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ARCHITECTURAL RECORD

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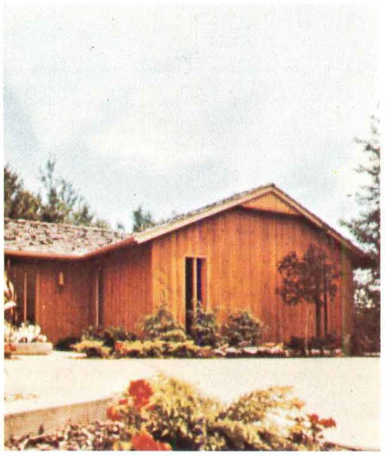

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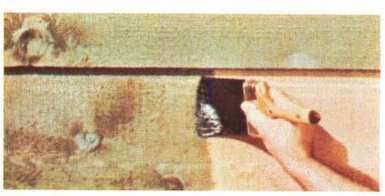

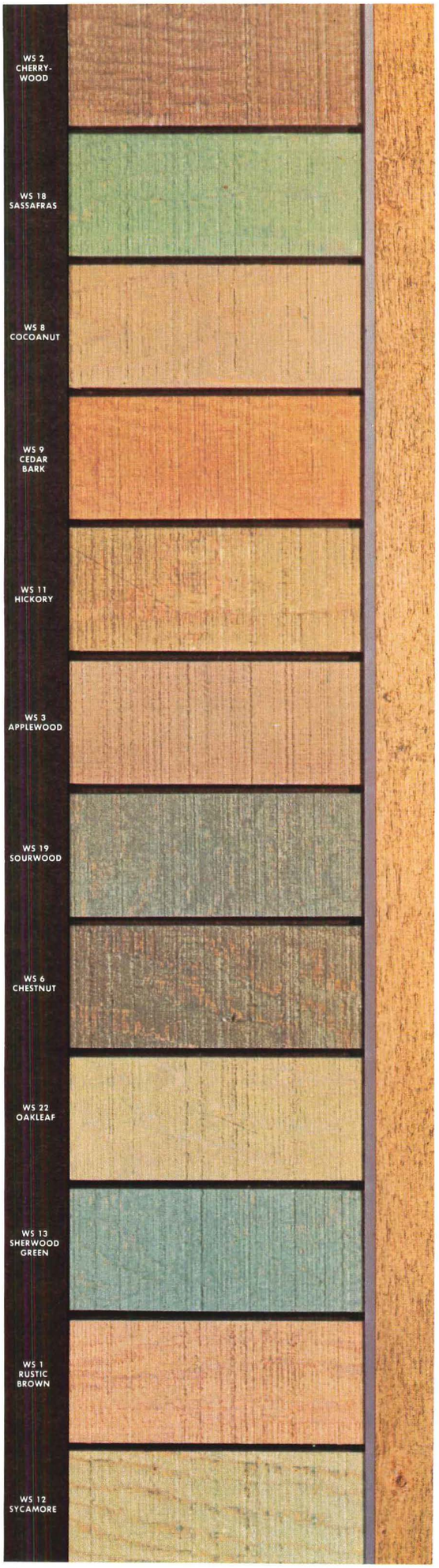

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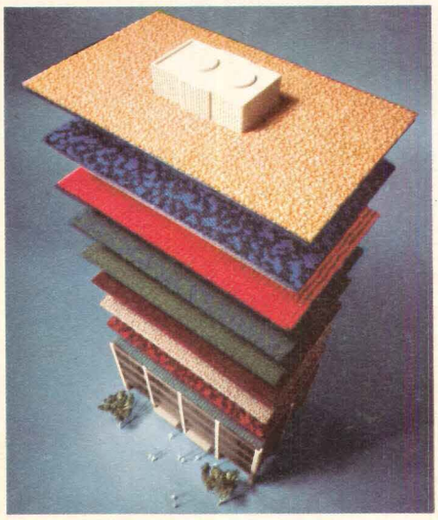

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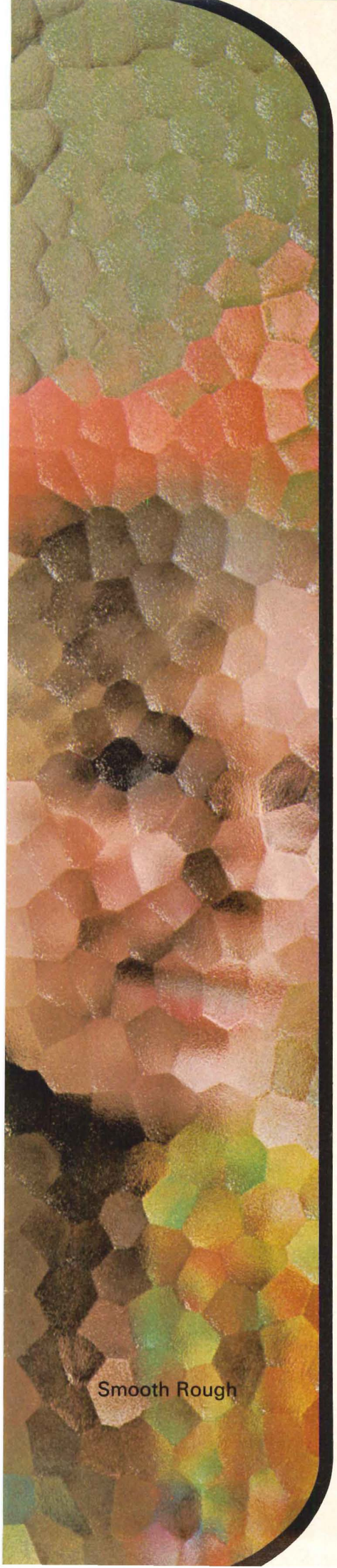

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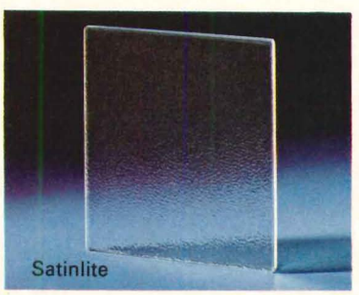

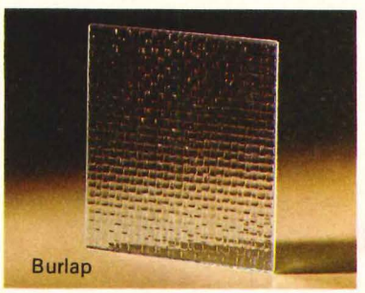

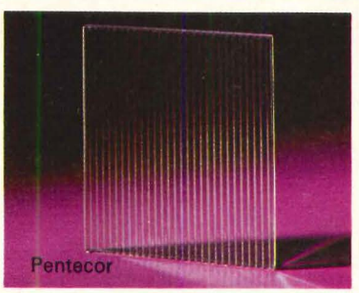

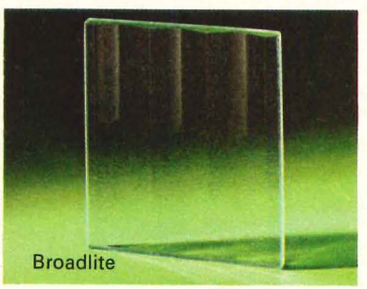

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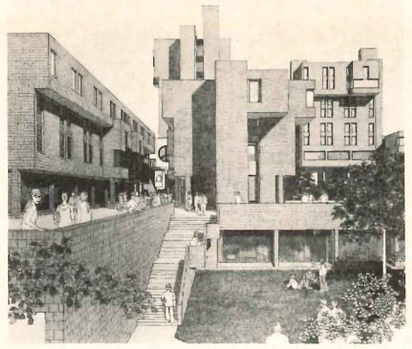

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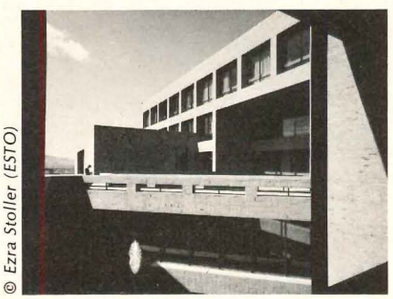

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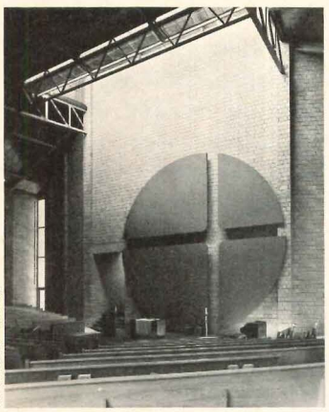

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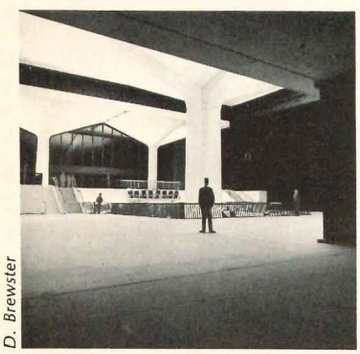

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COMING IN THE RECORD

BUILDING TYPES STUDY: SHOPPING CENTERS

Next month three of the most recent enclosed mall shopping centers designed by the Dallas firm of Harrell and Hamilton will be examined in a two-part report that explores the firm's innovational design concepts, as well as their far-reaching and very successful attempts at providing the client with a vast array of services that bracket the planning and design area, involving the architects in virtually the entire development process.

A CORE CITY HOUSING PROJECT

Westbeth Artists Housing, to be featured next month, is one of the largest and most complex rehabilitation projects in the country. Designed by Richard Meier, Westbeth has turned a square block of old buildings in Manhattan into some 384 new apartments for working artists and their families. In rehabilitating the old buildings, instead of tearing down and starting over, and in claiming apartments from commercial space as it does, the Westbeth design offers insights into possible ways of improving all cities.

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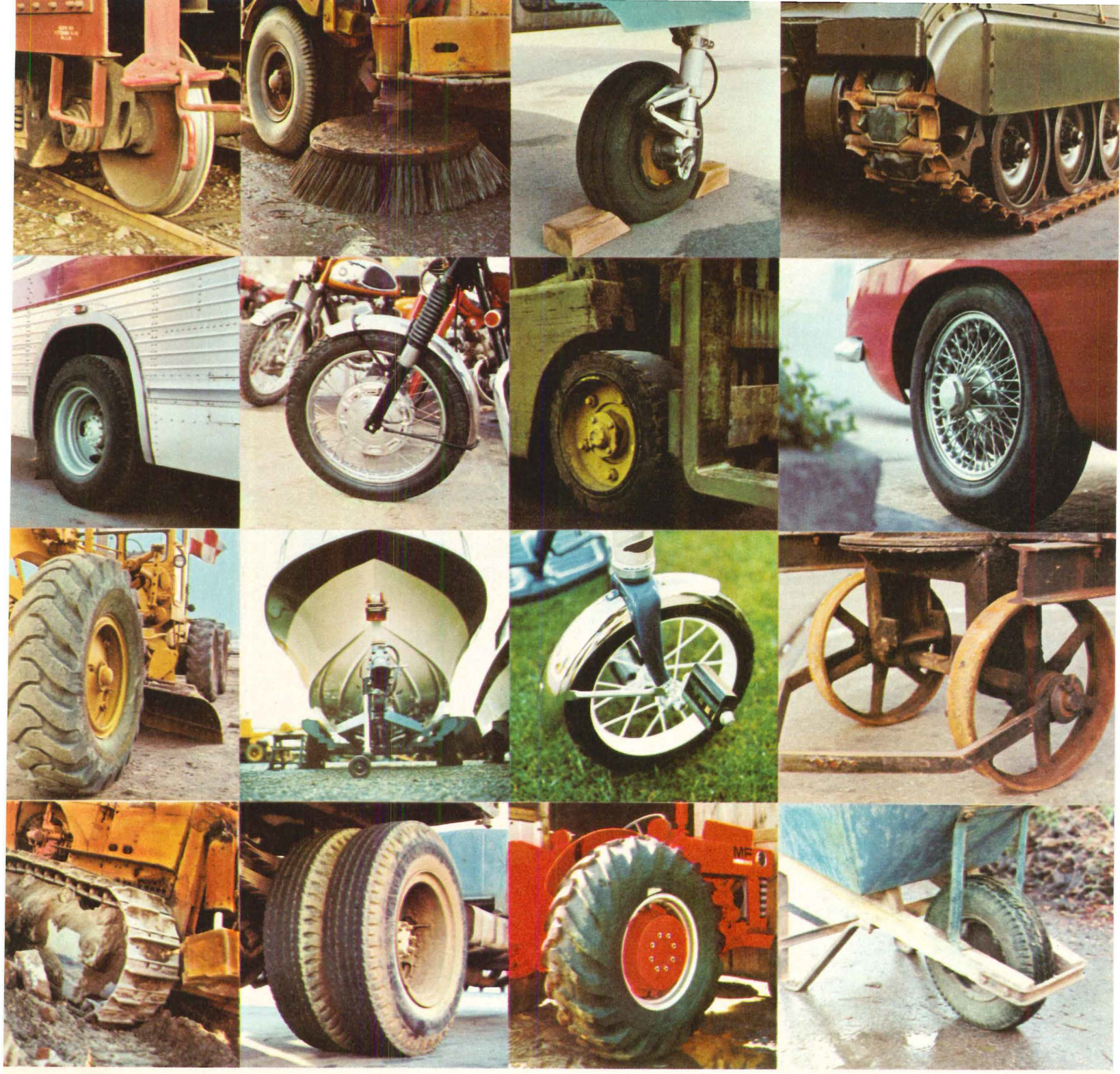

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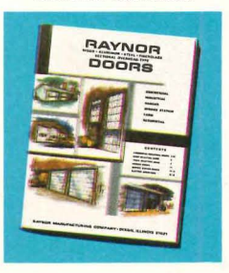

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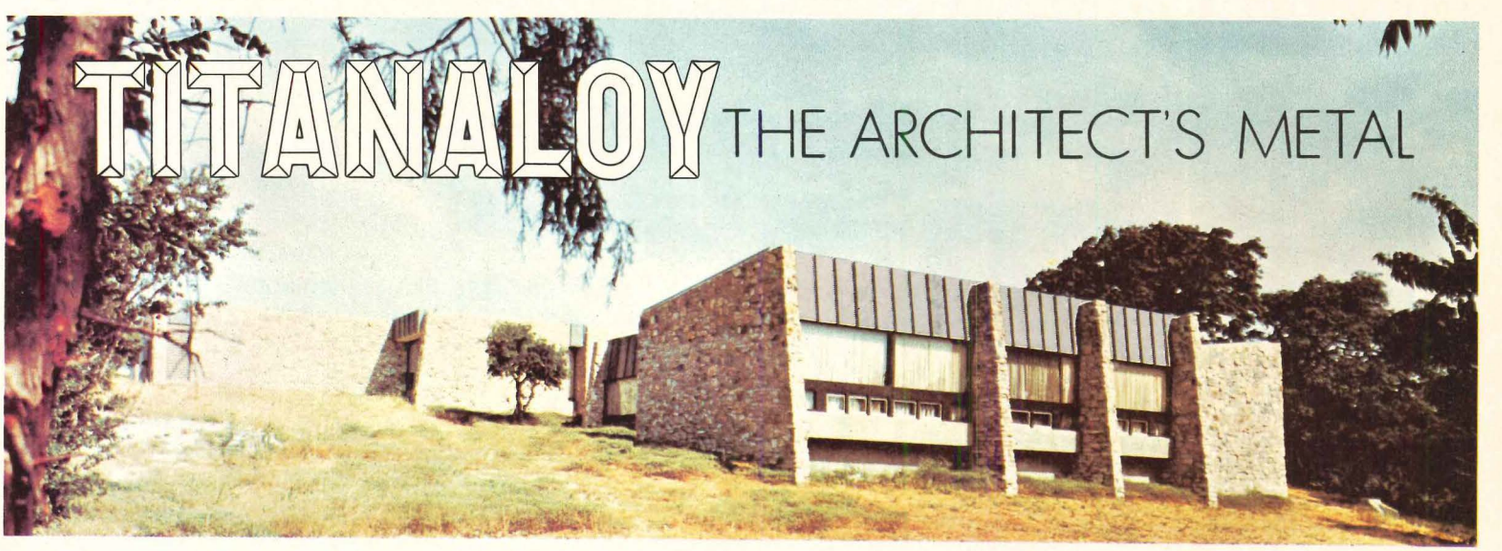

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The architect vs. the builder: does it have to be that way?

This is a time when architects (and everyone else in the building industry) need to be focusing all of their thinking and study and creativity on future needs—planning for the fantastic growth we know is ahead, studying the changes implicit in the social revolution now under way, and coping with all of the changes in practice from methods of information retrieval to the very nature of the client. Instead, architects (and everyone else in the building industry) find themselves coping with a never-ending series of internecine battles.

Those internal problems were well spelled out at the first organizational meeting some months ago of the Construction Industry Foundation, which was conceived and is being organized by architect Robert Cerny. The list includes: equitable and sensible control of the flow of an owner's money to general contractors, subs, suppliers, manufacturers and others; bidding abuses such as bid shopping by general contractors, bid peddling by subcontractors, and bonding and qualification of bidders; vague, incomplete plans and specifications; inadequate product standards and guarantees; professional liability and the problems of fairly fixing liability for the inevitable imperfections; and so on and on.

One architect put it to me this way just last week: "The adversary relationship of architects and builders is taking a greater and greater emotional toll. And it's such a waste—it really needn't be."

Indeed it needn't be; in fact it must not be. For the price of internal problems is not just the emotional toll on the building professionals involved. The price is that everyone must constantly be on guard against each other, instead of working together. The price is that time needed for thinking and designing is spent defending oneself. The price is a great reluctance to undertake any experimentation. The price is that shoddy practices proliferate. The price is that honorable men are tempted to cut corners.

I used to think that any problem could be resolved if sensible men would sit down and talk it over. I'm not sure I believe that any more, but I do think that the problems of the "adversary role" of architect and builder can be resolved if sensible men sit down and talk it over—and can be resolved without abandoning the architects traditional, critical, and honorable role of agent for the client.

The resolution of those internal problems is now partially under way. At a recent meeting, Cerny reported on the accomplishments the fledgling Construction Industry Foundation has made in its first months:

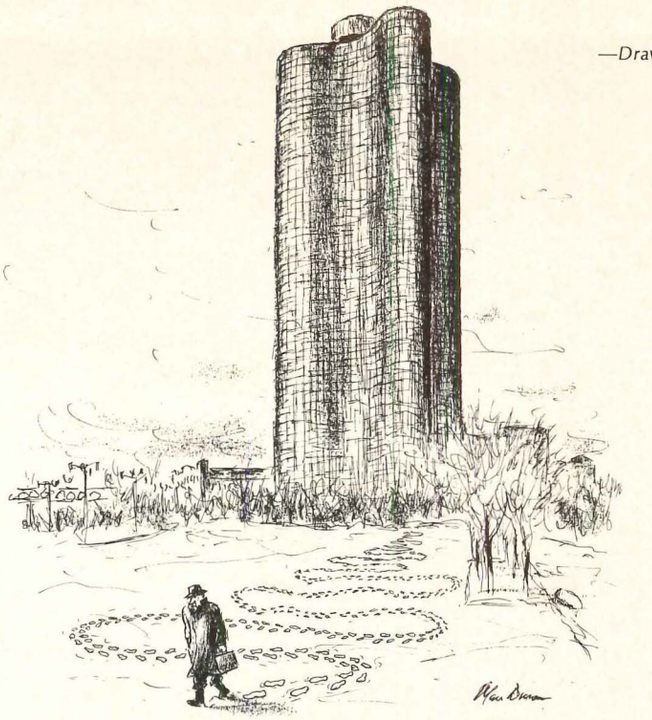
1. Research is under way into the "complex ritual" of the industry's payment practices—the flow of the owner's money. Everyone knows that after an owner has paid for work completed, it is not abnormal for it to take months for that money to trickle down to the sub or supplier. Further, the withholding procedures and retainage systems, and lien rights and lien waivers, are subject to abuse. Owners are frequently guilty of "slow pay." The goal: cash flow in a goldfish bowl. And why not?

2. Research is also under way in establishing standards which can be agreed to by all on just how complete plans and specifications need to be, and therefore should be. In a booklet just published by C.I.F., an example too familiar to most people in the industry is spelled out this way: "The fault is particularly pronounced in plans for FHA-insured apartment buildings and those prepared for development contractors. Specifications may call only for 'heating controls'—a requirement that can technically be met with one thermostat for a ten-unit apartment building." Yet, what architect has not been burned by a subcontractor who has found a way to cut costs (and quality) despite a most carefully worded specification.

What is important about this and other research either under way or soon to be undertaken by C.I.F., is that everyone involved—architect, engineer, builder, banker, producer or manufacturer—has (as he must have) an equal voice. Reasonable men with varying points of view—indeed conflicting points of view—are trying to solve joint problems. The Construction Industry Foundation is envisioned as, and is growing towards, an organization of equal partners; an organization representing homebuilders, subcontractors, bankers, surety bondsmen, insurers, manufacturers and producers, engineers, architects and (soon, one hopes, though they have not yet chosen to participate) general contractors and organized labor.

The goal is clear, and it is a good one: To set fair rules, agreed to by all, so that there is no opportunity for the chiseler or corner-cutter, and so that honorable men can operate honorably. The goal is to set standards of quality in product, in workmanship, in business dealings that are agreed to by all so that the man who is trying to maintain a standard—whether he is an architect or an engineer or an owner or a general contractor or a plumbing journeyman or a banker can perform his job to those standards without risking being undercut or spending half his working day fighting the absence of quality standards.

—Walter F. Wagner, Jr.



—Drawn for the RECORD by Alan Dunn

Three cheers for the civil engineers

Last month, the governing body of the 63,000-member American Society of Civil Engineers officially restated its concern for esthetics in engineering design. The resolution:

"Recognizing that functional civil engineering designs often produce forms that are totally pleasing to the human eye; that structures conversely can be functional but not at all pleasant to behold; that excellence of appearance need not be costly; that natural beauty can be destroyed in the creation of man-made facilities; but that through care in design natural beauty can be preserved or enhanced in the construction of things:

"The American Society of Civil Engineers . . . urges an even greater concern for esthetics among all of its members involved in designs or decisions affecting the physical environment;

"Urges all its members to advocate reasonable additional expenditures if needed to achieve esthetic quality in their work;

"And assures the public that concern for esthetics continues to be the policy of this Society . . ."

Which is, it seems to me, a pretty good kind of policy. Again, three cheers for the civil engineers.

And three cheers for HUD's Harold Finger . . .

. . . who in a speech to the ASCE late last fall told the assembled civil engineers:

"We can no longer think in terms of adding two new lanes or a new highway to overcome a rush-hour traffic crunch. This may only provide an incentive for the 'U-drive-yourself' buff and further increase the city's burden of congestion, noise, pollution, accidents. Simultaneously, it may reduce the economic incentive and the benefits of developing good public transportation systems. . . .

"We can no longer think of solving our waste collection problems by simply adding more garbage trucks that also increase congestion, pollution, noise, and operating costs. And we cannot simply burn more refuse to add pollution and generate fill for land that is no longer available near our cities. . .

"We cannot simply locate sites for housing or industry or airports without considering desirable and beneficial urban growth problems. . . .

"We cannot simply build more housing for low-income families only in our central cities. . . ."

Looking for a good man . . . or a good new job?

Then it might be worth taking a look at RECORD's new classified section which will be appearing each month (beginning last month). It will include "employment opportunities, selling opportunities, business opportunities, financial opportunities [I didn't see any of those in January] and professional services." Anyway, it's our hope that this new service will prove helpful, and if you're interested in placing a classified ad, you simply contact the McGraw-Hill District Office nearest you on the Advertising Index page.

"Beauty is not a sissy word . . ."

From a broadcast made by Vancouver architect and planner Warnett Kennedy: "Canadians are now demanding that our cities should be beautiful. The old-fashioned word 'beauty' is not a sissy word. We should use it again and again. If I am not misled, I think that people want greenery more than they want paving and blacktop. They want air that is fresh and full of oxygen. They want clean, clear water. They want to see and to smell and to hear the sounds of nature—and all this *inside* our future cities.

"This calls for a better statement of social goals *before* expensive plans are prepared. As things are today, City Councils sit merely as referees while the developers with their plans and brochures perform their tribal dances in front of them. . ."

Hear, hear, City Councils everywhere!

An architect's solution to automotive smog

With more and more evidence pointing to the combustion engine as the No. 1 air polluter, this proposal by Edgardo Contini, partner of Victor Gruen Associates in Los Angeles, and reported in *The Christian Science Monitor,* is worth more thought:

Contini proposes that instead of trying to legislate clean air, the government should simply declare that clean air is a public asset —like national parks. Anyone who takes the clean air and returns it dirty should be charged a use fee for the privilege.

Under his plan these collections would go into a fund that would be distributed to those people willing to use smog-free automobiles.

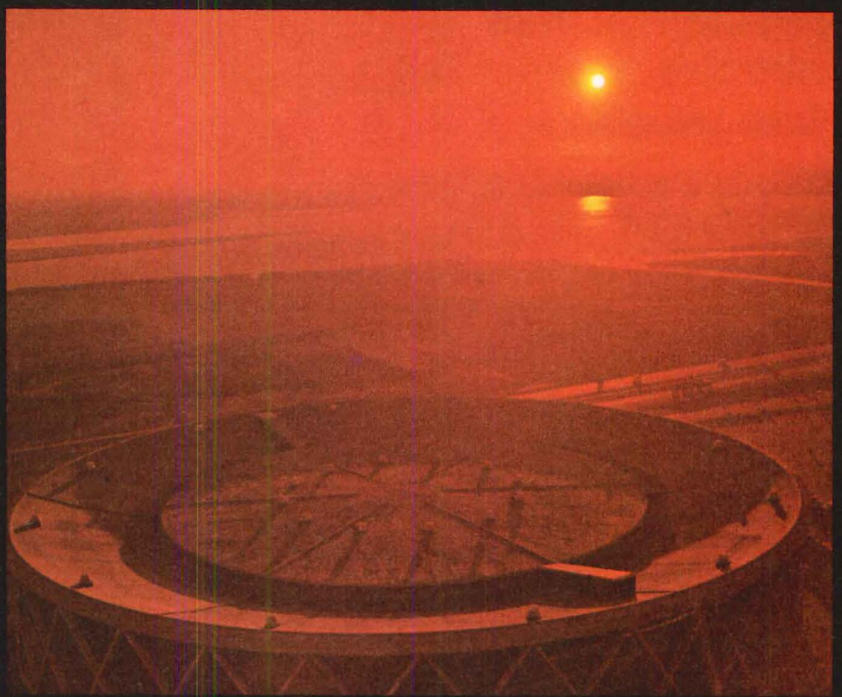
The example cited: "The user of a conventional internal combustion engine would pay on a sliding scale, starting at $20 and rising in yearly increments of $20 to a maximum of $200 per year.

"If, in the first year, only one per cent of all vehicle users used smogless vehicles, they would each receive an incentive bonus of $2000 from the fees collected. In subsequent years, this bonus would tend to decrease in proportion to the relative number of polluters and nonpolluters."

It's an intriguing idea—and an intriguing principle. That might be applied to, say, water pollution and noise pollution.

"Anyone who takes the clean air and returns it dirty should be charged a use fee for the privilege." Think of that.

—*W.W*

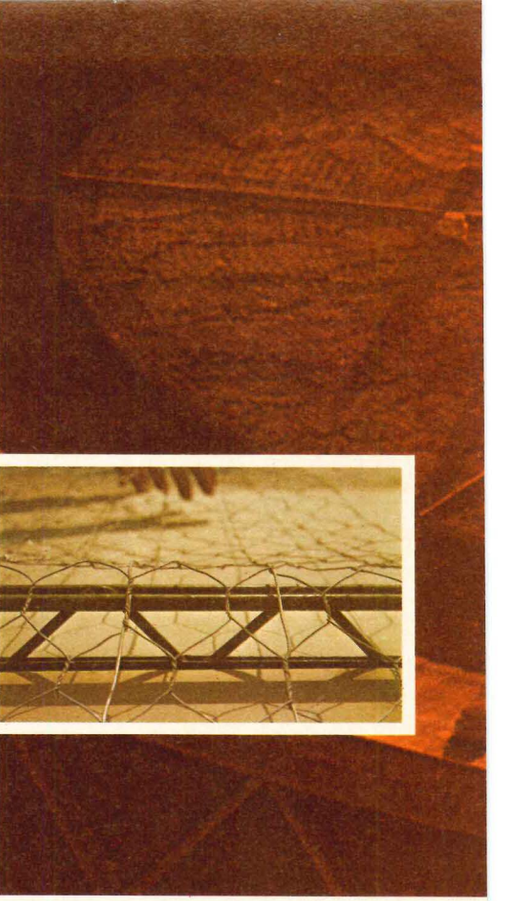


inner strength

FROM KEYSTONE

inner strength
FROM KEYSTONE

Inner strength reinforcements make roofs, walls and floors stronger with less weight.



Fire-rated roof decks are made lighter, stronger, truly monolithic with Keydeck Truss-T Subpurlins and Keydeck Reinforcement.

The cast-in-place material flows through the open webs of Keydeck Truss-T subpurlins. Result: a truly monolithic deck with the material bonded *through* the subpurlins. This makes the total deck section stronger. It is also lighter because there is less dead steel weight in the subpurlin.

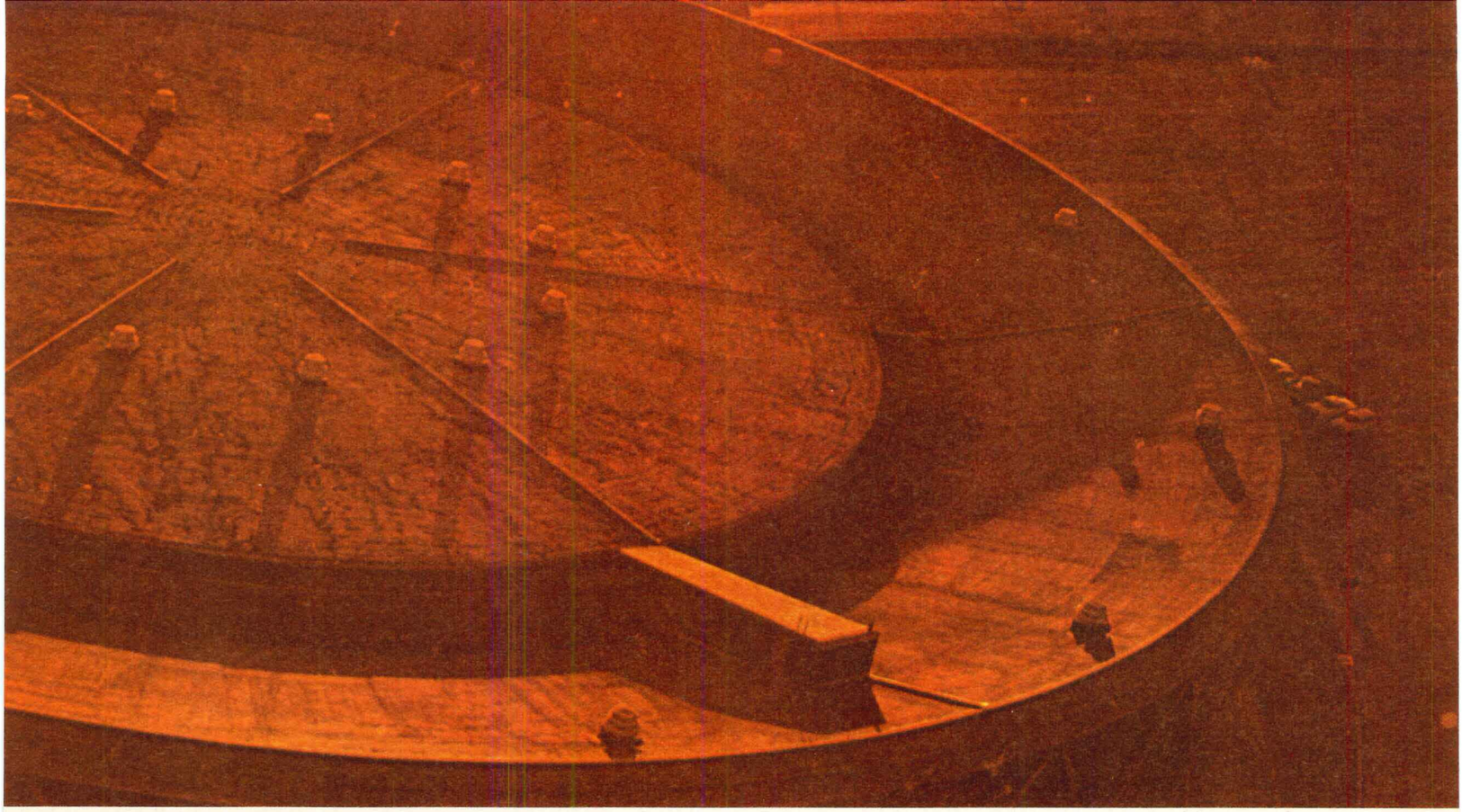
Keydeck reinforcement unrolls flat and the twist weave construction gives maximum bond with the deck materials. Keystone Steel & Wire also supplies the popular bulb-T subpurlins.

Oakland Coliseum, Oakland, Calif.
Architects: Skidmore, Owings & Merrill.
General Contractors: Guy F. Atkinson.
Roof Deck Contractor: Anning-Johnson.
Roof Deck System: Cast in place gypsum reinforced, with Keydeck Truss-T subpurlins and Keydeck reinforcement.

Keyweld reinforcement sheets save on steel; cut construction time, inspection time and labor costs with mechanical handling and placement.

Improvements in welded fabric equipment now make it possible to weld large steel sizes into large sheets to meet the reinforcing requirements of individual jobs. Steel sizes to ⅝″ diameter with 2″ to 16″ spacing in sheet-sizes up to 16′ wide and 36′ long. Just supply the floor plan and the concrete and steel reinforcing specifications. We will recommend the Keyweld weight, spacing and sheet size.

Addition to Finished Products Warehouse, Weirton Steel Division of National Steel Corporation at Weirton, West Virginia. Designers: Weirton Steel Engineers, J. W. Martt, Chief Engineer. Construction by Weirton Steel Construction Department, F. W. Schmidt, Superintendent.



Keywall masonry reinforcements are matched to the mortar strengths for better, stronger, walls.

Conventional mortars need the extra bonding surface, mortar locks and mechanical anchors provided only by Keywall Multibond. Together they work to better control thermal movement and cracking in masonry walls bonded with conventional mortar.

The lightweight rolls are easy to handle; the mesh easy to cut with a pair of snips for lapping, making accurate cutouts, etc.

Truss-type Keywall, which is matched to the strength of high strength mortar, is also available from Keystone Steel & Wire.

Columbian Elementary School, Kokomo, Indiana. Three additional school buildings in Kokomo by same architect, general contractor and masonry contractor: Maple Crest School, Haworth High School and Sycamore Jr. High School Addition. Architect: Everett I. Brown & Co., Indianapolis. General Contractor: Modern Structures, Inc., Indianapolis. Masonry Contractor: B. E. C. T. Co., Indianapolis. Construction: Concrete block and brick cavity walls alternate courses of blocks reinforced with Keywall Multibond (Roll-Type) Reinforcement.

Inner strength FROM KEYSTONE

For complete information, call your Keystone representative or write Keystone Steel & Wire Division of Keystone Consolidated Industries, Inc., Peoria, Illinois 61607.

For more data, circle 7 on inquiry card

build a colorscape that lasts

With color coatings that withstand the corrosion and grit of industrial atmospheres, and stay attractive and maintenance-free for years.

Build your next metal-walled building with panels protected by the best of the color coatings. The long-lasting finishes containing Kynar 500®.

You can choose from nearly 100 colors, ranging from bright pastels to subdued bronzes. And match your color, exactly, panel after panel.

Coatings made with our fluorocarbon resin, Kynar 500, resist chemicals, corrosive atmospheres and mortar stains; won't crack or craze; and take abrasion in stride. In fact, accelerated tests by Pennwalt project 30 years of maintenance-free life.

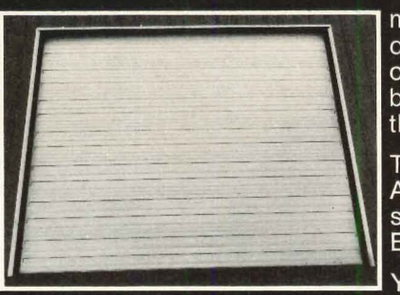
Banish the dull and ordinary. Build a colorscape with finishes containing Kynar 500. Contact the Plastics Department, Pennwalt Corporation, 3 Penn Center, Philadelphia, Pa. 19102. Tel: 215-LO 4-4700.

®Kynar 500 is Pennwalt's registered trademark for its vinylidene fluoride resin.

1 Consolidated Edison Arthur Kill No. 3 Station, Staten Island, N.Y.
Panel manufacturer and erector: E. G. Smith
Finish: DeSoto Fluropon®

2. Laboratory and office building:
Wisconsin Steel Division
of International Harvester, S. Chicago
Panel manufacturer: Walcon Corp.
Panel erector: Jones and Brown Co., Inc.
Finish: DeSoto Fluropon®

Pick a color. Any color. And we'll match it. Exactly.



Up until now, your choice of uprising steel door finishes was limited to the manufacturer's standard, or costly on-site painting with (hopefully) a close color match.

No more.

Now Crawford brings you uprising steel industrial doors prefinished *in the color of your choice as an optional extra.* Any color.

At last, you can include a door in your designs that will blend with color anodized curtain walls.

Or a door that will match the color of glazed brick chosen for facade.

Or a door color keyed to function (i.e. red for receiving, yellow for shipping).

Suddenly, your industrial buildings are a little more interesting. A little more exciting. And your clients are more appreciative of your work. Prouder of the building you've designed for them.

The specification is simple. All you do is provide a color sample. And we'll match it. Exactly.

Your local Crawford distributor has the full story. He'll also tell you about other Crawford innovations that will help you precisely match every uprising door you specify to the job it must do. He's listed in the Yellow Pages under "Doors." Call him. Or write to us.

Crawford Door Company, 4270 High Street, Ecorse, Michigan 48229. Manufacturers of uprising sectional doors, rolling doors, grilles, shutters and sliding doors. A subsidiary of the Jim Walter Corporation.

CRAWFORD

For more data, circle 9 on inquiry card

On any Crawford Steelmaster Uprising Door.

Carpets are cheaper than floors.

Did you ever think of putting carpets in your school? It doesn't sound logical, does it? Kids running up and down the halls all day. All the wear and tear. Can carpets take it?

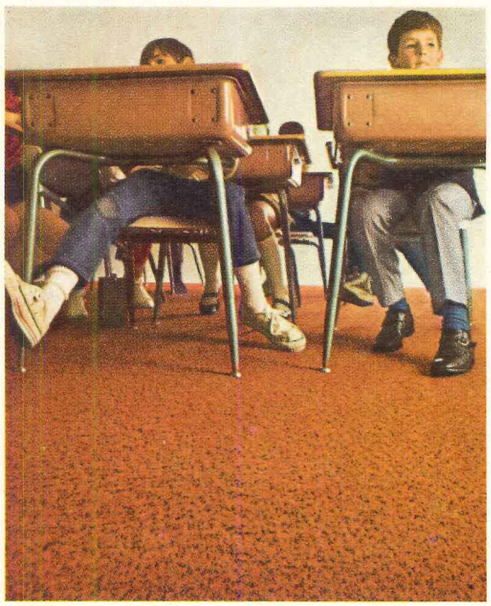
They can take it better than your floors can.

Just take a look at your floors. They're probably scuffed and scratched and boring looking. And just keeping them that way costs you a lot of money. Because you have to pay to have somebody sweep them, wash them, wax them and then to take off the wax and put it back on again.

We make Stevens-Gulistan carpet. And that's another story. Because these days our school carpets are cheaper than school floors. All you have to do to our carpet is have somebody vacuum it at night and shampoo it maybe once a year.

That's our kind of carpet. It's made of Anso* nylon and comes in two styles. With cushion attached *or* without self-cushioning. Both are specifically tested to withstand the wear and tear a student can dish out.

A lot of schools have our carpets already. So do hospitals, churches, apartment houses, hotels and more places you can think of. If you know a school that needs carpets, *call Stevens-Gulistan Carpet collect, in New York at 212 679-1220, Extension A1.*



Stevens-Gulistan, a division of J. P. Stevens & Co., Inc., 295 Fifth Avenue, New York, N.Y. 10016.

Stevens-Gulistan
Our carpets take care of themselves.

*TM Allied Chemical Corp., for its nylon fiber.

From the radical and the daring comes the revolutionary.

They're here to revolutionize treatment of walls and ceilings. To give interiors a radically different look. To break traditional paneling barriers.

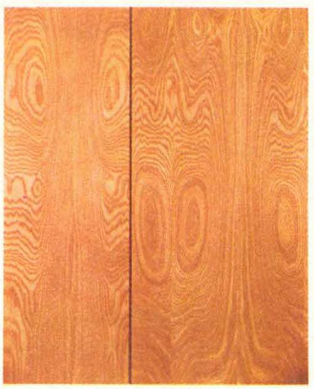
Element I™ from U.S. Plywood. Five exclusive concepts in which veneers of a wide variety of wood species are used as they've never been used before.

Panels of mismatched or random-matched veneers. Panels which retain the rough natural textural beauty of wood. Panels joined in new ways with plastic or built-in reveals. Panels or battens that are available in many widths to vary surface treatment.

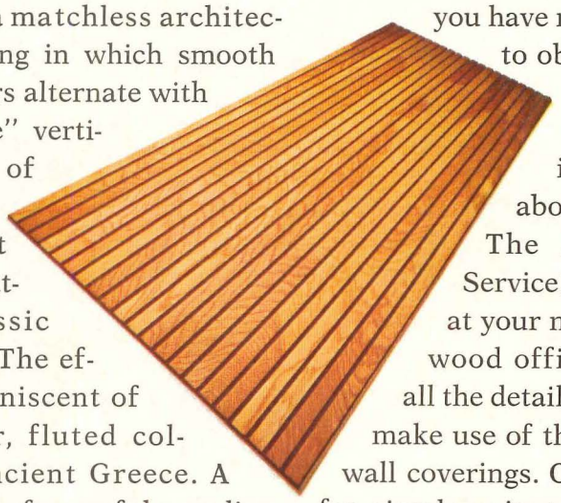
For a breakthrough in the use of wood for interior design, U.S. Plywood's Element I includes:

Butcherbloc™—a paneling of dramatic impact inspired by the counter of the neighborhood butcher shop. Cedar veneers are laid end-to-end in vertical rows to reproduce the handsome look of heavy board inlay. Veneers are random length, in a variety of natural color tones and grainings. The overall effect is solid and audacious—in keeping with the paneling's namesake.

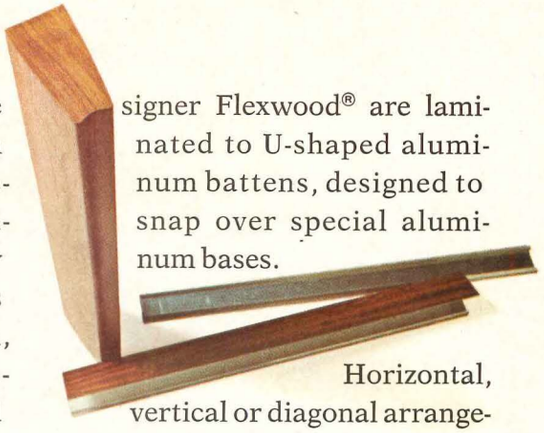
Collage™—choice wood veneers of birch, elm, oak, walnut, pecan, teak and rosewood are overlapped in random arrangements across each panel face to form a syncopated pattern of wood grains and color shadings. Veneers vary in length and width, texturing the surface of each panel in bold three-dimensional relief. A special bonding process has been devised to retain this unique and strikingly beautiful sculptured appearance.



Ionic®—a matchless architectural paneling in which smooth wood veneers alternate with "black olive" vertical reveals of plastic. This arrangement creates a pattern of classic simplicity. The effect is reminiscent of the slender, fluted columns of ancient Greece. A masterpiece of graceful paneling.



Palisade™ batten & trim—an unconventional decorating material in which veneers of Designer Flexwood® are laminated to U-shaped aluminum battens, designed to snap over special aluminum bases.



Horizontal, vertical or diagonal arrangements produce a limitless range of arresting visual effects. A novel, versatile, unique decorating material.

Concept 32™—a stark, beautifully basic interior paneling in which natural grain patterns of walnut, ash, teak and rosewood swirl unfettered across 32-inch wide panel faces, accented by charcoal black or deep chestnut brown reveals. Faces are mismatched and flush. The look is modern, symmetrical, fundamental.

Element I. Because of its radical departure from tradition, it may be the kind of wholly different wall or ceiling treatment you've always wanted to specify, but one that you have never been able to obtain until now. So why not get more complete information about Element I? The Architectural Service Representative at your nearest U.S. Plywood office can supply all the details you'll need to make use of these innovative wall coverings. Or, if you'd prefer, simply write to U.S. Plywood, 777 Third Ave., N.Y., N.Y. 10017.

U.S. Plywood

A Division of U.S. Plywood-Champion Papers Inc.
777 Third Avenue, New York, New York 10017

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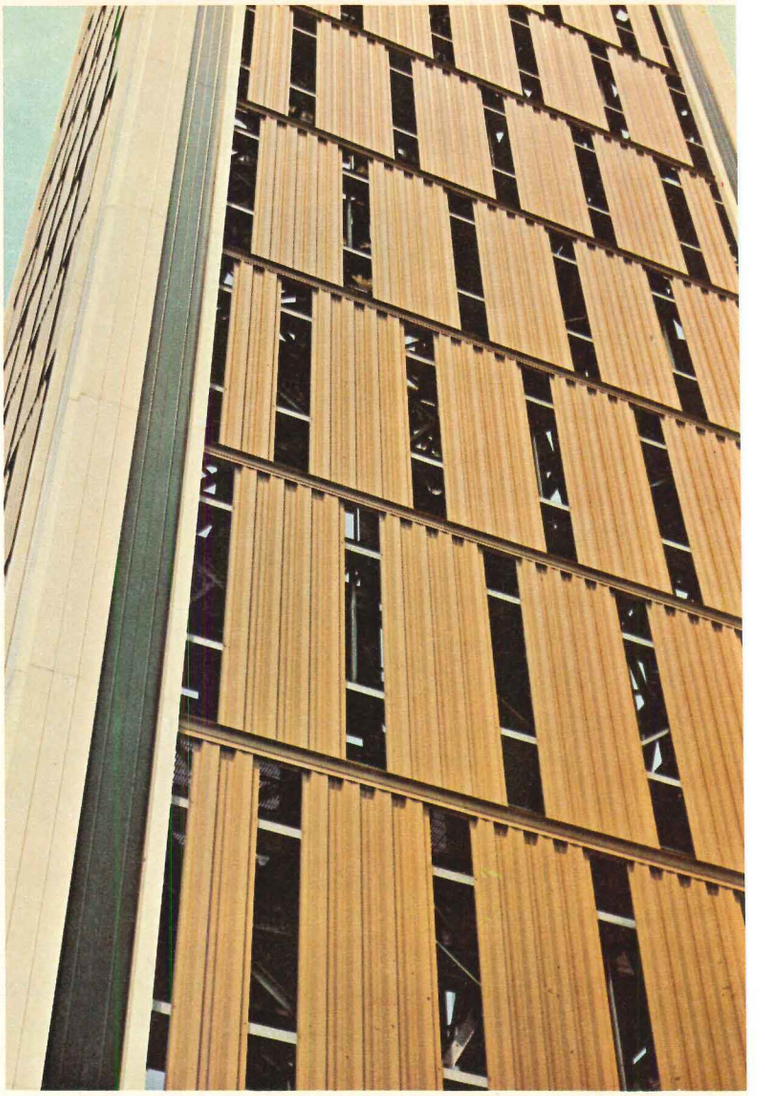
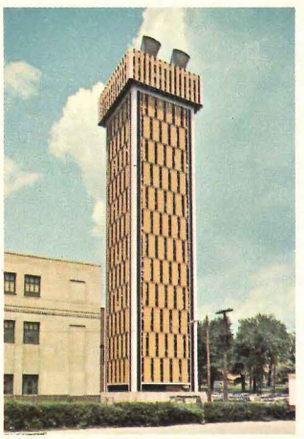
Smith metal walls are versatile



Ohio Bell Telephone Co., Youngstown, O./Architects: Damon, Worley, Cady, Kirk & Associates, Cleveland, O.

They can be decorative as well as functional, plain or fancy, subdued or colorful. They can be tall . . . wide . . . or even canted. Smith Walls are practical and economical for industrial buildings . . . power plants . . . schools . . . office and commercial buildings . . . even such unusual applications as a microwave tower. Their versatility gives you a design freedom unlimited as your imagination. So let your imagination go!

Smith Metal Walls are available insulated or uninsulated . . . with twenty different basic metal profiles. Use a single panel configuration for simplicity . . . or combine two or more for interesting architectural effects. You can add Smith decorative mullions if you wish. And you can choose from a wide selection of finishes and colors to blend or contrast with the surroundings. Smith Walls are custom-engineered to your design and specifications, delivered and erected by Smith personnel. We call it the Smith Single Responsibility concept. We do it ourselves, so we know it's right. And you know that you and your customer will be satisfied.



Specify Smith Walls in place for your next building project . . . new construction, expansion or modernization. For full details, consult your Sweets' File or write today.

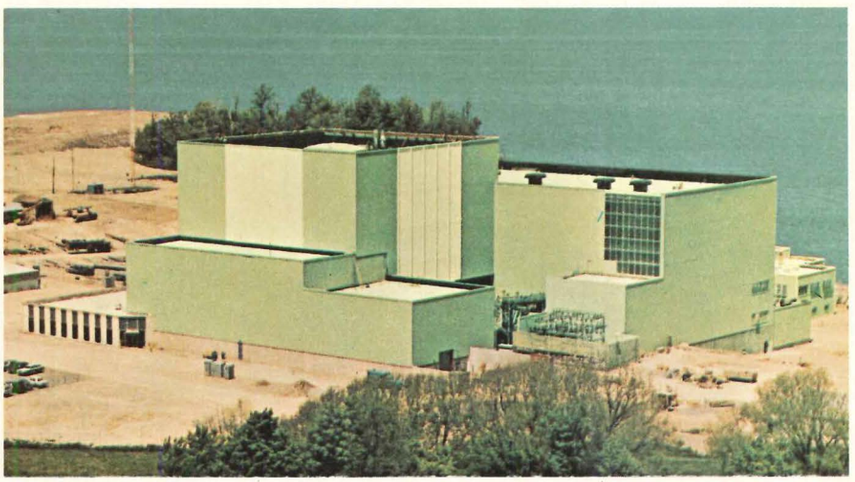
SMITH

ELWIN G. SMITH & COMPANY, INC. Pittsburgh, Pa. 15202

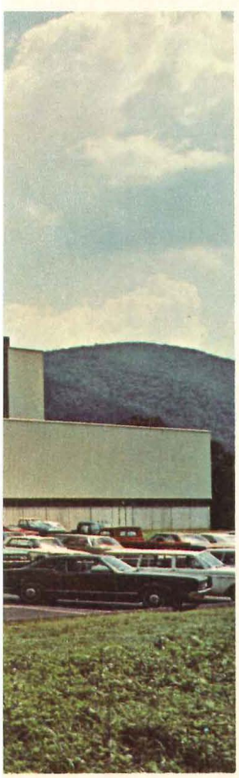
Sales Offices in Principal Cities

Westinghouse Electric Corporation, Industrial Plastics Division, Flexible Insulation Plant, Bedford, Pa. Architects: Ingham Kaffka Marcu, Pittsburgh, Pa.

Two Wincopin Office Building, Columbia, Maryland. Architect: Harold Lionel Esten, Silver Spring, Maryland.



Ginna Station, Rochester Gas and Electric Corporation, Rochester, New York/Design Engineers: Gilbert Associates, Inc., Reading, Pa.



Quigley High School, Baden, Pa./Architects: Joseph Bontempo & Associates, Rochester, Pa.

Hengerer's Department Store, Seneca Mall, West Seneca, New York. Architect: Herbert E. Johnson Associates, Washington, D.C.

For more data, circle 12 on inquiry card

BREAKAGE AND SUNLIGHT... A DISPLAY WINDOW'S TWO WORST ENEMIES!

Conquer Both Hazards With Protectopane® U-V!

Breakage and sunlight, a display window's two worst enemies, leave store owners vulnerable to property destruction. Breakage can result in expensive window replacement and loss of merchandise; sunlight can fade expensive display material making it worthless for re-sale. Either way, destruction cuts into profits and store owners lose money!

This needless waste can be avoided with Protectopane U-V! This new glass, specially created for store front windows, provides break-through protection *and* prevents fading due to ultra-violet light!

Protectopane U-V features a clear vinyl interlayer which acts as a repellent to ultra-violet light—lets through only 1% of the ultra-violet rays in the critical region of 380 millimicrons and below; whereas ¼" clear plate glass transmits about 52% of these harmful rays! Protectopane U-V provides color fast protection for draperies, paint, furniture, clothing and other articles behind the glass.

Protectopane U-V is almost totally impervious to break-through. Repeated heavy blows may break or crack the glass, but will not cause it to easily shatter or fall out.

Provide a double shield against display window property destruction! Write Dearborn today for complete details and specifications on Protectopane U-V!

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Lennox presents the "tenant system" of apartment comfort control

Indoor comfort is a highly personal need. Individual. And complicated. As apartment dwellers become more sophisticated in their comfort demands, so must the equipment that heats and cools their individual living areas. Lennox answers this need with a "tenant system" of comfort control (where the tenant completely controls his environment), as opposed to mass, central systems of take-it-or-leave-it heating or cooling.

continued overleaf . . .

Brooktown Apartments, Addison, Texas. 400-unit development of garden-type apartments styled for the casual, indoor-outdoor living of this Dallas locale. Each tenant controls his own Lennox heating and cooling system. *Inset photo:* New model, low-silhouette Lennox condensing units hide quietly.
Architects: Burson & Hendricks. Developers: Brooktown Properties.
General contractor: C. C. Blaylock Construction Co.
Heating/cooling contractor: Citywide Plumbing & Air Conditioning.

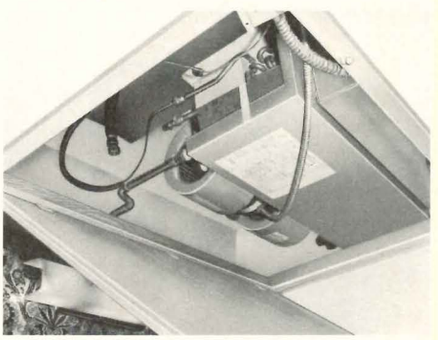
For more data, circle 14 on inquiry card

Heritage Village, in Southbury, Connecticut, is an all-electric condominium community planned for 2000 units in "houses that fit the land." Lennox equipment providing cooling for 1800 units and heating for 900 permits use of "tenant system" comfort control. Planning and design consultant: Charles Warren Callister. Developers: Paparazzo Development Corp.

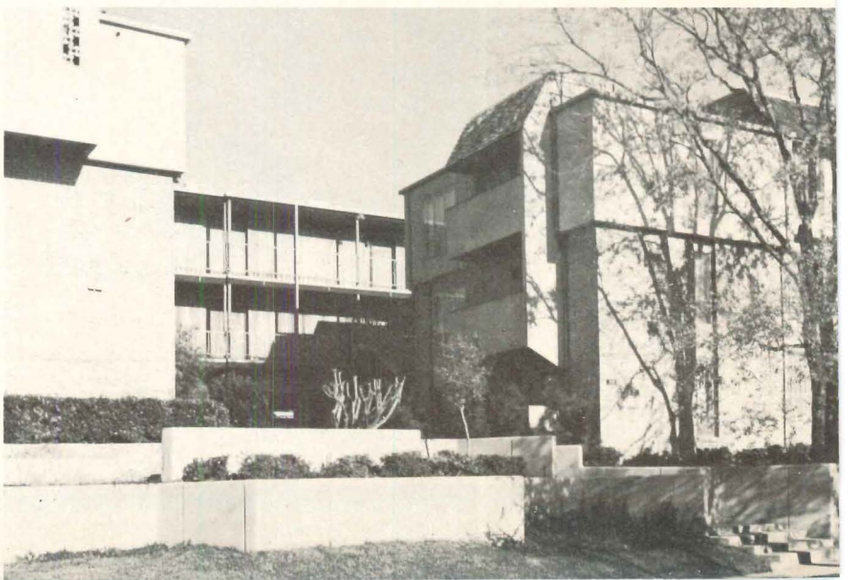
continued . . .

"tenant system" apartment comfort control

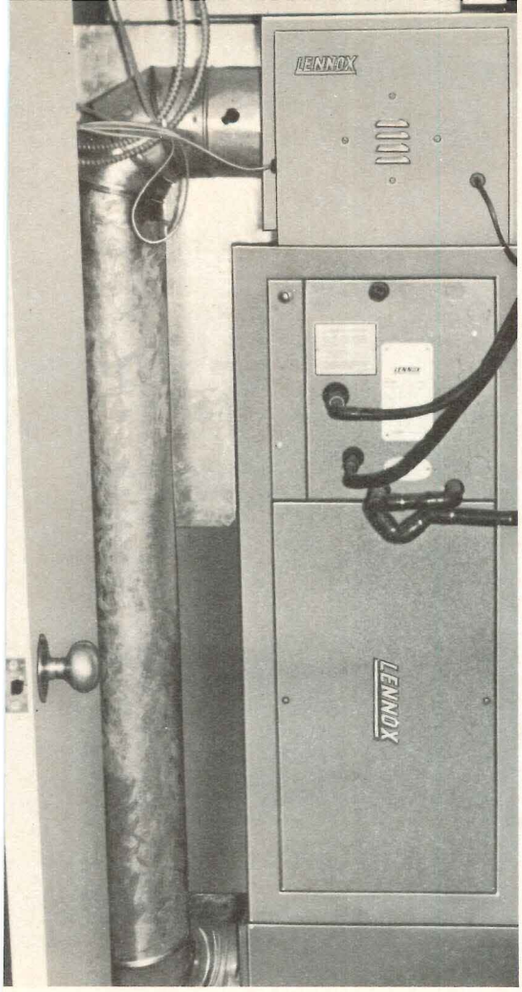
Lennox systems are designed to serve the owner as well as the tenant. There are scores of systems to select from. Every fuel. Endless sizes. Indoor. Outdoor. Through-the-wall. Both rooftop and ground units are compact, low silhouette, easily-concealed. They are all quality-built. They will last longer, cost less to maintain. Because they are factory-assembled and -wired, including controls, cost of installation is fully predictable (on-site labor is minimal). And cost of owning is fully predictable. Extended guarantees cover critical components.



Brooktown Apartments (preceding page) have hallway, bathroom or kitchen ceiling hideaway for easy access to compact Lennox electric heating/cooling units.



The Saracen, Dallas mini-rise garden apartments. Landscaped for hideaway-privacy effect, optimum land usage. Lennox ducted electric heating and air conditioning, "tenant system" comfort control. Rooftops conceal condensing units. Designed and built by the Brookgreen team (listed at right), plus consulting engineer Herman Blum.



Total Comfort in a closet: Complete Lennox Total Comfort System—electric heating, cooling, humidifying and electronic air cleaning equipment—neatly and compactly fitted into the closet of a Heritage Village condominium unit.

Mi Amigo Apartments, under construction in Dallas, is a complex of 149 apartments with individual ducted Lennox heating and air conditioning. New-design cooling units hide low on the rooftops. Architect: John Moss. Building Contractor: GTC Company. Heating/cooling contractor: Citywide Plumbing & Air Conditioning. Owners: George T. Connell and M. I. Harris, Jr.

Long-term service contracts are available. Being modular, failure of a unit affects only the area served. A network of 5000 Lennox dealers, with instant availability of parts, insures quick recovery of service. And because we build all the equipment, we accept total, single-source responsibility. If anything is wrong, we're wrong.

If you're planning a development, remember that comfort design is as important as esthetic design. Offer Lennox "micro-climates" with individual tenant control.

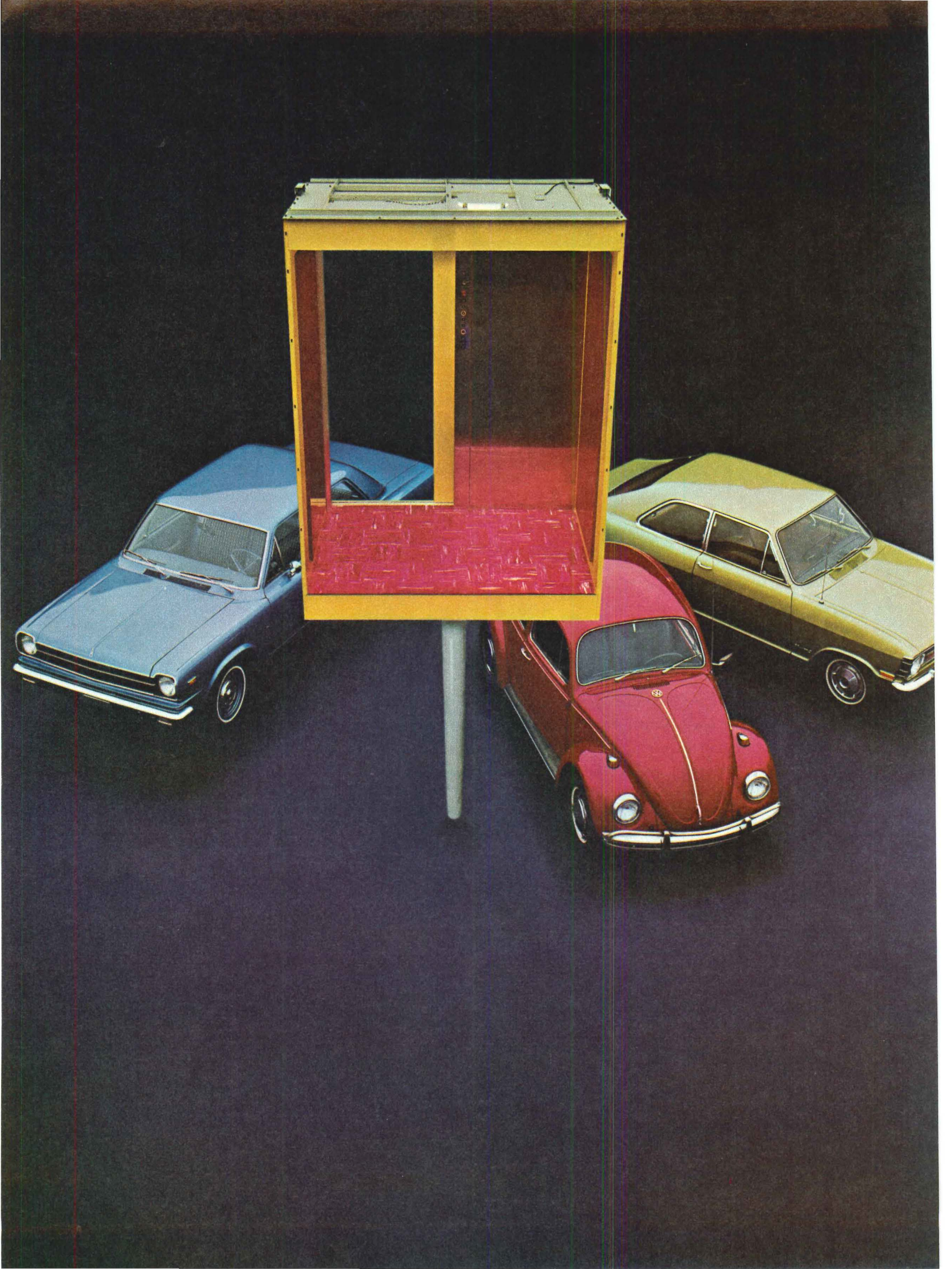
LENNOX

AIR CONDITIONING • HEATING

See Sweet's 29a/Le, or write Lennox Industries Inc., 799 S. 12th Avenue, Marshalltown, Iowa 50158.

Brookgreen Town Houses, striking 230-unit development in Dallas. Imaginative planning includes efficiency town houses. Individually-controlled Lennox ducted electric heating and air conditioning; condensing units hidden from street. Architects: Ralph Kelman & Associates. Structural engineers: Chappell, Taylor & Mitchell. Owner/developer: I. C. Deal.

For more data, circle 14 on inquiry card



The economy car that's in a class by itself.

It has a luxury look.

It has a "big-car" ride.

It comes in two models, with room to hold ten or twelve passengers comfortably.

But it still qualifies as an economy car because it's an elevator that's pre-engineered to save you money.

It's the Otis hydraulic elevator.
Models HP-1500 and HPA-2000. Designed to simplify elevator planning and installation.

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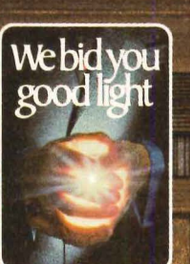
You see here Sky-Cube®, large enough to brighten an acre. Smaller units to light a walk. Up-down lights and wall-mount luminaires that paint the architect's mood.

Of course, to fit your design of things, we have hundreds more than you can see here. We'd like to show you.

Circle the reader service card. Call us. Or call your nearby Crouse-Hinds agent. He'll do the analyzing, costing and comparing, with an assist from our home office computer.



Crouse-Hinds Company,
Outdoor Lighting Dept.,
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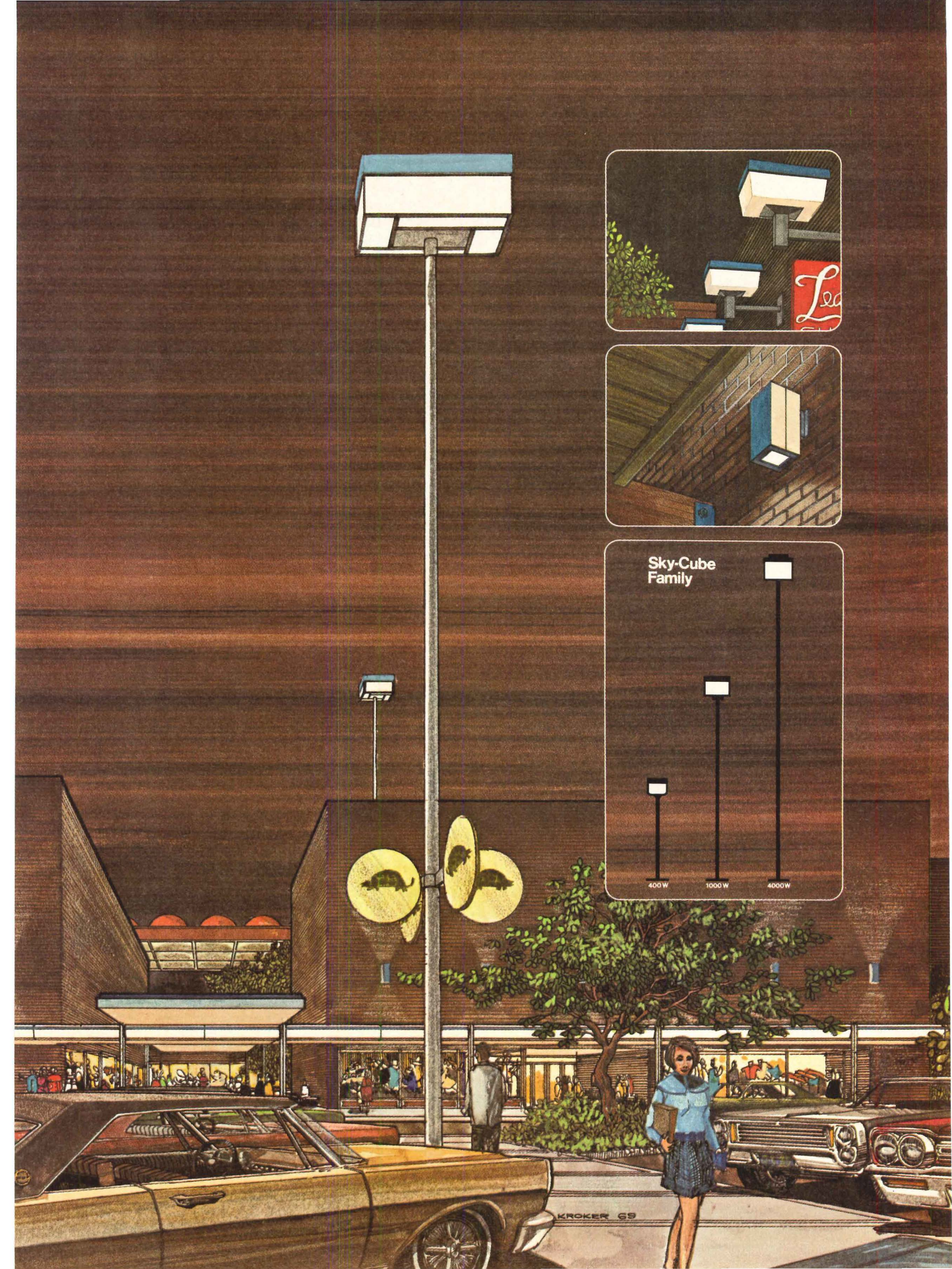

Sky-Cube
Family
400W
1000W
4000W
KROKER 69

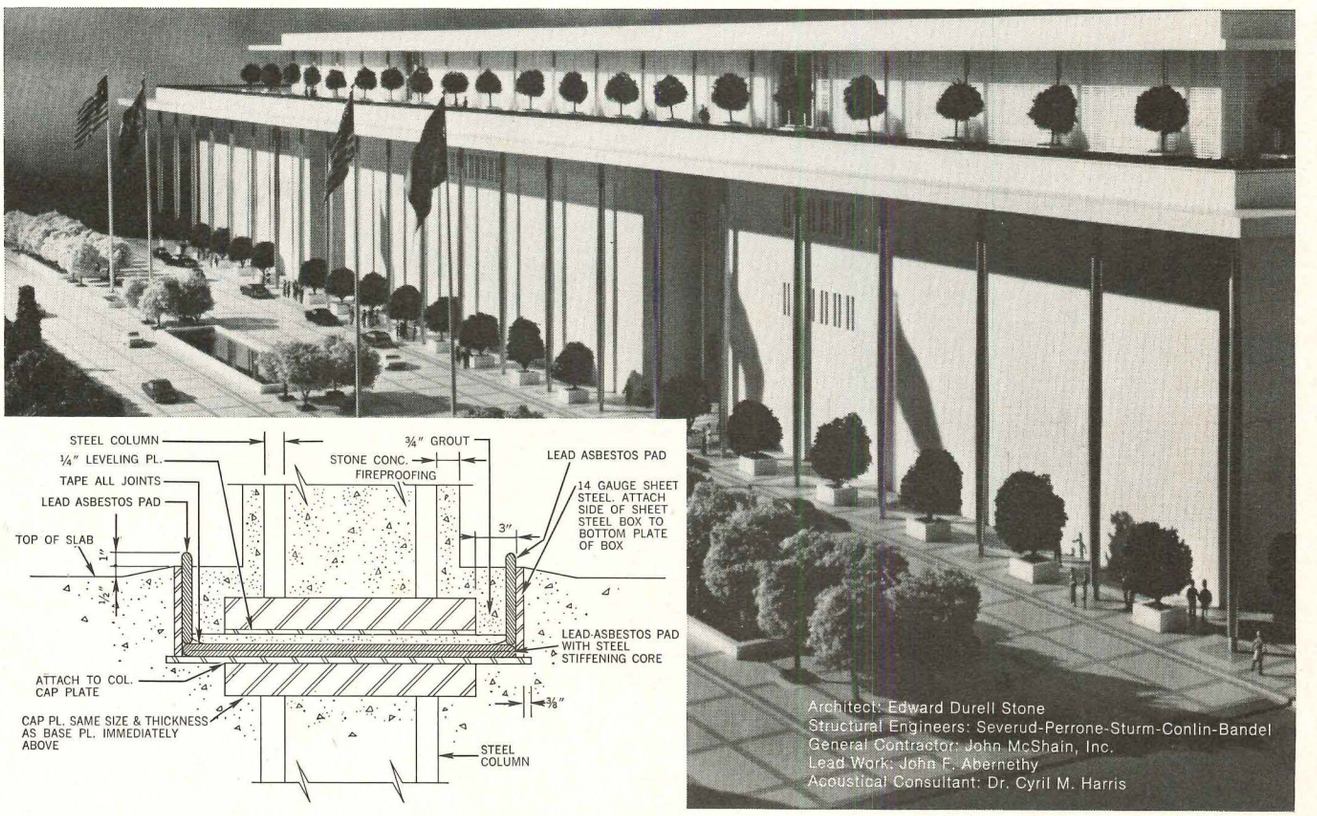
Lead Anti-Vibration Pads Intrinsic Part of Kennedy Center Design

Theatre and music buffs happily anticipate next year's opening of the John F. Kennedy Center for the Performing Arts in the nation's capital. A rarity, indeed, the single building that comprises the Center will contain a concert hall, opera house and two theatres on top of three parking levels. The arrangement permits simultaneous performances that will be thoroughly protected from vibration.

Each hall rests on lead-asbestos anti-vibration pads that completely isolate it from vibration generated in the adjacent halls as well as the Rock Creek and Potomac Parkway that passes beneath the building's cantilevered terrace. It took 82 pads in all to get the desired results, a total of 1,000 square feet in area and 10 tons of lead. Pads are standard 1-inch thick construction, consisting of an envelope of 8-lb. lead enclosing two layers of 3/8-inch thick asbestos roll fire felt, with a 12-ga. steel stiffening sheet in center to facilitate handling.

For additional information on the architectural uses of lead for isolation of vibration write to Lead Industries Association, Inc., Dept. LL 2, 292 Madison Avenue, New York, N.Y. 10017.

Lead Industries Association, Inc.



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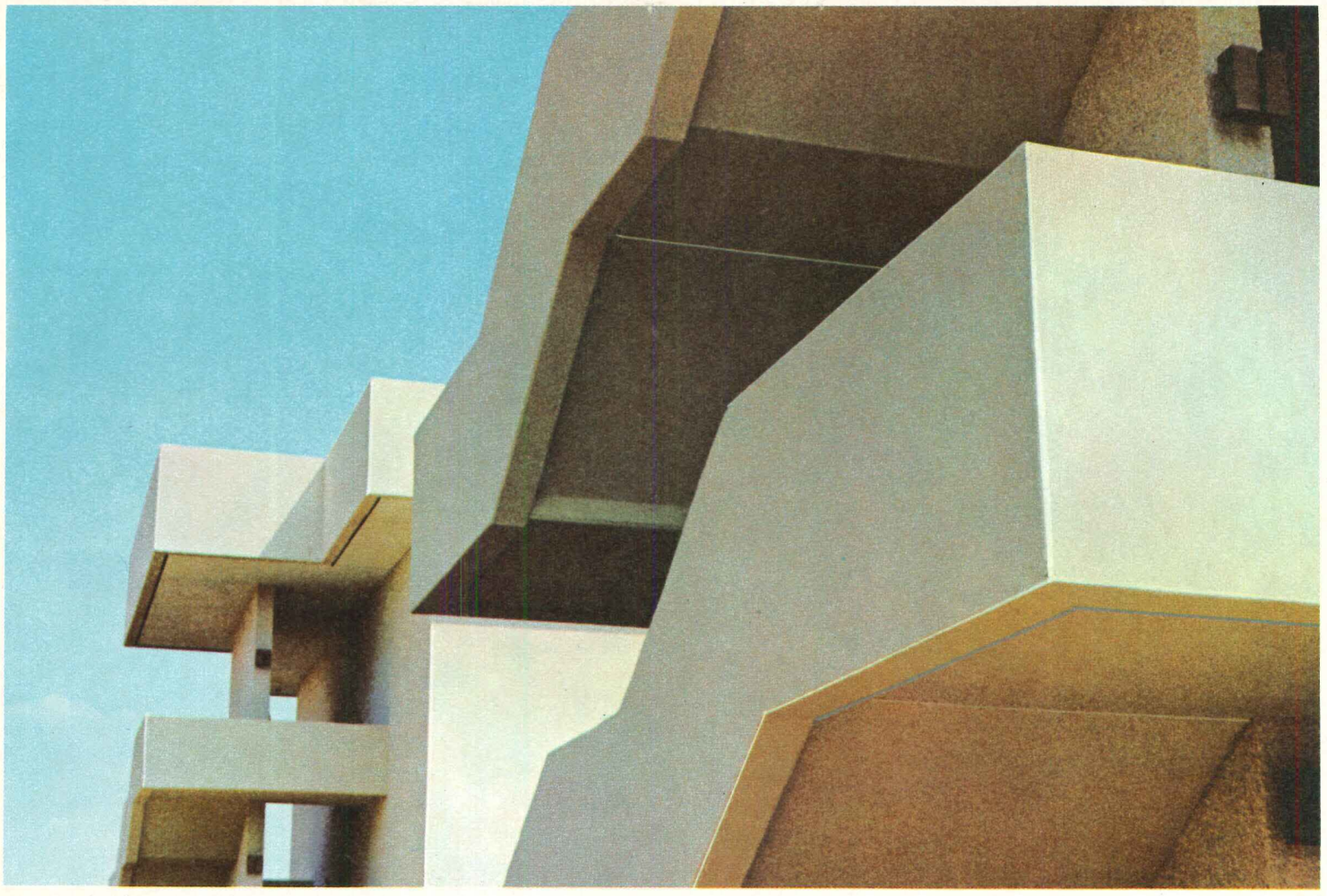

American Airlines Stewardess College

- ARCHITECT & ENGINEER: Preston M. Geren & Associates, Fort Worth
- CONTRACTOR: McCord-Condron & McDonald, Inc., Fort Worth

Exciting patterns of light and color reflecting the clear sky and bright sun of the Texas plains characterize the new, 150,000 square foot American Airlines Stewardess College nestled in a grove of native oak trees between Dallas and Fort Worth. Smooth expanses of concrete spread in angular shapes from the 3-story dormitory, the 2-story maintenance facility, and the 2-story dining and administration area through an enclosed, connecting passageway to the classroom building. ChemComp cement concrete was used in almost the entire structure to help prevent drying shrinkage cracks that would mar an otherwise beautiful design. And a college to train stewardesses for American must be beautiful, mustn't it?

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News in brief

R. Buckminster Fuller will receive the Gold Medal of the American Institute of Architects at its June convention in Boston (see also page 41). Other A.I.A. awards to be presented: Architectural Firm Award: Ernest J. Kump Associates; Fine Arts Medal: Richard Lippold; Craftsmanship Medal: Trude Guermonprez; Industrial Arts Medal: Barbara Stauffacher Solomon; Allied Professions Medal: Robert L. Van Nice; Architectural Photography: George Cserna; Citation of an Organization: National Park Service/ Mission 66; Architectural Critics' Medal: Henry-Russell Hitchcock; Architectural Critics' Citation: American Broadcasting Company, Inc.

HUD's Operation Breakthrough has designated site planners for its prototype housing sites (January, page 36). They are: Caudill Rowlett Scott: Houston; Skidmore, Owings and Merrill: Indianapolis; David A. Crane: Jersey City, N.J.; Perkins & Will: Kalamazoo, Mich., Eckbo, Dean, Austin and Williams: King County, Wash.; Reynolds, Smith and Hills: Macon, Ga.; Miller, Wihry and Brooks: Memphis; Wurster, Bernardi and Emmons: Sacramento, Cal.; Hellmuth, Obata and Kassabaum: St. Louis.

President Nixon put heavy emphasis on environmental protection in his State of the Union Message, as conservation (survival?) becomes the issue of the day. A roundup of recent events appears on the next page.

At three A.I.A. Grassroots conferences in January, commissions on The Environment, Education and Research, Professional Practice, and Professional Society (formerly Task Force on Social Responsibility) were created, and considerable controversy arose over the issues of ethical standards and social responsibility.

1969 was a record year for construction, and, despite a steady downward trend, 1970 will not be a bad year, according to George Christie, chief economist of the G. W. Dodge Division of McGraw-Hill Information Systems Company. Full effects of 1969's anti-inflationary credit restrictions will be felt during the next few months (see page 60).

The 1970's will be America's greatest era for construction of rapid transit facilities, according to Dr. William J. Ronan, president of the Institute for Rapid Transit (Washington, D.C.) and chairman of New York City's Metropolitan Transportation Authority. (According to the New York Times, Dr. Ronan has become so unpopular in New York after recent fare increases, he is protected by eight body guards.)

Construction wage increases due in 1970 have hit a record high according to the Bureau of National Affairs, Inc. 1970 increases will be 50.5 cents an hour compared with 40.0 cents in 1969. This is double the next highest wage increase in a major industry.

Liberalization of Federal tax rules could have far-reaching implications for corporate architectural practice (see page 59).

New ways for architects to implement city plans and involve the community are needed as much as or more than new plans, says the Urban Design and Development Corporation, which the A.I.A. organized ten months ago. The U.D.D.C. recently reported on its work in several cities, including Houston, Washington, D.C., and Minneapolis. "We want to show architects how they can catalyze plans," says Ralph G. Schwarz, president of the U.D.D.C.

In a major policy statement, the National Society of Professional Engineers says, "It is not possible to define and delineate the functions of architects and engineers in such a way as to draw a valid line of demarcation between them which could be successfully applied in practice."

The Homes for Better Living awards deadline for registration is March 1, for entry material, April 5. The program is sponsored by the A.I.A. in cooperation with American Home and House and Home.

Sachio Otani has received the Pan Pacific Citation of the Hawaii Chapter of the A.I.A. Mr. Otani teaches Urban Engineering at the University of Tokyo; he has designed numerous major buildings in Japan, having begun practice under Kenzo Tange.

A non-architect, Maurice D. Kilbridge, will be the new Dean of the Harvard Graduate School of Design, succeeding Jose Luis Sert. Mr. Kilbridge, now Professor of Urban Systems at Harvard, will place emphasis on understanding aesthetic, scientific and public policy aspects of environmental control. He received B.S. and M.A. degrees from Loyola University in Chicago, and a M.S. from the Illinois Institute of Technology, where he taught before going to Harvard.

Saving the world—literally—becomes a national issue: a roundup of events

Earth Day
April 22 is the day of the National Environmental Teach-in, "Earth Day", first proposed by Senator Gaylord Nelson (D.—Wis.), and being coordinated by a nonprofit Washington organization set up for the purpose. Local communities and schools will decide upon the issues to be discussed and the actions they may want to take. The teach-in's organizers expect it will be not only educational, but also a sign of powerful popular desire for action.

Education
Senator Nelson has also introduced The Environmental Quality Education Act, under which school curricula "would place man in the total environment rather than above it." Training programs for teachers, community education and development of new curricula for all age levels would be among the provisions of the act.

National Policy Act
President Nixon signed the National Environmental Policy Act into law January 1, saying, "Unless we move on it now, believe me, we will not have an opportunity to do it later." The act makes it Federal policy to create and preserve harmony between man and nature; it establishes a full-time, three-man council on Environmental Quality within the Executive Office of the President; and it requires the President to submit to Congress an annual report on environmental quality. Senators Henry A. Jackson (D.—Wash.) and Theodore F. Stevens (R.—Alaska) sponsored the bill.

No Everglades Jetport
No commercial jetport will be built in or near the Everglades (October, page 38, November, page 35). The concerted action of 22 conservation groups convinced the Departments of Transportation, Interior, and Commerce to forbid its construction and to require the phasing out of the training strip recently built on the site.

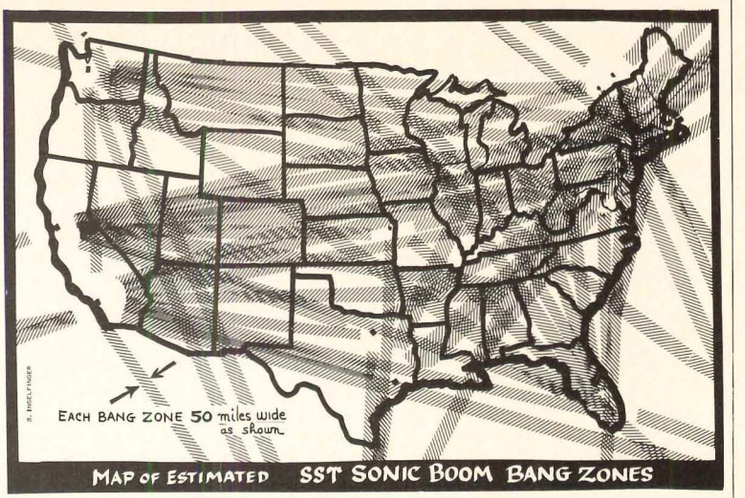
House Committee
Rep. Donald Brotzman (R.—Colo.) is pushing for the creation of a top-level House Committee on Environment, and he has received strong support from members of both parties. The committee's concerns would be water, air, weather modification, waste disposal, pesticides and herbicides, and noise.

Jets will be smokeless
The major U.S. airlines, under pressure from H.E.W. Secretary Finch, have agreed to eliminate smoke from their planes by late 1972. According to Senator Edmund Muskie (D.—Maine), who has proposed legislation to prevent jet pollution, 78 million pounds a year of pollutants are emitted by jet engines in the U.S. New Jersey and Illinois are already imposing stiff fines for jet smoke.

Nixon on Environment
President Nixon, in his State of the Union Message, January 21, put heavy emphasis on environmental issues. Mr. Nixon emphasized incentives for private industry rather than government-financed programs, although he not only originally opposed the Jackson environment bill (above), but also in his message requested only one-half the Congressional allotment for water pollution.

The President would like to put responsibility for pollution control with the Federal agencies regulating their sources. However, Senator Muskie argues that, for example, the Atomic Energy Commission should not be responsible for establishing pollution requirements for its own plants.

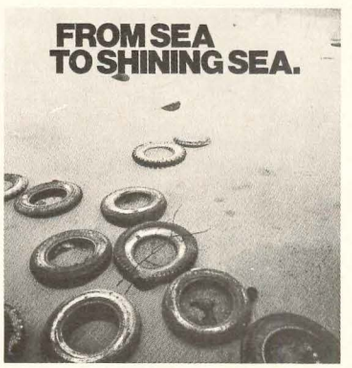
A.I.A. gets concerned
Rex W. Allen, American Institute of Architects president, told the three January A.I.A. grassroots meetings pollution is reaching an intolerable rate, and that A.I.A. members have "a clear duty" to inform the public about the danger to "our spaceship earth." He said we must aim for stability rather than constant growth.



The A.I.A. has been placing environment-conscious ads in major national magazines and newspapers, and has received wide T.V. play for its two 60-second spots. It is the first advertising campaign the A.I.A. has ever run (photo, below left).

A Consortium on Environmental Awareness and Public Education met at A.I.A. Washington, D.C. headquarters in December, consisting of representatives from more than 25 private and public organizations, including the National Academy of Sciences, the National Society of Professional Engineers, and the American Society of Civil Engineers. They will work to arouse interest and improve the quality of environment education.

A "Day of Awareness," in which A.I.A. members will form regional seminars to plan for protection and improvement of the environment will be part of the 1970 convention.



F.O.E. fights S.S.T.
Friends of the Earth, a new activist international conservation organization (October, page 35) is kicking off with an all-out battle to kill the supersonic transport plane once and for all. It has just brought out the "S.S.T. and Sonic Boom Handbook," a Ballantine paperback, written by Dr. William A. Shurcliff, a professor of physics at Harvard and Director of the Citizens League Against the Sonic Boom.

The book puts to rest two widely - held misconceptions: that sonic booms occur only when a plane goes through the sound barrier (they are continuous throughout the flight, and would cover a 50-mile-wide strip below the plane); and that flights of S.S.T.'s will not be permitted over the United States (the F.A.A. has consistently refused to ban S.S.T. flights over land). Already, the book points out, U.S. homeowners have filed damage claims of more than $30 million against Air Force boom damage. Air Force planes have only 10 to 20 per cent of the S.S.T.'s weight, so these booms are far less intense. The S.S.T. would consume so much fuel that maneuvering to avoid all inhabited areas would be impossible (a sharp turn takes 100 miles), so the average U.S. town could expect 10 to 50 sonic booms per day. National parks and vacation areas would be especially hard hit.

Over water, "persons on ships must expect as many as one or two sonic booms per hour, day and night," occasionally strong enough to break plate glass. About 80 per cent of the North Atlantic would be "blanketed by booms."

F.O.E. claims there is strong, but unorganized, opposition to the S.S.T. in Congress and within the Executive branch. According to F.O.E., the Departments of Interior, Treasury, Labor, the Council of Economic Advisors, and the Office of Science and Technology have opposed the plane.

F.O.E.'s next step will be to get involved with anti-S.S.T. groups in Europe to stop production of the French-English Concorde S.S.T.

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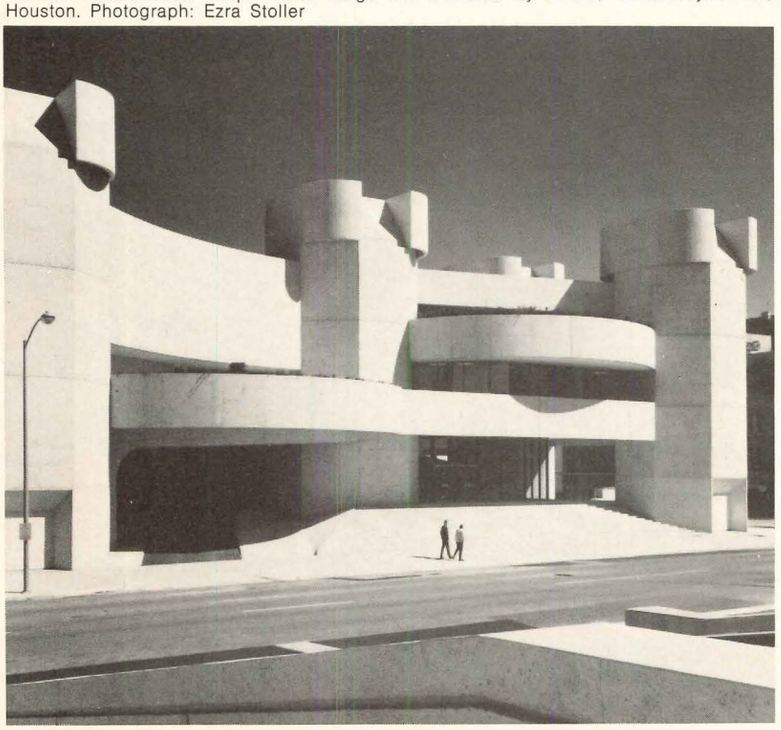
Theater and Classroom Building, Birmingham-Southern College, Birmingham, Ala. Architects: Warren, Knight & Davis. Theater Consultant: Dr. Arnold Powell. General Contractor: Brice Building Company, Inc. Dover Stage Lift installed by Dover Elevator Co., Birmingham.

Alley Theatre, Houston, Texas. Architects: Ulrich Franzen & Associates. Associate Architects: MacKie & Kamrath. Consultant: George Izenour. General Contractor: W. S. Bellows Construction Corp. Dover Stage Lift installed by Dover/Hunter-Hayes Co., Houston. Photograph: Ezra Stoller



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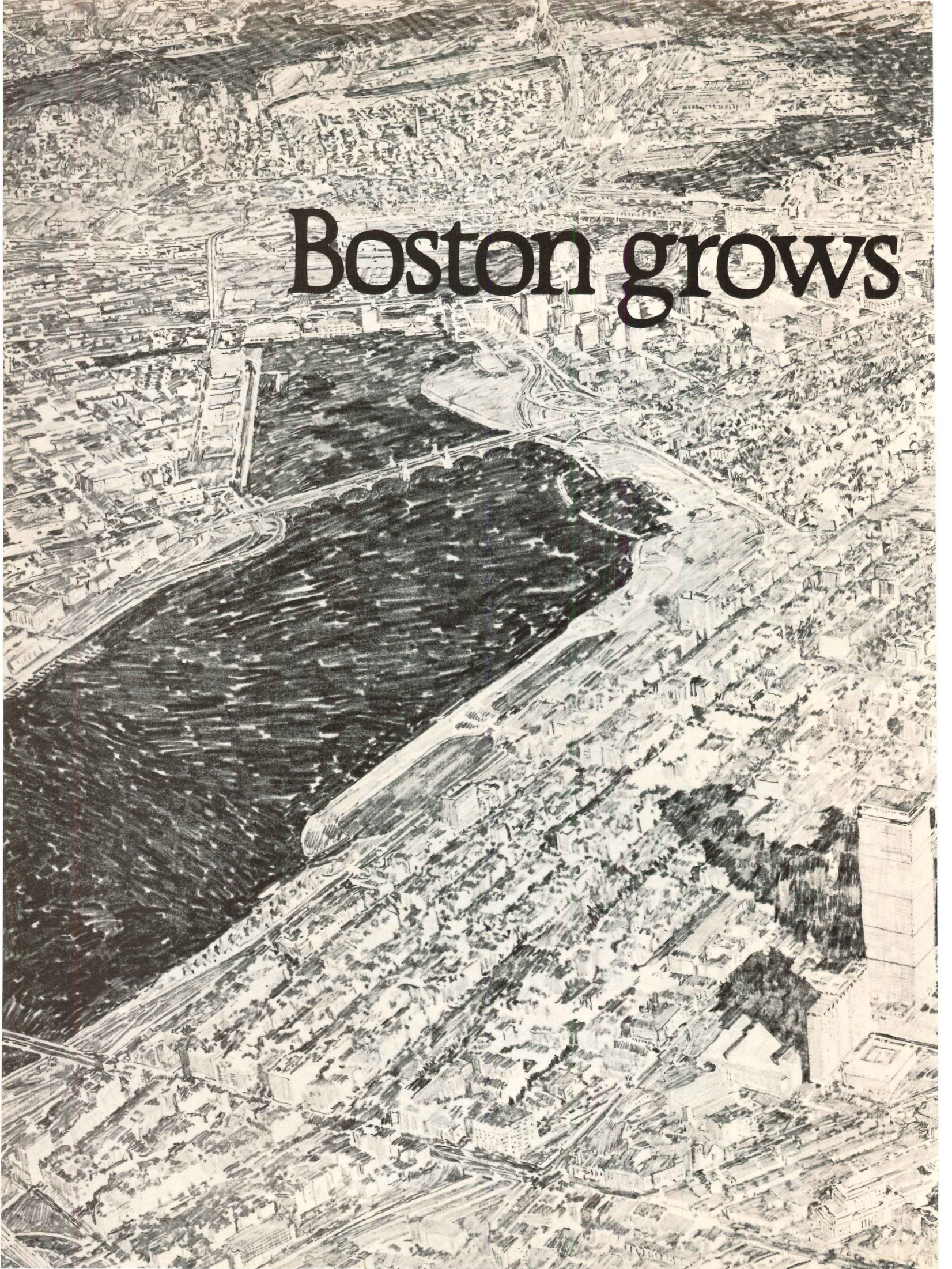
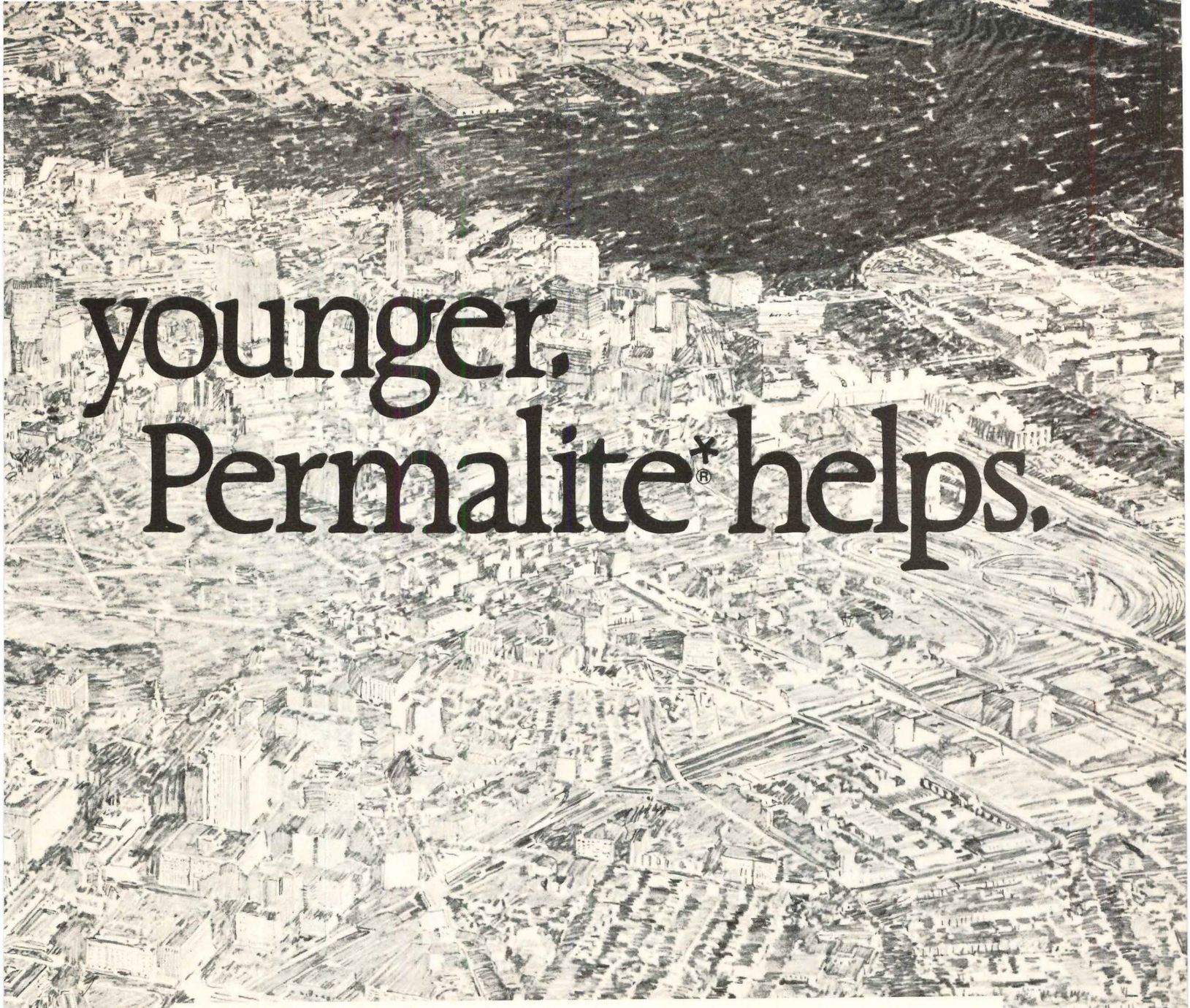

Boston grows



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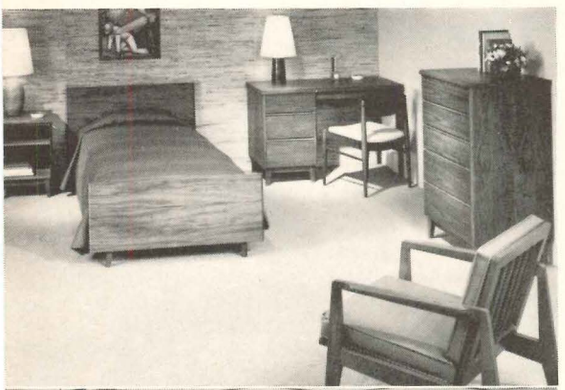

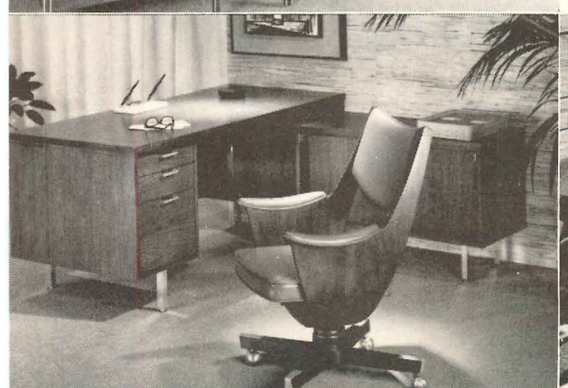

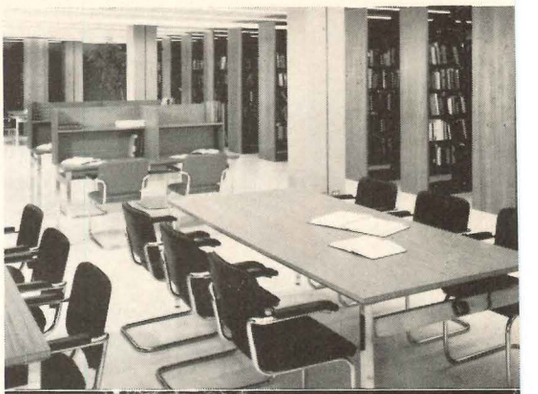

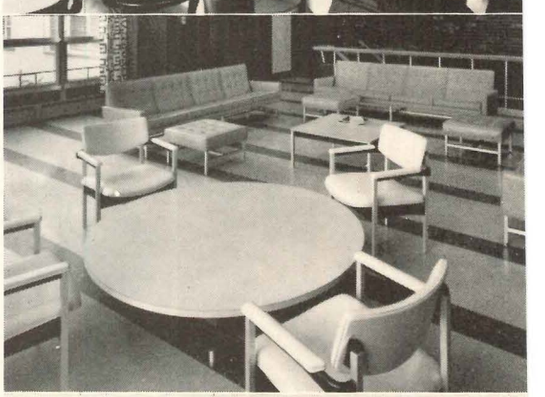

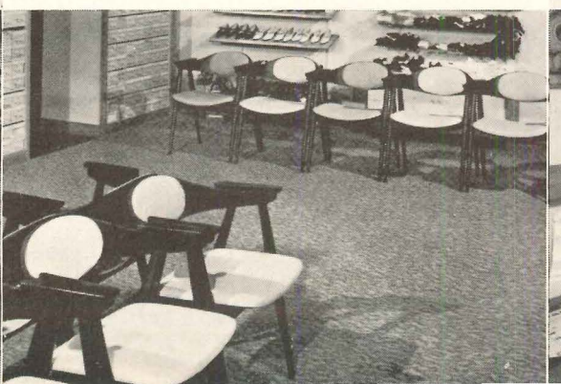

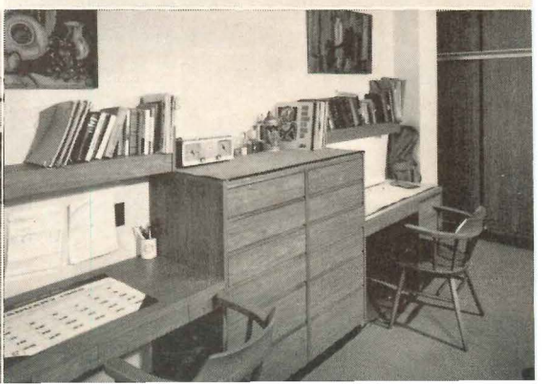

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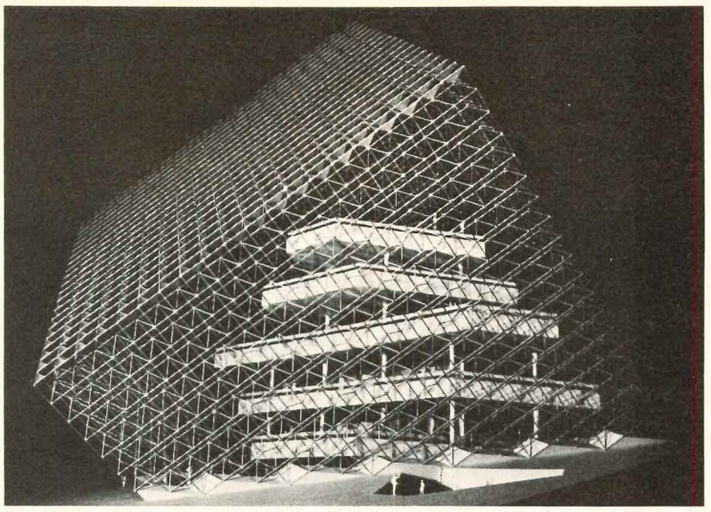
Buckminster Fuller gets A.I.A. Gold Medal
Synergetic spin-offs keep coming



The Piedmont Center at the North Carolina Tricentennial, designed by Buckminister Fuller with Synergetics, Inc. (Raleigh, N.C.), with exhibitions by Kissiloff and Wimmershoff, Inc. (New York City), will open this spring.

R. Buckminster Fuller will receive the highest award of the American Institute of Architects at its June convention. Mr. Fuller has designed several major buildings, and has used his geodesic structures for such diverse purposes as international trade pavilions (Moscow, Montreal—both retained permanently), movie theaters, private homes, and Radomes. The Fuller geodesic dome has covered more space on earth since 1947 than any other single kind of shelter, according to the A.I.A.

But the geodesic dome, one of more than 20 patented Fuller inventions, is only a "spin-off" from his ideas, the most central of which is the concept of *synergy,* behaviors of wholes unpredicated by the behavior of their parts, the principle upon which the geodesic dome—and the universe—according to Mr. Fuller, works.

The World Game

At Carbondale, Illinois, where Buckminster Fuller is a Distinguished Professor at Southern Illinois University, the computers of the $16-million World Resources Center are compiling an inventory of the Earth's resources—"metaphysical and physical"—and their whereabouts. The players of the "World Game" will test their theories of how to make the world work, using the immense quantities of information only computers can handle.

Utopia or oblivion

Mr. Fuller believes the "World Game" of logistics can be played in reality so that everyone will win, that the Earth is capable of supporting a larger number of humans in far better conditions than are even imagined in conventional political and economic thought. Most important, he believes these better conditions—the results of greatly increased awareness made possible by technology—are a necessity: "I think we are at that critical historical moment in which we have just broken our shell of permitted ignorance and henceforth we can survive only by learning to operate in our universe in a very different way." In other words, "Utopia or Oblivion"—the title of Mr. Fuller's newest book (Bantam).

Whole Earth Catalogue

Tools—books, machines, materials—listed under such categories as "Understanding Whole Systems", "Shelter and Land Use", and "Learning" are described in the Fuller-inspired "Whole Earth Catalogue." The catalogue, which offers for sale much of the material it describes, is published by the Portola Institute, a non-profit educational corporation in Menlo Park, California. The Fall 1968 issue sold 2,000 copies, Fall 1969 sold 60,000.

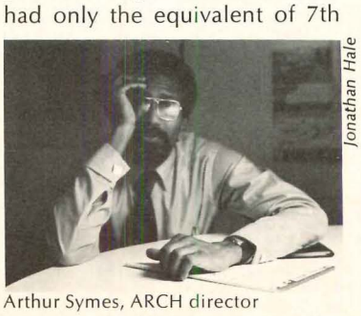
Buckminster Fuller, who is 74 and went to Harvard, spends most of his time lecturing around the world, traveling about 250,000 miles a year. Last year, he published two books, and, since 1961, he has patented eight inventions. His design firm, Fuller and Sadao, Inc., is located in Cambridge, Mass.

Harlem's ARCH gets minorities into the profession

Six blacks and Puerto Ricans who never thought they'd make it to college are studying architecture and city planning as part of a program run by ARCH, the Architect's Renewal Committee of Harlem. The program, "Architecture in the Neighborhoods," has strong backing from the New York City Chapter of the American Institute of Architects (they are currently trying to raise $45,000 to help pay for it), and it has received substantial help from the Ford Foundation, as well as contributions from the Rockefeller Brothers Fund. The program will put twelve to fifteen more students in college this fall in five to six-year courses of architectural and academic study.

The director of the training program is Arthur Symes, who came to ARCH from Howard University in 1968 to run the program, and who is now running ARCH. He says the idea isn't just to make a few people comfortable, but to give them a real awareness of what a place like Harlem needs in the hope they will come back and use their skills in the neigbhorhoods they came from.

The six students now in school were part of an original group of 25, of whom it was expected only one or two would make it. Many of them had not graduated high school and some had only the equivalent of 7th grade. However, the year-long pre-college program was so intensive, and the motivation of the students so strong, it worked beyond anyone's expectations. This year, an even higher percentage is expected to go on to college.



Jonathan Hale

Arthur Symes, ARCH director

The program consists of a summer of classes eight hours a day, divided between academic subjects and drafting. The students get preparation first for high school equivalency exams, then for college entrance exams, while preparing for drafting jobs they will hold during the year in offices of A.I.A. chapter members. During the summer, ARCH pays the students a $40.00 weekly stipend, which is sharply reduced for absence from class (a student-made rule). After the summer, the academic classes continue three nights a week.

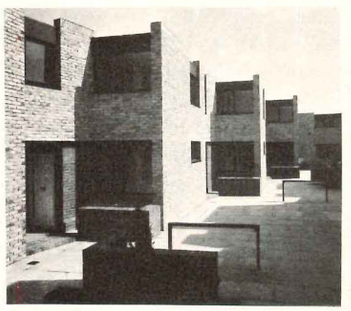
ARCH hired the teachers, all of whom are black, and it rents space in a Harlem public school. The students get individual attention (no classes larger than 10). It is the high quality of the teaching and the teachers' personal involvement with the students which inspire the motivation which makes the program work, says Arthur Symes.

Money is the biggest problem. The 1969-70 budget is $152,000, and it could easily hit $300,000 in five years, with a full load of students, despite the substantial scholarships colleges have awarded them so far. Ford is not expected to continue its major support after 1970, nor can the local A.I.A. chapter find such sums (the national A.I.A. recently allotted $200,000 a year for the whole country for similar programs).

U.S.-British architects join in housing design

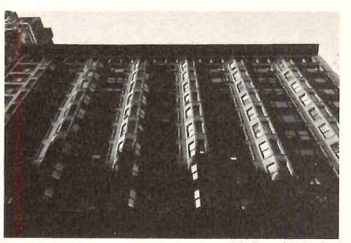
The newly-formed "Architects' Coalition", consisting of two Washington, D.C. firms, Brown-Wright-Mano and Sulton and Campbell, and the London firm of Higgins Ney and Partners, will specialize in the field of low and moderate cost housing for urban areas.

The British firm has designed a low-rise, high-density concept, "High Deck-Housing", which is being used for gradual redevelopment in deteriorated sections of London (below). A similar design will be used in the American version, to be known as "Low-rise In-city Family Environment", separating pedestrian and automobile traffic, and including stores, open areas, community facilities, and separate entrances to each living unit.

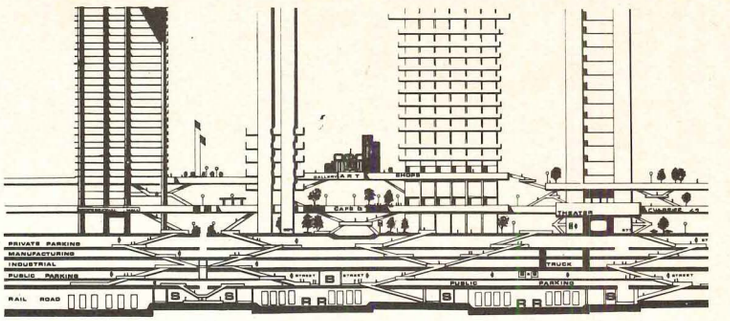


Sullivan skyscraper in danger

The Chicago Stock Exchange (below), which Louis Sullivan designed in 1893, has been bought by developers who plan to demolish it, according to the Commission on Chicago Historical and Architectural Landmarks. The fight to save the building will be the first test of Chicago's new landmark law. The law, considerably weaker than its New York City parallel, requires consent of the owner or a ruling by the city council if this consent is not given. The building still contains much of the original ornament and rests on the first caisson foundation ever used in Chicago.



Richard Nickel

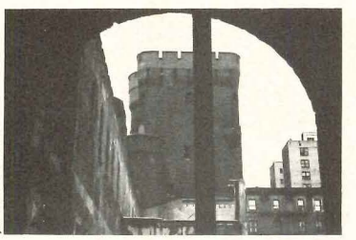


Air-rights megastructure proposed for New York City

On the theory that high-density cities in general, and New York specifically, must continue to expand, New York planning firm James Manoussoff Associates has developed a plan for a possible third city center for New York, as lower and midtown Manhattan are approaching saturation.

The new urban center across the East River from midtown Manhattan would make use of air-rights above the huge Sunnyside, Queens subway yards, and would include a total area of 200 acres. Several rapid-transit lines and major roads converge on the area, making it ideal for both expansion and keeping unnecessary traffic out of Manhattan.

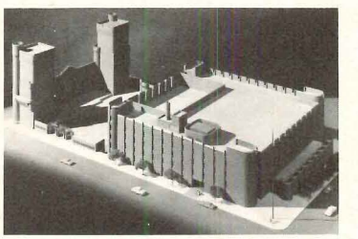
The megastructure (above) would be stratified, with rapid transit at the lowest level, then huge parking lots where commuters to Manhattan would leave their cars to change to trains; higher levels would contain light industry, and finally a platform "ground floor" for the residential-business-shopping-entertainment area. This area is conceived along the lines of Battery Park City (June 1969, December, page 149). The planners say the project could be funded the same way, and could be self-liquidating. Philadelphia is considering a similar air-rights plan (November, page 41).



Jonathan Hale

Last-minute landmark and school planned together

The last walls of the 70-year-old Squadron A Armory on New York's 94th Street were about to succumb to the wreckers when a frantic call from a neighbor to the city's Landmarks Preservation Commission saved the day. Only an order from the mayor could stay the demolition. The order was given, and the school planned for the site was redesigned to harmonize

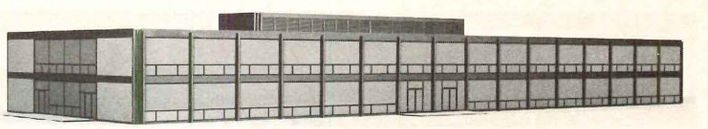


with the Armory (above).

Architects Morris Ketchum, Jr., and Associates, the Board of Education, and the other groups involved, worked smoothly together to make the school—an air-conditioned prototype containing flexible spaces—fit well with the Armory's remains. The space enclosed by the old walls will contain a playground for the school, and will also be used as an outdoor theater for the community.

Prototype hospital among last Mies designs

One of the last designs completed by the Office of Mies van der Rohe in Chicago before his death was a prototype extended care facility (right) for American Health Facilities, Inc., a subsidiary of American Hospital Supply Corp. The simplified function (post-acute only), the



economical use of materials, and the modular design are meant to make the structure considerably less expensive than the general hospital facilities usually used by convalescents, while permitting combination with existing buildings.

The plan encourages contact between the patient and activities outside his room, using interspersement of patient rooms and activity areas, as well as an unusually open room plan.

University notes

■ The University of Colorado School of Architecture has become the College of Environmental Design and will develop an undergraduate program leading to a Bachelor of Science degree in environmental design. ■ Columbia University has introduced a degree-granting program in environmental science and engineering to treat "subjects of increasing nationwide concern and alarm." ■ Bruce Erickson has been appointed head of the department of architecture at the University of Cincinnati, succeeding Richard H. Wheeler. Mr. Erickson, 35, has taught at the University of Michigan since 1960, and has been in private practice since 1964; he has written several volumes concerning his research on precast structural systems. ■ HUD will offer about 100 $3500 fellowships in urban studies to graduate students for the 1970-71 academic year. HUD will pay tuition in addition to the fellowships.

Mini-environments bring calm to the city

Getting away from city pressure and into yourself is the concern of "Contemplation Environments," a collection of one- and two-man spaces at the Museum of Contemporary Crafts in New York City through March 8. Architect Gamal El-Zoghby designed the over-all arrangement, which uses three levels of the Museum, and worked with the artists in executing their ideas. The environments use texture, sounds, and light to encourage relaxation and "fulfill man's need for peaceful solitude." The architect would like to see large numbers of such spaces (Paley Park, by Zion and Breen, is one relatively conservative example) throughout cities and even in shopping centers.

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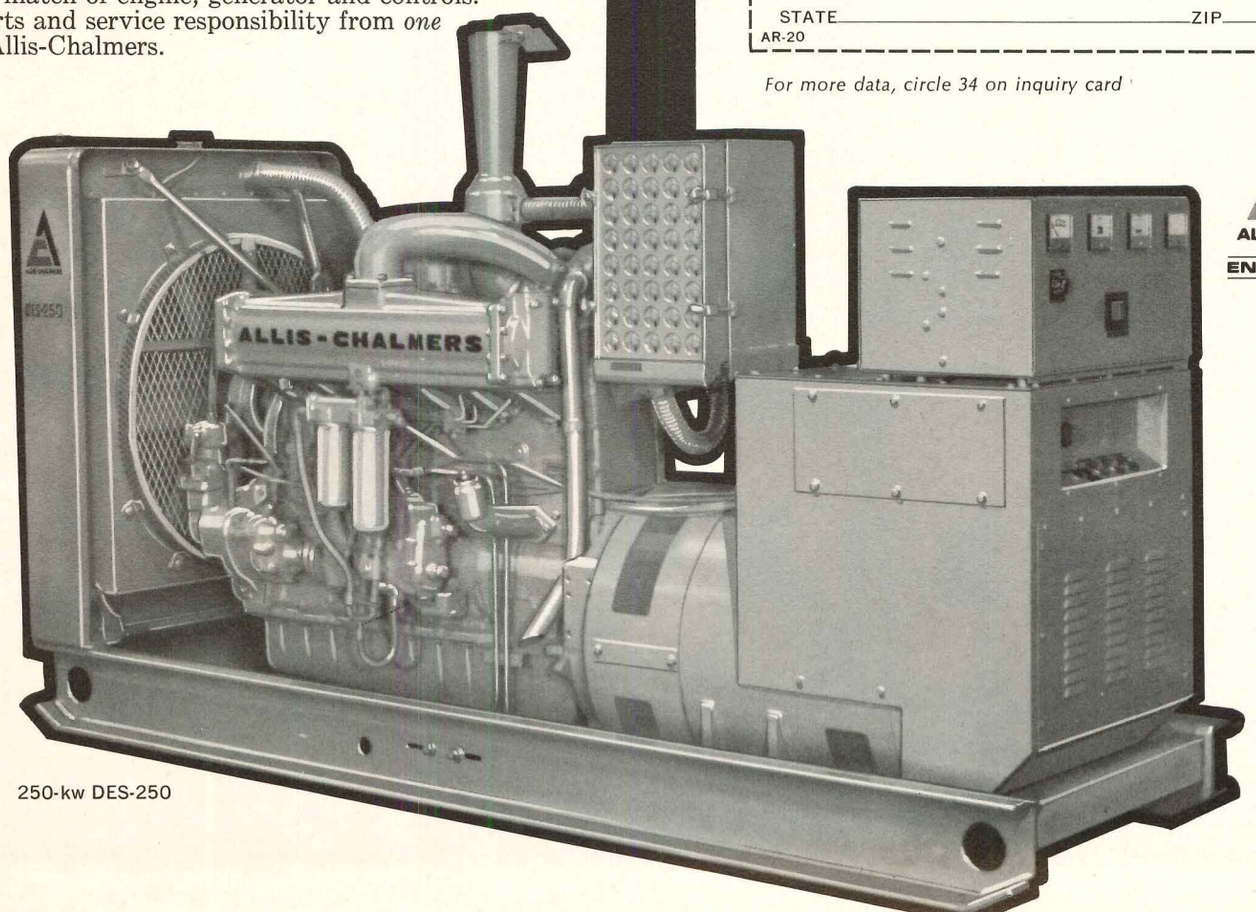

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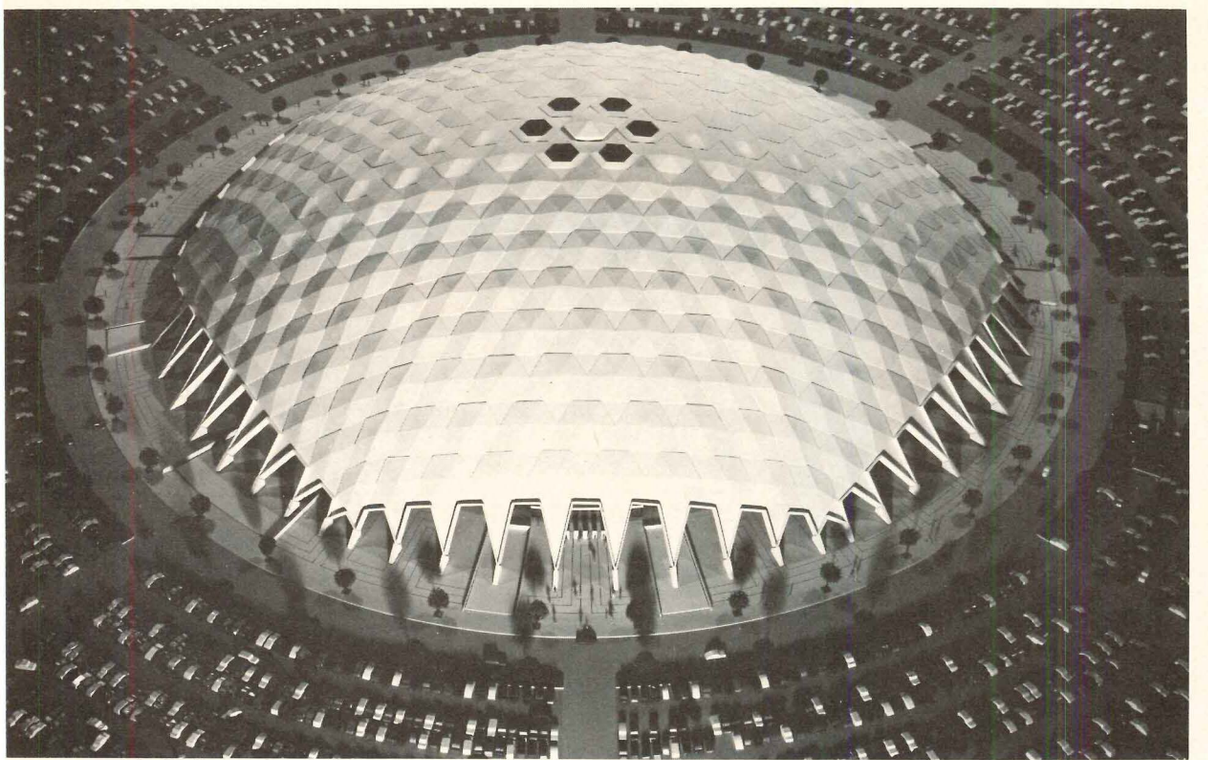
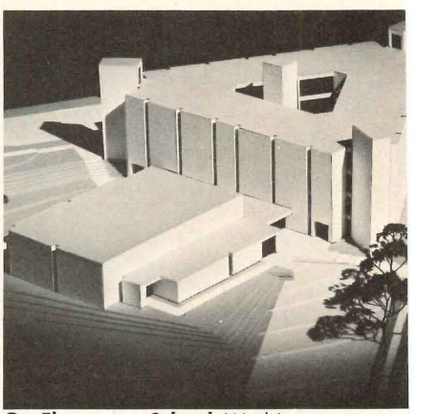


John De Bus

Erie County Stadium, Buffalo, New York, will cover a record 13.2 acres with a clear span of 856 feet—there will be an elastomeric roofing. Seating capacity for football: 55,000. Architects are Turley Stievater Walker Mauri & Associates in collaboration with Wilson, Morris, Crain & Anderson and Lloyd, Morgan & Jones.

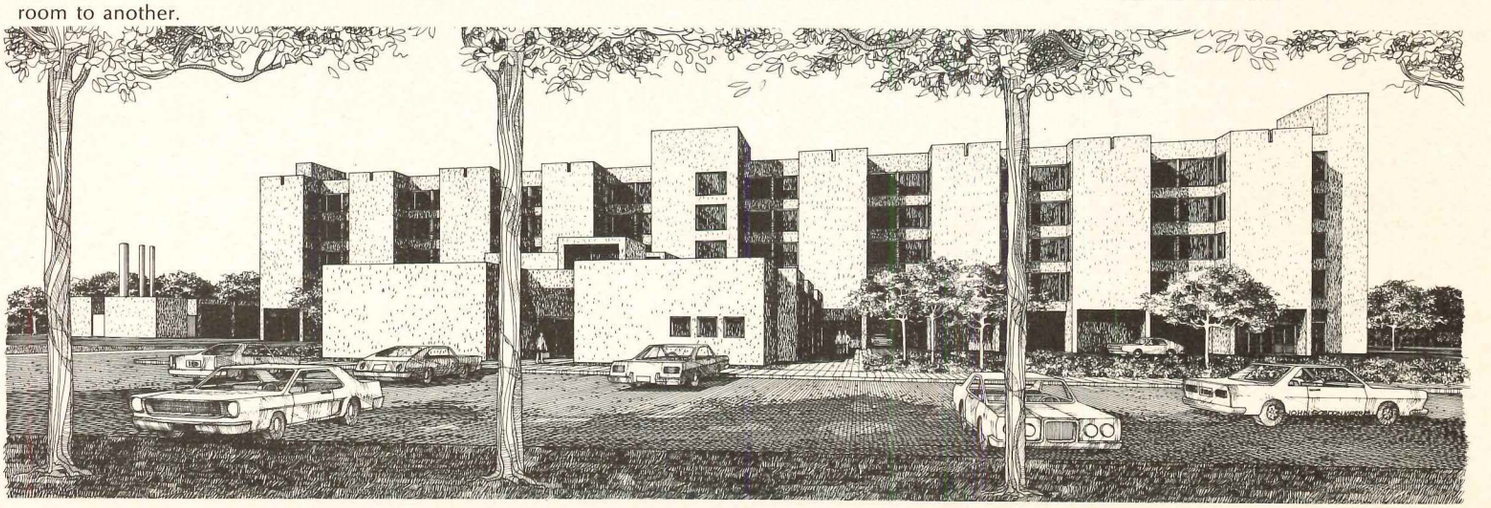


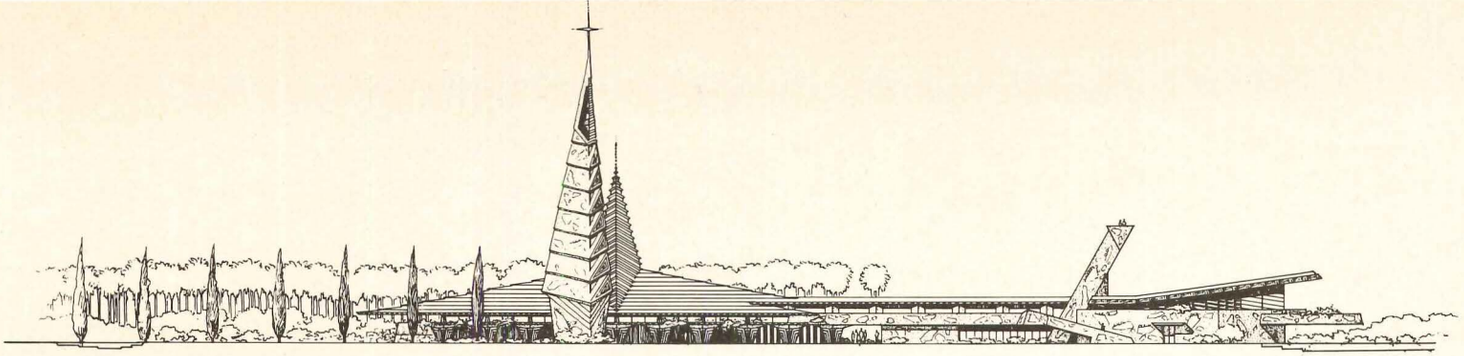
Orr Elementary School, Washington, D.C., is an "open space school." Classrooms are non-existent, allowing spaces to be shaped by furniture and moving walls according to the specific teaching-learning process. Architects Louis C. Kingscott & Associates have designed the brick building with windows that are a vertical slit between alcoves.

Alfred A. Dé Lardi

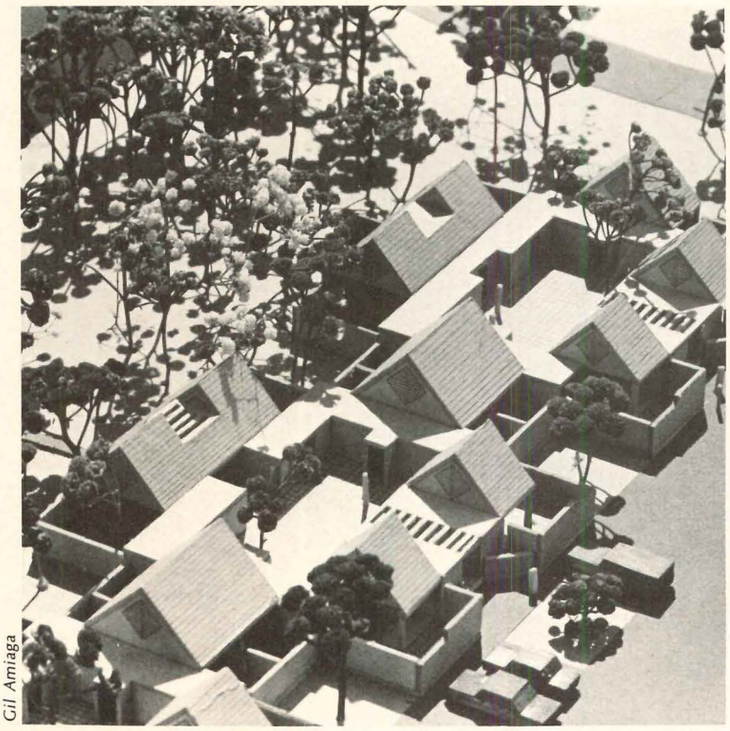
Stanislaus Memorial Hospital, Stanislaus County, California, has a central corridor with services along its sides and alcoves at regular intervals. Rex Whitaker Allen and Associates designed the building so that patient rooms are clustered in groups of four around each alcove. Even though all rooms open to a court, the windows are so located as to avoid visual intrusion from one room to another.

Philadelphia Retirement Home for the United Presbyterian Church will be a concrete building with glass enclosed entrance, a library and a solarium. Architects are Carroll Grisdale & Van Alen.



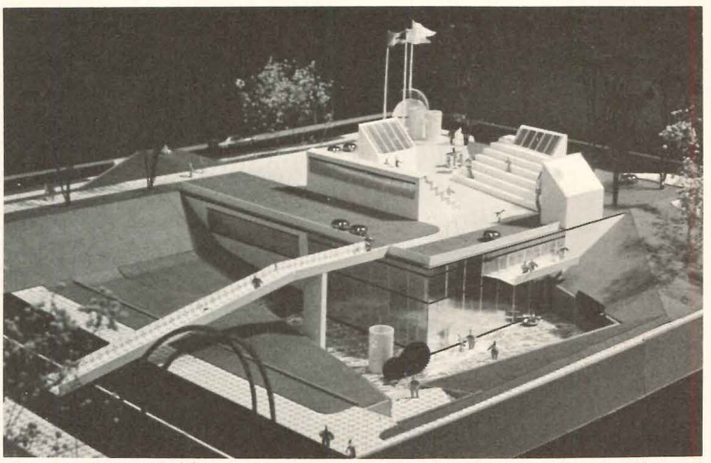


The First Christian Church, Phoenix, Arizona, is an adaptation of the 1950 Frank Lloyd Wright design for Southwest Christian Seminary. Taliesin Associated Architects are in charge, with Mrs. Wright advising.

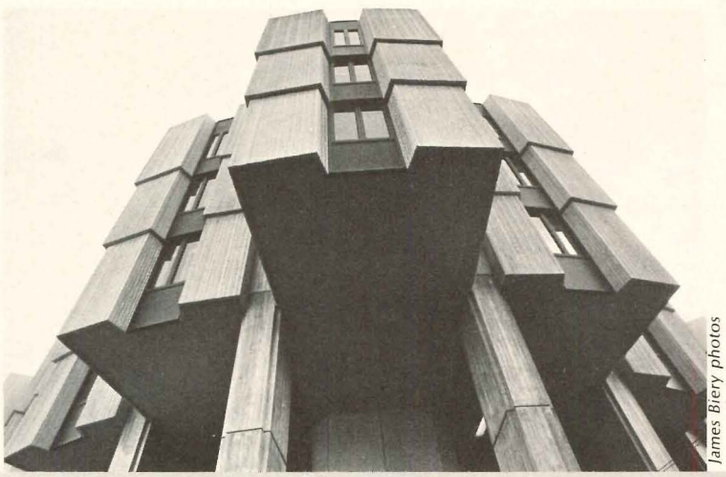


Gil Amiaga

Villa complex, Hilton Head Island, South Carolina, is designed by architects Copelin and Lee with each large room defined by its own roof and subsidiary rooms under flat roofs. The villas can be rented in a number of ways—each bedroom with storage and bath, individually, or combined with the living-dining rooms or with another bedroom.



The Brooklyn Children's Museum, New York City, is described by its architects Hardy Holzman Pfeiffer Associates as "a continuous experience of exploration . . . a half buried strong box whose unassuming exterior acts as an extension of the surrounding park."



James Biery photos

Northwestern University Library, Evanston, Illinois, has a form developed partly from the desire to provide the variety of reader environments needed for individual or group study, specialized reading or seminars, as well as to provide for the technical library demands. "The primary contribution, however, came from the combined common purpose of maximizing edge to give light to as many individual readers as possible and to give this immense library (400,000 gross square feet) an over-all reader scale as a collection and as an object in the environment." Architect: Walter A. Netsch of Skidmore, Owings and Merrill.

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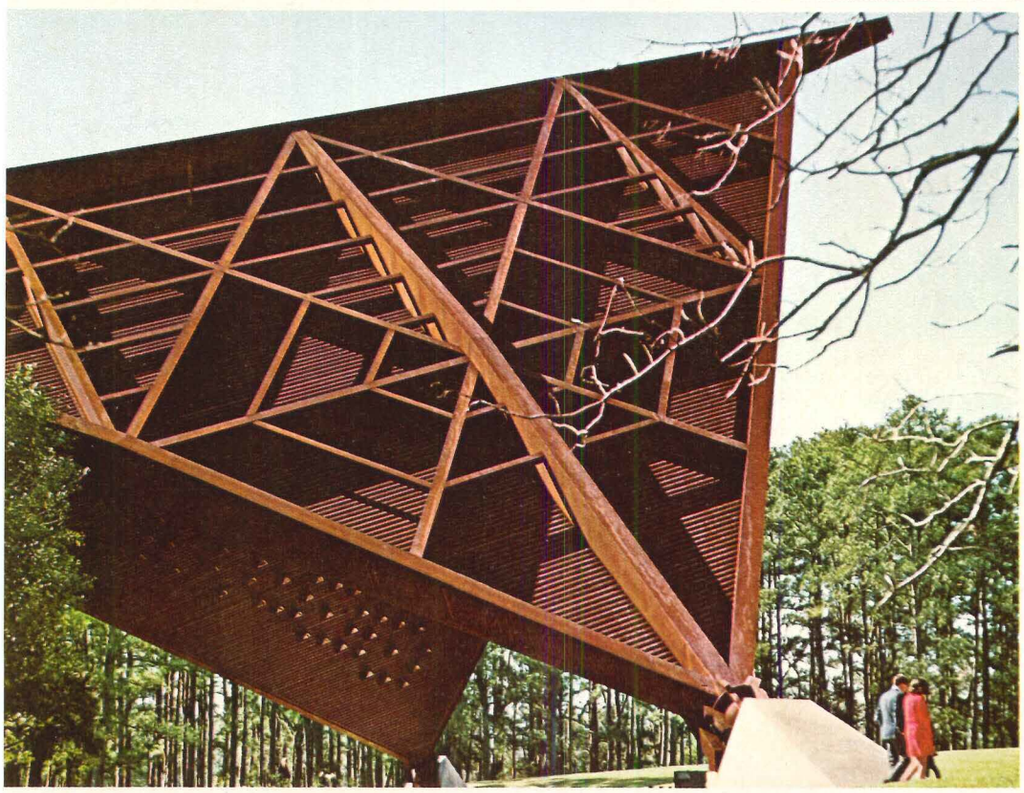

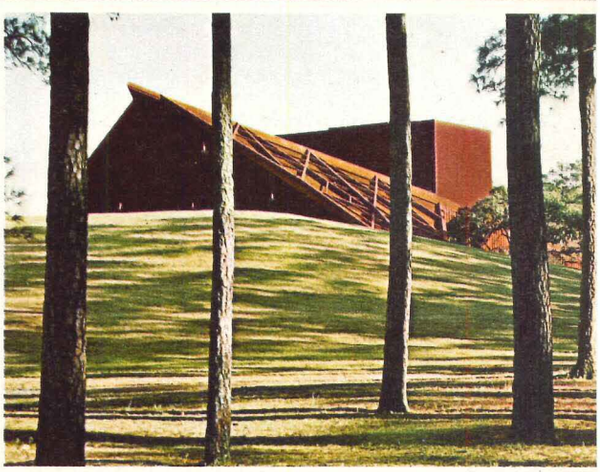

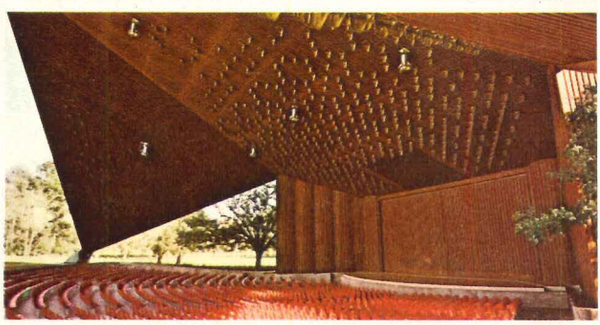

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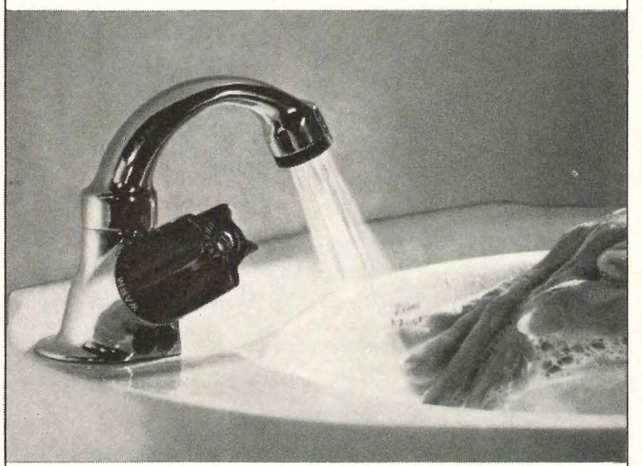

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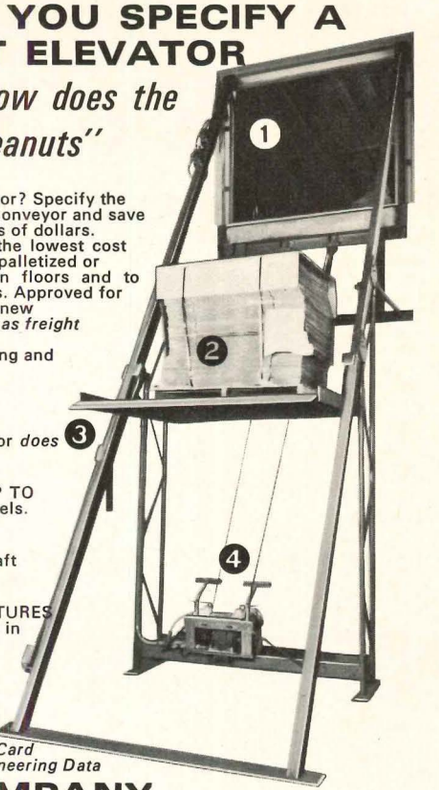

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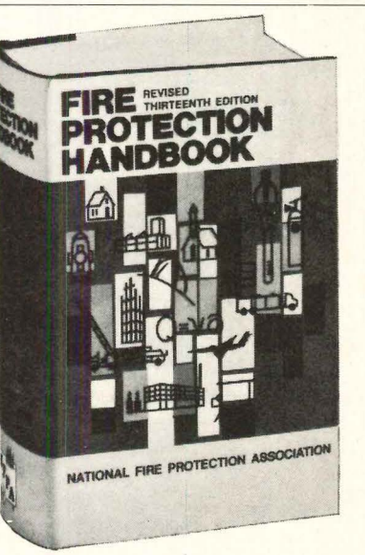

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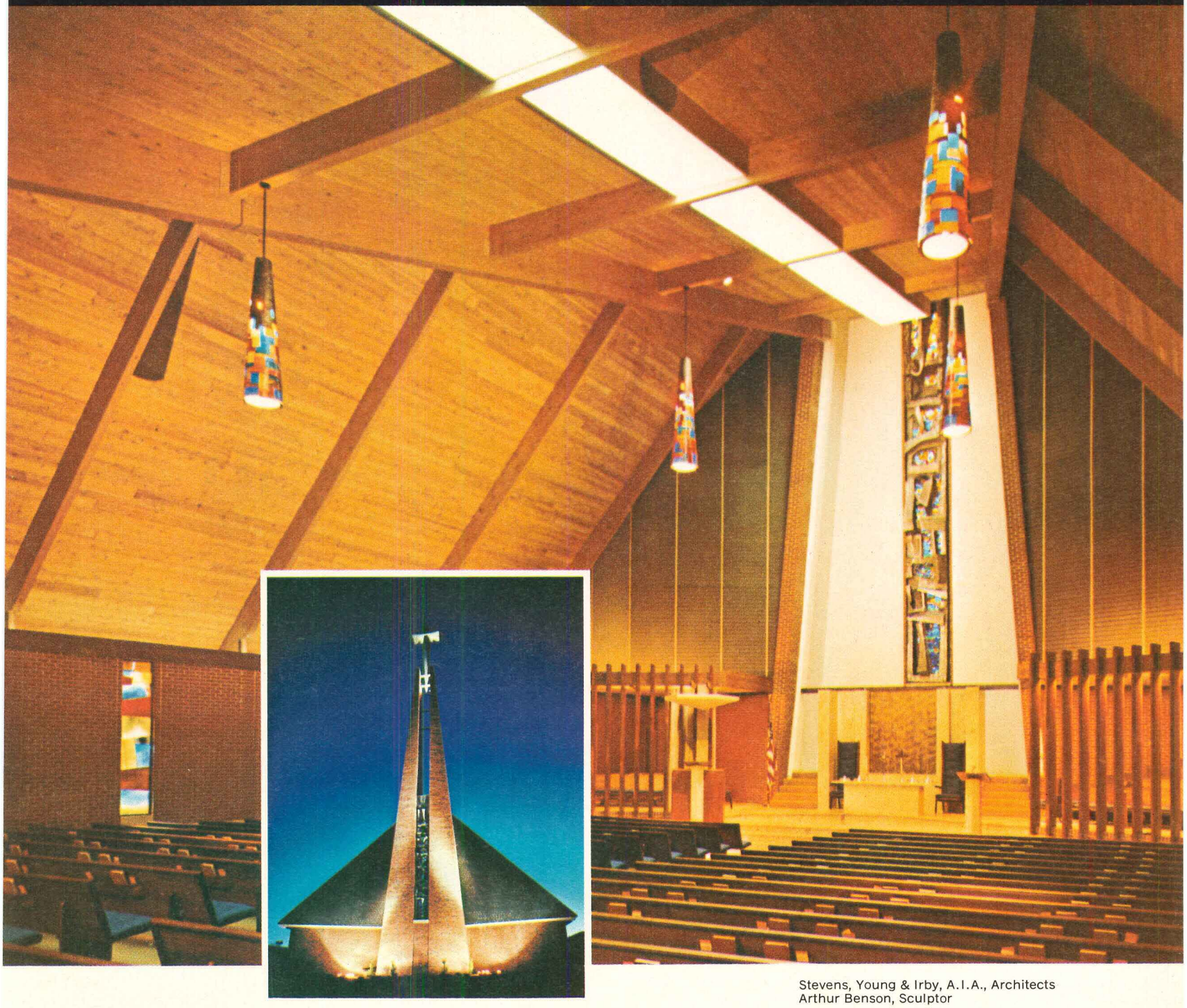

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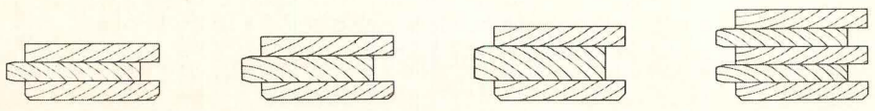

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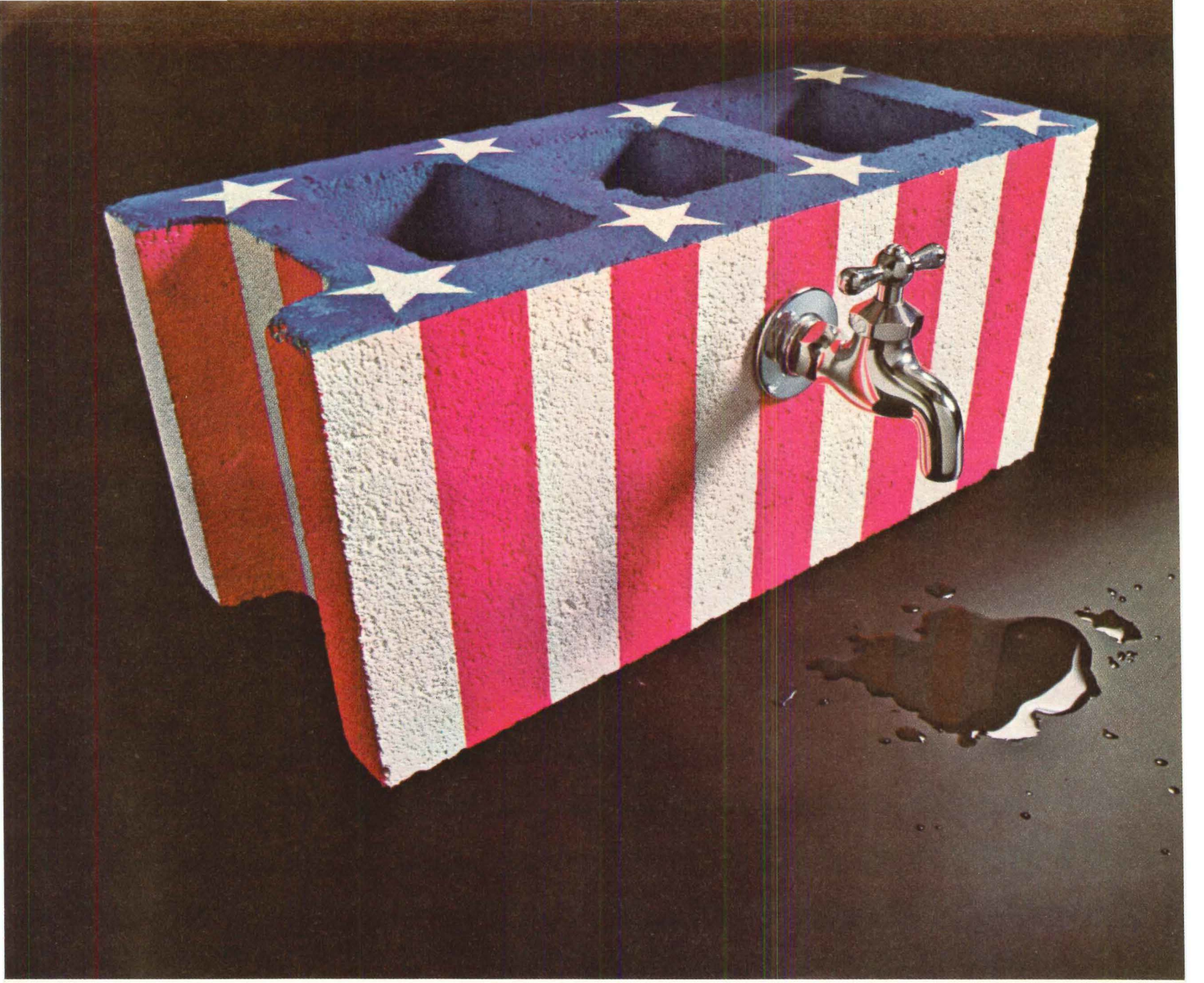

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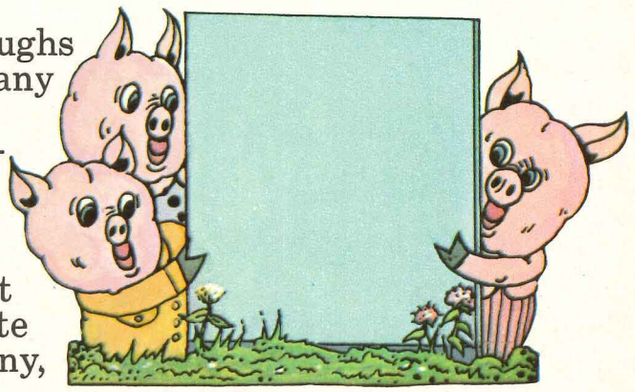

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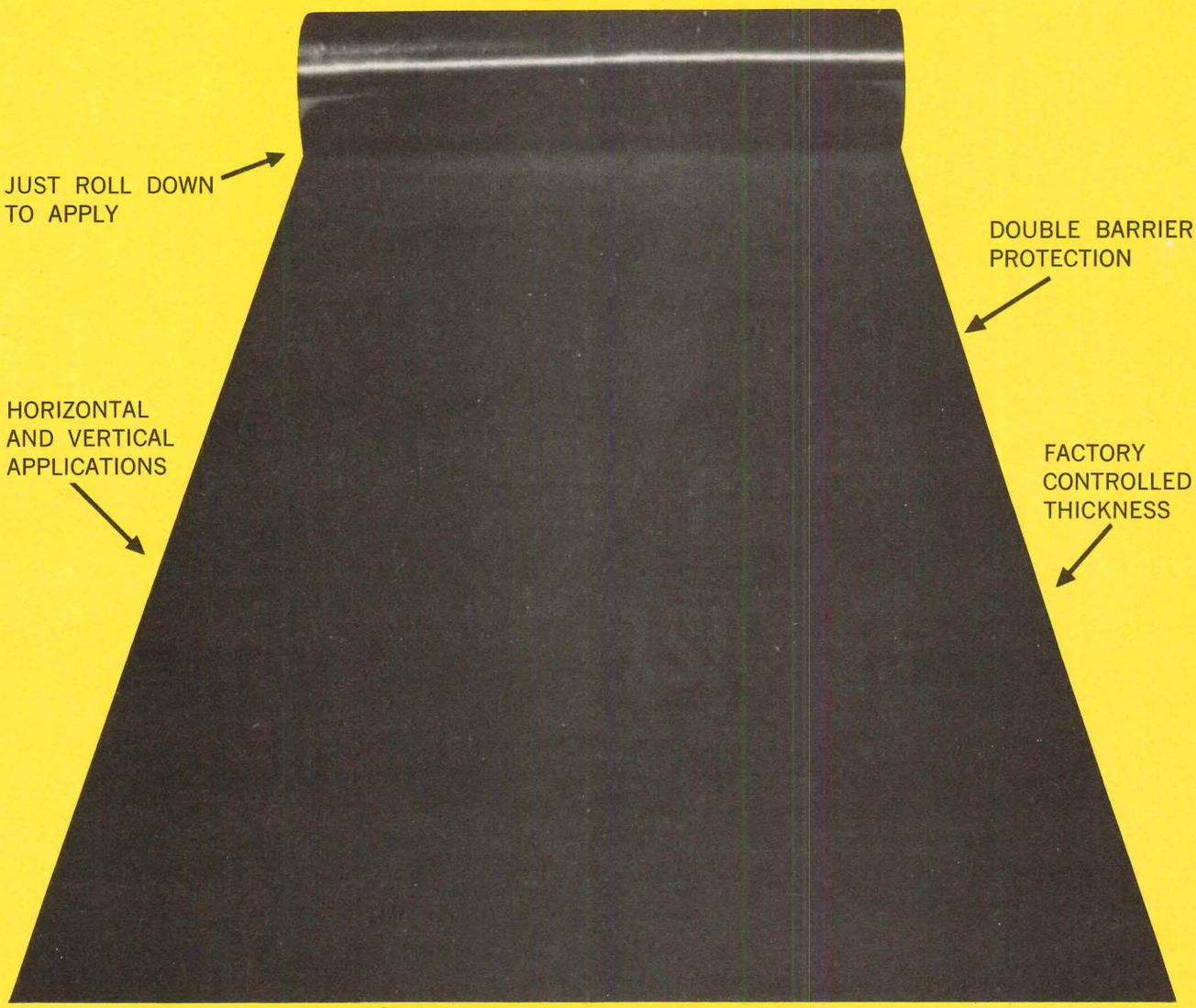

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Signs and portents of construction activity

The new tax bill's elimination of a seven per cent tax investment credit on new plant construction will seriously curtail industrial expansion plans, some observers believe. But the McGraw-Hill survey of plans for capital spending in 1970 and '71, released last November, indicates that the effect of the tax ruling may be less than dramatic. Only six per cent of responding companies indicated they would reduce capital spending plans for 1970 because of that provision in the tax bill. Actual cuts in 1970 plans, as of November, amounted to about $287 million out of over-all plans to spend $76.71 billion for new plants and equipment in 1970 (still eight per cent above the 1969 spending level).

Another note of mild optimism for the construction industry in the McGraw-Hill fall survey (not a forecast, but a definite report of spending plans) is the fact that construction contractors plan to increase their capital spending by one-third in 1970. This surge of spending will be made in spite of slipping growth rates of construction to be put in place this year and also seems inconsistent with a projected one per cent decline in spending plans of building materials and equipment producers. The spending by contractors suggests that they may be trying to improve profitability by investment in more efficient equipment—perhaps anticipating further implementation of the renowned "Philadelphia plan" for spreading the base of unskilled labor, and further reflecting the hope that unions will increasingly accept the inevitability of pre-assembled systems as delivered parts of structures.

As to delivered building systems, interpretations of the Philadelphia Door decision were refined in an October ruling of the National Labor Relations Board which overturned a trial examiner's decision which had previously upheld the right of an Illinois carpenters' local to refuse to hang certain pre-machined plastic-faced doors on a hospital project. In this case, the NLRB noted that the doors in question were hospital specifications, not a choice of the contractor. The NLRB noted that only the architect could revise such a specification, and the union was ordered to cease its unlawful conduct. The principle emerging appears to be that unions cannot refuse to install prefabricated components which are called for in plans and specifications.

The changing Federal tax profile has gained some definition as the Internal Revenue Service has finally conceded that organizations of professional people incorporated under state law will be treated as genuine corporations for Federal tax purposes. This decision follows upon and clarifies a series of appellate court decisions adverse to the IRS position that professional service corporations should be treated as something other than true corporations for Federal income tax purposes. The implications for corporate architectural practice could be far-reaching.

To throttle, not to choke the economy seems the aim of recent actions at Federal level. These could be interpreted as a series of delicately balanced moves to combine anti-inflation measures with a central purpose of directing expenditures toward investment in housing rather than an over-all brake on the economy. Many of these moves (such as the cutback in Federal spending on construction, the "privatization" of Fannie Mae, a continuation of various support and subsidy programs in housing legislation, Operation Breakthrough and many others) are stated to support this view. Nevertheless, for some reason, housing starts continued to drop through 1969.

Pundits abound and disagree in their interpretations of these facts, so one may venture simplistic questions without too much fear of ridicule. For example: If the Federal Reserve Board in its wisdom seeks to stem inflation by making mortgage money more expensive—and FHA responds by raising the ceiling on permissible rates for insured mortgages to 8.5 per cent to meet "the demands of the market place"—how can this really precipitate a flow of money into housing? Since single-unit houses and condominiums are purchased by individuals, is the new mortgage rate not more compatible with the financier's vision of "the market place" than it is to the increasingly harassed perspectives of upper-middle-income individuals whose resources are not unlimited? Further, under present tax laws, does it not remove from the taxable flow a marked increase in the "interest" deduction allowable against the Federal income tax?

The effect of change in chairmanship of the Federal Reserve Board from the 18-year tenure of William McChesney Martin Jr. to Arthur F. Burns is still to be assessed. It is not likely to be dramatic, but some speculations indicate that the hand on the throttle of the economy may respond to a slightly different set of input and variables. Mr. Burns is an economist rather than a financier, observers point out, and his observations may encompass signals in areas of construction, jobs and income in addition to the basic money-market signals that have gained almost total attention heretofore. What this means for the construction industry is problematical, but it seems likely that this industry might now become more visible in its maverick phases—hence better (or worse) controlled—than has heretofore been its lot as an averaged-in component of total money flow.

The Gross National Product will reach one trillion dollars a year before the end of 1970 according to Standard and Poor's weekly Outlook. Only about 60 per cent of the gain will be in real growth; inflation will account for 40 per cent. The Prudential Insurance Company forecast concurs (within a mere $10 billion) and says that an over-all gain of six per cent in GNP will be about 1.5 per cent gain in real growth. The combined GNP of the free world's 20 leading industrial nations in 1970 will be about $2.1 trillion at current market prices according to the McGraw-Hill Economics Department.

A decline in consumer confidence, observed in a year-end survey released by the National Industrial Conference Board, has affected buying plans for housing, automobiles and major appliances. The survey report says that 2.2 per cent of consumers plan to buy a house between now and mid-1970, as against 3 per cent who planned to purchase houses last spring. Reaching for

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the bright side, N.I.C.B. observers point out that this year's survey results portend little danger of increased inflationary demand from the consumer sector of the economy.

In a review of the decade of construction in the '60's, George A. Christie, Chief Economist of the F. W. Dodge Division of the McGraw-Hill Information Systems Company, observes that the U.S. spent about $700 billion on all construction (about 1/10 of the entire GNP) for a 10-year period. But, Christie points out, that was not enough to come even close to meeting the nation's needs for housing and better facilities and was actually a smaller share of GNP in construction than was spent in the '50's. If the '50's proportion had been sustained, it would have added a full year's building output to the '60's decade. Further, inflation reduced the effectiveness of the actual $700 billion by the equivalent of still another year's output.

Factory-made homes got a green light in California with passage of a law effective last November that would allow permanent homes to be constructed in factories and shipped intact, or in components, to a site in any community in the state. Local building codes are overridden by state standards under this law, and local electrical, plumbing or earthquake regulations will not apply to factory-built homes. The California Housing and Community Development Commission will set standards for the factory-built homes. Spokesmen for the Commission said: "We don't expect to lower building code standards but will have statewide uniformity." Once a unit has met the standards, it can be erected anywhere in the state. Zoning regulations established by local communities to deal with setback, subdivision and density will not be affected by the new law which covers only construction codes. The California Council, A.I.A., has urged legislators to enable speedy clarification of applicable standards through "adoption-by-reference" of the Uniform Building Code, a nationally recognized, extant document that could save the State Building Standards Commission much writing and printing time and expense.

A labor agreement involving manufactured housing announced in mid-1969 points to an upsurge in manufactured housing on a national scale. The agreement was between the 900,000-member United Brotherhood of Carpenters and Joiners of America, AFL-CIO, and Stirling Homex Corporation, Avon, New York. It provides that the union will furnish qualified journeymen during erection and completion of houses using Homex modules anywhere in the nation. Stirling agreed to recognize jurisdiction of the Brotherhood—and of other involved trade unions—for work at the job sites.

An innovation (in line with objectives of the Philadelphia Plan?) was a section of the pact which committed the unions and Stirling to a three-way arrangement with the National Urban League to establish training centers at which unskilled and unemployed workers in a given area will be trained in techniques of putting together manufactured housing.

Theodore W. Kheel, the mediator who piloted these negotiations, said: "This proves that it can be done and reaffirms my conviction that major obstacles in the development of new technologies can be solved at the bargaining table."

Construction market assurances implicit in stated urban goals have been urged by one labor leader as prerequisite if unions are to open their ranks to increasing numbers of trainees. Thomas F. Murphy, president of the Bricklayers, Masons and Plasterers International Union, pointed out during mid-year negotiations that the construction industry must be provided with the same kind of work assurances that pertain to highway and aerospace industries if they are to implement national goals of "rebuilding America." If the Federal Government can redefine urban redevelopment goals and break them down into regional plans, Murphy proposes, then the construction industry in the various regions would be able to expand to meet that kind of assured market by training more craftsmen and improving productivity.

Assessing 1969 construction progress, George A. Christie, chief economist of the F.W. Dodge Division of McGraw-Hill Information Systems Company, pointed out in a January review that 1969 was a record year, with contracts valued at $66.5 billion, an eight per cent increase over the previous year. On a seasonally-adjusted basis, the peak rate of contracting was achieved in the first quarter of the year.

"Although the monthly pattern was very erratic," the Dodge economist said, "the trend throughout the year was unmistakably downward. Furthermore, most of the gain for the entire year was in the form of higher prices, with construction costs rising an estimated seven per cent in 1969.

"What happened to bring about this year-long decline in contracting and rise in costs is a familiar story. Inflation was the year's major problem, as it still is. Early last year, with the tax surcharge already in effect for six months and with credit being tightened again, it seemed only a matter of time before balance would be restored between demand and the capacity to meet it. But it didn't work out that way," Christie said.

"Instead of responding to fiscal and monetary restrictions by tightening their belts, both consumers and the business community dipped into savings or borrowed to buy goods and build new facilities before prices went up even higher. This brought on further inflationary pressures, another round of credit tightening, and Government spending cuts, rather than the hoped-for easing by mid-year. The construction industry became both a source of inflation and a victim of its results, as the rush to put up new office buildings and manufacturing facilities drained scarce funds away from the housing market and led the President to order cutbacks in public building. The full effects of these measures are expected to be felt in the opening months of 1970."

Contract values for nonresidential buildings rose 11 per cent to $25 billion in 1969. About two-thirds of this gain was accounted for by a record volume of new office building construction. Headed by the huge World Trade Center complex, office construction in New York City more than doubled the previous record set in 1968 and accounted for over a quarter of the national total.

Contracts for new manufacturing facilities rose to a new record in 1969, spurred on largely by the incentive to modernize in the face of rising labor costs. Contracting for hospitals and other health facilities jumped 30 per cent.

Educational building got off to a good start in 1969, but dropped sharply by year-end as many states and municipalities were unable to float new issues in the bond market. Public building followed a similar trend as Federal construction cutbacks made themselves felt by the closing months of the year. For 1969 as a whole, the value of contracts for both types of building just about equaled the year-ago levels.

The value of residential building contracts fell just short of the $25-billion mark, showing just a fractional gain for the year as a whole. Buoyed by a fairly easy monetary policy at the end of 1968, the year opened with the rate of housing starts at its highest level in several years. As interest rates rose and funds began to drain out of the mortgage lending sources, housing starts began to slip. The drop to a 1.3 million unit rate by the final quarter was not greater largely because the Federal National Mortgage Association (Fannie Mae) actively supported the housing market all during the year.

The shift toward apartment building, which began in the mid-1960's, continued in 1969. Contract values for apartment houses rose 13 per cent, while those for one- and two-family units dropped five per cent.

Contracts for nonbuilding construction totaled $16.6 billion in 1969, a 16 per cent gain over the previous year. Most of this was accounted for by a 30 per cent jump in highway contracting. The Highway Trust Fund—the major source of money for road building—had been "frozen" during the late months of 1968, so contracts in 1969 included not only the normal rate of building but also the amount held over from the previous year. Sewer and water facilities contracting posted a small gain as growing concern with the problem of water pollution hastened construction in many areas. Utilities construction kept pace with the record rate set in 1968, with several nuclear facilities accounting for the bulk of the contracts. *—William B. Foxhall*

CURRENT TRENDS IN CONSTRUCTION

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

Construction versus inflation: Part 2, Labor's role

In last month's article on the major causes of inflation in construction, it was pointed out that rising wage rates were a major factor behind the steep climb in construction costs. This is true enough, but wage rates alone don't explain anything. If the hourly pay for bricklayers were doubled but only half as many bricklayers were used on a construction project, the net effect on cost would be zero. The same would be true if technology were available that would help the same number of men lay bricks in half the time. In the latter case, the productivity—or output per man-hour—of labor would increase enough to offset the higher wage rate.

Wages and productivity are really two sides of the same coin—at least in theory. In the simplest economy, each man's wages are what he produces, and if he can devise tools or methods to increase production, his "wages" automatically go up by the same amount. Translated into a money economy, this means that under ideal conditions (perfect competition), "real" wages (adjusted for price changes) should increase at about the same rate as productivity. In reality, there are usually a number of factors that prevent this from happening. Powerful industrial management can fail to pass on the benefits of higher productivity to its workers and has been known to pocket the surplus as profit. Strong labor unions can demand wage increases in excess of productivity gains—especially in a tight labor market—thereby either reducing profits or forcing prices up. Governments, through their taxing and spending programs, can redistribute the benefits of higher productivity in any way that they see fit.

The U. S. economy as a whole increased its productivity at a three per cent annual rate during the past ten years, and real income per wage earner rose at about the same rate—a near-equality that is necessary for the total economy in the long run. At the same time, productivity in manufacturing was increasing at a 3.5 per cent annual rate, while real average weekly earnings of production workers rose at only a 2.2 per cent rate. Partly for this reason, wholesale prices of industrial goods have lagged the increase in the general price level, permitting both a higher level of investment (hence, even greater productivity) in manufacturing and a redistribution of resources outside the industrial sector.

The experience in construction has been just the opposite of this. During the past decade, *productivity,* as measured by total value (adjusted for price change) divided by man-hours worked, has risen at an annual rate of just under one per cent—*the smallest such increase for any major sector of the economy.* At the same time, real wages of construction workers have gained at a three per cent annual rate—better than the general rise in earnings. The difference between the gains in productivity and in real wages—over two percentage points—represents a strong inflationary pressure on construction, for it has either to be deducted from profits or absorbed in higher costs. Although contractors' profits have suffered to some degree in this period, the demand for new construction has remained strong enough to pass on most of these wage increases, so that inflation in the industry has averaged over one and a half times that in the economy as a whole.

Why has productivity growth in construction been so small, while increases in real wages have been able to outpace those in the economy as a whole? There are no simple answers to these questions, but by and large they can be explained by a number of rigidities that characterize the industry:

- *The local nature of construction* affects both productivity and wage rates. Widely varying building codes have inhibited the development and use of technological innovation and mass production techniques that have spurred productivity in other sectors. At the same time, the relative immobility of labor has given local construction labor markets strong bargaining power.
- *Union policies* have inhibited the growth of the construction labor force—especially in some of the more essential skills—and held back technological advance by requiring on-site, rather than factory, assembly of components.
- *The seasonality of construction* results in inefficient use of labor.

Not all of these factors are amenable to simple solutions, but some modifications must be found or the industry will be in serious trouble. Recent Bureau of Labor Statistics estimates indicate that at a zero rate of productivity growth, the construction labor force will have to increase almost a third by 1975 to satisfy the projected demand for construction in that year. The current rate of growth in building employment would require a two per cent annual increase in productivity—well above the ten-year average. To change this situation, governments will need to revise their thinking on building codes; unions will have to liberalize their entrance requirements; builders will have to spread their workloads more evenly throughout the year; and architects will have to design greater efficiency into construction if the needs of the next several years are to be met.

How tax reforms will affect construction

After a series of last-minute marathon sessions in a House and Senate conference, the much heralded tax reform bill of 1969 came out in final form and was signed into law by President Nixon on December 30. It's a lot different from the original bills proposed by either house, but the items affecting construction are basically unchanged.

The provision most directly bearing on construction is the reduction of double depreciation on commercial buildings to 150 per cent. Since the boom in new office building has already peaked and a substantial drop in commercial construction is expected in 1970, it will be difficult to determine the impact of this measure on new building. It will increase the cost of operating new commercial structures, so that some marginal projects will be dropped. Since the double depreciation was retained for apartment buildings, the net effect will probably be to shift some of the funds of institutional investors into the housing market.

Some other provisions of the tax bill will indirectly affect construction. Cancellation of the seven per cent tax credit on new industrial equipment might delay construction of some of the buildings planned to house this equipment. In other cases, it may encourage the construction of more efficient buildings to house present equipment. Other measures that increase the tax liabilities of banks, corporations and utilities will reduce funds available for construction and other investment. Finally, reductions in personal income taxes and larger moving expense allowances may encourage homebuilding.

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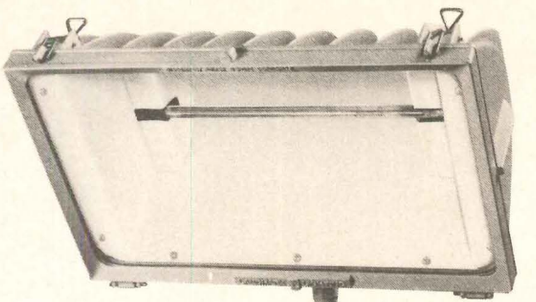

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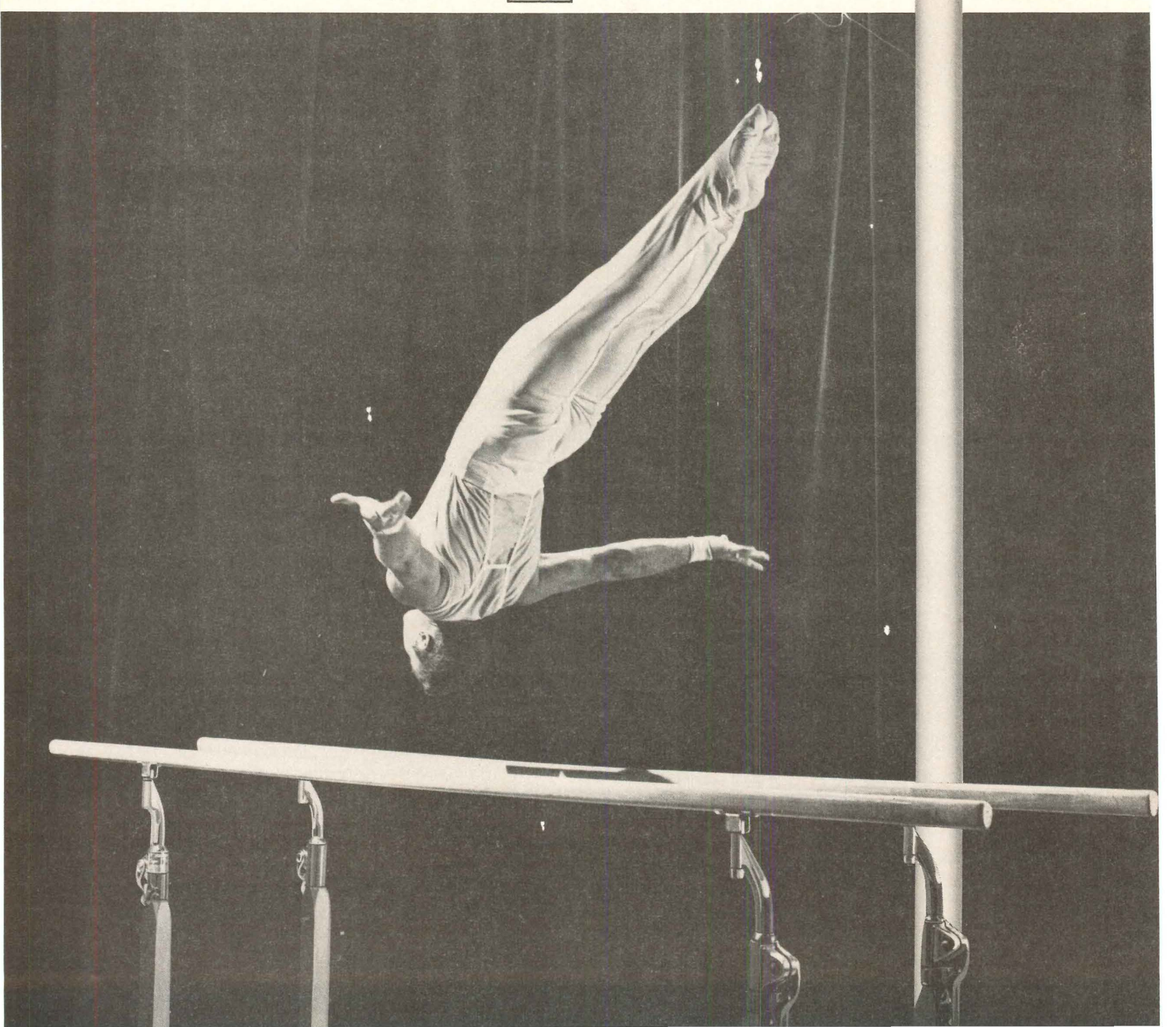

Steel Joist Institute adopts specifications for steel joist shop protective coatings

After extensive research, the Steel Joist Institute has adopted specifications covering the shop paints of open web steel joists. Now you can specify joists with confidence that they're effectively coated and protected from manufacturing plant to jobsite.

SJI requirements now demand that the standard shop paint shall conform to one of the following:

(a) Steel Structures Painting Council Specification 15-68T, Type 1 (red oxide)

(b) Steel Structures Painting Council Specification 15-68T, Type 2 (asphalt coating)

(c) Federal Specification TT-P-636 (red oxide)

(d) Or, shall be a shop coating which meets the minimum performance requirements of one of the above listed specifications.

Standardization of shop painting is the latest in a long series of positive contributions by the Steel Joist Institute towards the advancement of open web steel joists, the versatile structural members of modern building practices.

■ If you would like a copy of the Steel Structures Painting Council Paint Specifications, write us at the address below.

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TRENDS AND ANALYSIS

Computerized cost estimating is ready now—almost

By Bradford Perkins, McKee-Berger-Mansueto Inc., Construction Consultants

The theory is well developed, and some systems go
But softwear problems for the ultimate are massive

Architects are now devoting more time to planning for the introduction of currently feasible computer systems than (as in the recent past) to contemplating dream applications. Fewer articles are being written predicting that the draftsman will be replaced in five or ten years by cathode ray tubes, electric light pencils and automated drafting equipment. Instead, architects and their consultants are showing a growing interest in such areas as accounting, management information and control, specifications and scheduling and cost estimating systems where EDP solutions are more readily attainable. Today's rampant inflation in the construction industry has made the last of these system types particularly attractive. As a result, more and more firms are currently developing or expanding automated cost estimating systems.

There are a number of basic ways in which computers can be used in the estimating process:

1. *Take-off assistance*—where the computer is employed—via digitizer and keyboard—to translate lines, areas and building material counts to construction quantities.
2. *Pricing assistance*—where the computer stores a library of costs to apply against estimated quantities and performs all multiplications and totalling.
3. *Inventory systems*—where the computer is employed to organize an estimate into a variety of formats: i.e., by building element, contract trade, supply source, etc.
4. *Accounting assistance*—where the computer interfaces an essentially manual estimating effort with a computerized cost accounting system for use by contractors.
5. *Data file storage and indexing*—whereby historic cost information is kept current and available for many output requirements.
6. *Exploded detail generation*—wherein simplified building systems or composite building elements are measured and "exploded" via computer to a detailed bill-of-materials format.
7. *Unit cost synthesis*—wherein the computer analyzes a more or less detailed data file to determine composite building element costs; i.e., cost per square foot for a heating system, etc.

All of these systems and appropriate combinations of them are attempts to create a tool for the basic cost management needs of professionals and clients—establishing and evaluating budgets, evaluating alternative design decisions and providing a basis for predicting, evaluating and controlling the project's actual cost.

A secondary goal, of course, is to make such a system more rapid and accurate and less expensive than the currently available manual techniques.

Unfortunately, none of the extant approaches has been developed to a point where it fully satisfies either the primary or secondary objectives for more than a handful of users. Therefore, it is worthwhile to move beyond the dazzle of the concept and take a close look at the problems and potential of each of the major approaches to computerized estimating.

Uses of historical cost data need sophisticated approaches

Historical bid and estimate data have been a traditional base for many firms' estimates. Recently, several firms have been automating this data base in order to speed information recall and manipulation.

In the least sophisticated systems, the costs for an entire building are recalled and are updated via a published index.

The usefulness of this basic approach is often limited because of its lack of sensitivity to the differences among projects, especially in program scope and method of construction. To meet this problem, several firms have taken the historical-data approach one step further and have organized their data by systems or components rather than building types. In some cases, this has meant cost information can be recalled for such categories as elementary school classrooms, hospital bed wings, hospital operating suites and similar facility components.

In others, past project costs have been divided into the costs of the wall, floor, electrical, HVAC and other systems. Data are stored on the cost per linear or square foot for concrete block walls, poured-in-place concrete slabs, metal stud and dry wall, different HVAC components and the other basic building systems. If the data base is sufficiently large, information can be recalled and adjusted to form a cost cross-section for any project.

Retrieval concept is simple but the data base is huge

Conceptually, the historical data approach is quite simple—store historical data, recall that which is relevant to some outline description of the proposed project, modify it for inflation and geographical considerations, and one has a reasonably accurate estimate of the probable construction cost. Unfortunately, while the concept is simple, the implementation process is expensive and difficult.

The data base, for example, must be extremely large if it is to be at all comprehensive. The number of building types, building facility components or building systems which must be included is immense. One high school is obviously not a sufficient data base for all projects of this building type. Even a wealthy suburban high school's science wing is not fully comparable to the science area of a less-affluent rural district's facilities. And the possible variations in building systems are equally large. Therefore, even firms with specialized practices will require a large, carefully selected data base to provide the detail required for reasonably accurate estimates.

Format of the bid limits pricing detail

A problem closely related to size of the data base is the fact that few bids or detailed cost estimates are prepared in a format which permits development of the detail necessary for the data base. Costs are almost always prepared in terms of the entire facility rather than the important facility components or systems, unless these components are quoted as alternates.

Even if a good data base is obtained, however, there is at least one other major problem facing the systems analyst—the creation of accurate indexes to reflect locality and time differences.

Computer programs call for more sensitive price indexes

A previous article, "Cost studies point up risks of index misuse" (September 1967), has pointed out the shortcomings of the more popular published indexes. Basically, most are not sensitive to the differences among building types and/or methods of construction. An index which assumes that each building type uses the same relative amounts of the specific types of labor and material cannot be a true reflection of the differences in the cost movements of one facility type versus another. And an index which is not modified for unique price situations in trades and materials in an area overlooks a most vital consideration.

Although indexes have been designed for the estimating systems currently in operation, none is sufficiently comprehensive or flexible to meet more than a few estimating uses. However, indexing systems for each major building type keyed to a cost and productivity data base have been developed and are currently being integrated into a cost estimating system.

The ideal is known but needs a little work

An ideal cost estimating system for use by architects would contain these features:

1. Cost models of buildings, building systems or building elements of sufficient number and diversity to embrace all the kinds of buildings the architect would encounter and all the major design alternatives available to him.
2. A file of individual product or material unit prices.
3. An indexing system which permits the cost models and the cost file to reflect accurately any desired construction market profile.
4. A versatile coding system or chart of accounts to permit estimate interfacing with CSI codes or contractor bid formats.

Unfortunately no such ideal estimating system has yet been developed although several approaches are in process. Chief difficulties lie in the immense range of detail required for an adequate data base and in the problem of universal indexing.

Several firms have developed approaches based on cost models of a number of building systems. Under one development, for example, the model for a particular wall system is made up of quantity and size of lumber, quantity of nails, hours of carpentry, etc., all developed as a function of the linear foot of a number of types of walls. The computer stores these quantities and a file of unit cost expressions for each. When the system measurements are input, the computer produces a priced bill of materials and a labor estimate for each system.

A less ambitious but more attainable model-based approach is that followed by at least one public agency system. In 1968 consultants developed a system to provide HUD with cost data to evaluate the price of turnkey housing proposals.

Instead of models for individual systems the consultants created models for thirty different Federally financed housing types. A base price for each of these building models was then established. The final step was to create an index based on fifteen trade wages and fifteen material prices. An indexing equation was developed for each of the building types, expressing its relation to each of the wage and price indicators. This "differential" indexing thus permits building costs to be indexed in a way which reflects true differences between building costs in different locations; steel vs. concrete, high-rise vs. one-family, etc. Local labor and material prices for two hundred cities are currently being entered each quarter to arrive at an adjustment in the base price. But this means HUD is able to obtain equitable prices for each of the housing types in a representative cross section of areas.

The construction of similar models and indexes for other building types is a manageable task. However, like all shortcuts this approach has several limitations. The most important of these is that this approach will not provide a sensitive cost estimate for buildings which deviate significantly from the model. Since most buildings will deviate from all of any feasible number of models, this approach should only be employed for establishing and evaluating budgets.

Quantity take-off input needs good price data

There are several programs available which are computerized replacements for the quantity survey approach. These approaches require a detailed take-off of construction material quantities, whether by traditional manual methods or with the assistance of a digitizer and/or desk-top computer. The quantities input under this system are then related to a material and labor unit cost data file to produce a priced estimate. Such systems are more useful to a contractor than to an architect since they require a sophistication about unit costs which only a contractor is likely to have, and further, they require rather fully developed working drawings to produce the necessary quantities.

It seems certain that more efforts will be made to produce an estimating system of real value to architects. Just such a program may be developed by the A.I.A. or its chapters; it is currently under preliminary consideration.

Certain government agencies, national contractors and developers have sufficient project experience to support development of an extensive cost data file, and some have begun the development of an estimating system for their own use. These systems may be available and useful to the design professions, but there can be no guarantee of this, since the purposes for which they are being developed are not parallel to the architect's needs.

The National Bureau of Standards is currently investigating the feasibility of a massive computerized cost data file and estimating system for use by government agencies. As in other applications the chief difficulty seems to be in the collection of reliable data. As a means of generating these data, the Bureau of Standards is considering the possibility of sponsoring a major change in Federal contracting methods. It is thought that bids based on a detailed bill of quantities, as in British practice, would facilitate development of a comprehensive pricing code and require contractors to reveal their unit costs. These costs could then be tabulated, analyzed, indexed, etc. to provide a cost data file. This study is in its very early stages and such major questions as industry acceptability have not yet been answered.

Key to any solution: a unified pricing base

It is clear from the above that the major obstacle to a solution for the architect's estimating dilemma is the elusiveness of reliable unit costs. This, of course, is a problem not confined to computerized estimating applications. Manual estimating systems have traditionally relied on an intimate knowledge of local construction costs supplemented by a general survey of such costs contained in commercially published unit price books. None of the books claim to be comprehensive and they reflect a general area of prices rather than prices identified with a specific construction market. Because no single chart of accounts for construction costs has gained wide acceptance among contractors, there has been no uniformity in the way in which cost records are kept.

The electrical contractors are an exception. Having developed a uniform code of accounts some years ago, electrical contractors have been able to develop intelligent, useful computerized estimating techniques and several are now in operation.

Automated estimating will never produce an infallible estimate. As we pointed out in a previous article, "Accuracy of estimates: close but never perfect" (RECORD, May 1968), no system can ever account for all the vagaries of the construction industry. This point emphasizes the need for human judgment. No estimate which fails to account for contractor interest, the strengths and weaknesses of the local construction market, and the many other variables which are so difficult to quantify, will be fully satisfactory. Because of these factors, machines will become increasingly useful tools, but they are a long way from replacing experienced human judgment as the final source of accurate cost decisions.

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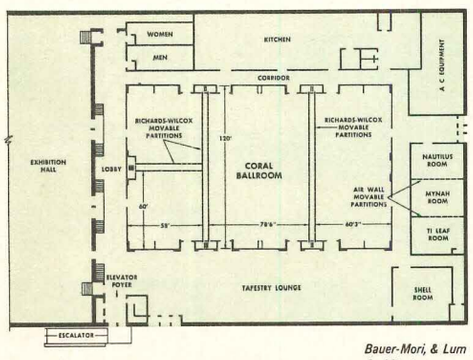

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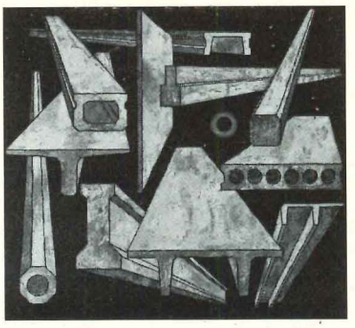

You are invited to enter the 1970 PRESTRESSED CONCRETE INSTITUTE awards program

JURY OF AWARDS

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Purpose of the PCI Annual Awards Program is to recognize excellence in design using precast and/or prestressed concrete.

Attention in judging will be given to the use of precast and/or prestressed concrete to achieve aesthetic expression, function and economy. Importance is placed on the use of the structural system as an expression of design intent and to enhance the function of the project.

Interesting methods of systems integration will also be recognized as will ingenuity in the use of materials, methods and equipment to reach an outstanding solution.

Bridges will be judged as a separate category.

Any kind or type of structure in the United States or Canada using precast and/or prestressed concrete may be entered. Structures completed within the last three years, or those that are substantially completed now, are eligible for this year's program.

Because of broad diversity in the nature of problems offered to architects and engineers, no first place Award will be made, but all Awards will express equivalent recognition of a high level of excellence.

ELIGIBILITY: The Awards Program is open to all registered architects and engineers practicing professionally, and government agencies, in the United States, its possessions, and Canada, except Directors of PCI and all Active Members and their employees.

SUBMISSION OF ENTRIES: Entries must be made by the designer of record. An entry shall consist of the following:

1. The first page of the entry will be a "fact sheet" stating the following:

A. Type of project.
B. Size in total square footage, or in the case of bridges – the length.
C. Number and dimensions of precast components and prestressed components (and whether the latter are pretensioned or post-tensioned).
D. Special design features you wish emphasized for the purposes of judging.
E. Date structure was completed or is scheduled for completion.

2. Concise description outlining the advantages achieved by the precast or prestressed concrete, typed on 8½" x 11" sheets.

These PCI Active Members will be glad to give you complete details on the PCI Annual Awards Program:

ALABAMA Riverside Prestress Concrete Products, Lincoln • Southern Prestressed Concrete, Inc., Montgomery, Huntsville

ARIZONA Arizona Sand & Rock Company, Phoenix • United-Metro Materials & Concrete Co., Inc., Phoenix

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COLORADO American Stress Wire Corp., Englewood • Flatiron Prestress, Inc., Boulder • Mack Precast Products Co., Adams City • Prestressed Concrete of Colorado, Inc., Denver • Rocky Mountain Prestress, Inc., Englewood • Southern Colorado Prestress Co., Colorado Springs • Stresscon Corp., Colorado Springs

CONNECTICUT Allied Building Systems, Inc., Manchester • Blakeslee Prestress, Div. of C. W. Blakeslee & Sons, Inc., New Haven

FLORIDA Capitol Prestress Co., Jacksonville • Dura-Stress, Inc., Leesburg • Florida Prestressed Concrete Co., Inc., Tampa, Winter Park • Hughes Supply, Inc., Orlando • Juno Prestressors, Div. of Cleary Bros. Construction Co., West Palm Beach • Meekins Bamman Prestress, Inc., Hallandale • Pre-Cast Industries, Inc., Miami • Prestressed Concrete, Inc., Lakeland • Southern Prestressed Concrete, Inc., Pensacola, Tallahassee • Stresscon Div., Maule Industries, Miami

GEORGIA Atlanta Structural Concrete Company, Atlanta, Powder Springs • Concrete Materials of Georgia, Inc., Forest Park • Macon Prestressed Concrete Co., Macon, Jonesboro

HAWAII Dillingham Precast, Honolulu • H C & D, Ltd., Honolulu • United Pacific Concrete, Div. United Concrete Pipe Corp., Honolulu

IDAHO Ready-To-Pour Concrete Co., Boise, Idaho Falls

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IOWA A & M Prestress, Inc., Clear Lake • Midwest Concrete Industries, West Des Moines • Prestressed Concrete of Iowa, Inc., Cedar Rapids, Des Moines, Iowa Falls, Granger • C. W. Shirey Co., Waterloo • Wilson Concrete Co., Red Oak

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3. A minimum of two 8" x 10" photographs and two 35mm color slides of the completed or substantially completed structure. Detailed photographs, plans, perspective drawings, or large scale details if considered significant by the entrant.

4. Design computations and specifications if they show to a greater extent the design aspects of the entry.

5. Anonymity of entries will be preserved throughout the judging. A sheet giving the proper name of entry, type of structure and location, names and addresses of architect, engineer, and owner, and the date of completion shall be sealed in an envelope affixed to inside back cover of the entry.

All the above to be bound in ring or other type binder, approximately 10" x 12". **Entries to be received not later than July 1, 1970,** at the Prestressed Concrete Institute, 205 W. Wacker Drive, Chicago, Illinois 60606.

NOTIFICATION OF AWARD: Notification of Awards to entrants will be made as soon as practicable after judging is completed.

OWNERSHIP AND PUBLICATION OF ENTRIES: All entries and all material submitted with entries shall become the sole property of PCI.

Since one of the purposes of the PCI Awards Program is to encourage new and advanced architectural and engineering approaches in the use of precast or prestressed concrete, the Prestressed Concrete Institute shall have the right to make all entries and all material submitted with the entries available through publication and dissemination editorially, or in advertisements in its own or other publications. This shall include the right to publish photographs and names of any and all Award recipients without compensation.

The decision of the Jury of Awards shall be final.

By taking part in the program, the contestant agrees that he or she shall have no claim against the Jury of Awards or any member thereof, or the Prestressed Concrete Institute or its individual members.

Address all communications concerning this Awards Program to:

Prestressed Concrete Institute
205 West Wacker Drive, Chicago, Illinois 60606 ■

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For more data, circle 52 on inquiry card

INDEXES AND INDICATORS

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

BUILDING COST INDEXES

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

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, are used. Prices of four common building materials are included for each listed city.

FEBRUARY 1970

Metropolitan area	Cost differential	Current Index residential	Current Index non-res.	% change year ago res. & non-res.
U.S. Average	8.6	317.9	338.7	+ 7.54
Atlanta	7.4	366.7	389.0	+ 8.75
Baltimore	7.9	308.9	328.6	+ 4.57
Birmingham	7.4	286.1	307.6	+ 6.72
Boston	8.4	282.6	299.1	+ 6.46
Chicago	8.9	343.6	361.4	+ 4.89
Cincinnati	9.1	310.8	330.4	+ 7.67
Cleveland	9.8	342.2	363.7	+ 8.08
Dallas	7.7	301.8	311.7	+ 9.55
Denver	8.2	322.7	343.1	+ 8.48
Detroit	9.4	340.2	357.1	+11.54
Kansas City	8.3	283.1	299.6	+ 6.29
Los Angeles	8.4	321.7	352.0	+ 7.50
Miami	8.5	317.8	333.6	+ 7.86
Minneapolis	8.7	315.3	335.2	+ 7.04
New Orleans	8.0	284.7	301.7	+ 8.50
New York	10.0	328.0	352.8	+ 7.19
Philadelphia	8.6	309.4	324.8	+ 6.40
Pittsburgh	9.2	296.1	314.7	+ 5.85
St. Louis	9.1	310.7	329.2	+ 6.67
San Francisco	8.7	412.4	451.2	+ 9.48
Seattle	8.5	292.0	326.4	+ 8.76

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

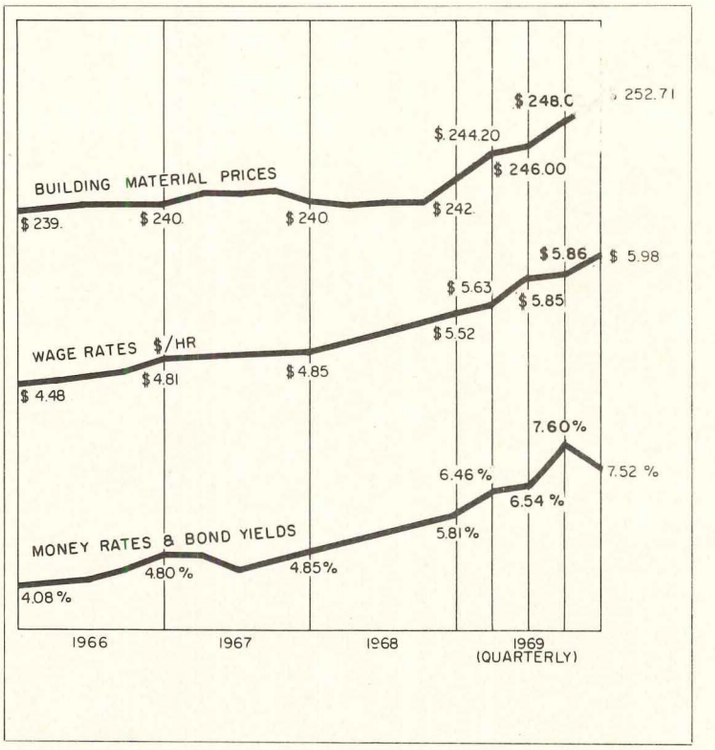
ECONOMIC INDICATORS

Indicators are intended to show only general direction of changes.

BUILDING MATERIALS—The U.S. average price of a "package" of common materials.

WAGE RATES—The U.S. average wages of nine skilled trades and common labor. Fringe benefits are included.

MONEY RATES AND BOND YIELDS—An arithmetic average of the latest prime rate, short term prime commercial paper rates, and state and local government AAA bond rates.



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

1941 average for each city = 100.00

Metropolitan area	1961	1962	1963	1964	1965	1966	1967	1968 (Quarterly) 1st	2nd	3rd	4th	1969 (Quarterly) 1st	2nd	3rd	4th
U.S. Average	264.6	266.8	273.4	279.3	284.9	286.6	297.5	301.5	302.6	309.3	310.0	314.9	316.5	332.4	333.5
Atlanta	294.7	298.2	305.7	313.7	321.5	329.8	335.7	345.6	346.7	352.3	353.1	364.2	365.9	382.8	384.0
Baltimore	269.9	271.8	275.5	280.6	285.7	290.9	295.8	302.9	304.1	307.9	308.7	311.4	313.0	321.8	322.8
Birmingham	249.9	250.0	256.3	260.9	265.6	270.7	274.7	278.5	279.5	283.6	284.3	288.4	289.9	302.4	303.4
Boston	237.5	239.8	244.1	252.1	257.8	262.0	265.7	269.3	270.3	276.3	277.1	278.2	279.6	294.0	295.0
Chicago	289.9	292.0	301.0	306.6	311.7	320.4	328.4	329.4	330.0	338.7	339.5	340.4	342.1	354.9	356.1
Cincinnati	257.6	258.8	263.9	269.5	274.0	278.3	288.2	291.4	292.5	301.8	302.6	309.8	311.5	324.8	325.8
Cleveland	265.7	268.5	275.8	283.0	292.3	300.7	303.7	316.5	318.3	330.7	331.5	334.9	336.7	357.1	358.3
Dallas	244.7	246.9	253.0	256.4	260.8	266.9	270.4	272.3	273.4	281.0	281.7	287.2	288.7	307.6	308.6
Denver	270.9	274.9	282.5	287.3	294.0	297.5	305.1	304.9	306.0	311.7	312.5	317.9	318.5	337.9	339.0
Detroit	264.7	265.9	272.2	277.7	284.7	296.9	301.2	309.2	310.4	315.5	316.4	326.8	328.5	351.8	352.9
Kansas City	237.1	240.1	247.8	250.5	256.4	261.0	264.3	267.5	268.5	277.2	278.0	281.0	282.3	294.5	295.5
Los Angeles	274.3	276.3	282.5	288.2	297.1	302.7	310.1	312.0	313.1	319.3	320.1	323.7	325.4	343.0	344.1
Miami	259.1	260.3	269.3	274.4	277.5	284.0	286.1	293.1	294.3	304.5	305.3	309.6	311.2	328.3	329.3
Minneapolis	267.9	269.0	275.3	282.4	285.0	289.4	300.2	300.0	301.0	309.0	309.4	310.6	312.2	330.1	331.2
New Orleans	244.7	245.1	248.3	249.9	256.3	259.8	267.6	270.6	271.6	273.9	274.2	285.5	287.1	296.6	297.5
New York	270.8	276.0	282.3	289.4	297.1	304.0	313.6	315.9	317.0	320.6	321.4	324.9	326.6	343.4	344.5
Philadelphia	265.4	265.2	271.2	275.2	280.8	286.6	293.7	293.3	294.2	300.9	301.7	304.6	306.2	320.0	321.0
Pittsburgh	250.9	251.8	258.2	263.8	267.0	271.7	275.0	293.0	284.2	291.3	293.8	297.0	298.6	310.0	311.0
St. Louis	256.9	255.4	263.4	272.1	280.9	288.3	293.2	293.7	294.7	303.6	304.4	306.8	308.3	323.7	324.7
San Francisco	337.4	343.3	352.4	365.4	368.6	386.0	390.8	396.4	398.0	401.9	402.9	415.6	417.5	439.9	441.1
Seattle	247.0	252.5	260.6	266.6	268.9	275.0	283.5	286.2	287.2	291.6	292.2	296.1	297.5	316.8	317.8

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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LETTERS

Getting Tuskegee Chapel built

As architectural consultant to Dr. Luther H. Foster, president of Tuskegee Institute, I am writing to commend you on the outstanding journalistic coverage of the Tuskegee Chapel. This was a beautiful job, with exquisite photographs by Mr. Stoller and sensitive writing by Miss Schmertz.

However, I would like to add some personal comments for the information of your readers. The design by Paul Rudolph was unusually complicated to translate into working drawings, and special recognition should be given to the black firm of Fry and Welch for their execution. Not only were they extremely well done, but were also in themselves a work of art. Individuals especially meriting commendation are: Col. John A. Welch, for his outstanding leadership and diplomacy; Mr. Louis A. Fry, Jr., for his persistence throughout the working drawing phase; Mr. Henderson Walker of Fry and Welch, particularly as he made a major contribution to the working drawing production as well as handling the relations with the contractor during construction. My praise cannot be overstated.

A word is also in order concerning the contractor and the parts played by Mr. J. L. Padgett and Mr. Charles D. Snepp, Jr. under most difficult procedures.

In my opinion, this is the finest building in the State of Alabama, and it is significant that black leadership in Alabama had the vision, the good taste, and the ability to bring it to fruition.

Moreland Griffith Smith, F.A.I.A.
Atlanta, Georgia

Operation Breakthrough

I read with interest and some alarm your comment on the HUD policy with respect to "Operation Breakthrough" (November, page 10). I am a practicing architectural acoustic consultant and have written to a number of my fellows to draw their attention to your comments and the importance of the message to our professional group, as well as the architects of the country. I have asked some of the big names of our professional society to contact Sec. Romney so that he will know that we are watching.

Peter V. C. Quaintance
Christopher Jaffe Inc.
Norwalk, Connecticut

Co-op at University of Cincinnati

Concerning the University of Tennessee "internship" program (October), perhaps you do not realize that the University of Cincinnati School of Architecture has had a similar, though broader, program for years. This "co-op" plan entails alternate quarters of work and school after the freshman year. Students must attend school for six years to receive a B.S. degree in Architecture.

As an alumnus I feel that some recognition should be given to the university that founded the co-op system in this country.

more letters on page 226

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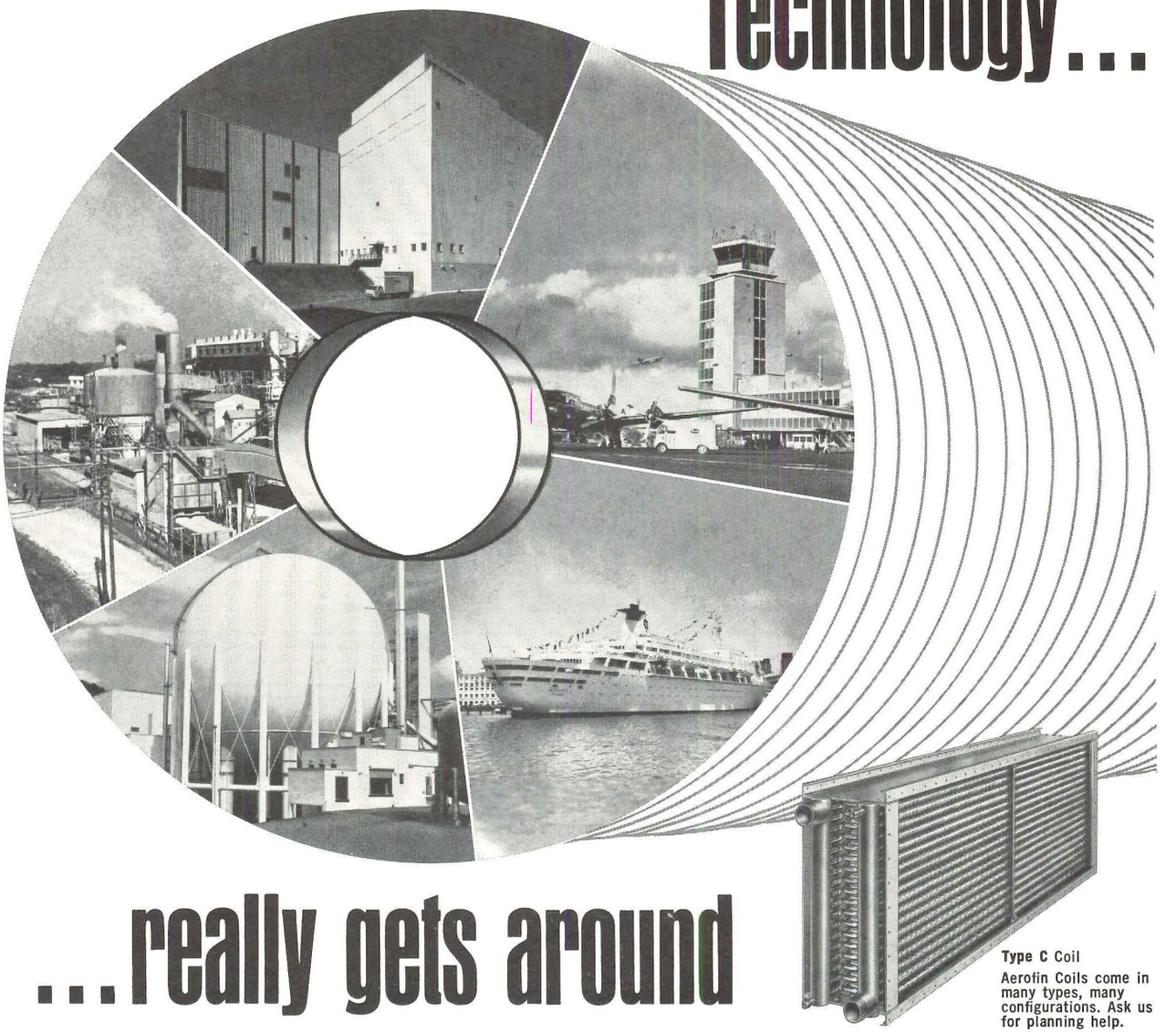

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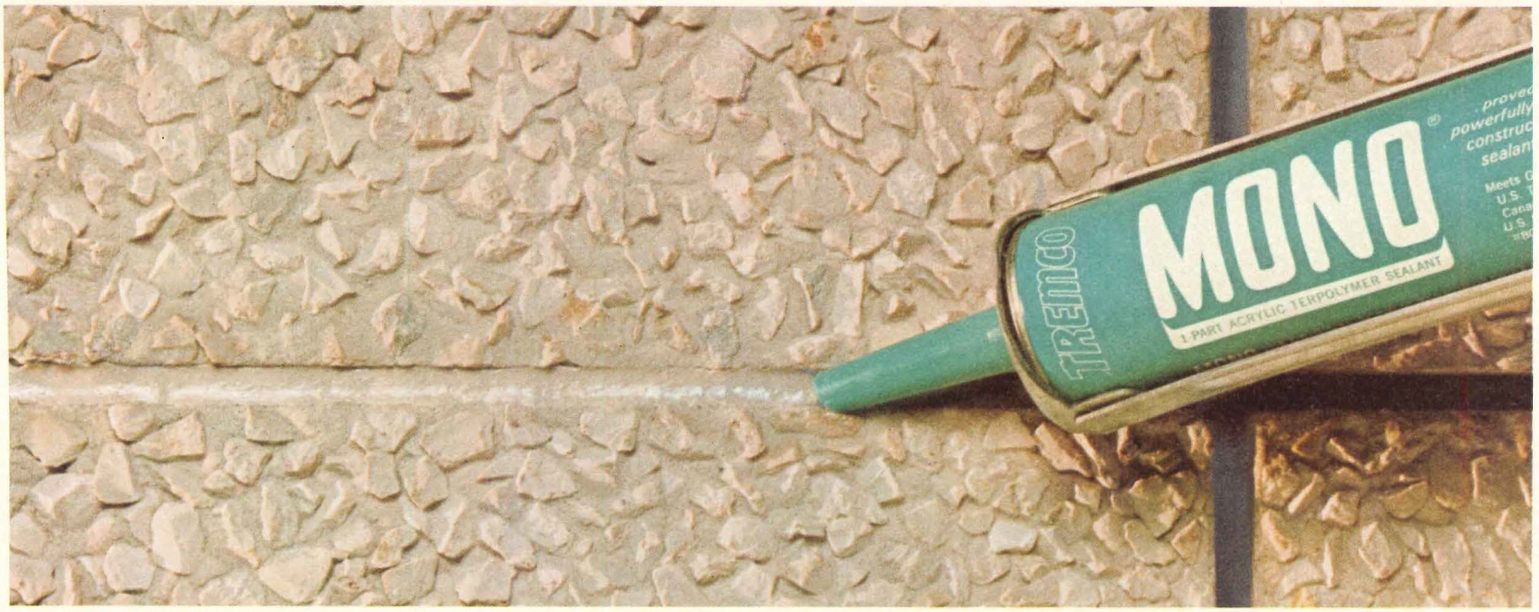

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We know you'd like an all-purpose trouble-free construction joint sealant. □ So would we. But right now, MONO's as close as we can come . . . and it won't do everything, any more than any other types and brands we've tested. □ Sure, MONO's good and works so well under the kind of adverse conditions (dust and moisture) that are common to the job site, that we suspect many construction people actually look on it as an all-purpose sealant. □ But actually Tremco's business isn't based on selling *any* all-purpose sealant. Instead we're a single-purpose company. We're The Water Stoppers and we want to give you leakproof security in every joint on the job. □ So we make not one, but fourteen other sealants besides MONO, like a very good polysulfide (Lasto-Meric), a highly-regarded preformed tape (440) as well as a dozen others with special purposes. □ The only all-purpose item in our catalog is the Tremco Representative. He has been thoroughly trained to provide you the proper sealant for each application and is ready to give job-site assistance before, during and after each project. □ Why not give him a call next time you run into the sealant gap? He'll get you across every time. □ The Tremco Manufacturing Company, Cleveland, Ohio 44104; Toronto 17, Ont.

TREMCO
The water stoppers

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One step beyond

The Vista III Postop® Series by Holophane is designed for the day, engineered for the night.

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Imagine the kind of performance you'd expect from such units, performance that puts plenty of comfortable light right where it works hardest.

Now imagine these qualities combined in a versatile family of outdoor luminaires. That's Vista III Postop Series by Holophane.

There are three basic and beautiful Vista III luminaires. Ellipse. Square. Tapered. Use them singly or in multiples. Pole-mounted or wall-mounted. On arms or poles in aluminum, black, or custom colors.

Each luminaire has a carefully engineered prismatic refractor. This precision refractor spreads the light for maximum comfort...directs the light for maximum efficiency. In fact, Vista III Postop luminaires deliver *more light over a greater area for fewer dollars than any other architecturally styled outdoor luminaire.*

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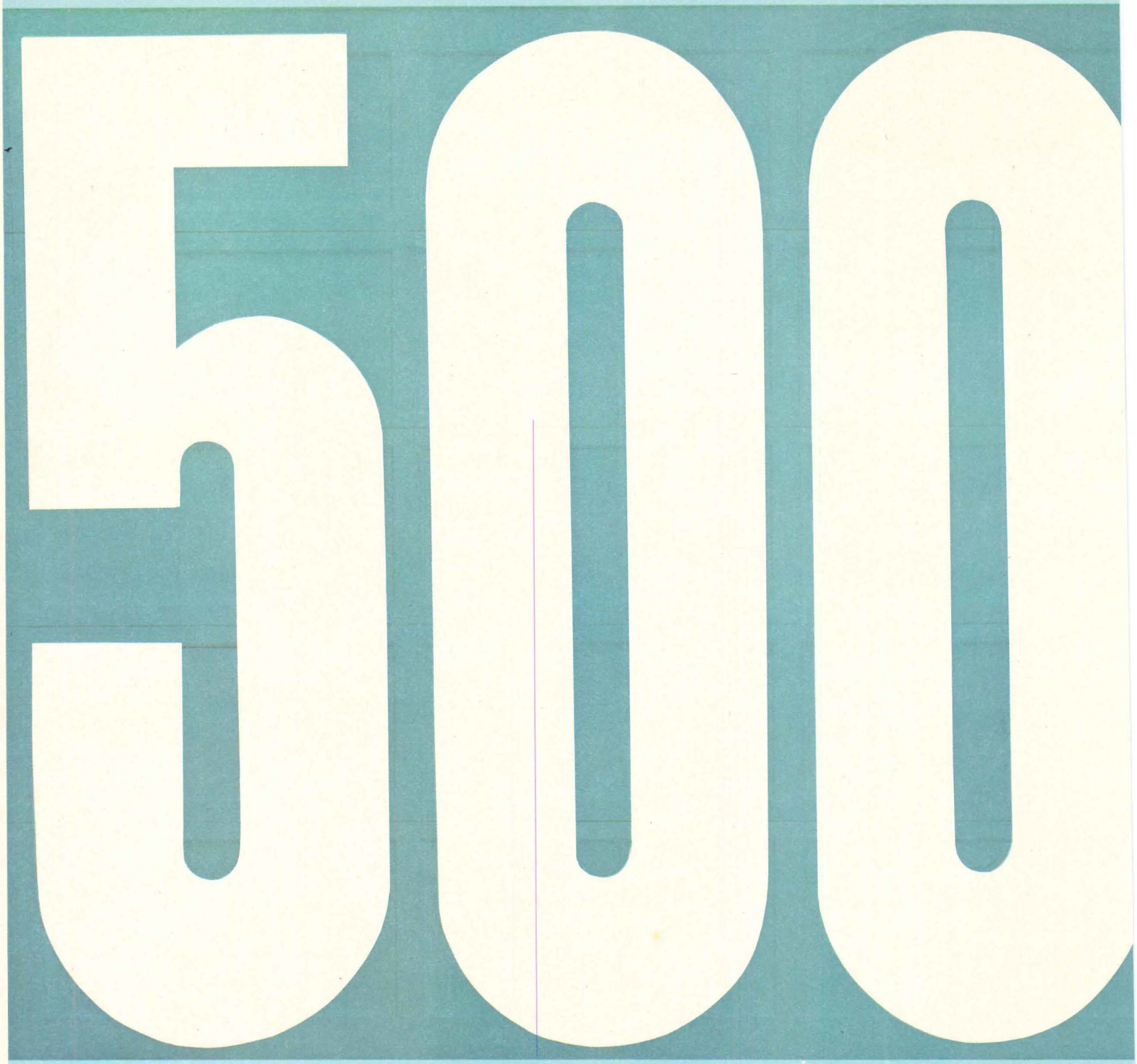

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Is it quality, availability, or service that prompts nearly all Fortune 500 companies to choose The "OVERHEAD DOOR"?

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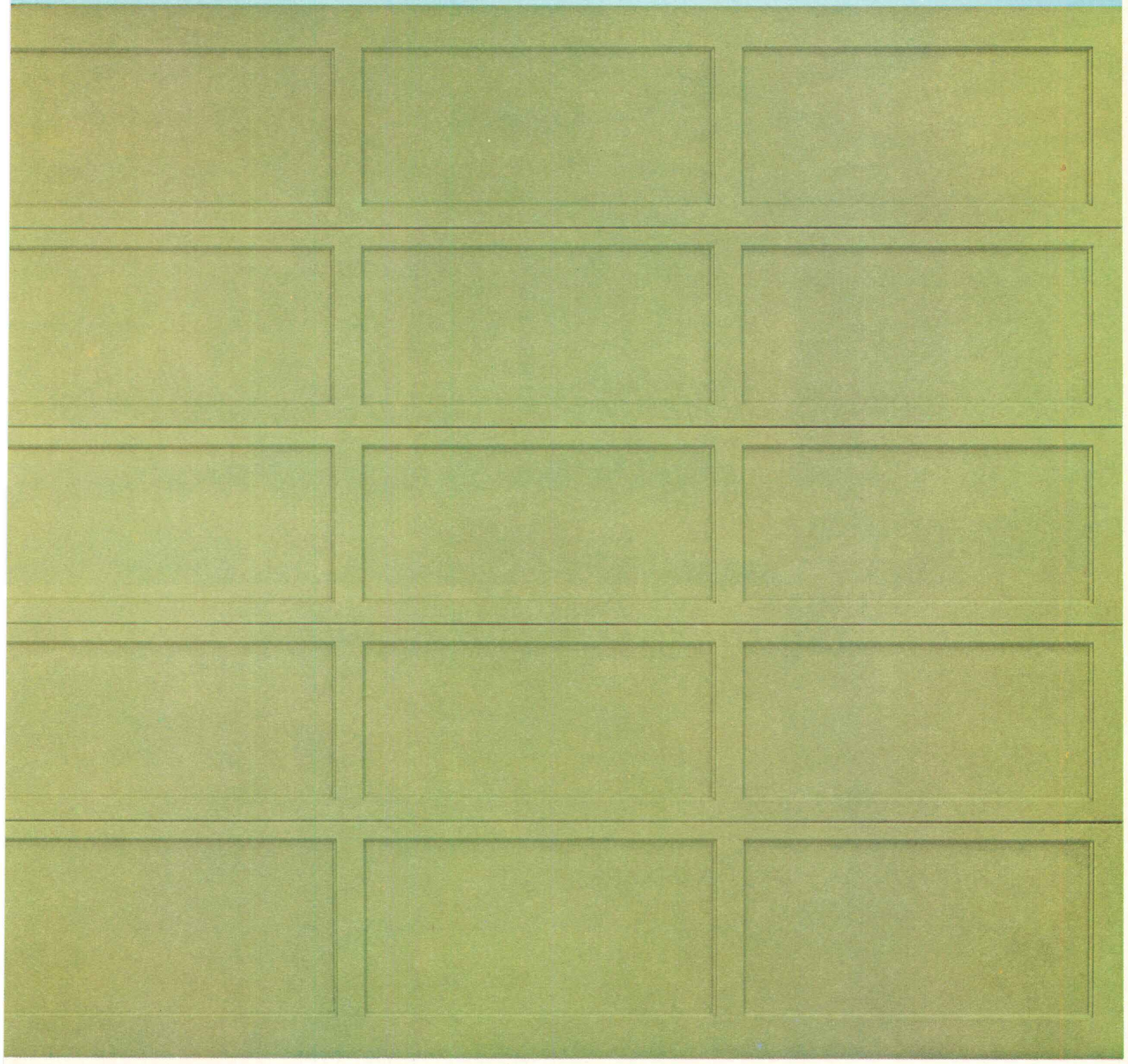

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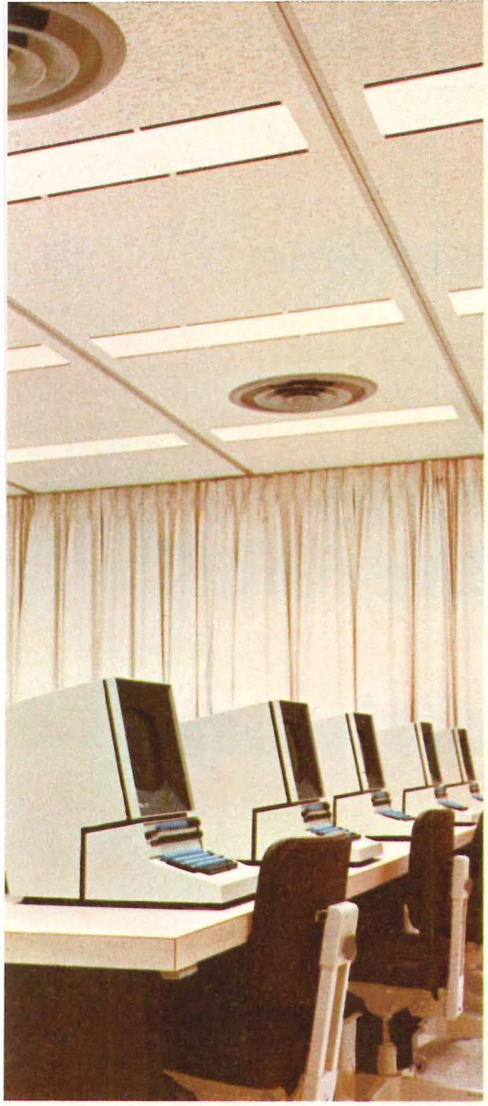

Gulf Life Tower,
Jacksonville, Florida

Architects:
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Associates,
Los Angeles

Associate Architects:
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General Contractor:
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Florida's tallest office building manifests a design continuity inside and out.

An unusual ceiling module was chosen to link the basic interior plan and the small window breakup of the exterior. Gold Bond Fissured Solitude (selected for most of the building) was easily adapted to the 4′8″ module.

Running in one direction but capable of working in both, this system using Solitude tile presents an efficient combination of light, air distribution, and acoustical control. Gold Bond® Solitude tiles carry a Class A noncombustible rating and an NRC ranging between .55 and .65. Factory finish is a non-yellowing white, highly resistant to staining and easily washed with a mild detergent.

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ACOUSTICAL PRODUCTS

The name Gold Bond identifies fine building products from the National Gypsum Company. For further information on Gold Bond Acoustical Materials, write Dept. AR-20C, Buffalo, New York 14225.

In areas where walls are permanent, such as pictured at left, 12″x12″ Gold Bond Standard Fissured Travacoustic Tiles were used for travertine stone appearance plus NRC in the range of .60 to .70.

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What isn't costly about installing this Type 45 Thru-the-Wall Air Conditioner?

Labor, Time, Peripheral equipment

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But, whatever the job, whatever the Type 45 selected, you'll be dollars ahead when finished. And that's where the payoff really shows. Contact your local American-Standard Sales Representative today. Or, write for Bulletin 22-03 to:

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Overlooked: An avalanche of innovations is being developed to send data, pictures, charts, diagrams—you name it—over our network.

Overlooked: Within a few years every company with more than a hundred employees will need a computer or access to one.

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To help you plan for the communications explosion, call 212-393-4537 (collect) for our complete list of Building Industry Consultants.

They'll help you steer clear of Overlooks.

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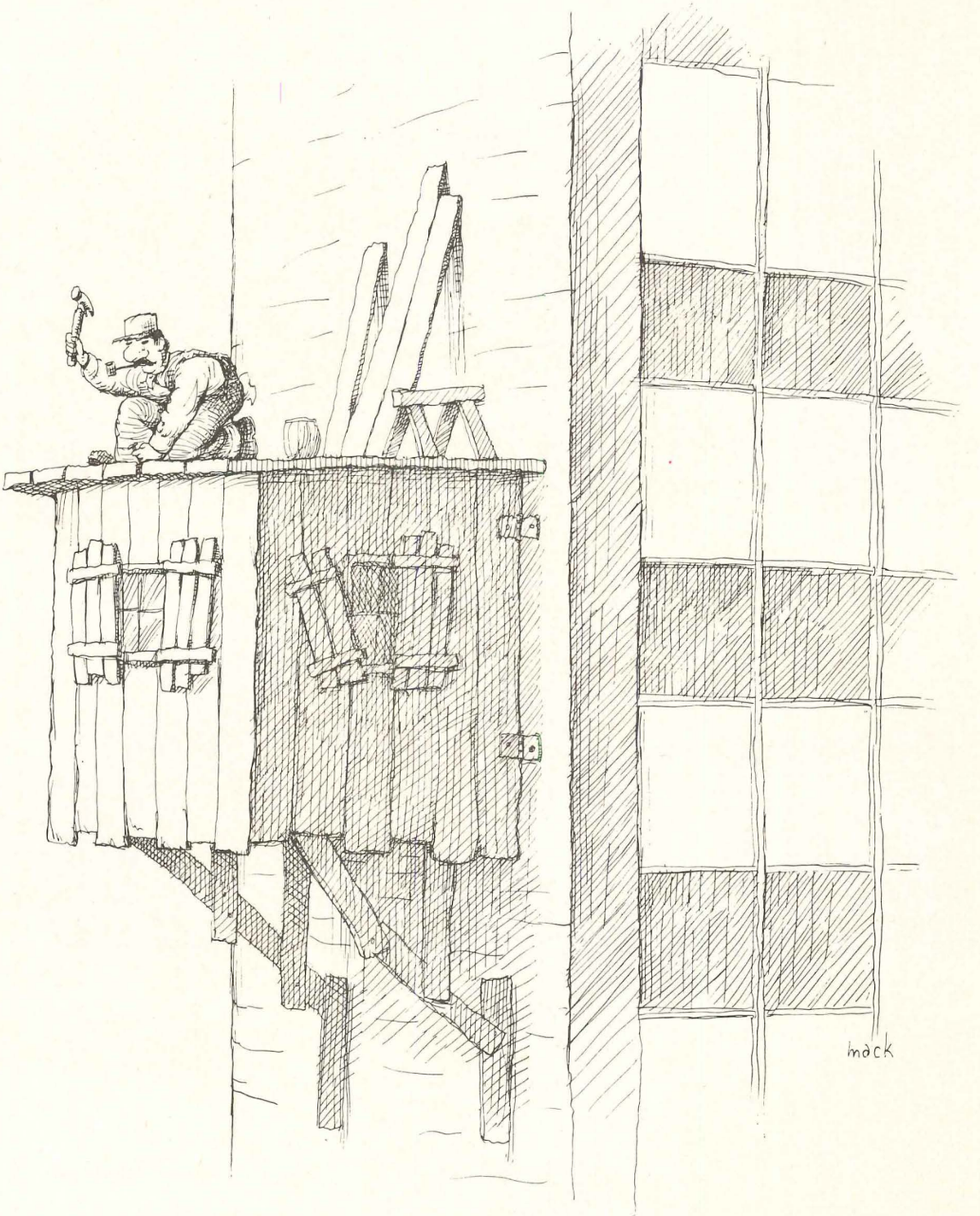
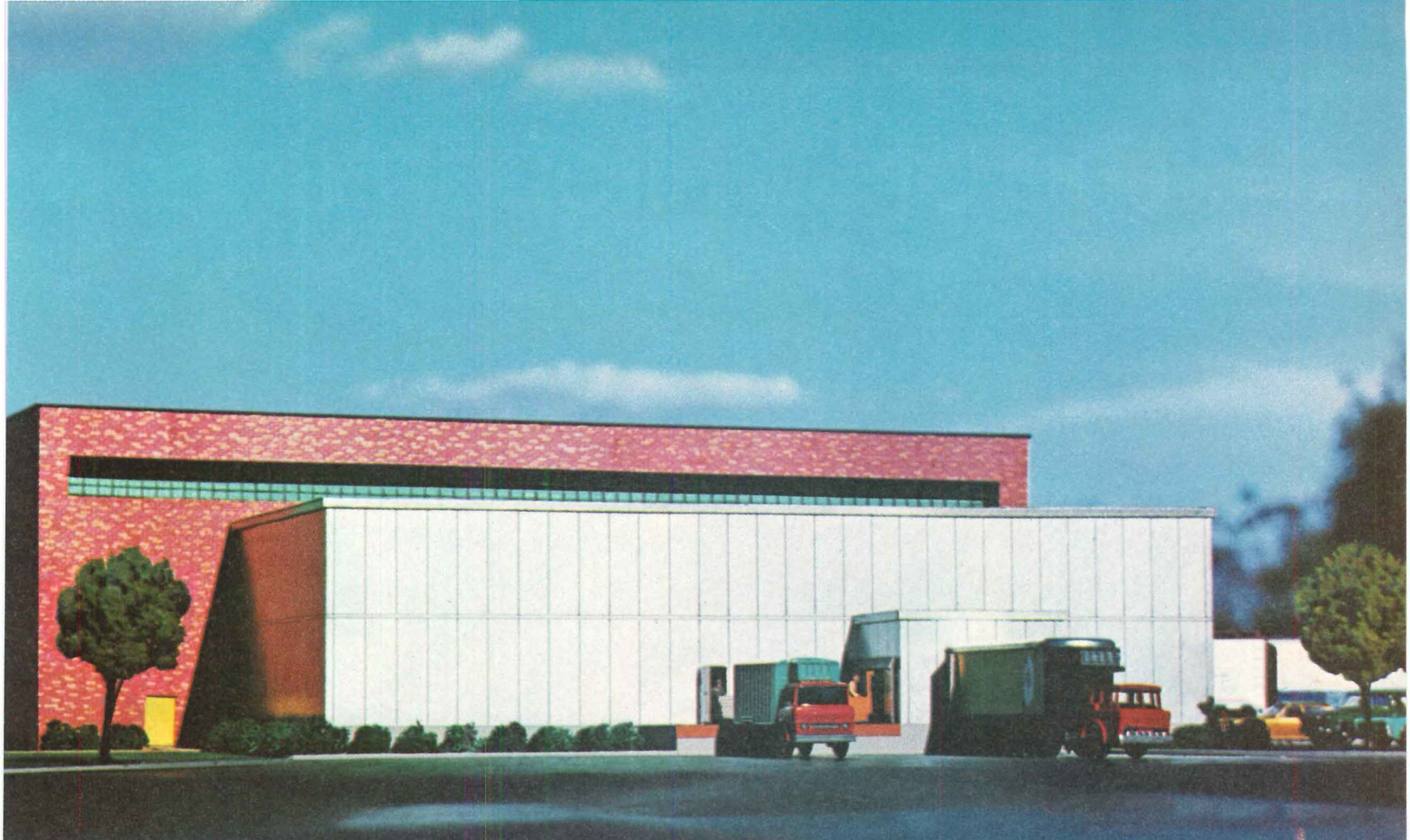
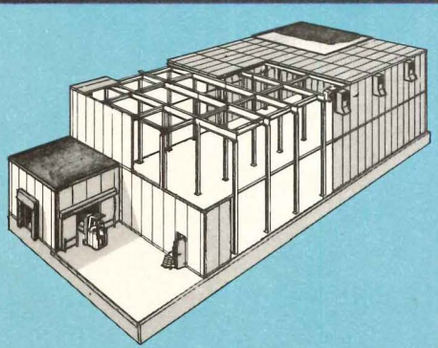




Bally Refrigerated Warehouse Buildings . . . like Bally Prefab Walk-Ins . . . keep pace with the evolution in mass feeding. Food processing and commissary cooking for satellite distribution require giant capacity refrigerated buildings. Bally's pre-fabricated / pre-engineered refrigerated structures can be assembled quickly in any size up to 36 feet high with standard metal-clad panels. Urethane insulation, 4-inches thick (equal to 8½″ fiberglass) cannot pick up moisture . . . is ideal for outdoor use. Factory assembled refrigeration systems are easy to install and service. They fill every temperature requirement, (as low as minus 40°F), for processing or storage. Learn about important Bally features from our 32-page book and urethane wall sample.



Cut-away view illustrating structural steel, insulated panels, roof construction, and refrigeration units in a typical Bally building.

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is now a simple one step.

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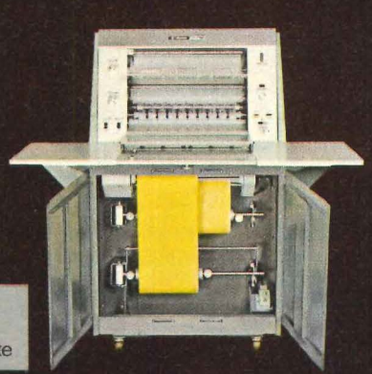
For everything graphic, think Bruning. Your one source of supply for the smallest instruments as well as the largest whiteprinters. And all the rules, scales, curves and supplies in between. A single graphic source for draftsmen, designers, engineers and architects.



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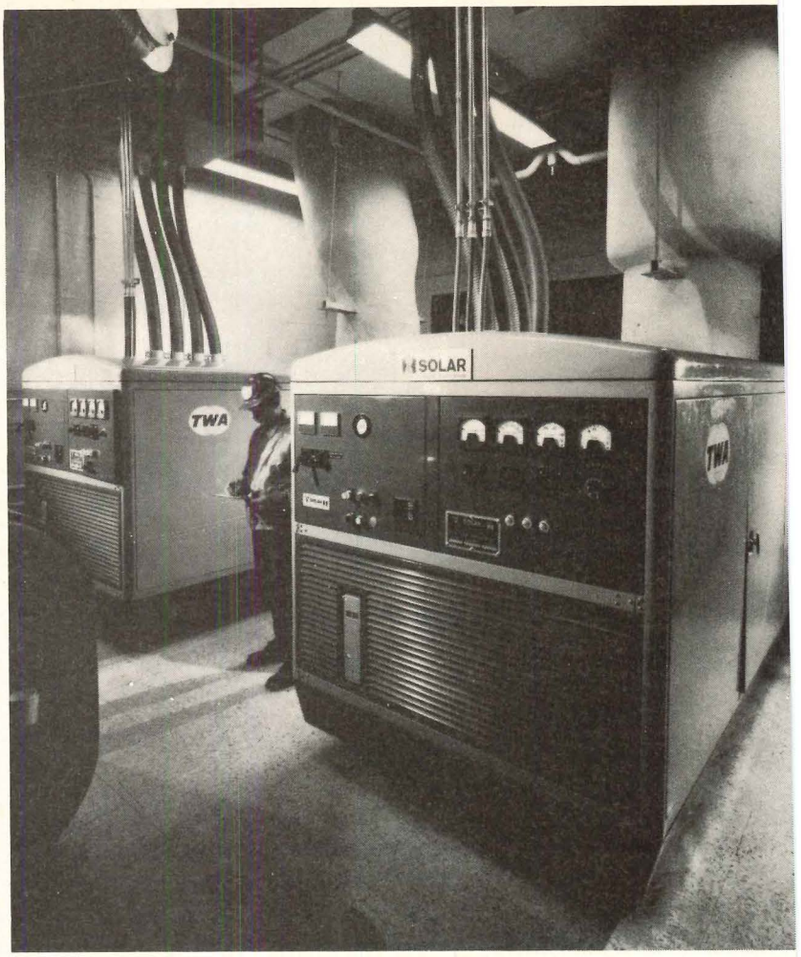
TWA computerized reservations center, largest such facility ever built.



Two Solar gas turbine generator sets supply the center's emergency power needs.

Why TWA selected Solar gas turbines

for emergency electrical power at its giant computerized reservations center.

Trans World Airlines, Inc.'s sophisticated computer facility at Rockleigh, New Jersey, handles world-wide passenger reservations, cargo scheduling, flight plans, equipment availability, and other airline data. Electrical power outages here are completely unacceptable.

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One turbine generator set is used to charge the storage batteries in the computer's "no-break" electrical supply. The second Solar set provides emergency power to the air conditioning system for the computers, which are extremely sensitive to their environment and cannot tolerate a temperature change of more than 3°F. in one hour.

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Hundreds of Solar gas-turbine-powered generator sets, including 750 kw, 800 kw, 200 kw and 225 kw units are now in operation providing emergency electrical power for a wide variety of installations throughout the world. And coming soon is Solar's new *Centaur* gas turbine 2000-kw generator set.

For more complete information on these reliable, compact, lightweight, gas turbine generator sets write: Solar, Dept. S-145, San Diego, California 92112.

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DIVISION OF INTERNATIONAL HARVESTER COMPANY

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Plexiglas.®
The no-risk lighting lens at John Hancock Center.

Plexiglas acrylic plastic, code-approved nationwide for lighting lenses and diffusers, is now demonstrating its superior performance characteristics in John Hancock Center, and in practically every other new big-name building you can think of.

First there's lighting efficiency. Precision lenses of Plexiglas provide maximum light on the task with low surface brightness at normal viewing angles.

Then there's permanence. Neither time nor the destructive effects of fluorescent illumination cause noticeable discoloration of Plexiglas. And the light weight, easy cleaning and high breakage resistance of Plexiglas provide obvious maintenance advantages.

You also get complete design freedom with Plexiglas. You can cover greater areas because you're free to use panels as large as 5 feet by 5 feet.

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Plexiglas is made only by ROHM AND HAAS
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John Hancock Center, Chicago
Owner/Developer: John Hancock Mutual Life Insurance Company
Architects: Skidmore, Owings and Merrill

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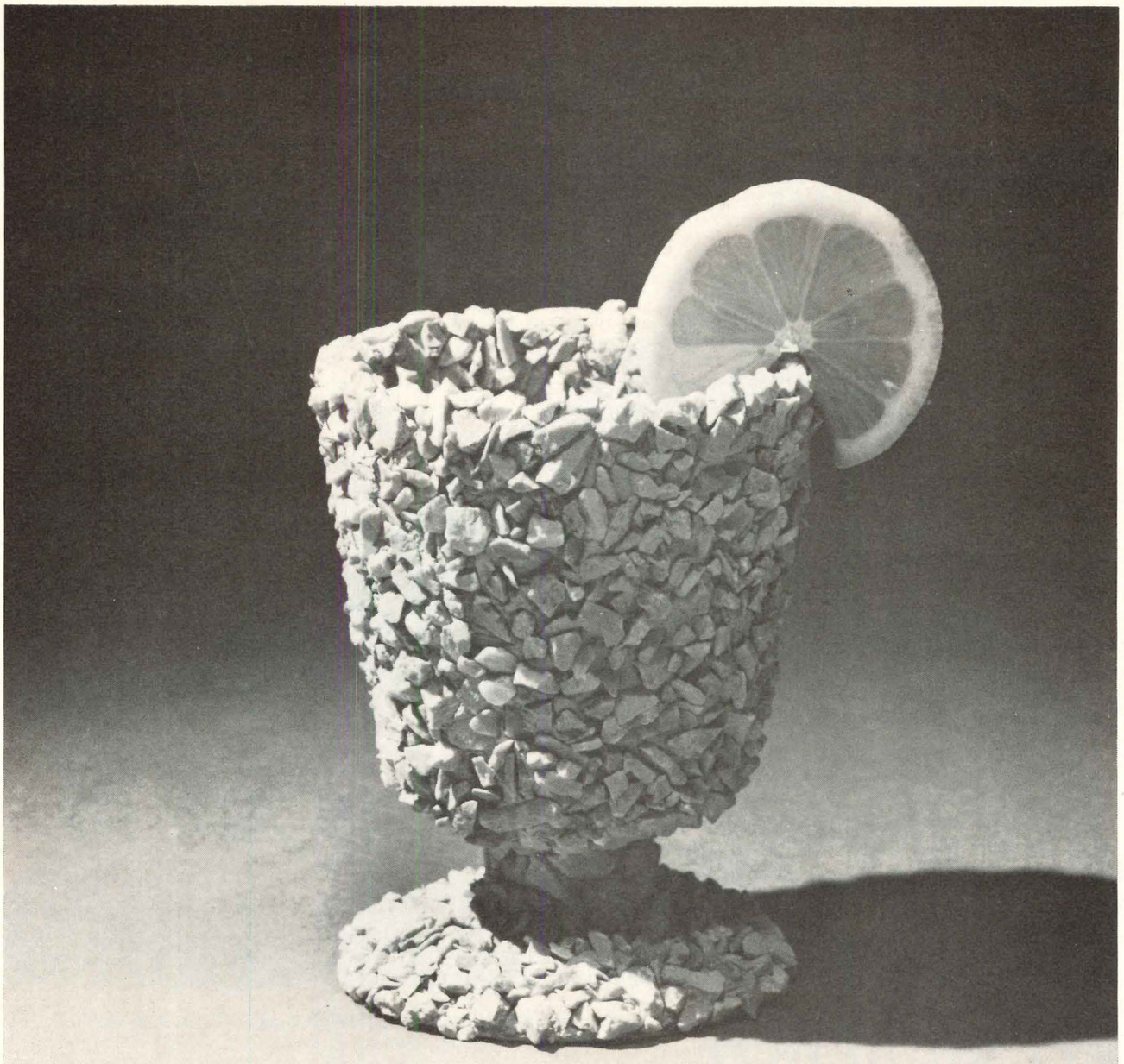

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It's an epoxy-based matrix for exposed-aggregate walls. And it has held larger rocks (and more of them) for a longer time than any other epoxy matrix!

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What's more, Tuff-Lite's holding power has been proven in temperature cycles of −40°F. to +135°F. for periods of up to 8 years.

Which is pretty high proof of Tuff-Lite's dependable performance and remarkable quality.

Write for specs on Tuff-Lite Epoxy-Based Wall Matrix. And we can also give you specs on our complete line of epoxy floor systems: Tweed-Tex® Epoxy/Ceramic-Granule, Tuff-Lite Epoxy Terrazzo (both conventional and conductive), and Heavy-Duty Epoxy Floor Topping. Refer to Sweet's Architectural File Numbers 11g/Fu, 11o/Fu and Industrial File Number 10e/Fu.

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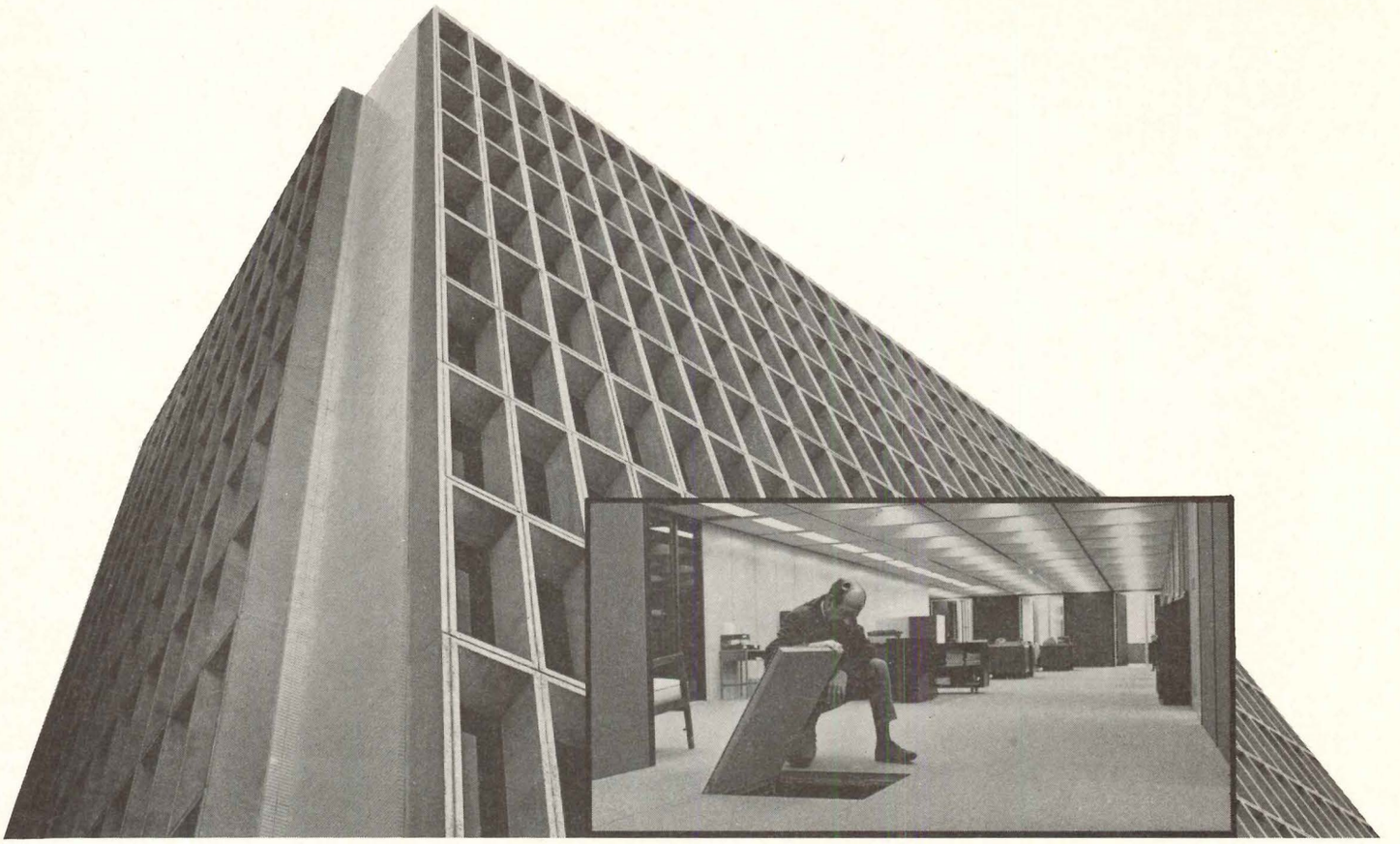
128,300 sq. ft. of free-access Weberfloor . . .



pays off in new 12-story Chicago office building.

Typical of the growing trend toward access flooring in general construction is the American Hospital Association's new building, designed by Chicago architect, Richard O. Evans of Schmidt, Garden & Erikson.

The structure's 128,300 square feet of free-access Weberfloor, 90% of it carpeted, was installed for less than $2.00 per square foot exclusive of floor covering. Most of this figure will be offset by a combination of immediate savings in construction costs and future maintenance economies.

By providing ample, fully accessible underfloor space for electrical services, the Weberfloor system completely eliminated the cost of headers and raceways in the floor slabs. Pedestals were installed on the semi-finished slabs and then adjusted for height. Power troweling was eliminated. Floor slabs were poured as soon as formwork and reinforcing were in, with mechanicals installed later on top of the slab. Result: a shorter pour schedule that moved completion ahead a full month.

Future savings and complete flexibility in use of the building's floor space are even more attractive. Because Weberfloor panels can be raised and interchanged at will, electrical and telephone lines can be reached and relocated economically, without slitting carpets or drilling concrete.

Write for free booklet. The use of free-access Weberfloor in two major applications and its significant advantages for general construction are covered in detail. Write for your copy to Weber Architectural Products, Division of Walter Kidde & Company, Inc., 1340 Monroe Avenue N.W., Grand Rapids, Michigan 49502.

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There's a Haws fountain that's just right for every wall, every hall—
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HAWS® Since 1909 **DRINKING FOUNTAINS**

Let Haws solve your drinking problems.

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But don't let the bright, good looks fool you.

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Weyerhaeuser Prefinished Siding/Panel 15 goes just about anywhere. It's a great siding. And a hard-working interior paneling that can take it where the going is rough.

There's a full line of accessories to meet most installation requirements. And non-treated Panel 15 carries a Class II flame spread rating, with Class I flame spread rating also available.

If all that doesn't convince you it's time to take a long look at this product, full technical data will.

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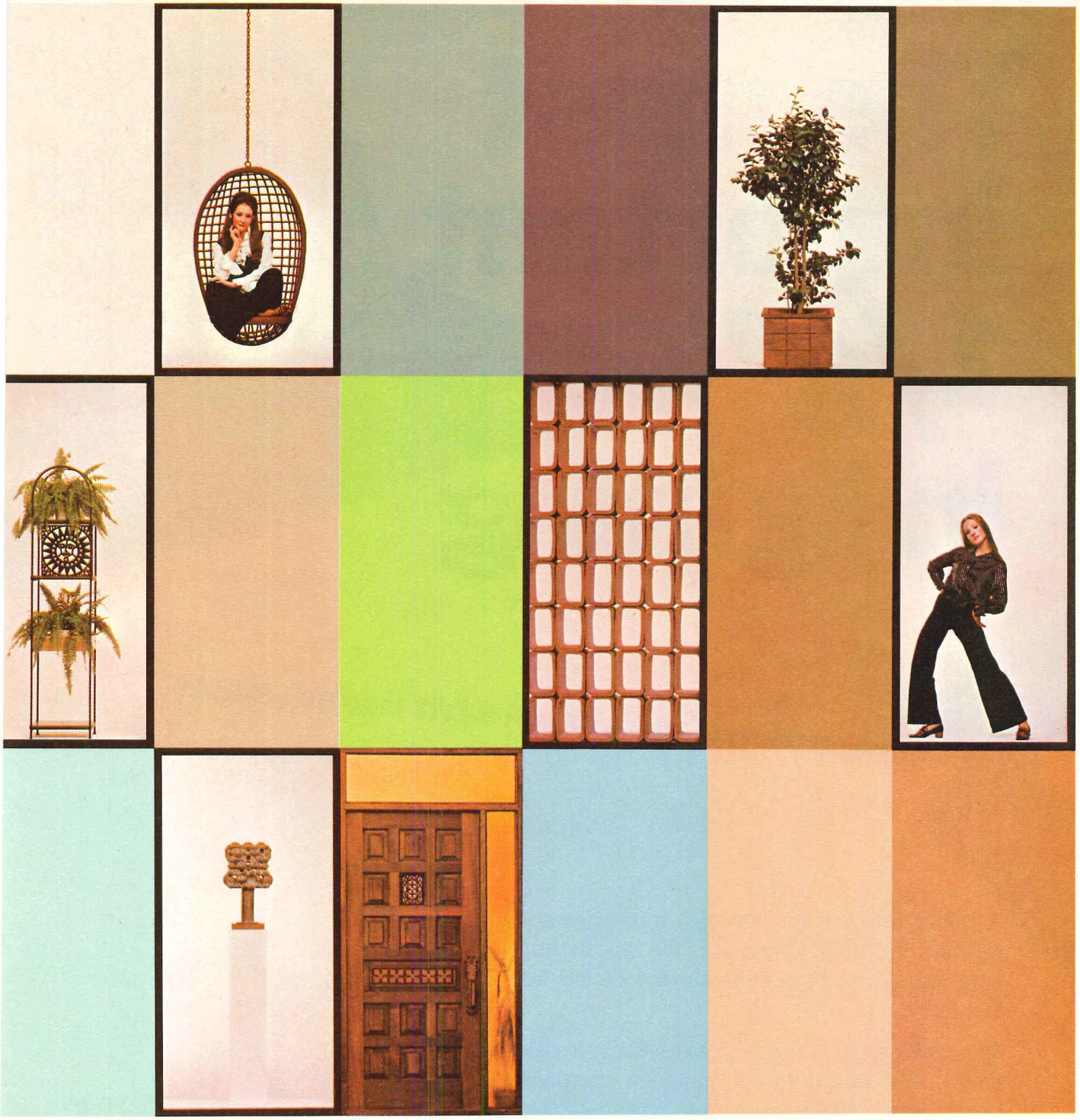
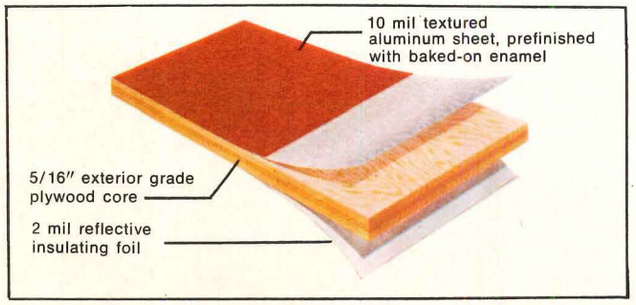


23 basic colors. Or dream up your own.



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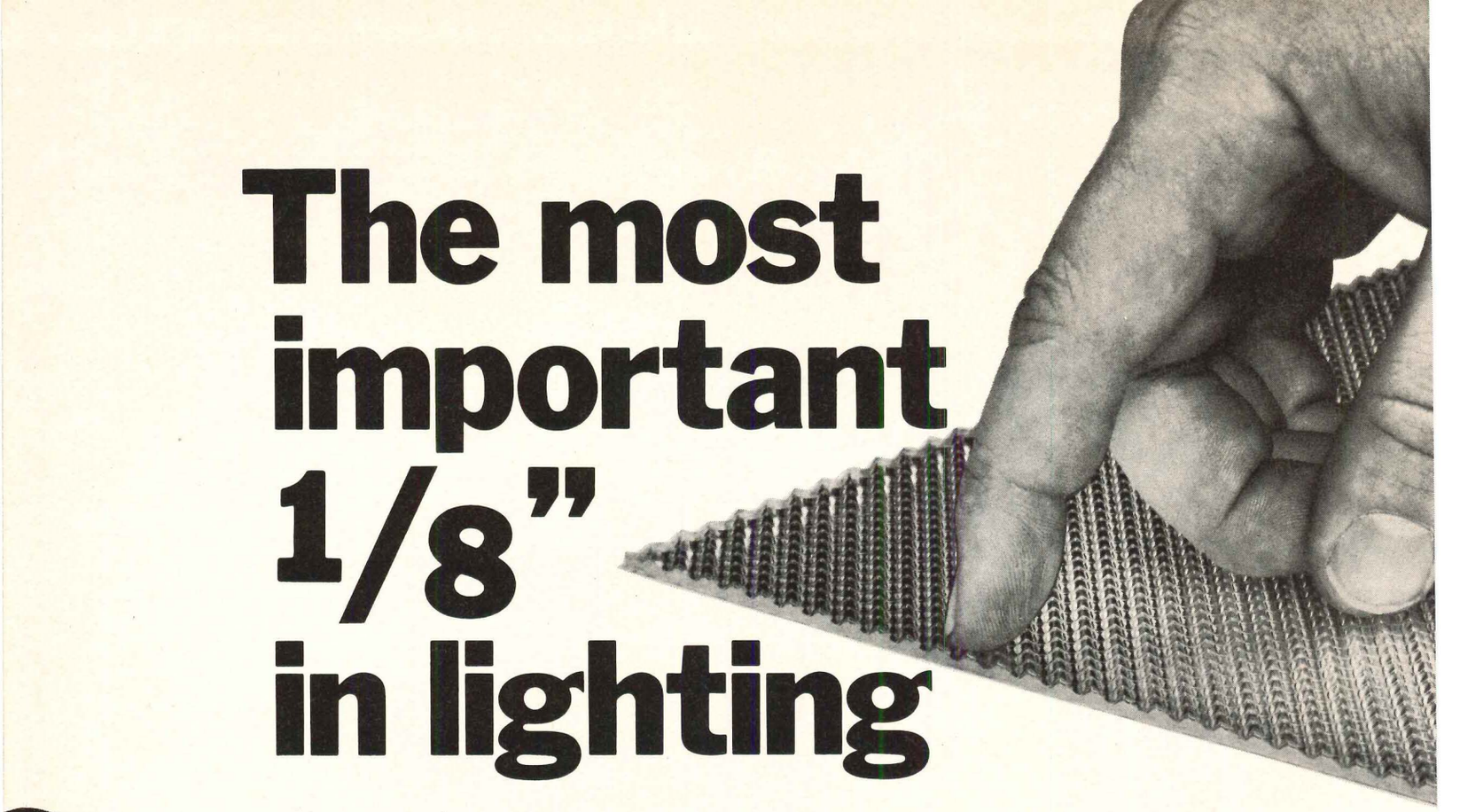
Weyerhaeuser

The most important 1/8" in lighting



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An office should be a place of beauty and comfort, as well as efficiency. The executive sees more of it than he does of his own home. Don't condemn anyone to days of drabness if you can help it—and you can. Only a man's signature says more about him than his office.

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DESIGNS FOR THE CAMPUS

BUILDING TYPES STUDY 406
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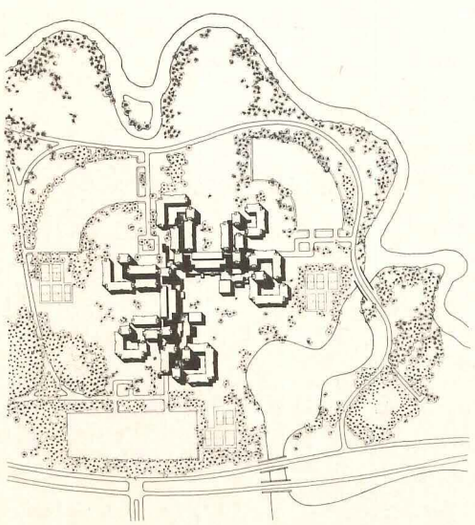
A good share of the best current architecture is still to be found on the U.S. campus, and campus planning and college building design continue to form a major part of the work in the offices of many leading architects and planners. Among the better clients is the State University Construction Fund which under the direction of its general manager, Dr. Anthony Adinolfi, plans the development and constructs the buildings for over 30 campuses in New York State and has worked with over 100 architectural firms in the process.

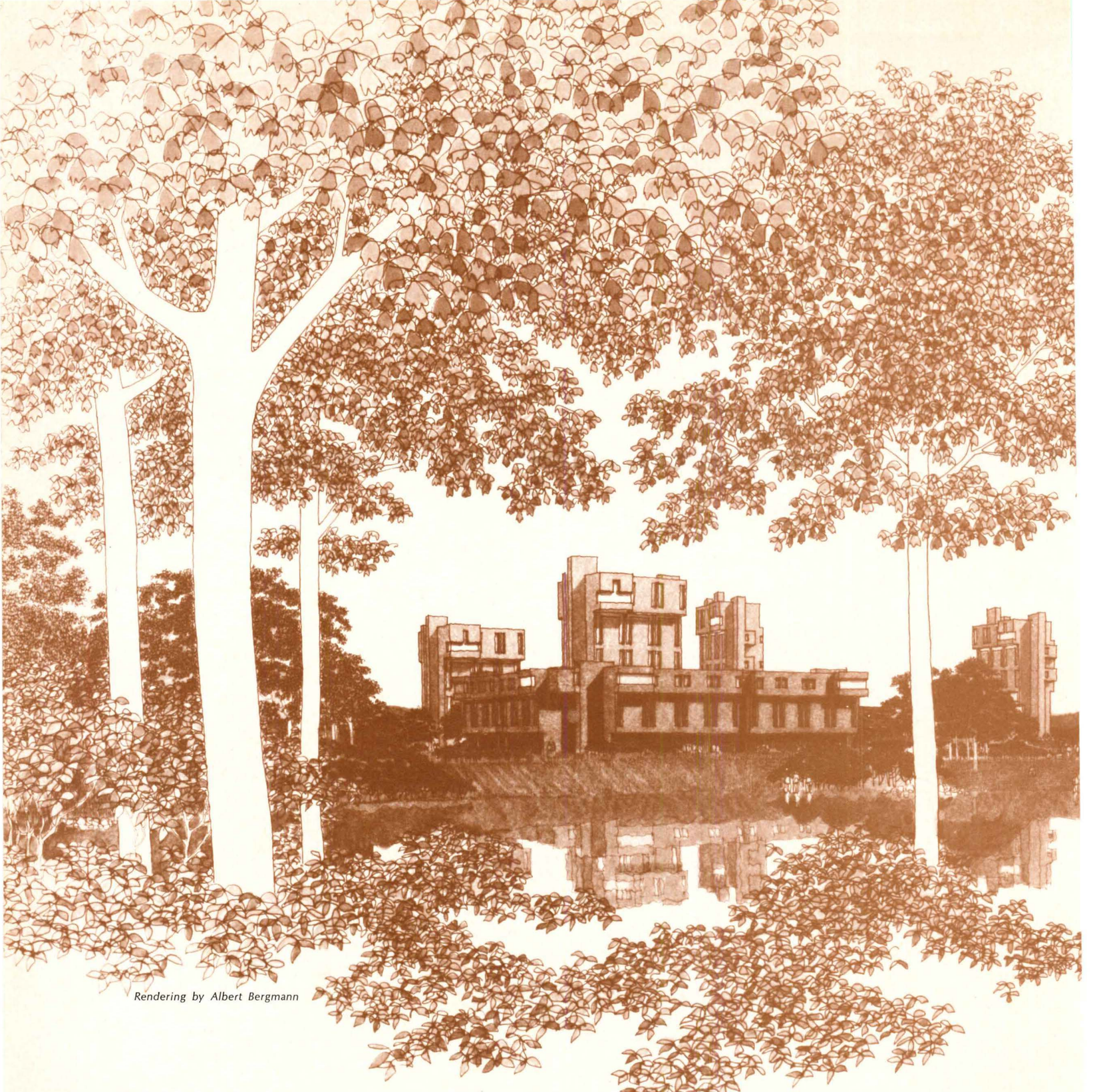
Of great recent interest is the new 1,200 acre campus of the State University of New York at Buffalo to accommodate between 30 and 36 thousand enrolled students by 1975. Over 20 distinguished architectural and planning firms are now involved in this huge project. Although it is still too early to do a design report on the complete campus, the first residential college complex, a group of six interrelated colleges for 6,000 students, is fully developed as a design, and is shown in project form on the following pages. It is the work of the firm of Davis, Brody and Associates who are also the architects of new residential buildings for the State University College at New Paltz, New York, also shown in this issue.

Included also are two science buildings designed by Edwin William de Cossy of the firm of Douglas Orr, de Cossy, Winder & Associates—one a small general facility for Hollins College, the other a large life sciences center for Trinity College. Both buildings share a common design approach. Larger and more complicated than either of these two science buildings and presented for purposes of contrast is the Amherst College Science Center in Amherst, Massachusetts by Campbell, Aldrich & Nulty.

—Mildred F. Schmertz



Site plan for the six-college complex for the State University of New York at Buffalo.



Rendering by Albert Bergmann

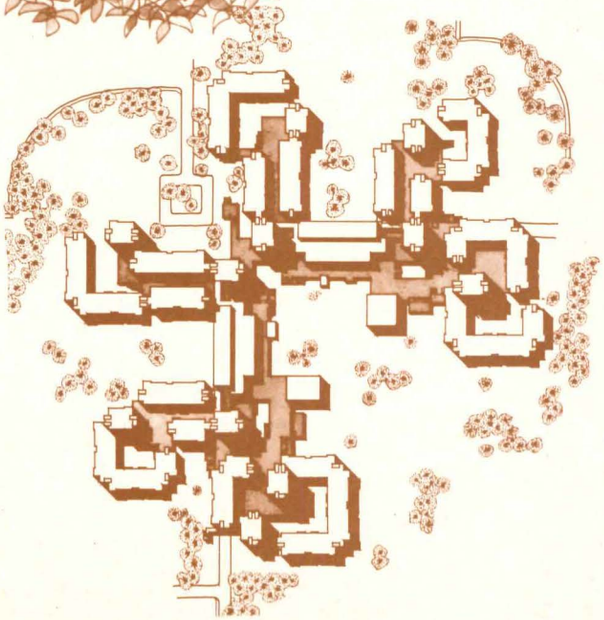
A SIX COLLEGE COMPLEX—FLEXIBLE BUT STABLE, COMMUNAL

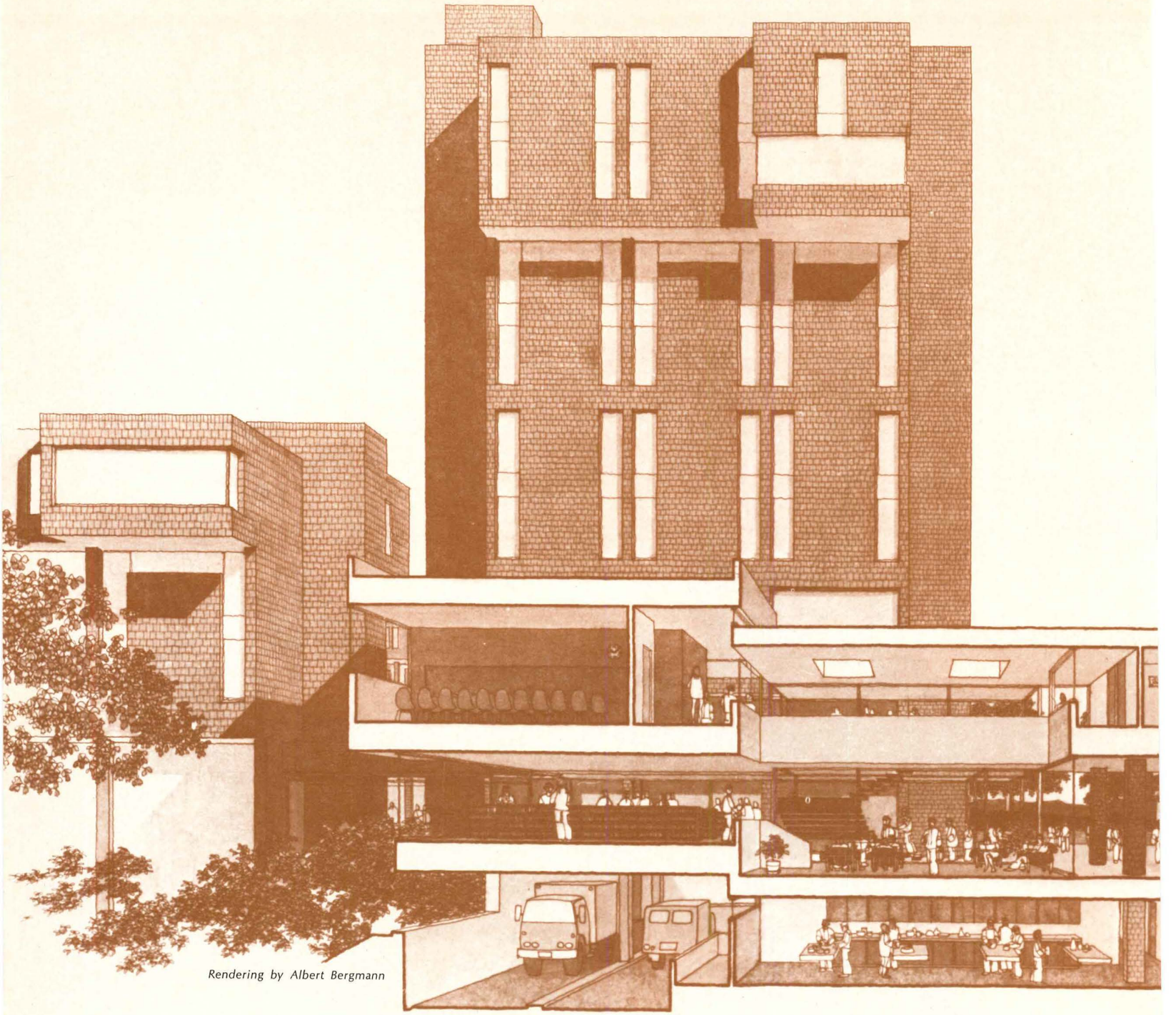
The resolution of these paradoxes and some others equally trying is a major concern of the group of leading architects and planners presently at work on the new 1,200-acre campus of the State University of New York at Buffalo in suburban Amherst. Planned to become one of the major universities of the nation within the next decade, and a planning and construction project of unprecedented scale in its field, it will eventually accommodate 30,000 students and 5,000 faculty members. Poser of the paradoxes is Martin Meyerson, president of the University and noted planner. In an extensive programing directive in which he outlines the hoped for character of the future university and establishes a basis for flexible and changing physical development he demands a "sophisticated coping with paradoxical requirements (which often means provisions for both ends of the paradox)."

Begun first and therefore furthest along in the planning process is the six-college complex for 6,000 students (2,400 residents and 3,600 commuters) by Davis, Brody and Associates shown on these and the following two pages. Meyerson believes this solution to be an excellent and highly encouraging example of what he is after. In this complex the forms are flexible, but the lightweight steel construction, the overscale tan brick finishes, the other materials chosen, as well as the methods of detailing are all consistent and unchanging. The basic manner in which dormitory, dining, library, classroom, lounge, communal and cir-

THOUGH PRIVATE, USEFUL YET BEAUTIFUL

culation facilities are integrated is stable and constant, yet flexible, repeatable and extensible in many variations. Opportunities for group activity and expression as well as informal student faculty encounters are infinite, yet there are spaces where each student and teacher may find privacy and quiet. The architects have found an esthetic in this usefulness, flexibility and consistency. The towers which become landmarks identifying their colleges are handsome. Well-scaled open space within the colleges and on their perimeters is free, a gift of the intricate and ingenious plan. A man-made lake, the solution to a drainage problem, will greatly enhance the scene. The six colleges with their interconnecting plazas are shown in the plot plan (right).



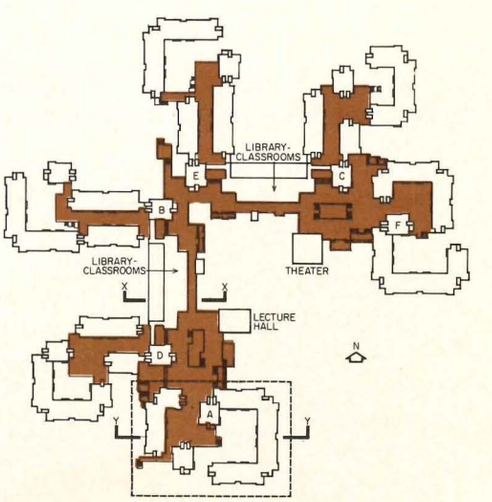


Rendering by Albert Bergmann

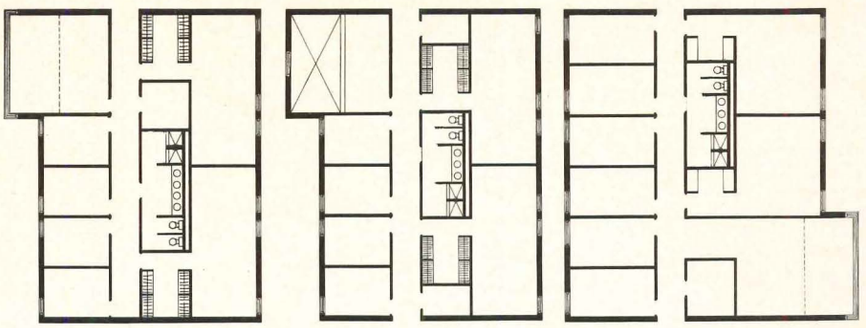
College 'A' will be the first of six colleges to be built in this complex. Also scheduled for early construction will be the library-classroom wing shown in the rendered section above. This wing will link Colleges 'A' and 'D' with 'B' and 'E' whose dormitory towers appear in the rendering. A two-lane service roadway can be seen at the lower left-hand corner of the section, below the main plaza level. This road enters the complex from the southwest and extends north to the intersection of Colleges 'B' and 'E' and east to 'C' and 'F'. It will provide underground service to each of the six dining hall kitchens located at this level as well as to other receiving areas. It is also an automobile and bus road, and bus stops will be provided. Included among the facilities on this level are the libraries for Colleges 'A' and 'F', arts and crafts studios, a computer center, classrooms, a book shop and storage space.

Shown in the section at the plaza level is a two-story high library space, one of four provided for Colleges 'D', 'B', 'E' and 'C'. Classrooms and offices are located at the mezzanine level of these libraries. Also located at the plaza level, for the use of all six colleges, are a lecture hall and drama workshop. The plaza itself forms a continuous pedestrian outdoor link for all six colleges. As the plans indicate, it will be quite an interesting and varied space interrupted by overhangs, broad steps and terraces, and offering good views of people, activities, buildings and landscape. Indoor pedestrian passageways beneath the plaza interconnect the colleges, permitting comfortable circulation in all weathers. The dormitory floors are based on three typical 10-student unit plans (opposite page top), separated by stairs and entrance halls. Each unit has a common bath facility and lounge space. Room sizes vary and some single rooms are provided. Students can arrange furniture to suit themselves.

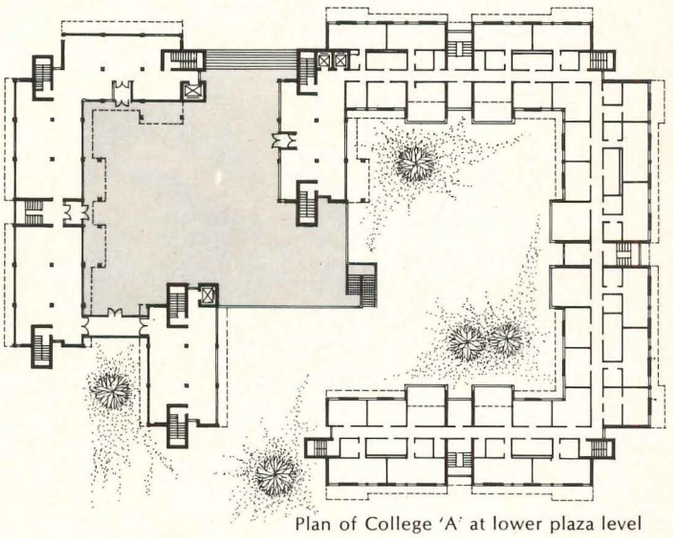
SIX COLLEGES, STATE UNIVERSITY OF NEW YORK AT BUFFALO, Amherst, New York. Client: *State University Construction Fund.* Architects: *Davis, Brody and Associates;* associate architects: *Milstein, Wittek, Davis and Associates;* structural engineers: *Geiger and Berger;* mechanical and electrical engineers: *Cosentini Associates;* landscape consultants: *Sasaki, Dawson, DeMay Associates.*



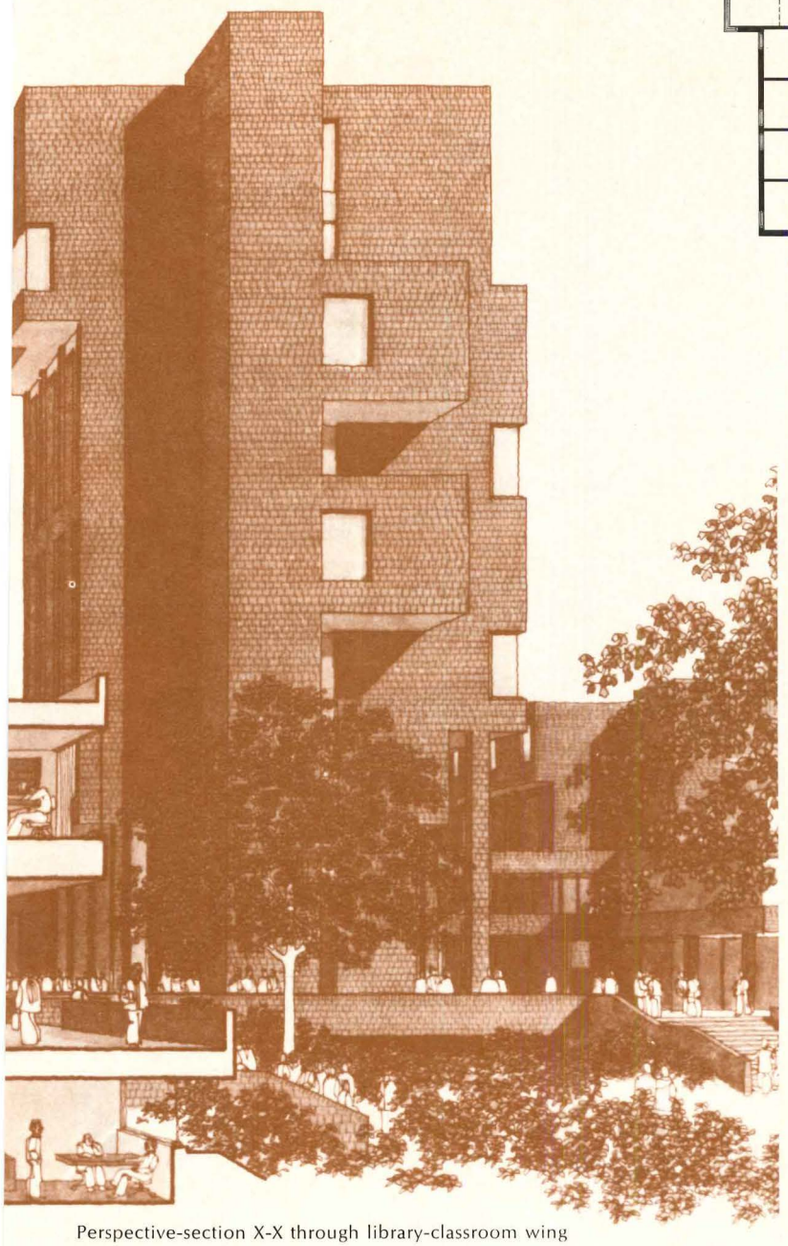
Plaza level of Colleges 'A' to 'F'



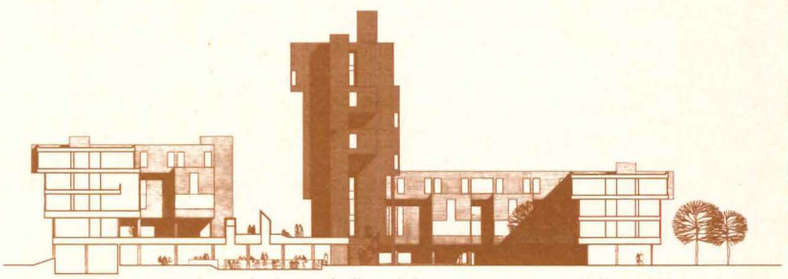
Typical 10-student dormitory units



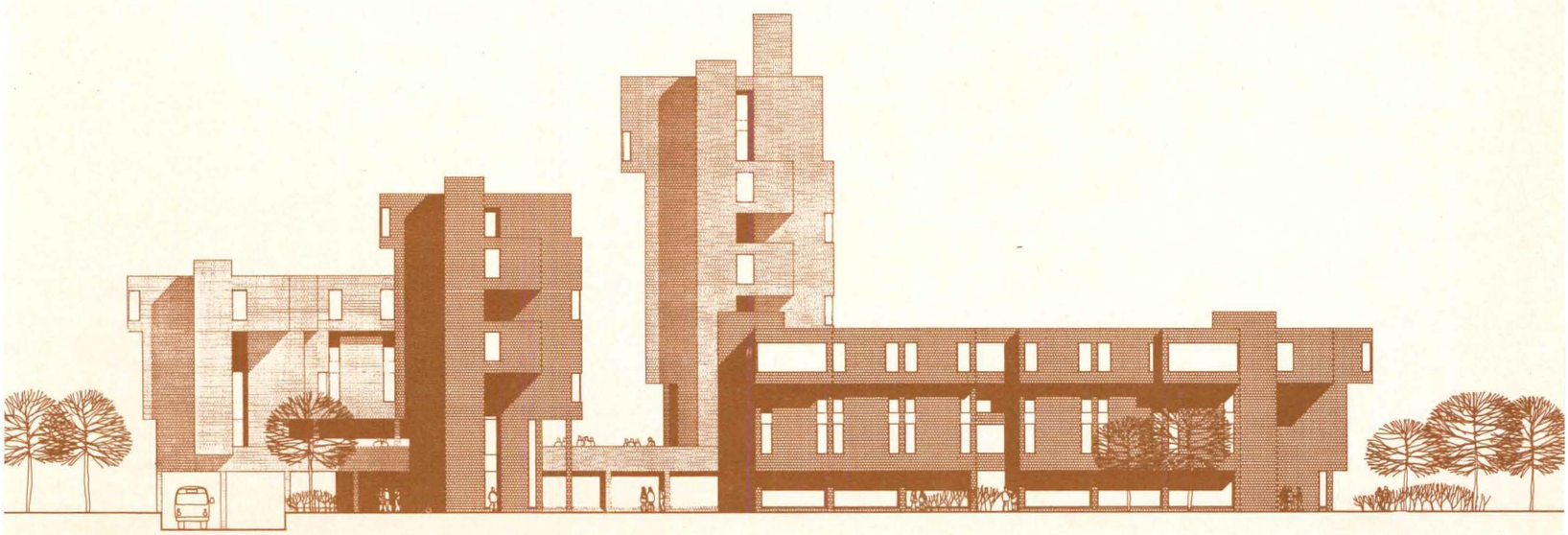
Plan of College 'A' at lower plaza level



Perspective-section X-X through library-classroom wing

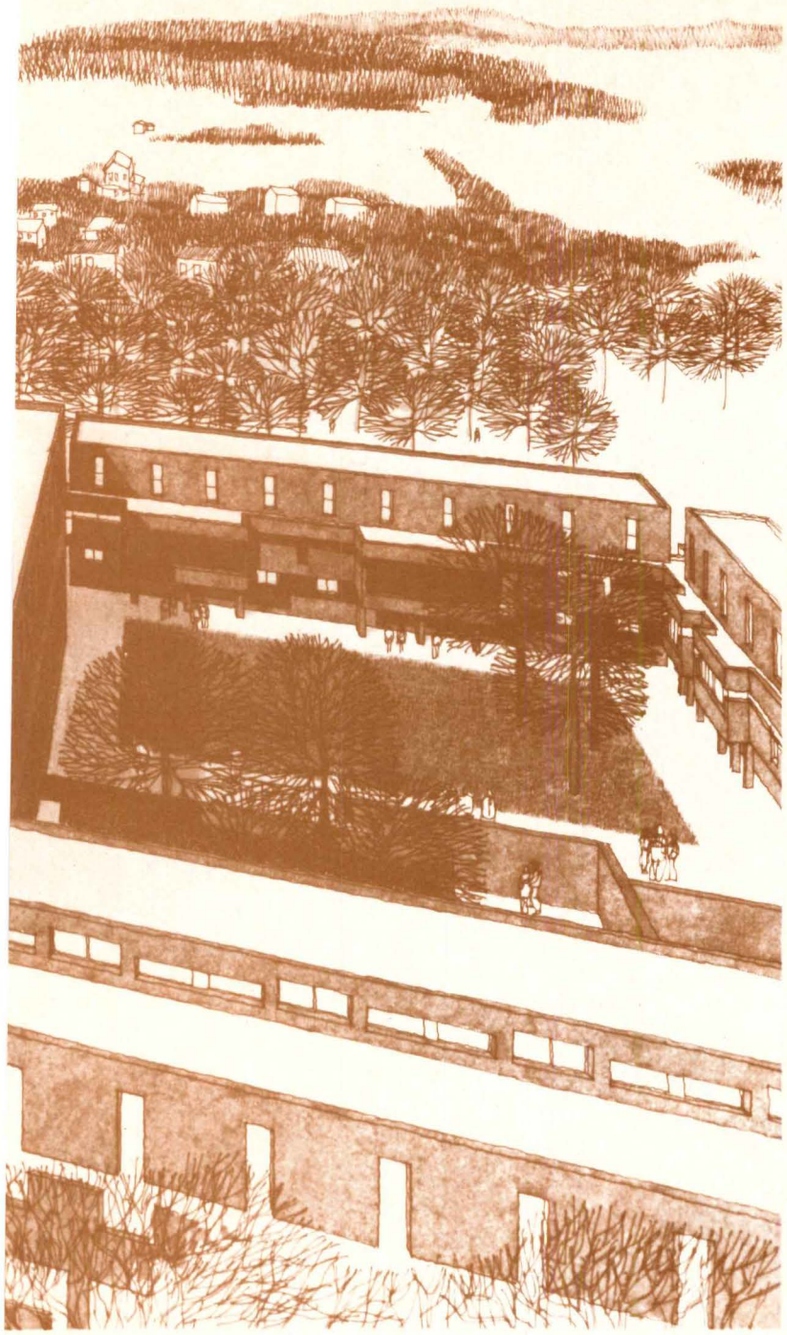


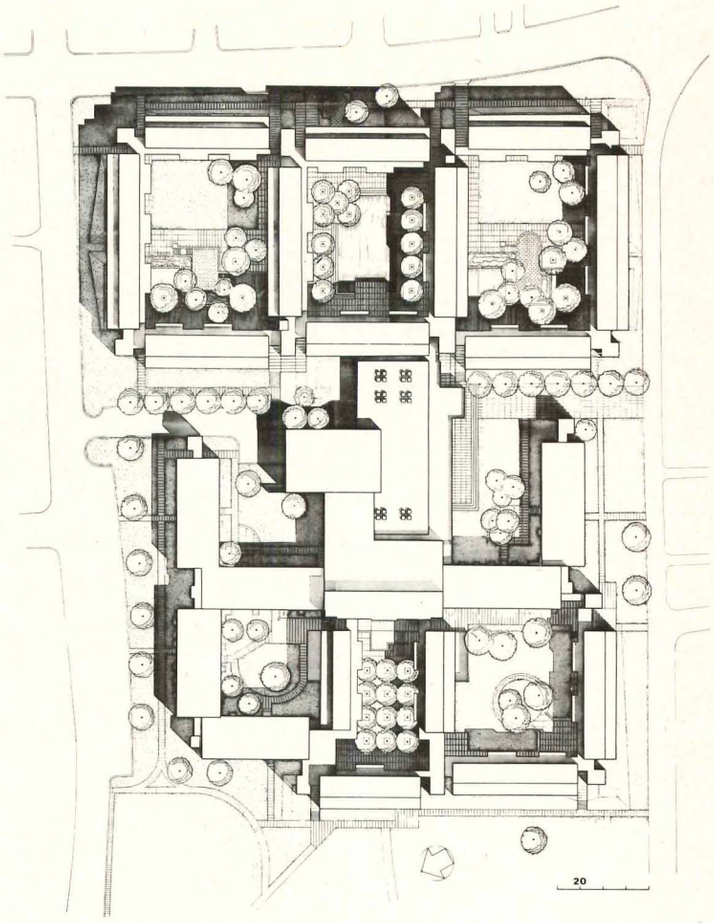
Section Y-Y through dining hall and dormitory units at College 'A'



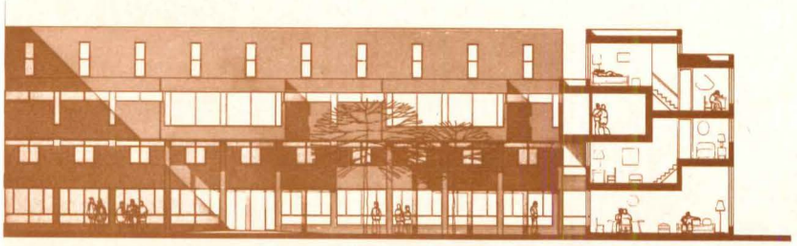
Rendering by Albert Bergmann

A LARGE CAMPUS

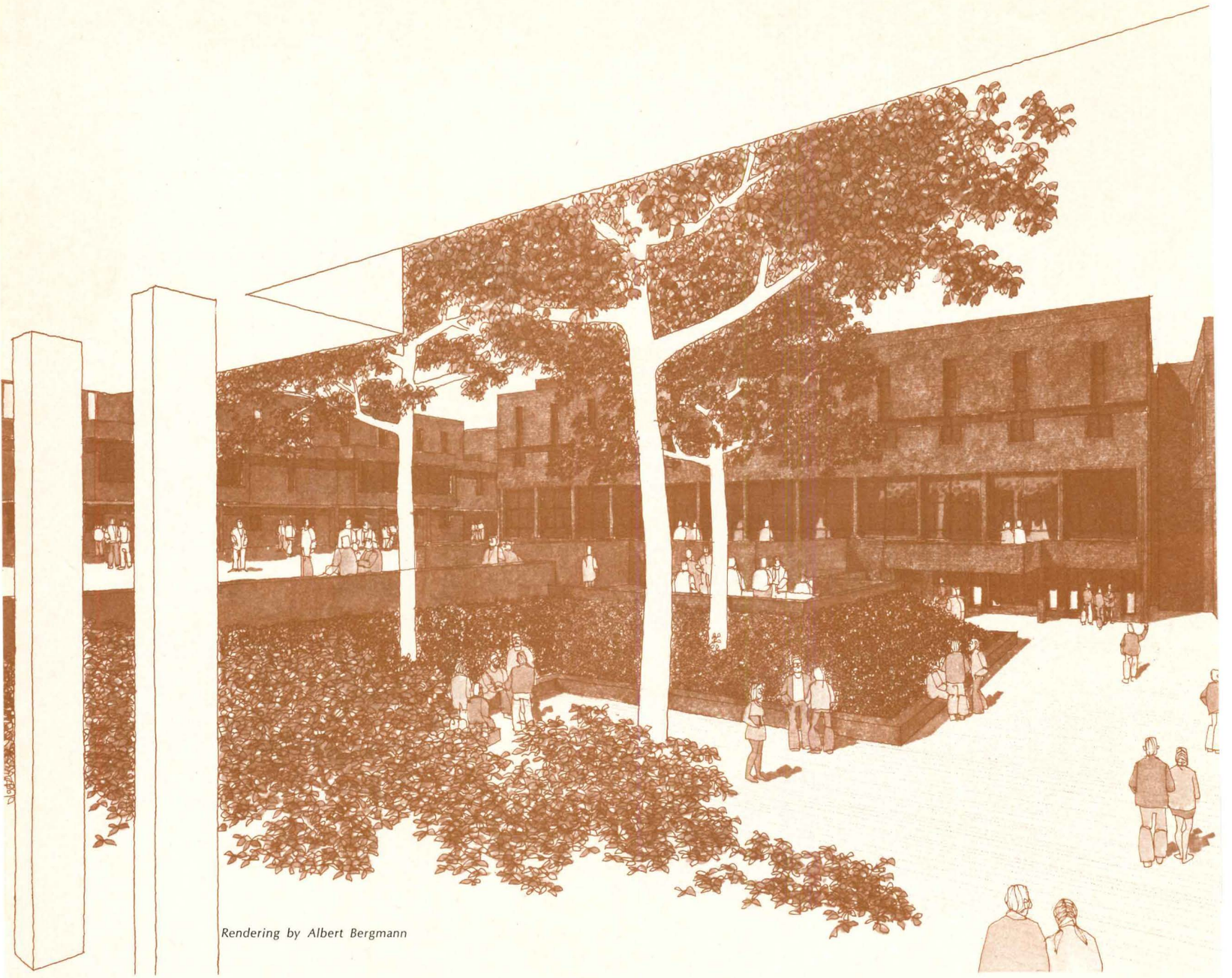




RESIDENTIAL COMPLEX DESIGNED TO ACHIEVE A SMALL-SCALED RESIDENTIAL CHARACTER



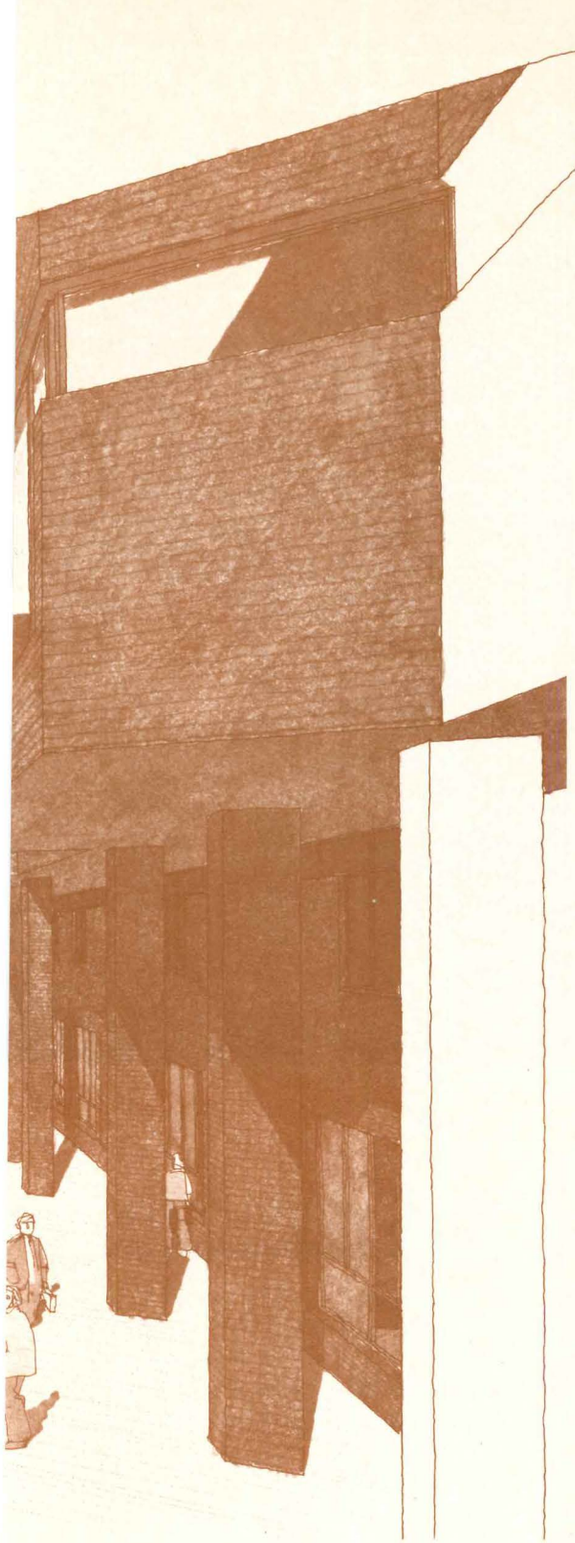
These 600-student dormitories for the State University College at New Paltz by Davis, Brody and Associates, like the six colleges this firm designed for SUNY at Buffalo, achieve economies by being essentially repetitive in their structural system, materials and details. They are more repetitive in form than Buffalo, however, consisting of ten similar wings forming three well-scaled courts linked to the existing College Hall shown in the plot plan. Five more wings will eventually be added to the opposite side of College Hall, which is to have its dining facilities expanded. These new wings will create three additional courts and complete the complex. Although the wings are a repetitive and unifying factor, this portion of the New Paltz campus will have great spatial variety and interest as well, for, as the perspective drawing and combined section-elevation (left) indicate, the interior spaces are intricately fitted together in a skip-stop arrangement which creates an intimately scaled pattern of windows and projecting elements.

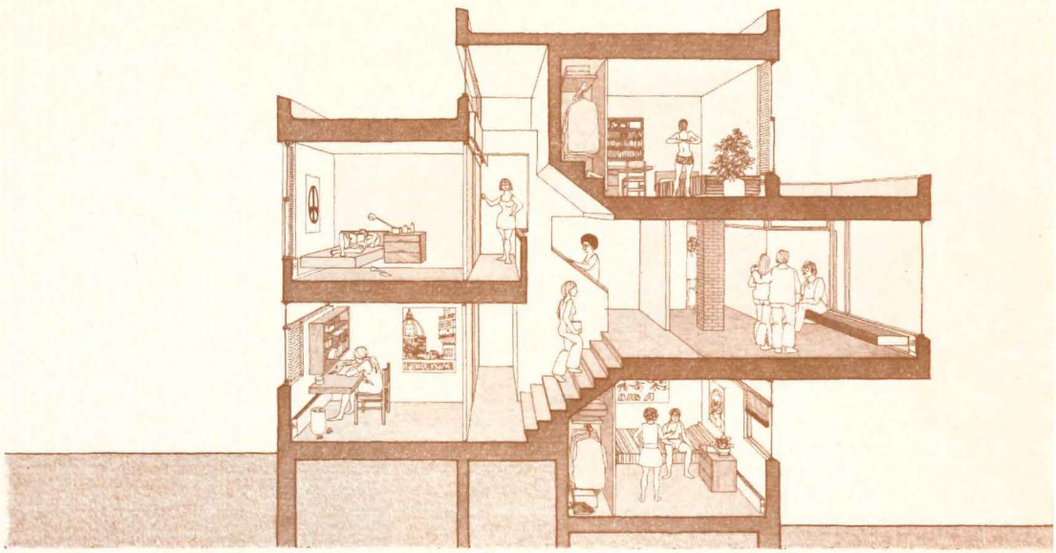


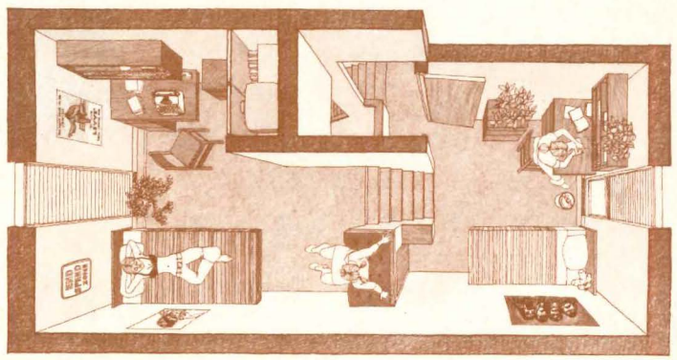
Rendering by Albert Bergmann

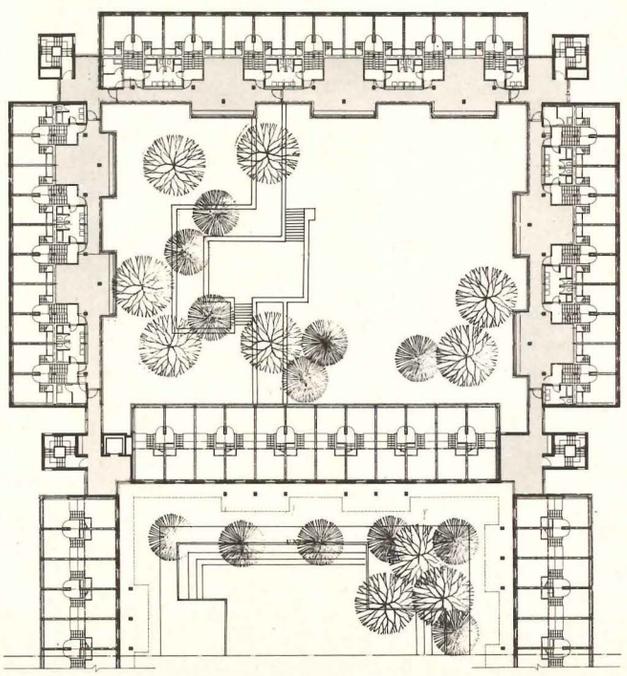
The arrangement of the two student sleep-study units is ingenious. The plan (right) shows three wings at one level and a partial plan of the levels directly above or below. (The main floor at courtyard level with its lounge, study and recreational areas is not shown.) Corner stair towers link the main dormitory-suite circulation floor with its cantilevered study-lounges (one for every eight students) and its common bathrooms (one for every four students). From this floor one enters each four-student suite—down to one two-student unit, and up to the other. As the perspective-section and perspective plan show, the two-student units provide a 7-step change of level within the unit, thus providing the individual student with a sense of being separated from his roommate and giving him a greater degree of privacy.

This scheme successfully satisfies a set of user-requirements which the architects developed in the feasibility study which they prepared for the State University Construction Fund before commencing the design preliminaries. According to their report, the student should be able to have a private study space which is his alone, but should be able to find a varety of study spaces that are different from his private study space, to provide a change of scene during protracted periods of work. He should be able to study in groups of varying size and with students who are not his immediate neighbors. He should be able to study at any time of day or night without disturbing or being disturbed by others. His bathroom should be shared with as few other students as feasible and should be directly accessible from his living unit. In addition, he



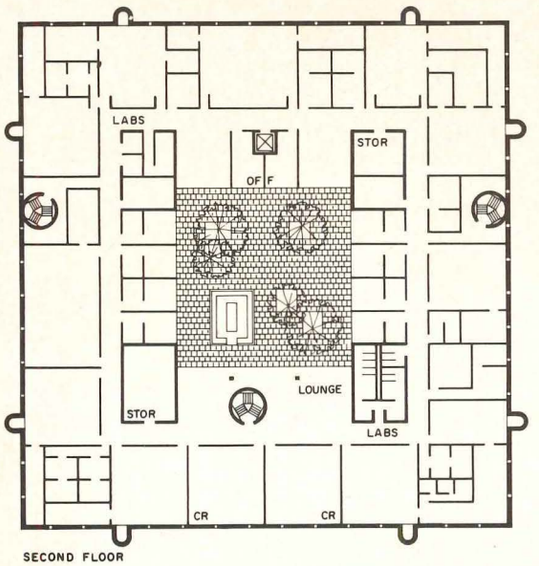




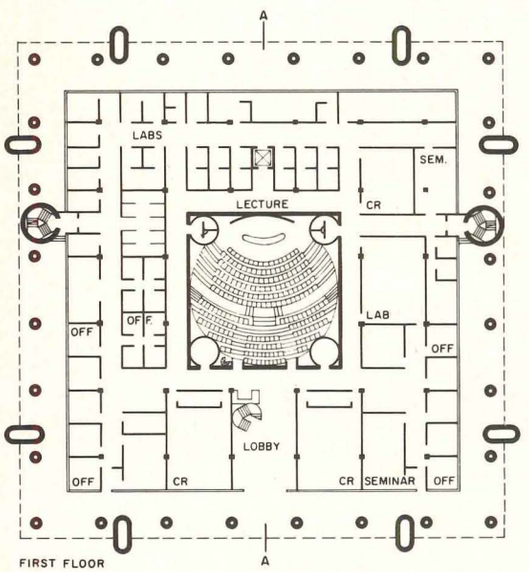


should be able to walk under cover between dormitory units, move easily from indoor to outdoor recreational areas, sense a difference in scale and architectural character between his dormitory complex and the academic buildings.

STATE UNIVERSITY COLLEGE AT NEW PALTZ, New York. Client: *The State University Construction Fund.* Architects: *Davis, Brody and Associates;* structural engineers: *Wiesenfeld and Leon;* mechanical engineers: *Wald and Zigas;* landscape consultants: *M. Paul Friedberg Associates.*

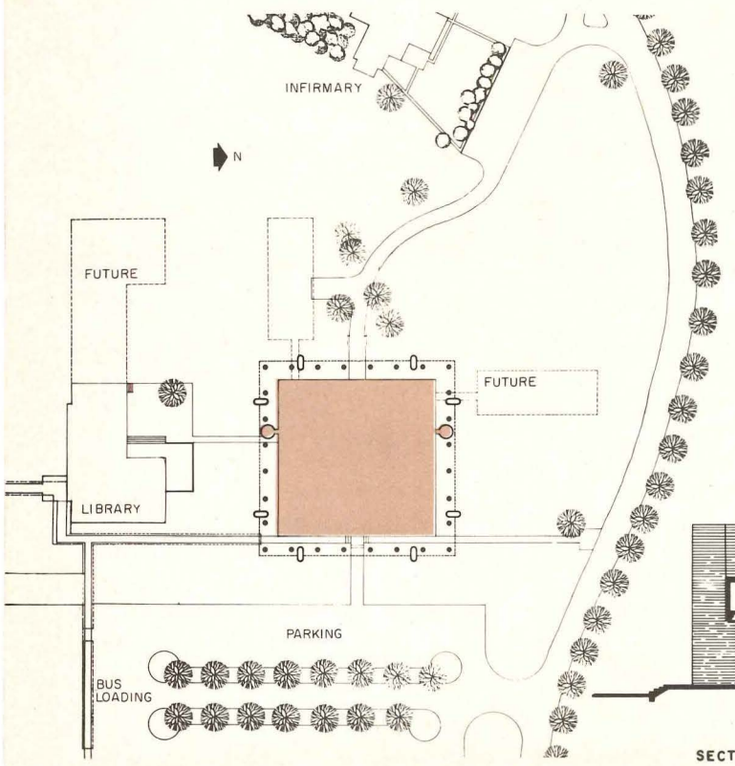


SECOND FLOOR



FIRST FLOOR

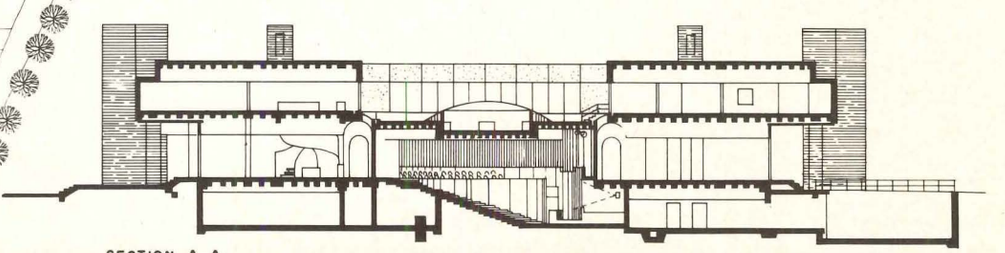
A SCIENCE BUILDING—CONTEMPORARY YET SEDATE—FOR AN OLD SOUTHERN COLLEGE



Hollins College is a 125-year-old school for women located in a lovely valley rimmed by mountains. Its new research and teaching facility, built of reinforced concrete columns and waffle slabs with exterior walls of pink brick, does not aggressively assert its scientific purpose, but is gracious, humane and inviting in a manner befitting the traditions of the school.

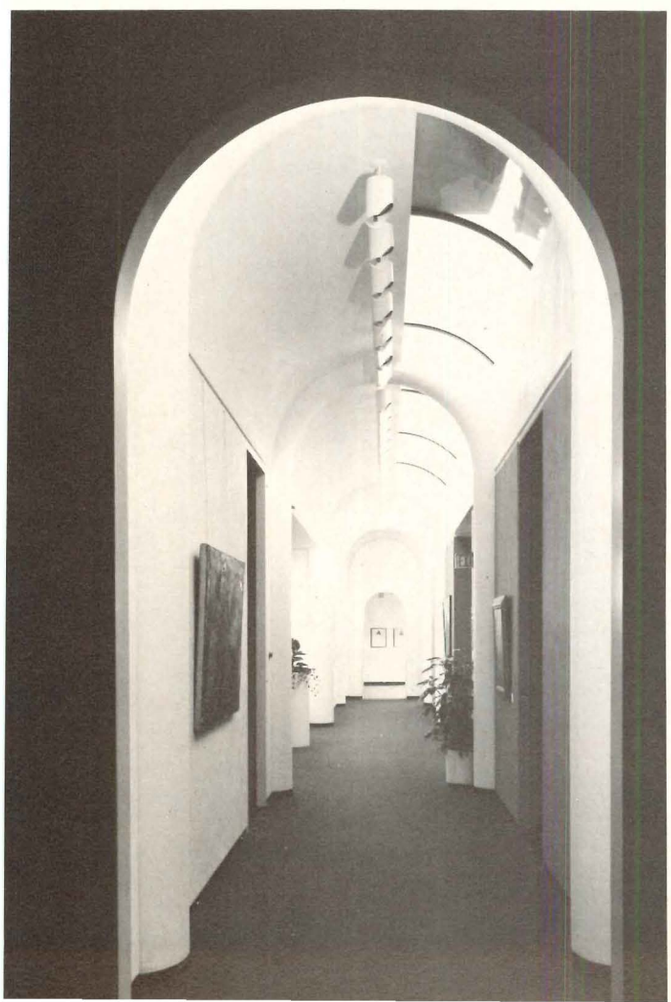
Small and well-scaled, it has been designed to accommodate those departments with the heaviest traffic—mathematics, statistics and psychology—on the first floor, and those departments with exhaust problems—biology, chemistry and physics—on the second. The vertical shafts carry all major air-conditioning and mechanical service lines.

The building has many amenities including the curved ceiling, sky-lit corridors surrounding the square lecture hall, a domed conservatory on the roof terrace and generous lounge spaces, all shown in the section (below) and in the photos (opposite page).



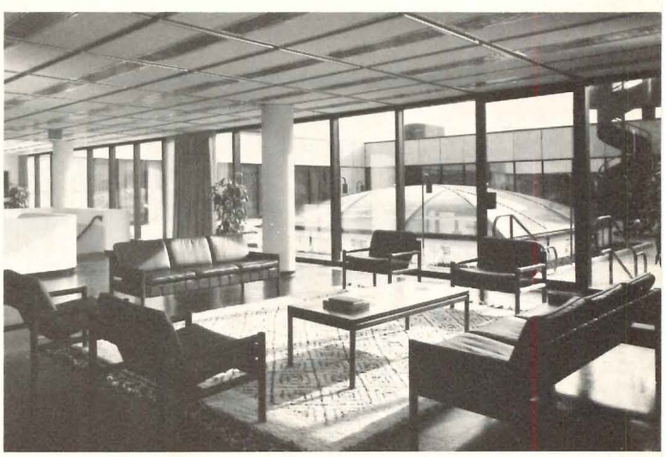
SECTION A-A

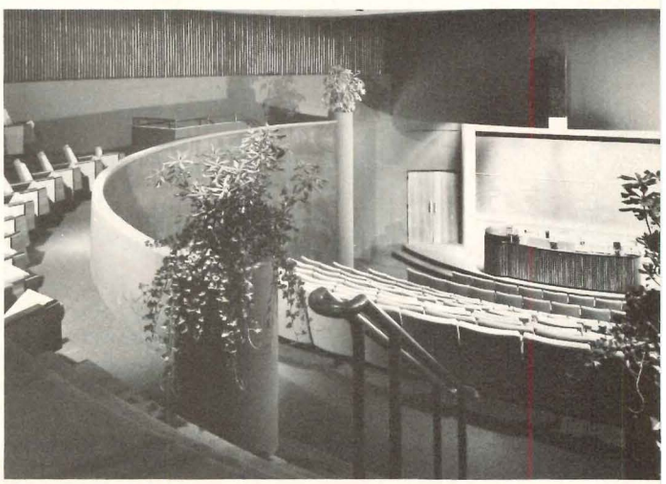
© Ezra Stoller (ESTO) photos

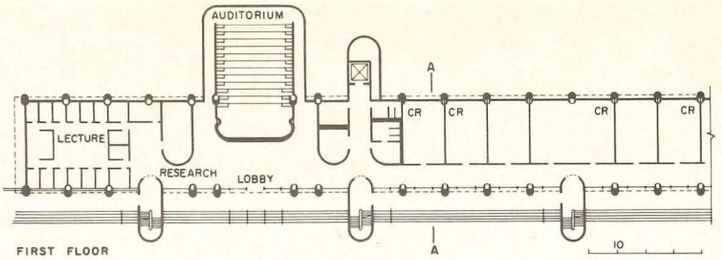


The roof-top terrace shown below and beyond the lounge in the photo (right) has, in addition to the domed greenhouse, an aluminum spiral stair which leads to a circular platform called the Astronomy Tower.

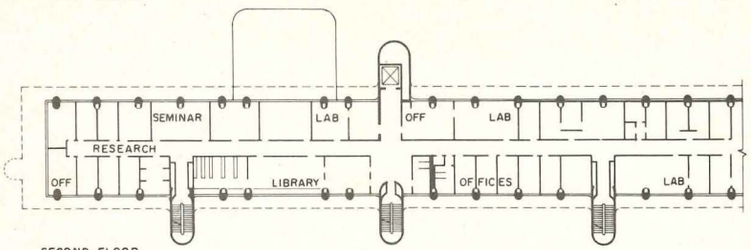
THE CHARLES A. DANA SCIENCE BUILDING, Hollins College, Virginia. Architects: *Randolph Frantz & John Chappelear and Douglas Orr, de Cossy, Winder & Associates-Edwin William de Cossy, partner-in-charge of design;* structural engineers: *Fraioli-Blum-Yesselman Associates;* mechanical engineers: *Sowers, Rodes & Whitescarver;* landscape architects: *Zion & Breen Associates;* contractor: *H. A. Lucas & Sons, Inc.*



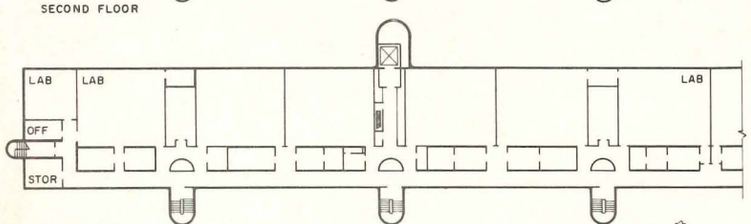




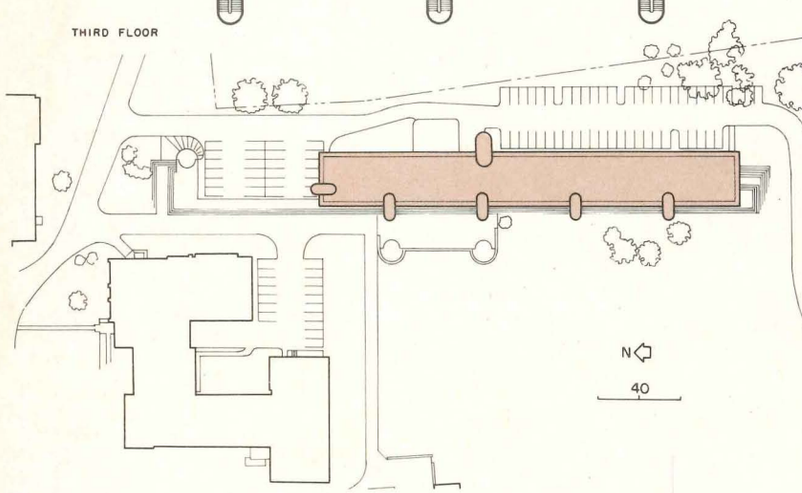
FIRST FLOOR

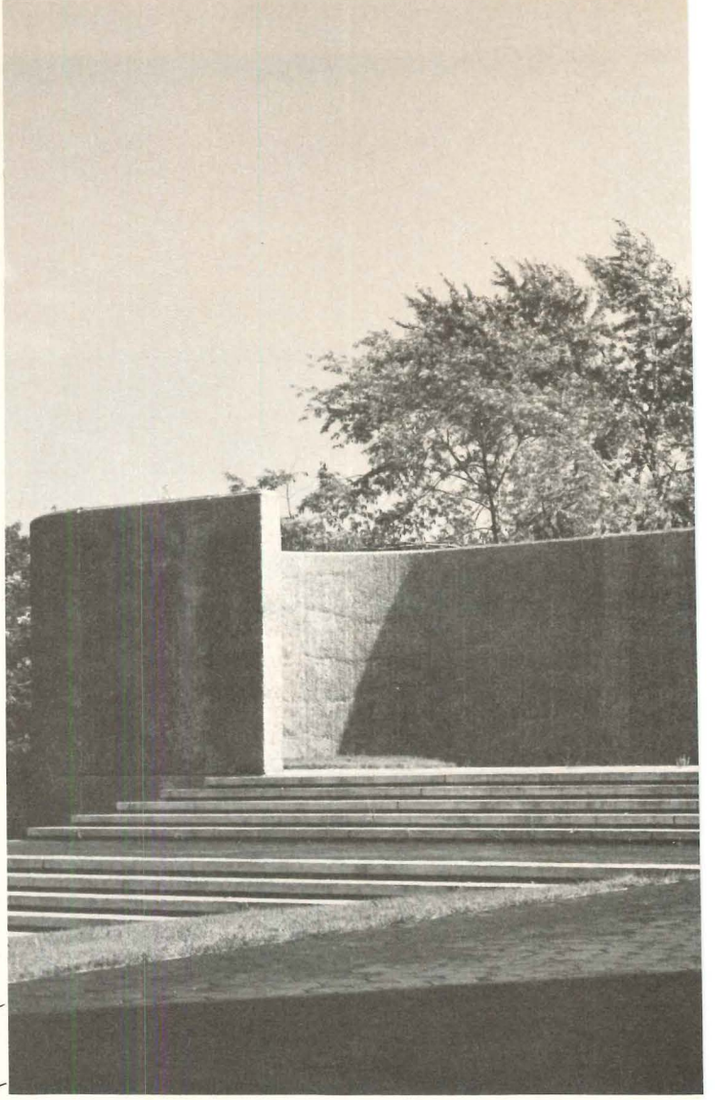


SECOND FLOOR

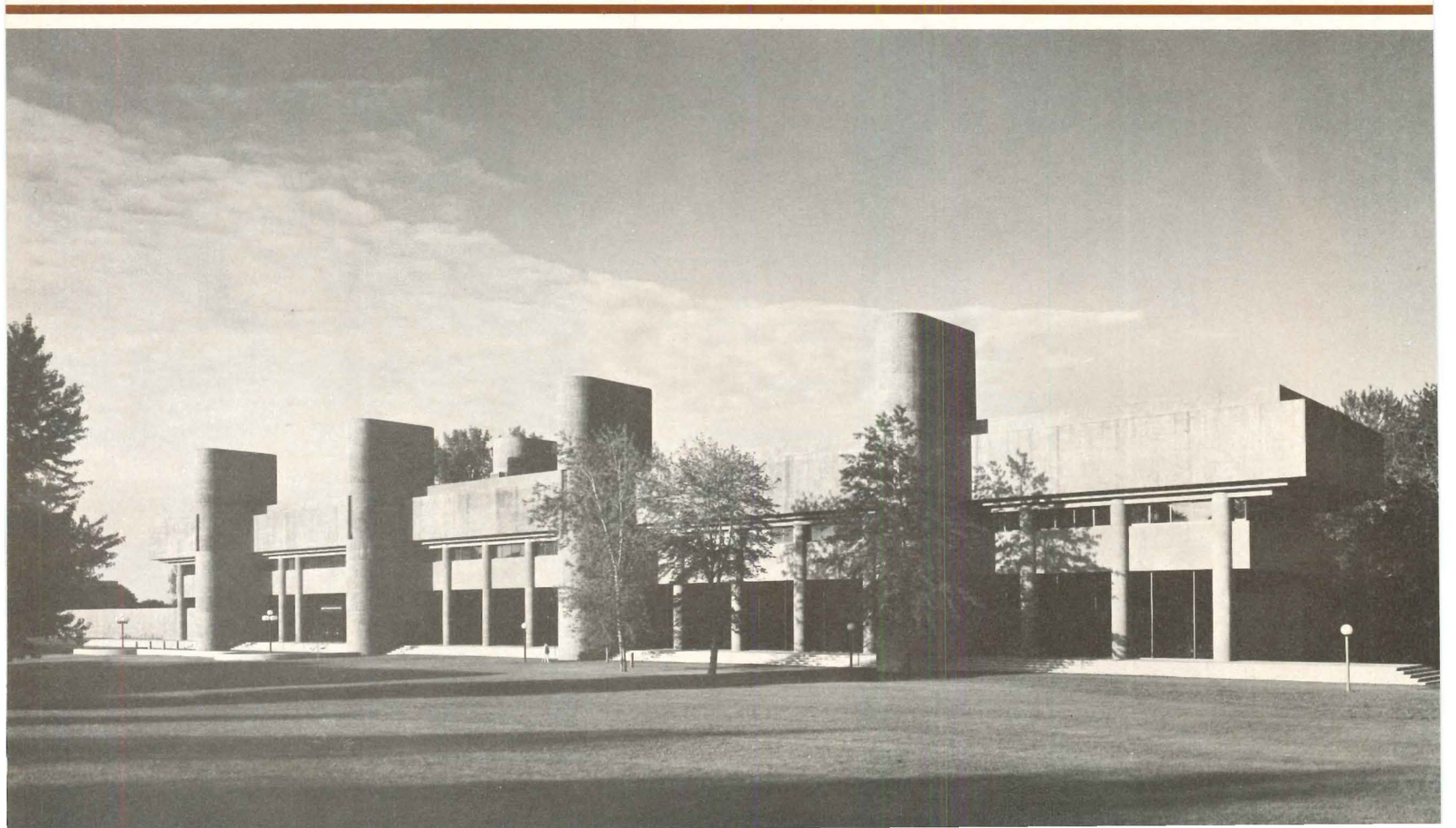


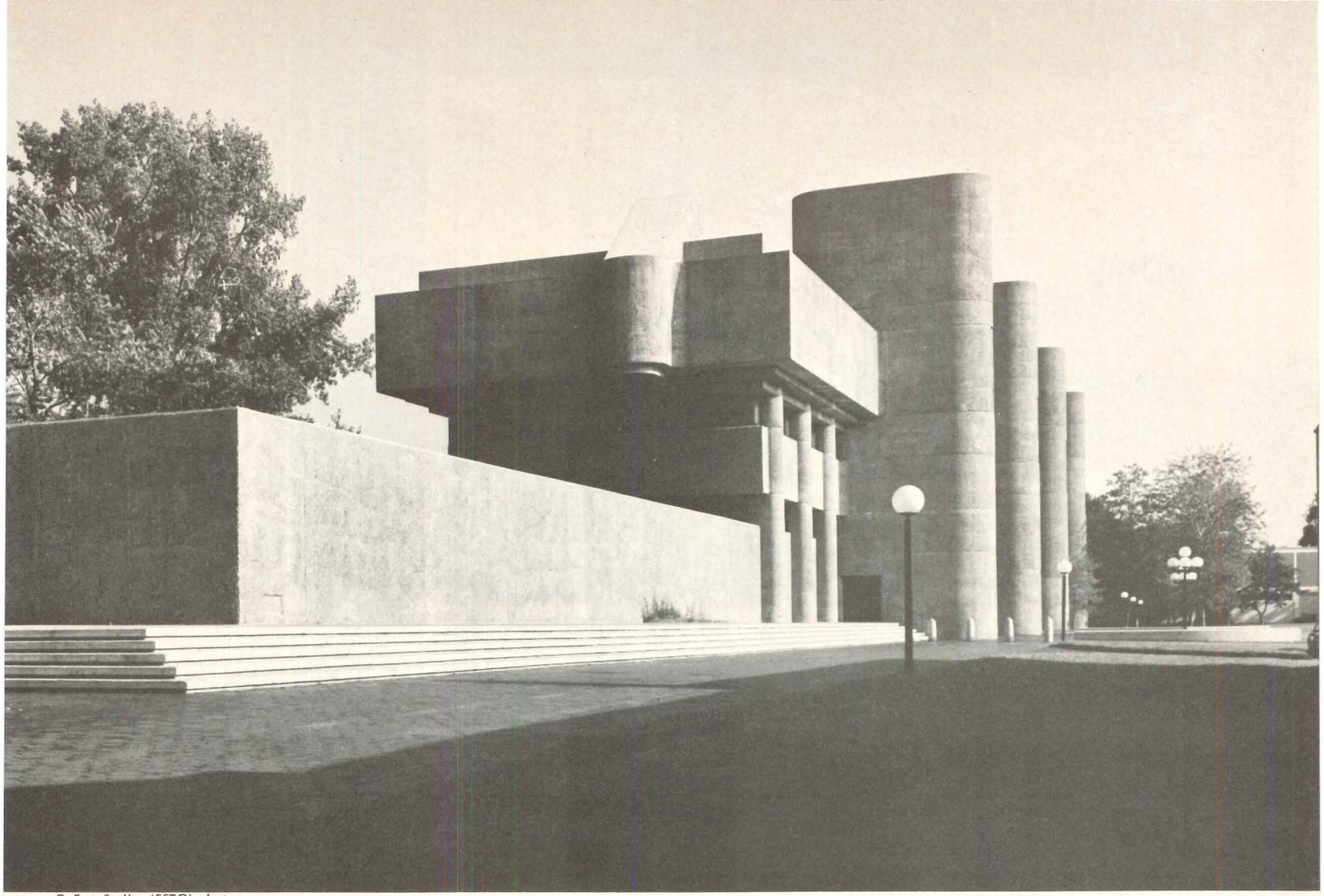
THIRD FLOOR





A LIFE SCIENCES BUILDING

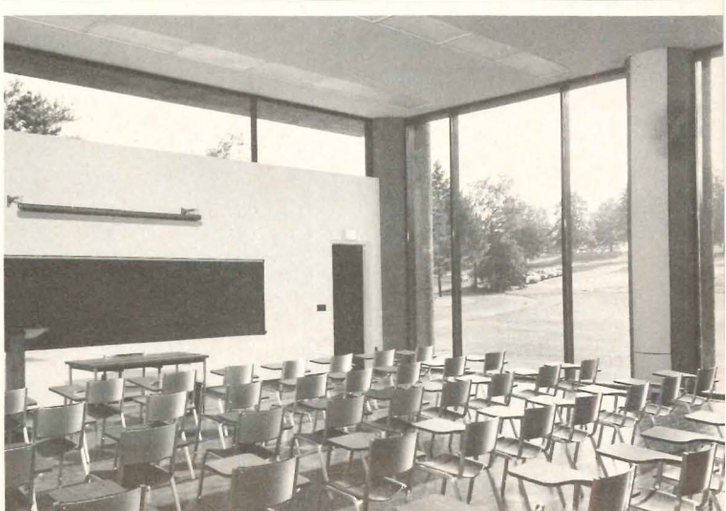


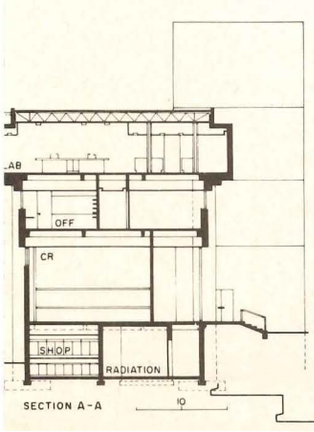


DESIGNED AS A WALL

This elongated structure, recently completed for Trinity College, is actually a 400-foot-long wall building which closes and visually contains an important portion of the campus space. Much of the oldest part of the Trinity College campus is composed of long, interconnected, three- and four-story stone masonry buildings which taken together form the campus space by walling off the street. Thus the over-all concept of the Life Sciences Building is based upon the past planning traditions of Trinity.

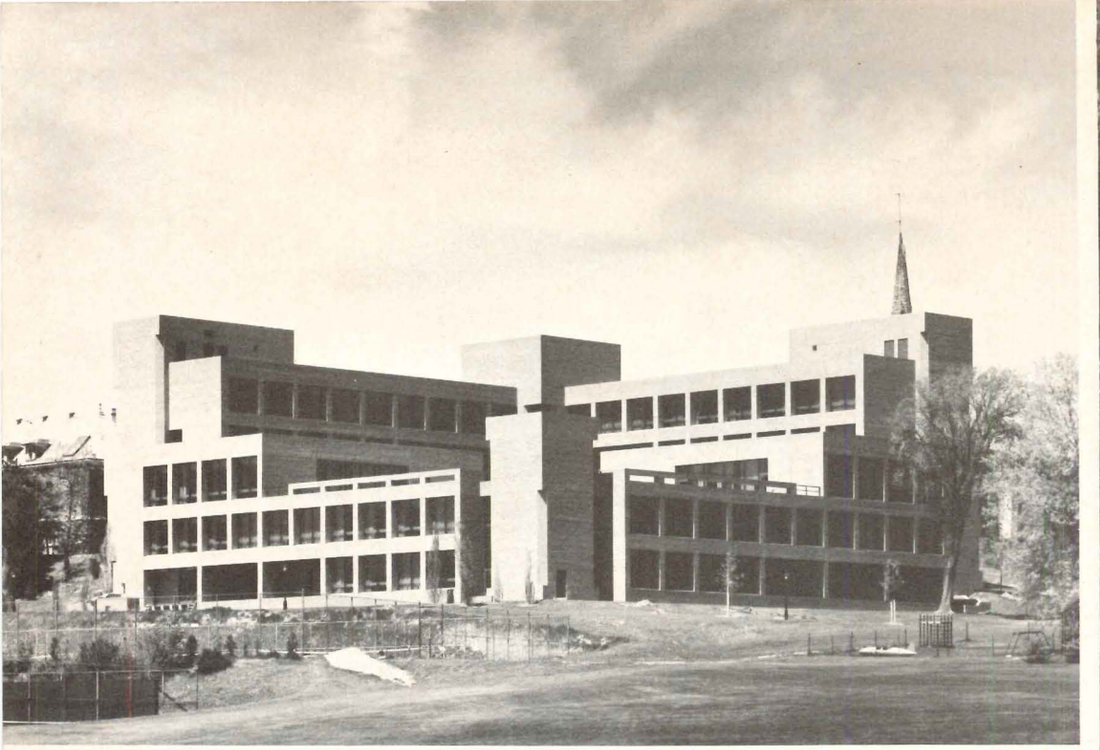
As the plans (opposite page) indicate, the eight major biology laboratories to which there is sporadic traffic are located on the top floor in the most flexible space. The faculty research laboratories and offices, as well as the more specialized activities of the psychology department are located on the second floor. The general classrooms, a teaching auditorium, and the major teaching area of the psychology department are at the ground level.

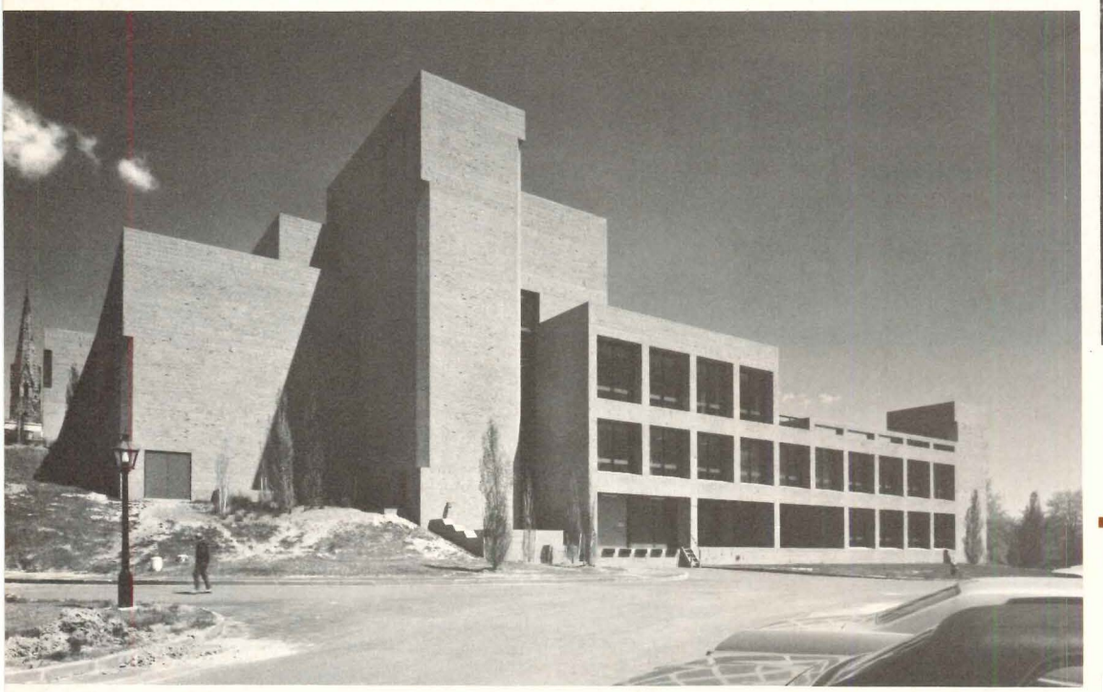


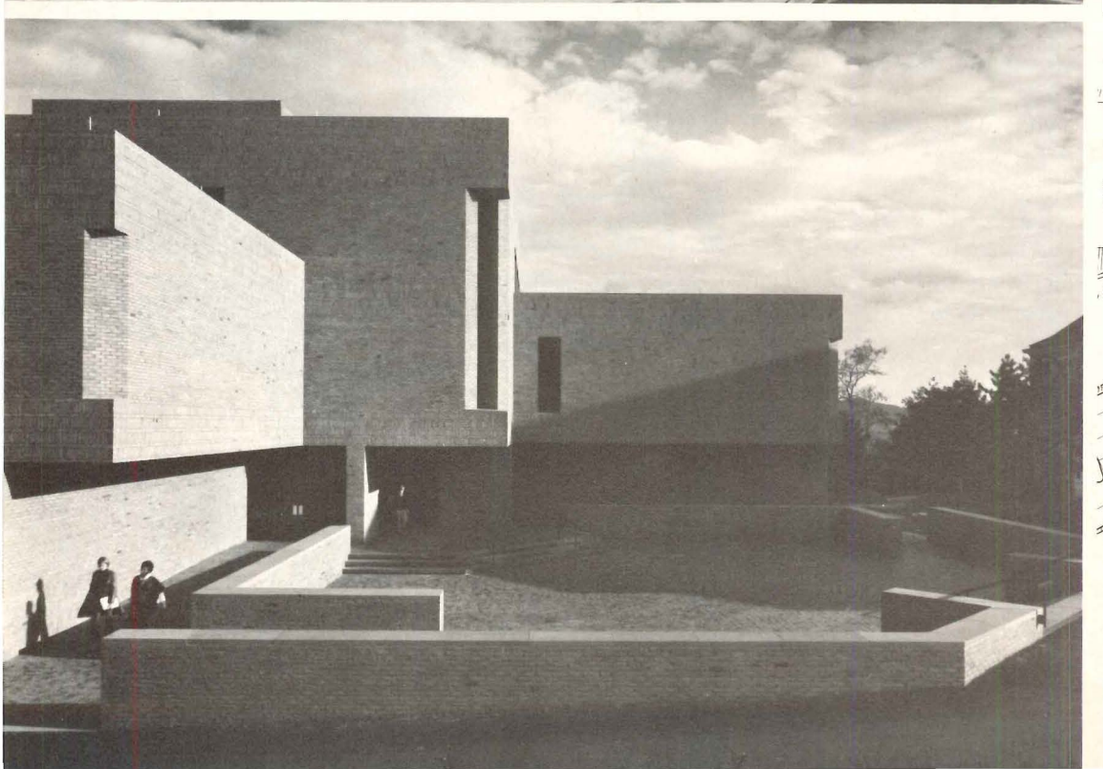


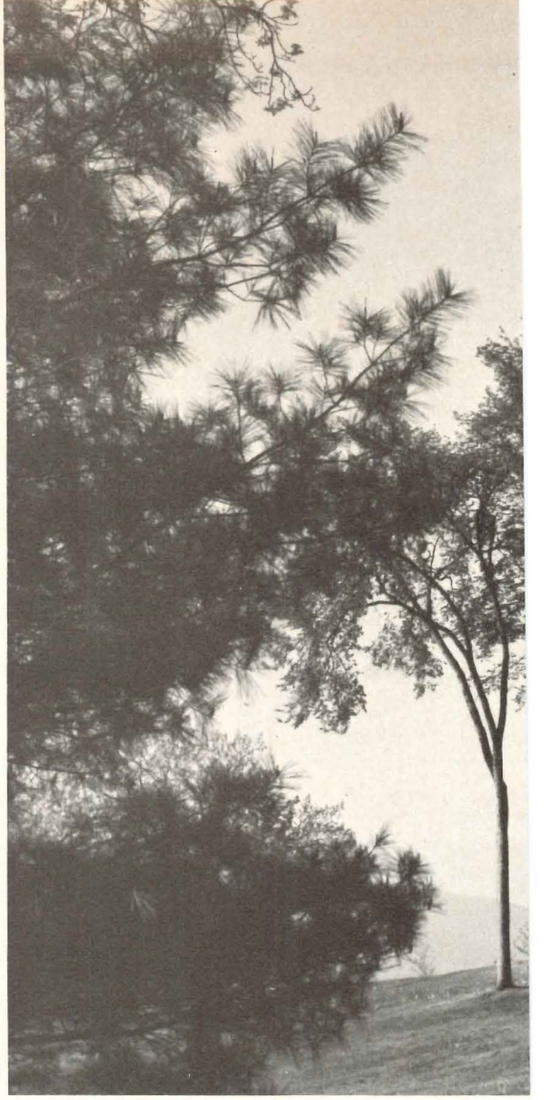
The stair towers, which appear taller than one would expect, house mechanical equipment in their upper portions. They recall the entry systems used elsewhere on campus and provide direct access to specific areas. The principal entry (right) and the classroom (below) show typical interior finishes. The long, low horizontal wall (top photo) conceals a large outdoor parking area. The structural system consists of concrete columns and pan slabs.

THE ALBERT C. JACOBS LIFE SCIENCES BUILDING, Trinity College, Hartford, Connecticut. Architects: *Douglas Orr, de Cossy, Winder & Associates —Edwin William de Cossy, partner - in - charge - of - design;* structural engineers: *Pfisterer, Tor & Associates;* mechanical engineers: *van Zelm, Heywood & Shadford;* landscape architects: *Zion & Breen Associates;* contractor: *The Wadhams & May Company.*

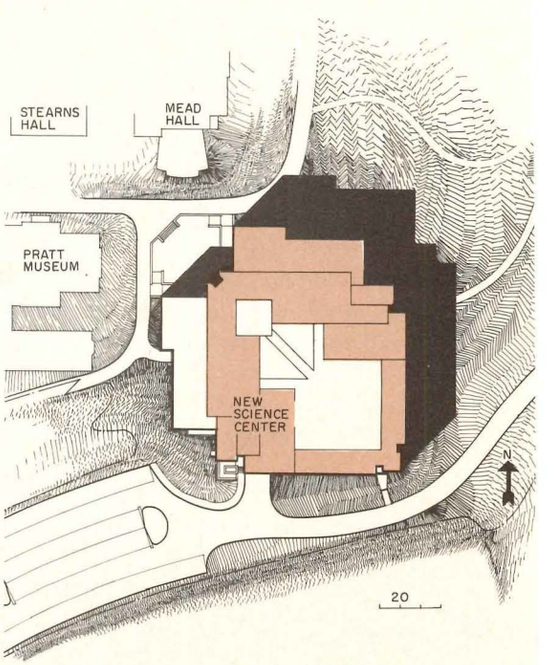


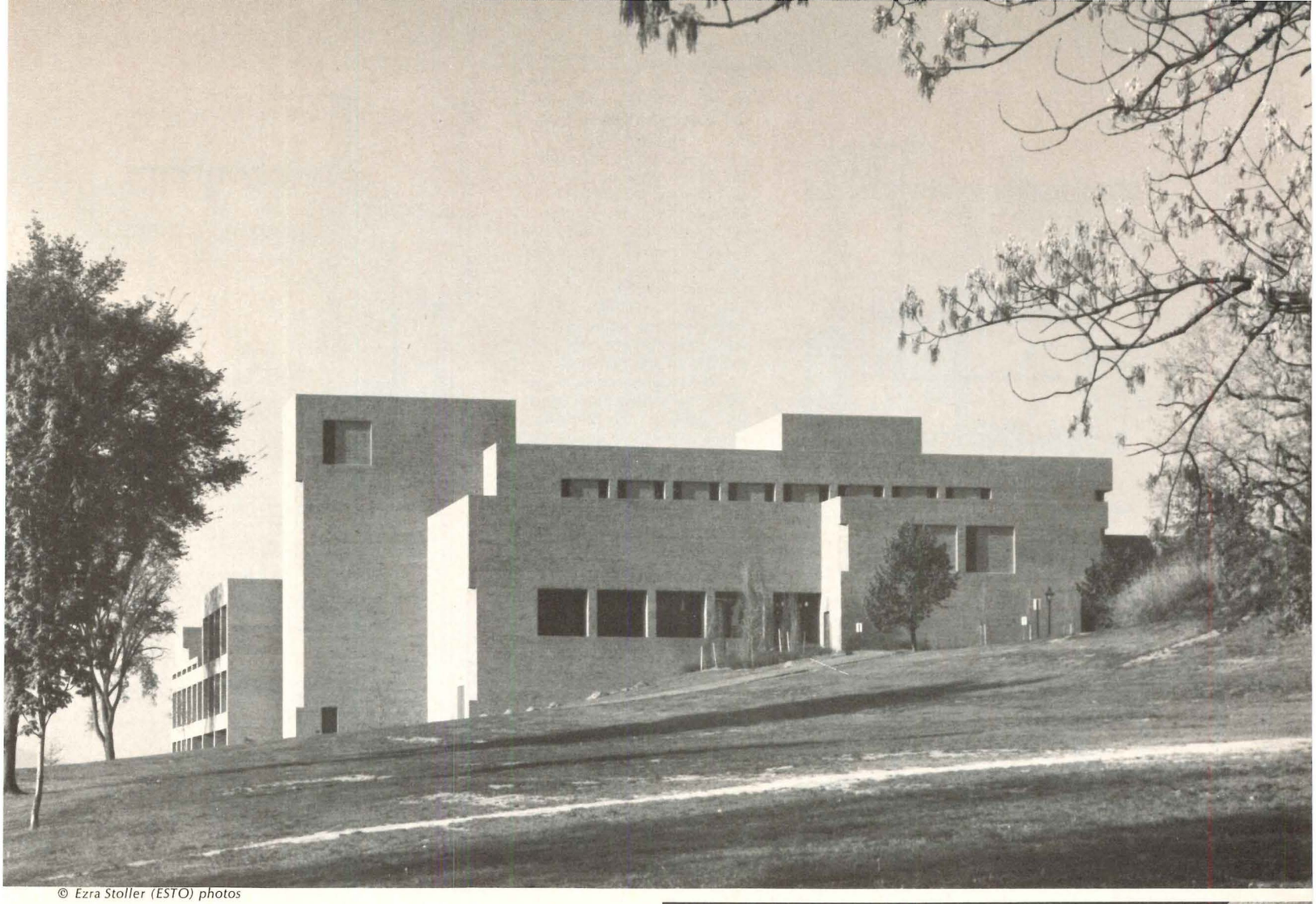






A BIG SCALE SCIENCE

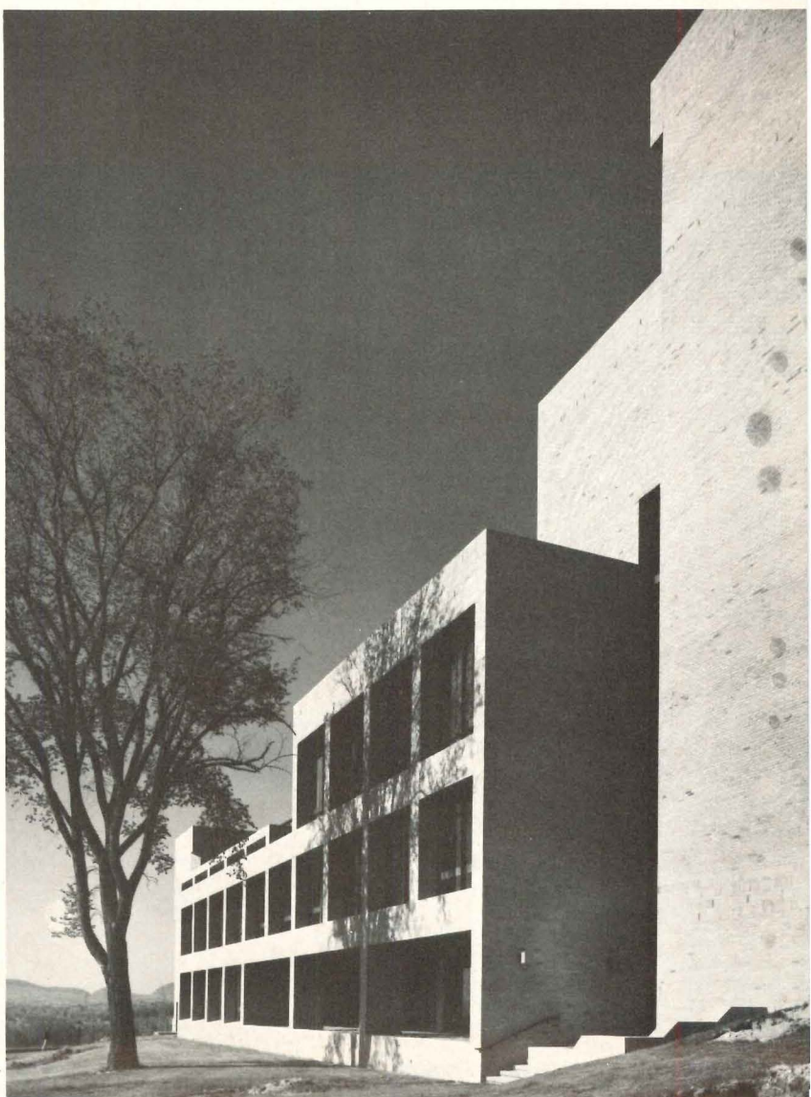




CENTER ON A SMALL SCALE CAMPUS

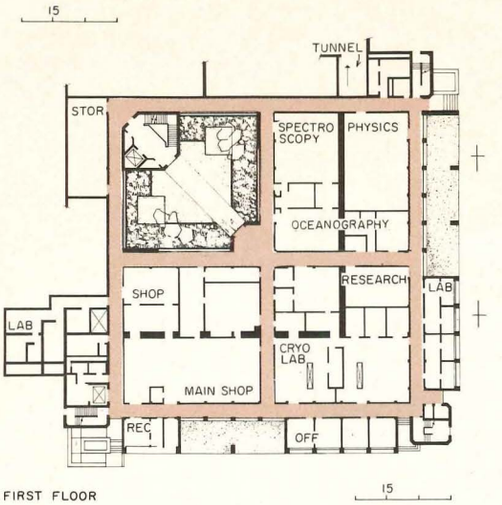
The new Science Center at Amherst College consists of five levels which comprise the astronomy, chemistry and physics departments, as well as a faculty lounge and dining facilities. The building is entered from the middle level through a small entrance court at the southeast corner of the campus and the northwest corner of the building, as shown in the site plan (opposite page left), and photo (opposite page bottom). Campus and building circulation patterns determined the importance of the middle level for shared activities and its orientation toward the campus core. Here are located three large lecture rooms, four classrooms, a joint science library and an all-campus commons and dining complex connected to a large open terrace.

The major esthetic problem was that of relating a building as large and complex as this to the smaller buildings which surround it on an essentially nineteenth-century campus. Since it was to occupy a corner site, an effort was made to reinforce the corner. The solution takes advantage of the sloping site to achieve differences in scale. From the campus quadrangle side, only three stories are visible, achieving a scale in relation to the surrounding buildings which the architects deemed appropriate (opposite page bottom). From the downhill sides (other photos) all five stories are visible, thus reinforcing the corner of the campus perimeter and relating the scale of the building to the distant mountains.

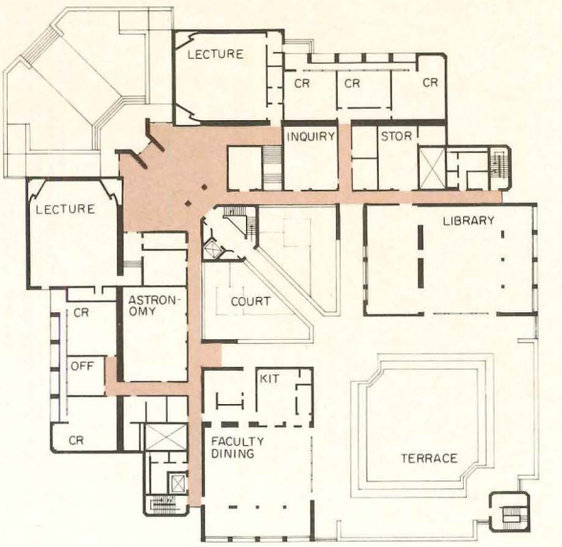


The Amherst Science Center consists of long, continuous loft spaces which house teaching and research laboratories. These areas contain no columns and all the partitions are non load bearing and therefore removable. Utilities are placed in vertical shafts which run parallel between laboratories and then horizontally between floors for flexibility and economy of distribution. Classrooms, seminar rooms and offices are located on the exterior of the building.

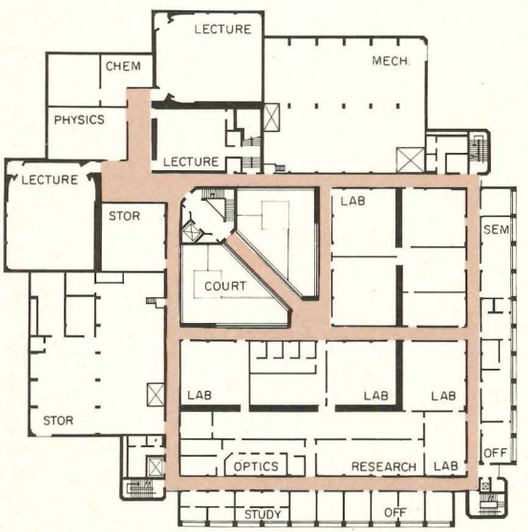
The astronomy department shares the middle level which also contains the building's major 'community' spaces. The bottom two levels which comprise the physics department surround a central light court and elevator shaft. The upper two levels which also surround the light court contain the chemistry department.



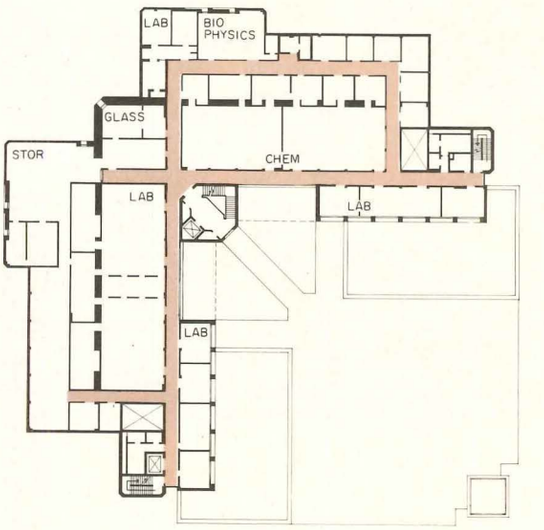
FIRST FLOOR



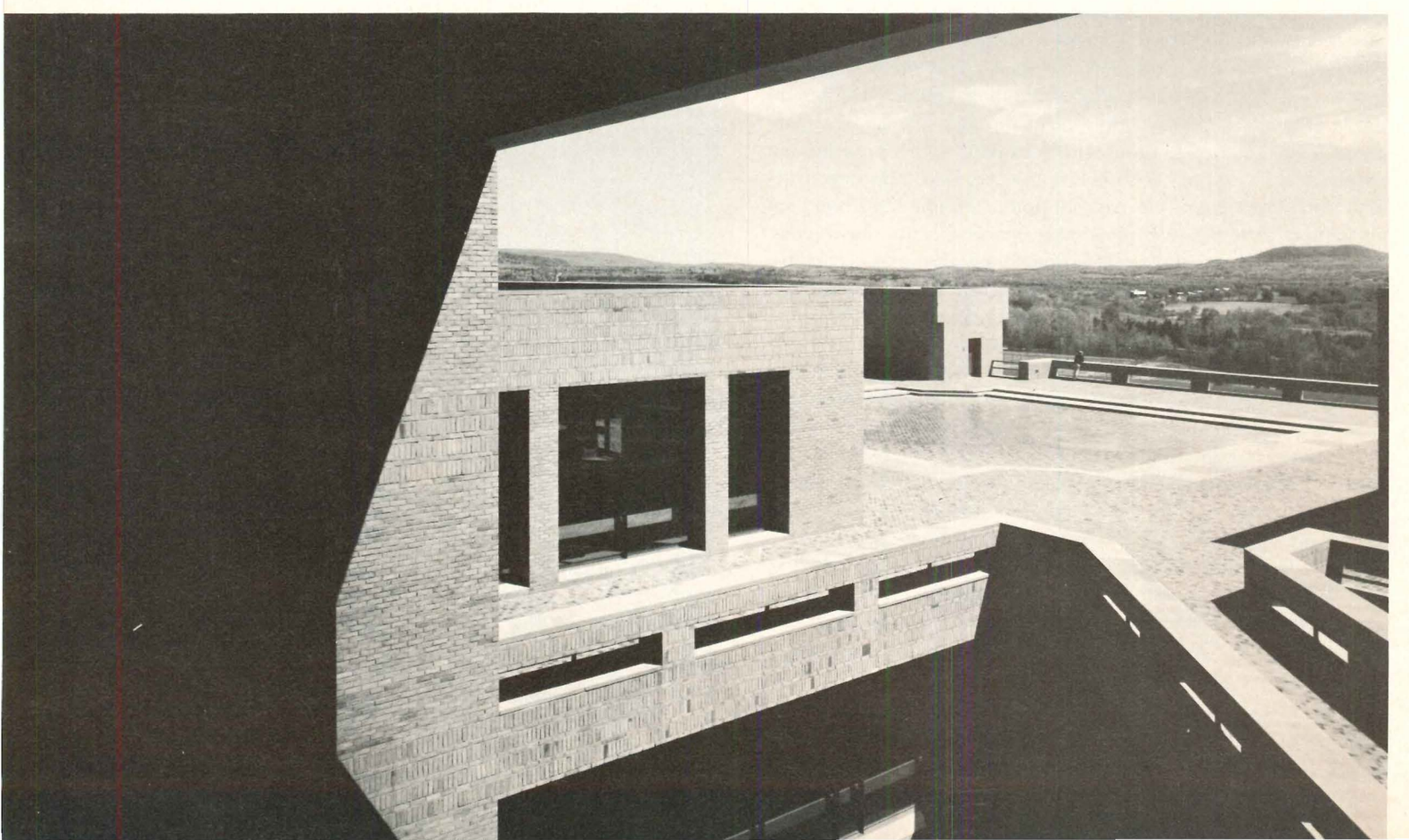
THIRD FLOOR



SECOND FLOOR

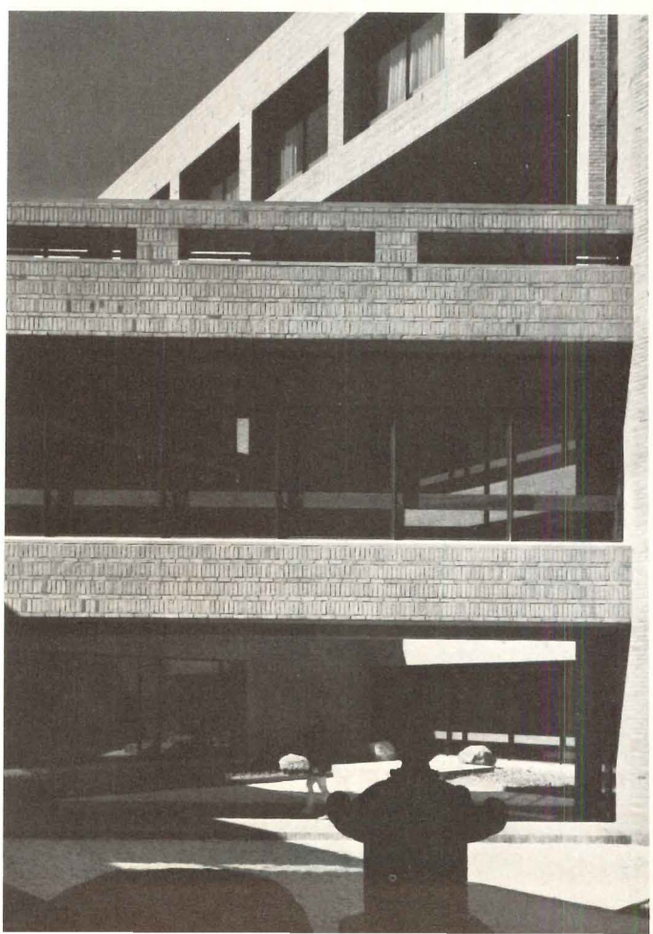


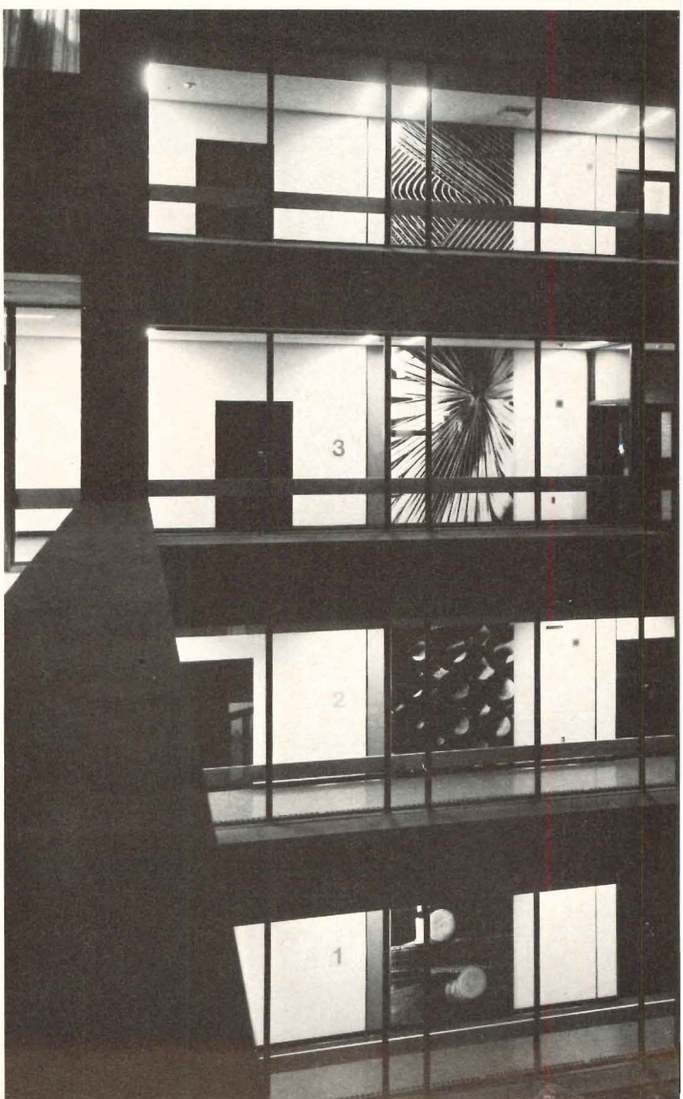
FOURTH FLOOR

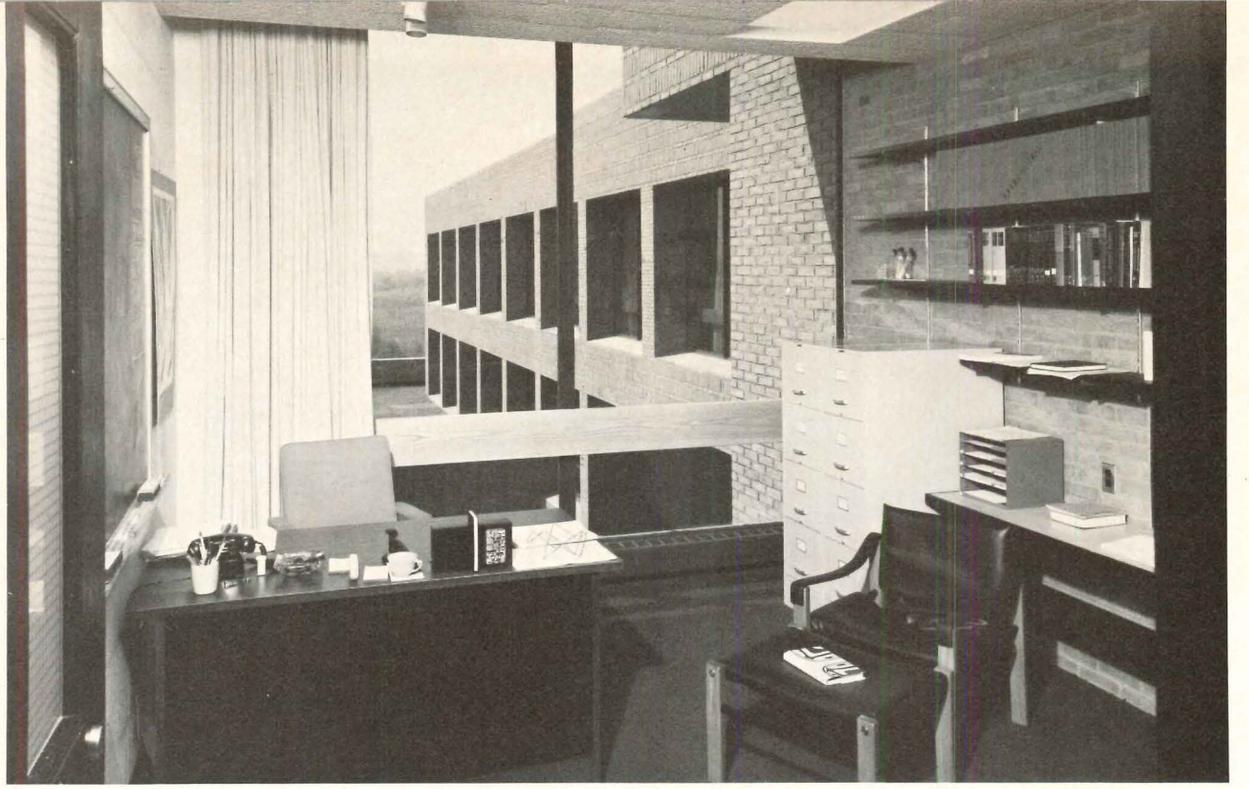


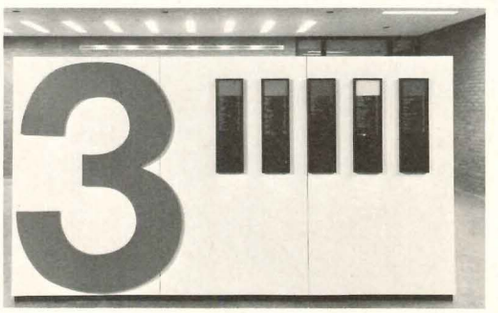
The central light court is bisected diagonally by a brick and glass corridor (above) which affords interesting views of the graphics which identify each floor (right), and which overlooks the courtyard and its sculpture (left). The corridor roof (opposite page bottom) links the roof terraces.

The building is of concrete frame construction. All exterior walls are of brick with brownstone trim. Completed in October 1968, its total cost was under $6.5 million including laboratory furniture, air conditioning and carpeting.



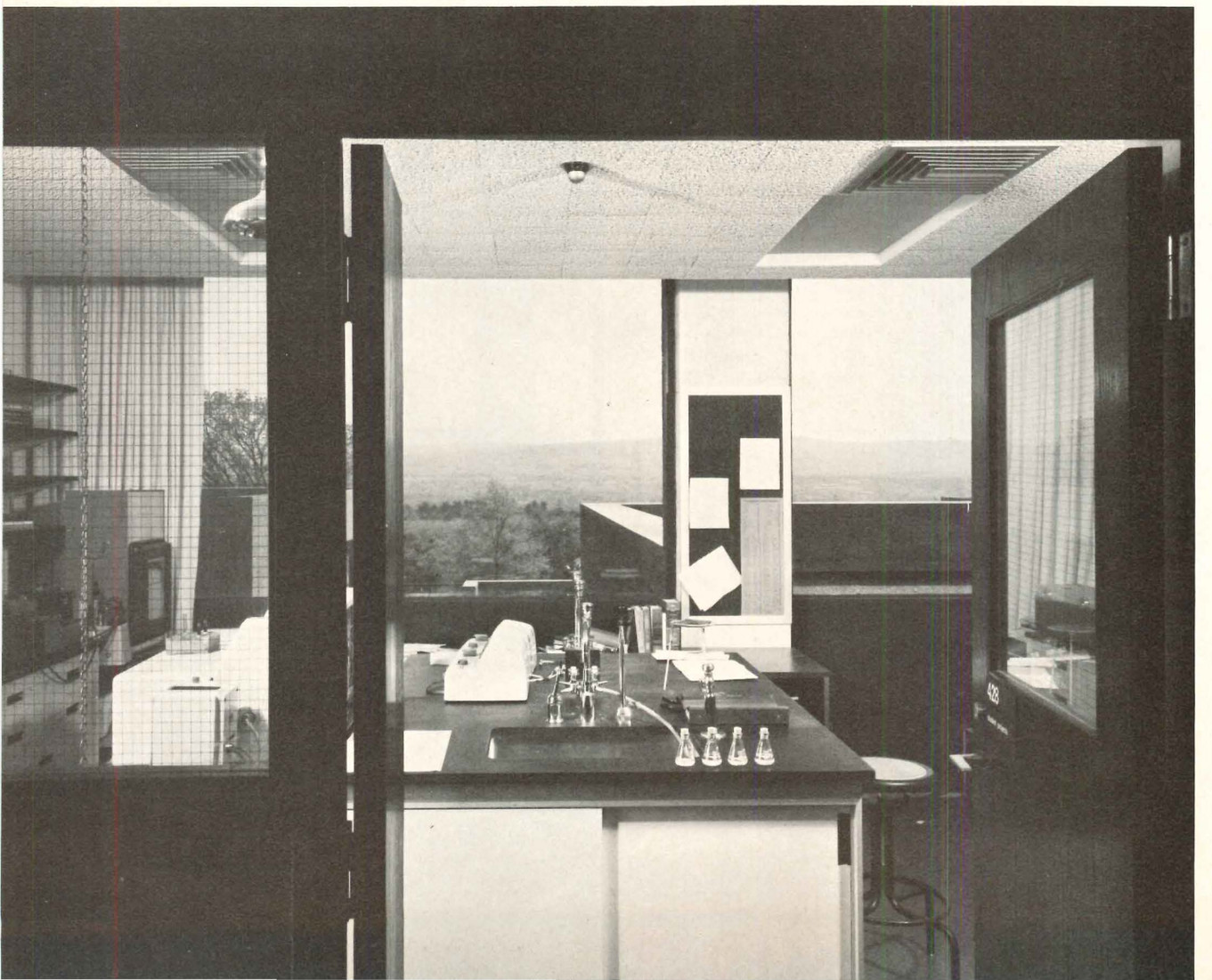




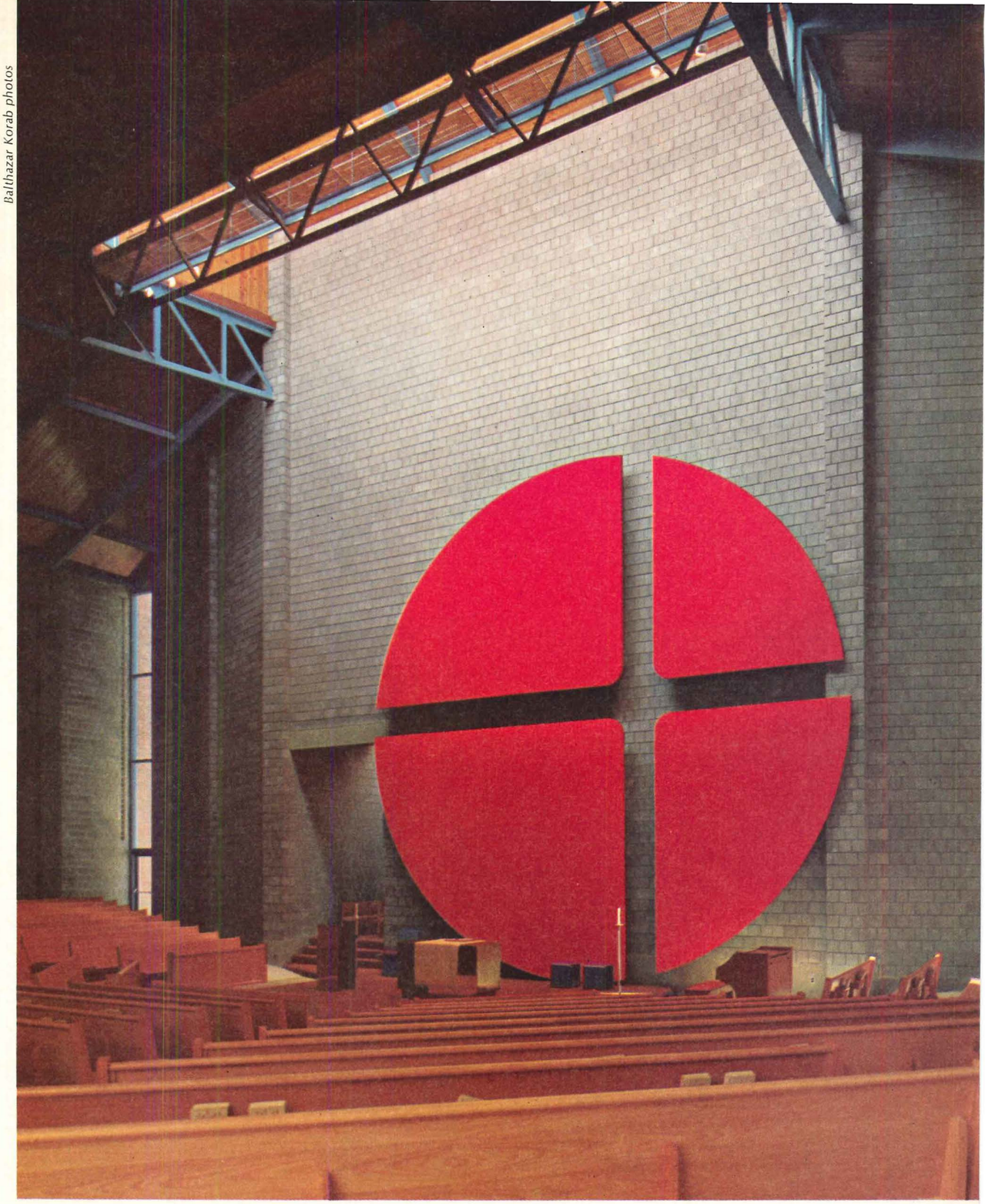


The faculty office (above) and the laboratory (below) are typical, and were designed by the architects as were the rest of the interiors and the graphics.

THE AMHERST COLLEGE SCIENCE CENTER, Amherst, Massachusetts. Architects: *Campbell, Aldrich & Nulty—partner-in-charge—Nelson W. Aldrich, project-manager-and-designer—Glenn R. Merithew;* structural engineers: *Le Messurier Associates;* mechanical and electrical engineers: *Francis Associates;* interiors: *Campbell, Aldrich & Nulty—graphics—Linda Grossman;* landscape architects: *Clarke & Rapuano;* laboratory equipment consultants: *A. B. Stanley Co.;* specifications consultant: *Philip Todisco & Associates;* general contractor: *Daniel O'Connell's Sons Inc.*

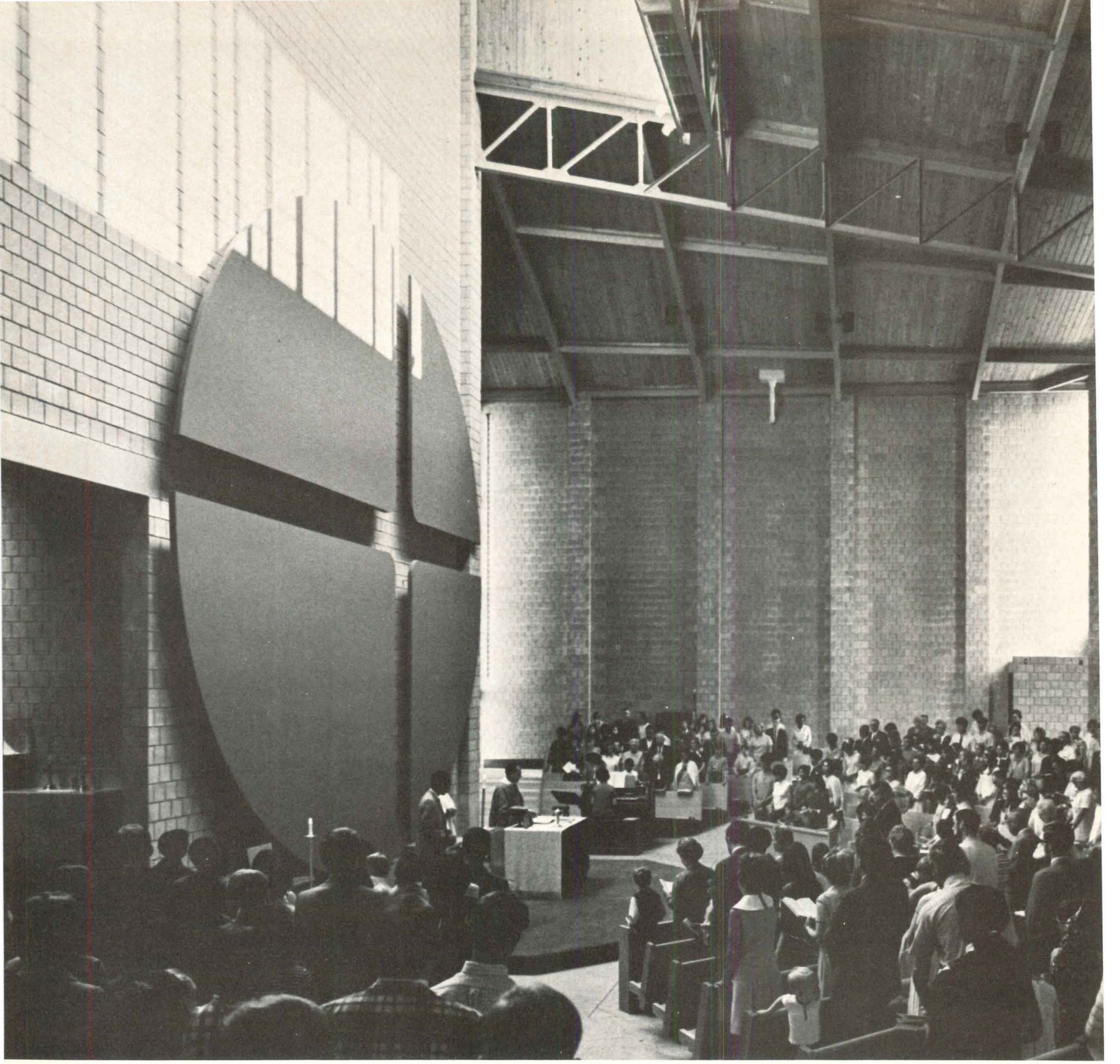


Balthazar Korab photos



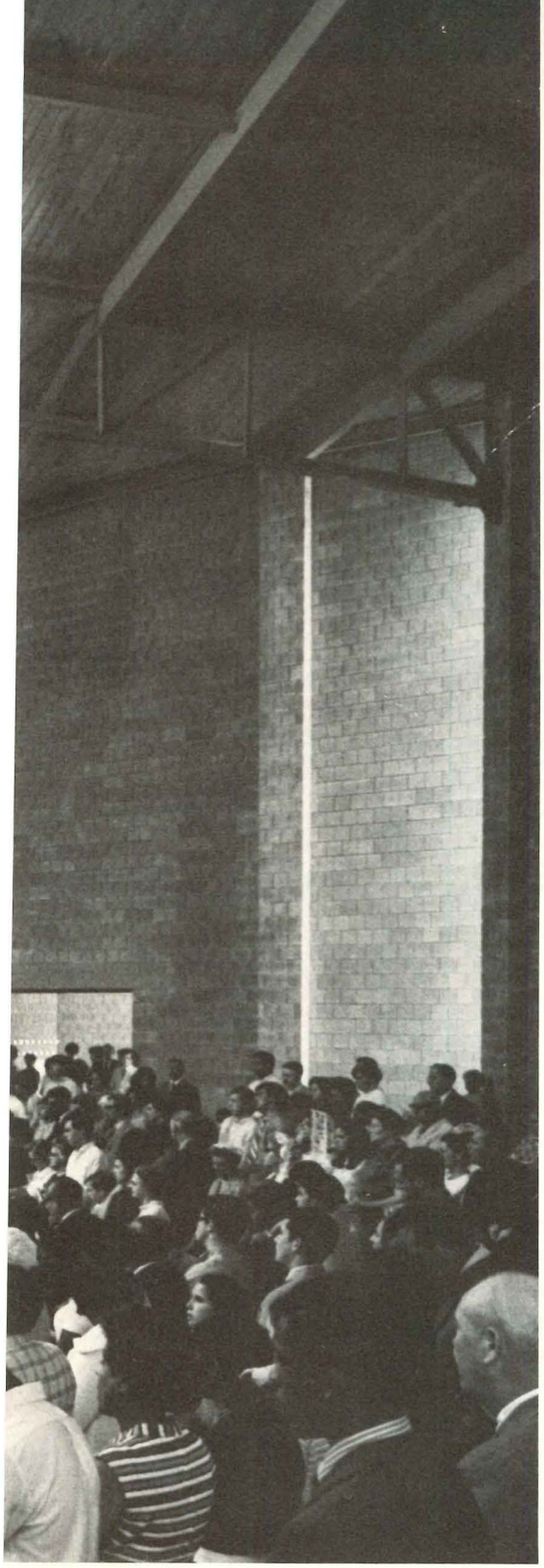
A CHURCH FOR THE REVISED CATHOLIC LITURGY

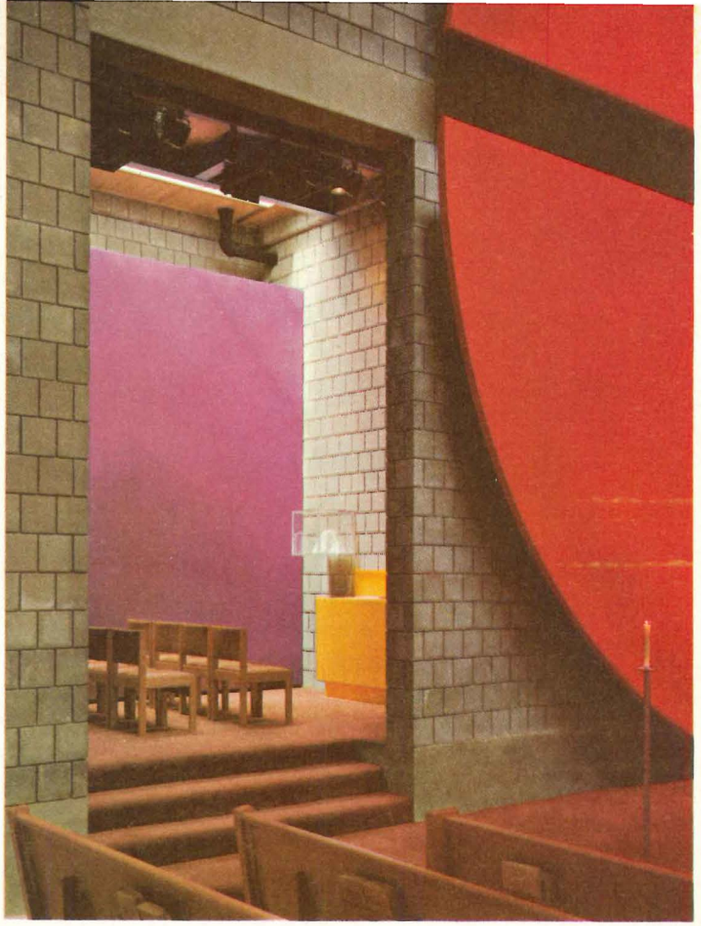
In the Church of St. Thomas Aquinas, in Indianapolis, the firm of Woollen Associates has responded to the architectural requirements of the simplified Roman Catholic liturgy with a design of great simplicity itself. The cross in the photograph above, for example, is the only one in the entire building. Nor will you see any devotional statues, softly flickering banks of votive candles, nor stained-glass windows. Gone is the romantic richness of architecture and decor, lovely and valid in its own day, but which properly belongs to eras now irrevocably dead. It has been replaced by a forthrightness and strength of design that has an immense power all its own, and a 'message' in the language of today. The kaleidoscopic array of changing meanings which the architects' vibrant red design inspires is also in keeping with the space itself. The stainless steel altar furnishings, designed by the firm, can be removed so that the great high space becomes a multi-purpose auditorium or theater.



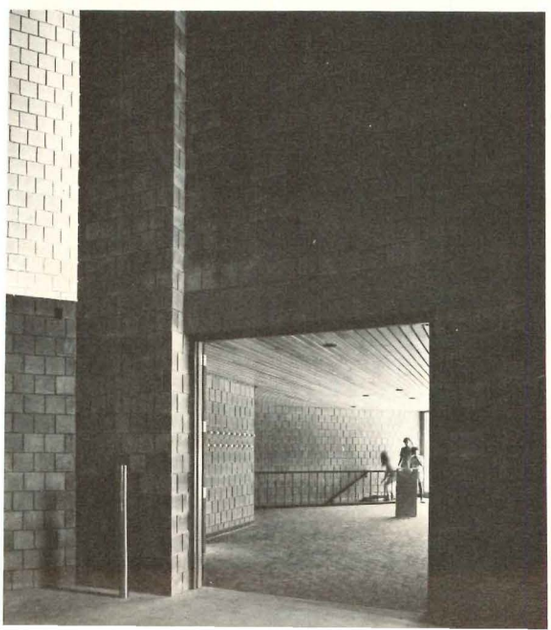
The stimulus for the radically new and different kind of Catholic church architecture, of which St. Thomas Aquinas Church is an outstanding example, comes from outside the field of architecture itself. The broad aim of the Second Vatican Council was the modernization of the Church. In seeking to purify the liturgy, precepts were evolved which were aimed at giving back to the Mass more of the simplicity and spirit of the early Church. These precepts in turn were bound to drastically alter the layout and design of Catholic places of worship. The altar was made once again free-standing; the priest now faces the congregation gathered around it, all co-participants in the service, as opposed to the former long narrow nave arrangement where the average worshipper was perhaps too apt to think of himself as a spectator. In devising his own rendition of the new scheme, Woollen unabashedly borrows from modern theater design: the sanctuary becomes a thrust stage around which the congregation is arranged on a gently sloping incline in arc-like segments. The building itself is 'bent back' to greater than 180 degrees to further the idea of the altar as the center of a great circle. Another divider between priest and participants disappears with the absence of an altar rail. Worshippers now stand, rather than kneel, to receive Communion. "A church," Woollen said at the dedication ceremonies, "is a portrait of its people at a particular moment in time." Judged in these terms St. Thomas is as resoundingly successful in fulfilling its program as anything created during that age 'when the cathedrals were white.'

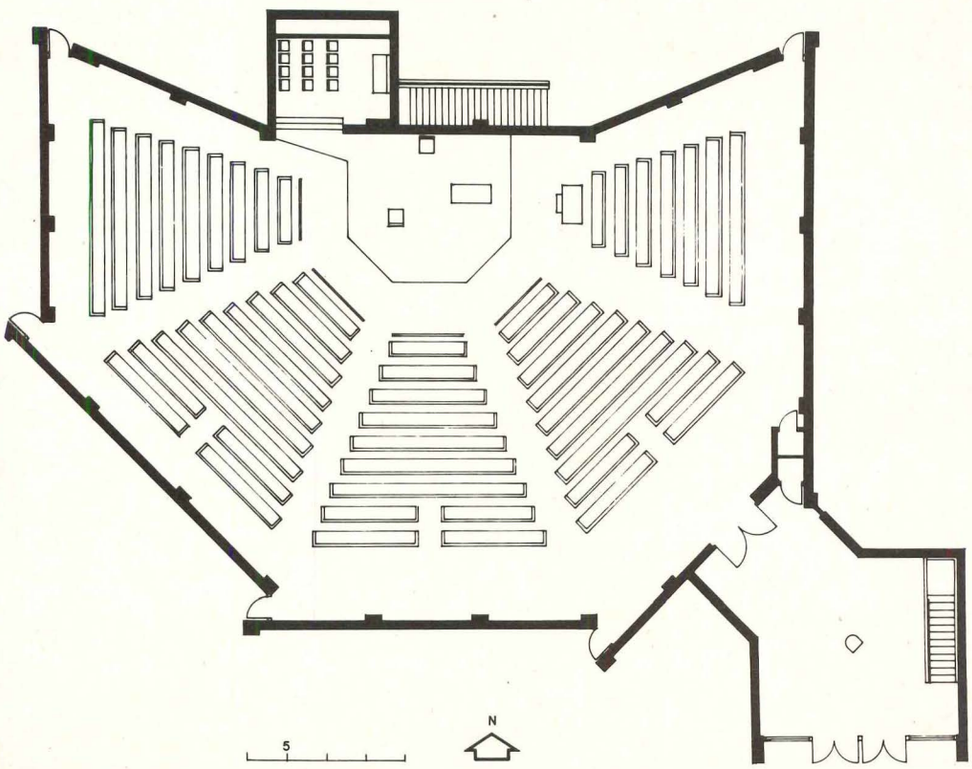
ST. THOMAS AQUINAS CHURCH, Indianapolis, Indiana. Architects: *Woollen Associates—Lynn Molzan, project architect;* engineers: *Fink, Roberts and Petrie, Inc. (structural); J. M. Rotz Engineering Co., Inc. (mechanical);* liturgical consultant: *Fr. Aiden Kavanaugh, O.S.B.;* acoustical consultant: *Dr. James Hyde.*

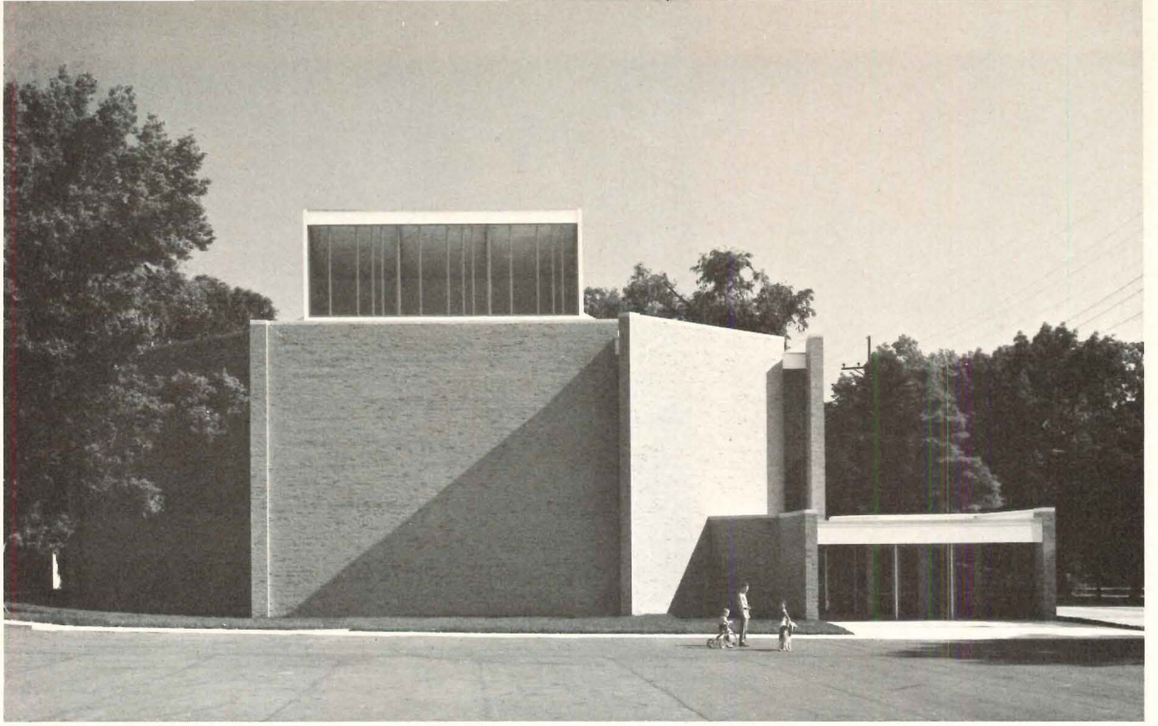


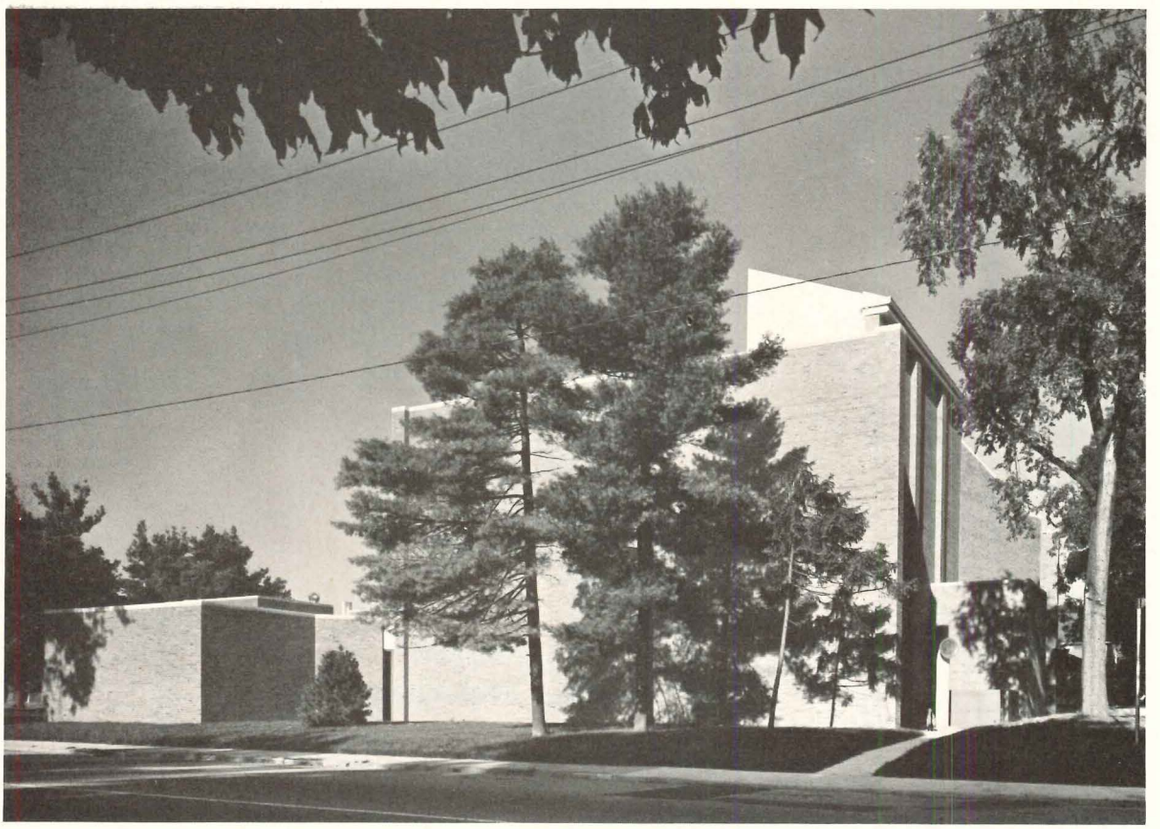


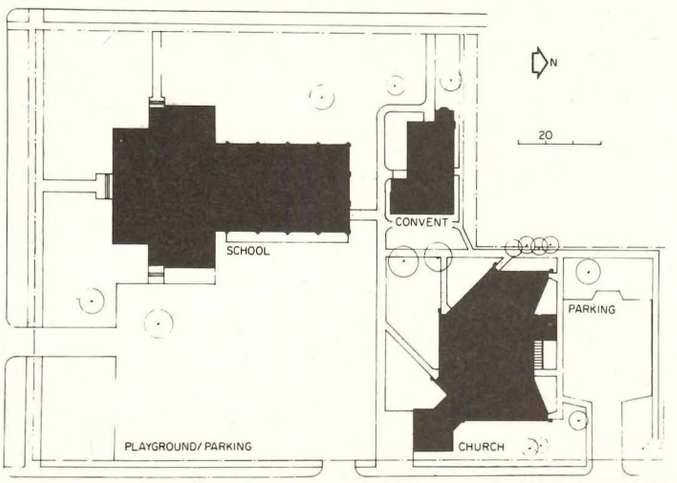
To the left of the sanctuary stands the Blessed Sacrament chapel, an intimate space for private worship. The rich purple wall ties in with the red of the cross but does not compete with it. Tabernacles formerly stood on the main altar, but are now once again placed in a separate area. The tabernacle's transparent sides and simple shape are perfectly in keeping with the church's bare block walls and exposed services and roof structure. The narthex, below left, contains the baptismal font and the penitent's entrance to the confessional. Stairs lead to a basement sacristy.











Making a virtue out of a necessity, the Woollen firm saw that ostentation would be out of place in a non-affluent neighborhood, as it is, perhaps, for churches anywhere. Although constructed on a very low budget ($1.10 a cubic foot), St. Thomas assumes its place on its tree-lined, but busy, street with quiet dignity, while avoiding all the time-worn cliches that shout 'church.' The building's interlocking of broad uninterreputed wall planes creates simple but interesting light and shadow effects, while at night the light from each window washes the wall adjacent to it. The church is sited so as to form, with the pre-existing buildings, a court that functions as a playground, except for Sunday parking. The church's low entrance becomes a gatehouse-like structure designating the entrance to this area.

THE FUTURE OF THE PROFESSION

by Rex Whitaker Allen, president,
The American Institute of Architects

Has the architectural profession changed enough to be ready for the different world of the 1970s—its new dynamics, its new demands, and its new opportunities? This article explores what lies ahead for the profession—and what the A.I.A. is trying to do about it. And it explores what lies ahead for individual architects—those who prepare, and those who do not.

As the new decade opens, there is little doubt that there is a future for the architect. But there is also little doubt that his role will be quite different in the future from what it has been in the past. And how he will meet the challenge of change is—at this moment—a wide-open question.

In need for his services, in opportunity to make an impact on the physical environment and in actual work in hand, the architect has never looked better. He has more work, a broader range of commissions, and greater influence than he has ever had before. He must, however, face up to the different world of the Seventies, a world that has moved a long way from what it was even 10 years ago, and that is vastly different from what it was 20 years ago. A large percentage of architects who will be practicing in the Seventies were practicing in the Fifties and Sixties. Yet all the changes they experienced during the last decade or two are as nothing compared to what lies ahead.

Have we as a profession changed too? Are we ready for this different world of the Seventies with its new dynamics, its new demands—and its new opportunities? If we are not now ready, what are we doing to get ready, and how soon can we expect to be ready? The future won't wait for us if we lag behind.

The period in which we are now, and the period ahead, will see profound changes in society, government and economics due to the impact of people, technology and science. All of these will greatly affect—and not without benefit—the profession of architecture. But we must overhaul some of our methods and attitudes so that we can gear ourselves to accomplish what is being asked of us: literally, the building of "a second America," a different, better America than the first one has been.

I believe we will meet this challenge. But we must be willing to do an about-face on a cherished tradition: detachment from the world of politics. For we must involve ourselves in the issues of the day, specifically those that affect the shape of the physical environment. Decisions will be made, with or without our help. Can we honestly justify standing on the sidelines, particularly on issues so much

"Decisions will be made, with or without our help. Can we justify standing on the sidelines . . . ?"

a part of our own concerns, as architects *and* as citizens? Let us recognize—as we must—that the government is not a third party; the government is *us*.

At long last, architecture has an open door to be what it has always said it was, a social art. Not only must we develop our own social response to the urgent social problems of our time, but we must as a profession understand and work with participatory planning, in a way we have not yet experienced, to achieve the kind of human environments to which we have so often given lip service. We must forget the patron as client. Today, as in the future, all society must be our client.

Further, we must be willing to work in new ways to meet the pace of need and demand. We must do this or others will take over. We must use new tools to help us to accomplish the tremendous task ahead. With improved management procedures, and better communication not only among the segments of the building industry but between ourselves and society, our client, we can and will direct the construction of "a second America." It is not a question of having the resources for so vast a program; we have them. What is needed is the will. I believe that we have that too.

Some years ago, in this mood of forward thrust, the American Institute of Architects established a Committee on the Future of the Profession to "discuss and determine on a more factual basis the problems facing our profession not only today, but insofar as it is possible in the years ahead." The Committee was to "initiate fact-finding procedures (to) enable the Institute to plan more surely to meet the demands of the future." In addition to the Committee's own report, the Institute commissioned two interlocking research projects, one to report on trends in social developments that will affect the physical environment, the other on what seems to be ahead for the building industry.

"It is not a question of having the resources for so vast a program. We have them. What is needed is the will. . ."

On trends in society, the Report tells us:

- We are a low-morale society. We must become a high-morale society if we are to capitalize on our opportunities.
- We are in the critical period of change.
- Of all the forces of change, population growth and migration, and fast-paced technological developments, seem to have special importance in the social sector. To direct technology to human ends, we need new social inventions such as new zoning concepts; housing and building code revisions; new ways to finance physical development; innovations in marketing; new taxing methods.
- The changes we face are equal in magnitude to the agricultural and industrial revolutions. We can neither hold them back nor exactly predict their detailed impact. We can suggest possible trends and results from already apparent developments. But we cannot predict unexpected discontinuities—"systems breaks"—with these trends. Such breaks may be accidental or deliberate—for example, a low birth rate, a longer vigorous life expectancy, a national population settlement policy, a stabilized population (and market)—and their effects would be spread throughout the social and economic structure of the country. How would we face the effects of abandoning "growth" as an economic stimulus? Could we substitute "quality"? The imagery of Buckminster Fuller's description of the earth as a space ship is both timely and apt for, like a space ship, the earth is limited in size and in resources.
- It is clear, the Report says, that our society can have *anything* it wants, but it must make decisions as to what it wants, for we cannot have *everything* we may want.

The Report's study of the building industry concludes that it is a low-technology industry and it presently lacks the capacity to accomplish the building program now being called for.

- Within the next 10-15 years, it will undergo rapid and dramatic changes. Market growth; new science and technology, especially in communications and management; and public policies which will effect greater accord between the public and private sectors of the industry will be the major forces in bringing about these changes.
- Government will assume a larger role in the processes of building, affecting it through financial policies, which may be beneficial if they assure stable, constant and long-range government financing which would really move the industry ahead; or deleterious if they reduce the amount of money for construction, as happened recently.
- Government will also seek partnerships with industry, usually with larger firms which can offer the full range of services to bring a project into reality (including a guarantee of delivery).
- It will take government action to revitalize our decayed urban centers.
- Land use will be intensified as land costs rise.
- Many restraints on innovation in building will be eliminated within the next 10 years. Functions within the industry which are now separated will soon be integrated. The industry is already moving

toward a classic industry configuration: "fragmentation will be gradually replaced by coherence and cohesiveness," says the Report. "Three main forces are moving it in this direction: general economic-efficiency measures; housing requirements for the whole population; and a higher quality physical environment demanded by a people with rising affluence and expectations."

■ Non-industry building organizations, already exploring the industry's opportunities and advantages for themselves, will enter the field, bringing with them new people with higher technological skills. "Systems management," long familiar to them but not to the building industry, will force reassignment of building functions.

How much the architectural profession will adjust to changing patterns of practice is difficult to foretell. Young architects beginning now to emerge from those schools whose curricula have recognized the revolution occasioned by social and technological developments of the last 20 years will be motivators of changes in practice. Architects now in practice may not accept so easily changes in management, method and structure but, more likely than not, will be forced to adopt them in order to stay in practice.

New roles will inevitably emerge for the profession. How well the architect updates himself and his practice, and how he reacts and adjusts to changes in the building industry as a whole will determine the kind and range of opportunities which the future will offer him and, in the main, will determine what his place in the industry will be.

It is hard to underestimate the impact of some aspects of technology on the structure of architectural practice. Increasing amounts of data and a larger number of options will result from the use of sophisticated technological tools. So great will be the demand for data, in fact, that something almost like a national "information utility" may become a necessity.

New "actors," invading the field from other industries, will bring with them analytical tools which may well cause "role shifts" within the processes of architecture. The project initiation phase for large developments appears to grow more complex with a greater part of the analysis and decision-making completed before it gets to the designer. For instance, the designer is increasingly presented with a predetermined program which in some respects limits him ("don't concern yourself with alternate site uses"), but in others liberates him ("we don't need this use pattern; what is the optimal configuration and design?"). Return on investment, optimum use patterns and construction phasing as it relates to marketing schedules are determined with technological tools.

Yet it is not so much new technology that will concern and affect the architectural profession in the immediate future as it is the "development of methods of delivering known technology in order to raise the standard of living for all groups."

"How well the architect updates himself and his practice . . . will determine what his place in the industry will be. . ."

Public expectations from the industry (greater speed and economy, more technological gadgetry, better environments) and from the design profession (an integrated social-economic-physical theory for the form of the environment, coordinated methods for dealing with environmental problems and a more comprehensive solution for coordinated planning and higher standards of quality) spell out the need for pressing change in the building field.

The public's demand for speed and economy will affect the time sequence for planning and construction and will accelerate the development of pre-manufactured, off-the-shelf systems and will lead to the overlapping of the design-construction process. But this will be, the Report adds, "in addition to the public's concern for character, style, and a sense of fulfillment which can be gained from the physical environment."

The demand for technology will focus on accessories but will include sophisticated environmental controls and materials systems.

The demand for a better environment will be "less well articulated but most basic. It will be expressed by each segment of the population if it is permitted reasonable choice in the selection of living and working environments."

How well the architectural profession shows its ability to find the resources to meet the varied demands that the future will put on it, and whether it effectively combines forces with those from other fields to develop an integrated concept for the form of the environment, will determine the extent to which the public will seek its leadership. The charge may not be so clearly expressed, says the Committee on the Future of the Profession, "but the frustration at lack of action to date may precipitate an emotional rather than a rational rejection of the present professionals as being unable to meet the challenge."

". . . frustration at the lack of action may precipitate an emotional rather than rational rejection of the present professionals."

The point is, however, that the capability exists within the profession to do what is expected of it,

in theory, in design and in leadership. What is needed is the attitude of accomplishment and the willingness to adjust roles as well as methods. Let me quote the Committee:

"What is needed is the attitude of accomplishment, and willingness to adjust roles and methods."

"If the profession is to exert a major influence on the quality of physical environment beyond the capacity to personally design an individual structure or project, then it must become more fully committed to policy role in government at the local, regional, and Federal levels." And that brings me back to my first point: involvement.

Two immensely important steps have been taken by the Institute toward furthering the architect's involvement with the social, political and technological issues of our time. The appointment of the new executive vice president, William L. Slayton, signalizes an intensification of our concern with the development of broader activities directed toward formulation of new policies in government which also affect the physical environment.

Through new programs in subjects such as "creative economics" the Institute intends to help the practicing architect to acquire skills in fields which his education did not cover but which are vital to him as he moves into the Seventies and their new kinds of opportunities. The goal of such programs is not to make architects into specialists in other fields overnight, but to give them the necessary background and information in these fields to permit them to perform and manage the full range of the creative process, applying their vision and imagination to all aspects of a project, even to the process by which a project is made financially feasible.

Our involvement is real—with social issues, but not as sociologists; with politics, but not as politicians; with technology but not as technologists. What we do—and must do—will be as humanists, and we must do this, not selfishly but in the public interest.

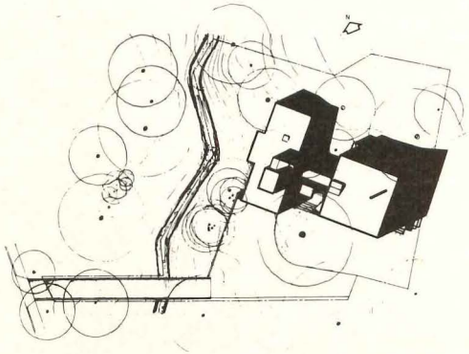
"Whether there will develop a more rewarding physical environment will depend on the objectives and skills of the individuals who are concerned, the ideals which they visualize, and the degree to which they convince the public that their visions are worth achieving..."

We are in the "shock front" of an era of new development and new opportunity unlike any in history. The choices made now will determine our future. In the words of the Report, "Whether there will develop a higher standard of living, a more rewarding physical environment, or a slow deterioration of human values will depend on the objectives and skills of the individuals who are concerned, the ideals which they visualize and the degree to which they convince the public that their visions are worth achieving."

That is the challenge. We accept it.

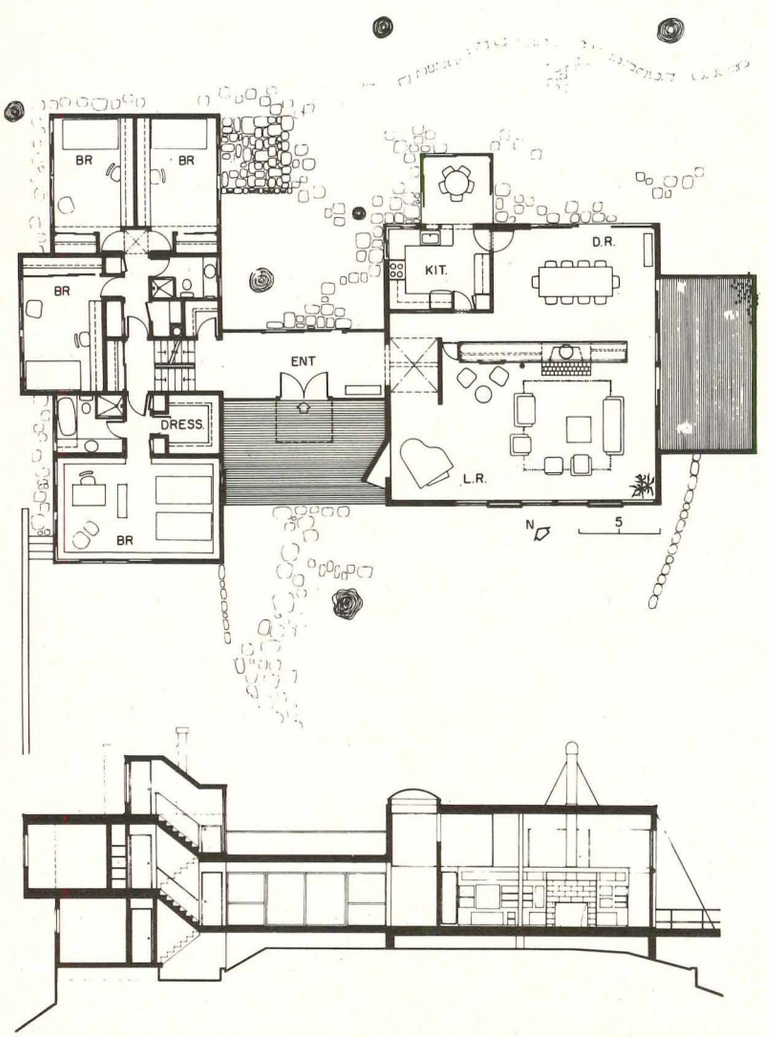
Rondal Partridge photos

Controlled geometry shapes house for a woodland site



A good site can be a great asset in designing a house and, like a restricted budget, a challenge as well. In this case, the site is a small but a very romantic and private one in Berkeley, California—a wooded lot on the slope of a creek, accessible only by a long bridge. Instead of blending the structure with the woods, architect Donald Olsen has offset—and enhanced—the setting with an uncluttered geometry, equally uncluttered spaces, and a sophisticated choice and handling of major exterior materials: stucco, glass and black aluminum trim. Elegant detailing and expansive spaces were achieved not only within the discipline of simple wood framing and an unusually practical plan, but—as bid in late 1967—within a $17-per-square-foot cost. Deliberately varied living areas are as strikingly responsive to the potential of the site as the deliberately simple forms; views of the glass-walled living "pavilion" are shown on the following page.

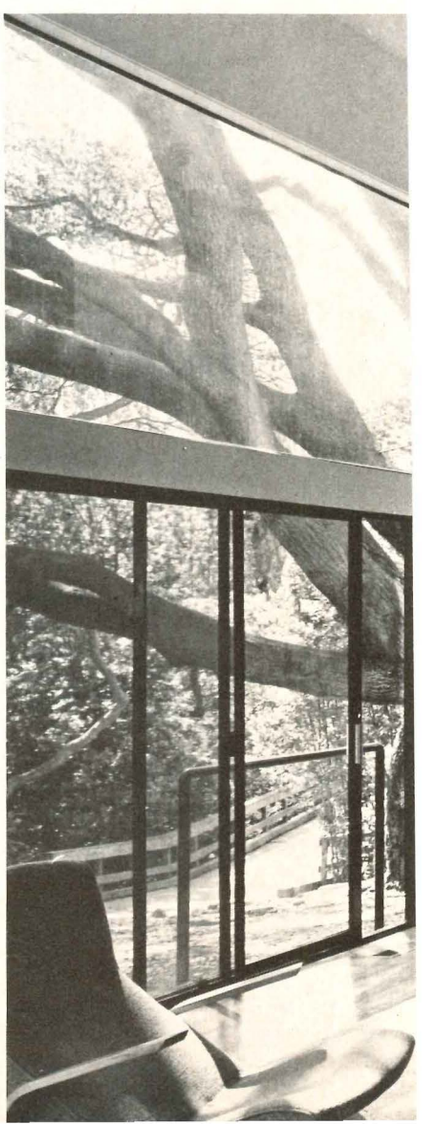
RUTH HOUSE, Berkeley, California. Owners: *Mr. and Mrs. Herman D. Ruth;* architect: *Donald E. Olsen;* engineer: *Jack N. Kositsky;* landscape architect: *Peter Walker, Sasaki, Walker & Associates;* contractor: *Charles Mee.*



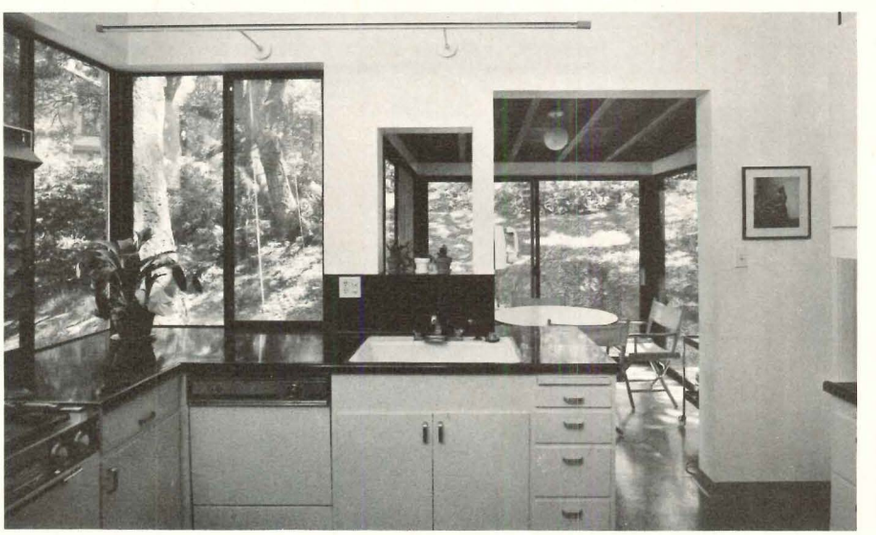
The living pavilion shown on these pages is only 32 feet square but gives the impression of being twice that size. Cabinets, shelves and fireplace are pulled together in a central divider to baffle living and dining areas and leave the perimeter free for glass. Though monochromatic, the house was in fact designed to support bright color, which comes from a yellow rug, red wall tapestry and the large-scale paintings the owners collect.

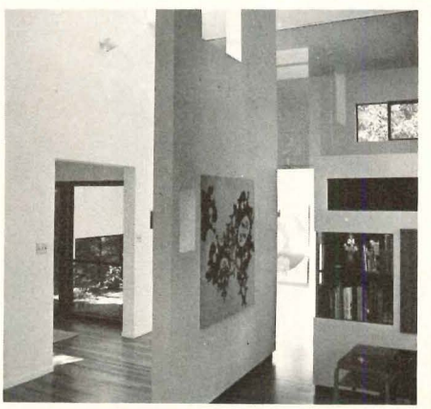
The family includes three boys, and separation of activities, as well as space for entertaining, was required. Minimal vertical traveling was another major request. Technically, the preservation of the site of several very large oak trees proved the most demanding problem, influencing not only the shape and orientation of the house, but the construction of a foundation made of special shallow-grade beams. A two unit plan admirably exploits the natural slope and views while meeting practical needs.

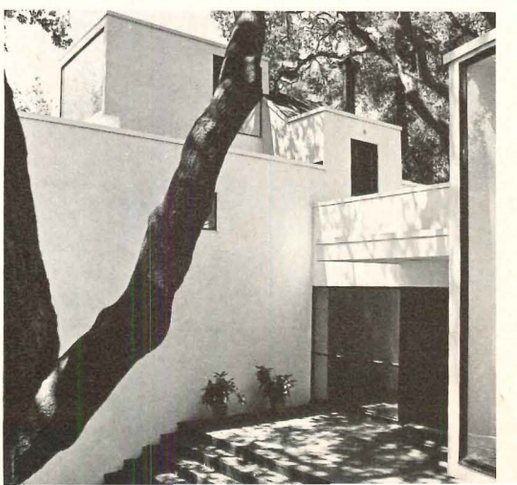
In addition to the bedrooms shown in the ground level plan, the second tighter unit makes use of the slope to dispose a t.v. room on the lower level, with a small, roof-level "penthouse" on the third floor. The owners are delighted with their house. "This house *is* light" they report, and natural light from varied sources does form a major design ingredient, combining with recessed fluorescent lighting and white walls.



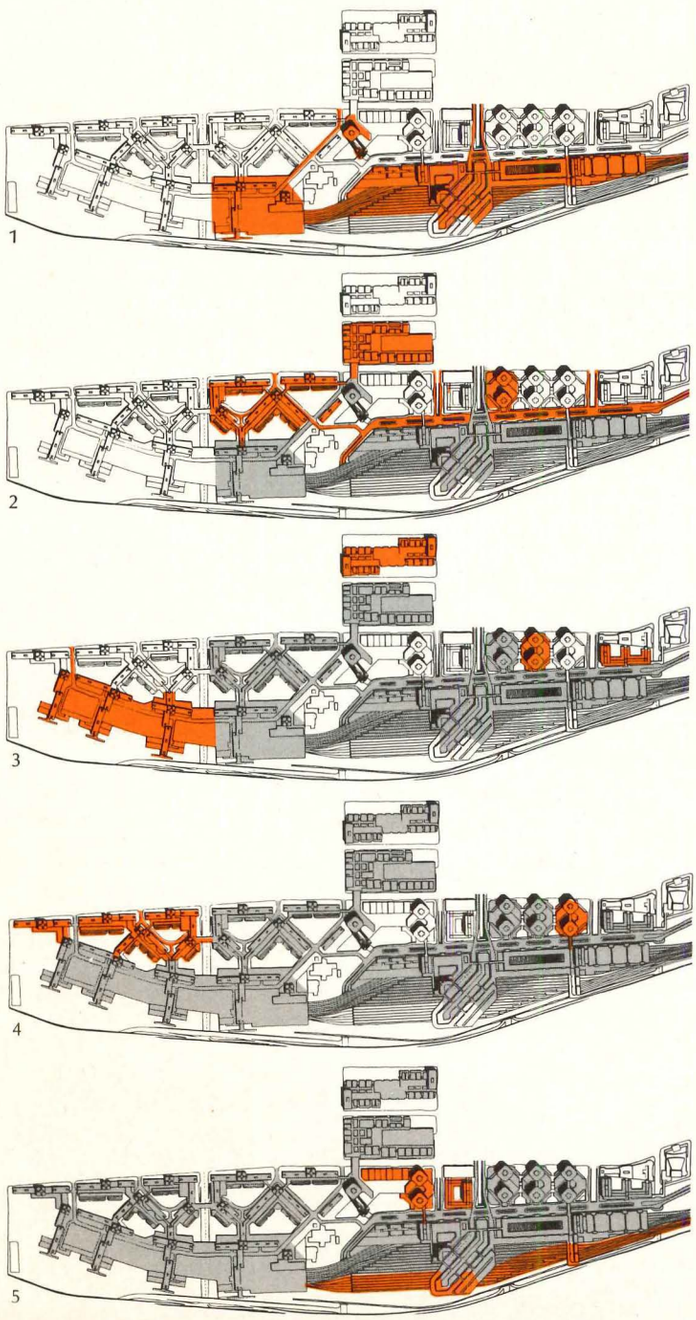
The dining room is part of the living pavilion shown on the preceding page. Floors are oak strip. Black anodized aluminum is used for sliding doors. "It's a house that's comfortable with our modern furniture," said the client, "but I'm sure that if someone moved in with Louis XV it would look just as well." The site is a small division of a 50-year-old estate designed by Frederick Law Olmsted to provide color throughout the year, and care was taken not only to preserve the huge trees but to return the land, which abounds in rhododendrons, camellias and fuchsias, to its early, "natural" state. A virtual umbrella over the house was created through its careful placement among the trees. Because of this measure, no air conditioning was required. The view, below right, is from the living unit through to the entrance hall. Many vistas and changing shadow patterns add visual interest throughout. The entrance hall gives directly onto the rear terrace, right, to facilitate entertaining outdoors. Everywhere possible opportunity is taken to expand the visual space, but there is plenty of opportunity for privacy as well. A penthouse, shown at right, was designed as "an elevated version of a conversation pit" and gets a view past branches of the trees.







DESIGN AND PROCESS: FOUR PROJECTS BY THE JOHN ANDREWS OFFICE



These pages present four buildings or additions to cities designed by John Andrews, Architects: three of the projects are currently under construction in at least their initial stages. Belconnen is a new satellite city, planned for the outskirts of Canberra, Australia. Its first phase (pages 132-135) is principally a government office complex, with the beginnings of a pedestrian shopping spine which will be the eventual commercial center of the new town. Metro Center (pages 136-139) is a 200-acre addition to Toronto, with residential, office, and transportation facilities developed in the air rights over the city's present rail yards. Harvard Graduate School of Design (pages 140-142) will provide new space in Cambridge for students in architecture, city planning, landscape architecture and for the faculties of these programs. The Library-Instructional Center for Sarah Lawrence (pages 143-145) is a multi-use classroom project for that school in Bronxville, New York.

There are consistent design directions implied by these four projects which should be briefly examined. The office has also developed a *process* of designing—a process of working with each other and developing projects—which is different from the way many offices operate. The Andrews office consists of 23 people, excluding clerical staff, and 20 of these are registered architects. Every man who has been with the firm for at least three years is automatically eligible for full partnership in it, gaining an equal share with the other partners in control of the office, its assets, and an equal share of the liability. There are now 10 full partners in the firm out of 23 participants, and differences of experience, contribution and ability, as there must be, are acknowledged by differences in salary alone, as set by the partners. The three-year waiting period is not fixed, partnership may occur sooner; the intent is to give each individual in the firm a clear path to a full share of the profits, and to keep to a minimum the number of people working only for salaries.

A second process that has influence on the office's work is called pre-project evaluation. When an initial contact has been made with a prospective client, and before the contracts are signed, there is a formal effort to gather facts about the proposed commission; its financial needs, its design restraints, the nature of professional services required, the kind of communications existing within the client's organization. If the client is not organized to communicate his needs to the architect—develop criteria upon which a design can be based—this issue is thrashed out before an

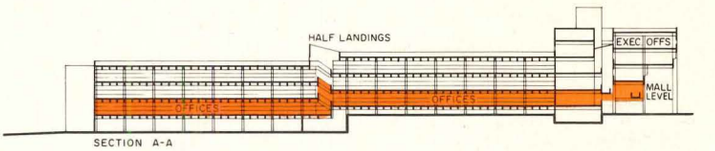
text continued on page 146

BELCONNEN TOWN CENTER

CANBERRA, AUSTRALIA

Belconnen is a new city based upon the Metropolitan Canberra Plan, and is being built by the National Capital Development Commission about eleven miles from the center of Canberra, Australia. It is planned ultimately for a population of 120,000 people, reaching 30,000 by 1975. The first stage of Belconnen's Town Center will consist of government department offices to accommodate 3,000 personnel, a computer service center, housing, transportation and commercial areas.

The Andrews office received its commission for this first stage of Belconnen (shown here) in September of 1968. The project is now in working drawings and completion of this stage is planned for late 1972. The following design rationale is based upon the office's Final Sketch Plan Report for Belconnen, and deals with the office component particularly. Project group for the Andrews office: John Andrews, Peter Courtney, Roger du Toit and Larry Diamond.

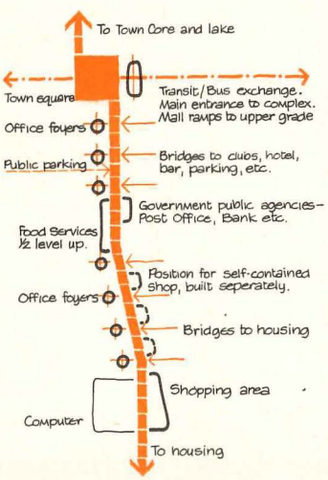


Right: Over-all floor plan of Belconnen's government office complex, including the pedestrian mall which is its focus. Above: a section taken through one of the office "fingers" showing the difference in elevation which forms the "half-landing" concept of the plan. Below: a photograph of the model of Belconnen, showing the mall facade.

The general site plan

The Belconnen Town Center will be located on a new lake created by damming Ginninderra Creek. It is designed around a pedestrian spine of tightly-knit urban character: a sequence of malls, squares, and pedestrian ways flanked by communal elements such as shopping, recreation, entertainment, transportation and eating places. This pedestrian system is to be grade-separated from motor vehicles.

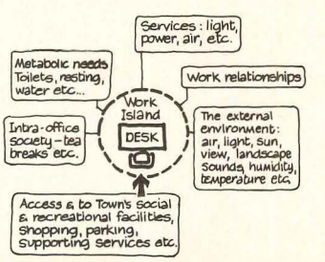
This pedestrian mall comprises the real urbanity of the town core; it is the major organizational element of the design as a whole. Thus a varied number of public activities are accessible along the mall, and these are ordered so that the user is able to comprehend the organization of the town as he walks through it. The diagram at left shows the communal elements that are a part of the mall within the site area.

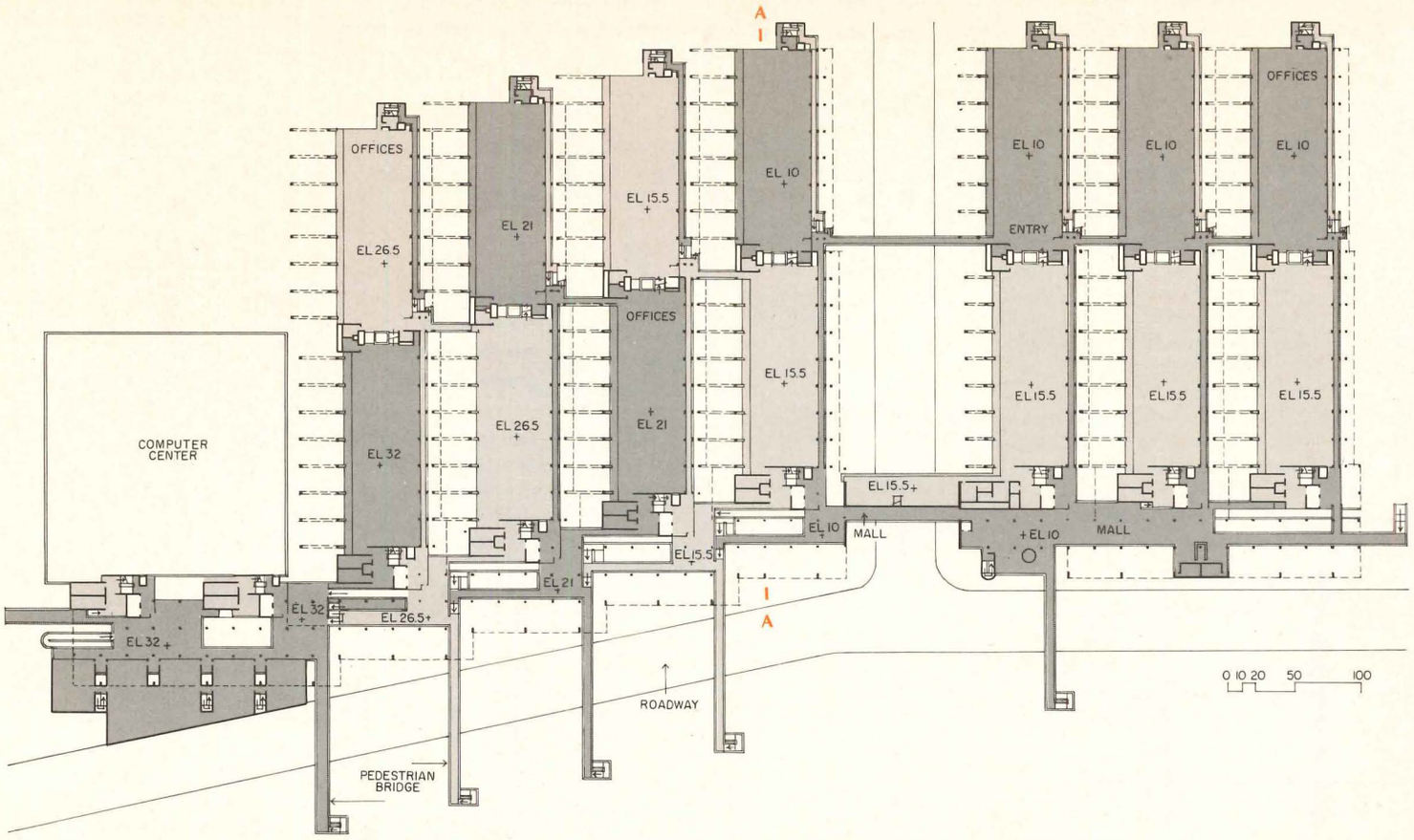


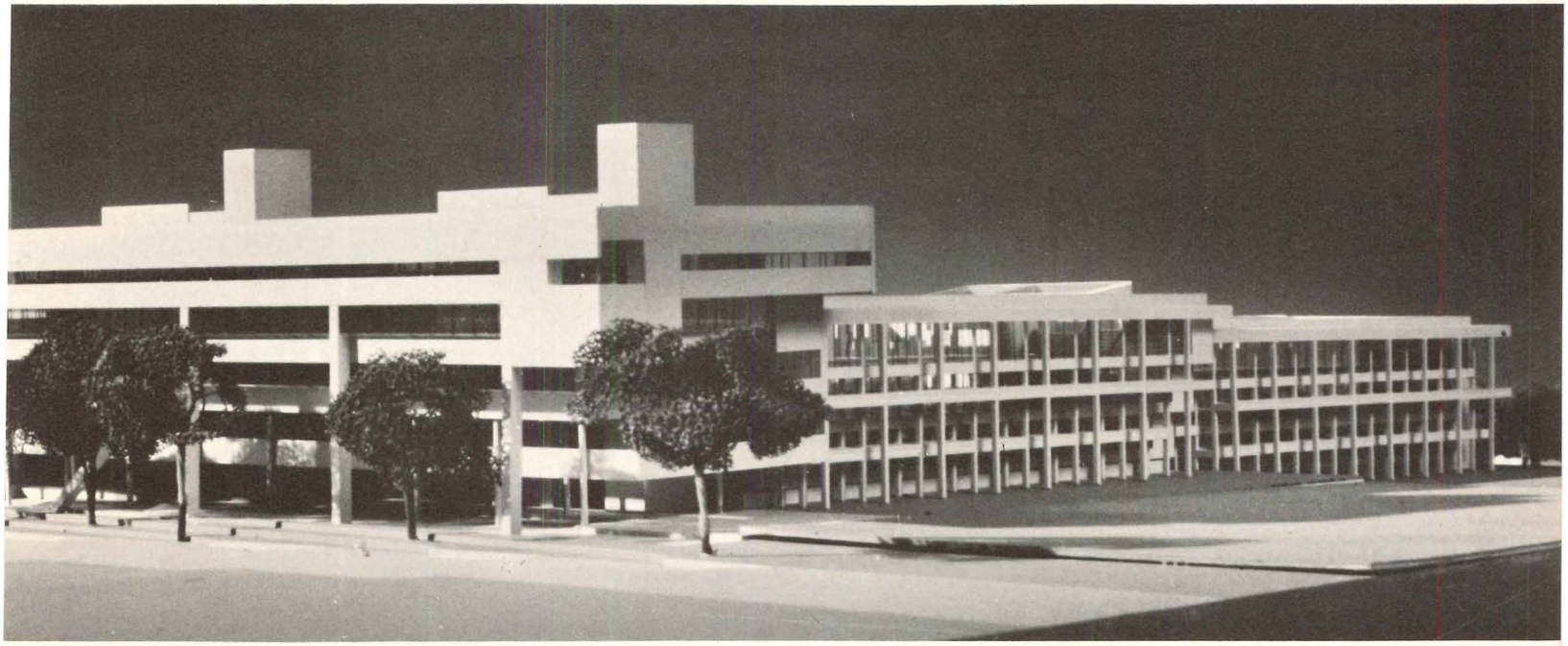
A working generalization concerning government offices

Government offices do not have the same demands for separate, competitive tenancies as does private enterprise. We need not and should not take the traditional office forms created by the commercial world and use them to answer the problem of government offices.

The immediate physical needs of the office worker are his desk, files, furniture and equipment that constitute what might be termed his "work island." These may be seen as occurring in a context of needs illustrated in the diagram below.





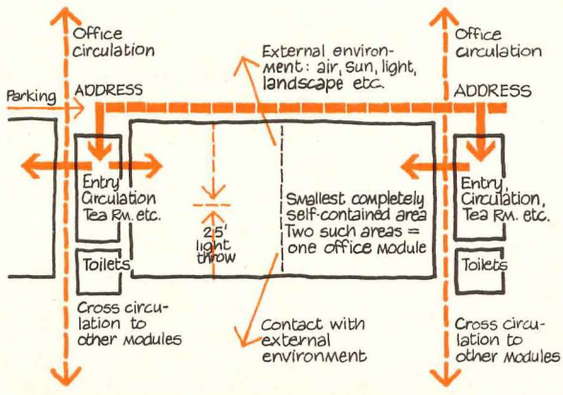


Of these needs, the services, metabolic needs, work relationships and access have a long precedent of mechanically efficient solutions; it is the function of any architectural design to solve these well. Merit lies mostly in how the solution goes beyond the problems of mechanical efficiency such as service and access, and into the creation of a meaningful environment. Those needs that have to do with intra-office communication and the user's access to the outside environment do not have a strong precedent of good architectural solutions and involve more than mechanical efficiency; these two aspects have therefore commanded special attention.

The office module

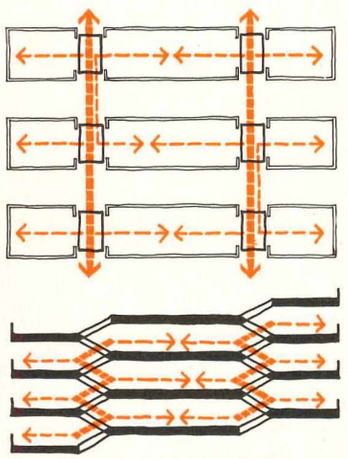
An attempt was made to find an idealized floor area able to fulfill all of the requirements briefly outlined above. The resulting basic module and the design conditions it fulfills is shown at right.

It is 50 feet wide by 150 feet long with entry points at both sides to accommodate two distinctly identifiable departments with all access, toilet, social and escape requirements to make them self-contained units. Within these departments work groups or offices may be partitioned off, and the two areas can readily be combined to form a larger floor space. This is the basic repetitive office module which creates, in plan, the "fingers" of Belconnen Government Center.



Office organization:
The half-landing walk-up grid

The architectural system of organization devised for the office complex may be called a half-landing walk-up grid. Each "finger" of offices is composed of two office modules (preceding sketch) and these modules are staggered in section, so that the floor level of one is about six feet above or below its neighbor's floor level. These half-landing fingers are, in turn, horizontally connected at the module divisions by cross-court enclosed links, which form a circulation "grid" pattern in plan.



From a single point midway in such a half-landing walk-up grid a large amount of floor space is accessible within a 45 second walk—three times that of the normal large slab tower of at least 15,000 square feet per floor.

Vehicular circulation

The parking areas are planned to fulfill four main requirements: they provide visible and direct access to

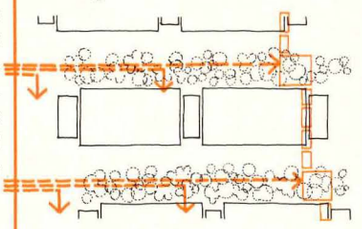
the driver's destination: they are open-ended to allow a driver, on finding one bank of spaces full, to move on to another; they allow the driver, on becoming a pedestrian, the option of walking through the center of the town's commercial and communal life, the Mall; and they do not present a vast uninterrupted desolation of bitumen.

There is an additional need for visitor access from the road to the lobbies associated with the mall. By being elevated at midpoint, the mall can serve three stories of offices with only a one story walk up or down. Visitor access and parking occurs, therefore, below and alongside the mall itself.

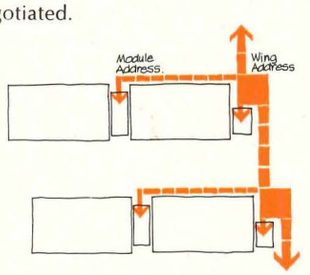
Pedestrian circulation

There are three basic types of pedestrian circulation at Belconnen:

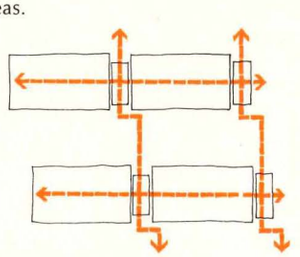
1. The open-air, landscaped routes pass through and alongside the treed courts that separate the office modules. This is a decentralized system originating in the parking areas and taking the user directly to his office without having to go through other parts of the building.



2. The "address route" is a hierarchial system of bypass branches providing access to each office module stemming from the mall as trunk. It is protected from rain, sun, and wind but is open to the air, and incorporates three "levels" of address: the *main address* of the complex as a whole, the *wing address* for division by departments, and the *module address* based upon subdivisions within departments. The address system throughout the complex is designed for wheels—whether for cart service or for handicapped persons. At no point do stairs have to be negotiated.

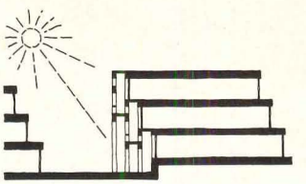


3. Interdepartmental routes within the office space proper make up the "half-landing walk-up grid" and occur for the most part within air-conditioned space. Although all the circulation types combine into a comprehensive system, these internal routes connect particularly with the bypass routes so that uninterrupted interdepartmental circulation takes place easily without passing through intermediate office areas.



The stepped section

Stepping the section and dropping the bypasses one-half level permits the architecture itself to control sunlight penetration, allows privacy for the pedestrian using the bypass route and breaks up the facades of wings otherwise directly facing each other across the courts.

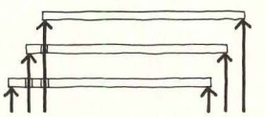


The open, laced structure provides a further reminiscence of the Australian balconies with their cast iron supports. The building and the courts between them slant toward the sun allowing the windows to be shaded while maintaining a maximum of sun penetration into the court surface itself.

The structural system

The structural solution to the three story office wings developed from four factors:

1. The concept of a stepped section meant that the insertion of columns on the south side would seriously interfere with the interior space and would be difficult to handle structurally since the adjacent spans are so dissimilar.



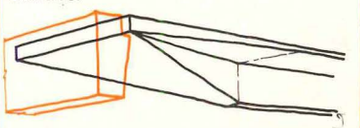
2. The plan form of the office modules, a rectangle of three to one, is most suited to a one way spanning system.

3. There was a strong possibility that the size of the project makes precasting a really economic solution.

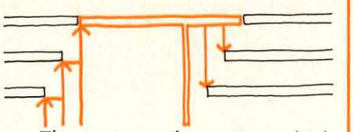
4. Integrated but physically separate mechanical, electrical and structural systems were needed.

These factors led to the development of a floor unit similar to a single tee beam, but flattened at its ends, and to suspending the floor system from free-standing structural supports.

The tapered floor tee leaves room for mechanical runs perpendicular to it. Shear and moment forces at the bearing ends are more easily dealt with than in the usual tee-shaped end, particularly the large fixed-end moment that is often caused in a deep tee by its depth and by its irregular bearing surface.



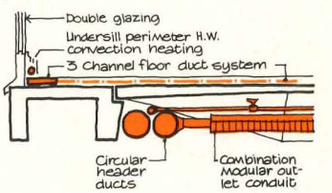
The structural support for these slabs is a T-shaped cantilever set in the courts between fingers of the complex; floors are suspended from one flange of the T, and the other flange is tied back to the column-supported floors of the opposite wings.



The system of erection which emerges from this method of dealing with the force systems is particularly suited to precast procedures. The frames, located *between* the buildings rather than within the buildings, can be erected independently from the floors and do not depend on them for stability. The tee units sling in between leaving relatively complete freedom of access for mobile lifting equipment.

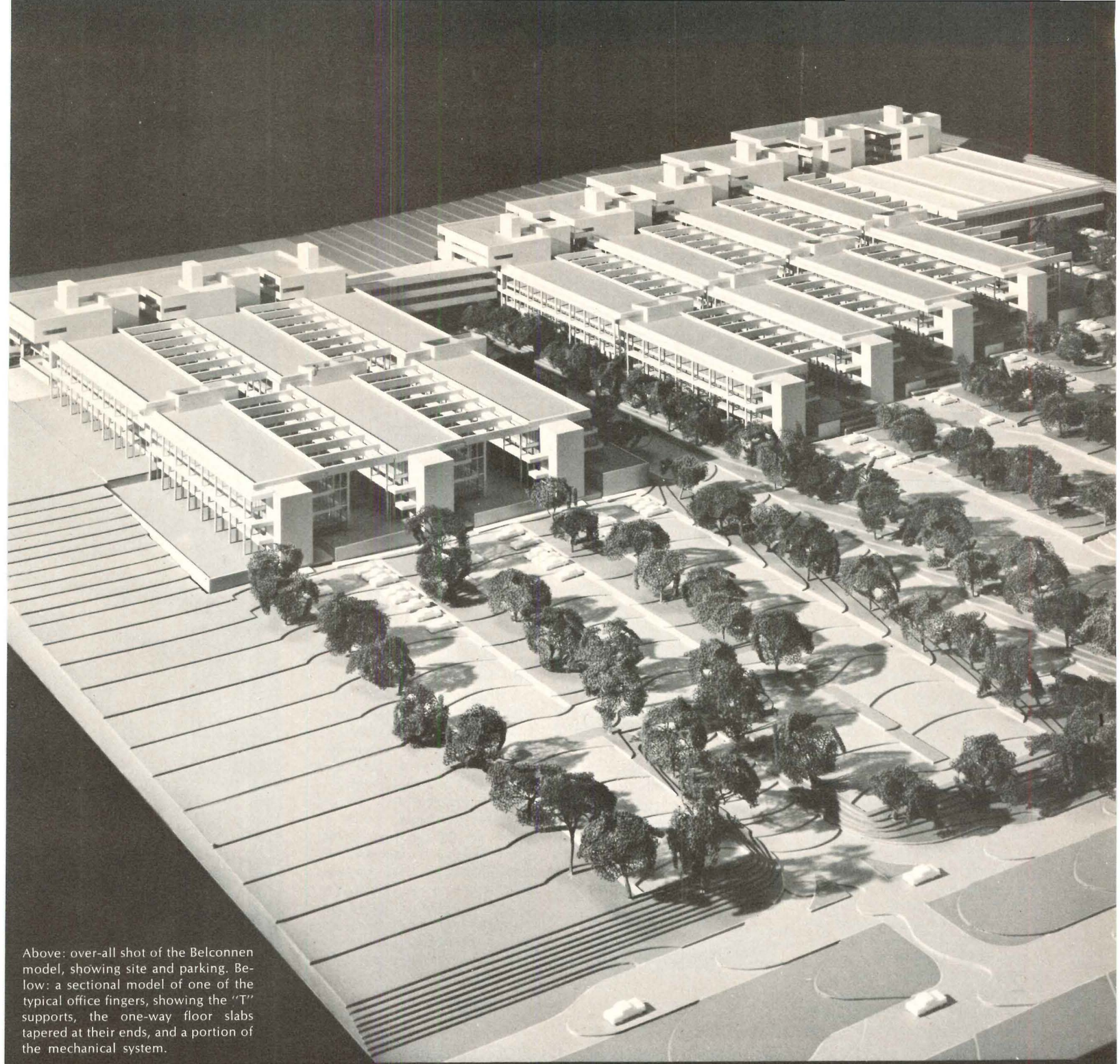
Heating and air conditioning

With the use of double glazing, and the shading provided by the stepped section, a lightweight system of under-sill hot-water convection heating became possible, thus treating the whole interior space as one climate-control zone and satisfactorily air-conditioning it with a low-velocity variable volume system. Thus a single duct supply only is required and can be clearly ordered and expressed within the occupied space.

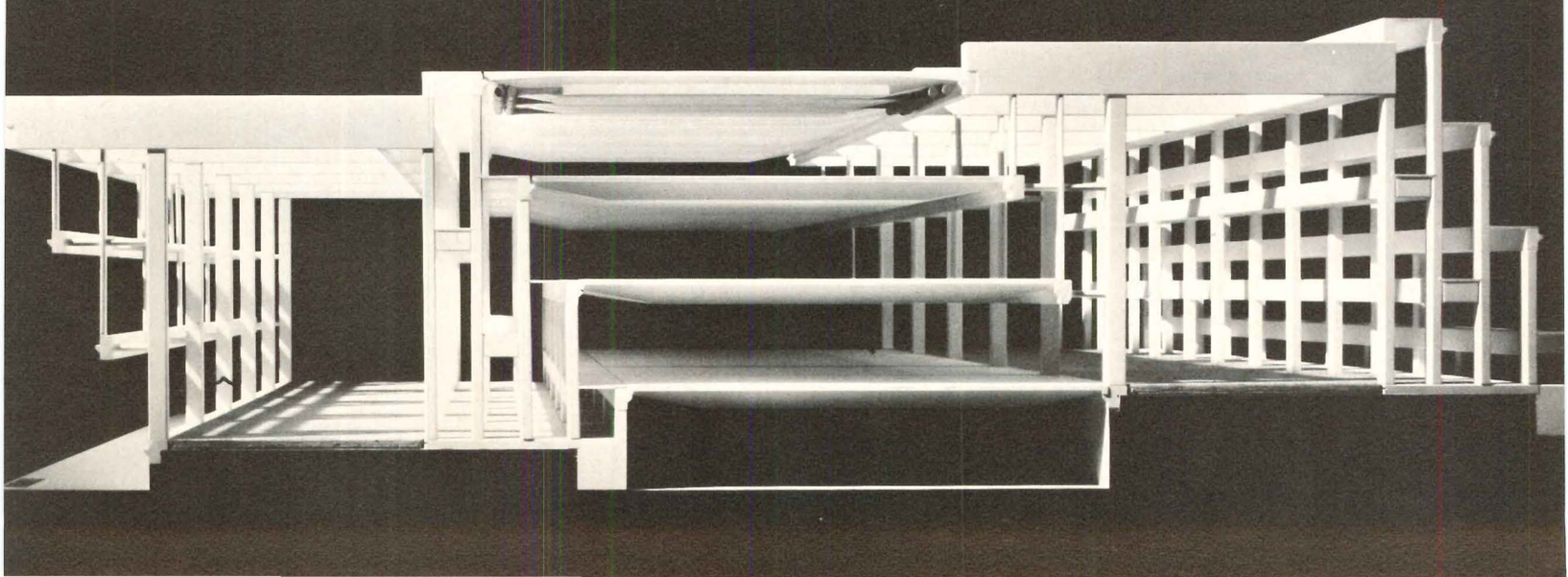


Each floor is served by main distribution ducts alongside the window walls. From these, combination modular outlet conduits that carry air diffusers, lighting, electrical and fire sprinkler services extend into the occupied space between each structural rib. This modular conduit concept allows for maximum off-site factory manufacture, with resultant economy and quality of finish.

BELCONNEN GOVERNMENT OFFICE COMPLEX, Canberra, Australia. Architect: *John Andrews, Architects;* structural engineers: *Miller, Milston, Ferris;* mechanical & electrical engineers: *D. S. Thomas & Partners;* quantity surveyors and specifications: *McCredie, Richmond & Johns;* landscape architects: *Richard Strong & Associates.*



Above: over-all shot of the Belconnen model, showing site and parking. Below: a sectional model of one of the typical office fingers, showing the "T" supports, the one-way floor slabs tapered at their ends, and a portion of the mechanical system.

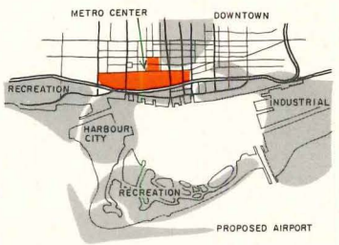


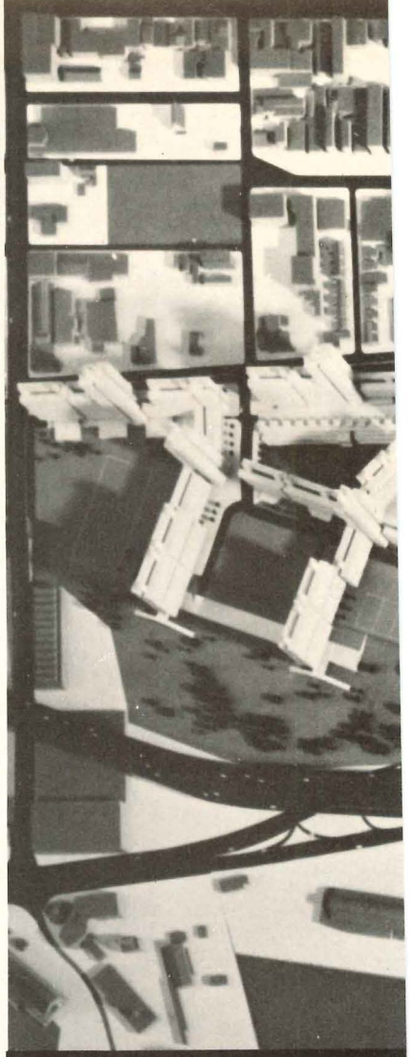
METRO CENTER

TORONTO, CANADA

Metro Center is a multi-million dollar proposal for the development of existing land in downtown Toronto. The site comprises some 200 acres, now occupied by the yard and tracks of the Canadian National Railway, which owns the land and is sponsoring Metro Center. The Andrews office was commissioned as urban designers and architects for Metro Center, along with Webb, Zerafa, Menkes as associate architects, in June of 1967, and these design proposals were first presented to the public in January of 1969.

Metro Center proposes the creation of a large-scale central transportation terminal, 9,000 new apartments, and 4.5 million square feet of office space. Construction is now under way on the visual focus of Metro Center: a 1,200 foot high transmission, restaurant and observation tower. The following design rationale is edited from the Andrews office's Technical Report on Metro Center. Project group: John Andrews, Roger du Toit, and Larry Diamond.





Panda Associates

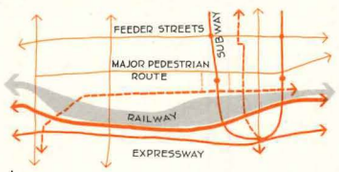
A point of view on master planning

Master planning deals with the organization of generalized functions. Its main concern is with connections, relationships and movement flows; with how these are ordered to provide amenity and comprehension to the whole. The plan is usually implemented over a long period of time, with all the change and progress that this implies, and for this reason can never be a fixed, completed entity. It is a system, not an edifice, and for this reason the drawings and models of building forms are to be taken as examples only of one possible built form. The reality of the plan lies in its system of movement and access and in the ability of these systems to grow and accommodate future change, either of its functional elements or of the whole layout itself, without destroying the validity of its general organization. It does not rely as much as a building does on particular sizes, quantities or forms for its organization. It shows connections without being specific on dimensions.

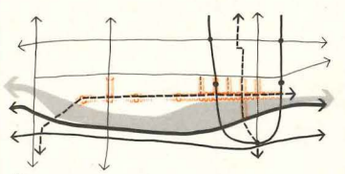
The framework idea

The building types in Metro Center can be split into two kinds of use—one general, the other specialized. The general aspects—access, service and communal facilities such as shopping and dining—are common to all the special building types: These will be needed for all buildings which are likely to be included in Metro Center, whether offices, hotels, clubs, studios or apartments.

These communal aspects, when superimposed upon the lines of pedestrian movement and transportation outlets (A), will form a structure of convenience (or communal framework) varying in intensity as demand dictates (B), to which are attached the specialist building types (C). This framework of central



A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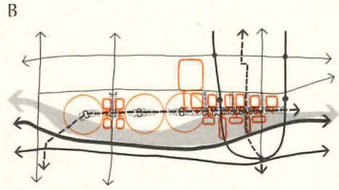
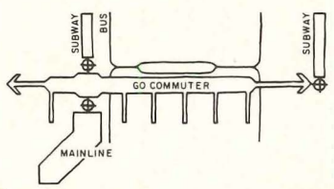

C

activities, which allows for maximum change in peripheral events, is a principal concept governing the Metro Center plan, in both its detailed forms and in its over-all scope. The major element of the framework is the east-west pedestrian route—the spine of Metro Center—either fully pedestrian or "pedestrian assisted" with a local mechanical shuttle system.

The transportation component

The Metro Center site brings together almost all the transportation modes that metropolitan Toronto has to offer; inter-city and commuter rail passengers, the regional expressway system, the subway system and the proposed underground downtown pedestrian spine.

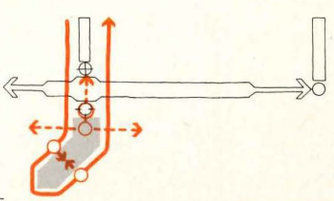
It was apparent from the beginning that each of these transportation modes at Metro Center has different physical requirements, both for passenger and for vehicle handling, requiring individual expression and operation. The concept that developed is one of a series of independent elements linked together through the pedestrian framework. Each transportation mode is free to operate under its own disciplines, to grow and to change without affecting the others, yet they are structured into a unified functional relationship through the framework (D).

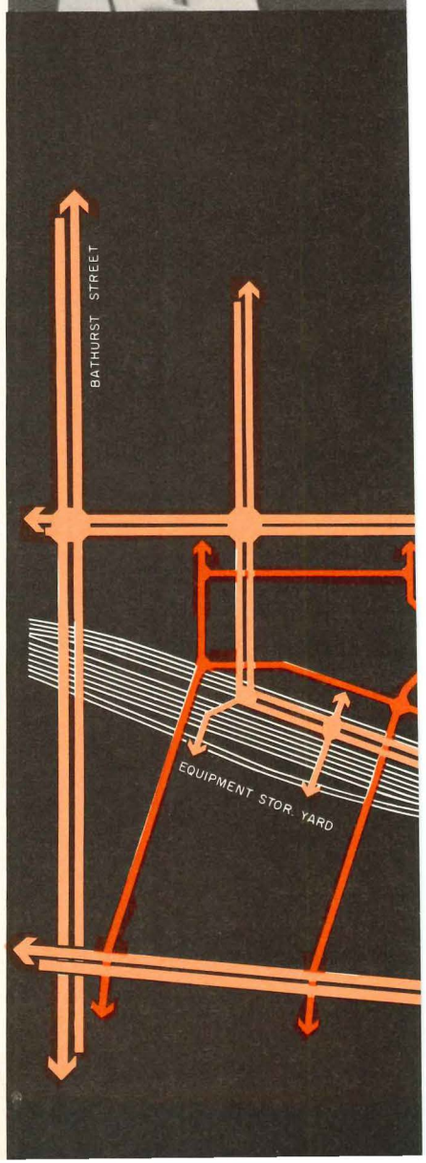


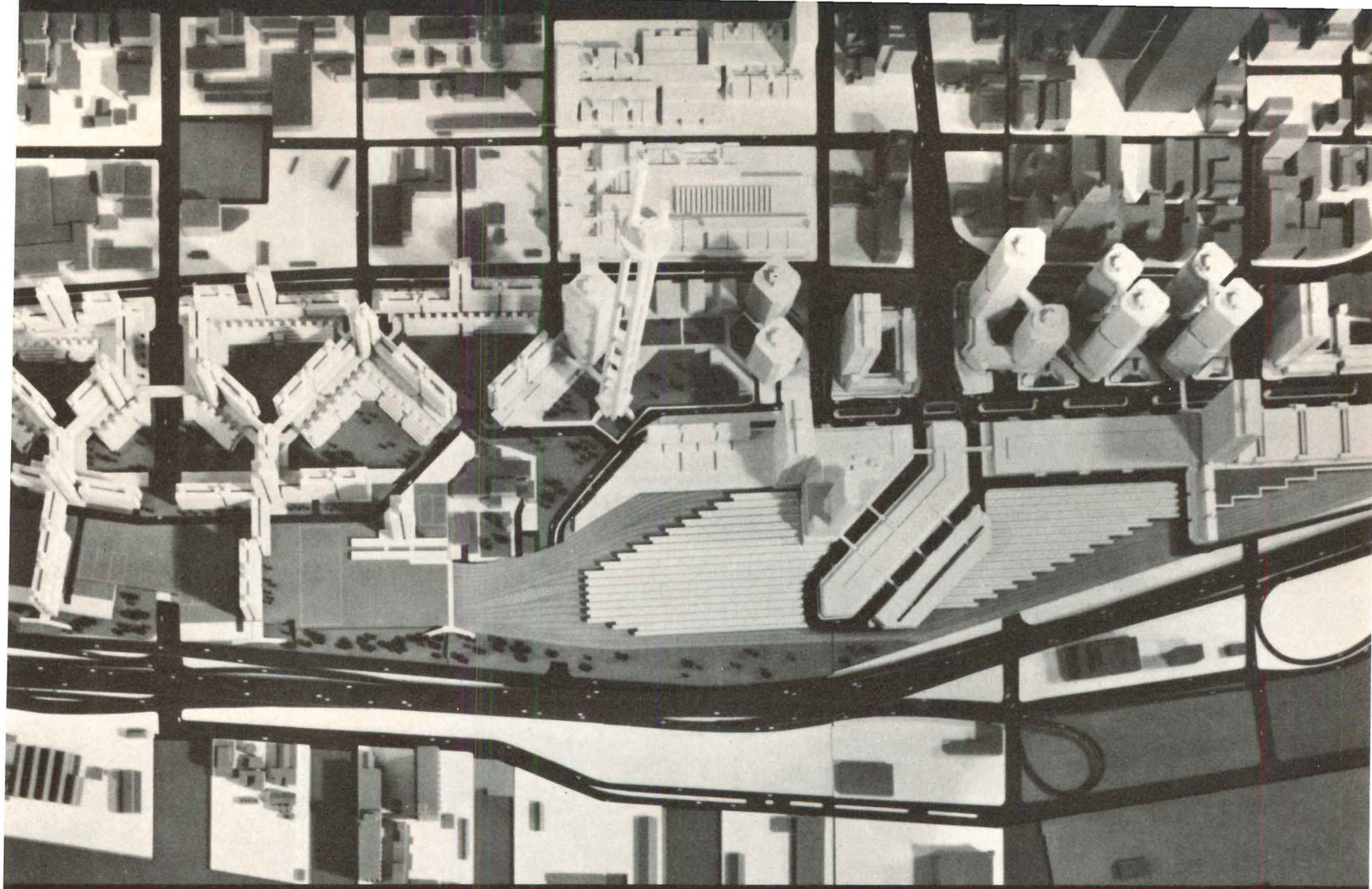
D

Mainline rail station

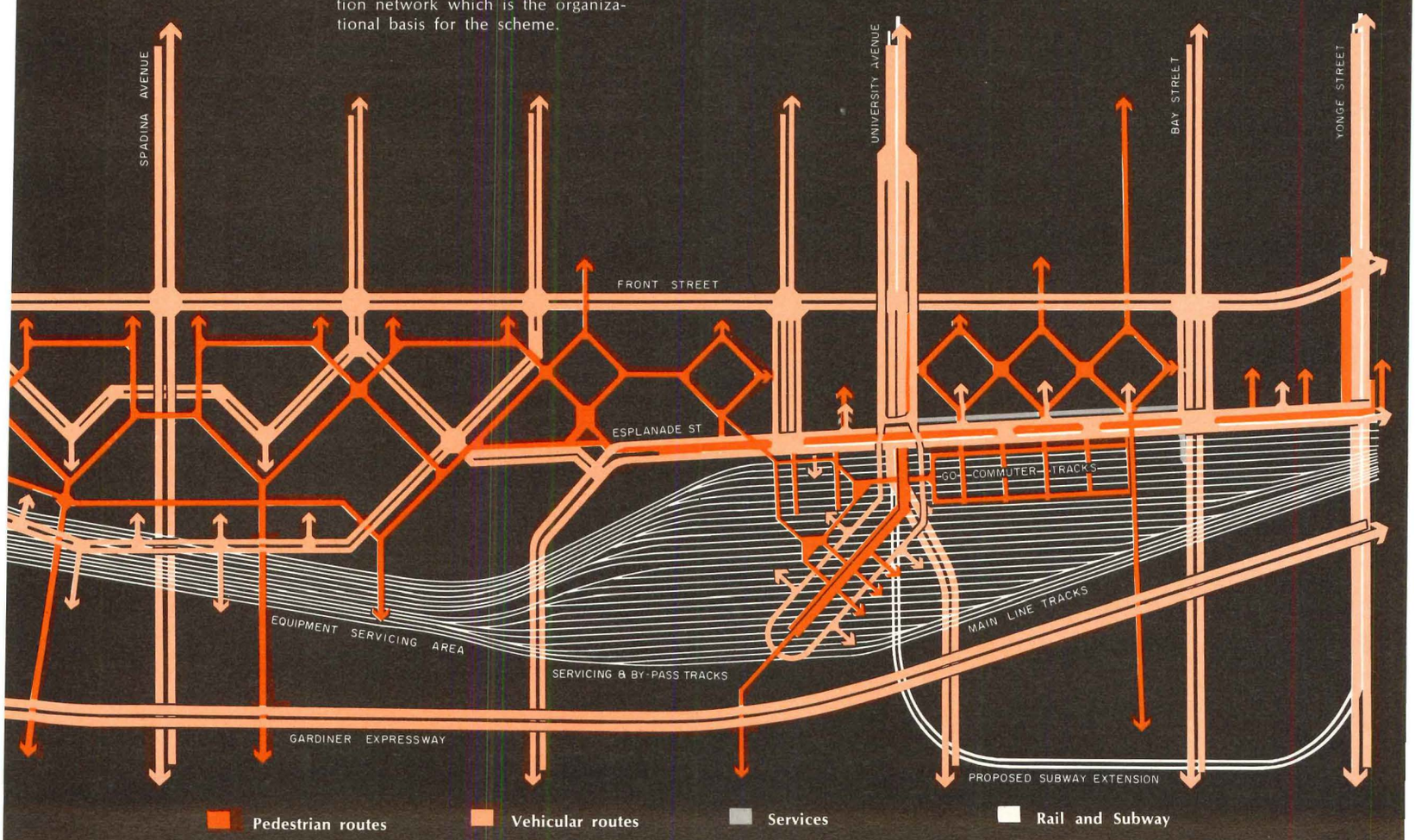
The primary connection to mainline trains is by automobile. To meet this requirement, University Avenue extends to loop around the station concourse, providing maximum exposure for both taxi and private drop-off and pick-up (E).

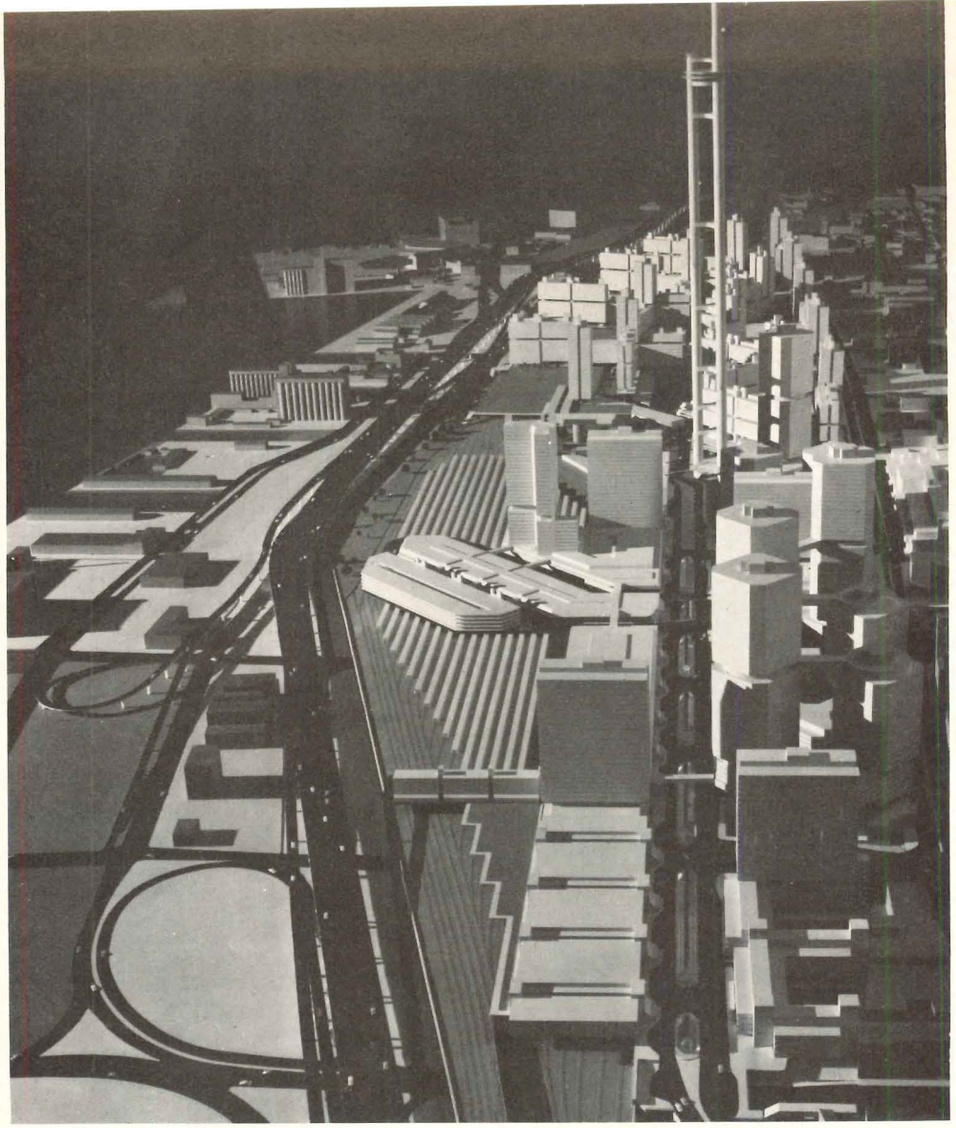

E





Above: the completed model of Metro Center, showing the final stage of development. The staged system of growth for the project is shown on page 131. Below: the transportation network which is the organizational basis for the scheme.





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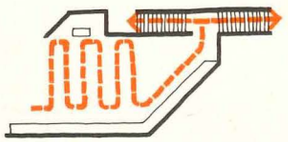
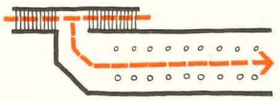
The train passenger arriving by automobile proceeds directly to a special holding area for his particular train (F). This is a compact,



F

rather than a linear, grouping system; it does not interfere with other departing operations, and lines are confined to each holding area, before people descend stairs to the platform.

A linear meeting area above the train platform accommodates the line of people waiting to greet arriving passengers (G). This linear

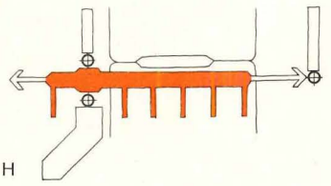


G

form of the arrival bay facilitates the installation of airline-type luggage distribution, if the railroads should require it in the future.

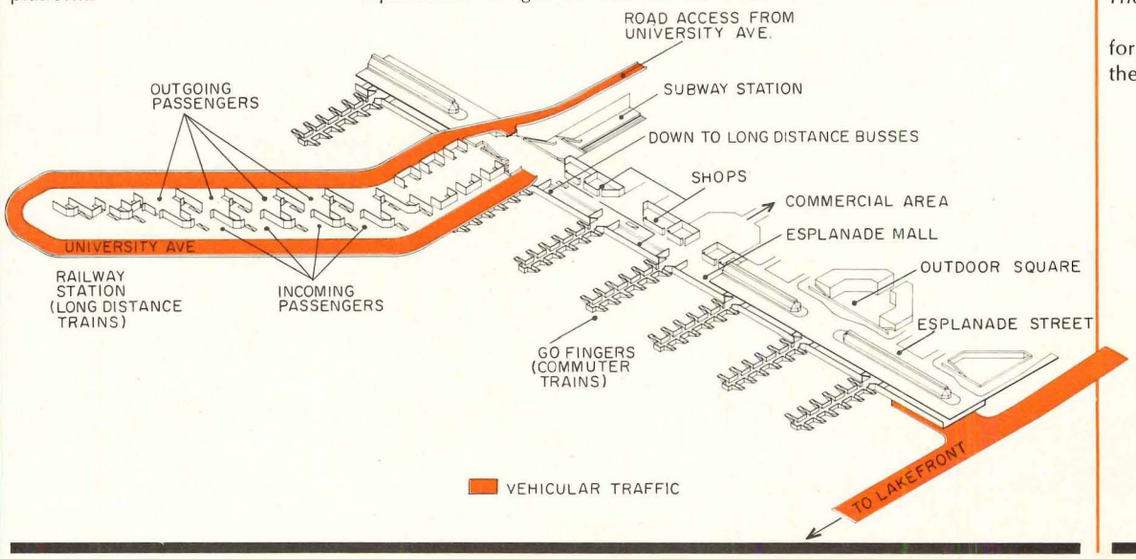
The Go commuter station

The commuter has but one requirement: to get on and off his train and into the city in the simplest possible way. The "Go station" therefore consists of access conduits feeding the trains directly from a main "sidewalk" of the city: Esplanade Mall (H). Ticket check-



H

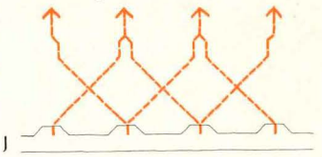
ing, whether manual or automatic, occurs at the mouth of each conduit.



The commercial component

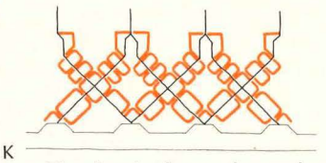
The organization of the commercial area is developed around the pedestrian flow between the transportation exchange and the downtown core.

To take pedestrians in the most direct way from the Esplanade Complex to their destinations in the city, diagonal "desire line" routes cut through the area (J).



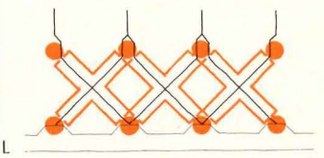
J

At the main pedestrian level leading from the GO access conduits to Front Street these lines are flanked by shopping and other amenities heavily used by the public (K).



K

The level above these shopping routes lies level with Esplanade Street and ten feet above Front Street. Overlooking the shopping, it accommodates office entrance foyers at the connection of diagonal routes and the street sidewalks (L).



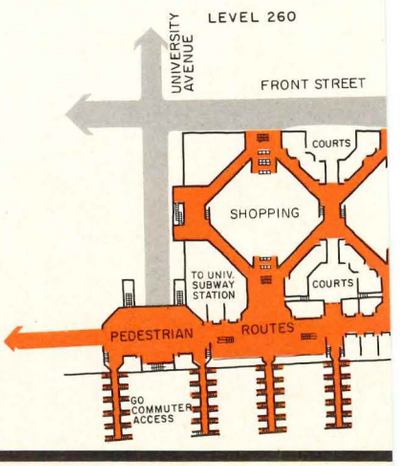
L

Secondary public facilities such as restaurants, clubs, travel agencies and the like form a link between the foyers, forming a secondary diagonal route overlooking the first.

Both of these enclosed ways relate to open spaces which link together to allow outdoor movement routes throughout the area on a north-south axis.

The office types

In analyzing the requirements for office space in Metro Center there were few specific users' re-



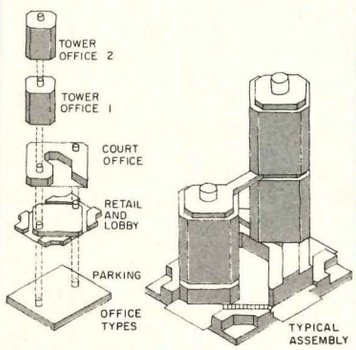
quirements known at this planning stage. The concentration was on producing a strong but flexible office system which would later accept the criteria of individual clients.

The first step was to determine the general types of office and commercial space that the market required. The conclusion was that there were four office types:

1. Public space
2. Corridor offices
3. Smaller office tower
4. Larger office tower

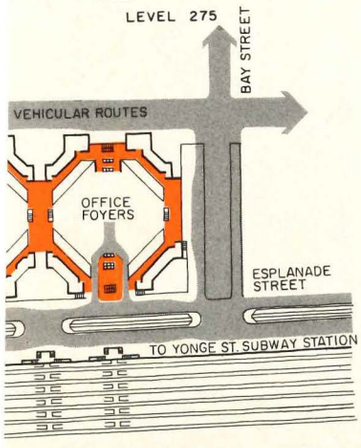
Office organization

Once these types were established, they could be arranged in the way best suited to the requirements of each, according to client demand, marketability or whatever determinants may operate at the time of construction. It soon became apparent that it is their vertical organization that most clearly delineates their use (M). The major public level occurs at grade. The corridor or court offices lie above, being used by larger and more public-oriented tenants. These offices open onto courts formed by the roof of the commercial space below, being at the same level as the railway station and convention center over the tracks. Above these corridor offices rise the free-standing towers (M).



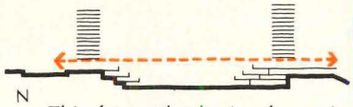
M

The components may combine in a variety of ways into an assembly unit of a workable construction size.



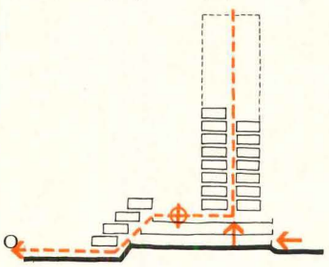
The residential component

Front Street is elevated above the residential area's natural grade, as is the level of the new track layout. Development of the site between these two edges could therefore be arranged so that the pedestrian walking across the area remains at the same level, the upper level of Front Street (N).



N

This forms the basis of a residential section which integrates family units, taking the form of terrace housing stepping down to ground level, with views over the children's play area (O). The apartments are reached by elevator and have long-range views. Car parking is located underneath the pedestrian route and below the apartments, with direct elevator connections, and can be naturally ventilated.



O

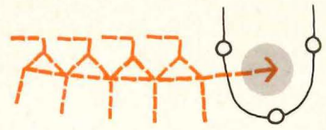
Having established this basic section, the plan layout was approached from two directions: organization by physical conditions and organization by social conditions.

Sun orientation, views, winds, and the geometry imposed by the edge conditions of the track area and at Front Street, together with the structural limitations of building over tracks, are the main physical conditions.

The diagonal south-westerly and south-easterly exposures receive four hours of sunlight daily, more than either southerly, easterly or westerly exposures. A diagonal pattern such as this also allowed direct views to the city and lake, and provided natural connecting lines to the transportation exchange and downtown core. This diagonal arrangement became the basis of the plan (P).

P

The next step was to modify the basic layout to the edge conditions (Q). To the south of the main-line rail tracks, which form one of our two original "edges" of the site, the structural grid supports for



Q

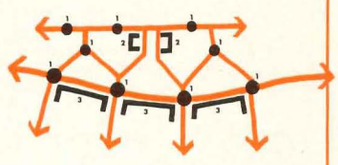
housing had to be placed at right angles to the tracks; thus the housing units form "fingers" stretching across the tracks out towards the lakefront. The layout was also modified at the Front Street edge, the units being arranged along the line of Front Street.

Layout by social conditions

Private living and community living are two primary aspects of the urban experience. In regard to private living the main concern was to be certain that the design made such living possible, believing that individual private spaces such as apartments were best dealt with at a later time, when requirements were known and more specific. The main concern at this planning stage was provision for and the organization of the communal facilities.

The basic objective was to place the communal facilities in areas of maximum public exposure along the pedestrian routes, with functions overlapped and grouped together as much as possible. People using one facility should see another activity in progress: In this way the proximity of each function reinforces the others and, overseen every day by tenants on their way to and from the elevators, these activities will create a point of common experience.

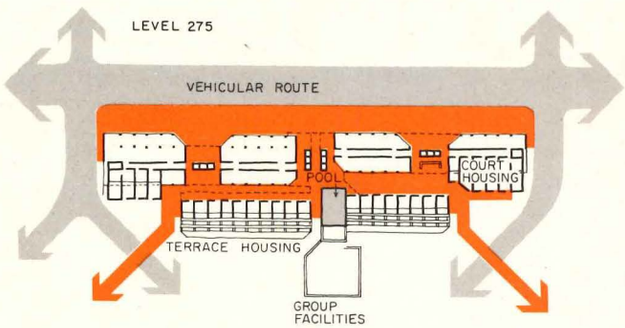
The communal facilities combine together along the track edge in a rhythm of types connected together by a pedestrian way (R).

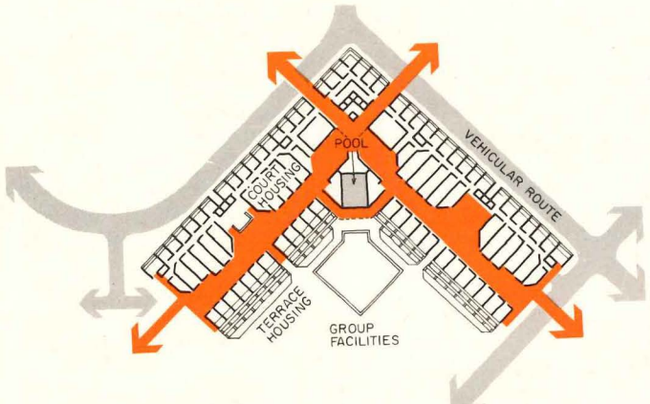


R

Each pedestrian route leads somewhere; a route cannot exist without destinations, and by following each pedestrian route or "line" a person will reach a cluster of communal functions, or "node", in each direction. Each urban dweller has a wide variety of choice, an overlap of contacts within the community, providing a communal identity without creating a single monolithic and inflexible "planned" social structure.

METRO CENTER, Toronto, Ontario. Architect: *John Andrews, Architects;* associate architects: *Webb, Zerafa, Menkes;* structural engineers: *R. R. Nicolet & Associates;* mechanical and electrical engineers: *Ellard-Willson & Associates;* traffic engineering: *Barton-Ashman Associates;* market analysis: *Murray V. Jones & Associates;* municipal engineering: *Marshall, Macklin, Monaghan Ltd.;* social and recreational services: *Leon Kumove.*



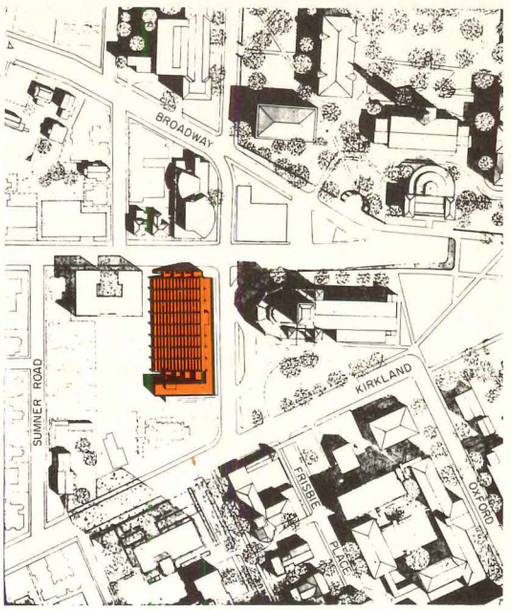


HARVARD GRADUATE SCHOOL OF DESIGN

CAMBRIDGE, MASSACHUSETTS

The new Harvard Graduate School of Design will be located across the street from Harvard's famous War Memorial Building by Ware & Van Brunt, and about one block from Le Corbusier's Visual Arts Center. It will house four levels of studio space for architects, city planners and landscape architects, a large library, substantial exhibition spaces, instructors' offices and administration; total interior area on six "floors" will be 160,000 square feet. A primary architectural feature will be the single space within which a portion of all the studio areas occur; a stepped series of floors covered by a single span of trusses.

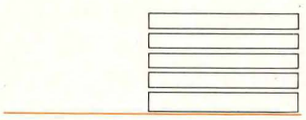
The Andrews office received its commission for the Graduate School in April of 1968; bids have now been received on the working drawings, and total completion of the building is scheduled for September of 1971. Project group for the Andrews office: John Andrews, Edward R. Baldwin and John Simpson.



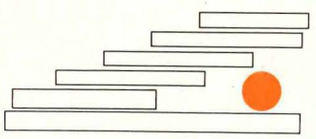
The basic section

The initial assumption was that studio spaces for both architects and planners should be on the same level with each other and with supporting facilities such as library and offices: a horizontal circulation system. This required too

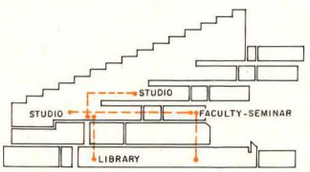
large an area for the specified site. Stacking the studios vertically fits the site but circulation and communication between floors is un-



satisfactory. A staggered configuration of studios provides relatively efficient circulation, and better general communication between levels can be achieved. Larger supporting facilities such as the lecture hall may be attached under the overhanging floor.



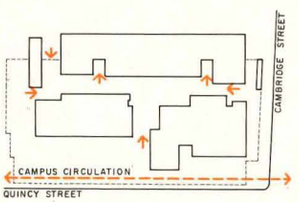
The configuration of studios provides for maximum inter-floor contact both physically and visually. On three levels, half of the studio



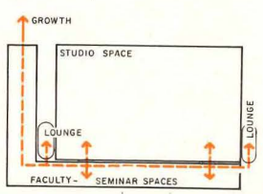
space is arranged under the level above to allow students the choice of working within the large open space or in the more intimate space under the overhanging level above.

Movement and interior spaces

Major campus circulation passes under the building adjacent to an exterior area which has the potential of becoming an outdoor exhibit area. The formal main entrance is replaced by several points of entry to a general circulation exhibition area from which access is open to the main elements of the building and to the courtyard.



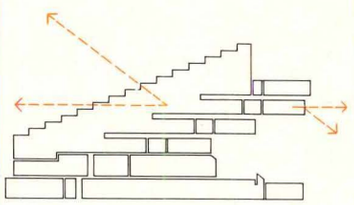
Within the building, circulation from studio to studio takes place on open interior stairways from level to level, within the main central space of the stepped roof. Each studio space is immediately adjacent to a range of faculty offices and seminar rooms to provide for spontaneous slide shows and group discussions. Studio space is designed to accommodate the optimum number of approximately 350 students. A lounge with an adjacent



outdoor terrace on each studio level is a connecting point between student and faculty areas. Office and research spaces may expand to the east, as required by program.

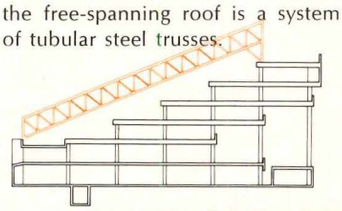
Light and view

Direct daylight may be admitted from the stepped overhead windows of the truss system, and there will be a view to the ground and surrounding environment from the upper studios through windows near their same level. There will be views from the rear areas of the studio down to the courtyards under the studio.



Structure

The building is basically of reinforced concrete with flat-slab construction. The primary structure of the free-spanning roof is a system of tubular steel trusses.

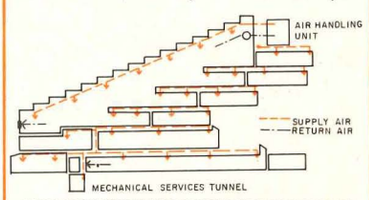


Mechanical

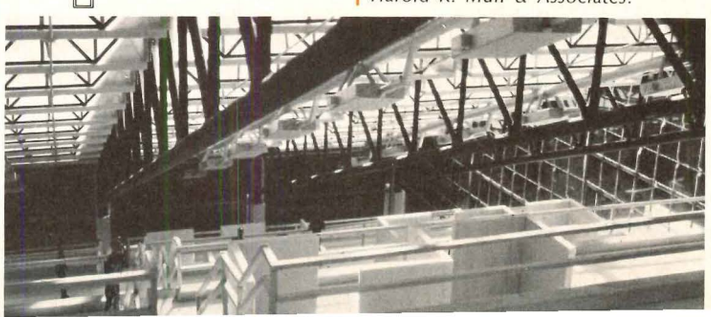
The building is fully air-conditioned and is divided into several clearly defined zones.

The studio area has circular air supply ducts visibly suspended within the roof structure and an exhaust system at the highest point in the space. Both of these systems relate to air-handling units situated on the flat roof. The perimeter zones adjacent to studio areas are handled from the same air-handling units.

The mechanical room in the basement handles the special areas lower in the building such as the lecture hall, library and workshops.

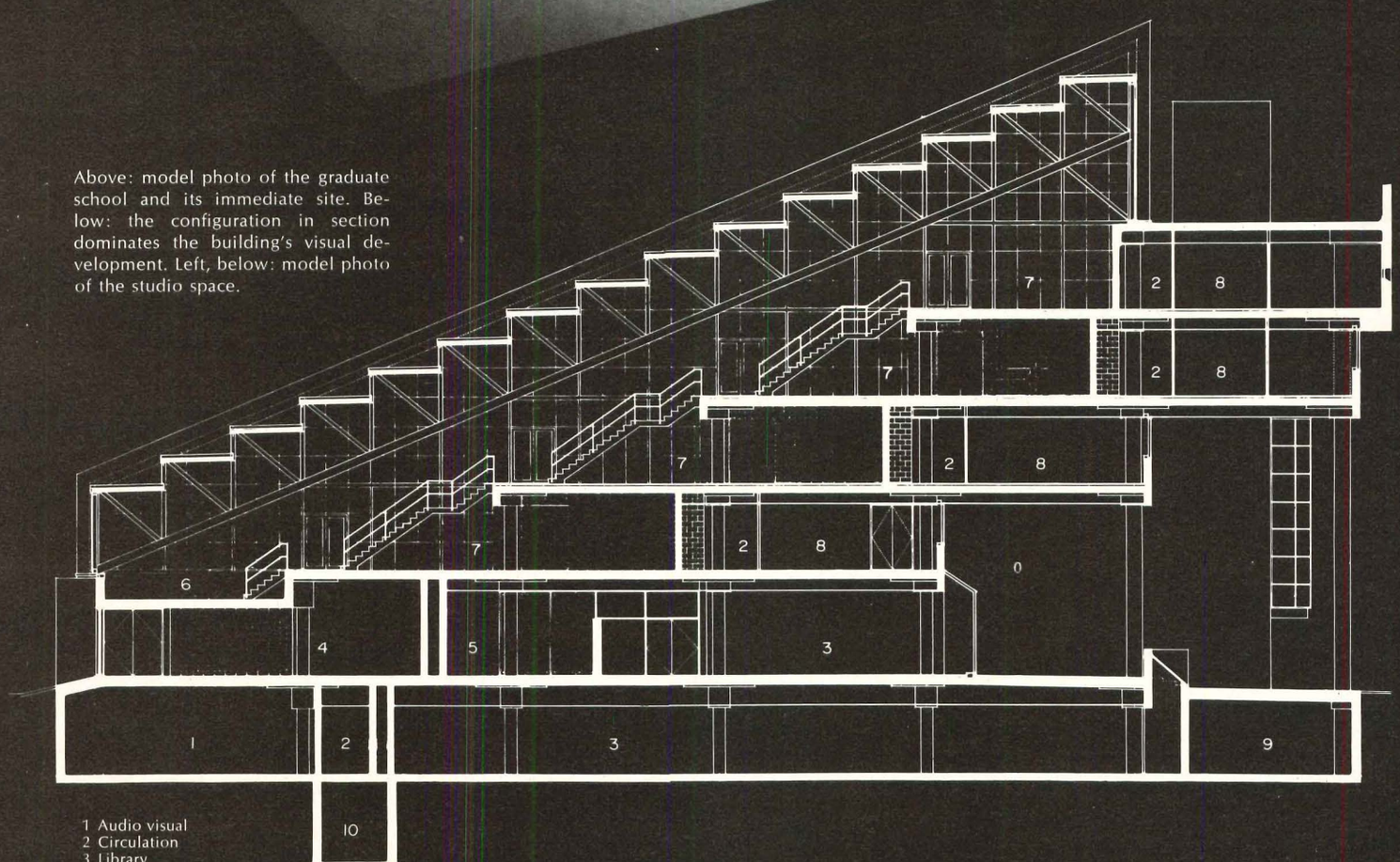


GRADUATE SCHOOL OF DESIGN, Harvard University, Cambridge, Massachusetts. Architect: *John Andrews, Architects;* structural engineers: *Le-Messurier Associates;* mechanical engineers: *G. Granek & Associates;* electrical engineers: *Jack Chisvin & Associates;* cost consultants: *Helyar, Vermeulen, Rae & Mauchan;* landscape architects: *Richard Strong Associates;* specifications: *Wood, Angus & Owen Inc.;* acoustical consultant: *Harold R. Mull & Associates.*

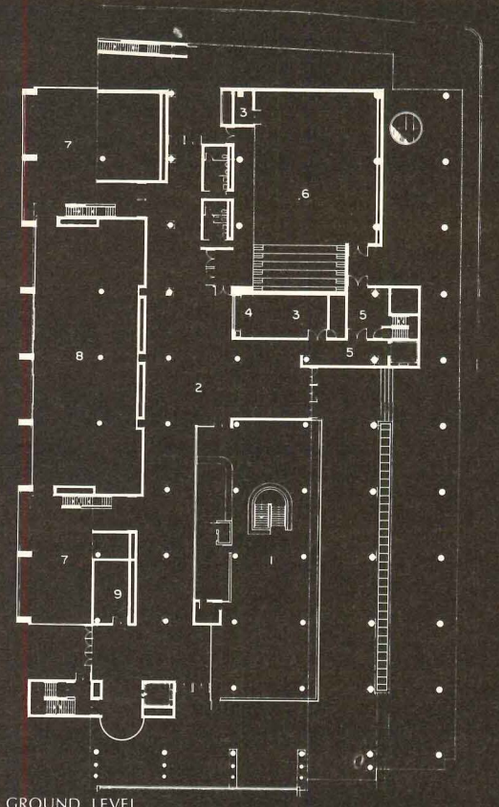


Carol Rankin photos

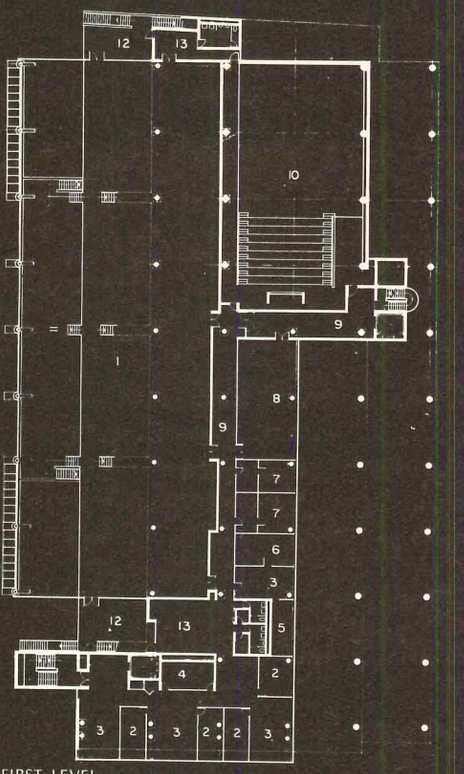
Above: model photo of the graduate school and its immediate site. Below: the configuration in section dominates the building's visual development. Left, below: model photo of the studio space.



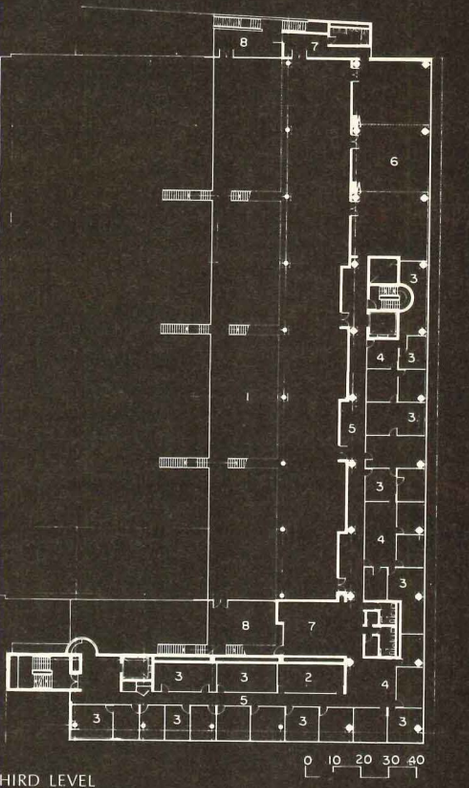
1 Audio visual
2 Circulation
3 Library
4 Technology workshop
5 Exhibition
6 Design workshop
7 Studios
8 Faculty offices
9 Microfilms & maps
10 Mechanical tunnel



GROUND LEVEL



FIRST LEVEL



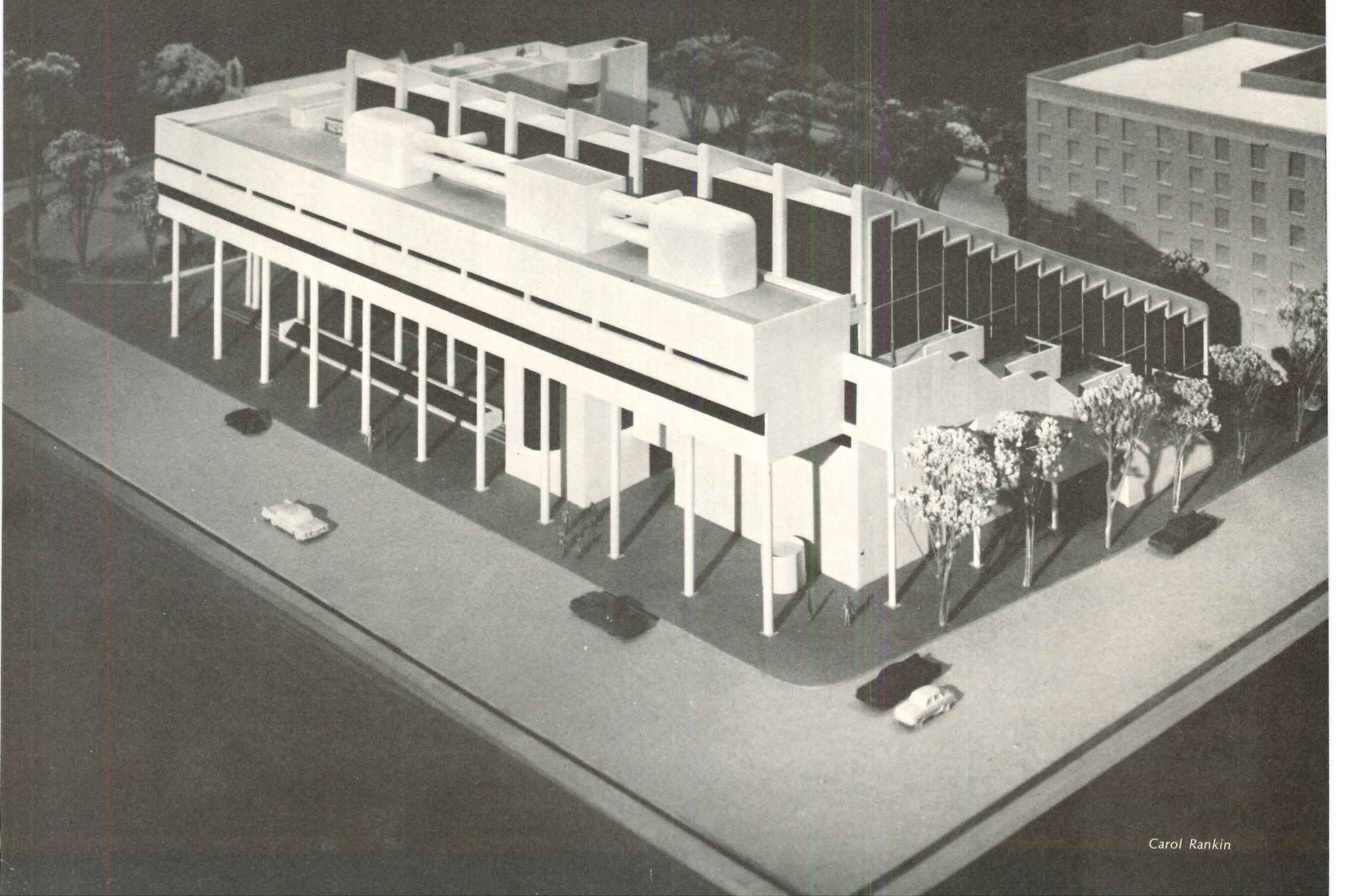
THIRD LEVEL

FLOOR PLANS—HARVARD GRADUATE SCHOOL OF DESIGN

1 Library
2 Exhibition
3 Storage
4 Bar
5 Circulation
6 Lecture hall
7 Studio
8 Technology workshop
9 Janitor

1 Studio
2 Chairman
3 Secretarial
4 Conference
5 Assistant dean
6 Dean
7 Administration office
8 Seminar
9 Circulation
10 Lecture hall—upper level
11 Design workshop
12 Terrace
13 Lounge

1 Studio
2 Conference
3 Faculty offices
4 Secretarial
5 Circulation
6 Seminar
7 Lounge
8 Terrace



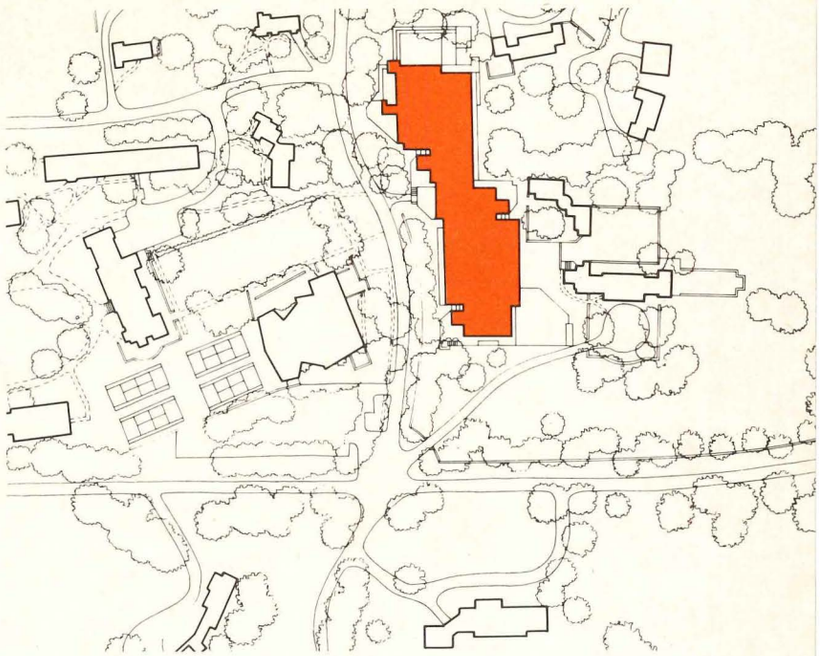
Carol Rankin

SARAH LAWRENCE LIBRARY–INSTRUCTIONAL CENTER

BRONXVILLE, NEW YORK

Sarah Lawrence College is a residential college of liberal arts for women, located fifteen miles north of New York City. In 1968 the enrollment of the college was approximately 260 students. The Andrews office received a commission to design a new Library-Instructional Center for the college in September of 1967. The project proceeded through site studies and working drawings, but it was recently terminated by the college for a variety of reasons unrelated to the design solution.

The following is a description of the design rationales by which the Andrews office developed the project. The design includes a library for 250,000 books, small instructional classrooms, science laboratories, art studios, and a 175-seat auditorium; a total of 140,000 square feet of space on three floors. Project group for the office: Robert Anderson and Tony Parsons.



The site

Sarah Lawrence College is situated in a residential area, and the majority of the college buildings are small-scale, in stone and brick. The site available for the new construction was itself restricted and heavily treed, with rolling land. It therefore seemed essential that the new construction be as small in scale as possible, so that the character of the neighborhood would be retained.

Since the college is situated in an area which is zoned for single-family dwellings, a special zoning variance is required for all new construction. The variance granted for the Library-Instructional Center established a number of restrictions on the building's form and appearance. An over-all height limitation of 35 feet above an average grade line influenced the structural solution. Setback requirements, the height limitation and program requirements determined that a three-story building would be required, and that each story of the building would step back from the roadway in certain areas.

Only masonry and glass were allowed as exterior materials by the zoning variance. To fulfill these requirements, preserve privacy and control light while preventing the building from becoming a solid mass, glass block was employed in many areas.

Program requirements

The basic program formulated by the college called for a series of flexible and physically connected teaching spaces. Spaces had to allow for individual growth and change within departments, for possible mergers and closer relationships between different subject areas, and for new fields which might develop in the future.

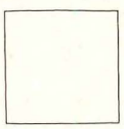
Principally, the college emphasized its need for flexibility in the general teaching spaces; it became imperative to define the space categories which would be required to fulfill the long-term needs of the program and the immediate needs of the college, staff and students. Two major categories of space were defined:

1. *General space,* providing the flexible teaching spaces required by the program.

2. *Specific space,* accommodating the large particular-use spaces such as the library, or instructor's offices, and including also small miscellaneous spaces which might be needed for other specific uses.

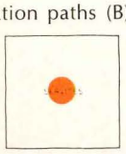
Plan rationale: The typical cell

The primary generator of the plan was the thinking used to create the large areas of general flexible space. The rationale began with a large unpartitioned square space as the basic flexible cell (A). This space



A

required services such as mechanical equipment, stairs, and lavatories; placing these in the center shortened mechanical service runs and circulation paths (B).

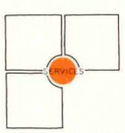


B

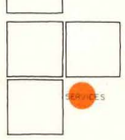
To support the space structurally, it could most conveniently be divided into four bays, representing major structural supports (C).

C

To provide for the possible expansion needs of the service spaces, and to provide direct pedestrian access to and from that service core, one structural bay was removed from the basic cell (D), and the service spaces were moved just outside the intersection of the structural divisions of the cell (E).



D



E

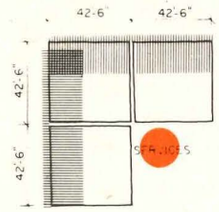
The dimensions of the cell and structural bays within the cell were determined by several factors, including:

a. Maximum exit distances as specified by local fire codes.

b. Most economical and efficient structural system. A maximum span in the structural bays of 45 feet might be approached, but not exceeded, as this is the cut-off point between short-span steel joists and the more expensive long-span sections.

c. The dimensions of the standard partitions and the furniture available including laboratory equipment.

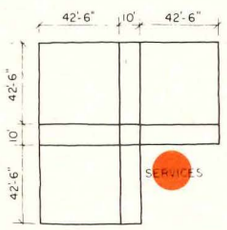
Using such criteria, it was finally determined to use a 2-foot, 6-inch square module as a basis for laying out mechanical ducts, lighting and partitions, and to make each of the three bays within a typical cell 42 feet 6 inches square (F).



F

The height limitation dictated an integration of structure and services which could best be obtained with metal framing: a beam and joist structural system in steel. The openings in the joists allowed services to enter the bay unobstructed and run at right angles to the joists.

To accommodate the primary mechanical runs between cells, and from the service areas to the bays of each cell, a "service strip" ten feet wide was added between each bay (G). These service strips would

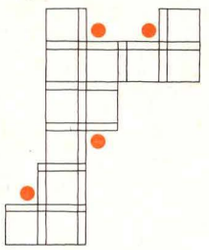


G

be apparent in the structural framing plan or mechanical equipment layouts but not necessarily in a floor plan; in other words, only between the ceiling of one level and the floor of the level above it, as the actual space within all three

bays and the service strips between them is open, flexible, and to be divided in any way according to programmatic needs.

The basic cell—three bays, service strips, and service core—can be added to other cells. (H).

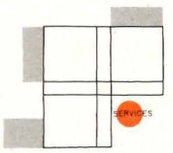


H

Since each bay has two open sides, it would be possible to join each bay to another cell while leaving one side free for the application of specific spaces. Each bay of each cell has a potential for both expansion by cells and for specific localized growth.

This, then, was the rationale used for the development of a theory for the general flexible spaces at Sarah Lawrence.

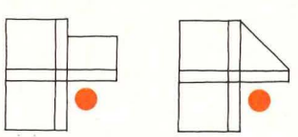
The second category of use areas—specific space—can be applied to the open sides of the general space cells (I). Specific spaces



I

may be small areas such as growth chambers for laboratories or temporary enclosures for large sculptural works being constructed. These small specific spaces would tend to be erected and removed within a few years, in response to a specific space requirement which cannot be satisfied by the general space of the basic cell. Large permanent specific spaces such as auditoriums and boiler rooms with specialized requirements not satisfied by or not requiring a general flexible area are added in a similar manner.

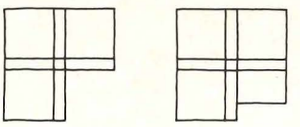
If land formations on the site or boundary restrictions do not allow the use of a full cell, the cell may be distorted—any or all bays may be decreased in size by modular deductions parallel to the joist span (J).



J

If a cell does not need services and is sparsely used, the service area may be eliminated (K). Supplementary peripheral circulation and service areas will then be required.

The basic cell can thus be

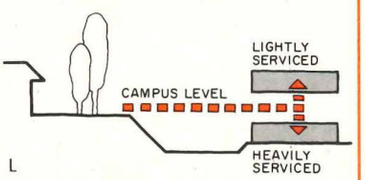


K

varied by additions, distortions, or variations in servicing. It is capable of accepting a wide range of changes without compromising its function of providing general flexible space.

The allocation of cells by site, program and servicing

The level of the main campus to the north was approximately twelve feet above the average grade line established by the zoning variance. Since the major portion of the site consisted of granite with only a few inches of top soil, excavation would have proven extremely expensive. It was therefore decided to establish a "campus level" in the new building which would extend the grade of the main campus across an intervening roadway via a



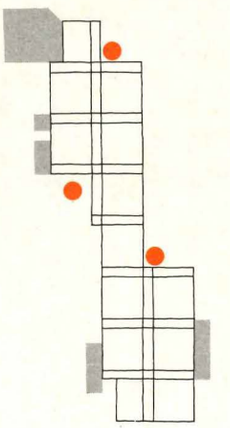
L

bridge (L). This level would extend the campus circulation into the building and provide an area for cross campus facilities such as lecture halls, exhibition areas and library services.

All cells whose use requirements call for heavy servicing in mechanical, electrical or plumbing connections, such as laboratories, were located at the average grade line, below the campus level. This space was serviced in the first building stage to accommodate biology, psychology, physics and chemistry laboratories. A central preparation area and animal colony were structured as specifics, as well as the central boiler and electrical rooms. A rock outcropping at the west end of the site necessitated a distortion of one bay. This distortion "lifted" the heavily serviced sculpture area to the campus level.

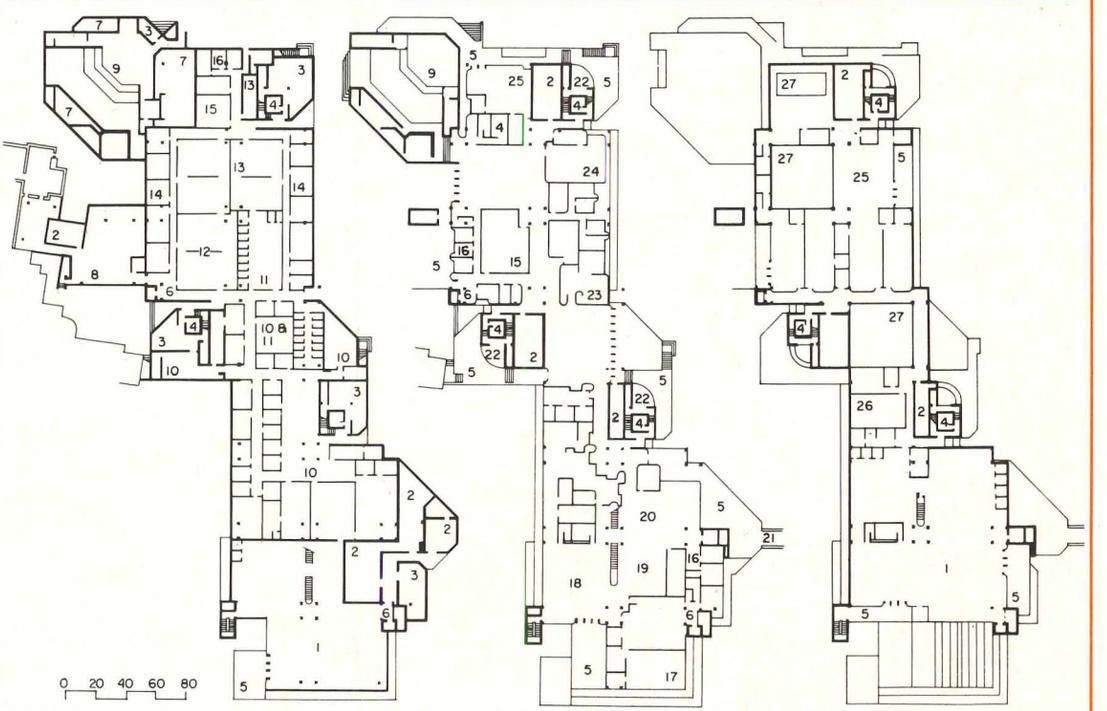
Basic lightly serviced space with "normal" mechanical electrical and plumbing needs were placed above the campus level, accommodating visual arts and psychology laboratories. With this location, natural lighting could be used in the visual arts areas.

The plan for the Library Instructional Center is basically, then, composed of three general flexible space cells linked together, each including the small specific spaces of their service components (M).



M

Larger specific-use spaces (such as the auditorium) and smaller specific-use spaces (such as science preparation rooms) have been added to cells where needed by function, and specific uses can be added or subtracted in the future. A complete three-bay cell without its service component was added to accommodate library book storage, and the service component replaced by a fourth bay. Thus the particular configuration of cells in the new building, the number of cells required, and the changes to be needed in them, have and will be dependent upon conditions of circulation, site, program and local codes.

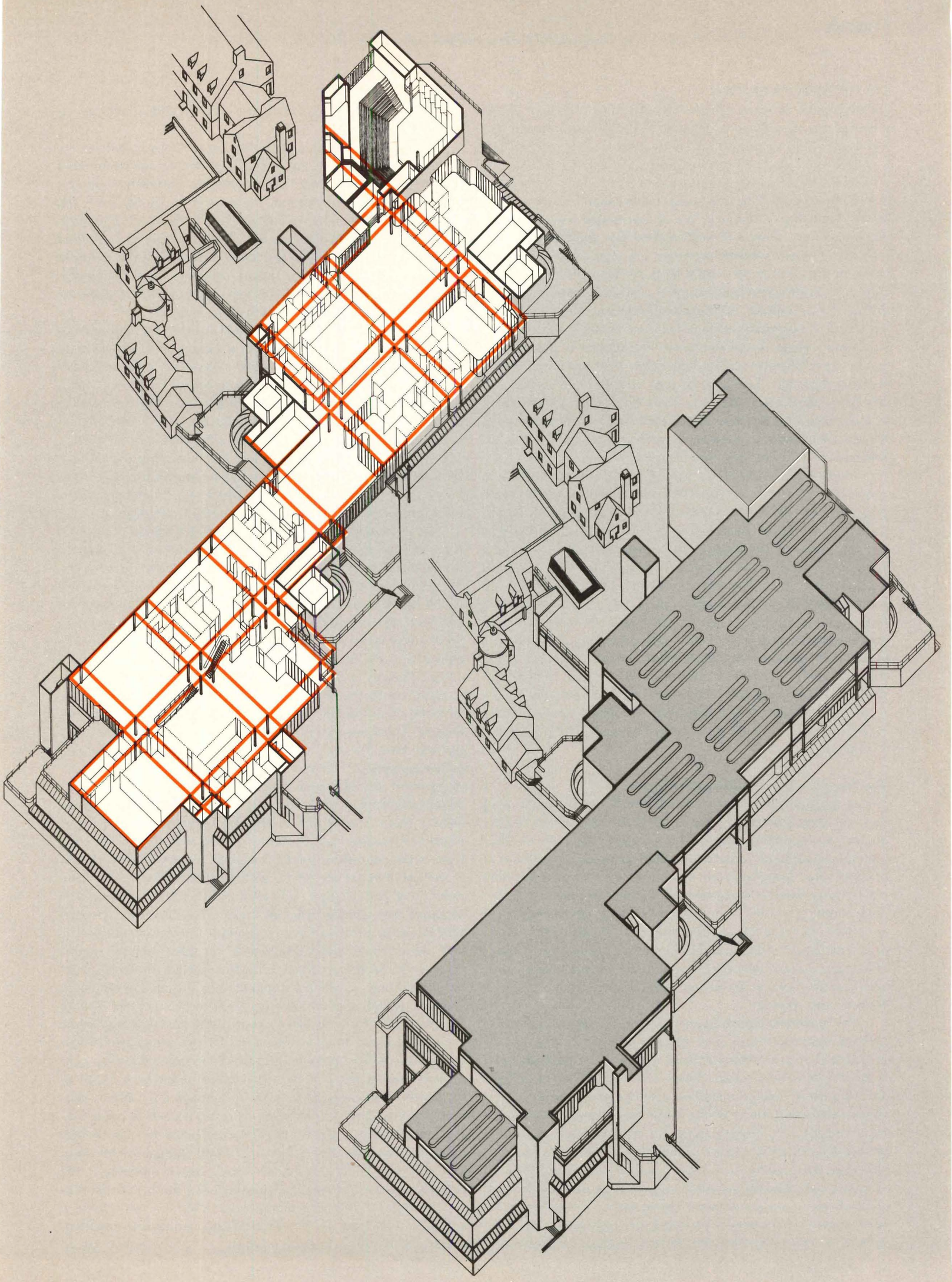


HEAVILY SERVICED LEVEL (LOWER FLOOR)

CAMPUS LEVEL (MIDDLE FLOOR)

LIGHTLY SERVICED LEVEL (UPPER FLOOR)

1 Library
2 Mechanical
3 Storage
4 Washrooms
5 Terrace
6 Elevator
7 Unexcavated
8 Shops
9 Auditorium
10 Biology
11 Psychology
12 Chemistry
13 Physics
14 Research
15 Classroom
16 Faculty
17 Tech. services
18 Periodicals
19 Catalogue
20 Reference
21 Bridge
22 Lounge
23 Teaching Museum
24 Exhibition
25 Visual Arts
26 Psychology
27 Open to below



text continued from page 131.

architectural contract is signed. The office's philosophy of design depends on its ability to generate specific clearly-stated user needs, and those clients who are not equipped to or are somehow opposed to developing this kind of program with the architect are usually frightened off. A third important process within the office is the vertical rather than horizontal organization of each project. At the beginning of a project, two to four people are assigned to it permanently, taking it through preliminary studies, design, design development, working drawings, job supervision, and doing much of the client contact. Specialists are brought into the team at various points when needed, and the project is reviewed by the partnership as a whole, or designated members of it, at all stages. Such vertical organizations are not unusual in offices today but the horizontal system is still dominant; the project is passed to a group of people in the design department, then to a new group in working drawings, there is a separate specifications writer, and one man—the project architect—does the paper work and client contact. The vertical system allows each professional a refreshing amount of freedom to develop his architectural ability; it is fulfilling to see a job through from beginning to end.

John Andrews exercises a control over this kind of office in more subtle ways than are usual. He started the firm and his name is on the door; certainly these factors exert their weight from day to day, but he may be outvoted at a partners meeting, and he gets the same share of the yearly profits as anyone else. His authority in the day-to-day design decisions of a project is very powerful; he is acknowledged as a brilliant designer and his opinions are sought out. Perhaps his influence can be said to exert itself most through the respect accorded his abilities by the participants of the firm, and through their own acknowledgement of what he has taught each man about design. Andrews is now in Australia setting up a branch of the practice covering Southeast Asia, and has permanently taken up residence there, at least until the new branch is well established. A man uncertain of himself or his abilities would not create the kind of firm that has become John Andrews, Architects.

The Projects: Ordering Design Rationales

The design for the Belconnen Office Center is a clear exposition of how the designers *thought* about the problem, and the relative degrees of importance they placed on elements within it. They saw the central issue as the environmental needs of a worker at his desk; the design process was an attempt to identify these needs, order them in importance, and fulfill them efficiently. The design itself is a kind of accounting of how the architects attempted to translate this commitment into a building. The principal architectural results of the commitment were the "finger" offices and the six-foot changes in floor elevation at fixed points, both created to make travel time and communication between workers most efficient.

The dominant motive in Metro Center is the creation of a planned framework on which specific physical designs can be placed later, in any number of ways. The basis for the framework is the transportation system; Metro Center's circulation patterns are hierarchical, and restricted to specific uses. Rail traffic is of course separated from vehicular traffic and pedestrians are separated from both, but pedestrian traffic is further subdivided within the commercial areas; there is a direct-to-the-city route for those not shopping or going to an office, another route for short-term shopping and stopping, yet another open space walkway through relatively quiet courts and parks. The design of Metro Center has been based upon the need for creating these separated circulation systems, designing the most efficient ways of separating them, and a close analysis of where each circulation system should go, or seems to *want* to go.

The configuration in section dominates Harvard; studying the section is the best way to understand the building, and by Andrews design rationale statement it was principally designed in section, more than in plan or elevation. The basis of the design lies in the spaces needed rather than in the circulation system between them, as at Belconnen and Metro Center. The principal spaces required by Harvard were the design studios, and Andrews' conception of these spaces—need for natural light, need for some communication between studios, need for some privacy within studios—implied its form: a single, stepped skylit interior.

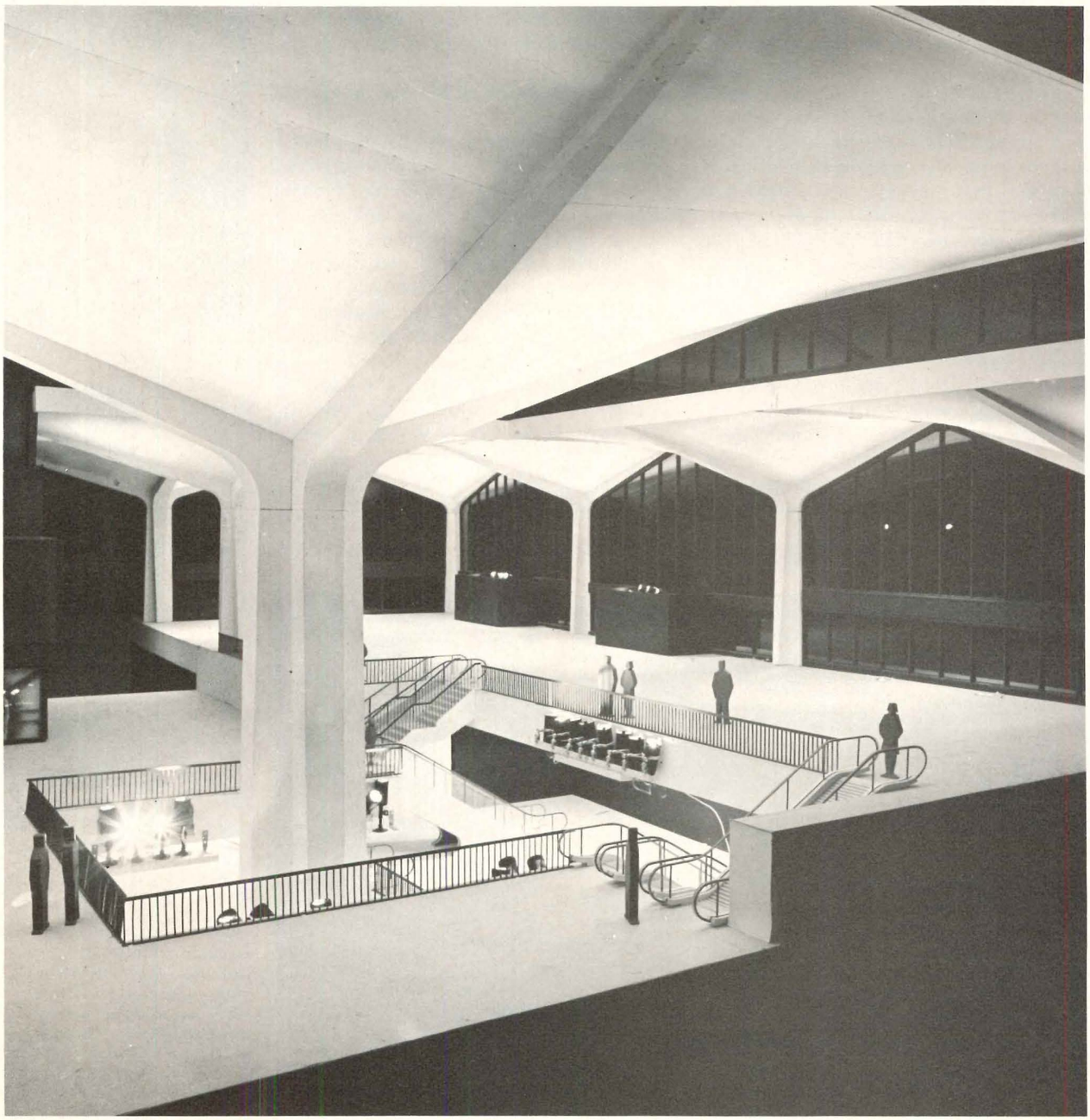
In Belconnen, Metro Center and Harvard certain physical demands of the program or conditions of the site have been selected as "most important" (efficient worker communication and walking times at Belconnen; the existing city patterns at Metro Center, as well as its transportation system; the studios at Harvard) and the design has been created about these issues; symbolically emphasizing them, visually articulating them from other "lesser" issues. The lesser issues are dealt with too, of course, but the projects show an exceptional ability to translate a clear hierarchical ordering of problems into physical forms which reflect the initial ordering, expressing the assumptions which guided the designers.

Sarah Lawrence is different from the other three projects. It is based upon a single cube (or cell, as they call it), defined as an irreducible "building block" of space. The cube of space is designed to fulfill generalized needs for access to it, change within it, and additions to it, and specific facilities for Sarah Lawrence are created from many of these generalized cubes, placed together to fulfill the program and accommodate themselves to the site. The emphasis in the design rationale is placed upon the consistency and correctness of the rationale itself, rather than on the accommodation of the building to a selected physical priority of needs, as in the other three projects. The Sarah Lawrence rationale emphasizes erection and design systems, mechanical/structural integrations more than the other projects do. In its emphasis on generative geometries—things created by combining small "modules" of identical shapes—Sarah Lawrence is related to the work of Alfred Newmann in Israel, and even to certain buildings by Walter Netsch. Metro Center, Belconnen and Harvard seem like direct visual descendants from Corbusier's work, with a touch of Louis Kahn in the rationales. The mall facade of Belconnen may be seen as vintage International Style, with its interlocking corner windows, long strips of glass, light unmodelled surfaces, and its grid of round, free-standing columns in plan. The basic parti for Harvard is similar to that of the La Tourette Convent by Corbusier; both have central spaces emphasized for their symbolic importance, with smaller repetitive cubicles wrapping around this central space. Long slit-window strips evenly interrupted by structural elements passing behind them occur on the upper story of both Harvard and La Tourette, and are remarkably similar in proportion.

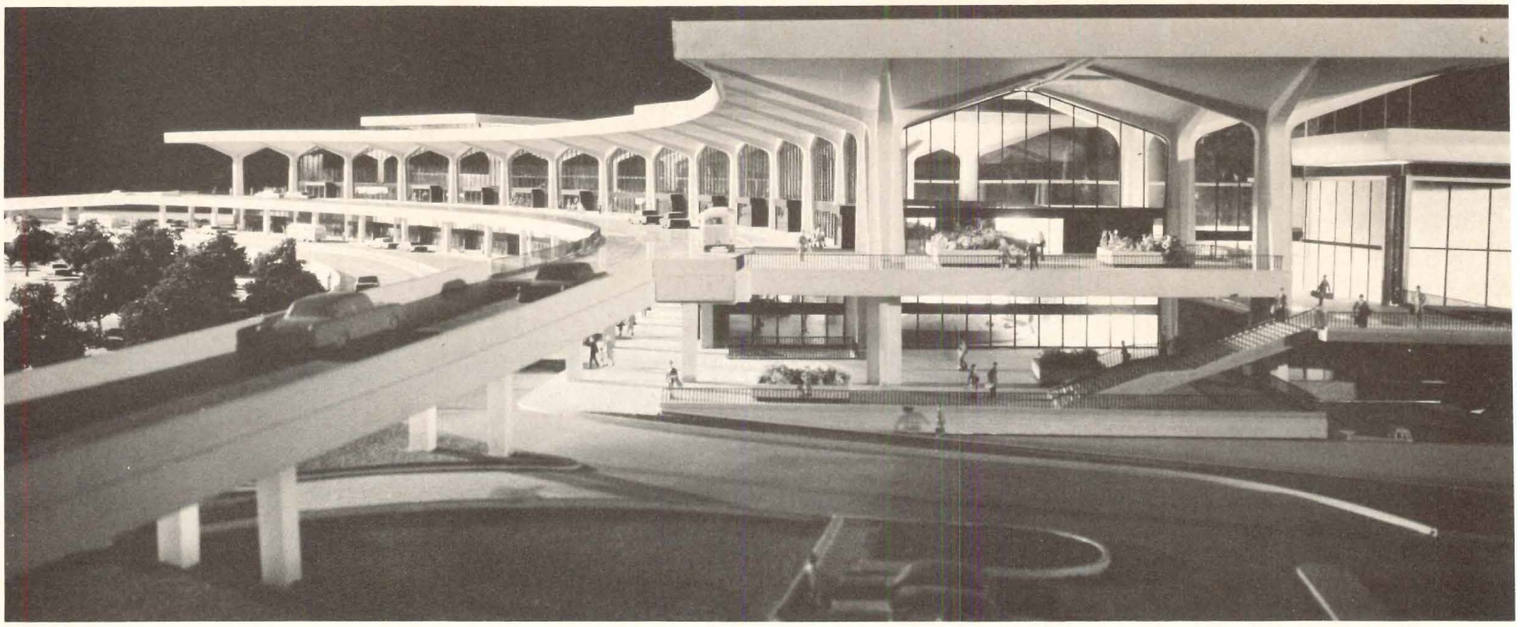
The forms of all four projects, in the end, are *images* of efficiency. The designs represent sure-footed accommodation to foreseeable requirements, but the visual drama of the works is not an outgrowth of meeting functional needs, though it is carefully integrated with such functional needs. Rather, it overrides and controls and finally makes coherent the material and circulatory commitments. Andrews designs are in the end studied *visual* forms, and they repeatedly use certain visual, spatial modelings—the stepped sections in Harvard, Belconnen, and the residential portion of Metro Center; the multi-storied interior street, always a symbolic, linear space—to help make the architecture important artistically, as well as making it work. —*Robert Jensen*

Engineers develop lighting design from model tests

They used a large-scale model of one of three umbrella-structure terminals under construction at Newark Airport to confirm the validity of initial concepts, to create the "actual" desired lighting effects, and finally to help determine the optical characteristics of the luminaires.



Miniature luminaires, designed for close optical control, illuminate one of the large umbrellas located at a traffic focal point of the terminal. In the actual buildings, the luminaires will be mounted on four tall poles, eight on each, at the corners of the opening.

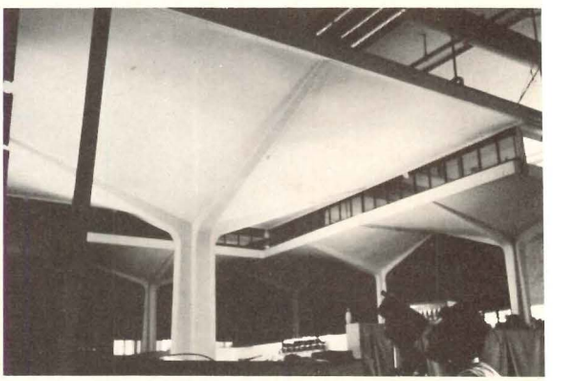


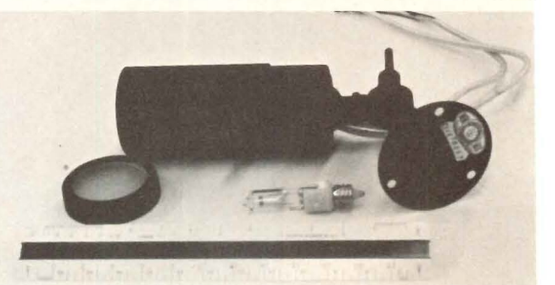
Port Authority staff architects had a general idea how they wanted the three new terminals at Newark Airport to appear when lighted. Basically they wanted the illumination to enhance the form of the huge hyperbolic paraboloids and cruciform columns that make up the umbrella-type structure. They said that the umbrellas should have the feeling of "growing up out of the slab." But they encountered difficulties in bridging the gap between their subjective requirements and the technical approach and requirements that would produce satisfactory results. Port Authority staff engineers produced solutions that approached the desired lighting effects, but the solutions were not entirely satisfactory and the architects had reservations about fixture locations, types of fixtures, and similar lighting hardware considerations. Looking for a fresh approach, the Port Authority interviewed a number of lighting consultants and chose Henry Wald of the New York City firm of Wald & Zigas.

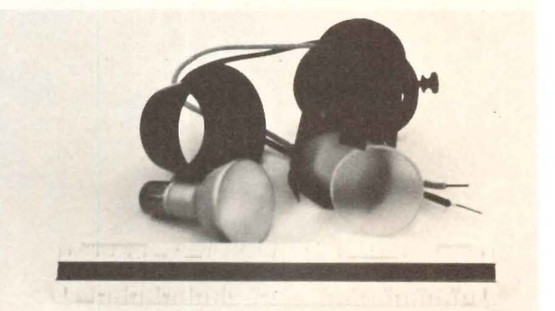
Some basic facts about terminal design and function

The passenger terminal area design is a simple oval embracing three terminal buildings. Each of these, in turn, is connected to three satellite buildings. This three-unit scheme was considered optimum between extremes of complete centralization and decentralization. The new terminal area will be able to handle 83 DC-8 jets simultaneously.

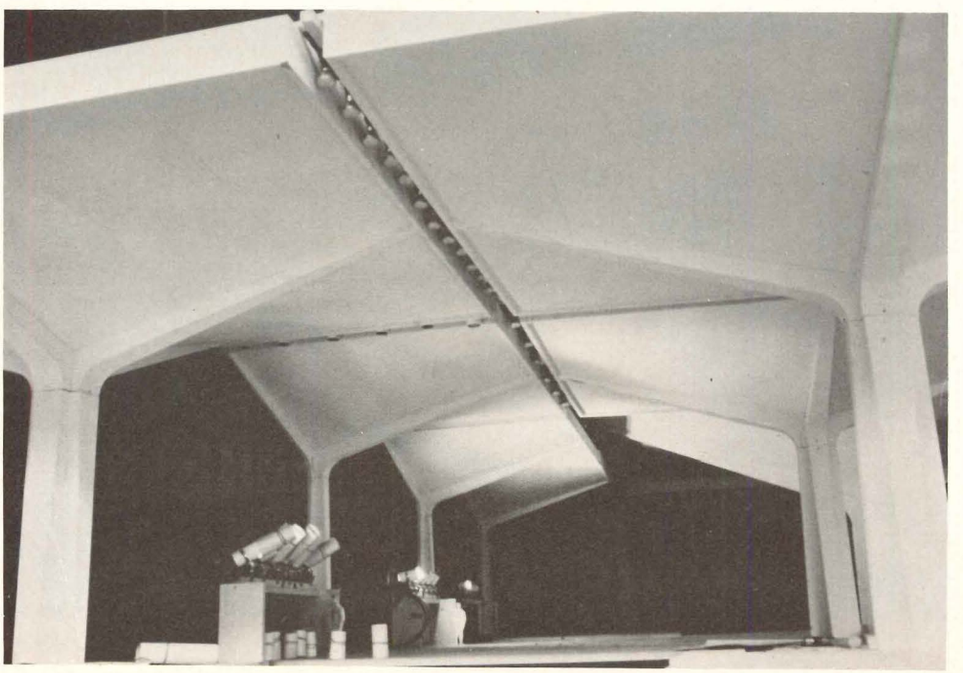
The terminals are of split-level design—three levels in the front and two in the back. At the front, the bottom is the parking lot, the middle level is for baggage handling, and the upper level is for ticketing. Vertical circulation takes place at the three large umbrellas, which are about four times the area of the small umbrellas.







Small airplane reading lamps were used for uplights (over the vestibule) and downlights to prove out initial concepts. Cardboard tubes cover uplights for beam control. Note pattern created by uplights.



Brightness readings, taken by aiming a luminance meter at selected points on the illuminated umbrellas of the model, were translated back into theoretical photometric curves which were then used to design optics of the actual luminaires. While early testing was done as shown at left, final lighting patterns were obtained with the more sophisticated fixtures shown above. The lighting analysis on the model, the photometric derivations and the optical design of the fixtures were done by James D. Kaloudis of Wald & Zigas.

A definition of the problems, and how the lighting consultants proceeded

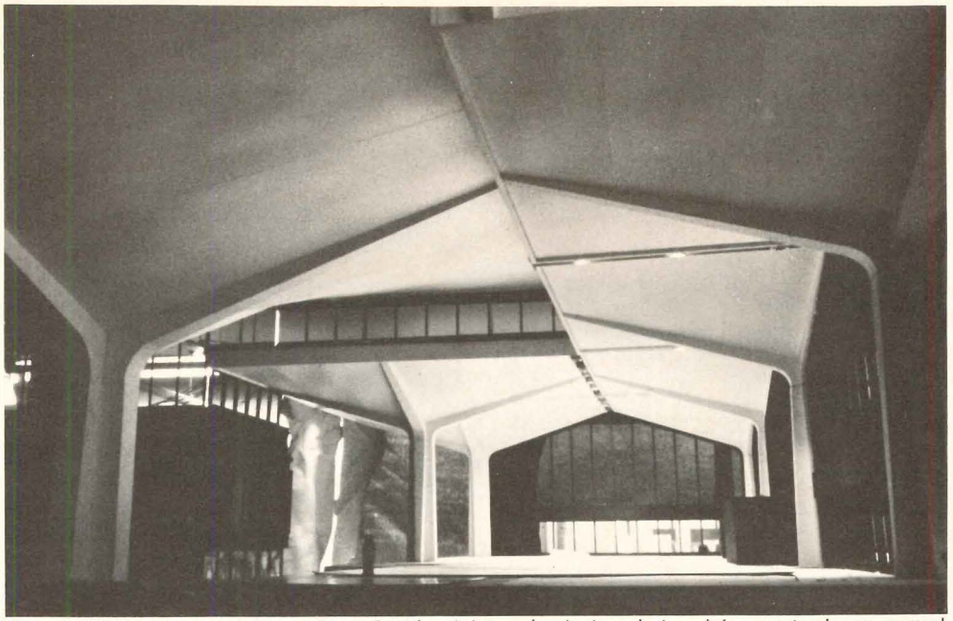
As already noted, one of the basic problems —the reason for which Wald & Zigas was engaged—was bridging the gap between a subjective feeling about how the building was to look and affect people, and implementing this technically. The second problem was determining the basic quantitative values of illumination and developing the equipment required.

Wald & Zigas first wrote a "concept" report suggesting that the umbrellas be illuminated by direct-indirect means. Fortunately, the Port Authority already had built a 1/10 scale model for architectural studies, and this was available to the lighting engineers for confirming the validity of their concepts that had been worked out on paper, and for solving a few critical problems in terms of luminaire location and optical design, illumination levels and brightness ratios. One of the most difficult problems was to develop equipment that would bring out the subtle curves of the warped surface of the hyperbolic paraboloids. Also they felt that the columns needed further subjective evaluation.

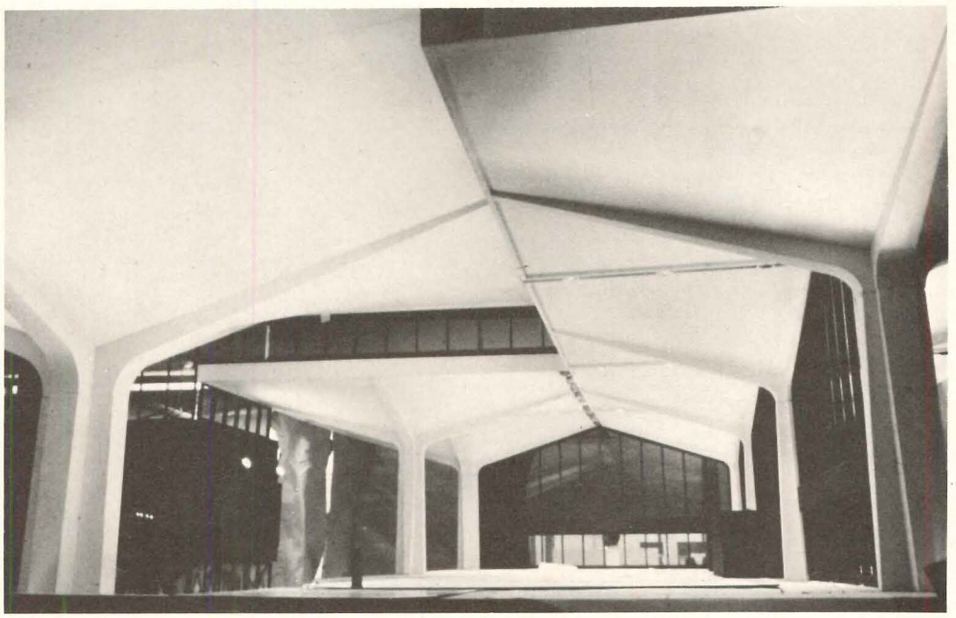
In early studies, Port Authority engineers found that mounting luminaires on the columns was undesirable functionally—aside from the fact that this location was not good esthetically. Column-mounted luminaires created peculiar shadows on the ribs of the h.p.'s that could not be "washed" out. The ideal, of course, was to create a lighting system whereby the occupants would not be conscious of sources, but only effects.

One logical place for the luminaires was in the area over the vestibules. A "crude" test was conducted to make sure this approach was feasible. Also a "crude" downlighting system was tried with lamps located in spaces between the umbrellas. The uplighting-downlighting approach produced desirable subjective effects, but no measurements could be taken because the number of lamps used was somewhat arbitrary, particularly for downlighting.

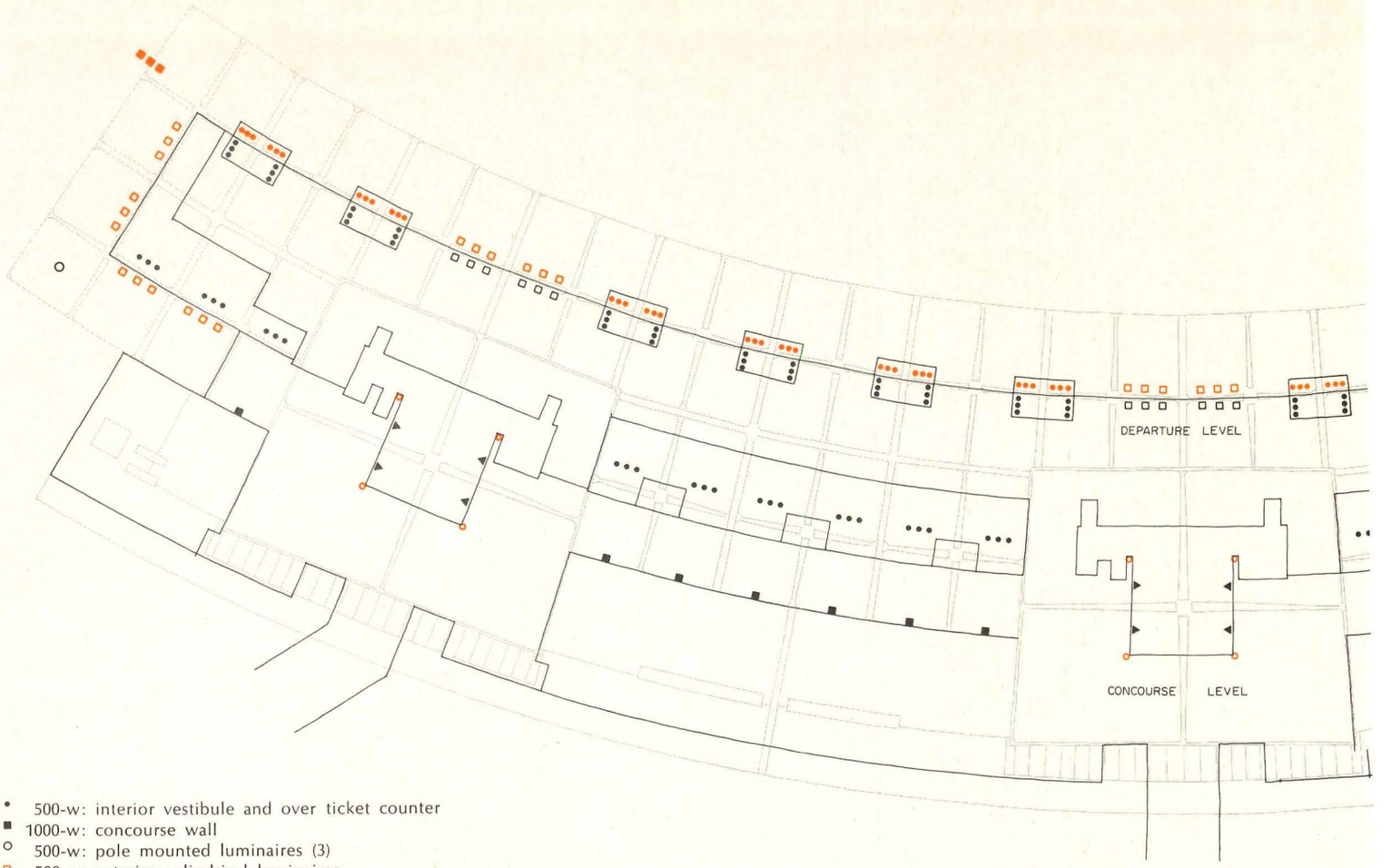
After the engineers demonstrated that the concept was feasible, there still were some variables to pin down. One was reassurance about the total quality of light measured in footcandles. Another was the breakdown in quantity between uplight and downlight. The engineers sensed that subtleties in appearance of the structure were a function of this ratio. Further, because of the cost the lighting system would entail, the Port Authority staff felt it desirable to demonstrate to their commissioners what the lighting system would do for the building. Wald & Zigas were then asked if they could duplicate the "actual" lighting effects on the 1/10-scale model. The consultants agreed to do this, but they had little idea at the time how difficult this would be to accomplish. First of all they had to have light sources with 1/100 the output of actual lamps because of scalar effect. Further, the lamps had to be oversized so that they could be dimmed downward to evaluate quantity



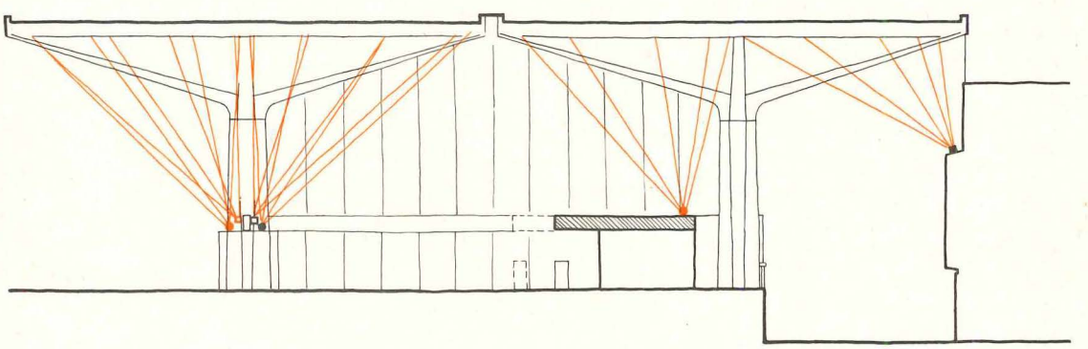
More sophisticated testing was performed with miniature luminaires designed for precise beam control. Only downlights are turned on here. Contribution of uplights can be seen in preliminary tests across page.

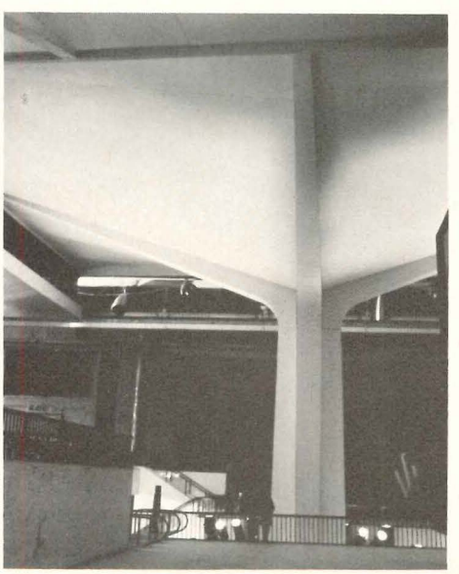


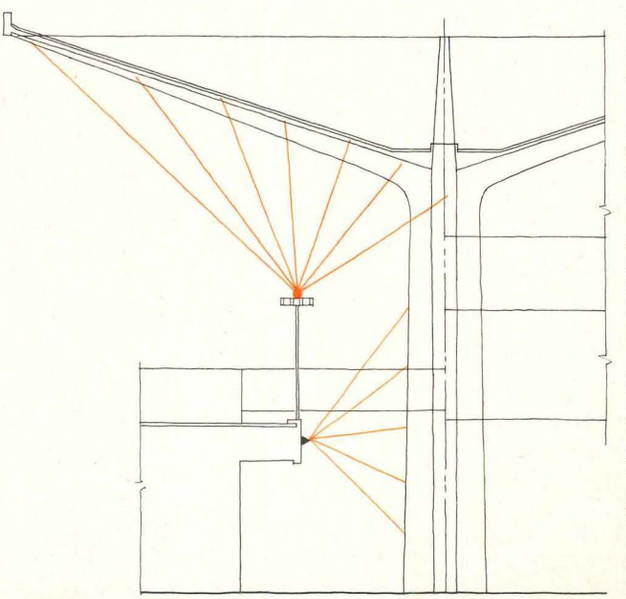
Both uplights and downlights are on in the photo above. Idea was to have maximum brightness at columns and feather out to edge of the umbrellas. Below is photo showing interior and exterior lighting.



- 500-w: interior vestibule and over ticket counter
- 1000-w: concourse wall
- 500-w: pole mounted luminaires (3)
- 500-w: exterior cylindrical luminaires
- 500-w: exterior vestibule
- 500-w: exterior (mounted on wall parallel to service road)
- 500-w: interior cylindrical luminaires
- 500-w: luminaire recessed in well fascia
- 1000-w: pole mounted luminaires (8)



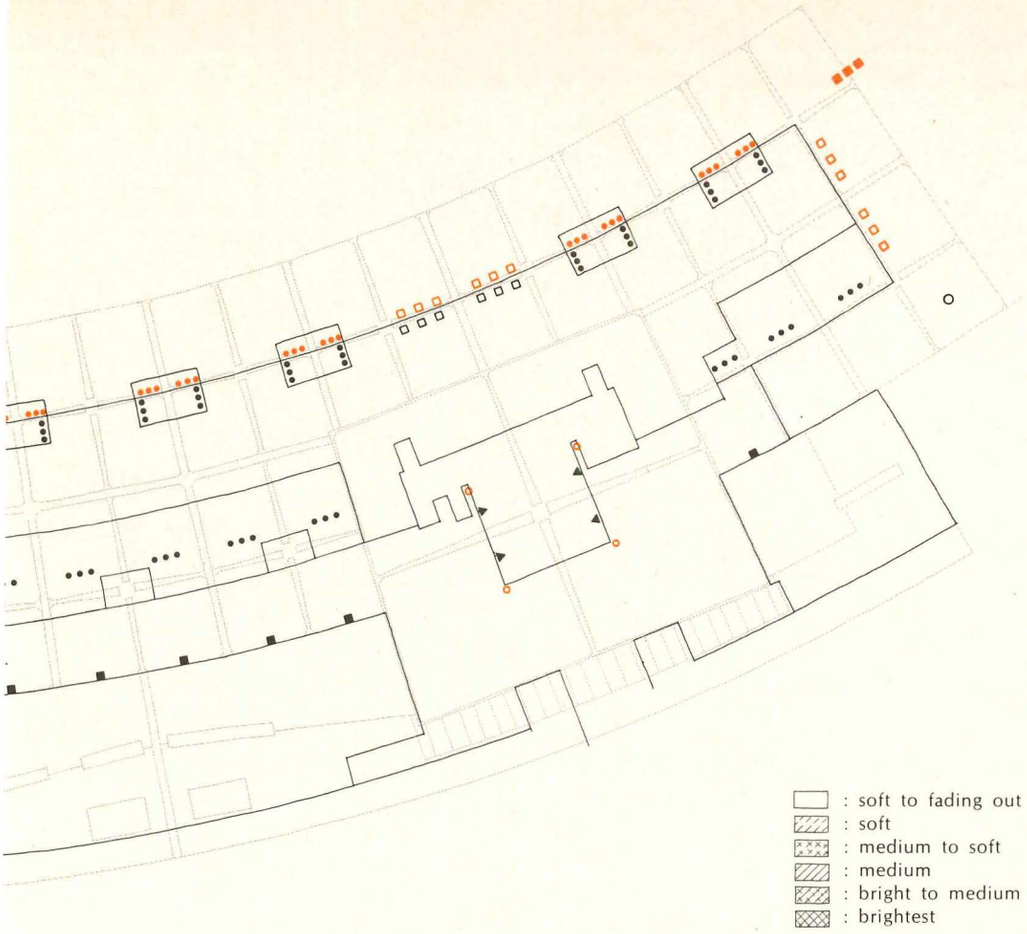


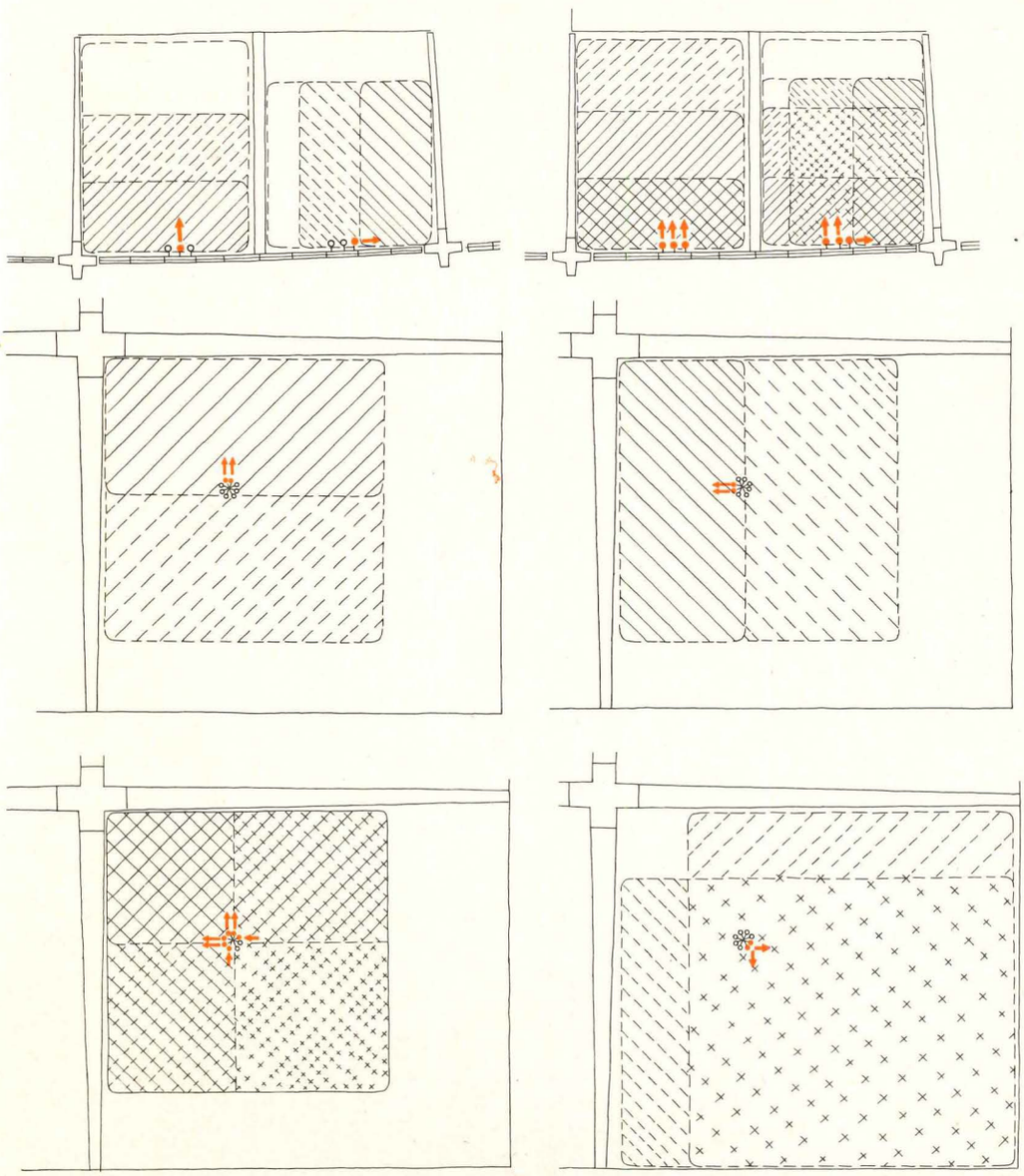


Finding locations for the uplights that illuminate the small and large umbrellas called for some ingenuity from the consultants Wald & Zigas and the Port Authority staff, inasmuch as the objective was to have the occupants conscious of the lighting effects and not the sources (see lighting plan, above, and sections, left). Over the vestibules was a logical location. At the several points along the glass wall where there are no vestibules, cylindrical luminaires will be attached to the mullions. The consultants thought at first they might have to light the fronts of the rear umbrellas with theatrical spots because of the distance from the vestibules. But later the roofs of the ticket counters became available for locating luminaires. The other half of the rear umbrellas is illuminated by fixtures mounted at the top of the concession-area wall.

For some time the consulting engineers worked with the idea of illuminating the large umbrellas from fixtures around the perimeter at the well opening, as was shown in the photo on the first page. But providing proper shielding from glare of the sources would have required the opening to be larger than the Port Authority architects preferred. Instead the luminaires (eight in a group) are mounted on poles at the corners of the fence around the well. The column of the large umbrella is lighted by means of special luminaires set flush in the well fascia.

The drawings across page illustrate the light contributions by the luminaires at the glass wall for the small umbrellas, and by the pole-mounted luminaires for the large umbrellas. The drawings of the small umbrellas show two schemes for feathering out the brightness patterns. Note how the beam patterns are designed to avoid spilling light on the ribs of the umbrellas.





of illumination and ratio of uplight to downlight. The consultants picked the most compact source they could—a 75-w, 28-v tungsten halogen lamp—and enclosed it in a small black cylinder, 3¼-in. long and 1¼-in. in diameter, which they designed. It employed the principle of the Linnebach lantern used in stage lighting for projecting scenes or designs. It is a black box with a point source that gives a beam pattern dictated by the particular cut-out placed over its opening. This miniature luminaire gave a flexible tool for controlling light beams in the model testing. It meant that no matter where the light sources were located, it was possible to confine the beam pattern within the ribs of the umbrellas.

The consultants developed a similar scaled-down downlighting luminaire that had a black cone simulating commercial downlights, and which would accept an R-12 airplane reading light.

The engineers' refined study gave an opportunity to evaluate the limits of the variables suggested in the concept report. While they could state with confidence how much total illumination would be required for seeing, they did not know what was needed to create the most pleasing esthetic effect in terms of uplight and downlight. Shadow effects on the ribs of the umbrellas were impractical to predict analytically.

In the refined testing, Wald & Zigas were able to work backwards from the desired appearance to the photometric criteria that could be used in designing the luminaires. The procedure was to make comprehensive brightness readings, translate these back into theoretical photometric curves, and use the photometrics to design the optics of the luminaires. To determine the limits of the light intensity and distribution required from a luminaire, it was necessary that the engineers know the brightness of the surface as well as the solid angle through which the light energy would be radiated. Because of the complex geometry of the h.p.'s, solid angles were determined by running pieces of string to the underside of the umbrellas.

Once the optics for the luminaires had been worked out, the final step was to have mock-ups built of the two basic types of luminaires and to check their photometrics.

Beyond assuring the engineers that the luminaires would work, this step was additionally helpful to the Port Authority inasmuch as they are a quasi-public agency and have a fairly rigidly controlled bidding procedure. The Authority was able to set up a fair competitive bidding procedure in terms of narrowing down the amount of development work necessary by the bidders. Bidders were not completely limited in exercising some ingenuity in design and manufacture, but performance was fixed within reasonable limits.

Determining generally what lighting levels would suit the purpose

First, this was rationalized by Port Authority technical staff surveying other buildings and

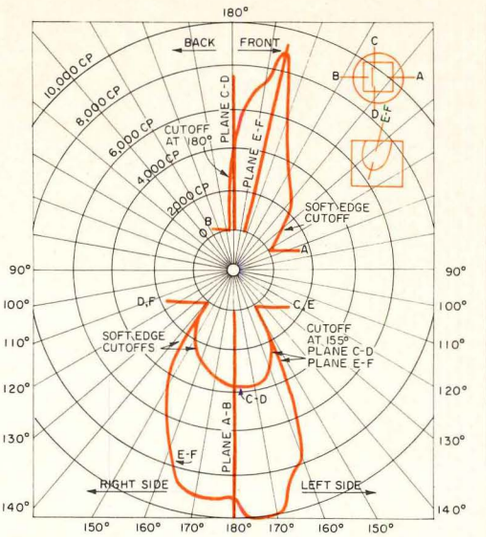
determining which situations "felt right" to them. They took measurements and found out that these were close to the illumination levels that had been recommended by the Wald & Zigas engineers.

Henry Wald states that he had in mind an illumination level in the range of 15-25 footcandles. This, he says, takes into consideration the problem of transitional adaptation in going from the highway which may be lighted to ½ fc, to the parking lot which will have 3-4 fc, to the final step, the terminal, with 15-25 fc. Of course, footcandle readings were by no means the most significant criterion; more important were the overall brightness patterns.

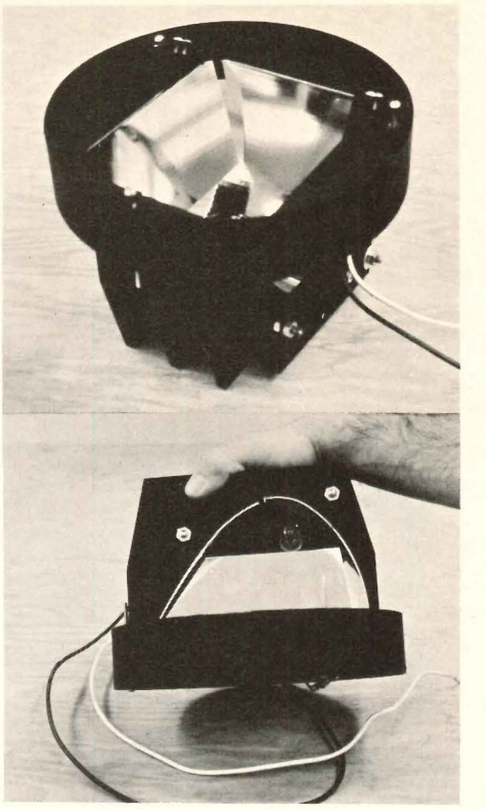
All lamps are incandescent. Uplights practically had to be incandescent because the light source had to be small and capable of being controlled without losing too much efficiency. Only two types of lamps are being used for the uplights—500-w and 1000-w tungsten-halogen lamps. The downlights will use 1000-w tungsten-halogen, reflector-flood lamps. High-intensity discharge lamps (metal-halide mercury and high-pressure sodium) were considered for the downlights. The engineers' cost analysis showed that there was not a very large difference in total annual lighting cost between metal-halide mercury lamps with 6000-hr life and tungsten-halogen incandescent lamps with 3000-4000-hr, operated at 5 per cent reduced voltage. The consulting engineers say that if manufacturers could develop high-intensity discharge lamps with 15,000-hr life or more, they would recalculate the total annual cost for the downlighting.

Because incandescent lamps are the least efficient in terms of light output for watts input, the Port Authority and the consulting engineers were concerned about the maximum illumination required because of the effect on air-conditioning costs. For example, the consultants point out that incandescent sources generally have a range of effectiveness of between 5 to 10 fc per watt per sq ft. If you are considering a nominal value of 15 fc for the illumination of the terminal space, the additional power required to produce an additional 5 or 10 fc means an additional 1 watt per sq ft. Thus it was very important to refine with as much assurance as possible the quantitative values required. The lighting level will average between 15 and 20 fc, with a maximum of 30 fc directly under the downlights.

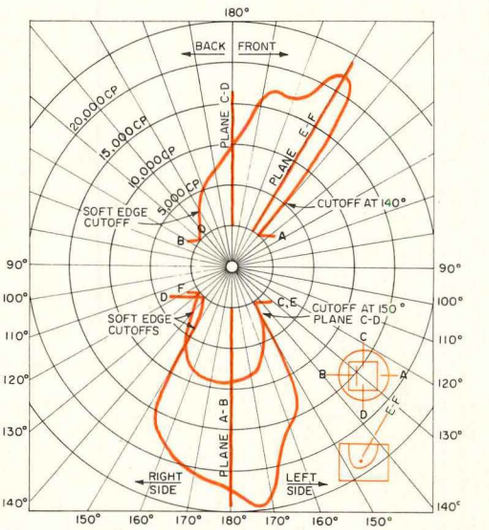
The large umbrellas are purposely being made brighter than the smaller ones because of their visual importance to vertical circulation. The brightness of the underside of the large h.p. will be a maximum of 60 footlamberts and average 30. On the small umbrellas the maximum will be 40 foot lamberts and average 20. The brightness will be greatest next to the columns and feather off to 5 footlamberts at the edge of the h.p. The columns are fairly uniformly lighted because of reflected light from the floor. The columns of the large umbrellas are being partially lighted by special incandescent fixtures set in the fascia of the well.



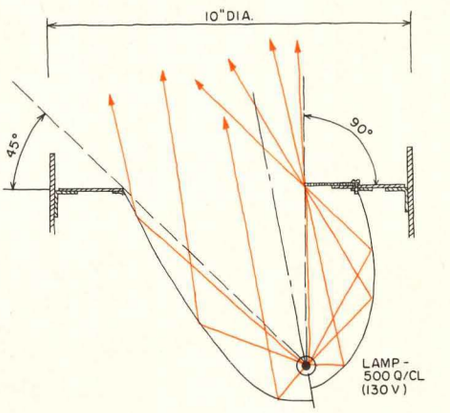
Above: candlepower curves for the principal luminaire used to illuminate the small umbrellas

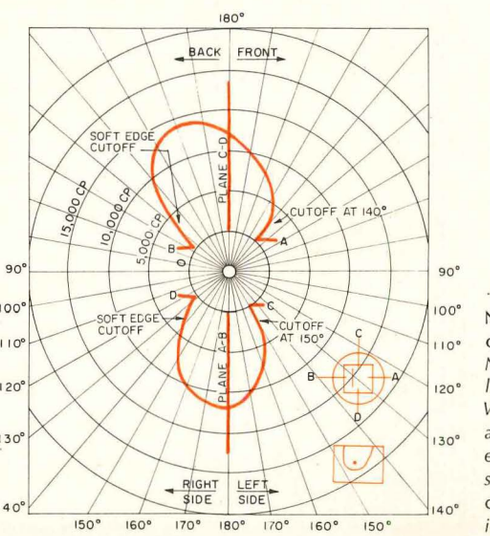


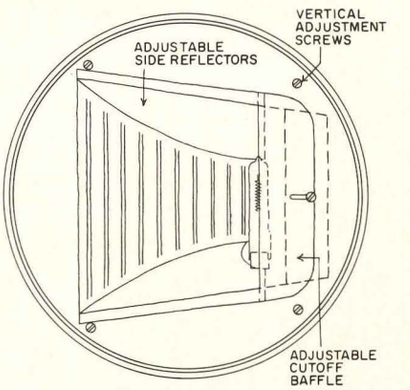
Above: mock-up of one of the basic luminaires. Below: basic configuration of the luminaire. Note effect of parabolic and elliptical curvatures.



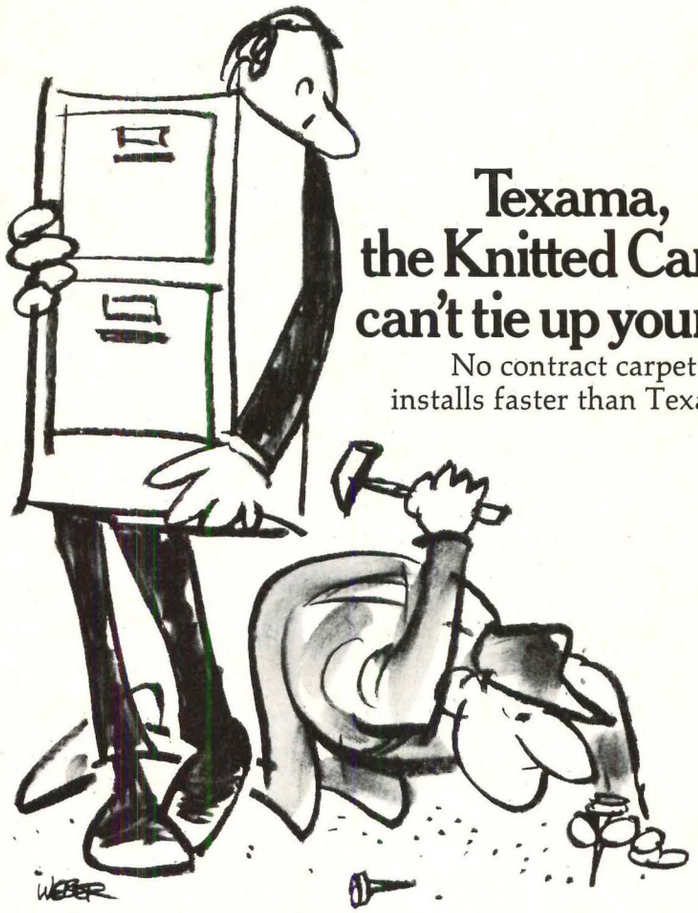
Above: candlepower curve of the luminaire used for six of the eight luminaires for the large umbrella. Below: curve for other two luminaires







NEWARK AIRPORT, New Jersey. Architects and engineers: *The Port of New York Authority—John P. Veerling, project director; Sheldon D. Wander and George E. Ralph, PNYA architects; Daniel L. Goldberg, chief electrical engineer, S. Leo Perlstein, senior electrical engineer.* Lighting consultants: *Wald & Zigas, consulting engineers.*



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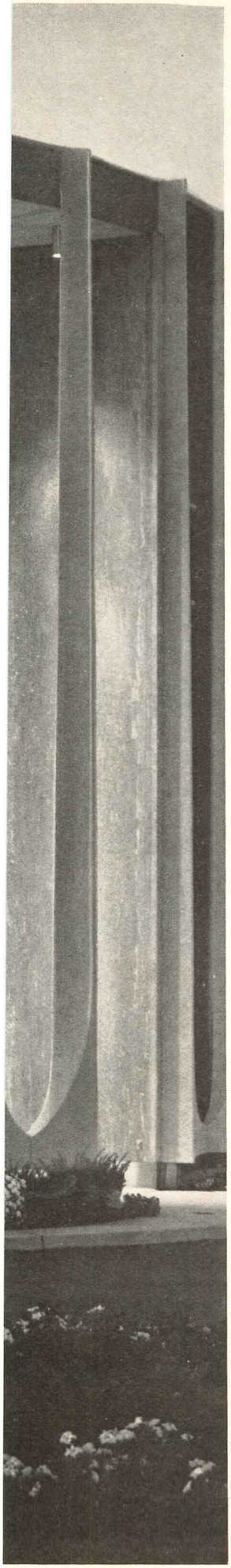
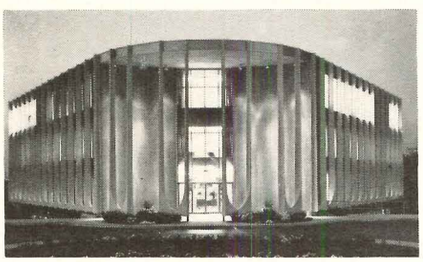


Architect John A. Benya must love All-Electric design. It gave him the freedom to design a heart-shaped bank.



John A. Benya won't build anything unless it's All-Electric—the most flexible approach to total environmental control.

The people at the Creve Coeur Bank in Creve Coeur, Missouri, bought this concept when they asked him to design a new bank. Now the town of Creve Coeur (French for broken heart) has an All-Electric bank in the shape of a heart. Two years ago Mr. Benya used the freedom of All-Electric design to build a football-shaped bank.

For the Creve Coeur Bank, Mr. Benya used electric baseboard units plus supplemental heating units in the environmental control system. This system allows the bank to heat one area while cooling another. The system is totally flexible and it gives the freedom to expand the building when necessary.

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SCOTWALL

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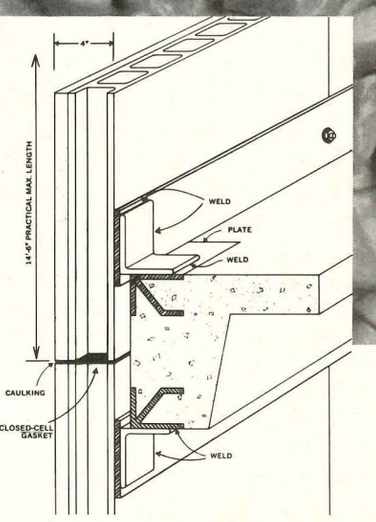

The new Scotwall, first introduced with marble veneer, is now also available with virtually any kind of aggregate facing. The asbestos-portland cement substrate is the same in both cases. The Scotwall panel is a lightweight, moisture-proof, unit of great strength and remarkable versatility. It recommends itself for interior and exterior walls; large soffits and ceiling panels; multi-faced fin panels; free-standing partitions; screens; fasciae; spandrels and a lot more. It's light to ship, quick to install, and the in-place cost can be under that of less desirable materials. May we tell you more about it?

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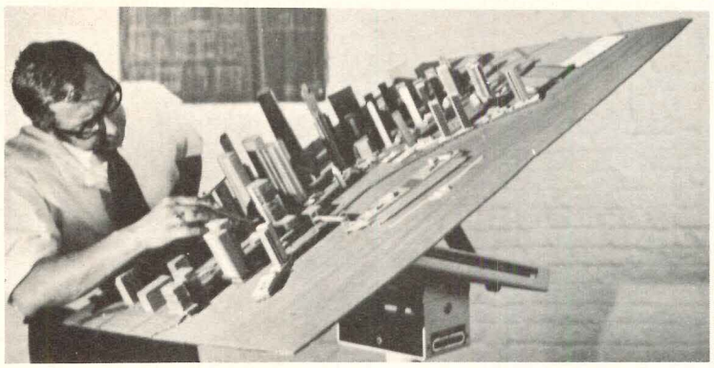
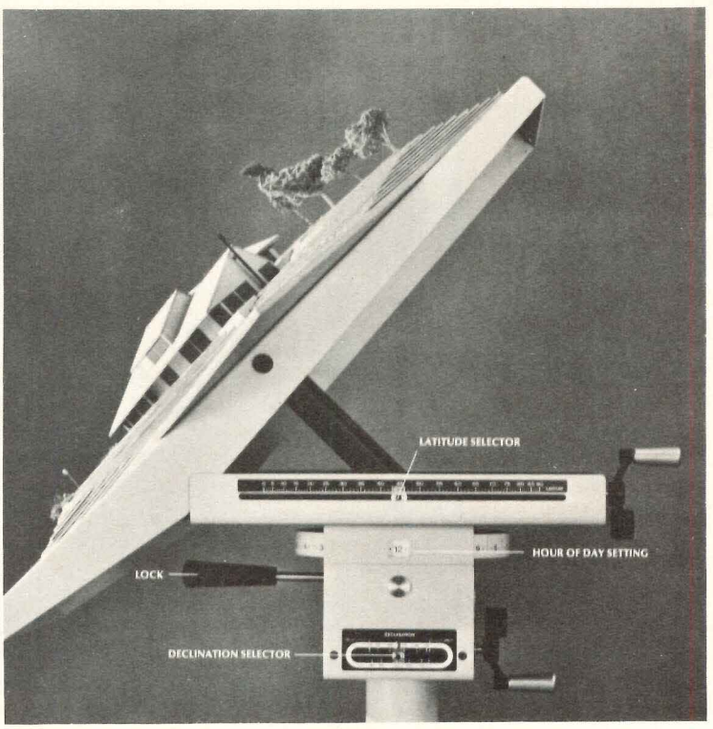


A precision instrument determines effect of sun and shadow on a building or city



A California Company, Heliolux, has developed a calculator, also called *Heliolux,* that promises to determine, in advance, the position of the sun and shadows on the environment if a new high-rise building were to be built. This is done with two pieces of equipment that "stop the sun" at any time, date or latitude on earth, simulating three-dimensional shadow patterns on a scale model of a building, portion of a building, or a larger area of the environment.

The purpose of the system is to aid architects, planners, industrial designers, landscape architects, universities and government bodies, as well as concerned citizens, in knowing the effect of the new high-rise buildings, before costly construction mistakes and environmental problems are made. For example, it could mean that some secretaries will not face the problems of fellow workers now in glass buildings where windows have to be blocked or curtained to ward off too much sun. And landscape architects won't have to guess what the microclimate of a contoured hill may be when siting outdoor recreational facilities or plantings.

Heliolux consists of an artificial sun—a quartz iodine, 650-watt light set in a cast aluminum stand—and a calculator platform that has a 40-in.-square wooden top attached to the metal surface. Models are mounted on the board just above settings for latitude, declination and hour of day.

The latitude selector tips the platform to receive the exact angle of the "sun's rays." The declination selector sets the platform to match the tilt of the earth's axis relative to the sun for the appropriate date, and the hour-of-day setting rotates the platform to match the rotation of the earth. A camera mount allows the permanent recording of the shadow patterns.

The system was developed by E. Clifford Potter, working with Tepper/Steinhilber Associates, Inc., industrial designers. In the photo top left, Gene Tepper examines the model of one proposed plan for San Francisco. A prototype of *Heliolux* has already been used to solve a problem of sunglare in a building in Alaska, designed by San Francisco architects Knorr and Elliott.

The price of the calculator is $1,000 F.O.B. San Francisco. ▪ Heliolux, San Francisco.

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more products page 162

Another building built to last with glazing gaskets of Du Pont Neoprene.

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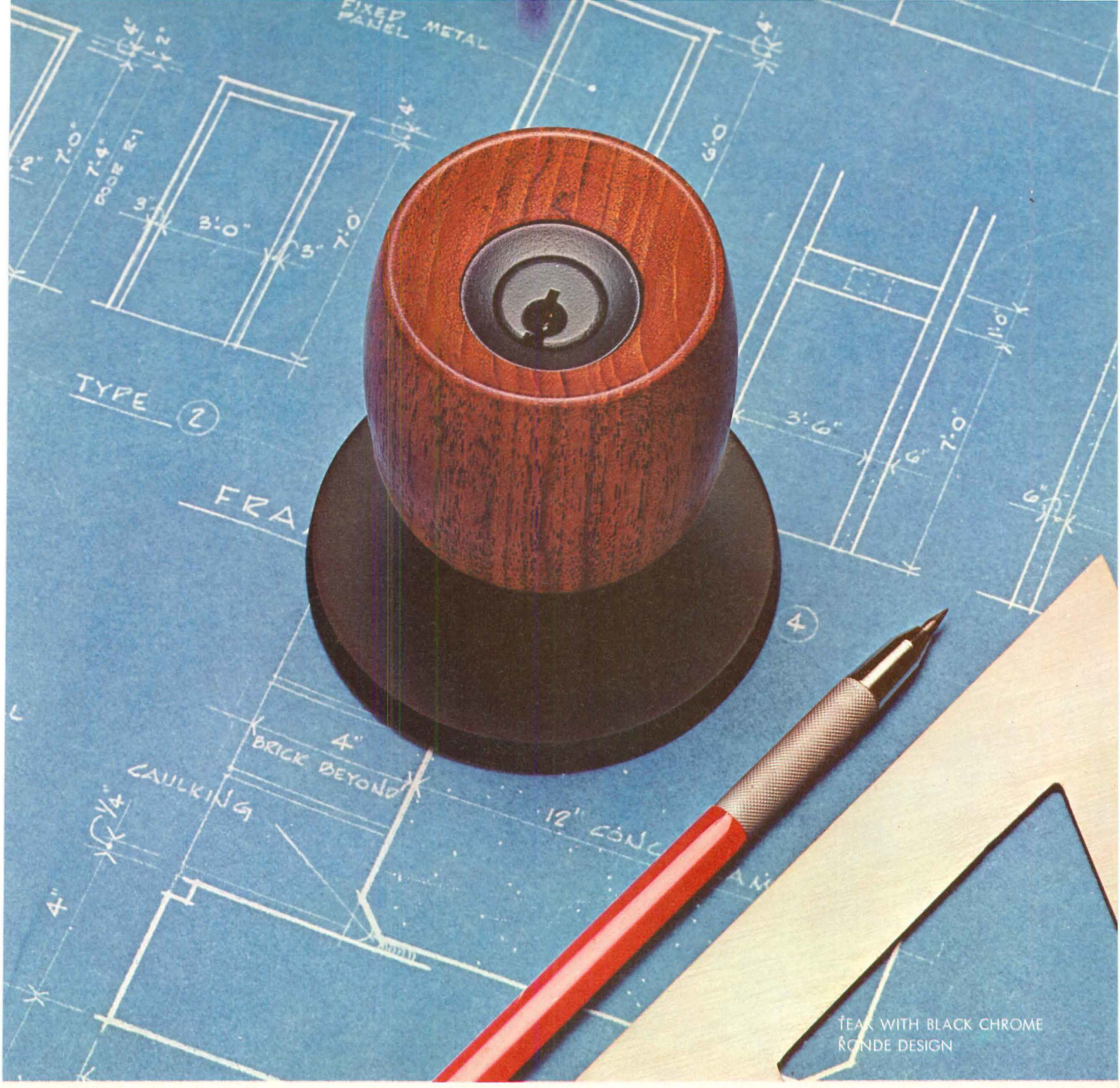
Architect: William Lescaze
and Associates



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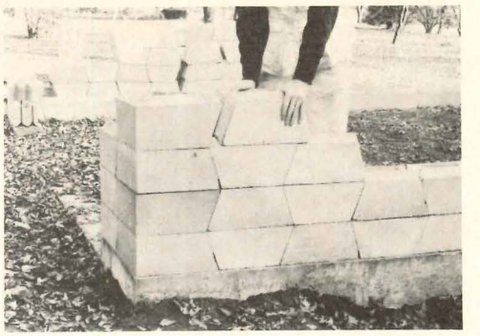
continued from page 157



MORTARLESS CONCRETE BLOCKS / Mass-produced blocks that fit together in perfect alignment vertically, horizontally and in straight rows, leaving only hairline cracks, require no mortar to mix, no joints to strike and are said to be laid more than three times faster than conventional blocks. Test results indicated compliance with all requirements of ASTM Specification C90. The Compressive Strength Test C140 indicated that *Wedge Blocks* were more than twice as strong as conventional blocks. The blocks measure one block to the running foot and two blocks to the vertical foot. Said Norman L. Hancock, president of the company producing the block, "Bricklayers' and masons' union officials were quick to recognize the potential of the block and laid definite claim to jurisdiction over its application on all types of construction projects." ▪ Wedge Block, Incorporated, St. Louis.

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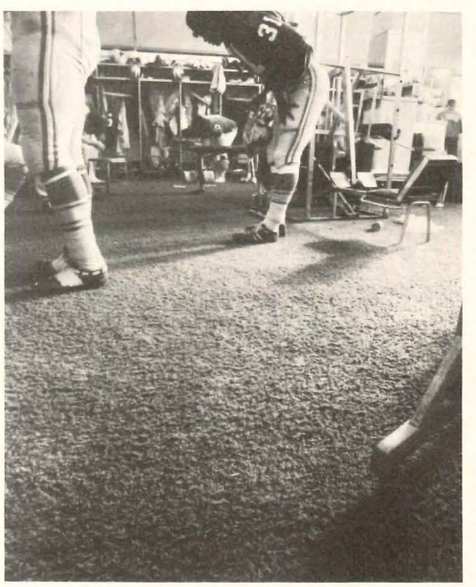

LOCKER ROOM CARPET / Any resemblance between this locker room and the family den may not be purely coincidental. *Wishing Well* nylon shag frieze, a budget-priced soft floor covering, was tested favorably in the locker room shared by Detroit's football Lions and baseball Tigers for more than two years. The carpet was developed for use in high and/or tough traffic areas in the home. ▪ Monticello Carpet Mills, Burlington Industries, Inc., New York City.

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Retail stores in shopping centers and malls have found Kinnear doors especially adaptable to their varied requirements of design and protection. 24-hour traffic through these expanding centers is a real security challenge, and Kinnear doors are added insurance against "off hour" problems.

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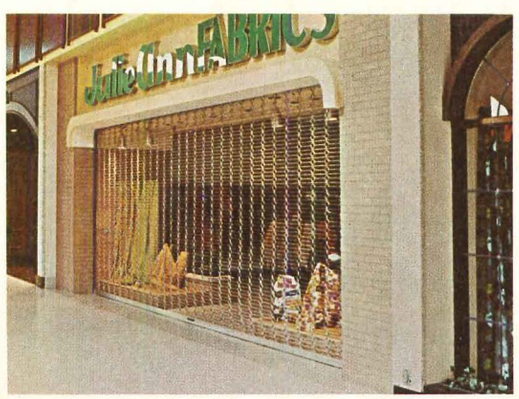
Wehmueller's, West County, Jewelry Store, St. Louis, Missouri. A striking illustration of how "open or closed," the two Kinnear doors in this mall-way store fulfill every requirement. And, notice how the door blends well with the tasteful architectural design of the store facade. The open door completely disappears in a minimum storage space above the lintel, using no valuable display or work area.



Kinnear Rolling Grilles, that operate on the same principle as the Rolling Doors, have found great acceptance from store owners. Where display, ventilation and light is important during closed hours, Kinnear's Grilles — made of steel or aluminum — are extremely rugged but very compatible to building design. Grilles are also ideal to close off corridors and stairways to traffic.

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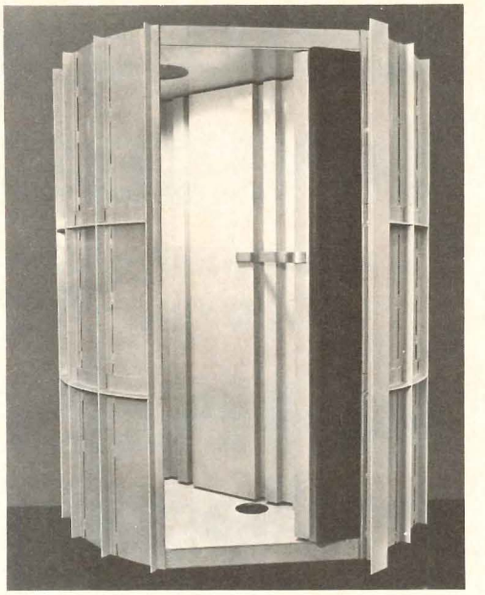

BLAST DOOR / Like the commercial revolving door, this blast door revolves around a center spindle leaving a 2-ft, 6-in. passageway on either side. Also, it is 6-ft, 6-in. high and sets in a shell with an inside diameter of 5 ft, 6 in. Unlike the regular commercial door, however, the *Pantex Plant* door is installed underground and is built on a frame of steel I-beams with 10-in. wide flanges and with a steel skin. ▪ Overly Manufacturing Co., Greenburg, Pa.

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APARTMENT HOUSE SYSTEMS / Two new items for apartment house entrances are the *Direct-a-Com* communications system and the *Recessed Vertical Mail Box System*. The *Direct-A-Com* in silver or brass anodized aluminum finish, includes alphabetical name panels and amplifier/control unit. Callers are announced by an electronic tone through apartment speakers. Full size individual mail compartment doors include pin tumbler lock with 250 key variations. Units are heavy gauge construction with anodized brass on extruded aluminum finish. ▪ Nu-Tone, Cincinnati.

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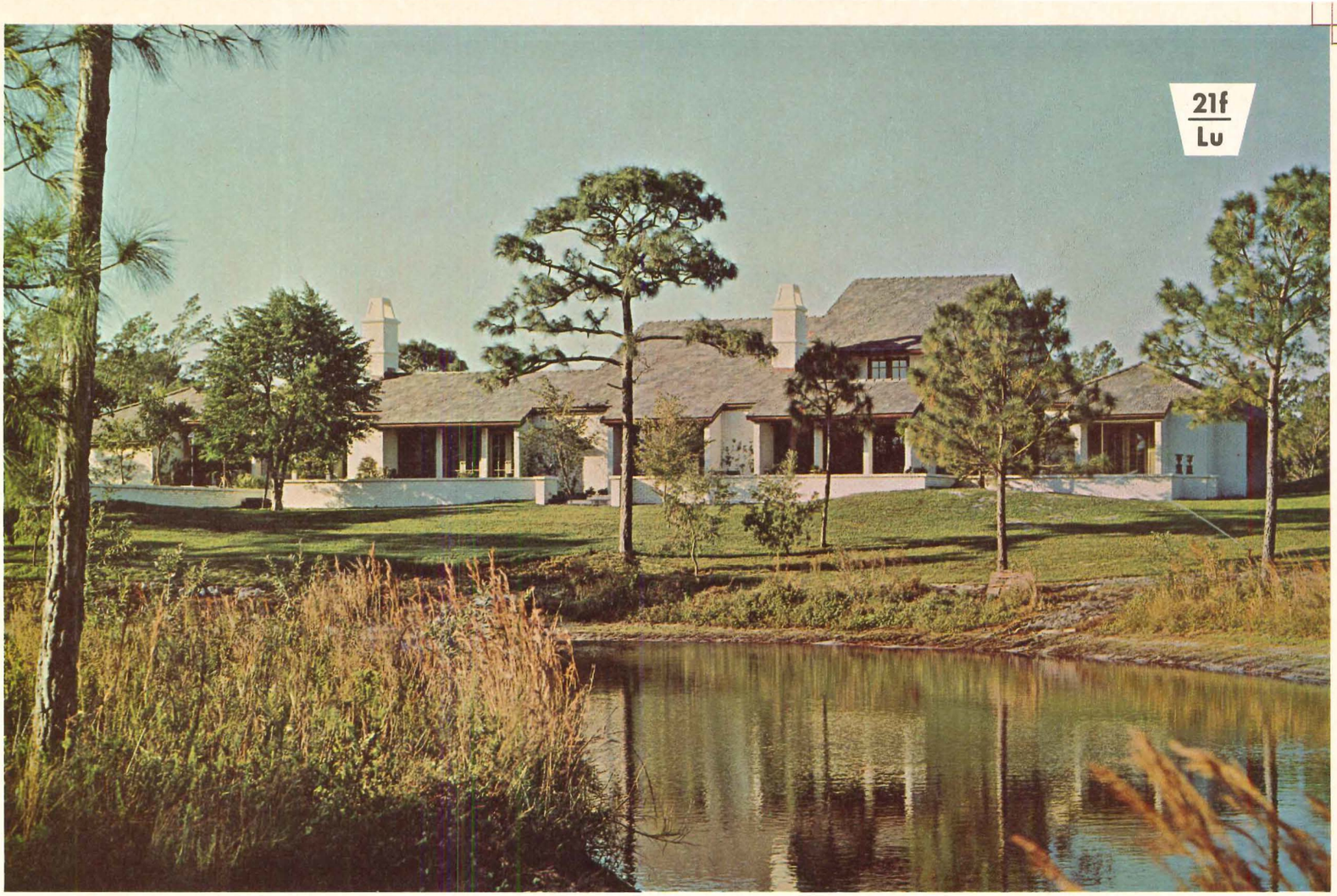
more products on page 168D



Waverly Farms
Village of Golf, Florida

Architects: Bywaters & Duemmling
Fort Lauderdale, Florida

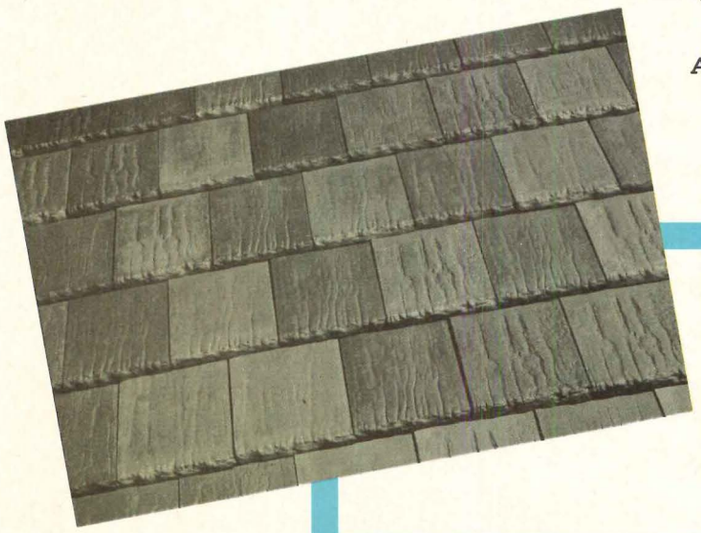
Roof: Designer Early American
by Ludowici-Celadon Co.

The Architects selected Ludowici's Designer Early American pattern Roofing Tile in a range of Dark Gray

for the roof of this gracious residence and several other buildings on the estate.

They chose this prestige material for its beauty—its durability—its non-fading colors.

Architects can offer their clients this superior roofing material of hard-burned clay tile in a great variety of colors, patterns and surfaces, all architecturally correct.



EARLY AMERICAN

Simulates heavy wood shakes on roofs of homes and institutions of the Revolutionary period—in permanent fire-proof clay tile. One of the most popular patterns in subtle color blends of mellow gray, green and red. Natural red and fire-flashed colors provide roofs of lasting beauty in endless sparkling, yet subdued, color variations. Also available in weathered surfaces red, brown or black. Average laying exposure 8¼″ x 11″. Weight—8 lbs. per sq. ft. average.

For additional information write or phone:

LUDOWICI-CELADON COMPANY 75 East Wacker Drive • Chicago, Illinois 60601

Manufacturers of quarry tile, the nation's largest producer of roofing tile and NAILON Facing Brick

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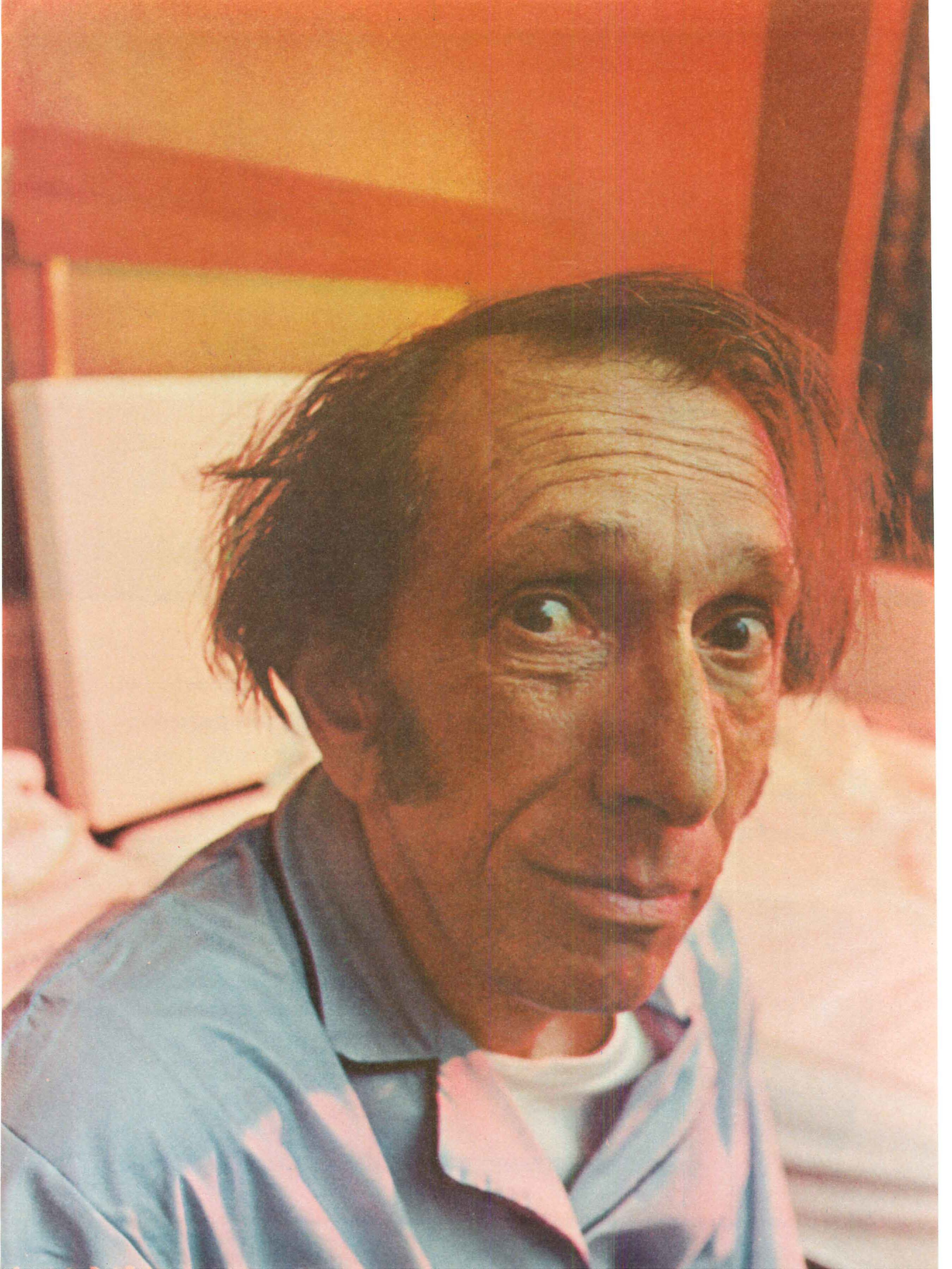

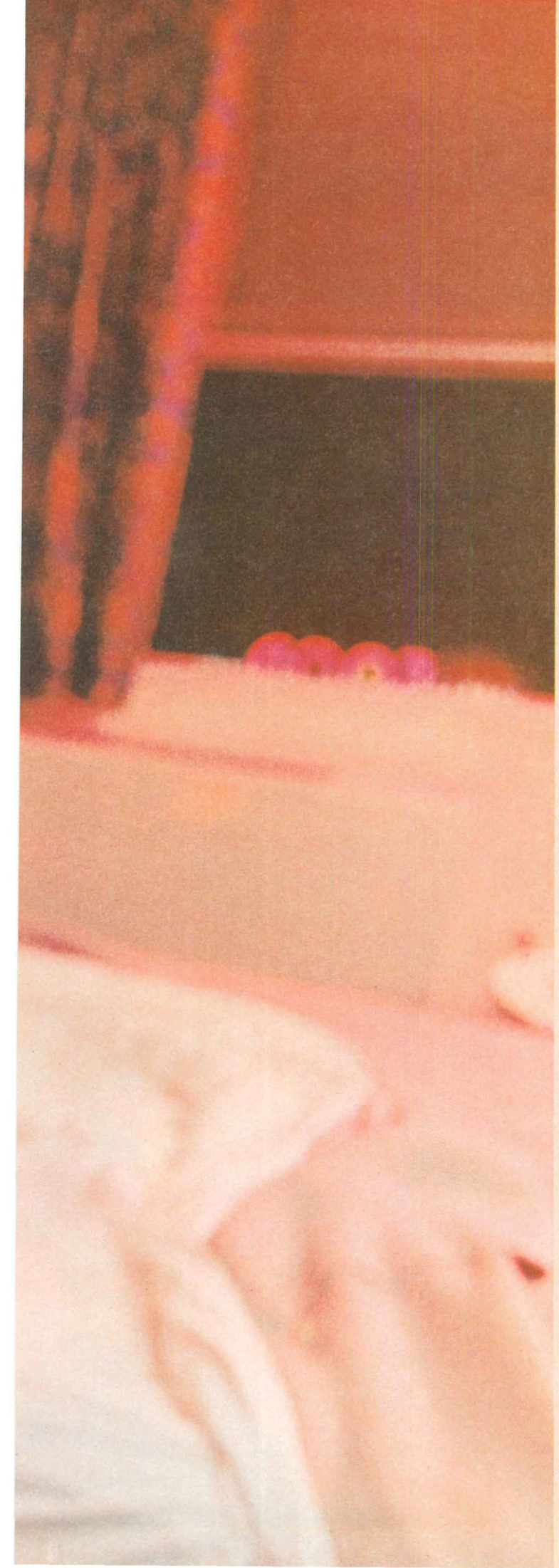

Noise today is enough to drive you mad.

Literally. Studies are showing that high decibel levels in modern cities can cause mental imbalance—as well as loss of hearing acuity.

Keene hasn't figured out what to do about pneumatic drills and taxi horns, but we are doing a lot inside commercial buildings. We make an instant-access acoustical ceiling system that provides a tight wall-to-wall noise barrier. To keep noise from coming through registers and ductwork, we design baffles, fan-silencers and air-conditioner plenums. We also engineer sound-absorbing systems to cut the din in swimming pools and bowling alleys.

Why is Keene, a major manufacturer of innovative building products, working so hard to fight noise pollution? We think somebody better before we all go nuts.

KEENE
CORPORATION

We've just begun to grow.

Do you need to control noise in commercial and industrial structures? Keene can help. Write to our Sound Control Division, Princeton Service Center, U.S. Route #1, Princeton, N.J. 08540

New Facad is so sculptured, it's almost sculpture.

There's a new way to incorporate sculpture and textural relief in building design. It can be done with Facad®.

This sculptured facing system of easy-to-install thin, molded, reinforced cement panels can be used as a total wall element; as spandrel panels, fascias, balcony panels or soffits.

Sturdy, but lightweight (2 pounds/square foot), Facad is easy to handle. It comes in sizes up to 4′ x 10′. No special skills or extra structures are required. Installation is within the competence of carpenters or glazers.

Facad is durable. Because it is all mineral, it is completely incombustible.

Facad comes in a series of standard panel surfaces, one of which is shown above. It can also be custom molded to afford architectural designers a broad choice of texture, color and pattern.

For complete information, call the Architects Service Representative at your nearest U.S. Plywood office or write:

U.S. Plywood

A Division of U.S. Plywood-Champion Papers Inc.
777 Third Avenue, New York, N.Y. 10017

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Built for the school of hard knocks.

Day after day, year after year, school lockers have to take some pretty rough punishment. These lockers have to be built to take *whatever* is dished out.

Which is one reason school administrators select Republic "Decor 19" lockers. These lockers are built not only to last, they're built to last *quietly*. Frames: 16-gage. Doors: 16-gage. Hinges: five knuckle, full loop, tight pin. Locking: kick-and-pick proof.

And they come in 19 decorator-selected colors at no extra cost. Beautiful — and a great value.

Steel

REPUBLIC STEEL MANUFACTURING DIVISION

YOUNGSTOWN, OHIO 44505

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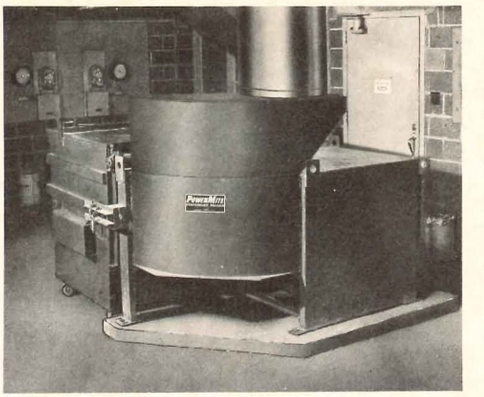
continued from page 166



REFUSE COMPACTOR / The *PowerMite,* designed for high-rise buildings, crushes refuse to a fraction of its former volume into any size container. When the container is full, a truck handling unit detaches the container from the *PowerMite,* picks it up, hauls the container to the disposal area, empties it and returns the container for more storage. ▪ Dempster Brothers, Inc., Knoxville, Tenn.

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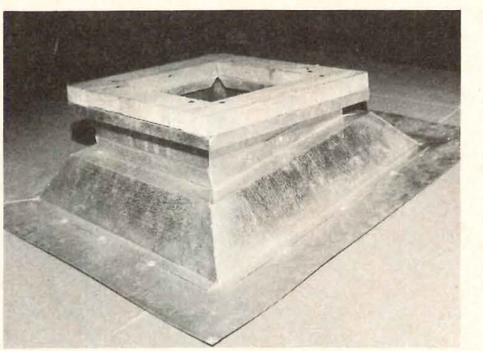

ROOF CURBS / This adjustable roof curb can be set for any roof pitch. The curb is made of galvanized aluminum and is insulated for acoustics. ▪ Miller Metal Products, Inc., Appleton, Wis.

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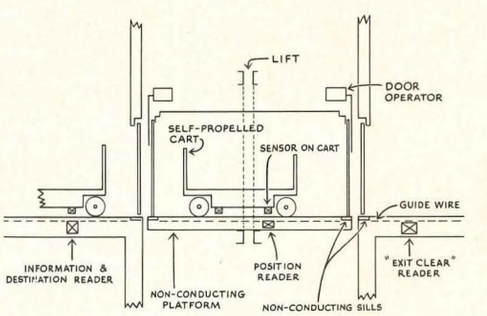

HOSPITAL DISTRIBUTION / Special lifts that carry electronically guided, self-propelled carts automate distribution of food and supplies throughout a multi-story hospital. The carts are programed for preselected routes and are guided by radio-like signals from wires in the floor. To move from one floor to another a cart automatically calls the lift. ▪ Otis Elevator Company, New York City.

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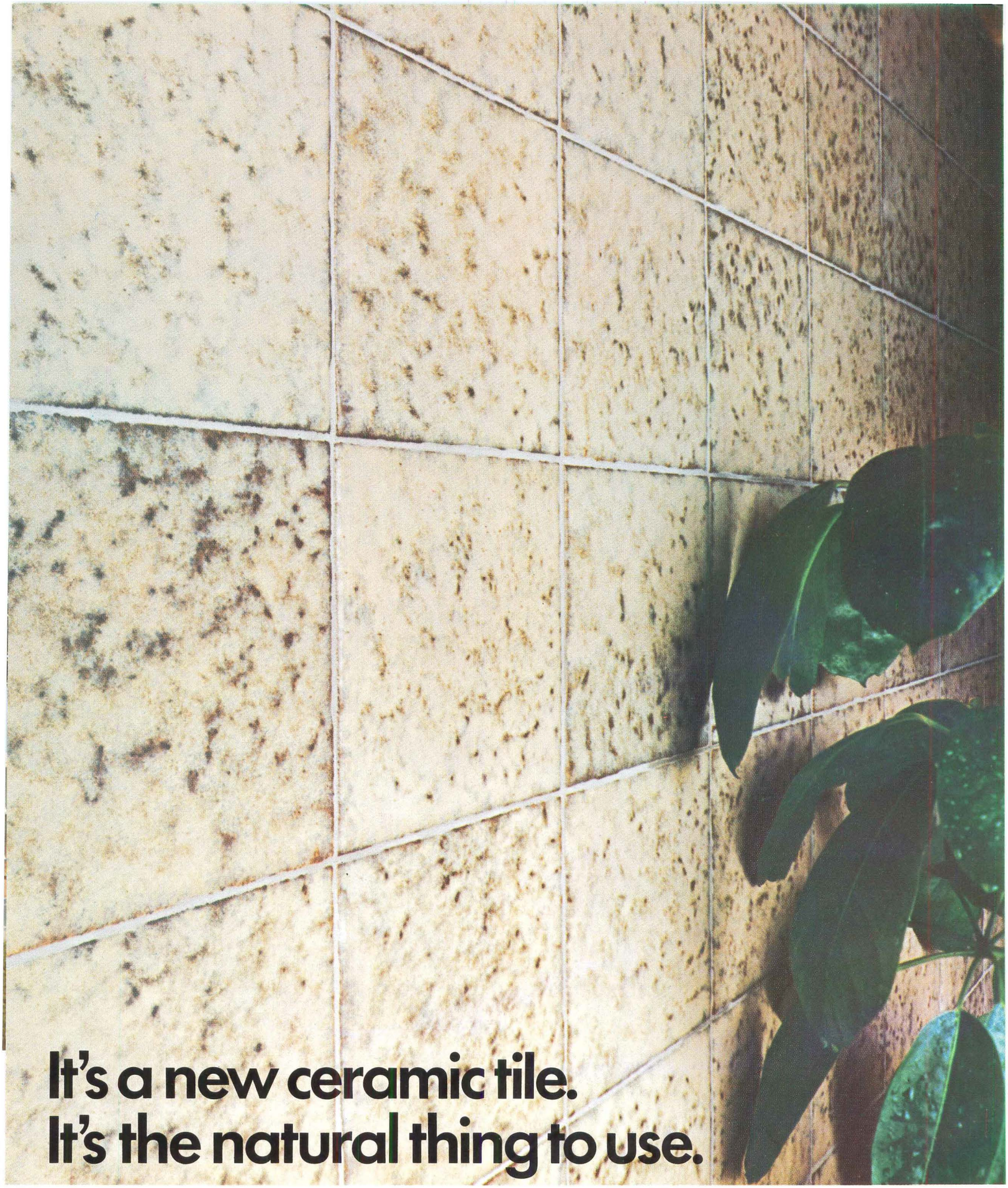
more products on page 184



It's a new ceramic tile. It's the natural thing to use.

Plate No. 226

Here you have Tuscany,™ American Olean's new ceramic tile with an interesting Old World look. Only a natural material can look so natural.

Note the interesting variations in surface and coloring. And think of where it can lend excitement to your designs.

As an accent surface. As a total area. It is suitable in big doses—and small places. Naturally.

Tuscany for walls everywhere. In Tuscany Pearl, Tuscany Gold, Tuscany Blue, and Tuscany Moss. 4-1/4" squares. Design service, yours without charge.

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Write American Olean, 1362 Cannon Avenue, Lansdale, Pa. 19446.

CERAMIC TILE
American Olean
A Division of National Gypsum Company

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For more data, circle 90 on inquiry card

For more data, circle 92 on inquiry card

Darn clever, these Chinese.

4,000-year-old building secret revealed in ancient Chinese porcelain-enamel vase

The fact that porcelain enamel as a building material is virtually indestructible was dramatically demonstrated by the discovery of this 4,000-year-old Chinese vase. Its brilliant colors and gleaming finish have not aged over the centuries.

TODAY LEADING ARCHITECTS AROUND THE WORLD ARE SPECIFYING ALLIANCEWALL PORCELAIN ENAMEL PANELS MORE AND MORE. The unusual durability of AllianceWall panels has greatly contributed to this growing popularity. After decades of tough, punishing wear, early-day AllianceWall installations still look bright and new. Consider these facts:

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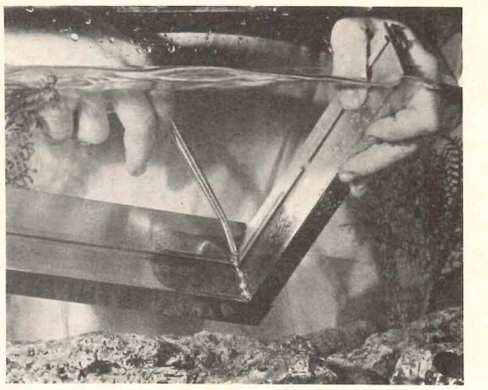
continued from page 168D



SEALANT / A fish tank serves as a demonstration facility for an acrylic seam sealant, Acryl-R®, which can be applied directly to oily or moist surfaces without impairing adhesion or performance. ▪ Schnee-Morehead. Chemicals, Inc., Irving, Texas.

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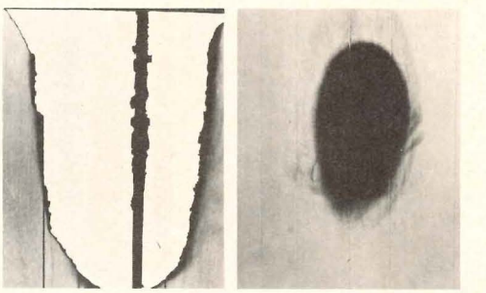

FIRE-RETARDANT PAINTS / *Fire Foil* is reported to combine "high Underwriters' Laboratories ratings with the handling characteristics of top quality paints." Photographs of a burning comparison test show a paneling not treated with *Fire Foil* on the left. There is a gaping hole after being subjected to a flame of 300,000 Btu for two minutes. On the right is the same type of paneling but treated with *Fire Foil* and exposed to the same flame for five minutes. The paint foamed up to protect the paneling behind it. ▪ The Valspar Corporation, Rockford, Ill.

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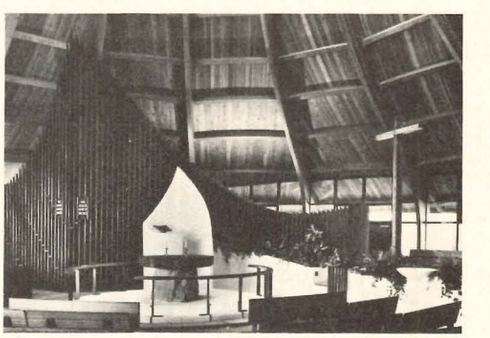

LAMINATED DECKING / Prestained decking is available in 36 colors that allow grain and texture of wood to show through. The decking is manufactured in Ponderosa pine, hemlock or cedar. ▪ Weyerhauser Company, Tacoma, Wash.

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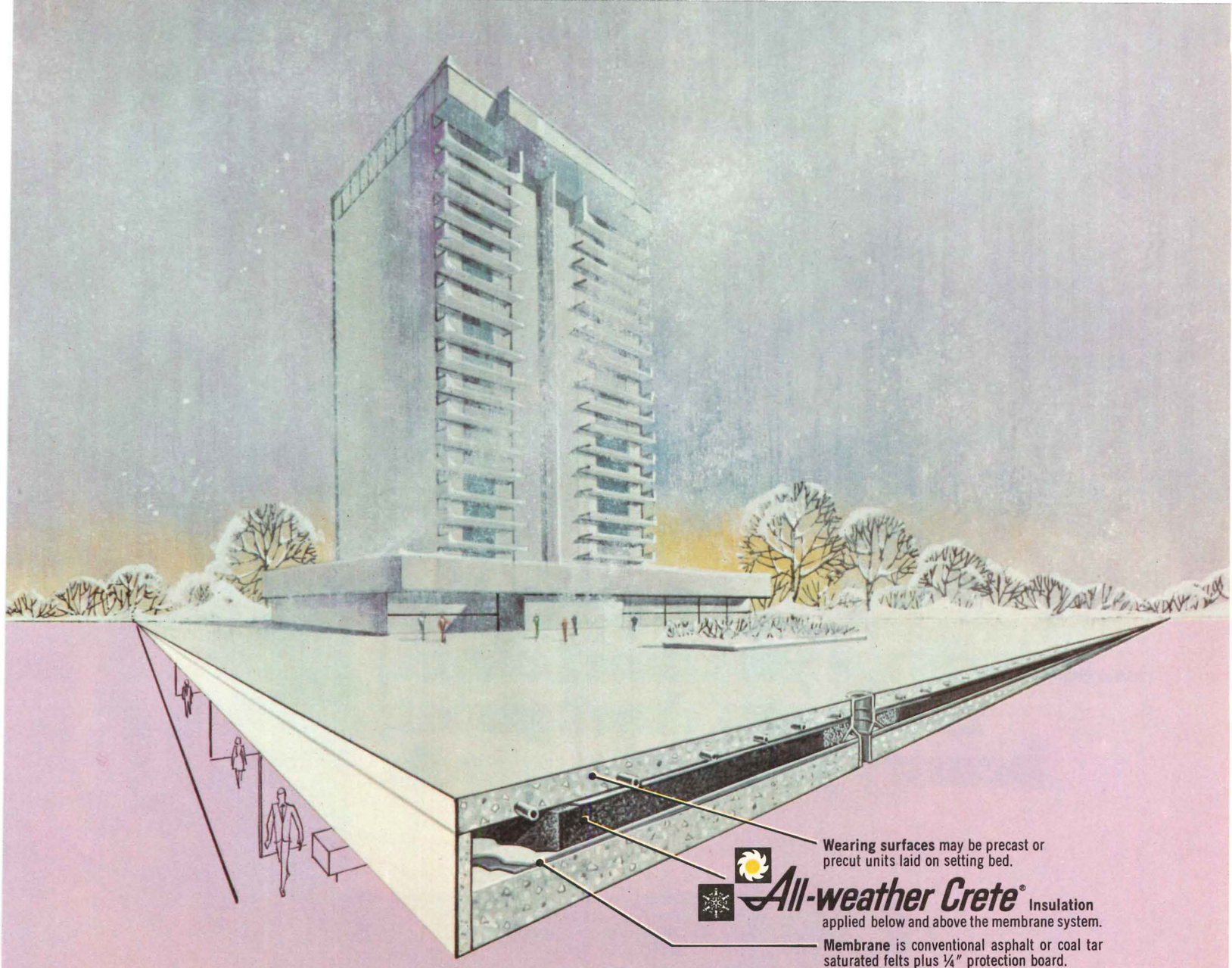
more products on page 188



plaza six

Will snow be a problem on your next plaza design? "Plaza Six", another proven All-weather Crete insulated plaza design, solves this problem with snow melting coils in sidewalks, ramps and loading areas over occupied areas.

There are seven other AWC Plaza Systems. Each is developed for a different purpose. These systems are being used today by leading architects throughout the nation. Why? Because no other type of insulation offers so many advantages in plaza construction. Heavy density All-weather Crete acts as an insulating cushion to protect the waterproof membrane, thus solving a failure problem often encountered in other systems. The K factor is .46; it has excellent load bearing capabilities and can be sloped or applied level. There are other advantages too.

Check out "Plaza One"—Two—Six—all Eight! Write for a full color brochure complete with diagrams and specifications. (You may want to design "AWC Plaza Nine" yourself.)

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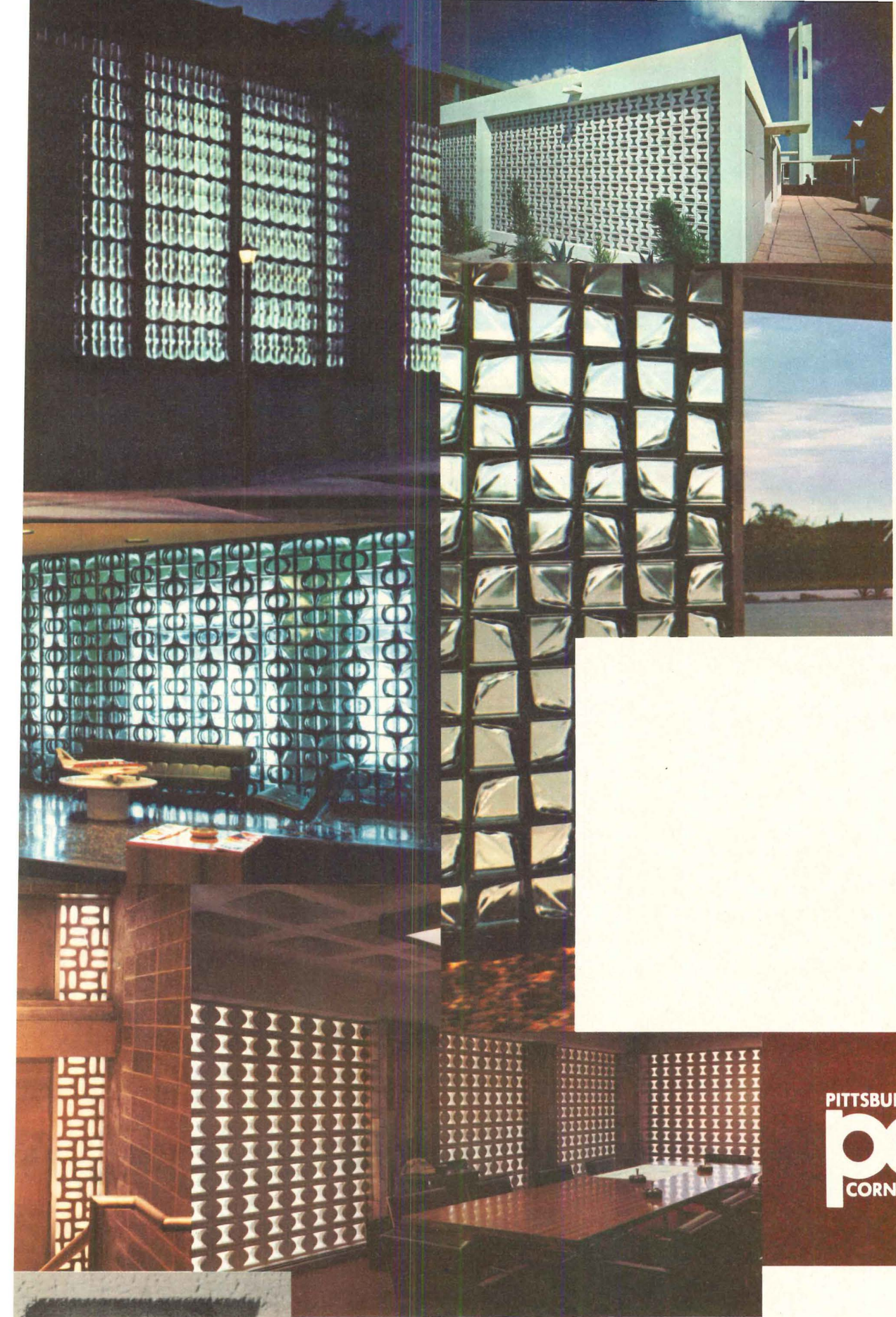
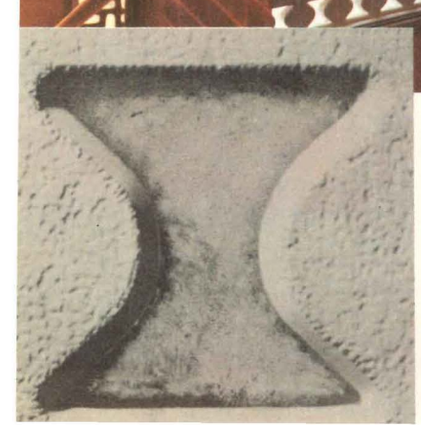
Glass blocks ...windows you don't clean, walls you don't paint, beauty you can't match.





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More than ever, architects are discovering the functional beauty of glass blocks by Pittsburgh Corning.

Functional, because each glass block contains a hermetically-sealed partial vacuum. Keeps out the winter cold and that blistering summer heat. Heating and air conditioning costs are significantly lower. So are maintenance costs —glass blocks are virtually self-cleaning!

Beautiful, because of the look and the feel you can achieve using ten different patterns, individually or in combination.

Our catalog will start you thinking. Write for it: Pittsburgh Corning Corporation, Dept. AR-20G, One Gateway Center, Pittsburgh, Pennsylvania 15222.

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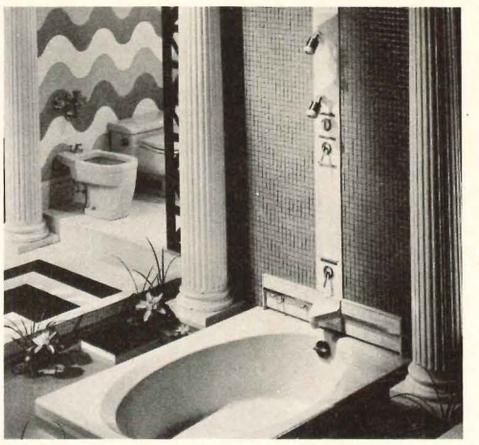

SHOWER COLUMN / A single-unit combination of several shower facilities represents "the largest amount of *Cymel* melamine molding compound ever used in a single assembled unit." *Cymel* was selected mainly because of its high degree of color flexibility—the product is well known for its use in quality dinnerware—but also has an outstanding surface hardness. The *Cymel* compounds are produced by American Cyanamid Company's Plastic Division. By using a combination of colors, the company was able to achieve a marble-patterned finish. There are two shower heads, which may be used simultaneously, plus a hide-away handspray. Also available are three adjustments for therapeutic whirlpool action. ▪ Kurz-Kasch, Inc., Dayton, Ohio.

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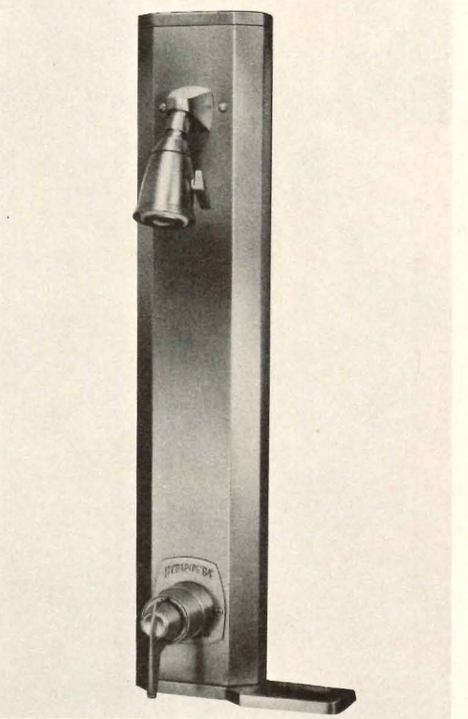

GANG SHOWERS / The *Hydapipe* prefab gang shower unit goes on the wall, not in it. "This means no pipe chases, thinner walls, a faster job." ▪ Symmons Engineering Company, Braintree, Mass.

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more products on page 192

FOLLANSBEE TERNE

...and the revival of metal roofing

While most architects have only recently discovered in the traditional metal roof a building element superbly adapted to the special idiom of contemporary design, roofers themselves have been aware for generations that no other roofing system can provide equivalent protection against the relentless attack of wind and weather. And Follansbee Terne is unique among metals in combining a natural affinity for color with unexcelled durability and relatively modest cost. May we send you the substantiating evidence?

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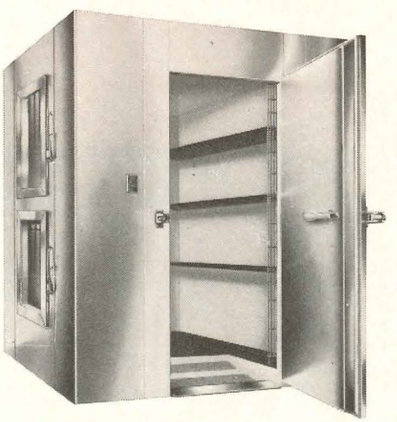
Des Moines, Iowa Residence Featured in Record Houses
Architect: John D. Bloodgood
Roofer: Iowa Sheet Metal Contractors, Inc., Des Moines, Iowa

I want a walk-in with one full-length stainless steel door and a steel plate, Ramp-In floor and adjustable wire shelving and an Automatic Defrost-Vaporizer and two half-length glass service doors and an Alarm System and I want it yesterday.

You want Nor-Lake. With a full range of components and options, the only thing we won't change is the quality.



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ONE IF BY RAIL... FIVE IF BY TRUCK!

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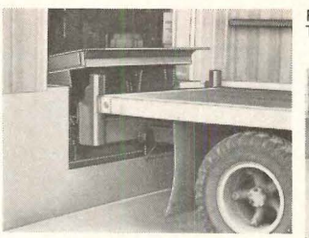
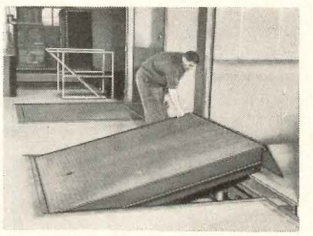
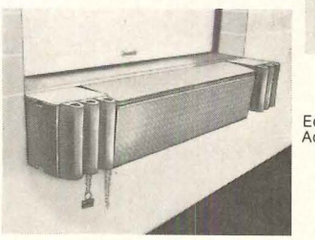
Choose from over 25 styles for the safest, most efficient, economical answer to your dock site problems. The world's first fully mechanical dock levelers, made by Rite-Hite, are still working after 23 years of heavy usage. Truly an investment you'll appreciate.



Fully-Automatic Truck Actuated



Semi-Automatic Flush Return



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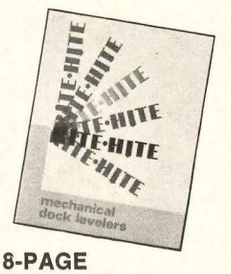
Also vertical hinged lip dock leveler for bi-level operations, torsion bar hinged lip dock levelers, and total dock safety chocking kits.



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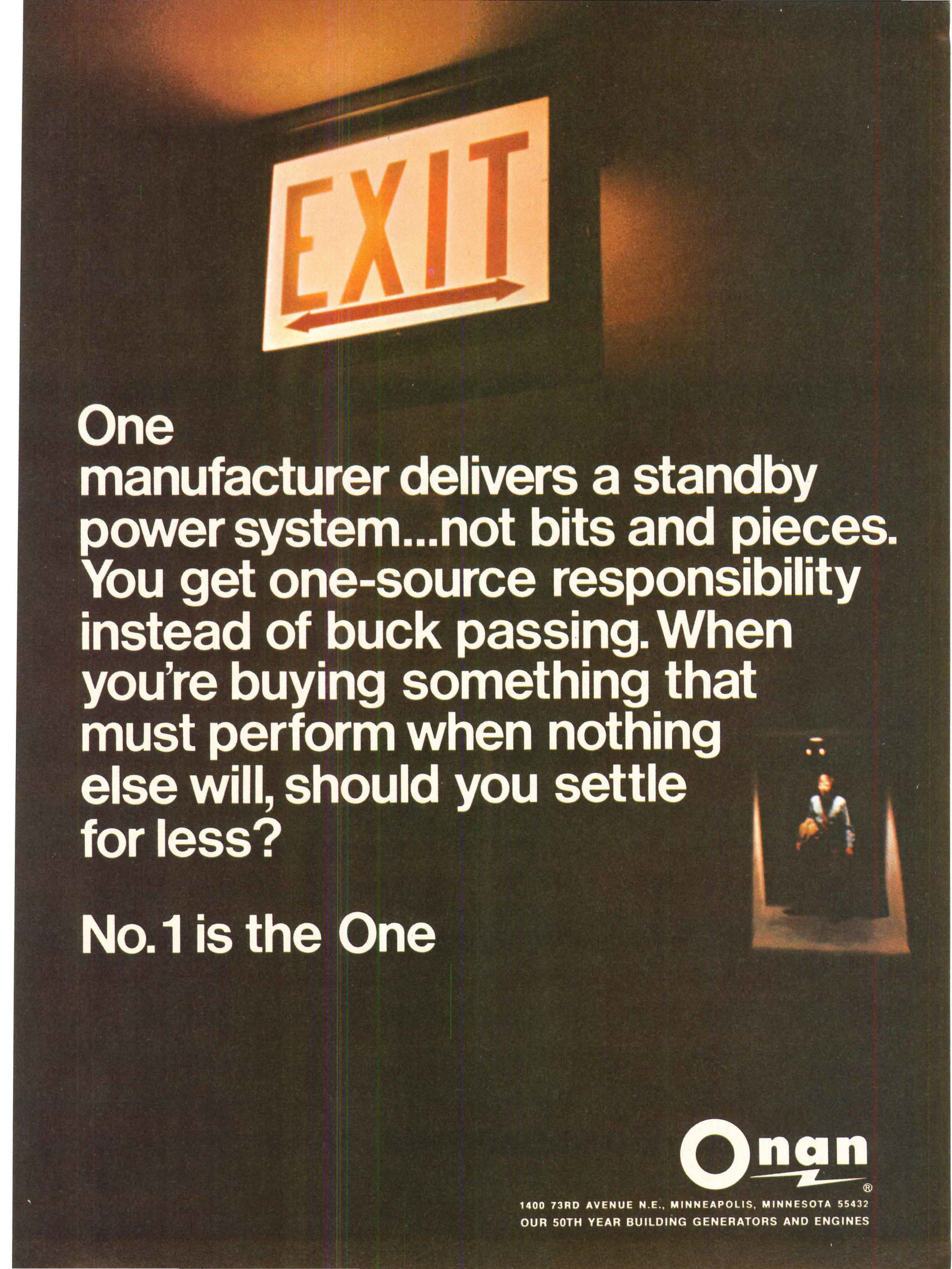

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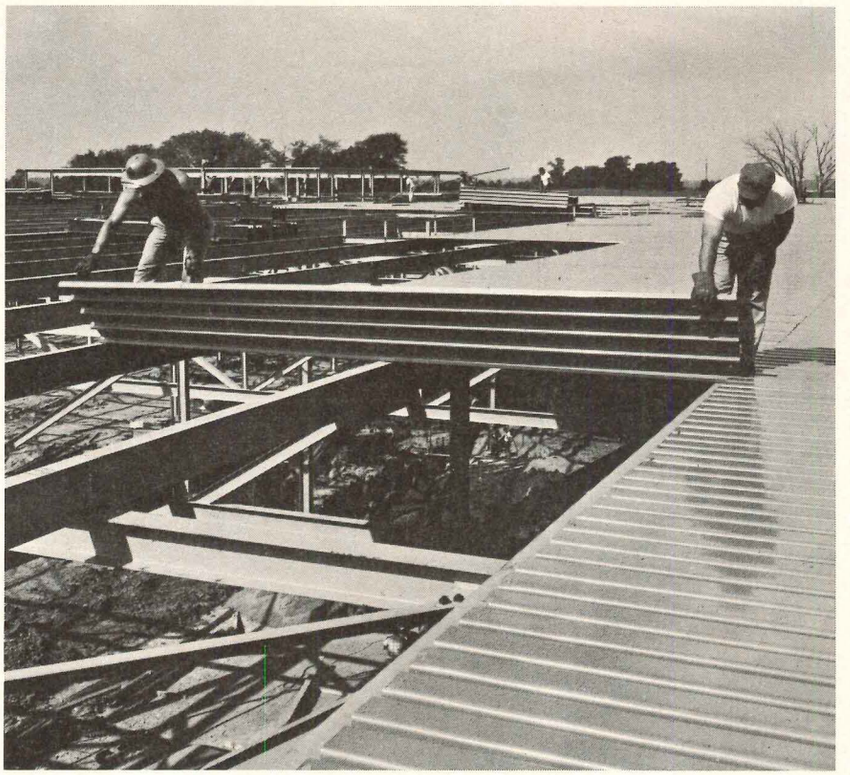

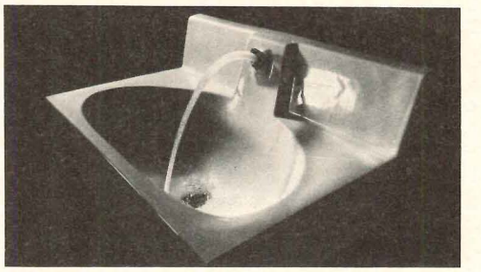

THE UNTOUCHABLES / Water flows in a trajectory stream into this scrub-up sink automatically when a surgeon (or anyone) stands before it. The control box located under the sink ties into any standard AC current supply. The design of the Proximatic TM sink minimizes splash. Also available is the *Proximatic Urinal* that flushes electronically after each use. ▪ American-Standard, New York City.

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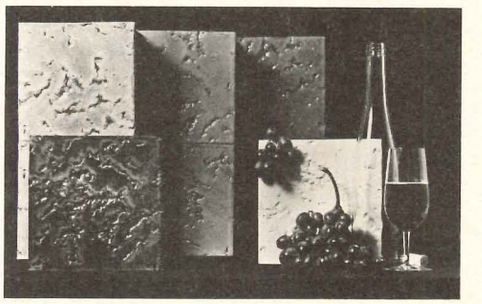

INTERIOR WALLS / *Carawall I* "combines the quality of structural glazed tile with the dimension of intaglio form. Subtle glazed color irregularities contribute to an unusual surface effect. The surface is particularly recommended for high traffic and critical areas such as stairwells and corridors where maintenance is a problem. ▪ Glen-Gery Corporation, Reading, Pa.

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EXTERIOR COATING / The steel and concrete Theme Building at the Los Angeles air terminal, striking because of its central core and "floating" restaurant, has been coated with a vinyl-plastic called *Liquid Envelope*. The coating, applied to a thickness of 40 mils, "is tough, impervious and monolithic. It completely waterproofs the building and makes surface dirt easy to wash away. Atmospheric corrosion of the surface, or joint sealants, is eliminated." The covering is particularly recommended for densely populated areas. ▪ Essex Chemical Corporation, Clifton, N.J.

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Project your client's corporate identity in enduring metal that provides almost limitless creative possibilities . . . and blends beauty with permanence.

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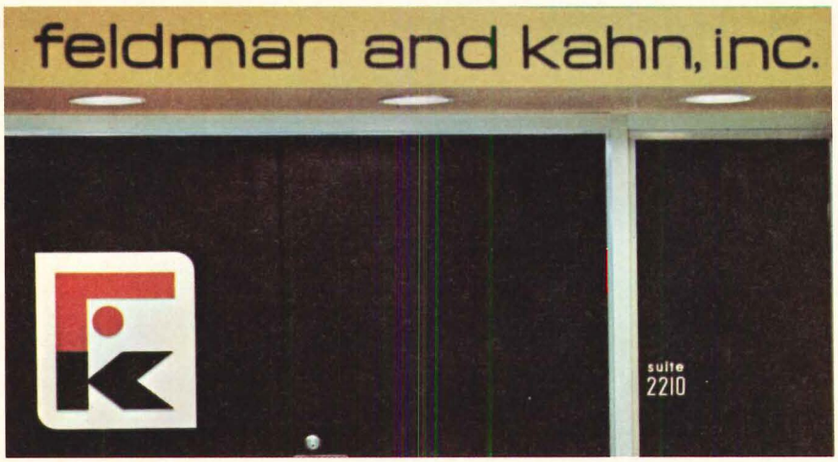

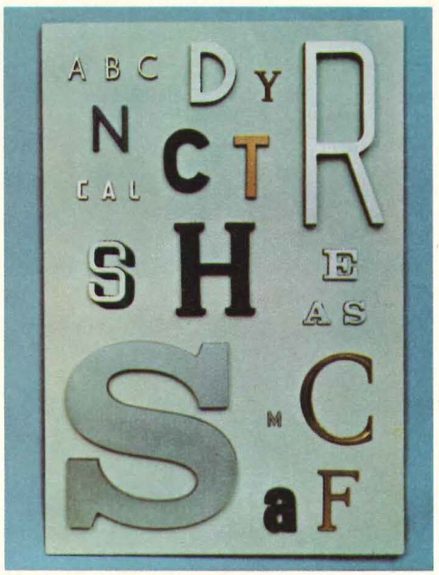

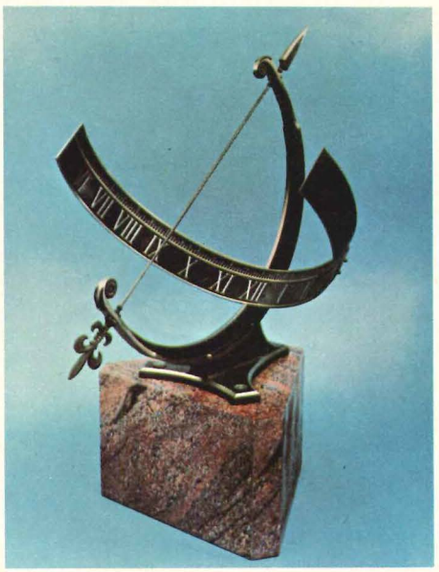

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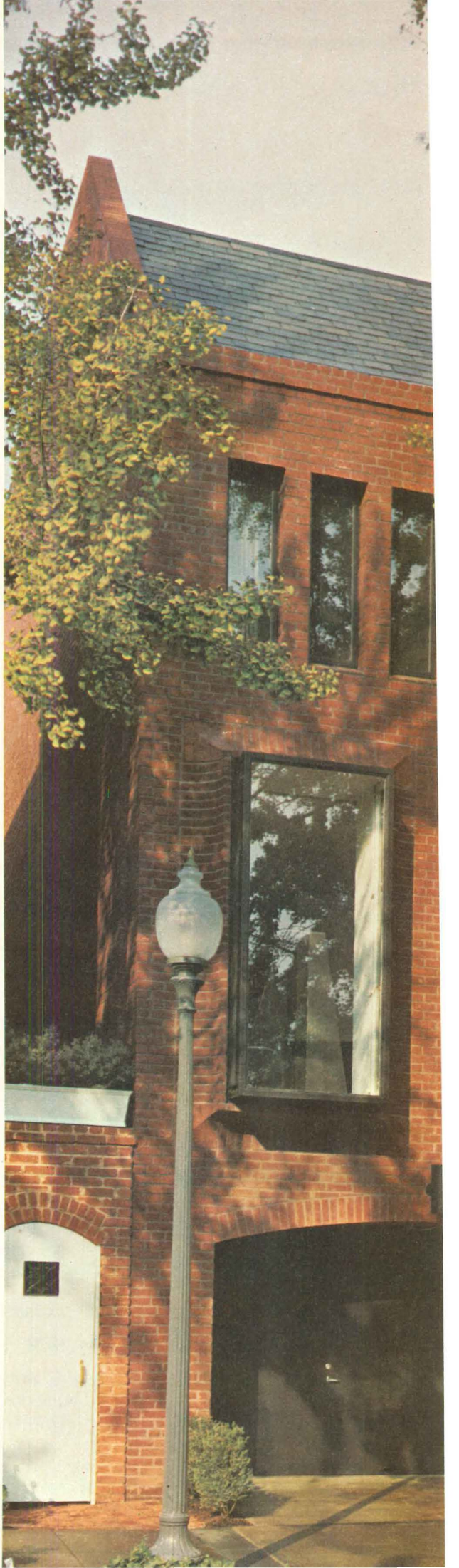
Architect: Hugh Newell Jacobsen
Photographer: Robert C. Lautman

House for Mr. and Mrs. Charles Dunbar, Winhall, Vermont
Architect: Giovanni Pasanella
Photographer: David Hirsch

House for Mr. and Mrs. Jack Goldberg, Manchester, Connecticut
Architect: Gwathmey & Henderson
Photographer: William Maris

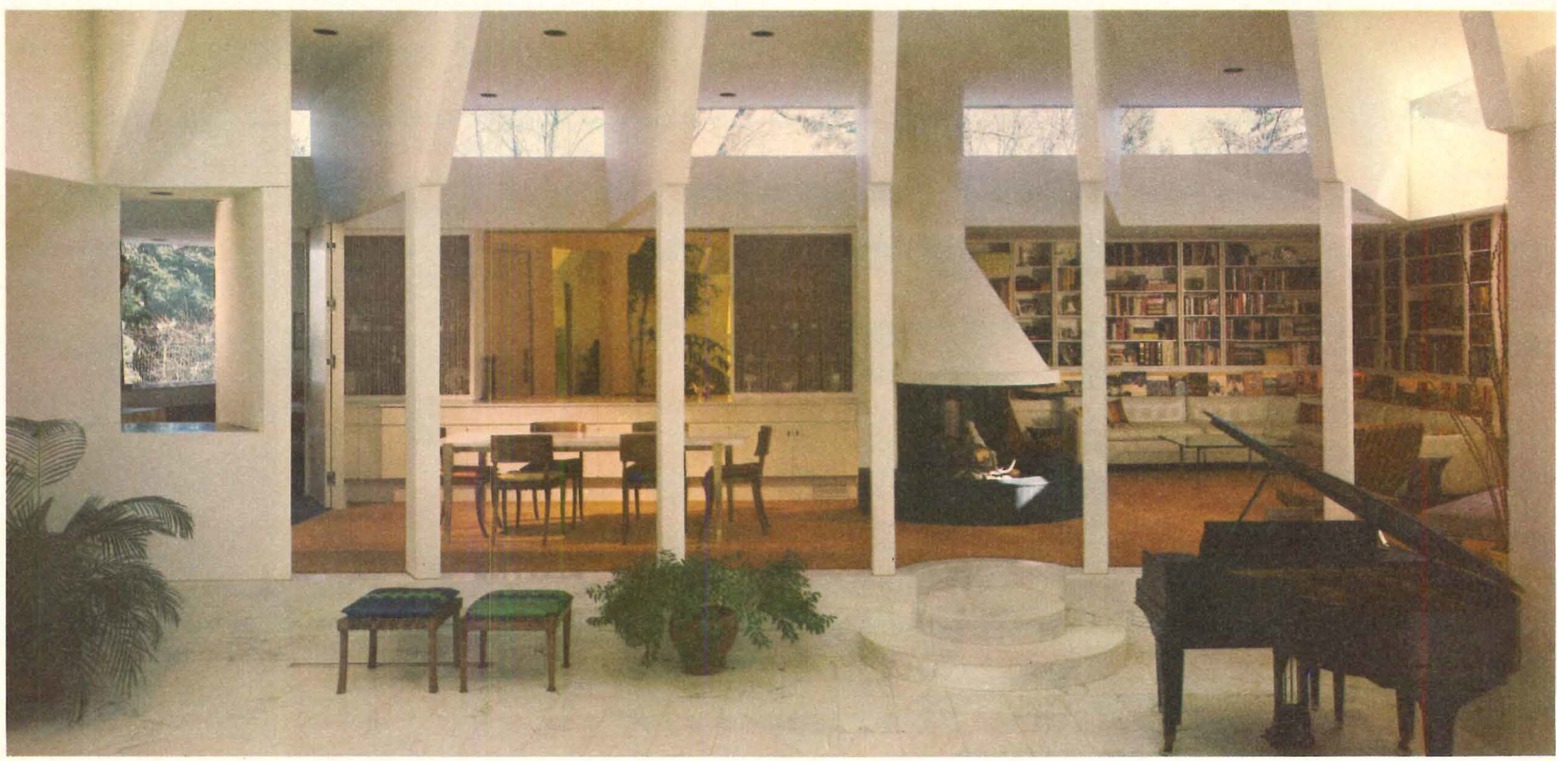
Townhouse sponsored by American Iron and Steel Institute, Houston Lighting & Power Company, and General Electric Company, Houston, Texas
Architects: Wilson, Morris, Crain & Anderson
Photographer: Jay Oistad

Atrium House, Grand Rapids, Michigan
Architects: Gunnar Birkerts & Assocs.
Photographer: Bill Engdahl, Hedrich-Blessing



RECORD HOUSES OF 1970 plus APARTMENTS OF THE YEAR

- In mid-May 1970, Architectural Record will publish the 15th annual edition of "Record Houses"—and call it "Record Houses of 1970 plus Apartments of the Year." In addition to the 20 finest architect-planned houses of the year, it will feature the best new ideas in architect-planned garden apartments.
- This expanded editorial presentation reflects the growing importance of apartments in the housing market and the increasing involvement of architects and builders with this building type.
- "Record Houses" offers you a unique opportunity to reach and influence all major groups of specifiers and buyers in the housing market, including over 40,000 architects and engineers, who are verifiably responsible for over 87 per cent of the dollar volume of all architect-planned residential building in the U.S.; the nation's 20,000 foremost builders, qualified by Sweet's on the basis of annual building activity and (at your option) 6,000 leading interior designers, qualified by Sweet's to receive the Interior Design File.
- "Record Houses" will work for you all year long—and longer! Of those architects who received "Record Houses of 1956," 46 per cent are still referring to it 13 years later!
- Here is an ideal opportunity to get greater mileage out of your residential advertising dollars. Plan now to advertise in "Record Houses of 1970 plus Apartments of the Year." Closing date: April 15.



Your Architectural Record representative has a new ten-minute presentation called, "Sell the Men Who Sell Ideas." Don't miss it.

ARCHITECTURAL RECORD

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NEW YORK, N.Y. 10036

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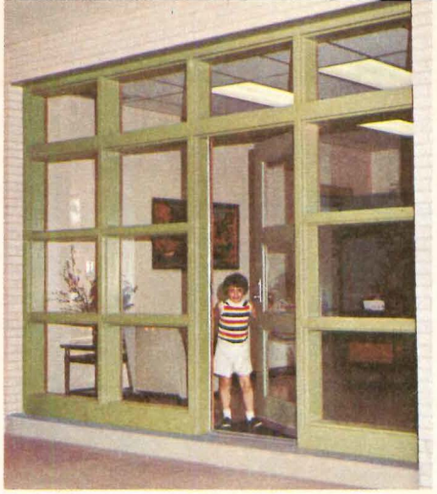
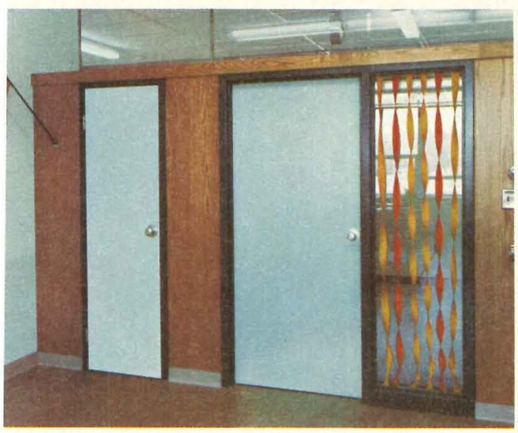
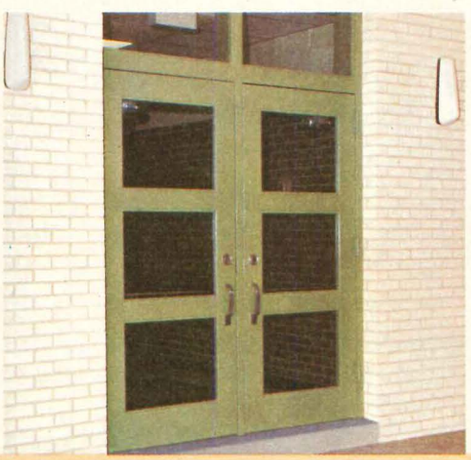




ARCHITECTS CAN REALLY DO THEIR thing



PINEWOOD ELEMENTARY SCHOOL
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ARCHITECT: J. H. Haveman
CONTRACTOR: Viking Construction Co.

THOMAS S. JUSTISS ELEMENTARY SCHOOL
Paris, Texas
ARCHITECT: B. P. Denney
CONTRACTOR: M. D. Misso Construction Co.

VOCATIONAL INSTITUTE
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ARCHITECT: Andrew Isaak
CONTRACTOR: Harvey Construction Co.

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DIVISION OF THE MARMON GROUP, INC. (MICHIGAN)
ERIE, PENNSYLVANIA 16505

For more data, circle 106 on inquiry card

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 227-228.

SPORTS LIGHTING / To guide lighting designers, "Current Recommended Practice for Sports and Recreational Area Lighting" updates the 1961 report of the Illuminating Engineering Society's Committee on Sports Lighting. The 70-page book includes a table showing recommended levels of illumination for 54 sports in footcandles and also in the newly-adopted dekalux units. $1. ▪ Publications Office, Illuminating Engineering Society, 345 East 47th Street, New York, New York 10017.

EXPANSION JOINT COVER / A 4-page brochure shows how to install expansion joint covers above high water line on roof decks to give an economical weatherproof covering to all structural and seismic roof deck openings. ▪ Grefco, Inc., Los Angeles.*

Circle 400 on inquiry card

HOSPITAL TV / Hospital closed-circuit television systems is the subject of a 16-page brochure describing "how this versatile tool helps combat rising operating costs, manpower deficiencies and increased public demand for services." Covered are such unique uses as microscopy and action record systems. ▪ Motorola Communications and Electronics, Inc., Chicago.

Circle 401 on inquiry card

CARPET COMPARISON CHART / A comparison chart is believed to be the only one that "permits direct comparison of carpet service life regardless of construction, fiber or manufacturer." ▪ Sequoyah Carpet Mills, Oklahoma City.

Circle 402 on inquiry card

SOUND CONDITIONING / "Sound Conditioning with Carpet" is a 27-page booklet that reports on a new study to pinpoint the acoustical properties of carpet and padding combinations. The study was made to "provide specifiers with meaningful guidelines for selecting the proper carpet and padding combinations in sound conditioning commercial and residential interiors." ▪ The Carpet and Rug Institute, New York City.*

Circle 403 on inquiry card

COMPACT INCINERATOR / The *Combustopak* incinerator is presented in an eight-page folder that explains the unit's materials handling, thermal reduction, residue removal and air pollution control systems. The unit is designed for towns of 10,000 to 30,000 populations, industrial complexes and institutions. ▪ Combustion Engineering, Inc., Windsor, Conn.

Circle 404 on inquiry card

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

more literature on page 214


The hinge so superior
it deserves a pin to match!
TRI-CON
The world's slimmest concealed ball-bearing hinge now adds the green Teflon*-coated pin . . . the pin that never needs oil so there's never oil seepage to mar hinge appearance. Teflon combines with the Delrin bushing for inner-barrel mechanism that gives the smoothest friction-free movement ever achieved. Yet Tri-Con sells for the price of ordinary premium hinges.
Hager
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*DuPont's Registered Trademark
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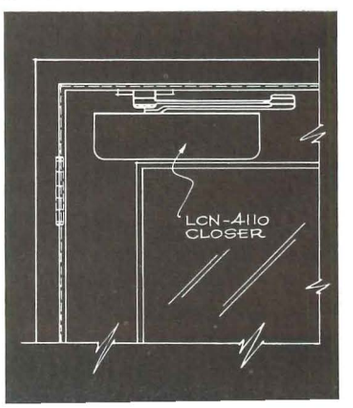
The Cannery, San Francisco, California. Joseph Esherick and Associates, Architects, San Francisco.

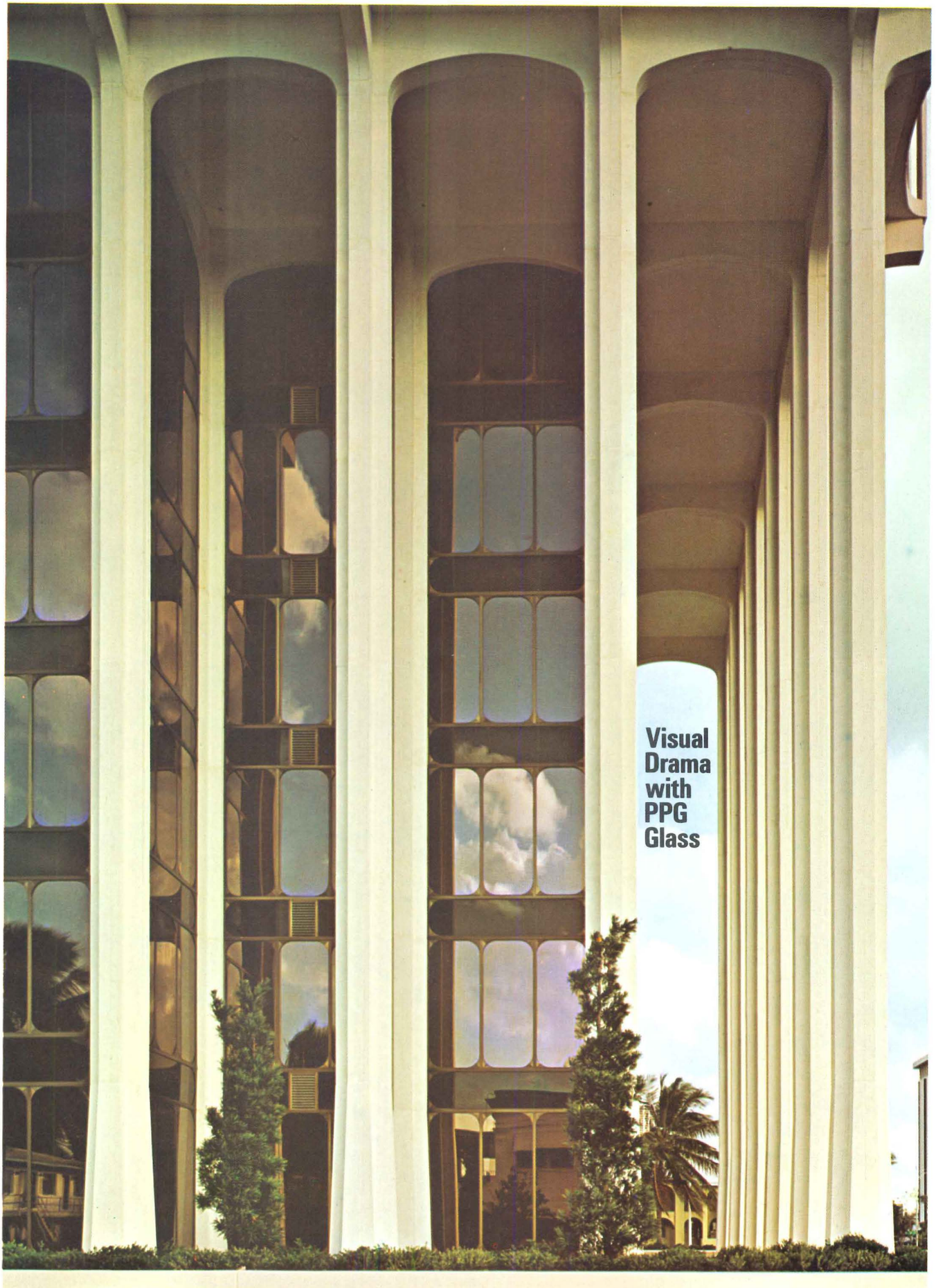
Smoothee® Closers with hold-open arms

meet every requirement for door control in public buildings. They look great. They perform flawlessly. They require virtually no care. Perhaps best of all, they're from LCN . . . the company that has made nothing but door closers for over 40 years. See catalog in Sweet's, or write: LCN Closers, Princeton, Ill. 61356.

For more data, circle 89 on inquiry card



For more data, circle 110 on inquiry card

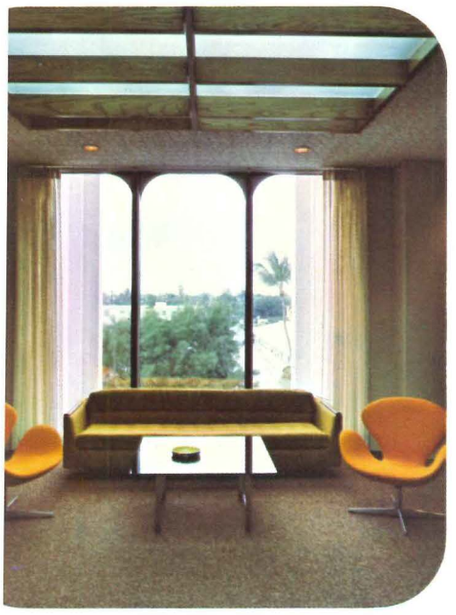

Visual
Drama
with
PPG
Glass

PPG Glass helps open up Miami

Mutual of Omaha asked for a dramatic glass wall design for its new building to take full advantage of its view of Biscayne Bay. The architect faced a very difficult design problem: keeping a glass wall building cool in spite of the intense Florida sunshine. He found PPG's *Solarban® Bronze (3) Twindow®* Insulating Glass an excellent solution to both esthetic and engineering requirements. The warm bronze tone of *Solarban Bronze* was selected as a handsome color complement for the building's white concrete columns, and as an extension of the bronze tones of the exterior metals and interior color scheme.

The reflecting qualities of *Solarban* add design interest, help keep the building comfortably cool, and significantly reduce the size and cost of the building's cooling system. The functional and design advantages of PPG Performance Glass have made a larger, better view of Miami both possible and practical.

The custom *Twindow* units were fabricated to match exactly the poured-in-place arches. The curves of the window openings correspond with the arches extending from the tops of the building's exterior columns.



With *Solarban Bronze (3),* sunlight seems only one-eighth as bright to the indoor viewer, an important consideration with light-colored concrete construction in the brilliant Florida sunshine. The bronze hue of these units harmonizes with the warm earth tones selected for the interior decor.

Solarban's reflecting qualities provide a new visual dimension to the building while turning back much of the sun's radiant energy.

Architects for the Mutual of Omaha Regional Home Office found that PPG's Performance Glass solved both their design challenges: it added to the building's beauty while helping to keep it cool efficiently and economically.

Mutual of Omaha Regional Home Office, Miami

Architect: Houstoun, Albury, Baldwin & H. Maxwell Parish, Miami
Interior Design: Houstoun & Parish, Miami
Consulting Design Architect: Leo A. Daly Co., Omaha
Consulting Engineer: Breiterman, Jurado & Associates, Miami

There's a PPG Performance Glass for every design problem

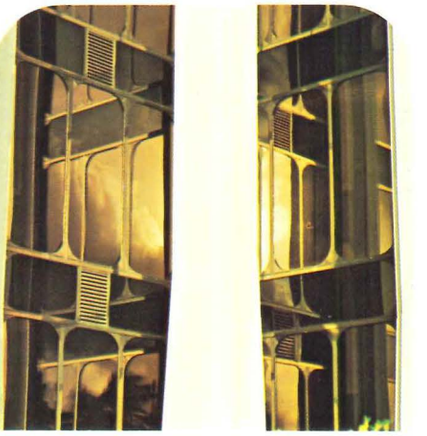
Mutual of Omaha's consulting engineer states, "This glass, *Solarban Bronze (3),* permitted us to use the air conditioning system we did. If you want to have an open-building design like this in Florida, you would have to figure it with glass like this."

Solarban Twindow units offer a reflective film coating which keeps much of the solar radiant energy outdoors rather than permitting it to become a load on the cooling system. This same low-emissivity reflective film enables *Solarban Twindow,* a normal insulating unit with ½" air space, to perform like triple glazing in reducing the conducted heat loss during Florida's winter months. Coupled with PPG's *Solarbronze* Plate Glass in this *Solarban Twindow* unit, the reflective coating reduces the overall light transmission to 12%, thus shading much of the outdoor brightness without obstructing the occupant's view.

Write: PPG Industries, Inc., One Gateway Center, Pittsburgh, Pennsylvania 15222.

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

PPG INDUSTRIES



Consulting Engineer: Hamlin-Deupree, Mobile

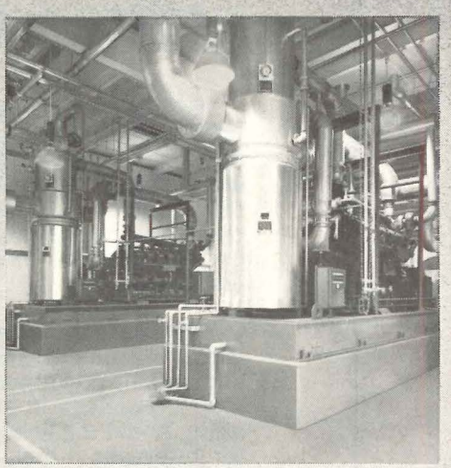
Alabama college students keep their cool with Waukesha power

Two Waukesha VHP gas engines deliver 2400 tons of air conditioning at University of South Alabama

Twin Waukesha L7042 12-cylinder gas engines at the University of South Alabama, Mobile, are a classic example of efficient power application. They develop 1300 hp at 1000 rpm each to drive twin 1200 ton centrifugal ammonia compressors. Chilled water at 45° is supplied to all campus classroom buildings through insulated pipes from a central utility building. The system also includes waste heat boilers to provide hot water and heat for the complex.

Any application that calls for big-output power like this is a job for Waukesha power. You'll find a range of horsepower and speeds that let you plan an ideal match-up for big compressors, deep well pumps and on-site power generation. Waukesha VHP engines, gas or diesel, provide high specific output for maximum utility and economy, both in capital and operational costs.

Your Waukesha distributor can supply complete details. Or write for Bulletin 5031.



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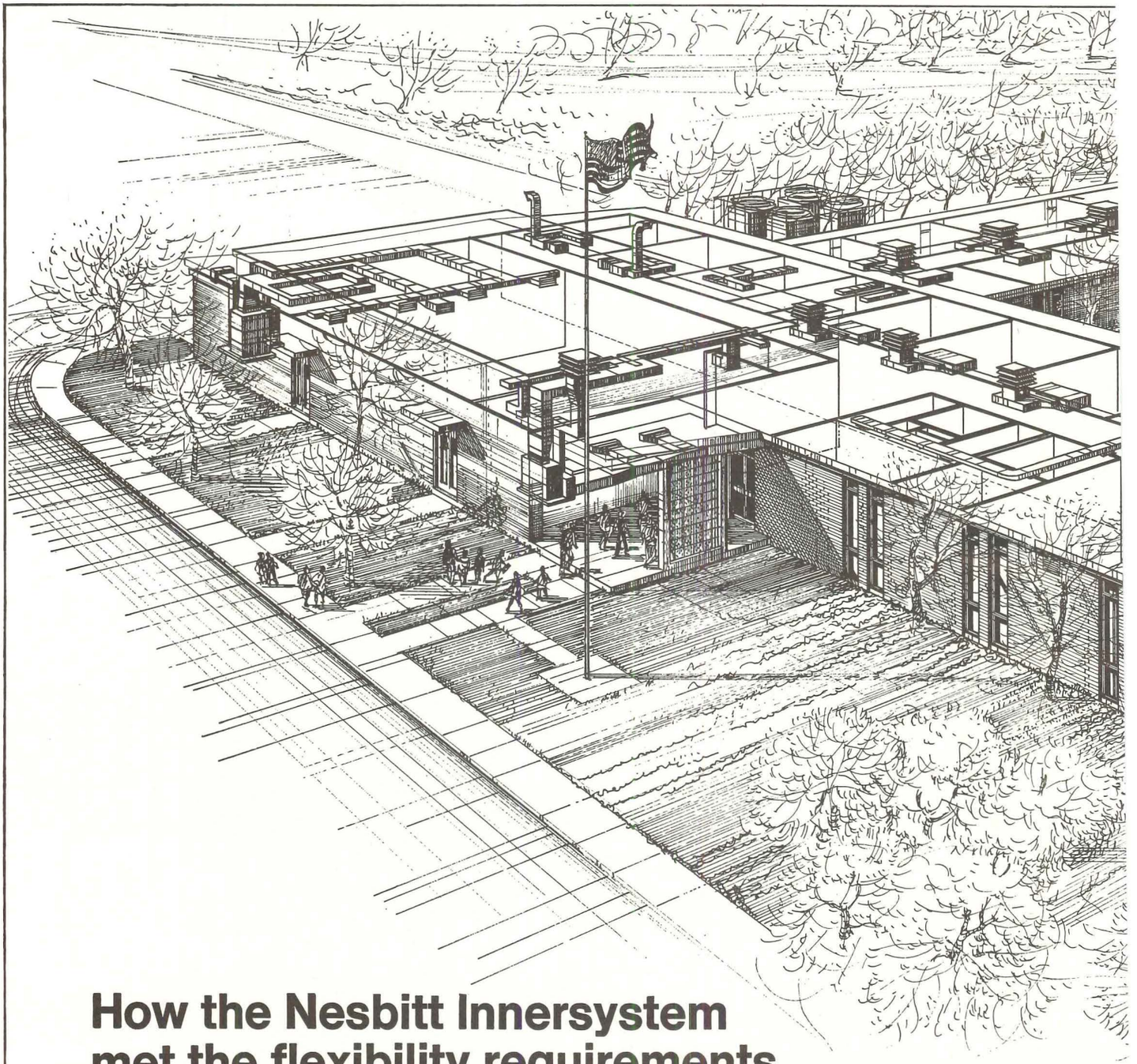
For more data, circle 114 on inquiry card



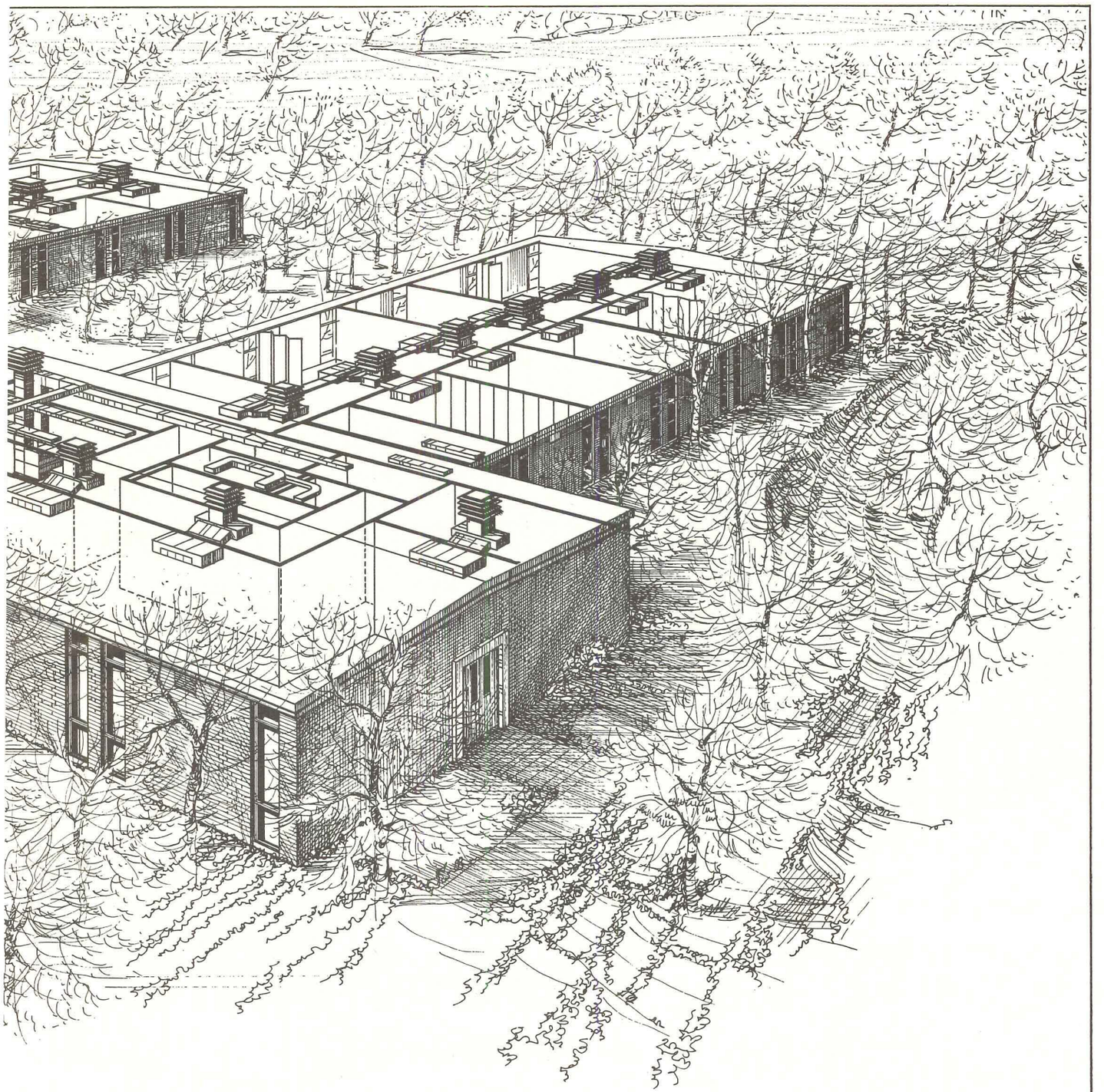
How the Nesbitt Innersystem met the flexibility requirements of Tibet Avenue School at $2.77 per sq. ft.

What's an Innersystem? You might ask that question of the Savannah, Georgia School District where the Tibet Avenue Elementary School is located, but the chances are they've already forgotten about the Innersystem and justly so.

You see, the Innersystem provides year-round heating, ventilating and air conditioning to service learning spaces in all shapes and sizes. And if the school district has forgotten about that—the reason is plain. The Nesbitt Innersystem isn't in view! It was designed to fit at the ceiling or in the ceiling sandwich, out of sight, saving valuable floor space.

The versatility of the Innersystem is unmatched for air conditioning, heating and ventilating. Hydronic, electric or a combination of hydronic and electric. Add to this, simplified maintenance provided by the exclusive Nesbitt Vac-Clean filter. You can see how easy it is to forget about the Innersystem. Actually, the Vac-Clean filter never needs changing. When the filter media in use becomes dirty, a tiny light signals the custodian. He advances the reel of filter media to a clean section. Once every two years, he vacuums the entire reel of permanent filter media. That's it, no ladders required at any time.

At the Tibet Avenue Elementary School, Architect Oscar M. Hansen and his Consulting Engineers, White, Hobbs and McClellan selected chilled water cooling and electric heating for their Innersystem units. It is the first system of this type in the State of Georgia. As



a matter of fact, the Tibet Avenue Elementary School will be the first fully air-conditioned school in the Savannah District. That in itself meant that everyone was extremely careful in the selection of the equipment and the system.

The Savannah School District bought the best possible comfort conditioning system available for $2.77 per square foot. With the Nesbitt Innersystem, individual area comfort is always maintained. This means that one area can demand heating while another cooling and the individual Innersystem units serving those areas can handle both these requirements simultaneously.

To create even more learning spaces, the builders chose to place the refrigeration system outside the building, piping chilled water to the individual units. Innersystem piping is installed in the ceiling sandwich, eliminating pipe trenches as well as shortening piping runs.

Note also, that with the Innersystem, fresh air intakes do not have to be located in perimeter walls. Doing so could defeat educational flexibility. You see, the Nesbitt Innersystem was developed out of educational demands. It is the most reliable system for answering the call for flexibility.

For further details on the Nesbitt Innersystem of air conditioning, heating and ventilating, write Nesbitt Operation, ITT Environmental Products Division, International Telephone and Telegraph Corporation, Philadelphia, Penna. 19136.

NESBITT ITT

For more data, circle 115 on inquiry card

TESTING.

There's an idea floating around the construction industry. It has to do with microfilming information. Like catalog pages. It's not a new idea. In fact, we at Sweet's have already spent five years and over one million dollars working on it. And we're still working on it, because it still needs work.

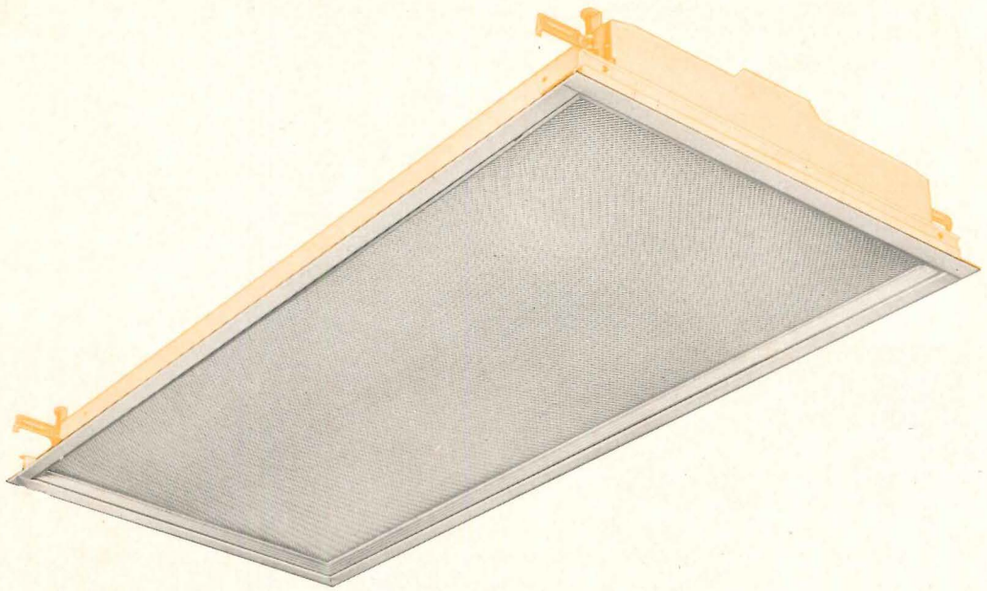
Several companies have announced that they have stopped working and started selling. They haven't announced that they still have problems. Which can become your problems. Like cost. Like locating information. Like browsing and comparing. Like queuing up at the reader/printer. Like color.

For the record, we'd like to announce that we have a microfilm library, too. Sweet's Architectural Microfilm Library—only it's not *just* microfilm. Together with Sweet's Architectural Catalog File, which you all know and use, it forms a complete system combining the advantages of printed and filmed data. In total, over 120,000 pages of product information.

Our new system will be rigorously tested this year in 300 architectural offices. And only when it has passed these tests and we are satisfied that it is the best system available will we sell it.

By best, we mean the most efficient, trouble-free, economical information retrieval system in the market. Like you'd expect from Sweet's.

So, if you're interested in microfilm and are somewhat confused about all the blue-sky claims and promises being made by various companies, join the club. And get un-confused—we have some down-to-earth facts for you on this whole microfilm subject. Just send your name and address to: Architectural Microfilm Library, Sweet's Construction Division, McGraw-Hill Information Systems Company, 330 West 42nd Street, New York, New York, 10036



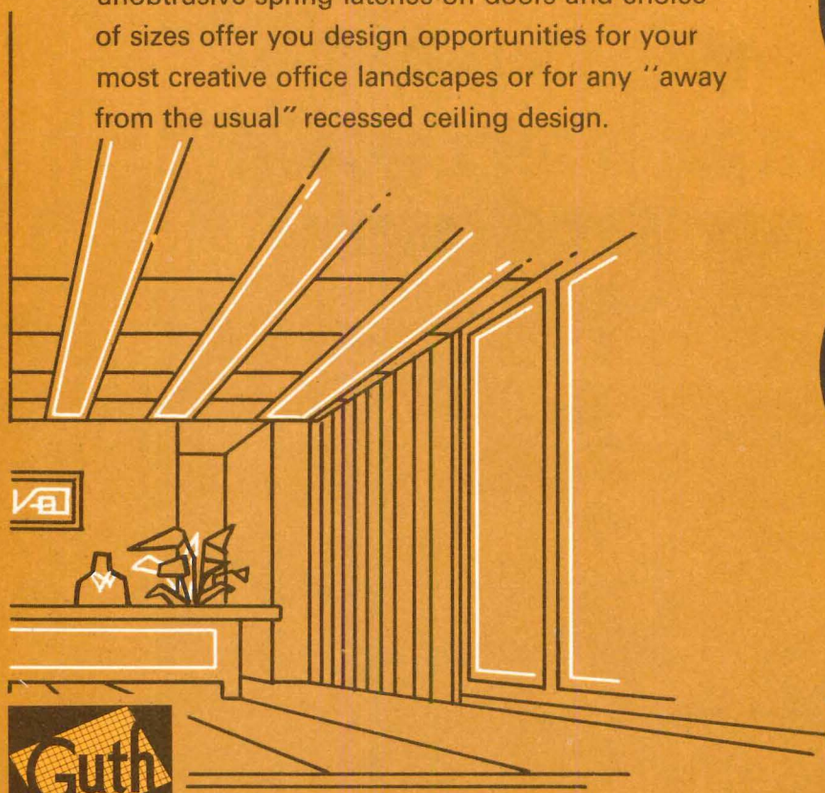
NEW STATIC FLUSH AND REGRESSED TROFFERS

"Now" features like Extruded Aluminum Trim, crisply designed Flush or Regressed appearance, unobtrusive spring latches on doors and choice of sizes offer you design opportunities for your most creative office landscapes or for any "away from the usual" recessed ceiling design.

FLUSH

REGRESSED

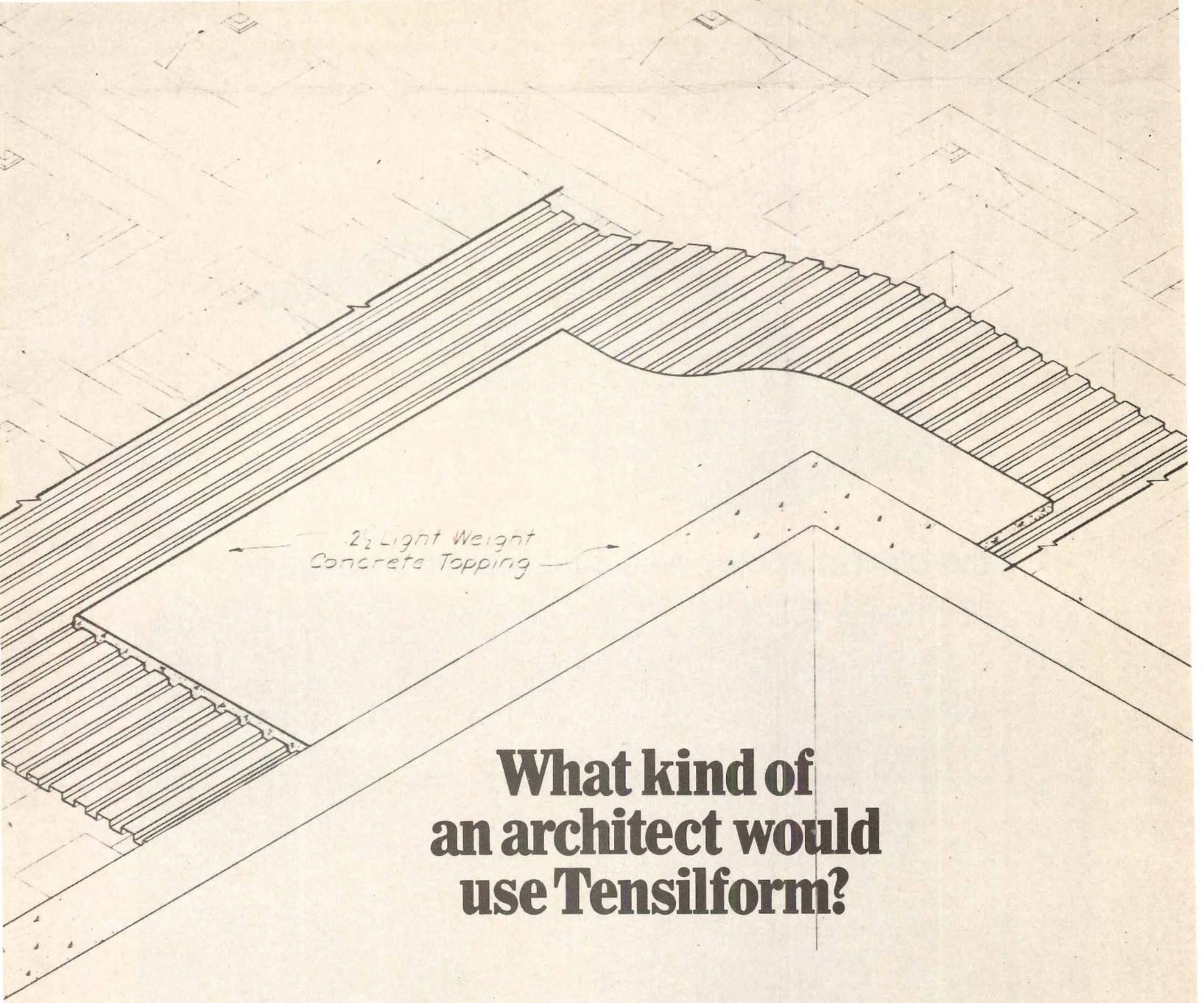
SPRING ACTION LATCHES



Guth LIGHTING

THE EDWIN F. GUTH COMPANY
2615 Washington Avenue, Box 7079
St. Louis, Missouri 63177

For more data, circle 117 on inquiry card



What kind of an architect would use Tensilform?

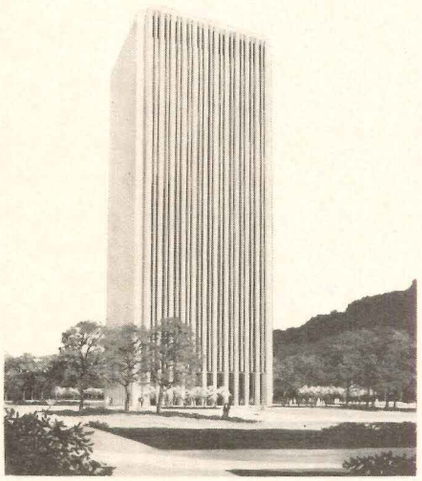
EDWARD DURELL STONE, ARCHITECT
7 EAST 67TH STREET NEW YORK 21, N.Y.

PRAEGER - KAVANAGH - WATERBURY STRUCTURAL ENGINEERS
200 PARK AVENUE NEW YORK 17, N.Y.

CAPITAL PLA
OFFICE BUILD

PROJECT:

*Edward Durell Stone architect for Phase I of the project
in association with Lee Potter Smith, Pritchett, Hugg and Carter of Frankfort, Ky.
Structural engineers for entire project are Praeger-Kavanagh-Waterbury, N.Y.



An architect who knows how to get the most out of a budget, because he knows how to get the most out of new building materials.

An architect like Edward Durell Stone and his associates.*

When they designed the master plan for the urban renewal project in Frankfort, Kentucky, the budget for Phase I was $23 million. So in the Capital Plaza Office Tower–the largest building on the site–they used approximately 215,000 square feet of Wheeling Tensilform®; the permanent steel form for concrete floors.

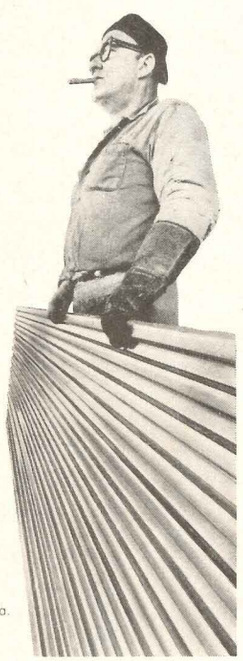
It's not hard to see why.

The contractor didn't need a team of carpenters to put up all the scaffolding that's needed for wood form. And what's more important, he didn't need them to strip the form and dismantle scaffolding once the concrete was poured.

When Tensilform is down, it stays down..

Another important plus about Tensilform is the way it comes–all carefully pre-cut according to detailed drawings prepared by Wheeling. There's no trimming to be done on the site. And tradesmen can walk on it as soon as it's down.

All this adds up to a pretty impressive cost story. But probably the simplest and most eloquent advertisement for Tensilform is the architect's name at the bottom of that drawing.



Wheeling Tensilform.

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

continued from page 198

AIR MAKE-UP HEATERS / Units are said to create plus pressure within a building, cutting heating and air-conditioning costs, controlling moisture, preventing corrosion and improving working conditions. Flyer presents photos and details. ▪ Sioux Steam Cleaner Corporation, Beresford, S. D.

Circle 405 on inquiry card

MEDICAL CEILINGS / An 18-page brochure, "Ceiling Systems that Work: to help you build better medical facilities," illustrates systems and materials available and describes the advantages of each. ▪ Armstrong Cork Company, Lancaster, Pa.*

Circle 406 on inquiry card

OFFICE CONSOLE FURNITURE / An 8-page color catalog presents office work station components and concepts. The furniture includes adjustable-height steel desks, steel and wood consoles and credenzas, flexible desk-top organizers, returns and tub-file desks. ▪ Kwik-File, Minneapolis, Minn.

Circle 407 on inquiry card

GAMMITE FLOORING / *Gammite* wood-plastic parquet flooring—made by impregnating oak parquet tiles with a plastic that is hardened by radiation—is shown in a 4-page brochure. Favorable characteristics of the material are explained. ▪ Radion Products, Inc., Fairfield, N.J.

Circle 408 on inquiry card

APPALACHIAN OAK / An 8-page brochure entitled "Appalachian Oak for Fine Cabinets" describes oak as the "decorator's delight" because of its light, natural color that can be finished in a number of ways. ▪ Appalachian Hardwood Manufacturers, Inc., Cincinnati.

Circle 409 on inquiry card

PLAYGROUND EQUIPMENT / A 44-page catalog describes all-aluminum *Playscapes*, "scientifically-planned environments for creative child's play." The catalog presents specifications, costs and illustrations of 15 different age-scaled designs. ▪ Playground Corporation of America, Long Island City, N.Y.

Circle 410 on inquiry card

ELECTRIC BOOSTER HEATERS / A 12-page bulletin presents INDEECO electric booster heaters for dishwashing machines. ▪ Industrial Engineering & Equipment Co., St. Louis.

Circle 411 on inquiry card

HINGES / An eight-page catalog presents *Tri-Con* hinges, three-knuckle hinges with concealed ball bearings. ▪ Hager Hinge Company, St. Louis.*

Circle 412 on inquiry card

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

more literature on page 218

NO EQUAL

Von Duprin 66 series. The *original* stainless steel devices. And still unequaled in design, quality and engineering. Rim, mortise lock and vertical rod type. See your Von Duprin representative or write for detailed catalog material today. Compare the Von Duprin 66 series devices for value by any standards. There is no equal.

Von Duprin® the safe way out

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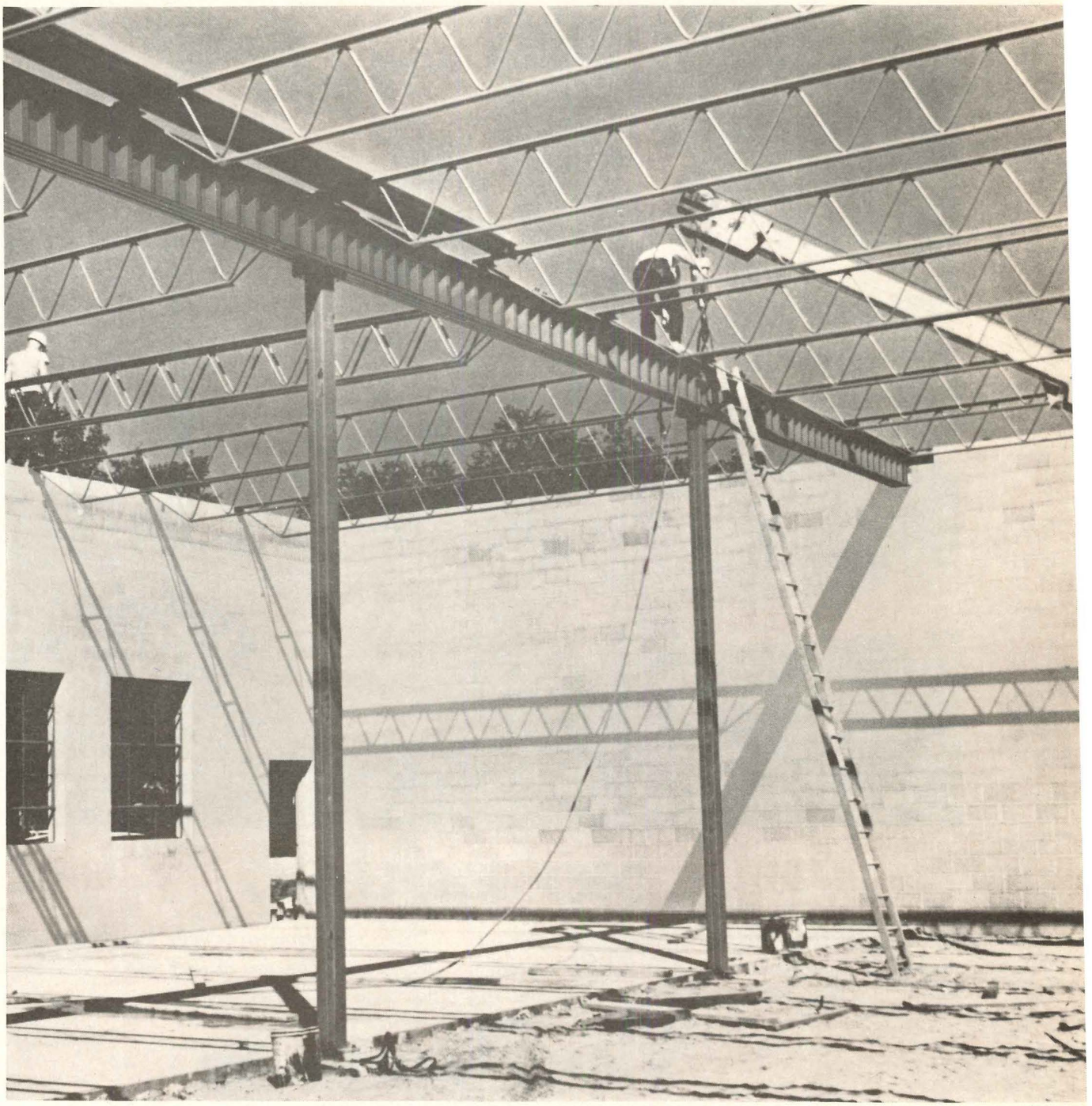
For more data, circle 120 on inquiry card

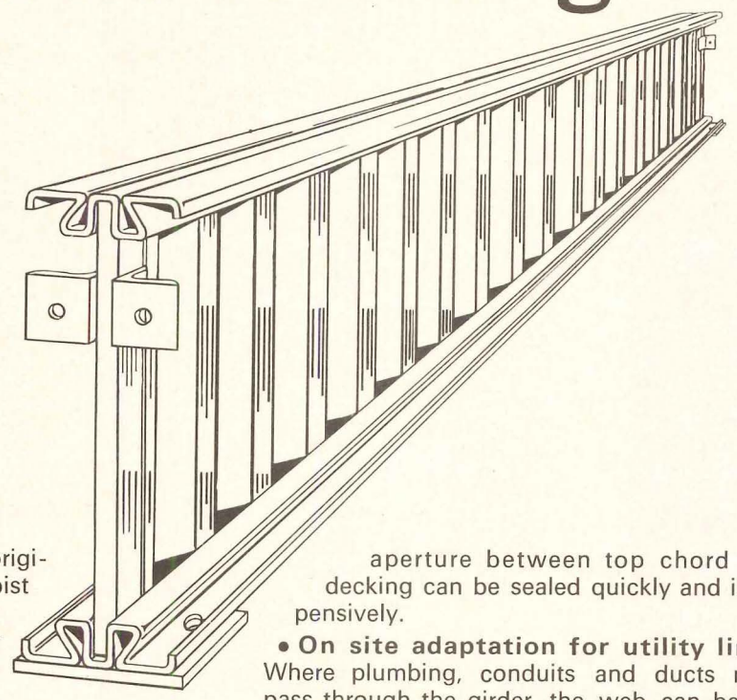
ANOTHER FIRST FROM MACOMBER

The *PANLWEB*® girder:



Modern buildings using the new PANLWEB girder can be found in your section of the country.
Northwest: West Coast Grocery Company Warehouse, Salem, Oregon. *Northeast:* Roger Brothers, Inc., Industrial Building #2, Hudson, New Hampshire. *Southwest:* U.S. Post Office, Odessa, Texas. *Southeast:* Gold Triangle Store (Division of Federated Department Stores), Coral Gables, Florida. *Midwest:* IGA Foodliner, Carrollton, Ohio.

engineered to save time, weight and building costs.



Macomber Incorporated, originator of the open-web joist and the V-LOK® Modular Component System, now brings you another advance in materials for building construction: the PANLWEB girder, designed to cut engineering time and reduce weight without sacrificing structural performance.

The PANLWEB girder consists basically of top and bottom flanges joined by a ribbed steel web. It is ideally suited for light-to-medium construction, such as warehouses, commercial and industrial buildings.

The PANLWEB girder offers you:

• **Earlier occupancy.** PANLWEB greatly reduces engineering time and gets your job into the shop faster for earlier delivery to the site. Point loadings are easily accommodated because of the continuous ribbed web.

• **High strength-to-weight ratio.** PANLWEB gives you a big weight saving over solid structural girders of equal strength and, in optimum situations, may even save weight over open-web girders. Savings in weight are reflected in savings in cost.

• **Simple installation.** Normal erection procedures may be followed.

• **Improved fire-control characteristics.** Each PANLWEB girder serves as a draft curtain, 18 to 40 inches deep and as wide as the bay. Where codes demand total closure, the narrow aperture between top chord and decking can be sealed quickly and inexpensively.

• **On site adaptation for utility lines.** Where plumbing, conduits and ducts must pass through the girder, the web can be cut and reinforced with the girder in place. Instructions for reinforcing to preserve load-bearing properties will be supplied to the contractor.

• **Macomber quality.** The PANLWEB girder, open-web purlins, columns and decking combine to form a perfectly-matched framing system. Top quality is assured by constant inspection and testing by both Macomber inspectors and resident inspectors from an independent testing laboratory.

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AIR CONDITIONING / Complete descriptions, specifications, installation and operating data for the *Thinline II Seasonmaker* hide-away fan-coil air conditioner are included in a 24-page catalog. The units are designed for apartments, hotels, motels, offices, hospitals and other institutions. ▪ McQuay, Inc., Minneapolis.

Circle 413 on inquiry card

INTERIOR SYSTEMS / *SPEC 30* is a modular interior system for commercial buildings. The systems-engineered interior uses the production facilities of the company's various divisions to coordinate sound control, illumination, air distribution, movable wall panels, and metal doors in each module. A 6-page folder explains the system in detail. ▪ Keene Corporation, Princeton, N.J.*

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DOWNLIGHTING / Renewed interest in high-wattage incandescent downlighting and design of heating-cooling systems to meet close operational requirements are the subjects of two new monographs in the Electrical Design Library series published by the National Electrical Contractors Association. Monograph 9 explains that "new equipment and lamps enable architects and consultants to use filament light sources to good advantage in ceiling design." Numerous photographs show some of the recent designs. The material also explains the practical limits on illumination levels in order to avoid excessive radiant heating effects.

Monograph 10 summarizes existing engineering knowledge relative to meeting the new demand for more specific comparative cost evaluation of heating-cooling systems. ▪ NECA, Washington, D.C.

Circle 415 on inquiry card

OUTDOOR LIGHTING / A comprehensive catalog presents information on outdoor lighting equipment, on methods of determining layouts for specific types of problems and on how to specify and order the right type of lighting equipment. ▪ McGraw-Edison, Canonsburg, Pa.*

Circle 416 on inquiry card

GOLF LIGHTING / A 4-page handbook, "Lighting Systems for Golf Courses" will aid in selecting proper economical lighting for nighttime golf. ▪ The Spero Electric Corporation, Cleveland.

Circle 417 on inquiry card

MOTOR CONTROL / Complete information and specifications on low- and medium-voltage motor control is contained in a 124-page digest. ▪ Allis-Chalmers, Milwaukee.

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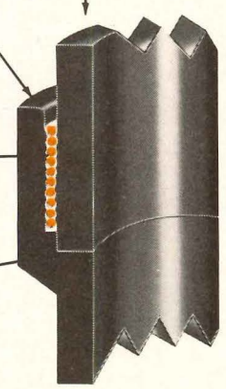

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For more data, circle 125 on inquiry card

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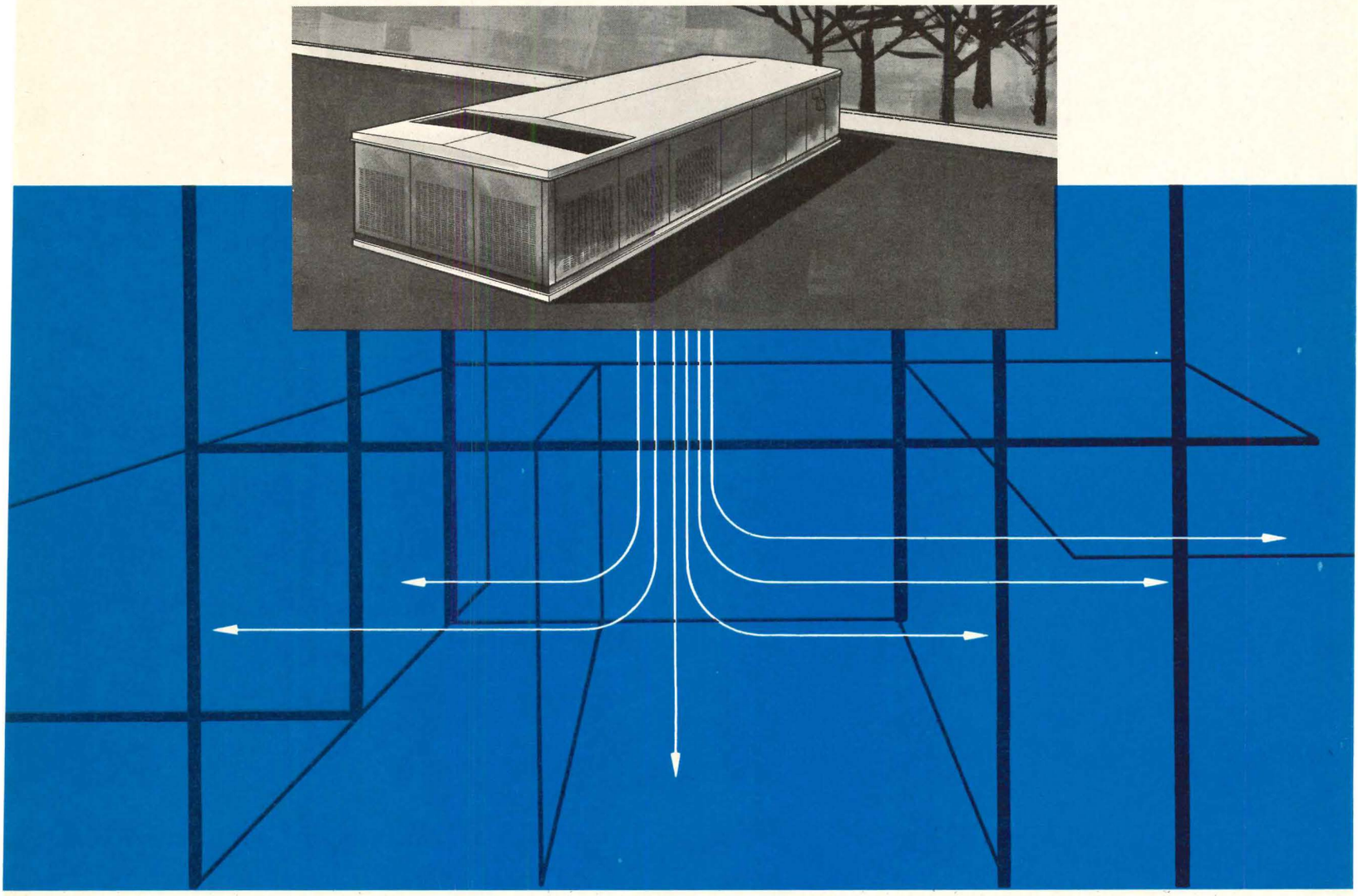

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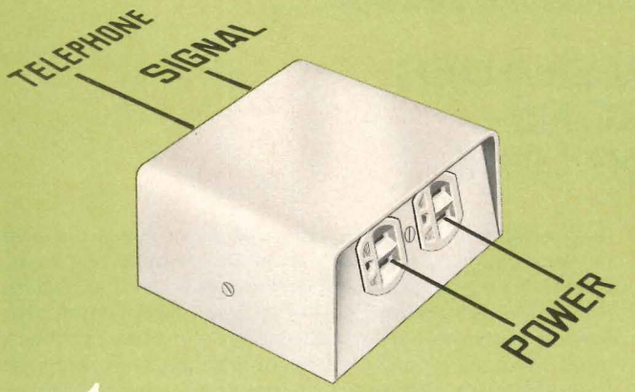

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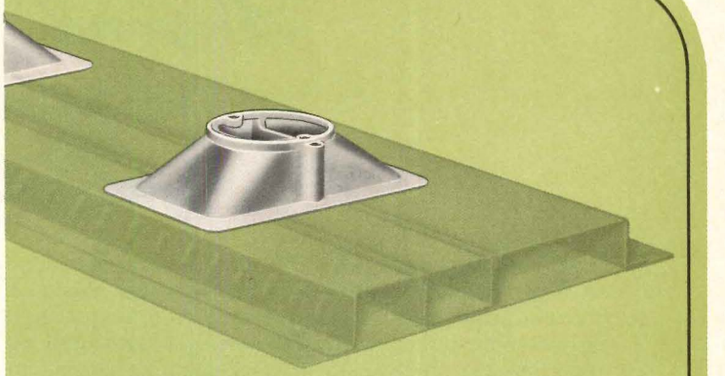

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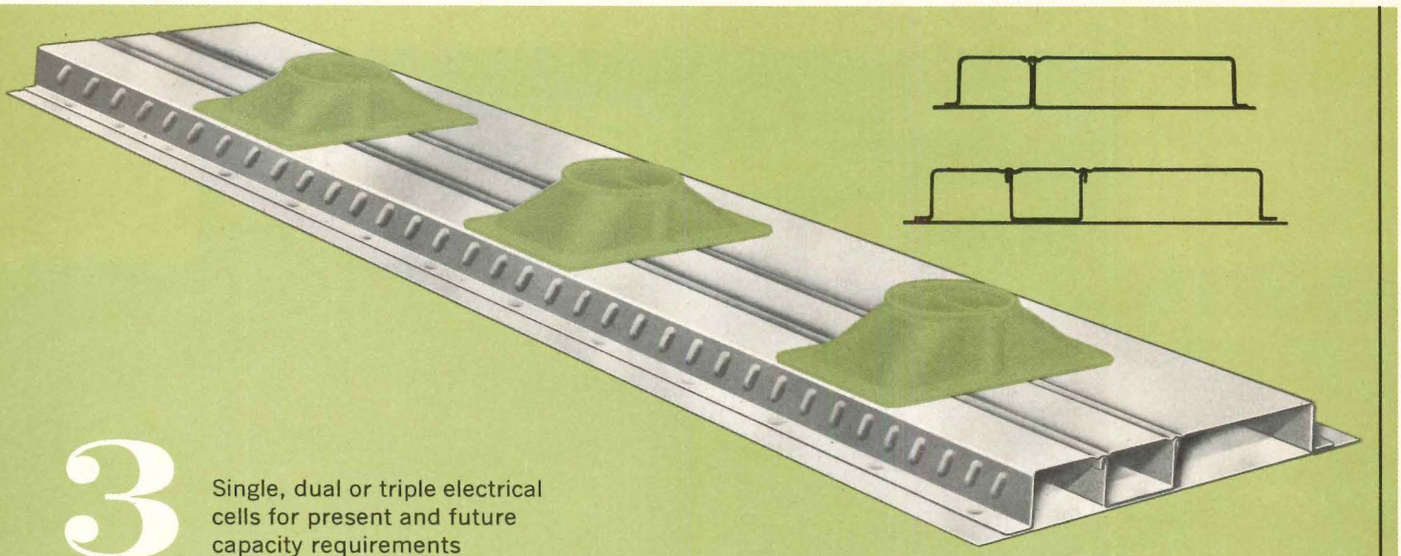
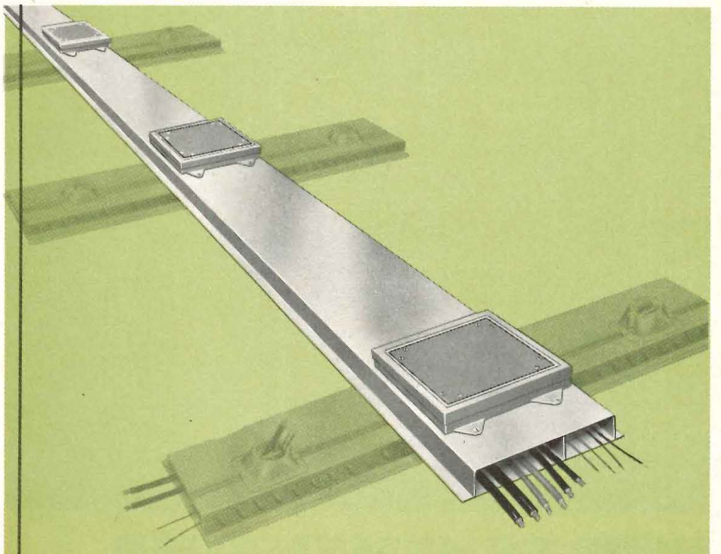
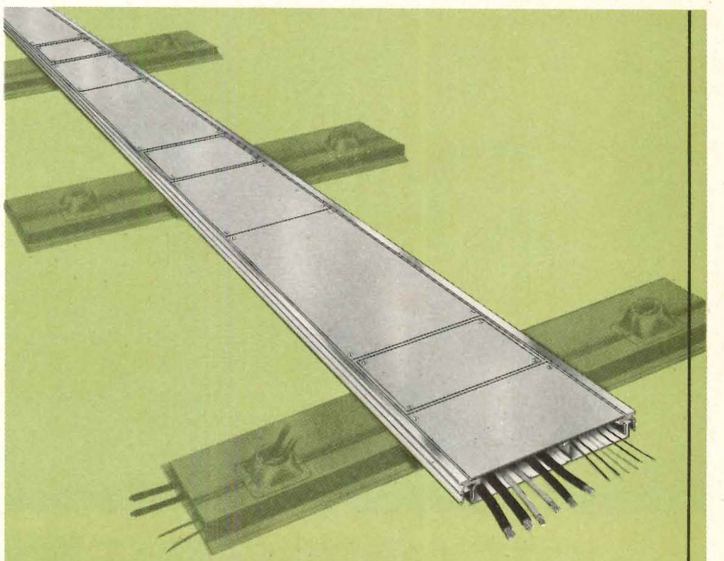


3 Single, dual or triple electrical cells for present and future capacity requirements



4 A variety of feeder systems to supply cells



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Steel

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IMAGINATION IN STEEL

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continued from page 72

Actually, Cincinnati has this program for engineering and business, as well as design, architecture and art.

Paul S. Jacobson
Cleveland

The Cincinnati program is indeed a well-known and respected one. No doubt it and other "co-op" programs have contributed to evolution of the "internship" idea described for Tennessee. Two chief points of difference seem to emerge: 1) Conditions during at least half of the internship work period are required by the school to be at the junior-executive/learning-experience level, so that 2) it can be academically credited as part of the degree requirement without extending the over-all period.

—WF

Conference Center in Vienna
Thank you very much for your news coverage (November) of our winning design for the International Organizations Headquarters and Conference Center in Vienna. However, I am deeply concerned at the omission of the names of the other members of the design team. The project was completely a team effort by volunteer participants under the sponsorship of Gruen Associates. All of the team members participated fully in every phase of the design and are deserving of full credit. They are: Roylance L. Bird, Jr., Richard Dodson, Arthur Golding, Friedrich Kastner, Douglas Meyer, Victor Schumacher, Engelbert Zobl.

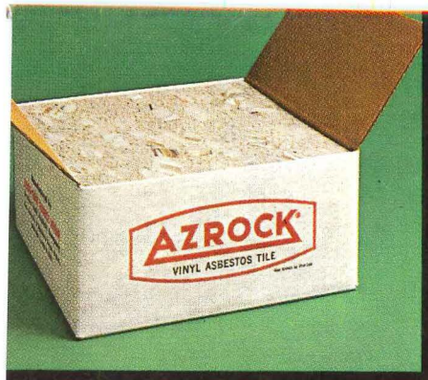
Cesar Pelli, Partner
Gruen Associates
Los Angeles

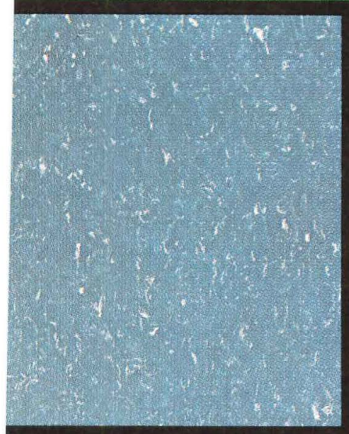
Small, but significant, building
In your editorial appraisal of Mies van der Rohe (September), I was glad to find a recognition on your part of a relatively small, but a significant building, done lately by a great master at Nun's Island, Montreal. This service station points out again the validity of the functional thinking before any other considerations can be made. It also demonstrates the paradox of America, Auto Paradise, that no other architect before Mies was able to conceive or put into reality that obvious solution of sheltering effectively the service station attendants and the car owners at the same time, protecting them against the bad weather.

Adam M. Kaas, architect
New Haven, Connecticut

Not just in the U.S.
Your July editorial was a "shot in the arm." It gives us Filipino architects a distinct perspective of where to go in light of the change now emerging in architectural practice in the country. The irresponsible challenges that you have mentioned are also seeping into the country so architects are in the throes of self-analysis.

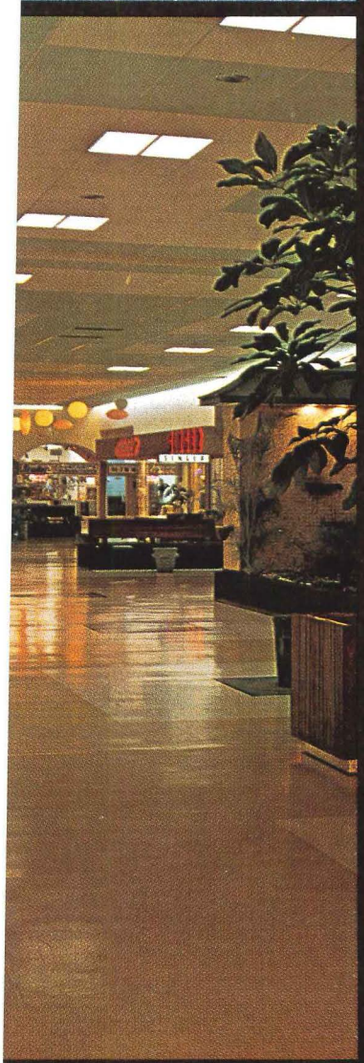
Geronimo V. Manahan
Director, Philippine
Institute of Architects

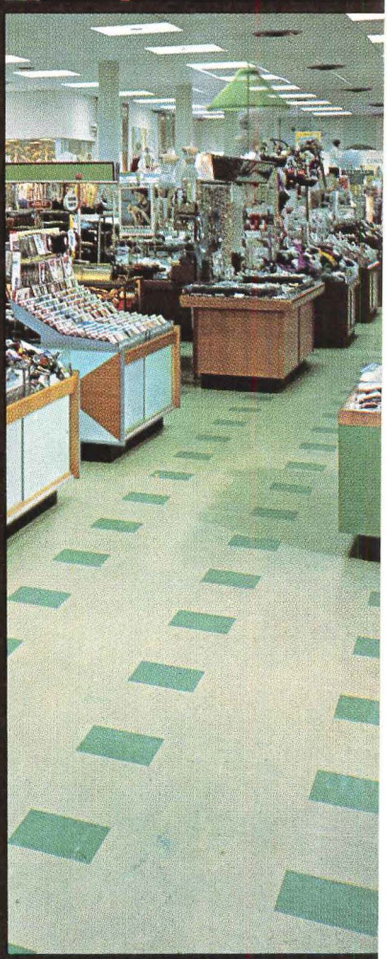




Carton Full of Miracles

Azrock Vinyl Asbestos Tile. It's what's happening in shopping center flooring.





To shopping center planners and designers who equate value with beauty and performance, floors of Azrock vinyl asbestos tile rate exceptionally high. The designer can look to Azrock's "Carton Full of Miracles" for more than 120 colors and styles with which to create floors that look inviting . . . take the toughest foot and shopping cart traffic in stride . . . and do all this at a low initial cost and low maintenance cost unique among flooring materials. Put Azrock's creative styling and superior value to work on your next store project.

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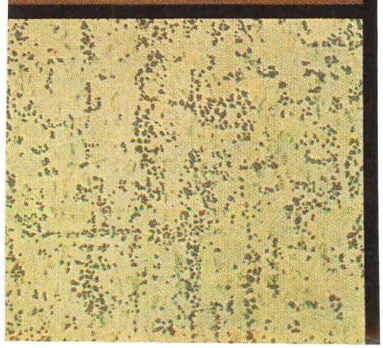
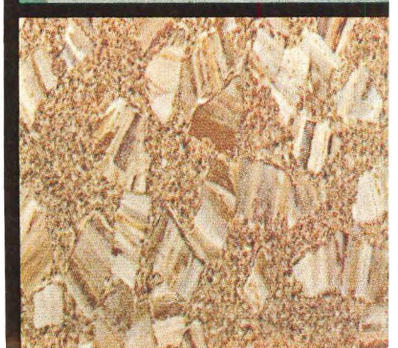
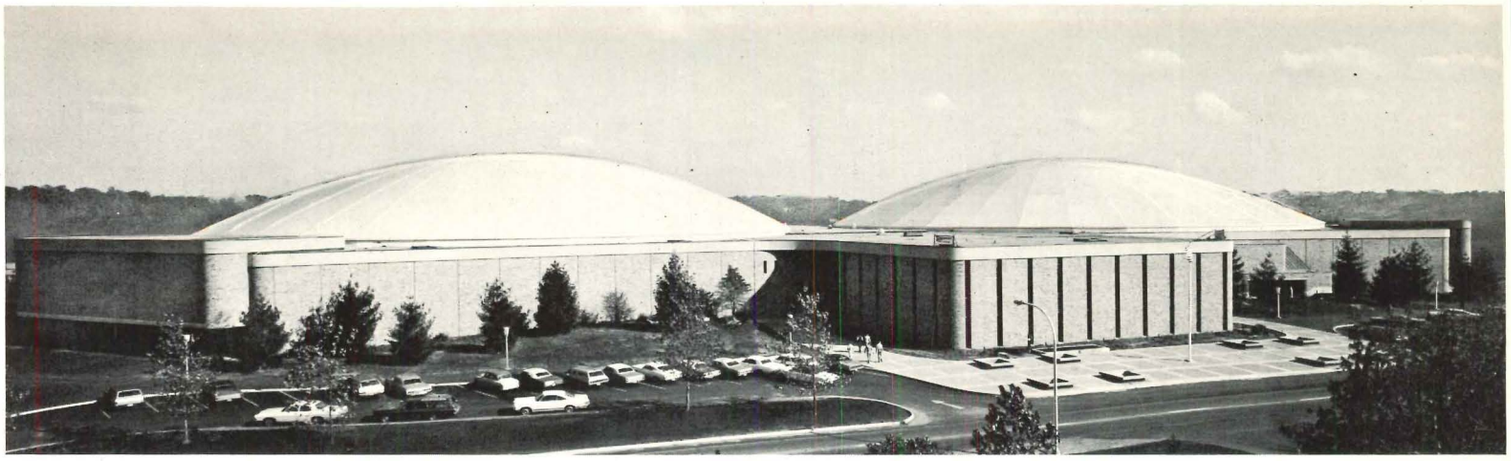




Consult Sweet's File or write for samples. Azrock Floor Products Division, 524A Frost Building, San Antonio, Texas 78205.



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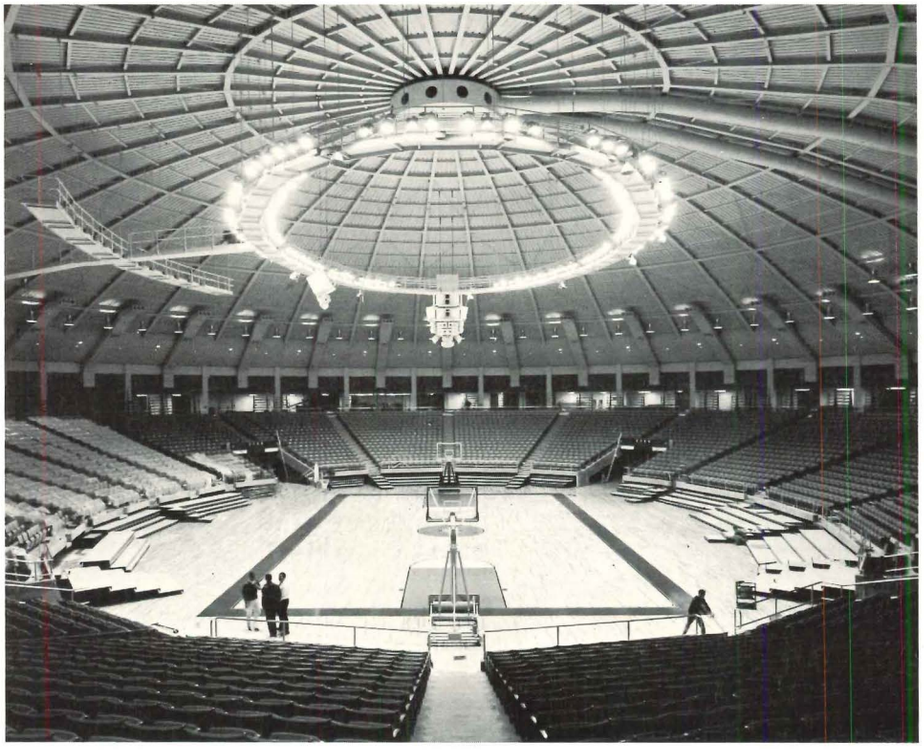


Notre Dame's Athletic and Convocation Center

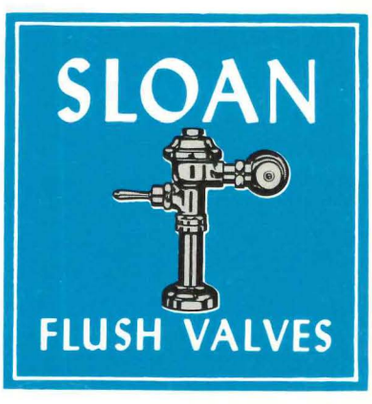
Twin-domed complex houses sports, trade shows, conventions, simultaneously, —rain or shine

Weather's no problem in South Bend. Not at Notre Dame's fabulous new sports arena and convention center which can house as many as 15 activities at one time beneath its cavernous 10.5 acre roof.

Developed through cooperation of the University and the South Bend business community, this fantastic eight-and-a-half-million-dollar facility provides complete physical education facilities, as well as a trade show and convention center of unique and comprehensive design.

A big time hockey and year 'round ice skating rink, a ten lap per mile special composition running track, a gigantic basketball arena, a baseball infield, four gymnasiums, classrooms, meeting rooms and offices—embrace activities to keep the center open from 7 A.M. to 11 P.M.

Buildings at Notre Dame are built with minimum maintenance in mind—one very important reason why the flush valves in this beautiful new complex are Sloan. Sloan Quiet-Flush II Flush Valves are famous for quality, dependability, quietness and low maintenance costs. Your building, too, can have these same extra advantages which are Sloan. Just be sure you specify and insist on Sloan Quiet-Flush II Flush Valves. Most people do.



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