ARCHITECTURAL RECORD

12 DECEMBER 1965 • TWO DOLLARS PER COPY

BUILDING TYPES STUDY: OFFICE BUILDINGS

TWO NOTABLE CHURCHES

SPATIAL VARIETY IN TWO MUSEUMS

A VISIT TO PIHLAJAMÄKI

SEMI-ANNUAL INDEX • FULL CONTENTS ON PAGES 4 & 5

FINLANDIA:
LOOKS AS GOOD AS IT LOCKS

Sure Yale locks lock. Safe. But nobody ever looked inside and said "Hey, that's beautiful." That's why we spend so much time on the part people see. Isn't that the part you're interested in?

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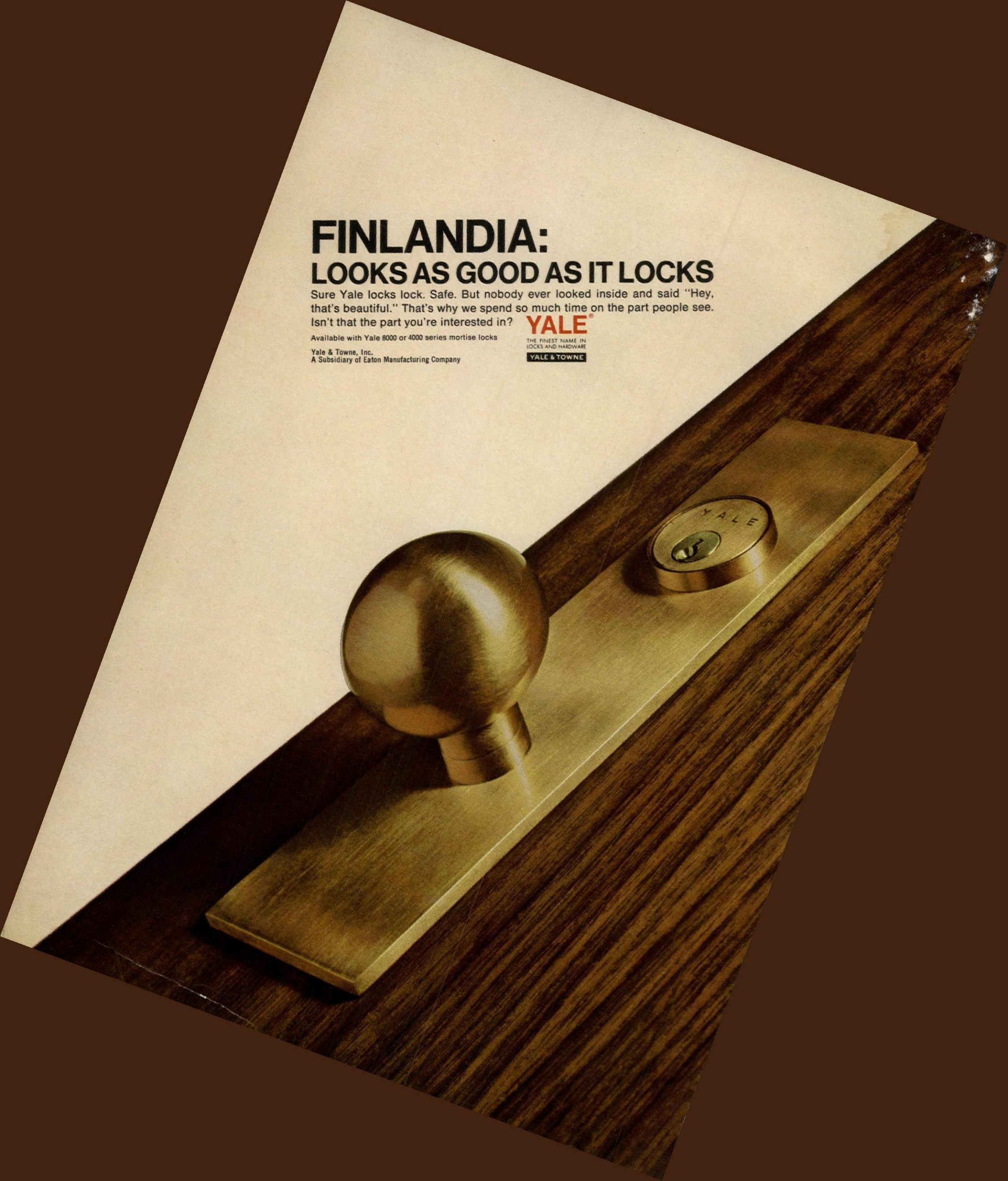

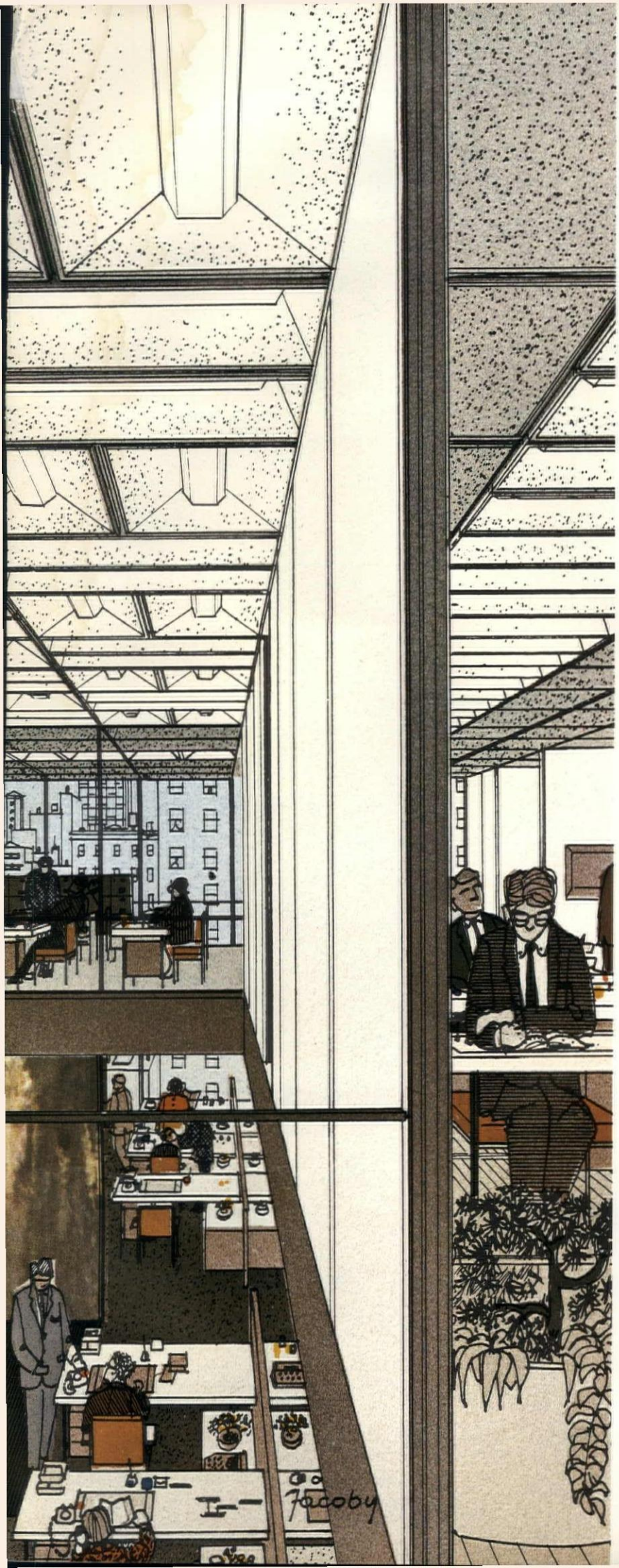

system

Heats, cools, ventilates, lights, absorbs noise. Permits easy, unobtrusive sprinkler installation; provides unusual layout flexibility; enables significant savings on installation, lighting, maintenance costs. □ Newly published 16-page brochure presents complete details on this remarkable, new full-function ceiling system. Full application-engineering data and guide specifications included. Write for it: Armstrong Cork Company, 4212 Rock St., Lancaster, Penn.

C-60 Luminaire

Armstrong

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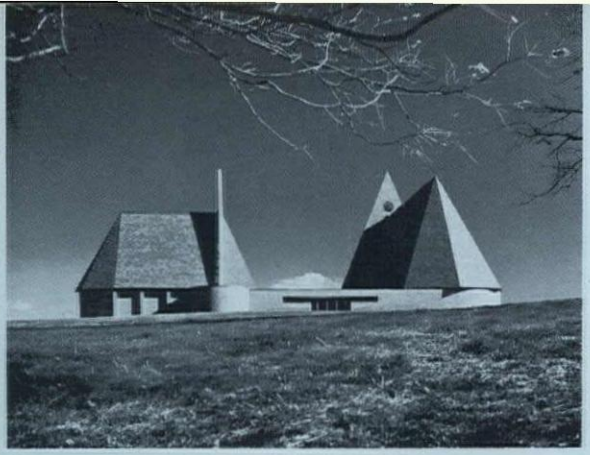

Cover:

First Baptist Church of Columbus, Indiana. Architects: Harry Weese & Associates. Photographer: Balthazar

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RECORD

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December 1965

Building Types Study 353: Office Buildings

Coming in the Record

APARTMENTS: THE REAL NEED IS FOR FRESH THINKING

In the midst of the battle to provide a sufficient quantity of apartments, the search for quality often gets bypassed or overlooked. Next month's Building Types Study examines some fresh design ideas—in land use, environmental planning, room layout, pleasant indoor and outdoor spaces, and combined commercial-residential space—that may lead to better ways of living.

ENVIRONMENT AS DESIGN INSPIRATION

Architects have been girding themselves to lead a "war on community ugliness," and on all sides there seems to be increasing consciousness of and concern over the unsightliness of manmade surroundings. Now comes Architect Benjamin Thompson to point instead to the beauty and joy and new design inspiration to be found in the environment and life around us, and to call for more positive efforts toward architectural response to human needs. Color photographs taken under Mr. Thompson's direction reflect some of the inspiration he finds.

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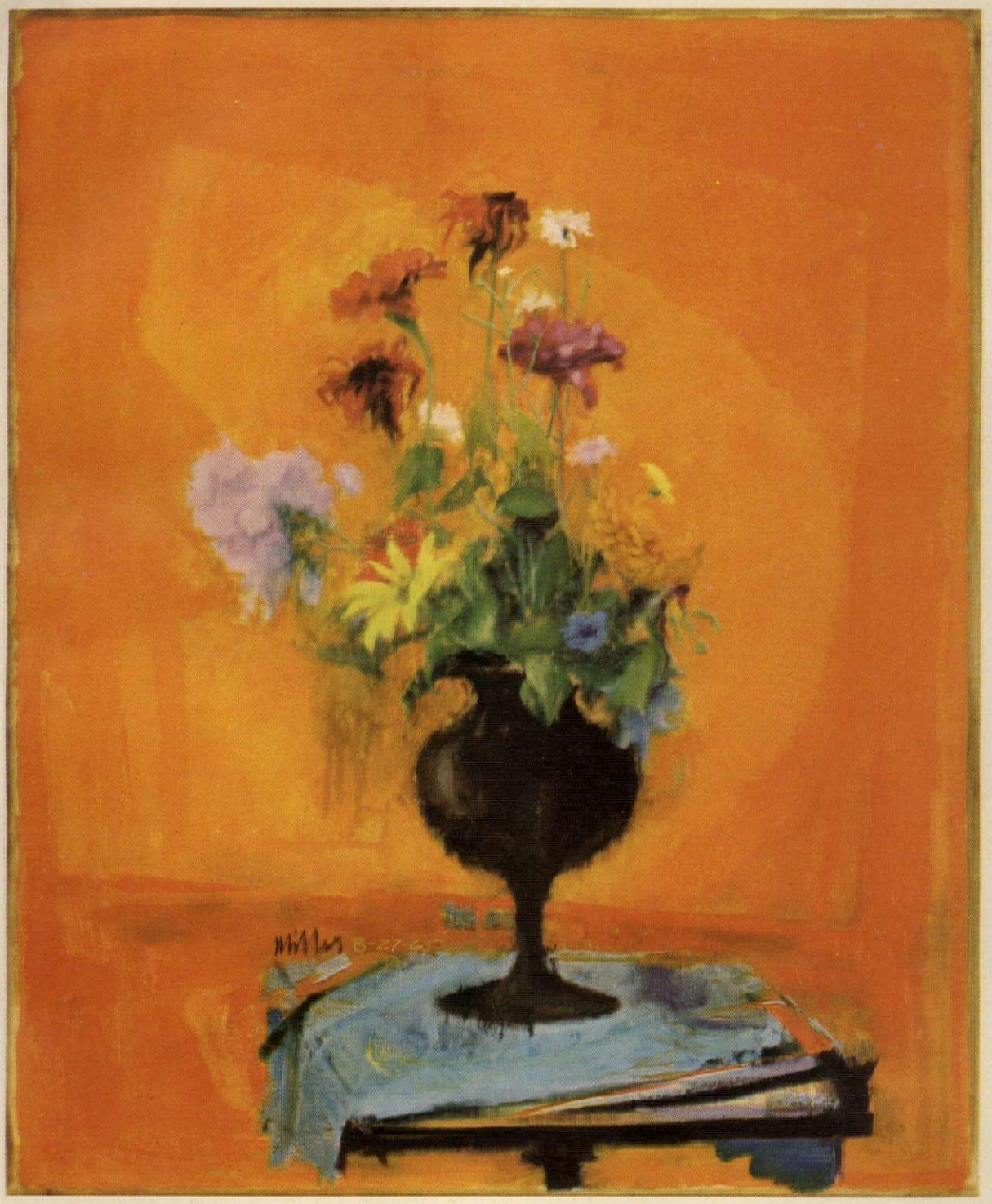

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The Fair Had No Patent On Absence of Design

As the New York World's Fair stumbled on to its dismal close, this observer was reminded again that he had never observed it. No posture here (some people did sort of boast about not seeing the Fair), but it does seem worth remarking that the Fair never did sound inviting. It sounded dull and uninteresting in the beginning—back when the architects were fighting with Moses (Robt., that is)—and nothing seemed to change that impression.

Could it all be a matter of design?

Well, I have disqualified myself as expert observer, admitting to never having been there, but no studied investigation is required to offer a strong affirmative to that question.

Let me take a moment to deny vociferously that I was ever really biased against the Fair. In fact, I thought in the early squabbling that the architects who were being disagreeable were guilty at least of ineptitude. In objecting to this and that and demanding architectural control, and then huffily withdrawing, they were, or so it seemed to me, merely leaving a vacuum. A vacuum to be filled by just anybody that came along, good, bad, indifferent. How familiar is that vacuum, when architects protest and leave the field!

Right! The architects were right; things were in a terrible mess. But perhaps my reservation could also be supported, at this moment of hindsight—however intolerable the planning situation was, in those early days, there was left a vacuum. And by and large it was filled by those of indifferent talent and taste.

And so the whole thing was a bore.

It seems amazing how little conversation was generated by a billion-dollar affair, which was designed to start conversations. Or I should say, "intended," in place of "designed." I didn't go to the Fair just because nobody, no photographs, no publicity, no talk-talk, nothing stirred me out of my normal patterns.

But listen to an expert—Ewen Dingwall, who had charge of the good Seattle Fair, and who is now preparing the HemisFair 1968 for San Antonio: ". . . In tracing some of New York's difficulties, I must underscore the self-evident antipathy of New York's top management to listen to or to take advantage of independent professional advice. Sound judgment dictates that outstanding talents in design, architecture and many other aspects of fair management should be brought in to assist. . . . Such talents do not always tell you what you want to hear, believe me. But it is a good idea to listen.

"A crucial example is the New York site plan. The 1964-1965 site is virtually identical to the 1939-40 plan. The site is unnecessarily large, poorly organized, confusing to the visitor, and uneconomic to administer. The weakness of the site plan is one reason for their difficulties. Distinguished architects attempted to point out all this to the New York management in 1960-61. Their advice was scorned and they left the team."

One wonders if perhaps the droopy New York Fair isn't indicative of many of our more typical surroundings and of the heavy but heavy-handed efforts to amuse us or impress us. People today are advertised to, sold to, televised to, communicated with, entertained, lectured and generally harangued. And bored.

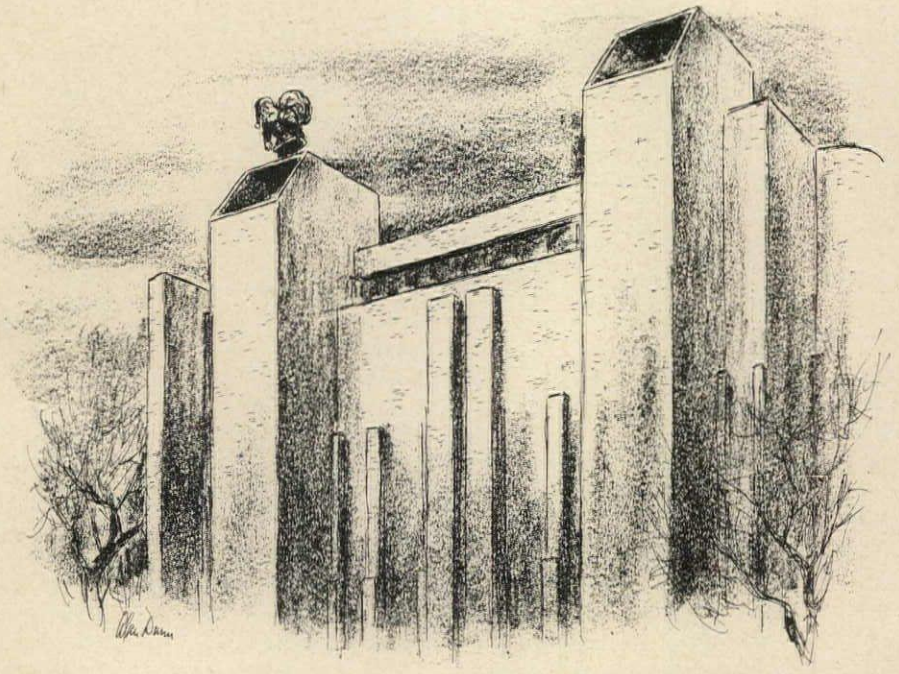
Perhaps public sophistication is really in an up-trend, due to all this communication. The Fair seemed to bear this out—the better things did get talked about, and visited.

But even on the negative side, the New York Fair at least proved that the absence of good design left people cold, hampered operations, and left a dismal trail of bickering.

All right, let's carry the negative side to other matters, just for a moment. Aren't we getting pretty bored with the highway jazz type of design, with motels and trailer parks, with bowling alleys and shopping centers, with split-level housing and 100-foot lots, yes, and with urban renewal patterns?

The New York Fair had no patent on the absence of good design. But perhaps as a device for measuring the resulting boredom, the Fair will have served some purpose.

—Emerson Goble



Drawn for the RECORD *by Alan Dunn*

Impertinent Suggestion Re Research on Research

This impatient observer, no stranger to cynicism, has frequently raised his voice in favor of more research in the architectural and building field. When one thinks of all of the money poured into counting female mosquitoes and such like in the medical field, one is moved to moan about how little similar investigation is available to architects.

There is cynicism here, yes, and I have been known to mutter about spending $100,000 to learn that boys do in fact chase girls. With, of course, some thoroughly documented, highly technical provisos. And I have wept a little about research grants for such things as studying the technological lag of cities, in Paris, naturally, which do, of course, have the positive result of providing some young professorial minds a pleasant sojourn abroad. And I have sat helplessly by and watched research grants to organizations being dissipated in committee gatherings which were merely researching the research for which the grant was intended.

No matter. Research is a must. There are so many areas of building design, of environment creation, that need real study, that we must applaud all serious efforts to get something started. If researching research is necessary at the beginning, well, let's get on with it.

I was encouraged last spring to learn of the A.I.A. grant to Princeton to research architectural education, and I hope there won't be too much dissipation of energies, and funds, in committee conclaves.

A committee of architects for the Graham Foundation made a recent study of education, and made nine specific suggestions, one of which seems especially pertinent:

"That the A.I.A. encourage either the Ford Foundation or the Rockefeller Foundation to announce a program of institutional grants of $100,000 to $500,000 to architectural schools that could demonstrate ways of dramatically improving themselves. The schools would have to show that the increased investment would be permanently maintained money and should be granted on, say, a one-two matching basis."

Which leads to the impertinent suggestion that if we must start each research project with committee studies of the research project, let's at least study said project to the point of some specific programs, and determinations, so that one of the Foundations would have something solid to review.

Certainly studying female mosquitoes had definite relevance to preventing malaria. But after we have saved Mr. Citizen from malaria, let us learn something about saving him from the malaise that seems endemic in our congested cities.

A Chance for Fame: Goof and Then Tell

I suppose we asked for it, having written something about when the roof leaks, but an advertising agency now writes to ask us for some stories of architects' goofs. Like the omission of the letter drop in a great new Post Office, or a freight building in the south with no door, or the hotel that had boilers but no smoke stack.

The agency wants us to tell them some more stories because they can make good use of them. It's always the architect's fault, of course.

Well, if you know of any goofs, goofs the other fellow has made, please don't write and tell us. We want to drop the whole subject.

Do it Yourself With Clip-on Architecture

The Walker Art Museum, Minneapolis, deadpans in a recent release a story about the development in England of "indeterminate," or "clip-on," architecture. This, according to Reyner Banham—whom the release calls a "controversial English author, critic and historian"—has been circulating in Britain for 15 years.

He tells us—so goes the release—that it took hold because of "the simple desire to be cautiously noncommittal among the uncertainties of postwar construction." The building can be "cut to length as required . . . 10 units or a thousand" because it is all a matter of visual repetition.

The same news release tells of Joan Littlewood's "Fun Palace," a kit of architectural gimmicks which can be assembled, animated, and "put back in the box in the morning."

In the U. S., of course, there are already on the market those clip-on muntins for house windows. You snap them off to wash the windows, then back in place.

But why stop there? Why not a set of architectural clip-ons, so that architecture can suit the mood of the occasion. We should not have to be content with hanging festoons of lights around at Christmastime. With clip-ons we could add columns for a formal occasion, or barn doors for a cook-out, and so on. Or strip the building clean when the local art group gathers. Or clip on some decrepit pieces when the tax assessor comes. Just be sure all clip-ons are locked up, come Halloween.

You can't design a bronze curtain wall for $7.00 a square foot. Right?

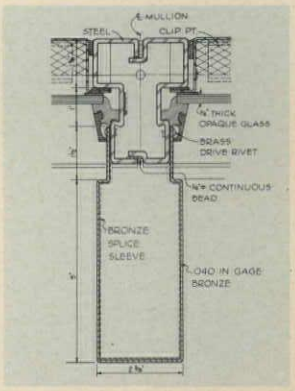
Wrong.

Imaginative use of bronze by the architect and fabricator resulted in an in-place cost of less than $8.00 a square foot for the curtain wall shown above. Further simplification of the mullion design could have brought it in for under $7.00 a square foot.

This curtain wall is basically a rectangular steel grid system with infill panels in place at time of shipment. It was erected and glazed before the non-structural bronze was put on. The mullions, brake-formed by Fenestra, Inc. from .040" and .032" gage bronze sheet, were installed with no interior or exterior fasteners showing.

The basic system utilized in this installation allows the architect greater flexibility in mullion design and appearance. The strength and rigidity of light gage bronze makes it practical and, at a competitive cost, provides the owner with all the richness and permanence of bronze so important to a bank.

Our new brochure, "Copper, Brass and Bronze in Architecture," shows other ways to accomplish the same objective. For a copy, just send a note on your letterhead.



First National Bank, Lincoln, Nebraska
Architects: Davis & Wilson, Clark & Enerson
Metal Fabricator: Fenestra, Inc.

COPPER DEVELOPMENT ASSOCIATION INC.

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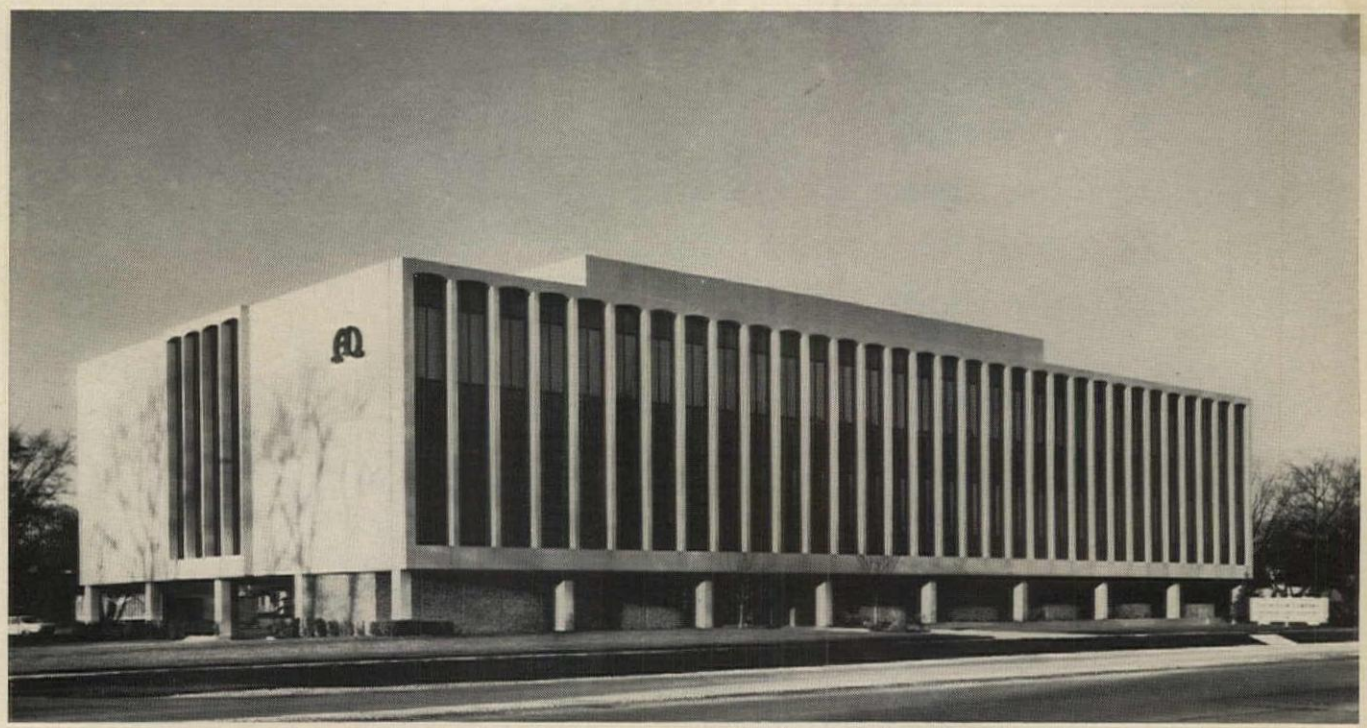

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This is The Austin Company's new Chicago headquarters. The air-conditioning equipment is Worthington's.

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The Big move up in Air Conditioning

WORTHINGTON

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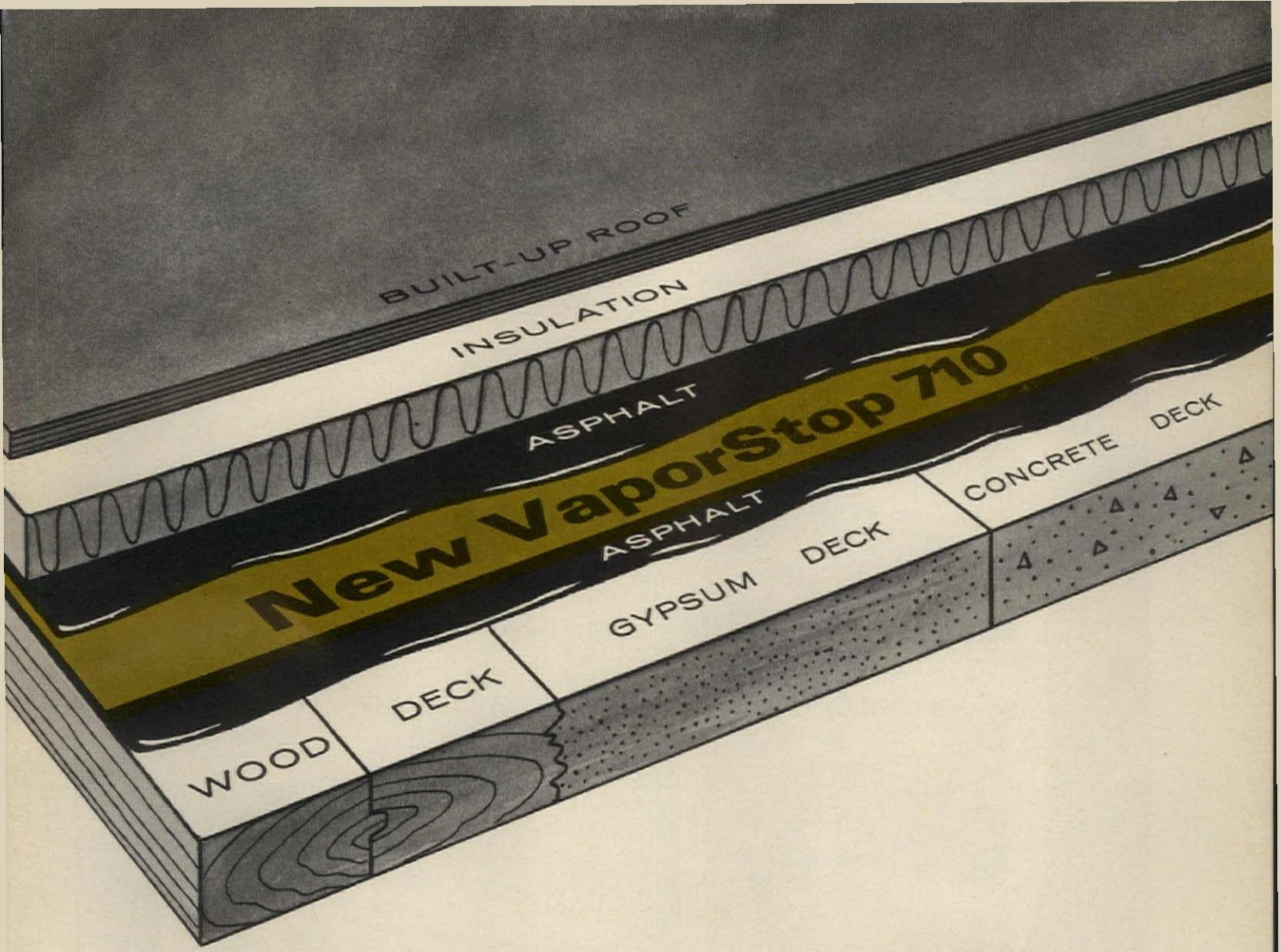

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- No absorbing or holding of moisture
- Less chance of moisture entrapment
- Weight is 80% less per square in place, with 5 fewer roll changes and end laps
- Greatest possible assurance of 100% coverage

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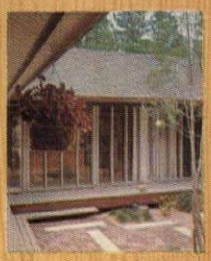
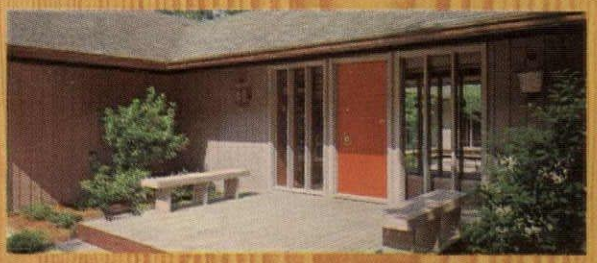
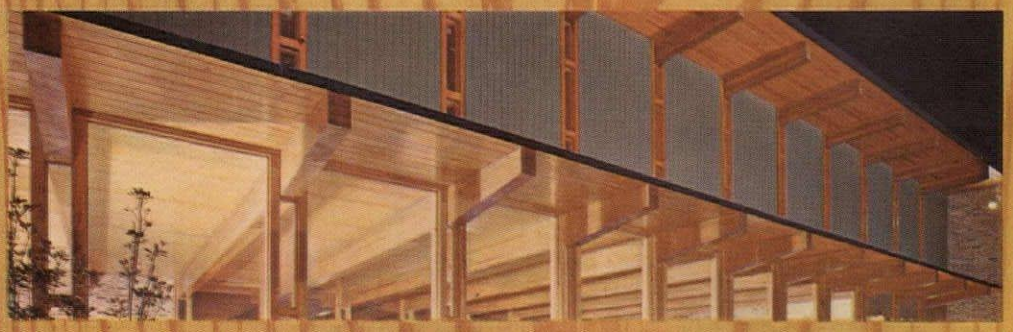


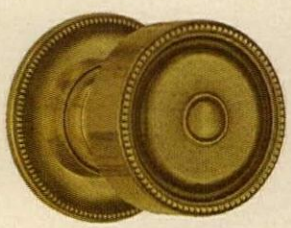




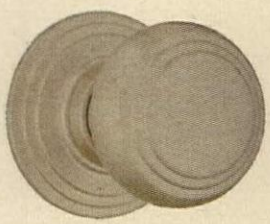
101 DIFFERENT LOCK DESIGNS

23 DIFFERENT FINISHES

CROWN
Polished Brass Oxidized
Knob, 2-1/4";
rose, 2-9/16"

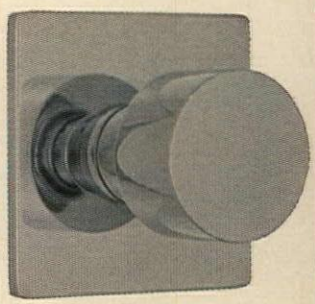


NOVO
Satin Aluminum
Knob, 2-1/4";
rose, 2-9/16"

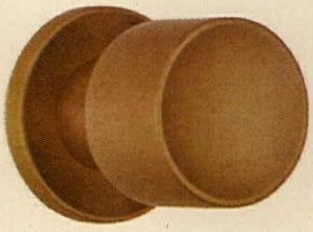


MERCURY
Polished Bronze
Knob, 2";
rose, 3-5/8"

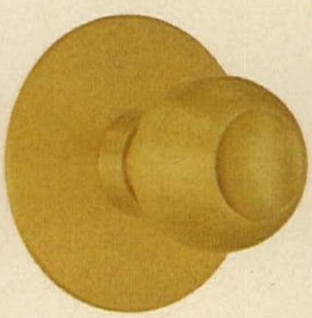
CENTURY
Polished Chromium
Knob, 2-1/8";
rose, 3-5/8" square



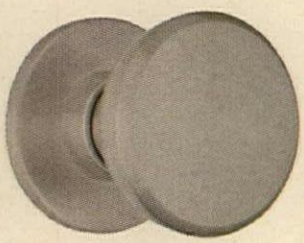
LUNA
Oil Rubbed Bronze
Knob, 2-1/8";
rose, 2-9/16"



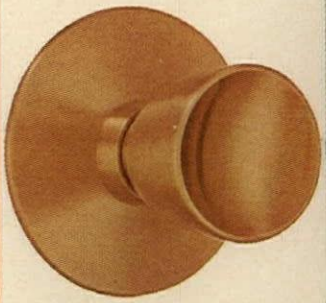
VISTA
Satin Brass
Knob, 2-1/16";
rose, 3-5/8"



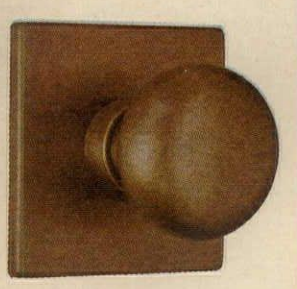
CUPRA
Satin Chromium
Knob, 2-1/2";
rose, 2-9/16"



MAGNOLIA
Satin Bronze
Knob, 2-3/32";
rose, 3-5/8"

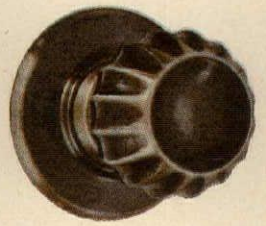


HANOVER
Oil Rubbed Bronze
Knob, 2-1/4";
rose, 3-1/4" square



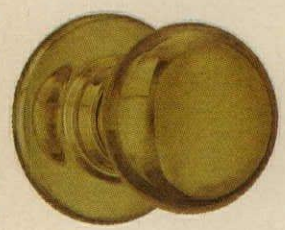
CLAREMONT
Oxidized Bronze
Knob, 2-1/4";
rose, 2-9/16"

LOTUS
Satin Nickel Oxidized
Knob, 2-3/32"
rose, 2-9/16"

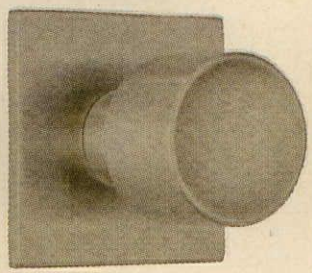


COLONIAL
Polished Brass Oxidized
Knob, 2-1/2";
rose, 2-9/16"

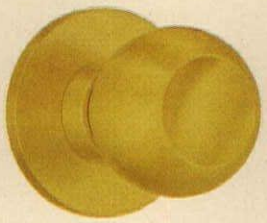
PLYMOUTH
Polished Brass
Knob, 2-1/4";
rose, 2-9/16"



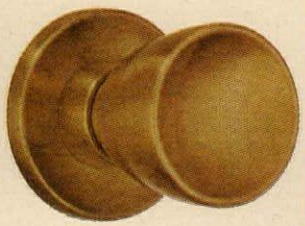
METEOR
Satin Chromium
Knob, 2-1/8";
rose, 3-1/4" square



SATURN
Satin Brass
Knob, 2";
rose, 2-9/16"



TULIP
Satin Bronze
Knob, 2-3/32";
rose, 2-9/16"



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You get so much more with ®SCHLAGE©

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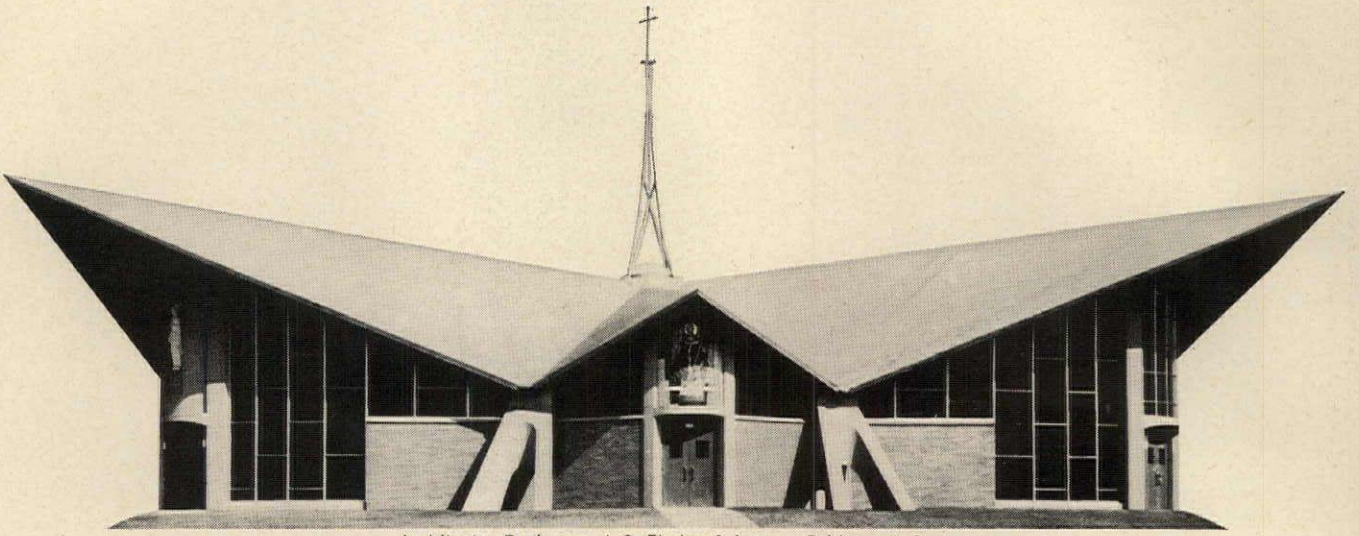

Architects—Engineers: J. G. Phelan & Assoc. • Bridgeport, Conn.

Design: Modern with Gothic space and spirit.

Heating/Cooling: Modern with Arkla Gas economy and efficiency.

St. Mary's Church in East Hartford, Conn., presented an energy system space problem. A conventional boiler system would take much of the room allotted to the sacristy. Instead, engineers chose two Arkla Gas-fired water chiller-heaters.

Installed outdoors, the factory-sealed Arkla units provide all the hot and chilled water needed to heat and cool the church. Because these Gas-fired units have no moving parts, noise, vibration (and maintenance) are virtually non-existent. Service life is considered indefinite.

Another Arkla equipment advantage: the great economy of Gas. For trouble-free low cost, year 'round heating and cooling... investigate Arkla and Gas. Call your local Gas Company Sales engineer. Or write: Arkla Air Conditioning Co., 810 East Franklin, Evansville, Indiana. AMERICAN GAS ASSOCIATION, INC.

For heating and cooling...Gas is good business

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Concrete gives a world trade center built-in sales appeal

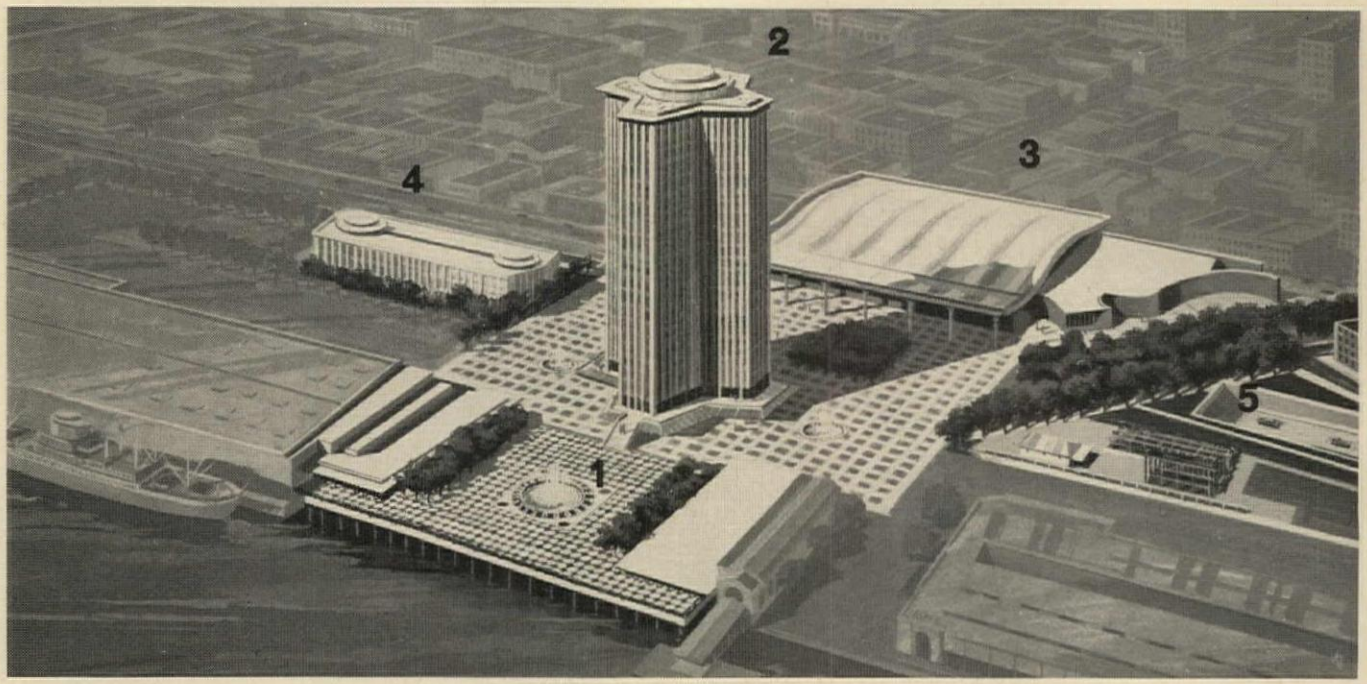
The buildings of New Orleans' new International Trade Center are designed to serve the buyers and sellers of merchandise from every corner of the world. Here, through the imaginative use of concrete, is expressed the very spirit and pace of modern-day trade. □ In the Convention-Exhibition building, the New Orleans architects used a concrete barrel shell roof to create striking beauty, as well as an interior clear span of 253 feet, sufficient to seat 17,600 people. Textured exterior concrete walls provide tasteful contrast. □ The adjacent 33-story Trade Mart tower also utilizes concrete throughout. The highly compressible qualities of New Orleans' soils were mastered by prestressed concrete piles, providing firm foundations for the light but strong reinforced concrete frame and floors designed by advanced new structural criteria. Gleaming exterior curtain wall panels of precast concrete assure visual interest. An eight-story concrete parking tower is nearby.

Portland Cement Association

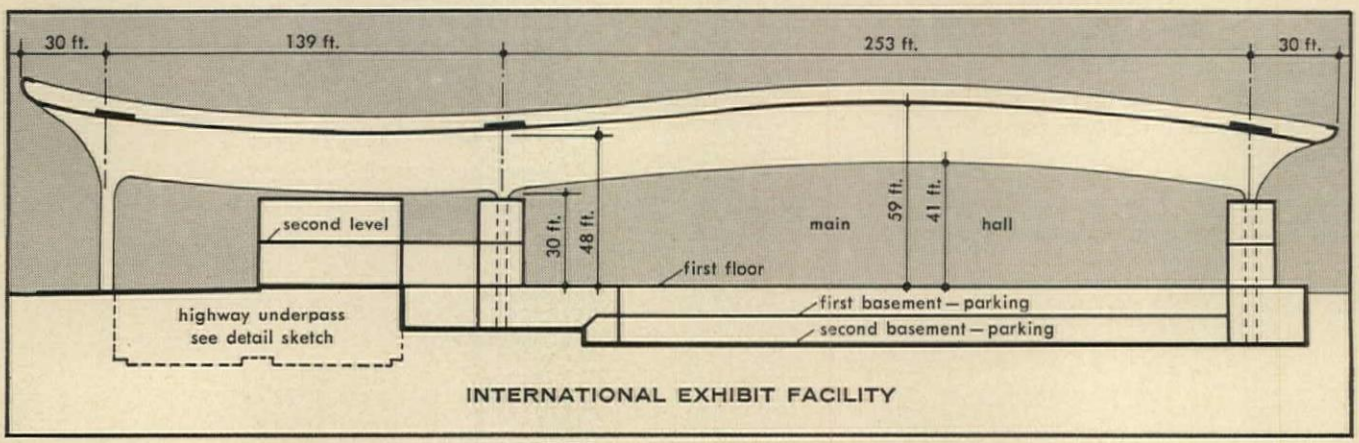
An organization to improve and extend the uses of concrete, made possible by the financial support of most competing cement manufacturers in the United States and Canada

NEW ORLEANS INTERNATIONAL EXHIBITION FACILITY: ARCHITECTS: CURTIS & DAVIS, EDWARD B. SILVERSTEIN & ASSOCIATES, AND MATHES, BERGMAN & ASSOCIATES, ALL OF NEW ORLEANS. STRUCTURAL ENGINEERS: WORTHINGTON, SKILLING, HELLE & JACKSON, SEATTLE, WASH., AND A. W. THOMPSON & ASSOCIATES, NEW ORLEANS. CONTRACTOR: C. H. LEAVELL CONSTRUCTION CO., EL PASO, TEXAS. INTERNATIONAL TRADE MART: ARCHITECT: EDWARD DURELL STONE, NEW YORK. ASSOCIATE ARCHITECT: ROBERT LEE HALL AND ASSOCIATES, MEMPHIS, TENN. STRUCTURAL ENGINEERS: ELLER AND REAVES, MEMPHIS, TENN. CONTRACTOR: BLOOMFIELD BUILDING INDUSTRIES, MEMPHIS, TENN. HIGHWAY UNDERPASS: STRUCTURAL ENGINEERS: B. M. DORNBLATT & ASSOCIATES, INC., NEW ORLEANS

International Trade Center dominates New Orleans skyline with spectacular architecture



Covering six city blocks, the all-concrete, 40-million-dollar New Orleans Trade Center, pictured in the illustration above, is located where the mighty Mississippi River meets Canal Street—the main thoroughfare of New Orleans. One of the widest streets in America, it terminates at the five-acre Plaza (1). Dominating the entire complex is the 33-story, 407-ft. high, reinforced concrete Trade Mart tower (2), providing 520,000 square feet of office and commercial space. The Mart tower is flanked by two other concrete structures, the International Exhibition Facility (3), a long-span, prestressed concrete barrel shell structure supported on tapered diamond-shaped columns, and an eight-story Parking Facility. (4). Passing under the entire Trade Center complex is a six-lane section (5) of Interstate highway 310.



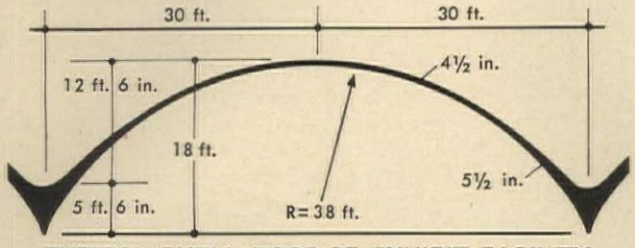
INTERNATIONAL EXHIBIT FACILITY

Undulating concrete shell roof of Exhibition Facility provides economical, column-free space

Long, cylindrical barrel shells roof an area roughly 420x452 ft. in the Exhibition Facility. Associated architects for the building noted: "The need was for a maximum column-free space to accommodate exhibit shows and large meetings. After months of study, it was determined that a thin shell concrete roof would accomplish a fluid architectural form which would compare favorably in cost to a conventional type frame." In addition to providing a fire-safe, low-maintenance structure spanning large areas, a concrete shell roof eliminates the necessity for a hung ceiling to hide unsightly structural elements.

Interesting architectural treatment was achieved by using diamond-shaped, cast-in-place columns to support the shell. The columns are skewed 45 degrees to the shell and taper from 5 ft. 6 in. at the floor line to 3 ft. 6 in. at the top. Models were used to study the relationship between shell and column to find the desired esthetic effect. Such freedom in form is obtainable only with concrete.

World's longest barrel shell span achieved by prestressing



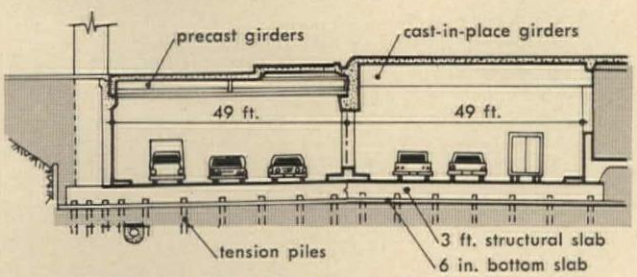
TYPICAL SHELL ROOF OF EXHIBIT FACILITY

Each barrel of the Exhibit Facility roof is 60 ft. wide and rises 18 feet. The thickness varies from 4½ in. at the crown to 5½ in. at the valleys where the shell flares into "V" shaped beams 5 ft. 6 in. deep. Through shell action and prestressing, a 253-ft. clear span was possible over the main hall, believed to be the world's longest for a barrel. A side span has a 139-ft. column-free area. In addition there is a 30-ft. cantilever all around the building.

The entire roof is prestressed in two directions. Draped steel strands used in each barrel over the main hall carry a force of 1,820 tons; similar strands in each valley beam carry 840 tons. The shell is post-tensioned transversely at the column lines. Design of the shell roof was based on concrete with a strength of 4,000 lb. per sq. in. at 28 days after casting.

Shell structure and six-lane highway underpass supported on concrete-filled tension piles

A 900-ft.-long, six-lane segment of Interstate 310, passing beneath the front section of the Exhibition Facility is incorporated into the foundation system of the structure, (see section). Since the surface of the Mississippi River, nearby, will periodically be above the roadway elevation, the structure must be held down by tension piles. Sixty-foot-long, concrete-filled shell piles perform this task. They were designed for an uplift force of 24 tons per pile.



SECTION THROUGH UNDERPASS

A 6-in. concrete dry bottom protects a continuous reinforced slab 3 ft. thick, the top surface of which serves as the pavement. Columns with continuous caps support the roof down the centerline.

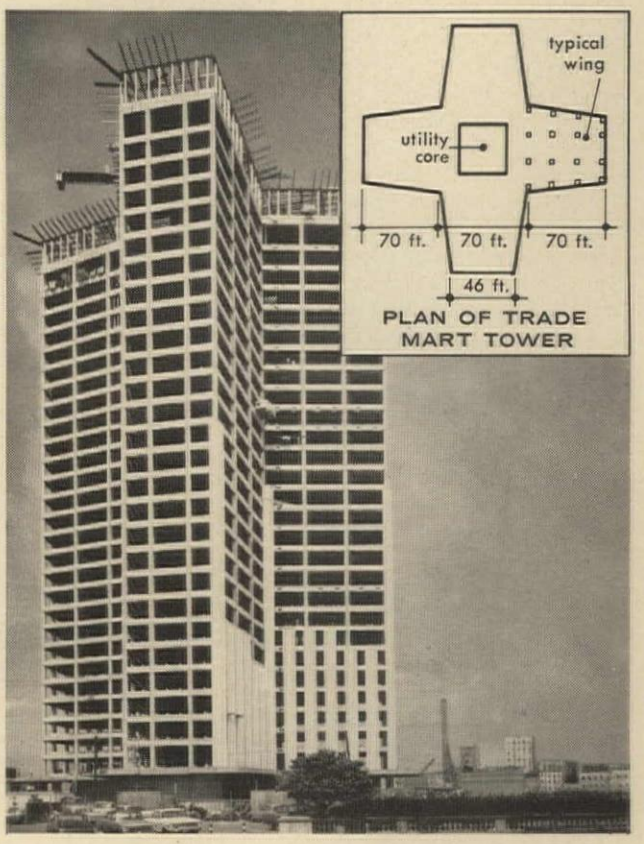
The typical underpass roof consists of standard precast, prestressed concrete highway girders spaced at 7 ft. 6 in. and topped with a 7½-in. monolithic slab. This roof structure is designed for H20-S16 highway loading, since the surface is part of plaza and service drives. Where highway passes beneath the Exhibit Facility, the precast girders are replaced by cast-in-place girders on 15-ft. centers.

616 prestressed concrete piles support 33-story Trade Mart tower

The Trade Mart tower is a reinforced concrete frame structure clad in white concrete panels. Prestressed concrete piles were chosen for the foundation after comparison with several other types showed concrete carried the greatest load per pile dollar. More than 64,000 lineal feet of octagonal piling were used.

Lightweight aggregate concrete was used throughout in the frame and curtain wall, resulting in over 12,000 tons savings in dead load. This reduction in dead load means substantial savings in the cost of the foundation and reinforcing steel in the frame.

The frame design was based on the 1963 ACI Code using ultimate strength design criteria. A concrete strength of 3,000 psi was used in the pan-joist floor system, with 4,000 psi concrete used for columns and walls above the 3rd floor, and 5,000 psi below this point. Column sizes were held to a minimum through use of ultimate strength design and new large-size reinforcing bars. Exterior columns were 24 in. square, interior columns a maximum of 30 in. square.



Concrete framing and wall panels offer dramatic cost savings

Total cost of the completed tower, including interior finishing, was a little over 15 dollars per square foot, according to Harry Bloomfield, President of Bloomfield Building Industries, contractor on the Trade Mart tower. Mr. Bloomfield noted, "We do not believe we could have accomplished the Trade Mart in steel for at least 5 dollars per square foot more, and we feel we have a much better building with concrete."

You're looking at Philadelphia through a new glass from PPG that shuts out 70% of the sun's heat and has a "U" value of .35

Photo taken through a sample of SOLARBAN TWINDOW simulating typical building location. Camera: 4x5 Calumet, 1/50 sec at f/11 with Ektachrome daylight.

COMPARATIVE PERFORMANCE DATA		U Value	Maximum Heat Gain (BTU/hr./sq. ft.)	Visible Light Transmittance %
PLATE GLASS				
Regular Plate Glass	¼"	1.1	200	88
Solargray®	¼"	1.1	150	42
Solarbronze®	¼"	1.1	150	51
Solex®	¼"	1.1	150	73
LHR Clear	¼"	1.1	140	47
LHR Solargray	¼"	1.1	110	24
LHR Solarbronze	¼"	1.1	110	27
LHR Solex	¼"	1.1	110	35
SHEET GLASS				
Clear Sheet Glass	3/32"	1.1	205	90
Graylite™ 31	⅛"	1.1	170	31
Graylite 61	3/16"	1.1	195	61
Graylite 56	7/32"	1.1	190	56
Graylite 14	7/32"	1.1	150	14
Graylite 52	¼"	1.1	185	52
HIGH PERFORMANCE (Insulating, Heat and Glare Reducing)				
Clear Twindow®		.60	170	78
Solarban Twindow		.35	65	20
LHR Solargray Twindow		.60	90	22
LHR Solarbronze Twindow		.60	90	25
LHR Solex Twindow		.60	90	32
Solargray Twindow		.60	115	36
Solarbronze Twindow		.60	115	45
Solex Twindow		.60	115	65

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What gives PPG SOLARBAN TWINDOW these remarkable properties? Actually, it's two panes of glass enclosing a dry air space. On the air space side of the indoor pane, an exclusive coating reflects 46% of the sun's total energy.

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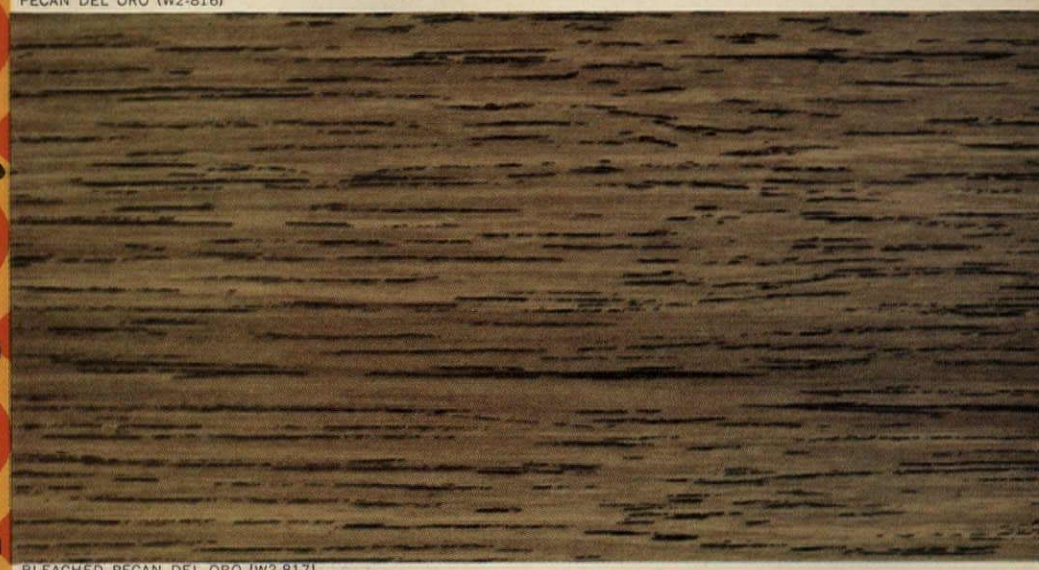
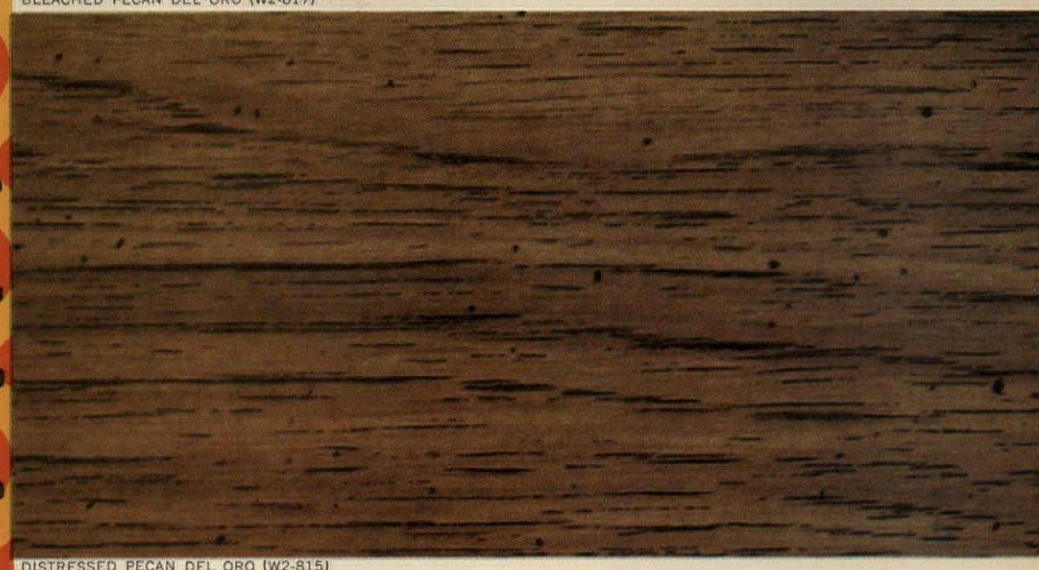
PECAN DEL ORO (W2-816)



BLEACHED PECAN DEL ORO (W2-817)



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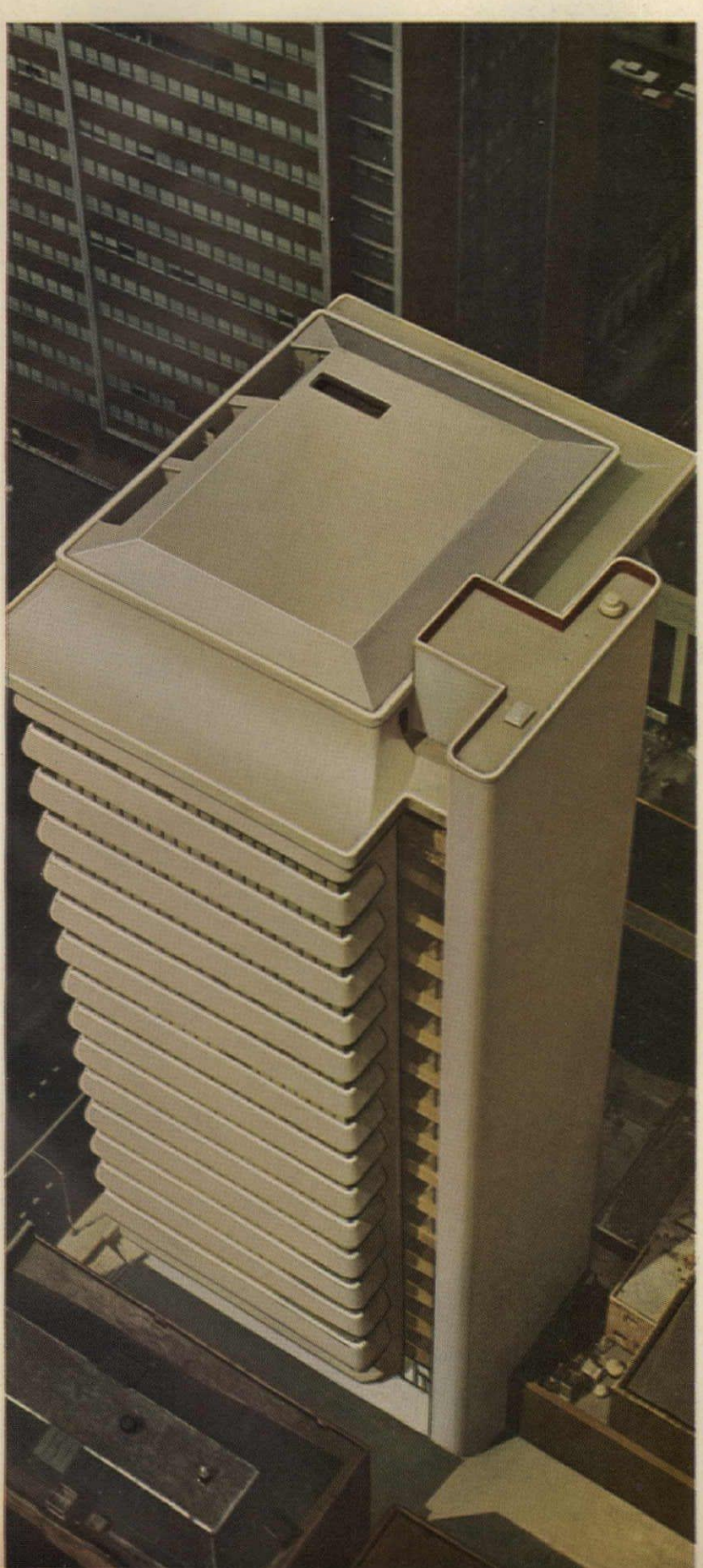
DEVOE has a way with colors that dress up a beautiful building.



Let us tailor paint for your job, too.

We were asked to do it for this spectacular Atlanta building—a soaring, post-tensioned concrete structure of sculptural simplicity. It features flowing lines and distinctive colors and textures that make this a beautiful, welcoming place for people.

Our job was to bring this bold concept to life —and we did, matching the colors specified by using our vast Library of Colors® system of over 1,000 shades. And Devoe also supplied TRUE-GLAZE for the elevator lobbies—resulting in a rugged, tile-like surface for much less than the cost of tile.

Devoe works with architects and designers in many ways. We offer a complete line of quality paints—the *right* finish for every surface. And we offer the services of our local representative—the Man from DEVOE—for assistance of almost any kind. To get in touch with him, just call or write the nearest DEVOE office.

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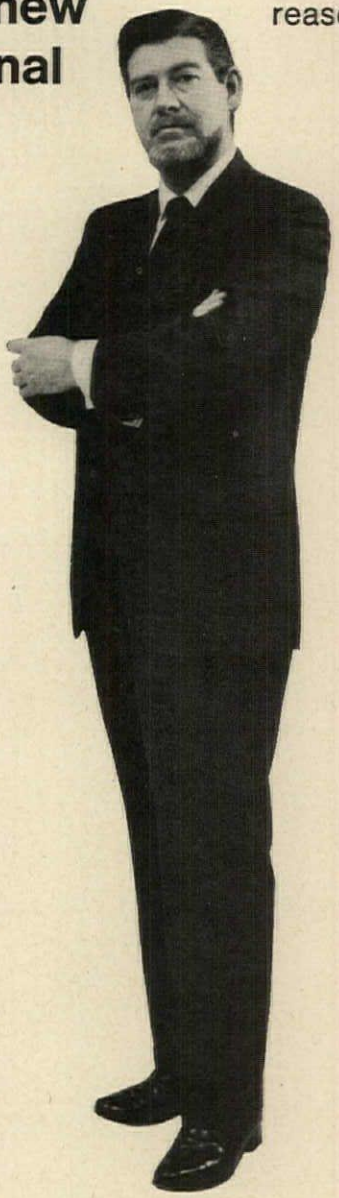
Designer Paul McCobb added an exciting new style to our functional equipment.



Paul McCobb, one of America's leading contemporary designers, says there is every reason to believe that heating and cooling equipment can be beautiful as well as functional. He proved it.

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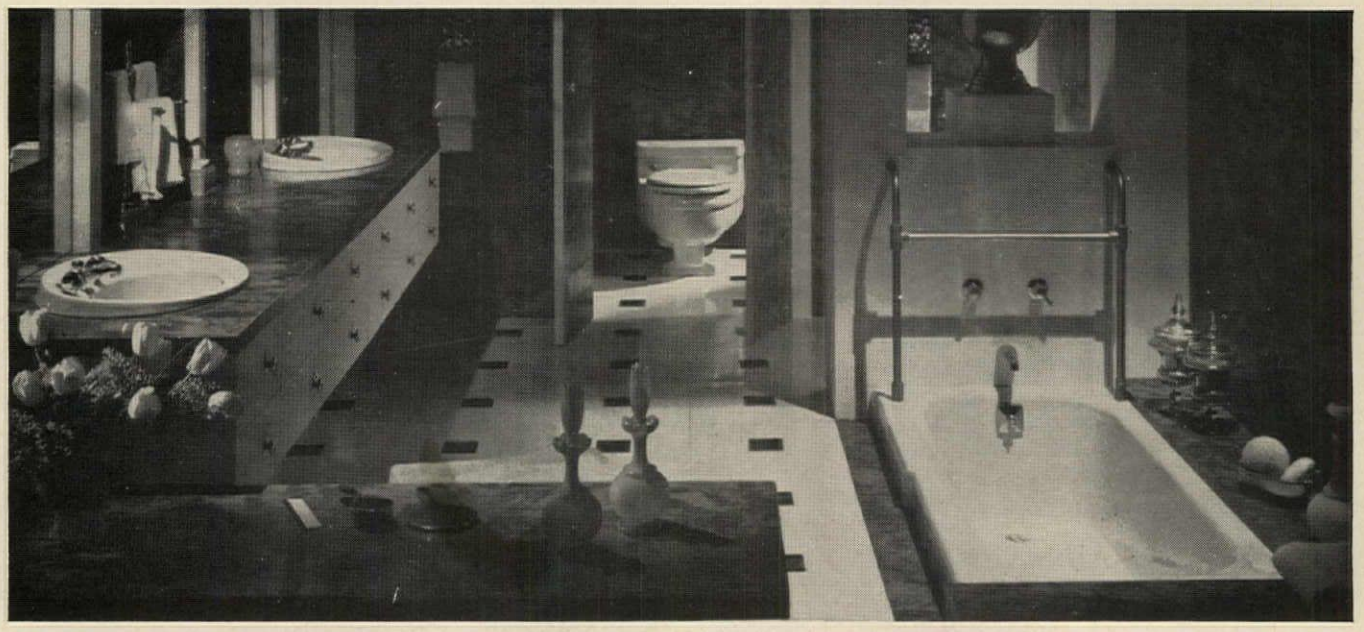

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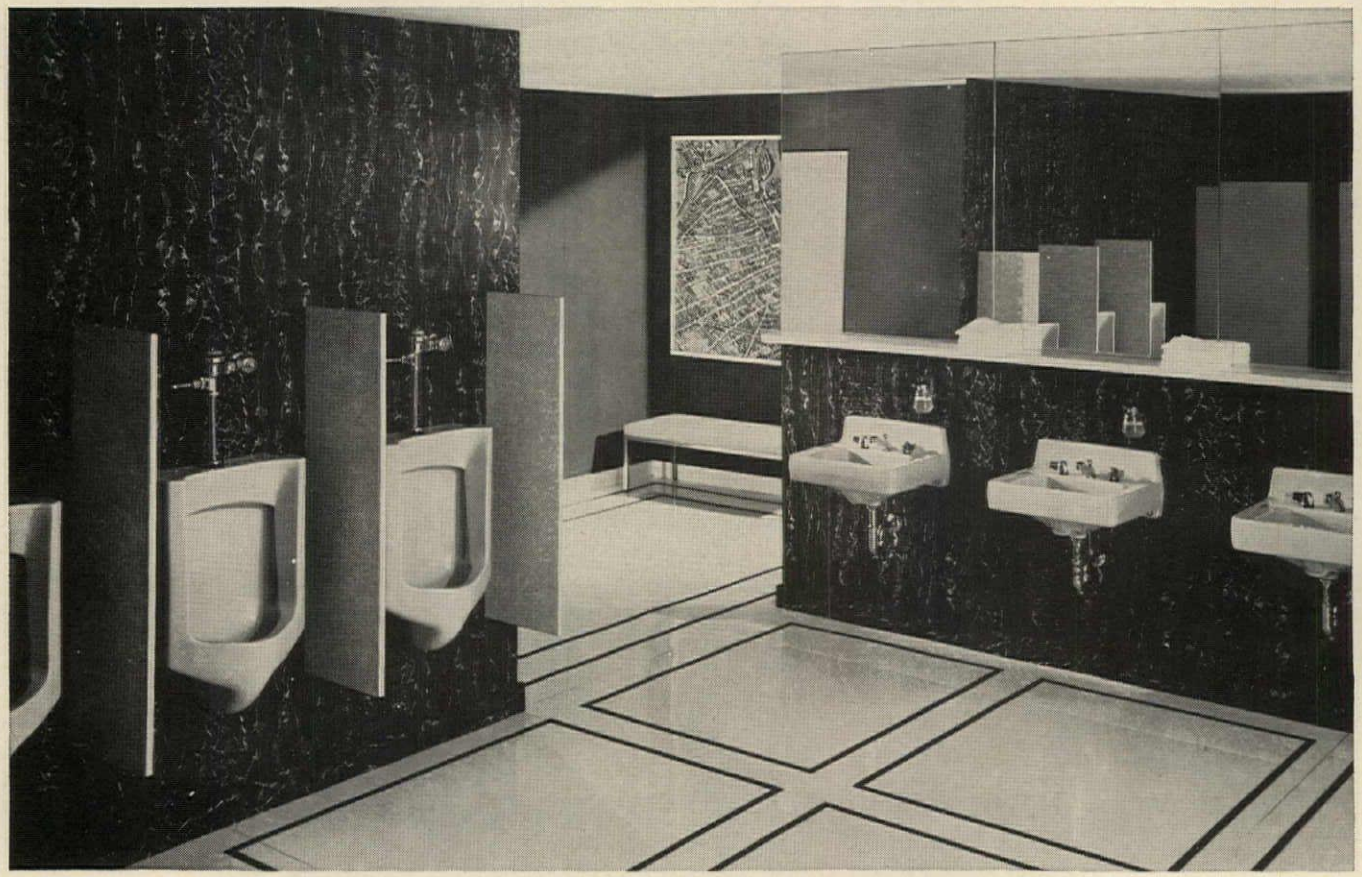

...appreciate offices and schools furnished like this

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COMMUNITY EFFORT RESULTS IN MODEL JUNIOR HIGH

The new junior high school in Eaton, Colorado, a town of only 1,200, is proof of what can be accomplished when the citizens, school board, the superintendent and his staff, and the architect all work together. The result—a unique, well-planned school facility.

Visitors marvel at how both community and school needs have been accomplished in planning the entire facility. Movable walls and folding partitions not only provide for present flexibility, but for future expansions, also.

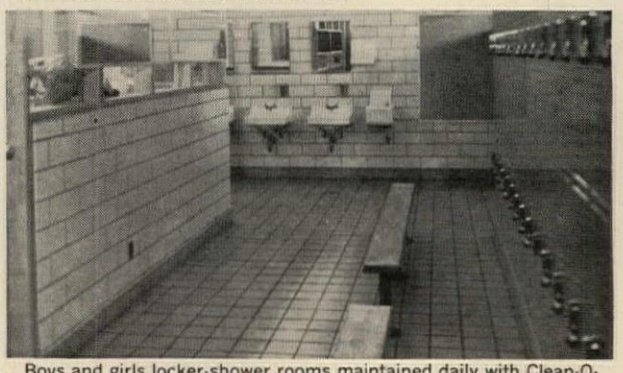
Planned, preventive maintenance was carefully considered for this building, too. Experience gained from the use of Hillyard products in the grade school, completed in 1955, led to the selection of Hillyard products for the new junior high school building.

There's a Hillyard architectural consultant near you and he'll gladly consult with your specification writers on proper, approved procedures and materials for the original treatment of any floor you specify. Follow-up "job captain" service protects your specification. Write, wire or call collect.

Truly a floor of champions . . . Hillyard Trophy Seal and Trophy Finish used to finish gym floor.

Ceramic tile pool with quarry tile aprons mopped daily with Clean-O-Lite as a disinfectant for maximum sanitation and for prevention of athlete's foot.

Hillyard Hil-Tex undercoater-sealer used on all corridor and classroom floors (resilient). Super Hil-Brite carnauba wax used for floor protection and easy daily maintenance.



Boys and girls locker-shower rooms maintained daily with Clean-O-Lite, a synthetic cleaner, deodorizer, sanitizer and disinfectant.

Architect: Claude A. Nash
Contractor: Hensel Phelps Construction Co.

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Institute Conducts New Feasibility Studies For Headquarters Location

The American Institute of Architects is undertaking a study of the "economic and architectural feasibility" of enlarging its headquarters site in Washington, D. C. under a special committee headed by Charles M. Nes, Jr., first vice-president of the Institute. Under consideration is the purchase of the adjoining site of the Lemon Building, costing more than $20,000, which would permit construction of a large new headquarters building without any crowding of the existing site. Such a purchase would have to be approved by the full convention in Denver next year. Mitchell/Giurgola Associates of Philadelphia, winners of the original competition (February, page 10) presented new feasibility and schematic studies to the Board of Directors in a meeting in Washington from November 30 to December 2.

Transportation Symposium Set For Pittsburgh

The First International Symposium on Urban Transportation Planning, sponsored by the Urban Transportation Development Council of the Pittsburgh Chamber of Commerce, will be held in Pittsburgh on February 1-3. Bennett S. Chapple, Jr., administrative vice president—commercial of the United States Steel Corporation, will be chairman of the program committee.

GSA Names Hegner

Casper F. Hegner, for three years Manager of Operations in the construction office of the Veterans Administration and before that a Denver architect, has been named Commissioner of Public Buildings in the General Services Administration, Washington, D.C. by Lawson B. Knott, Jr., Administrator of General Services. Mr. Hegner is the first architect to serve in this position. William H. Scheick, executive director of the American Institute of Architects said, "We applaud the recent appointment of an advisory panel of architects by GSA, and we believe that as chairman of that panel Commissioner Hegner will be equipped to work for the most effective administration of the public buildings program."

Artega Photos

Masterful Arches—Old and New

Two arches are in the news this month—a 15-foot entrance arch from the Paris subway designed by Hector Giumard in 1900 and the 630-foot-high St. Louis Gateway Arch designed by the late Eero Saarinen. The Guimard arch has been installed in the Abby Aldrich Rockefeller Sculpture Garden of the Museum of Modern Art in New York after extensive renovation. It was given to the museum in 1958 by La Regie Autonome des Transports Parisiens (the Paris Transit Authority).

The final triangular section of the Gateway Arch was raised into place last month. The keystone section, the last of 142 triangular sections, was raised into place as a jacking force of some 425 tons was applied to the two legs of the Arch to spread them so that the eight-foot-wide steel keystone section could be put into place. The entire project, including the passenger conveyance system within, is expected to be completed early next year. Structural engineers were Severud, Elstad, Krueger and Associates, prime contractor is the MacDonald Construction Company, and fabricator and erector is the Pittsburgh-Des Moines Steel Company.

P.I.P. photo by Photo News Service

Gargoyles Gone Modern—Et Tu Pluto?

The medieval gargoyles were crumbling away on St. Euselius' Church in Arnhem, Holland, and so—"pop art" to the rescue. Architect Theo Verlaan commissioned sculptor Henrik Vreeling to replace the old gargoyles with 22 cartoon characters. Pictured at left is Walt Disney's "Goofy," and second from the right is Mr. Disney's "Pluto." The other two characters defied identification by our source. When the new statuary was unveiled, protests followed: the architect said, "It's 20th century art."

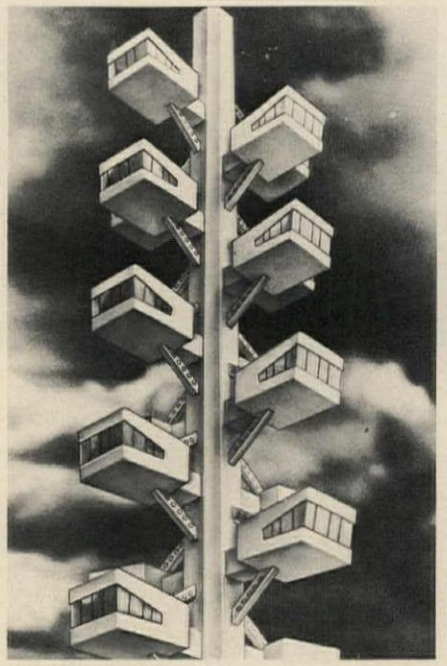
Puerto Rico Will Get Architecture School

The University of Puerto Rico will have a school of architecture opening in the fall of 1966. Local architect Jesus E. Amaral has been named by University of Puerto Rico Chancellor Jaime Benitez special assistant in charge of establishing the school, which is expected to have an initial enrollment of 25 to 40 students. The Cornell University School of Architecture will serve in an advisory capacity in the establishment of the school.

New York Engineers Give Award to Eipel

William Eipel of the New York engineering firm Eipel Engineering was presented last month with the Founder's Award of the New York Association of Consulting Engineers. Mr. Eipel is the second recipient of the award, which was originated to recognize outstanding service to the Association.

German Information Center



When Is a Hotel a Tree?

Horst Dollinger, an architect from Stuttgart, Germany, has designed a collapsible hotel he proposes as a solution for temporary accommodations. The collapsible cabin tower can be easily transported and re-erected in a very short time. The vertical mast of steel and aluminum contains stairs and elevator, off which are hung sleeping cabins. The tower is kept stable by steel cables. The architect says he has found a contractor for his "sleeping tower."

Nominations Sought for 1966 Reynolds Award

Nominations are being accepted through January 31, 1966 for the R. S. Reynolds Memorial Award, entering its 10th year. The international award, administered by the American Institute of Architects, is conferred each year for design of a significant work of architecture in which aluminum has been an important contributing factor. It gives a prize of $25,000 and an original sculpture. Preference is given to structures completed within the last three years. Brochures on the award have been mailed to A.I.A. members and to architectural societies in other countries. An architect can be nominated by anyone, including himself or his firm, using a form included in the brochure or by writing The Reynolds Award, The American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006.

Imperial Photo Studios

Louis I. Kahn Honored By Danish Architects

The Danish Architectural Association's Medal of Honor was presented to American architect Louis Kahn at a ceremony at the Danish Consulate General in New York. Mr. Kahn is receiving the award from Finn Monies of Copenhagen, chairman of the Danish association as Frederik Harhoff, Danish Consul General in New York, looks on. The citation read in part: "Your works are familiar to all of us and your ideas about the ends and means of architecture are hardly unknown to any of us. . . . With you, Louis Kahn, practice comes in direct continuation of theory. You have been able to translate your sublime ideas of the creation of architectural works into projects and real buildings."

A.I.A. Affiliates With Guild For Religious Architecture

The American Institute of Architects has entered into formal affiliation with a second organization—the Guild for Religious Architecture. Milton L. Grigg, member of the Institute's Committee on Religious Architecture and immediate past president of the Guild, explained, "this affiliation . . . reflects the institute's interest in the broadest sharing of specialized resources with its entire membership." The other formal affiliation of the A.I.A. is with the Producers Council.

Two Architects Nominated As Silver Anniversary All-Americans

Two architects, John Carl Warnecke of San Francisco and Washington, D.C. and Louis A. Young of Devon, Pennsylvania have been nominated by their alma maters for this year's Sports Illustrated Silver Anniversary All-America Awards. They are among 64 candidates, all cited for their exceptional success in life since the football season of 1940.

Mr. Warnecke, nominated by Stanford University, was a tackle on Clark Shaughnessy's only undefeated, untied team and the 1941 Rose Bowl champions. He did architectural graduate work at Harvard.

Mr. Young, nominated by Dartmouth College, was captain of his team during Dartmouth's most famous game, the "fifth down" win over Cornell. He is a partner in the Philadelphia firm of Alexander Ewing & Associates.

Twenty-five of the entrants will be selected for the awards as a result of balloting by a panel of 12 distinguished citizens. There is no architect on this distinguished panel.

Baltimore A.I.A. Holds Competition for Newsstand

Baltimore news dealer Abe Sherman has an architect-designed kiosk for a newsstand, designed by Robert A. Cyr as a result of a competition sponsored by the Baltimore Chapter of the American Institute of Architects. Mr. Sherman's old wooden newsstand which he had operated in Baltimore's Monument Square was torn down when the square was redesigned. Mr. Sherman found a new location, but business didn't prosper. Thus the competition. Now he has a kiosk which harmonizes with its new environs. Constructed of rigid steel, the kiosk has sliding glass doors, radiant heating, and wall-to-wall carpeting.

Rino Levi Dies

Rino Levi, Brazilian architect, died September 26. His office in São Paulo, under the direction of his colleagues Roberto Cerqueira Cesar and L. R. Carvalho Franco, will continue to work under the same organization.

Architect: Walton & Madden, Riverdale, Md.
Screen erected by: Acme Iron Works, Inc., Washington, D.C.

BORDEN DECOR PANEL AS BUILDING FACADES

Shown above is Deca-Grid style Borden Decor Panel used as a facade for the Pargas, Inc. building in Waldorf, Maryland. Set off by piers of white precast stone, the sturdy aluminum Deca-Grid panels are finished in blue HINAC, Pennsalt's new finish for metals.

This Deca-Grid installation has tilted spacers, a feature called the Slant-Tab variation wherein spacers may be mounted at angles of 30°, 45°, 60° or 90° as desired. The Slant-Tabs may be further altered by use of non-standard angles, or lengthened tabs.

All the Borden Decor Panel styles, including Deca-Grid, Deca-Gril, Deca-Ring and Decor-Plank, are highly versatile in design specification and in application as facades, dividers, grilles, fencing and the refacing of existing buildings. In standard or custom designs, Borden Decor Panels provide a handsome, flexible, maintenance-free building component.

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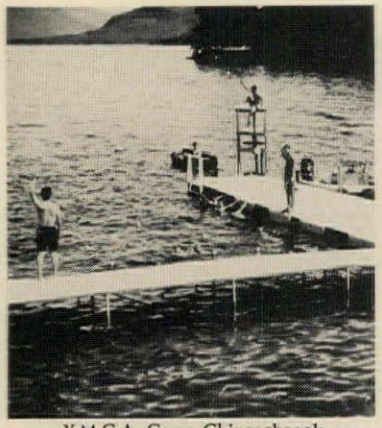
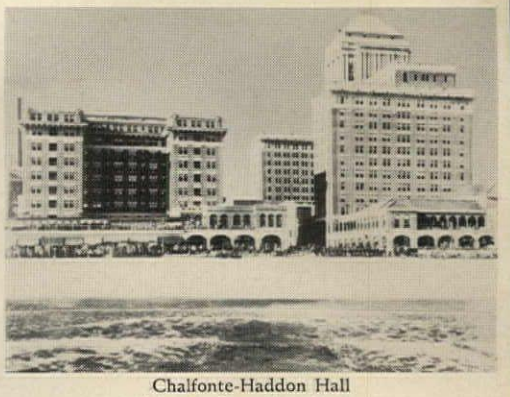
For more data, circle 31 on Inquiry Card



Y.M.C.A. Camp Chingachgook
Pilot Knob, New York

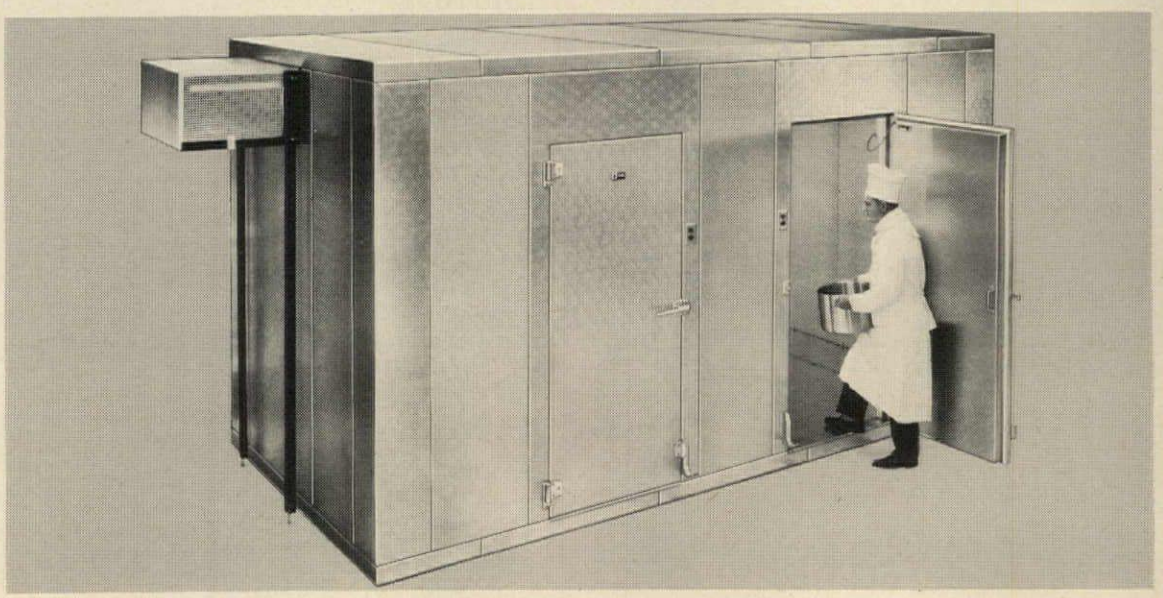
Carmel Valley Golf and Country Club
Carmel, California

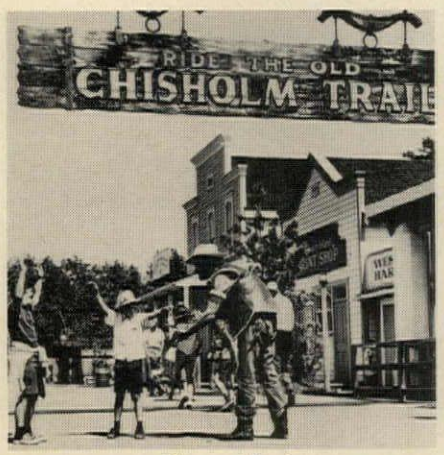
Garden State Park
Camden, New Jersey



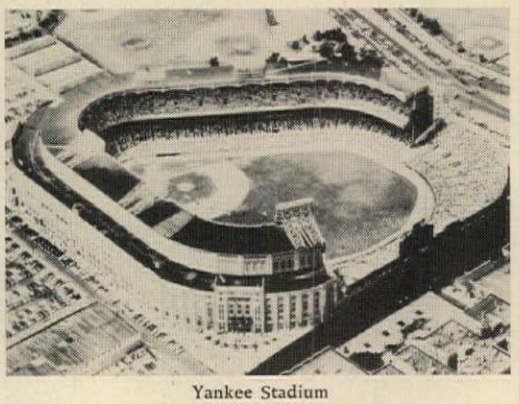
Chalfonte-Haddon Hall
Atlantic City, New Jersey

for club, recreation and resort walk-in





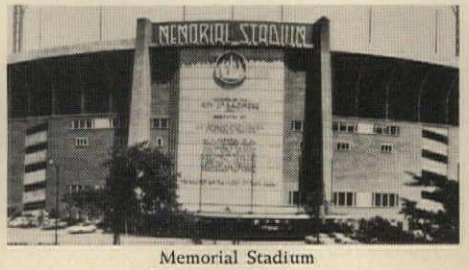
Pleasure Island
Wakefield, Massachusetts



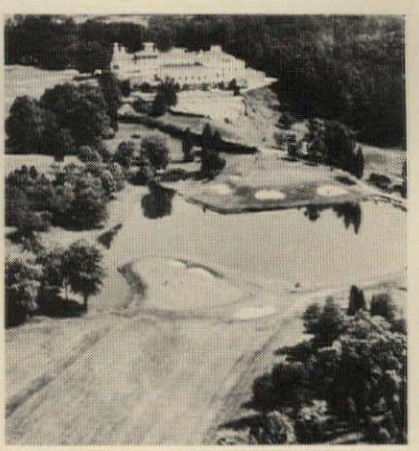
Yankee Stadium
New York, New York

Pine Lakes International Country Club
Myrtle Beach, South Carolina

Saratoga Race Track
Saratoga Springs, New York



Memorial Stadium
Baltimore, Maryland



Congressional Country Club, Inc.
Washington, D.C.

Girl Scouts of Rochester and Genesee Valley, Inc.
Rochester, New York

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See Sweet's File 25a/Ba

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Elko Lake Camps
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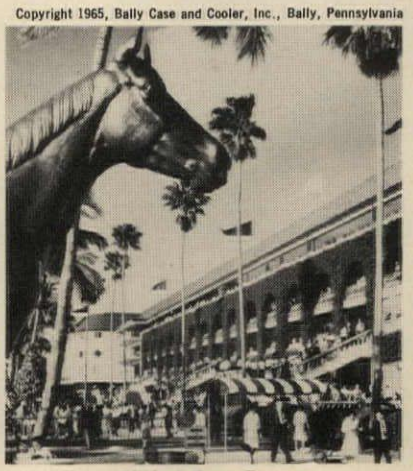
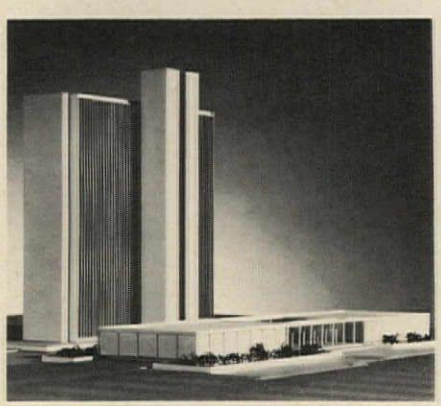
The Country Club of Florida
Delray Beach, Florida



Hialeah Race Course
Hialeah, Florida

For more data, circle 33 on Inquiry Card

New Federal Office Building for Los Angeles



The 19-story $13.7-million Federal Office Building in West Los Angeles will have fire stairs, restrooms, mechanical distribution ducts and elevators in separate towers which rise 200 feet, allowing greater flexibility of arrangement within office areas. Architect is Charles Luckman Associates. Mechanical engineer is Albert Zimmerman and structural engineers are King, Benioff & Associates. Landscape architect is Robert Forey.

It contains 595,953 square feet.

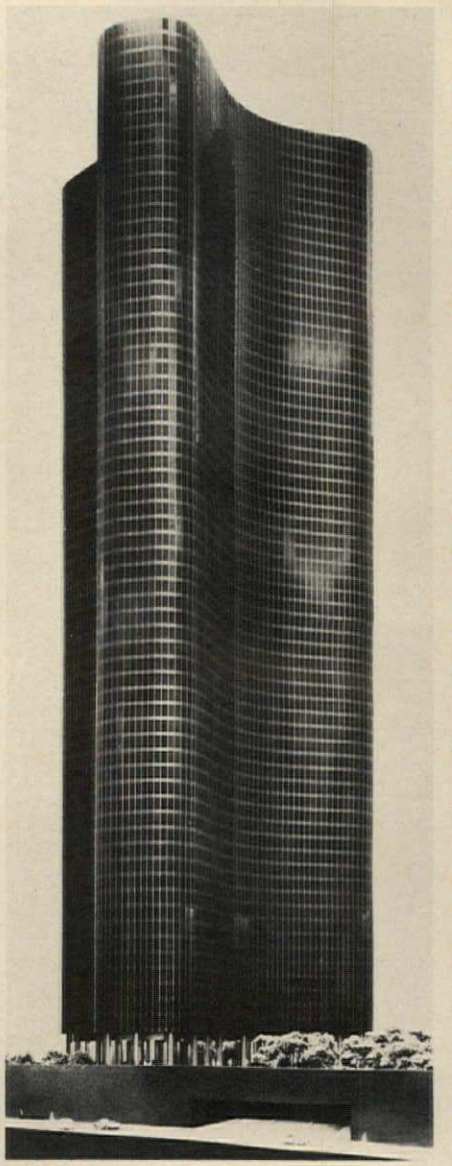
Dormitories Will House More Than 2000

The Melrose Towers dormitories at the State University of Iowa in Iowa City will be comprised of one 18-story woman's tower and two 12-story men's towers connected at ground level with a one-story commons. The project was designed by Leo C. Peiffer, Architect & Associates. The woman's dormitory will have 16 typical floors containing facilities for 54 women and one adviser. Each of the men's towers will have 11 typical floors also housing 54 students and one adviser. The facades are of precast concrete and glass. The roof level of each tower provides a sundeck and mechanical penthouses.

Unesco/Dominque Roger

Underground Building Complete in Paris

The fourth building at UNESCO Headquarters in Paris, designed by architect Bernard Zehrfuss, was built below ground on a square 350 feet by 350 feet excavated to a depth of 33 feet. The building, now complete, is shown above during construction. It is built around six court yards, each 82 by 49 feet. The floor area totals 68,000 square feet and there are 350 offices. There are also two conference rooms, one seating 260 and the other, 340. Also below ground is a garage for 350 cars. Brazilian landscape architect Roberto Burle Marx designed the patios, which are invisible from street level. Within the patios are pools, fountains and a variety of plants. Stones of varied colors are used to create contrasts.



70-Story Apartment Is Planned For Chicago

The 70-story Lake Point Tower in Chicago has continuously curving walls around a triangular service core which will house elevators, stairs, mechanical risers and elevator lobbies. The $20-million, 645-foot-high structure will contain more than 1.3 million square feet and will have 900 apartments. The curtain walls will have bronze-tinted, heat-absorbent glass and aluminum mullions.

The building will rise from a two-story base which will contain lobby, restaurants, health club and parking for 700 cars.

Associated architects are Schipporeit—Heinrich and Graham, Anderson, Probst & White. Structural engineers is William Schmidt & Associates and mechanical engineer is William Goodman. General contractor is Crane Construction Company.

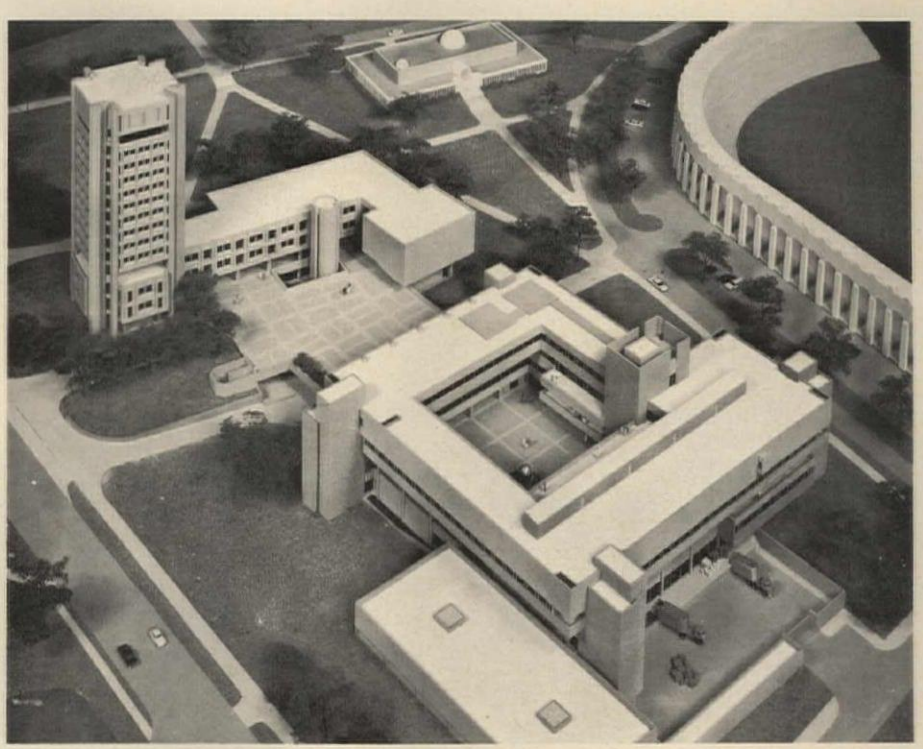
© *Louis Checkman*

Fordham Campus Will Add Two New Buildings

A 14-story multi-purpose element (center) joined below grade to a theater element (right) comprise Stage II of Fordham University's Lincoln Square campus adjacent to the Lincoln Center for the Performing Arts in New York City. The existing Law School Building is at left. Architects are the Perkins & Will Partnership. The larger element will contain offices and classrooms on upper levels and library, cafeteria and administration on lower levels. The theater will contain a subdivisible auditorium with stage. Budget is $14 million.

Physics Building For N.Y.U.

The Andre and Bella Meyer Hall of Physics at New York University will have an exterior design in keeping with a unified plan developed by architects Philip Johnson and Richard Foster for other buildings to be erected or renovated by N.Y.U. at Washington Square in New York City (January, page 15). Mr. Johnson and Mr. Foster have been named architects for the exterior of the block-long 11-story structure. Architects for the interior, which will total 120,000 square feet of floor space, are Wank, Adams & Slavin.



Science Complex Planned For Princeton

A Physics Building (right) designed by Hugh Stubbins & Associates, and a Mathematics Building (left), designed by Warner Burns Toan Lunde, will complete a science complex at Princeton University. Also in the complex is Charles Peyton Hall (at rear) designed by Minoru Yamasaki (June, page 15). The stone-faced, $5.8-million, 13-story Mathematics Building with three-story adjoining wing, has caused a controversy with Princeton Township authorities, who think it is too tall. On December 6, the Township Committee will meet to consider a zoning amendment which would limit the height of University buildings to 100 feet instead of the present limit of 170 feet. The $8.2-million Physics Building, faced with reddish brown brick with stone trim, will contain 210,000 square feet. Landscape consultant for the complex is Michael Rapuano.

New Library Planned For University of Chicago

The Joseph Regenstein Library at the University of Chicago, designed by the Chicago office of Skidmore, Owings & Merrill, is an $18-million, five-story structure containing a total gross area of 575,000 square feet. The library, which has precast concrete panels and glass on its exterior, will have storage space for three million books and periodicals and will have a seating capacity of 2,400. It will also have 260 separate study units assigned to faculty members. The library was made possible by a $10-million grant from the Joseph and Helen Regenstein Foundation. It will be located on Stagg Field, a central campus site.

Detroit Honors Four Projects

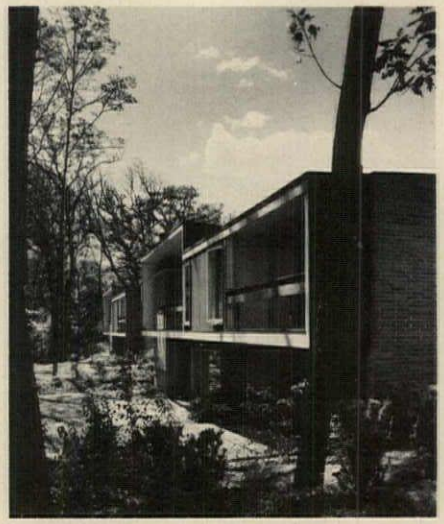
The Detroit Chapter of the American Institute of Architects announced the winners of their 1965 Honor Awards Program at the chapter's annual meeting. The jury, consisting of Dean Olindo Grossi of Pratt Institute, Jan C. Rowan, editor of Progressive Architecture, and James S. Hornbeck, senior editor of ARCHITECTURAL RECORD, commented, "the jury expressed disappointment that there was a rather limited number of entries and that the level of quality was not as high as might be expected for the Detroit area. . . . but since none (of the four winners) was clearly more outstanding than the others, no First Honor Awards were given."

Balthazar Korab

Award of Merit: Oxford Houses, Dormitories for Women, The University of Michigan, Ann Arbor. Architects; Frederick Stickel Associates; structural engineer: Clifford Holforty; mechanical and electrical engineers: Levin, Pierce & Wolf; landscape architects: Johnson, Johnson & Roy; and general contractor: Erickson & Lindstrom Construction Company.

Jury comment: Residential feeling overcomes the blockiness of most dormitories; the short length of the wings is good although there is a certain amount of a barracks quality in the uniformity of repetition of units.

Balthazar Korab



Award of Merit: Cluster Housing for Willits West Company. Architect: Carl Luckenbach; and general contractor: Willits West Company.

Jury comment: Well planned; pleasant, appealing arrangement of units; interesting variety of one- and two-story levels; two units not as well situated as the others.

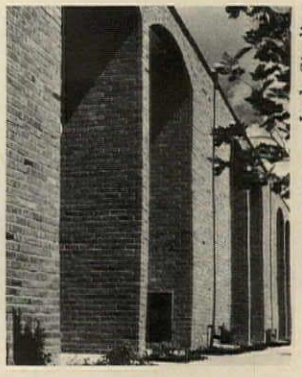
Award of Merit: Shapero Hall of Pharmacy, Wayne State University, Detroit. Architects: Paulsen, Gardner & Associates; structural engineer: Robert M. Darvas; mechanical engineers: Hyde & Bobbio, Inc.; and general contractor: Lerner-Linden Construction Company.

Jury comment: Vigorous form, refined detail—surface treatment skillfully handled; when complex is completed, the design concept will be realized.

Award of Merit: Medical Research Building, Wayne State University, Detroit. Architects and engineers: Smith, Hinchman & Grylls Associates, Inc.; and general contractor: R. E. Dailey & Company.

Jury comment: Exceptionally well organized, orderly, functional plan; pattern of fenestration a bit labored—could have been more effective by giving stronger emphasis at mullions opposite columns.

Jack Sterling



Honor Award: Wyandotte Square Apartments, Franklin County, Ohio. Architects: Ireland & Associates and general contractor: Irving Schottenstein.

Jury comment: The jury felt that the quality of the solution was outstanding and should merit wide recognition as a valuable piece of architecture. The project should provide a very pleasant atmosphere for gracious living.

Honor Award: Orrville Methodist Church, Orrville, Ohio. Architect: Conrad & Fleischman; and general contractor: Boegli and Kauffman.

Jury comment: A very simple straight forward but yet sympathetic handling of masses and material. The project should be further enhanced when the final stage is completed.

Ohio Honor Awards

Two honor awards and five merit awards were presented in the first annual Honor Awards Program of The Architects Society of Ohio. The awards were presented to projects completed since May 1, 1961. The awards jury consisted of New York architects Richard W. Snibbe, chairman, William B. Tabler and Robert W. Cutler.

Winning awards of merit were: Jim Morgan for The Ivory Towers (housing); Ireland & Associates for Golden Bear Center (shopping center) Hoag-Wismar-Henderson Associates for New Parking Structure, University Circle Development Foundation; Robert A. Little & George F. Dalton & Associates for Community Health Foundation; and Richard Levin and Associates for Rothenberg Medical Building.

Titche-Goettinger Company store.

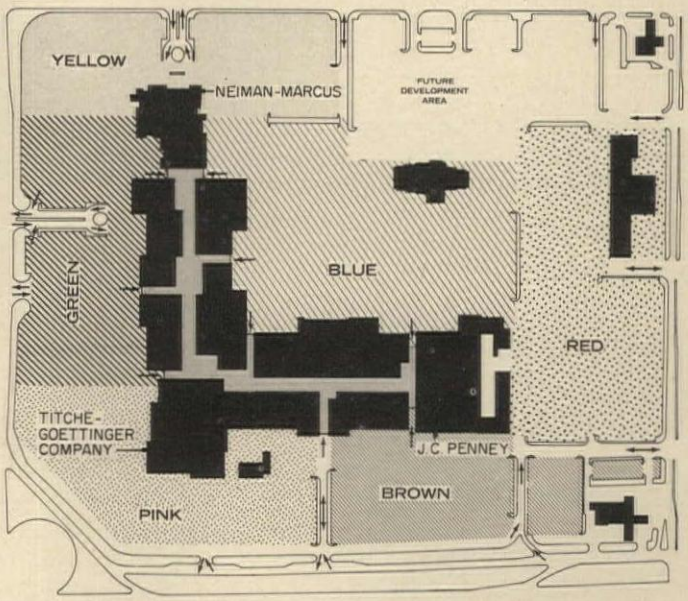
Part of 25-acre climate-controlled mall.

"World's Largest" Shopping Center Opens

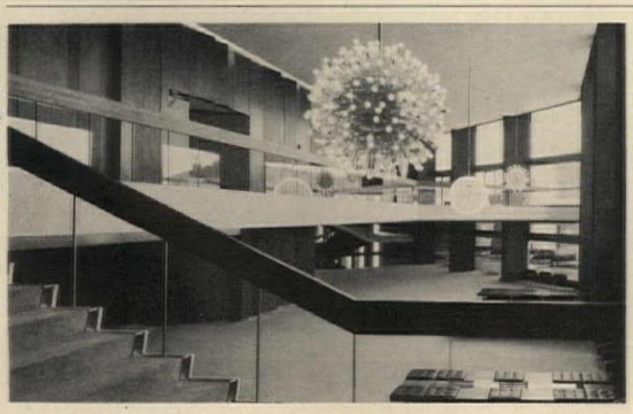
Northpark, a regional shopping center outside of Dallas, Texas, contains almost 100 stores occupying 1.3 million square feet on a 94-acre site. Its developers claim that it is "the world's largest climate-controlled mall-type shopping complex." Its enclosed mall covers 25 acres.

Largest tenants are the three major department stores located on the corners of the complex—Titche-Goettinger Company, 258,000 square feet; J. C. Penney 180,000 square feet; and Neiman-Marcus, 140,000 square feet. Parking in color-coded areas is provided for 6,000 cars. The entire complex is faced with white brick.

Architects for Neiman-Marcus were Eero Saarinen & Associates while Harrell & Hamilton were architects for Northpark center. Lawrence Halprin & Associates were landscape architects and the contractor was Henry C. Beck Company. Raymond D. Nasher is developer and owner.



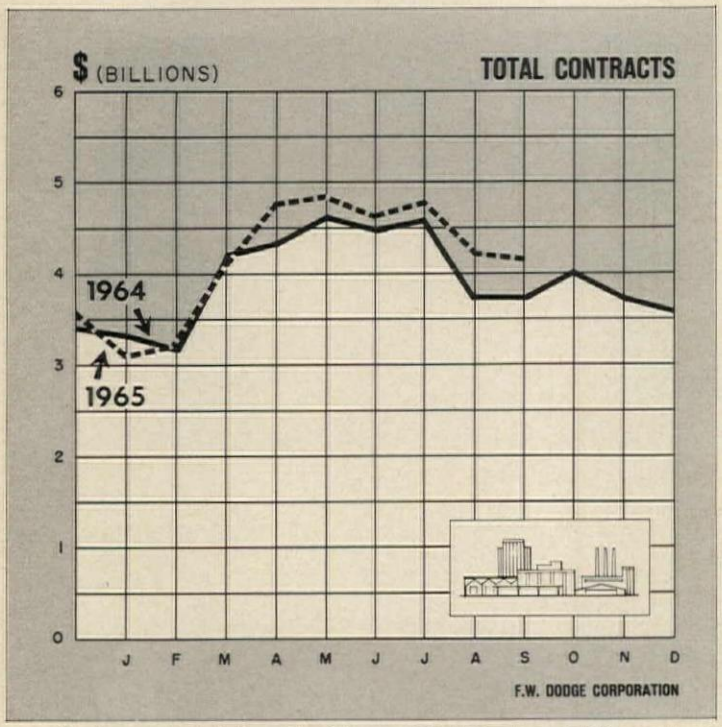
Hein Engelskirchen



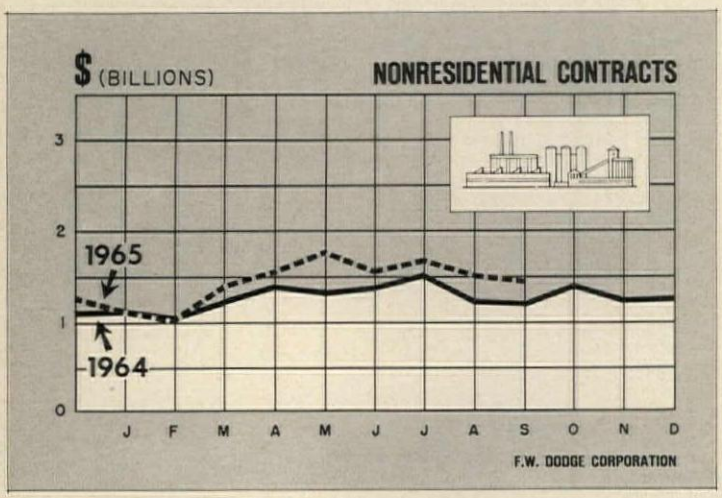
Competition-Winning Theater Has Computer-Run Lighting System

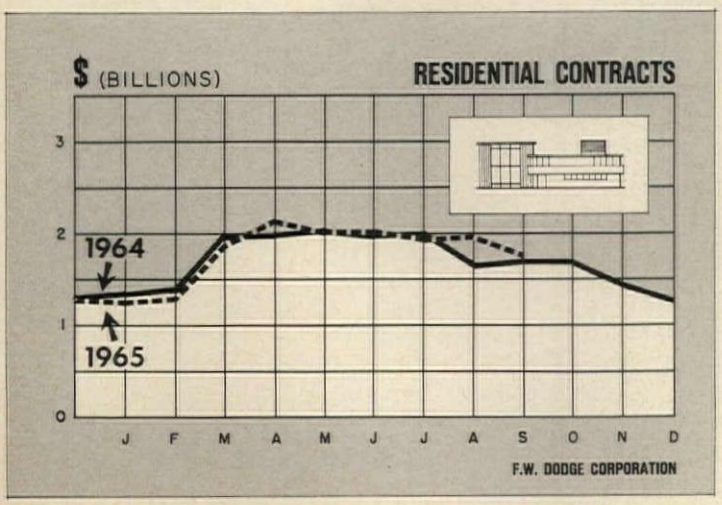
The recently completed theater in Bonn, Germany, designed as the result of a 1960 competition by Klaus Gessler and Wilfried Beck-Erlang, contains a 900-seat auditorium with no seat farther than 78 feet from the stage. The stage, with a maximum proscenium width of 50½ feet, has a maximum depth of 130 feet. The building itself is divided into three main elements—the 115-foot-high stage tower with auditorium, which is faced with aluminum plates; the lobby areas, which are horizontal layers of concrete and glass; and the workshops, located within a windowless concrete block. Technical innovations within include a computerized lighting system capable of programing and executing the lighting effects for any performance.

Otto Piene, a German artist who just had his first one-man show in America, a "Light Ballet" at the Howard Wise Gallery in New York, was responsible for the lobby lighting as well as for the luminous ceiling within the auditorium. Shown above left are three of Mr. Piene's creations—in the foreground is planet "Hedgehog," in middleground is planet "Onion Flower," and in the background is planet "Fly's Eye."



Total contracts include residential, nonresidential and non-building contracts





THINKING BIG

There's an undeniable fascination in really large-scale construction projects. To the man on the street they offer an opportunity to pursue his time-honored avocation as sidewalk superintendent. To the architect and engineer such big undertakings often represent the challenge of a career or the making of a reputation.

Jobs of this caliber—let's set the dividing line for *real* bigness at $10 million—are pretty few in number. Through the first three-quarters of this year there were 133 construction projects contracted at ten million dollars or more, and that's not very many projects in comparison to the total of more than 800,000 construction jobs of all sizes in the same nine month period. (On that basis the big ones represent a mere two hundredths of one per cent of the total.) And this simply underscores the fact that by far the bulk of new construction activity is concerned with the hundreds of thousands of small- and medium-sized building projects that are put up each year in communities all over the country.

On a *value* basis, however, this handful of king-sized construction projects looms a lot larger. In 1965 these 133 jobs, though an infinitesimally small proportion of the total number of projects, were nevertheless worth more than $2.5 billion, and that comes close to seven per cent of the aggregate dollar value of all construction. The following table shows a breakdown of the number and size of the 1965 construction projects that qualify for the $10-million-dollar club:

One thing almost leaps right out of this table, and it's the fact that the narrow range between $10 million and $20

1965's LARGEST CONSTRUCTION PROJECTS

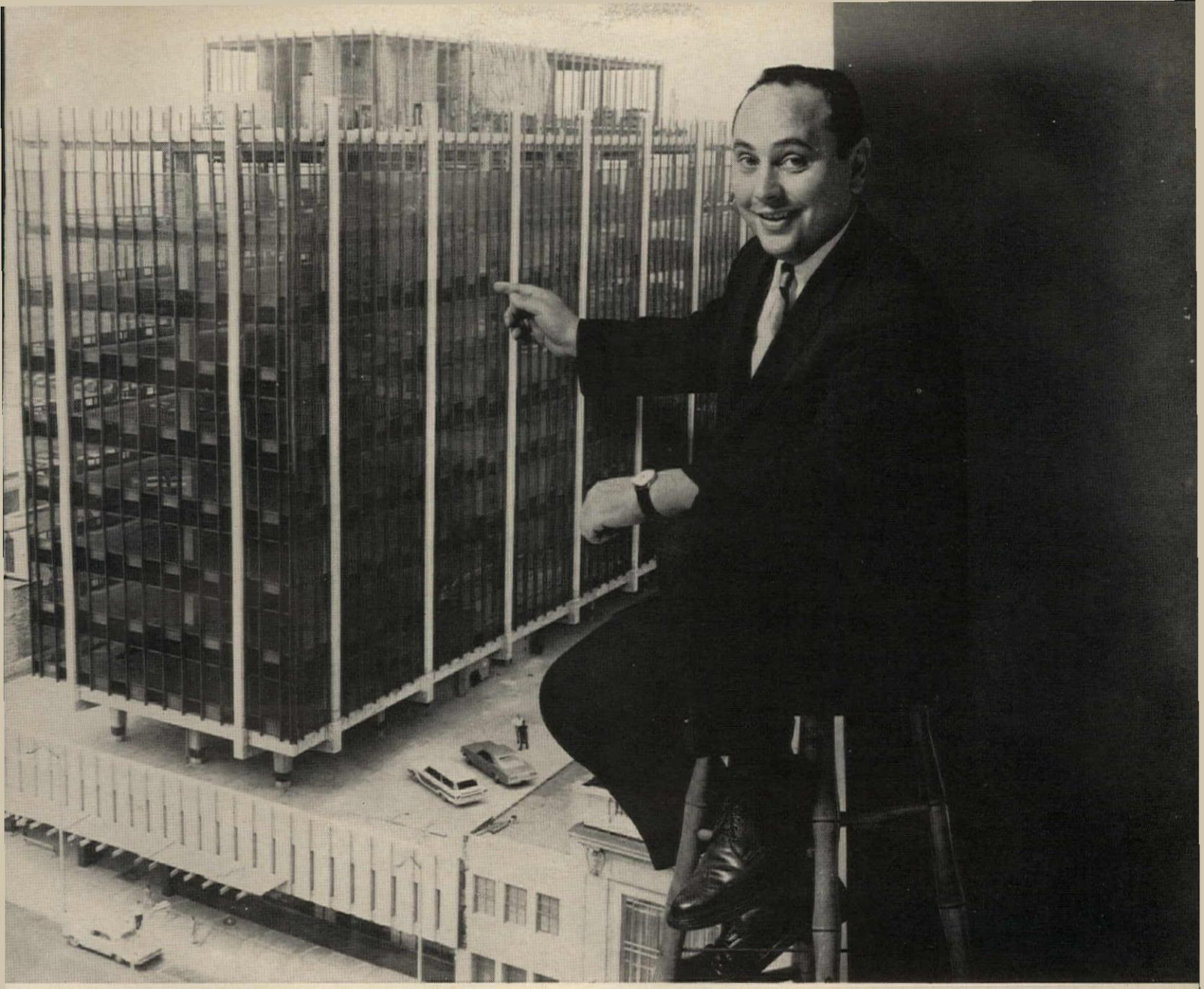
SIZE OF PROJECT	TOTAL CONSTRUCTION CONTRACTS (first nine months)		
	Number of Projects	Contract Value (millions)	Percent of Total Value
$50 million & over	6	$417	1.1%
$40–49.9 million	4	176	0.5
$30–39.9 million	9	308	0.8
$20–29.9 million	16	355	0.9
$10–19.9 million	98	1,265	3.4
Total over $10 million	133	$2,521	6.7%
Total under $10 million	832,369	35,173	93.3
Total All Projects	832,502	$37,694	100.0%

F. W. Dodge Co., A Division of McGraw-Hill, Inc.

million takes in almost three-quarters of all the giant projects. Once beyond the $20-million level, each job takes on a strong identity of its own, like John Hancock's $70-million combination apartment-office building in Chicago, Texaco's huge new $75-million refinery near Baton Rouge, or the government's $33-million Forrestal building in the nation's capital.

Nonresidential buildings show up more frequently in the rarified atmosphere above $10 million than do either residential buildings or nonbuilding projects. The latter category has been offering its share of dams, electric generating facilities, and the like this year, but mainly 1965 has been a year for offices and industrial buildings. So far, no less than 20 huge factories and 18 major office buildings have been started, pushing the totals for these two categories to new highs. In addition, the year's listings show a healthy volume of residential work with 14 outsized apartment complexes, as well as two large hotels and a $15-million dormitory.

George A. Christie, Chief Economist
F. W. Dodge Company
A Division of McGraw-Hill, Inc.



DEVELOPER EDMUND FUSCO points proudly to a photomural of New England's newest all-electric office building, to be completed in the fall of 1965. *Design Supervisor:* Bennett J. Delle Bovi. *Architect/Engineer:* Fletcher-Thompson, Inc.

"All-Electric Design cut construction costs $180,000 in our new Connecticut office building"

Edmund Fusco, President of HF&A Development and Management Corporation, reports on the advantages of using flameless electricity for all heating, cooling and lighting in the $3,000,000 People's Savings Bank Building in Bridgeport

"Extensive comparison studies by our architects and design engineer proved that all-electric design for our new People's Savings Bank Building would result in substantial benefits both to ourselves and our tenants," reports HF&A President Edmund Fusco.

"By going all-electric, we estimate an immediate saving of $180,000 in initial costs alone. This includes a 40% saving in the cost of heating and cooling equipment. In addition, we freed 4800 square feet of rentable penthouse space by the elimination of flame-fired equipment. This will produce an additional net revenue of $15,000 per year.

"All-electric design also makes it possible to offer occupants complete flexibility and comfort in heating and air conditioning. Each tenant can select his own temperature, regardless of the size of his office. And this choice is so flexible that one office can be heated while the immediately adjacent office is being cooled.

"From now on, we will always give all-electric design primary consideration in our projects. For example, our next two major jobs, comprising 460,000 square feet of office and commercial space in New Haven, and 300,000 square feet in Buffalo, have already been specified as all-electric."

It will pay you to compare all-electric design with other systems in planning your commercial and industrial projects. Just contact your local electric utility company. Their specialists will welcome the opportunity to work with you.

BUILD BETTER ELECTRICALLY

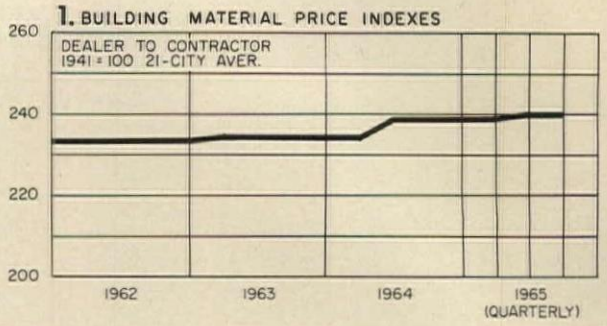
Edison Electric Institute, 750 Third Avenue, New York, N.Y. 10017

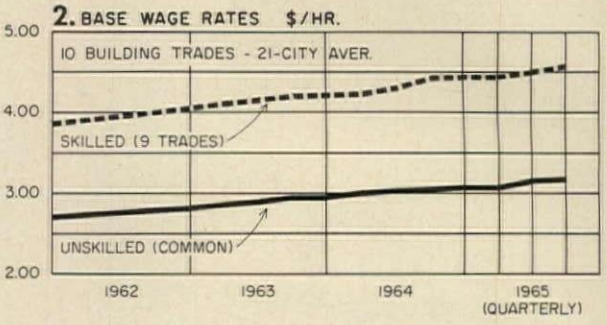
THIS PLAQUE, now given by many electric utility companies, identifies a modern building which has met the high standards of electric heating, cooling, lighting—and other applications—set by the Edison Electric Institute. On your clients' buildings, this All-Electric Award serves as a reminder of your role in specifying clean, automatic, economical electric equipment.

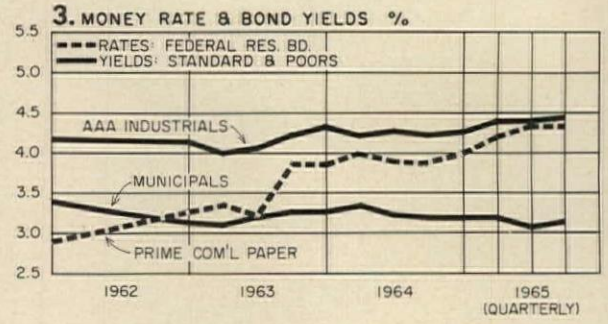
Building Construction Costs

By William H. Edgerton
Manager-Editor, Dow Building Cost Calculator,
an F. W. Dodge service

The information presented here permits quick approximations of building construction costs in 21 leading cities and their suburban areas (within a 25-mile radius). The tables and charts can be used independently, or in combination as a system of complementary cost indicators. Information is included on past and present costs, and future cost can be projected by analysis of cost trends.







A. CURRENT BUILDING COST INDEXES—NOVEMBER 1965
1941 Averages for each city = 100.0

Metropolitan Area	Cost Differential	Current Dow Index Residential	Current Dow Index Nonresidential	Per Cent Change Year Ago Res. & Nonres.
U. S. Average	8.5	271.0	279.6	+1.94
Atlanta	7.2	306.8	325.5	+2.35
Baltimore	7.9	273.1	290.5	+1.67
Birmingham	7.4	250.3	269.1	+1.60
Boston	8.5	246.6	261.0	+2.22
Chicago	8.9	300.3	315.9	+1.66
Cincinnati	8.8	261.1	277.5	+1.44
Cleveland	9.4	278.7	296.2	+3.32
Dallas	7.7	254.6	262.9	+1.32
Denver	8.3	279.5	297.1	+2.19
Detroit	9.0	274.1	287.7	+2.37
Kansas City	8.3	245.2	259.6	+2.35
Los Angeles	8.4	277.4	303.5	+3.12
Miami	8.4	267.5	280.8	+1.24
Minneapolis	8.8	270.9	288.0	+0.95
New Orleans	7.8	244.9	259.5	+2.27
New York	10.0	282.5	303.8	+2.69
Philadelphia	8.1	270.2	283.7	+1.96
Pittsburgh	9.0	253.8	269.8	+0.94
St. Louis	9.1	268.5	284.5	+3.23
San Francisco	8.5	344.4	376.8	+0.98
Seattle	8.4	246.7	378.2	+0.86

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

1941 average for each city = 100

Metropolitan Area	1952	1958	1959	1960	1961	1962	1963	1964 (Quarterly) 1st	2nd	3rd	4th	1965 (Quarterly) 1st	2nd	3rd	4th
U.S. AVERAGE 21 Cities	213.5	248.9	255.0	259.2	264.6	266.8	273.4	274.7	276.8	278.6	279.3	279.5	281.0	288.7	
Atlanta	223.5	277.7	283.3	289.0	294.7	298.2	305.7	310.0	312.3	313.4	313.7	313.9	317.9	320.6	
Baltimore	213.3	251.9	264.5	272.6	269.9	271.8	275.5	277.2	279.3	280.5	280.6	280.5	281.0	284.7	
Birmingham	208.1	233.2	233.2	240.2	249.9	250.0	256.3	258.0	259.9	260.1	260.9	261.2	264.1	264.9	
Boston	199.0	230.5	230.5	232.8	237.5	239.8	244.1	246.1	247.9	251.3	252.1	251.7	252.6	256.3	
Chicago	231.2	273.2	278.6	284.2	289.9	292.0	301.0	302.2	304.5	305.1	306.6	306.5	307.3	310.2	
Cincinnati	207.7	250.0	250.0	255.0	257.6	258.8	263.9	265.1	267.1	268.9	269.5	269.4	270.2	272.9	
Cleveland	220.7	257.9	260.5	263.1	265.7	268.5	275.8	276.3	278.4	282.0	283.0	282.3	283.4	290.8	
Dallas	221.9	230.5	237.5	239.9	244.7	246.9	253.0	253.7	255.6	255.6	256.4	256.9	257.9	259.5	
Denver	211.8	252.8	257.9	257.9	270.9	274.9	282.5	282.6	284.7	287.3	287.3	287.3	288.2	292.7	
Detroit	197.8	239.8	249.4	259.5	264.7	265.9	272.2	272.7	274.7	277.7	277.7	277.7	279.3	283.5	
Kansas City	213.3	235.0	239.6	237.1	237.1	240.1	247.8	246.2	248.0	249.6	250.5	251.2	252.0	255.0	
Los Angeles	210.3	253.4	263.5	263.6	274.3	276.3	282.5	284.0	286.1	286.1	288.2	288.9	289.7	295.8	
Miami	199.4	239.3	249.0	256.5	259.1	260.3	269.3	270.1	272.1	273.1	274.4	274.4	275.4	276.6	
Minneapolis	213.5	249.9	254.9	260.0	267.9	269.0	275.3	275.0	277.1	281.6	282.4	283.4	283.6	283.9	
New Orleans	207.1	235.1	237.5	242.3	244.7	245.1	248.3	247.1	248.9	249.3	249.9	250.5	253.1	255.1	
New York	207.4	247.6	260.2	265.4	270.8	276.0	282.3	284.8	286.9	289.7	289.4	290.2	294.0	296.0	
Philadelphia	228.3	257.6	262.8	262.8	265.4	265.2	271.2	271.1	273.1	274.5	275.2	275.5	276.4	279.5	
Pittsburgh	204.0	236.4	241.1	243.5	250.9	251.8	258.2	260.8	262.7	262.9	263.8	264.0	264.9	265.9	
St. Louis	213.1	239.7	246.9	251.9	256.9	255.4	263.4	266.8	268.8	271.4	272.1	272.9	276.1	279.9	
San Francisco	266.4	308.6	321.1	327.5	337.4	343.3	352.4	358.2	360.9	364.1	365.4	366.6	366.9	367.7	
Seattle	191.8	225.8	232.7	237.4	247.0	252.5	260.6	260.1	262.0	265.7	266.6	265.1	266.3	267.8	

HOW TO USE TABLES AND CHARTS: Building costs may be directly compared to costs in the 1941 base year in tables A and B: an index of 256.3 for a given city for a certain period means that costs in that city for that period are 2.563 times 1941 costs, an increase of 156.3% over 1941 costs.

TABLE A. 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 first city are 25% higher than costs in second. Also, costs in second city are 80% of those in first (8.0 ÷ 10.0 = 80%) or 20% lower in the second city.

TABLE B. 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 index for a city for one period (200.0) divided by index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than those of the other. Also, second period costs are 75% of those of the other date (150.0 ÷ 200.0 = 75%) or 25% lower in the second period. CHART 1. Building materials indexes reflect prices paid by builders for quantity purchases delivered at construction sites. CHART 2. The $1.20 per hour gap between skilled and unskilled labor has remained fairly constant. CHART 3. Barometric business indicators that reflect variations in the state of the money market.

It's too late to save money now!

Good design provides for modern communications long before the concrete is poured.

Complex telephone systems, television, data transmission . . . today's businesses are depending more and more on services like these.

Plan for them in the blueprints.

Call the Architects and Builders Service at your local Bell Telephone Business Office.

No obligation, of course.

For further information on communications planning, see Sweet's Architectural File 33a/Be.

Bell System
American Telephone and Telegraph and Associated Companies

Floors, please! THE NEW CISSELL PETITE DRYER is as much at home on the 20th floor... as it is the basement!

That's the beauty of the new Cissell Dryer. It is designed especially for high-rise apartments and can be installed anywhere. Because of its small size . . . 48″ height, 28¾″ width and 30″ depth . . . it does not require a lot of space or extra ceiling height. It can easily be installed in the basement . . . or in smaller individual floor laundries. But that's only the beginning. The new Cissell Petite Dryer holds a full 16 pounds. It dries rapidly . . . has two temperature settings . . . 150 degrees Low and 185 degrees High. Its big 28″ x 20″ basket assures soft, fluffy clothes . . . will not snag the most delicate materials.

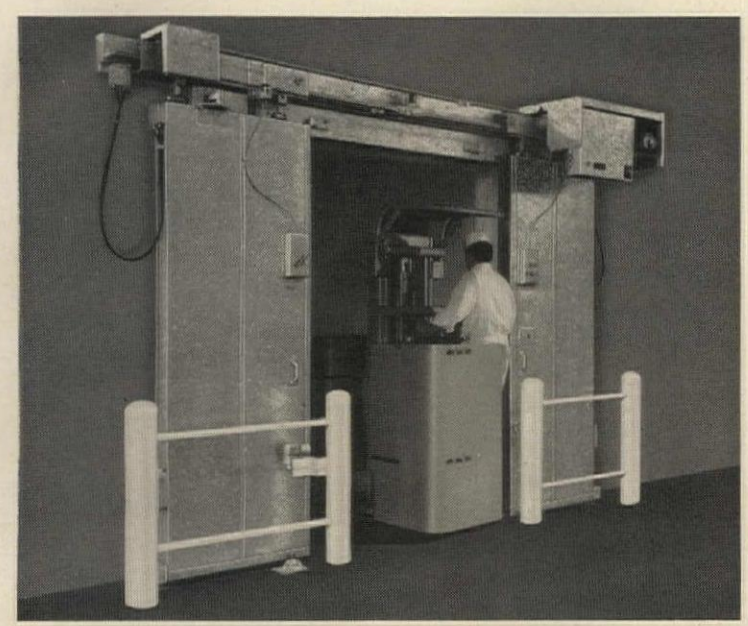
The W. M. Cissell Mfg. Co., Inc., has been manufacturing commercial laundry and drycleaning dryers, and a complete line of drycleaning finishing equipment, for more than a quarter of a century. Cissell Dryers and Finishing Equipment are in service today in virtually every country of the world. W. M. Cissell Mfg. Co., Inc., Louisville, Ky. **CISSELL***

*T. M. Reg. U. S. Pat. Off.

← For more data, circle 35 on Inquiry Card For more data, circle 36 on Inquiry Card For more data, circle 37 on Inquiry Card →

Jamison doors meet critical requirements of temperature, traffic, or limited space

HIGH VOLUME TRUCK TRAFFIC speeds through Electroglide Mark II doors. These power doors offer fast, automatic opening and closing to handle heavy traffic and save refrigeration. Available in both bi-parting and single leaf.



RESISTANCE TO HARD, ROUGH USAGE. Jamison JAMOTUF* Plastic Door for cooler or freezer is made from a new high-strength, tough plastic formulation. Ideal for food processing and meat packing plants.

LIMITED WALL SPACE. Jamison Vertical Sliding Door permits closer positioning of loading dock doors to service more trucks. Requires adequate ceiling height.

LIMITED CEILING HEIGHTS. Jamison Hinged Panel Overhead Door is for loading docks with low overhead space. Trucks back tight against gasket-type cushion, minimizing cold loss.

Whatever your door problem, Jamison makes a door to solve it. Write for data to Jamison Cold Storage Door Co., Hagerstown, Md.

JAMISON
COLD STORAGE DOORS

*JAMOTUF is a Jamison trademark.

For more data, circle 65 on Inquiry Card

PRACTICAL WALL AND CEILING SYSTEMS FOR SOUND AND FIRE CONTROL

IN HOMES / APARTMENTS / STORES / MOTELS / OFFICES / SCHOOLS / HOSPITALS

Bestwall Gypsum, a leader in incombustible wall and ceiling assemblies, now makes available for the benefit of contractors, builders, architects, a brochure called "Sound Advice."

This manual describes sound and how to control and isolate it. It reports on various wall assemblies, demonstrating them with cutaway drawings, discusses sound and fire test ratings achieved in each assembly, lists materials, provides complete application details.

WOOD STUD PARTITIONS
(load-bearing)

2 Layers Bestwall Firestop Both Sides
STC-41—Fire rating—2 hrs. Combustible

Bestwall Firestop On Resilient Channel
STC-47—Fire rating—1 hr. Combustible

Bestwall Firestop Over Sound Deadening Board
STC-46—Fire rating—1 hr. Combustible

2 Layers Bestwall Firestop One Side, 1 Layer On Resilient Channel Other Side
STC-48—Fire rating—1½ hrs. Combustible*

Bestwall Firestop On Resilient Channel With Fiber Glass Insulation In The Cavity
STC-50—Fire rating—1 hr. Combustible

STEEL STUD PARTITIONS
(non-load bearing)

2 Layers Bestwall Firestop Both Sides
STC-47—Fire rating—2 hrs. Incombustible

2 Layers Bestwall Firestop One Side, 1 Layer On Other Side With Fiber Glass Insulation In The Cavity
STC-50—Fire rating—1½ hrs. Incombustible

Bestwall Firestop And Coreboard With Fiber Glass Insulation In The Cavity
STC-52—Fire rating—1½ hrs. Incombustible*

2 Layers Bestwall Firestop Both Sides With Fiber Glass Insulation In The Cavity
STC-52—Fire rating—2 hrs. Incombustible

GYPSUM STUD PARTITIONS
(non-load bearing)

Bestwall Firestop Over Sound Deadening Board
STC-51—Fire rating—1 hr. Combustible

DOUBLE SOLID PARTITION
(non-load bearing)

Bestwall Gypsum Wallboard Over Coreboard
STC-47—Fire rating—2 hrs. Combustible
(Rated Incombustible with metal track instead of wood runners)

TRIPLE SOLID PARTITION
(non-load bearing)

1 Layer ½" Bestwall Gypsum Wallboard Over Coreboard With Fiber Glass Insulation In One Cavity
STC-57—Fire rating—3 hrs. Combustible*
(Rated Incombustible with metal track instead of wood runners)

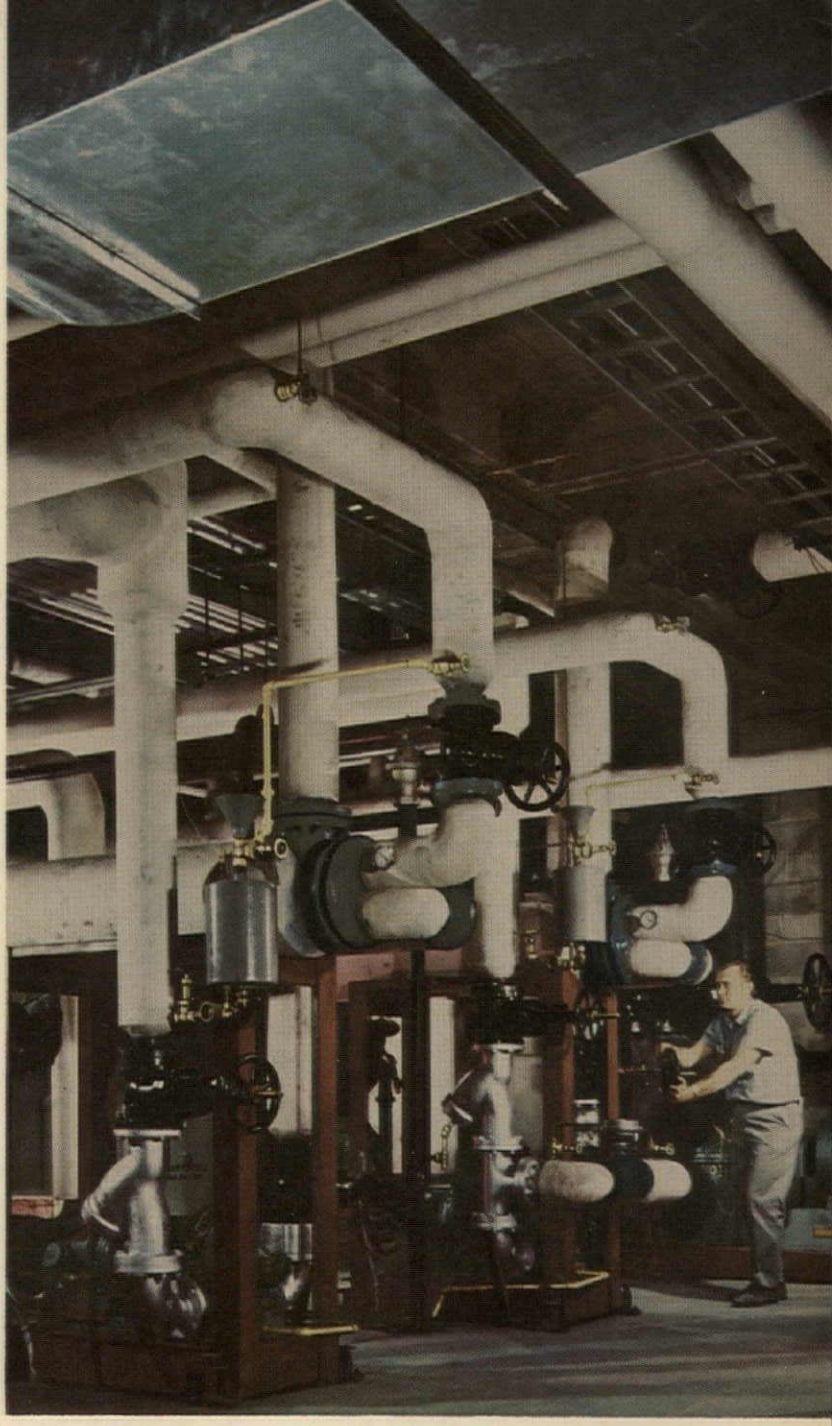
WOOD FLOOR AND CEILING ASSEMBLY WITH BESTWALL FIRESTOP APPLIED TO RESILIENT METAL FURRING
STC-47—Fire rating—1 hr. Combustible

Get your free copy of this valuable manual from our division headquarters, or from any of our district sales offices. Call or write promptly.

*Estimated, pending completion of official fire tests.

GP GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION
2 INDUSTRIAL BOULEVARD, PAOLI, PENNSYLVANIA

For more data, circle 66 on Inquiry Card



How to keep your building earning beautifully

For the sake of future occupancy, put the enduring beauty of stainless steel to work where people can see it . . . in your building exterior, entranceway, lobby, and elevators.

For the same reason, put the reliability of steel tubular products and ductwork where people can feel it . . . in your building's vital heating, air conditioning, plumbing, and electrical systems . . . and in sidewalk snow melting.

Republic Stainless Steel grows more beautiful with the passing of time. Its soft, lustrous surface resists staining and tarnishing. Stainless is easily washed. It gives you outstanding protection against scratches, denting, or other accidental damage.

Galvanized steel ductwork and pipe provide high strength, low coefficient of expansion, easy installation, and are firesafe. These features add greatly to the dependability and maintainability of mechanical systems.

In electrical conduit, steel again gives you maximum life and at lower cost—as with Republic's lightweight ELECTRUNITE E.M.T. Buried in concrete or exposed, this light-walled conduit has proved its reliability in tens of thousands of installations. Cost savings are such that you can buy and install the next larger size ELECTRUNITE® in place of rigid steel conduit at no extra cost.

There are many more cost-cutting ideas in steel waiting to give you a better return on your building investment. For information, write Republic Steel Corporation, Dept. AR-1327, 1441 Republic Bldg., Cleveland, Ohio 44101.

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This Month's Books

Nervi

AESTHETICS AND TECHNOLOGY IN BUILDING. *By Pier Luigi Nervi. Harvard University Press, Cambridge, Mass. 201 pp., illus. $9.95.*

Nervi shared the Charles Eliot Norton Professorship of Poetry for the year 1961-62 at Harvard University. This publication is a result of those lectures. The text is paralleled with numerous photographs of Nervi's major works (mostly familiar) at various stages of construction.

The language is clear and reflects Nervi's dual investigation of architecture of the past and the present and of his point of view as builder and as philosopher: "A technically perfect work can be esthetically inexpressive, but there does not exist, either in the past or in the present, a work of architecture which is accepted and recognized from the esthetic point of view which is not also excellent from a technical point of view. Good technology seems to be a necessary though not sufficient condition to good architecture."

His search among the great variety of building techniques to find a number of constants which define building technology gives meaning to the statement. The conditions are summed up in the famous phrase, "built correctly," an objective which "is the same for the constructions of today as those of the past."

His revolutionary advances with "ferro-cemento" and the elimination of wooden forms have allowed for a new vocabulary of forms. He speaks at length on the "plastic richness of concrete," elucidating by providing analyses of his major works. "The relationship between esthetics and technology in building has acquired a new richness and variety with the introduction of reinforced concrete, the most fertile, ductile and complete construction process that mankind has yet found. It is not an exaggeration to say that the development of a new esthetics . . . is being brought about by the unique construction and plastic potentialities of this material."

Flaminio Stadium, Rome—from "Aesthetics and Technology in Building"

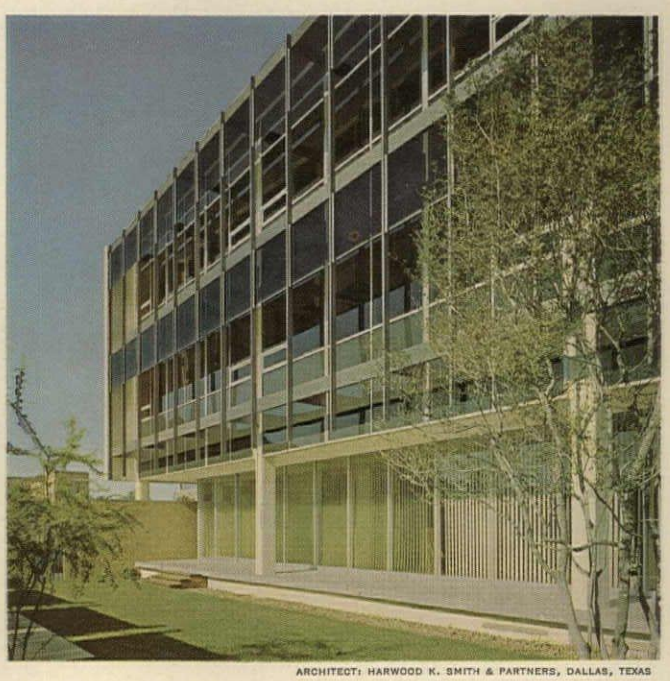
The author's analyses of his design problems give one a clear understanding of the technical and construction problems involved. Also, he reconstructs and describes the methods and objective data which guided the planning phases of his buildings starting with the Municipal Stadium of Florence in 1928 and extending through an extensive series of later examples.

Nervi's prime condition of architectural expression—"the inevitability of its structural design"—is echoed in his concluding statements in these addresses: "The resisting structure of a building must be correctly conceived, founded on schemes which best correspond to the function of transferring weights and stresses to the supports and to the foundations by the simplest and most natural method. It is also necessary that the scheme take body and become a complete organism, true and authentic *structural architecture.*"

On the training of architects: "The core of the problem, then, is how to develop in students a *static sense,* the indispensable basis of intuition of structural imagination, and how to

continued on page 73

For solar control... sun screens of PLEXIGLAS



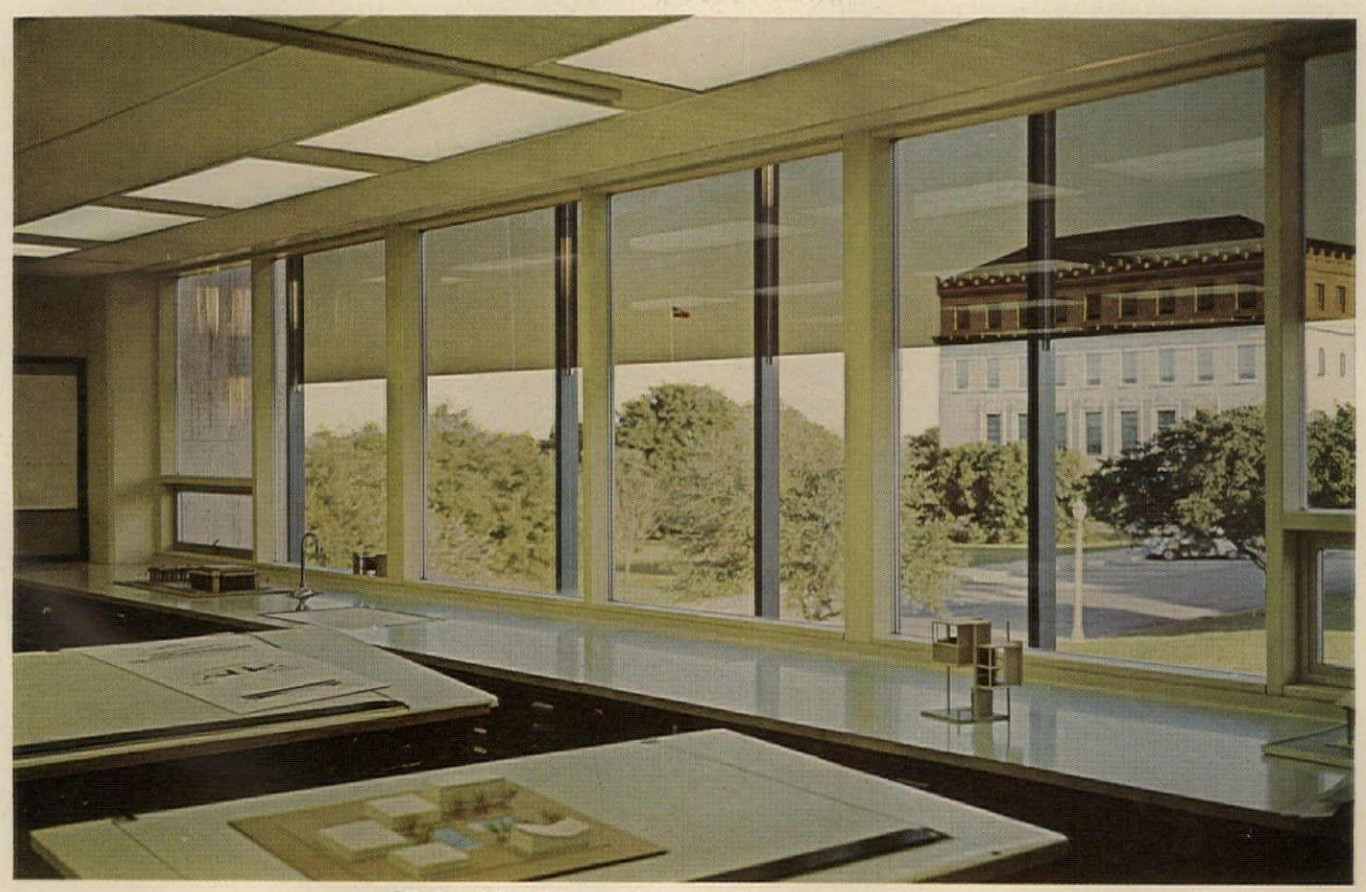
ARCHITECT: HARWOOD K. SMITH & PARTNERS, DALLAS, TEXAS

When the architect for the Texas A. & M. University Architectural School at College Station, Texas, considered the problem of solar control with sun screens, PLEXIGLAS® acrylic plastic was specified. Why? Because the light weight and impact resistance of PLEXIGLAS make possible a minimum structure to support the sun screens.

The ⅜" thick transparent gray #2088 PLEXIGLAS sheet selected for these sun screens is one of a full range of tints that are available to satisfy a wide variety of light transmittance, glare and solar heat requirements.

Get information and installation details on sun screens of PLEXIGLAS acrylic plastic. Write to Rohm & Haas for technical bulletins PL-591 and PL-592.

ROHM AND HAAS
PHILADELPHIA, PENNSYLVANIA 19105



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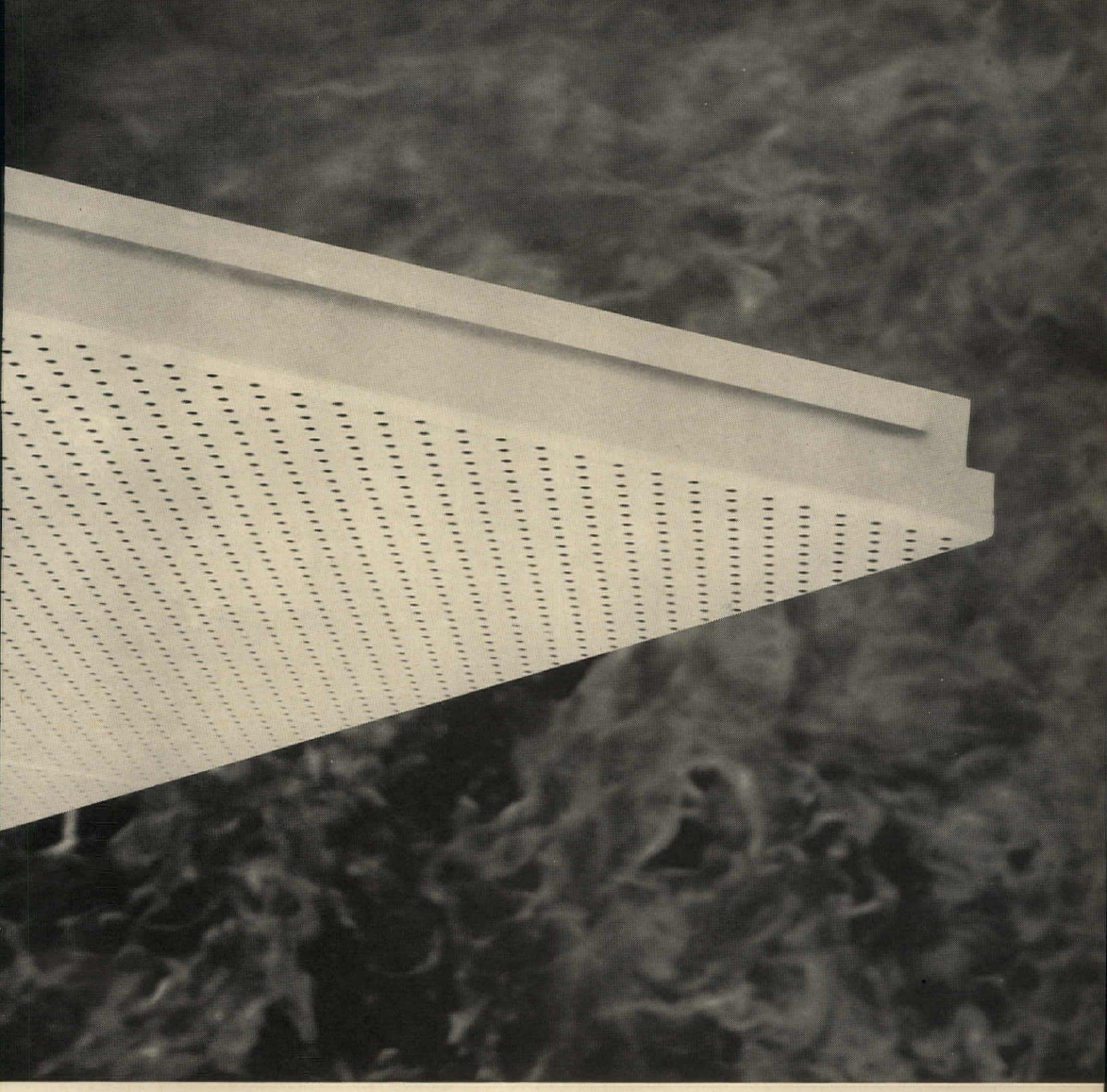
Permanence! Low-cost beauty!

New Gold Bond Fire-Shield Acoustimetal is the *only* 2-hour fire-rated metal ceiling material that offers accessibility plus three surface patterns (Needlepoint, Diagonal and Square); two



sizes (1'x1' and 1'x2'); durability, washability, high light reflection and .80-.95 NRC ratings. Cost? Fire-Shield Acoustimetal installed cost compares favorably with other fire-rated concealed tile assemblies. Thinking about distinctive ceilings? Think new with Gold Bond. Your Gold Bond® Representative has literature and samples. Or write to National Gypsum Company, Department AR-125, Buffalo, New York 14225.

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ACOUSTIMETAL

One of many fine products that come from 40 years of thinking new

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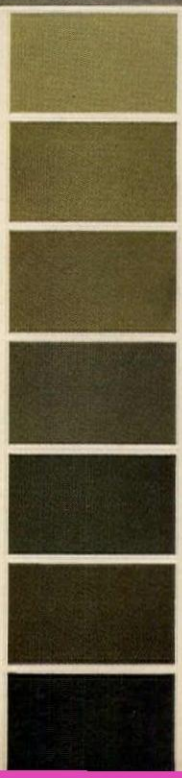


to the boldest black yet achieved."

NEW DESIGN SCOPE WITH REYNOLDS ALUMINUM ARCHITECTURAL FINISHES

The Reynocolor 5000 series excels in color selection and in depth and hardness of the anodic coat. Colors range from gold through bronzes and grays to the boldest black yet achieved.

These finishes are produced not by dyes but by the reaction of special alloys to the anodic bath. They stand up under exterior exposure without perceptible fading, and are especially resistant to abrasion.

5000 series finishes apply to both sheet and extrusions. They add new design values for curtain walls, store fronts, re-facing and partitions. For information, write to Dept. R-12, Reynolds Aluminum, Richmond, Va. 23218.

Watch "THE RED SKELTON HOUR", Tuesdays, CBS-TV

REYNOLDS
where new ideas take shape in
ALUMINUM

Required Reading

continued from page 68

give them a mastery of rapid, approximate calculations for purposes of orientation. I think the best method would be to trace the development of structural schemes from ancient times. . . ."

This "master builder," recipient of the 1964 A.I.A. Gold Medal, also said, "The architect must be aware of all technical possibilities, all services to be rendered . . . and add that indefinable element of art."

Books Received

THE CITY IS THE FRONTIER. *By Charles Abrams. Harper & Row, 49 E. 33rd St., New York, N.Y. 394 pp. $6.50.*

CAMILLO SITTE AND THE BIRTH OF MODERN CITY PLANNING. *By George R. Collins and Christiane Crasemann Collins. Volume Number 3 in the Columbia University Studies in Art History and Archaeology. Random House, Inc., 457 Madison Ave., New York, N.Y. 10022. 232 pp., illus. Paperbound, $2.95.*

ANODIZED ALUMINUM—STP 388. *By the American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103. 150 pp. $3.00.*

ARCHITECTURE WORTH SAVING IN RENSSELAER COUNTY. *By Bernd Foerster. Rensselaer Polytechnic Institute, Troy, N.Y. 207 pp., illus. $2.75.*

NEW YORK CITY IN CRISIS. *By the staff of the New York Herald Tribune; prepared under the direction of Barry Gottehrer. David McKay Company, Inc., 750 Third Ave., New York, N.Y. 10017. 212 pp. Clothbound, $4.50; Paperbound, $1.95.*

REINHOLD DATA SHEETS. *By William J. Hornung. Reinhold Publishing Corp., 430 Park Ave., New York, N.Y. 10022. 238 pp., illus. $15.00.*

HOUSING FACTS AND TRENDS. *By House & Home Magazine. McGraw-Hill, Inc., 330 W. 42nd St., New York, N.Y. 10036. 201 pp., illus. $15.00.*

ENCLOSED MALL SHOPPING CENTERS. *By the International Council of Shopping Centers, 445 Park Ave., New York, N.Y. 10022. 60 pp., illus. $18.00.*

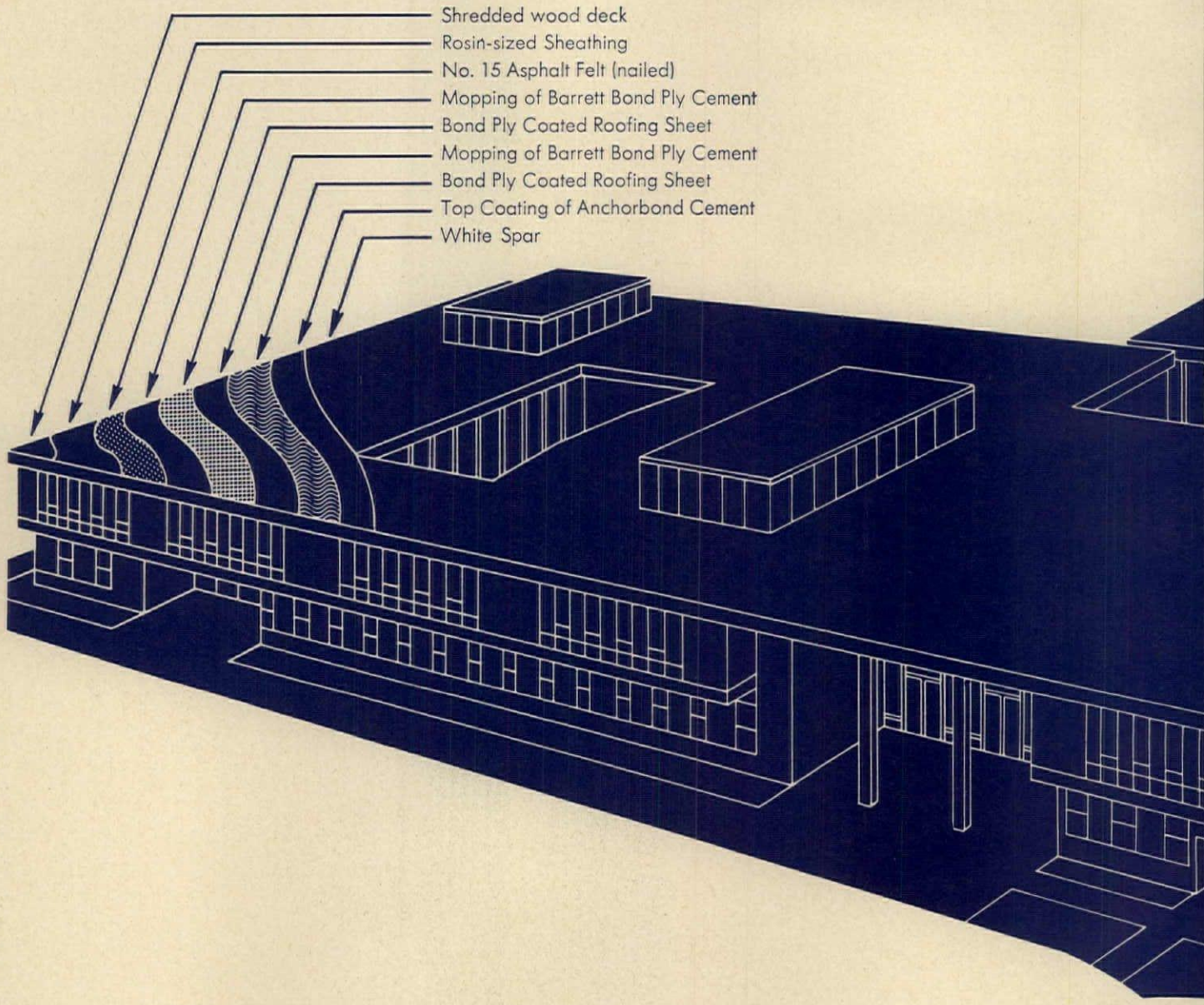
THE RADIANCE OF CHARTRES. *By James Rosser Johnson. Volume Number 4 in the Columbia University Studies in Art History and Archaeology. Random House, Inc., 457 Madison Ave., New York, N.Y. 10022. 96 pp., illus. Paperbound, $2.95.*

THE ARTIST AND THE NUDE. *By Mervyn Levy. Clarkson N. Potter, Inc., 23 E. 67th St., New York, N.Y. 10021. 155 pp., illus. $10.00.*

continued on page 78

Half of this roof was built in a factory.

It meant less time and trouble to put it down, and extra quality to boot.



Northern Highlands Regional High School, Allendale, N.J.

Architects: The Perkins & Will Partnership, White Plains, N.Y.
Builder: A. A. La Fountain Inc., Hackensack, N.J.
Roofer: Advanced Roofing & Sheet Metal Co., Wallington, N.J.

Here's a new roof system that gives you the same 20-year bonded protection that conventional systems offer, but makes life a lot easier. It's a Barrett Bond Ply Roof. Perkins & Will used it on the spanking new Allendale, N. J. Northern Highlands Regional High School.

A Barrett Bond Ply System consists of Barrett Bond Ply Coated Roofing Sheet—coated on each side with a heavy, uniform layer of asphalt—and put down with Barrett Bond Ply Cement. This means extra quality because a big chunk of the labor originally done on the job is done in our factory under conditions of strict quality control.

Results: two less sheets and two less moppings for the roofer. More of the roofing dollar in known quality materials, less in labor. And more accurate job bids.

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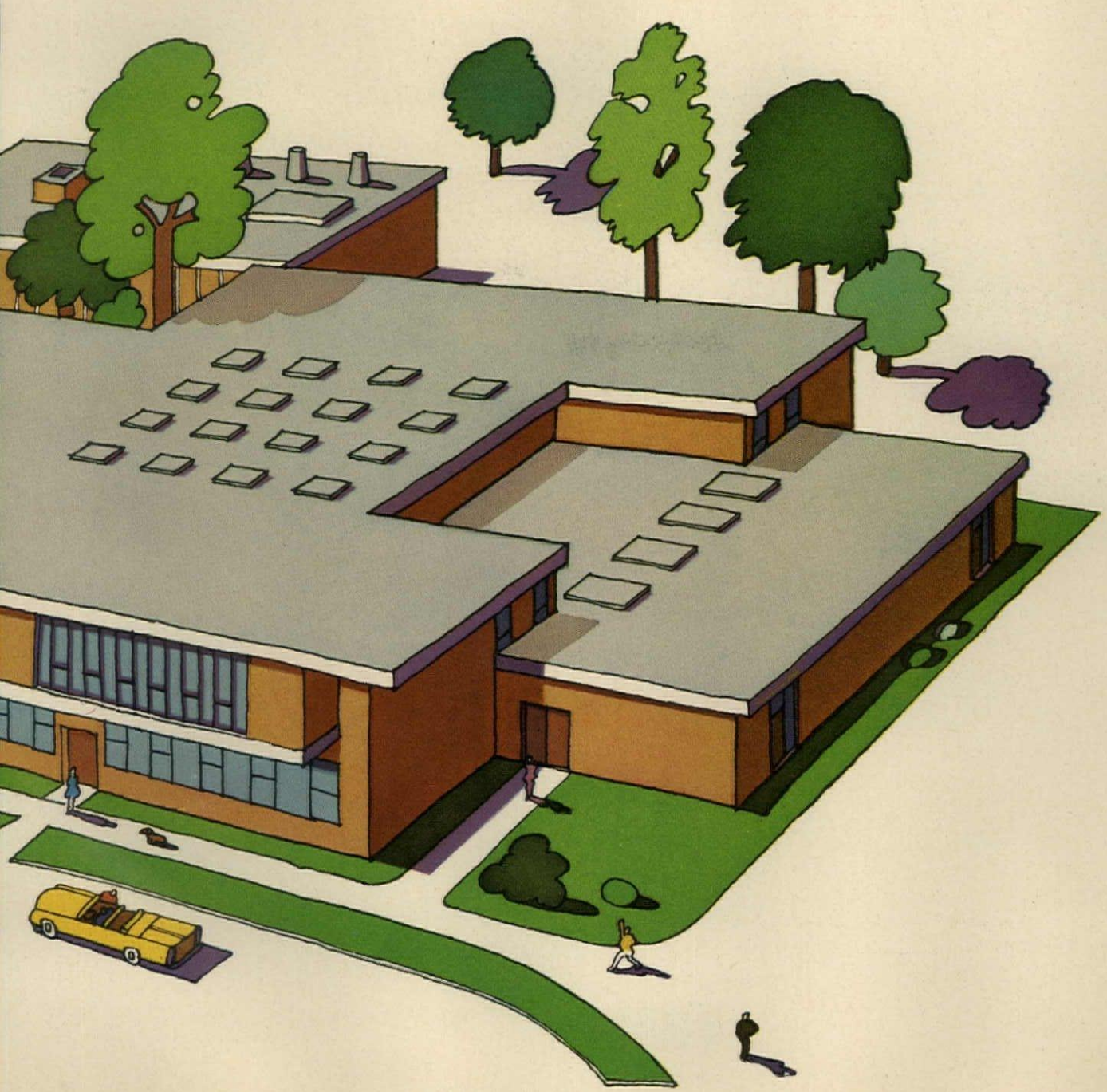

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The new movable partition system that's beautiful—durable and versatile

Modern Partitions' new Movable Partition Systems are made with Videne Paneling by Goodyear, featuring the remarkable surface that looks and feels like real wood veneer, yet fights abrasion, stains and fade. Even crayon wipes off with a damp cloth. Videne will not chip, crack, peel, or yellow with age.

The Modern System incorporates many unique engineering features to speed installation and permit quick space alterations. Extra large built-in raceways permit the use of standard wiring materials and reduce wiring costs.

The new M3 Sound Core construction offers excellent acoustical qualities for better sound control. Riverbank Laboratories rate the system as Sound Transmission Class 43.

Modern offers virtually unlimited design possibilities with Videne paneling: 16 realistic woodgrain patterns, 34 architecturally oriented solid colors and 6 abstract designs.

What about cost? Modern Partitions, made with Videne Paneling, are actually priced below other top-quality partition systems.

For more information on Modern Partitions, write Modern Partitions, Inc., Holland, Michigan 49423—Representatives nationwide.

For information on Videne Paneling, write The Goodyear Tire & Rubber Company, Videne Division, Akron, Ohio 44316.

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MODERN PARTITIONS, INC.

HOLLAND, MICHIGAN 49423

with surfaces of

VIDENE by GOODYEAR

For more data, circle 77 on Inquiry Card

Required Reading

continued from page 73

APPLIED STRUCTURAL DESIGN OF BUILDINGS. *By Thomas H. McKaig. McGraw-Hill Book Company, 330 W. 42nd St., New York, N.Y. 10036. 494 pp., illus. $17.50.*

GUIDE TO GOVERNMENTAL PURCHASING. *By Joseph W. Nicholson, Thomas J. Nammacher and Keith L. Smith. Lakewood Publications, 1645 Hennepin Ave., Minneapolis, Minn. 55403. 450 pp. $15.00.*

THE CHICAGO SCHOOL OF ARCHITECTURE. *By Mark L. Peisch. Volume Number 5 in the Columbia University Studies in Art History and Archaeology. Random House, Inc., 457 Madison Ave., New York, N.Y. 10022. 177 pp., illus. Paperbound, $2.95.*

GARDENS MAKE ME LAUGH. *By James Rose. Taplinger Publishing Co., Inc., 119 W. 57th St., New York, N.Y. 151 pp., illus. $4.95.*

CONTEMPORARY FURNITURE MAKING FOR EVERYBODY. *By John G. Shea. D. Van Nostrand Company, Inc., 120 Alexander St., Princeton, N.J. 178 pp., illus. $7.95.*

CITY PLANNING ACCORDING TO ARTISTIC PRINCIPLES. *By Camillo Sitte. Translated by George R. Collins and Christiane Crasemann Collins. Volume Number 2 in the Columbia University Studies in Art History and Archaeology. Random House, Inc., 457 Madison Ave., New York, N.Y. 10022. 196 pp., illus. Paperbound, $2.95.*

HOW TO BUILD MOBILE HOME PARKS. *By Fred Sparer. Trail-R-Club of America, Box 1376, Beverly Hills, Calif. 301 pp., illus. $8.50.*

DESIGN IN THE FEDERAL GOVERNMENT. *By the Graduate School, U.S. Department of Agriculture, Washington, D.C. 58 pp., illus. $3.00.*

CONCRETE TECHNOLOGY AND PRACTICE. *By W. H. Taylor. American Elsevier Publishing Company, Inc., 52 Vanderbilt Ave., New York, N.Y. 10017. 639 pp., illus. $15.00.*

DESIGNING AND DECORATING INTERIORS. *By David B. Van Dommelen. John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10016. 277 pp., illus. $9.95.*

KITCHEN PLANNING GUIDE. *By Robert Wanslow, A.I.A. Small Homes Council, Building Research Council, Mumford House, University of Illinois, Urbana, Ill. 255 pp., illus. $4.00.*

DILEMMAS OF URBAN AMERICA. *By Robert C. Weaver. Harvard University Press, Cambridge, Mass. 138 pp. $3.50.*

SUBURBAN DIFFERENCES AND METROPOLITAN POLICIES. *By Oliver P. Williams, Harold Herman, Charles S. Liebman and Thomas R. Dye. University of Pennsylvania Press, 3729 Spruce St., Philadelphia, Pa. 19104. 363 pp., illus. $6.00.*

ARCHITECTURAL PRINCIPLES IN THE AGE OF HUMANISM. *By Rudolf Wittkower. Volume Number 1 in the Columbia University Studies in Art History and Archaeology. Random House, Inc., 457 Madison Ave., New York, N.Y. 10022. 173 pp., illus. Paperbound, $2.95.*

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5601 West 26th Street, Chicago, Illinois—Telephone 312/BI 2-2000; in Cicero: 312/TO 3-4000. Manufacturers and erectors of a full line of steel and aluminum building components for the construction industry, including aluminum windows, curtain walls and grid wall systems with Kalcolor finishes. Inquiries are solicited from other manufacturers requiring large volume Kalcolor work. Sales offices in principal cities.

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MILLER INDUSTRIES, INC.
Reed City, Michigan—Telephone 616/832-4911. Custom extruders and fabricators of architectural aluminum shapes. Complete line of standard and custom narrow line and wide stile doors. Full flush panel doors and commercial sliding assemblies, frames, grids, guard rails, etc. Quotations on custom and specialty items will be furnished on request.

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SOUTHERN EXTRUSIONS, INC.
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Dallas, Texas—Telephone: 214/741-3521. Texas Aluminum Company Division: for soft and hard alloy extrusions. Aluminum Finishing Inc. Division: for buffing, etching, dyeing, anodizing and Kalcolor processing. Aluminum Fabricating Division: for painting, K.D., and fabricated parts of all kinds. Aluminum Fronts Division: for store fronts, and related architectural products.

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800 East Bridge Street, Plainwell, Michigan—Telephone: 616/685-8711. Vampco's major products are aluminum windows, curtain walls, entrance doors and extrusions. We have a 2000-ton and a 1250-ton extrusion press, cast house, stretching, heat treating, machine fabricating and ample packing and shipping facilities. We also have etch and lacquer and anodizing equipment operated by skilled workmen.

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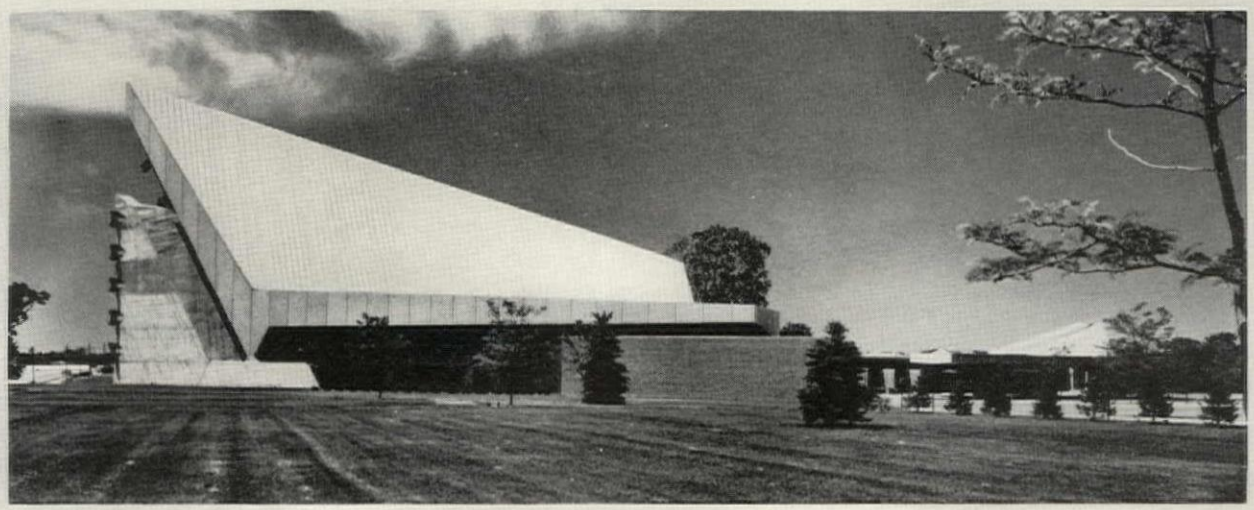
Kaiser Aluminum salutes the National Association of Architectural Metal Manufacturers and the Architectural Aluminum Manufacturers Association for their outstanding work in the establishment of quality standards for materials and workmanship in the field of architectural metals.

AN ARCHITECT LOOKS AT TERNE: Percival Goodman, one of the foremost living designers of ecclesiastical buildings, has this to say of the eighty thousand square feet of Terne metal roofing recently installed on Shaarey Zedek, the world's largest synagogue: "To be entirely frank, we had originally wanted to use a considerably more expensive material than Follansbee Terne. Now that the latter is in place, however, we are satisfied that no better choice could have been made. Terne not only afforded the widest possible latitude in form and color along with time-tested functional integrity, but it did all this at a figure well below preliminary estimates for a metal roof."



Congregation of Shaarey Zedek, Southfield (Detroit), Michigan
Architects & Engineers: Albert Kahn Associated Architects & Engineers, Inc., Detroit, Michigan
Associated Architect: Percival Goodman, F.A.I.A., New York, New York
Roofing Contractor: Firebaugh & Reynolds Roofing Company, Detroit, Michigan

Follansbee is the world's pioneer producer of seamless terne roofing

FOLLANSBEE STEEL CORPORATION
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Operating windows, fixed windows, single-light windows, large windows, small windows, divided-light windows.

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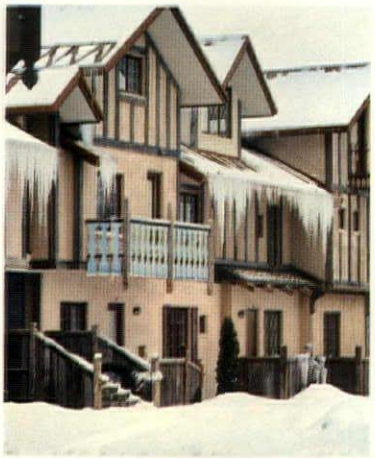
But not a single imported window! And scarcely any custom millwork! Virtually all are **stock windows.**

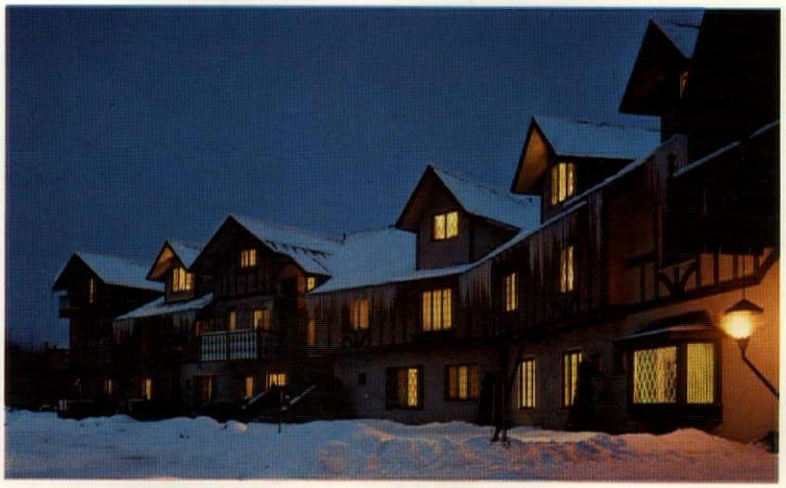
Virtually all are Andersen Casement Windows—one of six types available in an abundant variety of sizes.

Notice how they contribute to the chalet's overall design . . . helping to create a unique, stylized piece of architecture.

It's what you might expect from a window design so **carefully detailed** . . . so precisely manufactured.

Don't import it. Design it with the help of stock Andersen Windows

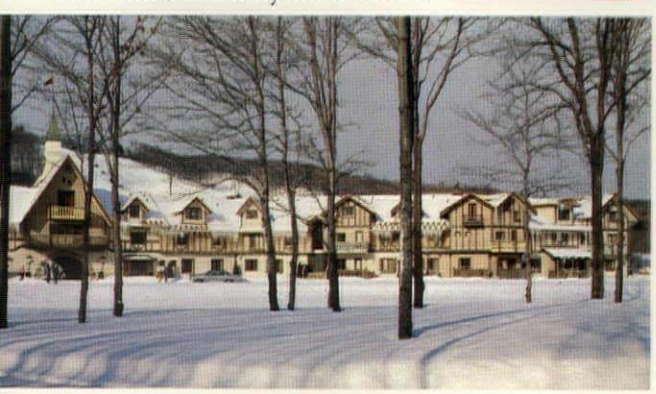


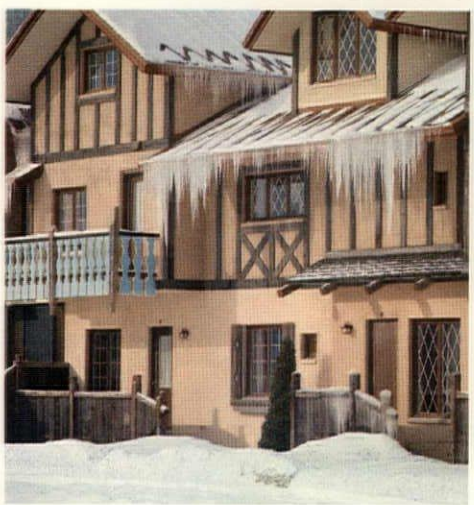


Equally important is the way they keep skiers in **snug, draft-free comfort** when the temperature dips to 30 below!

Extra-weathertight Andersen Casements (with welded insulating glass) help the owner save on heating costs, too.

Perhaps the lesson here is this: getting all involved in custom millwork may be needless.





See Andersen in Sweet's File instead. Or contact your Andersen distributor for a Tracing Detail File.

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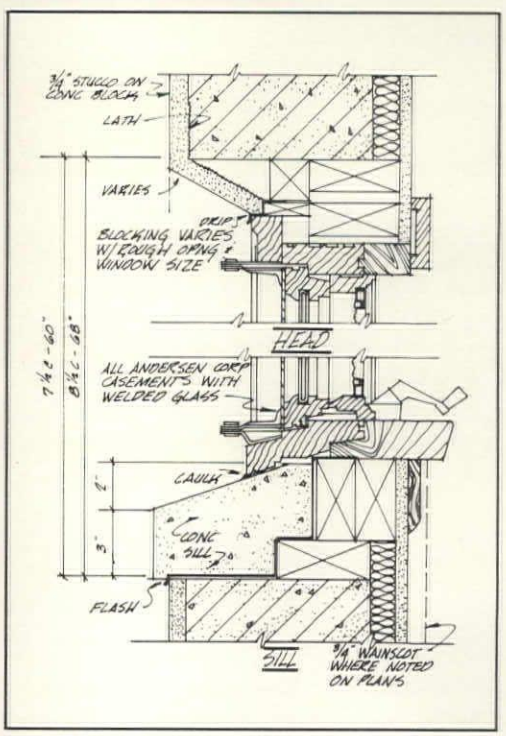

Boyne Highlands, Michigan
Architect: James H. Livingston Associates
Windows: Andersen Casements

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Highly effective gas absorption air conditioning roof mounted units are so quiet and free from annoying vibration that even top floor occupants can live or work in complete comfort.

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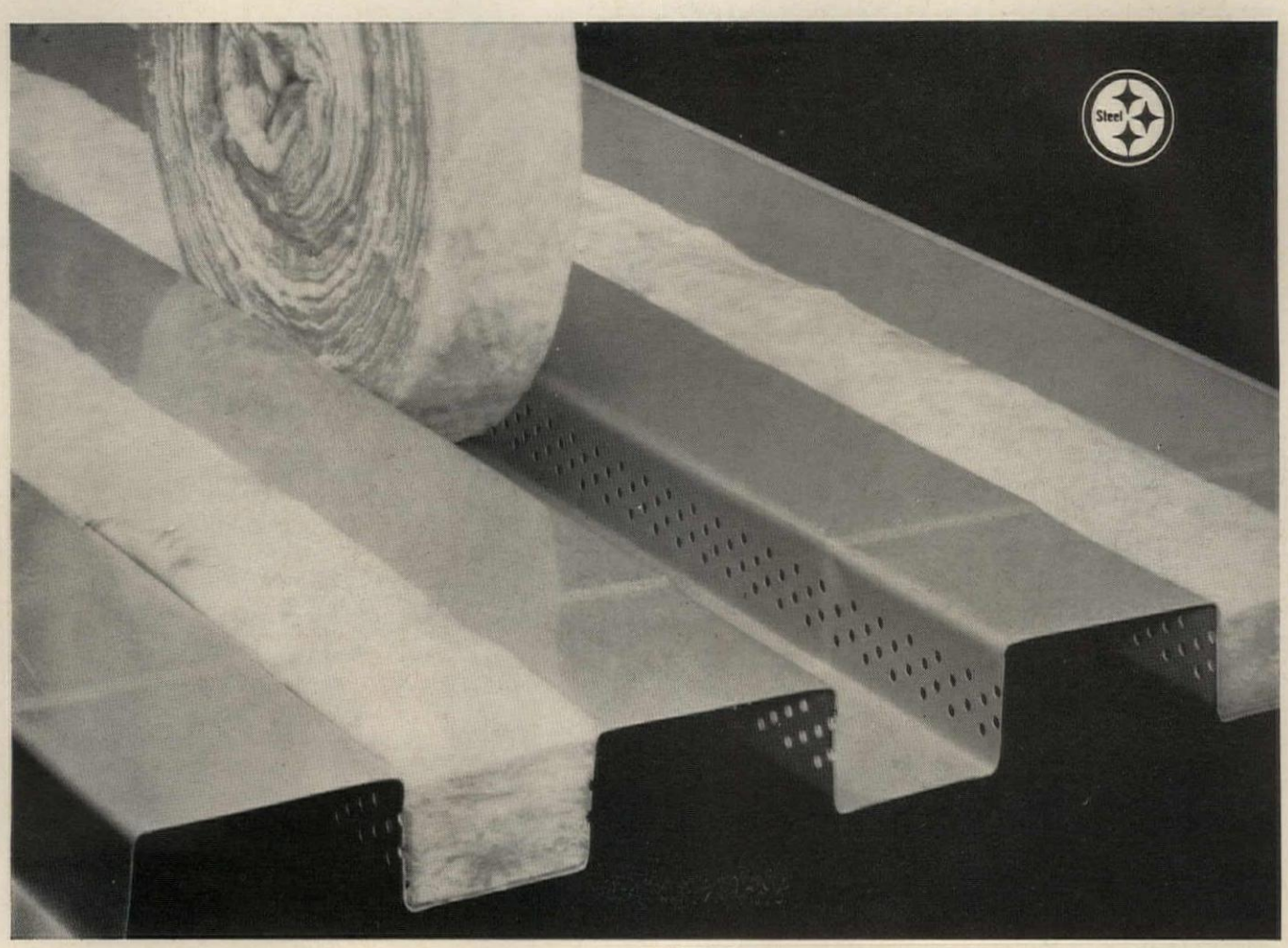

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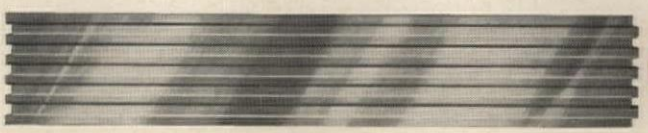


Wheeling Steel

For more data, circle 62 on Inquiry Card

Office Notes

Offices Opened

Donald V. Baker has opened an office for the practice of architecture, 4900 Travis, Houston 77002.

Arthur D. Benjamin, consulting engineers, will be at 468 Park Avenue South, New York City 10016.

Kenneth Russell Miller, architect, has opened an office at 3139 Commodore Plaza, Coconut Grove, Miami.

Helm Roberts, architect-planner, has opened an office at 217 North Upper Street, Lexington, Ky. 40507.

New Firms, Firm Changes

Garfinkel, Marenberg and Associates is the new name for the consulting engineering firm of *Aaron Garfinkel* and *Sol Marenberg,* New York City.

Loebl Schlossman Bennett & Dart, architects and engineers, Chicago, have named the following men associates: *Roman Franczak, Donald J. Hackl, Kenneth Jacobs, David C. Juliano, Imre S. Langmar, Donald E. Madgwick, Joseph F. Pappalardo, John I. Schlossman* and *Frank A. Szilvasy.*

The Perkins & Will Partnership, architects with offices in Chicago, New York and Washington, has named seven new associates. In the Chicago office they are *Vytautas Germanas, John M. Marin* and *Saul H. Klibanow,* and in the Washington office they are *Virginia S. Conklin, Edmund C. Sonnenschein, Louis A. Cuomo* and *John V. Lesley.*

Slingerland and Booss, architects-engineers, New York City, have announced that *Joseph J. Mangan, R.A.* has become an associate.

Wendell A. Smith, A.I.A. and *William C. Smith, A.I.A.* have formed the partnership of *Smith & Smith, Architects, A.I.A.,* 7310 Axton Street, North Springfield, Va. 22151.

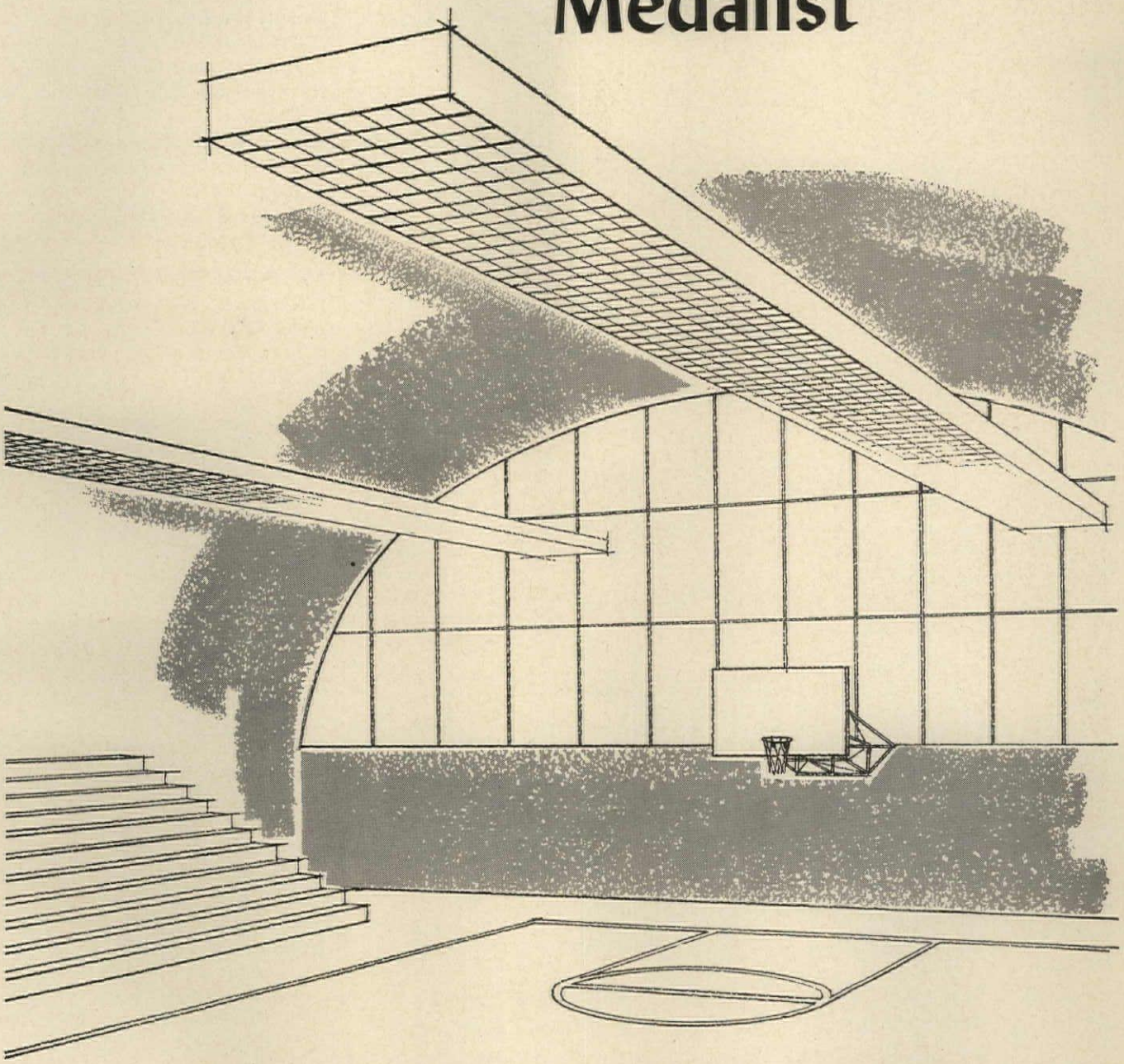
Tarapata-MacMahon Associates, Inc., architects, engineers and planners of Bloomfield Hills, Mich. have elected the following as associates: *Samuel V. Tavernit, Stanley E. Beebe, Willard Harju, William A. Talbot, Robert A. Mazur* and *Gerald E. Cullimore.*

New Addresses

Atchison, Kloverstrom, Saul & Atchison, Architects, 3970 East Exposition Avenue, Denver, 80209.

Harrell & Hamilton, Architects 2400 Republic National Bank Tower, Dallas 75201.

NEW LITECONTROL Medalist



Designed for Gymnasiums

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Nicholas J. Perkov, senior Sales Engineer, New York Branch, is a specialist with over 14 years experience in the control systems industry. He is typical of the calibre of ROBERTSHAW engineers staffing our field offices throughout the country. Call on ROBERTSHAW for assistance in the design, installation and service of complete environmental control systems.

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CONTROL SYSTEMS DIVISION

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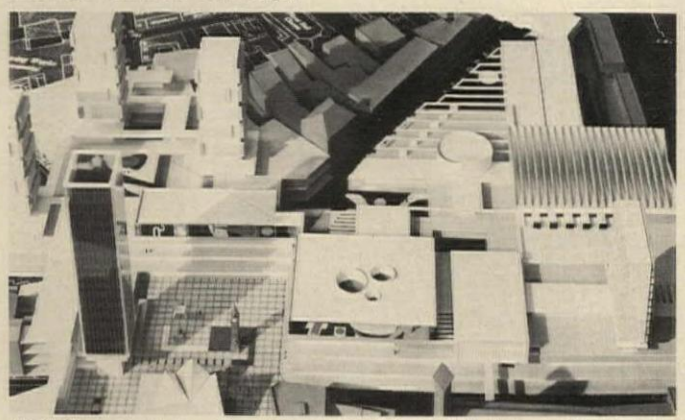
Dorchester Towers, New York City.
Owner-Builder: Milstein Associates; Architect: S. J. Kessler & Sons; Consultants and Engineers: Starrett Brothers & Eken, Incorporated; Mechanical Contractor: AFGO Engineering Company
Robertshaw
TEMPERATURE CONTROL SYSTEM

English Intersection To Become Entertainment and Commercial Core

The Clock Tower area in Leicester, England, now a busy and confused traffic intersection, will, in the next four years, be transformed into a cultural and entertainment area. This is the first large redevelopment scheme for this town, forming part of a comprehensive long-term plan of rebuilding the city center. City planning officer in charge of the project is W. K. Smigielski. In charge of the design was H. Blanchnicki.

The Victorian clock tower is being retained in a large pedestrian plaza for "continuity of tradition rather than its artistic merits." It is located next to, and is dwarfed by, a tower which will contain prestige offices. Smaller towers will be provided to the northwest of the office tower for luxury apartments. The plaza itself will also contain reflecting pool, modern sculpture and other elements to transform it into a "formal urban space."

The triangular area to the east will be developed with shops grouped along a system of shopping arcades and a large pedestrian concourse. The upper floors will be occupied by an entertainment center composed of a theater, ice rink, cinema, dance hall, hotel, restaurants, cafes and roof garden. The basement will be for delivery and will provide an underground system of service roads. A parking garage for 500 to 600 cars will be located at the extreme east of the site.



At left is luxury office tower within a pedestrian plaza, surrounded by stepped walkways. At right is the triangular block containing a comprehensive shopping and entertainment center. At top left is a cluster of apartment towers.

View of the proposed entertainment center, located above the two shopping levels and storage-delivery area.

Modern Door Control by

LCN

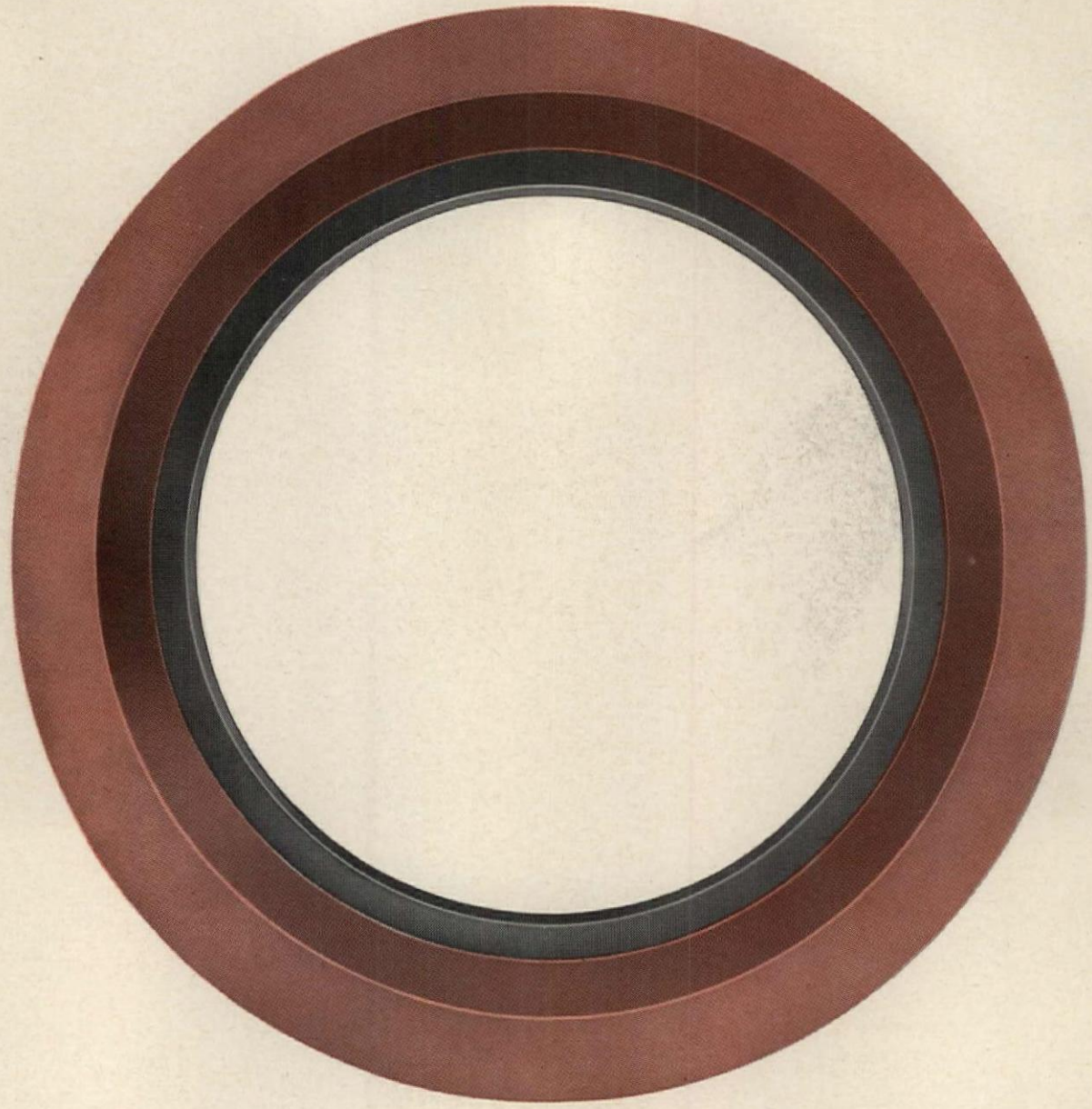
Closers concealed in head frame

Hugo Winkenwerder Forest Sciences Laboratory
University of Washington, Seattle

Grant, Copeland, Chervenak, A.I.A. & Associates
Architects

LCN CLOSERS, PRINCETON, ILLINOIS

Construction Details on Opposite Page



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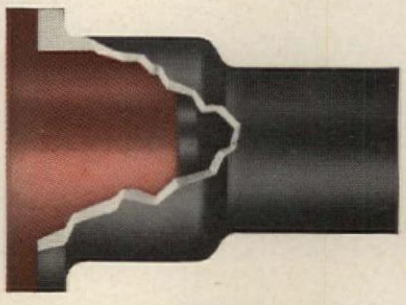
Your customers benefit from decades of trouble-free service. You benefit from big savings in time and labor. Which, in our trade, are benefits that won't stay secret for long.



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Harr, Hedrich-Blessing photos

A BAPTIST CHURCH BY WEESE

In his design for this recently completed church in Columbus, Indiana, architect Harry Weese hoped to discover, in his words, "... fresh combinations of old ingredients appropriate to present problems."

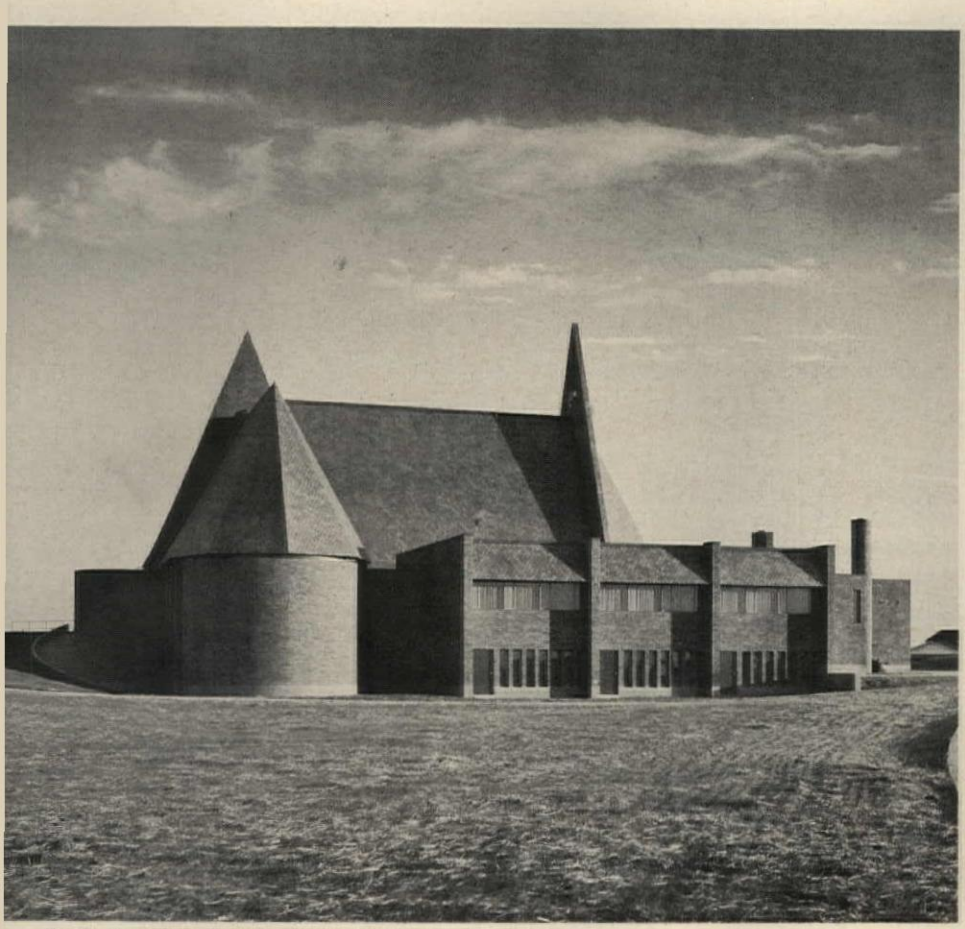
Balthazar Korab

Apse of main church. School and chapel roof are at left.

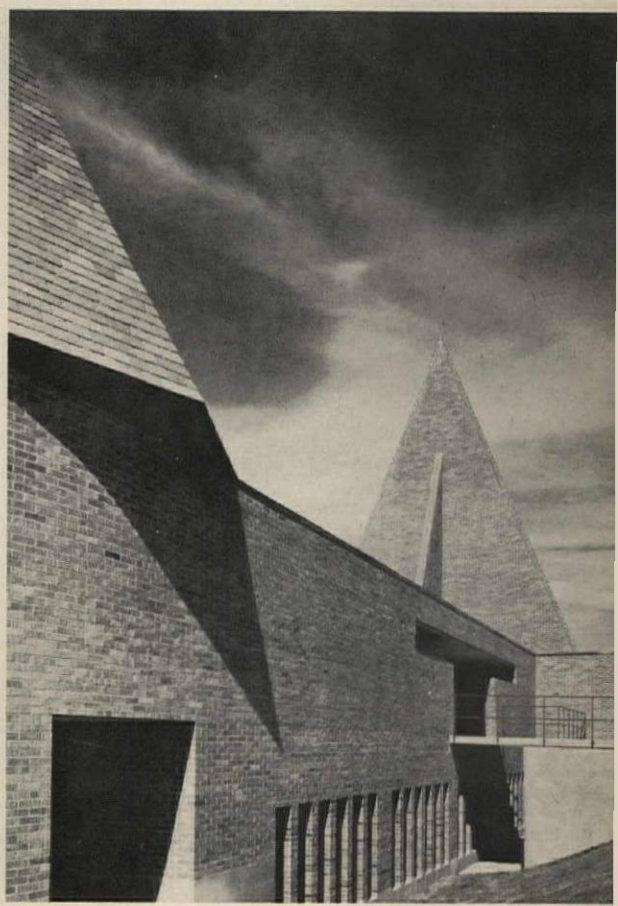
Cylinder adjoining chapel encloses interior stair.

Midwestern Baptists in Columbus, Indiana now worship in a new church which appears to be an abstract evocation of the architecture of thirteenth-century France. The elements of a Vitré or Carcassonne have here been transformed with an eclecticism which is brilliant and austere. Although architect Harry Weese might deny that medieval France was the specific provenance for this design, he asserts his dependence upon the architecture of the past: "If present day architecture is ever to mature, it needs to eschew the fashion of the hour and consider the realities of decades. The art of building is not relearned every generation; it is an ongoing thing. . . . The joy and stimulus in architecture is the discovery of fresh combinations of old ingredients appropriate to present problems. Faced with the choice, I would rather be right than contemporary."

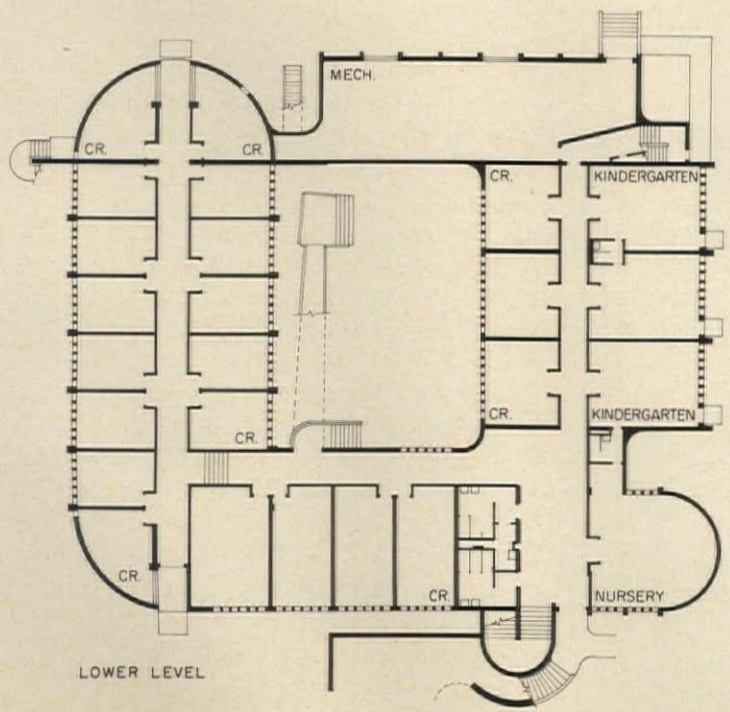
First Baptist Church of Columbus, Indiana
ARCHITECT: *Harry Weese & Associates*
STRUCTURAL ENGINEERS: *The Engineers Collaborative*
MECHANICAL ENGINEERS: *Samuel R. Lewis & Associates*
LIGHTING CONSULTANT: *William Lam*
INTERIORS CONSULTANT: *Dolores Miller*
LANDSCAPE ARCHITECT: *Dan Kiley*
GENERAL CONTRACTOR: *Repp & Mundt Construction Service*

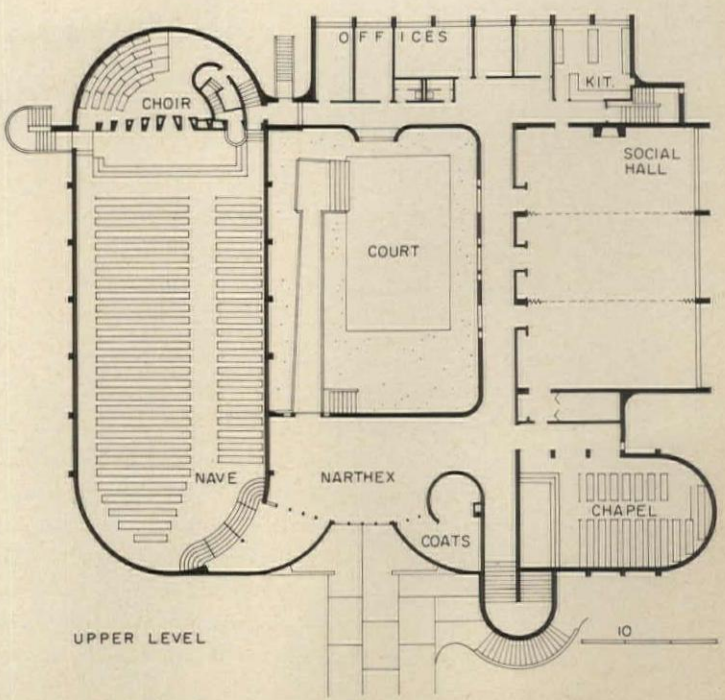


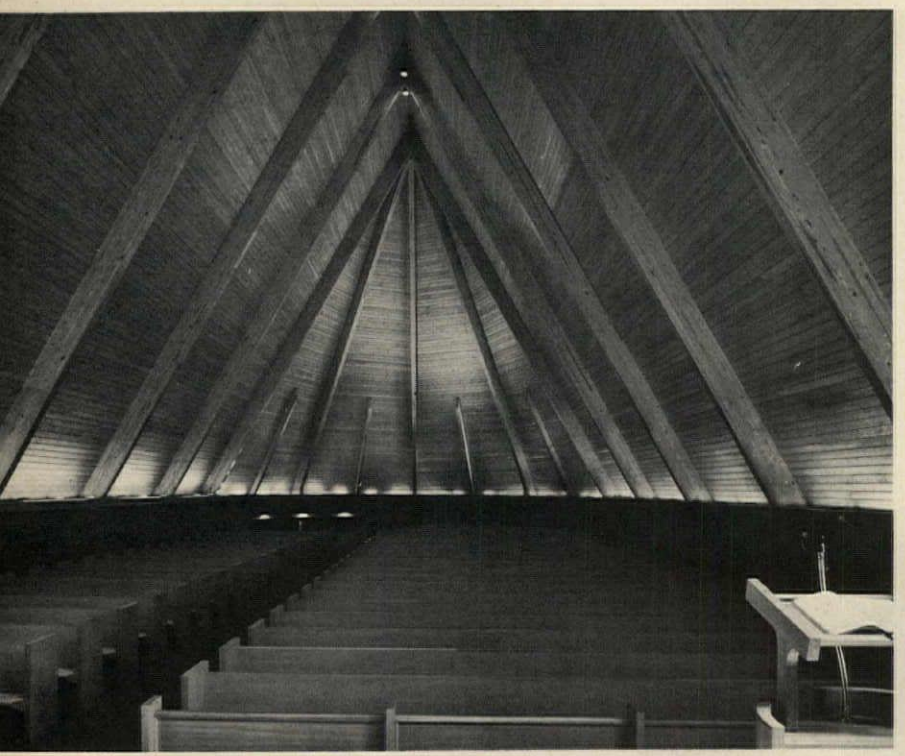
Both chapel and main church dominate the ensemble.



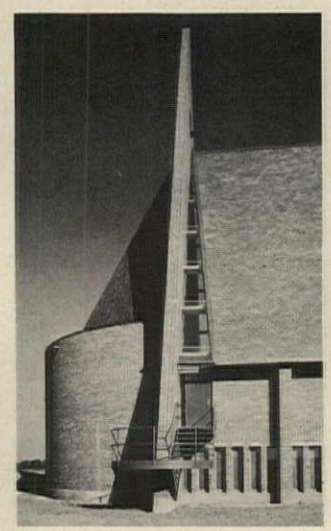
Narthex is entered at the upper level.





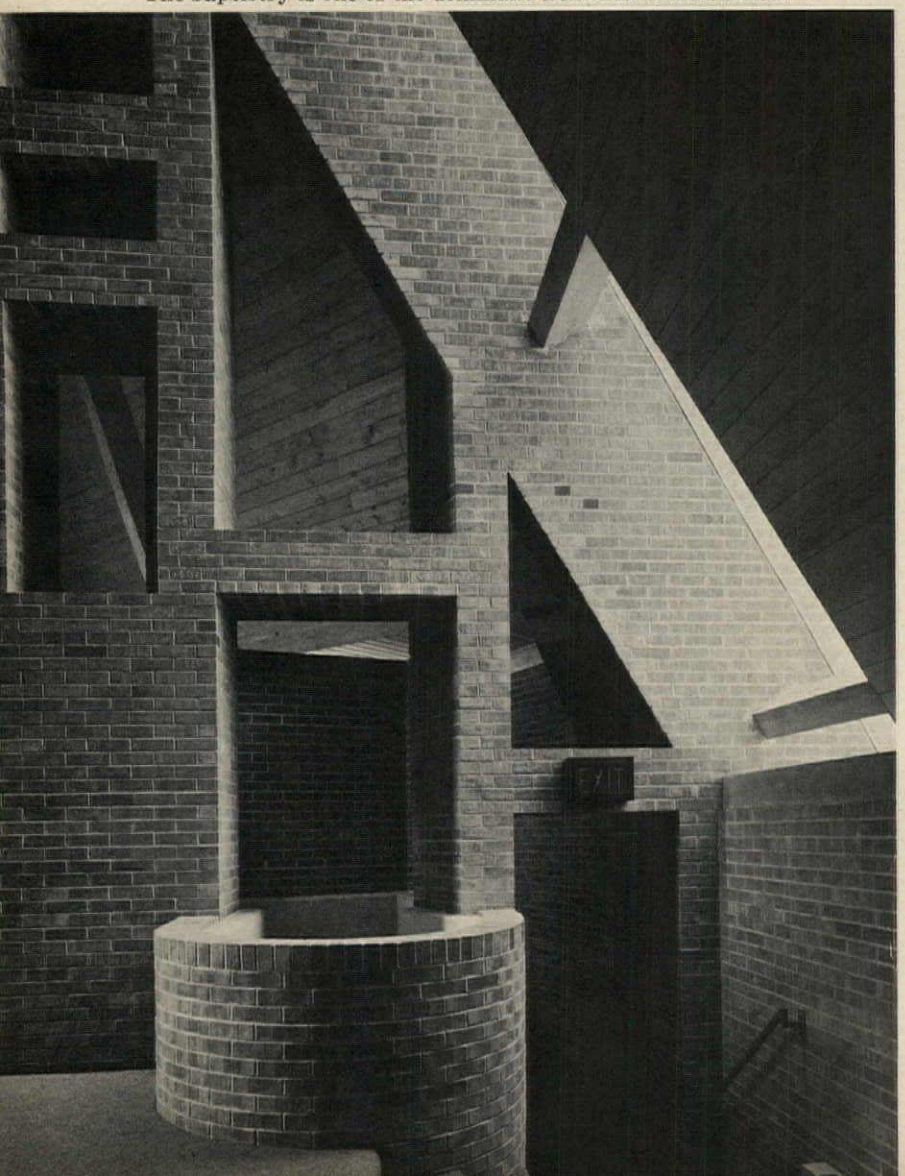


View toward rear of main church.

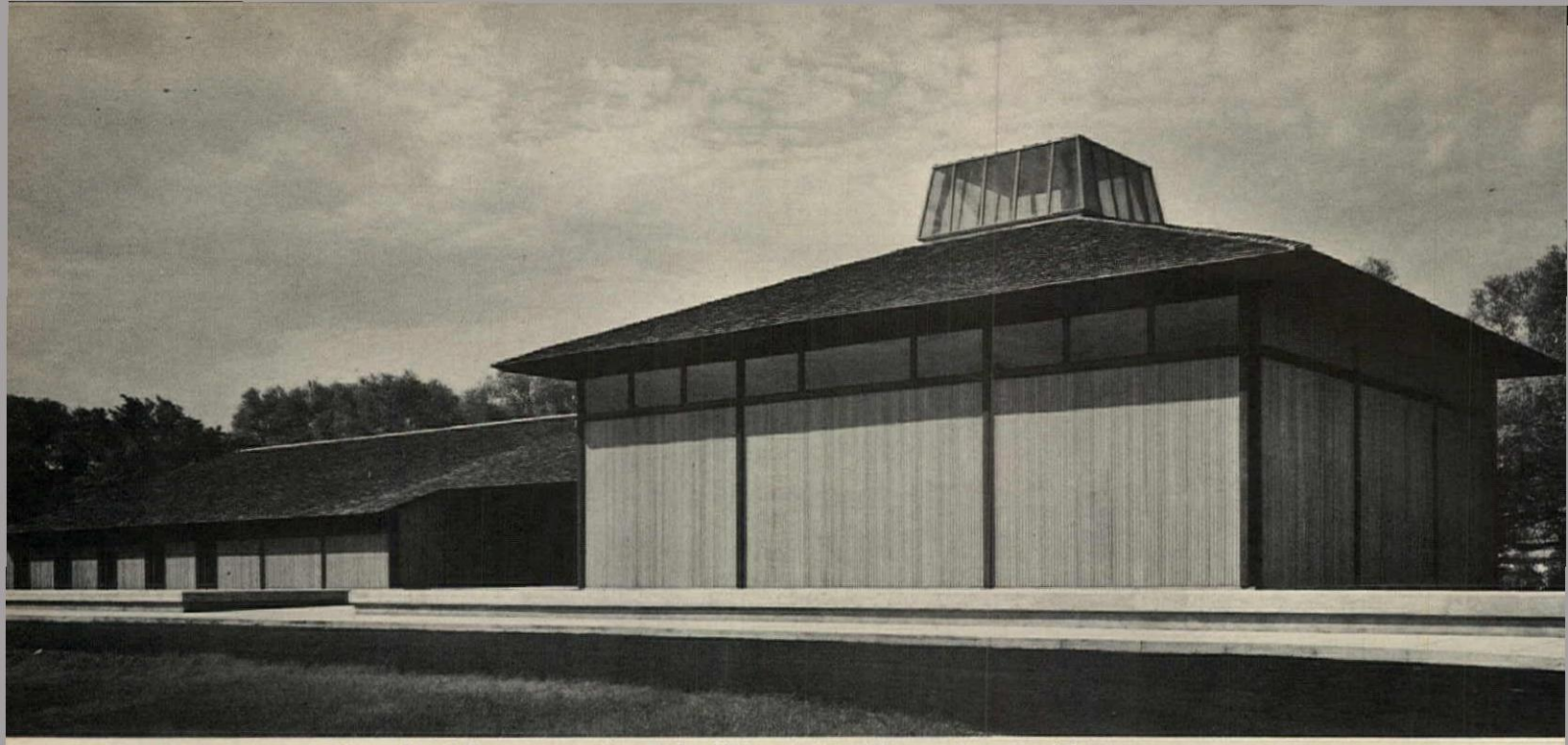


Chancel screen and window are clearly articulated.

The baptistry is one of the dominant elements in the chancel.



A perforated brick screen separates the choir, located in the circular apse, from the chancel and sanctuary.



Auditorium is to the right of the entrance foyer, the dining and social room is to the left.

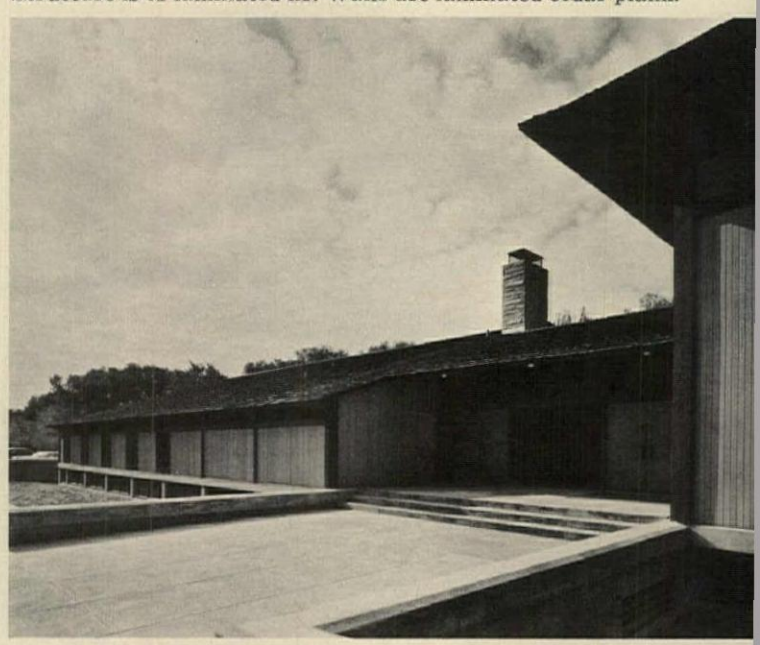
A UNITARIAN CHURCH BY BELLUSCHI

Members of Unitarian congregations believe they have a right to private judgement in theological matters. Many are nontheistic humanists. Architects who must design for them cannot properly work within the well established architectural vocabularies of other liturgies. Custom and symbol, so frequently resorted to as stimulus for a design solution, are not available. Simplicity and directness of design are called for, but without very subtle skills are rarely achieved. As a result Unitarian churches, and more specifically their interiors, are often drab affairs.

Pietro Belluschi, who has designed churches for many faiths with unfailing grace, has succeeded once more in this, his most recently completed church. His modest straightforward approach serves the Unitarians well. The building is an organization of four elements, an auditorium, a foyer, a dining and social room, and a complex of classrooms, each clearly conceived and expressed.

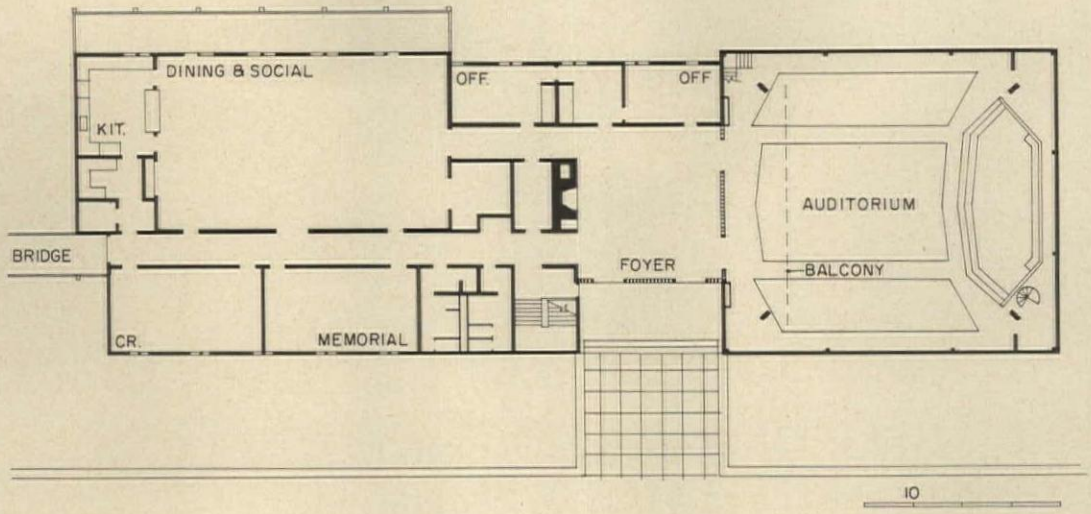
May Memorial Unitarian Church, Syracuse, New York
OWNER: *Unitarian Congregational Society of Syracuse, Inc.*
ASSOCIATED ARCHITECTS:
Pietro Belluschi and Pederson Hueber Hares and Glavin
STRUCTURAL ENGINEERS: *Eckerlin & Klepper*
MECHANICAL ENGINEERS: *Edward A. Fassler*
ACOUSTICAL CONSULTANTS: *Bolt, Beranek & Newman*
GENERAL CONTRACTOR: *Samuel Kosoff & Sons*

Structure is of laminated fir. Walls are laminated cedar plank.

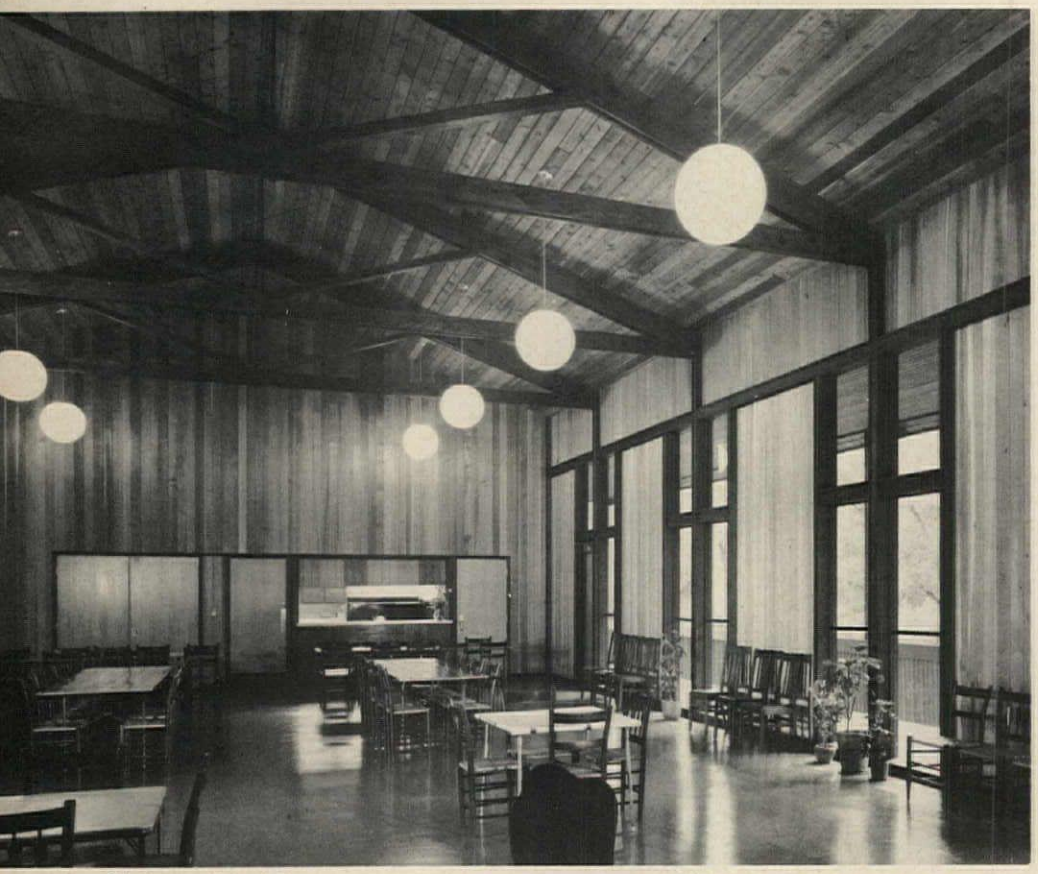


Sloping site permits adequate exposure at classroom level.

Joseph W. Molitor Photos



Views toward front and rear of auditorium. Roof, framing and walls of carefully contrasted woods enclose a simple volume.



Dining and social room.

Stained glass panels in the foyer give additional color to a palette of wood finishes.

A Visit To Pihlajamäki

This residential district near Helsinki provides better answers to the problems of New Towns than many more famous examples

By Jonathan Barnett

A new town provides an unparalleled opportunity for creating a fully designed environment in which architecture, landscape, and the residents' way of life all become part of a single, harmonious composition. This is the new town ideal; but to visit some much-praised new towns like Vällingby in Sweden, Cumbernauld in Scotland, or Tapiola in Finland, is to learn that reality falls far short of expectation—at least that was my own experience. However, when I was in Finland a few months ago, I had a chance to see another new town, called Pihlajamäki, which seems to come closer to providing a true designed environment than many far better known examples, and without recourse to some of the special experimental measures that made other new towns possible.

Pihlajamäki (Peek'-lie-ya-mĕkĭ) is situated in a suburban area north of Helsinki and will someday be tied to the urban center by a new rapid transit line. Right now, it is about a 15-minute trip by road, and the usual way to go there is to take one of the blue Volvo buses that leave from the elder Saarinen's railroad station in downtown Helsinki.

Finland is a sparsely populated country, but even so it is not exempt from urban sprawl. At the outskirts of Helsinki, new apartment houses

The Pihlajamäki residential district is situated about 15 minutes by road from the center of Helsinki. A central service road runs along a valley in the middle of the site, connecting to feeder streets and to an industrial park at the northern end of the town.

begin to appear, set down amid farm land and forest with the same disregard for consequences that private house development has shown in the United States. In this setting Pihlajamäki is instantly recognizable. It stands on a rock out-cropping crowned with pine trees; and, from the plain below, the tall white apartment buildings stand out in sharp relief. As the bus turns off the highway and enters a curving, up-hill road, the town is lost to view, not to appear again until the bus emerges at the shopping center.

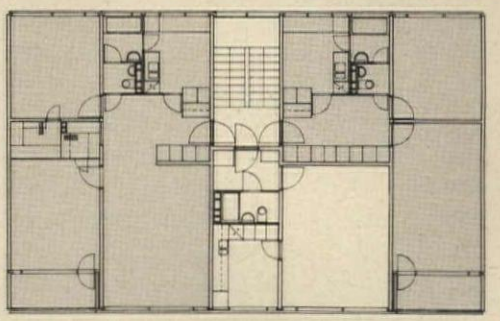
This town center is situated in a valley between Pihlajamäki's two main residential districts. The road continues through the site, following the valley to the town's small indus-

1

trial complex on the north. The residential areas are not really visible to the arriving visitor, but their location is marked by the tower blocks rising above the rocks and trees (1).

The shopping area is primarily for pedestrians, and is in fact within walking distance of every point in the town; but it has not been designed in imitation of town squares in warmer climates. Instead of the artificial pedestrian precincts and carefully contrived vistas that one sees at Vällingby and Farsta, there is a straightforward group of shops, soon to be enlarged, that will form a shopping mall. The coffee bar at one corner is a popular teen-age hang-out. On the day that I was there, the girls were sitting on the terrace, while the boys gunned their motor scooters back and forth along the street outside. The scene may have been noisy and anarchic, but it seemed much more a natural part of modern life than the sedate activities usually portrayed in architects' renderings of pedestrian precincts. The town center of Pihlajamäki seems a normal and

2



3

natural place. Without any special architectural merit, it nevertheless has many unassuming virtues—being well-organized and free of garish signs.

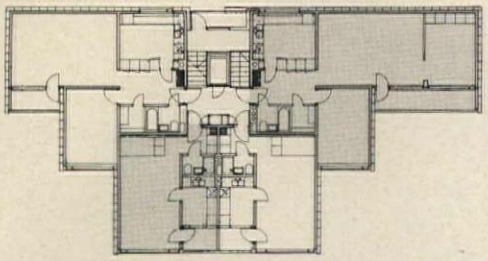
As one climbs up the hill to the southwest, the truly impressive aspects of Pihlajamäki begin to unfold. The site is naturally spectacular, with sweeping views over the surrounding countryside; and the natural topography has been used to great advantage. The residential areas are divided into precincts composed of tower blocks and long, low buildings (2), with each grouping designed for about 1,500 people. The four-story buildings are divided into both small and large apartments (3)

4

and most of these have balconies. The architect for the buildings in this area was Lauri Silvennoinen, who designed them in close collaboration with the site planner, Professor Olli Kivinen of the technical university.

The tower blocks have almost blank north walls (4) as protection against

5



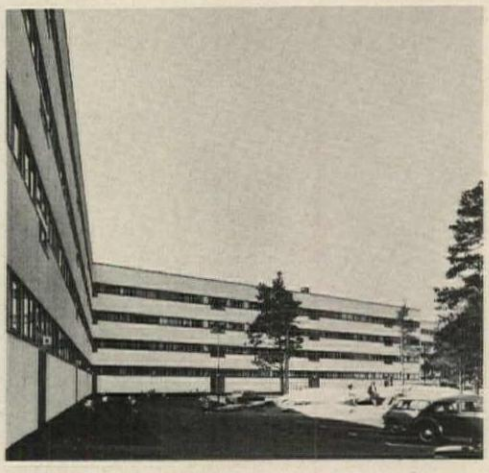
winter winds, but open out with glass walls and balconies on their south sides (5, 8). The low blocks have been used to form semi-enclosed exterior spaces which provide a certain amount of warmth and shelter. Even in June there is still a chill in the air, and this type of protection is welcome. The balcony sides of these long blocks are also turned southwest towards sun and view, so that the exterior courts formed by the north walls have a rather dull and unrelieved appearance. They are not as oppressive in reality as they appear in the photographs (6, 7), but these long, monotonous facades are certainly the weakest part of the design.

Even so, it comes as a surprise to learn that many of these buildings were built from prefabricated concrete panels, which were poured on the site and hoisted into position by tower cranes. There is none of the insubstantial, house-of-cards appearance which is so often associated with prefabricated low-cost housing, and, despite the repetition of elements; the buildings have considerable individual character.

The question of individual character versus unity of effect is certainly central to new town design. Tapiola new town, which was widely hailed in its earlier stages when the whole complex was held together visually by its beautiful setting, has since developed a very disorganized appearance. The experimental nature of the town led to the hiring of many different architects and the development of a great number of housing types. The resulting confusion ended by overwhelming a good site plan and a fine town center. At Pihlajamäki there is some loss of individual character, some difficulty in identifying individual dwelling units; but, on balance, the result seems to possess artistic unity, not just in the town center, but in the residential districts themselves.

Another basic new town problem is to find the right population density; and, again, Pihlajamäki seems to have struck about the right balance. The first post-war new towns in England, like Stevenage, were formless and sprawling. Later towns like Cumbernauld over-compensated by providing futuristic town centers, denser than any city, surrounded by a sea of unrelated, nondescript housing. By contrast, Pihlajamäki has a distinct form, and yet still provides for the individual and the unplanned.

North of the buildings designed by Silvennoinen are woods that slope down towards the industrial area. Scattered among the trees are the remains of concrete pill boxes, now covered with moss and carpeted with pine needles, providing, in typical Scandinavian fashion, both a reminder of tragedy and a good place for children to play. Also on the northern end of the site is a flat area given over to allotment gardens, and a wooden recreation area with a ski run and ski jump.



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The buildings in the eastern portion of Pihlajamäki were designed by another architect, Esko Korhonen, who also co-ordinated his design with the development of Professor Kivi-

8

nen's site plan. Korhonen's tower blocks (10, 11, 12) do not have such a strong architectural character as Silvennoinen's, although their standard of accommodation is quite similar. Korhonen's sector also provides an ingenious double maisonette block (9, 13, 14) which takes advantage of the hillside to make the top duplex more accessible. The lower unit has a semi-private terrace, the upper has a large balcony.

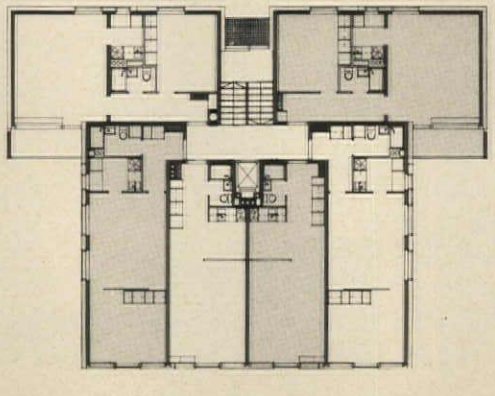
10

11

Many of the long, low blocks in this eastern area are three stories high instead of four, and, as they are approached from the south side, where the balconies are, they present a more pleasant appearance to the visitor (15, 16, 17).

The tower blocks in this eastern sector are also prefabricated, the low buildings are of conventional construction; but the building process was carefully rationalized and coordinated.

12



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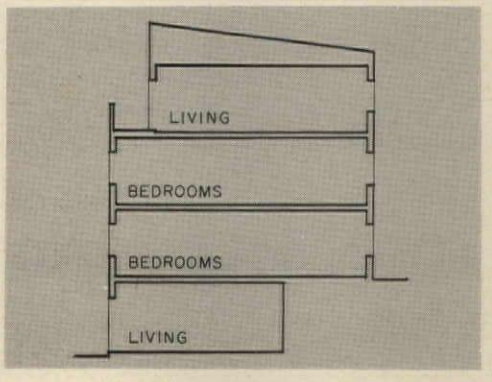
The developers of Pihlajamäki were two non-profit housing co-operatives called Sato and Haka, which, in turn, are owned by other consumer co-operatives. They acquired the land jointly with the city of Helsinki, and the city retained Professor Kivinen to do the master plan. After a competition, Sato retained Silvennoinen as its architect, and Haka hired Korhonen.

These three men worked closely with each other, and with the structural engineer. Even the mechanics of the precasting process were provided for in the master plan, so that no modifications were found necessary during construction.

The city of Helsinki has purchased some of the housing units, and rents them out as subsidized low-rent housing. Other residents own their apartments on a co-operative basis, the majority under the so-called "arava" system, which is a state-subsidized long term loan. Thus a good social balance is maintained in the community without the mechanics of the process being obvious.



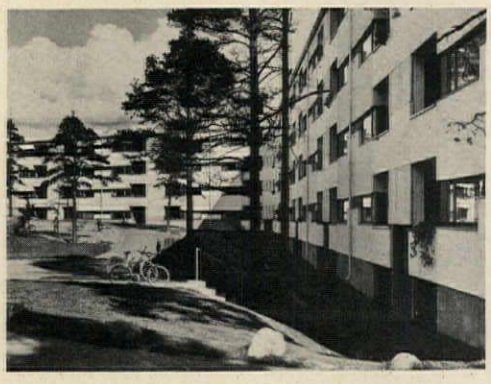
14

Perhaps the most impressive single aspect of Pihlajamäki is that it seems to have been produced without fanfare or a sense of brave-new-world accomplishment. The development of housing by collaboration between the government and non-profit co-opera-

9

tive organizations is an accepted procedure in Finland. It is more unusual to have such close collaboration between site-planner, architect and engineer, but the arrangement was decided upon as much for its evident practical advantages as for any abstract artistic purpose.

Pihlajamäki is relatively small, about 2,200 dwelling units, perhaps 10,000 people; but there is nothing in its concept that would be adversely affected if it were only a single unit in a larger complex. Whittlesey and Conklin have divided Reston into



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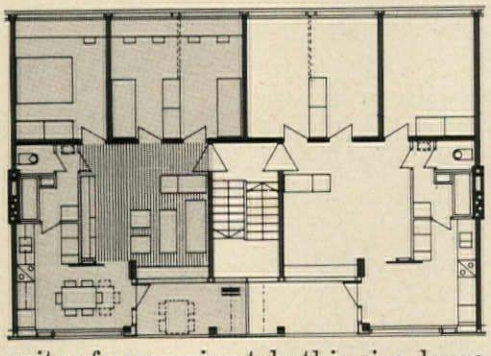

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units of approximately this size, large enough to be built efficiently and small enough to remain comprehensible.

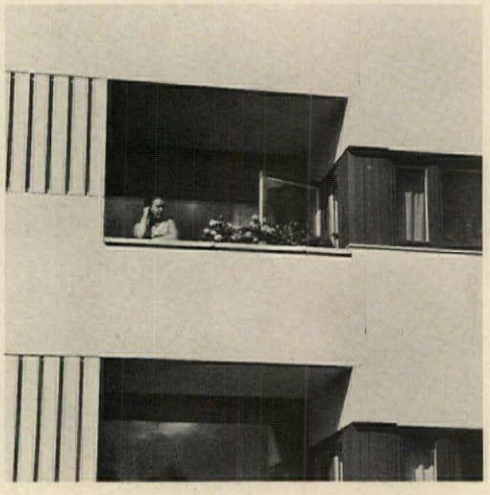
It is interesting to speculate about the effect that the co-operative nature of the development has had upon the result. Certainly, if the residents must live in an apartment instead of a house, it seems appropriate that they make this sacrifice on a co-operative basis; and, somehow, cooperation seems to have had its influence on the architecture. If nothing else, it has apparently freed the developers from the desire to devise fake Italian piazzas, which even the practical Swedes have been known to do, or artificial local color, such as the masses of imitation crofters' cottages that the Cumbernauld Corporation felt compelled to provide.

17

The close collaboration between the architects and the site planner, on the other hand, has had a very obvious effect. It accounts for the remarkable unity of design that the whole Pihlajamäki complex possesses. The composition may sometimes be rather impersonal, but it is never confused. There is a definite harmony between buildings and landscape, and this relationship unfolds in new and perpetually surprising ways as the visitor walks around the site. At the same time, nothing has been included which is not useful, nothing has been done solely for visual effect.

Even in Finland, which is a small country with many good architects and rather close control over the use of land, Pihlajamäki is not typical. In other countries, even the best of intentions and much higher budgets have seldom produced anything as good.

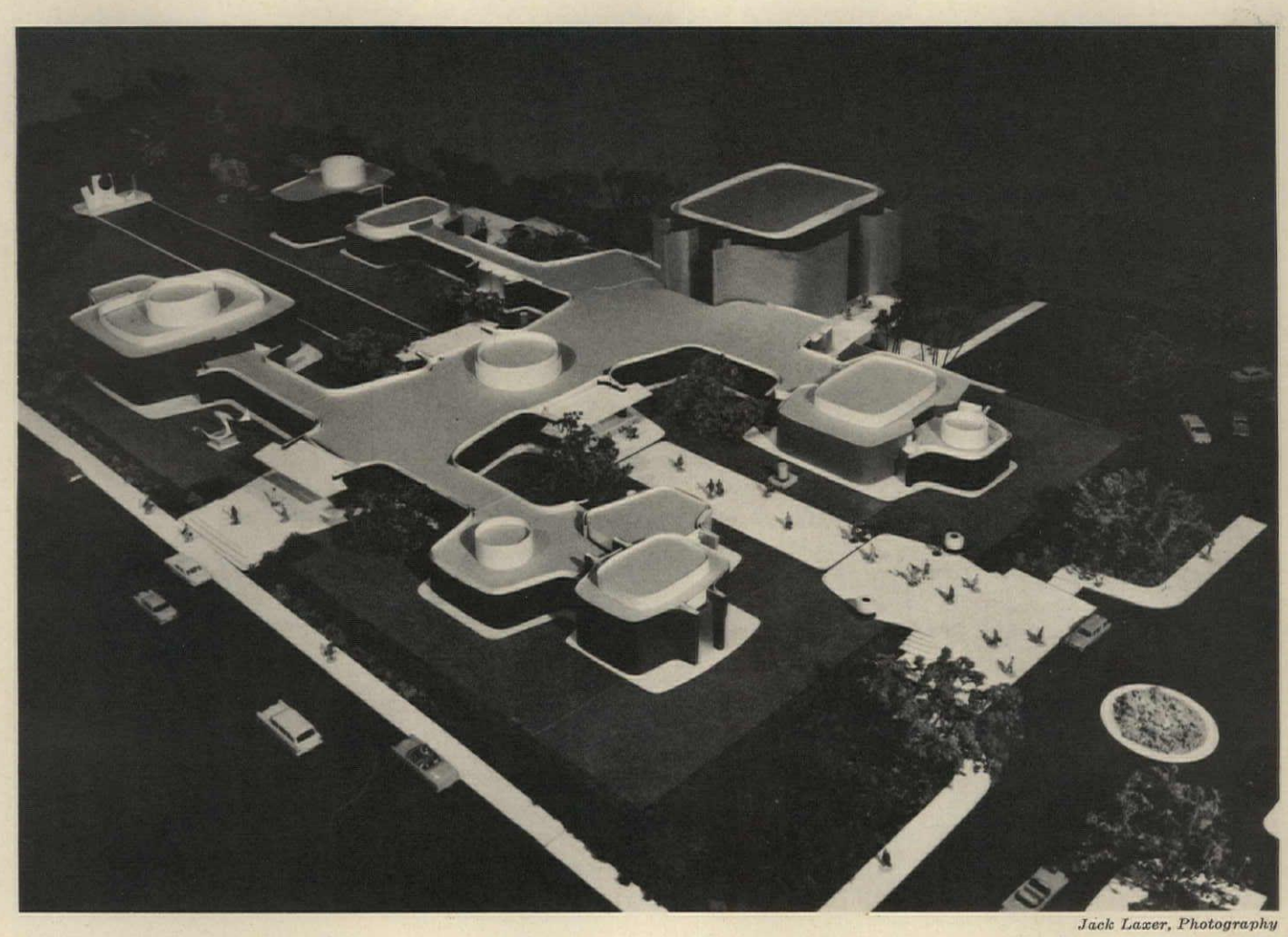
On the way back to Helsinki, jouncing through the typical mindless development of modern-day suburbia, one wonders about a world in which towns like Pihlajamäki are found to be so exceptional.



18

SPATIAL VARIETY IN TWO MUSEUMS

The two art museums presented below and on the following pages—
Carmelita Cultural Center, designed by Ladd & Kelsey,
and the University Arts Center, designed by Mario J. Ciampi—
differ completely in their approaches to creating an exciting progression of spaces,
although the goal of effective exhibit areas is well-achieved in both.

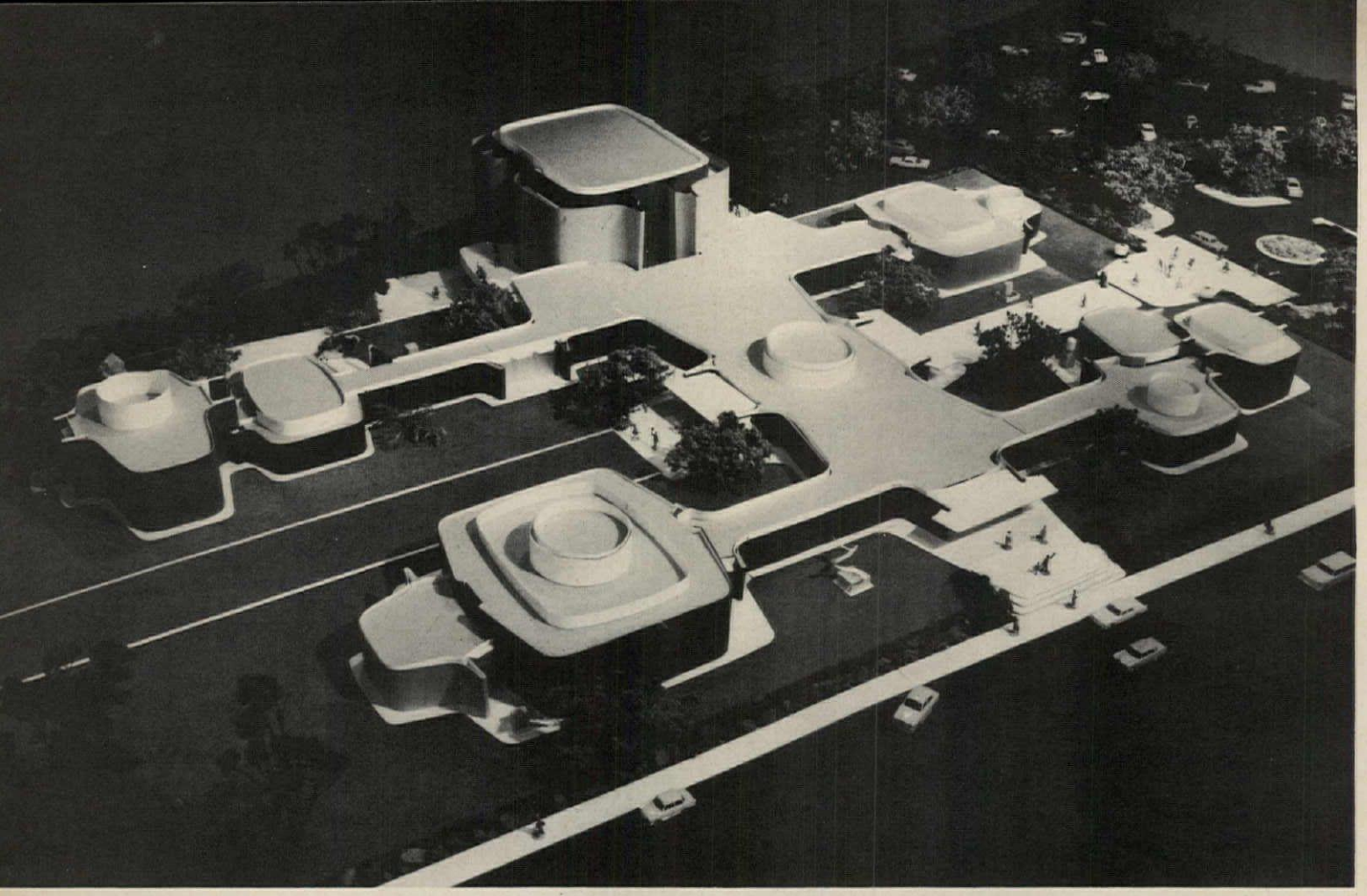


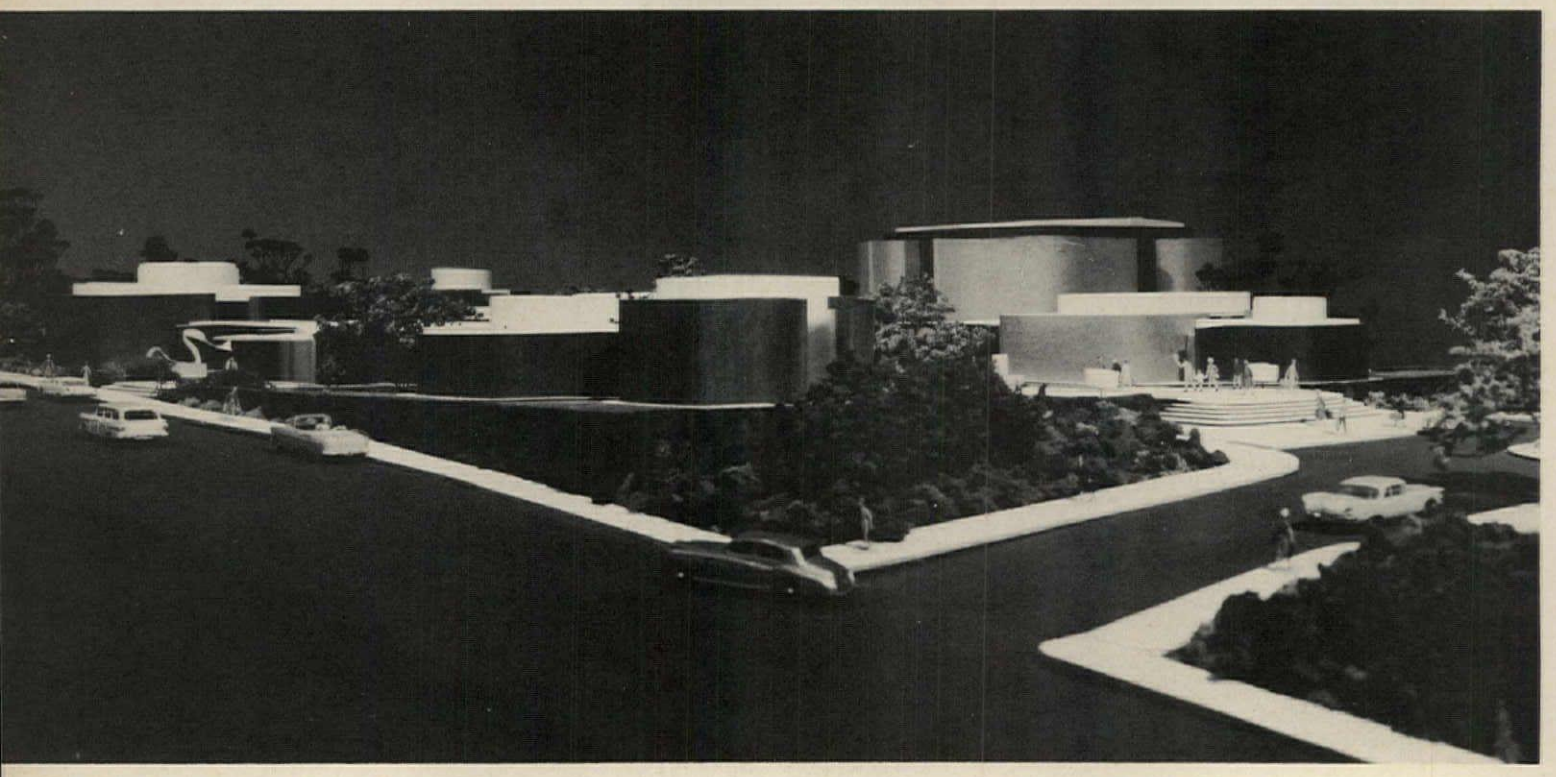
Jack Laxer, Photography

GALLERY SPACES DEFINED BY VARIED WIDTHS AND HEIGHTS

The Carmelita Cultural Center in Pasadena, California, designed by Ladd & Kelsey, develops on one level a constantly changing, almost fluid sequence of gallery spaces. "The over-all design concept," says Mr. Kelsey, "was to create spaces of varying volumes linked together in such a way that the visitor senses a strong feeling of motion as he passes through the various exhibit areas."

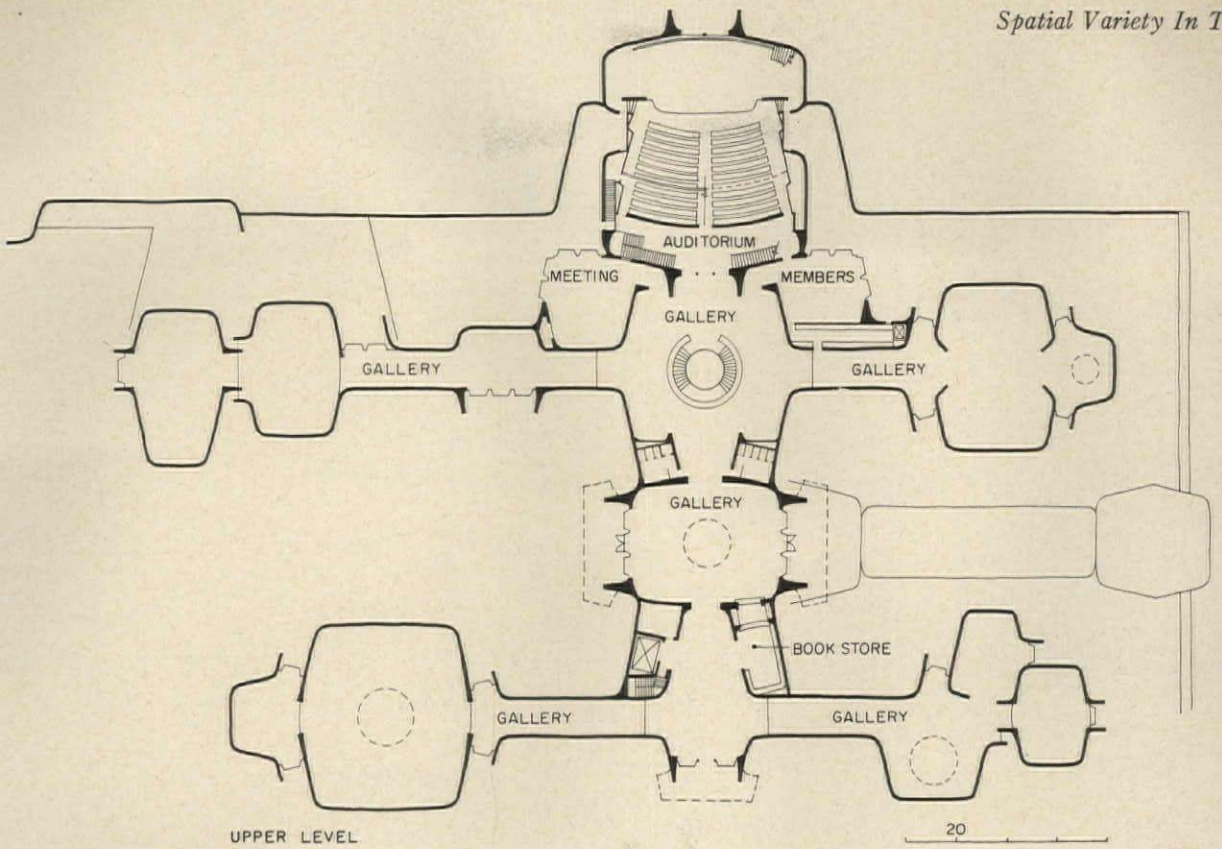
Essentially, the main gallery spaces are designed as clusters at the end of long connecting arms which radiate from the central entrance space. These connecting spaces have, since the model was photographed, been widened from 12 feet to 20 feet so that they, too, will be vital exhibition areas rather than just passageway galleries. The galleries are designed so that complete flexibility of exhibits can occur, depending on the particular mood and character of the proposed exhibition. For example, the permanent collection could be displayed in one of the large galleries or a particular feature of it could

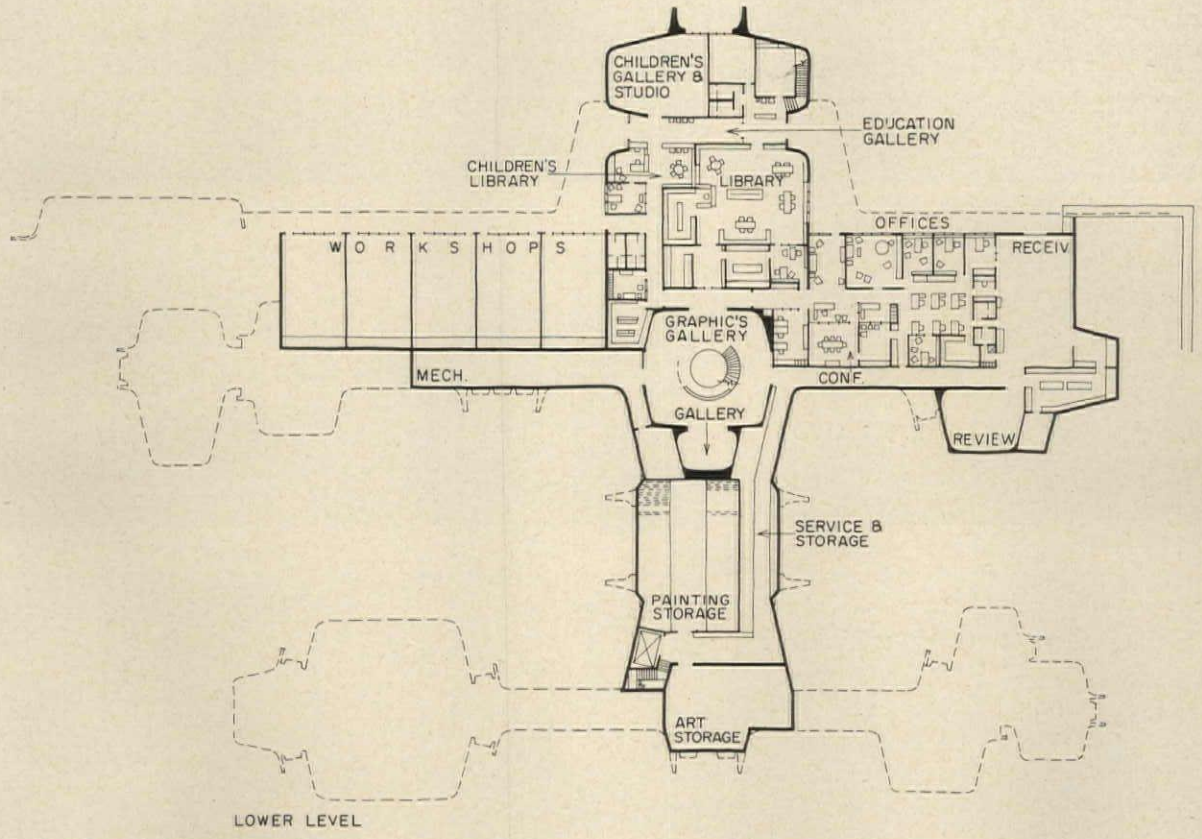




be abstracted and displayed in one of the smaller gallery clusters. The main galleries will be lighted by truncated cylindrical skylights, and there are windows for added natural light where the major building elements join—since the architects feel that natural lighting is by far the most effective way of displaying paintings because it gives them changes of mood. Supplementary artificial lighting will be provided over hanging panels of diffusing material, creating a skylight effect.

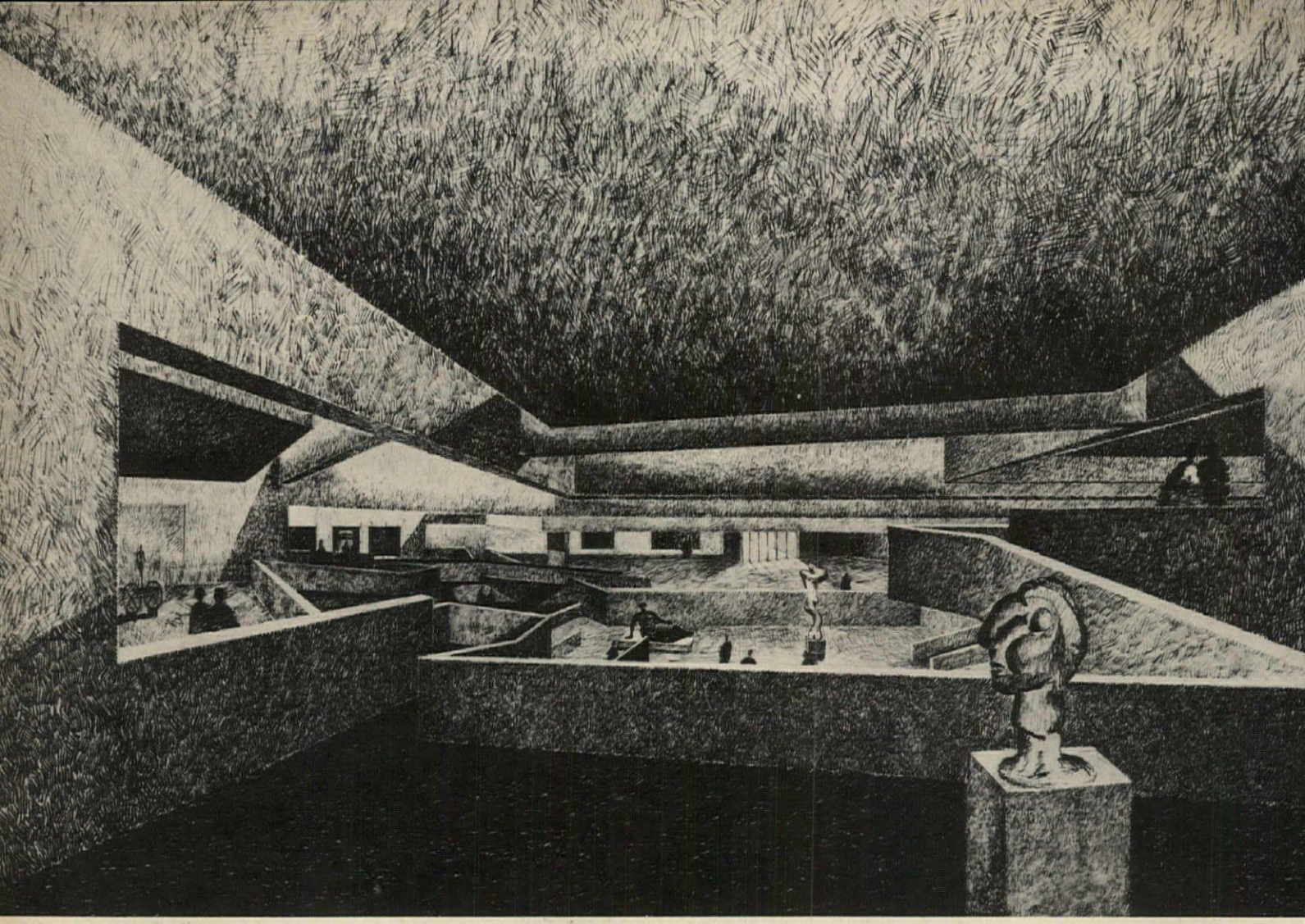
The auditorium, which will seat 400 and which will be used frequently by local organizations, is so

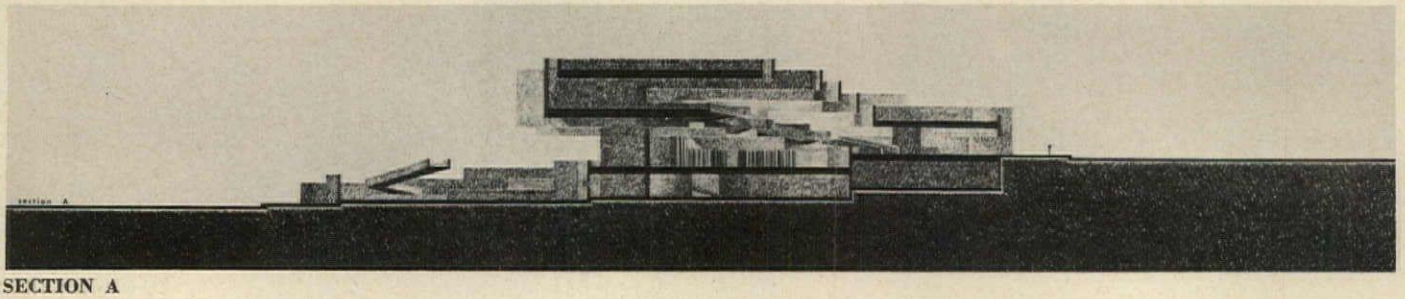




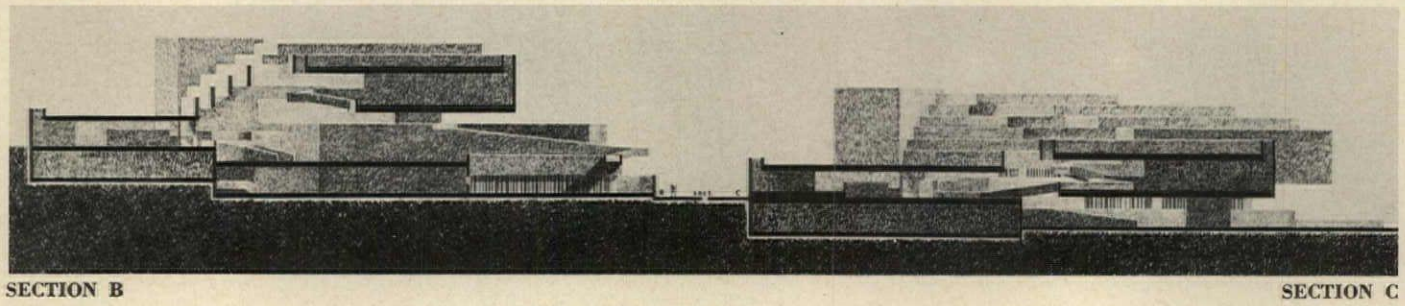
located that "users will be forced to partake of the museum experience." Only the non-public and semi-public elements—education, administration and service—are on a lower level. A total area of 75,000 square feet is provided in the total complex.

An excellent outdoor sculpture area is achieved around a 240-foot-long by 32-foot-wide reflecting pool, which is located on line with the entrance walkway and the central hall of the museum. All galleries have "considerable visual access to outdoor areas," allowing the visitor to orient himself within the structure as well as to outside display areas.





SECTION A

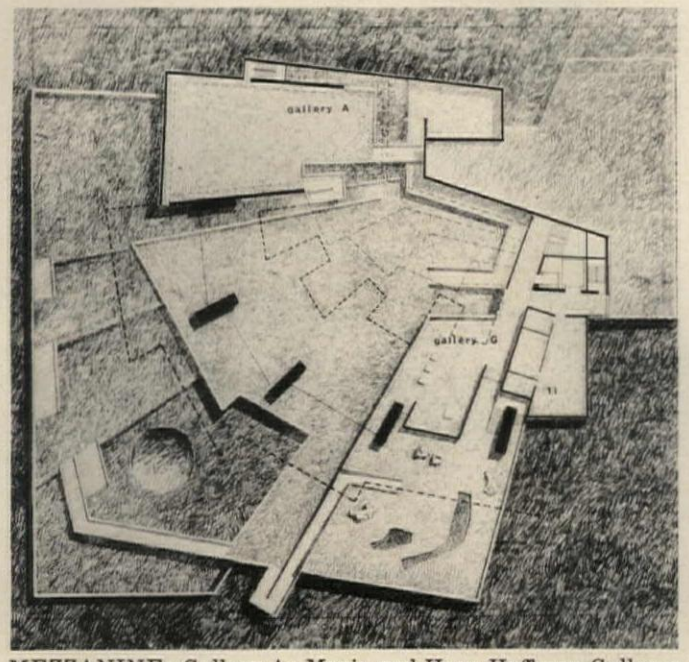


SECTION B

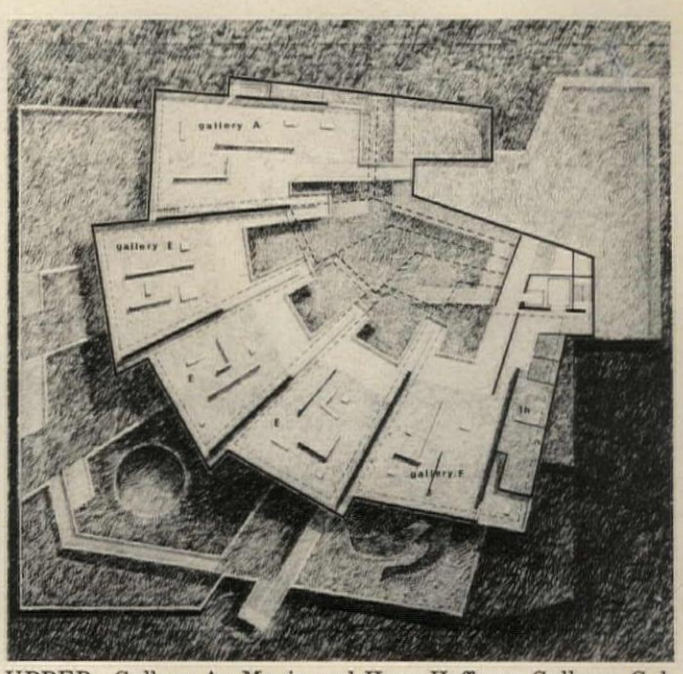
SECTION C

GALLERY SPACES DEFINED BY MANY CHANGES OF LEVEL

The University Arts Center at the University of California, Berkeley, develops its sequence of spaces through the vertical integration of many levels in the gallery areas. According to Mario Ciampi, head of the competition-winning design team which also included Paul W. Reiter, associate architect, and Richard L. Jorasch and Ronald E. Wagner, design associates, the Center was conceived "as a vital and expanding system of radial terraces and visually inter-connected spaces superimposed in two levels to achieve a synthesis of architecture and sculptural order. . . . The building exploits the potential of a

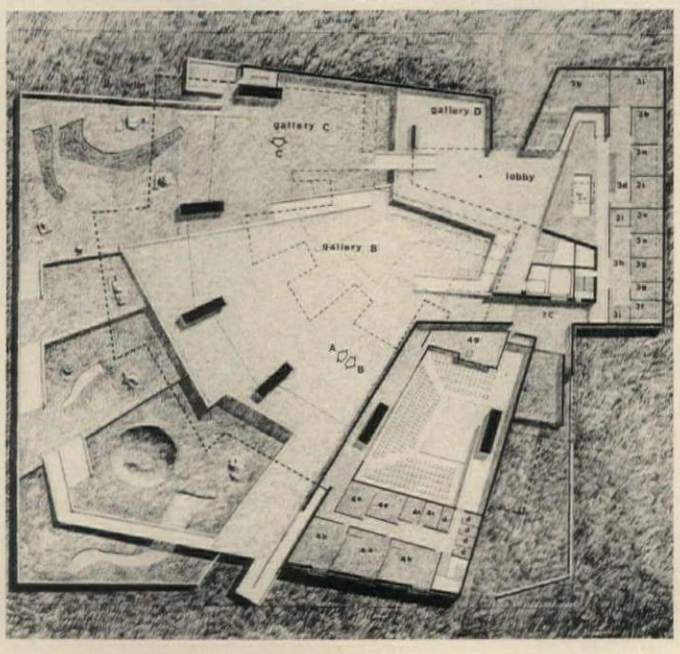


MEZZANINE: Gallery A: Maria and Hans Hoffman Gallery; Gallery G: prints and drawings; 1i: workshops and storage.

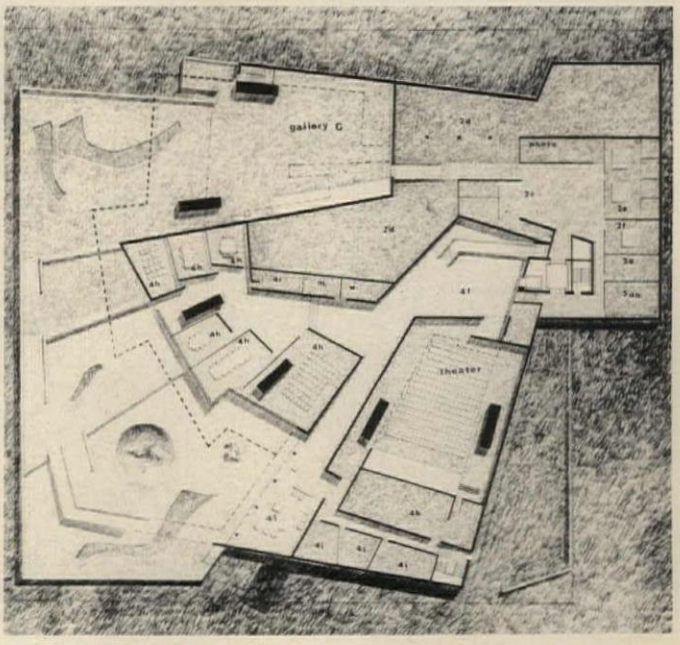


UPPER: Gallery A: Maria and Hans Hoffman Gallery; Gallery E and F: permanent exhibitions; 1h: study and storage.

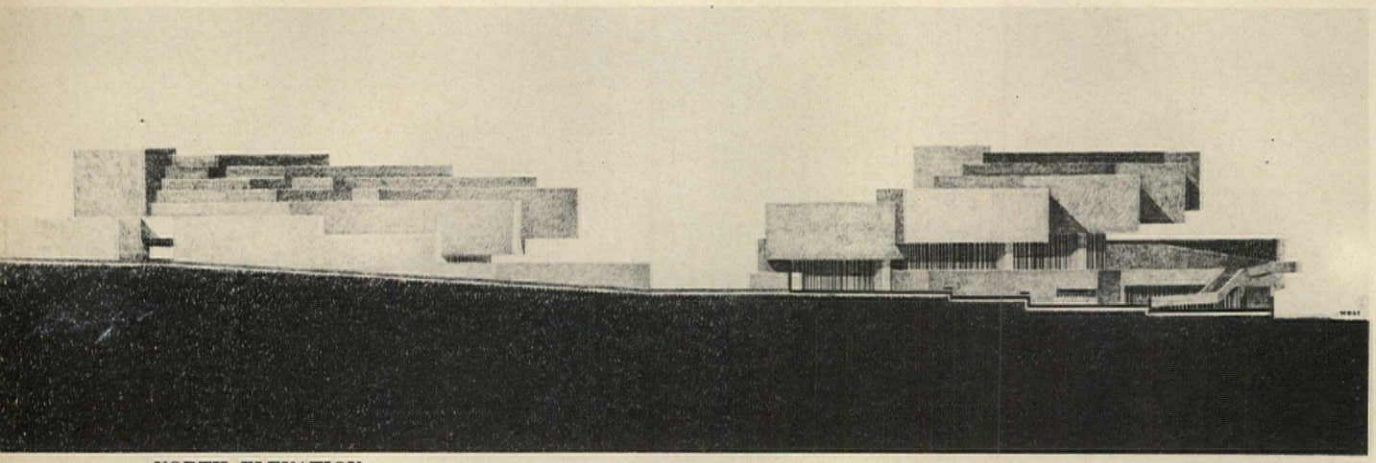
ENTRANCE: Gallery B and C: changing exhibitions; Gallery D: new acquisitions; 2b: coat room; 2c: receiving; 3a, b, c, d, e, f, g, h: offices; 3i: library; 3j: store room; 4c: lavatory; 4d,e: dressing rooms; 4g: projection room; 4k: studios.



GROUND: 2c: shipping and receiving; 2d: art storage; 2e: picture conservation; 2f: picture examining; 2g: periodical storage; 5ab: maintenance; 4b: backstage; 4f: foyer; 4h: conference rooms; 4i: kitchen; 4j: music practice; 41: lounge.

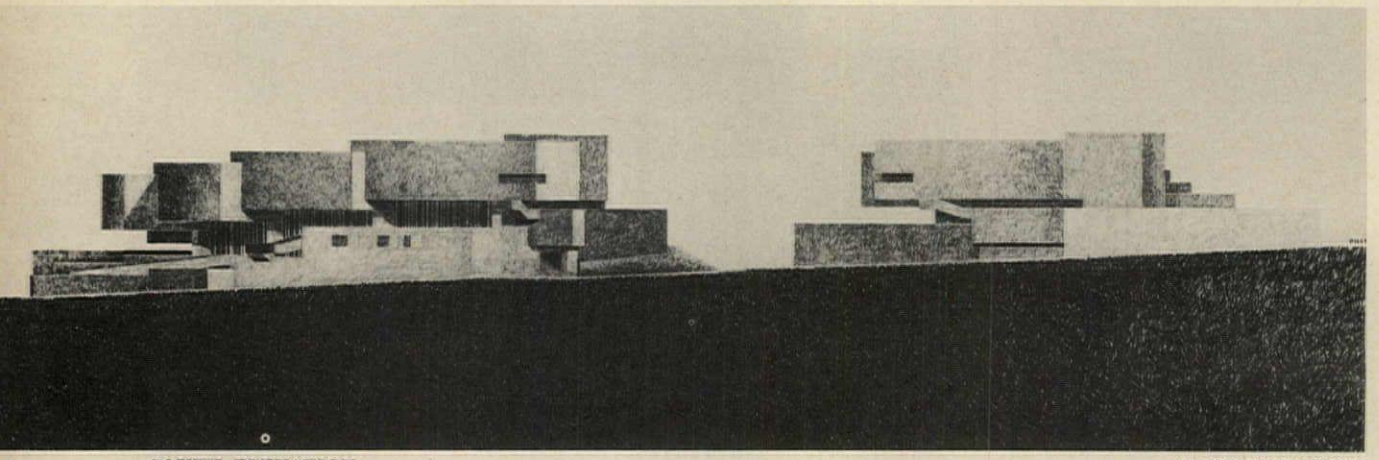


sloping site by means of exhibition and sculpture terraces which step down from the entrance toward the garden areas. Rising above these lower spaces are the permanent exhibition galleries, easily accessible from the entrance, further reinforcing the radial concept of maximum visibility from a central point. The upper and lower gallery spaces are of varying heights employing natural lighting to articulate and give special emphasis to the display areas." As in the Carmelita Center, the non-gallery elements—a theater for 300, studio and conference facilities—are grouped at a lower level, independent



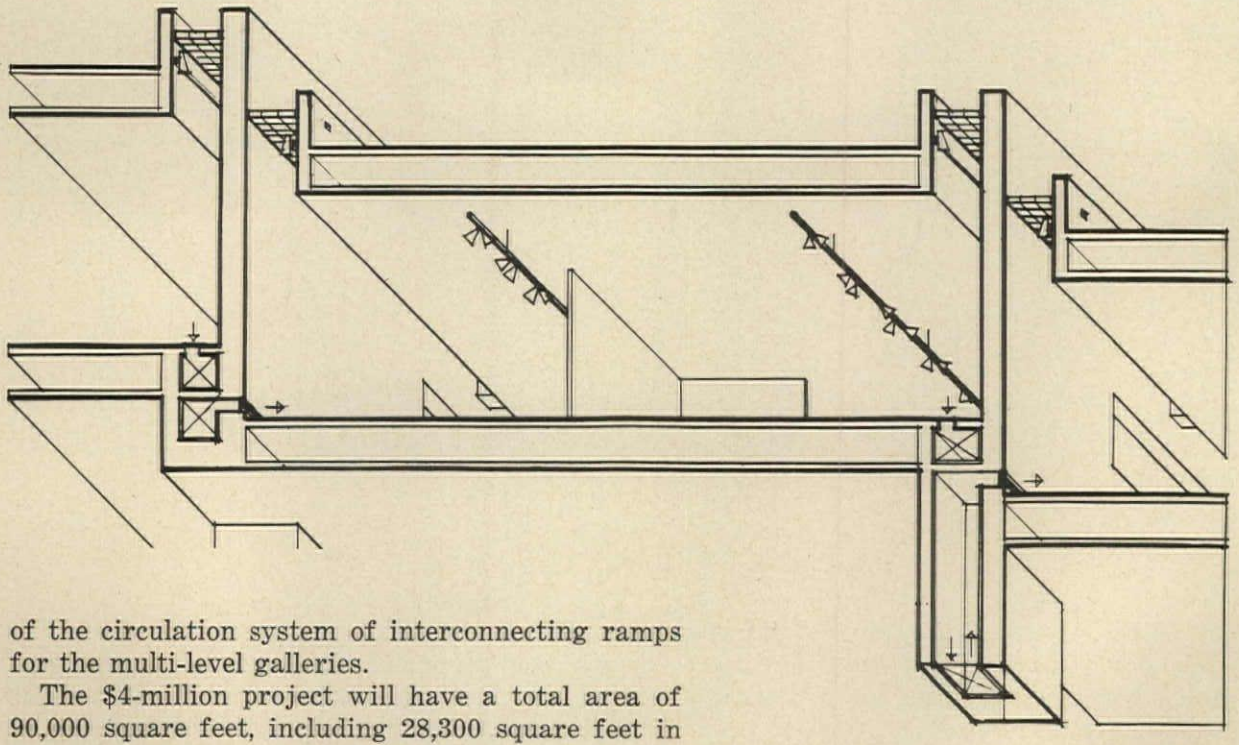
NORTH ELEVATION

WEST ELEVATION



SOUTH ELEVATION

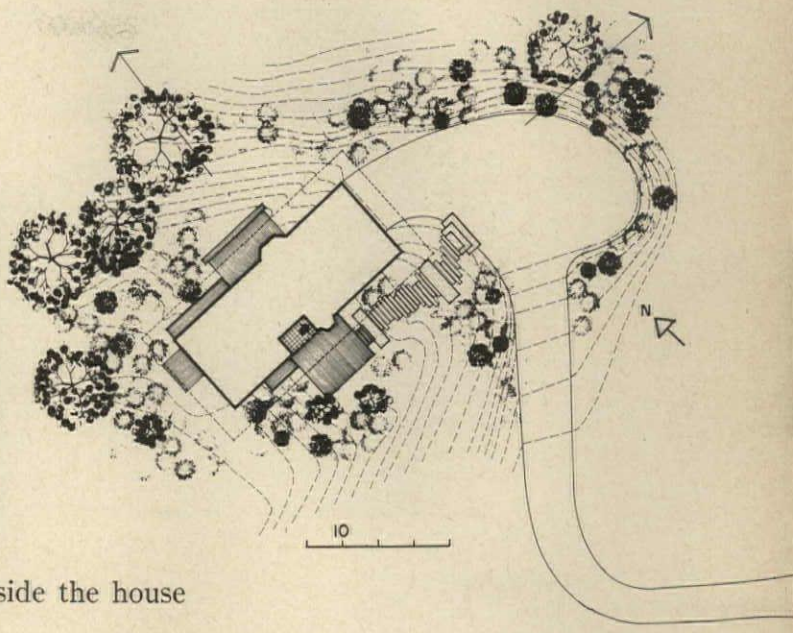
EAST ELEVATION



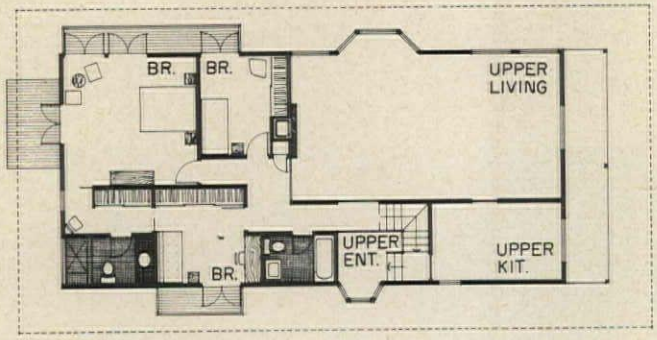
of the circulation system of interconnecting ramps for the multi-level galleries.

The $4-million project will have a total area of 90,000 square feet, including 28,300 square feet in the seven galleries. Provision has been made for future expansion of 80,000 square feet.

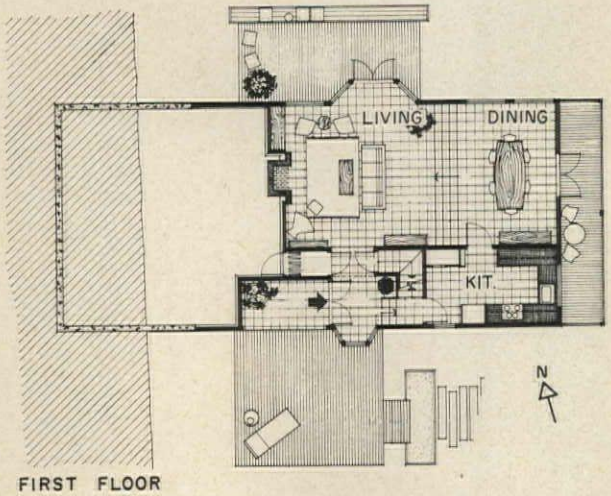
CHANGES IN LEVEL ADAPT HOUSE TO HILLSIDE



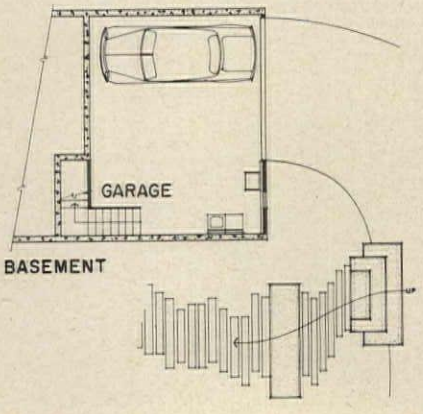
John Field uses outdoor decks and balconies for extra living area and also to articulate the different levels inside the house



SECOND FLOOR



FIRST FLOOR



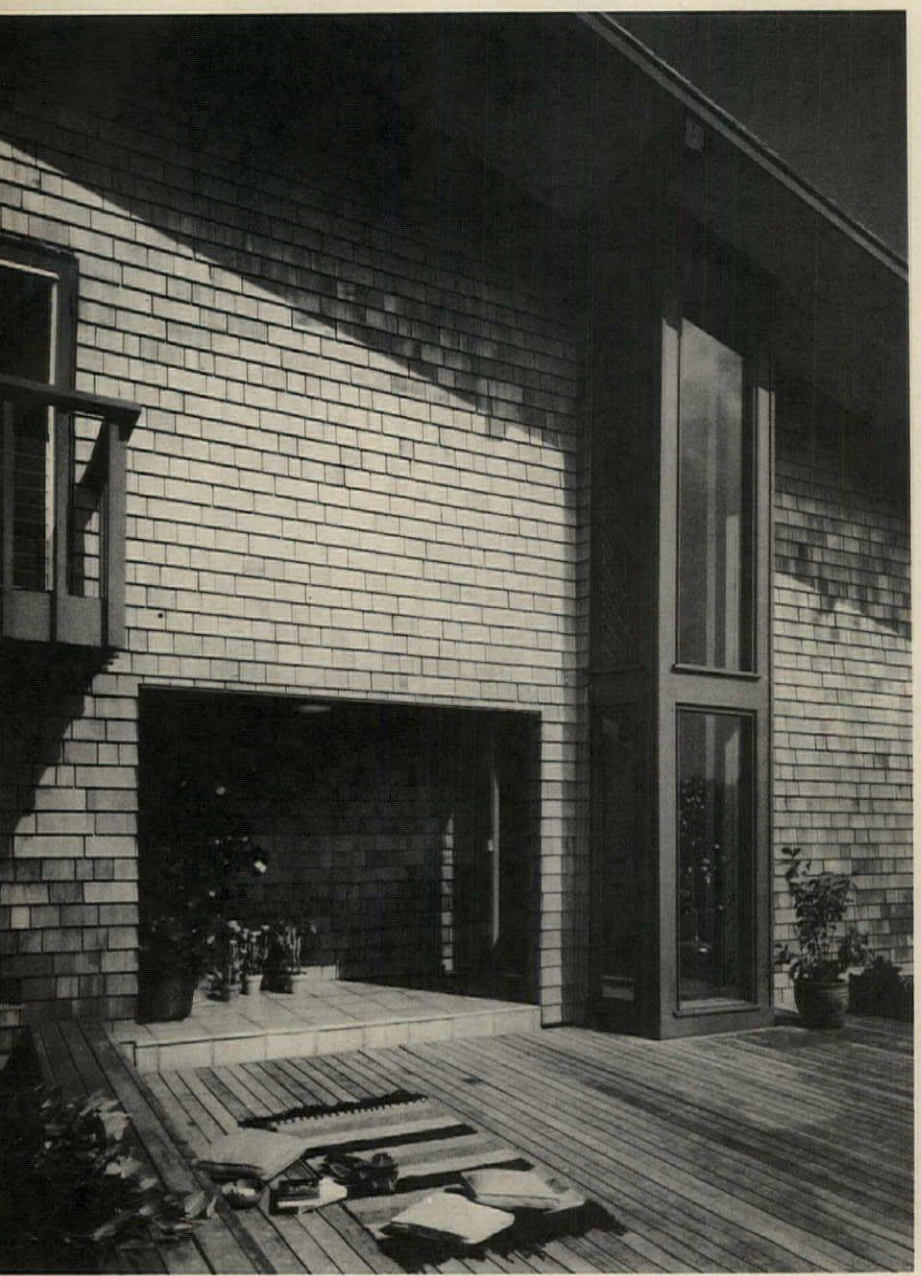
BASEMENT

5

A sloping ridge in the hills above San Francisco Bay, with the advantages of good views to the north and east and abundant natural growth of shrubs and trees, was selected for this attractive cedar-shingle house. A steep road cut into the side of the hill provides the only access to the site on which three plateaus had already been cut by the developer. The house was sited so that no additional grading was needed and no trees had to be cut. By placing the house well back from the eastern edge of the lowest plateau, the architect ensured that other houses and the road would be almost completely hidden from view by the trees and shrubs. Thus, Mr. and Mrs. Seitle can easily imagine that they are living alone on a hillside in the heart of the country, while in reality they are comfortably near to civilization.

A limited budget of about $35,000 restricted the amount of living space to only 1,500 square feet, but decks and terraces around the house substantially extend these areas and provide pleasant opportunities for sunbathing and meals out of doors.

The changes in level, which were necessary to accommodate the sloping site, have been used imaginatively by the architect to create a sense of variety and to increase the feeling of space. Although the bedrooms on the upper level are completely separated from the two-story living area, when the doors are open, the architect says "one is constantly aware of the total volume of the house." Visually, the interior is rather exciting. Sitting in the living room, one has intriguing views of the deck and hillside beyond on the north side, of the raised dining area, the balcony passage leading to the bedrooms and of the airy entrance hall with its floor-to-ceiling window bay.

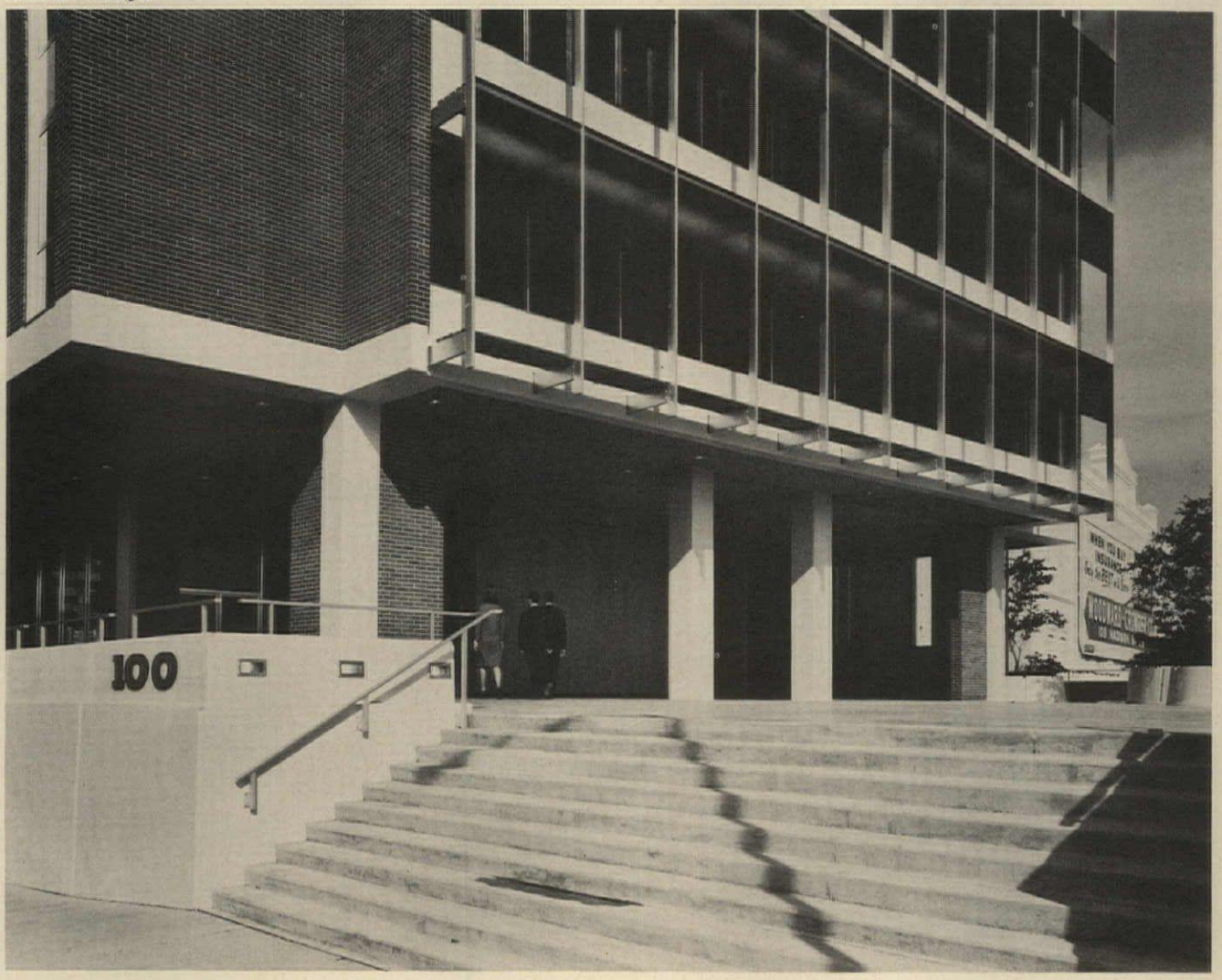


Morley Baer photos

Residence for
Mr. and Mrs. Rolf Seitle
San Mateo County, California
ARCHITECT: *John Louis Field*
CONTRACTOR: *Anthony Mazotti*
LANDSCAPE ARCHITECT:
Sasaki Walker Associates

The materials and construction of the house are simple—douglas fir frame with cedar shingle walls and rough 2-inch by 3-inch laminated roof deck, sprayed lightly white and spanning between dark stained roof beams. The roof deck is left exposed on the inside, but surfaced with red cedar shingles on the outside. Unusual and well executed detailing such as the hall window, the porch recess for plants, the way in which exterior balconies articulate the different levels inside—give the house its distinctive character.

Alexandre Georges



OFFICE BUILDINGS

The eight buildings in this 24-page study range from large to medium in size, and possess in common one great virtue—good design. As one surveys the unprecedented number of office buildings going up at year's end 1965, these—in terms of commercial architecture—are as good as one will find. Happily, the architects represented have extended their design interest beyond property lines, concerned with making their project an attractive element in its neighborhood, a visual asset in its community. The picture brightens, for such concern was uncommon a generation ago.

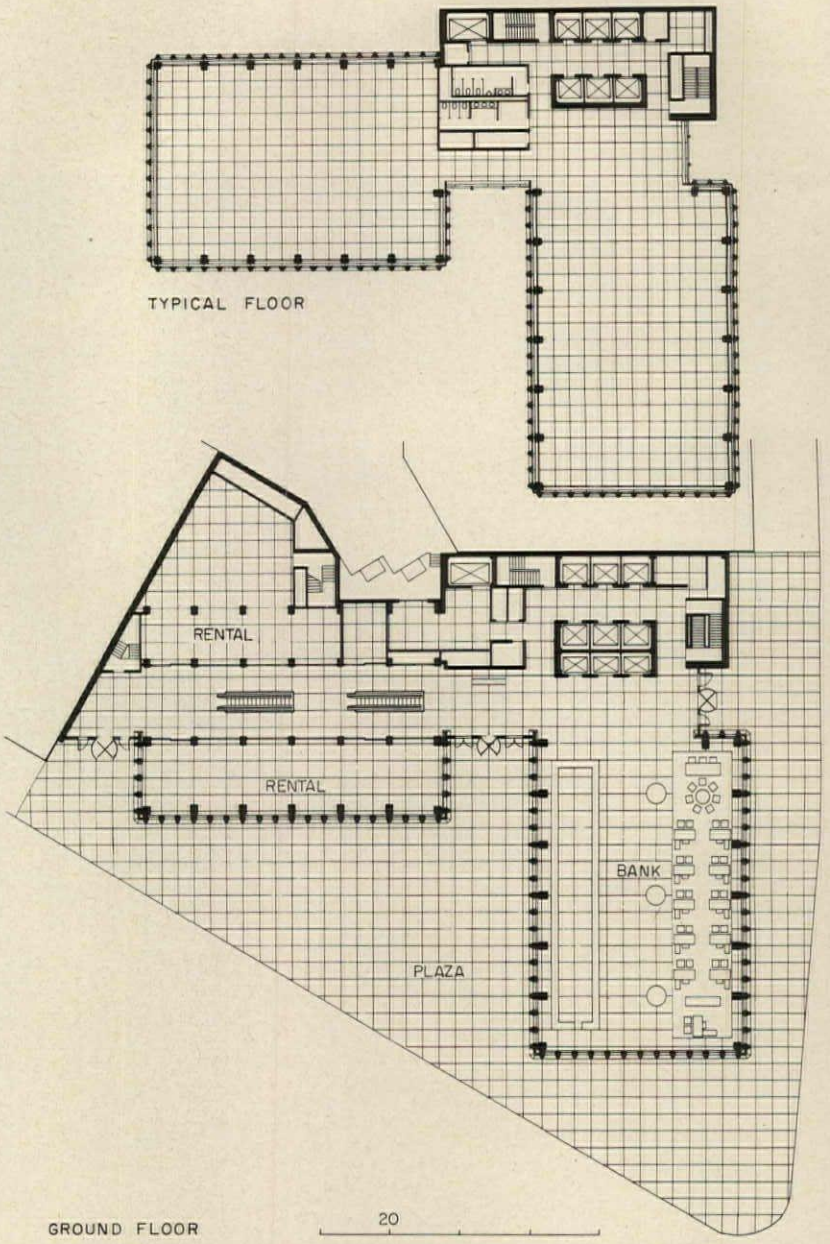
—James S. Hornbeck

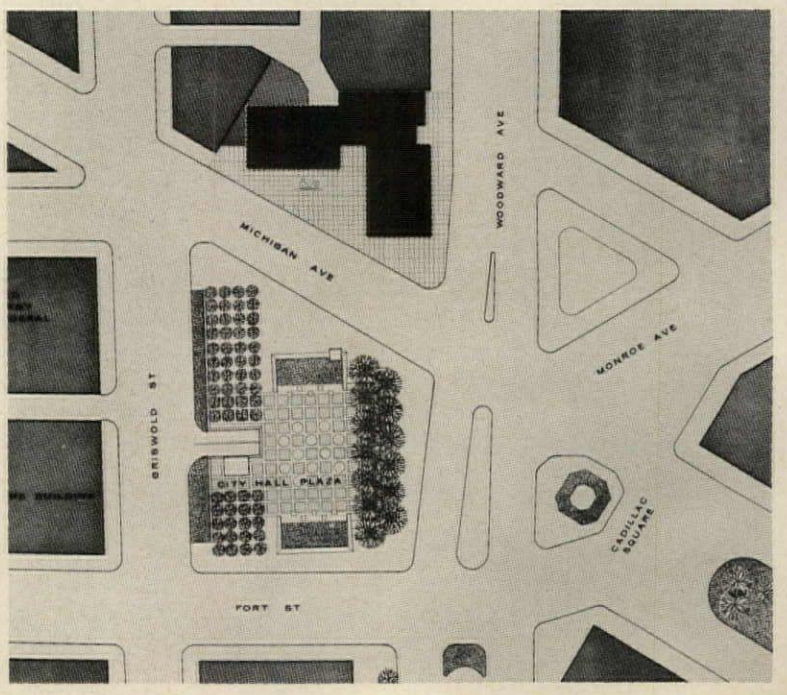
TRIANGULAR PLOT SHAPES TRIPLE TOWER

Architect Sigmund F. Blum, designer of Detroit's newest skyscraper, explains, "The site chosen for the First Federal Building is triangular in shape—a challenge to the designer seeking to provide efficient, pleasant office space within a structure that will relate properly to nearby existing buildings and City Hall Park. The site faces south to the openness of the park. Thorough study of alternates convinced us that the new building should stand at right angles to Woodward Avenue in order to establish a more rectilinear, unified definition of the park space. The building then relates directionally to the existing major buildings on the park, and makes a strong visual statement as seen from the south along Woodward Avenue (see photo at right).

"We arrived at the triple tower scheme after careful consideration of various other arrangements of office space and service core suitable to the triangular site. Locating the service elements in a tower on the north property line (top of plans) made it possible to provide two glass-enclosed office towers completely free of interior columns, disposed in a pattern that offers six corner-office spaces and frees an area at ground level for a small plaza.

"We chose polished dark gray granite for the exterior because it has a quality of permanence and is very durable. Using it as a thin facing for precast elements brought its cost into line."

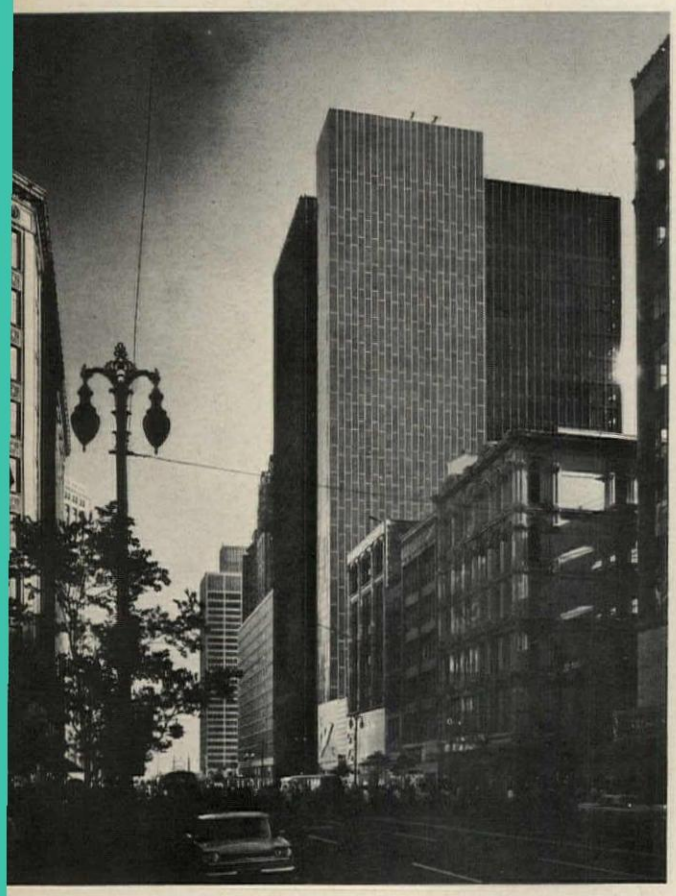




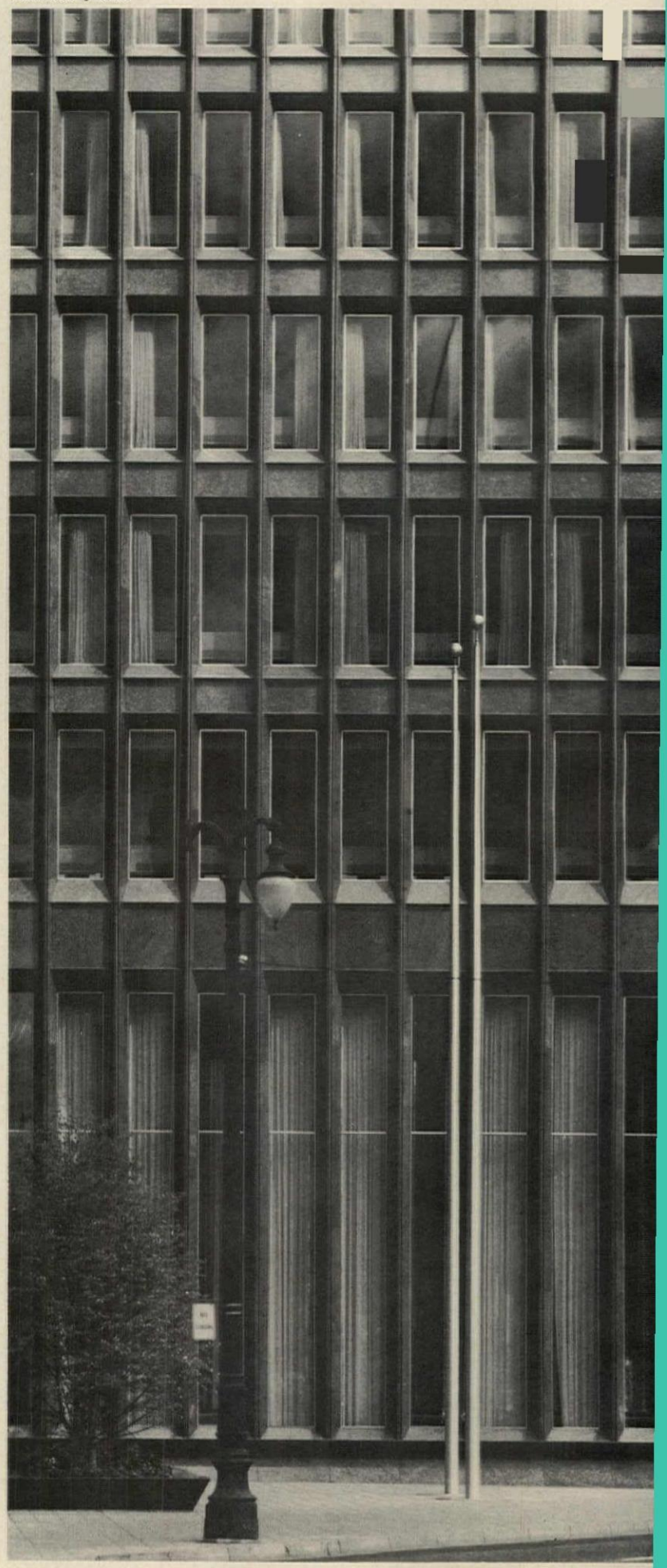
First Federal Building, Detroit. Owner: First Federal Savings and Loan Association; managing agents: Reaume and Dodds; architects and engineers: Smith, Hinchman & Grylls Associates—Robert F. Hastings, president—Bernard L. Miller, partner in charge—Sigmund F. Blum, partner in charge of design; executive floors interiors: Ford & Earl Design Associates; banking room interior by the architects; sculpture: Joseph McDonnell; general contractor: George A. Fuller Company

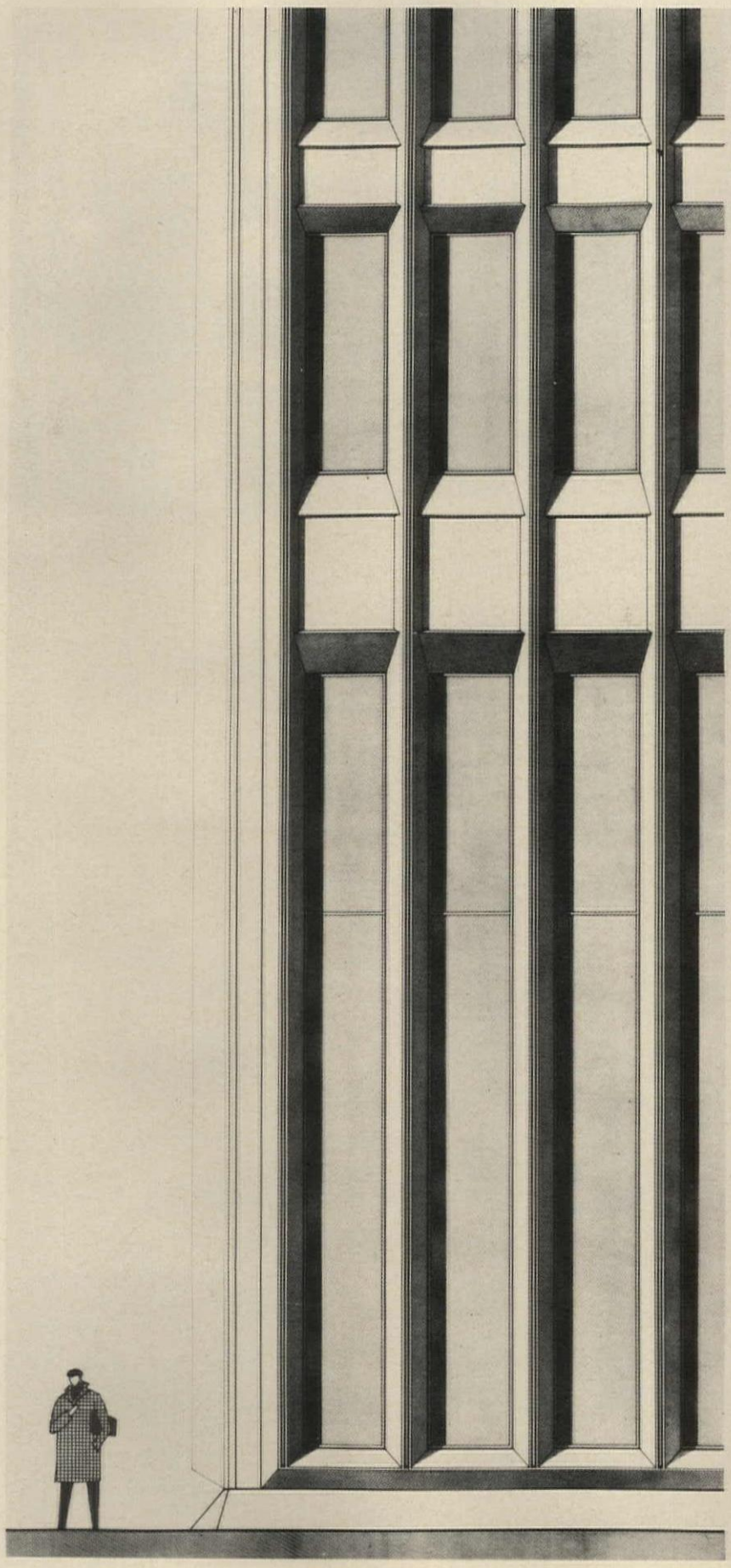

HUDSON
KEEP

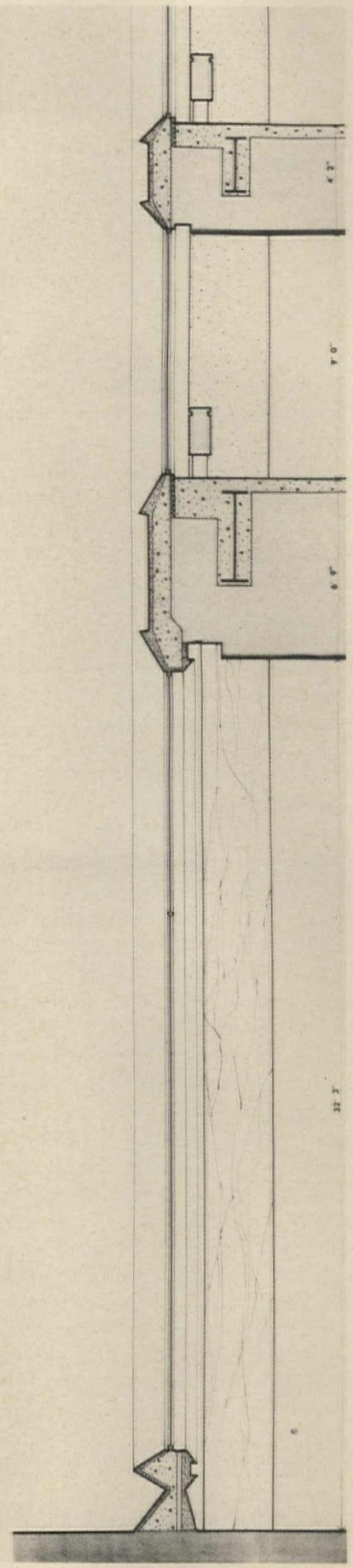
Balthazar photos



The patterned, flush-walled service tower is prominent in the north view of the building, shown above. The ground floor banking room, designed by the architects, is shown below. The floor, column covers, pedestals, and counter dies are Portuguese marble; the top of the banking counter is polished gray granite similar to that used for the exterior of the building.







The polished granite—which comes from Minnesota and is called dark pearl—is used in thin slabs as a facing material for the precast elements that cover the building. The curtain wall is composed of faceted forms which receive or shade the sun in changing patterns. The design emphasizes the verticals slightly, but the building appears as a cage, and properly so.

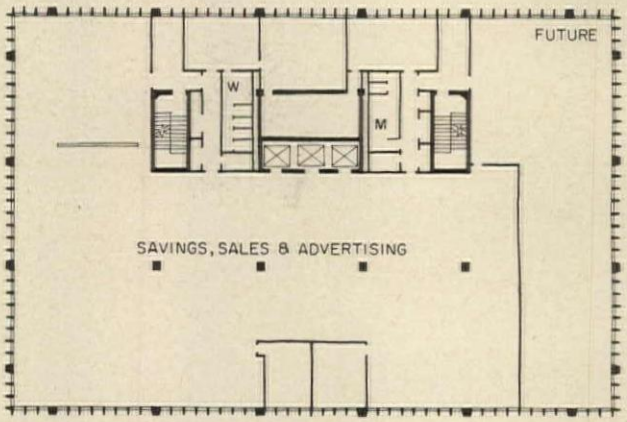
"CONCERNED WITH OLD-FASHIONED QUALITIES"

Architect Pietro Belluschi, in discussing the design of this Portland headquarters for the Equitable Savings and Loan Association, says, "The design represents one carefully executed example of concrete used as a plastic medium. It shows that it is possible again to derive delight from the play of light on the surfaces of a building, and one may say that it is a tentative return to a more romantic architecture. Through an enlightened client, and the mutual respect developed over 36 years of acquaintanceship, the opportunity was given and taken to use the site generously and imaginatively; and it was also possible to be concerned with old-fashioned qualities of scale and proportion and color—with restraint, yet with enough freedom to avoid stuffiness. I believe the building is successful with Portland citizens because they feel that quality has been given a chance to show that it can serve both private and public interest."

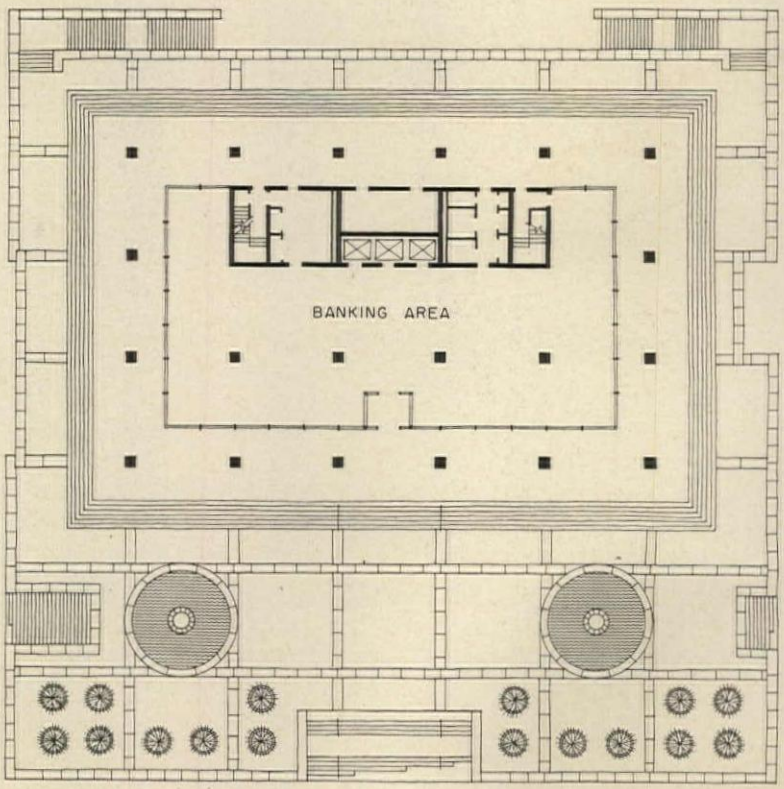
The project consists of a four-story building placed over three levels of parking; the latter covering the entire block. The building occupies about one-half the plot, and rests upon a raised plaza of travertine and brick paving, attractively landscaped, and containing two circular fountains. Placing the building on such a podium gives it visual importance and the added dignity appropriate to its use. The building's steel frame is clad with quartz aggregate, white precast units, similarly finished for exterior and interior. Glazing surrounds are of aluminum, cast in place.

Office building for Equitable Savings and Loan Association, Portland, Oregon. Associated architects: Pietro Belluschi and Wolff & Zimmer; structural engineers: Cooper & Rose & Associates; mechanical engineers: J. Donald Kroeker & Associates; electrical engineers: Grant Kelley & Associates; general contractors: Reimers & Jolivette

Ezra Stoller Associates photos



SECOND FLOOR



PLAZA LEVEL

10

LOFTY PORTICO --A TERMINATION AND A TRANSITION

To explain his design for this graceful insurance company office building in its park-like Minneapolis setting, architect Minoru Yamasaki says, "The challenge was to find a concept appropriate to the site—the focal point of the Gateway Center redevelopment—which would serve as a terminus for Nicollet Avenue, the major downtown shopping street. The program also required passage through the new building for pedestrian access from Nicollet to the relocated Gateway Park and the river beyond.

"After investigating many alternative ideas, including a tower to end the avenue and the usual building on stilts with its inevitable tunnel-like passage through at ground level, we decided that a six-story-high portico would make an exciting termination for Nicollet Avenue and a clear transition to the park, as well as providing enrichment to the other major approaches.

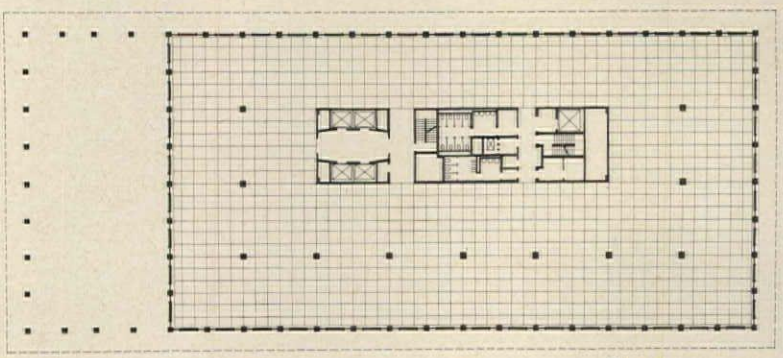
"The portico provides a solution to the demands of the site, and enables the basic building to be a simple, completely functional, six-story block.

"In keeping with the severe climate, the exterior walls contain a minimum of glass, which is punctuated by panels of dark green marble as a foil for the white quartz-aggregate precast columns.

"The building lobby faces the portico, and contains a wire sculpture called 'Sunlit Straw,' by Harry Bertoia (top photo). Designed and executed by Masayuki Nagare, a garden of stones, sculpture, and planting adjoins the portico."

Office Building, Minneapolis. Owner: Northwestern National Life Insurance Company; architects and engineers: Minoru Yamasaki and Associates; structural engineers: Worthington, Skilling, Helle & Jackson; acoustical consultant: Bolt, Beranek & Newman; interiors: Ford & Earl Design Associates; landscape architects: Sasaki, Dawson, DeMay Associates; sand garden and sculpture: Masayuki Nagare; sculptural screen: Harry Bertoia; portico lights: Lee DuSell; general contractor: George A. Fuller Company

Balthazar photos



TYPICAL FLOOR

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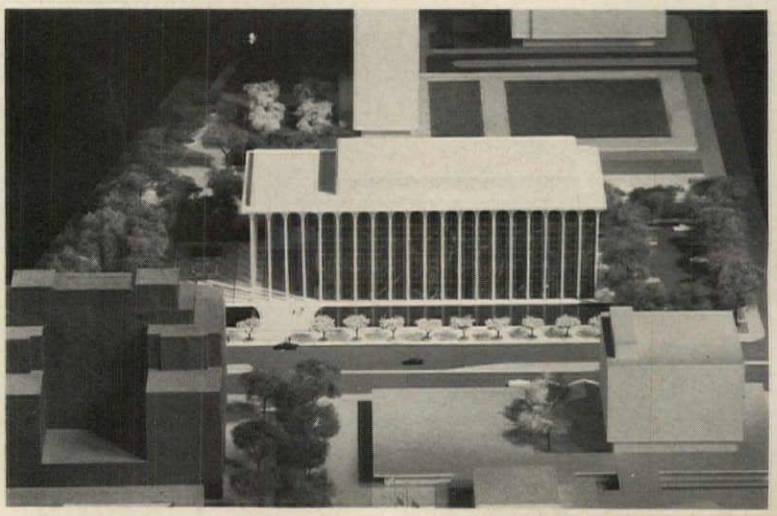
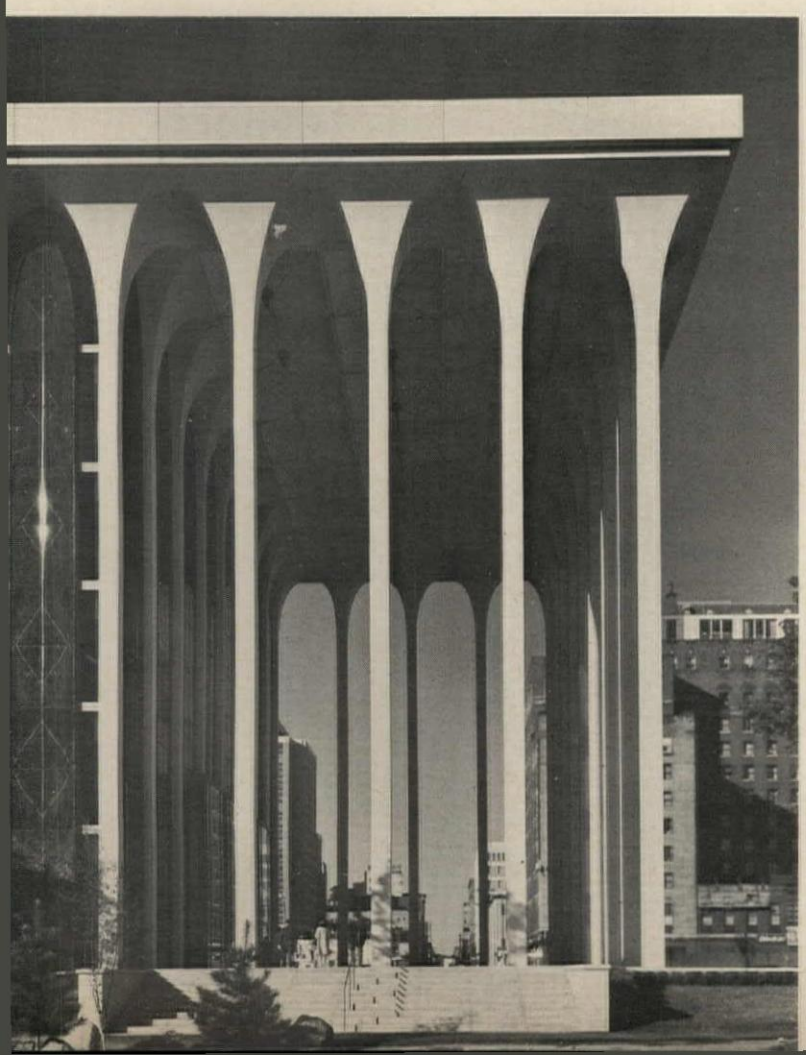
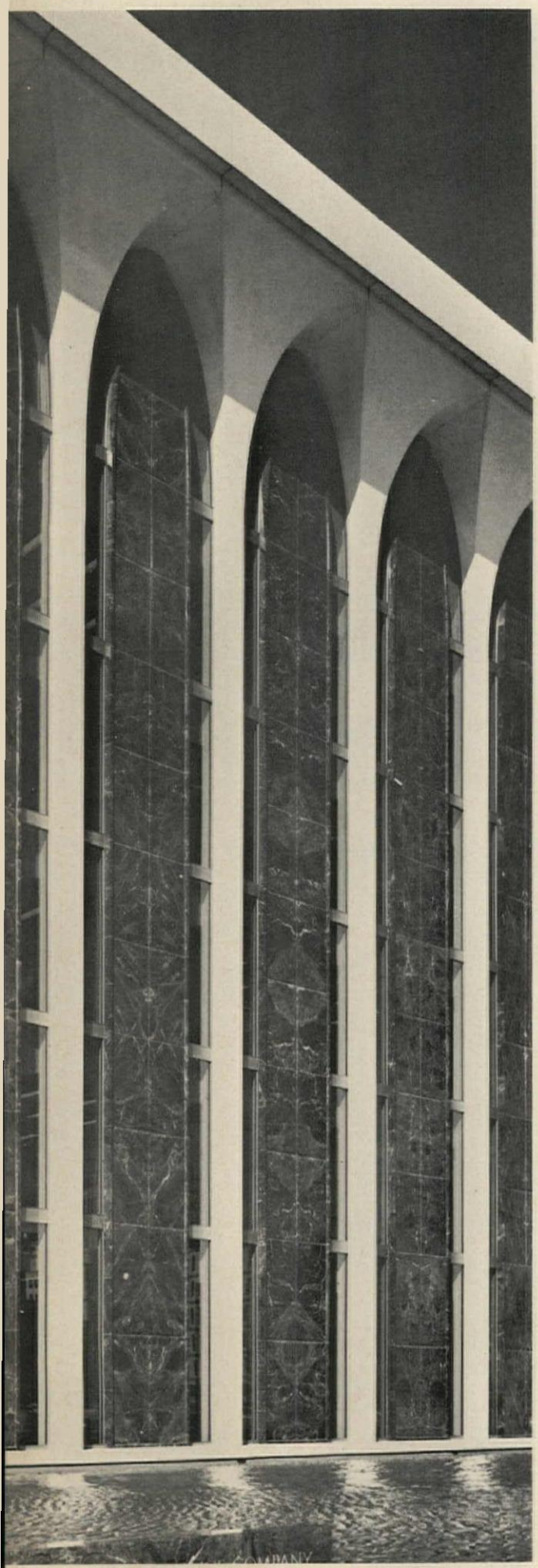
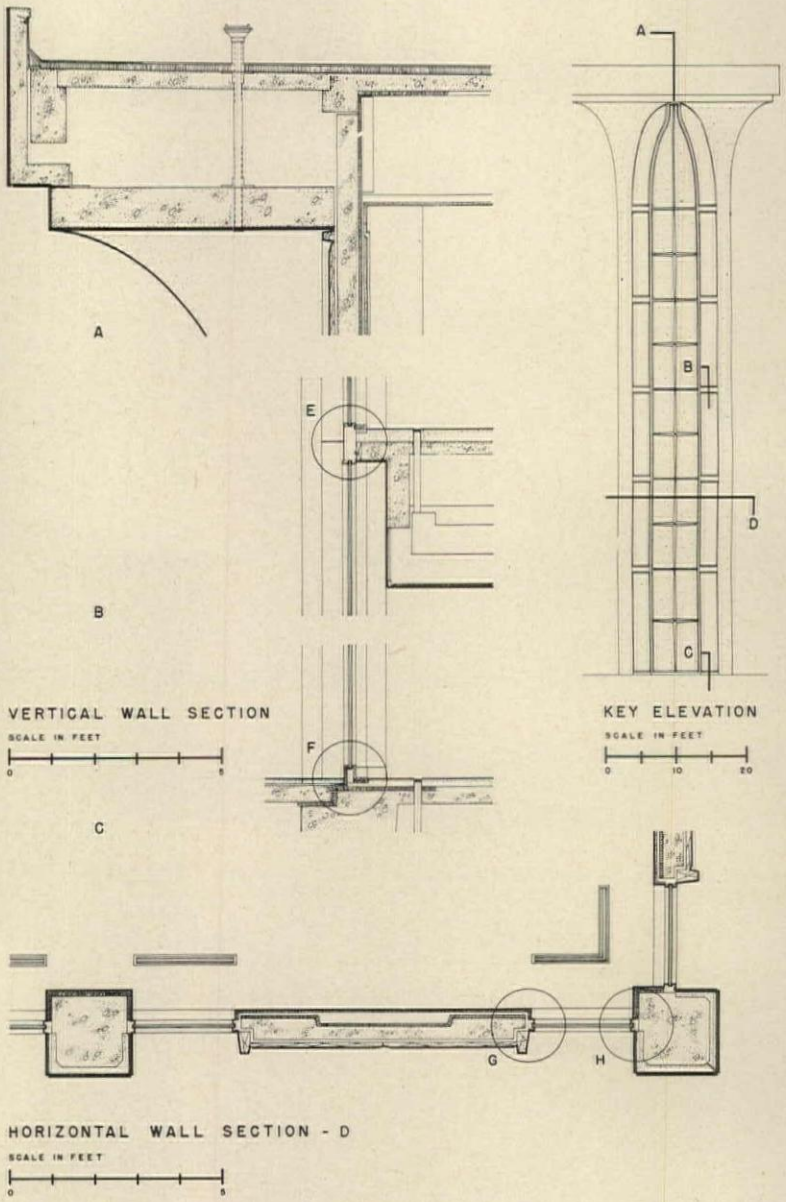


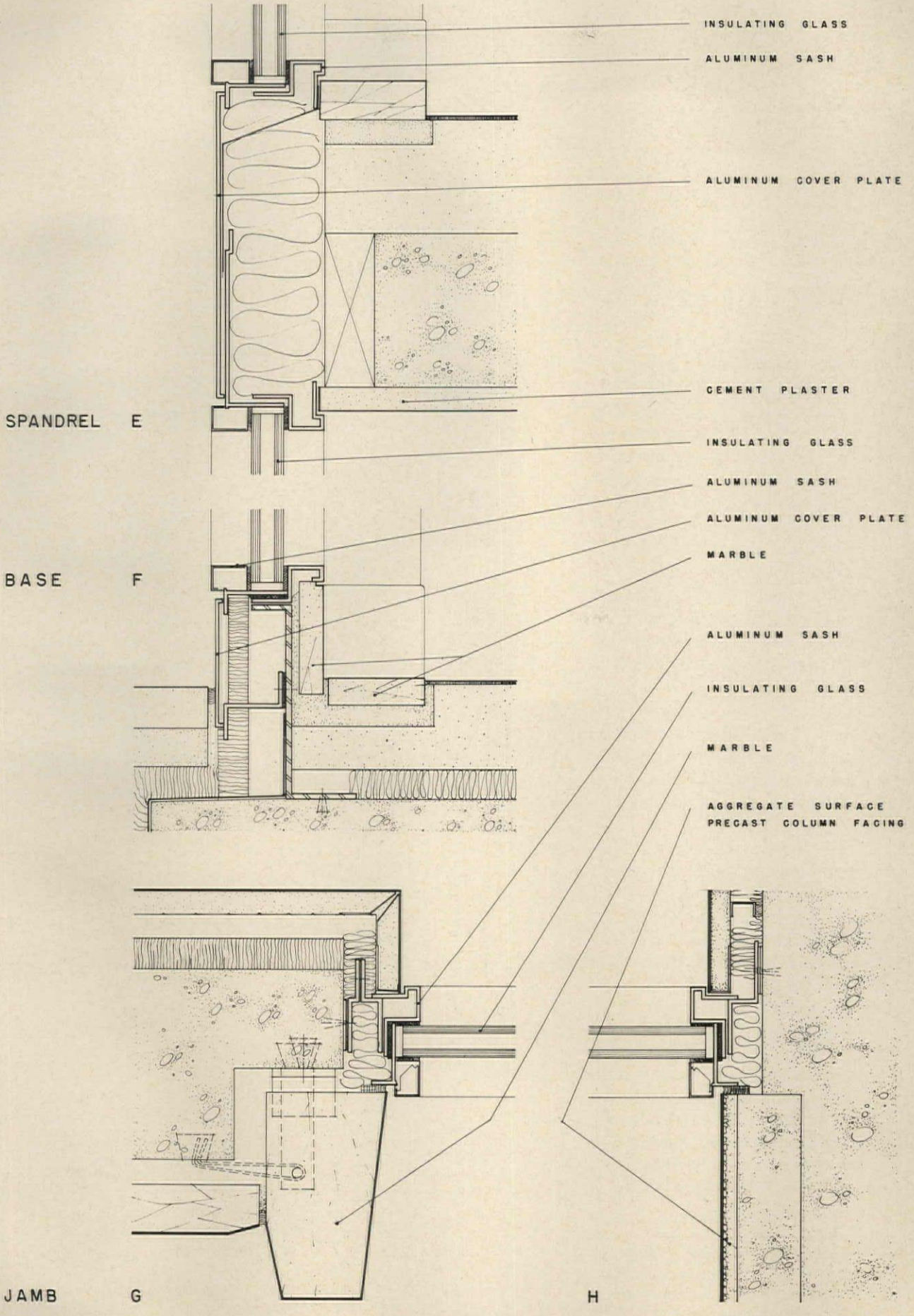






Details of the exterior wall are shown on these two pages. The building perimeter is composed of 63 slender, white quartz-aggregate precast columns, 80 feet high, which are flared outward at the top, forming a series of arched openings which give the building its unusual character. Within the arches, and serving as the actual outer wall of the building itself, are a progression of faceted Verde Antique panels—dark green with white, gray, and black veining—flanked by slender ribbons of gray solar glass set in aluminum surrounds which have received a bronze-colored hard anodic finish.

The building, which is 282 by 114 feet, is supported by a reinforced concrete structural frame. Modular walls and ceilings provide flexible office space, readily rearranged. Interior utility lines are carried within an underfloor duct system; an electric snow melting system is provided for winter entrance to the building.



WALL DETAILS

WHY DID YOU MAKE THE BUILDING BLACK?

When Atlanta citizens—or visitors—ask architect Joseph Amisano this question about the Peachtree-Palisades office building, he answers, "For me, this is an adventure in creating a quiet spot among a great variety of commercial buildings—the black granite material has this quiet character. Black materials were substituted for many details usually handled in lighter colors, so there would be a progression of black values. There are subtle variations in the color of the granite in certain changes of lighting, revealing the deeper reflective depths of mica.

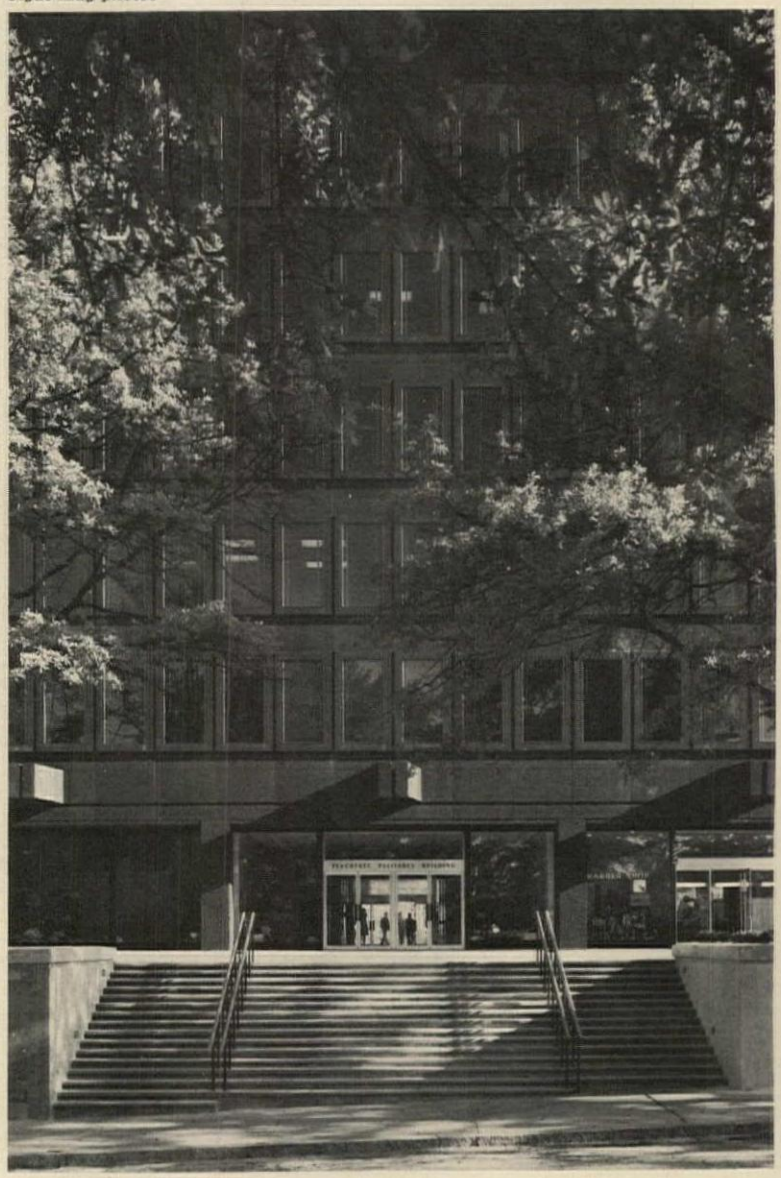
"By designing a quiet exterior, we could then use vibrant interior colors in contrast. The exterior is seen in the context of surrounding external color, while the interior is seen in its own color environment."

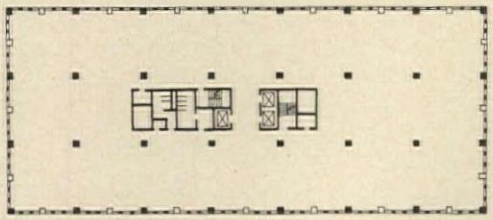
Enlightened owners made it possible to commission seven Atlanta artists to provide a painting for each of the seven floors of the building, thus enhancing the elevator lobbies. In addition, a sculptor was commissioned to produce the bronze group located in the outdoor circular pool—see photo at bottom right.

The building is clad in precast panels with exposed Canadian granite aggregate, and is glazed with gray solar glass set in neoprene surrounds. The structure rests on a raised plaza of exposed gray granite with colored matrix, which covers a parking garage for 328 cars, plus a drive-in bank. The building lobby is finished in Roman travertine.

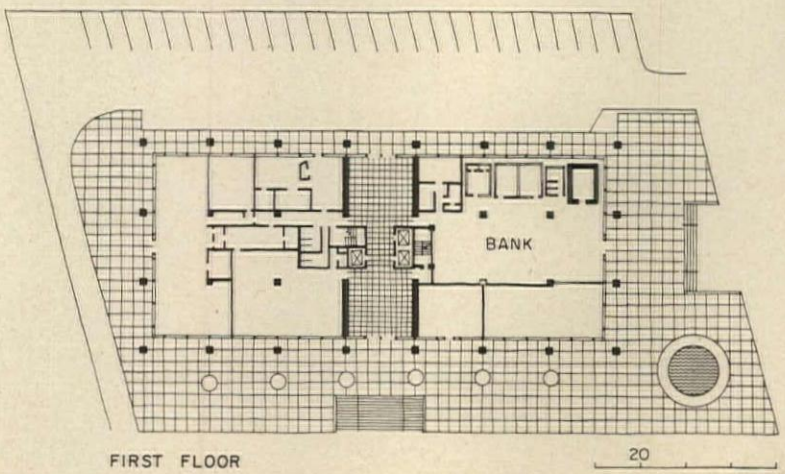
The Peachtree-Palisades Building, Atlanta. Owner: Stanley Mallin; architects: Toombs, Amisano & Wells; structural engineers: Chastain & Tindel; mechanical engineers: Newcomb & Boyd; landscape architects: Sasaki, Dawson, DeMay & Associates; general contractor: S. S. Jacobs; sculptor: Elbert Weinberg

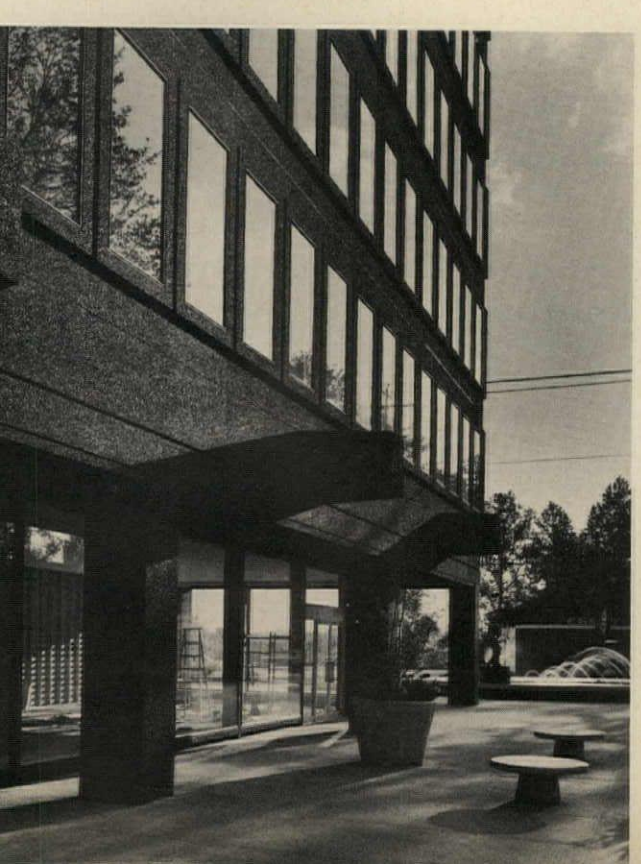
Clyde May photos





TYPICAL FLOOR





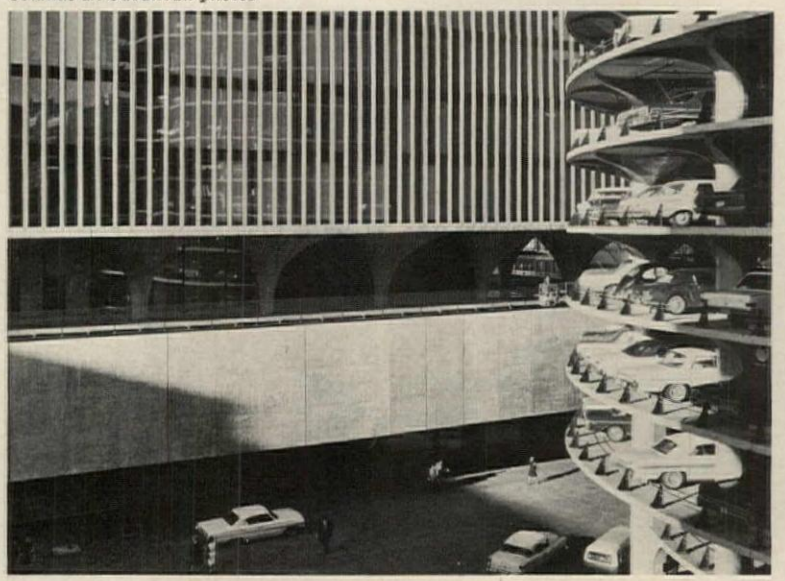
MARINA CITY ADDS A STRONG HORIZONTAL LINE

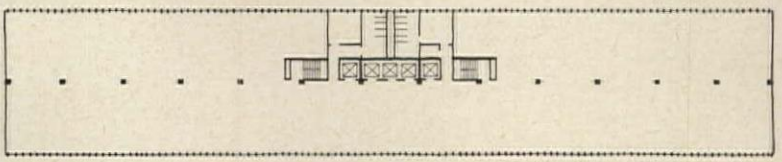
An office building—with concrete bearing walls in a fine-grained pattern—has been added to the by-now-famous circular towers of Marina City, thus bringing that complex a step nearer completion. The Marina City concept brings together within a dense urban complex the elements necessary for 24-hour use of expensive downtown land—facilities for business, living, and recreation. Thus, the complex now provides offices, shops, services, parking, apartments, meeting rooms, several restaurants, bowling, swimming, gym, skating, and a marina. A theater building—which will also house exhibit space and a second auditorium—is now under construction, and will complete the project. Architect Bertrand Goldberg, who is responsible for the idea of such intensive land use, pointedly calls it "living over the store," and describes Marina City as the translation of a daring idea into exciting reality. "Such ideas are not rare, but such realities *are* rare."

The office building is a long, narrow, slab-like structure with blank concrete end walls, faced on its long side with a vertical pattern of concrete bearing mullions which extend through and are sprayed with plaster for interior finish. Office areas are laid out on a modular grid, the modules being 2 feet 8¾ inches parallel to the windows and 5 feet 3⅜ inches perpendicular to the windows. No office area is more than 30 feet from a window. Ceilings are 9 feet 10 inches high, except within a central area 13 feet wide, where they are 8 feet high.

Marina City Office Building, Chicago. Owner: North Marina City Building Corporation; architect: Bertrand Goldberg Associates; structural engineers: Severud & Associates; foundation engineers: Mueser, Rutlidge, Wentworth & Johnston; foundation consultants: Dr. Ralph Peck and Alfred Caldwell; general contractor: James McHugh Construction Company

Orlando R. Cabanban photos





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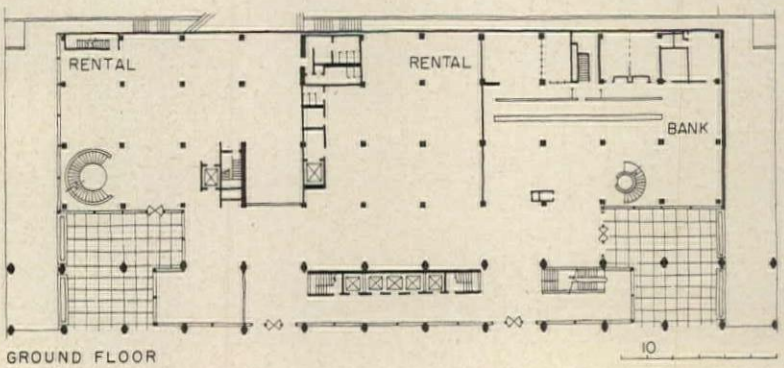
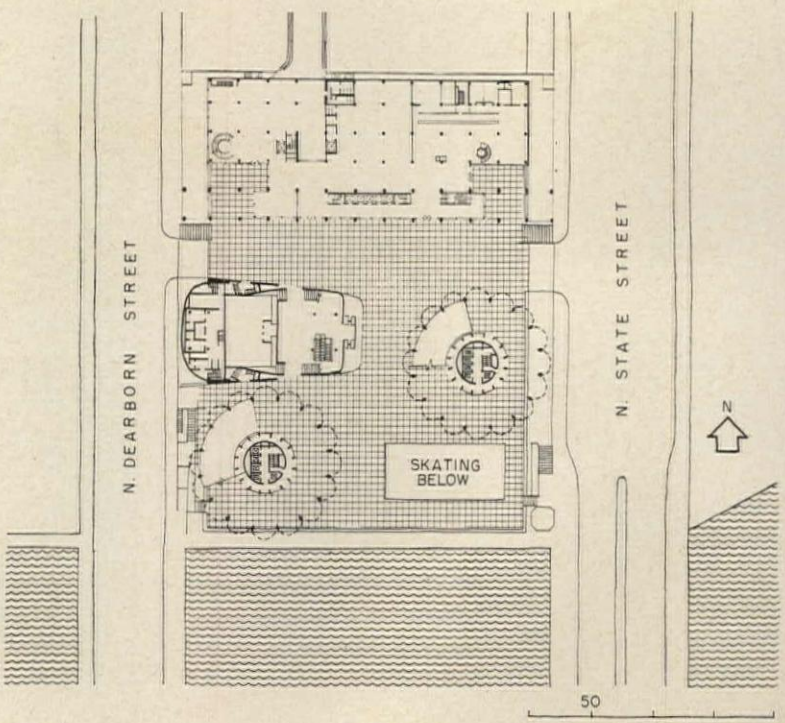
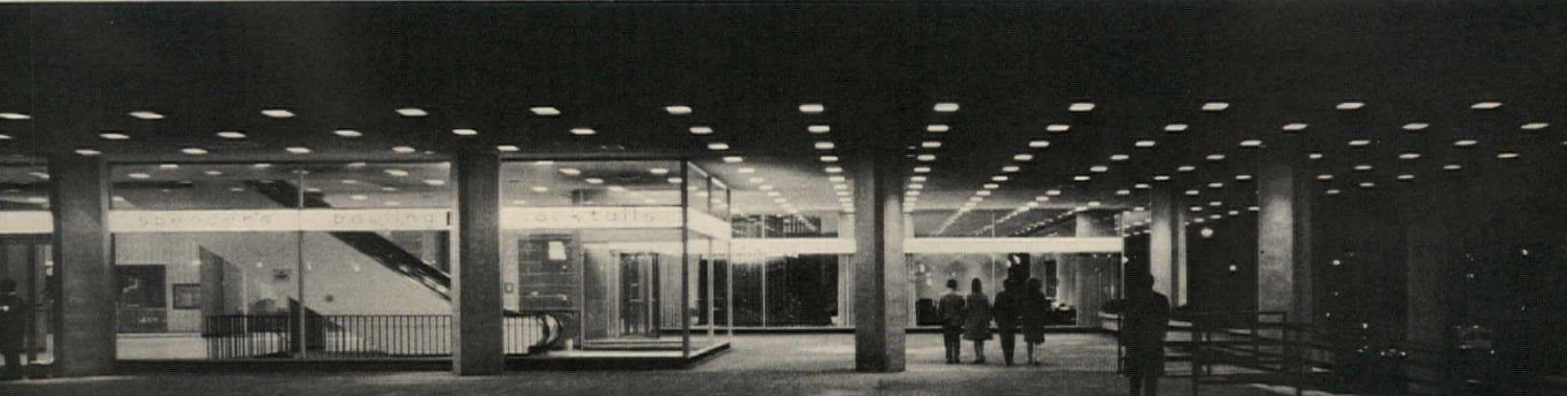


GROUND FLOOR



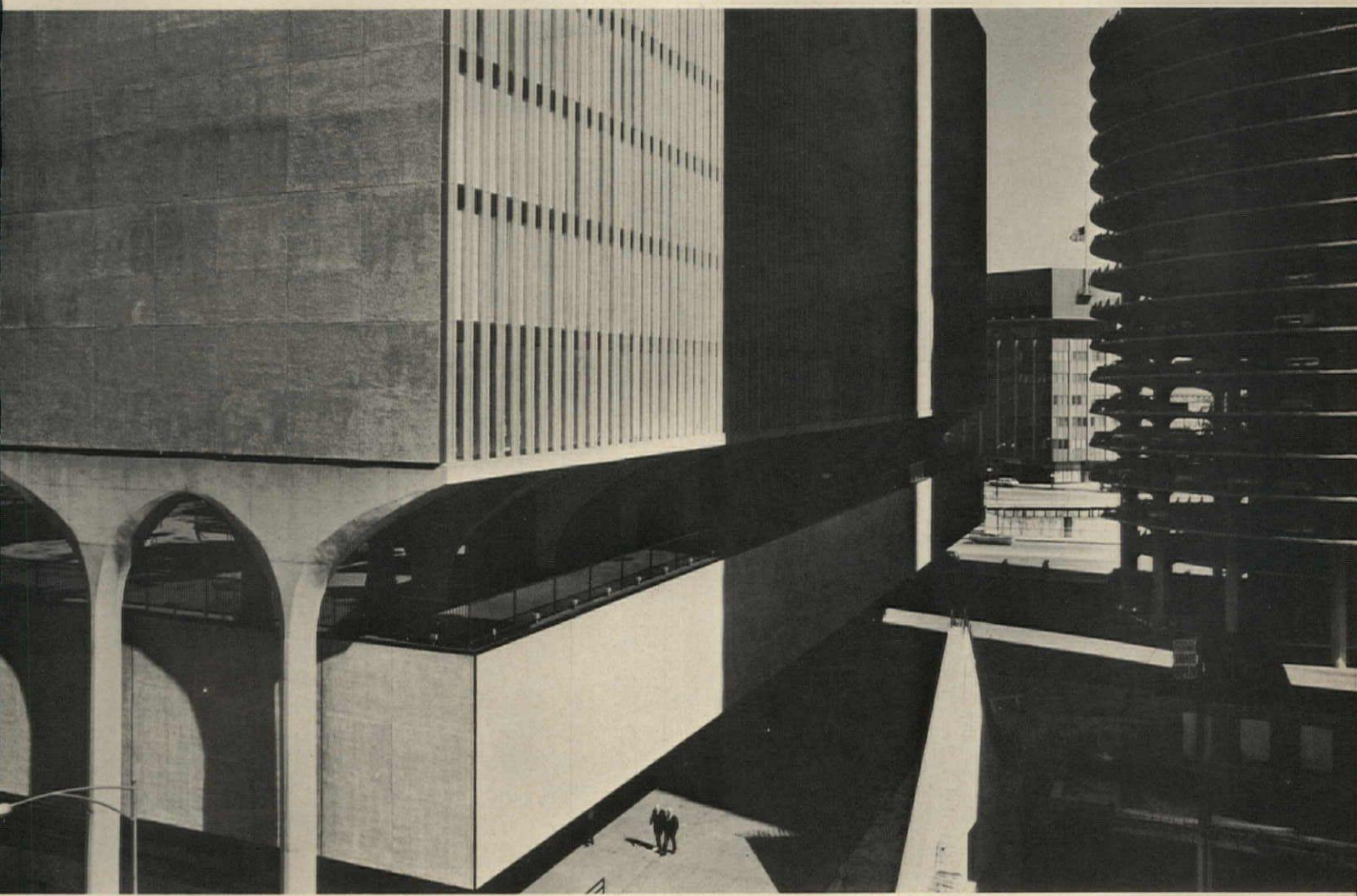
Hedrich-Blessing



The photographs on these two pages show the office building in its several aspects, and picture its relationship to the apartment-parking towers and the several lower levels. The outdoor spatial relationships are intimate, small in scale—almost medieval in character—and why not, since they serve only for pedestrians? A truly urban design asks for such density.

The blank-walled element that floats between street level and office block houses a bowling alley and bar; its roof is a promenade for office workers and visitors which offers interesting views of the city. The street level floor houses a concourse, elevator lobby, and rental areas (photo at *bottom, right*) ; the lower levels contain a swimming pool, health club, storage areas, and service facilities. The theater—now being built—will lie just south of the office building; the photograph at top left shows its construction in progress.

The luminous ceilings of the office building, shown at left, are an interesting feature—they furnish 250 foot-candles of light at desk level, yet have a very sharp cutoff angle, making them a dark source. These lighting units serve as a major heat producer in winter—the heat rises through openings into ducts to be circulated. In summer, the same heat is dissipated through exhaust grilles in the outer walls.



RAISED PLAZA LENDS PRESTIGE; PROVIDES A VIEW

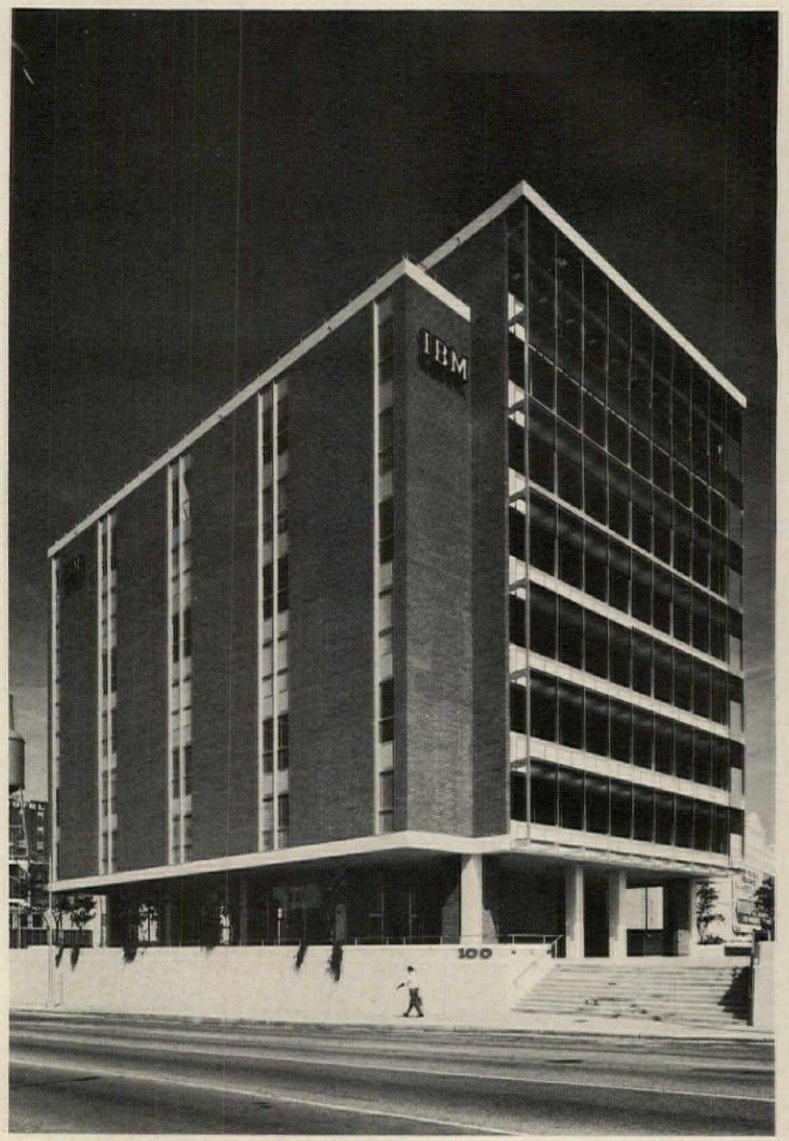
To make the most of a riverfront site in downtown Tampa, Florida, architect Richard Aeck provided a raised plaza as a base for this new eight-story IBM building. The elevated plaza provides an attractive landscaped terrace with a view up and down the river; removes the lobby and ground floor rental areas from street noise and distraction; and serves as a raised platform base for the building, adding to its visual appeal. In more mundane terms, the plaza is actually the roof of a two-level parking garage that covers the entire trapezoidal-shaped property. The garage and service entrance are reached from a side street which runs parallel to the river.

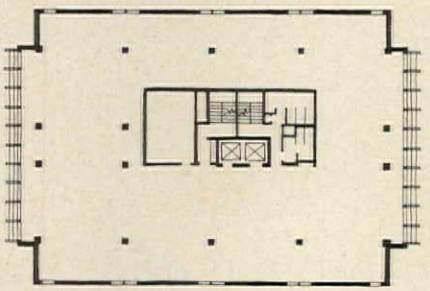
Of interest also are the solar screens which cover the east and west facades of the building. They consist of a light aluminum framework that supports vertical panels of unpolished, opaque dark gray glass, and horizontal catwalks. The solar glass is set out three feet from the building and extends from eye level to the floor above. The combination of glass and catwalks acts as a very efficient sun barrier; thus saved $1,700 per floor in mechanical equipment cost. The catwalks are used for window washing and made it possible to install fixed sash as a further economy measure.

The 132-foot-high structure is of concrete, and has walls of face brick. Typical floors have a 2-foot by 6-foot ceiling grid of aluminum T's, with alternate panels containing acoustical tile or a 12-inch by 4-foot troffer for lighting and air distribution.

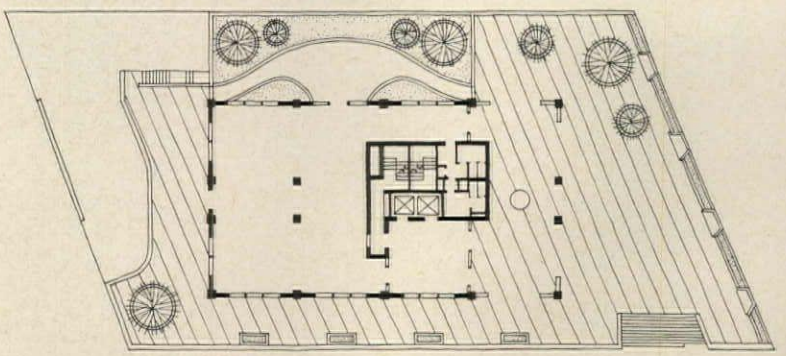
IBM Building, Tampa, Florida. Owner: International Development Corporation; architects: Aeck Associates; structural engineers: Chastain and Tindel; mechanical engineers: Lazenby and Borum; electrical engineers: Blakely-Daniel and Associates; general contractors: International Construction Company

Alexandre Georges photos





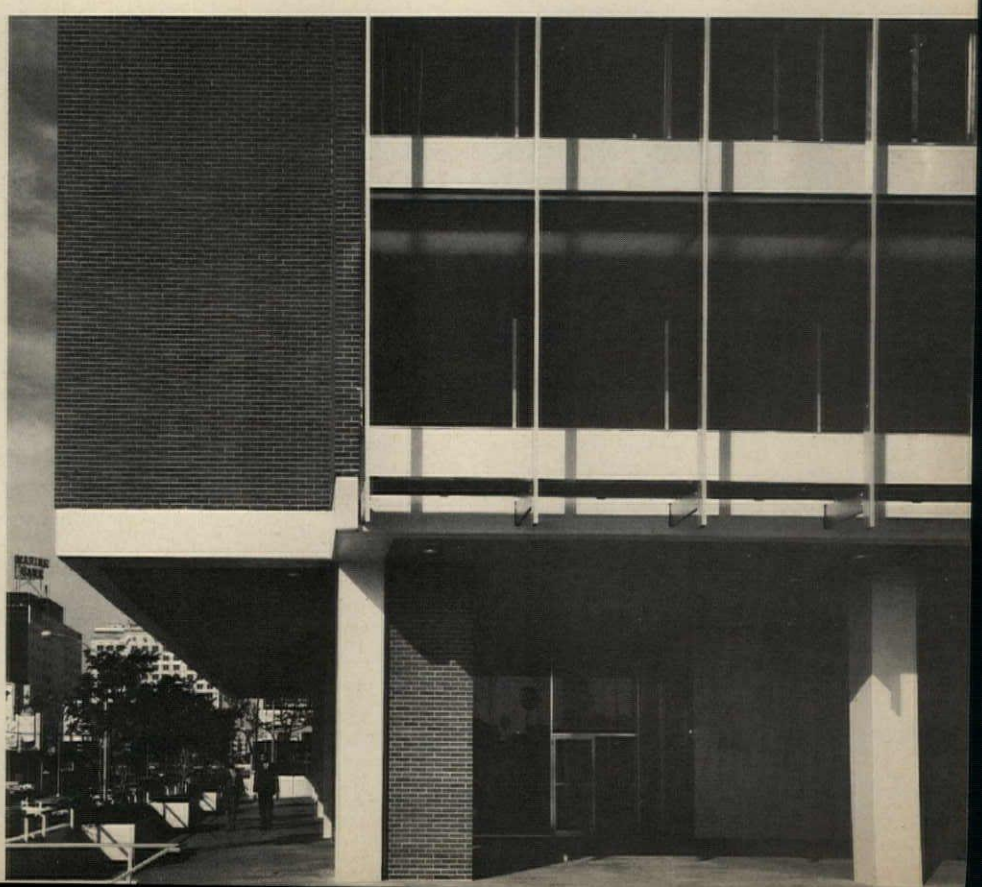
SECOND FLOOR



FIRST FLOOR

10


IBM



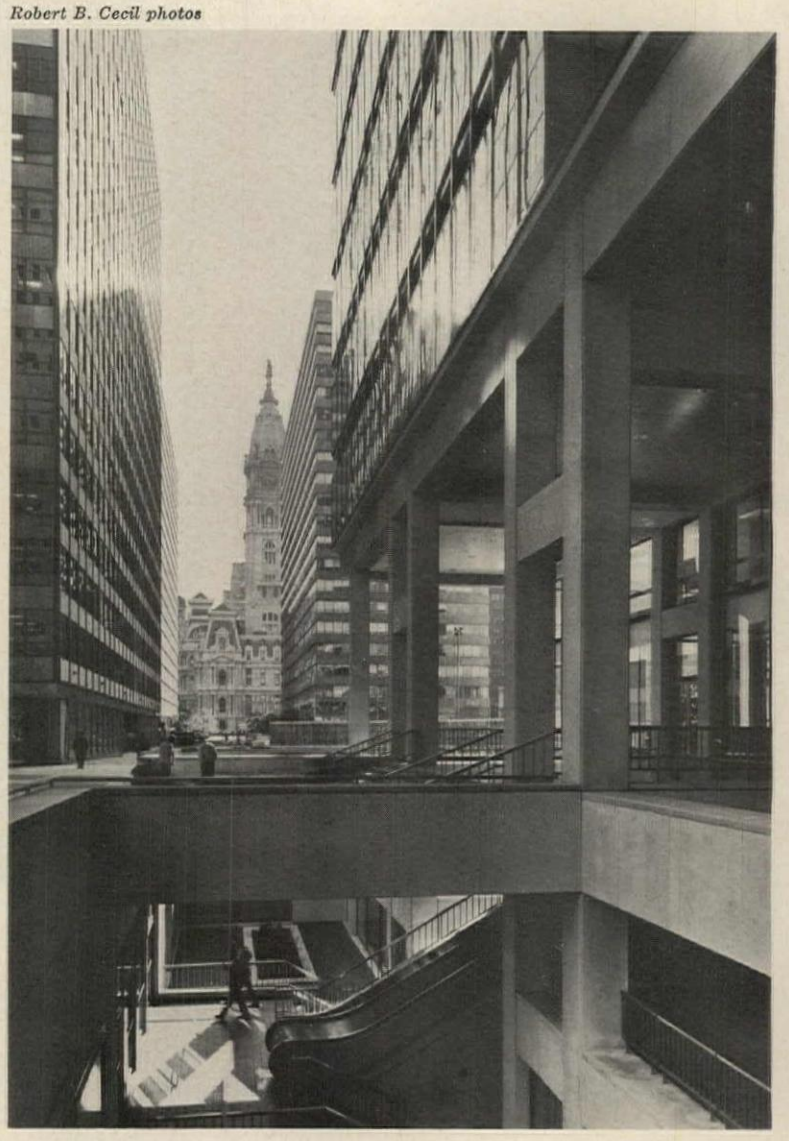
UNUSUAL STRUCTURE FOR AN UNUSUAL PLAN

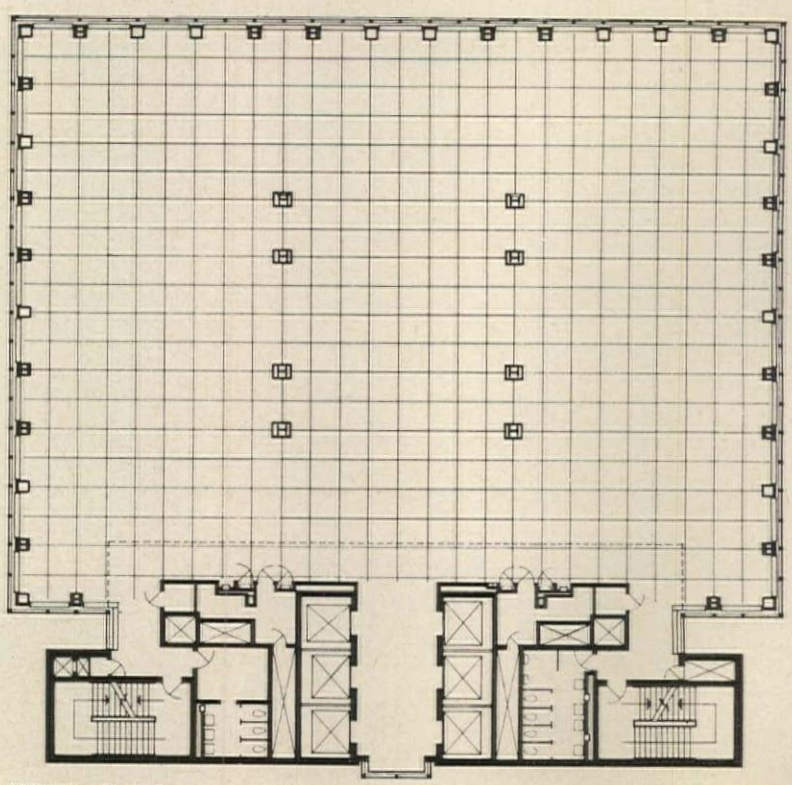
This new IBM tower in Philadelphia's Penn Center has three walls of glass and one of limestone. The reason: its unusual plan, in which a typical floor is composed of 12,000 square feet of open glass-enclosed space, which is served by an offset core almost entirely sheathed in sheer limestone. The design produces a bold and unusual look—that seems both pleasing and appropriate to the progressive character of IBM. The building is arranged to synchronize its traffic—pedestrian and vehicular—with that of Penn Center at both street and concourse levels. A system of open, glass-walled courtyards joins concourse and street level lobbies (see two upper photos). A long courtyard at the north property line achieves visual connection of the two levels and brings light to the concourse. The main entrance to the building is by way of a wide bridge across this courtyard from the esplanade to the north, which contains the Center's skating rink. This entrance, and another on the opposite building face at 17th Street, adjoin an escalator and stair system rising from the concourse level, for the benefit of persons using railway, subway, or parking facilities.

The structure of the 21-story tower employs its offset core as a backbone and its steel framing as a rib cage. The service core is a rigid concrete mass, constructed by the slip-form method. It serves as an anchor for the office portion steel cage, which is also anchored to heavy foundations to resist wind loads. Mechanical equipment is located in a two-story, limestone faced penthouse.

IBM Office Building, Penn Center, Philadelphia. Owner: International Business Machines Corporation; architect: Vincent G. Kling and Associates—Dan Peter Kopple, project architect; engineers: Jackson and Moreland; general contractor: Basic Construction Company

Robert B. Cecil photos





TYPICAL FLOOR


BOX
THEATRE

"TO SUPPRESS THE VISUAL IMPACT OF THE AUTOMOBILE"

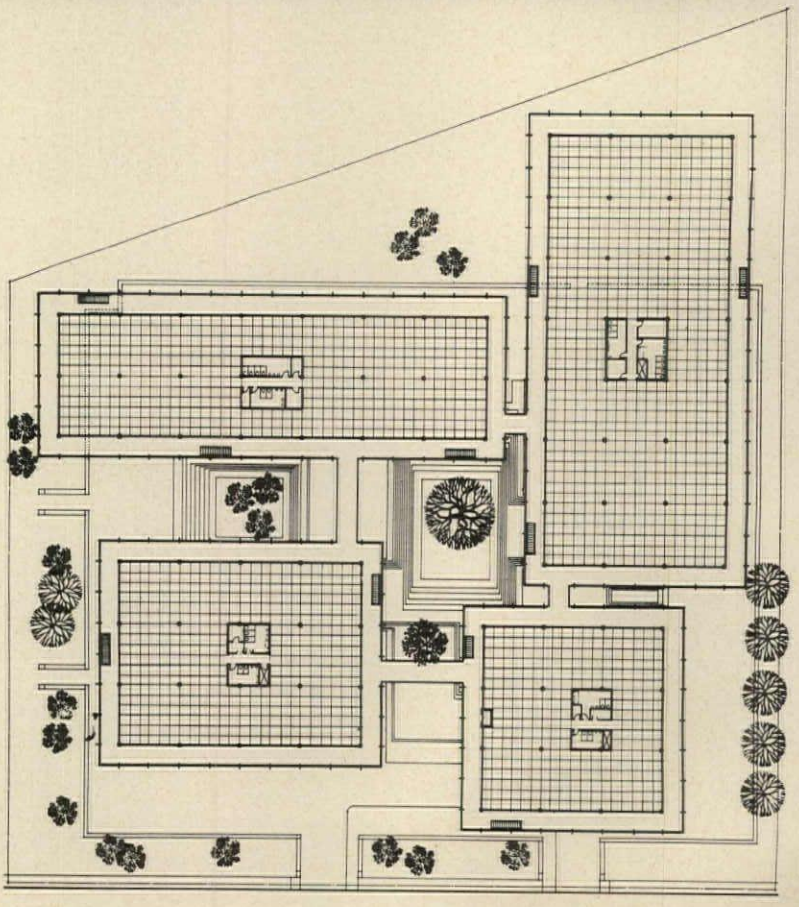
In addition to being efficient and attractive, this office complex is notable for the way in which it provides convenient parking and yet practically hides the cars from view—"suppresses the visual impact of the automobile," as SOM partner David A. Pugh puts it. This worthy objective is achieved by raising the project's four interconnected one-story office units above ground level and over depressed parking areas. Automobiles are thus convenient, sheltered, and nearly out of sight. The four office units are joined by an arrangement of bridges (see plan), and are situated in a park-like setting, grouped about a series of open landscaped courtyards. Some 52,000 square feet of floor space is provided for 17 tenants. All structures are designed on a 5-foot modular basis within 30-foot square concrete structural bays. A 5-foot-square pan system was devised, making use of reinforced plastic forms.

Exterior walls are of glass set in frames of stained laminated wood; vertical fins—of precast exposed aggregate concrete—serve as acoustic and sun baffles.

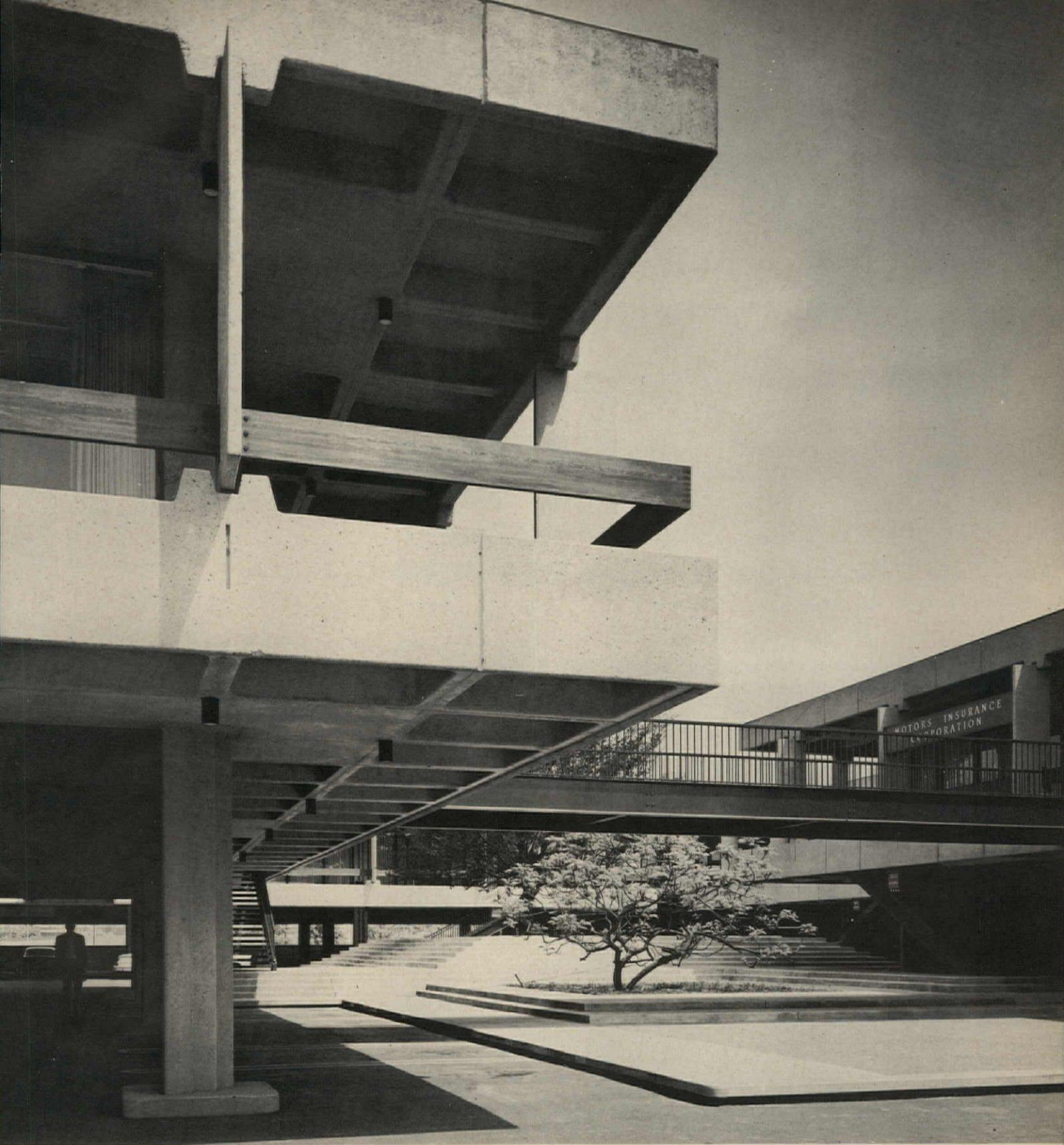
The design permits individual tenant approaches, parking, and identification; allowances for signs were part of the basic concept and serve to maintain a professional atmosphere.

The project, recipient of an Honor Award from the Portland Chapter, A.I.A., fulfills in a stylish manner the owner's desire for office space close to downtown Portland with an environment not usually possible in such a location. *The Sunday Oregonian* describes the project as both "away out" and "in."

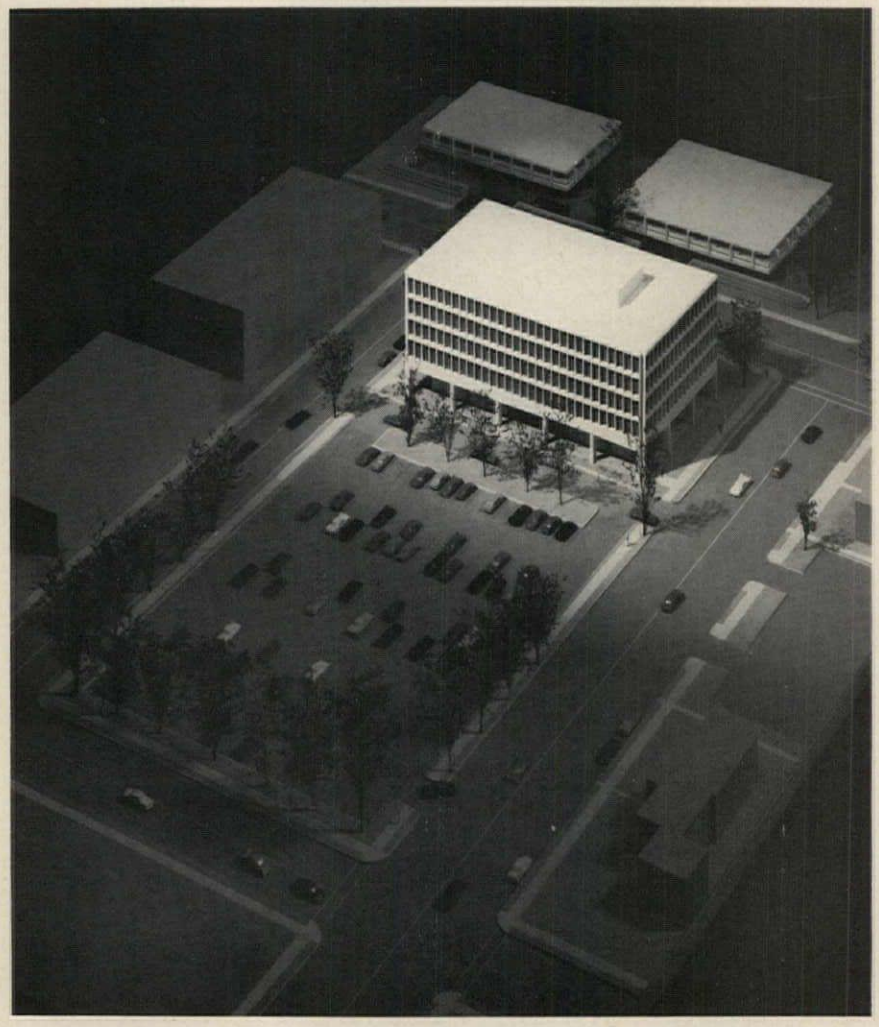
Morley Baer photos



Lloyd Plaza, Portland, Oregon. Owner: Lloyd Corporation, Limited; architects: Skidmore, Owings & Merrill; structural engineers: Cooper & Rose & Associates; landscape architects: Arthur Enfeldt & Associates; general contractor: Holladay Construction Company


MOTORS INSURANCE

The photograph above shows the way ground levels were handled beneath and between buildings to provide semi-hidden parking and attractive spaces.



This model photograph shows the second phase of the project—a five-story unit and large, open parking lot—which is approaching completion across the street. This development is called 1500 Plaza, and will, when built, include a second five-story building at the opposite end of its rectangular site.

Interest Mounts In Street Furniture

Formation of a national Urban Design Center which would develop designs for street furniture is currently being studied by the American Institute of Architects, according to its president, Morris Ketchum Jr. In addition to working on such items as street benches, trash receptacles and light standards and fixtures, the proposed Center would look into the design of store signs, and the graphics of street and highway directional signs.

Actually considerable research has been done on the understandability of traffic signs, but is just now being put into practice. The May issue of Popular Science tells of the work of Dr. Slade Hulbert who "began the first American research on sign understandability—the first scientific probing of the psychology of giving and following directions."

In Hulbert's research, which he calls "directionology," at U.C.L.A.'s Institute of Transportation and Traffic Engineering, it was found that people read upper and lower case letters a split second faster than all capitals. It also was found that dark green, or better yet, blue background improved readability. The European system of using symbols rather than words was tried out in five states. But, according to the Popular Science article, American drivers' reactions were "predictably erratic, since no attempts had been made to teach the motorists their meanings."

Hulbert's appraisal, after a five-months' trip in Europe, was that the traffic signs express their meaning in a flash and, if employed here, could compete better for drivers' attention in today's jungle of road signs.

Foamed Insulation For an Apartment Building

Sprayed-in-place urethane foam was used to insulate, as well as serve as a plaster base for, the walls of an $8-million apartment building in Alexandria, Virginia designed by Wosbeck-Ward & Associates, architects. The walls consist of 4-inch split rock with a 4-in. concrete block back-up. Urethane foam was sprayed directly on the concrete block to a depth of about 1 in. Fine wire mesh was fastened to the foam and block with roofing nails. Finally two coats of plaster were applied to a depth of ⅝ inch.

Blackout Underscores Need for Emergency Power

The 12 hours of chaos during the recent electrical power blackout of a multi-state area in the Northeast and the lack of reassurance that the experience will not be repeated point up the urgent need for more widespread provision of emergency and standby power installations. The range of such facilities can extend from $100 worth of storage batteries to such total energy systems as the $10.5-million plant that kept one large New York apartment development lighted during the emergency. The range is spelled out in an article by Louis Bello in the April, 1959 issue of ARCHITECTURAL RECORD. The New York Times quotes one company as offering such systems for buildings of almost any size at roughly $100 per kilowatt. But, it is pointed out, such units should be designed into the building because parts of the system are built in.

Earthquake Studies On Steel Frames

Earthquake engineering research conducted in the laboratory, on actual high-rise buildings, and by computers using records from past quakes was described at the annual convention of the Structural Engineers Association of California, held in Coronado, California.

The projects are among several university studies on earthquake effects being sponsored by the Committee of Structural Steel Producers and the Committee of Steel Plate Producers of American Iron and Steel Institute. Professor Egor Popov of the Department of Civil Engineering, University of California, Berkeley, described his laboratory studies of steel beam-to-column connections—particularly critical structural elements during an earthquake, of which still little is known of their behavior.

Professor Popov's tests are conducted on stub columns clamped into a rigid test frame with the beams projecting horizontally. The beam and column assembly is scaled to be in proportion to members commonly used in high-rise buildings.

During a typical test, a hydraulic jack applies up-and-down thrusts that eventually grow larger. This induces plastic strain more than 15 times the maximum elastic strength of the beam flanges.

Prof. Popov has concluded from these early tests that steel beams and the connection systems tested can withstand a large number of these reverse-loading cycles. Also, the tests have shown that moderate flange buckling does not indicate any loss of capacity of the steel connection. The buckling of flanges and web do not signal a collapse of the system—buckles will appear and disappear until the steel itself cracks.

A description of simulated earthquakes being carried out on an actual 15-story steel-framed building was given by Prof. J. G. Bouwkamp, also at the University of California, Berkeley.

The simulated quake or "building shaking" tests are conducted at the Medical Center of the University of California in San Francisco using two special mechanical vibration generators. Banks of sensitive instruments recorded the vibrations for computer analysis.

Also as part of American Iron and Steel Institute's portion of the S.E.A.O.C. convention, Prof. Glen V. Berg of the Civil Engineering Department of the University of Michigan described his analytical studies of the response of steel-frame structures to earthquake motions.

In these mathematical studies, a computer is fed the information on ground movements that has been

recorded during actual past earthquakes. This information is applied to a theoretical steel building frame to determine what the structure's deformation would be if subjected to such shaking of the ground.

Sound and Fire Testing In New Industry Facility

The new $1-million research center of the National Gypsum Company in Buffalo includes sound and fire laboratories large enough to permit the testing of actual-size rooms. An overhead crane system is used to transport the building systems to be tested from the construction area to the test furnace or sound test chamber.

The individual rooms in the sound laboratory include a reverberation chamber, an "over and under" room for measuring floor-ceiling noises and a Geiger & Hamme Room for controlled testing of sound. The fire portion of the new laboratory included three major test furnaces.

A Brand New Light Source

A new 400-watt bulb which produces six times as much light per watt as a household incandescent bulb is being produced by General Electric. The new lamp, which is expected to be used first for street lighting, parking lots, sports areas and industrial plants, was made possible through the development of a new white translucent ceramic called "Lucalox." The ceramic, shaped into a small tube the size of a cigarette is coated on the inside with sodium metal. When the current is turned on, the sodium vaporizes and the ionized gas creates a golden light. The ceramic can operate at much higher temperatures and pressures than materials such as quartz, and the conditions cause the ionized sodium gas to give off a light which is rich in both red and yellow, and is not monochromatic like the former sodium vapor lamps.

Performance Criteria For University Buildings From New York State

A complete series of performance criteria covering requirements for structure, mechanical systems, lighting and acoustics is being developed by the State University Construction Fund (New York) to serve as guideposts for architects and engineers engaged in designing buildings for the State's $700-million building program. So far three criteria have been issued which deal with concrete: (1) design and construction; (2) precast and prestressed concrete; and (3) precast wall panels. A fourth in this series will be issued on concrete aggregates, with special emphasis on the sources and quality of aggregates in New York State.

A seminar was held on September 28 to answer questions concerning content and use of the second and third criteria in this series, and provide a forum for discussion of possible changes. According to the Fund, the final criteria will have the force of policy. They are intended to be statements of minimum requirements which will serve to achieve a satisfactory structure.

Corridor Fire Hazards

Spread of fire in corridors is being studied via a full-size model at the Canadian Division of Building Research, National Research Council in Ottawa.

Because a number of tragic building fires have occurred in which rapid spread of flames has blocked escape routes, the Canadians are testing different corridor finishing materials in order to prescribe maximum flame rating such that fire in a corridor will not be self sustaining. The Canadian fire researchers point out that limitations in flame spread can be most effective as applied to corridors because they normally are free of furniture and other combustibles which can contribute to the fire hazard in other rooms.

New Lumber Sizes Approved by A.L.S. Committee

After much wrangling within the lumber industry, principally between the producers of dry and green lumber, the American Lumber Standards Committee approved on September 16, by a vote of 16 to 4, a new schedule for dressed sizes of dry and related green minimum sizes recommended by the subcommittee in August. It is now up to the Department of Commerce to determine whether there is a "consensus" favoring the proposed sizes. If adopted, the new schedule will call for a dry 2 by 4 to be $1\frac{1}{2}$ by $3\frac{9}{16}$ inches; a green 2 by 4 to be $1\frac{17}{32}$ by $3\frac{5}{8}$ inches. The schedule represents a compromise from some of the earlier proposals which make the size schedule much more acceptable to the green producers.

Programing Aids For Physics Building

Two booklets of interest to architects charged with the design of physics buildings have just been published by the Education and Manpower Division of the American Institute of Physics.

"Physics Buildings Today", a 64-page supplement to the 1961 publication "Modern Physics Buildings: Design and Function," describes 26 buildings for physics that have been constructed in the last five years.

The companion booklet, "Check-list for Physics Buildings," contains more than 300 items listed under 28 headings. Preparation of the booklets was supported by a grant from the Educational Facilities Laboratories.

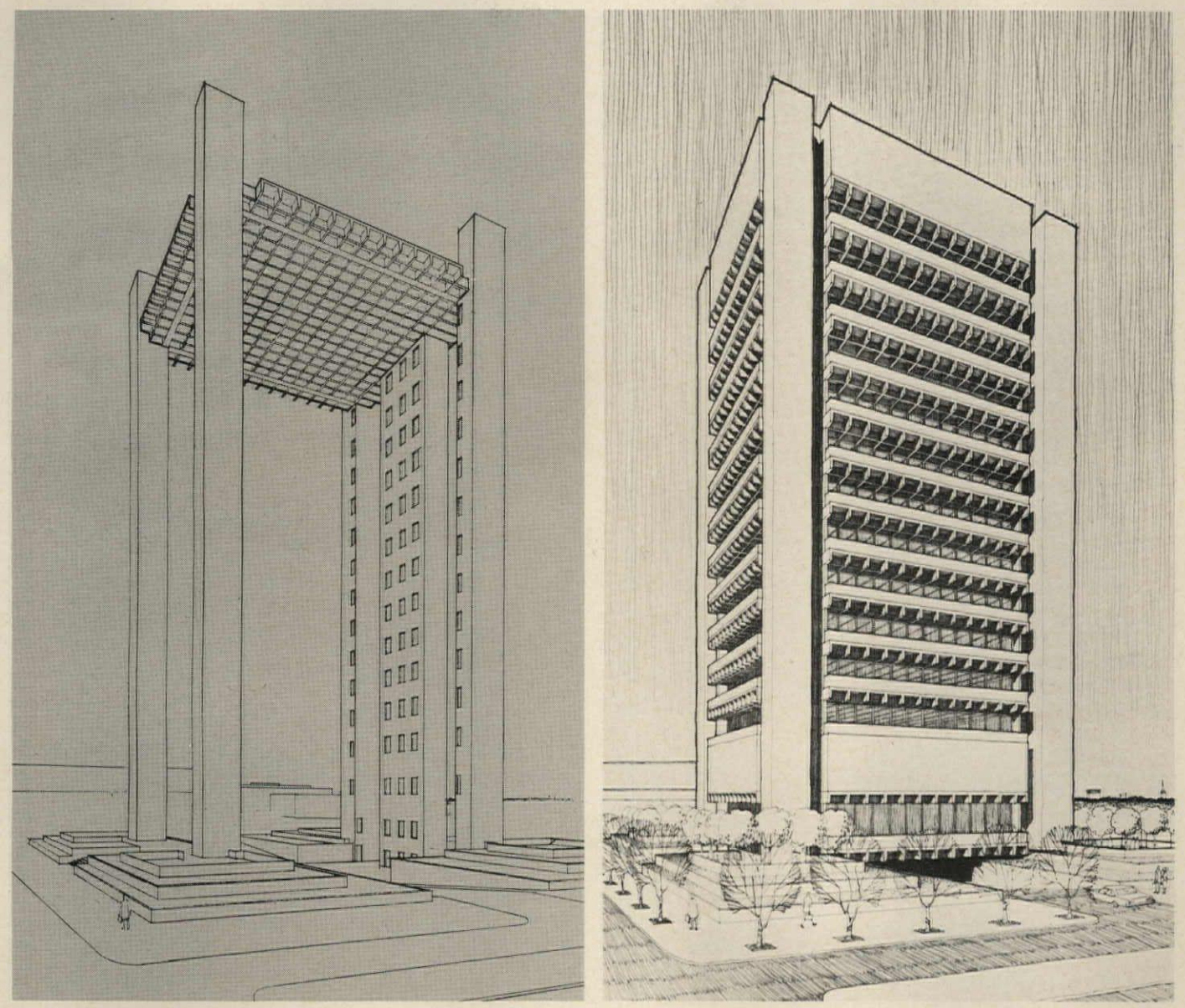
"Goals of Engineering Education"

Recommended changes in engineering education to help improve the engineer's performance and enlarge his scope of activities in today's society are set out in a new report, "Goals of Engineering Education," prepared under the auspices of the American Society for Engineering Education.

Of the 14 recommendations, the prime one proposes that the first *professional* degree in engineering be the master's degree, awarded upon the completion of an integrated program of at least five year's duration.

It is particularly interesting to note that another of the recommendations asks for increased emphasis on the analysis, synthesis and design of systems at all levels of the engineering curricula.

This Month's AE Section



Proposed office tower by Harrell & Hamilton, Houston architects, has four corner towers which would be slip-formed. The waffle slabs would be pan-formed, with formwork being lowered from floor to floor. Engineers, T. Y. Lin and Associates.

TALL BUILDINGS IN PRESTRESSED CONCRETE

By T. Y. Lin

Until now, multi-story buildings of prestressed concrete were mostly designed by substituting prestressed concrete for another material, based solely on economic justifications. As a result, these projects possessed architectural features and layouts which were originally intended for conventional materials. It yet remains for the architects to take into account the significance of this material and develop new designs based on prestressed concrete's own merits.

For multi-story buildings, the usual advantages of prestressed concrete are multiplied and magnified, as listed below:

1. *Repetition of Forms*—To fully utilize the potential of prestressed concrete, the repetition of shapes is essential. Since intricate patterns are frequently necessary to prestressed concrete, the repetition of these patterns throughout the stories becomes significant. Reuse of forms may be accomplished in a number of ways, the most common of which are precasting and movable forming.
2. *Reduction of Weight*—Prestressed concrete yields lightweight structures because of several reasons: the use of stronger materials, the active combination of these materials, the introduction of optimum shapes, and sometimes the use of lightweight aggregates. Frequently, the weight of the structure compares favorably with a steel frame supporting concrete floors, and is much lighter than ordinary reinforced concrete.
3. *Longer Spans*—The optimum span length for prestressed concrete is generally 50 per cent to 100 per cent longer than for ordinary reinforced concrete. Even greater spans can be obtained at a small premium, thus

The author, a pioneer in the application of prestressed concrete, is a professor at the University of California in Berkeley and heads a number of consulting structural engineering firms here and abroad.

putting new layouts within the designer's reach.

4. *More Efficient Vertical Loading*—If columns are eliminated, all gravity loads will be carried by the elevator cores and the exterior walls or frames. Since these are also the elements best fitted to resist wind and earthquakes, the increase in their vertical load helps to stabilize them. When bearing walls are used, their load-carrying capacity is high and they can be extended vertically with little additional cost. Vibration in multi-story buildings can be minimized by vertical prestressing of shafts and walls. Prestressed concrete floors serve as diaphragms to tie the vertical elements together. Thus, rigidity is supplied, not by mass, but by built-in energy and by proper layouts and arrangements.

A study of the above concepts leads to certain principles of architectural design which should be emphasized for multi-story buildings of prestressed concrete. First and foremost is the integration of structure and architecture. Architectural elements should be utilized to form structural elements. Exterior walls, partition walls and elevator cores can be designed to carry gravity and lateral loads. Floor slabs of minimum thickness, required for fire resistance and sound attenuation, can be prestressed to span between supports and serve as horizontal diaphragms.

A second principle is the simplification of floor layouts. A clean and clear layout is desirable, because it means costly joints can be omitted and construction facilitated. Girders, beams, and columns are often eliminated, so as to simplify forming and to reduce labor costs.

A third principle is to make maximum use of available plants, equipment and labor. Construction methods and procedures must be considered in the process of design. Some of these will be discussed below.

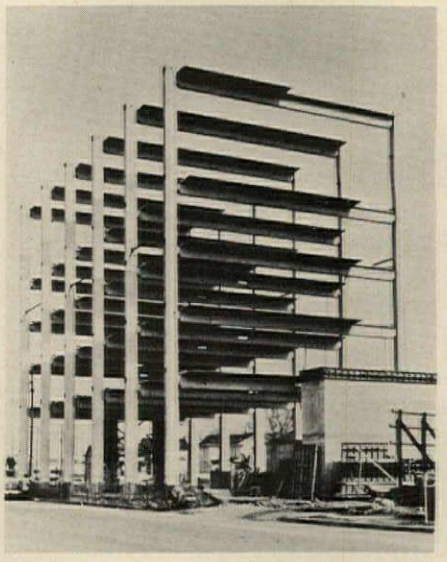
Construction Methods

To arrive at an optimum design, the method of construction must be chosen with respect to the time, the place, and the nature of the project, and oftentimes the personalities involved. For example, the experience of the engineer and the preference of the contractor may well affect the choice. Generally speaking, a number of methods are available and it is not likely that one particular method will always triumph over the others.

One natural result of prestressing is precasting, because the light and resilient panels produced by prestressing lend themselves well to handling and transportation. Over 200 plants throughout this country now manufacture prestressed concrete floor and roof panels, beams, girders, columns and walls which can be incorporated into multi-story buildings. While these plants do produce standard elements which can be used to advantage, a designer does not have to restrict himself to these available shapes. In multi-story construction, since each element can be repeated many times, the premium for new forms is low, and precast panels designed specifically for a project can be economically produced.

An outstanding example of tailor-made precasting is a nine-story office building at the University of California, Davis. Here the structure was made up of four new components. Eighty seven-foot precast, pretensioned concrete columns extending the full height of the building were precast, erected, and braced. All floors were formed of a channel section spanning the entire width of the building and with its four corners supported on the columns, thus doing away with beams and girders. The roof was made up of overhanging precast Tees. The building is enclosed with 6-inch thick precast wall panels, produced in two-story-high pieces and prestressed to resist handling stresses, prevent cracks, and improve water resistance. The economy of this design was verified by the bidding cost which came in at eight per cent under the budget.

The above all-precast system, while often economical in time and money, does require an experienced producer and erector who can keep within the permissible tolerances and knows how to handle the pieces. In case such a contractor is not available, a combination of precasting and in-place construction may be desirable. The degree of accuracy required for fabrication and erection is not as high, because a reasonable amount of dimensional variations can be taken up by the in-place concrete. A typical example of this type of building is shown in the structural skeleton for the Lumberman's National Bank Building, Muskegon, Michigan. Here, post-tensioned connections form the precast columns and girders into



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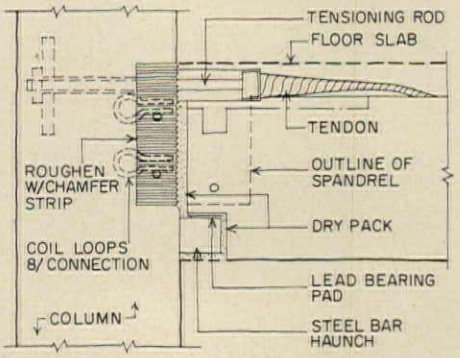

TYPICAL COLUMN FLOOR TEE CONNECTION

1. Post-tensioning cables tie columns to girders, forming rigid frames in the Lumberman's National Bank Building by Perkins & Will. Poured-in-place slabs span between girders. 2, 3, 4, 5. Nine-story classroom building by Gardner Dailey in Davis, California is all precast, including columns. All the building components were prestressed. Two-story high wall panels were prestressed to withstand lifting stresses and improve water resistance. 6, 7. Contractor preferred to precast columns at the site, but form floors in place for MacArthur-Broadway office building by architect Irving Shapiro in Oakland, California. Structural engineers for these buildings were T. Y. Lin and Associates and T. Y. Lin, Kulka, Yang and Associates.

R. Dolman

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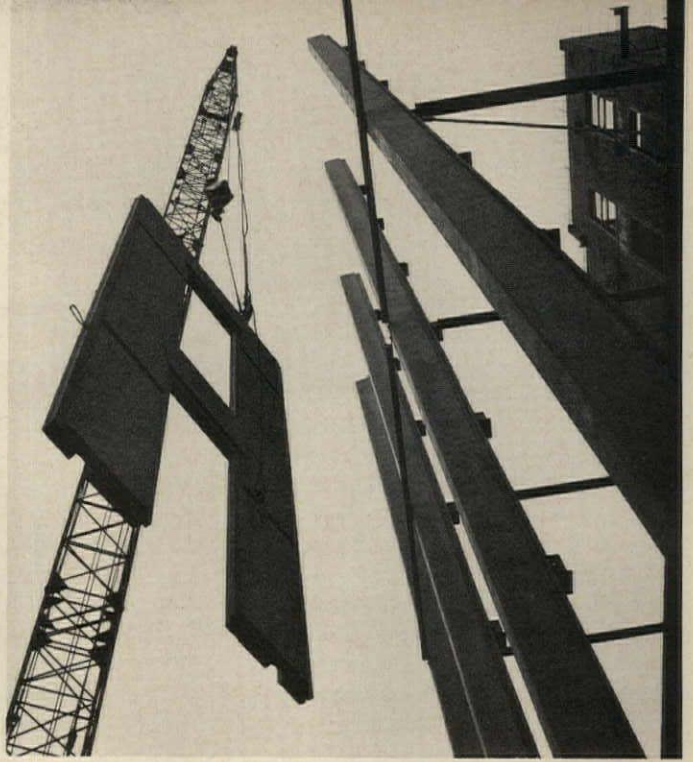

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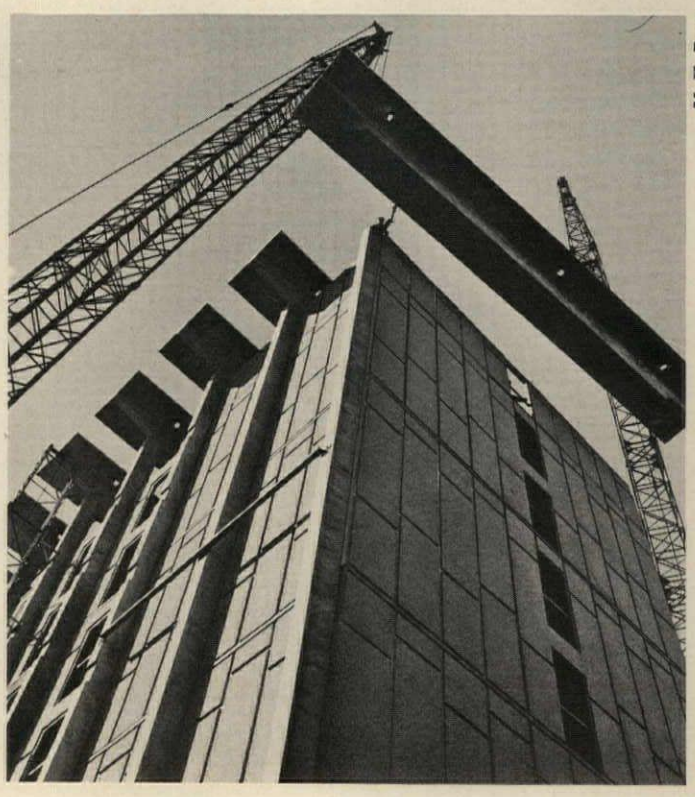
M. H. Berg



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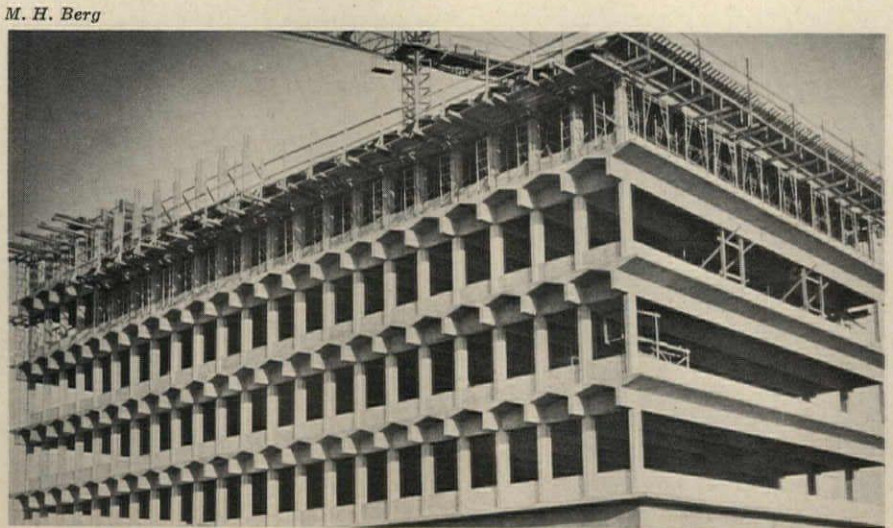

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M. H. Berg

7

rigid frames. The girders were pretensioned for economy, and contained additional post-tensioning cables to carry the in-place slabs which span between the girders. Economical span for these girders is around 60 feet, but can range between 40 and 80 feet.

Another variation of plant-precasting is to have the building components cast at the site. This, of course, saves transportation cost, but does require working space at the job site and a good contractor who can produce the components. When standard components are needed and their forms are available at established plants, on-site precasting may not be the most economical. The MacArthur-Broadway office building in Oakland, California features short columns cast at the site, with 70-foot girders formed in place. This has proved to be very economical and, in fact, was redesigned from a precast layout.

A variation of on-site precasting is lift-slab construction. This is especially suitable for apartment buildings where a flat soffit is desired and where a limited structural depth is desirable. When these floors are properly post-tensioned, they should remain practically level under sustained load conditions, whereas a conventionally reinforced slab would deflect and crack. During the last few years, one to two million square feet of these slabs have been built annually in the U.S.A. Generally they range to six stories high, but some of the tallest ones reach 13 stories or more.

For the vertical elements of a building, such as walls and large columns, slip-forming may prove to be the most economical. Of greater interest is the combination of slip-forming and post-tensioning for multi-story apartment buildings, as exemplified in the twin 15-story Eichler Towers, recently completed in San Francisco. Architecturally the concrete walls and slabs provide excellent sound-proofing and fire insulation. Structurally they resist all gravity and lateral forces, thus doing away with columns, beams, and girders. The uniformity of the vertical supporting elements, uninterrupted walls extending throughout the height of the towers, was designed to facilitate slip-forming. Post-tensioning in the floors ties the walls together and eliminates slab deflections. Special connections to pass the tendons through the walls were devised to enable the combination of these two techniques.

As yet, an untried combination is "slip-form up and drop-form down." This method becomes economical when the span gets longer, and ribs are required to reduce the amount of concrete. When complicated patterns or joints are desired either for architectural or structural reasons, one or two sets of steel forms can be made for the floor concrete placement. By dropping these forms from the top down, economical reuse of the forms is obtained.

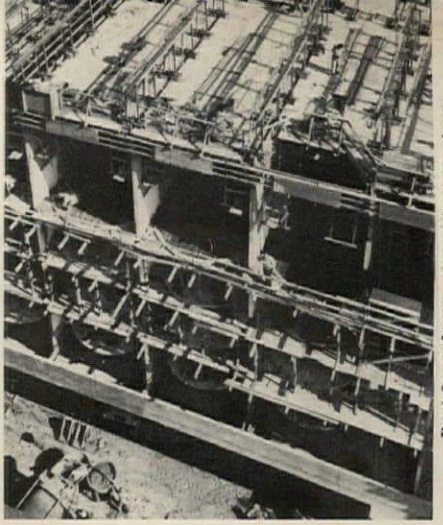
Design Techniques

While a design cannot be executed without considering construction procedure, neither can construction be decided upon apart from the design requirements.

As previously mentioned, prestressing is advantageous for long spans and tall structures. For wind resisttance, wall, columns, and cores can be post-tensioned vertically to provide rigidity and strength. A 16-story apartment building in Long Beach, California has post-tensioned floor slabs, which tie the entire building together for lateral force resistance. The core walls are post-tensioned into the foundations.

For high-rise buildings over 25 stories, composite steel-concrete construction may prove to be the most economical. The Tower Apartments in Long Beach, California has a reinforced concrete core in the center, then a composite steel-concrete core around it made of wide-flange steel sections braced by heavy reinforcing bars and encased in concrete. Then an exterior circle of WF steel columns are connected to the central core walls with post-tensioned slabs. The entire frame is thus tied into one and is designed to resist heavy earthquakes. It is noted that the radial and circumferential prestressing of the round floor slabs tend to help each other and enabled the use of an 8-inch-thick flat slab to span 30 feet between columns and cantilever 10 feet beyond them with no beams or girders. Designed for heavy earthquake resistance with a mat foundation on piles, the entire structural cost was under $4 per square foot, which certainly would not have been possible without the use of prestressing.

The horizontal extension of prestressed concrete buildings is typified by the use of long spans. The usual limitation of about 20-foot reinforced concrete flat slabs is now easily ex-



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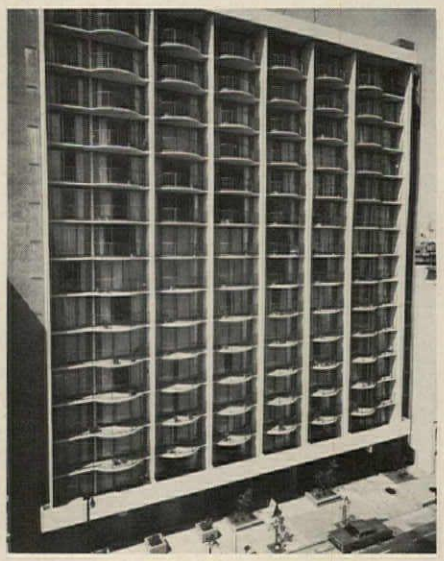

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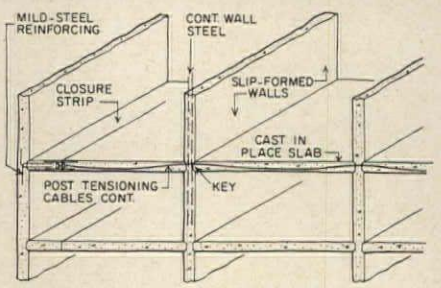

8, 9. Prestressing cables eliminate floor deflections and tie walls together, from one side of the building to the other, in 15-story Eichler Towers Apartments in San Francisco. Walls were slip formed. Floors were post-tensioned as indicated in the details. Architect was Claude Oakland and Associates; structural engineers, T. Y. Lin, Kulka, Yang and Associates. 11, 12, 13, 14. Prestressing tendons, both radial and circumferential, enable an 8-inch slab to span 30 feet between columns and cantilever 10 feet without beams or girders in this 34-story Tower Apartments building in Long Beach, California. An inner core enclosing elevators was slip-formed first (10); then an outer core braced with steel columns was constructed (11). Box columns support the prestressed floor slabs on the outer edge (12). Architect, Carl B. Troedsson; structural engineers, T. Y. Lin and Associates.

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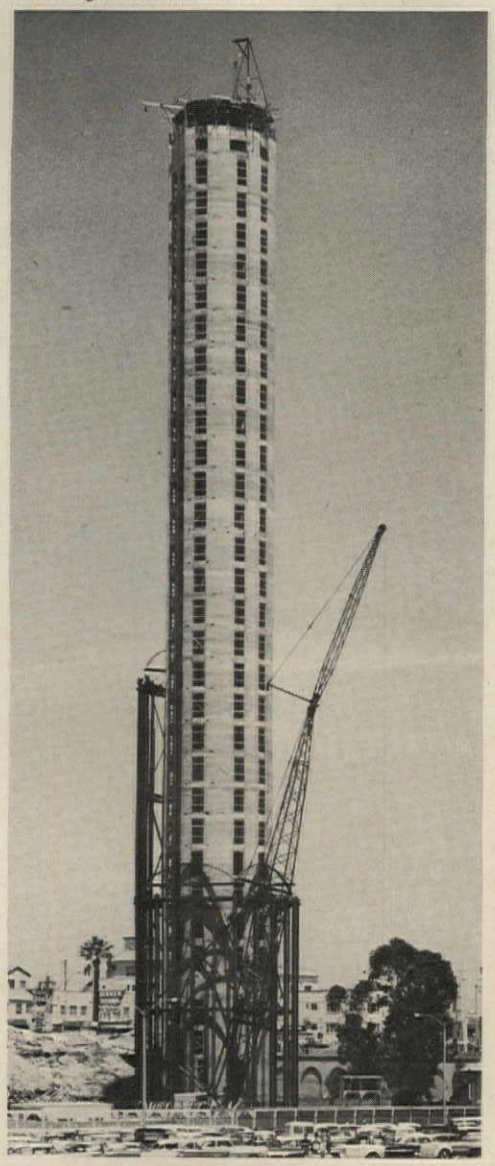

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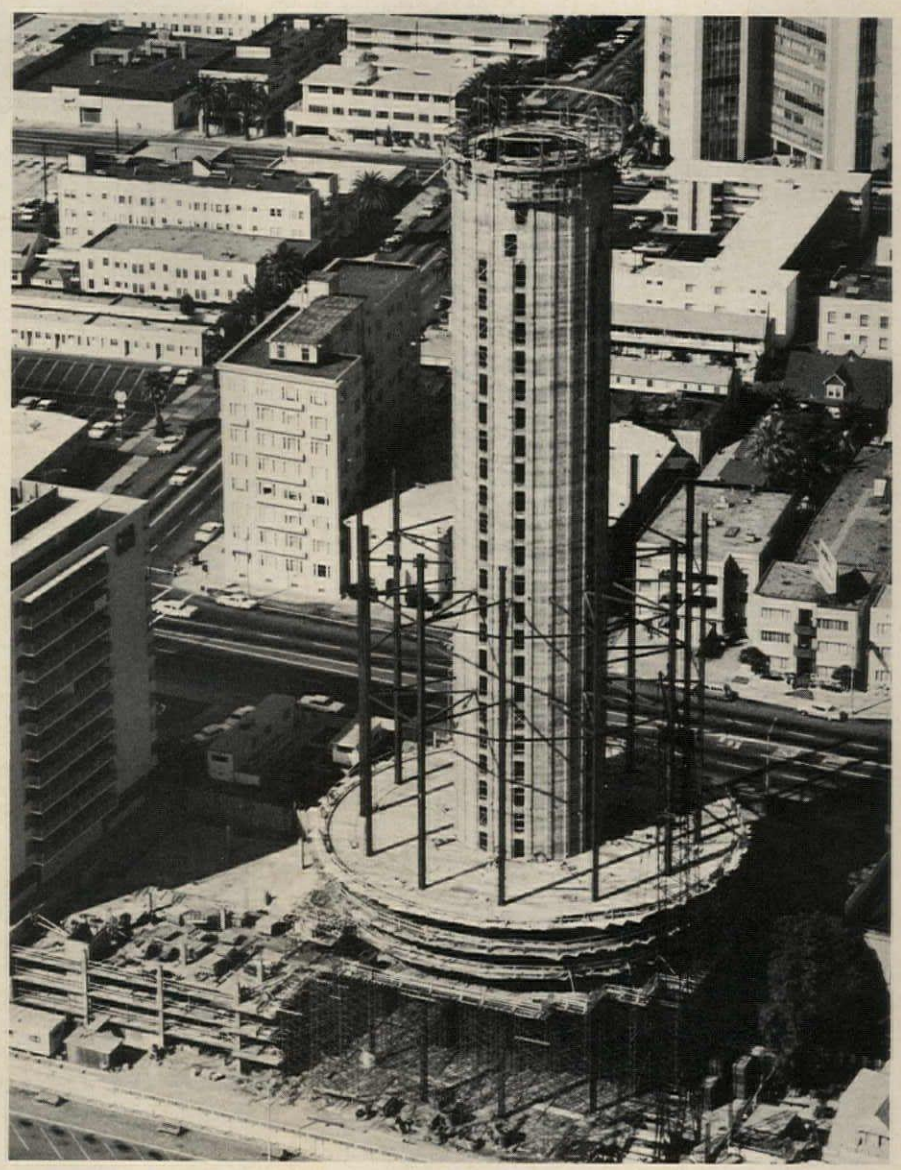

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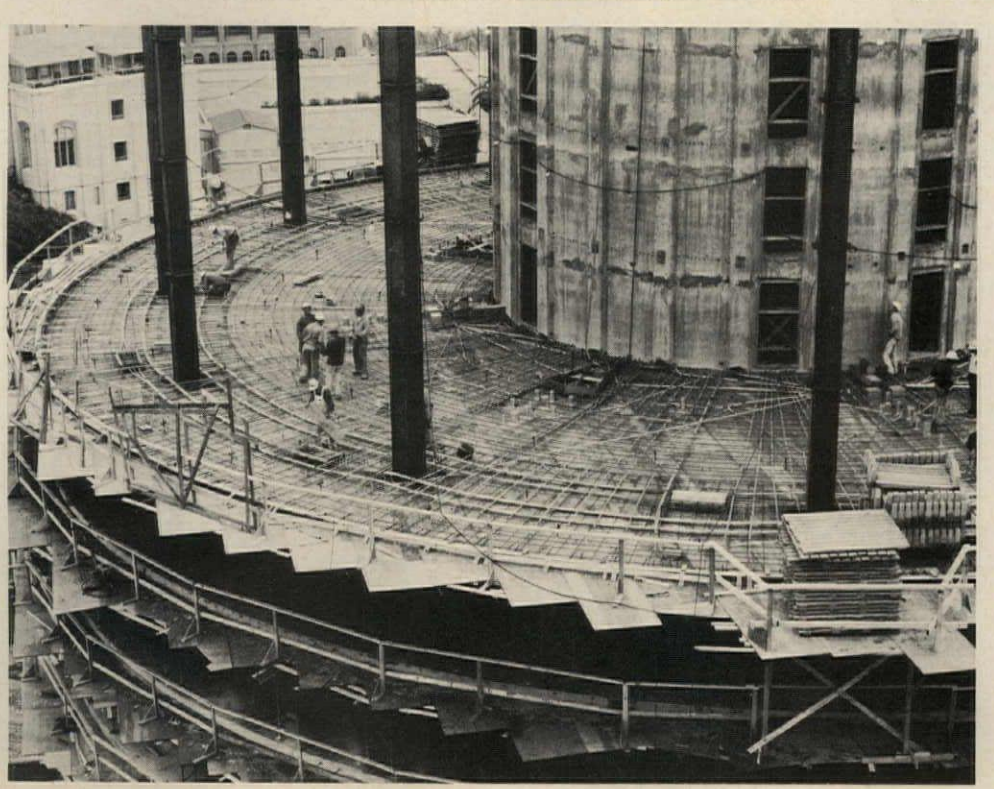

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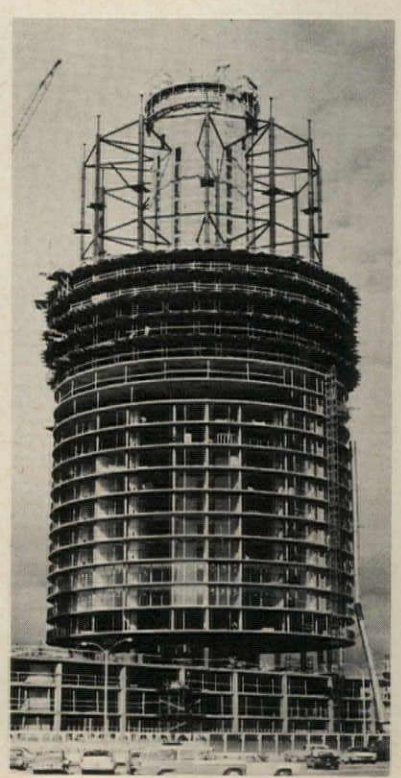

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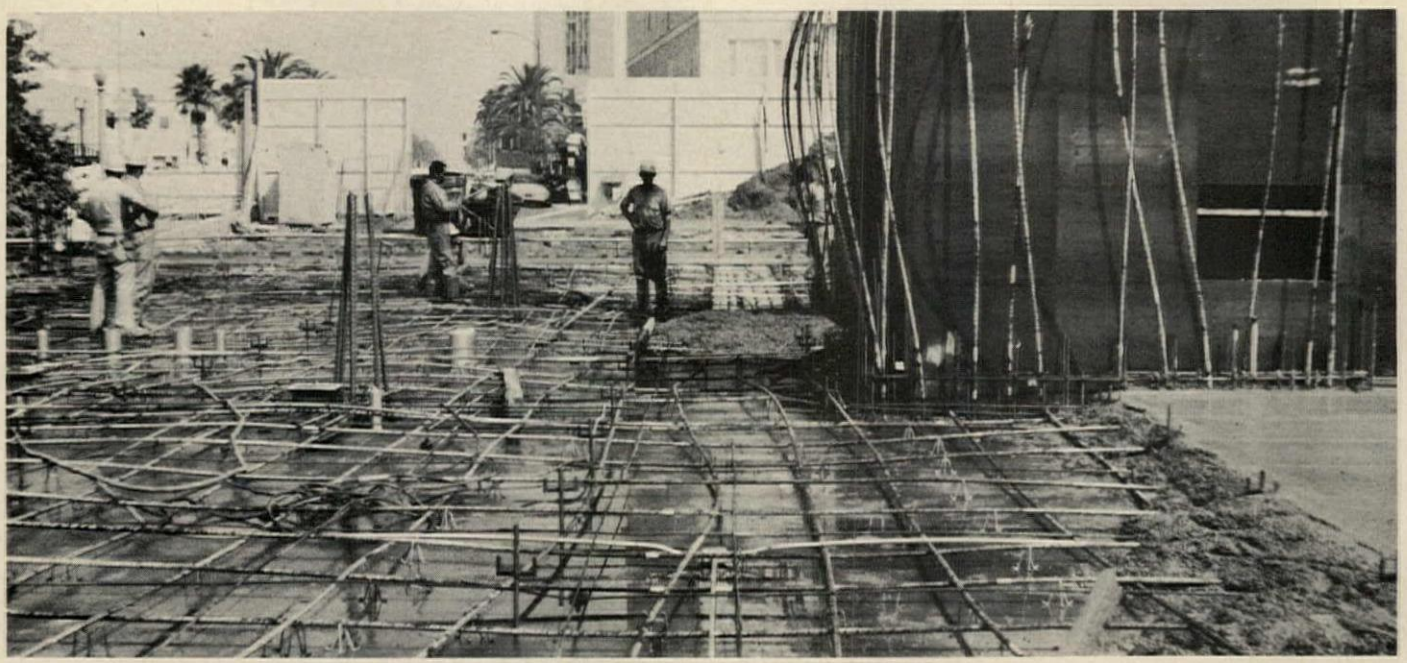
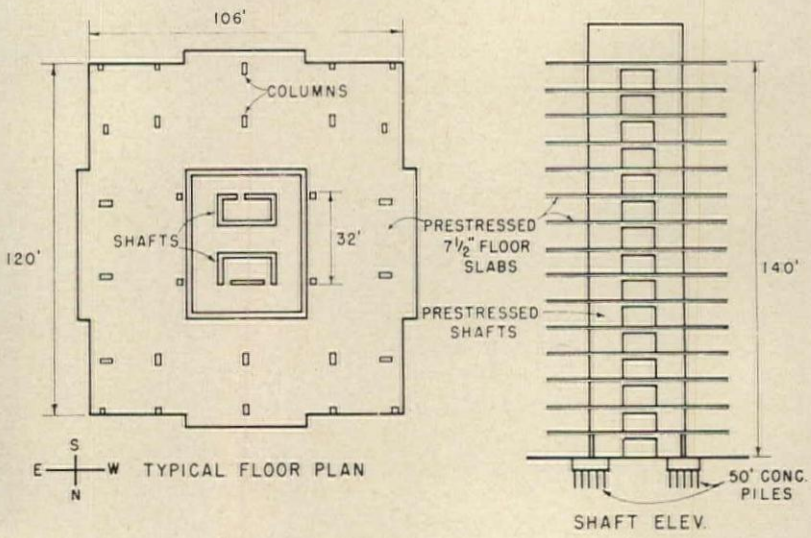


A 15-story apartment building in Long Beach, California has prestressed core and floor slabs prestressed in both directions. Post-tensioned floors serve as diaphragms to transmit wind and earthquake forces to the core. Architect, James R. Wilde.



tended to 30 feet, for the same thickness of slabs. For longer spans, the slabs can be haunched, and little additional concrete and steel are needed to span up to 35 and 40 feet. Beyond approximately 40 feet, waffle or grid floors are ideal for square panels, up to about 60 or 70 feet. The beam and slabs system, on the other hand, is economical for rectangular bays up to 25 by 70 feet or more.

Horizontal extension of prestressed concrete buildings involves one important problem, which is more serious than in a steel or a reinforced concrete building. As the building plan gets larger, suitable construction and expansion joints must be provided, not only to take care of temperature changes but also to allow for elastic, creep and shrinkage shortening.

It is impossible to overemphasize the use of modern technology for the design of these structures. Data concerning the physical behavior of concrete, steel, and their combination are widely available and should be fully utilized in the design and analysis. Almost invariably, modern mathematics and electronic computers are used for the study.

Conclusions

With the development of new construction and design techniques in prestressed concrete, it is now possible for the engineer to put multistory buildings of unusual height and spans at the service of the architects. However, because architects have not yet grasped many implications of prestressed concrete, full use of this whole array of new methods and proportions has not yet come about. New concepts of economical and desirable span length, of depth-span ratios, of new forms, of weight and cost variations, of new structural systems both horizontally and vertically, will enable better buildings to be built more economically and esthetically.

It is indeed only one example of the fast spiraling progress in modern technology that in the course of slightly over one decade, prestressed concrete has become accepted as a reliable and efficient structural material. The full development of its potential is now up to the architects.

SPECIAL LIGHTING FOR AN ATRIUM

By Sylvan R. Shemitz, Lighting Consultant

Lighting is a key element of design in the architecture of the new Waterbury Club, Waterbury, Connecticut.

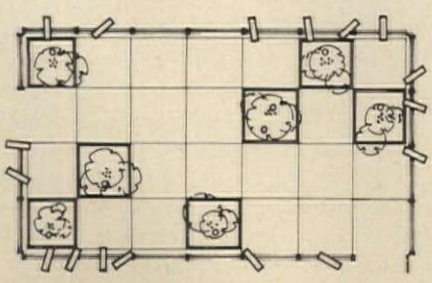
Major attention in the lighting task was given to illuminating the landscaped atrium, around which the club facilities were built. Purpose of the atrium was to provide an outdoor touch to a structure that turned its view inward for privacy in a location tightly surrounded by residential buildings.

The principal objective was to control the lighting in a way that would keep glaring reflections off the interior glass walls and offer occupants of the dining room—or bar across the way—a clear view of the atrium, day or night, yet prevent a view from dining room to bar or bar to dining room.

To prevent glare from hitting the glass, light was kept off walls and low reflectance materials were utilized on the interior walls. Dimming equipment on interior luminaires was used to control the balance of day and night brightness.

The atrium is illuminated by lights beamed from the roof and by light sources positioned in the planting boxes, to throw grazing light onto the tree trunks. The roof units contain light-blue filters, which create pleasing shadow patterns of the trees on the exposed aggregate walks of a quality closely approximating moonlight. Reflections of the trees on the exterior of the glass walls provide a screen to reduce the ability to see beyond the atrium.

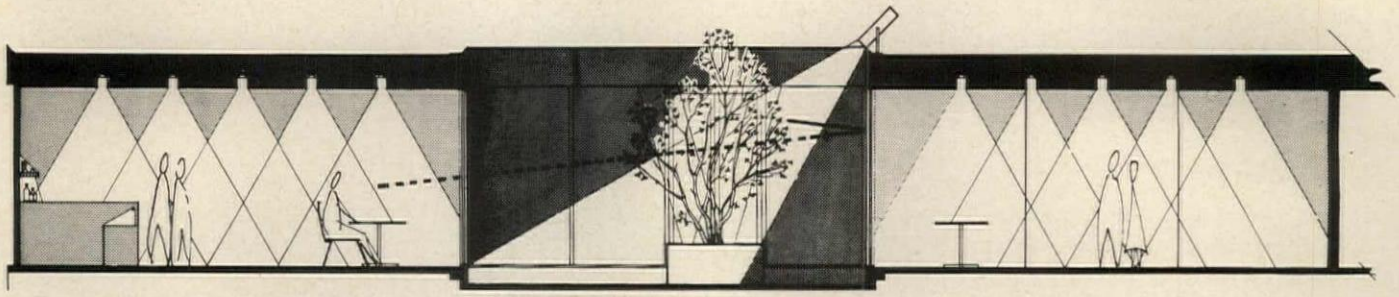
To create the desired visual impact, the atrium required a 10-to-1 brightness ratio in relationship to interior vertical surfaces viewed in the dining room and bar areas. Since glass had a transmission factor of 60 per cent,



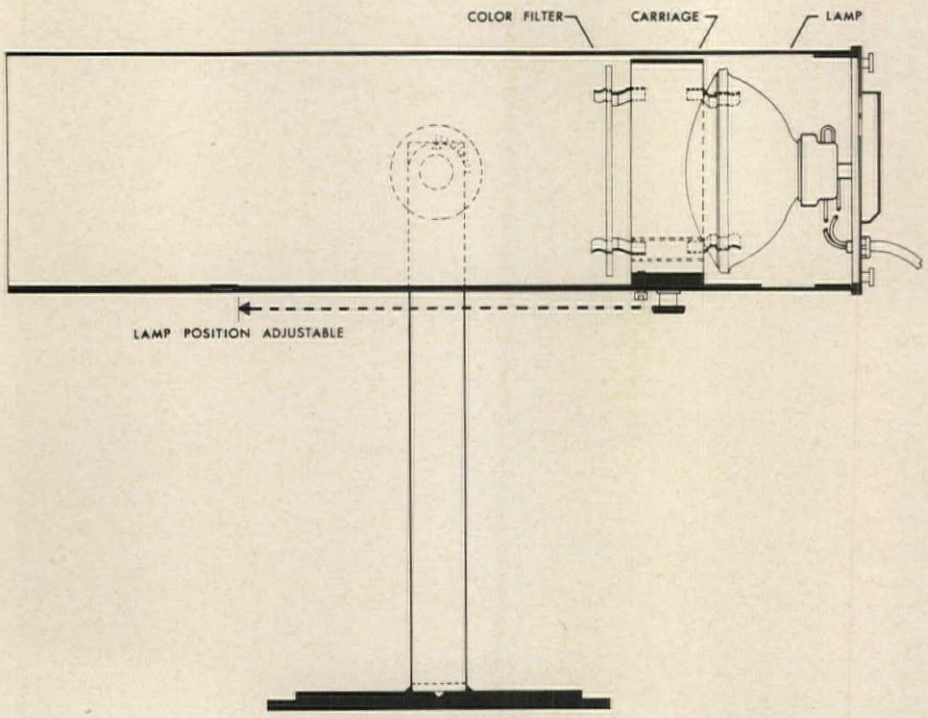
Arrangement of fixtures around atrium.

Alexandre Georges photos

Specially designed metal cans shield high brightness of blue filters from view.



Fixtures were designed and aimed to avoid spill lighting hitting the glass.



Dining areas on two sides of the atrium are lighted by recessed downlights.

it was necessary to increase the light delivered to vertical surfaces in the atrium to compensate for transmission loss.

The smallest lamp package obtainable at the time that would deliver the brightness required was the recently announced 500-watt quartz PAR lamp. This dictated the diameter of the housing.

In order to study the control of light so that it would not spill onto the floors of the dining room or bar, and so that the lamp would be properly shielded for all normal viewing angles, we built a scale model of the atrium. It aided us in determining the beam angles required. The minimum shielding is 45°, but in some cases is more.

If the source were shielded only for the comfort of a person seated or walking out in the atrium, it would not adequately shield the light source for the person seated in the dining rooms.

Because the filter would be the first visible source of brightness, it was determined that it had to be a minimum of 8 inches from the face of the opening. By means of an adjustment feature, we were able to increase the distance between the opening and the filter face to as much as 21 inches, giving us as much as 70° of shielding, where required. The diameter of the fixture was determined by the requirements of the traveler size necessary to hold the lamp and filter (8 inches). The over-all length was a design decision. We felt that since the lighting fixture could not be concealed in any way, it should be a bold and forthright design. The finished unit is completely devoid of any unnecessary hardware and is, we feel, the simplest form that falls within the criteria set forth above.

The reactions were quite interesting. Some members of the club felt that it was unfortunate to have big units up on the roof. Some found it acceptable, and others even pleasing.

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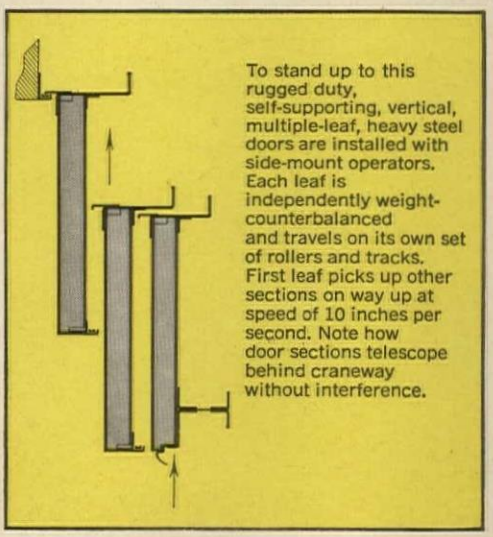

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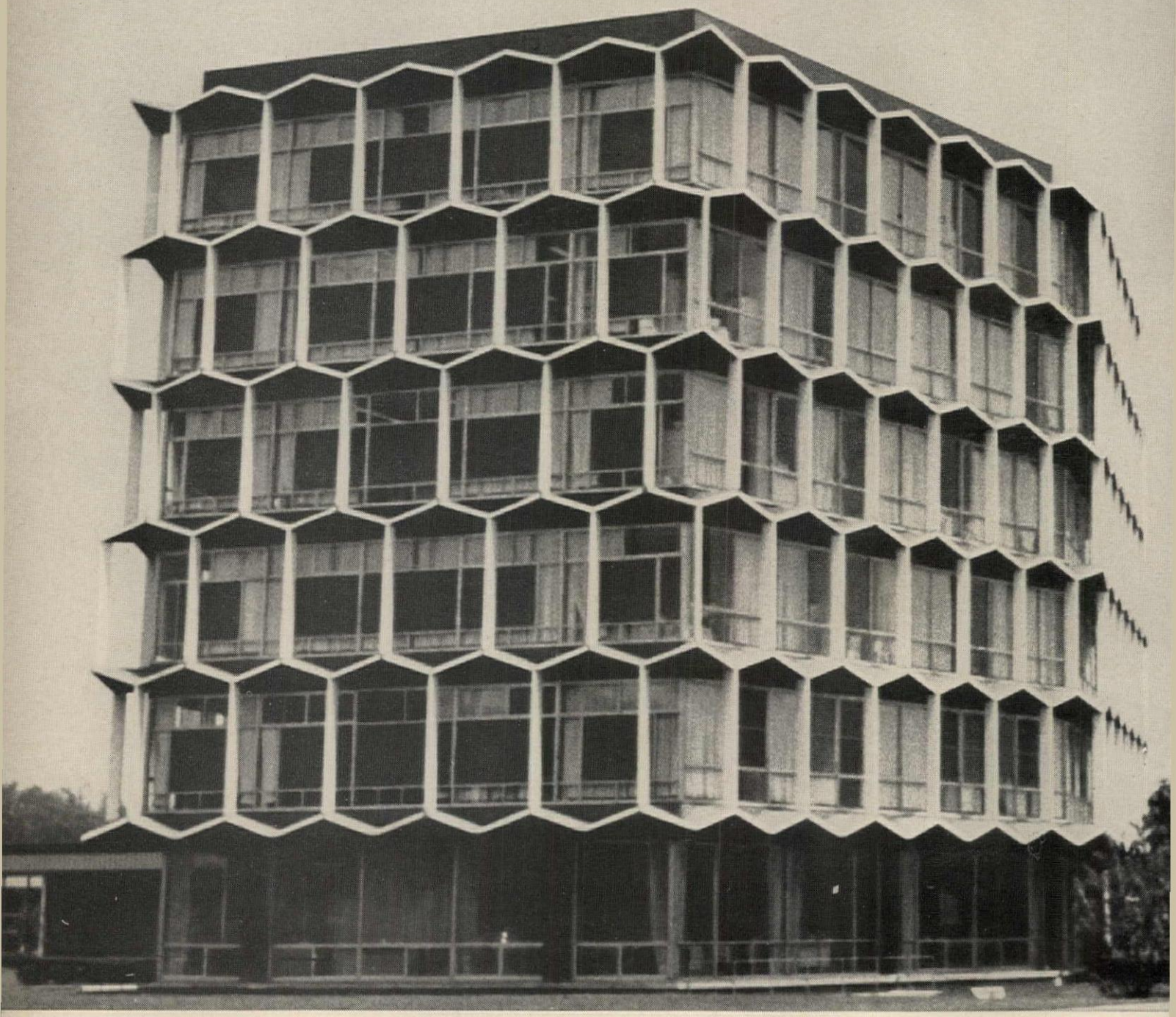

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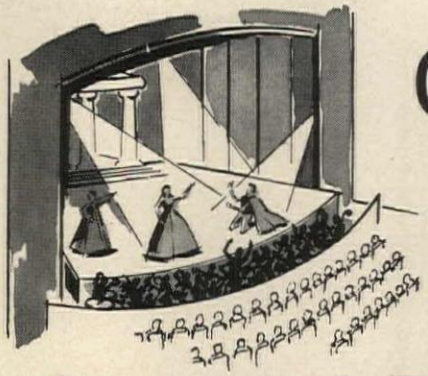

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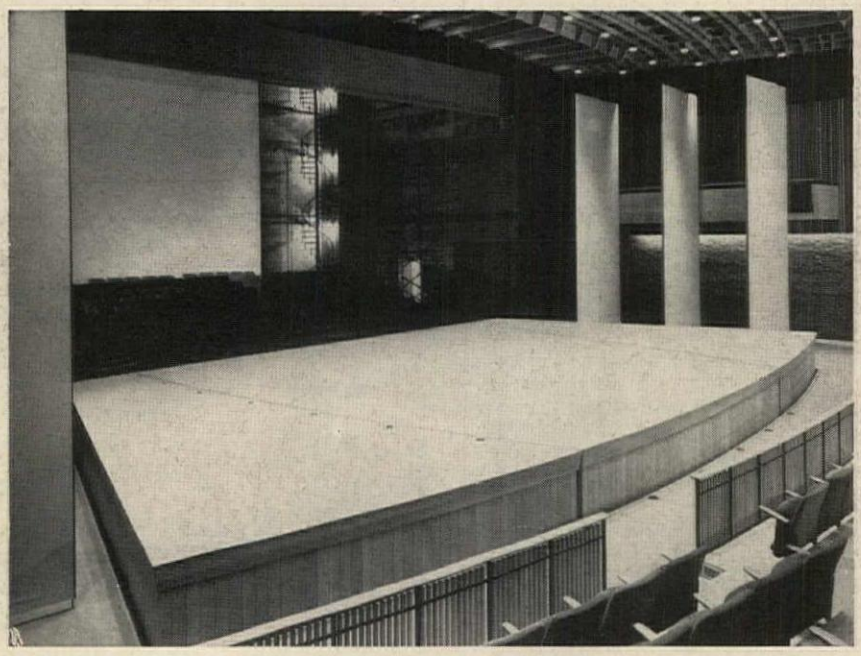

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CONTROLLING THE EFFECTS OF SUN'S HEAT ON STEEL DOORS

By John I. Yellott

When exterior steel doors are exposed to the direct rays of the sun, unexpectedly high surface temperatures can be attained, resulting in outward deflections through a kind of bimetallic action against cooler inner surfaces. This bowing can prevent the proper operation of the doors.

Although steel doors are widely used today, there has been virtually no information available by which the air-conditioning engineer can estimate the heat gains or losses through them. The following summarizes an extensive study of the thermal and mechanical effects of solar radiation upon steel doors of several different types.

The study was conducted in Phoenix, Arizona during the summers of 1963 and 1964 to measure the temperatures and deflections of typical hollow and solid-core steel doors which were installed in a rotatable solarium so that they could be turned towards any direction.

It was found that the surface temperatures could be predicted when the sol-air temperature * and the thermal conductance of the door are known. Thermal conductances were measured for a number of doors with different types of internal insulation and calculated values of the over-all coefficients (U-values) were derived.

For a particular set of outdoor conditions, the temperature which the door will attain is determined by its solar absorptance which, in turn, is controlled by its color. Solar reflectances were measured for more than 100 colors of a commercially available line of paints, and charts are presented by which surface temperatures can be predicted for moderate and severe summer conditions when the color of the door is specified.

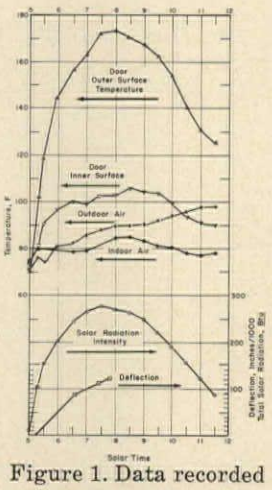


Figure 1. Data recorded at center panel position of east-facing solid-core steel door, June 17, 1963.

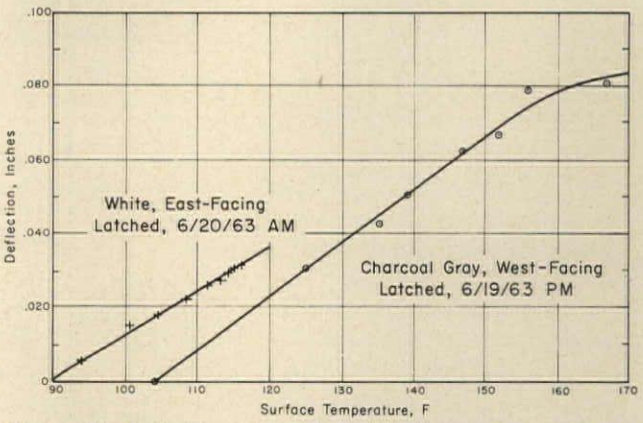


Figure 2. Deflection at center of outer surface versus surface temperature for the same solid-core steel door with charcoal gray and white paint. (Editor's note: The seeming inconsistency of a white door deflecting more than a dark door at a given temperature may be explained by a greater inside-outside difference.)

The 1963 test program was carried out in mid-June, using both a hollow steel door and a solid-core steel door with its interior filled with foamed polystyrene. The hollow steel door was made of 18-gage metal with steel reinforcing ribs spotwelded to the inner and outer faces at 6-inch intervals. The interior spaces were filled with rockwool (density, 2 lb per cu ft). The solid-core door was made of 20-gage steel, without ribs; the interior was completely filled with foamed polystyrene insulation which was epoxy-bonded to the metal surfaces. During the 1964 program, solid-core doors were tested with their interiors filled with polystyrene and with urethane insulation; in one test door, the urethane was foamed in place, while the other used slab insulation which was cemented to the metal surfaces.

Deflection and temperature tests were first run with the doors painted with their standard factory-applied charcoal gray priming coat. The absorptance of this paint for solar radiation was found to be above 0.90. Later tests were run with white enamel paint applied over the priming coat. Absorptance of the white enamel was approximately 0.25 for solar radiation.

If the gray door was latched before it was turned to face the sun, it could not be unlatched until it was turned away and allowed to cool. If it was unlatched in the cool condition, it could not be latched again while it was hot. These tests confirmed field reports from users in the Southwest who had experienced similar difficul-

John I. Yellott is director of the Yellott Solar Energy Laboratory, Phoenix, Arizona. This report is extracted from a paper prepared for presentation at the 72nd annual meeting of the American Society of Heating, Refrigerating and Air-Conditioning Engineers and will be published in full in ASHRAE Transactions.

* Sol-air temperature: a hypothetical air temperature which, by convection and conductance only, would result in the same rate of heat transfer to a building surface as is accomplished by the combined effects of the actual air temperature and solar radiation.

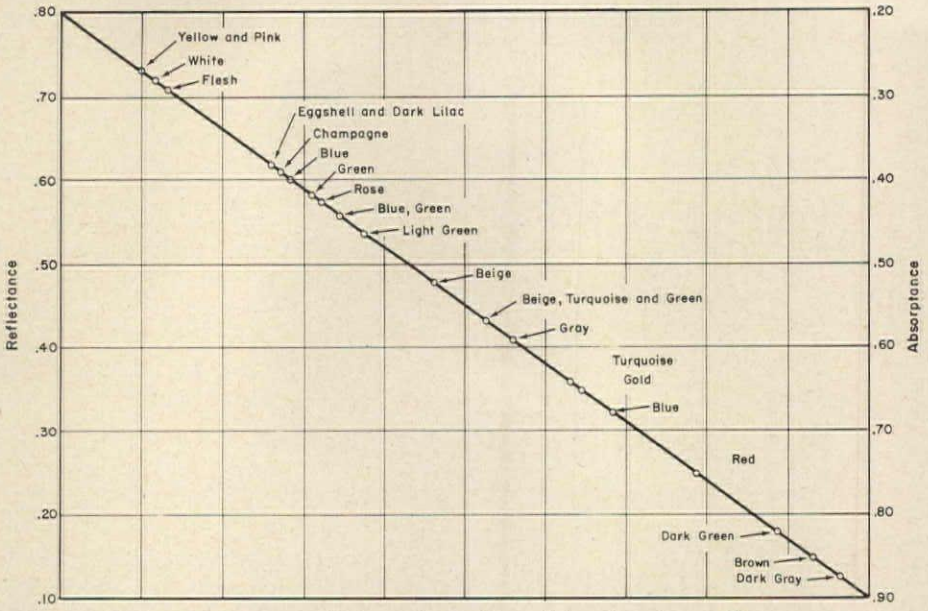


Figure 3. Solar reflectance and absorptance for paints of various colors.

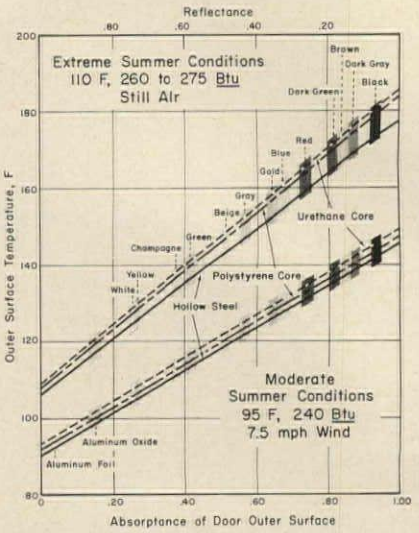


Figure 4. Attainable surface temperatures for sunlit steel doors under moderate and extreme summer conditions.

ties. No difficulty was experienced in opening or closing the white-painted doors.

Results of a typical east-facing test of a gray-painted solid-core door are shown in Figure 1. A temperature distribution pattern over the surfaces showed that the edges of the door are cooler on the outside and warmer on the inside than are the central areas.

The relation between surface deflection and temperature for the same door painted both gray and white is shown in Figure 2. Approximately the same results were obtained with the hollow steel door.

South-facing doors will not overheat in summer, because of the high solar altitude, but they can give trouble in winter, when they are struck by high-intensity radiation at low incident angles. Patios and overhangs which shade such doors in the summer are usually ineffective in winter because the sun's rays enter beneath them.

Analysis of Surface Temperatures

The temperature of an opaque surface exposed to the sun's radiation can be predicted by means of a conventional heat balance analysis involving absorptance of the outer surface, intensity of incident solar radiation, and other parameters including thermal conductance of the door. The results of a series of "hot-box" tests on the hollow steel door and three solid-core doors are given in Table 1. In making calculations of over-all coefficients, conventional values of inside and outside film coefficients were used for summer and winter conditions. No comparable data for steel doors could be found in literature. These estimated values are in good agreement with the temperatures which were actually found in the tests.

Table I. Thermal Conductances and Details of Test Doors (All doors were 30 x 80 x 1¾ in.)

Door Type Steel Gauge Internal Insulation	Hollow 18 Rock-wool (2 lb/ft³)	Solid-core 20 Urethane slab, bonded to door	Solid-core 20 Urethane, foamed in place	Solid-core 20 Polystyrene slab, bonded to door
Conductance of door alone, C_o, *Btu*/F	1.15	0.59	0.583	0.76
Conductance of door plus inner surface, C_{oi}	0.68	0.434	0.430	0.52
	Summer conditions			
Overall coefficient of door plus inner and outer surfaces, *Btu*/F	0.58	0.392	0.390	0.46
	Winter conditions			
	0.59	0.40	0.40	0.47

Btu/F=Btu per (hr) (sq ft) (F)

Solar reflectance was determined for well over a hundred different samples of paint. The results, shown in Figure 3, are in good agreement with other published data.

Colors are very difficult to describe in words, and so the results of the reflectance measurements can be summarized by stating that those colors which appear "light" to a normal eye have reflectances above about 0.45. That is, their absorptances range downward from 0.55.

Color and Surface Temperature

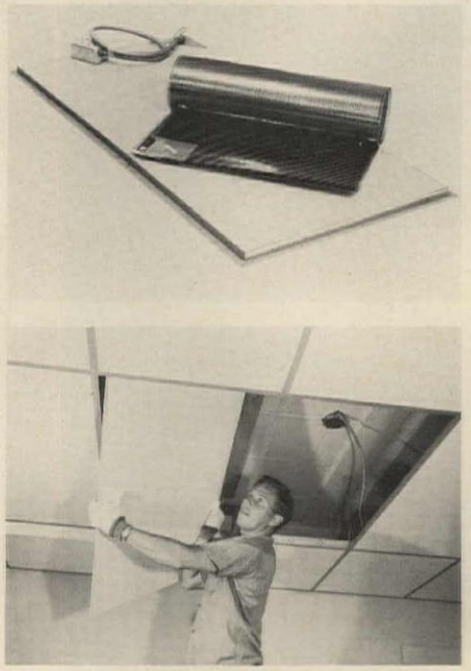
For a given set of outdoor conditions, the absorptance of the surface, which is determined by its color, is the controlling factor. Assuming that the indoor air temperature is constant at 75 F, the outer surface temperature can be estimated as a function of the absorptance, with the outdoor conditions—solar intensity, air temperature, and wind speed—as parameters. Results of such computations for moderate and extreme summer conditions are shown in Figure 4.

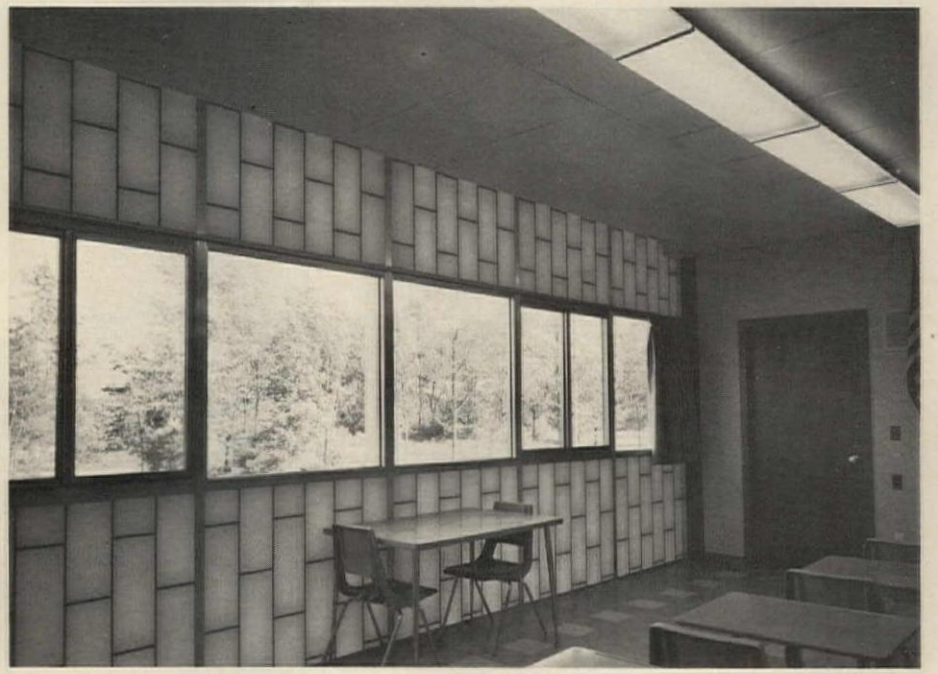
If it is desired to keep the surface temperature of sun-lit steel doors below 140 F to make sure that they will not experience excessive deflection, the colors at the dark end of the spectrum should be avoided. In the southwestern states, where conditions classified as "extreme" are encountered every summer, light colors must be chosen which have reflectances above 0.50. In the Northeast where more moderate temperatures prevail and where atmospheric moisture keeps the solar intensity down, colors need not be so restricted.

In all parts of the country, particular care should be taken with south-facing exposed doors, because they may experience overheating problems at midday in winter.

The research program which led to the preparation of the paper from which the foregoing was extracted was made possible by the financial and technical assistance of Overly Manufacturing Company of Greensburg, Pennsylvania and Los Angeles, the makers of the doors which were tested. The determination of solar reflectances for more than one hundred paint samples was accomplished through the cooperation of Deer-O Paints and Chemicals, Ltd., of Phoenix.

For more information circle selected item numbers on Reader Service Inquiry Card, Pages 243-244



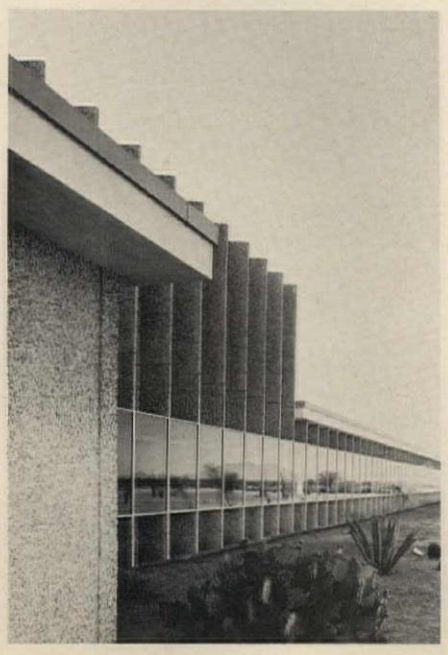


HIGH SCHOOL USES RADIANT ELECTRIC HEATING SYSTEM

The Kingswood Regional High School, Woolfeboro, New Hampshire is successfully using a radiant electric ceiling panel system as its sole source of classroom heat. Selected for economy of space, installation and maintenance cost, and inherent flexibility, the system consists of zinc-coated steel heating panels which are dropped into an exposed T-bar ceiling. Each 2 ft by 4 ft by ⅞ in. panel contains a printed circuit heating element bonded to a polyester-coated glass cloth and firmly secured to the panel itself.

The UL listed panels, which each produce 750 watts of heat (2,560 Btu/hr) at 277 volts, are located in the ceiling at the outer perimeter of the building, where heat loss is greatest. A step controller above the dropped ceiling in the center of each room is operated by a standard wall thermostat and heaters are modulated according to the temperature at the thermostat; panels operate in groups of two or three at a time, creating a comfortable and even pattern of heat. *Litecontrol Corporation, Watertown, Mass.*

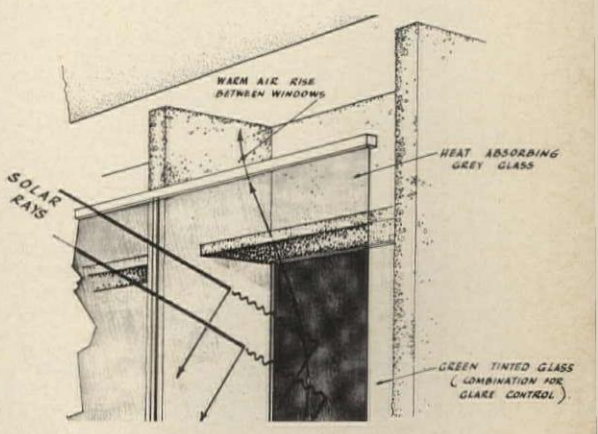
CIRCLE 300 ON INQUIRY CARD



SOLAR PROTECTION IN DESERT AREA

The combination of solar screen, tinted glass, overhang and vertical fins, on the western elevation of General Motors Engineering Administration Building near Mesa, Arizona, effectively protects the interior from approximately 80 per cent of the desert's solar glare and heat.

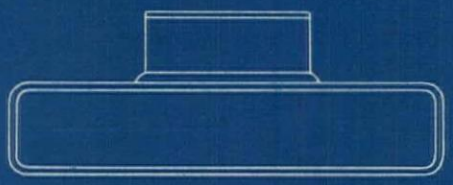
A solar screen of ¼-in.-thick *Parallel-O-Grey* plate glass acts as an outside shielding device and excludes about 40 per cent of the total solar heat. Precast concrete panels projecting perpendicularly from the building support the screen, which stands about 2 ft away from the building and 2 ft off the ground. Bluish-green heat absorbing glass is used in all windows and a precast concrete overhang—protruding about three-quarters of the distance between the wall and the solar screen—gives additional protection. *Libbey-Owens-Ford Glass Company, Toledo, Ohio.*



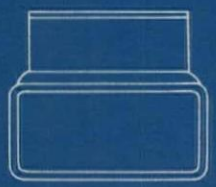
CIRCLE 301 ON INQUIRY CARD

more products on page 188

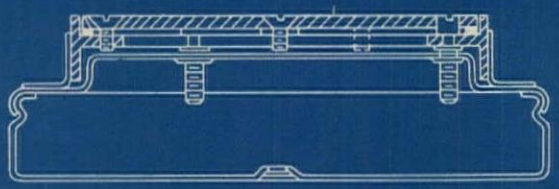
ADJUSTABLE FLUSH HEADERDUCT



TYPE H NEPCODUCT



TYPE K NEPCODUCT



14000 HEADERDUCT

FLUSHDUCT

JUMBODUCT

Make your future floor plans today

(WITH PORTER'S COMPLETE LINE OF "NATIONAL ELECTRIC" UNDERFLOOR RACEWAYS)

If it's a combination of flexibility and dependability in underfloor raceways, then Porter offers a wide range from which to choose. No matter if it's new construction or renovation . . . there is a "National Electric" underfloor raceway system to meet your requirements.

Designed for high and low potential service . . . "National Electric" underfloor raceways offer the following: Type "H" and Type "K" Nepcoduct — provide separate wiring facilities for high and low potential and may be used as a single duct system or in multiples of two or three ducts for additional capacity. □ Jumboduct—Flexible and versatile for heavy duty power distribution where overhead, crane bay or bus systems are necessary. □ Flushduct—Allows trenching of existing floors so installation of ducts can be flush with the surface of the floor. □ Headerduct—All steel and fully grounded, offers power-light-communication raceway distribution from panel to floor. □ Adjustable Flush Headerduct—Has one or more compartments to accommodate all high and low potential systems in one duct run.

If you are looking for an underfloor raceway system that will fit into your plans for tomorrow . . . then look to Porter today. For more information on "National Electric" underfloor raceway systems and service fittings, write for our Catalog. Electrical Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh, Pa. 15219.

PORTER **ELECTRICAL DIVISION**
H. K. PORTER COMPANY, INC.

For more data, circle 74 on Inquiry Card

Office Literature

For more information circle selected item numbers on Reader Service Inquiry Card, Pages 243-244

AIR STRUCTURES

The functions and features of the company's *Airshelters*, a line of air-supported structures which can be used for industrial warehouses, exhibition space, for enclosing swimming pools and tennis courts, and for school recreational facilities, are described in a newly published booklet. The booklet contains illustrations showing how these semipermanent enclosures can be most successfully used. The structures, which are described as weatherproof and impact-resistant, can be heated and lighted and can also be taken down and stored. *Airshelters Division, Birdair Structures, Inc., Buffalo, N.Y.*

CIRCLE 400 ON INQUIRY CARD

INSULATION AND ELECTRIC HEATING

Each of the company's four specially designed insulation products for use in electrically heated homes, is described in a new, 12-page brochure. The booklet stresses the importance of good thermal design, and includes tables, which make use of the All-Weather Comfort Standard endorsed by the Electric Heating Association, to give maximum heat loss limits for electric heating as well as thermal performance values. The company's four products—*Sta-Fit, Foil-Faced Fiber Glass, Spinsulation* and *Spintex Blowing Wool*—all meet the specifications of this Standard. Instructions are given for correct ventilation, vapor barriers and glazing. *Johns-Manville, New York City.**

CIRCLE 401 ON INQUIRY CARD

REQUIREMENTS FOR ELECTRIC EQUIPMENT IN HOSPITALS

The special requirements of electrical systems for the hospital operating room and other explosion-prone locations where combustible anaesthetics are used or stored are set out in a new 16-page booklet. A complete line of electrical equipment for use in such locations—among them self-contained isolating distribution panels and ground detector alarms—is described. *Crouse-Hinds Company, Syracuse, N.Y.*

CIRCLE 402 ON INQUIRY CARD

MORTARS MODIFIED BY SYNTHETIC LATEXES

"Latex Modified Cement Mortars," is a 45-page bulletin issued by the company to introduce two new synthetic latexes, *Dow Latex 460 and 464*, which are compatible with highly alkaline portland cements, and are said to improve the bond, compressive, tensile and flexural strengths of mortars used in surfacing applications. The bulletin contains general formulation information, different formulations for a number of specific applications and test data to indicate the improved mechanical and physical properties of modified mortars. *Plastics Sales Department, The Dow Chemical Company, Midland, Mich.**

CIRCLE 403 ON INQUIRY CARD

INSULATION OF METAL BUILDINGS

G-B Ultralite fiber glass insulation for pre-engineered metal buildings is the subject of a comprehensive brochure. Information is presented in the form of charts and tables and illustrated descriptions of various installation techniques. The back flap of the brochure contains samples of a number of facing materials suitable for use with *Ultralite*, and a pocket-sized booklet explaining heat transfer. *Gustin-Bacon Manufacturing Company, Kansas City, Mo.**

CIRCLE 404 ON INQUIRY CARD

OUTDOOR LIGHTING

Outdoor lighting equipment for a wide range of applications is featured in a new 22-page catalog. The catalog also includes sections on photoelectric controls, fixtures for the new quartz-PAR lamps and general accessories. *Bryant Electric Company, Bridgeport, Conn.**

CIRCLE 405 ON INQUIRY CARD

ELECTRIC HEATING

Various types of electric heaters are shown in a new brochure which includes baseboard heaters, fan heaters, quartz lamp and tube heaters and unit suspension heaters. *Seaboard Products Corporation, Newark, N.J.*

CIRCLE 406 ON INQUIRY CARD

STAINLESS STEEL ROOFING

The advantages of stainless steel as roofing material for churches, institutional and commercial buildings are discussed in "Stainless Steel Architectural Data Sheet, No. 13." Five roofing application methods are illustrated and design details given for each. *Committee of Stainless Steel Producers, American Iron and Steel Institute, New York City.*

CIRCLE 407 ON INQUIRY CARD

PARTITIONS OF MOVABLE STEEL

The "Workalog" catalog supplement consists of a drawer-size card with an attached pocket containing usable material to assist architects in the preparation of working drawings for movable steel partition jobs. The package contains adhesive transparencies of partition details to scale, and ready-to-use guide specification sheets. *Virginia Metal Products Division, Gray Manufacturing Company, Orange, Va.*

CIRCLE 408 ON INQUIRY CARD

FIRE-TREATED PLYWOOD ROOFS

In most states, treated plywood roofs now receive insurance rates comparable to rates for unprotected steel roofs, and a booklet has been put out to explain the variety of support systems which can be used with treated plywood. The support systems covered in the booklet include fire-treated wood joists, long-span steel joists and trusses and a plywood stressed-skin system. All systems explained in the booklet have passed UL tests. *American Plywood Association, Tacoma, Wash.**

CIRCLE 409 ON INQUIRY CARD

BANK FIXTURES

The latest catalog contains a wide range of design coordinated signs, fixture components and desk accessories for use in banks. *Kerr-Changepoint, Tulsa, Okla.**

CIRCLE 410 ON INQUIRY CARD

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

more literature on page 258

This trim beauty

stops 'em cold

Steel vs. Steal . . . and the challenger lost. This is the door to a restaurant in one of New York's most successful chains—Chock Full O'Nuts. You'd never know that would-be burglars tried to jimmy it a few days before these pictures were taken. The door is stainless steel. The burglars didn't get through because of the toughness of this fine architectural metal. The minor damage was repaired the next day without removing the door. Today it's as good as new.

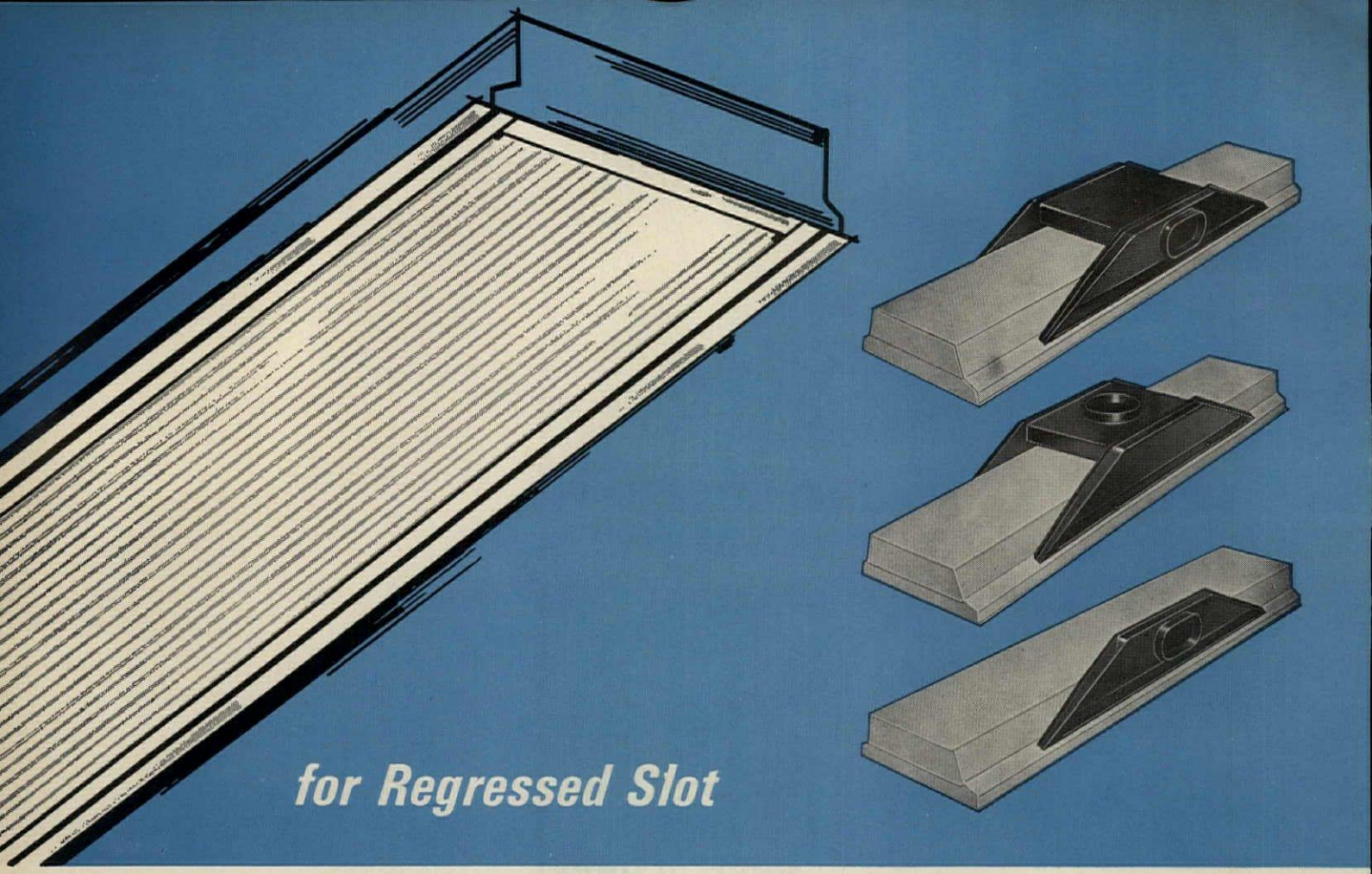
The problem of good design and maximum safety has always been a challenge to owners and designers of entrances for commercial and monumental buildings. This restaurant found the practical answer in low-cost stainless steel doors and frames, manufactured by The Alumiline Corporation, Pawtucket, R. I., from stainless steel provided by Jones & Laughlin Steel Corporation.

If you have a design idea that involves stainless doors and entrances, contact The Alumiline Corporation. For further information concerning stainless steel, let us refer you to our Architectural Services.

Jones & Laughlin Steel Corporation

STAINLESS Stainless and Strip Division • Detroit 48234

For more data, circle 81 on Inquiry Card



NOW — today's only complete line of high

No longer are you limited in your selection of equipment combining lighting and air handling!

Titus' new wide selection, including the *new line of Titus Air Diffusers for regressed slot troffers,* now makes it possible for you to specify an air diffusion unit (in conjunction with a wide range of makes, types and sizes of light troffers) — that *exactly* meets your specifications.

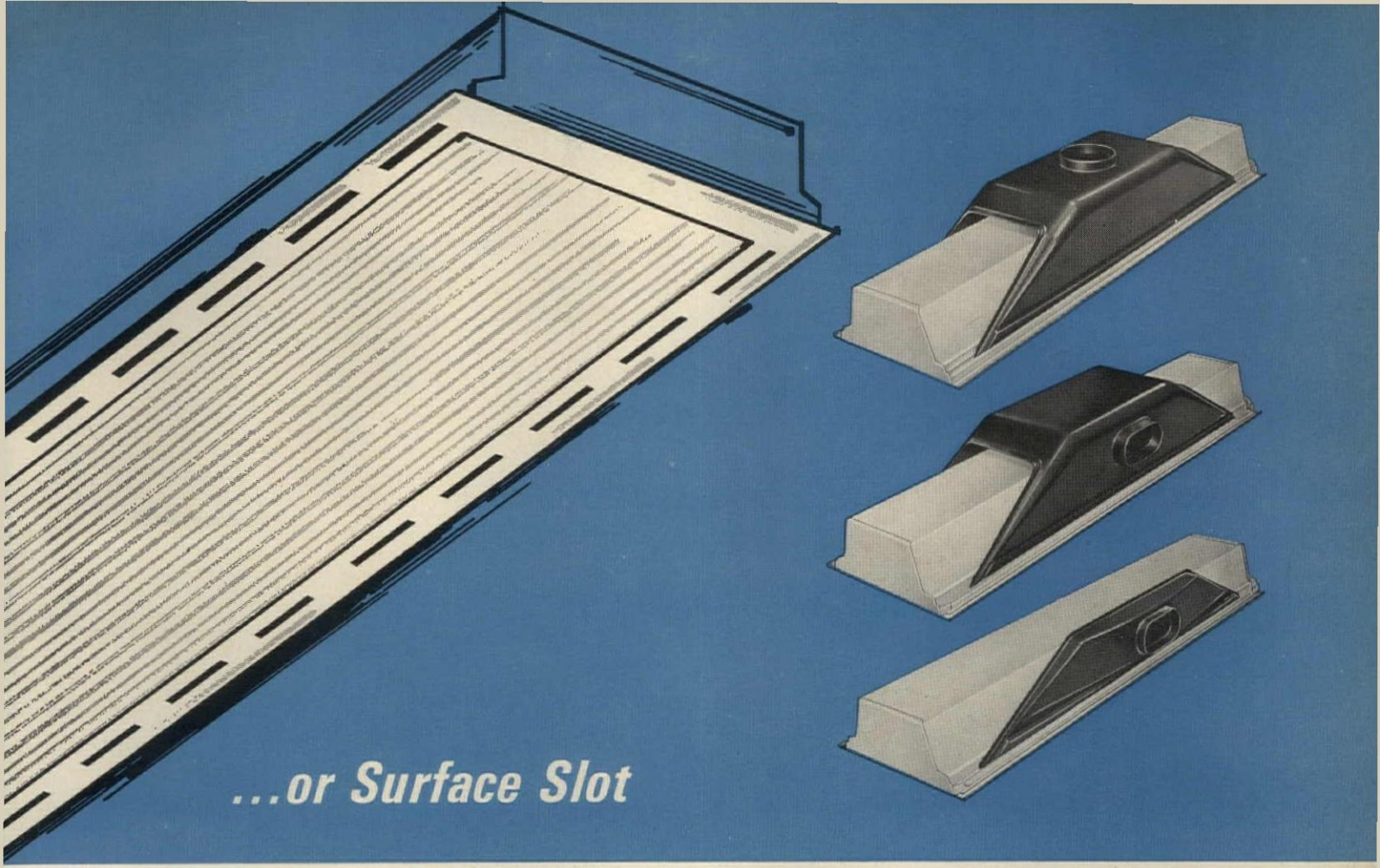
Think what this means! Now even problems like critical space requirements, heat removal, complex air distribution requirements — *CAN BE SOLVED AS SIMPLY AS SPECIFYING TITUS.*

Titus was the original manufacturer of air distribution units for universal use with many different makes of light troffers. Consequently, Titus has had the wide experience of working very closely with many light troffer manufacturers, has performed many troffer heat removal tests, UL tests — and has assisted troffer manufacturers in developing their heat removal units. This background of valuable experience, plus today's largest line of extremely efficient Air Diffusing Units for troffers, is the best reason in the world for *YOU* to specify *TITUS!*

Remember — *air distribution* is Titus' business — Titus' *only* business. When you select Titus you're *SURE* of the most soundly-engineered air distribution money can buy!

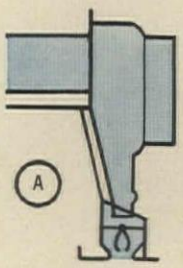
by TITUS®

MEMBER / AIR DIFFUSION COUNCIL

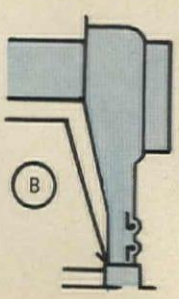


efficiency air diffusers for troffers!

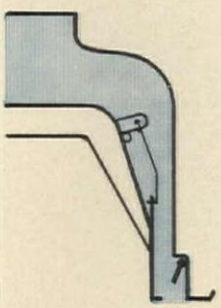
NEW TITUS LTS SERIES DIFFUSERS FOR REGRESSED SLOT TROFFERS. Special compact, low-profile design — plus side feed — make these the perfect diffusers for use in tight plenum spaces. Provide superior Titus air distribution, greatest efficiency. Smaller surface area assures minimum heat exchange between diffuser and plenum, diffuser and troffer (no insulation required!) **AVAILABLE 2 BASIC MODELS** in saddle-type with side feed, single units with side feed, and alternate saddle-type with top feed.



MODEL LTS (drawing "A" at left) has special Titus-designed linear air controllers that are built into the troffer (by troffer manufacturer) and used in conjunction with Titus Air Diffuser that snaps onto troffer. Provides full 180° adjustable air pattern, plus volume control. Complete height, with side-feed unit, only 6⅜".



MODEL LTS (drawing "B" at left) features Titus Air Diffusion Unit with built-in linear air controllers and volume controller. Provides 90° adjustable air pattern. Unit simply snaps onto troffer. Complete height, with side feed, generally under 7 inches.



TITUS LT SERIES DIFFUSERS FOR SURFACE SLOT TROFFERS. The most widely accepted units in the industry! For use with many makes , types, sizes of troffers. (Contact Titus for names of qualified light troffer manufacturers).

Simply snap onto troffer. Air pattern controller provides full 90° adjustable air pattern. Dampers give complete air volume control. Both adjustable from face of diffuser — before, during or after diffuser installation.

Saddle type with top or side feed, and single unit side feed models.

NEW CATALOG -- MAIL COUPON

TITUS MANUFACTURING CORPORATION • WATERLOO, IOWA

☐ Send new Catalogs on Titus complete line of Air Diffusers for light troffers. ☐ Have Titus representative call.

NAME .....

COMPANY .....

ADDRESS .....

CITY ..... STATE .....

For more data, circle 82 on Inquiry Card

Model of Life of Georgia Tower, Atlanta. Architects: Bodin & Lamberson, Atlanta. Associate Architects: Eggers & Higgins, New York City. Glazing Contractor: Binswanger Glass Company, Atlanta.

L·O·F offers New Glass Cost Analysis* for any building on your boards

An analysis that compares the economics of using various glass types: *Thermopane*® insulating glass; one of L·O·F's heat-absorbing plate glasses or regular plate.

It considers heat gain or loss through each type of glass: effect of heat gain on air-conditioning load; comparison of glass costs, taxes, insurance; all other factors affecting costs for the life of the building.

If you wish a cost analysis for any building on your boards, get in touch with your local L·O·F representative. He is prepared to work with you, or your mechanical engineer, in selecting the most economical type of glass on the basis of your plans. Give him a phone call. Libbey·Owens·Ford Glass Company, Toledo, Ohio 43624.

MADE IN U.S.A.

L·O·F GLASS

Libbey·Owens·Ford

Toledo, Ohio

*Example

An L·O·F Glass Cost Analysis for the Life of Georgia Tower compared the economics of *Thermopane* insulating glass (with an outer pane of ¼" *Parallel-O-Grey*®) with single glazing of ¼" *Parallel-O-Grey*. The uniform annual costs for the glass were based on an anticipated useful life of 40 years for the building. For the air-conditioning equipment, a 20-year life was used. Both costs are for borrowed money at 5% interest.

The $0.80 per sq. ft. for the Grey plate glass and the $2.30 for Grey *Thermopane* were contract glass prices and did not include installation, since installation costs for both would be the same according to the glazing contractor. The $1,100 per ton figure of the air-conditioning equipment was estimated by the mechanical engineers.

The initial cost of the *Thermopane* and the air-conditioning equipment it would require is slightly higher than for single grey plate and the air-conditioning equipment needed for it. But the total annual cost of owning and operating the building glazed with *Thermopane* will be substantially less.

	¼" Parallel-O-Grey	Grey Thermopane
Initial glass cost (57,520 sq. ft.)	$ 46,010	$132,300
Initial cost of air-conditioning equipment to overcome heat gain through glass ($1,100/ton)	301,400	220,000
Initial cost of glass and air-conditioning	$347,410	$352,300
Uniform annual cost for glass	$ 2,670	$ 7,670
Uniform annual cost for air-conditioning equipment	24,110	17,600
Annual operating and maintenance costs	27,490	22,980
Total annual owning and operating cost for glass and necessary air-conditioning equipment	$ 54,270	$ 48,250

For more data, circle 83 on Inquiry Card

Product Reports

continued from page 179

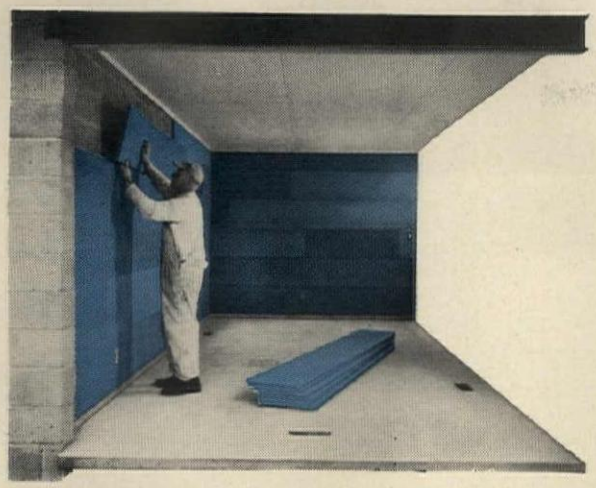
HIGH PERFORMANCE LAMP

General Electric's new, compact 400-watt *Lucalox* lamp produces 42,000 lumens, or 105 units of light per watt of electricity consumed. This rate of performance is made possible by a cigarette-sized *Lucalox* ceramic arc tube, which permits the arc in the sodium vapor to be operated at higher temperatures than had previously been possible. This results in the production of a high efficiency "golden white" light.

One application of these lights can be seen in the photo of the company's new Industrial Lighting Center in Cleveland. In the photo, simulated machine shop, heavy industry area and "super clean" room are lighted by *Power Groove* fluorescent lamps, a combination of color-improved mercury (175-watt), *Multi-Vapor* (175-watt) and *Lucalox* (400-watt) lamps, and a completely diffused lighting system using parabolic wedge-shape louvers. *General Electric Company, Nela Park, Cleveland, Ohio.*

CIRCLE 302 ON INQUIRY CARD

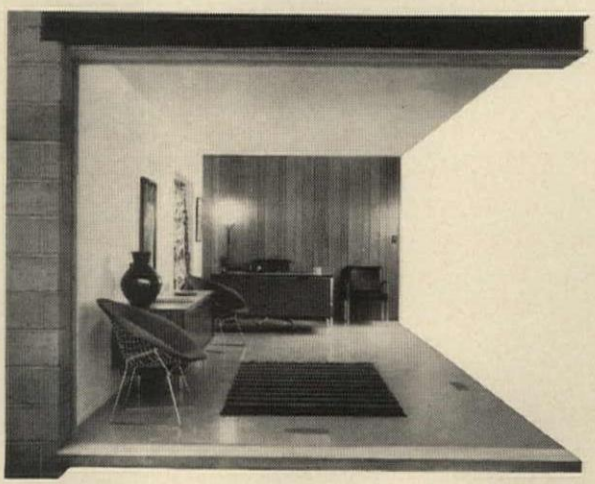
more products on page 208



Remember Styrofoam.

(You've probably specified it as a cold storage insulation. And liked it.
So why not specify it for roofs and walls. It's every bit as good.)

Moisture resistance. Permanent effectiveness. Lightness. Remember? These are some of the things that make Styrofoam® FR brand insulation so popular in the cold storage field today. And they're good reasons, too, for specifying Styrofoam FR for walls as well as Styrofoam RM for built-up roof insulation. Whatever the application, you can rely on Styrofoam. Water can't penetrate its closed cell construction. No vapor barrier is needed. Its light weight means easier handling and installation. There's no chance of rot or mold. Or of deterioration, either.
Remember its versatility when you remember Styrofoam. And to fortify your memory there's Sweet's Architectural File 10a/Do and 8a/Dow.
Or write and we'll send more data and specifications. The Dow Chemical Company, Plastics Sales Department 1313N12, Midland, Michigan.
Styrofoam is Dow's registered trademark for expanded polystyrene produced by an exclusive manufacturing process. Accept no substitutes . . . look for this trademark on all Styrofoam brand insulation board.



O.K. Now forget it.

(Until your next roofing or wall insulation job.)

DOW

For more data, circle 85 on Inquiry Card

THE ONLY COMPLETE LINE OF FIRE EXIT HARDWARE

Von Duprin offers you the only complete line of Fire Exit Hardware for A, B, C, D and E labeled fire doors. Rim. Mortise Lock. Concealed vertical rod. Surface mounted vertical rod. All providing the Von Duprin high standard of quality and dependability. All listed by Underwriters' Laboratories. For complete details on the only complete line of Fire Exit Hardware, write for catalog bulletin 652.

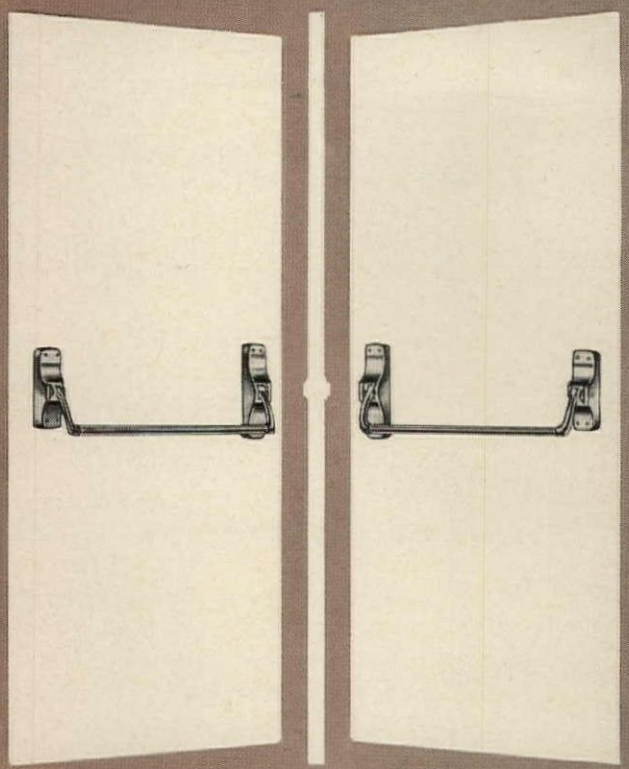
VON DUPRIN DIVISION • VONNEGUT HARDWARE CO., INC.
402 WEST MARYLAND ST. • INDIANAPOLIS, INDIANA 46225
VON DUPRIN LTD. • 903 SIMARD ST. • CHAMBLY, QUEBEC

For more data, circle 86 on Inquiry Card

Von Duprin

EXCLUSIVE

88-F RIM TYPE FIRE EXIT HARDWARE



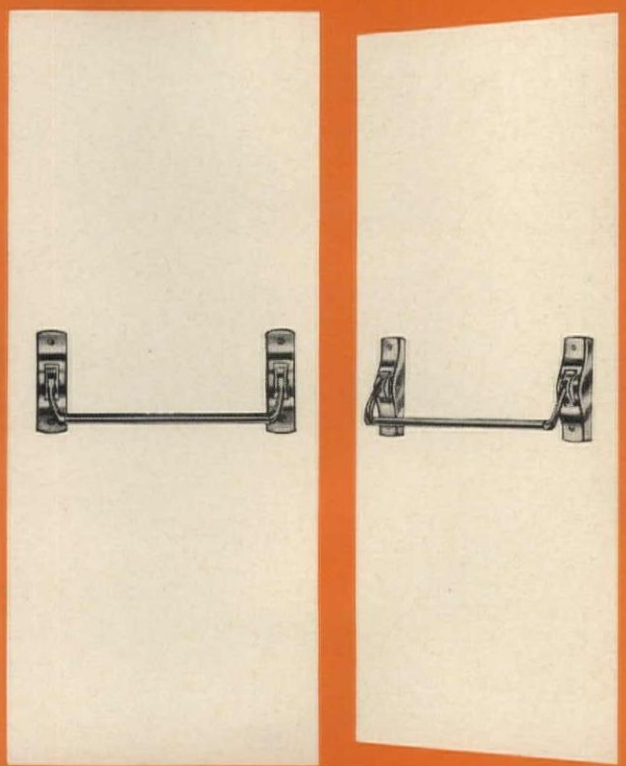
Von Duprin offers you the first and only rim type device listed by UL as Fire Exit Hardware for single door installation or double doors with a removable mullion, eliminating the need for an overlapping astragal and coordinator.

Von Duprin rim devices are listed for A, B, C, D and E labeled doors in single openings up to 3'6" x 7'2" and the 8854 mullion for double door openings up to 7'0" x 7'2".

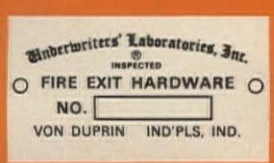
Von Duprin

EXCLUSIVE

CONCEALED FIRE EXIT HARDWARE



Concealed type vertical rod Fire Exit Hardware is another Von Duprin exclusive. Available in Von Duprin 55, 66, 77 or 88 series, the devices can be used in combination with the mortise lock Fire Exit Hardware for double doors.

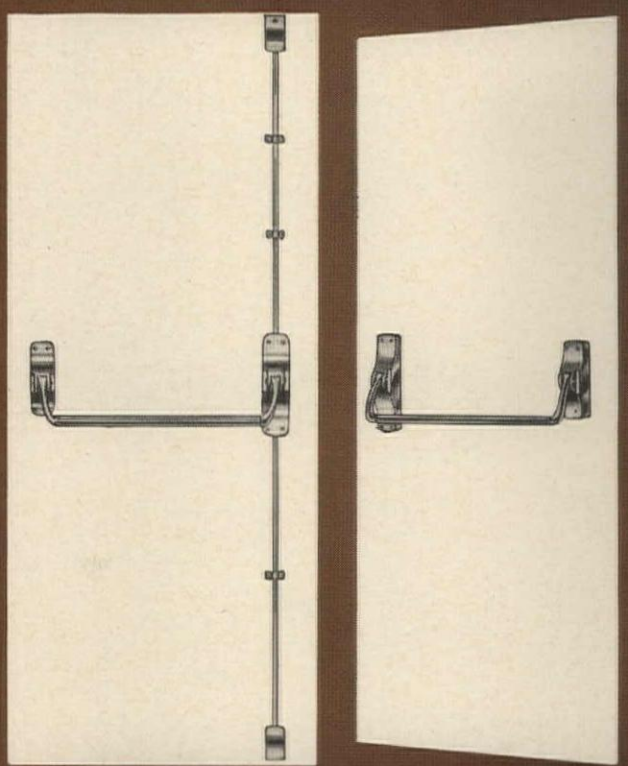


Listed for A, B, C, D and E labeled doors in combination with mortise devices in double door openings up to 7'0" x 8'0". Also for B, C, D and E labeled doors up to 8'0" x 7'0".

Von Duprin

NEW

8817 SURFACE MOUNTED FIRE EXIT HARDWARE



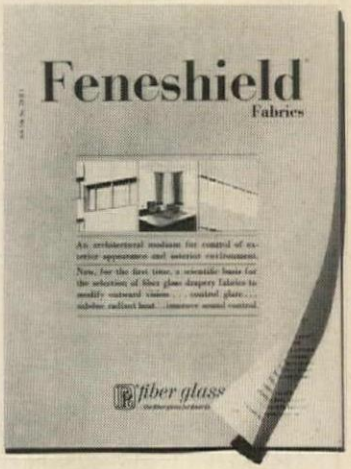
In addition to rim, mortise lock and concealed vertical rod Fire Exit Hardware, Von Duprin also offers this 8817 *surface mounted* vertical rod Fire Exit Hardware for use in combination with Von Duprin 88 series mortise lock devices.

Von Duprin surface mounted vertical rod devices are listed for A, B, C, D and E labeled doors in combination with mortise devices in double door openings up to 7'4" x 7'2".

Cut it out

Pittsburgh Plate Glass Company, Fiber Glass Division
Rm. 900, One Gateway Center, Pittsburgh, Pa. 15222

Please send the Feneshield Fabrics brochure, including shading coefficient tables.



Name_____

Title_____

Company_____

Address_____

City_____ State_____ Zip_____

and we'll show you how to cut out any window treatment problem. Free!

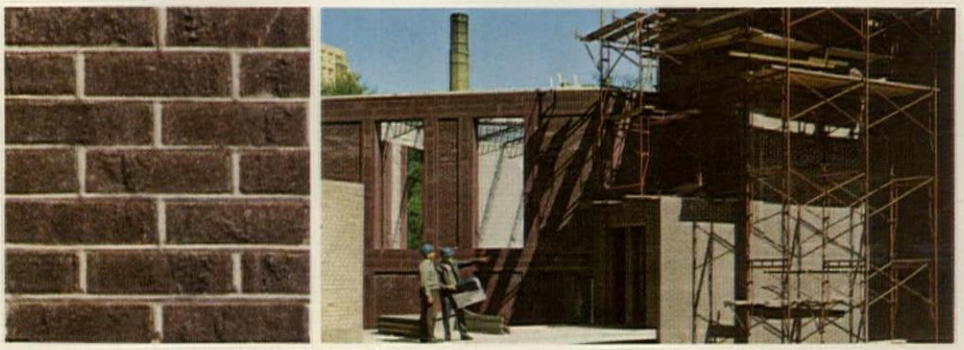
Find out how PPG Feneshield® Fabrics can improve your building's exterior appearance. How these fiber glass fabrics help control solar heat gain, glare, outward vision, and noise. How to select scientifically the best fiber glass drapery for any window treatment. How you can save money by replacing other window treatments with fiber glass draperies.

PPG® **fiber glass**

For more data, circle 87 on Inquiry Card →

(DO WHAT THEY DID)

SPECIFY MEDUSA CUSTOM COLOR and enhance the brick with THE PROPER colored mortar



Student Union Building, North Park College, Chicago, Illinois. Architect: Daniel Bryant & Associates, Chicago, Illinois. Gen. and Masonry Contractor: Mercury Builders, Forest Park, Illinois. Flooring Contractor: McWayne Company (Quarry Tile), Chicago, Illinois. Custom Color supplied by Consumer Co., Div. of Vulcan Mat'l Co., Chicago, Ill.

"We were much impressed with the wide range of colored mortar mixes possible with Medusa Custom Color Masonry Cement and we were able to quickly arrive at a sympathetic colored mortar to enhance the brick work."—Daniel C. Bryant, Architect.

(They are pleased to be able to specify by Code No., the proper color for any masonry design. On this project, 75C was used with the brick and 73A with the quarry tile).

Write direct for more information about Medusa Custom Color Masonry Cement.

MEDUSA PORTLAND CEMENT COMPANY

P. O. Box 5668 Cleveland, Ohio 44101

Jackson Arms, 12 story, 104-unit Gold Medallion apartment, Sommerich & Wood, Architects

Why Jackson Arms went total-electric . . . with General Electric

Jackson Arms, first total-electric high-rise apartment in St. Louis, is the latest Gold Medallion project of developer Melvin Dubinsky. The 104-unit building is equipped by General Electric from its zone-electric heating and cooling units to its modern electric kitchens.

Mr. Dubinsky explains, "In a climate as variable as ours in St. Louis, it's important to have flexibility in the control of heating and cooling. But individual tenant control of temperature and quick response are just two reasons for our going total-electric."

There are many other reasons why **your** next development should be total-electric: reasonable initial investment, economical operating costs, wide selection of equipment and appliances and, of course buyer/tenant appeal.

Let us tell you how General Electric's customized promotional programs and other services can be fitted to your total-electric developments. Write to: Construction Market Development Operation, General Electric Company, Appliance Park, 6-230, Louisville, Kentucky.

Melvin Dubinsky is a partner of Jack Dubinsky and Sons, a real estate company with 50 years experience in the development and ownership of apartments and commercial properties.

GENERAL ELECTRIC

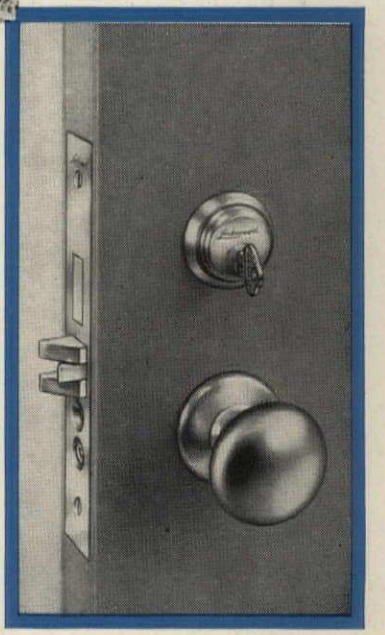
For more data, circle 88 on Inquiry Card

For more data, circle 89 on Inquiry Card →

LOCKWOOD

TO LOCK UP "MOON PORT"

First step to the stars



Rising out of the dunes of Florida's Merritt Island is the skeleton of what will soon be the largest building in the world—N.A.S.A.'s Vertical Assembly Building.

Over 57,000 tons of structural steel alone were used to form the framework and when complete the building will reach 507 feet into the air and measure 709 feet in length and 513 feet in width.

It will be here that a new era in history will be written as giant Saturn V launch vehicles will be assembled prior to manned voyages to the moon.

As with all N.A.S.A. projects the door hardware had to satisfy two rigid standards—SECURITY and DEPENDABILITY. Lockwood's Heavy Duty Mortise locksets and Ball Bearing Door Closers came up with the right answers for both.

When you're looking for security and dependability in hardware, look to Lockwood. We've found our place in the stars.

BUILDING PHOTO COURTESY U. S. STEEL

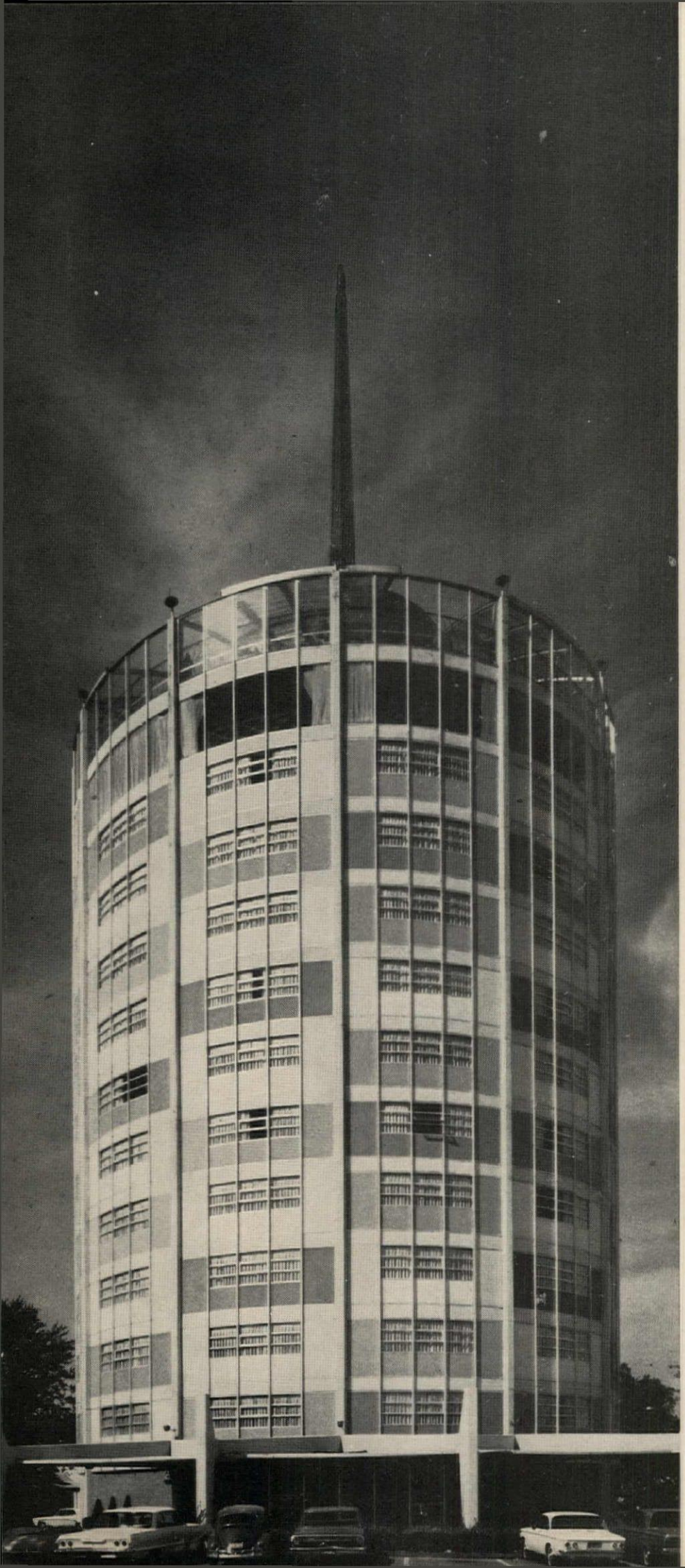
LOCKWOOD

LOCKWOOD HARDWARE DIVISION

INDEPENDENT LOCK COMPANY ILCO

Fitchburg, Massachusetts

For more data, circle 98 on Inquiry Card



Architect
R. Ben Johnson, Owensboro, Kentucky
Consulting Engineer
Waldron, Batey & Wade, Hopkinsville, Kentucky
General Contractor
Clark Construction, Owensboro, Kentucky
Mechanical Contractor
Koenig Bros., Louisville, Kentucky

Guests dial their own comfort with Gas-powered Carrier cooling

The unusual Gabe's Motor Inn, Owensboro, Kentucky, is complete with roof-top pool. And the luxury continues down in the guest rooms. A Carrier air conditioning system responds to each guest's temperature preference. Quietly, sensitively, year-round.

The same Gas-fired boilers that power the Carrier absorption refrigeration unit serve the guest rooms' heating needs. Chilled water for cooling and tempered air for heating are supplied to room Weathermaster® units with individual controls.

An exclusive Carrier solution capacity control keeps efficiency high, even at partial loads. And the economy of gas is unbeatable. Check the benefits of fully hermetic, Gas-absorption Carrier cooling equipment. Call your local Gas Company Sales Engineer. Or just write: Carrier Air Conditioning Co., Syracuse, N. Y. 13201.
AMERICAN GAS ASSOCIATION, INC.

For heating and cooling... Gas makes the big difference

For more data, circle 99 on Inquiry Card

"VIM" goes High...Wide...and LAMSON with Selective Vertical Conveyors

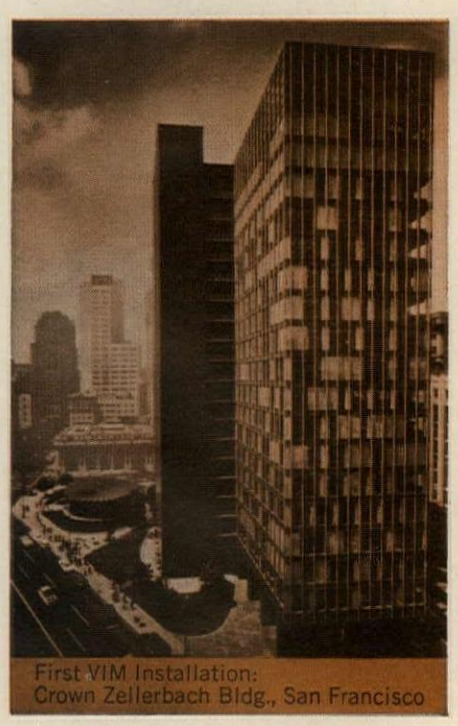
The Post Office has developed a farsighted Vertical Improved Mail (VIM) System for fast, continuous service in high-rise buildings. At the heart of this system is the selective vertical conveyor.

LAMSON, pioneer in mechanized communications systems, has designed, built and installed a large majority of the world's vertical conveyors, including the highest and largest systems.

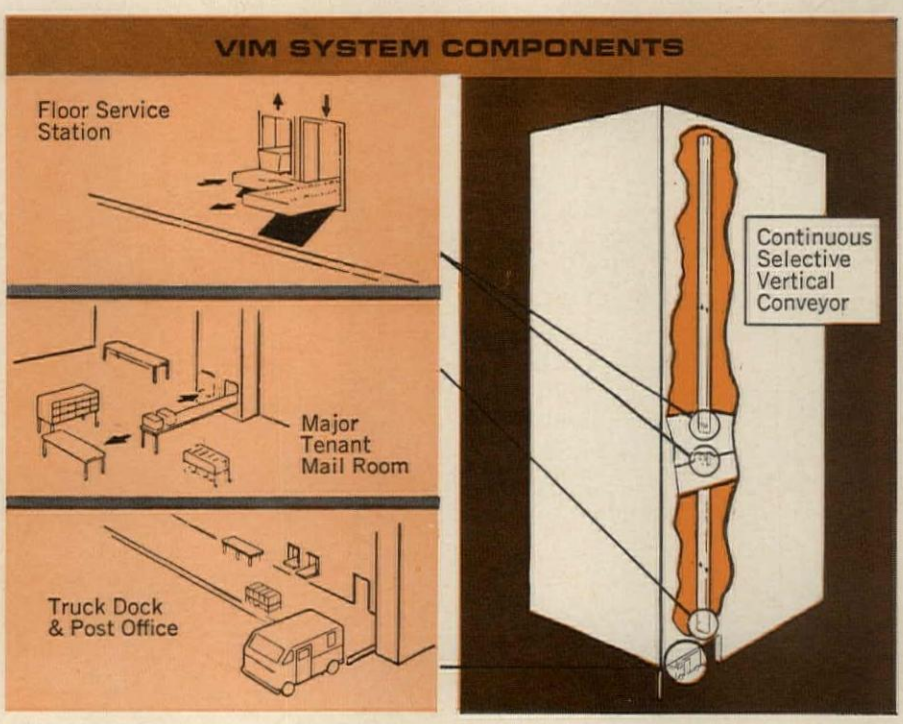
In addition to the selective vertical conveyor, a VIM System also includes a truck dock and a Post Office operated mail room at street or basement level. Here, incoming mail is sorted and locked in tenants' trays for automatic dispatch to all floors via the conveyor. Tenants pick up trays at floor service stations. Outgoing mail may also be sent down to the Post Office mail room from these points.

VIM offers many advantages: mail is delivered early to all floors . . . security is improved . . . congestion from bags and carts in building is relieved . . . day-long mailing permits faster processing to and through the main Post Office . . . contract messenger service is reduced. Equally important: major tenants occupying several floors can use conveyors for their own interoffice distribution of mail, supplies, EDP tapes and cards, etc.

Continuous, high-speed mail service is the lifeline of any business. In designing new high-rise buildings, consider carefully the additional income, efficiency and utility value provided by making provision for a VIM System. For full details on selective vertical conveyors, write to: LAMSON CORPORATION, 183 Lamson Street, Syracuse, New York 13201.



First VIM Installation:
Crown Zellerbach Bldg., San Francisco



master of mechanized motion

LAMSON CORPORATION

Lamson Street, Syracuse, New York
Also: San Francisco and Toronto, Canada
Offices in All Principal Cities

For more data, circle 100 on Inquiry Card

Product Reports

continued from page 188

TEMPORARY STORAGE

Designed for temporary storage accommodation, this system is composed of six 12 in. rigid craftboard modules with three removable shelves. The four supporting struts

are made of colored plastic, and the complete system can be easily assembled without tools. *The Design Workshop, Detroit, Mich.*

CIRCLE 303 ON INQUIRY CARD

INTEGRATED CEILING SYSTEM

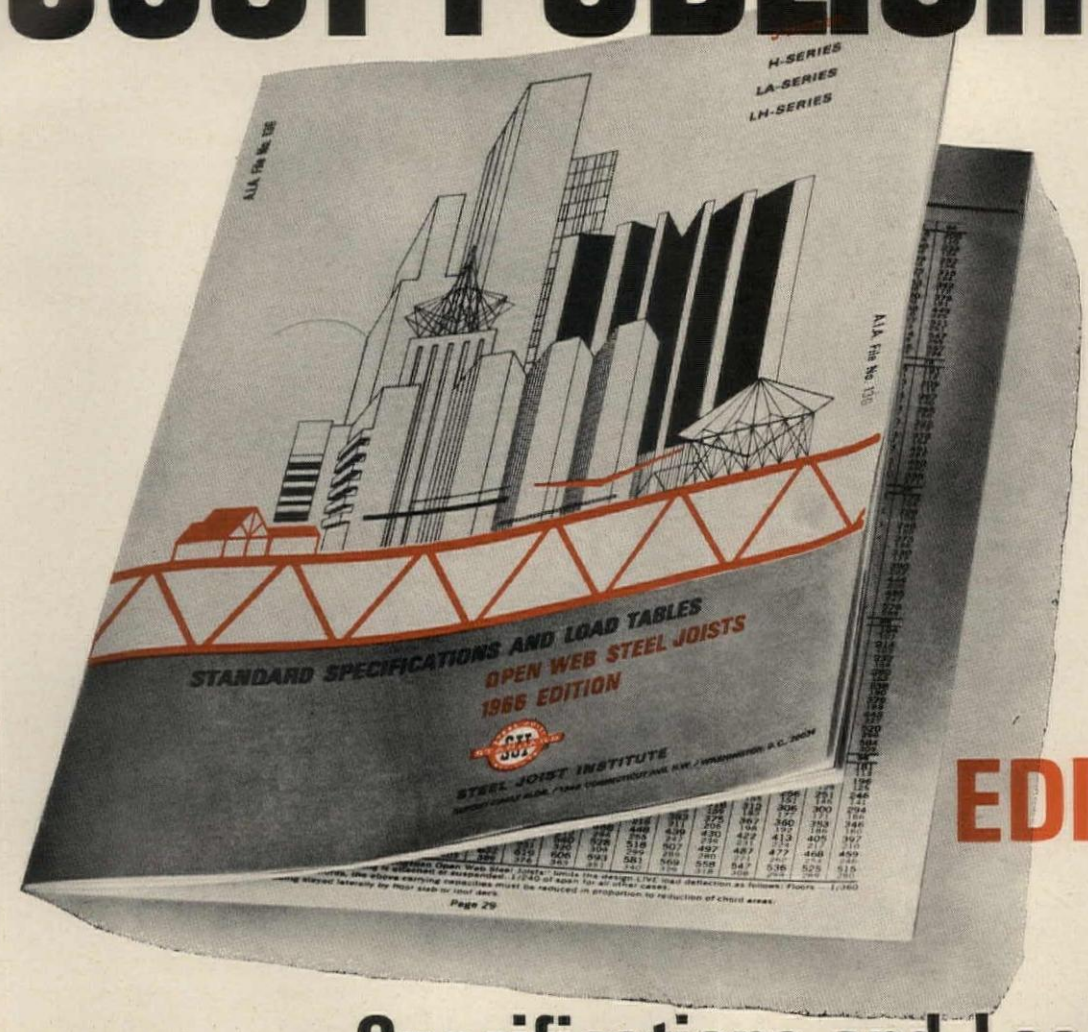
Armstrong's new *Luminaire C-60* ceiling system employs a series of folded-plate modules which serve as mechanically independent sources of lighting, air distribution and sound control. The system offers a choice of one or two-lamp fixtures with 48-in. lamps, shielded or unshielded.

Plenum height requirements are less than 10 in. The inclined end panels make it possible to use standard 4-in. lighting fixtures, even though the system employs a new 30-in. by 60-in. module. *Armstrong Cork Company, Lancaster, Pa.*

CIRCLE 304 ON INQUIRY CARD

more products on page 216

JUST PUBLISHED!



1966 EDITION!

Specifications and Load Tables for High Strength Open Web Steel Joists

Here, from the Steel Joist Institute, are 32 pages of specifications, load tables and everything else you need for fast, accurate specification of joists to carry uniform loads on spans up to 96 feet. Covers the following joists: J-SERIES, joists made from 36,000 PSI minimum yield strength steel; LA-SERIES, longspan joists compatible with the J-Series; H-SERIES, high-strength joists made from 50,000 PSI minimum yield strength steel; LH-SERIES, longspan joists compatible with the H-Series. Send for your free copy of this valuable booklet.

STEEL JOIST INSTITUTE
DuPont Circle Bldg., Washington, D.C. 20036

MAIL COUPON TODAY!

STEEL JOIST INSTITUTE
DuPont Circle Bldg., Washington, D.C. 20036

Please send me a complimentary copy of the 1966 Edition of Specifications and Load Tables.

Name_____

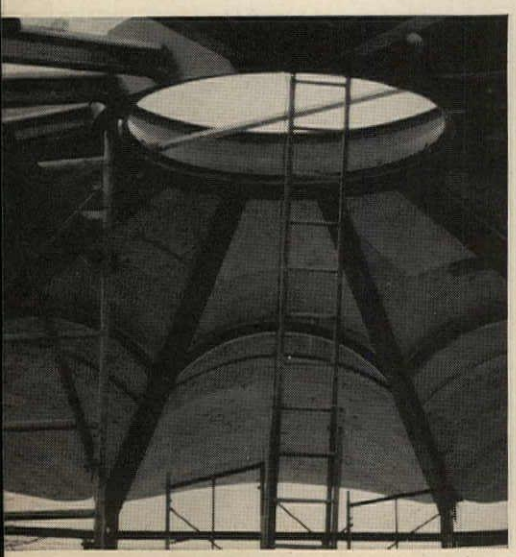
Company_____

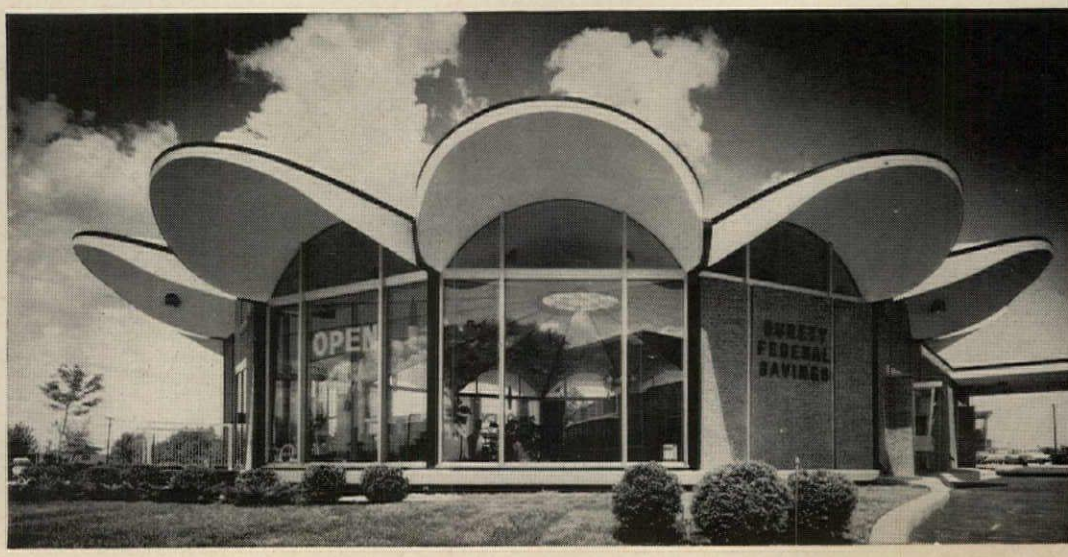
Address_____

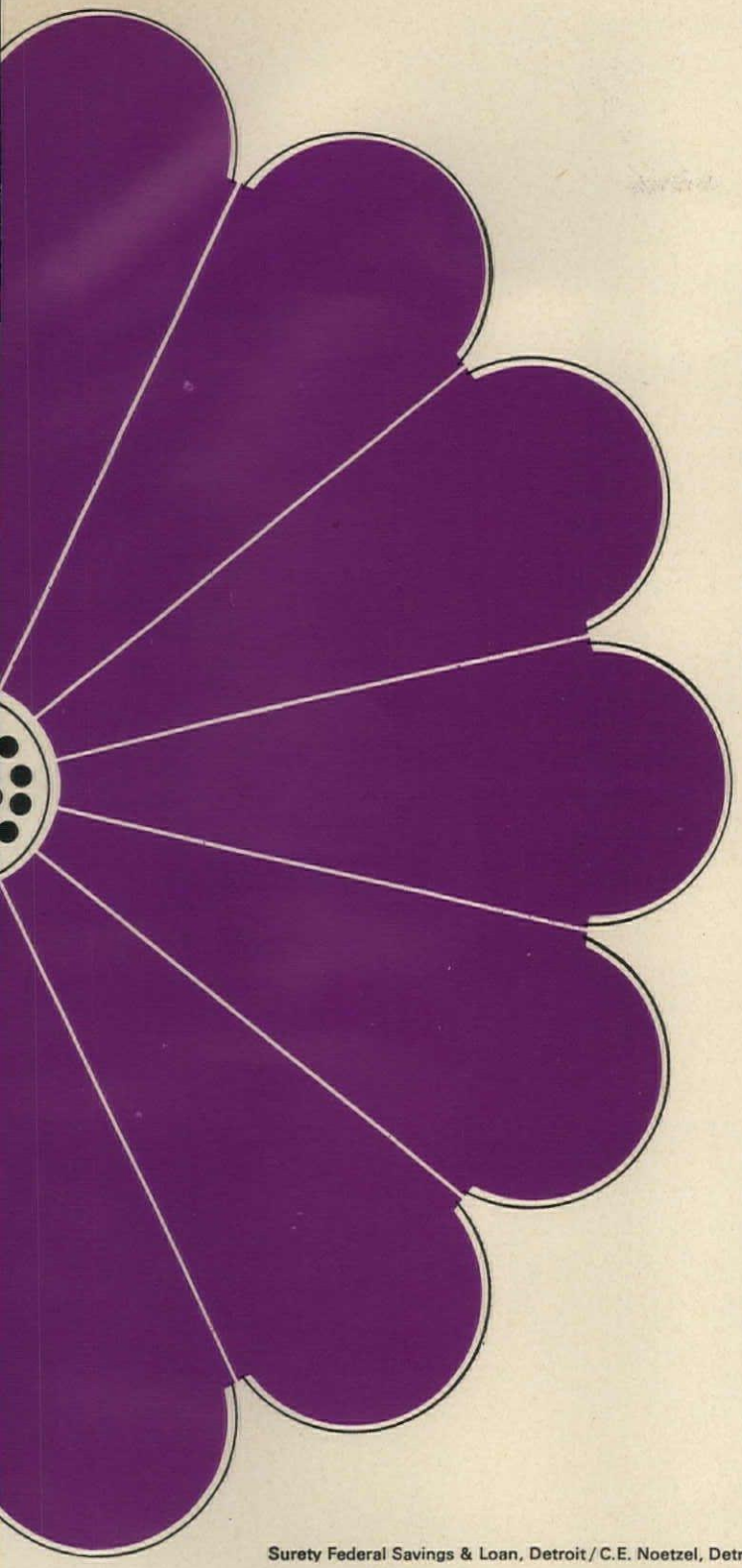
City_____ State_____ Zip_____

For more data, circle 102 on Inquiry Card

the most exciting ideas take shape in plywood





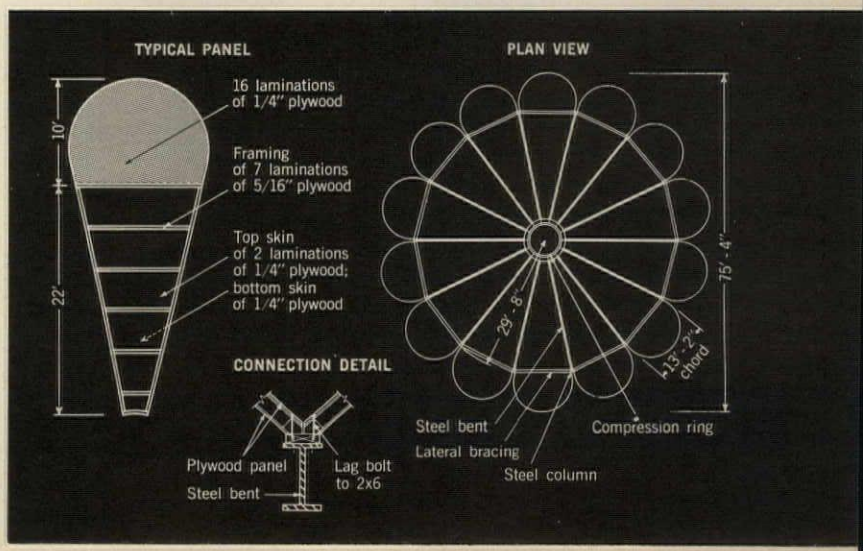


Surety Federal Savings & Loan, Detroit / C.E. Noetzel, Detroit, Architect / Plywood Structural Div., G.H.L. Corp., Auburn Heights, Mich., Fabricator

Fourteen petal-shaped plywood components roof this drive-in bank that blossoms by a busy Detroit highway. It's another case where only plywood could reconcile a demanding design with a tight budget. Concrete was considered but would have cost twice as much. The conical plywood panels were so lightweight and so carefully engineered that they took only three days to install. Whenever your designs call for unusual shapes, high strength and low cost, look into plywood components and structural systems. For more on DFPA plywood, write us at Tacoma, Wash. 98401 (US only).

AMERICAN PLYWOOD ASSOCIATION

TESTED DFPA QUALITY



Hetron®-based panels let nature pay the light bill

Daylight floods through these translucent plastic panels and lights up the darkest corners of Pier 94, in Brooklyn.

Artificial lights go on only at night, or on days so overcast there is not enough light even outdoors. As would be expected, savings in electricity are substantial.

The strong, lightweight Hetron-based panels were easy to install and are easy to maintain. Neither storms nor vandals can shatter them. Because they eliminate dark spots, they permit freight handling in the pier at top speed without "blind spot" hazards.

Meet rigid codes. The Hetron-based panels are inherently fire retardant. They have a flame-spread rating of 35 to 60 by the U/L tunnel test and meet the rigid building code and fire-retardant specifications of the Department of Marine and Aviation.

We do not make the panels—just the Hetron polyester resin that helps make them strong, translucent, lightweight, fire retardant, and chemical resistant.

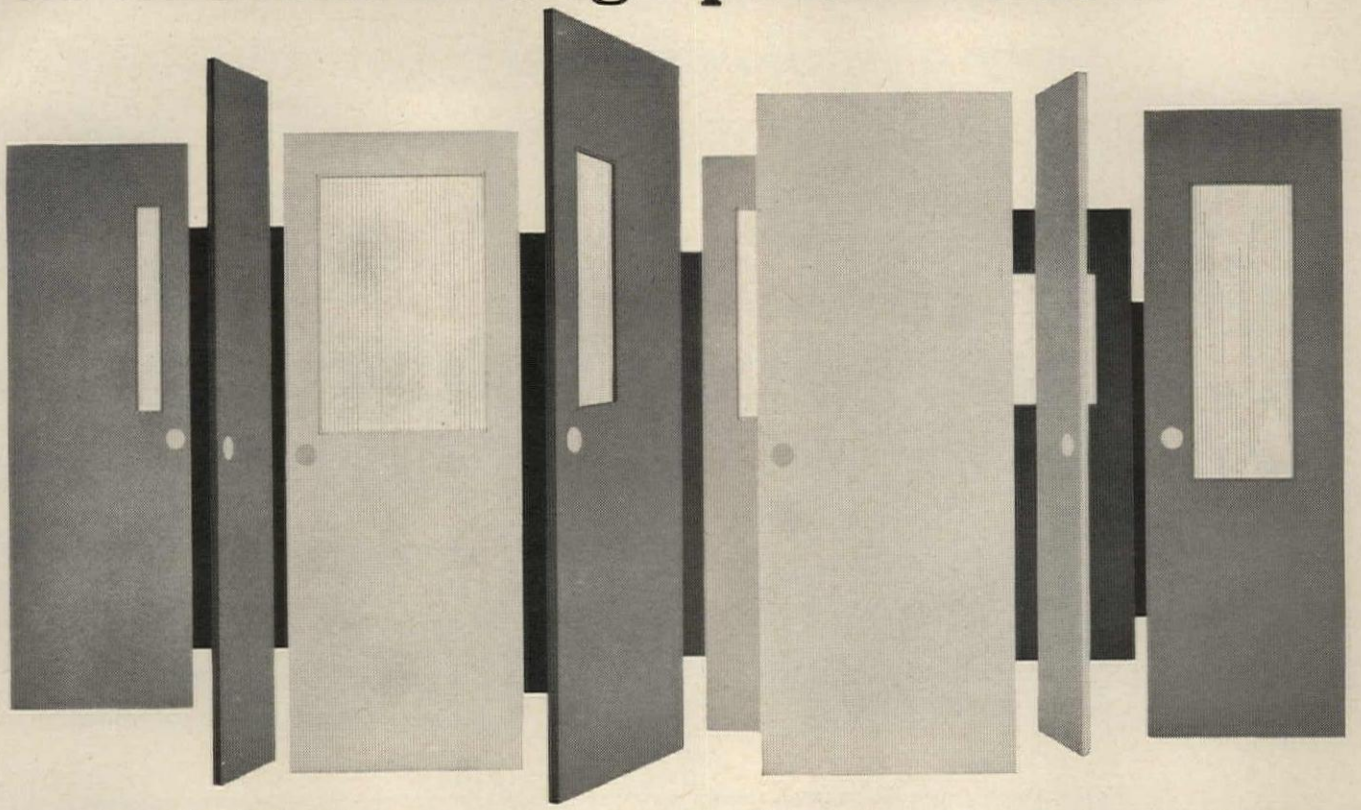
For more detailed information on the excellent properties of Hetron and a list of fabricators, please write Durez® Plastics Division, Hooker Chemical Corporation, 8812 Walck Road, North Tonawanda, N. Y. 14121.

HOOKER CHEMICALS® PLASTICS

DUREZ PLASTICS DIVISION

Hetron-based panels let in a flood of daylight at Cunard Pier 94. Panel fabricator: Filon Corporation. Engineers and architects: Praeger-Kavanagh-Waterbury.

This new Imperial Door swings open on unlimited design possibilities...



It's the Imperial Full Flush Door — trim, modern in appearance — compatible with any decor. So versatile that a single style, with the glass frame section and snap-in glazing bead provided, makes possible any glass or louver treatment. For the architect this means specifying prefabricated economy without limiting design possibilities. For the builder it means handling only one type of door at the jobsite and this saves time and money. Because it's reversible — "no handing" — it simplifies construction.

For the people who will live with the Imperial Flush Door — whether it is in a residential, commercial or public building — its highly functional design, handsome appearance and rugged durability mean years of carefree service. It hangs square — and stays that way — with a complete perimeter channel, fully welded, to provide added strength to the heavy gage steel that never warps, sags, binds or splits. It is rust inhibited with exterior surfaces protected by a five-step phosphatizing process.

The new Imperial Flush Door arrives at the site prepackaged — fully protected against damage. You can get immediate delivery from a network of warehouses. And behind every Imperial Door — guaranteeing its quality and performance — is the reputation, skill and experience of the Manufacturing Division of Republic Steel Corporation.

Call or write for a complete catalog of Imperial Doors.

Strong
Modern
Dependable

REPUBLIC STEEL

MANUFACTURING DIVISION
REPUBLIC STEEL CORPORATION
Dept. AR-1583, Youngstown, Ohio 44505

CALL THE MAN FROM MANUFACTURING!

The new IMPERIAL Flush Door sounds good! We'd like:
☐ Literature ☐ A call from your representative

Name_____ Title_____
Company_____
Address_____
City_____ State_____ Zip_____

For more data, circle 104 on Inquiry Card

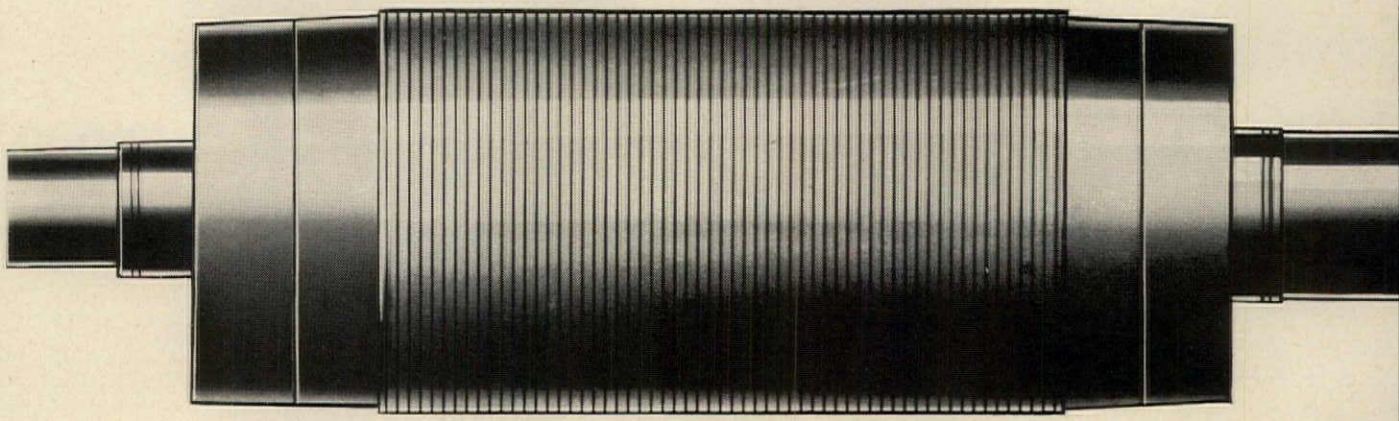
← For more data, circle 103 on Inquiry Card

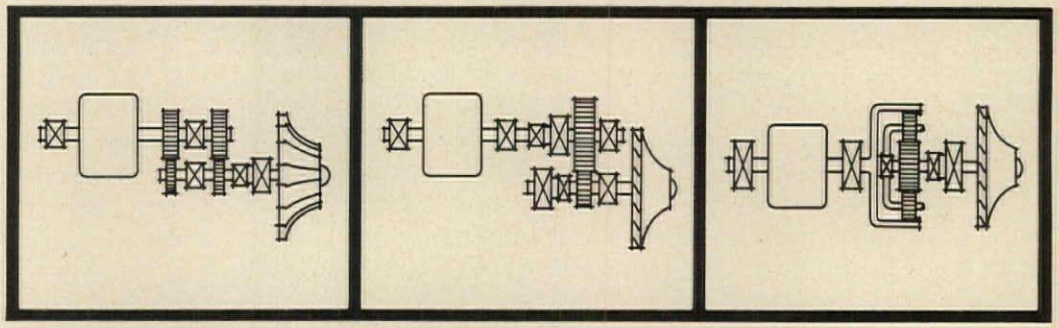
Only one moving part, two bearings

It just stands to reason. The simpler the design, the fewer the parts. The fewer the parts, the more reliable a machine will be.

And the integral rotor-impeller of TRANE's compact direct drive is a single rotating assembly. There are no gears between the motor and compressor that can fail.

That's the key to the success of TRANE's compact CenTraVac. Compare its simplicity with other water chillers.





Make "A" Gear-drive, including four gears, three bearings, plus a high-load thrust bearing.

Make "B" Gear-drive, including two gears, four bearings, plus two high-load thrust bearings.

Make "C" Gear-drive, including five gears, seven bearings, plus a high-load thrust bearing.

Direct drive design makes Trane

In the words of a leading paper company divisional chief engineer (name on request): "Two compact, direct drive CenTraVacs have been in operation during the past year with no maintenance problems whatsoever."

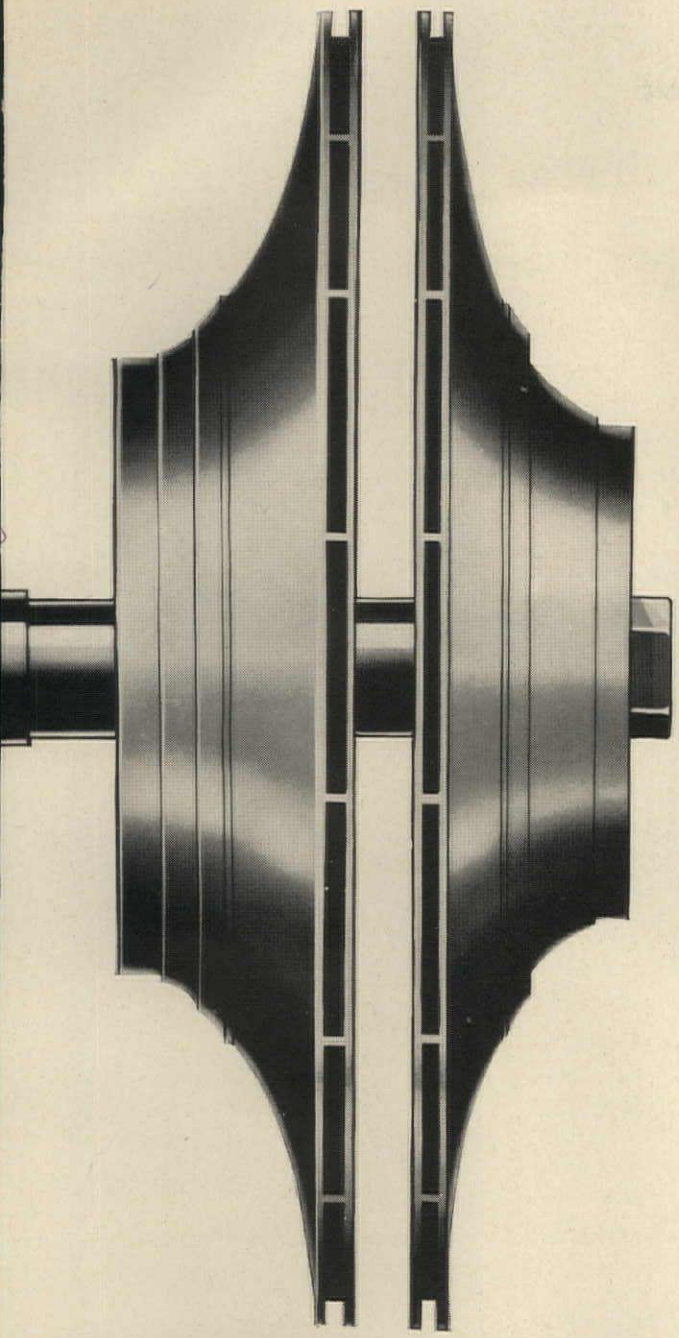
He goes on to report that "We feel this was to be expected since we have six older CenTraVacs operating in various parts of the country, again with almost no maintenance problems."

And, he concludes, additional CenTraVacs are planned for their new Los Angeles plants.

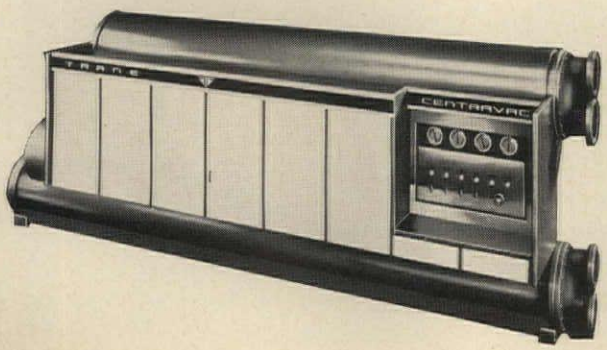
This experience is typical. In a comprehensive field test program, a number of compact CenTraVacs operated up to the equivalent of three years of normal air conditioning service. No operating problems were encountered, confirming extensive laboratory test results.

The CenTraVac is a complete factory-assembled water chiller. Only external and auxiliary water piping connections and main electrical connections are necessary. Sizes range from 225 to 555 tons.

For complete information, call your nearest TRANE Sales Office. Or, write for the CenTraVac Catalog, DS-399P.



CENTRAVAC the reliable one.



TRANE

FOR ANY AIR CONDITION

MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING, VENTILATING AND HEAT TRANSFER EQUIPMENT

The Trane Company, La Crosse, Wisc. • Scranton Mfg. Plant, Scranton, Pa. • Clarksville Mfg. Plant, Clarksville, Tenn. • Salt Lake Mfg. Plant, Salt Lake City, Utah • Lexington Mfg. Plant, Lexington, Ky. • Trane Company of Canada, Limited, Toronto • Trane, Limited, Donibristle, Scotland • Epinal, France • 120 U.S. and 20 Canadian Offices

For more data, circle 105 on Inquiry Card

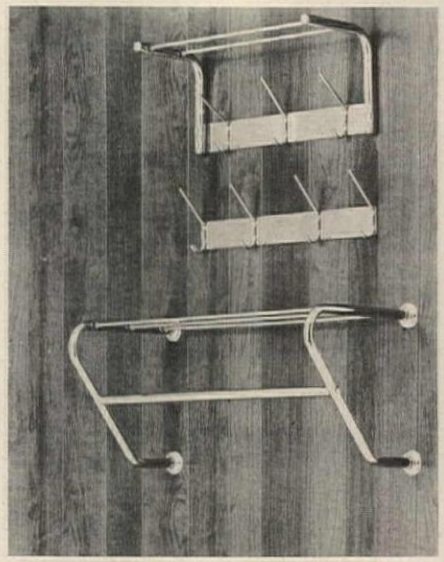
Product Reports

continued from page 208

COAT RACKS FOR ALL NEEDS

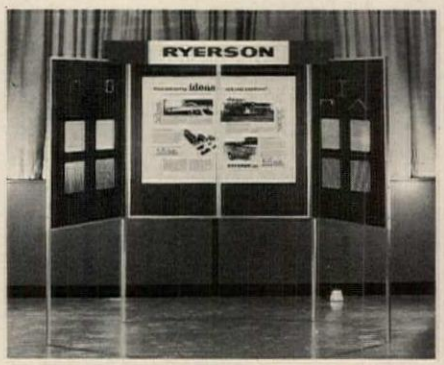
A comprehensive range of coat racks and hangers includes nine different wall models, three booth models and eight floor standing units. *Fixtures Manufacturing Corporation, Kansas City, Mo.*

CIRCLE 305 ON INQUIRY CARD



PORTABLE DISPLAY BOARDS

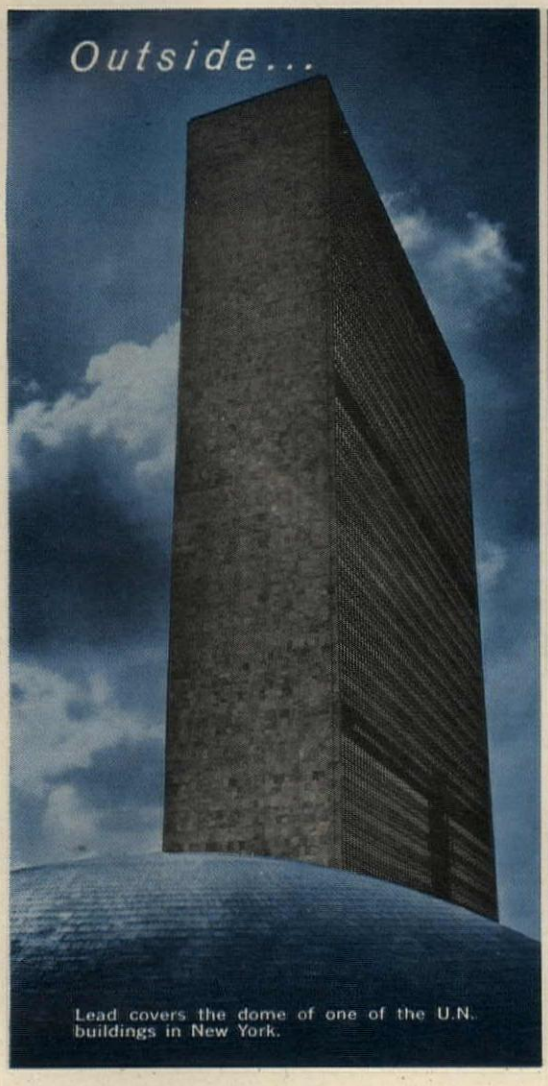
Easily carried and erected by one person, the *E-Z-Zibit* portable display has been designed specifically with the individual exhibitor in mind. The system folds down into two halves which can fit easily into the



trunk of a small car. Legs can be extended for floor exhibits or retracted for table-top display. The illuminated sign is an integral part of the display. *Display-Pak, Evanston, Ill.*

CIRCLE 306 ON INQUIRY CARD

more products on page 220



Lead covers the dome of one of the U.N. buildings in New York.

Automatic machines with single or multiple torches are used to bond lead to surfaces such as the steel cylinder shown here.

LEAD is a practical, pliable defense against corrosion

Lead is an old — yet new way to ward off corrosion. Its use is constantly growing — with more lead being used for corrosion defense today than ever before.

Reasons — lead is inherently immune to a vast range of corrosives; it is low cost, easy to form, fabricate and alloy. It is a versatile material, being used in such varied forms as sheet, bonded linings, cast shapes, pipe, tubing, molten sprays, electroplated coatings, anodes for cathodic protection and as a pigment in paint.

Today's designers and architects use lead as a proven barrier against corrosion and against noise, vibration and radiation. It is a metal for the future.

ST. JOE

ST. JOSEPH LEAD COMPANY

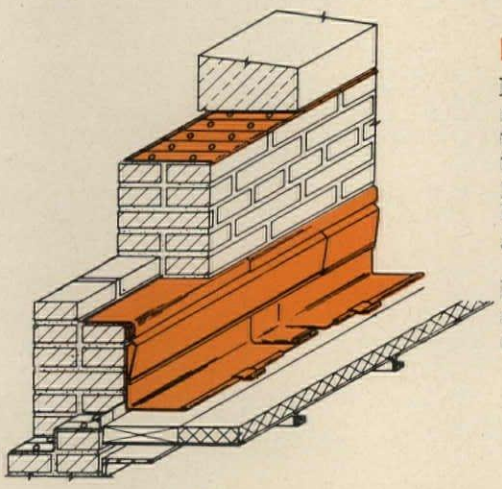
250 PARK AVENUE, NEW YORK 17, N.Y.

THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES

PB-263

NOW...
a new line of Improved, Expanded Revere Flashing Products to perform even better in installation and service!

HERE'S THE *NEW* REVERE FLASHINGS LINEUP:

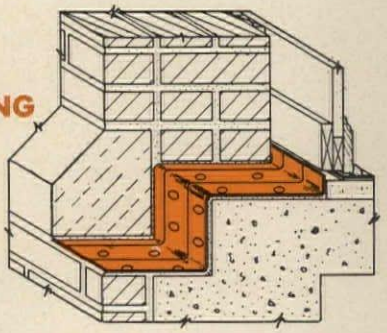


REVERE-KEYSTONE TWO-PIECE CAP FLASHING

Permanent, trouble-free weather-seal against leaks, seepage. Receiver member installed at time of masonry work, the counterflashing insert member inserted, without tools, *after* roofing or base flashing.

NOW WITH FOUR TYPES OF RECEIVER TO FIT RANGE OF SITUATIONS

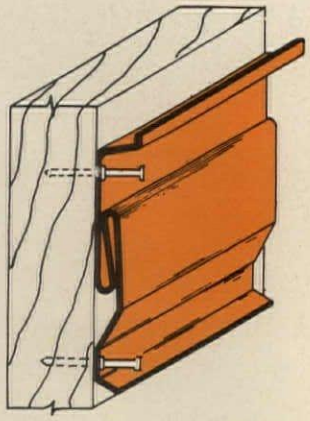
a) *Combination Thru-Wall* with dual function of cap flashing and mechanically-keyed thru-wall flashing
b) *4"-In-The-Wall*, the standard cap flashing
c) *1"-In-The-Wall*, for cap flashing in existing masonry wall
d) *Face-Mounted*, for cap flashing in existing wall, also in wall constructions without usable mortar joints



REVERE-KEYSTONE INTERLOCKING THRU-WALL FLASHING

Soundest, most practical method for weatherproofing of masonry structures. Provides mechanical key bond in every direction. Lasting protection against seepage, leaks.

NOW WITH RAISED BUTTONS AT 4" INTERVALS TO INCREASE MECHANICAL BOND AND ELIMINATE MOVEMENT ACROSS WALL. Combines features of the former 2-way and 3-way systems.



REVERE-SIMPLEX REGLET SYSTEM

Full moisture protection for spandrels, shelf angles, lintels. Nailed to wood form before concrete is poured. After form is removed, reglet is ready for the quick, immediate insertion of the flashing member. The only reglet system with horizontal slot in vertical plane!

NOW IMPROVED TO PROVIDE MORE POSITIVE ATTACHMENT TO WOOD FORMS:
2 rows of prepunched nail holes, one above reglet slot, one below, ensure against grout seepage into reglet slot.

GET *YOUR* FREE COPY OF REVERE'S NEW FLASHING FOLDER TODAY!

Simply fill in this coupon and mail to Catalog Service Dept. F-1,
Revere Copper and Brass Incorporated
230 Park Ave., New York, N.Y. 10017

Name_____

Title_____

Co._____

City_____ State_____ Zip Code_____

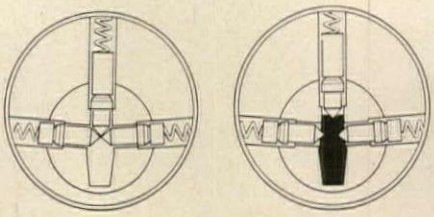
For more data, circle 109 on Inquiry Card

Product Reports

continued from page 216

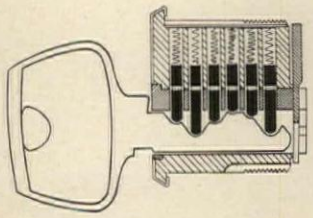
NEW LOCK CYLINDER FOR GREATER SECURITY

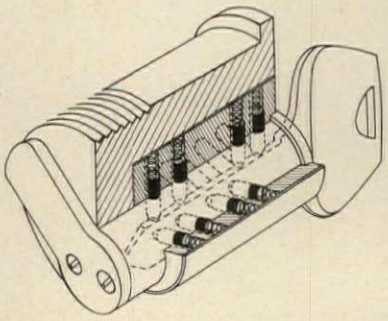
The *Sargent Maximum Security System* is said to offer far greater security than conventional locking devices, because the new cylinders baffle lock picking by means of multiple rows of interlocking pins which



bar the way to any picking tool, and the keys are marked by precision milled depressions which cannot be duplicated on any key cutting machine now in use. Each installation of the new system has its own individual combination of pin lengths and position, which is never re-used in another installation.

Unlike the conventional pin-tumbler lock cylinder, which turns when the key raises a single row of pins to the "shear line," the Sargent system key positions every pin in three different rows to a precisely predetermined height before the cylinder will unlock. The notches and grooves, common to the conventional key, have been replaced by a number of milled hollows on the edges and flat surfaces of the key, which is designed to be reversible and cannot be inserted upside down. *Sargent, New Haven, Conn.*





CIRCLE 307 ON INQUIRY CARD

more products on page 232

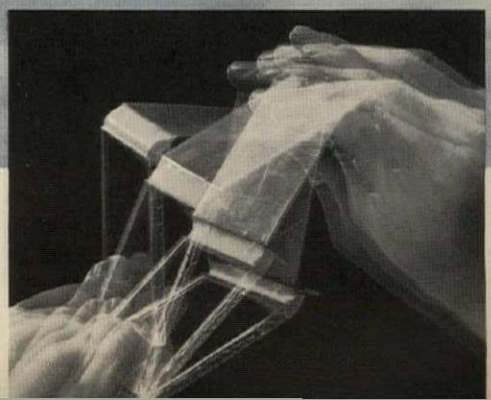
If it weren't for the cold, you wouldn't need Dow Corning 780 building sealant.

Most sealants stiffen with cold and lose elasticity. The colder it gets, the harder they become. When this happens, expansion and contraction often cause the sealant to crack or pull away—and that's the beginning of a costly and embarrassing leak.

One sealant that applies easily and stays flexible at all temperatures is Dow Corning® 780 building sealant. A true silicone rubber, this elastomer is unaffected by extremes of cold and heat, direct sunlight, ozone and ultraviolet. That's why Dow Corning 780 building sealant maintains a watertight seal indefinitely.

FREE SAMPLE:
We'll send you a two-ounce sample tube of this remarkable sealant for your own cold weather evaluation.

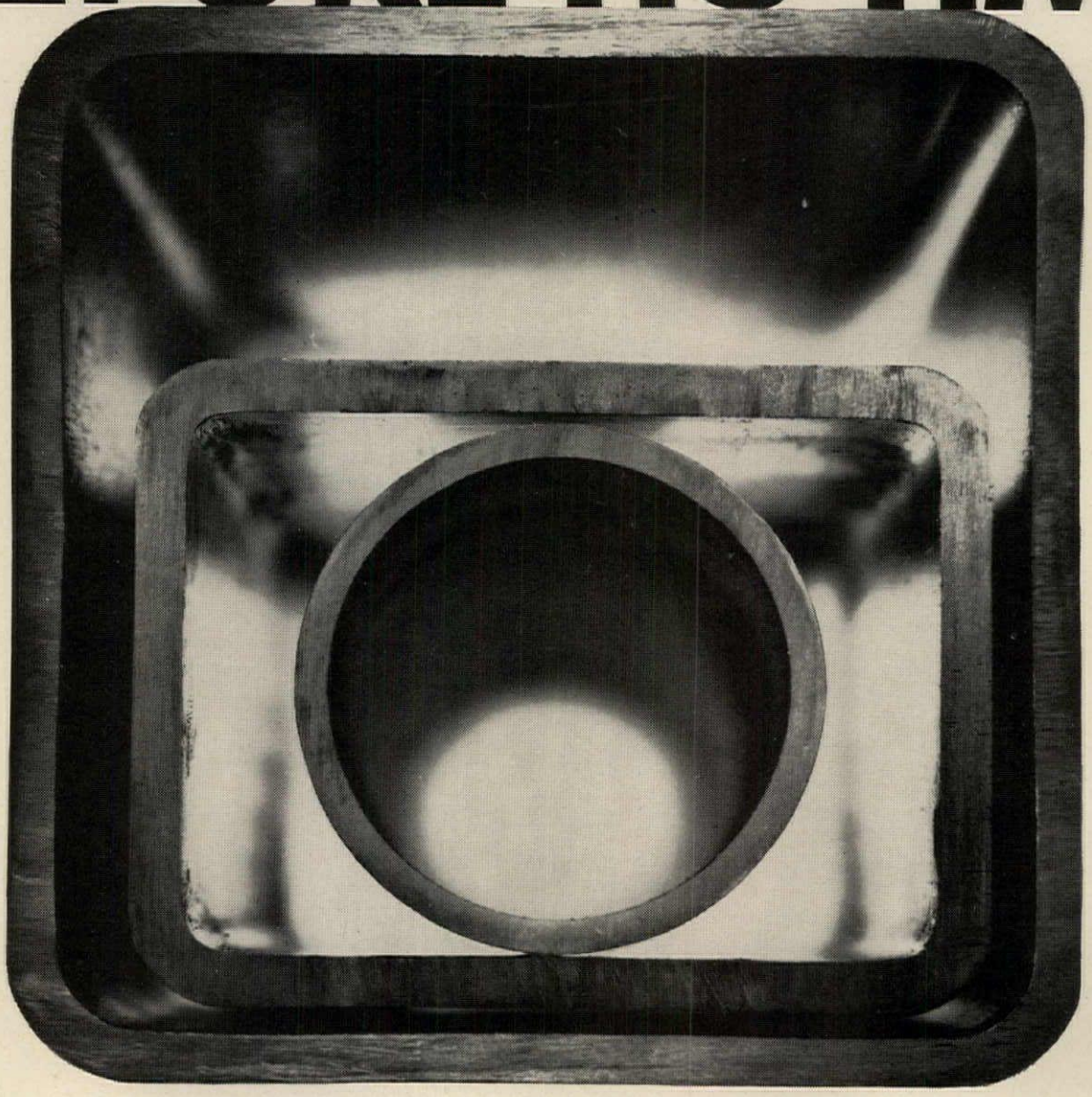
flexibility at 20° below



Write Dow Corning Corporation, Dept. 0624,
Chemical Products Division, Midland, Michigan, 48641.
For nearest distributor, see Sweet's Architectural File.

For more data, circle 111 on Inquiry Card

THREE YEARS BEFORE ITS TIME

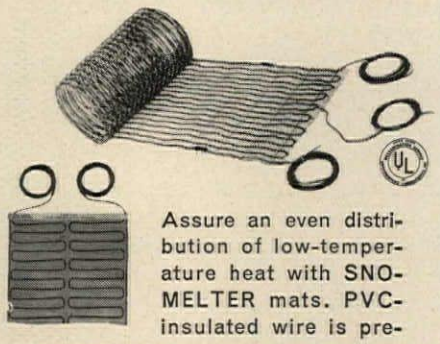


TO MELT SNOW OUTDOORS OR HEAT CONCRETE FLOORS

specify

EASY-HEAT* *and* ***Sno-Melter**** *electric heating cable products*

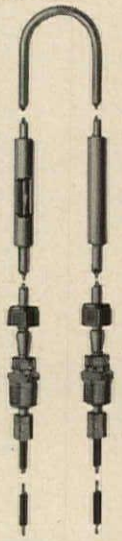
Wire Mesh and Fiber Mesh SNO-MELTER Heat Mats



Assure an even distribution of low-temperature heat with SNO-MELTER mats. PVC-insulated wire is pre-assembled and anchored in place on wire or fiber mesh. Mats roll out fast, save time and money to install. Embedded in concrete or asphalt, they operate unseen, *automatically.*

Mineral Insulated Heating Cable Units

Select from over 1000 EASY-HEAT M. I. Cable units. Pre-assembled, 24 to 3782 feet long, 10 to 50 watts per lineal foot. Choice of 120, 208, 240, 277, 480 V. Single or dual conductors, completely insulated with magnesium oxide and a waterproof, gas-tight copper sheath. Has 7′ cold lead, 12″ insulated pigtail, explosion-proof UL-listed threaded glands.



Fiber Mesh Concrete Floor Heat Mats

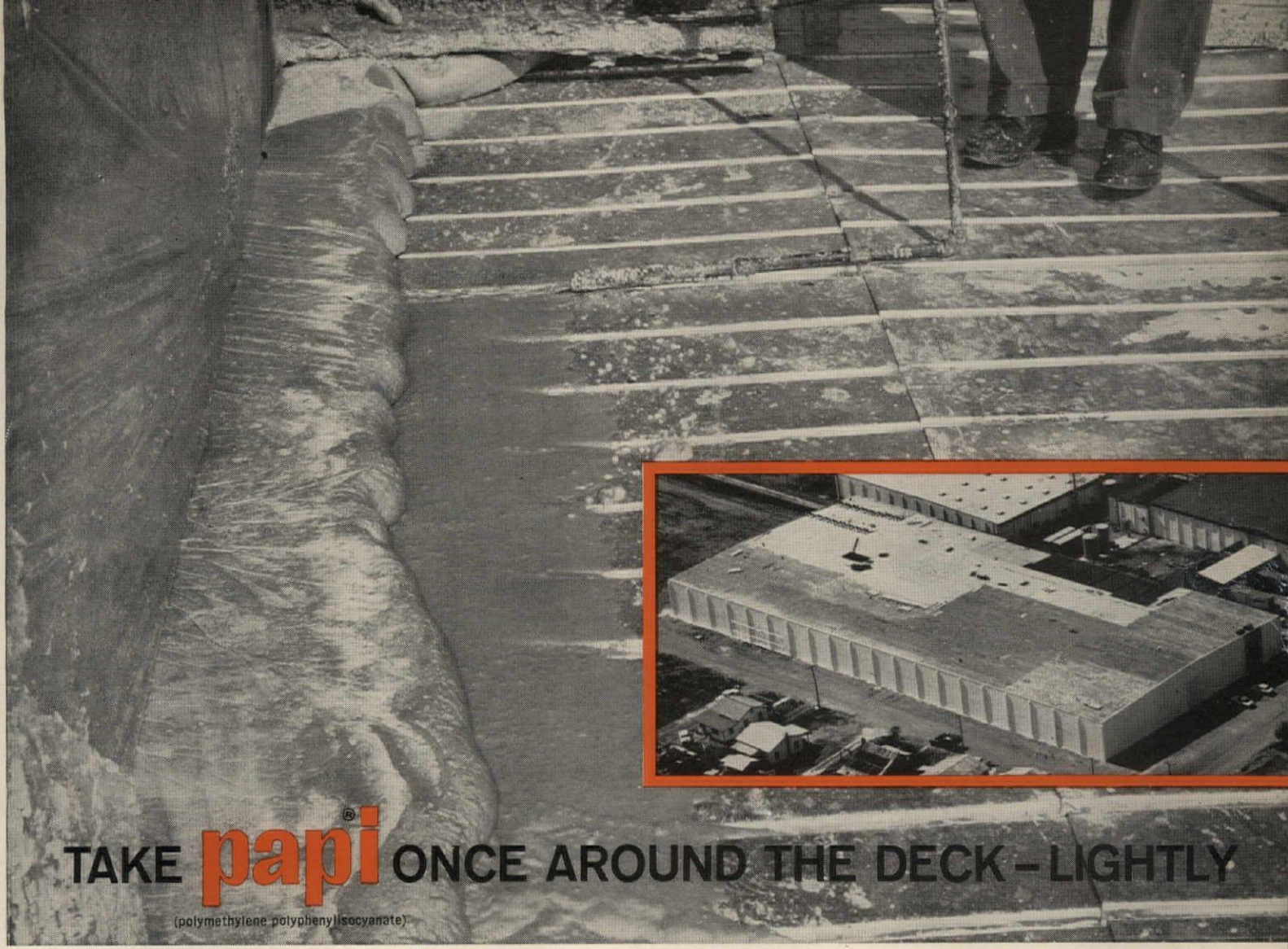
Wherever warm slab floors are desired—factories or schools, etc.—EASY-HEAT Electric Floor Heat Mats, embedded in concrete, offer great flexibility at lowest cost. Factory assembled, PVC heating wire bonded to Fiberglas mesh to provide 10 or 20 watts per sq. ft. of heated area. Mats can be fitted around corners, and curves, columns, fixtures.

Write for illustrated spec folder and cost data on the COMPLETE line.

*A Trademark of THE SINGER COMPANY

CLIMATE CONTROL DIVISION • THE SINGER COMPANY, DEPT. 550, AUBURN, NEW YORK.

For more data, circle 113 on Inquiry Card



TAKE papi® ONCE AROUND THE DECK – LIGHTLY

(polymethylene polyphenylisocyanate)

PROBLEM:

How to insulate a 72,000 sq. ft. warehouse roof to keep a million cases of fresh orange juice at 35°?

SOLUTION:

Cover the course with ISONATE®, the poured-in-place, PAPI-based rigid urethane foam. It takes only 3 inches to give the sun a cool reception.

In an application at Tropicana Products' new storage plant, ISONATE was poured directly on the galvanized steel deck. The controlled, three inch rise resulted in a rigid foam with the desired low K factor. This PAPI polyisocyanate formulation provided a tough, uniform, lightweight insulation, impervious to water, rot or mold. A roof dressing of tar, felt and gravel completed the surface. PAPI can be custom formulated in an ISONATE foam system to solve other hot problems. If you have one, why not let us put it in the cooler — with PAPI?

Upjohn *Polymer Chemicals Division*

THE UPJOHN COMPANY

KALAMAZOO, MICHIGAN

PAPI® • PAPI®-50 • ISONATE® FOAM SYSTEMS • CARWINATE® 125M • CARWINATE® 136T • CARWINATE® 390P

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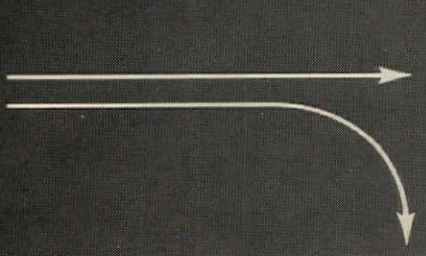
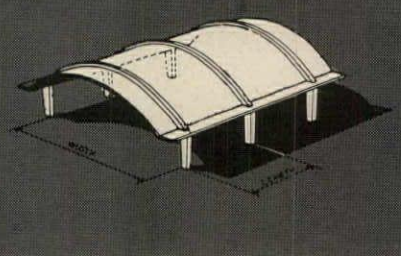
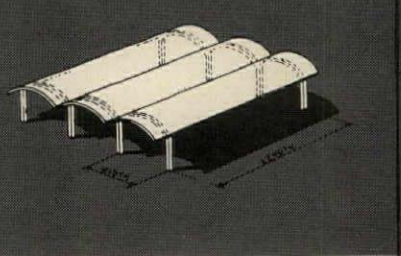
No. 16 / CONCRETE ROOF







Type of Roof	Short Barrel Shell	Long Barrel Shell
*Typical Bay Dimensions**		
Width	100 to 250	30 to 60
Length	30 to 50	80 to 150
Main Features	Usually cast-in-place but can be pre-cast.	Barrel shell roofs are capable of providing large areas free of interior columns.

SYSTEMS

Clip for a.i.a. file 4-a

Prepared as an industry service by Portland Cement Association

In evaluating structural costs, the roof system is a basic factor, and its square-foot price is quite often the most meaningful cost guide available to a prospective owner.

In most cases, concrete roof systems are in the $1.00 to $3.00 per square foot range. Construction costs, of course, are not uniform throughout the nation and are dependent upon variables such as spans, loads, bay sizes, and manufacturing requirements. Local builders can provide accurate estimates geared to local labor costs and other considerations.

Since the roof system is such a basic factor in most industrial or one-story building construction, the selection of roof type and the spacing of its supports are especially important. The roof and its column spacing must be designed to meet specific occupancy requirements. These include the arrangement of machinery, processing ductwork, accessory equipment and production lay-outs. Concrete roof systems can be efficiently and economically designed to meet all industrial and commercial needs. The chart below compares some common concrete roof systems.

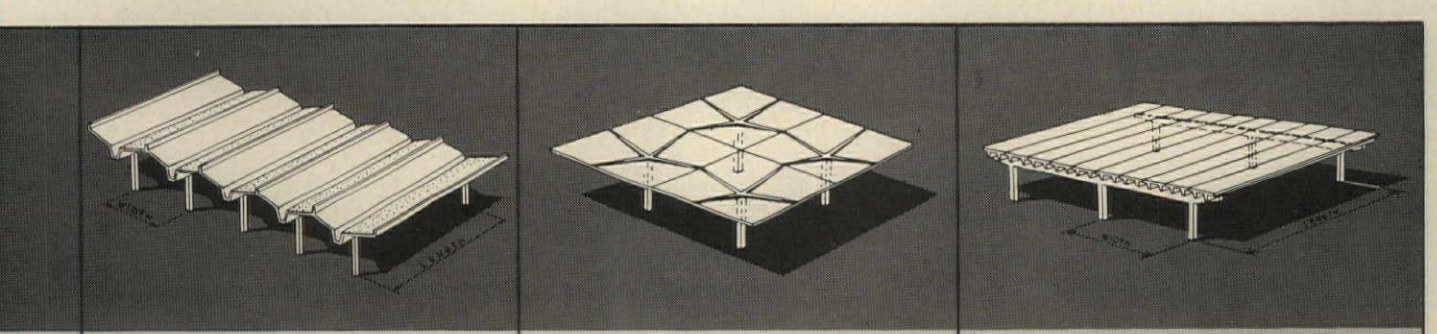
Write for free literature. (U.S. and Canada only.)

The light, spacious look of concrete roof systems is accentuated here by the repetitive forms of these folded plates. Capitol Federal Savings & Loan Assoc., Denver, Colo. Architect: Bank Building and Equipment Corporation of America, St. Louis, Mo.

Portland Cement Association

Dept. A12-8, 33 W. Grand Ave., Chicago, Ill. 60610

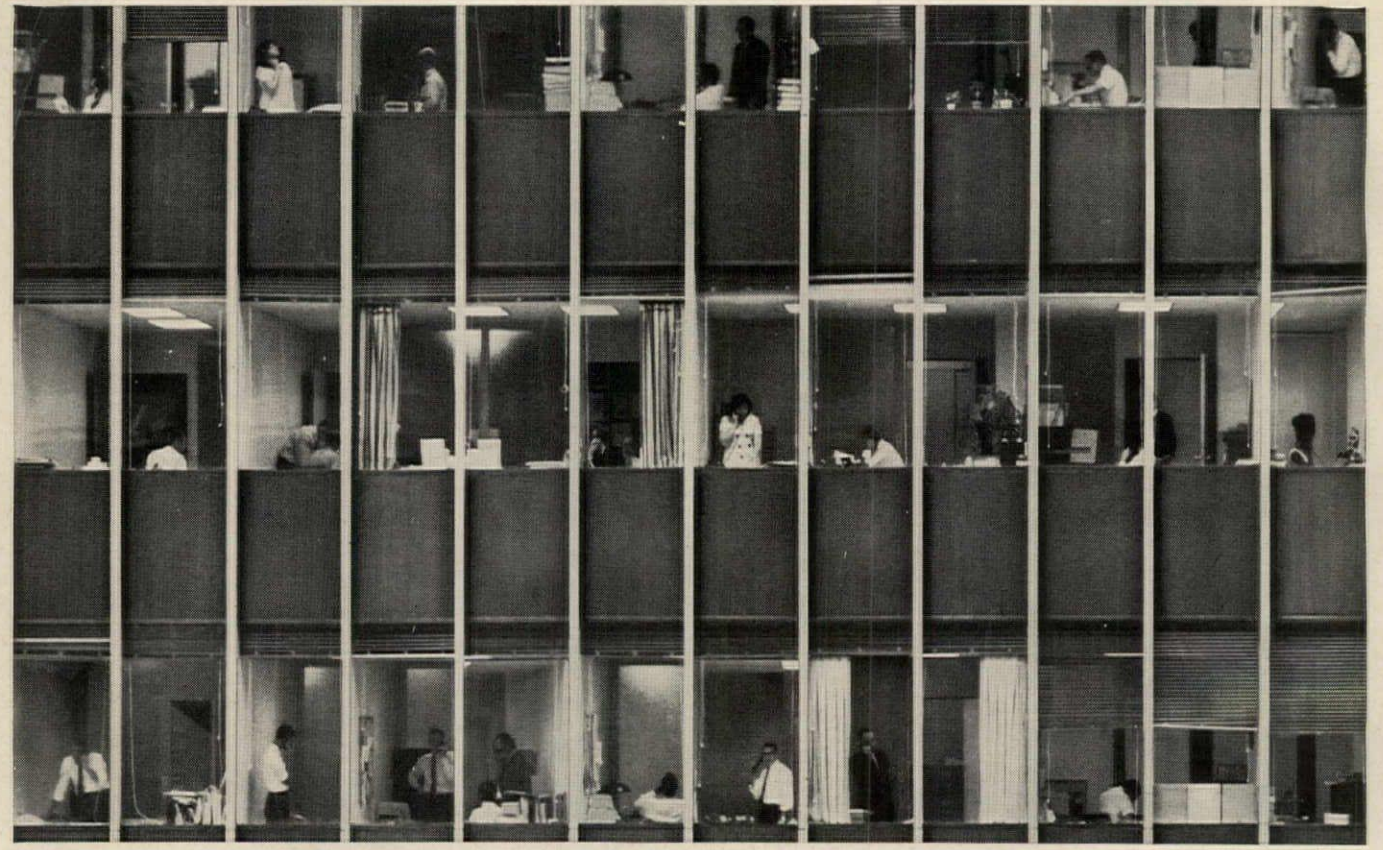
An organization to improve and extend the uses of concrete, made possible by the financial support of most competing cement manufacturers in the United States and Canada.



Folded Plate	Hyperbolic Paraboloid	Prestressed
15 to 30	20 to 100	25 to 50
50 to 150	20 to 100	30 to 100
Versatile designs can accommodate a wide variety of span and processing requirements.	Adaptable and very economical.	Structural members provide long, clear spans with esthetically pleasing shallow depths.

**Representative dimensions only. Specific column spacing and spans may vary for individual designs. Dimensions given in feet.*

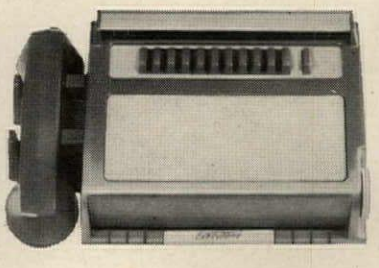
For more data, circle 115 on Inquiry Card



Are you 500 people? Or 5?

Executone intercom can cut your monthly phone costs.

And pay for itself in the bargain. Because an Executone company-wide intercom (500-station or 5) reduces costly callbacks. Breaks switchboard bottlenecks. Takes inside calls off your phones. Frees lines for incoming-outgoing *customer* calls. Tie in our pocket-page or a sound system and you get those important calls even when you're not at your desk. You're in touch with anybody and everybody in your company—and vice versa—instantly. Provable savings on your monthly phone bill will pay for your Executone system . . . giving you the benefits of *two* channels of communication for less than the cost of one! Whatever your business. You can depend on it.

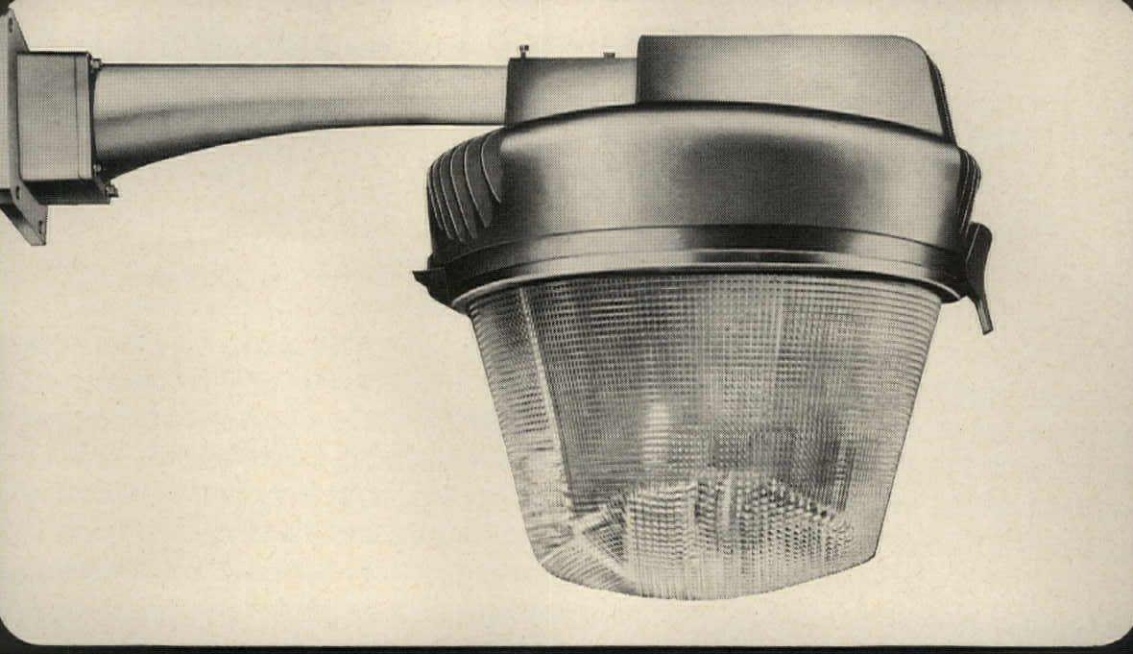


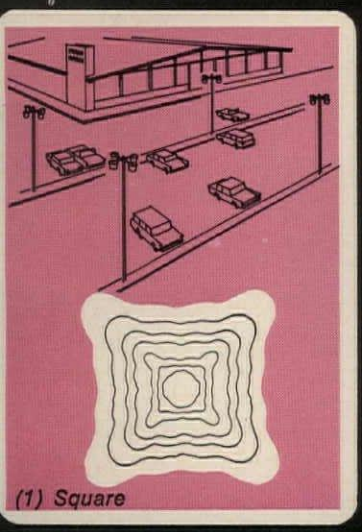
Executone

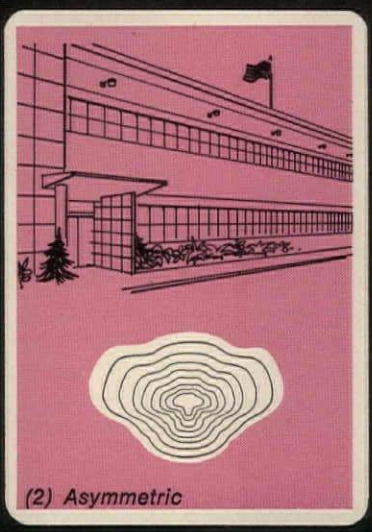
For a portfolio of literature showing how Executone intercom can cut your phone costs, write Executone, Inc., Dept. K-2, Austell Place, Long Island City, N. Y. 11101

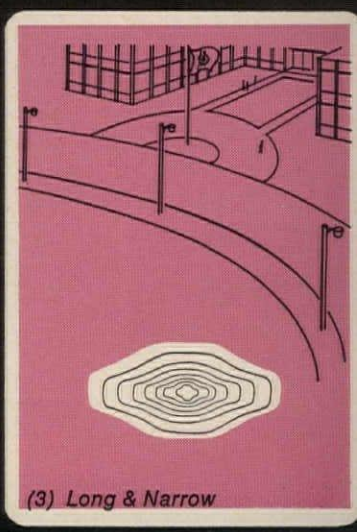
For more data, circle 116 on Inquiry Card

For more data, circle 117 on Inquiry Card →









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very outdoor area

cury or 500 W. Incandescent Lamps • In-Bilt Constant Wattage Ballast

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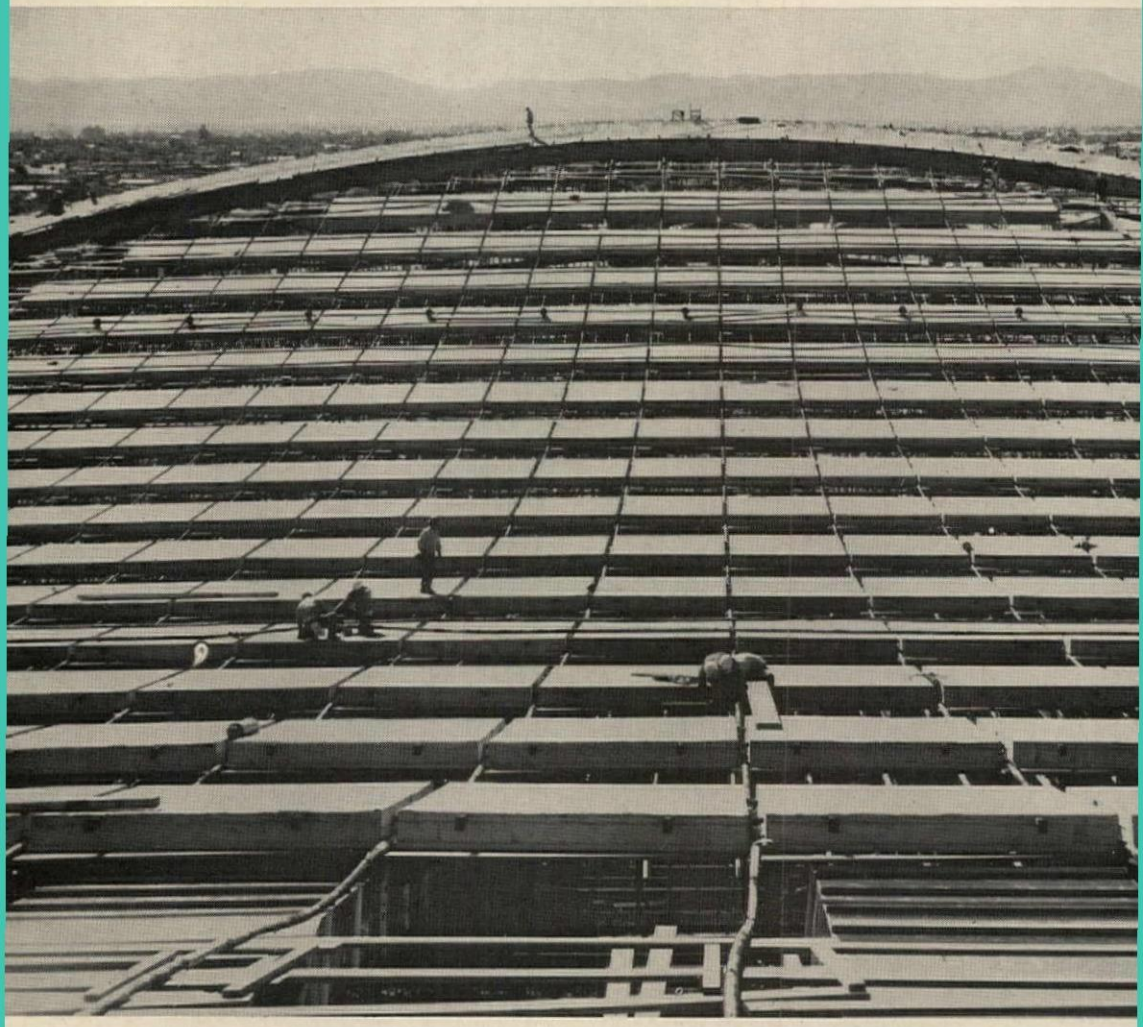
ane Company, Inc. *Lighting Authorities Since 1898* 1120 Avenue of Americas, New York, N.Y. 10036

Holopha

THESE BIG, BOLD ROO



SUSPENDED HYPERBOLIC PARABOLOID—Believed to be by far the world's largest of its type, the circular saddle-type roof of the Arizona Veteran's Memorial Coliseum at Phoenix boldly spans a column-free area of 119,500 square feet, giving an unobstructed view from all 15,000 seats in the arena. The roof structure consists of a reinforced concrete compression ring of 380′ diameter with a 10′ x 10′ gridwork of Ryerson post-tensioning tendons strung across its center. Precast panels are hung on the tendons and the spaces between them filled with grout. The north-south tendons sag 33′ from ends to center. East-west tendons rise 5′ from ends to center and serve as tie-downs to overcome aerodynamic lift. Tensioning to a range of 462,000 to 544,000 lb. was applied in stages before, during and after grouting.
Management and Operations Consultant: Emmett Race.
Architects and Engineers: Associated State Capitol Architects; Lescher & Mahoney; Place & Place.
Consulting Engineer on roof structure; T.Y. Lin & Associates, Dallas, Tex.
General Contractor: Manhattan-Dickman Construction.
Arizona State Fair Commission.

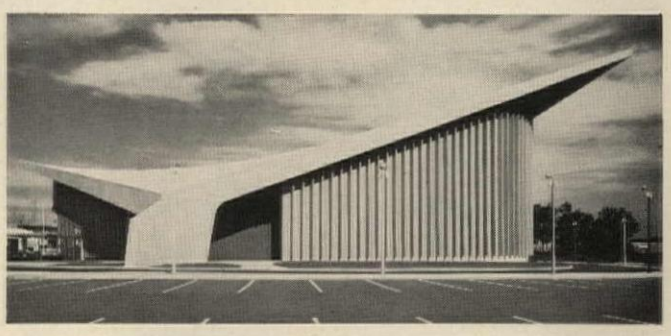
ANOTHER OF THE WORLD'S LARGEST BUILDINGS—the Seattle Center Coliseum, also ma tensioning by Ryerson. Four triangular steel trusses and concrete edge beam form four hyperbolic paraboloids an way system of tensioned tendons. These tendons provide aluminum panels that cover the 400-foot square roof.
Architect: Paul Thiry.
Structural Engineer: Peter H. Hostmark and Associates.
Contractor: Howard S. Wright Construction Co.

PROVE THE POINT...

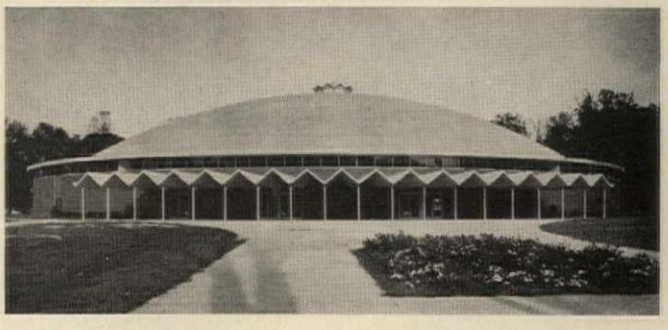
BBRV POST-TENSIONING BY RYERSON

- minimizes support requirements
- maximizes freedom of design
- at reasonable cost

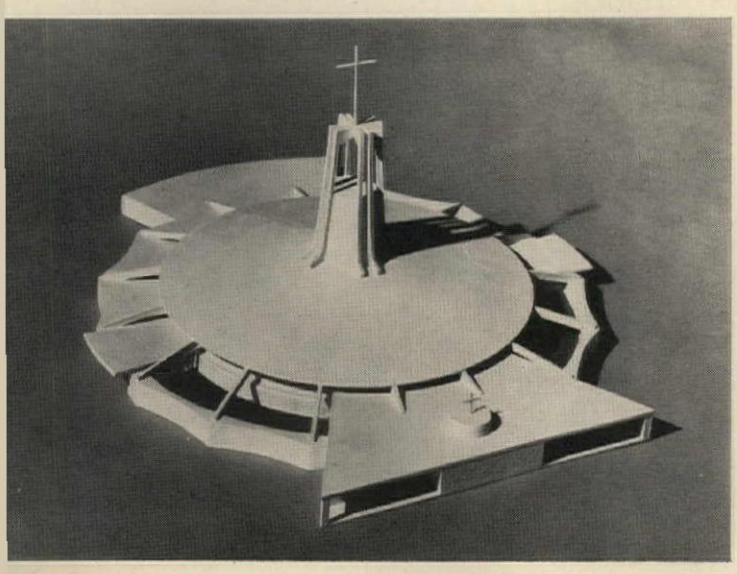
LONGEST SINGLE SPAN FOLDED PLATE ROOF is a distinctive architectural feature of the Physical Education Building at Indiana State University in Terre Haute. Longitudinally the span is 160′ between support points with a 3′ overhang at each end. In the transverse direction each of eight segments has a horizontal span of 26′ and a vertical rise of 11½′. Each side of each segment is post-tensioned by six Ryerson tendons.
Architects: Ewing Miller & Assoc. • **Architectural Designer:** David J. Field.
Structural Engineer: Homer Howe • **Contractor:** J. L. Simmons Co.



CANTILEVERED HYPERBOLIC PARABOLOID—The dramatic saddle shell roof of Edens Theatre at Northbrook, Ill. (also probably the largest of its type) stretches 159′ between working points at abutments; 221′ from tip to tip. The entire shell (only 4″ thick) is rotated about the abutment points so that one tip is 59½′ above floor level; the other only 39½′. Vertical Ryerson post-tensioning tendons prestressed the abutment walls, and these rest on post-tensioned foundation pads. To absorb horizontal thrust, the pads are connected by a post-tensioned tie beam.
Architect: Perkins and Will • **Engineer:** The Engineers Collaborative.
Contractor: Chell and Anderson.



GRACEFUL SWEEP OF THIS THIN-SHELL DOME spans 268′ and covers an auditorium seating 7200, with provision for a balcony seating 5000 more. Yet, cost of structural elements was only $178,000 and total building cost only $6.50 psf. The concrete dome, cast on the ground and lifted into place, is circled by a tension ring in which twelve Ryerson post-tensioning tendons of 40 wires each supply a force of 720,000 lb. Warner Auditorium for The Church of God, Anderson, Indiana.
Architect: Johnson, Ritchhart & Associates.
General Contractor: Lewis Construction Co.



STRUCTURAL STEEL POST-TENSIONED—contributing to the eloquent forms of this structure is a less common use of post-tensioning. The WF beam tension ring (which resists the horizontal thrust of 32 big triangular steel space trusses supporting the dome) is circled by 8 Ryerson post-tensioning tendons. These are anchored at staggered points so that a complete ring, 4-tendons deep, exerts a force of 400 kips, with 300 kips more in reserve for live load. Result: Weight of the WF ring beam could be reduced by two-thirds and, of course, supporting structure also lightened. St. John Brebeuf Church, Niles, Illinois.
Architect: Gaul and Voosen. • **Engineer:** Paul Rogers & Associates.
General Contractor: Valenti Builders, Inc.
Steel Subcontractor: Pittsburgh-Des Moines Steel Co.

If you would like more information on Ryerson post-tensioning service or help on a current project, call your nearby Ryerson plant or write Box 8000-A, Chicago, Illinois 60680.

RYERSON

JOSEPH T. RYERSON & SON, INC., MEMBER OF THE INLAND STEEL FAMILY

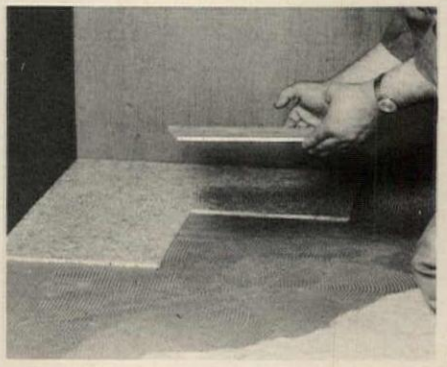
For more data, circle 119 on Inquiry Card

Product Reports

continued from page 220

VERSATILE TILE RANGE

Cipco Jewel-Stone flat-back tiles are available in 21 colors for use in bathrooms, kitchens, porches or as decorative wall panels in lobbies and entrance halls. *Paragran II Resin* which has been used as the transparent binder between crushed marble, crushed mother of pearl, and synthetic mother of pearl filler, is said to provide a high degree of flexibility



and scratch resistence. The translucent effect of the tiles can be employed to provide unusual interior settings, particularly when backlighting is used. *Cincinnati Industrial Products Company, Cincinnati, Ohio.*

CIRCLE 308 ON INQUIRY CARD

FLEXIBLE TIES FOR MASONRY CONSTRUCTION

A new line of products to provide flexible and adjustable anchorage for masonry walls, includes *Flex-O-Lok*, designed to tie masonry walls to steel columns or steel beams, and *Dovetail Flex-O-Lok* for use with concrete columns and concrete beams. Both types of tie are designed for flexible anchorage and to permit vertical adjustment during construction. Normal expansion and contraction of masonry walls can take place while the ties restrain both inward and outward lateral movement. The company has also introduced adjustable ties for cavity walls, permitting up to 4 ins. of vertical adjustment, and for concrete block veneer, which permit up to 8 ins. of vertical adjustment. *AA Wire Products Company, Chicago, Ill.*

CIRCLE 309 ON INQUIRY CARD

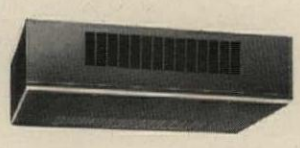
more products on page 254

LOOK TO THE LEADER...

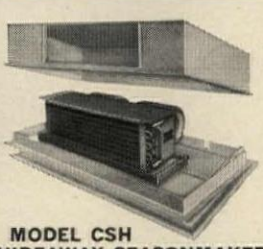
McQuay

FOR A NEW Seasonmaker® HIDEAWAY FAN-COIL UNIT THAT CUTS INSTALLATION COSTS AND IS FULLY ACCESSIBLE FOR MAINTENANCE

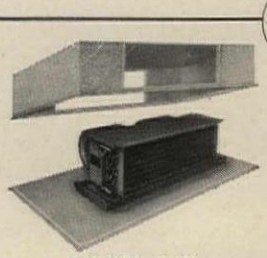
Extremely compact with a modern thinline design, McQuay's new Model CSH Hideaway Seasonmakers offer benefits never before attainable in horizontal fan-coil units. They are available in eight sizes, 200 through 1,200 cfm with nominal cooling capacities of ½ through 2¾ tons—Standard Ratings ARI Certified. The CSH Model is a fully encased horizontal unit for recessed applications with an adjustable ceiling frame and access panel permitting installation in stages compatible with construction progress. Important time savings result. The ceiling frame is telescopically fitted into the cabinet enabling a perfect alignment regardless of the ceiling type. Maintenance is highly simplified as the controls, filter, fan deck and entire base unit are readily reached, or removed, through the hinged ceiling panel. Maximum thermal efficiency is achieved with McQuay's exclusive Rippled-Fin and staggered tube coil design.



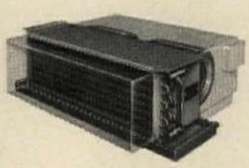
MODEL SC CEILING TYPE SEASONMAKER



MODEL CSH HIDEAWAY SEASONMAKER



MODEL BSH HIDEAWAY SEASONMAKER



MODEL SH HIDEAWAY SEASONMAKER

FREE
TECHNICAL & ENGINEERING DATA
for all 4 Thinline Seasonmaker models (8 sizes each, 200 thru 1,200 cfm with nominal cooling capacities of ½ thru 2¾ tons) from your McQuay representative in Bulletin #714—or write McQuay direct.

McQuay INC.

13600 Industrial Park Blvd.
Minneapolis, Minnesota 55427

AIR CONDITIONING • HEATING VENTILATING • REFRIGERATION

MANUFACTURING PLANTS AT FARIBAULT, MINNESOTA • GRENADA, MISSISSIPPI • VISALIA CALIFORNIA

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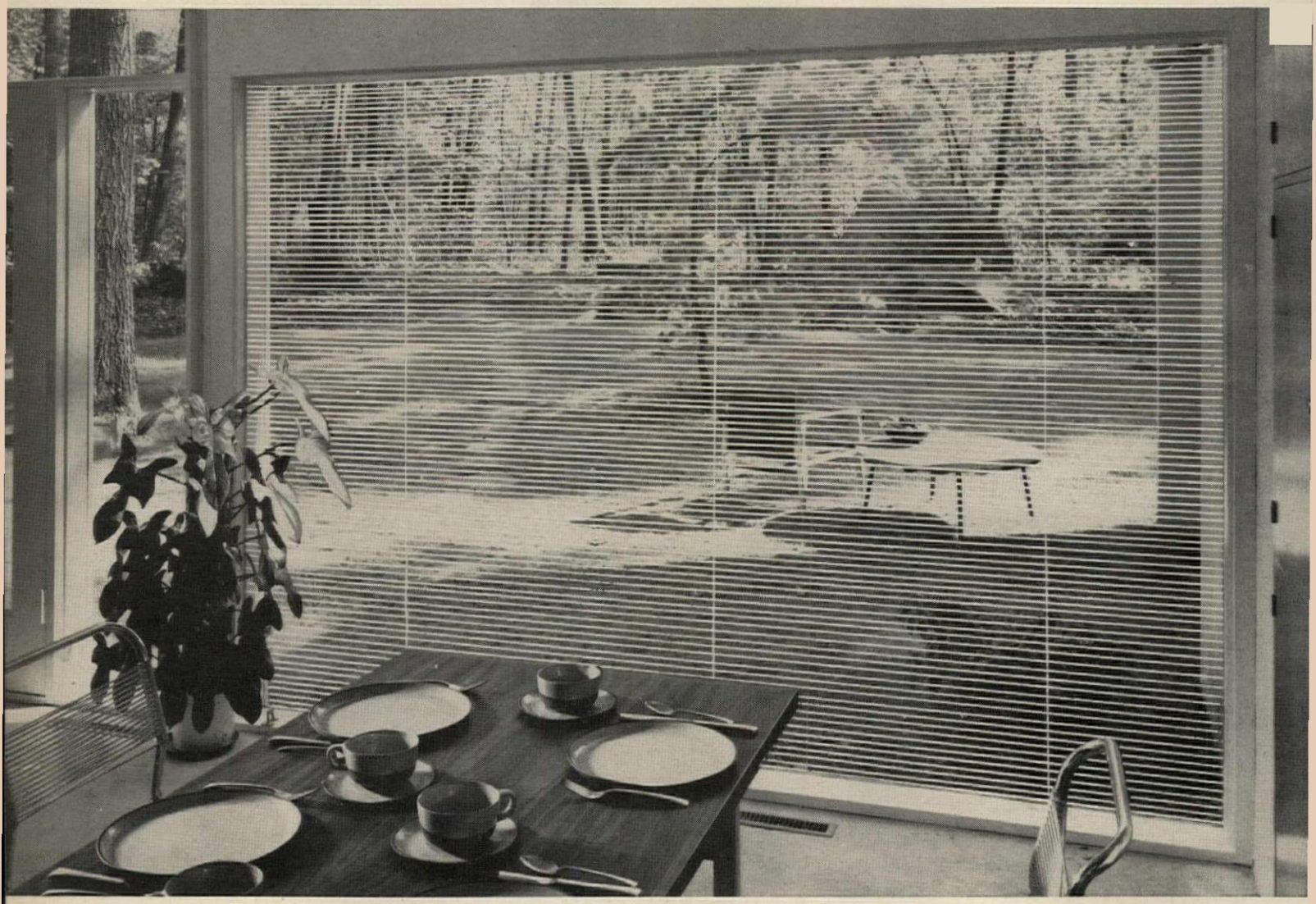
The Soft Blind is here!

The effect is soft and graceful.

New slender slats just an inch wide. New extra-slim cord and almost-invisible tape.

Look for the low metal head with the crossed Ls on the installation brackets, special new hardware, and slender matching bottom rail—symbols of design by Levolor.



LEVOLOR *Riviera*

a venetian blind of invisible beauty

Levolor Lorentzen Incorporated, 720 Monroe Street, Hoboken, New Jersey

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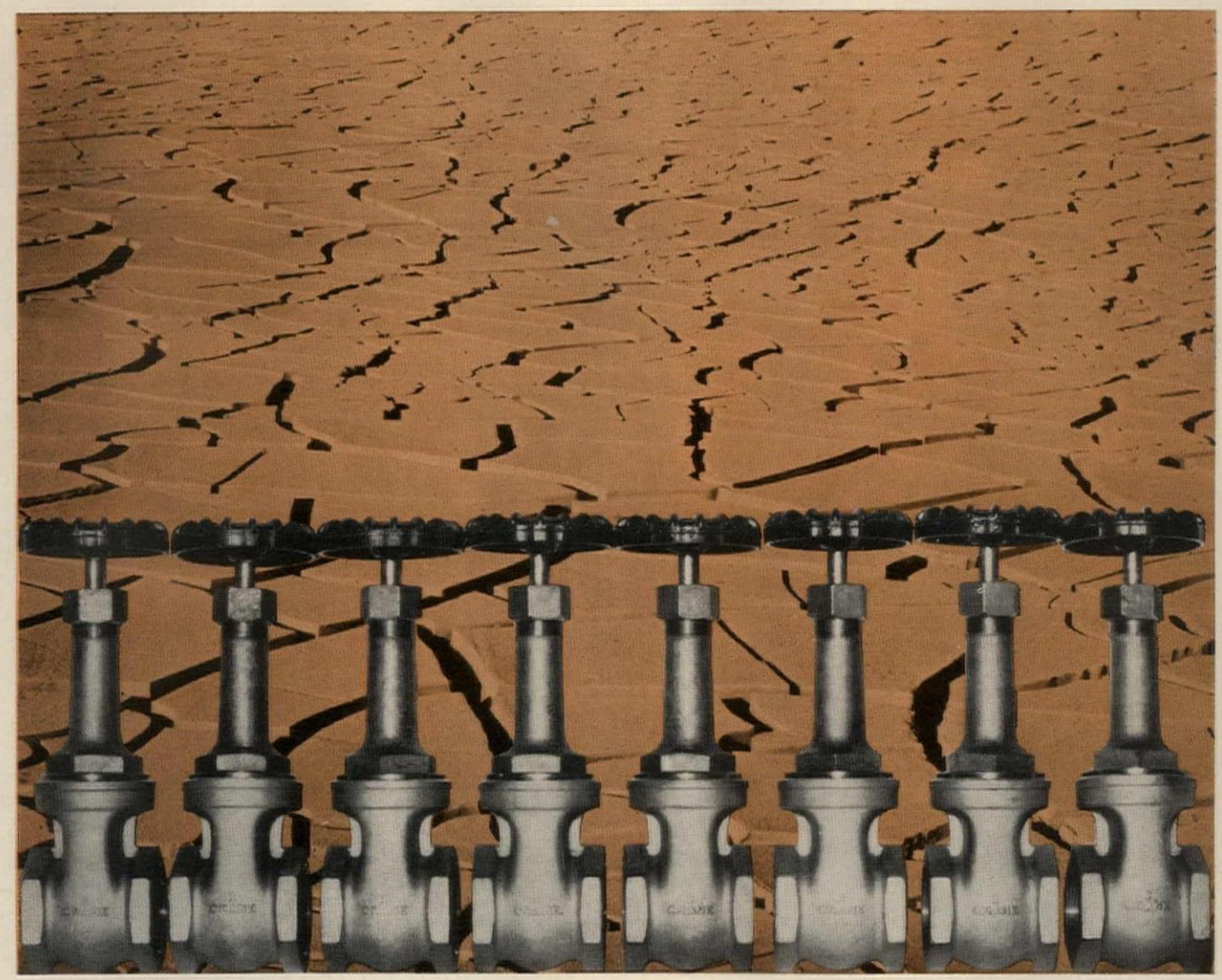
The Crane bronze valves installed last year...



could empty Lake Erie in 10 hours.

That's a lot of bronze valves! And there are a lot of solid reasons why Crane bronze valves are universally specified. But probably the two biggest reasons are: **Reliability.** Strength is the big key. Cylindrical design and proportional stem diameter add strength . . . which adds *life* . . . which adds up to near-perfect *flow control* for twenty, thirty, forty years—and more.

Availability. 500 well-stocked distributors serving 1300 marketing areas offer the broadest line of bronze valves in the industry. All types and sizes. This vast distributor network is backed by 20 strategically located centers where Crane technical personnel offer prompt assistance on application problems. ☐ Next time you specify bronze valves, specify Crane bronze valves. For details write Crane Co., Dept. 008 4100 S. Kedzie Ave., Chicago, 60632.

THE NAME IS

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VALVES · PUMPS · FITTINGS · WATER TREATMENT
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Condominium owners will enjoy 20% lower operating expenses with a Garrett total Gas energy system

Occupants of Salt Lake City's plush Canyon Crest Apartments will each own their own living quarters. And a Garrett total Gas energy system promises each owner heating, cooling, and electric power at a savings up to $20 per month.

Two Garrett-AiResearch Gas turbine generators will provide all power for the 17-story building. (A third will be held in ready reserve for standby.) The hot exhaust from the Gas turbines will be utilized to cool and heat 167,000 sq. ft. of living space, as well as provide domestic hot water and heat an outdoor swimming pool for tenants.

Want to know more about Garrett-AiResearch total Gas energy systems? Call your local Gas Company Sales Engineer. Or write: The Garrett Corp., AiResearch Manufacturing Division, 180 North Aviation Blvd., El Segundo, Cal.

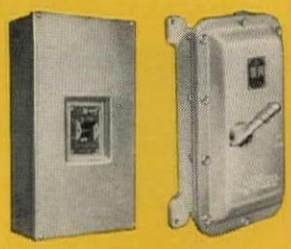
AMERICAN GAS ASSOCIATION, INC.

For total energy...Gas makes the big difference

← For more data, circle 132 on Inquiry Card

For more data, circle 133 on Inquiry Card

Safety Switches for Normal and Hazardous Locations



Industrial Circuit Breakers for Normal and Hazardous Locations

Load Centers—Circuit Breaker and Fusible

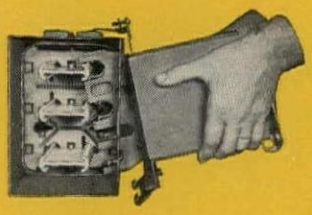
Drum Switches

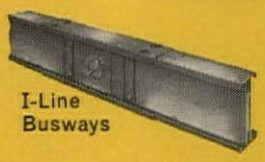
SQUARE D MANUFACTURES A

Fusible and Circuit Breaker Lighting and Power Panelboards

Power Distribution Switchboards and Switchgear

Plug-In Duct

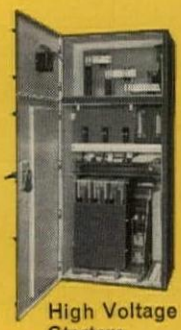




I-Line Busways

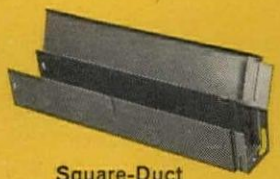
Motor Control Centers

Synchronous Motor Starters



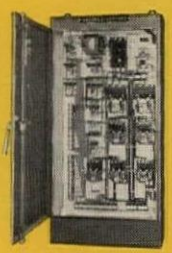
High Voltage Starters

ON DUTY···WHEREVER ELECTRICITY I

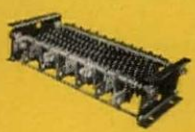


Square-Duct Wireways

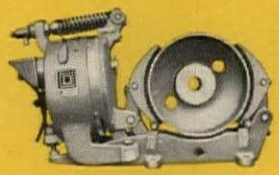
Underfloor Duct



Special-Purpose Control



Resistors



Magnetic Brakes

SQUARE D COMPANY

For more data, circle 134 on Inquiry Card

Control Relays

Timing Relays

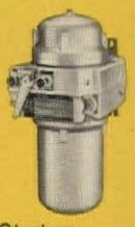
Manual and Magnetic Starters

complete LINE OF EQUIPMENT

Limit Switches

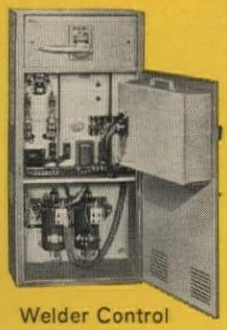
Push Buttons

Combination Starters



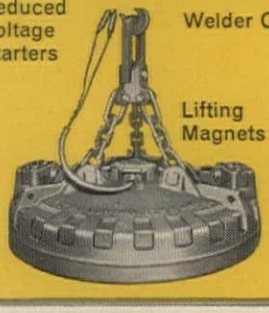
Starters for Hazardous Locations

Reduced Voltage Starters

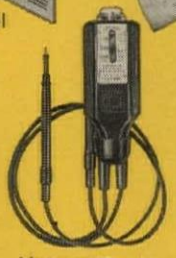


Welder Control

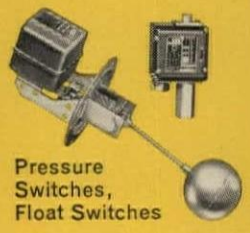
Static Logic Control Components and Systems



Lifting Magnets

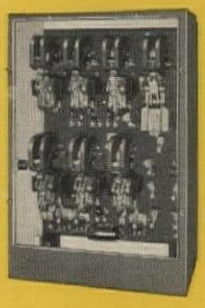


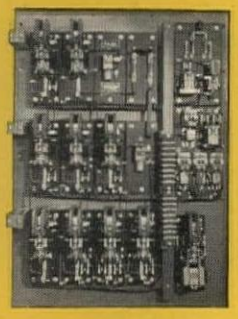
Voltage Testers



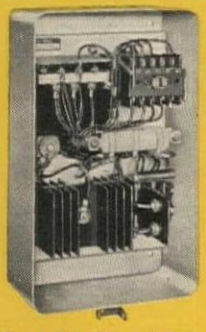
Pressure Switches, Float Switches

DISTRIBUTED & CONTROLLED





Crane and Mill Control



Adjustable Speed Drives

EXECUTIVE OFFICES • PARK RIDGE, ILLINOIS

ADJUSTABLE SPEED DRIVES
BUSWAYS & WIREWAYS
CIRCUIT BREAKERS
CONTROL CENTERS
CRANE & HOIST CONTROL
DISTRIBUTION SWITCHBOARDS
ELECTRIC TRUCK CONTROL
HIGH VOLTAGE CONTROL
LAUNDRY CONTROL
LIFTING MAGNETS
LIGHTING AND POWER PANELBOARDS
LIMIT AND FOOT SWITCHES
MACHINE TOOL CONTROL
MAGNETIC BRAKES
METERING EQUIPMENT
MOTOR STARTERS
PRESS CONTROL
PRESSURE, FLOAT, & VACUUM SWITCHES
PUSHBUTTONS
RELAYS AND CONTACTORS
RESISTORS
SAFETY SWITCHES
SERVICE ENTRANCE EQUIPMENT
STAGE DIMMERBOARDS
STATIC LOGIC CONTROL
STEEL MILL CONTROL
SWITCHGEAR & UNIT SUBSTATIONS
SYNCHRONOUS MOTOR CONTROL
TERMINAL BLOCKS
TEXTILE MACHINE CONTROL
TIMERS
UNDERFLOOR DUCT
VOLTAGE TESTERS
WELDER CONTROL

Product Reports

continued from page 232

SHOWER FLOORS OF MOLDED STONE

The company's range of Cascade molded-stone shower floors included nine different floors ranging in size from 32 ins. by 32 ins. to a luxury model 60 ins. by 32 ins. The corner model illustrated is a recent addition to the line. The floors which are

lightweight and durable are said to be easy and economical to install and maintain. *Fiat Products Department, American Cynamid Company, Plainview, L.I.*

CIRCLE 310 ON INQUIRY CARD

FIRE EXTINGUISHER

The *ABC* extinguisher is capable of fighting fires of ordinary combustible materials, flammable liquid fires and electrical wiring and equipment fires. Lightness of weight, only 18½ lbs filled, and compactness of size, make this extinguisher easy to install and operate. A slight squeeze on the lever

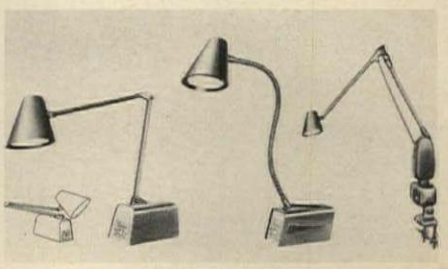
handle gives instant discharge. The extinguisher fills with 10 lbs of dry chemical, and has a heavy duty steel cylinder, a leakproof high compression valve, flexible, corrosion-proof hose with nozzle and is UL approved and classified. *W. D. Allen Manufacturing Company, Bellwood, Ill.*

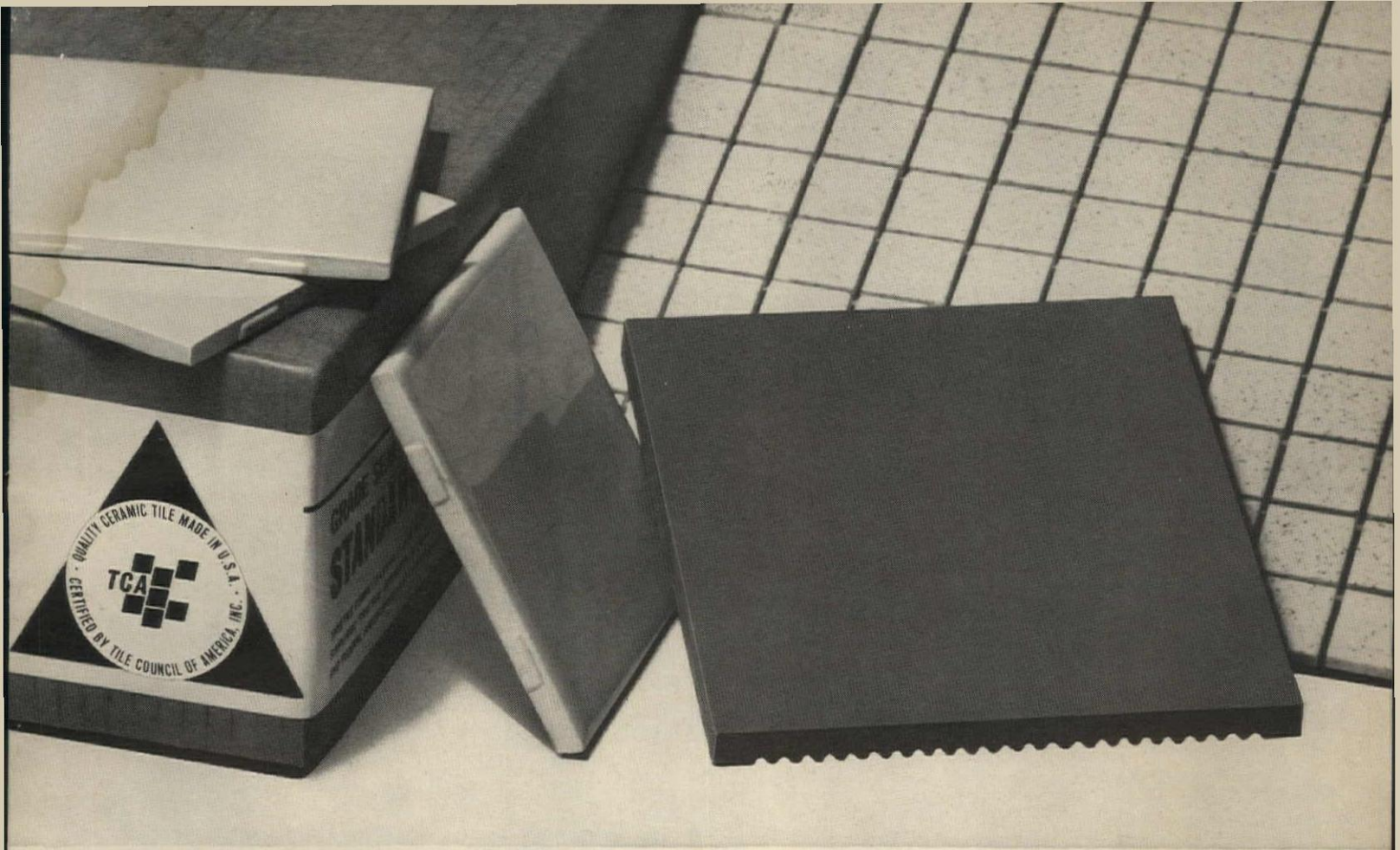
CIRCLE 311 ON INQUIRY CARD

HIGH INTENSITY LAMPS

Some of the advantages of this range of lamps are: an air-cooled reflector which rotates on a universal switch; an easy to operate hi/lo switch, a 9-ft. thermoplastic cord; heat resistant wiring, and a long-life transformer. *Dazor Manufacturing Corporation, St. Louis, Mo.*

CIRCLE 312 ON INQUIRY CARD





You can stake your reputation on this mark

It labels Certified Quality Ceramic Tile made in U.S.A.

Quality design and construction require quality materials. And the Tile Council of America knows it. That's why we developed the "Certified Quality" program. It means this: You can now select ceramic tile with complete assurance that it was made in the U.S.A. and is quality tile—tile to tile, carton to carton. We put our reputation on it. You can too.

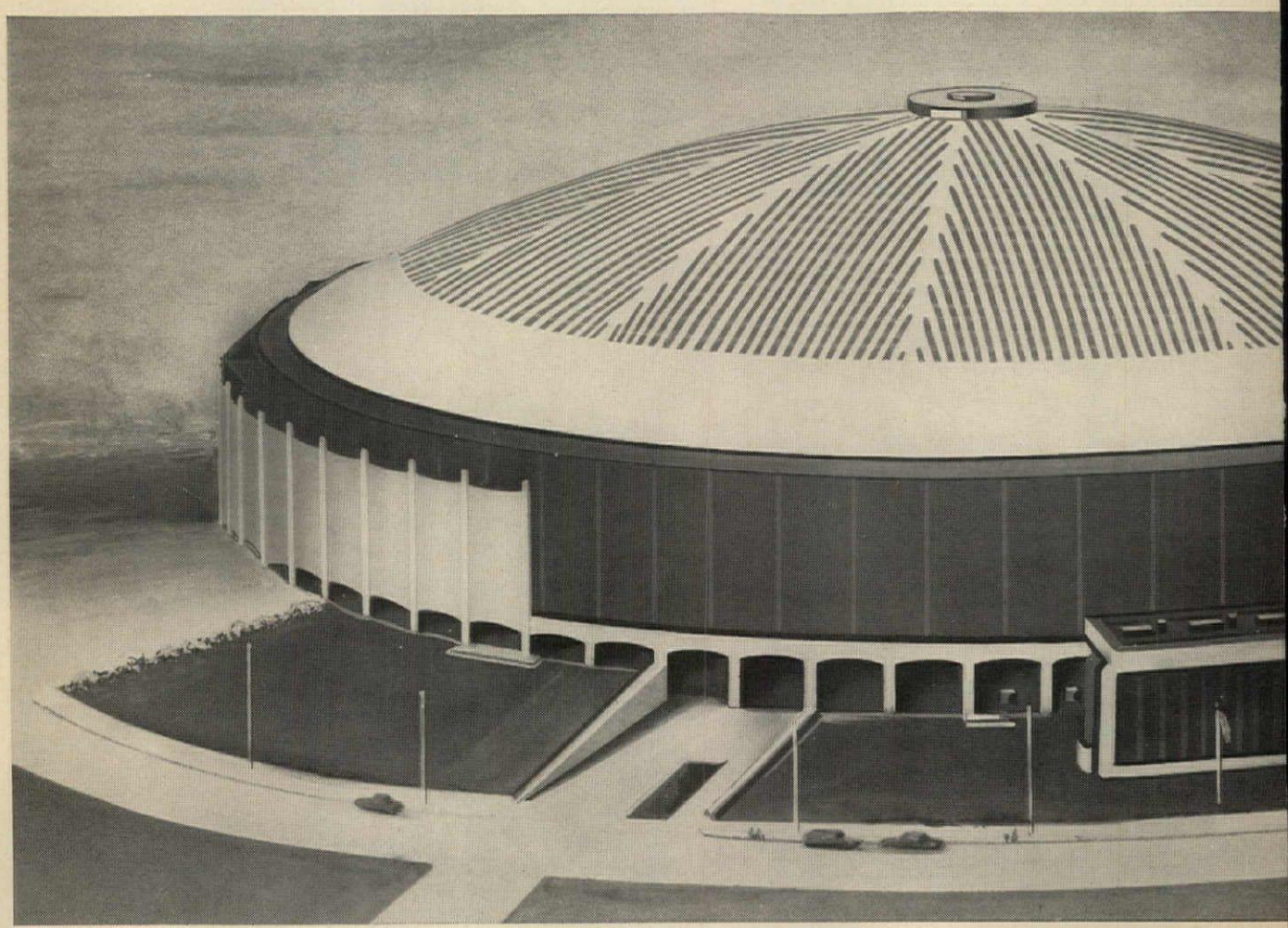
Here's how it works. Tile manufactured by participating companies now undergoes regular inspections by an independent laboratory. Certified Tile must meet the highest quality standards ever set for the industry. These standards are published by the government in SPR R61-61 and in Federal Specification SS-T-308b.

So why take chances? Specify that each carton of tile shall bear the Certification Mark of the Tile Council of America. You will be glad you did.

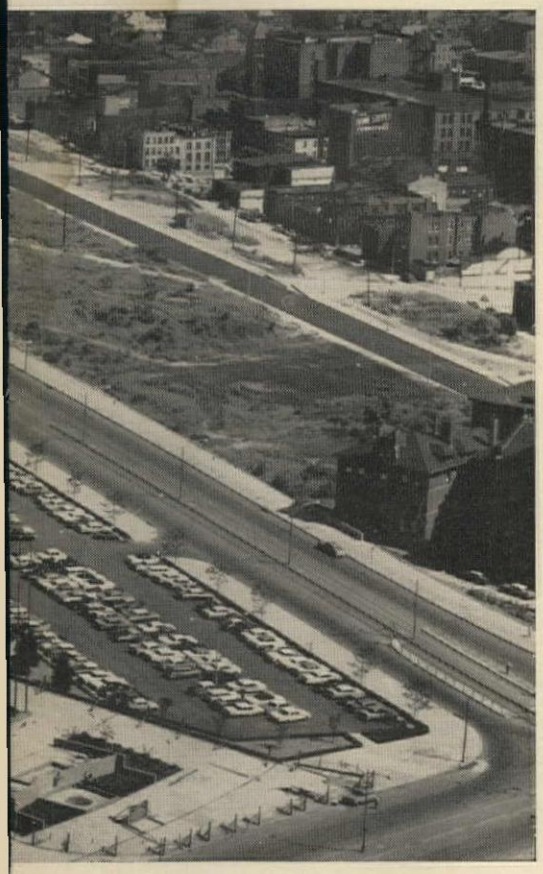
Tile Council of America INC.
800 SECOND AVENUE • NEW YORK, N.Y. 10017

MEMBER COMPANIES: American Olean Tile Co., Inc. • Atlantic Tile Manufacturing Co. • Cal-Mar Tile Company • Cambridge Tile Manufacturing Co. • Carlyle Tile Company Continental Ceramic Corporation • Florida Tile Industries, Inc. • General Tile Company • Gulf States Ceramic Tile • Highland Tile Company • Huntington Tile, Inc. • International Pipe and Ceramics Corporation • Jackson Tile Manufacturing Co. • Jordan Tile Manufacturing Co. • Lone Star Ceramics Co. • Ludowici-Celadon Company • Mid-State Tile Company Monarch Tile Manufacturing, Inc. • Mosaic Tile Company • Oxford Tile Company • Pacific Tile Company • Pomona Tile Manufacturing Co. • Redondo Tile Company • Ridgeway Tile Company Sparta Ceramic Company • Stylon Corporation • Summitville Tiles, Inc. • Texeramics Inc. • United States Ceramic Tile Co. • Wenczel Tile Company • Winburn Tile Manufacturing Co.

In 1960, Pittsburgh's 415-ft. clear span dome was the biggest in America. (And it's retractable, no less.)



Now Houston has the nation's biggest dome. Its clear span is 642 ft., and it covers a baseball field.



American Bridge built both of them—from steel, naturally.

Nearly all of today's large domes—and many small ones—are built with steel, because steel has the best weight-strength-cost combination of all building materials. It can be erected in any season, fast. At Houston's Harris County Stadium (the Astrodome), for example, American Bridge erected the 2,900-ton dome—and the other 6,600 tons of steelwork—in less than four months.

If you're planning to build, let American Bridge help you in the early stages. (We've been building the big ones—and small ones—for over 50 years.) Call or write American Bridge Division of United States Steel, Room 605, Five Gateway Center, Pittsburgh, Pa. 15230.

This mark tells you a product is made of steel. Steel

USS TRADEMARK **American Bridge**
Division of United States Steel

Office Literature

continued from page 181

DEWPOINT CONTROL SYSTEMS
Both thermal and electronic dewpoint control systems are presented in an 8-page booklet which also defines the term "dewpoint" and explains how it can be measured and controlled. Sensors, controllers, indicators and recorders for both control systems are discussed and illustrated, and the advantages and limitations of each system pointed out. Copies are available from the apparatus controls division of *Honeywell Inc., Minneapolis, Minn.*

CIRCLE 411 ON INQUIRY CARD

CONCRETE FORMING EQUIPMENT
Forming equipment for a full range of applications is shown in this 32-page catalog. Special features of the catalog are the company's new heavy duty *Superfoam* and *Slab Shore* systems. A section also deals with the use of *Steel-Ply* forms and fillers in the construction of straight, curved, haunch and battered wall forming. Also included are culvert and column forming equipment, panel ties, steel bay corners, cap-waler braces and haunch brackets. On-job photos show the company's equipment in use. *Symons Manufacturing Company, Des Plaines, Ill.*

CIRCLE 412 ON INQUIRY CARD

FREE ACCESS FLOORING
Photographs of new installations of elevated flooring are included in this new brochure, published for those interested in the design of data-processing rooms or other locations where wiring, cables and ducts must be concealed yet readily accessible. Four types of floor panels are described: laminated metal-faced plywood with particle-board or plywood core, steel with steel core, and an aluminum die cast panel. All panels are surfaced with ⅛-in. vinyl tile, and are said to be vibration proof and sound-deadening. *Evans Products Company, Grand Rapids, Mich.*

CIRCLE 413 ON INQUIRY CARD

SPECIFICATIONS GUIDE FOR LIGHTING CLUSTERS
A new catalog describes mounting hardware for floodlight clusters used in area lighting. Both residential and commercial lamp fixtures are illustrated, with mountings for conduit, box, wall, ceiling, trough or pole top. Graphs and charts give the size and number of lamps required to produce stated footcandle levels at varying distances. Photoelectric switches up to 2000 watts, and other accessories are also included. *Steber Division, The Pyle-National Company, Chicago, Ill.*

CIRCLE 414 ON INQUIRY CARD

FLOORING PRODUCTS
The 1966 catalog contains full-color illustrations of all available colors and patterns in *Azrock* vinyl asbestos tile, asphalt tile, feature strip and cove base. Also included is general information on sizes, gauges, uses, installation, light reflectance values, and brief specifications. *Azrock Floor Products, San Antonio, Tex.*

CIRCLE 415 ON INQUIRY CARD

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

more literature on page 262

People who think seamless flooring is new, are cracked.

And we'll take a stand on that statement. Monolithic magnesium oxychloride cement has a 50-year record of successful use. Successful *monolithic* use. No seams. Just easy-to-install, strong, durable, non-combustible, economical, dimensionally stable, flexible and grease-resistant flooring. With the beauty of a natural material.

Whether it's being used for terrazzo, general purpose, underlayment, non-slip, heavy duty, or industrial granolithic, when it's made with FMC OXYMAG it's the only oxy cement that consistently meets ASA specifications.

Sweet's Architectural Catalog File has the oxy cement story, or you'll have it in the information we send you when you contact Department 12212N.

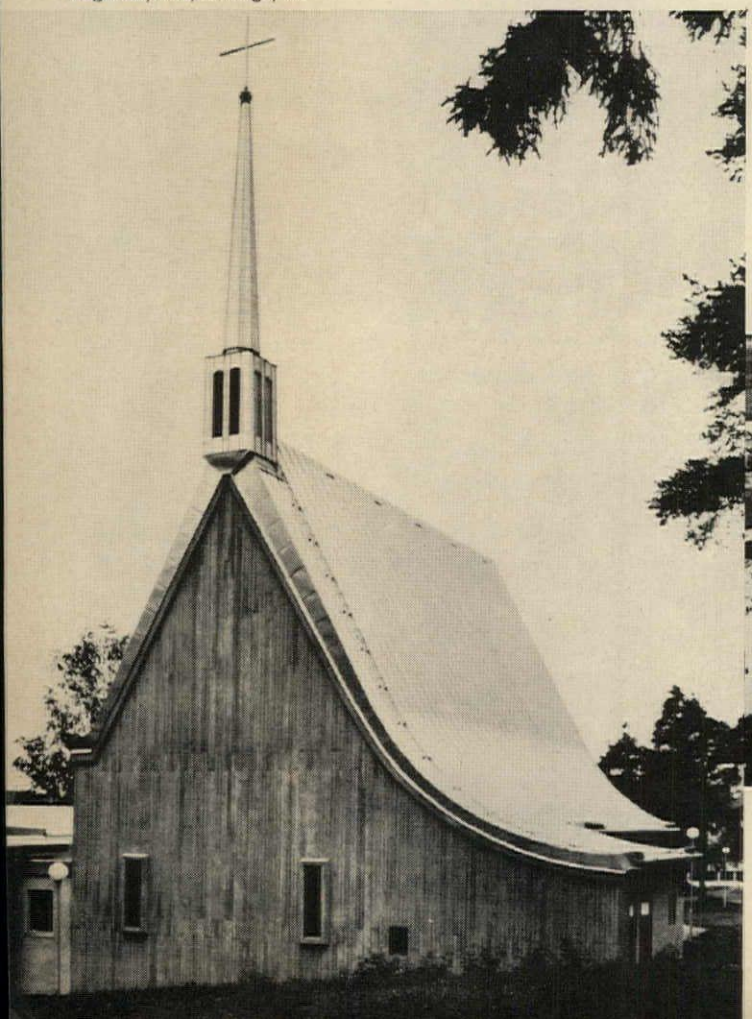
FMC CORPORATION
INORGANIC CHEMICALS DIVISION
633 THIRD AVENUE, NEW YORK, N. Y. 10017

fmc CORPORATION

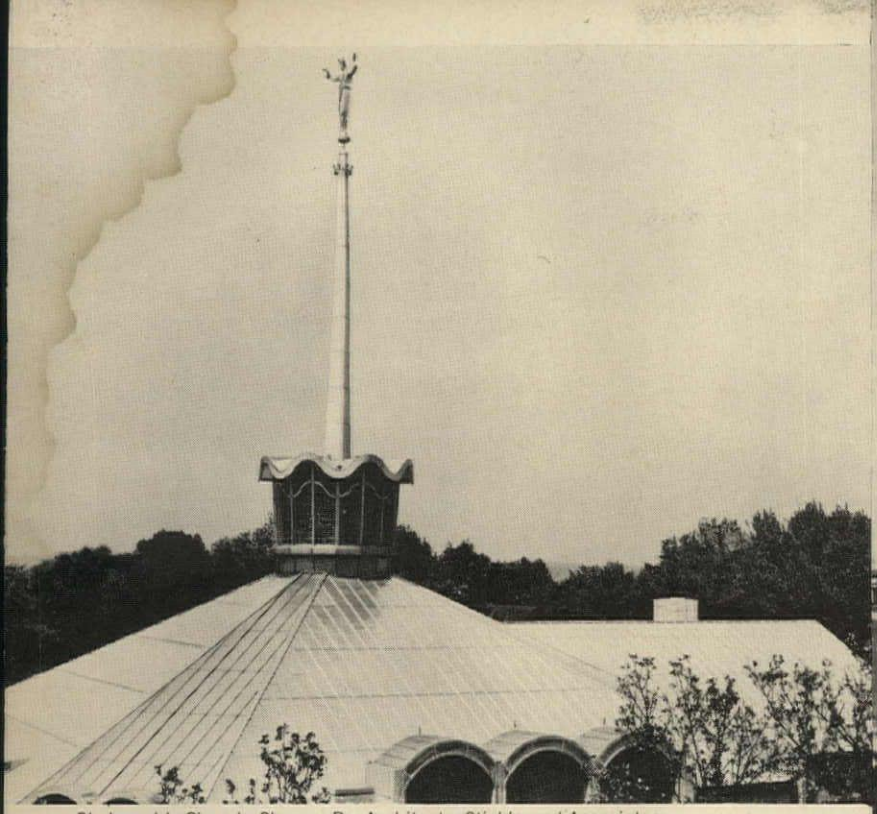
International Arrival Building, J. F. Kennedy Airport, New York, N. Y.
Architects: Skidmore, Owings & Merrill, New York, N. Y.
Stainless steel roof: Overly Manufacturing Co., Greensburg, Pa.

Take a new look at stainless steel for roofing, flashing and fascia.

All Saints Church, Sodertalje, Sweden. Architect: Rolf Bergh, Sodertalje, Sweden. Stainless steel roof: Fagersta Bruks AB, Fagersta, Sweden and Fagersta, Inc., Chicago, Ill.



Pittsburgh Civic Arena, Pittsburgh, Pa. Architects: Mitchell and Ritchey, Pittsburgh, Pa. Stainless steel roof: Limbach Company, Pittsburgh, Pa.



St. Joseph's Church, Sharon, Pa. Architects: Stickle and Associates, Cleveland, Ohio. Stainless steel roof: Overly Manufacturing Co., Greensburg, Pa.

Sears Roebuck and Co. Store, Livonia, Mich. Architects: Dunlap & Esgar, Chicago, Ill. Stainless steel fascia, roofing and flashing: Chaffee Roofing Co., Detroit, Mich. and Ornamental Iron Work Co., Akron, Ohio.

Lower initial costs, new soft tempers, faster installation methods make it practical as well as beautiful.

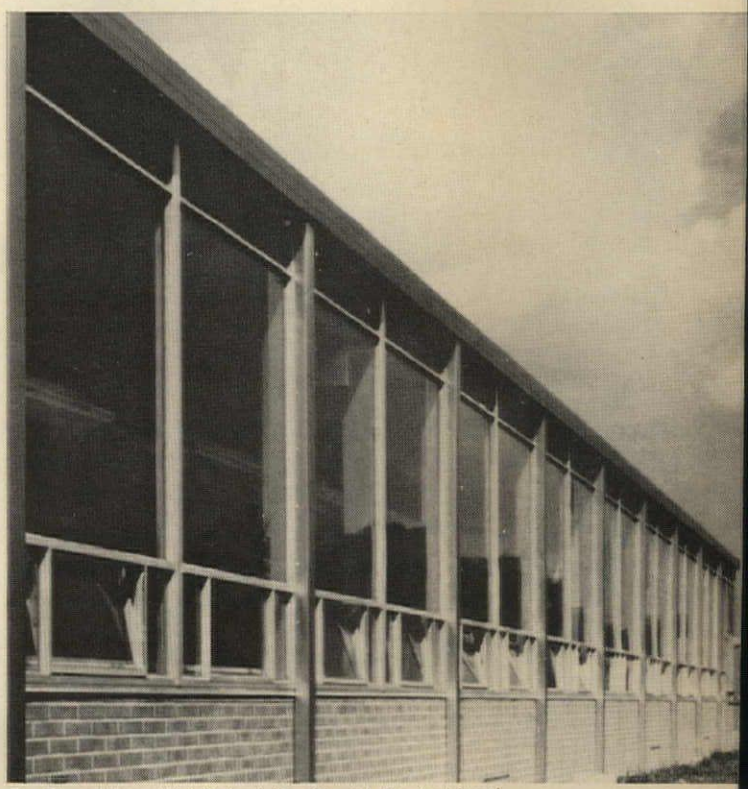
There are many *new* reasons why you should specify nickel stainless steel for roofing, flashing and fascia. First, the price of nickel stainless is now competitive with other top-quality roofing metals. Second, new dead soft tempers eliminate spring-back, making bending and fabrication easier than ever. Third, new soldering techniques plus automatic machines for flanging, folding and welding stainless strip keep installation costs down.

There are plenty of other reasons, too. Stainless steel's high strength permits the use of lighter, more economical gauges. It's corrosion resistant in virtually all atmospheres. There's no danger of corrosion products streaking or staining adjacent materials. Stainless steel's soft, permanent luster blends with any color, texture or material.

For your next design, why not specify the practical advantages and lifetime beauty of nickel stainless steel roofing, fascia and flashing. Windows, doors, curtain walls and hardware, too. Write for Inco's helpful "Architect's Guide to Nickel Stainless Steel Flashings."

The International Nickel Company, Inc.
67 Wall Street, New York, N.Y. 10005
Nickel...its contribution is Quality

For more data, circle 140 on Inquiry Card



Fox Chapel Area High School, Fox Chapel, Pa. Architects: Hunter, Campbell and Rea, Altoona, Pa. Stainless steel "Flo-Line" fascia gravel stop: Dawson Metal Co., Jamestown, N. Y.

Office Literature

continued from page 258

CONCRETE ROOF DECKS, FLOOR FILLS AND CURTAIN WALLS
The lightweight construction uses of perlite concrete are given in a new publication, which contains specification, typical details and comprehensive physical property data for the use of perlite for roof decks, floor fills and curtain walls. *Perlite Institute, Inc., New York, N.Y.*

CIRCLE 416 ON INQUIRY CARD

EFFECTS OF INDUSTRIAL NOISE
A technical report, Bulletin 1413, dealing with industrial noise—its economic considerations, legal trends and suggestions on how to combat noise problems is now available. The 6-page bulletin also gives tabulations of noise levels produced by 13 types of foundry machines and 30 other common industrial machines. Guidelines are given for noise reduction at source as well as for control of noise transmission. *Industrial Acoustics Company, Bronx, N.Y.*

CIRCLE 417 ON INQUIRY CARD

CHANGING YOUR ADDRESS?

If you're moving, please let us know five weeks before changing your address. Use form below for new address and attach present mailing label in space provided.

ATTACH
PRESENT MAILING LABEL
HERE

NAME

STREET

CITY STATE ZIP

FIRM NAME

TYPE OF FIRM

TITLE OR OCCUPATION

Mail to: Fulfillment Manager
Architectural Record
P.O. Box 430
Hightstown, N. J. 08520

CONTRACK® BLUEPRINT

DRAPERY FIXTURES APPLICATION IDEAS AND DETAILS

Graber Contrack concealability and quiet operation specified for interiors of Georgia Mental Health Center

Inside and out, the Georgia Mental Health Center complex in Atlanta presents a unique combination of clean architectural lines and function.

A drapery fixture that neither dominates nor distracts from the architect's basic expression was the decor objective of the Interior Designer. Graber Contrack was selected because it could be flush mounted in a ceiling recess for an almost invisible installation. Its smooth face and anodized aluminum finish match window frames and hardware.

Smooth, quiet operation was of prime importance to Center administrators. Contrack's exclusive ball-bearing carriers answered this requirement.

The installer, concerned about ease of installation, was especially enthused with Contrack's exclusive pulley housing design. An integral slide gate allowed him to insert the required carriers after installation. A return clip permitted pinning the last pleat flush to the wall — important since most draperies were hung wall to wall. As a final touch, Graber cord-tension pulleys were used to keep the draw cords off the floor.

ARCHITECT
A. Thomas Bradbury & Associates
Wilfred J. Gregson & Associates
Associated Architects — Atlanta, Georgia

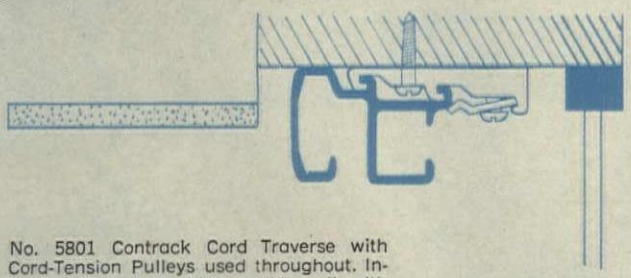
INTERIOR DESIGNER
Joe Blake, A.I.D.
Evanston, Illinois

GENERAL CONTRACTOR
Beers Construction Company
Atlanta, Georgia

INSTALLER
Atlanta Drapery Service
Atlanta, Georgia

Write for samples of six Contrack cross sections, Architect's File with Catalog, Specifications, and Price Information Dept. S

MATERIAL AND INSTALLATION DATA



No. 5801 Contrack Cord Traverse with Cord-Tension Pulleys used throughout. Installed flush to ceiling wall-to-wall with ceiling brackets. Required carriers installed through pulley housing after track was in place.

Graber drapery fixtures
CONTRACT DIVISION
MIDDLETON, WISCONSIN

DESCRIPTION
GEORGIA MENTAL HEALTH CENTER

LOCATION
ATLANTA, GEORGIA

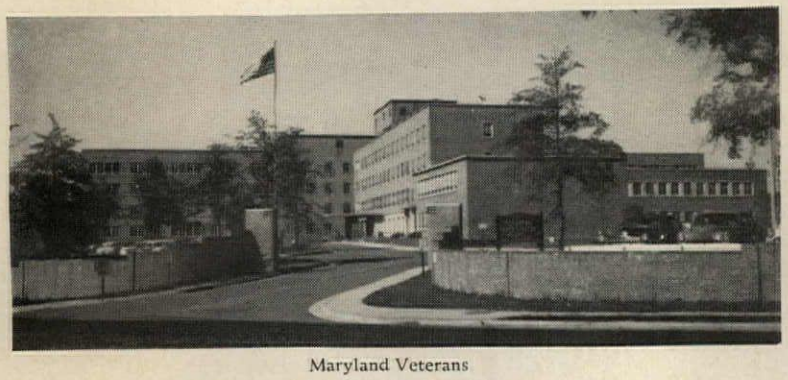
TRACK STYLES
No. 5801

FILE NUMBER
C-1004

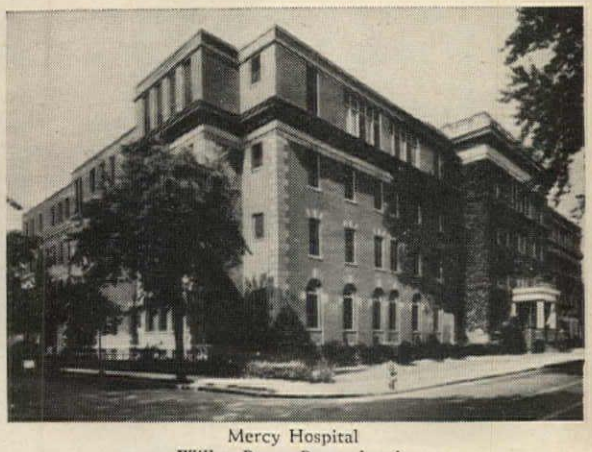
4912

For more data, circle 142 on Inquiry Card

for hospital walk-in

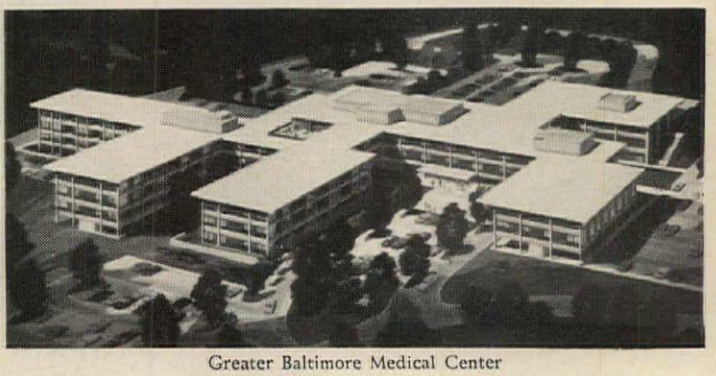


Maryland Veterans
Administration Hospital



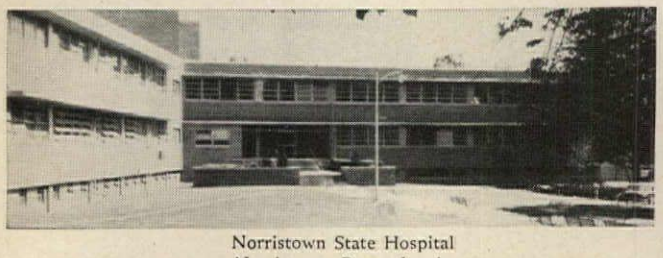
Mercy Hospital
Wilkes-Barre, Pennsylvania

Florida Sanitarium and Hospital
Orlando, Florida

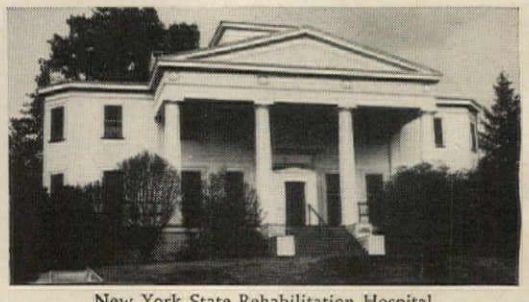


Greater Baltimore Medical Center
Baltimore, Maryland

Eastern State Hospital
Williamsburg, Virginia



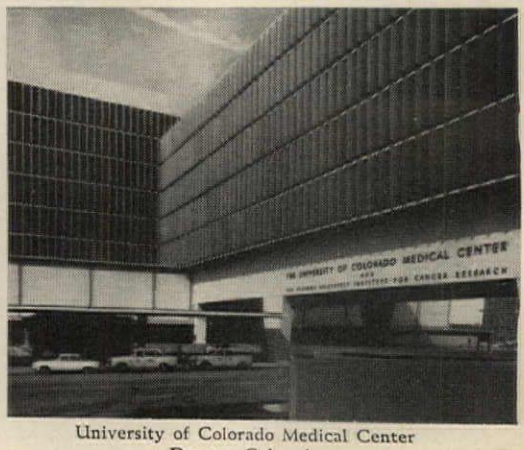
Norristown State Hospital
Norristown, Pennsylvania



New York State Rehabilitation Hospital
West Haverstraw, New York

John F. Kennedy Memorial Hospital
Stratford, New Jersey

Veterans Administration Hospital
Perry Point, Maryland



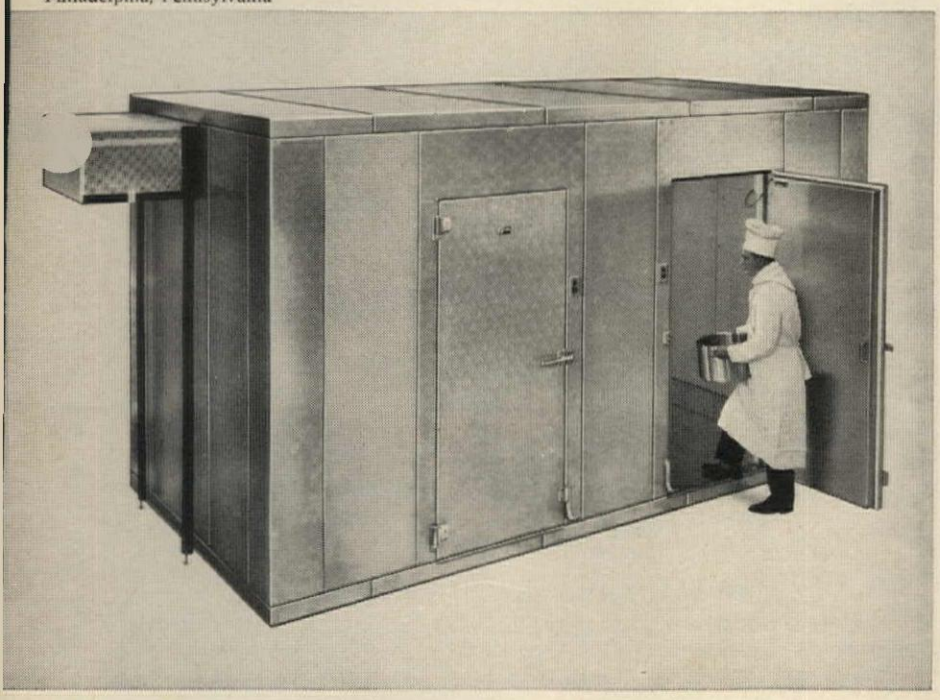
University of Colorado Medical Center
Denver, Colorado

refrigeration needs... specify Bally prefabs

Hospital of the University
of Pennsylvania
Philadelphia, Pennsylvania

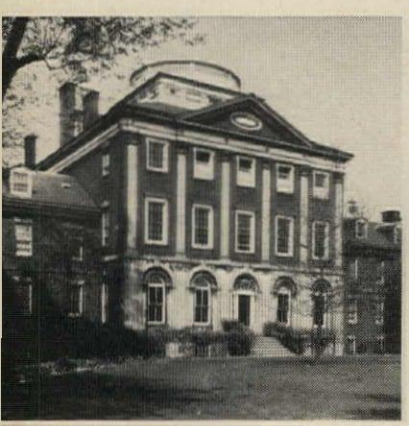
These hospitals, like many other institutions and places of business, are benefiting from Bally Walk-In coolers and freezers with revolutionary construction techniques and design features. Bally has set a new high in refrigeration efficiency.

When you specify Bally you can be sure that your clients will get many advantages not found in conventional prefab Walk-Ins... never available in on-the-site "built-ins"... and at far lower cubic foot cost than "reach-ins". There is never a need to accept an "or equal" or a substitute. Bally Walk-Ins are available to all dealers everywhere at uniform published prices. *Write for Fact File with new brochure, specification guide and sample of urethane wall.* *See Sweet's File 25a/Ba.*



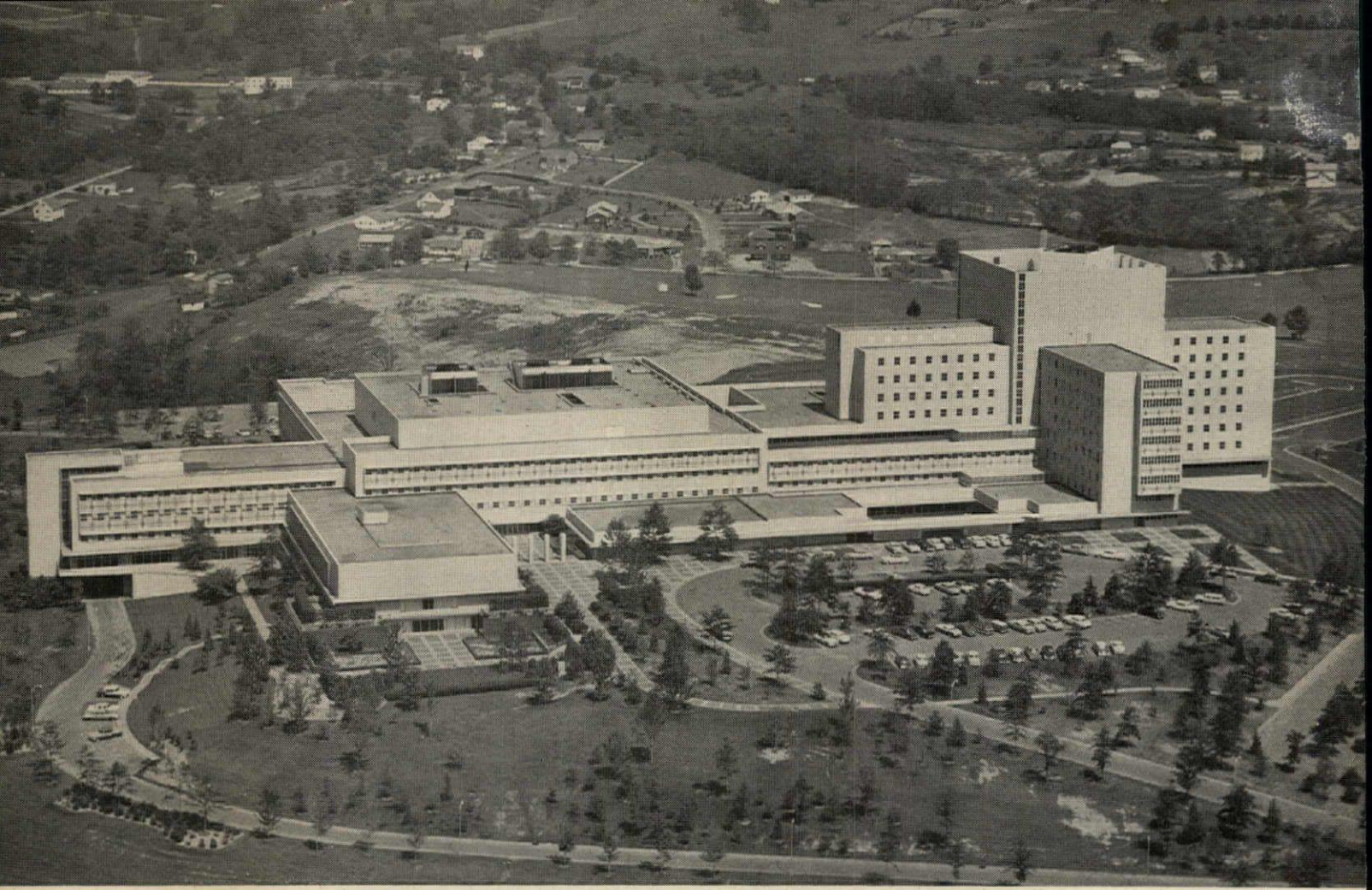
Bally

Bally Case and Cooler, Inc.
Bally, Pennsylvania



Pennsylvania Hospital
Philadelphia, Pennsylvania

Sinai Hospital of Baltimore, Inc.
Baltimore, Maryland



WVU's $30 million Medical Center. On the left is the Basic Sciences Building. On the right is the 12-story Teaching Hospital. Architect: C. E. Silling & Associates, Associate Architect: Schmidt, Garden and Erikson, General Contractor: Virginia Engineering Company, Masonry Contractor: Baker and Coombs, Inc.

Why NATCO Vitritile was selected for the new West Virginia University medical center

More than 4,000 tons of Natco Vitritile was used in the interior construction of the new West Virginia University Medical Center in Morgantown, West Virginia.

Some of the many reasons behind the choice of Natco Vitritile for the $30 million dollar center were:

Sanitation . . . Vitritile's ceramic glazed facing is non-porous and impervious to moisture. A simple cleansing with common soap or detergent and water is all that's necessary to keep Vitritile sparkling clean and sanitary.

Modular design . . . Coordinated modular Vitritile units permitted faster construction and, thus, lower immediate cost. Modular drawings made it possible for the tile contractor to bid low and accurately. Minimum cutting and fitting of tile units greatly reduced on-the-job costs.

Beauty . . . Colorful Vitritile never loses its "new look" because its colors and finishes are permanently "fired" on each unit under intense heat. Walls of Vitritile will last the life of any building.

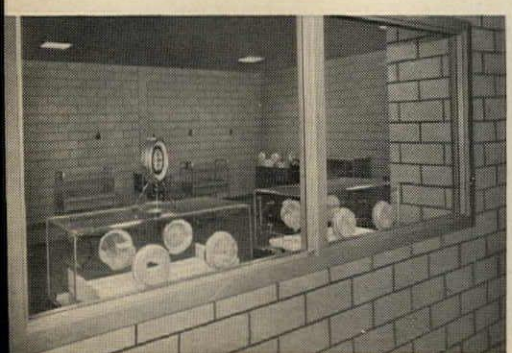
Chemical resistance . . . Vitritile meets all chemical resistance tests specified by the Facing Tile Institute.

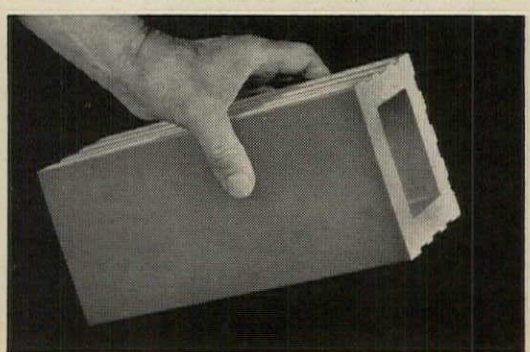
NATCO CORPORATION

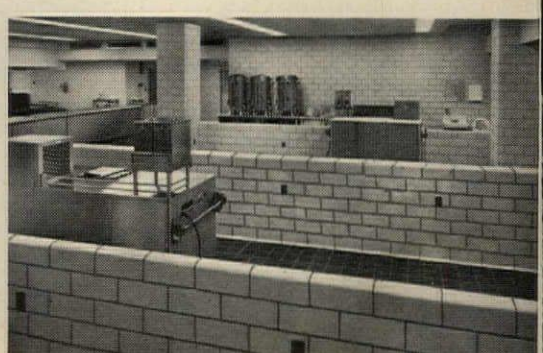
NATCO QUALITY CLAY PRODUCTS SINCE 1889

General Offices: 327 Fifth Avenue, Pittsburgh 22, Pa. Other Branch Sales Offices: Boston, Chicago, Detroit, Houston, New York, Philadelphia, Pittsburgh, Birmingham, Ala., Brazil, Ind. In Canada: Natco Clay Products Ltd., 55 Eglinton Ave. E., Toronto

Vitritile (center) comes in three nominal face sizes: 8″ x 16″, 5⅓″ x 12″ and 5⅓″ x 8″, in 2″, 4″, 6″ and 8″ thicknesses. Nursery (left) and hospital kitchen (right) show typical installations.

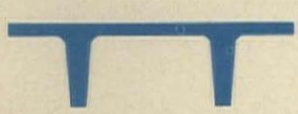






plant-produced
prestressed concrete shapes
fill a wide range of structural and architectural needs

These typical prestressed concrete units can be your answer in achieving quality, economy and an earlier completion date for your next structure

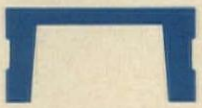


DOUBLE TEE

Basic floor and roof panel member, span range to 60 feet. Also made as giant double tee in spans to 125 feet. This versatile unit simplifies and speeds erection of single and multi-story structures. May be used exposed with or without finishing. Excellent for long cantilevers. Creates dramatic effect used vertically as exterior wall panels. Underwriters Laboratory label service is available on double and single tees and most prestressed concrete products.

I GIRDER

Generally used as long span beam to support extremely heavy loads. Serves as principal girder in many beam and deck systems. Spans to 120 feet.



CHANNEL SLABS

A very rigid member with minimum deflection characteristics at maximum load conditions. Used where heavy floor and roof loads are encountered in short and medium span ranges.

MONOWING OR F SECTION

Primary roof and floor deck members, used to best advantage where hidden joints are required for architectural reasons. Provides spans to 60 feet with minimum depth.

BOX GIRDER

Principal application as girder in heavily loaded structural framing systems. Void accommodates mechanical and electrical services. Also provides complete deck requiring grouting only between members. Ideal for industrial applications.

INVERTED T BEAM

This basic component beam reduces total structural depth since deck members can be supported on haunches. Mainly used with double tee, single tee and hollow core slabs for structural framing including the deck sections.

WALL PANELS

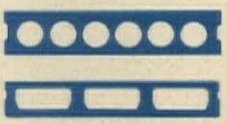
. . . of every description are made in precast and precast prestressed concrete for partial and full story heights for curtain wall or load bearing use. An unlimited choice is available in plain, sculptured, textured, or exposed aggregate units of all shapes and sizes. May be combined with insulating material for partition or exterior walls.

SINGLE TEE

Used for floor and roof structural decks in the longer span ranges, to 125 feet. Normally 6, 8 and 10 feet in width, each unit provides large coverage. Popular for exposed ceilings in gymnasiums, garages, bowling alleys, etc. Ends can be custom shaped to provide architectural treatment when cantilevered.

COLUMNS AND PILES

Square or octagonal piles in sizes beginning at 10" serve as foundation supports where poor bearing conditions are encountered. Precast columns, with or without haunches, are used as an integral part of the precast column-beam-deck concept which makes fast erection possible.



HOLLOW CORE SLABS

Major use is in office, commercial and apartment structures where flat ceilings are desired. Provides high insulation and low sound transmission. Voids may be used for mechanical and electrical systems. Shorter spans, to 40 feet.

Send for your free copy of "PRESTRESSED CONCRETE/applications and advantages"

PRESTRESSED CONCRETE INSTITUTE

205 WEST WACKER DRIVE • CHICAGO, ILL. 60606

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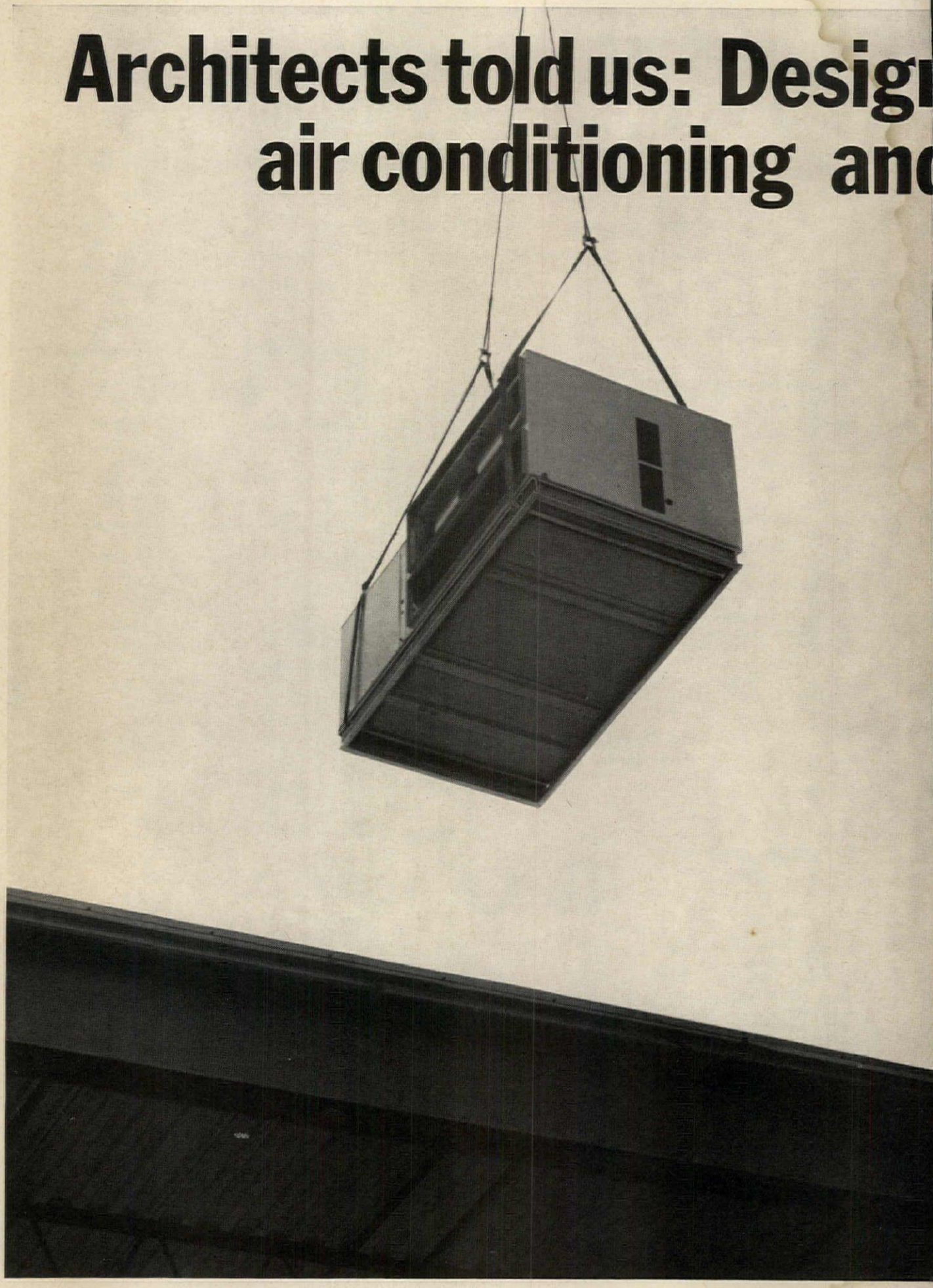
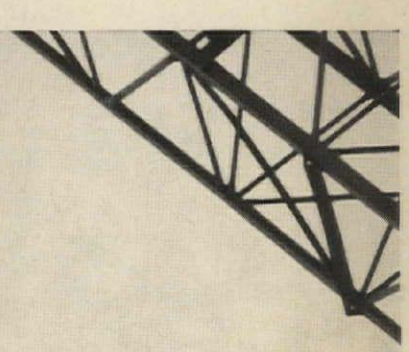
Architects told us: Desig
air conditioning and



quality roof-top heating unit that:



- has a low silhouette
- cuts roofing problems
- won't shake the building
- keeps on cooling inside, even when it's sub-freezing outside!

So we did:

The Fedders Adaptopak roof top unit is only 40" high. No flashing or curbing is needed around the unit. It can even be installed before roofing.

Special isolators eliminate vibration problems. Heavy insulation reduces even further the already low operating sound.

A special power vent eliminates unsightly flue stack. Provisions for quick and easy rigging are built into the unit. So is low ambient protection. (Unit operates in coldest weather.)

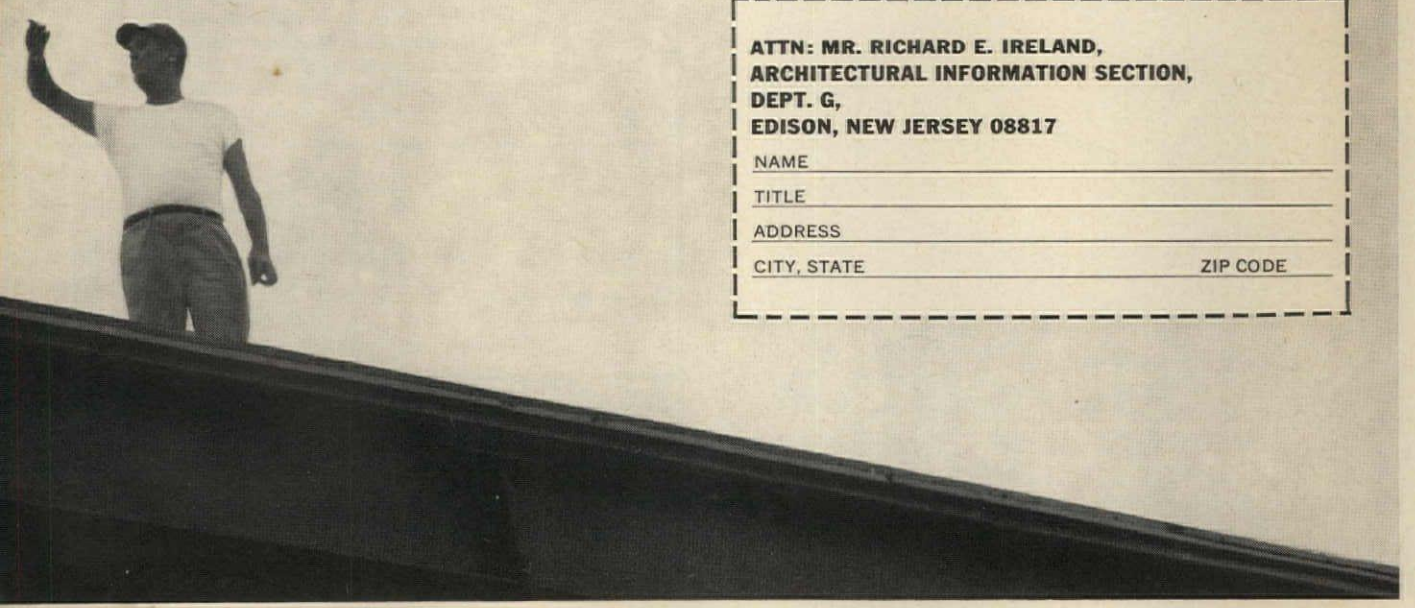
And, there's even more: Fedders designed this electric air conditioning, gas heating unit with your requirements in mind. Cooling from 28,000 BTUs to 180,000 BTUs. Heating: from 60,000 BTUs to 275,000 BTUs.

Important Note: When specifying roof top equipment insist that the condensing section be U.L. listed for outdoor application; insist, too, that the entire air handling and heating section be AGA approved for outdoor application. Fedders Adaptopak carries both these important labels.

We'd like to send you a spec sheet that details why Fedders offers the most outstanding unit available. Don't wait. Mail coupon today!

FEDDERS

Major distribution and service points across the nation
Edison, New Jersey 08817



ATTN: MR. RICHARD E. IRELAND,
ARCHITECTURAL INFORMATION SECTION,
DEPT. G,
EDISON, NEW JERSEY 08817

NAME _____

TITLE _____

ADDRESS _____

CITY, STATE _____ ZIP CODE _____

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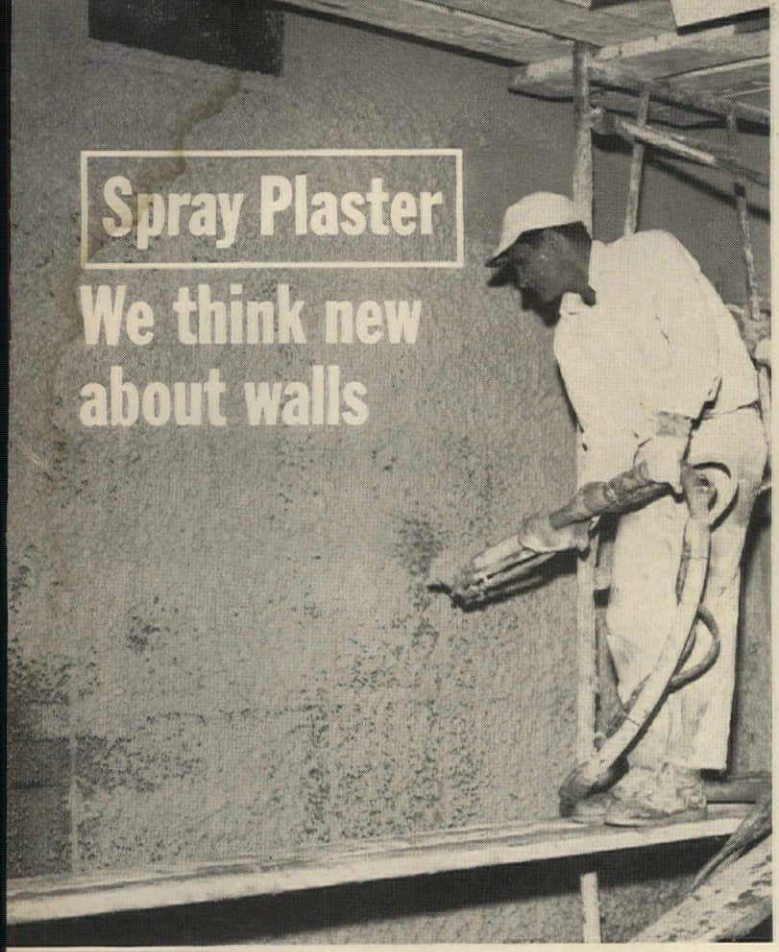
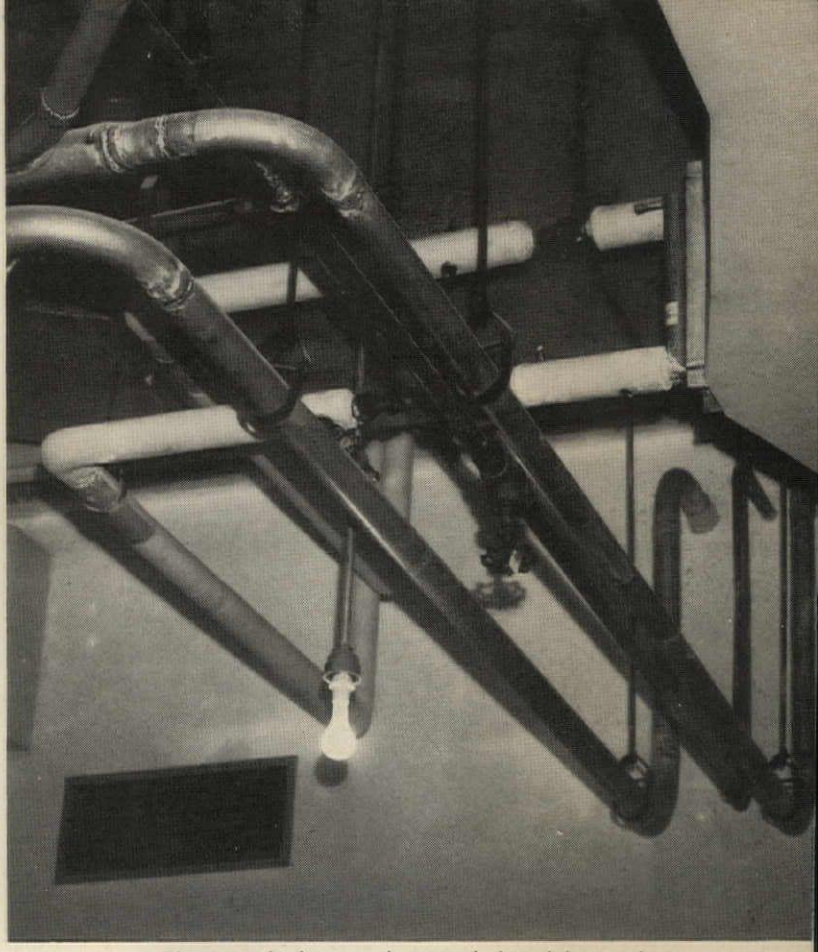
Spray Plaster
We think new about walls



Application of scratch coat with spray machine over metal lath and steel studs.



Plasterers had to work around the piping and ductwork necessary for conveying film chemicals.

Technicolor Laboratory,
Universal City, Calif.

MCA Inc., Owners

Skidmore, Owings &
Merrill, Architects &
Engineers, San Francisco

Dinwiddie Construction
Company,
General Contractors
Los Angeles, California

A. D. Hoppe Company,
Plastering Contractor,
Glendale, California

R. D. Reeder Company,
Lathing Contractor,
Van Nuys, California

Exposed hardwall plaster exterior will receive aluminum channel and black glass facade.

They "gunned" the walls at Universal City. **The need for speed and versatility made Gold Bond Machine Spray Plaster the perfect choice for the Technicolor building. This modern film processing laboratory, with its maze of pipes and ducts, received beautifully finished interior walls... the easy, up-to-date, spray machine way. Gold Bond Machine Spray Plaster was the base coat, followed with a brown coat and finished with Gold Bond Keene's Cement. Thinking about better plastering systems? Think new with Gold Bond® Call our representative, or write to National Gypsum Company Dept. AR-125L, Buffalo, N. Y. 14225.**

Gold Bond
LATH AND PLASTER

Some of the many fine products that come from 40 years of thinking new

NGC **NATIONAL GYPSUM COMPANY**

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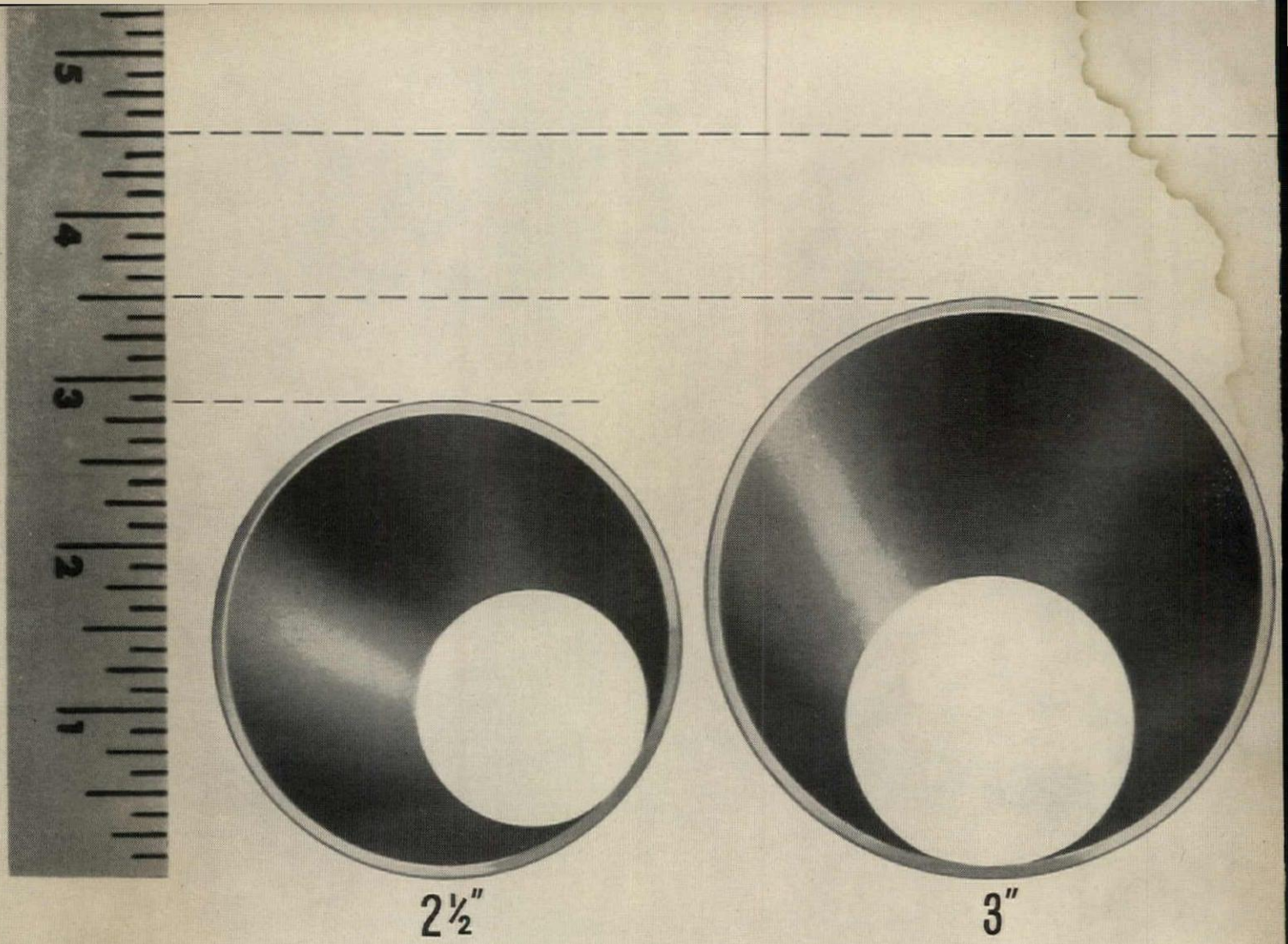


ELECTRUNITE IN THREE NEW BIGGER SIZES

FOR NEW BIGGER SAVINGS

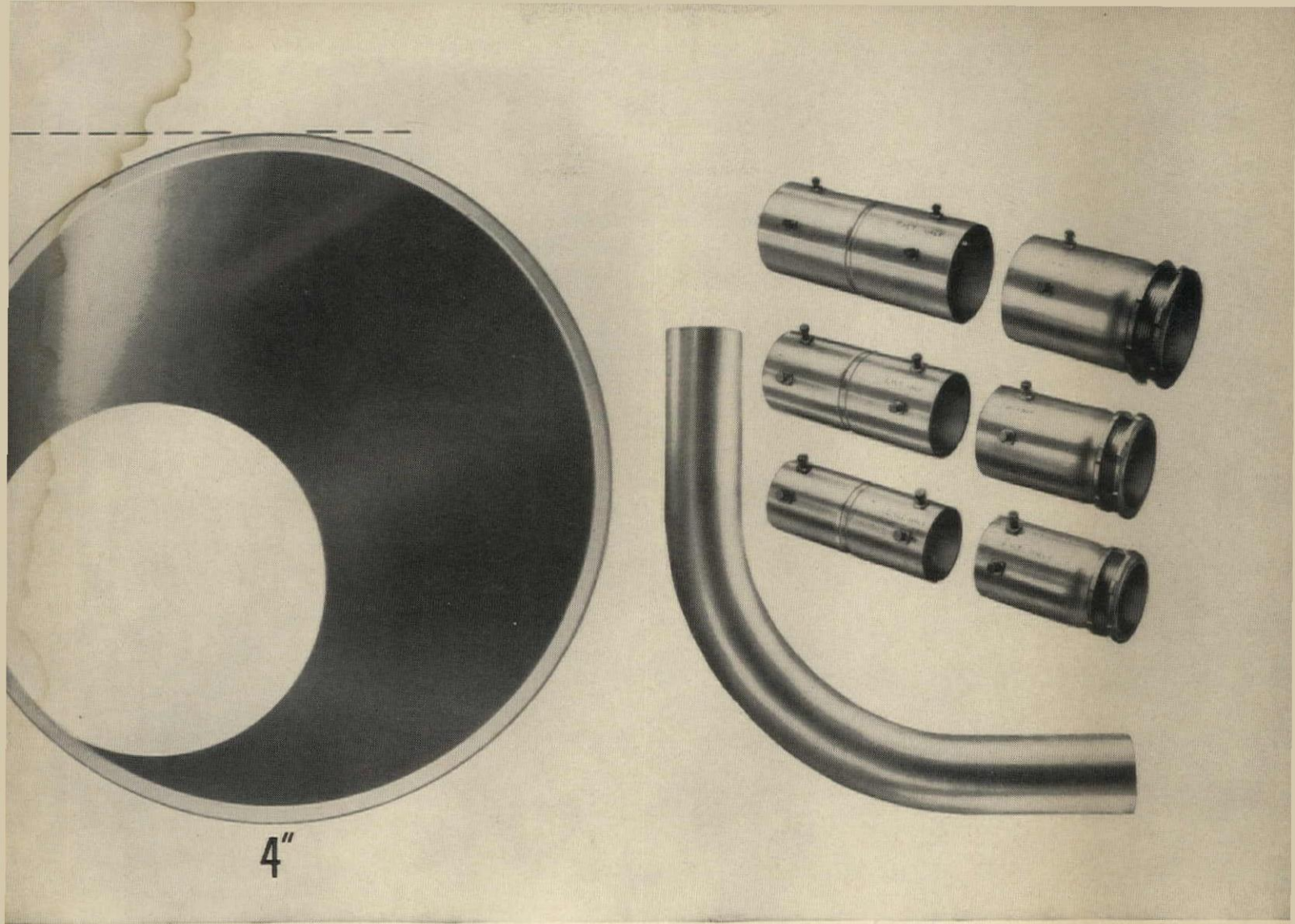
FOR

Republic's ELECTRUNITE®, in use for 35 years, breaks the size barrier of Light Wall Conduit—with three new larger sizes: 2½" ... 3" ... and 4" Electrical Trade Size.

Look at all the new benefits these new ELECTRUNITE sizes bring your clients:

- UL listed; approved in the new 1965 N.E.C. Code.
- ELECTRUNITE is approximately one-third the weight of Rigid Conduit per 100 feet. And ELECTRUNITE has the strength of *steel.*
- Less weight cuts handling cost on the job.
- Galvanized finish assures protection in concealed, open, or concrete construction.
- No costly galvanic action, since ELECTRUNITE is compatible with other building materials, such as concrete and steel reinforcing bars.
- Cuts costs. ELECTRUNITE provides up to 22% more inside space—for more room for easier-than-ever wire-pulling (already easier because of SILVERSLICK® inside finish).
- No wasted time threading—ever. Fittings are threadless.
- Easy coupling with Republic supplied couplings and connectors, UL listed. Compatible with present Rigid Conduit straps and accessories.
- No cutting away zinc due to thread cutting operations.

This STEELMARK of the American Steel Industry on a product assures you it is made of modern, versatile, economical Steel. Look for it on the products you buy; put it on the products you sell.



YOUR CLIENTS

• Factory elbows in 45° and 90° are available, and bending radius is in accordance with Underwriters' Laboratories Standards for Rigid Conduit.

All these features of the new ELECTRUNITE sizes of E.M.T. add up to big savings for your clients. Specify the ELECTRUNITE that broke the size barrier. Send coupon for a full range fact sheet.

You Can Take the Pulse of Progress at

REPUBLIC STEEL
Steel and Tubes Division
Cleveland, Ohio 44108

REPUBLIC STEEL CORPORATION
Steel and Tubes Division • Dept. R-1845-B
201 East 131st Street • Cleveland, Ohio 44108
Please send more information about the new sizes of ELECTRUNITE E.M.T.

Name_____
Title_____
Company_____
Address_____
City_____ State_____ Zip____

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ARCHITECTURAL RECORD

Published by McGraw-Hill, Inc., 330 West 42nd Street, New York, New York, 10036.

SEMI-ANNUAL INDEX

VOLUME 138
JULY-DEC. 1965

Readers using the index will find buildings, with only a few exceptions, entered in three ways: by architect's name, by owner's name, and by building type (apartments, hospitals, schools, etc.). Still other categories cover the special subjects dealt with in the magazine's engineering section (concrete, lighting, prefabrication, etc.).

ABBREVIATIONS: BTS—Building Types Study; AE—Architectural Engineering; TSS—Time-Saver Standards; BC—Building Components

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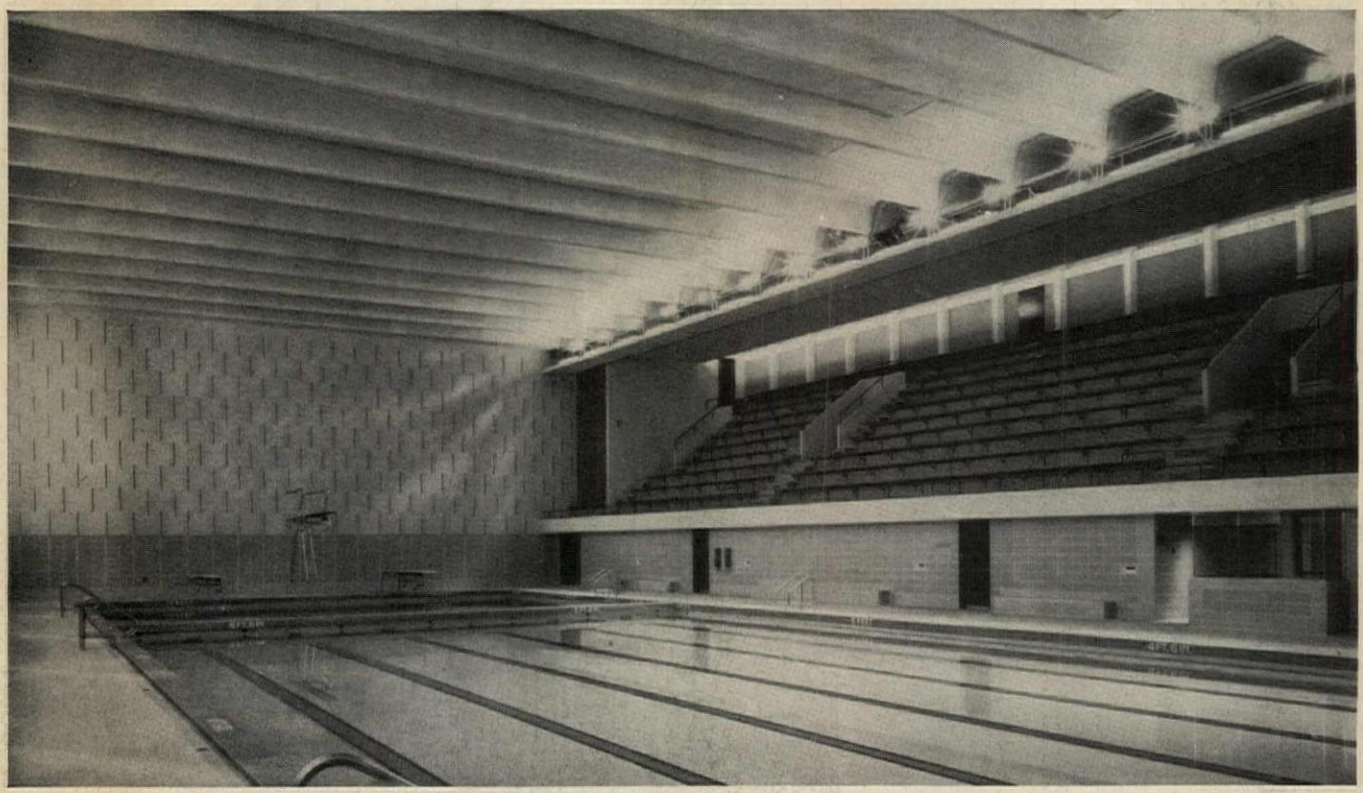
Required Reading

Index to Advertising

PRE-FILED CATALOGS of the manufacturers listed below are available in the 1965 Sweet's Catalog File as follows: (A) Architectural File (green), (IC) Industrial Construction File (blue), (LC) Light Construction File (yellow).

NEW YORK—James E. Boddorf, Advertising Sales Mgr,. Sam H. Patterson, Promotion Mgr., Joseph R. Wunk, Production Mgr., 330 W. 42nd St.; NEW YORK SALES OFFICE—John I. Howell, Donald T. Lock, Ted Roscoe, 500 Fifth Ave.; ATLANTA—Sheldon F. Jones, 1375 Peachtree St., N.E.; BOSTON—Ted Roscoe, 607 Boylston St.; CHICAGO—Robert T. Franden, James A. Anderson, Robert G. Kliesch, 645 N. Michigan Ave.; CLEVELAND—Louis F. Kutscher, 55 Public Square; DALLAS—Bradley K. Jones, Vaughn Bldg.; DENVER—David M. Watson 1700 Broadway; DETROIT—Richard W. Pohl, 856 Penobscot Bldg.; LOS ANGELES—Robert L. Clark, 1125 West Sixth St.; PHILADELPHIA—Michael J. Davin, John A. Teefy, 6 Penn Center Plaza; PITTSBURGH—John C. Jackson, 4 Gateway Center; ST LOUIS—Richard Grater 7751 Carondelet Ave.; SAN FRANCISCO—Tom Tredwell, 255 California St.



Variety of prestressed concrete tees for roof and floor in new Johns Hopkins University Athletic Center

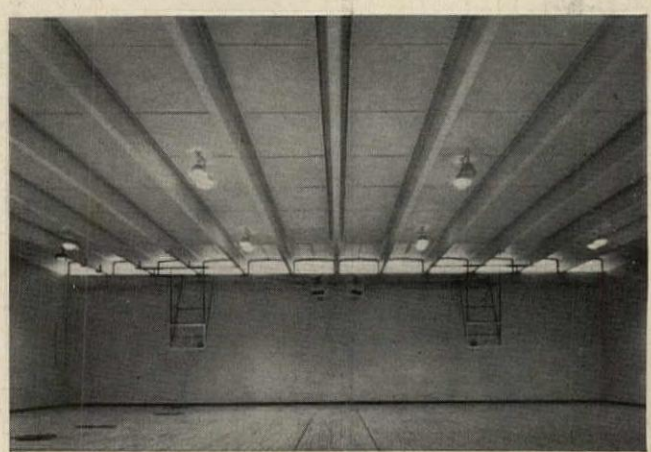
Large floor and roof areas in the new Johns Hopkins Athletic Center are made with giant tee sections of prestressed concrete. They range in length from 39 feet to 95 feet.

In the gymnasium floor, 22 tees, 8 feet wide by 28 inches deep are used. The gym roof is made of 13 tees, 95 feet long, 8 feet wide by 36 inches deep. In the natatorium (see picture) 18 tees form the roof. They are 96 feet long, 8 feet wide by 36 inches deep.

Clean interior lines, easily finished and maintained, are an architectural feature of the structure. Clerestory effect is formed by the legs of the tees where they bear on walls.

This project is a classic example of the use of prestressed concrete to achieve functional and distinctive design, while gaining the economies of material, construction speed, finishing cost and maintenance. And the selection of Union TUFWIRE® Strand for prestressing strand in the tees reflects the increasing reliance of prestressed concrete producers on this product. TUFWIRE Strand, TUFWIRE and other Union Wire Rope products are made by Armco Steel Corporation, Department W-1905, 7000 Roberts Street, Kansas City, Missouri 64125.

Owner: The Johns Hopkins University, Baltimore, Maryland
Architect: Meyer, Ayers and Saint, Baltimore, Maryland
Engineer: Van Rensselaer P. Saxe, Baltimore, Maryland
Contractor: Piracci Construction Co., Inc., Baltimore, Maryland
Prestressed Concrete Fabricator: Shockey Bros., Inc., Winchester, Virginia



ARMCO STEEL ARMCO

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