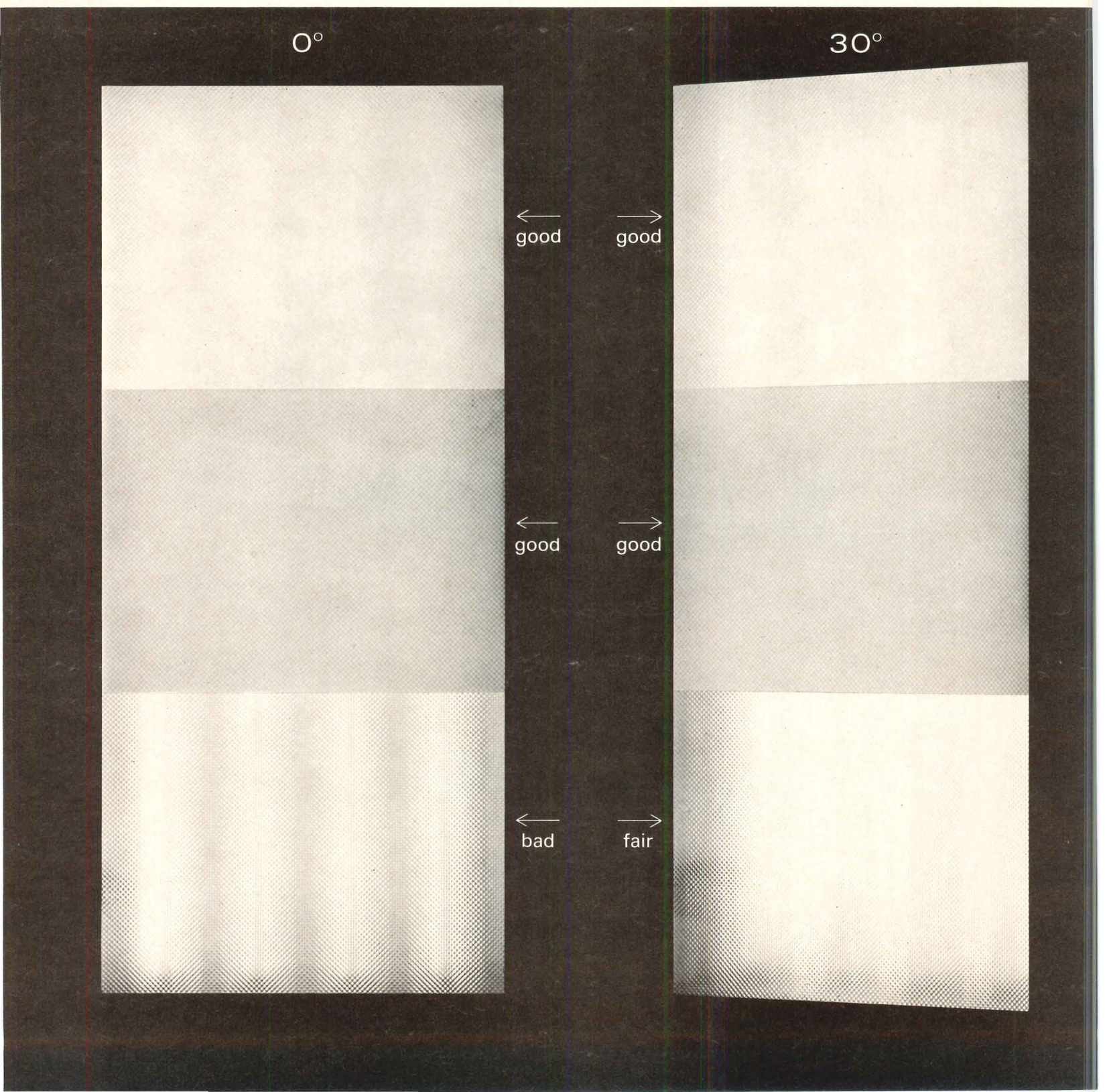
NOW! FOR THE FIRST TIME–

Control reflected glare

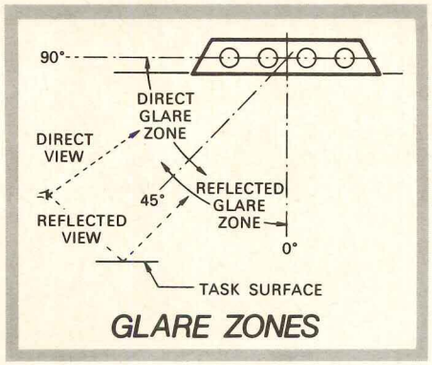


Until now — the big emphasis in lighting has been on *high footcandles and control of direct glare.*

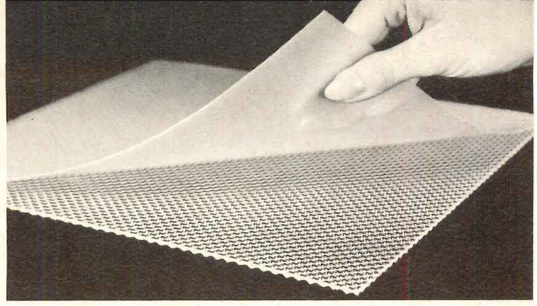
Now — research has shown the importance of emphasizing *visual efficiency and control of reflected glare.*

Note: Reflected glare occurs in two forms: (1) veiling reflections with the task or (2) annoying reflections adjacent to the task.

K-16 is the first panel designed to put this new thinking into your lighting plans.



GLARE ZONES

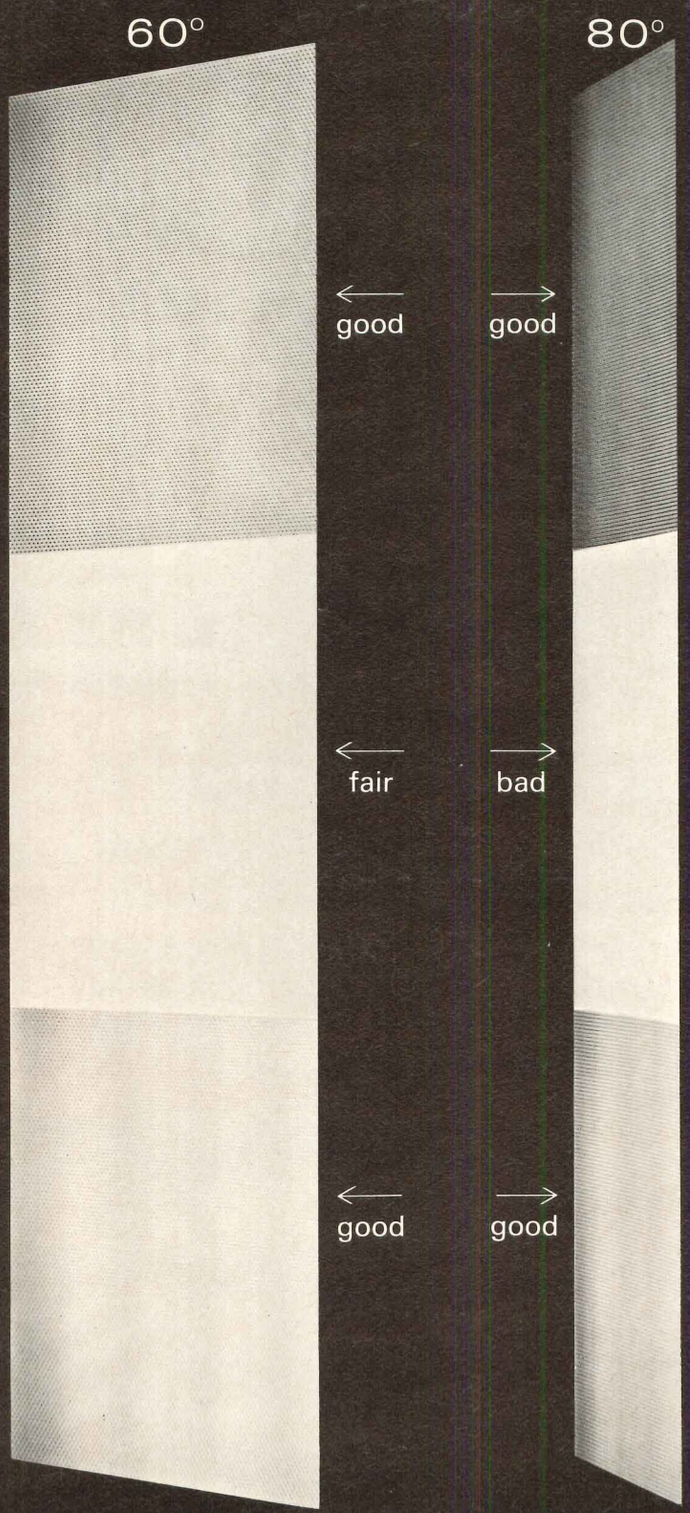


K-16 is a composite panel. A thin sheet of acrylic on top of a high-quality KSH prismatic panel. The edges are sealed together to make it moisture-proof.

For more data, circle 45 on inquiry card

K-16* by K-S-H – a new generation of prismatics

*Patents Pending



The New K-16 prismatic panel
is the first lighting panel that controls both reflected and direct glare at all angles. It's also a "no show" panel — provides lamp-hiding power equal to an opal panel. And K-16 still maintains high efficiency and full prismatic control.

The white opal panel
hides the lamps. But as the viewing angle becomes greater it becomes very bright and produces harsh direct glare. Efficiency of this panel is low.

Prismatic panel
shows lamps clearly from directly below. It produces reflected or veiling glare at the working surface. This is the basic problem with ALL prismatics except the new K-16!

K-LITE®

WRITE FOR K-16 BROCHURE NO. KI-444

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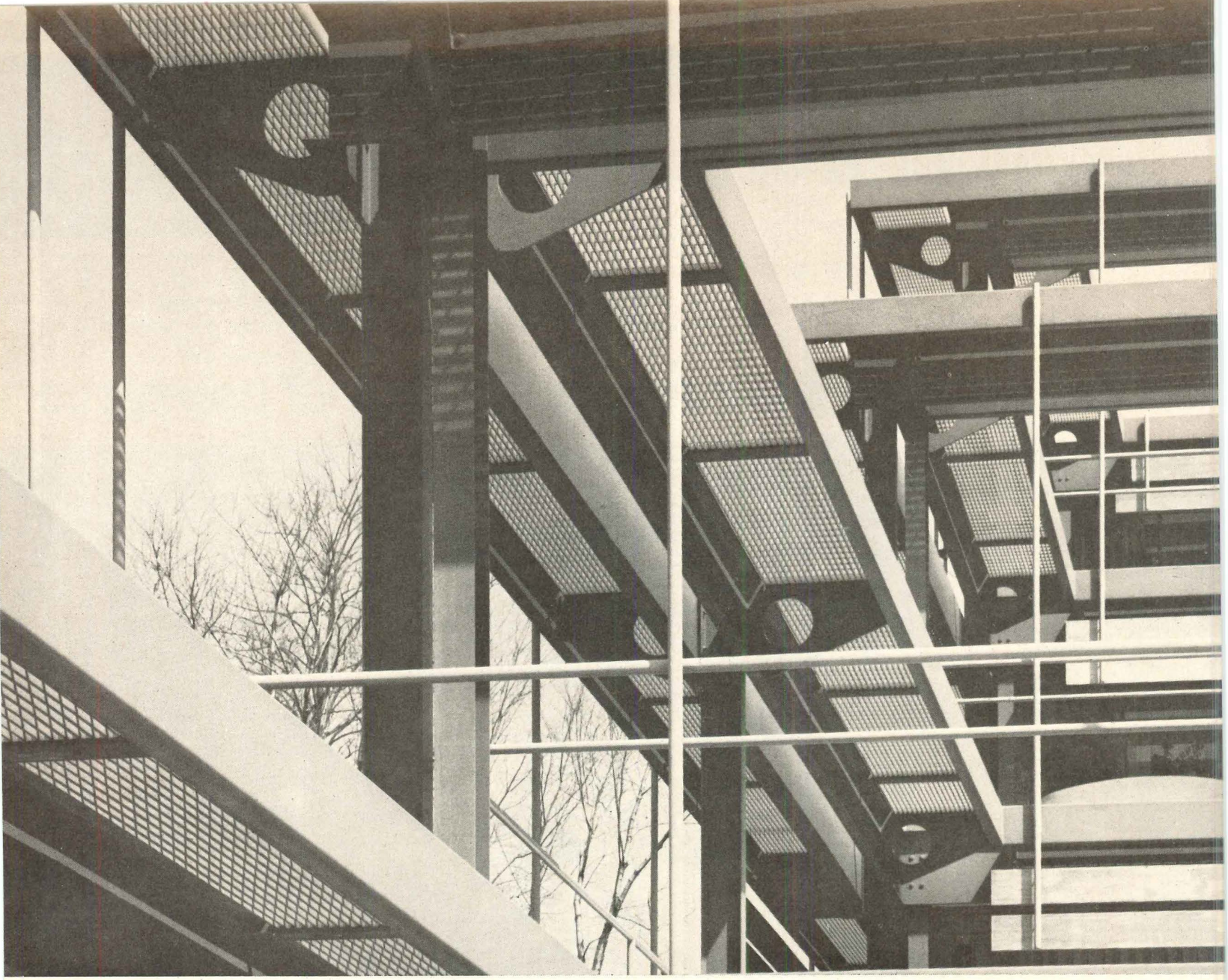

VERSATILE BORDEN PRESSURE LOCKED GRATING

Borden's Pressure Locked steel grating is used extensively as the flooring of the continuous balconies surrounding the new Washington, D. C. German Chancery building shown here. An integral part of the design of this striking 95,000 sq. ft. steel-and-wood-framed structure, the grating adds the practical advantages of sun shading, ease of window cleaning, and requires no maintenance.

Available in many subtypes, Borden's Pressure Locked Type B, approved for all general purposes, was chosen for the above application. For complete information on this and other grating types, including Riveted and All/Weld in steel or aluminum, write for . . .

a free copy of
The 16-page Borden Grating Catalog

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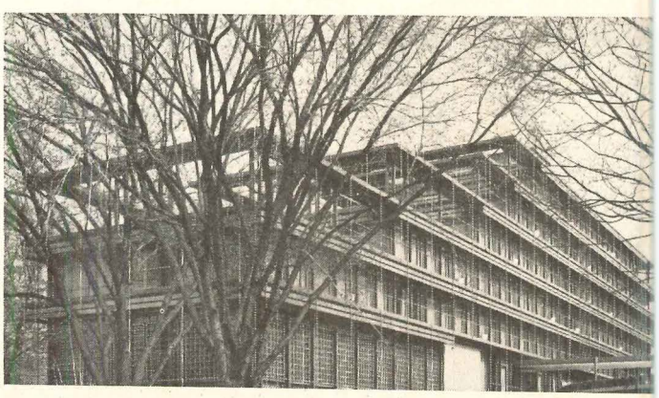

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The cost index: working tool or trap?

by Lawrence Jaquith
McKee-Berger-Mansueto, Inc.
Construction Consultants

When an architect makes a cost estimate on a current project, he often tries, using various multipliers, to relate his figures to a similar project he has designed in the past. He will take itemized costs from a former job and try to adjust them from one city to another and/or from the past to the present or to some future time. He often uses cost indices to accomplish this. Considering the frequency of inaccurate results, it must be asked whether an index is appropriate at all to the estimating process—and if so, when? Is it appropriate during all stages of design, or when a design is complete but the project is delayed? If an index is partially effective, what additional information is necessary to project a cost accurately?

In this column in the past, we have discussed some of the problems with commonly-used indices—mainly their lack of sensitivity in accounting for different building types and/or different methods of construction, and the limited number of cities and towns covered. The first objection applies to those indices where weighted price ratios of wages and materials are compiled. The second refers to the "summary of contract costs" index, which is usually limited to a few cities or a few building types because it is compiled mostly by contractors who, no matter how large, tend to have limited experience in certain areas and building types.

Detailed index prepared for conceptual-phase estimates

For its own purposes, our firm has developed an index which covers some fifty different building types for 200 cities in the U.S. Its use, while alleviating some of the difficulties mentioned above, nevertheless has underscored the restraint which must be employed in using any index to translate costs from one place or time to another.

A carefully compiled and judiciously handled index is quite helpful during the early stages of design when most features are still conceptual. Since the bid date is a long way off, and little design information has been developed, a figure developed through prudent use of a good index is about the only means available for preliminary cost estimation.

As the bid date approaches, however, and as the design features are elaborated, an index can serve only as a starting place in cost evaluation. The best estimates, of course, are prepared using known local unit costs. But accumulation of detailed local cost information is a difficult, costly and time-consuming task. It can be wasteful if applied when a design is in a phase of development and change. During that phase, the index is useful to update or translate historical costs, but the demands upon its sensitivity increase beyond prudent limits as the design reaches the pre-bid phase where accuracy falters in the pinpoint specifics of a given project. At that time greater accuracy is essential to selection of alternates if the budget so requires.

Local productivity and market can greatly modify index

Most published indexes available to architects do not give adequate attention to two important evaluating factors: 1) productivity of labor and 2) local market conditions. These may, in some cities, have such effect as to greatly modify or even reverse the relative values which may be derived from popular indexes.

A recent comparison, made by our firm, of cost differences between two Midwest cities illustrates this point. City X is a large metropolitan city; City Y, a smaller city 100 miles away.

To make an index, put in all factors

The first step in evaluating the differences in building costs was to create an index using "real costs." This includes those factors which define or determine the cost of building construction elements in-place, independent of temporary effects of supply and demand on the activity of the market.

These factors are comprised of material, equipment, and labor components combined in appropriate empirical relationships and augmented by *normal* costs for supervision, logistical support and other overhead items.

Indexing equations are specific for each building type

An indexing equation was developed for the specific building type under consideration. Key cost factors of indicators like labor and materials were then collected for each locale. Using City X as the base city, the equation was then solved for the values of each set of indicators. These indicators were selected as determinants of various building costs and include 13 construction trades wage rates and 13 building materials prices. Each indicator represents a larger group of trades and materials and is assigned a weight for each building type and method of construction, to be indexed on the basis of its individual contribution to the total system cost. The general indexing equation states that the target index is equal to the base index times the sum of weighted ratios, target-to-base, of all component factors of wages and materials.

The following cost data were gathered for the study:

BASIC COST INDICATORS

Wage Rates (Base + Fringes)	City X	City Y
Building laborer	$4.87	$4.48
Carpenter	6.25	5.45
Bricklayer	6.73	5.83
Structural ironworker	6.92	5.63
Lather	5.96	5.10
Plasterer	6.02	5.58
Architectural ironworker	6.18	5.63
Painter	5.68	5.20
Plumber	6.38	6.05
Steamfitter	6.39	6.05
Sheet metal worker	6.40	5.95
Asbestos worker	6.33	5.55
Electrician	6.18	5.77

Material Costs	City X	City Y
Ready-mix concrete	$ 13.50 CY	$ 14.25 CY
Ready-mix concrete (lightweight)	21.00 CY	23.10 CY
Plywood, ext. gr., ¾"	230.00 MSF	233.00 MSF
Reinforcing steel, ¾"	6.82 CWT	7.07 CWT
Concrete block, 8"x8"x16"	0.26 EA	0.225 EA
Common brick	40.00 M	55.50 M
Structural steel	8.24 CWT	8.55 CWT
Drywall, ½" thick sheet	59.50 MSF	60.00 MSF
Gypsum block, 4" hollow	0.17 SF	0.20 SF
Copper wire, #12 TW	17.40 MLF	22.10 MLF
Conduit, ¾" rigid	15.77 CLF	16.50 CLF
Pipe, 2" galvanized	44.80 CLF	47.20 CLF
Sheet metal, 24 gauge, galvanized	11.00 CWT	11.27 CWT

Weights of Cost Indicators at City X for a Typical Dormitory-Type Facility

Labor	
Building laborers	8.3%
Carpenters	9.5
Bricklayers	9.0
Structural ironworkers	3.5
Lathers	3.1
Plasterers	3.1
Architectural ironworkers	0.8
Painters	1.5
Plumbers	2.7
Steamfitters	1.8
Sheet metal workers	1.0
Asbestos workers	0.5
Electricians	5.2
	50.0%
Material	
R-M concrete	2.2%
R-M concrete (lightweight)	3.5
Plywood	3.8
Reinforcing steel	5.8
Concrete block	4.0
Common brick	5.5
Structural steel	4.5
Drywall	1.7
Gypsum block	1.7
Copper wire	2.5
Conduit	3.8
Pipe	8.2
Sheet metal	2.8
	50.0%

Note that weights are determined empirically by conditions of the building type and operating circumstances. Weights represent each item's share in the total cost. While total weights of wage and material items always add up to 100 per cent, the 50-50 split shown here is coincidental. Other building types will show a different distribution.

Using the above data in the selected indexing equation, City Y was indexed as 101.27 when City X = 100.

Productivity generates 4.37 per cent differential

However, when the productivity of each trade in each locale was considered, this index number became greatly altered. It is assumed that if a past point in time is the starting point, some information is already known about productivity during that time in that place. Thus, productivity information can be gathered from contractors and job records. Contractor data produced the following factors for the two cities:

PRODUCTIVITY

Work item	Work unit	Manhours City X	Manhours City Y
Set common brick	MH per M	20	20
Plastering	MH per 100 SY	24	28
Place & finish concrete s.o.g.	MH per 10 CY	32	38.3
Carpentry	MH per 100 SF	10	12
Painting, 3 ct.	MH per 100 SF	1	1.1
Piping-based on 2"	MH per 100 LF	17.8	19.8
Pipe insulation, 2"	MH per 100 LF	8	10.7
Install sheet metal ducts	MH per 100 LB	11.4	14.3
Install conduit, 2"	MH per 100 LF	5.3	7.1

These factors adjust the labor factors from expressions of "cost per hour" to expressions of "cost per unit of work." Adding these productivity factors to the original indexing equation, with each factor modifying the appropriate trade, produced an index number of 105.7 for City Y when City X = 100. Productivity alone was thus seen to account for a 4.37 per cent cost differential between the two locales.

Market conditions need analysis of many factors

The second element to consider in developing a more sensitive and accurate index is construction market conditions. This includes all factors affecting differences in experienced building costs which are not a function of the aggregate of cost differences in individual building elements. Generally, these factors are not *normal*, are short range in application, and lead to experienced costs which are greater than would be expected through analysis of construction cost index factors. Included are all factors resulting from disturbances or imbalances in the capacity/demand ratio of the market.

The major difficulty in quantifying these items is that they cannot be isolated by the identification of one or more associated economic variables. Thus, these factors can only be evaluated in a subjective manner, through interviews with contractors, builders, building trades councils, etc. This requires extensive research and at best, can only be accomplished for the current time period.

Interviews with contractors answer difficult questions

The factors isolated for analysis and some of the questions asked of contractors in the field were:

1. *Materials shipment delays*

What items are being delayed? For how long? Are these delays regular or infrequent? Are there any anticipated delays not now being experienced? How are these delays affecting costs? What percentage of the project cost will be affected by current or anticipated delays?

2. *Adequacy of fabrication facilities*

How many facilities are available in the area? Are they adequate for the amount of work at present or for that anticipated? Have delays or poor workmanship resulted? Has this been regular or infrequent? How has this affected cost? What percentage of the project cost is involved?

3. *Shortage of labor*

In what trades are there shortages? Indicate the number of men in each area by trade. How severe is the present shortage? Is it temporary or permanent? In what trades will men be needed? How has this affected the quality of work? How has this affected cost? What percentage of the project is involved? How has this affected project duration and scheduling? Are there any anticipated shortages that do not exist at present? If tradesmen are coming from other areas, what areas are they coming from? What trades?

4. *Overtime and premium pay*

What trades are receiving overtime and premium pay (including travel pay)? In terms of number of hours, what is the average weekly overtime by trade? What is the average premium pay in terms of dollars per hour by trade? Is it a temporary or permanent condition? How is this affecting cost? What percentage of the job cost is affected by this condition?

5. *Construction volume*

Information should be obtained from building permits, the Department of Commerce (Construction Statistics), Building News Service, Hill Burton Register, etc. What is the present and anticipated volume of construction by building type? What is the percentage increase? (*Note:* Item Number 5 is important as related to items 1-4 and item 6.)

6. *Competition*

How many contractors bid on similar work in each locale? What is the average number? This information should be grouped in terms of different size projects. What do the contractors anticipate as a work load for themselves next year?

7. *Seasonal factors*

Are there any seasonal differences that would account for a cost differential?

8. *Work jurisdiction and other problems*

Are there work rules that add to the cost of a job in one area more than in the other? (Note: this may be accounted for in productivity.)

9. *Building codes*

Are there building codes that add to the cost of a job in one area more than in the other?

These questions should be answered as specifically as possible to produce an accurate index adjustment. After speaking to numerous contractors in both areas, and evaluating their reports of market conditions, a project surcharge of 4.75 per cent was added to City Y. Adding this element to the indexing equation yields a new index number for City Y—when City X = 100, City Y = 111, i.e. any given project will cost 11 per cent more to construct in City Y than in City X.

To review the breakdown of comparison calculations for the two cities:

a) Labor and material cost differences:
City Y = 101.27; City X = 100

b) Application of productivity factors:
City Y = 105.7; City X = 100

c) Market condition surcharges:
City Y = 4.75; City X = 0
105.7 x 1.0475 = 111.0

Consideration of these two factors has, therefore, altered the original index number by 9.6 per cent, a substantial amount when one is dealing with projects worth millions of dollars.

Studies may help pinpoint complex value judgments

At the present time, there is no easy method of quantifying either productivity or market conditions as factors for inclusion in a general indexing equation. Both require careful and extensive research. Currently there are many studies under way for measuring productivity in cities throughout the U.S. Market conditions are more difficult to pin down since they are short term in nature. However, the study discussed above illustrates the importance of both productivity and market conditions in project cost determination and, therefore, the need for their inclusion to produce a more sensitive and workable index for the architect's use.

EXPANDED SERVICES

Paul B. Farrell, Jr.
Economic Research and Planning
Smith, Hinchman & Grylls Associates, Inc.

Tax know-how: more money for architecture?

The architect can do his client a great service —and may even free considerable money for a higher construction budget than his client thought he could afford—if he takes the time to study a few basic principles of Federal tax law that relate to how a building is designed and how its costs are budgeted and allocated. Depreciation deductions and investment tax credit on certain parts of a facility can have a large impact on the client's available capital, especially for the first few years when an investor's cash return is much greater than he might expect. This is because the accelerated depreciation and interest deductions are both greater than normal in the earlier years of operation. Hence taxable income and taxes are reduced, and available cash for operation or expansion increases.

While the specific rules are often complex and even unclear, there are a few basic principles which can be quickly grasped so that the architect can improve his judgment as to whether pre-budget tax consultation is warranted. The following example is intended to clarify some step-by-step considerations the architect can apply to advise his client as to the potential for minimizing annual taxes by maximizing annual deductions and credits.

A simple example underscores the investor's cash flow options

The client in this example has a tract of land valued at $300,000. He wants to house a computer installation that is currently on order at a cost of $700,000. Preliminary estimates show that the building will cost $1,200,000. So the total investment for land, equipment and building is valued at $2.2 million.

The client estimates that his revenues will be $1.5 million the first year of his operating expenses (salaries, etc.) will be $1 million. He will operate through a corporation on which the Federal income tax rate is assumed to be 50 per cent of net after deducting interest, depreciation, etc.

The client will invest $600,000 of his own cash in the project, and the bank will lend him $1.6 million to make up the total $2.2 million. He agrees to pay back this mortgage debt within 15 years at 7 per cent interest. Compound interest tables show that this will require an annual payment (including amortization) of about $176,000.

Three kinds of tax deductions will increase available cash

The Federal income tax on business is imposed on the net annual income after deducting (in this example) operating expenses, depreciation on various kinds of property, and interest on the mortgage. Since this client estimates he will receive $1.5 million in gross revenues and pay $1 million in expenses during the first year, his net income before taxes (and before paying the $176,000 mortgage payment) will be $500,000. The summary tabulation (page 82) shows these and subsequent calculations.

Depreciation allowances increase when assets are separately classified

Depreciation of physical property is a procedure which permits an investor to deduct some part of his initial capital investment each year from his income before taxes. The annual amount of depreciation depends upon the number of years its owner (and the I.R.S.) expects that asset to produce economic benefits for him. Various assets wear out over different periods of useful life.

Land is assumed to have an infinite useful life so no depreciation deduction is allowed for the $300,000 land value. The building, however, is assumed to have a useful life of 40 years. Therefore, one fortieth or 2.5 per cent of its cost ($30,000) may be deducted each year for 40 years. The computer equipment is assumed to have a useful life of only 10 years. So 10 per cent of its cost ($70,000) may be written off each year for 10 years. The client now has a total depreciation deduction of $100,000 per year for the first ten years; and $30,000 per year for the following 30 year period.

Since the shorter useful life increases the annual depreciation, a greater return on investment can often be realized if the parts of any building are separately classified and depreciated over shorter useful lives. Five basic "useful life" categories are:

1. Buildings (including heating, plumbing, air conditioning, elevators) generally may be depreciated at 40- to 50-year useful lives;
2. Land improvements (sewers, pavements, landscaping) for 20 years;
3. Office equipment, furnishings and machinery for 10 years;
4. Transportation equipment (trucks, etc.) for 3 to 6 years;
5. Machinery and equipment used in manufacturing processes from 8 years (aircraft industry) to 12 years (steel fabrication) to 20 years (cement manufacture).

Separate component accounting begins in the pre-design phase

The parts of a building can be separately depreciated only if separate accounts are created for each part. This would require the owner's accountant and the architect (with advice from a cost consultant or contractor) to reasonably allocate the total cost of the building among its parts in the conceptual and programing phase so that budget adjustments can be made. If this is done, the foundation and building shell, for example, can be designed to have a useful life greater than the normal 40 to 50 years with a consequently smaller (though longer) annual depreciation, on the grounds that mechanical, electrical and other systems may all have useful lives of 15 to 20 years and consequently higher depreciation rates affecting contemplation of the budget.

Other specific examples of even shorter useful lives would be signs, land improvements, parking lots, fire protection, sprinklers, machinery foundations, special equipment wiring, special floors and environmental controls necessary for equipment (as for a computer installation), air and water pollution control equipment, loading docks, craneways and other parts of materials handling systems which are part of a manufacturing process, interior partitions and even the roofing surface.

Accelerated depreciation schedules can double first-year allowances

Using a "straight" depreciation schedule, the client for the computer installation would take a constant annual amount for specified periods as described above. To free more capital for investment, however, the client may instead elect to take an accelerated form of depreciation. Two main forms which can be simply calculated are the "double declining balance" method and "sum of the digits" method.

Double declining balance depreciation simply allows the client to double his straight line depreciation rate but requires that it be applied to his depreciation balance (initial cost less prior depreciation) rather than in constant yearly amounts. The build-

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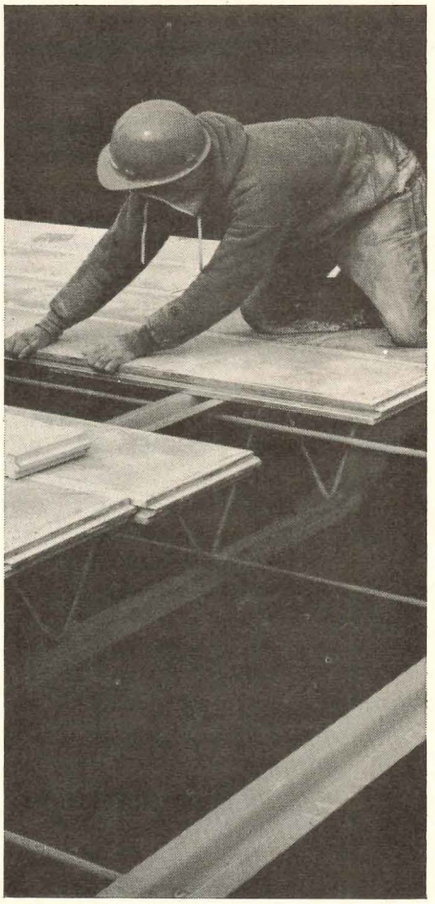
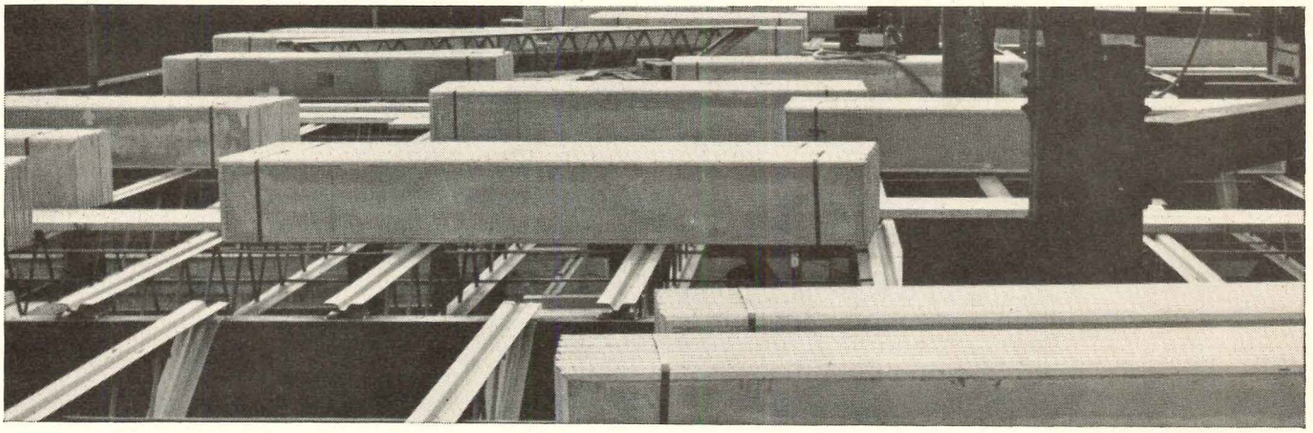
Apartments:

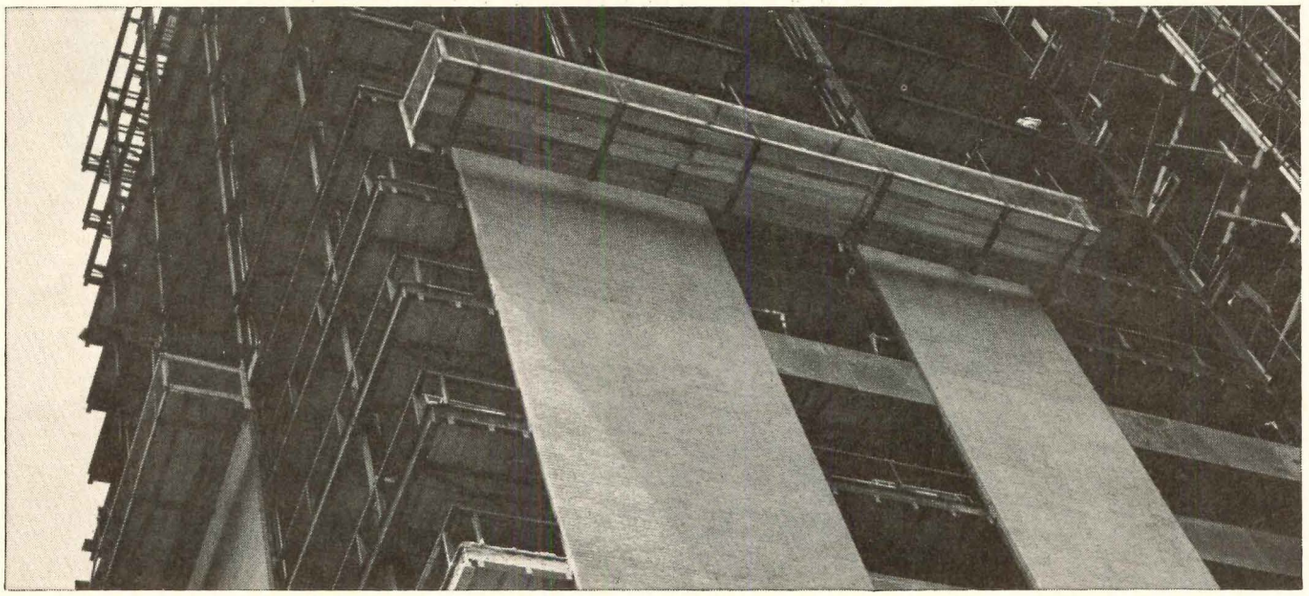


Steel-edged gypsum planks are welded to steel bar joists and to each other.



CRICKLEWOOD HILL APARTMENTS, Pittsburgh, Pa. Owner: Pittsburgh-Duquesne Development Corp. Architect: Joel Robert Hillman & Assoc. Structural Engineer: William Schimdt & Assoc. General Contractor: Mellon-Stuart Co. Steel Fabricator: Levinson Steel Co.

When steel goes up costs come down



Cricklewood Hill Apartments is costing less to build because of a steel frame and a new floor system. Chicago architect Joel Hillman has designed a steel-framed high-rise apartment building in which he estimates a savings of $500,000 under the cost of the originally conceived flat plate concrete design. Over-all construction efficiency, reduced foundation costs, reduced dead load in both the structural frame and floors, and the basic efficiency inherent in this new dry-floor system resulted in the savings which works out to about $2.30 per square foot.

The new dry-floor system consists of 2″ thick gypsum planks, manufactured by U. S. Gypsum Co., reinforced with 18 gage steel mesh and edged with 22 gage galvanized steel tongue-and-groove sections. Fitted together on top of steel joists, the planks are tack welded together and to the top flange of the joists. Troweled mastic, applied ½ inch thick, will level and provide a subfloor for the finished flooring when the building is completed.

As the gypsum planks are laid, they form a solid floor for workmen and stacked materials, obviating the need for temporary flooring.

The gypsum plank floors act as diaphragms, transferring lateral loads from the walls to the frame, where they are resisted by four K-braced bents across the building's 60-foot width, and one K-braced bent parallel to the 190-foot longitudinal axis.

The combination system of dry-floor and steel frame was jointly developed by U. S. Steel Corporation and U. S. Gypsum Company. The design was the outgrowth of research into low-cost floor-ceiling construction for low-income high-rise housing.

The braced steel frame uses A36 steel beams and some columns. The more heavily loaded columns are USS EX-TEN 42 and 50 High-Strength Low-Alloy Steels, with 42,000 and 50,000 psi minimum yield points, respectively.

The building's exposed spandrels are made of bare USS COR-TEN High-Strength Low-Alloy Steel. Left unpainted, bare COR-TEN Steel develops an attractive coating that retards further atmospheric corrosion.

STRUCTURAL REPORT. There are many ways to keep costs down with steel. Used imaginatively, steel usually wins out in first cost compared with other building materials. In the long run, there's no question. Only steel-framed buildings can be altered economically when it comes time for major remodeling.

For a more detailed report on Cricklewood, ask for a copy of our "Structural Report" (ADUSS 27-3903-01) on the building. Call a USS Construction Marketing Representative in the nearest USS sales office, or write U. S. Steel, Box 86 (USS 5934), Pittsburgh, Pa. 15230.

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USS United States Steel

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ing depreciation rate, then, would be twice the 2.5 per cent straight rate or 5 per cent of $1.2 million and the client could take $60,000 depreciation instead of $30,000 on the building the *first year.*

The second year his depreciation will be 5 per cent of the $1,140,000 balance or $57,200. Similarly, depreciation on the computer will be 20 per cent, or $140,000 the first year, $112,000 the second year, and so on. Using this form of accelerated depreciation, the client would have a total first year depreciation of $200,000 rather than $100,000. While double declining balance depreciation is limited to new property, used property may be depreciated on a 150 per cent declining balance formula.

Sum of the years digits is the other common form of accelerated depreciation which should be understood by architects. The equation for this method is $(n + 1 - i)$ divided by $(0.5)(n + 1)$; where (n) is the number of years useful life and (i) is the year for which the depreciation is being calculated. Thus, the first year depreciation for the $700,000 computer with a 10 year useful life would be $(10 + 1 - 1)$ divided by (5×11) or 18.2 per cent. The depreciation would thus be $127,000 the first year. Unlike the double declining balance method of depreciation, the sum of the years digits method requires that the estimated salvage value of the property must be used to reduce the cost in establishing the amount depreciated. For our illustration we have assumed that the computer has no salvage value and that the client will elect to use the double declining balance method.

Tax laws permit additional first year depreciation on personal property (computers are so classified) with a useful life over 7 years. This tax rule does not apply to buildings. It permits an initial deduction of 20 per cent of the cost of the property plus regular depreciation computed on the remaining 80 per cent of the cost without regard to the salvage value of the asset. This initial deduction, however, is limited to a maximum of $10,000 and its usefulness is therefore limited to small investment situations. We can ignore it in our client's case, but the rule should be kept in mind, especially when the investor is a partnership. If our client had been a partnership of five individuals, for example, *each* individual would be entitled to a separate credit of $10,000 for total possible credit of $50,000.

Interest deductions are a familiar procedure

Interest is the remaining deduction which concerns our client. We have already seen that the client agreed to pay his mortgage with a constant annual 11 per cent debt service payment for 15 years (i.e. $176,000). He agreed on an interest rate of 7 per cent. Although the interest rate is constant at 7

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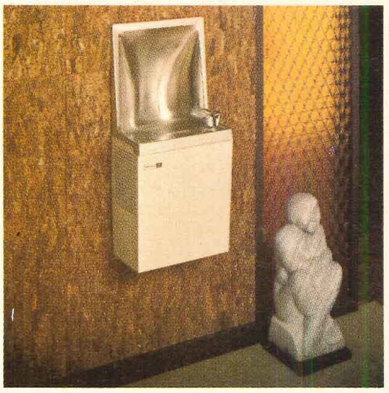
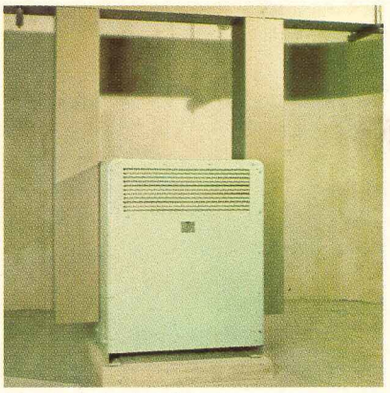


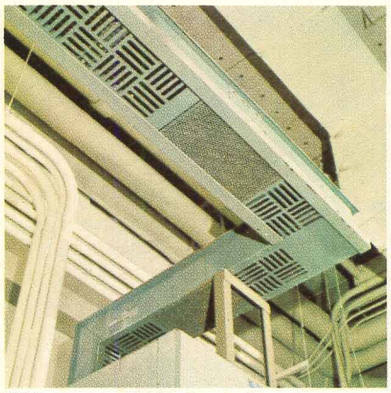
Good-looking water coolers

Modern indoor and outdoor lighting fixtures

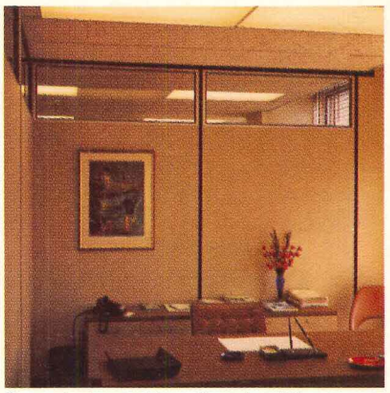


Advance-design transformers

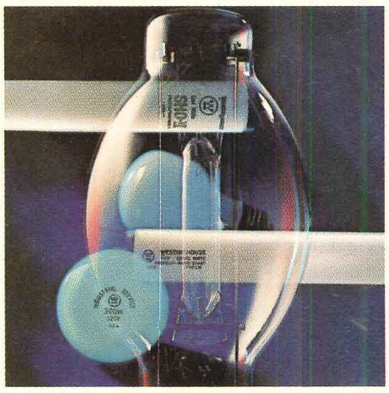
Reliable heating, cooling, ventilating equipment



Efficient power distribution equipment

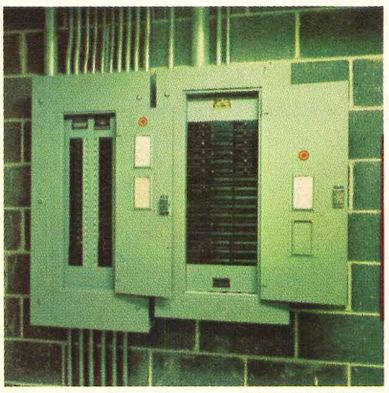


Convenient moveable walls and partitions



Lamps for every need

Elevators, electric stairways to move people



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per cent it is a per cent of the outstanding mortgage balance, which is declining each year. As a result, the interest part of the constant debt service will decline each year while the amortization part (repayment of the debt itself) will increase. Thus, the first year interest payment will be 7 per cent of the $1,600,000 mortgage or $112,000. The first year amortization will be $176,000 less $112,000, or $64,000. This will reduce the mortgage balance by $64,000 from $1,600,000 to $1,536,000, and reduce the second year interest to $107,520. And so on.

Cash left after first year is greater than taxable income

As shown in the summary chart, the client has estimated gross revenues less net operating expenses to leave $500,000 gross income before taxes. From that he has a total first year accelerated depreciation deduction of $200,000 and a first year interest deduction of $112,000, which reduces his taxable income to $188,000, on which he will pay an assumed 50 per cent corporate tax. Thus, his after-tax income is $94,000. Now, the important question is: How much *cash* does he have at the end of the year?

The client's cash left after paying his bills will be more than the $94,000 net income. He had $500,000 left after paying his operating expenses (salaries and so forth). Next he paid the mortgage lender $176,000 (interest and amortization) which left him $324,000. And before computing investment tax credit, the client's Federal income taxes would be $94,000. So he will have $230,000 in cash remaining after he pays his "bills" (operating expenses, debt service and taxes) rather than $94,000. The reason his cash return, the first year, is so much greater than his taxable income is because the accelerated depreciation and interest deductions are both greater than normal in the earlier years of this operation.

Investment tax credit, a complicated windfall

On new personal property which has a useful life of eight years or more, a taxpayer may directly reduce his tax by 7 per cent of the cost of the property. (A smaller credit is permitted on property with shorter useful lives.) This so-called investment tax credit does not apply to buildings, but the $700,000 computer cost will produce a credit of $49,000. However, in any one year this credit figure must also come under the ceiling limit of 50 per cent of the corporate income tax over $25,000. In this case, 50 per cent of $69,000 is $34,500 which, when added to the basic $25,000, gives a ceiling limit of $59,500. Since this ceiling is higher than the 7 per cent credit figure, the client can take the full $49,000 the first year and thereby reduce his taxes from $94,000 to $45,000. Conversely, his cash return will increase by $49,000, since he won't have to pay his amount in taxes. Now, his cash return will be $230,000 plus $49,000, or $279,000.

While the investment tax credit does not apply to the conventional structure of buildings, an investor may be entitled to the credit for certain special parts of buildings. These may include temporary or moveable partitions, signs, vault doors, shelving and cabinets, kitchen appliances, air and water pollution control equipment meeting Federal standards, unit air conditioners, elevators and escalators, and air conditioning essential to the operation of specific equipment (such as a computer). The basis for qualification is directly related to the use of the item. Generally, investment tax credit is allowed for tangible personal property if it is an integral part of the process of manufacturing, production or extraction; or the process of furnishing utility, communication or transportation services; or in a research or storage facility related to these business uses. A storage silo or facility designed to house equipment may qualify if the equipment has a short life and the building has no value for other uses.

Other tax rules can improve cash flow

There are a few other related tax rules with which the architect should be familiar:

Non-taxable mortgage financing: Mortgage funds received from a lender are considered to be a non-taxable receipt of money. This can be an important incentive encouraging the owner to refinance his building when the mortgage term is 40 to 50 per cent completed. For example, between the eighth and tenth year our client's computer facility may have appreciated in value so that he could obtain a new mortgage on more favorable terms while "cashing out" his equity build-up (i.e., the annual amortization part of the debt service plus the appreciated value of the property). He may do this because he prefers to have the money working in his business operations (such as financing improvements) rather than tied up as an investment in his building.

SUMMARY OF EXAMPLE FOR FIRST YEAR OPERATIONS

Investment		
Land	$ 300,000	
Building	1,200,000	
Computer Equipment	700,000	
		$2,200,000
After tax cash flow		
Gross Revenues from Business		$1,500,000
Operating Expenses		—1,000,000
Net Operating Income		$ 500,000
Debt Service on Mortgage		
Interest	$ 112,000	
Amortization	64,000	
		— 176,000
Income Taxes (see below)		— 45,000
After Tax Cash Flow		$ 279,000
Income taxes		
Net Operating Income		$ 500,000
Interest Deduction		— 112,000
Depreciation Deduction		
Computer	$ 140,000	
Building	60,000	
		— 200,000
Taxable Income		$ 188,000
Income Taxes before Investment Credit (Assume 50% tax rate)		94,000
Investment Tax Credit on Computer		— 49,000
Income Taxes		$ 45,000

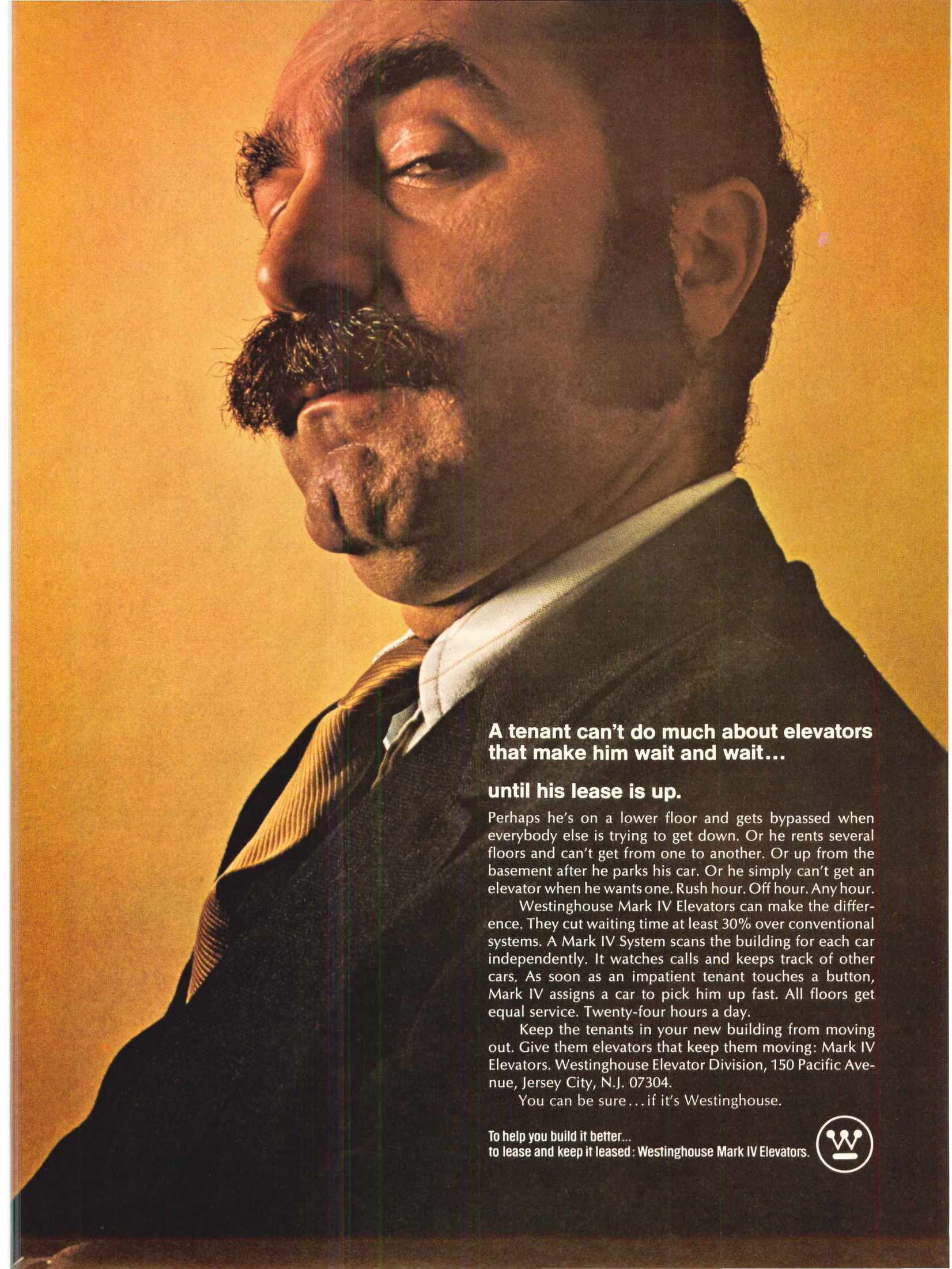
Capital gains or ordinary income: The computer installation example illustrates the rules which apply to annual income tax situations. If the building is sold, another set of rules will determine the amount of taxable income to which the 25 per cent capital gains tax applies. Thus, if after the tenth year the building is sold for $1,500,000, the client will be taxed on the difference between $1,500,000 and the purchase price of the building less its accumulated depreciation. If by the tenth year the total depreciation deductions for that period were $500,000, then the capital gains tax would be 25 per cent of $1,000,000 or $250,000. The seller would have $1,250,000 cash available for other purposes such as paying off the balance of the mortgage or the refinancing of a new generation of computers.

Recapture of accelerated depreciation: If property is sold before certain time limits, the Internal Revenue Service will require that a certain portion of the depreciation deduction be recaptured as ordinary income. For example, with real estate sold less than ten years after purchase, a percentage (100 per cent minus 1 per cent for each month the property is owned over 20 months) of the difference between the accelerated depreciation actually taken and the straight line depreciation which could have been taken is taxed at ordinary income rates (50 per cent for a corporation instead of the capital gains tax rate of 25 per cent). The depreciation recapture rules for personal property (such as computers) are stricter in that *all* depreciation is recaptured as ordinary income up to the amount of gain on the sale of the asset. If the gain is less than the total depreciation, the balance is then taxed as a capital gain.

Expensing or capitalizing costs: An owner has the option to either expense or capitalize certain costs incurred during construction. These include interest on interim financing, property taxes and payroll taxes. Thus, an owner can elect to deduct these costs directly from his current operating income rather than depreciate them.

It is wise to work closely with the owner's accountant during the preparation of working drawings and specifications. Wherever possible, construction documents which reflect the separate asset classifications the owner will use in future years are very helpful. During management of the construction process, the architect can continue to assist the owner by controlling the contractor's invoices, since they will be used as the basis for depreciation or tax credits. The coordinated efforts of the architect and accountant will thus improve the client's return on his investment.

Two books which would be helpful desk references to the architect interested in analyzing the economic impact of Federal tax law are: Casey, *Real Estate Desk Book,* Institute for Business Planning (ed. 1968), and *Ellwood, Tables for Real Estate Appraising and Financing,* American Institute of Real Estate Appraisers (2 ed., 1967).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CURRENT TRENDS IN CONSTRUCTION

Robert M. Young
Senior Economist
McGraw-Hill Information Systems Company

Credit and construction: what next?

Back in October, the F. W. Dodge Construction Outlook for 1969 called for a nine per cent increase in the value of construction contracts this year and for a housing market of 1,650,000 units. One of the assumptions underlying this outlook was that ". . . With balance restored between fiscal and monetary policies, the credit-starved housing market will be getting a lot more nourishment." This was certainly the intent of the Revenue and Expenditure Control Act of 1968, which was designed to remove $20 billion from the spending stream through a surcharge on income taxes and a cut in government outlays. With spending slowed down, the pressure was supposed to be taken off prices, and the Federal Reserve was to be able to pursue an easier monetary policy.

Consumers threw a wrench into this sequence, however, by cutting back sharply on their rate of saving and increasing their spending for goods and services despite the cutback in aftertax incomes. Whether they did this simply because they were reluctant to change their spending patterns or because they were afraid prices were going to climb faster than the value of their savings, is not clear. What *is* apparent is that the stepped-up spending strengthened inflationary pressures, so that the Federal Reserve, after a momentary easing last summer, has had to *tighten* credit rather than loosen up. On top of this, it is becoming fairly clear that the surtax will not be allowed to expire at mid year.

What effect will these changes in the economic climate have on the construction outlook for 1969? Some observers are predicting a repeat of the 1966 credit "crunch," in which high interest rates in the money markets caused funds to flow out of the Savings and Loan Associations and savings banks into higher-yielding corporate securities, with a drastic effect on the availability of mortgage financing.

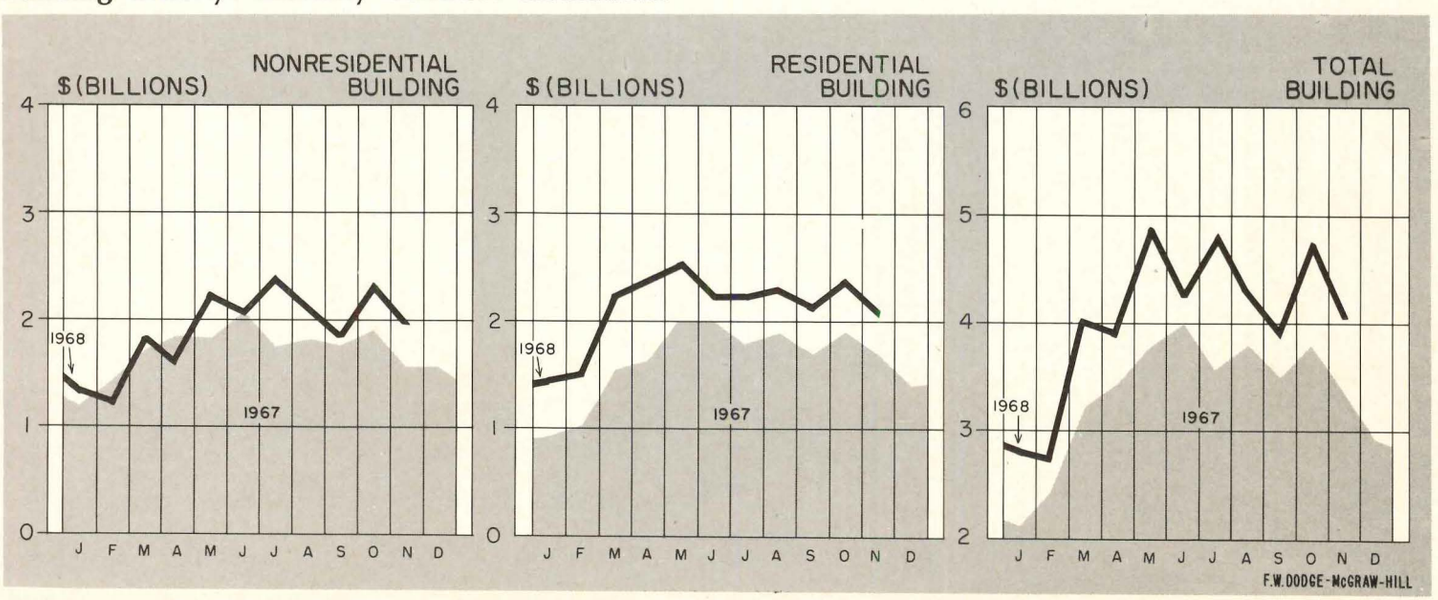
The chances are this won't happen again. The S & L's are in much better financial condition than they were in 1966, and the Federal Reserve is committed to preventing the large outflows of funds from savings institutions that caused all the trouble in 1966. In addition, the FNMA, in its new semi-private role, can give the mortgage market more support in 1969 than it did in 1966, if need be. The problem this year, as in 1968, is likely to be one of the *cost* of borrowing, rather than the availability of funds.

So, home buyers will be paying even more for their mortgages, at least for a while, than they have been for many years. But mortgage rates were a lot more expensive in 1968 than they were in 1966, yet 300,000 more dwelling units were built. This happened because most of the growth took place in the construction of apartments, where high mortgage rates can be passed on in the form of higher rents. Since much of the current and prospective housing demand is for apartment units, a continuation of this trend could still yield a housing market of 1,650,000 units in 1969.

Other types of construction will be at least temporarily affected by the latest shifts in monetary and fiscal policies. State and municipal building projects may be postponed until interest rates on bonds fall below legislature-imposed limits. This may put a damper on construction of schools and hospitals, which were slated to show good gains this year, and on municipal water and waste disposal facilities.

Some business spending may be curtailed until the tax surcharge is rescinded, since profits will fall below earlier expectations. The chances are, however, that the present credit tightness, combined with a continuation of the tax surcharge-expenditure cut program, will accomplish the desired cooling-off of inflationary pressures by mid-year. A turnaround in monetary policy at that time would mean that postponed building projects could begin to come on stream. Except for some differences in timing, then, 1969's construction market may very well end up about as projected.

Building activity: monthly contract tabulations



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INDEXES AND INDICATORS

William H. Edgerton
Manager Dodge Building Cost Services
McGraw-Hill Information Systems Company

FEBRUARY 1969 BUILDING COST INDEXES

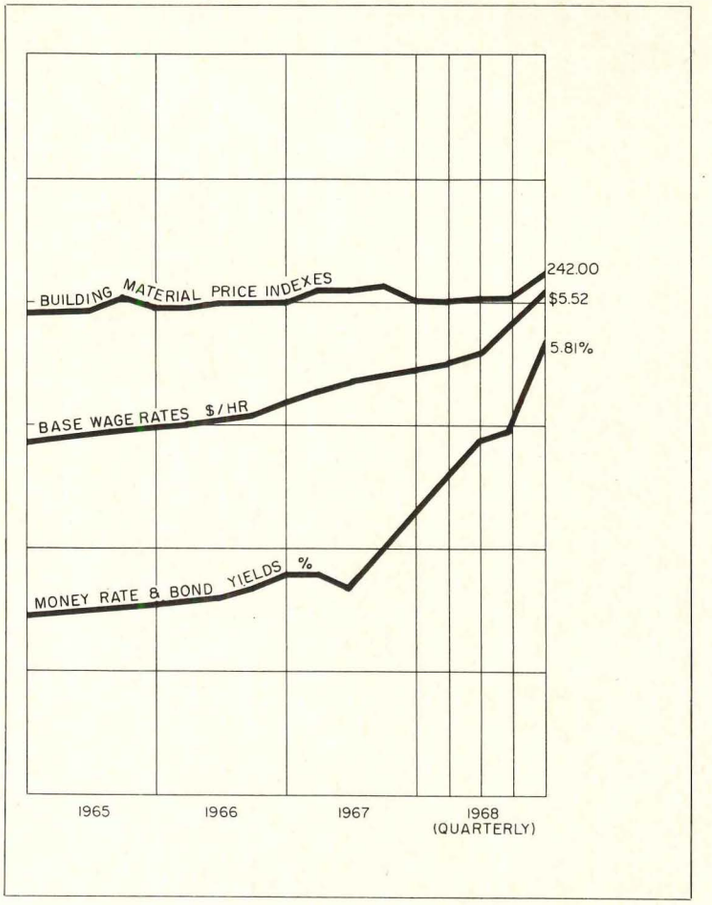
1941 averages for each city = 100.0

Metropolitan area	Cost differential	Current Dow Index residential	Current Dow Index non-res.	% change year ago res. & non-res.
U.S. Average	8.6	295.6	314.9	+4.14
Atlanta	7.3	337.2	357.7	+5.09
Baltimore	7.9	295.4	314.2	+4.25
Birmingham	7.3	268.1	288.3	+3.38
Boston	8.5	265.5	281.0	+4.17
Chicago	9.0	327.6	344.6	+3.25
Cincinnati	9.0	288.7	306.8	+4.89
Cleveland	9.8	316.6	336.5	+9.05
Dallas	7.7	275.5	284.5	+4.06
Denver	8.2	297.5	316.2	+2.32
Detroit	9.2	305.0	320.2	+4.94
Kansas City	8.3	266.3	281.9	+5.10
Los Angeles	8.4	299.3	327.5	+3.12
Miami	8.5	294.6	309.3	+6.60
Minneapolis	8.8	294.5	313.1	+2.96
New Orleans	7.8	262.4	278.0	+2.35
New York	10.0	306.0	329.1	+2.36
Philadelphia	8.6	290.8	305.3	+2.62
Pittsburgh	9.2	279.7	297.3	+6.72
St. Louis	9.1	291.3	308.7	+3.68
San Francisco	8.6	376.7	412.2	+2.99
Seattle	8.5	268.5	300.1	+2.96

Differences in costs between two cities may be compared by dividing the cost differential figure of one city by that of a second; if the cost differential of one city (10.0) divided by that of a second (8.0) equals 125%, then costs in the first city are 25% higher than costs in the second. Also, costs in the second city are 80% of those in the first (8.0÷10.00=80%) or they are 20% lower in the second city.

The information presented here indicates trends of building construction costs in 21 leading cities and their suburban areas (within a 25-mile radius). Information is included on past and present costs, and future costs can be projected by analysis of cost trends.

ECONOMIC INDICATORS



HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1960	1961	1962	1963	1964	1965	1966	1967 (Quarterly) 1st	1967 (Quarterly) 2nd	1967 (Quarterly) 3rd	1967 (Quarterly) 4th	1968 (Quarterly) 1st	1968 (Quarterly) 2nd	1968 (Quarterly) 3rd	1968 (Quarterly) 4th
U.S. Average	213.5	264.6	266.8	273.4	279.3	284.9	286.6	292.7	293.7	295.5	297.5	301.5	302.6	309.3	310.0
Atlanta	223.5	294.7	298.2	305.7	313.7	321.5	329.8	332.4	333.4	334.6	335.7	345.6	346.7	352.3	353.1
Baltimore	213.3	269.9	271.8	275.5	280.6	285.7	290.9	290.4	291.5	294.9	295.8	302.9	304.1	307.9	308.7
Birmingham	208.1	249.9	250.0	256.3	260.9	265.6	270.7	272.9	274.0	273.8	274.7	278.5	279.5	283.6	284.3
Boston	199.0	237.5	239.8	244.1	252.1	257.8	262.0	262.9	263.9	264.8	265.7	269.3	270.3	276.3	277.1
Chicago	231.2	289.9	292.0	301.0	306.6	311.7	320.4	320.4	321.3	327.3	328.4	329.4	330.0	338.7	339.5
Cincinnati	207.7	257.6	258.8	263.9	269.5	274.0	278.3	278.7	279.6	287.3	288.2	291.4	292.5	301.8	302.6
Cleveland	220.7	265.7	268.5	275.8	283.0	292.3	300.7	300.0	301.3	302.6	303.7	316.5	318.3	330.7	331.5
Dallas	221.9	244.7	246.9	253.0	256.4	260.8	266.9	267.6	268.5	269.5	270.4	272.3	273.4	281.0	281.7
Denver	211.8	270.9	274.9	282.5	287.3	294.0	297.5	297.6	298.5	304.0	305.1	304.9	306.0	311.7	312.5
Detroit	197.8	264.7	265.9	272.2	277.7	284.7	296.9	298.0	299.1	300.1	301.2	309.2	310.4	315.5	316.4
Kansas City	213.3	237.1	240.1	247.8	250.5	256.4	261.0	260.8	261.9	263.4	264.3	267.5	268.5	277.2	278.0
Los Angeles	210.3	274.3	276.3	282.5	288.2	297.1	302.7	303.6	304.7	309.0	310.1	312.0	313.1	319.3	320.1
Miami	199.4	259.1	260.3	269.3	274.4	277.5	284.0	283.4	284.2	285.2	286.1	293.1	294.3	304.5	305.3
Minneapolis	213.5	267.9	269.0	275.3	282.4	285.0	289.4	292.0	293.1	299.2	300.2	300.0	301.0	309.0	309.4
New Orleans	207.1	244.7	245.1	248.3	249.9	256.3	259.8	262.3	263.4	266.7	267.6	270.6	271.6	273.9	274.2
New York	207.4	270.8	276.0	282.3	289.4	297.1	304.0	309.4	310.6	312.5	313.6	315.9	317.0	320.6	321.4
Philadelphia	228.3	265.4	265.2	271.2	275.2	280.8	286.6	287.1	288.1	292.8	293.7	293.3	294.2	300.9	301.7
Pittsburgh	204.0	250.9	251.8	258.2	263.8	267.0	271.7	272.2	273.1	274.1	275.0	293.0	284.2	293.1	293.8
St. Louis	213.1	256.9	255.4	263.4	272.1	280.9	288.3	290.3	291.3	292.3	293.2	293.7	294.7	303.6	304.4
San Francisco	266.4	337.4	343.3	352.4	365.4	368.6	386.0	388.1	389.2	389.6	390.8	396.4	398.0	401.9	402.9
Seattle	191.8	247.0	252.5	260.6	266.6	268.9	275.0	276.5	277.5	282.6	283.5	286.2	287.2	291.6	292.2

Costs in a given city for a certain period may be compared with costs in another period by dividing one index into the other; if the index for a city for one period (200.0) divided by the index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than the costs in the other. Also, second period costs are 75% of those in the first period (150.0÷200.0=75%) or they are 25% lower in the second period.

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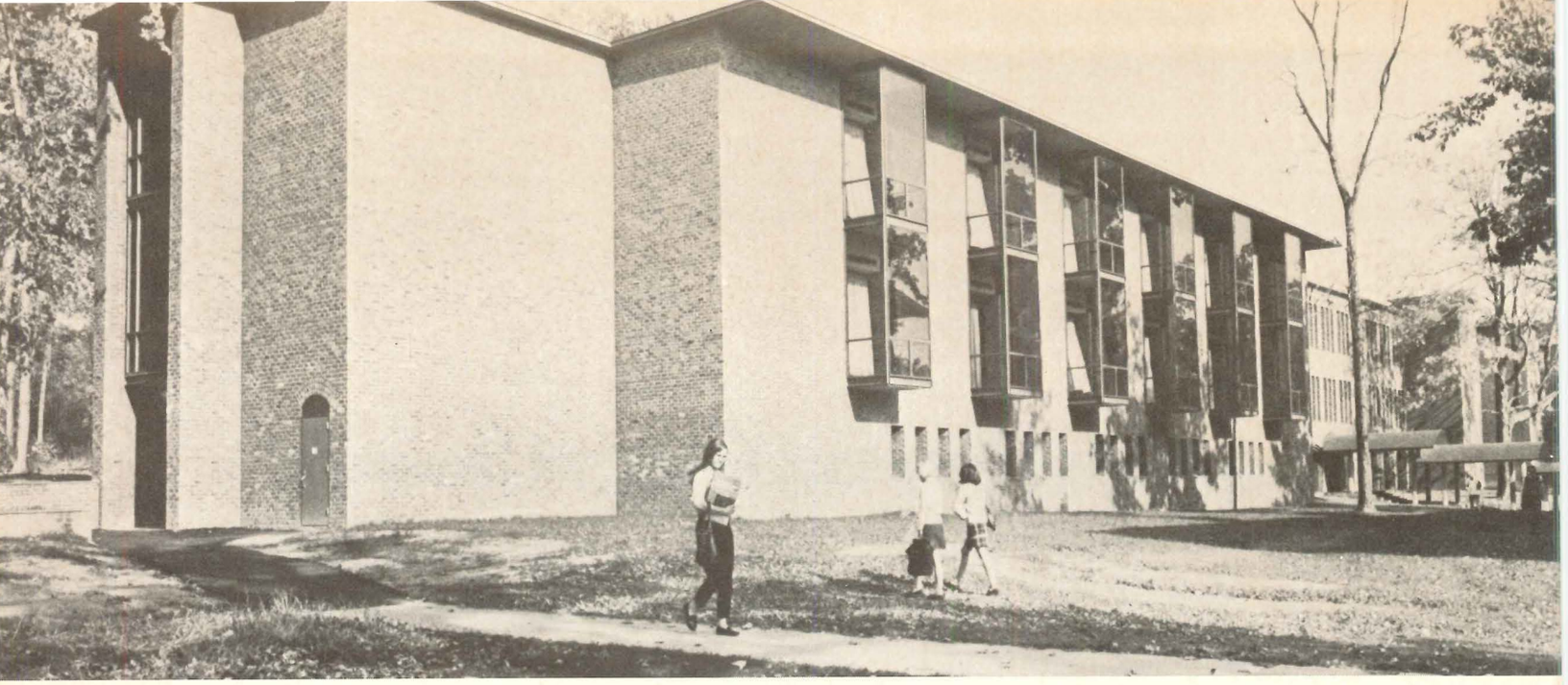

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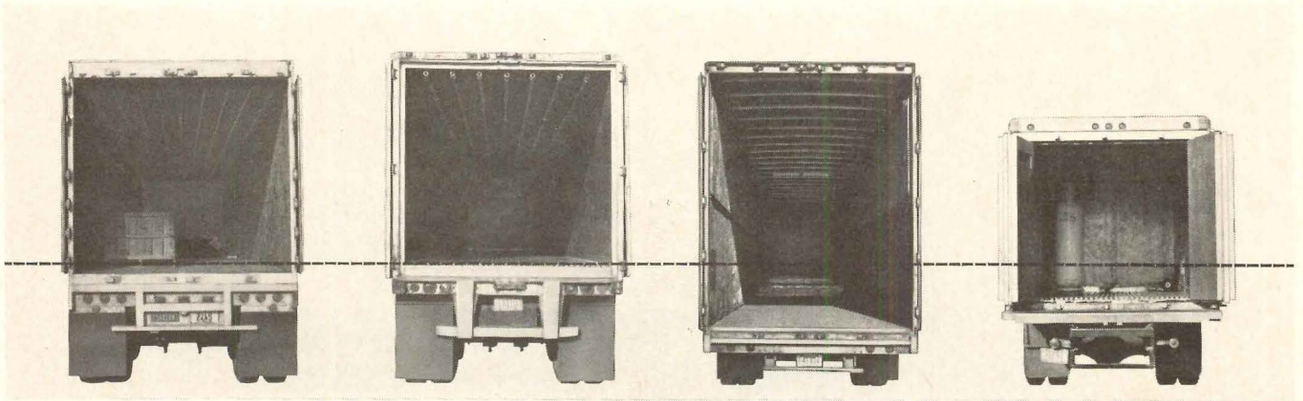

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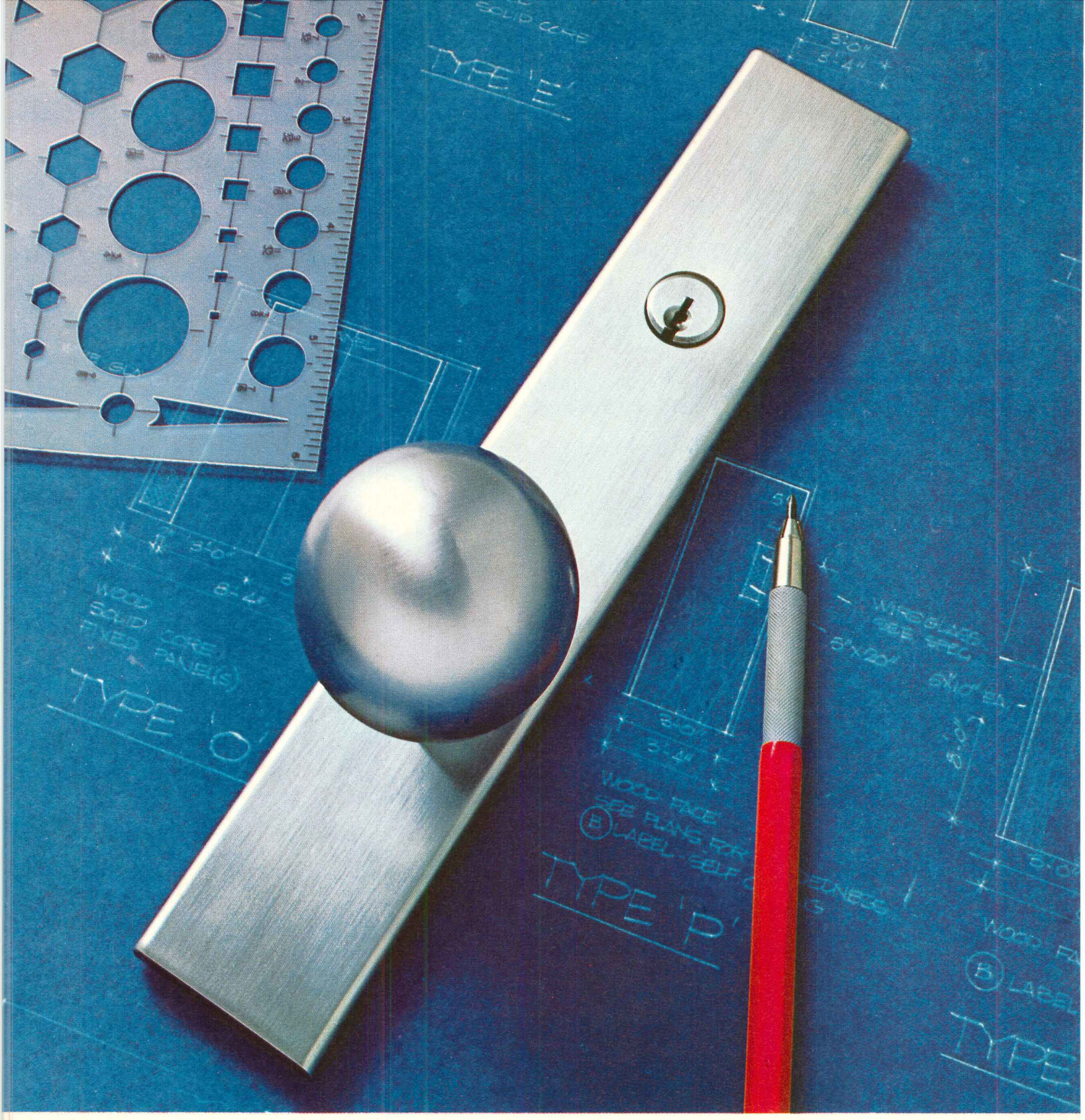

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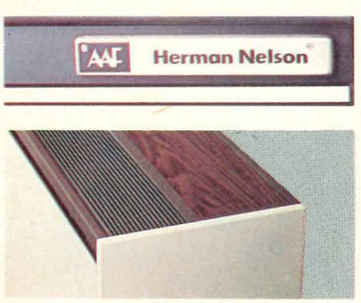

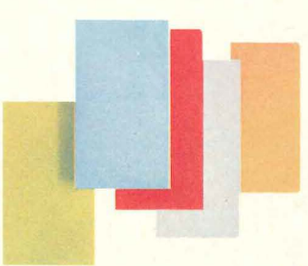

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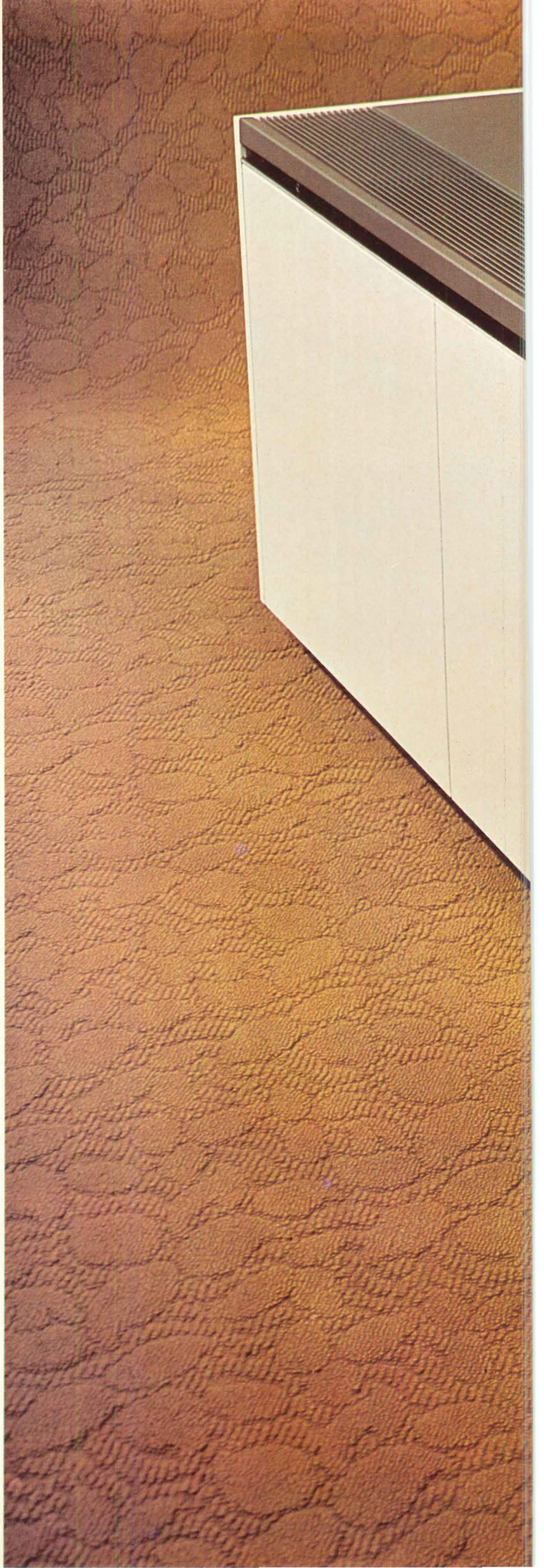

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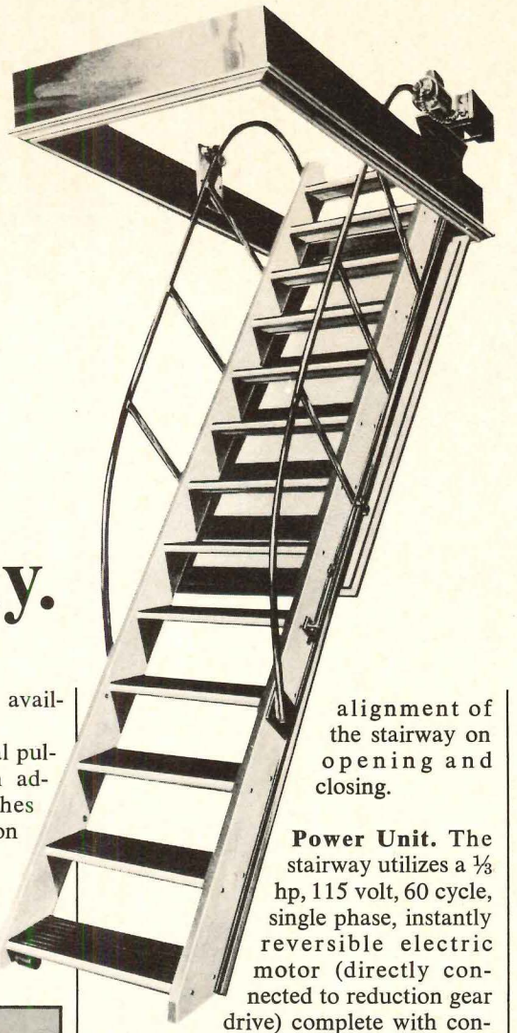

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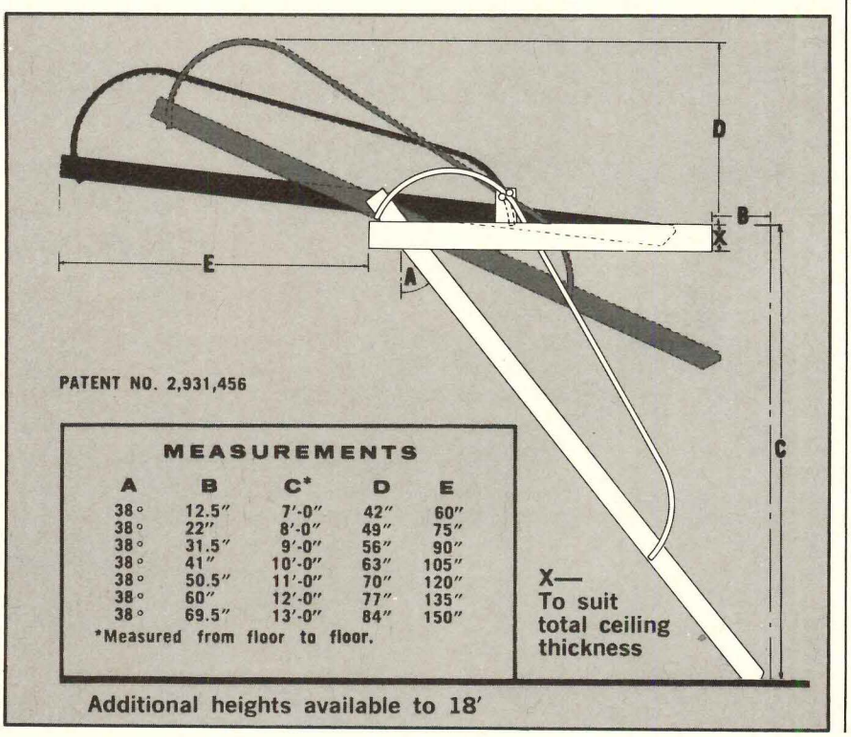

Available In Wood Or Aluminum. Standard specifications on wood models are: 1″ Plywood Frame (Box or Angle) 1 1/16″ x 6½″ Straight Grain Stringers • 1″ x 6½″ Straight Grain Treads, Covered With Non-skid Rubber • ¾″ Fir-Ply Door • 1¾″ B-Label Optional.

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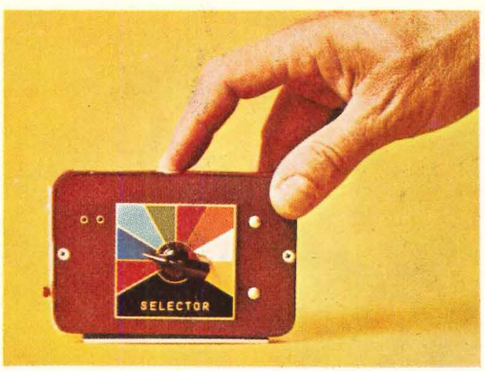

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Architects: Morehouse, Chesley and Thomas,
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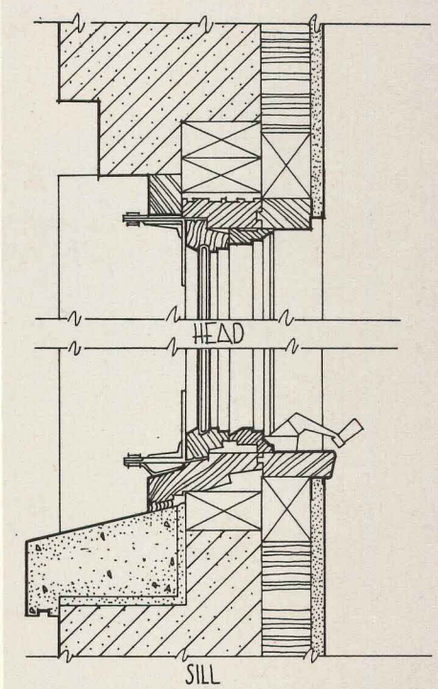
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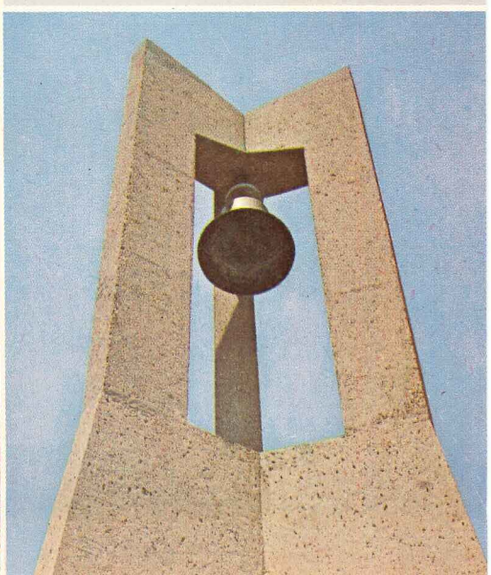

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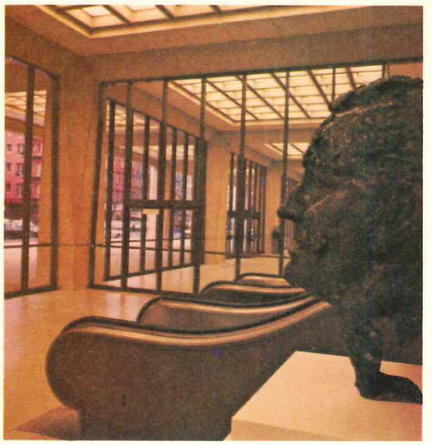

Office of Max O. Urbahn, Architects

In New York's first post-tensioned skyscraper...

ASG's Starlux separates space, ASG Bronze helps soak up the sun

With its rhythmic facade of concrete window frames, the Franklin Delano Roosevelt Postal Station and office tower is one of New York's most tasteful new skyscrapers. It rises 32 stories over the East Side and is the first building in the city to be built using post-tensioning techniques.

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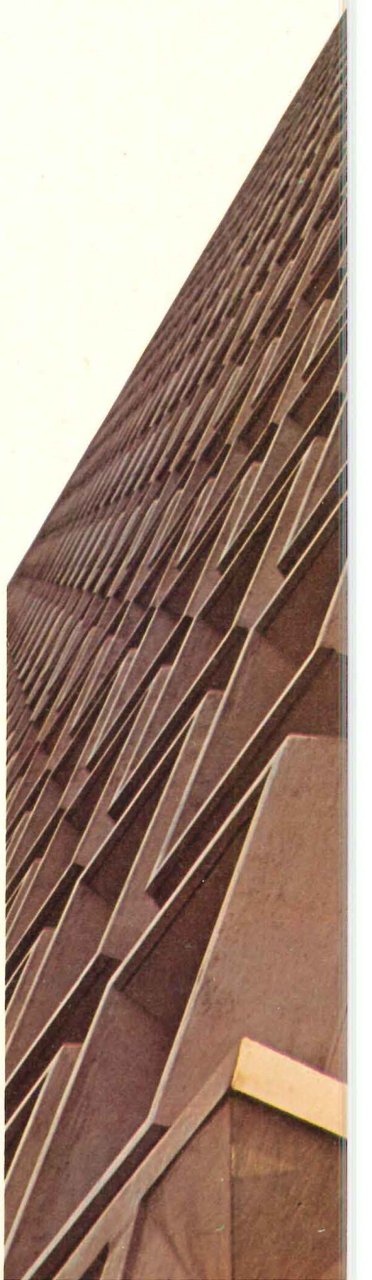
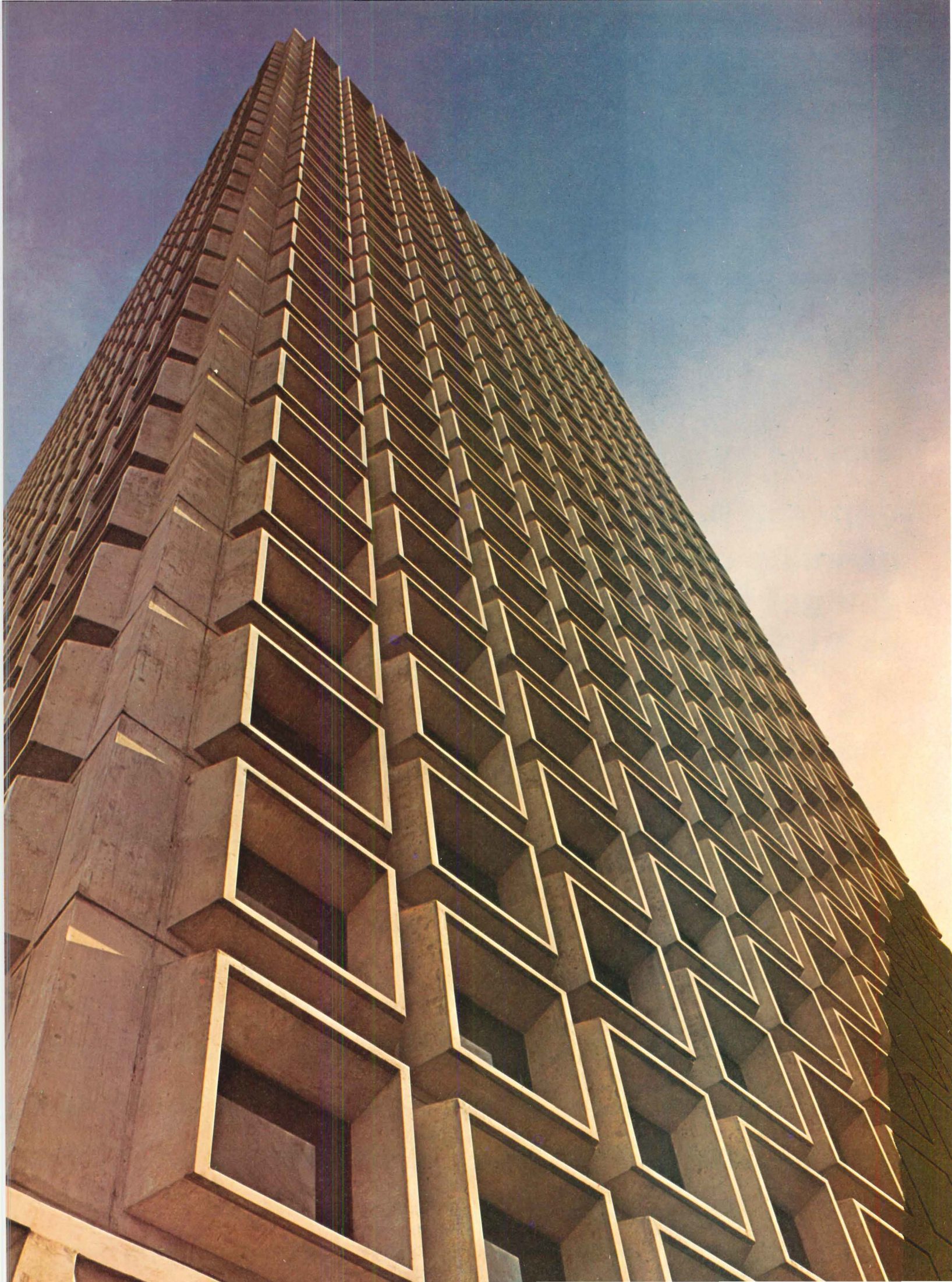
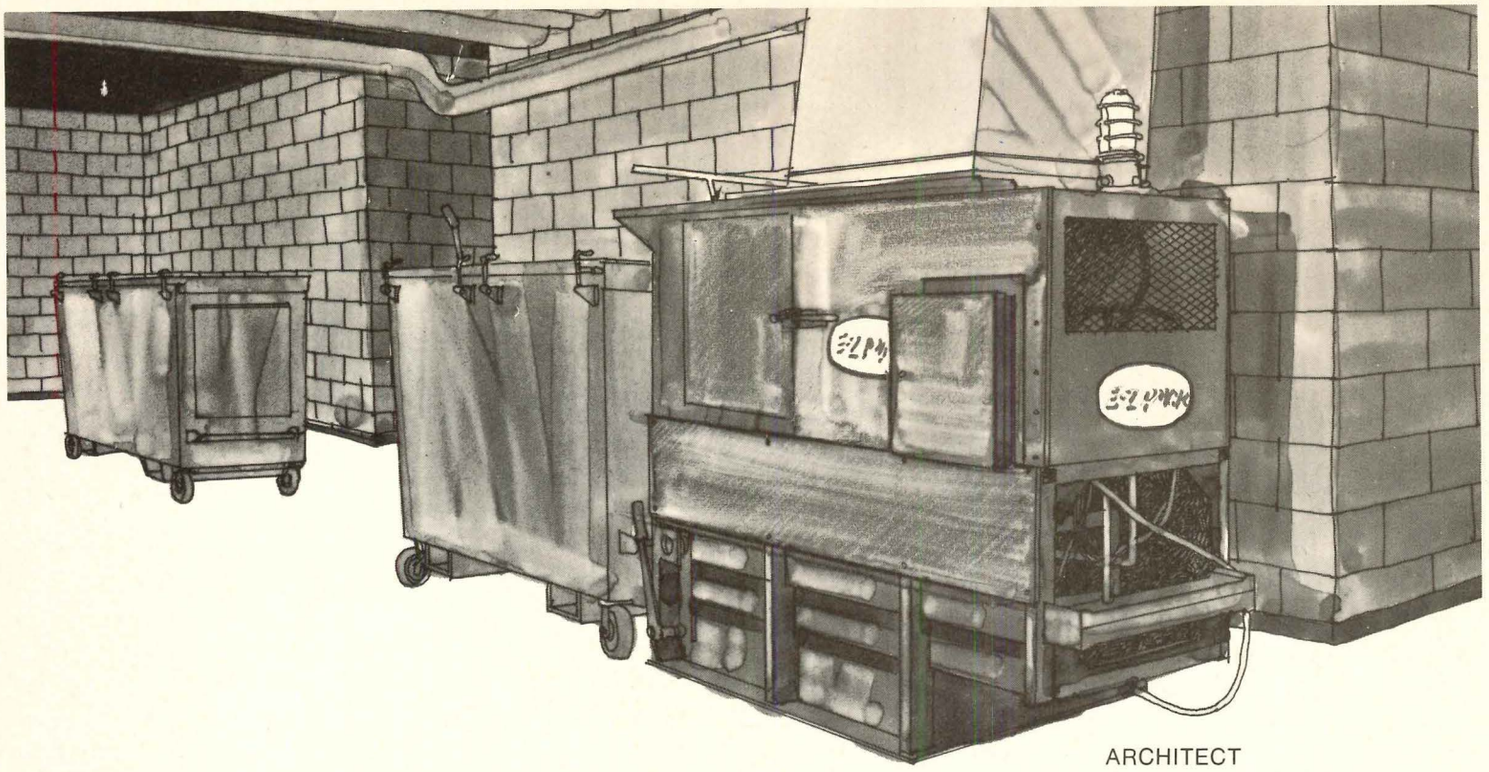


Glass by... ASG CREATIVE IDEAS IN GLASS





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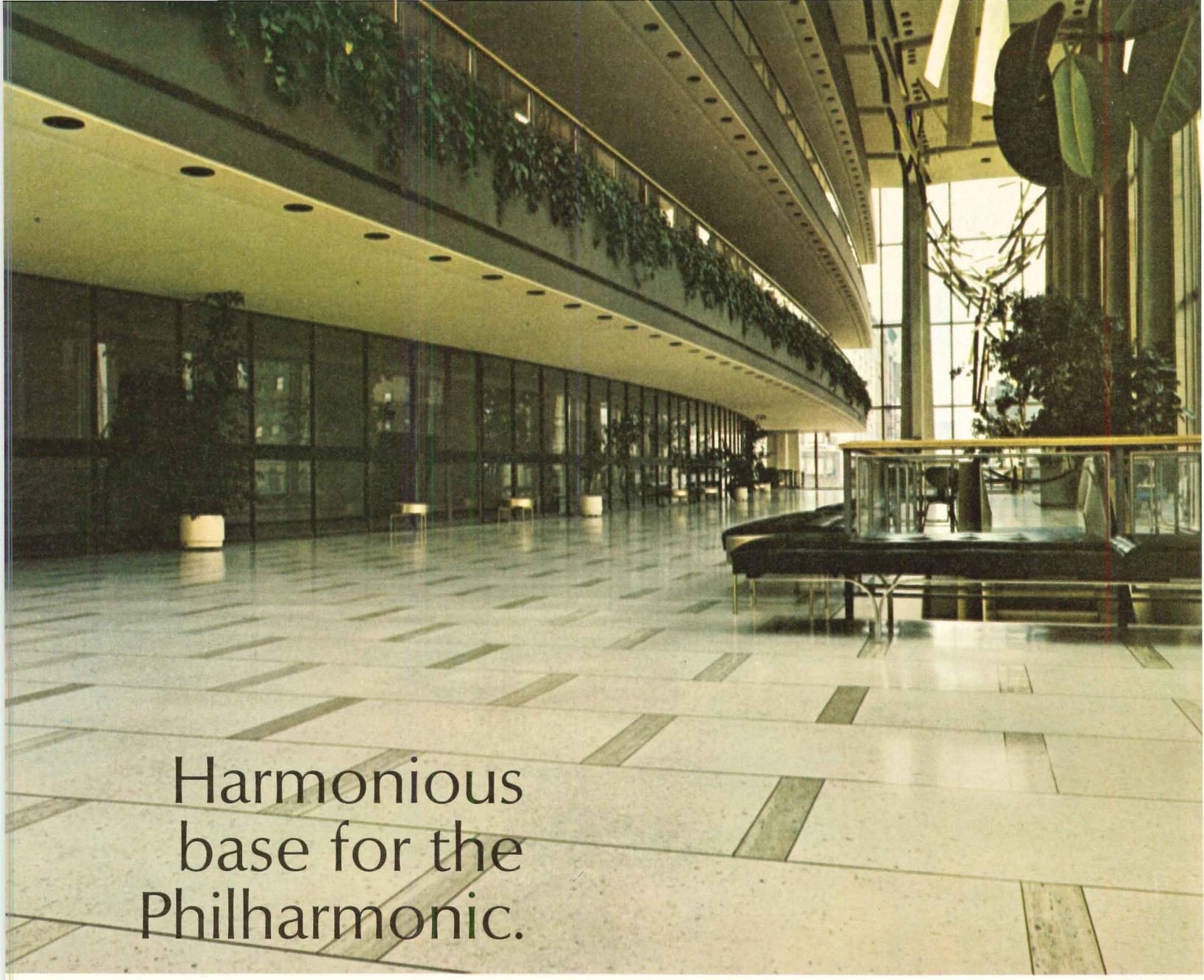

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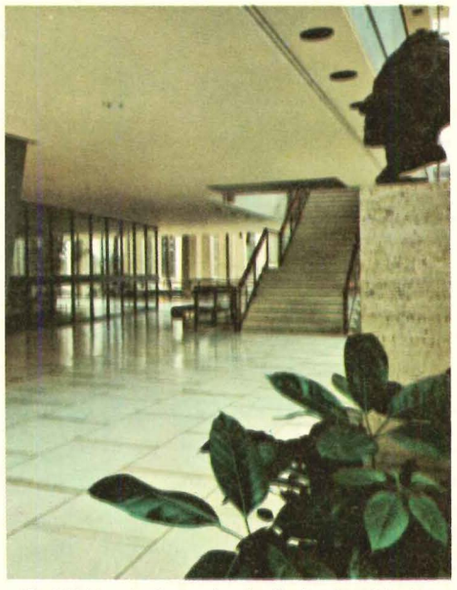

PHILHARMONIC HALL, LINCOLN CENTER FOR THE PERFORMING ARTS, New York, N. Y. *Architect: Harrison and Abramovitz, New York, N. Y. Gen. Contractor: Turner, Walsh, Fuller & Slattery (Joint Venture), New York, N. Y. Terrazzo Contractor: Foscato, Inc., Long Island City, N. Y.*

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FRANZEN UNIFIES AN ARCHITECTURE OF FRAGMENTS INTO GOOD PLACES FOR PEOPLE

FIVE NEW PROJECTS BY ULRICH FRANZEN

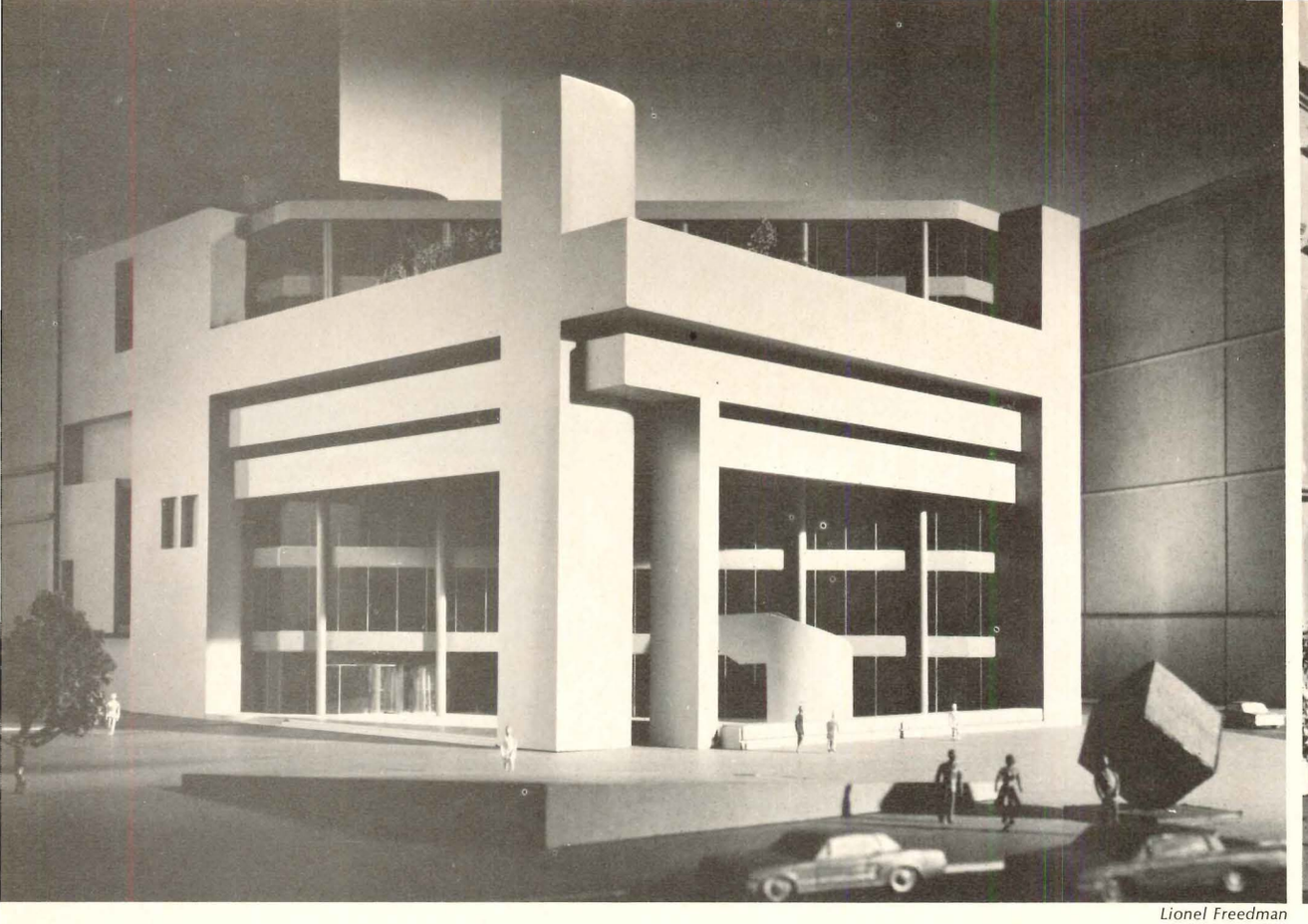
Lionel Freedman

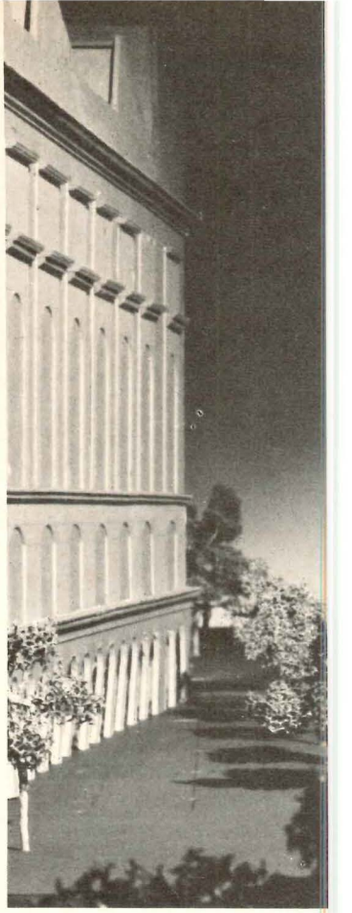
With his enormously impressive design for New York City's Bronx State School for the retarded (see photo left, and page 126), Ulrich Franzen has synthesized his approach to architecture into a varied and lively, but nevertheless unified complex that could have great impact on future urban structures.

Appropriate and carefully articulated, human-scale spaces are the dominant factors which link all the five new projects shown in the following pages. Franzen comments that, "since I do not believe that a good building today can be an isolated and utopian form, the site and the building's location form a major part of the problem. A building form should derive much of its energy and visual dimension from factors operating at the site. These factors can be topographical in nature, or they can be an existing urban setting. They must also include people and their needs, located in an area."

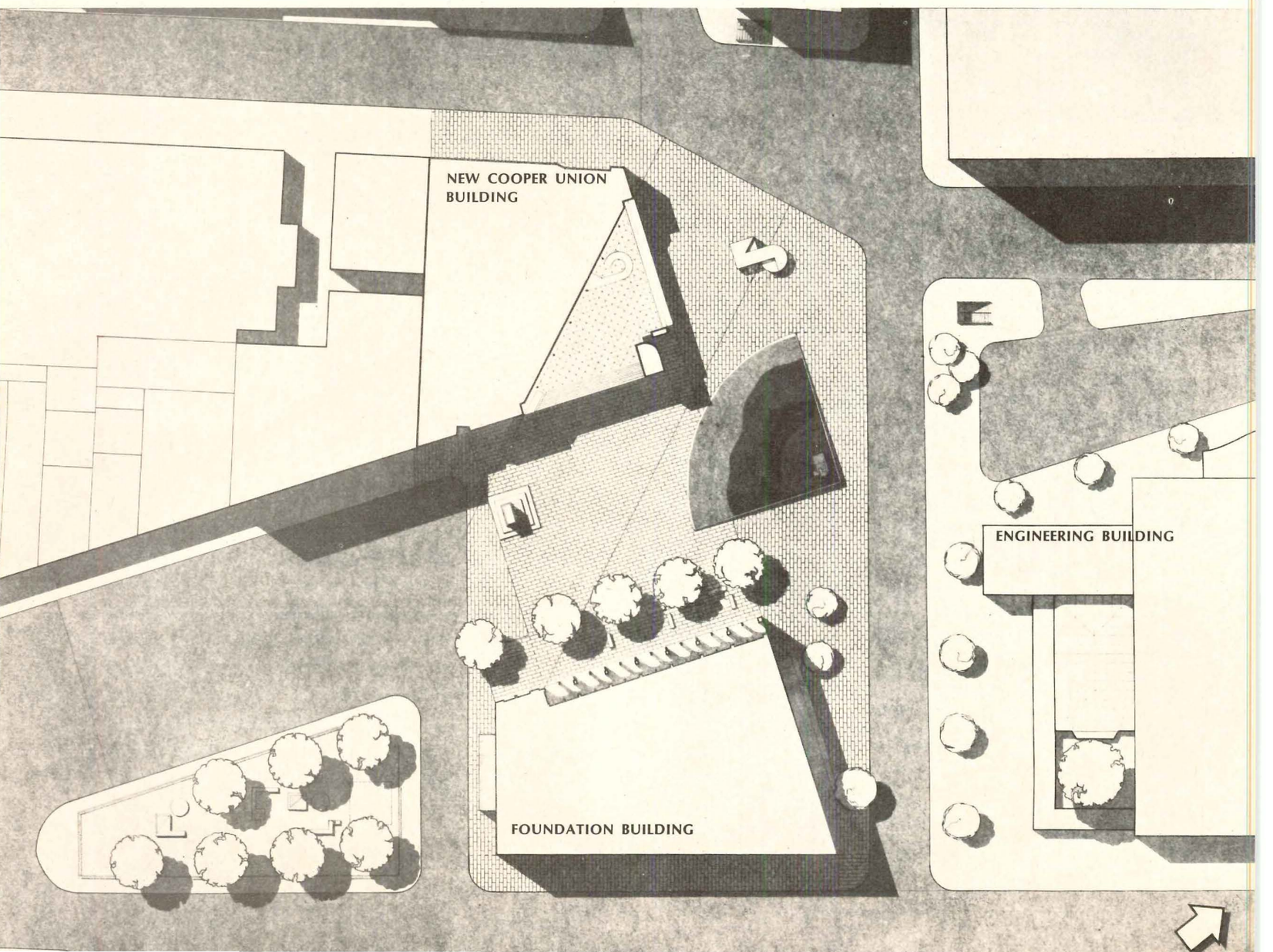
The five buildings shown here range from a house, to a university dining hall, a multi-purpose college facility, a research tower, and the big Bronx State School. Each, in its own way, is highly functional, well zoned and articulated—but above all, each is extremely well related to its place and contributes much to its neighborhood. The way of life that it will shelter is stressed: "whenever there was a choice, from a design point of view," Franzen states about the Bronx school, "of giving a dominant role to the unity of the whole or giving emphasis to a fragment of daily life, the fragment was given emphasis. It is hoped that as a consequence, an architecture made up of fragments is the result, unified only by the life of the people." This is an attitude that has great bearing and validity on the design of a city.

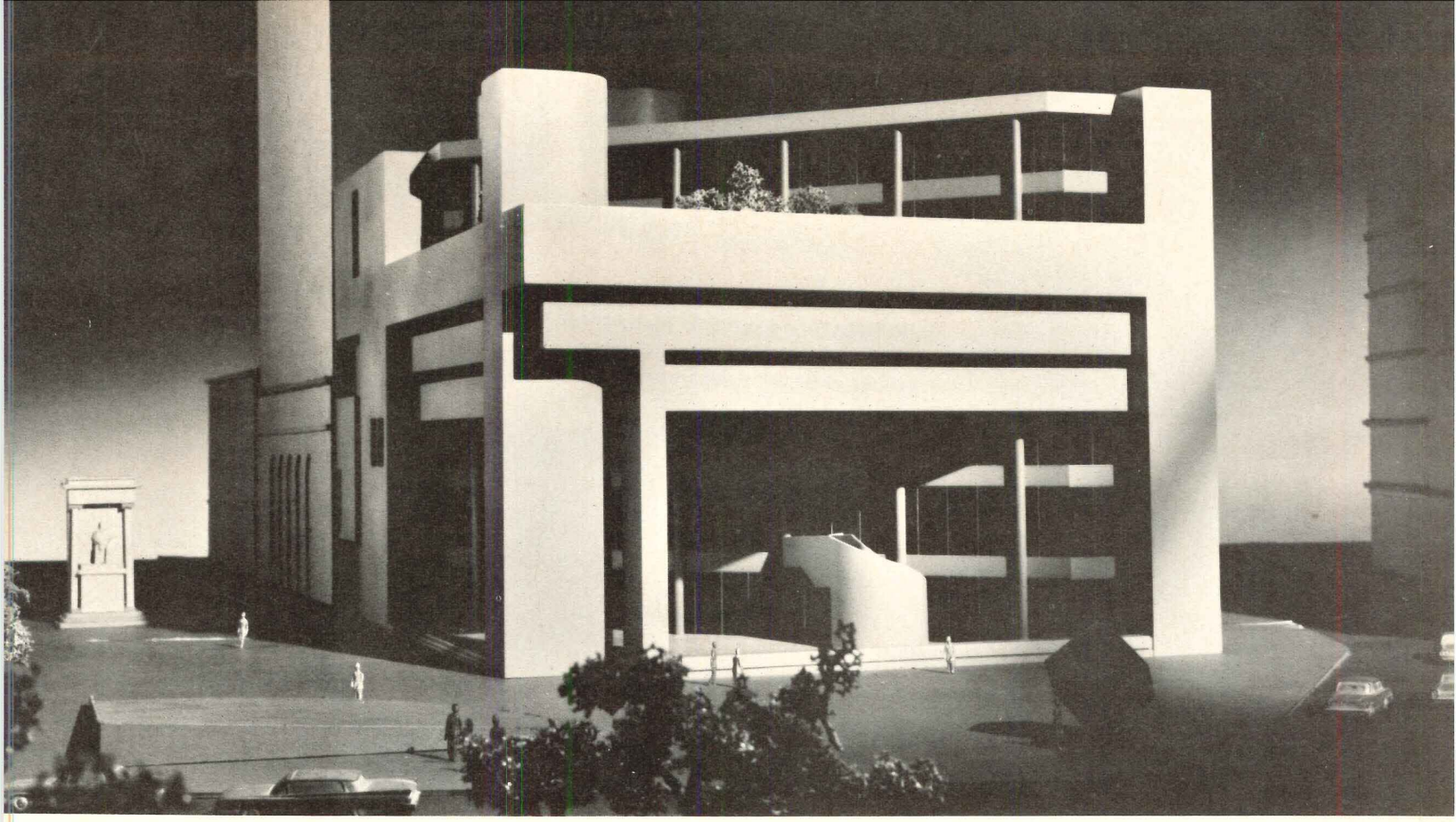
—Herbert L. Smith, Jr.





Lionel Freedman





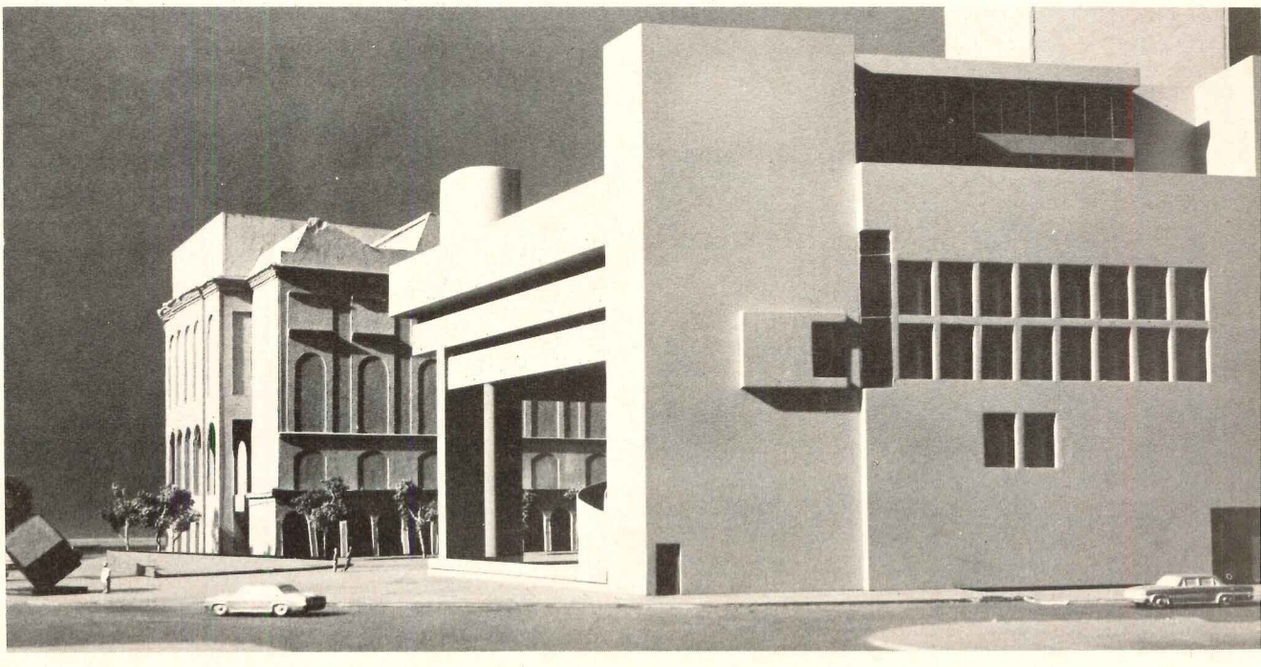
COOPER UNION ADDITION GIVES PLAZA AS BONUS

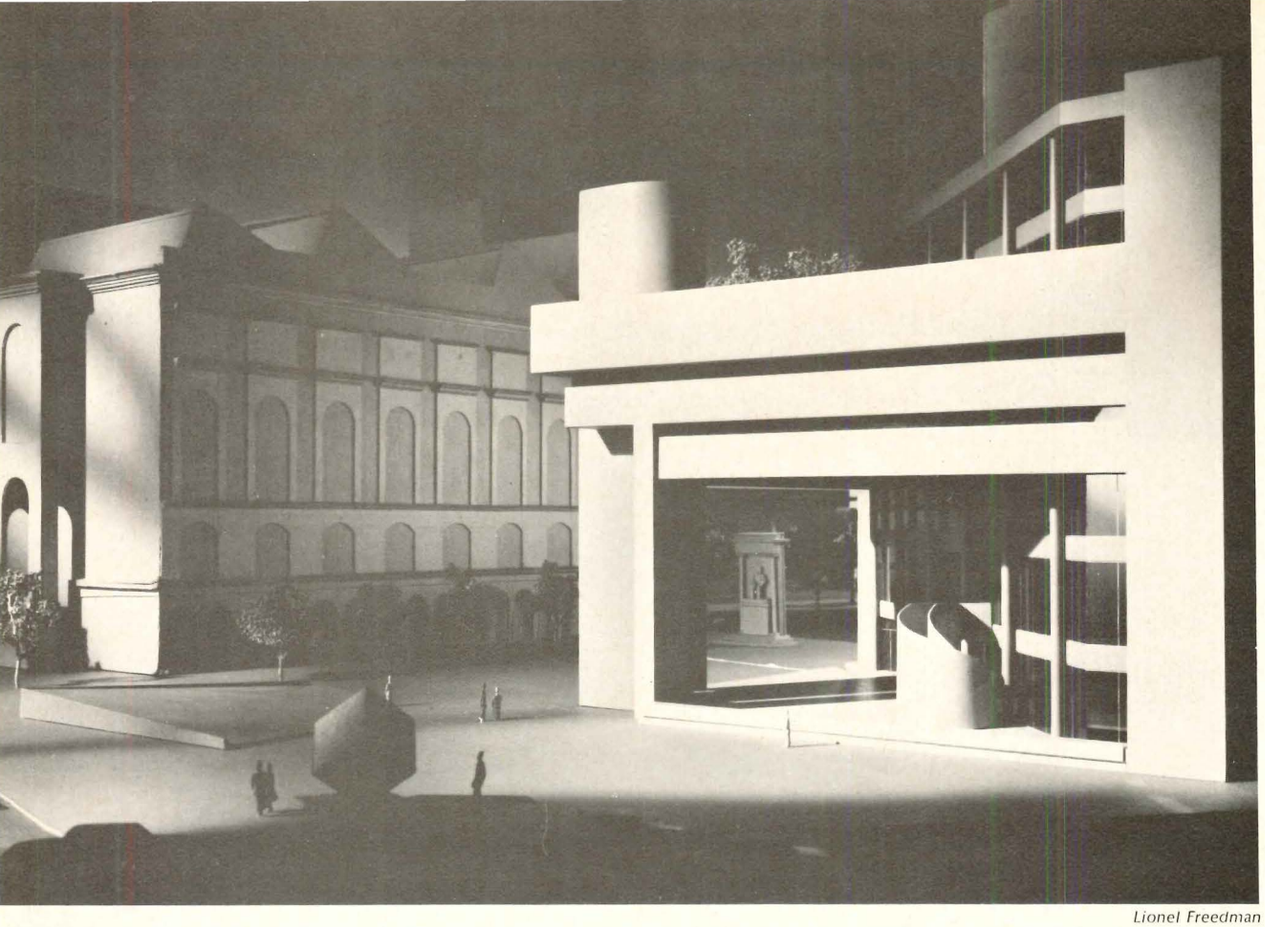
NEW YORK CITY

A great sense of urban appropriateness has been developed in this new, third building for The Cooper Union For The Advancement Of Science And Art. As an institution of higher learning, it has been famous since its founding in 1858 for its excellence in private, free education in the fields of art, architecture, engineering and science; but it has had little, if any, sense of "campus." This new building, modest in size as it is, does much to achieve that desirable condition.

THE NEW COOPER UNION BUILDING, New York City. Architect: *Ulrich Franzen—Edward Rosen, associate-in-charge;* consulting engineers: *Cosentini Associates;* structural engineers: *Garfinkel, Marenberg & Associates.*

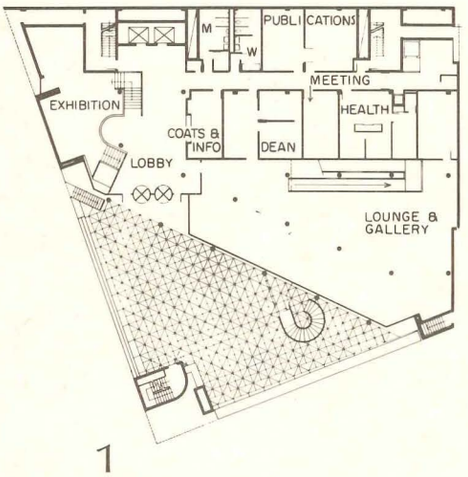
Designed to function as a major pivot in a large-scale urban setting, this new building incorporates larger and bolder elements than usual for its size. Most arresting is the sheltered, three-story-high outdoor room created by a diagonal set-back to add space for students to gather; flanking this space is an outdoor plaza formed by closing off an unnecessary street. The three elevations of the building are intentionally quite different, though extremely compatible, and are each designed to relate to the structures around them. As can be seen on the next page, the building also houses a variety of functions.





Lionel Freedman

To supplement facilities in Cooper Union's engineering and science complex, and those of the School of Art and Architecture in the original Foundation building, this new structure incorporates a wide variety of needed facilities, as can be noted in the section and plans. The entrance is conceived as the control point for this considerable variety of work and activities, and each function is related to the entrance by its expected volume of student traffic. Thus auditorium, student activity rooms and cafeteria are all given positions close to street level.



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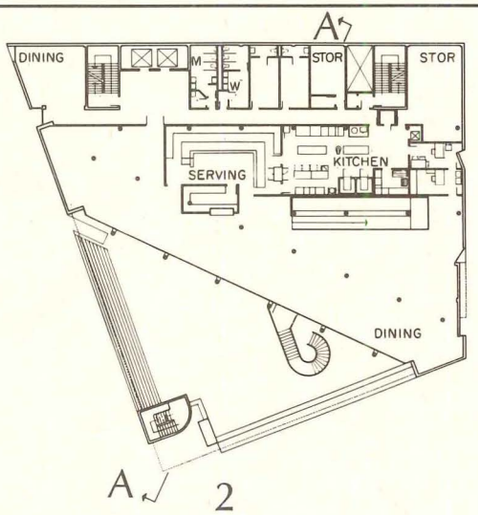

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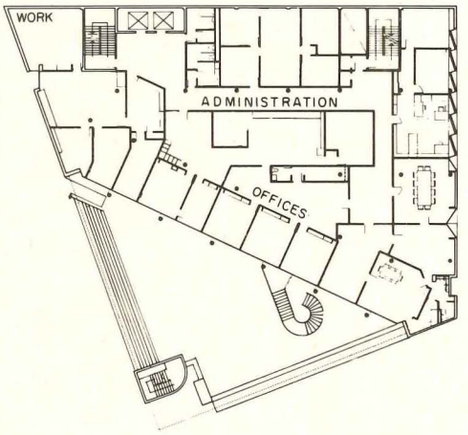

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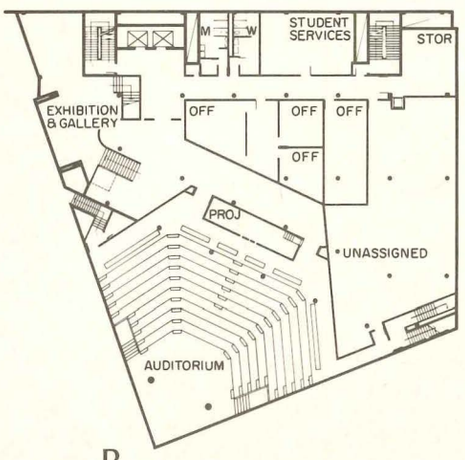

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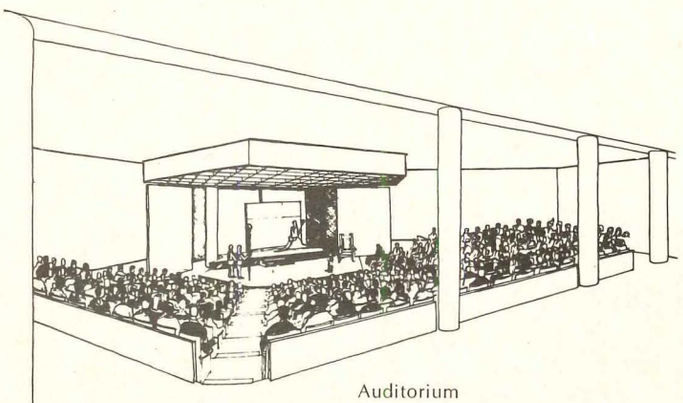
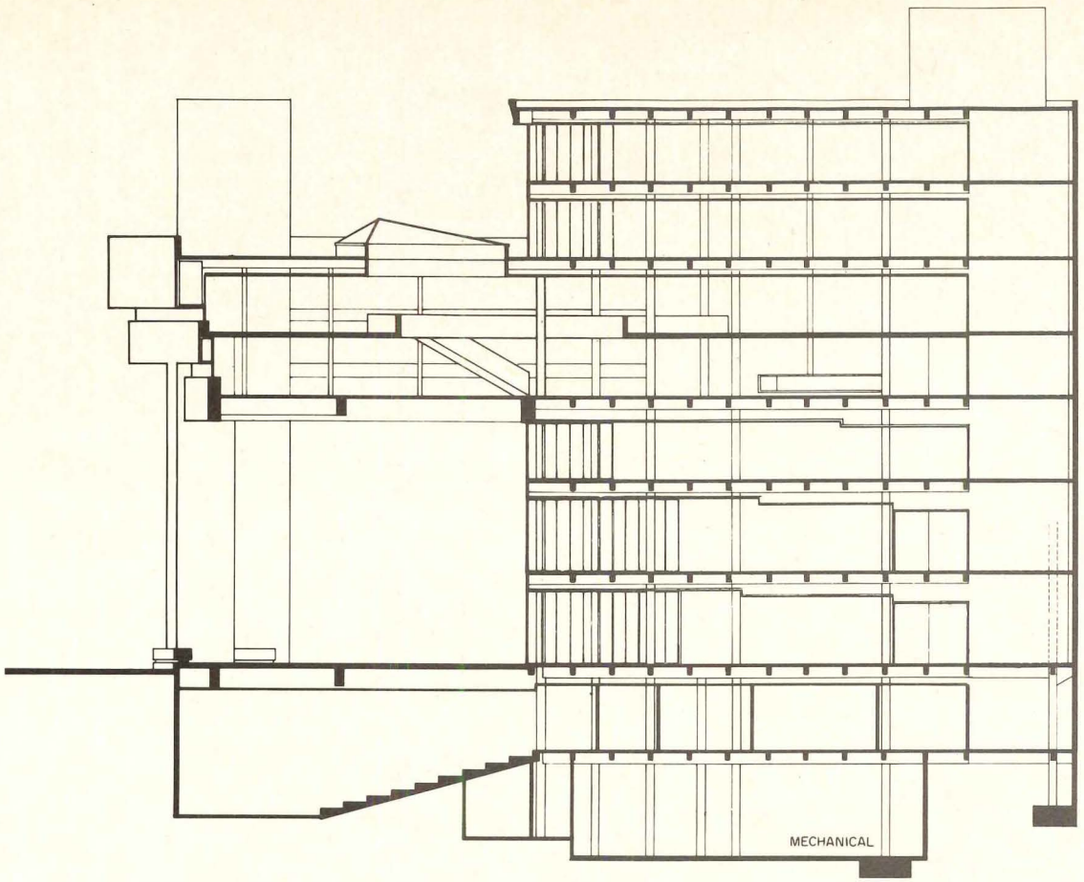
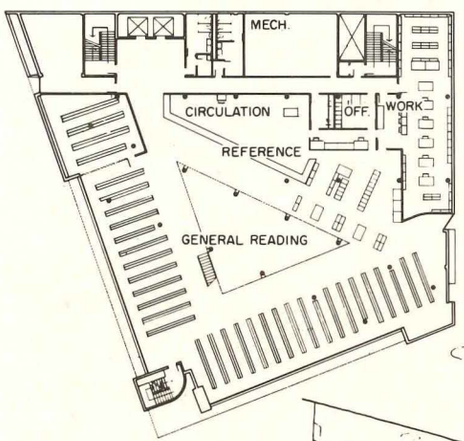


Auditorium

Study-dining





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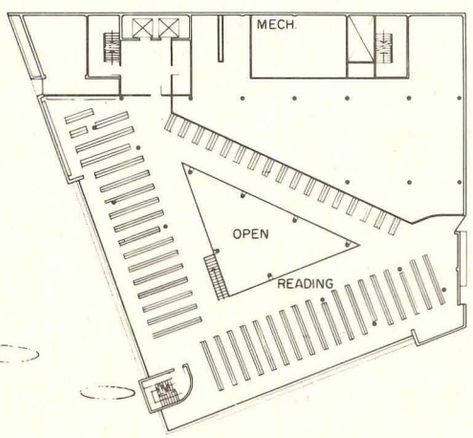

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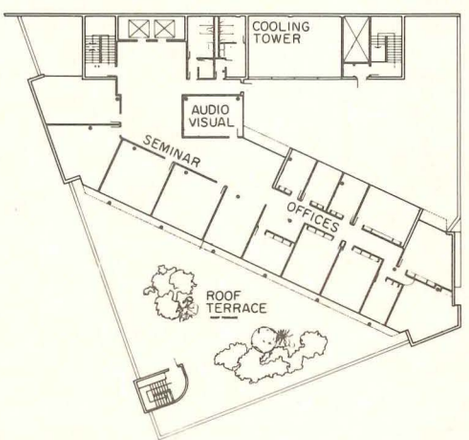

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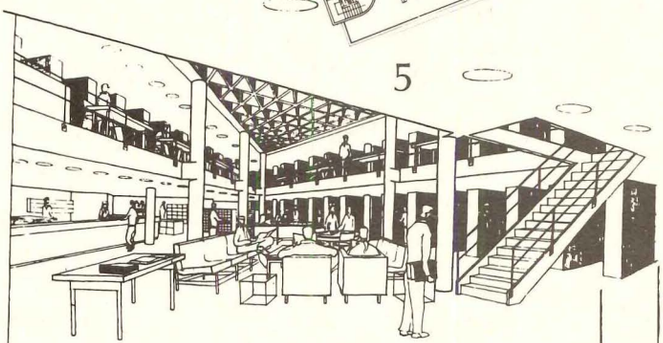
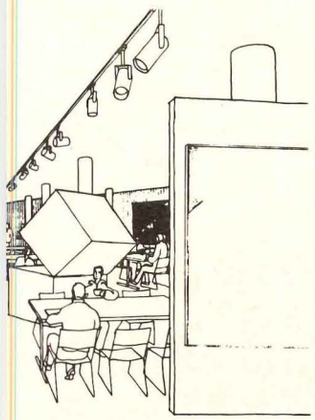
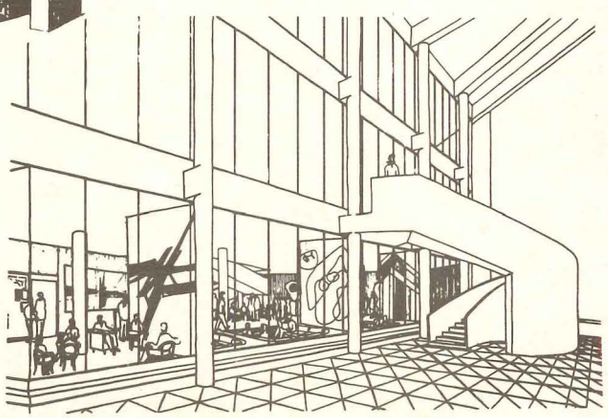
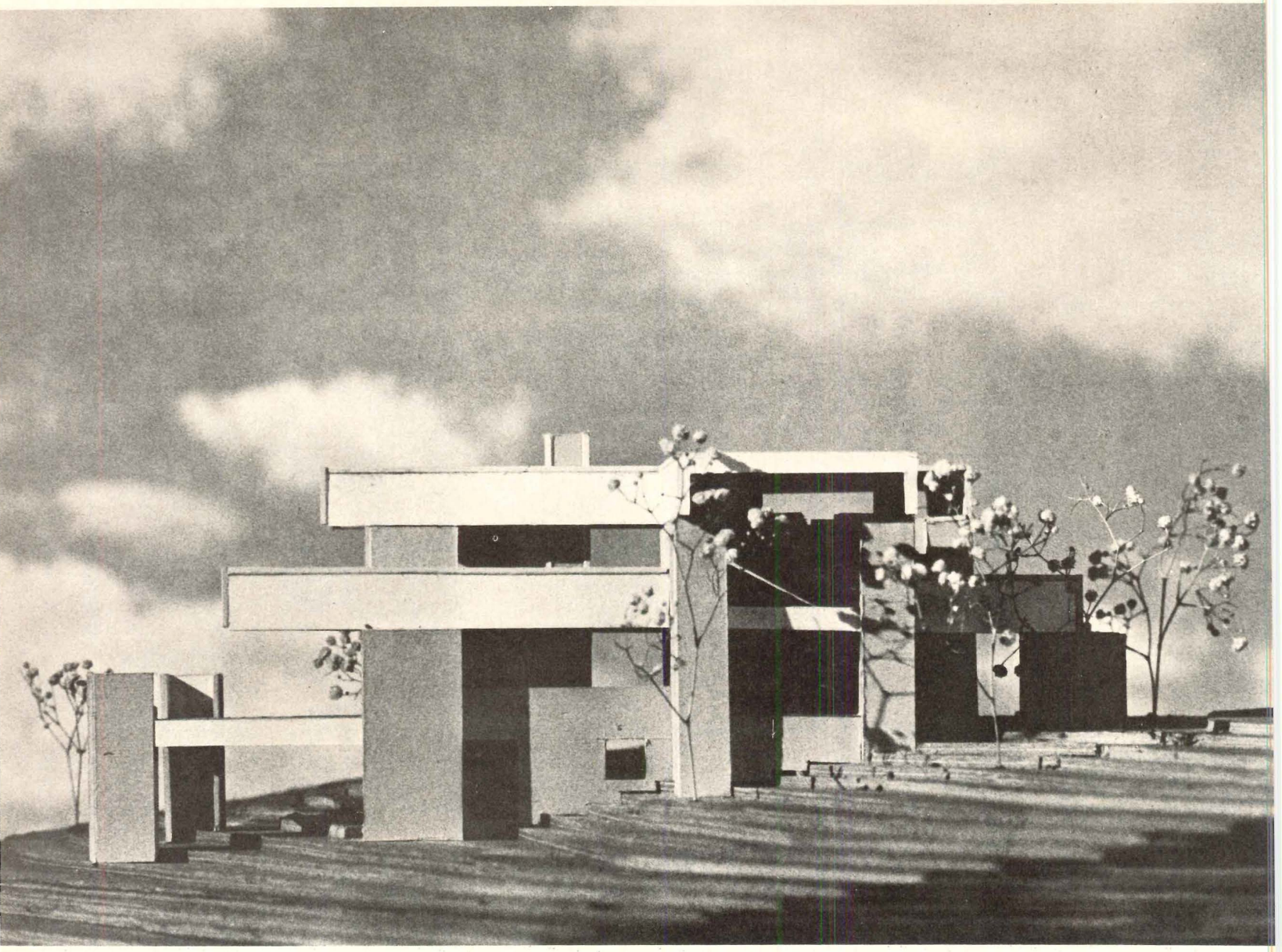


Library interior





Interior of lobby showing exhibition in place in the lounge

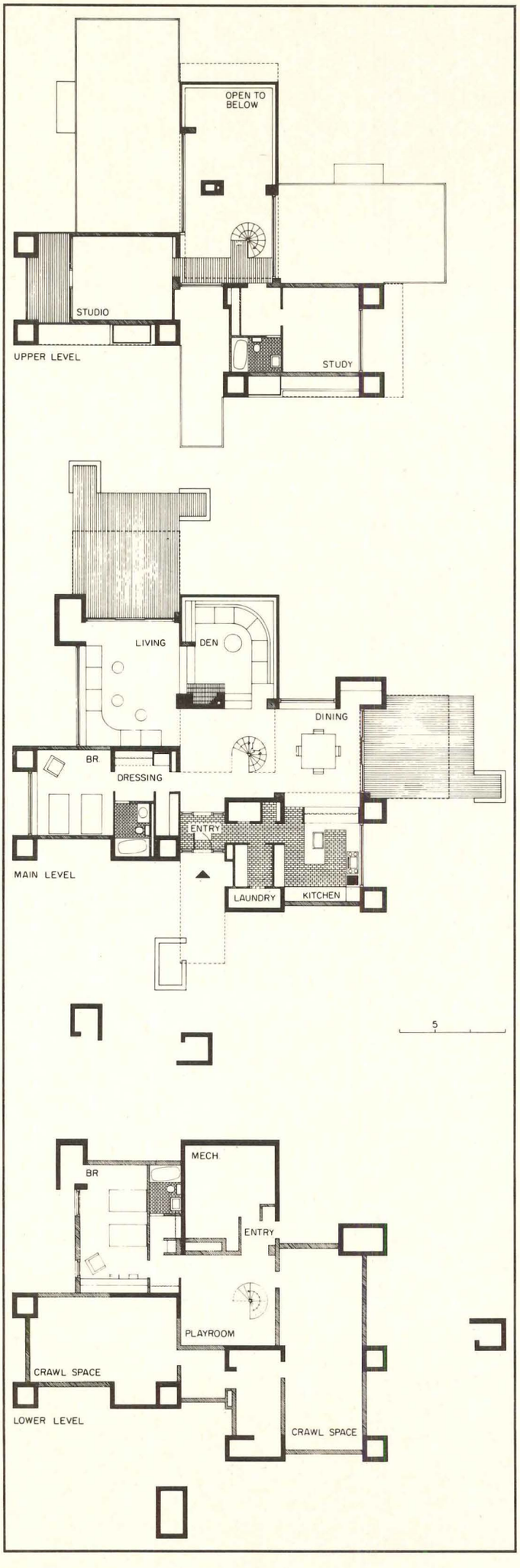


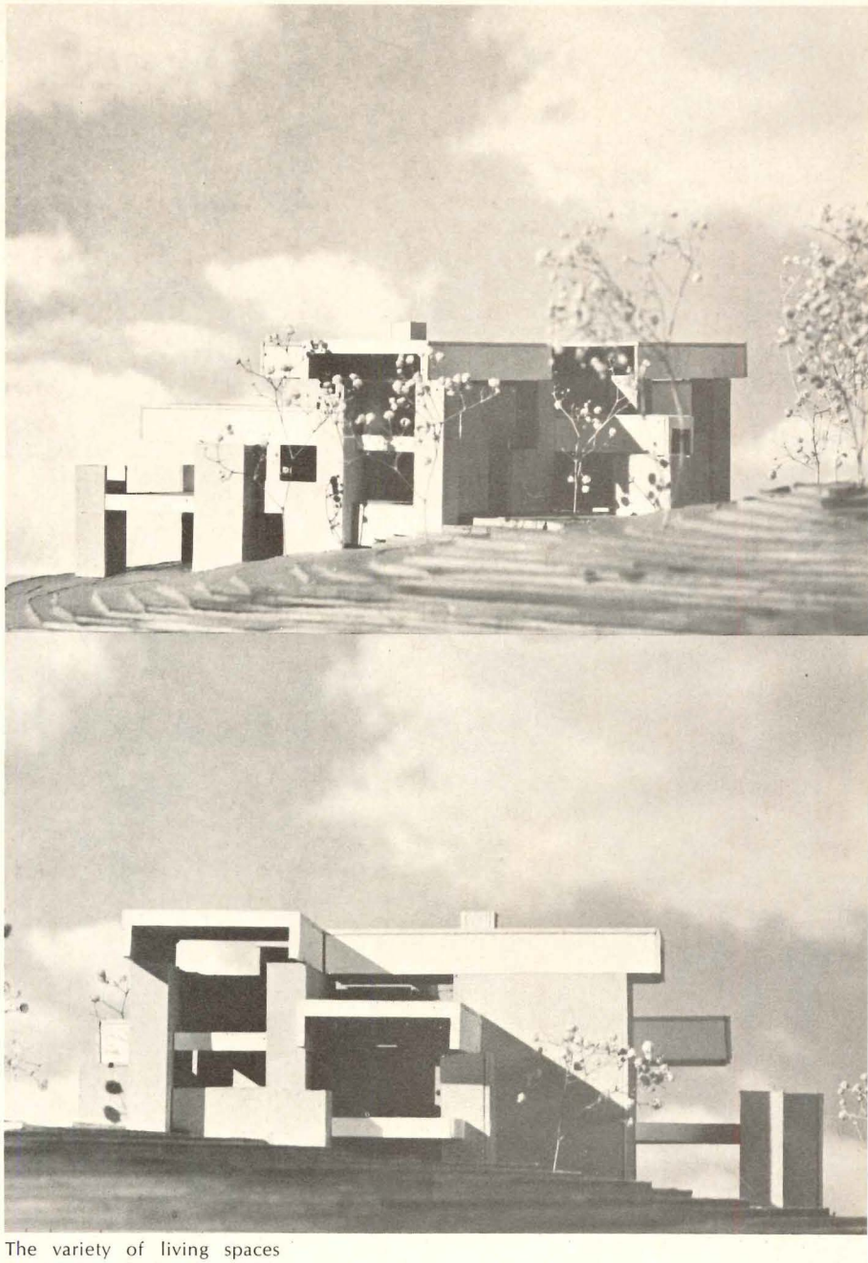
HOUSE REFLECTS A SPRAWLING KNOLL

POUND RIDGE, NEW YORK

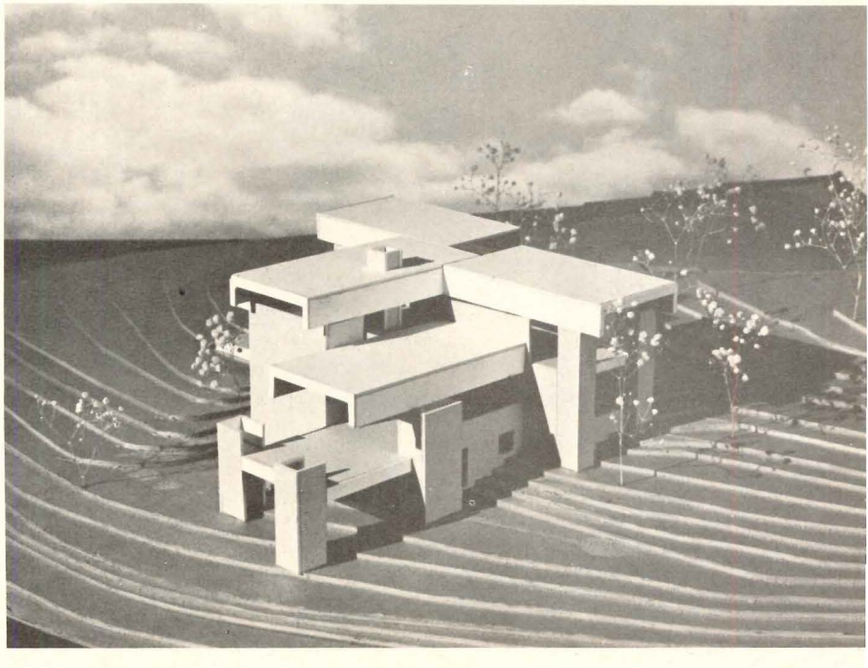
A deep concern with site and place is also becoming more dominant in Franzen's designs for private houses, so that they closely fit the land, and reach out to it in all directions—somewhat in the manner that Wright achieved in the best of his Prairie houses. The site for this house is on an elevated point with steep slopes running away from it in all directions. Although Franzen has provided his clients (a family of two adults and one child, with no regular outside help) with an efficient, well-zoned and very articulated plan, it is expressed in a relaxed, expansively comfortable manner. His use of textured concrete-block piers and a laminated wood, box-girder system for roofs also acquires a more random, informal effect as the structure terraces up and beyond the knoll of land. It is a house to be lived in and looked out of, instead of the usual "hilltop house" mainly designed to be looked at. The decks and wide windows will afford good views of trees on the lower portions of the slope, and a different view from each area.

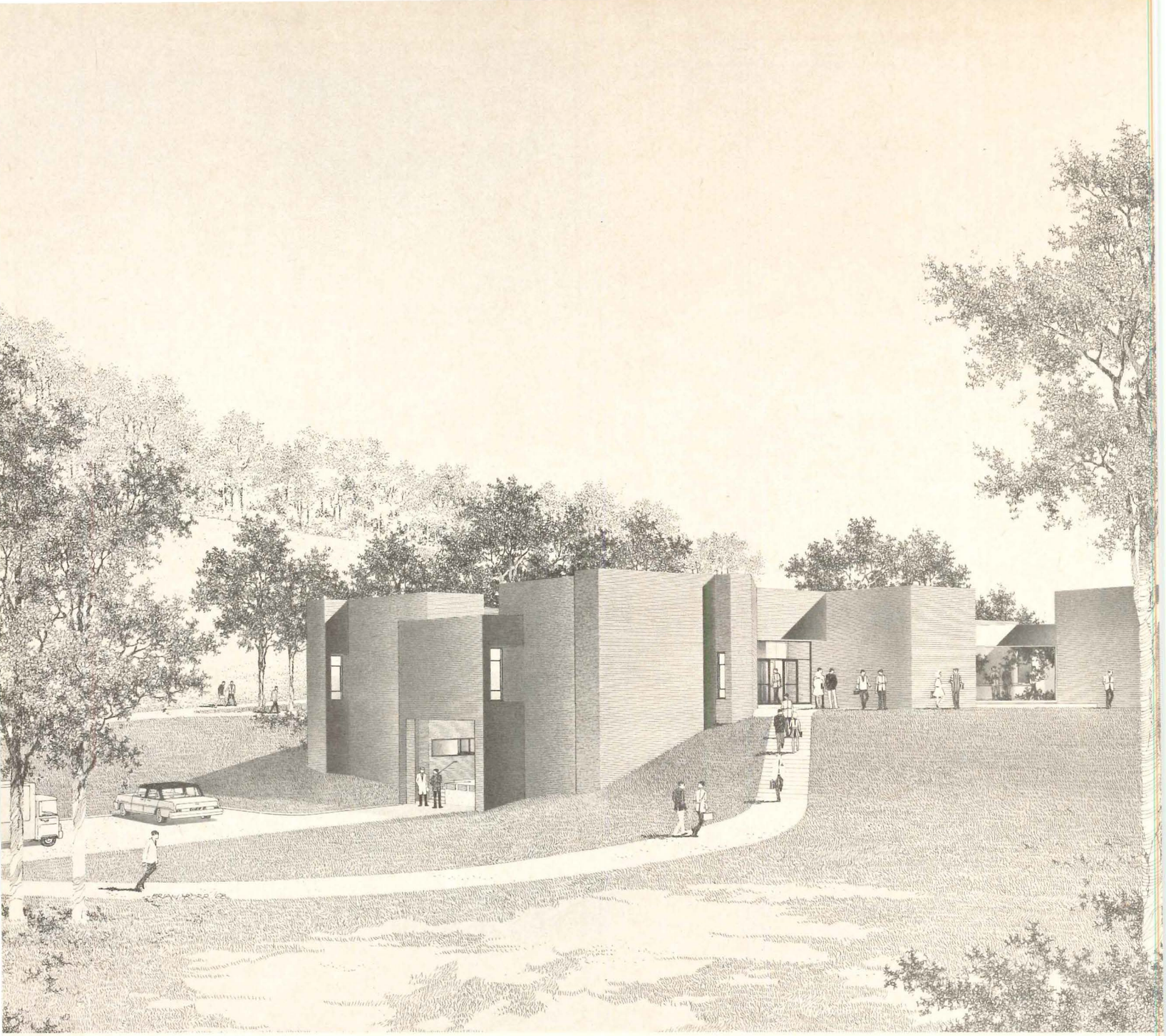
RESIDENCE IN POUND RIDGE, NEW YORK. Architect: *Ulrich Franzen.*

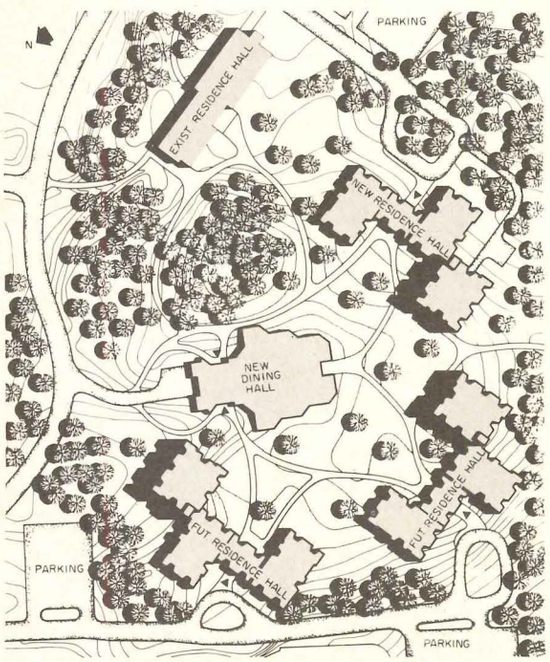




The variety of living spaces provided on the interior of this house is clearly reflected on the exterior—even by the thrust and direction of the roof systems toward views.





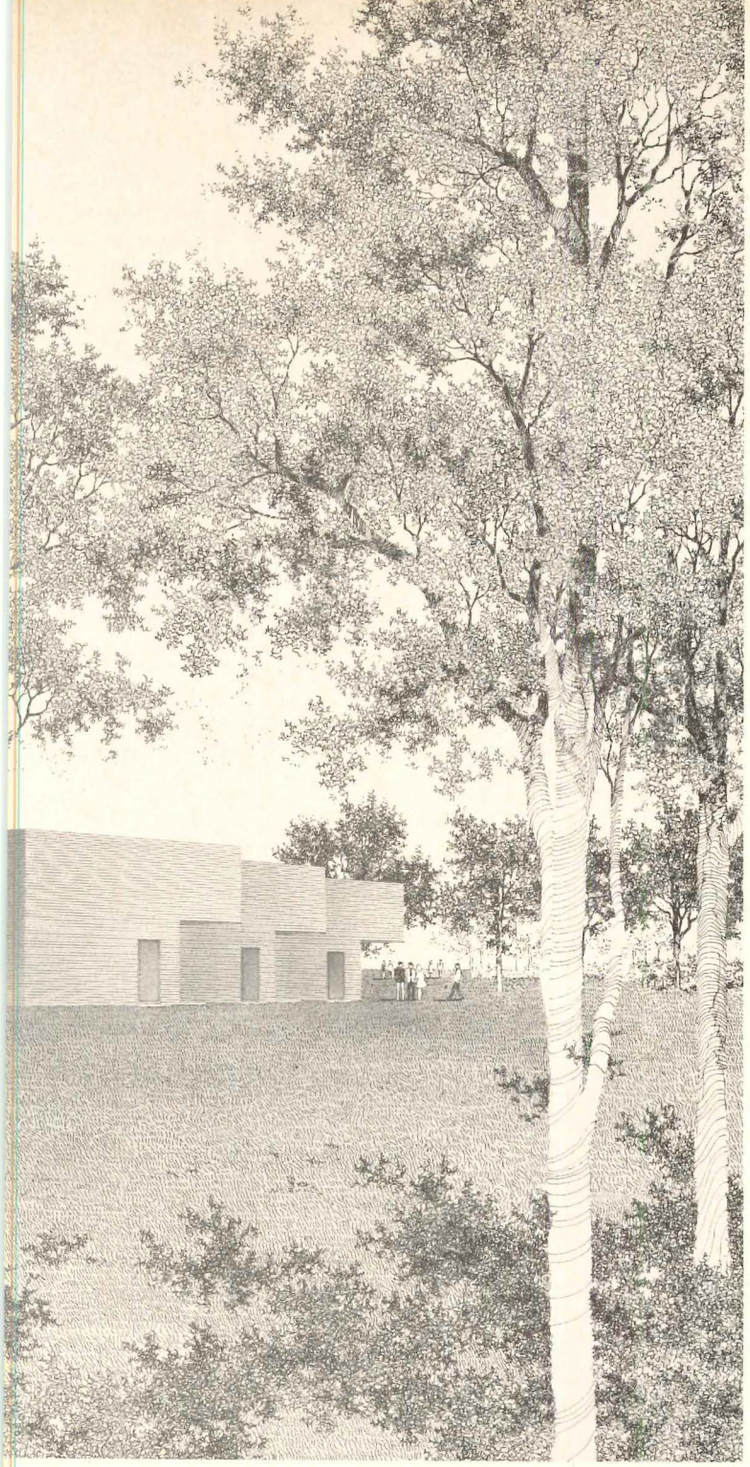


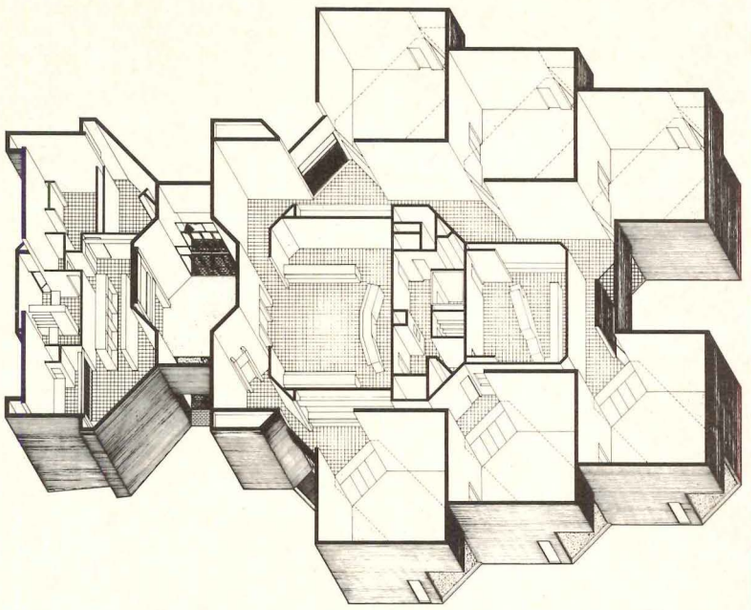
DINING HALLS AT HUMAN SCALE

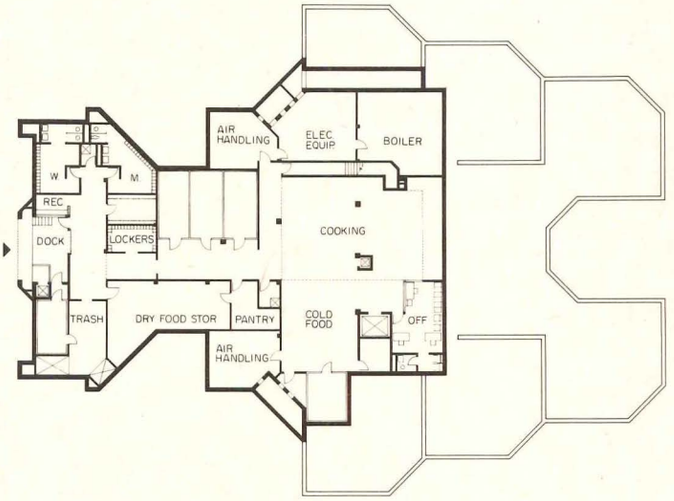
UNIVERSITY OF NEW HAMPSHIRE

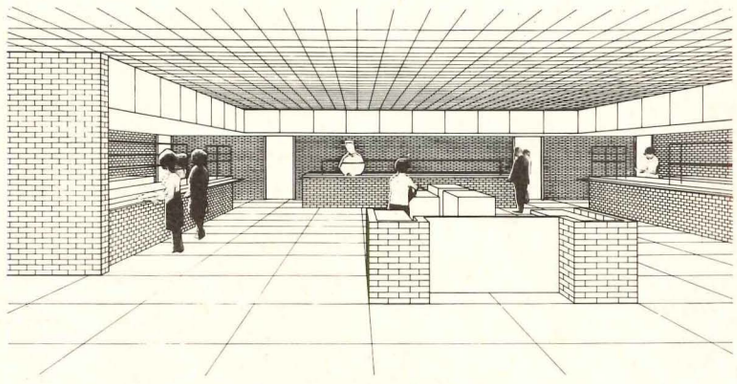
To create a more personal, less institutional environment than the typical university dining hall, Franzen has developed several planning devices which, not incidentally, also add to the building's efficiency and usefulness. Initially, this new hall is to provide food service to 500 in two sittings, but it will be expanded to serve 1200. To reduce the scale, the scheme creates a series of adjoining dining rooms for 90 to 100 students each, and uses a slope in the site selected to place kitchen and storage areas partially below grade and completely separate student circulation and service traffic. All the food service areas are sized for the ultimate dining capacity.

NEW DINING HALL AT THE UNIVERSITY OF NEW HAMPSHIRE, Durham, New Hampshire. Architect: *Ulrich Franzen—Samuel Nylen, associate-in-charge; Durwood Herron, job captain;* consulting engineer: *J. Altieri;* structural engineers: *Garfinkel, Marenberg & Associates.*

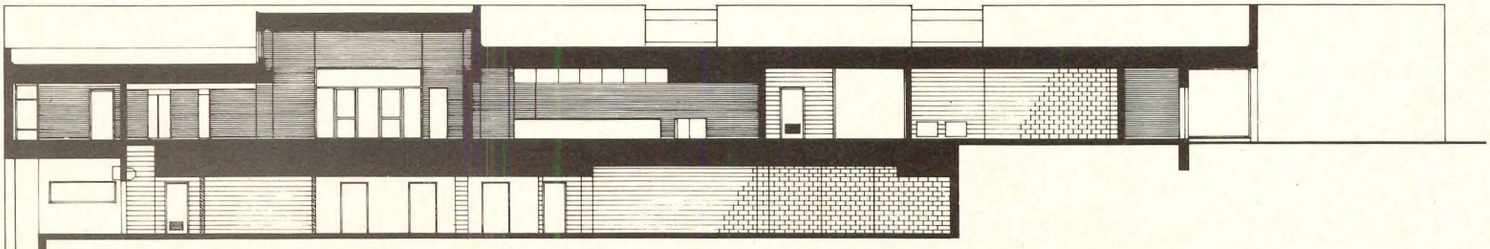


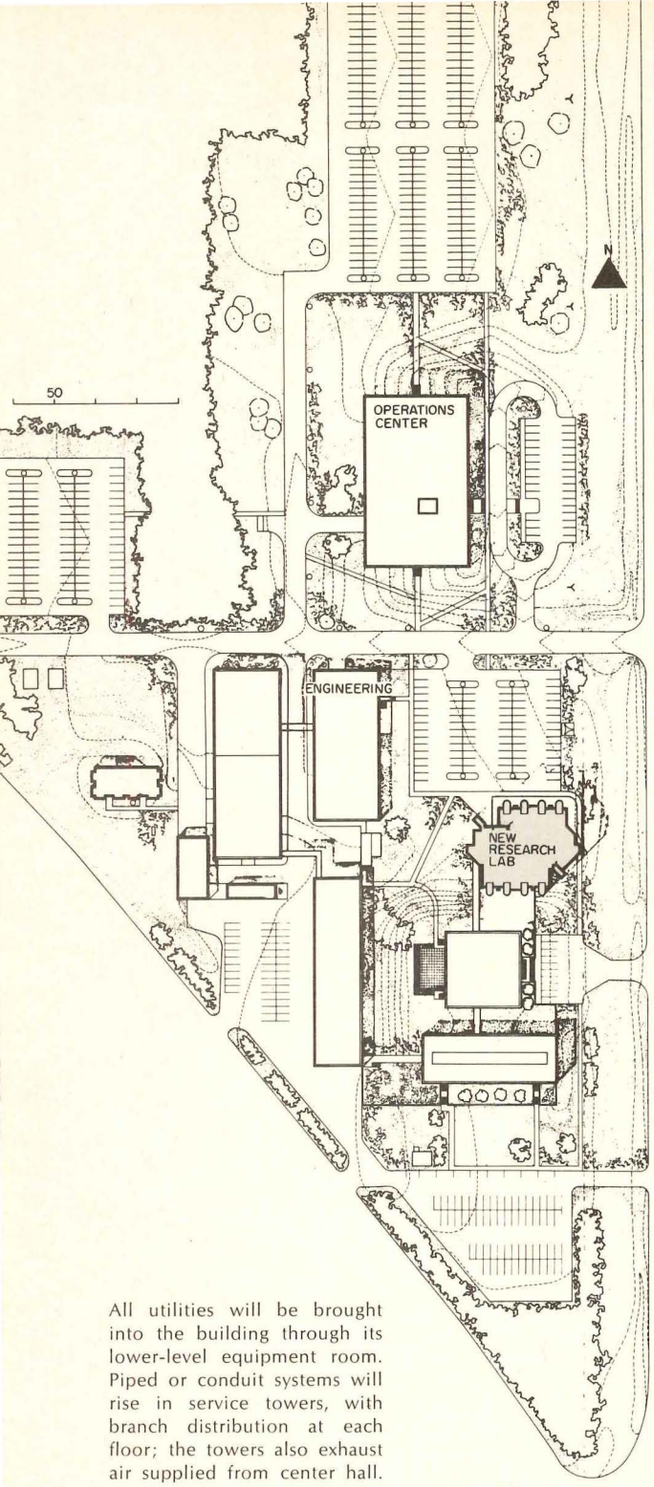


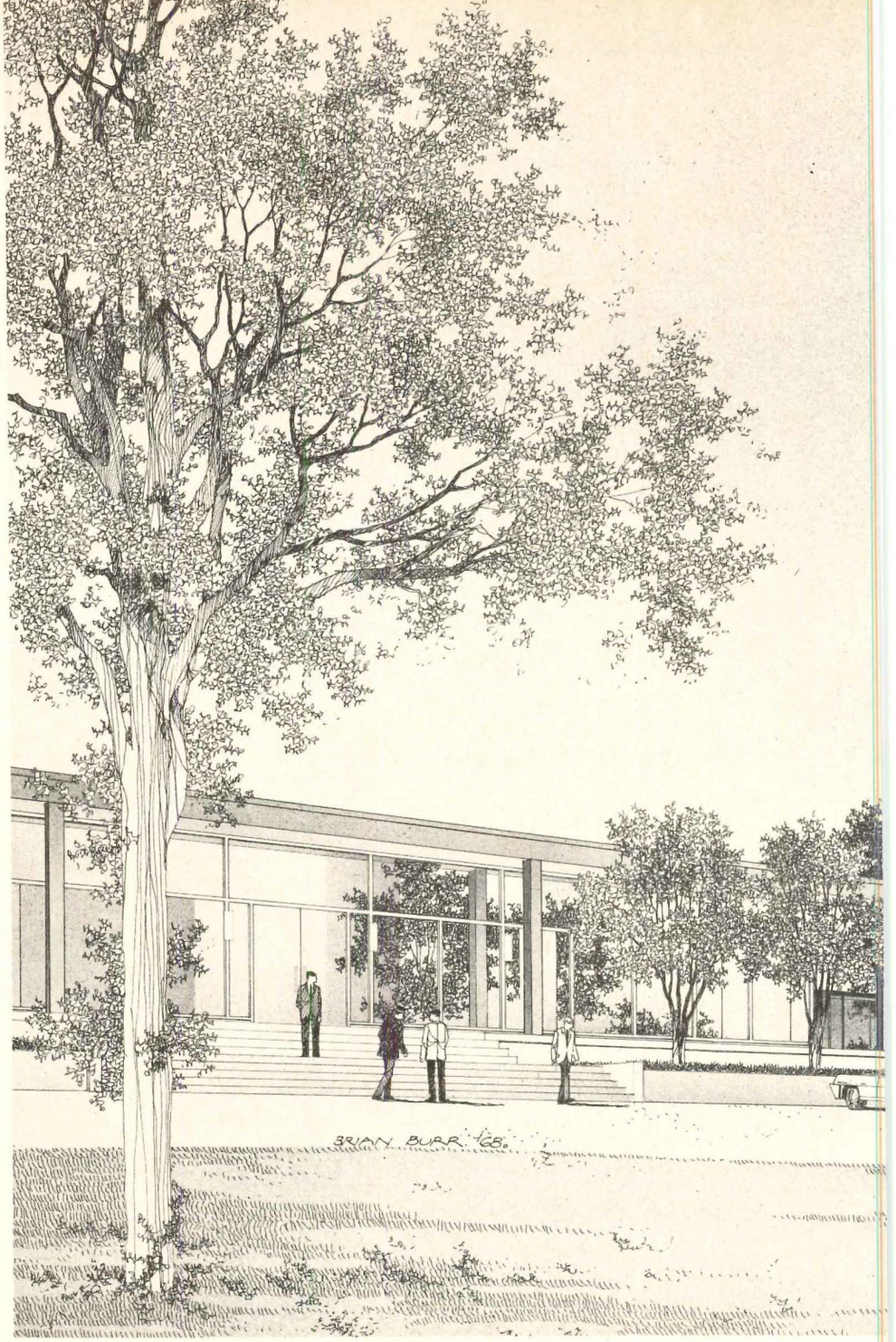




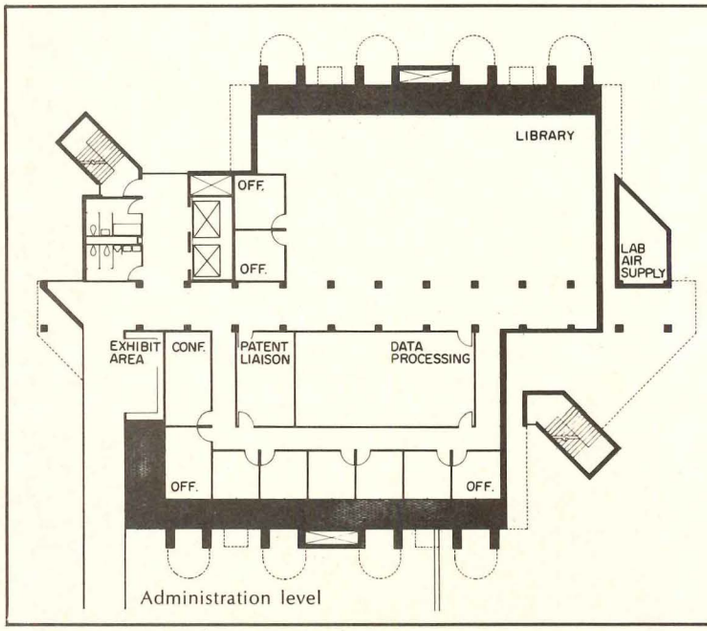
The new dining halls form the focal point for a new residential quadrangle that Franzen is presently developing. The six dining spaces are related to residential houses within the complex and have outdoor access for use as meeting rooms when not used for dining, and when kitchen facilities are closed. One of the rooms might be kept open for a snack bar if desired. For general dining, a free-flow or scramble service is planned. The brick used inside and out reflects the general campus; roofs are dark, heavy timber.



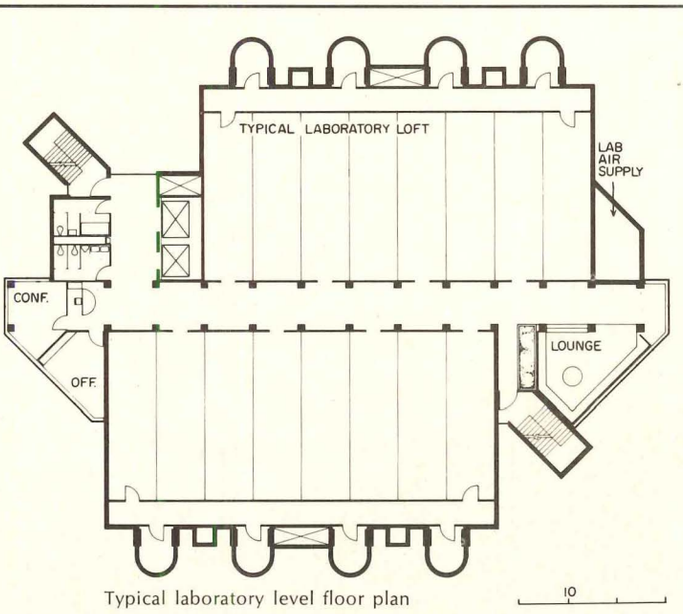




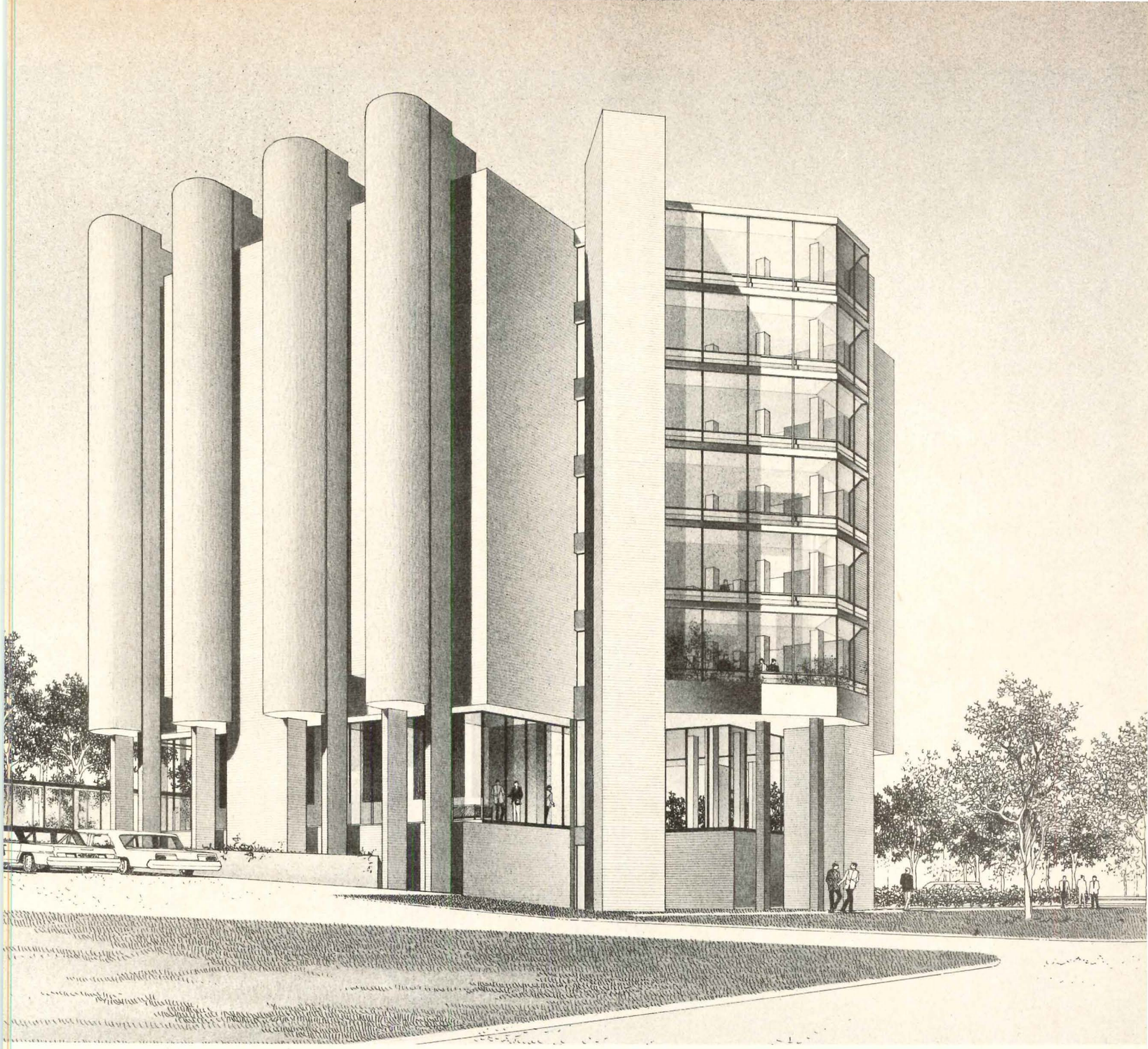
All utilities will be brought into the building through its lower-level equipment room. Piped or conduit systems will rise in service towers, with branch distribution at each floor; the towers also exhaust air supplied from center hall.



Administration level



Typical laboratory level floor plan

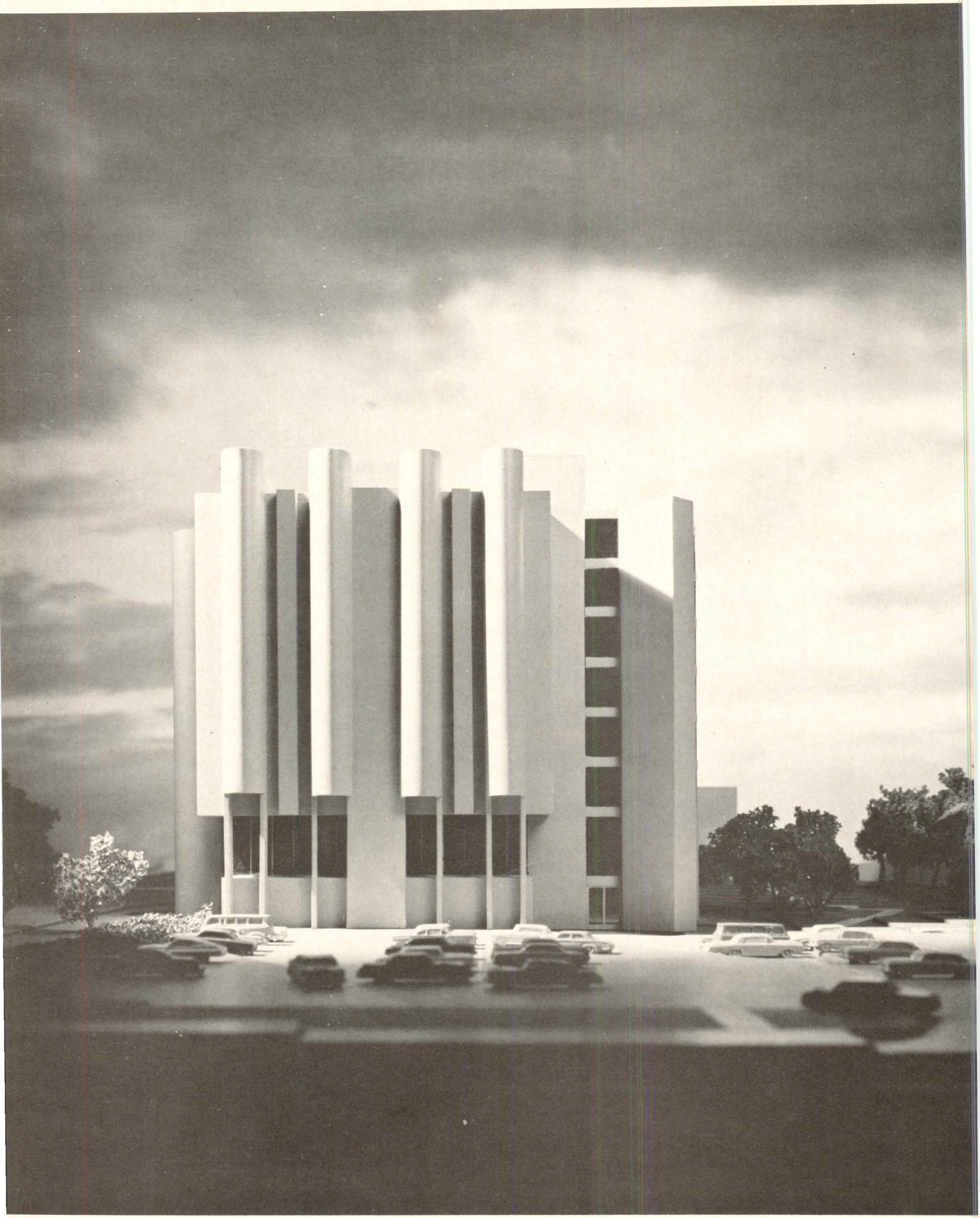


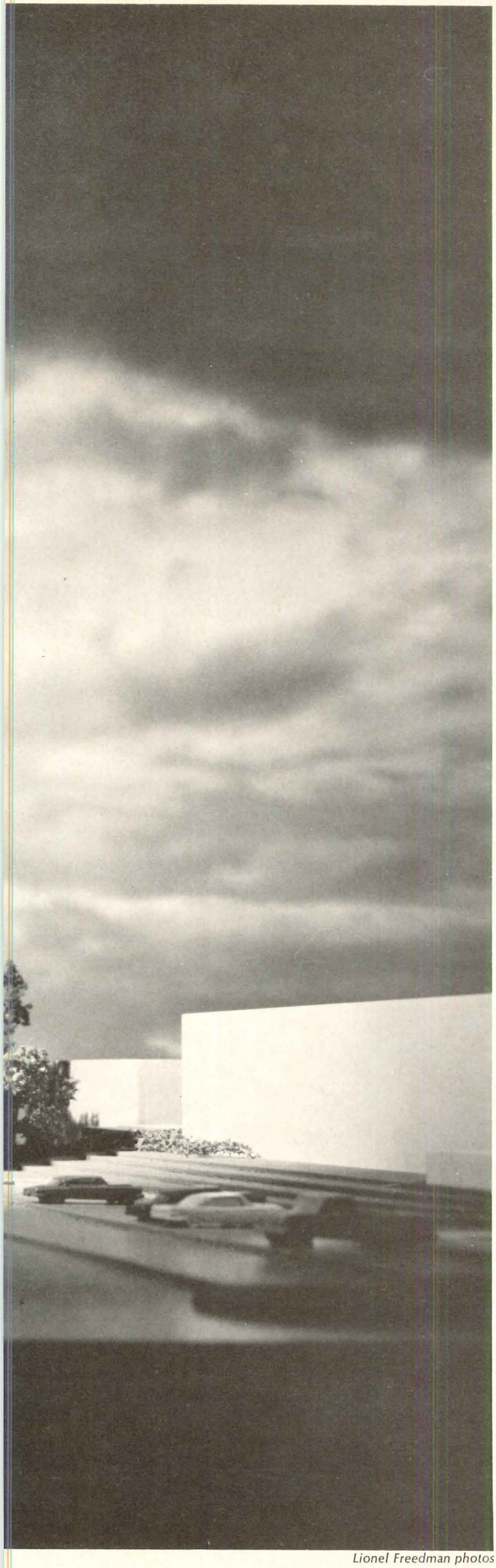
TOWER EXPANDS RESEARCH COMPLEX

RICHMOND, VIRGINIA

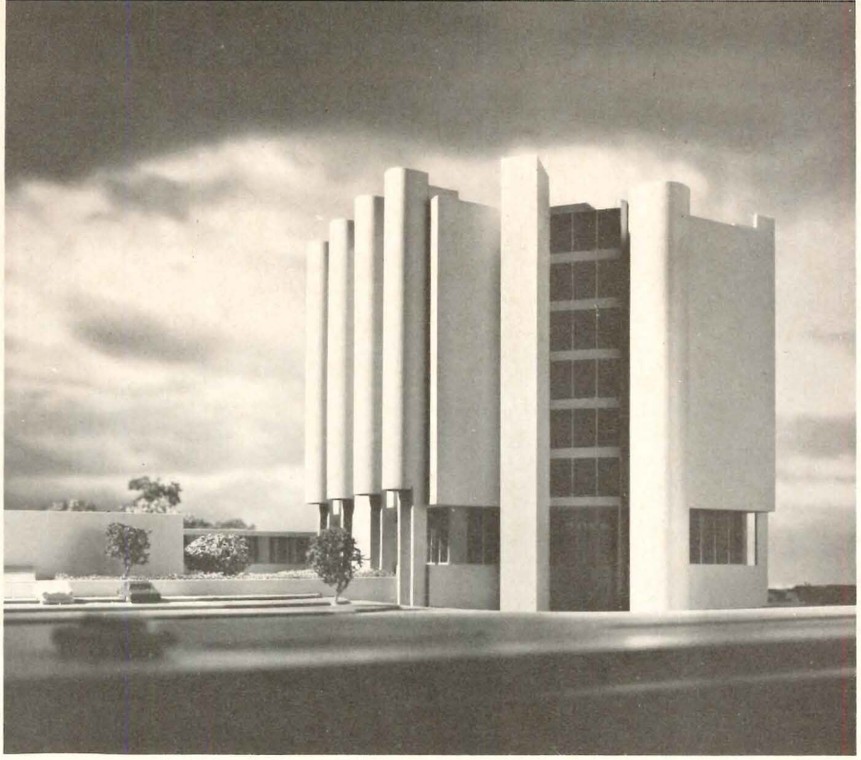
Franzen's latest addition to the Philip Morris Research Center, which he has been planning and building in successive stages during much of his career, represents a very elegant evolution of the building type he explored in the Agronomy Building at Cornell. Here, as in the other, the building is designed as a vertical accent in a basically horizontal landscape of structures—and the verticality is strongly justified by the economics of the systems to be incorporated. The upper floors are principally flexible, loft-type laboratory spaces flanked by a central corridor, exterior service towers and glazed lounges and offices. The building also houses a library and auditorium.

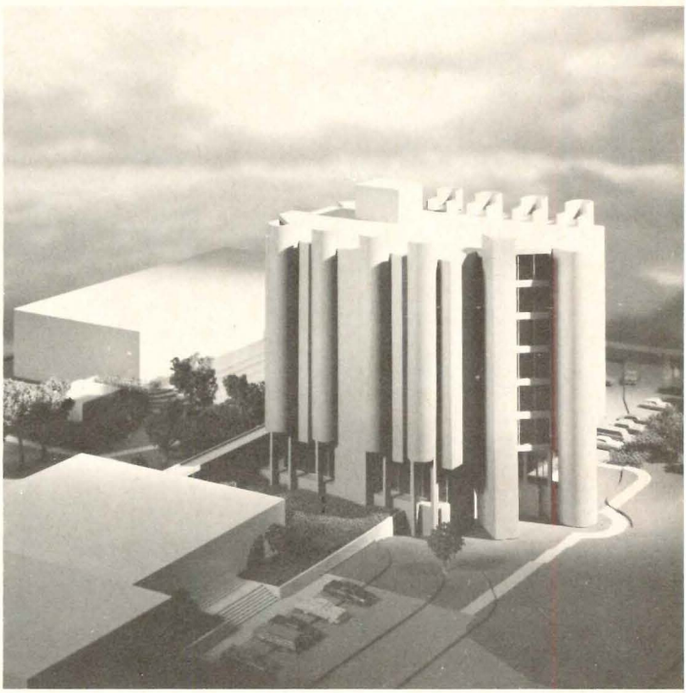
NEW WING FOR PHILIP MORRIS RESEARCH CENTER, Richmond, Virginia. Architect: *Ulrich Franzen—Robert Thorson, associate-in-charge;* engineers: *Robert S. Spratley & Associates (consulting); Garfinkel, Marenberg & Associates (structural).*



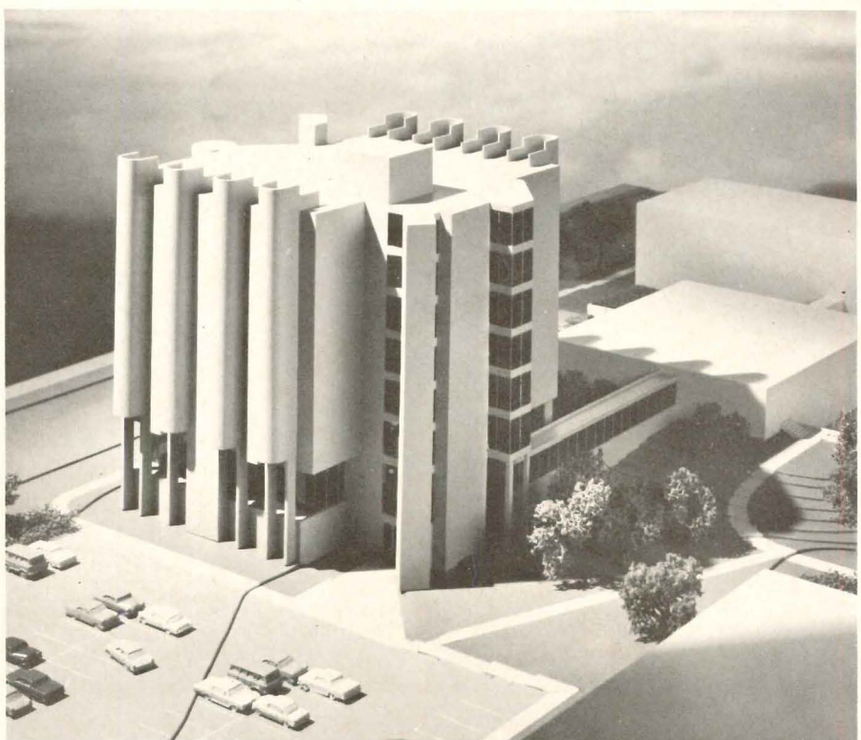


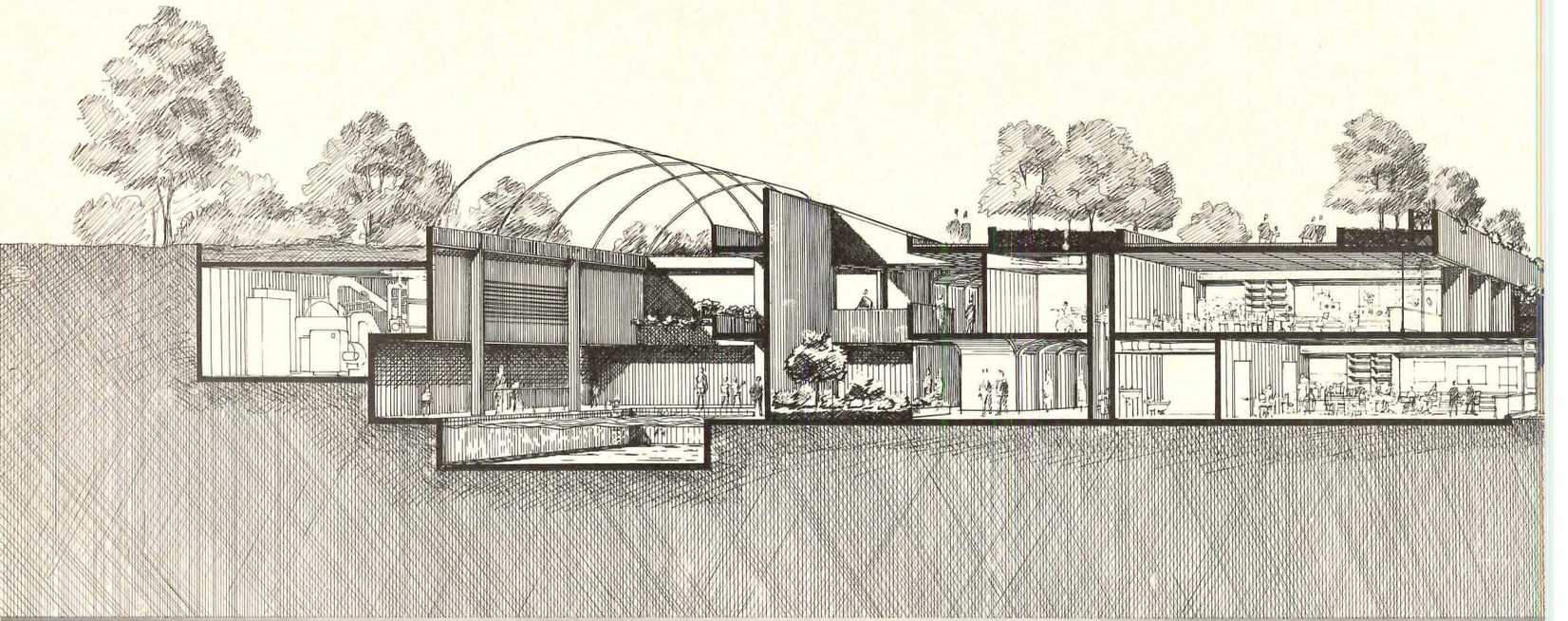
Lionel Freedman photos

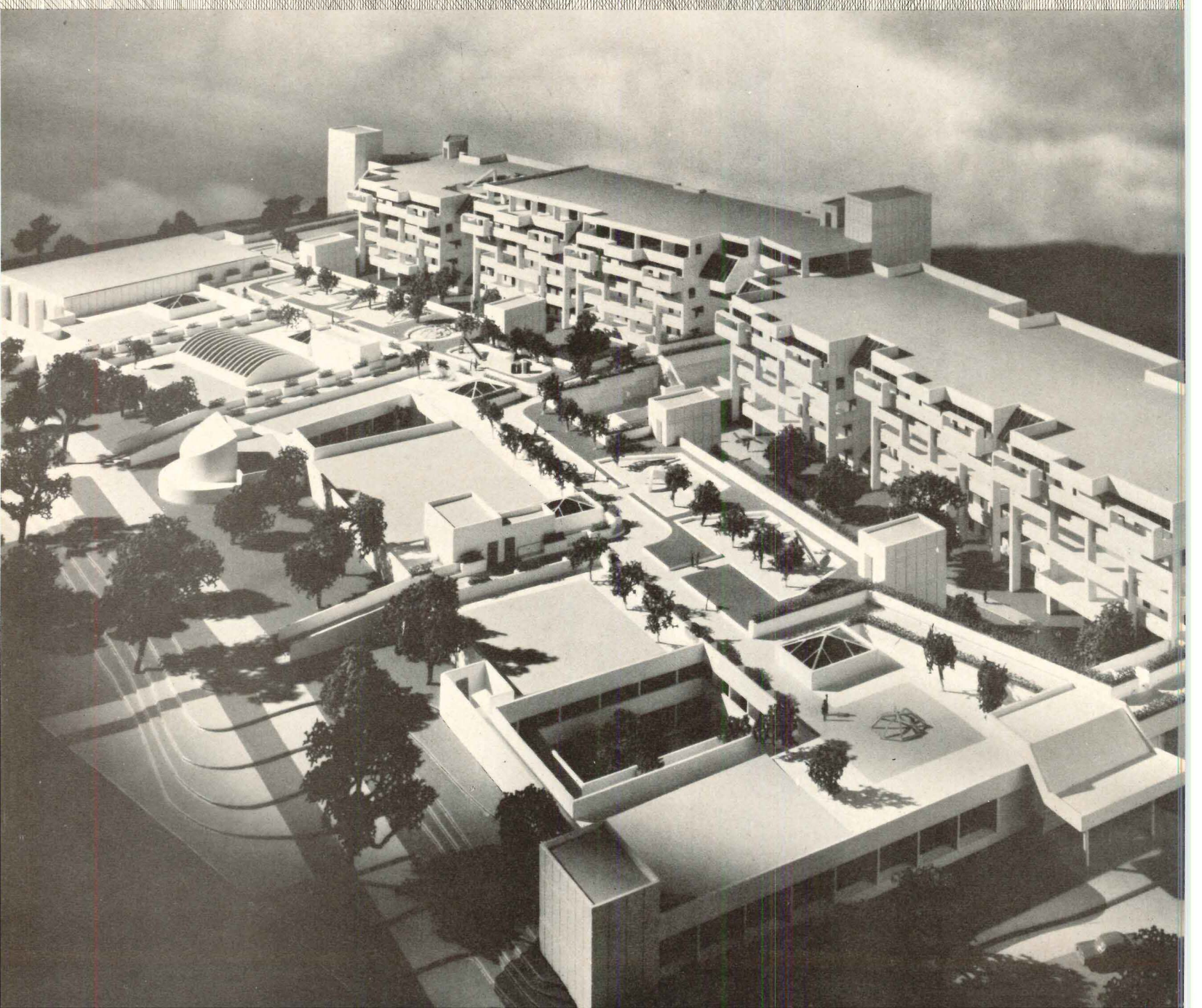


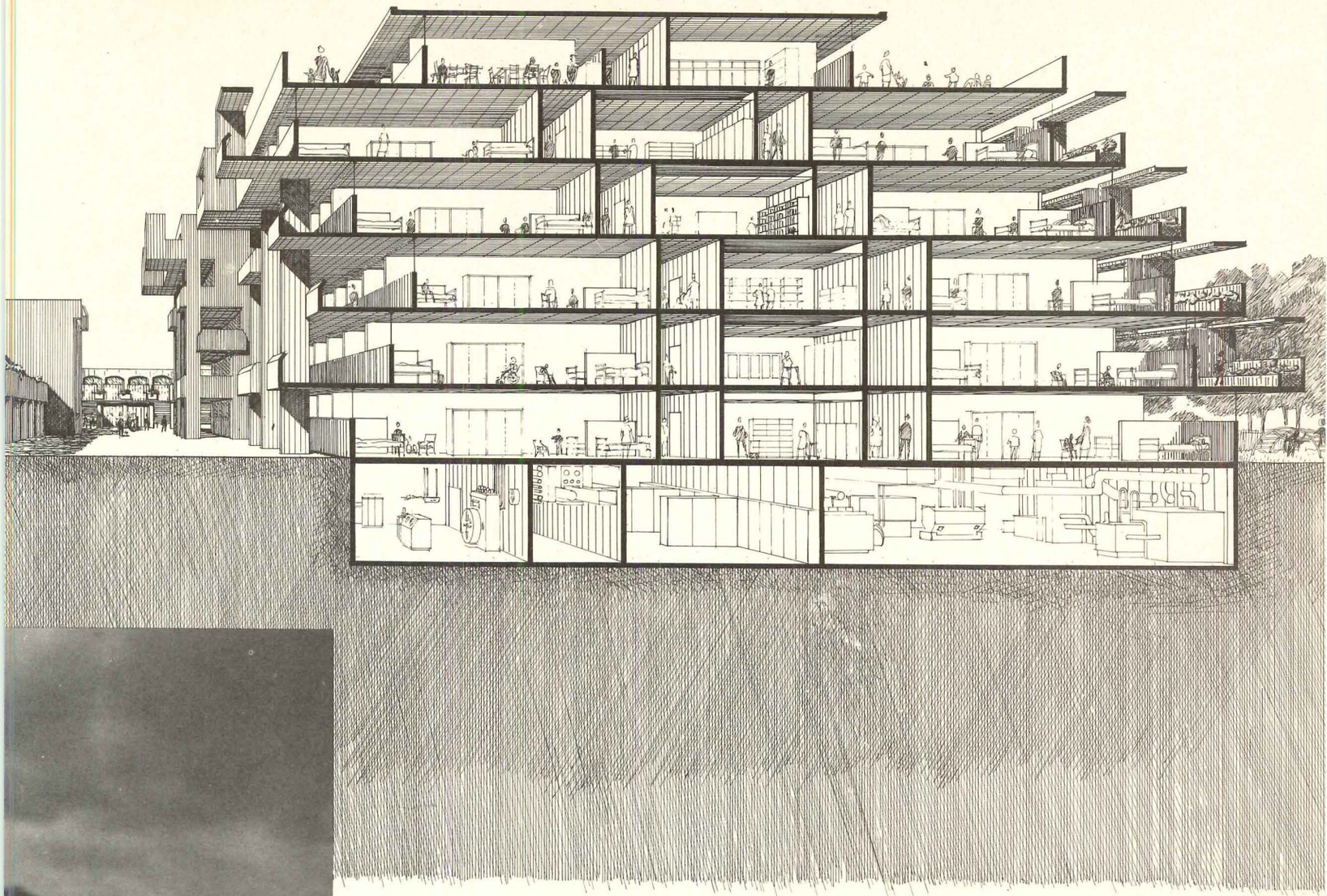


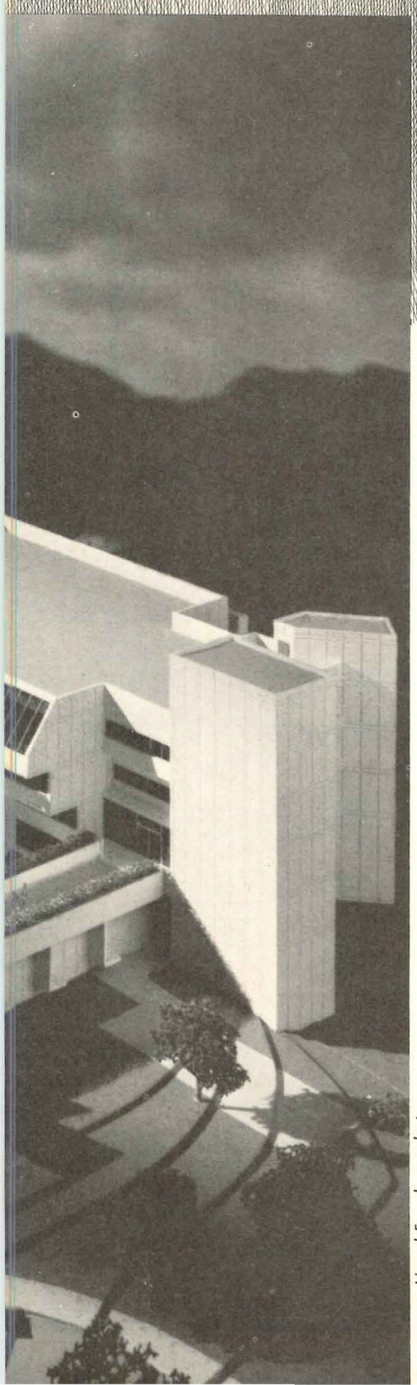
Though function and economics played a dominant role in the evolution of this new Philip Morris research tower (at a cost of about $4 million it is reportedly considerably less expensive than similar, fully-equipped facilities), design care has integrated its many clearly expressed elements into an extremely handsome and vital architectural development. Piped or conduit systems will be distributed vertically in the exterior service corridors, while air supply will rise in a single shaft and be distributed on each floor in the ceiling of the main corridor. This scheme avoids system overlap and reduces floor-to-ceiling heights.











Lionel Freedman photos

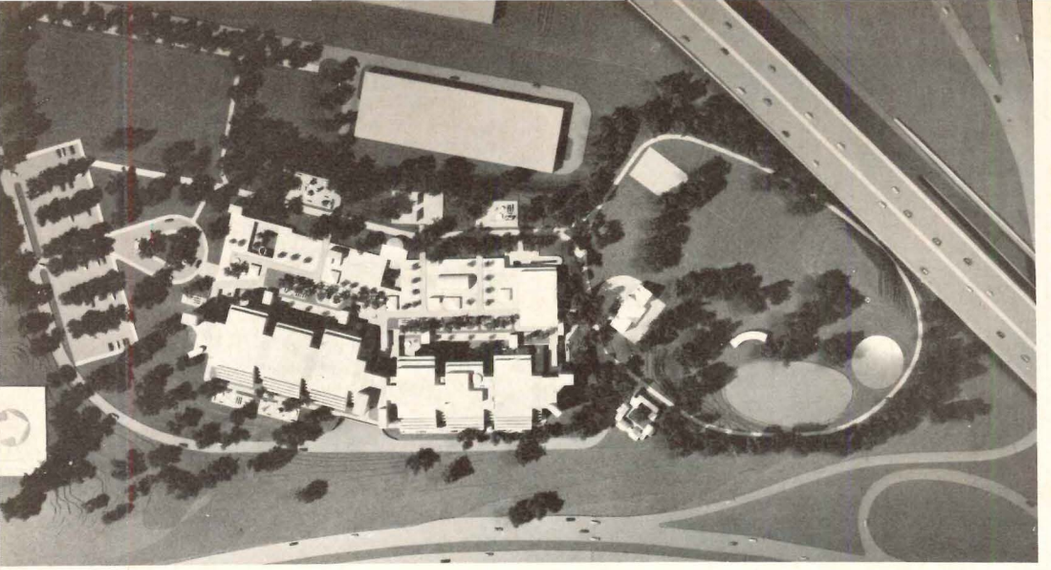
VIGOROUS PLAN FOR AN INSTITUTION

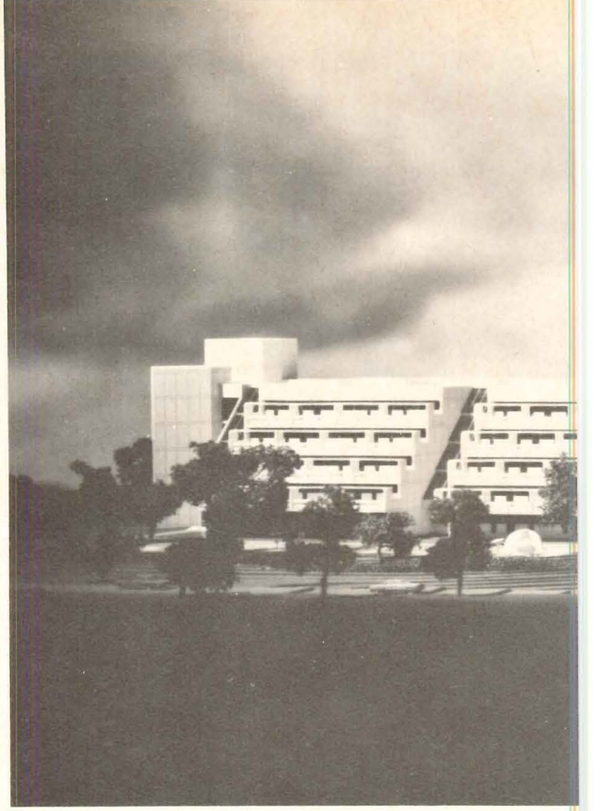
BRONX, NEW YORK

This remarkable facility for 960 retarded children represents a big departure from the usual concept of cottages spread over vast acres of ground—perhaps connected, but yet distinctly isolated. The architects did both program and design, and launched their fresh look with the premise that an urban center might best have a consolidated, multi-story solution. Further studies of circulation, communication, safety, systems and costs made the decision firm, and this complex, highly efficient and urbane structure is the result. It is at the same time a very intimate, free arrangement (based on a basic living element or "house" for groups of 24), which Franzen feels was "made possible by the introduction of mechanical systems such as pneumatic soiled linen disposal, and which were in turn made economically feasible when a vast complex such as this was made more compact."

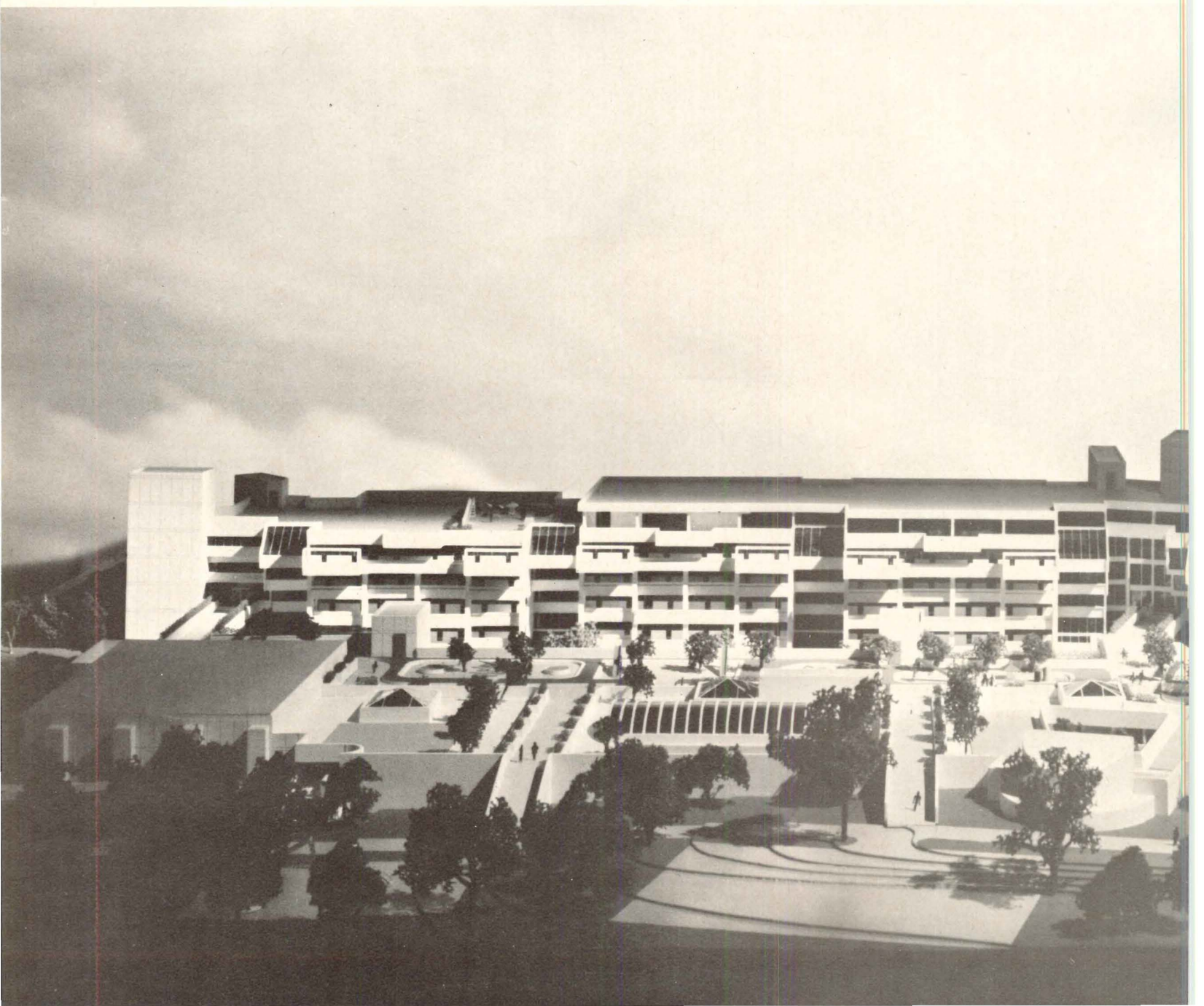
Though a near-hospital kind of institution, the school will be basically therapy- rather than custody-oriented.

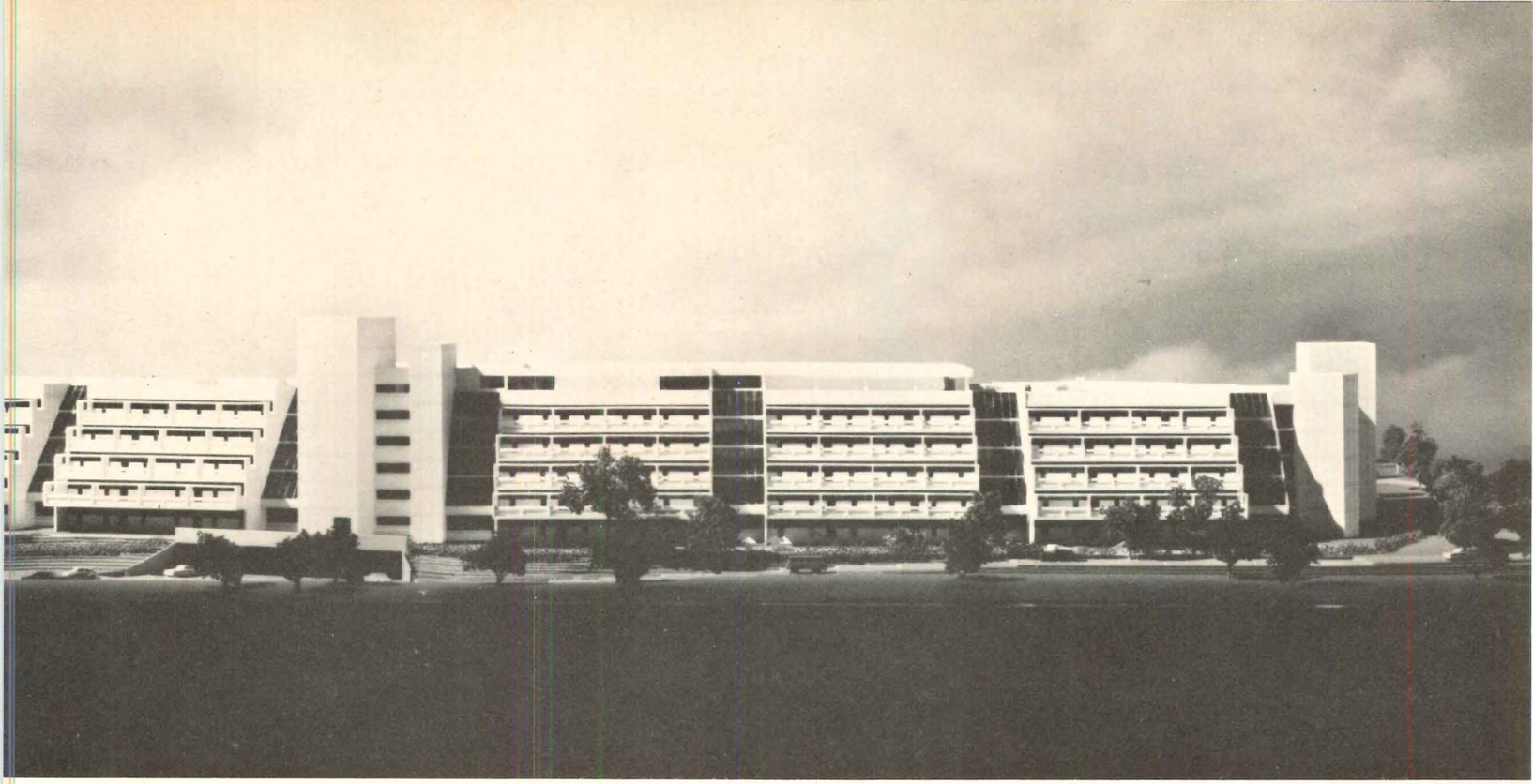
BRONX STATE SCHOOL, Bronx, New York. Owner: *Health and Mental Hygiene Facilities Improvement Corporation, State of New York;* architect: *Ulrich Franzen—Allen Anderson, associate-in-charge;* hospital consultant: *Joseph Blumenkranz;* consulting engineers: *Cosentini Associates;* structural engineers: *Weiskopf & Pickworth.*



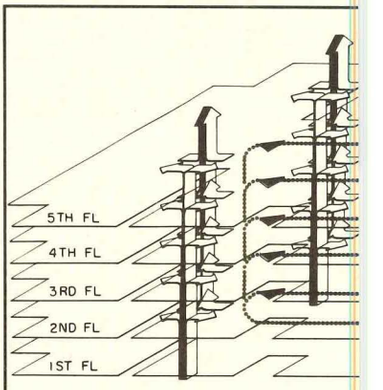


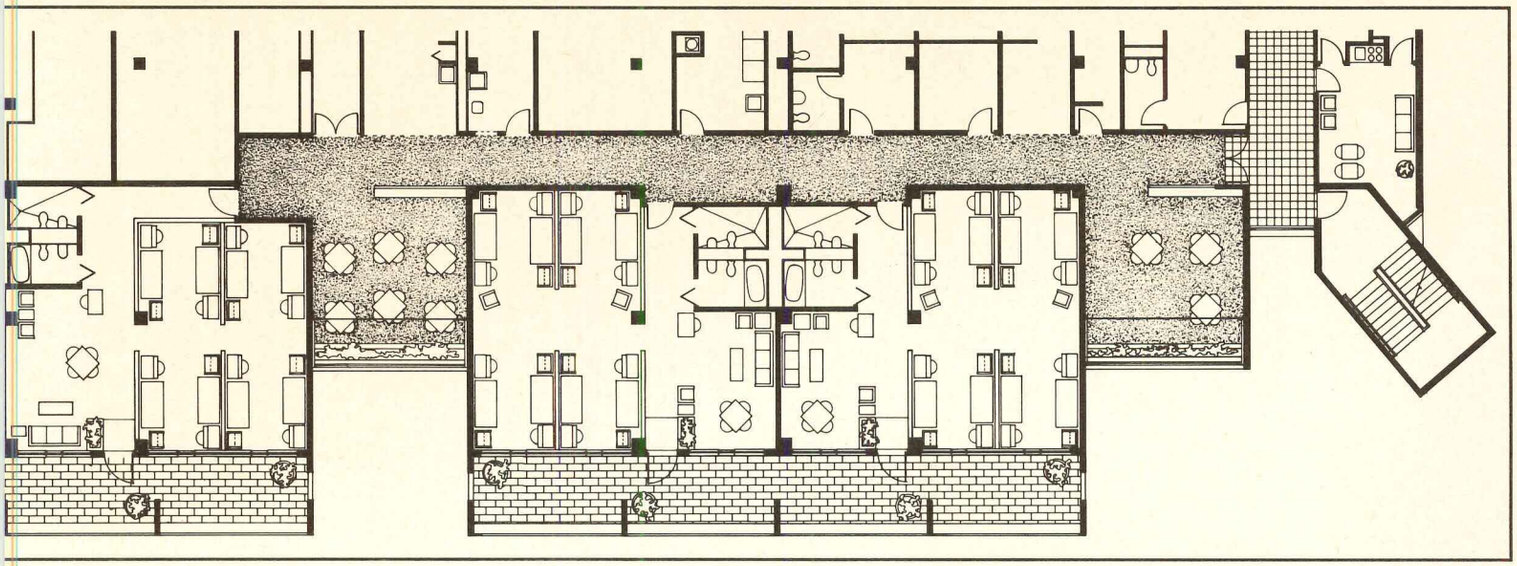
The site for the Bronx State School is a near-island between an industrial zone and superhighways. Thus the facade toward the road is highway scale, to be seen and understood from an automobile. Its inner core is fragmented and human scale—an enormously interesting "main street."

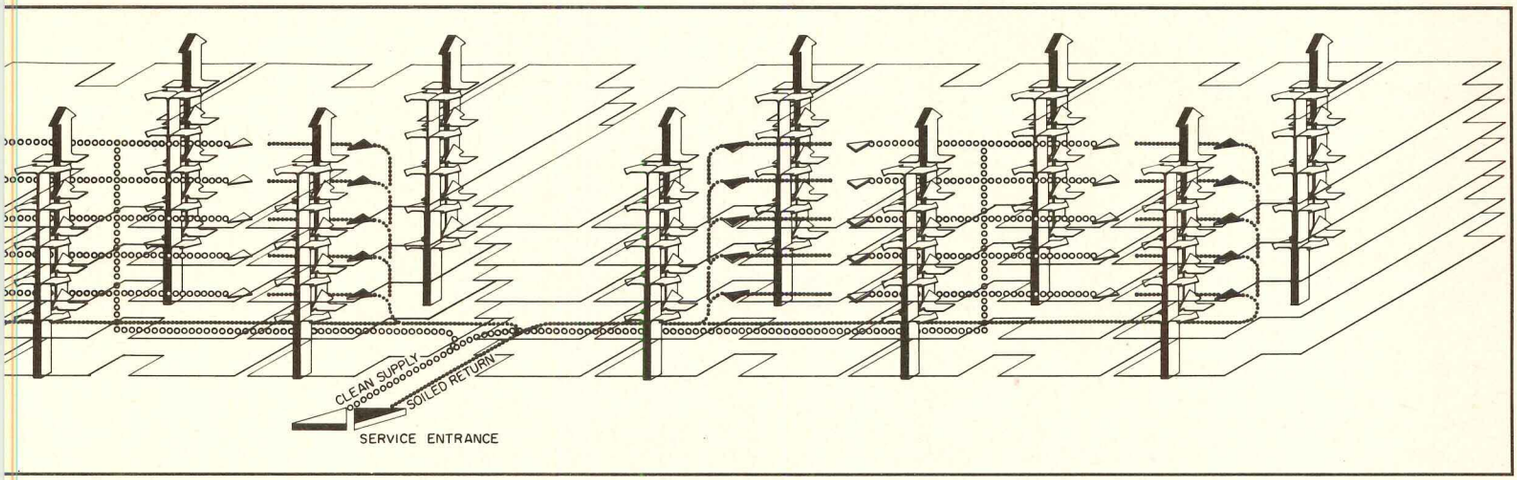


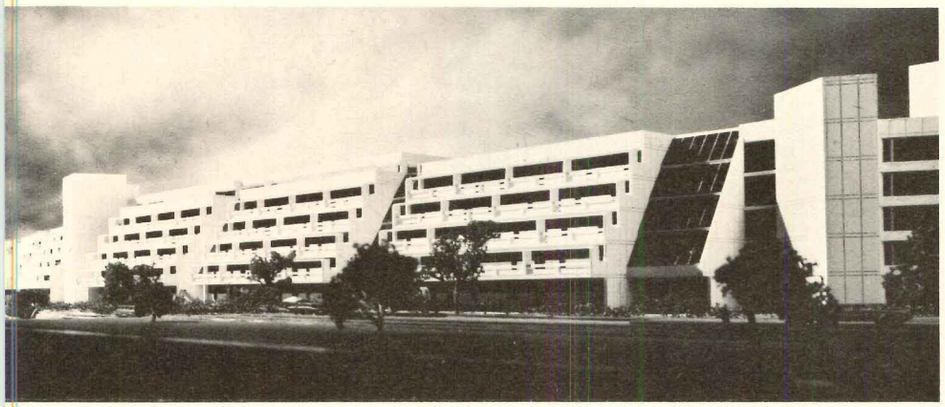


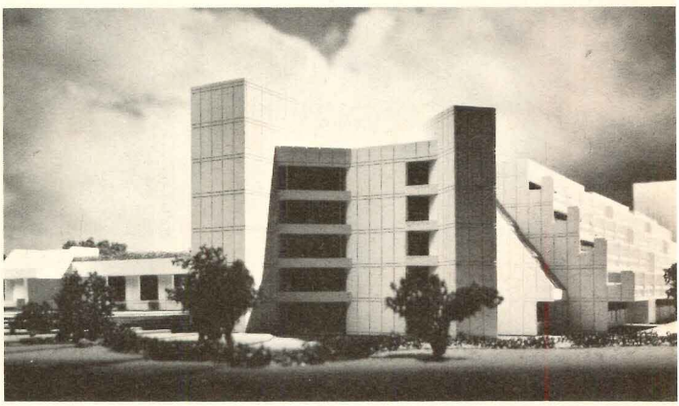
The plan divides the building into two elements: a residential wing along the highway, and a school, therapy and rehabilitation center of equal size. The latter is a terraced and mounded structure adjoining a newly-created high grade on the side where playing fields are located. Great care was taken with the circulation areas. In the rehabilitation center, a kind of interior street was created on each of its two floors, interrupted laterally by planted courtyards and vertically by large sky-lit openings to mark important intersections. By these routes everyone will daily pass shops, movies, the church.

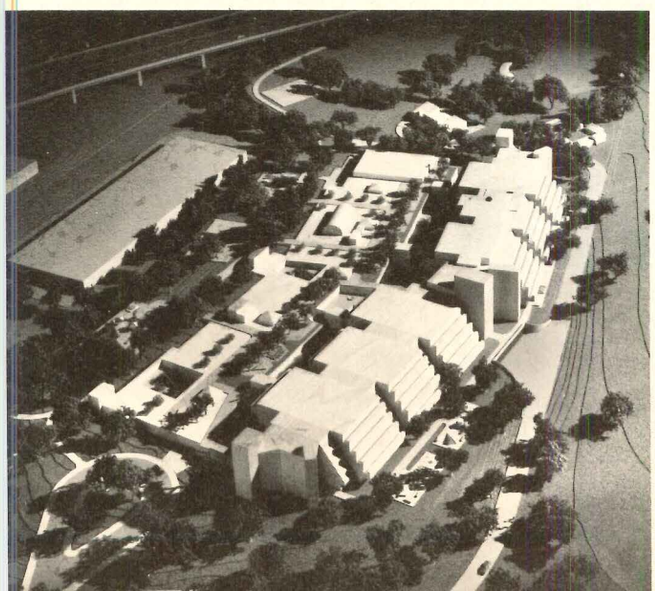




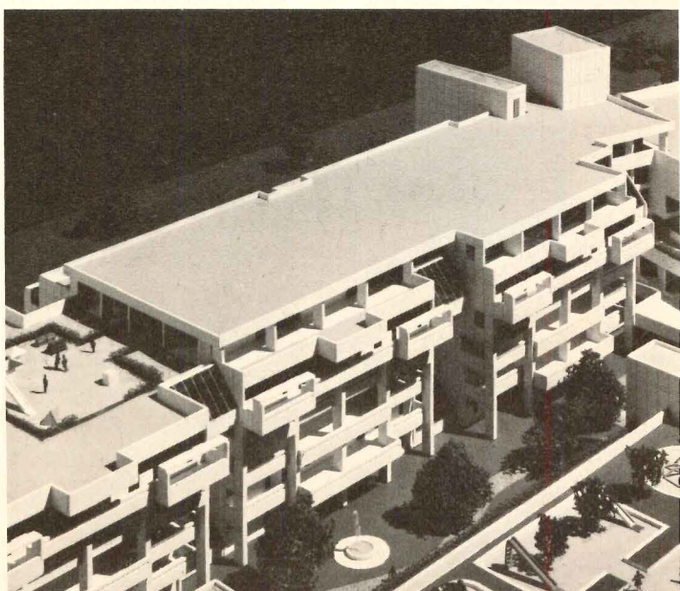








Residents of the school are divided into a "family size" group of eight; single, double or larger rooms will be available with common living indoor and outdoor areas. Three "families" of eight will join to form the basic "house" for dining, recreation, and most of the residential services. All are linked by a complex but neatly developed system of services, diagramed (above). And each element, according to its type and function, is given unusual and articulate expression in the over-all design of the institution. The site beyond the structures has special playgrounds and a hill, a pond, a greenhouse, and a small animal farm.



The landscaped main street for the Bronx State School provides a maximum variety of life experiences for the patients and maximum identity for them and for the staff. Thus an architecture of small elements and fragments is the result—but with a happy, unified feeling.

© Ezra Stoller (ESTO) photos

THE NEW BOSTON CITY HALL

Now complete except for the square, Boston's great new landmark, begun during the administration of Mayor John F. Collins, will be dedicated this month. A triumph for Gerhard M. Kallmann, Noel M. McKinnell and Edward F. Knowles—three comparatively young and, except for Kallmann, unknown architects who, in 1962, won the chance to build it in a national competition—the Boston City Hall will increasingly become the focus of wide-spread interest and will be evaluated from many points of view.

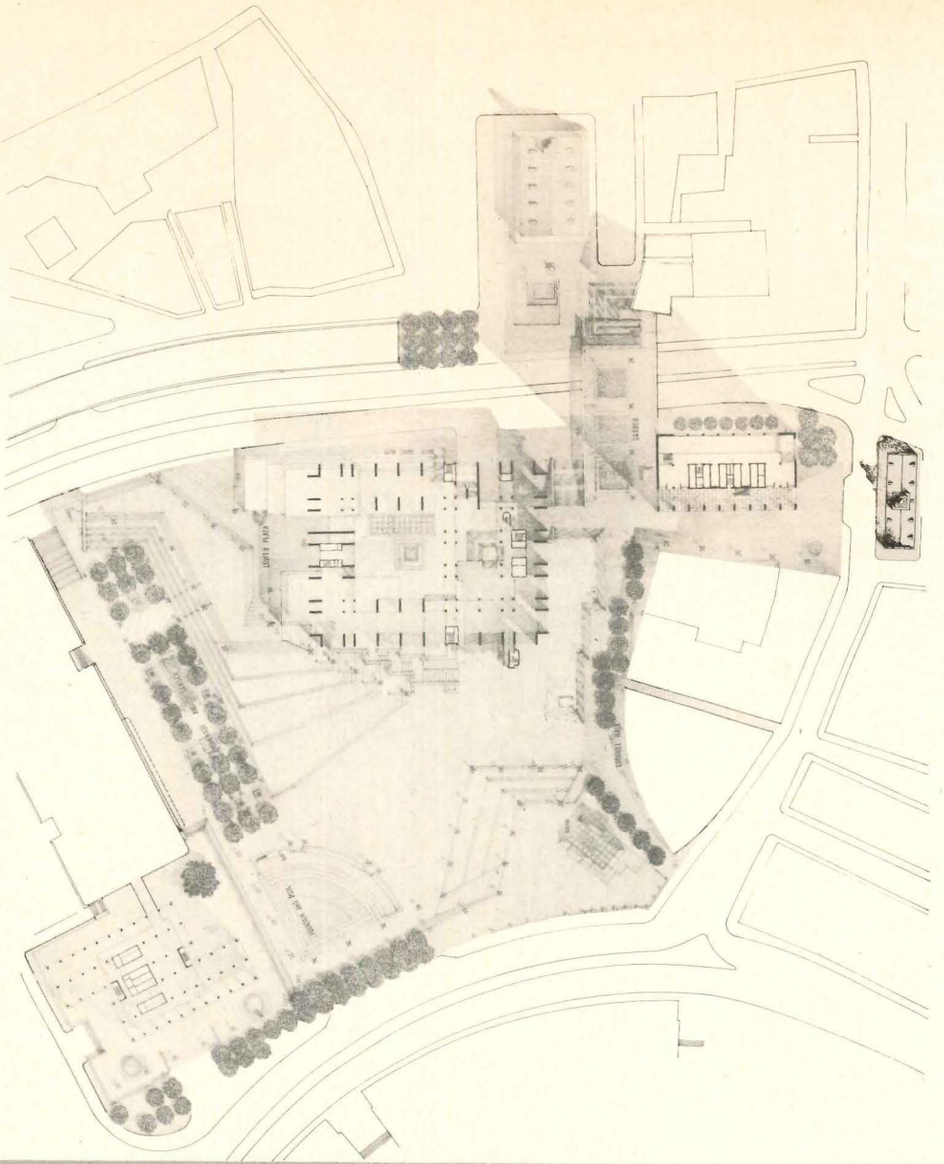
Those who may be perplexed by the building can be grateful to Kallmann, the eldest member of the team. Some years ago he produced a number of speeches and manifestos, establishing the philosophical, ethical and stylistic criteria by which his work, when he would eventually get some, could be interpreted, understood and judged. The writing of manifestos, as everyone knows, had been almost a daily activity for the founders of the modern movement —masters whom the most gifted young architects quite naturally hope to supplant—but for Kallmann's generation it was a lost art. His was almost a solitary voice because he was among the first with something new to say. Born in Germany in 1915, and like the English-born McKinnell, British-trained, he was known to the British and American architectural avant-garde as a brilliant spokes-

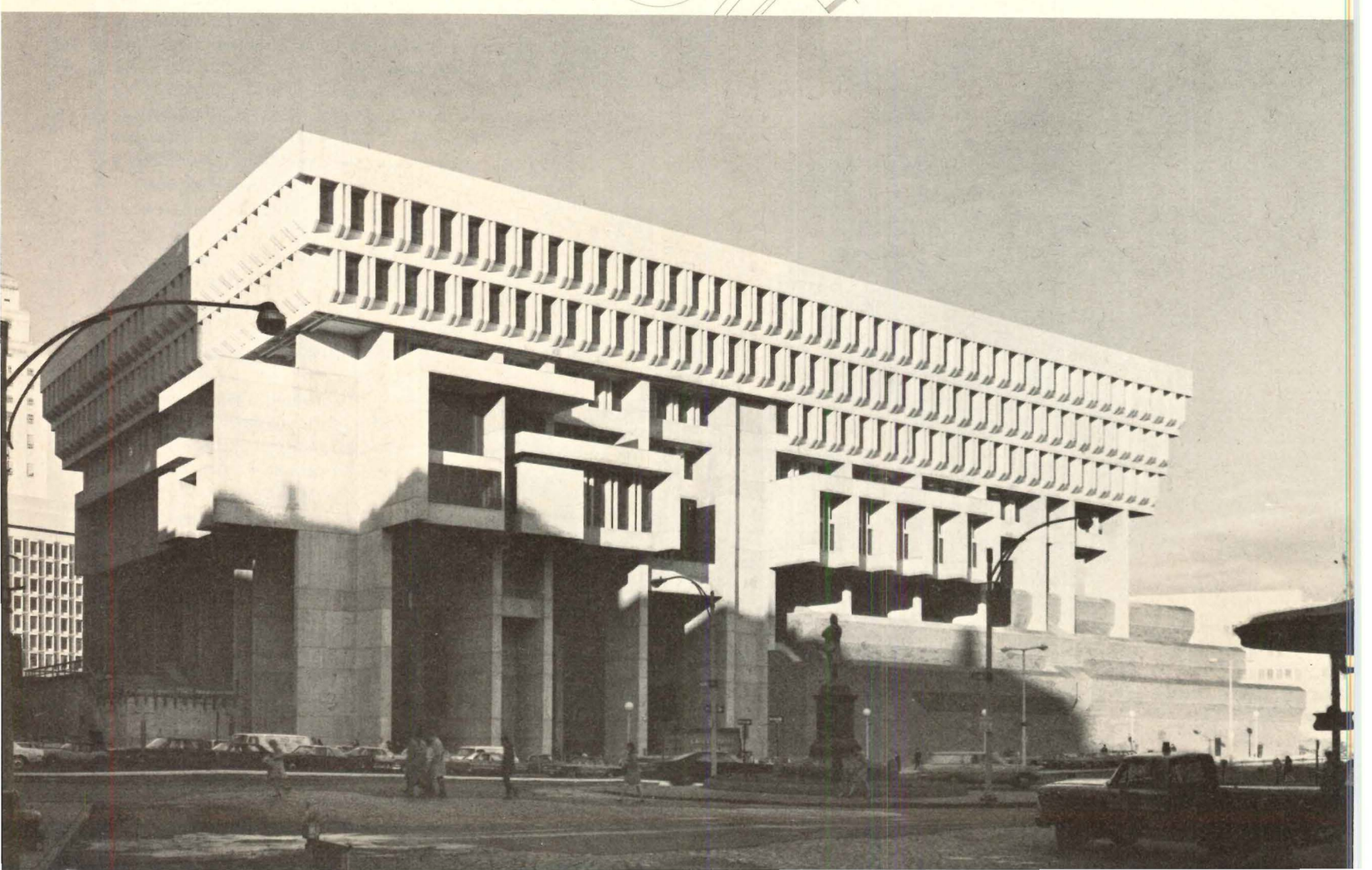
continued on page 144

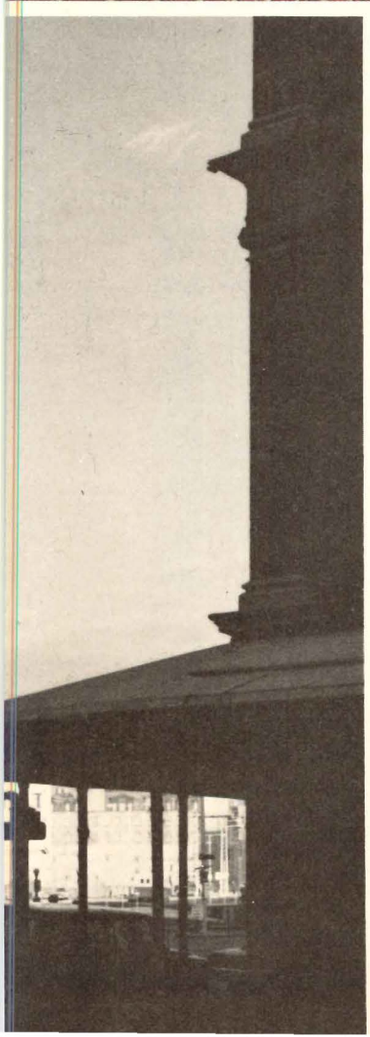
City Hall Square, comparable in scale to St. Mark's Square in Venice and St. Peter's Square in Rome, is essentially a trapezoid with two curved sides. The Boston City Hall architects, Kallmann, McKinnell & Knowles, have treated the square as a great brick plane on which people move—into and through the public spaces of City Hall, across to the raised podium of the Federal Office Building, or down by means of broad steps to Faneuil Hall (shown at the top of the site plan and in the photographs) and beyond to the old Quincy Market and the waterfront area. The south facade (shown on the preceding page) will face a secondary square which is to provide a setting for a new office building now complete and the Old State House (as shown in the drawing).

The projecting hooded elements (shown in the photograph below) mark the mayor's corner suite and the municipal library. This facade has been designed to eventually form an effective visual enclosure to Dock Square. The interconnecting bridge shown in the drawing has not yet been built. The mound at the left in the photo (opposite right) is a subway kiosk.

The basic volume within which the City Hall could be designed, and its specific location, had been determined in a master plan for the entire Government Center urban renewal area prepared for the Boston Redevelopment Authority by I. M. Pei Associates.

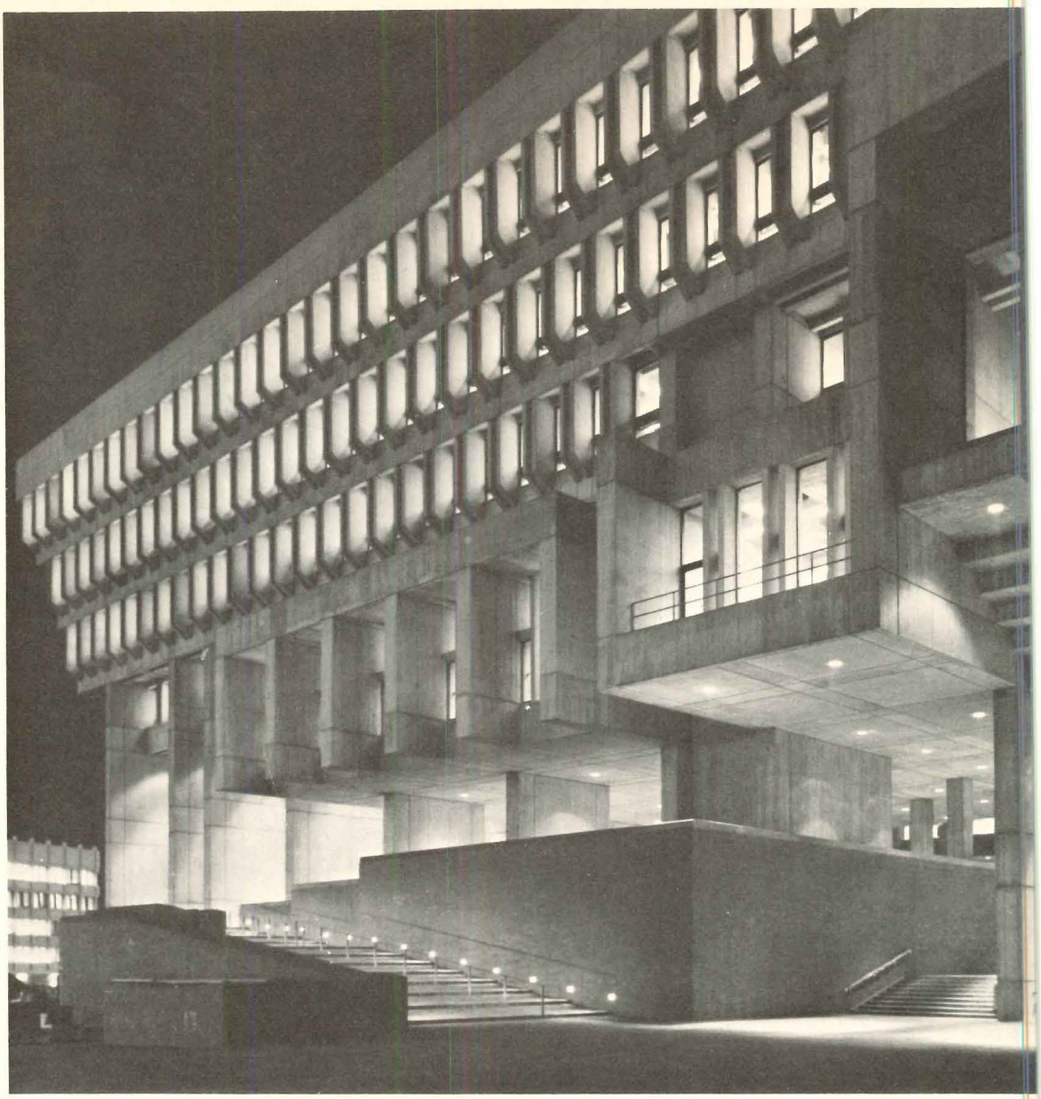


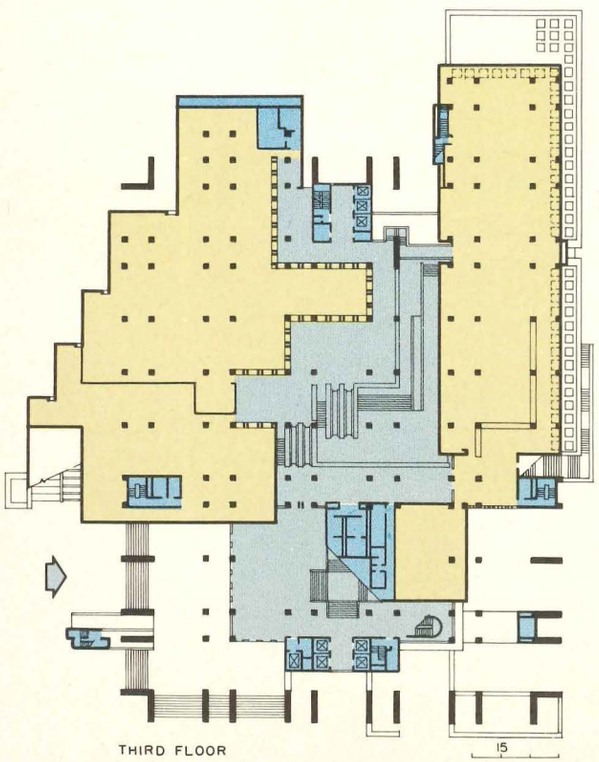


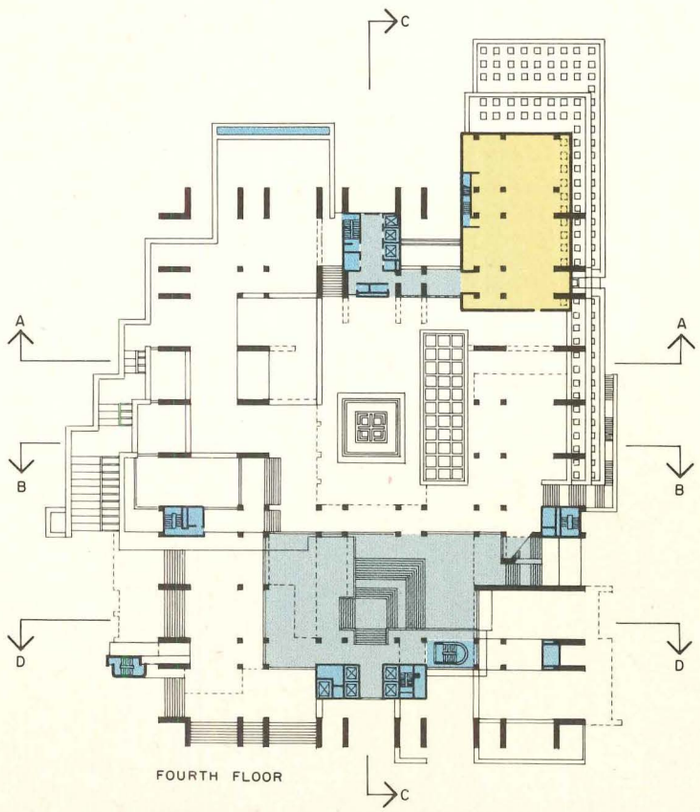


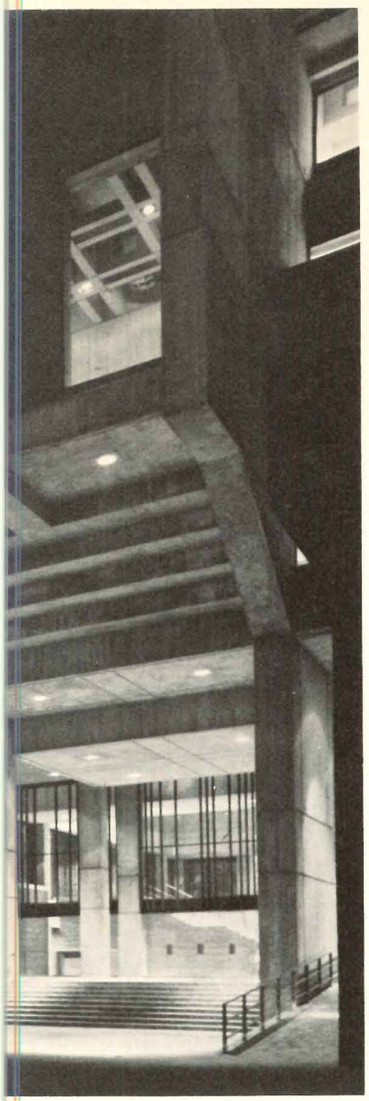
The spatial organization of Boston City Hall is highly complex. The site slopes downward and the first two floors within the brick mound are partially buried in the hill. The two lower floors (not shown) contain mechanical and computer spaces, central files, a garage and office space. The building's secondary entrance to the north is on the second floor, and from here the concourse moves upward by means of ramps and escalators to the third floor or mezzanine areas and to the principal entrance at the southwest corner. On the second and third floors are the services used by large numbers of citizens. The south entrance provides access to the ceremonial spaces—the mayor's suite, the council chamber, the councilmen's offices and the municipal reference library—all of which are suspended above the interior court. The court itself, on the fourth level, is an extension of City Square and is open to the sky and to all four exposures. The hooded projections in the photograph (right) express the council chamber and the councilmen's offices. The top floors contain office spaces requiring a minimum amount of public traffic.

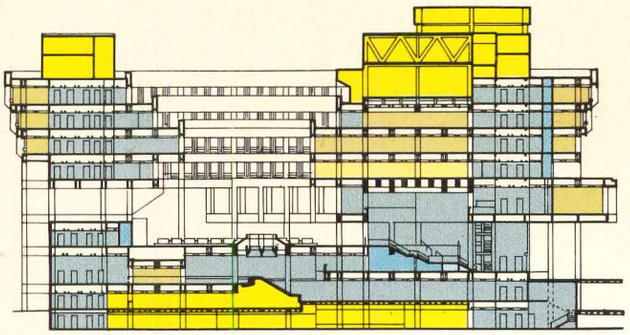
The completed City Hall bears a very clear resemblance to the winning design because the space requirements, circulation and adjacency patterns prepared by the space planning firm of Becker & Becker and made part of the original competition program were quite thoroughgoing and realistic.



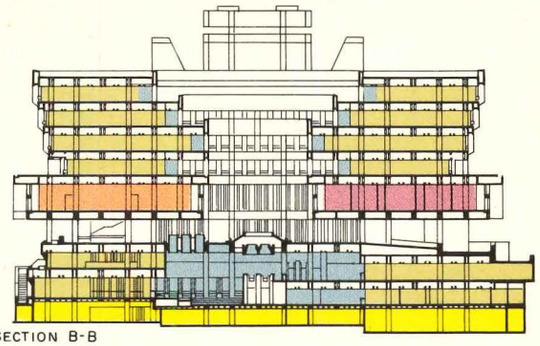








SECTION C-C



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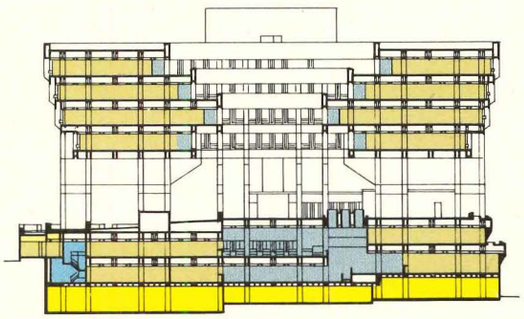
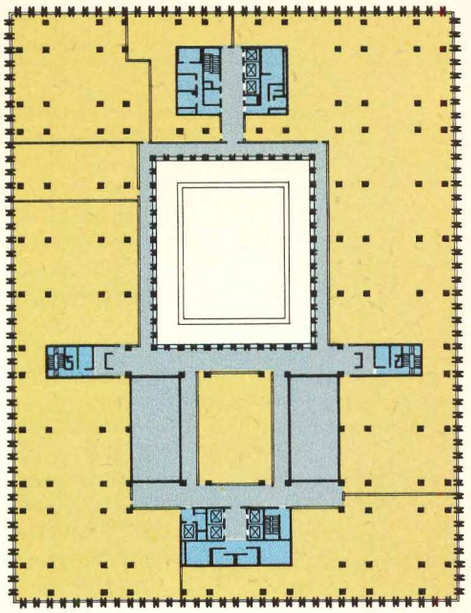
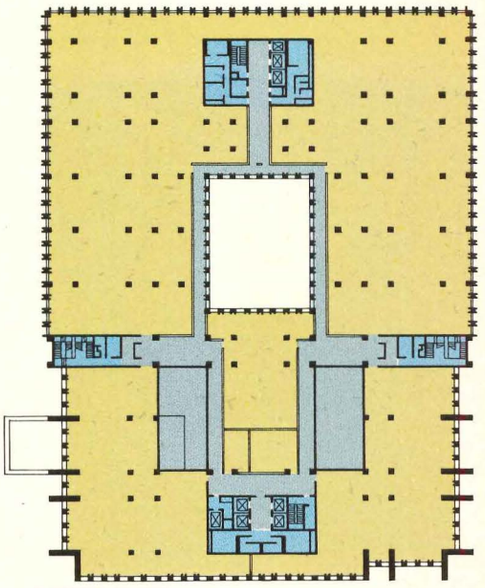


SECTION A-A



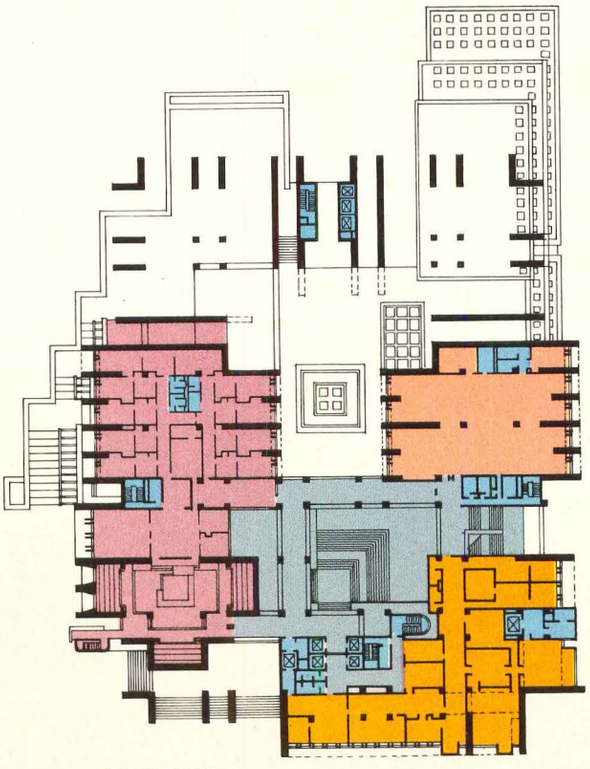
EIGHTH FLOOR



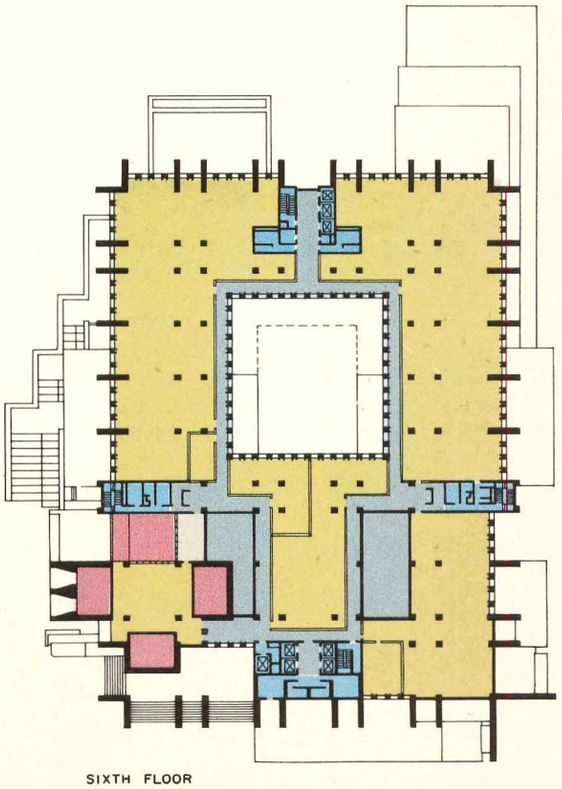
SEVENTH FLOOR

LEGEND

- Service cores
- Office Space
- Symbolic space and/or public circulation (enclosed)
- Department of the mayor
- Municipal reference library
- Department of the city council
- Mechanical equipment, data processing and garage



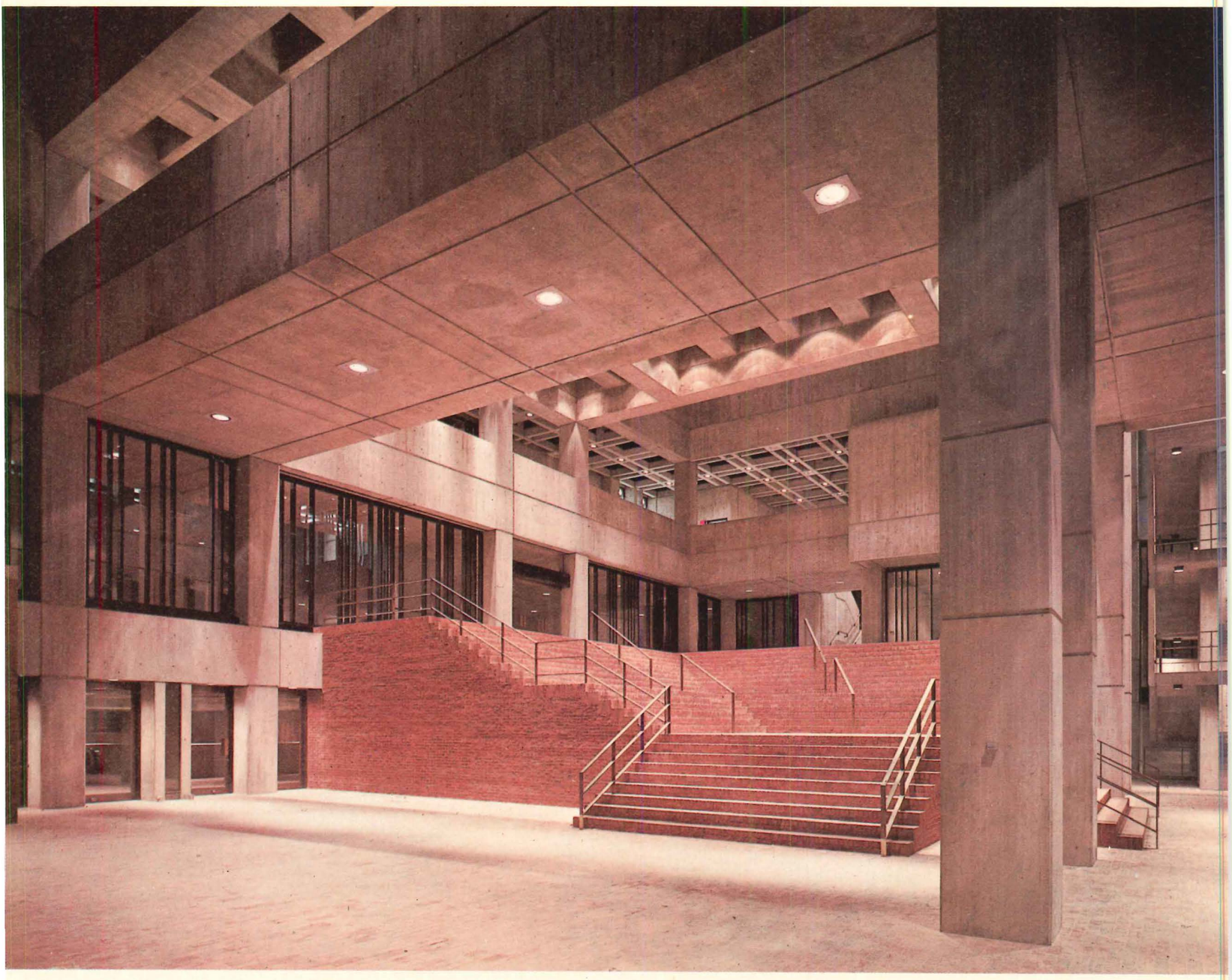
FIFTH FLOOR

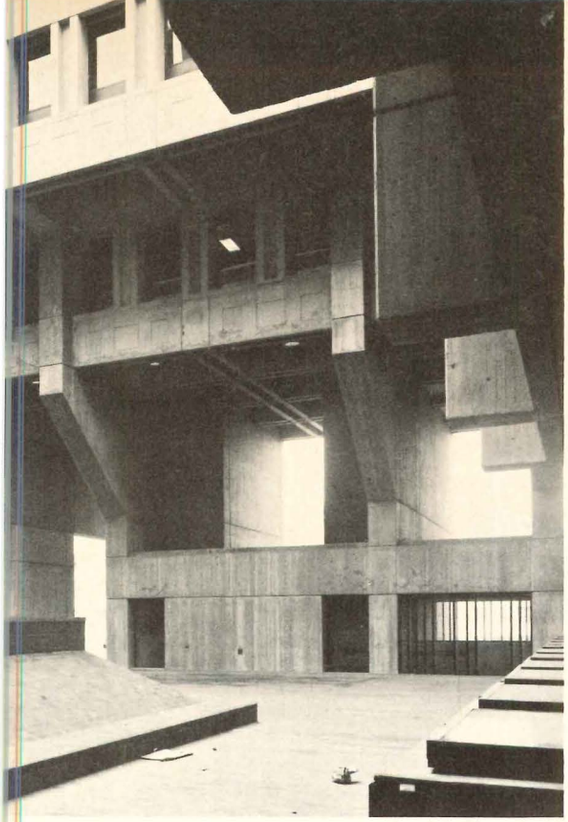


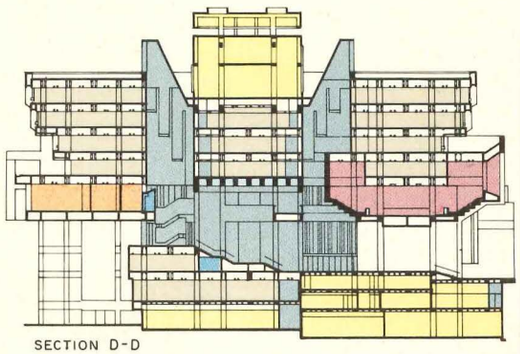
SIXTH FLOOR

The south entrance hall is the principal interior volume which links spatially all of the elements of the city government. Its light shafts (one of which is shown in the two pictures at right) extend upward to the full height of the building. The brick stair (shown below) is an extension of the brick-paved City Square, and takes the form of an amphitheater. From its upper level it offers views of Washington Street, the Old State House, Dock Square, Faneuil Hall, Quincy Market and the harbor beyond. It also gives access to the inner terrace and court (right) which is an elevated extension of the City Square and is linked to it and to Dock Square by ramps and stairs. The architects point out that the inner public court epitomizes the concept of openness and accessibility that generated the design of the City Hall. To be open day and night, it allows the citizen to walk through and be part of his City Hall without once opening a door.

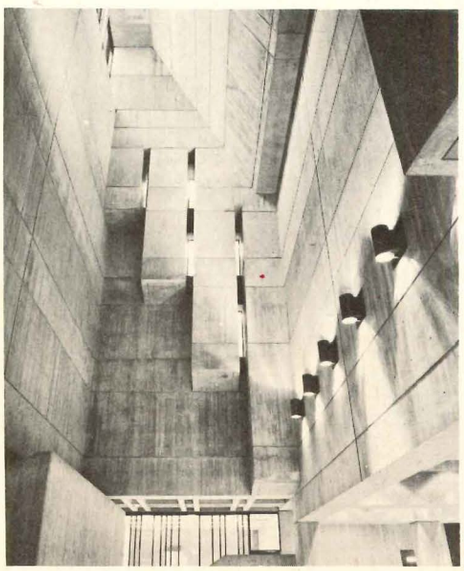
Lili and Todor Gorchev

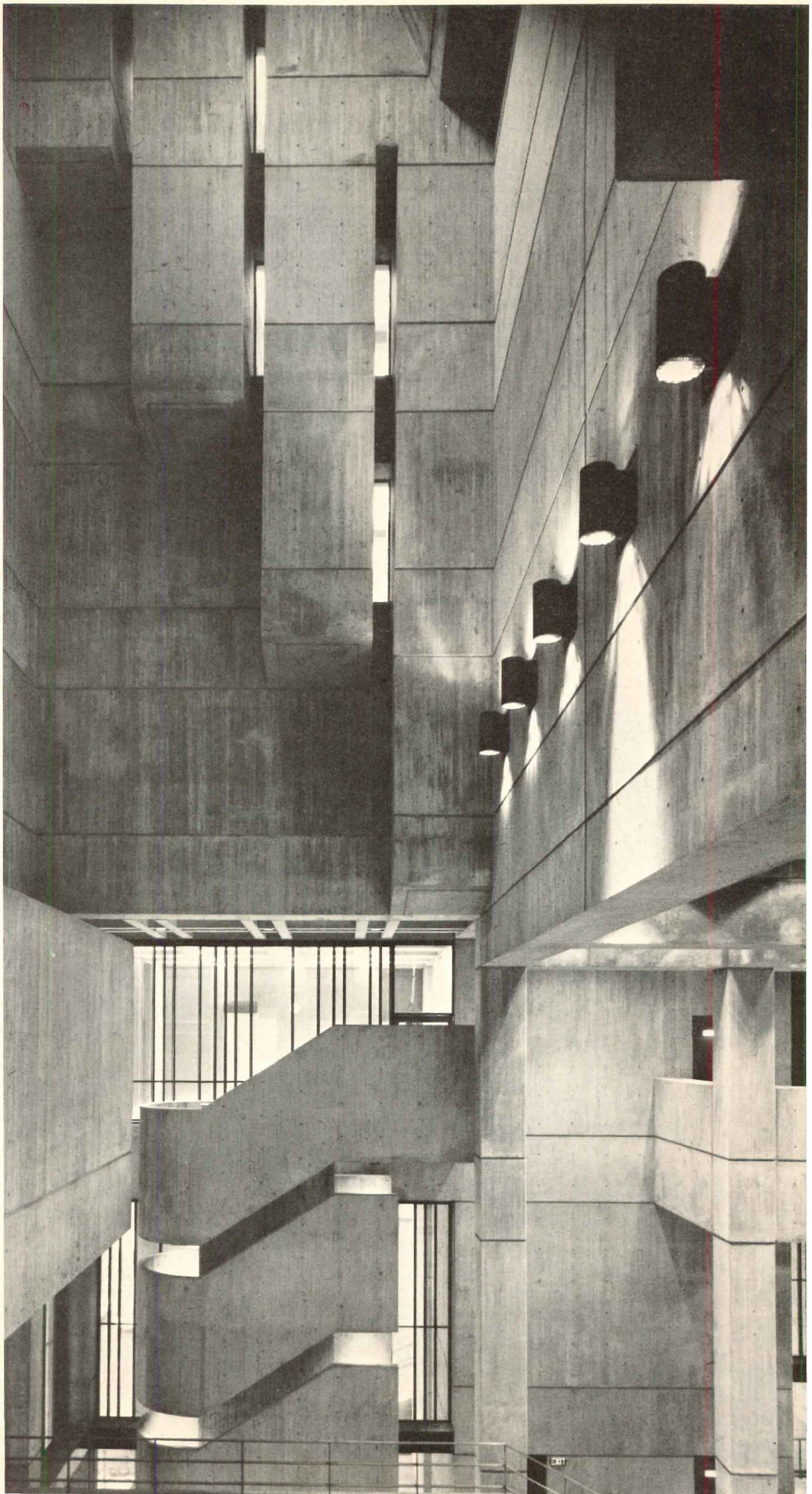




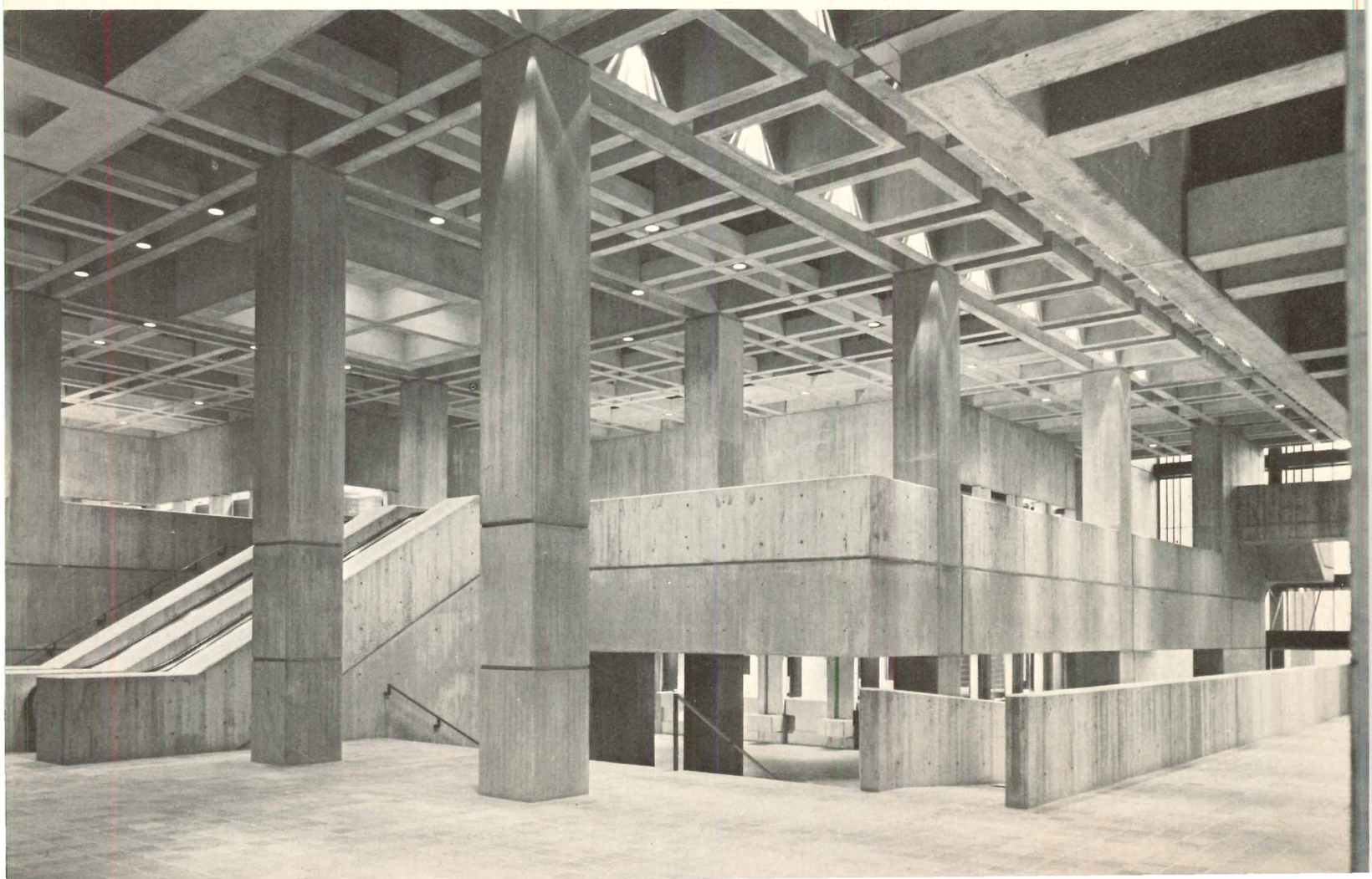


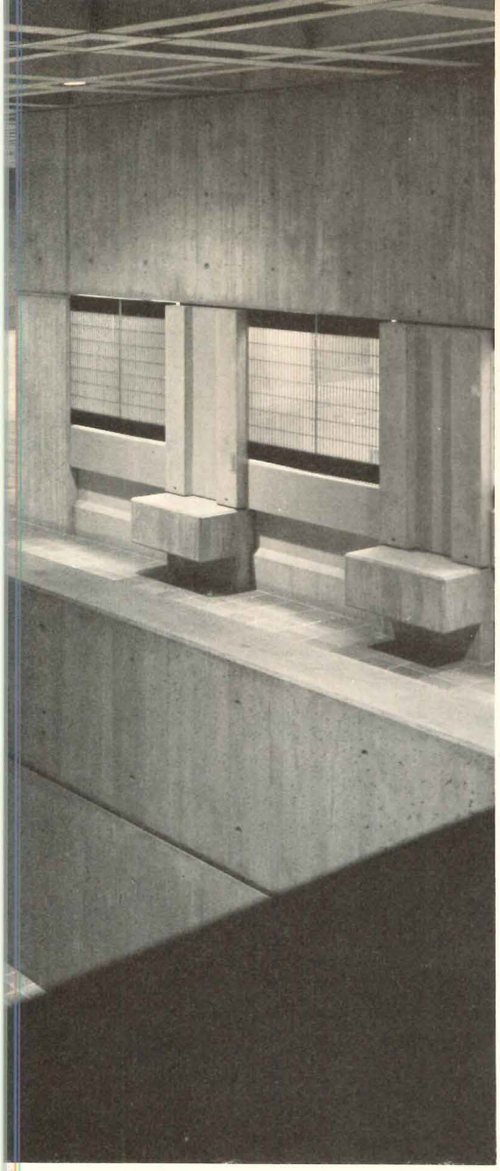
SECTION D-D

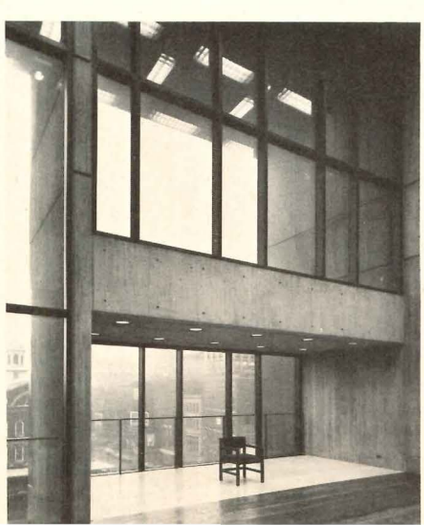




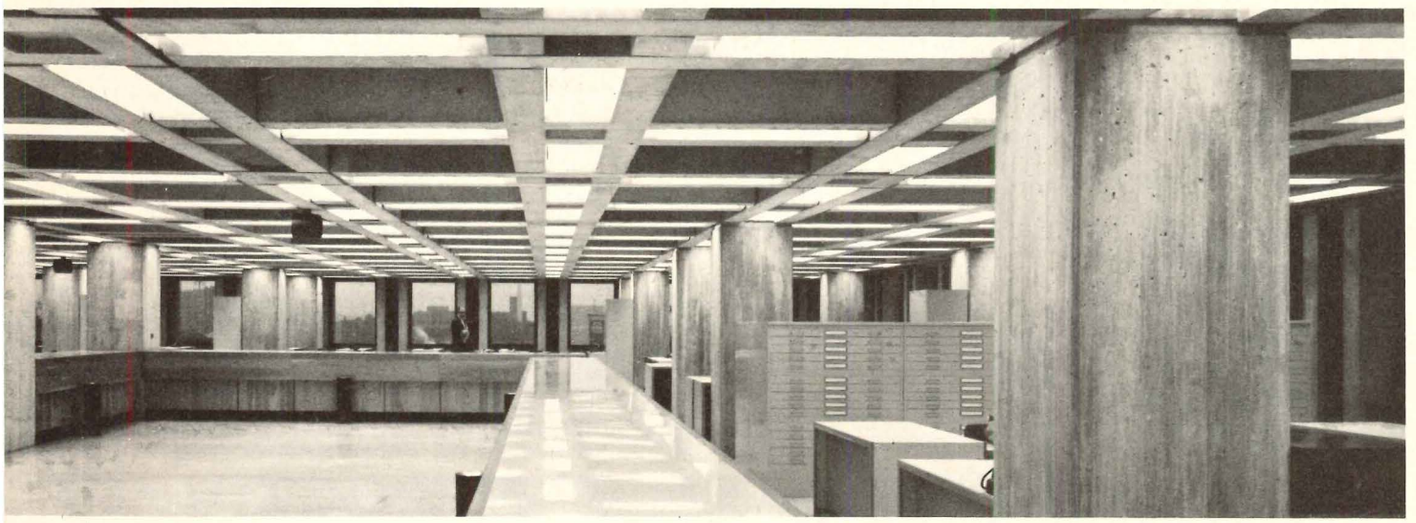
The concourse (shown below and at right) is entered from the north at a lower level. It provides generous lobby spaces interconnected by escalators, ramps and broad staircases for the 5000 persons who will do business there each day. Placing the most heavily used areas close to the ground in the building's brick-clad base has considerably reduced the number of elevators which the City Hall would otherwise require. The building will be newly furnished throughout. All movable furniture and built-ins have been designed or selected by ISD Incorporated, the interior design consultants. According to Louis Beal, executive vice president of ISD, the designers strove to select furnishings which could not be overpowered by the rugged monolithic character of the surroundings. At the same time, however, their choices were limited to furniture which could be obtained by publicly advertised competitive bid at prices which would be most advantageous to the city. Where possible stock or standard furnishings were used, and adapted where necessary to improve appearance and durability. Typical interiors include custom-built desks of which more than 1300 were made. The only major interior not to be designed by ISD will be the mayor's office (small photo). The new mayor, Kevin H. White, has elected to decorate his office in a traditional manner.

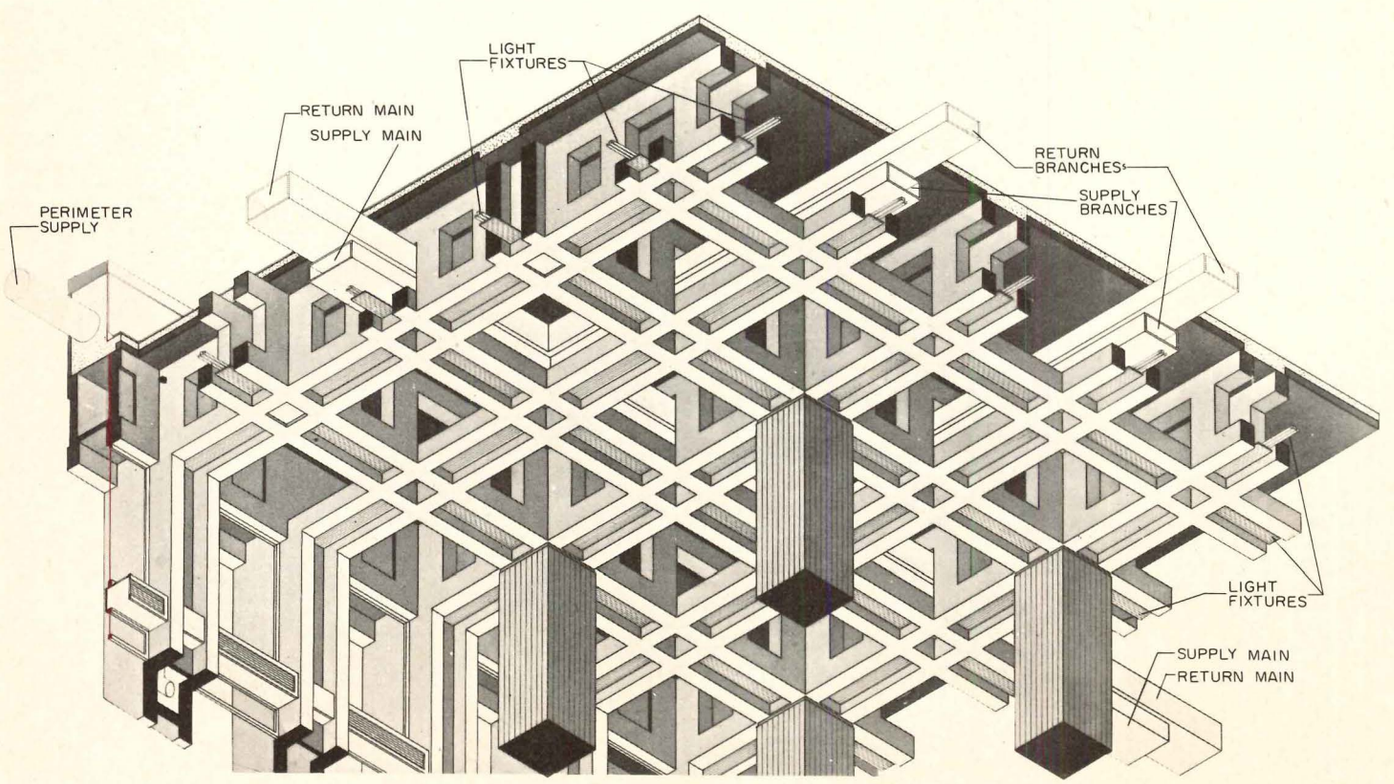




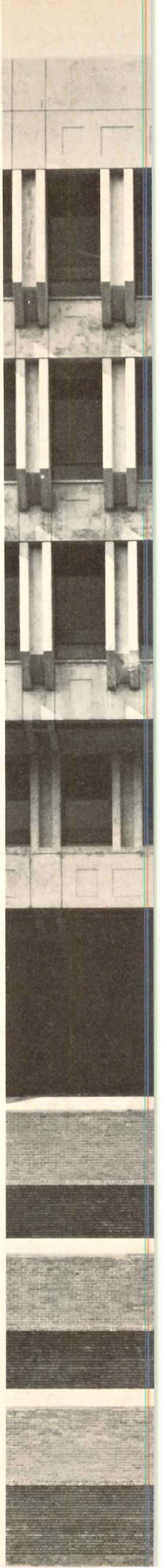


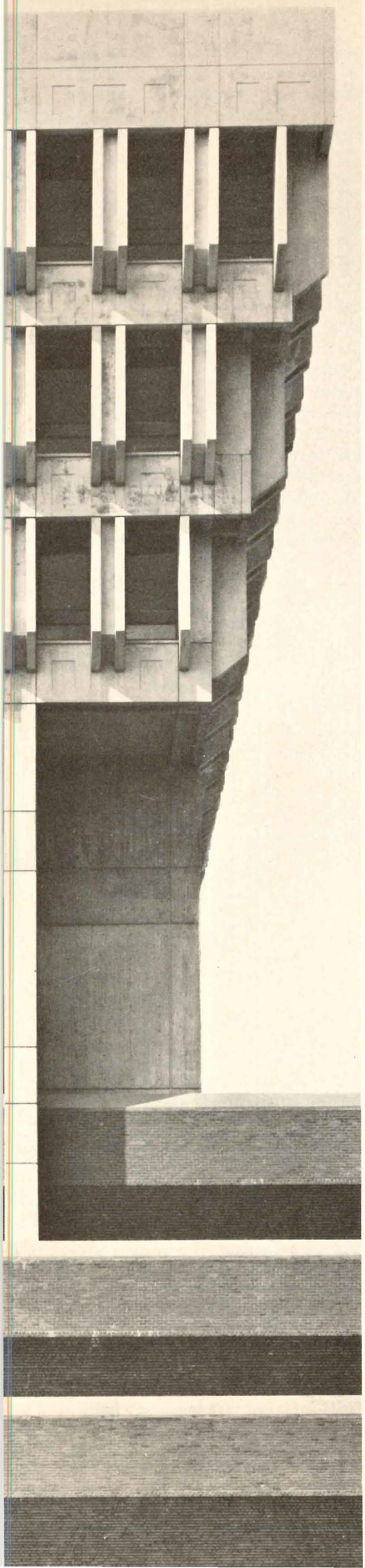
The structural system consists essentially of poured-in-place concrete columns and cores, precast concrete Vierendeel trusses, and precast non-structural members which carry the light fixtures and ducts. The structural bay is 14 ft-4 in. square with columns at 14 ft-4 in. or 28 ft-8 in. Modules are 4 ft-6 in. and 2 ft-8 in. General office floors have a clear height of 8 ft-6 in. below a structural depth of 5 ft. Mechanical equipment consists of a central modular duct system which passes horizontally through the truss openings and vertically at the cores. A perimeter induction unit system at the windows is fed vertically from the roof through precast exterior fins, as shown in the detail (opposite page right).

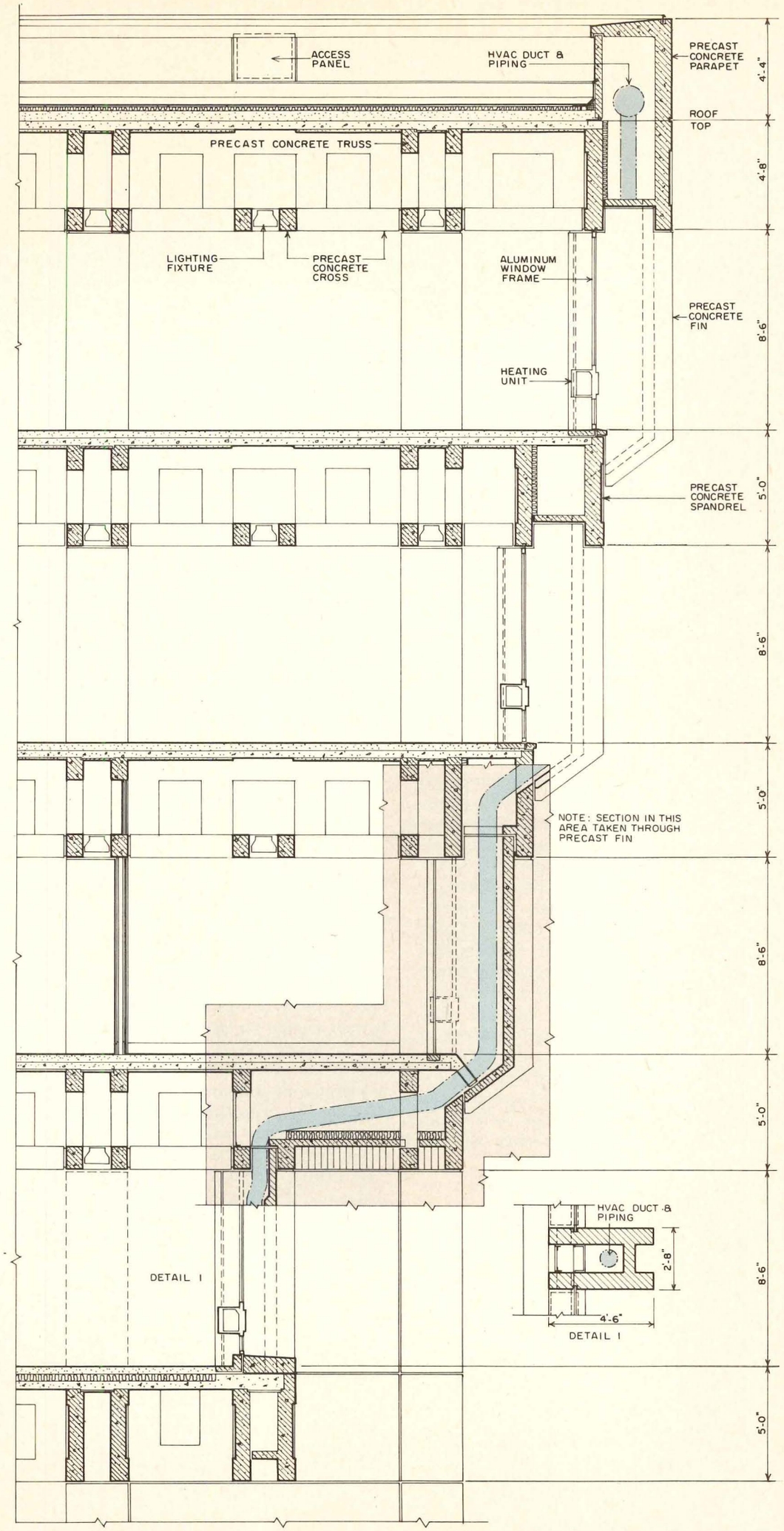




Lili and Todor Gorchev






ACCESS PANEL
HVAC DUCT & PIPING
PRECAST CONCRETE PARAPET
4'-4"
ROOF TOP
PRECAST CONCRETE TRUSS
4'-8"
LIGHTING FIXTURE
PRECAST CONCRETE CROSS
ALUMINUM WINDOW FRAME
PRECAST CONCRETE FIN
8'-6"
HEATING UNIT
PRECAST CONCRETE SPANDREL
5'-0"
8'-6"
NOTE: SECTION IN THIS AREA TAKEN THROUGH PRECAST FIN
5'-0"
8'-6"
5'-0"
DETAIL 1
HVAC DUCT & PIPING
2'-8"
8'-6"
4'-6"
DETAIL 1
5'-0"

In a lecture entitled "Experimental Architecture" given at the 46th Paris Prize dinner three years before he and his collaborators won the Boston City Hall competition, Kallmann discussed the two new movements which were to shape their work: ". . . there do exist design processes which seek to arrive at architectural coherence by means of images revealed in the process of discovery. They are explorative of potential patterns of certainty and proceed experimentally into the unknowable for what it may be worth. For the contemporary eye finds meaningful fluid images, not instantaneously created and absolute, but in the process of trending . . . the finite form conceived in terms of the solids of classical physics has lost its power. It cannot anymore evoke a believable universal order such as the Platonic and Neo-Platonic era understood to exist. Today's experimental attitude is interested no longer in simple form against a void but in continuous patterns of interrelatedness. Two directions in which this search is proceeding interest me most. They are both experimental in that they are not establishing closed systems but are open about the possible results. One trend [the brutalist] is toward a deliberate, starkly physical embodiment of architecture, sometimes in brutal head-on collision of parts and untamed by any superimposed order of things in the rational manner. The other trend [the compositional rigorist] is towards a rigorous thematic construction of all space following severe laws of topology, in which geometric or organic spatial sequences are manipulated within defined rules." Editor's note: Topology, in the mathematical sense of the term, transcends the simple geometries which control most architectural composition and concerns itself with the continuous transformations of surface. In its definitions a brick is the same "shape" as a billiard ball since it is an unpenetrated solid, and a phonograph record is the same "shape" as a teacup since it is a continuous surface with one hole.

continued from page 133

man for the then-emerging "new brutalist" and "compositional rigorist" canons of design. (See box.) Brutalism's strongest influence has been Le Corbusier, while Louis Kahn has led the rigorists. These partially contradictory yet overlapping approaches both provide major segments of the conceptual framework for the Boston City Hall. The latter approach is dominant. Whereas brutalist work, in Kallman's view, is eccentric, violent and anti-rational, the compositional rigorist strives for the structural and mechanical coherence and logic which lends such power to the spaces of the City Hall.

The paths of movement across the great square and into and through the astonishing interior spaces of Boston City Hall are topologically ordered. The intensified spatial experience has been created by the fracturing of static, contained architectural form. Space breaks out beyond the building boundary, shatters the classical contained volume, dissolves outlines and reaches toward new relationships and unities. The effect is overwhelming, but those who would dare to call it beautiful should use the word with care. Kallman was one of the first to point out that the new architects, including himself, are "contemptous of agreeable and acceptable esthetic effect. [The new trends] are expressive only of the process of their genesis; they communicate fundamentally only the manner of their own making, and they do not declare themselves in terms other than those of architectural actuality. . . . It appears [that thus is ending] a phase of over-much gratification of the desire to please, and that an architecture more stern and less sensorially directed is in the making." [1]

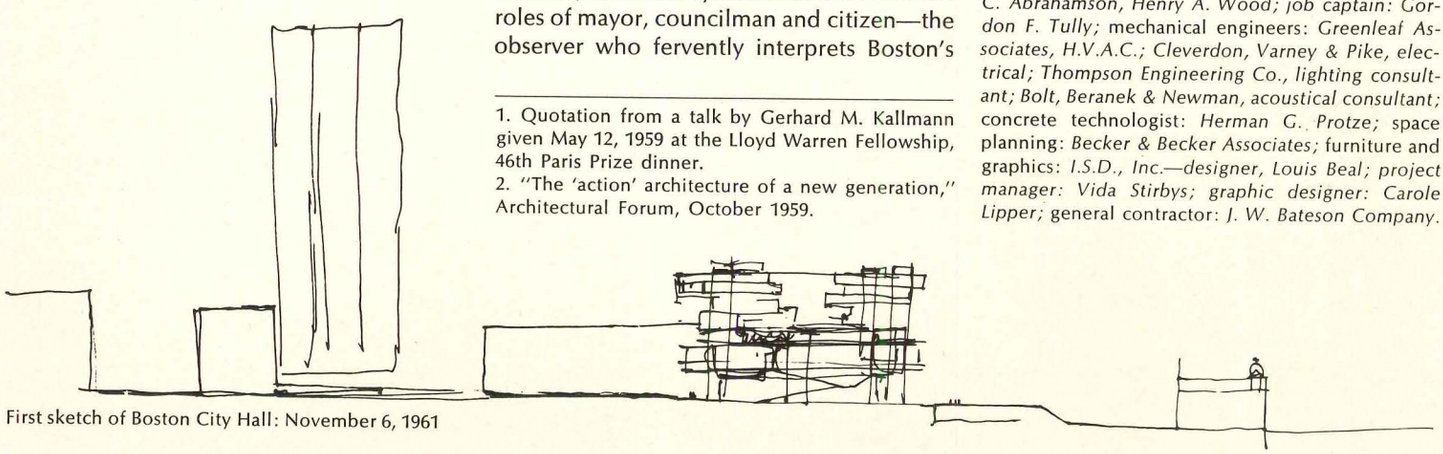
Not only has the sensuous been eliminated as a principal esthetic element in the design of Boston City Hall, but so has deliberate interpretation of humanist content. Further, neither the building nor any part of it is symbolic in the classical sense. Kallmann and McKinnell consider their building "a celebration of government" but in a newly symbolic way that derives its strength from function, program and structural logic. Although the functions of government receive clear physical articulation from within and without, as do the symbolic and ceremonial roles of mayor, councilman and citizen—the observer who fervently interprets Boston's new landmark as "architecture for the people" in a positive, comforting or peaceful sense fails to grasp the building's grand neutrality. It is architecture for the people to the degree that it will probably encourage some new kinds of interaction between them and their government, but whether this interaction is good or bad in a given case will depend on one's personal point of view. Fortunately—unlike the scaleless indistinguishable boxes typically built to house government today—the Boston City Hall, like most great works of architecture, is a splendid, multi-level, random-focus stage for crowd scenes, whatever the intent or performance of the crowd.

The architects of Boston City Hall have certainly created an "architecture for the people" in a philosophic and ethical sense. Essential to the brutalist canon is the requirement that its images assert the primitive human reality which the brutalists see existentially as the condition in which modern man, believing himself alone and knowing he must die forever, asks if he really exists. Small elegances and refinements have no place in this architecture, since such are believed to be inappropriate to the human condition, and indeed beneath us, belonging to a world which more of us, and principally the young, are learning to reject.

The architectural assertion of this primitive human reality is marked by an elementary and intense stylization of a kind which by its negation has always marked the beginning and end of artistic movements and has always been a sign of a civilization in revolt against itself. In 1959 Kallmann wrote: "The new architecture in its physical concreteness and firmness of build, strives for a confirmation of identity and existence to counter the modern fear of nothingness." [2] Thus when the Boston City Hall was still only a politician's dream, one of its architects-to-be, with clarity and vigor, laid bare the existentialist roots from which the new building springs. —*Mildred F. Schmertz*

BOSTON CITY HALL, Boston. Client: *Government Center Commission of the City of Boston—chairman: Robert M. Morgan;* architects and engineers for the Boston City Hall: *a joint venture of Kallmann, McKinnell & Knowles, architects; Campbell, Aldrich & Nulty, architects; LeMessurier Associates, Inc., structural engineers—project managers: Robert C. Abrahamson, Henry A. Wood; job captain: Gordon F. Tully;* mechanical engineers: *Greenleaf Associates, H.V.A.C.; Cleverdon, Varney & Pike, electrical; Thompson Engineering Co., lighting consultant; Bolt, Beranek & Newman, acoustical consultant;* concrete technologist: *Herman G. Protze;* space planning: *Becker & Becker Associates;* furniture and graphics: *I.S.D., Inc.—designer, Louis Beal; project manager: Vida Stirbys; graphic designer: Carole Lipper;* general contractor: *J. W. Bateson Company.*

1. Quotation from a talk by Gerhard M. Kallmann given May 12, 1959 at the Lloyd Warren Fellowship, 46th Paris Prize dinner.
2. "The 'action' architecture of a new generation," Architectural Forum, October 1959.

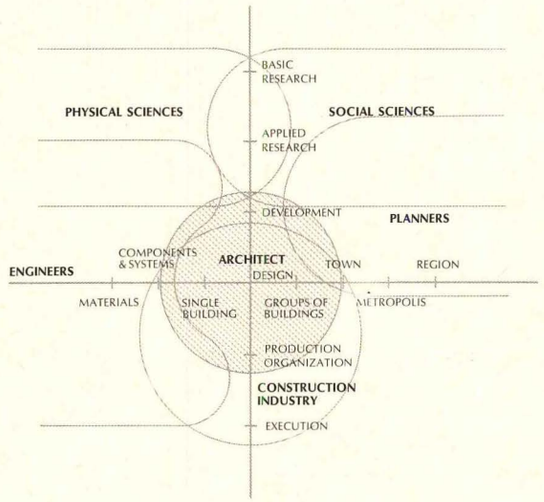


First sketch of Boston City Hall: November 6, 1961

EDUCATING THE PROFESSIONALS OF THE BUILT ENVIRONMENT

by Richard Llewelyn-Davies

If their sphere of interest and action seems certain to expand in all directions, does this mean that future architects should be educated as generalists or as specialists? What skills will a future architect need? What "tasks" will he perform? This article suggests some of the possible alternatives to searching for answers to unanswerable questions in the development of an architectural education for tomorrow.—J.M.D.



What are the professions, industries, and sciences concerned with the built environment—those responsible for studying the environment, developing new methods for achieving society's goals, designing buildings, towns and cities and finally for carrying through these plans to execution? And how do they interact?

The drawing is an attempt to show their spheres of interest. The vertical scale on the diagram shows the sequence from basic research, through applied research and development, to design, followed by production and execution. The elements which have to be studied, designed and made vary in size from simple building materials, such as the brick, through components and systems to single buildings, groups of buildings, to towns, to the great metropolis and the region. This sequence constitutes the horizontal on the diagram. Using these horizontal and vertical scales, it is possible to place the spheres of activity of the various sciences, professions and industries in relation to one another.

Such a diagram is, of course, highly subjective. It is drawn from the point of view of architecture, which is therefore placed in the middle, with the other professions and sciences shown in relation to the central role of architecture. Equally valid would be a similar diagram drawn from the point of view of any of the other professions or sciences.

As we work toward integrating education for the professions dealing with the built environment, different approaches must be expected, depending on which particular professional group initiates a program of integration. The initiating discipline will naturally place itself in the middle, and integrate with a balanced group of peripheral subjects. There is no harm in this: indeed, it encourages the sort of variety and richness that education should offer. I speak from the point of view of architecture as the central discipline only because I myself am an architect and head of a school of architecture, and not because I regard architecture as intrinsically more central than any other subject.

A number of important relationships are suggested by the diagram:

1. Note the symmetrical position which the construction industry occupies in relation to architecture. It occupies almost exactly the same place on

Lord Llewelyn-Davies is both architect and educator. His office, a partnership with J. R. Weeks, is in London; and he has been since 1960 professor of architecture and director, Bartlett School of Architecture, University College London. From 1953 to 1960, he was director of the Division of Architectural Studies of the Nuffield Foundation, and became especially known in this country for a pioneering investigation of hospital functions related to design. His article "Deeper Knowledge, Better Design" was published in the RECORD in April 1957 and "The Future of Research" (with Peter Cowan) appeared in September 1964.

"As we work toward integrating education for the professions dealing with the built environment, different approaches must be expected . . ."

the horizontal scale and is only moderately displaced on the vertical scale.

2. If we compare the position of the architect with that of the structural and mechanical engineers, an interesting contrast is apparent. The architect's sphere of activity is heavily concentrated around design, with only moderate extensions upwards towards research, and downwards towards the execution of the building project, while the engineers are more closely involved with research and with execution. There is a considerable overlap of activity and interest between the engineering professions and scientists, particularly physicists, whose theoretical work provides the basis for new developments in engineering. Again, engineers participate actively in construction work to a greater extent than do architects.

3. Architecture's nearest neighbors on the other side, the various professions concerned with planning, occupy an unsymmetrical position above the horizontal axis. They are deeply involved in research and have a substantial overlap with the social scientists, particularly with geographers, economists and sociologists. They touch, though rather lightly, on the problems of design; but at present at least, they are not very much involved in the execution of their plans in practice. Thus there is a fairly large blank area in the right-hand bottom quarter of the diagram, because until very recent days, planning proposals at a scale larger than that of groups of buildings have only rarely been carried through to execution.

Now we must ask ourselves: How are these relationships likely to change? And this is really two questions: First, will there be any substantial shifts in the areas covered by the various professions and sciences concerned with the built environment? Second, if there are such shifts, will this tend to change the nature of the education for the building professions, and, in particular, will the education of each tend to become more *specialized* or more *similar?*

"We have to look forward to a future in which the boundaries between the professions as now defined will become more blurred and . . . much, perhaps most, professional work will be in the areas of overlap . . ."

There is likely to be a shift of interest away from the design problems of the single building towards those of groups of buildings and towns. Thus, the area of overlap between architects and planners seems certain to increase, bringing closer links with geographers and some other academic subjects. On the other side, the question we have to ask is how far will the building industry shift from its present pattern towards one of prefabrication and system building? Insofar as it moves in this direction, the overlap between architecture and engineering will increase.

So far, we have been considering shifts on the horizontal scale and the impact on the professions of social and economic changes in which, as professions, we have little to say. If we now consider the vertical scale, it is apparent that the architectural profession is at present weak in its relationship with science and research. It seems clear that the sphere of interest of architects must be deliberately expanded upwards on the scale towards research.

Unless we can establish effective and continuous contact with the physical and social sciences relevant to our subject we shall not be able to make the changes in our thinking and methods of action which will be needed to meet the problems facing us. But this change is not something that will happen naturally. Unless the architectural profession makes a deliberate effort, primarily through its educational institutions, to expand its sphere of interest upwards into research and to establish effective collaboration with the physical and social sciences, it just will not happen. Therefore movement in this direction is something that we will ourselves have to initiate.

Finally, there is the question whether or not it is needful for architects to play a bigger part, as engineers do, in the actual construction of buildings through the building industry. This is a debatable question. I, personally, believe that this expansion in our sphere of interest is vitally necessary; but here again this is something that will not happen automatically unless the profession makes this objective a matter of deliberate policy.

We can say that architects will be drawn willy-nilly to much closer involvement with some aspects of engineering and most aspects of planning and, in addition, that it might be right for them to deliberately extend the sphere of interest of architecture upwards into research and downwards into building.

The result of these various movements would be a general expansion of the circle of interest for architecture. Even should the other professions and sciences remain static the area of overlap would thereby increase. But, of course, the developments I have been describing for architecture are also occurring elsewhere, and an engineer or a planner giving an account of the future of his sphere of interest would show similar expansion, still further increasing the areas of overlap.

Thus we have to look forward to a future in which the boundaries between the professions as now defined will become more blurred and in which much, perhaps most, professional work will be in the areas of overlap. This work will need to be carried on either by teams of people from different professions and disciplines working in collaboration or by men whose education and experience cover more than one discipline.

How should the professions and universities prepare to meet these new patterns of work? The general answer is obvious. We must move towards closer integration in our education for all those who will be concerned with the built environment. But a statement as broad as this is not enough.

Integrated education can mean anything. It might simply imply a new form of college where all the traditional courses in the various disciplines leading to traditional professional qualifications are conducted under one roof. At the other end of the scale it might mean the institution of a single course so designed as to produce a combined architect/engineer/scientist/planner who could work in all the areas I have been discussing. Current proposals for integrating our education fall between these two extremes.

In Edinburgh's new School of the Built Environ-

ment, by bringing together the existing departments of architecture, civil engineering, geography and planning, it will be possible to foster joint educational courses, and joint research activities, while maintaining, for the time being, separate educational streams leading to the various professional and academic qualifications. However, there is the clear expectation of closer integration in the future, and it is already proposed that architecture and civil engineering students should have a joint first year, and that the student's choice between the two professions may be left open till the end of his first year.

At University College, London, we are moving towards the same goals, but we have started differently, by broadening the basis of study within a single department—architecture—and establishing with other departments a pattern of cross-disciplinary opportunities in postgraduate training for master's degrees.

Before comparing the two patterns of integration, we should try to be a little more precise as to the goals we are seeking to reach. This can be done by looking at the problem from either end. We can look at the end product, the type of man we might think it right to try to produce, or we can look at the process of education itself and the students who enter it.

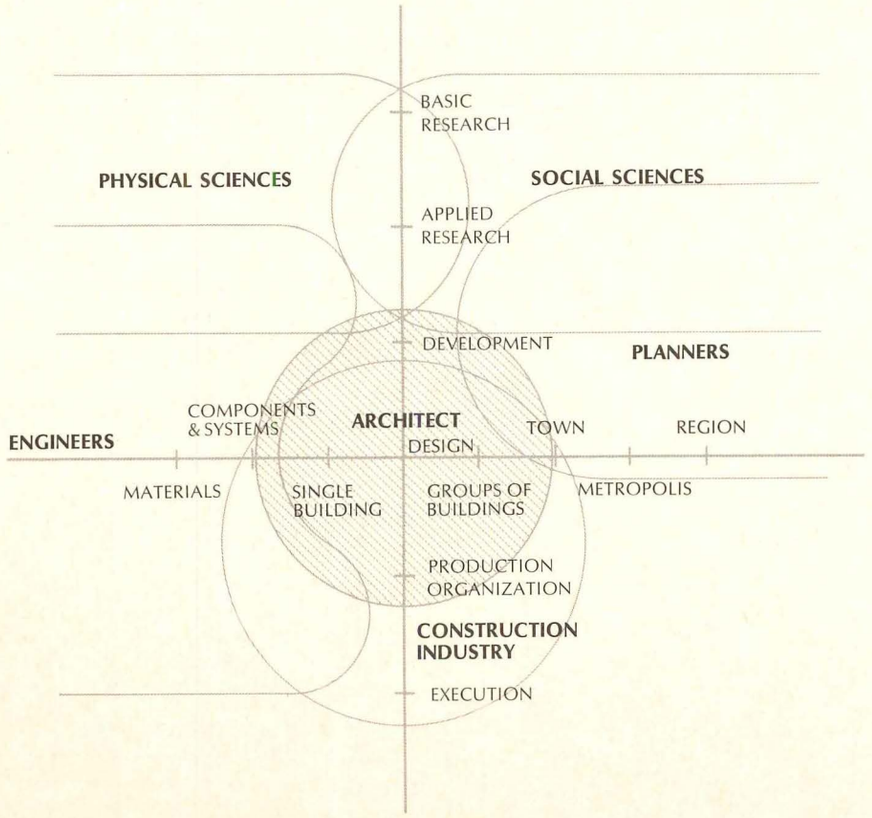
The first approach, to look at the end product, is a familiar one to architects and is therefore generally used in discussions on education within our profession. We begin by trying to define the role of the architect in future society and then work backwards from this definition to establish the education he needs. I have some doubts as to whether this is the right way to approach the problem but, nevertheless, let us see what we can make of it.

If we accept that the sphere of interest and action for architects is going to expand in all directions, it is apparent that future architects will either have to have an enormously broad knowledge or else specialize to some extent and devote themselves mainly to work in one or another sector of architecture rather than covering its whole span. Both alternatives present difficulties. If a man is trained to cover the whole sphere of interest then it can be argued that his training will inevitably be shallow. On the other hand a future in which every architect has to be a specialist is also unattractive. The choice therefore seems difficult and both alternatives unpleasant. But if we are to try to deduce an architectural educational system from the end product, then we will have to accept as corollary that this choice has to be made.

"We can look at the end product, the type of man we are trying to produce, or we can look at the process of education itself and the students who enter it . . ."

Perhaps it is better to say that we are not yet in a position to be very certain about what the end product ought to be. Indeed, we might say that the expansion of the architect's horizon to cover all aspects of the built environment makes it very difficult for us to define just what the future architect's skill will have to be.

We might even go further and say that the best educational system might be one which permitted the widest *range* of possible end products, which permitted a student to enter with a general interest in the problems of the built environment and to make a succession of choices from time to time during his education: both as to the direction in which he wishes to move and the breadth of knowledge and range of skills which he wishes to acquire. Maybe some people will indeed want to be, and need to be, highly specialized. Maybe others will want to work in a



1. SPHERES OF INTEREST of the sciences, industries and professions of the built environment are related on horizontal and vertical scales.

broader sphere and at less depth. Maybe we shall need a great range of people educated to fill different roles between the extremes of specialization and generality. If this is true for architects, then it may also be true for the other professions concerned.

The view of the future which I have here put forward suggests that in planning a comprehensive, integrated curriculum we should set ourselves the following objectives:

1. We should take in students who wish eventually to work as architects, as planners, as builders, as engineers, and perhaps in other roles related to the built environment.

2. We should take in students who have not formed a clear view of the particular professional field in which they might eventually work—within the general area of building, architecture and planning.

3. We should plan the courses to postpone separation into different specialist streams for as long as possible.

4. We should provide not only a range of alternative professional outlets, but also alternatives in the lengths of courses.

5. Some courses should lead to *double* qualifications, for those who want to work in the overlapping areas of two traditional professions.

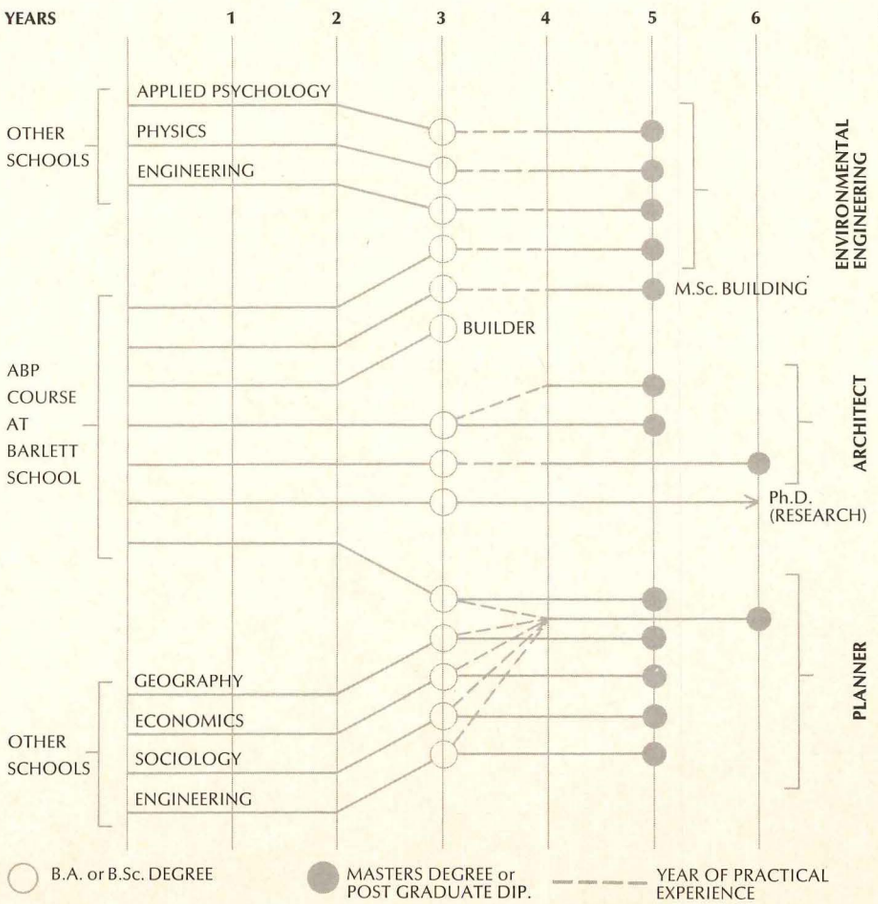
6. Postgraduate courses should, so far as possible, be planned to take in graduates from adjoining areas, as well as graduates from environmental courses.

"The best educational system might be one which permitted the widest possible range of end products. . . . Maybe we shall need a great range of people educated to fill different roles betweeen the extremes of specialization and generality . . ."

The present arrangements at University College London represent one attempt to meet these aims. The drawing (2) shows in a broad, diagrammatic form the structure of the present courses. The Bartlett undergraduate course, which lasts three years, leads to a B.Sc. degree in "Architecture, Planning and Building" (this might well be called a degree in Environmental Studies). It provides, for students who want to work eventually on the planning, design or construction of the man-made environment, something similar to the Oxford P.P.E. (Philosophy, Politics and Economics) which leads to careers in political and administrative spheres.

Through the first two years the course is the same for all students; in the third year some options, covering 30 per cent of the time, are available. Thus a student can postpone his decision as to his eventual career until the third year of the undergraduate course. After the first degree a variety of postgraduate courses, most of which lead to M.Sc. or M.A. degrees, and which carry various professional qualifications, are available. Some of these accept students from undergraduate schools in other subjects. The opportunity for planning and mounting these postgraduate courses is one of the great advantages of a School of Environmental Studies. To provide the spread of courses to meet future needs a considerable spectrum of disciplines, from geography to engineering, must be able to work together.

In the drawing (2) some postgraduate courses are shown as following directly on the first degree.



2. PATHS OF DEVELOPMENT as curricular structure at University College London now seeks to provide them.

While this is possible, it will be the exception and not the rule. In most cases students will be required to spend a year or more in gaining practical experience outside the university before taking up a master's course.

The degree structure, however it is arranged, is no more than the bones of an educational system. The subject matter, and the modes of teaching, determine what is actually done.

We do not start with a blank sheet: the student at entry already knows a great deal. The college period is an episode in a continuous process of learning, not something complete in itself. The student entering college has already spent 12 or more years learning, and after leaving he will go on learning intensively for at least another 10 years. Thus it is vital to take account of what the student is at entry, and what he will do on leaving, in thinking about the educational structure. The curriculum must build on the student's skills and knowledge, and gradually focus them towards his future area of action. At entry all students have pretty much the same educational background, and the problem is to decide how long they can continue to learn together, and how soon and how far they will need to diverge.

The table (3) shows the relation between some traditional subjects taught at school and university, and some of the main subjects that occur in environmental degree courses. The traditional subjects learned at school are not to be seen as mere collections of facts. Far from it: each of them is a complex amalgam of concepts, attitudes, skills and knowledge. Most embody characteristic modes of thought, and characteristic solutions to the general problem of ordering and using knowledge. Some of these modes of thought are in direct opposition to others. For example, the teaching of history encourages students to weigh incommensurable items of evidence and reach a conclusion, whereas the teaching of physical science rejects such behavior implicitly. We might feel that the traditional subjects are not the best way of packaging learning, but we must accept that they exist at present, are deeply rooted in our culture, and profoundly determine the mental equipment and attitudes of students entering a university course.

The design of an undergraduate course must not ignore or seek to destroy the pattern of learning with which the student enters. Neither must it accept this pattern as something unchangeable. The course should be designed to re-structure it, and add to it, in such a way as to give the student the right intellectual instruments for thought and action in his chosen sphere.

"The problem is to decide how long they can learn together, and how soon and how far they will need to diverge . . ."

The table also shows the main subjects which could form a group of undergraduate courses preparing students for careers in environmental sciences and professions. Here again these subjects are not to be thought of as collections of facts, nor as training in specific skills. Their main purpose is to help the student to build up a flexible and powerful armory of concepts and modes of thought. Each groups two or more traditional subjects and focuses on an aspect of the total course. Each involves many modes of teaching: seminars, lectures and design problems in the studio.

It is important to note how large an element of overlap there is between the subjects, especially as they become more advanced. This overlap is the key to the design of an integrated curriculum, as it can be exploited to enable students who will ultimately reach different qualifications to stay together for as long as possible. First, however, we need to discover the hidden structure that connects the elements.

The drawing (4) shows the relationships arising from the table (3) presented in a different way, as a semi-lattice, a notation taken from the theory of sets. (I owe the idea of analyzing an educational process by this means to a paper on another subject by Christopher Alexander.) This diagram makes it much easier to grasp the interdependence of the various subjects which go to make up a course of environmental study, and to see how one subject rests on the shoulders of others.

This diagram, like the first drawing (1), is centered on architecture, but again like that drawing, it is, of course, only one of a series of possible diagrams, depending on which discipline is placed in the middle, and all are equally valid. It is also far from complete, but it serves to bring out sharply several of the most difficult questions we have to face in environmental studies.

3. RELATIONSHIPS OF SUBJECTS taught in Bartlett BA/BSc course with traditional subjects are shown in table.

TRADITIONAL SUBJECTS		HISTORY OF ARCHITECTURE	COMMUNICATION	ORGANIZATION AND MANAGEMENT OF BUILDING	BASIC ENGINEERING THEORY	BUILDING MATERIALS	PSYCHO-PHYSICS OF ENVIRONMENT	MAN AS AN INDIVIDUAL	CLIMATOLOGY	DESIGN METHOD	STRUCTURAL ENGINEERING	BUILDING SYSTEMS	URBAN STUDIES	BUILDING TECHNOLOGY	ENVIRONMENTAL ENGINEERING
HISTORY	1	X								X			X		
PHILOSOPHY	2		X												
ART	3	X											X		
SOCIOLOGY	4			X								X	X	X	
ECONOMICS	5			X								X	X	X	
MATHEMATICS	6		X		X					X	X	X		X	X
PHYSICS	7				X	X	X		X		X	X		X	X
CHEMISTRY	8					X					X			X	
BIOLOGY	9							X							X
PSYCHOLOGY	10						X	X		X					X
GEOGRAPHY	11								X				X		X

How can we re-package groups of subjects, traditionally not taught together, to suit our present education needs? For example, the rapidly developing science and practice of environmental control in buildings requires a basis of physics, psychology and physiology. For this purpose the material taught in traditional courses for undergraduate physics or psychology is irrelevant and useless; even the physics taught to mechanical engineers is of little use. We need a new discipline, made by combining certain parts of several old ones. Similar problems arise with subjects such as transport, which requires a new mix of mathematics, civil engineering and economics, and with many other subjects essential for future architects, planners and engineers.

The solution probably lies in the establishment of these new cross-disciplinary subjects as fields of research in the first instance, developing a teaching function later. This is the means we are trying to use at University College London. In the last three or four years we have been able to establish four chairs of this sort, and we now have professors of Environmental Engineering, Building Economics, Transport, and the Economics of Urban Development. (The first two are within the Department of Architecture, the third in Civil Engineering, and the last in the Department of Town Planning).

Characteristically, each new chair begins as a focus for research, proceeds to generate postgraduate teaching, and eventually contributes to undergraduate teaching, although this is not an inevitable pattern.

Another, and very difficult, question is: How wide a range of subject is it wise to span in a single undergraduate course? Or: How wide a range of students with differing ultimate professional goals can be taught together for one, two or three years?

I do not think we know the answers, and some experimentation is necessary. My own view is that the new cross-disciplinary subjects to which I have just referred can be of great help, as they tend to deal in matters relevant to several professions. They also reduce the spread of subjects, by concentrating the relevant portions of several in one new package. I am sure we should aim at undergraduate courses that are as broad as possible, and accept the need for diversification into various specialized qualifications at postgraduate level.

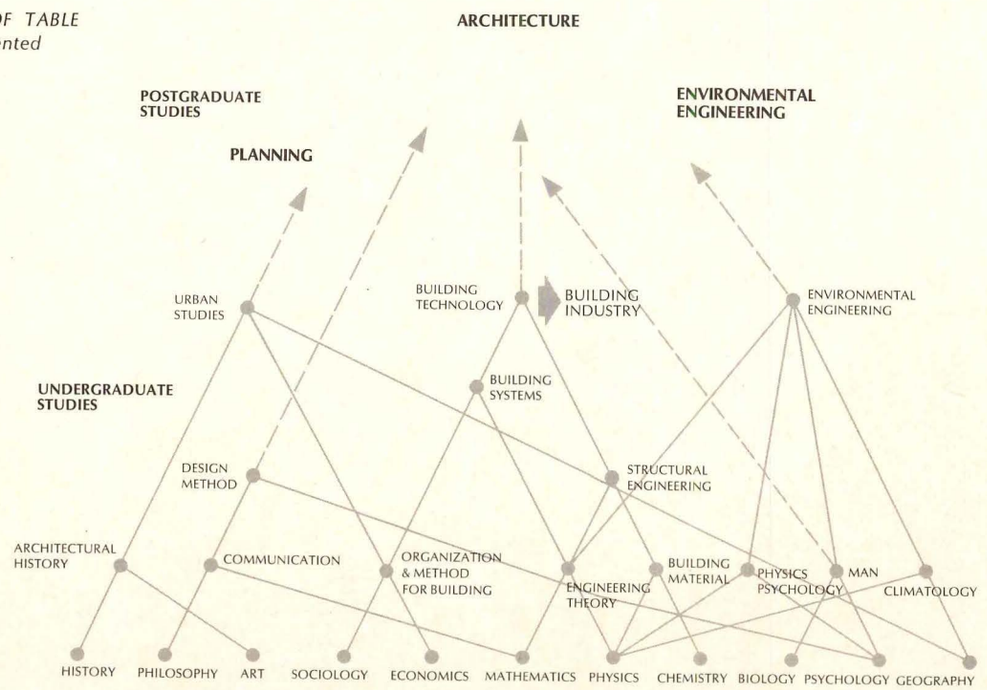
The future of environmental studies will depend wholly on the development of research. I have devoted most of this discussion to questions of education because these have received less public discussion than has research. But the development of new patterns of education will be dependent on the advance of research.

"Mathematical tools may once again, as in the times of Alberti and Wren, open up for us a new dimension in man's control of his environment . . ."

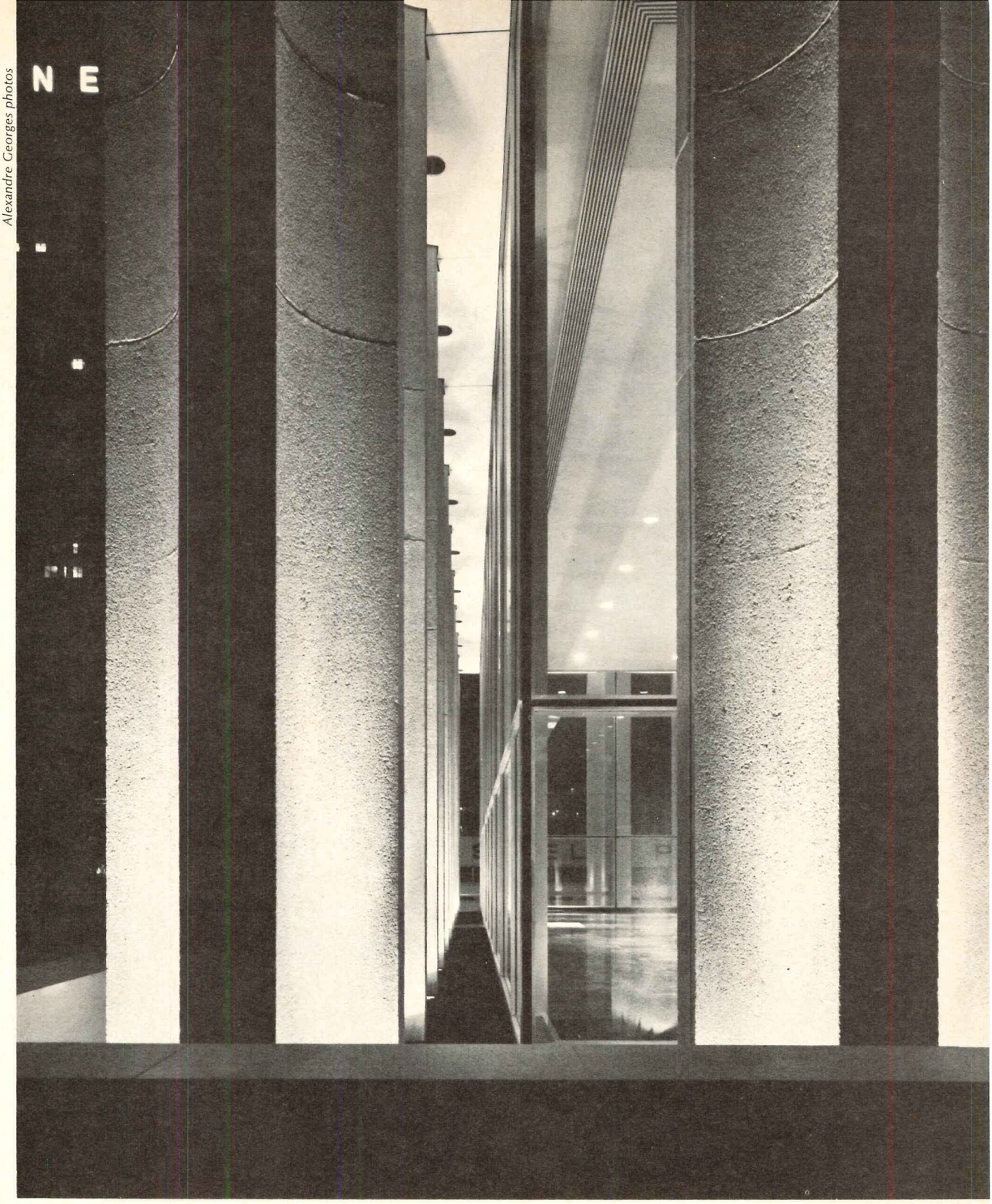
The problems of the built environment now rank with those of medicine and agriculture in national importance, and Britain should have an Environmental Research Council ranking with the Medical Research Council and the Agricultural Research Council. Despite the vigorous support of the Royal Institute of British Architects, the environmental professions have not yet succeeded in the battle to have such a council established. But we have achieved certain limited successes and government support for research is now flowing, although thinly, through a number of channels including the Science Research Council, the Social Science Council and the Center for Environmental Studies.

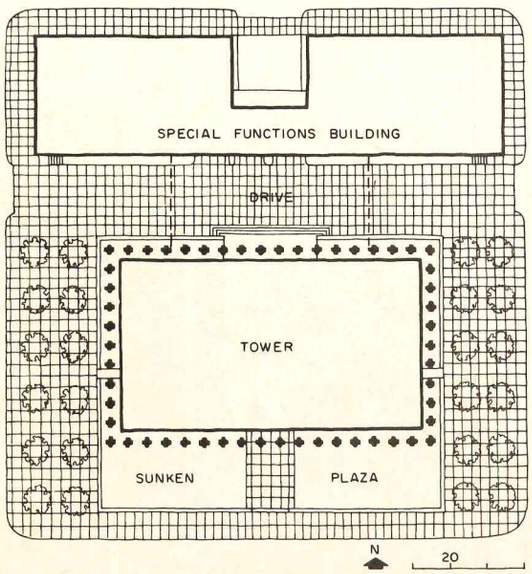
The opportunities for research are tremendous. There are many areas of possible study, many of which will be rewarding, some disappointing. My own hunch is that the study of the design process and of the operational theory of planning may be very fruitful fields. Mathematical tools may once again, as in the times of Alberti and Wren, open up for us a new dimension in man's control of his environment.

4. RELATIONSHIPS OF TABLE (preceding page) presented as "semi-lattice."



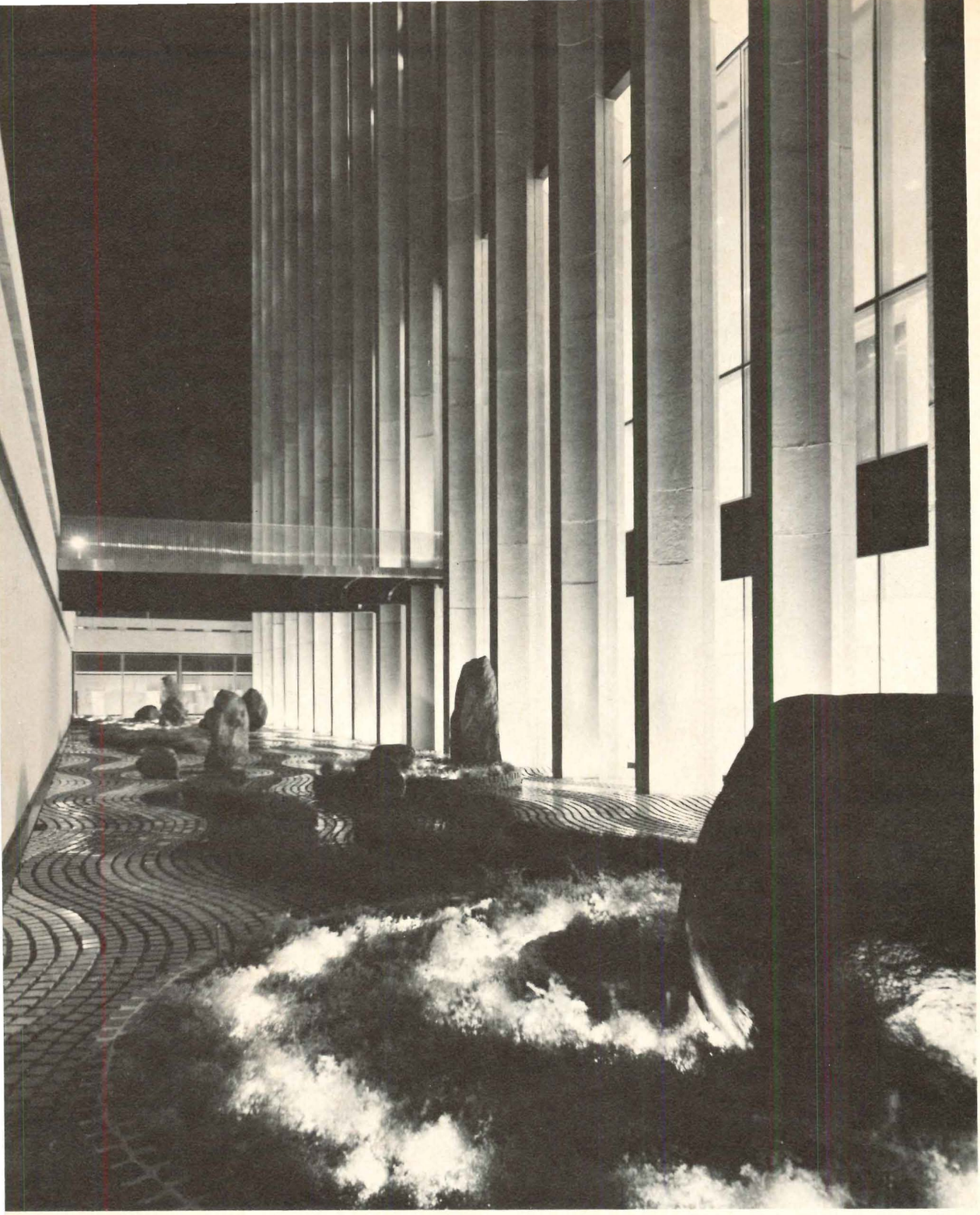
Alexandre Georges photos

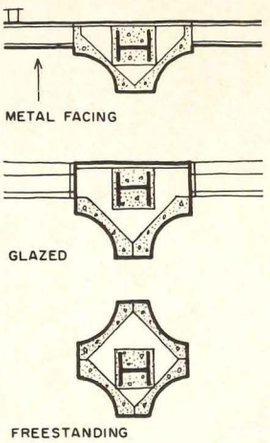




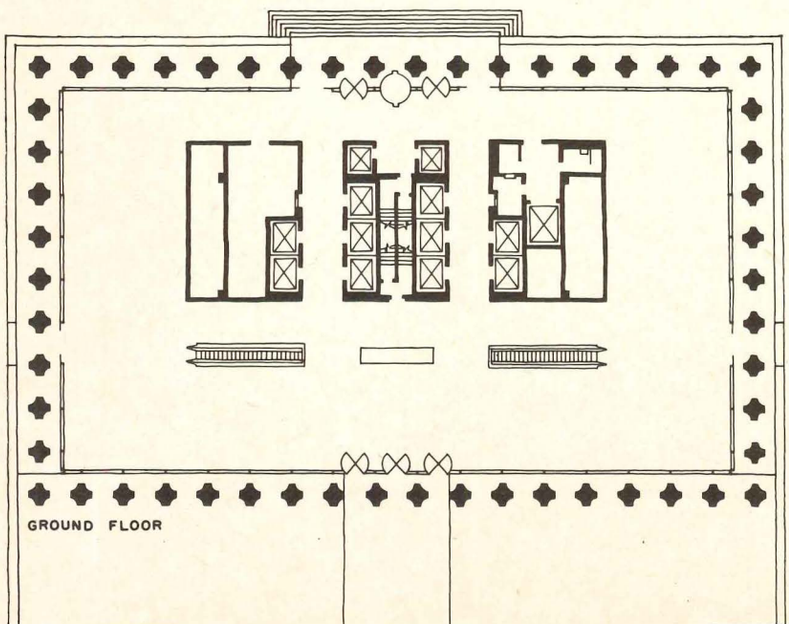
Bold tower for a utility company

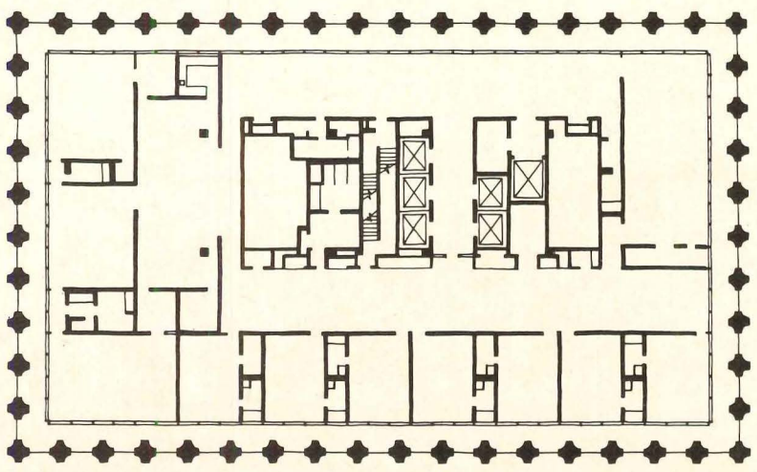
Wilson, Morris, Crain & Anderson have provided downtown Houston's fast-changing cityscape with the handsome 27-story tower shown in detail above, as part of a trim solution to both the general office and special computer-oriented needs of their client, Houston Lighting & Power Company. The architects rejected the obvious, though economical, solution of filling the 250-foot-square block of real estate with a single six-to-eight-story building. Instead, a low windowless computer center is linked to a 27-story office tower, which, as pictured on these pages, creates a strong image on both skyline and street, shows off the company's services in a skillful integration of heating, lighting and architecture, and as an added bonus, offers as a public garden what it saved in land.

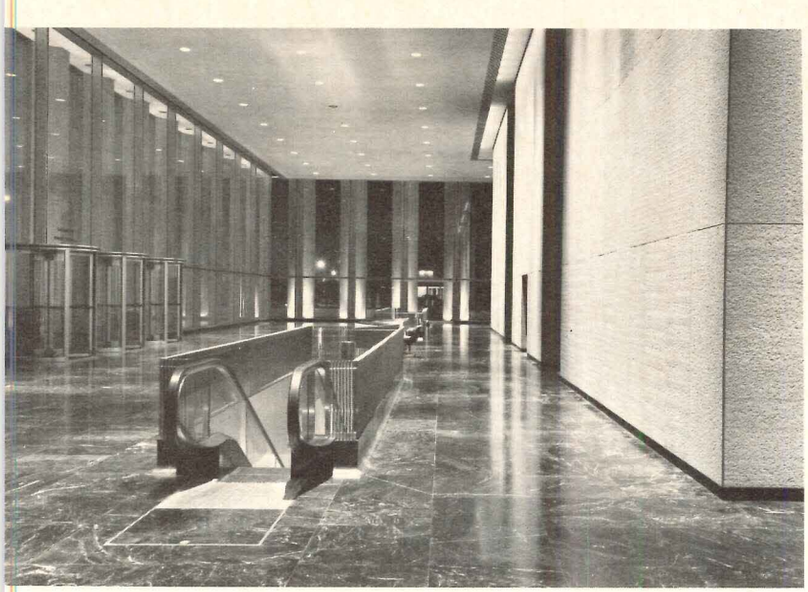


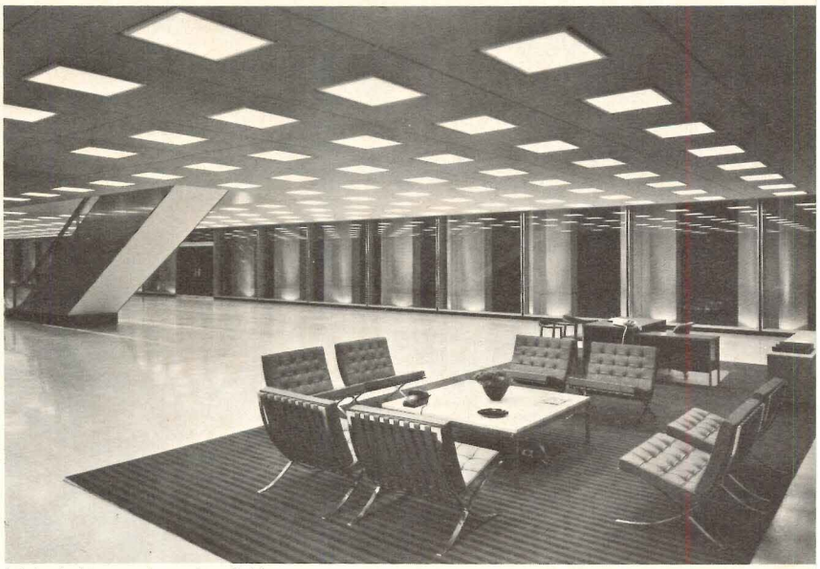


Architectural theme for the building is based on the precast columns, spaced on a five-foot module and carrying the full height of the building from the sunken garden shown, left. Columns are aggregate finished, and alternate with glass and aluminum spandrels on office floors and aluminum louvers on mechanical floors. The main entrance bridge crosses the delightful Japanese garden shown in the photo, which is actually 17 feet below the street, and can thus be enjoyed by passersby and employes alike—as well as by the visitors en route to frequent homemaking exhibits held on the lower levels. Plans, below, include main lobby, executive and typical office floors. The unusually wide chases house dual ducts for air distribution. Heating and cooling are provided by five heat pumps on top floor.

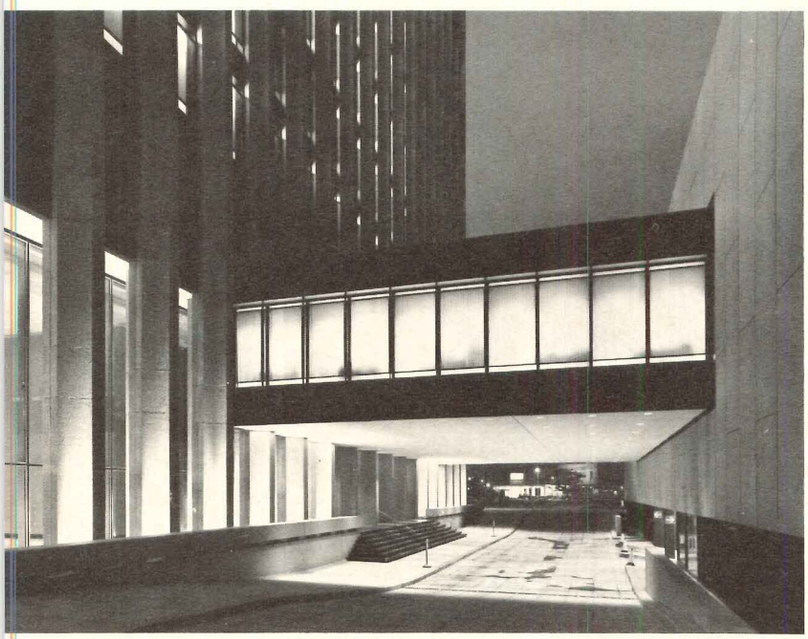


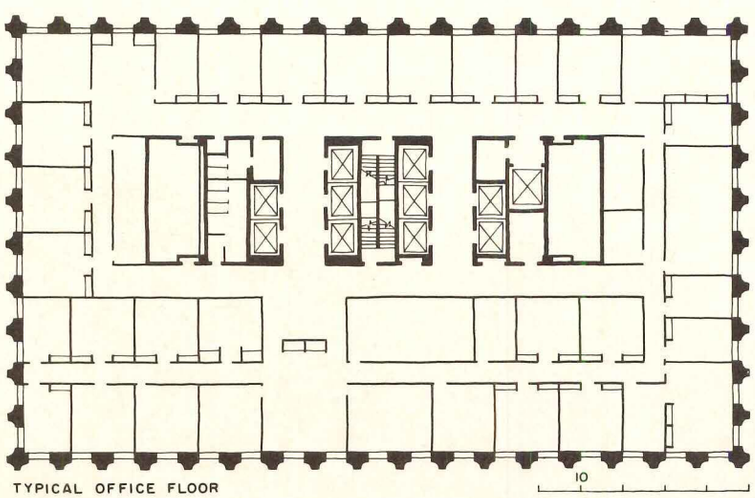




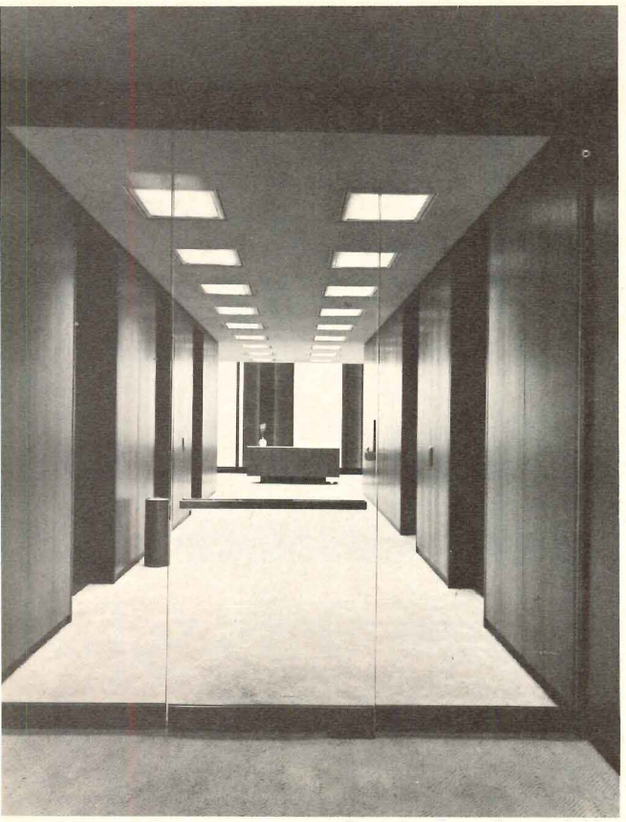


Main lobby and garden lobby (right) provide ample public exhibit space, while floors above are solely for company use. "Programmers' bridge" below, linking tower and annex, spans company car drive, main lobby and below-grade garage entrances. Heavy paper flow is processed in annex, routed via separate truck docks to stay clear of drive.





TYPICAL OFFICE FLOOR



Executive floor elevator lobby, above, leads to reception area, right. Offices here, as throughout, make good use of advanced mechanical concepts. Heat-from-light, for example, is returned for redistribution through slots in special fluorescent luminaires, shown in office below. The fixture itself was designed for open parabolic-louvered low brightness and minimal glare, yet with high foot-candles and efficiency. Lighting and materials complement each other throughout. Neutral teak and marble are accented in brilliantly colored furniture and felt walls. Wall in office below is formed by half-columns, while office to right is inset for continuous glazing. Special glazing includes outer, open-ended glass panels, to promote convection currents for cooling in summer. Draft barrier strip heaters line windows.

ELECTRIC TOWER, Houston. Owner: *Houston Lighting & Power Company.* Architects: *Wilson, Morris, Crain & Anderson—Robert O. Biering, associate architect;* structural engineers: *Walter P. Moore & Associates;* landscape architect: *Fred Buxton & Associates;* lighting consultant: *Edison Price;* acoustical consultant: *Dr. Paul Boner;* contractor: *W. S. Bellows Construction Company.*

SMALL INDUSTRIAL BUILDINGS

by Seymour Howard

This study will analyze the role of the architect in the design of four small industrial buildings. By "small," we mean those buildings which have less than 100,000 square feet of floor area, a building type too often designed and constructed without the services of an architect, to the detriment of the owner and the environment in which the building is placed.

Hopefully, a good architect can bring to the design of such buildings certain amenities and distinctions which cannot as easily be achieved by somone not trained in design. Most often, what he brings is an acquired knowledge of how particular parts of a design problem—site circulation, process functions, an appropriate esthetic, the building's relationship to the environment around it—combine to effect the quality of the whole. For an industrial building cannot be judged as being successful on purely functional criteria alone—not by the owner, by the workers, or by the designer.

In terms of processes within the plant and the proper arrangement of spaces, the four industrial buildings presented here all function very well. Recognizing, then, that these buildings first of all work efficiently, it is useful to point out other important areas in which they succeed. At the risk of some rigidity, the discussion will be presented within the framework of the following six criteria:

1. **Environment,** the building's relationship to the community and to the natural setting around it. Zoning regulations of the past 50 years have attempted to set factories apart in enclaves. Industrial parks are the result. Some look remarkably similar to their suburban counterpart, the speculative housing project: lawns like putting greens, "features" such as ridiculous porticoes, "Colonial" false fronts, and a meaningless variety of materials. Others have succeeded by limiting materials, using forms derived logically from function and structure. Oberlin Printing (page 160) and Sea & Ski (page 156) are examples. The social isolation of the industrial parks is fortunately being broken down by including restaurants, snack bars and motels, which link them peripherally to neighboring towns and airports.

An inner-city factory built from scratch is relatively rare today. The need for large plots of inexpensive land leads to the suburbs or rural areas. Adaptation and remodeling of existing warehouses, lofts and manufacturing buildings is more characteristic of inner-city practice. On a small scale, Eastern Press (page 162) in New Haven is an interesting example of how an existing plant was able to grow within an urban renewal area, maintaining variety in the neighborhood.

2. **Access.** How the factory site is linked to the public lines of circulation around it is an essential functional question, and an esthetic one as well. No one will notice carefully sited trees if he is caught in a traffic tie-up, or if he can't find a place to park. The design advantages of a building are not noticed during a long hot or wet walk through a vast field of cars.

3. **Entrance.** Le Corbusier argued that "an entrance should be like a lighted candle in a dark room." This is essential for newcomers, who should not have to read signs to find the right door. All the buildings shown here solve this problem in terms of devices more subtle than the traditional two-story tower in the center of a facade. The entrance for employes, of course, can be inconspicuous; they know the building and where to go. Truck entrances can generally be recognized by the obvious loading platforms and large doors. The central requirement is that the main road lead directly to them.

4. **Plan and massing.** Plans result from one of two basic approaches: the subdivision of one space; the accretion of separate forms. For a small company the principal design task will usually be the subdivision of a single space, as in the case of Oberlin Printing. Esthetically, the problem is usually how to preserve an awareness of the total volume even though subdivided. For larger factories, however, it is more efficient to separate the major functions into buildings of different forms, corresponding to the separate needs, as shown by River Cement (page 164). The approach is essentially an open-ended one, more easily adapted to change and growth.

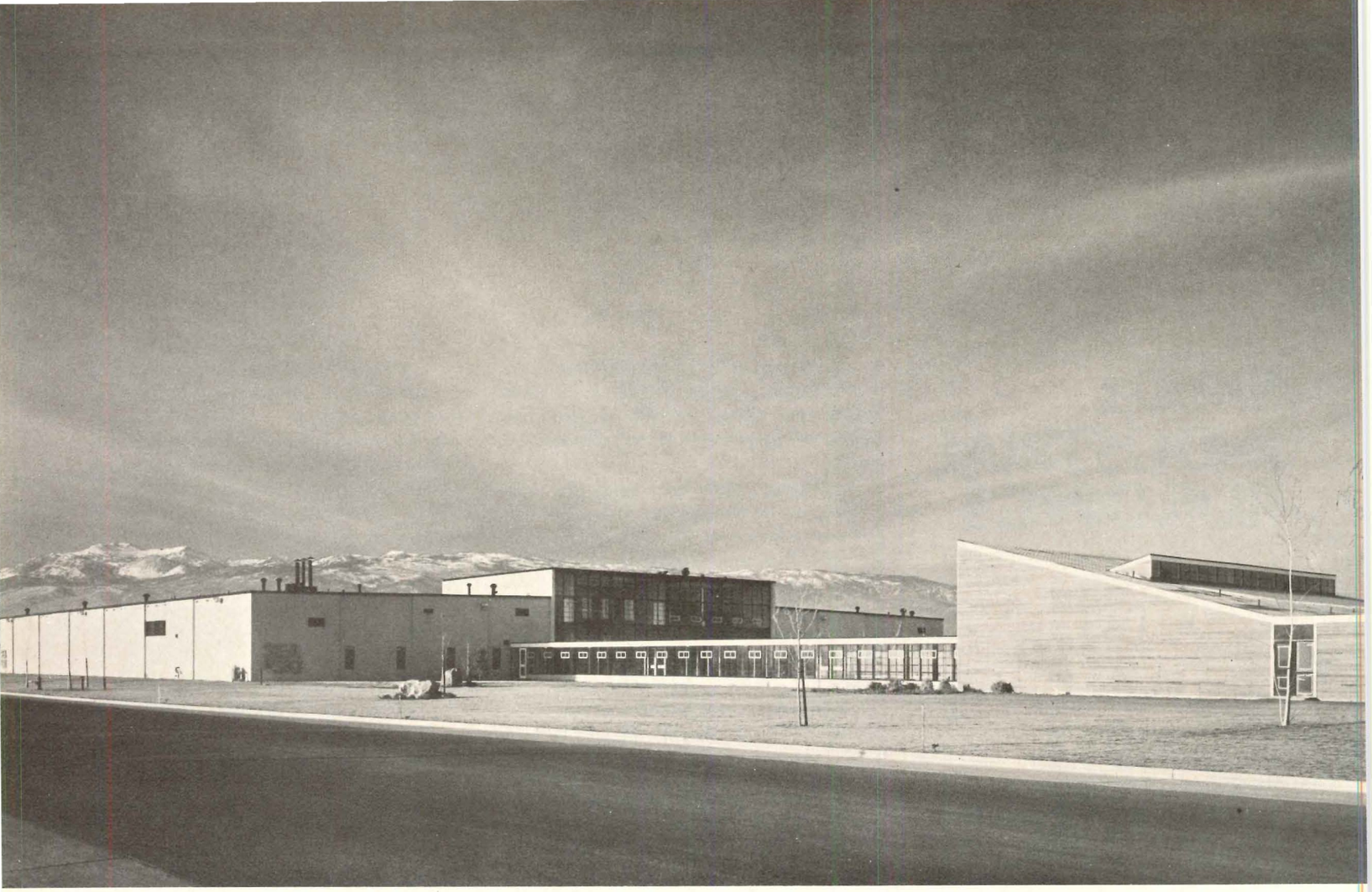
As exterior composition and mass, the single building solution can gain significant interest from a strong geometric form, from allowing the interior subdivisions to show through on the facade, or from organizing into a formal pattern the mechanical equipment usually scattered haphazardly over the roof scape. The different requirements for spans and ceiling heights in offices and in manufacturing or storage spaces can be expressed by establishing a dominant mass, with the smaller elements arranged in a clear geometrical relationship. The design of the Sea & Ski plant shows this very well.

5. **Interior space.** A place to work should be practical and matter-of-fact. Large spans and exposed structure usually give interest in themselves to interior spaces, especially in manufacturing areas. Care should be taken in the design of trusses to avoid the visual confusion of web members set at varying angles. Equipment or materials stored against the exterior walls usually limit window location. The often-seen solution of a continuous bank of windows just below the roof is very logical, one of the "good cliches" of modern architecture. Interesting variations on this are shown in the River Cement plant.

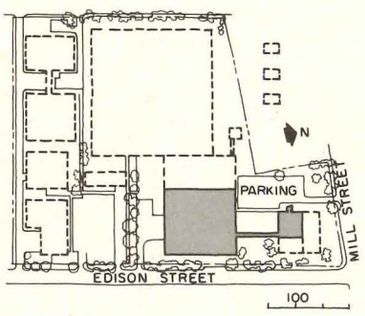
6. **Expansion.** Provision for expansion should be made at the initial stage of site planning, even if the form of the future buildings need not be completely determined. The site plan should be like a good city plan, with areas and volumes approximated but with freedom for future design.

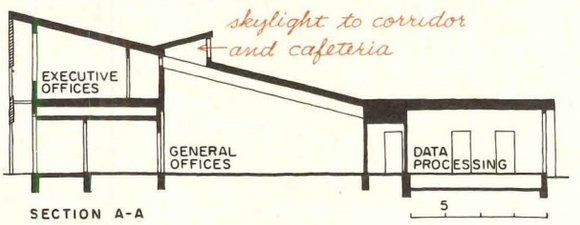
As should be expected, not all of the preceeding six criteria have been emphasized by the architects of the industrial buildings within this study. We will not, therefore, need to look at any individual building from all six aspects, but they are all legitimate points from which to begin.

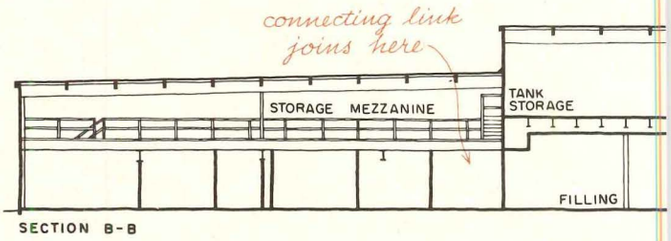
Seymour Howard is a practicing architect and a former member of the faculty of the School of Architecture at Pratt Institute. He has published technical studies in *Time-Saver Standards*, and in 1966 McGraw-Hill published his book: *Structure: an Architect's Approach*. Mr. Howard is now teaching at the Ecole d'Art et Architecture in Marseilles.



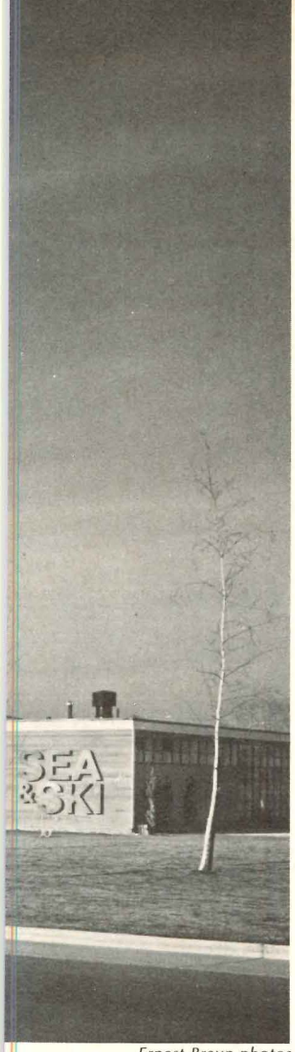
The plot plan, below, shows the Sea & Ski plant in relationship with the total properties of Smith, Kline and French, of which Sea & Ski is a subsidiary.



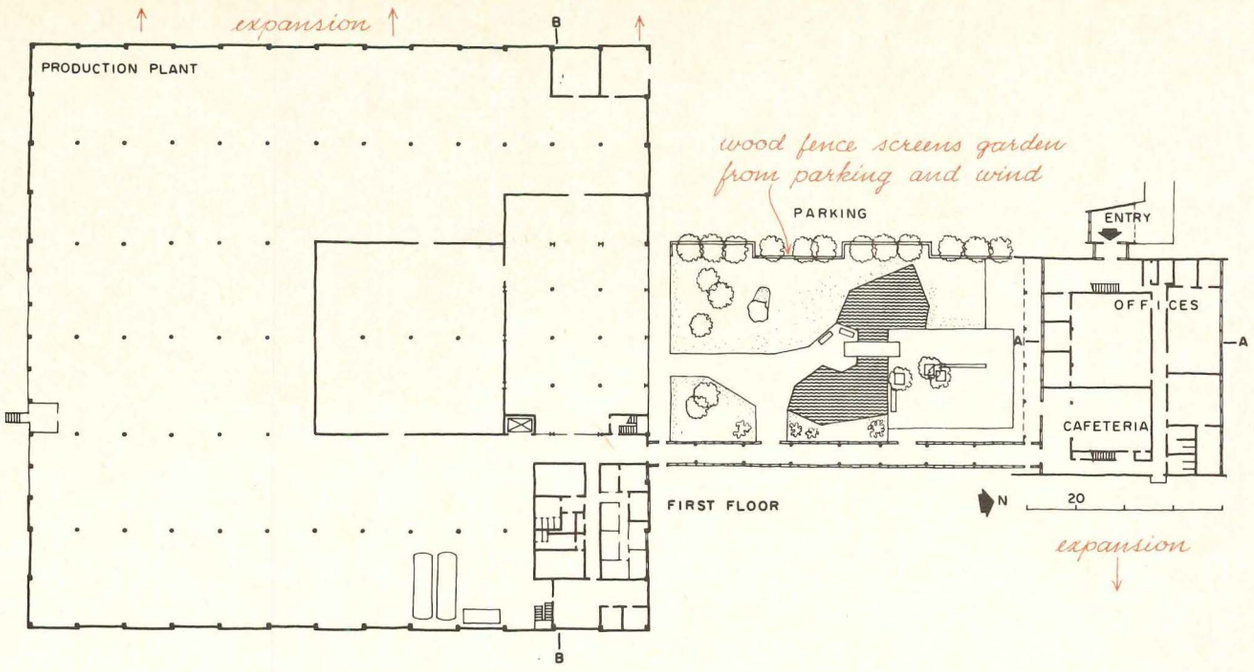


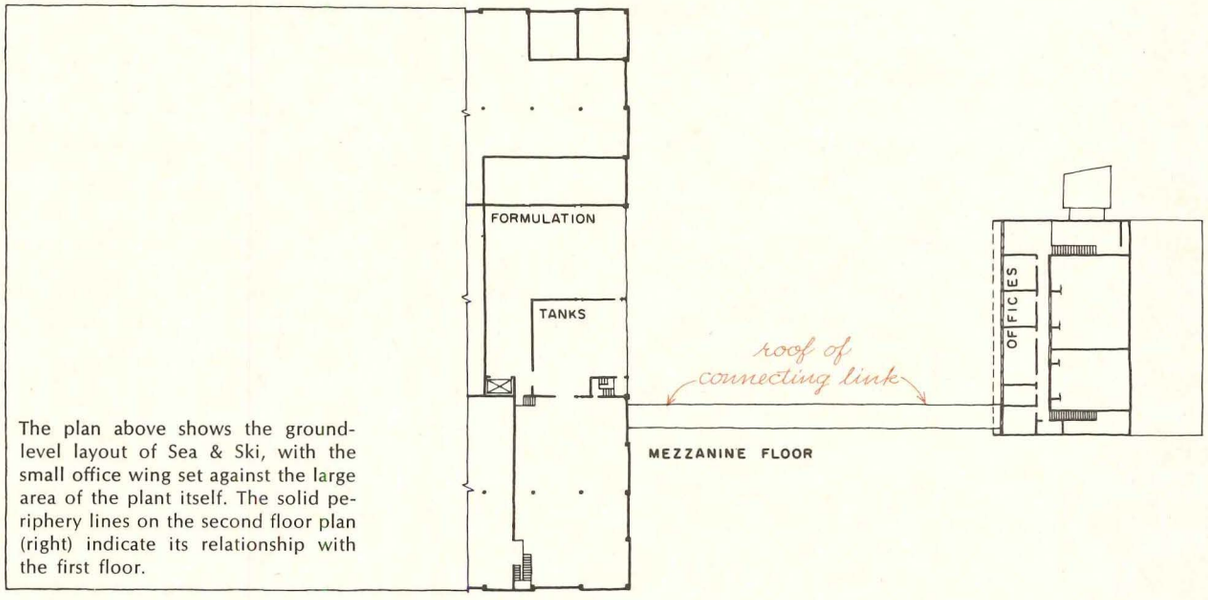


SEA & SKI CORPORATION: THE SCALE IS FOR MEN NOT MACHINERY

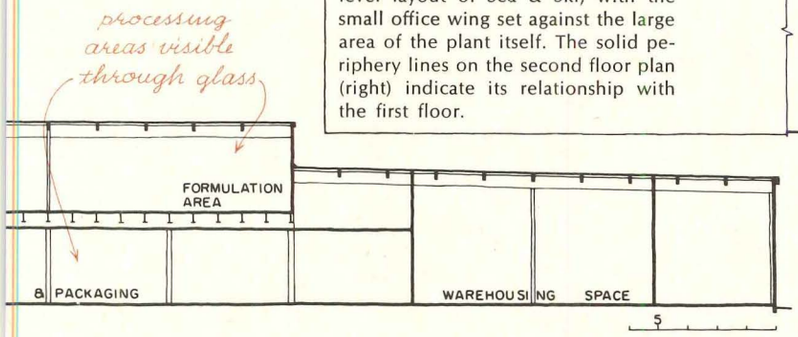


Ernest Braun photos





The plan above shows the ground-level layout of Sea & Ski, with the small office wing set against the large area of the plant itself. The solid periphery lines on the second floor plan (right) indicate its relationship with the first floor.



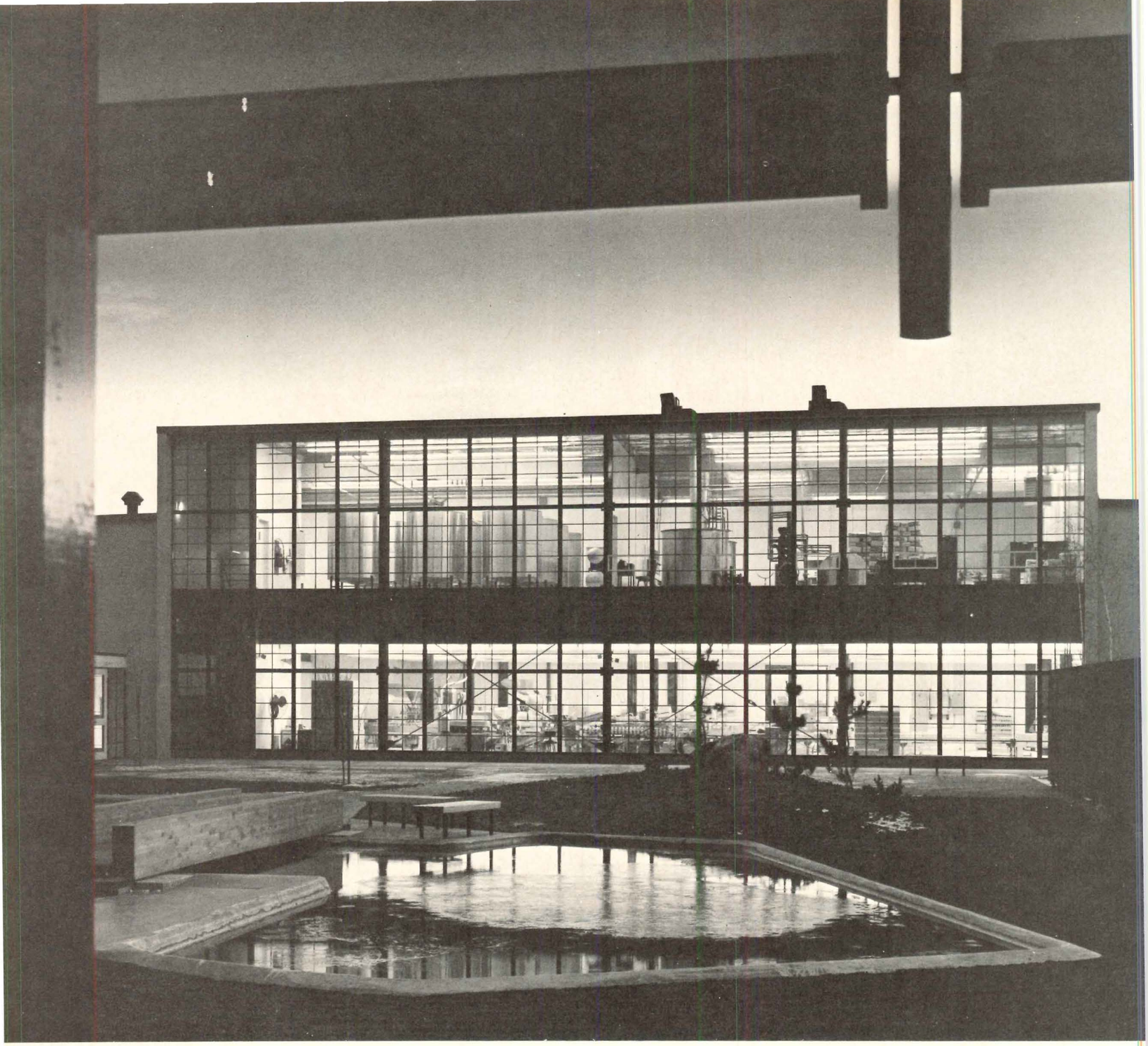
The new offices and processing plant of the Sea & Ski Corporation are currently the largest manufacturing facilities in northern Nevada. A good-sized manufacturing plant in the desert could have become a barely-habitable disaster, but Marquis and Stoller have succeeded in creating a small oasis for workers and management: a building scaled for men, not machinery. The time from commission to occupancy of the Sea & Ski plant was a remarkable 15 months. Marquis and Stoller were retained in May of 1967, and all construction was completed by July, 1968. The cost per square foot was $11.00, including fees but not including major production equipment. Sea & Ski was thus completed within the time limit and under the budget.

Plan and massing. There is an interesting visual tension between the two-story block of the manufacturing building and the two-story facade of the offices. Both walls are the only completely glazed portions of their respective buildings, suggesting by these voids that they are mating elements which have been pulled apart.

These two glass walls talk to each other across the garden. Each of the many panes of the manufacturing building reflect the louvered sun-shades of the south wall of the administration building. From their offices, the administrators can look across into manufacturing, with the stainless steel tanks and formulation room upstairs and the colorful filling and packaging machinery below.

Corresponding to the interior section, the butterfly roof profile of the administration building implies an almost residential character, an impression which is reinforced by the use of wood as exterior finish.

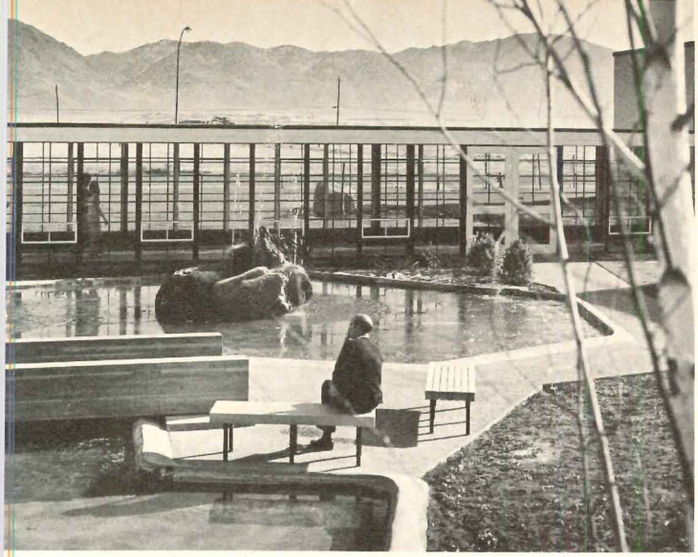
In all their discussions and studies, the architects were dealing with very understanding clients. In Marquis' words: "The parent company, Smith, Kline and French Laboratories, and the president of Sea & Ski, Byron W. Mayo, realized that good architecture pays off in intangible ways, such as employe morale, reduced employe turnover, and especially in 'image' and advertising value. Sea & Ski wanted a building to reinforce the image of a strong, vigorous, young and aggressive company. There was no problem in 'educating' the client in matters of esthetics."

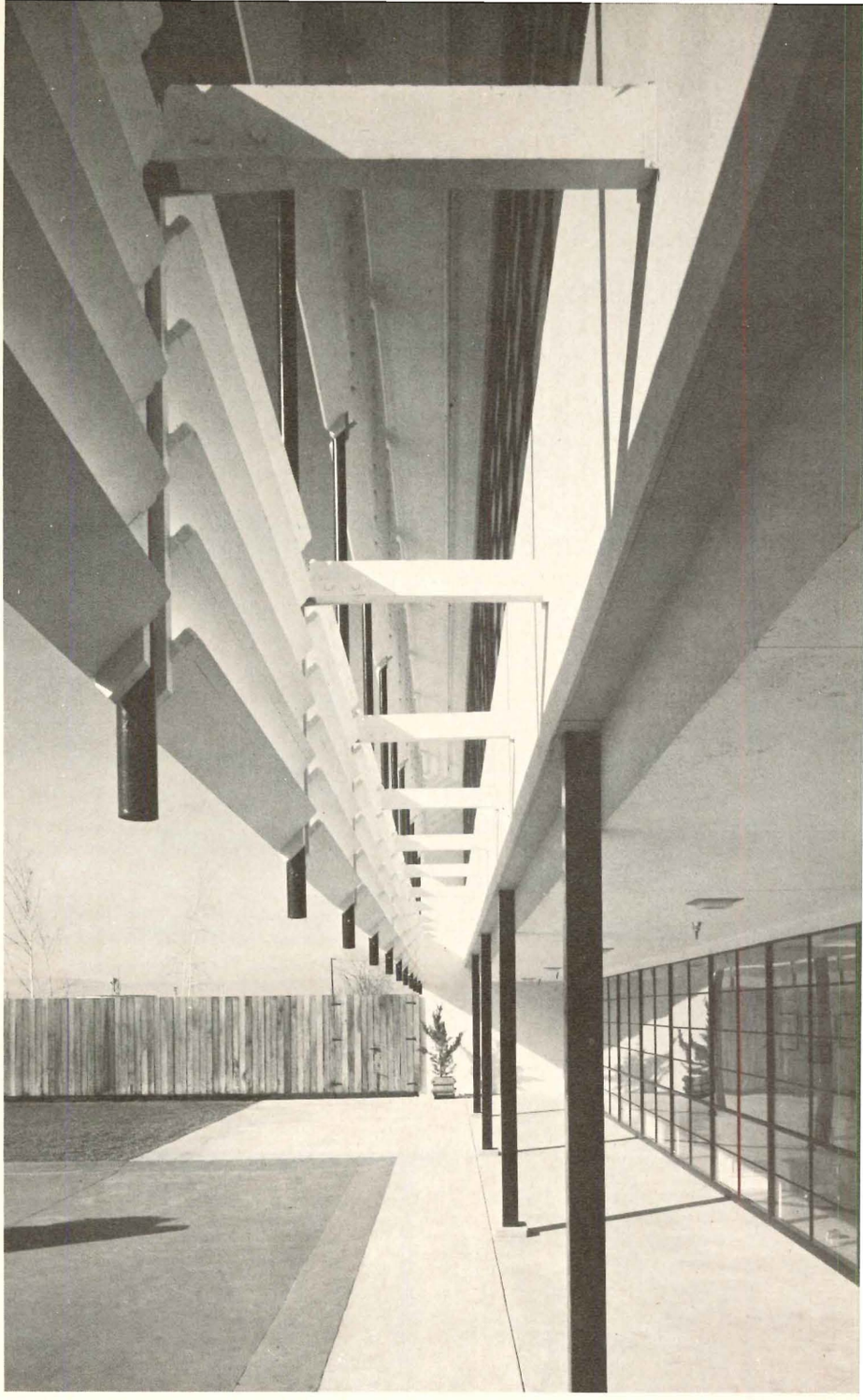


SEA & SKI continued

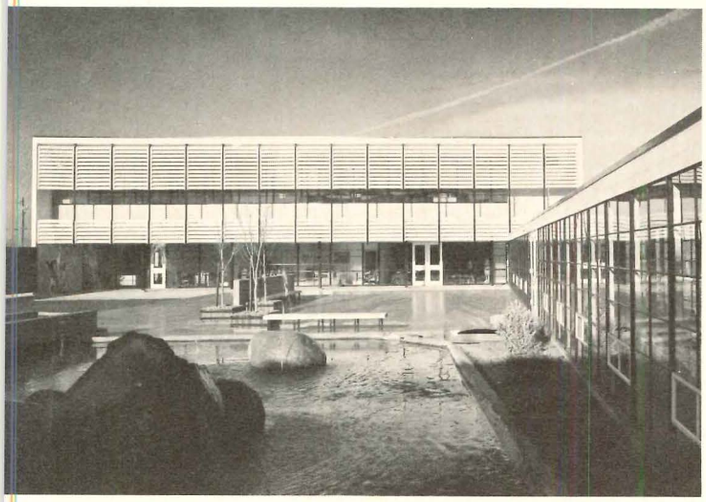
Employe facilities. Interesting as the shapes of the two buildings are, it is the space between them which is the most significant—a carefully designed garden that invites movement through it. The link along the east side is available for bad weather, still visually united with the garden through the glass. Movement is part of daily life, for both administrative personnel who visit production and plant personnel who come to the administration building at lunch time.

The cafeteria opens south onto the garden, and meals can be eaten there in good weather. The importance of the cafeteria is also emphasized by the high ceiling, which follows the sloping roof up to the mezzanine corridor and gets extra light from the continuous clerestory. At the present time





The two-story facade of the manufacturing building (left) faces the office building (below), with a carefully designed garden between the two. The equipment and working areas in manufacturing can be seen clearly through the large expanses of glass on the court facade. Redwood louvers have been placed in front of the windows of the office wing (right), and there is a protected exterior walkway along its court facade. The principal exterior materials for Sea & Ski are stained redwood siding and exposed concrete. Most of these walls, including the concrete, were tilted into place. The foundations are concrete grade beams over caissons.



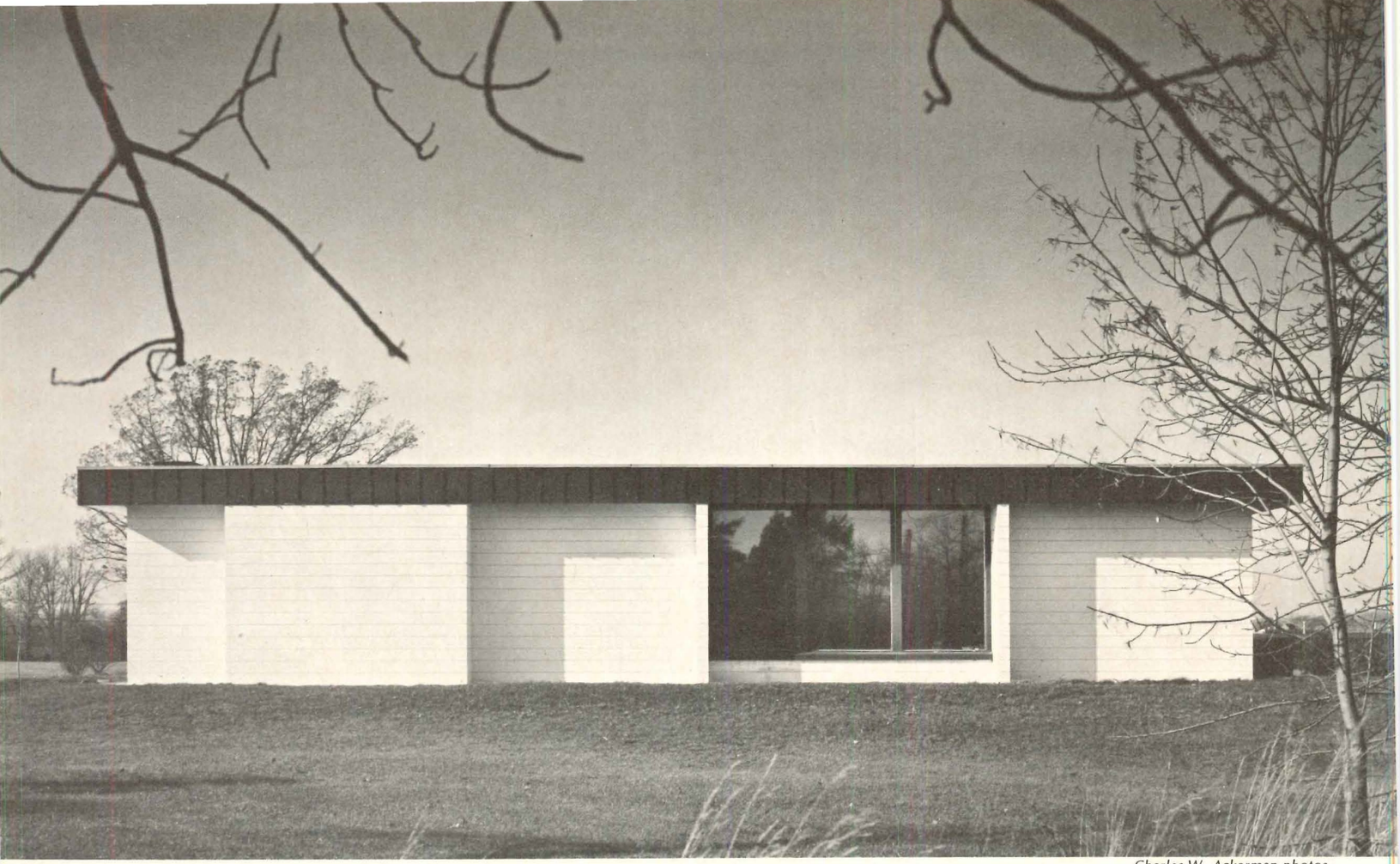
vending machines and a sandwich bar are the only source of food besides lunch boxes, but a short order counter will be included in the first expansion. The garden was designed by the architects with advice on plant materials from local nurserymen, so that its plantings are compatible with the desert's ecology.

Access and entrance. The Sierra Pacific Industrial Park, where Sea & Ski is located, is under development in agricultural land just east of Reno. As you come from Reno, you enter the Sea & Ski property directly from Mill Street (see plan) driving past the entrance into the parking lot. Trucks continue on Mill Street and turn right into Edison Street, which is part of the industrial park's road system, and right again into the truck loading turn-around. This is depressed about four feet below normal grade in order to bring the tailgates level with the warehouse floor.

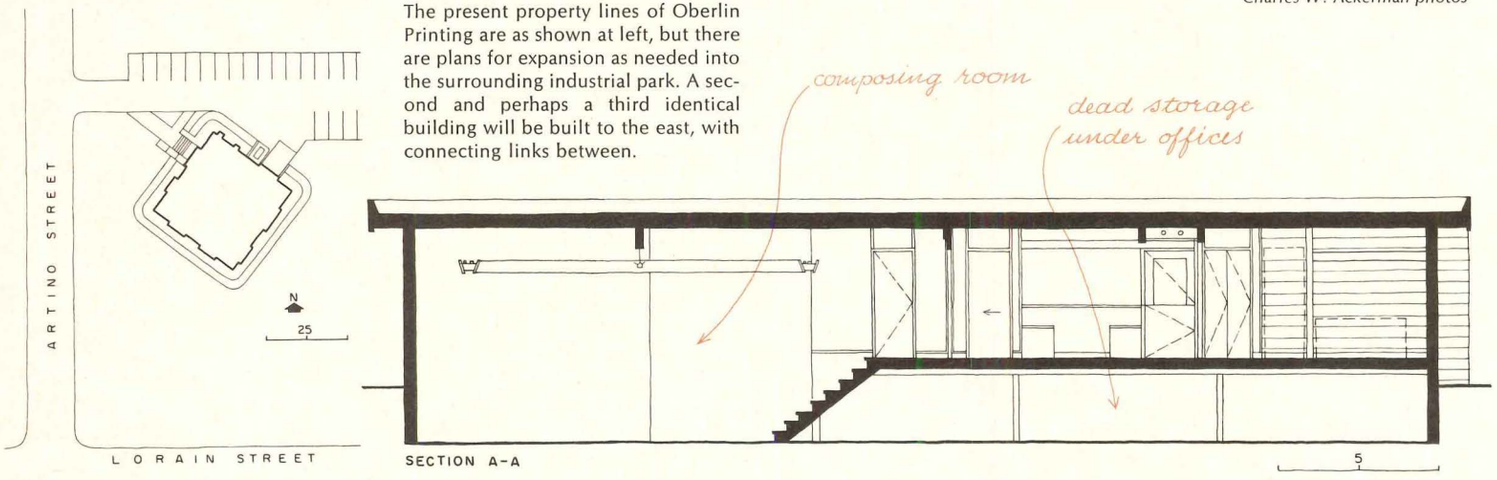
Movement into the administration building is organized and dramatized by a free-standing shelter, open toward Mill Street, fairly shouting that this is the way in. Employees who work in production and warehousing use the same parking lot, entering the outdoor lobby-garden through gates in the redwood fence along its west side. In bad weather they can cross the garden under shelter along the office building facade and enter the door at the north end of the glazed passageway, or in good weather into the south end of the link and then directly into the factory lobby.

Expansion. As a subsidiary of Smith, Kline and French Laboratories, the Sea & Ski Corporation has been growing rapidly. The new plant is three times as large as the old. Plans for expansion on the new property can accommodate the 150 per cent expansion (phase 2) expected by 1973, and as much as 400 per cent by 1978 (phase 3). Whether this growth will be necessary, only the future can tell. What is essential at the initial stage is that sufficient land be retained to make it possible, and that each part of the initial plant be able to expand.

SEA & SKI CORPORATION PLANT, Reno, Nevada. Architect: *Marquis & Stoller;* structural engineers: *Gilbert, Forsberg, Diekmann & Schmidt;* mechanical engineers: *Kasin, Guttman & Associates;* electrical engineers: *R. F. Darmsted & Associates.*



Charles W. Ackerman photos



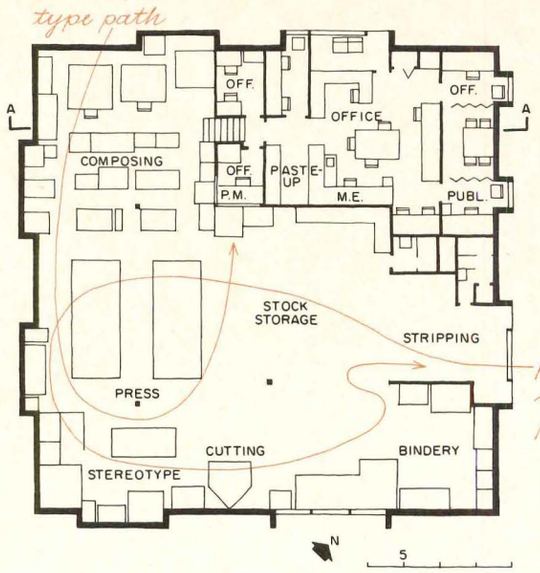
The present property lines of Oberlin Printing are as shown at left, but there are plans for expansion as needed into the surrounding industrial park. A second and perhaps a third identical building will be built to the east, with connecting links between.

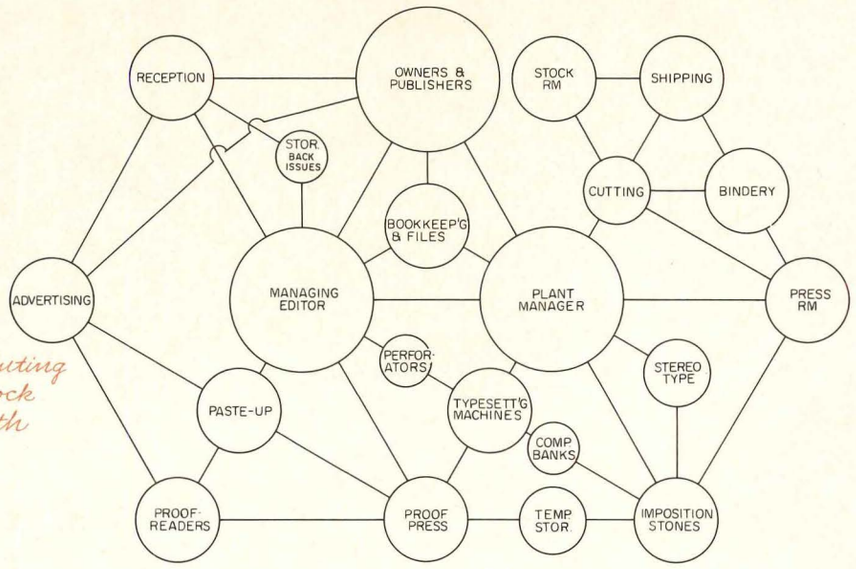
OBERLIN PRINTING: DIVERSE FUNCTIONS WITHIN A SINGLE FORM

Like many small businesses, the Oberlin Printing Company has a rather complex management and production hierarchy—ownership, strategic management, advertising, production management, productive personnel, materials handling. Aware of this and how it might affect the design of new facilities, architect Jim Morgan spent much time analyzing the organizational structure and physical requirements of the printing firm with the owners and staff. He took down the measurements of every piece of equipment to be used in the new plant, learning their purposes and relationship to other equipment. He thoroughly analyzed the interaction between the various elements of the firm, eventually expressing the relationship of identifiable functions in a simple geometrically-arranged diagram (shown above).

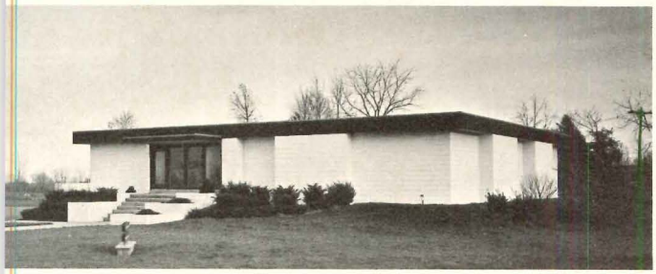
This kind of detailed study not only led to a thoroughly efficient and functional plan, but also expedited production work and construction. Eight months after the owners hired their architect, Oberlin Printing was complete and ready for occupancy. The cost was $11.50 per square foot not including fees, but including office furniture.

Environment. The owners of Oberlin Printing were anxious to present a good image to the highway, and Morgan made the most of the small mass of the building by setting its diagonal approximately parallel to the highway. Coming from Oberlin, the two facades you see first are the southwest, windowless because the printers and compositors do





The plan of Oberlin Printing (above) is here shown with one of Morgan's final "function diagrams" prepared in the early stages of design. The basic triangle of (1) owner and publisher, (2) managing editor, and (3) plant manager is in the center, with their importance emphasized by the size of the circles. The lesser functions and their lines of relationship form two overlapping hexagons surrounding the basic triangle. A study of the plan will show a similar arrangement in the final design.



not want daylight, and the northwest, with the entrance door. The two facades blend into one long white wall. As you pass, the southeast facade comes into view, with a large window through which employes who do collating work can look out to the road and its activities. The dominant effect of the wall is enriched by the shadows cast by structural piers and reveals, and the shape of the building is defined as a square by the thick roof and its dark metal fascia.

Access and entrance. Artino Street (see site plan) leads directly from the highway into the industrial park. The main entrance to Oberlin Printing is clearly visible, accentuated by a flight of steps (themselves a reflection of the interior space) and protected by a simple marquee, set just below the roof fascia to distinguish it from the roof, but parallel to it to reinforce its horizontality.

Parking is available along a short driveway, which, in the future, will become a loop road connecting Artino Street back to Route 10. The truck entrance is off this drive, under the watchful eyes of the owner and the publisher.

Interior space. The ingenuity of this solution is revealed by studying the section. The offices are raised five feet above the plant floor, giving them an appropriate eight-foot ceiling height under the same roof plane as the plant with its 13-foot ceiling. The space below the offices, which is used for storage, has enough headroom so that workers can conveniently refer to back issues of the newspaper and the "dead" type which has to be kept for several years. By providing a kind of well in the roof, the mechanical equipment, which must be out of doors, is hidden from view. To inexpensively deaden sound in the press area, Morgan used perforated hardboard panels on the ceilings, with mineral wool insulation above. In the work area, industrial-type fluorescent fixtures are hung upside-down under the plywood box beams, so they bounce light off the ceiling.

OBERLIN PRINTING COMPANY, Oberlin, Ohio. Architect: *Jim Morgan;* contractor: *Clark Bros.;* mechanical and electrical design by architect.

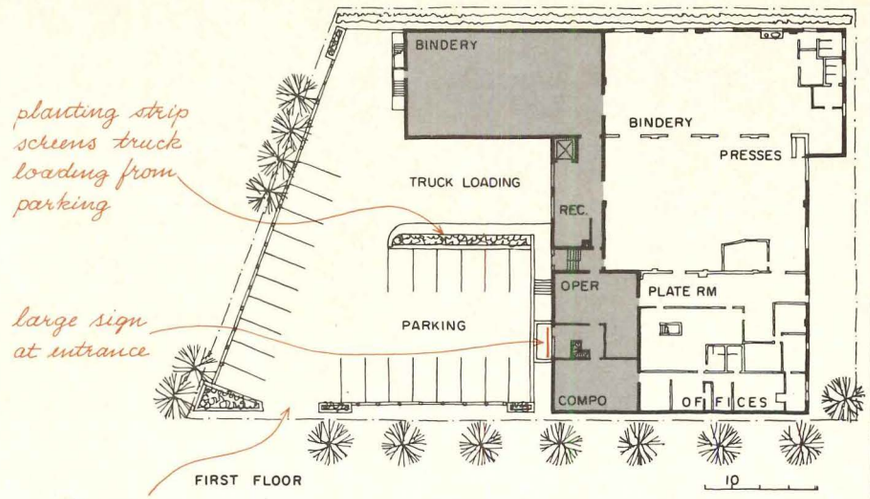
Jack Stock Studios photos

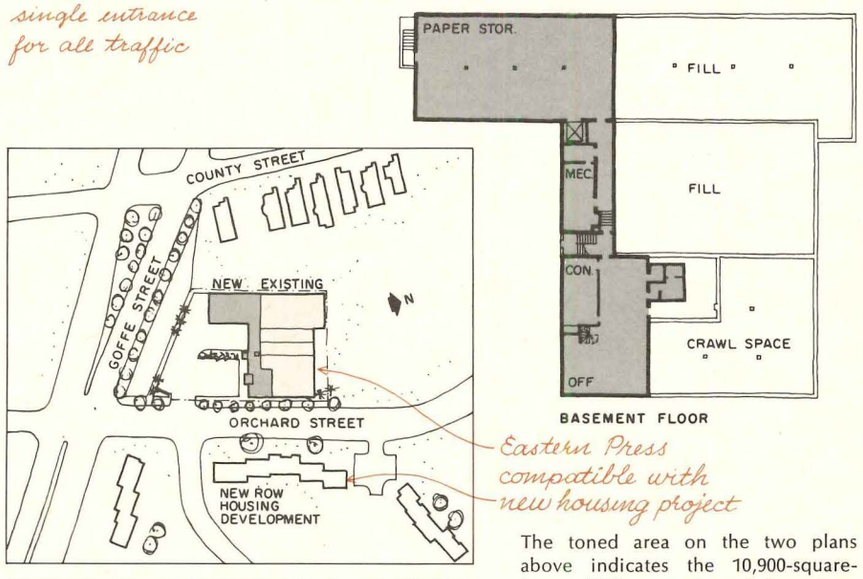
EASTERN PRESS INC.: RENOVATION AND EXPANSION IN AN URBAN SETTING

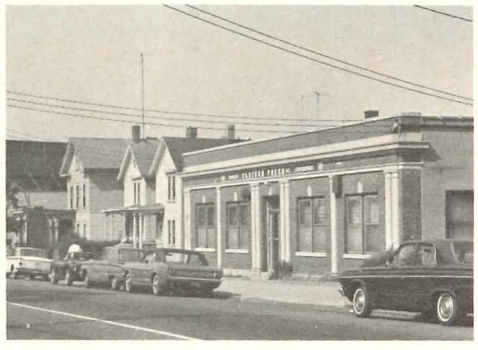
When the City of New Haven was planning the Dixwell urban renewal area, the question was debated, "Should Eastern Press and other non-conforming uses be allowed to remain in a residential neighborhood?" Business was growing rapidly for Eastern Press Inc. and the 40-year-old building was in good condition, though it needed expansion. Supported by the owner of Eastern Press Inc., Ray Johnson, his architect Earl Carlin and others, the planners who believed that urban neighborhoods should not be rigidly compartmented by zoning uses won the debate. Given this theoretical victory, the architects had still to translate it into the physical form of a building that the people living in the neighborhood would find compatible.

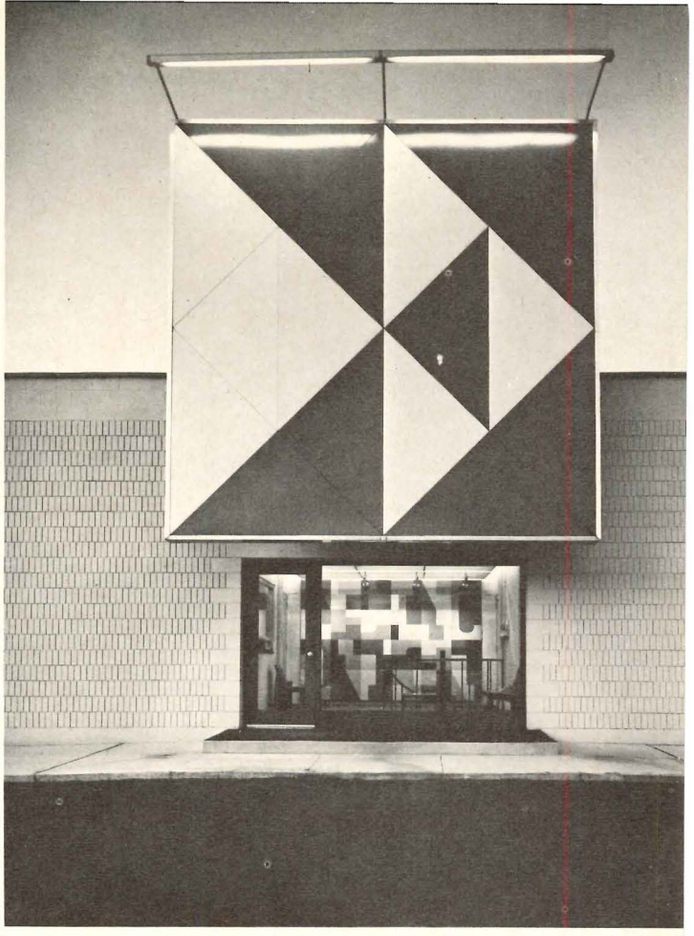
Access and entrances. The site is trapezoidal, separated from Goffe Street to the south by a greenbelt strip which the City retained for future widening and planting. The location of the existing building and internal functions determined that the entrance drive and parking lot be to the south. A single curb cut on Orchard Street serves where two had been necessary for the original plant. Parking is clearly differentiated from truck movement, and the loading area is screened off by a row of jack pines, which will soon form a dense hedge. There are few pedestrians on this side of Orchard Street; the movement is on the east side around John Johansen's new two-story housing project.

The architects clearly differentiated loading dock, personnel entrance and pub-









The toned area on the two plans above indicates the 10,900-square-foot addition to the existing plant, built in the 1920's. The patterned block used for the addition was designed by the architects and was carried around the front and north side of the existing building to join new with old. Norman Ives' banner dominates the main entrance (above, right) and adds bright accents to the main office area (right). The three wood-framed residences that appear in the photo of the old Eastern Press (left) were torn down by the New Haven Redevelopment Agency, making room for the building's expansion.

lic entrance. The public entrance is marked by graphics designer Norman Ives' giant porcelain-enameled panel, a pattern of red and white triangles suggesting an "E", which has the gaiety of a medieval knight's banner and somewhat the same purpose. Two more material functions are also incorporated within the sign: The horizontal part of its support keeps rain off the entrance and the sign itself shades the glass-walled lobby from the southwest sun.

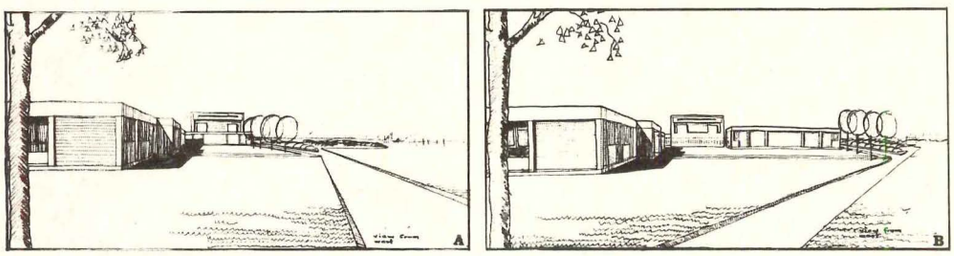
Plan and massing. One story in an industrial plant equals two in a house. This relationship was already established by the existing building and its neighbors (see above), and was maintained in the design of its expansion, to compatibly relate Eastern Press to a new two-story housing project (designed by John Johansen) across the street. Painted concrete blocks of special design are intended to echo the materials used in the Johansen project, and are carried across the face of the old building to unify the composition. A six-foot-diameter helical stair in the lobby leads downward to offices, in an interesting reversal of conventional movement. Additional work and storage areas are provided on the lower floor. The lack of windows in the bindery must bother the claustrophobic, but there are compensating advantages for air-conditioning and for the exterior form.

Expansion. Ray Johnson started Eastern Press by accident. In 1958 he sold a press to the editors of the Yale Daily News. They soon learned that printing as well as editing a paper was more time-consuming than their studies could permit. Johnson took over printing their paper and did it so well that more and more printing work was brought to him, including extensive lithography for advertising.

He cannot expand further on this site. Johnson has chosen to grow by establishing branches, and there are now three in addition to this main plant, each with a semi-autonomous management.

EASTERN PRESS INC., New Haven. Architects: *Carlin, Pozzi & Associates—associate: Peter Millard;* structural engineers: *Henry A. Pfisterer;* mechanical engineers: *Hill & Harrigan;* graphic design: *Norman Ives;* contractor: *Jaybe Construction Co.*

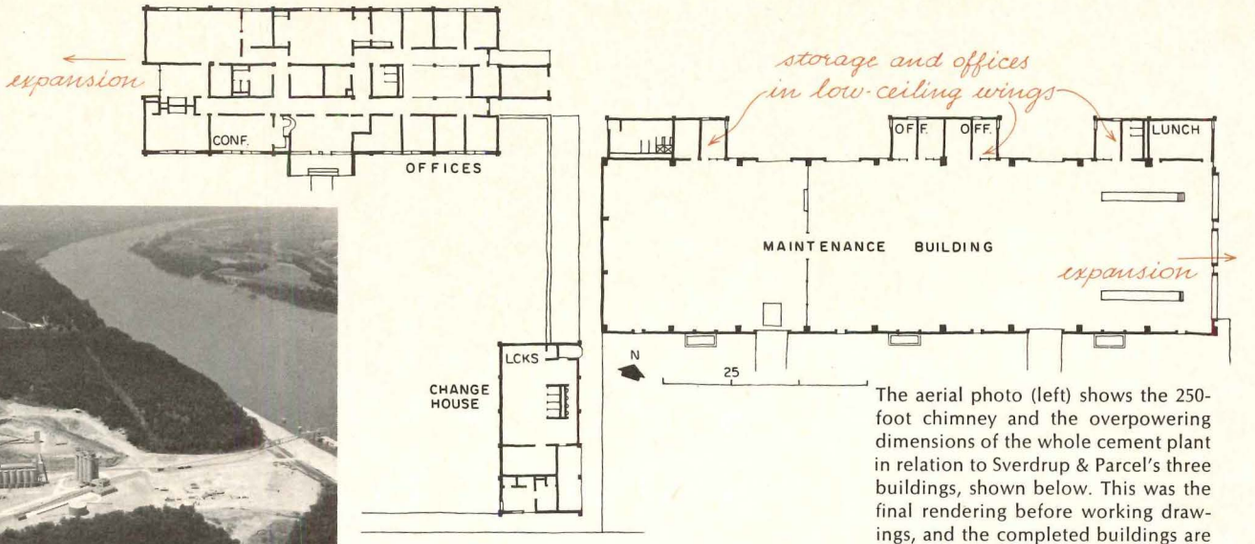
Harr, Hedrich-Blessing photos except as noted



The completed maintenance building is shown above. At the left are two sketches of the complex as viewed from the approach road, done by architect Hosier early in design development. These are from a series showing the client alternative schemes in building placement and circulation. The architects considered the series of "B" alternatives most successful, and the clients acceped them as revisions from the first "A" series.

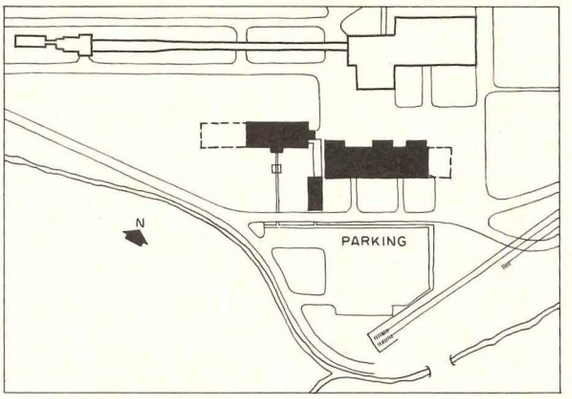
RIVER CEMENT COMPANY: THE GENESIS OF THREE BUILDINGS

The River Cement Company, a division of Mississippi River Fuel Company, has established a three-million-barrel cement plant 60 miles south of St. Louis. The cement plant is the product of two firms, MacDonald Engineering and Sverdrup and Parcel Associates. MacDonald, an engineering firm, designed and coordinated the largest part of the plant: a 1000-foot-long line of structures which included exhaust stacks, the giant rotary kilns, the bins and silos. These are the manufacturing facilities, properly fulfilling their wholly functional requirements. Sverdrup and Parcel, however, were called in to design three structures that are primarily for the accommodation of people—administrative offices, a building for workers to change their clothes, and the main-



White Studio

The aerial photo (left) shows the 250-foot chimney and the overpowering dimensions of the whole cement plant in relation to Sverdrup & Parcel's three buildings, shown below. This was the final rendering before working drawings, and the completed buildings are nearly identical to it.



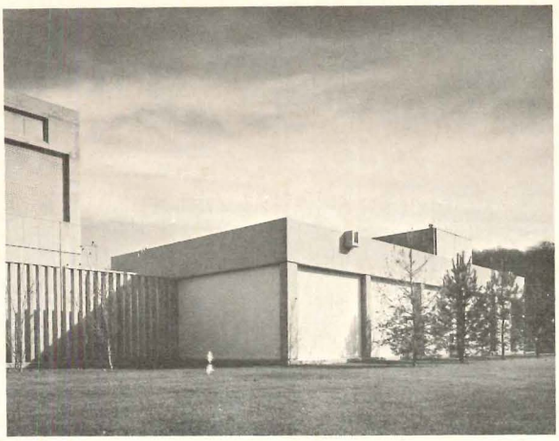
tenance area for repair of equipment.

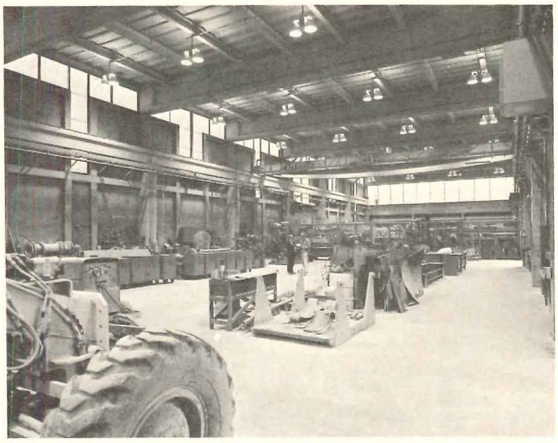
Sverdrup and Parcel employ over 900 engineers and architects. While most of the firm is made up of engineers, their architectural section is small but growing. In their solution to the design of these three structures, they have proved it is possible to create good architecture for a client who was basically concerned with process efficiencies and costs.

The establishment of good communications with the clients through meetings and visual presentations was a principal reason for their success. In the words of Arch Hosier, the project designer: "During meetings with the client . . . (we) established the real goals lying beneath the initially stated requirements. While discussing what was meant by the 'most economic building', we found that they were willing to spend money for planning, logical construction, good finishes, special details, etc. The client learned during the project that the preparation of an architectural program enables the client and architect to understand what they are trying to achieve. Most important, our ability to convey ideas by sketches led to our success in persuading the client of the validity of our design decisions."

Massing and Plan. The three elements—office, change house and maintenance building—are freestanding. Heights can correspond to needs; the maintenance building even has three low blocks attached to the north side to accommodate functions that do not require the 27-foot ceiling height. The office and maintenance buildings are parallel to each other and to the main axis of the complex established by the kiln to the north. Set at 90 degrees to this axis, the change house and the fence linking it to the office block act as transverse elements.

Environment and expansion. River Cement has been carefully sited in its limestone valley, opening onto the Mississippi from the foothills of the Ozark mountains (see aerial photo). The 250-foot-high chimney unmistakably marks the beginning of the plant —it is a working symbol and the major vertical element in the composition. The change house has been built to satisfy the needs of a three-kiln plant (the proposed ultimate size of the total facility). The office and maintenance buildings were oversized





The photo above shows the change house in relation to the higher maintenance building. The maintenance interior is the major space within the three buildings, and is partially lighted through the translucent plastic panels which form a series of "T's" both inside and on the exterior. Cast-in-place concrete is the primary material used in the three buildings, along with painted concrete block. Poured concrete surfaces were bush-hammered and rubbed to expose the aggregate.

to accommodate the additional facilities necessary to support a second kiln, which has since been added. In addition, these two buildings have been sited so that they may grow in length without interfering with other operations.

Access and entrances. As you enter from Highway 61, stack and kiln are to your left, a creek to your right. The road leads directly to visitor's parking, then plant employes' parking, in successive areas on the right.

Visitors and office personnel cross the road in a straight line from their parking lot toward the main lobby. Employes engaged in maintenance and production cross the road from their lot, punch the time clock in the change house, change their clothes and go to work.

Interior world. The maintenance building provides the major space, 62 feet wide by 225 feet long, with its 10-ton traveling crane overhead. The precast concrete girders are apparent inside and on the end walls, where they are separated from the masonry screen wall below by a continuous window of translucent plastic. The windows form giant "T's" or "L's" on the facades, with their vertical strips varying in width and location. They are wide and central to match the garage doors below, or narrow to allow the the fresh air units or the lower blocks to intersect the main mass of the building without clumsiness. Thus a handsome composition has been made out of the necessary elements, without introducing anything functionally or formally extraneous.

OFFICES, CHANGE HOUSE, AND MAINTENANCE BUILDINGS OF THE RIVER CEMENT CO., Selma, Missouri. Architects and engineers: *Sverdrup & Parcel—chief architect: I. R. Veron; project designer: A. H. Hosier;* constructing engineers: *MacDonald Engineering;* contractor: *J. S. Alberici Construction.*

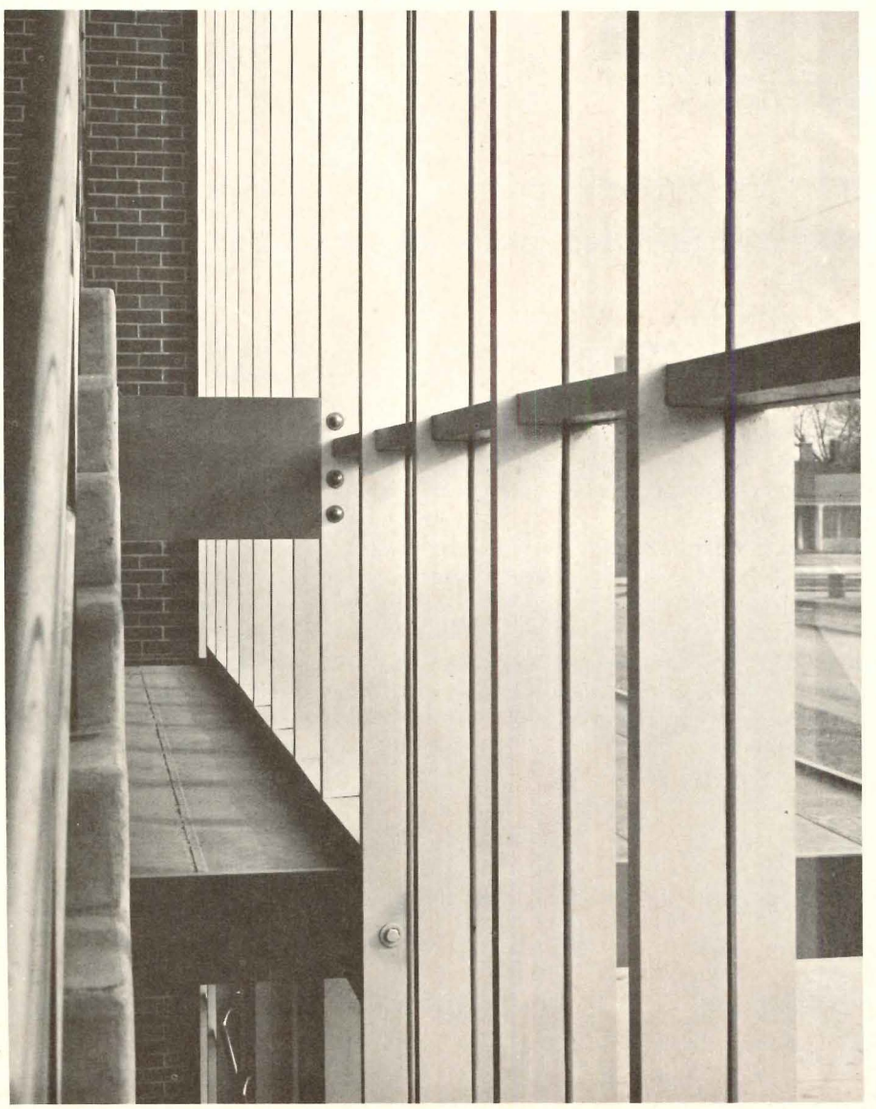
Three structural techniques use metals inventively

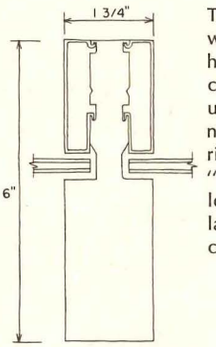
Aluminum columns in glass walls carry both roof loads and wind loads

1

Structural aluminum members in the glazed walls of this elementary school do much more than support the lights of glass—they are actually columns that carry roof and floor loads. Result is that the customary freestanding columns are eliminated, thus achieving a light, airy, open, uncluttered appearance. This is the third school in which architects Ganster & Hennighausen have used the aluminum columns, and the firm has also employed them in a small office building. Here, in the Gertrude M. Carman Elementary School in Waukegan, Illinois, the extruded aluminum columns carry floor and roof loads at the two-story-high, canopied glazed areas seen in the photo, lower right. They also support the entrance canopy, take half the roof load, and carry part of the stair load, in the front lobby. A thin stainless steel bar connects steel framing of the stair to one of the aluminum columns, where the tongue of the bar is attached to the column by means of stainless steel bolts.

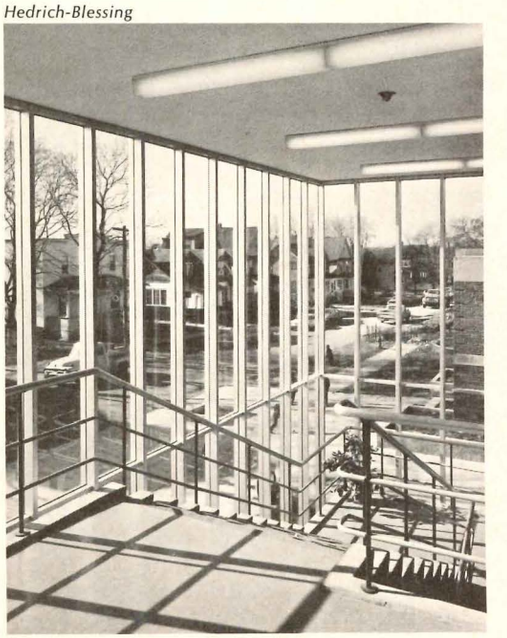
The columns, designed and fabricated by Aluminum Structures Company of Wilmette, Illinois, are only 1¾-in.-thick and 6-in.-deep, and are spaced on 20-in. centers. The columns are extruded sections, configurated on the narrow portion to receive snap-on glass stops. Seal between glass and stops is made by neoprene gaskets. The horizontal aluminum members are basically the same shape as the aluminum columns, only slightly smaller, and they also use the snap-on glazing stops. The columns are bolted at their base to the foundation and at their top to an 8-in. channel that transfers loads on roof and floor joists to the aluminum columns.

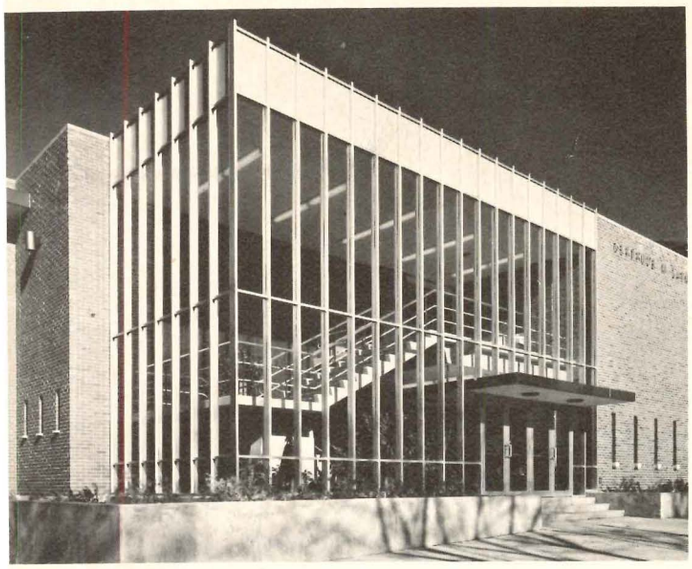


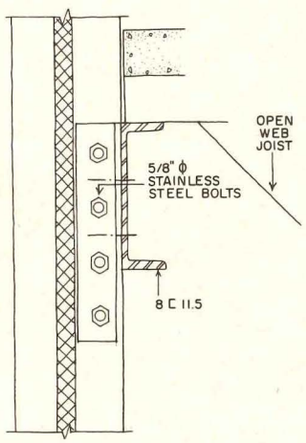


The extruded aluminum glass-wall framing members shown here are actually load-bearing columns. One of these columns in this Waukegan, Illinois elementary school carries part of the load of the "freestanding" stairs. A stainless steel bar connects a stair-landing beam to one of the columns (see photo, left).

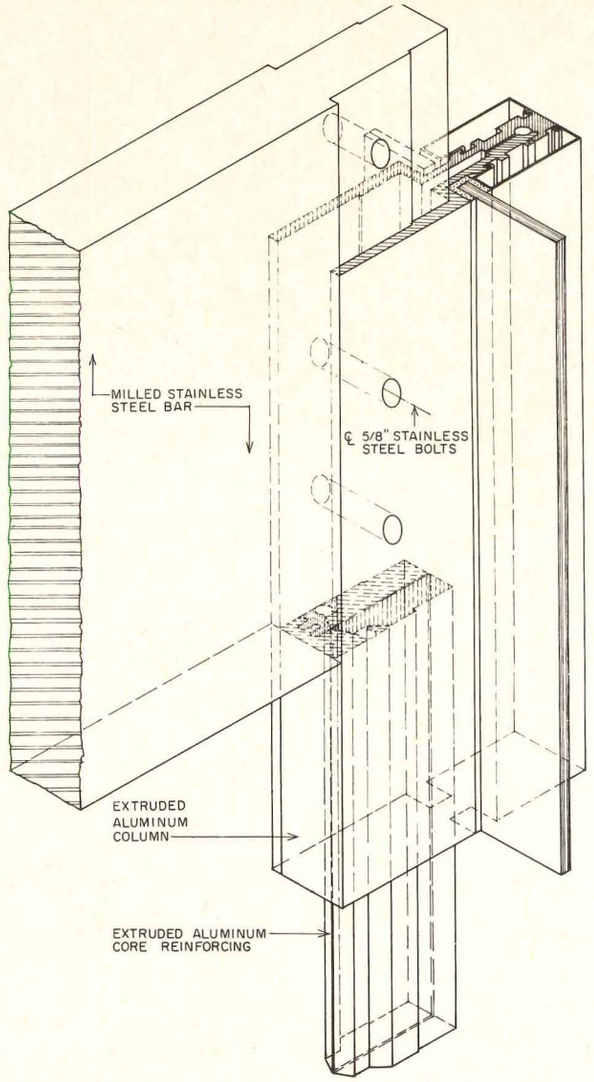
Hedrich-Blessing







Load of floor joists is transferred to the aluminum columns by providing an 8-in channel, bolted to a steel angle, which in turn is bolted to the aluminum column. A somewhat more complicated, but visually simple, connection was made between a stainless steel bar and one of the columns for carrying a portion of the stair load. The end of the bar was machined to fit into the column, and this end was bolted to the column as shown in the detail. The column was reinforced with an extruded aluminum core.



End-plate design cuts cost of moment connections for steel frame by 26 per cent

2

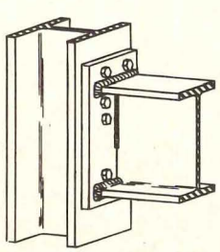
A relatively new type of moment connection, called end plate, cut costs of the steel framing by 23 cents per sq ft for an eight-story apartment building designed by Dalton-Dalton in Cleveland. This connection utilizes a system of flat plates shop welded to the beam ends and punched for bolted erection. Although end-plate design is not yet a "standard" steel connection detail, its proven economy in both the fabrication and erection of the structural steel has won over designers, fabricators and erectors who have used the detail.

Owned by the AFL-CIO, Federation Towers, a $3.5-million low-rent apartment project now nearing completion in Cleveland, utilized end-plate moment connections on all floor beams in both directions.

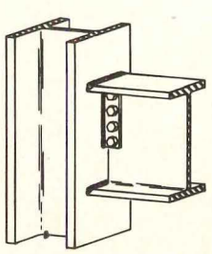
The beam-and-joist framing system for this 173,600-sq ft structure was set up on a 16-ft module dictated by the size of the residential units. Wind bents in both directions required that nearly every beam have moment connections on both ends. Each end-plate connection represented a savings of 26 per cent over its closest competitor, a field-welded connection, and 55 per cent ($40 each) over split-tee connection. Floor joists were set in the same direction as major wind bents in each wing so as to reduce the maximum moment on the connections. As a result, only two thicknesses of end plates were required, combined with a total of three bolt patterns.

The fabricator-erector, Burger Iron Co. of Akron, Ohio, furnished 590 tons of structural steel (approximately 6.8 lb. per sq ft) for the project, including 20 tons of plate for the connections. Tolerances were plus zero and minus 1/16 inch. All steel was type A36, and all bolts were ¾-in. diameter, high-strength type A325.

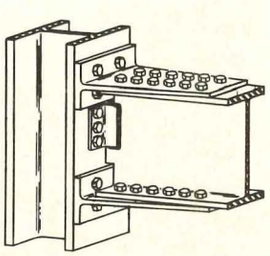
Recognizing the apparent economy of the system, the architect-engineer, Dalton-Dalton Associates, under the direction of Robert P. Dalton, made a thorough study into the design of end plates. The study, by Emil Hach, director of structural design, led to a simplified design procedure. The analyses of design parameters and several design aids were developed by the firm's computer department on a third-generation Univac 1108 digital computer. The architect-engineer has since used the end-plate system on several other projects, including a seven-story, 250,000-sq ft office building and a three-story department store.



END PLATE



FIELD WELDED



SPLIT TEE

Two of the major deterrents to the development and use of end-plate connections have been the lack of tested design parameters available to engineers, and the hesitancy of many steel fabricators to work out the new fabricating techniques required for this unusual framing system. The first of these obstacles was partially overcome by two series of tests conducted by research teams at the University of Illinois and later at Cornell University. First, it was found that under certain conditions large prying forces can be developed in the end-plate and the connection bolts. Then design parameters and design formulas for both working load and plastic design methods were developed and tested under the joint sponsorship of the American Institute of Steel Construction and the Industrial Fasteners Institute. At the same time, forward-looking fabricators in Pittsburgh and Cleveland were developing techniques that permitted economical production of large quantities of end-plated beams while maintaining required tolerances of plus or minus 1/16-inch.

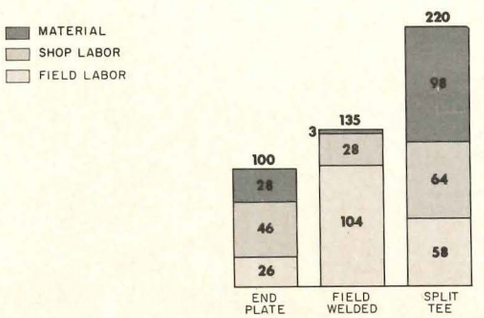
Steps to be taken in the design procedure

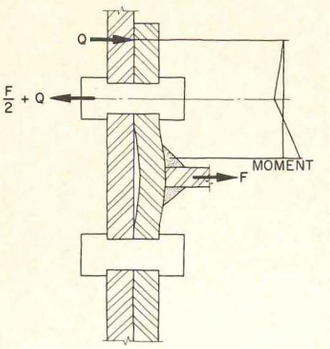
Design parameters for end-plate connections involve the bending stress in the end plate itself, and a prying action which affects the tensile bolts. Although these are closely related, independent calculations are required in order to arrive at a suitable size of end plate. A typical design of an end-plate connection involves only three steps. After arriving at a required beam size, the designer selects the number and size of bolts required to develop the moment and shear forces. An end-plate size is then selected that will resist plate bending moment and produce no more than the allowed prying forces on the tensile bolts. Finally, the weld sizes are specified. The design procedure is as follows:

1. *Choose the bolts.* After a fixed-end moment is established, the force in the tensile flange of the beam is compared with the allowable tensile values for high-strength bolts types A325 and A490. An even number of bolts is selected, with a minimum of four, so that the tensile capacity of the bolts equals or exceeds the tension flange force. The excess bolt capacity is the amount of prying force the bolts can resist; or, the maximum allowable bolt prying ratio is:

$$p = \frac{\text{excess bolt capacity}}{\text{tension flange force}}$$

The plate will pry on the bolts; the prying arm is the distance from centerline of top





row of bolts to the center of the flange weld fillet, as shown in the drawing. The prying arm will vary with bolt size chosen and size of weld fillet. Shear bolts are selected of the same size and type as the tensile bolts.

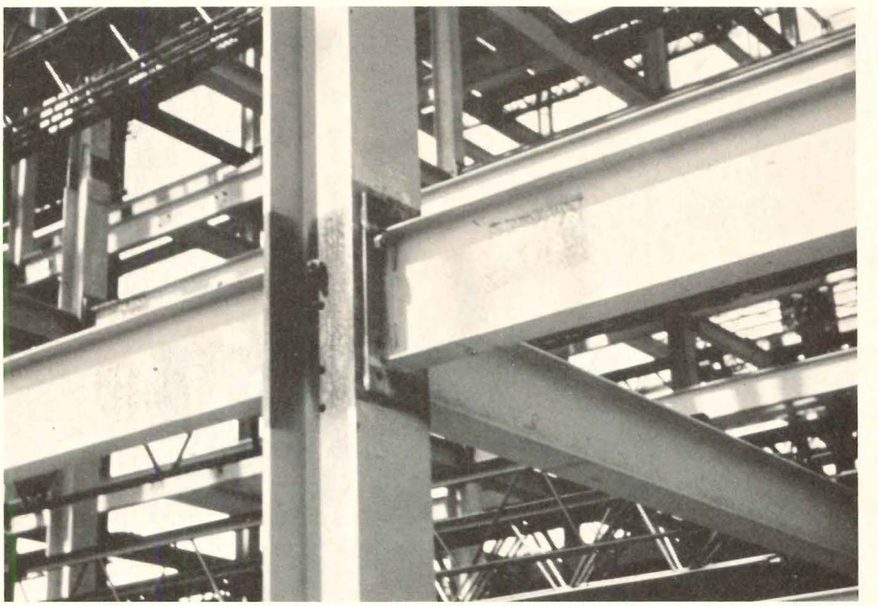
2. *Select a plate.* Start with a trial plate wider than the beam flange, but no wider than required. As the end plate designs accumulate on a particular project, several popular plate widths may evolve. The prying ratio produced is then determined.*

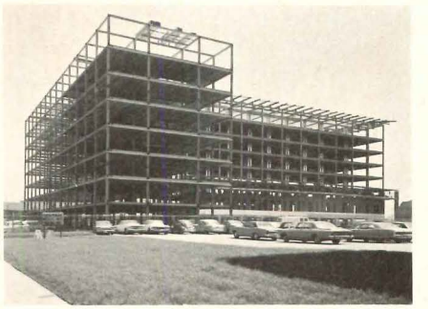
3. *Design the welds.* The size of shop weld required to develop the tensile flange forces produced by the fixed-end moment is specified for the top and bottom flanges of the beam. The required shear weld is placed along the web, preferably on both sides of the web for a minimum distance of half the depth of the beam.

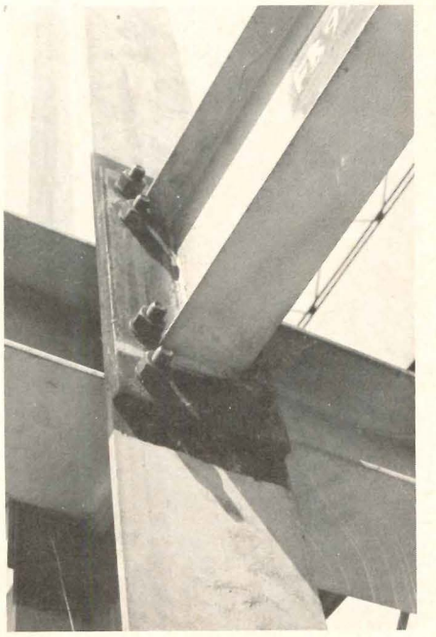
Fabrication is not difficult but requires accuracy

Fabrication of an end-plate moment connection often involves nothing more complex than milling the beam ends, carefully placing the end plate for tack welding to the beam, and finally running the proper welds on the beam flanges and web. It is essential, however, that the beam be properly supported during milling so that the parallel end plates are perpendicular to the working axis of the beam. With this done, erection of end-plated beams can be relatively trouble-free. The end-plate hole patterns align with those in the columns.

* The formula for calculating prying force is given in "High Strength Bolted Moment Connections," by Richard T. Douty and William McGuire. *Journal of the Structural Division*, Proceedings ASCE, 4298, No. ST 2, April, 1965.







End-plate-type moment connections were used for the floor beams of this 176,000-sq-ft low-rent housing project in Cleveland, saving 26 per cent over field-welded connections, and 55 per cent over split-tee connections. All steel was A36, and all of the bolts, high-strength A325. Eight bolts were used, four on either side of the top flange and four at the bottom flange.

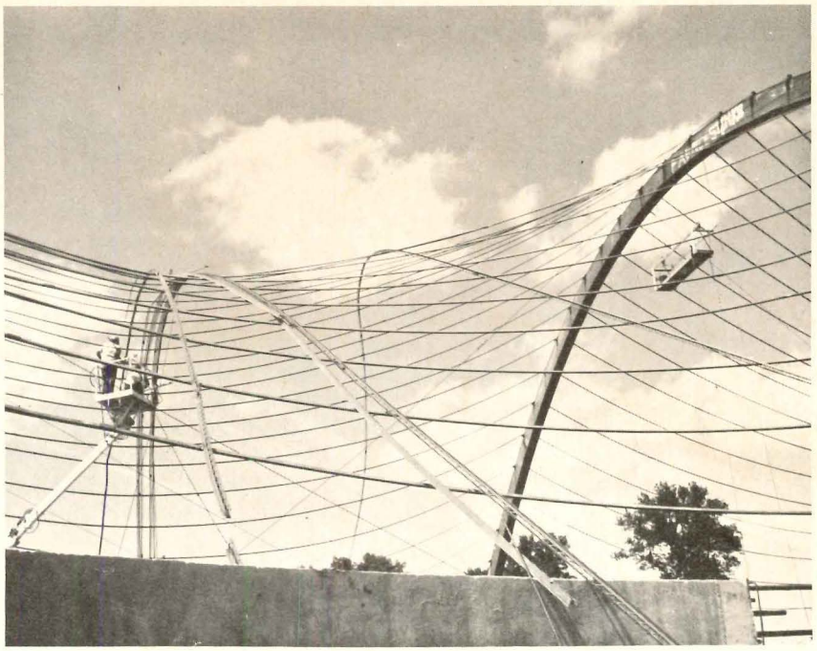
Super-light, saddle-shaped roof is made of plastic foam over tensioned-steel web

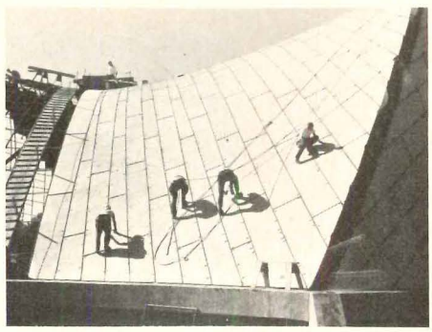
3

Thin-skin roofs are often dreamed up for projects, but few ever see the light of day. One that did is the hyperbolic-paraboloid-shaped roof structure for a 300- by 175-ft physical education building at Graceland College, Lamoni, Iowa, designed by Shaver & Company, architects. The tensioned-bar-supported roof consists of 2 to 3 in. of foamed-in-place polyurethane insulation over 1½-in.-thick wood-fiber formboard. Roofing is fluid-applied Hypalon.

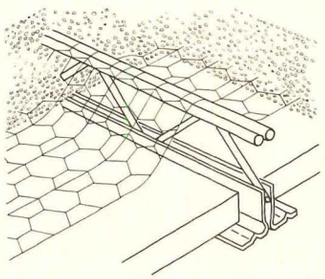
The roof is reinforced and partly supported by trussed-tee subpurlins. Lengths of the heavier of the two sizes of subpurlins used were welded together to form ties as long as 175 ft, which, when tensioned, make the ¾- by 2-in. draped bars become taut. After these subpurlin ties were tensioned, they were welded to the draped bars where they crossed each other—making a total of over 5000 welds. The long lengths of thin bars were draped over 175-ft wide box-beam arches to form the saddle-shaped roof, and anchored at the perimeter to the 10-ft-high foundation wall. The lighter of the two sizes of subpurlins spaced the cables and supported the formboard.

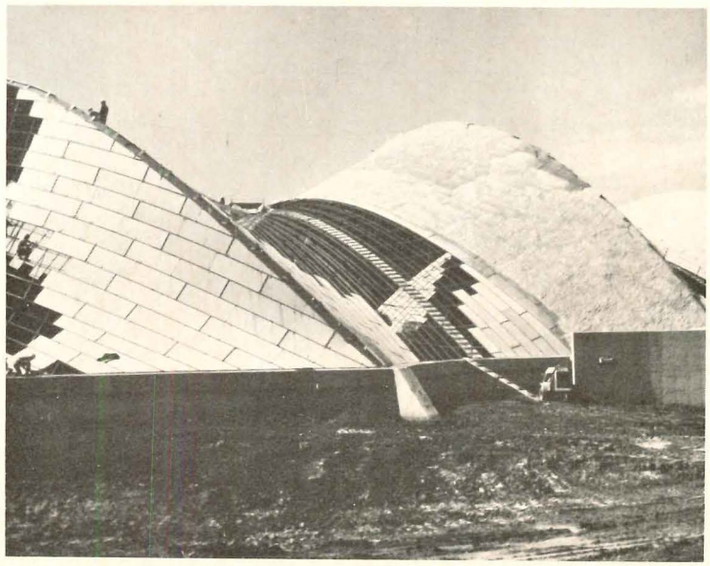
The building was designed to house four basketball courts, an ⅛-mile track, pole-vaulting and high-jumping areas, and moveable bleachers for spectators.

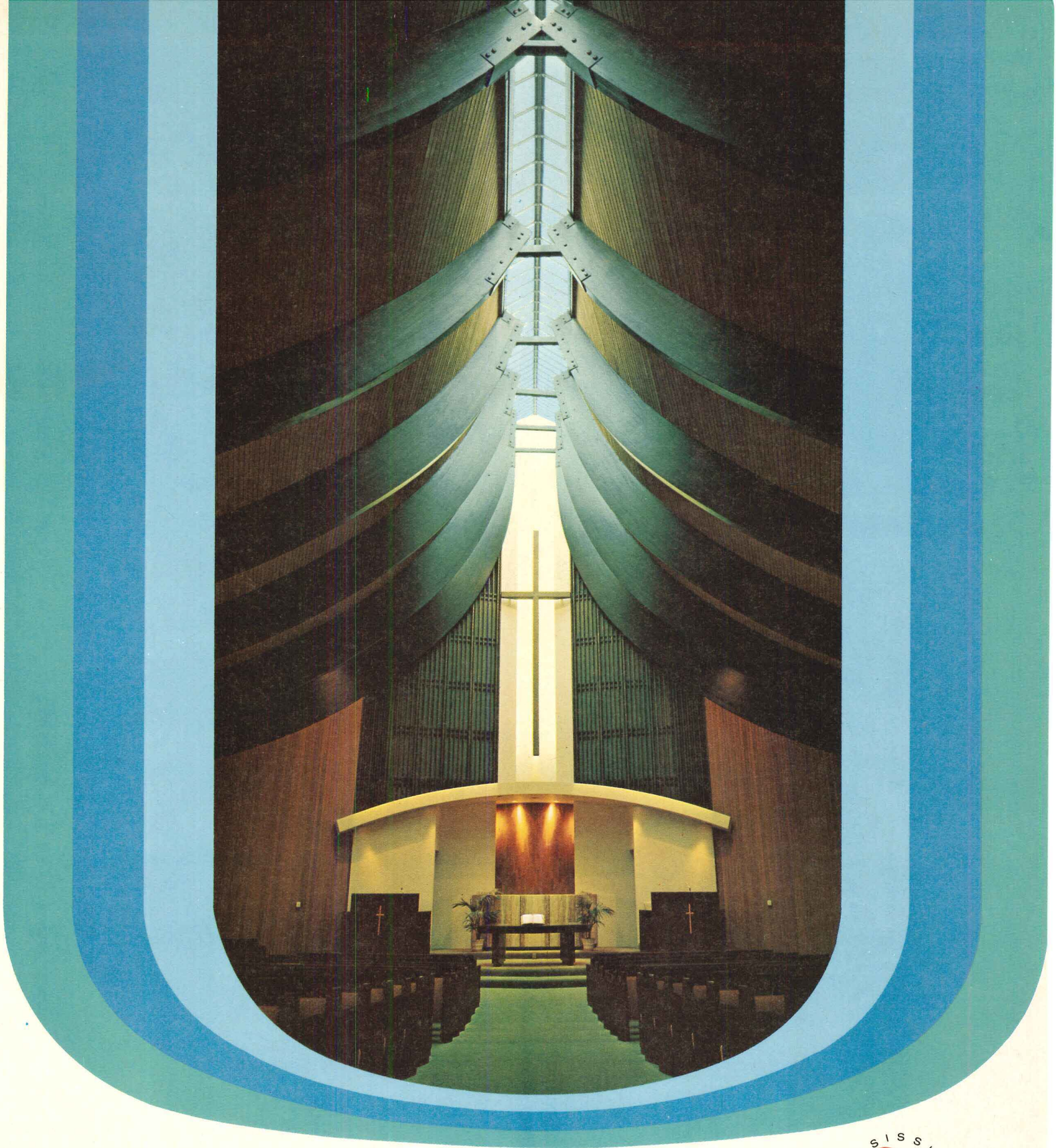




After long lengths of thin bars had been draped over arches to form basic shape of the roof, trussed-tee subpurlins made up in lengths of 150- to 175-ft from stock 30-ft sections were looped over the bars, pulled taut and welded to the bars. In order for welders to perform their job, the contractor, Lawton Construction Company, used a cherry picker to lift them to working level. Formboard was used 1½-thick, so that tradesmen could safely walk over it. Because of the warped shape of the roof surface and the looping configuration used for the long-length subpurlins, only every other section of formboard could be used in standard-size sheets. Alternate sections were pie-shaped to make the geometry come out right. Short lengths of subpurlins spread the thin bars to the requisite distances. Wire mesh provides anchorage and reinforcement for the foamed-in-place polyurethane insulation.







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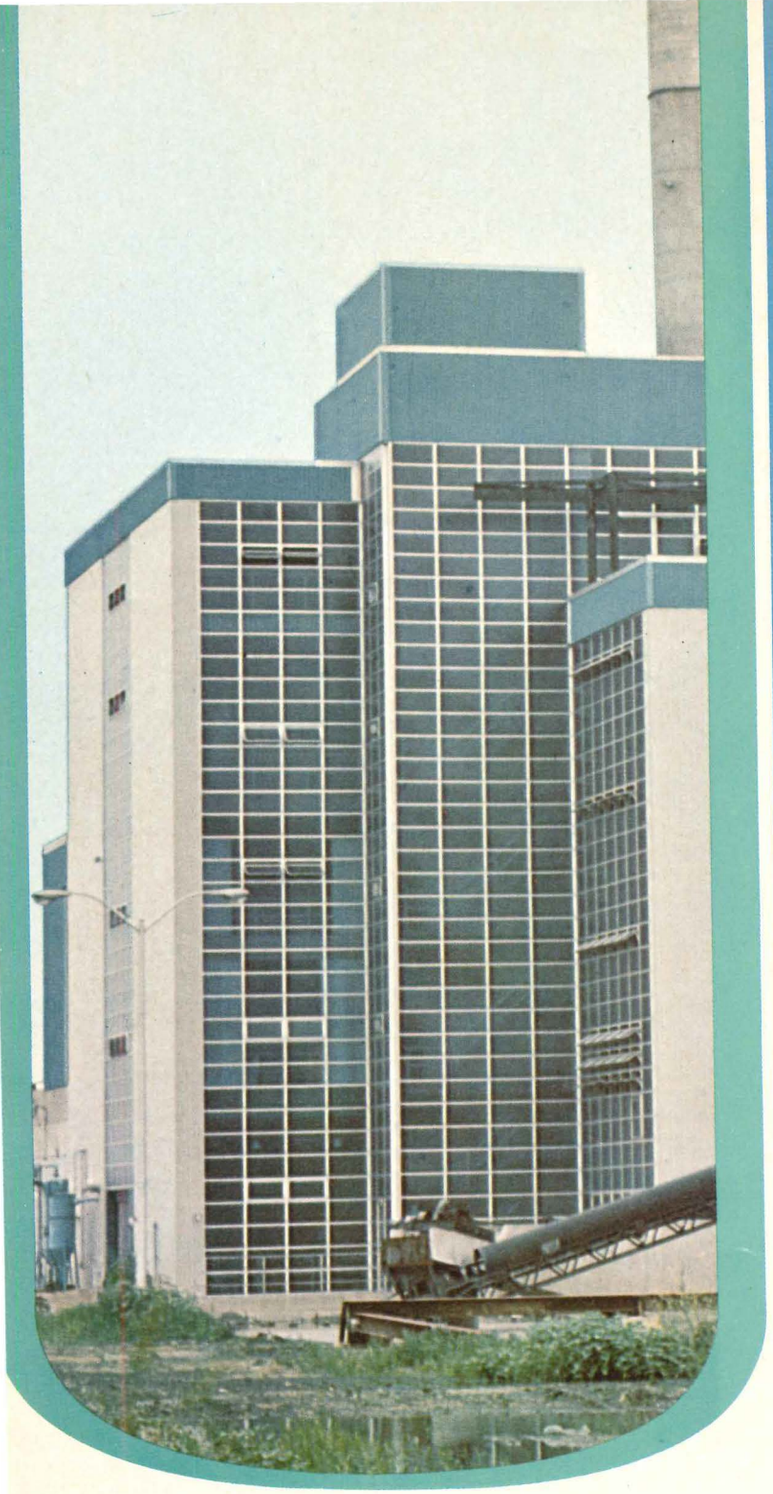

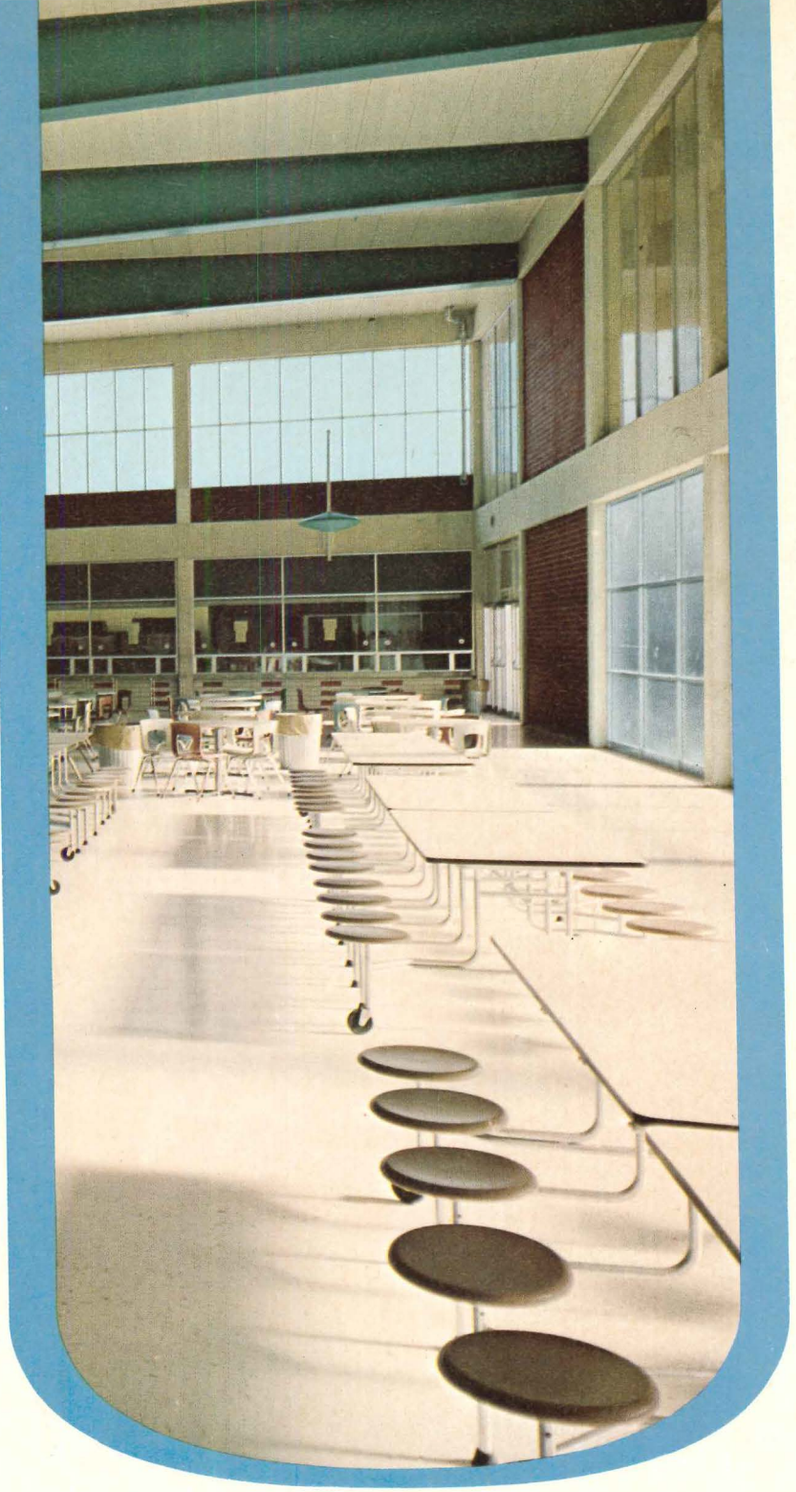

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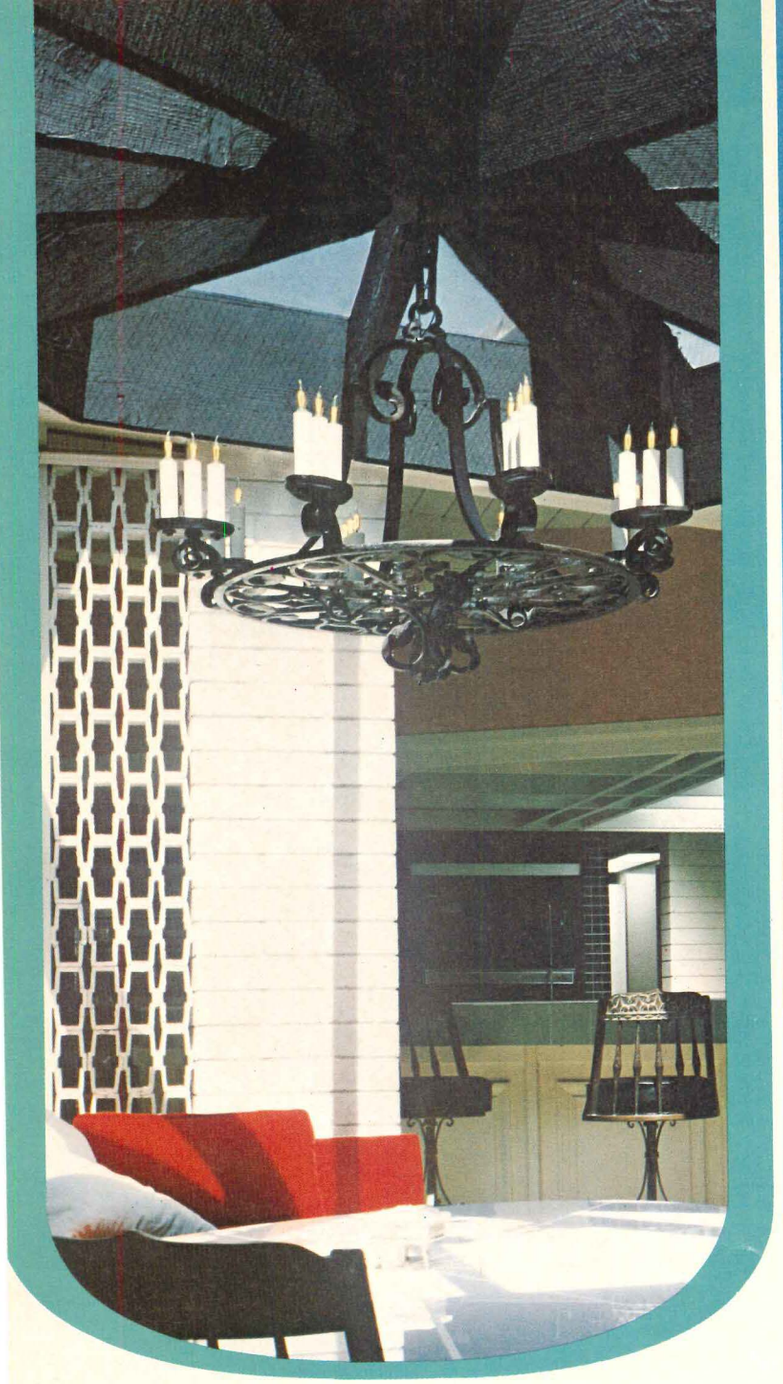

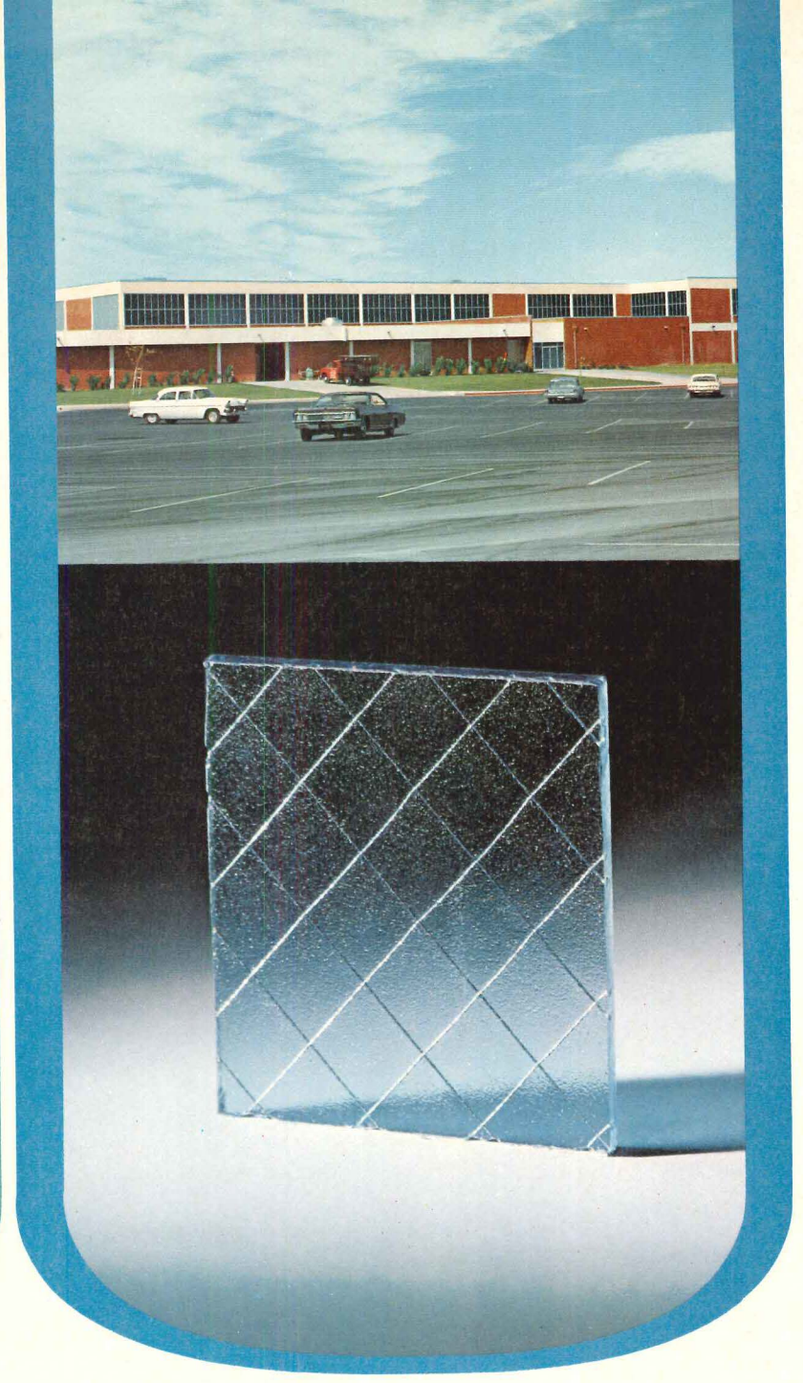

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Pointers for designing and specifying perlite roof decks

by Frank Coda, managing director, Perlite Institute

Edward S. Padykula

Perlite aggregate combined with Portland cement, water and an air entraining agent produces an insulating concrete which is available widely, easily prepared and adaptable to all variations of roof configuration and drainage sloping. In addition, perlite insulating concrete roof decks have inherent thermal insulation as an integral part of the roofing system.

Added advantages of a perlite concrete roof deck are inertness—it will not react with other materials; durability; moisture and vermin resistance; and a low water/cement ratio.

Perlite is not a trade name but rather a petrographic term for a naturally occurring siliceous volcanic rock. Expanded perlite can be manufactured in densities of 2 lb per cu ft and may go as high as 15 lb per cu ft.

Roof deck systems: three basic types

Perlite roof deck systems may be divided generally into three basic types. They are:

1. Structural steel or steel bar joists with corrugated metal deck.
2. Form board systems with or without steel tees.
3. Precast or structural concrete decks.

A perlite insulating concrete over steel form units is one of the most economical roof deck assemblies available to the designer today when compared on the basis of equivalent U values, comparable design based on dead load savings, insurance ratings, permanence and maintenance.

Perlite insulating concrete poured-in-place over form boards provides a simplified, continuous reinforced roof deck that combines insulation with structural strength.

Structural and precast concrete roof slabs, as the basic unit of another roof deck system, form the base for perlite insulating concrete to produce a system which has excellent U value at low cost.

Here are some particular advantages of perlite concrete systems:

1. Slope for drainage can be achieved without costly sloping of structural members.
2. Perlite concrete is not structurally damaged by water.
3. Water/cement ratio of perlite concrete is lower than other types of insulating concrete. It therefore has less water, develops greater strength with less shrinkage, and has fast drying characteristics.
4. In those cases in which the structural deck does not permit downward venting, it is only necessary to provide for perimeter or edge venting for vapor pressures that may develop within the insulation upon exposure to solar radiation. Vent stacks are not required.

Special considerations for the three types of decks

The following special considerations should not be overlooked when using perlite insulating concrete.

Perlite concrete installed over steel form units.

1. Where chemically active fumes are present the manufacturer of the steel deck should be consulted with regard to protective coatings for the galvanized sheets.
2. Where the occupancy of a building indicates high humidity factors, the thickness of perlite insulating concrete should be designed to prevent condensation as well as to provide adequate insulation.
3. No admixtures or accelerators containing calcium chloride or chloride salts should be used in the perlite insulating concrete.
4. No equipment, ceilings or fixtures should be suspended from the metal deck unless the deck has been designed for these loads.
5. When the deck is to be designed for seismic or other lateral forces, the perlite aggregate manufacturer should be contacted for design recommendations.

Perlite concrete over form boards.

1. Formboard should be stored and installed under dry conditions and should not be used in places of continuous high humidity. When a suspended ceiling is used, the area between the ceiling and the deck shall be adequately vented to dissipate construction moisture.
2. Unless system is adequately designed, ceilings, pipes, etc. should not be hung from deck and superimposed loads should be individually supported.

3. Light reflection is improved by field painting but this should not be attempted until deck is dry. Acoustical form board requires a spray-on mold-inhibiting nonbridging emulsion type paint.

Built-up roofing on perlite concrete installed over structural concrete. Built-up roofing is normally applied to perlite insulating concrete over structural concrete roof decks before the perlite concrete has had an opportunity to dry completely. This procedure is necessary to protect the deck during unpredictable weather conditions. The moisture retained in the perlite concrete after roofing must be removed to obtain the greatest possible thermal efficiency of the assembly.

To successfully remove this moisture the structural concrete surface upon which the perlite is placed should not be sealed or treated with a water-repellent compound. A 43-lb coated base sheet is provided as the first ply of roofing applied directly to the perlite concrete. Nailing or strip mopping of the base sheet to the perlite concrete equalizes vapor pressures below the roofing membrane, and provides horizontal channels between the perlite concrete surface and the base sheet for the release of vapor pressures at the perimeter of the roof. All end and side laps of the base sheet are sealed with bitumen prior to application of the upper plies of 15 lb saturated felts.

Provision must be made for perimeter or edge venting of vapor pressures by use of an open-type metal gravel guard or facia.

Mixing, application, and installation of perlite concrete

If pumping is employed, it should be in accordance with recommendations of the perlite producer and shall meet the specified physical properties at the point of placement.

Although mixing, application and installation of the perlite concrete are the concrete contractor's responsibility, certain aspects should be given attention by the architects' representative:

1. *Installation.* Perlite concrete should be conveyed from the mixer to the place of final deposit by methods which will prevent segregation or loss of material.

Perlite concrete should be deposited and screeded in a continuous operation until the placing of a panel or section is completed. Rodding, tamping, vibrating or troweling are not recommended, since this will have a detrimental effect on physical properties.

2. *Air entraining agents.* The use of the correct amount of air entraining agent is very important in successful perlite construction. The air entraining agent produces countless tiny air bubbles in the concrete which help control density and yield, contribute to the insulation factor of the dry concrete and increase workability.

3. *Curing.* The built-up roofing should be applied as soon as the perlite insulating concrete can carry construction traffic and is dry enough to develop adhesion with hot asphalt or pitch.

Normal conditions: Perlite concrete has an adequate mixing-water content so as to have sufficient water for proper curing of the concrete without additional precautions. Under these conditions the concrete should be permitted to air cure.

Hot, dry conditions: When perlite concrete is placed during hot, dry weather, additional water may have to be sprinkled on the concrete for a sufficient period of time to allow hydration of the cement and for a short period thereafter to minimize shrinkage cracking.

Cold weather conditions: For winter pouring the use of high early strength (Type III) Portland cement is recommended. All concrete materials, reinforcement, and forms with which the perlite concrete may come in contact should be free of frost. No frozen material or materials containing ice should be used. When it is anticipated outside temperature will be below 40 F within 24 hours after placing of the concrete, the mixing water should be heated to a maximum of 120 F. Perlite insulating concrete should not be placed during freezing weather unless the contractor is experienced in the special techniques required.

Quality control

Since the physical properties of a concrete, compressive strength and thermal insulation, vary with density which, in turn, is affected by yield, quality control of concrete preparation typically involves yield calculation. Typical quantities of materials for a cubic yard of perlite concrete are: 1) *36 pcf oven dry density*—6.75 bags of cement, 27 cu ft of perlite, 61 gallons of water, 6¾ pints of air-entraining agent; 2) *27 pcf oven dry density*—4.5 bags of cement, 27 cu ft of perlite, 54 gallons of water and 6¾ pints of air-entraining agent; 3) *22 pcf oven dry density*—3.38 bags of cement, 27 cu ft of perlite, 54 gallons of water, 6¾ pints of air-entraining agent.

Yield is defined as the ratio between the volume of the wet perlite concrete as discharged from the mixer and the volume of perlite concrete aggregate used in the mix. If the correct quantities of material and mixing procedure are used, a 100 per cent yield should result. One hundred per cent yield is of importance also from the standpoint of economy.

Field check for wet density. The first step necessary in making a field check for yield is to determine the wet density of the perlite insulating concrete. Wet density can be checked beginning with the first batch mixed or with the first transit truck load delivered. Adjustments to the mixing procedure should be made at that time and additional checks made from time to time during pouring.

Design considerations

Roof drainage. One of the most important factors to be considered in assuring trouble-free roofs is provision for roof deck drainage. The built-up roofing industry has recognized it is desirable for maximum roof performance to eliminate conditions resulting in standing water and recommends roof design provide for slope so the roof will drain freely throughout the life of the building.

Thermal expansion joints. In roof deck constructions, the perlite insulating concrete is the first rigid material to receive the effects of hot summer sun. The top surface can reach a temperature of 150 F, or more, on a typical summer day, which could represent up to a 100 F temperature difference for perlite concrete which may have been placed in cooler months (50 F average). For a 27 pcf density perlite concrete roof slab thermal expansion would be 0.576 in. per 100 lineal feet.

Since perlite insulating concrete does not have excessive shrinkage, it is recommended that at least a 1-in. expansion joint be provided through the thickness of the perlite concrete at the juncture of all roof projections, such as skylights, penthouses, ventilators, parapet walls and perlite concrete.* This recommendation assumes that suitable consideration has been given to the use of adequate through-building expansion joints. A highly compressible material that will compress to one-half its thickness under a load of 25 psi is recommended.

Three typical fire-rated roof decks

1. *Three-hour fire rating—Protected steel roof deck:* Roof deck of 2-in. minimum thickness perlite concrete on 28 gauge galvanized steel form units supported by steel joists 4 ft. on center. Ceiling of ⅞-in. perlite-gypsum plaster on expanded metal lath attached to ¾-in. furring channels wire tied to lower chord of joists.

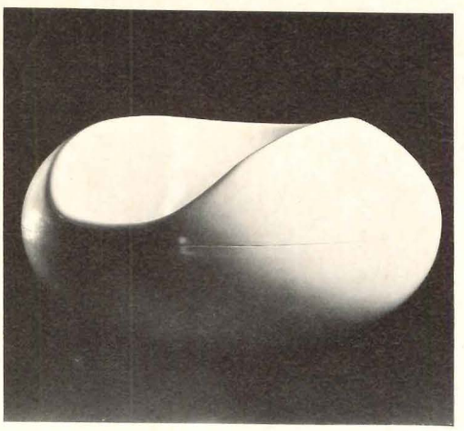
2. *Two-hour rating—Unprotected steel roof deck:* 2½-in. minimum thickness perlite concrete reinforced with 2160-2-1619 wire mesh on 24 gauge galvanized steel form units. No ceiling protection. Beams individually protected with 1½-in. sprayed fiber fireproofing.

3. *One-hour rating—Unprotected steel roof deck:* Corrugated galvanized steel deck topped with 2⅝-in. average thickness of perlite concrete reinforced with 48-1214 wire mesh. No ceiling protection. Beams protected with ⅞-in. perlite-gypsum plaster on metal lath.

One of the advantages of perlite insulating concrete in many types of construction is the fact that it is easily nailed. Roofing contractors, for example, may nail the first ply of built-up roofing to perlite insulating concrete roof decks. This is the preferred method of attaching the base sheet to the substrate and the holding power of the nail is very important. It is recommended that nails designed for this purpose be used.

* These recommendations do not apply when the roof deck is designed as a diaphragm to resist horizontal forces.

For more information circle selected item numbers on Reader Service Inquiry Card, pages 269-270



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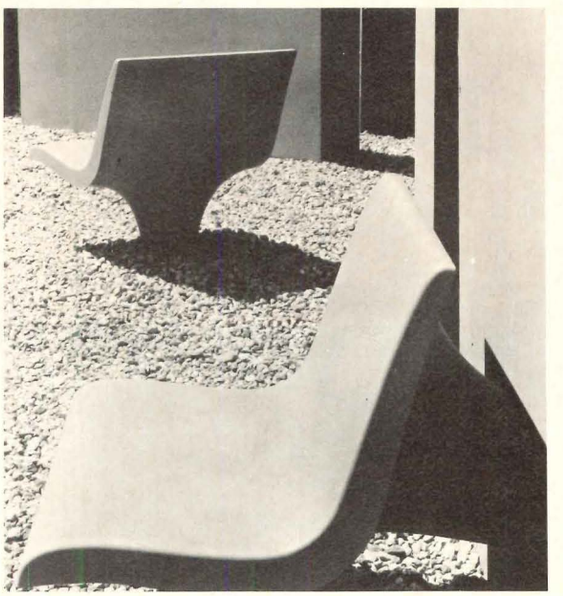

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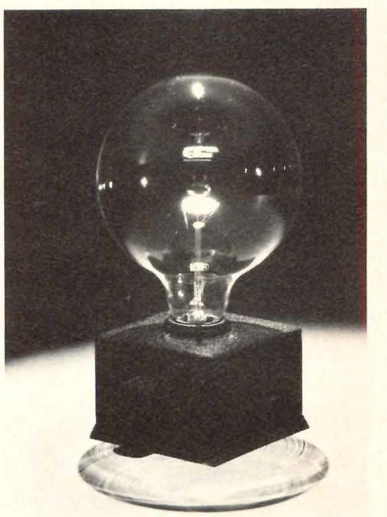

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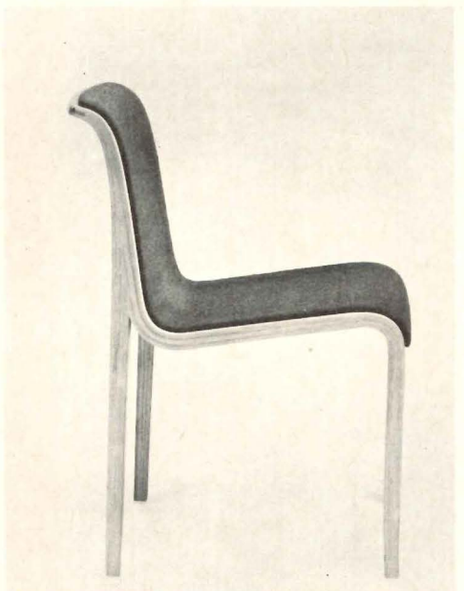

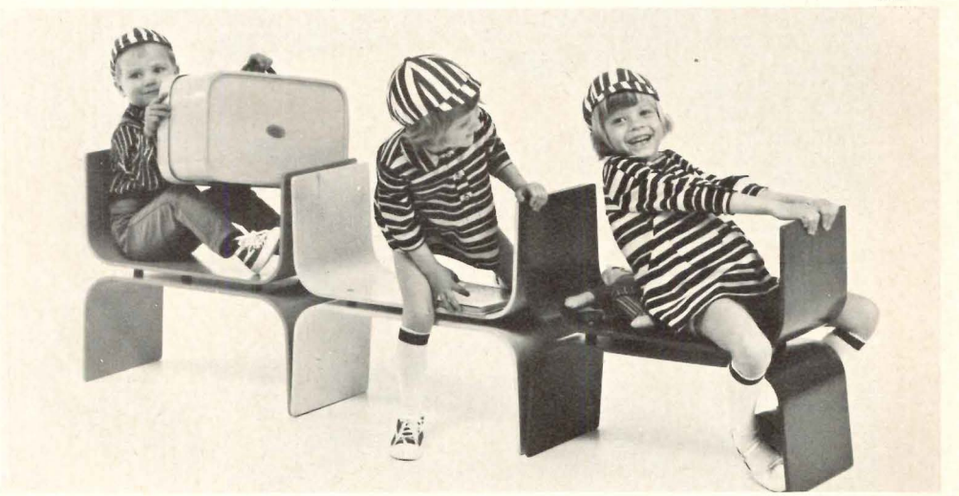

American Institute of Interior Designers gives 24th annual awards

From over 600 entries—the largest number in the history of the program—25 products won awards in the 24th Annual International Design Awards program held by the A.I.D. Among the winners:

The *Gyro* chair, made of molded fiber glass, has a seating indentation in what is otherwise a purely geometric form. The chair, designed by Eero Aarnio, can be used both indoors and outdoors. ▪ Stendig, Inc., New York City.

Circle 300 on inquiry card

Exceptional strength is combined with organic design in this William Stephens chair, which uses a frame of laminated oak fitted with a seating shell. ▪ Knoll Associates, Inc., New York City.

Circle 301 on inquiry card

Furniture for public areas may be installed in floor or wall surfaces both out-of-doors and inside terminals, lobbies, and similar public interiors. The pedestal slips over a mounting device and fastens into position. In new construction, a fiber glass sleeve can be placed in floor or wall when concrete or other material is poured to act as a receptacle for the pedestal. It is designed by Douglas Deeds. ▪ Architectural Fiberglass, Inc., New York City.

Circle 302 on inquiry card

The *Tom Edison Lamp,* designed by John Gardner, has a self-contained dimmer that can alter the mood from low fireplace to high brilliance. It can replace candles or a night light, or be used decoratively in groups lit to varying intensities. The light comes in a variety of colors, as well as clear, and can be wall-hung or used standing up. ▪ TSAO Designs, New Canaan, Conn.

Circle 303 on inquiry card

Poppa is a U-shaped frame of laminated birch that can be used by itself or joined to other frames to provide innumerable combinations. It is designed by Anna Tauriala. ▪ Children's Workbench, Inc., New York City.

Circle 304 on inquiry card

more products on page 182.

Amid all the claims for movable partitions, we make just three.

Masonite Quick Change partitions give design flexibility.
The inside of your building shouldn't look like the inside of every other building.

How do you get variety?

Answer: Masonite Quick Change partitions. They give you the design flexibility you need to give every building interior its own personality.

For instance, there are ceiling-high and cornice-high Quick Change partitions. Low rail and glazed rail versions. Flush post and feature post models.

Then there's a variety of Royalcote woodgrain finishes to choose from. And decorator colors, too. Or, leave the hardboard panels unfinished for field decorating.

In total, design flexibility.

Fast and easy installation.
Part of any partition cost is installation time and labor.

Quick Change partitions are designed for fast, economical installation with

a unique friction fit that minimizes labor and parts. Our designers understood labor costs and kept them to a minimum. So they designed a system that permits you to run a straight ceiling-high partition wall almost any length without the use of mechanical fasteners. One that's sturdy and good-looking, too.

Quick Change partitions are really movable.
It may be stating the obvious, but movable partitions should be movable.

As the name implies, with Quick Change you can change quick. Not as fast as Superman in a phone booth—but quick.

The reason is the inherent design simplicity of Quick Change partitions.

They can be moved and put back together again easily. And as sturdily as ever.

When you think about it, beauty coupled with design flexibility, fast, easy installation, and quick changes are the most important considerations for movable partitions.

We've got another secret weapon, too. It's our Partition Representatives. These partition specialists are trained, skillful professionals who are strategically located near you. They're waiting to give you all the details on Quick Change Partitions.

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MASONITE CORPORATION, Dept. AR-2
Box 777, Chicago, Illinois 60690

☐ Please send me your literature on Masonite Quick Change movable partition systems.

☐ Please have your representative call.

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Company_____

Street_____

City_____ State_____ ZIP_____

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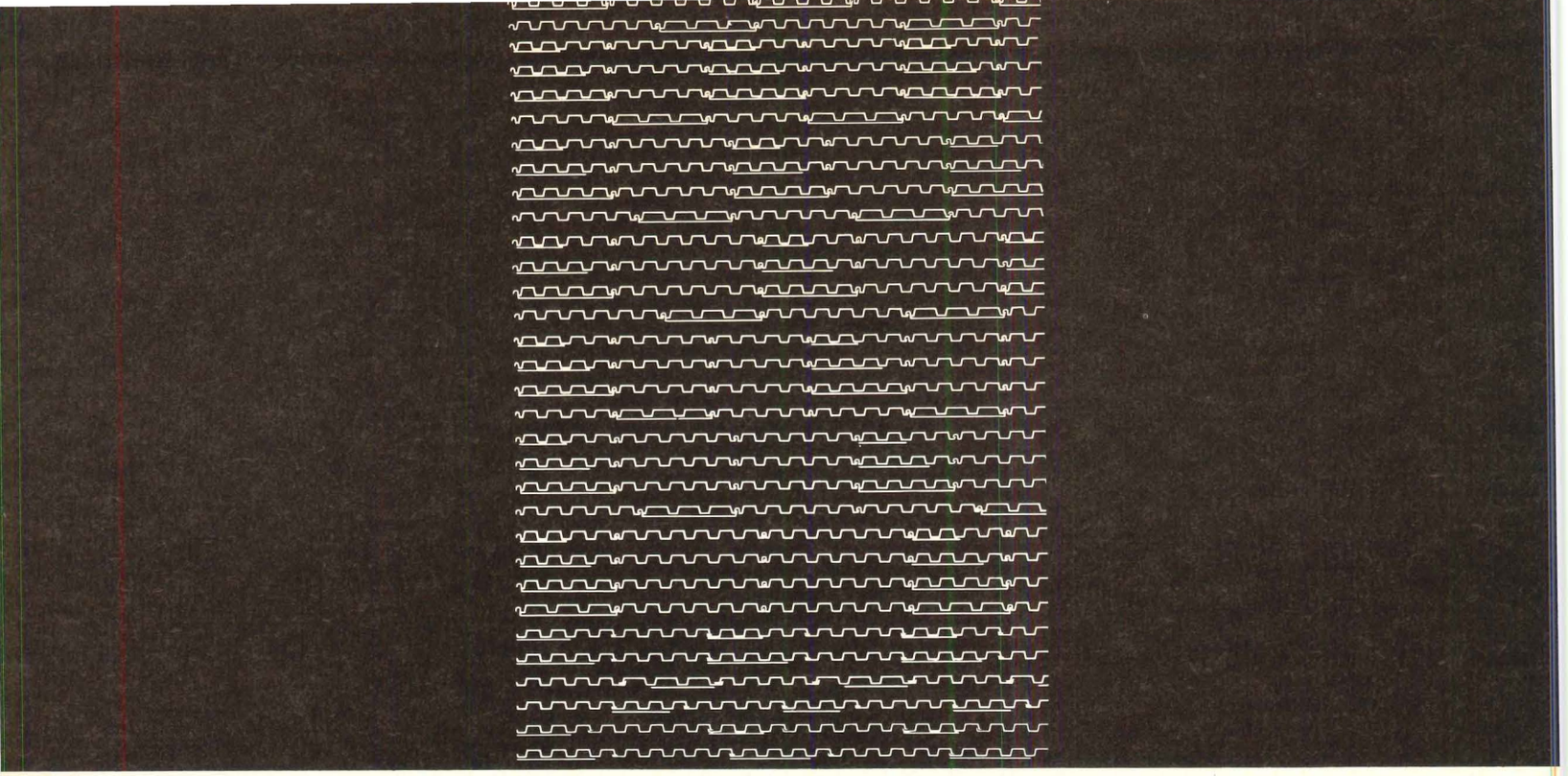
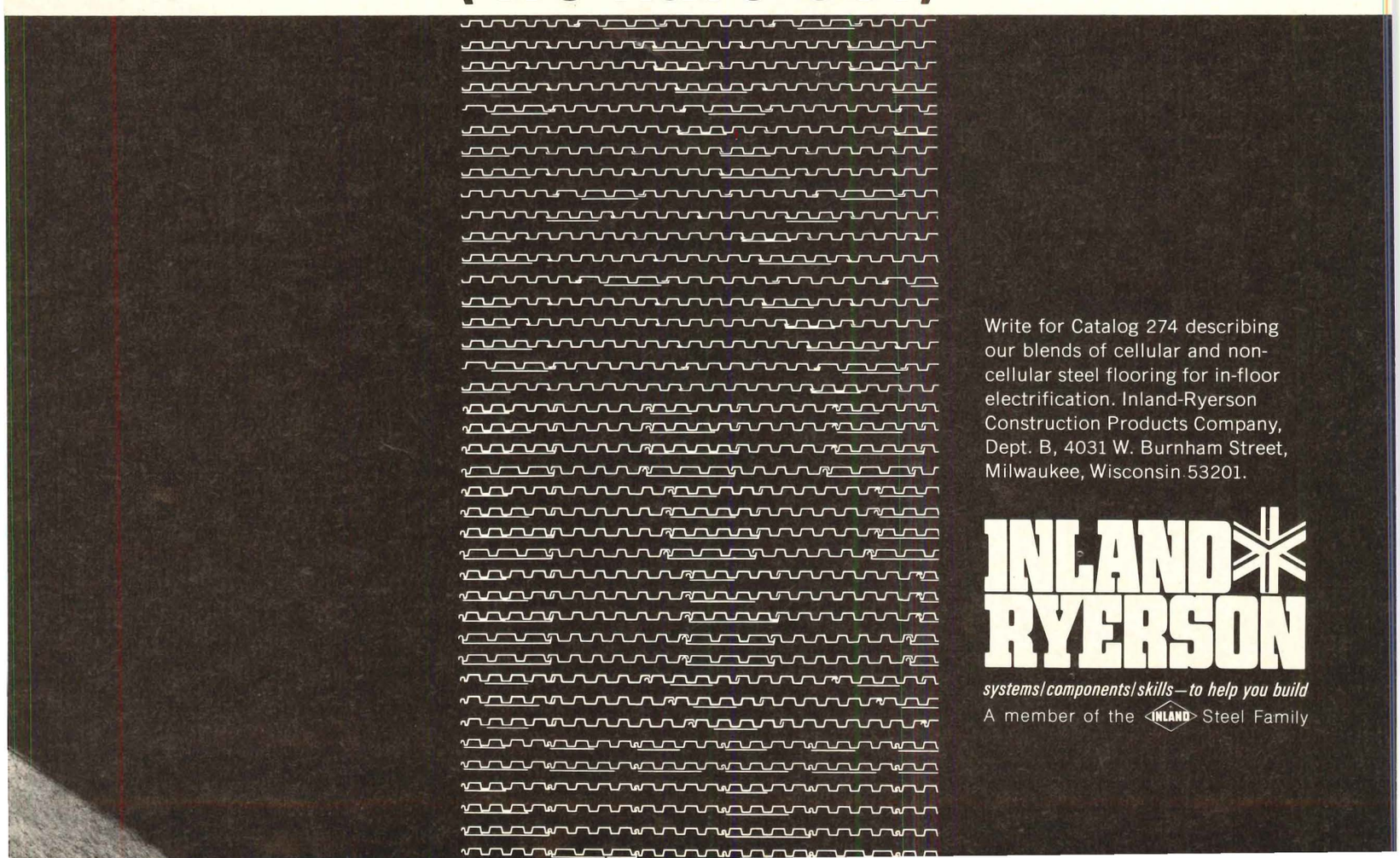


Show us your module... one of our Celluflor® blends will fit. (We have 65!)



Write for Catalog 274 describing our blends of cellular and non-cellular steel flooring for in-floor electrification. Inland-Ryerson Construction Products Company, Dept. B, 4031 W. Burnham Street, Milwaukee, Wisconsin 53201.

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systems/components/skills—to help you build

A member of the INLAND Steel Family

MOISTOP WON'T LET THEM PUNCH HOLES IN YOUR PERM RATINGS!

Moistop® is the Super-Strong one. The moisture-vapor barrier that stays intact under the toughest job-site abuse. Maintains a 0.10 MVT Rating for life. Polyethylene film on both sides of rot-proof kraft. Glass-fiber reinforced. Seven plies in all. Practically impossible to rip or tear. Moistop does cost more than thin polyethylene film, but Moistop makes sure buildings **stay** protected against moisture migration. Send for free sample and Specification Guide. Sisalkraft, 30 Starkey Avenue, Attleboro, MA. 02703.

Moistop is 7 plies strong.

Polyethylene film can be easily punctured by abuse.

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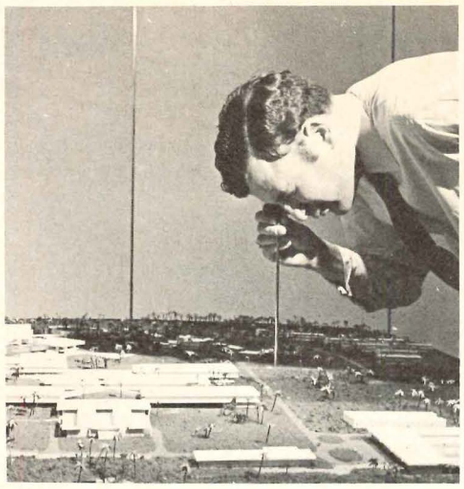
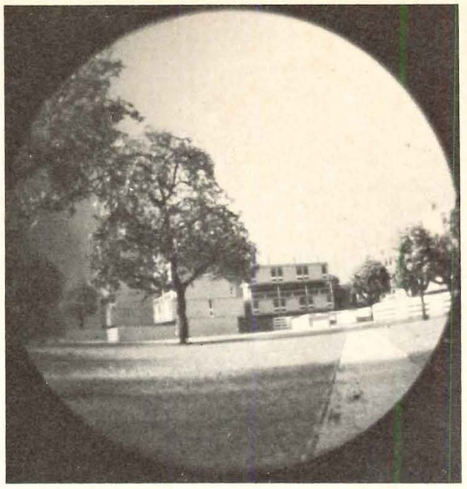
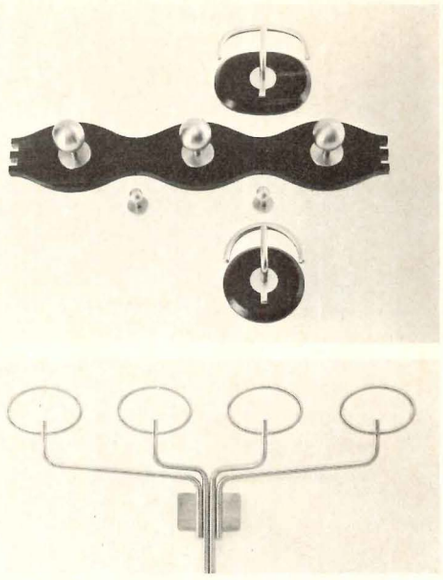
continued from page 177





MODEL VIEWING / *Modelscope* allows the viewer to inspect a model as though he were walking through it. The instrument, which is 5mm in diameter and 200mm long, has a depth of field from about 5mm to infinity. In addition, a special adapter makes photographs and motion pictures possible. Cost of the *Modelscope* is $295; the adapter is $35. ▪ HCI Sales Corporation, New York City.

Circle 305 on inquiry card



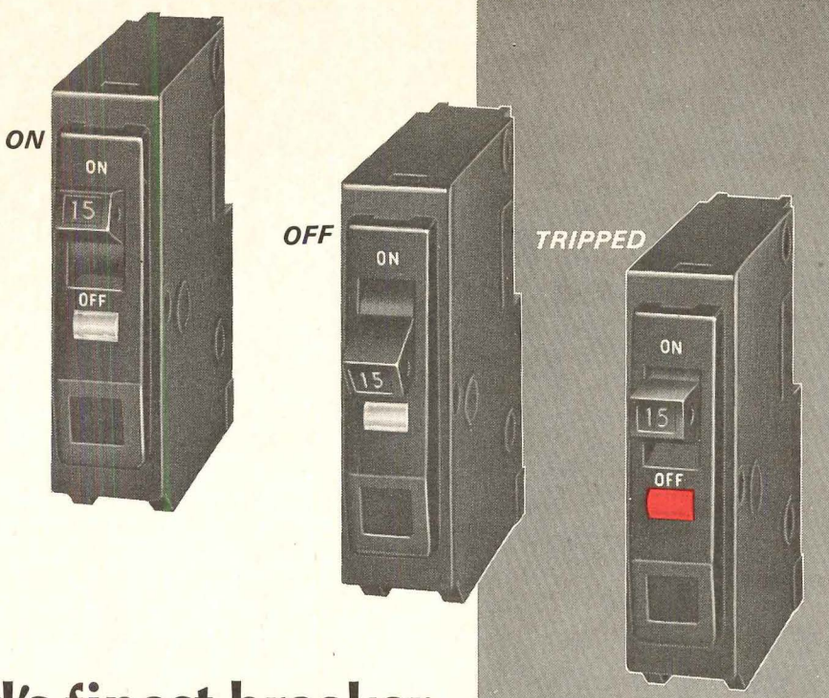
HAT AND COAT HOOKS / Imported from Italy, this line, designed by Sergio Mazza and Emma Gismondi, is produced in brass with polished chrome finish on rosewood scutcheons. ▪ Peter Pepper Products, Inc., Wilmington, Calif.

Circle 306 on inquiry card

STAINLESS STEEL ENTRANCES / Roll-formed stainless steel entrances that are reported durable, easy to maintain and corrosion-resistant were specified by architect Richard C. Niebuhr for three recently completed Pawtucket, R.I., schools. Stainless steel entrances are said to be especially important for low-budget buildings because of the standardization of roll-formed shapes, which makes possible a 50 per cent reduction over former costs. ▪ The Alumiline Corporation, Pawtucket, R.I.

Circle 307 on inquiry card

more products on page 203



QO
–the world's finest breaker–
now with VISI-TRIP!

The red VISI-TRIP indicator in the QO breaker on the right tells—instantly—that a fault has occurred and the breaker has tripped and opened the circuit. Simply reset the breaker and restore the service. There's nothing to replace.

The VISI-TRIP window is sealed to prevent the entrance of dirt and other material. It also eliminates the possibility of exposed live parts. The red VISI-TRIP shows only with the breaker in the TRIPPED position—it is dark when the breaker is ON or OFF. The red indicator disappears when the QO breaker is reset.

Your clients get all the features that make QO the finest breaker ever built. They get a Qwik-Open® mechanism for flash protection—*UL listed lugs for both copper and aluminum conductors*—a single handle for 2 or 3 pole breakers. There are 1, 2, and 3 pole breakers for plug-in or bolted connection panelboards.

In addition to standard 5,000-ampere interrupting capacity, QO breakers with higher interrupting capacities of 10,000 and 75,000 amperes are available. QO breakers, load centers and panelboards are tested together to provide an integrated equipment rating. This rating verifies not only the breaker interrupting capacity, but also the ability of the bus structure and insulation assembly to withstand any ionized gas discharges and short circuit forces and stresses. The higher interrupting capacity breakers are identified by handle color and special UL labels.

Get all the facts on QO circuit breakers with the VISI-TRIP indicator from your Square D field office or write Square D Company, Dept. SA, Lexington, Ky. 40505.

SQUARE D COMPANY

Wherever Electricity is Distributed and Controlled

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WALL-TO-WALL HALL

Clear the way with OASIS Fully-Recessed water coolers—an "in" design that never stands out.

Stop the cluttered hallway before it gets off your board. Design now, to take full advantage of OASIS Fully-Recessed water coolers 5- or 10-gph capacities.

Put refreshing cool water wherever it's needed, without transgressing one sneaky little inch into the primary *traffic* function of any hall or passageway.

Always aesthetic and practical, OASIS Fully-Recessed models now take on new significance when your plans must comply with the new "Hill-Burton" bill for corridor safety in hospitals.

Design the 100% hall, wall-to-wall. See Sweets or write for full description of features and specifications.

NEW COMPACT ON-A-WALL. The off-the-floor and out-of-the-way OASIS economy cooler. Only 15" high, 17" wide, 13" deep. For offices, shops, service stations, classrooms. Three- or five-gph capacities. For complete data write for specifications.

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Quality you take for granted.

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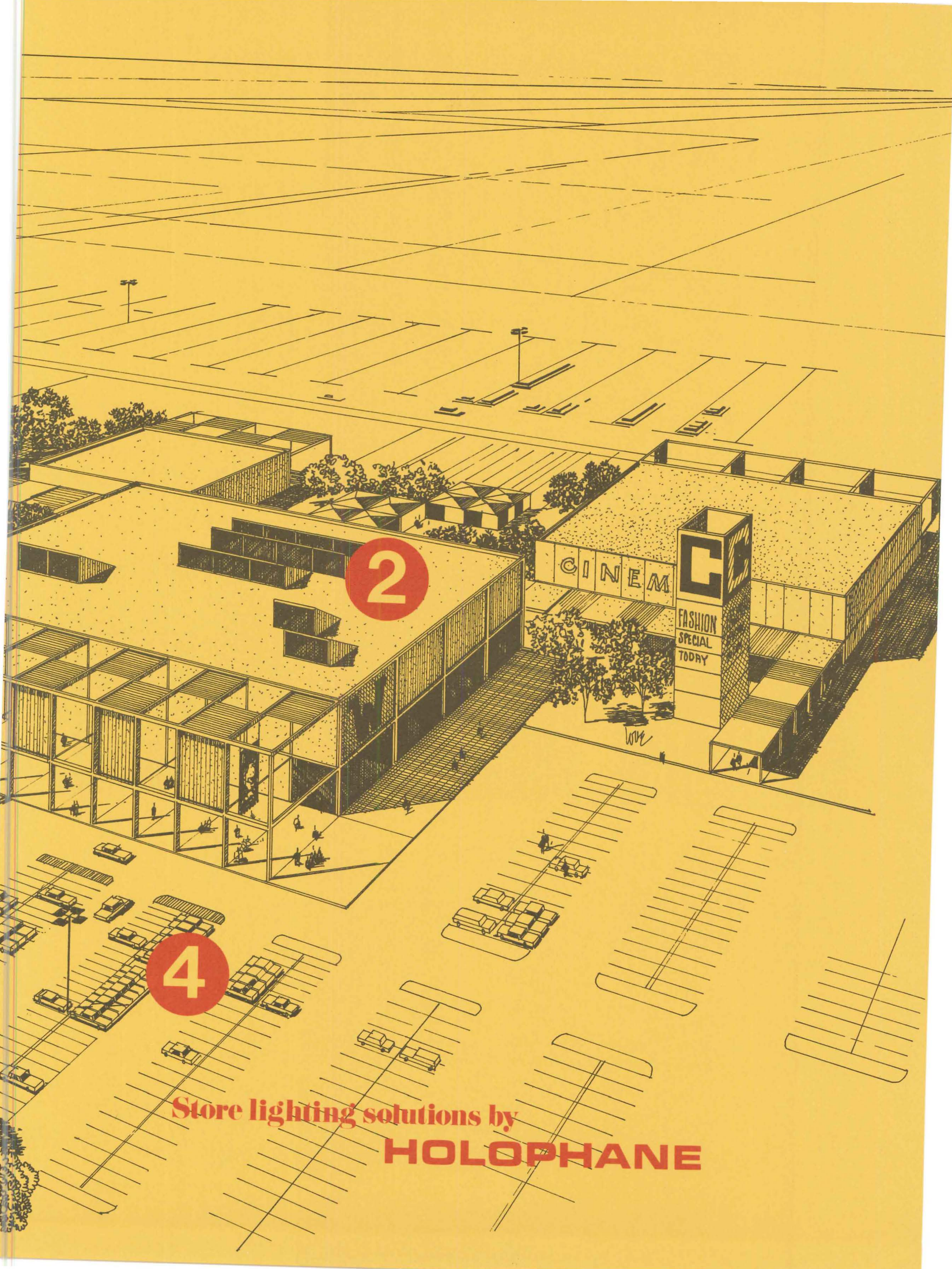

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Next mid-May, Architectural Record will publish the 14th annual RECORD HOUSES. Like its predecessors, RECORD HOUSES OF 1969 will be devoted in its entirety to the year's outstanding developments in house planning—including interior design—and technology. Editorial emphasis will again be placed on what has come to be regarded as the most stimulating and influential editorial feature in the field—"The Twenty Houses of the Year"—planned by architects for individual owner and merchant clients. But there will be an important difference to advertisers.—In 1969... you have a choice of three different editions of RECORD HOUSES.

When you plan your advertising budget for RECORD HOUSES OF 1969, you can select the market coverage that is most meaningful to your advertising goals. All of the three editions of RECORD HOUSES are based on the Record's quality architect and engineer circulation.

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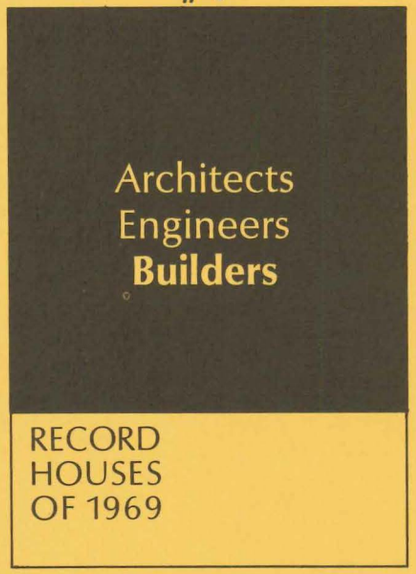

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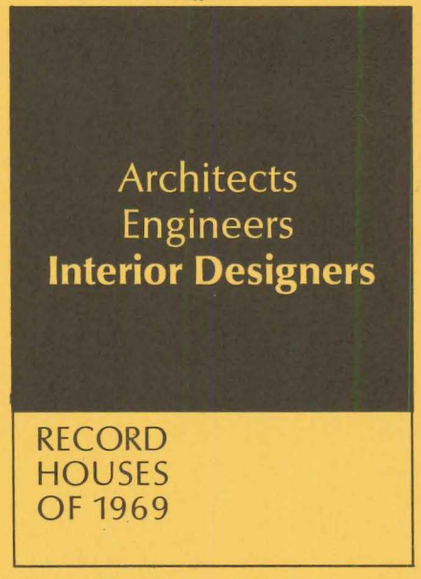

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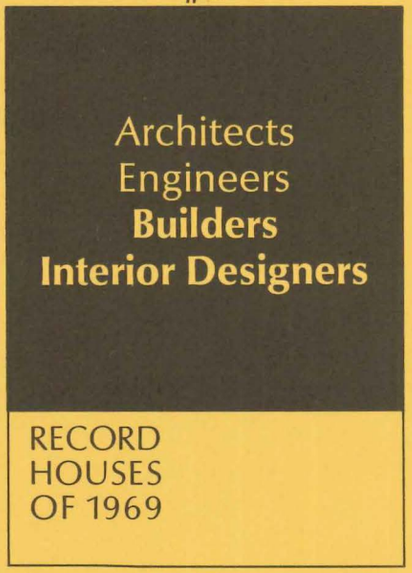

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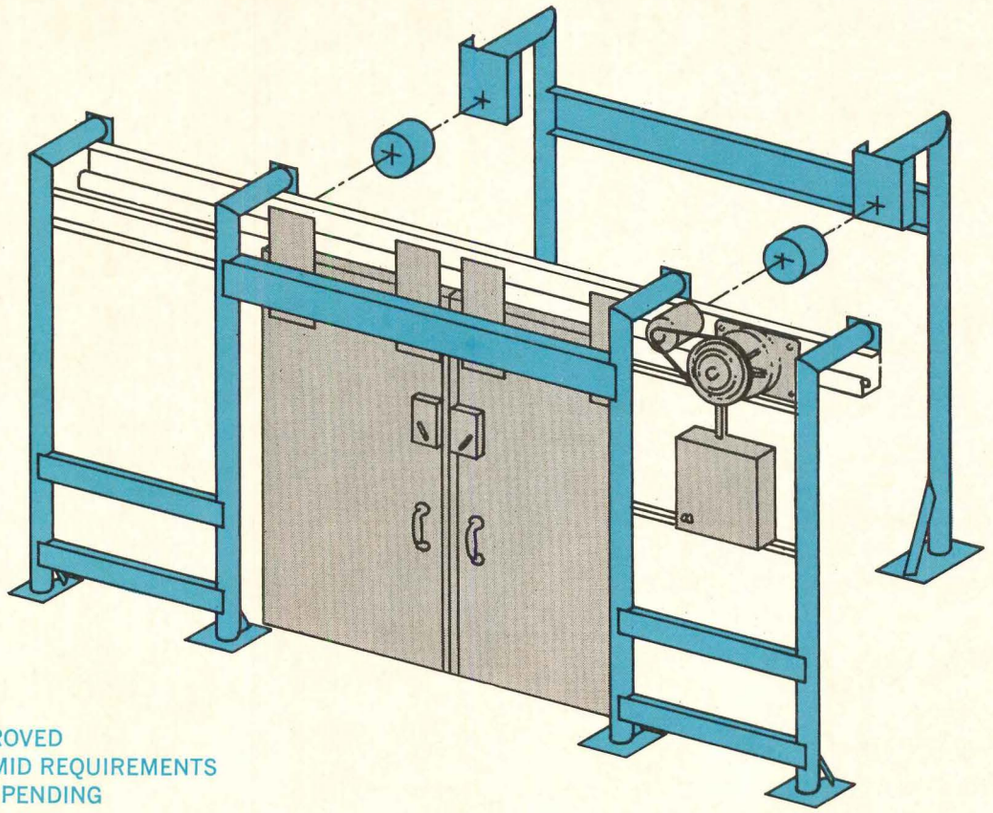
...Self-Suspension Horizontal Sliding Doors



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MEETS MID REQUIREMENTS
PATENT PENDING

Jamison has scored another first with a brand new revolutionary development: The SS Door System offers an entirely new method of installing horizontal sliding cold storage and industrial doors. It reduces the hazards of installing doors in walls that give inadequate support and are not built to withstand the combined stresses of door weight, rapid opening and closing, and abuse from hand and fork lift trucks.

Eliminates Need For Bucks. In addition, the SS Door System makes bucks and buck support unnecessary, thus saving costs and eliminating the common risk of incorrect buck installation.

Unique, New Development. The Jamison SS Door System provides a suspension system that takes the entire weight of the door from the wall and transfers it to the floor! Moreover, the rigid support system offers ample protection to door panels, track, and operating mechanism. Installation is easier and faster. The complete door, along with the self-suspension system, is factory assembled and tested. Shipped in major components for easy field erection. This establishes a single source and responsibility for the total doorway requirements. This combination of door, protecting and supporting system reduces overall cost.

The door is the Jamison lightweight, power-operated bi-parting door, and can be furnished for cooler, freezer, or industrial use. Call your Jamison representative for details, or write for SS bulletin to Jamison Door Company, Hagerstown, Md. 21740.

COLD STORAGE DOORS BY
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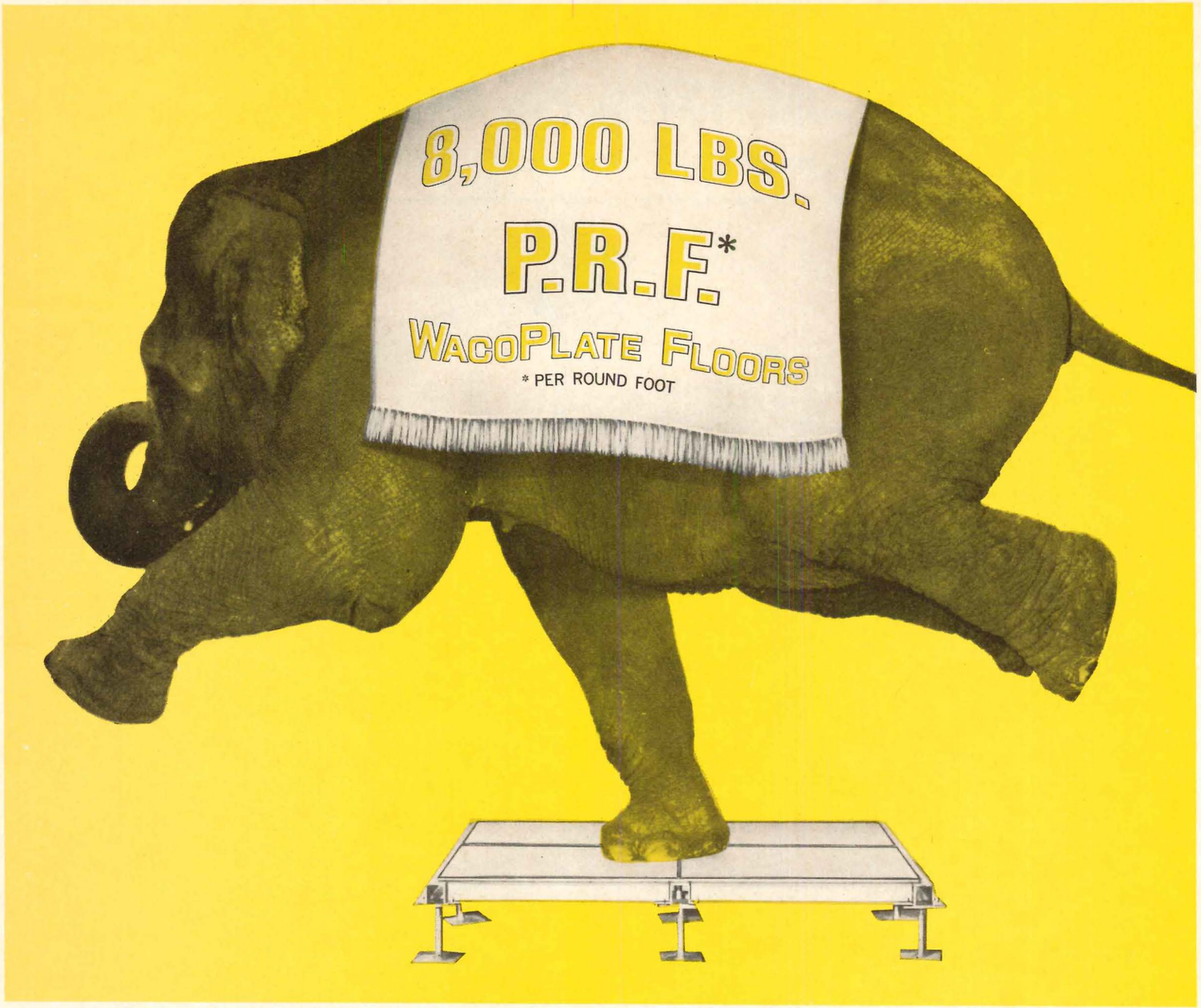

OK, load our raised floor with 8,000 pounds on one foot!

(but don't try it with any other floor)

WacoPlate Raised Floors provide two advantages you won't find in any other floor. Anywhere.

One is more strength than any other floor. You avoid problems like deflection and dimpling, or costly reinforcement to meet later — possibly unforeseen — requirements.

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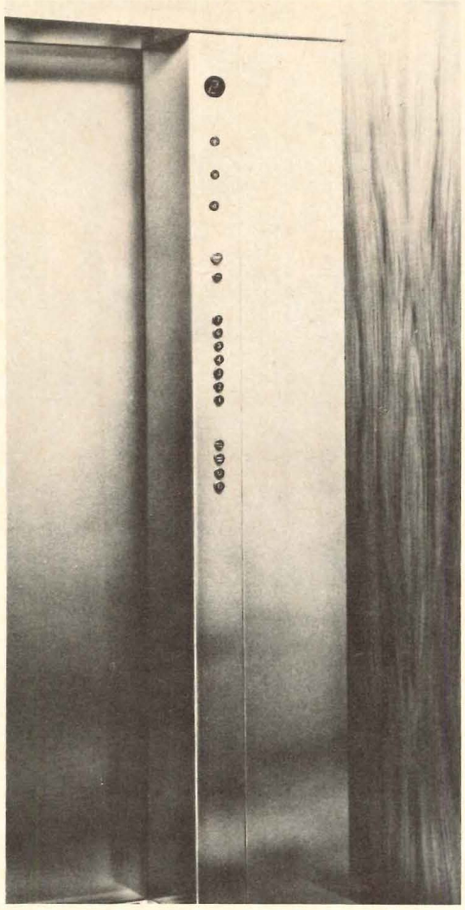

ELEVATORS / A new design integrates control and signal equipment within the column flanking the car entrance. ▪ Otis Elevator Company, New York City.

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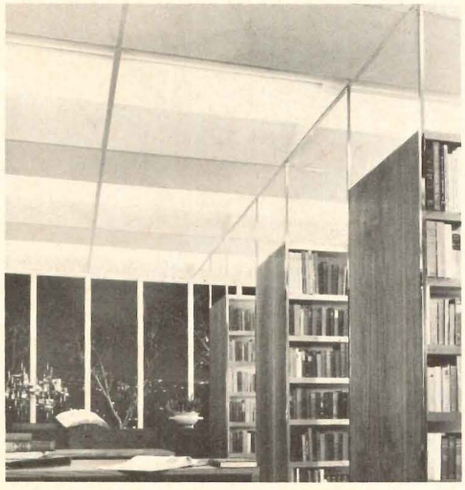

VAULTED LIGHTING FIXTURES / Vaulted fixtures for economy-priced suspended ceilings occupy a 4-ft by 4-ft space and merely attach to the grid in place of two 2-ft by 4-ft acoustical lay-in panels. The angled side panels direct light downward for even, glare-free distribution at the working level and offer noise control as well. ▪ Armstrong Cork Company, Lancaster, Pa.

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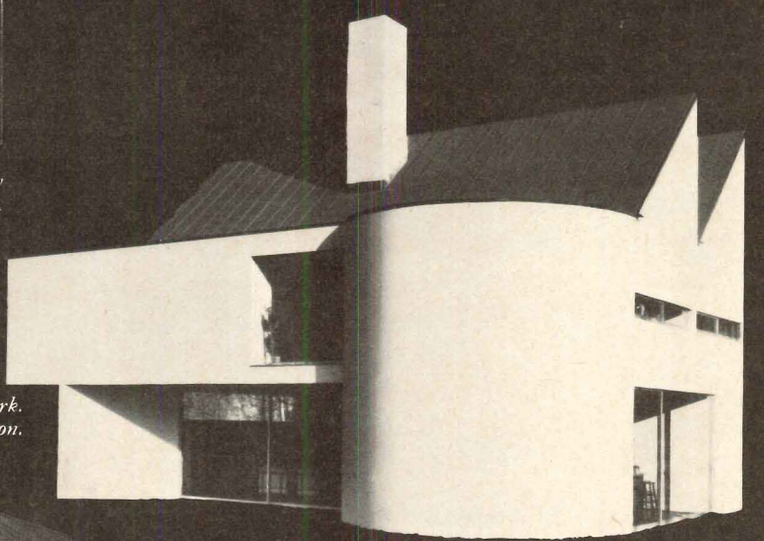
more products on page 214

We are indeed gratified that Follansbee Terne is a major design component in four of the twenty buildings selected by the American Institute of Architects for a 1968 honor award.

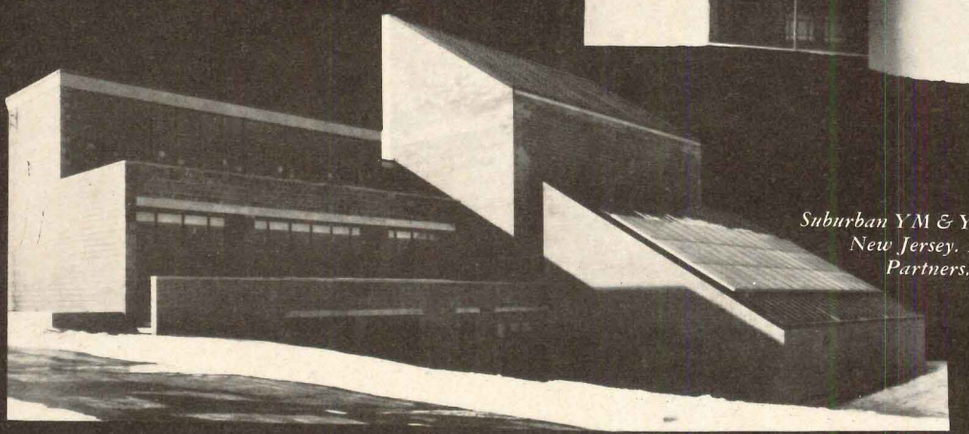
FOLLANSBEE

FOLLANSBEE STEEL CORPORATION
Follansbee, West Virginia

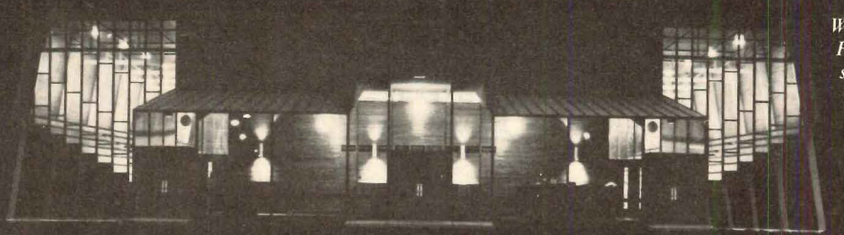
Jefferson Market Branch Library (Restoration) New York, New York. Architect: Giorgio Cavaglieri, FAIA.



Residence. Purchase, New York. Architects: Gwathmey & Henderson.



Suburban YM & YWHA, West Orange, New Jersey. Architects: Gruzen & Partners. Consulting Architect: Abraham W. Geller.



Washington and Lee High School Gymnasium, Montross, Virginia. Associated Architects: Stevenson Flemer, Waitsfield, Vt., Eason Cross and Harry Adreon, Washington, D.C.

A word to architects about microtexture...

The finer, the better.

OTHER LEADING LATEX PAINT

SPRED SATIN LATEX PAINT

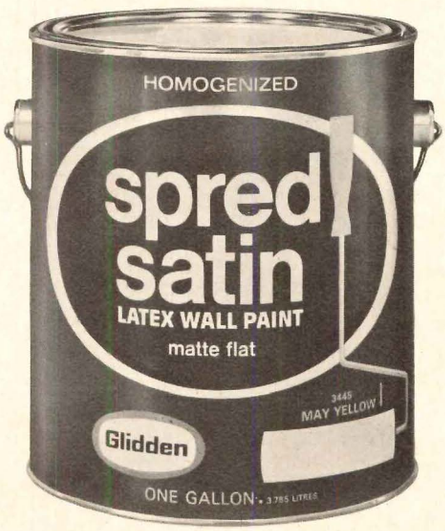
MAGNIFIED 20 TIMES
(unretouched)

You know what happens to a coarse texture under wear conditions: it collects dirt, and the rough parts tend to burnish.

Spred Satin® latex paint doesn't do that. Its microtexture is fine and flat. It doesn't collect dirt; it doesn't turn glossy with wear.

A unique latex-polymer formula gives Spred Satin a flat matte finish that eliminates glare... and provides the strength to take years of everyday wear and frequent cleanings.

Spred Satin helps you create walls that are handsome *and* hardworking ...walls that keep clients in mind long after construction. Call your local Glidden representative for a complete demonstration or write to Glidden Maintenance Coatings, 900 Union Commerce Building, Cleveland, Ohio 44115.



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they got 400,000 watts of light insurance when they chose a Waukesha Enginator®

Lakewood Hospital, Cleveland, Ohio, recently completed a large new wing. At the same time, it installed a light insurance policy that pays off within six seconds after the power line goes dead. The "policy" is a Waukesha VC Series standby Enginator® capable of producing 400 KW, 120/208 volts AC power — enough to meet all the hospital's electrical needs.

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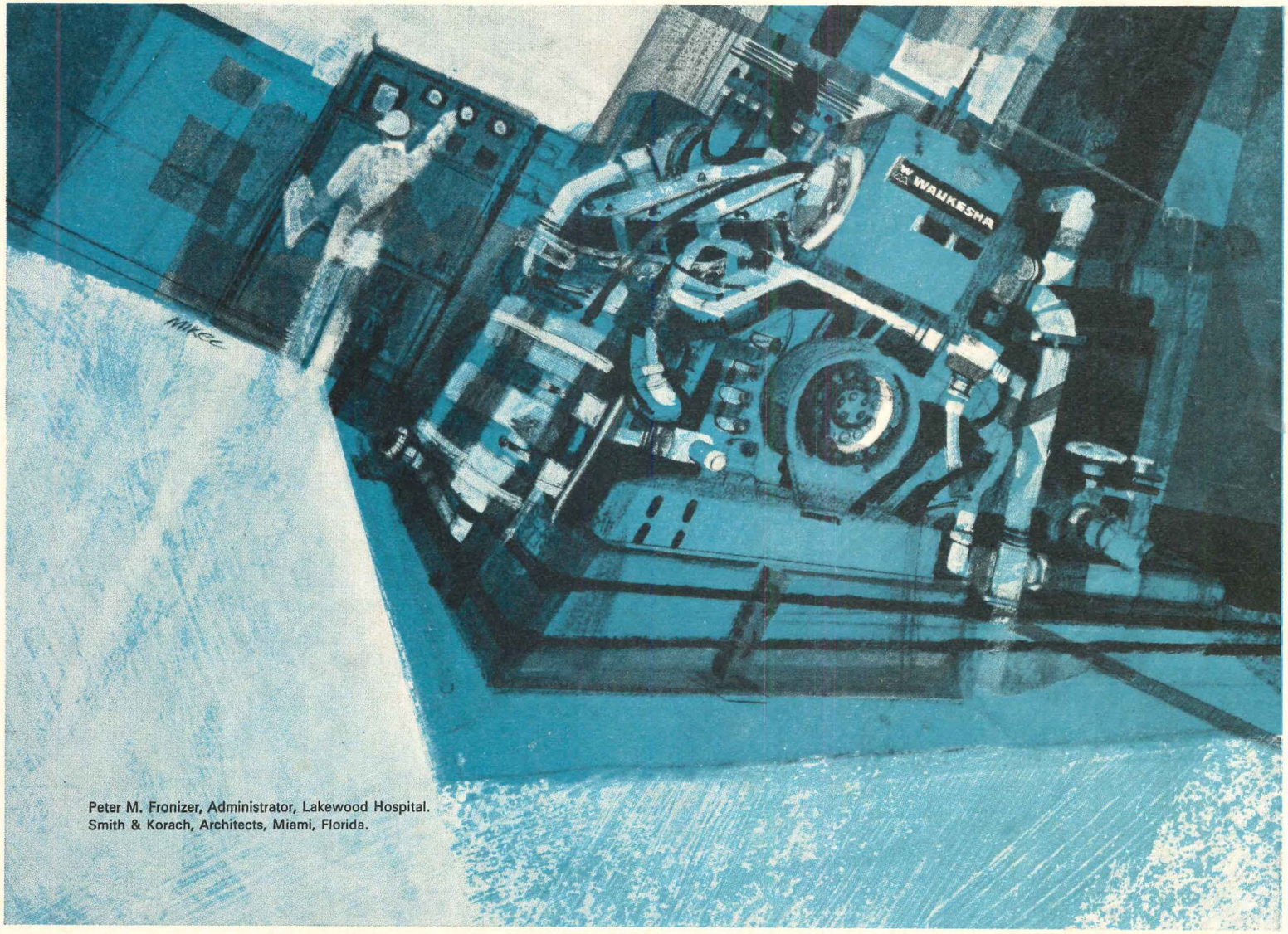
698

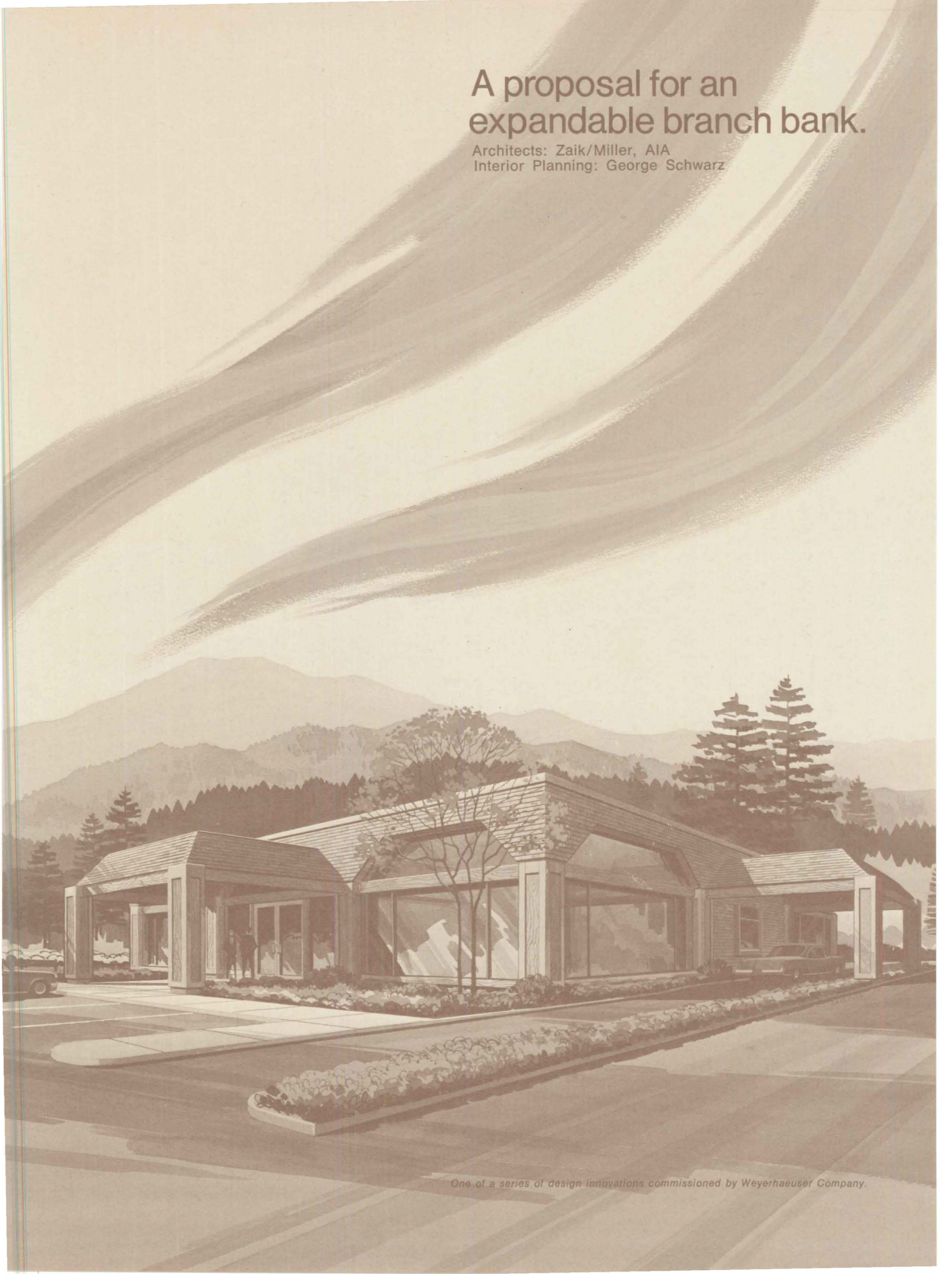


Peter M. Fronizer, Administrator, Lakewood Hospital.
Smith & Korach, Architects, Miami, Florida.

For more data, circle 96 on inquiry card

A proposal for an expandable branch bank.

Architects: Zaik/Miller, AIA
Interior Planning: George Schwarz



One of a series of design innovations commissioned by Weyerhaeuser Company.

Weyerhaeuser Company has commissioned a number of leading architectural firms to create design innovations which highlight the potential of wood in public and commercial buildings. This original design by Zaik/Miller, AIA, Portland, Oregon, is the 17th in the series.

"There is a need in branch bank operations for structure that can respond to changing needs. Today, banks need buildings that can grow."

"Branch banking is based on the soundest of principles: Take services to the customer instead of waiting for the customer to bring business to the bank.

"But in the rush to establish outposts in suburban shopping centers, industrial parks and outlying neighborhoods, a good many banks have outrun their architects. They've set up shop in make-do prefabs, old stores,

and even in converted mobile homes.

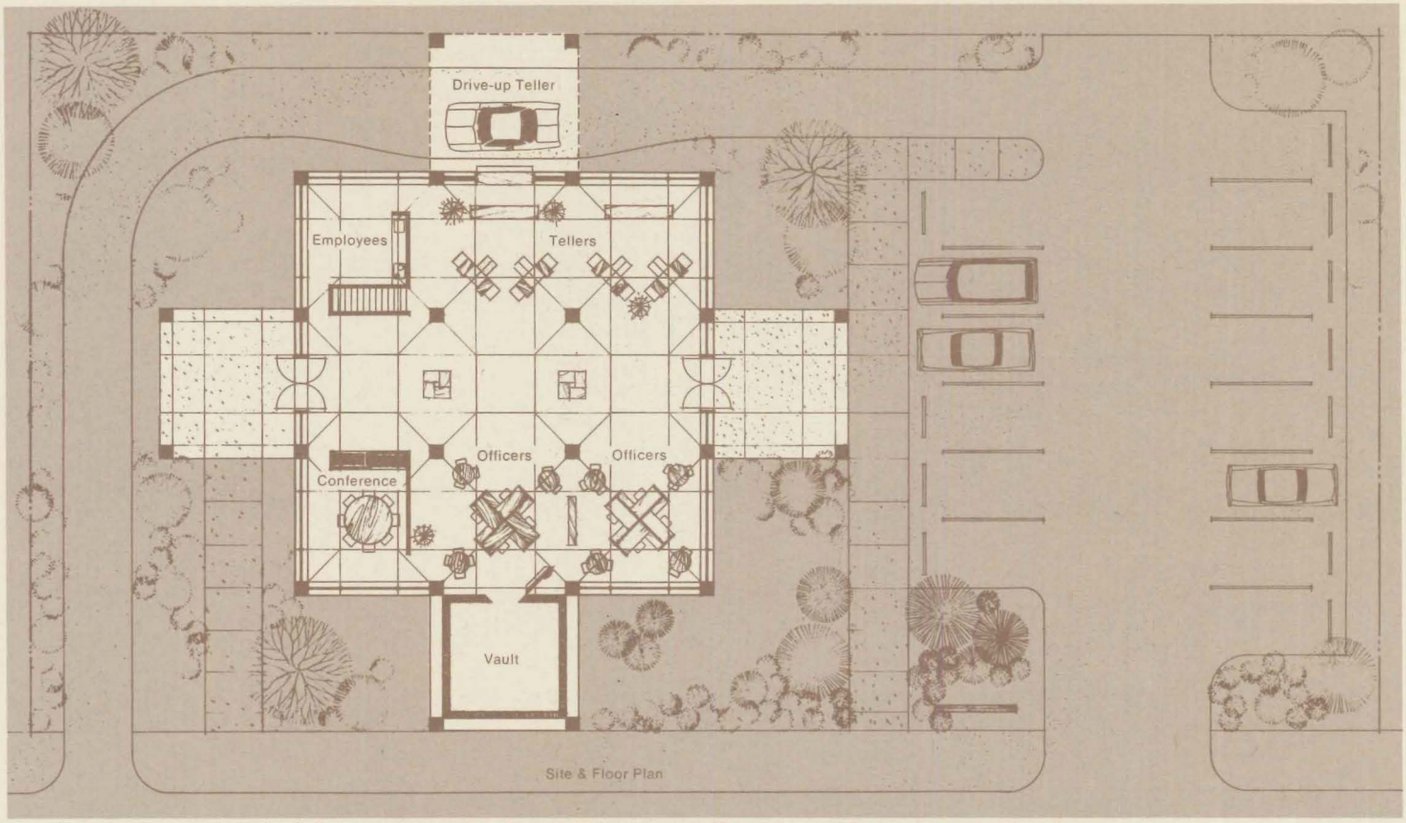
"The results range from unfortunate to costly. And only rarely does a starter bank reflect the image of permanence, trustworthiness, or neighborliness the parent institution would prefer.

"As a solution, we propose an expandable structure which, from the outset, includes all of the amenities of full service banking — and the appearance of it. We suggest not a partial bank, but a miniature one that can grow big gracefully as business expansion warrants it.

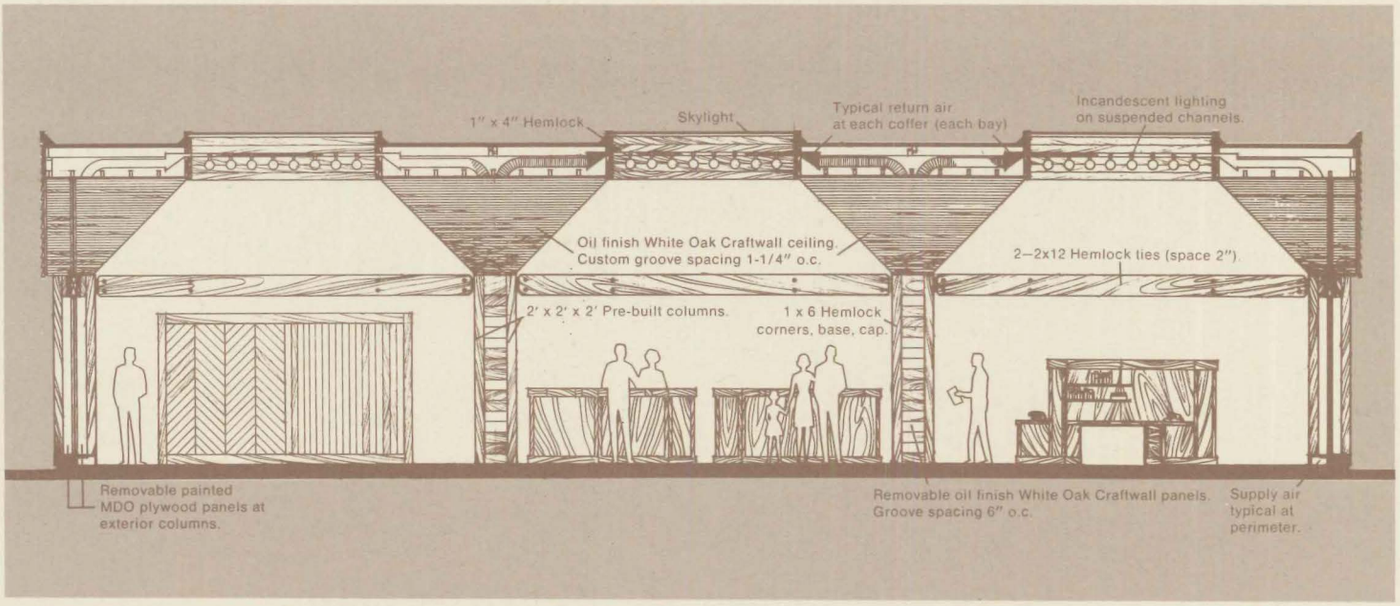
"The system is based on 20 x 20-foot bays achieved with 2 x 2-foot prefabricated, wood-frame columns capped by 10 x 10-foot cantilevered inverted pyramids. The pyramids would be connected with 2 x 6 framing, and prefabricated roof components dropped over the framing to complete the structural system.

"The form is so designed that it can be expanded in any direction. Or, completely dismantled and reassembled on another site."

Saul Zaik



The interior plan: Modular bank fixtures designed to fit the 20′ bay layout. The site would be 200′ square, preferably, and the starter unit 1200, 2400 or 3600 sq. ft.



The structural system is based on 2′ x 2′ prefabricated wood frame columns with inverted pyramid caps. Skylights, and/or light fixtures, are centered in each bay.

Interiors that provide a setting appropriate to a financial institution.

The interior, like the structural shell, is designed for expansion. Teller fixtures are plug-in units fabricated with oil finished hardwood plywood. Wheeled coin units are on a 4′ module. Officers' furniture is built into a radiating screen wall fixture that fits the 20′ bay module in a manner that provides necessary privacy for four officers in a minimum of space.

The basic interior theme is established by Craftwall® hardwood paneling — warm, inviting, yet distinctive and expressive of stability, and good taste. The ceiling panel design calls for Custom Craftwall with ¼-inch grooves, 1¼ inches on center. Column panels have ¼-inch grooves, 6 inches on center.

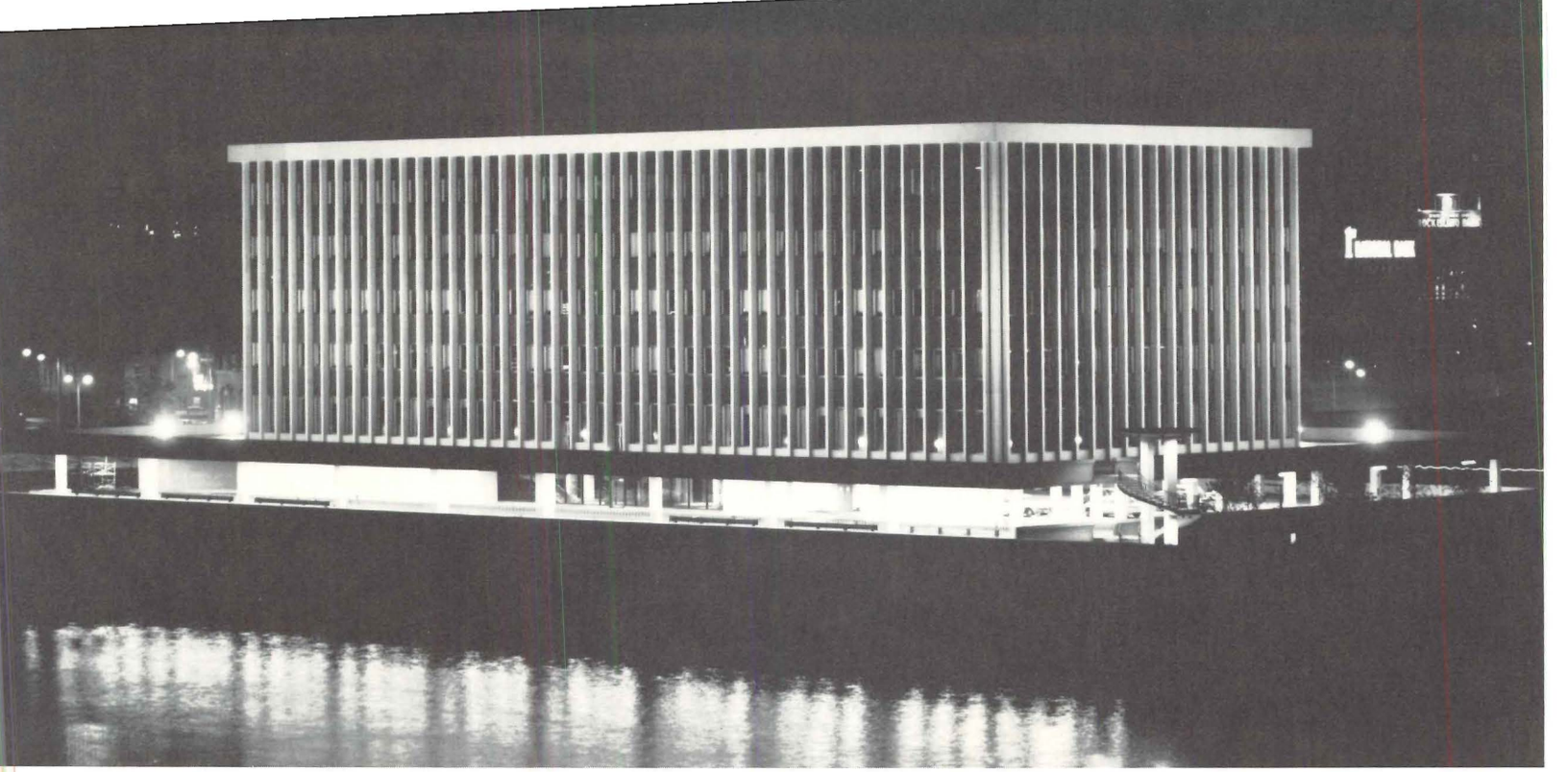
Based on criteria provided by banking institutions, the Zaik/Miller expandable structure provides practical answers to complex architectural requirements. It draws on the best of current technology, yet retains warmth of tradition, never slipping into a mere technical exercise.

And this is the Weyerhaeuser approach. We emphasize technology, supporting the largest research establishment in the wood products industry. But we pursue technical innovation from a design standpoint.

For information, call your Weyerhaeuser Architectural Representative, or write to Box B-5693, Tacoma, Washington 98401.

Weyerhaeuser

(For more data, Circle 5 on Inquiry Card.)



Outside and inside, the Modern Woodmen of America Building, Rock Island, Illinois, represents the best in materials, equipment, craftsmanship and design. Architect: Graham-Anderson-Probst and White. General Contractor: Priester Construction Co.

montgomery moves people in the Modern Woodmen Building on 4 High-Speed Elevators with ESP Measured Demand

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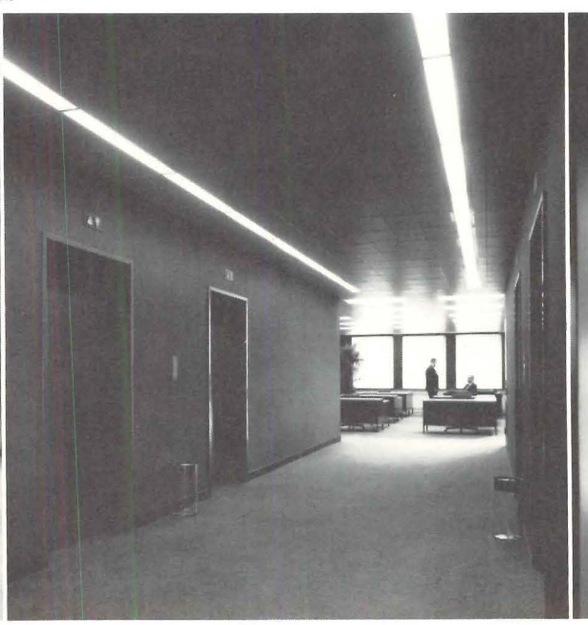
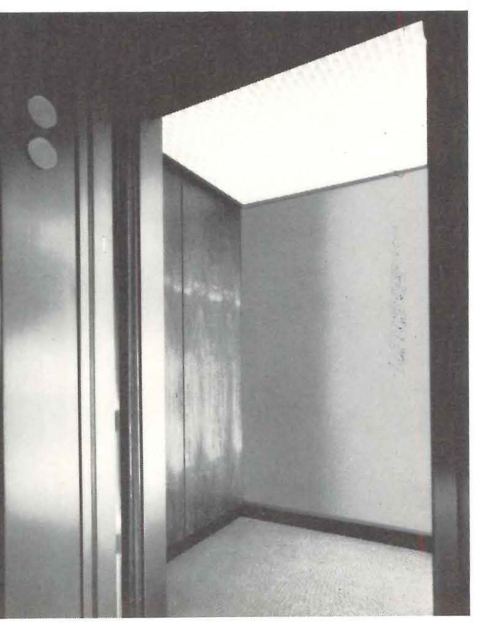
The cars, machinery and controls in this Montgomey installation provide the ideal combination of fast, smooth, comfortable elevator service for this nationally-known life insurance organization.





A ceiling for a school can't get by on looks alone.

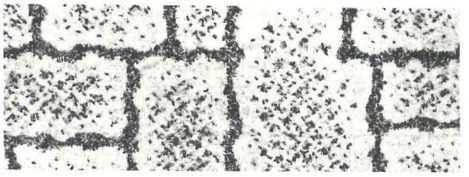
It has to provide the flexibility to meet requirements that may change. And it has to function. Which is why C-60 Luminaire is chosen for so many schools. C-60 can handle air, for example, any one of seven different ways and not show it. It can provide from 30 to well over 300 fc of glare-free light. (And do it with fewer fixtures and less wattage than conventional light sources.) Additionally, C-60 offers superior acoustical control and rated fire protection. And design flexibility, too. Vaulted modules and flat areas are interchangeable. Our folio on C-60 Luminaire and other ceiling innovations goes into more detail. Please write for a copy. Armstrong, 4202 Rock Street, Lancaster, Pa. 17604.

Armstrong

Ceiling Systems that work

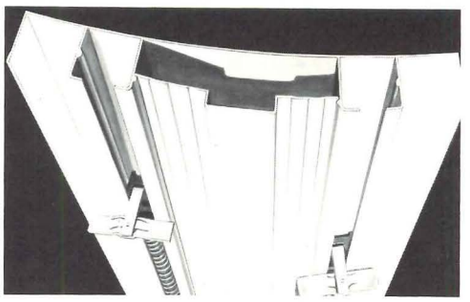
Or for more data, circle 1 on inquiry card.

continued from page 214



CONTRACT CARPET / Yarn fibers of custom Wilton contract carpets with DuPont's *Antron* nylon pile are structured to reflect light and thus conceal soiling. This makes it practical to use carpets of lighter colorings. The carpet will be offered in a variety of weights and textures and in any color. ▪ Philadelphia Carpet Company, New York City.

Circle 312 on inquiry card



REMOVABLE WINDOW EQUIPMENT / *Transeal,* a combination weatherstrip and sash balance for removable double-hung wood windows, is constructed of *Vyneel* (white polyvinyl chloride laminated to steel). It is virtually maintenance-free with insulating qualities reported as excellent. Other features include: full track from head to sill; sash platforms that hold sash at any position during operation and lock automatically when sash is removed; and spring-loaded parting stop section and silent balance springs. ▪ Zegers Incorporated, Chicago.

Circle 313 on inquiry card

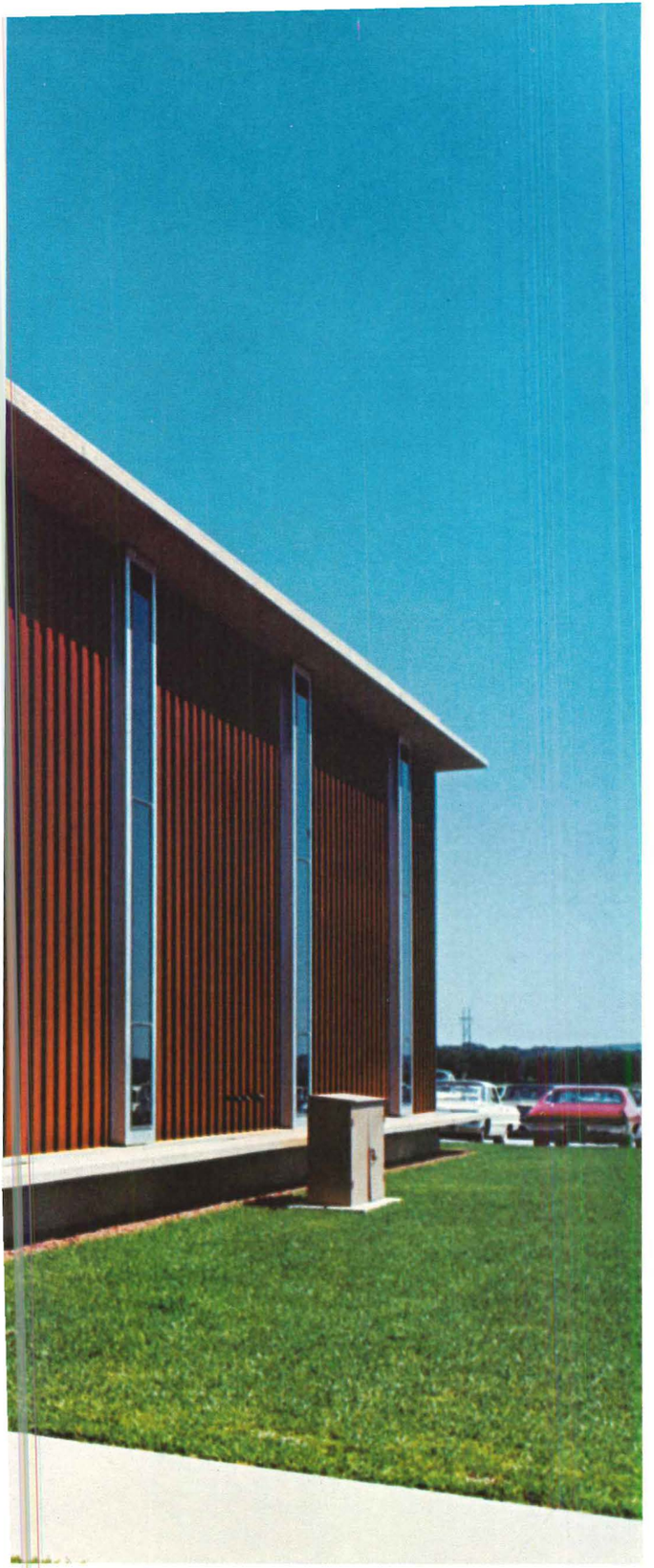
TILT WINDOW / The tilt mechanism of the *Kasco* aluminum window allows sash to swing inward for washing of glass and frame from the inside of the building. The unit, which adapts to all types of facilities and window opening requirements, has already been used in residential and commercial buildings and is being recommended for institutional buildings. ▪ Kassl Window Company, Inc., Plainview, New York.

Circle 314 on inquiry card

For more data, circle 98 on inquiry card ➧

The IBM manufacturing, engineering, and office building in Austin, Texas, was designed by Page, Southerland, Page, architects. Steel fabricator: Alamo Steel and Machine Works; engineer and builder: H. F. Campbell Company. Mayari R siding by R. C. Mahon Co.

The gutter with drain holes built below the Weathering Steel siding is a straightforward and attractive solution to the staining often associated with Weathering Steel.



Weathering Steel wraps IBM Building in natural, protective coating

This one-story manufacturing and office building built for IBM in Austin, Texas, combines the use of Weathering Steel (Bethlehem Mayari R) with precast concrete having exposed aggregate. This type of construction offers a truly distinctive alternative to conventional masonry for industrial buildings. The Weathering Steel is insulated on the interior, and there is virtually no maintenance on the outside. Weathering Steel ages into a rich, deep-brown oxide coating, closely grained, acting as a barrier to oxygen and moisture. The light red-brown color shown in these photographs is typical for Mayari R after approximately six months of weathering.

The building was hardly completed before additions were being made. The first phase of 200,000 sq ft is now being augmented with a 100,000 sq ft addition, and a new wing of 150,000 sq ft is under construction. The entire building will feature a Weathering Steel exterior. Because the building is steel-framed, there is flexibility in making these additions; simply remove the exterior and add on. And the contractor reports that the speed of steel erection lets him stay well ahead of schedule.

Our new booklet discusses Weathering Steel in detail, both as to its design potentials and its properties. Write for your copy . . . Bethlehem Steel Corporation, Bethlehem, PA 18016 . . . or get in touch with the nearest Bethlehem sales office.

BETHLEHEM STEEL

Steel-framed structures are easily expanded, as shown by this addition of a new wing to the original building.

Just another Heat Transfer Coil?

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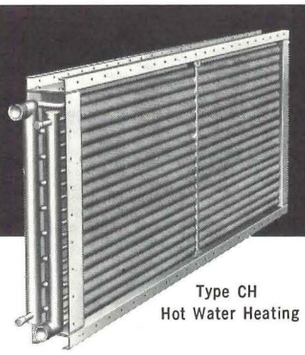

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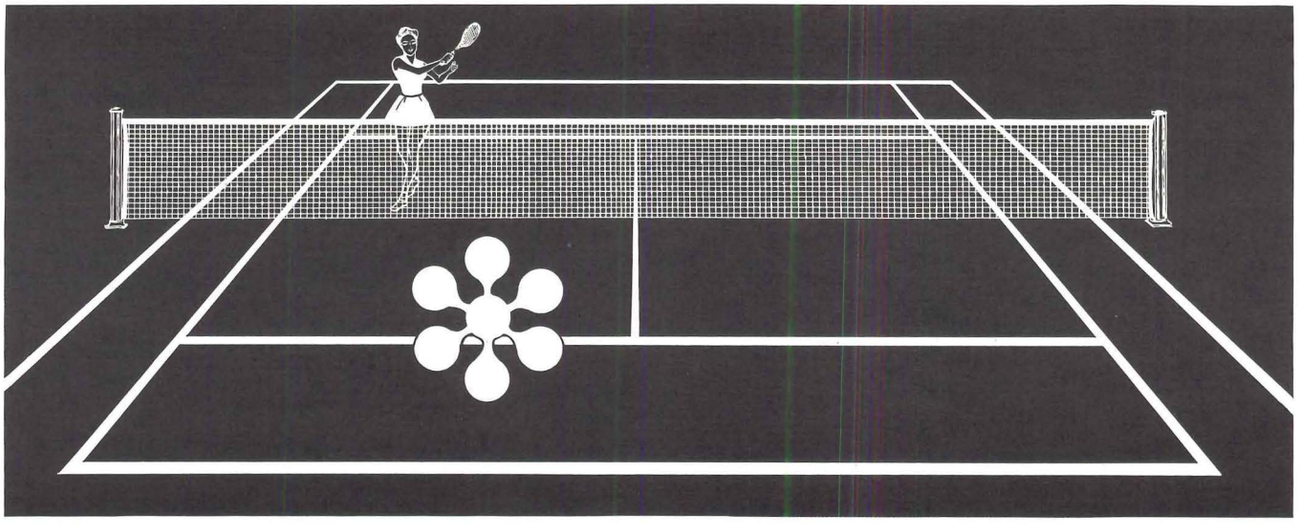

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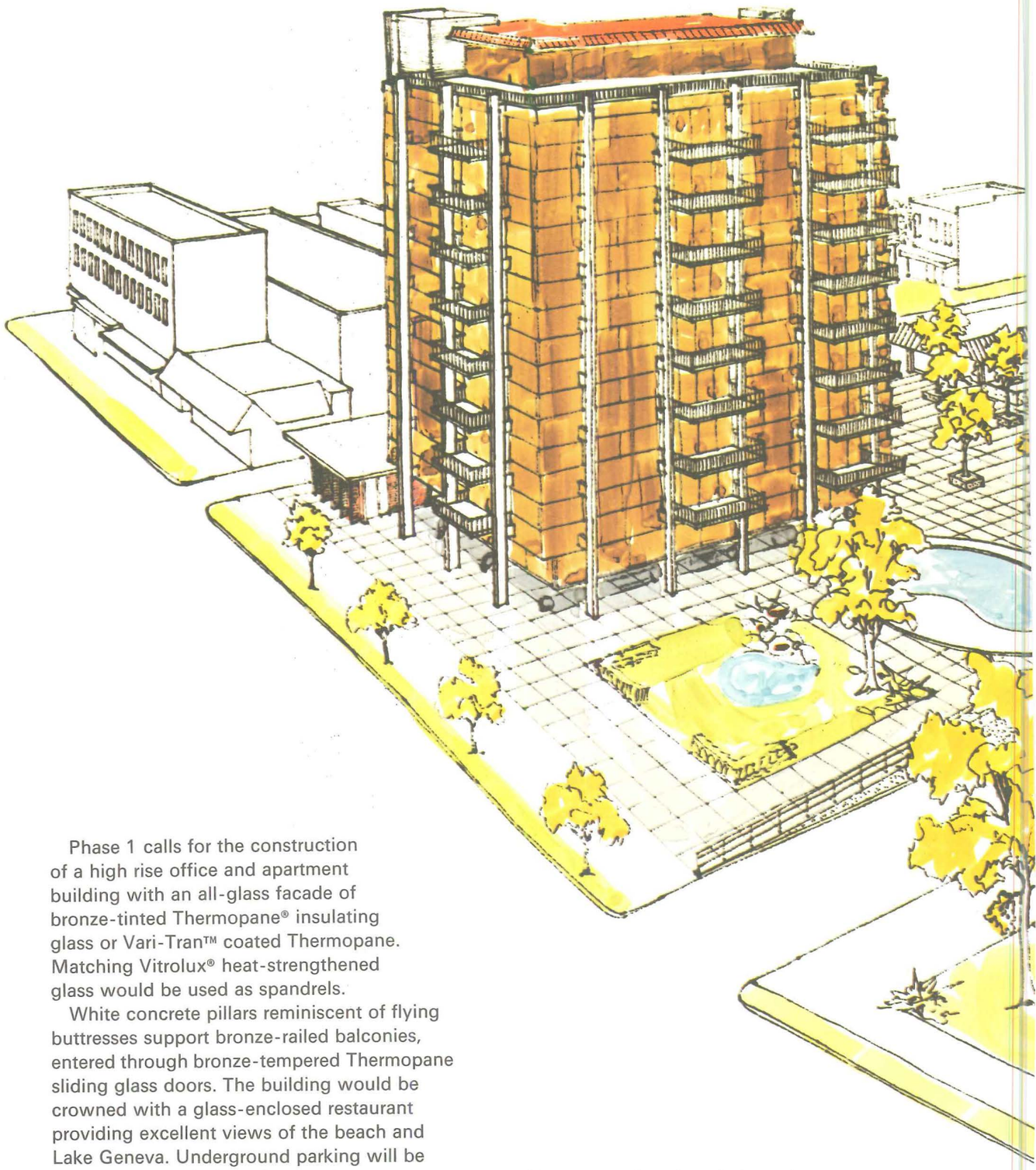
West and Seron have designs to get urban renewal off dead center.

The site is in the heart of a run-down section of downtown Lake Geneva, Wisconsin. A site presently occupied by a small resort hotel past its prime designed by Frank Lloyd Wright.

At first it was thought that the hotel could be remodeled but a recent fire severely damaged the building. This literally created the spark for a renewal of the entire area.

Aerial photo
Larry Whiting
Lake Geneva, Wisc.



Phase 1 calls for the construction of a high rise office and apartment building with an all-glass facade of bronze-tinted Thermopane® insulating glass or Vari-Tran™ coated Thermopane. Matching Vitrolux® heat-strengthened glass would be used as spandrels.

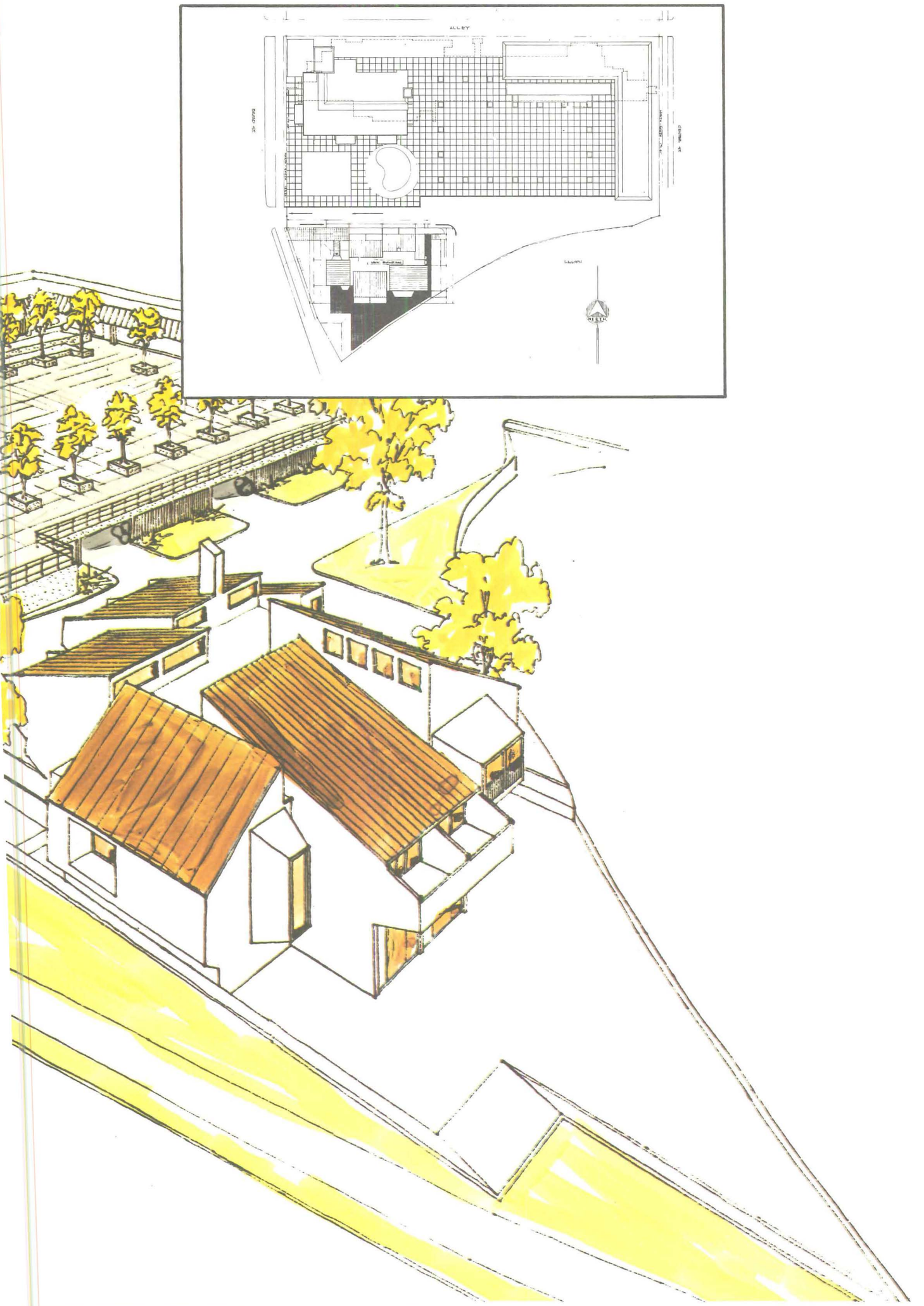
White concrete pillars reminiscent of flying buttresses support bronze-railed balconies, entered through bronze-tempered Thermopane sliding glass doors. The building would be crowned with a glass-enclosed restaurant providing excellent views of the beach and Lake Geneva. Underground parking will be provided beneath the street level terrace.

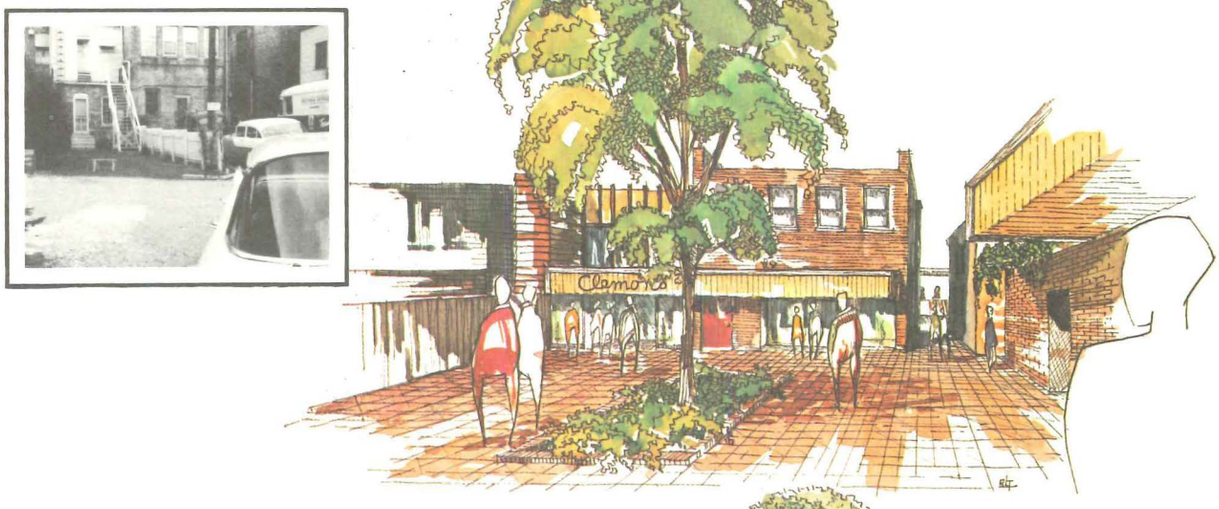
Phase 2 envisions the erection of some small studio apartments down near the lake. These will have copper roofs. Bronze-tinted Thermopane windows will provide indoor comfort and control of reflected glare from the sky and lake.

Mr. West has also developed suggestions for the rehabilitation of Main Street stores which separate the two sites.

He expects that the whole project will encourage property owners in the adjacent three- or four-block area to remodel their buildings to create a smart shopping center in the heart of town. Many are enthused.

Thus, Derald West, A.I.A., Lake Geneva, and Levon Seron, A.I.A., Joliet, Ill., associated architects, hope to inject new vitality into this growing resort town.


ALLEY
LAUNDRY



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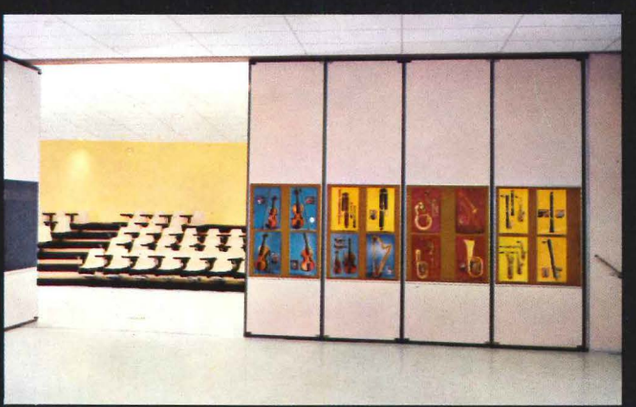
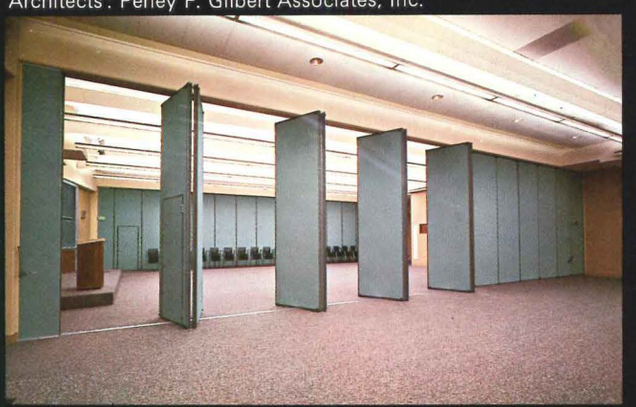
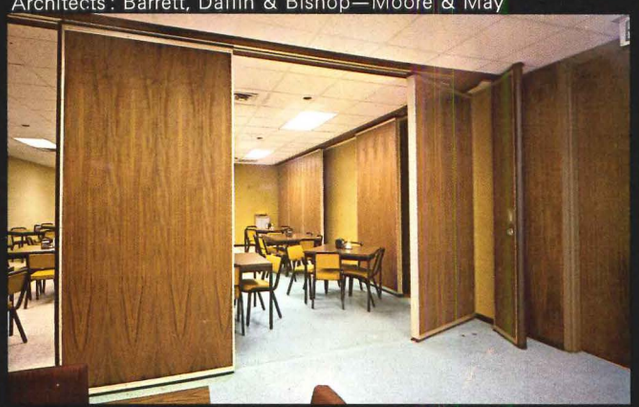


Architects: Perley F. Gilbert Associates, Inc.

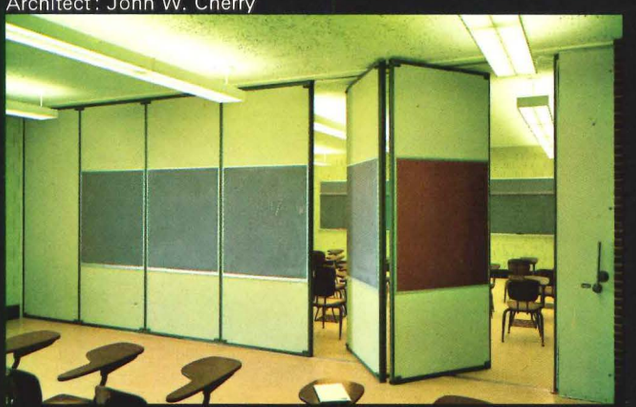
Architects: Barrett, Daffin & Bishop—Moore & May



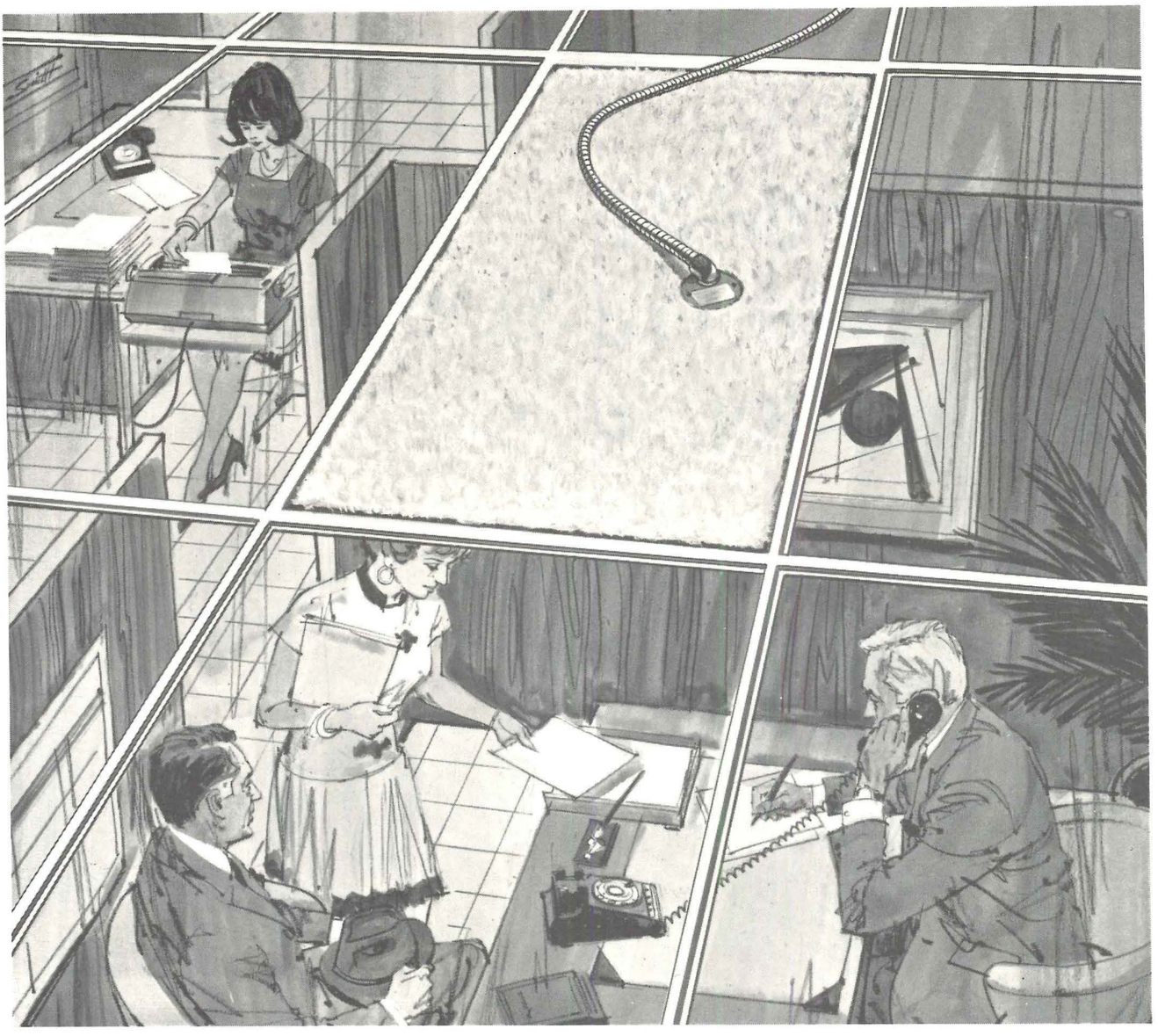
Architect: John W. Cherry



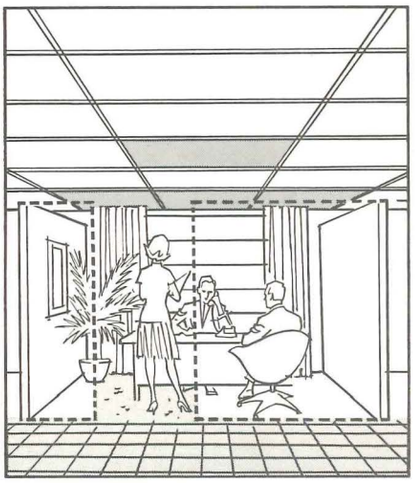
Engineer: Bernard Johnson, Inc.



Architects: Lankton—Ziegele—Terry & Associates



Office needs can change overnight, so drop in a heating system that can change, too.



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Electro-Products Division 3M COMPANY

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For more data, circle 101 on inquiry card

For more data, circle 102 on inquiry card

Frame Division Plant. Owner: Midland-Ross Corporation, Maumee, Ohio.
Contractors: Lathrop Company, Toledo, Ohio. Engineers and Architects: Rossi & Nickerson, Toledo, Ohio.
Finish: Metal walls finished with Fluropon† made with Kynar 500.

Metal walls cost less... and last longer when coated with finishes containing Kynar 500*

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Make your base specification a finish containing Kynar 500!

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For more data, circle 103 on inquiry card

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OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 269-270

LIGHTING / A 52-page guide has an extensive selection of imported contemporary crystal chandeliers along with a number of custom designs. ▪ Metropolitan Lighting Fixture Co., Inc., New York City.
Circle 400 on inquiry card

LIGHTING CONTROL / Requirements for applications demanding accurate and dependable intensity control of large lamp loads are supplied in a 54-page catalog. Besides the established line of professional equipment, new products are shown, including wholly integrated, modular components for many needs. ▪ Skirpan Electronics, Inc., Long Island City, N.Y.
Circle 401 on inquiry card

EMERGENCY LIGHTING / A 16-page manual covers selection and installation of emergency lighting equipment for industrial plants, institutions, commercial establishments and other public-assembly places. ▪ Carpenter Manufacturing Co., Somerville, Mass.
Circle 402 on inquiry card

ENGRAVED DOOR KNOBS / *Adventures in Design,* a four-page color brochure, represents a few of the thousands of possible designs in stainless steel, Corillium, chrome, brass and bronze. Designs may be faceted or may be the seal or symbol of the corporation, institution or person. ▪ Yale Lock and Hardware Division of Eaton Yale & Towne Inc., Rye, New York.
Circle 403 on inquiry card

POWERED EXHAUSTERS / A high-performance line of direct- and belt-drive exhausters and relief/intake vents maintains a low roof silhouette to blend into the skyline. A 12-page booklet explains that the cover and curb cap/orifice combine for a three-way weather, moisture and storm protection barrier. ▪ Jenn-Air Corporation, Indianapolis.
Circle 404 on inquiry card

DECORATIVE LAMINATES / Specification data for *Decorative Micarta* laminated plastic products is contained in a six-page release. ▪ Westinghouse, Hampton, S.C.*
Circle 405 on inquiry card

HEAT EXCHANGERS / A line of rotary air-to-air heat exchangers, *Therm-O-Wheels,* is designed for use in heating and cooling the air streams in heating, ventilating, air conditioning and industrial air processing systems. Units are said to recover up to 80 per cent or more of the thermal energy, hot or cold, normally wasted by exhaust air. ▪ Carnes Corporation, Verona, Wis.
Circle 406 on inquiry card

**Additional product information in Sweet's Architectural File*

more literature on page 246

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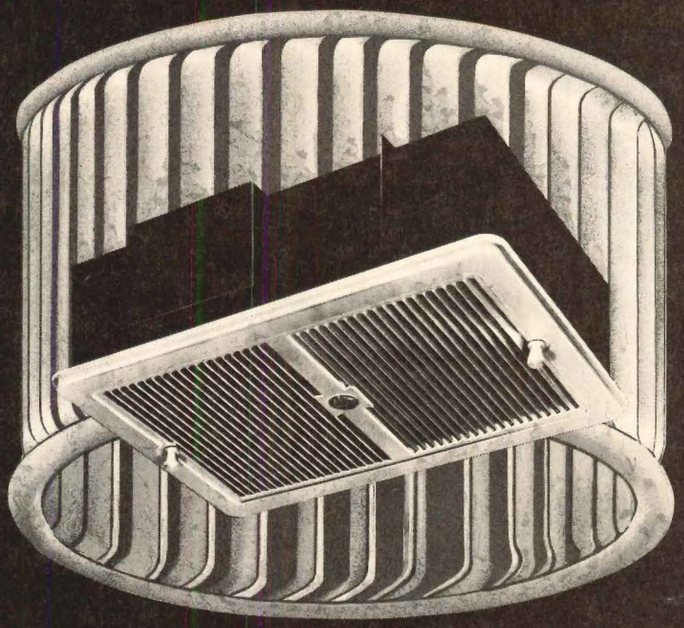
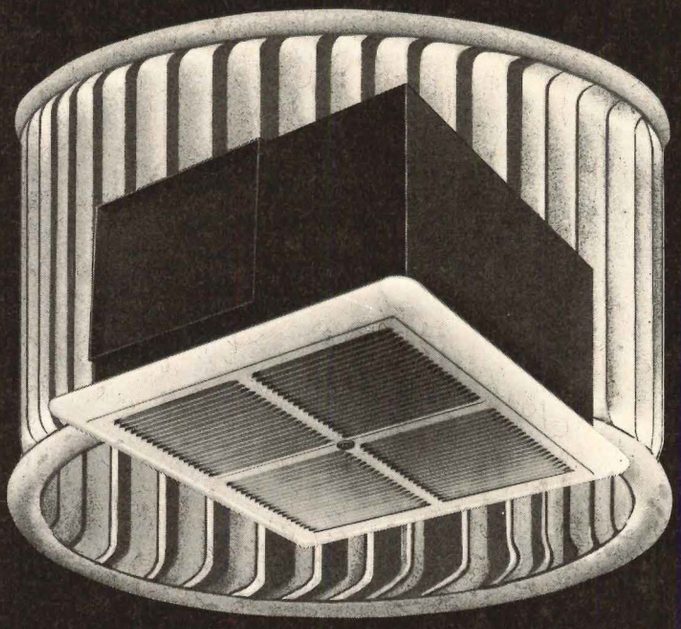
With Trade-Wind QT Ventilators





The quietness of the remarkable Trade-Wind QT Ventilators is achieved through the use of a single over-sized wheel turning at a low speed. The minimal motor vibration is dampened out at the source through the use of special motor mount assemblies. The heavy gauge housing is virtually free of vibration.

For maximum QUIET, specify QT:
V-QT-90: 90 CFM at 0.1″ static pressure
Chrome grille.

V-QT-200: 190 CFM at 0.1″ static pressure
V-QT-300: 285 CFM at 0.1″ static pressure
V-QT-400: 425 CFM at 0.1″ static pressure
Neutral beige enamel grille.

Write for details. *Trade-Wind by* **THERMADOR**

5119 District Blvd., Los Angeles, Calif. 90022, Dept. AR

Division of Norris Industries

Literature illustrating and describing Republic lockers and colors available sent promptly.

The "wish to learn" starts here

The important thing is not so much that every child should be taught as that every child should be given the wish to learn.
John Lubbock*

A school is an institution, right? Wrong. Nor should it look like one. Stultify a promising young mind with drab, oppressive surroundings? Never. Leading educators and architects and Republic progressed to this philosophy years ago. Today, Republic "Decor 19" school lockers *in colors* are as exciting as the new audio-visual teaching aids, the open study areas, the carpeted classroom. Use them with imagination. Mix colors and styles. Box lockers as "vanities" in girls' dressing rooms. As dividers in multipurpose open areas. In your choice of 19 decorator-selected colors everywhere, to help the children *want to be there.*

Isn't that where the "wish to learn" begins?

*1st Baron Avebury, British archaeologist and man of science (1834-1913). Author of numerous books and essays, including a compilation known as "Lubbock's Hundred Best Books."

REPUBLIC STEEL
MANUFACTURING DIVISION
YOUNGSTOWN, OHIO 44505

For more data, circle 112 on inquiry card

For more data, circle 111 on inquiry card

continued from page 232

CARVED WOOD / "Fresh new ideas in carved wood" is the theme of a 32-page color portfolio presenting grilles, panels and doors. ▪ Customwood Manufacturing Company, Albuquerque, N.M.*

Circle 407 on inquiry card

MATERIALS COST CHART / A cost comparison chart allows quick computation of 21 engineering plastics and metals, regardless of price fluctuation. ▪ Borg-Warner Corporation, Washington, W. Va.

Circle 408 on inquiry card

FIBER GLASS PIPE / *Flextran* Pipe, a flexible, fiber glass-reinforced conduit produced in large diameter for gravity transmission of water and waste water, is described in a 10-page brochure. The brochure also describes installation procedures, joint design and dimensions, infiltration and exfiltration, and corrosion and abrasion resistance. ▪ Johns-Manville, New York City.*

Circle 409 on inquiry card

COOLING TOWERS / Units for industrial water cooling and commercial air conditioning are the subject of a 20-page booklet. The factory-assembled, completely hot-dip galvanized steel towers range in capacity up to 2300 tons. ▪ Baltimore Aircoil Company, Inc., Baltimore.

Circle 410 on inquiry card

BLOWERS / The *BI* series of backward inclined blowers has been expanded "to meet industry demands." A 10-page brochure of charts presents information on nominal wheel sizes ranging not only from 12 through 30 in., but also available in 33-in. and 36-in. sizes, delivering up to 26,000 CFM for a wide range of heating, ventilating, and fume removal applications. ▪ The Brundage Company, Kalamazoo, Mich.

Circle 411 on inquiry card

BUILDING PANELS / A 24-page booklet covers the company's complete field of building panels. Featured is a section on a shop-assembled panel that permits faster installation with all erection work done from the exterior of the building. A profile and finish selector aids specification. ▪ Plasteel Products Corporation, Washington, Pa.*

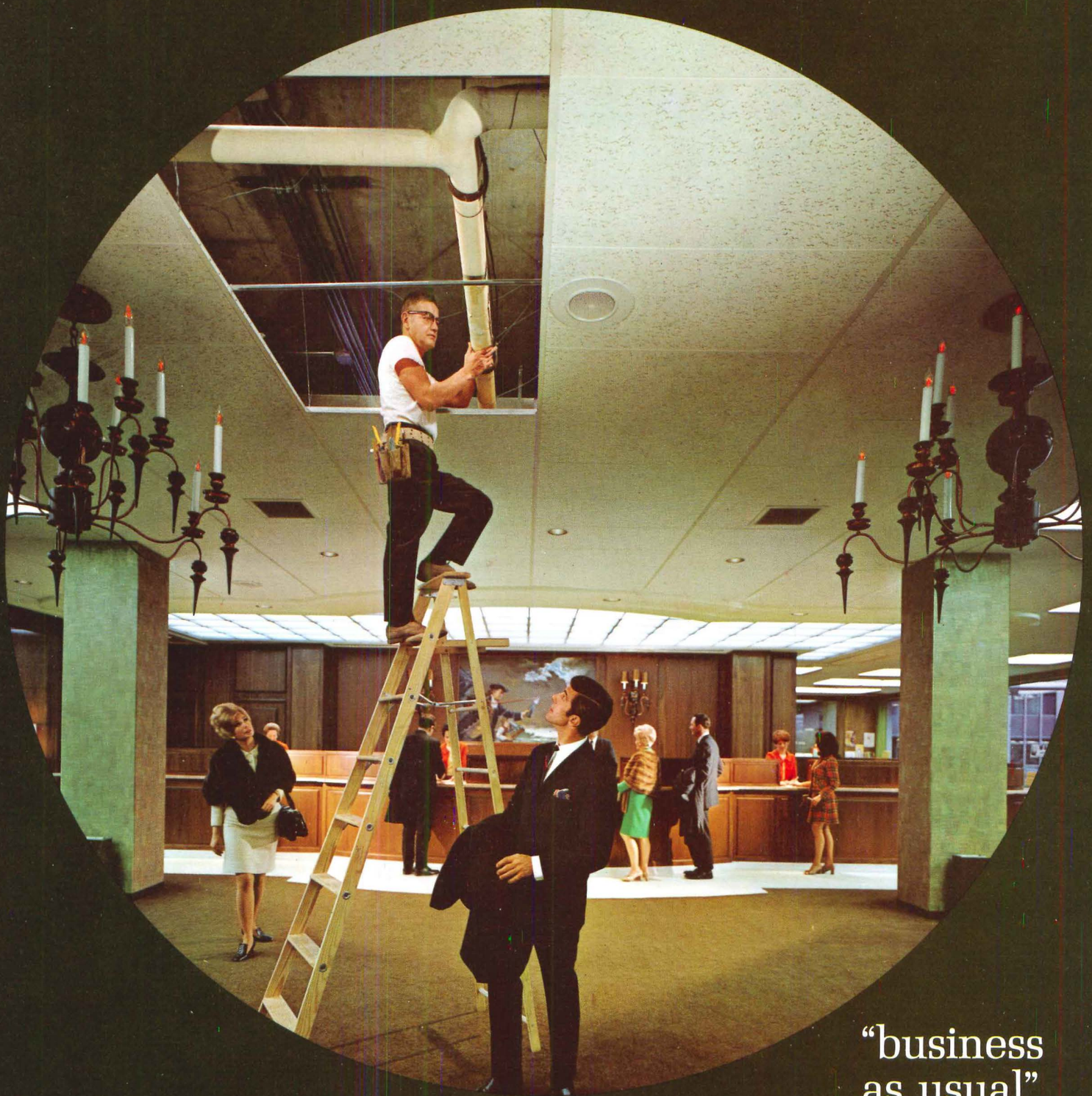
Circle 412 on inquiry card

GLASS DRAINLINE / *Kimax* tempered glass drainline, particularly recommended for research laboratories, teaching laboratories, industrial processing plants and other areas desiring corrosion-resistant waste systems, is fully discussed in a 24-page booklet. The pipe can handle liquids from their freezing point up to 212 deg F continuously. ▪ Owens-Illinois, Toledo, Ohio.

Circle 413 on inquiry card

**Additional product information in Sweet's Architectural File*

more literature on page 260



"business as usual" —with

Conwed®

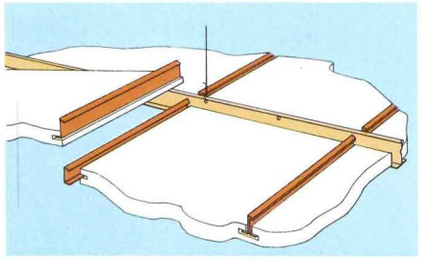
SEMI-CONCEALED CEILING PANELS

ENDURING CEILING BEAUTY PLUS INSTANT ACCESSIBILITY

Design beauty plus suspended ceiling accessibility and economy are achieved with Conwed's new Semi-Concealed ceiling. This unique ceiling system reduces visible grid to a few parallel main runners for linear design emphasis. If desired, even the exposed grid can be hidden by lighting fixtures. The Semi-Concealed system offers a truly beautiful and versatile designer ceiling for the architect and interior designer.

What's more, Semi-Concealed permits complete accessibility to the plenum area, so in demand for maintenance and remodeling. Result —

1. No down-time in normal business activity.
2. No costly overtime labor.
3. No long delays in "entering" the ceiling.

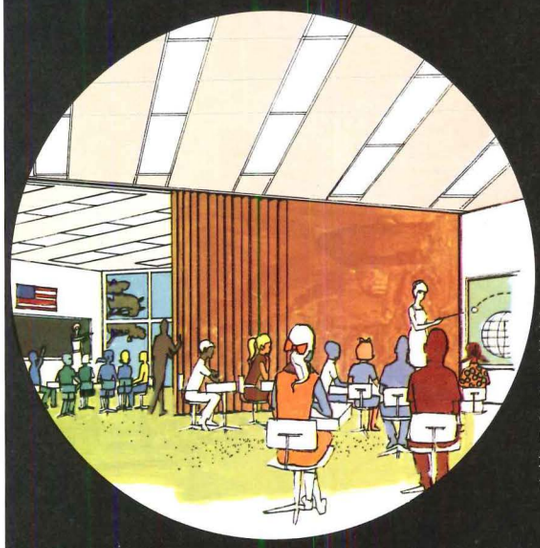


Secret of accessibility without exposed cross tees lies in the superior dimensional stability of Conwed mineral acoustical panels coupled with concealed access splines. This unusual stability permits Conwed to offer panels up to five feet in length.

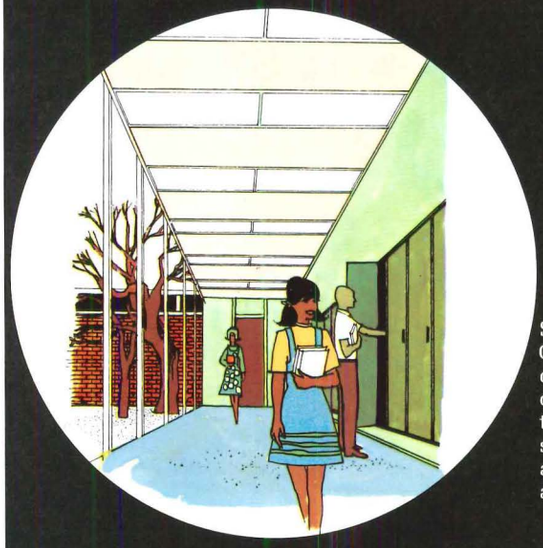
Look into this unconventional designer ceiling from Conwed that offers all the conventional benefits. Write for complete data.

Conwed Corporation, Dept. CI,
332 Minnesota Street,
St. Paul, Minnesota 55101.

Conwed® CORPORATION



Fewer grid lines make Semi-Concealed a beautiful, practical ceiling for open-plan school arrangements. Ceilings appear to flow from one room to another.



Since lines in a Semi-Concealed ceiling flow only one way, you can choose the direction to make narrow spaces appear wider and wide spaces appear narrower.

Obtain the appearance of fully concealed 12″ x 12″ tile by combining Semi-Concealed ceiling panels and recessed lighting troffers. Yet all conventional suspended ceiling accessibility and economy features are retained.

FRONT PAGE PHOTO
PROJECT: Ben Franklin Savings & Loan, Oakbrook, Illinois
ARCHITECT: Midwest Bank Builders, Inc., John F. Carson, Architect

TRI-CON*

The world's slimmest concealed ball bearing hinge!

Practically friction-free with its Delrin-lined barrel and exclusive new Teflon-coated pin. Inner movement as fascinating as the outer appearance of this exciting new slimline by Hager.

Everything Hinges on Hager

Hager

HAGER HINGE COMPANY
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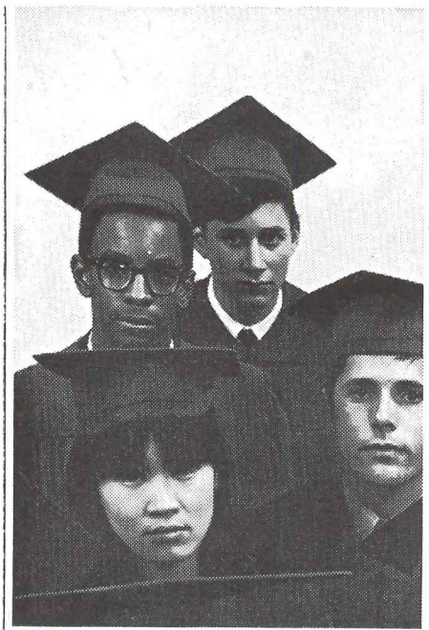
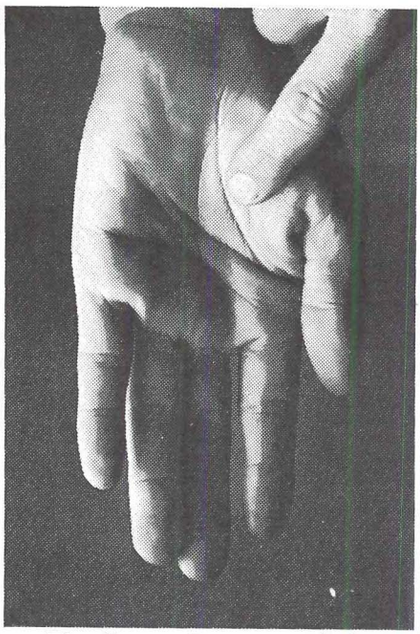
*Patent Pending

Advertising. Who needs it?



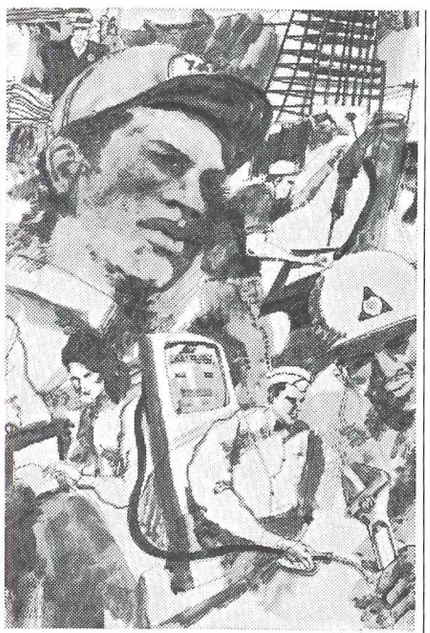
Colleges and universities need it. And get it.

Donated by media and business for the public good. Through The Advertising Council, in behalf of the Council for Financial Aid to Education. Last year this free advertising helped raise $1.3 billion in contributions to colleges and universities.



The Peace Corps needs it. And gets it.

Since the founding of the Peace Corps, free advertising, donated by media and business through The Advertising Council, helped interest more than 250,000 Americans in applying for Peace Corps service.



The JOBS program needs it. And gets it.

The National Alliance of Businessmen's drive for employing the hardcore unemployed is being supported by a national advertising campaign through The Advertising Council. Again, the entire campaign has been donated free by media and business in the public interest.

Who needs advertising? Our country . . . our citizens. Each year more than $300 million dollars worth of advertising is donated . . . to help government agencies and public service organizations to get things done.

The Advertising Council consists of people who work in business, broadcasting, publishing . . . in advertising agencies and media. Through the Council, they give their money, talent, their time and space in newspapers, magazines, business publications, company publications, radio, television, transit and outdoor . . . to support the critical needs of our country.

Through The Advertising Council, men and women in advertising are helping get something done . . . about the crisis in our cities . . . about broadening opportunities for our youth . . . about finding meaningful jobs for the hardcore unemployed . . . about expanding the role of business in our social and economic problems . . . about uniting our people and strengthening our nation . . . about what each of us as an individual can and must do to help solve today's most pressing problems.

For free illustrated brochure, write to Advertising Council, 25 West 45th Street, New York City 10036.

advertising contributed for the public good

ADVERTISING COUNCIL

For more data, circle 118 on inquiry card

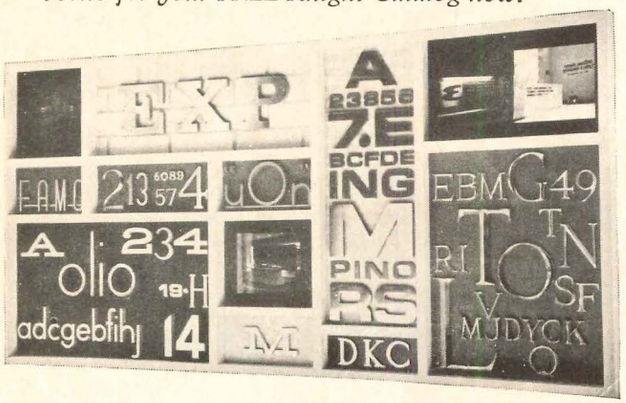
For more data, circle 120 on inquiry car

Don't let your client down after the building is up...

Name what you have created in lasting metal letters —costs a little more but lasts a whole lot longer.

Knight will cast 3-dimensional *letters in solid bronze, brass or aluminum. Select from a wide variety of sizes, type faces and finishes. Or we'll create new letters, company trademarks, to your design.*

Write for your FREE Knight Catalog now.



H.W. KNIGHT & SON INC.
Metal Letters & Figures
14 Lane St., Seneca Falls, N.Y. 13148

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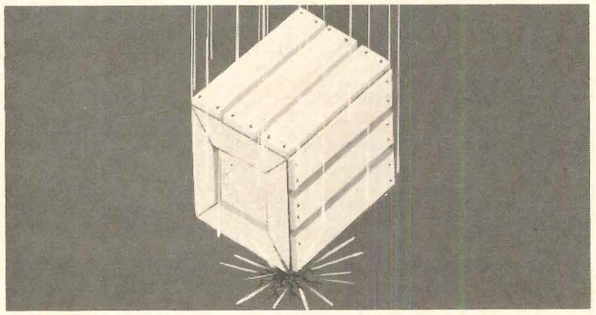
MAKE INDUSTRIAL FLOORS TOUGHER THAN CONCRETE



Save your clients money by including a Permaflex floor surfacing system in your original design. Costs far less than resurfacing later. Vital for many industries. Reduces in-plant dust. Improves impact resistance. Withstands loads up to 20,000 lb/sq. in. without rutting or denting. Resists corrosive chemicals such as acid, caustic, salt and sugar. Reduces maintenance expense and hazard of damaged floors. Choose from the complete line of Permaflex industrial flooring systems—including epoxies and latex.

Free consultation. Write for information and literature on the best and most economical floor surfacing system for any application. Permaflex is 47 years in the floor surfacing business.

THE PEOPLE WHO KNOW MOST ABOUT FLOORS

PERMAFLEX

EFFICIENCY MAINTENANCE

Products Company, Inc.
1844 N. Front St., Philadelphia, Pa. 19122

Sales offices in major cities

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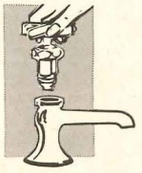
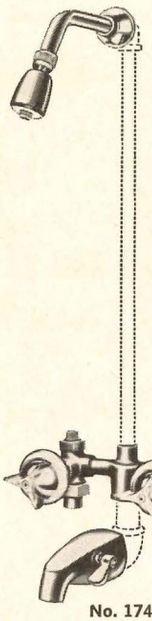
What's the Big Idea in Chicago Faucets?



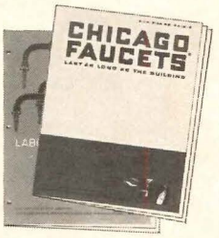
It's simple really. The faucet body doesn't wear out. The parts that do wear are all in one replaceable unit. And today's unit still fits Chicago Faucets made as much as 50 years ago—completely renews the operating heart almost as easily as you'd change a light bulb.

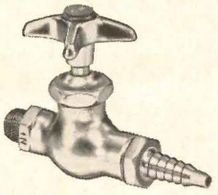
No other faucet can offer you such assurance of long life expectancy, ease of maintenance, or honest economy. Keep the Chicago Faucet idea in mind for your next job.



No. 1749-6 Built-in Tub and Shower Fittings.

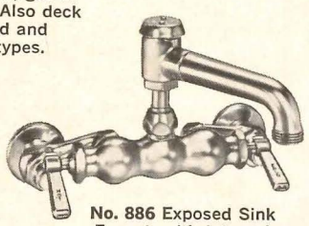
You can get this Big Idea in the biggest selection of faucets available—for residential, commercial, institutional and laboratory use. Write for catalogs.





No. 937 Laboratory Table Fitting, Available for water, steam, gas or air service. Also deck mounted and turret types.

No. HC807 Push Button Lavatory Spout allows about 10 seconds flow, then closes automatically. Smart new answer for public or school washrooms.



No. 886 Exposed Sink Faucet, with integral vacuum breaker. Other types with wall brace, pail hook, integral stops, etc.

PLUMBING BRASS INSTITUTE PBI

PHCIB

CHICAGO FAUCETS®

LAST AS LONG AS THE BUILDING

THE CHICAGO FAUCET CO., 2100 S. Nuclear Drive, Des Plaines, Ill. 60018
(A Suburb of Chicago)

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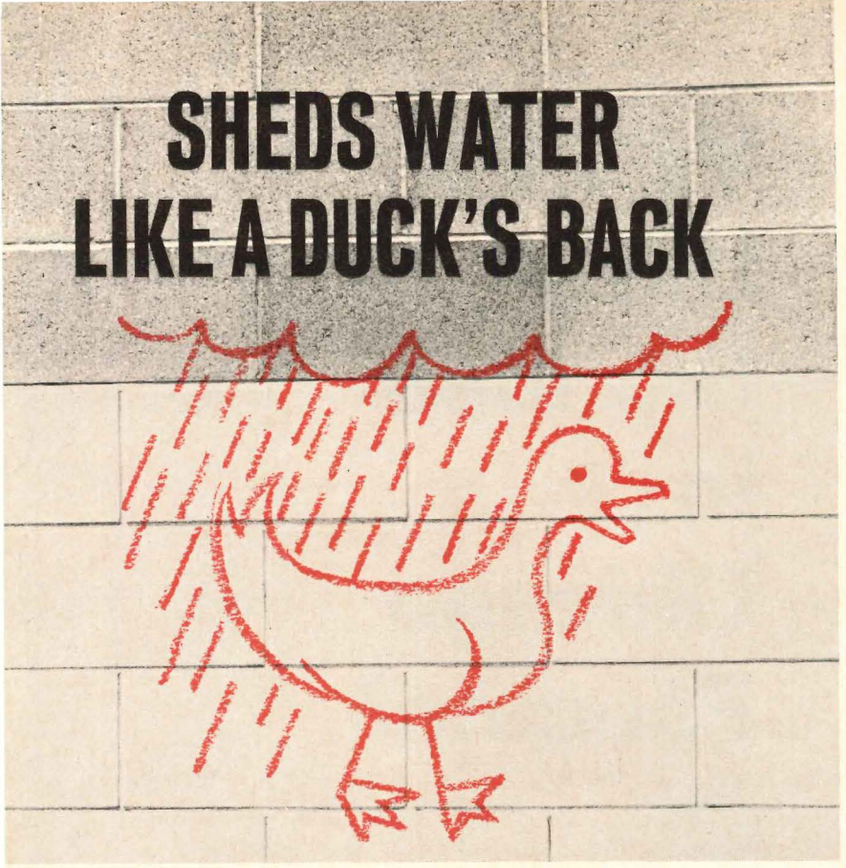

PRIME 'n FILL*

BUILDING BLOCK COATER

Perfect paint base, perfect moisture barrier for concrete block. In one operation, PRIME 'n FILL primes, fills, and surfaces the block. Moisture cannot get through this impenetrable barrier; PRIME 'n FILL seals every void in the block. The surface becomes hard, dense, and non-porous — a perfect base for all vinyl, acrylic, or oil-base coatings. The basic economy of block construction is extended right to the finish, when you use this low cost, high quality, time-tested product on exterior and interior surfaces. Paint goes farther — usually covers perfectly with one finish coat. So forget the problems and high cost of painting concrete block. Just PRIME 'n FILL... then paint.

*ALSO AVAILABLE...
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makers of SYNKO products

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Los Angeles, California 90063

Gentlemen: Tell me more about PRIME 'n FILL.

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COMPANY_____
ADDRESS_____
CITY_____
STATE_____ ZIP CODE_____

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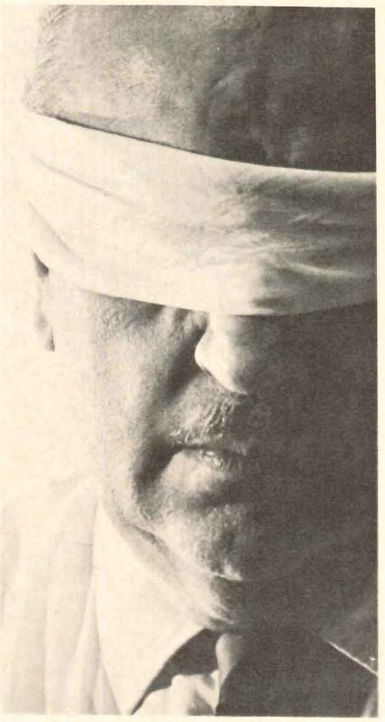
There's just one thing worse than finding out about cancer.



Not finding out.

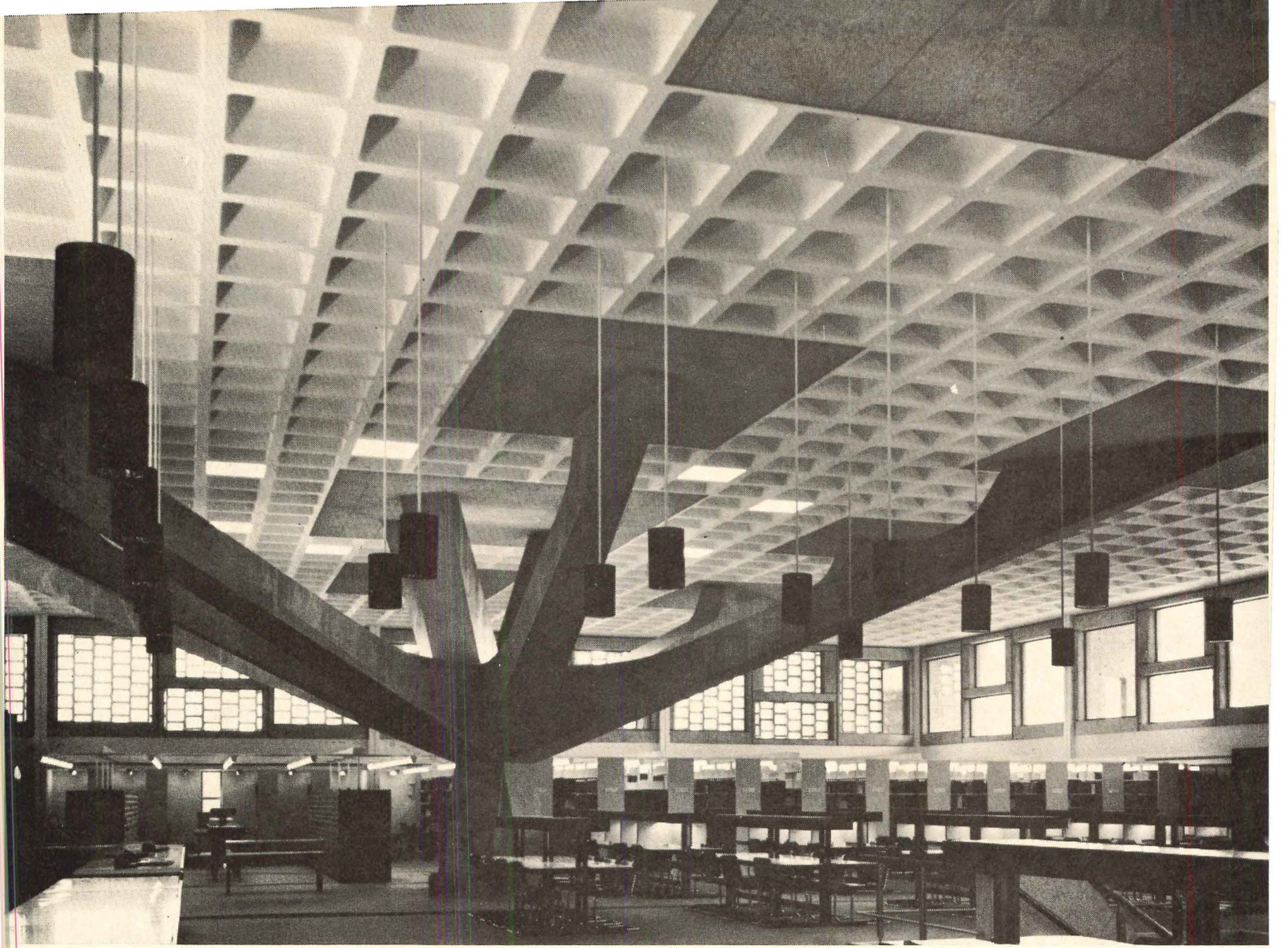
Sure, finding out is a shock. But finding out gives you a fighting chance. And the earlier cancer is found, the better the chances of beating it.

There's one certain way to lose to cancer. And that's not to find out. Until it's too late.

The thing to do is to have your physician give you a good going over now, when you feel great. And then when your doctor tells you that you *are* great, you'll feel even better.

american cancer society

This Space Contributed by the Publisher



St. John's University Library, Collegeville, Minnesota
Marcel Breuer & Associates, architects
Johnston-Sahlman Company, structural engineers
Gunnar I. Johnson & Son, Inc., contractors
Ceco Steeldome Service for waffle-pattern monolithic concrete joist construction

Find aesthetic repetition in Ceco's Standard Steeldome Floor-Forming experience

Think how you can use these repetitive units to bring beauty out of standardization. Standardization spawns creativity. It has always done this, from the Parthenon to the skyscraper. Great things come out of standardization.

This is no less true with standard steeldome modules for monolithic concrete joist construction. You can use them aesthetically in sculptured waffle ceilings. You can create with a sure hand, relying on Ceco's 56 years of experience in forming floor systems with removable steelforms. This means you work and shape fluidly, molding versatile monolithic structures of strength and rigidity. Ceco's experienced crews and project supervisors are adept at carrying out your design and coordinating with other trades. Your project starts fast, speeds ahead. Forms, rebars, concrete materials are close at hand.

Another thing: monolithic concrete floor forming is economical, often $1.00/sq. ft. less than other types. Ceco is big in experience as a nationwide specialist in floor forming, known for dependability and quality. So as you plan your next project, call on Ceco experience. The Ceco Corporation, general offices: 5601 West 26th Street, Chicago, Ill. 60650.

CECO

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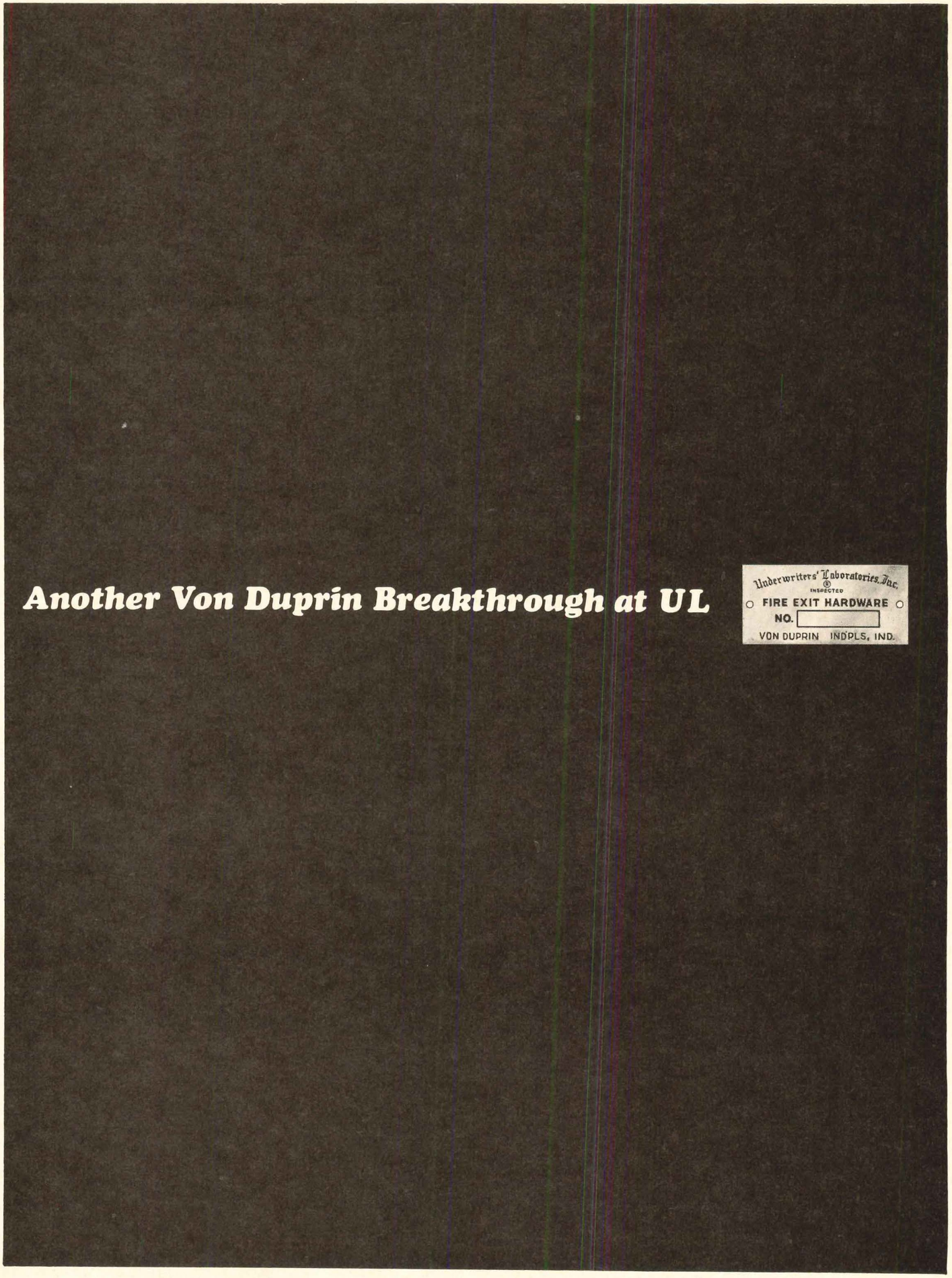
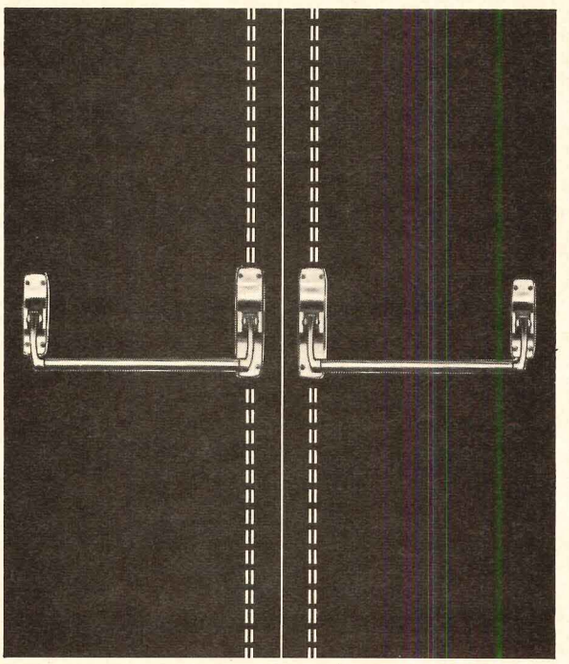
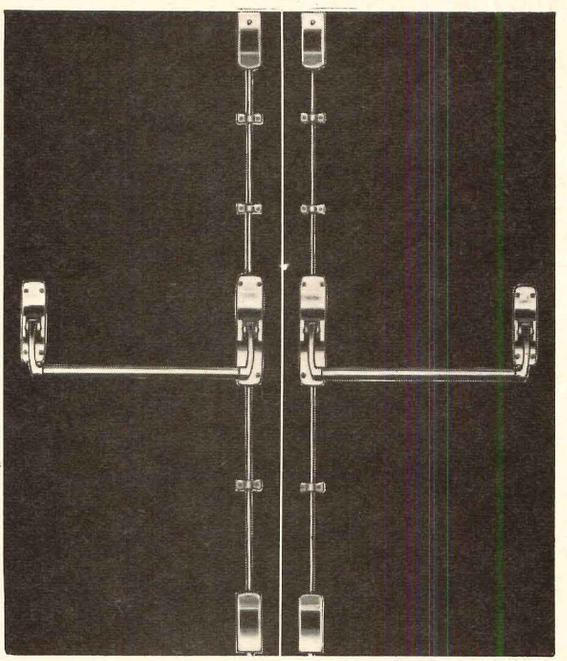

Another Von Duprin Breakthrough at UL
Underwriters' Laboratories, Inc.
INSPECTED
FIRE EXIT HARDWARE
NO.
VON DUPRIN INDPLS, IND.



Concealed Fire Exit Hardware

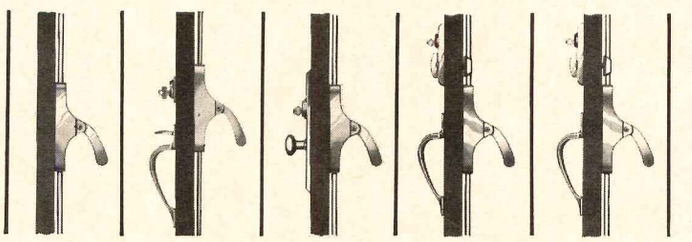
The Von Duprin concealed vertical rod Fire Exit Hardware is now listed by Underwriters' Laboratories for use on B, C, D and E label fire doors in openings up to 8′ by 8′. No astragal . . . no coordinator. Available with exit only function, or with outside (hinge side) lever operation. For complete details on this newly listed application of Fire Exit Hardware, write for Bulletin 676.

No Astragal · No Coordinator · B, C, D, E Label Fire Doors



Surface Mounted Fire Exit Hardware

Another major breakthrough by Von Duprin in Fire Exit Hardware listings at Underwriters' Laboratories! For the first time, you can now use a pair of vertical rod devices on B, C, D and E label fire doors. Without an astragal! Without a coordinator! And in openings up to 8′ by 8′. And you have a choice between surface applied devices, or the concealed devices above. Write for Bulletin 676.



8817 Exit only

8817TP Key locks thumbpiece

8813 Key locks knob

8819TL Thumbturn operates device except when locked by key

8817TL Thumbturn operates device only when key is used

Von Duprin®

the *only* complete line of Fire Exit Hardware

VON DUPRIN, INC. • 400 WEST MARYLAND STREET • INDIANAPOLIS, INDIANA 46225
VON DUPRIN LTD. • 903 SIMARD ST. • CHAMBLY, QUEBEC

For more data, circle 126 on inquiry card

continued from page 246

WATER COOLERS / Models for schools, hospitals, offices and special applications are presented in an eight-page brochure. ▪ Sunroc Corporation, Glen Riddle, Pa.*

Circle 414 on inquiry card

CHANGING LIGHTING NEEDS / A catalog explains the *Lite-Trac System,* a flexible system of adjustable, directional lighting that uses a variety of portable light sources. ▪ Prescolite Manufacturing Corporation, San Leandro, Calif.*

Circle 415 on inquiry card

CERAMIC TILE / A ten-page color brochure presents *Terra Vitra* in assorted designs and colors for floors and walls. First consideration in creating this line of high- and low-relief tiles was "empathy with the architect's world." ▪ American Olean, Lansdale, Pa.*

Circle 416 on inquiry card

FLOOR AND ROOF SLABS / An eight-page booklet explains the use of precast concrete floor and roof slabs in the new $12-million, 300-room Playboy Club-Hotel in Lake Geneva, Wisconsin. ▪ The Flexicore Co., Inc., Dayton, Ohio.*

Circle 417 on inquiry card

GRATING / A 12-page catalog provides information on steel grating and new aluminum products. Items include riveted and welded gratings, bridge decking, floor armor, vessel linings, stair treads and drain grates. ▪ Klemp Corporation, Chicago.

Circle 418 on inquiry card

HEATERS / A 96-page catalog includes application and design information on a complete range of custom-designed and standard electric blast coil duct heaters, components, special constructions and accessory remote-mounted equipment. ▪ Industrial Engineering & Equipment Company, St. Louis.

Circle 419 on inquiry card

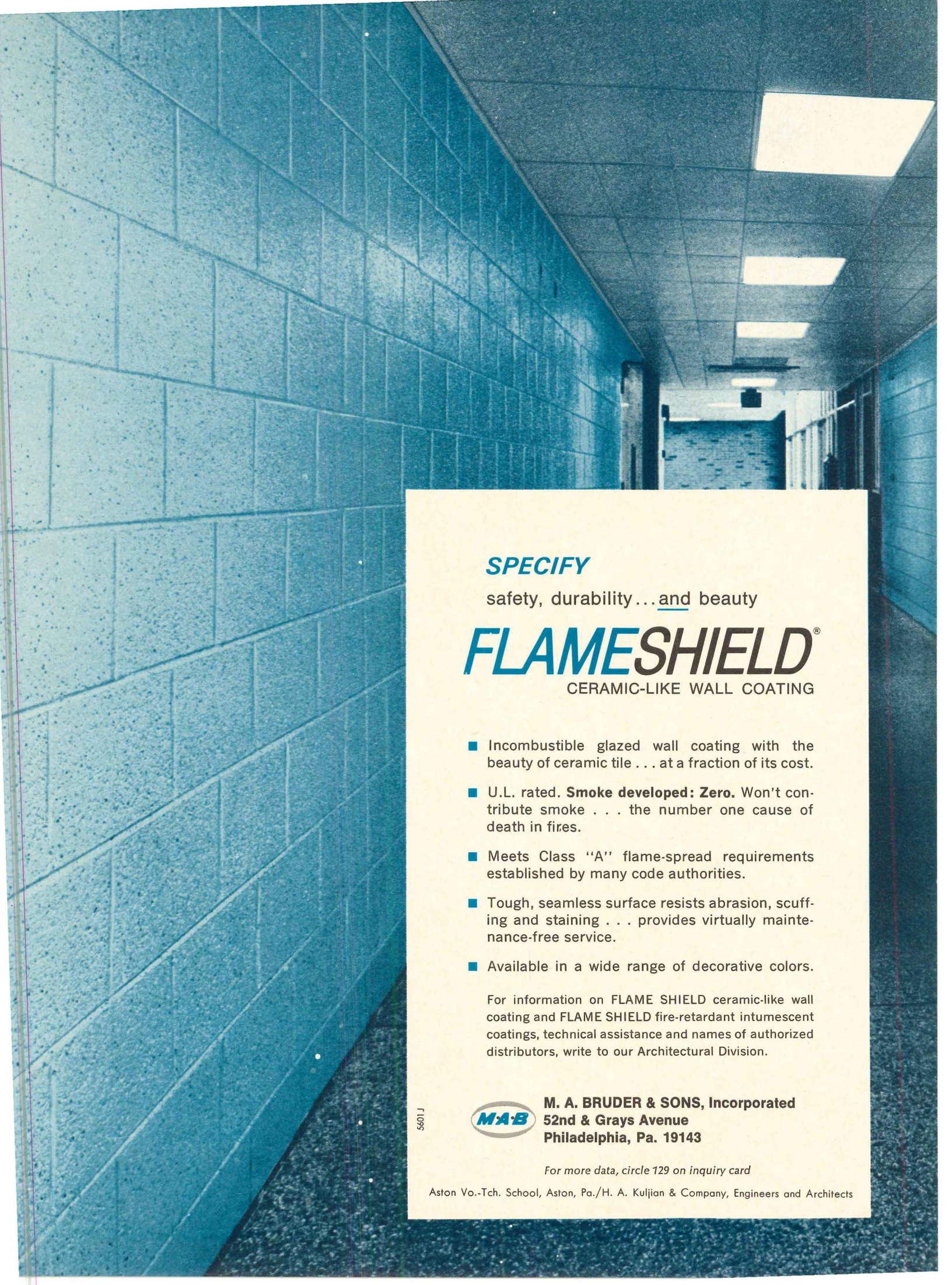
REGLET / A rigid PVC reglet is reported to help insure weathertight installation of neoprene structural gaskets into openings in concrete panels. A four-page data sheet explains all the details, including the fact that the reglet is cast directly into the concrete panels when manufactured. ▪ The Standard Products Co., Port Clinton, Ohio.*

Circle 420 on inquiry card

CONTRACT LAMPS / A 30-page catalog contains illustrations and specifications for over 77 basic designs that "conform to budget limitations and offer a wide selection of materials, sizes, and applications." ▪ Nessen Lamps Inc., Bronx, N.Y.

Circle 421 on inquiry card

**Additional product information in Sweet's Architectural File*



SPECIFY

safety, durability... and beauty

FLAMESHIELD®

CERAMIC-LIKE WALL COATING

- Incombustible glazed wall coating with the beauty of ceramic tile . . . at a fraction of its cost.
- U.L. rated. **Smoke developed: Zero.** Won't contribute smoke . . . the number one cause of death in fires.
- Meets Class "A" flame-spread requirements established by many code authorities.
- Tough, seamless surface resists abrasion, scuffing and staining . . . provides virtually maintenance-free service.
- Available in a wide range of decorative colors.

For information on FLAME SHIELD ceramic-like wall coating and FLAME SHIELD fire-retardant intumescent coatings, technical assistance and names of authorized distributors, write to our Architectural Division.

5601 J

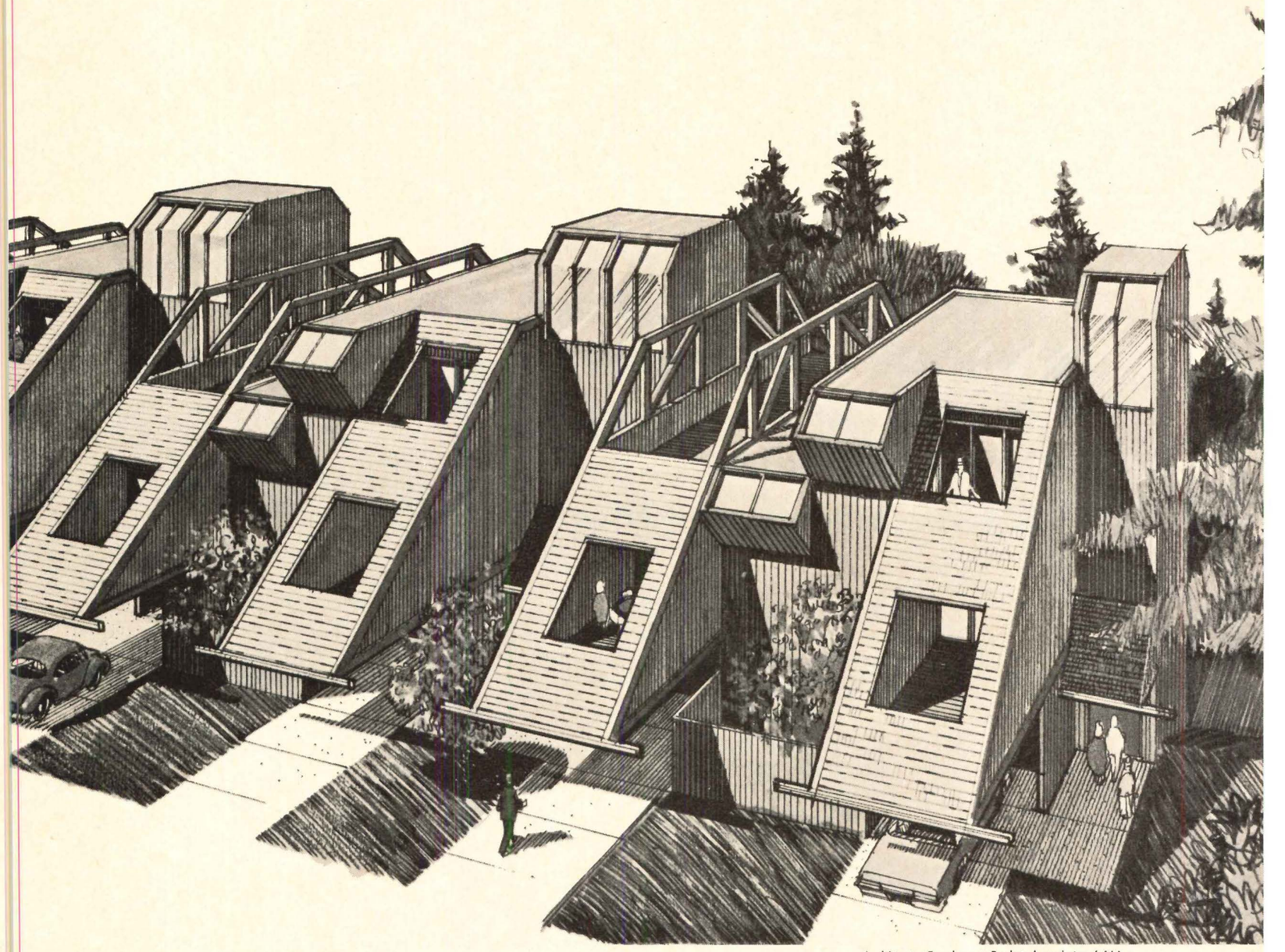
M·A·B

M. A. BRUDER & SONS, Incorporated
52nd & Grays Avenue
Philadelphia, Pa. 19143

For more data, circle 129 on inquiry card

Aston Vo.-Tch. School, Aston, Pa./H. A. Kuljian & Company, Engineers and Architects

An entire way of life suspended from a strapping wood truss.



Architects: Farnham • Peck • Associates / AIA

Western Wood does it beautifully.

Dramatic townhouses like these create an appealing total environment, yet cost less to build. With Western Wood as both framing and finish, structural elements become dynamic design elements. They work together to create the warm, luxurious atmosphere demanded by today's more affluent renters. But perhaps most important, Western Wood requires no special techniques . . . it's an economical, prestige product that's available anywhere in many grades and sizes.

Exciting ideas on multi-family dwellings are just part of the extensive Western Wood Urban Projection concept . . . a program conceived and sponsored by the Western Wood Products Association to help guide the natural growth, change and renewal that occurs in every community business district.

For more ideas, mail the coupon below for the new Western Wood booklet "Western Wood Multi-Family Structures . . . More Profitable by Design." Also, check the coupon for the Urban Projection booklet and information about a 20 minute full color 16 mm movie.

Western Wood Products Association
Dept. AR-368, , Yeon Building,
Portland Oregon 97204

Please send the free material marked:

☐ Western Wood "Multi-Family Structures" Book
☐ Urban Projection Book

Name

Firm

Address

City

State Zip

Western Woods include knotty and clear grades of Douglas Fir, Ponderosa Pine, Western Red Cedar, Incense Cedar, Western Hemlock, White Fir, Engelmann Spruce, Western Larch, Lodgepole Pine, Idaho White Pine, and Sugar Pine.

One of a series presented by members of the Forest Products Promotion Council.

For more data, circle 131 on inquiry card

if you were sure that one publication delivered over 90% of your market potential, would it make sense to place all your advertising there?

It would... if you can't answer "Yes" to this question... "Am I doing the job I ought to be doing in the one publication that's strong enough to do the job alone?"

THE PROBLEM YOU FACE

Typically the prime objective of advertising in the building market is to get architects and engineers to specify certain products into the buildings they design. One of the hurdles advertisers must overcome is that architects and engineers are among the busiest and most sought after groups of people in this country. Small in number they control through their specification practices, the selection of virtually every product that goes into our nation's buildings. As a result they are deluged with magazines of all shapes, sizes and quality. Direct mail, catalogs, folders, brochures and salesmen flood into their offices. They can't and don't pay attention to them all. Under these circumstances how can you hope to get their attention? It's simple. Do what they do and cut out waste and duplication. Go where they find value. Take the available dollars and do your advertising in Architectural Record. Our editors already have their full attention and this cuts your work in half. Make the rapport we've spent 76 years building with the profession work for you.

WHAT ARE THE BENEFITS?

The major benefit of using just one magazine in a field rather than two or more is that it frees money to do some of the other things that are necessary to attract the attention of busy, involved people. Achieving a measure of impact in your advertising is a relatively simple thing to do. Let's take a look at some of the elements of impact advertising and see how putting the same dollars to work in a single publication will help you achieve that goal.

Dominant space units... it's a fact that, on the average, larger space units get better readership than smaller ones. The advantages of 12 pages or 12 spreads in one strong magazine over six halves or six pages in each of several magazines is readily apparent. In short you can look bigger, seem more important and increase readership scores at the same time.

Maximum frequency... every available piece of research indicates that advertising readership scores also increase with frequency of insertion. The advertiser who runs in every issue of a publication gets higher scores than those who do not.

Strong copy and layout... while the basic strength of your copy and layout depends on the talent of your specialists, it's possible to enhance these elements through the use of four-color. Architectural Record is now offering substantial color premium discounts, similar to the traditional frequency discounts.

Thus by buying only the Record you get a double barrelled discount, your ads look better and you get the higher readership scores that come with color.

Consistency... the concept of consistency in impact advertising involves planning over a period of years not just months. Although the benefits seem obvious it is one of the hardest elements to sell to top management. In our experience the best way to achieve its acceptance is through the careful application of the other three elements — dominant space units, maximum frequency and strong copy and layout. Apply these three principles effectively and the advantages of consistency follow naturally and rewardingly.

WHY RECORD?

That's where you'll find the active architects and engineers. Record subscribers handle over 90 per cent of the dollar volume of all architect-designed nonresidential and large residential building. This is a fact documented by a continuing state-by-state check of the activity of architectural

firms. We compile the number of projects, the types of projects and the dollar volume as reported by F. W. Dodge. Then we compare this construction activity to the Record's subscriber galleys to determine our market coverage.

Thirty-eight such state-wide checks during a recent 12-month period reveal a coverage of the market that has great significance for advertisers. Here are some of the key findings... over 95 per cent of school dollar volume is in the hands of Record subscribers... over 90 per cent of the apartments... over 95 per cent of the hospital market. The significance to advertisers is that there is a single publication in the architectural field which alone is strong enough to carry their advertising message. Clearly one publication is enough if it's the Record.

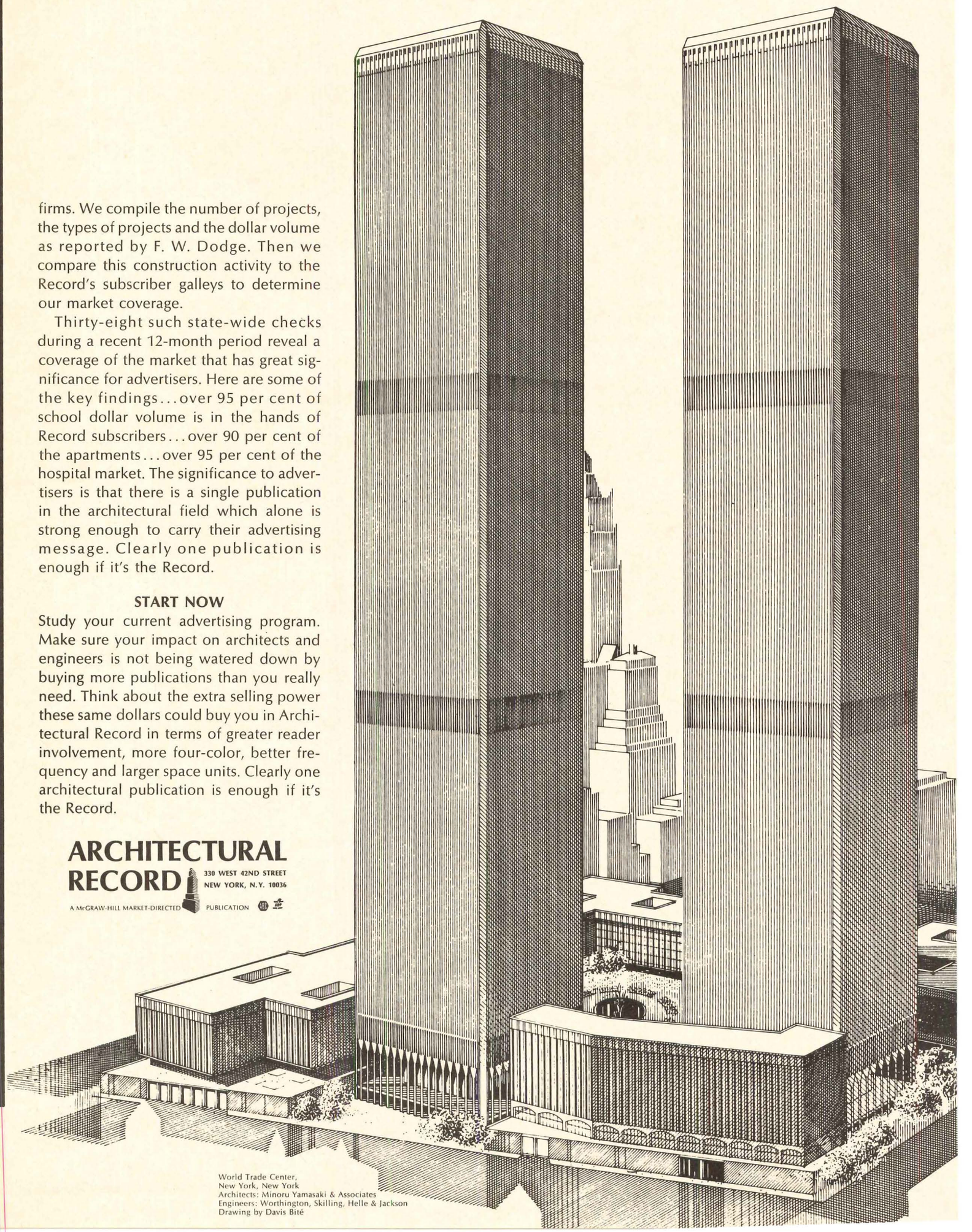
START NOW

Study your current advertising program. Make sure your impact on architects and engineers is not being watered down by buying more publications than you really need. Think about the extra selling power these same dollars could buy you in Architectural Record in terms of greater reader involvement, more four-color, better frequency and larger space units. Clearly one architectural publication is enough if it's the Record.

ARCHITECTURAL RECORD

330 WEST 42ND STREET
NEW YORK, N.Y. 10036

A McGRAW-HILL MARKET-DIRECTED PUBLICATION



World Trade Center,
New York, New York
Architects: Minoru Yamasaki & Associates
Engineers: Worthington, Skilling, Helle & Jackson
Drawing by Davis Bité

ADVERTISING INDEX

Pre-filed catalogs of the manufacturers listed below are available in the 1969 Sweet's Catalog File as follows.

A Architectural File (green)
I Industrial Construction File (blue)
L Light Construction File (yellow)
D Interior Design File (black)

ARCHITECTURAL RECORD

McGraw-Hill, Inc., 330 West 42nd Street,
New York, New York 10036
Advertising Sales Mgr.: Louis F. Kutscher (212) 971-2838
Production Mgr.: Joseph R. Wunk (212) 971-2793
Promotion Mgr.: Sam H. Patterson, Jr. (212) 971-2858
Research Mgr.: Elizabeth Hayman (212) 971-2814

District Offices:

Atlanta 30309 — Edward G. Graves
1375 Peachtree St., N.E., (404) 892-2868

Boston 02116 — Ted Roscoe
607 Boylston St., (617) 262-1160

Chicago 60611 — Robert T. Franden, Edward R. Novak
645 N. Michigan Ave., (312) 664-5800

Cleveland 44113 — David B. McCourt
55 Public Square, (216) 781-7000

Dallas 75201 — Wayne L. Loving
1800 Republic National Bank Tower, (214) 747-9721

Denver 80202 — Richard W. Carpenter
1700 Broadway, (303) 255-5483

Detroit 48226 — Tom Brown
2600 Penobscot Bldg., (313) 962-1793

Los Angeles 90017 — Robert L. Clark
1125 W. Sixth St., (213) 482-5450

Minneapolis 55402 — Edward C. Weil
1104 Northstar Center, (612) 332-7425

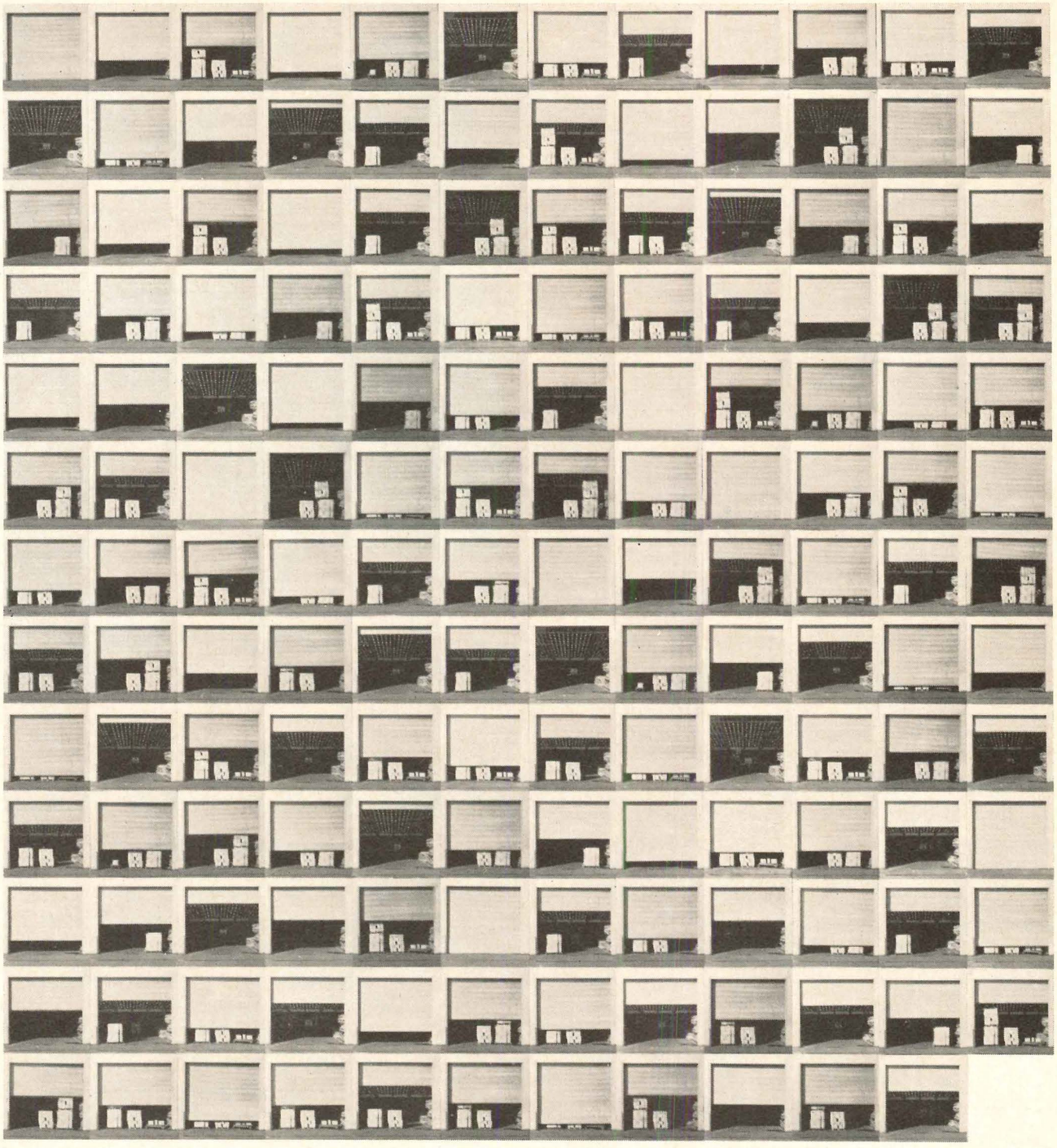
New York 10036 — Donald T. Lock, Ted Roscoe, John S. Renouard
500 Fifth Ave. (212) 971-3583

Philadelphia 19103 — Robert G. Kliesch
6 Penn Center Plaza, (215) 568-6161

Pittsburgh 15222 — Bradley K. Jones
4 Gateway Center, (412) 391-1314

St. Louis 63105 — Richard Grater
7751 Carondelet Ave., (314) 725-7285

San Francisco 94111 — Wayne C. Carter
255 California St., (415) 362-4600



155 NEW WAYS IN AND OUT OF SAN FRANCISCO

And every one secured by a Cookson steel rolling door

When the Port of San Francisco opens its new Army Street Terminal for business every morning, Cookson opens the doors. And closes them again at night.

155 Cookson power-operated steel rolling doors provide easy access to, and complete security for, the $25 million installation's 820,000 square feet of enclosed cargo handling and storage facilities.

On the basis of quality, operating ease, reliability and cost, the Port of San Francisco's choice of Cookson power-operated rolling steel doors was an open and shut case.

"Best Way to Close an Opening"

THE COOKSON COMPANY

700 Pennsylvania Ave., San Francisco, Cal. 94107

For more data, circle 132 on inquiry card

COOPER-BREGSTEIN REALTY CO.
owner-builder

CUSHMAN & WAKEFIELD, INC.
renting agent

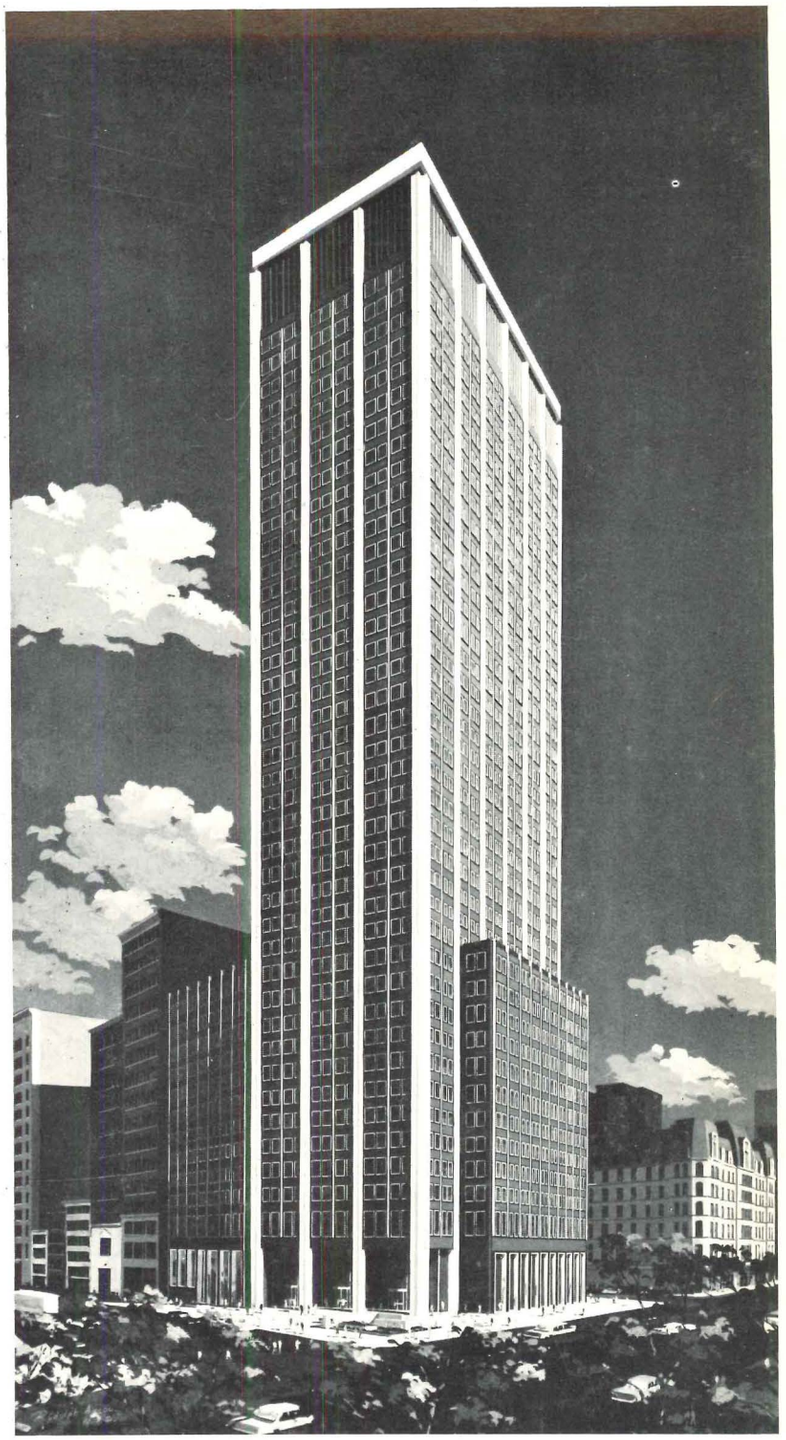
SHREVE, LAND & HARMON ASSOC.
architect

W. A. DI GIACOMO
mechanical engineer

FEIN MECHANICAL CORP.
plumbing contractor

GLAUBER, INC.
plumbing wholesaler

KOHLER COMPANY
fixture manufacturer

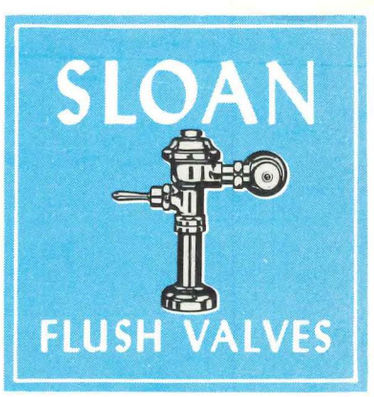


Herald Square booms with new 1250 Broadway Skyscraper

■ Once-glamorous Herald Square is undergoing architectural renaissance with the opening of the distinguished, highly efficient, forty-story 1250 Broadway building.

Hard by Penn Station and the nation's most famous department stores, this handsome steel and glass structure is the first new office building to be constructed in the area in close to half a century.

A distinguished entrance plaza and spacious lobby with 14 high speed elevators bespeak the building's fine business image. Floors of 12,500 to 21,500 square feet are structurally designed for convenient office layout customized to tenant specifications. The most modern and sophisticated services available provide zone climate and sound control and elegant hardware and lighting. Toilet rooms are similarly designed with the most modern facilities appropriate for efficient housekeeping and lowest maintenance costs. The flush valves, of course, are Sloan Quiet-Flush II, renowned for their quietness, dependability and low maintenance costs. Your building, too, can have this same Sloan quality. Simply specify and insist on Sloan Flush Valves—most people do.



SLOAN VALVE COMPANY • 4300 WEST LAKE STREET • CHICAGO, ILLINOIS 60624

For more data, circle 134 on inquiry card