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SHOWCASE FOR "DESIGN RESEARCH"

WESTYARD: A HANDSOME NEW "WAREHOUSE" FOR NEW YORK CITY

BUILDING TYPES STUDY: PLACES FOR PEOPLE TO PLAY

FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

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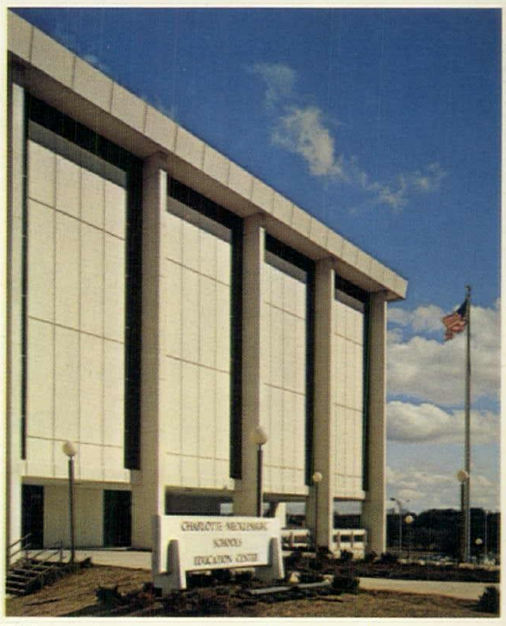
The modular design of the exterior is picked up on the inside by customizing with standard flooring materials: Imperial Modern Excelon Tile and Excelon Feature Strips.



This crisp, modern facade belongs to the Education Center for the Charlotte-Mecklenburg Schools in Charlotte, North Carolina.

ARCHITECTS: Charles Morrison Grier & Associates, Inc., 904 South King's Drive, Charlotte, North Carolina.
INTERIOR DESIGNER: Mrs. Sue Goodman of the Grier firm.
CONTRACTOR: James E. Cox Construction Inc., P.O. Box 11528, Charlotte, North Carolina.
FLOORING CONTRACTOR: Carter Floors, 189 Trade Street, Matthews, North Carolina.

Imperial Modern Excelon (vinyl-asbestos) does a double job for this Charlotte facility. It provides an economical, long-wearing floor. And with 28,000 lineal feet of 3″ feature strip, it color-coordinates the files, furniture, and accessories.

The Imperial Modern Excelon used here is ⅛″ gauge. Depending on service and budget requirements, 3/32″ gauge is available as an alternate. In both cases, the contemporary, mottled pattern goes all the way through the tile's thickness, so the look lasts the life of the floor.

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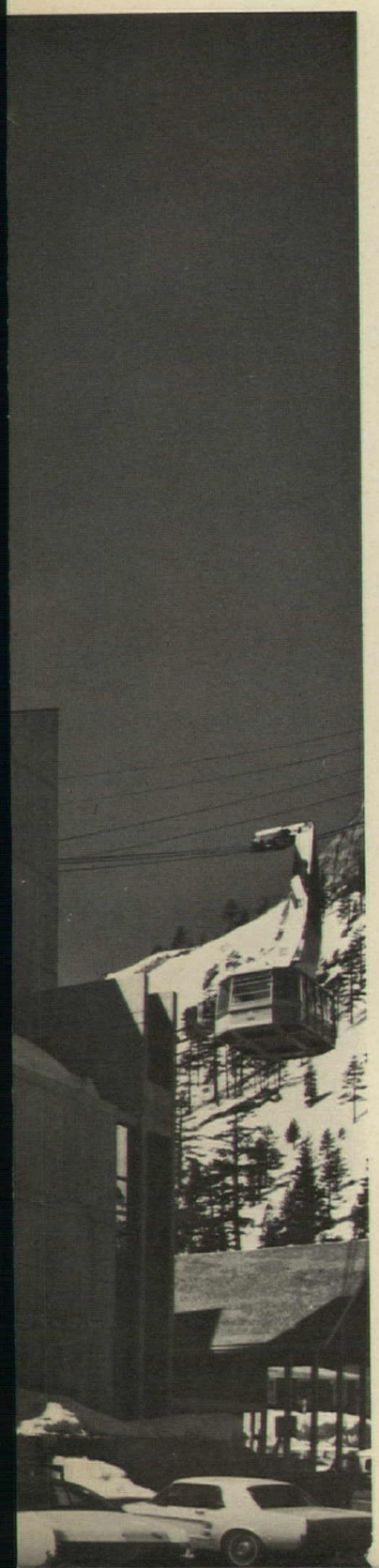
Dover designed a special Oildraulic® Elevator to meet the unusual requirements of the Squaw Valley Cable Car Terminal at Olympic Valley, California. The car measuring 11′ 6″ x 28′ will take 120 skiers (one cable-car full) from the main entrance level to the cable car level. The car is glass-walled, and moves in a glass-enclosed hoistway with no clutter of overhead cables or machinery. Total lifting capacity of 45,000 lbs. is provided by the powerful Dover Oildraulic cylinder and power unit. ARCHITECTS: Shepley, Bulfinch, Richardson & Abbott, Boston, Massachusetts. GENERAL CONTRACTOR: Campbell Construction Co., Sacramento, California. PHOTOGRAPHER: Julius Shulman, Los Angeles. Dover Oildraulic Elevators installed by Valley Elevator Co., Sacramento, California.

Dover delivers

elevators to give a lift to 120 skiers at once, or to a single handicapped child.



At Litchfield Junior High School, Litchfield, Conn., a Dover Continental Oildraulic Elevator was installed so that handicapped students might move more easily among the three classroom levels. Like the school, the elevator is distinctive, being pre-engineered to fit a specified hoistway size and thus saving on engineering costs and delivery time. OWNER: Town of Litchfield, Connecticut. ARCHITECT: John M. Johansen, FAIA, New York City. GENERAL CONTRACTOR: C. H. Nickerson & Co., Inc., Torrington, Connecticut. PHOTOGRAPHER: John Veltri, New York City. Dover elevator installed by Eastern Elevator Co., New Haven, Connecticut.

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Cover: Science Center, St. Vincent College
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Architect: Tasso Katselas
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ARCHITECTURAL RECORD

CONTENTS: MAY 1970

BUILDING TYPES STUDY 409

Diane Serber

ARCHITECTURAL ENGINEERING

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COMING IN THE RECORD

AN ARCHITECT'S GUIDE TO EXPO '70

The June issue, to contain the first article to present the Osaka fair from an architectural viewpoint, will include photographs and comments by senior editor Mildred Schmertz and emphasize Tange's theme pavilion and site plan, new air-supported structures and sophisticated display techniques.

BUILDING TYPES STUDY: COMMUNITY COLLEGES

June's Building Types Study on community colleges will contain examples from both sub- and inner- "urbia." Despite their widely differing physical settings and mushrooming numbers, in-depth designed community colleges have perhaps more similarities than differences: the best designed tend to be tightly-knit physical plants just as tightly integrated into their surroundings. And the community college in the city is growing in another direction as well: adding an array of community service functions to its basic educational role.

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The President on construction: hopeful ideas, hard questions

A few weeks ago, President Nixon issued a "Statement on Combatting Construction Inflation and Meeting Future Construction Needs." It appears without fanfare (unlike the first such statement: Remember Mr. Agnew's leak of the news that "construction will be cut back 75 per cent"?) And it has not (at least that I've seen) gotten much attention—which seems odd considering the enormity of the conflicting problems involved: inflation continuing to inflate on one hand and housing continuing to slump on the other.

One approaches this second major Presidential statement on construction with mixed emotions: full of hope, since the mere issuance of such a document suggests that the industry's problems are finally on the front burner. But one must also approach with caution, for the first such message—the famous "75 per cent cutback"—turned out to be something much different than it first appeared to be. Reading it (on September 4th) scared everyone out of his fourth quarter profits, but as noted on this page in October with a quote from McGraw-Hill economist George Christie, "The estimate of actual reduction in expenditures comes to only $300 million. . . . As a move to relieve some of the pressure of excessive demand and thereby inhibit inflation in construction, this step is apt to be quite ineffectual." Well, it was, of course. For example, statistics on February construction contracts show a 9 per cent increase over the previous February, and no change in the pattern which has now persisted for several months—a depressed housing market, but an exceptionally high volume of non-residential construction (non-residential building is up 20 per cent over last February and non-building construction, including the highest rate of highway contracting ever, is up 36 per cent).

Well, that "75 per cent cutback" has been cancelled, at least in part, by the new message; and we now must see where the President feels we should go from here.

In the new statement, President Nixon wrote on four points:

1. *To achieve "more dynamic management" the President calls for "new materials, new techniques, improved designs and innovations in marketing."* There's a one-sentence "strong endorsement" of Operation Breakthrough (what do you make of that?) and he calls for "more effective use of science and technology" and "an improved information system . . . as a basis for improving the quality of policy decisions involving the construction industry." There's a demand for "counter-seasonal contract award procedures . . . so that peak on-site employment coincides with the peak construction unemployment." The President urges Federal agencies to conduct "experimental pilot projects in off-season construction," firmly demands that "within the next three months, agencies responsible for Federal construction shall identify those programs that can best use off-season labor," and directs that "Interior construction activities such as repair, rehabilitation and painting shall be performed during winter months . . ."

Winter building is of course a pretty old saw, well worked around these days. Missing from the President's Statement is any version of a device that could be much more effective than off-season construction work in spreading around demand: to wit, a directive to Federal agencies to award contracts only in slack areas of the country.

2. *On "stabilizing the cost of building materials," the statement is predictably a bit short on detail.* The President notes the decrease in lumber and plywood prices (which is a relative thing and a special case). But since there is little the government can do —short of The Big Freeze and except for an over-all cooling of inflation—to stabilize material prices, there are no proposals.

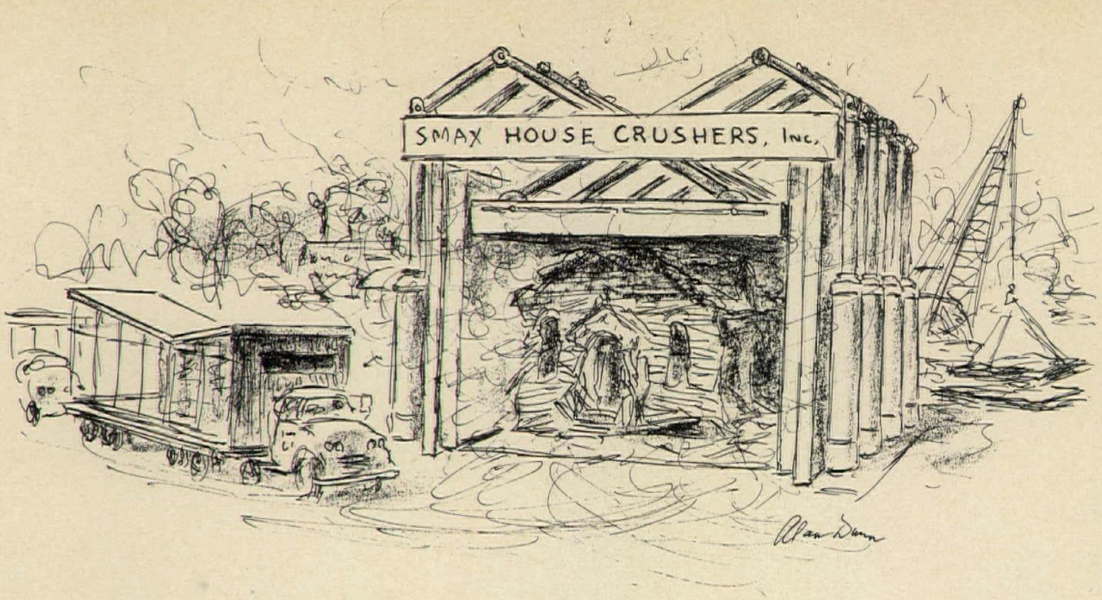
3. *On "moderating severe increases in the cost of labor," the Statement gets pretty specific—but here the questions really start.* For example (and these are only a few examples from a very detailed part of the President's message): The President directs "the Secretary of Labor to prepare a plan within 60 days expanding present enrollment in Department of Labor programs providing training for construction skills by 50 per cent, increasing this pace over the next five years." Question: Surely Mr. Shultz has a pile of such plans in his desk drawer, including some left by his predecessors. What's going to be different this time, and make it work this time?

In addition to this 50 per cent increase in training programs, the President calls for wide expansion of apprentice programs, veterans' training programs, and supplementary training "for the disadvantaged." Question: Where's the money coming from?

Further, the President "directs the heads of all Federal government agencies to include a clause in construction contracts that will require the [maximum] employment of apprentices or trainees on such projects." Question: Is the apprentice system really the most effective way to increase the supply of labor—since so far it has proved limiting in the extreme both by reason of its administration by the unions and the amount of over-training required? And question: What about the Philadelphia plan? (Not mentioned).

4. *And on the biggest bugaboo of all—money—the President makes some pretty specific recommendations (and raises some*

—Drawn for the RECORD by Alan Dunn



pretty specific questions):

The President's first recommendation calls for "A doubling of the production of subsidized housing from 223,600 units in 1969 to more than 450,000 units in 1970." Hooray, but . . . Question: Is there provision in the budget (none is apparent) for this kind of rent and interest supplement? And if not, will Congress give HUD this kind of money even if the President lets up on his demand for a surplus?

The second recommendation: "A reallocation of $1.5 billion of special assistance funds to programs to increase housing starts." Hooray, for that's enough money for something like 100,000 units, but . . Question: Where is that much money going to be reallocated from?

The third: "Authority for the Federal National Mortgage Association to deal in conventional as well as FHA and VA mortgages." Hooray, but . . . Question: How is Fannie Mae to decide (in the absence of the uniform standards that apply to FHA and VA mortgages) which conventional mortgages it can take up? This is an idea that has been talked about for years, and has always foundered on just that score.

Finally, the President "calls upon Congress to pass the legislation we have proposed to authorize the Federal Home Loan Bank System to create a secondary market for conventional mortgages." Question: as above, how is the HLBB to tell the good ("secondarily marketable") conventional loans from the bad ones?

In a nutshell, then: The President, with this new major Statement on Construction, has suggested some hopeful ideas—and how they are needed; but his ideas raise some very hard questions. Perhaps there are some very good answers—and if so, the appropriate Federal agencies should make their own statements—and soon. For a lot of what happens within our biggest industry—and a lot of what happens to the nation's under-housed families—depends upon those answers. —*Walter F. Wagner, Jr.*

Some stands by the A.I.A.: a growing attempt to influence

Not long ago, the A.I.A. board made it clear (RECORD, November 1969) that "as professionals we must become involved in the creation of public policy that will lead to the creation of a better environment." I guess I'd known that the new policy was being implemented in a number of ways. But I was nonetheless impressed to see—in a "Where We Stand" summary issued by the A.I.A.—that in addition to strong stands on cities and urban policy, on housing, and on quality of design, the A.I.A. had:

1. Asked for a National Pollution Abatement Authority to halt pollution and establish "true costs of development proposals . . ."

2. Asked for a Joint Congressional Committee on the Environment . . .

3. Urged lawsuits by private citizens, state and Federal government over such pollution cases as oil spills off the California coast, strip mine erosion in Pennsylvania, and contamination of Lake Erie. The newly appointed Council on Environmental Quality and the lawsuits "should make it clear to public and private polluters that property rights do not provide a basis for contaminating the environment."

4. Urged city planning commissioners and planning staffs to stop being mere passive review agencies . . . and to take the lead in suggesting how areas should be developed and designed. . . .

5. Backed wider use of Planned Unit Developments, clustering to conserve open space, and state development corporations . . .

6. Backed the Redwood National Forest in California, a proposed Gulf States National Seashore, and protection of the Great Lakes. . . .

7. Battled to save the Vieux Carré waterfront from 'irreparable harm' by an interstate highway link, and helped the Department of Transportation to find an alternate route . . .

8. Called for more effective ways to control billboard blight . . .

9. Sought a master plan to protect Capitol Hill; helped kill, for the present, expansion and changes in the West Front.

10. Asked for higher authorization funding levels for the Historic Properties Act of 1969, pointing out that Congress has so far appropriated only $1,369,000 in grants-in-aid to be shared by 25 states and Puerto Rico.

Which is, it seems to me, a pretty impressive beginning. Three cheers! More, more!

This is a good time to know where the economy is headed . . .

. . . and one of the best ways to get some real insight into where the money is going would be to attend The McGraw-Hill Conference on Capital Expenditures, to be held May 20-21 at the New York Hilton. Subjects: The state of the economy, Where are capital expenditures heading?, Capital investment plans: intentions vs. reality, Can you prepare for the impact of new technology?, The investment needed to protect our environment where investment decisions clash with public policy, Pollution control: glaring costs, hidden benefits, Finding money for capital investment, Federal policy and capital spending, The new realities of foreign business. There will also be concurrent sessions on outlook for the many industries that will be represented, including of course, construction and housing. The program and the quality of the speakers—all top-level people in industry, banking, and government—would seem to make the $325 registration fee well worth it. For registration or further information, write Capital Expenditures Conference, Room 1717, McGraw-Hill Publications Co., 330 West 42nd Street, New York, New York 10036. —*W. W.*

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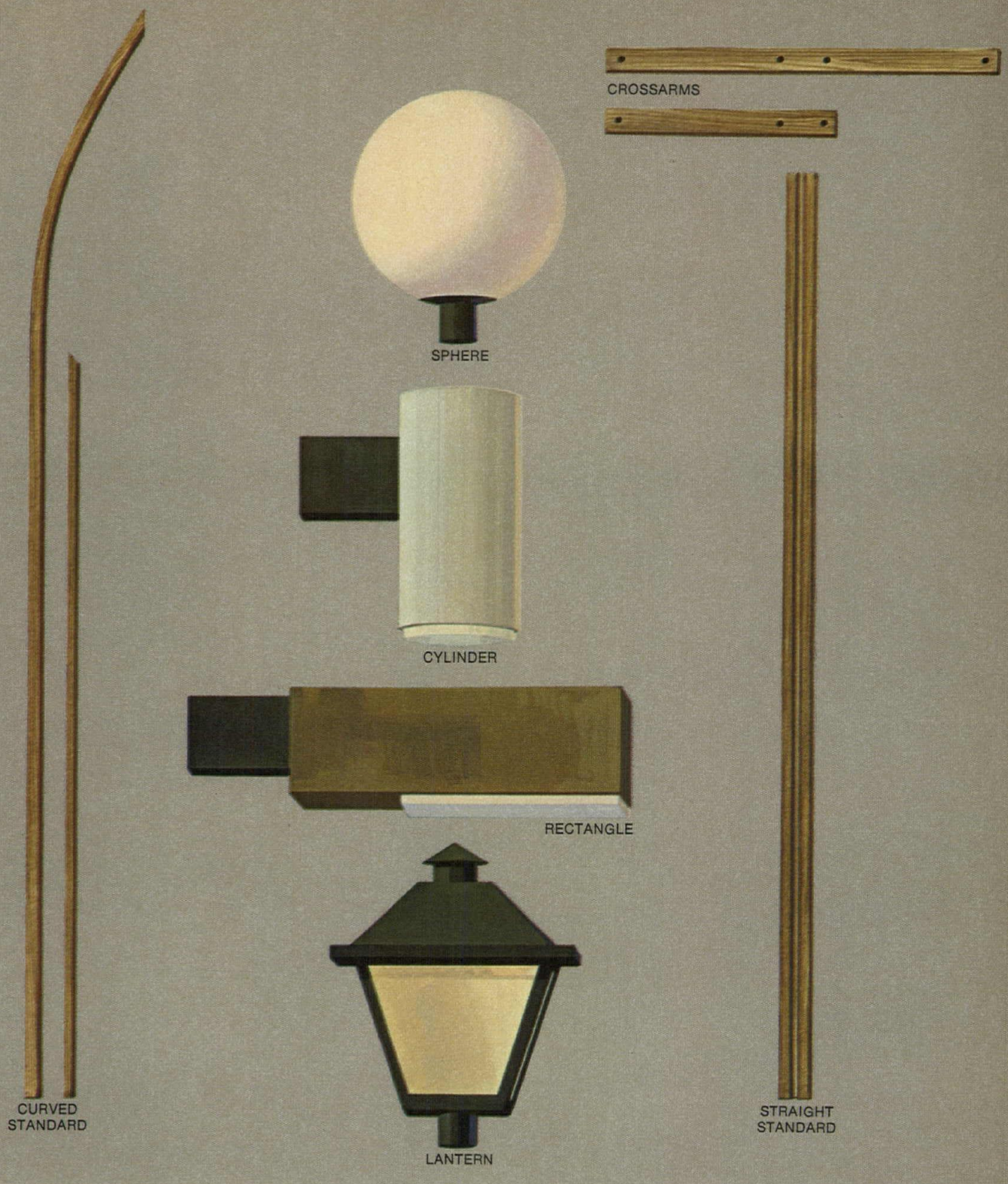

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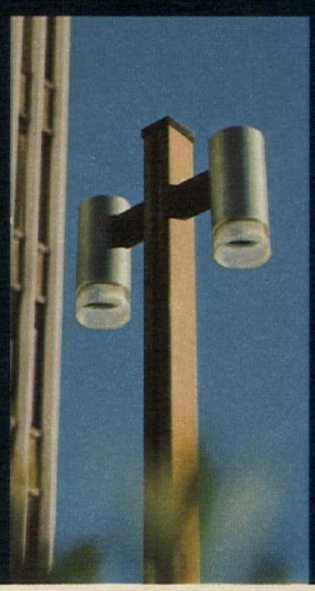

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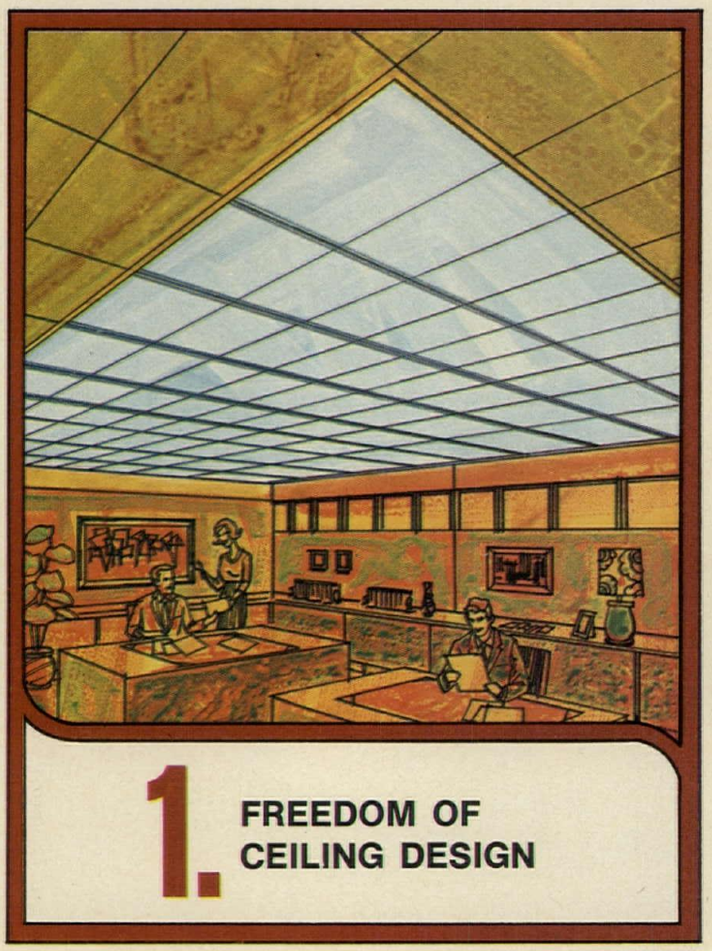

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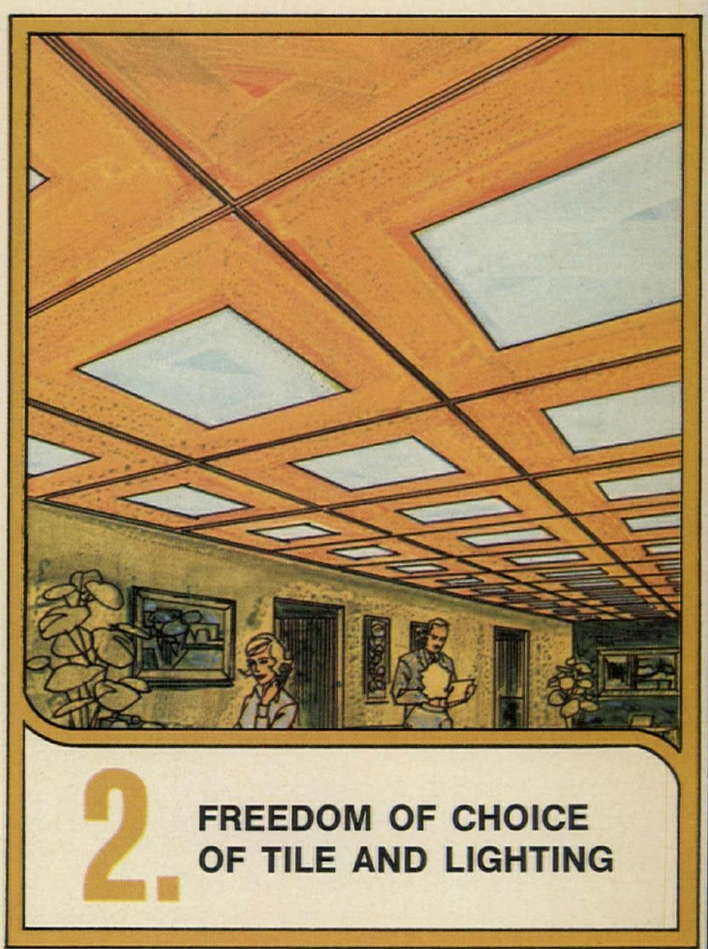

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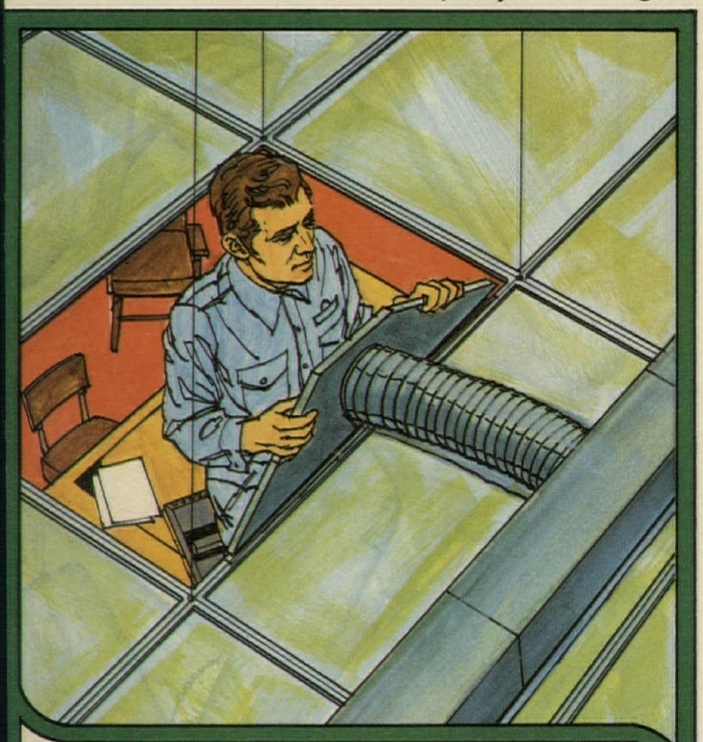

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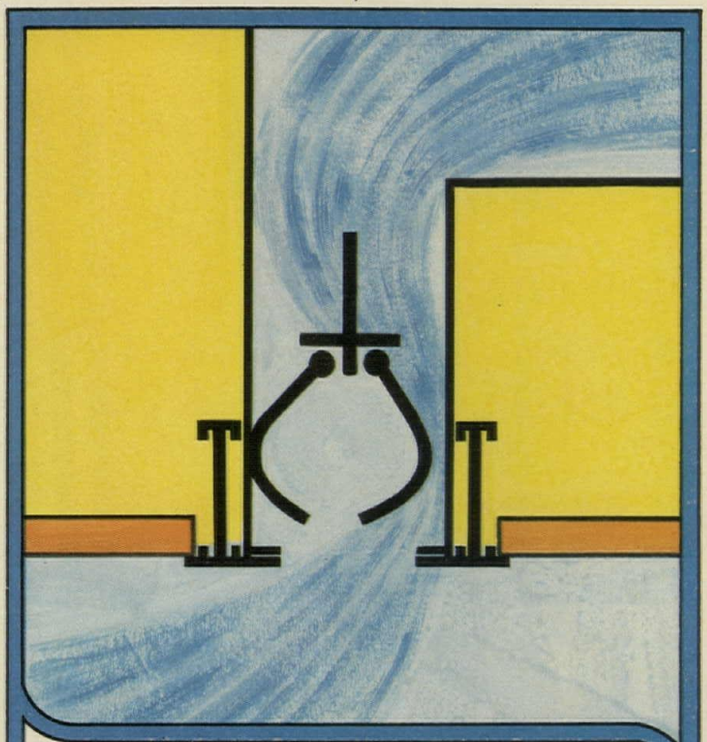

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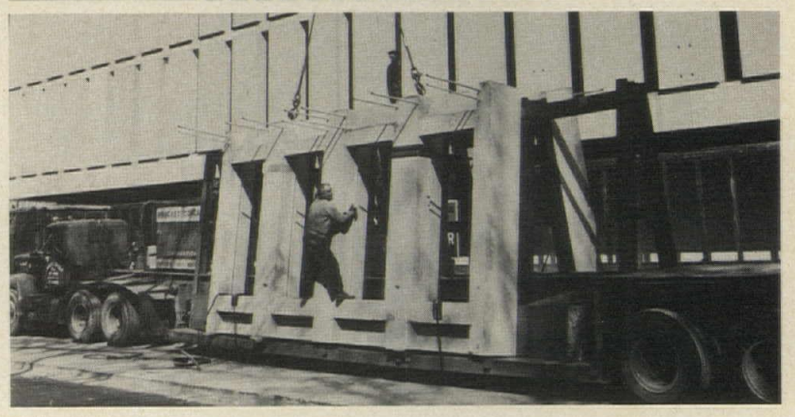

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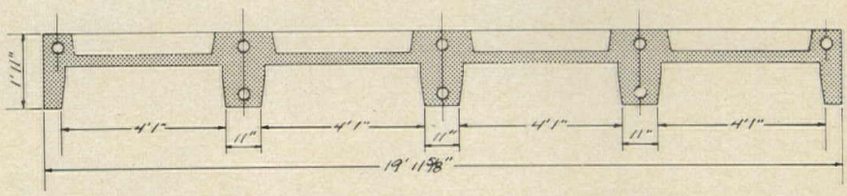

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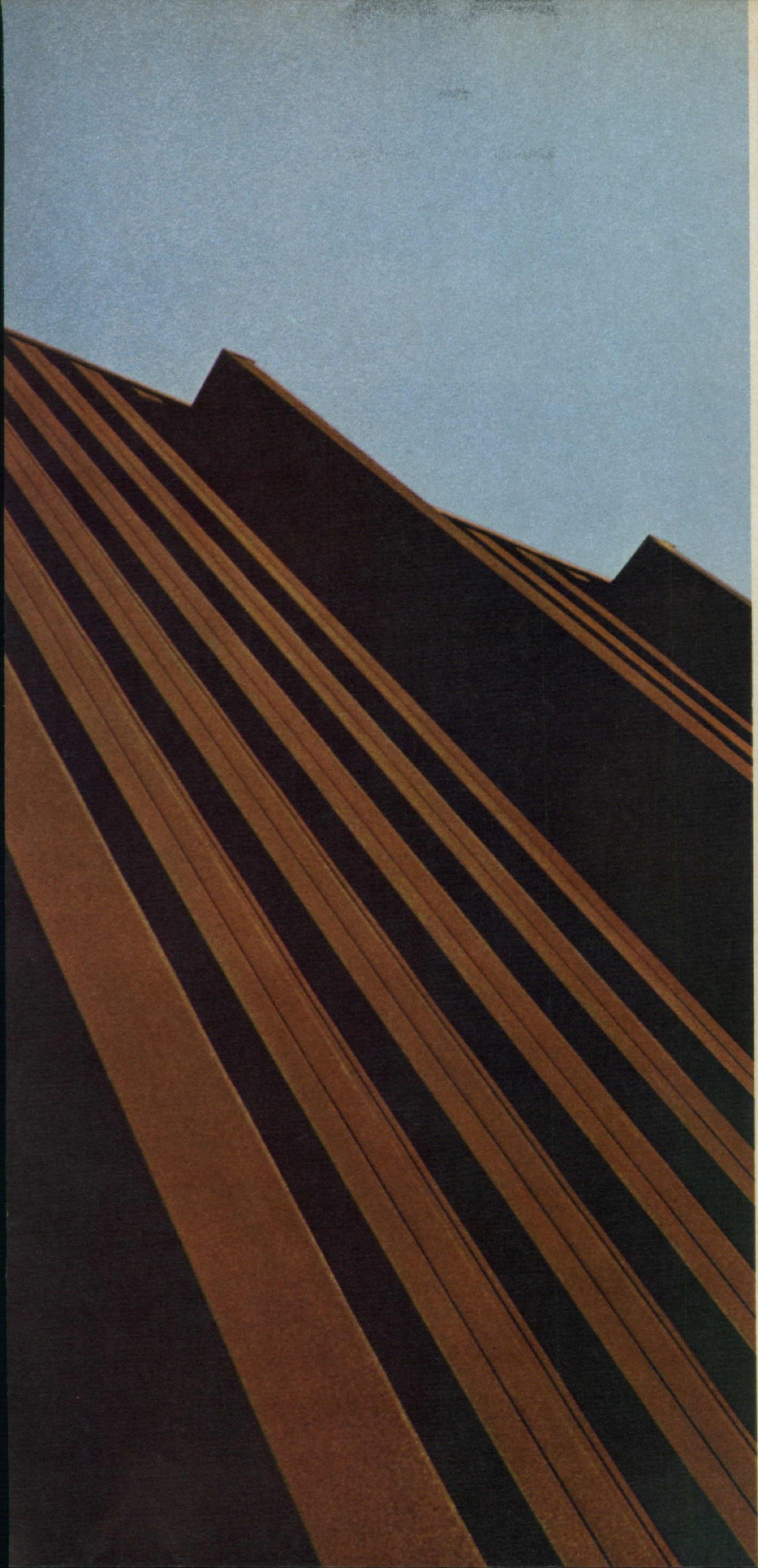

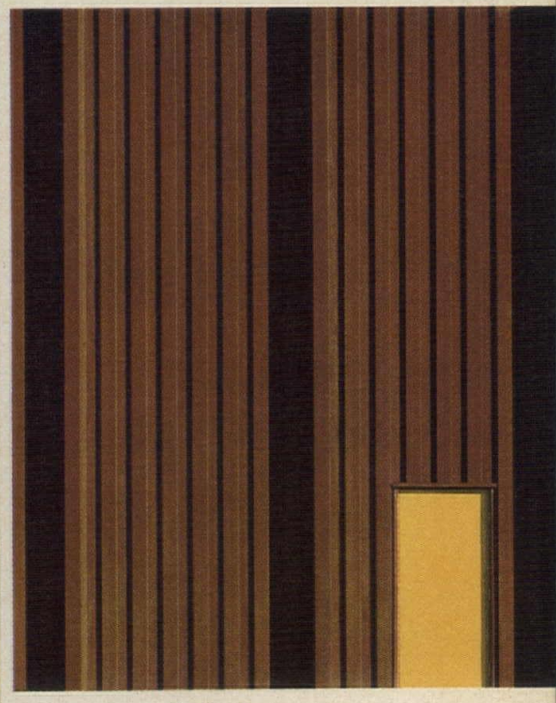

National Screw & Mfg. Company Building, Mentor, Ohio.
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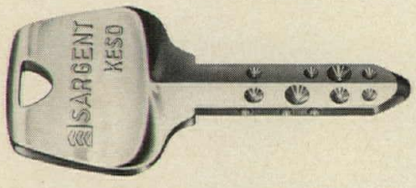
Georgia State Hospitals safeguard with Sargent Maximum Security System

The Georgia Regional Hospitals have an architectural design in common — a low cluster of buildings, rather than a towering, forbidding institution. This is the Augusta hospital which is typical.

The state of Georgia has just completed three regional hospitals in Savannah, Augusta, and Atlanta. They form the vanguard of 8 to 10 such hospitals, each designed to provide the best possible treatment for emotionally disturbed or mentally retarded patients.



Every one of the doorways in the three complexes is guarded by the new Sargent Maximum Security System lockset which operates only with a special key that cannot be duplicated on "corner-store" key cutting machines.

Analyzing the reasons for the selection of the Sargent system, William R. Scaife, manager of the architectural firm of Jones and Fellers said, "We looked over every advanced lockset system — but couldn't find the same key control features that are available to us in the Sargent Maximum Security System. Its pick-resistance and the expanded levels of master keying are bonus benefits."

Other outstanding installations of the Sargent Maximum Security System include the Los Angeles County Medical Center at Olive View, the Loyola University Medical Center in the Chicago suburb of Maywood and the offices of the Secretary of Defense in the Pentagon.

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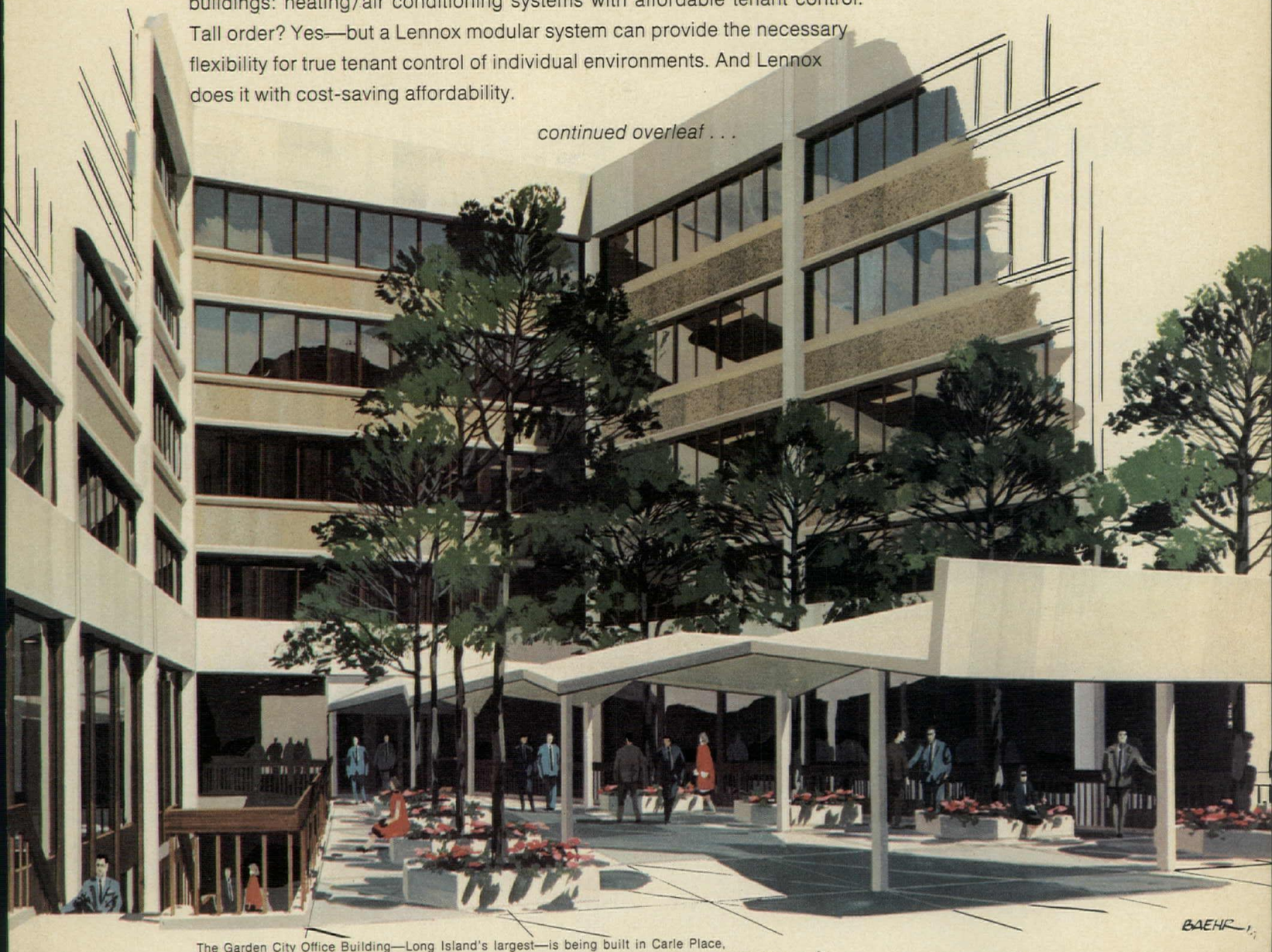
LENNOX PRESENTS

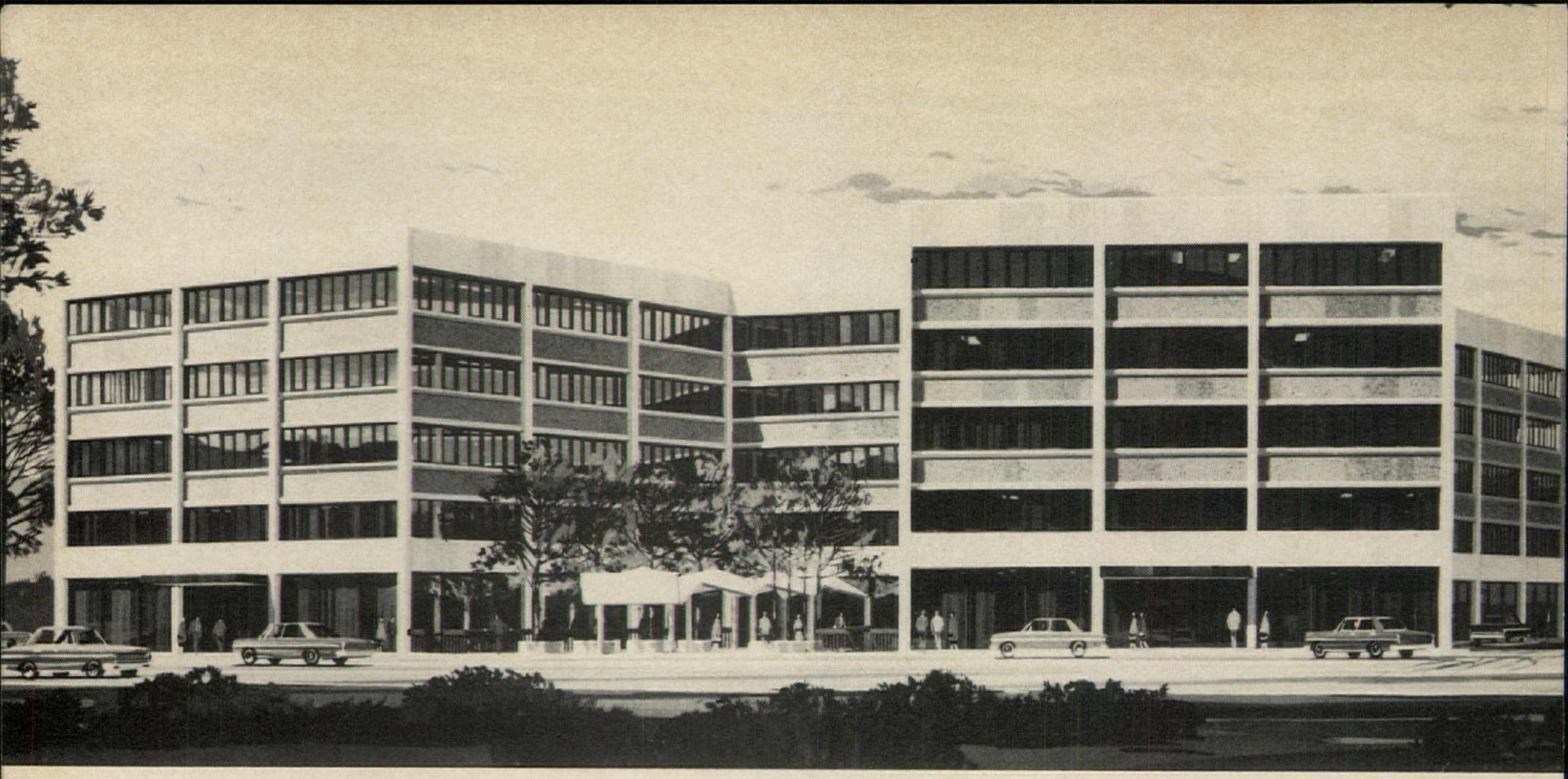
Office comfort with affordable tenant control

Growing demands for individualized office comfort—plus spiraling costs and expensive money—all have combined to create a new "specification" for many buildings: heating/air conditioning systems with affordable tenant control. Tall order? Yes—but a Lennox modular system can provide the necessary flexibility for true tenant control of individual environments. And Lennox does it with cost-saving affordability.

continued overleaf . . .



The Garden City Office Building—Long Island's largest—is being built in Carle Place, near Mineola. The five-story, 289,000-sq. ft. area will have individual comfort zones, regulated by tenant control of Lennox heating and air conditioning. Architect: Theodore E. Bindrim, A.I.A. Engineers: S. M. Limoggio Associates. Owner-Builder: Garden City Plaza Corporation.



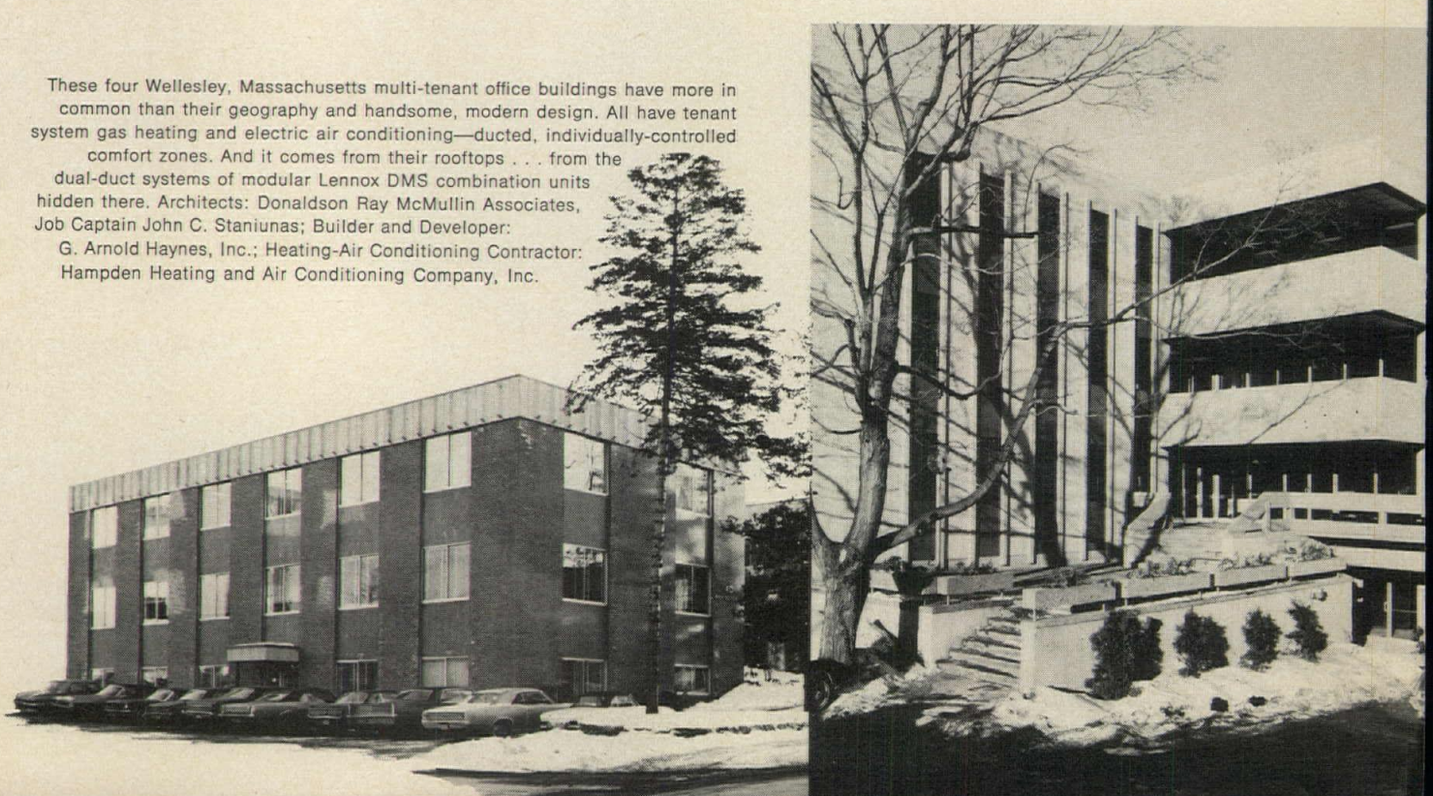
Long Island's new Garden City Office Building has Lennox modular heating and air conditioning because, according to Tom Pepitone, president of the owner company, "We need tenant (zone) control. With a central system, this would have cost two or three times as much. One supplier—Lennox—provided all equipment needed." On the roof: Direct Multizone System (DMS) and single-zone combination gas heating/electric cooling units, and single-package air conditioning. In the basement: indoor DMS and blower-coil units with POWER SAVER™ for ventilation.

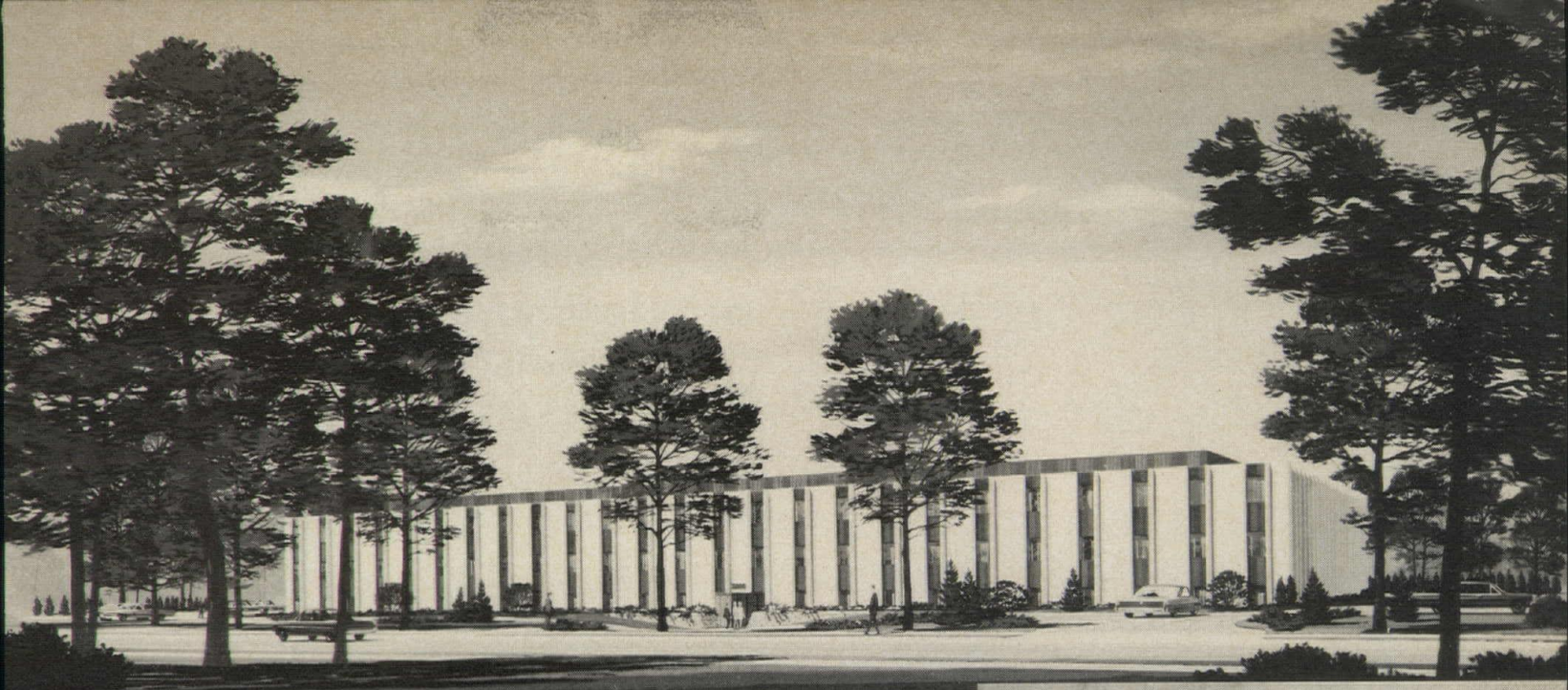
Continued . . .

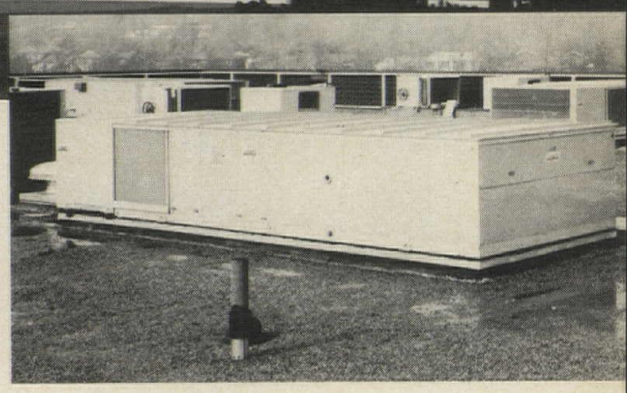
affordability in office comfort

Consider the benefits in tenant control of individual environments, and practical owner cost—both achieved without design restriction. It's done with Lennox modular systems. Here's the widest equipment choice, too, to fit *your* building's design: any type and size—in single-zone, multizone, combination units, remote, indoor and out, thru-the-wall, rooftop and ground. For any fuel. Lennox designs for predictable installation costs. Minimal on-site labor is assured by flash-in mounting frames, and equipment which is factory-assembled and -wired, including controls. No costly standby overcapacity needed.

These four Wellesley, Massachusetts multi-tenant office buildings have more in common than their geography and handsome, modern design. All have tenant system gas heating and electric air conditioning—ducted, individually-controlled comfort zones. And it comes from their rooftops . . . from the dual-duct systems of modular Lennox DMS combination units hidden there. Architects: Donaldson Ray McMullin Associates, Job Captain John C. Staniunas; Builder and Developer: G. Arnold Haynes, Inc.; Heating-Air Conditioning Contractor: Hampden Heating and Air Conditioning Company, Inc.







Tenant comfort control lends added appeal to "2000 Marcus Avenue," new 100,000-sq. ft. Lake Success (L.I.) office building, leased by Unicard Division, Chase Manhattan Bank. Says J. Louis Lazarus, president of Elan Associates, owners, "Lennox rooftop units are ideal for zoned heating and cooling in a three-story building like this. No consideration was given to a central system, due to its considerably higher costs and inflexibility." Architects: DeNigris & Maier. Engineers: Benjamin Silberstein Associates. Builder-Owner: Elan Associates. General Contractor: Louron Construction Corp. Heating-Air Conditioning: Con-Air Corp.

Owning costs are predictable, too—with equipment quality-built for long, reliable service, low maintenance. Extended component quarantees. Long-term service contracts available. *And Lennox single-source responsibility*. Lennox ducted modular systems are designed for progressive occupancy, fast-starting pay-out. And they won't let a whole building down at once. If something does fail, it's back in service fast, with fewer tenants inconvenienced. To top it off, low-profile Lennox equipment hides easily and its light weight allows non-load-bearing walls. Think about that, too, next time you plan.

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For more data, circle 13 on inquiry card

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The world's tallest bank building demonstrates how lighting panels of Plexiglas acrylic plastic pay dividends in more ways than one.

First there's design flexibility. The First National Bank of Chicago uses a variety of lightly tinted lenses of Plexiglas to create different lighting effects in various sections of the building.

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Plexiglas is code-approved for lighting nationwide and is demonstrating its superior performance characteristics in practically every new big-name building built in recent years. Write for our case study on the First National Bank of Chicago, technical literature and the names of lighting equipment manufacturers using Plexiglas.

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Architects:
C. F. Murphy Associates
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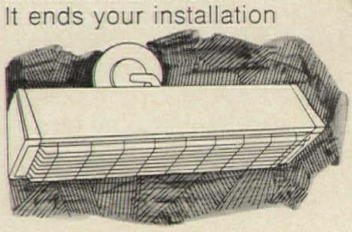
Our new infra-red spot heater is as versatile as aspirin. It brings quick comfort to chilly workshops and utility rooms. To farm buildings and garages. To loading docks, guard shacks, in-plant cold spots.

But Ceraglo cures a lot more than the chills. It ends your installation headaches and relieves maintenance troubles.

The secret ingredient is a totally new heating element.



A 3M discovery. It lets this 1500-watt unit operate safely and efficiently on 120 volts. Allows simple, direct mounting with standard junction box, wiring and switches. Ceraglo's heating element is a strong, solid state ceramic designed for a long, healthy life. With no fragile internal filament or resistance wires to break or burn out. Operates in any position.

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We build Ceraglo to put heat where your customers want it. And to take the heat off of you.

3M. We make it hard to go wrong.

3M COMPANY

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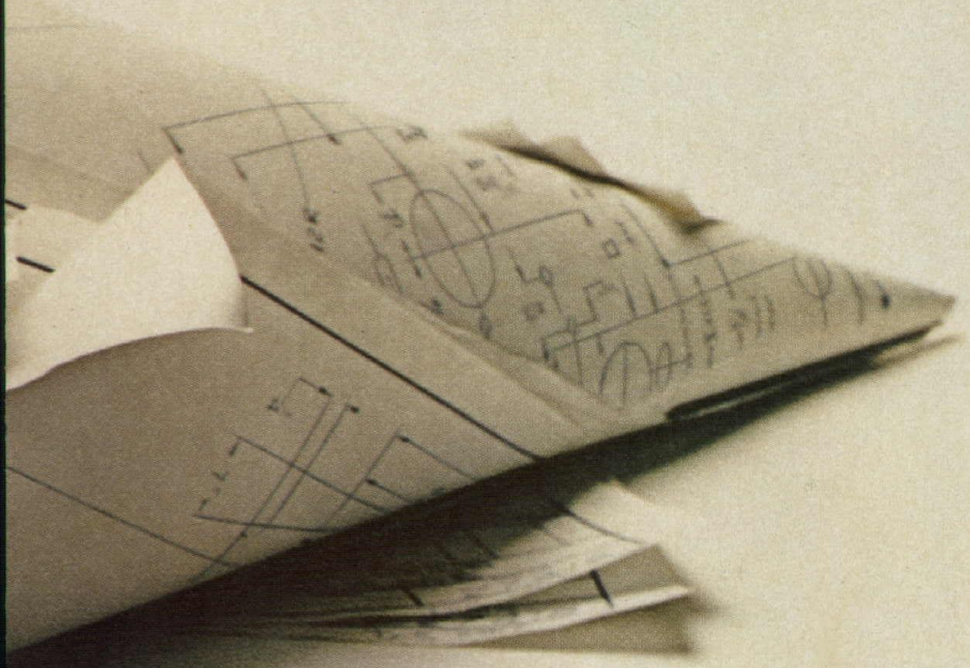
Whiteprints that won't

BRUNING: A SINGLE GRAPHIC SOURCE

wrinkle your nose.



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This revolutionary new process is featured in the new Bruning Model 80 tabletop whiteprinter. It makes full-size whiteprints up to 42 inches wide by any reasonable length. Which gives most small, but growing architectural or engineering firms the printmaking capacity they need for quick jobs. Like checkprints.

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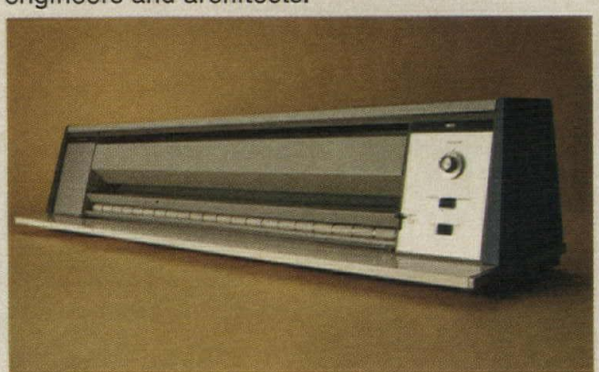
For everything graphic, think Bruning. Your one source of supply for the smallest instruments as well as the largest whiteprinters. And all the rules, scales, curves and supplies in between. A single graphic source for designers, draftsmen, engineers and architects.



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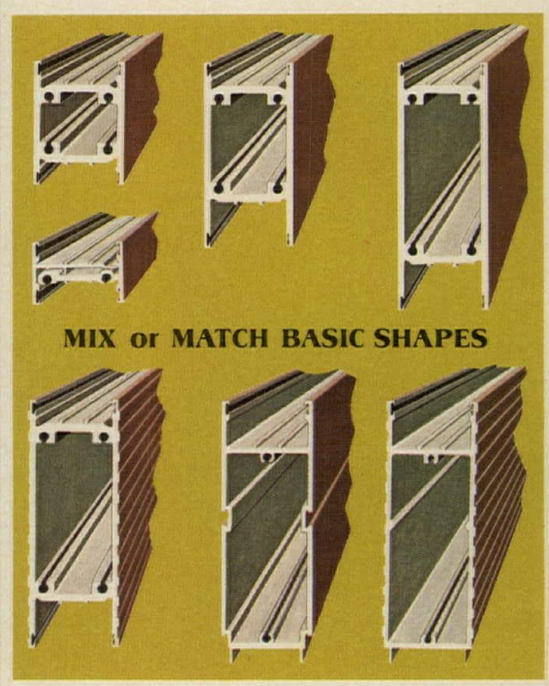
Now you can design entrance areas as individual and memorable as your buildings.

For the first time you aren't confined to stereotyped entrance styles.

Entara is a system of aluminum extrusions, sub-assemblies, parts, pieces and hardware. Variants in stiles, rails, plankings, glazing options. Related in appearance and in function to achieve a wide selection of interchangeable design elements for an almost limitless variety of entrance configurations.

To put it another way . . . Entara is a system of entrance coordinates. Door coordinates—Frame coordinates —Hardware coordinates. New form, dimension, plane, texture, color. New push-pull hardware, created as part of the system, can be varied to meet your design individuality.



The multiple components of the Kawneer/Entara system give you optimum design freedom. For full information, see your Kawneer representative or contact Kawneer Product Information, 1105 N. Front St., Niles, Michigan 49120.

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Designs and renderings by Richard P. Howard Associates, Architectural Illustrators, Sylvania, Ohio, Harold R. Roe, A.I.A.

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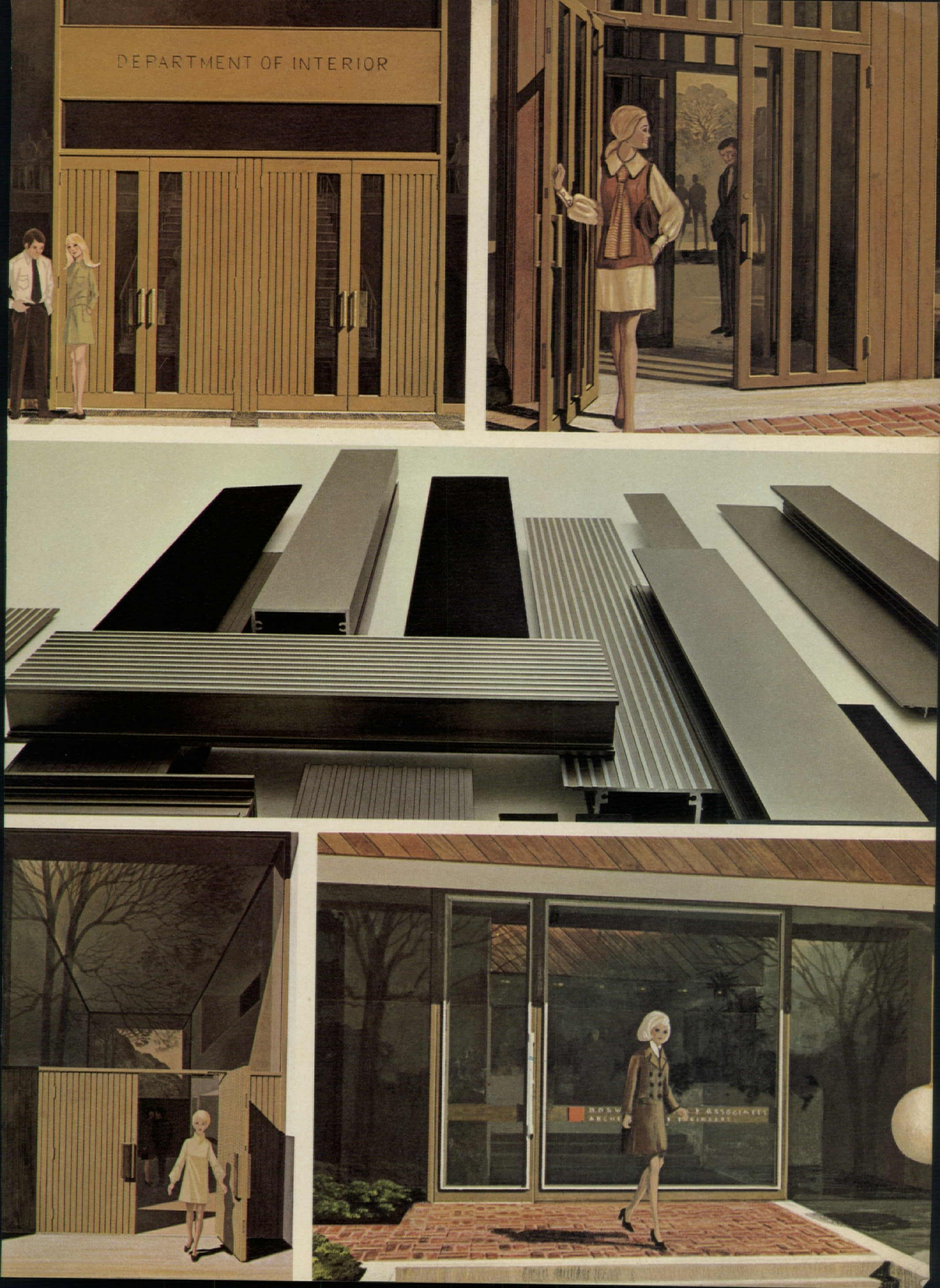
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Joan Gregory in 12F is sleeping beautifully.

Of course she is.

She knows the people responsible for her apartment have done everything possible to make her safe and secure.

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At night, before Joan goes to bed, she turns Jamb-Gard on with her key. If the door is opened, the alarm goes off. Loudly. Otherwise, Joan gets on with her sleep.

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But plan now. Jamb-Gard must be flush mounted; you'll be doing the right thing aesthetically—and protectively.

And you'll be helping the Joan Gregory's of this world get their rest. Think about it.

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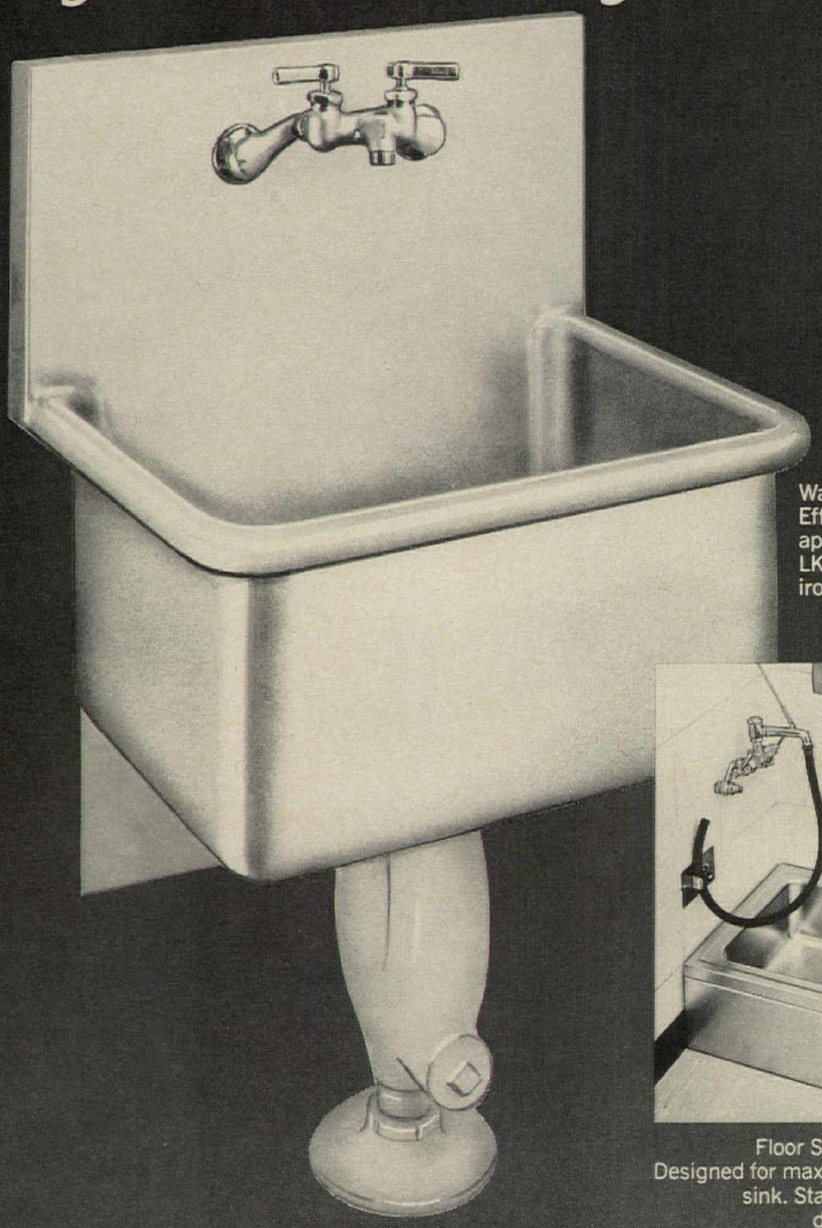

Wall Service Sink Model ESSB-2520. Efficient design for today's service sink applications. Standard fittings include LK-400 mixing faucet and LK-173 cast iron, enameled inside, adjustable "P" trap.

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see our catalog in Sweet's (S)

For more data, circle 21 on inquiry card

News in brief

Environment and labor will get priority attention at the 1970 convention of the American Institute of Architects in Boston June 21-25. Senator Edmund S. Muskie (D-Maine) and Walter Reuther, President of the United Automobile Workers, will speak on these subjects. June 24th will be a "day of awareness" planned by architects and architecture students to bring environmental programs and issues into focus. Hugh McKittrick Jones, Jr., F.A.I.A., of Guilford, Conn., will be national chairman of the convention. A recessed session of the convention will be held in London on June 29th in conjunction with the Royal Institute of British Architects.

A bill aimed at pumping emergency funds into the housing market is under Senate consideration. The measure would create a new secondary market for conventional loans operated by the Federal National Mortgage Association. $250 million in special funds would go to the Federal Home Loan Bank Board to bolster the dollar flow to member banks. Also, $750 million would go to the Government National Mortgage Association for special assistance for low and moderate income single family mortgages. A dual market system for determining allowable rates on FHA-VA mortgages would come into being and the Federal Reserve Board would discount up to $3 billion in FHLBB obligations.

Seven black architects have begun a visiting instructors program with Southern University at Baton Rouge, La., the first such program in the country. The architects, Robert J. Nash, A.I.A., Leon Bridges, A.I.A., Leroy Campbell, A.I.A., William Todd Wallace, A.I.A., Roger Margerum, A.I.A., Robert Madison, A.I.A., and John Chase, A.I.A., will each spend two consecutive days at Southern. "It promises to bring the students something most schools don't have, whether they are white, black, or mixed," said Mr. Nash, a graduate of Howard University.

The Urban Coalition and Urban America will combine under the leadership of John Gardner, former Secretary of Health, Education and Welfare and currently head of the Urban Coalition. The new organization will be called the National Urban Coalition. An Urban America non-profit housing center is being kept, as is *City* magazine.

The urgency of the need for recreation areas and facilities was stressed by Secretary of the Interior Hickel in his mid-April proposal to raise the Land and Water Conservation Fund—made up of revenues from outer shelf mineral leasing, Federal recreation area entrance and user fees, sale of Federal surplus property and motor boat fuel taxes—from the present $200 million to $300 million. (For more on recreation, see page 131.)

HUD Secretary Romney is pressing hard for removal of impediments to acceptance and application of new or improved technology. Romney's department wants legislation which would allow it to waive any legal provisions (in laws it administers) restricting Operation Breakthrough systems. The Secretary says local officials are awakening to "the need for action at their level if Federal preemptive action is to be avoided."

The Ford Foundation has given $500,000 for urban planning fellowships for minority group students to the American Society of Planning Officials. Over the next three years, sixty fellowships will be awarded for studies leading to the master's degree at twelve to fifteen schools. The society, located in Chicago, is the professional service organization of the citizen members of town, city, county, and regional planning commissions. **The first two research fellowships of the National Trust for Historic Preservation** have been awarded to two graduate students. Each will receive $7,000. **The American Academy in Rome has awarded six $4,500 Rome Prize fellowships** in architecture, environmental design and landscape architecture. The jury included Edward L. Barnes, Philip Johnson, Kevin Roche, Robert Venturi, Nathaniel Owings, Edmund Bacon, Buckminster Fuller, and Paul Friedberg. The new head of the Academy is Bartlett Hayes, former director of the Addison Gallery in Andover, Mass.

McGraw-Hill will sponsor a major conference on Industry and the Environment June 16-18 at New York's Americana Hotel.

Lewis Mumford will receive a Gold Medal award of the National Institute of Arts and Letters May 26. Mr. Mumford's most recent book is *The Urban Prospect* (1969). He received the National Book Award for *The City in History* in 1962. The other 1970 Gold Medal will go to painter Georgia O'Keeffe. **Kenzo Tange has received the Thomas Jefferson Memorial Foundation medal** in architecture of the University of Virginia.

Tight space determines two major New York City expansion designs

Venerability is no help when an institution wants to expand in New York City, as Columbia University and the Metropolitan Museum of Art have discovered.

Columbia grows inward

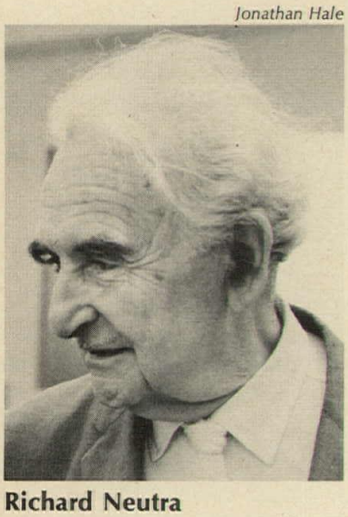
Fresh from a bitter battle over construction of a new gym, a major cause of the riots of 1968, Columbia hired I.M. Pei and Partners to find a solution. The architects proposed putting the gym under South Field, right in the center of the cramped campus. They also proposed a general expansion plan which would avoid infringing on nearby Harlem and Morningside Heights. Two 23-story towers flanking South Field would contain offices. Wide two-floor openings would prevent the towers from closing in at ground level. The architects point out their construction would reduce South Field to the width Charles McKim intended for it in his original 1893 plan. Five levels would be developed beneath South Field. The upper level would be a concourse linking the towers and containing stores and meeting rooms above the gym. Columbia is likely to build the gym, while the rest of the proposal, which also suggests guidelines for the rest of the campus, with proposals for renovation of local buildings, remains under consideration.

Museum keeps off the grass

The Metropolitan Museum, painfully aware of protests against its encroachment on Central Park greenery, asked Kevin Roche John Dinkeloo and Associates to preserve the park while providing major additions. New structures to house two large new collections and an Egyptian temple will be built along with two glassed-in parks. All the additions will be of glass in the Crystal Palace tradition of park architecture. According to the Museum, there will be no loss of green area, as the new structures will be built principally over existing parking lots

and driveways, putting parking facilities undergound. The plan will also continue Roche and Dinkeloo's extensive renovation of the existing building in order to provide better circulation and orientation. Six million people visit the Museum each year.

Jonathan Hale



Richard Neutra is dead at 78

Richard Neutra died April 16 in West Germany of a heart attack. He had been travelling with his wife, Dione, on a tour of architectural projects in Europe.

Mr. Neutra came to the United States from his native Vienna in 1923, and he studied with Frank Lloyd Wright. He soon became a highly influential innovator himself. During the 1950's, he reached a new generation with his book, *Survival Through Design* (republished in paperback in 1969), and in recent years, he traveled throughout the world lecturing. The Neutras found themselves in Czechoslovakia on the day of the Russian invasion.

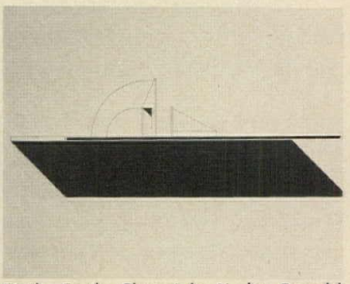
Mr. Neutra's architecture grew out of the individual's needs and responses. He coined the term "Biorealism" to express this approach. Although he was a pioneer of new building methods, and although his designs were widely imitated, he believed Biorealism was his most important contribution.

Mr. Neutra's son, Dion, will continue the Los Angeles practice he shared with his father.

Birch Burdette Long prizes raise protests

The Architectural League of New York recently awarded its annual Birch Burdette Long Prize for Architectural Rendering to Ronald Williams "for his graphic exposition of an imaginary architecture," Daily Earth Chronicle X (right), and Theodore J. Musho for his sketch of St. Peter's. Both of the awards aroused some bitterness, expressed in a letter from a professional delineator to the League, particularly attacking the Daily Earth Chronicle as "an abstract, two dimensional graphic design" and "an insult."

Mr. Williams, an architect, explained to the RECORD that his design does indeed represent a real building project, though its function is more metaphysical and sculptural than utilitarian. The Daily Earth Chronicle, a sunken circular house bisected by a huge sundial wall containing stairways, is a project of ONYX, a group of artists and architects whose designs—which they hope to see built someday—often emphasize natural processes in monumental, superpure architectural forms, and whose interests range into media and education.



Daily Earth Chronicle X, by Ronald Williams

Bacon to leave Philadelphia planning post

Architect and planner Edmund Bacon, executive director of the Philadelphia City Planning Commission since 1949, will retire this month. Many of the accomplishments of Philadelphia's renewal in the last 20 years are obvious to any visitor, but Mr. Bacon believes his own most important achievements are the invisible changes in the city's ways of working, and in people's attitudes toward the city.

Edmund Bacon was born in Philadelphia in 1910, received a bachelor of architecture from Cornell and a graduate fellowship in urban planning from Cranbrook Academy. His *Design of Cities* (Viking) appeared in 1967, and he is working on a much-expanded edition. Mr. Bacon will continue to teach at the University of Pennsylvania, and has been asked to serve as consultant on urban development projects in several U.S. and foreign cities. He is an active member of the Citizens' Advisory Committee on Environmental Quality and chairman of the site task force of the Philadelphia Bicentennial Commission. As such, he is working to reformulate the international exposition. "Japan will be the last of its kind," he says.

With many of his programs well under way, he feels this is a good time for the Planning Commission to change leadership, and while a successor has not yet been named, Mr. Bacon has great confidence in the people who will work for that successor.

news continued on page 39

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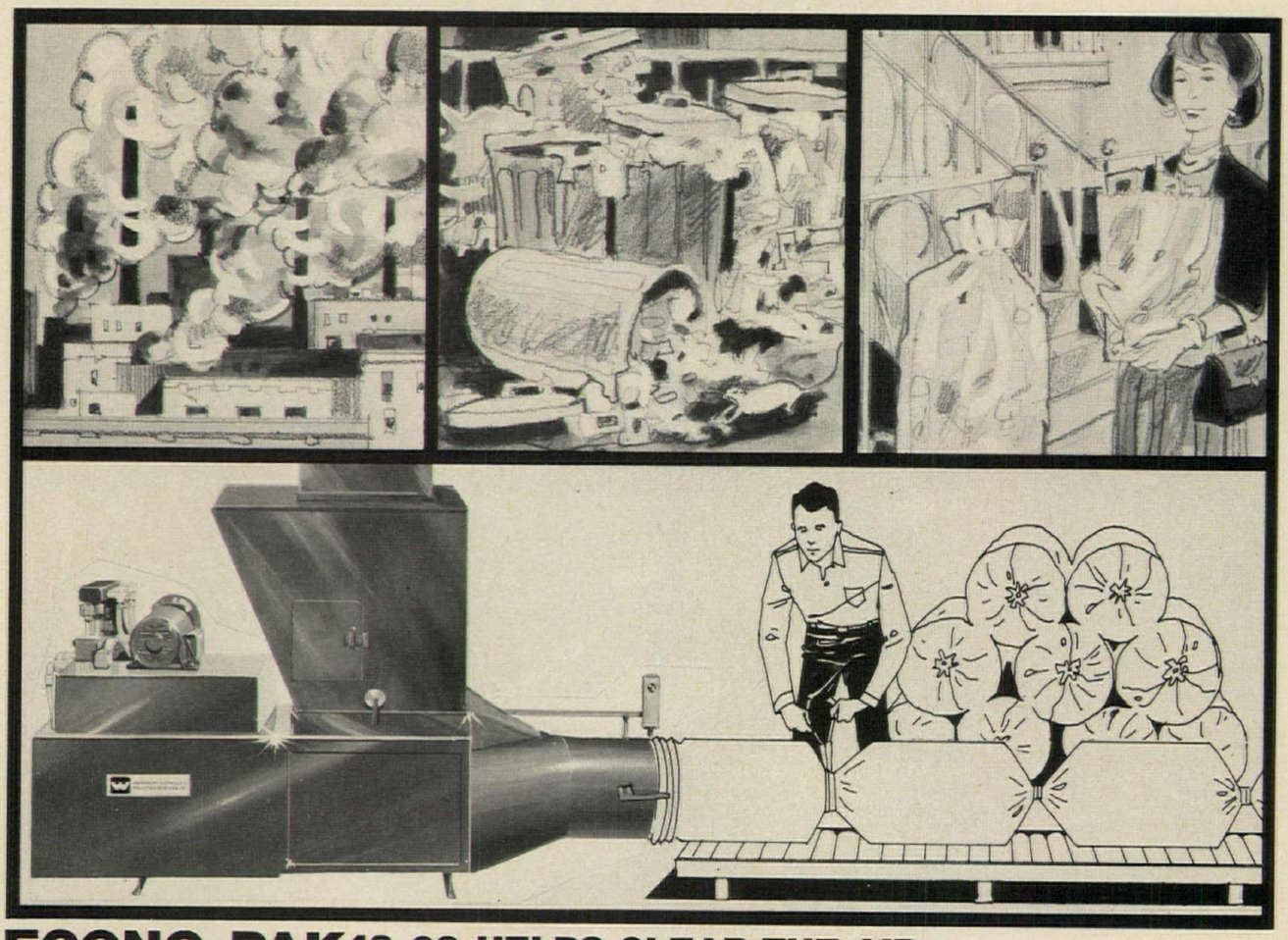

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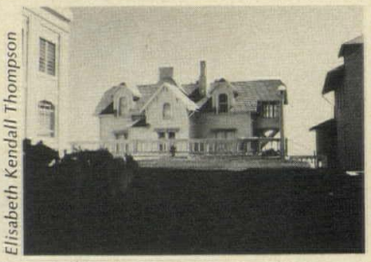
Alcatraz remains an unknown


Elisabeth Kendall Thompson

Everybody has heard of Alcatraz, but who knows what it is really like? Very few. There are some who have seen it who can evaluate it only in terms of its former use as a prison, and who reject entirely its potential for the future. For others, the as yet unexploited interest in Alcatraz looms as a bonanza. For a handful of Indians on "the rock" it is a symbol, and a very uncomfortable place to live (no water, for one thing). For the Department of the Interior it suggests a unique National Park.

It is a place of strong contrasts: concrete prison buildings, Victorian wood houses; bitter cold winds on the west side, and green lawn and roses on the east. On the island's highest spot is the now-deteriorating cell block building, entered from what elsewhere would be called a plaza, with the warden's Victorian house on axis to the east and a superb view to the Golden Gate on the west. The road up to the cell block building winds up from the boat dock, with vistas to San Francisco and Marin County through occasional cypress trees which rival—almost—the Riviera. Even on the windy west side, it is possible to overlook the dismal concrete-walled recreation yard and, succumbing to the 360 degree outlook, to forget what Alcatraz was for so many years. Its future, however, is still unclear. The Indian Council now on Alcatraz has said no to the latest Interior proposal for making it a park. Discussions between Indians and Government will resume on May 31.

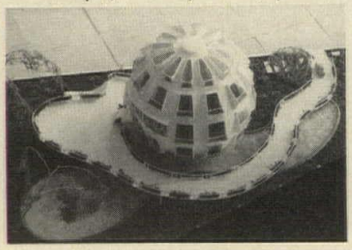

Elisabeth Kendall Thompson

St. Katharine by the Tower: sensitive redevelopment takes shape in London

On the site of the famous St. Katharine Docks, near the Tower of London, a project to include the biggest hotel in London, housing, schools, commercial space, a sports center, a theater, restaurants, and a yacht club will soon begin construction. The Taylor Woodrow Group, whose chief architect is Andrew Renton, won a Greater London Council competition for its design. Two of the early 19th century warehouses least damaged in World War II will be saved, though the most celebrated of all, those by Thomas Telford, will go. Existing water areas will be kept for use as a marina. The project is expected to revitalize by its influence a large area to its east. As well as preserving old structures, the project has been carefully conceived to complement, rather than overshadow, the Tower and Tower bridge.

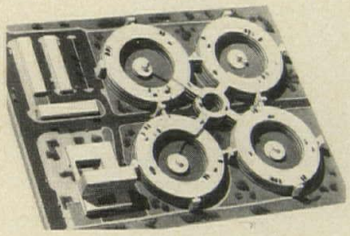
Globular buildings designed to resist shock

Four spherical anti-earthquake buildings have been built in Tehran, Iran, designed by Iranian Manoucher Foroutan. The largest of the four is 52 feet high and rests on a 20-inch base. The principle of the buildings is similar to that found in heavy-bottom toys which always return to upright, though Mr. Foutran says his buildings would tilt only a few degrees in the most severe quakes. Mr. Foutran is now living in Denver, which has had its own worries about earthquakes in recent months, but he may soon move to Germany, where he has sold his design to a firm which plans to put up his globular buildings in Europe, Turkey and Japan.



Small scale industrial estate centers on spiral ramps

Israeli architect and planner Arie Cohen has devised a system for housing small industry (below) which combines easy accessibility to transport with high density. The idea is to keep such industry in or near the central city. Small factories would be contained in the circumference of a spiral ramp for trucks. The trucks would ascend by way of



a central spiral, descending in the larger spirals without using their engines, to deliver and receive materials. Mr. Cohen's scheme calls for a 1000-square-foot module for the industries, which he would enlarge to 3,000 square feet for American use. The architect points out the slope would be virtually unnoticeable to workers in the wide spirals.

Architect-Engineer Selection Bill would encourage good design

Congressman Jack Brooks (D-Texas) has introduced a bill under which "Federal agencies requiring architect or engineering services would invite all interested architect-engineers to submit data as to their qualifications and performance." This bill would appear to encourage Federal hiring of the best available architect—a follow-up to President Kennedy's effective "Guiding Principles for Federal Architecture"—and help discourage the dubious practice of offering the design contract to "the lowest bidder." The bill, which is now under consideration by Rep. Brooks' own subcommittee, is considered to have very good chances of passage.

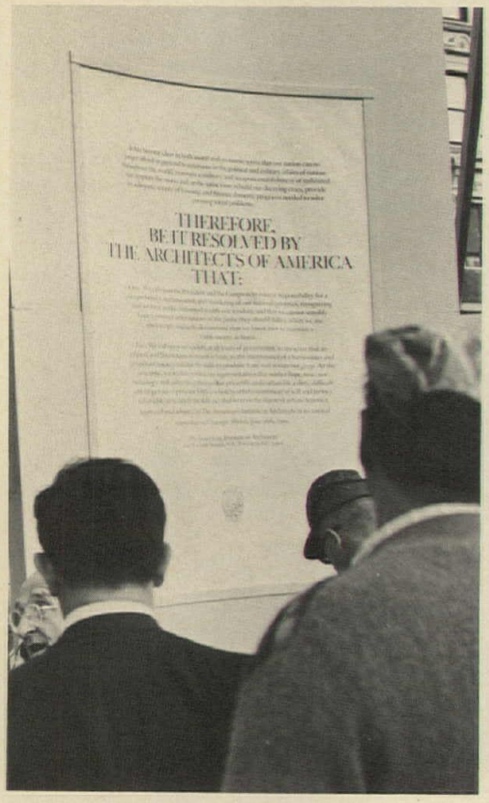
Peters weds Svetlana Alliluyeva at Taliesen

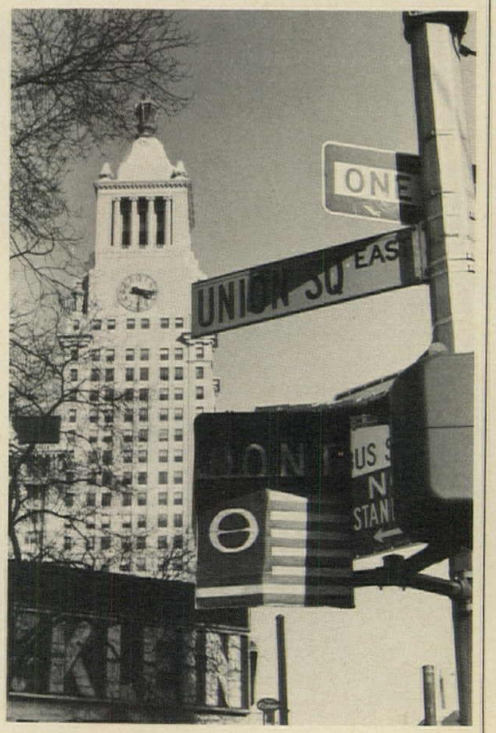
The romance of Taliesen West lives on, as architect William Wesley Peters, 58, vice president of the Frank Lloyd Wright Foundation, proved when he married Svetlana Alliluyeva, 44, April 7. Mr. Peters' first wife, also named Svetlana, who was a daughter of Mr. Wright, died in an auto accident in 1946.

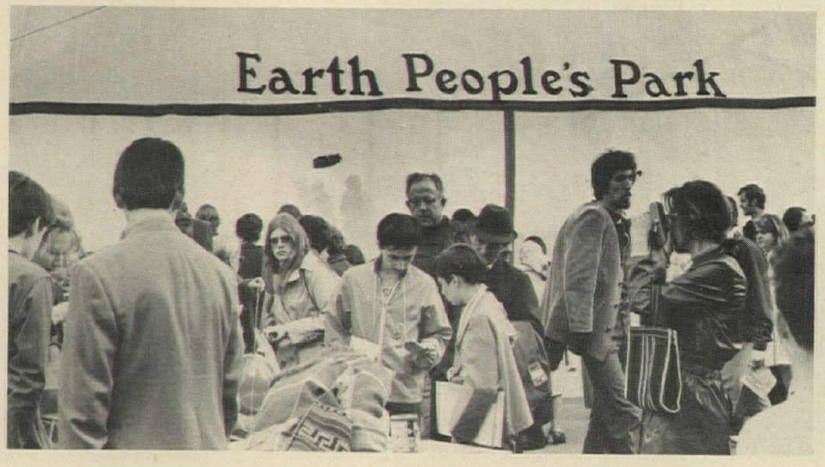

UPI Telephoto

EARTH DAY

Photographs by Jonathan Hale







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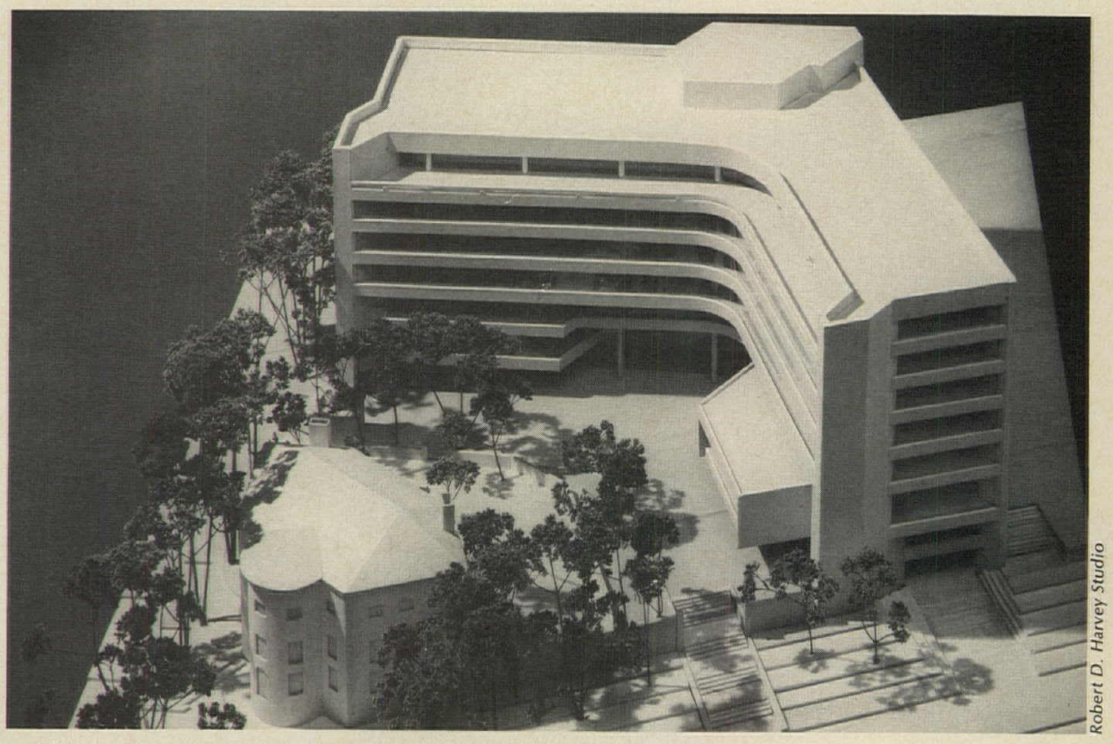
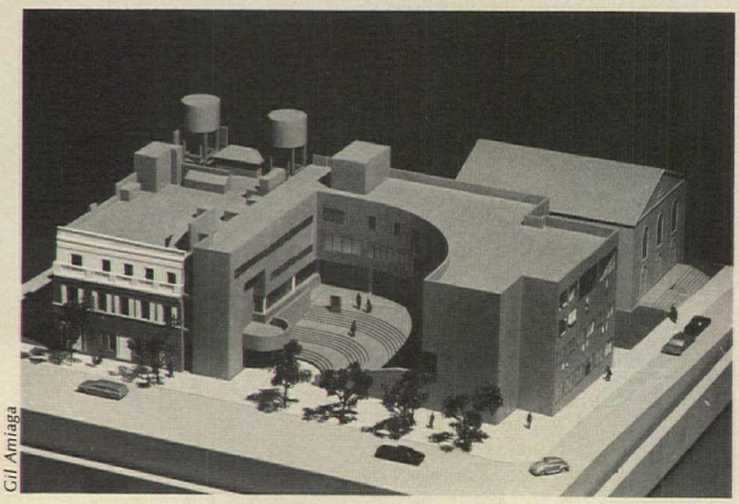
National Headquarters building of the American Institute of Architects in Washington, D.C., designed by The Architects Collaborative (Cambridge, Mass.), Norman Fletcher, F.A.I.A., principal-in-charge, has been approved by Washington's Fine Arts Commission. The A.I.A. hopes to begin construction by late fall. The seven-story building will be made of exposed poured concrete. Parking will be below grade. The design is the fourth made for the A.I.A. and the third submitted to the Fine Arts Commission, which had insisted on a "background" building that would not overshadow the A.I.A.'s historic Octagon House (lower left). A model of the building will be on view at the A.I.A.'s June Convention.



Robert D. Harvey Studio

Richard Payne

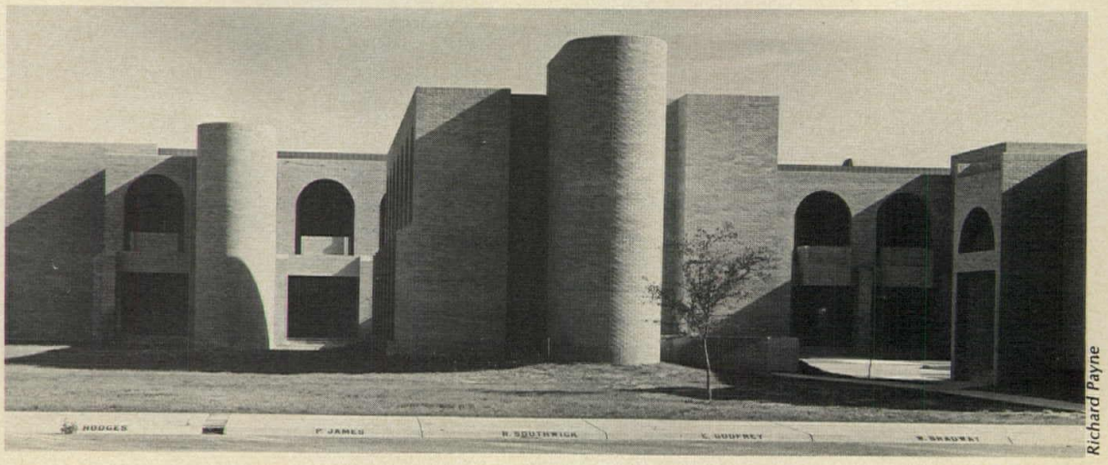
Mod mini-bank branch of the Bank of the Southwest in Houston, by Kenneth Bentsen Associates, puts tellers behind glass ovals in a stainless steel screen. A large vinyl pop art wall serves as a backdrop. Floors are glazed brick. Communication to the parent facility is provided by pneumatic tube, television and telephone computer.



Gil Amiaga

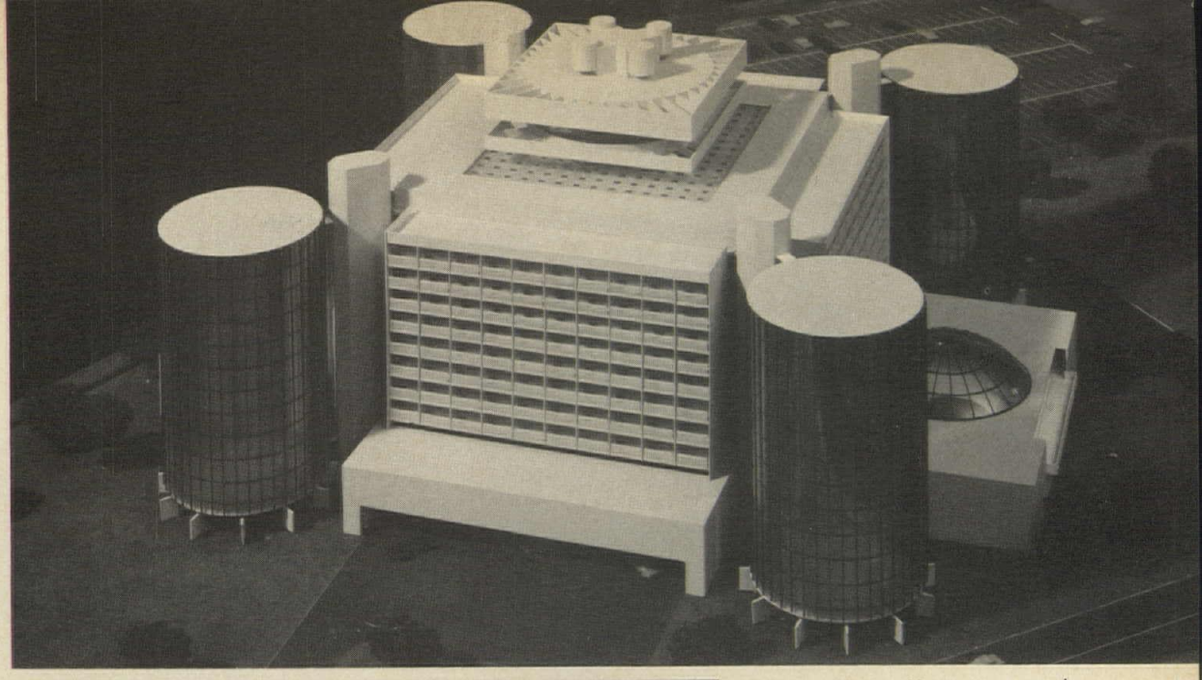
Arts-for-Living Center of the Henry Street Settlement (New York City) by Prentice and Chan, Ohlhausen, architects, emphasizes community involvement, drawing people into its open courtyard. The concrete and brick building will contain classrooms, a child care service, a community-owned cable TV station, a recital hall, studios, offices, and a glassed-in garden visible throughout the interior. To encourage interrelations, there will be an unusual amount of visibility among interior spaces.

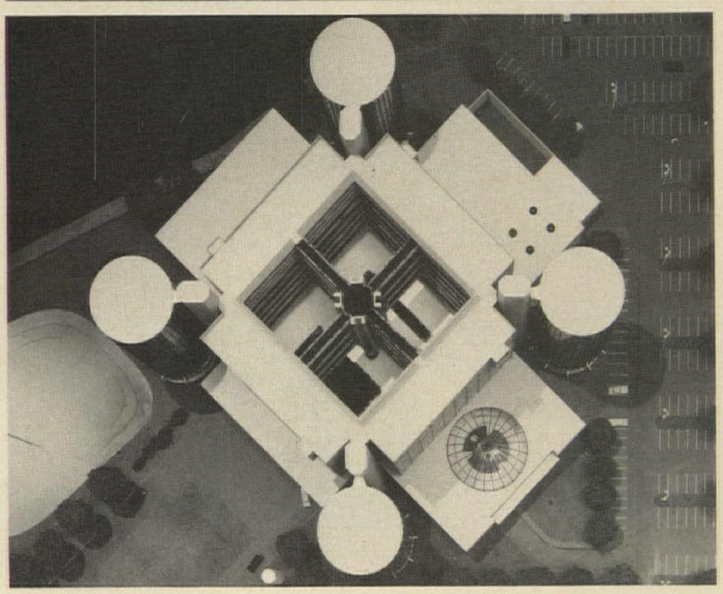
Pan American College buildings at Edinburg, Texas, Kenneth Bentsen Associates, architects (Houston), include a Fine Arts Center, Health and Physical Education complex, dormitories, Science Building, cooling plant and expanded library and College Center, linked by covered walks. Structures are brick and reinforced concrete.



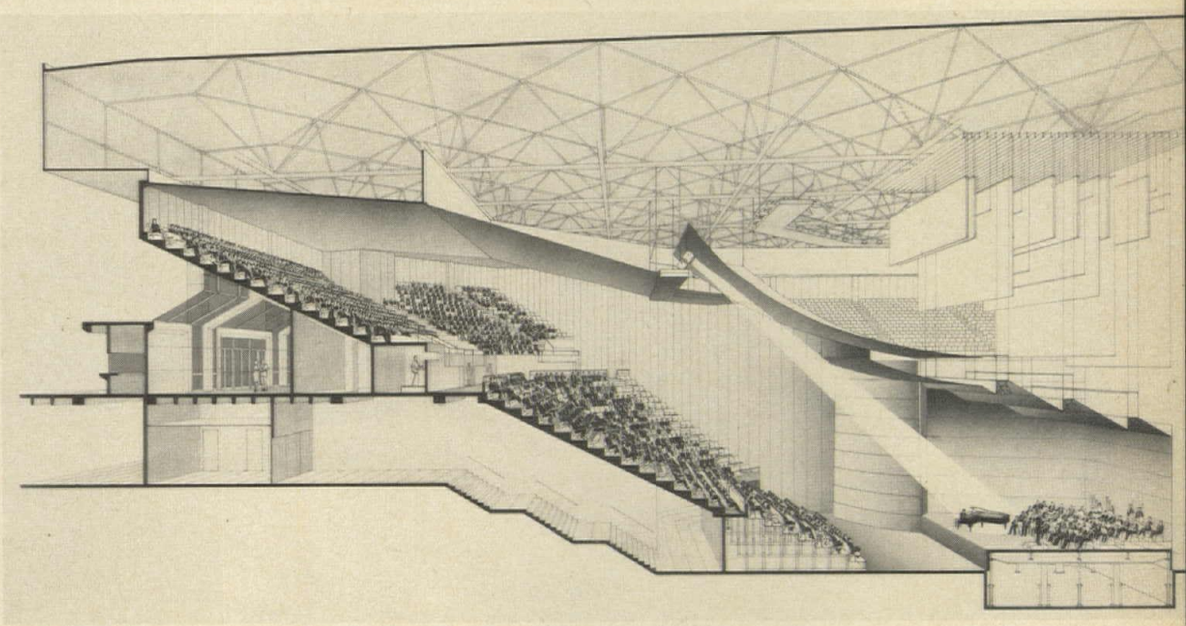
Richard Payne

Continental Bank and Trust Co., in Milwaukee, by Jordan Miller and George Waltz, Architects, A.I.A. and Associates, emphasizes its exposed concrete structure. The tapered wind-bracing exterior columns compensate for the removal of the service core to one side, allowing for maximum open space on the main banking floor.

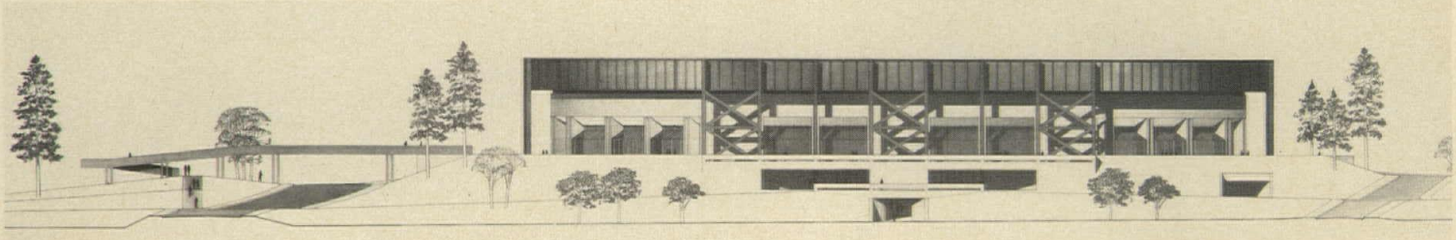




O'Hare Hyatt House, near the Chicago airport, will be a 1,500-room hotel complex, John Portman and Associates, architects. The first 750 rooms and convention facilities, opening early next year, will center on a ten-story atrium capped by a revolving restaurant, reminiscent of Portman's Regency Hyatt in Atlanta. Glass corner towers, as well as the main building, will hold guest rooms, reached on bridges through the atrium from a central core of glass elevators. The ground floor of the atrium will contain a dining area as well as the lobby. The hotel is planned for meetings and conventions, and will contain large exhibition spaces. Guest rooms are designed for small conferences.



Multi-purpose coliseum for Washington State University, designed by John Graham and Company, Donald S. Peterson managing architect, will accommodate a broad variety of athletic, cultural and entertainment events. The 360 x 290-foot octagonal building can convert in an hour from a 12,000-seat sports arena to a 2,600-seat concert hall or to a 1,100-seat theater, using movable walls, ceiling and floor. A remote-controlled reverberation chamber permits precise tuning of the auditorium.



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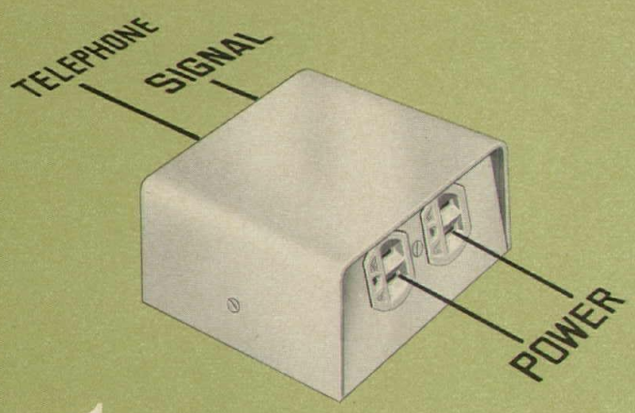

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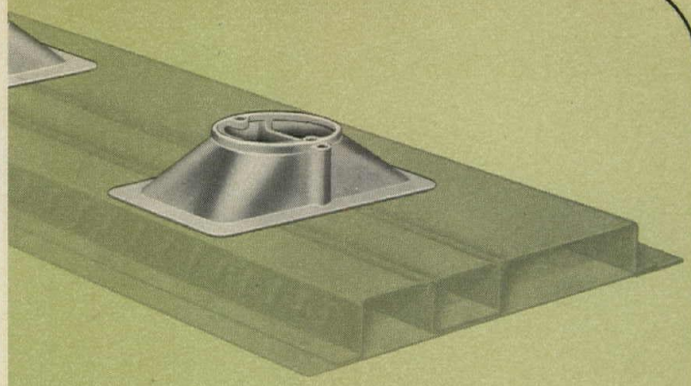
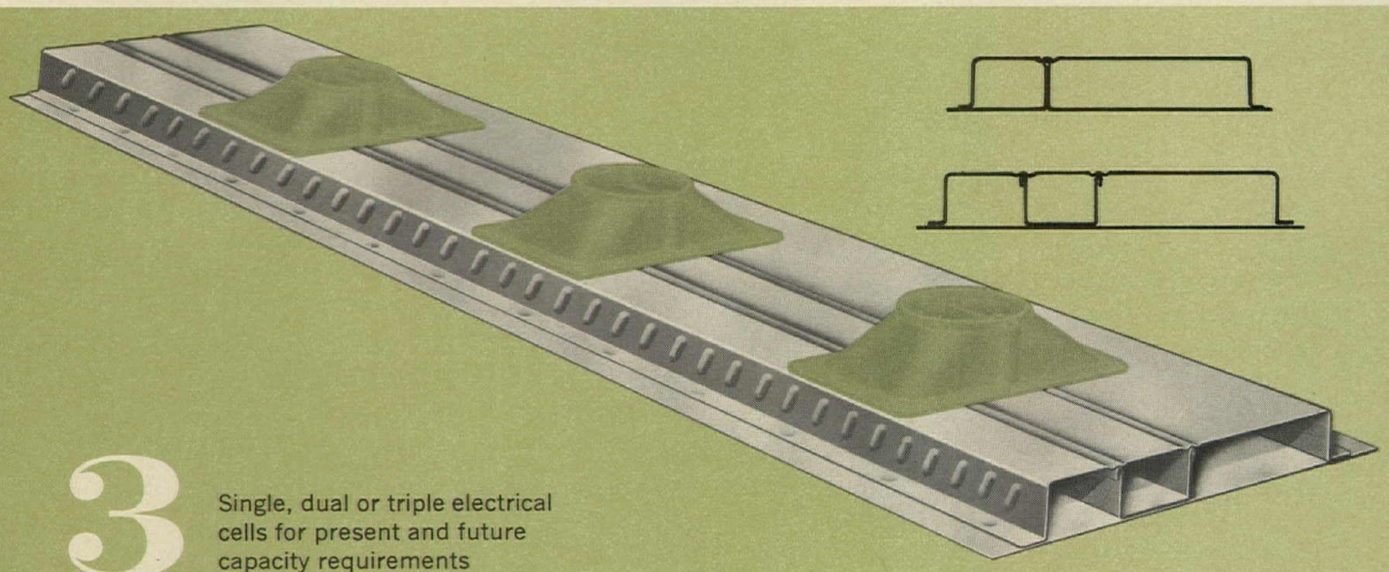


2 Matching pre-set insert for easy access to cells



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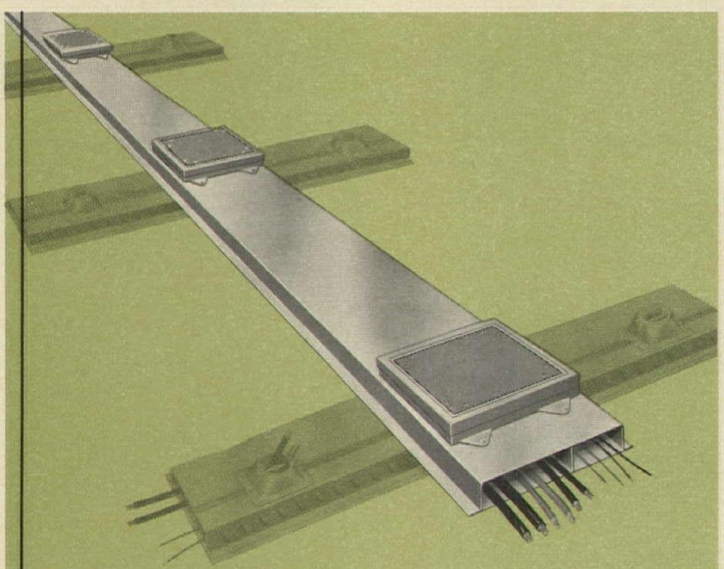
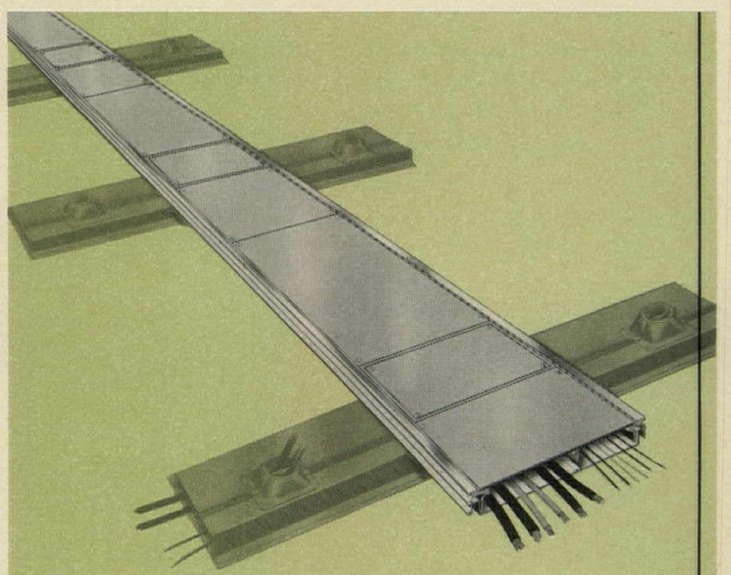


4 A variety of feeder systems to supply cells



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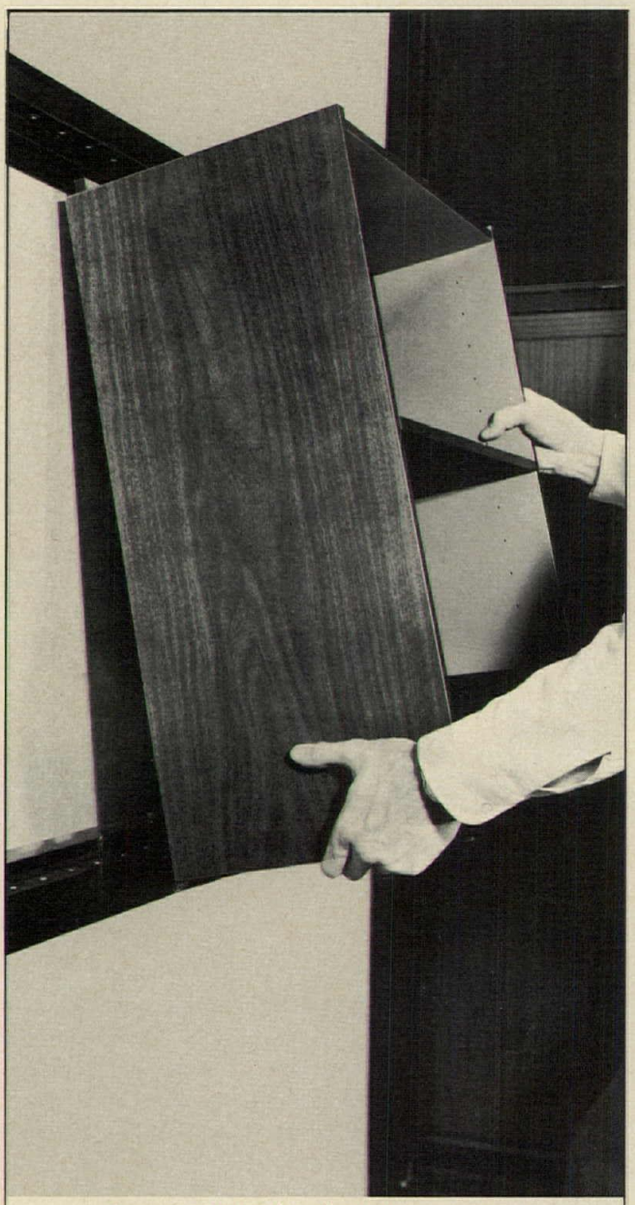

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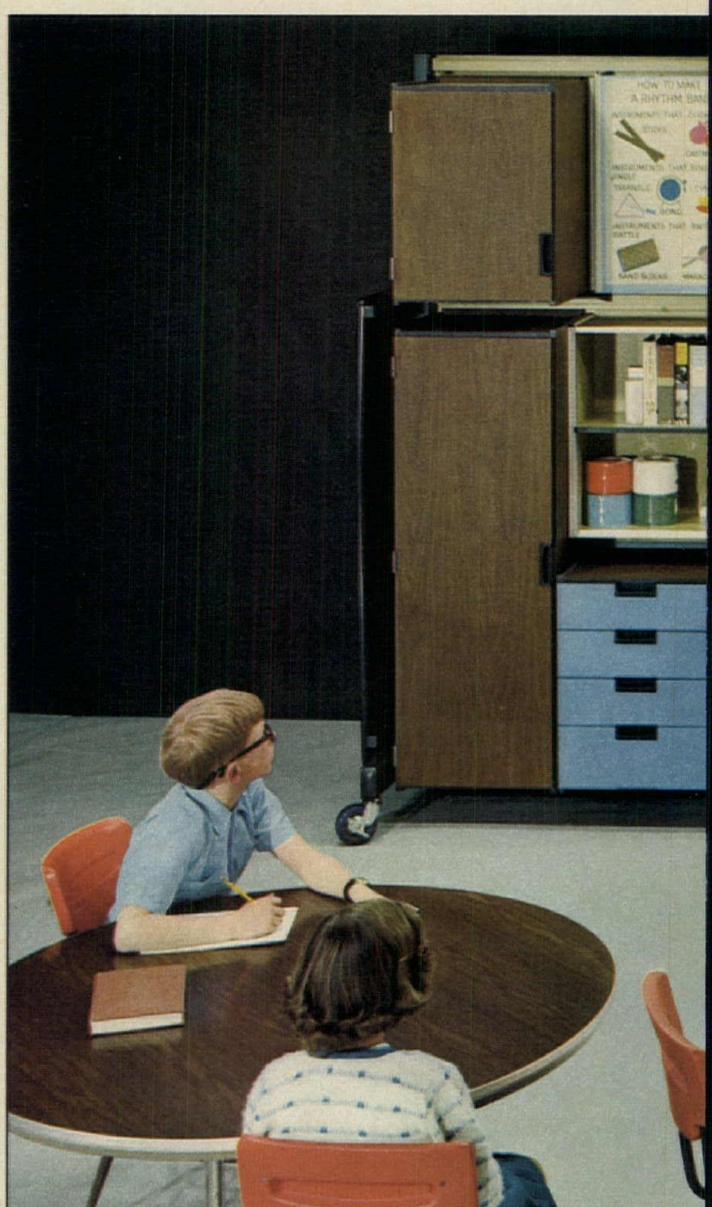

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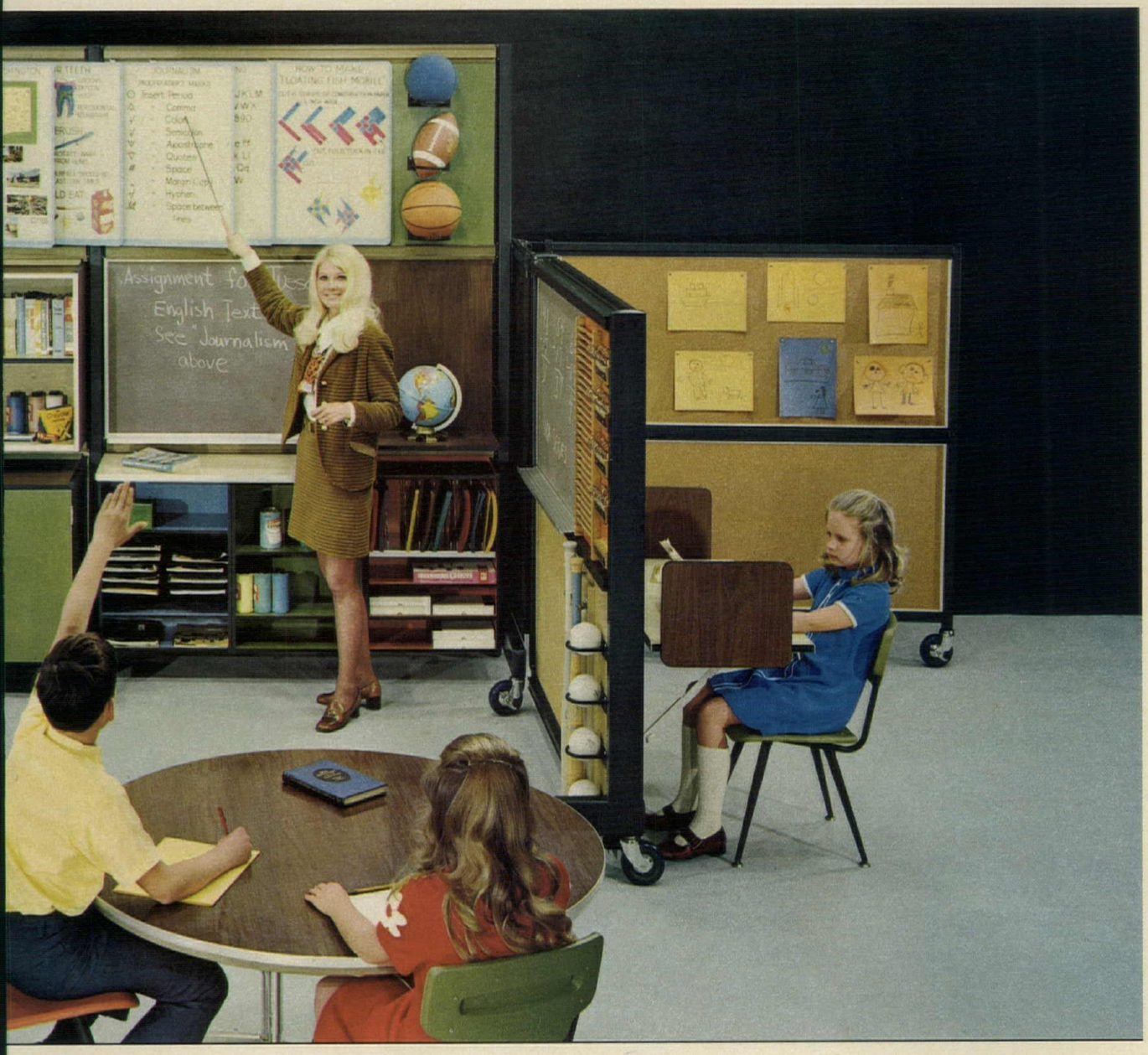

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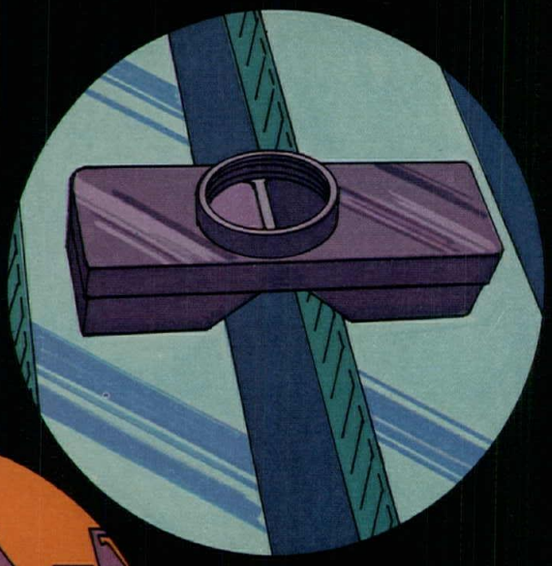

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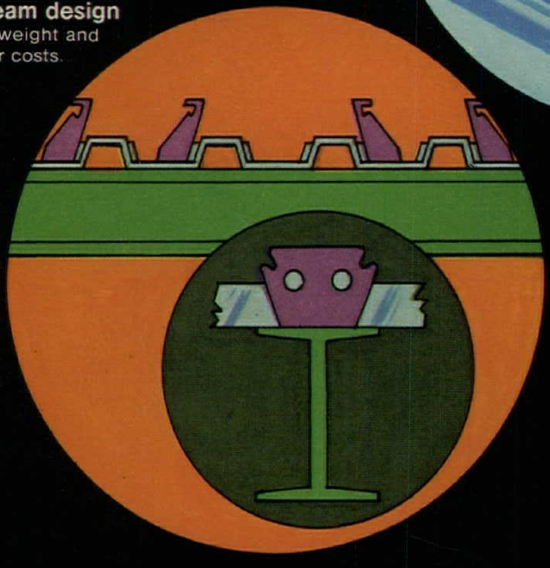
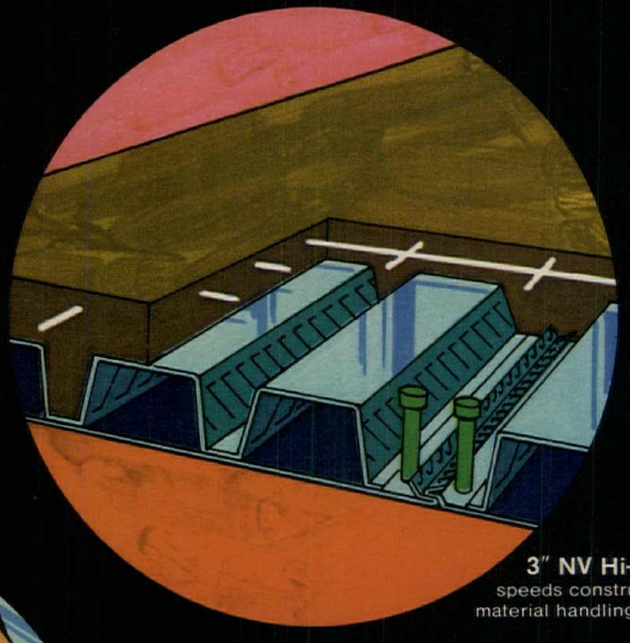
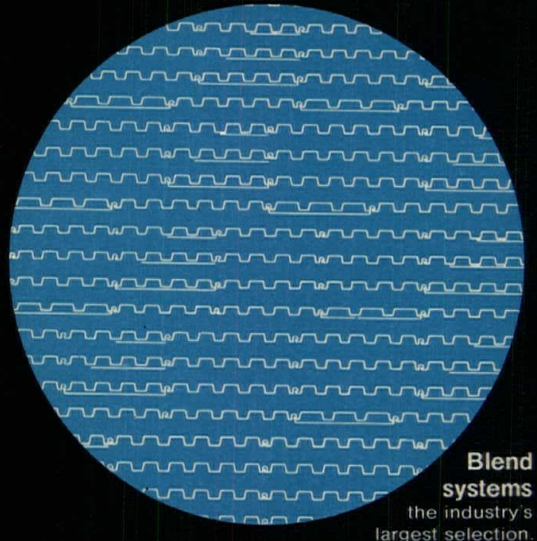
lowers weight and labor costs.





3″ NV Hi-Bond Celluflor®
speeds construction, cuts material handling.

Larger cell capacity
on 1⅜″ NF and NV Celluflor permits easy expansion of electrical service.



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the industry's largest selection.

here's how an Inryco™ floor system... can help you save up to 90¢ per square foot.

Inryco's advanced floor systems engineering has brought about new developments and new techniques that have resulted in greater overall savings.

Pre-set inserts save in location and relocation of outlets. Electrical and telephone outlets cost substantially less to install and move because Inryco dual pre-set inserts virtually eliminate the costly concrete drilling required for after-set inserts.

Composite beam design permits longer spans, cuts time and labor costs. This newest development in Inryco's composite design for multi-storied construction permits longer spans, lowers weight, requires fewer piece parts in structural steel on the job.

3" NV Hi-Bond® Celluflor® eliminates the cost of rebars, temporary forms, and wood shoring. Key to the success of Inryco's composite design are patented Hi-Bond lugs and exclusive V lock joint. Besides saving on material costs—forms, rebars, and shoring—labor costs are reduced with less material handling, faster construction. Exclusive pull-down hanger tab provides support of suspended ceilings and eliminates the need of costly separate accessories.

66% more cell capacity assures future savings in electrical service expansion. Inland-Ryerson's 1⅝" NF and NV Celluflors offer 66% more space per cell than standard profile 1½" electrified floor deck. Greater cell sizes permit large 4" hand holes for large diameter cables.

Blend systems can meet virtually any architectural design module. By alternating standard cellular and non-cellular floor panels, the cost of integral electrification patterns can be reduced. Inryco Blend Systems provide the industry's largest selection of floor panel profiles, widths and cell configurations that can be mixed to match virtually any architectural module.

Recent UL ratings on lighter gage cellular panels reduce material costs. Raceway requirements now permit the use of 20-gage steel for both fluted and flat plates of cellular deck, provided cells are covered by a minimum of 2½" of concrete. This is a distinct economy over the former 18/16 gage requirement for fluted tops and flat bottoms.

UL rated Inryco floor systems often save the cost of applied fireproofing. Many building codes have 2 hour floor requirements. Inryco engineers conducted fire tests to earn the Underwriters' Laboratories' two hour fire rating without fireproofing, thereby saving time and materials.

See how these and other value-building ideas can pay off on your next project. Inland-Ryerson has been a consistent leader in the development of new products and techniques in steel construction. Many systems, now standard, were developed to meet specific designers' needs in the field. Inland-Ryerson's sales engineers will be glad to put this experience to work for you in the selection and adaptation of Inryco components to meet your own design requirements.

Send for Inryco Floor Systems Catalog 21-1. Inland-Ryerson Construction Products Company. General Offices: Chicago, Illinois. Address Inquiries to: Dept. E, 4033 West Burnham Street, Milwaukee, Wisconsin 53201.

Typical cost savings made possible by Inryco floor systems. Listed below are just some of the savings you can expect when you put some of these Inryco cost cutting ideas to work for you:

Component	Costs Using Previous Techniques*		Costs Using New Inryco Techniques*	
Structural Steel	Non-composite beams	$1.63	Composite Beams and Studs	$1.34
Celluflor	NF 18-16 UL Labeled	1.46	NV 18-20 UL Labeled	1.25
Concrete	5½" Sand & Gravel	.26	6¼" Lightweight	.44
Fireproofing	Sprayed-On—2 Hr. Rating	.20	None—2 Hr. Rating	—
Floor Service Inserts	Single Afterset	.70	Dual Preset	.32
	One telephone & one electrical outlet on 10' x 10' grid, **9 ea.** dual services		One telephone & one electrical outlet on 5' x 5' grid, **36 ea.** dual services	
		$4.25 per S.F.		**$3.35 per S.F.**
				$.90/SF savings or 21.4%

*These are approximate costs which may vary in different areas.

INLAND RYERSON

General Offices: Chicago, Illinois

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The integrated electrical ceiling. Offering great design flexibility, it promises comfort and efficiency for years to come. It heats, cools, lights, and carries communications . . . thanks to electricity.

Your buildings need a lot of power—electrical power—to sustain a modern Electro-environment. An environment properly heated. Properly cooled. Properly lighted. An environment where intercoms and business machines and background music can all get along together in harmony . . . thanks to a qualified electrical contractor.

He, and he alone, possesses the theoretical and technical skills to translate new designs and concepts of electrical technology into working, functioning realities. Trust the qualified electrical contractor to wire your building safely. To anticipate future as well as initial power needs. To coordinate the work of other specialists — carpenters, sheet metal men, heating and refrigeration experts — while he himself handles everything electrical in such installations as integrated ceilings.

Remember: your qualified electrical contractor guarantees performance not only on the electrical functions, but on the entire ceiling installation he oversees as well.

National Electrical Contractors Association
Washington, D. C. 20036

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Practically every grade school throws George a party. And half the party always end up on the floor. Great for school kids. Bad for school budgets. To keep those maintenance costs down may we suggest the carpeting that Berven calls Extra Point. Extra Point is made with new Anso®—the nylon fiber that fights back. And it's tough enough to resist the kind of soiling you get with a classroom full of kids. Yet for all its toughness, Anso has rich color and texture. And it wears so well, Allied Chemical guarantees it for five years.* If you'd like to have more information on new Anso nylon, write to Berven of California, 2600 Ventura, Fresno, California 93717.

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ANSO®

THE VERSATILE FIBER THAT'S MADE TO FIGHT BACK.

*This carpet is guaranteed by the Fibers Division of Allied Chemical Corporation. If it is properly installed and maintained and the surface pile in any given area wears more than 10% within 5 years, it will be replaced at our expense. The guarantee does not cover tears, burns, pulls, cuts, or damage due to improper cleaning agents or methods.

OFFICE NOTES

OFFICES OPENED

Bruce Klee Brown, Architect has announced the opening of an office for the practice of architecture and related design disciplines at 511-B Wilton Street, Greenville, S. C.

L. P. Cotter & Associates, Architects, have opened an office for the practice of architecture at 26 East High Street, Lawrenceburg, Indiana 47025. The firm's Cincinnati, Ohio office remains at its present location.

NEW FIRMS, FIRM CHANGES

Robert L. Thorson has recently been named a partner of the New York City architectural firm of **Carson, Lundin and Shaw.** Also announced was the appointment of two new senior associates: **E. John Hornus** and **Joseph M. Marrow.**

Collins, Uhl & Hoisington, Architects & Engineers have recently become **Collins Uhl Hoisington Anderson, Architects, Engineers, Planners.** Offices are at 33 State Road, Princeton, New Jersey.

Two new associates to the partnership of **Ferendino/Grafton/Pancoast/Architects, Engineers and Planners**. have been announced: **Alexander Connell, A.I.A.** and **John D. Shelton.**

William V. Hukill, architect and professional engineer of **Kohlmann-Eckman-Hukill, Architects** has announced a change in the firm name to **Hukill—Pfiffner—Alexander—Duenow, Architects and Engineers,** accepting as partners **John F. Pfiffner,** architect; **Bruce G. Alexander,** architect and **Gerald M. Duenow,** professional engineer. Offices are at 610 Tenth Street, S.E., Cedar Rapids, Iowa and Airport Terminal Building, Ottumwa, Iowa.

Architect **Edward R. Jones, Jr.,** has been named vice president and general manager of the Phoenix office of **Charles Luckman Associates.**

William H. Leyh is now a partner in the New York City firm, **Shreve, Lamb & Harman Associates, Architects.**

C. J. Ocheltree, Jr. is now vice president and chief mechanical engineer of **The Ballinger Company, Architects/Engineers,** Philadelphia.

J. B. Olivieri & Associates, Inc. and **James G. Morris & Associates** have recently consolidated their practices with **Raymond W. Efthemiou, A.I.A.** to form the firm **Olivieri/Efthemiou/Morris, Architects and Engineers.** The firm maintains offices at 29111 Harper, St. Clair Shores, Michigan.

Engineer **Allen G. Poppino** has been named executive vice president of **Benham-Blair and Affiliates,** architect-engineer-consultant firm.

Rolf Ohlhausen has recently joined **T. M. Prentice** and **Lo-Yi Chan** as a partner. The firm is now known as **Prentice & Chan, Ohlhausen, Architects & Planners.**

Put a Bally Prefab Walk-In Cooler/Freezer in the kitchen. It's the way to more profit in Country Club feeding with beef and beer at the 19th hole . . . steak and salad for banquet crowds . . . chateaubriand and champagne for candlelight couples. Count on 'round the clock refrigerated storage in temperatures from 35° cooling to minus 40° freezing. Write for free 32-page booklet and sample of urethane wall.

There's an evolution in the kitchen

Bally

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Dept. AR-5

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gives you design flexibility *and goes up fast!*

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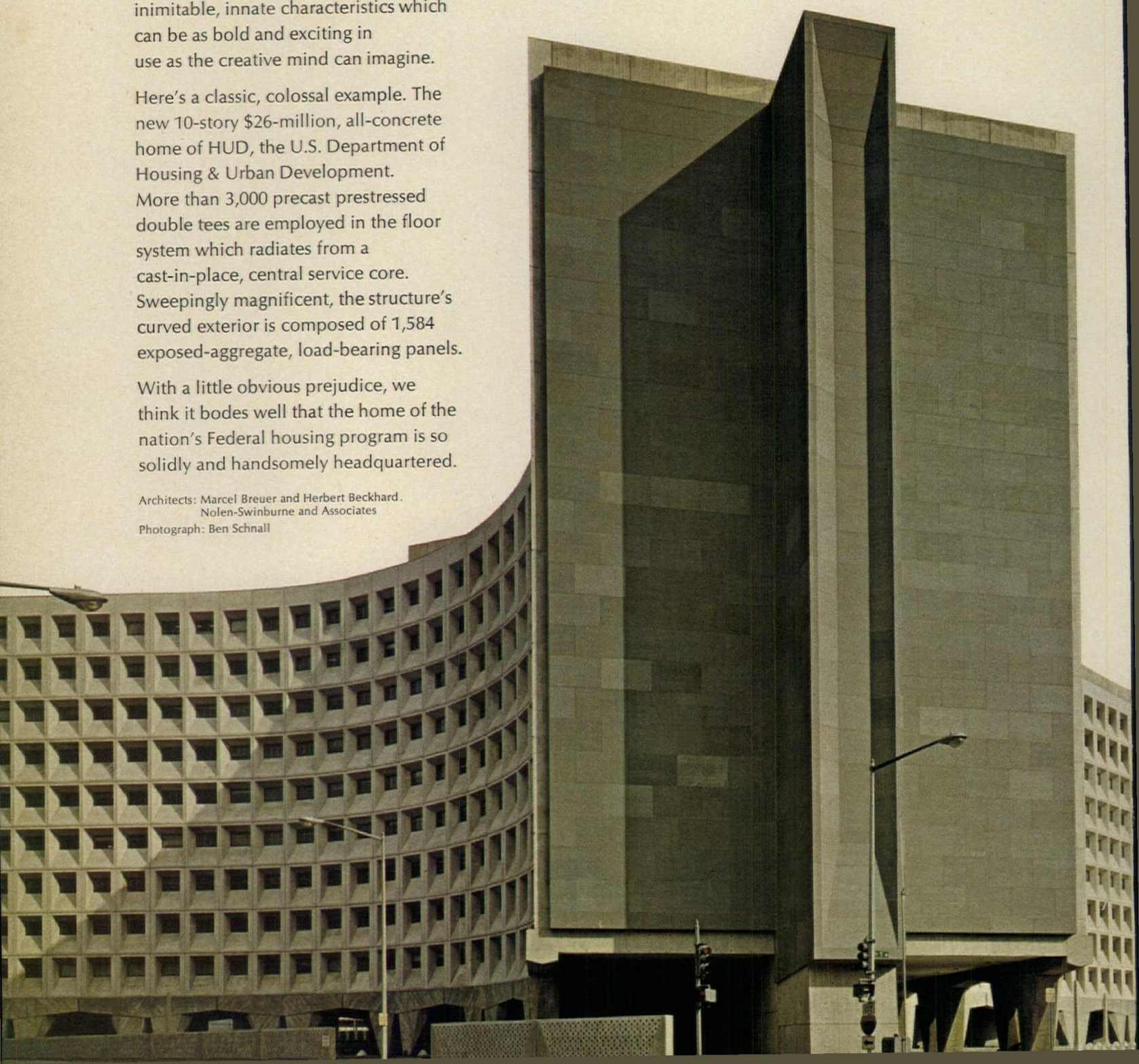
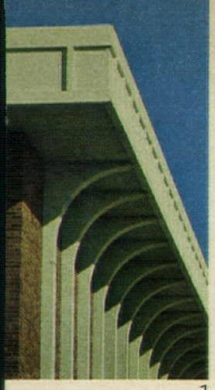
Here's a classic, colossal example. The new 10-story $26-million, all-concrete home of HUD, the U.S. Department of Housing & Urban Development. More than 3,000 precast prestressed double tees are employed in the floor system which radiates from a cast-in-place, central service core. Sweepingly magnificent, the structure's curved exterior is composed of 1,584 exposed-aggregate, load-bearing panels.

With a little obvious prejudice, we think it bodes well that the home of the nation's Federal housing program is so solidly and handsomely headquartered.

Architects: Marcel Breuer and Herbert Beckhard.
Nolen-Swinburne and Associates
Photograph: Ben Schnall





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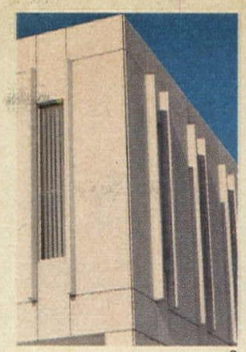

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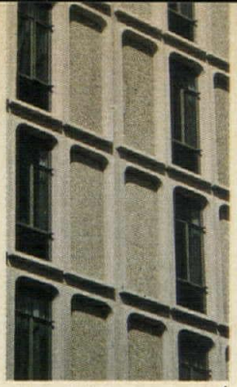

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1. Architect: Smith Voorhees Jensen Associates
2. Architect: Haarstick Lundgren and Associates
3. Architect: Richardson, Severns, Scheeler & Associates, Inc.
4. Architect: Charles Herbert & Associates, Inc.
5. Architect: Wescott & Mapes
6. Architect: Stenson and Warm, Inc.
7. Engineer: California Division of Highways

■ Architectural precast concrete knows virtually no restriction in shape, size, color, texture and depth of design. With it, *you* will know no restraint save architectural and structural integrity. These thoroughly practical panels react to light and shadow to create surfaces of sculptural intensity, brightening the face while adding brawn to modern building design. Perhaps that's why so many of today's most inventive architects, in creative partnership with precasters who transform design into concrete reality, are turning in ever-increasing numbers to this supremely versatile material.

■ The telescoping of construction time is yet another of prestressed concrete's attributes. And who knows better than you do the bite on-site labor costs take from today's building budgets? While site preparation and foundation work proceed, precast prestressed units are mass produced in the plant and move to the site on schedule for placement directly from truck to structure. Prestressed concrete members fit together so quickly and with such nice precision that your most anxious, eye-on-the-calendar client intent on early occupancy will approve.

■ Another structural method employs post-tensioned prestressed concrete. When cast in place, this type of construction takes on any shape you choose. Post-tensioning is often used to tie precast prestressed concrete units together. It is also combined with precast construction when continuous slabs are desired. For example, parking decks are frequently post-tensioned while precast units are used for structural framing. In segmental construction, now in ever-widening use, precast members are post-tensioned together to further extend the already long-span capability of precast prestressed concrete.

■ You will find that the longer spans so patently advantageous with prestressed concrete provide wide bays, increasing *usable*, column-free floor space. Ceilings are clean and trim when easily accessible mechanical and electrical systems are neatly channeled between stems of well-proportioned structural members. And this long-span strength is by no means limited to the indoors, as its burgeoning application to bridges will attest.

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ARCHITECTURAL STRUCTURAL

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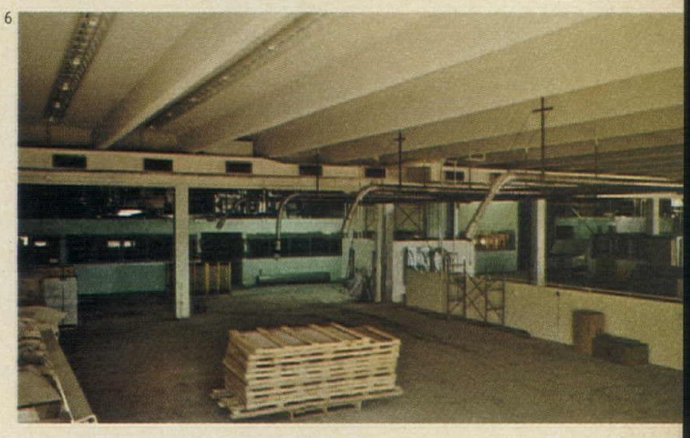

7

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This Cookson Side Coiling Grille protects 44-ft. of visual display on a 2-sided opening for this store.

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Doge Andrea Gritti, Titian, National Gallery of Art, Washington, D.C., Samuel H. Kress Collection

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Dental Reception Area, Health Sciences Center,
Case-Western Reserve University, Cleveland, Ohio

ARCHITECTS: Barnes, Neiswander & Associates, Cleveland, Ohio
STRUCTURAL ENGINEERS: R. M. Gensert & Associates, Cleveland, Ohio

Distinctive design expressed in form and finish characterizes the new Health Science Center at Case-Western Reserve University in Cleveland. ChemComp cement concrete was used under the open walkways to help prevent drying shrinkage and the resultant leaks that would be difficult and costly to repair. This feature of ChemComp cement also minimized the possibility of slab movement away from steel columns tied into the floors, thereby maintaining shear strength design values.

Resistance to drying shrinkage, lower permeability, dimensional stability, increased bond strength to reinforcing, fewer control joints, increased live load capacity, less sealing and caulking . . . all add up to greater freedom for the designer, better value for the customer.

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Information retrieval for design and specification

Some of the professional and commercial considerations behind new approaches to classification and storage of the growing mass of product information

As the amount of information about every aspect of human life has multiplied, the needs for quick access and precise application have also increased. The construction industry, in meeting these needs, has more severe problems than most. These problems are in the multiplicity and diversity of products and techniques that form its information bank; the hazardous consequences of misapplication; the legal implications of those hazards; the interdisciplinary requirement for universal and unequivocal comprehension; and the all-pervading concern for cost and quality control.

Basic to construction's special problems in setting up an information bank is the dual character of users' approaches to the information. First, in the design process, the entire body of product information and technical data must have modes of classification and access that permit rapid comparison, evaluation and selection among several design options. Second, in the preparation of bidding documents, the primary needs are for precise location and identity of products and for consistency in the format and language of their application so that the specification is understandable and familiar to the full complement of construction disciplines involved—including, of course, the original designer, the project manager and the installing contractor.

All of this calls for a uniform system of classification and indexing that is adaptable to both design and specification functions. This accounts for the increasing role of the so-called C.S.I. Uniform System of indexing in the now-familiar 16 categories of classification (see table). There is also need for realistic evaluation of the physical form of data storage (filed catalogs, microfilm, microfiche, aperture cards, etc.) that will best serve the needs of users. Further, important consideration must be given to the linkage of any system to the commercial universe of manufacturers and distributors who are its primary source of data. Matters of completeness and currency of data hinge on the answers to such questions as: Who pays for compilation, maintenance and distribution of the data bank? Who's in? Who's out?—and why?

Microfilm saves space, but that's not enough

The filing resources of many an office have been taxed beyond utility in their efforts to contain the prodigious volume of manufacturers' literature. Technology is ready with many devices for miniaturization, and the purveyors of microfilm, microfiche and computerized core data offer a burgeoning multiplicity of ways to house data in minimum space.

16 Divisions of the CSI Format for Building Specifications

1. General Requirements
2. Site Work
3. Concrete
4. Masonry
5. Metals: Structural & Miscellaneous
6. Carpentry
7. Moisture Protection
8. Doors, Windows, and Glass
9. Finishes
10. Specialties
11. Equipment
12. Furnishings
13. Special Construction
14. Conveying Systems
15. Mechanical
16. Electrical

The technical solution of reducing, say, 300,000 pages of product information to a few pounds of microfiche or aperture cards is a substantial advance in space saving, but the dual problems of access and organization remain. Adaptation of any microsystem to the architect's initial browsing process, for example, is difficult in the finding and arranging for side-by-side comparison of design options—especially where color is a factor. The equipment to do this is available, but it is expensive and, until the paths of access from the general to the particular are both familiar and automatic, it can be cumbersome to use.

ARCHITECTURAL BUSINESS THIS MONTH

The system has to work for everyone concerned

The choice of system for classification and indexing, then, becomes the first requirement for any workable solution to information storage and retrieval. Further, acceptance and understanding of the system throughout the design and construction universe is basic to both the communications and contractual roles of specifications and other bidding documents.

In response to all these considerations, the A.I.A. and C.S.I. in 1962 jointly sponsored the first conference on uniform retrieval systems and in March, 1963, the 16-division C.S.I. format for building specifications was published. The Uniform System manual, published in 1966, consists of a specification outline, a proposed filing system and a cost-accounting guide. It has the endorsement of the following organizations: American Institute of Architects, American Society of Landscape Architects, Associated General Contractors of America, Inc., Construction Specifications Institute, Council of Mechanical Specialty Contracting Industries, Inc., National Society of Professional Engineers and Producers' Council, Inc.

Endorsement of the uniform system by the above organizations is testimony of the broad base of response to a prevailing need. All of these organizations, however, are aware of the diversity of user function the system must serve; so they have formed a Joint Industry Conference for the purpose of continuing efforts to resolve small differences in facility of application between, for example, the architect's broad comparisons and the specification writer's trade-oriented categorization.

Those who deal professionally with the science of classification and indexing have noted that each category in the C.S.I. format is based on an interrelationship of place (site work, for example), trade (carpentry), function (moisture protection), or material (concrete). These categories, while they serve broadscope purposes, do offer grounds for confusion in specifics of some applications.

Dry run by Sweet's identifies some problems

An illustration of the complexity of some of these problems—and of the resolve of the

industry as a whole to solve them—may be found in some of the efforts of Sweet's Architectural and Industrial Catalog Files to organize their information services in accordance with the 16-division uniform indexing system. (It may be evidence of the respected position of this information source that its experts have been invited to participate in the ongoing work of the Joint Industry Conference.)

The first step in Sweet's adapting procedure was to experimentally reorganize all entries that had been in their 1969 Architectural Catalog File in literal accordance with sections of the uniform indexing system. Two kinds of problem emerged. One was the fact that some new products had no obviously assigned locale in the uniform system. The other was the fact that certain kinds of products that seemed to belong together for design comparison might be arbitrarily separated into different categories descriptive of their component materials or the trades involved in their installation. Framing or siding components, for example, might fall into two or more categories each, depending on whether they were wood, metal or concrete.

Over-all divergence from design-oriented logic was surprisingly small, but was considered serious enough to warrant a second phase of adaptation emphasizing design logic rather than the literal specification process. The component catalogs were reshuffled, still in keeping with the 16 divisions, but arranged so that comparable functions rather than trade affiliations were emphasized. This free adaptation did support some aspects of building systems theory, but it limited the ability of the file to adapt to the specifying process.

The ultimate solution was to return to strict conformity with the framework of the unified system and accept or adjust small differences where function as a retrieval system for design appeared to be in conflict with a primary role in the specification process.

Unity of objective supports professional approaches

It should be emphasized that there is no real conflict between the two categories of system use (that is, between the selection or browsing process and the bidding document preparation process). In fact, quite the contrary turns out to be the case when it is considered that the architect from the very earliest phases of his search is beginning a process of communication with the whole body of diverse individuals who must translate his concepts eventually into assemblies of the materials for which he is searching. This was the basic motivation behind the original joint effort of A.I.A. and C.S.I. And that same comprehensive communications objective has enabled the Sweet's file to be reclassified in more than substantial agreement with that joint effort, while at the same time avoiding excessive cross-references or duplication of data.

Classification and indexing, the first-order sciences

Keys to success of the uniform system itself and to Sweet's adaption to it have been not only the basic unity of purpose behind all such information retrieval systems but also the knowledgeable reexamination of the fundamental science of classification and indexing.

There are those who would urge that classification and indexing do in fact represent two different sciences. In the subtleties of the librarian's art, this may well be argued. In the real world of product information, identification and retrieval, however, it may be sufficient to point out some differences in definition. Classification is a method for organizing information in categories germane to the processes of the professions and trades involved in building design and construction. Indexing then takes the user of the classification system on a guided tour to the exact location of the specific product for which he is looking.

Thus it turns out that the expertise of the compilers of Sweet's information services found ready ground in the developing uniform system for the application of classification and indexing techniques that take into account not only the dual aspects already mentioned for the end use of the data bank, but also the practical drives of manufacturers in making their products known.

In the sophisticated world of construction, product information retrieval can and must rely upon a high capability of users to become accustomed to any new mode of documentation. The users will learn where any minor divergences in logic can occur and make their searches accordingly. Small discrepancies, again, represent no real conflict in an industry which is so diligently in search of unification.

Computerized short cuts in the specification process

The eight-year history of development of the uniform indexing system has run parallel to even more searching approaches to critical problems increasingly affecting the scope, language and form of specifications. One important result of these approaches has been the emergence of the so-called performance specification. Another has been increasing refinement of various techniques of automation in the spec-writing task. Both of these developments have common drives in simple economics, but there are deeper implications as well. Behind development of the performance specification, for example, has been the increasing quandary of professionals and manufacturers in liability situations of all kinds.

The performance specification seeks a uniform mode of describing exactly what the building designer requires in function and quality of a given component in terms that correspond precisely to the suppliers' description of the ability of products to perform those requirements. The statements of both the designer's sought-for and the supplier's promised performance then have to be made in specifications and warranties in terms not only comprehensible to all concerned but legally supportable in case of litigation.

Meanwhile, architects and specification writers have become increasingly aware of a possible role for various modes of automation in the specification process. The simple idea of a master specification which is editable for the specifics of any particular building is well known and has been described (RECORD, January 1968). Various modified formats for specifications and computerized or microfilm methods of making both the master specification and the product universe more or less mechanically available are on the market or under development.

One such emerging system, called Masterspec, is a computerized master specification which, although still under development, is already being offered to the professions through a non-profit organization called Production Systems for Architects and Engineers Inc. This organization has been funded and is sponsored by the American Institute of Architects.

Masterspec conforms basically with the C.S.I. 16-division format. Sections ready for release so far, however, seek to implement the concept of the performance specification to a greater degree than has been conventional in other systems.

A second system under development is the so-called SUNY information system now being developed for the New York State University Construction Fund by Sweet's Construction Division of McGraw-Hill Information Systems Co. This system also will enable architects to retrieve data regarding building products meeting specified performance criteria and, again, will be a computerized system.

Sweet's, incidentally, is also taking definite steps to test a new microfilm library for use in connection with their Architectural File.

A third system that is receiving increasing attention is a C.S.I.-sponsored system called Spec-Data II. This is a product retrieval system which is linked to a computerized microfilm method of retrieval. It was shown publicly for the first time by Information Handling Services, and C.S.I. at the National Housing Center in Washington April 14. Spec-Data II is the result of nearly two years of joint development by I.H.S. and C.S.I. It is available in two configurations. One is a central station of film cassette banks and photo-print equipment that allows the user to make a dry print of any filmed catalog page. The other is a desktop data station for display of filmed data, but without the dry-print feature. Subscription rates for the new system range from $77 per month to $490 per month, depending on which data and configuration are needed.

The industry is on the threshold of what must be considered a period of trial and error preceding ultimate solutions.

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Contact your local AWC specialist. He can supply you with detail drawings illustrating different membrane systems, wearing surfaces and drainage patterns. If you don't know his name, write us – we'll send it to you along with illustrated literature of roof deck types and plaza systems used by many of the nation's most successful architectural firms. (No obligation.) Just write Silbrico Corporation, 6300 River Road, Hodgkins, Illinois 60525 . . . . . or call (312) 735-3322.

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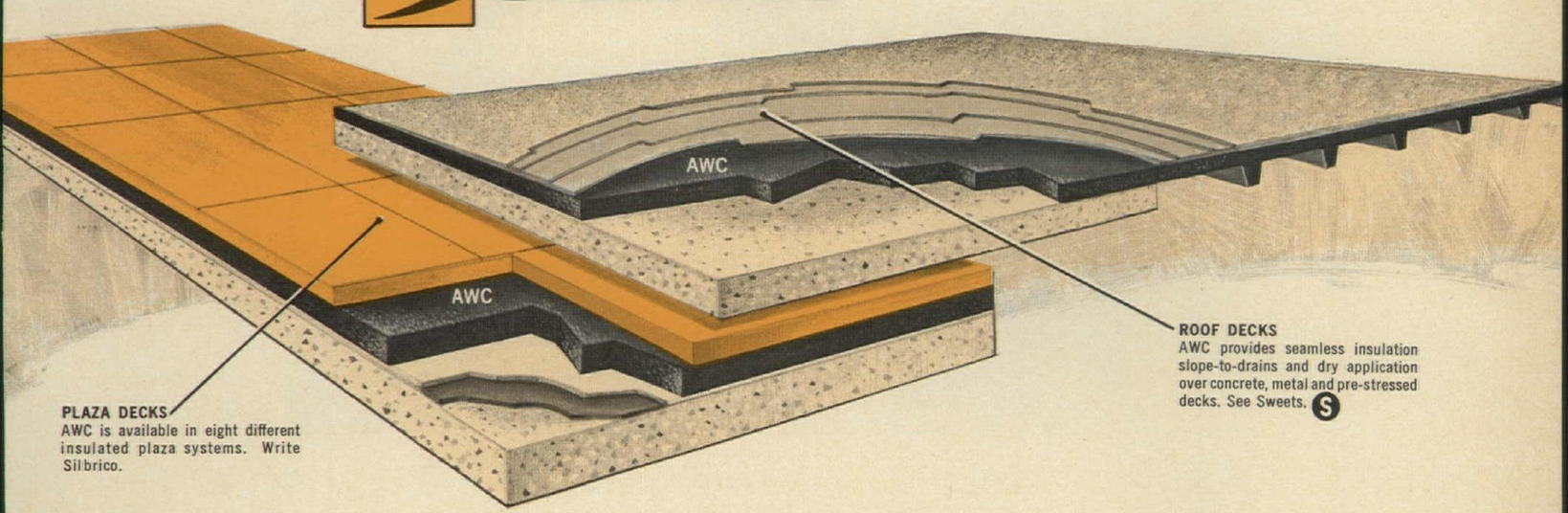

PLAZA DECKS
AWC is available in eight different insulated plaza systems. Write Silbrico.

ROOF DECKS
AWC provides seamless insulation slope-to-drains and dry application over concrete, metal and pre-stressed decks. See Sweets. (S)

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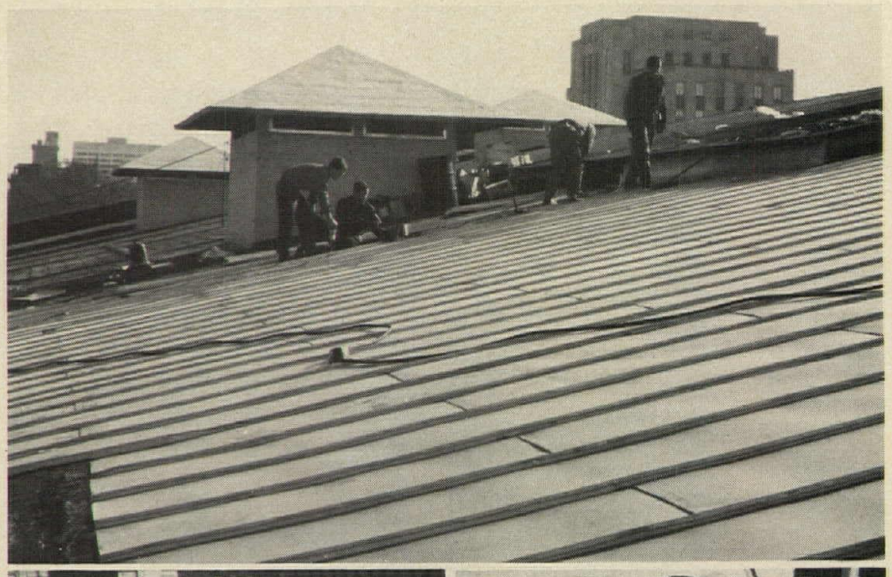
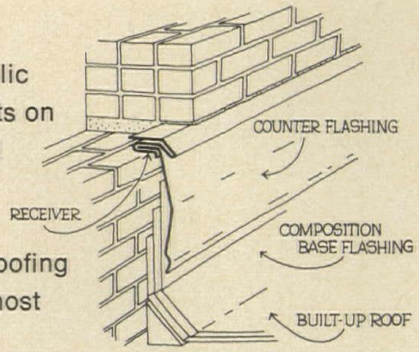
Sure cure for overhead overhead... Republic DUROFLASH stainless steel roofing sheets

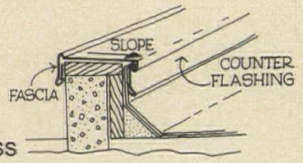
The Municipal Auditorium, Birmingham, Alabama, has a replacement roof of Republic DUROFLASH stainless steel covering 37,500 square feet. Installed over a concrete slab roofdeck. Former roofs had presented almost continuous leakage problems for more than 45 years. Complete satisfaction with the stainless steel roof has led city authorities to reroof an adjoining addition with Republic DUROFLASH stainless steel.



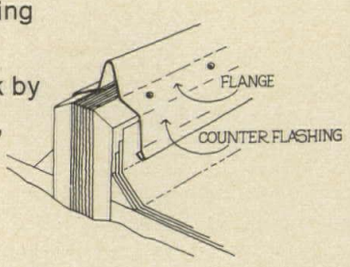
Costly roof maintenance and repairs are practically eliminated by installing Republic DUROFLASH® stainless steel roofing sheets on industrial and commercial buildings. Ideal on new construction. Or for reroofing older structures.



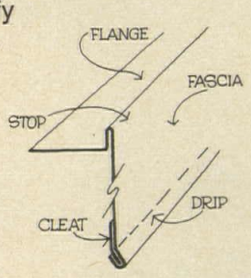
Republic DUROFLASH stainless steel roofing sheets are impervious to corrosion from most industrial and urban atmospheres. Keep their natural metallic color indefinitely without painting. Are tough to withstand impact and walking on. Yet are ductile enough to be sheared, formed, and flanged for economical application.



Roofers find Republic DUROFLASH stainless steel sheets easy to lay, shape, and flange because of their dead-soft condition. Standing seams, stops, and abutments are readily formed on the job with minimum springback by flanging or malleting to provide permanent, leakproof barriers. Standard soldering materials and techniques enable any competent journeyman to solder weather-tight seams and joints quickly.



You can confidently recommend and specify Republic DUROFLASH stainless steel for any type of roof, gutters, flashings, and downspouts.



WRITE for our architect's booklet, "Designing and Specifying Stainless Steel for Built-up Roofs and Moisture Protection Systems." Republic Steel Corporation, Cleveland, Ohio 44101.

Republicsteel

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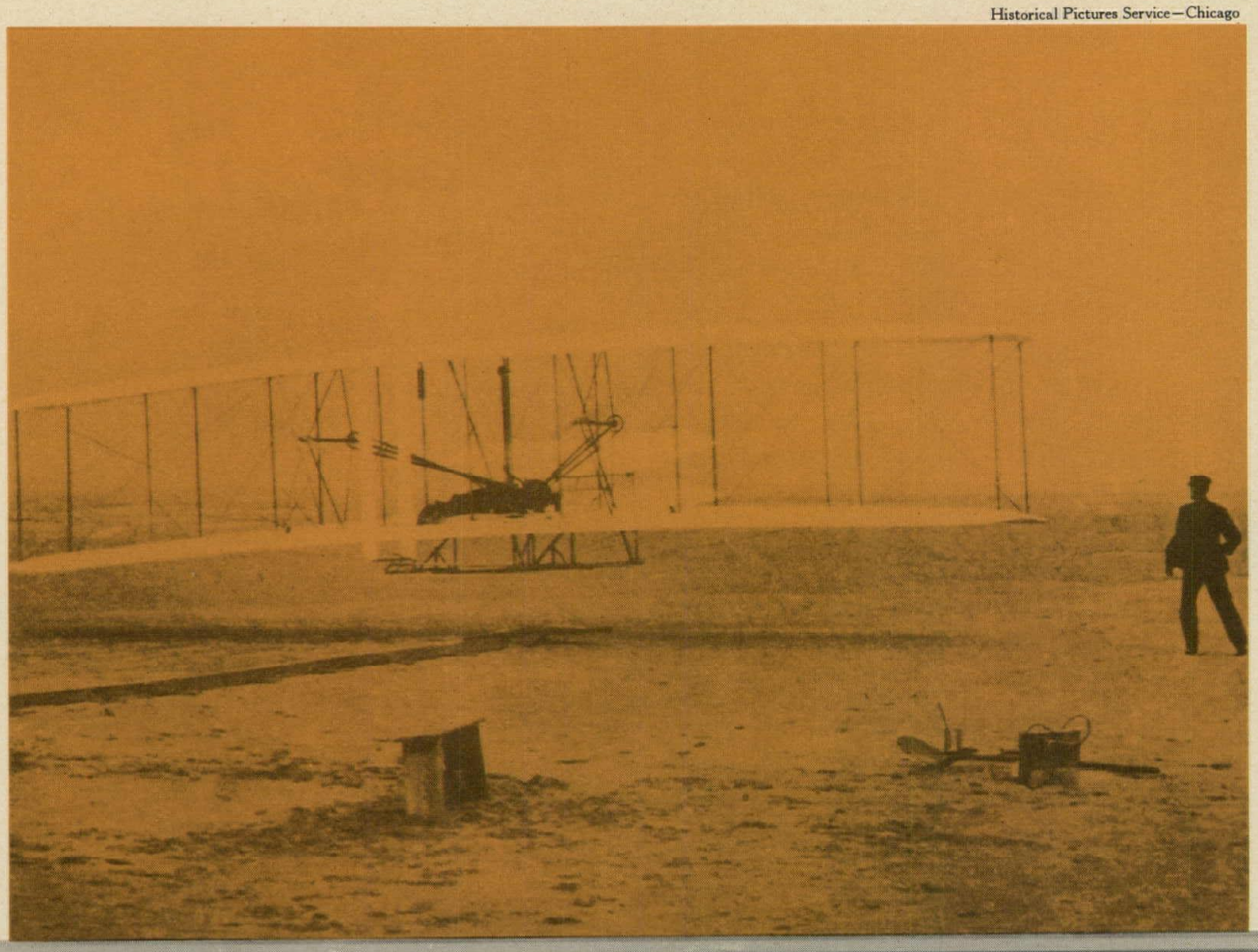
Historical Pictures Service—Chicago



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The Wright Brothers would be pleased that many of America's leading airlines use a combination Autoquip lift, platform, and roller system . . . the Lift-A-Weigh . . . that handles all types of raw material loads . . . whether on wheels, rollers, skids, or pallets.

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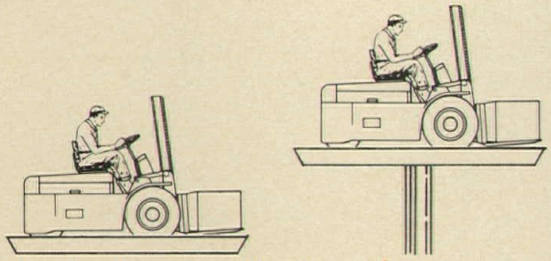

Write for description, literature and price.

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CURRENT TRENDS IN CONSTRUCTION

Robert M. Young
Manager, Economic Research
McGraw-Hill Information Systems Company

Where is the money coming from? Part 1: the problem

Construction's step-child, the high cost of money, is boosting inflation and throttling home building. Here is a summary of the situation. Next month, some possible solutions.

The demand for construction of all types has, of course, risen sharply in recent years, while the means of satisfying this demand have been in short supply. The result has been a sharp run-up in building costs, averaging over five per cent a year in the latter half of the Sixties. Labor shortages, increasing costs of building materials, outdated zoning requirements and union labor practices have all been cited as contributing to inflation in construction. This list is incomplete without adding money—or the cost of *financing* new construction. The interest charge on prime commercial paper doubled from 4.38 to 8.84 between 1965 and the end of 1969, while new home mortgage yields rose from 5.46 per cent to 8.62 per cent. The latter has the effect of adding over $10,000 to the cost of a $20,000 twenty-five year mortgage.

Looking behind the higher cost of money, we find the causes are similar in many respects to those behind rising labor and materials prices. Demand for funds to finance construction, inventories, equipment and other capital needs, as well as Federal government budget deficits, has exceeded the level that could be supplied even by normal growth in the money supply. And, just as union rules may affect the supply of labor, Federal Reserve actions can regulate the supply of money. So the "natural" shortage of investible funds has been aggravated recently by an "artificial" shortage in the form of a tight money policy. Construction gets a double jolt from this situation: Like everyone else, builders and buyers have to pay a higher price to finance their activities; in addition, however, a large chunk of the construction industry is hampered by absolute prohibitions on the amount that can be spent in the form of mortgage rate ceilings imposed by many states. Even builders of nonresidential structures have to balance the high cost of financing against the expected long-run return on their investment.

All this means that the construction industry has found itself in a kind of vicious circle. It has contributed to the high cost of money by an almost insatiable demand for funds to finance construction of new factories, office buildings, apartments, utilities and other structures during the last half of the Sixties. At the same time, high interest rates tend to shut out building—especially new homes—sooner than any other type of economic activity. And this in turn aggravates a situation in which demand far outstrips supply.

Can this circle be broken? Will the sharply increased demands for housing and commercial and industrial building projected for the Seventies be matched by sufficient growth in the capital funds market to supply not only construction money, but also financing for consumer goods and government needs? The answers to these questions depend, of course, on how realistic the projections of national growth and demands for capital goods are.

The Council of Economic Advisors, as well as most private projections, looks for an annual average growth rate of 4.3 to 4.6 per cent in the next decade. Adding a conservative 2.5 per cent annual rise in prices, this would put GNP in the mid-Seventies around 1.4 trillion dollars—about 50 per cent above the 1969 total. Business investment in plant, equipment and inventories necessary to support this level of output would have to jump almost 60 per cent. Outlays for consumer durables are expected to rise at the same rate; while state and local capital expenditures—largely for education—will grow at a somewhat lower rate. Projections of housing demand call for at least a 70 per cent increase in expenditures. The demand for capital funds will outstrip the growth of the economy—and construction's share of this demand will apparently rise.

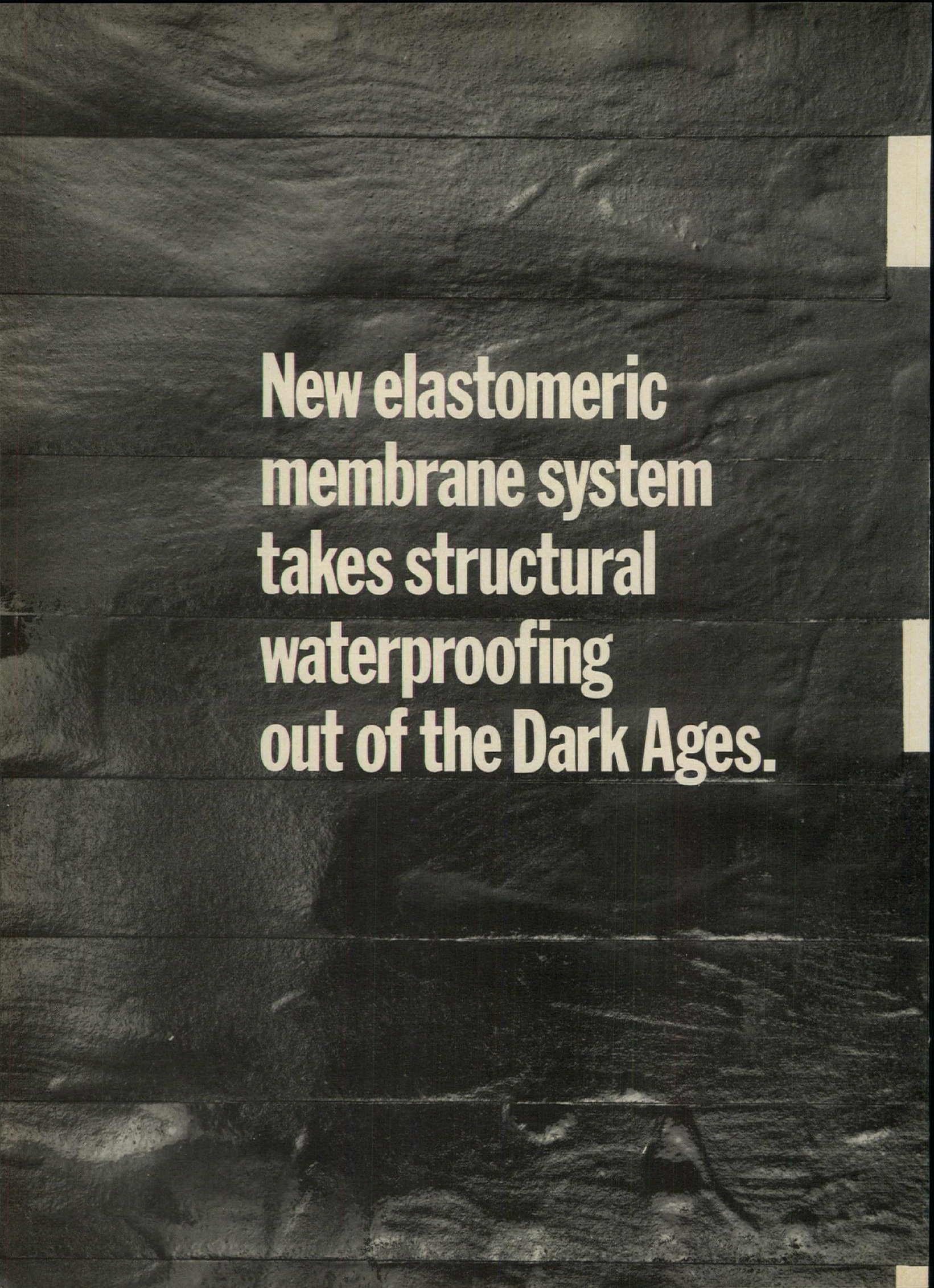
There will probably be enough money to finance the total investment needs of the economy. It will undoubtedly be more expensive than it was in the early Sixties, especially if the growth in the money supply is checked by balanced or surplus Federal Government budgets in the next few years. (A major reason for the rapid growth in the money supply—and in inflation—in the late Sixties was a string of Federal budget deficits that peaked at over $25 billion in 1968. Even so, the demand for capital funds grew faster than the supply of money, and interest rates climbed steadily.) At the same time, it's likely that money will be channeled through the capital markets differently than it has been in the past. Time deposits in banks and savings institutions will be increasingly bypassed in favor of direct investment in corporate bonds and other high yielding securities unless interest limitations on deposits are lifted. Private, state and local pension funds have been growing at twice the rate of insurance company assets in recent years, and their investment policies will exert a major influence on the distribution of capital funds in the Seventies. Finally—and perhaps most crucial—will be the priorities of Federal Government spending programs.

What does all this mean for construction? The table below lists the estimated principal sources of construction money in 1968 and the projected needs for 1975, assuming that each type of construction is financed essentially the same way it is today. The categories that will need to undergo the greatest growth—mortgages and Federal Government funds—are the two that, for different reasons, have historically shown the least capacity to expand in time of need. The ability of the construction industry to meet the demands of the Seventies, then, will depend largely on the development of a more flexible mortgage market and a shift in national budget priorities.

Although there is good reason to believe that the latter will begin to favor programs that will support construction—especially housing—history suggests that the changes will be slow and hard won. Following a decade of continuous Federal budget deficits, with their inflationary bias, top priority will no doubt be given to matching total government spending to receipts.

SOURCES OF CONSTRUCTION FINANCING
(billions of dollars)

1968 (estimated)		1975 (projected)
11	State & municipal govts.	16
16	Federal Government	31
22	Mortgages	39
9	Corporate borrowings	14
27	Other cash flows	39
85	**Total construction**	**139**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takes structural
waterproofing
out of the Dark Ages.

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For more information, and the name of your nearest Thiokol licensed formulator, write to Mr. Dan Petrino, Thiokol Chemical Corporation, P.O. Box 1296, Trenton, N.J. 08607.

One-step application

No need to prime the concrete. The liquid membrane also eliminates splicing, sealing tapes, adhesives and other time-consuming methods required by conventional waterproofing systems. Result: easier, faster application that cuts labor costs and speeds work schedules.

Seamless...even around pipes

Forms a continuous, 60-mil thick rubbery membrane on any configuration of vertical or horizontal surfaces.

Impermeable...even under water

An inert membrane that protects its underlying areas from water penetration. For above or below grade applications. Totally waterproof...even when immersed in water.

Bonds to substrate

Develops an adhesive bond to concrete and other structural materials as it cures. Even if membrane were mechanically pierced, there would be no lateral movement of water between membrane and substrate.

Unsurpassed flexibility

Expands and contracts with the substrate. Won't crack or become brittle. Maintains its bond and waterproofing properties in temperatures as low as −40° F.

Chemical and bacteria resistant

Offers high resistance to bacteria and the effects of oil, gasoline, jet fuels, dilute acids, and alkali solutions.

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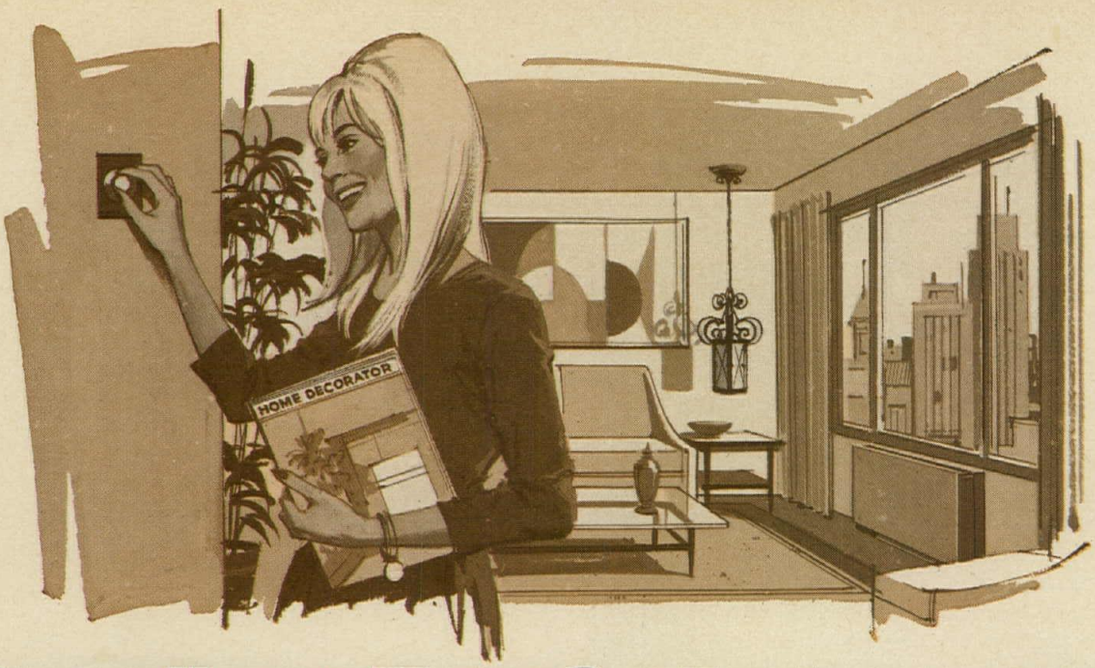
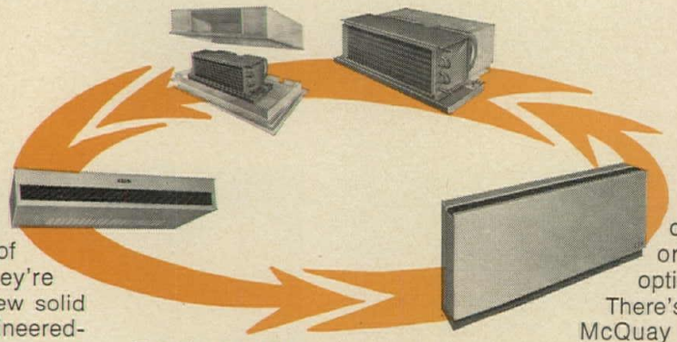


The silent Fan Coil generation turns on solid-state comfort in a McQuay environment.



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INDEXES AND INDICATORS

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

WHAT'S BEHIND COST TRENDS

While slowly easing interest rates and new Federal efforts to encourage the release of mortgage money from non-traditional sources, may soon increase the rate of single family housing starts, at least one inhibiting effect remains in the current rise in lumber and plywood prices. Although, in response to market conditions, those prices dipped sharply last year and are still at a level only 60 to 70 per cent of year-ago prices, their annual rate of increase is still steadily upward. Wood product prices won't fluctuate as they did last year but certainly will not return to previous low levels. The current lumber and plywood price increases are predicated upon producers' need to continue in business profitably. Thus they are not so responsive to market conditions and are just one more built-in increase to consider as a part of the total that is inching up to a national average of 10 per cent per year.

Building cost indexes

The information presented in the tables indicates trends of building construction costs in 35 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.

The indexes are computed on a basis of 40 per cent labor rate and 60 per cent materials price. Wage rates for nine skilled trades, together with common labor, and prices of four basic building materials are included in the index for each listed city.

Differences in costs between two cities can be compared by dividing the cost differential figure of one city by that of a second.

1941 average for each city = 100.00

MAY 1970

Metropolitan area	Cost differential	Current Index residential	Current Index non-res.	% change year ago res. & non-res.
U.S. Average	3.5	302.8	322.5	+ 7.80
Atlanta	7.5	382.5	405.7	+ 9.69
Baltimore	7.6	310.2	329.9	+ 3.79
Birmingham	7.2	286.6	308.1	+ 5.08
Boston	8.4	288.3	305.2	+ 7.96
Buffalo	9.2	334.9	356.7	+ 9.03
Chicago	8.8	350.1	368.2	+ 6.33
Cincinnati	9.0	318.0	338.0	+ 7.27
Cleveland	9.8	344.0	365.6	+ 7.27
Columbus, Ohio	9.0	323.7	344.8	+ 7.19
Dallas	7.7	304.1	314.0	+ 7.95
Denver	8.3	327.4	348.0	+ 8.21
Detroit	9.5	343.0	360.1	+ 8.61
Houston	8.1	296.2	315.5	+11.20
Indianapolis	8.8	287.5	306.2	+ 6.42
Kansas City, Mo.	8.3	289.5	306.4	+ 7.28
Los Angeles	8.3	324.3	354.9	+ 6.90
Louisville, Ky.	8.1	299.0	318.5	+ 8.58
Memphis	7.6	289.6	308.5	+ 5.56
Miami	8.6	326.8	343.1	+ 9.12
Milwaukee	9.2	357.5	380.7	+ 8.25
Minneapolis	8.9	325.7	346.2	+ 9.86
Newark	8.9	298.3	317.7	+ 7.82
New Orleans	7.9	292.7	310.2	+ 6.84
New York	10.0	334.8	360.1	+ 7.98
Philadelphia	8.6	317.5	333.3	+ 7.86
Phoenix	8.2	168.3	179.2	+ 6.71
Pittsburgh	9.1	302.2	321.2	+ 6.58
St. Louis	9.2	321.3	340.4	+ 9.17
San Antonio	8.1	122.2	130.1	+ 7.64
San Diego	8.2	122.6	130.6	+ 7.70
San Francisco	8.9	426.3	466.4	+ 9.43
Seattle	8.6	299.5	334.7	+ 9.80
Washington, D.C.	7.9	278.1	296.2	+ 8.23

Cost differentials compare current local costs, not indexes.

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

1941 average for each city = 100.00

Metropolitan area	1962	1963	1964	1965	1966	1967	1968	1969 (Quarterly) 1st	1969 (Quarterly) 2nd	1969 (Quarterly) 3rd	1969 (Quarterly) 4th	1970 (Quarterly) 1st	1970 (Quarterly) 2nd	1970 (Quarterly) 3rd	1970 (Quarterly) 4th
Atlanta	298.2	305.7	313.7	321.5	329.8	335.7	353.1	364.2	365.9	382.8	384.0	399.9			
Baltimore	271.8	275.5	280.6	285.7	290.9	295.8	308.7	311.4	313.0	321.8	322.8	323.7			
Birmingham	250.0	256.3	260.9	265.6	270.7	274.7	284.3	288.4	289.9	302.4	303.4	303.5			
Boston	239.8	244.1	252.1	257.8	262.0	265.7	277.1	278.2	279.6	294.0	295.0	300.5			
Chicago	292.0	301.0	306.6	311.7	320.4	328.4	339.5	340.4	342.1	354.9	356.1	362.2			
Cincinnati	258.8	263.9	269.5	274.0	278.3	288.2	302.6	309.8	311.5	324.8	325.8	332.8			
Cleveland	268.5	275.8	283.0	292.3	300.7	303.7	331.5	334.9	336.7	357.1	358.3	359.7			
Dallas	246.9	253.0	256.4	260.8	266.9	270.4	281.7	287.2	288.7	307.6	308.6	310.4			
Denver	274.9	282.5	287.3	294.0	297.5	305.1	312.5	317.9	318.5	337.9	339.0	343.4			
Detroit	265.9	272.2	277.7	284.7	296.9	301.2	316.4	326.8	328.5	351.8	352.9	355.2			
Kansas City	240.1	247.8	250.5	256.4	261.0	264.3	278.0	281.0	282.3	294.5	295.5	301.8			
Los Angeles	276.3	282.5	288.2	297.1	302.7	310.1	320.1	323.7	325.4	343.0	344.1	346.4			
Miami	260.3	269.3	274.4	277.5	284.0	286.1	305.3	309.6	311.2	328.3	329.3	338.2			
Minneapolis	269.0	275.3	282.4	285.0	289.4	300.2	309.4	310.6	312.2	330.1	331.2	341.6			
New Orleans	245.1	248.3	249.9	256.3	259.8	267.6	274.2	285.5	287.1	296.6	297.5	305.4			
New York	276.0	282.3	289.4	297.1	304.0	313.6	321.4	324.9	326.6	343.4	344.5	351.1			
Philadelphia	265.2	271.2	275.2	280.8	286.6	293.7	301.7	304.6	306.2	320.0	321.0	328.9			
Pittsburgh	251.8	258.2	263.8	267.0	271.7	275.0	293.8	297.0	298.6	310.0	311.0	316.9			
St. Louis	255.4	263.4	272.1	280.9	288.3	293.2	304.4	306.8	308.3	323.7	324.7	335.2			
San Francisco	343.3	352.4	365.4	368.6	386.0	390.8	402.9	415.6	417.5	439.9	441.1	455.4			
Seattle	252.5	260.6	266.6	268.9	275.0	283.5	292.2	296.1	297.5	316.8	317.8	325.4			

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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1. Wood costs less than steel

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1. Less concrete needed.

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To lay Tensilform, all you do is drop the sheets across the supports. Two men can do it in a matter of minutes. Again, money saved.

3. No time or labor spent in stripping Tensilform.

Since Tensilform is a permanent concrete form, you don't have to strip it. More money saved.

4. No time or labor spent in erecting scaffolding.

Since you don't need any scaffolding when you lay Tensilform, you don't spend any time erecting it. More money saved.

5. No time or labor spent in dismantling scaffolding.

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6. Other trades can work on Tensilform before pouring.

Tensilform sheets, when laid across the supports and spot-welded, are sturdy enough for workmen to walk on. Which means electricians, plumbers and other trades can do their work and move on before the cement is poured. These trades earn too much money to sit around waiting for cement to dry.

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Wheeling Corrugating Co., Div., Wheeling-Pittsburgh Steel Corp., Wheeling, W.Va.

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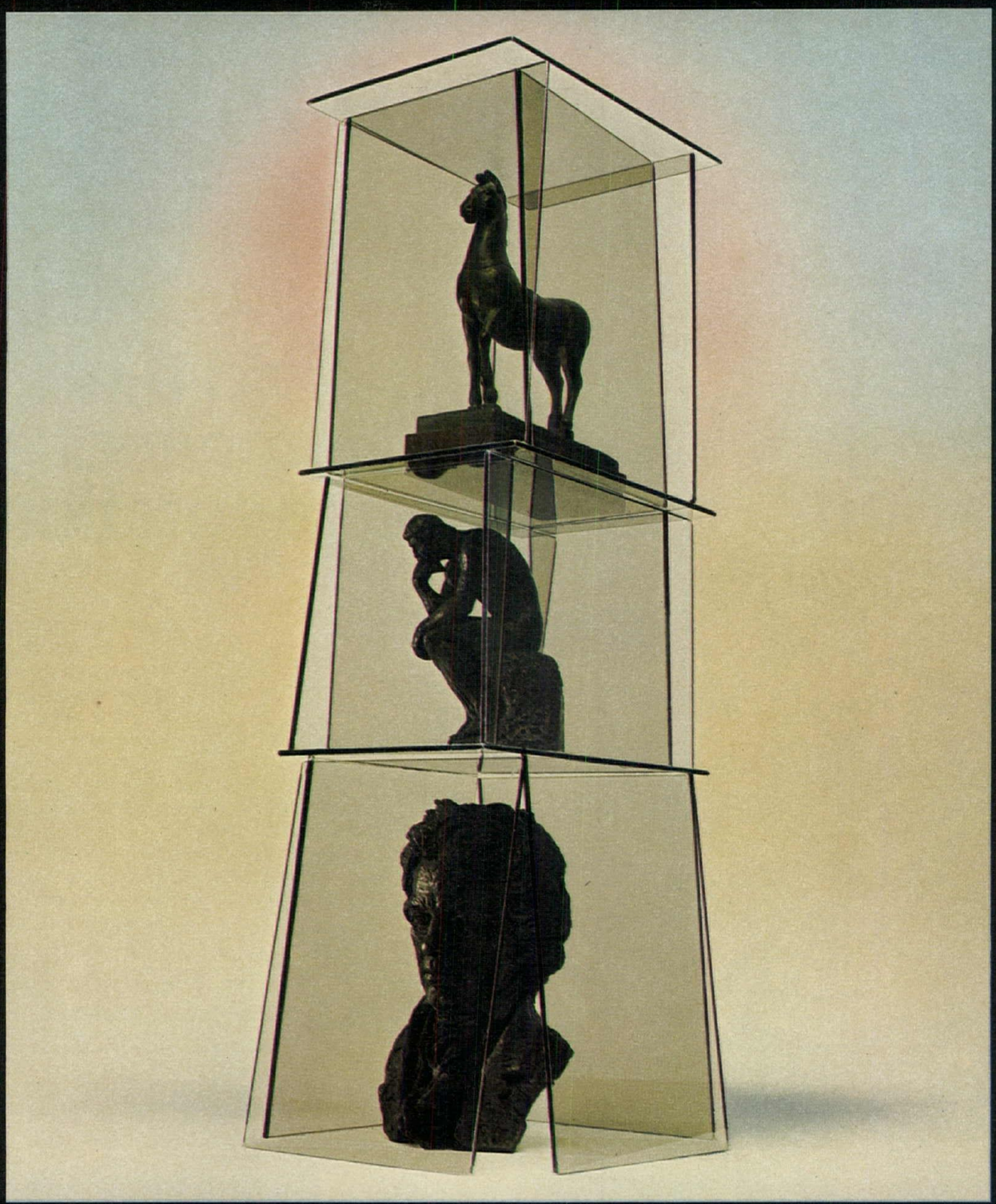

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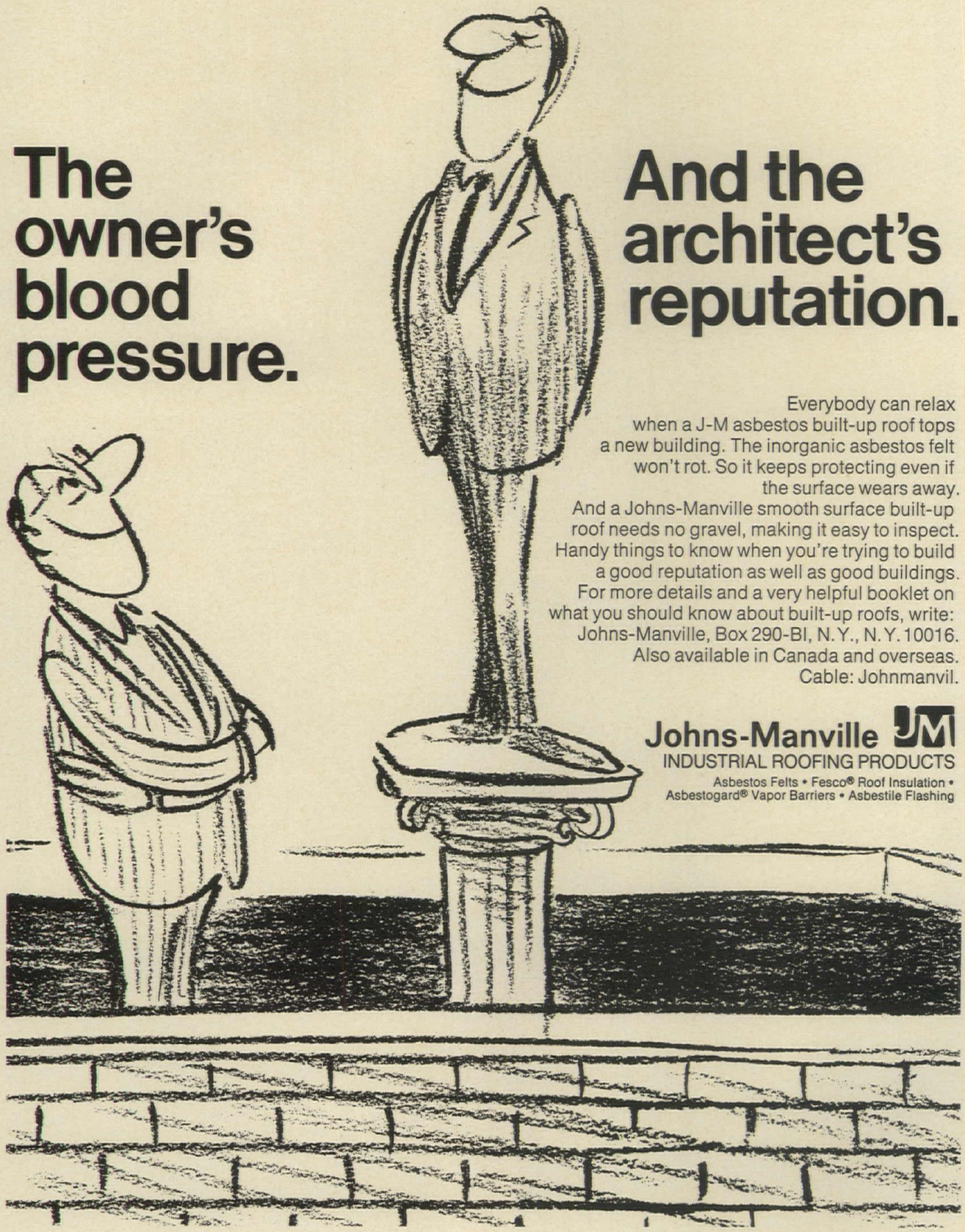

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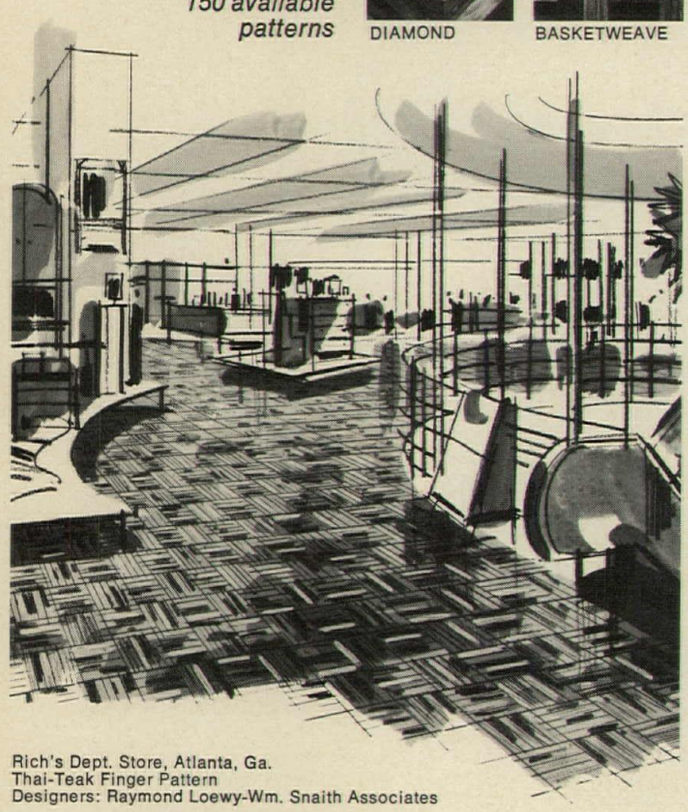

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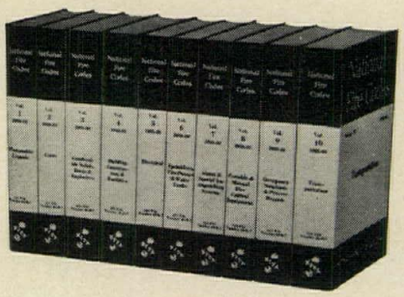

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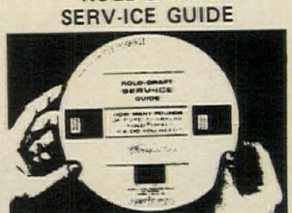

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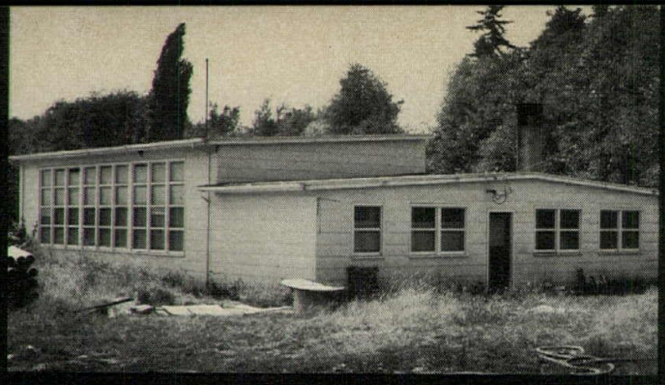
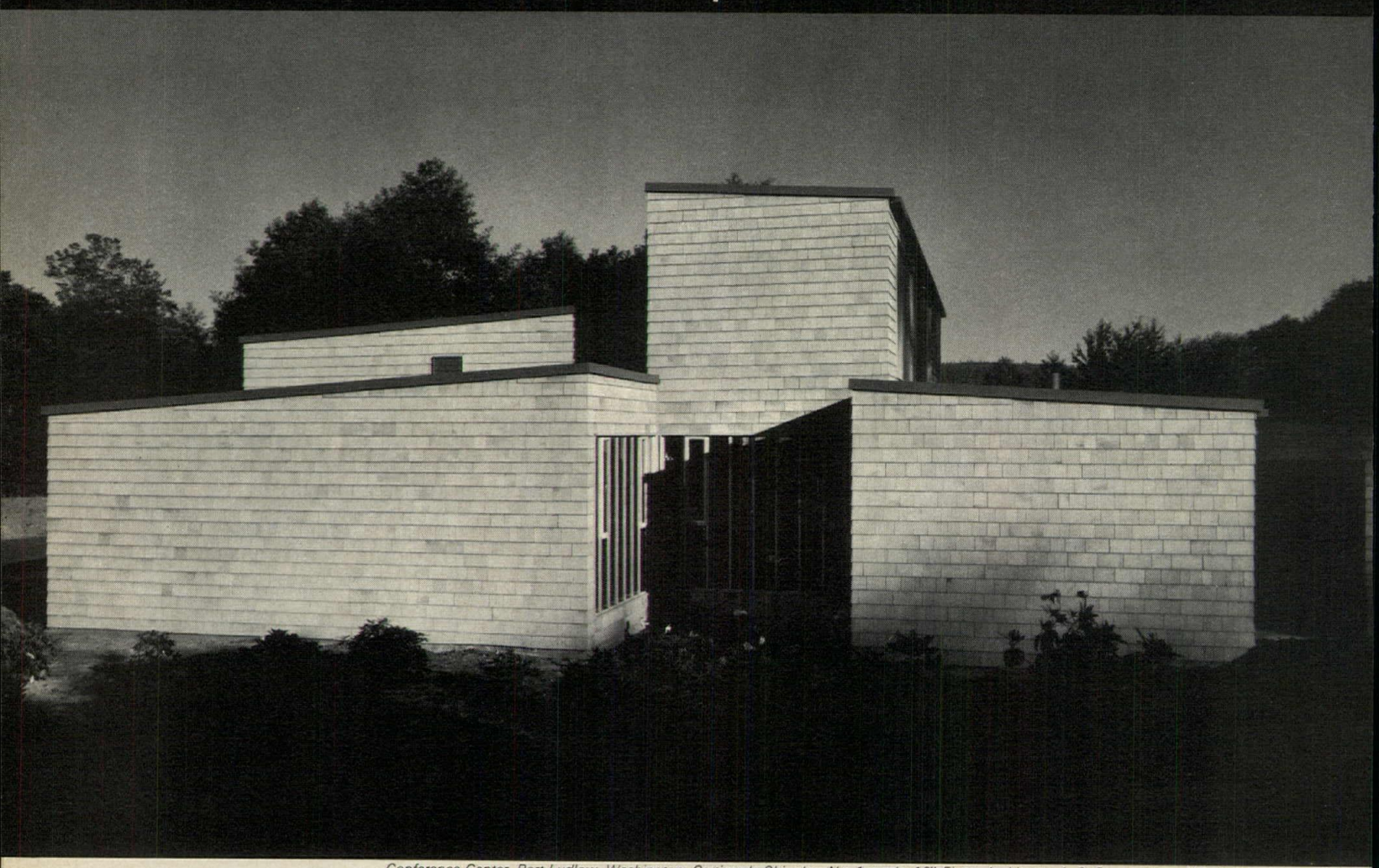
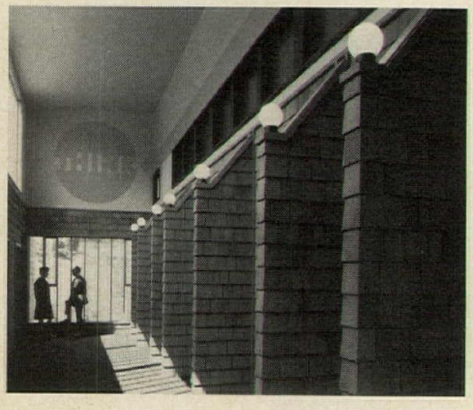


Red cedar shingles make an old place a showplace.



Conference Center, Port Ludlow, Washington. Certigrade Shingles, No. 1 grade, 16" Fivex. Architects: A. O. Bumgardner, AIA, & Associates



Needing a multi-purpose conference center, developers of an exclusive Northwest resort community completely remodeled a long-abandoned school building which had been on their property. The result is this "new" structure featuring imaginative applications of red cedar shingles inside and out.

The foyer with its richly textured cedar surfaces opens onto seminar rooms, an auditorium and restrooms. Outside, shingle sidewalls project severe block forms that nevertheless blend effortlessly into the rustic environment.

The use of red cedar is both beautiful and practical. These shingles will retain their elegant appearance for decades without maintenance. They are naturally insulative. And they'll withstand even hurricane winds.

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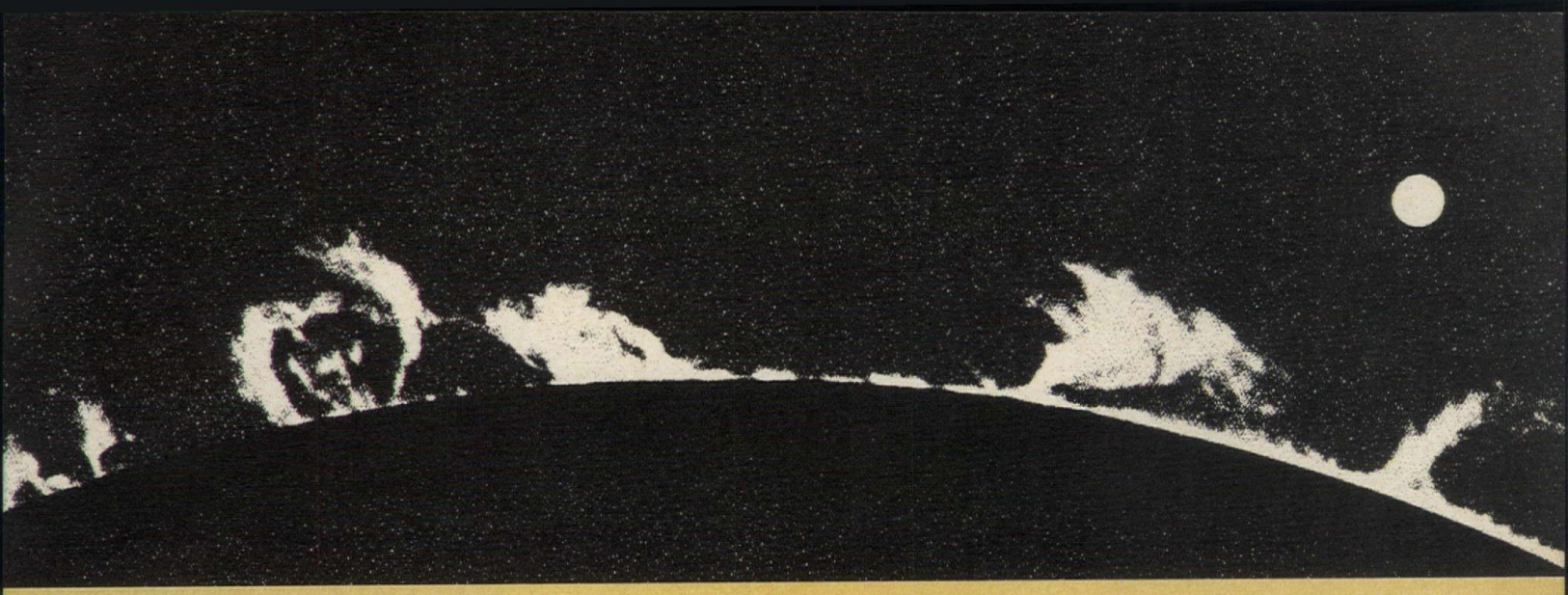

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	Heavyweight	.53	.36
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	Heavyweight	.46	.25

ZONOLITE

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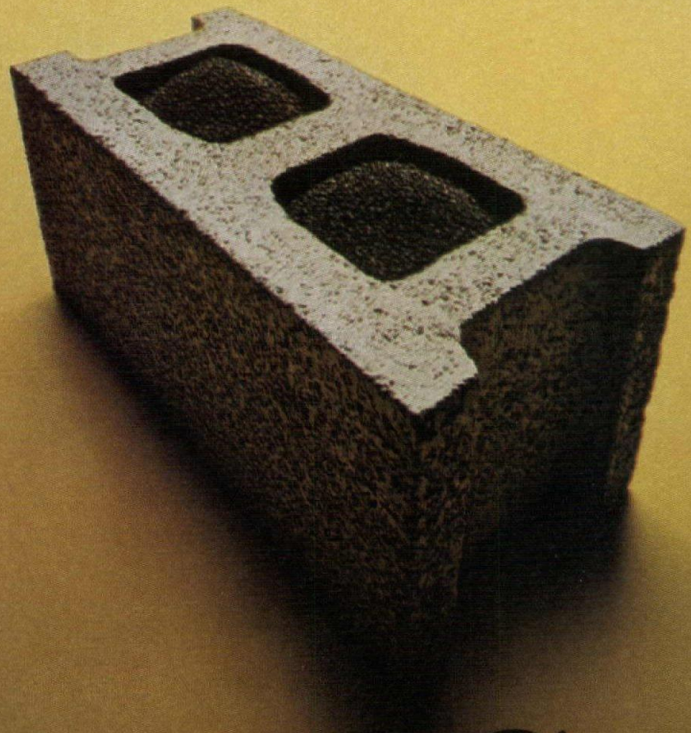

Just say Grace.

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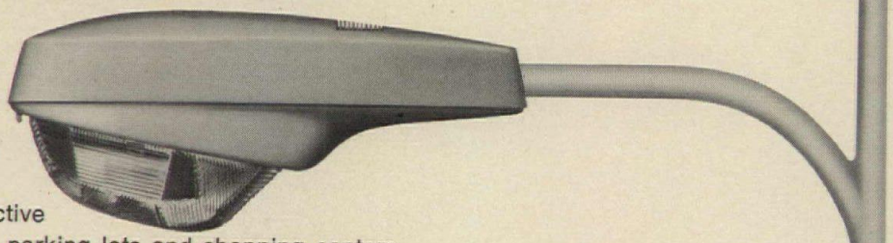
Landmark is performance in lighting



Landmark Horizontal Luminaires are designed for functional and esthetical performance. They are especially effective for teamwork lighting of areas such as parking lots and shopping centers. Landmark horizontals resist weathering, withstand excessive vibration and are positively sealed against contamination. Mercury and metallic vapor from 100 through 1000 watts in three compatibly sized profiles. Contact your electrical distributor, or write for catalog.

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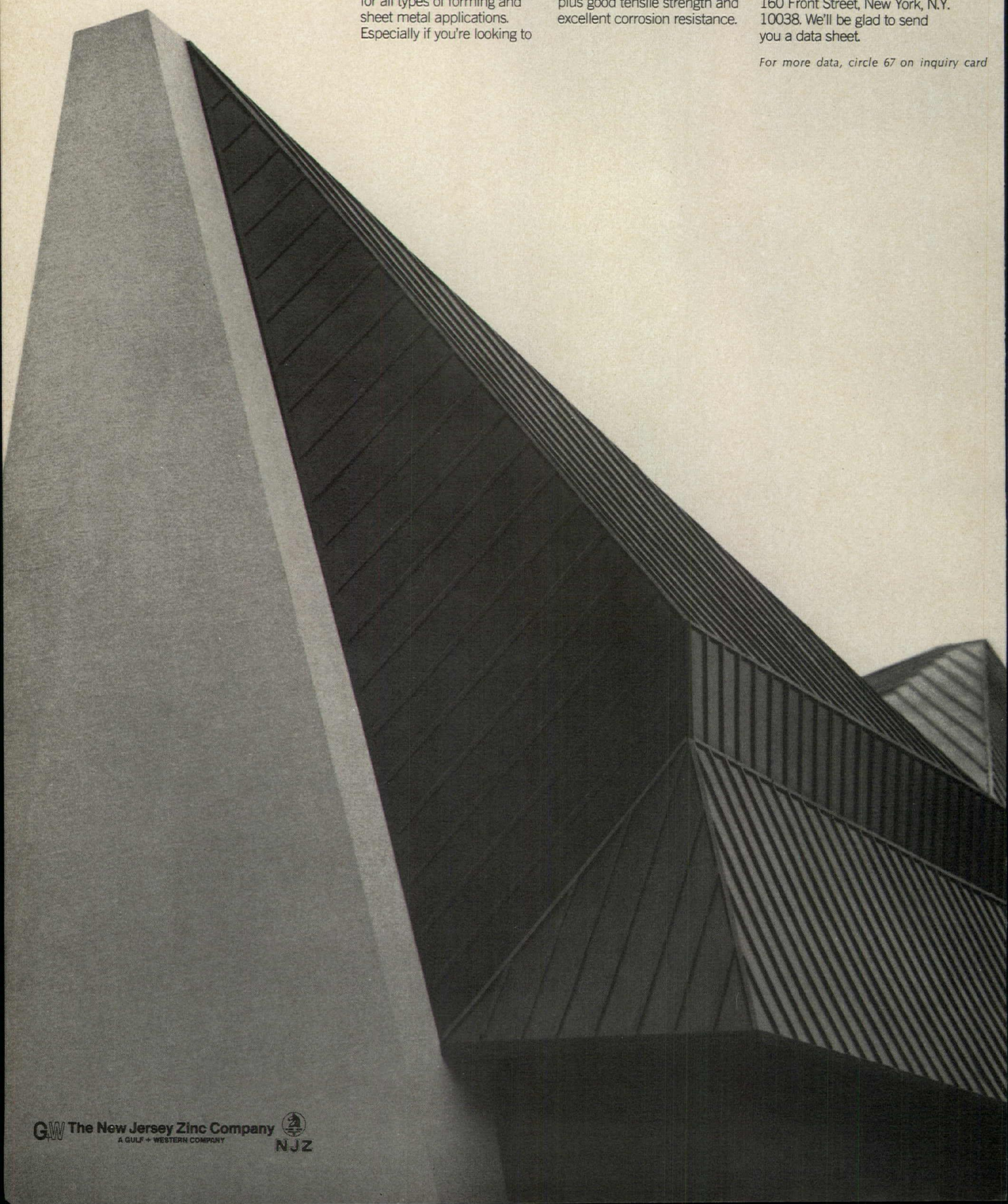

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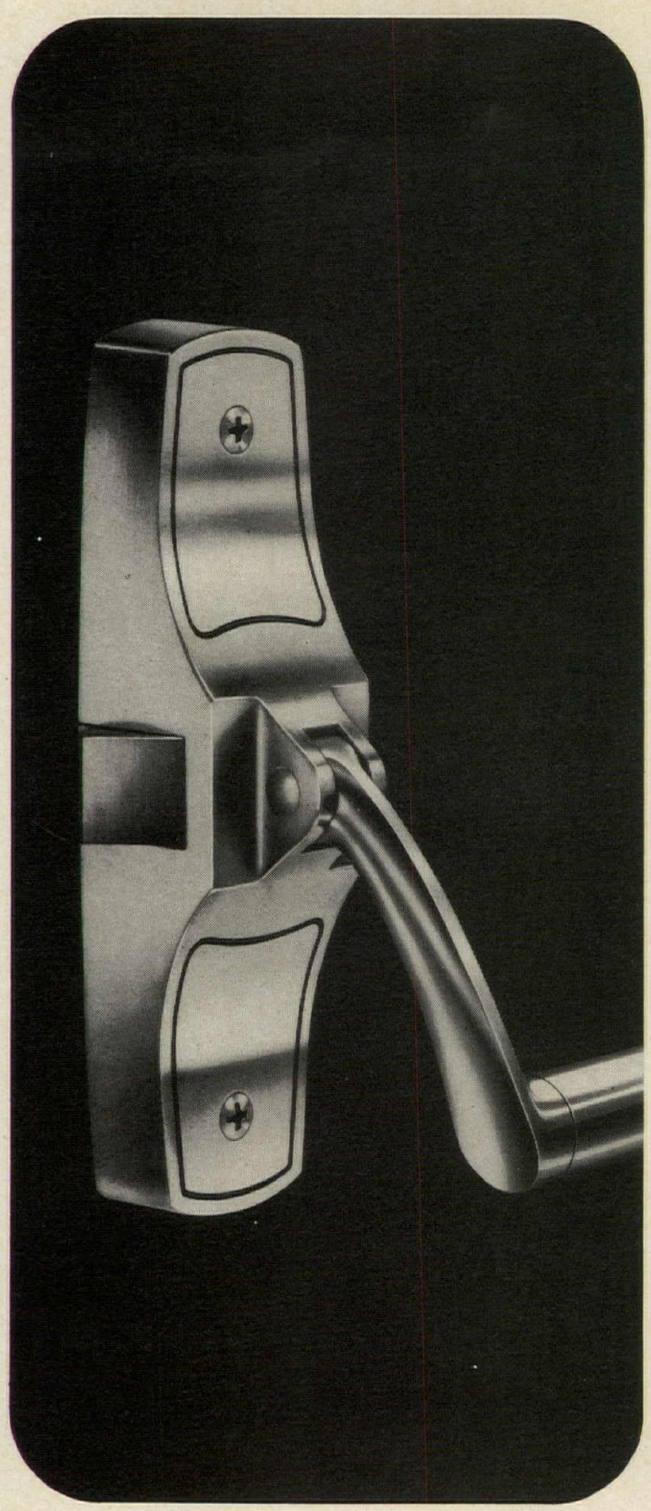

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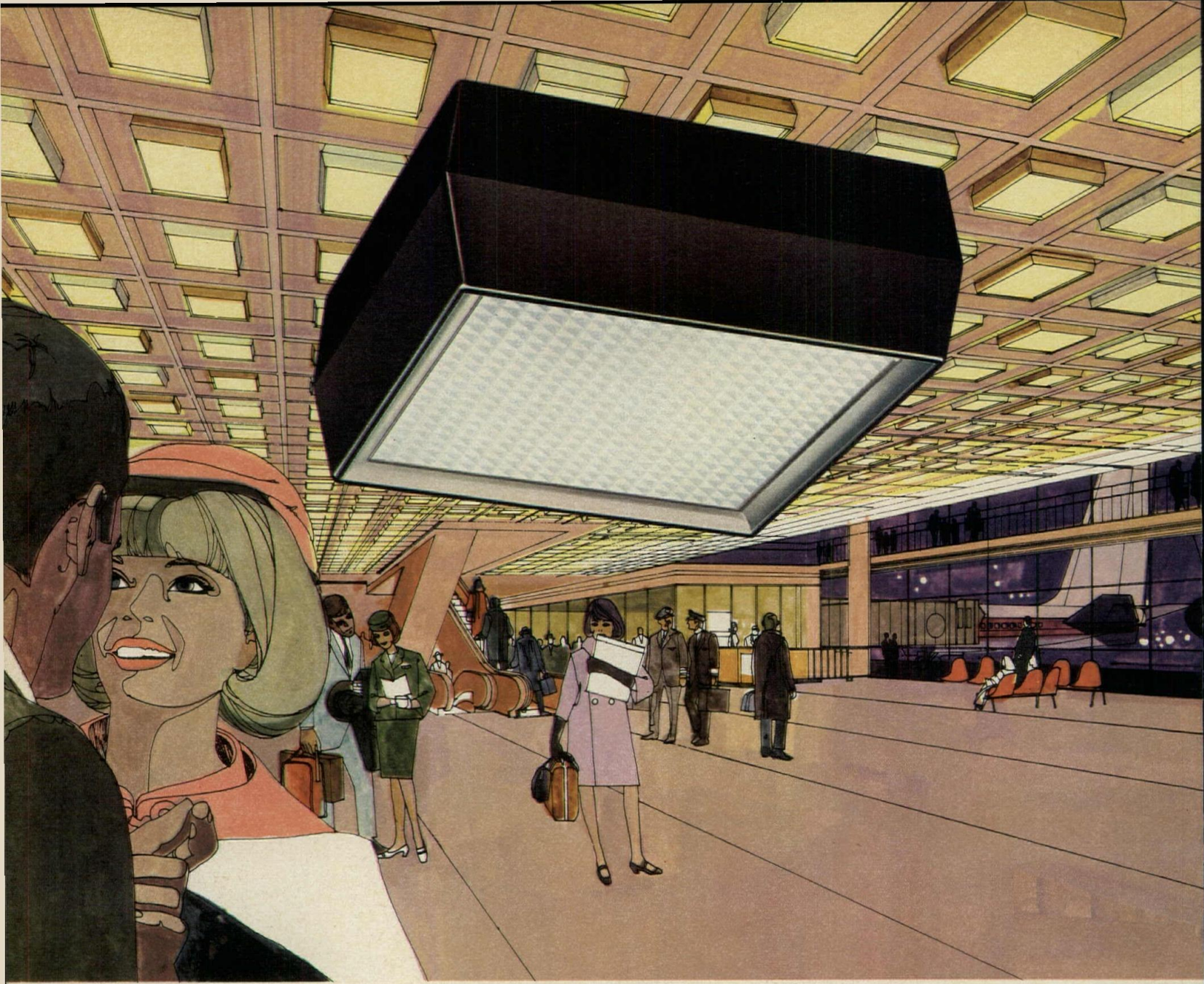

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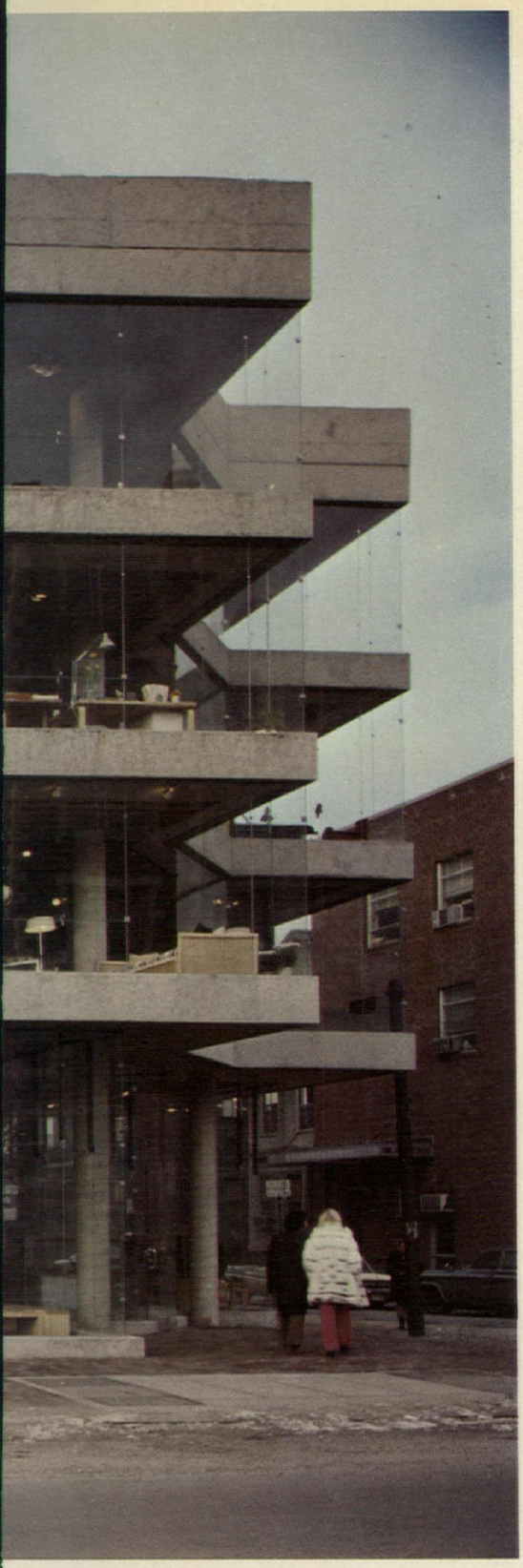
BRIGHT GLASS PRISM ON BRATTLE STREET

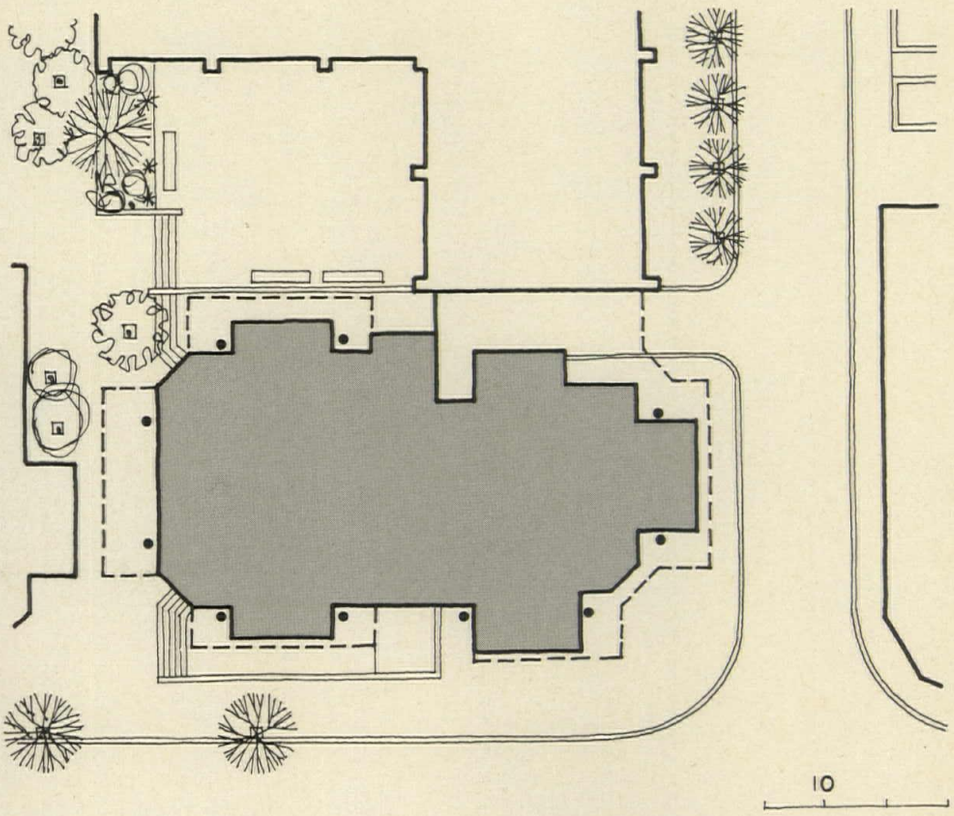
Brattle Street in Cambridge, Mass. leads away from historic Harvard Square. It still has trees and some handsome old clapboard houses, though it is fast developing to meet the needs of the thousands of students who make it a busy and bustling place. The newest addition to Brattle Street is architect Benjamin Thompson's Design Research building—headquarters (there are now branches in New York and San Francisco) for the retail business he formed in 1953 to sell "modern environment"—furniture, lamps, rugs; fabrics, dresses, umbrellas; glassware and dishes and kitchenware and candlesticks. For this special kind of store on this special kind of street, architect Thompson has designed for client Thompson a special kind of building. . .

As you walk along Brattle Street, the Design Research building fairly bursts upon you. For by day or night, its all-glass walls glisten with changing color and light. By day, depending on the color of the sky and the angle from which the many facets of the building are viewed, the building reads as a shimmering opaque shape, or an always changing pattern of the displays inside. By night, brightly lighted, the color from inside is even more demanding; and the movement of people inside adds to the kaleidoscope. So the building is a showcase, with what is and what happens inside an integral and critical part of the design.

For Thompson, this building is somewhere on the revolutionary side of evolutionary. As RECORD pointed out two years ago: "He is not a 'form-giver', and does not seek to develop for each client. . . new spatial and structural concepts. . . . So far, all of his commissions have been designed within a simple and consistent vocabulary."

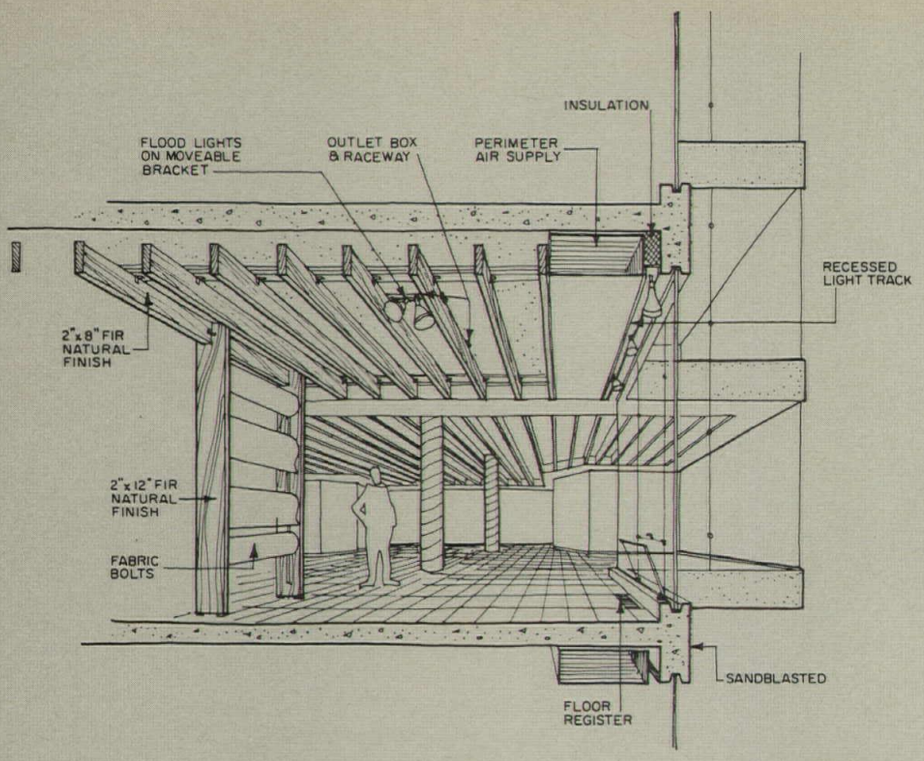
But, again, this building seems special. Thompson emphasizes the importance of the collaborative process both with his long-time associate Thomas Green and with the D/R design staff. "Many years of interaction," says Thompson, "between our architectural group and the store design group made the client/architect relationship a molding of halves of a single philosophy, and the result is, I think, more than a sum of the halves. I have a perhaps mystical feeling that this building could only have happened in Cambridge, against the background of its

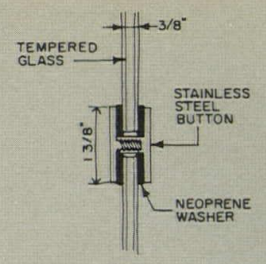


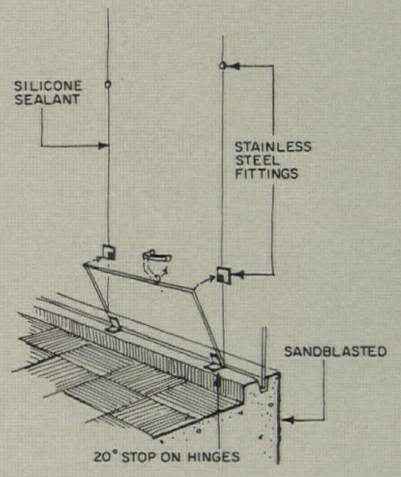


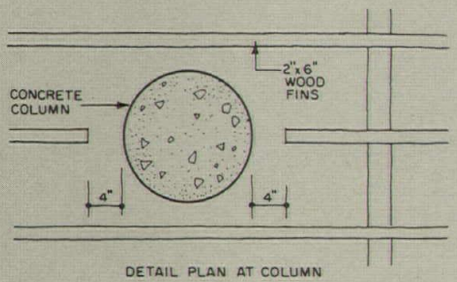
supercharged design orientation."

But in a general sense, this building may show the way to a non-building of transparency, using both reflection and absorption of light. It is not a pure rigid box, but a constantly changing volume that plays back many visions. This visual concept, plus the use of open corners to preserve vista and scale, perhaps points the way to a method of glass building that could create a warmer city, adding color and light and optimism to the life of the streets.

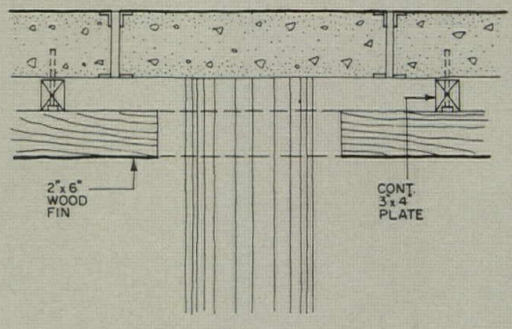




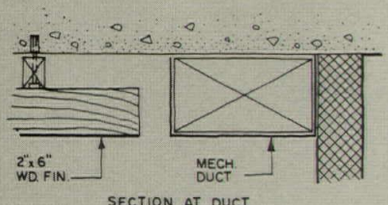




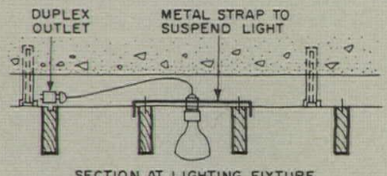
DETAIL PLAN AT COLUMN



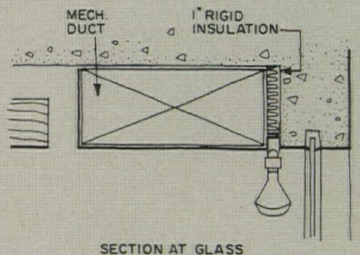
DETAIL SECTION AT COLUMN



SECTION AT DUCT



SECTION AT LIGHTING FIXTURE



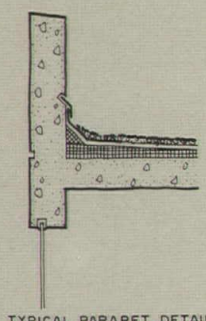
SECTION AT GLASS

Creating the image shown on the preceding pages required great attention to detail, but the result—as is so often the case when great attention *is* paid to detail—an almost elemental simplicity.

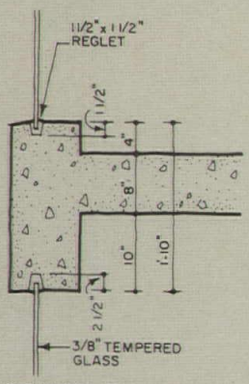
The basic construction is, of course, reinforced concrete, simple flat plate. The basic column spacing is 20 feet by 20 feet, and the slabs cantilever to a maximum of 12 feet. Throughout the interior the concrete is left unfinished, but the exterior faces of the perimeter beams are sandblasted.

The great sheets of glass are set back just 2½ inches into the perimeter beams so that the horizontal lines are minimized and the building is expressed as a volume, rather than as a structural shape. The glass is ⅜ inch thick, tempered; and set into reglets —1½ by 1½ inches at the sill, deeper (2½ by 1½ inches) at the head for installation. As the photo and the drawing above show, the sheets are clamped to each other by stainless fittings, and the spaces between sheets and at the sill and head are filled with a translucent silicone sealant.

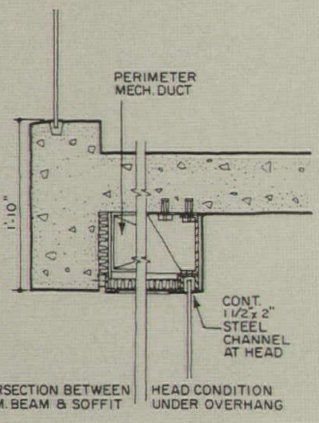
Extremely limited (9-foot, 4-inch) story heights were required so that the spandrels matched the spandrels of The Architects Collaborative office building (September, 1967), which is next door and which at one point abuts Design Research (see site plan, previous pages). Thus, to minimize floor thickness, there is no "finished" ceiling. Instead (see perspective above), 3-by 4-inch wood plates are fastened as required to the underside of the slab; they in turn receive



TYPICAL PARAPET DETAIL



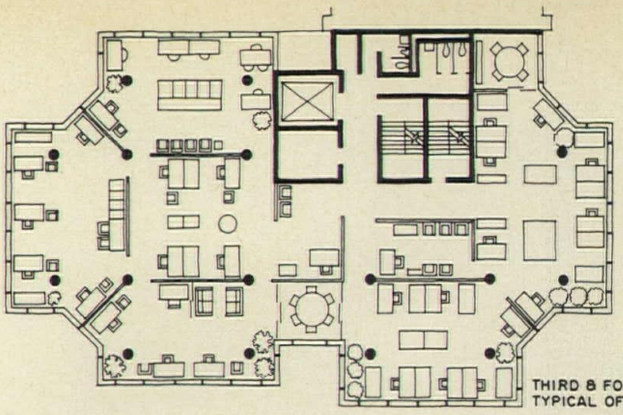
TYPICAL PERIMETER BEAM



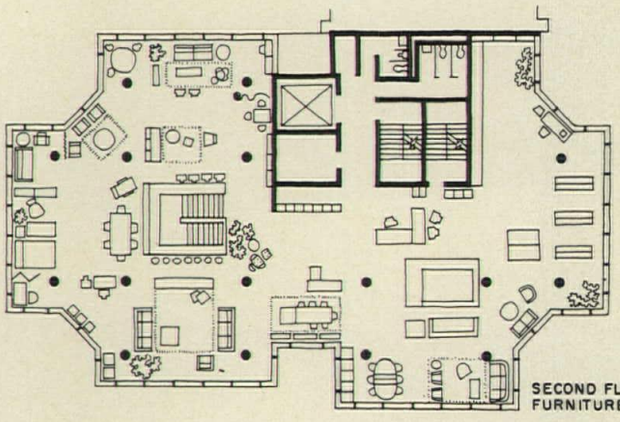
INTERSECTION BETWEEN PERIM. BEAM & SOFFIT

HEAD CONDITION UNDER OVERHANG

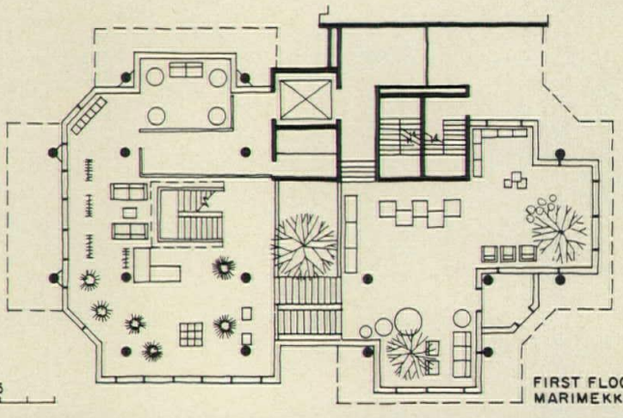
2- by 6-inch natural finish fir fins, 13 inches o.c., which form the ceiling in all of the store spaces. These fins are simply interrupted as required for the heating/air-conditioning ducts, which are 10 inches deep to maintain the ceiling plane. Lighting is by floodlights, mounted on simple and movable metal brackets hung from the tops of the fins, and served by cable set in spaces routed out of the top surface of the fins. The resulting system is not only inexpensive, but (see overleaf) exceedingly handsome.



THIRD & FOURTH FLOORS
TYPICAL OFFICE LAYOUT

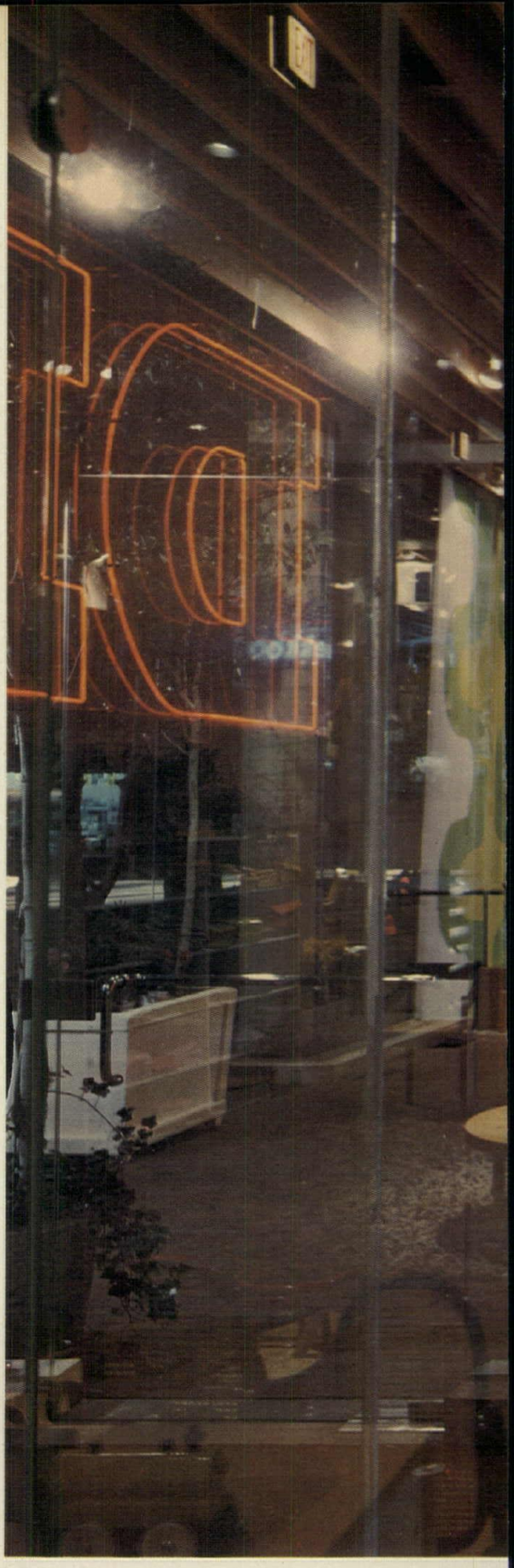


SECOND FLOOR
FURNITURE



5

FIRST FLOOR
MARIMEKKO



In most stores and shops, you are primarily aware of displays. At Design Research, you are aware first of what is on sale—the rugs, the furniture; your eye directed by the use of lighting, or a huge panel of fabric, or the color of a rack of dresses. Then you are aware of the architectural background—the plane of the ceiling or the great walls of glass. Then, especially above ground level, you become aware of the street and the city beyond; for just as the displays inside give the exterior its color, the views to the out-

side are a critical part, a critical impression, of being in the building.

There are 27,000 square feet of floor space on seven levels (though there are essentially four floors above grade and a sunken ground level visible and accessible from the street). The reception area (photo above) is story-and-a-half high, offering glimpses into the display areas both above and below. This flow of space and color continues through the building, as shoppers move up and down the open stairwells.

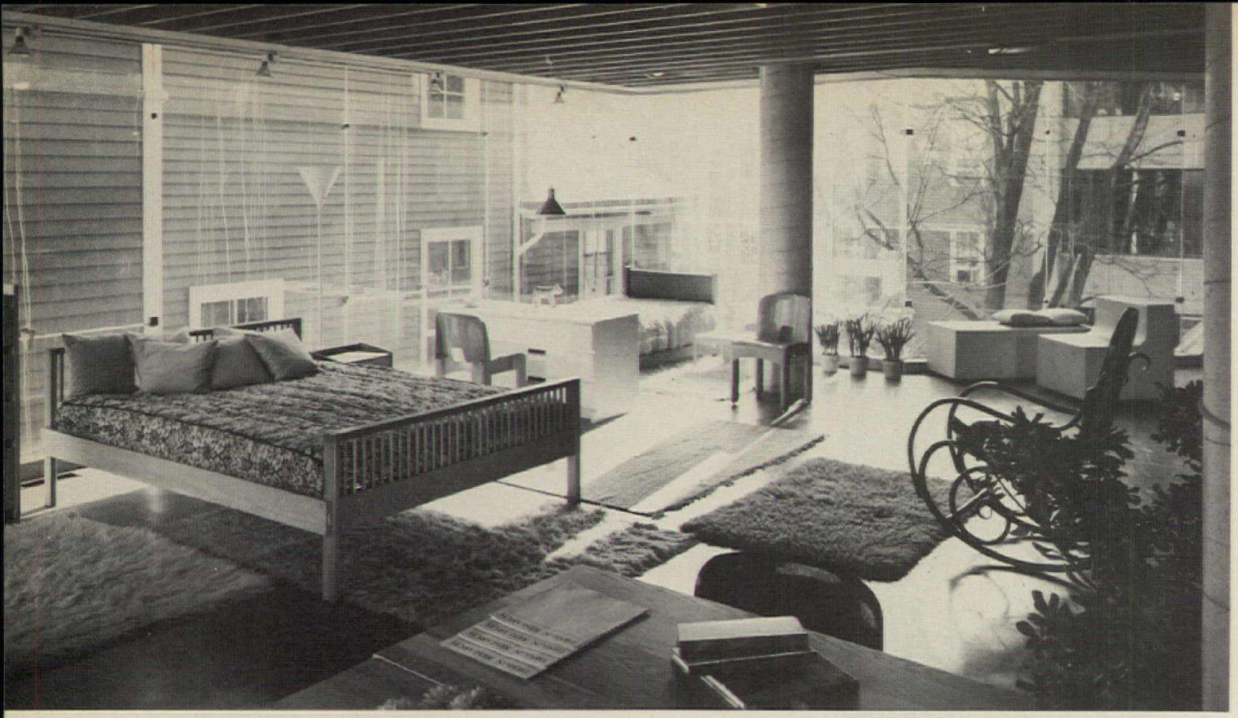
The shape of the building, with its "bays" and insets, is used effectively (see plans) to create room-like groupings of furniture set off with panels of colorful fabrics and lamps and accessories—in short, to suggest ways of living.

The upper two floors are office space, reached by elevator from either the reception area or the rear courtyard.

Interior walls are unfinished concrete block; floors are variously brick, hexagonal ceramic tile, cork, or sisal matting. All hardware is stainless steel or chrome finished.

The merchandise displays were designed by the architect. For example: much of the clothing is hung from stainless steel hoops suspended by simple brackets from the ceiling fins; and many of the racks for fabrics, hats, pillows, and the like are of the same fir as the ceiling and integrated with it. Finally, much of the furniture on sale was designed by Thompson and built in D/R's workshops.

So strong and so personal is the total



image—the total idea—of Design Research, that the store's only sign is the bright orange DR on the rear wall of the reception area shining through the glass walls.

Hillel Burger

DESIGN RESEARCH BUILDING, Cambridge, Massachusetts. Owner: *D/R International, Inc.* Architect: *Benjamin Thompson & Associates, Inc.—Benjamin Thompson, principal; Thomas Green, associate in charge; Edward Des Jardins, project architect; Darryl Pomicter, project supervisor;* interiors: *Benjamin Thompson,* with *Anne Amory, Agnete Kalckar, and Joan Sprague of D/R;* structural engineer: *LeMessurier Associates, Inc.;* mechanical and electrical engineers: *Reardon & Turner;* contractor: *Canter Construction Company.*

A WAREHOUSE TOO HANDSOME TO REMAIN ONE

Like a confident giant standing astride a broad valley, Davis, Brody & Associates' Westyard Building spans the Penn Central tracks between 31st and 33rd Streets on 10th Avenue in New York City. But behind any such comparisons, and the striking appearance of the building itself, lies a complicated succession of problems the architects met and solved. The monumental difficulties of building in midtown Manhattan were added to by the special engineering feats involved in spanning the 220-foot-wide open railroad cut with a fifteen-story structure flexible and strong enough to contain a variety of functions including offices, warehousing and even some light manufacturing. It was here, in the area of tenant mix, that perhaps the greatest problems were encountered. *During construction* a planned 65/35 per cent industrial facilities/offices ratio was almost directly reversed, as tenants, taken with the building's appearance, sought to have more of their offices housed in it.

Norman McGrath

WITHIN EXISTING CODES, A UNIQUE AND INVALUABLE CONTRIBUTION TO THE CITYSCAPE

Norman McGrath

Despite the many complicated problems created by constantly changing tenant requirements well into the construction phase, the Davis, Brody firm succeeded in stabilizing the exterior form of Westyard at a much earlier date. In so doing, they secured a maximum amount of flexible interior space, while at the same time making a major contribution to the much fabled New York skyline. Yet the building is no monster to be admired only from afar, but seems designed, above all, from the point of view of the city dweller's view of the cityscape. It is both comfortable in its surroundings (yet not without recriminations to its neighbors for their monstrous uniformity and lack of imagination) and nonoverbearing to its users and passers-by. The building's bold form is in part the architects' imaginative response to certain of the major tenants' need for large uninterrupted warehousing areas, especially on the lower floors, nearest the truck loading docks that almost completely line the base on the three street sides. From the base, the building rises in a sloping line following the set-back provisions of the zoning code. This space-making yet design-conscious solution results in the flaring out of the lower two-thirds of the building on three sides (the fourth or east side is sheer, and cantilevered fifteen feet out over a vehicular traffic approach to the Lincoln Tunnel), and gives the highly satisfying feeling that the building is straddling the railroad cut, which in engineering fact it indeed does. More importantly, and giving new dimensions to the term "air rights," the building's pyramidal facades open up the street vistas, both on the avenue, and on the side streets, especially with regard to the view of the river. The architects have made a double contribution to the country's most densely packed yet necessarily growing metropolis: by building on a site previously unused and an eyesore, and by a design that contributes to the enhancement, rather than the further congestion, of city space.

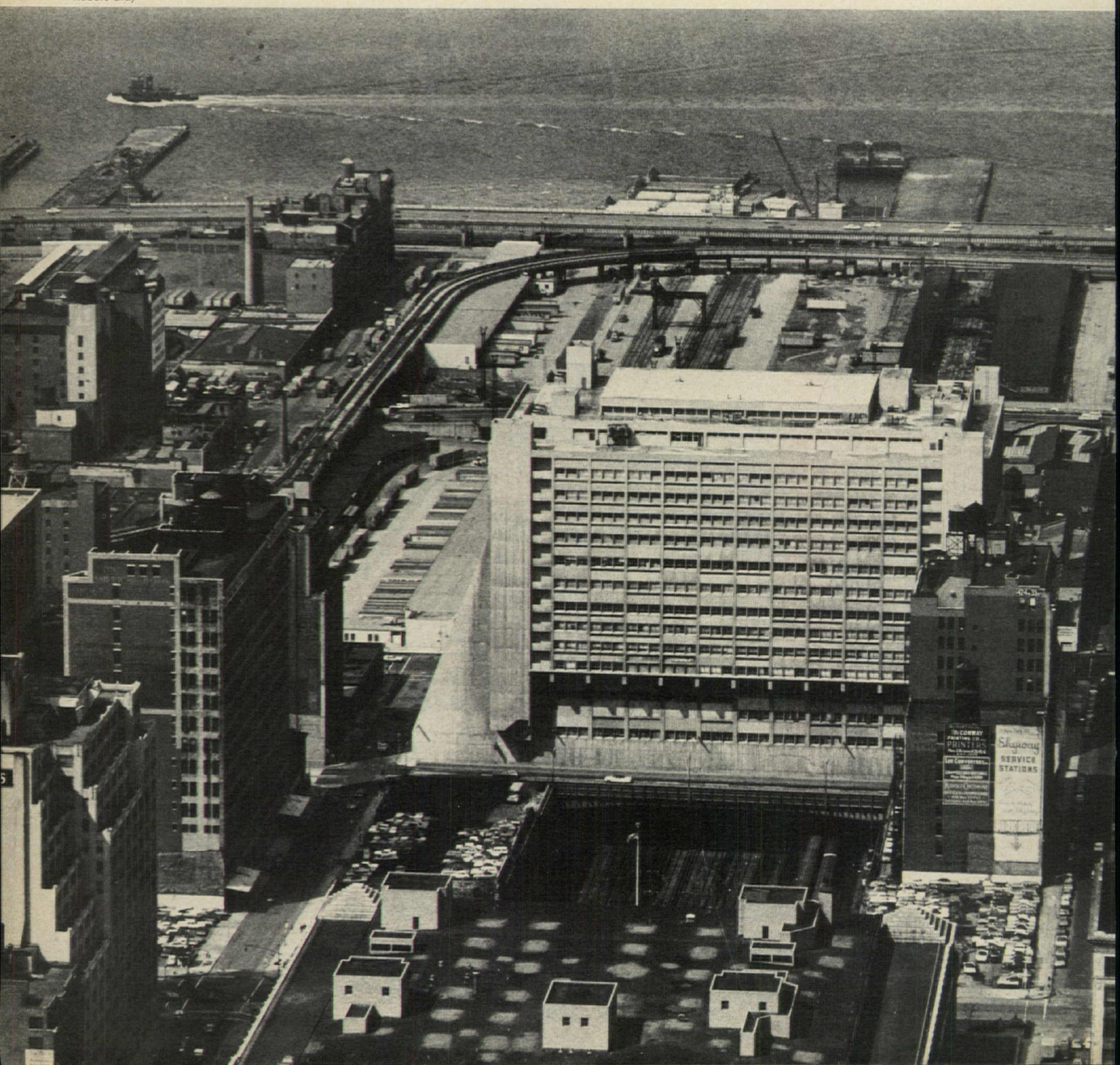
Jon Naar

Above, Davis, Brody & Associates' Westyard Building from the New Jersey shore, forming with the Empire State Building a composition vaguely reminiscent of the 1939 World's Fair Trylon and Perisphere—magnified to superscale for the '70s. Far left, north on Tenth Avenue. Left, a 33rd St. perspective. Despite the many substantial interior changes, the completed structure adheres closely to the earliest design conceptions. Below, west toward the Hudson past McKim, Mead & White's 1910-13 Post Office.

Jon Naar

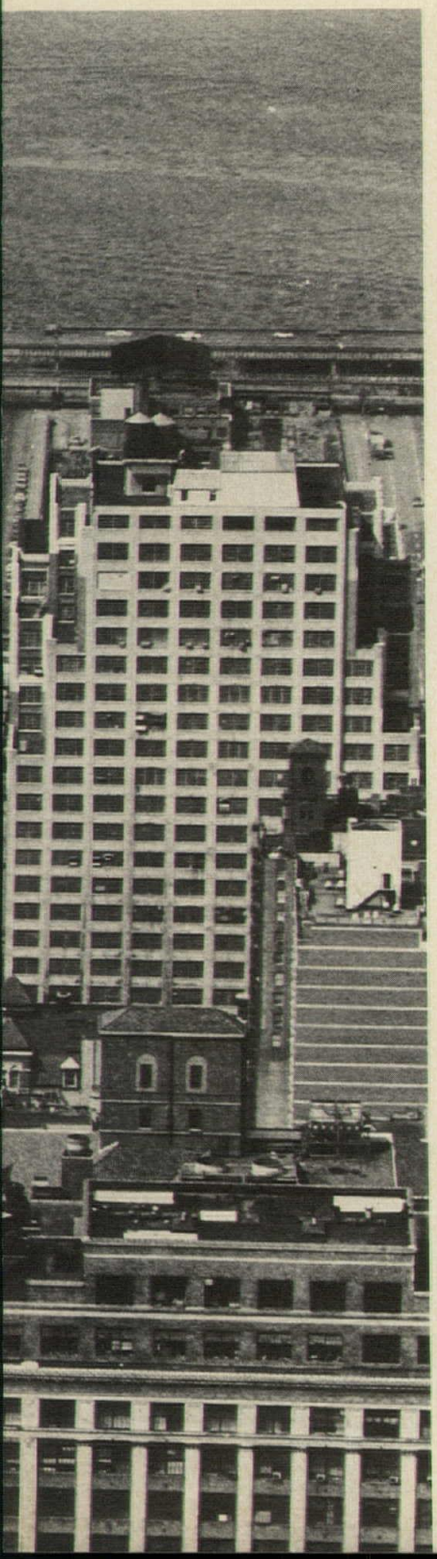
AN ENGINEERING ACCOMPLISHMENT TO MATCH AN INNOVATIONAL ARCHITECTURAL DESIGN

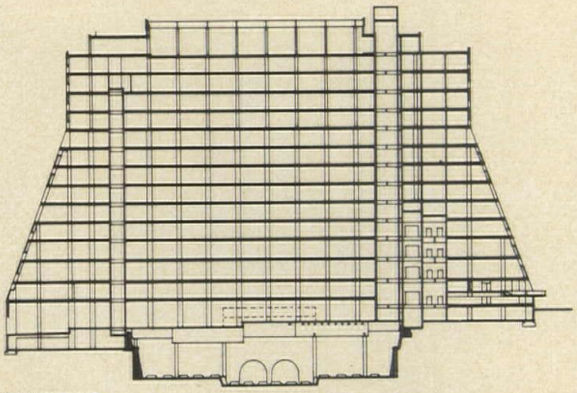
Robert Gray

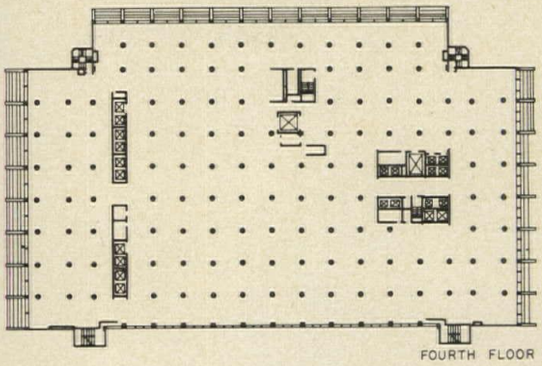


The rather spectacular photograph opposite was taken from the observation deck of the Empire State Building, using a telephoto lens, by a member of the Davis, Brody firm. The roof structure of the Westyard Building is a long-span truss system allowing a clear floor area for a professional ice skating rink—another blockbuster-type program requirement. The main part of the building is a cast-in-place textured reinforced concrete frame of beams and round columns which are approximately 26 feet on center and support waffle slab floors. The entire superstructure is designed for extra-heavy duty in order to achieve flexibility of tenant mix and uses. At the corners of the building the enclosed fire stair towers appear as massive piers. At ground level the sides rest on rock footings. The center portion of the building spans the 220-foot railroad cut in three 77-foot spans employing welded steel plate girders 12 feet deep. It was found that the existing retaining walls for the railroad cut were strong enough to carry the ends of a number of these girders. The walls were therefore sheared off to the desired height and notched to receive them (photos, lower right). Additional girder support is provided by steel columns and base plates on concrete footings between the tracks. Since the positions available between the tracks did not match the column centers of the superstructure, the girders were located to carry strings of columns. At the same time the footings had to be kept relatively small in relation to the substantial loads they carry in order to minimize disturbance to the track bed. All work in this area was done at times specified by the railroad to avoid major traffic movement.

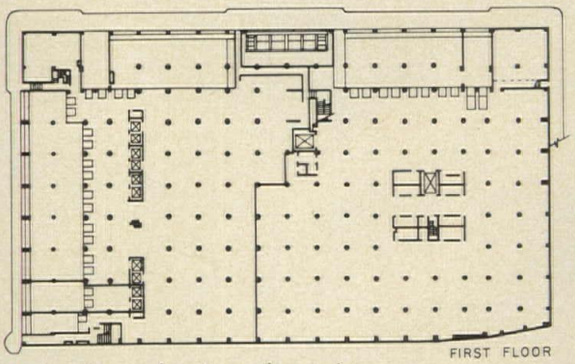
Robert Gray







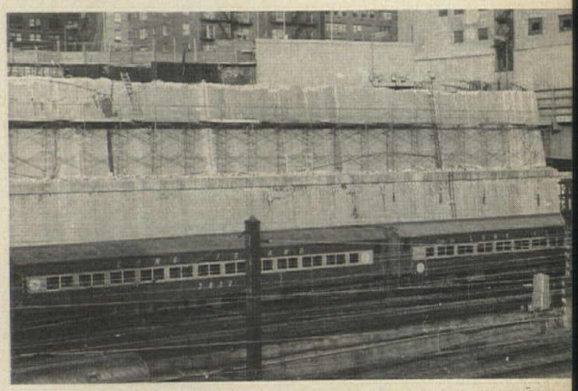
FOURTH FLOOR

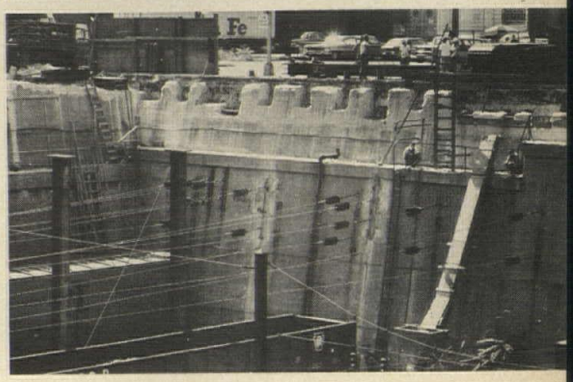


FIRST FLOOR

N 20

Westyard was built without interruption of rail service, and provisions against noise and vibration from passing trains was built into the building's fabric. There are plans, presently at an indeterminate state of development, that call for a housing project, also to be built over the tracks, east of the Davis, Brody building (in the foreground of the picture above).





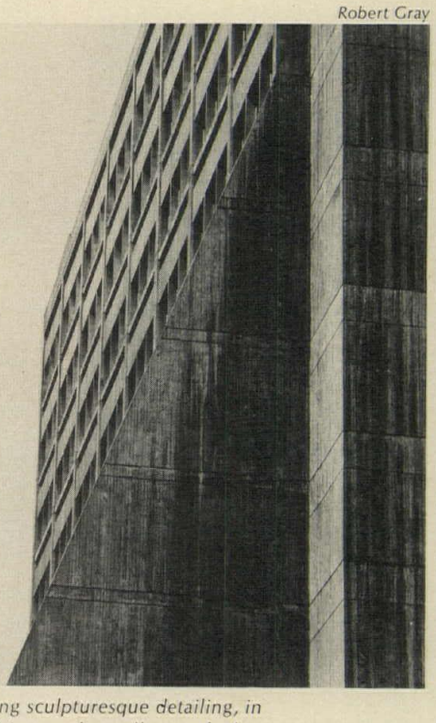
SCULPTURE-STRONG DETAILING

One of the best examples of the flexibility designed into Westyard is the use of a precast concrete modular wall panel. The panel is invertible, with the window usually placed high, as a clerestory, in the manufacturing and warehouse spaces, and low, at eye-level when sitting, in offices. In addition, a separate punch-out panel allows for additional air-conditioning intakes for the more populated building areas. The random exterior pattern that results from arranging these elements to meet the various tenants' needs is an ideal contrast to the building's strong, near-monumental quality.

WESTYARD BUILDING, New York City. Architects: *Davis, Brody & Associates—Jack Lebduska, associate-in-charge.* Structural engineer: *Robert Rosenwasser;* contractor: *H. R. H. Construction Corp.*

Norman McGrath

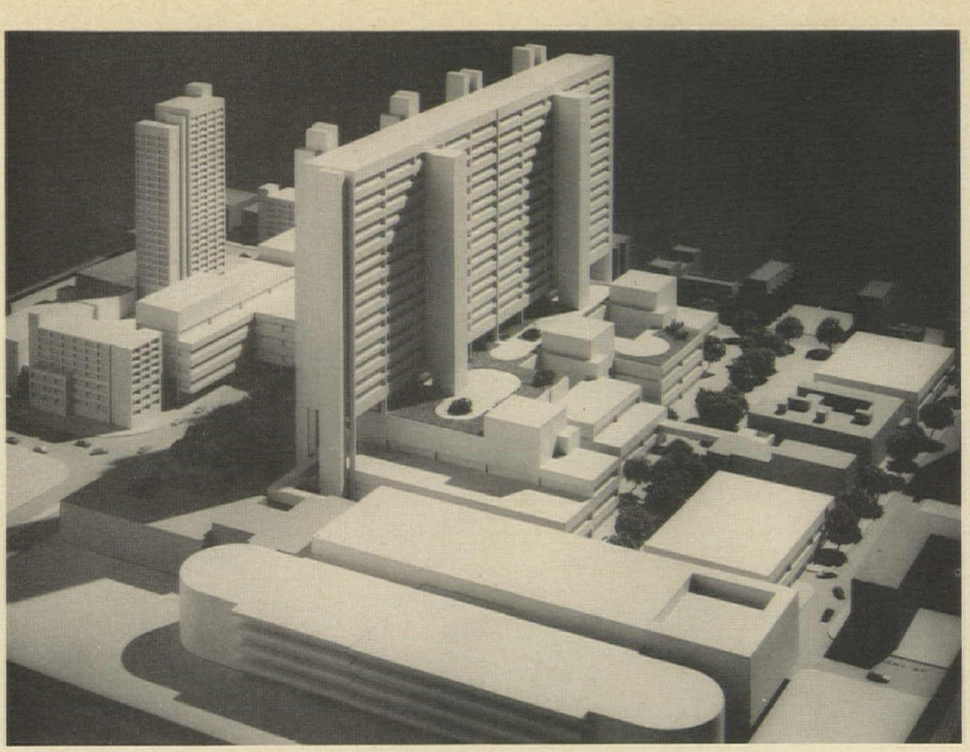
Robert Gray



Strong sculpturesque detailing, in addition to the wallop packed by the sloping wall itself, contribute to the building's attractiveness and power. At left, the bottom of the stair towers and the massive beams (10 feet high at point-of-support) that carry the cantilevered floors above. The latter device compensates for the loss of space due to the easement for the tunnel approach. Below, the main lobby, the fluorescent lighting integrated with the pan-formed concrete waffle ceiling. Structure is painted white, walls are dark gray slate panel infilling.

Jon Naar

BOSTON CITY HOSPITAL



For a complex job, a new partnership, Hugh Stubbins of Cambridge with Rex Allen of San Francisco, formed the nucleus of a many-disciplined team to regenerate a hospital without interrupting services

Masterplanning and design for redevelopment of the century-old Boston City Hospital became, in 1968, the commission of a transcontinental partnership. The Hugh Stubbins/Rex Allen Partnership combines the resources of Hugh Stubbins and Associates of Cambridge and Rex Whitaker Allen and Associates of San Francisco in a joint venture created to handle the hospital commission—and now formalized as an ongoing partnership. It has its own staff directed by Ramon A. Zambrano, who is also an associate of the Allen firm, with Merle T. Westlake, a Stubbins vice president, acting as associate director.

Formation of the partnership marked the confluence of three streams of events. Two of those streams, the professional careers of the founding firms, have been documented in the archives of excellence and awards in architecture. The hospital commission itself grew out of the third stream, a citywide redevelopment program piloted by Robert T. Kenney, director of the Public Facilities Department of the City of Boston.

In August, 1967, the Public Facilities Department had engaged the firm of Lester Gorsline and Associates, International, to program basic requirements of the obsolescent City Hospital to meet the development patterns of the area—the so-called South End Renewal Area adjoining Roxbury and South Boston. The Gorsline program was completed in June 1968, and in mid-November of that year the newly formed architectural partnership was commissioned to translate it into a master plan and basic design requirements that could be phased into reconstruction of the hospital.

The model photo at the top of this page shows the projected 1976-completion appearance of what is now a three-block, 17-acre concatenation of 39 buildings, 25 per cent of which are more than 50 years old. The present hospital is a 1000-bed teaching complex used by three universities: Harvard, Tufts and Boston University, which is adjacent across the street.

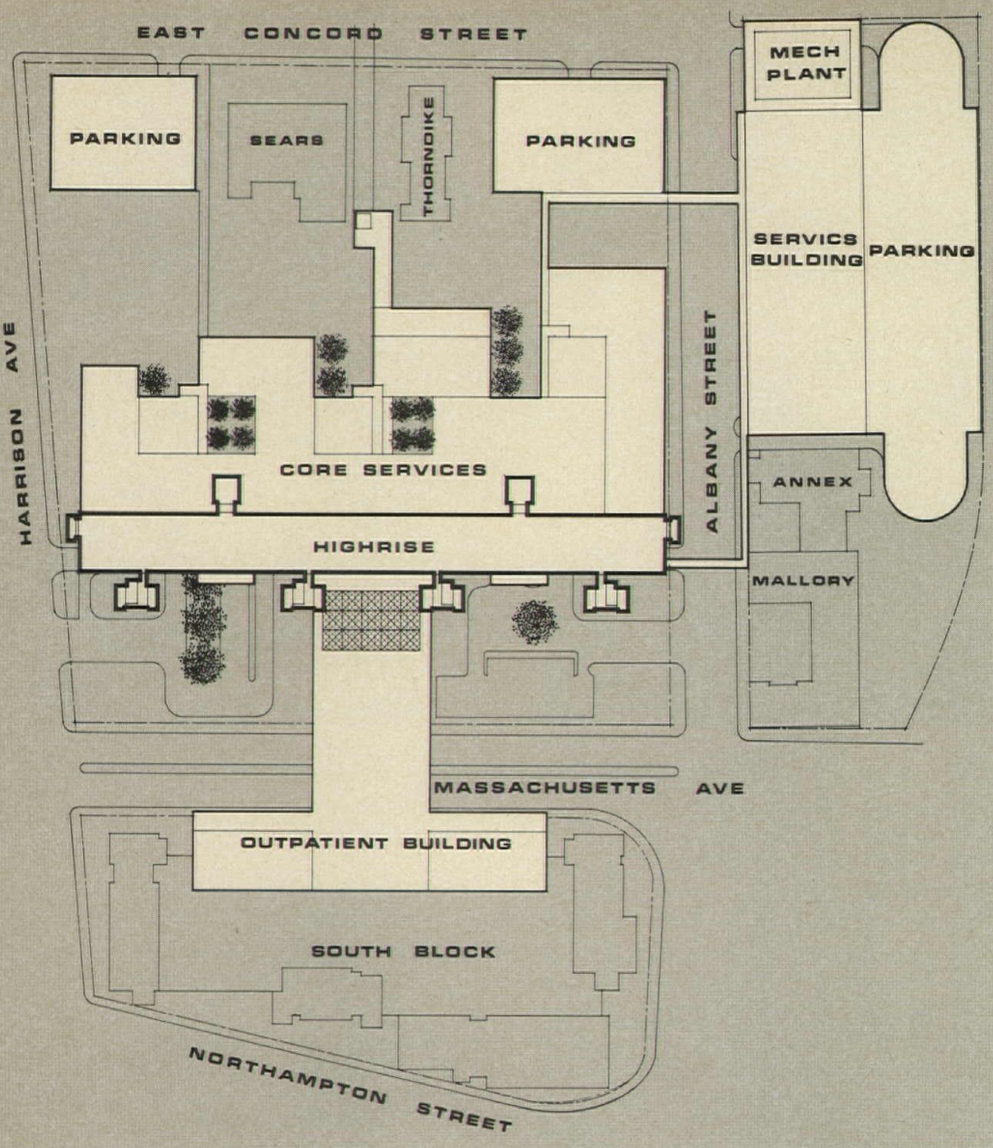
Architects rally disciplines in support of excellence

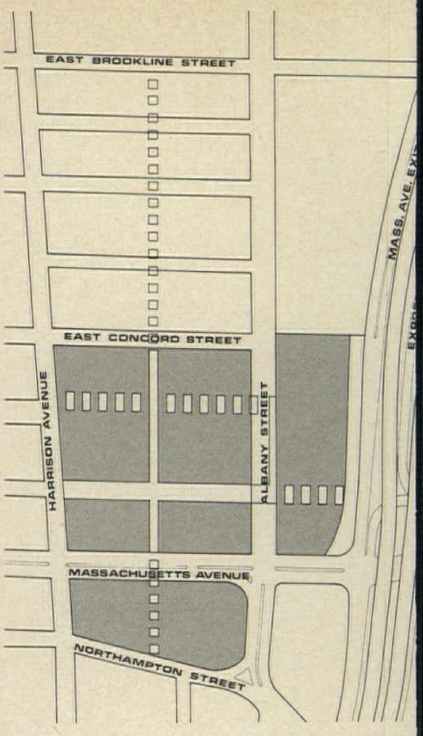
The requirement for step-phased replacement of virtually the total present complex, without curtailment of either present services or expected growth, called for a combination of high-level expertise in both the architectural and construction climate of the region, plus an equally high competence in the design of medical facilities.

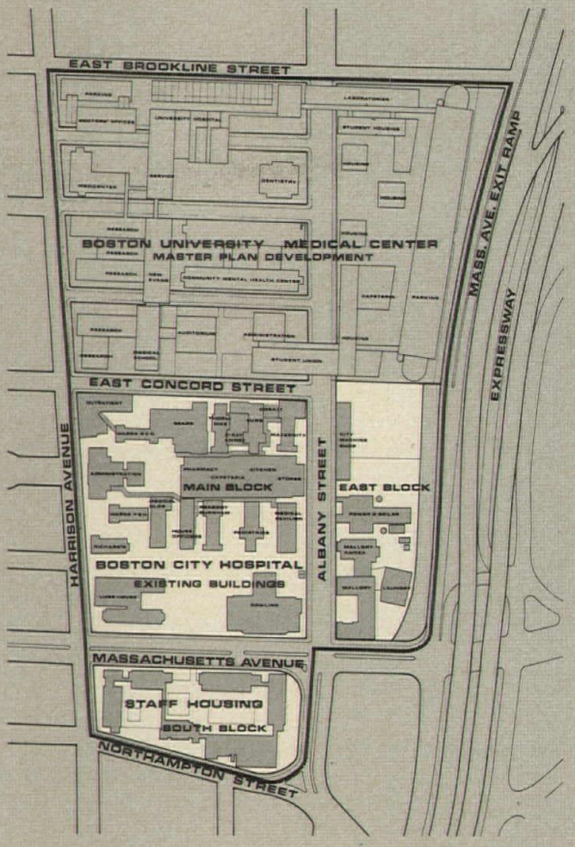
It would be an oversimplification to say that the regional know-how of Hugh Stubbins and the hospital-design experience of Rex Allen were the compelling factors in the idea of the partnership—although they were indeed obvious advantages. Beyond those advantages, however, was an important meeting of minds in the two firms regarding workable approaches to design excellence in the pressurized atmosphere of today's practice.

Both firms had separately used the joint-venture and consultant-team techniques in prior work. Their experience had reinforced the conviction that architects can and must form the coordinating nucleus bringing together pertinent disciplines throughout design development and construction. In that way, architectural integrity is maintained while responding to requirements for speed, cost control and the challenges of developing technologies. This need is especially critical in hospital design, as is underscored in the following description of the work for Boston City Hospital.

The master plan, started at the end of November 1968, was completed in early July 1969. This extremely tight schedule warranted detailed project analysis for development of a critical path network indicating decision points for architects, engineers, and all reviewing agencies. Consultants were



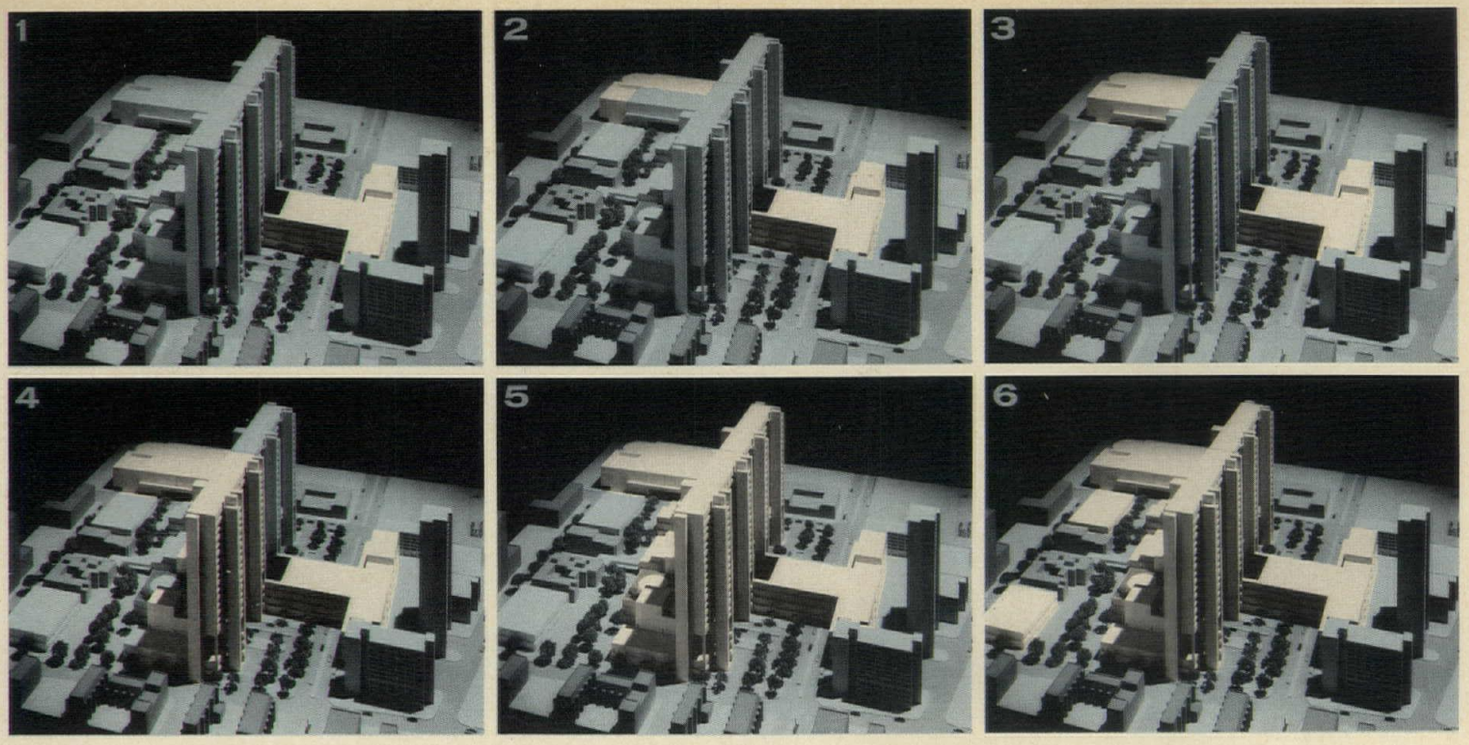




Boston City Hospital, the first municipally supported hospital in the United States, was established in 1861 and has continuously expanded to some 39 buildings on its present site (left, below). Teaching ties with Boston University Medical School, immediately to the north, will determine ultimate location of research areas incorporating new parking structures and the existing Sears and Thorndike buildings (top, left).

Site development was determined by the three-block character and logically fixed points of the 17-acre site (above). The so-called East Block, already containing central power and other mechanical facilities, will have new buildings for those resources plus central supply and major parking facilities with transport across Albany Street to the Main Block which is bounded on the south by Massachusetts Avenue.

The South Block is the locale for staff housing and a school of nursing (which have been designed by Samuel Glaser and Partners) as well as for the basic structure of the outpatient building, designed by the Hugh Stubbins/Rex Allen Partnership to bridge Massachusetts Avenue and have its main access through a central triage in the main block. (See plans, page 122).



selected from all over the United States, but with the proviso that they have specific knowledge of work in Boston.

The project team's work was reviewed periodically by Hugh Stubbins and Rex Allen at design-in meetings that usually lasted for two days. All outside telephone calls or other disturbances were banned during these design-ins, and the project received the undivided attention of the partners, consultants and design team. Goals were established in accordance with the critical path network. A date for the next design-in was set and the team's assignments for the interim were decided upon. Following the design-in a written summary of decisions and conclusions was distributed.

A master plan for change and phased replacement

Responding to the single certainty of rapid change in technological, medical, and administrative requirements, the master plan for Boston City Hospital required a reserve of flexibility that would assure the utmost longevity for early phases of the construction through their physical and functional adaptability to emerging requirements as construction proceeds.

Once the primary requirement for adaptability was established, practical development was based on three principles: first, the virtual inevitability of industrialized central supply and utilities—whatever the details of technical development might be; second, the effective management of a land-bank system of phased replacement of existing facilities on land cleared for new construction; third, compliance of the plan over a long term to certain initially fixed elements (such as power plant, supply base, structural nucleus, etc.) so that the development can proceed in a logical and adaptable sequence.

That was the generating force of the master plan for Boston City Hospital. The land bank sequence takes into account the prior existence of a power plant on what is called the East Block which therefore provides a fixed node for development of utilities and supply systems. The existence of Boston University immediately adjacent to the north locates the probable direction of growth for future research facilities as well as important traffic considerations. The previously demonstrated effectiveness of the interstitial mechanical system in such Rex Allen-designed facilities as Dominican Santa Cruz Hospital (RECORD, October 1968) established a mode of internal flexibility that could respond to almost any foreseeable requirement for adaptation.

A step-phased program for design and construction

The architects devised a proposed sequence of six major steps for design and construction (illustrated in photos above).

Step 1: Design and construct approximately 212,680 gross square feet of the outpatient building to house community-related clinics, doctors' offices, and space for future underground parking. Level 1 will contain the main entrance from Massachusetts Avenue and an entrance court (from Harrison Avenue), lobby, portions of admitting clinic, and appointment and information centers. Levels 2 through 5 will contain doctors' offices and clinics. Basement level will contain storage areas (to be converted to parking during a later construction step), a pick-up lobby, electrical equipment rooms, and elevator service to the floors above.

Step 2: Design and construct approximately 213,710 gross square feet of the East Block's service building, which will contain the mechanical plant and a parking garage. The mechanical plant will initially be equipped with mechanical, electrical, and telephone equipment for the existing facilities and those constructed in step 1.

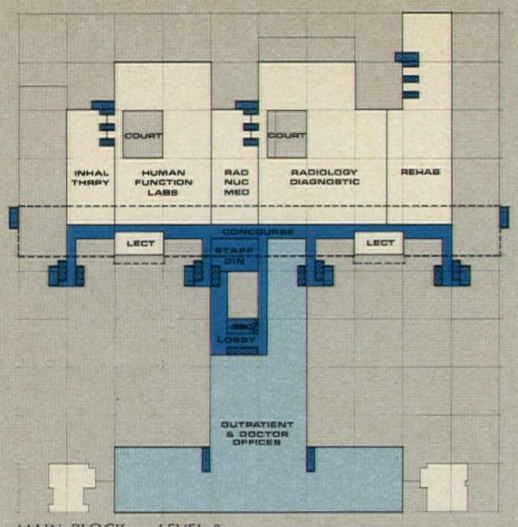
A six-story parking structure for 480 cars will be built along the east property line adjacent to the service building.

Step 3: Design and construct approximately 315,850 gross square feet of the East Block's service and parking building. This step will be the complete programmed area for the East Block and unite the East Block with the Main Block by means of a bridge across Albany Street. Permanent utility connections must also be made to the facilities on the Main Block constructed during steps 1 and 4. Basement level of the service building will contain physical plant and storage spaces. Level 1 will contain receiving dock and additional physical plant and storage spaces. Level 2 will contain pharmacy, central sterile supply, and the staging area for the materials handling system's carts. Level 3 will contain laundry and storage, and Level 4 the dietary service. Service floor levels will correspond to truss levels in the Main Block to facilitate horizontal transport of mechanical and supply systems which will use truss spaces for distribution in the hospital.

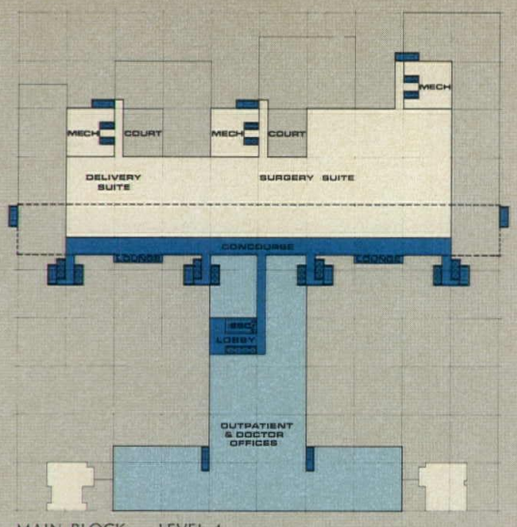
Step 4: Design and construct the first half of the 15-story high-rise tower containing approximately 672 beds and portions of core services, administrative services, emergency services, patient processing, supply and services, outpatient clinics, and underground parking. The completion of this step will provide a viable hospital with portions of all the required entities and systems.

The existing emergency department and ambulance entrance will be maintained during construction and moved to its new location at the completion of step 4.

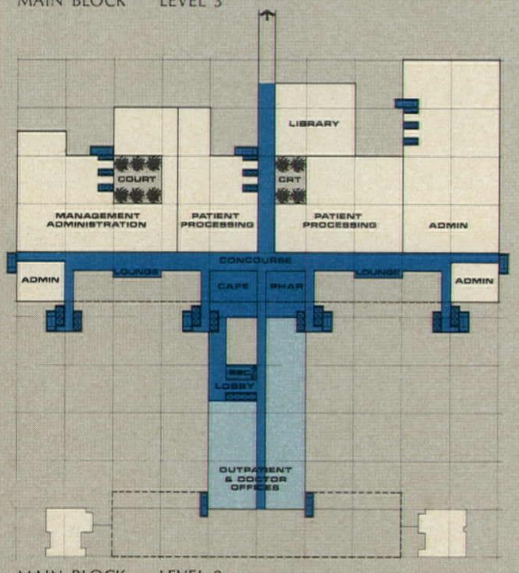
Step 5: Design and construct the final half of the 15-story high-rise and remaining portions of administrative services, core services, dietary, emergency services, patient processing, outpatient clinics, and underground parking. With the relocation of kitchen, central sterile supply, laundry, and



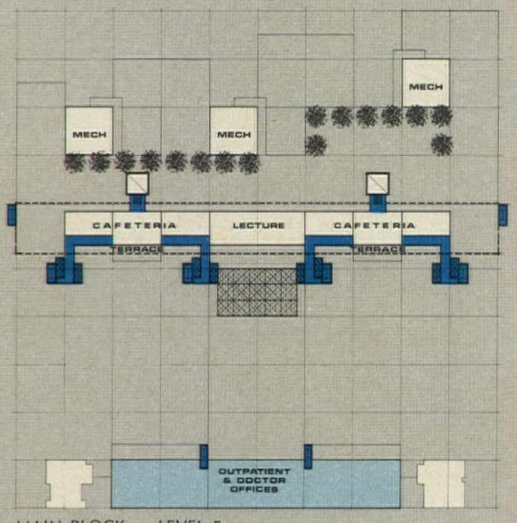
MAIN BLOCK LEVEL 3



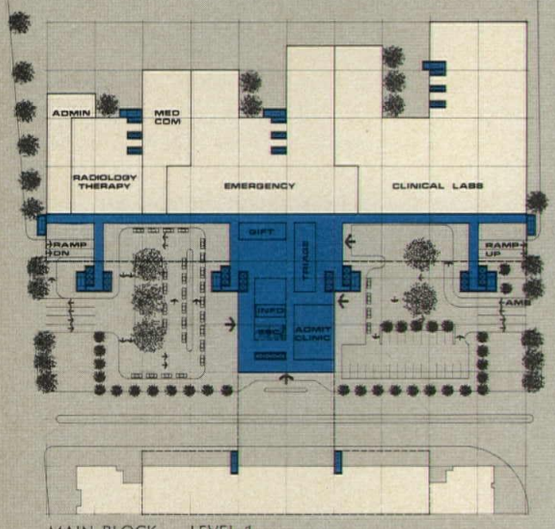
MAIN BLOCK LEVEL 4



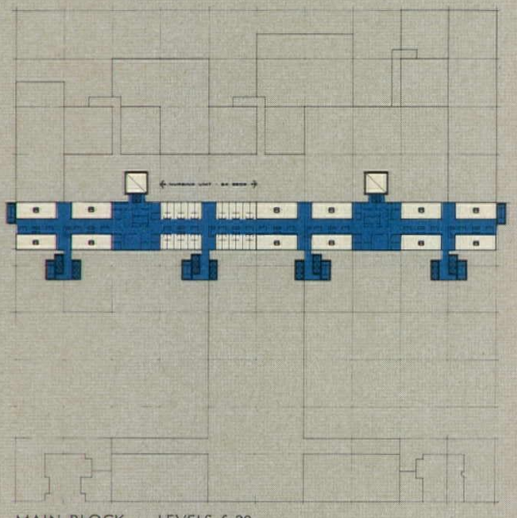
MAIN BLOCK LEVEL 2



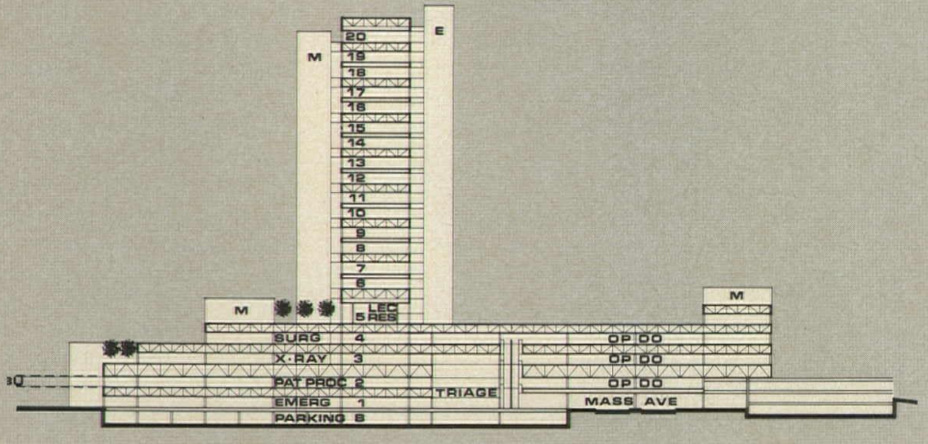
MAIN BLOCK LEVEL 5



MAIN BLOCK LEVEL 1



MAIN BLOCK LEVELS 6-20



Design of the Main Block and South Block complexes not only respond to the construction phasing requirement but also merge successfully with pre-designed facilities on the South Block for staff housing and nurses' training school. The outpatient building, first in order of construction priority, was designed to fit as a T into South Block structures and to maintain unity with the Main Block through its structural levels, systems floors and access through the triage and supporting service areas. In that way, phasing through temporary inpatient service on upper levels would be possible, and the heavy traffic of people and supplies expected in full OPD operation would be handled.

pharmacy to the service building (completion of steps 3 and 4 is coincident) and the relocation of inpatients, the existing buildings on the Main Block may be demolished.

During step 5, all systems (materials handling, vertical transportation, utility) started in previous steps will be expanded to serve the entire facility as completed.

Step 6: Design and construct parking structures for approximately 300 cars along East Concord Street. Demolish the buildings remaining on the Main Block, functions and occupants of which will have moved to the new facility. Complete the landscaping of the site. The parking structures will be designed so that future and as yet unprogrammed research facilities can be built over the structures, probably eliminating the present Sears and Thorndike buildings.

The construction cost analysis indicates a funding requirement of approximately $140,088,800, including Group I and II equipment and material handling systems. This amount was determined by evaluating the construction costs as of February 1969 ($103,520,100), and escalating each construction step to the midpoint of its scheduled construction duration. The total escalated project cost, including design and fine art fees, nonfixed equipment and fees, furnishings, clerk of works, and contingencies, amounts to $171,518,400.

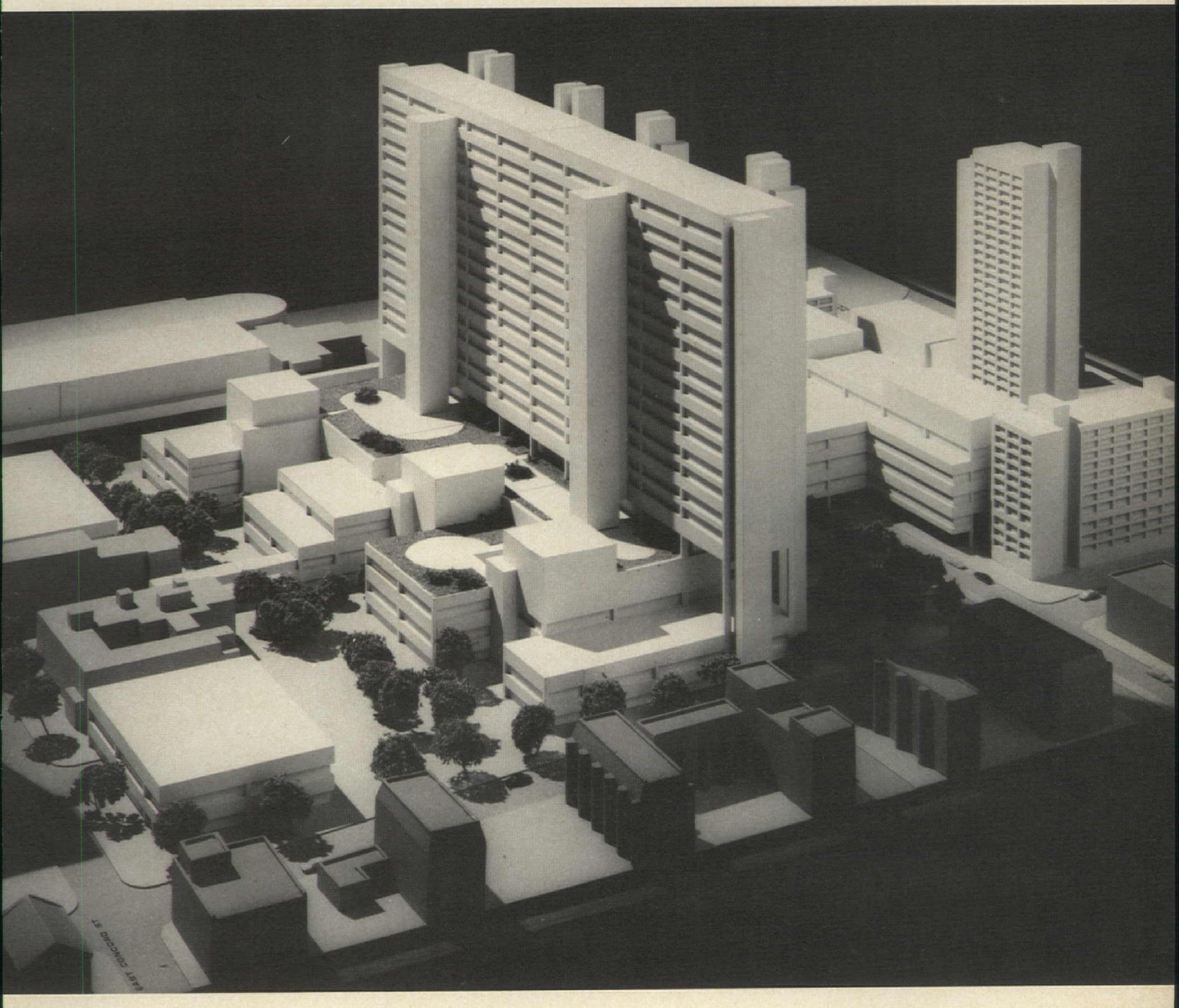
Organization for identity and a sense of place

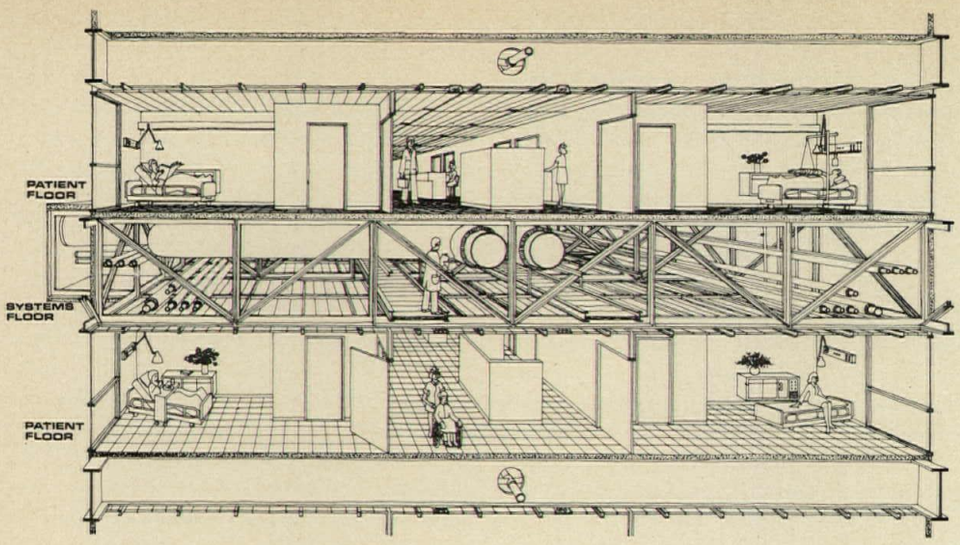
To simplify the movement of people and materials the hospital departments have been concentrated and laid out so that they can be easily found and reached with a minimum of effort. A concourse or circulation system in three levels will function as the main spine of the hospital. The fully automated supply system will move through truss spaces, a systems floor, free from conflicts with staff, patients, and visitors. Thus the materials handling will receive exclusive right-of-way and maintenance access will be gained easily.

Three separate entrances and two bridges, across Massachusetts Avenue and Albany Street, will greatly facilitate access to the hospital.

The systems floor, an investment in flexibility

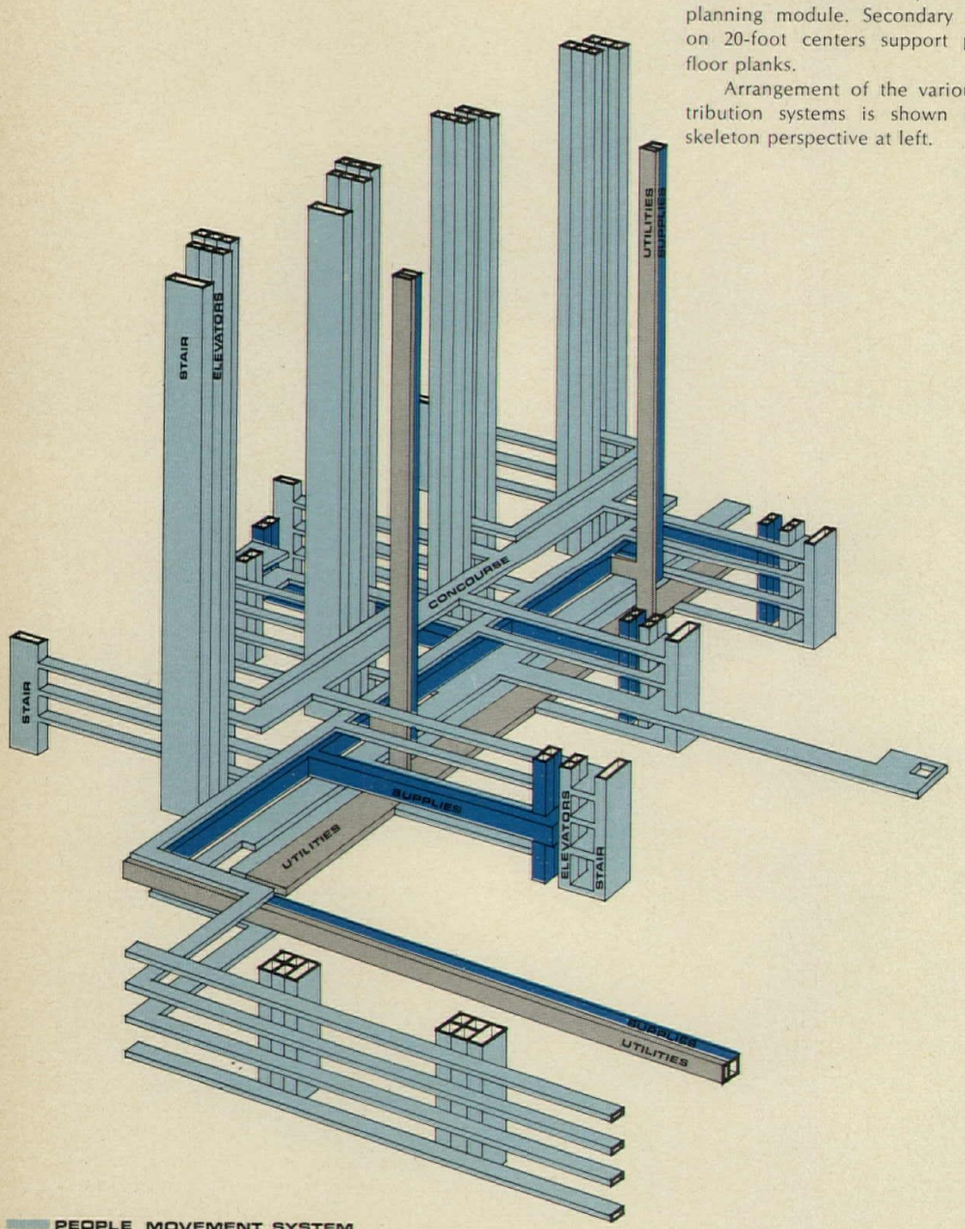
An important concept that will provide versatility in use of space, postpone obsolescence and simplify the daily operation and maintenance of the hospital is the incorporation of the systems floor. This is a mechanical and electrical service floor sized to accommodate the supporting systems of the hospital. A systems floor will be provided between each hospital floor in the low-rise buildings and between every other floor in the high-rise. The extensive medical, mechanical and supporting systems of the core services in the low-rise structures require the provision of one supporting systems





The basic structural element incorporated in the systems floor is an 8-foot-8-inch deep steel truss through which all mechanical systems and the proposed overhead monorail cart system of materials transport can pass. Dimensions of the trusses reflect not only the walk-through and transport requirements but also the span required for the 60-foot square of the planning module. Secondary trusses on 20-foot centers support precast floor planks.

Arrangement of the various distribution systems is shown in the skeleton perspective at left.



floor per hospital floor. In the high-rise the systems floor will feed both to the floor above and below. The systems floor will allow maintenance personnel to inspect, maintain, replace, or revise the supporting systems without disrupting the operation of the departments these systems serve. A system of catwalks will thread through the truss members to permit access for maintenance personnel.

Main framing members are steel trusses which will span 60 feet. The unusual spacing between columns in all areas will maximize the variety of functions for which an area can be planned for both initial and future needs. The inpatient floors, composed of 60-foot modules, will have no interior columns. Secondary framing members will span at 20-foot intervals between main framing members. Prestressed, concrete floor planks will be used to eliminate the forming of floors and permit more rapid construction. Where the systems floor is not required, plate girders will span the same lengths.

Vertical and horizontal distribution by design

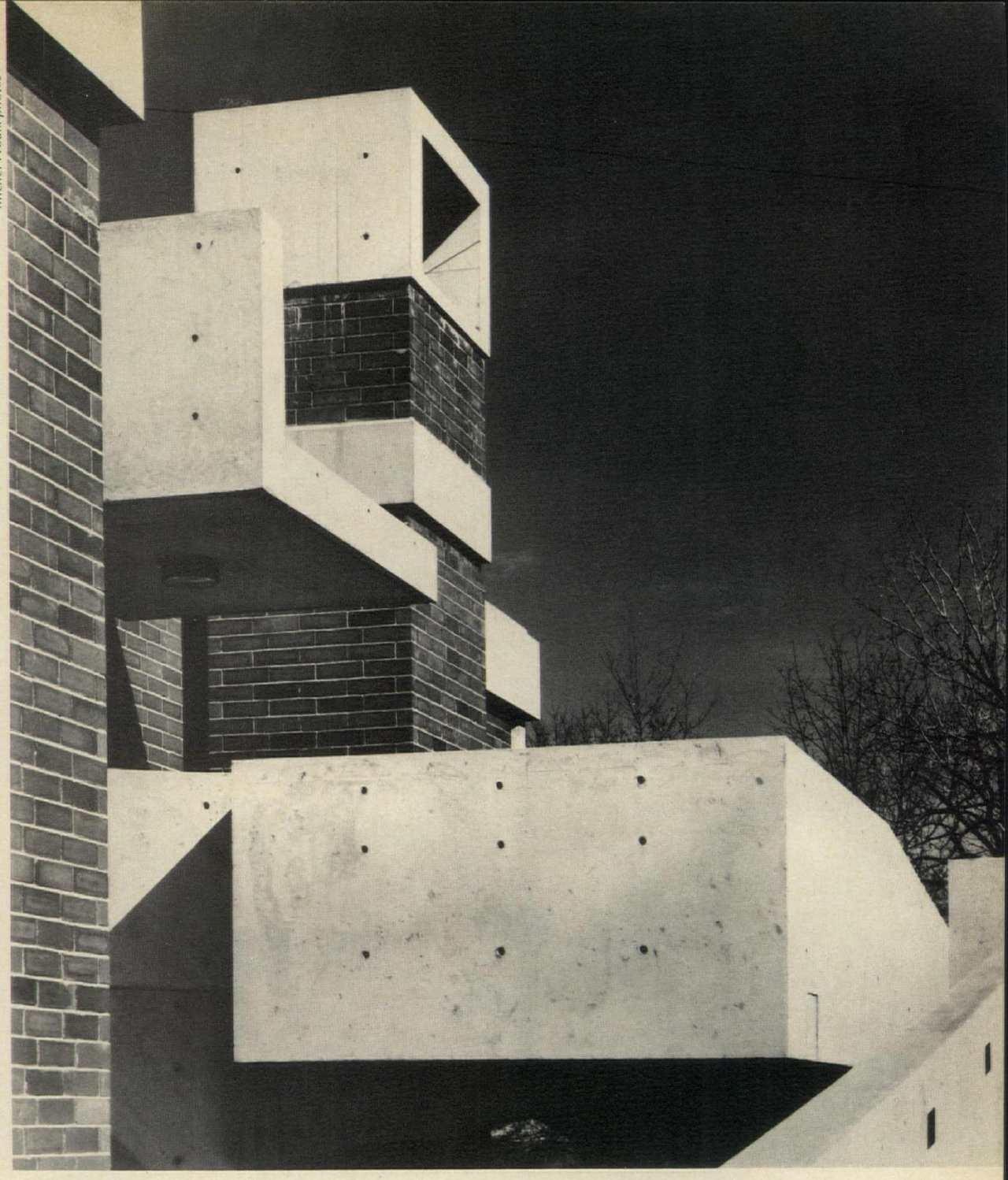
The demand for flexibility of the systems and in the utilization of building space calls for all systems to emanate from one central point—from which they are distributed as pipelines and ducts throughout the building complex. Vertical distribution to every basic area will be through pipe or duct risers generally outside the usable floor area. Pipelines and ducts will distribute horizontally within the truss spaces between floors to every point in each bay. The distribution system is sized for growth and will have the capacity to handle a predetermined unit load, wherever it may occur, in order to accommodate future needs.

Air supplied to the complex will generally be distributed at high velocity to save space. A heat recovery device in each exhaust air stream will economically preheat or precool the 100 per cent fresh outside air. Air handling units will be stacked vertically in separate utility shafts with air supply fed through the truss spaces in the systems floor.

Parking in the basement of the hospital and in three separate structures will provide space for 1480 cars. A special zone has been allocated for emergency parking. Five hundred and sixty additional parking spaces will be available for use by staff and students within the housing project at the south side of the site.

BOSTON CITY HOSPITAL, Boston, Mass. Owner: The City of Boston through its Public Facilities Department, Robert T. Kenney, director. Architects: *Hugh Stubbins/Rex Allen Partnership—Ramon A. Zambrano, executive architect; Richard Brewer, Robert Bryan, Joseph Hansen, Mark Lechowski and Thomas Twohey, design team.*

Consultants: structural, *LeMessurier and Associates;* mechanical/electrical, *Hankins and Anderson;* vertical transportation, *Edwin H. Hesselberg;* material handling, *Souder, Clark and Associates;* cost estimates, *McKee-Berger-Mansueto, Inc.;* food service, *Bert Marshall;* traffic and parking, *Barton-Aschman Associates, Inc.*



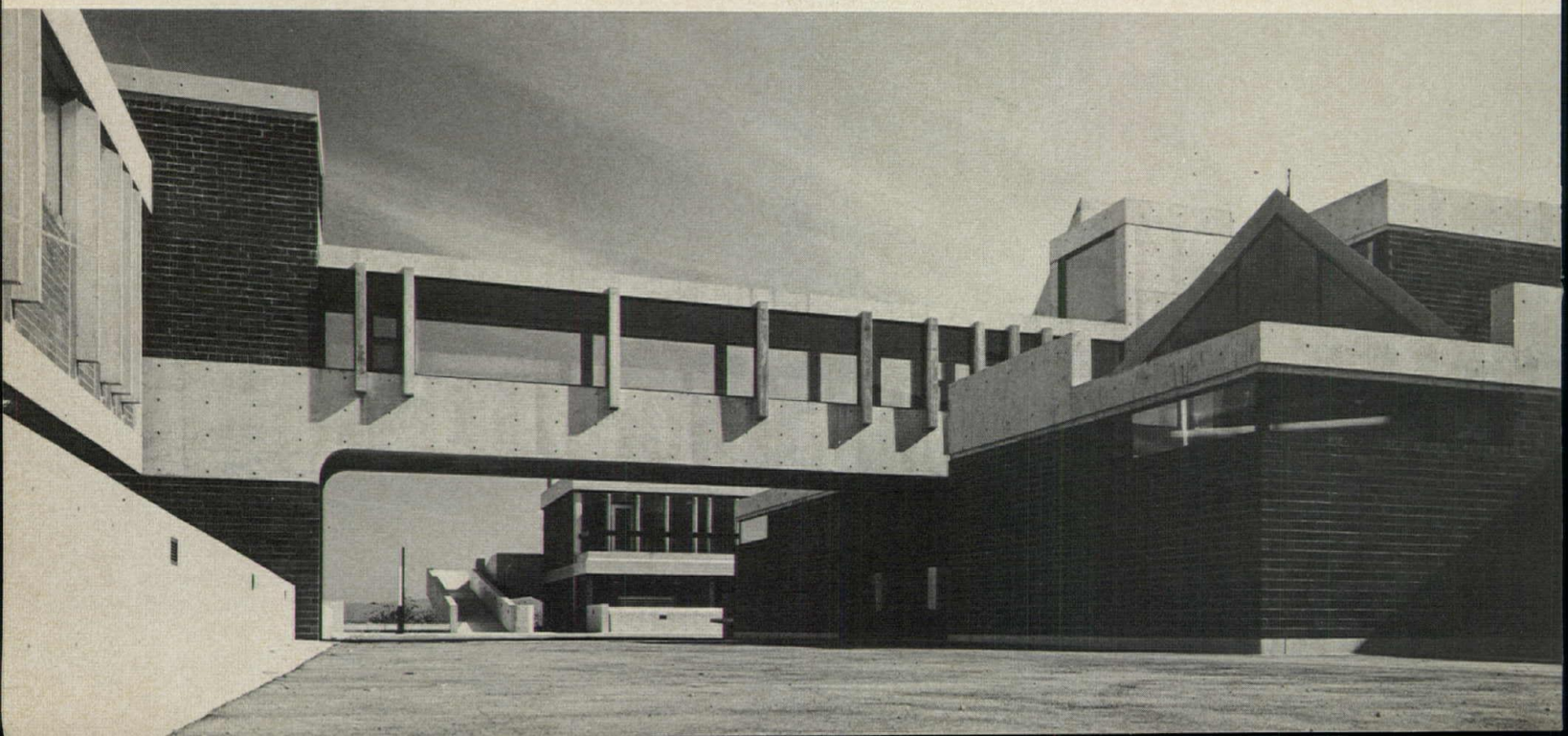
Michel Proulx photos

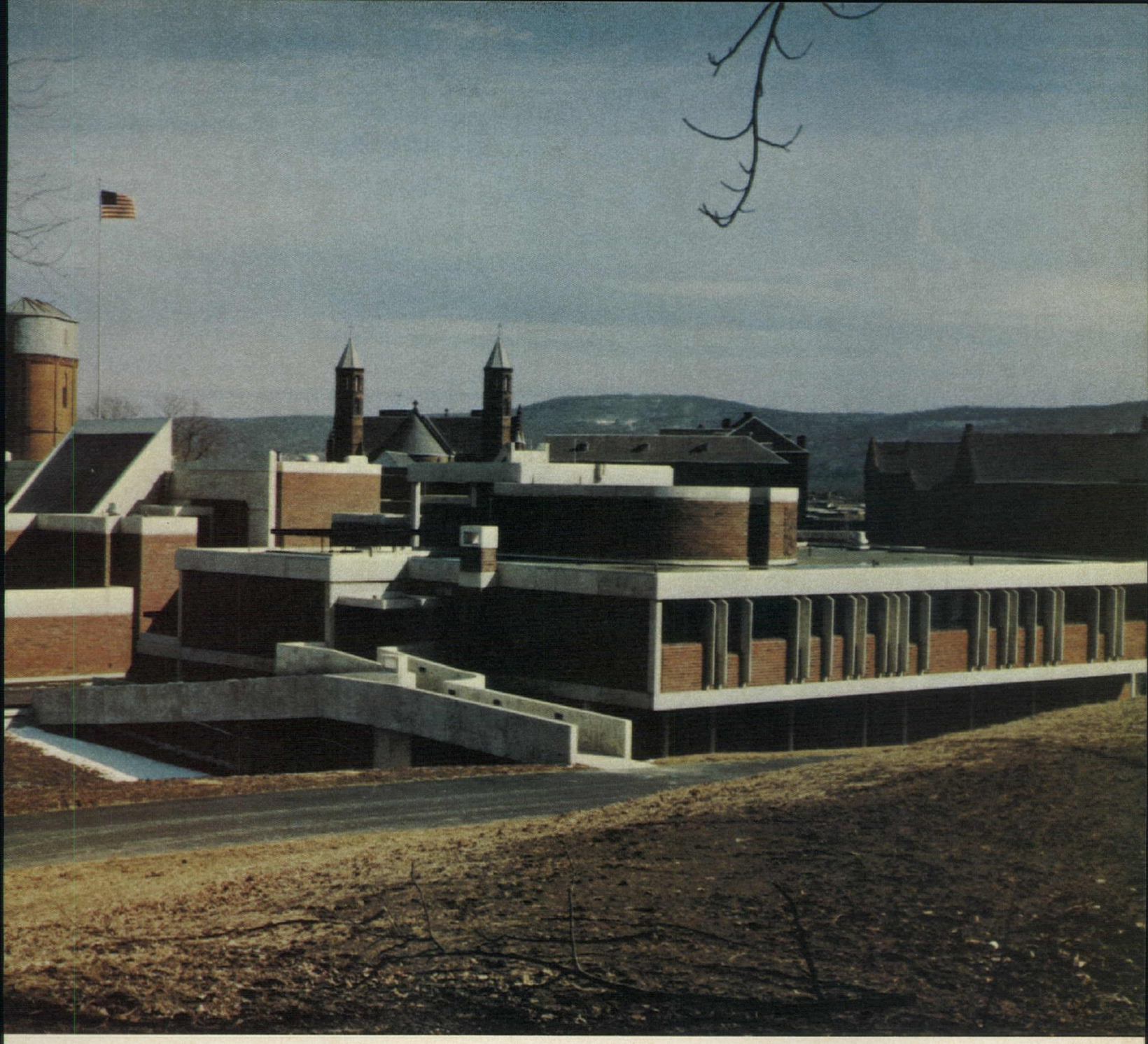
AN ARCHITECTURAL ANALOGY

Architect Tasso Katselas continues his work at St. Vincent Archabbey and College with this new Science Center. It is simple in plan, complicated in elevation— and revealing in what it tells us about the architect's commitments.

The organization and the plan of St. Vincent Science Center is clear. There are three buildings—one for chemistry, one for biology, one for physics—which house the laboratories, work rooms, and faculty offices needed for each. And there is a fourth building—the library/lecture hall—whose facilities are necessary for the other three in common. This common facility is placed in equal proximity to the other three buildings, on a unifying pedestrian plaza which connects the whole complex. The second floor of each laboratory is directly connected to the common facility by individual bridges.

In contrast to its simple plan is the Science Center's extraordinary visual intricacy—its almost picturesque composition. This mix of simplicity and intricacy is the basis of the architecture, and implies its significance.

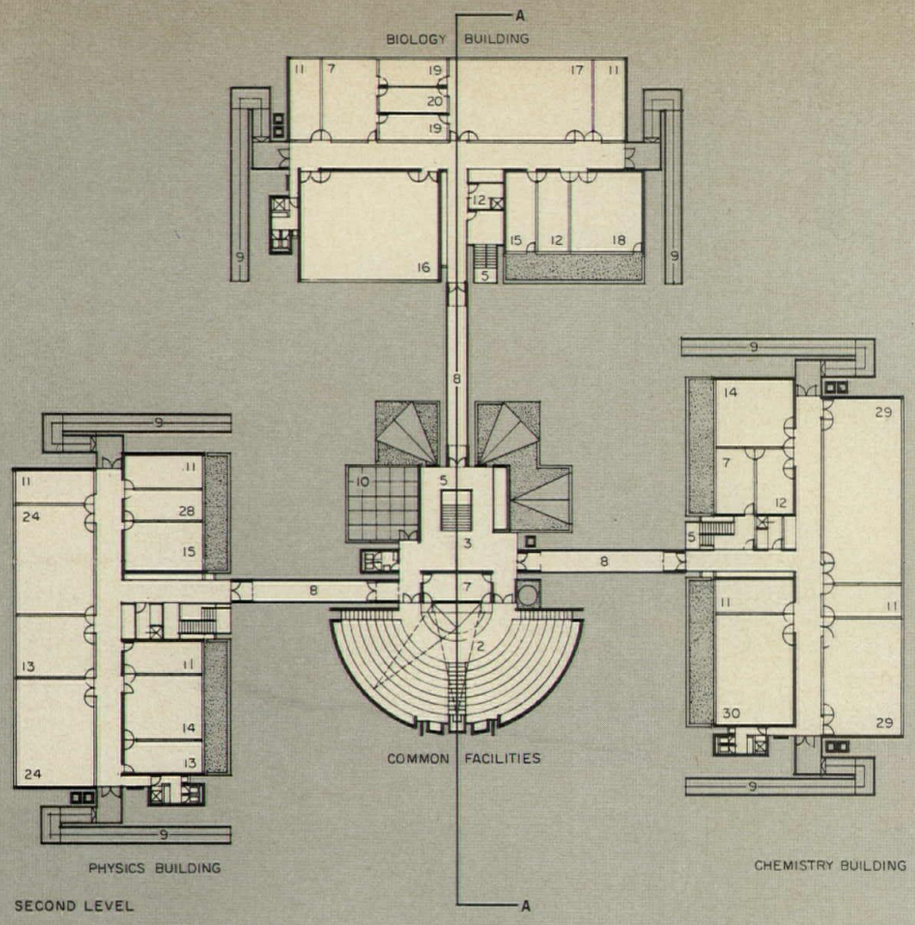




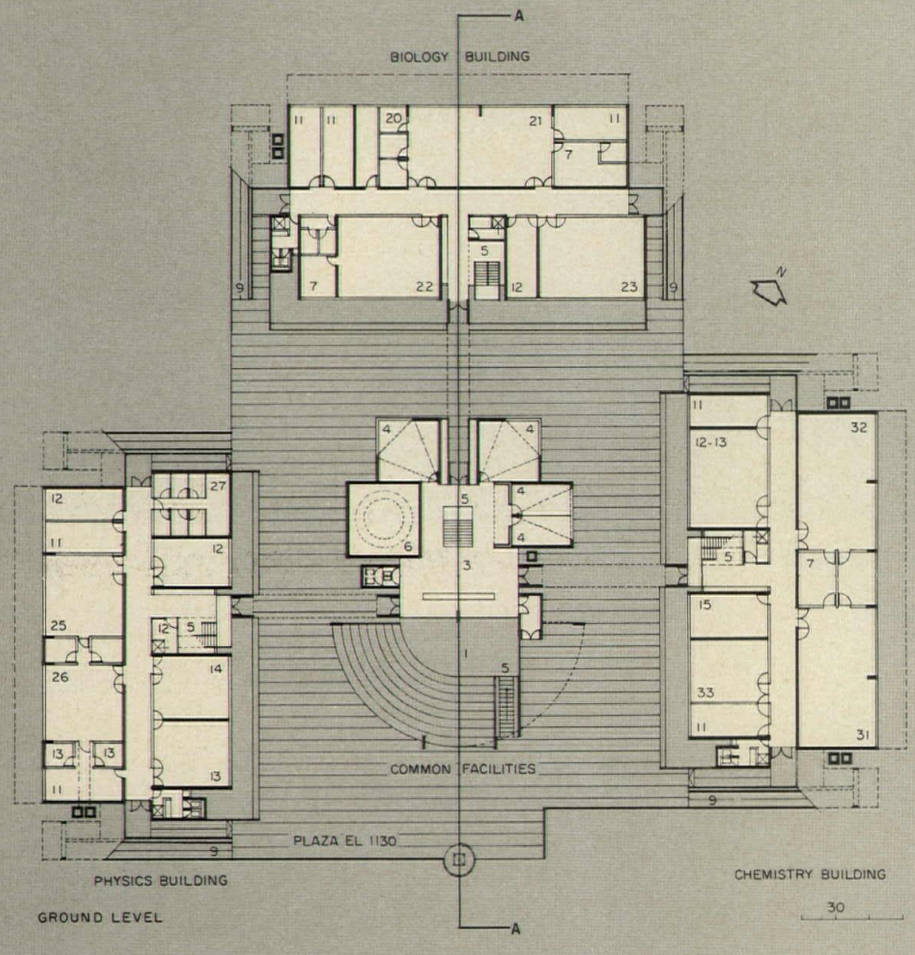
A complex skyline: strict use of two materials unifies the Science Center

In plan the Science Center at first appears to be symmetrical about its major approach axis, running between Kennedy Hall and the library, but it is not. The chemistry building and the physics building are not directly opposite each other and there are subtle differences between the right half and the left half of the library/lecture theater. Nor are the physics, biology, and chemistry buildings, when taken alone, symmetrical about any axis: they only appear to be.

The appearance of symmetry in the plan allows quick recognition of the Science Center as a whole and easy circulation and orientation within it, while the real asymmetry is a link with the elevational complexity of the buildings. This complexity is a result of the architect's recognition of each functional space and circulatory element as an event to be separated from the whole. Each classroom section, lecture hall, stair tower, and ramp is acknowledged individually by changes in wall plane and roof height. The natural lighting of these articulated parts increases the sense of intricacy; spaces are lit from the gaps created when wall meets wall and roof meets roof in separate planes. The exterior acknowledgement of individual parts allows the architect to incorporate into the science center exceptional spaces and extraordinary events at will, by simply arranging the architectural forms resulting from such events into the already existing grouping. In the completed buildings, stairs and exterior ramps are rounded at their intermediate returns, but in the plans made before construction (page 128) these returns are drawn as squared endings to the ramps and stairs. Also, the north ramp of the physics building (color photo,

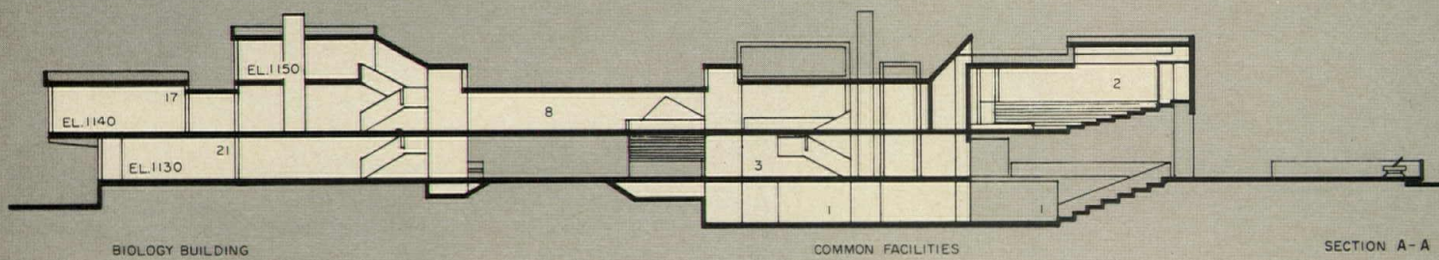


SECOND LEVEL

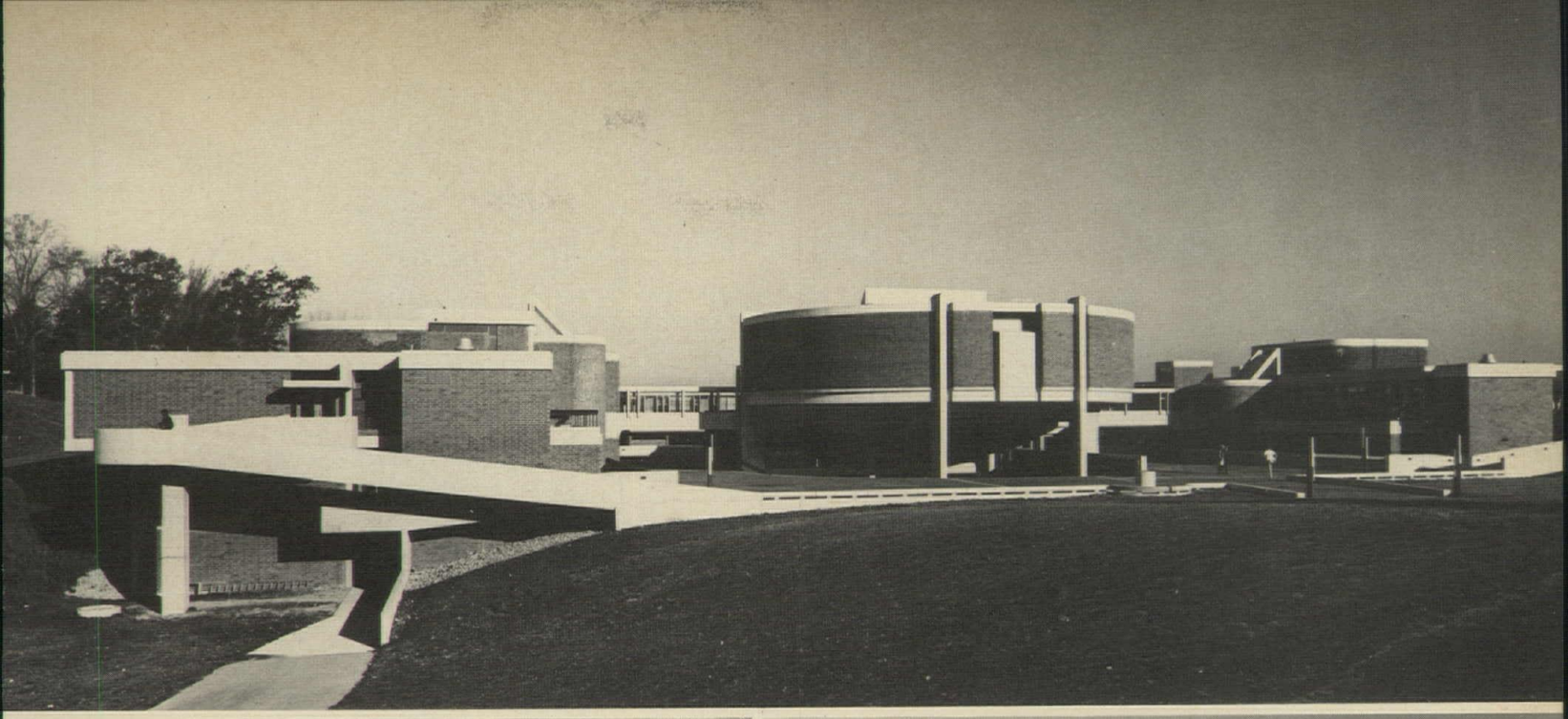


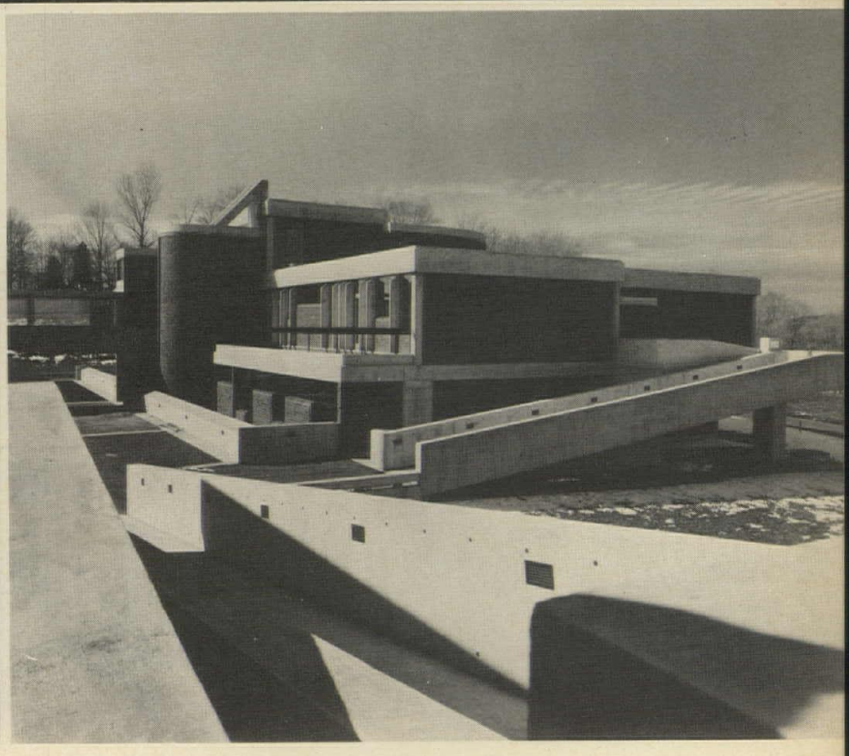
GROUND LEVEL

1 library
2 lecture theatre
3 lobby
4 classroom
5 stairs
6 planetarium
7 preparation room
8 bridge
9 ramp
10 terrace
11 office/laboratory
12 storage
13 equipment
14 research/laboratory
15 department head
16 general biology laboratory
17 anatomy, histology, zoology
18 herbarium
19 specimen
20 charts
21 physiology, bacteriology
22 ecology, geology
23 histology, embryology
24 general physicis
25 nuclear physics
26 spectography
27 optics
28 radio
29 organic chemistry
30 physical chemistry
31 freshman chemistry
32 quantitative analysis
33 instrumentation

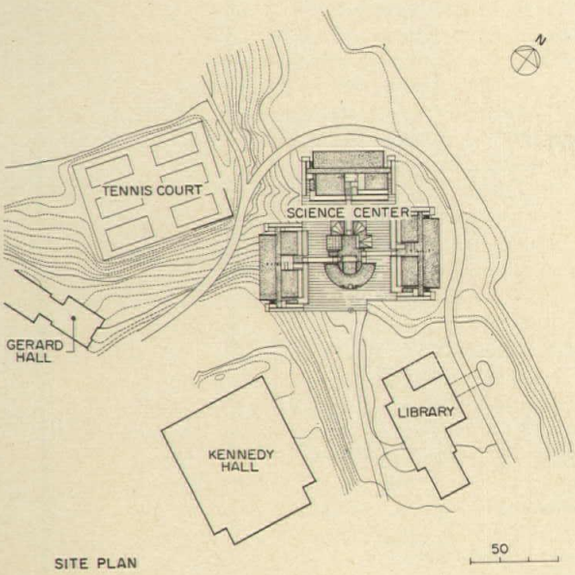


SECTION A-A





A simple plan: orientation for the observer walking through is relatively easy



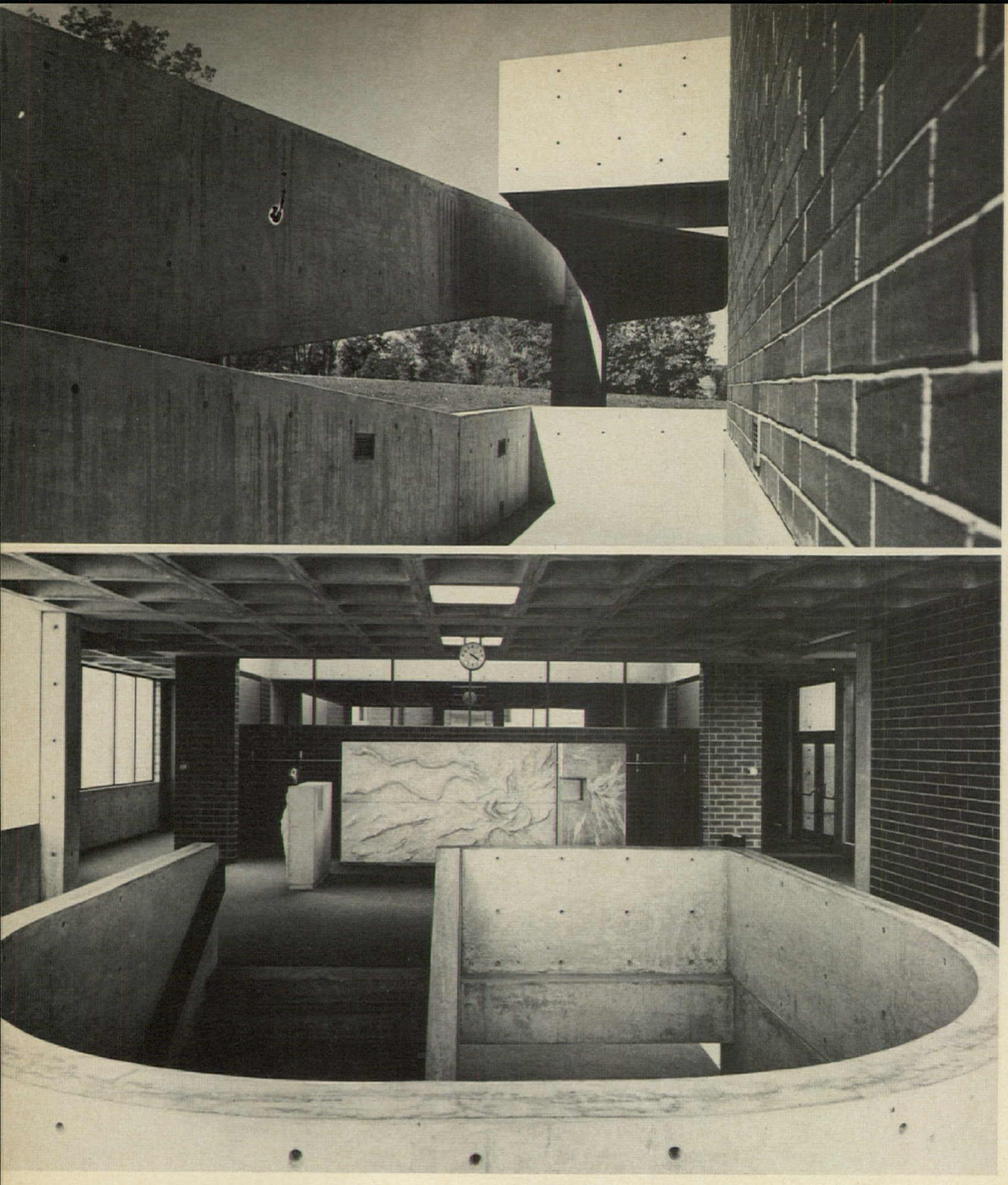
SITE PLAN

page 127) was extended during construction to link with the road rather than simply return upon itself, as in the original plan. The concept of freely positioning articulated elements makes such changes easy; one solution is no better or worse than the other when the whole is considered visually.

The ragged skyline of St. Vincent's is a result of this composition of the whole from articulated parts, and the skyline is successful in acknowledging the older academic gothic buildings around the science center, with their turrets and towers. The random mixture of shapes on the skyline is also, in a sense, a visual reflection of the rolling, random, inconsistent vistas around the science center—part untouched wood, part manicured farm, part suburbia cluttered with poles and aerials.

Holding these fragmented events of St. Vincent's together is the disciplined use of two materials —brick and concrete. Brick is used on the broad squarish planes and concrete is used for the accents, usually long ribbon-like shapes that carry the eye through the diverse forms, particularly at the floor line at elevation 1140 and the roof at elevation 1150.

All of these architectural statements—the apparently symmetrical plan for easy orientation, the visual articulation of individual spaces and events, the use of only two materials—are based upon a drive for clarity on the part of the designer; on an attempt at total revelation of structure and content. Such drives may be called a basis for our scientific and educational impulses—revelation of social content in the widest sense, and the structure of our physical world—which are in turn institutionalized in entities like



The articulation of parts: lighting helps reveal changes in wall plane and roof height

St. Vincent College. The Science Center may in this context be called an accurate three dimensional reflection of a part of our culture. It is an analogy—in three dimensions, in brick and concrete—with a dimensionless, rational/emotional set of values; not an uncommon intention in architecture. Such designs may be judged by the accuracy of the likeness they attempt, or by questioning the ability of the medium of architecture to allow such analogies to be successfully completed.

—Robert Jensen

ST. VINCENT SCIENCE CENTER, St. Vincent Archabbey and College, Latrobe, Pennsylvania. Architect: *Tasso Katselas;* structural engineer: *R. M. Gensert Associates;* mechanical engineer: *Evans & Associates;* electrical engineer: *Anton J. Eichmuller;* contractor: *Pevarnik Bros. Inc.*

WHY NOT A NATIONWIDE PLAN FOR RECREATION?

By the year 2000, some experts are predicting, outdoor recreation will have increased 141 per cent. Not all of us will be around to see the extent to which the population enjoys leisure activities, but quite a few of us will be able to see the increase of 60 per cent between the years 1965 and 1980. Where will all this outdoor activity go on? There's plenty of land, according to a study prepared for the Public Land Law Review Commission, because our farm production has become so efficient that we do not need the vast acreages once required. But how is the land to be used? What sort of program for orderly development by private and public sectors exists?

The answer to the first question is: If anyone, or any government agency, knows how the land is to be used, he or it has yet to make a public pronouncement in regard to the ideas involved. And to the second question the answer is: There is a Nationwide Outdoor Recreation Plan, prepared by the Bureau of Outdoor Recreation, as directed in Public Law 88-29, which is "intended to guide development of sound public policy in outdoor recreation . . . to consider outdoor recreation in the broadest sense, including preservation of natural beauty and quality of outdoor environment . . . encompassing urban and rural programs, public and private programs . . . to provide a framework for regional, state, local and private outdoor recreation programs . . . to appraise the variety, quantity and quality of outdoor recreation opportunities which Americans seek."

But the report has never been published. BOR was directed to submit the Nationwide Plan to the President and Congress—and to the people—by 1968. Where it languishes in Washington is anybody's guess.

No one knows whether it is a good plan or a bad one, whether its scope is indeed broad enough to meet the needs of a growing population and an increasingly urban one, whether it is imaginative and innovative, whether it is flexible or inflexible. Yet there was never a time in this country's development when a plan based, one must hope, on an intelligent study of the needs, means, wants and dreams of the American people, was more needed to assure a constructive, beneficial, rewarding use of leisure time—and the best and most far-sighted handling of our natural resources.

Without such a framework, without the guidance that a serious study of the recreation needs of this country could give, the overlapping of recreation facilities seems inevitable, and the abuse of the land a constant peril. California's determination that it will not overuse the precious heritage of its reserve of natural beauty, and its avowal—through the director of the Department of Parks and Recreation (whose description of the state's planning for a 40-million population appears on pages 132-133)—that in order to provide a *quality* outdoor experience, it will never even try to provide camping facilities for all of its residents, is a rare position. Some Federal agencies—National Park Service, for one—seem loath to take the necessary steps to preserve the natural heritage for which they are trustees on the unproved theory that "the people demand" more of everything. If the people do demand, a Nationwide Plan should show what they demand, where they need it, and where what is needed can be provided and by whom.

That facilities of a high quality can be provided for recreation is clear from the following representative examples, for public and private clients.

—*E.K.T.*

RECREATION FOR 40 MILLION PEOPLE

Twice the state's population visited California's state parks last year. Now the state is planning recreation for twice *that* number within the next 25 years.

By William Penn Mott, Jr.
Director, California State Department of Parks and Recreation

Last year 40 million people used California's state parks. A third of them went to the beaches, especially the warm water beaches near the large cities of Southern California. One eighth of the visitors went to state historical sites. The rest spread themselves over a wide variety of recreation facilities from the Oregon border to Mexico, and from the Pacific Ocean to the desert.

California's state park system—which includes this country's first state park, established in 1902—administers an eight-part spectrum of recreation facilities: scenic reserves, state beaches, state parks, historical sites, scientific reserves, underwater parks, wayside campgrounds and state recreation areas. Within these broad classifications are, again, many kinds of recreational opportunities, though not all kinds in any one unit.

Realizing that it serves a diverse public, the Department of Parks and Recreation's services are diverse. The objectives of the Department's program are clear and inclusive:

- To secure and preserve elements of the state's outstanding landscape, cultural and historical features.
- To provide for the meaningful and constructive use of people's uncommitted time.
- To help the people of California understand and appreciate through an interpretive program the state's cultural, historic, and natural heritage.
- To maintain and where necessary improve the quality of California's environment.
- To maintain a statewide recreation plan that includes a continuing analysis of the state's need for recreational areas and facilities, and a determination of the levels of public and private responsibility for meeting this need.
- To encourage all levels of government and private enterprise throughout the state to participate, whenever feasible, in the development and operation of recreational facilities.

These objectives are the basis of the planning now being done which looks toward the time—none too distant—when California's population will have doubled and when we can expect that the number of visitors to the state parks will also have doubled. This is an awesome prospect, to be approached not as something to fear, but as a challenge. Already we have greatly simplified one of our greatest problems—determination of the "carrying capacity" of each park so that its use will not become abuse—by using a management tool: computerized reservations for camping. This is only what private enterprise long ago adopted for its own controls. But it works two ways: the public too is accommodated, and campers are assured in advance of a place to camp by this system, or know that there is no space available.

Recreation needs, however, are expanding at a surprising rate, particularly in areas near the larger cities. This is true in every part of the country, not only in California. People in cities need recreation even more than those who live elsewhere: they are the new challenge. If we plan ahead, we can even make the "emerging cities"—of 50,000 or so population—more attractive and more liveable when they become metropolitan, by acquiring lands now on their fringes so that later as these cities grow they will have oases of green, open spaces. But we can't wait for that. We need recreation places *now*, near enough to large cities for people to get to them easily, and big enough to offer a great variety of recreation activities.

The projected state recreation area at Point Mugu will do just that. It is a 6540-acre tract on the coast, one hour's drive from Los Angeles, which has been planned to provide for a daily load of 22,000 people. It can be used as a day camp because of its proximity to the city or as a place to stay overnight—in trailer, camper or tent, or in hotel, hostel, dormitory or lodge. There will be everything from archery to horseback riding, from model airplane flying to rifle practice. Golfers and swimmers will flock to it, but so will artists and archeologists. It is a something-for-almost-everyone kind of place. Its setting is attractive, but it contains no great scenic splendors. We will preserve as much as possible of its natural resources—and use them as facets of our interpretive and educational programs—but we will be developing a recreation resource rather than preserving a scenic or scientific treasure. In planning for Point Mugu, careful consideration was given to data from many disciplines, to take full advantage of its assets. To determine the "carrying capacity" of the beach, for instance, we based its maximum capacity on one person per 100 square feet; but in determining the number and location of units for overnight lodging, we used the cluster concept rather than "so many per acre". Although we could have included many more camp sites in some locations, we recognized that not only does the public want open space as well as developed facilities, but large areas of undisturbed land are essential if the ecology of the area is to be preserved.

The size of Point Mugu presented the opportunity to incorporate a specialized activity which has not been accepted in recreation planning as a recreation form, but which has many devotees. In California alone there are 300,000 motorcycles registered for pleasure use, yet no public recreation area has provided trails for them to use. Consequently, these vehicles are being used on areas too sensitive to support their activity, with resulting environmental damage. This is especially true in the desert, where these vehicles have done serious damage. Realizing that these vehicles, and their riders, and this form of recreation are on the increase, we set aside a section at Point Mugu on which to develop trails which could traverse a varied enough terrain to maintain the riders' interest. We have space enough to develop other such specialized recreation activities at Point Mugu, and we probably shall do this, for the demand for specialized recreation forms is decidedly on the increase.

Point Mugu is not unique in offering many opportunities for private enterprise to participate in its development, but in number and variety of such opportunities it is unusual. No public agency alone can do all that needs to be done to meet the need for recreation today—or in the future. Much of it must be done by the private sector.

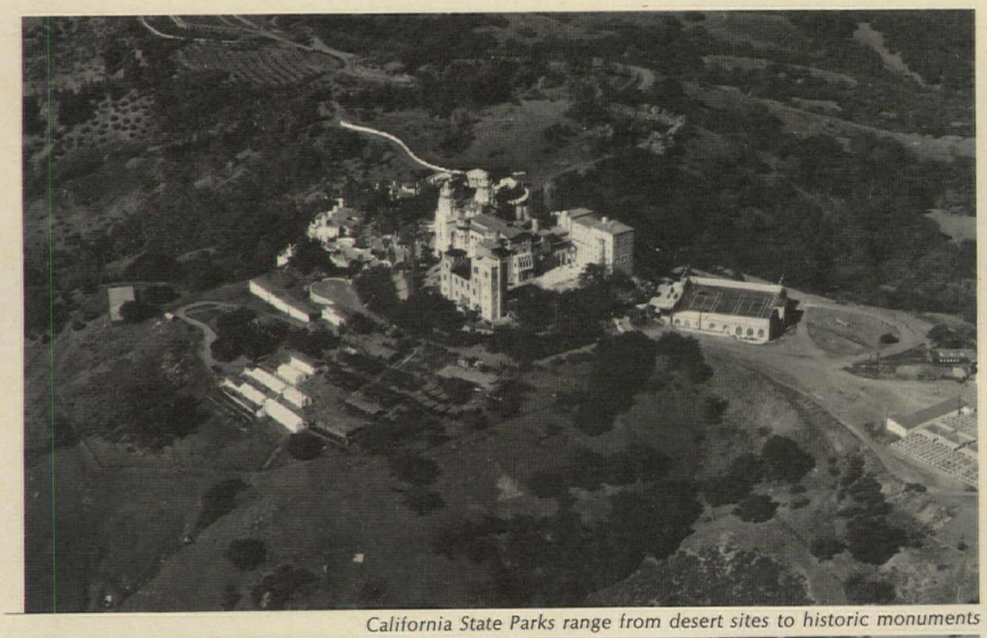
The demand for recreation is growing faster, actually, than population. In California, for example, we will need to add, by 1980, these units to our system: 83,800 camp units; 81,900 picnic units, 1300 boat launching lanes, 4720 additional miles of hiking and riding trails. These projections do not take into account possible changes in camping habits which may require new planning concepts, nor do they reflect the inevitable increase in demand for hotel or lodge-type accommodations which represent an obvious opportunity for private enterprise. It is clear, however, that to meet the needs of the public and to supply gaps in available recreation, greater cooperation between public and private sectors is required.

Greater mobility is a strong factor (along with higher incomes, more leisure and larger urban populations) in the rising demand for recreation. Provision must be made for the vehicles that this mobility implies: for beach access parking alone we will have to provide 65,000 spaces by 1980. But we see no reason to crowd beaches with parking lots and are therefore experimenting with parking locations as much as five miles away from beach parks, with transportation to the beaches by minibus or other public transportation. There is no reason to fear the automobile, but there is good reason to deal with it on human terms, and this we intend to do. Long ago, the State proved at Point Lobos—"the greatest meeting of land and water," as one writer has called it—on the California coast, that parking away from the sensitive areas was the only solution to preserving them. More recently at the Hearst castle at San Simeon, automobiles must park at the foot of the hill and visitors are transported to the castle by small bus. There is not space at the top of the hill for parking, and we do not intend to carve the hillside to make it. One of the terms of the bequest of the property was that it was to be maintained as Mr. Hearst had last used it. In respecting this we shall preserve the experience of visiting this unusual place for all.

We must also deal imaginatively with a kind of vehicle that has largely been ignored: the trailer. Trailer travel is on the increase everywhere. No one has thought of this as a recreation form, so no provisions have been made for it except in an off-hand sort of way, without realizing that it is a recreation type in itself, with particular needs in the way of facilities. The California Department of Parks and Recreation is completing the first—but not the last: we need them the length and breadth of the state—overnight wayside trailer camp. The concept has already sparked a major hotel chain to give serious thought to providing similar pleasant overnight trailer camps immediately adjacent to its existing motor hotels. Our camp will permit only an overnight stay since it is to serve the *travelling* trailer at night. But the experience of planning and providing this facility brought home to us the need for coordination between public agencies: not one mile away from the overnight trailer wayside is a Highway Department wayside rest, complete with water connections and toilet facilities, for day use. There is no room in the budget—of time and effort as well as of money—for this kind of duplication. It seems obvious, too, that parking lots can also be used for overnight camping under certain conditions, thus materially increasing capacity at little additional cost.

Private airplanes also must be provided for, because this mode of transportation is no longer the prerogative of the rich. People rent small planes as well as own them. A county airstrip has served the historic mining town of Columbia, now a state historical park, but at Anza Borrego, our great 480,000-acre desert park, we now have two airstrips in use, and we are studying the possibility of adding airstrips in some of our other parks, with ground (or helicopter) transportation from them to nearby camping areas. Planning for this kind of facility in a state park may seem far out today, but private flying is not destined to decrease in popularity. Our study suggested another kind of recreation opportunity for private enterprise: air tours of certain areas.

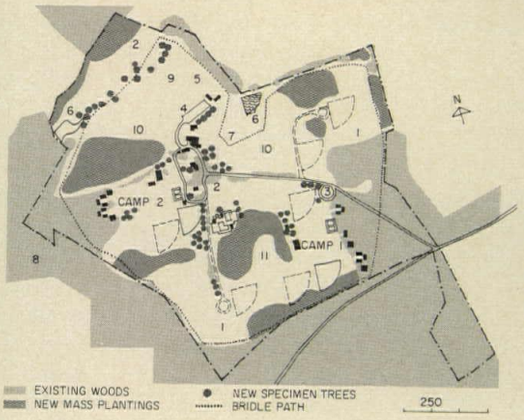
The problem of meeting the public's recreation needs is, above all, an opportunity as much as it is a challenge. A quality outdoor experience, which is what we are trying to provide, is both educational and inspirational. It is our plan, for instance, to have visitors pass through an interpretation center before they actually get into our parks so that they will have an understanding of the experience they are about to have. From understanding, a new sense of values—in fact, a new set of values—derives, and from these values a deep and, we hope, lasting awareness of the environment and its fragile ecological balance. (We cannot, and do not intend to, provide camping in state parks for everyone. Others must share in that responsibility, in other places and in other ways.) To determine these values and relate them to our planning for the future, we are involving all the disciplines in any way relevant: architects, landscape architects, biologists, botanists, geologists, ecologists, historians, archeologists, oceanographers. For only if we approach the solution to recreation needs as a problem in total planning—social (who uses the parks? people, of course) and environmental—can we be sure that the old single-purpose natural resource planning, which solved one problem only to create others, will no longer prevail, and in its place will be the multi-relational planning that reflects Nature's own interrelationships.



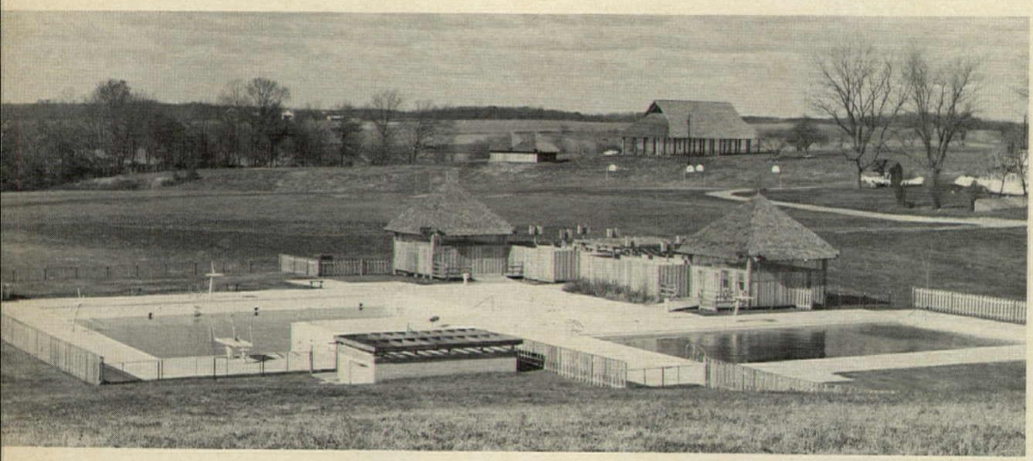
California State Parks range from desert sites to historic monuments

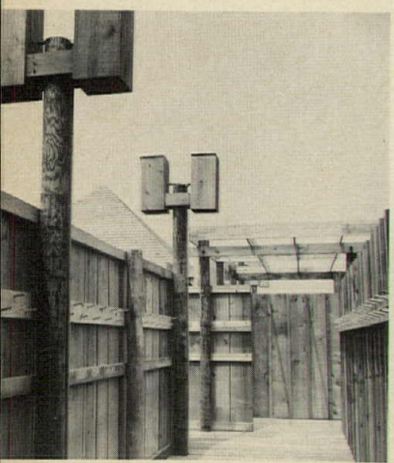
Richard L. Thompson

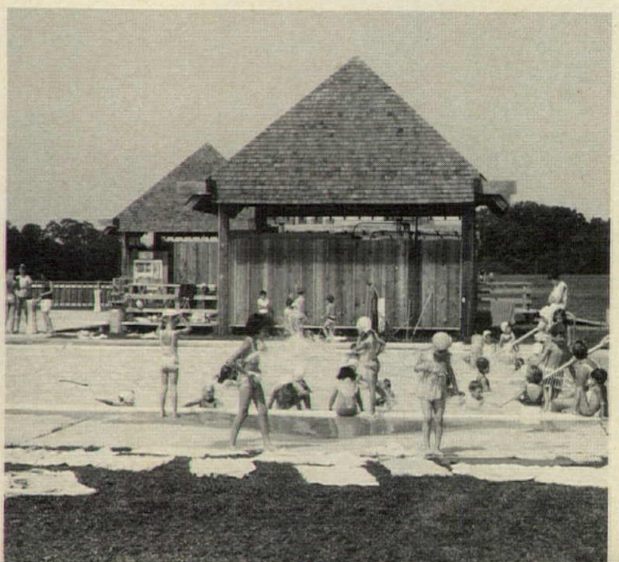
1. Future camp
2. Picnic area
3. Camp circle
4. Bus parking
5. Future model farm
6. Pond
7. Ski and sled run
8. Nature trail
9. Natural amphitheater
10. Open for vista
11. Knoll



COUNTRY CAMP FOR DAY AND OVERNIGHT USE

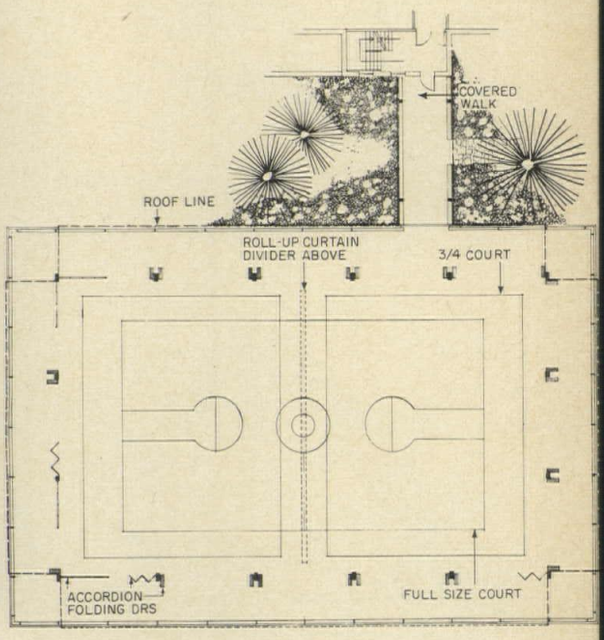




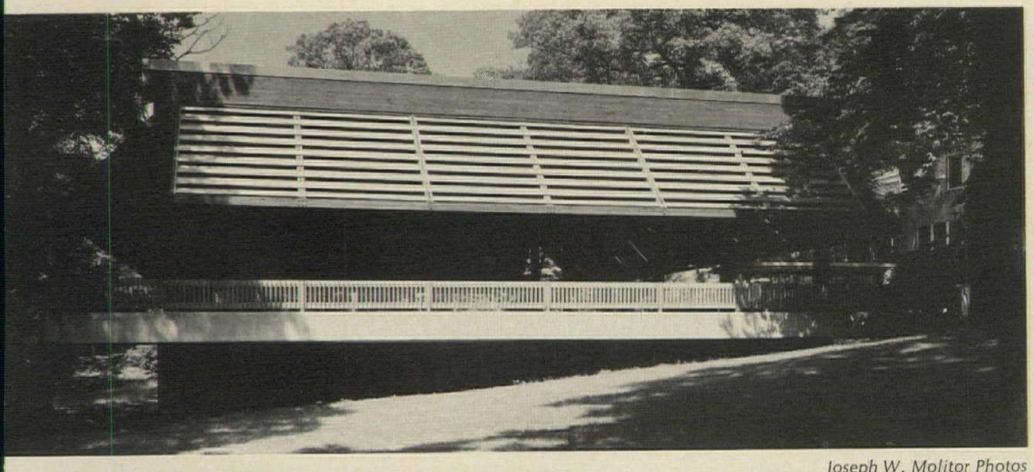


The Milldale Camps of the Jewish Community Center are located on a 155-acre site northwest of Baltimore, and serve a variety of purposes: city children get a taste of the country, adults and families use the camps year round for weekend outings and older people use an old farmhouse (existing on the property) for their activities. The site is kept as natural as possible, with the buildings—simple and modest wood structures with steep hipped roofs—unassertedly placed on the hillside, with the knoll kept open. Each of the basic units is 20 feet square; some with open, railed sides are used for shelters; others with red cedar walls are utility buildings. There are 20 such structures in each camp, and the camps, on the edge of the forest around the open hill, are almost concealed in spring and summer when the trees are in leaf. Each camp also has a large open pavilion located up the slope. In the open meadow are two swimming pools with minimal dressing shelters. Camps are far enough apart for their programs, simultaneously involving some 1000 young people, to be under way simultaneously without conflict.

MILLDALE CAMPS, Reisterstown, Maryland. Owner: *Jewish Community Center of Baltimore.* Architects: *RTKL Inc.—Charles E. Lamb, partner-in-charge; Paul T. Heineman, project captain;* contractor: *Ira C. Rigger, Inc.*



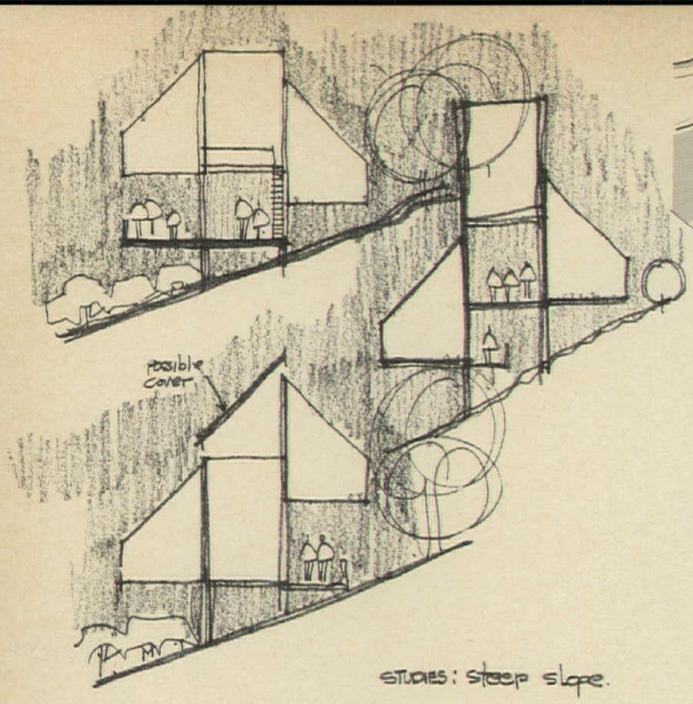
ALL-WEATHER PAVILION FOR ALL KINDS OF PLAY

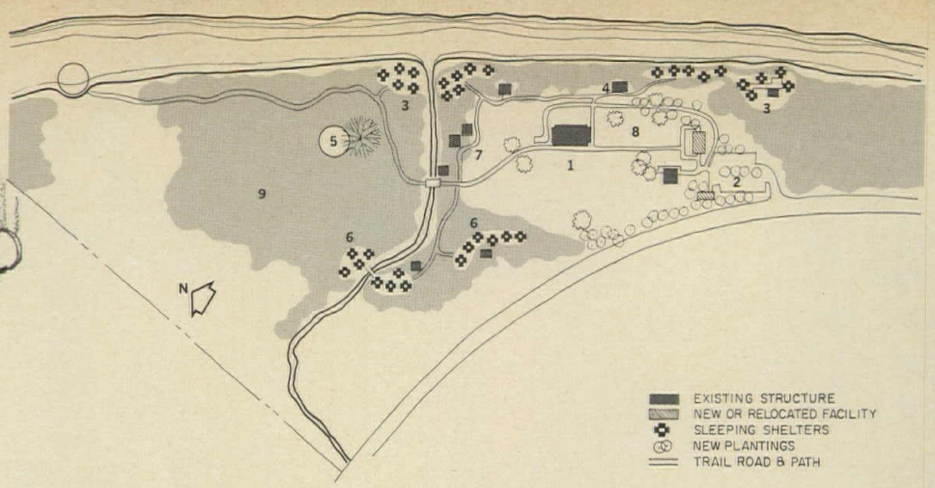


Joseph W. Molitor Photos

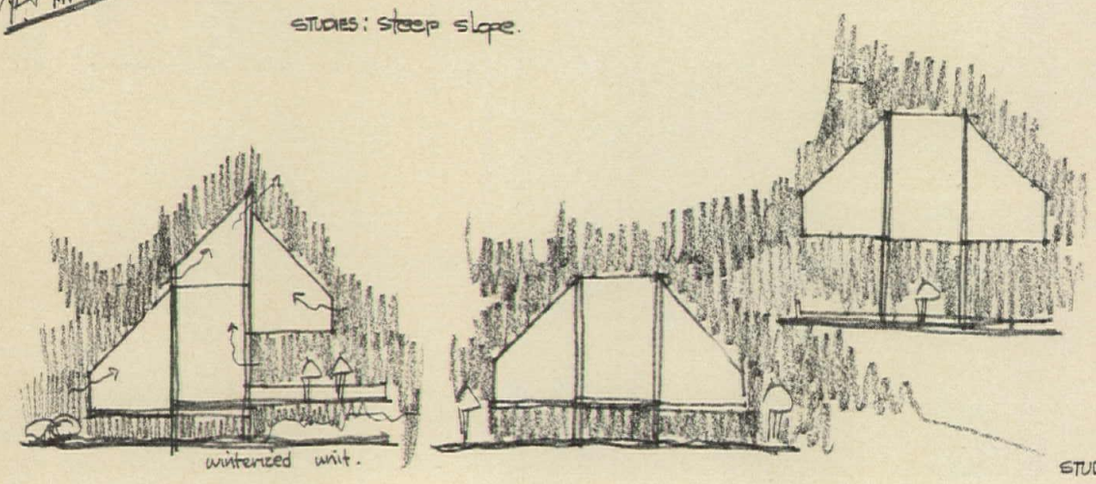
Open but protected, this 10,000 square foot play area—designed for a school but suitable for outdoor recreation of many kinds in a variety of locations—is used for outdoor games and other activities all year round, regardless of weather. On very cold days, radiant heat in the ceiling can be used and on windy days, canvas drops can be lowered along the perimeter to form walls. Fixed glass triangle at the corners give additional protection. The louvered wood overhangs shed rain and snow while admitting ample air. So pleasant is the "gymkhana" (Hindu for sports arena) that adults of the community use it after hours for their activities. The structure is simple but handled with skill and a sure eye for proportion, line, and the quality of space created. Twenty laminated wood girders 60 feet long by three feet deep span the court area and carry the roof, and are supported by 20-foot high columns which rest on a concrete slab. The pavilion cost $200,000.

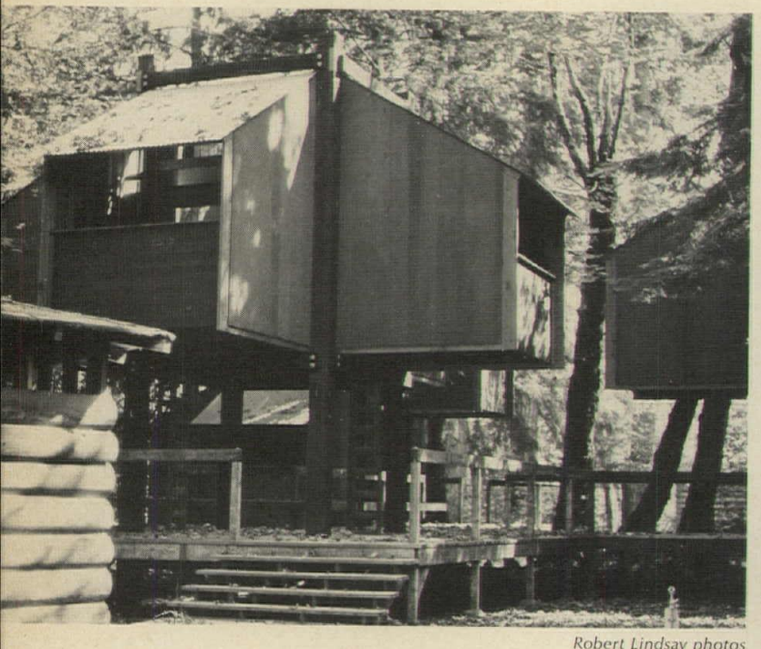
GYMKHANA, ELISABETH MORROW SCHOOL, Englewood, New Jersey, Architect: *Delnoce Whitney Goubert;* structural engineers: *Fraioli, Blum & Yesselman;* landscape designer: *Thomas F. Paterson;* contractor: *Romangino Construction Company.*



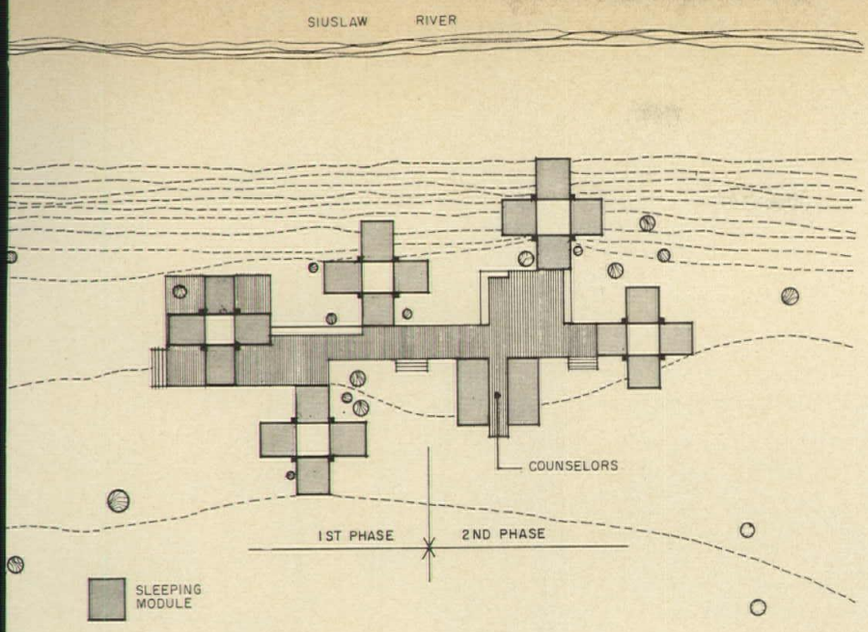


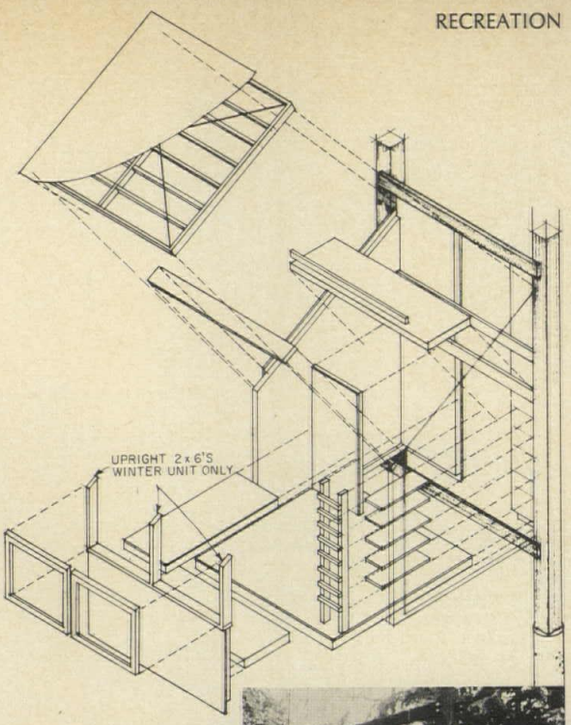
1. Lodge
2. Entrance & parking
3. Shelters & winterized shelters
4. Toilets & showers
5. Council ring
6. Sleeping shelters; toilets
7. Sewage treatment plant
8. Formal activity area
9. Nature study & trails

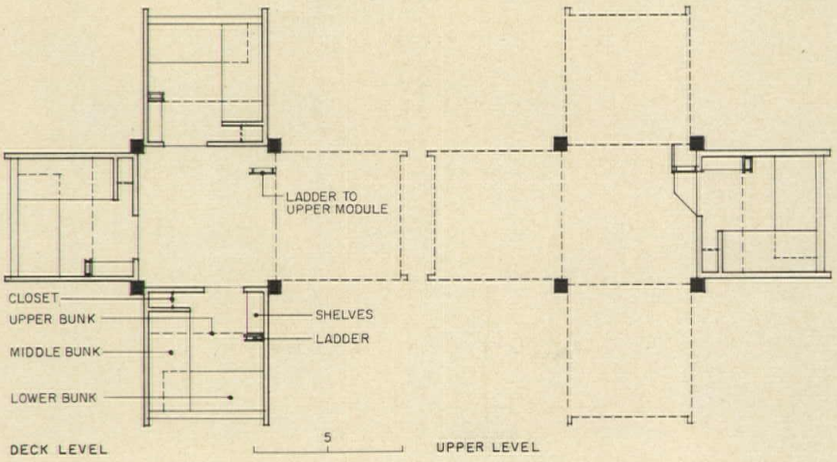


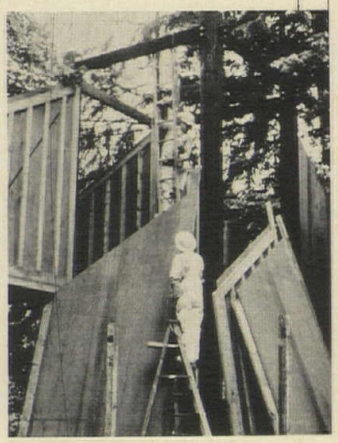


Robert Lindsay photos



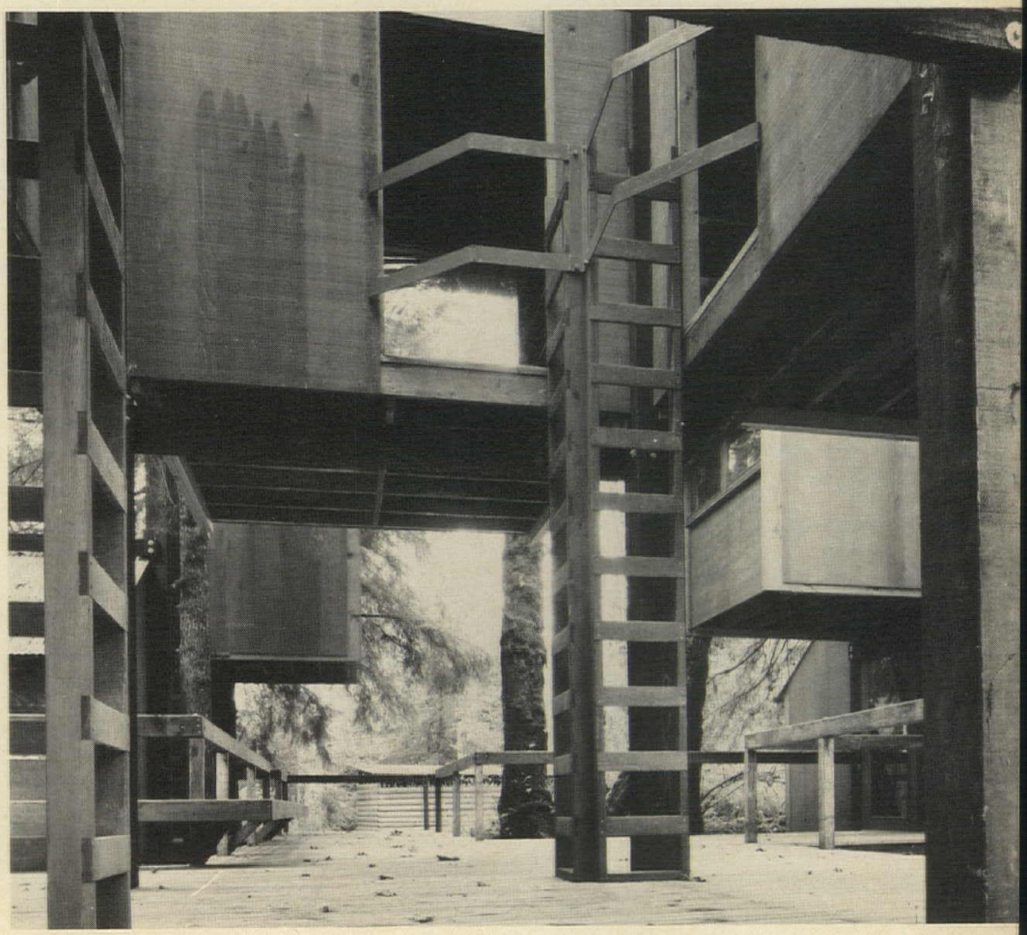






ORGANIZED GROUP CONFERENCE CAMP IN OREGON WOODS

County owned and administered, Camp Lane is used by organizations for conferences, programs and camping, with especial emphasis on young people's and children's groups. The architects were asked to prepare a master site plan to incorporate new shelters (some winterized) into an existing camp, for an eventual 150 persons. The 15-acre site is small for such a density; shelters are located on the edge of open activity spaces. Decks and elevated areas double as conference and play areas. Each unit is self-contained: furnishings are built in, simple and rugged. Because the camp is in such constant use, new construction has to be done fast and in brief periods. A prefabricated panel system permits rapid erection: a basic unit can be erected in slightly less than an hour, a group of 12 finished in one month. Units are grouped in clusters of four, with three persons to a unit. More units will be added as budget permits. The forms, bright colors, siting among trees, and interplay of decks were designed to be "different from home" and "fun" for all users, but particularly for children.



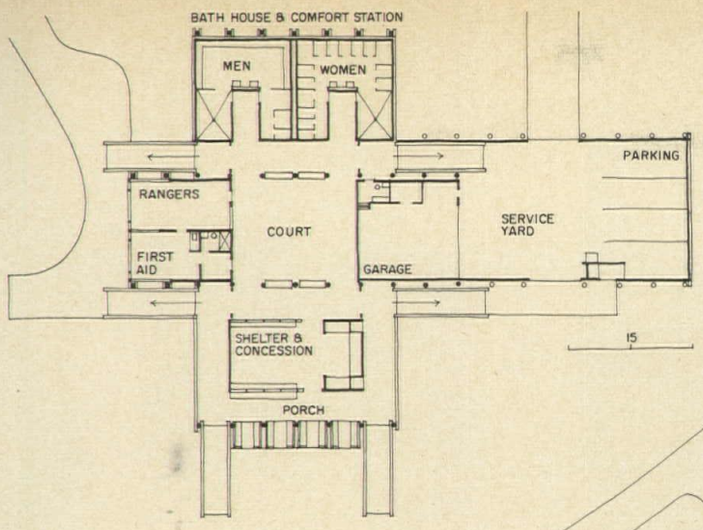
SLEEPING SHELTERS, CAMP LANE, (Phases 1 & 2), near Mapleton, Oregon. Architects: *Unthank, Seder & Poticha*. Contractor: *Lane County Parks Department (Phase I), Howard Nelson (Phase II)*.

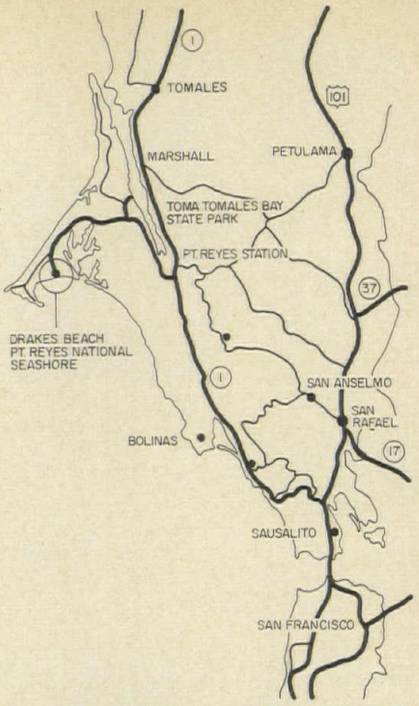
FOUR-USE VISITOR CENTER FOR NATIONAL SEASHORE

Joshua Freiwald photos

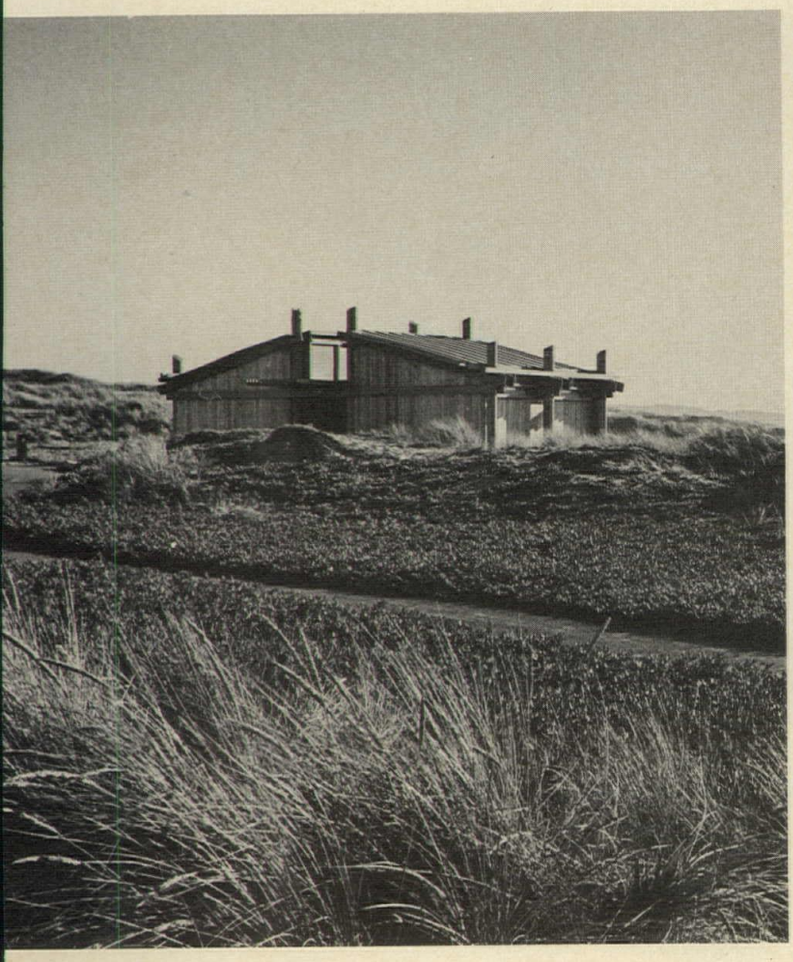
This visitor facilities building is the first such to be built in the new Point Reyes National Seashore, some 30 miles northwest of San Francisco, for which funds have just been authorized to complete acquisition of private lands within its over-all boundaries. The building, housing ranger's office, dressing rooms, garage and dining facilities, is for year-round use, in weather which varies from dense fog to warm bright sun, with winds which range from light to uncomfortably strong. The four uses of the building determined the plan and provided the desirable addition of a protected court for wind-free lounging and for interpretive talks by rangers. The slant of the roofs aids in reducing the amount of wind that reaches the court. The building is of wood construction, and stands on piles 30 and 40 feet long. Pilings are used throughout the building itself, treated with weathering oil. Like the other materials used, including the copper roof, they were selected because they required minimum maintenance.

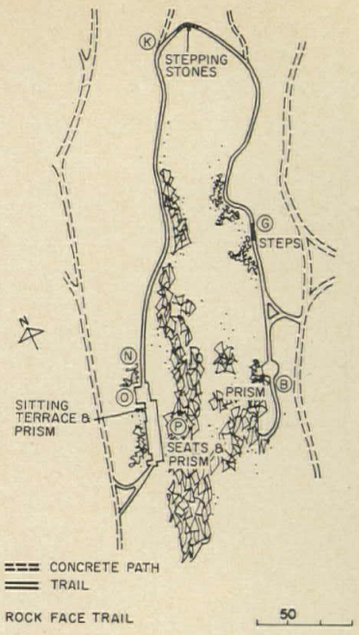
DRAKE'S BEACH FACILITIES BUILDING, Point Reyes National Seashore, California. Architects: *Worley K. Wong of Wong & Brocchini & Associates* and *John Carden Campbell of Campbell & Rocchia & Associates;* structural engineers: *Eric Elsesser & Associates.*





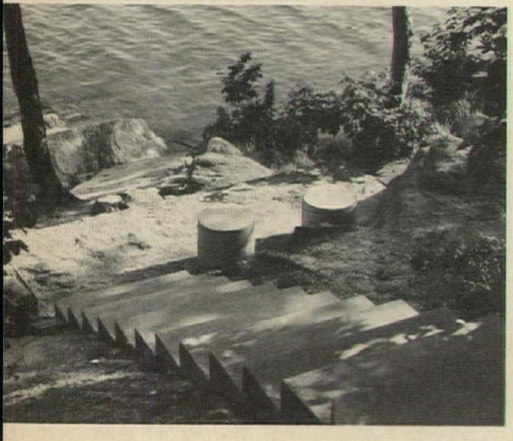
Drake's Bay is at the end of the Point Reyes road and is actually only one portion of the shore along Drake's Bay. The facilities building is located on the grassy dunes with a view to Point Reyes on the north and to the curving shore of the Bay on the south. Picnicking, swimming and sunning are the principal recreation uses of the area immediately surrounding the building, but it also serves hikers on the many trails in the park.

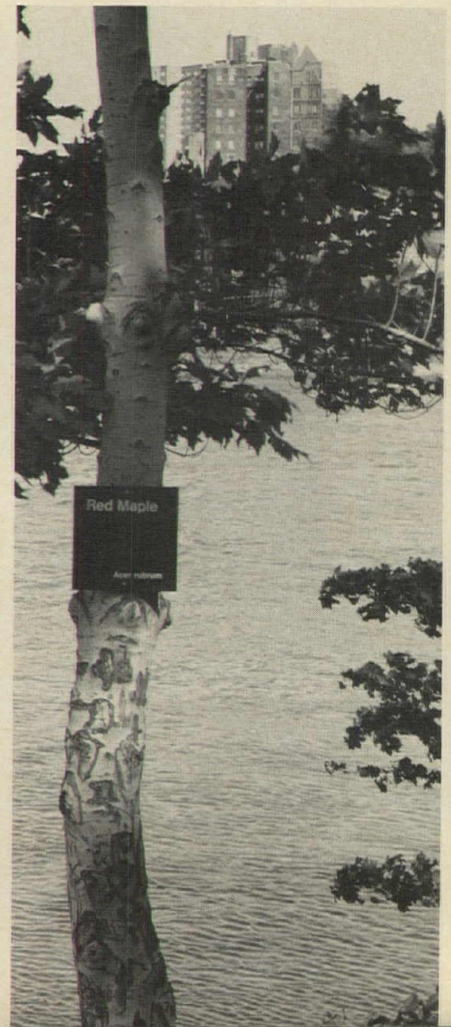




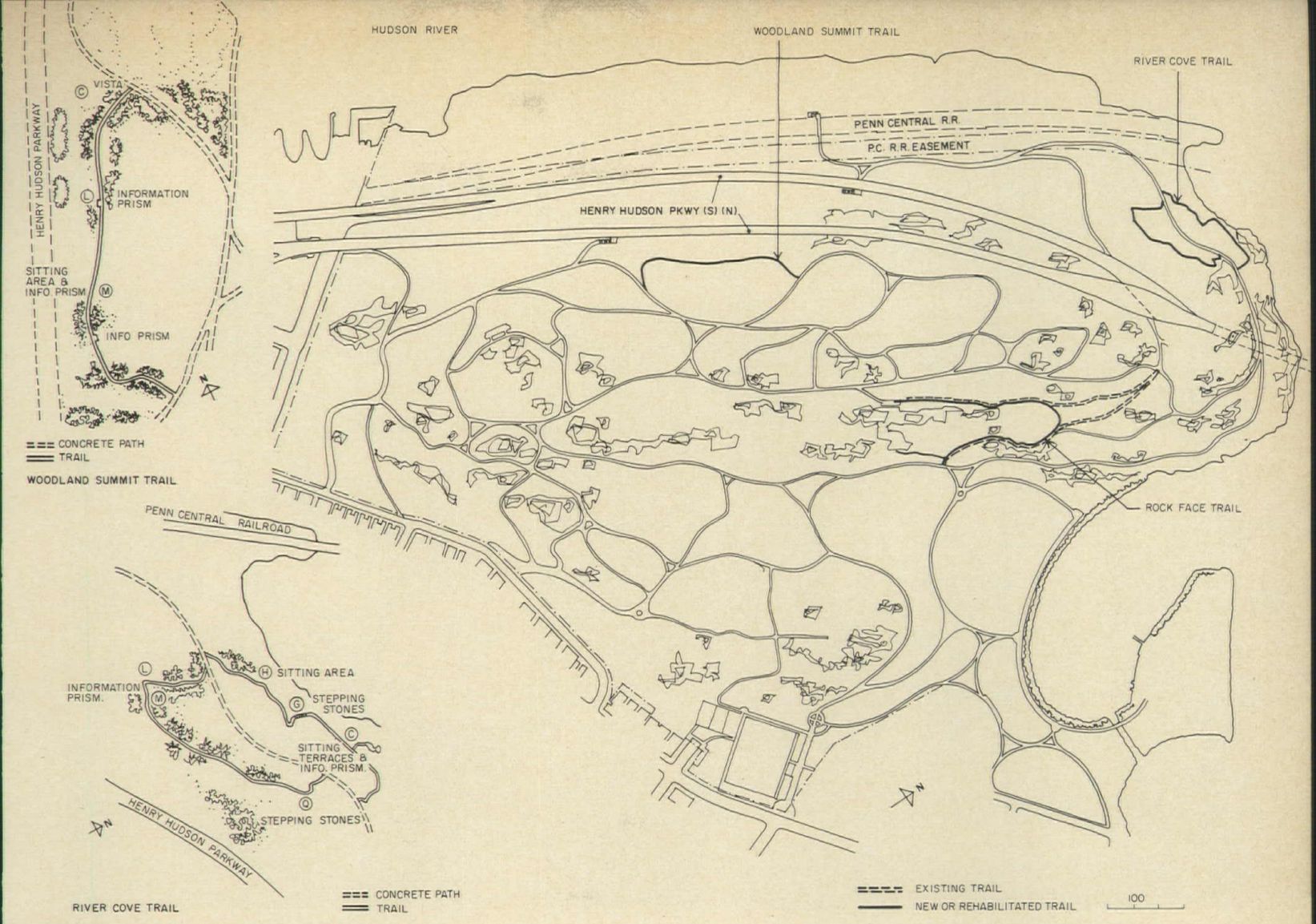
Many new plantings were specified along the trails: on River Cove, blueberry, bayberry, mountain laurel and hemlock; on Rock Face, ferns, iris, narcissus, dogwoods; on Woodland Summit, flowering trees, hyacinths, mountain laurel, narcissus, daffodils, viburnum. Plant materials were selected (with suggestions from City horticulturists) to enhance existing plant materials with seasonal color and variations of texture.

NATURE TRAILS IN A





Diane Serber photos



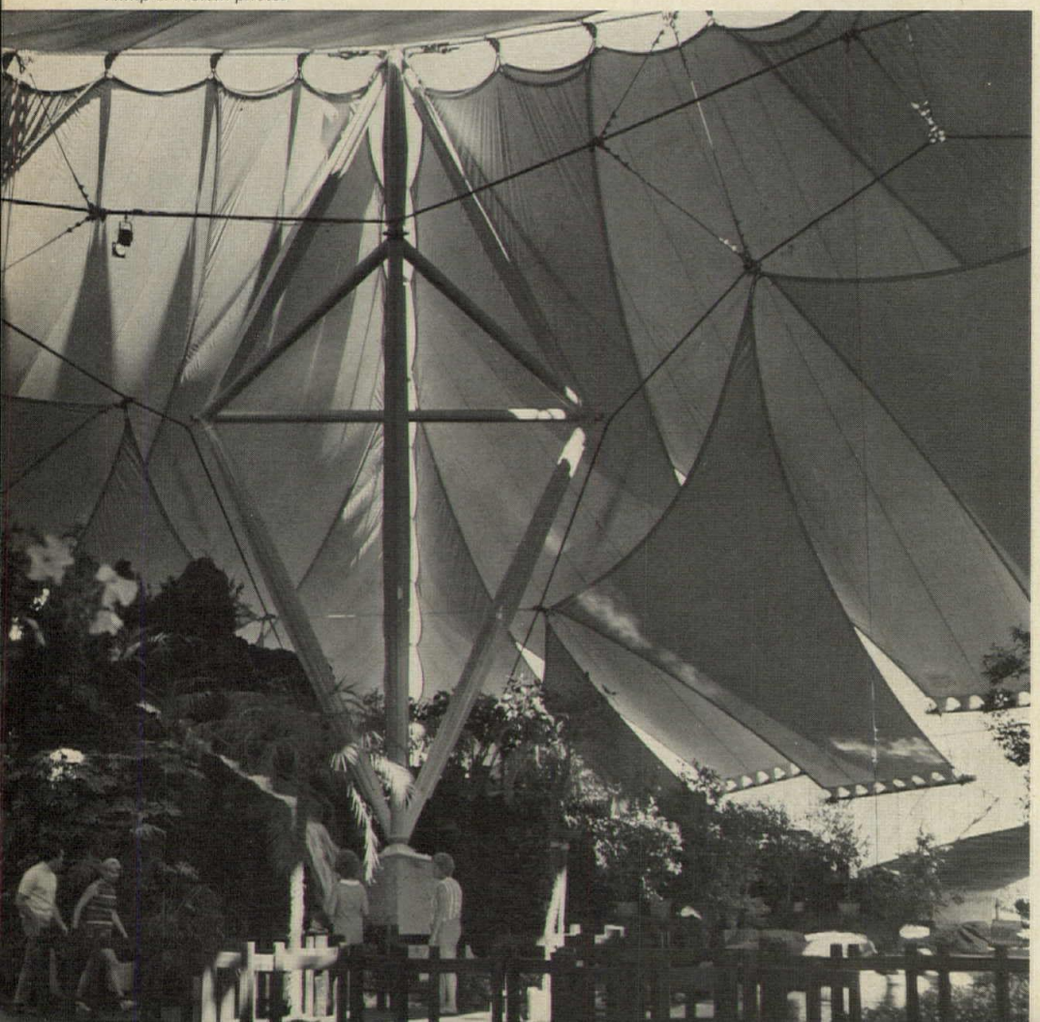
WILD PARK IN NEW YORK CITY

Walking for pleasure is—and will be, say recreation experts—one of this country's most popular recreation activities. But pleasant places to walk are few in number, especially in urban areas. The new nature trails at Inwood Hill Park are rare exceptions to the insensitivity of walks in city parks. This old park—a unique remnant of Manhattan's original natural state, historic in connotation, wild in much of its extensive acreage—is surrounded by the densely populated streets of New York City, and is easily accessible to city dwellers. The three new trails have been developed with exceptional sensitivity to the natural qualities of these environments. Restraint and subtlety of design keep man-made intrusion at a minimum but at the same time introduce new ways of heightening the outdoor experience: the concrete "information prism" with rocks and plant materials cast into its acrylic plastic top; sitting terraces and resting places using simple forms in informal groupings.

INWOOD HILL PARK NATURE TRAILS, New York City. Client: *New York City Parks, Recreation and Cultural Affairs Administration—August Heckscher, Administrator; Elliot Willensky, Deputy Administrator for Development; Roy Neuberger, Director of Conservation.* Architects: *Richard G. Stein & Associates—Diane Serber, associate-in-charge;* contractor: *Whitler Construction Company.*

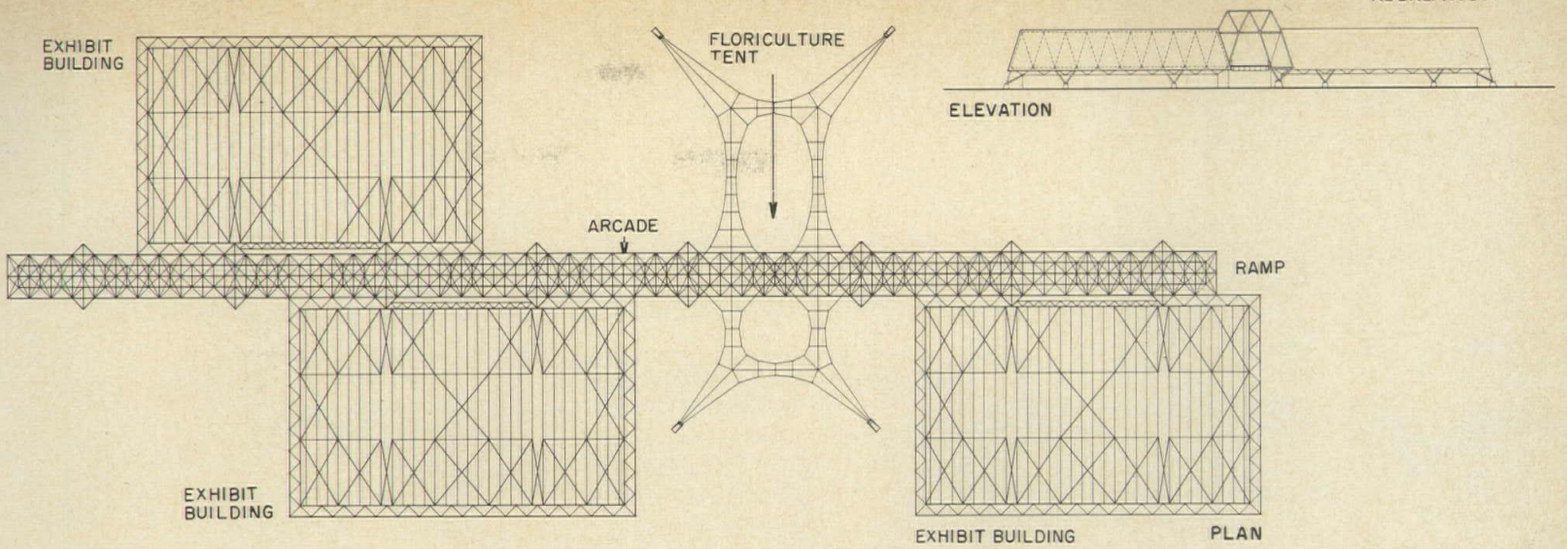
TENT PAVILION FOR FLOWER SHOW AT STATE FAIR

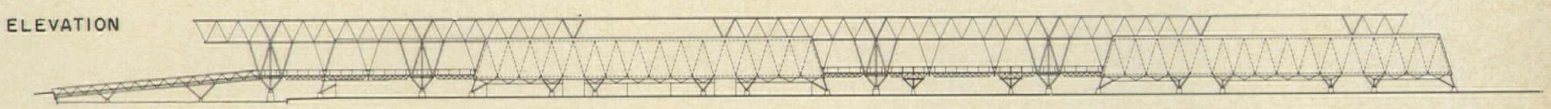
Philip L. Molten photos



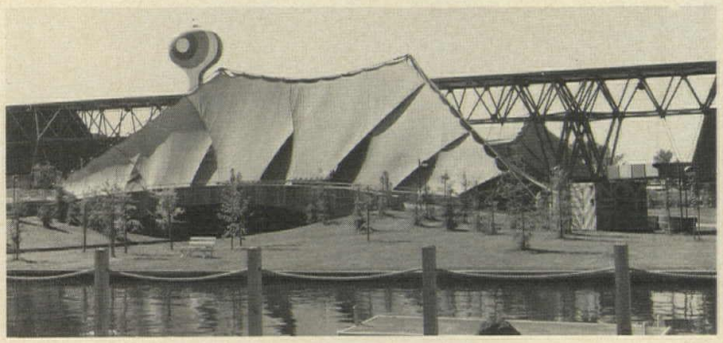
Fairs are major, though often brief, recreational opportunities, usually housed in undistinguished, utilitarian structures. California's new State Exposition and Fair, however, capitalizing on a mild climate and a large population from which to draw attendance, has been designed to provide for year-round operation, with exhibits and expositions housed in buildings designed by some of the state's best-known architects. The unusual Floriculture Pavilion, part of the Fair Activities Complex, is a favorite place for fair-goers, an oasis of color and greenery under a ceiling of filtered light, where visitors can stroll, picnic or sit and talk. The structure is steel cable with canvas panels and flies which can be removed completely or partially to obtain different effects. A double flap system of panels on the sides creates patterns of light and shadow on tent walls both inside and outside. A waterway meanders through the display area and connects with the lake.

FLORICULTURE PAVILION, FAIR ACTIVITIES COMPLEX, California State Exposition and Fair, Sacramento, California. Architects: coordinating and master plan, *Wurster, Bernardi & Emmons;* pavilion, *Callister and Payne;* structural engineers: *Gilbert Forsberg Diekmann & Schmidt;* mechanical engineer: *Paul Rosenthal;* electrical engineers: *Charles Krieger & Associates;* landscape architects: *Lawrence Halprin & Associates;* contractor: *Baldwin Contracting Co.* (complex), *Industrial Covers* (pavilion).



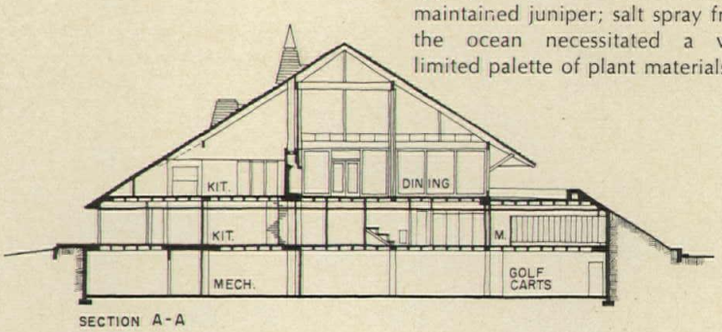


The dramatic entrance to the Fair Activities Complex is by way of a steel-framed covered walkway which bridges the floriculture tent and connects the central Fair plaza with the livestock and grandstand area some distance away, permitting visitors to see a wide variety of exhibits on their way. Stairs lead from this bridge and its mezzanine exhibit areas to the lower level where there is direct access to the tent. Exhibit buildings are steel framed, their exposed trusses providing a vast clear space where the traditional state fair exhibits are displayed. Other recreation includes boating on the lake in front of the complex and "water rides" through the tent.

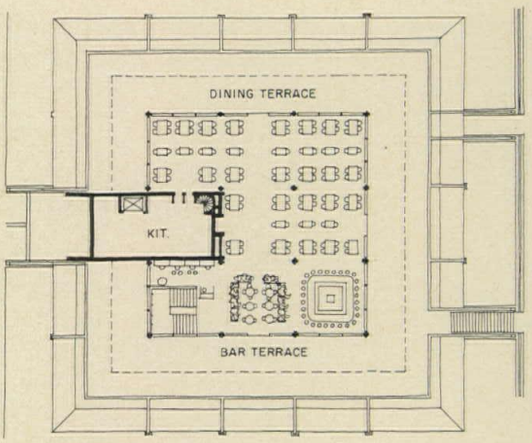


Ben Schnall photos

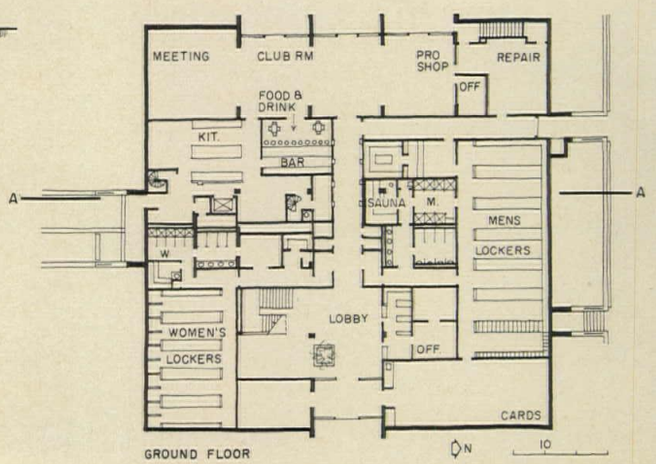
Main entrance and lobby are on the lower level, with stairs leading directly to the main dining room and its bar. From the deck surrounding the dining room, there is a 360-degree view over the countryside and to Montauk Bay. The berm on which the building sits is simple and appropriately landscaped with easily maintained juniper; salt spray from the ocean necessitated a very limited palette of plant materials.



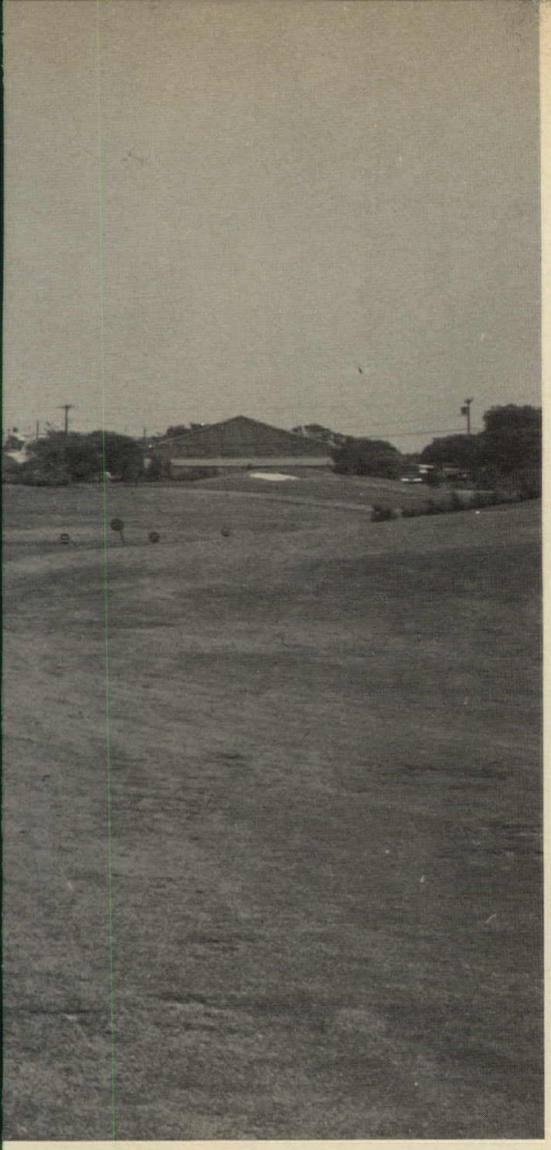
SECTION A-A



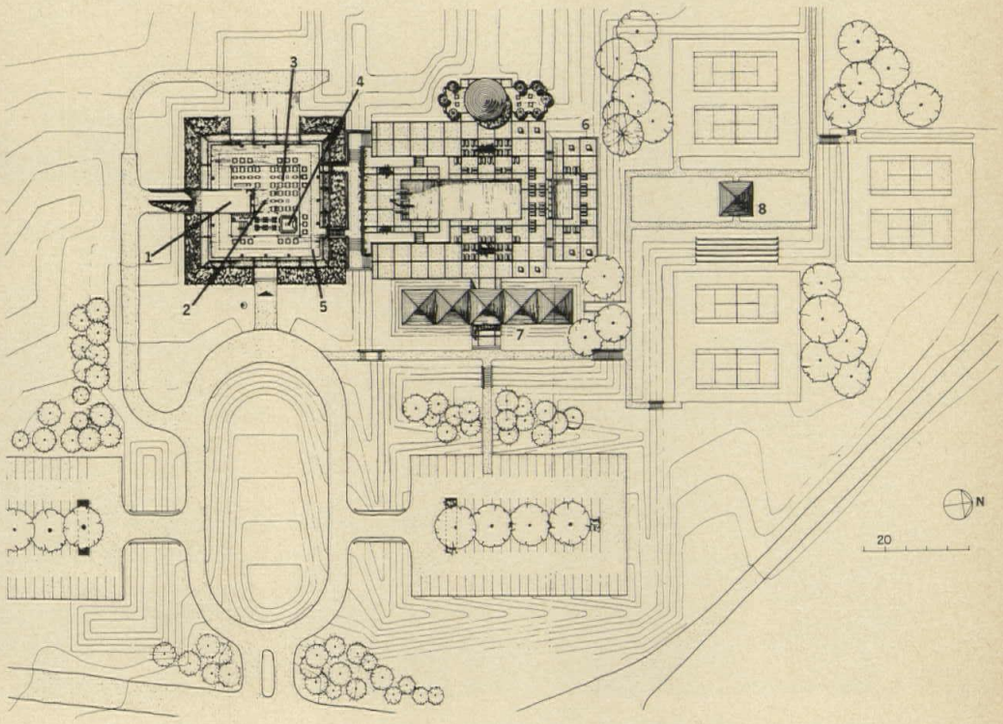
MAIN FLOOR



GROUND FLOOR



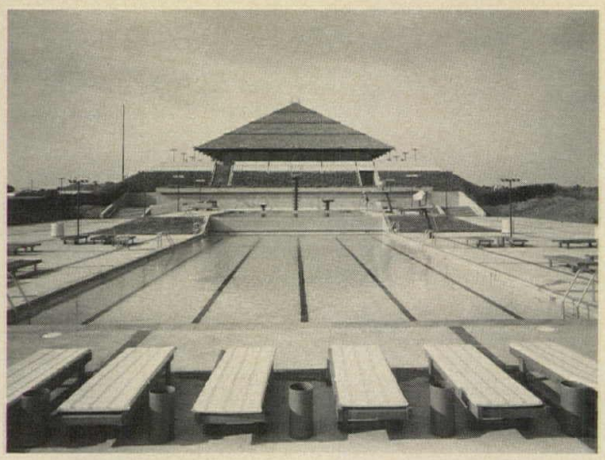
1. Kitchen
2. Dancing
3. Dining
4. Bar
5. Terrace
6. Refreshment
7. Future bath house & locker rooms
8. Pro shop

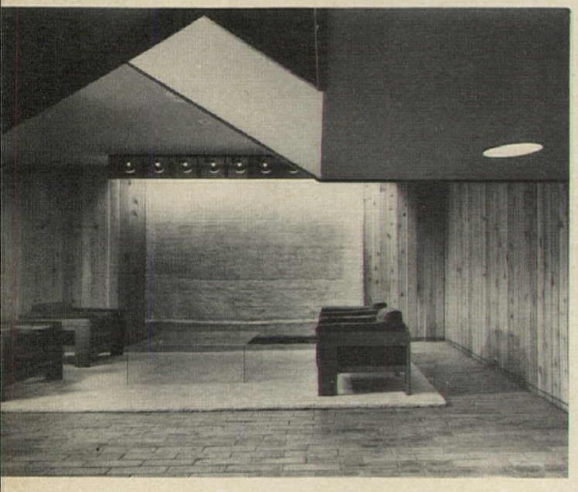


GOLF AND TENNIS CLUB ON LONG ISLAND SOUND

Rising from a windswept sand dune site, the pyramidal form of the Montauk Golf and Racquet Club is a landmark in the surrounding area. The strong lines of the roof—which emphasize the slope of the dune hill (highest in the area) on which the building sits, and recall indigenous farm buildings of the locality—are a happy design solution for function and for sensitivity to the environment. The building divides vertically by function, with the utility areas on the ground level and entertainment areas on the upper level, from which there is a 360-degree view of Montauk Bay and Suffolk County. The pyramidal roof lends its inverse form to the dining room and bar on the upper level, and overhangs a part of the surrounding terrace. All materials are simple and reflect indigenous uses: decks and lower floor are of ironspot brick pavers, walls are rough sawn red cedar and plank, exposed concrete faces are sandblasted or hand hammered, and the roof is covered with hand split cedar shakes. The building and its recreational facilities are designed for a membership of 500 families.

MONTAUK GOLF AND RACQUET CLUB, Montauk Point, Long Island, New York. Architect: *Richard Foster;* developer: *Montauk Improvement, Inc.;* structural engineer: *Zoldos Meagher;* mechanical and electrical engineers; *Harold Rosen Associates;* interiors: *Luss/Kaplan And Associates;* contractor: *Tandy and Allen.*



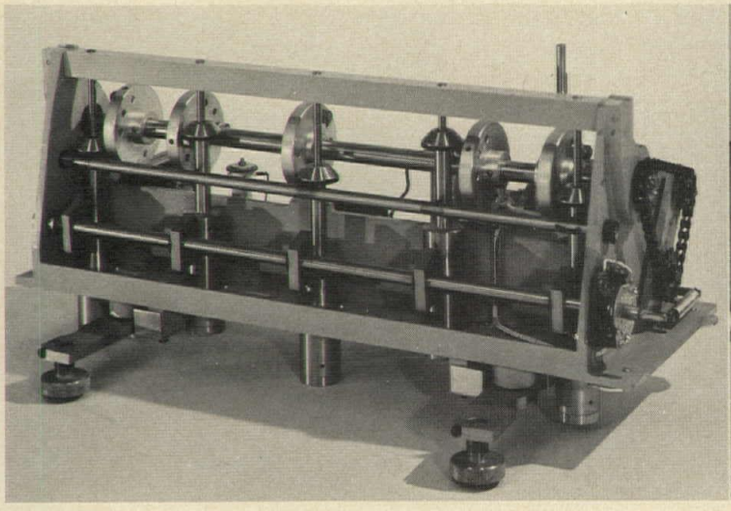


The dining room's high ceiling gives it exceptional spaciousness. Ceiling is red cedar plank, oiled; columns and rafters are fir. Location of the entertainment facilities on the upper level takes advantage of the sweeping view of the surrounding area; glass walls and low parapet around the terrace permit a clear view. Tables and chairs are of oak; carpet is green. Ground level bar (right) serves card, club and meeting rooms on that level. Stairway (top right) leads from main dining room to lobby on lower floor (above); rail is leather over foam rubber. The Olympic-sized swimming pool and the tennis courts are reached by steps from this level.

The hazards and hurdles in developing standards: a case history

The proposed use of a European tapping machine for rating the impact-noise resistance of floors illustrates the difficulty in developing standards that have real relevance to actual usage. This situation is significant and revealing because: 1) it involves a considerable dollar volume of construction, 2) it involves a wide variety of floor constructions, products and design solutions, 3) it can affect a large number of people. Therefore, it is the perfect case example of the non-validity of the old saw that some standard is better than no standard, and a perfect case example of an increasingly popular cop-out—searching for a quantitative number that rationalizes not taking responsibility for qualitative judgments

—Robert E. Fischer



Freedom from the intrusion of noise into occupied spaces is dependent largely upon two factors: 1) how well enclosing elements screen out the noise, and 2) how much masking sound there is within the occupied spaces themselves.

Architects can understand that the reasons we have more noise problems today are, first of all, the number and intensities of noise sources have increased, and, secondly, constructions have generally become lighter in weight.

The problem area that received earliest attention, and in which the most work has been done, is airborne noise. The reason, no doubt, is that airborne noise sources were the most obviously perceived—i.e. neighbors' voices. Standards have been developed that work satisfactorily enough for measuring the airborne sound-attenuating capabilities of partitions, ceiling assemblies and floors. The biggest problem has been in anticipating how close to laboratory test values field construction can come.

The problem of impact noise transmission through floors is another matter. Regulatory agencies in this country have been concerned with it for less than 10 years, and of course designers' familiarity is even less than this. The noise sources that cause annoyance include, first of all, footfalls, but also to varying degrees, dropped objects, floor cleaning machines and the shuffling of furniture.

The Europeans have had criteria and standards for impact noise for over 30 years, and, furthermore, many of the countries have conducted extensive user surveys in apartment buildings, upon which their criteria are based. The countries all have criterion curves which have been derived from an arbitrary correlation between acceptability or rejection of actual floors determined by surveys, and sound pressure measurements made in the laboratory using the ISO hammer machine as a test device.

In January 1963 FHA issued a guide on *Impact Noise Control in Multifamily Dwellings,* which was developed under the FHA Technical Studies Program. This guide proposed the use of the hammer machine for evaluating the impact noise resistance of various types of floor constructions used in multifamily dwellings. These floor constructions were given Impact Noise Ratings (INR) determined through the use of an impact noise criterion curve which had substantially the same shape as the curve used in the German standard which was first issued in 1938. Late in 1963 FHA included a listing of recommended performance ratings based on this method in their Minimum Property Standards. In September 1967,

HUD-FHA issued a new handbook, *A Guide to Airborne, Impact and Structure Borne Noise-Control in Multifamily Dwellings*. In the impact noise section, the FHA criterion curve has been slightly modified, and the rating numbers—originally called Impact Noise Rating (INR) and now called Impact Insulation Class (IIC)—have been raised to make them comparable in magnitude to the airborne sound ratings, Sound Transmission Class (STC). The HUD-FHA document stated that a committee (Sub-Committee VI of Committee C-20 of the American Society for Testing and Materials) was presently working toward developing a standard method of test.

The sub-committee is now up to its fifth draft and a standard is yet to be approved. The reason is that many committee members believe that the hammer machine technique is not a suitable method for evaluating impact-noise resistance. First of all, they say, the impacts produced by the hammer machine simulate nothing in reality. But, more importantly, they say that it can give highly erroneous impressions of relative efficacies of different types of floors. Unable to get the tapping machine adopted as a standard method of measurement, proponents of its use are currently suggesting that the method be published in the Book of ASTM Standards in the so-called "blue pages" which carry the designation, "published as information only." Nonetheless this material would be included in the book of standards, along with the fully adopted and tentative standards. (More on the implications of this later.)

Discrepancies were found between noise from impact machine and from footfalls

How did the tapping machine method get started anyway? Did it ever have any validity, that is, did it ever really reflect the relative efficacies of floors? The answer to this last question is a qualified yes. It seemed to work for the heavy, stiff concrete slabs that were used in European multifamily housing. But more recently as constructions and assemblies of floors-ceilings have changed, the Europeans have found discrepancies between the ratings of floors by hammer machine and the ratings of floors employing the footfalls of actual walkers. These discrepancies were brought to the attention of the building industry in this country in 1964 by Dr. Thomas Mariner, Manager, Physics Research Unit, Armstrong Cork Company, in a paper presented before the Building Research Institute, "Technical Problems in Impact Noise Testing." He pointed out that up to that time there had not been a concentration of effort and resources dedicated to a systematic solution of the impact noise measuring problem. He noted that a lot of sound level measurements had been made, but with the ISO tapping machine (International Organization for Standardization, headquartered in Europe). This machine, he said, is not related in any known way to natural impact sounds in buildings, and that social surveys had been conducted in European countries which indicated that certain constructions were satisfactory and others unsatisfactory for certain classes of people in those countries. For code purposes, he said, formal associations had been attempted between the valid and meaningful surveys and the *irrelevant* physical data taken with the ISO tapping machine. These associations, he continued, have no general applicability; many other equally arbitrary associations would have served the limited purpose well. All that is really known, he said, is that certain constructions are suitable, *but there is no valid synthetic test method* [as of this time].

As early as 1932, a tapping machine had been developed in Germany to make subjective evaluations of walking noise, using a hardwood "hammer" dropping at a normal walking rate. The machine was designed to simulate the character and strength of the walking of an adult wearing shoes with leather heels.

Somewhat later, the first German standard on impact noise was issued. But a big change had been made in testing techniques. Because subjective measurement of impact noise transmission was time consuming and inconvenient, testing organizations wanted to make objective noise measurements. But in order to do this they had to change the testing machine. Trouble was that the hardwood hammer did not make a hard enough impact to produce noise that could be measured on instruments existing at the time. Further, in order to get steady (accurate) readings on the instruments, the repetition rate of the machine had to be increased to 10 impacts per second. Not many years after the hammer machine had been in use, investigators acknowledged that it was questionable that the method gave a satisfactory imitation of walking, but nonetheless they felt that it had utility because results seemed to correspond with practical experience, and that, moreover, it made it possible to compare the data on various constructions obtained by different investigators.

Almost all European countries have standards that set limits on noise levels. And these countries have followed the lead of Germany in the use of criterion curves for the evaluation of the efficacies of floor-ceiling constructions in keeping impact noise down to tolerable levels. As noted before, the rating method appeared to work satisfactorily until recently. The rating curves have all been based upon actual measure-

Shouldn't standards be something more than

The industrial voluntary standards process has been characterized by one participant as, "developing in-house rules for competing in the market place." This is a strong statement, and, obviously, many exceptions could be cited. Nonetheless, this characterization seems to apply more and more frequently to standards affecting the consumer and the design professional in the building field.

The question raised, of course, is whether enough independent technical people are involved in standards preparation. While a certain amount of political infighting, and even honest bias, will always exist, this really does not matter too much if sufficient knowledgeable effort has been put into the technical work upon which a standard is to be based.

The trouble is that the committee approach—with one man, one vote—has failed to work satisfactorily at a time when the problems involved in the building field have grown by geometric proportion. The problem is further compounded by the pressure standards-making bodies are under to produce standards faster.

▪ All standards, by their very nature, involve the element of compromise—otherwise they would never get produced. Standards have to be practical and usable as well as technically correct. For standards to be honest and fair, the scope and limitations need to be spelled out for the user by technical people involved in their preparation. The user if he is a design professional should not have to dig and dig to find out its limitations. Design professionals do not have the time to do this—but they have the legal responsibility to understand any standard they use. The increasing use of performance specifications makes the need for explanations all the more impelling.

It is unfortunate that no commonly agreed-upon rules of procedure exist on the steps that need to be taken in the technical evaluation that forms the basis for standards. What happens is that the procedures that

ments of noise transmission through tests in the laboratory of constructions that had been proved satisfactory in practice. The shapes of the curves, though basically similar, vary from country to country because the typical constructions used for floors of multifamily dwellings vary.

Within the last five years, investigators in the government-sponsored building research organizations of Germany, Netherlands, France, Norway and Sweden have made studies and issued papers dealing with discrepancies between results with the hammer machine and actual impacts, mainly footfalls. Even with traditional constructions, the investigators say that the hammer machine overrates the magnitude of high frequencies. Further, and more importantly, they recognize the serious discrepancies that result when the hammer machine is used on floors that have compliant floor coverings such as carpet or foam-backed resilient sheet materials. To account for these discrepancies, they have proposed modified reference curves. Some proposals have been based on examinations of just a few floors. Others have been derived by trying to maximize a statistical correlation coefficient between subjective response to walking noise and objective measurements of hammer machine noise.

Knowledgeable people in the field of statistics say that a high correlation coefficient does not make newly proposed reference curves valid. They point out that data based on the new proposals involve discrepancies spread over substantially the same range as with the old reference curves, and that the only valid statistical measure is range of discrepancy.

Opponents of the hammer machine say the discrepancy between this machine and footfalls is intrinsic: first, in the radically different nature of machine and footfall impacts, and, second, in the peculiarities in response of floors. The effect of using the hammer machine to obtain data on floors that have compliant floor coverings is to exaggerate noise transmission in the higher frequencies relative to actual footfalls. Under the hard, fast impact of the hammer machine these coverings are highly compressed and act as if they are, in effect, hard, yielding little isolation in the higher frequencies. In fact, under footfalls, the compression takes place more slowly, so that the coverings are actually effective in the higher frequency range.

This phenomenon is known as non-linearity and it is presumed to occur not only with floor coverings, but with floor constructions themselves, particularly with those that involve isolation layers and flexible floors with joints.

The significance of non-linearity is that there is not necessarily a direct relationship between strength of impact and noise output of a floor system. In other words, the behavior of a floor system under harder impact of the hammers of the hammer machine can be different from its behavior under the impacts of human footfalls. It has been shown, for example, that some floors which have the same Impact Insulation Class (IIC) as rated by the hammer machine, can have considerably different efficacies when tested according to the measurements of footfalls.

It was noted earlier that European investigators—agreeing that hammer machine data does not correlate well with actual footfalls, particularly for the hard-heel impacts of women's heels—have suggested changing the shape of the criterion curves, or making adjustments to the hammer machine data. Some suggest changing the hammer machine, itself. Investigators at the Division of Building Technology in Sweden have said that (1968), "Both calculations and measurements have given results that show there is a need for a better testing method. The measuring problem is, however, so involved that still more investigations must be made both theoretically and experimentally. Especially there is a great need for more information on the properties of the real impact source. The investigations must not be specialized to one type of walker and one type of shoe. They ought to take into account men, women and children in high and low heeled shoes of heavy and light types, and also bare footed children.

The French have actually built a machine that simulates foot impacts, and conducted tests using different types of men's and women's heels that varied in degrees of hardness. Test results reported early last year showed that, "the actual manner of estimating the effectiveness of floor coverings [resilient floorings and carpet] with the aid of a standardized hammer machine attaches too much importance to the reduction of high frequencies for the results to have direct applicability to the case of normal walking".

"Detectability" is the criterion in a new approach to rating footfall noise

Some defenders of the tapping machine method have raised the question as to whether women's hard-heeled footsteps is representative of impact noise. They suggest that perhaps other impact sounds, such as those caused by dropped objects might be more disturbing. Opponents of the tapping machine method feel that hard-heel impact noise is the noise that occurs most often. In any event, they say, hard-heel walking cannot be said to be irrelevant.

Dr. Thomas Mariner has said that Armstrong Cork Company was in the process of developing a machine to simulate walking noise when a fairly strong controversy over

"in-house rules" for competing in the marketplace?

do result evolve from political negotiation rather than actual need. The situation being what it is, some people say that "a standard is better than no standard." But a standard which is erroneous and misleading is worse than no standard because if you have no standard, the advice of informed people utilizing their own judgment and experience will be listened to by the client. However, once a standard exists, specifications must consider what is in the standard, and the professional must justify why it is not good enough for him to use. Even though clients do not understand the whys and wherefores of a standard, in dealing with the clients it is not easy to persuade them to ignore it. If specifications have to be written around an erroneous, misleading standard, and the professional's judgment is that application of the standard will lead to a situation in which the client's needs are not fulfilled, the professional is in a tough spot.

- A long, hard look needs to be taken at the philosophies and rules involved in qualifying participants in standards promulgation. Such qualification would not be nearly so serious if standards had a more optional status than they do. The fact that a standard is issued under prestigious auspices means that it will be used—once a standard is issued it cannot be ignored.

A most unfortunate situation arises when someone at a policy-making level, particularly in government, makes a decision to go ahead, without proper technical advice, on a project intended to lead to promulgation of a standard. In such case, the fact that a project has been initiated means that there *will* be a standard, no matter what.

- By and large, standards are developed currently by representatives from industry and from government and educational institutions who have the time and/or the financial backing to engage in these activities. Participation by architects and consulting engineers is limited. Individual design professionals cannot afford either the

the tapping machine broke out into the open. He states they felt that in order to exercise any persuasion and overcome arguments of those who wanted to proceed with the tapping machine for a "standard," it was necessary to carefully document the underlying technology. Armstrong, on their own, developed evidence which they believe demonstrates deficiencies of the tapping machine with respect to its inability to evaluate structures for their relative merit in inhibiting intrusions of "real life" impact noise. The next step was directed toward development of a test device. This step consisted of trying to decide what physical factors in the acoustic environment associated with impact noise were relevant with respect to subjective reaction. To avoid the possibility of being accused of proprietary bias, they contracted with Bolt, Beranek and Newman, Inc. for study in this area. BBN found that for intruding footfalls to be marginally acceptable, they are weak; in fact, *just* clearly detectable. Their findings, based on theory and verified by experiments, permit the detectibility of intruding footfall noises to be calculated from measurement of the intruding footfall noise and the background noise. The relative merits of floor-ceiling constructions can be stated in terms of the level of background noise required to reduce the intruding noise to a just barely detectable condition. A single-number rating system was developed as an example, using the NC-30 shaped background noise as a reference.

The first studies by BBN did not include noise components below 100 cps because of the greater complexity of analyzing this range. Currently BBN has in progress a study to determine whether the subjective response in the frequency range below 100 cps depends upon the same factors as does response to the higher frequency region, and whether it does so in the same way. This information is needed in order to determine what aspects of the acoustic environment have to be reproduced by a testing machine. It is possible that the machine does not have to reproduce every detail of walking. Impact noise below 100 cps can occur with long-span concrete floors and with lightweight joist construction (i.e. flexible, limber structures).

Single-number rating for airborne noise is not misleading; hammer-machine is

Single-number ratings for the acoustical efficacies of building constructions, while open to misinterpretation by those who do not understand the limitations, or who prefer to ignore them, are probably inevitable.

Opponents of the tapping machine method argue that while the single-number method for rating the air-borne-noise-attenuating qualities of partitions and floor-ceilings may have some deficiencies, it does not have the "fundamental technological deficiencies that the tapping machine does." While STC (Sound Transmission Class) ratings are not likely to mislead the designer, tapping machine ratings of some types of constructions can mislead him very substantially. For one single-number rating obtained by the tapping machine method, there can be differences as large as 22 db in the level of masking noise required to make the intruding footsteps inaudible. Compared with this, it is said, arguments against the STC method are trivial. (STC ratings apply to speech privacy. It is necessary to have transmission loss data expressed as a function of frequency so that one can assess the suitability of any partition for uses other than providing speech privacy.)

"In the field of impact insulation, no practice has been commonly established and acknowledged for comparing the impact sound insulating capacity of floors. Therefore, the time for standardization on an international basis does not seem to have arrived." This was stated in 1965 by an architect working for the Norwegian Building Research Institute.

Currently the committee of ASTM responsible for acoustical standards (ASTM Committees C-20, acoustical materials, and E-6, building constructions) failed at last balloting (1969) to approve insertion of the tapping machine method in the "blue pages" for "information only." Committee E-6 voted the required simple majority, but Committee C-20 failed.

The question arises as to whether ASTM has built into its procedures adequate safeguards to protect the public interest. It is clear to those active in ASTM that the purpose of the "blue pages" is to make available supplementary information pertinent to standards published in the Book of Standards. But the same measure of society review is not applied to material going into the "blue pages" as it is to that going into an actual standard. Because the architect and engineer usually only see a reference to the Book of Standards, they cannot distinguish the relative merits of this kind of document and a document that has full standard status. The same aura of respectability applies to both. Thus it is inappropriate to have anything in the Book of Standards except standards that have been thoroughly reviewed.

Opponents of the tapping machine method are against it on both philosophical and technical grounds—and for this reason they are against including it in the "blue pages" as a "method for laboratory measurement of impact sound transmission through floor-ceiling assemblies." While the technical community has generally agreed that the tapping machine is not technically correct, it has not yet come up with an alternative.

"A misleading standard is worse than no standard."

time or the cost without some form of subsidy. Even if this problem were solved, chances are that their interest under current methods of operation would be diminished by the difficulties in communicating with those committee members who have primarily peripheral, rather than technical, interests. But, while design professionals are not experts in the specialty technical areas involved in standards, they are often conversant with many of the important detail areas that need to be covered in the standard. This is particularly true when the standard deals with physical installation.

In light of all this, it would seem to make sense to try to improve the knowledgeability (or the selection process), ergo the qualifications, of those who will be engaged in standards writing, rather than to try to educate the practitioner to a higher level of understanding on highly technical matters. As standards-making groups are currently constituted, there are too many non-technical people involved. One committee member has said that the meetings are a constant battle, and that the administratively-oriented members let the experts argue out the problem, and then "vote for the best numbers."

What knowledgeable technical people in a field think regarding a standard is of primary importance. A standard should not be promulgated unless a large majority of the technical people can agree that enough technical work has been done to enable an adequate standard to be formulated.

Now, more often than not, the technical people on a committee are there by chance, or by their volunteering, or because they have been designated to be involved as part of their job. But it is frequently the case that the only way a committee can obtain unprejudiced technical expertise is for the standards-making group to retain knowledgeable advice from the outside. Prestigious (sometimes of an honorary nature) advisory groups should not be involved because they cannot really give advice on specialty technical areas.

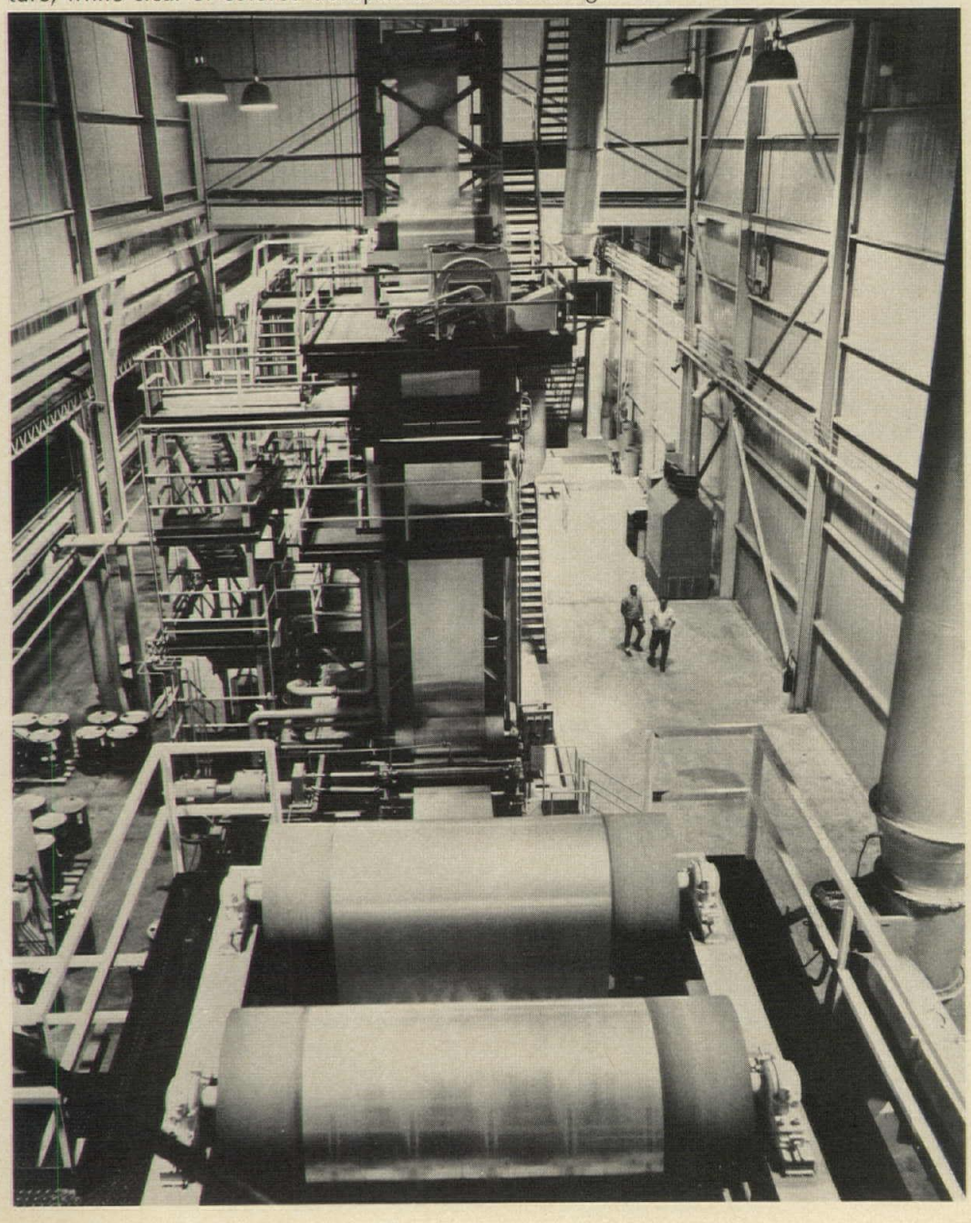
Applied aluminum finishes: guidelines for specifiers

Excerpts from two papers on organic and inorganic finishes and one on maintenance of architectural aluminum presented earlier this year at the Aluminum in Architecture Seminar, sponsored by The Aluminum Association

Where to use which coatings: organics, inorganics; coatings and films

Today's organic coatings, plastic films and porcelain enamels are capable of providing almost unlimited decorative and protective effects depending on choice of materials. Organic coatings, porcelain enamels or plastic films provide distinct color and texture, while clear or colored transparent organic coatings offer special effects over mechanical, chemical and electrochemical finishes.

Many times, design of building components influences the choice of finishing treatments. Sharp corners or highly detailed surfaces favor electrochemical finishes or electrocoating because of the uniformity of coating buildup in these areas. A change to more gentle radii would widen the choice to include consideration of organic coatings, plastic films or even porcelain enamels. Because design can influence choice, the selection of finishes should be considered early so that finish requirements can be taken into consideration. Too many times alloy, gauge, forming and design details are specified without due consideration to finish, the finishing process, and finishing plant capabilities.



Consideration must also be given to physical and chemical properties of the finish. An organic coating, for example, will not perform well in areas of abrasion or wear. An oxide film or porcelain enamel might be a better choice. On the other hand, a surface exposed to impact damage or flexing would favor the plastic films or coatings. Repair capability of surface damage in highly vulnerable areas restricts use of certain finishes. Color match is important, and on large flat surfaces built up from joined panels, color match problems can be relieved by minor design changes. Knowledge of finish capability and properties is therefore a valuable tool to the architect and design engineer.

Organic coatings, paints, lacquers are commonplace on aluminum surfaces. Research on pigments, polymers and coatings has brought these products a long way. Today, conventional solution vinyls, vinyl organosol and plastisol, acrylic and polyester formulations have demonstrated performance not thought of 20 years ago.

Several significant developments have helped to make these coatings more useful on aluminum surfaces. Research and development in the field of pigments produced chalk resistant whites, color stable organic and inorganic color pigments, and even pigments that chalk to about the same color when film erosion sets in, thereby minimizing color change during weathering. Flatting pigments used in most semigloss and flat coatings have taken on greater importance in formulating to achieve better film properties.

The science of color and color measurement has greatly advanced metal coating. On-line color equipment now makes

possible color control from coil to coil with astonishing precision.

Application of water-base coatings by electrophoresis is opening up new markets. Electron beam, ultraviolet light and microwave curing of coatings on metal could provide new ways of crosslinking sensitive monomers and prepolymers. This organic coating industry has a broad base and significant progess has been made and continues to be made on many fronts. For architectural application, however, there are areas that need further exploration. Because many applications use sheet and extrusions in combination, the durability differences between coil-cured strip coating and batch-cured extrusion coating and eventual air dry touch-up for damaged parts needs to be improved. Abrasion resistance of most organic coatings needs improvement. The compromise of the hardness to formability balance needs to be altered to enable coil coated stock to advance into store front type applications.

Organic fusion coatings have found limited use in architectural applications. Powdered resins can be applied by fluidized bed or electrostatic powder spray and are available in epoxy, polyvinyl butyral, nylon and ethylenic type polymers. Generally, these coatings are applied to a minimum of 0.005 inch and in this sense compete with a two-coat plastisol coating system.

From a paper by W. W. Binger, manager of Alcoa Process Development Laboratories, and R. Rolles, Chief, Finishes Division, Alcoa Research Laboratories

The "flexibility" of laminated films: in performance and in end use

Several types of synthetic resin films are used in lamination of aluminum for long term outdoor exposure including polyvinyl fluoride (PVF), vinyl, and acrylic materials. These differ appreciably in chemical composition and structure and, to a small degree, in their outdoor weathering performance. The following summary refers specifically to the PVF films, which have been available for a longer period, but applies generally to other types of films.

The resin film has excellent resistance to outdoor weathering attack. This has been demonstrated by exposure of panels for over 25 years and on building components for over 10 years. The clear resin film is essentially transparent to solar radiation in the near ultraviolet, visible, and near infrared regions and thus provides a base for preparation of colored films that is resistant to degradation by sunlight. The film is inert not only to the weather but to all common chemical agents, absorbs very little water, and resists chipping, crazing, and pitting. The performance is maintained even under severe industrial conditions. Toughness and flexibility is retained over a wide range of temperature. The surface remains very smooth and this minimizes dirt retention, so facilitating cleaning, whether by action of the rain or by hand.

The film elongates over 100 per cent without breaking and so adjusts readily to expansion and contraction of the metal substrate with seasonal temperature changes. It is important to note that outdoor durability, inertness, and toughness are due to the chemical structure of the resin and do not depend upon the inclusion of stabilizers, light absorbers, or plasticisers, etc.

Colors available, in standard formulations, are about ten in number, including black and white. Custom colors can be specially blended for large volume applications. Normally the material has a low gloss appearance.

A resin-laminated finish on aluminum can be considered as a high performance replacement for paint. The laminate film is thicker than normal paint films and thus for a similar color intensity has a lower pigment volume, providing a resin film with characteristics, such as resistance to sunlight and oxygen, more closely approaching the higher values of the pure resin. Other superior properties are its toughness, excellent formability resulting from high percentage elongation, freedom from crazing, possibly improved chalk resistance, ease of cleaning, smoothness, decreased porosity, and high tensile strength. The appearance of these finishes is well retained and repainting is no longer necessary, thus maintenance is virtually nil. Guarantees for long periods are provided.

Limitations of resin-laminated finishes on aluminum include their low resistance to penetration by contact with sharp instruments and the restricted gloss range available. In addition, costs may be higher than those of competitive finishes, for instance with small volume use of a non-standard color; but again, as with porcelain enamel coatings, this will depend appreciably on commercial factors.

Commercial use of resin film laminates on aluminum has been of moderate volume to date due to the short period (since about 1965) that material providing the full potential of the resin film laminate has been available and to its higher cost compared to some other architectural finishes on aluminum. Applications have been largely on homes and prefabricated buildings, but potential applications include roofing, curtain wall panels, column covers, office and warehouses in aggressive marine or in industrial atmospheres, etc.

From a paper by Roy C. Spooner, head, Chemisty Division, Alcan Research and Development Limited

Maintenance: design factors are as important as cleaning methods

Design factors are important in the ultimate maintenance requirements. For instance, it is poor practice to allow the alkaline drainage from cement surfaces to flow over aluminum. Of course, crevices and contact with absorbent materials should be avoided. Surfaces exposed to rain washing are much less subject to attack than sheltered surfaces. This is particularly true in regions with a high frequency of dew formation. It is common experience to find that test exposure samples in aggressive environments are strongly pitted on the underside—the sheltered side; whereas there is little or no attack on the exposed surface.

If rain drainage is channeled, it will streak any type of material. The dirt from large areas is carried to the narrow channeled area where it dries and accumulates with repeated rain cycles. This is unsightly. Of more concern, however, is the buildup of deposits and the effects associated with them. Corrodability of aluminum differs markedly among different alloys. Those containing copper—the 2000 series primarily—are more subject to attack because of the presence of the copper. Alloys containing magnesium (500 series), magnesium and silicon (6000 series) and manganese (300 series) are much less subject to attack. They are the commonly used alloys for architectural application.

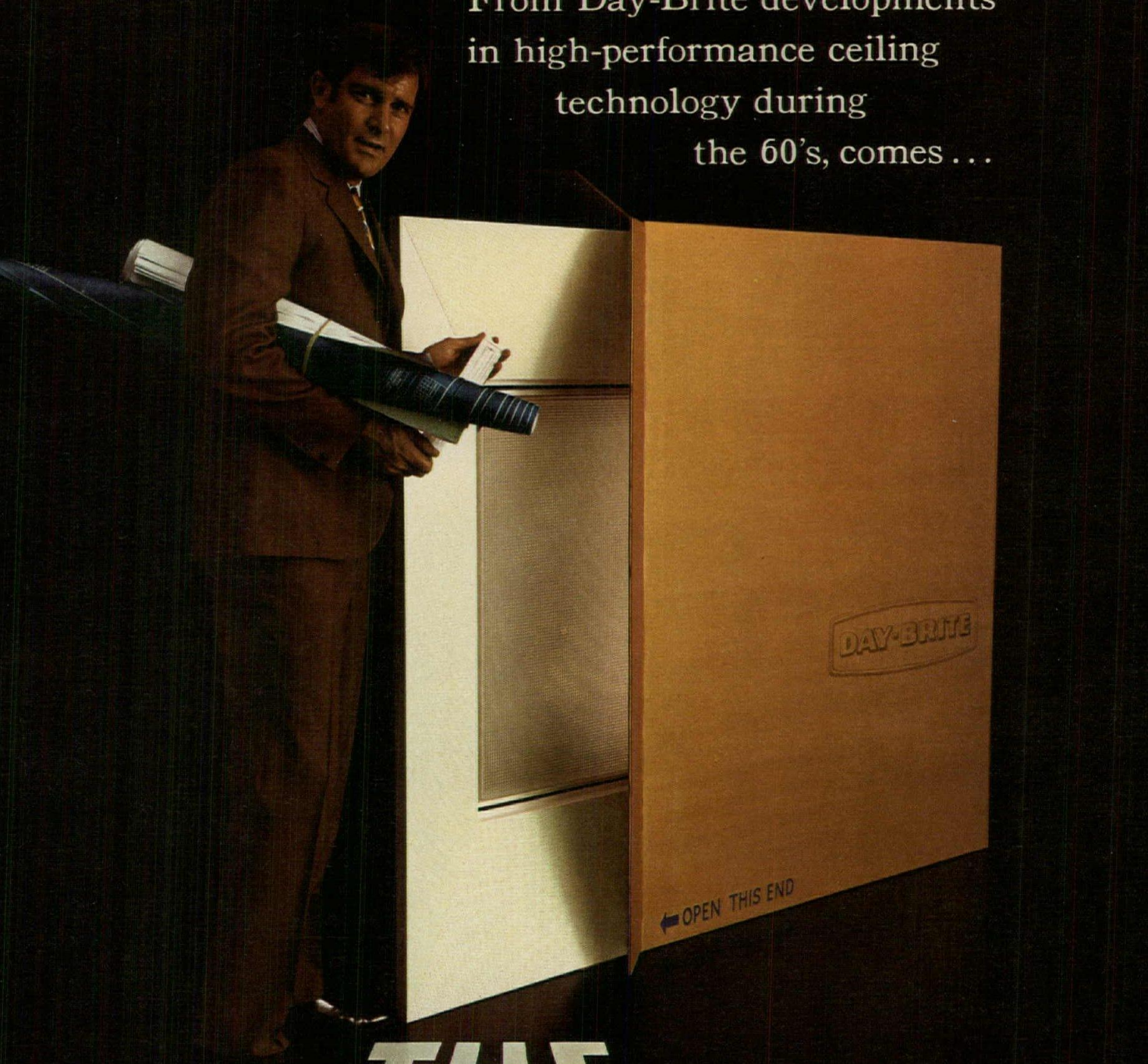
Cleaning and surface care of architectural aluminum are necessary only for the sake of appearance—no building exposure condition within the realm of reason could cause a substantial loss of strength. And to maintain appearance, there are two requirements; 1) removal of solids that accumulate on the surface, and 2) elimination of conditions that can lead to attack, and disfigurement of the surface.

Loose dirt may be flushed off with water. Lightly held deposits and oil films may be cleaned with mild soap or detergent and water. There is a wide variety of proprietary cleaners available. Several words of advice may be helpful, however: 1) follow the manufacture's directions 2) rinse well with water 3) clean off splashes on adjacent areas 4) apply the cleaning treatment *before* the surface becomes attacked under deposits; the frequency depends on the amount and nature of the deposits and contaminants.

Oil and grease films and stains may be removed with solvent or emulsion cleaners. Such cleaners should not be used on paint or lacquer surfaces until one is assured that they do not attack the finish. Tenaciously held deposits present a problem (it would have been much better to have cleaned the structure before this much dirt accumulated). Mild abrasive cleaners may be used on anodic and porcelain coatings. A wide variety of proprietary products are available—some including soaps or waxes. They may be employed on dirty or weathered "bare" aluminum. But they produce fine scratches that create a matte or satin appearance. Finally, an abrasive should not be used on paint or lacquer until one is assured that it does not destroy the film. Heavy abrasives may be employed in an emergency on anodic and porcelain coatings; they are too harsh for bare and painted aluminum.

From a paper by A. H. Bushey, technical supervisor, Metallurgy & Research, Kaiser Aluminum & Chemical Corporation

From Day-Brite developments
in high-performance ceiling
technology during
the 60's, comes . . .



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Compac is no experimental concept. Compac is *now* . . . completely developed, thoroughly tested, and performance proved. We'd like you to know *all* of its many advantages. So write, and we'll send you the complete story on . . .

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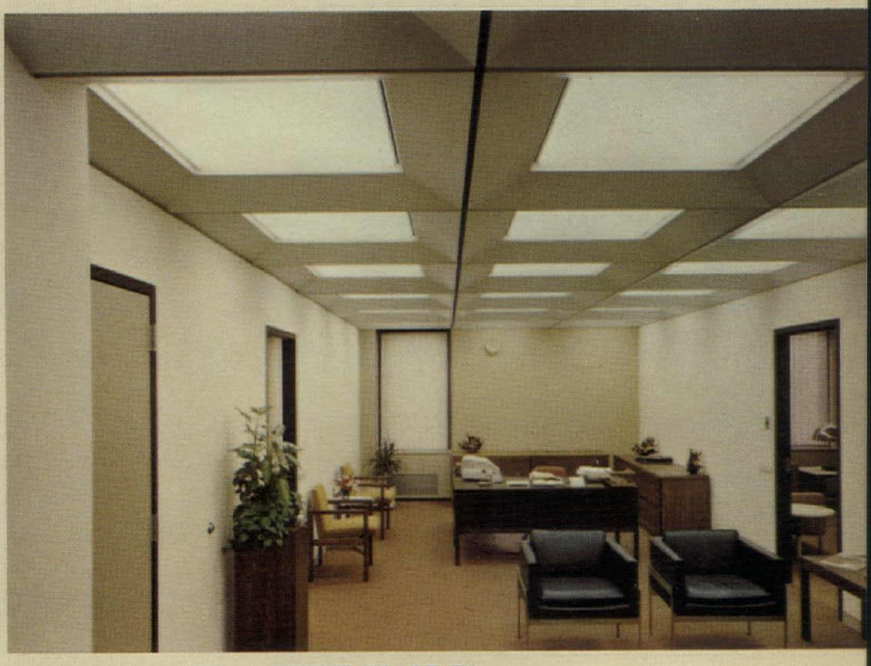


AMERICAN BANK and TRUST CO. OF PA.
ARCHITECT: Muhlenberg-Greene-Veres

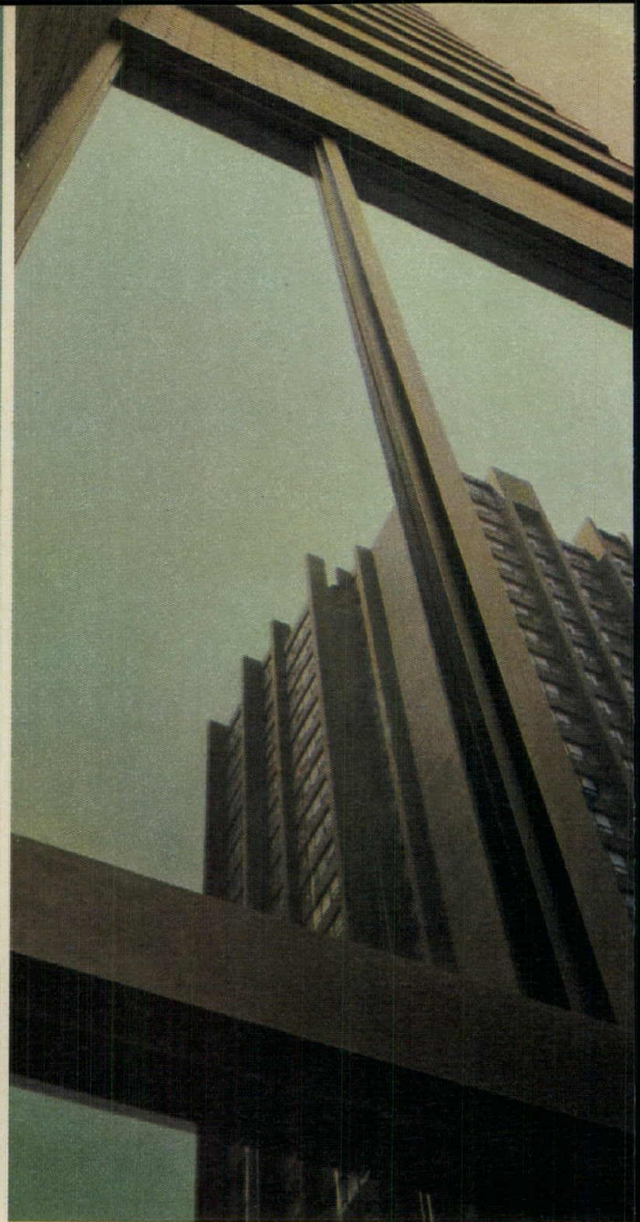
COMPAC
the ceiling of the 70's

DAY-BRITE®

DAY-BRITE LIGHTING DIVISION
EMERSON ELECTRIC CO.
5411 BULWER
ST. LOUIS, MO. 63147

EMERSON

For more data, circle 72 on inquiry card



NUMBER TWO CHARLES CENTER, Baltimore. Architect, Whittlesey & Conklin, New York, N.Y.; Window Fabricator, W. T. Industries, Baltimore, Md.; Coated Extrusions, Aluminum Shapes, Inc., Delair, N.J.

PPG Extrusion Coatings create a dramatic, enduring finish... at surprisingly low cost

Extruded aluminum shapes now can be finished in rich new PPG color coatings, allowing you complete color freedom . . . but at far less cost than other finishing systems. Color uniformity and stability of these PPG coatings are outstanding. These finishes are now available in DURACRON® thermosetting acrylic enamels and DURANAR™ fluoropolymer finishes to achieve the desired film durability on windows, mullions and other extruded shapes.

Take advantage of all of the architectural benefits of these new PPG color coatings—and pass the savings on to your clients. Check your latest Sweet's Architectural File, or write Market Manager, Extrusion Coatings, PPG INDUSTRIES, Inc., Dept. 16W, One Gateway Center, Pittsburgh, Pa. 15222.

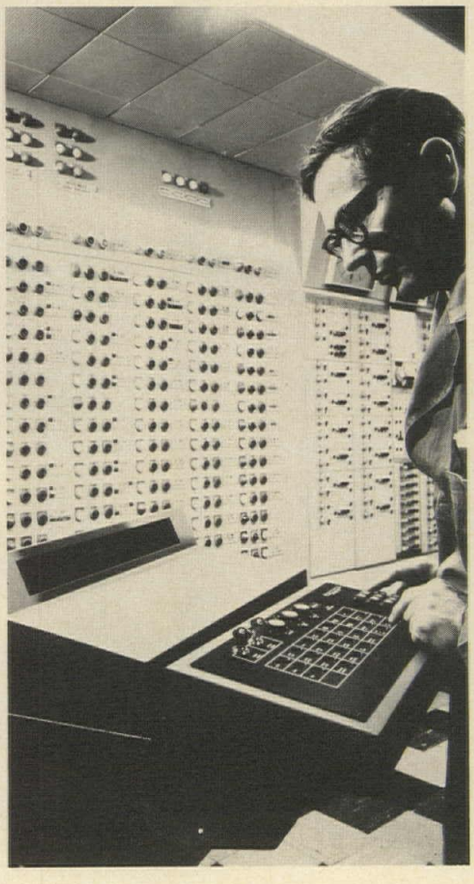
PPG is Chemicals, Minerals, Fiber Glass, Paint, and Glass. So far.

Extrusion Coatings PPG INDUSTRIES

For more data, circle 73 on inquiry card

For more information circle selected item numbers on Readers Service Inquiry Card, pages 231-232

Computerized control system for HVAC can control thousands of points using two wire transmission



Top right photo shows the most complex series, the *Delta 2500*, including printer pedestal, console, printer, keyboard and processor unit. Photo to the left shows printed-circuit cards being plugged into processor of *Delta 2000*. A compact version of the *Delta 2500* computer containing the console and controls is at bottom left. And to the right at bottom is keyboard being used by the operator, with a non-series panel board in the background.

Honeywell has introduced three new series of automatic control systems for large buildings which use computer technology to permit signals from multiple sources to be transmitted over two wires, no matter how large the building or group of buildings. Operating modules such as loggers and programmers may be added at any time so that the system can keep expanding to meet the building's needs.

The basic system, the *Delta 2000*, consists of a free-standing pedestal keyboard and a central processor cabinet; it offers centralized monitoring and control. This system can control up to 3900 points and can handle 50 control parameters such as on/off, day/night, manual/automatic. Temperature and humidity, start-up and shutdown, systems checkout, etc. may be controlled in this way. An alarm scanner signals the operator on a display board above the keyboard when anything out of the ordinary happens.

An optional analog control and readout allows the operator to change remote settings at the keyboard. He can raise and lower temperatures, change relative humidity settings, increase or decrease flow, etc.

The *Delta 2100* adds programming and analog alarm to the basic system. The most

Continued on page 160

Hauserman just set the cost of walls back 21 years.

Now everyone can afford movable walls. Because Hauserman boldly went against the trend toward higher costs and created a low-cost, high-quality demountable wall system.

It's Ready Wall. It's priced less than many fixed walls. And it has the flexibility and movability necessary to meet a wide variety of space division requirements. Without any sacrifice in quality. Without fastening to the floor.

When you're ready for today's and tomorrow's walls at 1948 prices, call your local Hauserman office or write Wall Systems Division, E. F. Hauserman Company, 5711 Grant Avenue, Cleveland, Ohio 44105.

You'll discover the good ol' days are back in business.

Hauserman Ready Wall:
Wall systems you can change as your needs change.

For more data, circle 76 on inquiry card

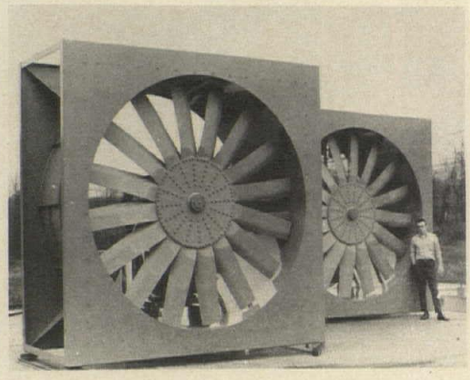
continued from page 157

complex series of the three, the *Delta 2500*, has complete computer control; it constantly analyzes and compares data and makes instant corrections. This series includes a pedestal-mounted printer that gives readout from computer calculations and feeds schedule changes, instructions, etc. to the computer. ▪ Honeywell, Inc., Minneapolis.

Circle 300 on inquiry card

SCIENTIFIC DIVINING ROD / The *Aquatometer*, a 2½ lb variety of water-sensing magnetometer, is used by Accurate Water Location to determine location, depth and flow rates of water. It is made up of a horizontally mounted compass to orient the instrument, and a vertical one which reacts to variations in the earth's magnetic field. The *Aquatometer* is shoulder-mounted and carried east to west: checks are made at three-pace intervals to look for variations resulting from ionized water flowing through rock. Analysis of data on these variations is used to determine water availability. This service has been used in commercial projects as well as by private individuals with what the company claims to be 98 per cent accuracy. Cost for individual dwellings averages $150-$250. ▪ Accurate Water Location, Inc., Poughkeepsie, N.Y.

Circle 301 on inquiry card



HEAVY-DUTY FANS / This 100-horsepower panel fan produces high-volume air at low sound levels. It is 10 ft in diameter and handles up to 200,000 cfm of cooling air. The company calls it the largest axial fan for process cooling ever built. ▪ Moffitt Co., Pittsburgh.

Circle 302 on inquiry card

more products on page 166

Want us to match a pebble? Please specify wet or dry.

No need to have one color in mind
and another on the floor.
Show us exactly what you want.
And we'll duplicate it. Exactly. Any color,
any texture, any pattern you call for. In as little
as 350 yards. At no extra charge.
Our unique Contract 350 program
offers 15 of the finest carpet grades,
engineered to meet any set of specifications.
All bear the wool mark label . . . mark of
the world's best . . . pure wool pile.
Ask about Contract 350. Another way
we do things with carpet nobody's done before.

Carpet by Roxbury
Framingham, Massachusetts

For more data, circle 78 on inquiry card

"The inflation fighter"

Shows you how you can control rising construction costs and operating expenses. This file doesn't cost you a thing. It can save you plenty. Just send the coupon.

The Code Book

. . . details permissive clauses of building codes, how they allow greater design flexibility, how construction dollars stretch further.

The High Cost of Burning

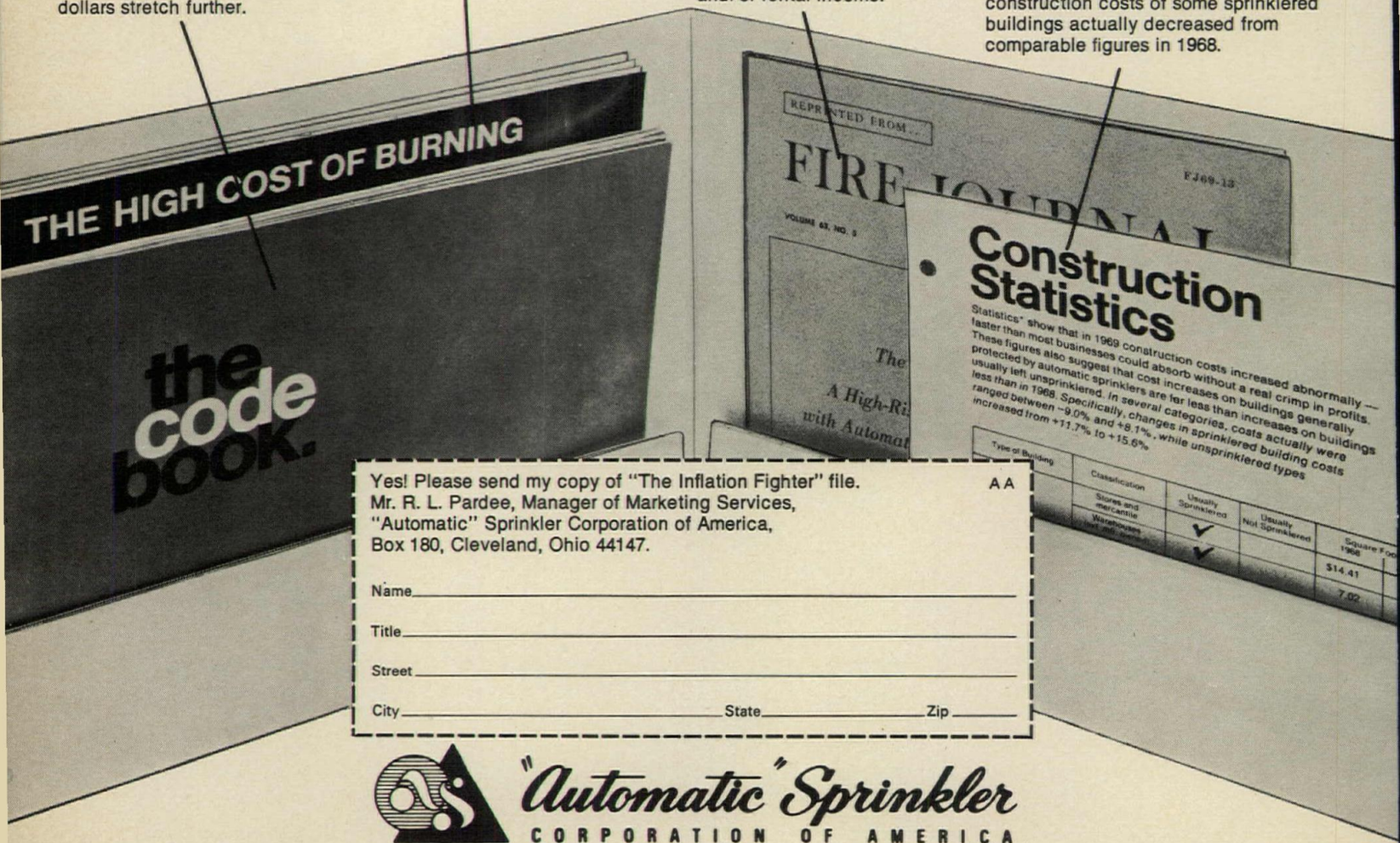
. . . the facts and figures about fire protection. It discusses how much "Automatic" Sprinkler protection can save you, and how fast it pays for itself in various types of buildings.

More usable space

. . . a reprint of a feature article in *Fire Journal*. Written by an architect, it's an eye-opening case history showing how automatic sprinklers provide additional space and/or rental income.

Construction Statistics

. . . an informative cost study of major non-residential building categories; sprinklered and unsprinklered. It shows how the 1969 per-square-foot construction costs of some sprinklered buildings actually decreased from comparable figures in 1968.



Yes! Please send my copy of "The Inflation Fighter" file. AA
Mr. R. L. Pardee, Manager of Marketing Services,
"Automatic" Sprinkler Corporation of America,
Box 180, Cleveland, Ohio 44147.

Name_____

Title_____

Street_____

City_____ State_____ Zip_____

"Automatic" Sprinkler
CORPORATION OF AMERICA
Division of A-T-O Inc.

For more data, circle 79 on inquiry card

For more data, circle 80 on inquiry card

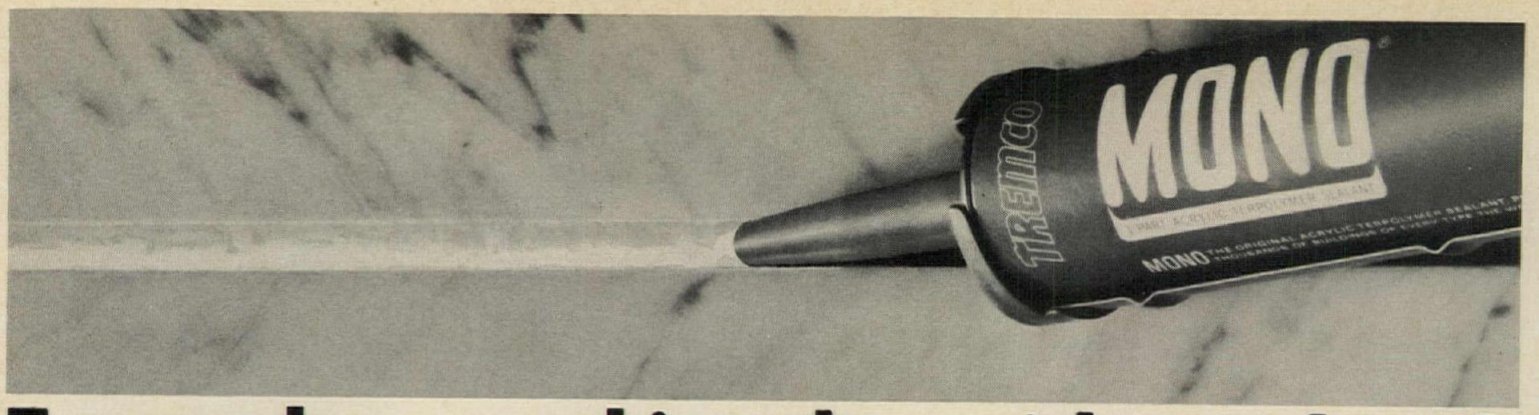
Square it isn't.

Flintkote's new Travertine Deluxe tile. 9″x18″ slabs—like real marble—instead of the usual "square" squares. Translucent vinyl polymer base...rich veining all the way through its 1/8″ or 3/32″ thicknesses ...new, deeper, more realistic embossing all make seeing *dis*believing. You have to *feel* it to tell it isn't marble. Even then. . . .

DESIGNS UNLIMITED WITH NEW EXCLUSIVE 9″x18″ TRAVERTINE DELUXE

FLOORING PRODUCTS DIVISION
480 Central Avenue, East Rutherford, N. J. 07073

FLINTKOTE®



Tremco has one thing that sticks to the job better than MONO.

The man who sells it.

When you order MONO construction joint seal-

a sealant specialist whose only job is to make sure you get permanent, weather-tight joints. And his way of "making sure" is to help you every step of the way...including on-the-job instruction. □ Most often, the Tremco man will recommend MONO. Because MONO penetrates dust and moisture to get a solid grip on joint faces...and gives you a tight, permanent bond under less-than-ideal conditions. □ But if MONO isn't the right sealant for your job, the Tremco man will tell you. And he'll help you select one of the 14 other Tremco sealants that will do the job. □ So call your local Tremco man. With him sticking to your job, you can be sure the

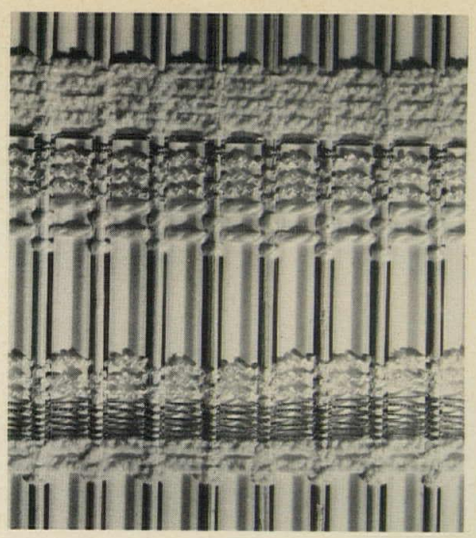
110 Corbin... where performance takes honors

When you graduate to Corbin, you'll have the highest degree of safety. Corbin door closers are renowned for combining dependable, efficient control under the most adverse conditions with design leadership second to none. For further information and service, contact a Corbin distributor or write P & F Corbin, Division of Emhart Corporation, Berlin, Connecticut 06037. In Canada, Corbin Lock Division.

For more data, circle 82 on inquiry card

CORBIN

continued from page 160



TEXTILES / Dorothy Liebes, well-known textile weaver, now designs many patterns for commercial reproduction including rugs, draperies, upholstery fabrics, etc. Above is a window blind produced by the Flexalum Division of Bridgeport Brass which uses aluminum, oriental reeds, and cotton, rayon and metallic yarns; it can be seen at the Dorothy Liebes Retrospective at New York's Museum of Contemporary Crafts co-sponsored by Du Pont. ▪ E. I. Du Pont de Nemours and Co., Wynnewood, Pa.

Circle 303 on inquiry card

CORK WALL COVERING / *Walton Corkwood* is an assemblage of cork rectangles on large modular panels which can be used to cover any size walls without revealing panel joints. They are ¼ in. thick, and are said to have outstanding acoustical qualities as well as being durable. ▪ Forms and Surfaces, Santa Barbara, Calif.

Circle 304 on inquiry card

PROTECTIVE WALL COATING / *Hylon* is elastomeric, thermoplastic wall coating which protects against chemicals and vapors and remains flexible at extreme temperatures. It can be applied over almost all wall surfaces, including putty coat plaster and painted walls. ▪ Desco International Assoc., Buffalo, N.Y.

Circle 305 on inquird card

more products on page 188

Haws

dresses a drink of wate

There's a Haws fountain that's just right for every wall, every hall—
and your every design idea. Consult Sweet's, or write for literature today.
Haws Drinking Faucet Company, 1441 Fourth Street, Berkeley, California 94710.

HAWS® Since 1909 **DRINKING FOUNTAINS**

Let Haws solve your drinking problems.

a material handling system is missing one of it's most critical parts

"In-plant" material handling systems often stop or start at the dock and make no provision to move goods and materials across the dock and into and out of trucks and rail cars. To help your clients effectively handle goods and materials in this critical dock area, Kelley offers a complete choice of Permanent Adjustable Dockboards. Kelley Dockboards offer patented safety and operating features which insure smooth, safe, efficient transfer of goods and materials. If you would like more information on planning this area, we will be happy to send you a copy of the third edition of "Modern Dock Design." Please return the inquiry card, or write: Kelley Company, Inc., 6768 North Teutonia Avenue, Milwaukee, Wisconsin 53209, (414) 352-1000.

World's largest manufacturer of permanent adjustable dockboards

KELLEY

The best thing that's ever happened to people who buy carpet by the acre.

How do you install carpet over trench ducts and still have easy access to the electric outlets?

Or, is it possible to install carpet over raised floors without showing ragged edges and unsightly seams?

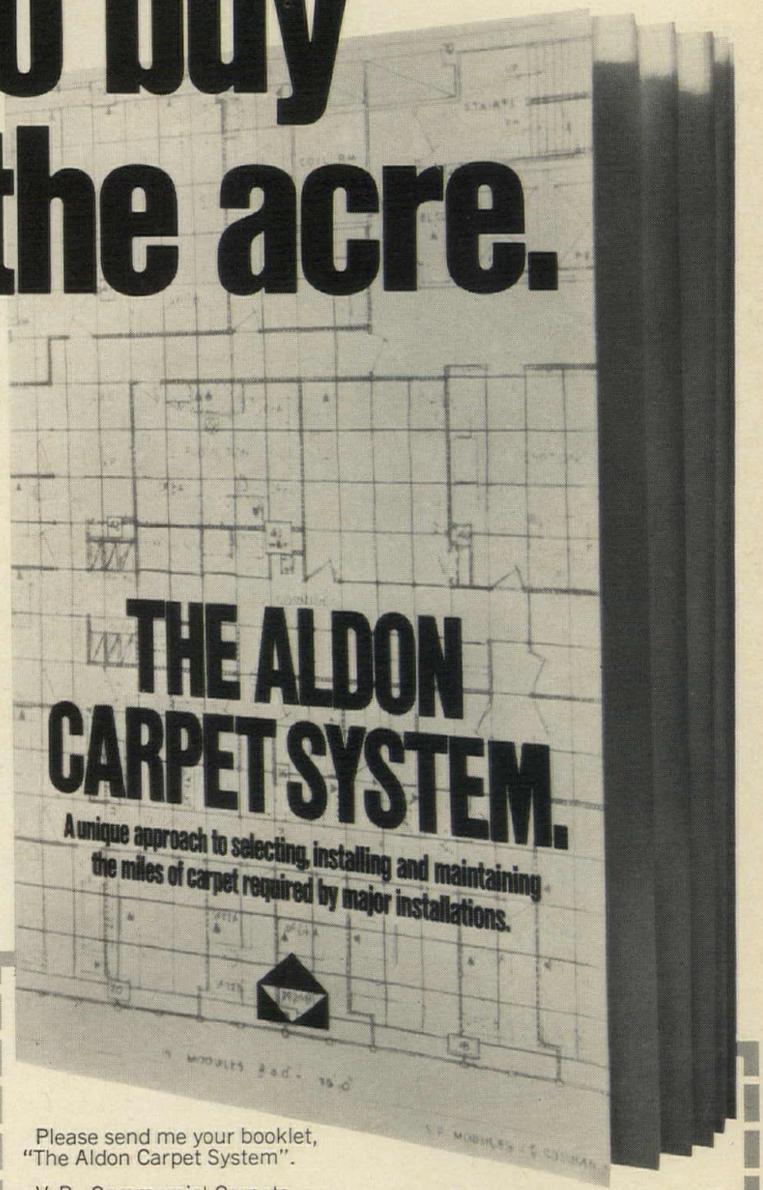
Just two of the minor problems you have to wrestle with if you're the one who has to specify, or buy, or make the final decision on the miles of carpet required by the larger installations.

But why bother with any problems, major or minor, when you can hire the Aldon Carpet System to take over the entire job. So you can take it entirely easy.

We have top engineers and technicians on our staff who will supply you with a detailed program of the total operation. From specifying the right carpet according to traffic-and-use areas, right on through installation and maintenance. All of it planned to save you miles and miles of money every inch of the way.

Now, if you're still worried about trench ducts and raised floors think of this: we've just invented a special process (patents pending) for installing carpet in these problem areas that gives complete access to electric outlets without a single seam being visible to the naked eye.

You see, we really do know more and care more about major carpet installations than anybody else in the business.



Please send me your booklet, "The Aldon Carpet System".

V. P., Commercial Carpets
Aldon Industries Inc.
295 Fifth Avenue
New York, N.Y. 10016

NAME_____

TITLE_____

COMPANY NAME_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

AR

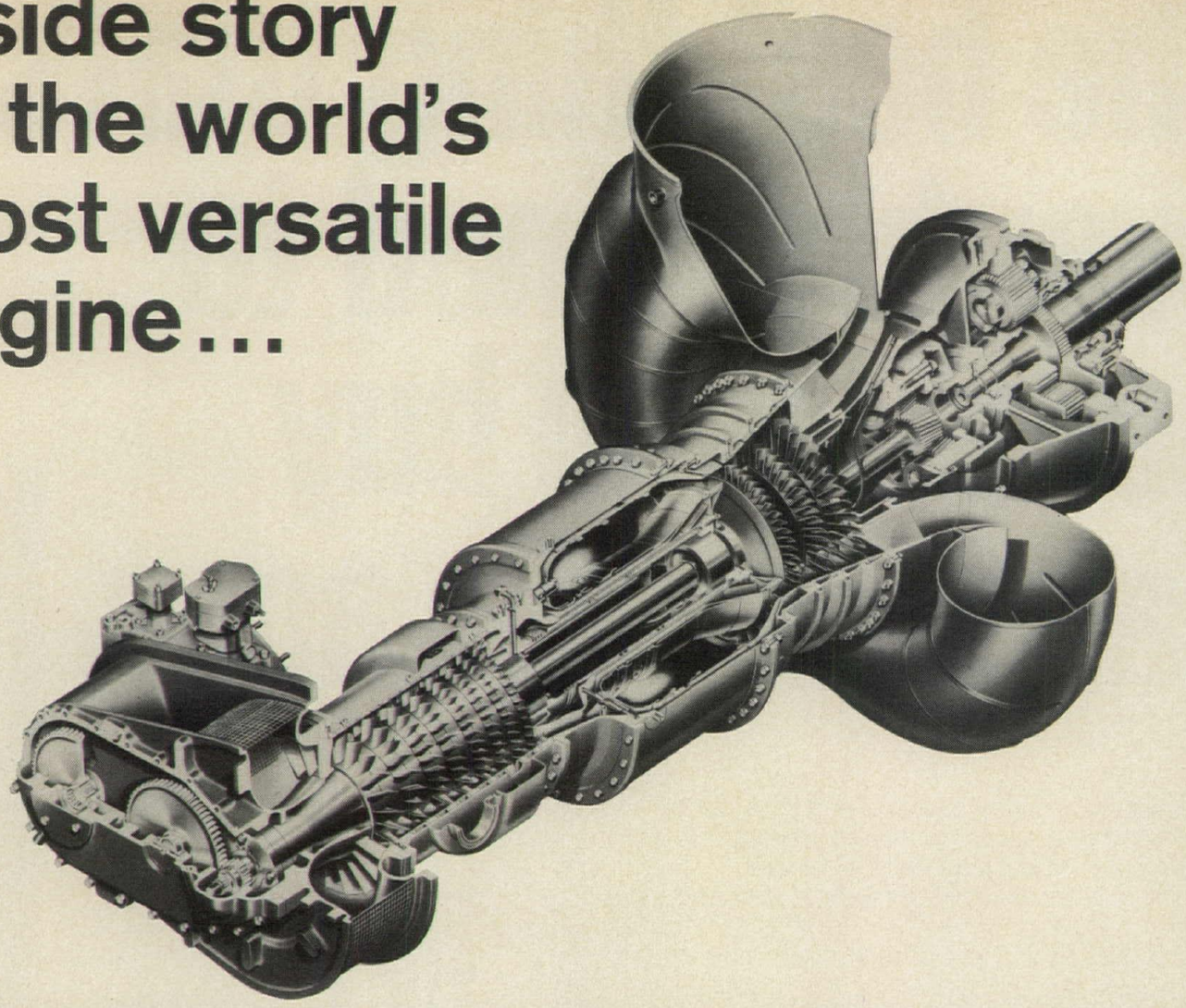
Aldon
THE INNOVATORS

The Aldon Carpet System features Antron® nylon and 501* nylon.
*DuPont certification mark.

For more data, circle 92 on inquiry card

◀ *For more data, circle 91 on inquiry card*

Inside story of the world's most versatile engine...



SATURN® TURBINE

Low-cost, modern power for emergency and continuous-duty generator sets.

The 1100-horsepower Solar *Saturn* gas turbine has proven its reliability in more than 9 million operating hours in all parts of the world, as a prime power source for emergency and continuous-duty generators, as well as for natural gas compressors and mechanical drive units.

Today Solar's family of prepackaged gas turbine emergency generator sets includes the *Saturn* turbine-powered 800-kw and *Spartan* turbine 225-kw units – *first of their kind within the installed price range of reciprocating equipment.*

If you're the owner of a high-rise apartment or office building, a hospital, airport, manufacturing plant with critical processes, or computer or communications center – you can't afford a power failure. And the most economical and reliable emergency generator sets you can get are Solar gas turbine units. Many operators, including American Telephone and Telegraph Co. rely on Solar turbine sets. AT&T and the Bell system have installed hundreds at their hardsite, disaster-proof communications centers and telephone exchanges coast to coast.

Solar continuous-duty 750-kw generator sets also power such total energy applications as that at Point Barrow, Alaska. Here two *Saturn* turbine units supply electricity for the entire community. And the turbine exhaust heat is used to produce potable water from a brackish lagoon.

In addition to Solar 225-kw, 750-kw and 800-kw turbine generator sets, Solar's new *Centaur* gas turbine 2000-kw generator set will be available soon.

For more information on these economical, reliable gas turbine generator sets, write: Solar, Dept. S-251, San Diego, California 92112.

SOLAR
DIVISION OF INTERNATIONAL HARVESTER COMPANY

For more data, circle 101 on inquiry card

For more data, circle 93 on inquiry card

Enthusiasm runs high when you install the quietest, most easily personalized steel office furniture. Lyon comforts include an adjustable typewriter platform that extends or retracts to match individual needs. Lyon modular design lets you combine basic components according to personal preference. Double-wall construction with lavish use of honeycomb filler has such a comforting, muffled sound. Desk and file drawers glide almost inaudibly. There are comforts galore, including a handy stationery pedestal. Convenient features like the exclusive "lock-in-top" that controls *all* desk drawers. Plus clean, crisp styling; so timely, so easy to live with. Call your Lyon dealer today!

The sheer comfort of Lyon says you care!

Show how much you care-write today!

Lyon Metal Products, Inc.
551 Monroe Ave., Aurora, Ill.

☐ I'd like the name of my nearest dealer
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LYON® OFFICE FURNITURE

Showrooms: New York, Los Angeles, Boston, Aurora, Ill.

Your Plans Are Never Complete Until They Specify Protection

If your plans do not provide for total protection . . . go back to the drawing board! No building is finished or functional unless you have specified full protection against fire and burglary, and have provided for supplementary communications and sound systems.

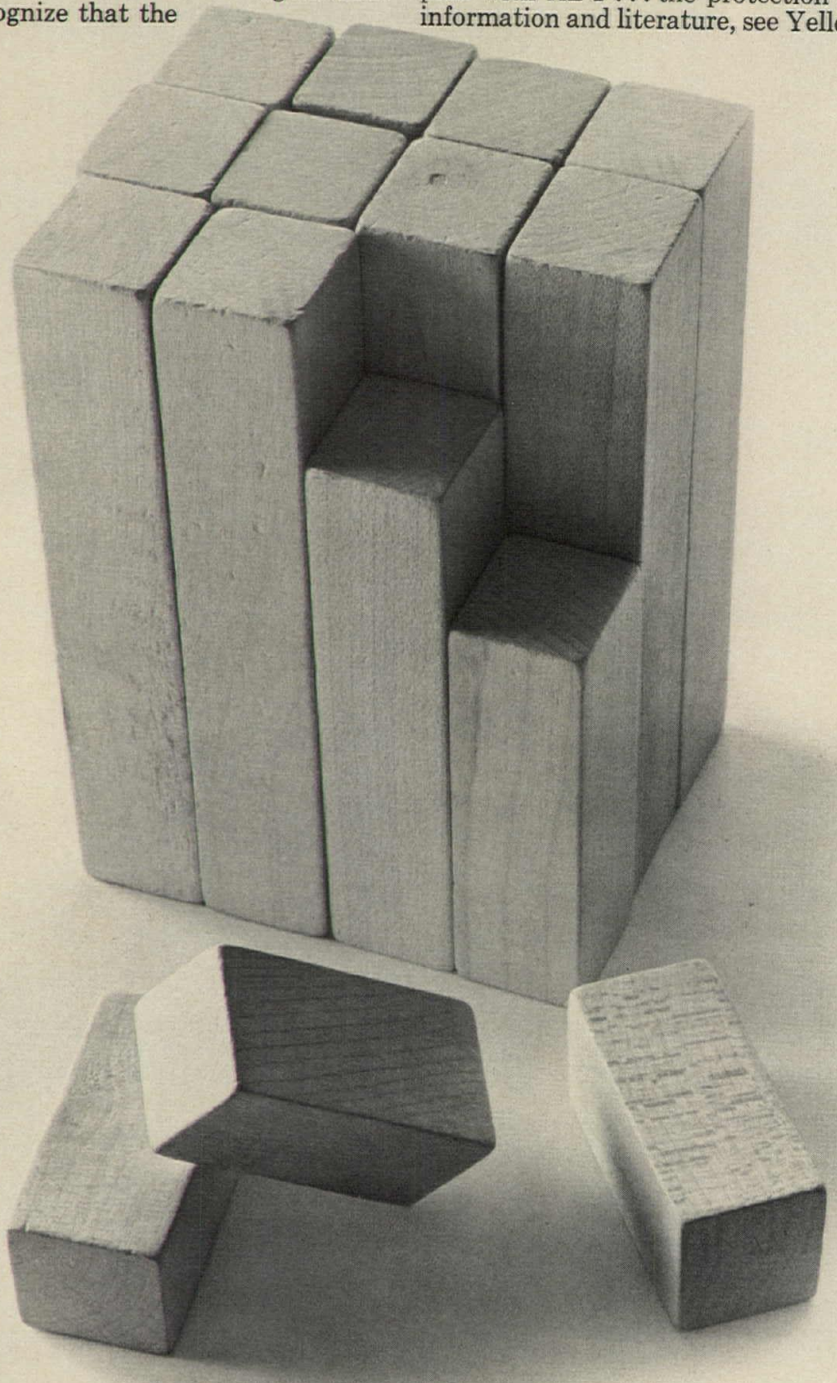
By planning for total security and sound systems in the initial stages, you guard against costly construction adjustments if the need for any of these systems has been overlooked.

We know you are aware of fire regulations. You should also recognize that the need for security systems today is equally important.

ADT protection consultants will work with you in the planning stages. They will assist you in integrating total, custom-built protection and sound systems into your building.

And with ADT you get the entire protection package. ADT designs, manufactures, installs and maintains its own systems. ADT service keeps them in top operating condition.

Progressive architects with a sense of security plan with ADT . . . the protection professionals. For information and literature, see Yellow Pages or write.



ADT®

An International Organization 155 Sixth Ave., New York, N.Y. 10013

For more data, circle 94 on inquiry card

For more data, circle 95 on inquiry card

Cove base was never anything to get excited about. No matter how many colors it came in, it was messy to install.

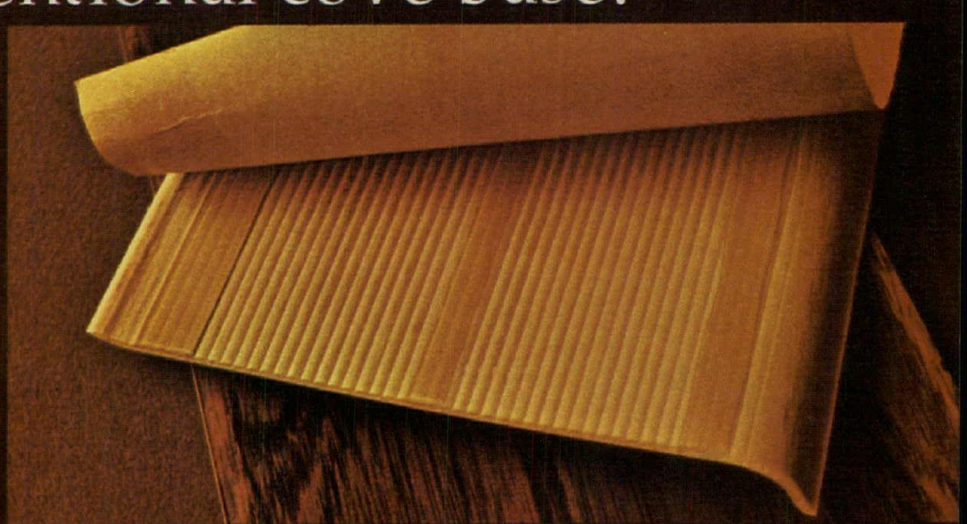
Wasteful. Costly.

Until Now.

Nafco has invented a self-adhering cove base that is guaranteed to work. In the widest range of colors and woodgrains available. It installs two to three times faster than conventional cove base.

Because nothing is required but a pair of hands.

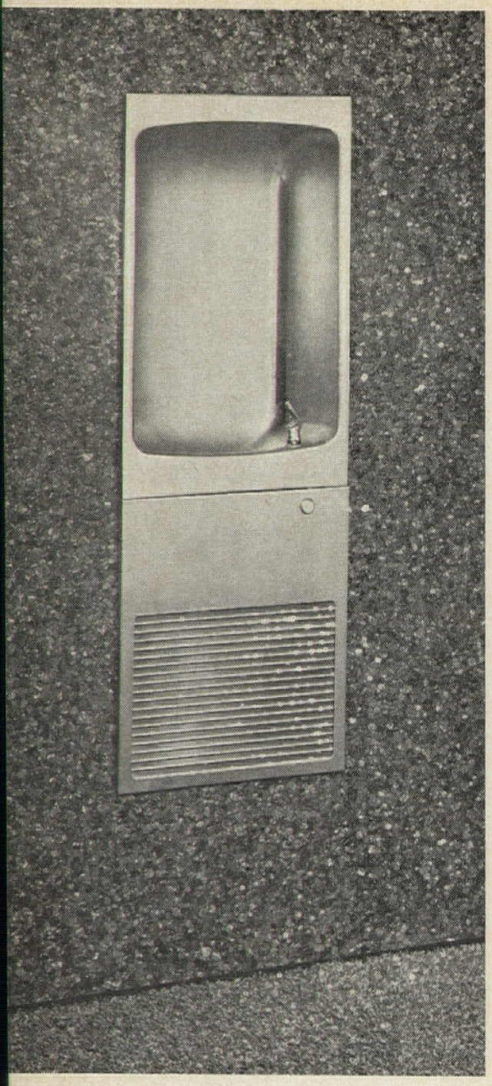
Any pair of hands.



Quik-Stick Cove Base by Nafco.

For complete information ask your Nafco representative or contact Nafco Sales Service Dept., P.O. Box 354, Florence, Ala. 35630 or phone (205) 766-0234.

continued from page 166



THE CRISP, CLEAN, CONTOURED LOOK IS

Halsey Taylor®

There is a touch of elegance in this new sculptured design from Halsey Taylor. The RC-8-A fully recessed electric water cooler features a one-piece contour-formed receptor and basin. Corners are gracefully rounded instead of square-welded — for easy cleaning. Receptor and louvered access panel are of type 304 stainless steel, polished to a subdued satin finish. Push button control and exclusive 2-stream projector are matching satin finish.

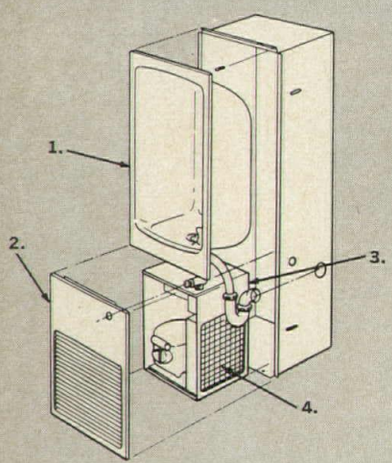
The fountain and cooling unit can be flush mounted in any type wall — requires only 12″ back recess.

Recommended where uninterrupted corridor space is required.

THE HALSEY W. TAYLOR CO.,
1560 THOMAS RD. • WARREN, O.

SUBSIDIARY • KING-SEELEY KST THERMOS CO.

NEW FULLY-RECESSED ELECTRIC WATER COOLER
COMPLETE PACKAGED UNIT IS EASY TO INSTALL



1. Receptor—Stainless steel—can be installed flush against wall with no exposed screw heads.

2. Removable Access Panel—provides easy access to cooling package and inner components. Louvers are at bottom and slanted downward.

3. Mounting Box—Sturdy steel box can be quickly secured in any type wall. Permits roughing-in of electric and plumbing connections prior to mounting of receptor fountain and cooling unit.

4. Cooling Unit Package—has capacity of 8 GPH of 50°F. water.

SUBMITTAL INFORMATION KIT
Information on the Halsey Taylor RC 8A fully recessed electric water cooler. If you need specification sheets, roughing-in drawings, full product description, and photographs for a current job, please fill in this coupon and mail.

I am submitting a proposal on _____ (please describe)
When would you require delivery? ☐ 1-3 months ☐ 3-6 months ☐ over six months
What quantity do you anticipate using? _____
Comments _____
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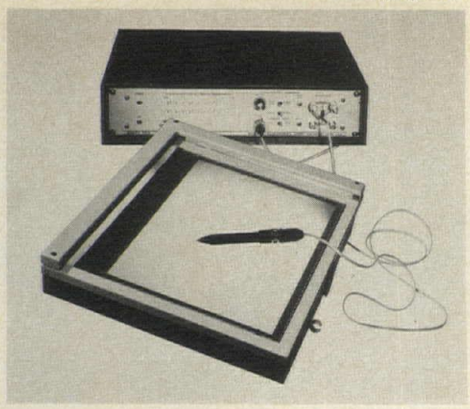
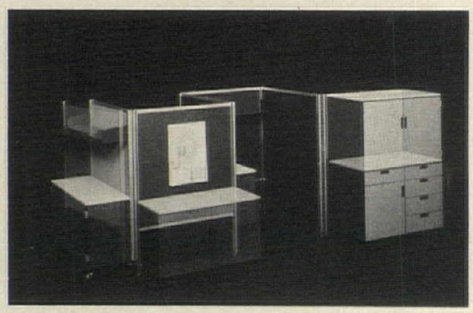
COMPANY or INSTITUTION _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

For more data, circle 96 on inquiry card



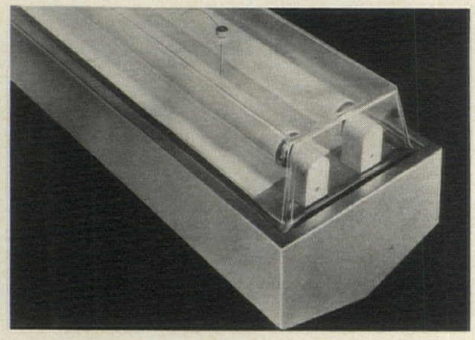
GRAPHIC TRANSMITTAL / The *Graf/pen* allows the user to draw or write on a tablet for instant transmittal to one or more cathode ray tubes. It can be hooked up to a voice-grade radio or phone circuit, or fed to a computer. This equipment can be used for graphic communication, allowing the users to graphically as well as vocally comment on each other's work. ▪ Science Accessories Corp., Southport, Conn.

Circle 306 on inquiry card



WORK/STORAGE UNIT / *Innovator* is a moveable, adaptable storage and work space unit, designed for school use. These units may be stacked or combined in a variety of ways and come with screens for space division. ▪ Educators Manufacturing Co., Tacoma, Wash.

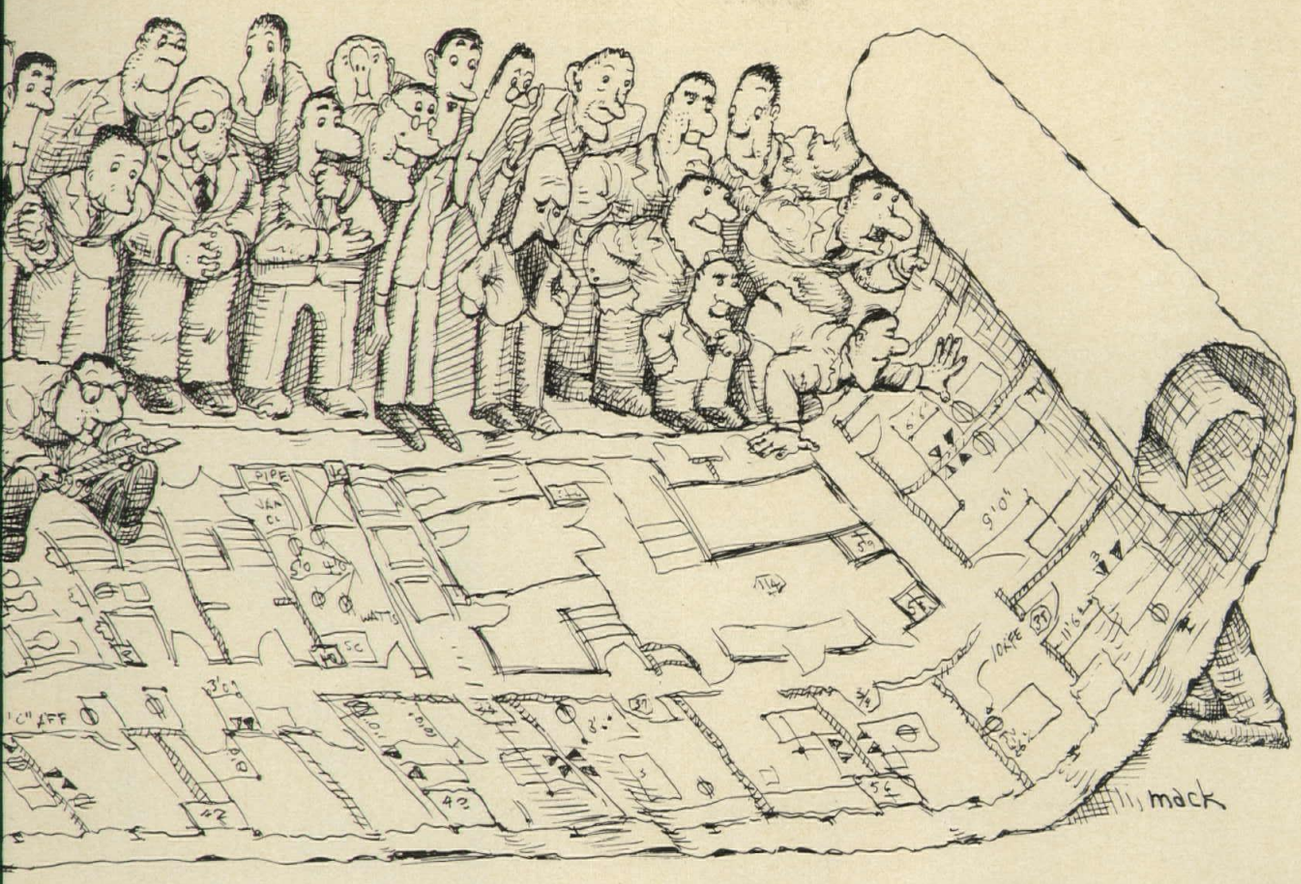
Circle 307 on inquiry card



FOOD INDUSTRY LUMINAIRE / The *Ellis Luminaire* is designed especially to keep out moisture; it is gasketed with polyurethane stripping, and contains no moisture-retaining plateaus or depressions. Bacterial growth is inhibited by the lack of open seams or cracks. Though designed especially for the food industry, this unit may be used in any humid environment. ▪ Lighting Products Inc., Highland Park, Ill.

Circle 308 on inquiry card

more products on page 198



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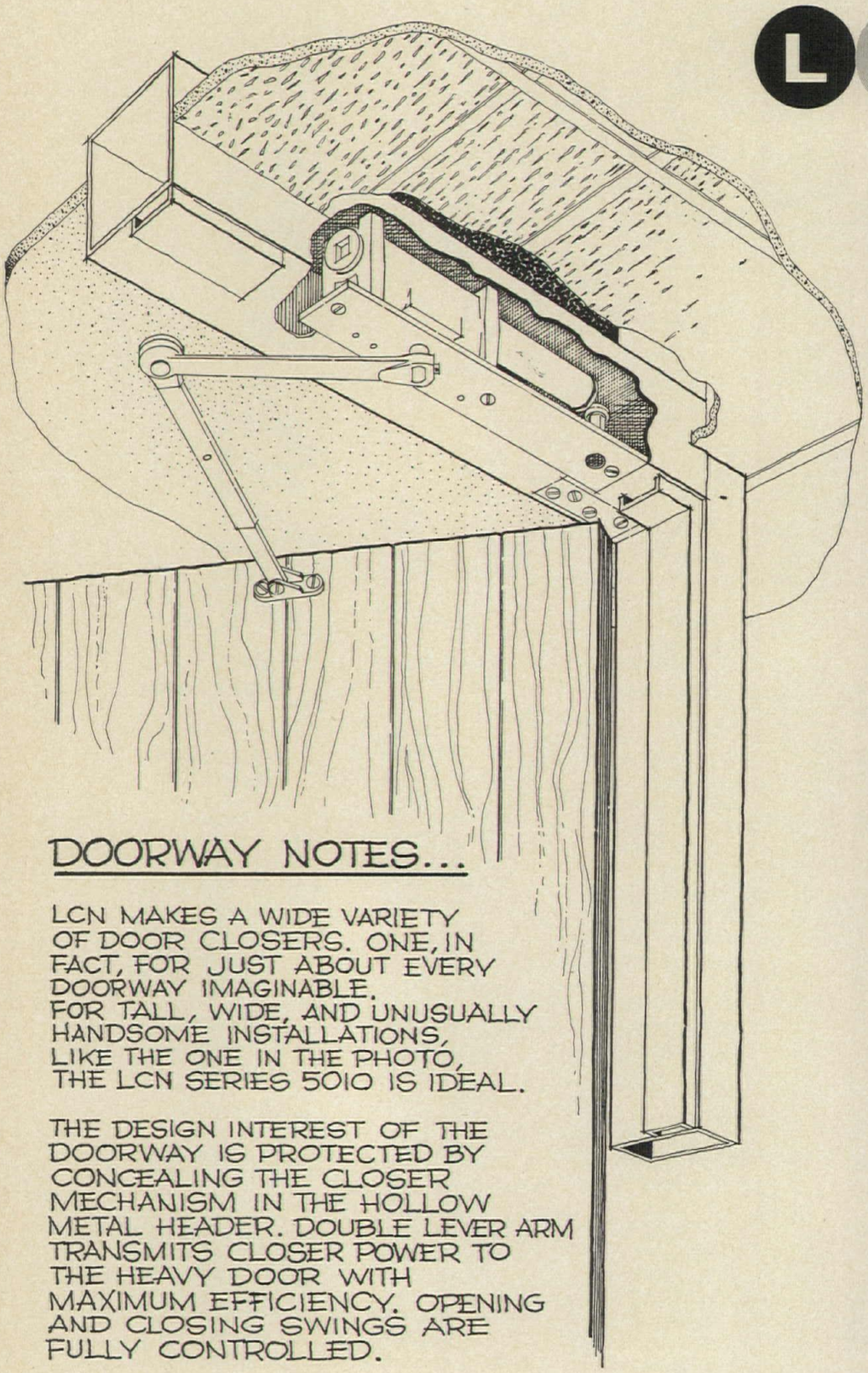

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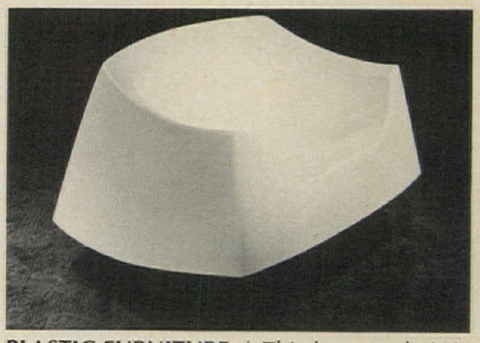
continued from page 188

STACK CHAIR / This high-stacking chair rests only ¾ in. above the one below it. The seat and back are made of reinforced plastic and are fastened to the frame with concealed mountings. The frame is tubular steel. ▪ Clarin Corp., Chicago.

Circle 309 on inquiry card



PLASTIC FURNITURE / This lounge chair is part of the *Trapazoid Collection* of plastic furniture reinforced with glass fiber. It is designed to be durable and maintenance free for use in public and semi-public lounge areas. ▪ Mark Inc., Cleveland.

Circle 310 on inquiry card

LONG ESCALATORS / Escalators 148 ft. long have been installed in a Tokyo subway station. They are sloped into the floor at a smaller angle for passenger comfort and ease in getting on and off. The elevators move at 90 ft/min and can carry 9000 passengers per hour. ▪ Hitachi America Ltd., New York City.

Circle 311 on inquiry card

more products on page 216

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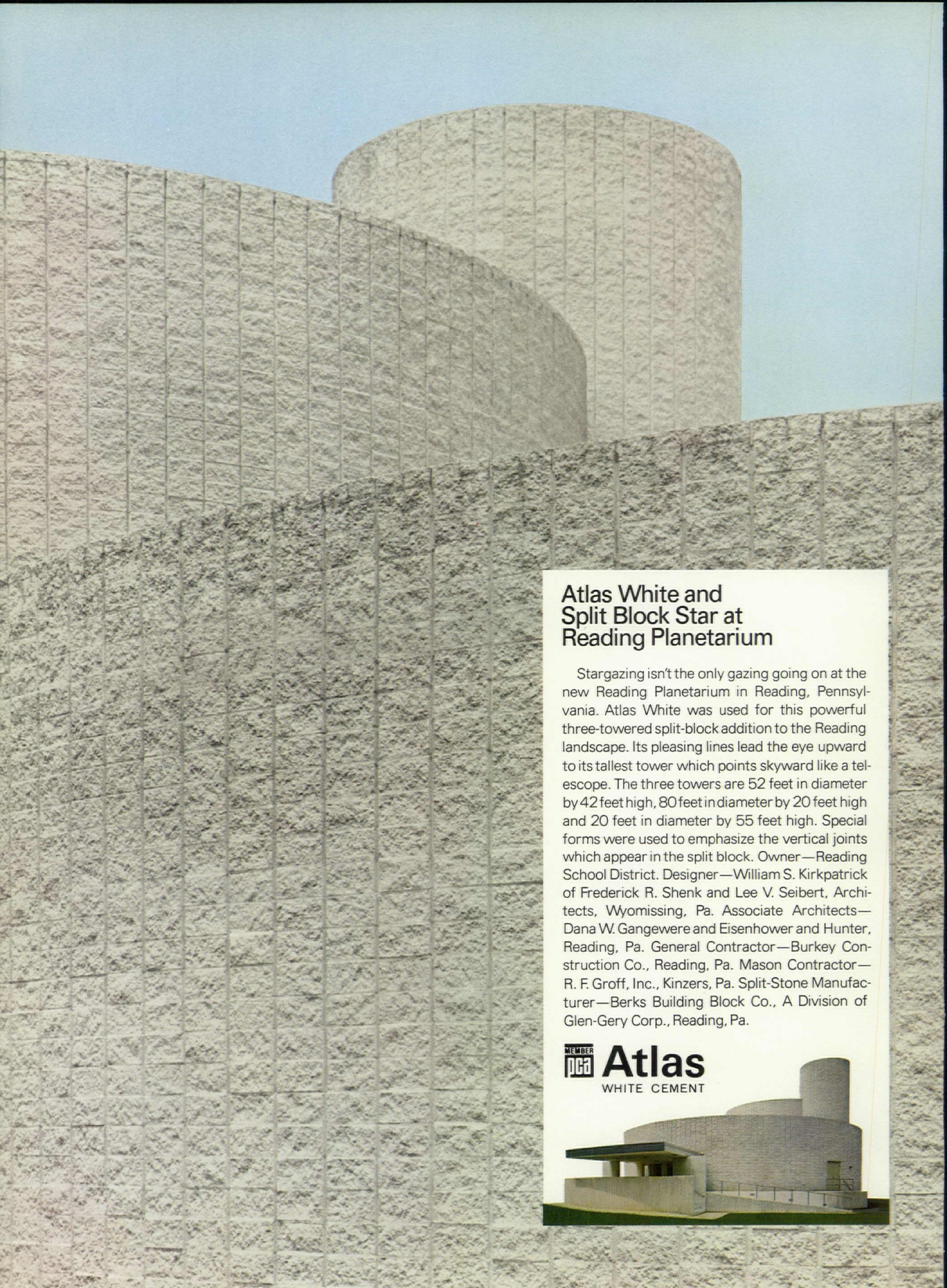

Atlas White and Split Block Star at Reading Planetarium

Stargazing isn't the only gazing going on at the new Reading Planetarium in Reading, Pennsylvania. Atlas White was used for this powerful three-towered split-block addition to the Reading landscape. Its pleasing lines lead the eye upward to its tallest tower which points skyward like a telescope. The three towers are 52 feet in diameter by 42 feet high, 80 feet in diameter by 20 feet high and 20 feet in diameter by 55 feet high. Special forms were used to emphasize the vertical joints which appear in the split block. Owner—Reading School District. Designer—William S. Kirkpatrick of Frederick R. Shenk and Lee V. Seibert, Architects, Wyomissing, Pa. Associate Architects—Dana W. Gangewere and Eisenhower and Hunter, Reading, Pa. General Contractor—Burkey Construction Co., Reading, Pa. Mason Contractor—R. F. Groff, Inc., Kinzers, Pa. Split-Stone Manufacturer—Berks Building Block Co., A Division of Glen-Gery Corp., Reading, Pa.

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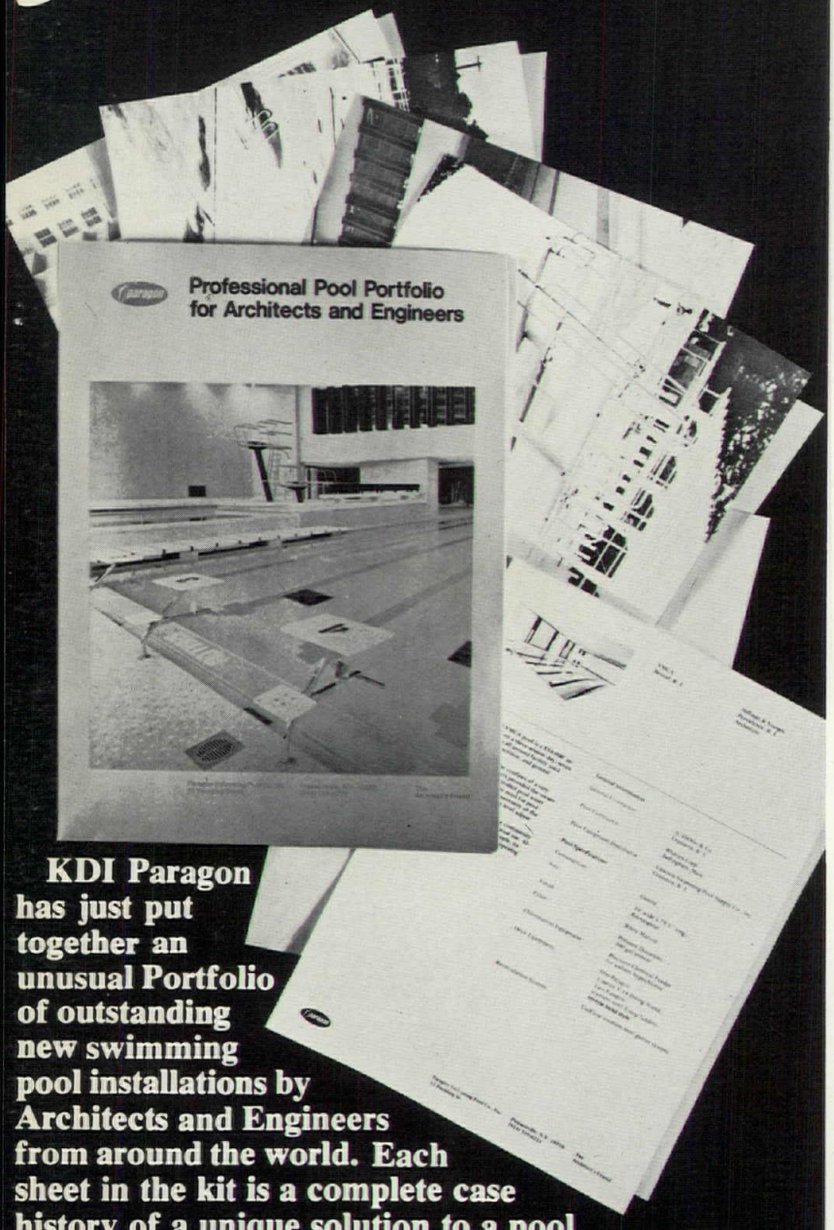

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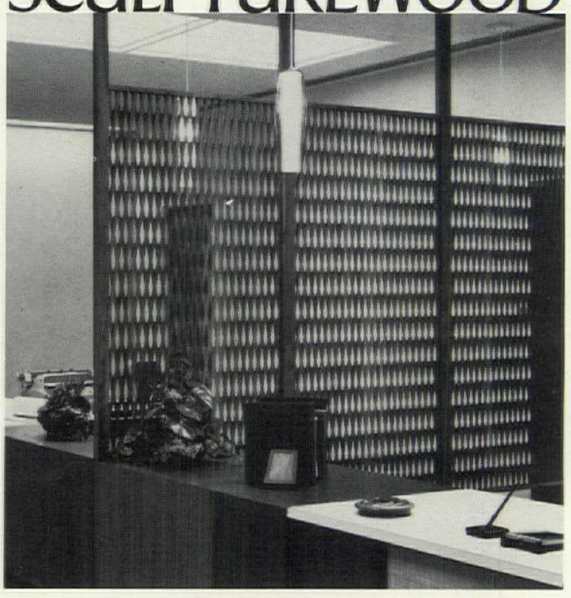

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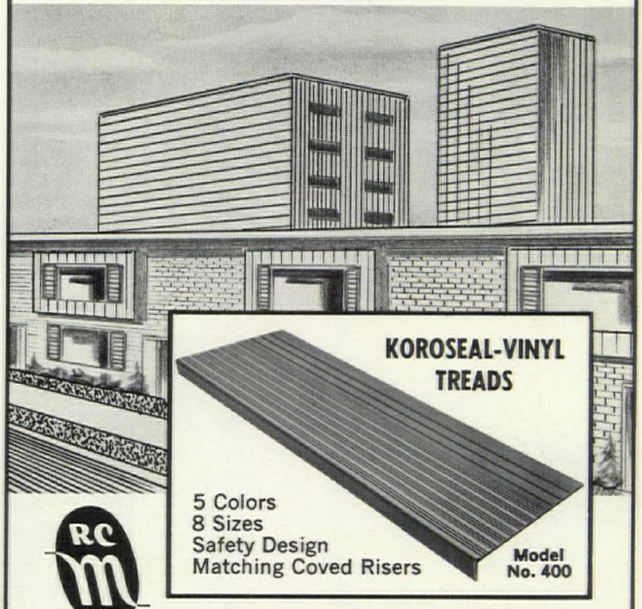

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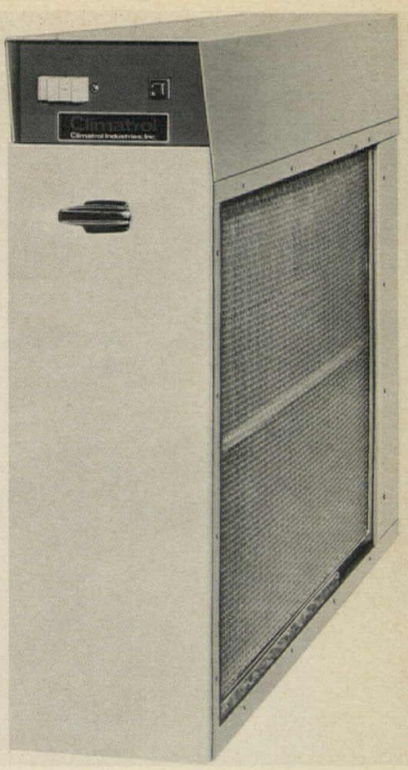
continued from page 198



ELECTRONIC AIR CLEANER / This air cleaner has the advantage of only eight inches of installation space while handling up to 1400 cfm. Its length is 27¼ in. and height is 25¼ in. It is available with return duct space sleeves, and can be installed in upflow, horizontal or counterflow installation requiring one simple lighting circuit hookup. ▪ Climatrol Industries, Inc., Milwaukee.

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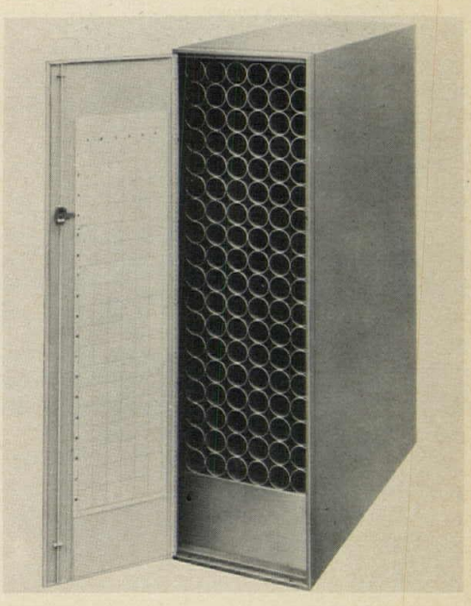

ROLL FILE CABINET / This steel file cabinet contains round tubes of steel-rimmed, reinforced, spiral-wound fiber board made to hold rolled material. The cabinets come in three different depths and tube diameters, and have index cards mounted on the inside of the door for identifying drawings. ▪ Stacor Corp, Newark, N.J.

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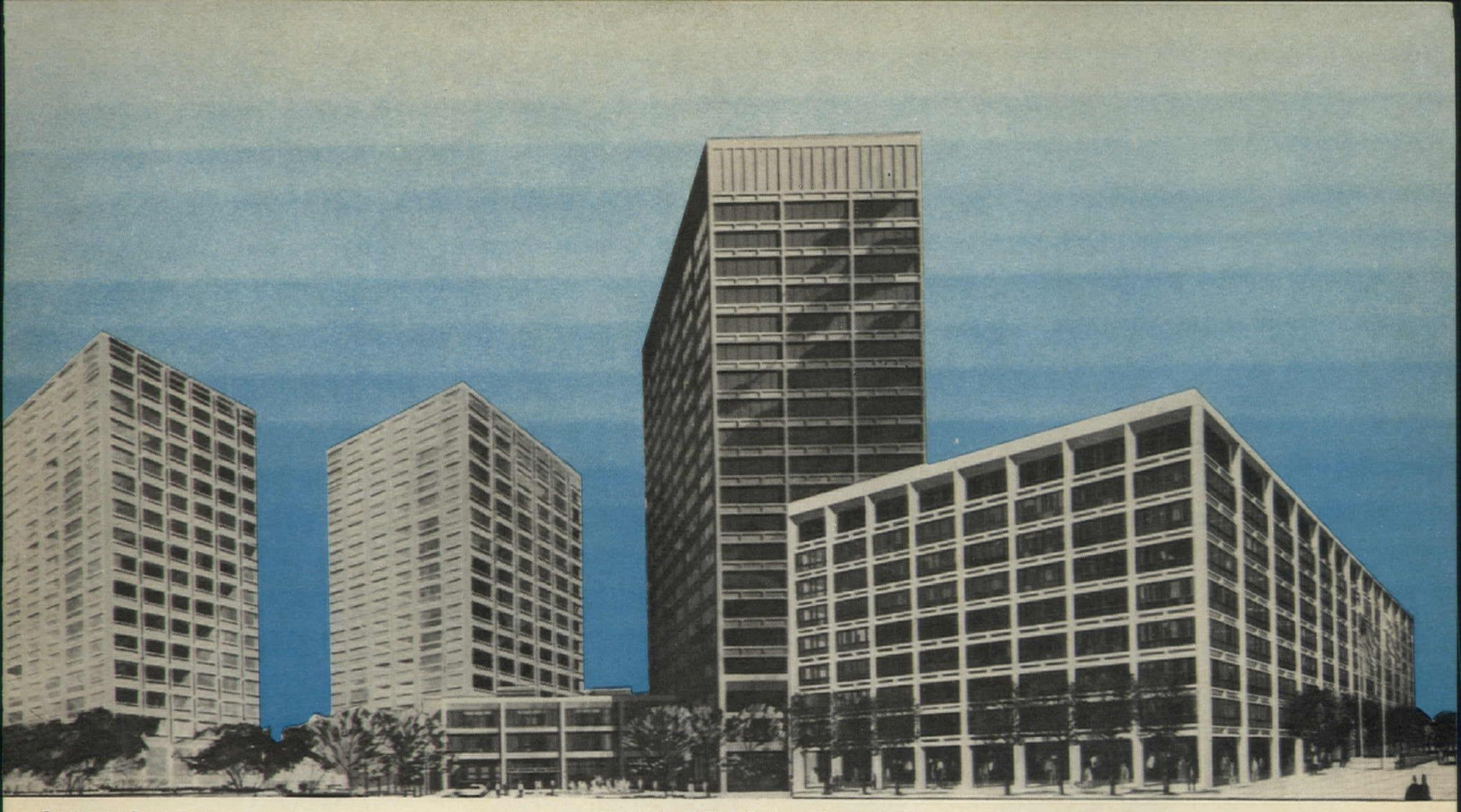

Providence Green Towers,
Southfield, Mich.
Architect: Basil Nemer.

First National Bank Building, Dayton
Architect: Harry Weese & Associates.

Tishman Downtown Center, New York City
Architect: Gruzen & Partners.

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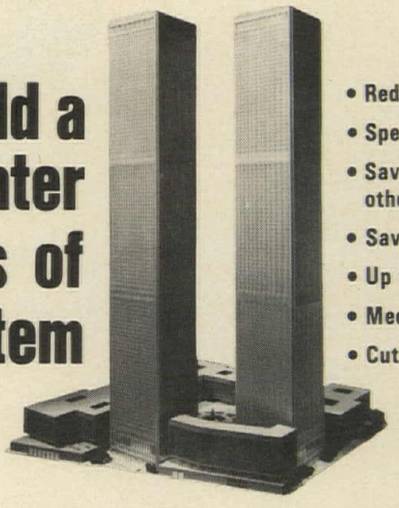

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Architects: Minoru Yamasaki & Associates,
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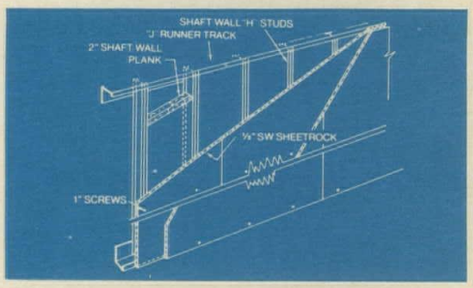

In this non-load bearing assembly, laminated gypsum coreboard 2″ thick is installed between metal H-studs or C-channels 24″, 16″, or 12″ o.c. J-runners anchor panels to floor and ceiling. SHEETROCK* SW Gypsum Wallboard is screw-attached to coreboard.

UNITED STATES GYPSUM

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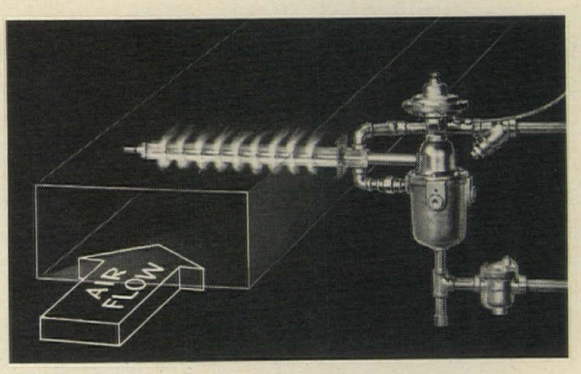

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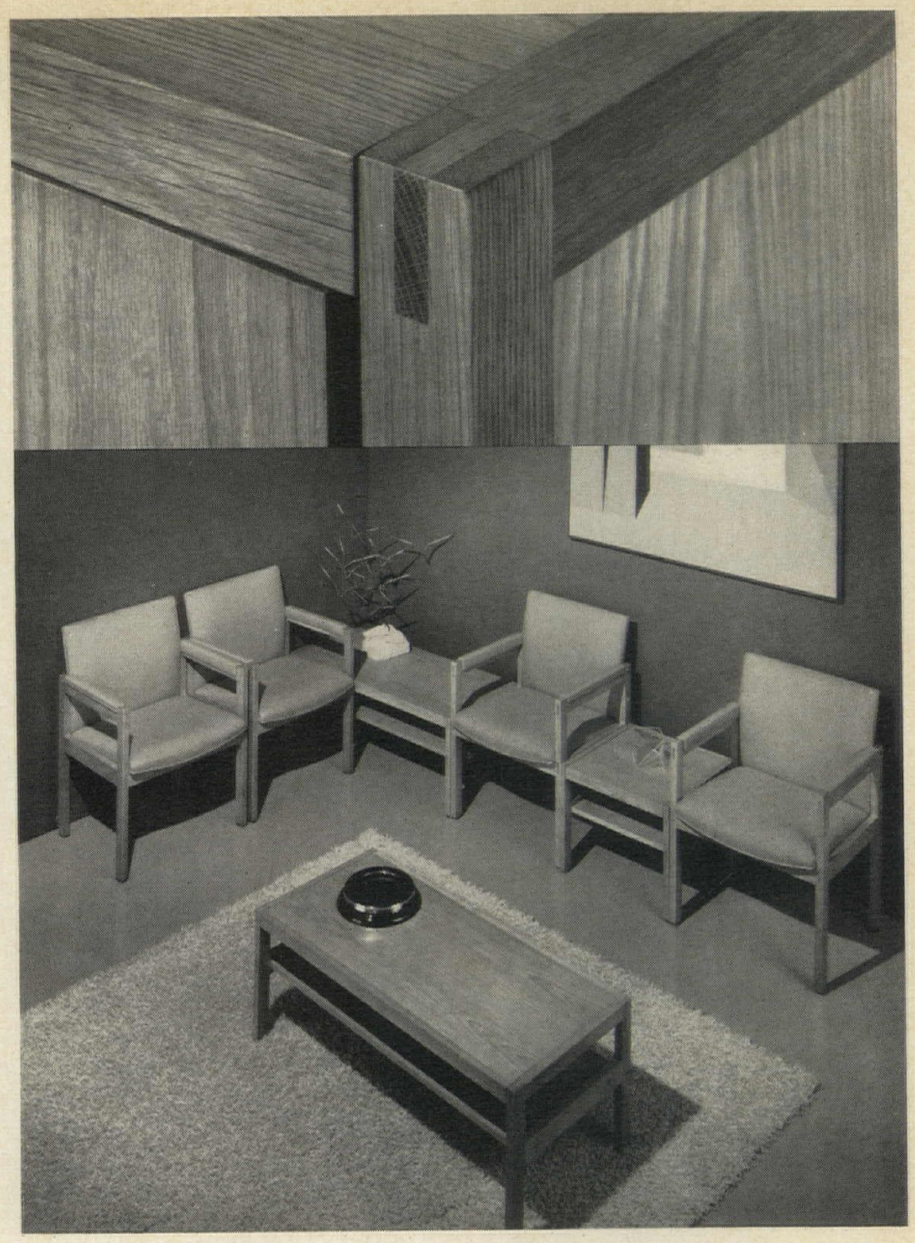

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EXECUTIVE ENVIRONMENT

For more data, circle 127 on inquiry card

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 231-232.

ROOFING / The 1970 "Barrett Built-up Roofing Systems" manual is a 32-page guide to modern roofing practices with sections devoted to roof decks, vapor barriers, roof insulations, membrane systems specifications, expansion joints and flashings, and general conditions applying to all roofing jobs. ▪ The Celotex Corporation, Tampa, Fla.*

Circle 400 on inquiry card

PARKING FACILITIES / "How to Plan Parking Areas" is an 8-page guide describing in detailed drawings the design and layout of off-street parking facilities. "Automated Parking Control Equipment and Systems," a 12-page catalog, shows parking and security control equipment. ▪ Federal Western Parking and Security Controls, Blue Island, Ill.

Circle 401 on inquiry card

WEATHERPROOFING / A 16-page guide to the use of silicone rubber weatherproofing materials features some common maintenance problems and their solutions. ▪ General Electric Company, Waterford, N.Y.*

Circle 402 on inquiry card

MOULDINGS / A 28-page catalog cross-indexed by style, application, size and function, shows standard available extruded aluminum mouldings, both decorative and functional, in addition to describing the company's special extrusions service. ▪ The B&T Metals Company, Columbus, Ohio.

Circle 403 on inquiry card

ACOUSTICAL INSULATION / "Sound Control Ceilings," a 52-page booklet, describes a complete product line of acoustical panels and tiles, giving sizes, specifications, ceiling STC, NRC spec range and flame spread index. ▪ Johns-Manville, New York City.*

Circle 404 on inquiry card

CARPETS / A 4-page architectural guide explains a direct glue-down method of installing double jute backed carpets. ▪ Jute Carpet Backing Council, Inc., New York, N.Y.

Circle 405 on inquiry card

HURRICANE CONSTRUCTION / A 23-page booklet, "How to Build Storm Resistant Structures," gives structural details that increase safety and resistance to the consequences of winds, tides and wear. ▪ Southern Pine Association, New Orleans.

Circle 406 on inquiry card

LIGHTING / A complete line of glass lighting panels and lenses is described in an 8-page brochure. Performance data, criteria for the selection of lighting panels and lighting estimation tables are included. ▪ Corning Glass Works, Corning, N.Y.

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

more literature on page 230

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Compliments from visitors to the Carleton plant are practically a weekly occurrence. All-concrete plant has been praised both for its beauty and its "solid functional look that makes it look like a manufacturing plant."

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It's easy to see that Carleton got a building as beautiful as the savings on insurance by choosing concrete. And in addition to its fire-resistant quality, concrete provides the durability so necessary in manufacturing plants.

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In this building, as in so many others around the country, Lehigh Cements are used by the producers of the concrete masonry units and the prestressed hollow core roof units in their manufacturing processes. Lehigh Portland Cement Company, Allentown, Pa.

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Designer: Kaye Westerlund, Minneapolis, Minn.
Engineer: James Swensen, Minneapolis, Minn.
General Contractor: C.O. Field Co., Minneapolis, Minn.
Mason Contractor: Donald R. Frantz, Minneapolis, Minn.
Ready-Mixed Concrete: Ready Mixed Concrete Co., Minneapolis, Minn.
Prestressed Concrete Hollow Core Slabs: Bladholm Bros., Osseo, Minn.
Concrete Masonry Units: Chas. M. Freidheim Company, St. Louis Park, Minn.
Decorative Precast Units: Arrigoni Brothers Co., St. Paul, Minn.

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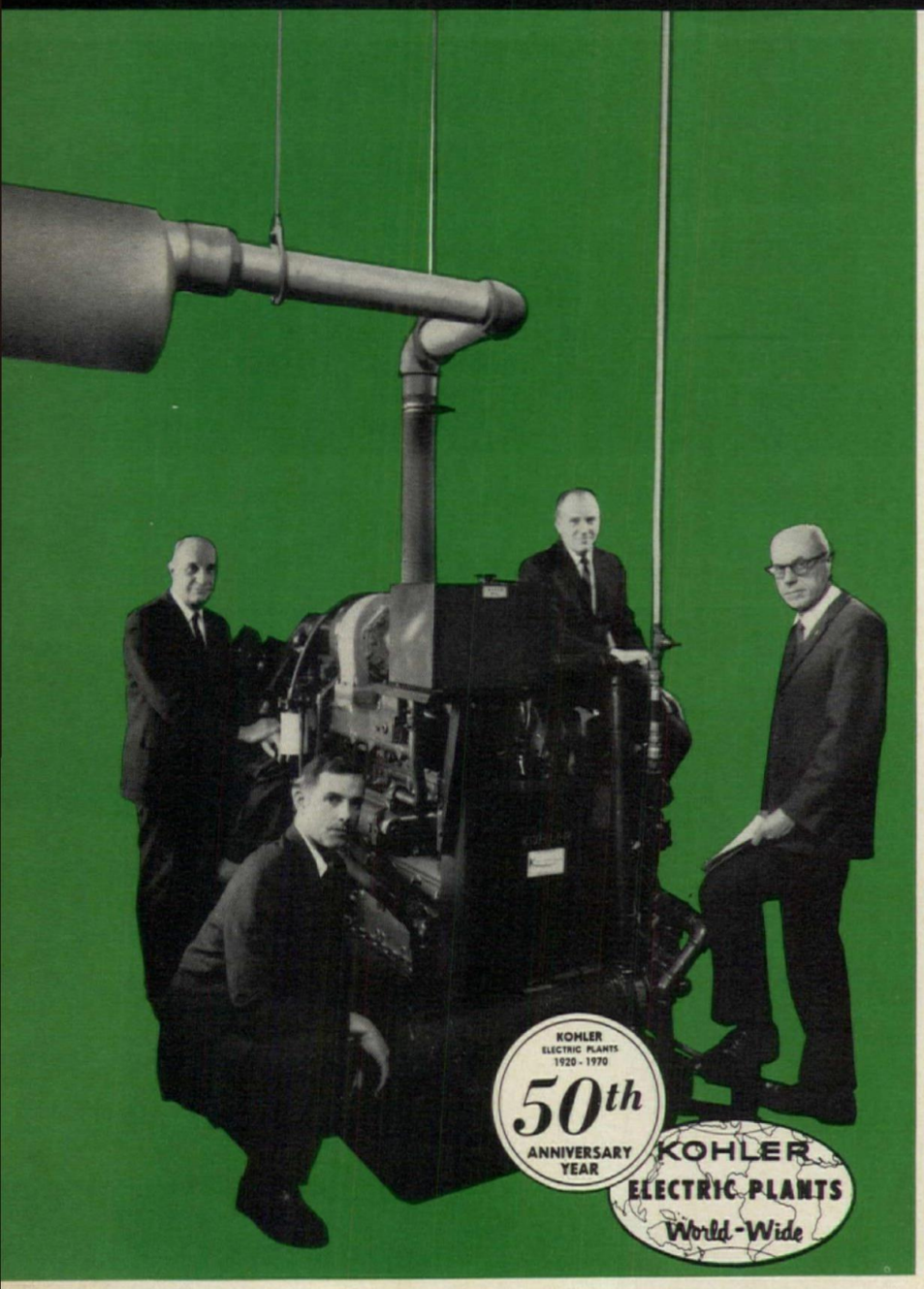
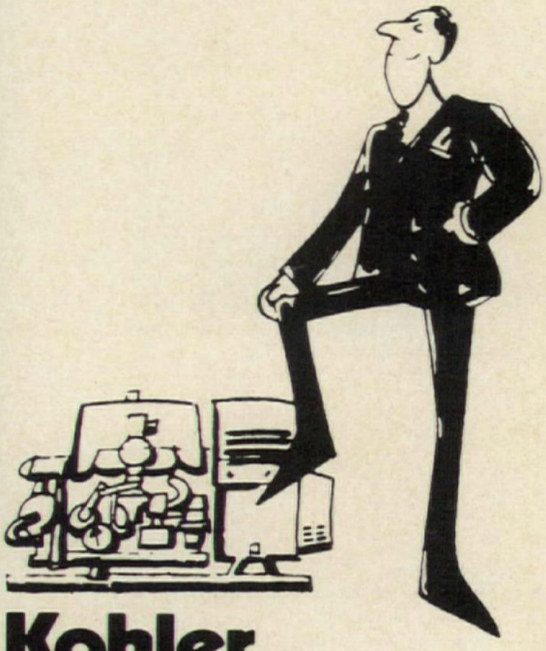
Take it for granted.

Job-matched dependability. That's why you can take a Kohler standby electric plant for granted. It starts with basic design. Rugged. Built to perform—every time. Kohler distributors and representatives take it from there. They help you determine size and type of unit, plus accessories that tailor it to the job—completely.

What's standard? Exclusive solid state static exciter for quick response, steady power under high loads. Kohler-designed cooling system. Elastomeric coupling between engine and generator and flexible mounts between plant and base which virtually eliminate vibration and torsional disturbances. Other features and options including automatic takeover.

You get one-source responsibility, Kohler service nationwide. For complete information, write Kohler Co., Kohler, Wisconsin 53044.





Kohler Electric Plants. We work hard to make them hardly noticeable.

Kohler Co., Kohler, Wisconsin 53044

For more data, circle 130 on inquiry card

ADVERTISING INDEX

Pre-filed catalogs of the manufacturers listed below are available in the 1970 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
Eastern Sales Mgr.: Donald T. Lock (212) 971-3583
Central Sales Mgr.: Robert G. Kliesch (215) 568-6161
Production Mgr.: Joseph R. Wunk (212) 971-2793
Marketing Services Mgr.: Elizabeth Hayman (212) 971-2858
Classified Advertising: (212) 971-2557

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 — Willis W. Ingersoll, 55 Public Square, (216) 781-7000

Dallas 75201 — Angus A. Macaulay, 1800 Republic National Bank Tower, (214) 747-9721

Denver 80202 — Douglas J. Carthew, 1700 Broadway, (303) 266-3863

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

Houston 77002 — Angus A. Macaulay, 2270 Humble Building (713) 224-8381

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

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

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

Pittsburgh 15222 — Edward C. Weil, 4 Gateway Center, (412) 391-1314

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

San Francisco 94111 — Richard R. Butera, 255 California St., (415) 362-4600

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Calhoun, Tennessee 37309

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Architects-Engineers, Everett Kelley Associates is well known for its professional placement of Technical people. Currently we have many qualified people seeking new opportunities. If you have a need contact us for complete listing. Contact in confidence, Ron Williams, EVERETT KELLEY ASSOC. 121 S. Broad St. 20th fl. Philadelphia, Penna. 19107. (Emp. Agcy.) (Exclusively an Employer FEE PAID Personnel Service).

POSITIONS VACANT

Architectural Teachers—Requirements: Masters degree in architecture and six years of architectural practice of which at least two years included interaction with computer applications related to completed building projects. Teach in a two year computer oriented architectural technology program. Location 28 miles northwest of Chicago, Illinois. Contact Chairman, Division of Engineering, William Rainey Harper College, Algonquin and Roselle Roads, Palatine, Illinois 60067.

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Dept. of Architectural Record
Send to office nearest you.
NEW YORK, N.Y. 10036: P.O. Box 12
CHICAGO, ILL. 60611: 645 N. Michigan Ave.
SAN FRANCISCO, Cal. 94111: 255 California St.

Architectural Designers/Draftsmen—Expanding Baltimore firm has permanent openings for personnel seeking challenging responsibilities. A team approach provides an opportunity to become involved in all phases of work and assures personal professional growth. Practice includes planning, architecture, urban design, research and development. Join a stimulating professional group dedicated to quality work. Salary commensurate with qualifications; periodic increases based on merit; comprehensive benefit program includes medical and life insurance plan; and liberal relocation allowance. Please send resume to Vice President of Personnel, RTKL INC., 806 Cathedral Street, Baltimore, Maryland 21201. An Equal Opportunity Employer.

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Partner wanted: principal of New York architectural firm established in commercial and store design seeks small firm or individual architect for merger or partnership to broaden practice. Address resume to P-1258, Architectural Record.

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Consulting Engineers
Construction Management • Preliminary Estimates
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312-338-6060

Classified Section Non-Display Order Form

To place a non-display advertisement, fill out this form, including your name, street address, city & state with ZIP code, attach it to a separate sheet containing your advertising copy, and mail it to:

ARCHITECTURAL RECORD / P.O. BOX 12
NEW YORK, N.Y. / 10036

Rates: $3 per line, minimum insertion ten lines, six words to a line, box number counts as one additional line. Display rates on request.

☐ Payment Enclosed $.....☐ Bill me

☐ Use Name & Address ☐ Use Box No.

Advertisement to appear.....time(s)

.....
Signature

continued from page 224

CEILINGS / An 80-page catalog describes a complete line of commercial ceiling systems with full specification and application data. ▪ Armstrong Cork Company, Lancaster, Pa.*

Circle 408 on inquiry card

TERRAZZO / The 98-page, 1970 edition of the "Terrazzo Technical Data Book" contains official NTMA specifications for 18 kinds of terrazzo. ▪ National Terrazzo & Mosaic Association, Alexandria, Va.*

Circle 409 on inquiry card

CONCRETE RESEARCH / "Square Openings in Webs of Continuous Joists" is the first of a series of research reports on the effects of openings in structural concrete members. This research will provide procedures for designing concrete members with holes. ▪ Portland Cement Association, Skokie, Ill.*

Circle 410 on inquiry card

SPRINKLER SYSTEM / "Fire Protection is Good Business" is a 24-page brochure describing a line of sprinkler systems. ▪ Grinnell Company, Inc., Providence, R.I.

Circle 411 on inquiry card

STEEL DECK / The 1970, 12-page edition of "Steel Roof Deck Design Manual" gives details on the latest fire ratings from one to two hours, the most recent revisions of the Basic Design Specifications, Architects Specifications, and the SDI Code of Recommended Practice. ▪ Steel Deck Institute, Westchester, Ill.*

Circle 412 on inquiry card

NOISE CONTROL / "Jamisonic Hi" is a 12-page brochure describing noise characteristics and control and presenting designs and material in a line of sound reduction doors and wall panels. ▪ Jamison Door Company, Hagerstown, Md.*

Circle 413 on inquiry card

THERMAL CONTROL WINDOW / A 12-page performance data booklet gives applications, performance, cost analysis and installation and glazing recommendations for *Heated Twindow*, a window unit providing year-round thermal control. ▪ PPG Industries, Pittsburgh, Pa.*

Circle 414 on inquiry card

GAS VALVES / A brochure describes a complete line of valves designed for instant, automatic closing of gas lines during earthquakes or explosions. Both gas and liquid service valves are available. ▪ Sentinel Valve Company, Huntington Park, Calif.

Circle 415 on inquiry card

HOSPITAL ENERGY SYSTEMS / An 8-page brochure describes the installation of four types of energy systems for hospitals. ▪ Waukesha Motor Company, Waukesha, Wis.

Circle 416 on inquiry card

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