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BUILDING TYPES STUDY: MENTAL HEALTH FACILITIES

FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

FEBRUARY 1967 A McGRAW-HILL PUBLICATION TWO DOLLARS PER COPY

Chubby's Coffee Shop, Irving, Texas
Architect: Dan M. Daniel, Dallas, Texas
Photograph: John Lee

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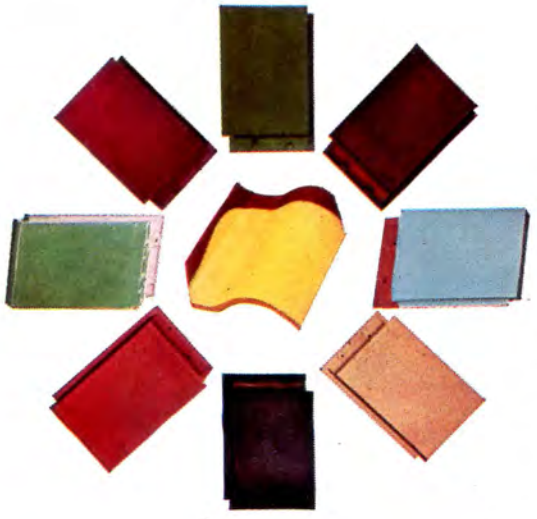

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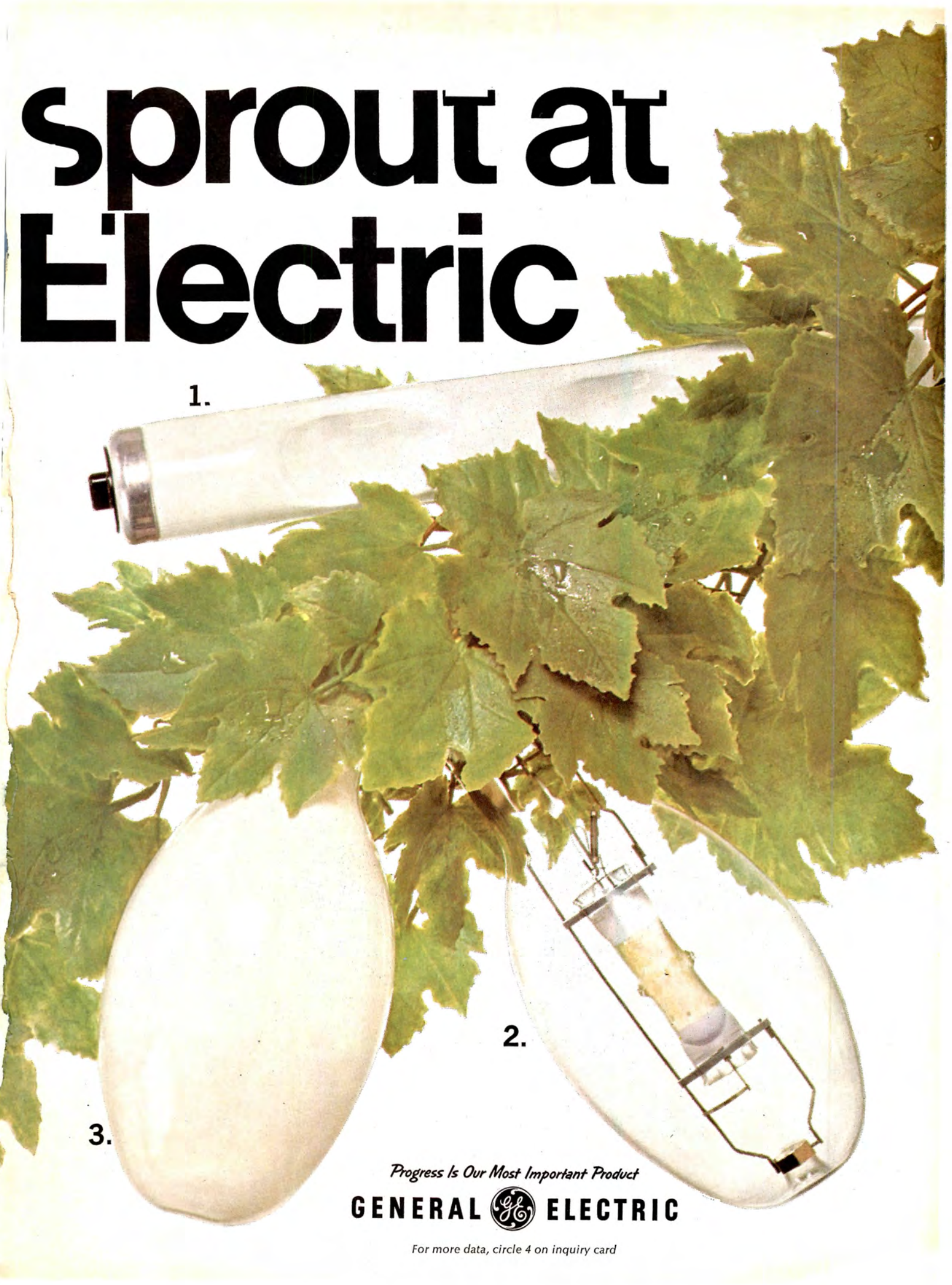

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GENERAL ELECTRIC

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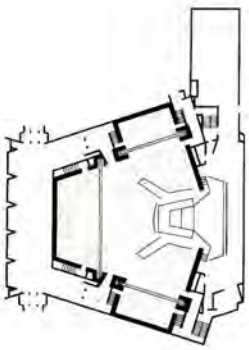
Cover: The Christian Science Organization Building,
Urbana, Illinois
Architect: Paul Rudolph
Sculptured doors by Roger Majorowicz
Photographer: Bill Engdahl, Hedrich-Blessing

FEATURES



BUILDING TYPES STUDY 357

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ARCHITECTURAL RECORD

CONTENTS: FEBRUARY 1967

ARCHITECTURAL ENGINEERING

THE RECORD REPORTS

COMING IN THE RECORD

CURRENT DESIGN DIRECTIONS FOR SCHOOLS

With the mounting tendency for the many schools being built to become larger and larger in size, current concern is the creation of appropriate scale and a good teaching environment for all the new teaching concepts. Next month's Building Types Study will examine a number of handsome new schools, from elementary through high school levels, which use skillful design to solve these new problems.

THE SYSTEMS APPROACH TO HOUSING

Carl Koch, long noted for his interest in the industrialized approach to house construction, has recently turned his attention to the use of standardized structural and material components for multi-family housing—both in an effort to bring down the cost, and at the same time permit an almost infinite variety of exterior materials and interior arrangements—from efficiency apartments to triplexes.

McGraw-Hill

ABC ABP MPA

ARCHITECTURAL RECORD (combined with AMERICAN ARCHITECT, ARCHITECTURE and Western ARCHITECT AND ENGINEER), February 1967, Vol. 141, No. 2. Title ® reg. in U.S. Patent Office

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IS THERE COMPREHENSION OF ARCHITECTS AND THEIR WORK?

One of my colleagues at McGraw-Hill once asked me why architects used such fancy phraseology; he said you couldn't understand what they were talking about. Naturally I tried to defend architects; I said that it wasn't architects who used high-flown language; it was the critics (or the editors). But he wasn't having any of that; as a chief editor of a magazine which frequently deals with building design, he had read too many releases or manuscripts from architects. He insisted that architects tended to surround their work with a kind of verbal mystique. He of course was making the point that architects are hurting themselves by lack of communication.

He cited several phrases from a recent story. The one that makes the point most emphatically was a fairly simple statement: "The building is of itself." I should say that that's not a common expression, even within the architectural profession, but nobody in the field would have any difficulty with it. Maybe they would say it some other way—"the building was designed from the inside out," or "it was designed first to serve its functions." These are more common expressions, but they are not exactly graphic either. I think my friend's point was not so much that he couldn't actually fail to come up with a meaning (although he was pretending he couldn't), but that such phrases interrupted his reading, and made him stop to consider their meaning.

It seems odd, when you stop to think of it, that a profession so deeply involved in graphics in the visual sense should be so insensitive to verbal graphics. Yes, of course, architects are well educated persons, and trained to speak in scholarly language. But scholarly diction can be understandable, or picturesque, or dramatic: even beautiful.

Notice that, in the phrases quoted above, there isn't a single "scholarly" word. So there's more to it than a simple desire to strike a posture. It would seem to be a complete lack of effort to communicate. Sounds almost like I'm referring to artists, who scorn communication as pedestrian.

In a recent speech president John Eastwick-Field of the Architectural Association (London) approached it from a different direction: "Most architects are uncomfortably aware, though they may not admit it, that much of their effort and skill is misunderstood and misrepresented: even alienates them from the public. Architects attempt in their own way perhaps presumptuously to plan and order society. They have been accused of 'architectural determinism,' of trying to impose on people the way they should live; and, of course, one can find remarkable inconsistencies in what is advocated by them—for a time they assert that people like living in high buildings so as to enjoy the views, and then quite suddenly that satisfaction is to be found only in the casbah; all of which must be very confusing."

Or more directly:

"Which brings me to what you may think an unimportant bone of contention about jargon. My point has relevance, I believe, to the problem of understanding between architects and their public because it is concerned with communicating thoughts intelligibly. If I were to refer you to 'the measurement of system contrast transfer function characteristics' or to 'an autonomous far-ranging tool complex' you would not easily guess to what I was referring. The first, though I doubt if you will be much wiser, is 'the modern method of evaluating image quality and lens performance,' and is to do with films: the second is somebody's idea of a ship. As the somebody happens to be Buckminster Fuller there is good reason to make the effort to understand—but not everybody who uses such language has so much to offer. My grouse is that *simple* things are too often said in a complicated way. Bizarre and freshly minted terminology simply antagonizes mortals—though they may find the scholarship impressive."

A third complaint comes from Edward J. Logue, Administrator of the Boston Redevelopment Authority (the one that's pretty receptive to architects' ideas), and in still different terms: "We need in architecture a language which the layman can understand." Now it is possible that in that quotation (out of context) the word "language" actually refers to architecture, not lingo. No matter—if the architecture won't speak for itself, all the more reason for some verbal language that will. —*Emerson Goble*

Drawn for the RECORD *by Alan Dunn*

"What do you have to have to become a Model City?"

What are we to conserve, nature or man?

Speaking of environment, Russell E. Train, president of The Conservation Foundation, recently told the American Society of Landscape Architects:

"The strongest motivating force in the traditional conservation movement has been the damage which man and his technology inflicts on nature. While we are concerned about what we are doing to nature, we should be more concerned about what we are doing to man!" This concern, he added, "must be at the very center of the planning and development of human environments, urban or otherwise, which will contribute rather than detract from the quality of human life." He cautioned that "the alienation of man" from his natural environments might "produce adverse psychological impacts on man as an individual and, ultimately, destructive impacts upon his social functioning and development."

"The esthetic of change"; or cars are here to stay

"The Changing Aspect of Architecture" has been the theme of two special issues of The Indiana Architect, and I found it especially interesting reading because of our own efforts (last July) in this direction. A few quick quotes seem in order:

Evans Woolen (architect): "Eventually, architects might not undervalue things with which we are not accustomed to dealing: inner-city expressways, mass rapid transit, automobile storage, low-income housing, industry. If a raised inner loop is ordained for a city of the plain, why could it not be a vital element? Why is it not done in the manner of a Morandi or a Maillart? The Roman aqueduct still remains eventful in the landscape, and it does not even accommodate people. Too long has the automobile been excoriated by the tasteful. Even if Marshall McLuhan were right and the private car is only here for another decade or so, we would provide for it simultaneously with the achievement of rapid transit. Parking structures are already in some few cases contributive and mighty. Like crabgrass, cars usurp open space because no one wants the land for anything else. When high density is achieved and open space is cherished, parking may become architecture.

"Architect-planners could well embrace the 'esthetic of change.' "

Anthropologists along with psychologists and architects

Still with The Indiana Architect, Ewing Miller talks about planning proper environment:

"The use of the anthropologist and the psychologist is often-times an overlapping field and less of the hard sciences than we have been discussing. The amount of knowledge that we have of man is still rather limited. We know more of him as an individual than we know about his behavior in groups and densities. An article recently by Mr. Lilienthal pointed out the problem that 300-million Americans would be wrong because these densities affect man's consideration of his government, how he reacts to democracy, and how he behaves in his moral concepts. If we are to maintain the freedom that we have today, we must start by agreeing that we have less than our grandfathers because of increasing densities and the resultant changing concepts of the freedoms. If we are to pass as many of our freedoms on to our children as we wish or deem necessary, then we must determine how densities and their effect upon the design of housing and transportation and distribution will affect concepts of thought.

"In our own firm we have used psychologists for the behavioral studies and student reaction. Mr. Swinburne has used anthropologists to help him design spaces for student living areas. The architect, therefore, clearly can be a partner in this area of environmental professions. If we ignore these disciplines then they will provide the data and hire artists to put it into volumetric concepts."

Future changes may limit design life of buildings

In the same issue of The Indiana Architect, Edgardo Contini speculates that accelerating change may shorten the life of our buildings:

"The second point (and this is a very challenging one because indeed it opens up altogether new horizons) is the acceptance of the fact that the economics of the building industry indicate that replacement is more advantageous than renewal or remodeling within the span of about one generation now (and probably less than one generation in the foreseeable future). In other words, the houses that are built today will be no longer viable 30 years from now, and it will be cheaper to build new ones than try to fix up the old. Now this is a horrifying thought to anyone who views architecture as the art of permanency, who takes expensive and tiring trips to Europe to see what remains from centuries ago—to think that what we are building today isn't going to last even for our children to see!"

—*E. G.*

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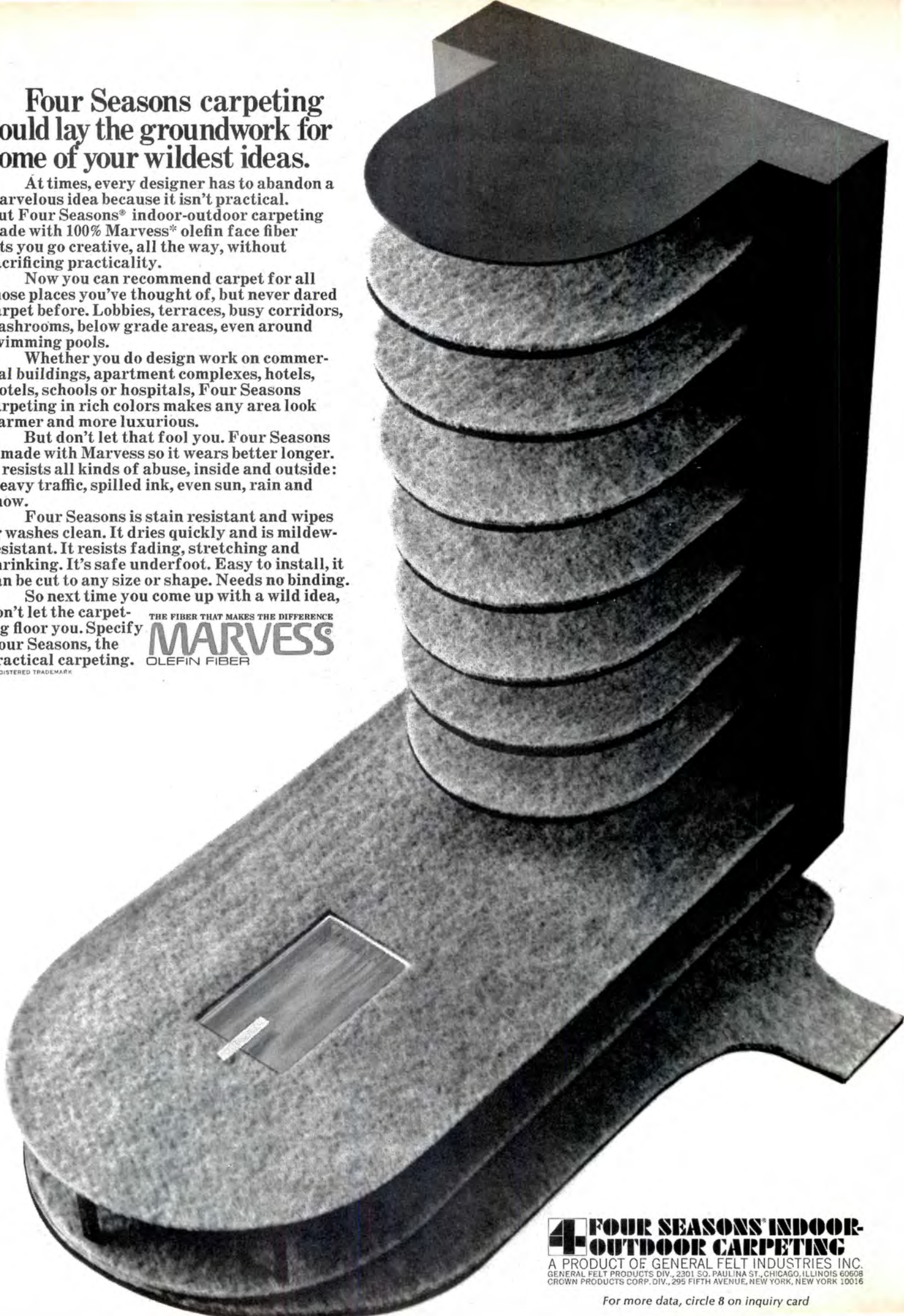

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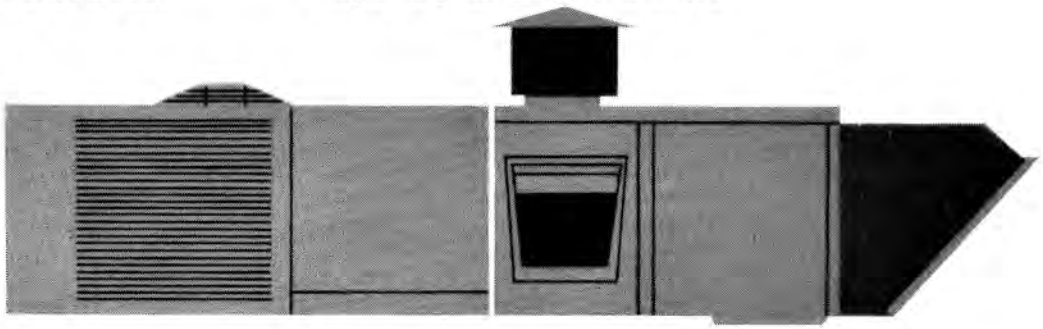

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The best ideas are more excit in CRETE

MONARCH MARKING SYSTEM COMPANY BUILDING, DAYTON, OHIO. ARCHITECT: YOUNT, SULLIVAN & LECKLIDER, DAYTON. STRUCTURAL ENGINEER: RICHARD SHELL, DAYTON. CONTRACTOR: MAXON CONSTRUCTION CO., INC., DAYTON

roofs in 1... inverted umbrellas of concrete bring beauty and efficiency at a saving

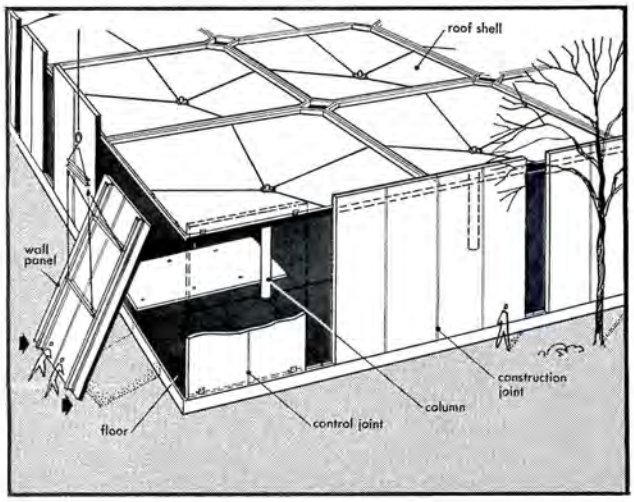
The new office-plant structure of the Monarch Marking System Company near Dayton, Ohio, demonstrates the excitement concrete can bring to industrial buildings. To cover the plant area, architects created a single 3½-acre roof by joining 88 inverted concrete umbrellas 42 feet square, each one self-supporting.

□ The design produced a highly pleasing and efficient interior, as well as a substantial cost saving over other roof systems. It also saved some 5 feet of headroom by permitting air-conditioning units, fans, ducts, and other equipment to be tucked neatly into the ceiling arches. □ Wall requirements were simplified through use of large tilt-up concrete panels, 19 x 26 feet. For efficient plant expansion, vital to a growing company, panels can readily be detached and repositioned on newly constructed roof units. In buildings of every type, concrete is today's bright idea material.

Portland Cement Association

For interesting design and construction highlights, see the 3 following pages

4 basic concrete components give design simplicity to MMS Company plant



The Monarch Marking System Company, manufacturer of equipment and supplies for labeling and pricing merchandise, chose concrete for their new $3.5 million structure with good reason: the most building for the least money. The economy in the 155,000-sq.-ft. plant unit was achieved through a simplicity of design that permitted repetition of 4 basic concrete components: floor slabs, columns, roof shells and tilt-up wall panels. All were cast on the site using ready mixed concrete.

Hyperbolic paraboloid shell roof offers special advantages

338 by 464 ft. of fully air-conditioned plant space, 65% of the facility's 243,000-sq.-ft. total, is roofed with 88 inverted concrete shells of hyperbolic paraboloid design. Each is 42 ft. sq., 3 in. thick, yet a single column supports it. This roof design offers valuable advantages not only in economy and appearance, but in spacious column-free bays, expanded headroom free of dust-gathering surfaces, improved drainage, along with superior fire resistance.

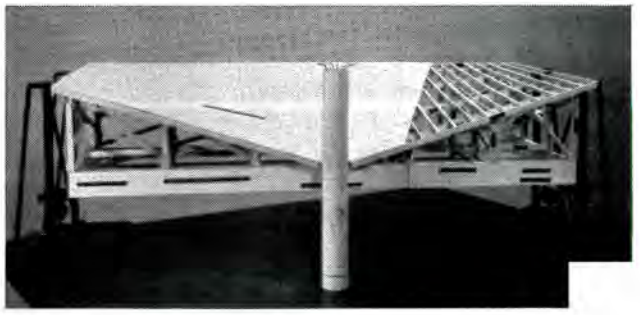
Floor provided smooth surface for rolling forms and casting wall panels

The 6-in. concrete slab-on-ground floor, cast by the checkerboard method, was constructed early in the building schedule. By providing the contractor with a smooth, hard work surface, this speeded moving and shoring of forms and casting of the roof shells. Doing double duty, the floor also served as a casting bed for fabricating of the tilt-up wall panels.

88 shell support columns carry utilities and drainage

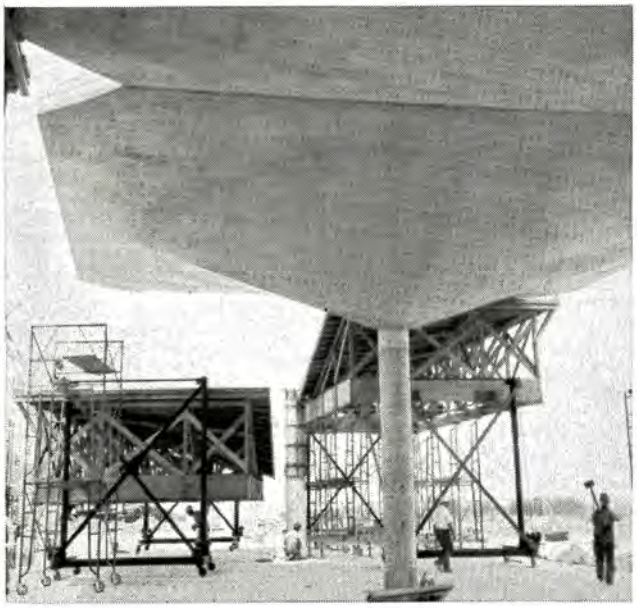
Reinforced concrete columns, 24 in. in diameter, were cast in steel forms using 4,000 psi air-entrained concrete. Designed into each column are electrical conduit and a 4-in.-diameter pipe to handle drainage for the 1,764 sq. ft. shell unit it supports.

Assembly line casting achieved with 6 sets of movable forms



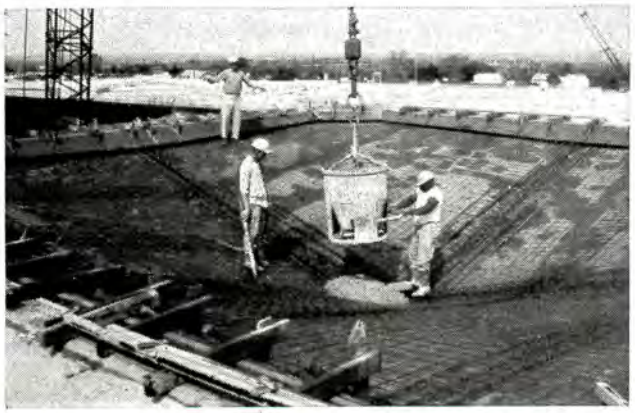
Special roof shell forms, designed and built by the *contractor,* gave efficient moving and maximum repeat use. 6 sets of forms, each in half-shell sections, were used to cast the entire 88-unit roof. Hyperbolic paraboloid formwork appears difficult to build, yet it is quite simple since the surface is defined by two intersecting systems of straight lines.

Forms stripped and reset in 1 hour—or less



As soon as a completed concrete shell was cured to satisfactory strength, forms were lowered on mobile jacks, rolled to another bay, and raised into position so reinforcing steel could be placed for the next shell. Only 1 hour—often less—was needed to remove both halves of a form from a completed shell and snug them into place around the column at the next bay.

Concrete placed at the rate of 2 shells per day



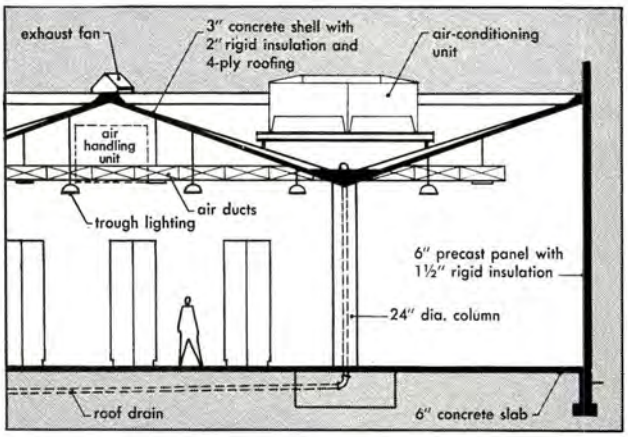
Through use of 4,000 psi high-early-strength concrete, shells were concreted at a 2-per-day rate. Before form removal, specifications required a strength of 3,200 psi, which occurred in 36 to 40 hours with the following mix proportions: Type III cement, 564 lb.; water, 267 lb.; sand, 1,300 lb.; ¾-in. aggregate, 1,890 lb.; entrained air, 6 percent.

Shell construction schedule

month	shells cast per day							shells cast per week	total
	sun.	mon.	tues.	wed.	thur.	fri.	sat.		
august						Y*		1	1
				YY				2	3
		YY	Y		YY	YY		7	10
		YY	YY	YY	Y	YY		9	19
		YY		YY	YY	YY		8	27
september			YY	YY	YY	YY		8	35
		YY	YY	YY	YY	YY		10	45
		YY	YY	YY	YY	YY		10	55
		YY	YY	YY	Y	YYY		10	65
		YY	YY	YY	YY	YY		10	75
		YY	YY	YY	YY	Y		9	84
		YY	Y	Y				4	88

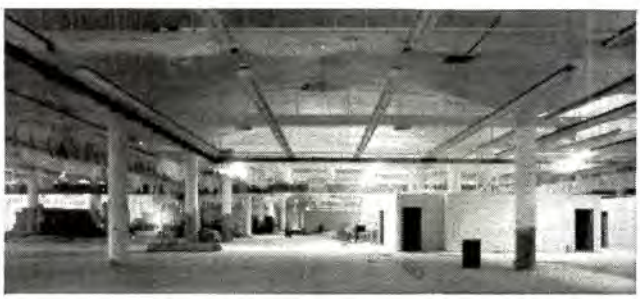
* first shell cast august 6th.

Nestling mechanical/electrical equipment in shells means more room inside, more beauty outside



Design characteristics of the inverted umbrellas were fully exploited by fitting mechanical and electrical equipment into the cavities formed both on top and under the roof. This improved plant appearance on the outside. Inside, it saved 5 feet of headroom which would have been needed to house devices such as ductwork, fans, and air-conditioning units.

Broad, open bays provide highly flexible space utilization

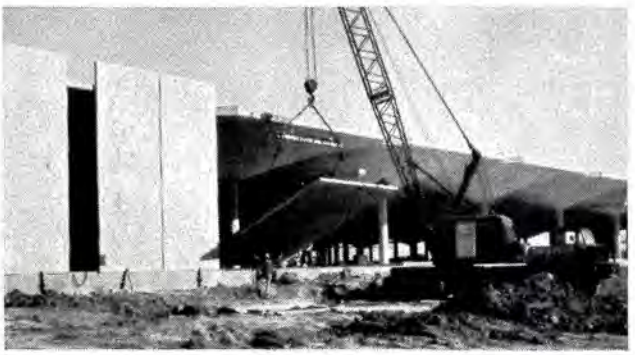


42-ft.-sq. column-free bays, required by Monarch for their many and varied production activities, provide a high degree of interior flexibility. Equipment and people can be freely shifted to accommodate new improved work flow patterns as they are developed. With the umbrella HP roof, 60-ft.-square bays are not uncommon.

Wall panels fabricated on plant floor

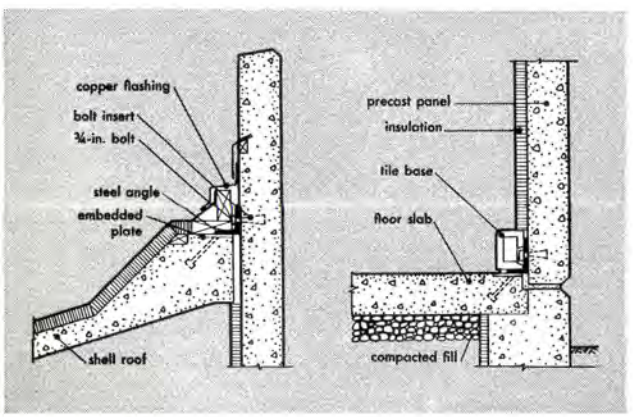
6-in. wall panels, each 26 ft. tall and 19 ft. wide, were conveniently cast right on the plant floor adjacent to their final positions in the wall. When tilted into place, the under side of the panel became the inside face of the wall. The top side, simply screeded and troweled, became the exterior face. 3,000 psi ready mixed concrete of the following mix proportions was used: Type I cement, 470 lb.; water, 240 lb.; sand, 1,465 lb.; ¾-in. aggregate, 1,921 lb.; entrained air, 5 percent.

Wall panels positioned at 4-a-day rate



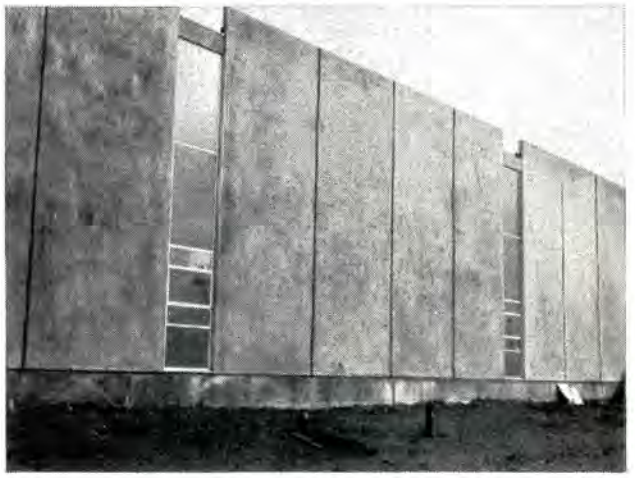
18-ton wall panels were tilted and positioned in as little as 2 hours each with a special telescoping steel strongback devised by the contractor. This was mounted to the panel's upper face and hooked to a crane. The strongback carried two removable jacks with wheels that reached beyond the inner (base) end of the panel, allowing it to roll outward as it was lifted. Once the panel cleared the roof, the wheels were dropped and the panel was turned 180 degrees and fitted to the wall.

Attachment of panels simplified



Panels were fastened to roof edge beams and the floor by bolting to steel angles which were welded to embedded metal plates. Inserts to receive ¾-in. bolts were incorporated into panels before casting. This made connections simple and expedient. And panels can easily be detached and relocated *whenever plant* expansion is called for.

Choice of concrete tilt-up walls based on numerous benefits provided



Tilt-up walls offered not only construction economy, but an efficient way to provide for future plant expansion. In addition, they permitted design harmony with the roof. Panel interiors have 1½-in. rigid insulation faced with cement-asbestos paneling. Exteriors are smooth-finished and painted white. Concrete's inherent resistance to fire, weather and abuse assures essential safety and low upkeep cost.

FREE—instructive booklets on design of HP shells and use of concrete for industrial buildings

"Elementary Analysis of Hyperbolic Paraboloid Shells," a concise 20-page design guide. "Concrete Profiles for Industry," a quick review of today's application of concrete to industrial buildings. To receive both booklets, just send the coupon, or mark the reader service inquiry card. For additional information, contact the PCA office nearest you.

Portland Cement Association
Dept. 2-8, 33 West Grand Ave., Chicago, Ill. 60610

Please send the PCA publications *"Elementary Analysis of Hyperbolic Paraboloid Shells"* and *"Concrete Profiles for Industry."* (U.S. and Canada only.)

NAME_____

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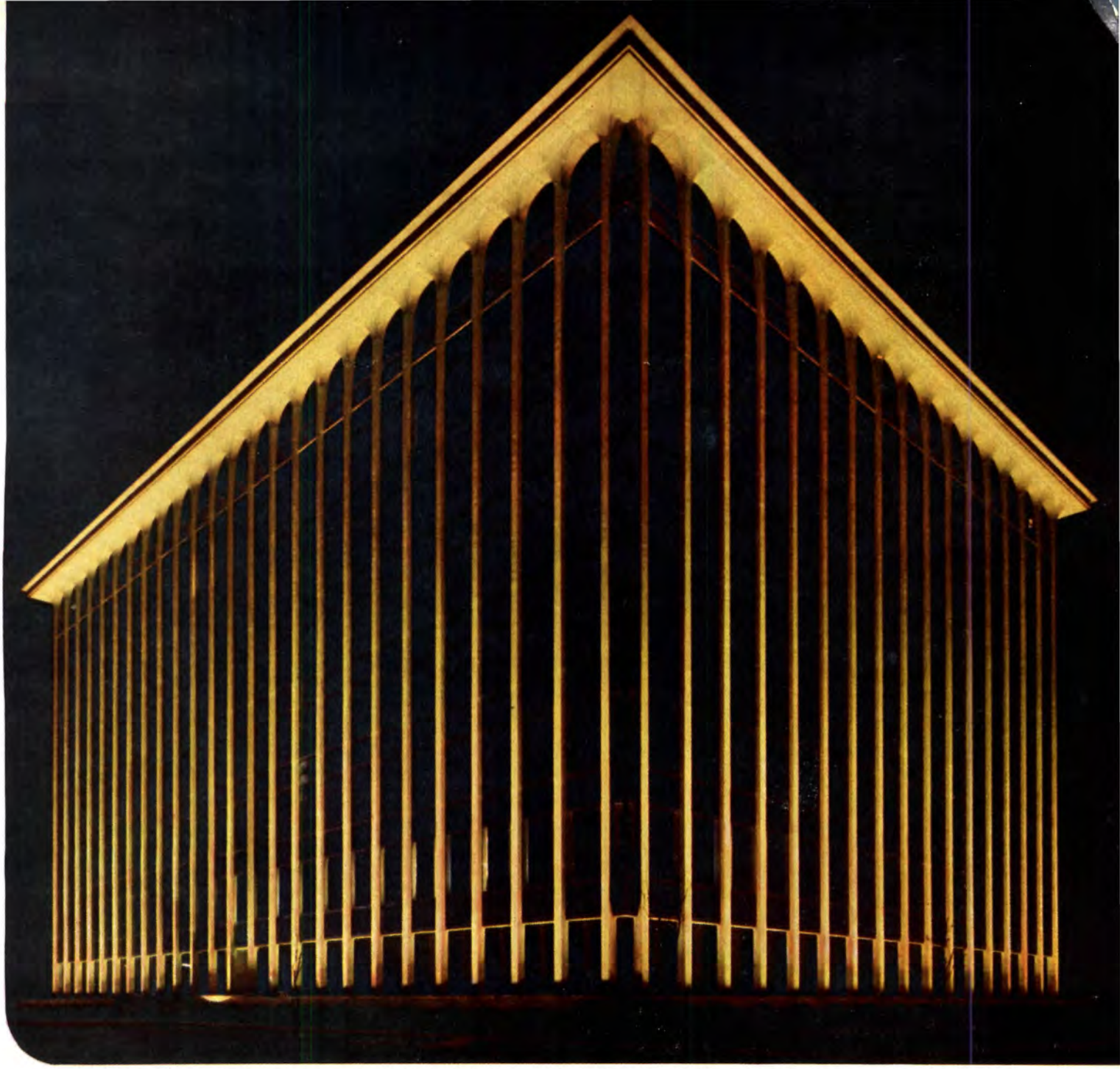
STREET_____

CITY_____ STATE_____ ZIP_____

PCA 1966 50th year

An organization of cement manufacturers to improve and extend the uses of portland cement and concrete

For more data, circle 11 on inquiry card



Empire Central Building, Dallas, Texas; architects: Neuhaus & Taylor, A.I.A., Houston; lighting: lighting designer John Watson, Dallas; electrical contractor; Harman Electric, Dallas.

another first in dramatic building lighting... Wide-Lite* floodlights with new Lucalox® lamps!

"Wide-Lite" SW floodlights with 400-watt "Lucalox" lamps add warmth and drama to the Empire Central Building in Dallas, and mark the first application of this intense new light source for illuminating the exterior of a major building.

When the building is fully occupied, the floodlighting system will be operated for less than 25 cents per hour—according to the local utility company.

The lighting designer used "Lucalox" lamps to create a "harvest moon" effect. He chose "Wide-Lite" fixtures because of their excellent beam patterns, efficiency and economy.

It's only natural that "Wide-Lite" floodlights were chosen for this pioneering job — Wide-Lite has always been first with highly efficient floodlights for the newest light sources. "Wide-Lite" units also were the first to be used for building floodlighting with 1000-watt Multi-Vapor® lamps (American General Insurance Company Building, Houston) and with 1000-watt Metalarc lamps (Fresno County Courthouse, Fresno, California).

For more information on the advantages of "Wide-Lite" floodlighting, contact your "Wide-Lite" representative, or write Wide-Lite Corporation, Dept. 24A-365, 4114 Gulf Freeway, Houston, Texas 77001.

WIDE-LITE

FLOODLIGHTS • *INDOOR LUMINAIRES* • BALLASTS
POLES • TRANSFORMERS

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A Division of Esquire, Inc.,
4114 Gulf Freeway, Houston, Texas 77001
Also manufactured in Australia, Belgium, Canada and Mexico
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BR_AKTHROUGH. *New Culligan automated electronic water softener*

New Culligan industrial Aqua-Sensor provides unlimited soft water, saves up to 36% on salt! Other automatic water softeners are recharged at pre-set times. But because industrial water usage varies, recharging can be too soon or too late. New Aqua-Sensor keeps pace with your water demands—never lets you run out of soft water, yet never recharges needlessly.

Fully Automated. Just as a thermostat detects the need for heat, Aqua-Sensor detects the need for soft water. No timer clocks to set, switches to flip, or buttons to push. Ever.

Unlimited Soft Water. When water usage or water hardness increases—no problem. You always get clear, filtered soft water.

Efficient, Economical. During periods of no water usage—no problem. Aqua-Sensor does not recharge. If the hardness of your water supply varies—same answer. Aqua-Sensor recharges only when needed.

Saves Salt, Saves Water. When a conventional automatic unit was replaced with our patented Aqua-Sensor, the actual salt consumption decreased from 3,900 lbs. to 2,510 lbs. And water needed for recharging was 6,720 gallons less.

How Aqua-Sensor Works. There are two sensors located at the bottom of the ion-exchange resin bed. When hard water reaches the upper sensor, the lower sensor is still immersed in softened water. The sensors electronically detect the difference and signal the solid-state controller. At the proper time, unit automatically recharges.

Lease or Buy. Comes in a full range of sizes, from 5 gpm to 600 gpm. Single and Duplex units. Available for outright purchase, or lease with option to buy. For your convenience, your Culligan Man offers automatic salt delivery service. All in all, the Aqua-Sensible thing to do is call and say—

Culligan Inc. and franchised dealers in U.S., Canada, Europe, Latin America, Asia, Australia • Home Office, Northbrook, Ill. • Franchises available.

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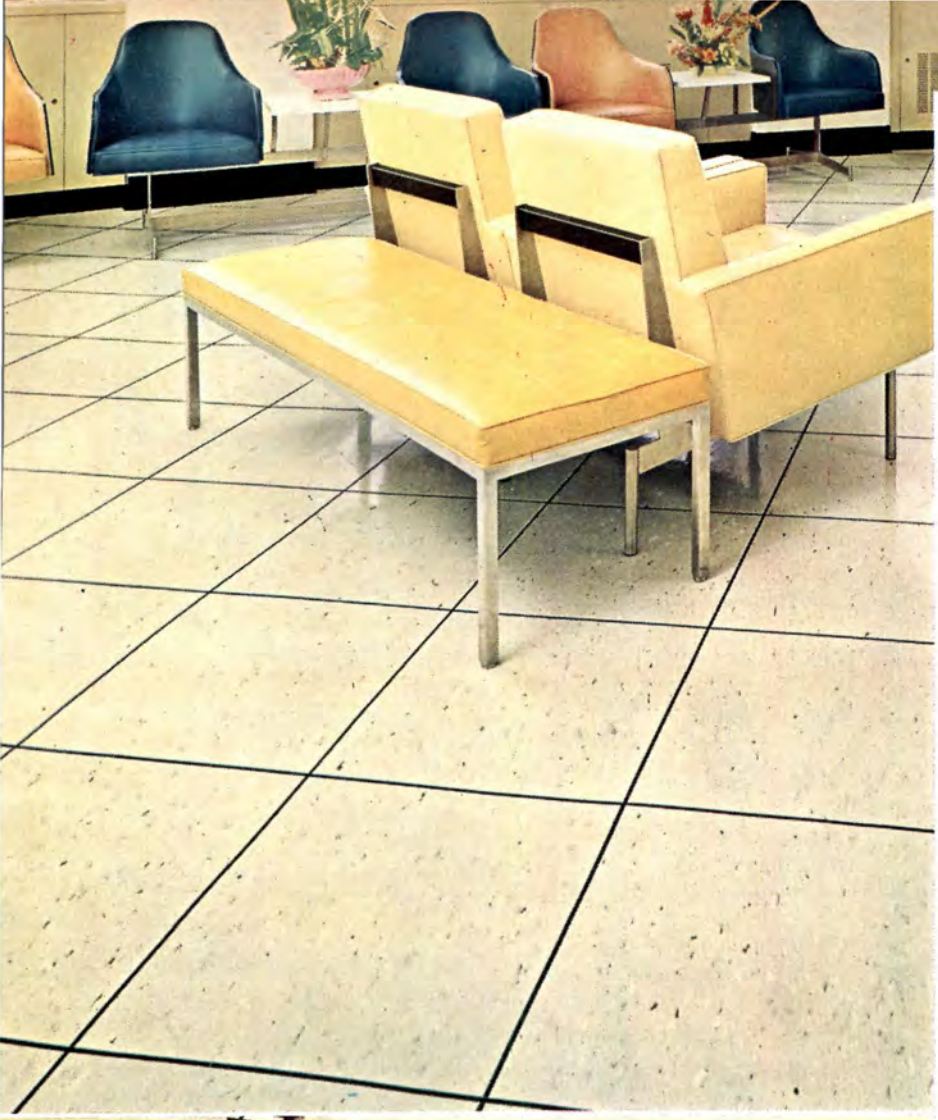


High style... Low maintenance! It's RUBEROID vinyl asbestos tile.

When easy upkeep as well as appearance counts, you'll find Ruberoid vinyl asbestos on the floor—pleasing patterns like *THRU CHIP* and *ROYAL STONEGLOW*. The rich marble veining won't wear off in unsightly traffic patterns. The design goes right down to the subfloor. The full ⅛" thickness helps conceal floor irregularities. Can be used throughout the building regardless of grade level.

It's resistant to institutional hazards... to impact pressures...to grease in food preparation...to stains in laboratories... to fading in glass-walled areas...to fire. Easy and economical to maintain.

If you are building or remodeling, specify Ruberoid vinyl asbestos. Ask your Ruberoid flooring dealer for samplers showing the entire Ruberoid line in architectural gauges. He'll give you the facts and figures on how to cut flooring costs. Want more information? Write Ruberoid at address below.

PATTERN WON'T WEAR OFF
Color Chips Go All The Way Through

The three milled down rings are, starting from outside ring, .025", .050", .075" deep.

RUBEROID®
FINE FLOORING
The RUBEROID Co., 733 Third Ave., New York, N.Y. 10017

(Above) Belle and Jack Linsky Pavilion
Beth Israel Hospital, New York, N. Y.
Flooring Contractor: Circle Floor Co., New York, N. Y.
General Contractor: Lasker-Goldman Corp., New York, N. Y.
Architect: Schuman & Lichtenstein, New York, N. Y.
Decorator: Michael Rabin, New York, N. Y.

(Below) Good Hope Intermediate School, Mechanicsburg, Pa.
Flooring Contractor: Bellwood Co., Inc., New Cumberland, Pa.
General Contractor: Reisinger Bros., Inc., Carlisle, Pa.
Architect: Bender Burrell Assoc., Camp Hill, Pa.

For more data, circle 14 on inquiry card

To reflect upon the familiar and breathe into it fresh ideas of color, of texture, even of form—this is the idea of KALCOLOR® aluminum. At Kaiser Aluminum, the idea is ideas.

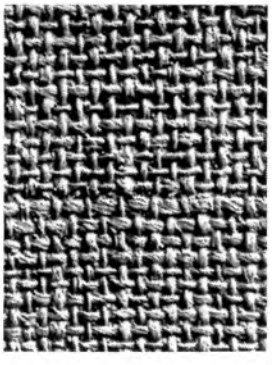
End bare wall blight.

Painting won't do it, but Koroseal vinyl wall covering will.

You can put new paint on a wall, but the blight always returns. Smudges. Scratches. Stains. Ruination.

Koroseal resists smudges, scratches, stains and all that. It's easy to wash. It doesn't chip, flake, yellow, fade, crumble.

Koroseal ends bare walls, too. Painted walls are bare walls. Dull walls. Koroseal dresses them up with textures that look like burlap, split cork bark, silk, linen, grass cloth, handwoven straw, tapestry, or others, plain or fancy.



It comes in 26 patterns, in 480 colors.

For more information on Koroseal wall covering, write B.F.Goodrich Consumer Products, Akron, Ohio 44308.

And begin the end of bare wall blight.

Koroseal—T. M. Reg. U.S. Pat. Off.

B.F.Goodrich

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For more data, circle 16 on inquiry card

Twice, because space-saving Duos can serve two students at one time. Yet, they extend only 16″ from the wall! And they're trim, colorful, attractive. So, progressive school planners use Duos throughout modern campuses: dormitories, labs, lounges, classrooms, as well as washrooms.

Foot-operated Bradleys are doubly sanitary, too: hands touch only a spray of clean, tempered water, never germ-laden faucets. And the bowl is automatically rinsed clean by the running spray. Result: Duos are also ideal for food handling areas and first aid rooms.

Finally, Duos save water and water heating costs, maintenance time, and installation costs.

Duos are available in a variety of beautiful colors and stainless steel. Insist on Bradley Duo Washfountains — they belong in modern schools!

For details, see your Bradley representative. And write for latest literature. Bradley Washfountain Co., 9107 Fountain Drive, Menomonee Falls, Wisconsin 53055.

Bradley

For more data, circle 17 on inquiry card

Jamison Food Service Doors match your brightest, cleanest, most sanitary interiors

Lightweight Jamolite® plastic doors offer modern, attractive appearance. Door in foreground is cooler door. Jamolite freezer door with Frostop® is in background.

Jamison FS double cooler and freezer doors in hotel kitchen are completely stainless clad for easy cleaning and bright appearance.

NSF APPROVAL

National Sanitation Foundation Testing Laboratory, Inc. has awarded seal of approval to Jamison Metal Clad and Jamolite Food Service Doors as meeting high public health standards.

In food service installations throughout the country, attractive Jamison doors are by far the leading specification. For better appearance, for easier operation and longer life, the top choice is Jamison! Write for catalog data to Jamison Cold Storage Door Co., Hagerstown, Md.

See-Thru plastic door for food service is transparent, lightweight and easy to operate. Door is acrylic plastic, 1″ thick.

JAMISON
COLD STORAGE DOORS

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One man operates the Honeywell Control Center that starts, stops, adjusts, reveals, alarms, monitors, analyzes, and checks almost everything in an industrial plant. Shown here: Two views of 57-acre Chrysler Corporation Sterling Stamping Plant, Detroit, Michigan. Architects and Engineers: Giffels and Rossetti, Inc., Detroit.

Now! Honeywell 1-man Control of your entire plant that pays a 33⅓% annual return

That's where the Honeywell automated environmental control story begins . . . operating cost savings that will pay for the installation in 3 years, and keep on paying for years to come.

One man at a Honeywell Control Center can, for instance, control all temperatures and humidities in an electronics plant . . . can efficiently operate rooftop fans in an automotive plant . . . can maintain precise humidity conditions necessary for fiber processing.

Without leaving his control console, one man can take temperature and humidity readings, reset all points, start and stop equipment, supervise alarm equipment, and follow through on complaints.

Why Honeywell? Only Honeywell offers 5 different systems to give clients what they need.

Only Honeywell offers microelectronic circuitry for longer life expectancy and greater reliability.

Only Honeywell maintains a field staff of Building Automation Systems Engineers to help you give clients full payback. And Honeywell has 112 offices around the country to insure 24-hour service should you need it.

In short, *only Honeywell can design, build, install, guarantee and service the complete system your client needs.*

Make us prove it. Ask for examples of operating economies in building projects like yours. Send coupon.

FREE BOOKLET!
☐ Send a copy of Building Automation Planning Guide.

☐ Have a Building Automation Systems Engineer call with examples of operating economies.

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Honeywell

automation systems help make people more productive

SO I CO ITROL

Crystal Plaza #5 . . . Builder: Charles E. Smith Construction Co., Wash., D.C. • Architects: Weihe, Black & Kerr • Acoustical Engineers: Polysonics • Glass and Glazing: Washington Plate Glass Co., Inc.

PROBLEM: Noise control from jet traffic at Washington National Airport and a nearby railroad for Crystal Plaza #5, an office building with 864 large windows.

SOLUTION: Polarpane Sound Control hermetically sealed windows with tinted glass and an acoustically designed separator.

COST FACTOR: Because of the high thermal insulating qualities of Polarpane construction and the shading factor of the tinted glass, the low cost of the acoustical windows can be recovered within five to seven years.

RESULT: Complete satisfaction with the quietness inside the office building.

APPLICATION: Polarpane has a complete range of high acoustical performance windows from 38 to 42 STC.

CONSULTATION: Write or call us about your sound control problems.

Polarpane®

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For more data, circle 19 on inquiry card

Sears at Richmond Mall, Cleveland, Ohio. **Architect:** Dalton-Dalton Associates, Cleveland. **General Contractor:** Wm. Passalacqua Builders, Inc., Cleveland. **Terrazzo Contractor:** O. A. Bertin Co., Cleveland. **Owner-Developer of Richmond Mall:** Edward J. DeBartolo Co., Youngstown.

The base for good business... terrazzo with MEDUSA WHITE

The main lower level floor in the busy Sears store at Richmond Mall, Cleveland, is beautiful, economical, long-lasting terrazzo . . . made with Medusa White as the matrix. The unduplicated whiteness of Medusa White, used white or tinted, sets off and enhances the marble chips of terrazzo for patterns and colors that never fade. Terrazzo's non-slip surface does not indent and requires little or no maintenance over the years. Ask your terrazzo contractor about Medusa White for colorful terrazzo or write P. O. Box 5668, Cleveland, Ohio 44101 for data.

MEDUSA PORTLAND CEMENT COMPANY

White & Gray Portland Cements • White, Gray & Custom Color Masonry Cements • ChemComp Shrinkage-Compensating Cement

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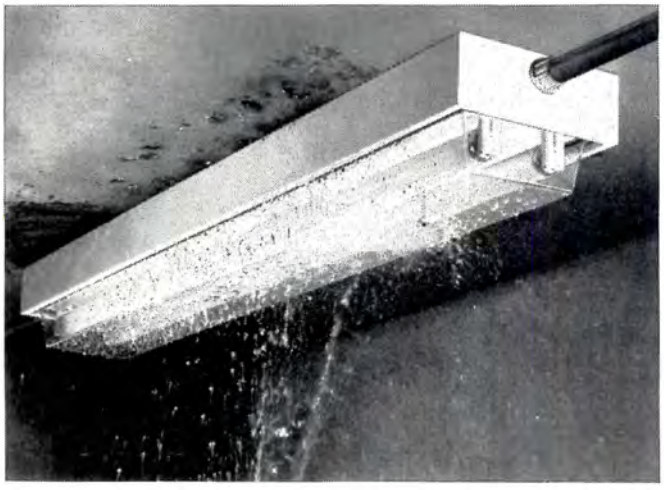
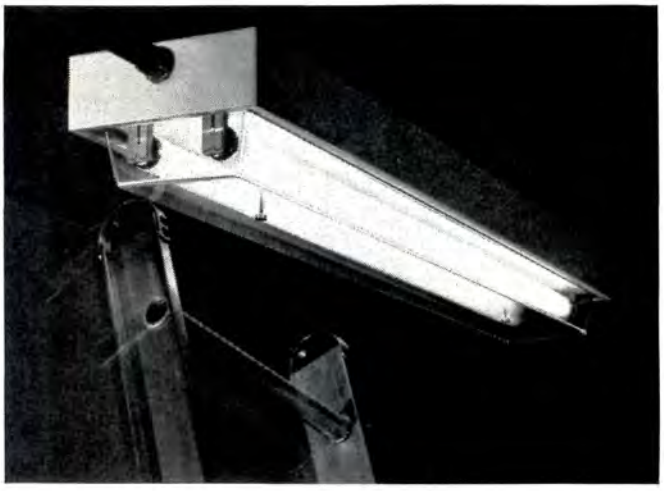
Wherever sanitation and safety is a must, use LPI's new EG Series fluorescent luminaires



Hose it

It's tightly sealed with a gasketed, heavy acrylic diffuser. EG Series has watertight aluminum threaded hubs at each end.

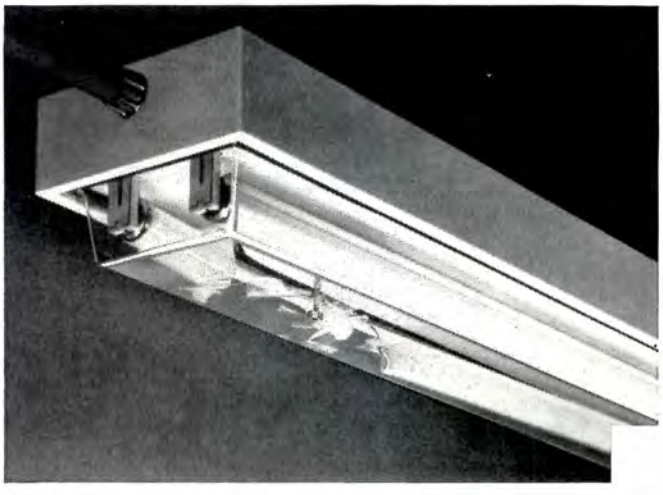


Bang it

Lamps are shielded against accidental breakage. Working area is protected from broken glass.

Expose it

Even outdoors, in covered areas, no bugs, dirt, or water can get to lamps or electrical components.



Trust it

Even if lamp breaks spontaneously, broken glass cannot get out to contaminate the working area.

UL listed for E. & G. (enclosed and gasketed) applications. Also available as M.R. (moisture resistant) luminaires. Lamped to meet your lighting needs. Ask your LPI representative, or write for complete information. LPI-6-215

LPI® FLUORESCENT LIGHTING

Lighting Products Inc., Highland Park, Illinois 60035

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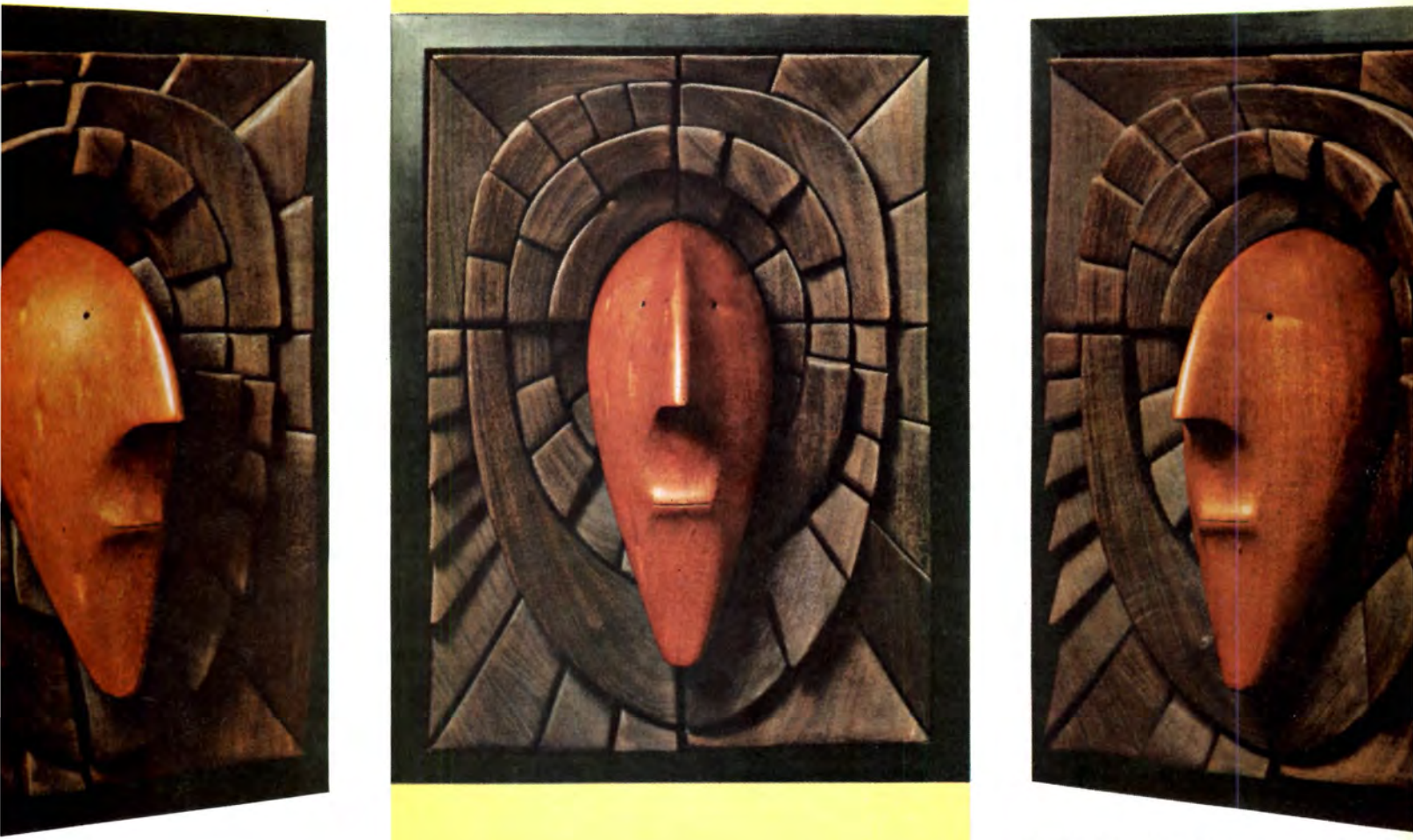

Savonarola by Robert Pierron—a sculptured wood relief from the private collection of WOODWORK CORPORATION OF AMERICA

FREEDOM TO CREATE IN WOOD... The promise of wood in the hands of a sensitive designer adds beauty to structure ... form to function ... feeling to flexibility. For more than two generations our single-source custom service has enabled architects and designers to unleash their total creativity on the wonderful warmth of wood. We invite you to think of wood as the medium ... freely ... unconcerned with construction and installation. We can produce it.

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ARCHITECTURAL WOODWORK:
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Custom Furniture • Merchandising Equipment

INDUSTRIAL WOODWORK:
Wood Components • Special Plywood

For modern luxury, nothing beats Acrilan.® Nothing

Acrilan acrylic has two kinds of luxury. The kind you see with your eyes and feel through the soles of your feet.

And the luxury of not having to be treated as if it were a tapestry. A carpet of Acrilan is made to retain its luxurious appearance in the face of repeated punishment.

It actually bounces back after being stepped on by thousands of feet. And it's simple to clean.

A carpet made with Acrilan® acrylic fiber in the pile is also mothproof. Mildewproof. Non-allergenic. You see, like all good modern things, Acrilan is functional as well as beautiful.

Which is the utmost in luxury for your client, isn't it?

Monsanto Textiles Division, New York, N.Y. 10001.

ACRILAN® acrylic fiber by Monsanto

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Classic-Aire

...THE MOST [MATIC FORCED-AIR HEATING DEVELOPMENT IN MORE THAN 50 YEARS!!

.....by Empire

Living Areas

Offices, Reception Areas

Recreation Rooms

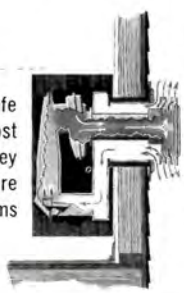
Classrooms

An Economical, Wall Mounted, Direct-Vent Gas Furnace with Baseboard Extensions for Peripheral and Multi-Room Heating...

Forced air gas heating has never been so easy to install, so economical, so flexible! New Classic-Aire offers complete adaptability with the use of open and closed face baseboard extensions in varying lengths to put heat where you want it. It's a bold new idea that permits thermostatically-controlled peripheral single or multi-room heating. Direct venting does away with vertical flu, duct work and expensive installation costs.

Nothing else does so many heating jobs so well and so economically in homes, apartments, offices, classrooms and multi-dwelling buildings. What's more, Classic-Aire's richly-handsome wood grain styled cabinet and baseboards add a tasteful decorator's touch to living areas. There's never been anything like it—until now!

Direct venting assures safe installation through most outside walls. No chimney or flu is needed. Secure outside vent cap conforms to building lines.



Gateway to the Best

Empire®

TO: Mr. Lee A. Brand
Empire Stove Co.
Belleville, Ill. 62222

Dear Lee:
You've got me interested. Now send me the full story on Classic-Aire including dimensions, specifications and performance data.

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COMPANY _____

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CITY _____ STATE _____ ZIP _____

VERSATILE BORDEN PRESSURE LOCKED GRATING

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

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

a free copy of
The 16-page Borden Grating Catalog

BORDEN METAL PRODUCTS CO.

MAIN OFFICE: 822 GREEN LANE, ELIZABETH, NEW JERSEY
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PLANTS AT: LEEDS, ALABAMA; UNION, NEW JERSEY; CONROE, TEXAS

When in New York City, see our exhibit at Architects Samples, 101 Park Avenue

Wallace Harrison will receive A.I.A.'s Gold Medal

Wallace K. Harrison, 71-year-old New York architect of the firm of Harrison & Abramovitz, has been named recipient of the 1967 Gold Medal, the highest honor bestowed by the American Institute of Architects. The Gold Medal, which is awarded for "most distinguished service to the profession of architecture or to the Institute," will be presented at the 99th A.I.A. convention to be held in New York City May 14-18. Mr. Harrison, who has been involved with such noted projects in New York as Rockefeller Center, the United Nations, and the Metropolitan Opera at Lincoln Center, will be cited for his "ability to lead a team in producing significant architectural works of high quality over a period of more than 30 years," and for "the highest order of architectural statesmanship."

The New York convention will have as its theme "The New Architect." In theme sessions on education, architectural practice, technology and design, the needs and challenges of the next 25 years will be evaluated to prepare the way for "the new architect." Other highlights of the convention will include the President's Reception to be held at the Metropolitan Museum of Art; a performance of the Royal Ballet at the Metropolitan Opera; an Architects-at-Home evening; and the annual banquet and investiture of new Fellows. Convention headquarters will be located at the New York Hilton Hotel.

National Council approves first architecture grants

The National Council on the Arts, Washing, D.C., established two years ago (April 1965, pages 346 and 350), has approved its first major grants in the fields of architecture, planning and design. The grants were announced during the seventh meeting of the Council on December 14 and 15. The grants included the following projects:

- Up to 50 individual grants of $750 each to undergraduate students in architecture, planning and landscape architecture for travel in the United States to see outstanding examples of American environmental design.
- A matching grant of $30,000 to the National Area Council of New York and the America the Beautiful Fund, Washington, D.C., to provide stipends for students of architecture to obtain practical experience through work in public agencies on significant public projects throughout the country.
- A matching grant of $10,000 to enable Tock's Island Regional Advisory Council (an intergovernmental conference of local, county and municipal governments) to hold a "design action conference" to discuss development of a new national park facility in the Pocono region of northeastern Pennsylvania.
- A matching grant of $10,000 to develop a design plan for the Little Calumet River Basin in Indiana which would serve as a prototype for other areas. The study will be made by the Lake Michigan Regional Planning Council.
- A study grant of $10,000 to Ronald Beckman of the Institute of Research and Design, Providence, Rhode Island, to improve highway sign graphics.
- An individual grant of up to $25,000 to Professor Ralph Knowles of the University of Southern California, to produce a manual on design based on his architectural course which deals with the effects of natural forces on three-dimensional forms.
- An individual grant of up to $25,000 to architect Carl Feiss of Washington, D.C., to produce a prototype for an American Guide Series of significant architecture, landscape architecture and planning, which will cover every state in the country.
- A joint grant, with the Graham Foundation for Advanced Studies in the Fine Arts in Chicago, of $25,000 for a two-year program under which G. E. Kidder Smith will prepare material on and photographs of American architecture, landscape architecture and planning. The material will be suitable for an exhibit as well as a book.
- A grant of up to $50,000 to appropriate groups on the Hawaiian Islands to develop design techniques as a means for preserving Hawaii's natural beauty.

M.I.T. names Lyndon to head Department of Architecture

The appointment of Donlyn Lyndon as head of the Department of Architecture at the Massachussets Institute of Technology has been announced by Lawrence B. Anderson, dean of the School of Architecture and Planning. Mr. Lyndon, 31 years old, is now head of the Department of Architecture at the University of Oregon. Mr. Lyndon attended Princeton University, receiving his B.A. degree in 1957 and a Master of Fine Arts degree in Architecture in 1959. He is one of the founders of the firm of Moore, Lyndon, Turnbull and Whitaker of Berkeley, California.

New York architecture firm observes 50th anniversary

Frederick G. Frost Jr. & Associates, Architects, of New York is observing its 50th anniversary this year. The firm was founded by the late Frederick G. Frost

in 1917. Today the firm, with a staff of 35, is headed by Frederick G. Frost Jr., with his son, A. Corwin Frost, as one of five associates.

Connecticut takes steps to improve highway esthetics

The Connecticut State Highway Department, in two separate actions, has started a program to achieve highway beautification throughout the state. In its first step the highway department has contracted with the architecture, landscape architecture, and engineering firm of Vollmer Associates to review road and bridge esthetics and to advise on conservation in connection with highway development. Objectives of the consultants will include preservation of the natural landscape and protection of natural resources and private property from highway and traffic incursions, particularly in park and recreation areas.

In its second action, the highway department has made a grant of $165,000 to the department of city planning at Yale University to undertake a two-year study of highway environment from an esthetic point of view. The study will be made under the direction of Professor Christopher Tunnard, who says the object will be "to learn more about the surroundings of highways with an eye to multi-purpose uses of highway land for recreation and other things besides travel."

A.I.A. names Codella to direct professional services

Frank L. Codella, an associate partner in the Cincinnati architectural and engineering firm of A. M. Kinney Associates, has been appointed administrator of the Department of Professional Services of the American Institute of Architects. Mr. Codella, in private practice since his graduation from Cornell University in 1949, succeeds Robert J. Piper, who will become co-ordinator of client services for the Perkins and Will Partnership.

Pevsner will receive R.I.B.A. Gold Medal

Art historian Dr. Nikolaus Pevsner will be presented the 1967 Royal Gold Medal for Architecture of the Royal Institute of British Architects. The award will be presented to Dr. Pevsner on June 20.

Applicants are sought for Rotch Travelling Scholarship

Applicants are being sought to select the 78th winner of the Rotch Travelling Scholarship, the stipend of which is in excess of $6,000. Those eligible must be American citizens under 31 years of age on March 9, "whose architectural record includes study or experience of required times and degree in Massachusetts". A detailed statement of eligibility requirements and application forms may be obtained before March 2 from: Walter E. Campbell, Secretary, Rotch Travelling Scholarship, 100 Boylston Street, Boston, Massachusetts 02116.

HUD names Urban Development Committee

Secretary Robert C. Weaver of the Department of Housing and Urban Development has announced the formation of a national committee to advise him in carrying out the new Model Cities and Metropolitan Development program and other related urban activities. The 17-member panel, to be known as the Urban Development Advisory Committee, will have as its chairman William L. Slayton, executive vice president of Urban America, Inc. The committee, composed of leaders in public and private affairs, includes only one architect—Roger Montgomery, of the Washington University School of Architecture, St. Louis, and Special Assistant on Design to Mr. Slayton when he was Commissioner of the Urban Renewal Administration.

Citizens' committee is planned for New Jersey at 19th A.I.A. conference on esthetic responsibility

"New Jersey, Garden State-Urban State," a one-day conference held at Princeton University in December under the sponsorship of the New Jersey Society of Architects and the Princeton University School of Architecture, brought together some 180 architects, planning officials, government and civic leaders "to discuss the past, present and future of New Jersey with emphasis on political, social, economic and environmental factors."

The New Jersey meeting was the most recent in a series of 19 conferences on esthetic responsibility held throughout the country in the last five years under the sponsorship of the American Institute of Architects. It was moderated by New York Architect Richard Snibbe, who was chairman of the first conference in 1962, a pilot project sponsored by the New York Chapter, A.I.A., and who, as a member of A.I.A.'s national Committee on Esthetics, has directed the efforts of the succeeding meetings.

Objective of the conferences is "to establish an atmosphere in which ugliness and bad planning are recognized and condemned, and the public will demand order and beauty," to create an awareness of and interest in the physical environment, and thus, according to Mr. Snibbe, "start a dialogue between the community and professionals." The conferences have become a major weapon in the Institute's "War on Community Ugliness."

The New Jersey conference, highlighted by the formation of a citizens' committee on environment, spent most of its time trying to define the massive problems confronting the state. Four major speakers and nine panelists, most of them architects and government officials, struggled with such problems as the lack of co-ordination among local, county, state and regional planning agencies, and the need for secondary education programs in the areas of design and environmental awareness. While such problems and their implications were discussed, they were never clearly defined and neither general nor specific proposals for solution were brought forth.

Even at so brief a conference, the prospects of effective communication would have been better if there had not been so complete a misapprehension of the planning process by the non-professionals among the conferees. The basic concept of planning as a vast inter-disciplinary effort among civic, government, educational, and planning officials was never separated from the concept of planning as a series of pretty pictures by social visionaries.

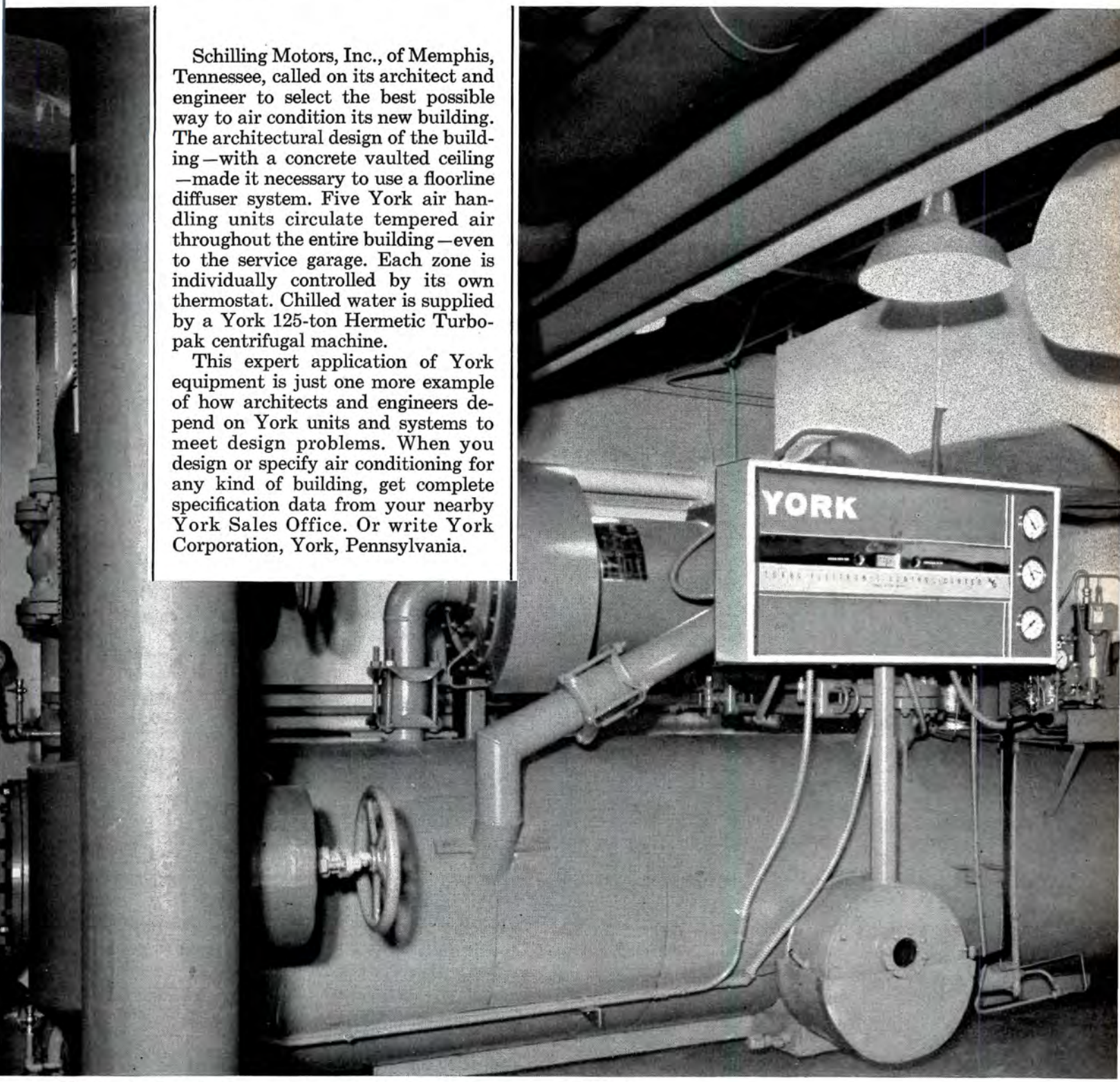
The positive result of the conference was the passage of a resolution which called for formation of a New Jersey Citizens Action Committee on Environment "whose field of interest shall be the total environment and the social and political structures affecting it. The Committee shall evaluate all plans or programs which would affect the State with respect to the environment and shall pass judgment and make recommendations on them to the pertinent people or agencies. It is further recommended that this committee search out possible improvements to the environment and take proper steps to put them into effect." Steps are now being taken to organize such a committee under the leadership of John Diehl, A.I.A.

more news on page 238

Yor__ air _____ioning _ rovi _____d m
f design for modern auto agency

Schilling Motors, Inc., of Memphis, Tennessee, called on its architect and engineer to select the best possible way to air condition its new building. The architectural design of the building—with a concrete vaulted ceiling—made it necessary to use a floorline diffuser system. Five York air handling units circulate tempered air throughout the entire building—even to the service garage. Each zone is individually controlled by its own thermostat. Chilled water is supplied by a York 125-ton Hermetic Turbopak centrifugal machine.

This expert application of York equipment is just one more example of how architects and engineers depend on York units and systems to meet design problems. When you design or specify air conditioning for any kind of building, get complete specification data from your nearby York Sales Office. Or write York Corporation, York, Pennsylvania.



Mechanical equipment room at Schilling Motors, Inc., Memphis, Tennessee. All water lines are color-coded and clearly marked. Thermometers and pressure gauges indicate readings at boiler and chiller as well as at each air unit. Basic system consists of a York Hermetic Turbopak of 125 tons capacity. Chilled water at 44° is circulated to five York central station air handling units, both single-zone and multi-zone. Architect, Roy P. Harrover and Associates; Mechanical Engineer, Office of Griffith C. Burr; Mechanical Contractor, George Wilson Company; General Contractor, M. C. White Construction Company.

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Twelve Concrete Techniques Work Together in This New College Building

The main entrance to the beautiful new concrete structure. (1) A system of concrete walks encircles the building. Some of them have exposed aggregate surfaces.

(2) Cast-in-place, post-tensioned entrance bridge takes advantage of the terrain. Bridge was cast integrally with the giant mushroom base. (3) Precast columns are used throughout the structure providing both interior and exterior architectural effects. Spandrel at top of building is also made of precast units.

• The new Center Campus Building of Fairfield University blends a wide variety of concrete techniques to produce a design of unusual interest. It shows how cast-in-place concrete combined with precast concrete can so easily conform to an architect's ideas. He is almost unlimited in his freedom of design.

Lehigh Cement was used in the ready mixed concrete for both precast and cast-in-place concrete. Precasting of wall panels, columns and miscellaneous units was done on the job site by The E & F Construction Company. With such a wide variety of construction techniques, uniform dependable quality of the ready mix was of vital importance. Coupled with the skill and ingenuity of the contractor, it permitted the rendering of a most unusual and interesting new structure. Lehigh Portland Cement Company, Allentown, Pa.

(4) Terrazzo floors add a note of luxury to interiors. (5) Concrete block walls with special exposed surfaces provide decorative effects throughout the structure. (6) Concrete block units are also used in partition walls throughout the building.

(8) West facade of building features sculptured, cast-in-place exterior walls. (9) Precast panels are used for walls above first floor levels.

(7) Cast-in-place beams over the recreation area of the building are post-tensioned.

(Concrete applications not shown in photos.) (10) Precast roof deck units. (11) Precast concrete fireplace chimney units. (12) Bushhammered texture on lower level exterior wall on east facade.

Owner:
Fairfield University, Fairfield, Conn.

Architect:
J. G. Phelan & Associates, Bridgeport, Conn./Robert H. Mutrux, Associate in charge

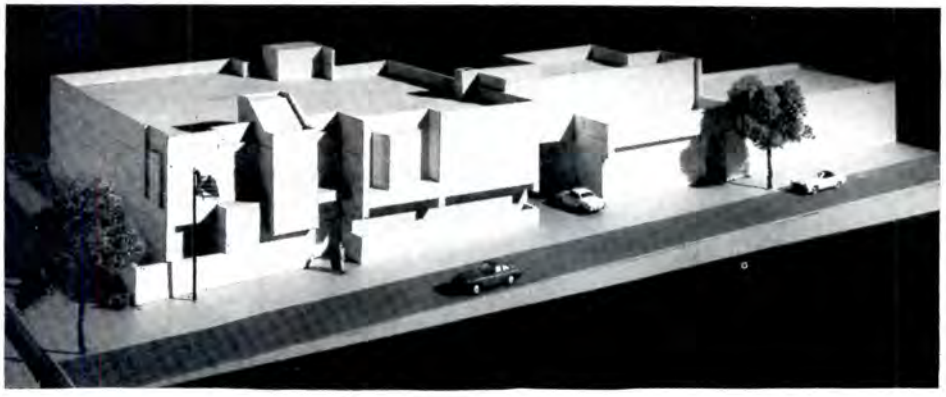
Contractor:
The E & F Construction Company, Bridgeport, Conn.

R/M:
Silliman Company, Bridgeport, Conn.

Concrete Block:
Milford Concrete Products, Inc., Milford, Conn.

LEHIGH CEMENTS

The 68th Police Precinct Station House, Brooklyn, New York, designed by Milton Frederick Kirchman, will be a two-story-high building containing precinct facilities and an emergency service wing housing auxiliary police facilities and lockers. The exterior will be faced with buff stone contrasting with matte speckled brick. "The structural system," says the architect, "is based on composite design, with lightweight concrete on metal deck and welded shear connectors to a structural steel frame for T-beam action." Consulting mechanical engineers for the project are Kaplun-Meyers-Goodman.



George Zimberg

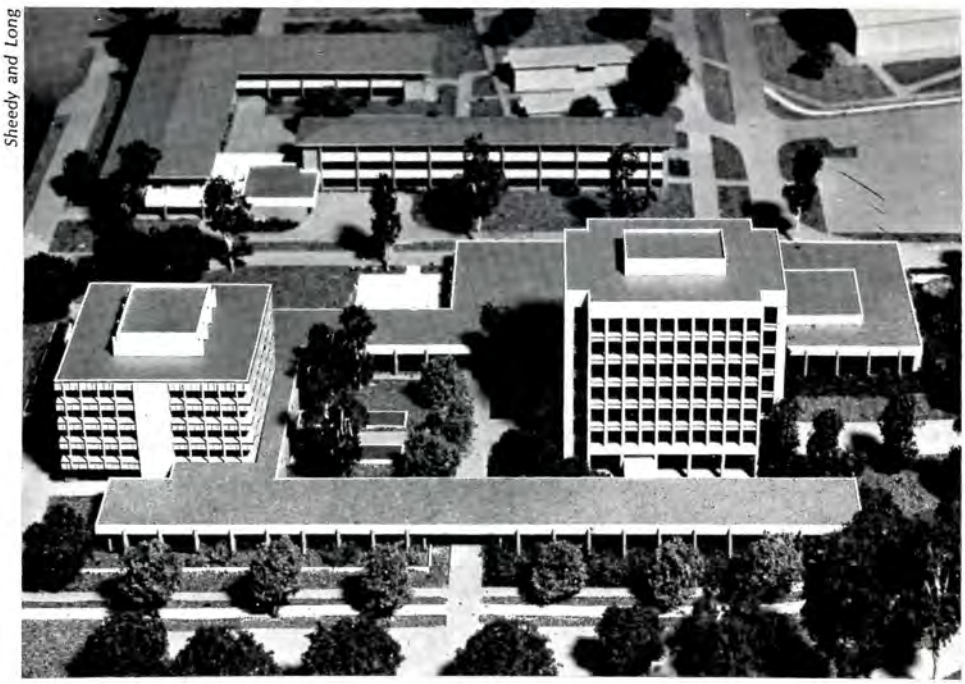
An academic center at the Cranwell School, Lenox, Massachusetts, designed by Peter McLaughlin, provides a main lecture hall and four large classrooms having a vaulted construction built up with a system of small hyperbolic paraboloid shells. The building will be constructed of reinforced concrete, exposed and painted on the interior, and bush-hammered on the exterior with infill panels of tan brick. The center will also contain nine smaller classrooms, seminar rooms, offices, teachers' room and faculty library, and a language laboratory. Mechanical facilities will be carried in four large towers at the front and rear elevations of the building.

Southwestern Oregon A.I.A. cites three buildings in annual awards program

Two high schools and a medical clinic have received merit awards in the annual awards program of the Southwestern Oregon chapter of The American Institute of Architects. Serving on the jury were architects Charles W. Moore, chairman of the Department of Architecture at Yale University; A. W. Bumgardner of the firm of A. O. Bumgardner A.I.A. and Partners, Seattle; and Norman Zimmer of the firm of Wolff, Zimmer, Gunsul, Frasca, Portland. Chairman of the awards program for the chapter was Jack Berry.

Merit Award: John F. Kennedy Junior High School, Eugene, Oregon. Architect: Wilmsen, Endicott & Unthank; structural engineer: William W. Wilson; mechanical and electrical engineer: Balzhiser & Colvin; landscape architect: Mitchell & McArthur; and general contractor: Vik Construction Company.

Sheedy and Long



Administration Unit 2 at the University of California, Santa Barbara, designed by Charles Luckman Associates, will be comprised of a main seven-story structure situated between two one-story wings and will surround a garden patio. Completing the complex is Administration Unit 1, at left in model photograph, also designed by Luckman, and finished in 1964. The new construction will add approximately 118,500 gross square feet to the complex. The new seven-story building will have four corner cutaways to provide eight corner offices on each floor. Windows will be protected from the sun by horizontal and vertical concrete projections.

A new campus for the University of Toledo's Community and Technical College, designed by Samborn, Steketee, Otis and Evans, will consist of six buildings connected by enclosed walkways. The $7.2-million complex will be located in Scott Park, which already contains recrational facilities. Focal point of the complex will be a four-story learning resources center which will contain a library, study rooms and faculty offices. Other units in the complex will be a classroom building, a basic science laboratory, an administration building, an engineering technology center, and a maintenance facility.

Hastings

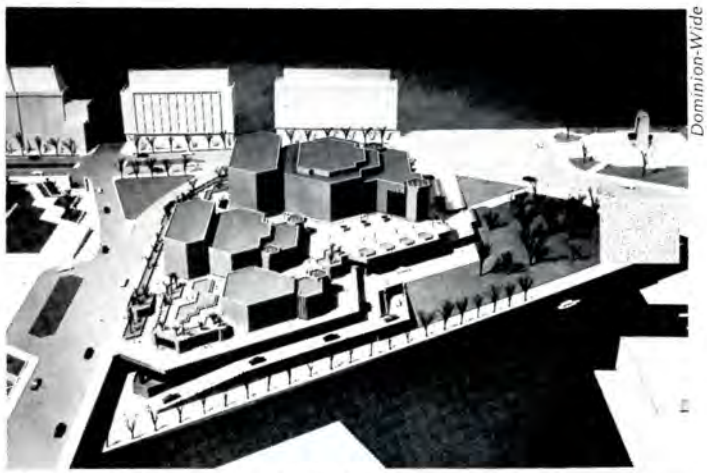
Merit Award: Medical office building, Albany, Oregon. Architect: Otto Poticha; general contractor: Ray Lillie & Son.

Robert Lindsay & Associates

Merit Award: Winston Churchill High School, Eugene. Architect: Lutes & Amundson; structural engineering consultant: Arthur M. James; mechanical-electrical engineer: Marquess & Yates; landscape architect: Mitchell & McArthur; contractor: Gale M. Roberts Co.

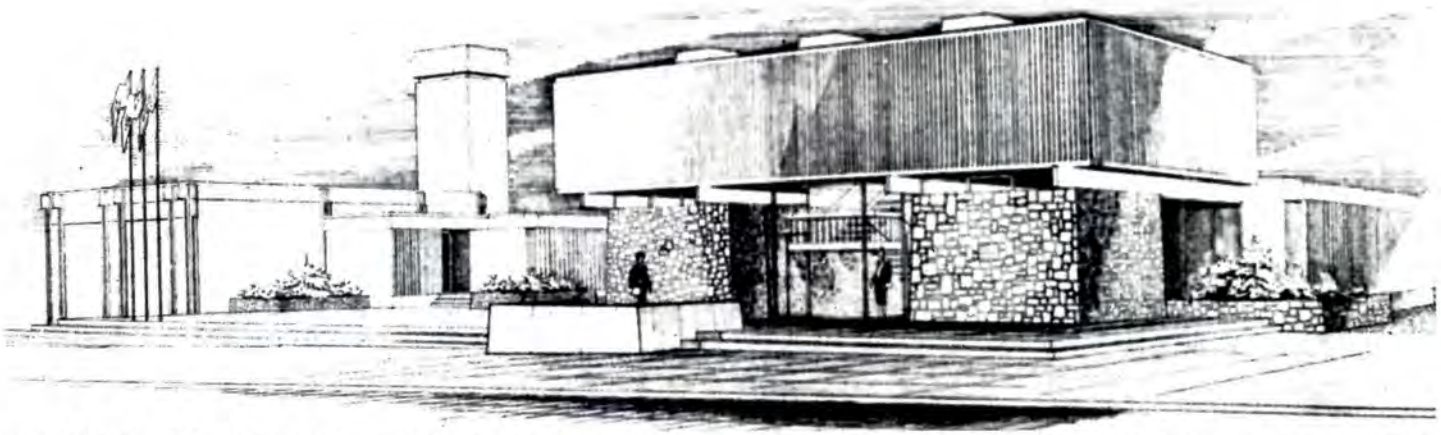
Mammoth building program marks observance of Canadian Centennial

Expo 67 is but one phase of Canada's observance of its centennial this year. The Canadian Centennial Commission, in two programs, is financing 2,271 projects with a total cost of $87,314,000 as permanent memorials to the Centennial of Confederation. The two programs are the Centennial Projects Program, which provides funds on a three-way cost-sharing basis for local projects, and the Confederation Memorial Program, which provides a grant to each province of $2.5 million or 50 per cent of the cost, whichever is lesser, for construction of a major project. The Northern territories will each receive $250,000. Shown here are some of the major projects of the Confederation Memorial Program.

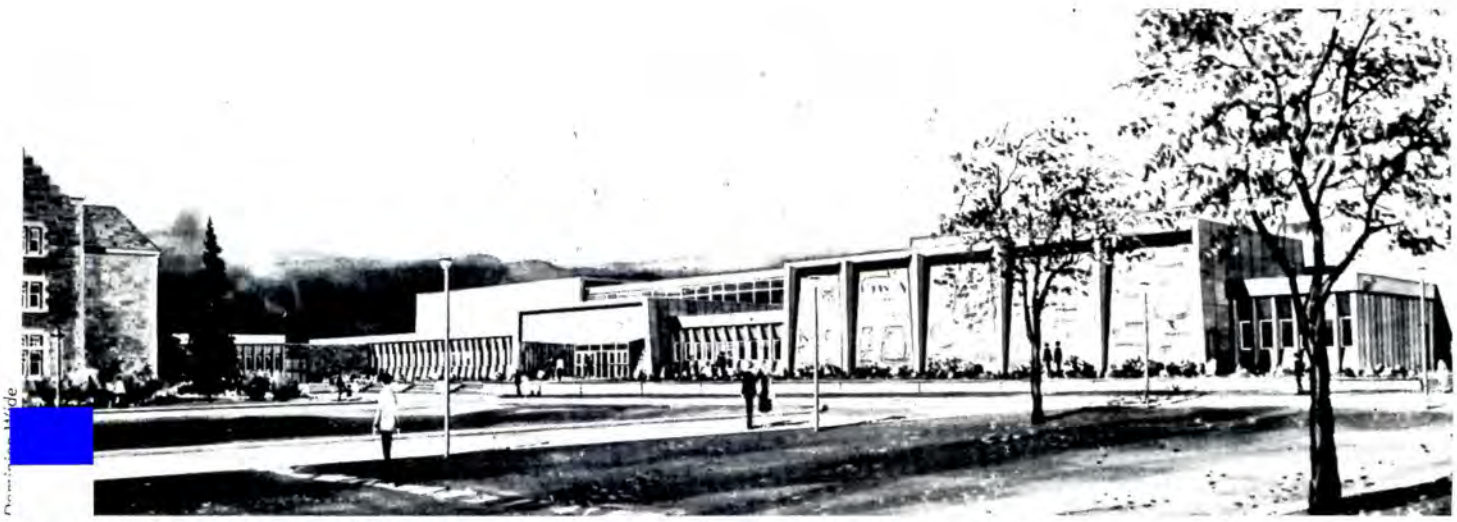


Dominion-Wide

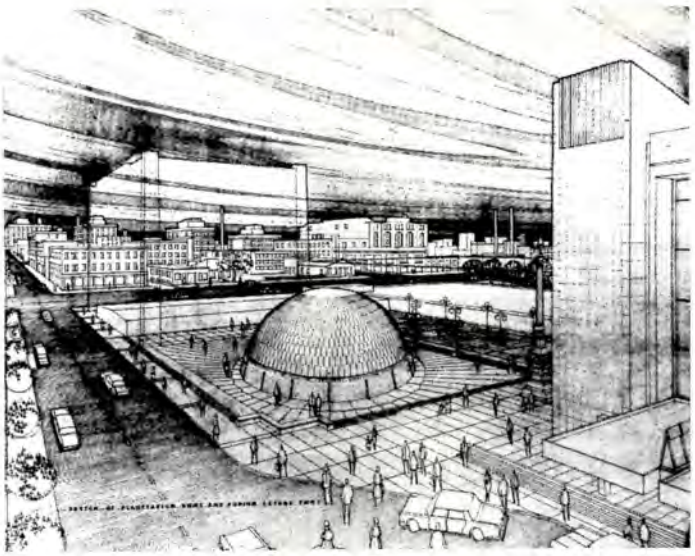
The Canadian Center for the Performing Arts, Ottawa, designed by Affleck, Desbarats, Dimakopoulos, Lebensold and Sise, will contain a 2,300-seat opera and concert hall, and theaters seating 300 and 850. (For a presentation of the design, see December, 1964, pages 130-31.)



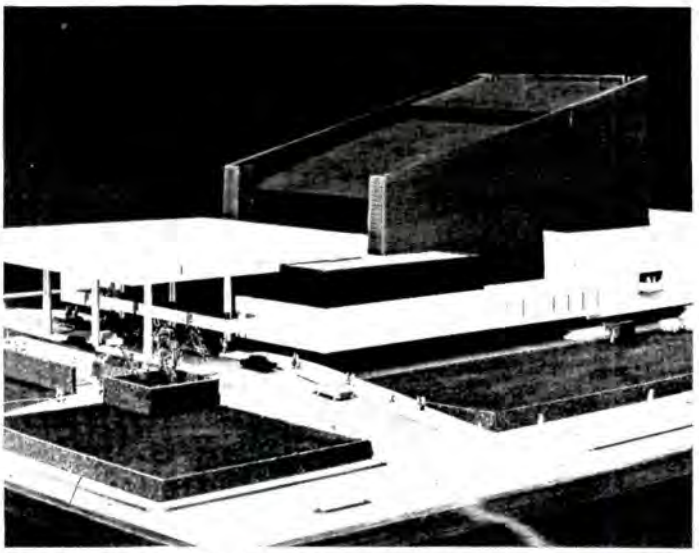
A civic block and fire hall, Whitehorse, Yukon Territory, designed by Howard and Robert Bouey, will contain council and committee rooms and civic offices. The $175,000 project will have as exterior materials local rock, cedar, plaster and stucco.



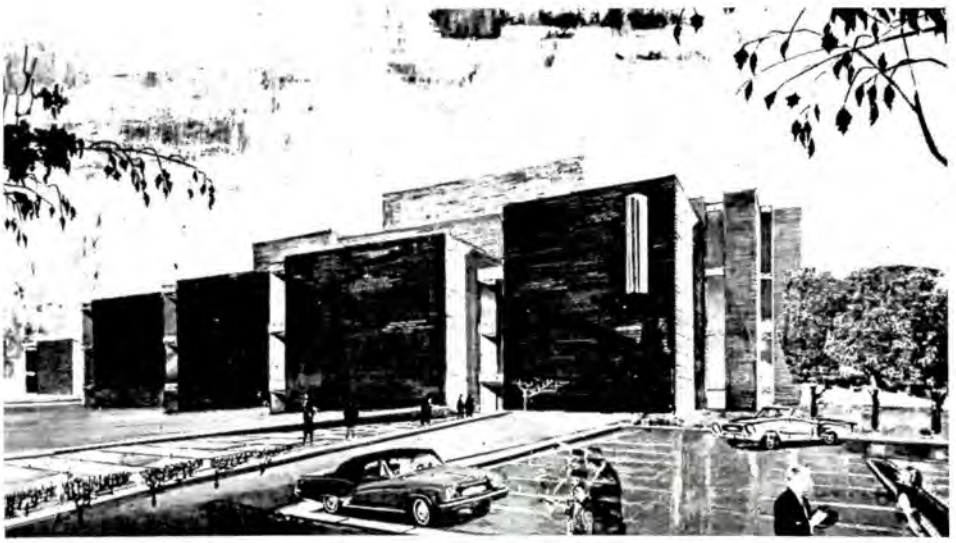
The Provincial Museum and Archives in Edmonton, Alberta, designed by architects in the Provincial Department of Public Works, will contain 200,000 square feet and will house display, production and public areas. The project will cost $5 million.



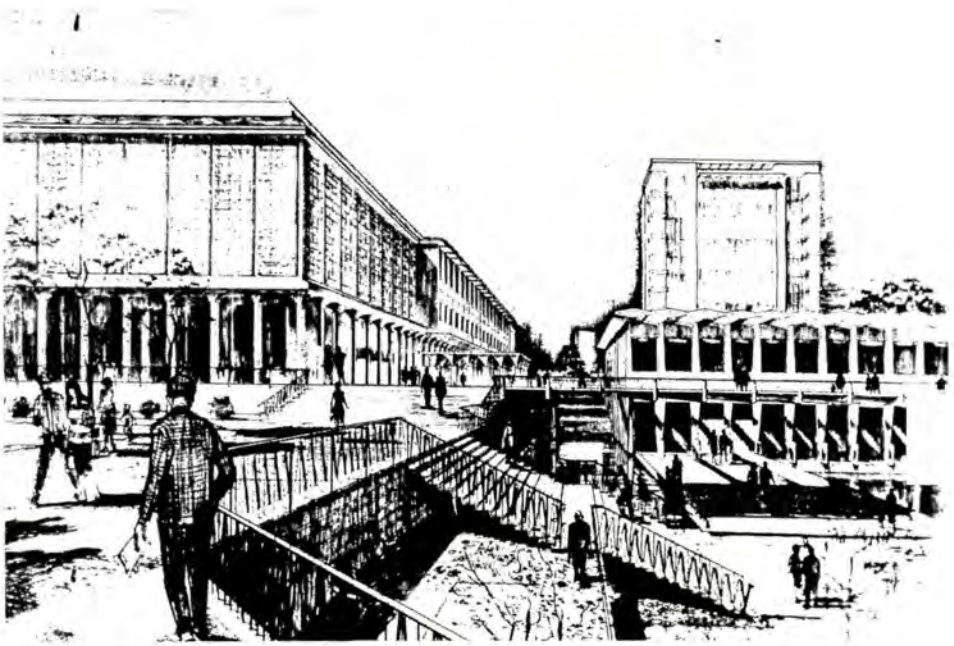
The $13.5-million Manitoba Arts Center, Winnipeg, designed by Green, Blankstein, Russell Associates, Moody, Moore and Partners, and Smith, Carter, Searle Associates, associated architects, will contain a 2,150-seat concert hall, planatarium, museum, and research building.



The Centennial Auditorium in Saskatoon, Saskatchewan, designed by Kerr and Cullingworth, is currently under construction and will cost approximately $5.12 million. The hall will seat 2,000, and is one of two auditoriums (the other in Regina) in this memorial project.



The Arts and Cultural Center, St. John's, Newfoundland, designed by Cummings and Campbell with Affleck, Desbarats, Dimakopoulos, Lebensold and Sise, associated architects, is a $5-million project containing a 1,000-seat theater, art gallery, public library and restaurant. Contractor is Newfoundland Engineering and Construction Company.



The Museum, Archives and Curatorial block for the British Columbia Provincial Government, Victoria, designed by architects in the Provincial Department of Public Works, will cost approximately $7 million, with completion set for later this year.

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On both accounts, studies indicated that the soundest choice was All-Electric design—with electricity as the single energy source for all needs, including heating and cooling.

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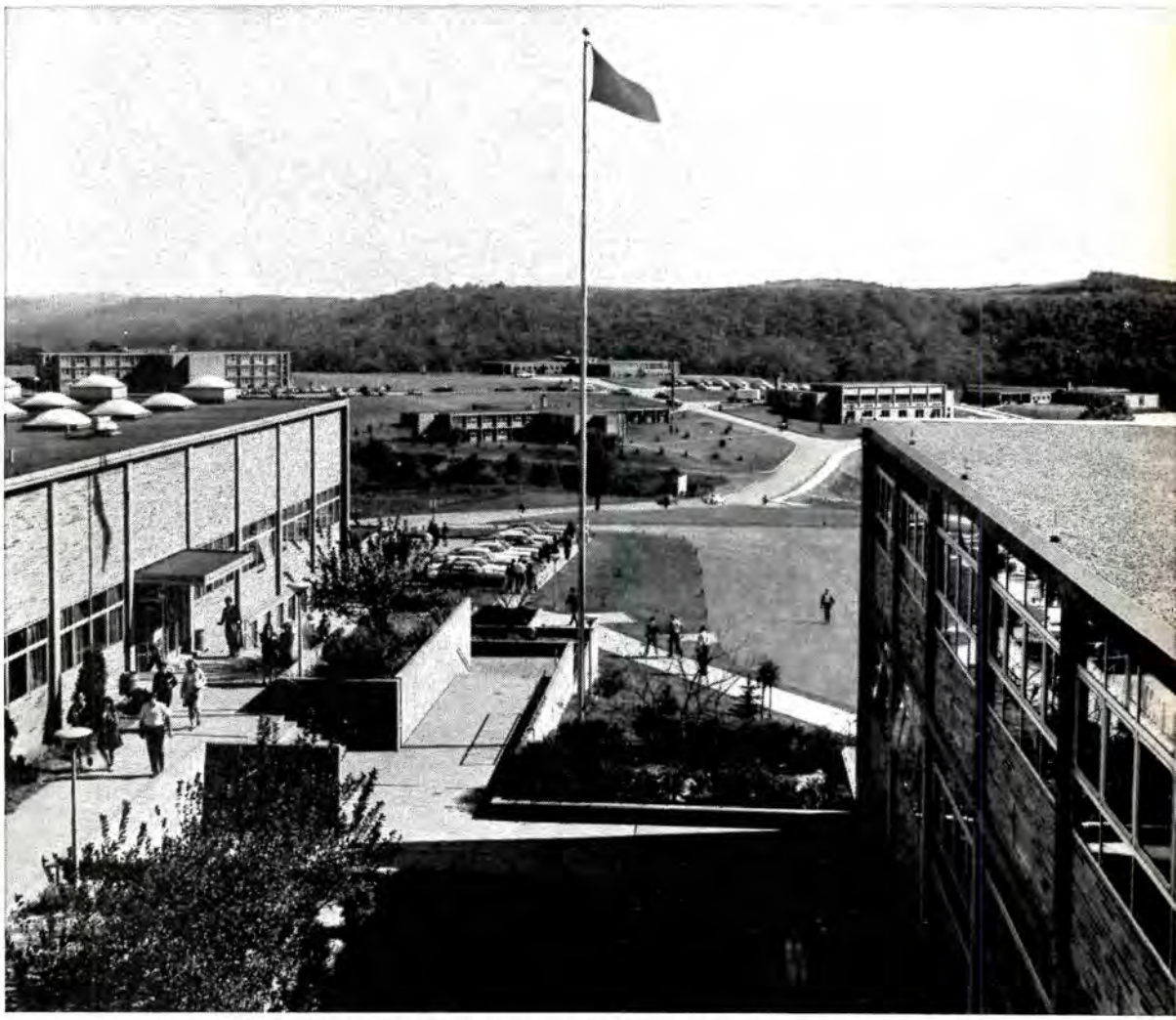
Now consider economy. All-Electric design precludes costly boiler rooms, chimneys, trenching, piping and fuel storage. Consequently, construction costs for both colleges were much lower than with flame-fired heating systems.

And annual cost of operation? Also much lower at both schools. Because electric heating permitted savings in maintenance, operation of equipment, repairs and other operating factors. At Steubenville, for example, estimated maintenance time

• **FLORIDA PRESBYTERIAN COLLEGE, ST. PETERSBURG, FLORIDA.** Enrollment: 811. Campus: 281 acres; 50 buildings. Cost: $11,000,000. Opened: 1960. Architects and engineers: Connell, Pierce, Garland & Friedman; Perkins & Will; Harvard & Jolly. • **THE COLLEGE OF STEUBENVILLE, STEUBENVILLE, OHIO.** Enrollment: 1,100. New campus: 50 acres, nine existing buildings (future will total 16). Cost of existing buildings: $5,000,000. Construction began: 1960. Architect: Joseph F. Bontempo. Engineer: Michael Baker, Jr.



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The colleges chose All-Electric design for other important considerations as well. Such as quality of study environment.

At Florida Presbyterian all buildings are air-conditioned to provide students and faculty with maximum environmental comfort throughout the year. At Steubenville all buildings incorporate provisions for future air-conditioning. In both cases, indications are that air-conditioning is considerably more economical with All-Electric design.

Another consideration was extra space. Because electric heating requires no bulky equipment, campus buildings gain extra space that can be used for classrooms, offices and dormitory rooms. (At Steubenville the space originally reserved for a boiler room is now the college book store.)

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LETTERS

Imitation of natural fruit flavor?

Your commentary on S.M.T.I. (RECORD, October 1966, page 149—just received here) is a striking analysis of an architect's work: you say that Mr. Rudolph is "interested" in Japanese architecture (i.e. joinery), in LeCorbusier's work (i.e. sections), in Louis Kahn's work (i.e. columns), in Mies' work (i.e. glazing), and in Baroque style (i.e. cornices).

So what is there left that Mr. Rudolph himself has contributed? To clarify this fascinating point, you then conclude that Mr. Rudolph "has synthesized these diverse elements into an original expressive vocabulary."

Does it not sound like that famous ad on chewing gum packages which proudly states that the gum embodies a genuine imitation of natural fruit flavor?

Prof. Jan Reiner, Head
Dept. of Architecture
Haile Selassie I University
Addis Ababa, Ethiopia

Apparently Professor Reiner feels that, if the comparisons made by the RECORD are possible, the building described is neither original nor valid. This attitude represents the orthodox functionalist view that the form of the building must arise entirely from the most literal aspects of the problem at hand. The idea that the architect is the medium through which the true nature of the building finds its expression is an excellent poetic description; the question is whether it isn't more than a little naive to take this description as a literal theory of artistic creation.

—J. B.

Gordon H. Schenck, Jr.

What's up front

We were pleased to see an article on the Southern Bell Telephone Company building in Canton by our firm featured in your November issue, but most upset to see a picture of the rear of the building used to illustrate the project. We are enclosing a print of the front of the building, the most interesting side.

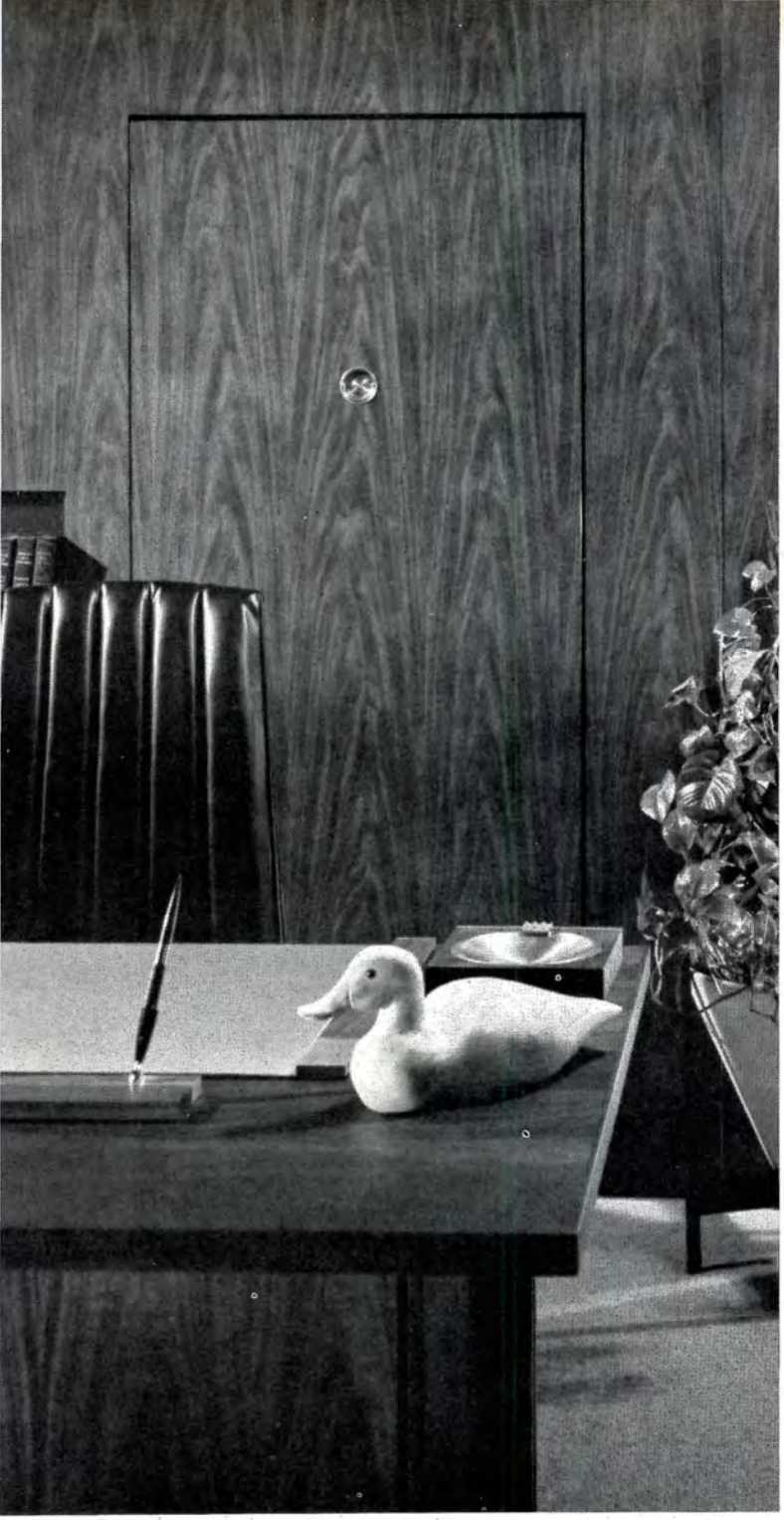
Stuart Baesel, A.I.A.
J. N. Pease Associates
Charlotte, North Carolina

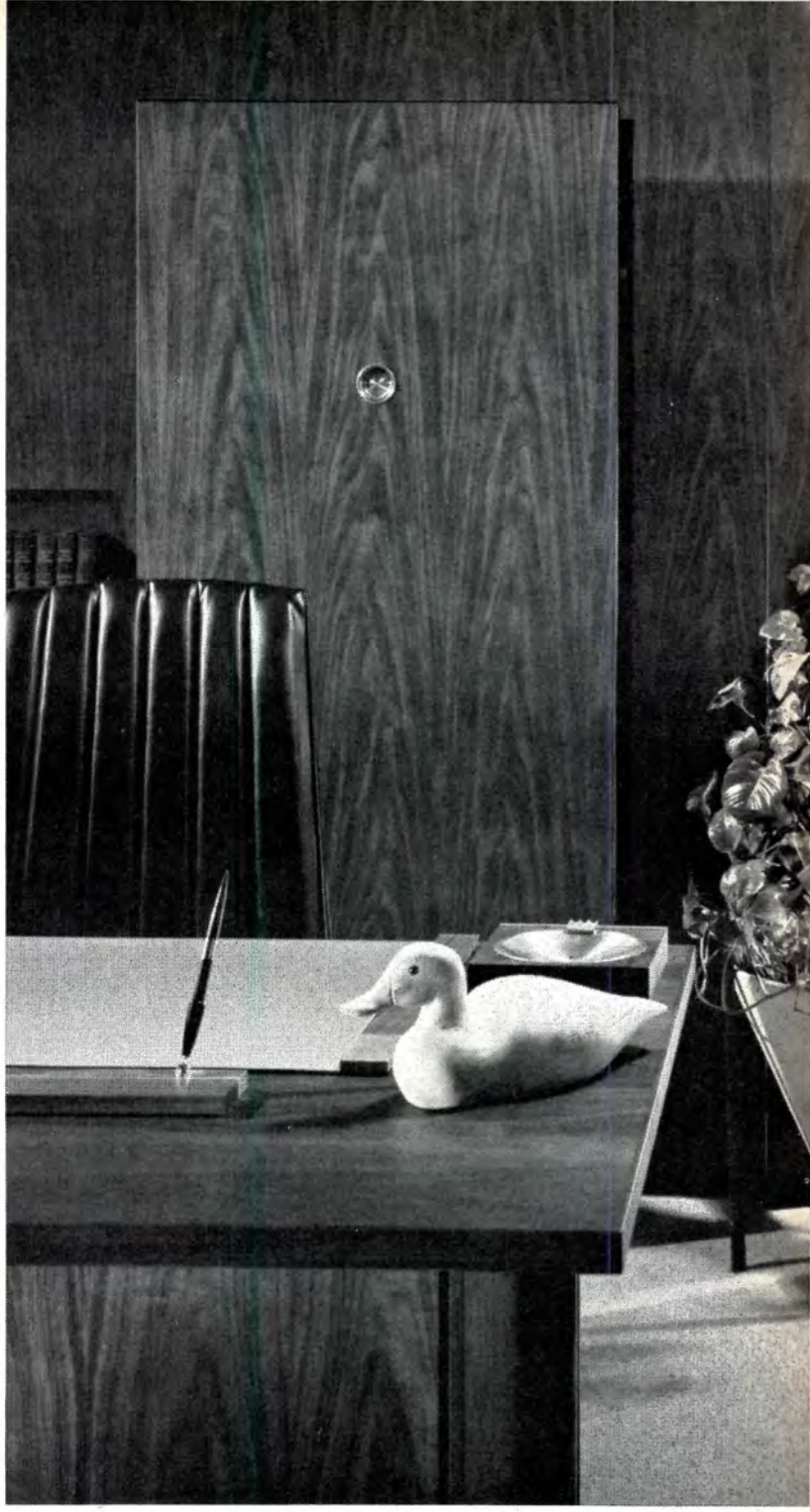
Architects and salesmen

Your editorial, "The Practical Pressures Pushing the Profession" in the October 1966 RECORD was of considerable interest to me. I agree with Mr. Hastings that there is too great a gap between theoretical engineering knowledge and applied engineering in the building field.

As acoustical consultants, Mr. Kodaras of New York City and I found that many of our clients lack the elemental knowledge of architectural acoustics required to properly understand the problem and evaluate different types of constructions. In our acoustical schools we attempt to bridge the gap between what is known in the laboratory and what should be known in the field. Over a period of a few years, we have had in our courses many of the leading manufacturers of building products having to do with architectural acoustics or mechanical equipment, as well as the distributors of such products. In addition, we occasionally have a few architects, such as Giffels and Rossetti of Detroit, with whom I occasionally consult.

more letters on page 53





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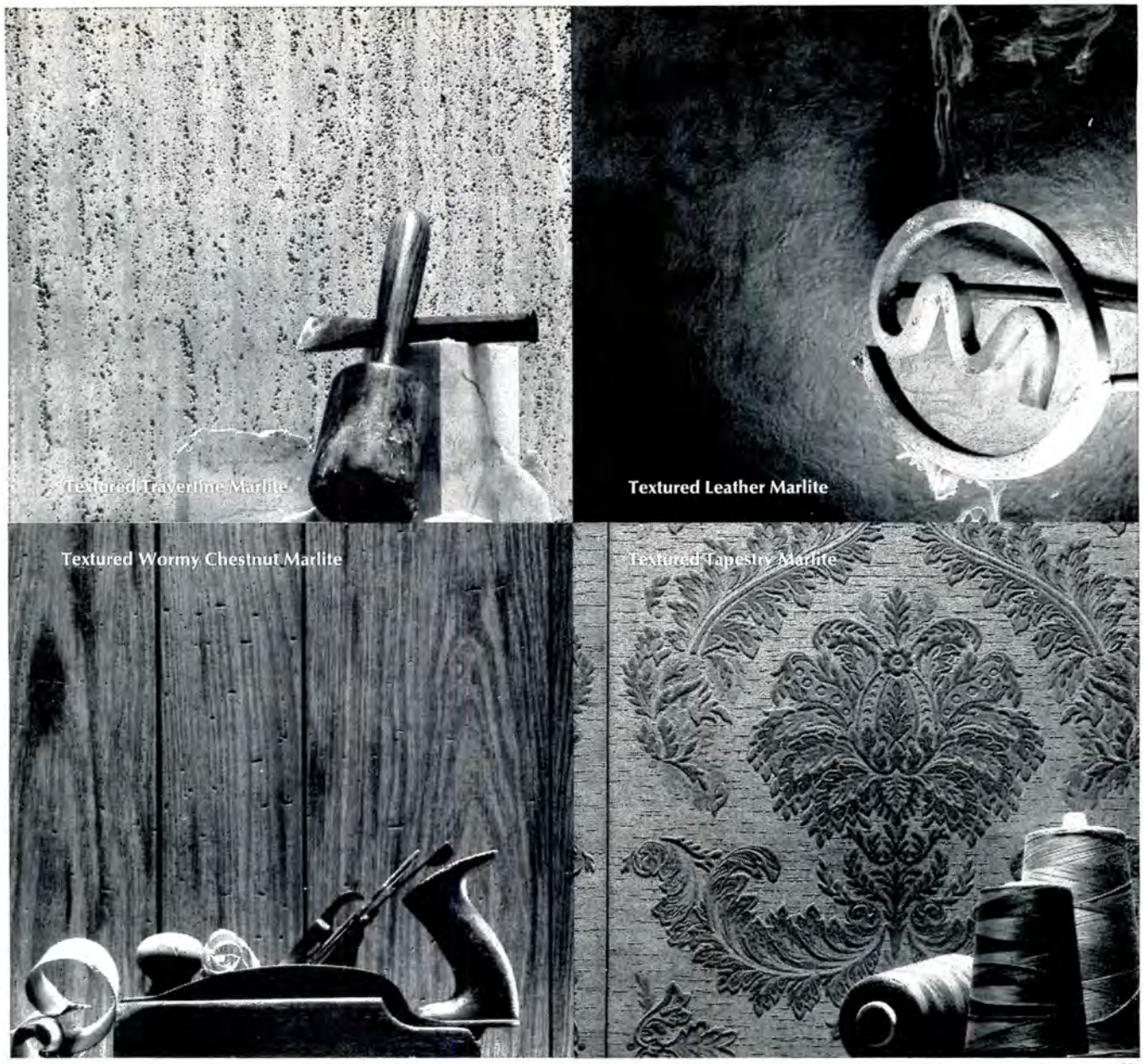

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continued from page 48

There is enough money being collected in some of the promotional funds of different industries that they could afford to teach salesmen and mechanics more about the products they are selling and installing. In the field of acoustics, for example, the average mechanic tends through his previous training to install products in the wrong way and lessen their acoustical effectiveness.

It would be good if architects would demand more in the way of basic training in the fundamentals of the building specialty manufacturers who send salesmen to contact the architect.

Robert Lindahl
Acoustical Consultant
Trenton, Michigan

Thanks—a millions

Forgive the delay in writing, but the entire office has been engaged in moving, so you can imagine the confusion.

Thank you for the December issue of RECORD including Wimberly, Whisenand, Allison & Tong's Pago Pago Intercontinental Hotel and the auditorium at Pago Pago. It has taken a long time on our part and yours to put these projects together, and we appreciate what you have done.

Thanks, too, for complimenting us on doing an $18-million hotel. Let's just hope Uncle Sam's Internal Revenue Service doesn't make us pay the difference in our fee on an actual $1.8-million project and an $18-million one. On the other hand, we'd like to have the difference. But we don't want to be million-dollar nit pickers, so we just say thanks again.

Hal Bock, Public Relations
Wimberly, Whisenand, Allison & Tong
Honolulu

RECORD regrets the monetary mistake (on page 107) and hopes it causes no ill effects.

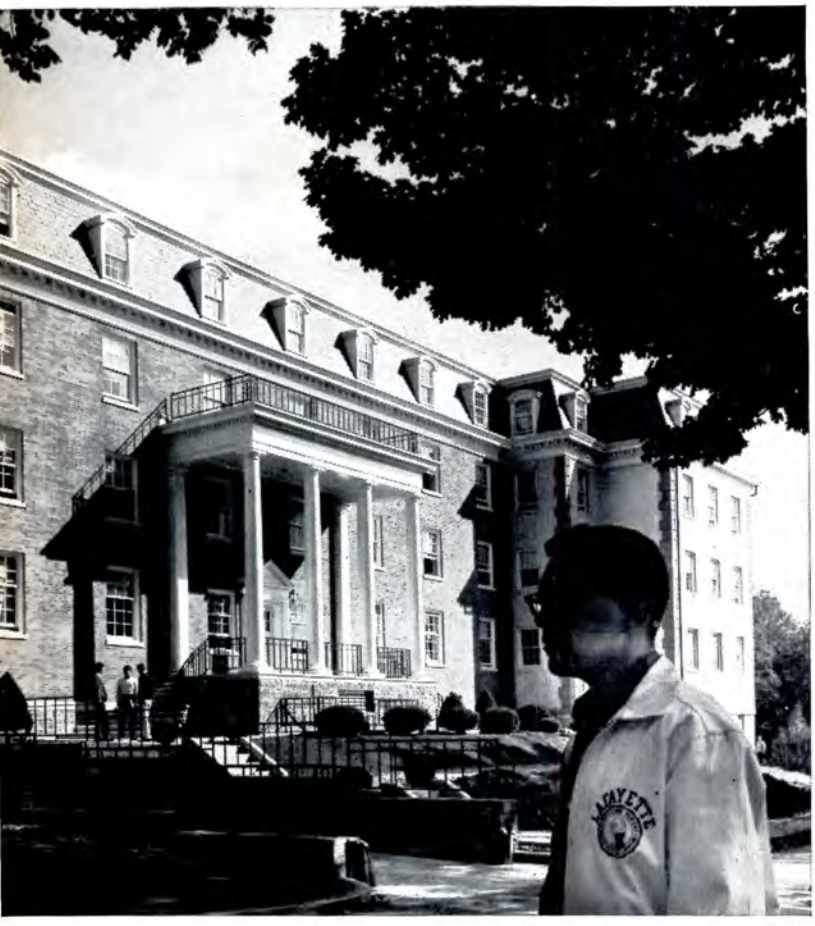
Credit where credit is due

Having played a role in planning the Medical Center, I read with interest "The far Pacific: a new frontier for architecture," December 1966. The article does not do justice to the problems nor to those whose original thinking developed solutions.

For this Medical Center, Governor H. Rex Lee engaged Dr. C. Earl Albrecht and me to determine the needs and to develop a plan to adjust these needs to the mores of the Samoan Islands and the Samoan people. That Governor Lee had

more letters on page 64

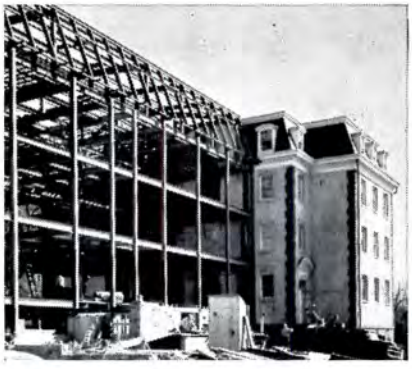
Structural Steel...



Architects: Everett Associates, Allentown, Pa.

Architects: Wilton Smith & Associates, San Francisco
Structural Engineers: Gilbert, Forsberg, Diekmann, Schmidt, San Francisco

Built a new "old" building...



South College is Lafayette's first building, dating back to 1833. After 130 years of service, the center portion was torn down and rebuilt, beginning with a new steel frame. And here it is today, new yet still "old" in its warm Colonial grace. Restoring or maintaining traditional architecture is easy with steel. Steel is so adaptable, so quickly erected, and so economical.

Changed a hillside to a hall...

Steel can tame a difficult site with ease. That's why San Francisco's College for Women was able to build a dormitory with 100,000 sq ft of floor space on an otherwise unusable location. The new building, including a prom room and assembly hall, connects to the existing Chapel via an enclosed steel bridge. Remember: most difficult building problems can be solved economically with steel.

Steel

Architects: Brown, Lawford and Forbes, New York; Warner Burns Toan Lunde, New York.
Structural Engineers: Severud-Perrone-Fischer-Sturm-Conlin-Bandel, New York

Created a column-free circular dining room...

In Middletown, Conn., Wesleyan University has built an attractive yet functional dining hall that is completely free of interior supporting columns. The radial steel roof beams meet in the center at a steel compression ring which frames a skylight. Along the periphery, the beams are supported by slender steel columns which frame the glass walls. Here indeed is a fine example of steel used to combine beauty with both economy and speedy construction.

Steel Offers Many Advantages: beauty and permanence . . . adaptability to traditional and contemporary architecture . . . shortened construction time . . . low initial building cost. Be sure your architect gives full consideration to the benefits of building in steel.

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See your Permalite representative, consult Sweet's or write for literature and samples. **GREFCO Inc./Building Products Division,** 333 North Michigan Ave., Chicago, Illinois 60601.

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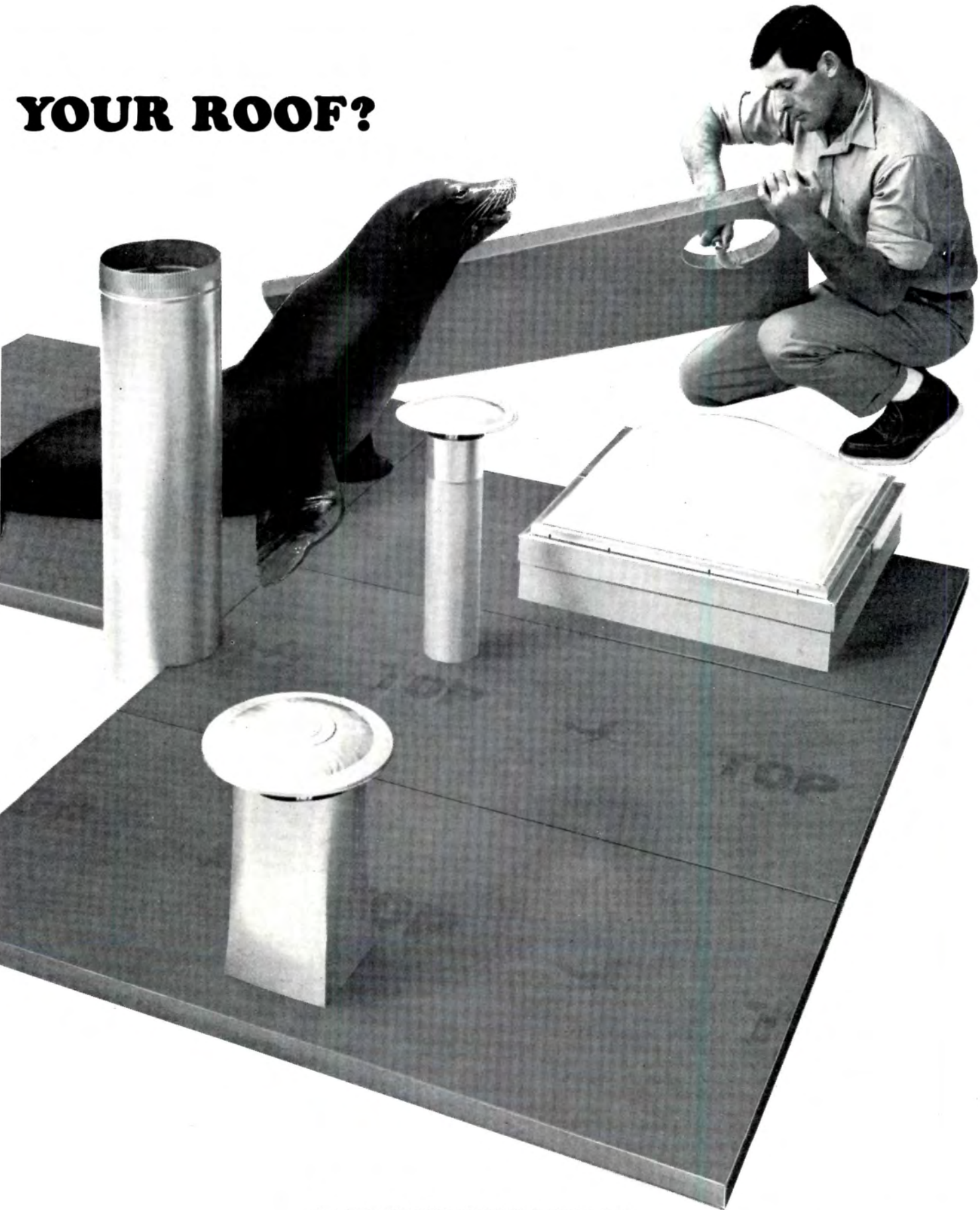

Seal photos taken at Marineland of the Pacific, Los Angeles.

Crane Chef Model 872
A complete compact kitchen. Includes gas or electric range with oven and broiler; sink; 8 cu. ft. self-defrosting refrigerator with 40 lb. freezer; storage compartment. Disposer optional.

Studio Efficiency Apartments
Model 872 (photo above). This complete kitchen is easily designed into any apartment decor and space requirement.

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Crane Chef Executive I enhances beauty and efficiency of any office. Luxurious real wood cabinet in popular finishes. Hinged top for console convenience.

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Model 554. Complete compact kitchen for tight space requirements of college dorms. Needs only 9 sq. ft. of floor space.

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40 all-new models to solve your space problems.

With a choice of 40 models, the all-new Crane Chef line gives you a flexibility of design and choice never before available in compact kitchens.

Look at design. New, clean, straight edge profiles are keyed to complement contemporary taste for attractive simplicity in decor. Choice of colors, white, wood grains, copper tones—or even luxurious real wood.

Look at space. Largest, *complete* kitchen needs only 15 sq. ft. of floor space. And Crane Chef gives it to you eight different ways—complete to refrigerator, freezer, range, oven/broiler, storage, sink and drainboard. Disposer available in most models—plus all kinds of other options.

Look at flexibility. If you're thinking smaller, choose from compact refrigerators or ranges—singly or in combination—with or without worktops or sinks. Ranges and ovens: either gas or electric.

Here's even more flexibility. If the various Crane Chef ideas shown here don't match yours—we'll help you with custom-designing.

The new Crane Chef line is the biggest innovation to hit compact kitchening in many and many a year. Get all the details now. Contact Crane Showrooms in New York, Chicago, or Los Angeles; distributors in most cities; or write Crane Co., 4100 South Kedzie Avenue, Chicago, Illinois 60632.

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Model 529-GS has gas or electric counter-top range, sink and built-in refrigerator with full-width freezer.

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Model 529 is an undercounter or free-standing refrigerator with full width freezer compartment.

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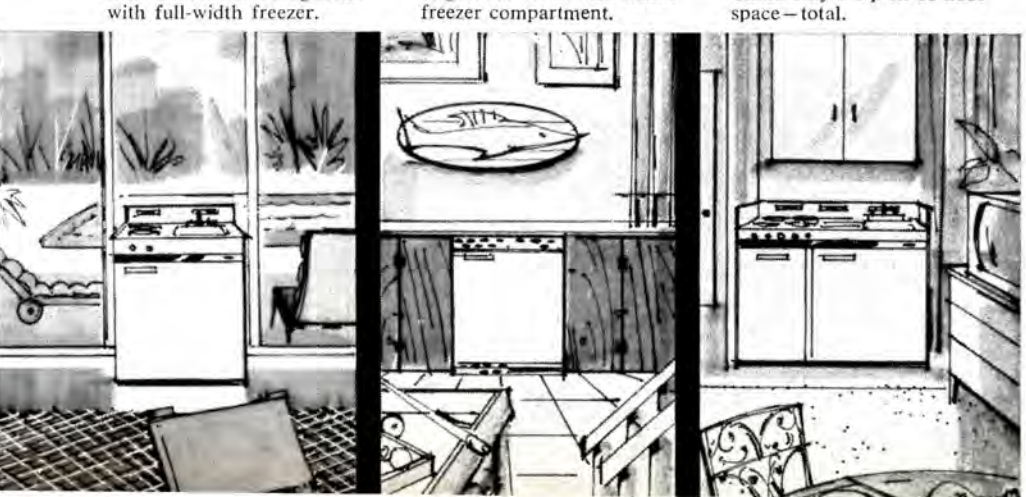
Model 548. This complete kitchen provides full utility where space is at a premium. Takes only 8 sq. ft. of floor space—total.



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Rush me a copy of your brochure on the all-new line of Crane Chef compact kitchens.

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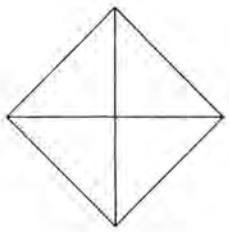
The formal generators of masonry structure:

The lozenge



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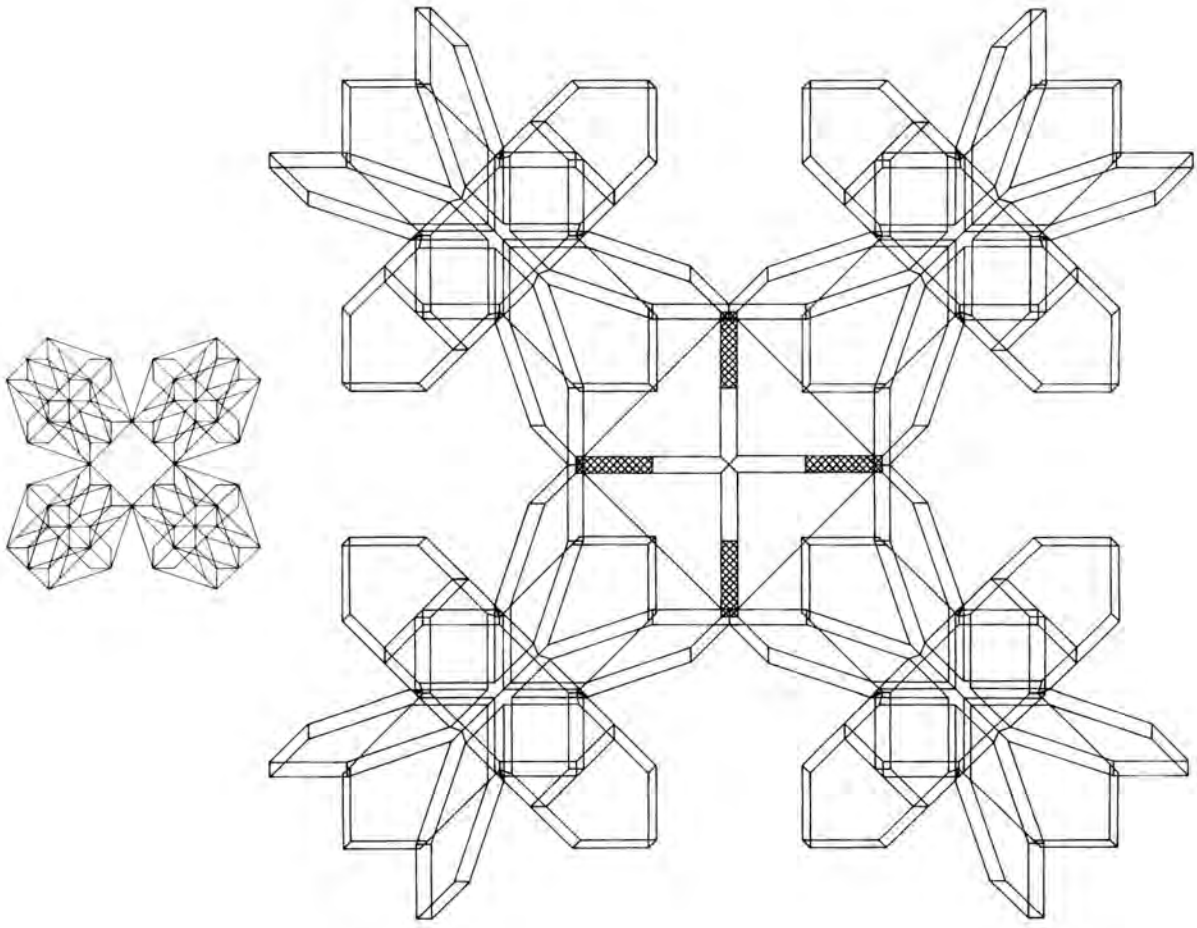
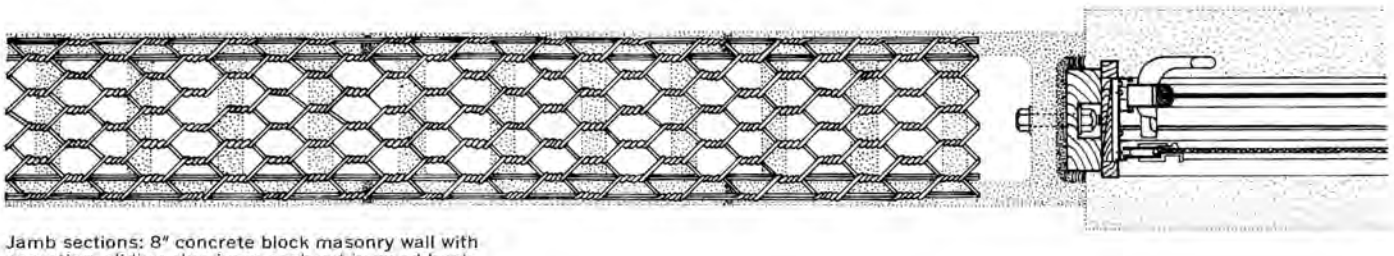
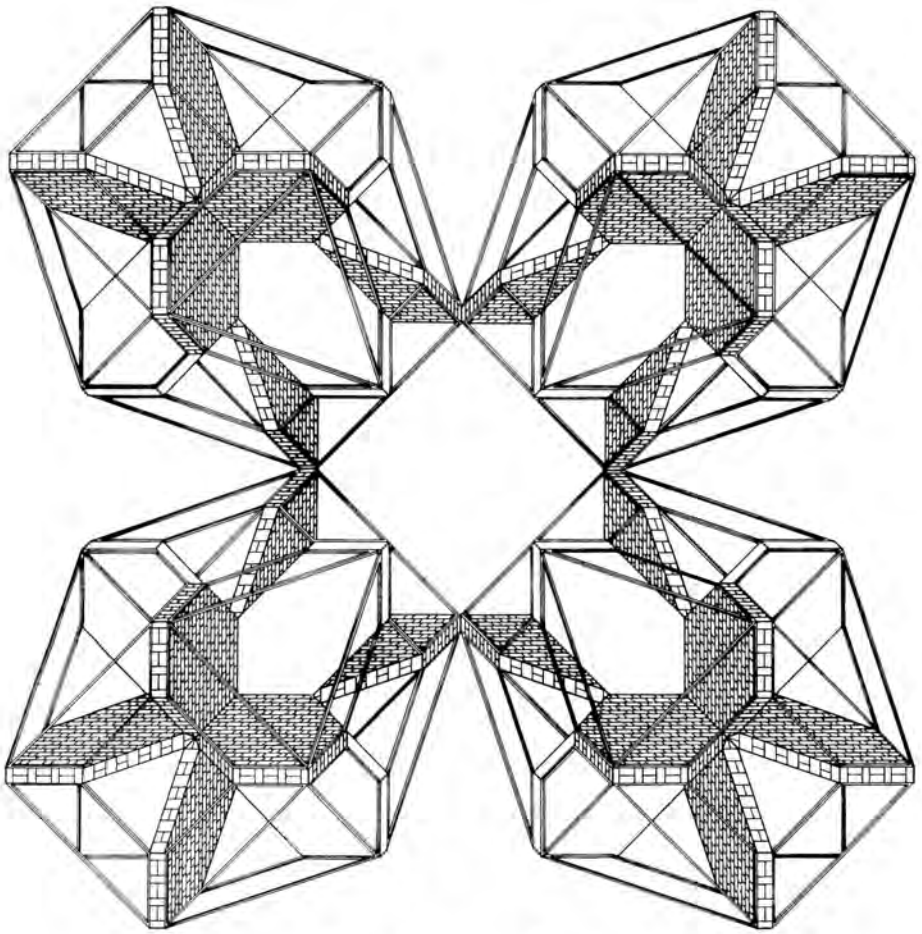


While this is not a true lozenge by dictionary definition, (a figure of four equal sides with two obtuse and two acute angles) it is the basic architectural form incorporating the use of the diagonal. Beginning with the two dimensional figure, architect Stanley Tigerman projects it from parti through floor plan to complete structure.

Throughout this series we shall continue to show how the basic orthogonal shapes of masonry construction — the square, lozenge, rectangle, pinwheel, cross and linked figure—can be developed and projected. We hope the drawings offered here will serve as both idea stimulators and time savers.



Jamb sections: 8" concrete block masonry wall with operating, sliding aluminum sash set in wood buck.



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As you may have guessed, we have an ulterior motive. We make two products, roll-type and rod-type Keywall® masonry reinforcement, that can help you improve the usage and quality of masonry construction. We'd like you to use them, so we make it easy by including them in the details shown below.

This structure—with the details drawn to 3″ = 1′0″ for easy tracing—is reproduced on convenient 8½ x 11″ sheets. To receive the entire series, write:

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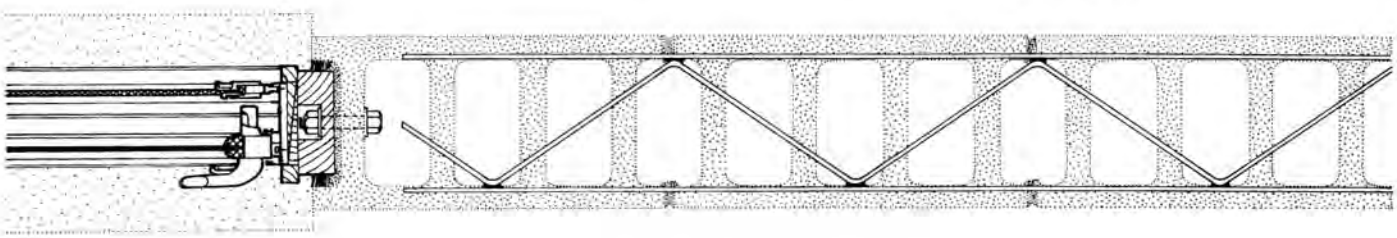
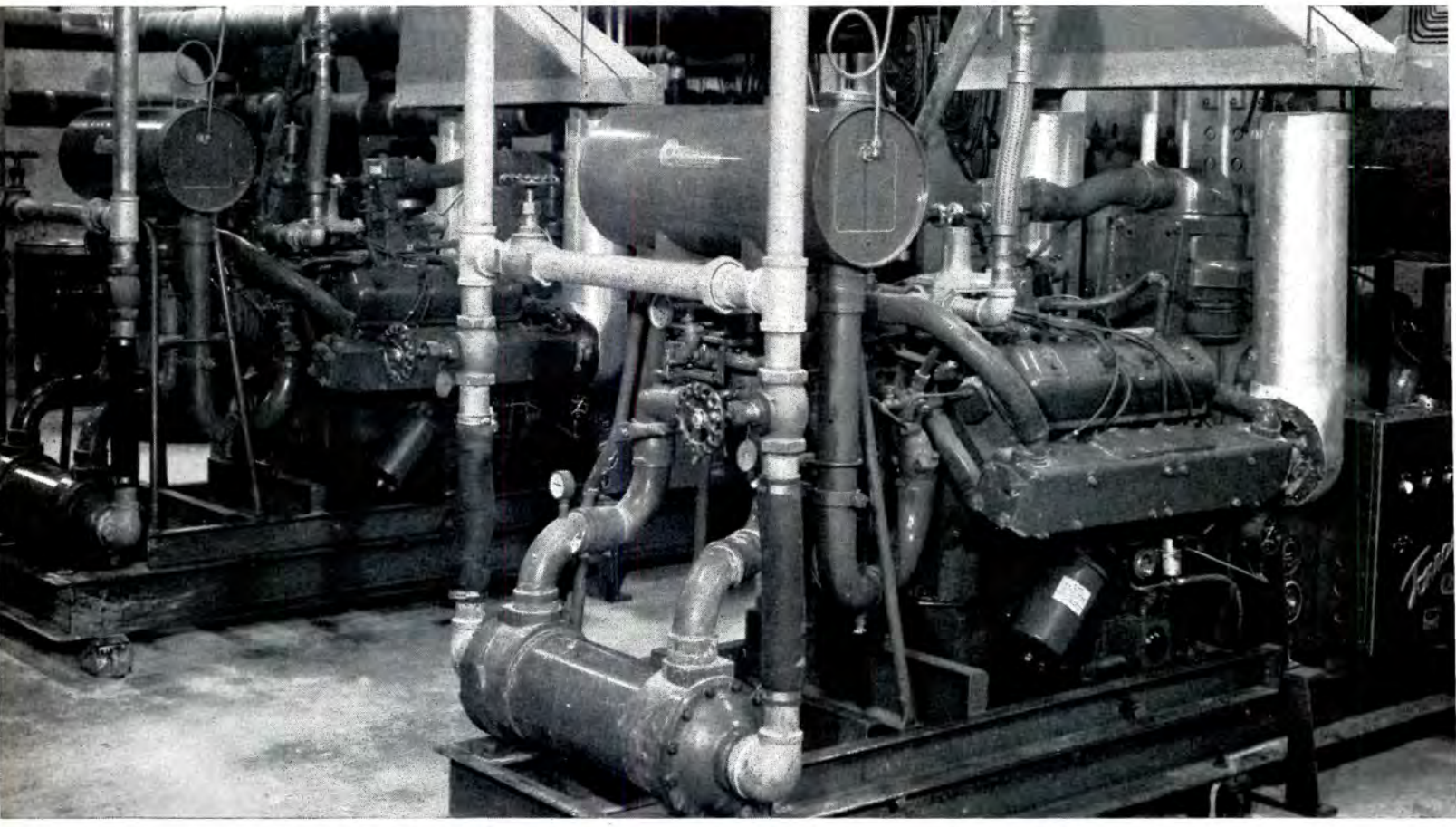
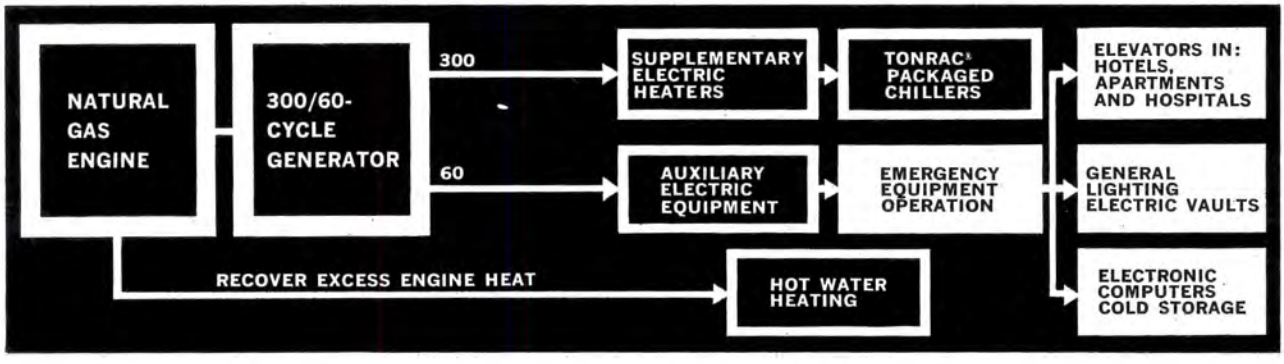


For more data, circle 41 on inquiry card

New ste use air c itioning e e for standby emergency power



Flexibility of power in a new air conditioning system developed by American Standard permits full conversion of engine power to emergency standby use. This pair of International UV-549's has the set-it-and-forget-it dependability necessary for such a system.



This air conditioning system provides a bonus of 60-cycle emergency standby power. Here's how it works. A dual frequency engine generator operates normally at 300 cycles for air conditioning. If main line power fails, an emergency transfer switch cuts in, and standby power is generated at 60 cycles. It's a power source that carries its own spare.

There's no spare for the engine. It has to be dependable. Like the International heavy duty V-8's shown here. They are built to run thousands of hours between overhauls. And remember, every International engine is backed by an unmatched parts and service network. For full information contact International Harvester Company, Engine Sales Dept., Melrose Park, Ill. 60160.

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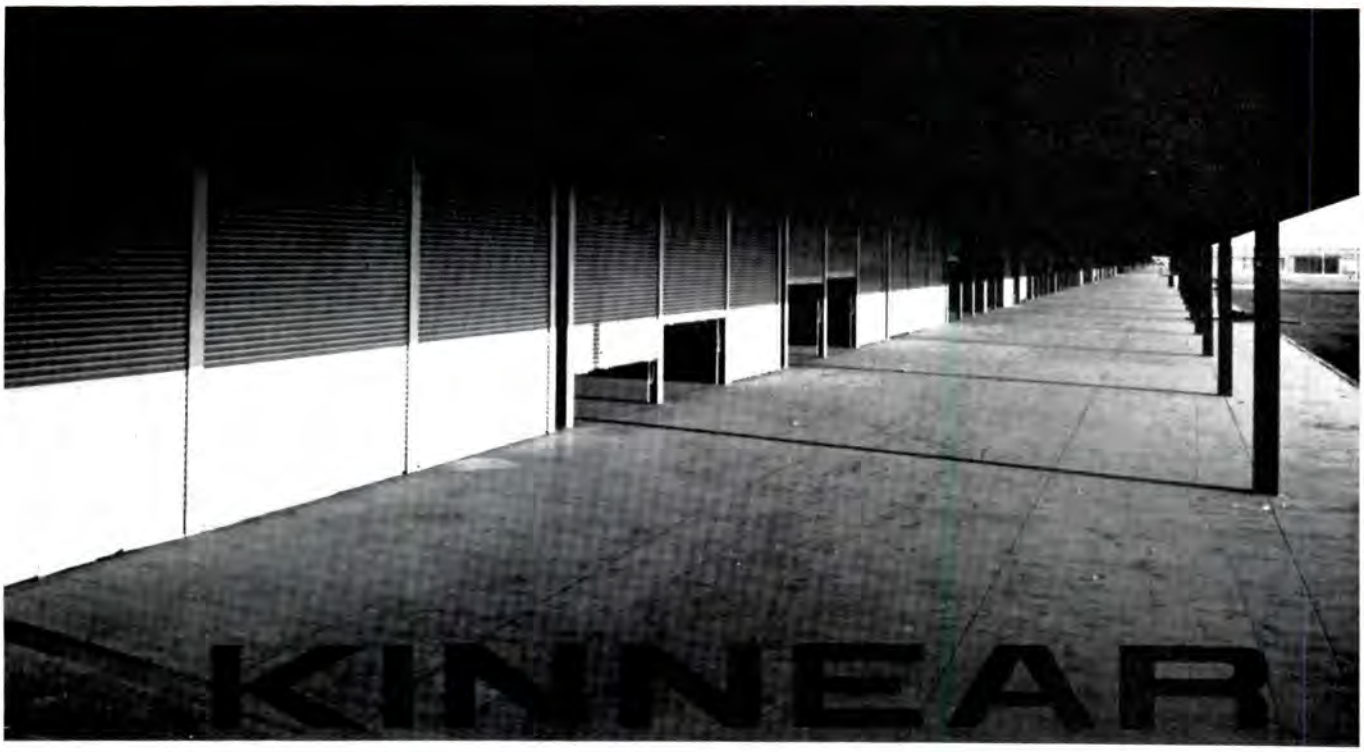
Security and cost-savings by the mile...



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Installations of **Kinnear Rolling Doors** of the magnitude of the New York City Terminal Market, Hunts Point, Bronx, of which only one of several similar bays are pictured above, has been a common occurrence for more than 70 years. And whether it has been miles of pier doors or gigantic gantry crane closures, such jobs have time-proved the security and operating economy of Kinnear's design and extra durable, rugged construction. They're real money-savers in the long run! Designed on the interlocking slat curtain principle, and of rugged all-steel construction, Kinnear Rolling Doors give real protection against "breaking and entering" and vandalism, as well as the ravages of hard usage, fire and the elements over the years. They're truly tough to penetrate.

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For more data, circle 43 on inquiry card

continued from page 53

found all previous studies and proposals unsuitable is an indication of the depth of the problems.

Dr. Albrecht and I accomplished the task by soliciting the help of knowledgeable locals, Bernshock, Kaufman, Lee, Melcher, Thrapp and others. Using their experience we were able to take full advantage of the available talents when making our proposals for the design and construction of the Center. I hope you can properly credit these "consultants" without whose guidance the project could not have succeeded.

Lawrence D. Conway
Health Facilities Planning Consultant
San Francisco

Accidental explosions

Thank you for carrying that very nice item in the December issue on our new structural design concepts to protect against accidental explosions.

Not only was your item succinct and directly to the point, but it has also solicited quite a bit of inquiry, attesting, once again, to the quality of presentation and wide readership of RECORD. For our part, it is always a pleasure to disseminate our knowledge among the profession.

Irvin Schwartz
Ammann & Whitney
Consulting Engineers
New York City

Glazing contradiction

The article "Glazing Recommendations for Tinted Glass" (December 1966) seemed to contain a contradiction. On page 153, discussing the types of shading, the "favorable" illustration was described as the worst condition.

Carl H. Krancke, Designer
Ebasco Services Incorporated
New York City

You are quite right. The misplaced legends are to blame. The caption is correct.

No box canyons please!

This is a request for discussion, consideration, and action of the psychological, not the physical, aspects of tall structures which are built so that they close off streets or dead-end the avenues.

These towering dead-ends cause obstruction of the sun at east-west in morning and evening and to the south at noon—sometimes for many blocks.

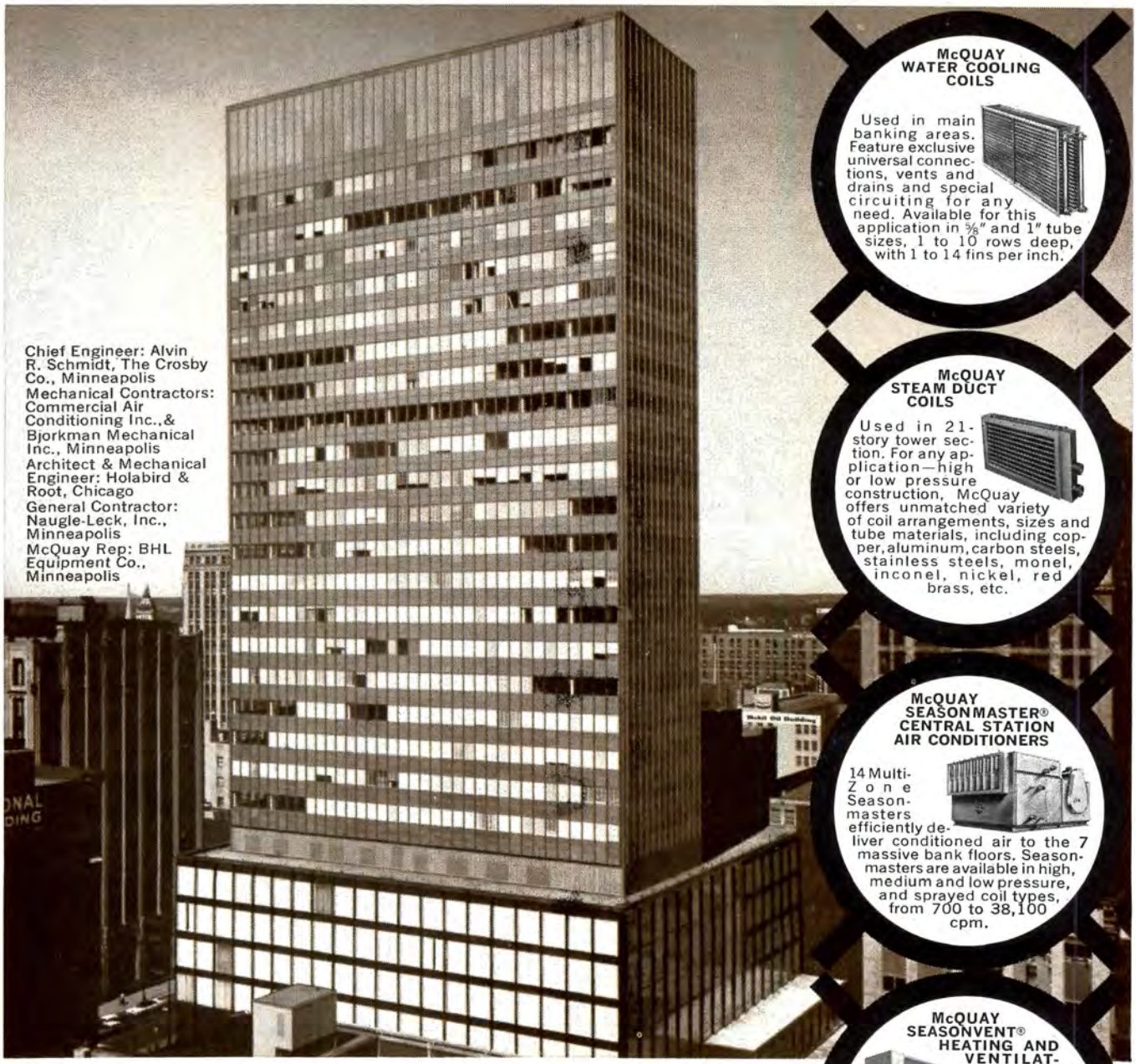
Persons who move through the thoroughfares of New York—and perhaps other cities—consciously or not, may be uplifted and even exhilarated by the extension of space expressed and implied by the unbroken view between our rows of high buildings. The converging lines of the deep vista lengthwise bring the sky to ground level while laterally the horizon is pushed scores of feet above our heads.

Walls moving upward on either side, variably toned and cut crosswise by fenestration often accent the height by vertical striation.

To call these thoroughfares canyons has long been a truism. Here, also, as in a canyon of the mountains, it is the elongated, extended vista that liberates the mind and lifts the spirit. This is not only a saving grace, but for the perceptive person it becomes a glory of New York. However, intercept the vista with a building, and the result is a box canyon —shut in, imprisoned. The vista is lost, the vision dissipated. If we are removed from that shaft of sunlight, that depth of distance, we are closed within our towering, inbrooding immensities.

Let us continue to delight in endless avenues that extend unbroken. Let them stay, so that they may lift our lingering sight out and beyond our daily mundane ways. But no box canyons please!

Anita Weschler



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Used in main banking areas. Feature exclusive universal connections, vents and drains and special circuiting for any need. Available for this application in ⅜" and 1" tube sizes, 1 to 10 rows deep, with 1 to 14 fins per inch.

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FIRST NATIONAL BANK, MINNEAPOLIS LOOKED TO THE LEADER . . . McQUAY FOR HIGHLY-EFFICIENT, TROUBLE-FREE OPERATION IN WATER COOLING AND STEAM DUCT COILS. *THEY GOT IT!*

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Easier to work with.

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And makes one fine roof.

So you want to build a better roof. Faster. Better. At less cost. No problem. STYROFOAM® RM Brand extruded foam is the answer. There's nothing else like it. Chances are you already know, but STYROFOAM RM extruded foam is extremely lightweight. No more sweat or strain. One square (a bundle) weighs about 20 pounds. And it's real easy to work with. Cutting, shaping and fitting can be done in no time at all. You can save plenty on labor and installation costs alone.

STYROFOAM RM puts you ahead of the game before you even start. And when you're finished, it adds up to quicker jobs and the driest, toughest, most foolproof roof in the business. One that will stay dry permanently. No more water logged insulation. There's more, of course. But to make a long story short: use STYROFOAM RM. It's the most practical kind of overhead a roofer can buy. For data information write: Construction Materials Sales, The Dow Chemical Company, Midland, Michigan 48640.

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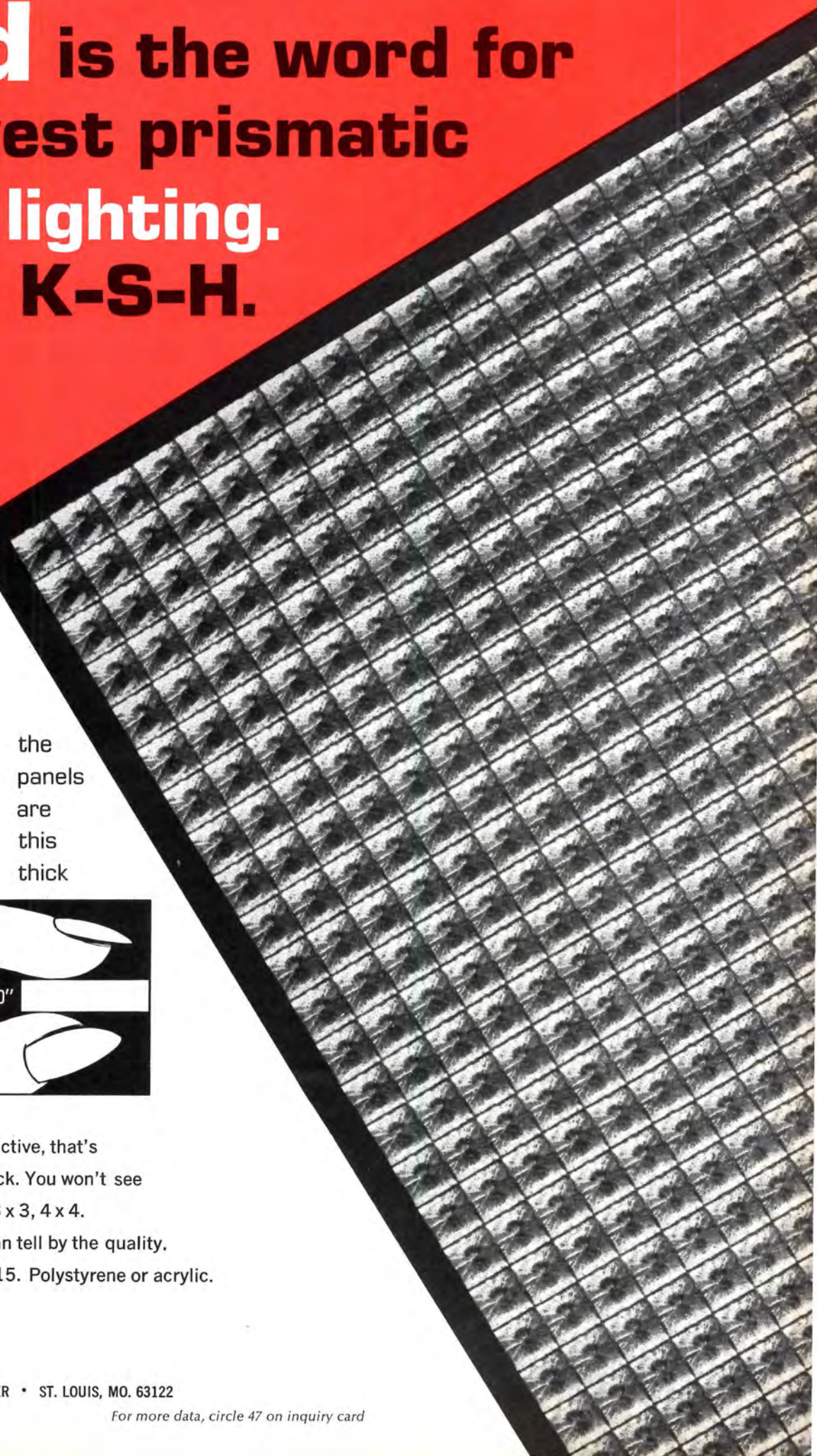
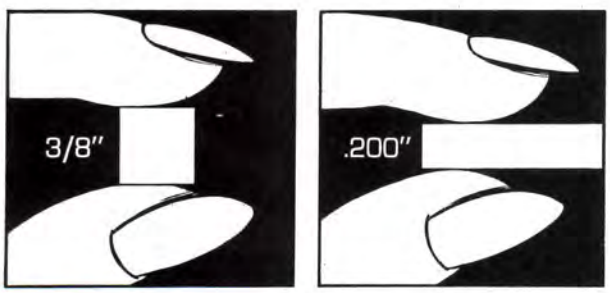
bold is the word for the newest prismatic panel in lighting. K-15 by K-S-H.



the prisms are this big

the panels are this thick



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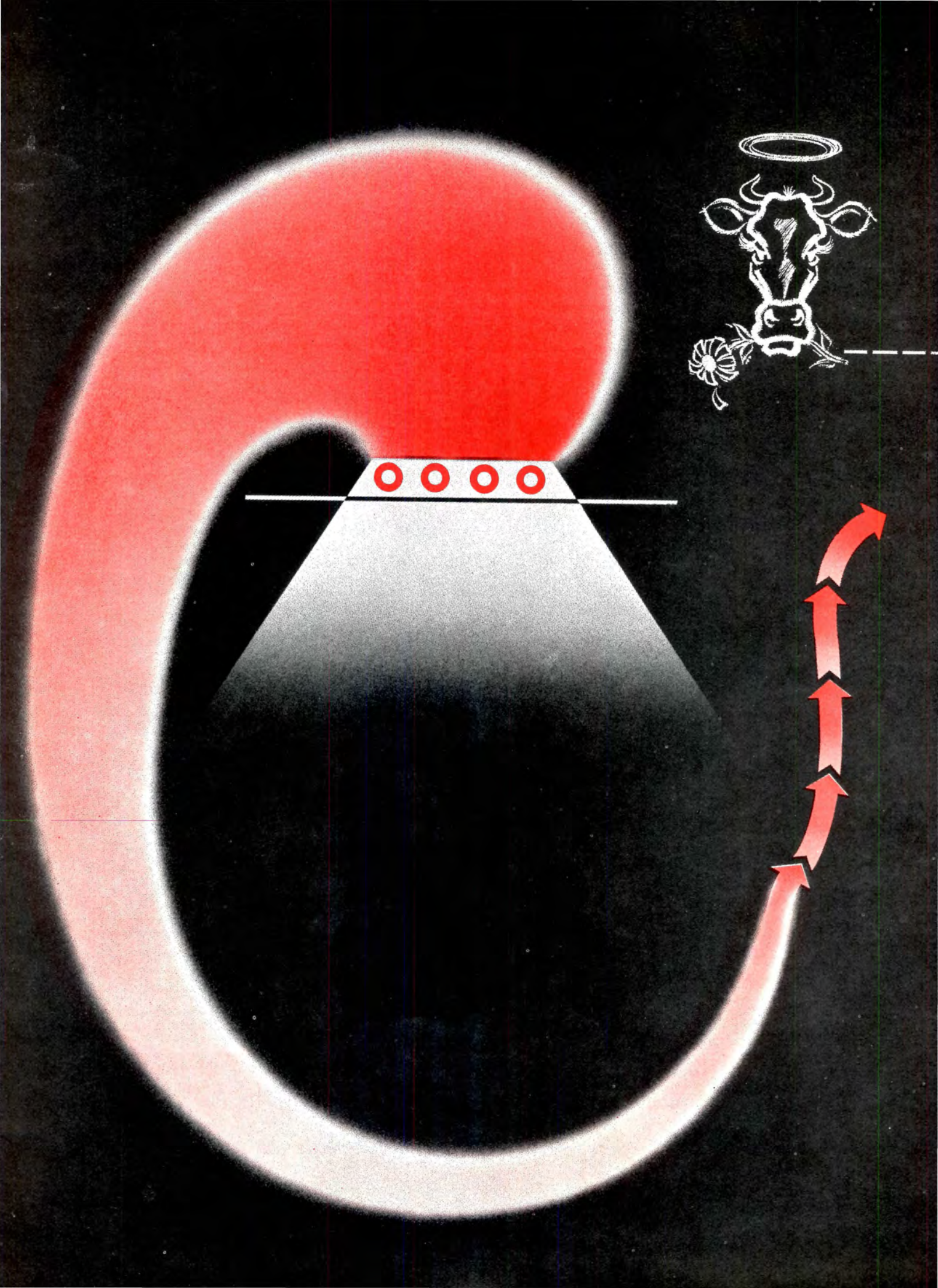

It's time someone butchered the sacred cows of air conditioning

"All heat from light is air conditioning load nonsense!

New Barber-Colman Heat-of-Light System puts light-generated heat to work for you, reducing the amount of heating equipment required and lowering operating costs.

"ALL heat from light is air conditioning load". This sacred cow of air conditioning can cost you money on your next building. So why not do something about it?

With the new Barber-Colman Heat-of-Light System, it's now possible to combine the lighting, heating and cooling functions into one efficient system.

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A thermostat works best in a moving air stream. That's where Barber-Colman puts it—concealed inside the Heat-of-Light air diffuser. The thermostat (which is electronic) responds up to 15 times faster than thermostats on the wall. Changes in temperature are acted upon almost *instantly*.

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"Invisible" air outlets add new beauty

Air diffusers used with Heat-of-Light Systems are practically invisible to blend beautifully with any ceiling design. Instead of imposing design problems, Heat-of-Light Systems reduce restrictions on architectural and engineering creativity.

With these versatile new systems, you are now free to design building interiors for greatest aesthetic appeal—uncluttered ceilings . . . off-the-wall thermostat locations . . . movable walls wherever needed.

For more facts, call your nearest Barber-Colman Field Office. Ask them about our simple Feasibility Study. It helps you determine the exact benefits of applying a Heat-of-Light System in your particular building. There is no obligation.

BARBER COLMAN

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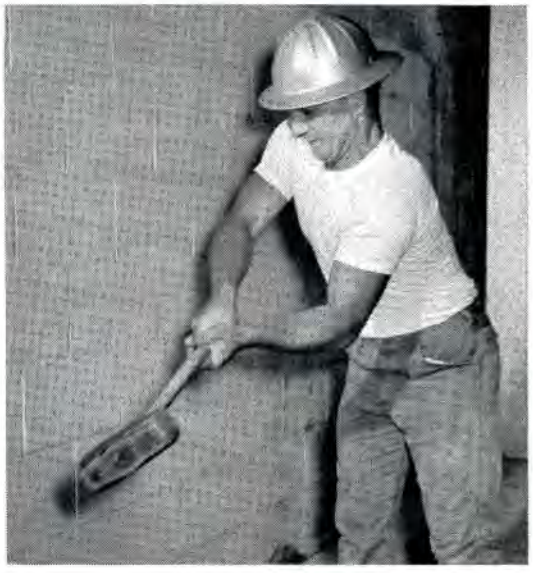
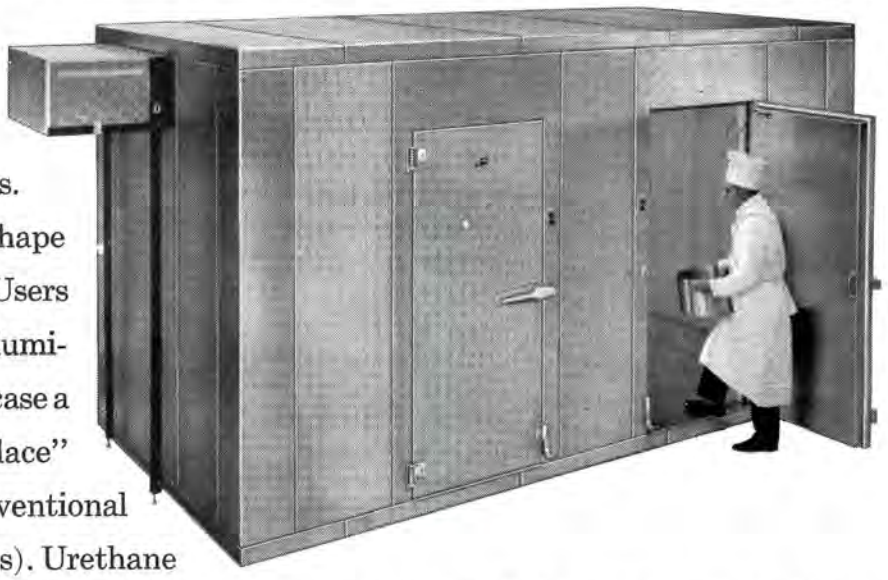
22 months ago the architect thought this was the most modern cooler and freezer he could specify... now they're ripping out walls to provide for today's extra need



All this trouble and expense could have been avoided had the original plan included a Bally prefabricated Walk-In Cooler and Freezer. Bally Walk-Ins can be specified in sizes large enough for present and near-future needs. But when the food operation requires more cooling or freezing area, Bally's sectional construction permits easy panel-by-panel expansion. No need ever outgrows Bally's capacity to expand. And if future needs dictate relocation of a Bally Walk-In, no major building alteration is necessary. It's easy to disassemble the Bally Walk-In and reassemble it, section-by-section, at the new location. ☐ Mass-produced Bally Walk-In Coolers and Freezers offer all the features most wanted by everyone in the food serving business. They can be assembled in any size or shape from standard modular sections. Users have a choice of galvanized steel, aluminum, or stainless steel skins which encase a 4″ wall of fire-retardant "foamed-in-place" urethane. Has double the value of conventional insulation (4″ equals 8½″ of fiberglass). Urethane is a 97% closed cell material and cannot absorb moisture, ever. ☐ Bally's "foamed-in-place" technique develops panels with great structural strength that do not require wood members and 100% of every panel is insulation. Built-in patented Speed-Loks make section joining fast, accurate and easy. Cubic-foot cost of Bally Walk-Ins is substantially lower than that of "built-ins" or "reach-ins". ☐ Write for Architect's Fact File with 32-page brochure, specification guide, and sample of Bally urethane wall. Ask about the Bally engineering program that provides specific refrigeration, capacity and construction information that is of great assistance in layout and specifying.



Bally Case and Cooler, Inc., Bally, Pennsylvania 19503

Address all correspondence to Dept. AR-2.

Bally

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WITH A MOTOR.

HOW CONSIDERATE. AND PRACTICAL. FIRST, BECAUSE ONLY VENETIAN BLINDS OFFER INFINITE LIGHT CONTROL AND UNMATCHED FLEXIBILITY OF EFFECT.

SECOND, BECAUSE RAISING HUNDRED-POUND BLINDS 25 FEET IS A TALL ORDER FOR ANYONE.

WHY LEVOLOR MOTORIZED VENETIAN BLINDS? ONLY A FIRM THAT CARRIES A CONTRACT FROM RESEARCH RIGHT THROUGH TO INSTALLATION CAN CUT TALL ORDERS DOWN TO SIZE.

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SHREVE, LAMB & HARMON SPECIFIED LEVOLOR MOTORIZED BLINDS FOR THIS RECEPTION ROOM AT RCA's DAVID SARNOFF RESEARCH CENTER, PRINCETON, N.J. THERE ARE EIGHT BLINDS 20′ x 25′; ENGINEERED, BUILT, AND INSTALLED BY LEVOLOR. ONLY LEVOLOR CAN SUPPLY THIS SERVICE. FOR A FREE BOOKLET THAT DESCRIBES THE INSTALLATION IN COMPLETE DETAIL, WRITE SPECIFICATIONS DEPARTMENT, LEVOLOR-LORENTZEN, INC., 722 MONROE ST. HOBOKEN N.J.

Lester can't tell a joke

Or if he can, he won't.
Not on your time.
On your time, Lester's all business.
He'll talk vinyls. Acrylics. Epoxies. Sealers.
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Keep it up to date with all of Devoe's 1086 colors.
And the 1087th, when that comes out.
The same way he keeps you up to date. Ably. Accurately.
That's Lester. And Sam. And Arthur.
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You can depend on the **Man from Devoe.**

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Installation is simple with positive self-seating.

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Features: Rugged weather resistant cast aluminum housings, thermal shock and impact resistant lenses, variety of lamp sizes; swivel mounting arms with degree aiming sectors; junction boxes that eliminate the need for special insulated service leads; quality gaskets at critical points for all-weather operation; many more.

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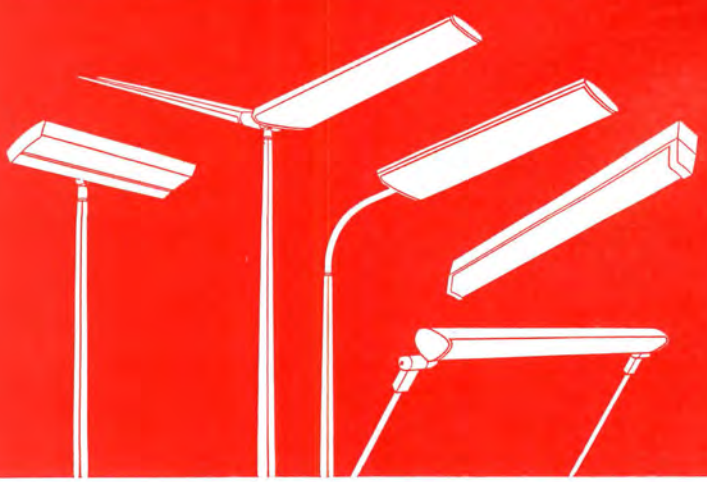

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High Bay Units, Industrial Reflectors and Vaportite Fixtures.

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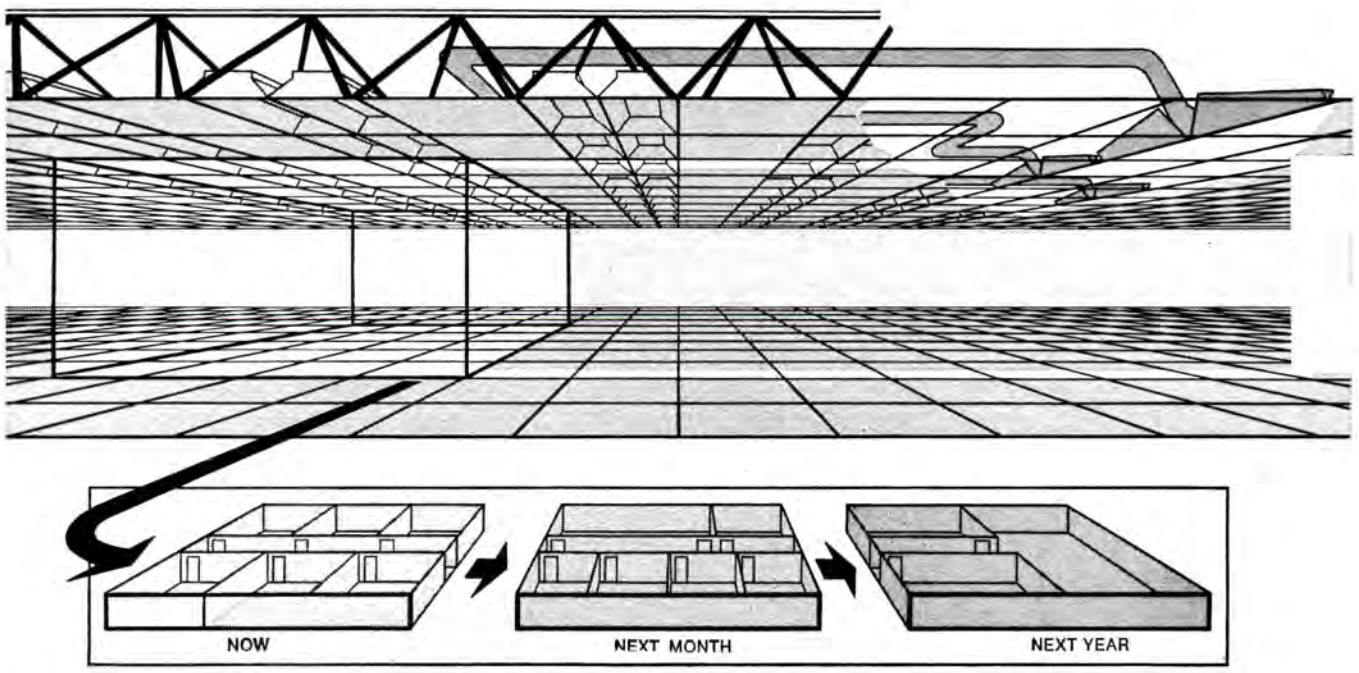
Through this new system you may design for room rearrangement at will while maintaining environment standards



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Space Grid is one of the successful solutions to the much-publicized SCSD** performance specification for California school construction. But the range of resources represented by the collaborating manufacturers comprising Space Grid extends its application to manufacturing, administration, commerce, recreation, rest homes and other similar end uses. Fast construction and single responsibility are bonus benefits. For further details, refer to Sweet's File 2A/Bu. Or write direct to Architectural Systems Department, Butler Manufacturing Company, 7427 East 13th Street, Kansas City, Missouri 64126.

*Butler Manufacturing Company, E. F. Hauserman Company, Lennox Industries Incorporated, Owens-Corning Fiberglas Corporation, and other cooperating manufacturers. Space Grid is a trademark of Butler Manufacturing Company.

**SCSD is the School Construction Systems Development project of the Educational Facilities Laboratories.

™SPACE GRID SYSTEM

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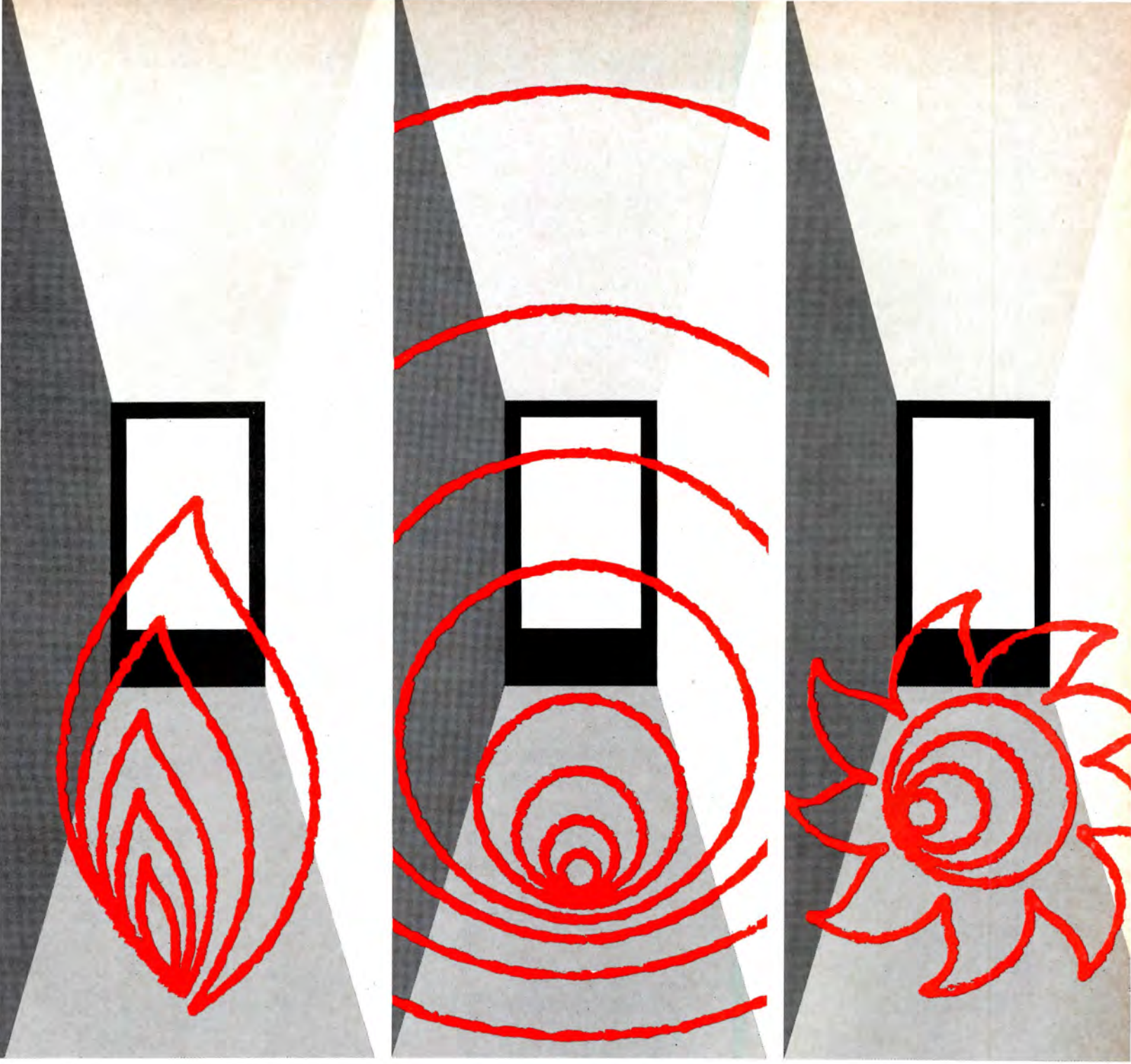

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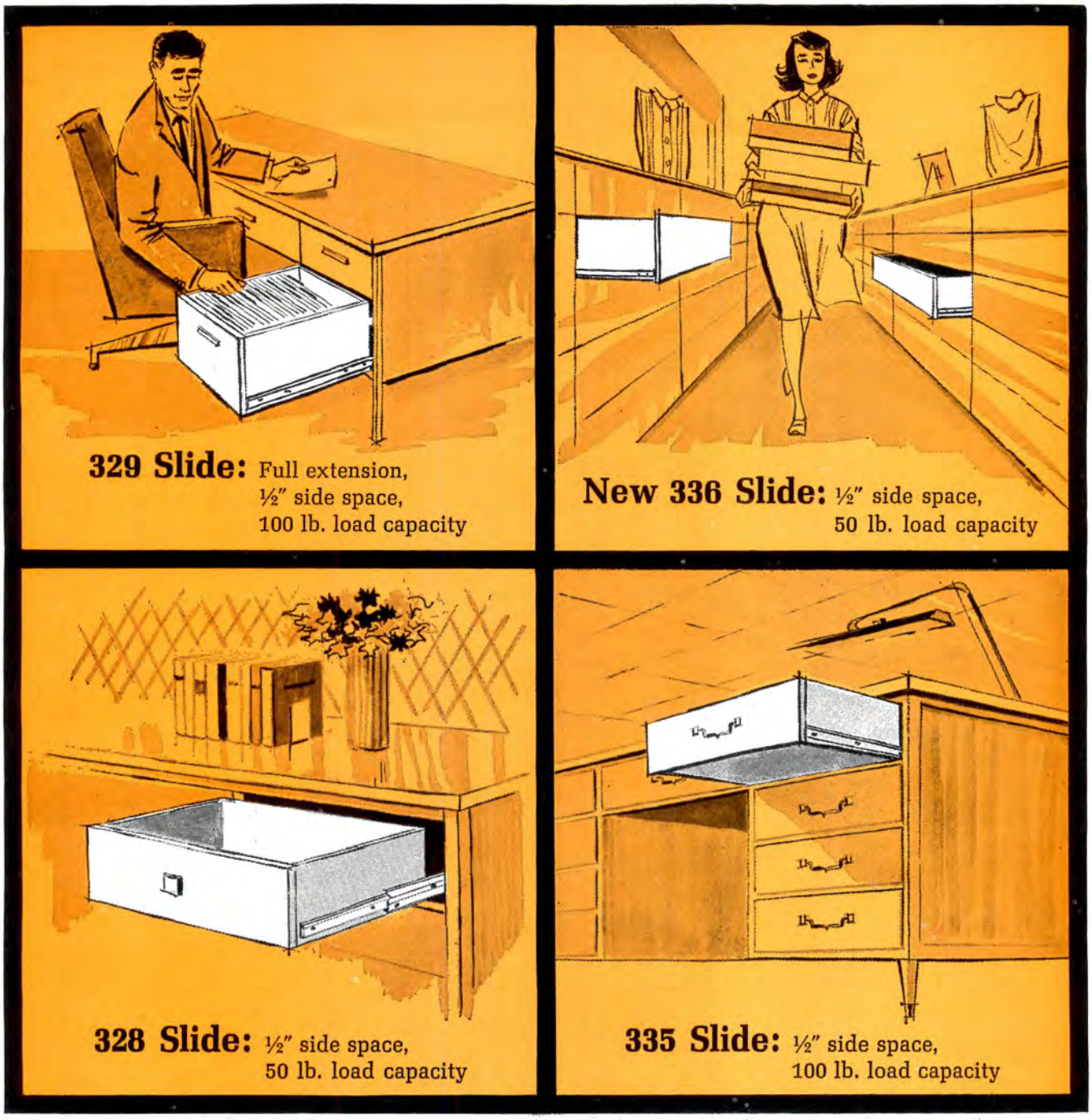

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Action is taken on contracts, costs and fees

Indemnification squabble: a better climate for agreement

A new—and hopeful—phase has been reached in the current dispute between the A.G.C. and the A.I.A., over the new hold-harmless clause introduced in revised document A 201, *General Conditions of the Contract for Construction* (January, pages 81, 82 and 93). At a joint meeting of contractors, architects and representatives of the insurance industry, the insurability of the new clause—the main bone of contention—was thoroughly discussed and agreement reached on new wording for subparagraph 4.18.3 "more precisely describing the responsibility of the architect and contractor regarding third-party claims."

The recommended revision was reviewed by the A.I.A., the A.G.C., and the insurance industry, and all have given final approval to a rewording that clarifies responsibilities and—hopefully—the air.

Prior to this meeting, the A.I.A. had initiated its own investigations on the question of insurability of the new clause, and is now able to quote the names of a number of architectural firms who report successfully using a similar indemnification clause for some time before the new document was issued. Firms specifically mentioned by the A.I.A. include Hellmuth, Obata and Kassabaum; Skidmore, Owings and Merrill; Fisher, Nes, Campbell; Daniel Schwartzman; Lundeen & Hilfinger; Bodman, Murrell & Webb; and Sherwood, Mills and Smith—none of whom reportedly found any particular difficulty in engaging contractors willing to accept the clause and able to secure the required insurance. These firms point out that insurance coverage, like performance bonding, requires examination of the contractor's qualifications as well as other project conditions—in other words favorable insurance will depend on a satisfactory general situation and not on isolated consideration of the indemnification clause.

Before publication of the revised document, the A.I.A. was careful to secure written statements from representative insurance companies indicating that—all other relevant things being equal—coverage would be available to contractors using the new indemnification clause. Since publication of A 201, however, specific confirmation of this position has been received by the Institute in the form of the following telegram from Continental Casualty Company: "Continental National American expects to make available to its contracting account insureds contractual liability insurance to cover indemnitee agreement in Article 4.18 (hold harmless clause) Document A 201. Coverage form and rate schedule being formulated."

National study will probe costs of providing architectural services

The A.I.A. board of directors has approved a $77,440 survey of the cost of providing architectural services. The California management consulting firm of Case and Company has been retained to carry out this study, which is in effect the extension of a pilot survey already completed. The results of the pilot study—based on inquiries made of eight selected architectural firms—have apparently proved the potential worth of this broader survey, which will cover some 210 architectural firms throughout the country.

The A.I.A.'s director of research programs, Ben H. Evans, summarized the Institute's reasons for going ahead: "The profession is continually pressed," he said, "particularly by government agencies, to substantiate costs with relationship to fees, which often leads to the establishment of statutory fee limitations. Efforts to present cost information supporting fees are hampered by the absence of reliable, profession-wide data from objective and impartial sources."

Once these data are collated, the Institute hopes that it will be possible to recommend more business-like office procedures for practicing architects, establish a more equitable fee structure, and arrive at a more generally acceptable definition of what constitutes standard or basic architectural services.

If a more uniform accounting procedure can be developed as a result of the survey, one long-term effect might be the setting up of computerized service centers to provide a broad range of services for architects.

ARCHITECTURAL BUSINESS THIS MONTH

Architects join engineers in protest against limit on fees for government building

A statutory limit of 6 per cent imposed in 1939 on architectural and engineering fees for government work has long been

a source of discontent to both professions. Official expression of this dissatisfaction has now been made by the A.I.A. in a paper submitted to the General Accounting Office to assist the GAO in its current study of interpretations and applications of government fee limits.

The A.I.A. paper urges repeal of the 6 per cent limit and suggests that architects' fees for government work should be negotiated—as they normally are on private projects—on the basis of the size, nature and complexity of specific jobs. Moreover, the Institute recommends a government-wide review of constructions practices—including methods of fee negotiation—to prevent the complications which presently arise due to variation in different agency procedures.

The A.I.A. has cogent arguments to support its position, since there can be little doubt that the increasing complexity of building techniques and building programs demands a vastly more complicated, time-consuming—and consequently more expensive—service from the architect.

The A.I.A.'s official protest joins similar protests already made by comparable engineering organizations.

1966 legislation provides more funds for health and educational facilities

Architects will get still more work in Federally supported health and education facilities as a result of several 1966 acts of federal legislation. Following is a brief summary of those acts of the 89th Congress as reported by the Department of Health, Education and Welfare:

Veterinary Medical Education Act of 1966 (P.L. 89-709) authorizes funds for the construction of facilities for the teaching of veterinary medicine.

Allied Health Professions Personnel Training Act of 1966 (P.L. 89-751) authorizes a three-year program of grants for construction of teaching facilities; and also establishes a new three-year, $15-million program of opportunity grants for needy nursing students which permits construction funds under the Nurse Training Act for baccalaureate, associate degree, and diploma programs to be interchangeable.

Group Practice Medical Facilities (Demonstration Cities and Metropolitan Act of 1966 (P.L. 89-754) makes available Federally insured mortgages under Title V for the construction and equipment of facilities for the group practice of medicine, dentistry and optometry. Other titles provide financial and technical assistance to cities to plan, develop, and carry out programs to rebuild and revitalize entire areas of slum and blight.

Establishment of Trusts for Construction Loans for Academic Facilities—Participation Sales Act of 1966 (P.L. 89-429) authorizes pooling of mortgages and other assets held by specified Federal agencies to establish trusts for making loans for the construction of academic facilities.

Library Services and Construction Act Amendments of 1966 (P.L. 89-511) extend the Library Services and Construction Act for five years; provide $575 million over the five-year period to raise the physical standards of libraries, replace outmoded buildings, and help provide "the 40-million square feet of library space needed" to meet the needs of increasing numbers of library users. Also authorized is $75 million to help states improve specialized library services for the handicapped.

Higher Education Amendments of 1966 (P.L. 89-752) extend for three years programs of assistance to higher education to meet the needs of dramatically increasing college enrollment; provide for grants contributing one-third of the total costs to public and nonprofit private colleges and universities for undergraduate and graduate classrooms, laboratories and library construction or improvements; make federal loans available for school construction.

While most of the relevant Acts have fairly wide application, a strange quirk of Federal legislation demanded a special Act of Congress to provide funds for the establishment of a single secondary school for deaf children. This school, attached to Gallaudet College, will provide secondary education for deaf children in the D.C. area and surrounding states. Although the Act *(P.L. 89-694)* mentions this as a "model" school which will make a "significant contribution to the complete lack of a genuine secondary school program for the deaf in the US", there seems to be nothing in the wording to suggest that it is in fact to be considered as a prototype for a more comprehensive program in this field.

Recreation acquisition program is endangered by lack of funds

Spiraling land costs and a serious shortage of funds are threatening the effectiveness of the nation's land and water conservation program. The seriousness of this threat has prompted the formation of a Federal task force to study the problem and investigate possible remedies including possible new sources of revenue for the Land and Water Conservation Fund, which finances land acquisitions by the state, local, and Federal governments. The task force report containing new legislative proposals is expected early this year. Members of the force include representatives of the Justice, Treasury, and Interior Departments as well as the Bureau of the Budget.

The reality of the present problem is underscored by a number of statistics and case histories quoted in a recent report from the Conservation Foundation. According to this report, the Forest Service reports paying about five times more per acre for land in 1965 than it did in 1950, while the National Park Service reports an average increase of 6 per cent a year on land in established areas in the east, and 10 per cent in the west, which, compounded, would double the cost of land in about 10 years. Moreover, state and local governments' share of the fund for the year ending June 30, 1967 has been cut by $18.7 million compared to last year, because of lower than estimated revenues.

All this underlines the urgent need for new revenue sources for the Fund, which is at present financed by revenues from the sale of surplus federal property, motorboat fuel taxes, annual conservation-recreation permits, and admission and user fees at Federal facilities. The Conservation Foundation suggests that possible new sources of revenue might include a new tax on recreation or camping equipment; use of currently unearmarked receipts of the Interior and Agriculture Departments and other federal agencies; and diversion of taxes now earmarked for the Federal highway fund into the Land and Water Conservation Fund, once the interstate highway program is completed.

The report also suggests that a reexamination of the practice and procedures of Congress and Federal agencies in the land acquisition business, might help to alleviate difficulties and increased expense arising from delay between Congressional authorization for land acquisition and granting of power to condemn to the appropriate agency without approval of the private land owner.

CURRENT TRENDS IN CONSTRUCTION

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

Nonresidential strong in housing's worst year

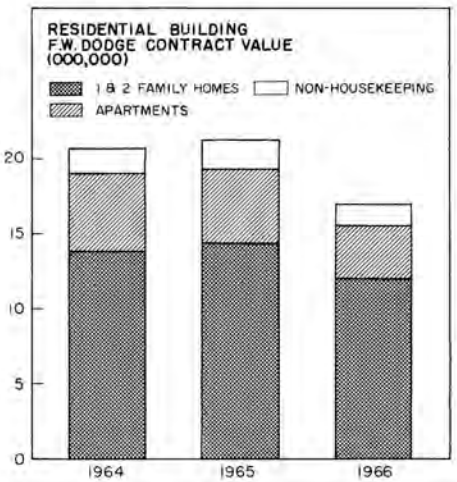
1966 was a special year for watchers of construction contract statistics. The $50-billion mark was reached and passed last year—a rate of contracting that works out to very nearly a billion dollars of new construction projects each week. And compared with 1965, it was like having an extra week in the year since the net gain in 1966 was almost a billion on the nose.

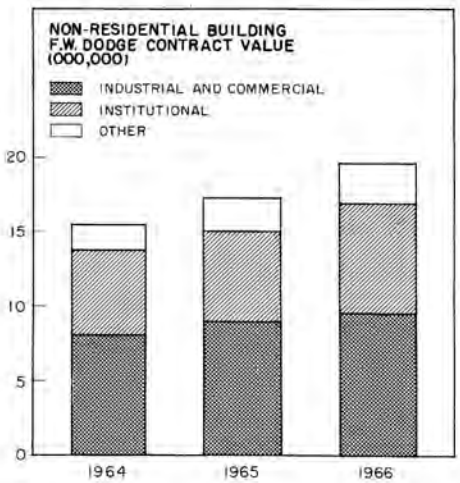
Architects had a lot to cheer about in 1966. Nonresidential building, which makes up the bulk of architect-designed construction, fared much better than the market as a whole. Yet, while the year's contract activity did mark another new high in total construction value, the virtual collapse of the housing market last summer, coupled with a leveling-off of many other building types, held the year's gain to only 2 per cent. And that's not exactly spectacular by recent standards. Both years immediately ahead of 1966 produced gains of 4 per cent, while the even boomier years of '62 and '63 offered back-to-back increases in the neighborhood of 10 per cent.

What made 1966 a weaker-than-average construction year? It certainly didn't start out that way. By the end of the first quarter, contract value was leading 1965's three month total by no less than 11 per cent. In April the seasonally-adjusted Dodge Index hit its all-time high of 161 (1957-59=100). But just about that time the complexion of the construction market began to change drastically. It underwent such a transition, in fact, that by year's end the big lead over 1965 which had been built up in the early months was all but gone.

A casualty of economic policy

The primary reason for the turnabout in construction activity last year was a chain of reactions to the inflationary pressure developing from the rise in military spending at a time when the economy was already working at capacity. To counter these pressures, government first resorted to its monetary weapons. And when the severe tightening of the money supply failed to keep the price level from rising, additional restraints—budgetary cutbacks, and the suspension of investment incentives—were brought to bear.





By year's end these combined measures had helped to cool down the overheated economy, but there's little question that by far their greatest impact fell squarely on the construction industry. First to feel the squeeze was the housing market. As credit was tightened generally, mortgage sources all but dried up. Housing activity, with only a trickle of funds supporting it, plummeted to a post-war low by autumn. And for the entire year, contracts for residential building fell some 16 per cent short of 1965's value (even though last year's housing units were both bigger and more costly than before).

The nonresidential building market is not as much at the mercy of the money markets as housing. As a result, it weathered the difficult months of 1966 in better shape. Internally generated corporate funds, plus the ability to command a bigger share of the shrinking total of available credit enabled the business sector to finance record plant and equipment expansion. Paced by a big gain in manufacturing plant construction, the combined total of industrial and commercial building contracts advanced a healthy 11 per cent last year. And that growth came atop gains of 13 per cent and 12 per cent in 1965 and 1964!

Institutional building, backed by lots of Federal money flowing from Great Society programs, also showed some big pluses last year. Educational building —college construction, especially—advanced by close to 20 per cent to lead all the nonresidential building categories. Hospital building contracts, up 15 per cent, weren't far behind.

Despite the continued buoyancy of nonresidential building markets in 1966, however, the gains scored there weren't quite enough to offset the losses sustained in housing. Total building contract *value* finished the year slightly below 1965's amount, and the *physical* volume of building—indicated by the square footage of floor area of last year's residential and nonresidential construction —declined by 7 per cent.

Nonbuilding construction projects showed a very large (20 per cent) gain in 1966, but part of that increase reflects the fact that 1965 was a weak year for utilities—a key construction type in this category. The utilities came back with renewed strength in 1966, nearly *doubling* the volume of the previous year.

Streets, highways and bridges make up roughly half the total value of nonbuilding construction, and 1966 was a banner year for the initiation of this work. One important factor behind the more than 15 per cent boost in the contract value of highway construction was the disbursement of funds through the new Appalachian development program. Roads are the key to this scheme to open that depressed area to commerce. Leaner months ahead are indicated for highway construction, though, by recently announced cutbacks of more than a billion dollars in Federal-aid highway construction money for next year.

1967 awards program

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

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

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

The nature of each project submitted will influence the weight given each of these considerations.

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Any kind or type of structure using precast and/or prestressed concrete which was completed within the last three years may be entered.

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

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prestressed concrete institute

made, but all Awards will express equivalent recognition of a high level of excellence.

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

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

1. Proper name of entry, type of structure and location, names and addresses of architect, engineer, and owner, and the date of completion. Anonymity of entries will be preserved throughout the judging. An envelope identifying the entrant and containing the required information shall be affixed to inside back cover of the entry.
2. Concise discussion outlining the advantages achieved by the use of precast or prestressed concrete, typed on 8½" x 11" sheets.
3. A minimum of two 8" x 10" photographs and two 35mm color slides of the completed structure or the completed precast or prestressed concrete portions of the structure. Detailed photographs, plans, perspective drawings, or large scale details if considered significant by the entrant.
4. Design computations and specifications if they show to a greater extent the design aspects of the entry.

All the above to be bound in ring or other type binder, approximately 10" x 12". Entries to be received not later than May 15, 1967, at the Prestressed Concrete Institute, 205 W. Wacker Drive, Chicago, Illinois 60606.

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

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

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

The decision of the Jury of Awards shall be final.

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

Address all communications concerning this Awards Program to:

Prestressed Concrete Institute
205 W. Wacker Drive, Chicago, Ill. 60606

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TRENDS AND ANALYSIS

Lawrence C. Jaquith, Economist
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Deferred wage increases: a step toward greater stability?

If there is an optimistic note for the future to be found in recent wage settlements in the construction industry, architects may see it in the trend toward deferred wage increases. Instead of the usual one- or two-year agreements, unions have been negotiating settlements that provide for these automatic yearly pay hikes over three- and four-year periods, or longer.

The cost of this stability may be extremely high

This year, over 900,000 construction workers will receive deferred pay hikes negotiated in previous years. Nearly all increases will be more than 3 per cent, amounting to at least 9 cents an hour. The average increase will be 6 per cent, and half of the workers will receive at least 25 cents. These deferred wage increases in construction will be substantially higher than in all other industries.

It might be hard to believe that this trend in collective bargaining could benefit anyone but the unions, especially if one recalls such instances as last summer's settlement with the San Francisco plumbers. They won a *six*-year package, providing annual increases of 50 cents an hour, to be divided between wages and fringe benefits at the union's option. By 1972 the plumbers will be earning a whopping $372 a week, exclusive of overtime. Other provisions include such embellishments as free dental care and the financing of resort homes for retired workers.

In this case, and in many others, the possible advantage of deferred wage increases is overshadowed by the high wage package . . .

But predictable costs may be worth higher wage levels

Long-term contracts may, in the long run, lead to substantial savings for architects, owners, and contractors in their day-to-day practice, even if the national economy is on the downswing. For one reason, it offers the prospect of greater stability for an industry that is notably lacking in this feature. Since negotiations would not be conducted on a yearly basis, the risk that a strike will halt work and delay occupancy dates is reduced.

This is especially important in peak periods of construction when unions often make excessive demands, realizing the costs that could be incurred from a delay. When one considers, for example, the amount of work that came to a virtual halt because of the lengthy New York plumber's strike, the yearly savings can be enormous.

In fact, even the anticipation of a strike adds a strong element of uncertainty. And this, too, can be costly for the architect if contractors, fearing labor problems, bring in their bids above the estimate. Then redesign may be required which, in many cases, represents a loss of time, money and good will. It also introduces an artificial loading of costs already under upward pressures.

Chart shows where 1967 wage negotiations will occur

To give a current picture of the trend toward multi-year settlements, the trade contracts of several major cities were examined and are charted below. The dates shown indicate contract negotiations coming up in 1967 for ten major

WAGE NEGOTIATION DATES FOR 1967

Cities	Bricklayers	Carpenters	Strl. Iron Workers	Cement Masons	Electricians	Plumbers & Stmftrs.	Plasterers	Painters	Lathers	Laborers
New York City	May					Feb.*				
Philadelphia	April			April	August		April	May		
Washington, D.C.			June					August		
Boston						Sept.				
Los Angeles	May							July		
San Francisco	August									
Seattle	July	Feb.	July		June			April		
Dallas					June			July		
Wilmington								March		
Albany										
Newark			June			April			May	
Chicago	June	May	May	May	Sept.	May	May	March	May	May
Baltimore	March	March	March	March	March	March	March	March	March	March
Detroit	May	May	May	May	May	May	May	May	May	May
Denver	May	May	May	May	May	May	May	July	May	May
Miami	June	June	June	May	June	May	June	June	June	May

*Anticipated settlement date

trades in each city. A blank space indicates that a deferred increase will automatically take effect. In two-thirds of these cities, less than 25 per cent of the trades will bargain in 1967.

Exorbitant demands are not inherent in the system

Many of the deferred increases that have already been negotiated for the next few years will prove to be exorbitant. They seemed too high even when industry expansion justified increases, and if construction tapers off, these inequities will be a subject of even more criticism. But this does not mean there is something inherently wrong with the concept of deferred increases—they do not *have* to be excessive. Reason:

Even if a high automatic wage adjustment is not included, there is still an incentive for unions to enter into this type of agreement. For deferred increases introduce an element of security and stability into construction employment. A recent settlement negotiated with the Seattle plasterers is indicative of the emphasis being placed on security these days. To gain a pension and vacation allowance, and an increase in welfare benefits, these workers were willing to take a 13 cent hourly wage cut.

However, the long run advantages that might accrue from deferred wage increases can be offset if these agreements tend to be negotiated primarily in peak construction years—as was the case in 1966. The high automatic pay hikes that are demanded in active periods do not accurately reflect market conditions in the future. Moderate increases coupled with adjustments tied to the government's cost-of-living index would offer a feasible alternative.

The onus for insuring an orderly collective bargaining system utilizing deferred wage increases falls equally on union and management. The system is self-defeating if unions press for short term contracts during slack construction periods in anticipation of a longer arrangement at the time of a boom. Management in turn should not allow considerations of short-run savings to dominate their own bargaining but rather should weigh the long-run benefits that the system provides.

Two estimating pitfalls: custom sizes and real wages

Two construction items which have lately been causing considerable difficulty to architects in projecting final building costs are installed laboratory equipment and cabinetry and architectural precast work. Both are major items in the cost breakdown of buildings in which they play a role. For example, in university science or medical buildings, laboratory equipment can account for as much as 10 to 20 per cent of the total building cost. Architectural precast concrete, while not as dominant as lab equipment, can nevertheless consume 5 to 7 per cent of the total building cost.

Suppliers may want special detailing to ease installation

These items are difficult to estimate for several reasons. In each case their supply is the purview of relatively few suppliers or subcontractors in a given local area. Frequently the architect will work with one or more such suppliers in developing his detailed working drawings. How these working drawings are developed with respect to a given supplier's capabilities has a great influence on the final cost. Architects are understandably cautious about designing to facilitate a given supplier, particularly in the case of lab equipment. What is often designed, then, is a compromise between what the owner demands, what the architect thinks best, and what the supplier can conveniently furnish.

Optimistic quotations reflect hope for compatible design

Unfortunately, the budget figures given by suppliers are almost always optimistic and reflect the hope that final design will be compatible with the standards produced by their factory or precast yard. Where this is not the case, the final bid is always higher than the budget assurances given to the architect.

Bids may be double quoted price and throw whole project over budget

It is the great variance experienced in many recent projects throughout the country between budget proposal and final quotation which suggests strong caution in these areas. In some projects of recent record the quotations given to general contractors were as much as twice the figures given earlier to architects. In many cases the supplier who had worked with the architect through the elaboration of design found himself unable or unwilling to quote when the project was actually bid. This all too common situation occurs when the optimism of the sales engineer is not shared by the factory or precast yard management responsible for producing the final product. Since these are items of relatively major cost, a 50 to 100 per cent over-run can easily throw the entire project over the budget.

An early meeting of minds at the factory may help

Perhaps the only way to avoid this difficulty is to be wary of the optimism of early quotations from suppliers for these construction items. There must be a clear meeting of the minds concerning the policy of the supplier to furnish the material for which he provides a quote.

Cost budgets should reflect real wages—not wage rates

Budgeting final construction costs is a problem for architects under any circumstances. With the severe shortages of labor being experienced in certain urban areas today, the problem is made still more critical. The difficulty lies in the confusion between hourly wage rates and the real wages which are paid to labor in some trades.

Overtime is a way of life in some cities

For example, in Detroit, Chicago and other urban centers, specialty subcontractors may be forced to work their trades as much as fifty hours per week. This situation develops for two reasons: First of all, there is simply not enough labor to staff their job for a normal work week, and still meet project deadlines. Secondly, when labor is in short supply, workers seek jobs with overtime premiums.

Thus contractors may have to guarantee fifty hour weeks in order to attract top tradesmen. With premium pay for overtime at time and a half, or even double time, this practice may result in a 37½ per cent or 50 per cent increase in labor costs.

The problem of overtime cannot be avoided, but can be reduced

First, in budgeting new projects by the inaccurate but time-honored method of comparing square foot costs with buildings already constructed, architects must weigh the relative labor markets and the possibility of increased costs due to this premium-pay situation. Secondly, where possible, architects should schedule longer completion periods for these contracts, thereby granting contractors greater flexibility in scheduling their labor forces.

INDEXES AND INDICATORS

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

FEBRUARY 1967 BUILDING COST INDEXES

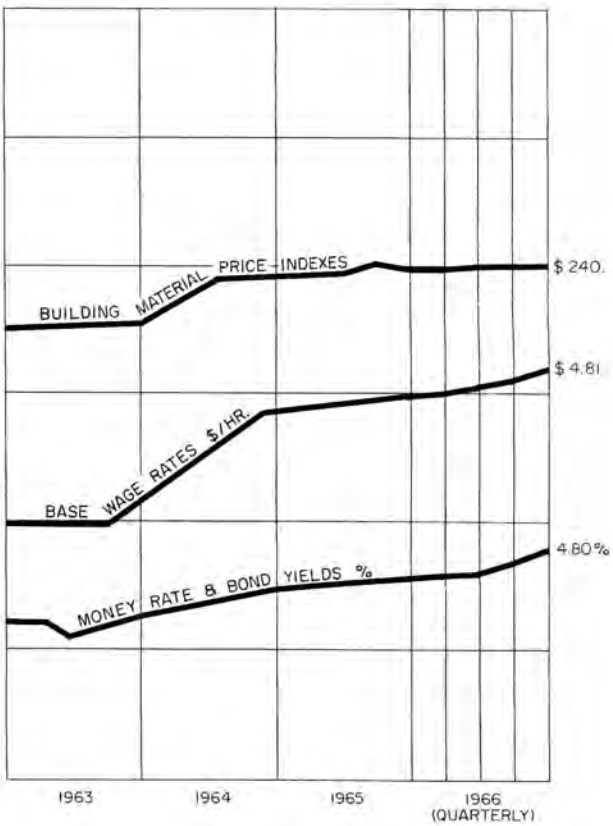
1941 averages for each city = 100.0

Metropolitan area	Cost differential	Current Dow Index residential	Current Dow Index non-res.	% change year ago res. & non-res.
U.S. Average	8.5	278.3	296.4	+2.23
Atlanta	7.2	315.2	334.4	+2.58
Baltimore	7.7	278.7	296.4	+1.78
Birmingham	7.5	255.4	274.7	+1.80
Boston	8.5	251.4	266.1	+1.63
Chicago	8.9	309.6	325.6	+2.75
Cincinnati	8.8	265.8	282.5	+1.53
Cleveland	9.2	287.4	305.5	+2.83
Dallas	7.7	261.3	269.9	+2.30
Denver	8.3	283.6	301.5	+1.22
Detroit	8.9	286.6	300.9	+4.28
Kansas City	8.3	250.3	264.9	+1.67
Los Angeles	8.3	283.3	310.0	+1.78
Miami	8.4	274.3	288.0	+2.27
Minneapolis	8.8	275.8	293.2	+1.54
New Orleans	7.8	248.9	263.7	+1.32
New York	10.0	289.8	311.7	+2.32
Philadelphia	8.7	276.6	290.3	+1.95
Pittsburgh	9.1	258.9	275.3	+1.72
St. Louis	9.1	276.2	292.6	+2.59
San Francisco	8.5	361.3	395.3	+4.71
Seattle	8.4	253.1	282.8	+2.26

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

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

ECONOMIC INDICATORS



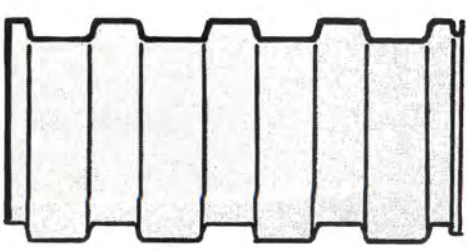
HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1952	1959	1960	1961	1962	1963	1964	1965 (Quarterly) 1st	1965 (Quarterly) 2nd	1965 (Quarterly) 3rd	1965 (Quarterly) 4th	1966 (Quarterly) 1st	1966 (Quarterly) 2nd	1966 (Quarterly) 3rd	1966 (Quarterly) 4th
U.S. Average	213.5	255.0	259.2	264.6	266.8	273.4	279.3	279.5	281.0	288.7	284.9	286.3	287.3	290.4	286.6
Atlanta	223.5	283.3	289.0	294.7	298.2	305.7	313.7	313.9	317.9	320.6	321.5	322.2	323.3	328.5	329.8
Baltimore	213.3	264.5	272.6	269.9	271.8	275.5	280.6	280.5	281.0	284.7	285.7	288.6	289.6	289.4	290.9
Birmingham	208.1	233.2	240.2	249.9	250.0	256.3	260.9	261.2	264.1	264.9	265.6	267.1	268.1	269.7	270.7
Boston	199.0	230.5	232.8	237.5	239.8	244.1	252.1	251.7	252.6	256.3	257.8	258.5	259.6	260.9	262.0
Chicago	231.2	278.6	284.2	289.9	292.0	301.0	306.6	306.5	307.3	310.2	311.7	312.6	313.7	318.9	320.4
Cincinnati	207.7	250.0	255.0	257.6	258.8	263.9	269.5	269.4	270.2	272.9	274.0	274.7	275.7	277.2	278.3
Cleveland	220.7	260.5	263.1	265.7	268.5	275.8	283.0	282.3	283.4	290.8	292.3	293.0	294.1	299.2	300.7
Dallas	221.9	237.5	239.9	244.7	246.9	253.0	256.4	256.9	257.9	259.5	260.8	261.7	262.6	265.8	266.9
Denver	211.8	257.9	257.9	270.9	274.9	282.5	287.3	287.3	288.2	292.7	294.0	294.6	295.5	296.6	297.5
Detroit	197.8	249.4	259.5	264.7	265.9	272.2	277.7	277.7	279.3	283.5	284.7	285.5	286.5	295.7	296.9
Kansas City	213.3	239.6	237.1	237.1	240.1	247.8	250.5	251.2	252.0	255.0	256.4	257.3	258.2	260.0	261.0
Los Angeles	210.3	263.5	263.6	274.3	276.3	282.5	288.2	288.9	289.7	295.8	297.1	298.0	298.6	301.6	302.7
Miami	199.4	249.0	256.5	259.1	260.3	269.3	274.4	274.4	275.4	276.6	277.5	278.4	279.2	282.9	284.0
Minneapolis	213.5	254.9	260.0	267.9	269.0	275.3	282.4	283.4	283.6	283.9	285.0	285.7	286.6	288.3	289.4
New Orleans	207.1	237.5	242.3	244.7	245.1	248.3	249.9	250.5	253.1	255.1	256.3	257.1	258.0	258.8	259.8
New York	207.4	260.2	265.4	270.8	276.0	282.3	289.4	290.2	294.0	296.0	297.1	297.8	298.7	302.8	304.0
Philadelphia	228.3	262.8	262.8	265.4	265.2	271.2	275.2	275.5	276.4	279.5	280.8	281.7	282.6	285.3	286.6
Pittsburgh	204.0	241.1	243.5	250.9	251.8	258.2	263.8	264.0	264.9	265.9	267.0	268.9	270.1	270.7	271.7
St. Louis	213.1	246.9	251.9	256.9	255.4	263.4	272.1	272.9	276.1	279.9	280.9	282.2	283.2	287.0	288.3
San Francisco	266.4	321.1	327.5	337.4	343.3	352.4	365.4	366.6	366.9	367.7	368.6	376.2	377.7	384.7	386.0
Seattle	191.8	232.7	237.4	247.0	252.5	260.6	266.6	265.1	266.3	267.8	268.9	271.1	272.1	273.9	275.0

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

It's hard to top Xerox when



But Wheeling has.

Eleven times. Eleven roofs of Super-Rib Roof Deck on eleven Xerox buildings in the past two years.

And every piece of that Super-Rib Roof Deck—all 651,436 sq. ft. of it—is an exact duplicate of every other piece. No variation.

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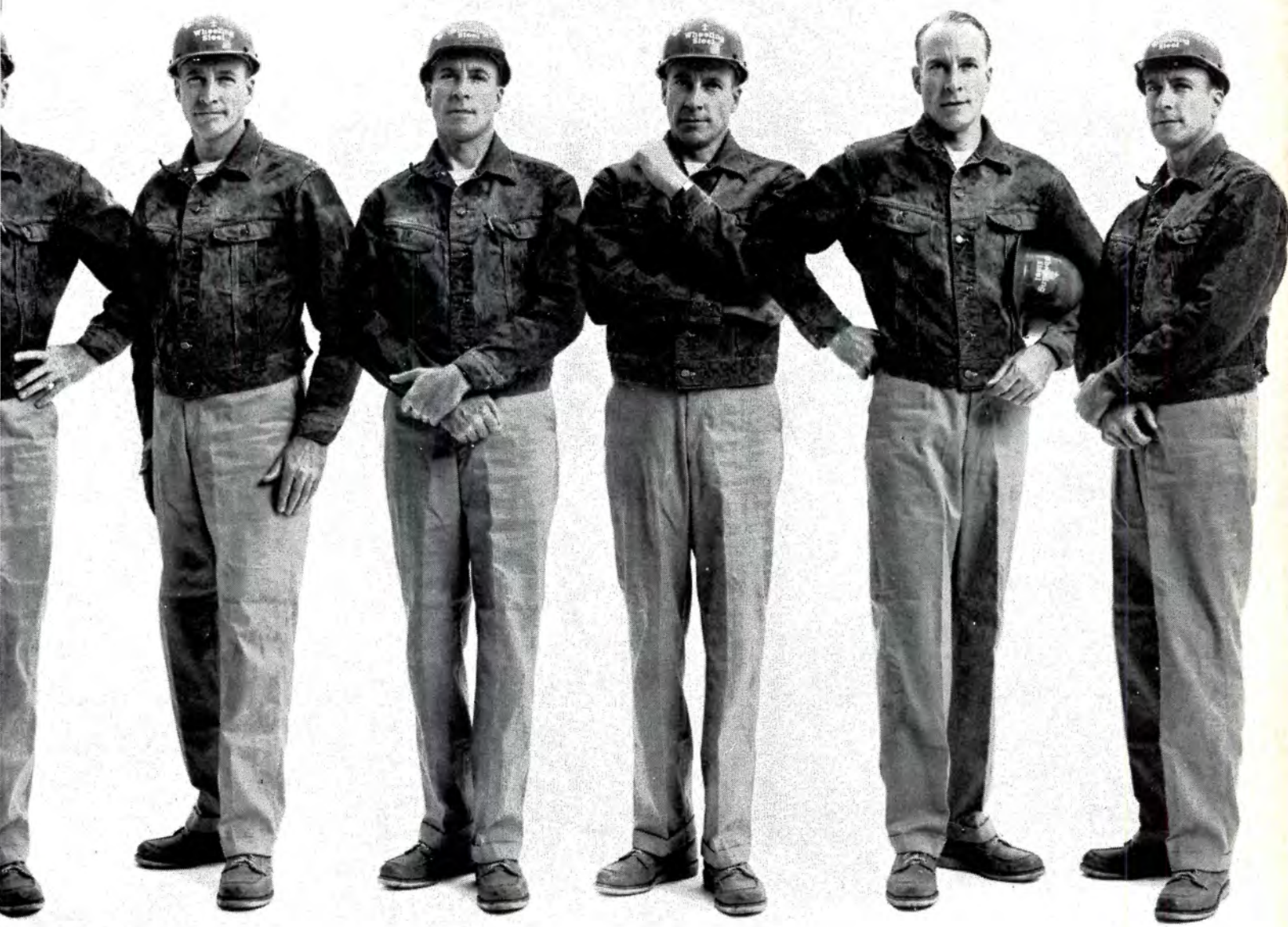

it comes to duplication.

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In gauges from 16 to 22.

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OFFICE MANAGEMENT

Harry A. Golemon
Senior Partner
Golemon & Rolfe Architects
Houston, Texas

Network planning: management tool for architects

Part one of two parts

Traditional management methods in the practice of architecture are no longer equal to the task of supporting comprehensive environmental design. The architect's fundamental concern for human values confronts a mushrooming technology generating environmental needs unheard of a generation ago. These needs call for expanded services and exert a profit squeeze on architects that can be met only by creative management. Network planning and analysis is one tool of creative management that can be used in any architectural office—large, medium or small.

Network planning develops the logic of a particular project work plan by showing the relationships of tasks, the time each requires, the responsible persons and resources required. It also provides a system by which to check progress of project development.

There are four basic steps involved in all methods of network planning: (1) task definition, which lists the various individual tasks required; (2) development of work-flow logic, which determines the dependency of certain tasks on the accomplishment of other tasks; (3) time estimating of tasks, which is the assignment of an anticipated duration for accomplishment of each task; and (4) computation and analysis of the network, which is the calculation of start and finish dates for each task based on the inter-dependency of tasks. Schedule requirements may set start dates and finish dates of particular tasks in accordance with the finish date established for the project.

Initially the design development phase was not so easy to network because Golemon & Rolfe had not rigorously analyzed the design procedure. To define a design methodology and major tasks to be performed in the design development phase was the first challenge to be accomplished before adapting the design network. After much discussion, the following major events were decided to be accomplished in the design development phase. Other architectural firms may establish a different set of events for the design procedure.

1. Research: (a) of existing conditions and limitations; (b) of functions and environment; (c) of major systems (MPE, structural, other technical requirements); (d) of esthetics.

2. Analysis of components, systems and related costs.

3. Comprehensive design analysis and criteria development.

4. Schematics.

5. Design development.

Within each major event there are many tasks and creative activities to be accomplished.

Three systems in use: CPM, PERT and PDM

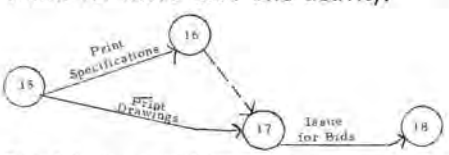
There are three major network diagrams systems used today—CPM (Critical Path Method), PERT (Program evaluation and review technique) and PDM (precedence diagramming method).

CPM and PERT both utilize the well-known arrow diagramming technique (see Introduction to CPM by E. Van Krugel, RECORD, September 1964). Both utilize the critical path, which is defined as the shortest time in which the total project can be completed. The two systems differ noticeably in one aspect: The expected time for completion of an activity is computed in the PERT system as the weighted average of three estimates, i.e., the most optimistic plus the most pessimistic plus four times the most likely; only one time estimate for an activity is used in the CPM system.

For the application of network planning and analysis to architectural practice (assuming basics of the different methods are familiar) some explanation is necessary about the differences between these systems and the third important system: PDM.

The PERT term for a task is "activity" and the start or finish of an activity is an "event." Activities require action and passage of time. The PERT arrow diagram, as shown in illustration A, contains events (the numbered circles) and activities (the labeled arrows). The selected events are laid out with activity arrows connecting them so that the plan progresses generally from left to right. The network is constructed to reflect the fact that an event cannot occur until the activities, leading to that event have been completed. Likewise, an activity cannot commence until the preceding event has occurred.

The "events" are numbered which then allows an "activity" to be identified by the numbers of its "predecessor," or go ahead event, and its "successor," or objective event. Identification by number is necessary if the network is to be calculated by computer. It is obvious then that no two activities can have the same "predecessor" and "successor" event. The following example demonstrates the use of a "dummy activity," a diagramming device used to avoid duplicate "predecessor" and "successor" events for more than one activity.

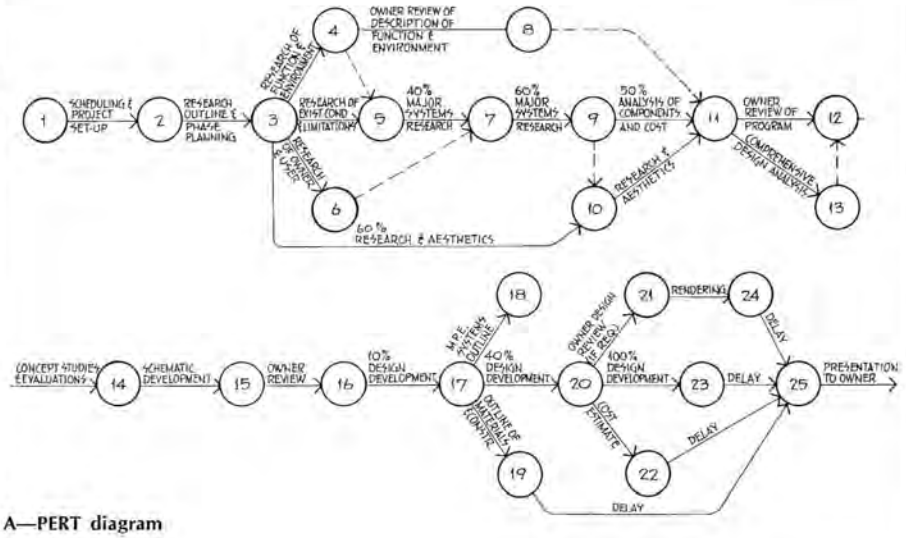


The "dummy activity' is represented by a dashed arrow and is activity 16-17. It does not indicate work or time, but simply that Issue for Bids cannot commence until Print Specifications and Print Drawings are complete.

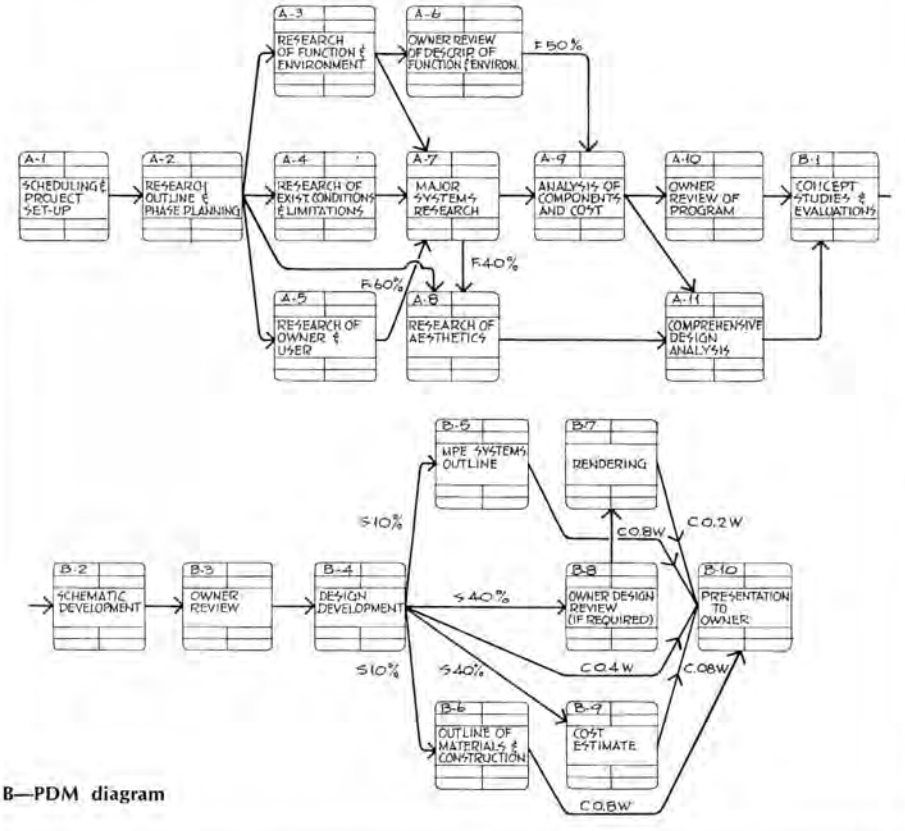
PDM also represents a graphic display (network) of a work plan and also establishes a critical path for the network. (Illustration B shows a PDM network comparable to PERT diagram A.) Earliest and latest times are calculated for each "work item." PDM differs from CPM and PERT in method of networking in that it focuses its attention on the work item itself and its specific relationship to serial or parallel work items. These points are emphasized in both the background calculations and the diagram itself. PDM allows each work item to be considered independently and as one unit of work. PDM also allows the planning phase to be split into four distinct categories: work item definition, work item logic, diagramming and time estimating. The analysis phase follows the planning phase.

Work item definition, with PDM, can be considered independently from the other phases of planning. As each work item is defined it can then be recorded and assigned a work item number. This

Code	Explanation of Lag Factor Code
S	The S code specifies that the work item begins at a certain interval following the start of the immediately preceding work item. Further stated by the S code is that the completion of the work item is not contingent upon the completion of the PWI associated with the S code.
C	The C code specifies a delay in the start of a work item until a certain number of days following the completion of the PWI.
Z	The Z code states, as does code S, that this work item cannot begin until a certain period following the start of the PWI associated with the S code. In addition, it also states that this work item may not be completed until the same interval following the completion of this PWI.
F	The F code states that the work item cannot complete until a certain interval following the completion of this PWI. However, the beginning of the work item is not restricted in any way by the predecessor.



A—PERT diagram



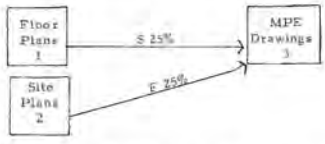
B—PDM diagram

definition of tasks should be given as much thought and consideration as possible so as neither to belabor the diagram with an excessive amount of detail, nor to decrease the effectiveness of the diagram by being too brief. When a basic list of work items is assembled, it becomes a simple procedure to expand or delete from the list as necessary.

Work item logic determines the specific relationships between work items. Serial and parallel are two basic relationships. If a work item is in parallel with another, there need not be any specific mention of this fact. However, work items in series are identified by relationship to the immediately preceding work item or items (PWI). A PWI specifies the logic or flow of work through the diagram. Each work item (except the first of the diagram) must have at least one PWI associated with it.

It may be desired to express a relationship between work items other than the solely sequential relationship. This feature of PDM is accomplished by the Lag Factor. *The Lag Factor facility of PDM is the principal difference between PDM and CPM or PERT.* In CPM and PERT only the sequential serial relationship between tasks can be expressed.

The lag factor is the means by which different job relationships may be expressed. Associated with the lag factor is a code of four letters used, as described in the tabulation, to modify certain time intervals or to indicate overlap of tasks, either as a percentage of the preceding work item's duration or as a direct time duration. The four code letters are used to distinguish the type of lag factor being used, as illustrated in the sketch.



The 25 per cent lag factor indicates that the MPE drawings can start after the floor plans are 25 per cent complete.

The F 25 per cent lag factor indicates that the start of MPE drawings is not dependent on the site plan, but that 25 per cent of the MPE drawings cannot be *finished* until the site plan is complete.

Diagramming provides a visual aid for determining the over-all work plan. While it is possible to do so, it is quite difficult to visualize or follow a work plan of any complexity without a diagram. In fact, sometimes it would be impossible even to set up a precedence work plan without sketching portions of a diagram to aid in visualizing complex situations.

(Continued Next Month)

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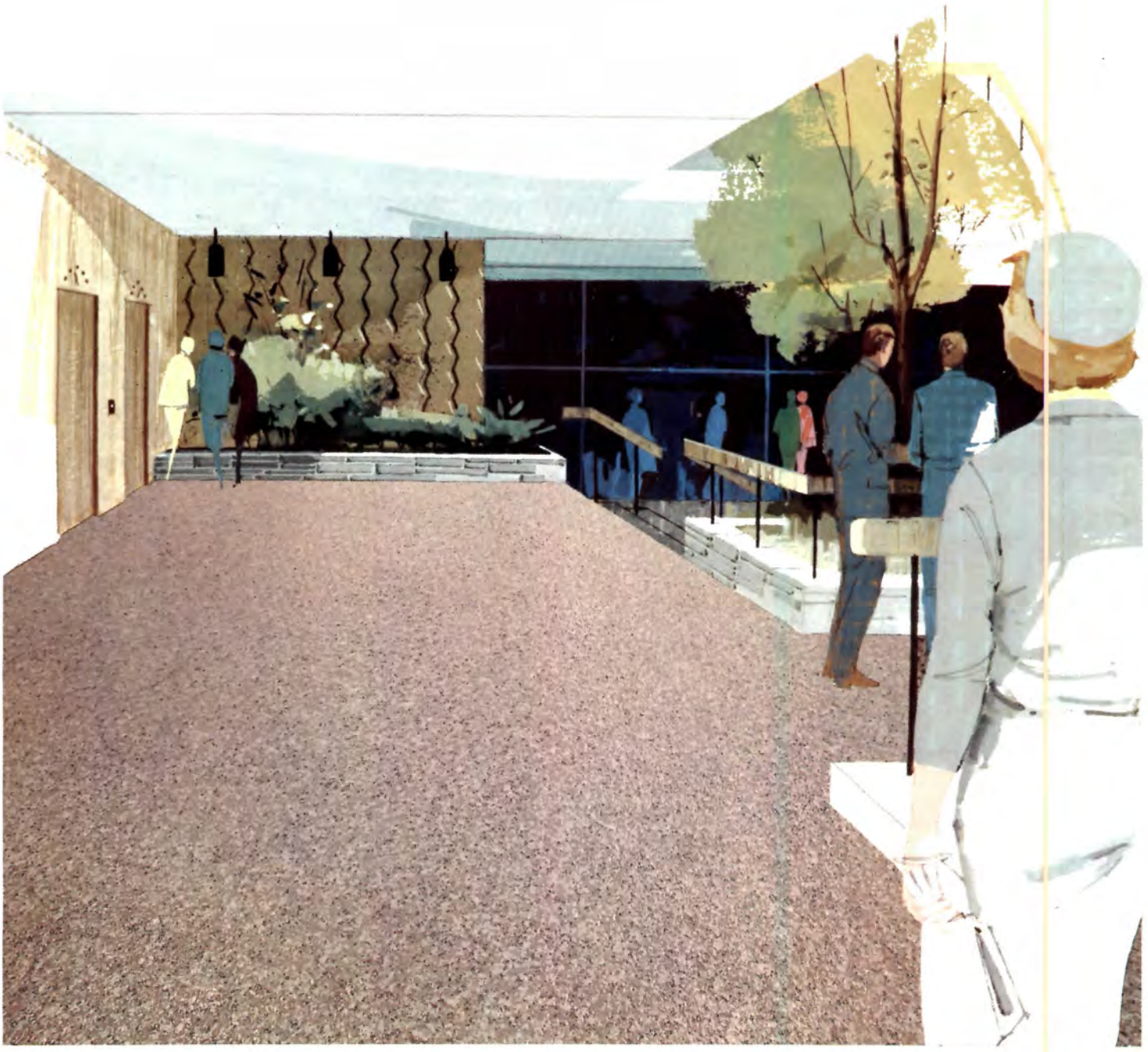

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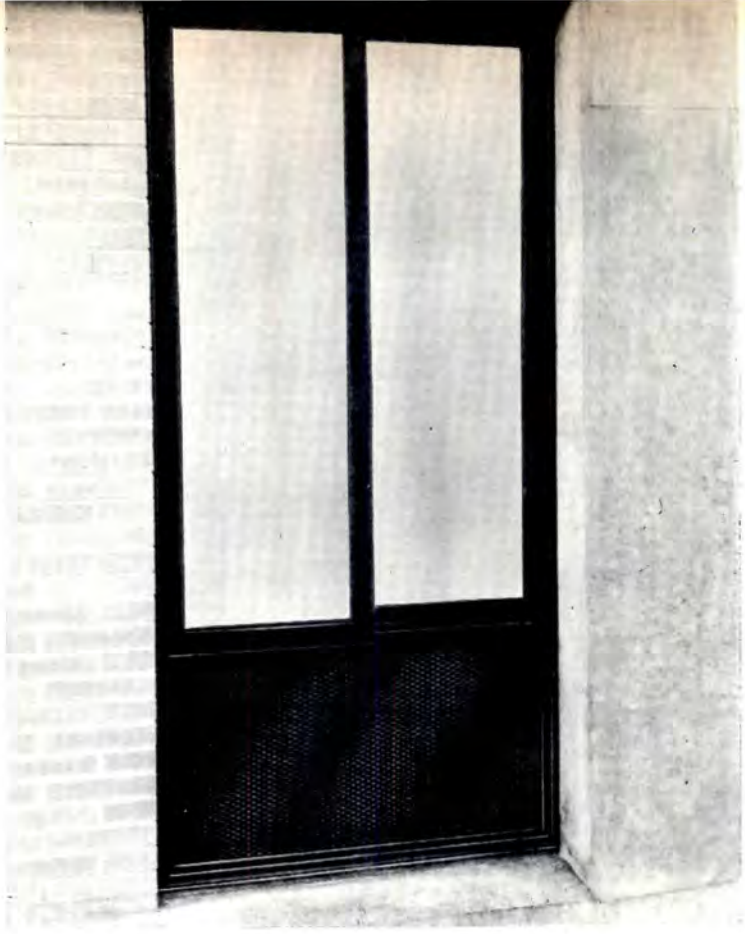

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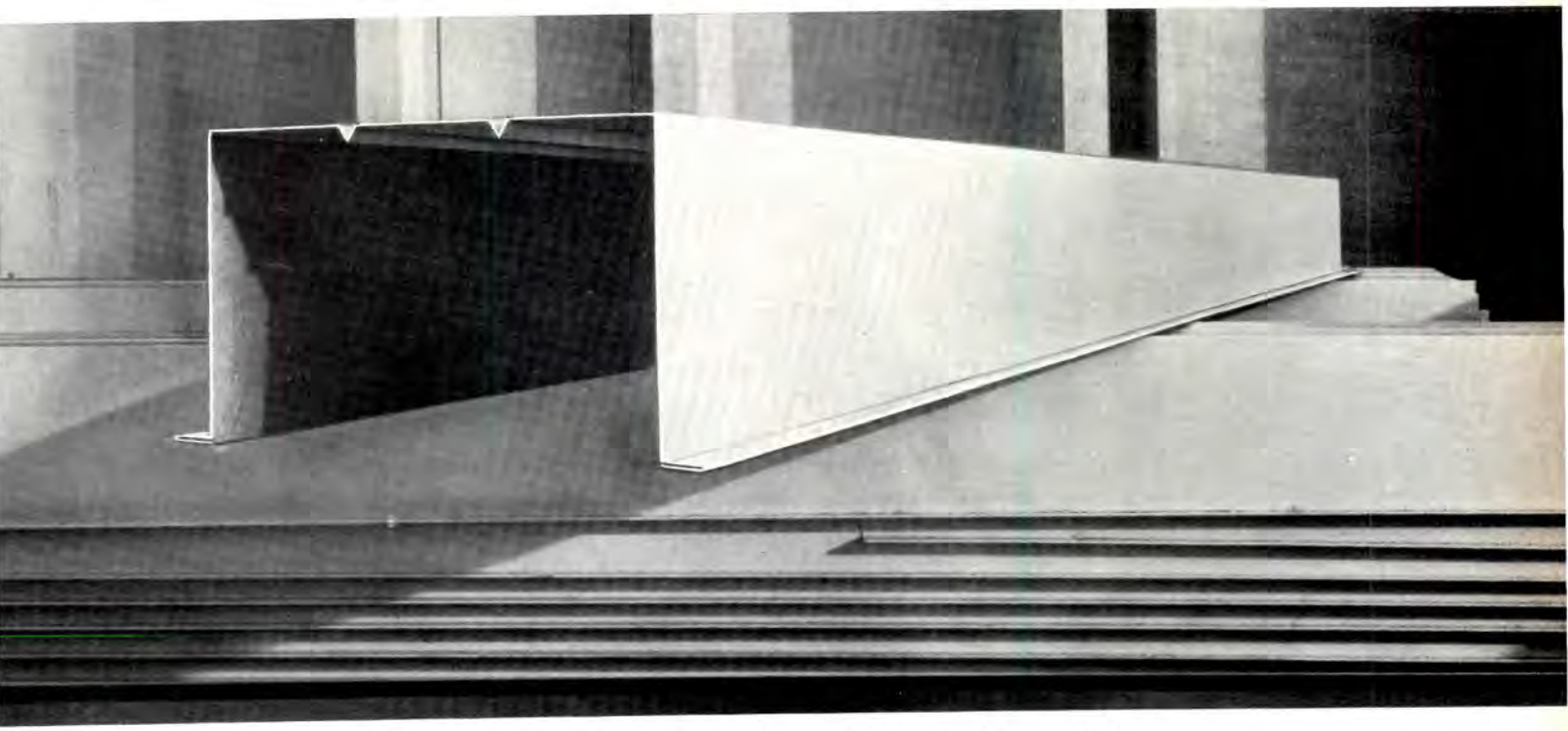

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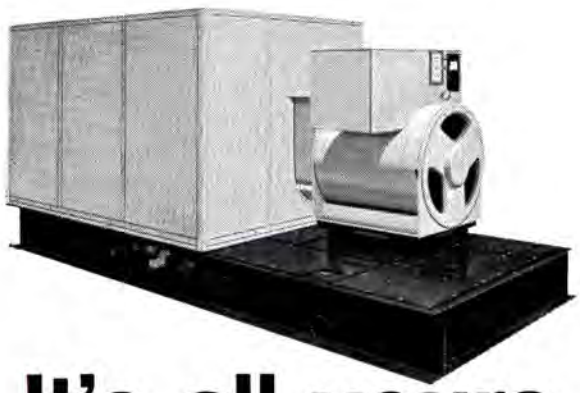

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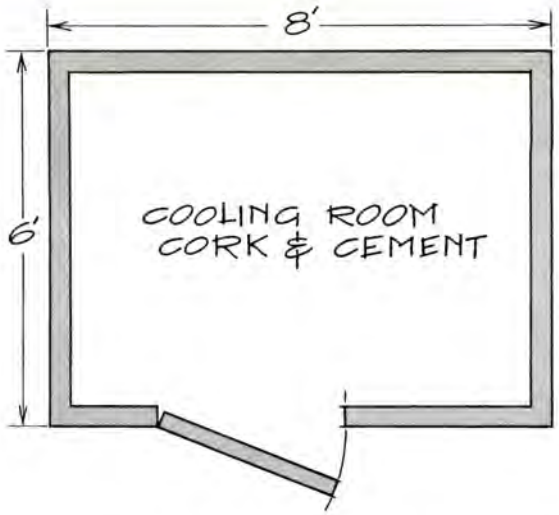

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Store Designers: Raymond Loewy/William Snaith, Inc., N. Y., N. Y.

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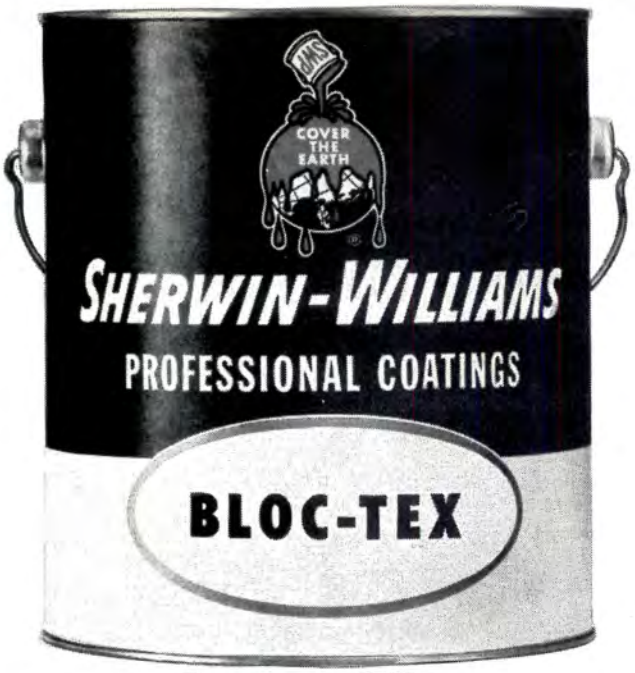

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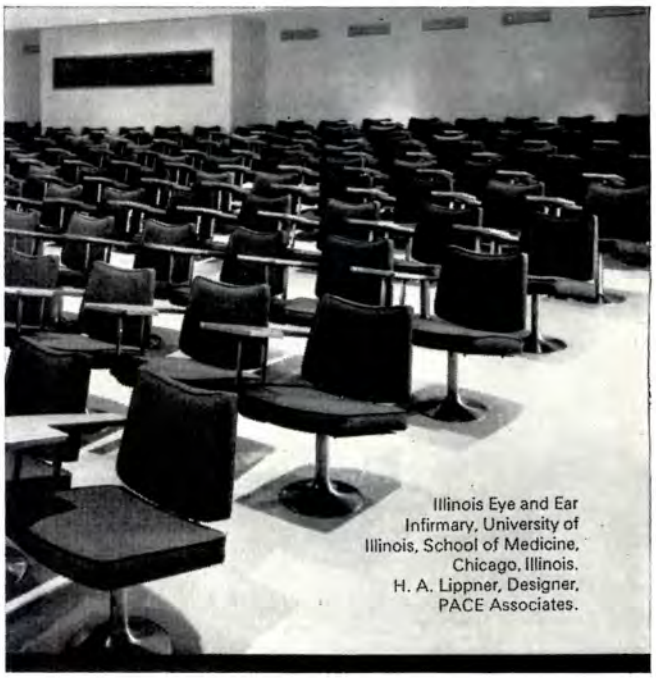

Illinois Eye and Ear Infirmary, University of Illinois, School of Medicine, Chicago, Illinois. H. A. Lippner, Designer, PACE Associates.

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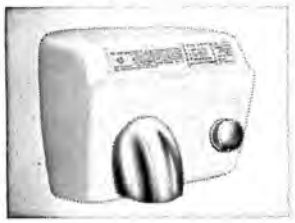

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Ceramic tile lends carefree warmth to an unusual circular home by John Nyberg.

Located in Pasadena, California, this circular home has an atrium as its focal point. All rooms of the masonry and tile structure open off the atrium with its circular pool.

Designed by the firm of Nyberg and Bissner as Mr. Nyberg's home, ceramic tile is used both decoratively and functionally. Quarry tile floors are found in the living room dining, area, kitchen and den. It is also used for kitchen counter tops and back splashes.

Scored glazed tile is used for bathroom counter tops and walls including a unique circular treatment of the walls of the master bath.

In keeping with the contemporary Spanish feeling sought for, extensive use of tile is made throughout other areas of this five bedroom home. Tile contractor for the home was C&D Tile Company of San Gabriel.

If you're looking for a material with limitless possibilities in combined decorative and functional use, look for ceramic tile made in the U.S.A. and Quality Certified by the Tile Council of America. The triangular seal at right is your assurance of glazed wall tile, ceramic mosaic tile and quarry tile that is tested to meet the most rigid government specifications. For more information about Certified Quality Tile, a material that can be used with confidence indoors and out, write: Tile Council of America, Inc., 800 Second Avenue, New York, N.Y. 10017. Or, see the current Sweets Architectural File.

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The major elements of the acoustical design can be seen in the photograph above and the section at left. They include the fan-shaped canopy for early sound reflection; the 12-foot-wide convex fins of prestressed plywood with batten surface which reflect sound downward to the audience; the balcony soffit which helps reflect sound toward the seats under the balcony; the pleated roof form which helps cross-wise sound-diffusion; and on either side and above the proscenium opening, a sound transparent screen composed of vertical panels of vinyl fabric, which permits the "acoustic coupling" of the stage house and auditorium when maximum volume is required for reverberation time.

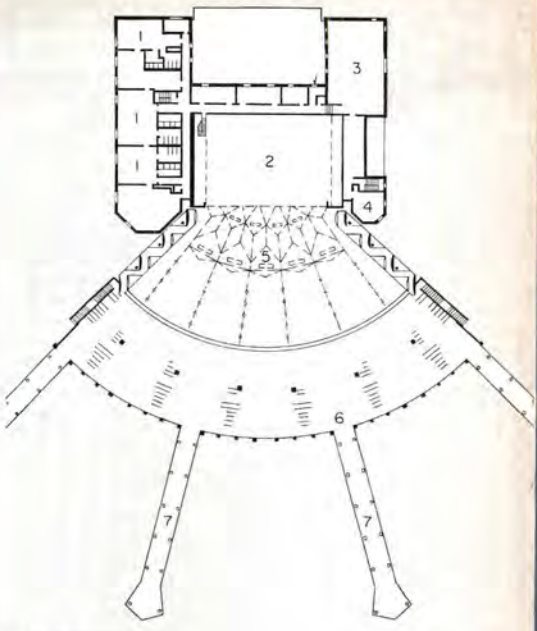
top of the demands for size, the pavilion was to be completely open from the rear, so that those on the lawn could see the stage; and as open as possible on the sides, so that those within could see and sense the outdoors. Said Veneklasen: "Every bit of open wall area permits the loss of acoustical energy. It is a difficult technical challenge."

A nominal reverberation time of 2.5 seconds was chosen as a design goal. Tests indicated that this value could be achieved if 50 per cent of the side wall area took the form of sound-reflecting panels, with the remaining percentage open. Veneklasen recommended a side wall form, zigzagged in plan, with large, solid and slightly curved acoustical reflecting surfaces, angled toward the stage to form a continuous surface facing the sound source (as shown in the photograph below) and tilted downward as well to reflect sound to the audience. The large canopy projecting from the top of the proscenium is the source of the primary sound reflections which contribute to clarity and definition. The final form and placement of the canopy and side panels were continually modified within the two-year period of design and construction. Veneklasen recommended shapes, angles and positions derived from and tested in an acoustical model of the theater 1/48th the actual size. These recommendations were adapted by Rotner to conform to esthetic, structural or budgetary criteria. In the model a tiny spark initiated the sound, and a tiny microphone "heard" the sound arriving from all surfaces. In this way, the intensity, direction and time delay of the echo from each surface or group of surfaces was determined.

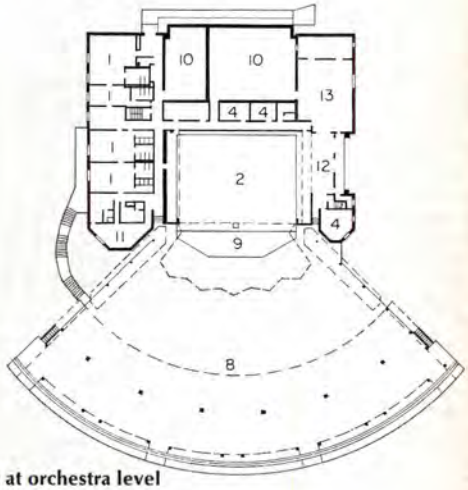
On opening night it was clear that the acoustics, stage facilities and the stage itself were excellent for ballet. The real test was held in August when Ormandy's musicians followed Balanchine's dancers into the center. How would the $2.6-million amphitheater sound with a major symphony orchestra in it? Said New York Times music critic Theodore Strongin reporting on the opening night, "The sound is very good indeed—warm, alive, rich, voluptuous . . . it climbs all over the listener and envelops him."

SARATOGA PERFORMING ARTS CENTER, Saratoga Springs, New York. Architects and engineers: *Vollmer-Ostrower Associates—partners in charge: Arnold H. Vollmer and Robert L. Rotner; chief landscape architect: Maurice Wrangell.* Acoustical consultant: *Paul Veneklasen Associates;* technical consultant: *Robert P. Brannigan;* auditorium consultant: *Benjamin Schlanger;* mechanical engineers: *Joseph R. Loring and Associates;* contractor: *L. A. Swyer.*

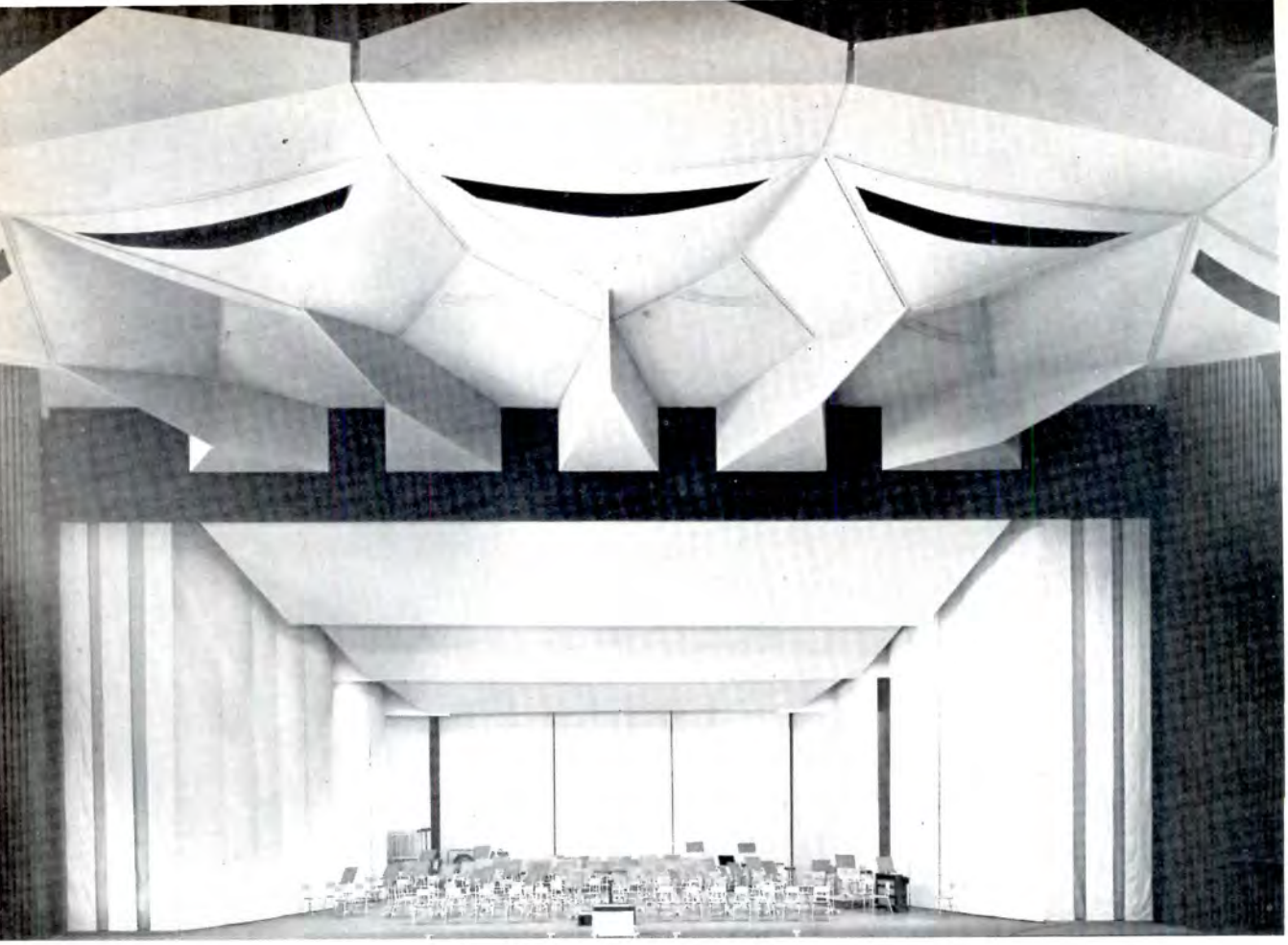
Feasibility consultants—architect: *Herbert D. Phillips;* acoustical consultant: *Bolt, Beranek & Newman, Inc.;* production consultant: *Dr. Carolyn Lockwood.*



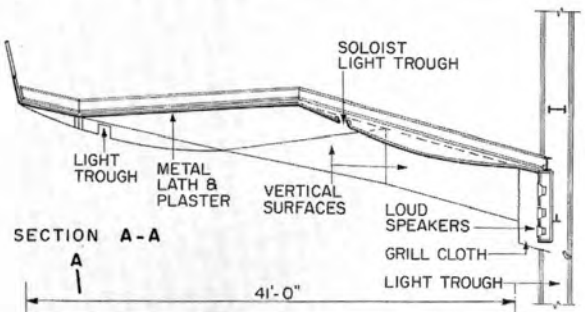
Plan at balcony level
1. dressing rooms
2. stage house
3. trunk storage
4. office
5. acoustical canopy
6. balcony
7. ramps to balcony



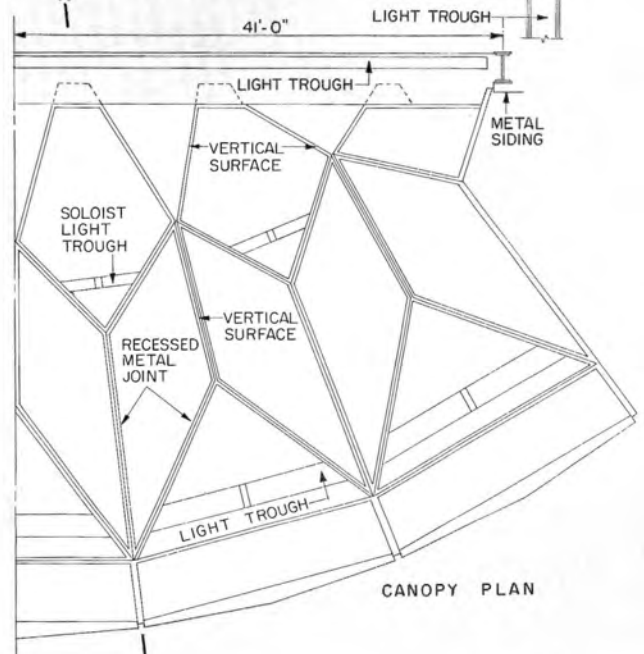
Plan at orchestra level
8. orchestra
9. orchestra pit
10. rehearsal rooms
11. green room
12. side stage loading
13. trunk room and shop



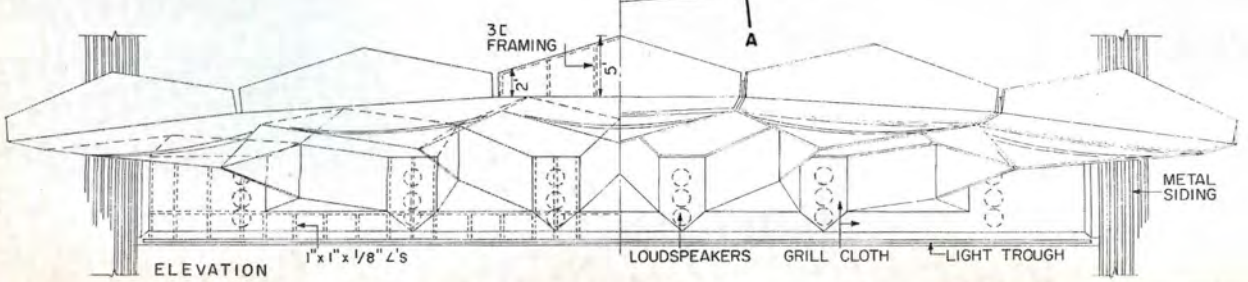
The principal single acoustical element is the cement stucco canopy on steel framing which extends 50 feet over the auditorium from the proscenium arch. It is 80 feet wide at the proscenium and is suspended from the roof trusses. The canopy joins with the orchestra enclosure to form a sound projection chamber which increases loudness and maximizes the projection of the direct and early-reflected sounds which enhance clarity. Reflections from the nearby surfaces enable the musicians to hear themselves and each other. The orchestra enclosure ceiling and canopy reflect sound toward the audience in the same direction as its source so that sight and sound are correctly associated. The canopy itself will eventually accommodate a six speaker system for the sound amplification required for drama and musical comedy. At present one speaker is available when required for amplification of the human voice.



SECTION A-A



CANOPY PLAN



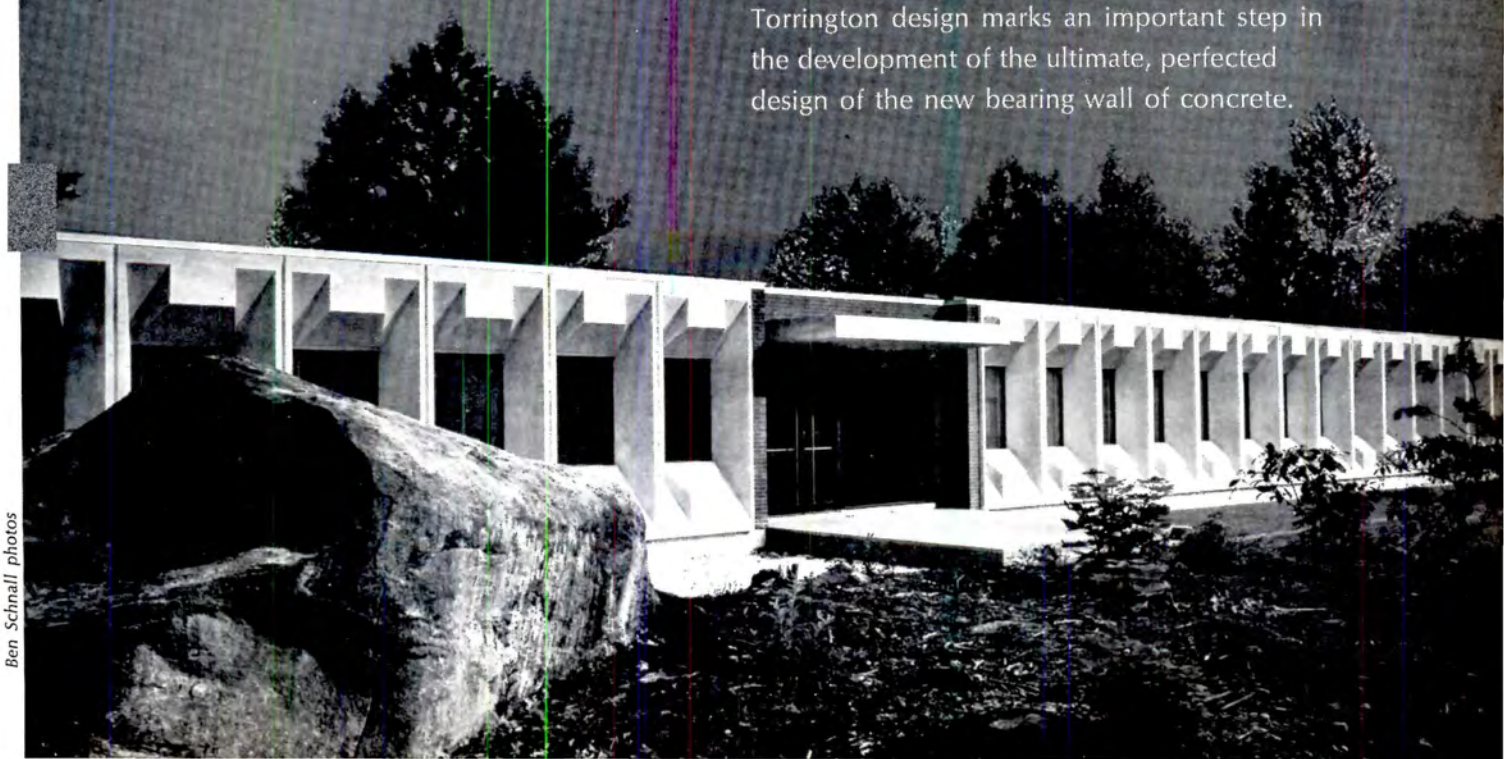
ELEVATION

Small office building by Marcel Breuer: sophisticated use of precast concrete

The new administration building for the Torrington Manufacturing Company is the latest example in architect Marcel Breuer's continuing search for a beautiful and appropriate expression of the precast concrete structural wall.

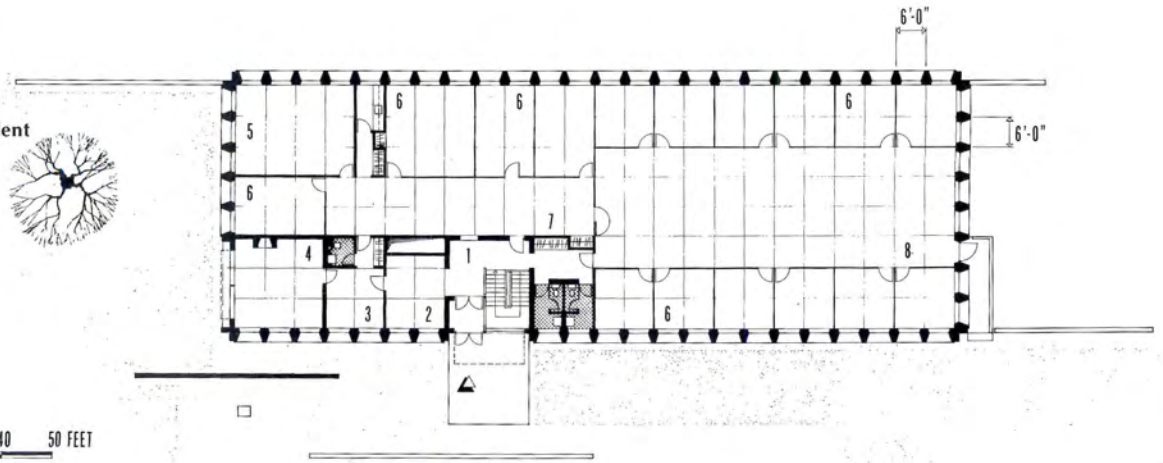
Its facades are assemblages of prefabricated units which serve as structure, interior and exterior finish, housing for mechanical and electrical equipment and distribution systems, and which—because of their depth and configuration—are able also to provide a degree of sun control. Esthetically, the planar modulations and patterns of sun and shadow create rhythmic architectural facades of great visual appeal which are—appropriately enough—expressive of the most advanced concrete construction technology.

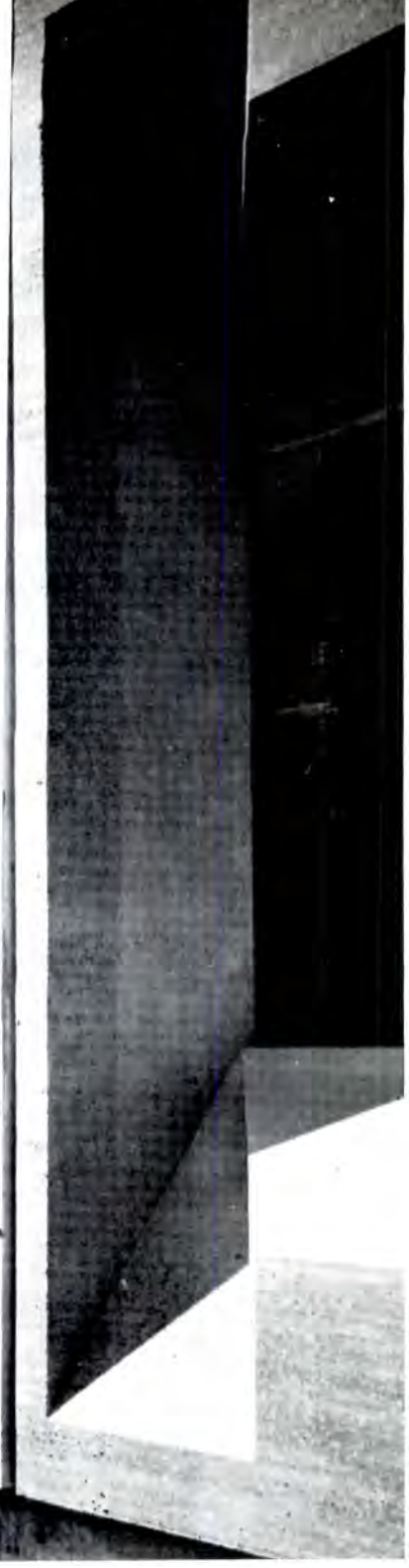
Thus, due to its inclusive character, the Torrington design marks an important step in the development of the ultimate, perfected design of the new bearing wall of concrete.

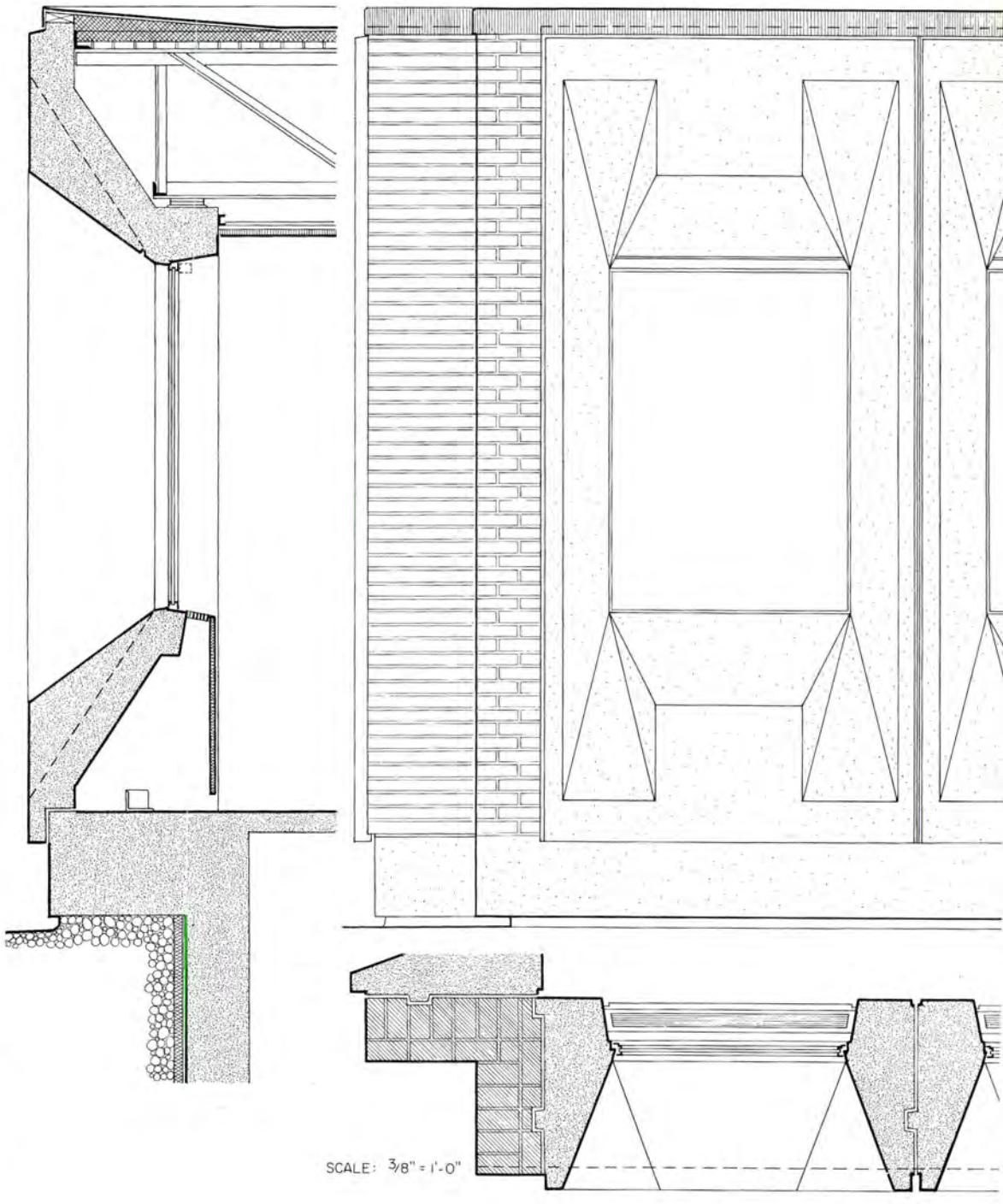


Ben Schnall photos

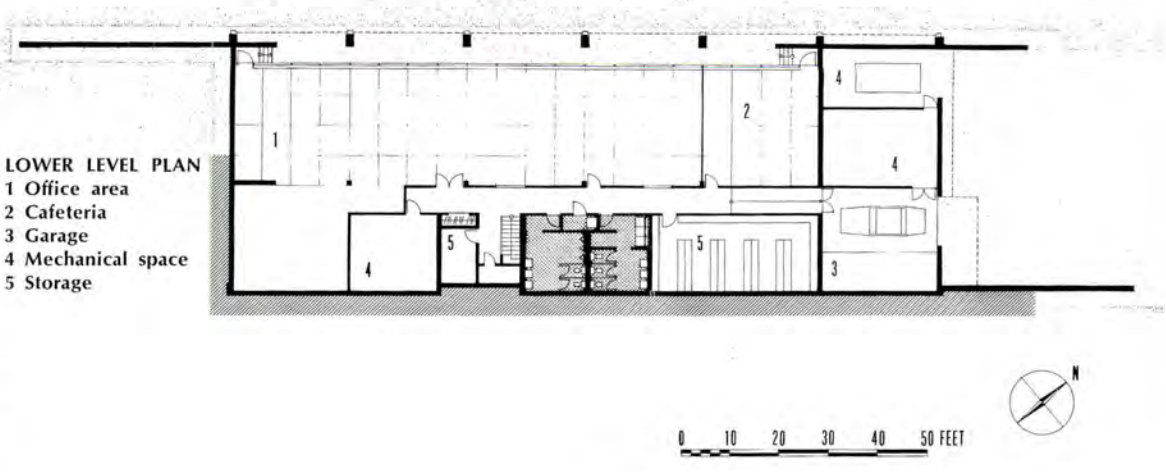
MAIN FLOOR PLAN
1 Lobby
2 Reception area
3 Secretary to president
4 President's office
5 Conference room
6 Private offices
7 Secretarial pool
8 General office







The two-story building is set against a hillside, with entrance and the more important spaces at the upper level. The lower-level construction is of black brick so that the precast assemblage becomes, in effect, a superstructure on a level, dissimilar base. The concrete units are of one type only; the modularity is rigorously carried out. To this end, negative-angled brick piers are used to turn outer corners; special brick handling separates the entrance. The precast units, each 12 feet—10 inches by 6 feet, have a white cement matrix and a subtly expressed aggregate pattern.



LOWER LEVEL PLAN
1 Office area
2 Cafeteria
3 Garage
4 Mechanical space
5 Storage

All interiors were designed by the architect, including the president's office (large photo above), which admirably fulfills that executive's request that his space relate strongly to the wooded site. The walls and fireplace are of bush-hammered concrete; the floor is pink-orange brick with a rug in off-white and natural tones; the coffee table is polished granite.

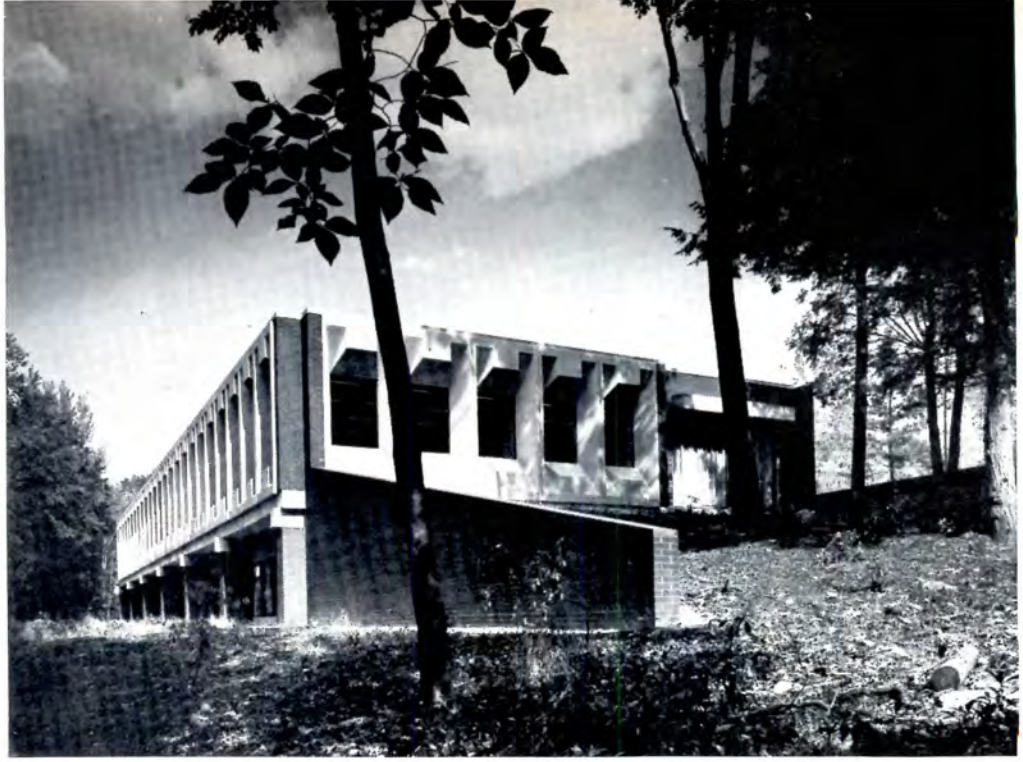
The general interior palette is made up of natural cork ceilings, white partitions, and brown-black over-all carpeting. Overrugs in blue, red, or white offer contrast, as do chairs, doors, and desk fronts, in vivid colors.

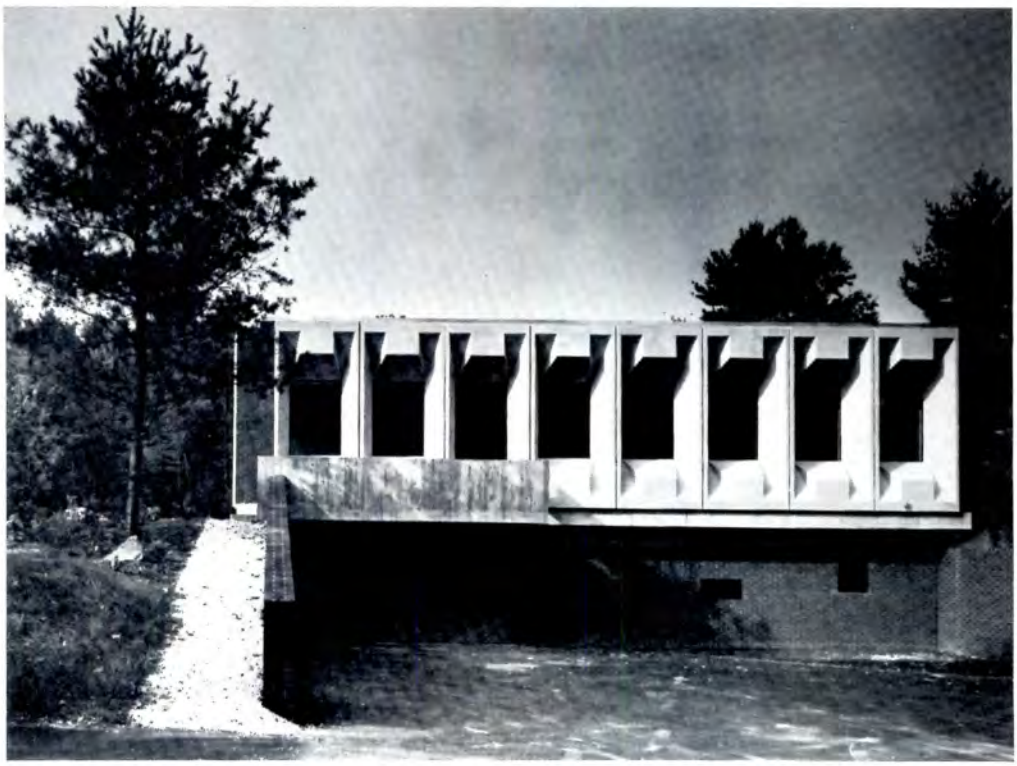
TORRINGTON
MANUFACTURING COMPANY
ADMINISTRATION BUILDING
TORRINGTON, CONNECTICUT

ARCHITECTS: *Marcel Breuer and Herbert Beckhard*

STRUCTURAL AND MECHANICAL ENGINEERS: *Westcott & Mapes*

CONTRACTOR:
McClean, Incorporated

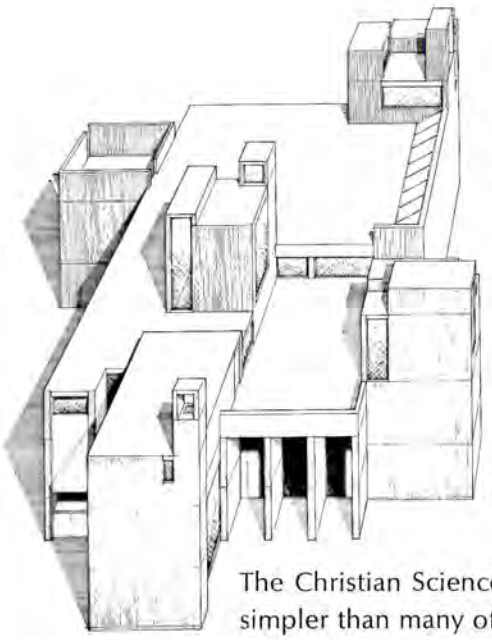




The upper two photos show the building as it relates to the hill; the photo below shows the prospect as one enters the property. The large T was made by joining two segments cut from typical wall units.

The matte-faced black brick is set in black mortar; the general effect of the concrete units is that of an off-white tone, with the aggregate pattern apparent only upon close inspection. This more-subtle-than-usual effect is produced by acid-etching the exposed surfaces, rather than sandblasting or hammering them. This aggregate covers a wide color range running from black through brown to warm beige. The mix for the matrix uses white cement.

A Christian Science Student Center by Rudolph demonstrates his virtuosity in the creation of



AN ARCHITECTURE STRONGLY MANIPULATED IN SPACE AND SCALE

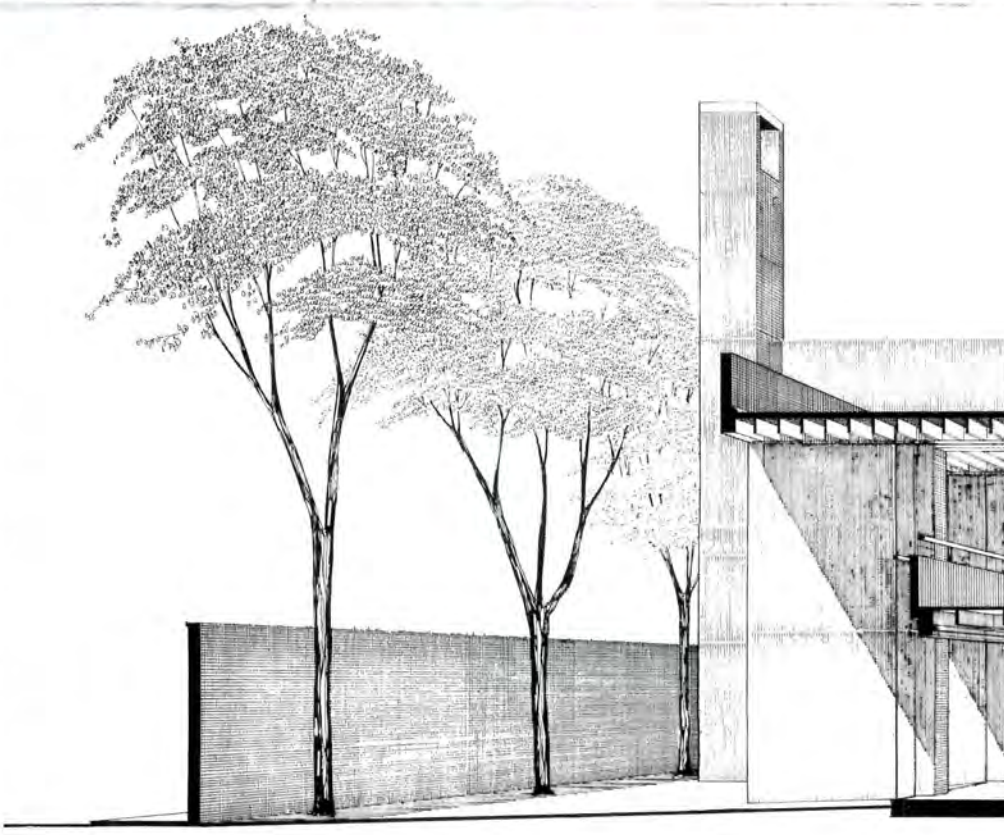
The Christian Science Organization Building in Urbana, Illinois, smaller and simpler than many of his projects, clearly shows Rudolph's alternatives to the kinds of architecture he is against. It exhibits strongly differentiated spaces which express and accent their separate and permanent functions.

Rudolph asserts that he will not create a universal space, adaptable to many uses—"flexibility is the enemy of architecture and should be limited as much as possible since it tends to become characterless." He is against what he calls "supercraftsmanship"—part of a "machine esthetic . . . in which buildings are boxes where all signs of human activity are hidden behind endlessly repeated glass or lightweight panels of absolute regularity." He is opposed to smooth machine-made finishes in buildings—to him these "seem inhuman, partially because they do not wear and consequently change with human use."

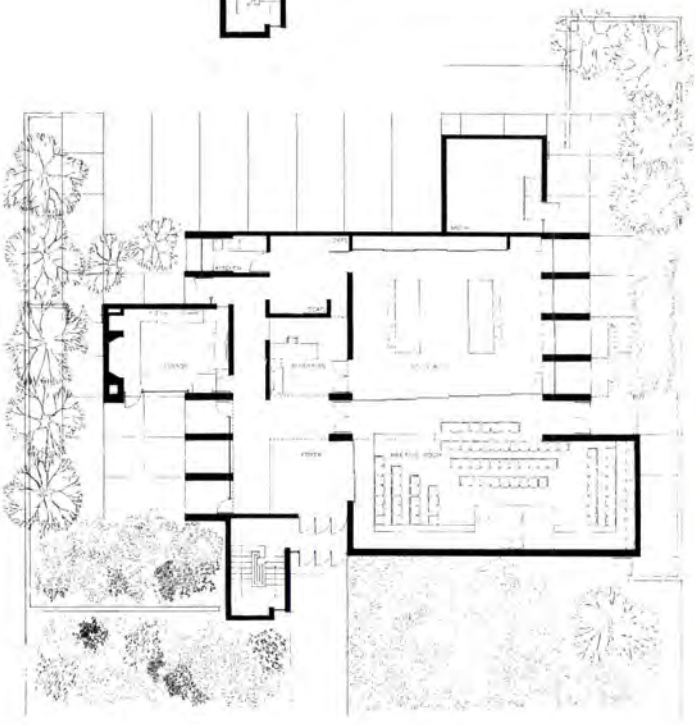
Although Rudolph's completed buildings show no signs of supercraftsmanship or the machine esthetic, his drawings suggest an architecture of great delicacy and precision. The isometric (above) and section (overleaf) delineate a structure as meticulously finished as the drawings themselves. On the other hand, the cover photograph, and the pictures on the following pages, reveal that the completed building differs greatly from its pen and ink images. Although the shapes have been faithfully translated into three dimensions, the claw hammered concrete of which they are formed is rough, irregular and raw. Rudolph's drawings, sharp as steel engravings, suggest that he didn't want his *beton* to be quite so *brut* as this.

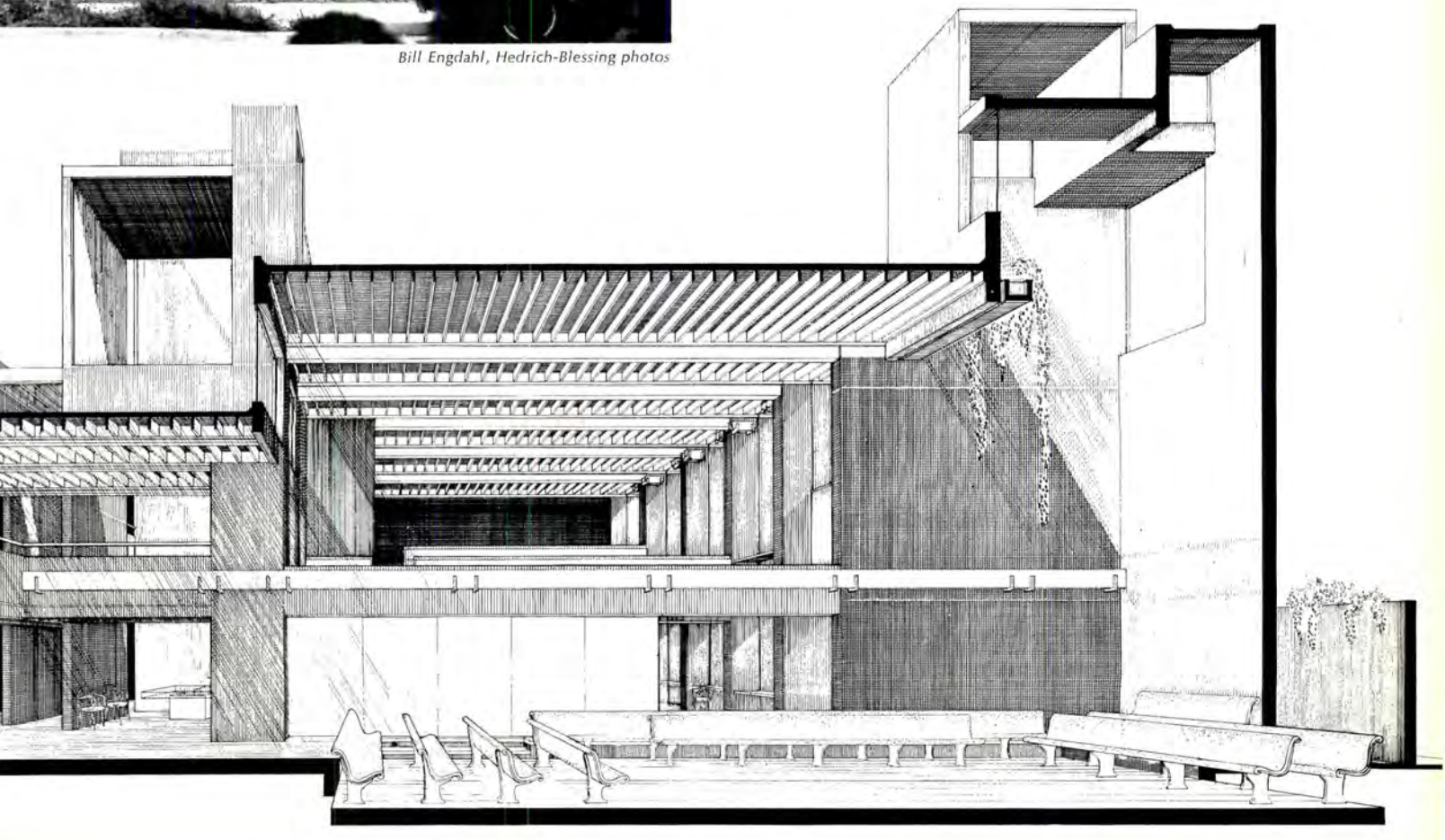
The plan is designed for a corner lot. Only the eastern facade (photo), with its entrance and stair tower, and the southern facade are visible from a distance. The point at which they meet has been strongly accentuated as the focus of the design. The building, adjacent to a busy intersection on the campus of the University of Illinois, is designed to attract visits from passing students and to provide quiet spaces for meetings and religious study. This activity is concealed from the streets by continuous expanses of concrete wall. At the focal point, large areas of glass reveal the spaces within.

Rudolph has minimized the fact that the structure is quite small in contrast to an immense armory next door. Scale-giving elements such as doors and steps are recessed and unit materials such as brick or concrete block are not used. The interior is made to appear bigger than the exterior by the skillful manipulation of vertical space. Room sizes are altered by means of sliding partitions.

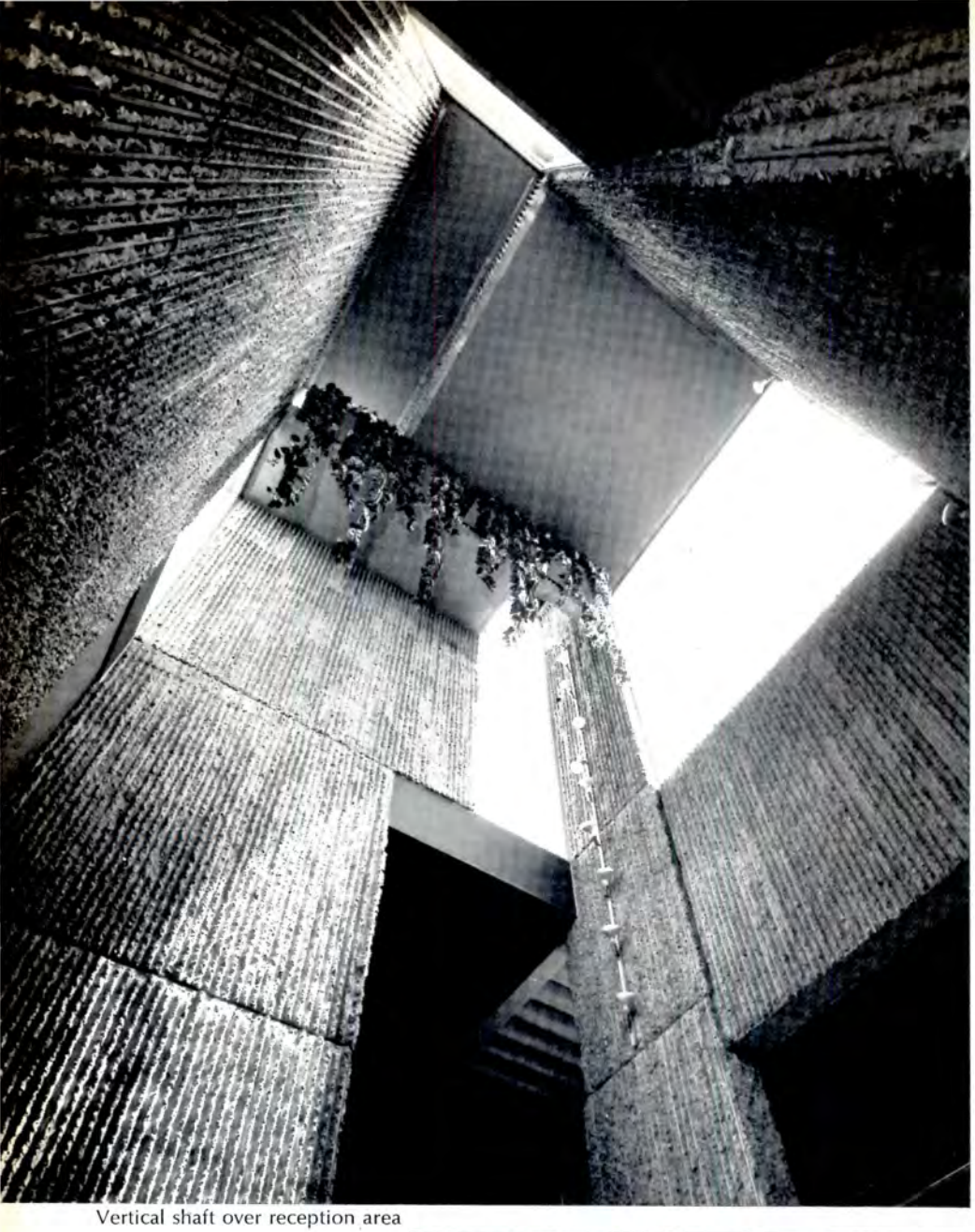


Bill Engdahl, Hedrich-Blessing photos



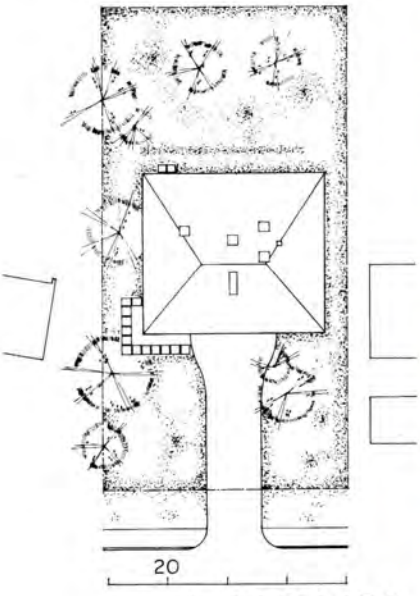


The photograph above shows the foyer and the reception area beyond. A display table in the reception area is centered within a vertical shaft into the top of which are set large glass panels of varying shapes to control the angles and intensities of light reflection. The bronze panel on the rear wall is a portrait in high relief of the founder of Christian Science, Mary Baker Eddy. Above the foyer is a T-shaped mezzanine corridor which gives access to the spaces at the second level and to the stair leading to toilet facilities and the custodian's apartment. The panels along its edge conceal lights. The room in the photograph at the left is a study space on the main floor. The desks and lighting fixtures were designed by Rudolph. The meeting hall shown at the right receives natural illumination from a skylight along the eastern wall, and from a tower to the north of the room. Each tower ceiling is painted in a different strong color which causes a softer hue to be reflected on the concrete walls.



Vertical shaft over reception area

Lounge



Hedrich-Blessing photos

A HOUSE PLANNED FOR CARS AS WELL AS PEOPLE

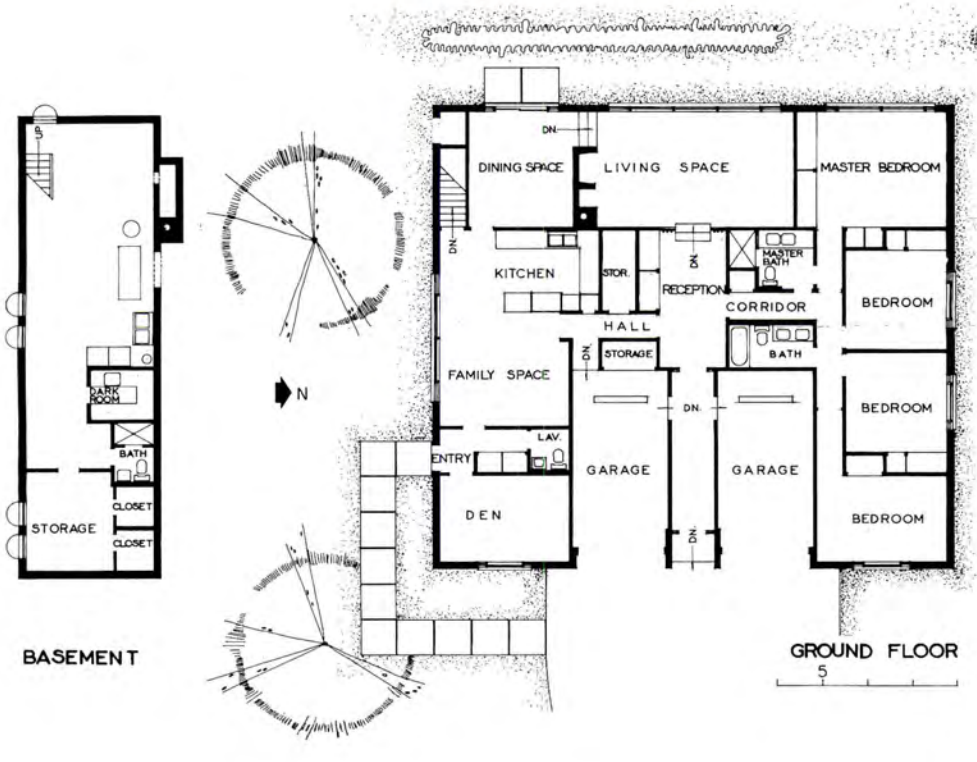
This design is one of the most positive approaches that can be imagined to the "problem of the automobile" and—as long as the garage doors are kept shut—a handsome one. Garages, so often inoffensive afterthoughts at best and definite eyesores at the worst, have here been integrated with the facade of the house into a neat, orderly pattern. Moreover, since most people arrive at the house by car, they can go directly from the garage to the house, while anyone who does still walk can enter the house via a passageway between the two garages.

The plan is organized around a central reception area which leads down some steps to the living room beyond. This room, on the western side of the house, has large glass areas overlooking the flower garden immediately outside. The bedroom wing, on the north side, and the kitchen-dining wing to the south are both immediately accessible from the reception area which provides zoning separation between them.

The owner is a psychiatrist, who consults at home and therefore needed a study which would be sufficiently separate from the rest of the house to allow patients to come and go without disturbing the family. The architects provided this at the south-east corner of the house, giving it its own separate entrance on the south side, but leaving a connection with the family room so that the study could be converted to a maid's room, guest room, or additional family space as required.

Structure of the house is brick veneer on a wood frame with a built-up tar and gravel roof. A dark metallic colored brick was chosen to provide a dramatic contrast with the white window frames and trim. Interior walls are mainly painted dry-wall, but some wood has been used to provide contrast and give a feeling of warmth inside the house. Parquet floors in the living rooms and gray-green slate for the floor of the entrance and reception areas were specifically chosen to create an atmosphere of comfort and luxury.

On bright days, sunlight floods into almost all rooms of the house lighting up the different interior surfaces. This is particularly pleasant in the kitchen-family area, where the glass walls enormously increase the impression of space. Both the dining room and the master bedroom look out over the garden; a small outdoor dining area is provided outside the dining room window.



Basement space under the north wing provides a large play or workshop area, a darkroom, an additional bathroom and ample storage accommodation. Year-round heating and cooling is provided by a gas-fired, forced warm-air system and electric air conditioning.

As can be seen from the plot plan, the site is a typical, narrow lot, but is distinguished by some good-size trees. The house is situated in the center of the lot so that the trees provide good shelter from the street and neighboring houses. Fairly casual landscaping at the front leads one up the driveway to the rather formal, closed front facade. By contrast, the back of the house is largely open, and the landscaping changes from grass and trees to paving, flower borders, a sundial and hedges—in fact all the attributes of a country garden.

RESIDENCE for Dr. and Mrs. Jack Teplinsky, Highland Park, Illinois. Architects: *George Fred Keck-William Keck;* contractors: *John H. Davies & Sons;* interior designer: *Marianne Willisch.*

MENTA HEALTH FACI IT ES

Architects are playing a key role in new approaches to the whole field of mental health. New kinds of facilities are emerging as medical and social emphasis shifts to the maintenance of mental health in the whole community rather than a concentration on custody and treatment of the mentally ill. Architects have participated actively in the development of community mental health centers, not only as to plans and configurations for this new building type, but also in the disciplines of program concept worked out in progressive dialog between architects and health professionals as summarized beginning on page 157.

There has been dynamic dialog also between architects and physicians concerning the more conventional but fast-shifting problems of care and treatment facilities for the mentally ill. Some of these problems were outlined in the Building Types Study for November 1963, where it was pointed out that new treatment methods would call for more emphasis on outpatient and day-care facilities, more human scale, more active involvement of buildings themselves as instruments of therapy. Events have borne this out. Even the gigantic custodial problems of densely populated states are receiving these kinds of architectural attention—as in New Jersey's Woodbridge, page 150; New York's Bronx Children's Hospital, page 156; Oregon's Fairview, page 152; and many others.

Mental retardation is a generic term for many degrees of affliction requiring many kinds of care for which there must be a corresponding variety of facilities. So far, new therapies have not resulted in the same dramatic increase in release rates that has reduced hospital censuses of other diagnoses. Therefore, with new funding legislation in force at state and federal levels, there has been a surge of design for the retarded in direct response to population increase. The article beginning on page 148 summarizes Public Health Service approaches to this area. And there are increasing opportunities for private facilities as amenities gain in demand and families of the retarded gain in their abilities to pay for them.

—William B. Foxhall

A NEW DEAL IN DESIGN FOR THE MENTALLY RETARDED

By A. Rorke Vanston

Loomis-Shade

Tom Burns, Jr.

In the slow but accelerating evolution of facilities for the mentally retarded, the term "human scale" takes on new meaning—in the still necessarily vast state facilities like New Jersey's Woodbridge (left) by Vincent Kling; Denmark's Lillemosegard (above) by Erik Ejlers, and Oregon's Fairview Home (right) by Wilmsen, Endicott and Unthank.

Increased national concern over the problem of mental retardation has had a major impact on architectural design in this field. The importance of creating a proper physical environment that reflects modern concepts is more widely recognized and the contribution that can be made by the architect to the betterment of the retarded is more fully appreciated. This poses a challenge to members of the architectural profession which should focus their attention on acquiring the special competence necessary if they are to design facilities that will not only permit but enhance an effective program of care and habilitation.

This interest in architecture for the mentally retarded is evident not only in the United States but in many other countries as well. An International Working Conference on Architectural Planning in Mental Deficiency was held in Copenhagen, Denmark, last April, sponsored jointly by the International Union for Child Welfare and the Danish Mental Retardation Service. Seventeen countries were represented by architects interested in this field. Some very excellent designs were exhibited indicating significant progress in the architectural expression of modern concepts.

A. Rorke Vanston, who prepared this article as architect with the Architectural and Engineering Branch, Division of Hospital and Medical Facilities, Public Health Service, Department of HEW, is now with the recently formed PHS Division of Mental Retardation.

Recent developments in this country have seen major advances in ameliorating existing conditions in this field. Forceful leadership has been provided at the highest level in the report of the Panel commissioned by the late President Kennedy to study the problem and by the appointment of the ongoing President's Committee on Mental Retardation by President Johnson. Congress has also made Federal funds available for construction to relieve the critical deficit in physical facilities for care and habilitation as well as for training specialized personnel and research.[1]

New facilities are smaller, community-based, patient-oriented

Perhaps the most significant development has been a new philosophy of care characterized by more concern for personal dignity and a greater recognition of human values. Historically, the mentally retarded have been confined to large overcrowded centralized institutions. Frequently they were hidden away in a remote area, inconvenient for many of the families, and the retardate had little or no opportunity to participate in community activities or utilize community services. Too often care was merely custodial and on a congregate basis geared to a fixed routine. In short, there was little attempt to provide a normal living environment or experience. This is wrong, even for the less than 10 percent of retarded who may require close medical and nursing care.

Future programing emphasizes small community-based and community-oriented facilities to provide a more nearly normal pattern of living for the retarded individual. These facilities will be more convenient for families, encourage closer interaction with the community, and permit utilization of community services and participation in community life. The President's Panel report clearly explains that a basic tenet on which its recommendations rest is 'bringing the provision of services as close as possible to the local community." It also offers a reasonable conclusion that when all factors are considered, the key to which is the well-being of the patient, new residential facilities should not exceed 500 beds, and for certain specific purposes, might well be under this number. For the past decade or more, other countries, particularly Denmark, Finland, and Sweden, have followed this concept in programing services for the mentally retarded. Care is administered through autonomous regions or counties, each having a central facility of approximately 500 beds and having a full range of comprehensive services. Smaller facilities are strategically located in the regions to provide specialized services.

This pattern of providing care is not without parallel in the United States, where the regional concept is being more

The hypothetical plan at right provides living units for 20 ambulatory retarded patients. It is one of many exhibits—definitely not intended to be copied or even simulated—shown in a publication, "Design of Facilities for the Mentally Retarded," developed by the Division of Hospital and Medical Facilities; Architectural, Engineering and Equipment Branch; Public Health Service; U. S. Department of Health, Education, and Welfare. The plan shows the general kinds of spaces now suggested for this single category (there are many others) of mentally retarded patients. A table of approximate areas lists some 26 kinds of space with a total net area of about 7,000 square feet.

But more impressive than the design guidelines is the varied role of architecture in providing day- and night-care facilities, education and training facilities, diagnostic and evaluation facilities—and for a population of some five-and-a-half million, 89 per cent of whom are but mildly retarded (IQ 53 plus). These are capable of truly rewarding response to care supported—indeed implemented—by sensitive design of the environment.

widely adopted by individual states in programing services. Connecticut, for example, is well advanced in its implementation through the so-called "Connecticut Plan." Early in 1960, steps were taken in Connecticut to create a network of regional programs throughout the State that would permit the retarded to remain close to their families, to utilize community facilities, and participate in community activities. Regions are generally defined on the basis of geography and population and each is to have a center providing many of the basic services for a variety of categories on a regional basis, including residential care for a limited number of retarded. Other community-based services and facilities, either generic or especially designed for the retarded, are an essential part of the plan. Several of the new centers have been constructed and are in operation and State authorities are highly pleased with the results.

Many other states contemplate this pattern, with necessary modifications, in their comprehensive plans of services. (See: *Illinois Plans Zone Centers for Mental Health, June 1965.*) Obviously there can be no fixed solution that would apply to all states or all communities. There are too many variables—the number and categories of retardates, the availability of community services, and the definition of size of the community—to name a few. The catchment area and travel distance for those using a facility or requiring services are also major factors. Whatever the particular conditions, however, it is difficult to reconcile the construction of completely new facilities for 1,000 or more retardates, or the expansion of some which already exceed this number, with current philosophy.

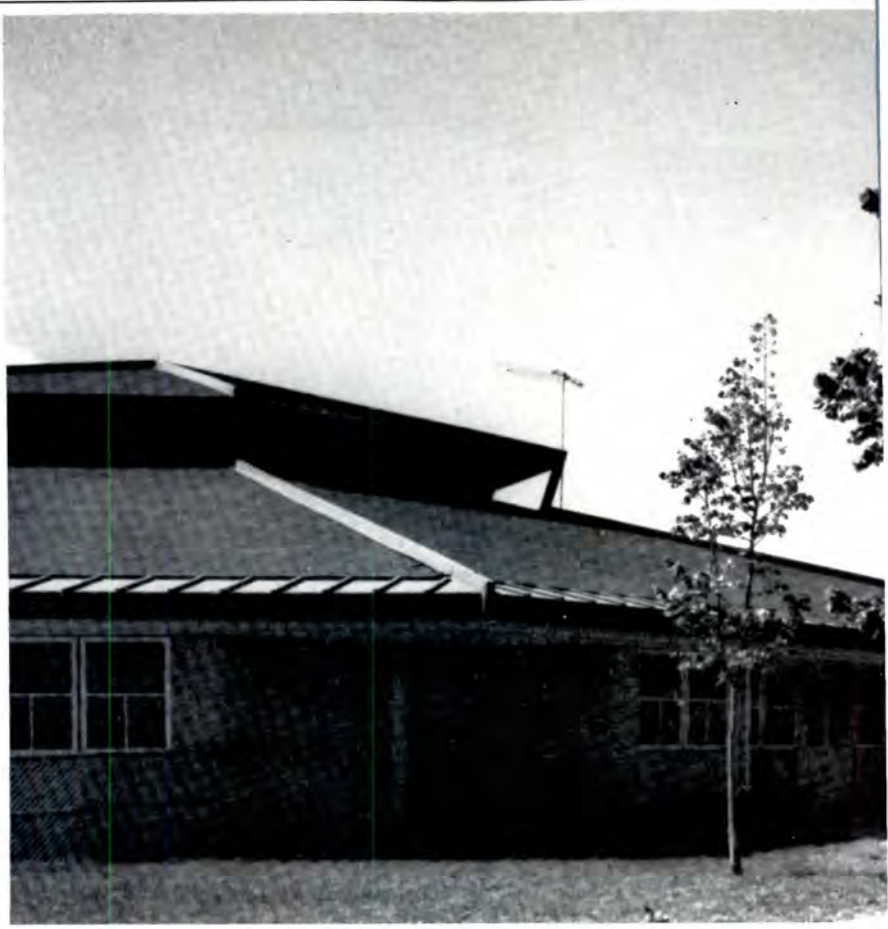
The contemporary form is human, dynamic, intimate, residential

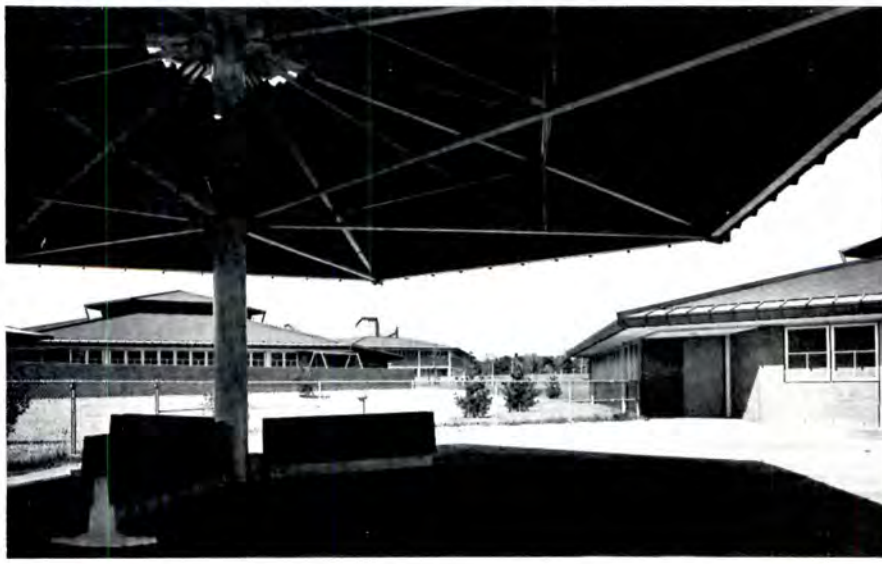
In any event, the importance of providing small living units within the institution that are conducive to individual care and a more normal living environment must not be disregarded. Every effort must be made to avoid perpetuating the traditional pattern of institutional life and exiling the resident from community experiences. Although determining the size and location of the facility is not within the immediate province of the architect, it does have a significant impact on the nature of his design. Whatever these factors may be, the architect must orient his design concepts to express contemporary philosophy in form and function. This suggests a new approach that is dynamic and imaginative and that recognizes the effective role of the architect in the total treatment process. To meet this responsibility, he must not only understand basic philosophies but must be provided with—let his client take note—a well-conceived and articulate functional program. This is fundamental to good design in which facilities actively contribute to psychiatric program concepts.

As human beings, the mentally retarded are entitled to surroundings that are warm, vital, and stimulating, where all the needs of the individual are recognized, including the amenities and niceties enjoyed by other members of our society. More than the usual amount of space should be provided for various functions, particularly in view of the training process often requiring attendants in every move and action of the retarded. Buildings should be human in scale and intimate in character with skillful use of color, texture, and materials, as well as good taste in furnishings. There is perhaps more response to attractive surroundings by the majority of retarded and less tendency to destroy than among normal individuals. Facilities should be planned to permit small groupings that will allow individuals to more easily relate themselves to their associates and their environment. This creates a psychological world that is more comprehensible and more conducive to normal psychological development.

These are the challenges which face the architectural profession in its role not only of creating a proper physical environment for a specific function but of inspiring man's efforts to enrich and ennoble the lives of his less fortunate fellows. This is not a new role for the architect nor will he forsake it.

Hexagonal cottages create human scale in state-supported school for mentally retarded





The problem of providing some kind of meaningful environment for seriously retarded children, many of whom may also have quite drastic physical defects and may require a lifetime of care and training scaled to the limits of their capabilities, has been imaginatively and sympathetically handled in the plan for Woodbridge School, designed for the state of New Jersey, Department of Institutions and Agencies.

Nineteen single-story residential cottages, each housing 50 residents, are grouped around a triangular-shaped two-story hospital building and a multipurpose building—also hexagonal in shape. Administration, food service, power-plant and maintenance facilities are all seperately housed near the entrance to the site.

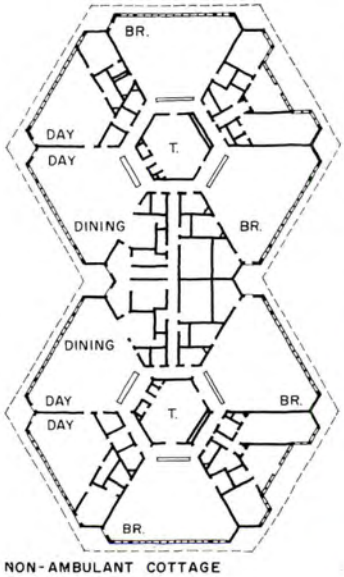
The campus is loosely divided in two—with the western half devoted to ambulatory residents, while cottages for non-ambulatory residents are linked in pairs at the eastern end of the site near the hospital to facilitate movement back and forth for treatment. The predominantly hexagonal motif was adopted to give a unifying element to a campus containing so many small buildings, but is also a highly efficient individual building plan, since it permits division of the cottage interior into six triangular segments all radiating from a compact central core containing washrooms, toilets and a supervisory area.

WOODBRIDGE STATE SCHOOL, Woodbridge, New Jersey. Associated architects: *Vincent G. Kling and Associates; Diehl and Stein (now Deihl, Stein, Miller);* structural engineers: *Severud Associates;* mechanical-electrical engineers: *Vogelbach and Baumann;* contractor: *Frank Briscoe Company.*

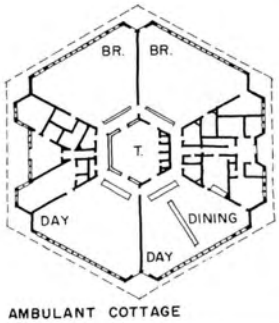
Loomis-Shade

All buildings—except the hospital which is reinforced concrete—are steel frame with brick cavity walls and poured concrete floor slabs.

The food service building is equipped to prepare more than 1,000 meals three times a day. Food is then carried in electrically heated carts to individual cottages and the hospital. This arrangement allows concentration of expensive kitchen equipment in one place, but prevents the impersonality of very large groups dining together. Interiors throughout are designed for easy maintenance.



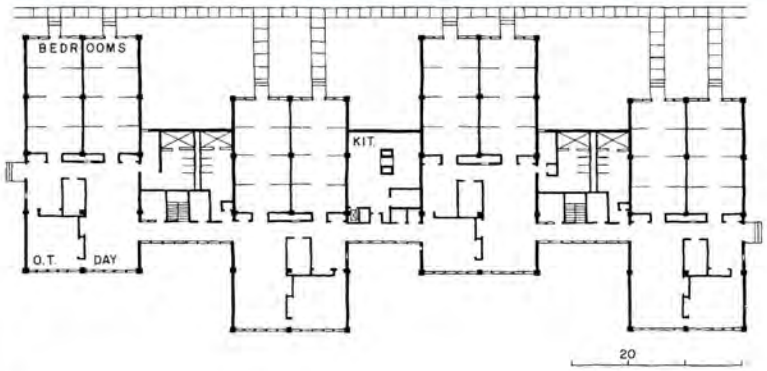
NON-AMBULANT COTTAGE

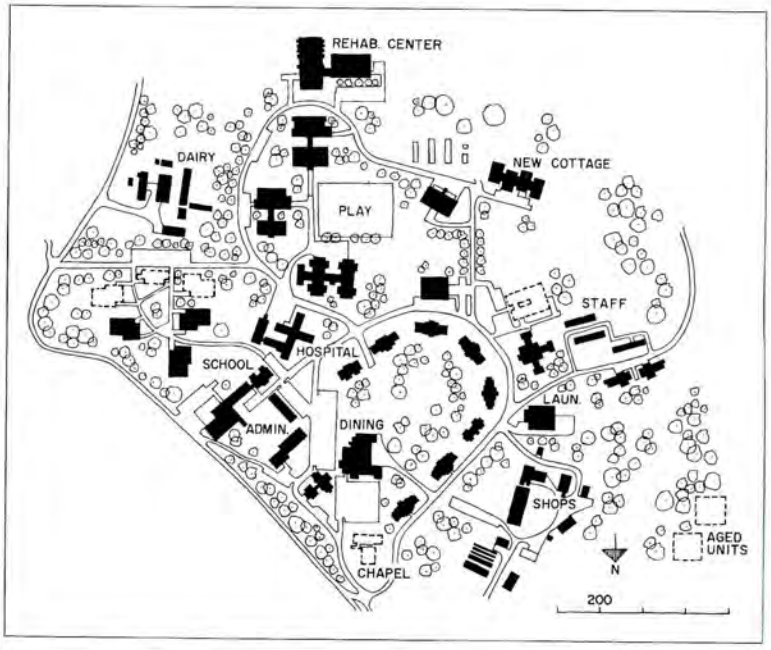


AMBULANT COTTAGE

Lawrence S. Williams, Inc. photos

Dynamic master plan keeps retardation center ahead of its time, a model of planned growth





Evolution of the Oregon Fairview Home, a state institution for the mentally retarded, from a circled group of two- or three-story wooden structures to an integrated community of buildings reflecting the infinite variety of long-range and immediate needs of all degrees of retarded patients, is the story of how comprehensive architectural approaches to master planning and design revolutionized the program for mental health facilities in an entire state.

Prior to 1954, whenever overcrowding demanded a new building at Fairview, one was dropped almost at random wherever there was open space. About that year, Wilmsen, Endicott & Unthank were commissioned to design one of the drops and to think, along with then-director Dr. Irvin B. Hill, about future plans. Perceptive Dr. Hill agreed, recalls Robert Wilmsen, that (1) random drops did not make sense; and (2) the range of needs of patients who vary from profound non-ambulatory to mild employable retardation imposed a logic on any future plan *if their number could be predicted.*

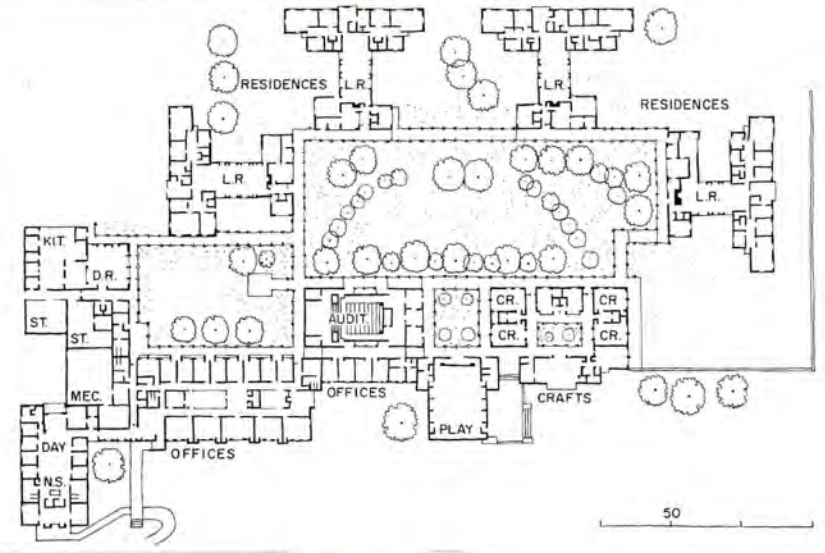
It was fairly simple, says Wilmsen, to show that frequency and degree of retardation is a nearly constant per cent of birth rate. By conventional projection of the birth rate, death rate and (negligible) discharge rate, growth of the institution could be planned. It worked so well that all other institutions in the state now similarly plan. The Wilmsen firm has planned Fairview through five administrations in about 18 constructions.

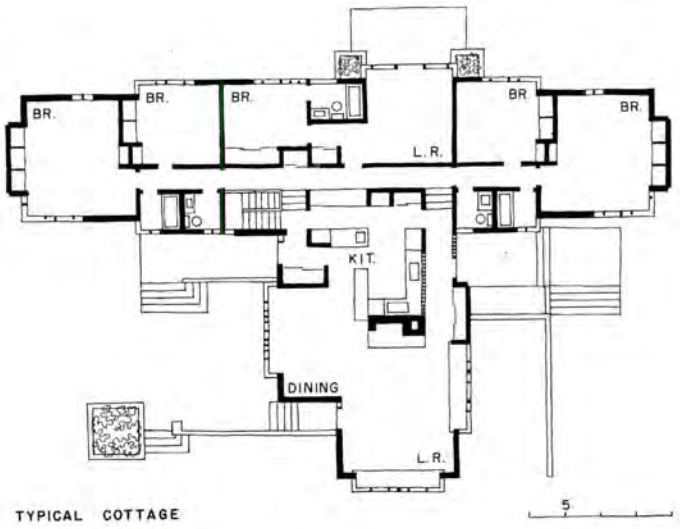
OREGON FAIRVIEW HOME, Salem. Architects: *Wilmsen, Endicott & Unthank.*

Tom Burns, Jr. photos

Although severe retardation has not yet responded to therapy by increasing discharges from care, successful rehabilitation and training of mild cases has progressed so that a dynamic master plan must provide for rehabilitation, and reflect increasing placement of patients in home, day-care and working situations. A recent building (above) houses high-grade patients in training prior to moving to a pre-placement cottage (interiors left) where single rooms, in-house meals and supervising married couple condition them for placement outside.

Two facilities for children by one architectural firm show the effects of program and diagnosis on design





TYPICAL COTTAGE

These two psychiatric facilities for children were both designed by Victor Hornbein & Edward D. White Jr. One (at top) is a state institution and the other is privately financed. They demonstrate similarities deriving from thoughtful approaches to programs for human and medical needs of the young patients—rather than convenience of the staff. They also underscore architectural differences that occur in part because of differences in admission and administration policies.

The state institution, the Rene Spitz Children's Division of the Fort Logan (Colorado) Mental Health Center, was designed as an autonomous facility for emotionally disturbed children (a broad diagnostic category). While it is intended to reflect the normal pattern of town and village planning with a series of graduated groups to which the patient may belong, it is better for these children, say the architects, to preserve, through sensitive design, the reality of a hospital as a treatment center rather than to disguise it.

Privately financed Wallace Village is for children aged from 6 to 16 with organic brain damage, most of whom have derivative emotional and behavioral problems which respond better to homelike atmosphere. It strives for a feeling of security in three present residence buildings housing 35 children and separate buildings for therapy, crafts and dining which handle about 25 additional day children.

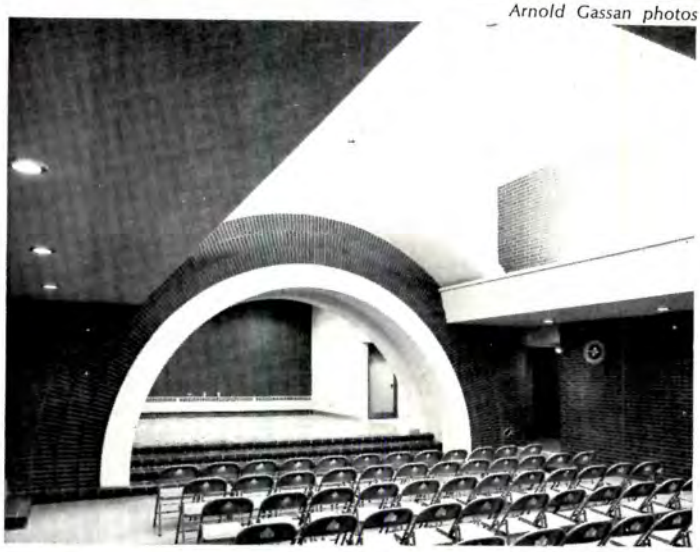
RENE A. SPITZ CHILDREN'S DIVISION, FORT LOGAN MENTAL HEALTH CENTER, Denver, and the WALLACE VILLAGE FOR CHILDREN, Broomfield, Colorado. Architects: *Victor Hornbein & Edward D. White Jr.*

Betty Baldwin

Wallace Village for Children
The buildings are scaled to children, with large wall areas and moderate use of glass, snug bedrooms and comfortable living spaces. Materials have natural finishes, mostly brick and wood. Light is diffused and soft. The goal was a sheltering but not confining quality for a reduction of tension and toward natural, integrated growth. Central feeding was a compromise with shortages of personnel for meal preparation.

Spitz Children's Division
Separate hospital functions are in separate buildings grouped to create small communities with centers and sub-centers at various levels. There are diagnostic, intensive short-term convalescent and activities units. Buildings for different age groups are planned around buildings housing common recreational and therapeutic functions. Buildings for patient care are planned with diagnostic and administrative buildings as a center, while central kitchen, maintenance and storage facilities relate to the whole. The Fort Logan Center provides limited services such as heat, housekeeping and maintenance.

Arnold Gassan photos

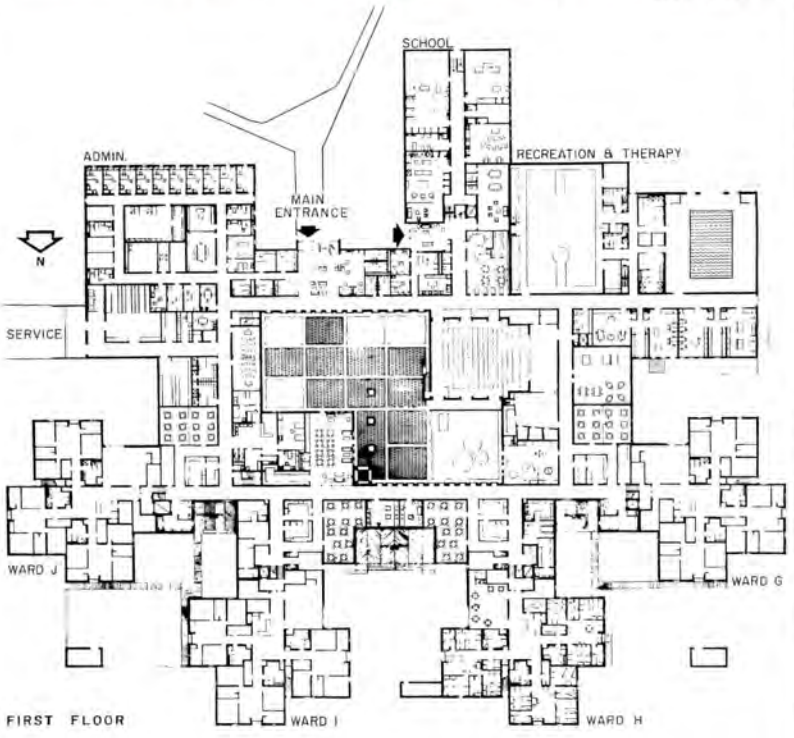


Betty Baldwin

Betty Baldwin

Comprehensive psychiatric care for children is provided in family-size units

Louis Checkman



TYPICAL WARD SECOND FLOOR

Designed to create a community of the scale and complexity a child might encounter in life at home, this $5.2-million psychiatric children's hospital, sited on the grounds of New York's Bronx State Hospital, will provide residence, treatment, educational, social and day-care facilities for some 200 children of mixed diagnosis, ranging in age from 5 to 15 years. This cluster of connected small buildings around a central courtyard is in marked and thoughtful contrast to the high-rise buildings housing the main 1,000-patient hospital—although these too would be visually familiar in this dense metropolitan area. Outdoor areas have been carefully integrated into the over-all design and include play fields, picnic areas and a large garden-court with sheltered terraces easily accessible from residence areas. A swimming pool, gymnasium, auditorium, canteen, beauty parlor and barber shop will also be provided on the grounds. A school for the mentally retarded is programed for another corner of the site.

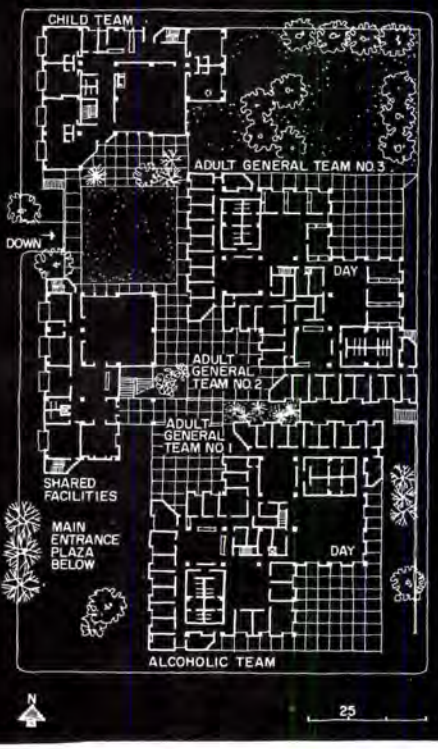
Living accommodations of the children's hospital are arranged in eight two-story units, and each unit is further divided so that groups of eight children can have their own living room directly accessible from their bedrooms. In this way, the children will have some kind of family identity.

The building is scheduled for completion early in 1968. The design won a New York Association of Architects' annual award of merit in 1966.

CHILDREN'S PSYCHIATRIC HOSPITAL, Bronx State Hospital, New York. *Architects: The Office of Max O. Urbahn.*

Although the buildings are warm and personal in scale and concept, materials and interior decoration had to be selected for durability and ease of maintenance, and the architects relied on color and texture to give a cheerful impression. The building is of brick bearing wall construction with steel joist framing, concrete plank roofs and concrete floor slab. Interiors are painted concrete block walls and vinyl asbestos floors. Brick accent colors are used on the doors and other wall panels. Radiant ceiling panels supply heating and air conditioning. Food service is from the main hospital.

A NEW BUILDI /PE TAKES SHAPE: THE COMMUNITY MENTAL HEALTH CENTER



This mental health center was designed as a pilot study sponsored by the National Institute of Mental Health for a specific district of San Francisco, as described in publications summarized in the text. While no single design can be called a prototype because of the inherent diversity of programs applying to such centers in different communities, the layout of this center reflects one set of choices that can be made in the present pattern of approaches to architectural interpretation of treatment and administration. Most significantly, it allows for changes if and when they may be required. The choice here lay between specialties of treatment by different therapists as patients progress, as against continuity of contact with a single team of therapists throughout the course of treatment. It was the latter that prevailed, in this four-building, five-team center with both separate and shared facilities, a whole building for children, central administration, common, lower-level parking and dining.

The concept of the community mental health center as a new building type has been under development since passage of funding legislation in 1963. It was first described in a RECORD article by Dr. Robert H. Felix in the November 1963 Building Types Study. Since then, the Community Mental Health Facilities Branch of the National Institute of Mental Health, with Clyde H. Dorsett as architectural consultant, has done much to clarify the architectural implications of the diverse functions inherent in the concept.

While many centers have been designed and several are in various stages of completion, actual use experience has not yet made an appreciable contribution to architectural guidelines for the future—except to underscore three principles of the design approach. First, as emphasized by Dr. Stanley F. Yolles, director of the Institute: "Since no two communities are alike, no two centers will be alike." Second, the only future certainty is change, so flexibility is a primary objective. Third, the fullest possible community participation, as for lectures or demonstrations, is desirable.

The work of the National Institute of Mental Health in developing architectural concepts of the community mental health center is graphically summarized in three publications [1]—one already published, one on the press and the third well along in work.

The first—"Planning, Programing and Design of the Community Mental Health Center"—describes the psychiatric, sociological and demographic elements of the concept of such centers and possible methods of their realization. A pilot project for a low-income industrial section of San Francisco is used to demonstrate how architects and planners can communicate effectively with psychiatrists and social workers in developing real programs and architectural solutions for specific communities.

Although the concept of the community mental health center embodies very definite approaches to problems of mental health, one of its greatest strengths is its inherent flexibility in adapting to the myriad permutations of requirements for various communities. Since each center reflects the needs of its particular community, no two will be exactly alike in program or execution. Further, the very transience of both the needs of the community and the techniques of therapy impose a mandate for both architectural flexibility and specificity perhaps unsurpassed in any other design problem.

Planning, programing and design of the community mental health center

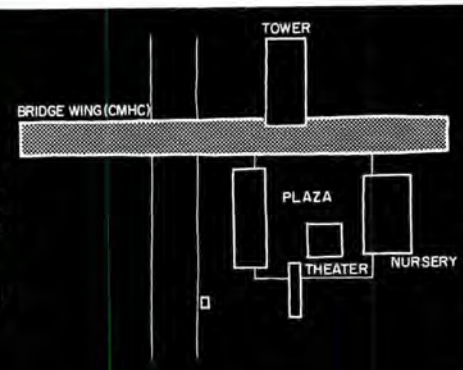
"In the past, the field of mental health construction has *not* been characterized by creative collaboration between the architect and the health specialist. Now health facilities are to take shape through the joint work of architects, mental health professionals and a wide range of concerned community figures." This statement in the text of Volume 1 keynotes the relationship of architects to the implementation of Public Law 88-164 (October 1963) which established and funded this new type of facility for mental health care.

For Federal funding approval, the essential elements of a CMHC program are: (1) inpatient services; (2) outpatient services; (3) partial hospitalization services; (4) emergency services; (5) mental health consultation and education services to agencies and professionals.

Desirably, but not essentially, the CMHC should also include for a truly comprehensive service: (1) diagnostic services; (2) rehabilitation services, including vocational and educational programs; (3) precare and aftercare services

[1] Volume 1, *Planning, Programming and Design for the Community Mental Health Center*. National Institute of Mental Health, Community Mental Health Facilities Branch, project officer Clyde Dorsett, A.I.A. Conducted by the Western Institute for Research in Mental Health, San Francisco. Project directors: Joseph J. Downing, M.D., Robert A. Kimmich, M.D., Ellis Kaplan, A.I.A., Herbert McLaughlin, A.I.A. April 1966, $8.00. Volume II, *Architecture for the Community Mental Health Center*. Rice Design Fete III sponsored by the National Institute for Mental Health. Due shortly, $12.00. Volume III, *Architectural Aspects for the Community Mental Health Center*. National Institute of Mental Health, Community Mental Health Facilities Branch: Clyde H. Dorsett, A.I.A., and Coryl La Rue Jones. Due Spring 1967. $6.00. All three volumes available for $20.80 from Mental Health Material Center, 104 East 25th Street, New York, N.Y. 10010.

Maurice Miller photos



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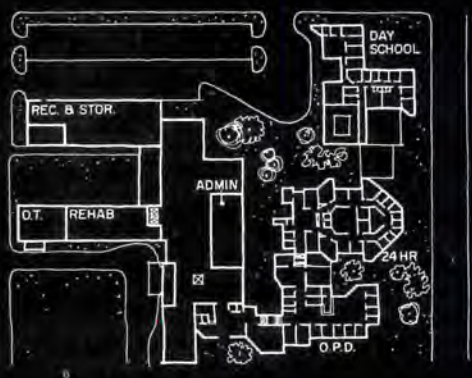


2

Some of the centers developed for the Rice Design Fete are shown on this panel—emphasizing the diversity of program and approach which characterizes this building type.

1. This study for a heterogeneous urban area in an eastern city symbolizes the progress from illness to health by placing the mental health facilities as a bridge between the hospital on the one hand and community activities on the other. Thus isolation and static despair are replaced by community spirit, dynamism, hope. Emphasis on preventive therapy is reflected in the provision of a children's nursery, a creative recreation center and an "educational node" for adults. (Team leaders: Alfred Paul Bay, M.D., W. W. Caudill, F.A.I.A.)

2 An isolated midwest agricultural region with present unemployment problems but a slowly improving economy must rely heavily on existing well-known health resources to combat communication difficulties. The mental health center is therefore sited next to the county general hospital in the 18,000 population county seat. The center itself establishes an ordered relationship be-

in the community, including foster home placement, home visiting, and halfway houses; (4) training of mental health professionals; and (5) research and evaluation. Each CMHC should serve a population of from 75,000 to 200,000 people. Despite use of the term "Center" in the legislation, there is no intent that the CMHC be conceived as a completely separate entity, divorced from existing medical and mental health facilities. Indeed the intent is to support the gains that have been made in recent years toward integration of mental health professions into the "main stream of American medicine."

The community mental health professional has found that hospital beds can no longer be considered the single yardstick in planning facilities for the treatment of mental disability. The comprehensive range of community-based services has made it possible for him to emphasize early detection of symptoms and to employ local resources in supporting former patients, thus minimizing rehospitalization. He has found that many patients can often be treated without being admitted overnight.

Pilot study in San Francisco clarifies the architect's role

In order to translate these principles into reality, it was necessary to focus on a real situation and to work out concrete proposals for an actual center serving a specific neighborhood. The Western Institute of Research in Mental Health, therefore, got together a team of architects (Kaplan & McLaughlin) and professionals in the mental and public health fields to make a study of the industrial southeast section of San Francisco, and plan a community mental health center.

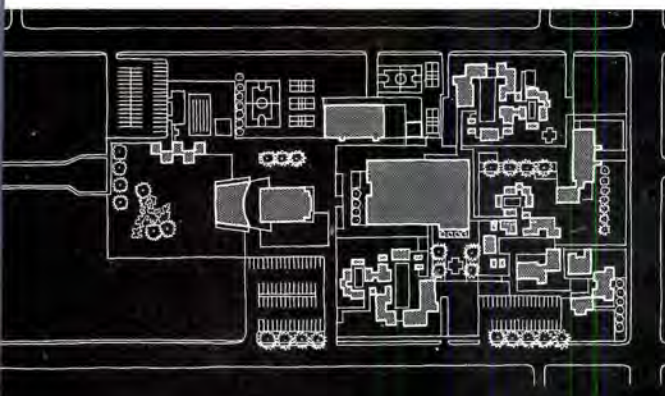
The strength of any CMHC will lie in its response to local needs, and it will succeed only if it can become an integral part of the community it serves—making use of every conceivable local resource in prevention treatment and rehabilitation. Any CMHC program, therefore, presupposes a survey of local mental health and related facilities, and the San Francisco study was no exception.

Although the San Francisco study showed a fairly wide range of public and private psychiatric and mental health facilities including the notable Langley-Porter Neuropsychiatric Research Institute, most of these facilities were found to be concentrated in the wealthy north central portion of the city. Liaison between the different agencies did not seem to be good and it was found that "patients get lost in the administrative cracks to turn up as suicides, emergency hospital admissions for alcoholism or juvenile delinquency." The city's major program deficiencies were related to the alcoholic, the county hospital psychiatric patient and the aged patient and were particularly lacking in consultation services, partial hospitalization services for children, and aftercare facilities for all.

Organization and treatment reflects the specific needs of the community

There are several ways in which the CMHC can take its place in the community. It can set up as an independent agency, operate as part of an existing department of local government, or it may be affilitated with an existing health facility. Since the general hospital is well known to the community as the place to go in emergency and since it can offer related physical care, it will often be desirable for the CMHC to be affiliated with a hospital, and in the San Francisco study, this alternative was adopted. However, while working closely with the hospital, the CMHC does not have to be physically in the same place, and it must avoid "the main danger of such affiliation which is a tendency to adopt the medical model of an authoritative staff imposing care upon the passive patient. This is, in some respects, the antithesis of the CMHC approach."

The administrative pattern adopted for San Francisco was based on the formation of multi-purpose teams who would provide the whole range of care—precare, treatment and aftercare—to specific segments of the population. This pattern was preferred to the more traditional breakdown of facilities by elements of service—inpatient, outpatient,



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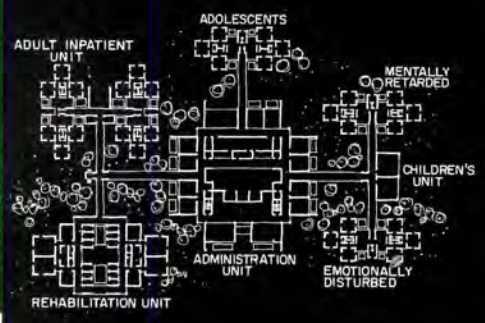


4

tween private and public spaces; a swimming pool links main facilities with the mental retardation area. (Ebbe Linnemann, M.D., Ellis Kaplan, A.I.A.)

3. A populous, largely Negro slum area in the heart of a west coast city, which receives large numbers of poor immigrants from small-town and farm communities demands a family-centered treatment program administered by teams operating from village-like bases within the center. (Joseph J. Downing, M.D., Wilmont Vickrey, A.I.A.)

4. This prosperous, metro-suburban-rural community is adapting to the shift from rural to city-oriented life. The mental health center, consisting of specialized units for various patient categories grouped around communal kitchen-dining and recreation facilities, is strategically placed near the main access routes to principal community services. (A. R. Foley, M.D., David A. McKinley Jr., A.I.A.)

Two further studies, one by Humphrey Osmond, M.D., and K. Izumi, and one by Robijn Hornstra, M.D., and Jean Paul Carlhian are reported in the NIMH publication.

partial hospitalization, etc.—as it was felt that the multipurpose team approach would have a greater capacity to provide continuing relationship between patient and therapist.

The San Francisco center was planned around five therapy teams: one alcoholism team, one children's team, and three teams serving adults from specific areas. The teams were to be headed by psychiatrists and would include nursing personnel, social workers, various kinds of therapists and supporting clerical staff. Medical consultants would of course be attached to the teams. Each team would have its own multiple purpose work area, but treatment services would be centrally based and would have direct affiliation with a general hospital. Buildings, staff, and facilities had to be large enough and sufficiently flexible to deal with a fluctuating situation.

Design objectives and an architectural program

It was decided that the San Francisco CMHC should be housed in a completely new building—connected by tunnel to the San Francisco General Hospital—which must fulfill the following broad design objectives: The building should present an open appearance to the community, but should provide private areas for patient use. The CMHC should have a readily identifiable character that will encourage patterns of early self-referral and its use as a mental health resource rather than as a last resort in time of crisis. The building should express the individuality of its various parts—that is, the distinct treatment team areas, admissions area, community facilities—rather than have the appearance of a single monolithic structure.

After careful consideration of four distinct design approaches—a terraced building, a quadrant plan, a dispersed building and a linear plan—a final scheme was developed which incorporates some elements of each of the individual approaches: Roof terraces for outdoor recreation were provided for each pair of treatment teams. Team offices, service spaces, and circulation were grouped on two sides of a large central multi-use space for group activities, meeting rooms and day rooms. Different elements of the CMHC were treated as individual building units each with neighborhood scale and a recognizable identity. A two-level design approach placed treatment teams on an upper plaza level and the main entrance at the lower level. In addition, each team was related independently to activity spaces at the entrance level.

Four distinct parts now comprise the CMHC: two pairs of adult treatment teams, an administration community facilities-admitting building, and a child-care building. No one of the elements dominates the others. All share a scale, height and size that is in keeping with the surrounding neighborhood.

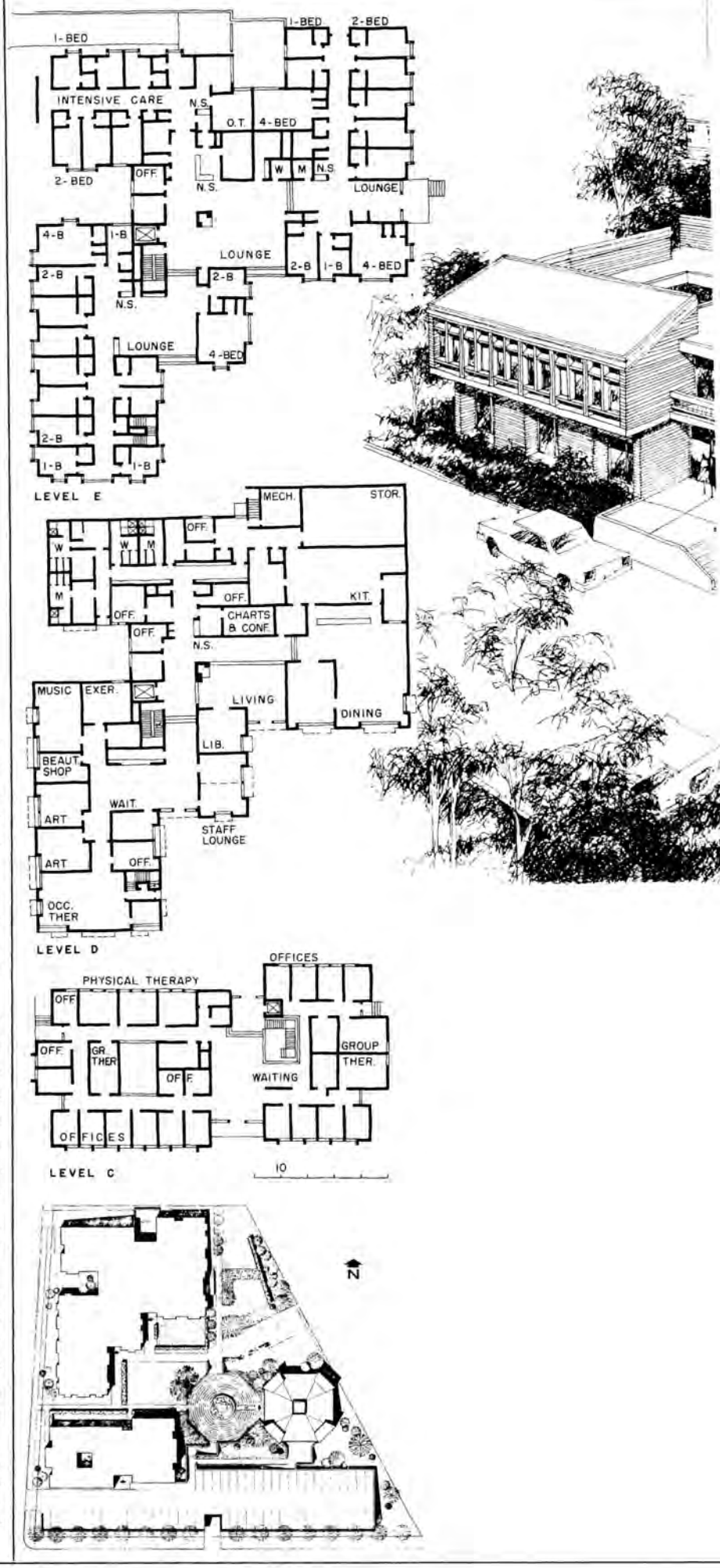
Design fete develops six centers from varied programs

In order to test the architectural translation of the CMHC into a number of specific situations, the 1965 Rice Design Fete,[2] under the sponsorship of the National Institute of Mental Health, was devoted to developing schemes for six different community mental health centers. Six teams of architects, mental health specialists and students worked for two weeks on these designs and the results of their effort will comprise the second volume in the series.

A two-week study of this kind, however carefully worked out and however well-qualified the participants, is necessarily artificial to some extent. The resulting schemes, while they undoubtedly embody valuable ideas and design approaches, should not be regarded as prototypes for future use. Similarly, the experience gained by the participators, while developing their understanding of different disciplines, will probably be most valuable in pointing up the scope and variety of the programs and suggesting ways of approaching them, rather than in demonstrating profound architectural solutions.

[2] The Rice Design Fete is an annual architectural charette, variously sponsored, conducted at Houston's Rice University.

Community mental health center exploits a sloping site for strong identity

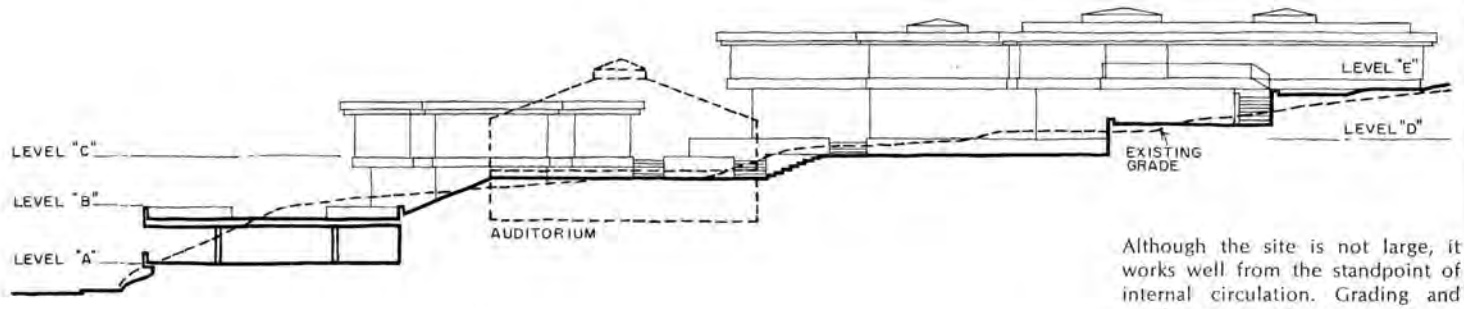


Over-all design objective for the Resthaven Community Mental Health Center, a private, hospital-affiliated facility in Los Angeles, was to make the buildings specific and identifiable because in mental health patients the ability to perceive is limited at best and may be quite impaired. To help patients find their way to scheduled activity areas, building exteriors avoid repetitive modules and are differentiated by form. Identification of activities also relates to changes of level which develop normally from the sloping site.

Building form and division further reflect specifics of the community and character of what is called the catchment area. That is, the projected distribution of therapy requirements affects space allocations within a primary requirement for flexibility. Since the center functions as a whole as patients progress from one phase to another, a hierarchy of spaces is established, and movement from one building to another becomes part of the center's function in re-training patients for return to the community. Dependency on one therapist in one location is thus minimized.

Externally, the slope of the site permits grade-level access from the street to emergency, admissions and intensive care at the top; day care and arts center from the side one floor below; administrative offices in a smaller building at the bottom near parking from which a walk leads to a workshop on the lower level of the auditorium building.

RESTHAVEN COMMUNITY MENTAL HEALTH CENTER, Los Angeles. Architects: *Kaplan and McLaughlin;* structural engineer: *Isadore Thompson;* mechanical engineers: *Yanow & Bauer.*



Although the site is not large, it works well from the standpoint of internal circulation. Grading and gentle steps in walkways permit easy and-important-readily discernible transition from residence and day care areas to physical and group therapy areas on the upper level of the small building. There is also access, across a focusing circular sitting area, to an auditorium on the second level over the workshop.

Community center on hospital site gives scope to intensive-care techniques

Ward facilities are arranged by patient category—children, alcoholic, adolescent and adult patients—and the specific needs of each group are recognized by the plan. The children's ward, for example, contains a school with classrooms, playrooms and a multi-purpose activity area.

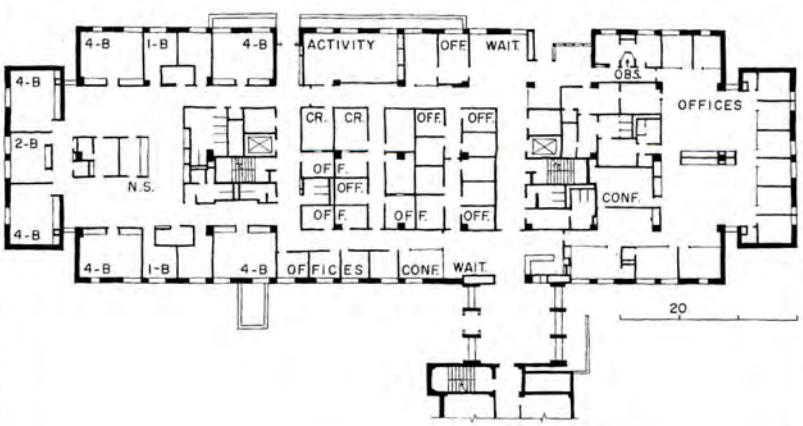
Structure of the building with brick walls and concrete base and fascia continues the style of the existing building.

L. D. Jones photos

Mental hygiene in central Missouri has taken a significant step forward with the establishment—within the State Division of Mental Diseases—of a new community mental health center. Since work on this center began before passage of the 1963 legislation, and since the program specifically demanded physical and administrative attachment to a pre-selected hospital, this center does not quite come within the terms of the NIMH national program. Nevertheless it does embody many of the central concepts of this program and makes a valuable contribution to the advancement of community mental health care.

The three-story center is sited directly west of the University of Missouri Medical Center and is physically attached to the hospital by corridors at each level. In addition to the provision of all basic psychiatric services, including intensive hospital care for 120 in-patients and outpatient treatment, the center also co-operates closely with the University in education and in-service training of psychiatric staff. Some 85 individual offices and a number of conference rooms with provision for closed circuit television are provided within the center.

Facilities are carefully geared to the needs of specific categories of patient, and the human element is stressed at every level in a demonstration of design for modern methods of intensive care.



MID-MISSOURI MENTAL HEALTH CENTER, Columbia, Missouri. Architects: *Kivett and Myers;* structural engineers: *Pfuhl & Stevson;* mechanical engineer: *W. L. Cassell;* general contractor: *John Epple Construction Company.*

Engineering approach to designing glass for wind

Not only has considerably more glass been used in the exteriors of buildings in recent years, but the size of glass lights is much larger, especially in the taller buildings. The result is that glass has been subjected to new sets of conditions which demand closer attention from both architect and engineer to the design aspects of glass. For example, there have been increasing reports of breakage of large lights of glass in tall buildings due to wind. Also—there have been increasing reports of breakage of tinted (heat-absorbing) glass due to thermal load, the problem being aggravated by uneven shading of glass, heat trapped by internal shading devices, and heat contributed by warm air supply too close to the glass. Design precautions and recommendations for tinted glass were in RECORD, December. This article deals, therefore, just with the engineering design process for wind load on glass when this factor may be critical—that is, large lights of glass and potentially high wind speeds.

Making the need for a prudent engineering approach to the design of large glass lights all the more important is the fact that buildings are not only subjected to positive pressures due to wind but to suctions on the leeward sides which may in many cases be half again or more as much as the wind itself. Thus with a 60 mph wind blowing, an area on the leeward side may have suction equivalent to a 90 mph wind. Generally the greatest suctions occur when the wind makes an angular attack on the building (figure 4).

What has been known about glass and wind

Obviously, to do an engineering analysis for a particular glass opening, two things must be known in addition to the glass area: (1) strength of glass, and (2) anticipated wind load. Information on glass strengths has been available for some time: for example, suggested glass areas for various wind loads have been in the literature for at least 25 years. Up until a few years ago, these values were based largely on practical experience. In the past five years, however, suggested glass areas vs. wind loads have been based on statistical analyses of laboratory samples and testing of full-size sheets.

A new and more rational approach to glass design

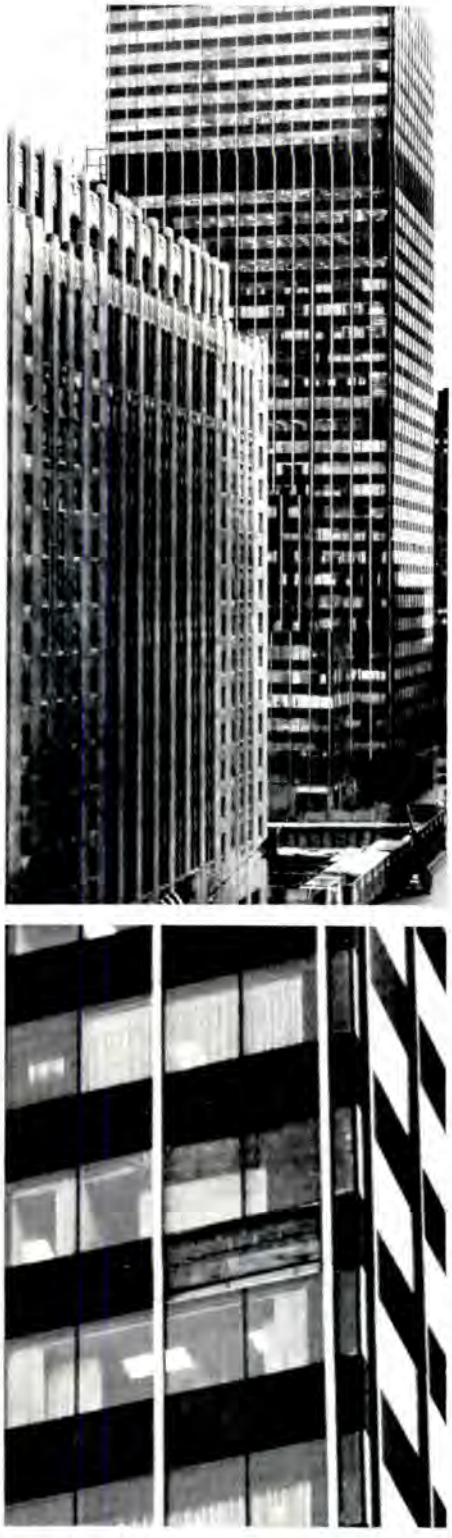
To achieve a rational approach to glass design in realistic wind environments utilizing available weather data, the structural engineering firm of Worthington, Skilling, Helle & Jackson has proposed the following approach for application to very tall buildings.*

First of all, annual extreme 20-minute average wind speeds can be derived from weather data for heights of from 1000 to 1700 feet above the ground. At this height, the wind (called gradient wind) is not affected by local features such as trees and buildings. As an example, plots of annual extreme 20-minute average winds for New York City, Pittsburgh and Seattle are shown in figure 2. Plots for the probability distributions of annual extreme wind speeds for a range of return periods (in years) are derived from data originating from "Winds Aloft Summary" Form WBAN22 for the nearest major airport available from the National Weather Records Center,

Now, to find out what the pressure variations are over the four facades of a building due to terrain roughness (buildings or topography), it is necessary to determine pressure coefficients by testing a model of the building in a wind tunnel. The engineers point out that it is necessary to test the model in a "boundary layer" wind tunnel using a representative terrain roughness rather than in an aeronautical-type wind tunnel. The difference is that, in the boundary layer wind tunnel, it is possible to more closely simulate actual wind conditions when model buildings and their surrounds are installed. Wind will vary from a top value at the gradient level, down to its least value at the "ground." By contrast, in aeronautical wind tunnels the air stream tends to be uniform in velocity throughout, not really mirroring the actual wind.

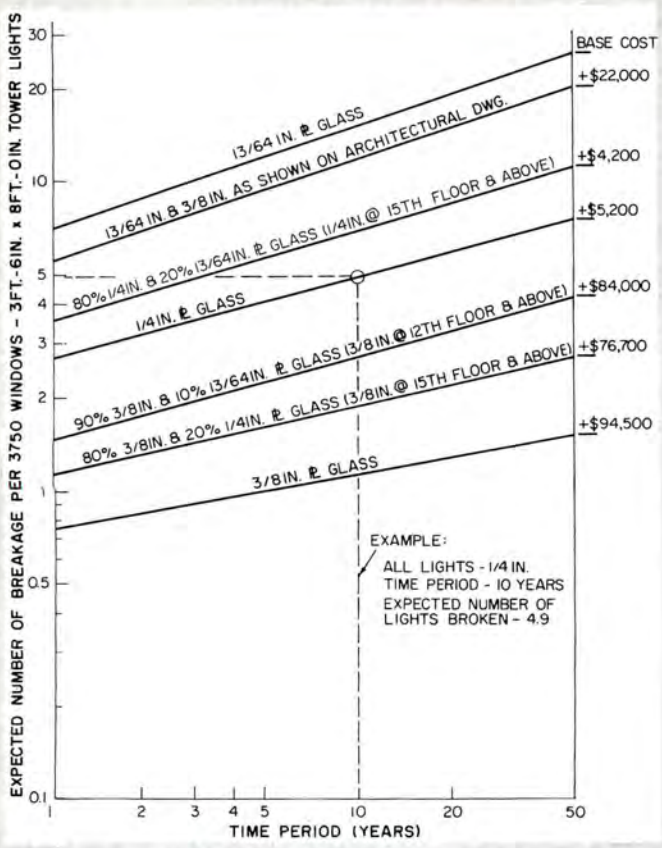
Wind pressure at a point on the exterior wall of a building may be found by multiplying the pressure coefficient times the velocity pressure at gradient height. The pressure coefficients are affected not

*Paper presented by Leslie E. Robertson, partner in Worthington, Skilling, Helle & Jackson, at the 1966 Fall Conferences of the Building Research Institute, "Glass Design and Building Code Implications of Recent Wind Load Research for Extremely Tall Buildings."



On a gusty March day last year, the wind, whistling around the corner of this New York skyscraper, ripped off the interlocking spandrel panels and sucked out the glass at these corner windows on the 18th and 21st floors.

Examples of an economic safety analysis



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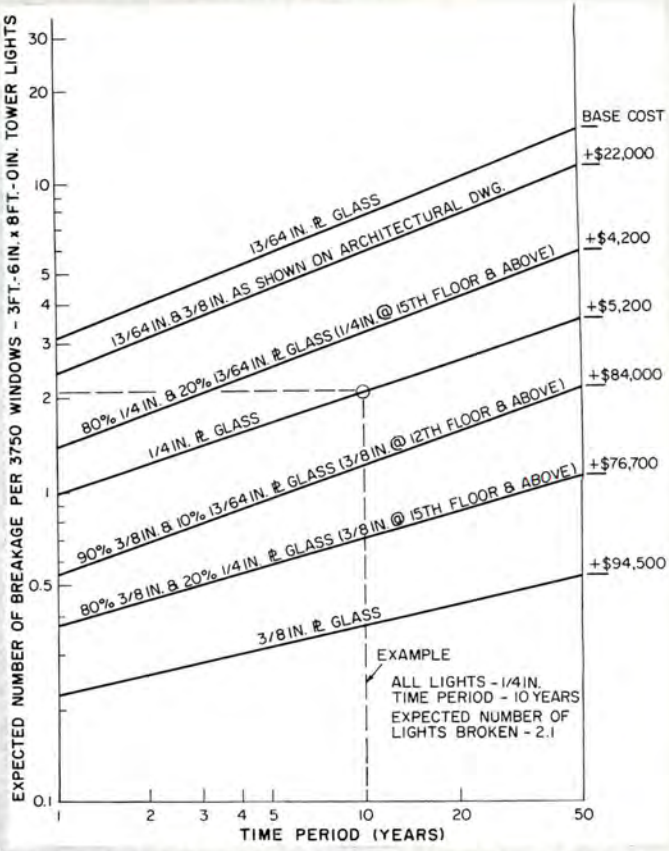
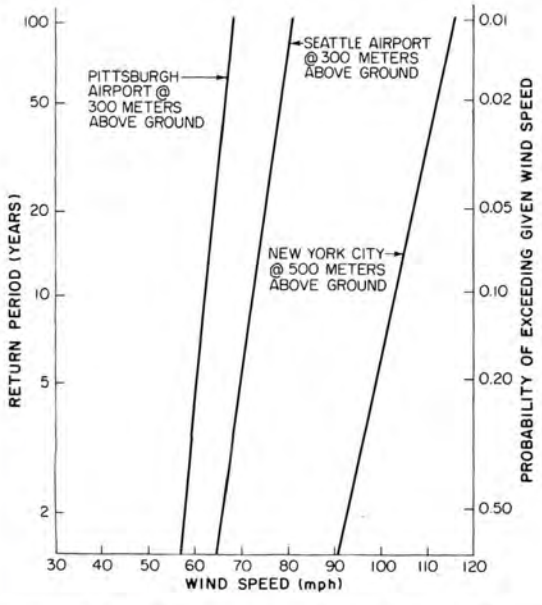


1b

These two graphs illustrate how the risks and costs of glass can vary for a particular building (area and number of lights are fixed) as the thickness is changed. They also illustrate the effect of the variability of glass strength (coefficient of variation C_v) on these same factors. Less variability has been assumed in figure 1b (C_v=0.23) than in figure 1a (C_v=0.25).

Determining the "design wind"



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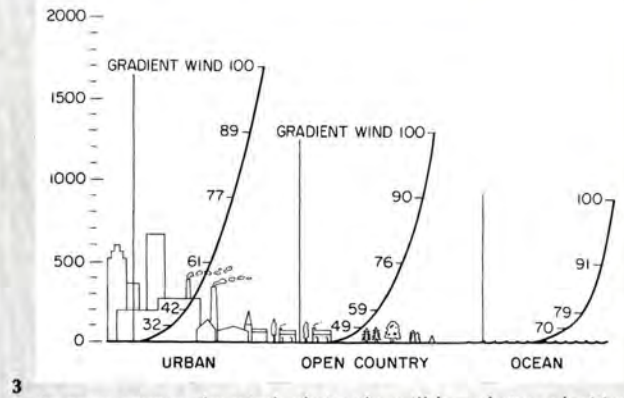
To determine what wind loads they should design for, in New York, Pittsburgh and Seattle, engineers Worthington, Skilling, Helle & Jackson plotted the 20-minute extreme winds versus *return periods*, in years, or probability.



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In open country the wind, obviously, will have faster velocities than in the built-up city. Graphs above (based on work by A. G. Davenport) show how the *profiles* of the wind vary with with the terrain "roughness."

Graphs in this article are from a technical paper by Leslie E. Robertson, partner in Worthington, Skilling, Helle & Jackson presented at the Building Research Institute 1966 Fall Conferences.

only by the terrain roughness, (see figure 5) but also by the direction of the wind (see figure 4). Thus measurements should be made at points covering the facade for different wind directions.

The return period of the maximum wind may be chosen by the designer as 10, 20 or 50 years, depending on the permanency and importance of the building as well as on the consequences of any breakage of glass.

The design wind pressures of glass panels are determined by adding the sum of the annual maximum pressures (or suctions) and the pressures (or suctions) due to stack effect, if it exists. Stack effect inside a building, according to the engineers, could amount to 0.5 psf for each 100 ft. of height, but should not exceed 1.0 psf for each 100 ft.

Deciding what strength of glass should be used

Glass is not a structural material in the sense that steel is: steel is ductile, but glass is not. When steel is overloaded it will show signs of distress before it fails completely. When glass is excessively loaded, however, it cracks or breaks instantaneously.

With ordinary annealed glass, a break starts at some surface variation which usually is undetectable before the break occurs. The reason for this difference in behavior is that steel is a crystalline material with clearly defined planes of atoms, so the material can be distorted without disruption. But glass is amorphous—the atomic arrangement is not regular—so it breaks rather than distorts. Solid glass is strong in compression, but weak in tension.

Suggested loadings for glass in buildings have been published for 25 years in Pittsburgh Plate Glass Company data books. But as larger lights of glass came into use, thicker lights were made available in the larger sizes, new research was conducted, and glazing methods were improved, it was realized that a new approach was necessary. Thus in early 1962, PPG introduced a new wind load chart in which a statistical approach was employed to give suggested maximum glass areas for various wind speeds. This chart was developed mainly by applying statistical analysis to the results of tests on laboratory samples.

This wind load chart allows for a safety factor of 2.5, which in statistical terms means that at *design wind load*, a probable number of eight lights out of 1000 would fail. A safety factor of 10 means that a probable 1.5 lights out of 10,000 would fail at design wind load. The designer could increase the factor of safety by increasing the assumed design wind load. PPG later in its Technical Service Report 101 increased the wind load chart information to include double glazing, laminated glass and heat strengthened and tempered glass.

In the fall of 1963 Libbey-Owens-Ford Glass Company introduced a design load chart for ¼- to ½-in. polished plate glass based on a testing program in which more than 1,000 lights of glass ranging from 36 to 200 square feet were statically tested to destruction. A second series of tests gave strength data up to ¾ in.

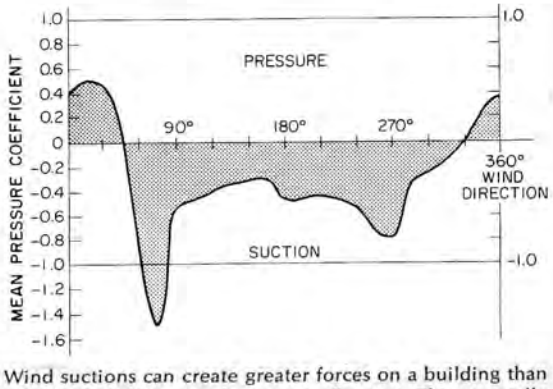
A comparison of the PPG and L-O-F figures shows very few, if any, differences. The L-O-F figures are based on tests of pristine glass. PPG shows shaded areas above the lines on their charts which are intended to account to some extent for the reduction in strength due to handling and exposure.

The statistical approach reinterpreted

One aspect of the statistical analysis of glass strengths that is only just now being considered in the engineering design of glass for buildings is the variability in strength of any given types of glass. But this variability can be, nonetheless, a very important consideration in determining the factor of safety for glass.

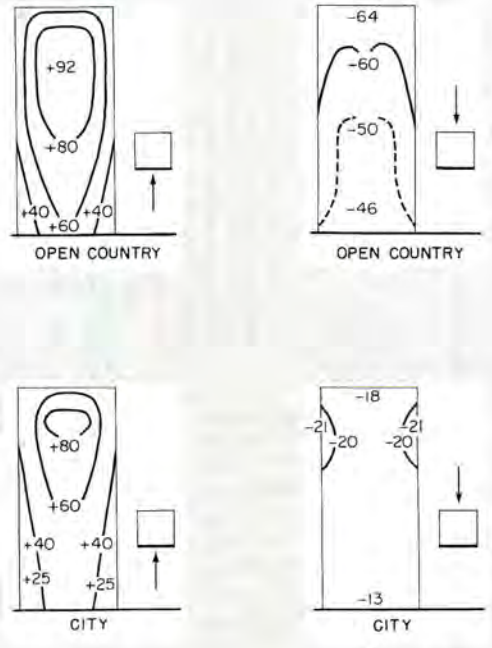
This can be visualized by taking examples of two extremes. If all the glass of a certain type as it came off the production line had nearly uniform strength —that is almost no glass testing less than this value and almost none more

Model tests show how wind forces vary over the building



4 Wind suctions can create greater forces on a building than the wind itself, as can be seen in figure 4. This generally occurs when the wind makes an angular attack on the building. Figure 4 gives wind coefficients for only one point on a building model as tested in a wind tunnel.

Variations in the relative wind pressures over the facade of a building model tested in a wind tunnel are shown in figure 5. The values indicate percentages of the gradient wind velocity. Note differences between city and country.



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—then the probability of the glass having less than this strength would be close to zero. Obviously, this is a practical impossibility. There are always some flaws—more in polished plate glass than sheet glass, since the polishing creates minor flaws. Heat strengthening and tempering processes tend to heal the flaws as well as increase the strength by building in compressive stress—prestressing in effect.

If, on the other hand, there were a wide variability in strength, then the probability of failure below mean strength could be quite high.

In figure 6a, where glass has a coefficient of variation of 0.25, one out of 100 lights of glass would have a strength less than 42 per cent of the mean. In figure 6b, where the glass has a coefficient of variation of 0.20, only 1.8 lights out of 1000 would have a strength less than 42 per cent of the mean.

In essence, the smaller the coefficient C_V, the lower can be the required safety factor chosen by the designer. This can be seen in figures 7a and 7b. The probability of *no* breakage in 7b is much higher than that in 7a. The first point to notice about these figures is that the coefficient of variation has much more effect on the required safety factor as the number of panels involved becomes larger. But when the number of panels is large the most significant points are that: (1) the smaller the coefficient of variation, the lower the required safety factor (thus, the larger the glass areas or the thinner the lights of glass permissible); (2) for a small increase in the coefficient of variation, the required safety factor for the glass lights increases sharply.

At the present time, the C_V (coefficient of variation) taken for various types of glass are as follows: annealed 0.25; heat-strengthened 0.20; fully-tempered 0.15. (In addition, heat-strengthened glass is twice as strong as regular plate, and fully-tempered glass is four to five times as strong.) The implications of these values become clear when you examine figures 7a and 7b. For example, if the C_V=0.20 instead of 0.25, the safety factor required in figure 7b for 1,000 lights is only one-third as great.

Of course heat-strengthened glass generally costs more than ordinary annealed glass, and fully-tempered glass even more. Obviously, however, more careful economic studies of glass selection are indicated. So far, these glasses have seldom been used for window glazing, being reserved for more critical applications such as doors and skylights.

It is said, however, that a contemporary glass factory with modern equipment might be able to justify a C_V of 0.23 for annealed glass rather than 0.25. This alone could halve the required safety factor in figure 7b for 1,000 panels.

Example of an economic/safety analysis

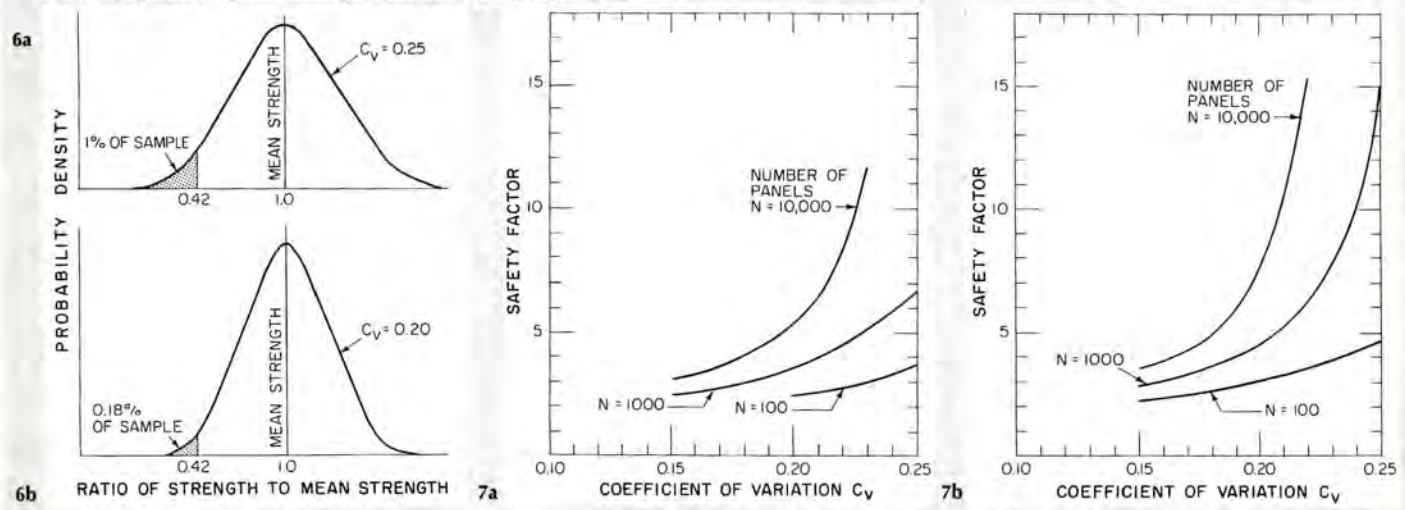
Figures 1a and 1b show how the designer might present an economic/safety analysis to the building owner. These figures illustrate how varying the glass thickness affects both the cost of glass for the building and the probable breakage at the *design wind load* over a period of 10 years (of course, a longer time period could be assumed). It also can be seen that reducing the coefficient of variation, C_V, from 0.25 to 0.23 reduces the expected number of broken lights in the example from 4.9 to 2.1—more than half. It also can be seen that to further reduce the risk any appreciable amount involves *quite a jump in cost.*

From graphs similar to figure 1, the designer may select the factors of safety which take into account:

a) the allowable breakage in a given period of years;
b) the degree of uniformity of glass;
c) the number of similar panels on a building; and
d) the statistical probability distribution of wind pressure.

After the design wind pressure and the factor of safety are fixed, the thickness of the glass panels may be determined from manufacturers' design charts.

How variation in glass strength affects the safety factor



The two probability curves above illustrate the implications of the coefficient of variation, C_V. In the top curve for which the C_V=0.25, one out of 100 lights of glass would have a strength 42 per cent less than the mean. In the bottom curve, for which the C_V=0.20, only 1.8 lights out of 1,000 would have a strength 42 per cent less than the mean. Figures 7a and 7b show how both the coefficient of variation and the total number of glass lights in the building change the required safety factor. With only a small number of lights, differences in the coefficient of variation do not have much effect, but with many lights, differences are great. With a high C_V and a large number of lights, the safety factor becomes very high. Probability of no breakage in 50 years in figure 7a is 0.667; in 7b, 0.90.

Audio-visual communications: trends and possibilities

New equipment and systems for audio-visual communication in buildings are proliferating at an astounding rate. The result is that the "hardware" (equipment) is a good bit ahead of "software" (presentation material, programed instruction, computer programs, and the like). But in architectural terms the biggest problem facing the building designer is to determine what facilities should be provided in the beginning, and what space and service provisions should be built in, to allow an orderly, conscious expansion of the communication systems.

While the systems approach to audio-visual presentation—i.e., an integrated and automated grouping of equipment—originated with military, and later began to be used by business, it is now finding its way into education. In fact, in the last three years, education has moved ahead of industry.

The focus is on two areas of audio-visual communications for education: (1) classroom-lecture halls; and (2) audio-visual information retrieval systems (AVIRS) for electronic distribution from a central source, whereby a student or group of students may select, remotely and at random, pre-programed information for listening and/or viewing. At the present time, while there are roughly 150 informational retrieval centers in existence, all but about 10 of these are audio.

Like many new tools, AVIRS is in danger of being sold too fast. According to communications facilities consultant Hubert Wilke, there is a great need for administrative guidelines as well as for a reasonable standard of specifications that will assist in competitive bidding procedures. Another problem is that no one type of individual has yet been able to encompass all of the implications of AVIRS. Neither the architect, the librarian nor the audio-visual director, alone, can conceive all of the requirements involved in designing a library (or resources center) that will accommodate the full range of electronic aids in conjunction with non-electronic facilities. Mr. Wilke suggests that some of the questions these professionals might ask themselves are:

1. Should provisions be made now for an AVIRS, or is the ability to "plug in" a variety of devices sufficient?

2. What is the ultimate difference in cost between having all electrical provisions for an AVIRS included during construction or starting from scratch after the plant has been completed?

3. Where should carrels be located in the building?

4. In the beginning, what ratio of carrels should be wired up (a wet carrel), to those having conduit provisions only (a dry carrel)?

5. Is it practical at the outset to provide for an orderly conversion from clusters of plug-in cubicles and listening posts to an electronic feed from an AVIRS?

6. Should the public address and intercom system be tied into an AVIRS?

7. Is there a preferable relationship of space and location with regard to carrels, books and periodicals, study areas, preparation rooms, etc.?

8. What over-all space should be allocated to each of the above?

9. How will AVIRS be programmed economically and effectively?

10. What space should be provided for the racks of equipment and programming devices required to feed the AVIRS system?

The Wilke organization recommends that schools and universities plan for and include in the construction space, conduits, outlets, etc. for both AVIRS and instructional television. In one college project for which the Wilke organization is consultant, provisions have been made to accommodate a gradually expanding AVIRS. Designed on a modular basis, the system may activate clusters of electronic carrels as the need arises. In addition, the AVIRS has been extended to classrooms as well as lecture halls. In the beginning 40 out of 300 carrels will be wired into the AVIRS, as well as 40 classrooms and three lecture halls.

If the information storage and distribution center handles audio only, the system may consist of but one or two tape recorders, capable of distributing a rather limited selection of aural information up to as many as 10 to several-hundred tape recorders.

To permit the retrieval of both visual and aural information, additional sources such as motion picture projection, videotape, slide and/or strip film projections must be added. Individual retrieval locations generally consist of a small TV monitor, speaker or earphone attachment, a dial/touch tone to select the desired information, and a microphone for communication with the distribution center. The equipment is often housed in a study carrel installed in the library, dormitories and selected study areas.

How the University of Texas set up a lecture classroom

This lecture room, in use for several years, was designed according to this program: While the teachers will be doing some sophisticated large-group teaching, some experimentation, and some demonstration, the facility is to be justified by its everyday utility. It was conceived as lending itself to the most

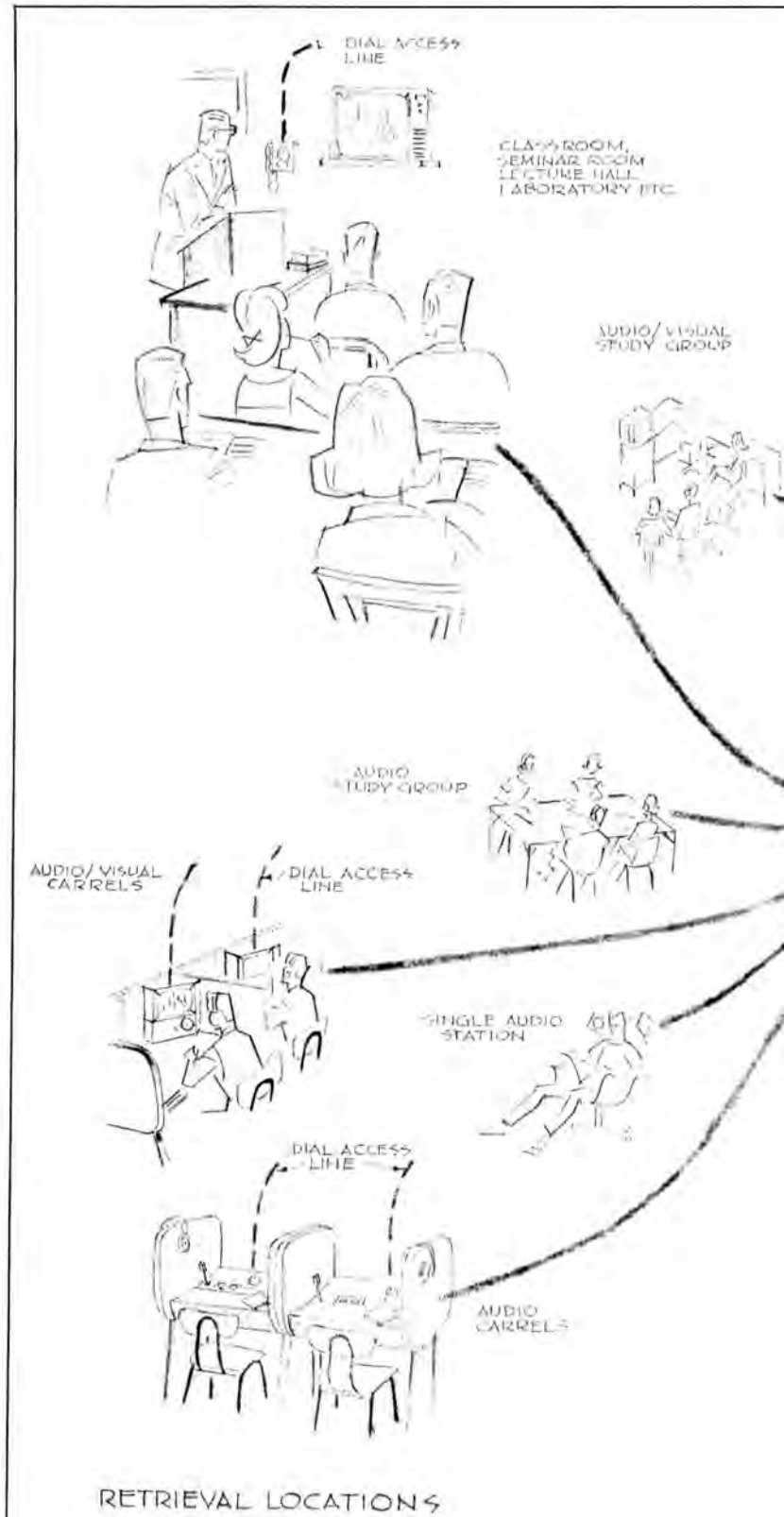
advanced instructional procedures, but still providing a space in which traditional lecturing is very much at home. Group sizes will range from 100 to 300.

The facility was planned in the beginning to be used chiefly by lecturers who depend chiefly upon verbal presentations supplemented and illustrated by various visual and auditory materials. These materials will range from home-made charts, graphs, and tables to sound tapes and film clips. Some teachers will use a variety of media in a single lecture; most, perhaps, will confine themselves to a single type of aid. Several will want to conduct "live" visual demonstrations.

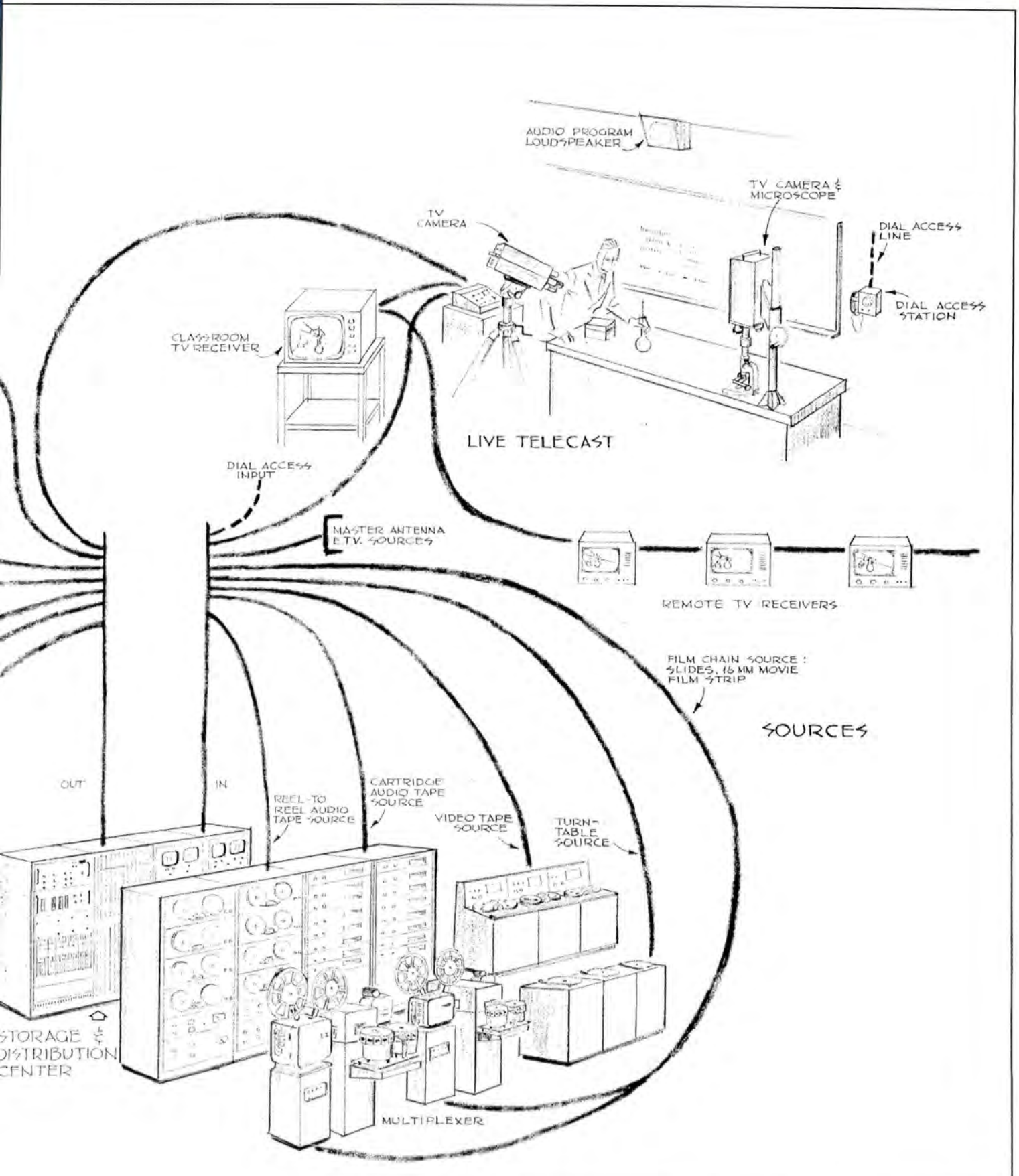
It was essential that the facility provide for employment of the full range of audio and visual devices, predicting as accurately as possible what might become feasible in the future as well as at present. This meant especially the incorporation of flexibility to capitalize upon technological advances without expensive structural modifications. It meant also that promising, but as yet unproved, installations did not have to be made now so long as the facility has the room and basic services to take advantage of them later. At the same time, the professor who wants to use only a slide projector or an overhead projector is enabled to do so without going through intricate control panels and complicated arrangements for screens and lighting and assistants.

An increasing number of professors will use this facility for carefully prepared, highly automated presentations in which several media, multiple presentation-points, and varied methods are combined into a co-ordinated teaching act. The facility provides for exploitation of both present and future possibilities for large-group instruction through multiple media. Yet, simplicity of operational requirements upon the teacher was essential.

Many professors will use this facility for exclusively verbal presentations. Some will read lectures from a prepared manuscript, others will use notes, and others will speak discursively. Some will stick close to a lectern; others will pace, or seat themselves on a table. Many will want to use a blackboard or some very simple substitute therefor. Voices will vary in quality and volume. For all, to get and hold attention will be important. For many, the "complications" of technical aids are distasteful. The facility was designed to unobtrusively support these lectures, lend itself to their psychological security, and at the same time assist the individual student in securing maximum benefit from their presentations. Specifically, the impact of sheer intellectual bril-



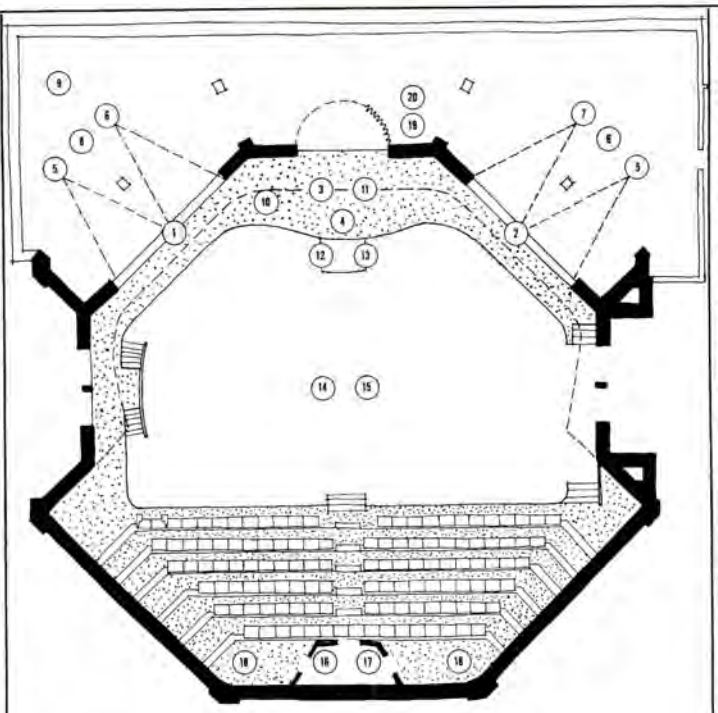
RETRIEVAL LOCATIONS



The range of possibilities of audio-visual equipment serviced by a central audio-visual information retrieval center is portrayed in this illustration by communications facilities consultant, Hubert Wilke. While, presently, no AVIRS centers this elaborate exist the various components shown are available; several systems are in operation, designed on a smaller scale; and several new buildings are being designed with *provisions for* a gradual buildup of an AVIRS, including space for communications centers and conduit runs connecting the centers and the classrooms, study carrels and auditoriums.

Projection aids

1. Rear projection screen, 7½ ft vertical, 20 ft horizontal, takes two simultaneous images 6 ft by 9 ft, or four 3½ ft by 6 ft.
2. Second rear projection screen.
3. Motorized retractable front projection screen, 8 ft by 8 ft, tilted or vertical.
4. Over proscenium of presentation area, fixed 12½ ft by 28 ft front projection screen, for movies and slides from projection booth.
5. Slide projector, 3¼ in. by 4 in., fixed in rack.
6. Slide projector, 2 in. by 2 in.
7. Sound movie projector, 16 mm.
8. Television projector, rear screen. Gives image on screen approximately 6 ft by 9 ft. Fed from vidicon cameras in auditorium; also from campus closed-circuit network.
9. Vidicon television camera, 600-line, to pick up images from display panels and racks in preparation area.
10. Roll-on vidicon camera, 600-line, fixed prefocus on lecturer possible, remote control. Lecturer has monitor in vision, can adapt presentation to fit camera without operator.
11. Television demonstration desk. Self-contained science demonstration facilities; monitor for instructor. Vertical-mounted 600-line camera with microscope attachment, transparency panel. Rolls on and off stage.
12. Overhead projector for transparencies, portable. May be mounted on floor or on roll-out platform. Projects to Screen 3.
13. Opaque projector, portable. Both 12 and 13 are stored in auditorium, are instantly available.
14. Slide projectors, 2 in. by 2 in. and 3¼ in. by 4 in. on table on floor for projection to Screen 3. Not tied to control panel; require operator or remote-control by lecturer.
15. Sound movie projector, 16 mm, on table on floor, for traditional use.
16. Slide projector, 3¼ in. by 4 in., Arc, manual slide changer; also accepts 2 in. by 2 in. slides. Projects to Screen 4.
17. Sound movie projector, 16 mm. Special lenses and other modifications for professional projection.
18. Mobile image-orthicon television cameras may be mounted here to cover presentation area and feed to campus closed-circuit network, videotape recorder, broadcast. Ancillary lighting and sound pick-up provided for.
19. Tape recorder inputs; also plug-ins for multiple recorders to tape lectures.
20. Master control and coordination center. Control console also mounted in lecterns and remote console can be operated from audience area.



Auditorium-teaching facility, *the University of Texas, Austin.* Investigation and planning was made possible by a grant from Educational Facilities Laboratories, Incorporated. Colbert-Lowrey-Hess-Boudreaux, Architects were special consultants on concept and design. TelePromTer Corporation were audio-visual consultants. George A. Dahl, Architects and Engineers were associate architects. Jessen, Jessen Millhouse and Greeven are consulting architects to the University of Texas.

liance in verbal presentation must not be impeded by the necessity of using unfamiliar or complicated mechanical devices.

Panel discussions and symposia presentations will occur with sufficient frequency to warrant special installations for making them successful. Specifically, it was desired that six persons be able to participate in rapid-fire verbal interchanges without shifting microphones and without becoming entangled in a morass of cables.

Still in its infancy, the art of providing for participation by students in large classes seems destined for rapid development. Samples: (1) forming discussion or reaction groups, necessitating flexibility in seating arrangements; (2) comments or answers by individual students, requiring ready access to the public address system; (3) push-button responses to directions, questions, explanations. Plans should be based upon best available predictions of developments in student participation.

There was a primary requirement for a self-contained closed-circuit system to be used as a visual aid inside the auditorium. Also, students in the facility were to have access to the campus closed-circuit network offerings. Existence of many classroom receiving points for closed-circuit offerings, however, means that this auditorium will be used only occasionally for television viewing.

Several ancillary and extended uses are also possible. Various types of public meetings can be housed here, for example. Unusual sound movies can be presented for specialized audiences. Exhibits can be set up.

Multiple viewing areas were used to introduce drama, enhance teaching opportunities, and provide flexibility. One screen may hold a composite process, for example, while sub-processes unfold on other screens. Changes from slides to opaque materials to films to television-amplified demonstrations are instantaneously possible. At the same time, lecturers preferring only one projection locus can have it.

Careful provisions have been made for coordination of aids. Projection devices may be mixed by the use of multiplexers with a television camera. Or, as many as four devices may be used concurrently without multiplexing. Concentration of devices and control panels makes it possible for one technician to serve all, out of sight of the audience. Control panels permit later addition of complete program automation by punched cards or programed sound tapes. Present control system permits pre-set sequences and can be operated directly by lecturer or by signal from lecturer to technician. Telephone communication from lecturer to operators is provided.

The two side screens are divisible into four viewing areas, each served by its own projector complex. Screens are backed by plate glass panels to eliminate noise penetration from backstage.

Magnification of on-stage demonstrations will be provided by vidicon television cameras feeding a rear-screen projector. Roll-on cameras will be used at present, but stage overhead structure will permit later installation of fixed-mount cameras if desirable. Fixed linkage to the campus closed-circuit television system permits rear-screen projection of programs from that network.

Many lecturers will want to continue the use of overhead projectors for opaque materials and transparencies. For them a roll-out podium is provided, still giving some elevation above student eye-levels, with a pull-down screen in the center of the stage. The same screen can be used for front projection of film-strips and slides.

For special showings such as wide-screen movies and unusual slides, front projection to a large screen over the stage is provided from the rear of the auditorium.

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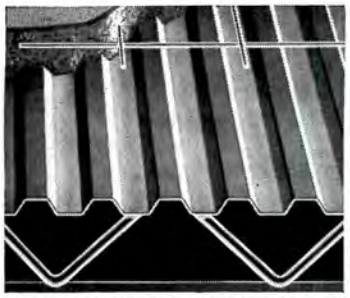

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Read the headline again.

Enka commissioned the Nationwide Consumer Testing Institute to create a nylon commercial carpet on paper.

It's in the form of minimum construction and performance standards. High ones.

And they're collectively called The Worst. Because anything less shouldn't be in your school, hotel or office building.

Other fiber makers have standards too. Construction specifications, mainly. Set up according to their own house rules.

But Nationwide makes our tests and our rules. And impartially makes them stick.

Any carpet of Enka nylon that doesn't meet the standards doesn't get the Enka Commercial Grade label. And that's that.

Picking the Standard Standard.

When you develop a carpet standard you have to start off with a real carpet.

The one that Nationwide picked is the one that's called The Workhorse of The Industry by the carpet people who know (who also happen to be people with no particular ax to grind either way).

Ironically, for Enka, it turned out to be wool —the good looking, good wearing, eight dollar loop, made by one of the most famous names in carpeting.

And, we've been told, it happens to be the carpeting used in the elevators of the Empire State Building. Which could be the supreme trial for any carpet.

Nationwide Tests The Workhorse.

The eight dollar wool was subjected to five basic performance tests:

In the Tug Test, it took 13 pounds of pull to yank a tuft of the wool out of its backing.

And in the Washout, a variety of common and household stains were tried. Wool proved to be readily cleanable with water and detergents.

In the Cement Mixer—a tumbling drum containing carpet samples and abrasive materials—The Workhorse was tested for pilling and fuzz resistance. Its performance was fair.

Then came the crucial tests:

The Workhorse met The Crusher. For 48 hours the wool carpet was subjected to a constant compression of 50 pounds per square inch. And the carpet pile made a 75% height recovery in 96 hours.

Finally it went to the Rubout, where it took 14,000 revolutions of an aloxite coated abrasion wheel, using a torque of 60 inch pounds, to wear through to the backing.

Good? No. Excellent for a wool carpet in the 8-9 dollar range.

But Nationwide wasn't finished with The Workhorse yet.

Their engineers tore it apart, just to see how well it was put together.

They examined tuft height, uniformity, loop density, primary backing and secondary backing. And when they were finally through they knew exactly how good they wanted The Worst to be.

The Absolute Worst.

The following are Nationwide's absolute minimum standards for performance *and* construction.

1. Cleanability — (The Washout). Common stains, both oily and non-oily, including foodstuffs, cosmetics and grime, must be readily cleanable.
2. Resiliency — (The Crusher). On the standard testing apparatus the carpet is compressed for 48 hours. It must recover at least 80% of its pile height within 96 hours. (Note: The Workhorse only scored 75% recovery on this test.)
3. Resistance to Pilling—(The Cement Mixer). Samples of the carpeting are tumbled in the drum with abrasive agents for 8 to 10 hours and must show only a minimal fiber distortion. On the rating scale 1 equals none and 5 equals very bad. A rating of 2.5 or higher is unacceptable.
4. Tuft Bind—(The Tug Test). If tufts can be pulled from the backing, with less than 7 pounds of pull it isn't acceptable.
5. Abrasion Resistance—(The Rubout). The carpet must be able to withstand at least 10,000 revolutions on the abrasion wheel before wearing through to the backing.
6. Pattern—The carpet must be a continuous filament loop type and they must be loops of even height. (Uneven loops don't give maximum support to one another and don't wear evenly as a result.)
7. Minimum Tufts—The absolute minimum tufts is 56 per square inch. That means they're packed together well for maximum wear and mutual support. You can see the difference in carpet samples when you bend the facing and can see the backing. This is called grinning.

And the more a carpet grins at you the unhappier you're going to be.

8. Finished Pile Height—Nationwide Testing says that 3/16" is the best height for maximum wear and minimum stress. Any more and the loops would tend to bend over and destroy the new looking appearance. Any less would give less wear and take away from the cushioning and insulating qualities of the carpet.
9. Primary Backing—This is the backing that the pile is tufted into. It's got to be strong enough to minimize distortion and support the pile. Nationwide says it should be 9 ounces per square yard, jute. Or a substantial polypropylene backing.
10. Second backing—The final step. When you look at the back of an Enka approved carpet you'll see double jute or high density foam welded to the carpet. The foam must weigh at least 32 ounces per square yard.

That's how the manufactufer gets the label. And to keep it he has to submit samples for periodic retesting.

The Worst vs. The Workhorse.

Naturally we're grateful to The Workhorse. It provided the basis for The Worst. But if it were a nylon carpet it wouldn't get the label. Because it flunks just one test—the resiliency test—by a mere 5%. But that's enough to make a big difference. (And The Workhorse costs eight to nine dollars a yard, while an Enka-Nationwide approved carpet can cost as little as half as much.)

Enka's Claim:

Dollar for dollar, you're better off with nylon than with wool.

And you're better off buying a nylon carpet with the Enka Commercial Grade label.

Because Enka's the only fiber maker that independently tests against impartial construction *and* performance standards—standards you can understand.

(You can write to American Enka Corp., 350 Fifth Ave., N.Y.C.—and we'll send you the actual certified test reports of any Nationwide approved carpets you're considering. And you can compare the results and prices yourself.)

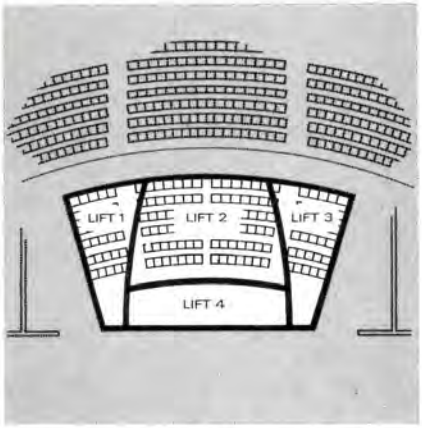
So when you buy a commercial carpet with the Enka label you'll know what you're buying. Not just who you're buying.

Before you buy the front of a carpet, read what's on the back.

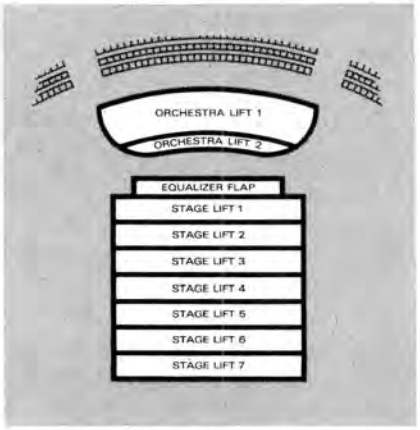
Enka

sta of stage, opera, and nightclubs

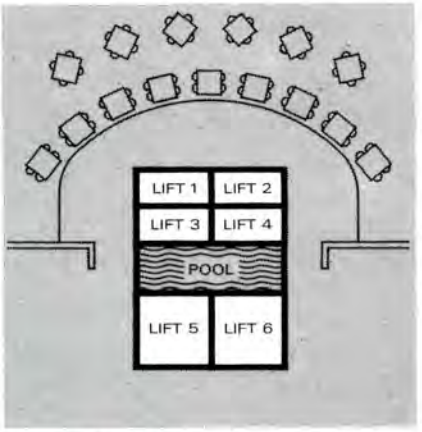
DOVER STAGE LIFTS



Loeb Drama Center, Harvard University—Four Dover Stage Lifts are used to create a theatre that easily converts for three different kinds of staging.



Metropolitan Opera House, New York City—The new home of the Metropolitan is equipped for fabulous stage effects with seven Dover Lifts on stage and two in the Orchestra.



Stardust Hotel, Las Vegas—Six Dover Stage Lifts, operating in combination or independently, bring performers and sets into view from below stage level.

These diagrams illustrate three of the more than 100 entertainment centers equipped for flexibility with Dover Stage Lifts. Dependable, smooth-running Dover hydraulic lifts produce elaborate theatrical effects, save valuable floor space, and help in the design of multi-use halls. There are practically no limitations on platform size, lifting capacity and systems for controlling combinations of lifts. For theatres, concert halls, opera houses, auditoriums, night clubs, wherever you need a rising stage, specify Dover Stage Lifts. Send your preliminary requirements for analysis and recommendation.

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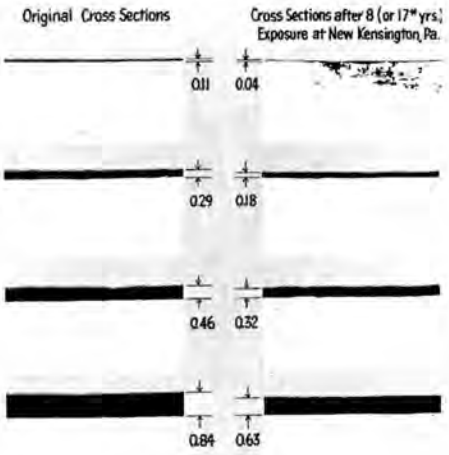
Weathering of aluminum based on long-term tests in both industrial and seacoast atmospheres



* 17 YEARS

EFFECT OF OXIDE THICKNESS (Mils) ON WEATHERING OF NON-MAINTAINED ANODIZED ALUMINUM

Most aluminum alloys—and particularly those used in the building products industry—have a high inherent resistance to corrosion. Exposures of as long as 30 years to relatively severe industrial and seacoast environments have caused only shallow attack and have resulted in only small losses in tensile strength of the various materials.

Because of their characteristic thin, protective oxide films, aluminum alloys corrode at only a relatively few points, and some, if not most, of the original surface of the metal generally remains intact even after years of weathering.

The outstanding characteristic of the commonly used alloys, 1100, 3003 and 3004, is that the rate of weathering decreases with time. This is also true for the other wrought and cast alloys. The decrease in rate of penetration of corrosion is most outstanding. The attack, at isolated spots, penetrates at an initial rate of approximately 4 mils per year but rapidly decreases so that after about two years the maximum rate does not exceed about 0.11 mil/year for severe seacoast locations and may be as low as 0.03 mil/year for less severe environments.

How different alloys weather

The resistance to corrosion of the commonly used commercial-purity aluminum (1100) and aluminum alloys containing manganese or magnesium alone, or in combination, is essentially the same.

The strength of 1100, 3003, 3004 and other similar alloys is determined by the amount of strain hardening present. In general, the corrosion rates of these alloys are substantially the same in either the annealed condition or in the strain hardened tempers.

Other strain hardenable alloys include those with increasing amounts of magnesium. These provide a group of alloys with a resistance to corrosion at least as good as 1100, 3003 and 3004 in industrial environments and somewhat superior in seacoast atmospheres. Alloy 5052 has experienced wide usage in marine applications for this reason. Other alloys containing magnesium in amounts as great as 5 per cent are now commercial and provide excellent resistance to corrosion when used properly.

Aluminum alloys such as 6053, 6061 and 6063 containing magnesium and silicon respond to heat treatment and artificial aging and can develop greater strength than the strain hardenable alloys. The compositions of these alloys were formulated to enhance certain characteristics without affecting their resistance to corrosion.

The high-strength, heat-treatable alloys containing large amounts of copper or copper in combination with magnesium and zinc do not possess as high inherent resistance to corrosion as some of the low or medium strength alloys. It is generally recommended that these alloys be given protection when exposed to the weather. However, in their cladded form these alloys have excellent resistance to corrosion.

Cladding—strength plus corrosion resistance

Clad aluminum products, in general, are outstanding in their ability to resist corrosion and maintain their structural integrity. It also is evident that high resistance to corrosion can be secured from clad aluminum products of the high strength structural alloys. This has been demonstrated by the use of high strength sheet clad aluminum in aircraft and similar plate products in bridge and other structures. Although 3003 and 3004 have exhibited a high resistance to atmospheric weathering, there are situations where it is advantageous to use them in the cladded form. This is particularly desirable where the metal is thin and maximum resistance to perforation is required. For example, the use of clad aluminum products is particularly valuable for applications involving gutters, flashings and valleys where the hazards of corrosion and perforation are increased by continual contact with water.

Effectiveness of anodizing alloys

The natural oxide film which develops on aluminum alloys is about 4×10^{-7} inches thick. Although this film has good resistance to corrosion and quickly heals when damaged, gradual roughening and soiling of bare aluminum alloys is an inevitable consequence of atmospheric weathering.

In the late 1920's, it was recognized that a variety of surface finishes were

This article is derived from a technical report on weathering of aluminum, by the Aluminum Company of America. The report was based on test exposures of over 30 years and by service of over 80 years.

esthetically desirable and a number of burnishing and mechanical finish operations were employed to produce these effects. Some chemical treatments were used to produce color and a prematurely weathered appearance. An electrochemical process, then called "deplating," was used to produce a uniform finish which coincidentally developed a thin but protective anodic film. This evolved to the present anodizing processes.

The thickness of the amorphous aluminum oxide coating formed is a function of time and current density. The outer portion of the coating is porous and may contain as many as 5.5 billion pores per square inch. These pores are receptive to dyes so that the coating may be colored if desired. The oxide is sealed by immersion in hot aqueous solutions, whereupon the surface of the oxide is converted to an aluminum hydrate and the accompanying volume change seals the pores in the coating.

The conventional anodizing produces oxides which may be colorless, gray, tan or gold, depending upon the substrate aluminum alloy chosen. For unmaintained architectural applications, the anodic film thickness is usually a minimum of 0.7 mil.

Special hardness and good durability of hard anodic and similar finishes, as well as an ability to develop integral colors, accounts for their widespread usage in many monumental buildings where appearance and weathering resistance are of primary concern. The hard anodic process utilizes higher voltages than the conventional anodizing so that the oxides developed are more dense and have higher abrasion resistance. This is because the higher voltages produce larger cells in the anodic coating, hence fewer cells (and pores) per unit area.

In the evaluation of anodic film performance on aluminum alloys, color, erosion and blooming (hazing) changes are evaluated. Unlike the metallic structure of the substrate, anodized films weather by very slow erosion from years of rainfall, wind-borne dust particles and chemical reaction with the atmosphere.

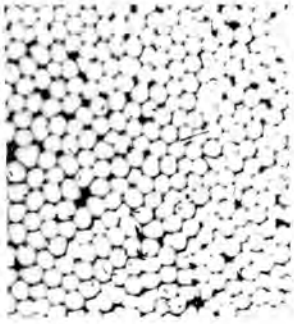
Weathering tests on anodized 1100, 3003 and Al-Si alloy panels have demonstrated a loss by erosion of only about 0.2 to 0.3 mil during several tests exposed for an 18 year duration in the New Kensington, Pa., industrial atmosphere.

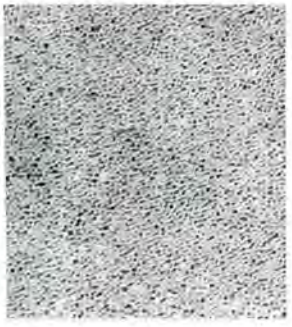
The more recently developed hard anodic coatings have yet to accumulate substantial periods of weathering time. Tests of four and one-half years in various locations have indicated no measurable loss in coating thickness. In addition, a wide variety of accelerated tests have indicated that these hard coatings will resist erosion by weathering as effectively as the conventional anodized finishes.

If the oxide surfaces are maintained by periodic washing and, perhaps, application of wax, the original surface appearance can be preserved indefinitely. Samples cleaned and waxed periodically are in excellent condition after exposures of more than 20 years in the industrial atmosphere at New Kensington.

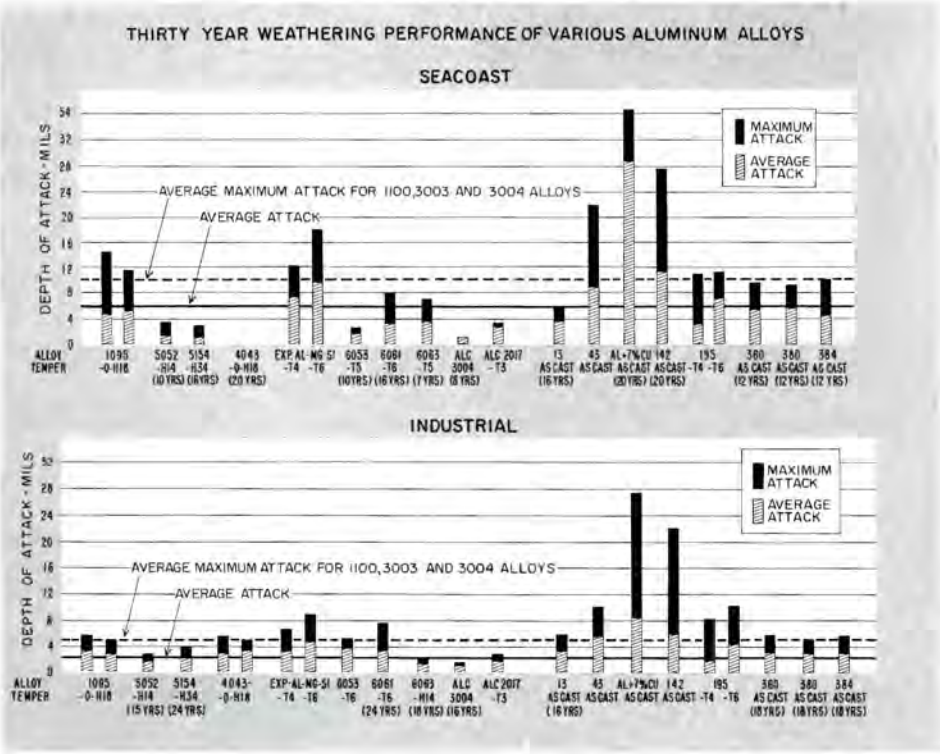
In high-rise, non-maintained architectural applications, it is the common practice to utilize a clear lacquer coating on the anodized surface when there is danger of construction damage, streaking by soil and drainage from fresh masonry. The Alcoa Building, erected in 1950, incorporated such a clear acrylic lacquer coating (0.7-1.0 mil thick) which has slowly but only partially eroded.

In summary, the resistance to corrosion of anodized aluminum alloys for architectural applications can be considered excellent both in maintained and non-maintained applications, provided that the oxide coating has been applied in adequate thickness, using properly supervised practices.





Hard anodic coatings have greater resistance to weathering than the ordinary types. The reason can be seen in the microphotos, left and right: hard anodic coatings have larger cells than regular anodic, and thus fewer pores which means less area for weather attack. Depths of attack on test panels of various aluminum alloys over a 30-year period in an industrial atmosphere (New Kensington, Pa.) and a seacoast atmosphere (Pt. Judith, R. I.) are shown in the two graphs. These tests were conducted by the Aluminum Company of America.



How does color hold up?

Color change appraisals of anodic coatings have been varied and difficult to correlate until recent instrumentation provided the means for evaluation. Anodizing and coloring processes in the metal industry can be varied to produce a corresponding variety of color range and surface texture characteristics. Coatings and colors which have been applied in proper thicknesses and under proper supervision have performed quite well and are on display through the country in many applications. Retention of specific color and gloss characteristics requires special consultation and is beyond the intended scope of this article.

No significant color changes have been detected on Duranodic 300 coatings after four years exposure to the industrial atmosphere at New Kensington, and 1½ years in the seacoast atmosphere at Point Judith, R.I. Accelerated simulated weathering tests of more than 20,000 hours in the Fade-Ometer, Weather-Ometer and Sunshine-Arc Weatherometer have produced no appreciable color change.

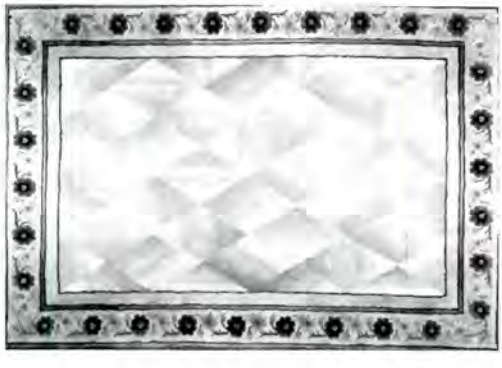
For more information circle selected item numbers on Reader Service Inquiry Card, pages 265-266

One-man studio offers diverse sculpture

William Bowie creates sculpture for a variety of environments from private homes to apartment buildings, from religious buildings to banks and offices. The works may be done individually or may be based on existing pieces. Although he works with many materials, Bowie concentrates mainly on metal. Color is often added by pigment preparation, high temperature brazing, or the use of gold and silver foils.

Recent works have included: a standing screen—10 ft by 40 ft—for the Syracuse Bank for Savings (New York); a wall sculpture—4 ft by 15 ft—in polished wood for the executive offices of the United States Plywood Corporation headquarters (New York); three fountains and a standing sculpture for La Guardia Terrace Restaurant in the airport terminal (New York); a sculpture for the Air France ticket office (Philadelphia); and several large wall and standing sculptures for the El San Juan Hotel (San Juan, Puerto Rico). ▪ The Sculpture Studio Inc., New York City.

Circle 300 on inquiry card



Texture ranks with color in interpreting new rug designs

The V'SOSKE Collection for 1967 places strong and equal emphasis on texture and color in the interpretation of 13 new designs. The textures, all developed in fine yarns, and the color combinations for the individual designs make the collection a noteworthy one.

"Shadow" (right) is achieved with subtle shades of violet browns; "Afghanistan" (middle) is an old Oriental design developed in rich browns and golds; and "Cactus" (left) with a softly brushed finish is a large-scale floral design with a leaf background. Another design, "Jasmine," is elegantly done in three textures and three levels.

Similarly, each of the 13 designs offers its own special character impressively handled. ▪ V'SOSKE, New York.

Circle 301 on inquiry card

more products on page 180

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 265-266

CRACKING IN BUILDINGS / An 8-page digest examines the causes of cracking and points out that an understanding of the factors responsible is necessary not only for correct diagnosis and repair, but also for minimizing future trouble in new buildings by good design and workmanship. ▪ Her Majesty's Stationery Office, York House, Kingsway, London W.C.2, England.

RESILIENT FLOORING / The 1967 catalog describes and contains color illustrations of all colors and patterns in vinyl asbestos tile, asphalt tile, feature strip, and cove base. ▪ Azrock Floor Products, San Antonio, Tex.

Circle 400 on inquiry card

WESTERN WOODS / Basic information on using lumber of 12 western softwoods is available in nine catalogs. Titles include: Product Use Manual, Structural Framing, Sheathing and Decking, Machine-Rated Lumber, Laminated and Solid Posts and Beams, Exterior Decks, Railings, Benches and Garden Structures, Exterior Siding, and Interior Paneling. ▪ Western Wood Products Assn., Portland, Oregon.

Circle 401 on inquiry card

BUILDING STRUCTURES / A 12-page study of ultimate cost/savings of model buildings (roof and walls) compares *Butler F-103* factory-insulated cover panels with conventional structures. ▪ Butler Manufacturing Company, Kansas City, Mo.

Circle 402 on inquiry card

SUN SHADES / A 6-page color brochure describes vision screens and sun shades made of fabricated and extruded aluminum. Pictures show installation on commercial, industrial, and institutional buildings. ▪ Airstream Products Co., Philadelphia.

Circle 403 on inquiry card

ELECTRIC PRESSURE SYSTEMS / Compact water pumping units which replace water towers for high-rise buildings and single-family residence areas are described in a 6-page technical bulletin. ▪ Crane Co., Chicago.

Circle 404 on inquiry card

ALUMINUM STADIUM SEATS / A 4-page brochure presents two types—contoured bleacher seats and folding, contoured stadium chairs. ▪ Liskey Aluminum, Inc., Glen Burnie, Md.

Circle 405 on inquiry card

CERAMIC TILE / The 1967 catalog presents the complete line and shows new tile setting techniques and design applications. ▪ American Olean Tile Company, Lansdale, Pa.

Circle 406 on inquiry card

EXTRUDED-ALUMINUM SKYLIGHT / A 16-page catalog provides design data, facts and figures on dome, ridge and multiple pyramid skylights, as well as on special types. The brochure shows skylight installations in schools, churches, banks, commercial buildings and homes. Letterhead requests. ▪ Super Sky Products, Inc., Dept. AD, Box 47, Thiensville, Wisc.

VERMICULITE FIREPROOFING / A data sheet provides diagrams and descriptions with U.L. fire resistance ratings awarded to *Mono-Kote* fireproofing for floor systems, beams, girders and columns. An 8-page catalog entitled "Vermiculite Plaster Aggregate And Spray-On-Fireproofing" explains that the aggregate, when mixed with gypsum, results in "a lightweight, insulating fire-resistant plaster." *Mono-Kote* is a cementitious, mill-mixed material that requires only water and is spray applied to steel, concrete and other surfaces requiring fire protection. ▪ Zonolite Division, W. R. Grace & Co., Chicago.

Circle 407 on inquiry card

FREE-STANDING FIREPLACES / Thirteen color photographs present three types of fireplaces in actual installations in homes, apartments, and cabins. Both wood-burning and gas-fired units are available in a selection of colors. ▪ Condon-King Company, Inc., Lynnwood, Wash.

Circle 408 on inquiry card

STEEL PIPE / "Basic Data—Steel Pipe In Refrigeration Systems" is a 4-page bulletin that covers refrigerant selection, and refrigeration circuit design. ▪ American Iron and Steel Institute, New York.

Circle 409 on inquiry card

DOMES / A 6-page brochure suggests the following uses for its curved-rib domes: storage for raw material; convention halls; auditoriums; theaters; stadiums; swimming pool coverings. The brochure promises that the dome "offers savings in construction time and materials, lower maintenance costs, and flexibility in construction and application." ▪ General Conveyor Inc. of Northern California, Walnut Creek, Calif.

Circle 410 on inquiry card

LAMINATED SOUTHERN PINE / A 12-page technical bulletin covers a wide range of lumber uses, applications, and information. Various types of glued laminated Southern pine arches and beams are illustrated. ▪ Southern Pines Assoc., New Orleans.

Circle 411 on inquiry card

STERILE AIR CONDITIONING / A 12-page manual on ultraviolet sterile conditioning of forced-air heating and cooling systems gives a description of the completely packaged units, which are adapted to air-flow systems for sanitization, decontamination and deodorization. ▪ American Ultraviolet Company, Chatham, N.J.

Circle 412 on inquiry card

FASTENER ENGINEERING / A 64-page illustrated manual covers engineering standards and application data for tapping screws and other fasteners. This enlarged sixth edition includes latest dimensional changes, hole-size recommendations and other technical information. ▪ Parker-Kalon Corporation, Clifton, N.J.

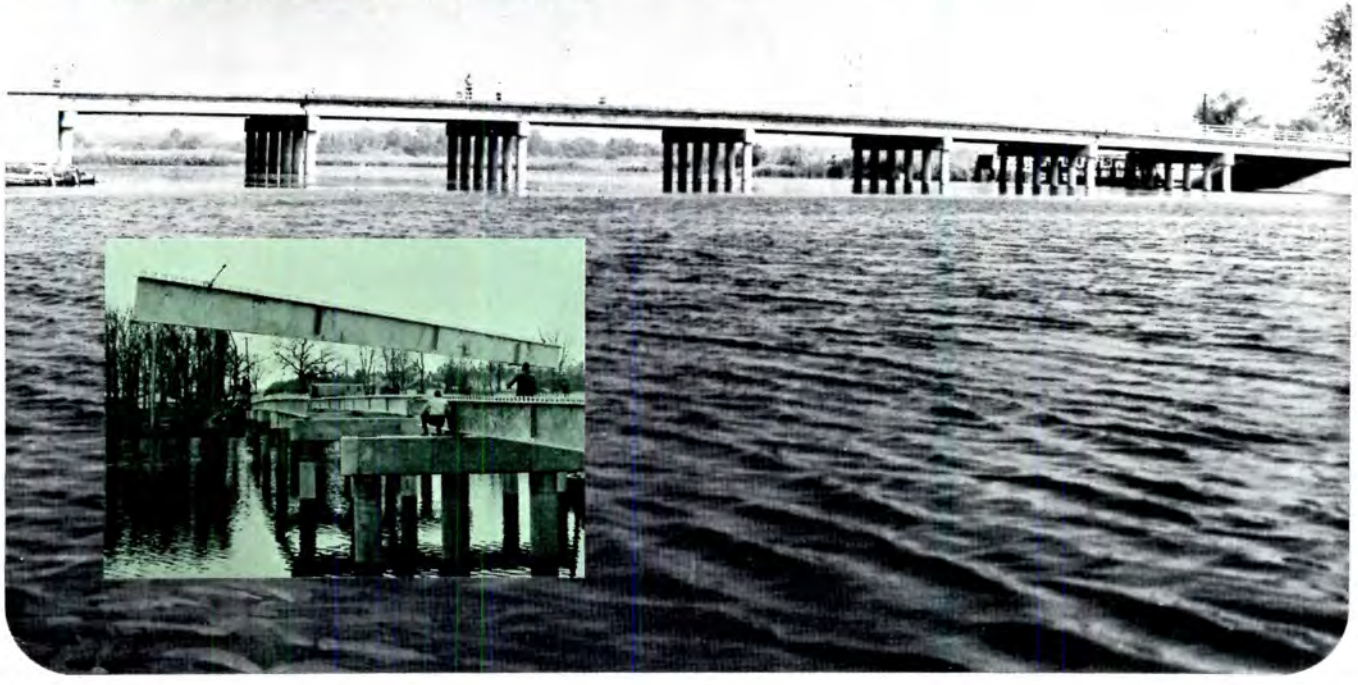
Circle 413 on inquiry card

PAINTED ALUMINUM SHEET / An 8-page edition of "Color and Quality Standards for Painted Aluminum Sheet" contains samples of 75 colors and gives the minimum quality standards for the product. The booklet also includes a table of recommended minimum bend radii for varying thicknesses of painted sheet. ▪ The Aluminum Association, New York City.

Circle 414 on inquiry card

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

more literature on page 226



The First **Hot Dip Galvanized** Bridge in the U.S. Spans a River of Maintenance 20 Years Wide

A zinc skin will provide 20 to 50 years of protection without maintenance for this bridge over Stearns Bayou, Ottawa County, Michigan. ☐ The bridge is 420 feet long with a 30 foot roadway and a 5 foot walk on each side. There are 8 spans, two at 60 feet and six at 50 feet. Design loading is H20-S16-44. All structural members, fasteners and other steel parts are protected against corrosion after fabrication by hot dip galvanizing specified at 2.3 ounces per square foot. Structural techniques proven successful in a hot dip galvanized bridge opened near Quebec City, Canada, in 1963 assure full friction of fastener contact surfaces plus the corrosion resistance of an unbroken zinc coat. ☐ The cost of galvanizing today is surprisingly close to that of a proper paint system. When maintenance costs are considered, galvanizing with its 20 to 50 year life expectancy is by far the most economical.

ST. JOE

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Producers of Zinc for American Industry

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ZN-307

continued from page 177

WATER CLOSET TANK / The *Neu-Sahara* sweat-free tank is designed with a urethane liner "to end tank-wiping and floor-mopping." Even when temperature reaches 80 deg with 70 per cent humidity and when the tank water is near freezing there is no condensation on the tank. The liner will not separate or absorb water. ▪ Crane Company, Chicago.

Circle 302 on inquiry card

ROOF WINDOW / A leak-proof unit is insulated and provides both light and ventilation. The base is a high-density overlaid plywood. Inner and outer bubbles of the clear acrylic-plastic double dome minimize heat transmission. ▪ Georgia-Pacific, Portland, Ore.

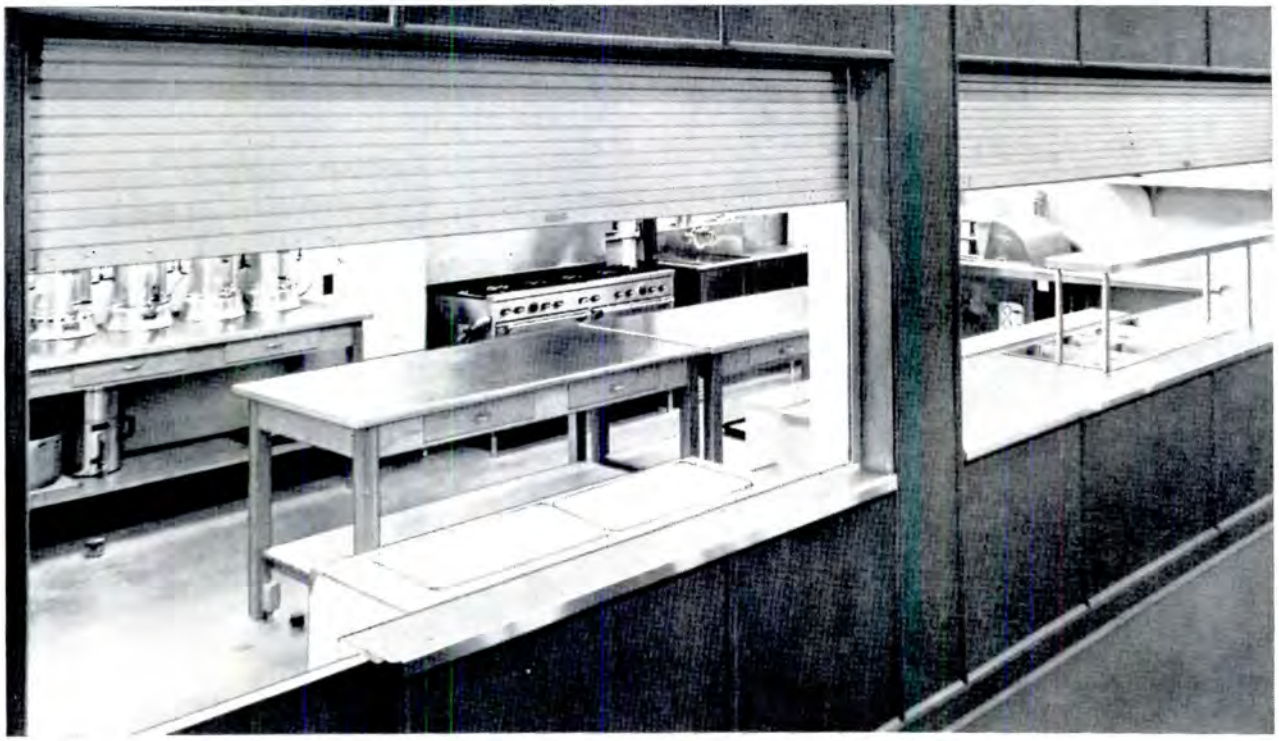
Circle 303 on inquiry card

SCHOOL HEATER / When modular electric units are mounted at the junction of the wall and ceiling, temperatures are reported throughout the classrooms to be even and automatically controlled with no cold spots near the large glass windows. Installation of the units in an entire school is reported favorable from several standpoints. ▪ Vitratherm Corporation, South Norwalk, Conn.

Circle 304 on inquiry card

more products on page 184

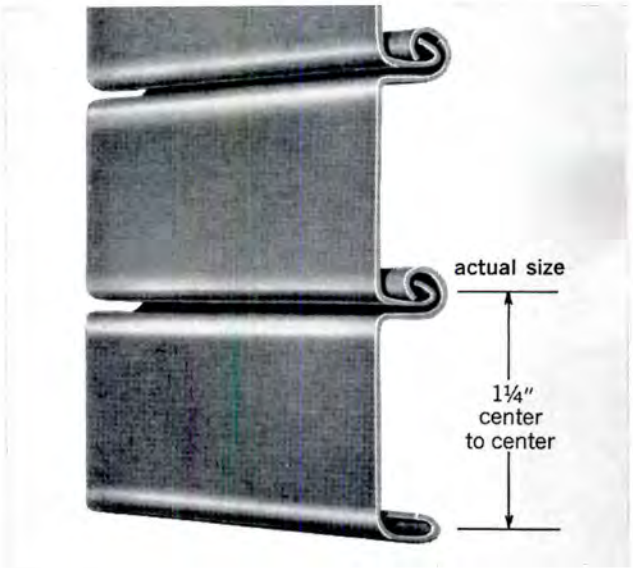
Now...an answer to one of your difficult closure problems...



The New COOKSON FD10 Series U. L. Labeled Counter Fire Doors

Service-counter closures offering maximum fire protection used to look massive, heavy and cold. Now they need not.

We have a solution to the problem, no matter how critical your taste. It's the new Cookson FD10 Series U.L. Labeled Counter Fire Doors, styled in slim lines to complement modern decor.



Available in either push-up or crank operated design, FD10 Series Doors are being specified and used extensively in schools, cafeterias, offices, stores, ticket windows, hospitals . . . wherever fire safety and security must be provided without sacrifice of appearance.

See our catalog in Sweet's; or write for your own copy.

Key To Slim-Line Styling Of The FD10 Series

The curtains of the Cookson FD10 Series Doors are fabricated from the miniaturized #10 slat, in either galvanized or stainless steel. With a center-to-center dimension of only 1¼", this slat has permitted substantial reduction of head and side room requirements.

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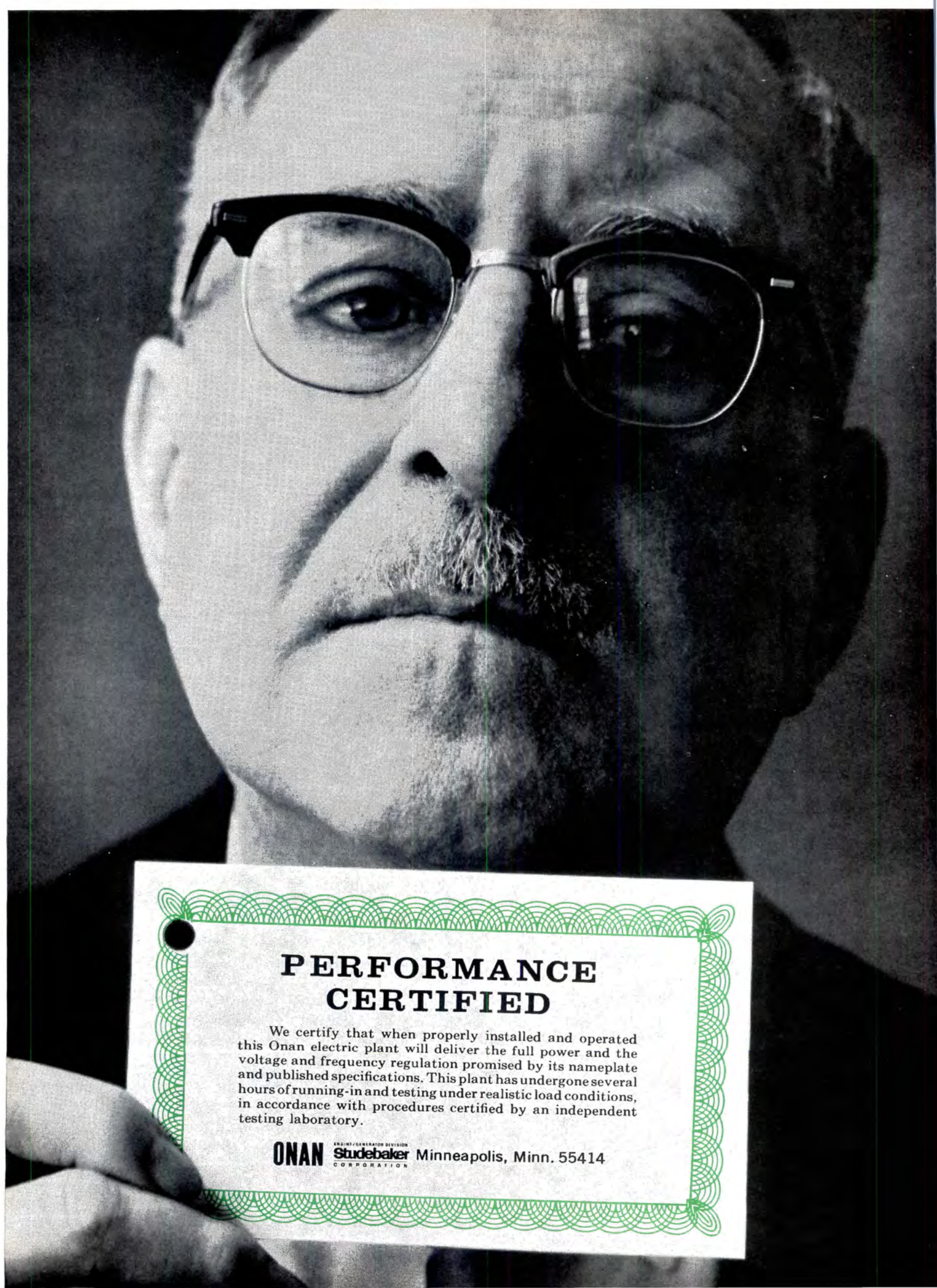
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We certify that when properly installed and operated this Onan electric plant will deliver the full power and the voltage and frequency regulation promised by its nameplate and published specifications. This plant has undergone several hours of running-in and testing under realistic load conditions, in accordance with procedures certified by an independent testing laboratory.
ONAN
ENGINE/GENERATOR DIVISION
Studebaker
CORPORATION
Minneapolis, Minn. 55414

We call Mr. Onan "Bud"

But we call Mr. Calva "Sir!"

Because he's the one who puts the teeth in Onan's exclusive Performance Certification. But don't get the idea that we take our president for granted. Bud Onan invented the Performance Certification idea for our electric plants.

But Mr. J. B. Calva is an outsider . . . the independent testing authority that makes it meaningful to you. And keeps us on our toes. And keeps the Performance Certified tag (one goes on every Onan plant) something that has to be earned; not just a gimmick.

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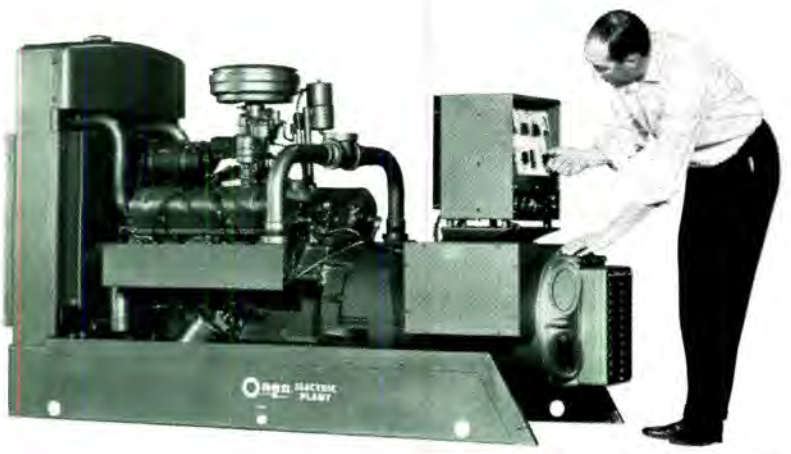

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ONAN ENGINE/GENERATOR DIVISION Studebaker CORPORATION
2515 UNIVERSITY AVENUE S.E. • MINNEAPOLIS, MINN. 55414

For more data, circle 81 on inquiry card

continued from page 180

RANGE SURFACE VENTILATION / An electric surface unit with surface-level ventilation promises more effective fume removal, less noise, and new design possibilities where no overhead exhaust system is needed. The *Jenn-Air 30* fits the normal 30-in. countertop opening. ▪ Jenn-Air Corporation, Indianapolis, Ind.

Circle 305 on inquiry card

SPACE-SAVING SINK / This *Swingaway Sink* may be used as an individual fixture wherever sink facilities are needed and space is at a premium. When in use, the stainless steel case is pivoted out from a fully concealed position below a counter or shelf or behind a cupboard door. ▪ Holderle Bros., Inc., Rochester, New York.

Circle 306 on inquiry card

HOSPITAL SINK / A stainless steel surgical scrub sink has a pedal-operated spray bar that discharges thermostatically controlled water for an area of approximately 10½ by 8 in. There are pedal-operated self-contained antiseptic soap system, towel dispensers and towel disposal receptacles. ▪ Logan Hospital Equipment Company, Glendale, Calif.

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more products on page 205

2 suggestions for architects who think ceiling seams are unsightly:

Hide them.

With the bold, textured ceiling tile whose sharp, square edges are meticulously arranged and designed to create a remarkably monolithic appearance. The seams virtually disappear. This is Armstrong Santaglio* Travertone™. It's noncombustible, fire retardant, and acoustical. Available in 12″ x 12″ x ¾″ tile, with self-leveling tongue-and-groove joints, you can suspend it mechanically or cement it to any firm, flat, dry surface. *U.S. Patent D-206,119.

Dramatize them.

With the lay-in ceiling system whose individual panels extend 11/32″ below the grid, creating a uniquely bold dimensional effect. This is Armstrong Tegular Travertone. It's noncombustible, fire retardant, and acoustical. Available with small through perforations for ceiling-wide air diffusion, it's fabricated for standard 24″ x 24″ grid suspension systems. You can create extra drama with a black or bold, brightly colored recessed grid system.

Specifications on both ceilings? Write Armstrong, 4202 Rock St., Lancaster, Pa. 17604. Or for more data, circle 1 on inquiry card.

CEILING SYSTEMS BY
Armstrong

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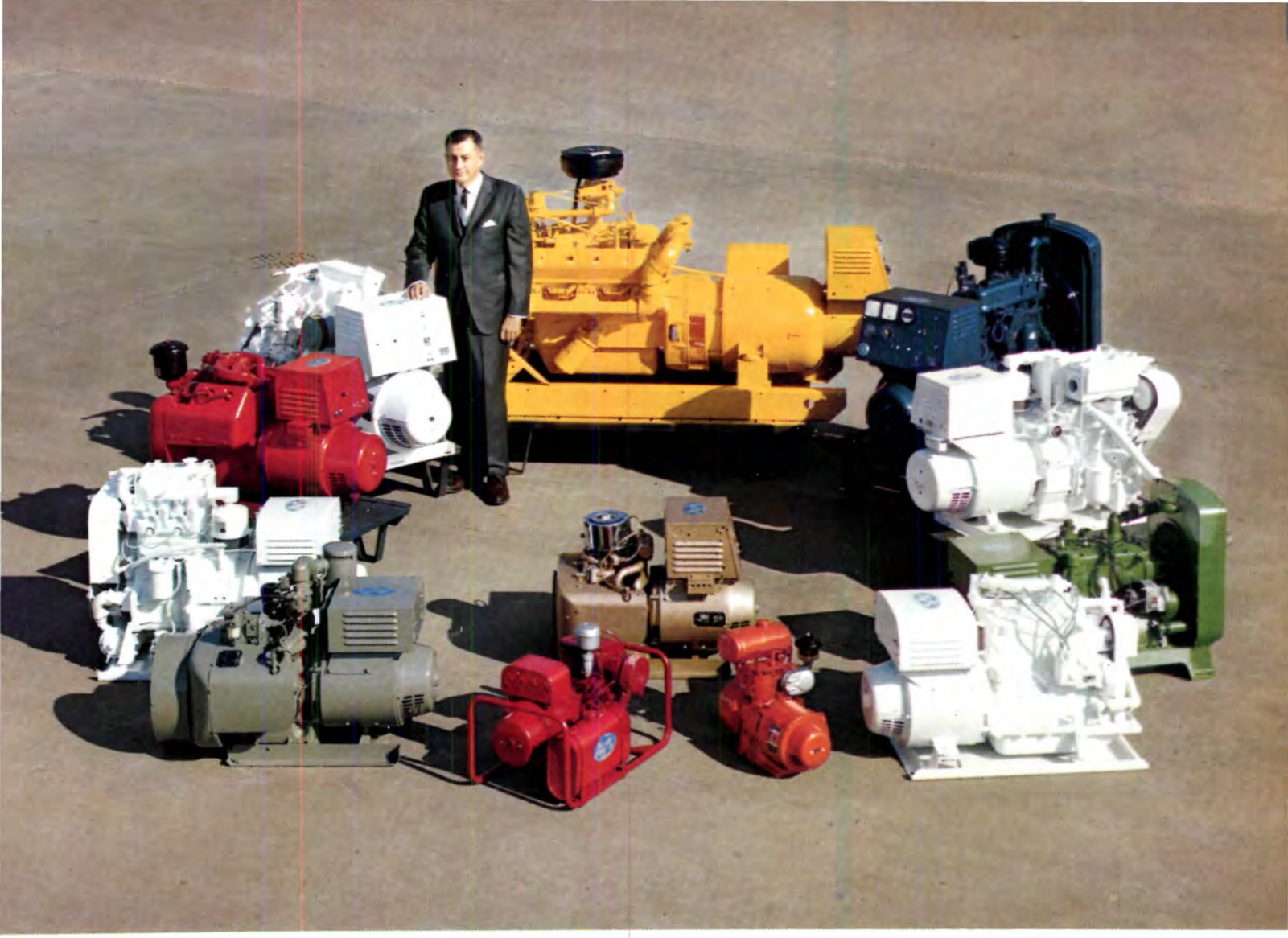

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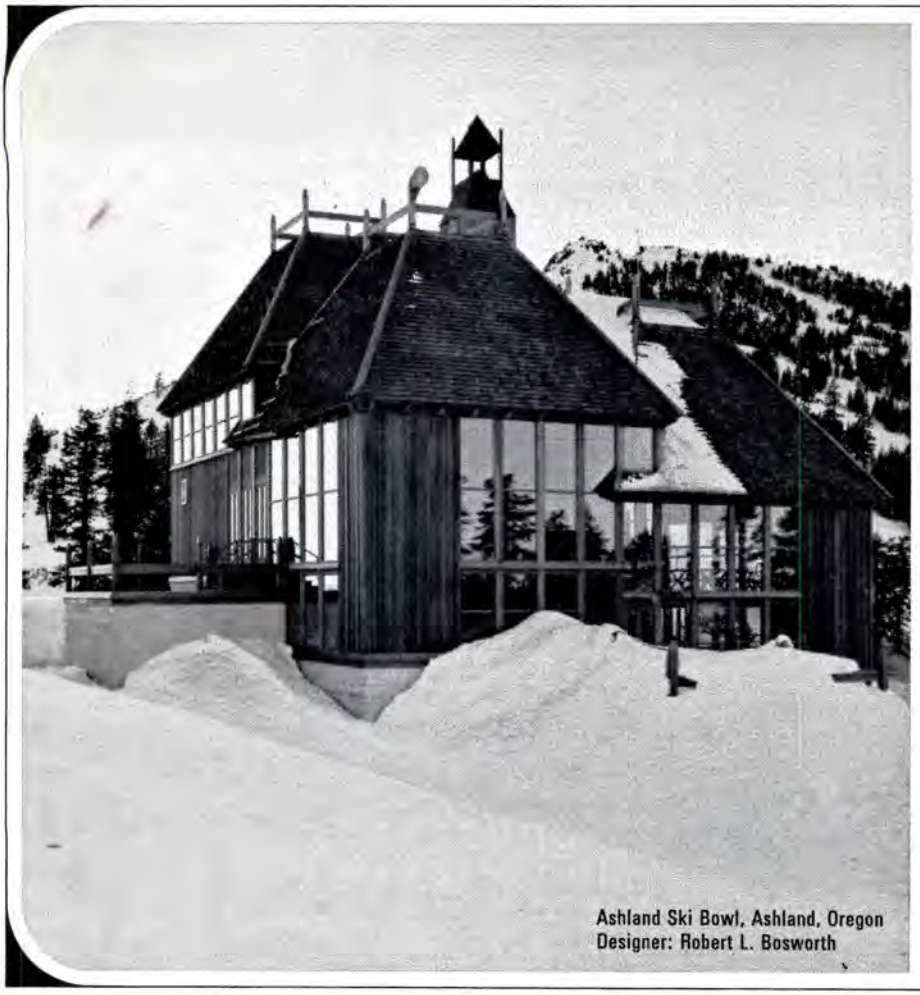
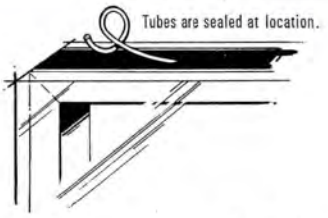


Ashland Ski Bowl, Ashland, Oregon
Designer: Robert L. Bosworth



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This special breather tube was required to equalize the atmospheric pressure inside insulating glass units manufactured at Thermoproof, Detroit (14.3 lbs. per square inch) with the Ashland Ski Bowl at 9000 feet (10.6 lbs. per square inch).

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Holophane's elegantly styled new Postop luminaire reaches UP...reaches OUT...to give you MORE light over larger outdoor areas.

Holophane's 4-Square Postop® is big, bold, powerful. It packs 4000 watts, towers up to 50 feet in mounting height. It's engineered for *king-size* outdoor lighting jobs. Yet this biggest Postop shares the cleanly detailed styling that characterizes *every* member of the Postop family. It delivers the same brand of superior performance, too!

- **Powerful output** of the 4-Square Postop means units may be spaced up to 5 *times* mounting height and still provide complete area coverage.
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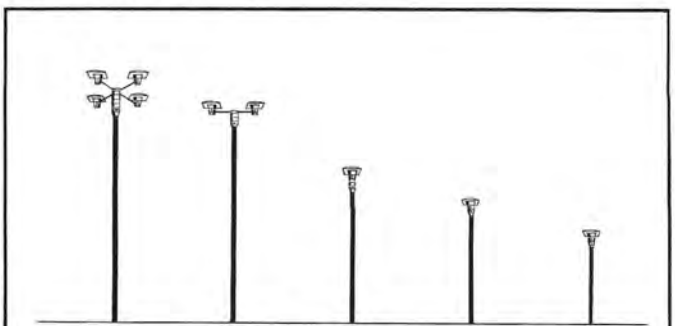
- **Glare-free illumination.** The 4-Square's exactingly engineered refractors control light *prismatically.* Illumination is uniform and glare free, refractor brightness low.
- **Four "layers" of light.** Each lamp distributes light over the *total* area. There's no dark quadrant should a lamp fail. For off-hour surveillance, one lamp can be used to deliver low, uniform illumination over the entire area.

Get the full story on this newest Postop—and on the whole family of Postop luminaires. Write Dept. H-2, Holophane Company, Inc., 1120 Avenue of the Americas, New York, N.Y. 10036.



There's a Holophane Square Postop for every outdoor lighting job.

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Architect: John Johannsen • New Canaan, Conn.
Structural Engineer: Milo S. Ketchum & Partners • Old Saybrook, Conn.
Soils Engineer: Ardaman & Associates • Orlando, Fla.
General Contractor: H. L. Coble Construction Co. • Orlando, Fla.

Owner: City of Orlando • R. S. Carr, Mayor

Diagram shows the lower end of a Vibroflot® machine in action to presettle sandy soil. Compaction is accomplished by a simultaneous saturation and vibration of the granular materials involved. During the application, fresh sand is added at the surface to compensate for the loss in volume caused by the increase in density (bearing capacity) of the compacted soil.

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FOR BUILDING ON SANDY SOIL

The foundation of the two-story Orlando Library in Orlando, Florida was built on soil compacted by Vibroflotation.

The uniformly densified sand provides high bearing capacity and protection against differential settlement.

Write for booklet A-51.

VIBROFLOTATION FOUNDATION CO.

930 Fort Duquesne Boulevard, Pittsburgh, Pa. 15222

For more data, circle 90 on inquiry card

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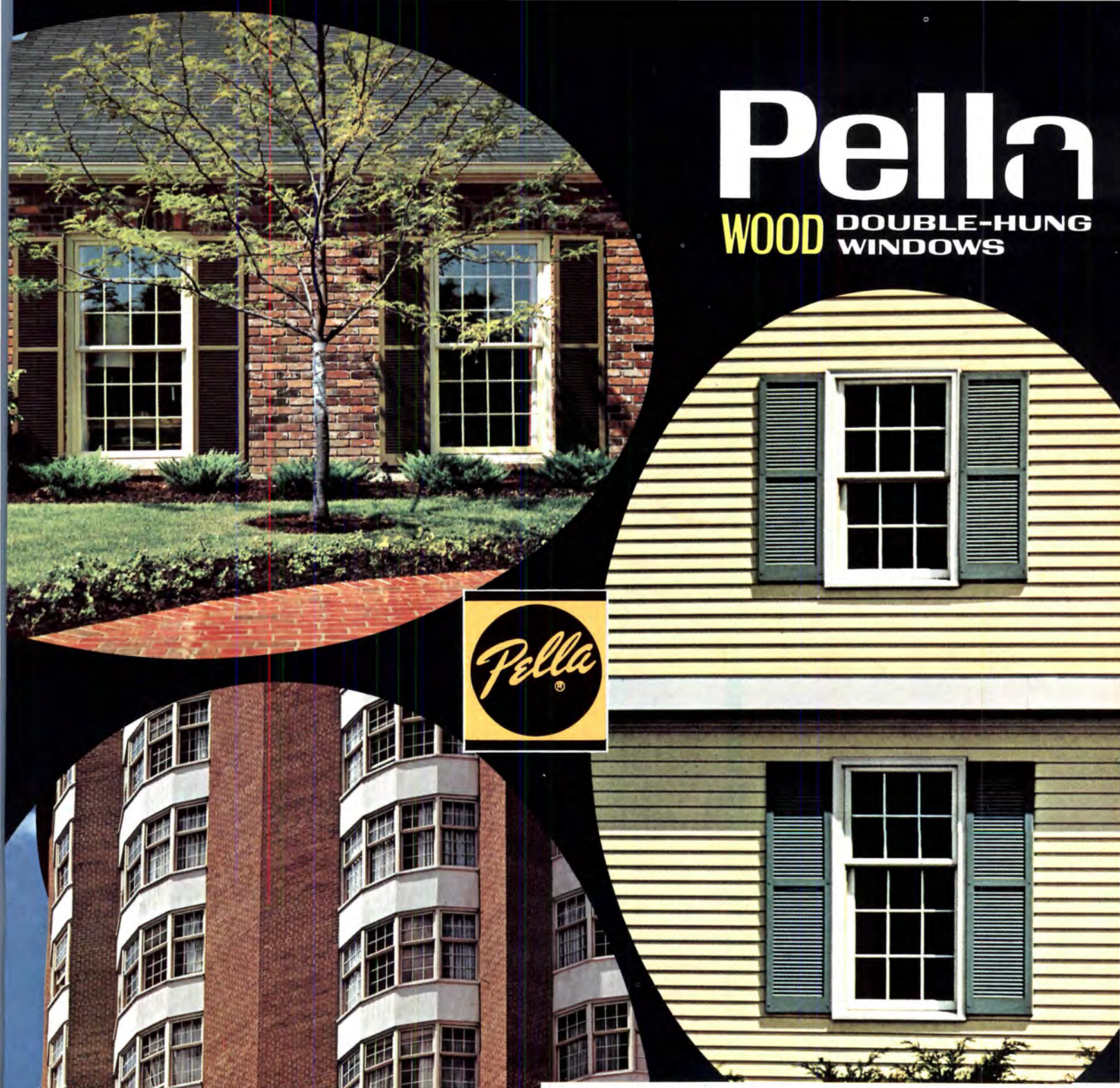

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ROLSCREEN COMPANY, PELLA, IOWA

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YES, via first class mail, rush me more color photos and information about the following PELLA products:

- ☐ PELLA Wood Double-Hung Windows
- ☐ PELLA Wood Casement Windows
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- ☐ PELLA Wood Folding Doors and Partitions
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CITY STATE ZIP (if known)

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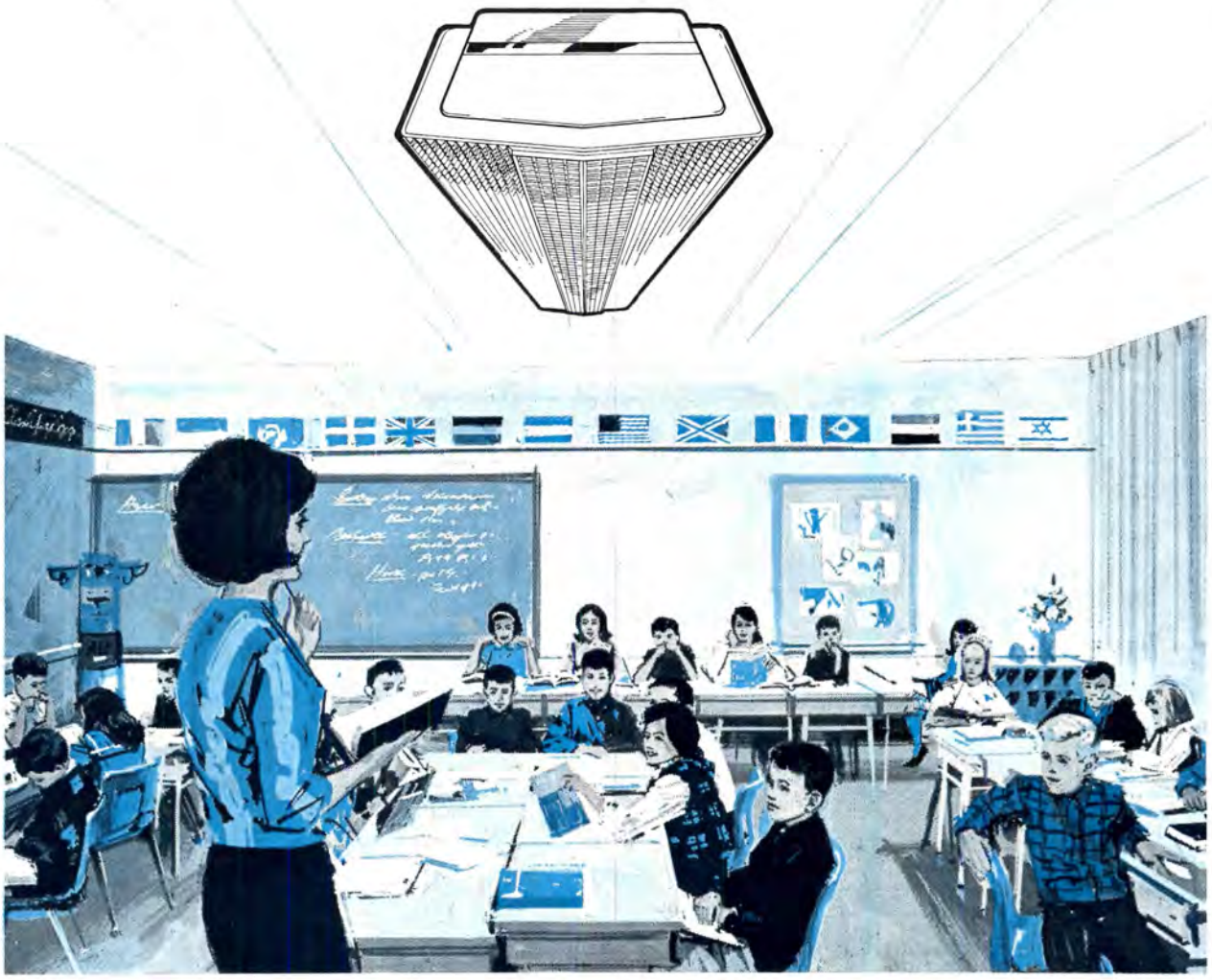
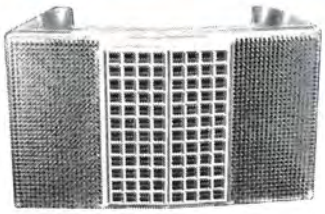




We punched holes in refractor design and increased efficiency 10%

Why argue with success? Our standard Photometric luminaire has been a top choice for school and commercial applications for some time. But we like punching holes in accepted standards—even our own. And in this case we punched 768 little square holes the length of our lens to make the first vented wrap around plastic refractor in the industry. Now air circulates freely throughout the unit, decreasing operating temperature, lengthening ballast life, and increasing efficiency almost 10 percent. The Vented Photometric is available with styrene or acrylic injection-molded refractors with the same strength as our popular solid Photometric units. 2-lamp 4-ft. and 2-lamp 8-ft. tandem fixtures are available. And they feature the same easy lift-slide-remove features with no latches or catches. Ask your Wakefield man or write for literature on the Vented Photometric . . . the only unit better than the Photometric. Wakefield Lighting Division, P. O. Box 195, Vermilion, Ohio 44089. ITT Wakefield Corporation, a subsidiary of International Telephone and Telegraph Corporation.

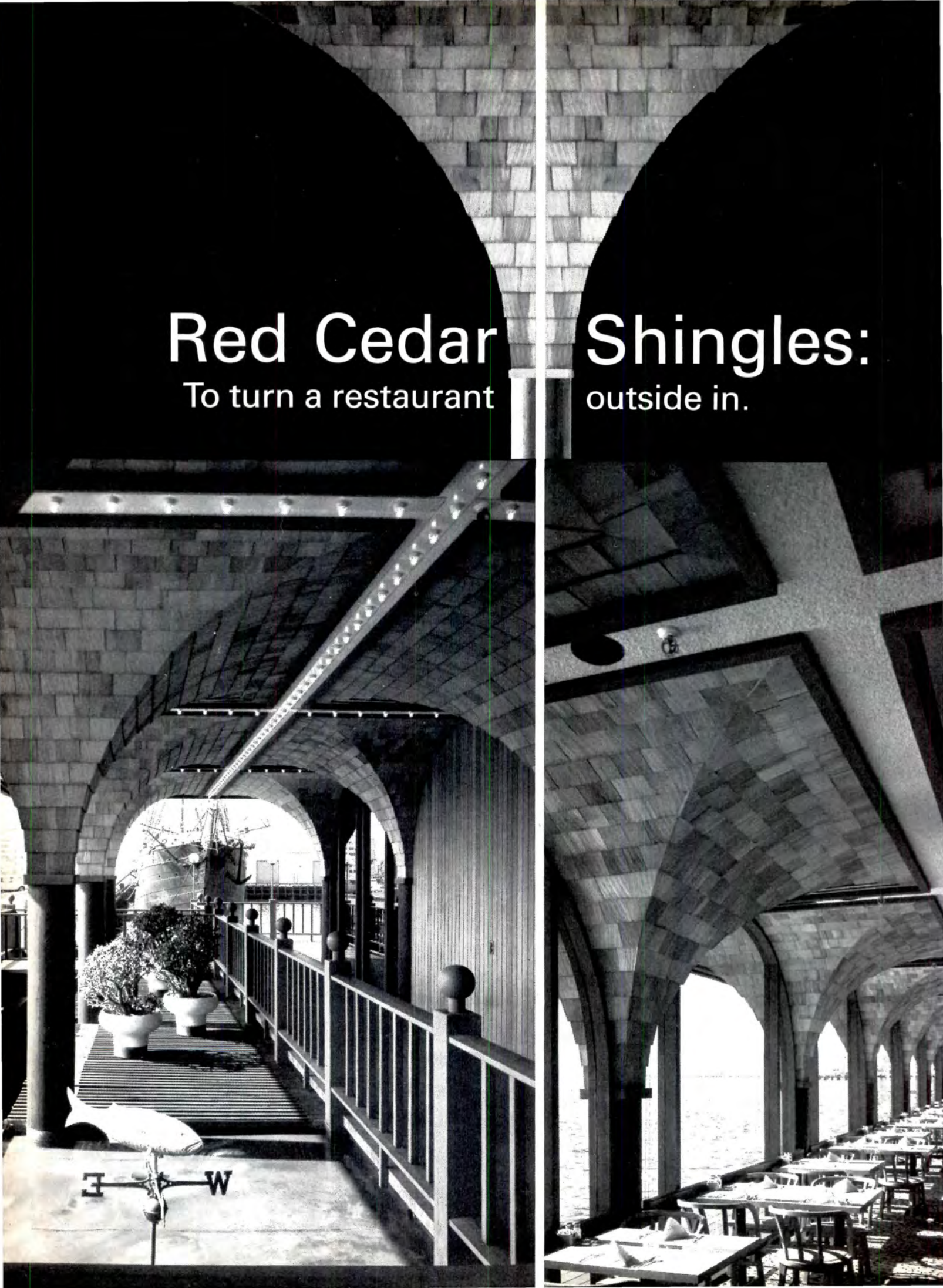
✓ another
NEW LOOK IN LIGHT
product

Wakefield Lighting **ITT**

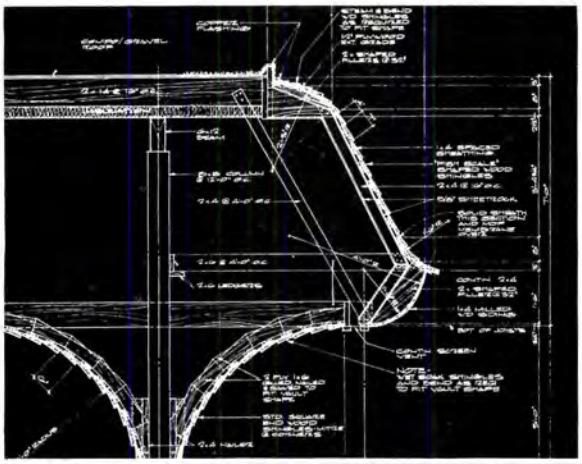
in Canada, Wakefield Lighting Ltd., London, Ontario

For more data, circle 93 on inquiry card

For more data, circle 92 on inquiry card


Red Cedar Shingles:
To turn a restaurant outside in.
E
W

The versatility of red cedar shingles is apparent in this tasteful approach to the grotto motif. The same shingles that face the weather, slip unobtrusively inside to lend warmth, flair and refinement to the vault forms. Even the fancy-butt "fish scale" shingles on the mansard roof reappear inside—as a space divider. In a variety of ways—ranging from durability to livability to design flexibility—red cedar shingles have something to offer the architect. For more information on Certigrade shingles and fancy-butt shingles (as well as Certi-Split handsplit shakes) just give us a call, or write. *The specification of* Certigrade *for red cedar shingles and* Certi-Split *for red cedar handsplit shakes gives both architect and client the protection of Bureau-enforced product grade supervision.*



RED CEDAR SHINGLE & HANDSPLIT SHAKE BUREAU
5510 White Bldg., Seattle, Washington 98101.
(In Canada: 1477 West Pender St., Vancouver 5, B.C.)

Restaurant, San Diego, California
Architects: Frederick Liebhardt and Eugene Weston III. Certigrade Shingles, #1 Grade, 16" Fivex with 5" to the weather. Mansard roof: Certigrade Rebutted-Rejointed Shingles specially sawed to "fish scale" design.

THE CROWNING TOUCH OF QUALITY • RED CEDAR SHINGLES & HANDSPLIT SHAKES •

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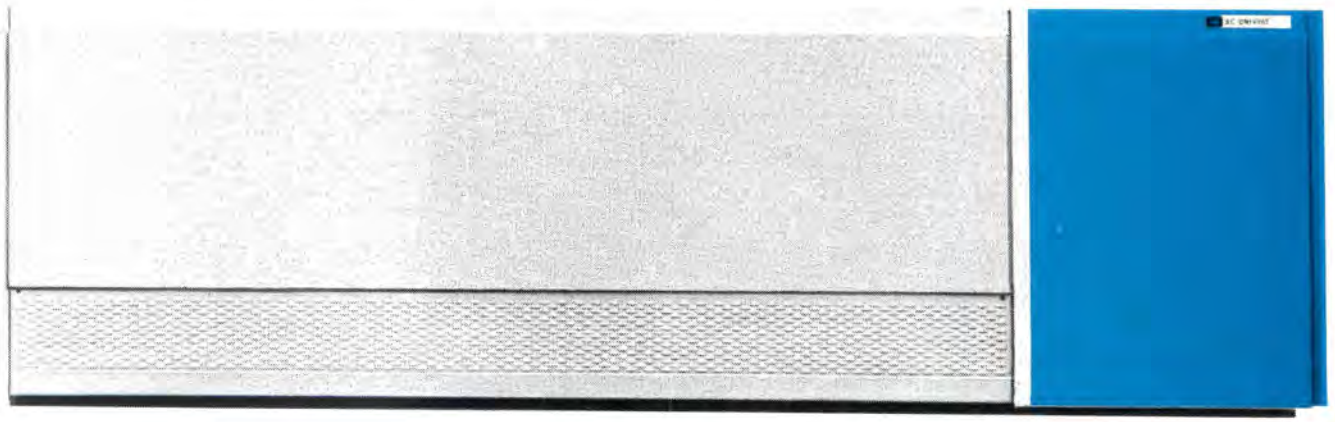
UNIT VENTILATORS

with self-contained refrigeration ...heat, ventilate, cool. Use them to remodel a single room or an entire central system.

The SC (self-contained) UNIvent is the most versatile, through-the-wall unit ventilator ever designed. It lets you air condition an entire new building or older ones one room at a time. Or the SC UNIvent can be installed first for heating and ventilating only. Then sealed refrigeration section can be added when budgets permit. Cooling capacity is 45,000 BTU/hr. Up to 100% outdoor air for natural ventilation cooling is provided for low operating costs. All motors and bearings are permanently lubricated and sealed—only maintenance necessary is periodic replacement of air filter. Award-winning design includes variety of four base colors, decorator panels in choice of six modern colors and full line of versatile classroom storage accessories.

Choose from seven fully automatic SC UNIvent models, including units for steam, hot water and electric resistance heating. The SC UNIvent readily fits supply piping from existing heating systems. Write for all the facts. American Air Filter Company, Inc., 215 Central Avenue, Louisville, Kentucky 40208.



AAF Herman Nelson
SCHOOL PRODUCTS DIVISION

For more data, circle 95 on inquiry card

continued from page 184

SOUND-RESISTANT GLASS / New fabricating methods have produced a laminated safety glass that has the highest sound-resistance rating of any single-glazed architectural glass, according to the manufacturers. The glass, which has an STC rating of 43, can be manufactured in clear or tinted heat- and glare-reducing form, in textures, or in grey or bronze transparent colors. ▪ Amerada Glass Corp., Elk Grove Village, Ill.

Circle 308 on inquiry card

SPRAY-ON INSULATION / *K-13* has a UL flame spread rating of 20, fuel contribution of 10, and smoke development of 0 and is thus rated as non-combustible. It has a thermal conductivity K factor of .126563. The insulation is applied by means of a specially designed nozzle which applies both the fibrous material and liquid adhesive simultaneously in separate streams. *K-13* adheres to any surface, and has been found to have good sound absorption qualities. ▪ National Cellulose Corporation, Houston.

Circle 309 on inquiry card

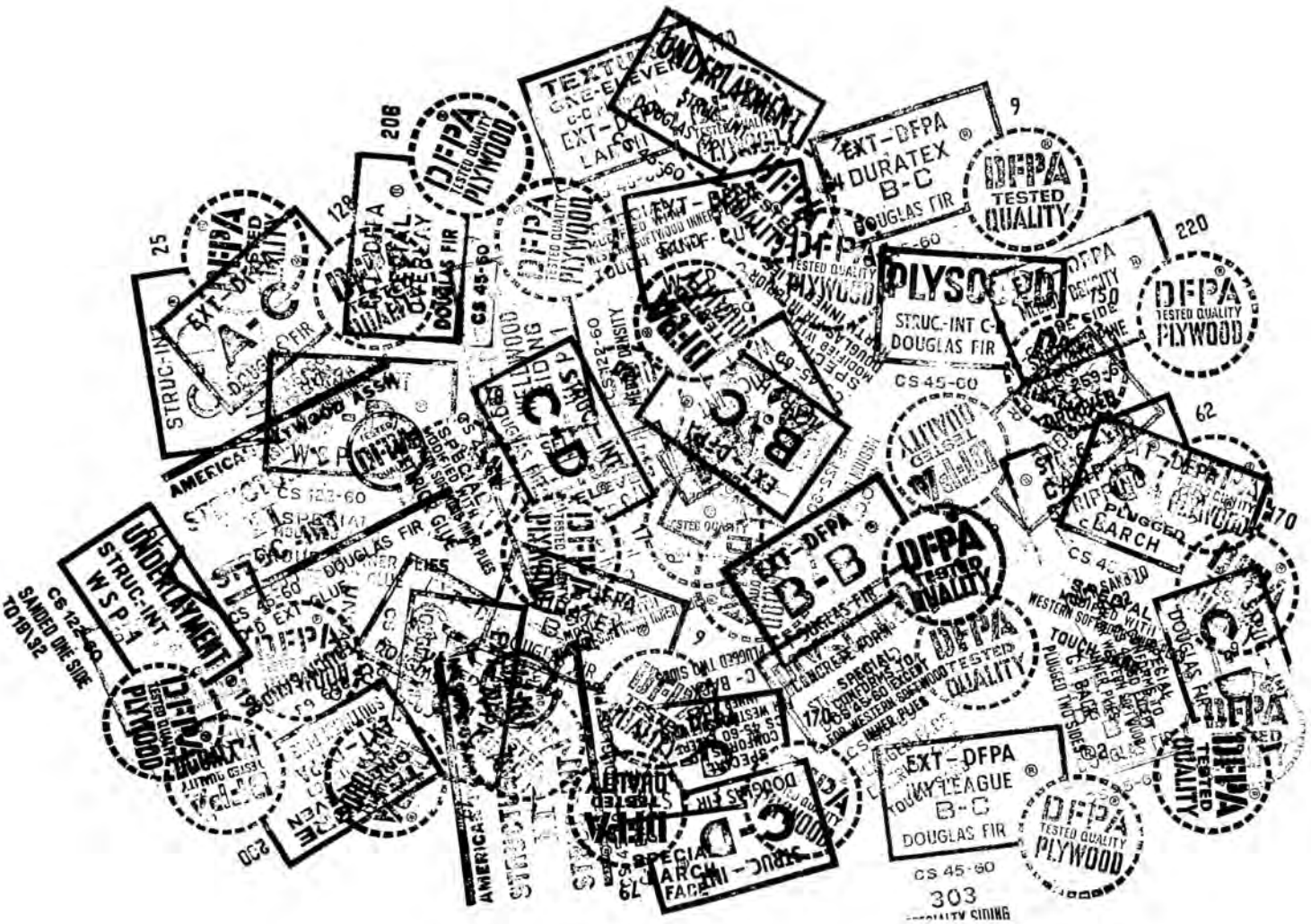
ELECTRIC BOILER / The completely packaged *Electra* for hydronic heating systems weighs under 90 pounds and occupies less than three cubic ft of space. This compact design permits wall-hung installation. The unit is available in four output sizes ranging from 34,000 to 82,000 Btu/hr. ▪ American-Standard, New York City.

Circle 310 on inquiry card

more products on page 209

For more data, circle 96 on inquiry card

P.ywood has grown ~o fast it takes a Philadelphia lawyer to understand all the grades, types and species.

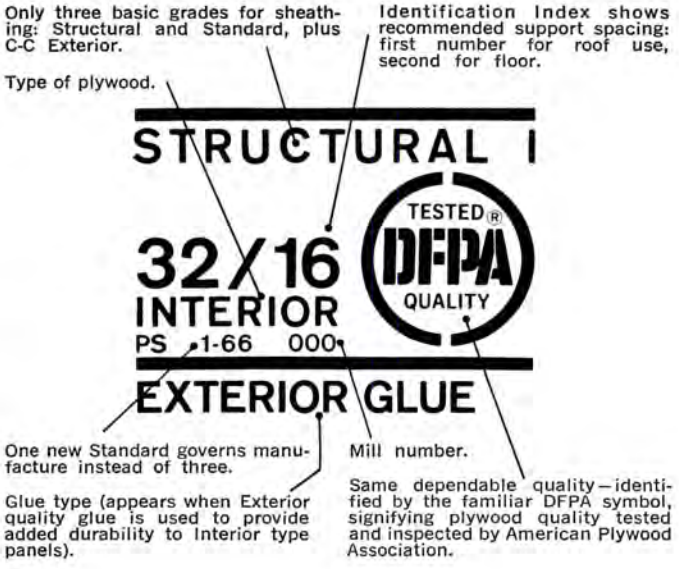


All tha_'s be_n_ cha_ _ged with a new system so simple that your mother-in-law can understand it.

The new consolidated Product Standard, PS 1-66, places the emphasis where it belongs: on plywood's end-use, rather than on its species.

The new system makes it easier for you to specify plywood. Grades are simpler. Panel markings are more informative. Building inspectors, architects and engineers can tell by glancing at the grade-trademark if the right panel is being used. Recommended support spacings are shown right on the stamp. (See example at right.)

The consolidated Standard is simple, but you'll still need new grade charts and some explanation of the new terms. We've prepared five key booklets that tell the whole story. Send the coupon today. Or contact us in Tacoma or any regional office: Atlanta, Chicago, Dallas, Detroit, Los Angeles, Minneapolis, New York, San Francisco, Washington, D. C.



AMERICAN PLYWOOD ASSOCIATION

American Plywood Association
Tacoma, Washington 98401, Dept. AR

TESTED DFPA QUALITY

Please send me free copies of the following:

- ☐ How to Buy and Specify Plywood under new Product Standard PS 1-66.
- ☐ Guide to Plywood Grades (Condensed grade-use handbook.)
- ☐ Plywood Construction Guide (For residential building.)
- ☐ Guide to Plywood Concrete Forms (Span tables for use under PS 1-66.)
- ☐ Plywood Design Specifications (Design reference for new Standard — working stresses, load factors, etc.)

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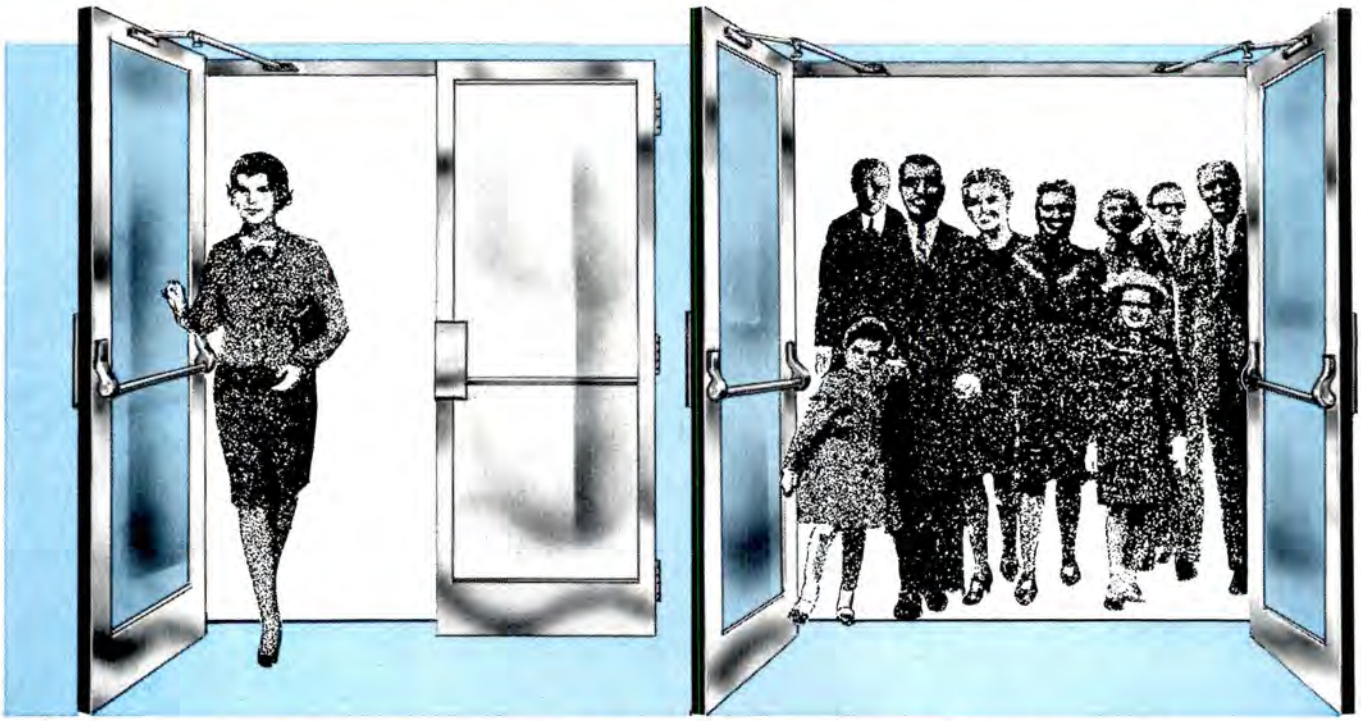
TO HOLD OPEN OR NOT TO HOLD OPEN

that is the question—easily answered with

GJ OVERHEAD DOOR STOPS and HOLDERS

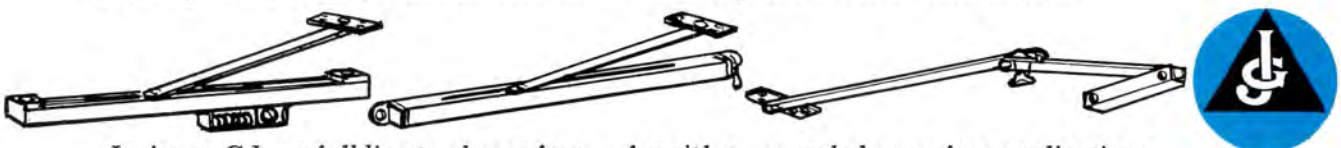


quickly adjustable for ONE...OR A CROWD

There are times when the door should be allowed to close after each opening . . . when occasional traffic is passing through.

Then, again . . . say at dismissal time . . . you'll want the door to stay open until a crowd passing through has diminished . . . to ease the wear and tear on the door and other hardware.

GJ overhead door stops and holders are quickly adjustable for every situation . . . for one person or a crowd . . . with just a flip of a lever or turn button.



Insist on GJ—a full line to choose from—for either concealed or surface applications.

GLYNN-JOHNSON CORPORATION 4422 North Ravenswood / Chicago, Illinois 60640

For more data, circle 97 on inquiry card

continued from page 205

SEAMLESS FLOORS / Designed especially for institutional and commercial-industrial construction, this non-porous flooring requires neither waxing nor buffing. There are no separations where dirt and germs can collect or where traffic damage can begin. The flooring is reported to have excellent sound-dampening qualities, is resilient and has a non-slip nature. ▪ Sonneborn Building Products, Inc., Des Plaines, Ill.

Circle 311 on inquiry card

DANISH CHAIR / This huge, black oxhide lounge chair with down seat cushion and the matching ottoman have been designed by Arne Jacobsen. Both are also available in fabric or vinelle. The swivel base is aluminum. ▪ Fritz Hansen, Inc., New York City.

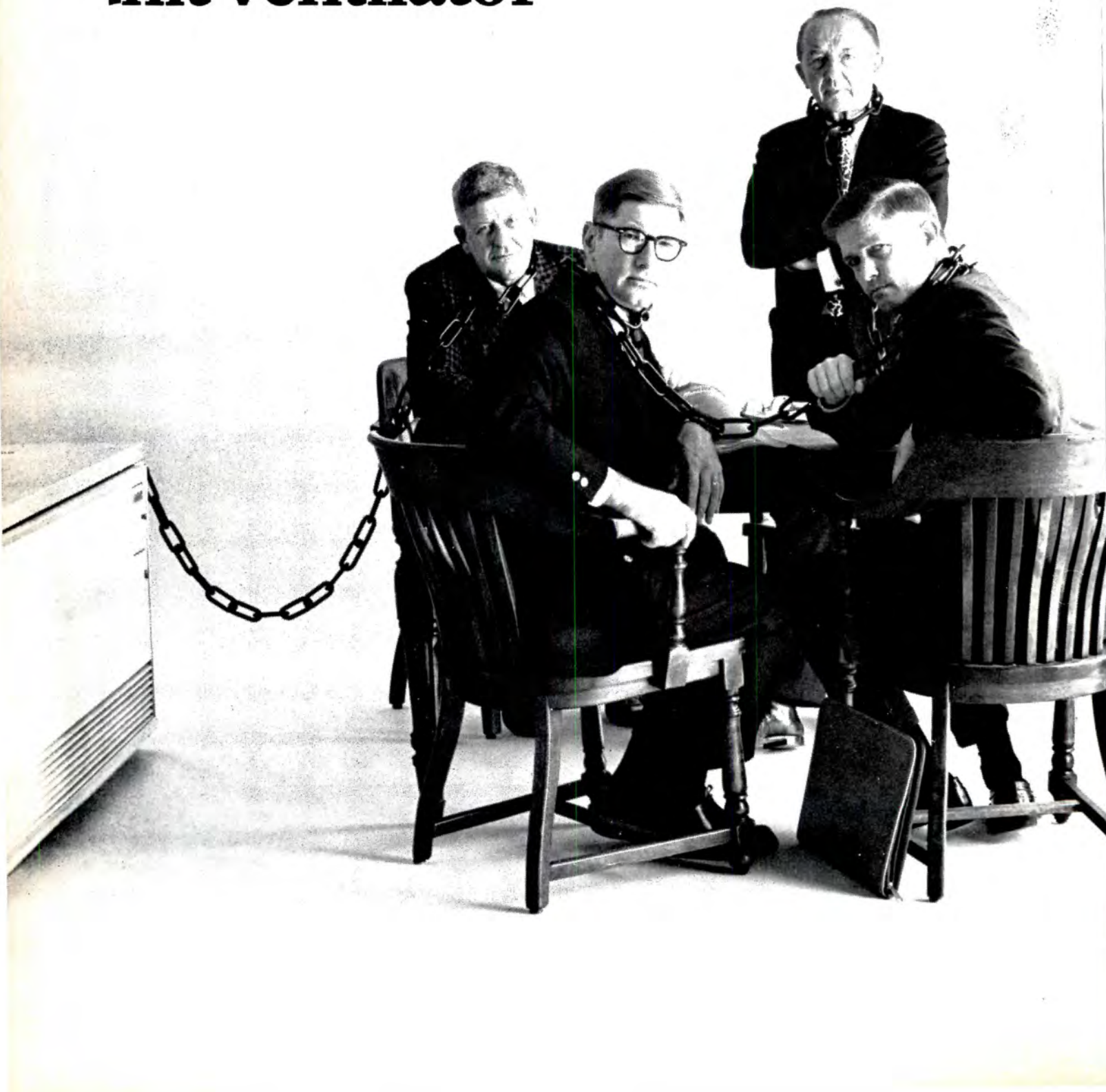
Circle 312 on inquiry card

OFFICE FURNITURE / This *Work Organizer*, an L-shaped desk system, combines a table supported on one side by polished chrome H legs, and on the other by a two-tier storage cabinet—43 in. high, 80 in. long, 18½ in. deep. The cabinet has horizontal and vertical open compartments, file drawers, pull-out writing surfaces, an off-the-desk built-in panel telephone, space for a dictating machine on a sliding shelf, and a concealed waste basket. ▪ Herman Miller Inc., Zeeland, Mich.

Circle 313 on inquiry card

more products on page 212

Don't chain school planners to an inflexible, immobile unit ventilator



Select the totally flexible Lennox DMS Heating-Cooling-Ventilating System

Many new schools are obsolete the day they open! Why? Because the planners became locked into inflexible mechanical and structural systems.

For example, unit ventilators. They require permanent walls, and permanent connections to a hot or chilled water supply. They occupy space within the classrooms. And the boilers and water chillers involved occupy costly space within the building.

The answer: The Lennox Direct Multizone System that requires no floor space, and no permanent walls, and no "boiler" room.

Because its overhead ducts are flexible, outlets can be moved at will. Therefore, walls can be moved, or added or eliminated. And buildings can be added to (you simply put additional DMS units on the roof).

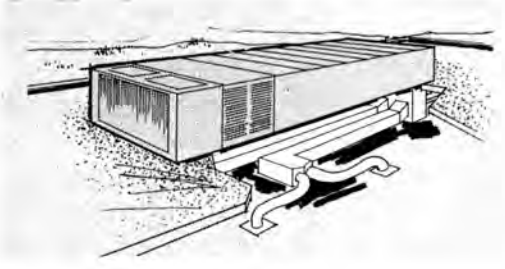
Each Lennox DMS provides room by room thermal control (up to 12 zones per unit). Each responds instantly to changes in weather, occupancy, or activity.

In fact, a DMS unit can provide 100% outside air if required. It can cool free, with outside air, any time temperatures are below 57°F. Mechanical cooling can be installed originally or added any time.

Gas, hot water or electricity can supply the heat.

A low (42″) silhouette, and wide choice of outlet designs, impose virtually no architectural limitations.

The Lennox DMS provides the ideal learning climate, both thermally, and in terms of spatial flexibility. For information, see Sweet's—or write Lennox Industries Inc., 101 S. 12th Avenue, Marshalltown, Iowa.



LENNOX®
AIR CONDITIONING • HEATING

For more data, circle 100 on inquiry card

continued from page 209

SHUTTERS / *X-act Wood-Mold Shutters,* resembling wood shutters, are made of lightweight, damage-resistant polymer. Box-frame construction (shown in cutaway) eliminates bending, buckling, or twisting. No seams or rivets show. ▪ H C Products Co., Princeville, Ill.

Circle 314 on inquiry card

LIGHTING / This luminous opal wall bracket has been designed for washrooms, entrance ways, corridors and stairways. It fits flush against the wall with no metal bracket exposed. ▪ Art Metal Lighting Division, ITT Wakefield Corporation, Cleveland, Ohio.

Circle 315 on inquiry card

AIR CURTAIN DOOR / *Clearway Entrance* automatically dampens its high-speed barrier to a low, comfortable flow when someone enters. This, say the manufacturers, permits an effective barrier against cold air and a psychologically appealing open door without the usual discomfort of a high velocity fan. ▪ ILG Industries, Inc., Chicago.

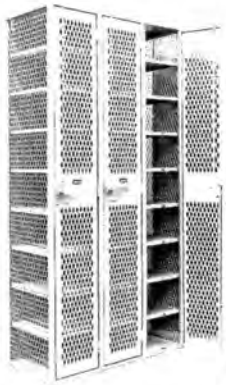
Circle 316 on inquiry card

CLASSROOM TABLE / This pedestal table, suitable for riser or single floor use, is constructed of metal, plastic and wood. Size and placement of legs are flexible. ▪ Irwin Seating Company, Grand Rapids, Mich.

Circle 317 on inquiry card

WATER-BASED PAINT SYSTEM / Acrylic latex finishes are water-based semi-gloss paints for high humidity areas such as kitchens, bathrooms and locker rooms; for high traffic spaces; and for dados, baseboards, moldings and doors. The enamel is reported to dry rapidly, have no odor and have little tendency to yellow, crack or peel. ▪ Rohm and Haas Company, Philadelphia.

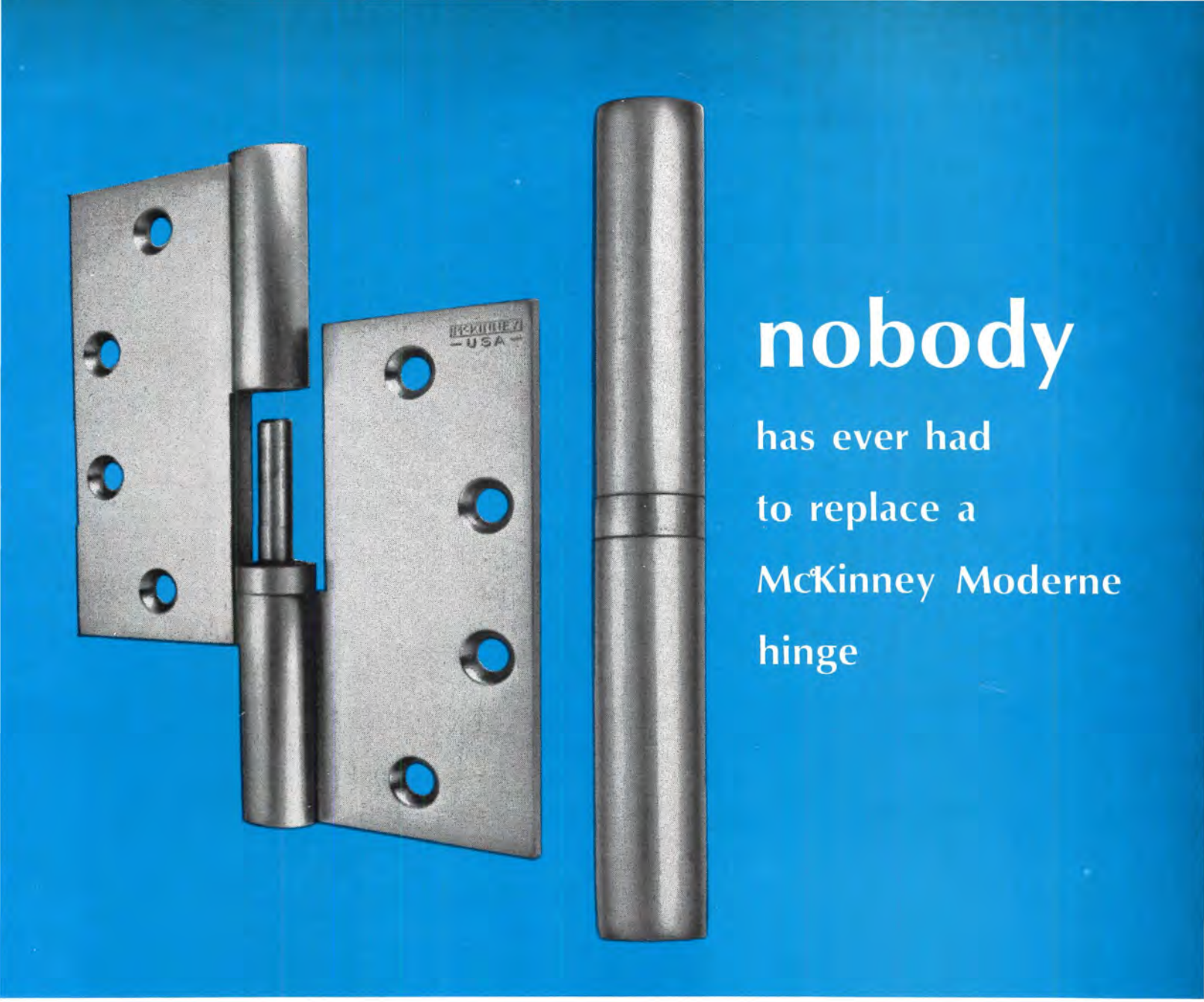
Circle 318 on inquiry card



GYM FURNITURE / A multiple locker unit has been designed for grade school pupils, who cannot be depended upon to carry a key or remember a combination. The unit is equipped with three full-length doors which conceal 27 cubicles. The doors are arranged for pad-locking or combination key control latches for the convenience of the teacher or custodian. Each shelf, door, and side is fully ventilated and each shelf is equipped with an identification number plate. ▪ Superior Wire and Iron Products, Harvey, Ill.

Circle 319 on inquiry card

more products on page 215



nobody

has ever had to replace a McKinney Moderne hinge

Six years ago, McKinney introduced the first really, different hinge the industry had seen in years, the McKINNEY MODERNE.

First of all, the McKINNEY MODERNE is architecturally beautiful. Straight, simple lines. Clean in appearance.

Secondly, McKINNEY MODERNE is designed for quiet, heavy duty service with one dependable stainless steel oil-impregnated bearing. And third, McKINNEY MODERNE integrated stainless steel pin means easier, labor saving installation. No pins to insert or lose. No difficulty lining up the door.

BUT DOES IT WORK? This question has been fully answered. There is no more dependable hinge, no better looking hinge, no better operating hinge on the market than McKINNEY MODERNE.

Thousands are in use right now. On the doors of the Astrodome in Houston, the GE Space Center in Valley Forge, the Amsterdam, N. Y. Memorial Hospital, the Toronto City Hall, the United States National Bank Building in San Diego and hundreds of other new buildings.

In actual tests, McKINNEY MODERNE extra heavy hinges showed less vertical wear than three competitive makes of 4-bearing hinges.

Since it has been introduced, NOBODY HAS EVER HAD TO REPLACE A McKINNEY MODERNE HINGE.

And quite probably, nobody ever will.

Available in all types, finishes and materials.

Full Mortise • Full Surface • Half Mortise • Half Surface • Hospital Tip Hinges (all types) • Full Mortise Swing-Clear • Full Surface Swing-Clear • Half Mortise Swing-Clear • Half Surface Swing-Clear
(Swing-Clear hinges extra heavy only)

McKinney
McKinney Sales Company, Scranton, Pennsylvania 18505

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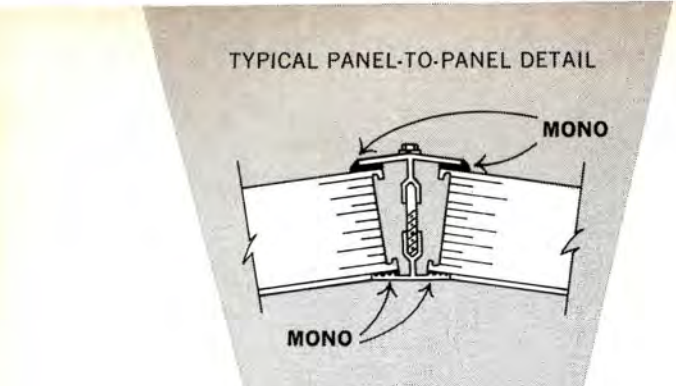
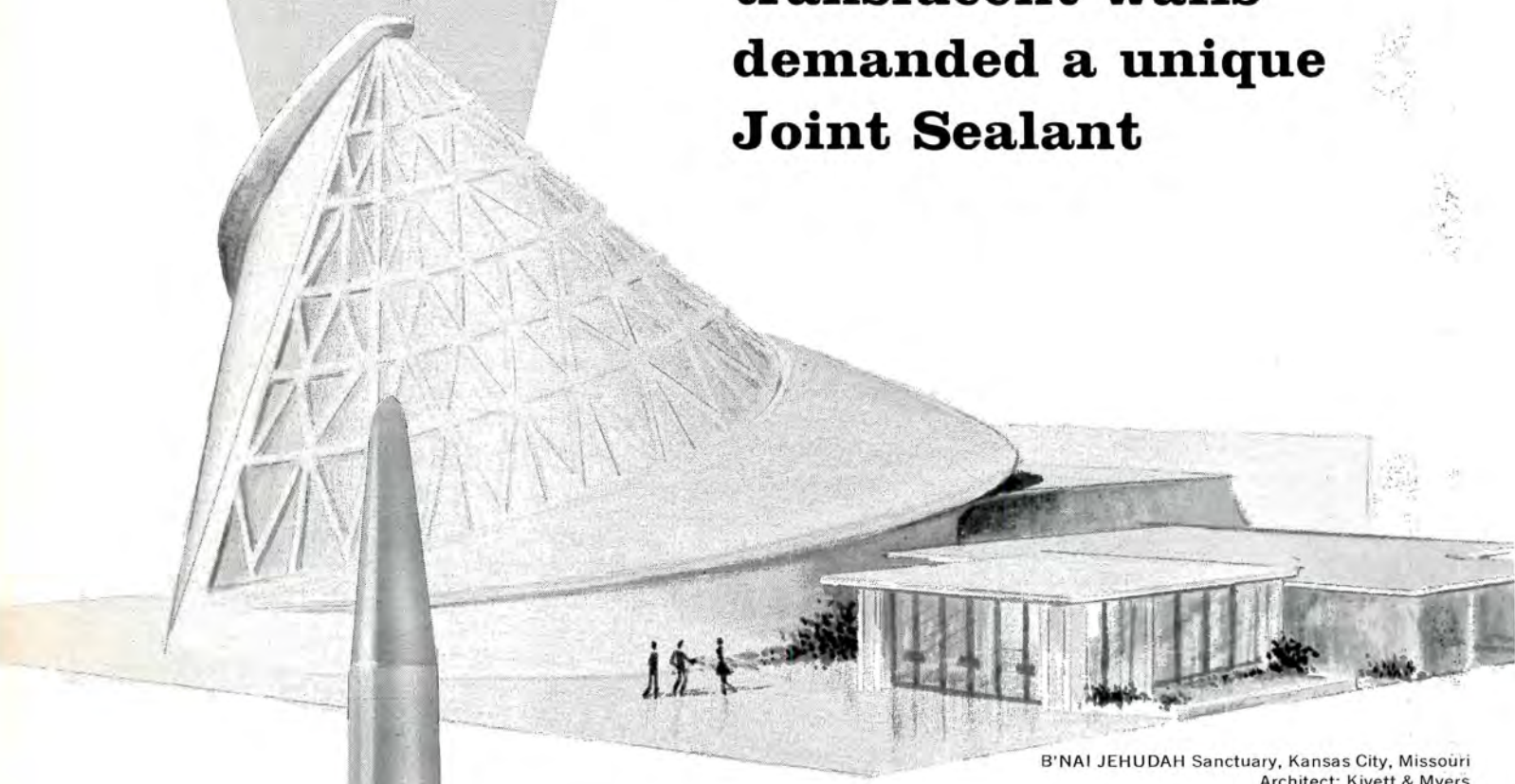


Exciting KALWALL® translucent walls demanded a unique Joint Sealant



B'NAI JEHUDAH Sanctuary, Kansas City, Missouri
Architect: Kivett & Myers

MONO proved best

The unusual roof of this building is enclosed with some 250 KALWALL translucent sandwich panels hung below a super-structure of steel. The KALWALL spreads soft, shadowless light throughout the interior of this sanctuary even on cloudy days. At night, with the interior illuminated, this building glows like an iridescent jewel. KALWALL roof and wall systems feature the KALWALL panel, a lightweight, structurally strong, shatterproof, insulating light transmitting sandwich panel.

To assure optimum security at minimum cost, KALWALL relied on MONO to provide weather-tight, leak-proof joints despite normal building movement.

Check SWEET'S for data on KALWALL or MONO

TREMCO
PRODUCTS AND TECHNICAL SERVICES FOR BUILDING MAINTENANCE & CONSTRUCTION

For more data, circle 103 on inquiry card

THE TREMCO MANUFACTURING COMPANY / CLEVELAND • TORONTO

continued from page 212

AUTOMATIC DOOR OPERATORS / *Tormax* is a complete line of precision electro-hydraulic door operators available in a range of sizes to suit a variety of swinging or sliding doors. One compact unit contains all the equipment—no hydraulic connections or separate power units are required. ▪ Holm's Automatic Door Unit Company, London, Ontario.

Circle 320 on inquiry card

TILE / *CrystaLace* (floor and counter in photo) is a crystal glazed ceramic tile. The finish is a satin smooth base spattered with a clear overglaze. The non-porous tile is available in squares, octagons and hexagons. ▪ Wenczel Tile Company, Trenton, N.J.

Circle 321 on inquiry card

GRID SYSTEM / Acoustical ceiling installations have module, depth and profile flexibility with the *3D Iso-Matic Grid System*. The system uses the same standard-size acoustical panels, air diffusers and lighting fixtures as with ordinary suspended ceiling installations. In the photo, a 14-ft ceiling became one with improved lighting and lower noise level. ▪ Chicago Metallic Corporation.

Circle 322 on inquiry card

CLEAR DOOR / The *Securit* interior door is made of ⅜-in.-thick polished plate glass, tempered for strength and safety. The door is available in three standard sizes for both wood and metal frames. Contemporary-styled hinges and lock housing in either dull bronze or satin chrome finish are supplied. The lock housing receives standard 2⅛-in. bore cylindrical locks with 2¾-in. backset. Closer mounting plates are available for standard closers. ▪ American Saint Gobain Corporation, Kingsport, Tenn.

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Coming in mid-May...

RECORD HOUSES OF 1967

Featuring...

The 20 Houses of the Year

5

A year in preparation, RECORD HOUSES OF 1967 will present the work of a wide variety of architects ranging from the well-known to talented unknown architects new to the ranks of major innovators. The houses will win for their architects and owners Architectural Record's coveted **Annual Award of Excellence for House Design.** All 20 award-winning houses are fully detailed with photographs (many in full color), plans and schematics. This highly visual presentation of each house, coupled with a clear statement of the problems and purposes behind its planning, will make RECORD HOUSES OF 1967 an ideal tool for opening your client's eyes to ways in which architecture can serve their individual needs, aspirations and way of life.

RECORD HOUSES OF 1967 comes to you as part of your subscription to Architectural Record. And again in 1967, RECORD HOUSES will be distributed to the nation's 23,000 foremost builders to accelerate the healthy trend toward greater architect-builder collaboration on tract housing. The house building and buying public will find it on sale at leading book stores.

FROM RECORD HOUSES OF 1966

1 Private Residence in New Canaan, Connecticut. Architects: Ulrich Franzen & Associates. Photo by Robert Damora
2 Private Residence, Martha's Vineyard Island, Massachusetts. Architect: Hugh Newell Jacobsen. Photo by Robert Lautman
3 Schramm Residence, Burlington, Iowa. Architects: George Fred Keck–William Keck. Photo by Hedrich-Blessing
4 Bassett Residence, Nassau Bay, Texas. Architect: Clovis B. Heimsath. Photo by Robert Murray
5 Same as 1

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For ne construction or remodeling...

ACOUSTI-CLAD*

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the only ceiling tile offering bacteriostatic sound control.

Now, for the first time, a single ceiling tile provides both peace and quiet *and* control of bacteria.

Acousti-Clad brings together the advantages of a sanitary aluminum facing with a bacteriostatic sound-control core. The result is a hygienic ceiling which won't support the spread or survival of pathogenic micro-organisms.

Acousti-Clad provides a ceiling compatible with modern room-sterilizing techniques as chemical "fogging"; or may be swabbed clean with ordinary hospital germicides.

Johns-Manville Acousti-Clad has been specified in hospitals most advanced in sterile procedure.

Independent laboratory tests confirm that it does not support the growth of dangerous bacteria.

J-M Acousti-Clad is exceptional in other ways as well. In installation advantages, ready to go, right out of the carton; in appearance, it offers a choice of three patterns; in moisture and fire-resistance it is rated by Underwriters' Laboratories, Inc.; in accessibility it provides easy access to utilities in overhead plenum areas.

Ideal for either new construction or remodeling, Acousti-Clad is factory fabricated; saves your hospital money on original cost, installation costs, long-term maintenance costs.

For all the data, write to Johns-Manville, Dept. HB-5, 22 E. 40th St., N. Y., N. Y. 10016. Cable address: Johnmanvil.

JM

Johns-Manville

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For more data, circle 115 on inquiry card

New design freedom
in the Open World of L·O·F glass

Derthick & Henley design a College Library to help students see the light

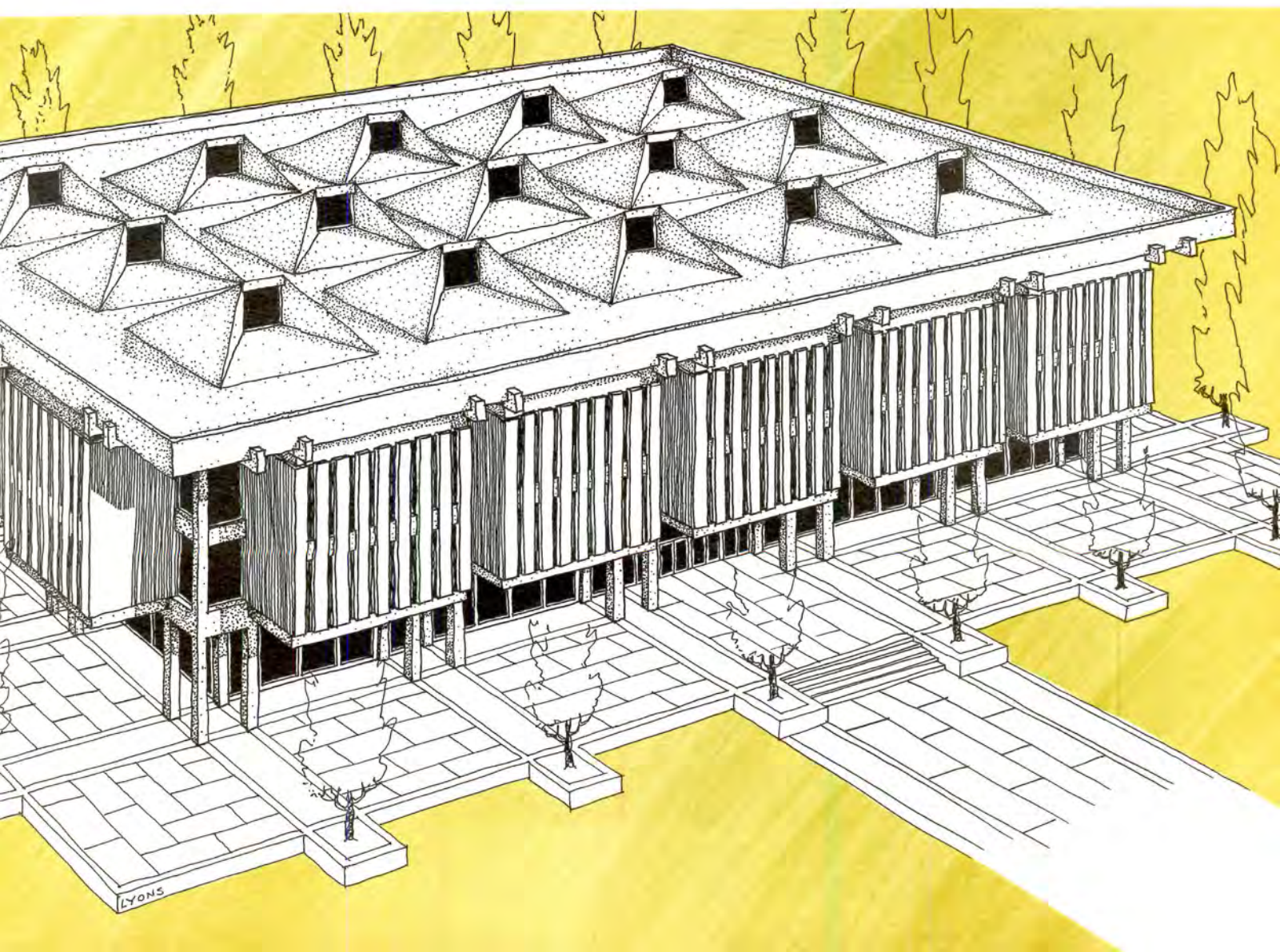
Every corridor looks out through glass to a vista of the campus.

Each structural bay has a hooded, polished wired-glass skylight oriented toward the north for controlled interior lighting. Shafts permit the daylight to penetrate through the floors to ground level.

Study carrels, faculty offices, and graduate study spaces are located around the perimeter of the upper two floors. The cantilevered carrels are sheathed in lava-bronze *Vitrolux*® spandrel glass banked by vertical vision strips of bronze-tinted *Thermopane*® insulating glass. Carrels are divided from each other with translucent Rough Plate glass or Patterned glass, and enclosed with *Tuf-flex*® glass doors and sidelights.

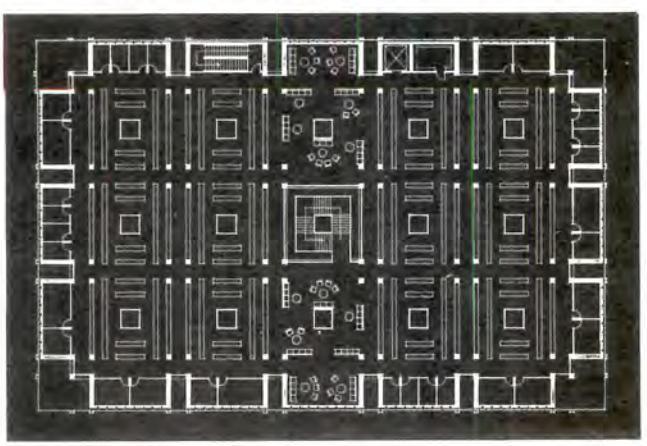
The building is designed on a 3'-0" module to provide flexibility in interior arrangement of stacks and reading areas. It can be expanded to either side—an important consideration for any college library.

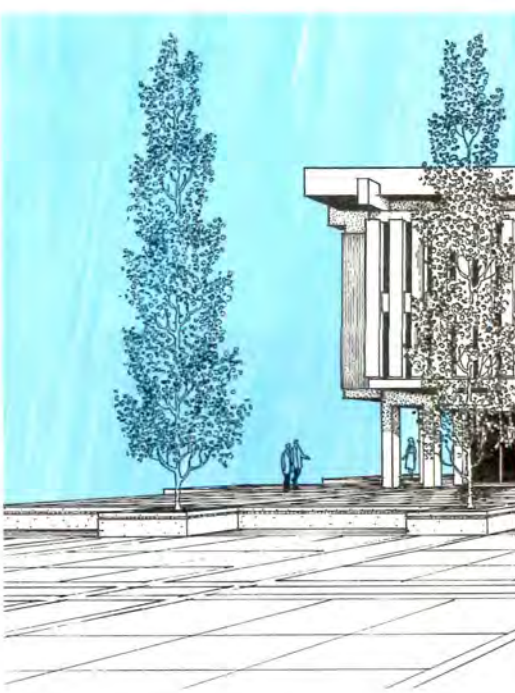
L·O·F commissioned Derthick & Henley, of Chattanooga, Tenn., to show how functionally glass can be used in library design. As you see by the drawings they met the challenge in a practical way.

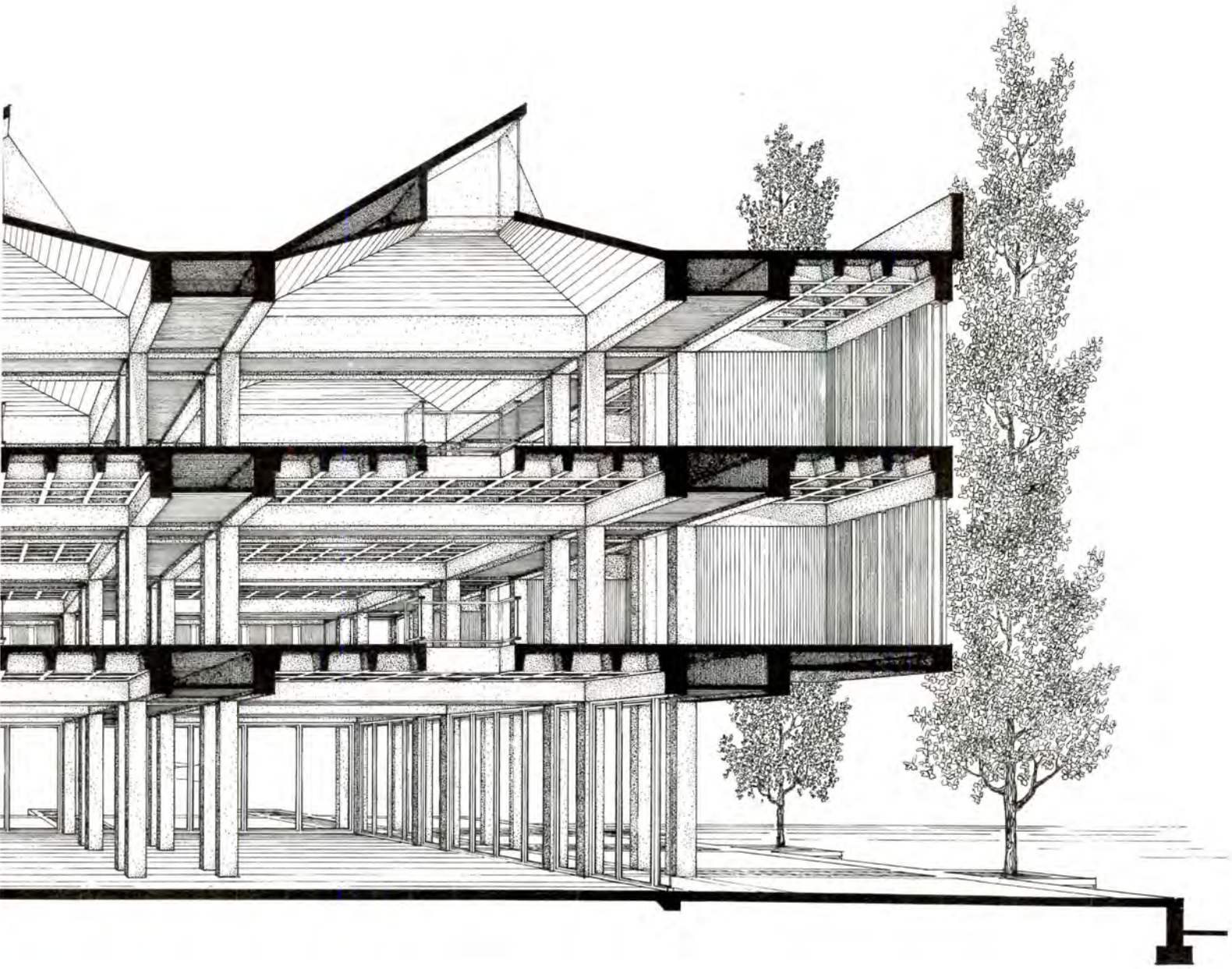


Areas on first floor: Reference; Reserve Book; Circulation; Periodical Room; Reading; Technical Processing; Catalog. Areas on upper floors: Stacks and Reading. Service areas in basement.

Double column arrangement sets up strong circulation patterns. Vistas of campus can be seen in all directions. Mechanical circulation handled between double column rows over circulation areas.







Large units of *Thermopane* insulating glass made of *Parallel-O-Bronze®* are placed at ends of all corridors. Glass-enclosed carrels and hooded skylight are also shown.

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Saratoga Performing Arts Center

Steel bridges reach over the lawn to the balcony so ticket-holders don't have to pick their way through orchestra and lawn crowds.

This summertime center for ballet and music made its debut last year as the home of the New York City Ballet (George Balanchine, Director) in July, and The Philadelphia Orchestra (Eugene Ormandy, Music Director) in August.

Situated on a 150,000 sq ft wooded plot at Saratoga Springs, N.Y., the Center has two main structural elements. First is the steel-framed, fan-shaped amphitheater which seats 5,100 people under roof. The steel frame was designed so that there is an unobstructed view of the stage from every seat. Six steel trusses, each 126 ft long, span out from the steel proscenium girder (82 ft x 10 ft) to form a pleated roof, specially designed to blend acoustical properties with the visual requirements.

The second structural element is the towering stagehouse, 100 ft high, 102 ft wide, and big enough to accommodate 104 separate sets of scenery. The stagehouse is heavily framed and braced with steel to satisfy all load requirements.

The Saratoga Performing Arts Center was designed by the architectural and engineering firm of Vollmer Associates. Structural steel was fabricated and erected by James McKinney & Son. General contractor: L. A. Swyer, Co., Inc. Bethlehem supplied the structural steel.

BETHLEHEM STEEL CORPORATION, BETHLEHEM, PA.

BETHLEHEM STEEL

BETHLEHEM STEEL

The sloping lawn provides room for about 7,000 people who can both hear and see the performances.

The pleated roof is supported by 126-ft-long trusses, ranging from 16 to 25 ft in depth. Major acoustical element is a steel-framed canopy 100 ft wide and about 50 ft long, cantilevered 50 ft over the audience.

University and community will share gymnasium

The new gymnasium for Columbia University, which will be located in Morningside Park, New York City, will provide on its two lower levels separate facilities for neighborhood residents. Provided for the community will be a two-story, 80- by 100-foot gymnasium and other facilities. New York City park officials have argued that this community space is not large enough, considering that public land is used. The university will have a gymnasium 128- by 158-feet, three stories in height, which will seat, 3,000, and other facilities. Architects are Eggers & Higgins.

Vermont pavilion at EXPO '67 symbolizes Green Mountains

Soaring vertical planes will symbolize the Green Mountains in Vermont's pavilion for Expo '67, the international exhibition to be held in Montreal starting this April. The $400,000 structure, which will occupy a 15,000-square-foot site, will be constructed entirely of materials native to Vermont. Included in the pavilion will be exhibits relating to the history, traditions and attractions of Vermont. After the exhibition, the entire pavilion will be dismantled and moved to Woodstock, Vermont, where it will serve a Ski Hall of Fame. Designers of the pavilion are Kissiloff & Wimmershoff. Consulting architect for the state is Andrew Titcomb, and associate architect for the project in Canada is Peter M. Acres.

For more data, circle 119 on inquiry card

Special needs of the aging

HOUSING THE AGED IN WESTERN COUNTRIES. *By Glenn H. Beyer and F.H.J. Nierstrasz. American Elsevier Publishing Company, Inc., 52 Vanderbilt Avenue, New York, N.Y. 10017. 261 pp., illus. $29.00.*

Although this monograph is intended for a wider audience than the architectural profession, it is a noteworthy study for the architect who is designing and planning housing for older people. The authors are concerned with the range of special needs of the aged, but their focus is on housing. Their study concurs with what the 1961 White House Conference on Aging pointed out: the aged want to care for themselves, and they want to participate in the lives of their families and of their communities in their own personal ways.

The problem of housing for the aged is one that has received different points of view from different authorities. For example, some may favor regarding all household fittings as functional for *both* elderly and other age groups and therefore favor design which meets this range of needs. Here, two world authorities on housing research have, after compiling their extensive research on housing of the aged and outlining present housing, economic and social situations of the elderly, placed their primary focus on independent living arrangements.

The book is based on the proposition that housing is one of the fundamental problems of aging. And the study makes clear the fact that there is no universal solution to the problem of independent living for the aging. It is apparent that many elderly persons are taking up hospital rooms and other needed rooms in nursing homes because of inadequate housing and home services for the aged. This book emphasizes the necessity of housing for the aged but, moreover, it underscores the desirability of permitting the elderly to live in their own households rather than in institutions except in cases where ill health warrants such an arrangement.

The authors discuss how attitudes of this age group toward new housing change when the situation becomes real to them. Empirical evidence proves that old people prefer to remain where they are, but "of those older people who have moved to newer and better housing, few would return to their old homes." This justification for new housing with independent living arrangements is assumed only after the first preference—permitting them to continue in their own homes—cannot be accomplished. A section of the book is devoted to describing some examples of the numerous types of new independent housing accommodations that are being provided, what kinds of structures are being built, how large the projects are, what site factors and room standards are being recommended, what financing schemes exist and how such housing is managed.

The book presents an overview of the policies and practices of housing and related types of care for the aging that have developed in the Western countries of the world. Many different solutions have been tried in different countries, and this study is an excellent comparison of the various policies. Combination facilities have worked in many countries. The U.S. Public Health Service defines a combined facility as one having two or more of the following categories: hospitals, nursing homes, communal homes, residential facilities. A good discussion of the pro and con arguments regarding these has been included along with photos and architectural plans of some examples.

The attention given to older people in modern society is the result of a combination of factors. A changed social-political philosophy in many countries has put their special needs in new perspective. Some countries have recognized their housing needs for several decades. In some countries policies for the care of the aged exist on the local rather than national level. The U.S. has never had municipal housing for the aged and as such our solutions of necessity have been private. Public or private, national or local, the question of inadequate housing for this age level is one of the fundamental problems of the community as a whole. This study will probably further research to help improve the possibilities of independent living for the aging.

THIS MONTH'S BOOKS

REVIEWS

Roman fountains

THE FOUNTAINS OF ROME. *By H. V. Morton. The Macmillan Company, 866 Third Avenue, New York, N.Y. 10022. 302 pp., illus. $12.95.*

Roman fountains have more or less determined fountain architecture in north and west Europe. They have enthralled visitors to Rome. Their history can be read as a sort of *precis* of Roman sculptural style, just as the history of the water supply that feeds them is a quick economic history of the city. *The Fountains of Rome* is an elegantly designed and well researched account of this type of architecture and sculpture.

H. V. Morton, well-known British travel writer, catalogues some 80 fountains and groups of fountains, and documents them with splendid color photographs by his collaborator, Mario Carrieri. This photographer has succeeded in eliminating any intrusive contemporary surroundings.

The author intersperses his descriptions with sound historical scholarship, as well as with personal impressions and anecdotal episodes. The anecdotal interest unfortunately supersedes the artistic; it is too bad the author is not better attuned to the Baroque style, or more comfortable in describing it, for surely the most typical of Rome's fountains are Baroque. A description of the 17th- and 18th-century Trevi fountain could almost be like a description of the Baroque style, so closely does this fountain seem to express the essence of the style itself.

The monumental Roman fountain is pure theater. The author might have un-

continued on page 253

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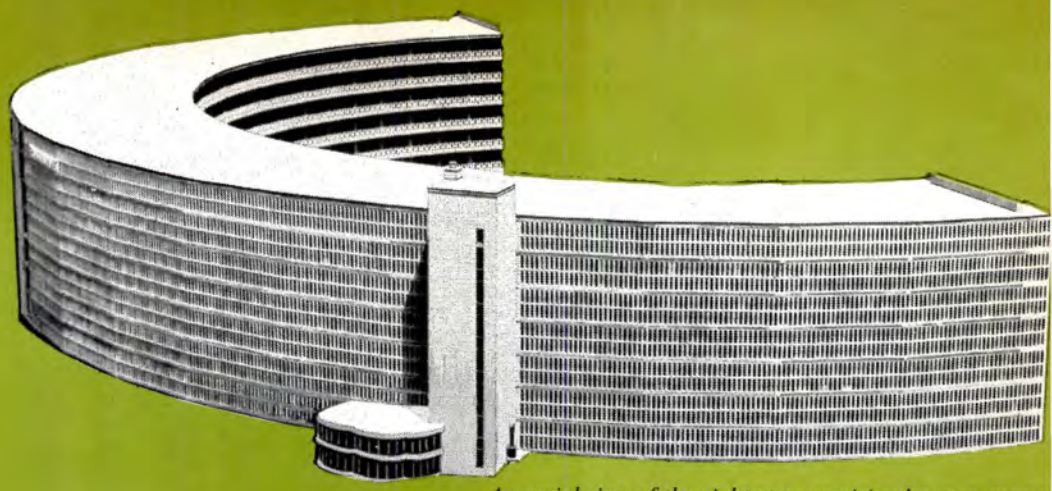

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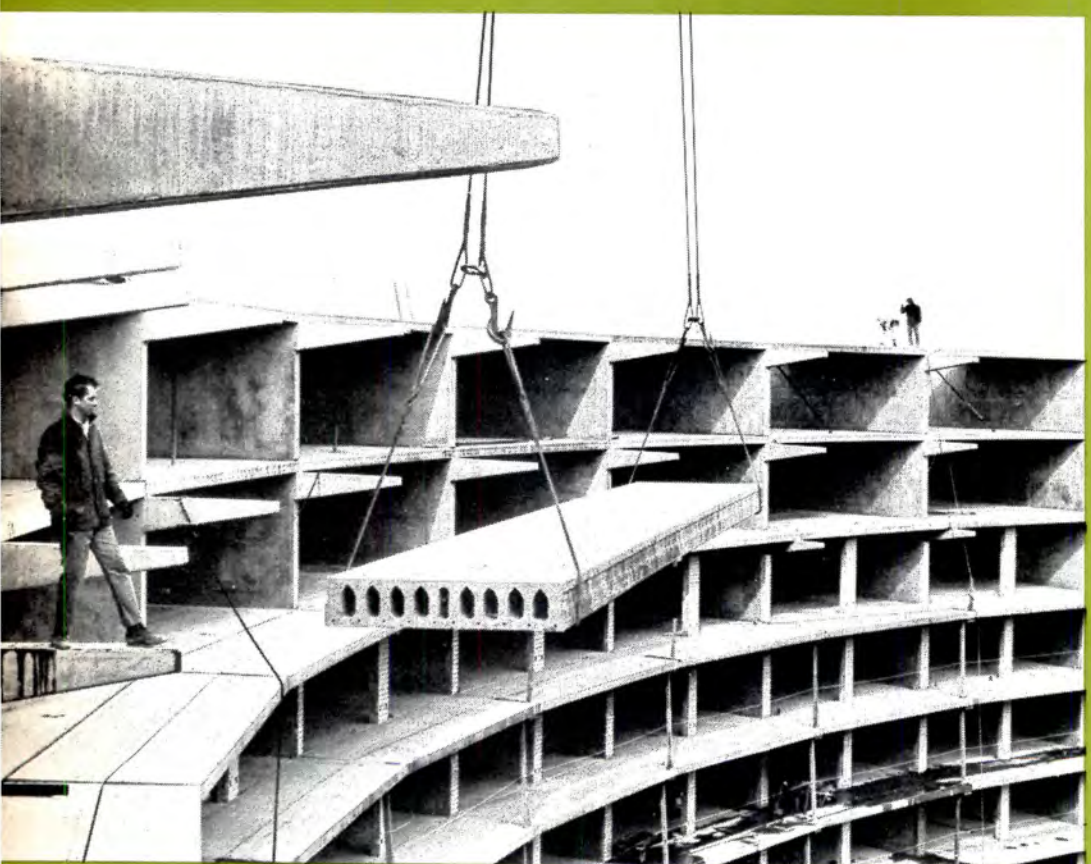

(Top) An 8-inch-deep hollow-core Spancrete plank swings into place. A five-man crew erected the entire structural shell in eight weeks. (Right) Grout was used to fill the small voids between the square ends of the Spancrete planks set in a circular pattern. Carpets, linoleum, and other finishing materials were applied directly over the Spancrete.

For more data, circle 127 on inquiry card

Parkview Apartments
Winchester, Massachusetts
Architects: Williams & Paige Associates
Structural Engineers:
Sepp Firnkas Engineering, Inc.
General Contractor: Berndt Realty Company

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derscored the relation between the theater, the fountain, and the Baroque style in his discussion. Instead we have descriptions like this one of the Trevi fountain: "Its Neptune, escorted by Tritons and seahorses . . . a display of primitive energy as violent and unexpected as a burst of water main in Picadilly." He best describes the Fountain of the Tortoises which by its grace, charm, repose and formal symmetry is Florentine and early Renaissance. However, this book conveys the long evident enchantment of Roman fountains and as such is a fine tribute. —*Anne Buerger*

BOOKS RECEIVED

THE ARCHITECT'S GUIDE TO MECHANICAL SYSTEMS. *By F. T. Andrews. Reinhold Book Division, 430 Park Avenue, New York, N.Y. 10022. 242 pp., illus. $12.50.*

ARCHITECTURE IN ANCIENT EGYPT AND THE NEAR EAST. *By Alexander Badawy. The M.I.T. Press, 50 Ames St., Cambridge, Mass. 02142. 246 pp., illus. $10.00.*

UNIVERSITY HOUSING IN CANADA. *By John Bland and Norbert Schoenbauer. McGill University Press, 3458 Redpath St., Montreal 25, Canada. 134 pp., illus. $4.50.*

DESIGN OF WELDED STRUCTURES. *By Omer W. Blodgett. The James F. Lincoln Arc Welding Foundation, P.O. Box 3035, Cleveland, Ohio 44117. 832 pp., illus. $7.00.*

FUTURE ENVIRONMENTS OF NORTH AMERICA. *Edited by F. Fraser Darling and John P. Milton. Published for The Natural History Press. Doubleday & Company, Inc., 277 Park Avenue, New York, N.Y. 10017. 767 pp., illus. $12.50.*

LAMPS AND LIGHTING. *Edited by H. Hewitt and A. Vause. American Elsevier Publishing Company, Inc., 52 Vanderbilt Avenue, New York, N.Y. 10017. 566 pp., illus. $10.00.*

LET'S SEE, No. 1—*The Use and Misuse of Visual Arts in Religious Education. Edited by Celia T. Hubbard with an introduction by Mary Perkins Ryan. Paulist Press, Harristown Road & Lincoln Avenue, Glen Rock, N.J. 07452. 96 pp. Paperbound, $0.95.*

IES LIGHTING HANDBOOK. *Edited by John E. Kaufman. Illuminating Engineering Society, 345 East 47 Street, New York, N.Y. 10017. 535 pp., illus. $12.00 for members; $15.00 for non-members.*

GOALS, PRIORITIES, & DOLLARS—THE NEXT DECADE. *By Leonard A. Lecht. National Planning Association, 1606 New Hampshire Avenue, N.W., Washington, D.C. 20009. 365 pp., illus. Hardbound, $6.95; Paperbound, $2.95.*

THE NEW JAPANESE PAINTING AND SCULPTURE. *By William S. Lieberman. The Museum of Modern Art, 11 West 53 Street, New York, N.Y. 10019. 116 pp., illus. Hardbound, $5.95; Paperbound, $2.95.*

NEW ARCHITECTURE IN NEW HAVEN. *By Don Metz and Noga Yugi. The M.I.T. Press, 50 Ames St., Cambridge, Mass. 02142. 83 pp., illus. Paperbound, $2.95.*

JOHN WELLBORN ROOT, ARCHITECT. *By Harriet Monroe with an Introduction by Reyner Banham. The Prairie School Press, 117 Fir Street, Park Forest, Ill. 291 pp., illus. $8.50.*

A GUIDE TO THE ARCHITECTURE OF FRANK LLOYD WRIGHT IN OAK PARK AND RIVER FOREST, ILLINOIS. *Edited by The Oak Park Public Library with an Introduction by W. R. Hasbrouck, A.I.A. Oak Park Public Library, Lake Street and Grove Avenue, Oak Park, Ill. 60301. 31 pp., illus. Paperbound, $1.00.*

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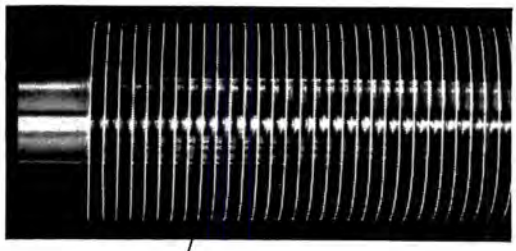

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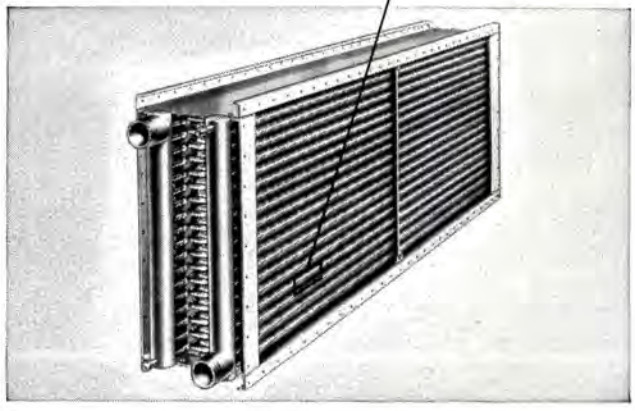

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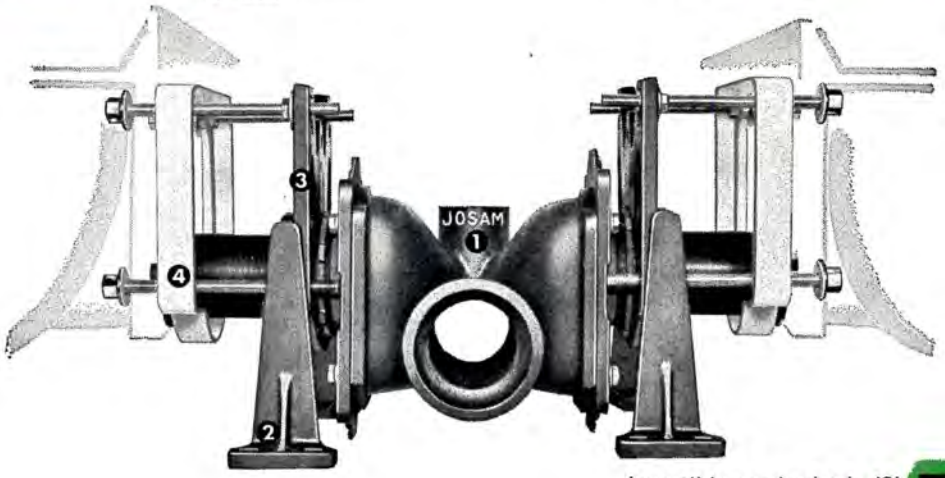

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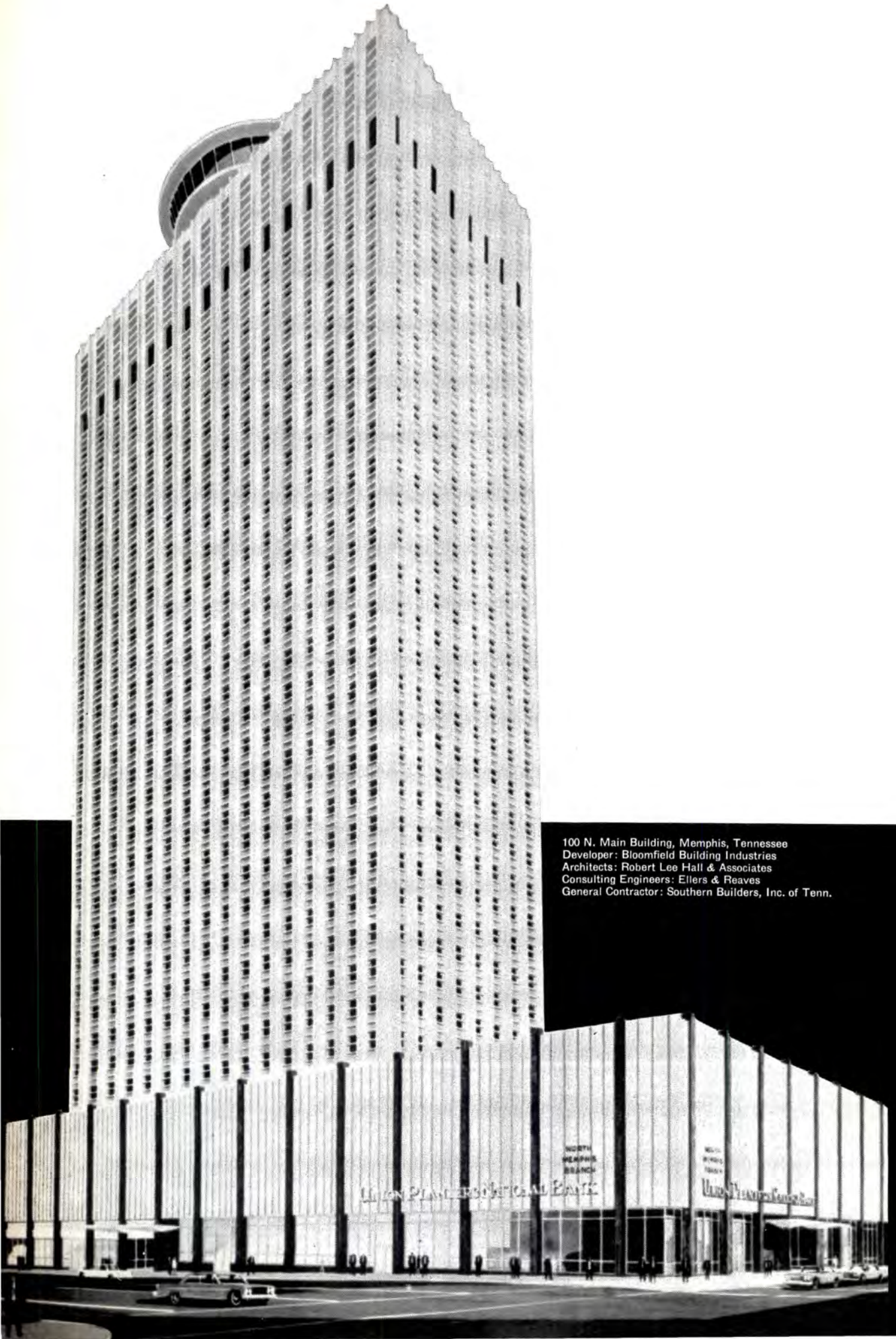

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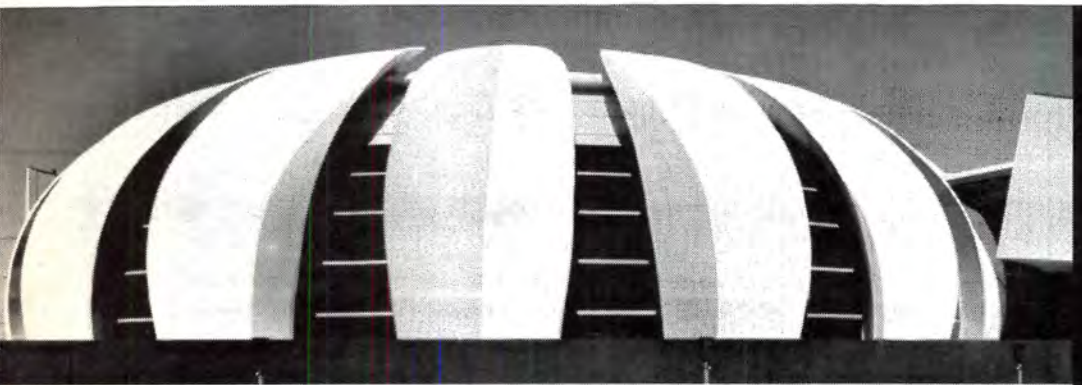

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Structural Engineers:
Ketchum, Koukle, Ryan & Fleming
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Chicago Teachers College, Chicago, Illinois
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Structural Engineers: Perkins & Will
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Architects: Perkins & Will
Engineers: The Engineers Collaborative
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A Architectural File (green)
I Industrial Construction File (blue)
L Light Construction File (yellow)

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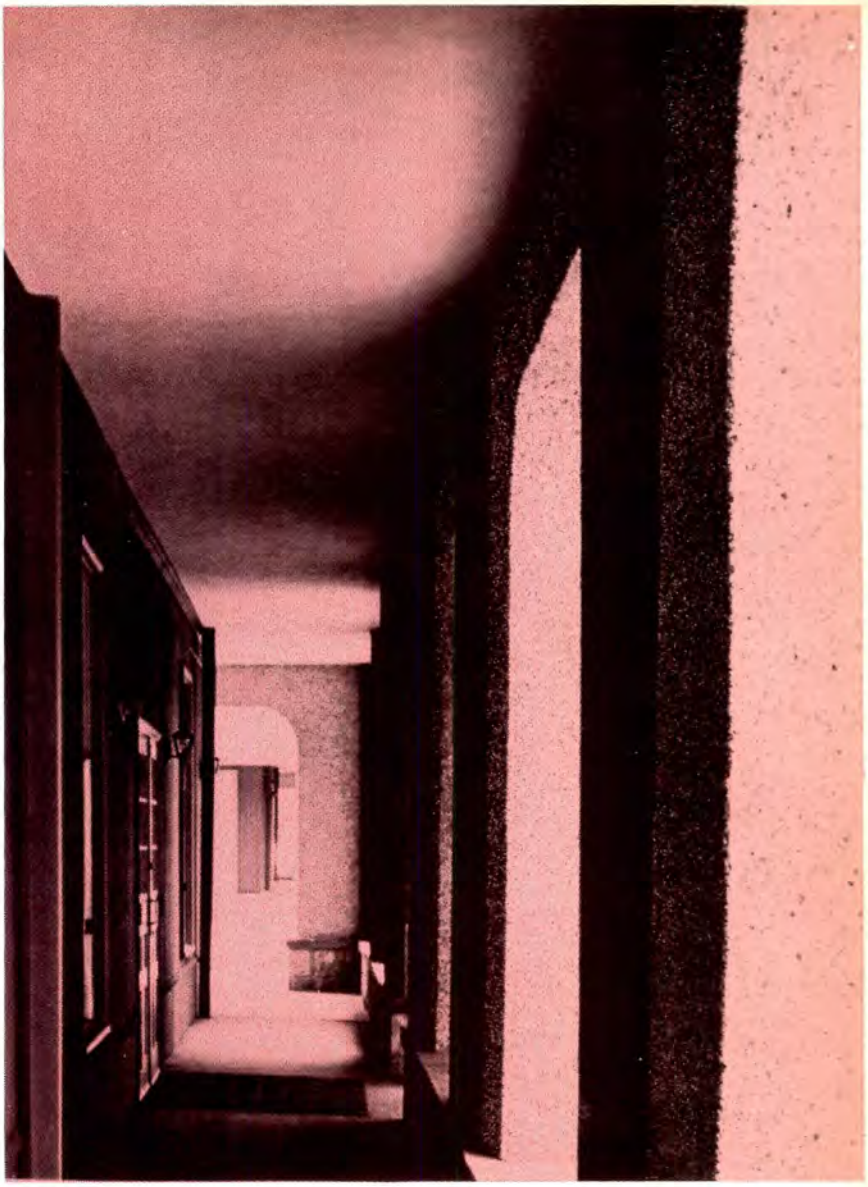

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