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BUILDING TYPES STUDY: DESIGN FOR RECREATION

SEMI-ANNUAL INDEX

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ARCHITECTURAL RECORD

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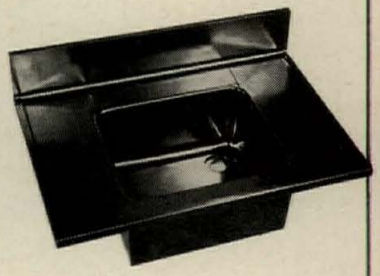

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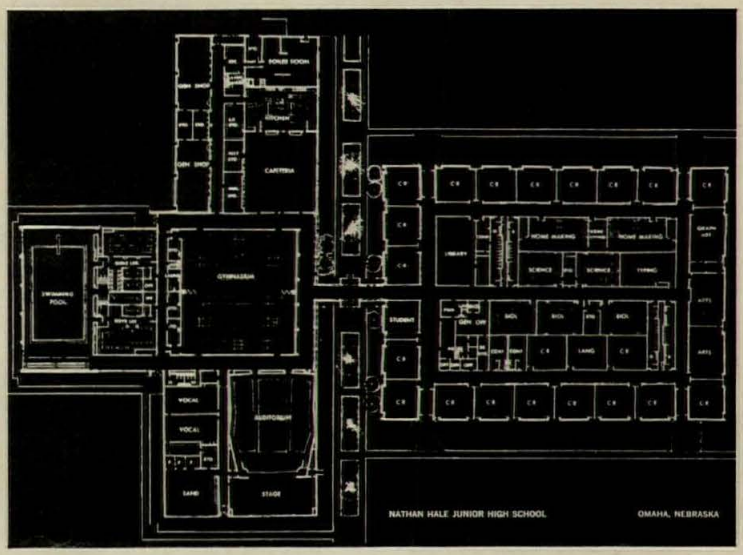

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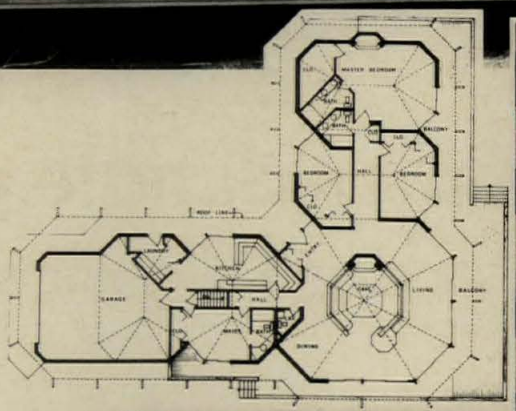
rickson and Stevens enhance modern day "cave" in a sophisticated ountry home with ceramic tile.



ne focus of this home located in a wooded of Winnetka, Illinois is the "cave"—a within a room. It was designed to meet wner's requirement of an intimate yet solated conversation area. The cave as as the surrounding entry, dining and g areas have ceramic tile floors.

ne philosophy behind the design of this e is the use of a prismatic plan offering mum opportunity to capitalize on spec- ar views in all directions. At the same privacy is accommodated by the adap- n of individual, adjoining living "cells," with its own roof.

roughout the home, architects Erickson Stevens have made extensive use of nic tile for decorative as well as func- l values. Bathroom vanity tops, tub en- res and walls are finished in random l ceramic mosaic tile with quarry tile . In the kitchen, counter tops and back- hes are tiled for color harmony and ility.

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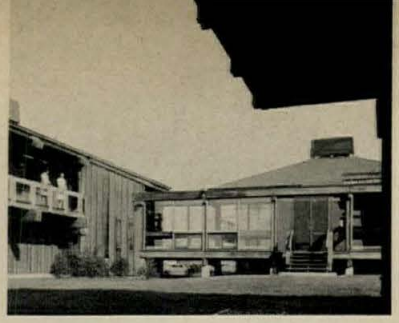

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FEATURES

Robert Wenkam

BUILDING TYPES STUDY 365

Philip Molton

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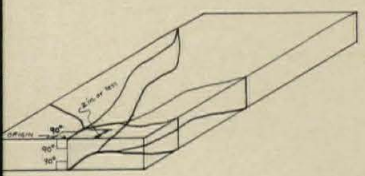

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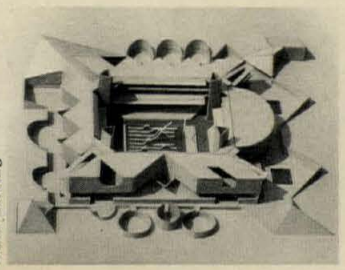

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Serving a great and growing need for currency in architects' general knowledge about costs in the very early phases of project development (rather than the pin-point expertise of the estimator's take-off) is the objective of a new service tapping the resources of consultants and information gathering facilities, interpreting what's happening that may affect either the client's program or the design development.

INDUSTRIAL ARCHITECTURE OF QUALITY

Next month's Building Types Study on Industrial Buildings offers a thoughtful look at the range and quality of the contribution architects are these days making to the architecture of industrial buildings, with a wide variety of examples testifying also, it would appear, to an increased interest on the part of industrial clients to amenity as well as efficiency.

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MAN IS REALLY AN ANIMAL AND THUS DOES HE RESPOND

If you are as preoccupied with other matters as I am, probably you never heard of "the territorial imperative," or the science of ethology. Hang on a minute: "the territorial imperative" is just the urge of animals and humans to grab a bit of territory, and defend it to the death. "Ethology"—it's not in my dictionary—is the science of the behavior of animals.

But I have had a very interesting time with a book called "The Territorial Imperative," by Robert Ardrey. It sets out to establish many of man's basic urges and needs, and it shatters many shibboleths about how man arrived where he is, and why he responds as he does. Thus it is important, I think, for anybody who sets out to design anything for man, and particularly anything in the area of environment. It ranges from the causes of war, frequently mistaken causes, to the rebellion of teenagers, who may simply be spoiled to the point of boredom.

The author actually says very little about, say, design of cities, but his basic premises extend very readily into environmental design of all kinds.

You don't really doubt that man has that compulsion about territory. That great American dream of a single-family house on a single lot has largely determined the structure of our cities. That same dream is also the dream of some of the lowest forms of life, going on up to insects, birds, mammals, primates. Give me a place to call my own, and I'll fight like a devil to drive out intruders.

Just a minute to relate it to war. Ardrey says that the worst blunder of history was the Japanese attack on Pearl Harbor. The war lords thought if they could knock out that bastion, we would all collapse in our soft living and surrender. If they could have understood the imperative to defend, they might have avoided the greatest military avalanche in history.

By any logic whatever, he says, Britain's resistance to the Germans was absolutely ridiculous—they didn't have a prayer. But they resisted, they rose to new heights of bravery and accomplishment, and they saved the world from Teutonic domination.

If man can defend like the British, he can also be a predator, like the Germans and the Japanese. The author even goes so far as to say that through history, war has been the natural state of humans. It represents the largest involvement of the three basic needs of mankind.

These he gives as identity (opposite of anonymity), stimulation (opposite of boredom), and security. Identity is the one which includes the territorial imperative, but of course it might take other directions, as in a great military organization, or as in a peacetime business complex. And war, as has been noted frequently, is the greatest possible unifier of diverse elements at home. It is naturally the greatest of stimulants, and involves security.

What—no sex? No civilization? No religion? No science? No evolutions? Well, they all come in and out; at least there is a great argument about them. But the thesis of the book is that man is an animal with those three absolute necessities. The author believes that if we understood these matters better, we might resist blowing ourselves into kingdom come.

And the architect? Well, it doesn't take much looking at the first of his human needs—identity—to see the importance of building design. Maybe man would fight for his little plot if it had only a miserable shack on it. But his territorial imperative is driving him ever to improve it, to build his identity to a higher status.

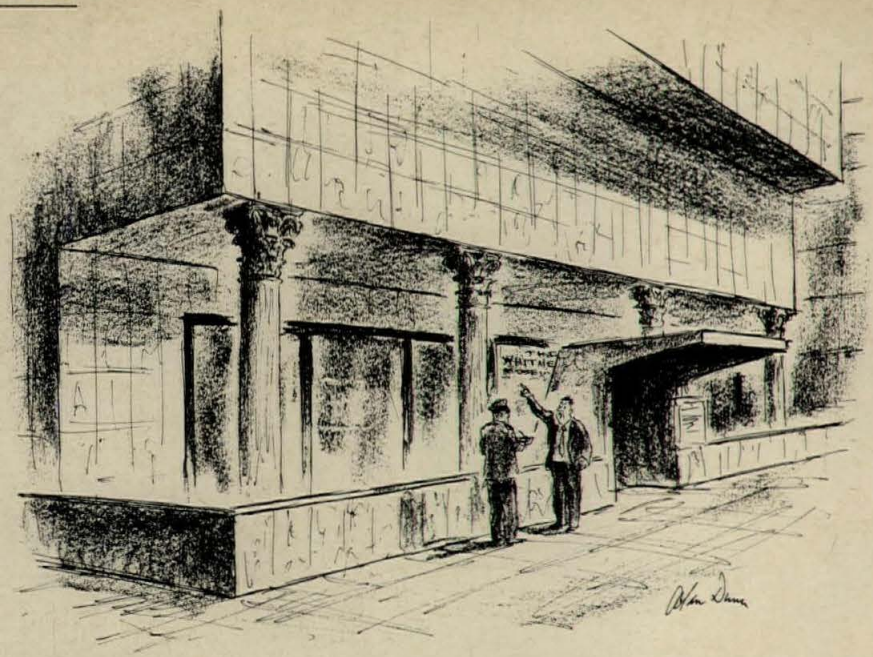
Probably, however, man's impulse to build identity gets into a thousand complications. Maybe he builds a great attachment for a little park, a monumental building, an architectural achievement. Even though none of these involve any ownership by him, he may develop an attachment which becomes part of his being, his identity. The territorial imperative is why, no doubt, slum dwellers fight so hard to preserve their miserable old houses—their identity is destroyed with their homes.

Quality of design is naturally a vital part of man's feeling of identity with buildings—or furniture, or anything else that he can form an attachment for.

I shall not try to tell you how to style your buildings, to build them into his territorial identity. I'll be content with just one observation: don't forget that the next necessity for man is stimulation. Don't bore him to death.

—Emerson Goble

Drawn for the RECORD *by Alan Dunn*



"It happened during the night—
Pure vandalism, I think!"

The engineering approach collides with esthetics

Esthetics won a considerable battle recently when Berkeley citizens voted to tax themselves more than $20 million to put its new transportation lines underground. That is, of course, for the three and a half mile run through the city itself. The voters believe in their city and its beauty and they'll keep it as they want it if it does cost some money.

One engineer, Leroy Greene, reminds engineers that perhaps they have a lesson to learn. "The city put its money on the line—$20 million worth— to back its esthetic choice.

"Community values are often left far behind in our search for economic solutions for engineering problems. We engineers need to reconsider the weighing of the ingredients that add up to the best solution to a given engineering problem. . . . While price is a major concern, the Berkeley community has indicated to us that an esthetic value has a weight that cannot be measured in pounds. . . . We engineers sometimes lose sight of the public's willingness to pay for what it wants."

Save New York's old buildings: 58,000 of them are waiting

Talking of the possibilities of rehabilitation of old neighborhood buildings, HUD Secretary Robert C. Weaver said that there are 58,000 buildings in New York City qualifying for rehabilitation. They provide housing for 800,000 families meaning, of course, 800,000 new kitchens and bathrooms, millions of windows and doors.

"What I have just been talking about are the figures only for New York City. To project the figures for the nation as a whole raises the prospect of dealing with numbers of walls, windows, and kitchens so astronomical that only a computer could comprehend them."

Well, that should satisfy the most ardent preservationist. It should satisfy too (see previous page) the built-in attachment of the slum dweller to his building and his neighborhood. And it might just be more popular than many a bulldozing urban renewal project. Secretary Weaver will have to watch out that he doesn't get caught in the middle.

The unhappy automobile, a national problem

It is almost a cliché now to say that we must not simply scorn the automobile, and ban it from our thinking. Paul Rudolph recently phrased it neatly: "The American genius for building throughways, bridges, intersections, rendered almost as voluptuous as a Rubens painting is deep in the American tradition of going on, on, on. There is an assuredness of form, when dealing with the *moving* automobile, that is often breathtaking. It is noteworthy that we seldom question the amount of money spent to get our cars from one place to another; however, the machine when at rest seldom seems happy, warring with its surroundings, indignant with being relegated to a slum of asphalt, ungainly lighting standards, multitudinous signs begetting other signs. The automobile, used to the splendors of the open road, is usually sad in its minimum car park and its occupant often has difficulty getting from the car to the building. In turn many buildings are almost entirely swallowed by the armadas of cars threatening them."

And: "Yes, the automobile and its relationship to the building will become the chief characteristic of the middle 20th century. Le Corbusier foresaw all of this in his proposals for Algiers and the revised road bed which becomes a building, or a series of buildings, several miles long."

"The proposed lower Manhattan expressway is usually discussed as being built above the ground (at about a half the cost), or below the ground. Land values are, of course, destroyed with a huge expressway above the ground. However it would be a different story if the raised expressway were conceived as a building or series of buildings, with the road bed at the top. Such a building should adapt itself to existing buildings on either side."

Rehabilitation being pushed from another direction

The idea of rehabilitating sub-standard buildings, instead of tearing them down, got a boost also from a manufacturer. James J. McLaughlin, of U.S. Gypsum, told the Producers Council that he sees a shift from land clearance to rehabilitation in the solving of city housing problems. He said that 30,000,000 Americans are said to be living in sub-standard dwellings, and that a government survey put the number of deteriorated apartments at 9.2 million.

U.S. Gypsum, he said, is convinced that private enterprise, working in concert with Federal agencies, can offer the best solution to the problem of deterioration. McLaughlin cited estimates that place this market at $52 billion in the next few years.

He points out that many old buildings are structurally sound, that it costs half to rehabilitate them as compared with replacing them, that time is a factor, and that neighborhoods can be preserved. —*E. G.*

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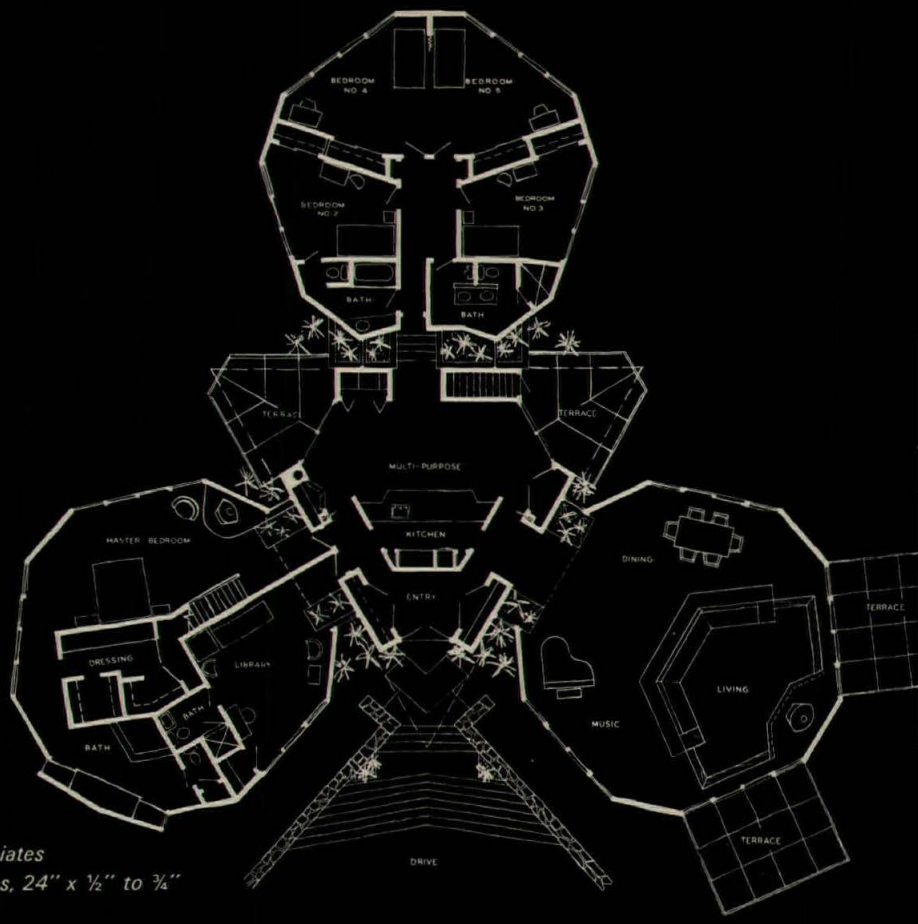

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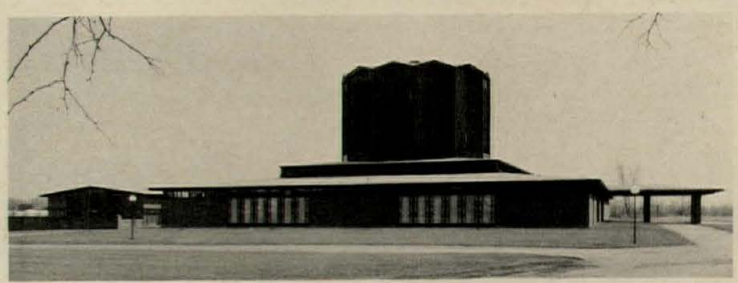

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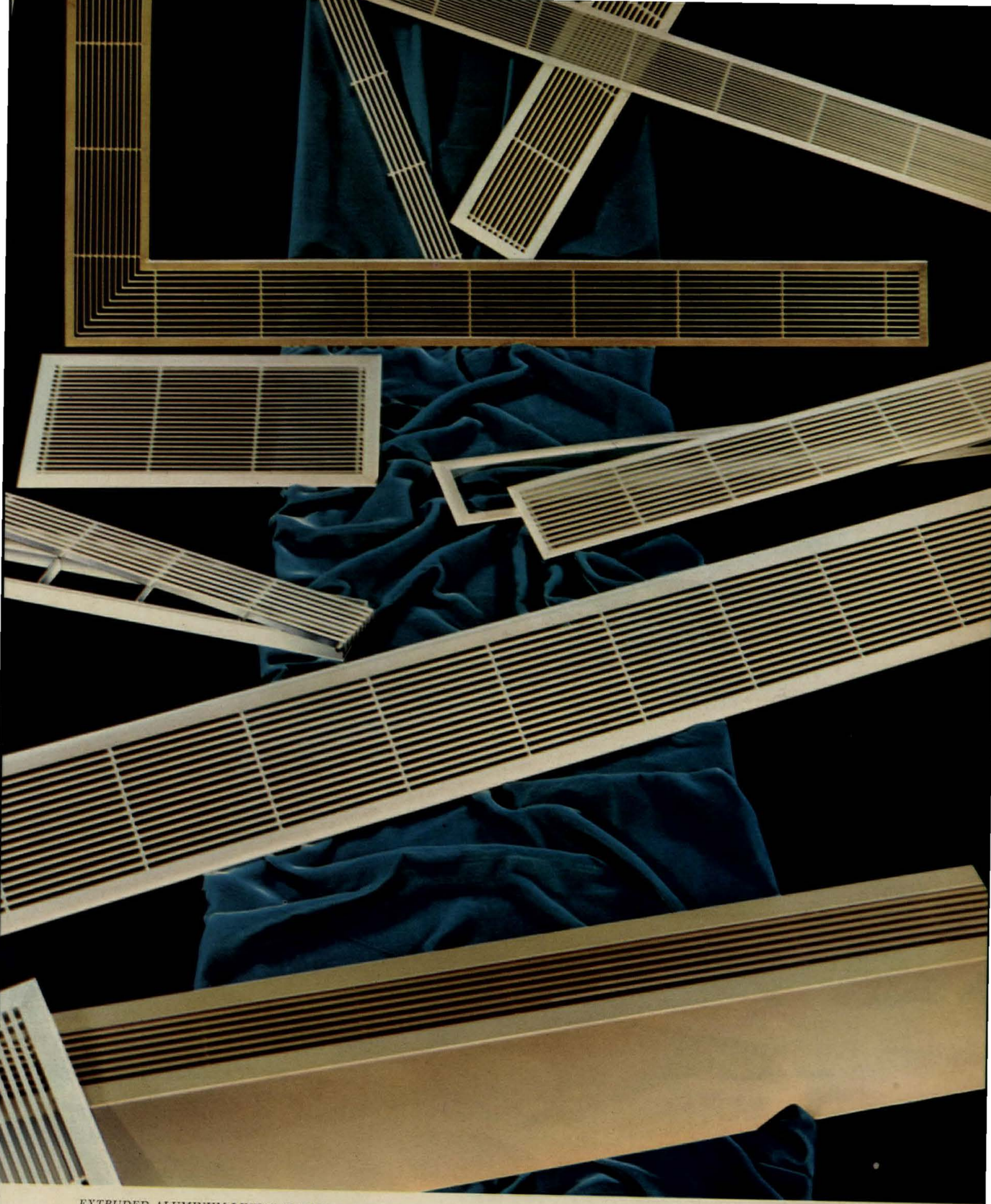

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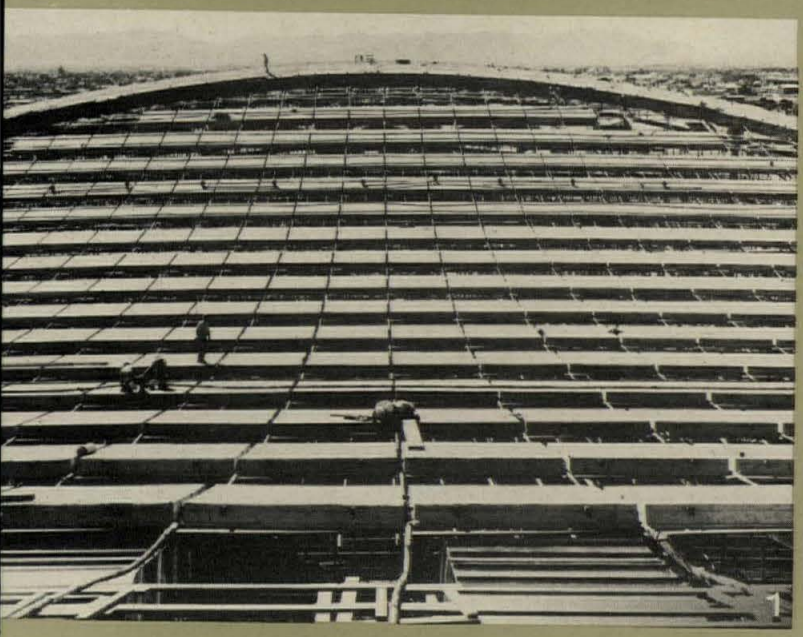
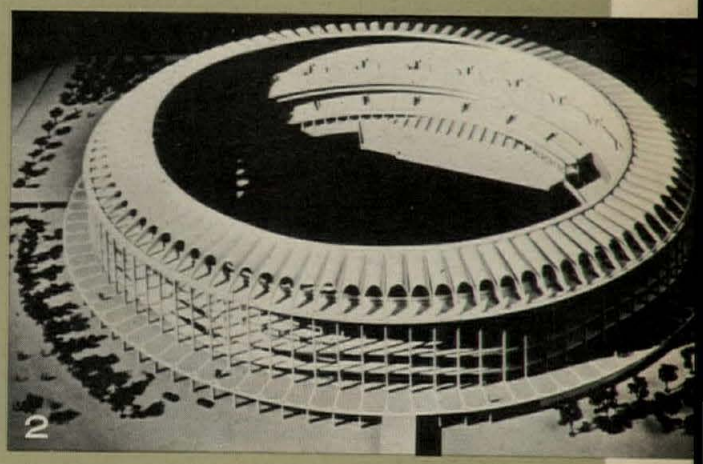
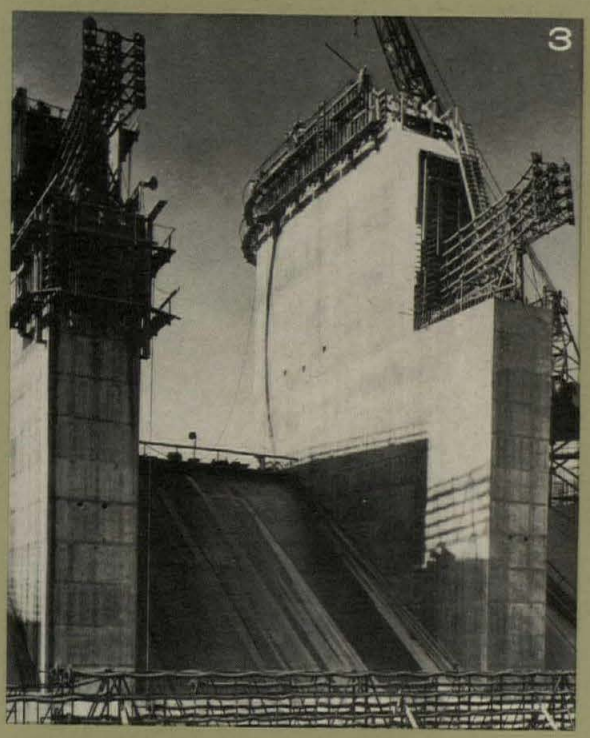
FOR PRESTRESSED CONCRETE STRUCTURES





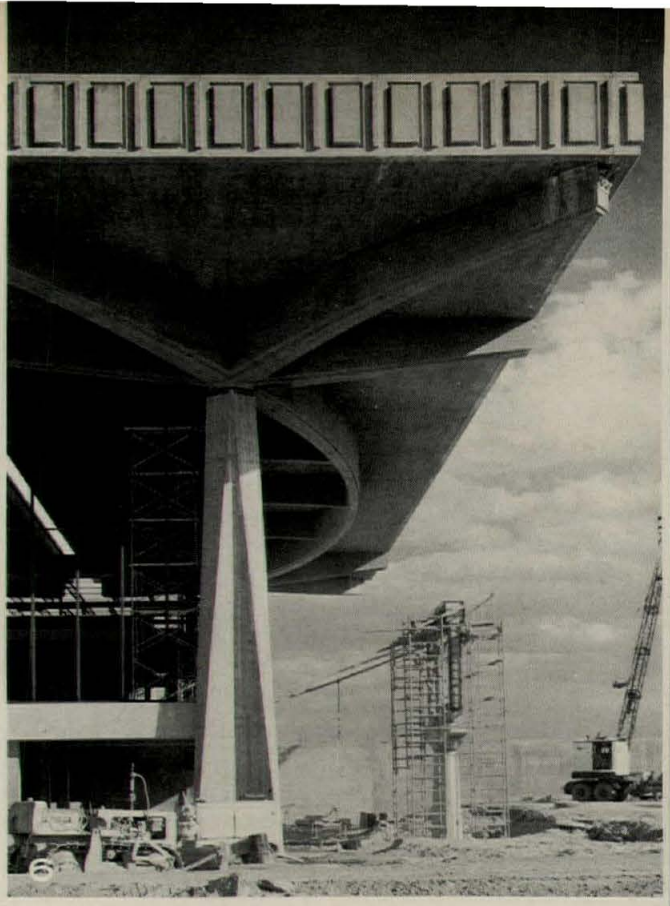


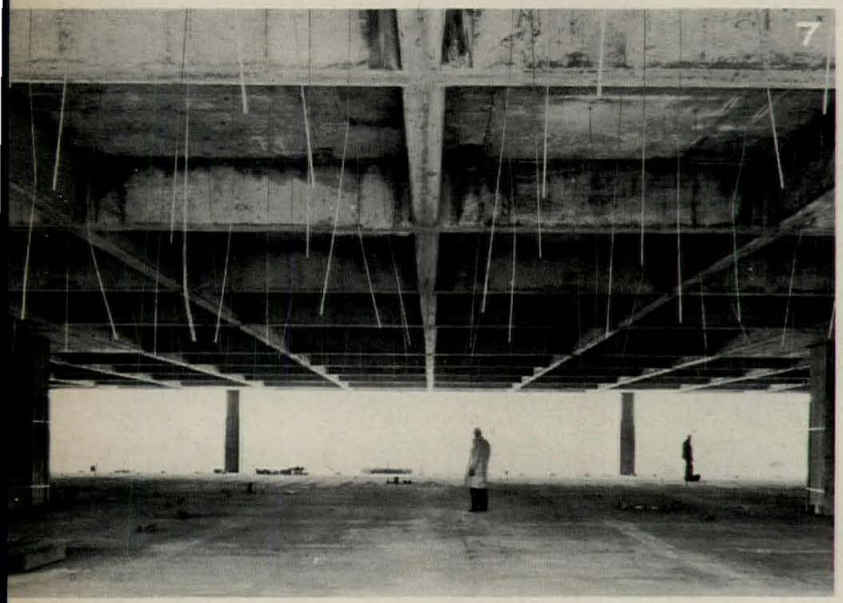
SEE LAST PAGE FOR PROJECT DETAILS

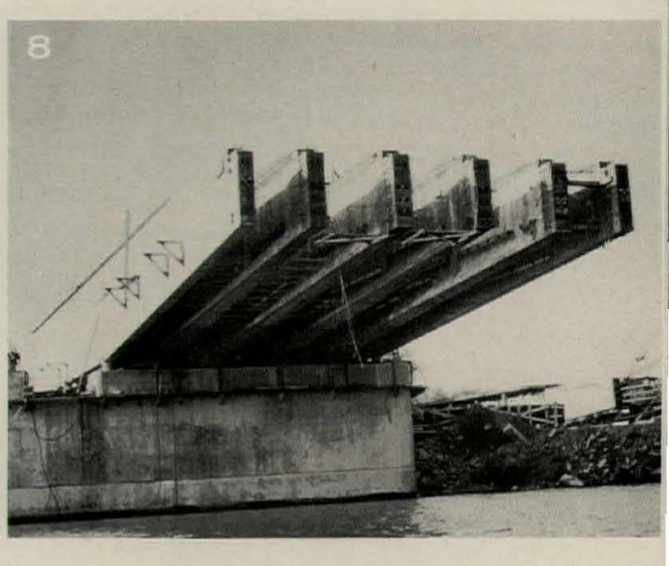
For more data, circle 13 on inquiry card

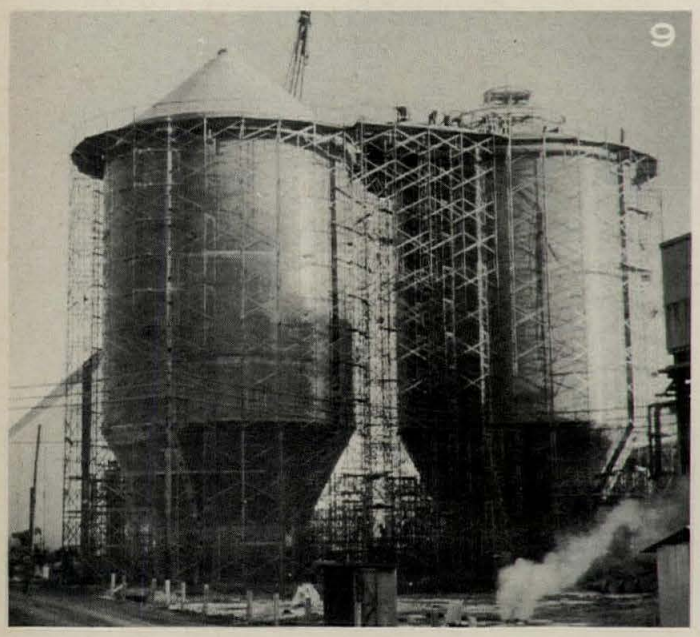
REPRESENTATIVE STRUCTURES POST TENSIONED BY RYERSON

5. Parking Structure for Stix, Baer & Fuller Dept. Store, St. Louis—Post-tensioned beams make long clear-spans more practical and economical. **Architect-Engineer:** Enco Associates, Inc. **Parking Consultants:** Richard C. Rich and Associates, Inc. **General Contractor:** G. L. Tarlton Contracting Company.









6. Airline Terminal, Detroit Metropolitan Wayne County Airport—Each of five 70 x 232-foot post-tensioned concrete roof panels made massive-looking by parapet beams is supported on two tapering cruciform columns. Roof loads are carried to columns by a graceful web of curved and straight post-tensioned concrete roof beams. **Owner:** Wayne County Road Commission. **Architects and Planners:** Smith, Hinchman & Grylls Associates, Inc. **General Contractor:** A. J. Etkin Construction Co., Oak Park, Mich. **Post Tensioning Subcontractor:** Conesco Midcontinent, Inc.

7. United Air Lines Executive Offices — Two-story structure near Chicago's O'Hare Field achieves dramatic 66′ x 60′ clear spans with continuous 2-way post-tensioning of waffle slabs 2′6″ thick. **Architect:** Skidmore, Owings & Merrill, Chicago. **Contractor:** Gust K. Newburg Construction Co.

8. Oneida Lake Bridge—Nation's longest post-tensioned concrete span is the 320′ center span of this bridge near Brewerton, N.Y. Shown here are six of twenty-four 146″ cantilever girders weighing 240 tons each. **Owner:** State of New York Dept. of Public Works. **Engineers:** Summers, Munninger & Molke. **General Contractor:** Terry Contracting, Inc.

9. Pulp Tanks for paper plant in Jackson, Alabama, have concrete cores faced with tile on both sides. Each has capacity of 138,320 cubic feet of high density pulp. Post-tensioned tendons resist all circumferential forces including ring tension at top of cone base. **Owner:** Allied Paper Corp. **Tank Designer:** James N. DeSerio, P.E. **Erector:** Stebbins Engineering & Mfg. Co.

RYERSON BBRV POST TENSIONING

FOR PRESTRESSED CONCRETE STRUCTURES

THE SYSTEM — Ryerson BBRV post tensioning provides the most efficent, economical and aesthetically satisfactory answer to a wide range of structural framing requirements.

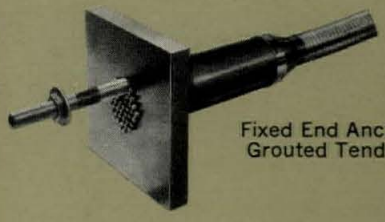
Frequently enlisted advantages of the system include: ■ longer spans at economical cost ■ good deflection control ■ reduced structural depth ■ watertight, virtually crack-free slabs ■ positive end anchorage making possible the development of ultimate tendon strength and accurate application and measurement of forces. And, of course, Ryerson BBRV post tensioning allows you to take fullest advantage of the design freedom offered by concrete framing.

THE SUPPLIER — When you make Ryerson your post tensioning source, you deal with one of the nation's largest suppliers of construction steels. With plants in 22 cities coast to coast, Ryerson has a local staff convenient to you — plus all the resources and facilities needed to provide a dependable service package.

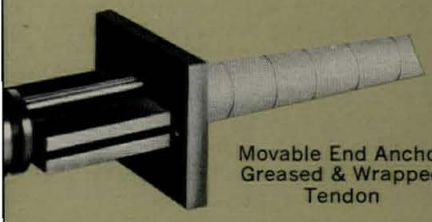
FOR ARCHITECTS & ENGINEERS Ryerson provides: ■ assistance in feasibility studies on the use of post tensioning in specific projects ■ preliminary cost data ■ specifications and details ■ information and experience gained in working on all types of post tensioned structures that may be helpful in your design and layout decisions. This experience includes the largest building and heavy construction projects, both within the U.S. and overseas.

FOR CONTRACTORS Ryerson provides: ■ shop-fabricated tendons completely assembled and ready for placement with all fittings attached ■ detailed placing plans, force computations and stressing data ■ equipment needed for stressing and grouting ■ reliable labor estimates plus job-site training in equipment use — or, if preferred . . . ■ in-place quotations with Ryerson providing the materials *and* labor needed to deliver a complete package — installed tendons, stressed and grouted.

Movable End Anchor Grouted Tendon



Fixed End Anchor Grouted Tendon



Movable End Anchor Greased & Wrapped Tendon

Fixed End Anchor Greased & Wrapped Tendon

TENDON FORCE CALCULATOR

When the location and magnitude of the prestressing force requirement for a structural member has been developed, Ryerson can, at your option, select the appropriate type of anchorage and tendon size. And we will provide placing drawings.

Wire is 0.25 inches nominal diameter (Area = 0.04909 square inches) complying with ASTM-A421-58T specification. Minimum ultimate strength of wire is 240,000 P.S.I.

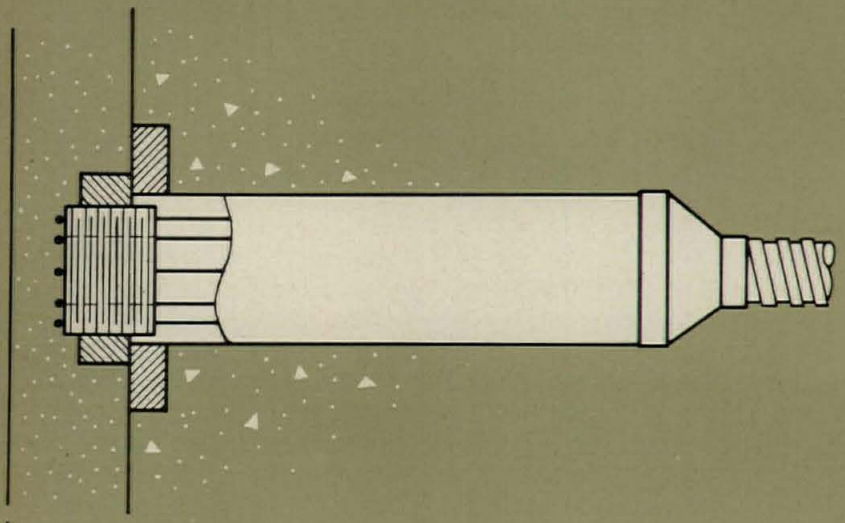
NUMBER OF WIRES	CROSS SECTIONAL AREA Square inches	EFFECTIVE PRESTRESSING FORCE Max. in Kips	TEMPORARY OVERSTRESSING FORCE Max. in Kips
1	.04909	7	9.4
6	.29454	42.5	56.5
8	.39272	56.5	75.4
12	.58908	84.8	113.1
14	.68726	99	132
18	.88362	127.2	169.7
20	.98180	141.4	188.5
24	1.17816	169.7	226.2
27	1.32541	190.9	254.5
28	1.37452	197.9	263.9
30	1.47270	212	282.8
36	1.76724	254.5	339.3
38	1.86542	268.6	358.7
40	1.96360	282.8	377
46	2.25814	325.2	433.6
54	2.65082	381.7	509
72	3.53448	509	678.6
90	4.4181	636.2	848.3

For more data, circle 13 on inquiry card

DATA ON PRINCIPAL STANDARD TYPES OF..

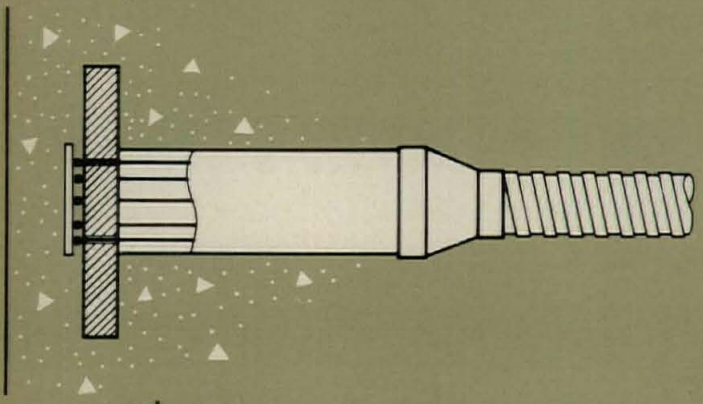
In order to serve you better we have standardized on the wire capacities and hardware sizes listed for each type of anchorage. But note that any anchorage can be used with any number of wires *(up to its maximum capacity)* required to produce a specified prestressing force. *Also note that special anchorages can be developed to meet unusual job requirements.*

Types B through N and type G are shown with grou type tendons. Types P through Km are shown wit greased and wrapped tendons. These are the usu applications, but all types of anchorages can be pr duced for either type of tendon.



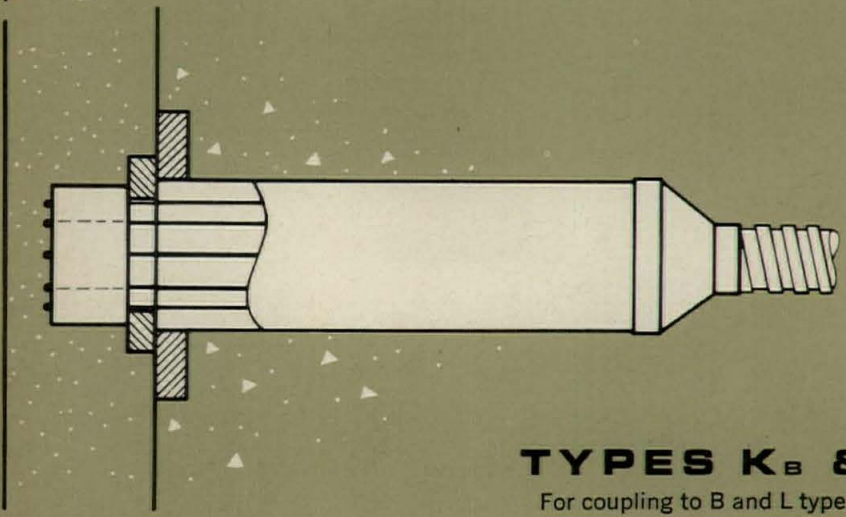
TYPE B

ANCHOR DESIGNATION	14B	28B	40B
NUMBER OF WIRES	14	28	40
BEARING PLATE SIZE IN INCHES	6¾ x 6¾	9¼ x 9¼	11 x 11
TRUMPET O.D., INCHES	4	5	5¾
CONDUIT O.D., INCHES	1⅝	2⅛	2½



TYPE E

ANCHOR DESIGNATION	14E	28E	40E	46E
NUMBER OF WIRES (Max.)	14	28	40	46
BEARING PLATE SIZE IN INCHES	6¾ x 6¾	9¼ x 9¼	10½ x 10½	11 x 11
TRUMPET O.D., INCHES	3	3½	4	4¾
CONDUIT O.D., INCHES	1⅝	2⅛	2½	2¾

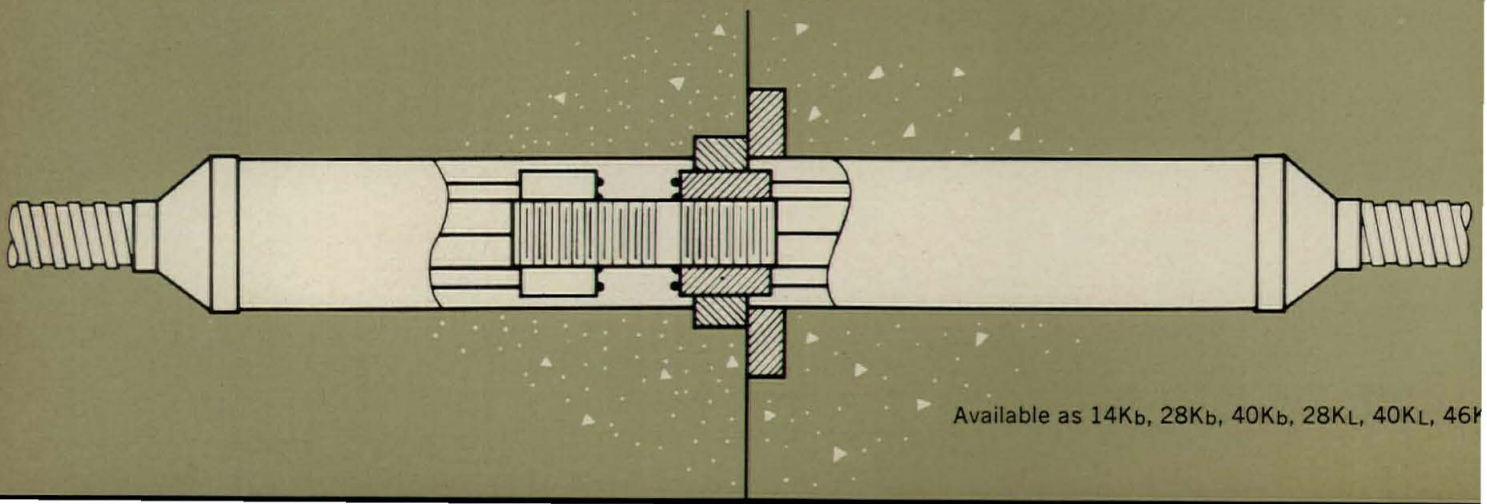


TYPE L

ANCHOR DESIGNATION	28L	40L	46L
NUMBER OF WIRES (Max.)	28	40	46
BEARING PLATE SIZE IN INCHES	9½ x 9½	11 x 11	11¾ x 11¾
TRUMPET O.D., INCHES	5¼	6	6¼
CONDUIT O.D., INCHES	2⅛	2½	2¾

TYPES K_B & K_L

For coupling to B and L type anchor

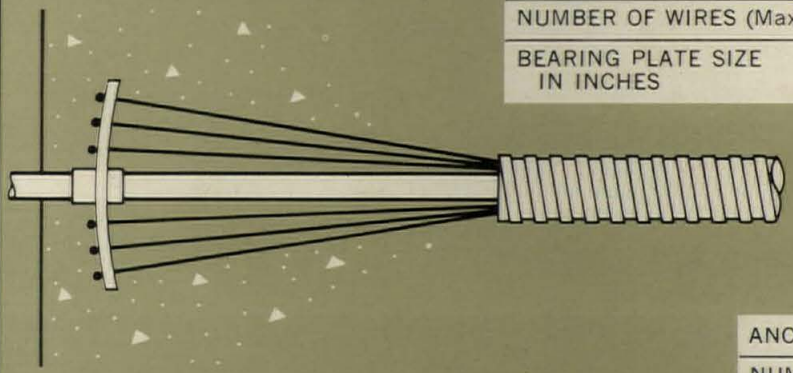


Available as 14K_b, 28K_b, 40K_b, 28K_L, 40K_L, 46K

...RYERSON BBRV POST TENSIONING ANCHORS

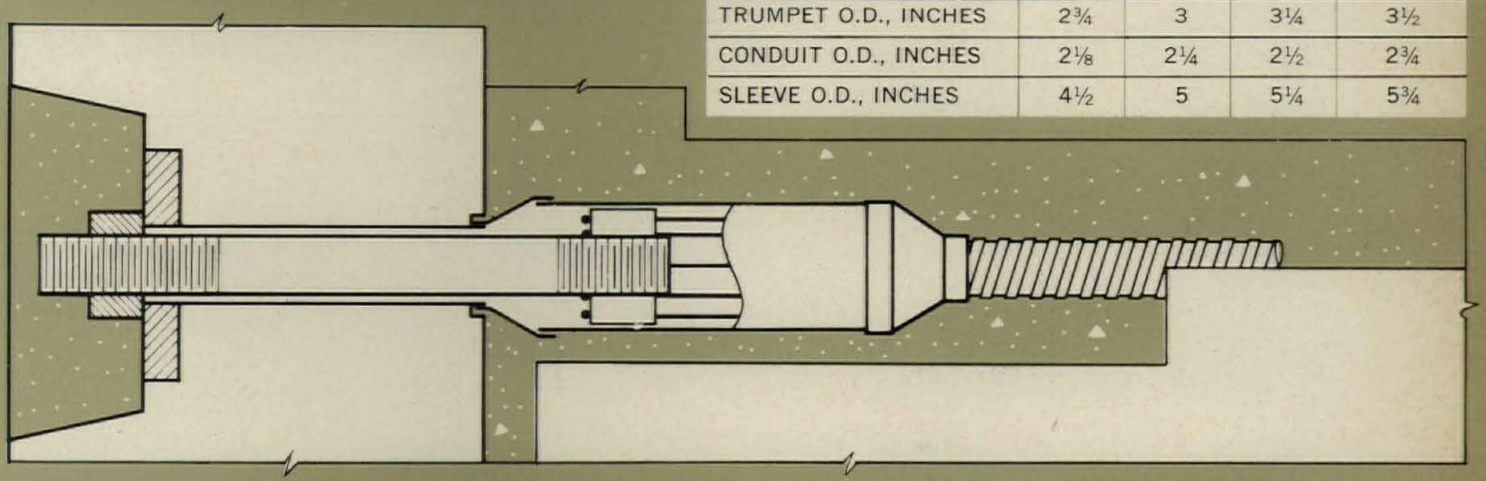
TYPE S

ANCHOR DESIGNATION	8S	14S	20S	28S	40S	46S
NUMBER OF WIRES (Max.)	8	14	20	28	40	46
BEARING PLATE SIZE IN INCHES	8 x 3	7¾ x 7¾	10 x 6	11 x 7	12½ x 8	13½ x 9½

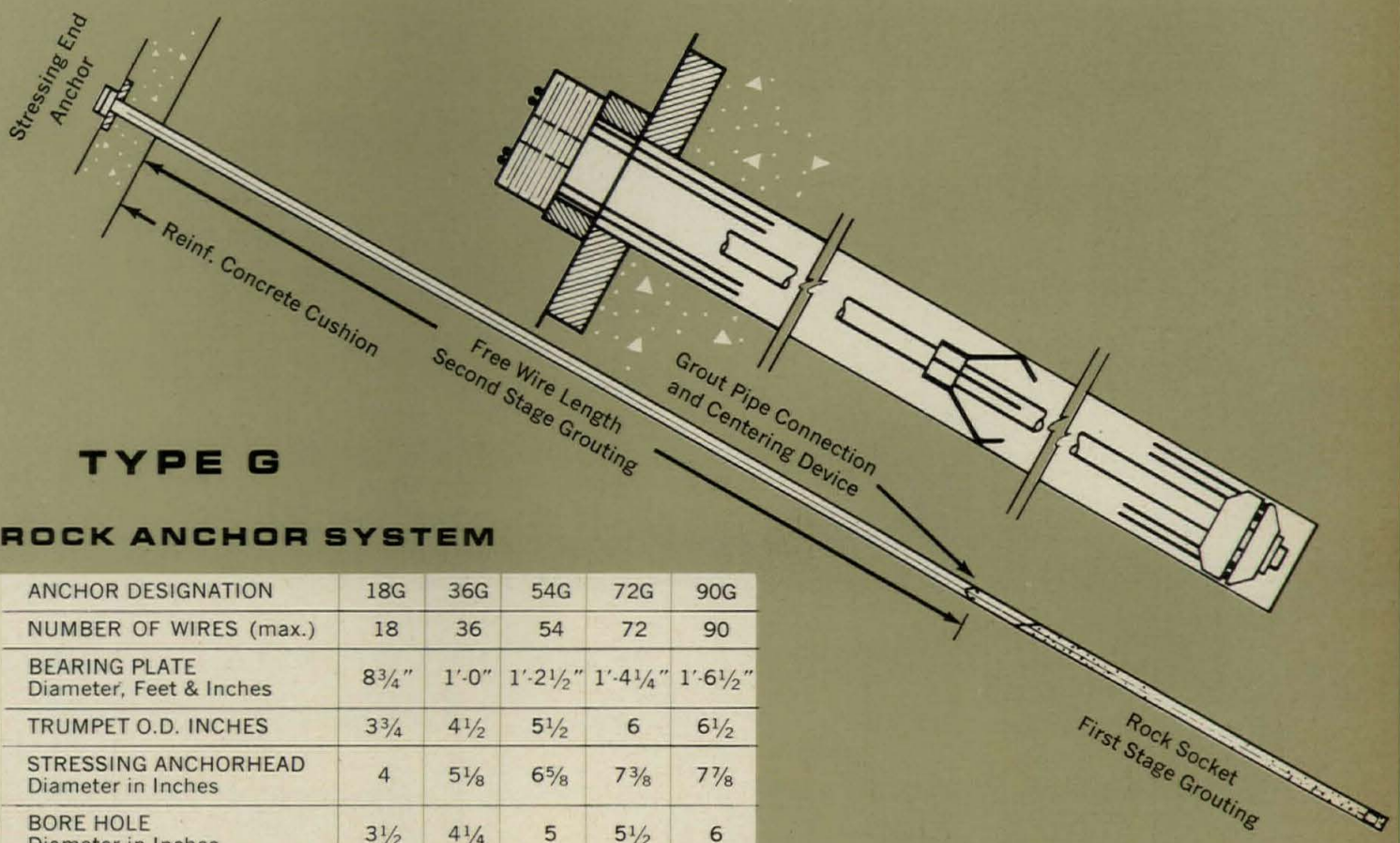


TYPE N

ANCHOR DESIGNATION	24N	30N	38N	46N
NUMBER OF WIRES (Max.)	24	30	38	46
BEARING PLATE SIZE IN INCHES	7¾ x 7¾	8¾ x 8¾	9¾ x 9¾	10¾ x 10¾
ROD O.D., INCHES	2	2¼	2½	2¾
TRUMPET O.D., INCHES	2¾	3	3¼	3½
CONDUIT O.D., INCHES	2⅛	2¼	2½	2¾
SLEEVE O.D., INCHES	4½	5	5¼	5¾



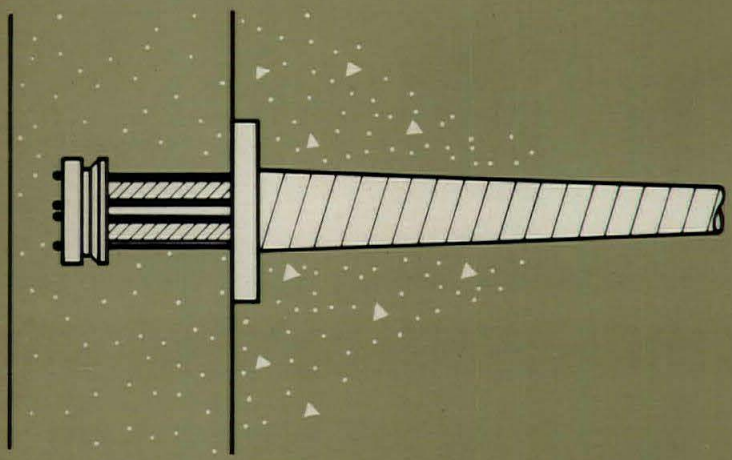
TYPE G



ROCK ANCHOR SYSTEM

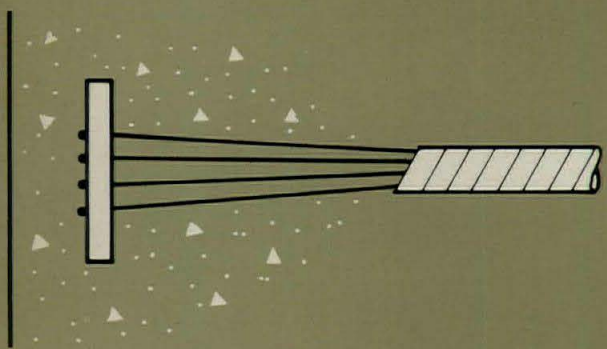
ANCHOR DESIGNATION	18G	36G	54G	72G	90G
NUMBER OF WIRES (max.)	18	36	54	72	90
BEARING PLATE Diameter, Feet & Inches	8¾"	1'-0"	1'-2½"	1'-4¼"	1'-6½"
TRUMPET O.D. INCHES	3¾	4½	5½	6	6½
STRESSING ANCHORHEAD Diameter in Inches	4	5⅛	6⅝	7⅜	7⅞
BORE HOLE Diameter in Inches	3½	4¼	5	5½	6
FIXED ROCK ANCHORHEAD Diameter in Inches	3¼	4	4¾	5¼	5¾

RYERSON BBRV POST TENSIONING ANCHORS



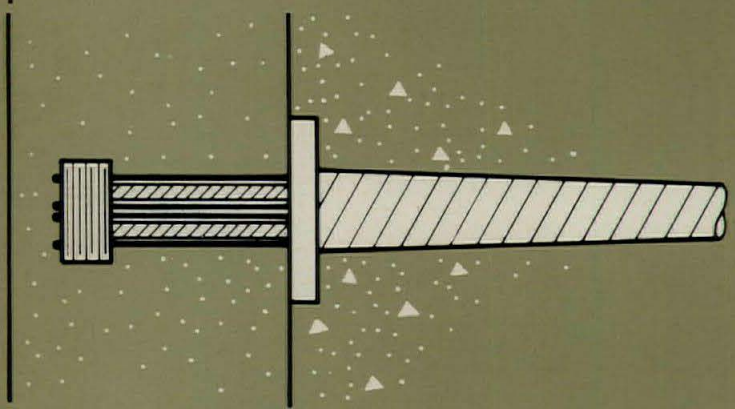
TYPE P

ANCHOR DESIGNATION	8P	14P	20P	27P
NUMBER OF WIRES (Max.)	8	14	20	27
BEARING PLATE SIZE IN INCHES	3½ x 8¼	5½ x 9	6 x 10	7 x 11



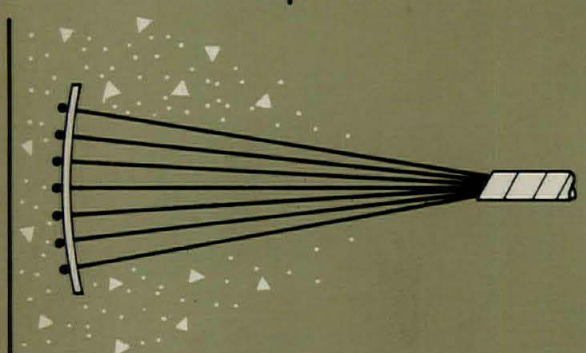
TYPE H

ANCHOR DESIGNATION	8H	14H	20H	28H	35H
NUMBER OF WIRES (Max.)	8	14	20	27-28	35
BEARING PLATE SIZE IN INCHES	3½ x 8¼	3½ x 9	6 x 10	7 x 11	10 x 12



TYPE M

ANCHOR DESIGNATION	8M	14M	28M	35M
NUMBER OF WIRES (Max.)	8	14	28	35
BEARING PLATE SIZE IN INCHES	3½ x 8¼	5½ x 9	7 x 11	10 x 12



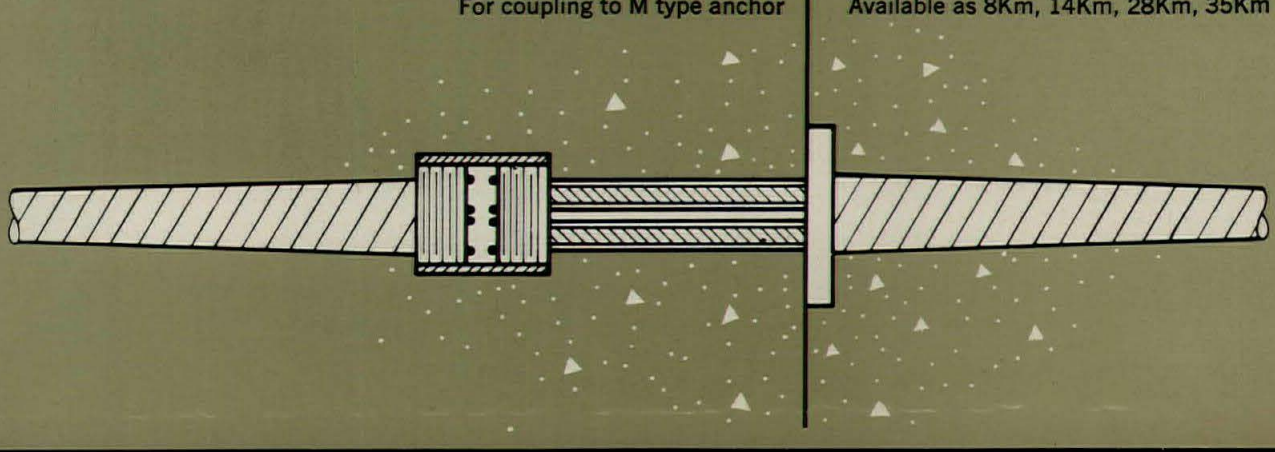
TYPE T

ANCHOR DESIGNATION	8T	14T	20T	28T	40T	46T
NUMBER OF WIRES (Max.)	8	14	20	28	40	46
BEARING PLATE SIZE IN INCHES	6½ x 3½	8 x 5	11 x 5	9½ x 8	16 x 7	13 x 9¾

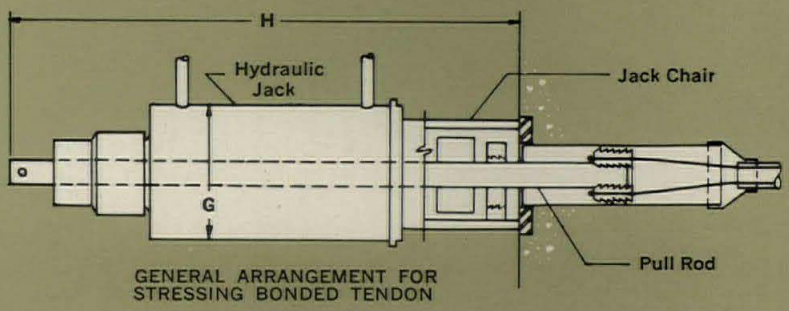
TYPE KM

For coupling to M type anchor

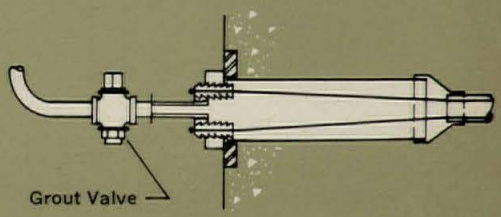
Available as 8Km, 14Km, 28Km, 35Km



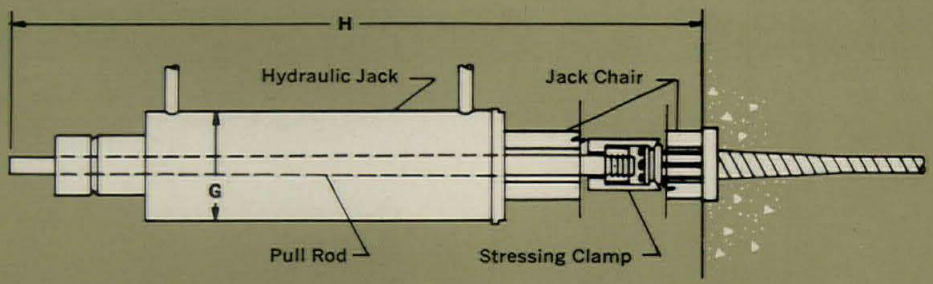
FIELD EQUIPMENT DATA



GENERAL ARRANGEMENT FOR STRESSING BONDED TENDON



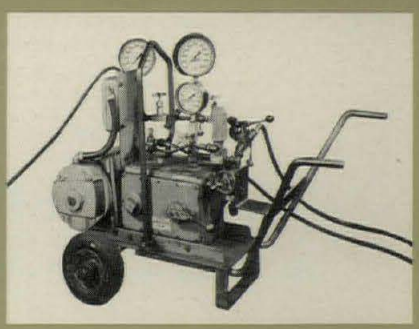
GROUTING

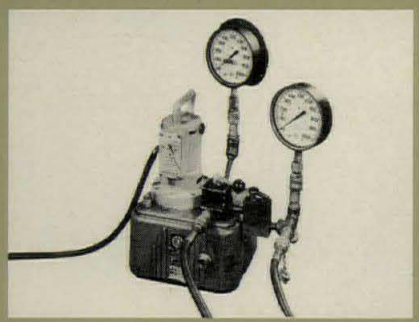


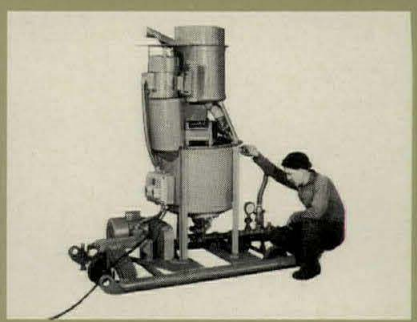
GENERAL ARRANGEMENT FOR STRESSING UNBONDED TENDON

STRESSING JACK DATA

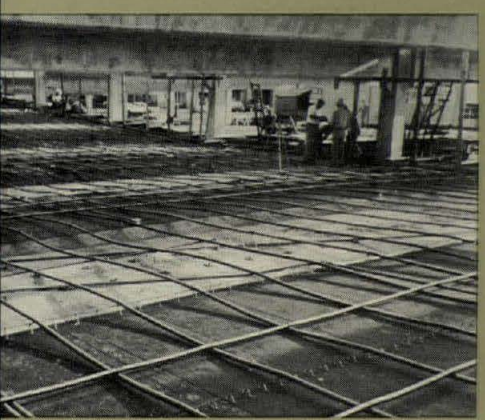
STRESSING CAPACITY (Max. No. Wires)	8	12	20	30	40	54	108
CAPACITY (Tons)	40	60	100	150	200	250	500
MINIMUM CLEARANCE (G)	5″	8″	9″	11″	13″	13″	18″
MINIMUM CLEARANCE (H)	3′-9″	4′-0″	4′-6″	5′-0″	5′-0″	5′-0″	5′-6″
JACK WEIGHT IN LBS. (With Accessories)	230	280	330	550	950	950	2550





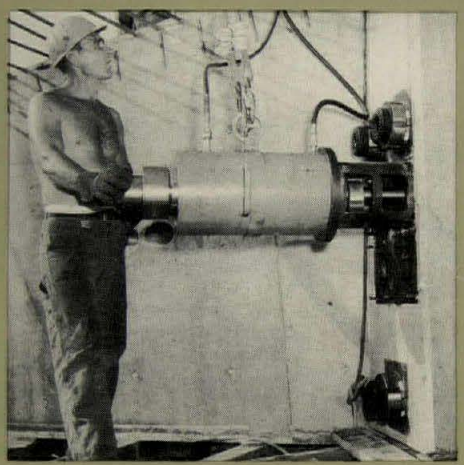


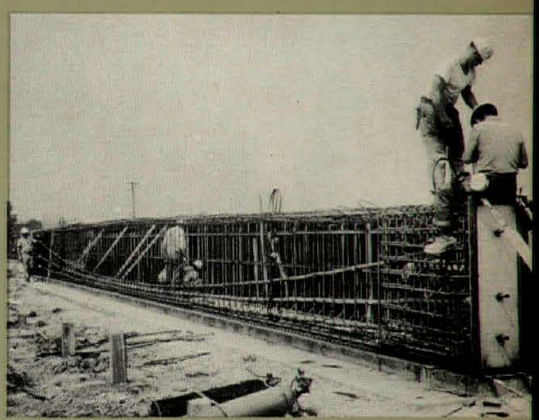
Left: High speed hydraulic pressure pump for operating stressing jack. Approx. wt., 700 lbs. **Center** Medium speed pump. Approx. wt., 75 lbs. **Right:** Combination grout mixer & pump. Approx. wt., 1650 lbs.



Above: Tendons for one-way slab to be poured in place over precast beams. (Tendons in one direction for temperature only.) Wide spacing with no auxiliary reinforcing steel needed makes placement of utilities and pouring easier.

Below: Stressing equipment including hydraulic jack and pump permit accurate measurement of force and elongation. Here, 200-ton jack is being used to stress 40-wire bridge beam tendons.





Above: Grout-type tendons positioned in simply supported beam —in this case precast at the job site. Because of large forces developed by the Ryerson BBRV tendons, only three were required in this 95 ft. beam unit.

FRONT COVER PHOTOS

1. Arizona Veterans' Memorial Coliseum for Arizona State Fair Commission — Circular saddle-type roof 380' in diameter is suspended on two-way grid of Ryerson tendons. **Architects & Engineers:** Associated State Capitol Architects; Leschner & Mahoney; Place & Place. **Consulting Engineer** on roof structure: T. Y. Lin & Assoc., Dallas. **General Contractor:** Manhattan-Dickman Construction. **Mgt. & Operations Consultant:** Emmett Race.

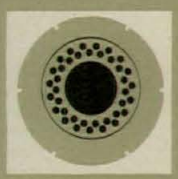
2. St. Louis Civic Center Busch Memorial Stadium — Extreme post-tensioned cantilevers keep columns back out of sight lines. **Engineers & Architects:** Sverdrup & Parcel and Assoc., Inc. **Architect-Designer:** Edward Durell Stone. **Associate Architects:** Schwarz & Van Hoefen. **Contractors:** Fruin Colnon Co. and Millstone Construction Co.

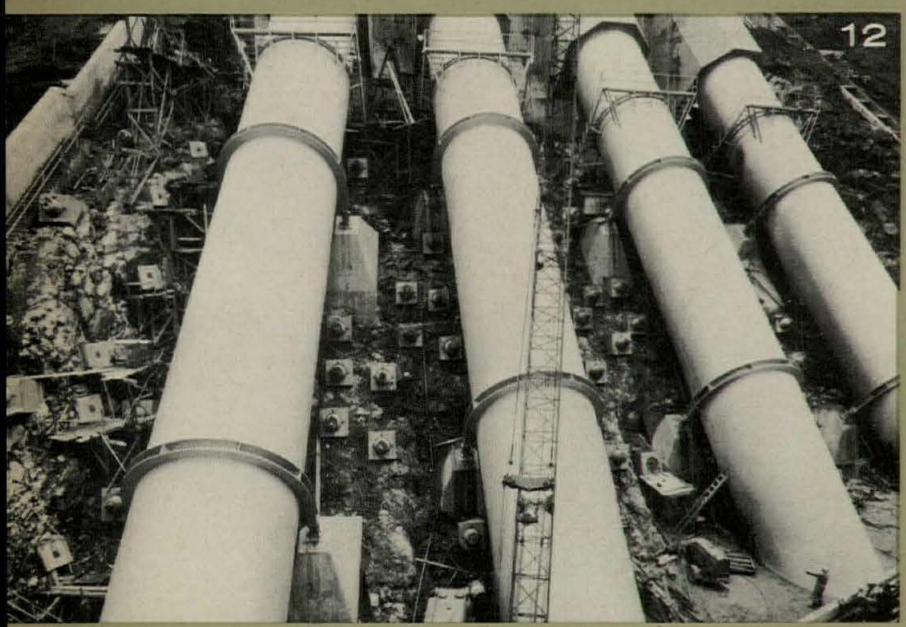
3. Wanapum Dam on Columbia River — Ryerson post-tensioning in piers supports tainter gates subject to 3,750 tons of pressure. P-T rock anchors also used for added stability. **Owner:** Grant County (Washington) Public Utility District. **Contractor:** Grant County Constructors (a joint venture of Morrison-Knudsen, Inc.; Henry Kaiser Co.; Macco Corp.; Raymond International and F & S Contracting Co.) **Engineer:** Harza Engineering Co.

4. LaGuardia Airport Runway Extensions — One of the largest prestressed post-tensioned projects in the world encompassing two million sq. ft. of pile supported slab extending jet runways out into Flushing Bay. **Owner-Engineer:** The Port of New York Authority. **Contractor:** Steers, Spearin, Tully & Gerwick.

ON THIS PAGE

10. San Juan Office Building — Nineteen-story Banco Popular Center economically achieves maximum column-free floor areas and minimum structural depth with post-tensioned one-way joist slabs. **Project Manager:** Cushman & Wakefield, Inc. **Architects:** Toro-Ferrer, and Kahn & Jacobs. **Structural Engineers:** Dinos & Vafi, and Lev Zetlin & Assoc. **General Contractor:** George A. Fuller Co. of Puerto Rico. **Sub-contractor for Concrete Work:** Pavarini Construction Co. of Puerto Rico. **Subcontractor for Rebar & Post-Tensioning:** G & H Steel Service, Inc.





11. Rotatable shipping racks give protection to coiled tendons enroute, minimize storage space requirements at job site and simplify handling and placement.

12. Penstock Slope Stabilization at Mayfield Dam. 90-wire rock-anchor tendons 150' long were used by the City of Tacoma, Wash., to prevent movement of unstable slope under weight of intake structure. **Engineers:** Harza Engineering Co.

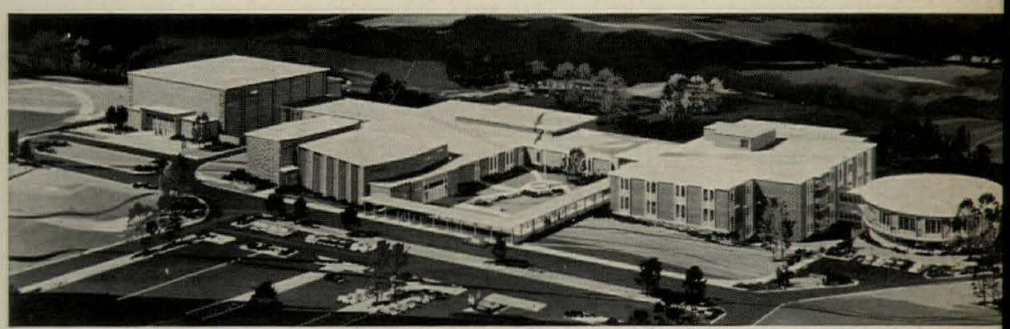
ALLAS, TEXAS: 34-story, 1,000,000 sq. ft. One Main ace office building. *Architects:* Skidmore, Owings & errill; Harwood K. Smith and Partners. *Engineer:* erman Blum. *Contractor:* Henry C. Beck.

CHICAGO, ILLINOIS: 33-story, 600-room Holiday Inn motor hotel. *Architect/Engineer:* William Bond & Associates. *Contractor:* Turner Construction Company.

WHITTIER, CALIFORNIA: 172,000 sq. ft. Broadway department store. *Architect:* Charles Luckman Associates. *Electrical Engineer:* C. E. Mauk.

SPRINGFIELD, MASSACHUSETTS: 5,000 sq. ft. Metropolitan Life Insurance Company branch office building. *Contractor:* A. C. Dufault. (Design by Metropolitan Life Insurance Company architects.)

TAMPA, FLORIDA: 8-story, 97,000 sq. ft. IBM office building. *Architect:* Aeck Associates. *Engineer:* Blakely-Daniels and Associates. *Contractor:* International Construction Co.



JOHNSON COUNTY, KANSAS: 2000-student, 287,400 sq. ft. Shawnee Mission South High School. *Architect:* Tanner, Linscott & Associates. *Engineer:* Scott, Kinney, Holloway and Perkins. *Contractor:* Sharp Brothers Construction Company.

Now...the big ones are going All-Electric

More and more architects and engineers are finding that all-electric design, with flameless electric heating and cooling, can hold down first costs for clients in buildings of all types through the elimination of such items as boiler rooms, fuel storage, stacks and long pipe or duct runs.

Annual costs can also be reduced, since simpler control systems and lower maintenance require fewer employees.

Moreover, because of the wide variety of equipment types to choose from, all-electric design permits greater architectural freedom and flexibility. Expansion becomes easier, too. And all-electric design can also provide from 5% to 10% more usable floor space for additional building capacity.

For more facts about the proven advantages of applying all-electric design to your industrial and commercial buildings, call your local electric utility company. They will welcome the opportunity to work with you.

This plaque identifies a modern building, meeting the standards of electric heating, cooling, lighting and other applications set by Edison Electric Institute.

ALL-ELECTRIC BUILDING AWARD

LIVE BETTER ELECTRICALLY

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

Money-saving idea

Now you can get structural durable shop primers based on

Tough, mill-applied coatings cost less than field application—give dependable protection during shipment, field storage and erection—provide an excellent base for a wide variety of topcoats.

UNTIL RECENTLY, mill-applied primers on steel products were costly and did a poor job of protection. So most users of structural steel had to do the priming themselves in the field.

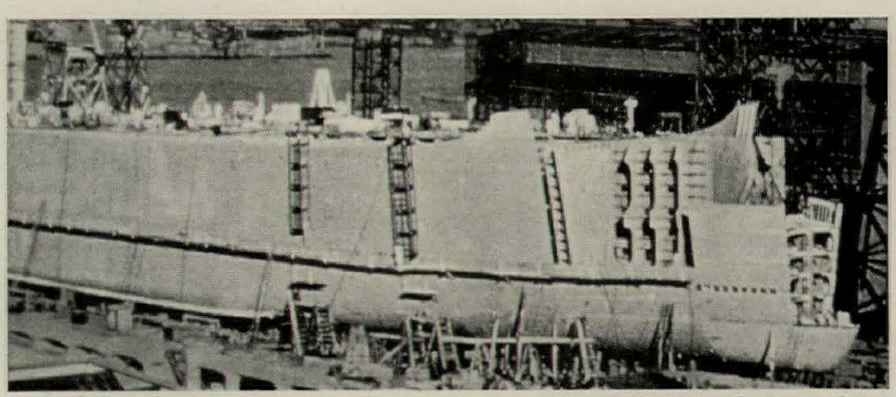
But no longer. Now many structural steel suppliers are equipped to apply the first truly durable and economical shop primers for steel. These highly impact-, weather-, and corrosion-resistant epoxy coatings are based on Shell Epon and Eponol resins. They *save you money* in two ways:

1. Fabricators can offer these coatings at a very attractive price compared to materials and labor for field priming. Fast dry of the coating system, plus new automatic sandblasting equipment, permit the economies of production-line operation.

2. These primers have excellent resistance to the heat of cutting and welding operations, as well as to physical abuse and corrosive environments. This minimizes the amount of spot-repairing required before application of topcoats, and insures long-lasting protection of the coated structure.

Excellent base for topcoats

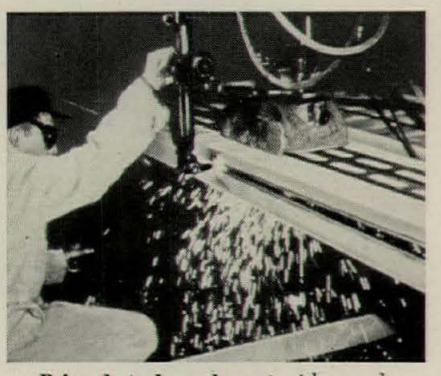
In addition, primers based on Epon and Eponol resins provide an excellent base for a wide variety of topcoat systems. In most cases, removal of surface contaminants by washing and/or solvent cleaning will insure good adhesion to the aged primer.



Ship's hull stays clean, rust-free during assembly when steel has been shop-primed with zinc-rich primers based on Epon or Eponol resins.

Bonus advantages

Cleaning and priming of the steel by the fabricator lets him do a better job of inspection. He's much more apt to spot flaws before shipment, saving you time and trouble on the jobsite. Also, shop-primed steel is cleaner and safer to handle.



Primed steel can be cut without adversely affecting corrosion resistance when zinc-rich primers based on EPON or EPONOL resins are used. The zinc fuses around the cutting area as in hot-dip galvanizing.

Three cost-saving shop primers

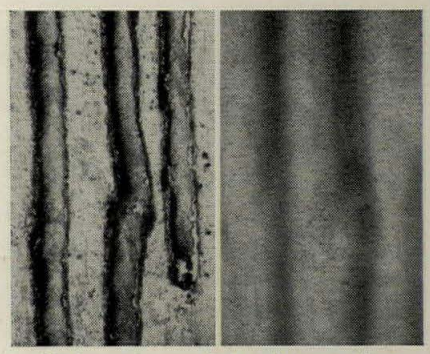
Choose from a shop primer based on Epon resin or from two different primers based on Eponol resin. Here are the advantages of the three primers:

1. Zinc-rich primers based on Epon resin offer:

- *Outstanding adhesion, toughness and abrasion resistance*—minimize damage in handling and fabrication.
- *Excellent resistance to corrosion at low film thickness*—in most marine and industrial environments as little as ½ mil gives adequate protection until the finishing coats are applied (not recommended if exposure to highly acidic or alkaline atmospheres is expected to occur prior to application of topcoats).

steel precoated with truly Shell Epon® and Eponol® resins

• *Weldability*—there's no loss of corrosion resistance due to heat from welding and cutting—no hazard to workers. Except for certain critical applications involving special grades of steel, welds of entirely satisfactory quality can be made with zinc-rich primers.



No loss of corrosion resistance after welding a plate coated ½ mil with a zinc-rich primer. (Left) Only the weld beads themselves show rusting after 6 months' outdoor storage. (Right) Except for discoloration, there is no apparent damage to the primer on the reverse side.

• *Cathodic protection*—retards corrosion of steel substrate even where surface is exposed by scratches or other physical damage to primer.

• *Good intercoat adhesion with a wide variety of topcoats.*

• *Resistance to solvents*—prevents softening when overcoated with paints containing strong solvents.

2. Zinc-rich primers based on Eponol resin

These primers offer the same desirable properties as Epon resin-based zinc-rich primers with the exception of solvent resistance.

3. General purpose primers based on Eponol resin offer:

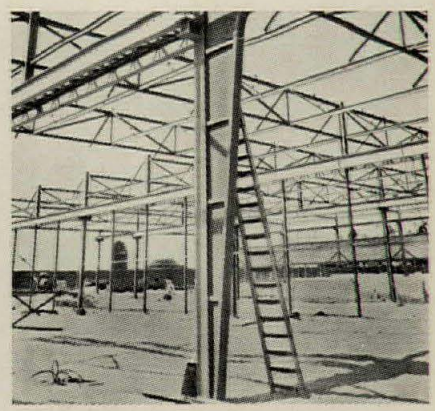
• *Outstanding adhesion and toughness*—minimize damage in handling and fabrication.

• *Excellent corrosion resistance*—a single 1-mil coat exhibits good resistance to atmospheric corrosion even in acidic, alkaline and marine environments.

• *Good intercoat adhesion with a wide variety of topcoats.*

Mail coupon for details and assistance

Many steel fabricators across the country can now apply these new shop primers to your specifications. At your request, Shell will arrange to have a formulator of these primers contact you. He will work with you and your steel supplier to bring you products with the exact shop primer your project needs. *Just send in the coupon.*



Steel members in this structure were coated with an EPON resin-based zinc-rich primer to prevent rusting during construction.

Shell Chemical Company
Plastics & Resins Division
110 West 51st Street
New York, New York 10020

Shell Chemical Company
Plastics and Resins Division

I would like to be contacted by a formulator of: ☐ zinc-rich primers based on EPON resin ☐ zinc-rich primers based on EPONOL resin ☐ general-purpose primers based on EPONOL resin.

I am interested in using shop-primed steel for_____

Name_____ **Position**_____

Firm_____

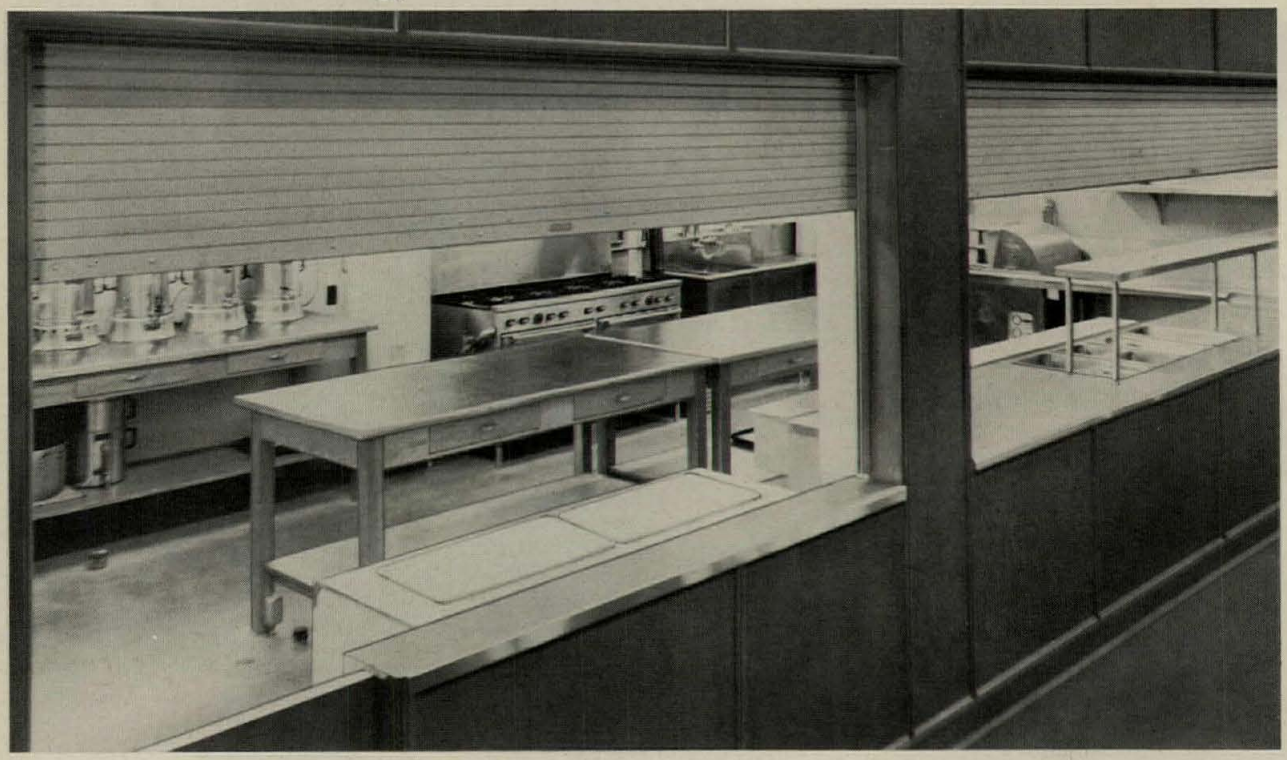
Address_____

City_____ **State**_____ **Zip**_____

AR-12

For more data, circle 15 on inquiry card

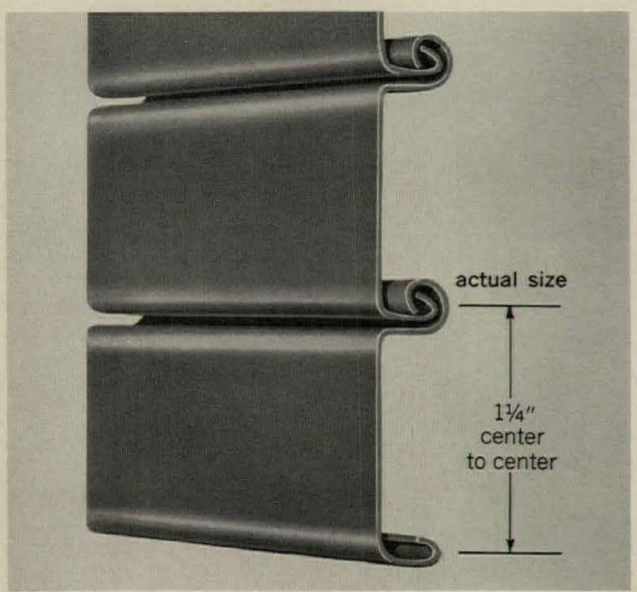
Now...an answer to one of your difficult closure problems...



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.

COOKSON®

"Best Way To Close An Opening"

THE COOKSON COMPANY
700 PENNSYLVANIA AVE., SAN FRANCISCO, CALIF. 94107

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New . . . for the budget-minded with elegant ideas . . .

meet the moderately priced Radcliffe

asing smooth-line sculptured
gn. Modern low silhouette. No
channels on the outside of bowl.
er-efficient siphon jet action.
y all give the new Radcliffe a look
legance.

et, this siphon jet beauty sells at
ld-fashioned, reverse trap price.
ou get a choice of elongated rim
gular rim, in telescopic and deco-
l seat options. Available in white
Crane decorator colors. As an
on, you can choose the Neu-
ara tank . . . urethane-lined for
imum sweat.

ne thing more, there won't be

any time-consuming, unprofitable return calls because the Radcliffe is built to endure. We'll stake our engineering reputation on that.

Call your Crane sales office, or wholesale distributor. Or write Crane Co., Dept. 008, 4100 South Kedzie Avenue, Chicago, Illinois 60632.

For more data, circle 17 on inquiry card

CRANE

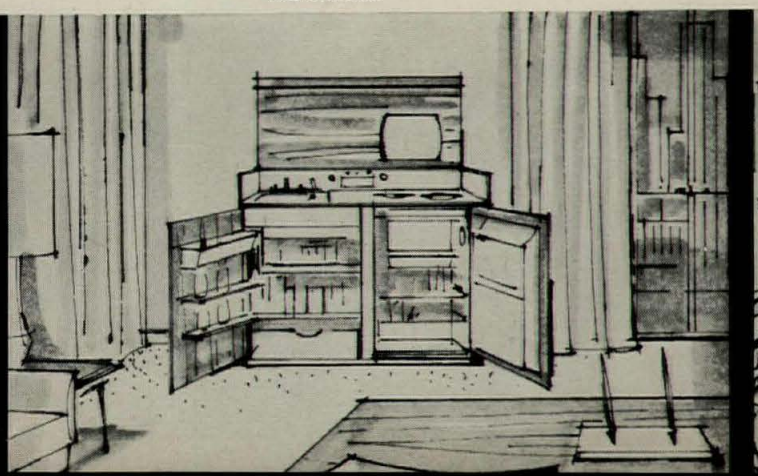
VALVES • PUMPS • FITTINGS • WATER TREATMENT
PIPING • PLUMBING • HEATING • AIR CONDITIONING

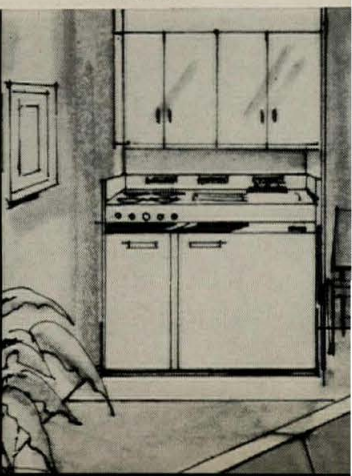
Crane Chef Model 872
A complete compact kitchen. Includes gas or electric range with oven and broiler; sink; 8 cu. ft. self-defrosting refrigerator with 40 lb. freezer; storage compartment. Disposer optional.

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

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

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





Crane Chef® announces the most complete line of compact kitchens—ever!

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.

THE NAME IS

CRANE

VALVES • PUMPS • FITTINGS • WATER TREATMENT
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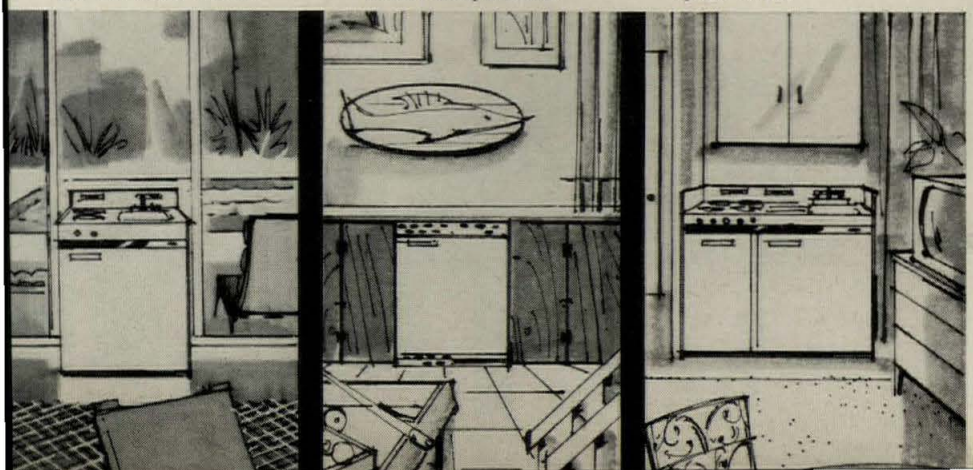
Second Homes
Model 529-GS has gas or electric counter-top range, sink and built-in refrigerator with full-width freezer.

Game Rooms
Model 529 is an under-counter or free-standing refrigerator with full width freezer compartment.

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



Crane Co.
Crane Chef—Dept. 008
4100 South Kedzie Avenue
Chicago, Illinois 60632

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

Name_____

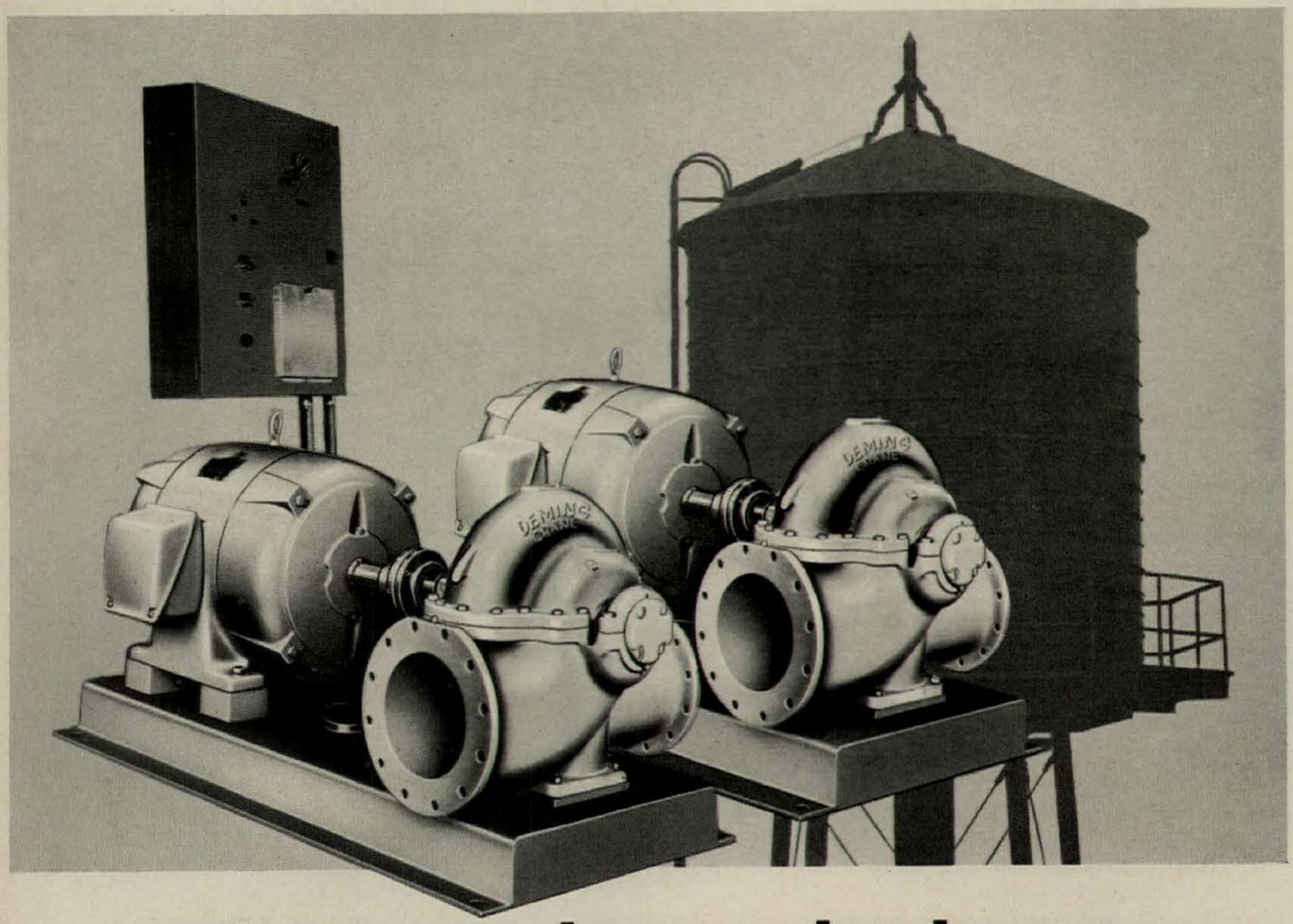
Company_____

Address_____

City_____ State_____ Zip_____

For more data, circle 43 on inquiry card

Crane constant pressure systems obsolete the water tower.



They cost less, take less space and do a better job.

Crane constant pressure systems offer a number of benefits old fashioned water towers just can't match.

First, these systems are compact. Incorporating Crane pumps in an electrically controlled system, they require less space than mechanical systems . . . eliminate the need to build expensive foundation-to-roof supports.

Second, constant pressure means just that. No matter how many showers, baths, or other demands for water are turned on at the same time, the control system automatically senses the pressure requirements and signals the pumps to meet them. This procedure also saves on fuel and increases the pumps' operating life.

There are benefits over mechanical constant pressure systems, too: the solid-state control system responds quickly and accurately, with no moving parts to wear out; it also eliminates the need for a bulky fluid-coupling device. Another important feature: you don't need anybody around to operate the Crane system.

Learn all the economical facts about Crane constant pressure systems. Write for bulletin CP-1000, Crane Co., Dept. 008, 4100 South Kedzie Avenue, Chicago, Illinois 60632.

CRANE

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Western Articles to go National; No More "Western Section"

Next month this so-called Western Section of ARCHITECTURAL RECORD will move into the main section of the magazine. That is to say, our coverage of western buildings and western architectural achievements will be reported in the main section of the magazine, and we shall drop this localized coverage in the "Western Section."

We are anticipating that by this move we can increase the attention of the architectural field to the happenings in the western states. So much has been happening there, so much that is significant to the rest of the country, that we feel it all needs national exposure. We shall stop the practice of "this for Western, this for National." That is not to say that every little news item that once made the Western Section will automatically make the national edition, but it does mean that every significant architectural event will be nationally, not just locally, exposed.

We have been increasingly interested in the West. The West has always been more progressive in some ways than the East. But lately the western willingness to fly far has been forced to assume responsible leadership in many areas. Industrial expansion, population growth, new towns, new campuses, new highways and transit systems, and so on.

Now I am getting fearful lest in this view of the West you imagine any reflection on the efforts of Elisabeth Kendall Thompson, for 19 years our western editor. Certainly none is intended; rather it is the other way 'round. We want Betty to spend her time on the national edition, and make a larger contribution to it. While she has made large contributions to the national editions, she has always had to take time to arrange all that western copy and write that western editorial, and so on. Betty is already, of course, busy arranging more stories on western projects, breaking away from what was essentially a news orientation to architectural material.

No, you will not lose Betty. She will be doing business at the same old stand, and she will be—as she has been—the only staff member of an architectural magazine stationed on the West Coast. She will be more free to travel and will be more available for the larger, penetrating stories. She will have more visits from New York staff members on special story assignments. And if it is really true that the West is finding earlier solutions to some of the problems of Eastern cities, Betty will be interpreting these matters for the national audience.

You will lose her editorial page; indeed you have already lost it, because I am usurping her usual space for this announcement.

Perhaps at this point you can stand a bit of the lore of publishing. Betty's Western Section was always well read. (You know we have readership checked every so often, so that we don't have to guess about how our readers are following our efforts.) And yet readers never did show much enthusiasm for the *idea* of a Western Section. We made them feel a trifle provincial, I suppose. And they always wanted their own material published in the "National," not the "Western."

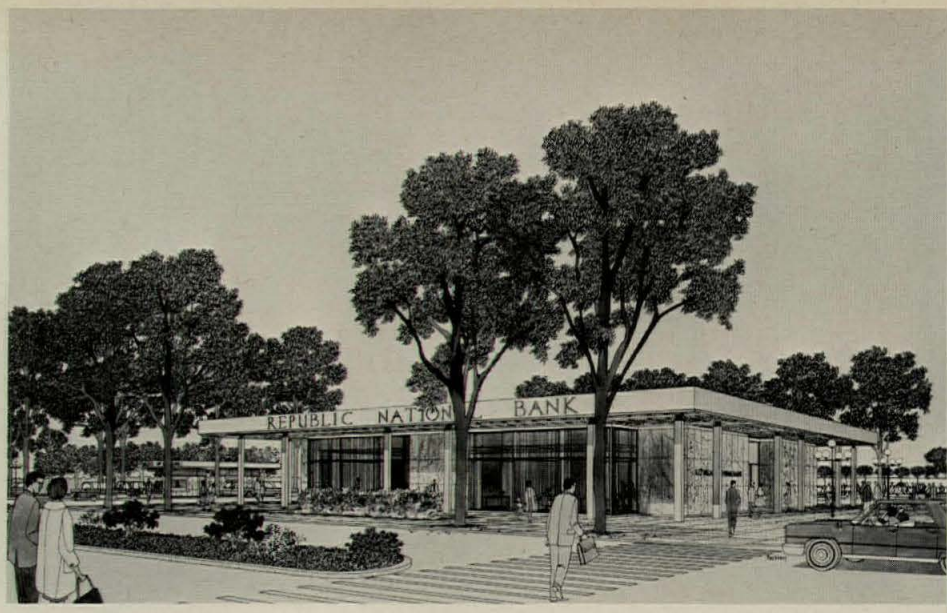
In any case, analysis shows that the original purpose of the Western Section has pretty well run out. Nineteen years ago the West was a lot farther away from the East than it is now. In fact, to tell the truth, it seems we started the special Western Section just as the two halves of the country began moving closer together. In the beginning many eastern building material manufacturers did not ship to the West Coast, and vice versa, and design was naturally restricted. For a while, too, the West necessarily paid more attention to local design influences —climate, outdoor living, and so on. But about the time the International Style was sweeping everything before it, all the other influences began to pull together, and we in the East learned about outdoor living and low-pitched roofs. Western readers began assuring us that they also lived in the United States.

Suffice it to say that magazines, like architects, are broadening their interests and activities, and the mere reporting of buildings of good architecture is but one of the functions of publishing. We shall never stop searching out and publishing good architecture, but we shall not limit ourselves to such recording. And so it is with the West—we need its architecture, yes, but we also need its leadership, its power, its penetration. —*Emerson Goble*

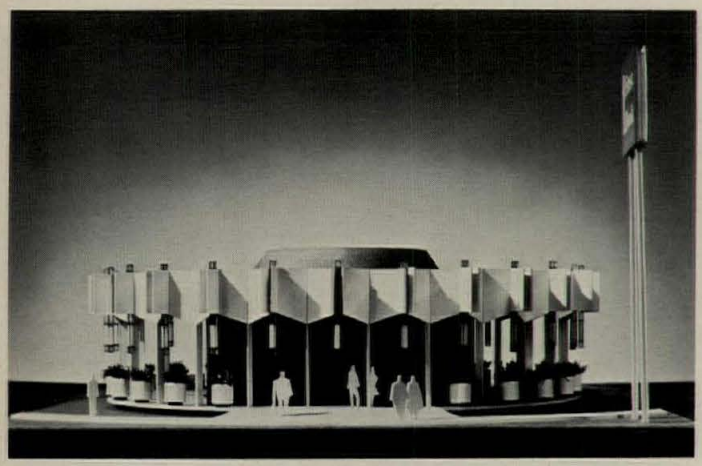
THIS MONTH'S WESTERN REPORTS:

WESTERN BUILDINGS IN THE NEWS

Designed to take a second story, the new Republic National Bank building in Englewood, Colorado will be a pleasant pavilion in its initial phase. Precast concrete exposed aggregate panels face the steel columns and roof fascia; the building ends will be marble-faced. Side walls will be solar bronze tinted glass. Entrances will be at either end. Architect: Charles S. Sink; structural engineer: Robert H. Voiland; mechanical engineer: Francis E. Stark; electrical engineers: Swanson-Rink & Associates.

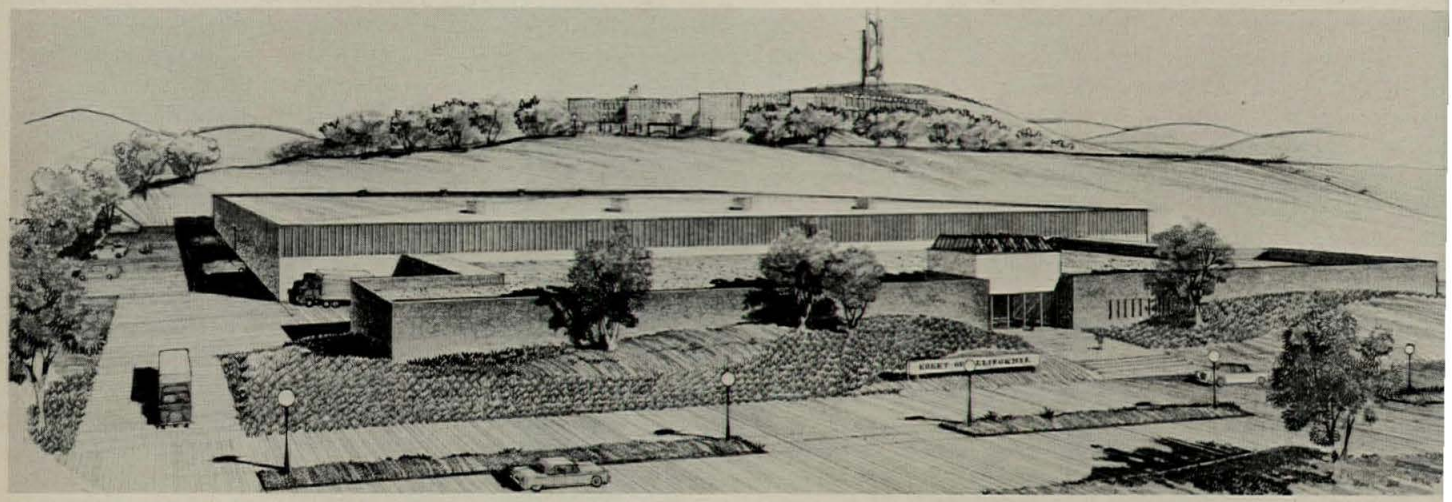


Jeremiah Bragstad

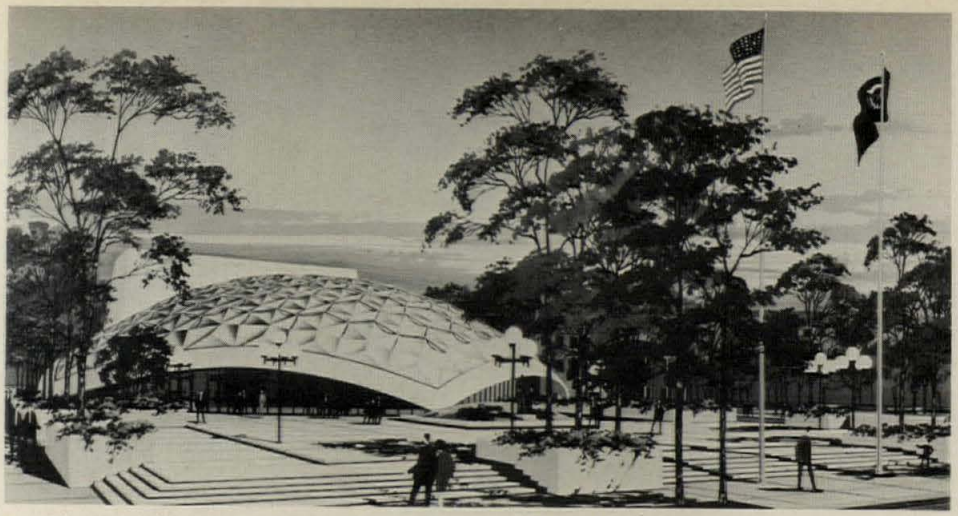


First of three new neighborhood bank buildings to be built by First Western Bank in its expansion program in California is this building in the West Shaw Shopping Center in Fresno. The design is the prototype for many such small branches to be built throughout the state. The building is actually square but appears circular because of the sunshades and trellis which shield the glass walls. Architects: Bodrell Joer'dan Smith & Associates; structural engineer: Yuda Wolfson; mechanical engineers: A-G Engineers.

An addition to Our Lady's Home for the Aged in Oakland, California will be the first phase of a four-phase expansion program aimed at ultimately providing accommodations and facilities for care of 450 ambulatory, semiambulatory and bed-ridden old people. The six-story addition will contain living quarters for 130 ambulatory persons, including single and (a few) double rooms, central kitchen, dining room, lounges and offices. Architects: Gerald M. McCue & Associates; general contractors: Pacific Company of Berkeley.



An automated distribution center for Koret of California, women's sportswear manufacturer, is under construction on a 10-acre site in Cabot, Cabot & Forbes Industrial Park in South San Francisco. The $3-million center will have a capacity for shipping of one-million units per month, and for storage of one-half-million units per month. Architects: Knorr & Elliott; contractors: MacDonald and Nelson.



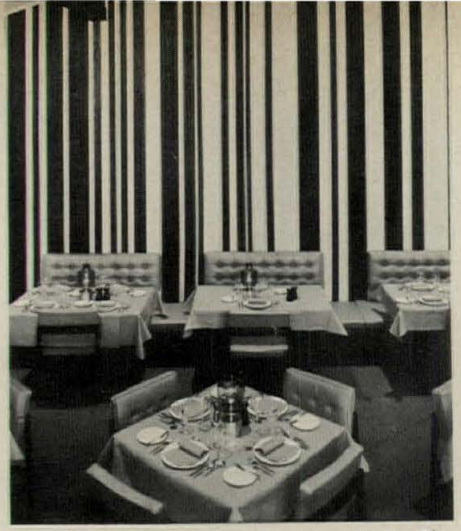
A gold-anodized geodesic dome will form the auditorium and exhibition hall for the Pioneer Theater-Auditorium in Reno, Nevada. The 144-ft diameter dome, weighing 40,000 pounds and capable of withstanding 125-mile per hour winds and of carrying a 240-ton load of snow, will be erected in three weeks. In addition to the 1401-seat theater-auditorium and the 12,000-square-foot exhibition hall, the building will contain meeting rooms and a cocktail lounge. Architects: Bozalis, Dickinson and Roloff, Oklahoma City, in association with Ferris and Erskine, Reno; contractors: (dome) Temcor, (general) Brunzell Co.

Los Angeles' tallest apartment building is the recently completed Sierra Tower, 32 stories high. The $10-million, 144-apartment building stands on a one-acre site near Sunset Strip and Beverly Hills. The first five levels above ground provide parking for 246 cars; the sixth floor is a health club. Architect: Jack Allen Charney; structural engineers: Erkel, Greenfield & Associates; general contractors: Minskoff Construction Co.

To retain as many mature trees and shrubs as possible, aerial photographs, contour surveys and on-site inspections by the architects were a part of the pre-design analysis for the new Finn Hill Junior High School in King County, Washington. Site is a 30-acre wooded area on the brow of a hill near Kirkland. The school provides for 830 pupils and includes facilities for 24 handicapped students. Total costs came to $19.21 per square foot. Architect: Waldron Dietz; structural engineer: John H. Stevenson; mechanical engineer: Notkin & Associates; electrical engineers: Beverly A. Travis & Assocs.; contractor: Vandivort Construction.

Low-rent housing for Alaska cities and villages is well under way, with the first of the post-earthquake projects due for completion early next year. Among projects under construction is Loussac Manor in Anchorage, an eight-acre subdivision of one and two story residential structures and a community center. Architects: Crittenden, Casseta, Wirum and Jacobs; contractors: Investment Contractors Inc.

Honor award, Western Mountain Region, A.I.A. Resources Inc., Denver, Colorado. Architects: Moore and Bush.



Honor award, Western Region, A.I.D. The Seven Levels Inn, Teton Village, Wyoming. Designer: Dick Heraty, Bethune and Moore.

A.I.A. and A.I.D. present awards at joint conference

This year's annual awards program at the Western Mountain region, A.I.A., conference was extended to incorporate a program for members of the American Institute of Interior Designers who met with the A.I.A. in Santa Fe. Each program was separately judged and honors were separately awarded. In addition to an honor award in each program, five architectural merit awards were presented.

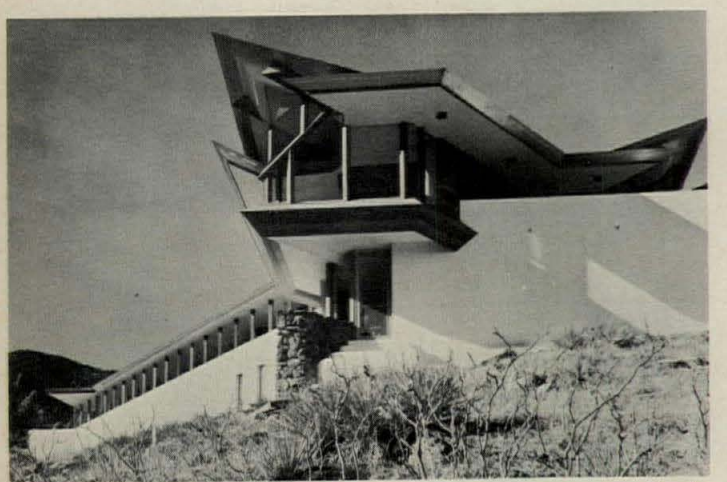
Merit awards, A.I.A.

Bill Sears

East Elementary School, Tooele, Utah. Architects: Scott & Louie.

First Unitarian Church, Albuquerque, New Mexico. Architect: Harvey S. Hoshour.

First National Bank of Arizona, Tucson, Arizona. Architects: Cain, Nelson & Wares.



Residence for Dr. Robert Willard, Boulder, Colorado. Architect: Charles A. Haertling.

Neil Koppes

Rush Memorial Medical Building, Phoenix, Arizona. Architect: Bennie M. Gonzales.

Spokane architects honor four buildings

Four buildings by three architectural firms received awards in the 1966 honors program of the Spokane chapter, A.I.A. Two residences, a prison chapel and an airport terminal were selected for honors by a jury of three architects: Robert Wilmsen, Portland; David McKinley, Seattle; and Donlyn Lyndon, Eugene, Oregon. A Design Concept Seminar, in which the jury participated, was held as part of the awards program.

Charles R. Pearson

Honor award
Residence for Mr. and Mrs. William Trogdon, Spokane, Washington. Architect: William H. Trogdon; interior designer: Dorothy Trogdon; contractor: Gilbert D. Brauer Construction Inc.

Charles R. Pearson

Merit award
Spokane International Airport Terminal Buildings, Spokane, Washington. Architects: Warren Cummings Heylman & Associates and Trogdon-Smith.

Merit award
Residence for Mr. and Mrs. Robert Kramer, Mohler, Washington. Architects: Warren Cummings Heylman & Associates; general contractor: Gilbert D. Brauer Construction Inc.

Merit award
Chapel Building for Federal Penitentiary, McNeil Island, Washington. Architect: Moritz Kundig; structural engineer: Lyerla and Peder; mechanical engineer: Rice, Strecker & Cook; electrical engineer: Joseph M. Doyle and Associates; landscape architect: K. Hellstrom.

Hugh N. Stratford

WESTERN TOPICS

Changes in the earthquake safety code, proposed by the Structural Engineers Association of California, have been adopted by the City of Los Angeles and by the International Conference of Building Officials. The new regulations lift the 160-foot-height limit—under certain rigorous design and construction conditions—to permit the use of a reinforced concrete frame in tall buildings. The change is based on attaining ductility on quake-resistant buildings and on the practical design and construction techniques for obtaining such ductility.

Washington State's 1961 billboard law, upheld as constitutional last August, is in for a real test. A group of billboard companies will appeal the ruling on the basis that the federal government, through the 1965 Highway Beautification Act, has preempted the field of billboard control, and that exercise of the state's police power should not preclude the possible compensation of billboard owners whose signs have to be removed.

Minimum effect on the village of Las Trampas, New Mexico, has been promised by Governor Jack Campbell as a result of a meeting with the governor at which four architects, Nathaniel A. Owings of San Francisco and Pojoaque, New Mexico, Santa Feans John Gaw Meem, John McHugh and John Conron were present. The new road, whose width and route had threatened the integrity of the historic village and its fine church (*Western Reports,* November 1966), now will wind through the village on the existing route and will not be widened. The architects led the fight for preservation.

An ordinance "to preserve historical, architectural or esthetic landmarks" is under consideration by the San Francisco Planning Commission. The proposed ordinance sets up an Advisory Board to recommend sites (such as Mission Dolores) and districts (such as Chinatown) worth preserving, and permits property owners to ask for classification of their property, if it is qualified, as a historical, architectural or esthetic landmark. Under the latter provision the owner would be under pressure to maintain his property and would require future buyers likewise to maintain it.

Hawaii's new state capitol building may be finished a year early—by November 1968—according to the contractor's present estimates. With continued good weather and on-time delivery of materials, it is expected that the first-floor chambers, for the Legislature and the Judiciary, and legislators' offices on the second and third floors, would be ready by February 1968 when the Legislature convenes. The upper floors would be completed later that year.

Planning and engineering studies for a transit system for metropolitan Los Angeles are under way, now that initial funds have been made available by the state for the purpose. The funds, hailed as the "green light" for Los Angeles' much-discussed rapid transit system, will actually cover only development of plans for the system. Financing—estimated at $2 billion—will have to be voted on in November 1968 before actual construction can begin.

WESTERN EVENTS

DECEMBER

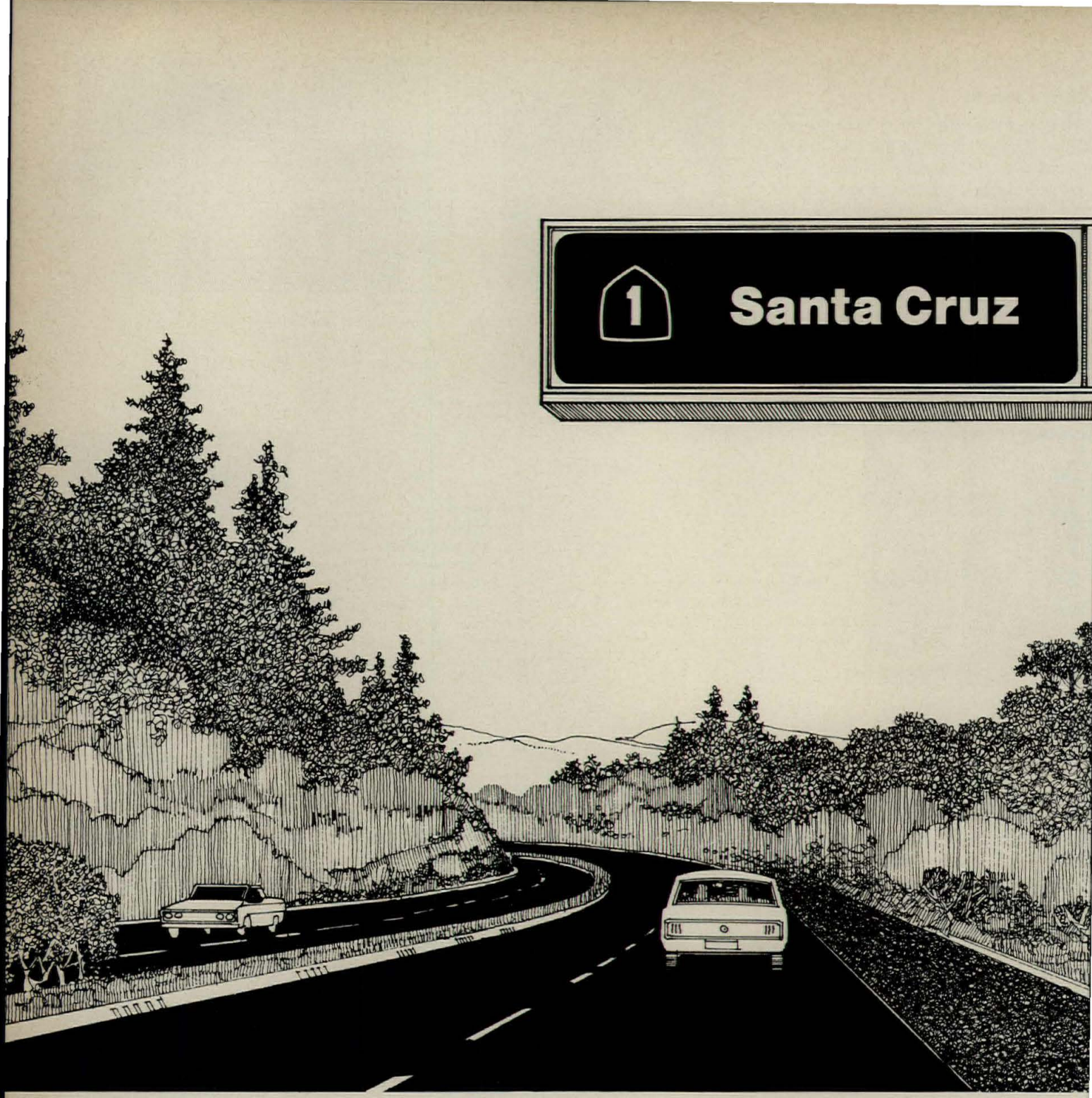
6-8 Sixteenth annual Architectural Exhibition of School Buildings and annual conference, California Association of School Administrators. Community Center, San Diego.

JANUARY

1 Closing date, exhibitions of work by artist and photographer Man Ray, artist Pablo Picasso, and artist Josef Albers. Los Angeles County Museum of Art, 5905 Wilshire Boulevard, Los Angeles.

FEBRUARY

25-March 1 Nineteenth annual California and Pacific Southwest Recreation and Park Conference. Fresno, California.



Drawing by Ernest E. Burden

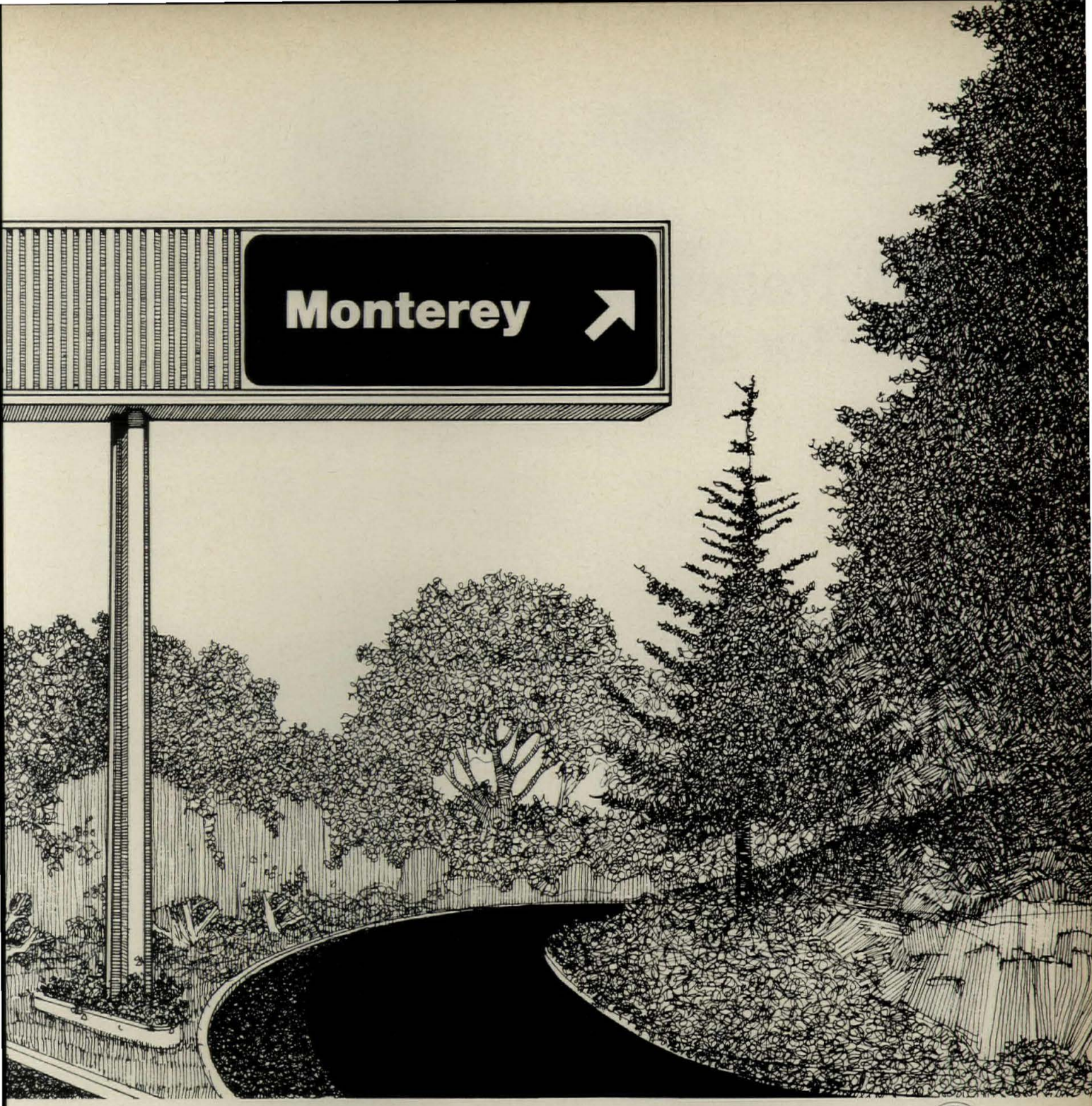
Steel signs...strength and beauty made possible by corrugated web girder design

DESIGNS OF THE TIMES... IN STEEL

PROBLEM: Design a freeway sign that combines maximum readability for safety, new attractiveness for highway beautification, and low costs for production and maintenance economy.

SOLUTION: The California Division of Highways designed this new corrugated web girder sign. The structure is essentially a box girder using formed plate for top and bottom flanges and corrugated steel sheets as web member.

RESULT: A sign which—*by design*—is more attention-commanding for safety, yet more esthetic and economical, too! Utilizing attractive but low-cost corrugated sheet for integral stiffeners, the design already has been specified for a major new freeway.



New corrugated web girder freeway sign, designed by the California Division of Highways Bridge Department, is specified for use on a new freeway.

Steel

This original solution is another example of how imaginative use of steel can result in exciting answers to ordinary problems. The corrugated web girder principle suggests still more possibilities . . such as exposed spandrel beams in ommercial building . . . or even use in arge bridge girders.

Could you use this corrugated web girder idea in one of your projects? Our Construction Marketing Department frequently helps steel users in the application of steel to designs like this. For detailed technical service, or just an answer to a question, write or call Construction Marketing Department, Kaiser Center, Oakland, California, 94604; telephone 415/271-2824.

KAISER STEEL

***ACTION* TO SERVE THE GROWING WEST**

For more data, circle 18 on inquiry card

Treacy Building, 1801 S. Catalina Avenue, Redondo Beach, California.
Architects: Young, A.I.A., & Remington. Owner-contractor: John Treacy.

The Treacy building is all-electric for a very good reason:

The builder and the owner are the same man.

When building and operating costs *both* come out of your own pocket, you don't compromise.

You build all-electric as Mr. Treacy did.

Putting in an electric heating and air conditioning system not only saved plumbing, ducting and space; it gave the architect more latitude. The absence of a boiler, flue stack and combustion air vents, for example, permitted a much more flexible design. The result was a more attractive building for less money.

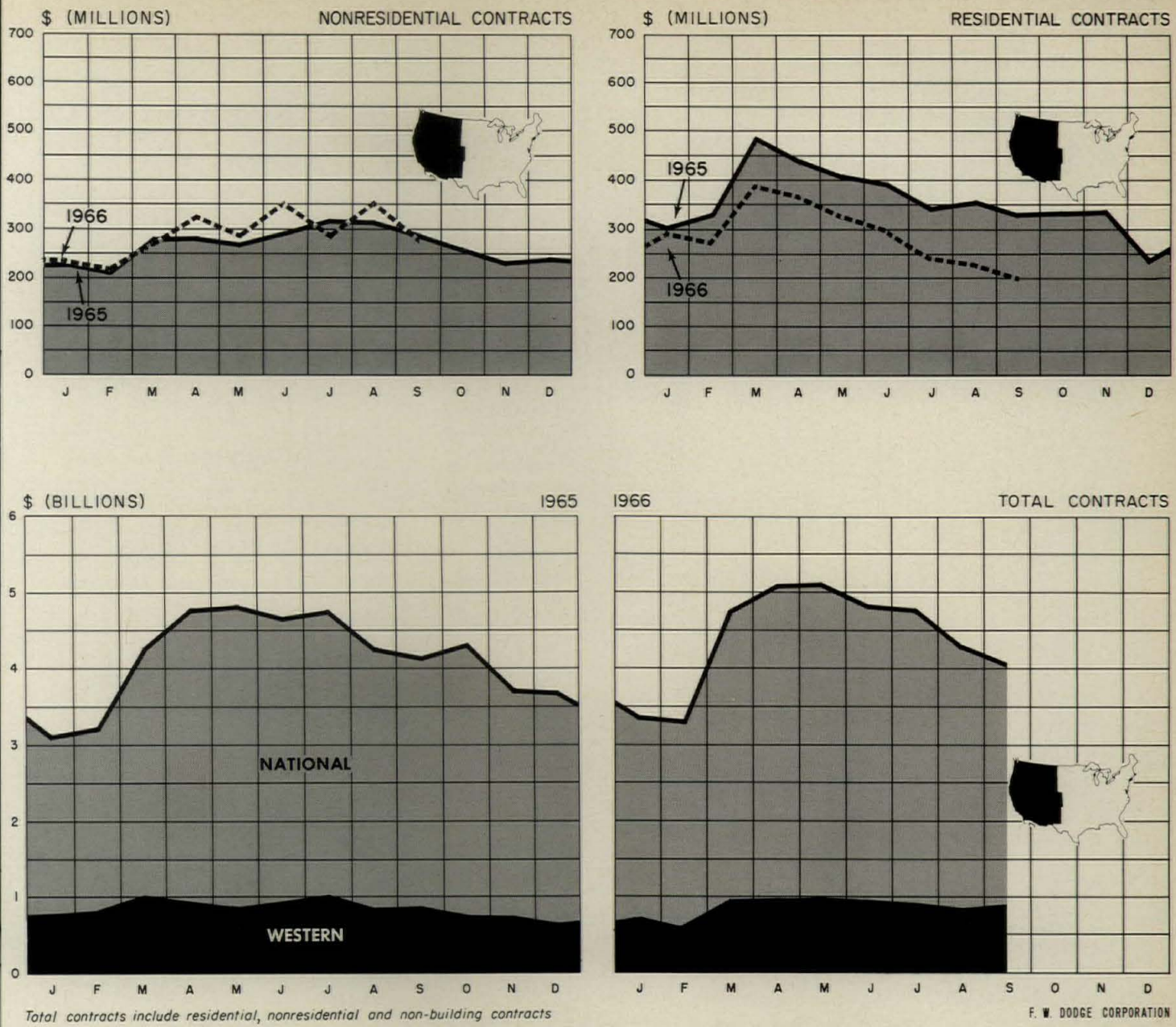
Operating costs also are low. Only one source of power is needed.

For complete information about all-electric building, write: Southern California Edison Company, Marketing-Engineering, P.O. Box 62, Terminal Annex, Los Angeles 90051.

SCE

Southern California Edison

For more data, circle 19 on inquiry card



Total contracts include residential, nonresidential and non-building contracts

F. W. DODGE CORPORATION

Western construction trends

FOR ANALYSIS OF CONSTRUCTION TRENDS NATIONWIDE SEE PAGE 44

The third quarter of 1966 closed on a higher note for Western construction. Three large electrical utility contracts—one of them for $150 million—combined to push total contract value up over $900 million for the month of September, 4 per cent ahead of the 1965 amount.

Nonbuilding construction, enjoying its fifth successive large monthly gain (this one a huge 61 per cent over September 1965), is now the strongest category in the West on a cumulative basis. Nonresidential building trended about even with the year-ago amount during September, while residential contracts experienced another sharp decline.

The Western housing slump reached the end of its third year in September. Residential dwelling units were being built at the exceptionally high annual rate of nearly 435,000 units during the third quarter of 1963. They have not come close to that level since. In fact, Western residential contracts have spent *every* month of 1966 below 1965 levels, and in every month but one, these declines have been in excess of 15 per cent.

Despite these extremely low levels of activity, the unrented and unsold backlogs have still not been worked off. Much to the surprise of housing analysts, third-quarter vacancy rate figures for the West were slightly *above* second quarter levels for both houses and apartments.

The composite performance of Western nonresidential building trended about even with the September 1965 figure, but this outcome was the result of some wide variations in the behavior of the individual components. Both hospital and social and recreational contracts were more than *double* their 1965 value. Commercial building gained 14 per cent on the strength of a sharp rise in office and bank contracts. Contracts for industrial plants fell a full 50 per cent, however, and educational and science building declined four per cent.

Cumulatively, the total value of Western construction contracts stood 5 per cent below 1965's figure at the three-quarter mark. This was mainly a reflection of the 22 per cent deficit in residential building. Nonresidential contracts were ahead of the year-ago amount by 6 per cent, while the nonbuilding category gained 9 per cent.

James E. Carlson, *Associate Economist*
F. W. Dodge Company
A Division of McGraw-Hill, Inc.

Estimator's Guide: Seattle and The Northwest

The Estimator's Guide alternates monthly among four Western areas. The prices at right are compiled from average quotations received by LeRoy Construction Services for commercial work of approximately $100,000-$250,000 total value. Except as otherwise noted, prices are for work installed including all labor, material, taxes, overhead and subcontractors' profit. Material prices include local delivery except as noted, but no state or local taxes.

EXCAVATION

MACHINE WORK IN COMMON GROUND

Large basement .....CY .90-1.20
Small pits .....CY 1.50-2.00
Trenches .....CY 2.00-2.75

HAND WORK IN COMMON GROUND

Large pits & trenches.CY 8.75-13.00
Small pits & trimming CY 12.80-17.00
Hard clay or shale, 2 times above rates. Shoring, bracing & disposal of water not included.

SEWER PIPE MATERIALS

VITRIFIED

Standard 4" .....LF .33
Standard 6" .....LF .66
Standard 8" .....LF .96
Standard 12" .....LF 2.03
Standard 24" .....LF 8.27

CLAY DRAIN PIPE

Standard 6" .....LF .33
Standard 8" .....LF .48

Rate for 100 LF FOB Warehouse

CONCRETE & AGGREGATES

Gravel, all sizes .....TON 3.75
Top sand .....TON 4.00
Concrete mix .....TON 4.10
Crushed rock
¼" to ¾" .....TON 4.00
¾" to 1½" .....TON 4.00
Lightweight aggregate .....CY 8.00
Expanded Perlite .....30# Sack 1.45
Roofing gravel .....TON 4.10
Sand (#1 & 2) .....TON 5.00
Cement
Common, all brands (paper sacks)
Small quantities ...Per Sack 1.40
Large quantities ....Per Bll 4.45
Atlas White .....Per Sack 3.70
Concrete mix
6 sacks in 5-yd loads...Per Yd 15.65
Lightweight 6 Sacks ...Per Cy 21.25
Curing compound
Clear, 5-gal drums....Per Gal 1.45

STEEL MATERIALS

SHEETS

Hot rolled .....LB .115
Cold rolled .....LB .125
Galvanized .....LB .125
PLATE .....LB .115
STRIPS .....LB .135
STRUCTURAL SHAPES .....LB .12
BARS
Hot rolled .....LB .115
Cold finished .....LB .156
Reinforcing .....LB .11
REINFORCING MESH
6 x 6" #10 x #10 .....SF .04
6 x 6" #6 x #6 .....SF .07

2000# FOB Warehouse

STRUCTURAL STEEL

$390.00 and up per ton erected when out of mill.
$420.00 and up per ton erected when out of stock.

BRICK & TILE

COMMON BRICK

Common 2½ x 3¾ x 8¼"..M 49.00
Select 2½ x 3¾ x 8¼" ....M 63.00

FACE BRICK

Standard .....M 78.00
Roman .....M 84.00
Norman 2½ x 11½ x 3½"..M 127.00
SCR 2½ x 5½ x 11½ .....M 182.00
2½ x 7½ x 11½ .....M 255.00

HOLLOW TILE

12 x 12 x 3" .....M 160.00
12 x 12 x 4" .....M 176.00
12 x 12 x 6" .....M 240.00

MANTEL FIRE BRICK

2½ x 9½ x 4½" .....M 135.00

GLAZED STRUCTURAL UNITS

2 x 6 x 12" Furring .....SF .60
4 x 6 x 12"—1 side .....SF .91
6 x 6 x 12"—1 side .....SF 1.32
4 x 6 x 12"—2 sides .....SF 1.00
Add For Color .....SF .25

CONCRETE BLOCKS

4 x 8 x 16" .....EA .25
6 x 8 x 16" .....EA .32
8 x 8 x 16" .....EA .34
12 x 8 x 16" .....EA .52
Add for color .....EA .02

BRICKWORK & MASONRY

BRICK WALLS

Back Up Common 8" .....SF 2.80
Back Up Common 12" .....SF 3.95
S.C.R. 6" .....SF 2.15
S.C.R. 8" .....SF 2.65

CONCRETE BLOCK, REINFORCED

6" walls .....SF 1.35
8" walls .....SF 1.50
12" walls .....SF 1.95

GLAZED STRUCTURAL UNITS

Facing 2" .....SF 2.35
Partition 4" .....SF 2.85
Partition 6" .....SF 4.70

BRICK VENEER

4" Select Common .....SF 1.70
4" Roman .....SF 1.85
4" Norman .....SF 1.75

STONE WALLS

Veneer 4" .....SF 3.45-4.20
Walls 8" .....SF 7.00-8.50

BUILDING PAPERS & FELTS

BUILDING PAPER

1 ply per 1,000-ft roll 4.30
2 ply per 1,000-ft roll 6.80
3 ply per 1,000-ft roll 8.80
Sisalkraft, reinforced, 500-ft roll.9.50

SHEATHING PAPERS

Asphalt sheathing, 15-lb
324 SF roll 2.20
30-lb 216 SF roll 2.95
Dampcourse, 216-ft roll 3.30

FELT PAPERS

Deadening felt, ¾-lb, 50-yard roll 3.00
1-lb, 50-yard roll 3.50

ROOFING PAPERS

Standard grade, smooth surface
432 SF roll,
Light, 45-lb 2.30
Medium, 55-lb 2.65
Heavy, 65-lb 2.95
Mineral surfaced 216-ft Roll ... 3.50

LUMBER

DOUGLAS FIR

Construction 2x4-2x10
MBM 94.00-102.00
Standard 2x4-2x10
MBM 90.00- 96.00
Utility 2x4-2x10
MBM 75.00- 82.00
Economy 2x4-2x10
MBM 57.00- 68.00
Clear, air dried ..MBM 200.00-230.00
Clear, kiln dried.MBM 280.00-400.00

REDWOOD

Foundation grade .....MBM 150.00
Construction Heart ....MBM 140.00
A Grade .....MBM 300.00
Clear Heart .....MBM 325.00

PLYWOOD (DOUGLAS FIR)

¼" AB .....MSF 95.00
¼" AD .....MSF 75.00
¼" Ext. waterproof .....MSF 81.00
⅜" AB .....MSF 109.00
⅜" AD .....MSF 99.00
⅜" CD .....MSF 75.00
½" AB .....MSF 145.00
½" AD .....MSF 124.00
½" CD .....MSF 96.00
⅝" AB .....MSF 160.00
⅝" AD .....MSF 141.00
⅝" CD .....MSF 108.00
¾" AB .....MSF 184.00
¾" AD .....MSF 165.00
¾" CD .....MSF 140.00
⅝" Plyform .....MSF 170.00

SHINGLES

Cedar #1 .....Square 17.00-19.00
Cedar #2 .....Square 14.00-17.00

SHAKES

Cedar
½" to ¾" butt ..Square 19.00-22.00
¾" to 1¼" butt..Square 21.00-24.00

INSULATION & WALL BOARD

FOB Warehouse

FIBRE GLASS INSULATION

foil backed	Per MSF
½" thick	41.00
2¼" thick	49.00
3⅝" full thick	59.00

SOFTBOARDS—wood fiber

½" thick 60.00
¾" thick 128.50

ALUMINUM INSULATION

35# Kraft paper with alum. foil
1 side only 24.00
2 sides 30.00

GYPSUM WALLBOARD

⅜" thick 51.00
½" thick 62.00
⅝" thick 86.00

HARDBOARDS—wood fiber

⅛" thick, sheathing 58.00
3/16" thick, sheathing 73.00
¼" thick, sheathing 85.00
⅛" thick, tempered 80.00
3/16" thick, tempered 110.00
¼" thick, tempered 130.00

CEMENT ASBESTOS BOARD

⅛" flat sheets 135.00
3/16" flat sheets 182.00
¼" flat sheets 238.00

ROUGH CARPENTRY

FRAMING

Floors .....BM .26-.32
Walls .....BM .33-.39
Ceilings .....BM .35-.44
Roofs .....BM .28-.34
Furring & blocking .....BM .45-.70

Bolted framing, add 50%

SHEATHING

1 x 8" straight .....BM .23-.29
1 x 8" diagonal .....BM .26-.32
5/16" plyscord .....SF .20-.25
⅜" plywood CC .....SF .28-.33

SIDING

1 x 8" bevel .....BM .47-.52
1 x 4" V-rustic .....BM .52-.62

Bolted framing add 50%

DAMPROOFING & WATERPROOFING

MEMBRANE

1 layer 50# felt .....SQ 10.00
4 layers dampcourse .....SQ 15.00
Hot coat walls .....SQ 10.00
Tricosal added to concrete.CY 1.00
Anti-Hydro added to concrete .....CY 1.50

ROOFING

Asphalt & Gravel	Per Sq
4 ply	17.00-21.00
5 ply	19.00-24.00
White gravel finish—Add	2.00- 4.00
Asphalt compo. shingles	25.00-30.00
Cedar shingles	25.00-32.00
Cedar shakes	28.00-35.00
Concrete tiles	45.00-65.00
Clay tiles	50.00-80.00

ROOF FLASHINGS

18 ga galv steel .....SF .85-1.30
22 ga galv steel .....SF .75-1.20
26 ga galv steel .....SF .65-1.10
18 ga aluminum .....SF 1.35-1.85
22 ga aluminum .....SF 1.15-1.30
26 ga aluminum .....SF 1.05-1.15
16 oz copper .....SF 1.90-2.45
20 oz copper .....SF 2.20-2.65
24 oz copper .....SF 2.30-2.95
26 ga galv. steel
4" OG gutter .....LF 1.15-1.40
Mitres and Drops .....EA 2.25-4.25
22 ga galv. louvers .....SF 3.75-4.75
22 oz copper louvers ...SF 4.50-6.00

CHIMNEYS, PATENT

6" ..... LF 1.45
8" ..... LF 2.05
10" ..... LF 2.85
12" ..... LF 3.50

Rates for 10-50 LF

MILLWORK

All Prices FOB Mill

D.F., clear, air dried S4S..MBM 220.00-250.00
D.F., kiln dried S4S .....MBM 280.00-400.00

DOOR FRAMES & TRIM

Residential entrance ....17.00 & up
Interior room entrance .. 9.00 & up

DOORS

1⅜" hollow core ..... 8.00 & up
1¾" solid core .....19.00 & up
1⅜" Birch hollow core ..10.00 & up
1¾" Birch solid core ....22.00 & up
Prefitted doors, frames & trim .....13.00 & up

WINDOW FRAMES

D/H singles .....SF .90
Casement singles .....SF .90

WOOD SASH

D/H in pairs (2 lts) .....SF .55
Casement (1 lt) .....SF .65

WOOD CABINETS

¾" D.F. plywood with ¼" plywood backs:
Wall hung .....LF 10.00-15.00
Counter .....LF 12.00-17.00

Birch or maple, add 25%

FINISH CARPENTRY

EXTERIOR TRIM

Fascia and molds .....BM .55-.75

ENTRANCE DOORS & FRAMES

Singles ..... 60.00 & up
Doubles .....100.00 & up

INTERIOR DOORS & FRAMES

Preset .....17.00 & up
Singles .....36.00 & up
Pocket sliding .....45.00 & up
Closet sliding (Pr.) .....55.00 & up

WINDOWS

D/H sash & frames ....SF 2.00 & up
Casement sash & frames .....SF 2.25 & up

SHELVING

1 x 12 S4S .....BM .40-.50
¾" plywood .....SF .45-.65

STAIRS

Oak steps, D.F. risers
Under 36" wide .....Riser 14.00
Under 60" wide .....Riser 19.00

Newel posts and rail extra

WOOD CASES & CABINETS

D.F. wall hung .....LF 17.00-20.00
D.F. counters .....LF 18.00-30.00

HARDWOOD FLOORING MATERIALS

OAK 25/32" x 2¼" T&G

Select .....M 245.00
#1 Common .....M 190.00

MAPLE 25/32" x 2¼" T&G

#1 Grade .....M 305.00
#2 Grade .....M 280.00
#3 Grade .....M 200.00

NAILS–1" FLOOR BRADS KEG 18.00

HARDWOOD FLOORS

Select Oak

Filled, sanded, stained and varnished
25/32" x 2¼" T&G .....SF .75- .90

MAPLE

2nd grade and better
Filled, sanded, stained and varnished
25/32" x 2¼" T&G .....SF .70-1.00

Wax finish, add .....SF .11

RESILIENT FLOORING MATERIALS

Linoleum, standard gage .....SY 2.65-2.85
Linoleum, battleship ...SY 2.95-3.10
⅛" Asphalt tile, dark ..SF .10- .11
⅛" Asphalt tile, light ..SF .14- .16
.080 Vinyl Asbestos tile .SF .19- .23
⅛" Vinyl Asbestos tile ..SF .23- .32
.080 Vinyl tile .....SF .67- .70
4" base .....LF .12- .14
Rubber treads .....LF 1.60-2.30
Linoleum paste .....GAL .85- .95

RESILIENT FLOORING

⅛" Asphalt tile, dark colors .....SF .22- .25
⅛" Asphalt tile, light colors .....SF .25- .28
⅛" Rubber tile .....SF .60- .70
.080 Vinyl asbestos tile..SF .32- .40
⅛" Vinyl asbestos tile ..SF .42- .52
.080 Vinyl tile .....SF .65- .75
⅛" Vinyl tile .....SF .85-1.05
Linoleum, standard gage .....SY 3.75-4.25
Linoleum, battleship ...SY 5.25-5.75
4" Rubber base, black ..LF .25- .35
Rubber stair treads .....LF 2.25-2.75

LATH & PLASTER MATERIALS

METAL LATH

Diamond 3.4# copper-bearing .....SY .49
Ribbed 3.4# copper-bearing.SY .53

ROCK LATH

⅜" thick .....SY .36

METAL

¾" Standard channel .....LF .038
1½" Standard channel .....LF .053
3¼" Steel studs .....LF .088
4" Steel studs .....LF .098
Stud shoes .....EA .026

PLASTER

Browning, hardwall .....Sack 1.58
Finish, hardwall .....Sack 1.75
Stucco .....Sack 2.60
Expanded Perlite ....30# Sack 1.35

LATH & PLASTER WORK

CHANNEL FURRING

Suspended ceilings ....SY 2.90-3.20
Walls .....SY 2.90-3.30

METAL STUD PARTITIONS

3¼" studs .....SY 3.05-3.40
4" studs .....SY 3.20-3.60
Over 10-0 high, add ....SY .25- .35

3.4# METAL LATH & PLASTER

Ceilings .....SY 4.40-5.20
Walls .....SY 4.50-5.25
Keene's cement finish, add .....SY .45- .65

ROCK LATH & PLASTER

Ceilings .....SY 3.35-3.80
Walls .....SY 3.45-3.95

WIRE MESH & ⅞" STUCCO

Walls .....SY 4.80-5.65

STUCCO ON CONCRETE

Walls .....SY 3.40-3.90
Metal accessories .....LF .25- .55

DRYWALL CONSTRUCTION

METAL STUD PARTITIONS FOR DRYWALL

1⅝" .....SF .33
2½" .....SF .36
3⅝" .....SF .40

GYPSUM BOARD FINISH

On Wood ½" .....SF .13
⅝" .....SF .16
On Metal ½" .....SF .15
⅝" .....SF .19
Taping joints .....SF .05
Texturing .....SF .03

TILE MATERIALS

FOB Warehouse

CERAMIC TILE

4¼ x ¼" glazed .....SF .72
4¼ x 4¼" hard glazed .....SF .74
Random, unglazed .....SF .19
6 x 2" cap .....EA .19
6" cove base .....EA .31
¼" round bead .....LF .18

QUARRY TILE

6 x 6 x ½" red .....SF .51
6 x 6 x ¾" red .....SF .53
9 x 9 x ¾" red .....SF .65
6 x 6" cove base .....EA .23

TILE & TERRAZZO WORK

CERAMIC TILE, stock colors

Floors .....SF 2.00-2.30
Walls .....SF 2.05-2.30
Cove base .....LF 1.40-2.00

QUARRY TILE

6 x 6 x ½" floors .....SF 1.80-2.20
9 x 9 x ¾" floors .....SF 1.95-2.35

TERRAZZO

Terrazzo floors .....SF 2.15-2.65
Cond. Terrazzo floors ..SF 2.30-2.80
Precast treads & risers ..LF 3.60-4.60
Precast landing slabs ...SF 3.00-4.10

WINDOWS

STEEL SASH

Under 10 SF .....SF 2.50 & up
Under 15 SF .....SF 2.00 & up
Under 20 SF .....SF 1.50 & up
Under 30 SF .....SF 1.00 & up

ALUMINUM SASH

Under 10 SF .....SF 2.75 & up
Under 15 SF .....SF 2.25 & up
Under 20 SF .....SF 1.75 & up
Under 30 SF .....SF 1.25 & up

Above rates are for standard sections and stock sizes, FOB Warehouse

GLASS—CUT TO SIZE

FOB WAREHOUSE

DSB Clear, aver 7 SF.....SF .28
SSB Clear, aver 4 SF.....SF .17
Crystal, aver 16 SF .....SF .35
¼" Polished plate, aver 50 SF .....SF .90
⅛" Obscure, aver 7 SF .....SF .35
⅛" Ribbed, aver 7 SF .....SF .45
⅛" Rough, aver 7 SF .....SF .45
¼" Wire plate, clear, aver 40 SF .....SF 1.90
¼" Wire plate, rough, aver 40 SF .....SF .90
⅛" Heat absorbing, aver 7 SF.SF .90
¼" Tempered plate, aver 40 SF .....SF 3.60
½" Tempered plate, aver 40 SF .....SF 6.40

GLASS BLOCKS

6" .....EA .85
8" .....EA 1.35
12" .....EA 3.45

GLASS & GLAZING

DSB Clear .....SF .85
SSB Clear .....SF .60
Crystal .....SF 1.00
¼" Plate .....SF 2.00
⅛" Obscure .....SF .85
⅛" Heat absorbing .....SF 1.35
¼" Tempered plate .....SF 4.75
½" Tempered plate .....SF 9.00
¼" Wire plate, clear .....SF 2.80
¼" Wire plate, rough .....SF 1.50

PAINT MATERIALS

All prices FOB Warehouse

Thinners 5-100 gal .....Gal .63
Turpentine 5-100 gal .....Gal 1.59
Linseed oil, raw .....Gal 2.36
Linseed oil, boiled .....Gal 2.43
Primer-sealer .....Gal 3.12
Enamel undercoaters .....Gal 5.54
Enamel .....Gal 5.58
White lead in oil .....LB .36
Red lead in oil .....LB .36
Litherage .....LB .32

PAINTING

EXTERIOR

Stucco wash, 1 coat .....SY .52
2 coats .....SY .85
Lead & Oil, 2 coats .....SY 1.18
3 coats .....SY 1.72

INTERIOR

Primer-sealer .....SY .48
Wall paint, 1 coat .....SY .58
2 coats .....SY 1.04
Enamel, 1 coat .....SY .70
2 coats .....SY 1.22
Doors & trim .....EA 15.00
Sash & trim .....EA 17.00
Base & molds .....LF .20

Old work, add 15-30%

VENETIAN BLINDS

RESIDENTIAL .....SF .45 & up
COMMERCIAL .....SF .55 & up
VERTICAL .....SF 1.25 & up

PLUMBING

Lavatories .....EA 350.00-410.00
Toilets .....EA 380.00-450.00
Bath tubs .....EA 400.00-500.00
Stall shower .....EA 250.00-300.00
Sinks .....EA 280.00-380.00
Laundry trays .....EA 160.00-270.00
Water heaters .....EA 135.00-420.00

Prices based on average residential and commercial work. Special fixtures and excessive piping not included.

HEATING

Furnaces—Gas-fired, Average Job

FORCED AIR FURNACE

60,000 BTU .....EA 214.00-275.00
80,000 BTU .....EA 235.00-295.00
120,000 BTU .....EA 305.00-345.00
Automatic control, add .....EA 40.00-60.00

DUAL WALL FURNACE

25,000 BTU .....EA 180.00-205.00
35,000 BTU .....EA 195.00-230.00
50,000 BTU .....EA 220.00-270.00
Automatic control, add .....EA 50.00-65.00

GRAVITY FURNACE

75,000 BTU 450.00-600.00
85,000 BTU 470.00-620.00
95,000 BTU 560.00-710.00
Automatic Control, add. 35.00-50.00

HEAT REGISTERS

Outlet 22.00-44.00

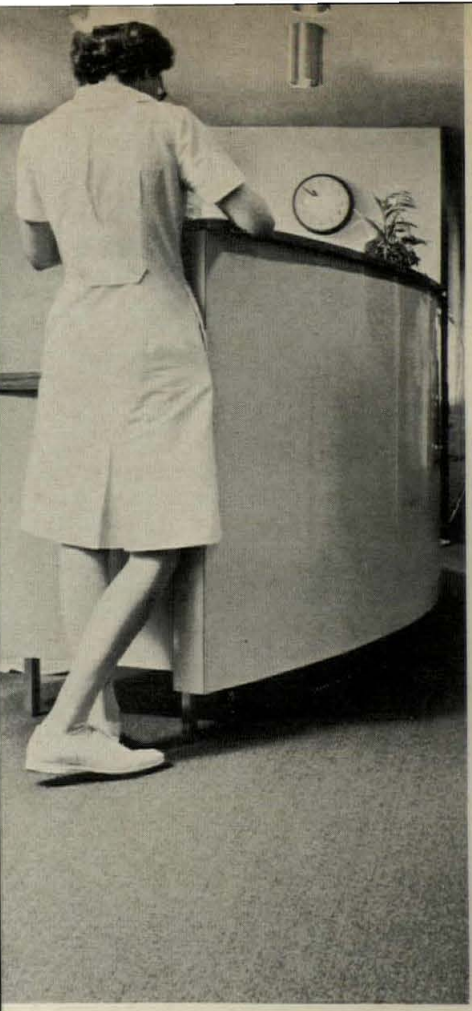
ELECTRIC WIRING

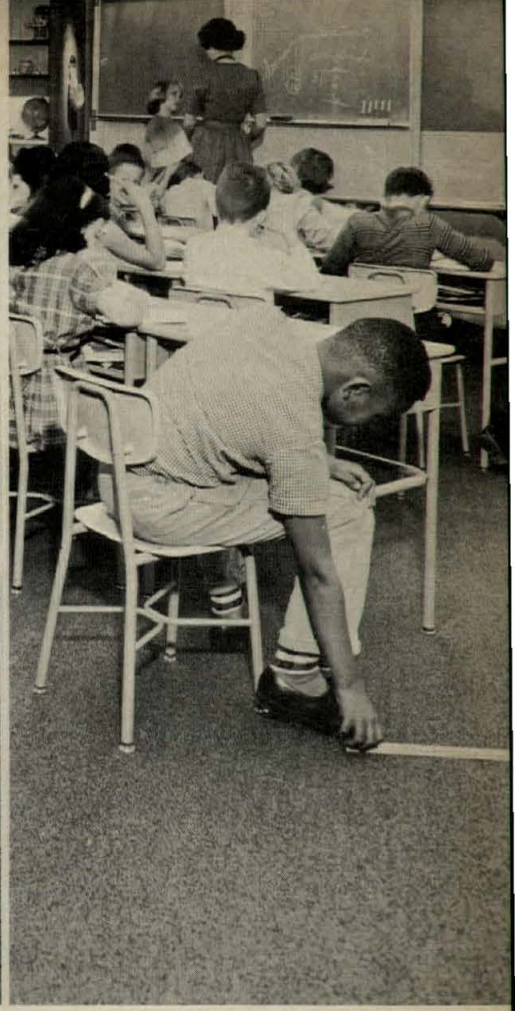
Per Outlet

Knob & Tube .....EA 14.00
Armor .....EA 22.00
Conduit .....EA 28.00
110-V Circuit 3 wire .....EA 33.00
220-V Circuit Range .....EA 170.00

ELEVATORS & ESCALATORS

Prices vary according to capacity, speed and type.
Consult elevator companies.
Slow speed apartment house elevators including doors and trim about $4,000 per floor.





Here's DENSYLON– the new floor covering that's obsoleted tile and carpet for high-traffic areas

Engineered for commercial use with A.C.E.† nylon

Not only is our revolutionary new DENSYLON* different than any other kind of floor covering—it's *better.*

Better for *every* area of *every* kind of building—schools, hospitals, offices, restaurants (even restaurant kitchens!).

Easier maintenance is one reason. Dirt, grime, or soil can't penetrate DENSYLON's extra-tight-twist, high-density nylon pile. Any kind of spillage—fruit juice, honey, even hot grease—wipes right off with a damp sponge. DENSYLON vacuums clean as new with half the strokes required by carpet. And the savings on never having to scrub or wash or wax a bare floor will pay for a DENSYLON installation in just a few years!

Superb appearance is another reason. DENSYLON comes in a broad range of handsome colors and patterns. It has all the warmth and luxury of carpet—but none of its disadvantages. And, unlike tile, DENSYLON can't be marred, or scratched, or dented. Even by spike heels or heavy fixtures.

For comfort and quiet, DENSYLON is permanently and integrally bonded to a 3/16" B. F. Goodrich sponge-rubber backing (note—that's *sponge,* not foam.) It carries a lifetime guarantee. DENSYLON can never ripple or buckle. *Big benefit:* when things (or people) fall, they land on a *cushion.*

Finally, there's wear. Or rather, *no wear.* Because *no* DENSYLON *installation has ever worn out.* Even at the G.E. World's Fair Exhibit where 15 million people trudged over DENSYLON. DENSYLON can be put in the heaviest traffic areas without showing "traffic lanes."

CCC is the world's largest exclusive manufacturer of commercial carpet. We make miles and miles of conventional carpet. Every fiber, every construction. For those areas that require conventional carpet, we recommend it. Now we're making miles and miles of DENSYLON. For where tile used to go. For where carpet never could.

We have the industry's largest staff of floor-covering specialists out in the field. One of them will be happy to explain why revolutionary new DENSYLON is making everything else obsolete. Or, we'll mail you the facts. Use the coupon. Now.

**CCC's trademark for its sponge-bonded, high-density nylon carpet*

CCC
10 West 33rd Street
New York, New York 10001 Dept. AR-12.
Attention: Mr. Oliver A. Wyman

☐ Send facts on revolutionary DENSYLON.
☐ Have representative give us estimate on approximately _____ square yards.

Name _____

Title _____ **Phone** _____

Organization _____

Address _____

City _____ **State** _____

†*Trademark: Allied Chemical Corporation*

Densylon

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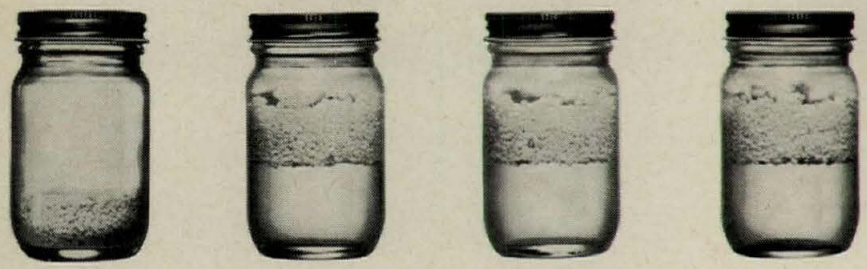
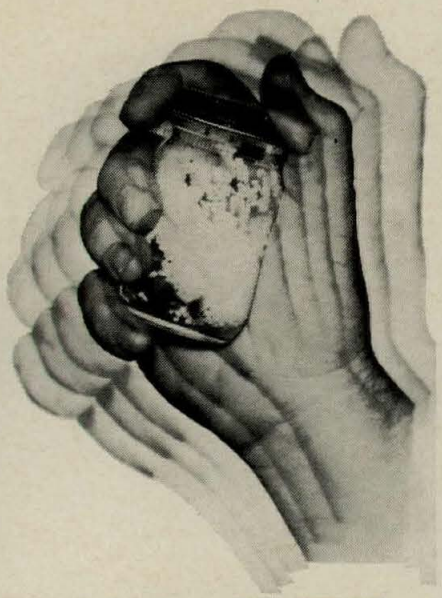
Commercial Carpet Corporation, New York City, Chicago. In Los Angeles, **Pacific Commercial Carpet Corporation.** Canadian Affiliate: **C. C. Carpet Co., Ltd.,** Woodstock, Ontar

MAKE YOUR OWN INSULATION TEST:





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Silicone-Treated

Fill stays dry

This simple, desk-top test shows why *Silicone-Treated Perlite Fill is the ideal insulation for cavity wall construction.*

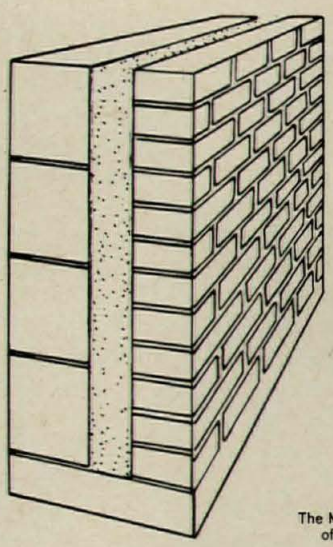
Positive proof comes from an independent laboratory test*: A specially-built cavity wall system insulated with Silicone-Treated Perlite Fill was blasted with the equivalent of a 5½"-per-hour rainstorm, driven by 50 mph winds for 6 straight days. The exterior wall leaked. The interior wall STAYED BONE DRY.

Insulation was provided by a mere 2½ inches of Perlite Fill. It absorbed only 2.14% of its weight... *the lowest of any inorganic insulating fill... five times better than the next best material.*

In addition, Perlite Fill is easy to pour in place; won't bridge, settle or pack; is fire-proof and rot-proof. Saves money, too. Heat transfer is reduced more than 50%.

Try this desk-top insulation test yourself. Your local Permalite man will be delighted to bring you jars and Fill to show you first hand how Silicone-Treated Perlite really repels water. Call him today or write for Technical Bulletin MF-2.

*Structural Clay Products Research Foundation.



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For more data, circle 21 on inquiry card

President signs important bills; names transportation head

In a series of important actions last month, President Johnson signed the Demonstration Cities Bill, a higher education bill, and a bill expanding last year's elementary and secondary school act (November, page 35). The President also named Alan S. Boyd to head the new Cabinet-level Department of Transportation. The new department will be the fourth largest Federal agency, but will not oversee mass transit, which remains under the jurisdiction of the Department of Housing and Urban Development. Mr. Boyd, former chairman of the Civil Aeronautics Board, was at the time of his appointment Under Secretary of Commerce.

HUD will name advisory panels for its major field offices

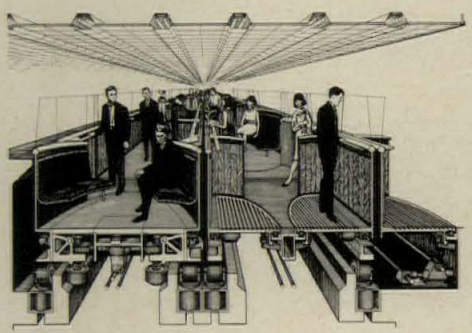
Seven four-member interprofessional panels will be named soon for the major field offices of the Department of Housing and Urban Development. Each regional design advisory panel will be made up of a representative of the American Institute of Architects, the American Institute of Planners, the American Society of Landscape Architects, and a member representing the engineering profession.

This new interprofessional cooperation with HUD follows an interprofessional evaluation of HUD's programs by 80 professionals from the fields of architecture, landscape architecture, planning and engineering. George T. Rockrise, adviser on design to the Secretary of HUD, initiated the idea. Purpose of the evaluations was to help HUD modify and improve its services, with the aim of improving the total environment.

Andrew Euston Jr., director of urban programs for the American Institute of Architects, served as coordinator, receiving information from the selected individuals, members of such organizations as the A.I.A., A.I.P., A.S.L.A. and A.S.C.E.

The advisory design panels and the HUD evaluation program are the most recent manifestations of interprofessional cooperation within HUD since Mr. Rockrise's appointment. Underlying this interprofessional effort is the reorganization of government action in these fields with the establishment of HUD and the new Department of Transportation, both of these agencies seeking to deal with problems comprehensively on a multi-disciplinary level.

Important meetings preceding these recent events included a conference at the Octagon on August 24 and 25, between HUD officials and the A.I.A., A.I.P., A.S.L.A., and A.S.C.E., and a meeting on September 15 in Washington of organizations representing the design professions, which have recently established the Interprofessional Commission on Environmental Design.



"Synchroveyor" is proposed to ease urban congestion

A fifth-year architectural student at the University of Illinois, Urbana, Larry S. Bell, has proposed a new type of horizontal transportation system for areas of high urban density—the main purpose of the system being to reduce vehicular traffic. The "synchroveyor," as the system is called, is electrically powered, conveying circuits which are synchronized to allow passengers to interchange from one circuit to another. There are two types of conveying circuits: one that operates at variable speeds between standstill and 30 miles per hour, for local traffic; and one that operates at a constant speed for express traffic. Loading and unloading on variable speed circuits is accomplished by means of rotatable transfer decks, revolving to interchange groups of people by a "lazy susan" principle. When the variable circuit reaches the same speed as the constant speed circuit, transfer from local to express can be made by a method similar to loading and unloading, thus allowing flexibility of destination within the system. Synchroveyors are conceived as underground or elevated systems. Mr. Bell was aided in developing his scheme by Professor Wayne Adkins of the University of Illinois department of mechanical engineering and by George G. Dodd, former research associate and instructor in electrical engineering, University of Illinois.

HUD awards program honors intergovernmental actions

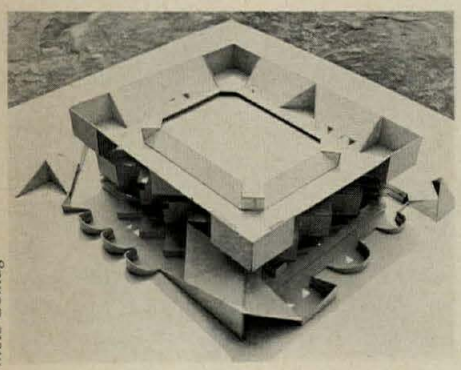
The Department of Housing and Urban Development through the Urban Development Intergovernmental Awards Program will recognize "superior, cooperative achievements between local governments and actions to improve state-local relations which further the national objective of helping to improve the living environment of our citizens." The awards in this first program will be presented this month at the National League of Cities Annual Congress. Eligible for participation were: any local governmental body, organization of elected officials, units of government acting jointly, regional bodies and state governments.

"As we approach more and more of our urban problems in depth," said H. Ralph Taylor, Assistant Secretary for Demonstrations and Intergovernmental Relations, "we realize the paramount importance of practical intergovernmental relationships that can result in productive actions. That is why we want to recognize and encourage more of this kind of local and state activity and broadcast their success to other communities with similar urban problems."

Ketchum given French award in the field of humanities

Morris Ketchum Jr., architect and past president of the American Institute of Architects, has been named a "Chevalier de l'Order des Arts et Lettres", the highest honor bestowed by the French government in the field of humanities. Mr. Ketchum, the first American architect to be so honored, was cited for his "international leadership in the architectural

profession, creative accomplishments in the field of urban design, and high esteem in which he is held by his professional counterparts in France."



Mete Goktug

Museum is proposed to house kinetic art

A gigantic concrete structure, 400 by 500 feet, designed by architect Roger Katan with sculptor Len Lye, would house all types of kinetic art, at a site yet to be determined. The four-level building would be organized around a great central hall which would house Len Lye's enormous project Sea Serpent, a series of stainless steel strips in violent motion and musical cacophony (see interior model photo on page 5). The spectator would enter through a "funnel of sound" (at bottom in photograph at left), and would be led through a series of displays in controlled environments in the four levels surrounding the great hall, as well as a roof level for display of sculpture and water-sculpture in a large pool.

The work of Gio Ponti displayed at U.C.L.A. show

An exhibit of the work of Gio Ponti, Milanese architect and designer, will continue through December 11 at the U.C.L.A. galleries, Dickson Art Center, Los Angeles. The exhibit includes business, residential, educational, and religious architecture; furniture, glass, silverware, stage and industrial design; and city planning concepts, paintings and drawings. The exhibit will be circulated to universities throughout the country.

H. Judd Payne is dead at age 66

H. Judd Payne, former vice-president of the Magazine and Book Division of F. W. Dodge Corporation (now a division of McGraw-Hill, Inc.) and publisher of ARCHITECTURAL RECORD from 1939 to 1959, died October 25 at age 66. Mr. Payne, an M.I.T. graduate, joined McGraw-Hill in 1923 as an assistant editor of Chemical & Metallurgical Engineering, and from 1929 to 1939 was with Associated Business Publications, the last four years as its executive vice president. During the period when Mr. Payne was publisher, the RECORD attained the largest circulation among architects and engineers concerned with building design, and also became the largest medium for architectural advertising. Mr. Payne had lived in Bernardston, Massachusetts since his retirement in 1962.

Nuns' Island new town will house 50,000 on site adjacent to downtown Montreal

A $300-million project to create a urban community of 50,000 on Nuns' Island, a 1000-acre tract in the St. Lawrence River, minutes from Montreal, is now underway with a landfill operation and installation of water and telephone services. Construction will start on the first residential community this spring, this phase consisting of 800 townhouse and apartment units and costing $15 million. More than 100 of these units will be completed by October, 1967, with all 800 units scheduled for completion by May, 1968. Total development of the island will take from 12 to 15 years.

Master plan for the site was developed by Johnson, Johnson & Roy of Ann Arbor, Michigan. The first 12-story high-rise unit is being designed by Mies van der Rohe; medium height units are being designed by Philip David Bobrow; and townhouses are being designed by Stanley Tigerman. Water and other utilities are being planned by La Societe B.L.M., a joint venture of three engineering firms: Beauchemin-Beaton-Lapointe; Lalonde, Valois, Lamarre, Valois & Associates; and Moffatt & Nichol. Traffic consultant is Barton-Aschman Associates, and ecological consultant is Calvin R. Fremling. The island was purchased in 1956 by the Quebec Home and Mortgage Corporation Ltd. from the Sisters of the Congregation of Notre-Dame who had used the island as a retreat during the 19th century and the first half of the 20th century. A 99-year lease to develop the island was signed last year by Metropolitan Structures of Canada Ltd.

The island first became accessible to downtown Montreal with completion of the $30-million Champlain Bridge in July, 1962. Primary access will be by the La Route expressway to the core of Montreal, scheduled for completion early next year. Bus transportation will link the island to the new Montreal subway which was completed earlier this Fall.

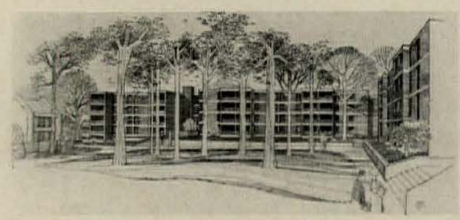
The master plan calls for a central parkway system to define three residential communities and a town center. The residential communities and town center are being individually developed in areas of 150 to 200 acres. Each community is organized around a central park which relates to the parkway on the interior and the water's edge on the exterior. Schools, services and recreational facilities will be located in the central park. A series of smaller open spaces will be related to the central park by pedestrian greenways.

Primary roads within each community will handle local traffic, public transit, and service. Secondary streets have *cul-de-sacs* and serve individual neighborhoods. Each community is composed of neighborhood units for 1,500 to 2,000 residents composed of building clusters housing 400 to 600 people. The building clusters will enclose a large pedestrian green or common. Parking space is provided under the buildings to keep the common as large as possible. High-rise structures will be located on the water's edge, related to a series of urban plazas to link waterfront activities with the center.

more news on page 227

Nuns' Island, two miles long and a mile wide, with city of Montreal in background.

Townhouses designed by Tigerman.



Four-story apartments designed by Bobrow.

High-rise apartment designed by Mies.

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

BORDEN DECOR PANEL AS BUILDING FACADES

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

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

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

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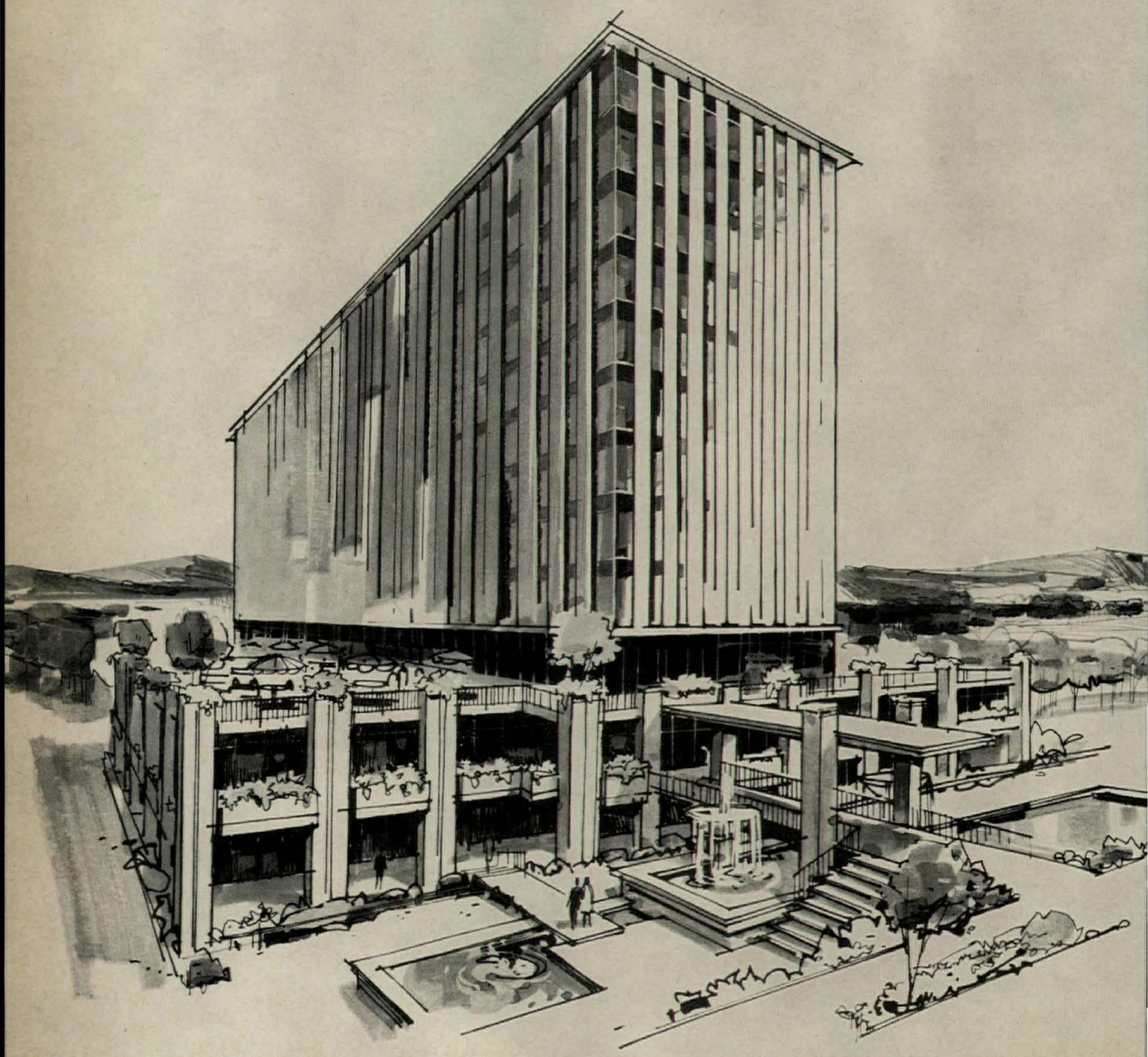
When in New York City, see our exhibit at Architects Samples, 101 Park Avenue

For more data, circle 22 on inquiry card

Garrett Gas turbines deliver low cost electricity, cooling and heating to these two California buildings.



One of these high-rise buildings is in El Segundo, Cal., the other in Pasadena. Aside from being architectural look-alikes, the structures have Gas Total Energy in common.·

Three Garrett AiResearch Gas Turbine-generator sets provide all the electricity needed. And turbine exhaust heat is captured and used for air conditioning, heating and hot water.

After maintenance and equipment lease costs, net annual operating savings run several thousand dollars a year over purchased power. This is based on a firm rather than an interruptible Gas rate, too. No need for oil burners and storage tanks.

At the receiving end of the roof-mounted Garrett Gas System is an advanced 4-pipe heating and cooling distribution network which serves multi-zone air handling units. Both heating and cooling are available the year round.

Investigate Garrett Gas Total Energy. It's feasible for office buildings, plants, apartment communities, shopping centers, hospitals and schools. Ask your local Gas Company Sales Engineer to tell you more about it. Or write: The Garrett Corp., AiResearch Manufacturing Div., 180 N. Aviation Blvd., El Segundo, Cal.

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Gas total energy makes the big difference

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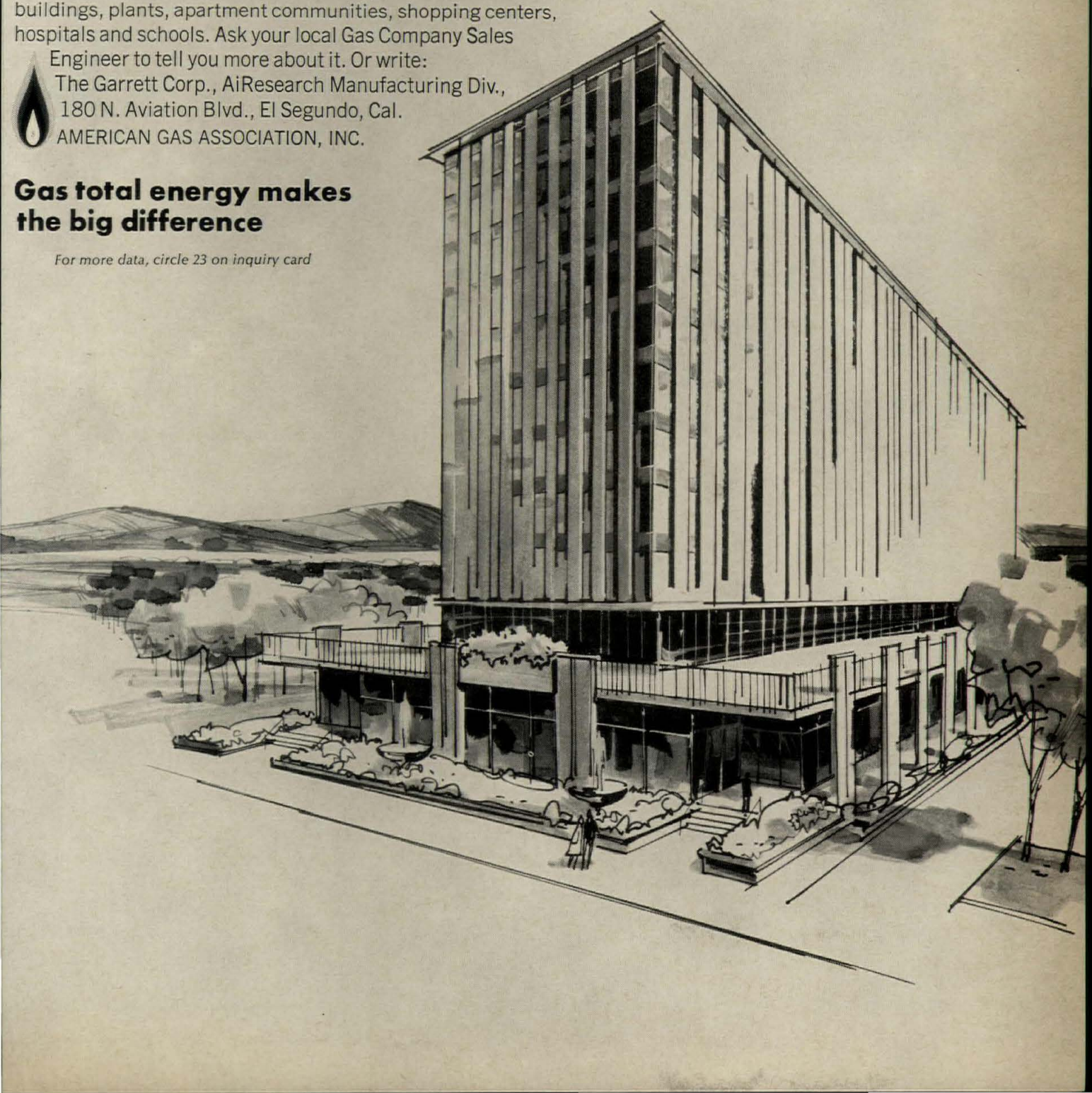
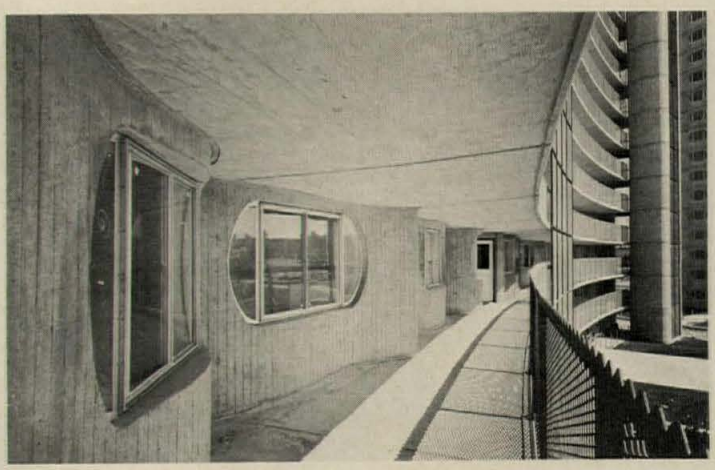
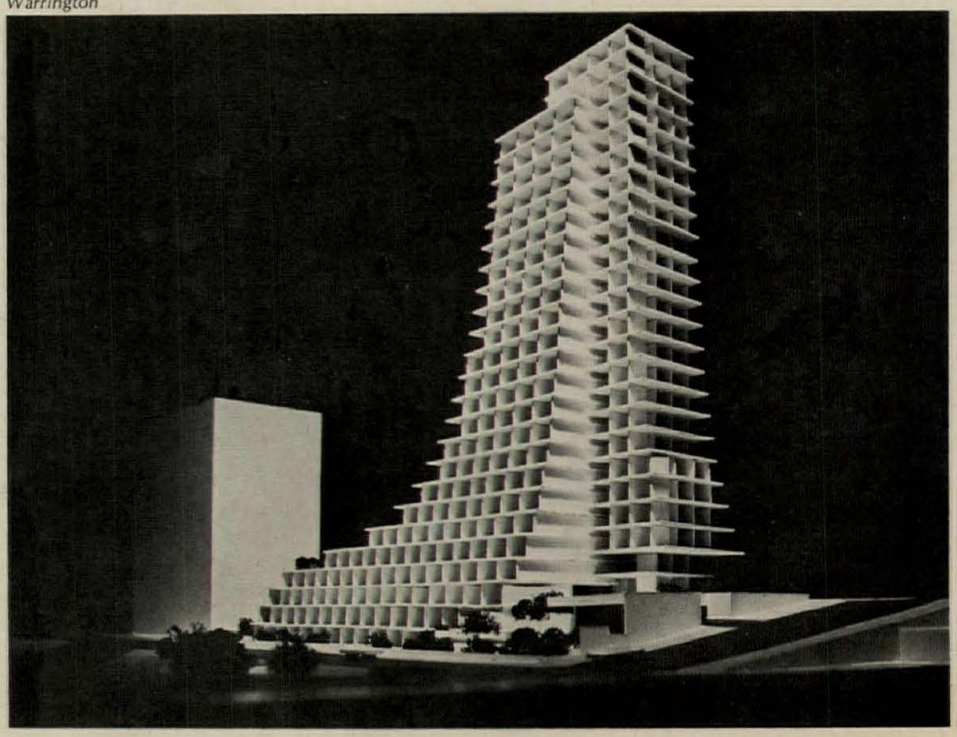


Harr, Hedrich-Blessing photos

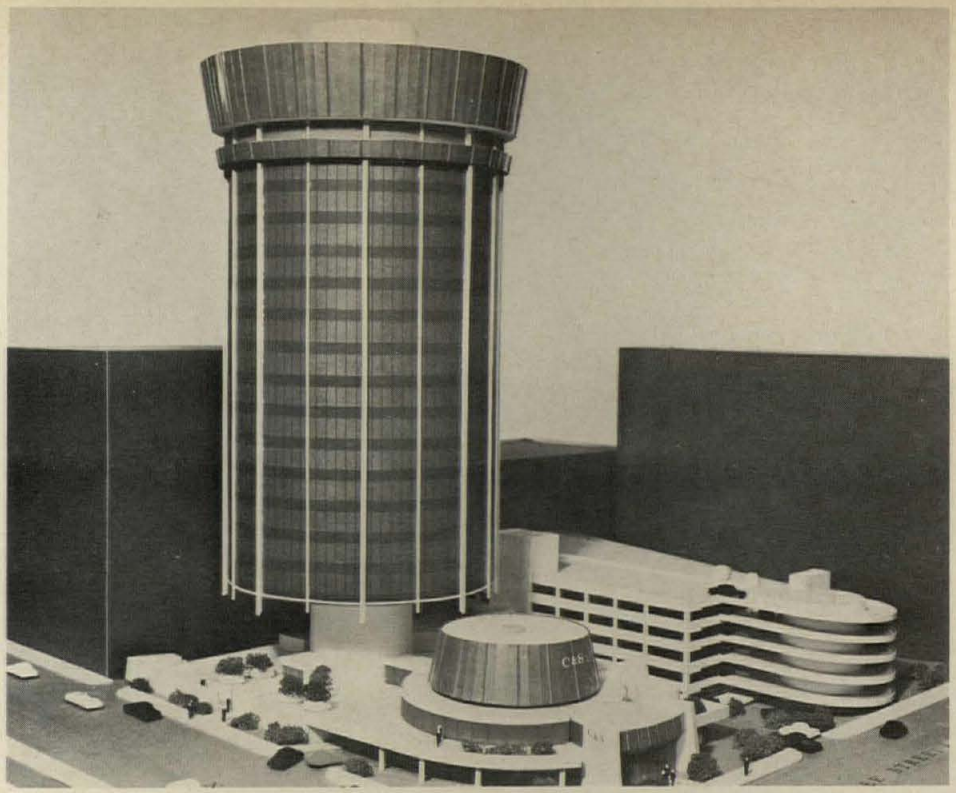


A public housing project at Cermak Road—State Street, Chicago, designed by Bertrand Goldberg & Associates (January, pages 158 and 159) is now completed. The project combines housing for the elderly with family housing in four buildings in a landscaped setting. A sunken amphitheater seating 1,000 is a central meeting point for elderly and young families. The elderly are housed in two identical 16-story round towers with 182 units in each building. Families are housed in two 22-story crescent-shaped structures with 168 units in each building (photograph of balcony, above right). General contractor was Paschen Contractors Inc.

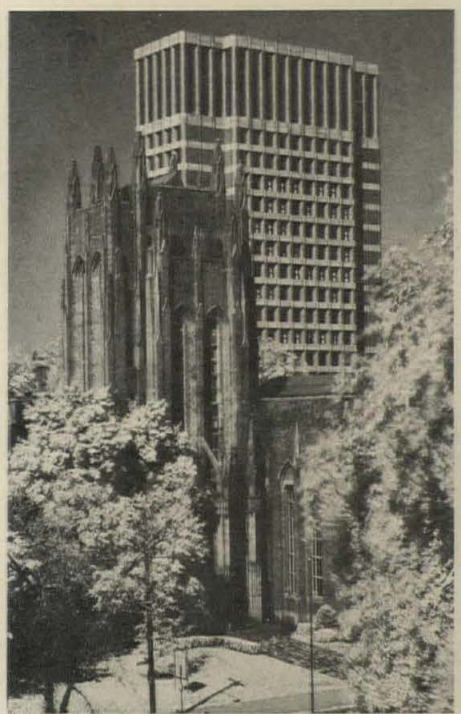
Warrington



The Beach Avenue apartment building, Vancouver, British Columbia, designed by C. B. K. Van Norman & Associates, provides 90 *de luxe* apartments in a 26-story structure. The building slopes upward to provide garden-terraces. The high concentration of units at the bottom of the structure allows every apartment to have a water view. Parking for 150 cars is located at the rear of the base. The first four floors will be a series of two-story townhouses with private entrances. Consulting engineers for the reinforced concrete, $2-million project are Kirwan and Chercover.

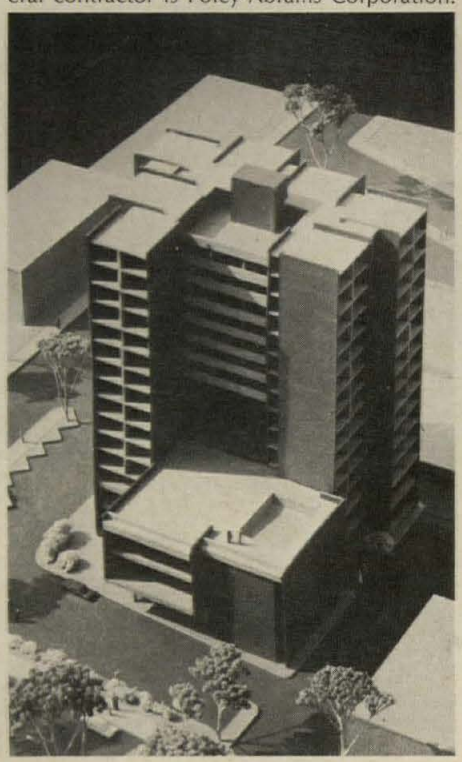


The Citizens & Southern National Bank and office building, Atlanta, designed by Aeck Associates, provides 110,000 square feet of office space in a circular tower and banking facilities in an adjoining low circular building. In the office tower, the floors are suspended 52 feet above the street from steel trusses which are in turn supported by the concrete silo core. Why a circular shaped tower? "It avoids an 'alley' which would have resulted between the surrounding buildings and a square or rectangular shape," says the architect. The banking structure provides five drive-in windows below a banking floor at roof garden level. A separate garage will hold 350 cars. General contractor is Beers Construction Company.

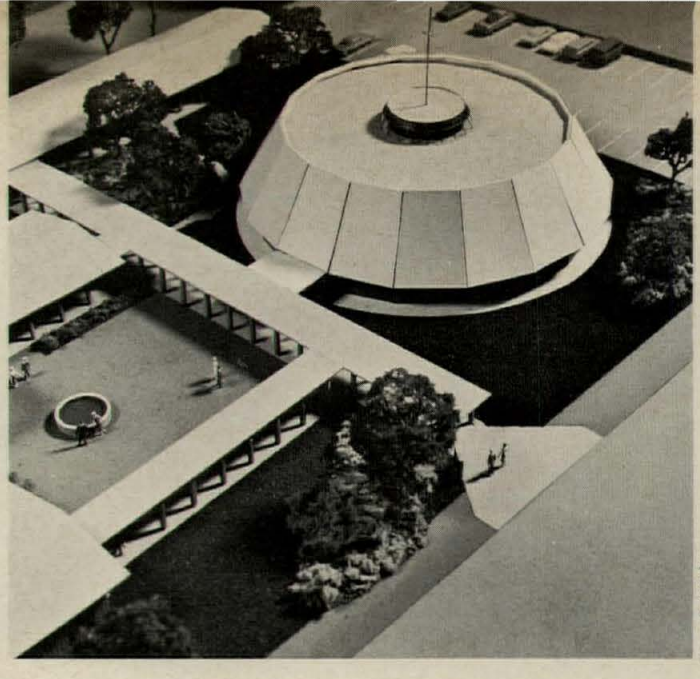


The Kline Biology Tower, Yale University, New Haven, designed by Philip Johnson and Richard Foster (the 100-year-old Peabody Museum of Natural History is in the foreground), has recently been dedicated, thus completing the Kline Science Center complex designed by Mr. Johnson. The $12-million, 14-story tower, of reinforced concrete construction, like other buildings of the center, has exteriors of plum-colored brick and sandstone. The tower provides 10 floors of laboratories with a usable space of 65,000 square feet, and a 12th floor cafeteria. The general contractor for the structure was the E & F Construction Company.

A high-rise motor hotel overlooking the Charles River, Cambridge, Massachusetts, designed by Salsberg & LeBlanc for the Sage Hotel Corporation, will be of brick, concrete and glass construction, and will, according to the architects be "compatible with the New Academic" of nearby Harvard and M.I.T. The $3-million, 15-story structure will contain in its 11,000-square-foot core building 203 rooms, including 27 two-room suites with balconies. Also included will be a 200-seat glass-enclosed restaurant overlooking the Charles and a 300-seat meeting room. General contractor is Poley-Abrams Corporation.

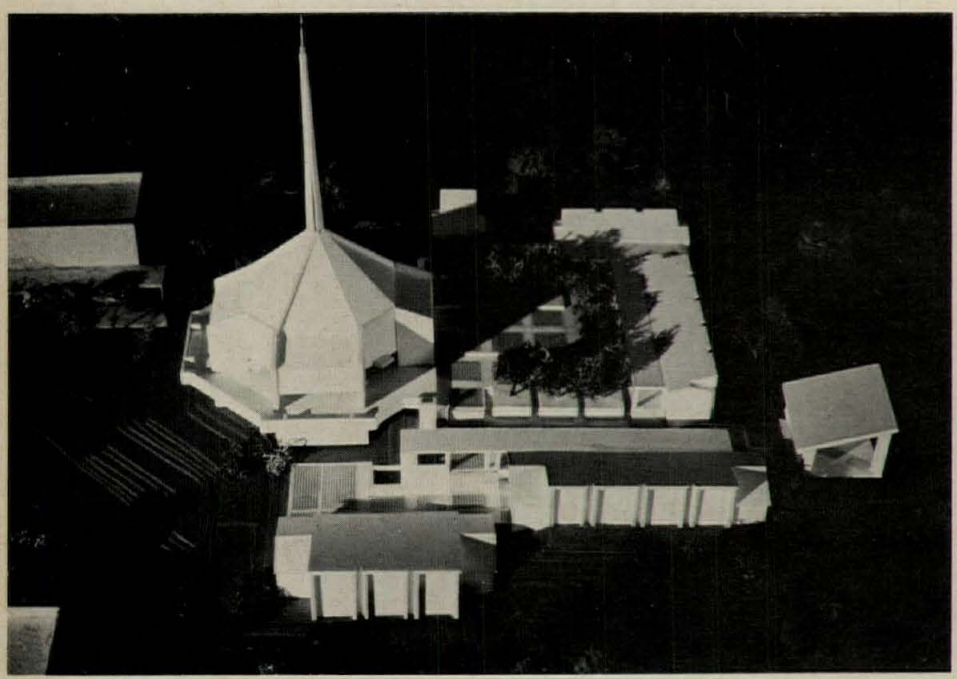


An office building in San Francisco for the Mutual Benefit Life Insurance Company, designed by Welton Becket Associates, is supported by 4-foot-10-inch-wide white prestressed concrete columns framing bronze-anodized aluminum windows twice as wide as the columns. The 32-story office tower will contain 575,000 square feet of office space with parking in the basement, and a two-story annex will contain 15,000 square feet of office space. The entire weight of the structure will be borne by the outside columns and the central elevator shaft, providing column-free interior space. General contractor will be Haas & Haynie Corporation.



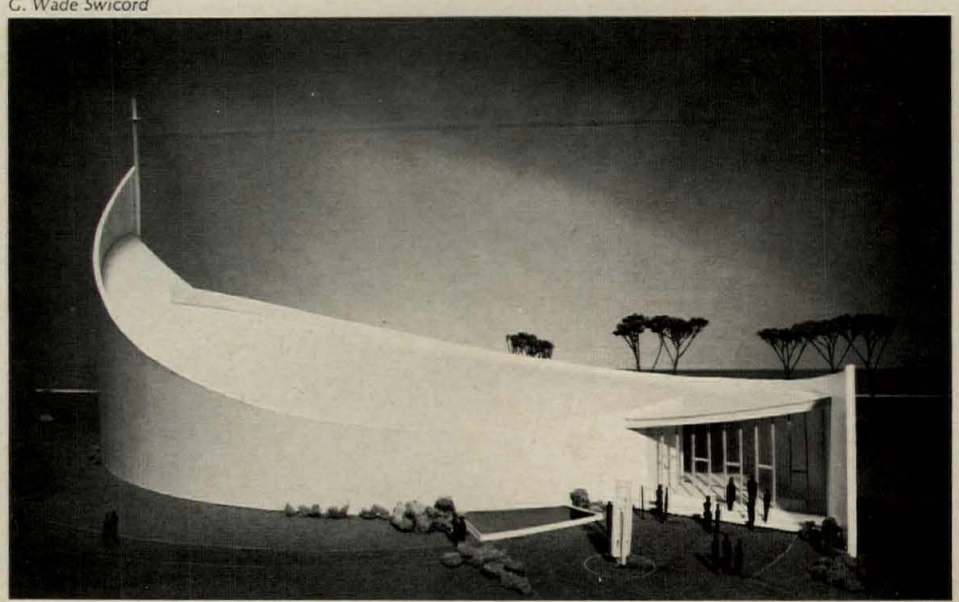
Tom F. Walters

St. Bartholomew's Episcopal Church, Livermore, California, designed by Ian Mackinlay and Associates, will seat 300 people in a central plan structure. The entire interior space is focused on the altar with the pulpit placed behind it on axis with the main doors. The structural system, the architect says, "avoids all view-obstructing posts by the use of heavy wooden trusses cantilevered from a concrete ring beam on concrete pillars. These pillars also define the 'back aisle.' The trusses are held down by steel tension members in the exterior wall and rise up to a central skylight which catches the sunlight, diffuses it through a hanging baldechino of wood slats and directs it onto the altar."

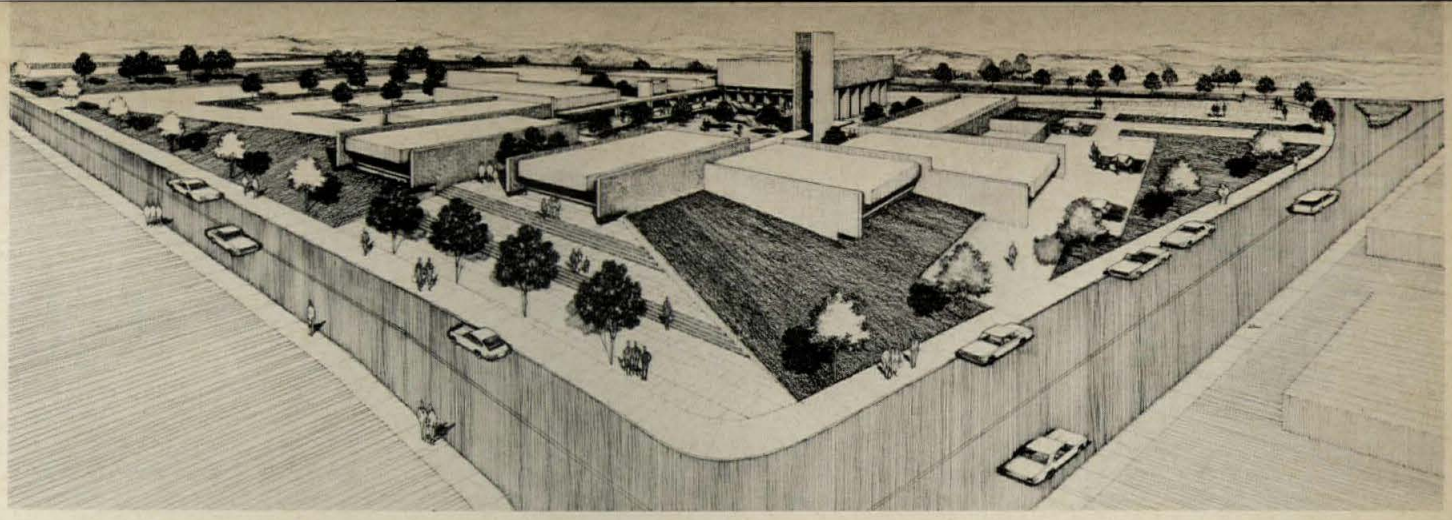


The Religious Center and Chapel at Inter-American University, San German, Puerto Rico, designed by The Perkins & Will Partnership with David P-C Chang and Lorenzo Ramirez de Arellano, associate architects, groups buildings for various related functions around a landscaped courtyard. The octagonally-shaped main chapel will seat 350, and its spire will rise 100 feet. In the foreground of the photograph is a fellowship hall seating 200. Other structures enclosing the courtyard are a smaller chapel which will seat 50, a unit containing seminar and conference rooms, an office element containing seven offices and a lounge, and a structure housing classrooms.

G. Wade Swicord



St. Paul's by-the-Sea Episcopal Church, Jacksonville Beach, Florida, designed by Ellis, Ingram and Associates, has "a form related to the sea—and to the church." The structure, which will seat 400 and cost approximately $275,000, is built of load-bearing walls poured with coquina (seashell) concrete exposed on the surface by a retarder in the framework. The highest wall rises to a height of 90 feet with the top of the Cross 120 feet above ground level. General contractor is Wesley of Florida Inc.

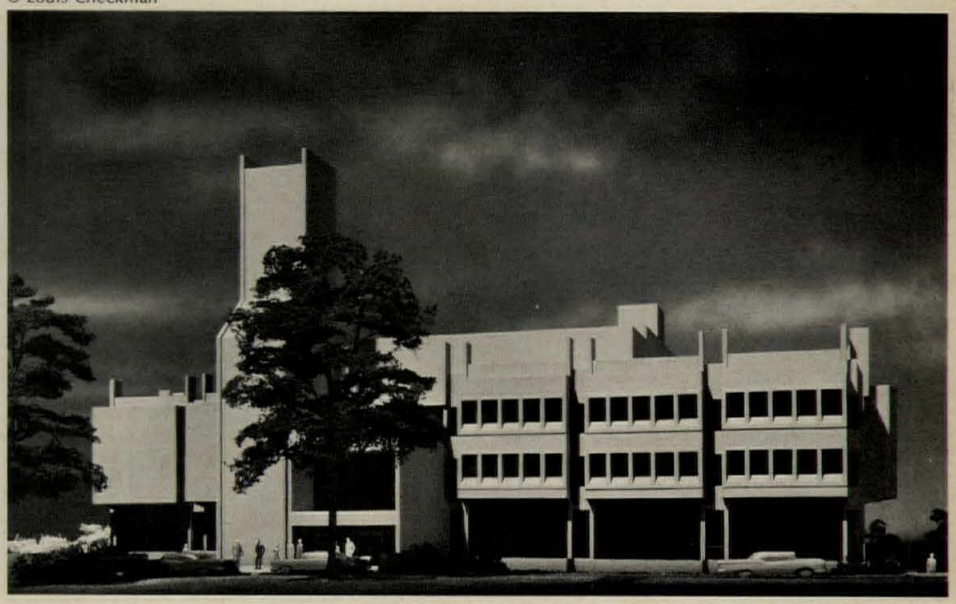


The Santa Rosa, California City Hall, designed by De Brer, Bell, and Heglund, winners of a regional competition for design of the structure, places municipal departments in separate buildings at various levels connected by a ramp system that culminates at the council chamber. The complex will enclose a public courtyard dominated by a tall sculptured element which serves as a symbolic point of reference. The council chamber is located behind the sculptured element in the photograph above. The first phase of this complex (shown above), will serve a present population of 42,000, and provide 48,000 square feet. Each of the departments is independently expandable, and totally new departments can be added. The primary construction material is concrete.

Robert D. Harvey

The Montego Bay Hospital, Montego Bay, Jamaica, designed by The Architects Collaborative, John C. Harkness, partner in charge, is a 400-bed general hospital which forms the nucleus of a ring of smaller "cottage" hospitals in the surrounding area. The hospital has two wings: a 10-story in-patient wing and a low three-story out-patient wing. Supplementary facilities include government health offices for the area, a training school for nurses and staff housing. Associate architects are Chalmers, Gibbs & Associates. Completion is set for 1968.

© Louis Checkman



The Georgetown University Library, Washington, D.C., designed by John Carl Warnecke and Associates, will hold 1 million volumes and will seat 1,800 students. A key design objective was to relate the structure to existing quasi-Gothic structures, and this was accomplished by extending the stair towers and supporting columns to give a vertical emphasis. The exposed dark gray granite aggregate in the poured-in-place concrete further relates the new structure to the dark gray granite older buildings. The structure, which will cost $5 million, has five library levels, will be 80 feet high, and will have underground parking for 100 cars.

Industrial construction: too much too soon?

Has industrial construction, with its phenomenal 15 per cent-a-year growth rate, managed to get too far out of line with the demand for manufactured goods?

Over the past several years, the nation's manufacturing plant capacity has been increased and modernized considerably. Nearly one-fifth of today's total available plant space has been built within the past five years. But at the same time, actual manufacturing output—in physical terms—has increased by over 40 per cent. In other words, the gain in output of manufactured goods since 1961 has been actually *twice* the increase in available plant capacity.

It's obvious that some other factors besides just the addition of new factory space are at work here. For one thing, back in 1961 many factories had idle capacity; today most plants are operating at their practical limits. Taking up the slack that existed back in '61 has alone accounted for about one-fifth of the growth in manufacturing output over the five year period.

Another very important source of growth in the volume of manufactured goods has been the steady gain in productivity. With more efficient machinery and newer and better-designed plants, as well as a more highly-skilled work force, we continue to produce more goods each year *per unit* of factory space. It is estimated that productivity gains arising out of these qualitative changes have accounted for as much as two-fifths of the total growth in factory output since 1961.

The remaining two-fifths of the 40 per cent increase in manufacturing output over the past five years (i. e., growth of between 15 and 20 per cent from the 1961 level) is the part that can be attributed to the actual increase in the quantity of productive factors—labor, machinery, and plant. And in this sense, the expansion of the nation's plant capacity during this period has been highly consistent with the growth in output, for capacity has also been increased by something between 15 and 20 per cent.

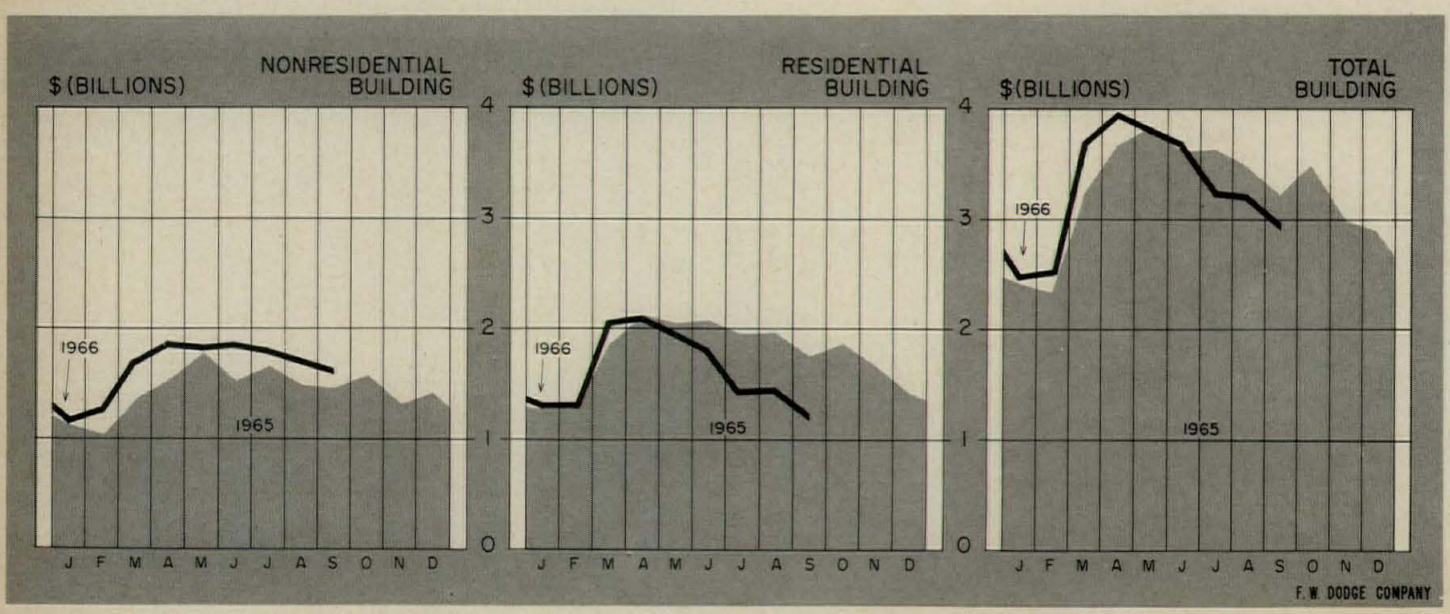
This pattern of balanced growth of capacity and output has to be tempered by the fact that further expansion of manufacturing capacity is very much dependent upon continued growth in the demand for manufactured goods. Even a leveling off in final demand would call for a sharp decline in new plant construction, since existing capacity is entirely adequate to maintain the present volume of output.

According to the just-released McGraw-Hill survey of business' plans for capital spending, manufacturers are anticipating a 6 per cent increase in the physical volume of their sales next year—about two percentage points *less* than the 1966 gain. What's more, the suspension of the 7 per cent tax credit and accelerated depreciation have prompted a $1½-billion slash in previously planned capital outlays. Tight money and narrowing profit margins are additional deterrants. On balance, the survey indicates that manufacturers plan a much smaller increase in total capital spending next year—about 6 per cent, against this year's 21 per cent.

Thus it would seem that there will be a noticeable slowing in the sharply upward trend of new plant construction in 1967, not because of any past excesses, but because of growing reservations on the part of businessmen about the near future.

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

Building activity: monthly contract tabulations



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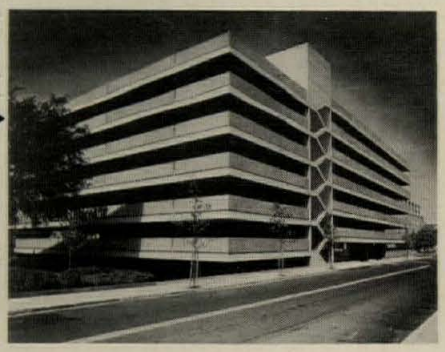
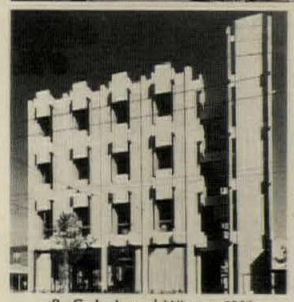
P. C. I. Award Winner 1966
Children's Hospital Parking Garage
Boston, Mass.
Architects: The Architects Collaborative, Inc.
Engineers: Sepp Firnkas Engineering, Inc.



P. C. I. Award Winner 1964
Observation Towers
New York World's Fair
Architects: Philip Johnson Associates
Engineers: Lev Zetlin & Associates

Theme Structure, 1967 World Exhibition
Habitat '67, Montreal
Associate Architects: Moshe Safdie & David, Barott, Boulva
Structural Consultant: A. E. Komendant
Structural Engineers: Monti, Lefebvre, Lavoie, Nadon & Associates



P. C. I. Award Winner 1966
The Century Building, Seattle
Architects: Bystrom & Greco
Engineers: Andersen - Bjornstad - Kane

A. I. A. Honors Award 1965
P. C. I. Award Winner 1966
Syracuse U. S. I. Newhouse Center
Architects: I. M. Pei & Associates
Associate Architects: King & King
Engineers: Eckerlin, Klepper & Hahn

P. C. I. Award Winner 1965
N. C. Mutual Life Insurance Co.
Durham, N. C.
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Associate Architects: M. A. Ham, Associates, Inc.
Engineers: Seelye, Stevenson, Value & Knecht

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BUILDING CONSTRUCTION COSTS

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.

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

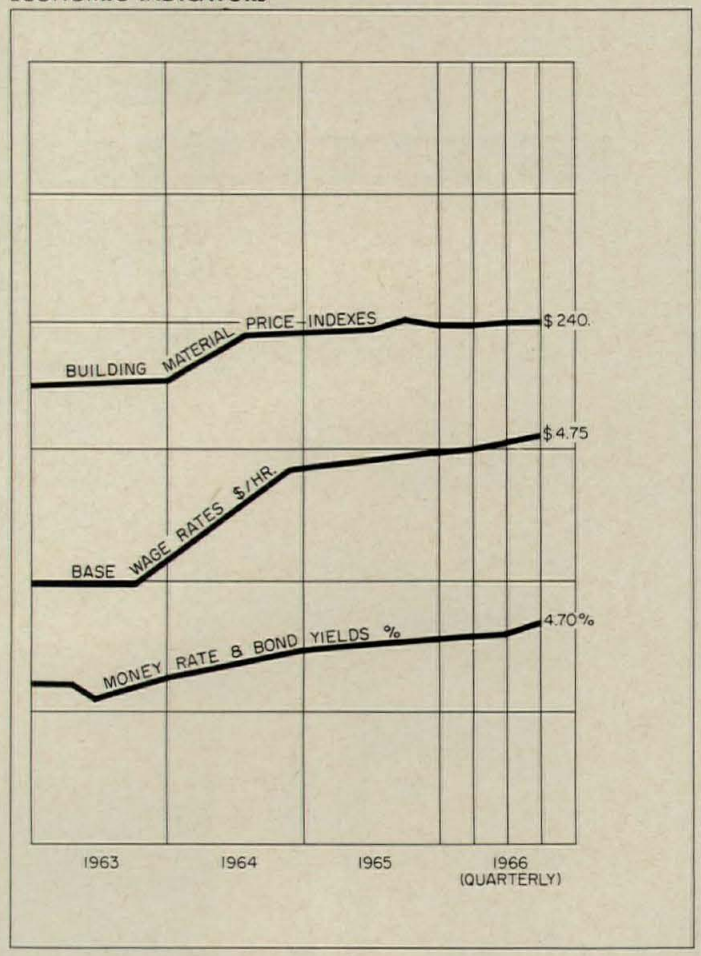
DECEMBER 1966 BUILDING COST INDEXES

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	277.5	295.7	2.28
Atlanta	7.2	314.6	333.7	+2.52
Baltimore	7.7	278.1	295.8	+1.82
Birmingham	7.5	255.0	274.2	+1.88
Boston	8.5	250.7	265.4	+1.67
Chicago	8.9	308.7	324.7	+2.79
Cincinnati	8.8	265.2	281.9	+1.57
Cleveland	9.2	286.8	304.8	+2.91
Dallas	7.7	260.6	269.2	+2.38
Denver	8.3	282.9	300.8	+1.23
Detroit	8.9	285.8	300.1	+4.29
Kansas City	8.3	249.7	264.3	+1.83
Los Angeles	8.3	282.6	309.2	+1.89
Miami	8.4	273.7	287.3	+2.31
Minneapolis	8.8	275.1	292.5	+1.55
New Orleans	7.8	248.2	263.0	+1.37
New York	10.0	289.0	310.9	+2.32
Philadelphia	8.7	274.7	289.6	+2.10
Pittsburgh	9.1	258.5	274.7	+1.84
St. Louis	9.1	275.4	291.8	+2.56
San Francisco	8.5	360.4	394.4	+4.67
Seattle	8.4	252.4	282.1	+2.31

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

ECONOMIC INDICATORS



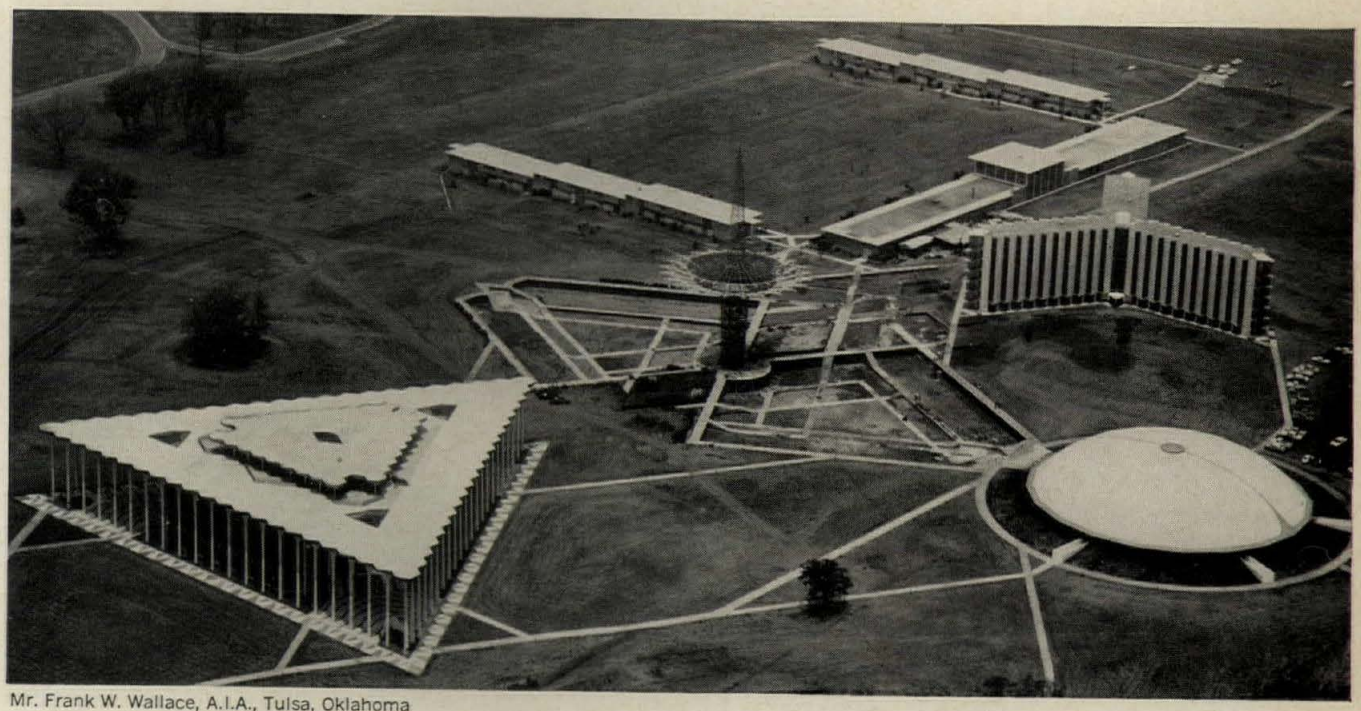
HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1952	1959	1960	1961	1962	1963	1964	1965 (Quarterly) 1st	2nd	3rd	4th	1966 (Quarterly) 1st	2nd	3rd	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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—
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	—

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.

Educational advance:



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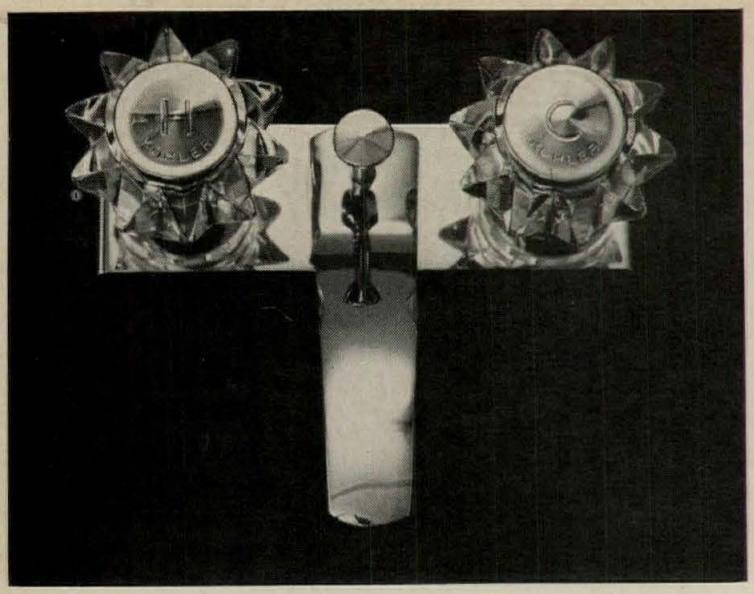

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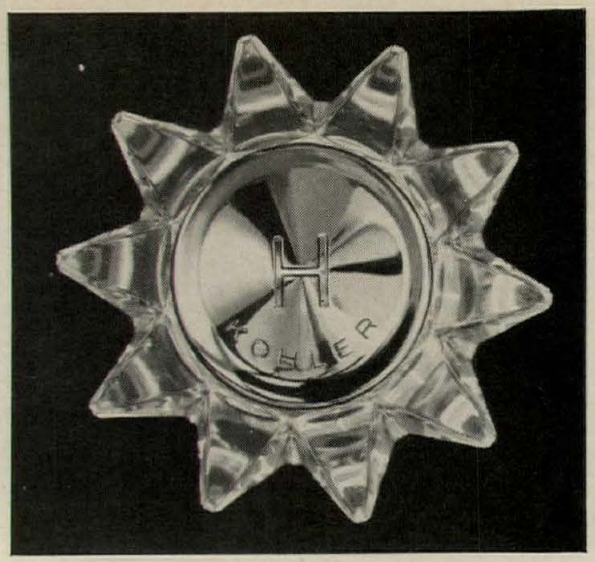

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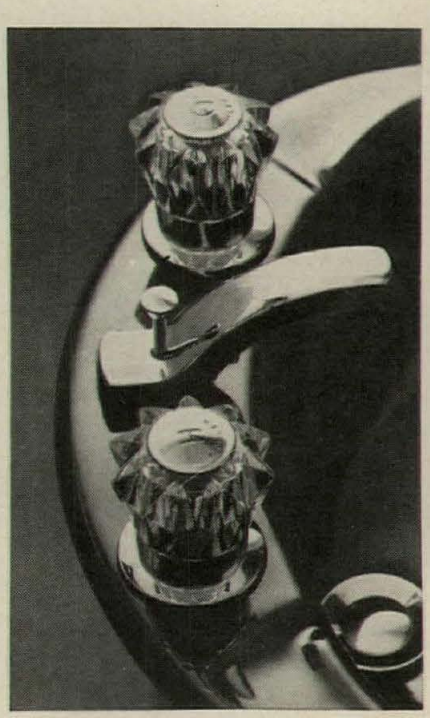

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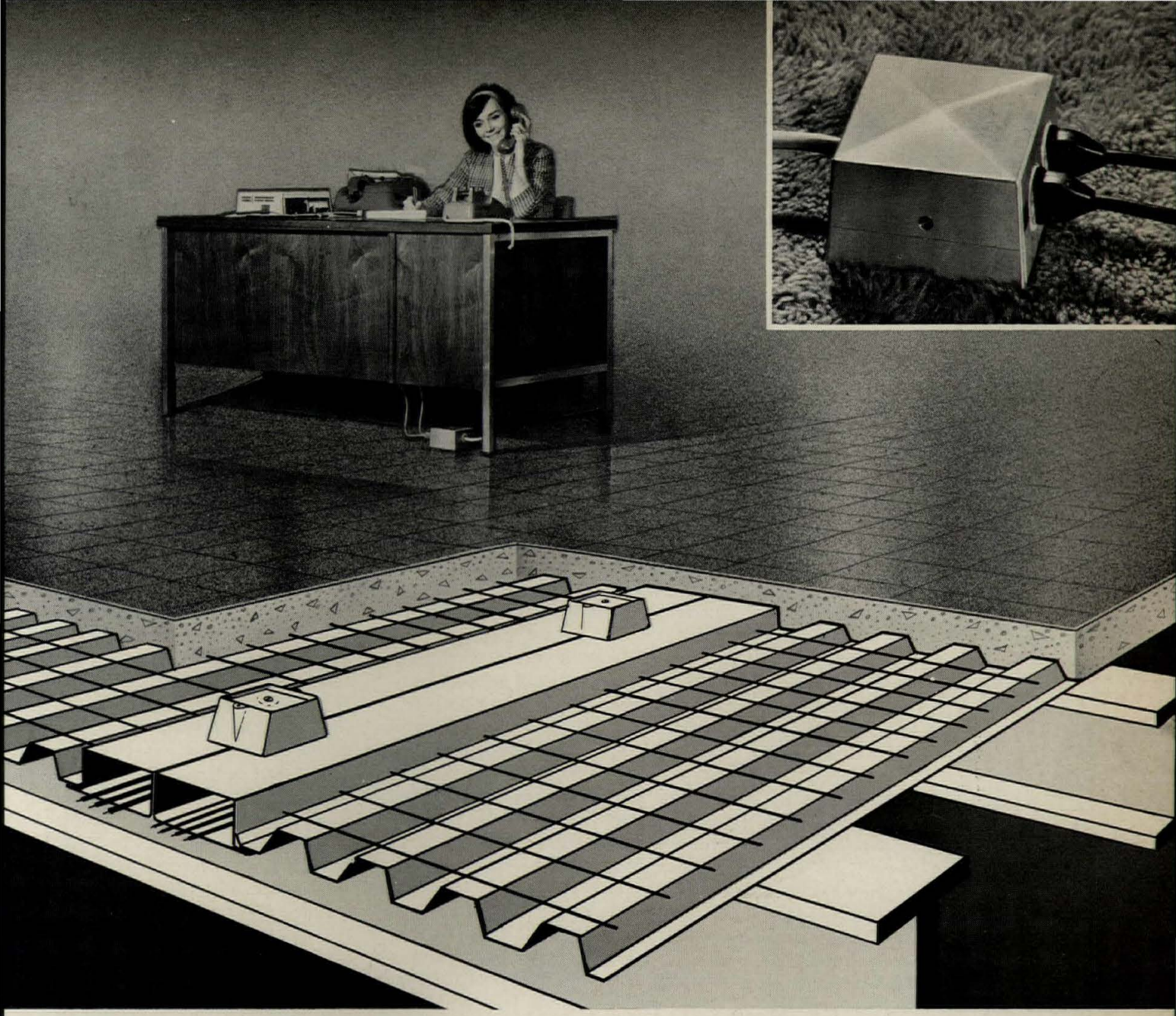

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Ideas behind modern architecture

ARCHITECTS ON ARCHITECTURE: *New Directions in America. By Paul Heyer. Walker and Company, 720 Fifth Avenue, New York, N.Y. 600 pp., illus. $14.95.*

This is a notable book in that it contains the personal views of architects—on architecture. It was brought about through interviews with leading architects who have spoken on their design approach, their ideas and their work. To their statements the author has added definitive remarks.

The studies are individual but in a larger sense this is a vigorous study of the general directions American architecture has taken. Splendid photographs add graphic awareness. The architects' accounts give life to their work and undoubtedly will be a useful record for future generations of architects and scholars.

The discussions begin with Mies who said, "All individualism is a left-over from the time of Luther—when he said: 'Here I stand.' I would look for more profound principles . . . Since the authentic approach to architecture should always be the objective, we find the only valid solutions in those cases where objective limits were imposed and there was no opportunity for subjective license." Jacques Brownson, once a student of Mies, stated, "We are creating buildings today that were never thought of before in terms of use, and we are going to arrive at other new building types. Significantly, Mies was interested in analyzing how to develop different building types. One of his greatest proposals was the unconstructed Chicago Convention Center. His concern was with the use of such a building, an approach to building types rather than to an individual solution."

Pietro Belluschi's statements include: "My approach to architecture is based on the three great principles of clarity, proportion (not in the classical sense, but the proportion of things in relation to themselves) and integrity. I am committed to a philosophy of simplicity, of understatement, but that of the saint, rather than that of the fool. It comes from deep understanding and purification. . . . To search for the solution in an abstract way is very tempting but only a few extremely gifted, elected architects can do it. Even when they are gifted, they too fall on their face." Also, "Today's architects find themselves in a schizophrenic state of mind when defending the old parts of Boston that are in danger of being destroyed by urban renewal. They do not like to admit that cities, like people, grow old and obsolete, must die and be reborn. The importance lies in the quality of what is rebuilt. The critic Allan Temko advocates that all new architecture should be anonymous, very rational and quite impersonal; obviously this is not possible."

From Eduardo Catalano, "The architect is not a sculptor, but a designer and builder of systems. He has to find the freedom within the set of laws that regulate any system. In these examples of systems one combination of units generates others; each form is not a static form that ends with itself, but a live system that generates many other ideas. Architecture (the whole and the parts of an organized urban complex) constitutes a continuous three-dimensional event that should originate, grow, change and be built according to a pattern of behavior and construction. This is architecture as system."

Philip Johnson spoke with his usual spiritedness, "Processionalism—how you approach a building, how you get into it, and how you feel when you are there—has carried right through, as a main concern in my work, from Mies to today. The Guggenheim is one way: no entrance really, you pop into the great space, which is quite a kick. . . . The search is for expression now, rather than for function. This is a much healthier period than the 1920's. The direction of architecture in the future will be with the person who keeps a serious eye on the use of a building, and the creation of the most exciting space that best fits that use."

Walter Gropius says, "You know that I, for my part, have always been identified since the early 1920's with the idea of 'functionalism' as the only straight and narrow line to take us into the future. But in the interpretation of those with only sectorially-developed minds, this line had become indeed so 'straight and narrow' that it led straight into a dead end. Its original complexity and psychological implications, as we developed them in the Bauhaus, were forgotten, and it was decried as a simple-minded, purely utilitarian approach to design, devoid of any imagination that would give grace and beauty to life. To this I can only say: The revolution of the 1920's was total and moral, and its creators looked at beauty not as something self-consciously 'added on,' but as something that was believed to be inherent in the vitality, appropriateness, and psychological significance of a designed object. . . . If our early attempts looked somewhat stark and sparse, it is because we had just found a new vocabulary in which to speak out, and this we wanted to set in the greatest possible contrast to the overstuffed bombast that had gone before. Besides, we were often held down to a minimum of expenditure by a public which could be sold on modern architecture only when it promised to be cheaper, because it did not yet recognize its esthetic qualities."

From Joseph Esherick, "There is a new cult in architecture, for the most part subjective and trivial, that concerns itself only with esthetics; beauty for beauty's sake, at all costs and no matter how arrived at. Beauty is a consequential thing, a product of solving problems correctly. It is as unreal as the goal. Preoccupation with esthetics leads to arbitrary design. No successful architecture can be formulated on a generalized system of esthetics; it must be based on a way of life." And Craig Ellwood indicates, "*Discipline* is the key word. The moment form becomes arbitrary, novel or stylish, it becomes something other than true architecture. . . . In nature, form and structure are one, and this should also be true in architecture. Nature is simple, but unfortunately it does not simplify. It

continued on page 68

THIS MONTH'S BOOKS

REVIEWS

Architect and Engineers: M. A. Nishkian & Co., Long Beach, Calif.; General Contractor: Steed Bros. Construction Co., Alhambra, Calif.; Flooring Contractor: Continental Floor Co., Monterey Park, Calif.

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continued from page 64

is up to us to search for this simplicity, to express logic and clarity, and to understand structure."

Other architects who are included but who are not cited here are: Harry Weese, Bertrand Goldberg, Ralph Rapson, Frank Lloyd Wright, Bruce Goff, Herbert Greene, Paolo Soleri, William Wilson Wurster, Vernon DeMars, Charles Warren Callister, Ernest J. Kump, John Carl Warnecke, Raphael Soriano, Richard J. Neutra, Edward A. Killingsworth, A. Quincy Jones, Edward Durell Stone, Minoru Yamasaki, Benjamin Thompson, Hugh Stubbins, Le Corbusier, Jose Luis Sert, Gerhard Kallmann, Noel Michael McKinnell, Marcel Breuer, Paul Rudolph, I. M. Pei, Edward Larrabee Barnes, John M. Johansen, Kevin Roche, Gordon Bunshaft, Walter Netsch Jr., R. Buckminster Fuller and Louis I. Kahn.

From these pertinent discussions on the beliefs of architects one can see the general directions American architecture is taking. Without doubt this book is useful, because it gives a penetrating view of American architecture at the present.

A future for slums?

THE TENEMENT LANDLORD. *By George Sternlieb. Urban Studies Center, Rutgers, The State University, New Brunswick, N.J. 269 pp., illus. No charge.*

The magic is gone out of urban renewal. Today the cry is, often, for rehabilitation. But rehabilitation for whom, by whom and at what cost?

The Tenement Landlord is not a book "for architects." But it is for the architect who wants to answer these questions realistically, or who is hunting for criteria so that he can formulate his position about rehabilitation.

The slum landlord is important to an understanding of the natural forces against rehabilitation. It is through knowing the fears and motivations of the landlords that the realities of tenement resale and rental markets will be appreciated, and on such facts that Federal and municipal rehabilitation programs and expectations should build in order to avoid disappointment and costly errors. Tax, finance and mortgage data on 566 parcels in Newark, New Jersey, were obtained, and in-depth interviews with more than 300 owners of the properties conducted. Dr. Sternlieb says when he defines the purpose of his study, what is "the optimum bundle of carrots and sticks with which to secure upgrading of slum housing"?

Two factors that cut across the categories set the scene. First, only 20 per cent of owners sampled get three-quarters or more income from slum properties. Most have outside occupations. To a number, slum income is a trivial proportion of their total capital or income. Some are stuck with unwanted properties; and "Shaking these owners loose from their lethargy and making them aware of possible government programs for aiding rehabilitation is perhaps more difficult than doing the equivalent for the full-time real estate owner," Dr. Sternlieb says.

Second is the fact that the slum owner typically owns nothing other than slums. About 78 per cent are in this category. "Government programs which might appeal [to the non-slum owner] may have no effect on slum owners . . ."

Although those working with urban renewal have noted the phenomenon, Dr. Sternlieb's book contributes to exploding the myth that slum lords dominate slums: 43 per cent of owners have one parcel and 22 per cent two or three parcels more. Only six landlords interviewed own more than 40 parcels, and two of this group hold, together, 200

continued on page 76

Dome Design: Welton Becket and Associates, architects and engineers, Los Angeles, New York, San Francisco, Houston

Architects and Engineers: Victor Gruen Associates, Los Angeles, Washington, New York and Alexander Ewing & Associates, Philadelphia

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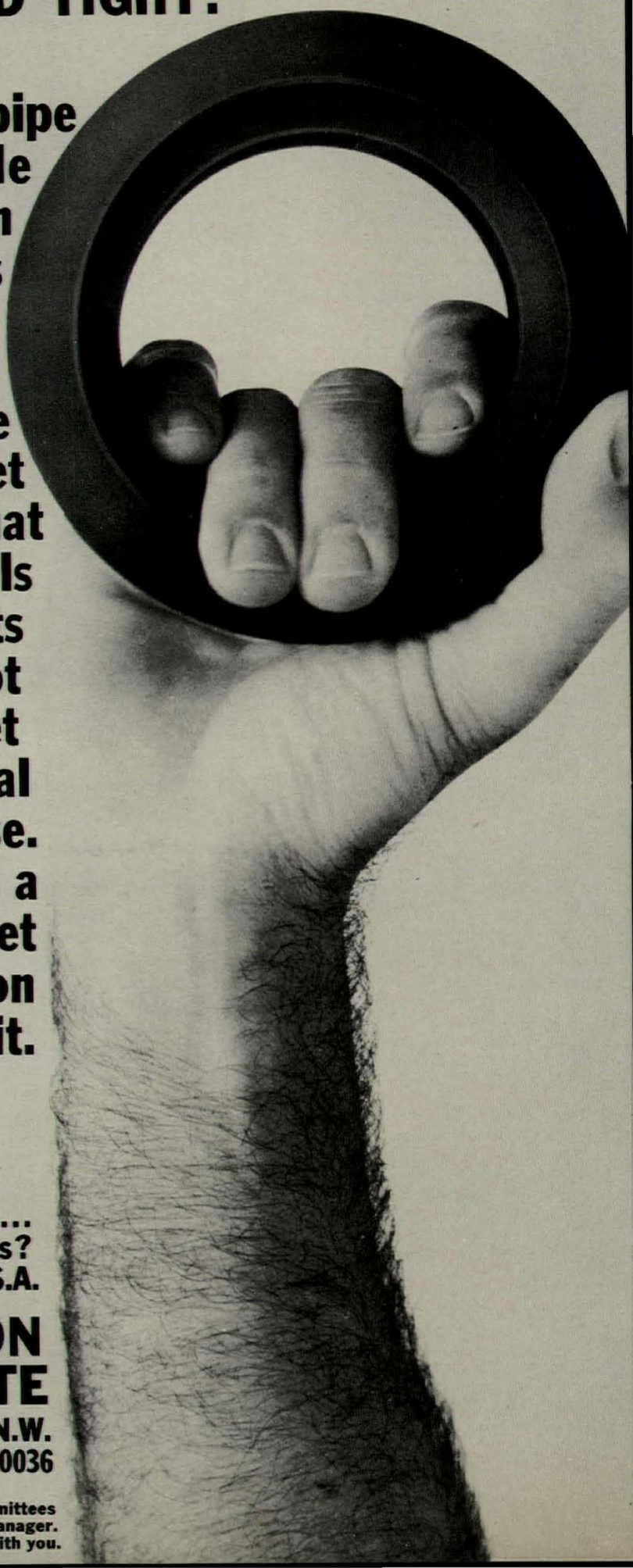

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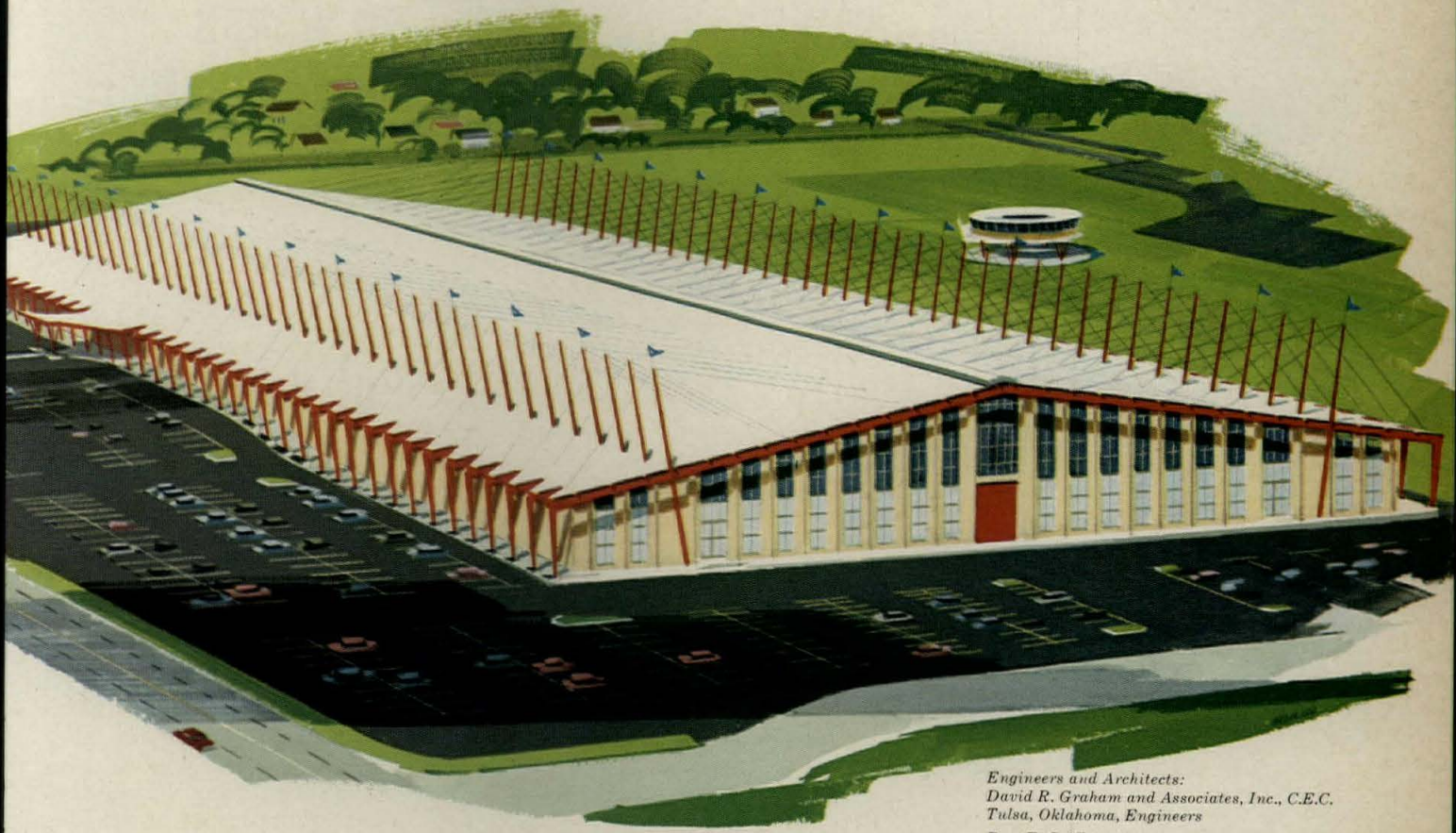

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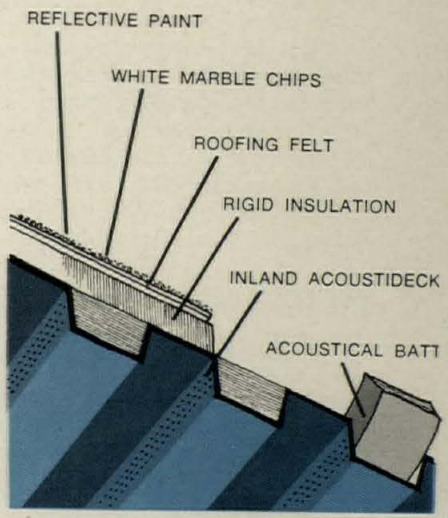

Excessive noise in the Tulsa Exposition Center is entrapped in fiber batts through perforations in the vertical webs of the Acoustideck panels. Insulation over the deck is topped with asphalt-impregnated felt and then a layer of white marble chips. This is coated with a highly reflective white paint.

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parcels. Consistently, he reports low owner concentration in his test areas. But when thinking about the high number of small owners, we still see left a large number of buildings owned by relatively few men.

Negroes own one-third of parcels sampled, and most are live-in owners. Resident-owners have better records of maintenance. The best records are held by single-parcel resident-owners who also work at a job in the area.

Resident-owners keep up their buildings, yet they are not good prospects for rehabilitation. Typically they are, or have been, tied down with high-interest, short-term mortgages. Usually they buy at inflated prices in order to get financing, since they have little or no money to put into the transaction. A parcel thus may sell to them for twice its assessment.

Resident-owners are largely ignorant of present government rehabilitation aid. In general they fear government action. They feel the pinch of recently raised municipal real estate taxes the most, and fear that improving property will bring higher tax assessment. For these reasons, as well the real unavailability of improvement money to most, they do not improve their properties. Improved properties do pay more taxes than unimproved properties, according to Dr. Sternlieb, but he also finds widespread ignorance of which improvements can be made without reassessment. Most of the latter are on the order of paint and siding.

Least interested in rehabilitating were the middle-group owners, the 8 per cent having six to twelve parcels. They owned some parcels in the worst shape. Inhibiting rehabilitation was the maxim "do not improve a building above its neighborhood." These owners say—"what's the use"?

Best prospects for rehabilitation programs, especially at the outset, are the most sophisticated of the owners, the 16 per cent who hold more than 12 parcels. By occupation most are in real estate. Most are oriented to profit through resale. They would improve now if a higher-paying rent roll could be obtained. But they are most often hit by vacancies (one owner had 18 per cent vacancies) because they own the least desirable, hard-core slums.

Urban planners have felt that vacancies would cause owners to improve their properties, but Dr. Sternlieb finds that it works the other way round. Vacancies make owners cautious and fearful of losing basic investment.

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Over-all, Dr. Sternlieb finds weak resale and rental markets. To succeed then, rehabilitation must be, he says, a three-pronged advance against slum conditions. First, code enforcement—but an enforcement concentrating on things that will improve the neighborhood's appearance, the people-oriented non-assessables like paint and siding, rather than the building-oriented items, like central heat. Second, better financing, especially better financing for improvements, with money available on a par with that for new construction. Third, a program of tax assurance. Tax assurance, Dr. Sternlieb defines, is taxes against unimproved properties, replacing the present system which is, in effect, against improved properties. He also wants rent subsidies for tenants so that they can continue to live in improved properties.

In the aspirations and numbers of the resident-owners the author finds hope of real improvement in slum conditions, given an extensive program of financial help and education. He characterizes his idea as being most like a "latter-day Homestead Act." Through a suitable program he also feels that the numbers of these owners could be greatly increased. There is now a trend in that direction, he notes.

But in finding that only larger-scale owners will be easily reached by a program, *The Tenement Landlord* makes us aware that rehabilitating, to the extent that attitudes of people must be reshaped, will be hard to achieve. It will not be inexpensive or easy. And it will not happen, on a broad basis, very fast. The architect must also think about the long-run desirability of substantial numbers of now-deteriorating buildings.

Do we vest the aspirations of a new middle class with ties to areas that may, in the not-too-distant future, look attractive for thorough-going renewal—including commercial renewal to provide jobs for those living in the areas? Do we saddle people who have little education and innate dread of government powers with slum properties or do we work toward, as Charles Abrams has suggested, condominium or row-house home ownership? Dr. Sternlieb's proposal, to rest our hope with resident-owners and give them total support, is quite attractive today, but perhaps an investigation of the concomitants, a search outside the purpose of this well-realized study, would be a logical next step in an appraisal of this idea for a focus for rehabilitation. (For more on the future of rehabilitation see Perspectives, page 10.) *—Sidney Abbott*

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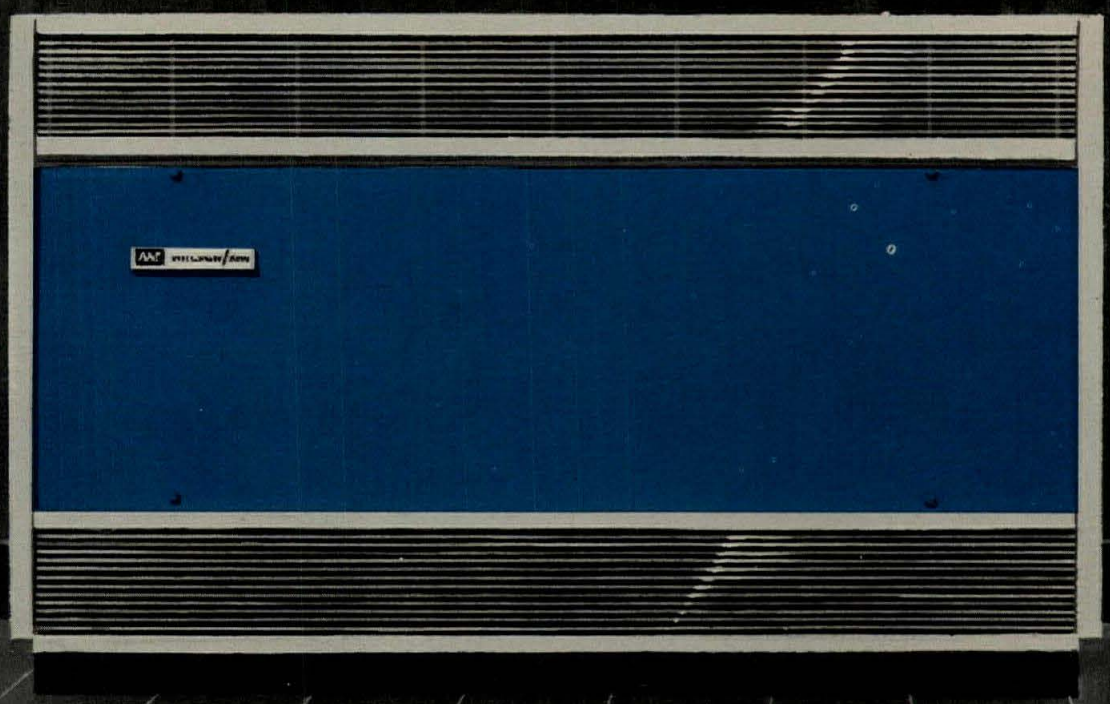


LETTERS

New breed

Unquestionably, you have brilliantly and precisely identified the most critical problems facing the architectural and engineering professions today in your editorial in the October issue. The problems you outline must be faced now. Your editorial formulates the challenge. Let us hope that practicing architects and engineers will meet it.

Because of the fact that you are obviously so clearly aware of what the basic problems are, I thought you might enjoy reading my article that appears in the October 1966 *Consulting Engineer*. I believe that the analysis of present-day engineering curricula presented therein fully substantiates Mr. Hastings' conclusions. What my article attempts to prove is that although some consulting engineers feel that they are ready to assume an increasingly greater responsibility for total building design, they were really never properly trained for it. Furthermore, those that are to follow them are not being given that type of broad training given to architects which would prepare them to accept such responsibility.

But splintered and makeshift solutions are not the answer. Perhaps a new breed of architect/engineer or engineer/architect, call him what you may, must be created. Only the cooperative effort of the most gifted minds of the leaders of the architectural and engineering professions can set the future goals of the building design professions and establish a projected and vitally new curriculum for the year 1975.

I hope that you will continue your efforts in the same vein as your editorial. Perhaps your kind of provocative and penetrating thinking will serve as a catalyst to bring into being that type of joint effort which is so direly needed. It is vital to the well being of the building industry and the professions that action be taken in this direction.

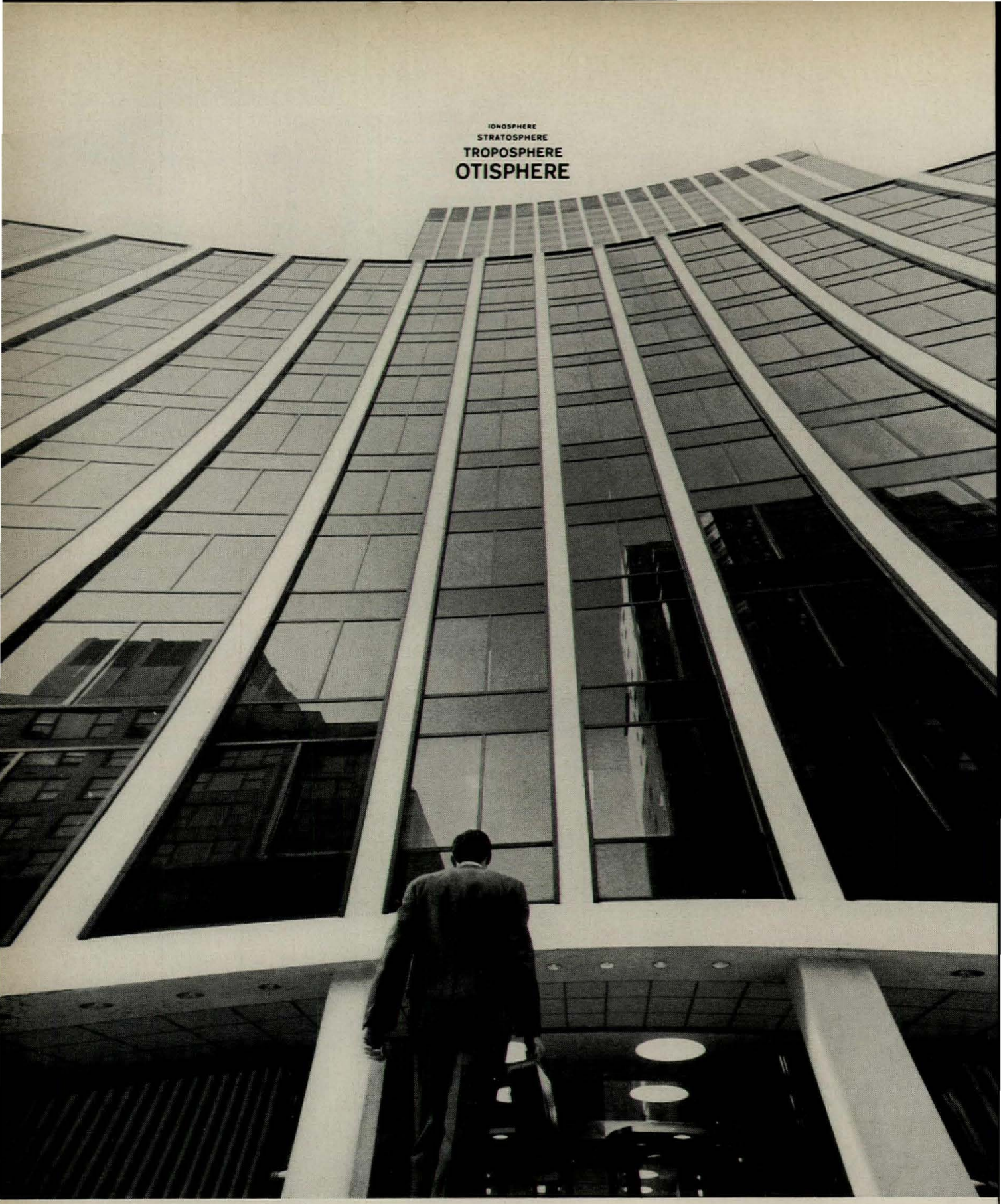
Joseph J. Pasquarelli
Technical Assistant to the
Executive Director
Board of Education of the City of New York

Anniversary grievance

There is still rankling about in my head a grievance with the Anniversary issue. And so I finally will commit it to paper in hopes of getting rid of the demon.

Quote from Emerson Goble: ". . . as the RECORD shifted its aim from the layman to the professional (First World War times) it gradually turned to a calmer, more professional attitude toward the inventions of architects, assuming the sophistication of the audience, and taking up what might more properly be

more letters on page 96



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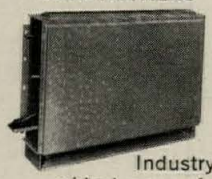

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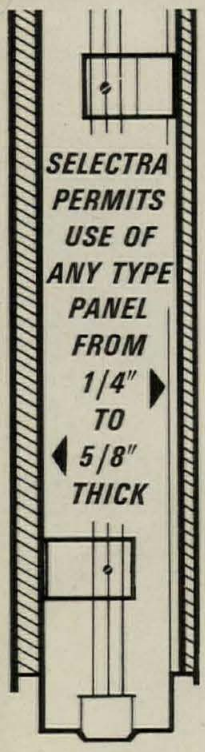

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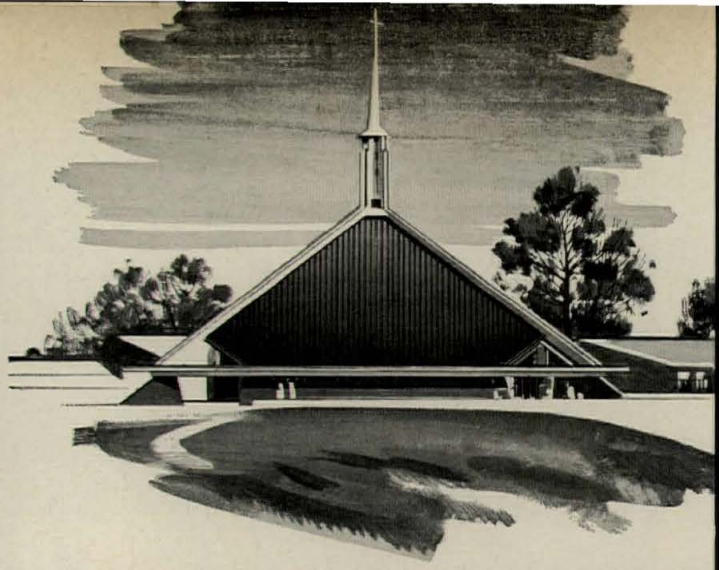

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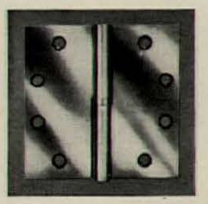

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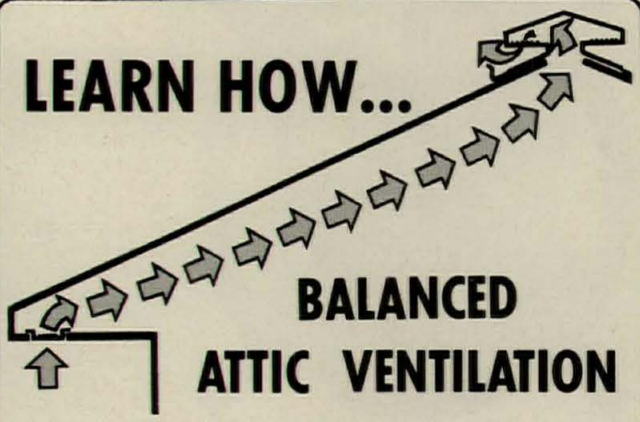

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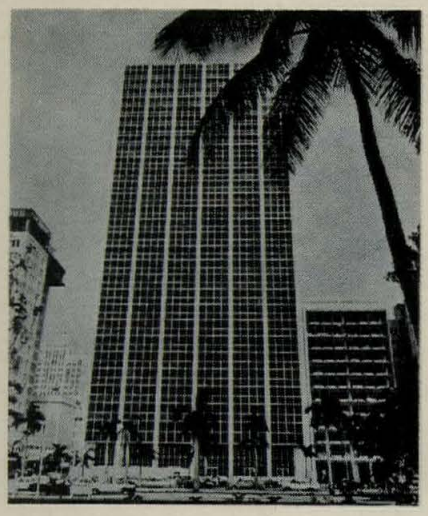

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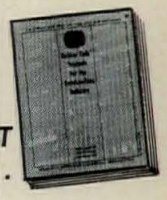

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continued from page 89

called reporting in depth rather than the more limited idea of 'criticism.' "

I am unconvinced that the continuing emphasis upon form as the measure of architecture is a contemporary tool. Proclaiming a "New Age of Modern Architecture," this anniversary issue bravely offers us "A New Meaning of Modern Architecture." But perhaps this New Meaning is only another set of bottles in which to pickle the past.

Architects are indeed dissatisfied with the pigeon-holing structure of former art history categorizations. The words "Style," "Beauty," "Order," "Classical" have all been rendered silly by our contemporary landscape. (What "Style" is a Boeing 727? Is it architecture? Has it "Beauty"? Has it got commodity? firmness? delight?).

But are RECORD's four new bottles more helpful? Being bigger-mouthed containers, these glassy clarifications will hold more, but are such transparent distinctions useful to an architect? The study of formalistic categories may sharpen the eye, but the study of the process by which form came into being gets behind surface chatter about "mass," "detail," "line" to the basic responsibilities of shaping a new environment.

Let the general readership magazines popularize architecture by neatening it up. One should be tidy for company. But wouldn't a magazine for the professional benefit from an investigation of the process by which its published "forms" are achieved?

Hugh Hardy
Hugh Hardy & Associates
New York City

The article, "A New Meaning of Modern Architecture," was not a proposal for a new kind of parlor game, but a discussion of the definition of modern architecture which questions the historical view, still generally held, that modernism is a 20th-century phenomenon. I would be inclined to think that discussions about architectural history benefit the profession, if only because false impressions of history tend to foster false expectations of the present.

Jonathan Barnett

Another plea

We are very pleased with the October article on our firm.

I was also pleased to read the editorial, "The Practical Pressures Pushing the Profession," and most particularly your closing plea.

I do believe that gradually the message is getting through to the profession and sincerely feel that you and your magazine deserve a great share of the credit. I hope that you will continue to challenge the profession to broaden its scope of responsibility to the point where they become qualified to truly practice comprehensive services instead of just talking about them.

R. F. Hastings
Smith, Hinchman & Grylls Associates, Inc.
Detroit

Elated team

Everyone here was very elated by the fine presentation RECORD did on our organization and work. I, in particular, was pleased because I thought the work you selected was very consistent and showed an insight and taste which I appreciated. I also thought the layout was excellent. I wish you would compliment the art director as well.

Sigmund F. Blum
Smith, Hinchman & Grylls Associates, Inc.
Detroit

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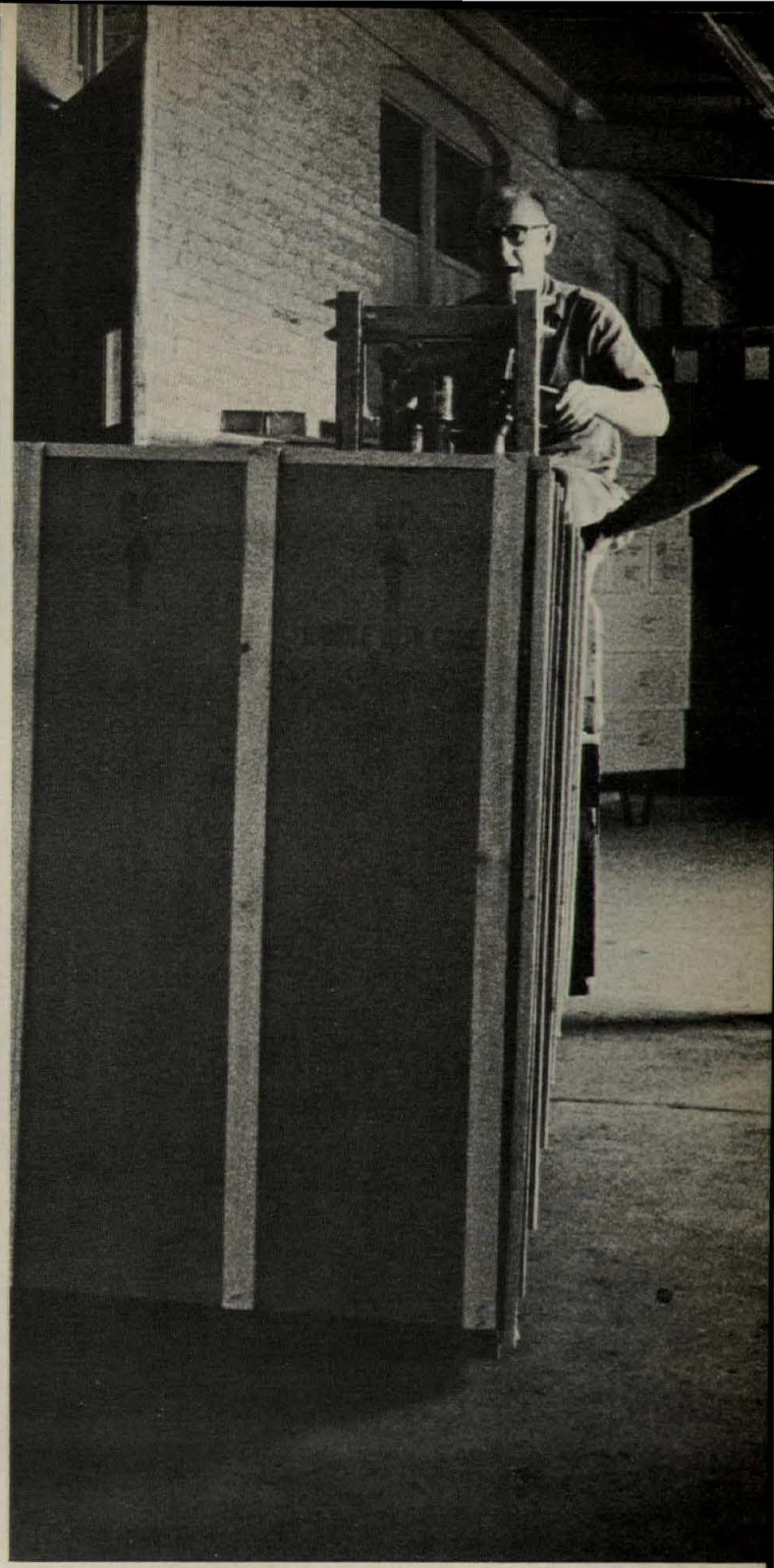

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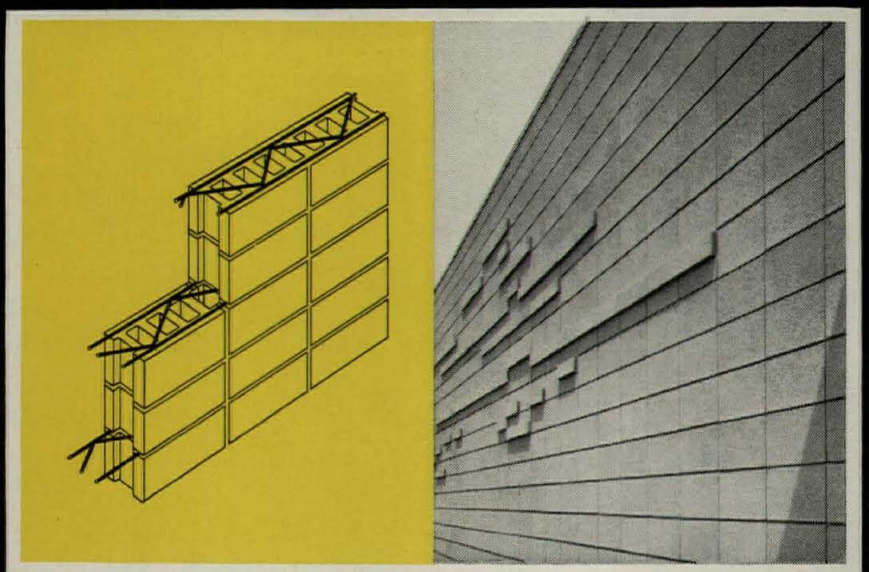

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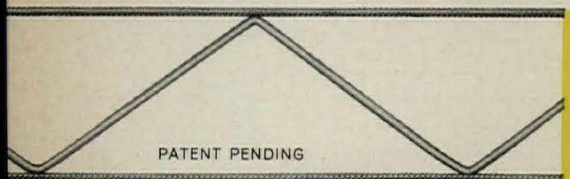

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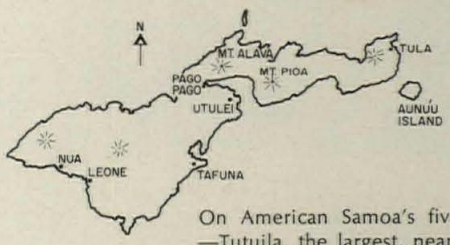
DECEMBER 1966

The far Pacific: a new frontier for architecture

Small islands in the vastness of the Pacific Ocean are not the most likely places to examine the forces of urbanization at work. Yet in elementary form these forces are exerting their pressures on United States territory 5,000 miles and more from the west coast of this country. The process is just beginning, but its progress can be studied for insights into problems of developed as well as undeveloped areas.

In American Samoa, a group of islands in the South Pacific which have been American territory since 1899 when the Samoans ceded themselves to the United States, an accelerated program of development has been under way for the last five years. Begun as a crash program of political expediency (to clean up the islands for an international conference in Pago Pago in 1962), this program has continued under a dynamic and far-sighted governor, H. Rexford Lee, as a program to develop the education, health and economic condition of the people of Samoa. The implications of a sudden, head-on meeting between a primitive culture and the 20th century may seem more anthropological, sociological and economic than architectural, but architecture has here been playing a significant role in effecting a transition-without-tears from primitive to modern ways.



On American Samoa's five islands —Tutuila, the largest, near Aunu'u, and the Manu'a group 60 miles away —the native building form is the *fale*, oval in plan, open-sided, thatch-roofed, admirably suited to climate and custom. Villages are clusters of *fales* fronting on a *malae* (open space). New buildings introduce today's technology into context of Samoan culture: precast concrete "trees" replace wood poles of *fale* for elementary school, redwood and shakes are used for roofs.

R. Wenkam

Pan American Airways

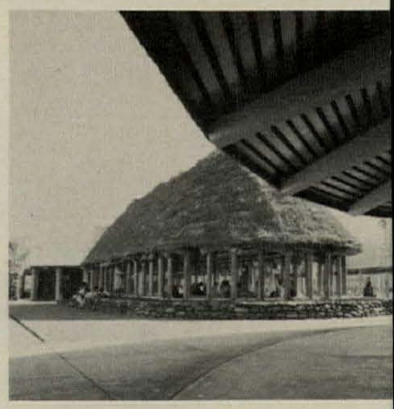
R. Wenkam photos

Fale and jet: Samoa's unique blend of cultures

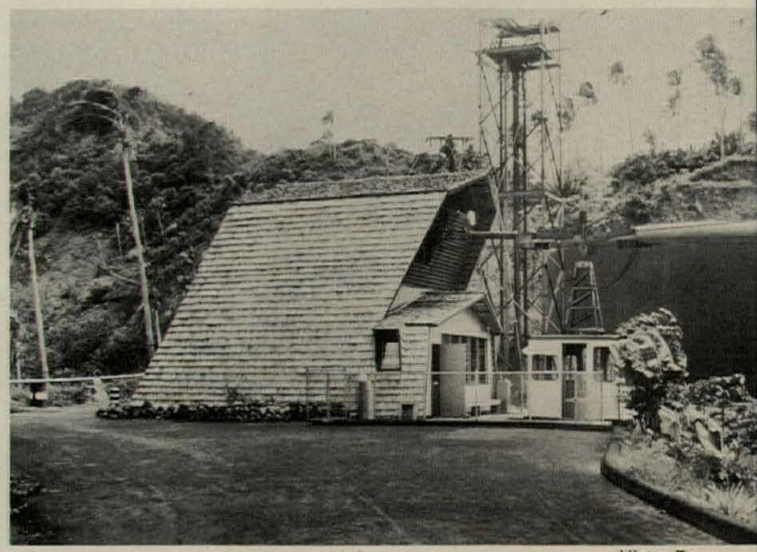
Native solutions to climatic problems are usually good responses to local conditions, and the Samoan *fale* (house) excellently solves the problems of building for a hot, humid climate where 200 inches of rain fall annually and mildew, rot, fungus and termites are inevitable accompaniments to heat and humidity. The thatched roof protects from rain without impeding air movements; the open sides let prevailing winds pass through: palm-leaf *pola* (the South Seas version of the venetian blind) can be lowered to shut out rain. There are disadvantages to this kind of construction but they are in comparison to modern convenience and sanitation rather than in essential comfort, and the advantages outweigh the disadvantages. Other than the indigenous *fale*, the only building types Samoans have known have been the missionary churches, a few settlers' tin-roofed shacks, and the ubiquitous, uninspired, non-regional wood frame government building. No modern building truly designed for the tropical climate had ever been built by the U.S. government in Samoa.

The extent to which architecture has affected the assimilation of Western ways into the *fa'a Samoa* (Samoan way of living) is evident in the new school buildings. Early in the development program Governor Lee, recognizing the need for continuing, on-hand advice on site planning and design, appointed Ned Wiederholt, a Minnesota- and Harvard-trained architect and former faculty member at Massachusetts Institute of Technology and University of California. To get the edu-

New jet airport at Tafuna confronts visitor on arrival with blend of cultures. New structures are modern. Ticketing and Customs buildings and ceremonial *fale*, built in traditional way by natives. Contemporary buildings and funicular station (below) were designed by Ned Wiederholt, Office of Architect-Planner, government of American Samoa.



Funicular, built to transport materials from port to top of Mt. Alava for TV tower construction, is now a tourist attraction with superb view of Pago Pago harbor.



Victor Torres

R. Wenkam

Farmer's market, in redeveloped area along Pago Pago waterfront, is open shelter of precast concrete bents. Wide overhangs and open central court cool building. Separate small buildings display native arts and crafts. Architect: Office of Architect-Planner, Ned Wiederholt.

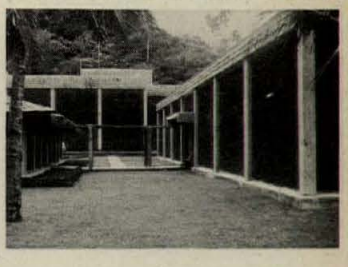
Lee Auditorium, rushed to completion for 1962 conference, was first of new buildings. Design, recalling traditional "rest *fale*", is response to indigenous conditions. Architects: Wimberly, Whisenand, Allison and Tong of Honolulu.

Ned Wiederholt photos

Simple detail and careful design produced houses for $14,000 each, half usual government house cost.

Education Administration and TV studio buildings, and house above, were designed by Office of Architect-Planner. Construction is tilt-up.

R. Wenkam



R. Wenkam photos

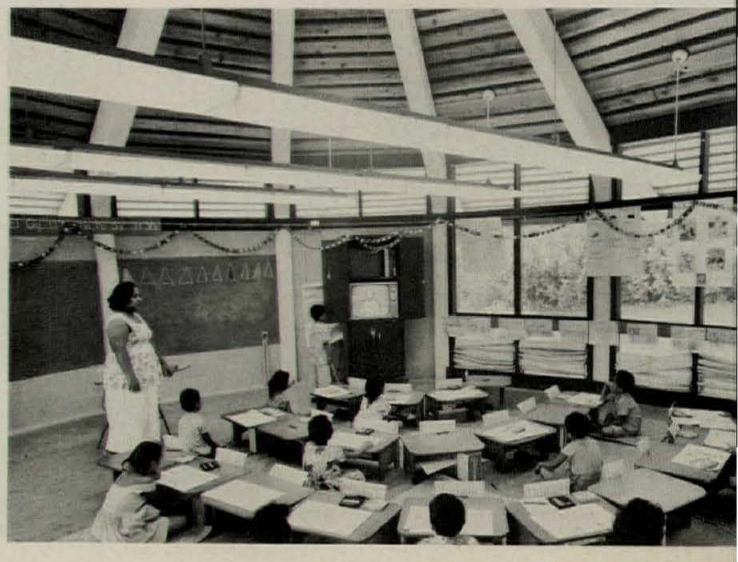
Teaching by TV: Samoa's advanced educational system

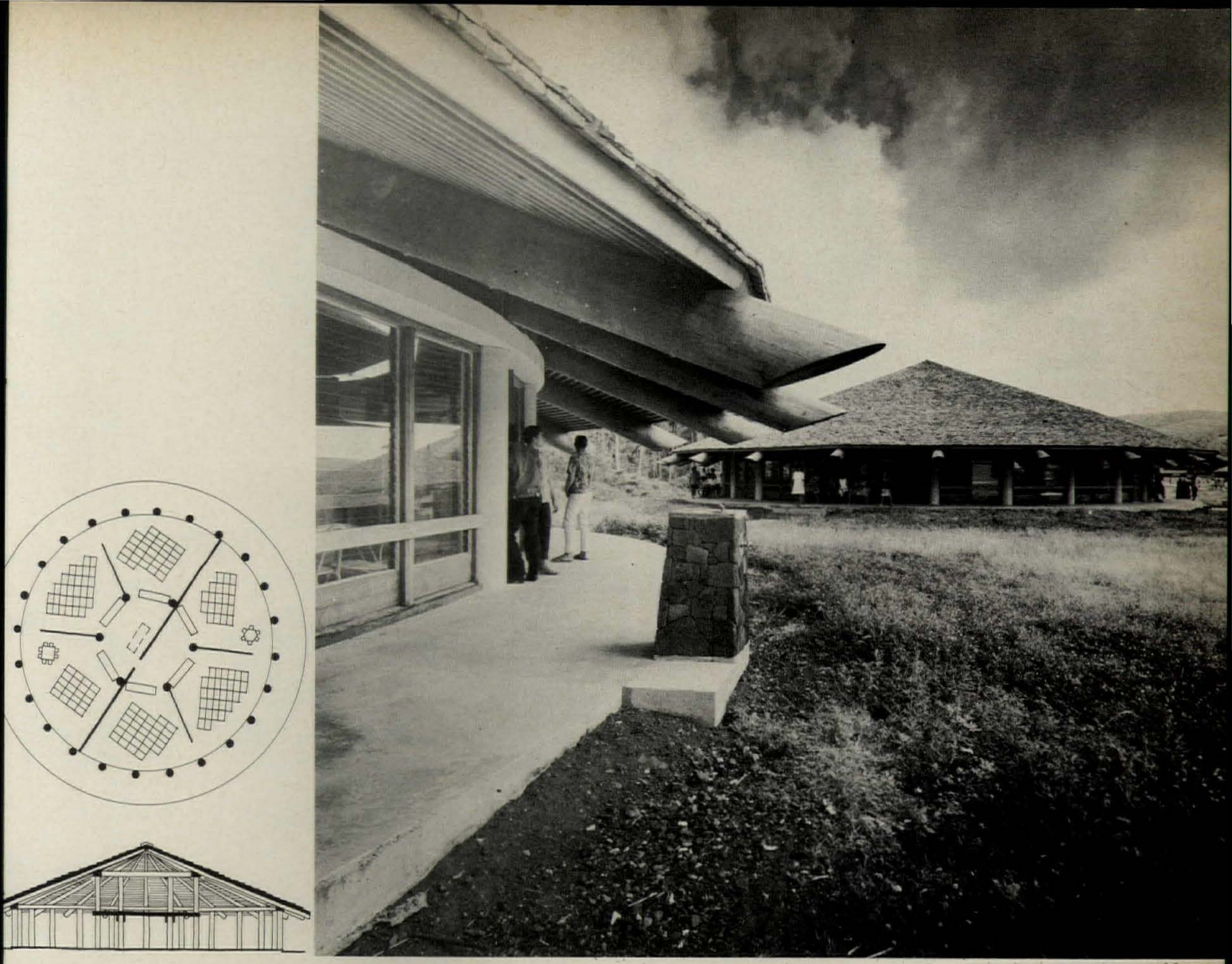
cation program under way, school buildings were acutely and immediately needed. Mr. Wiederholt and two members of a Honolulu architectural firm devised a contemporary version of the *fale* combining its form and climatic response with modern materials to obtain a simple and economical prototype structure adaptable to a variety of conditions.

The 1962 conference in Pago Pago of the South Pacific Commission was the turning point for Samoa. Instead of the neglect and isolation it had known for 60 years, American Samoa found itself emerging from oblivion, suddenly in communication with the world beyond its shores, and in at least one field more advanced than any other country in the world. Here in this remote island, a problem that presses on three-fourths of the rest of the world is being solved with a technology beyond even the dreams of this gentle, smiling people: the provision of top-quality education with a limited teaching force at a minimum cost in teaching staff and classroom space. The solution in American Samoa is television, but not television as it has been typically used in schools. This system uses television completely, as the mainstay of the system, not as a supplement to it. With this kind of educational system, it is of no consequence that the school population is spread over 76 square miles and five widely separated islands, or that the majority of the teaching staff are native teachers with the equivalent of no more than a sixth-grade stateside education, or that there is only a handful of fully trained teachers. The

Elementary schools are clusters of up to 14 two-classroom units around a multi-use *malae* (open space). Units were built at very low cost of $8.50 per sq. ft. Since schools are also recreation and health centers, location is within easy walking distance from village so older people can attend adult education classes.

Lessons prepared by "master teachers" are TV-broadcast from studios and transmitted by tower on 1,800-foot-high Mt. Alava to all classrooms where native teachers are monitors.

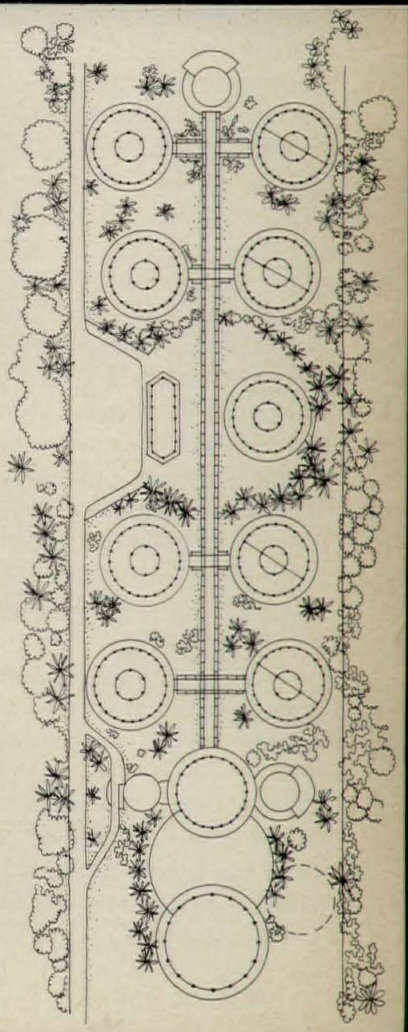




High school at Leone, prototype of three to be built, makes economic use of space and teachers. Circular plan allows 65 square feet per student (cf. U.S. average: 110) but also permits great flexibility of space use: TV screens, heart of teaching method, can be connected anywhere on perimeter or at building center; classes can be oriented in either direction, or divided for different activities. Good acoustics permit partial partitions, hung from joists. Ventilation is by jalousied glass wall panels and eave openings.

LEONE HIGH SCHOOL, Leone, Tutuila, American Samoa. Architects: *Reid and Tarics (John Lyon Reid, Dr. Alexander G. Tarics), Robert Olwell, project architect, Richard Campbell, job captain;* mechanical engineer: *P. T. Destin;* electrical engineer: *Stanley H. Anderson;* acoustical consultant: *Dariel Fitzroy.*

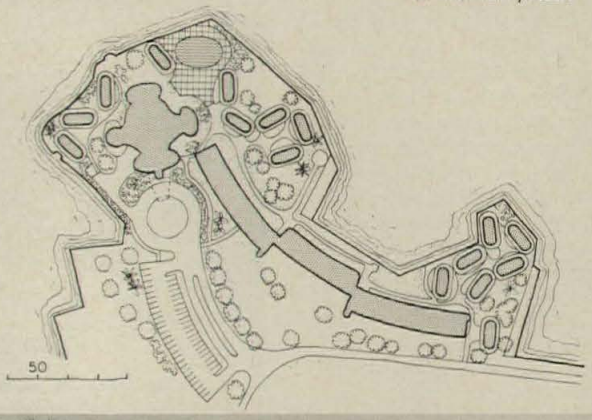
NUA ELEMENTARY SCHOOL, Nua, Tutuila, American Samoa. Architects: *Lemmon, Freeth, Haines & Jones and Government of American Samoa, Office of Architect-Planner, Ned B. Wiederholt.*



R. Wenkam photos

potential for such a system is unlimited, making the best in education available for the first time in places where it is most needed, and offering, before an actual experience of the developed world (so much the goal of the youth of undeveloped lands), the opportunity to know it visually. The American Samoa program was set up by Dr. Vernon Bronson, educational television consultant, and "master teachers," brought from the United States, formulate the curriculum and prepare lesson material specifically tailored to the Samoa situation. Lessons are broadcast over the six-channel system which reaches the farthest villages of the offshore islands. By using native teachers in the classroom to monitor the effect of the lesson and to assist where necessary, the personal relation between teacher and pupil is maintained. The native teachers also learn in the classroom from the broadcasts by expert teachers, as well as from after-school training programs. Adult education and some entertainment programs are broadcast at night.

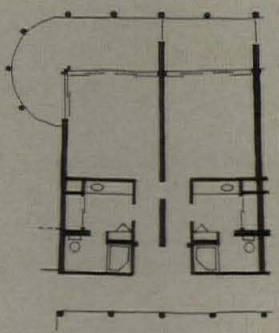
The new hotel: key to tourism and a rising economy



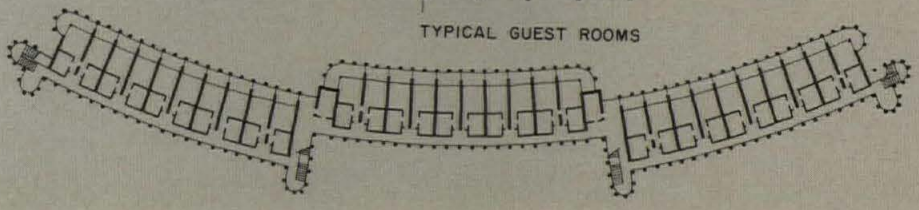
The islands' dream-like beauty held a natural potential for development of a tourist industry as a boost to the economy, but without an attractive hotel it could not be realized. An all-Samoan corporation, formed for the purpose, financed and built the new luxury hotel on Pago Pago Bay so that now, with the new jet airport at Tafuna, paved roads all the way around Tutula, a handsome government center at nearby Utulei Village, and the exotic scenery, tourism has a modest but promising start. The hotel's unusual blend of Polynesian forms

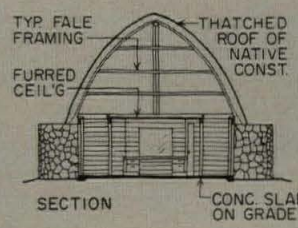
The hotel site across from Rainmaker Mountain is a rock promontory in Pago Pago Bay which was enlarged by 4.5 acres of fill. On the fill are two kinds of buildings—long houses and *fales*—providing 101 guest rooms. Public rooms (lobby, lounges, cocktail and dining rooms) are at higher elevation on rock. Hotel cost was $18,000,000. At left, above, is cocktail lounge with *fale*-type units beyond. Below: hotel entrance. Right: above, long houses, left, and *fales*, right. Center: left, typical room; right, *fale* room.

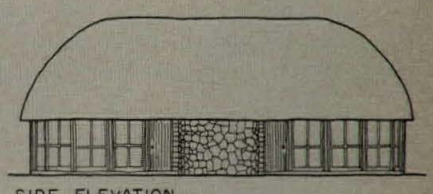
HOTEL PAGO PAGO INTERNATIONAL, Pago Pago, Tutuila, American Samoa. Architects: *Wimberly, Whisenand, Allison & Tong;* mechanical engineers: *Fred Kohloss & Associates;* electrical engineer: *Douglas V. McMahon;* landscape architect: *George Walters;* contractor: *Swinerton & Walberg.*

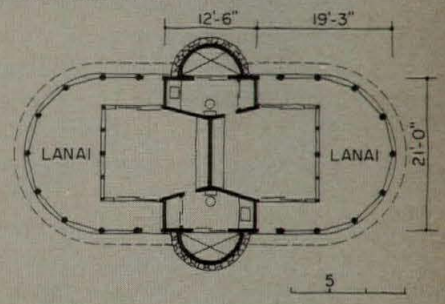


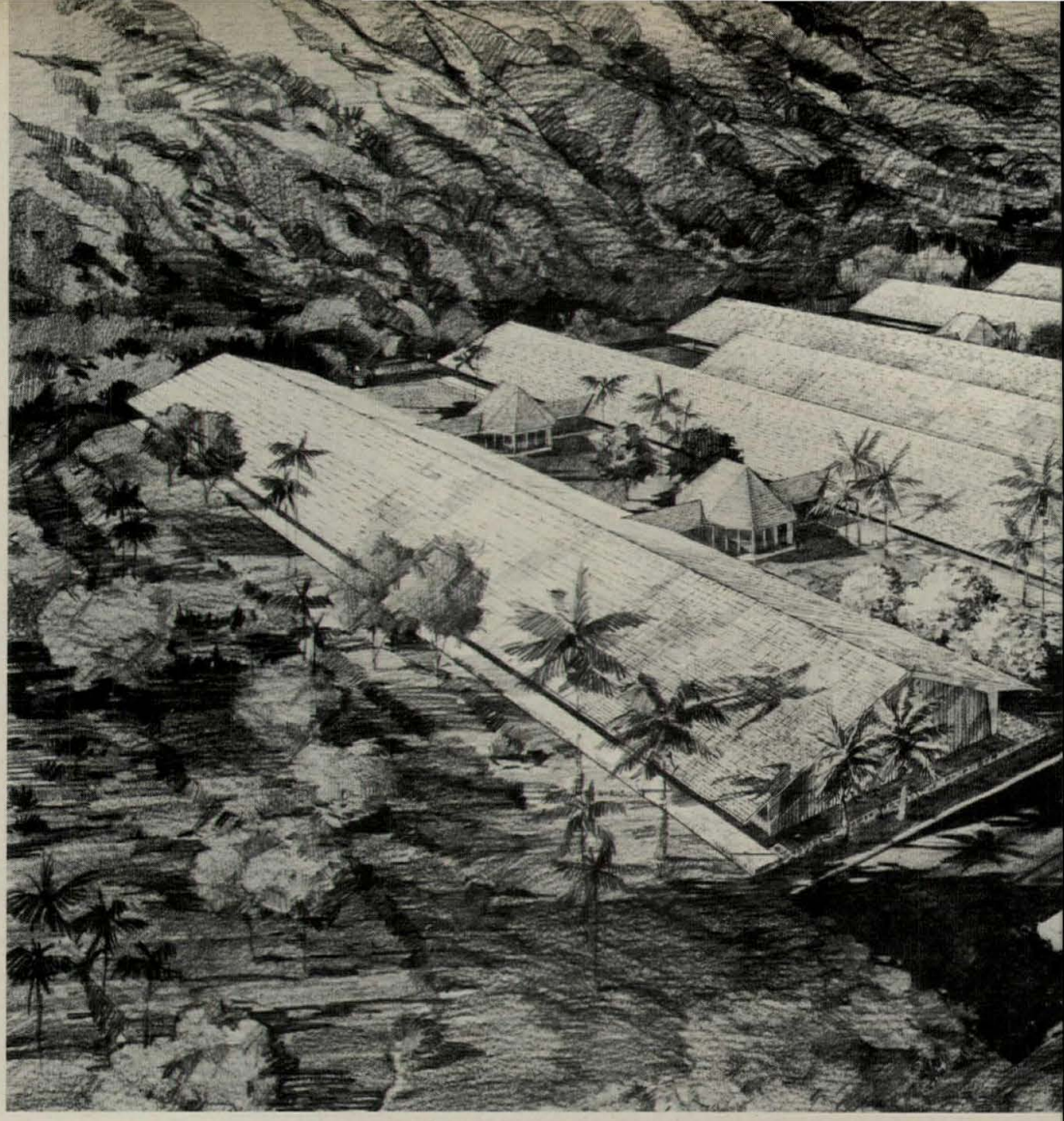
TYPICAL GUEST ROOMS







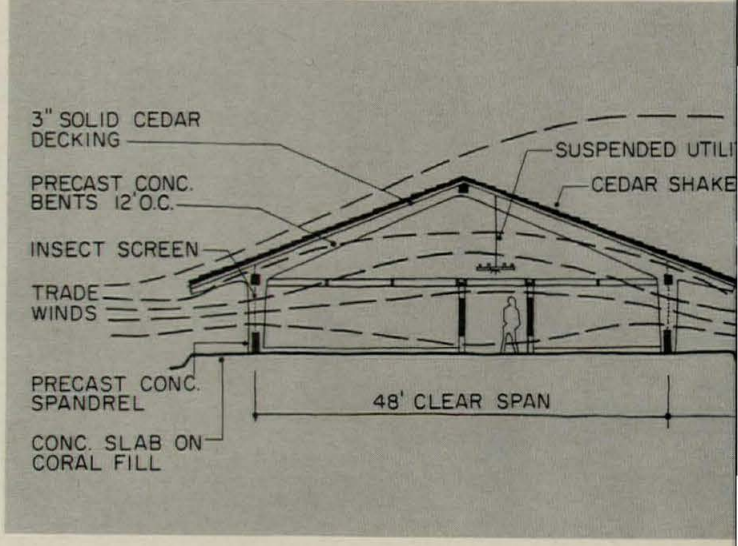




Medical center: breakthrough in tropical design

(three two-story "long houses" and a dozen thatch-roofed *fales*) with the accouterments of the modern resort hotel appeals outright to the romantic traveler, but reflects the over-all program of retaining in every possible way the unique culture of the Samoans. The "long houses," containing typical rooms, are of conventional construction, but the two-room *fales* bow to modern sanitary ideas: the roof structure is fire and vermin-proofed by a thin concrete membrane between the real thatch topping and the hand-tied ribs; concrete posts are used instead of native hardwood for termite and rot-proofing.

Ned Wiederholt



The architectural challenges of Samoa have proved to be lessons in analysis of the essentials of buildings, and this has been particularly true in the design of the new medical center now under construction. As in the other buildings, cost was important; but choice of materials and of structural system was equally important since almost all materials would have to be transported thousands of miles from the U.S. mainland, and construction would be by native workmen, skilled in their own crafts but without training in the more sophisticated methods of today's technology. The most important decisions, however, came from answers to soul-searching questions of essentiality: were any of the things in the taken-for-granted overlay of nonmedical refinements, common in U.S. hospital design, really necessary in Samoa? Community ambitions, staff capacities and capabilities, patient-demanded luxury, merchandising of hospital services in a competitive situation—all aspects of hospital

Drawing by Robert Olwell

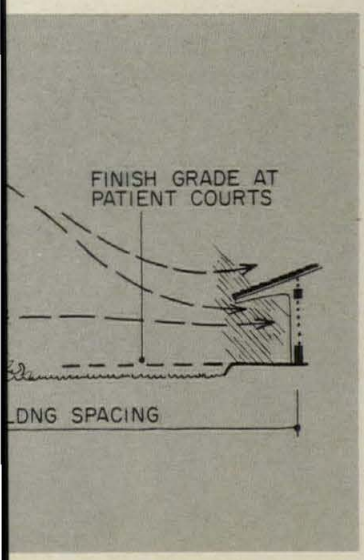
TROPICAL MEDICAL CENTER, Faga'alu,Tutuila, American Samoa. Architects: *Stone, Marraccini & Patterson, S. P. Marraccini, partner in charge, Jack Ely, project director, Victor Torres, project manager;* structural engineer: *T. Y. Lin International;* consulting engineers: *Buonacorsi & Associates;* consulting civil engineers: *Lee & Praszker;* general contractors: *Beck, Raber & Keif.*

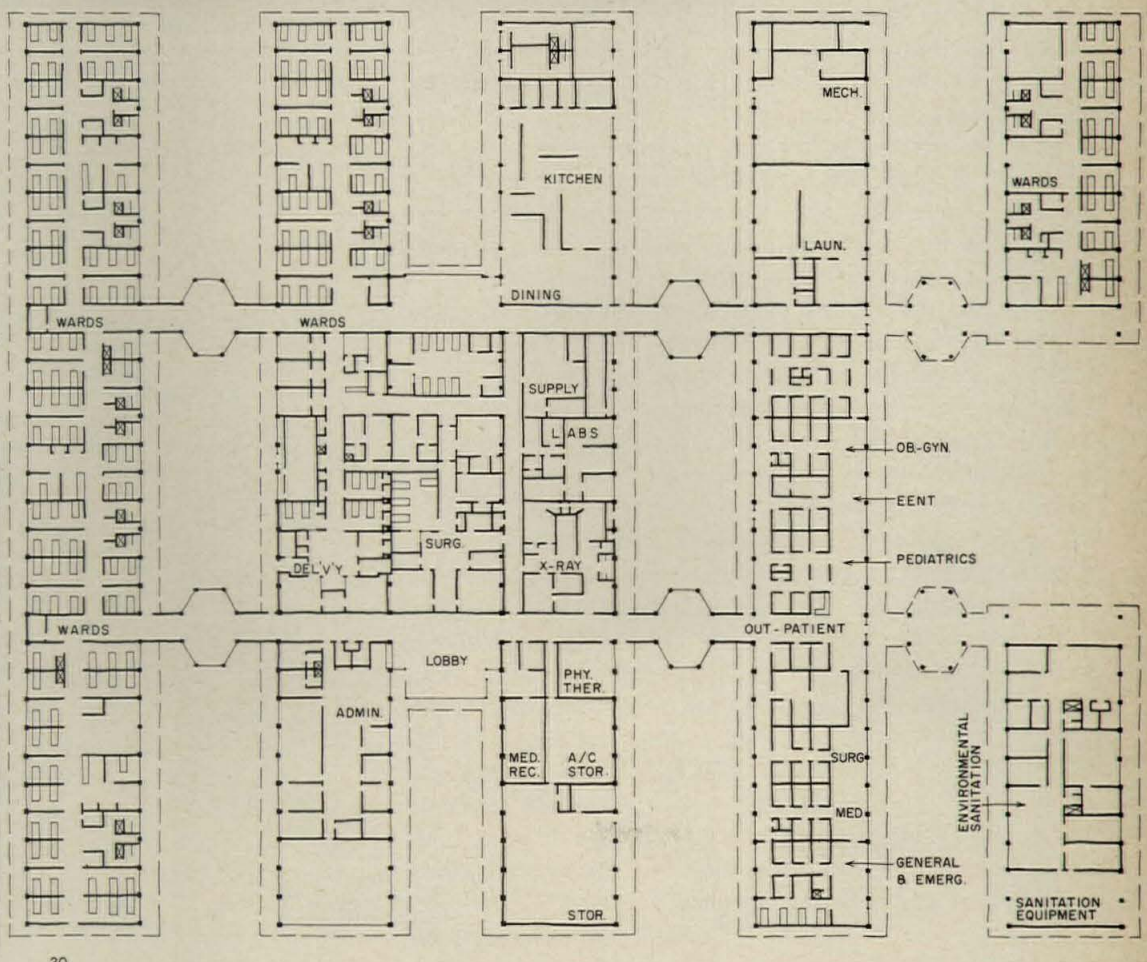
SCHOOL OF NURSING and NURSES' RESIDENCE, Faga'alu, Tutuila, American Samoa. Architect: *Government of American Samoa, Office of Architect-Planner, Ned B. Wiederholt.*

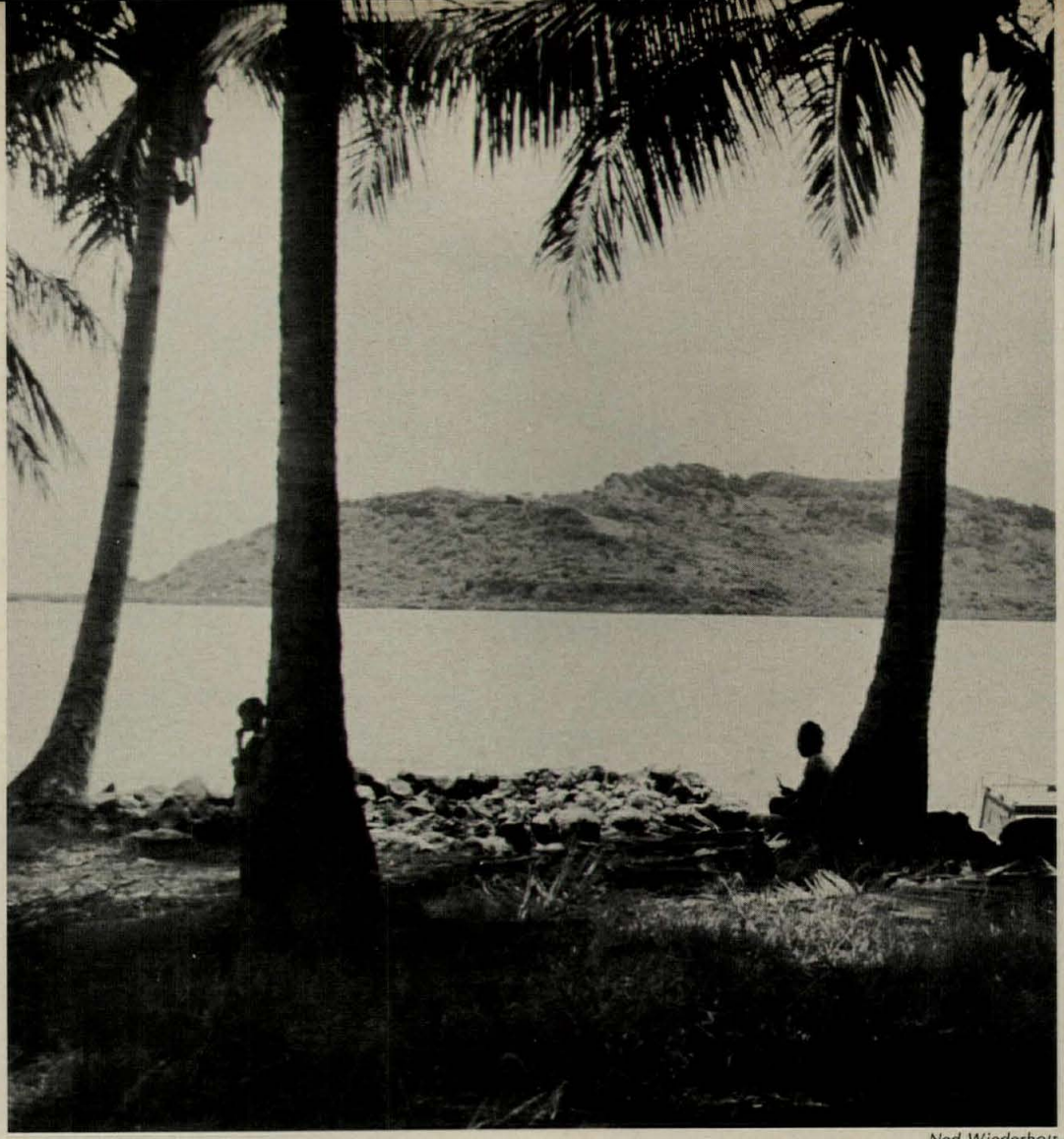
Victor Torres

Medical center site is in a valley off Pago Pago Bay, on a coral plain with poor soil conditions. One-story buildings, oriented to trade winds (and designed for winds up to 150 mph) allow maximum air cir- tion: walls are open (screened) above concrete spandrel, partitions are partial. Control and service are only air-conditioned areas.

Medical center is an indigenous solution, not a mainland adaptation. Its simplicity has direct advantages for flexibility, future expansion, low cost ($29 per square foot) and use of native labor for construction. *Fale*-type pavilions on corridors between patient wings open to courts and are day and waiting rooms. Large outpatient department will handle all diagnostic and treatment services; 160 beds are needed for patients from offshore islands. Nursing school and residence, left, are across the road from the center.

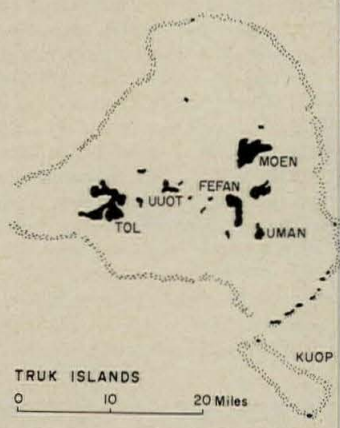




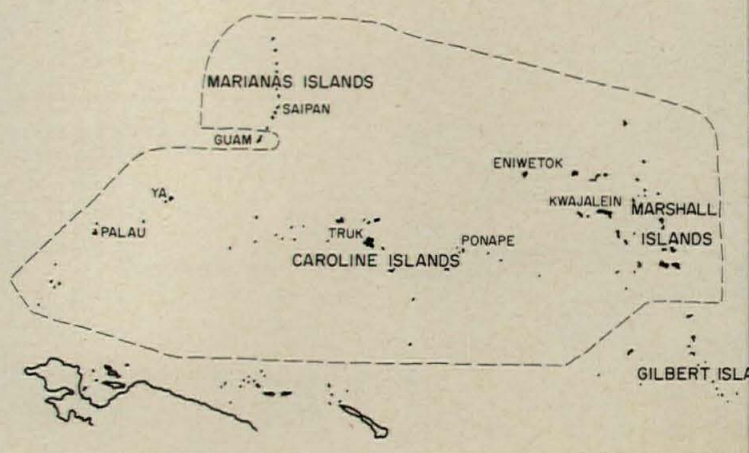


Ned Wiederholt

Trust Territory's new medical center site, above, (seen from Dublon Island) is on Moen Island, Truk atoll. Center will induce rapid development due to new jobs and Polynesian custom of camping nearby during relative's hospital stay.



The Mariana, Caroline and Marshall Islands of war fame make up U.S. Trust Territory. With same area as U.S. but only 88,000 population, it is more water than land. Controls on land use will be needed to direct growth for greatest benefit.

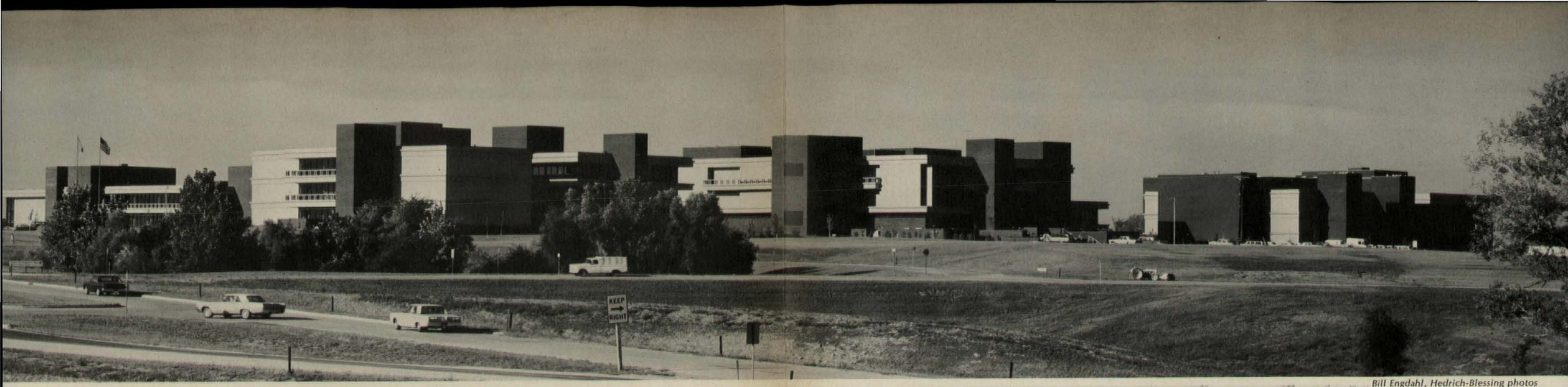


Micronesia in transition to the 20th century

design in the United States—simply had no relevance in Samoa, and design became, therefore, a matter of eliminating non-essentials, of plunging through the over-lay to the real requirements of a medical center. At the same time, whatever was designed had to be attractive and inviting, sophisticated enough for the future but satisfying for the present—within a framework to include modern hospital technology and a primitive culture.

The design is so suited to tropical conditions—particularly in remote corners of the world—that it is to be the prototype for a similar center to be built shortly on the island of Moen in the atoll of Truk, one of the Micronesian islands in the Trust Territory administered for the last 20 years by the United States for the United Nations. The development program already under way in the Trust Territory, hampered by inadequate funds, has as yet made little impact on these scattered islands. There is still a little time to plan for the planning processes which will bring the benefits of the 20th century to these primitive peoples and which can help them to achieve their own unique blend of technological advance and traditional cultural values. How serious and delicate a process it must be is clear when it is realized that the location of a single building can trigger irresistible urbanizing forces that will affect, for good or bad, not only the physical future of an area but the cultural, social, economic and political future of its people. Architecture, in such a circumstance, is no mere mirror of the times. Clearly and directly it has a major role in *making* the times.

—Elisabeth Kendall Thompson



Bill Engdahl, Hedrich-Blessing photos

A HANDSOME BEGINNING FOR SOUTHERN ILLINOIS' NEW EDWARDSVILLE CAMPUS

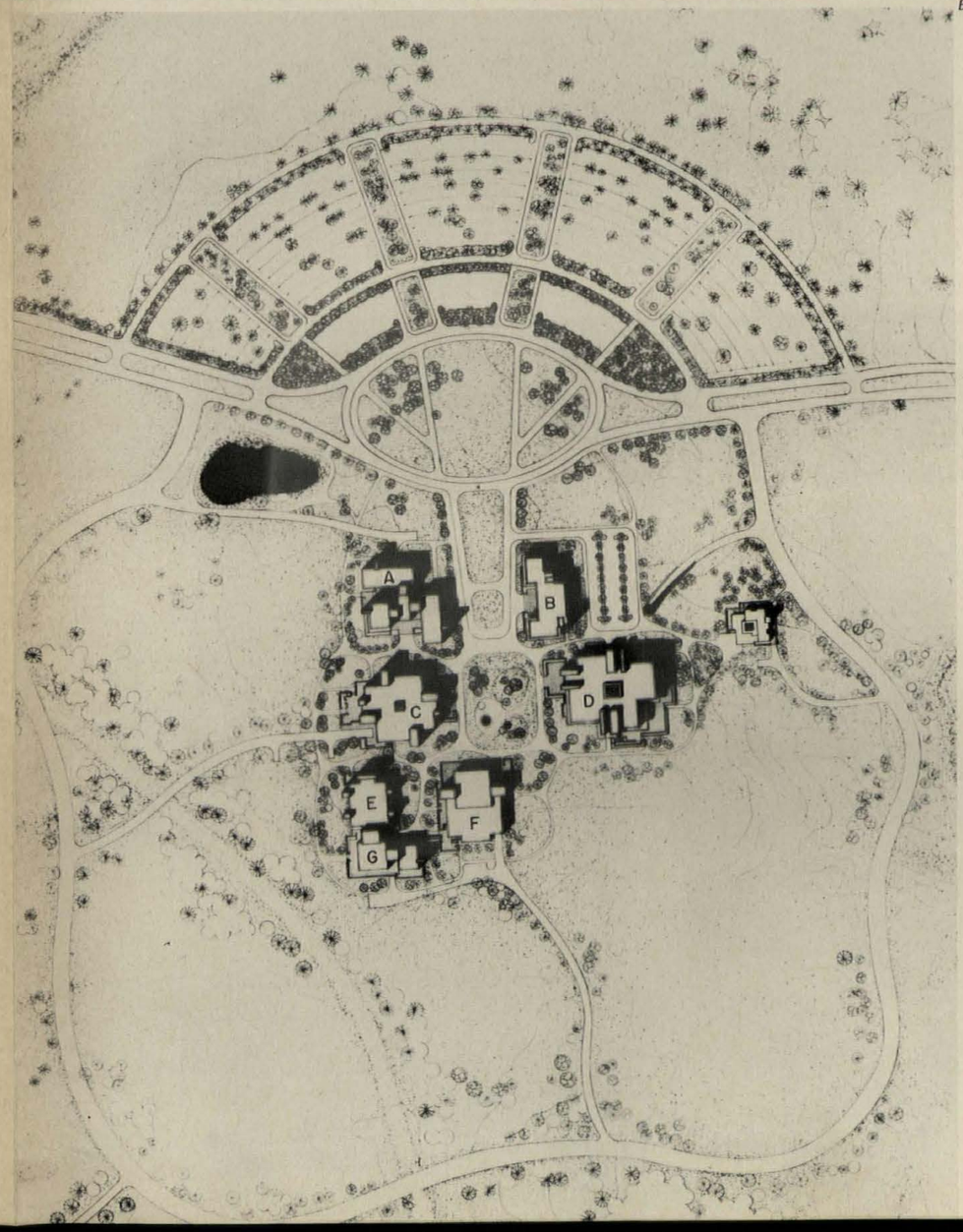
Amazingly faithful to its pre-construction sketches and models, the almost completed academic core of Southern Illinois University's totally new Edwardsville campus stands as a good object lesson in the handsome results obtainable when diverse buildings are planned with overall unity in mind. And its strong, basic design standards are expected to serve as the basis for unlimited growth and flexibility. The student body numbered some 4,000 last year, all of them commuters, but it is soon expected to be five times that size, multiplying the needs for specialized space and equipment.

Programing of the needs for the campus, from master planning to building design to furnishings, was the result of considerable research and consultation between S.I.U. President Delyte W. Morris and other educators, university architects Charles Pulley and John Randall, and Hellmuth, Obata and Kassabaum Inc., architects and master planners for the entire 2,600-acre campus. (See ARCHITECTURAL RECORD, August 1963, pages 109-116.)

The forward-looking success of this thoughtful programing for what may well become a major intellectual center in the Midwest, is reflected in the following statement from the office of the S.I.U. President: "New knowledge, rapidly changing technology and changing population patterns of our time called for new educational orientation, flexibility in physical plant, large growth potential, and acceptance of a high level of social responsibility. The philosophy of human operation in colleges and universities has been remarkably fixed and patterned into an organization of departments, courses and curriculum. . . . The university rarely uses research talents on itself. It never seems to look at itself to improve. The philosophy of this institution will be one in which changes may occur. Change should be the acceptance of the day, and this campus and its structures should show our willingness to try and question the rightness of everything. We believe this initial stage of building on the Edwardsville campus represents the flexibility and convertibility required for new educational programs of the future."

To achieve all this, Gyo Obata, HOK principal in charge of design, developed a series of general and special spaces to meet the educational program as it grows. The entire campus was organized on a functional basis rather than the traditional departmental plan. Thus, disciplines which use space in similar ways are grouped together, regardless of subject. Laboratory courses are in the science building, and disciplines which have fewer special space and equipment needs are taught in the classroom building.

Each of the buildings is also designed to provide a maximum degree of flexibility. Most of the interior spaces can be altered in character by a series of mova-



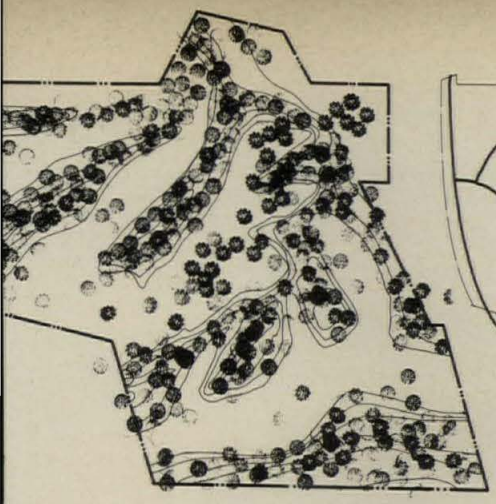
A. Classroom building
B. Administration building
C. University center
D. Library
E. Science building
F. Communications building
G. Science auditorium

S.I.U.

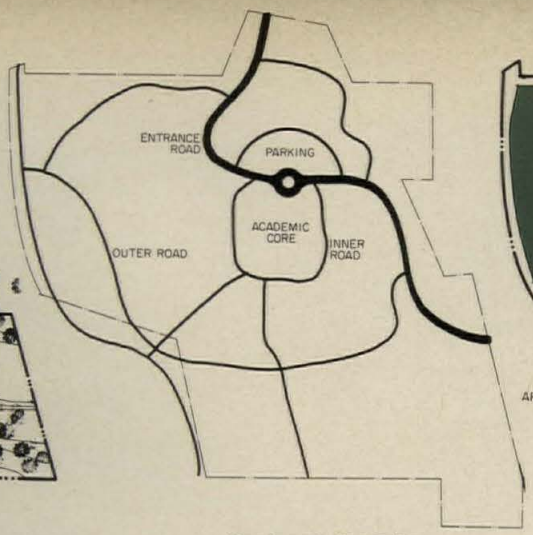
ble partitions and changeable services. However, brick towers at the perimeter of the buildings house all fixed service elements such as stairs, mechanical facilities and rest rooms. This device has permitted the formation of long, free spans to contain the active functions for which each building was designed. These spaces are expressed in precast concrete and dark glass. All of the buildings are unified by these concepts: the same, simple materials used to express an internal function. But for diversity, the materials can be combined in scores of ways to make each building an original solution to particular needs.

Vehicular circulation has been carefully planned for easy access and for views. Parking areas are divided into sections by landscaped mounds. Within the academic core, only pedestrians are allowed. It is the hope of the architects that, "The progression of spaces inside and between the buildings provides students and teachers with a sequence of places, some quiet and others busy, which makes the campus work by encouraging people to use it. In fact, the campus has established itself quickly as an equal partner with the older Southern Illinois University campus at Carbondale, 100 miles away. And the educators foresee an important future for the Edwardsville installation. Last year's mid-size, all commuter student body will certainly grow, and a residential student and faculty community will eventually redefine the current, local focus of the campus."

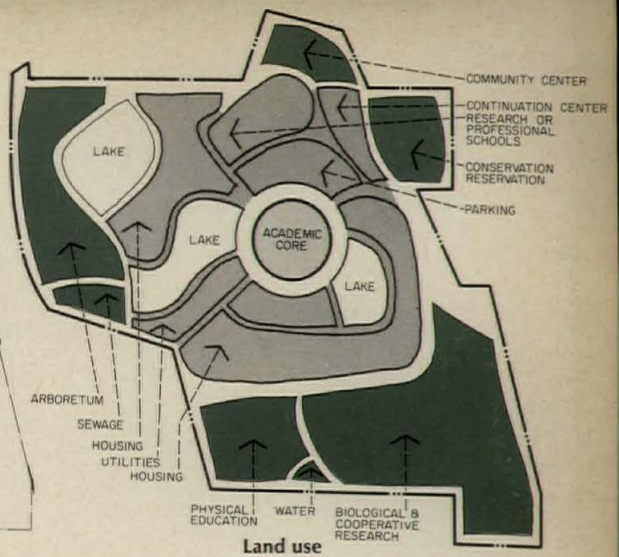
It will be extremely interesting to watch the future development and change of the campus, which will also be affected by the inevitable changes in instructional methods and in taste. If the simple, rational approach reflected in these beginnings is continued, future design on the campus should cope well with most eventualities.



The raw land



Roads and circulation

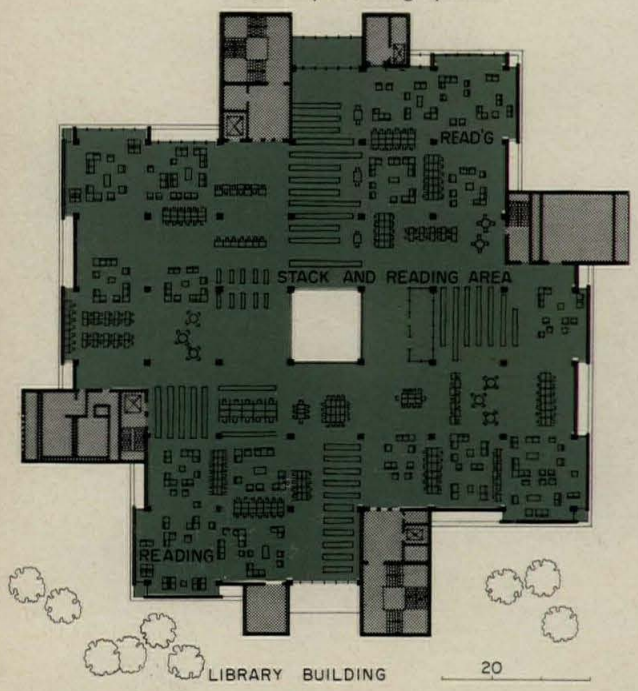


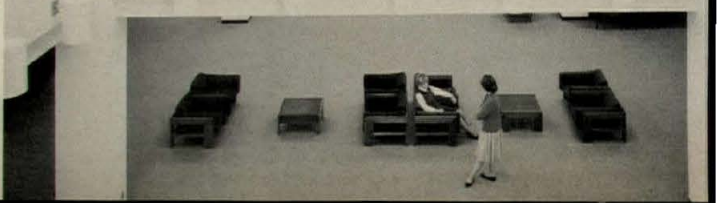
Land use

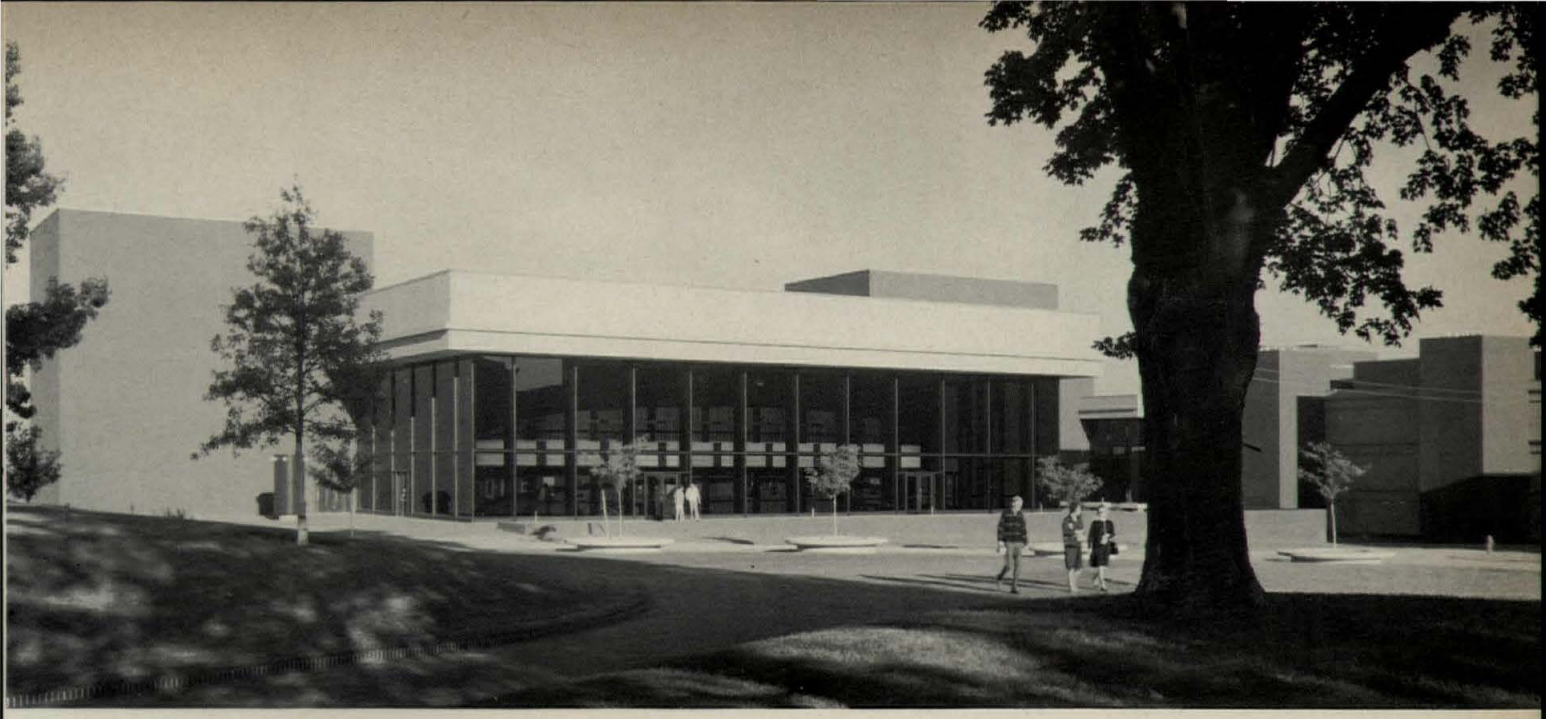
LIBRARY

An extremely open, flexible space has been provided for the library building, to permit unrestricted use of all resource material. The open-stack book collections, places for readers, offices, and the specially designed individual carrels can be placed wherever needed. Each of its four floors has about 40,000 square feet, a limit set by librarians for efficient supervision and operation. The total building has a capacity of about 450,000 volumes and 1,400 readers. For future expansion, it has been designed so that four more floors may be added. In the basement are an auditorium and a textbook rental store.

To give vertical relief to the horizontal open spaces, the center bay has been left open with a skylight above; and at the second level, the four corner bays are two-story reading spaces.



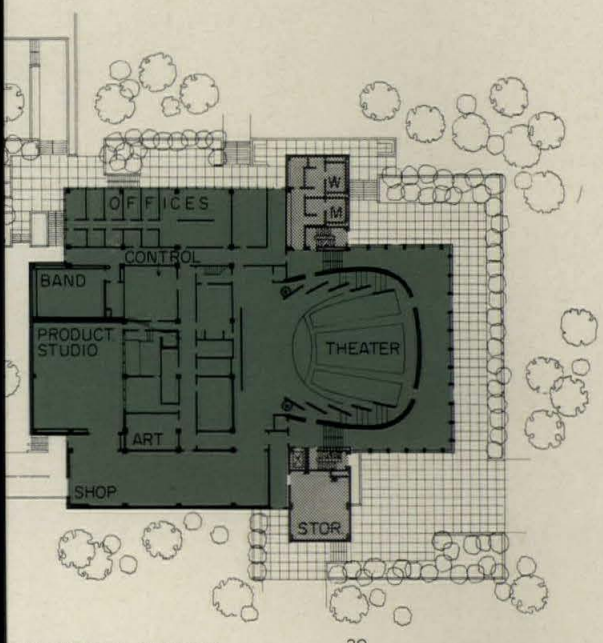




COMMUNICATIONS

Thoroughly 20th century in its comprehensiveness, the Communications Building contains not only traditional facilities for the dramatic and musical arts, but all the electronic equipment and facilities needed for television and radio transmission, audio-visual preparations and data processing. The combination permits development of many common auxiliary facilities, for operating personnel and technicians, as well as performers. A number of variously sized television studios are provided, and can be used for closed-circuit instructional programs or for local transmissions. A theater for 400 people is also included; it is planned with an "open stage" which partially envelops the audience and gives a variety of acting positions.

The building is currently in the final stages of completion. But, already, an addition which will house an audience of 1,500 people is being planned. The addition will share common workshop and other facilities in the present building. The present theater lobby is enclosed by gray glass, shielded by the overhang.

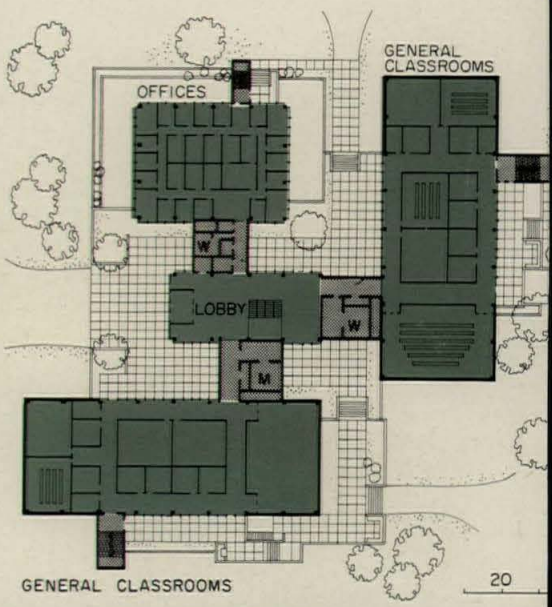


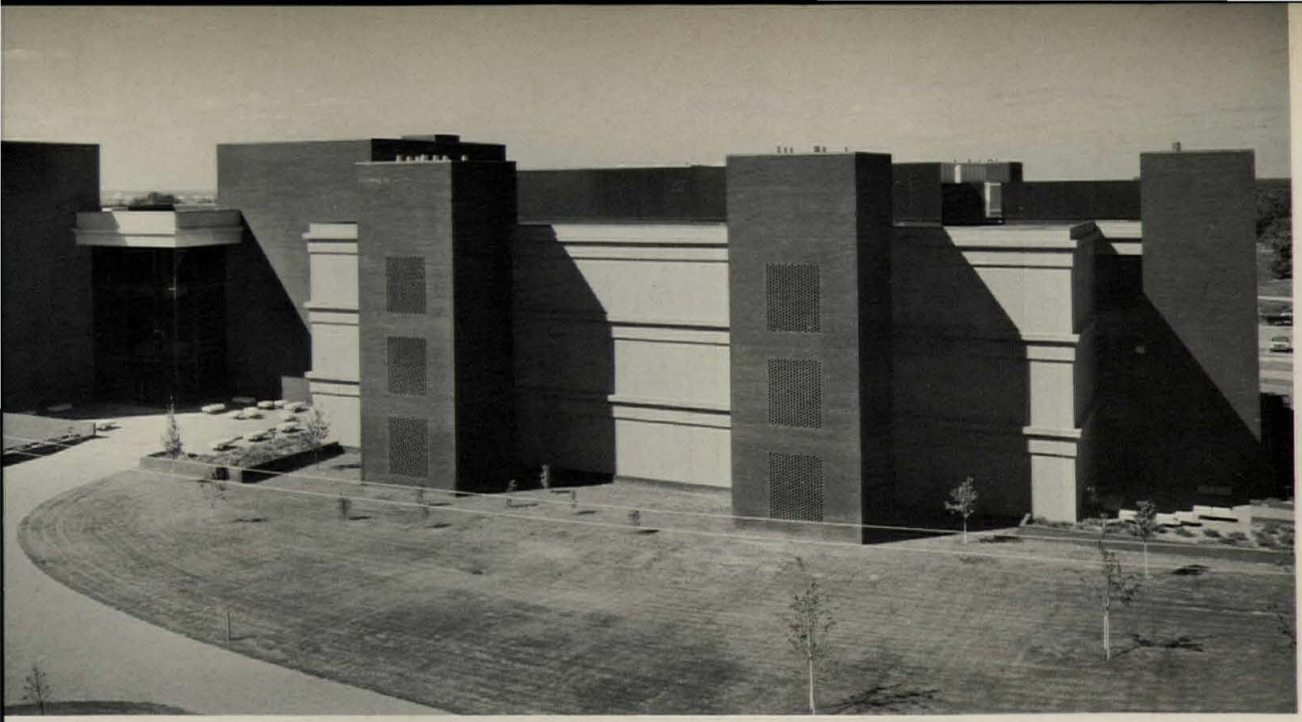
MUNICATIONS BUILDING

CLASSROOM BUILDING

The general classroom building is a complex of two identical classroom wings, a wing with one- and two-man offices for faculty members, and a central entrance unit with main vertical circulation for the complex and lounge areas.

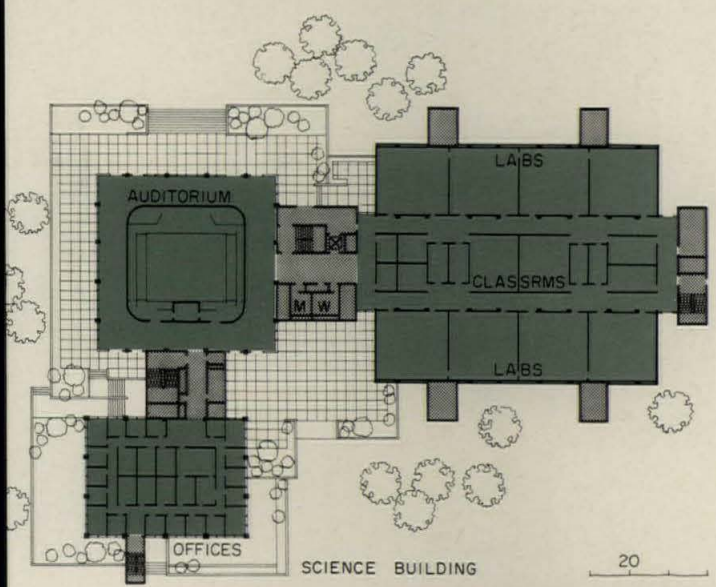
Each of the classroom and office wings has a 60-foot free span; this, together with use of a 5-foot module, reusable metal partitions, and modular design for mechanical services and lighting, makes it possible to create most any desired room arrangement. At present, a variety of classrooms have been set up for 12 to 200 students each. The University desired windowless classrooms to simplify audio-visual presentations. Thus, solid walls have been placed where classrooms are most likely, and glass walls around corridors to give some outward views. In the faculty office wing, all exterior walls are glass above a 3-foot mark from the floor.

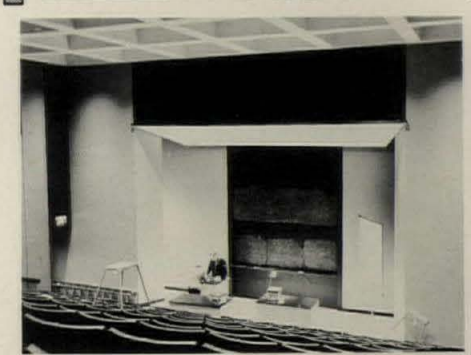


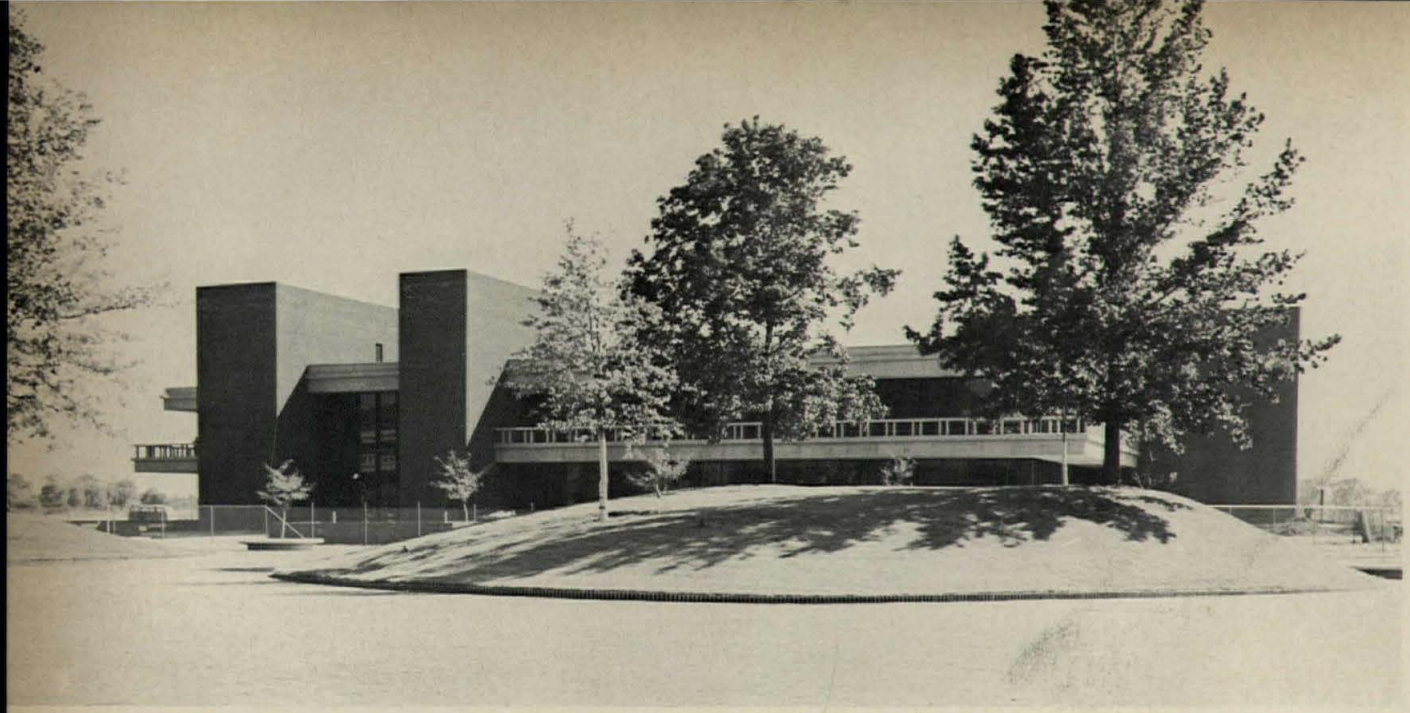


SCIENCE BUILDING

All laboratories of the various scientific disciplines (such as physics, chemistry, geology and botany) are brought together in the main wing of this building. It contains 32 labs, for 24 men each, on four floors, plus a variety of preparation and lecture rooms. Attached to this wing is a unit with two lecture-demonstration rooms, each seating 240. A replica of the faculty offices unit used in the classroom building is planned as an additional wing of the Science Complex. All laboratories are completely interchangeable among the various disciplines. To permit this flexibility, a new system of laboratory furniture components was developed through an Educational Facilities Laboratories Inc. research grant. (See August 1963, page 169.) A system of individual equipment storage "tote trays" was also developed to triple the use of each lab by speeding change of equipment.

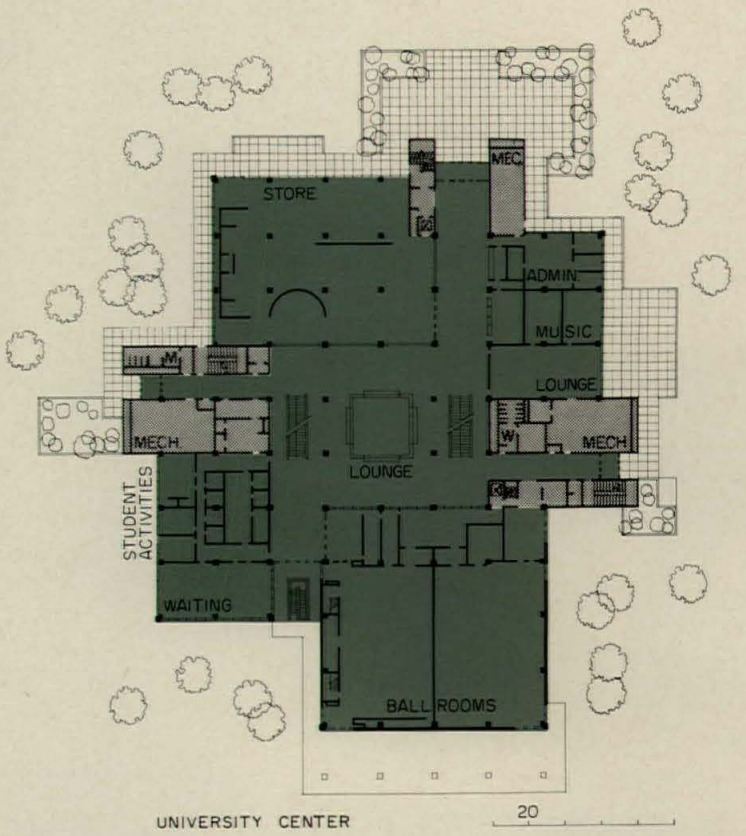






UNIVERSITY CENTER

A center for student services becomes an especially important focal point in a campus for commuters. This building has a variety of social, recreational, activities and food-service functions. Major access is provided from all four sides of the structure to a central, two-story, lounge "hub". Off this skylighted hub on the first floor are the university store, music and reading lounges, main ballroom, and student activity offices. The second floor holds additional lounge meeting rooms and a table-service restaurant. On the lower level, which opens out onto a terrace (with views of a wooded valley to the south) are snack bar and dining facilities, as well as bowling and recreational spaces. The kitchen is a "production" one, equipped to supply food to other dining halls throughout the campus, when they are built. This building is in the final stages of construction. Works of art are being placed in major spaces of all buildings, and special graphics were designed for all campus signs.



SOUTHERN ILLINOIS UNIVERSITY, Edwardsville, Illinois. Architects: *Hellmuth, Obata and Kassabaum Inc.*—principal in charge of design: *Gyo Obata;* assistant in design: *George B. Hagee;* project manager: *Chester E. Roemer;* structural engineers: *The Engineers Collaborative;* mechanical engineers: *Robert E. Hattis, Engineers Inc.;* utilities engineer: *Warren & Van Praag Inc.;* acoustical consultant: *Bolt, Beranek & Newman;* landscape architects: *Sasaki, Dawson, Demay & Associtates Inc.;* art consultant: *Katherine Kuh.*

WAREHOUSES AND DISTRIBUTION CENTERS

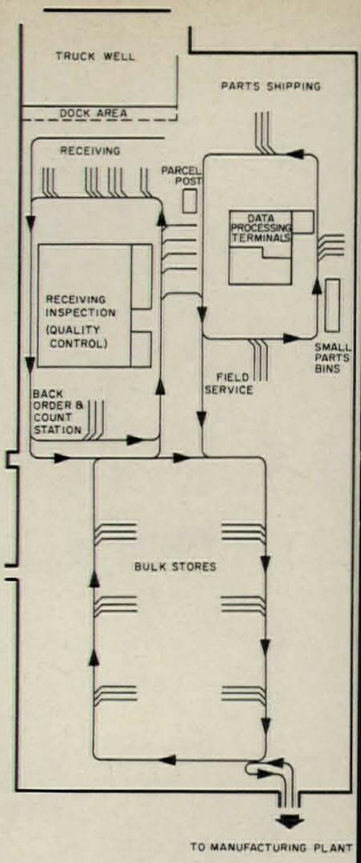
L. D. Jones photo

There is a quiet revolution taking place in the warehousing and distribution of goods—and for architects there is a new array of programing and planning considerations that imposes a sometimes surprising discipline on warehouse commissions. "Big, strong, empty space" is no longer the single objective, except in increasingly rare dead-storage situations. Although the function of storage and handling of goods implies a spaciousness as column-free as economy permits, opportunities for computerized mechanization, and changes in the role of the warehouse itself in the minds of industrial management, have generated new design conditions that require analysis before preliminary planning can proceed.

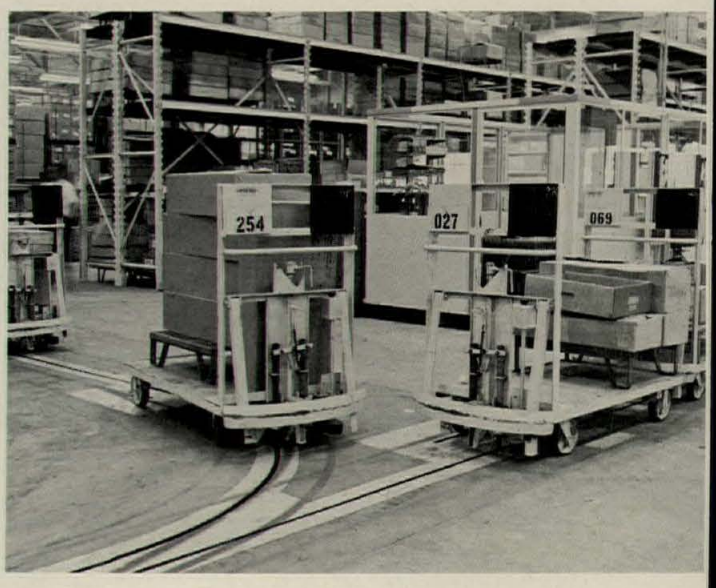
Fundamental to changes in distribution methods and facilities is the increasing realization by manufacturing management that in distribution (for which they pay about $150 billion a year) there are opportunities for huge dollar savings even with small per cent reductions in cost. So distribution has become a management function rather than a secondary routine delegated to responsible shipping clerks. Further, the scope of the distribution function has been enlarged to embrace not only warehousing and shipping but inventory control, production and sales planning, transportation and administration. This is not merely an evolution in the scale of management concern in response to cost controls. It is also a realignment of approaches to the distribution function brought about by technical and economic changes. And the effect upon architectural approaches is an increased responsibility for program and function analysis more closely related to management problems.

Two kinds of developments have affected programing and made possible the change from multiple, heavily stocked warehouses located near consumer centers and rail transport to fewer, more widely dispersed, regional distribution centers forming dynamic, controlled-inventory nodes between the production line and the consumer outlet. First are the technological developments of the computer as an order-inventory control, concurrently with sophisticated mechanized systems for handling and sorting goods. Second are newly evolved transport techniques and facilities which speed up the delivery of goods. Among transport developments are: air freight, container-ship transport (similar in concept to the trailer-ship operation at the Sea-Land terminal described on following pages), piggy-back trailer-rail services and the rapid trailer-truck services made possible by the interstate highway system.

Pacing the heart of the distribution system is the computer, keeping the whole network under such control that inventories are constantly in balance between production and consumption. This permits a sharp reduction in overall stock (with further opportunities for space reduction in computerized "random access" as opposed to compartmentalized storage of certain uniformly packaged goods) so that regional distribution centers are not necessarily much bigger than any one of the several local warehouses they are designed to replace. Richard Muther, industrial engineering and management



The IBM Materials Distribution Center in Poughkeepsie New York, is highly automated both in record-keeping and in materials movement. Computerized records are linked to a plant-wide information system through data transmission terminals (above). Materials move by automated trucks (below) pulled along at 60 feet per minute by 7,500 feet of tow chain recessed in the floor. Layout of the 703- by 324-feet center (aided by computer-simulated flow data) provides four loops of tow line to areas shown in the plan. Each truck has a transistor unit which directs it to any one of 13 dialed stations along the line. Special stock-picking equipment was designed for transfers to and from the 19-feet-high shelves of the bulk area (left). Builder of the center was the H. F. Campbell Company Inc., Detroit.



consultant and author of workbooks on plant layout and materials handling analysis, calls this new look in integrated production-distribution systems "vertical autogration" from raw material to consumer. While noting the revolutionary roles of computerized mechanization and rapid transport in bringing about fundamental changes in general approaches to distribution, he makes the cautioning point that architects must approach each commission in this field from the specific point of view of client requirements that may or may not call for highly automated solutions. He cites the example of the two neighboring Kansas City warehouses designed by architects Kivett and Myers as described on following pages. Although both of these warehouses have similar programs insofar as transport, area served and kinds of goods are concerned, organizational requirements resulted in two entirely different solutions—one conventional, the other highly automated, both economically sound.

In general, Muther observes, every materials-handling analysis needs a classification and organization of data in four basic categories: (1) physical shapes and sizes of materials; (2) quantities; (3) timing characteristics of the operation; (4) special control characteristics involving security, records, communications, etc. It is then possible to approach the planning of the distribution center in four rational phases: (1) external integration with transportation, utilities and community; (2) over-all handling plan establishing modes of transport between gross area allocations within the complex; (3) detailed handling plan refining methods and specific systems relating one work-

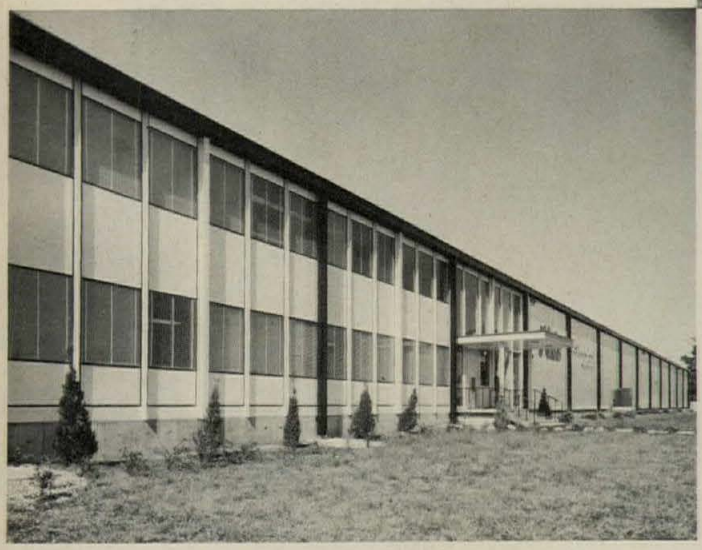
The United Parcel Service Distribution Center in Chicago represents a high degree of automation in materials handling with many points of human interplay for the rapid in-and-out sorting and re-dispatch of two heavy streams of goods traffic—one a metropolitan system, the other an interstate system—with exchanges of parcels at random frequency between the systems. The interior is accordingly laid out with a conveyor assembly for incoming goods on one side and one for outgoing goods on the other. Both conveyors pass through a control center at mid-floor where a carousel arrangement with giant destination pigeon holes (bottom right) aids the hand sorting of parcels. A mezzanine and cat-walks provide access for supervision and foot traffic. Separate loading docks and marshalling areas with traffic control stations for each system are sheltered under second-floor office space or by steel sheds. The center was designed by architect Edward D. Dart, now of the firm of Loebl, Schlossman, Bennett & Dart Inc.

Robert Nowell Ward photos

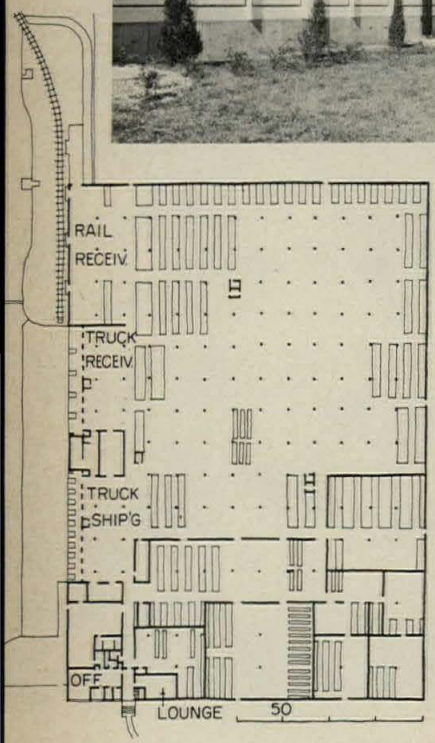
place to another; (4) installation detailing and specifications as to equipment, completion schedules etc.

Although the degree of mechanization will always vary with the warehouse program and the physicial characteristics of goods handled, it is impressive to observe the ever-advancing frontiers of ultimate development. An early 1963 report in The Wall Street Journal describes "a 250-ton, computer-controlled monster" named ADMOS (automatic device for mechanized order selection) which reads punched cards at a Johnson & Johnson warehouse and automatically delivers cartons to waiting trucks at a rate of some 1,400 cases an hour, keeps track of inventory, and flashes warnings when stocks run low.

The IBM Materials Distribution Center in Poughkeepsie, New York was constructed in 1961 to replace warehouse space in a half-dozen buildings. It was designed (with the aid of a computer program simulating operational flow) to be a highly automated service for the adjacent manufacturing plant. Originally, the center had its own computerized system of record keeping which required a substantial air-conditioned area within the building. Recently this system was replaced by a plant-wide management information system called COMPASS (computer-oriented management planning and scheduling system) which links distribution records with those of purchasing and other departments through a computer located in another building. The air-conditioned space in the center was released for other purposes by substitution of a number of data transmission terminals which communicate with the plant-wide system over telephone lines.



L. D. Jones photos



Besides its 214,546 square feet of warehouse space, the Katz structure has 12,000 square feet of office space, most of which is air conditioned. Porcelain-enamel and glass window-wall construction was used for this area.

Compacted earth fill was used to raise the floor line of the building the required 4 feet above the natural terrain, and spread footings were placed directly on the fill. Foundations and floor slabs are concrete and exterior warehouse walls on three sides are insulated aluminum.

The storage and handling system used requires a "staging in" area for sorting incoming merchandise, storage space and a "staging-out" area for assembling outgoing orders into shipments for the individual stores.

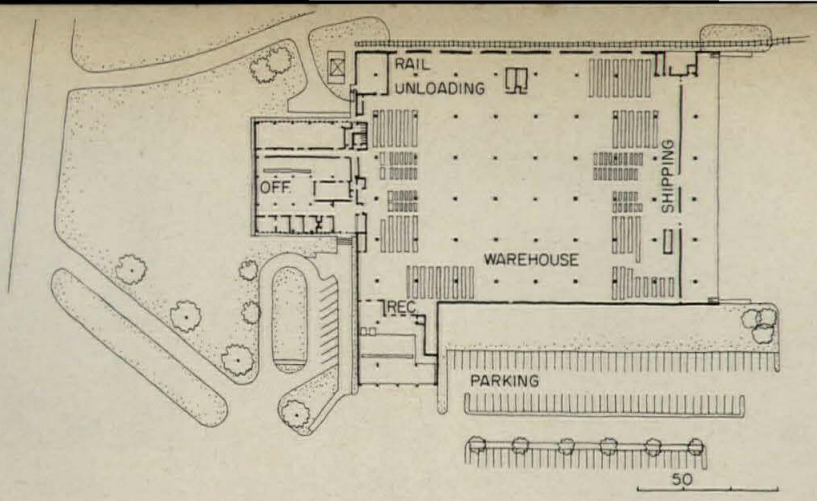
Two warehouses by one architect show how mechanization affects design

Two warehouses for drug companies—one requiring a high degree of mechanization and the other using traditional methods of storage and materials handling—were designed by Kivett and Myers for neighboring sites in Kansas City.

The McPike Company is a wholesale firm supplying independent drugstores throughout the Kansas City area, and as such the warehouse had to be equipped for rapid, frequent and accurate selection of a very wide range of items for immediate shipment. In view of this, it was decided to install a highly mechanized conveyor system. A peripheral dragline conveyor transports goods from the receiving dock to assigned storage stations, while a system of core conveyors pulls coded

Window walls on the south and west exposure of the McPike office area are protected by roof overhang and motor-operated sun louvers. This part of the structure has a steel frame and poured gypsum roof and houses executive and general office areas, as well as a special telephone order room and a data-processing room. The entire building is air conditioned.

To give maximum accessibility to truck docks, the driveways circle the building, 119,027 square feet of warehouse and 13,900 square feet of office space.



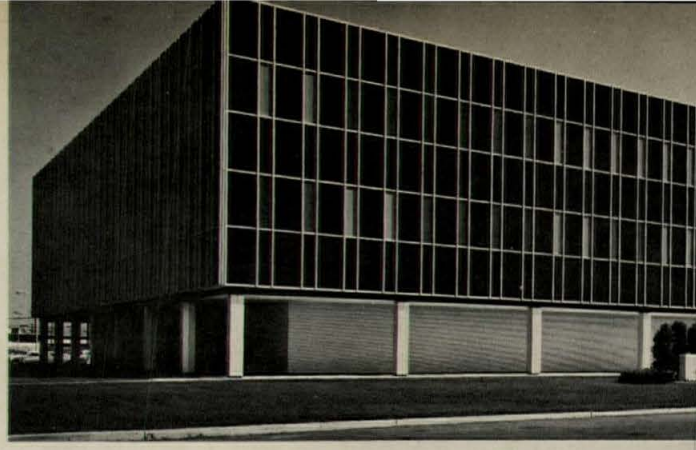
orders through the center of the warehouse past the various stations. Items ordered are picked from the shelves and placed into tote boxes which are labeled and coded with sensitized tape. The boxes then proceed automatically to their coded position on the shipping dock.

The Katz Company, on the other hand, owns and operates a chain of drugstores which are completely supplied and serviced by the distribution center. Since the staff can anticipate and control timing, shipment and minimum size of orders, they do not require elaborate conveyor systems, but can make effective use of fork-lift trucks and conventional equipment.

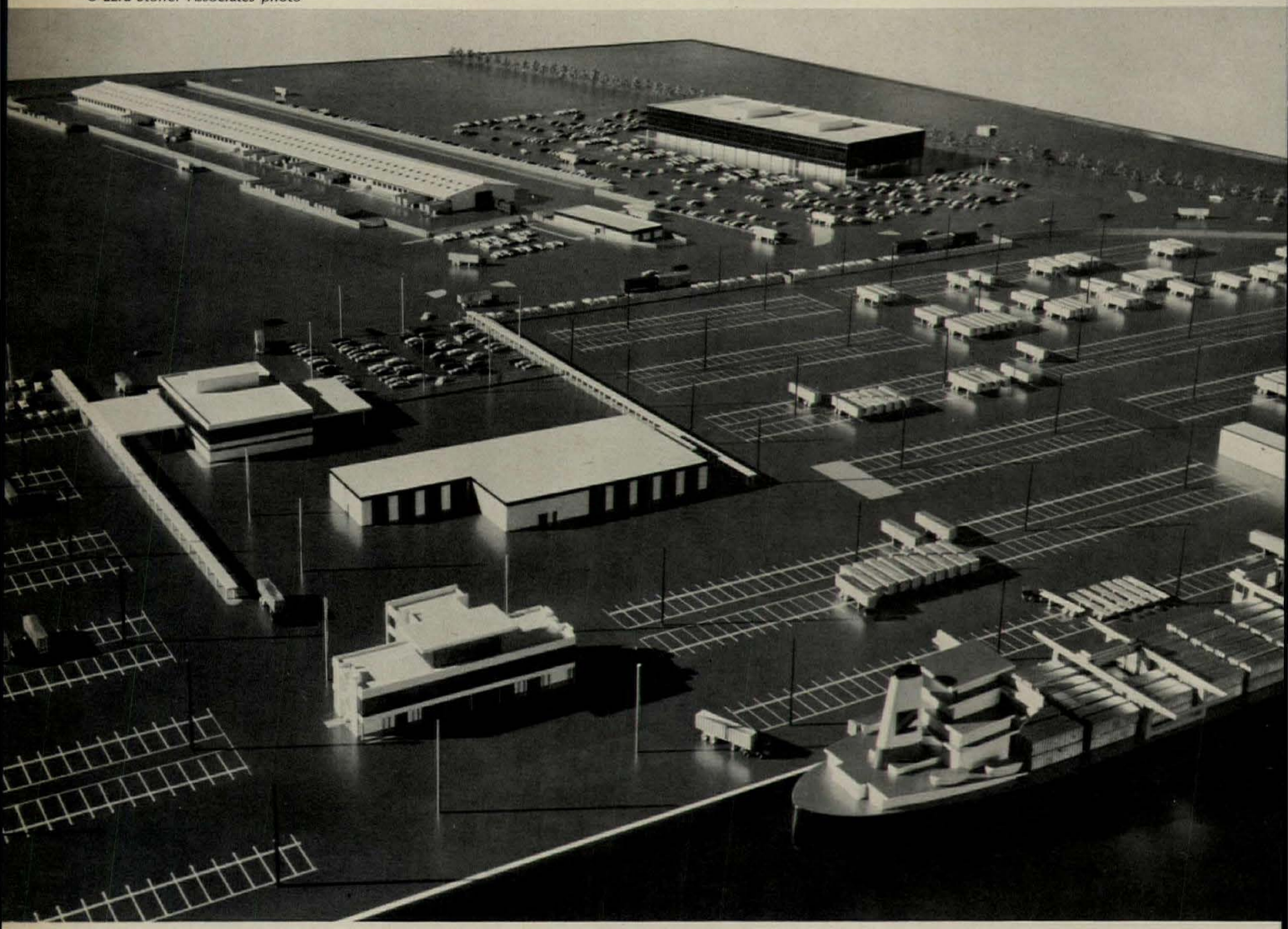
The design and construction of the two warehouses reflect the difference in the systems used. The Katz warehouse is a traditional, utilitarian, steel-framed warehouse building, heated by gas-fired unit heaters and ventilated by wall-mounted exhaust fans, with conventional lines and height of storage shelves. The fully air-conditioned McPike warehouse, on the other hand, consists of 58 reinforced concrete hyperbolic paraboloids, each approximately 45 feet square, giving large areas of unobstructed floor with 16-foot height to beams.

Both buildings required protected truck dock areas and facilities for unloading railroad cars. Insulated metal was used in each case for exterior walls, with one masonry wall to be knocked down if future expansion is needed.

WAREHOUSES FOR THE KATZ AND MCPIKE DRUG COMPANIES, Kansas City, Missouri. Architects: *Kivett and Myers;* structural engineer: *Robert Campbell;* mechanical and electrical engineer: *W. L. Cassell;* industrial engineering consultants: *Richard Muther and Associates.*



© Ezra Stoller Associates photo

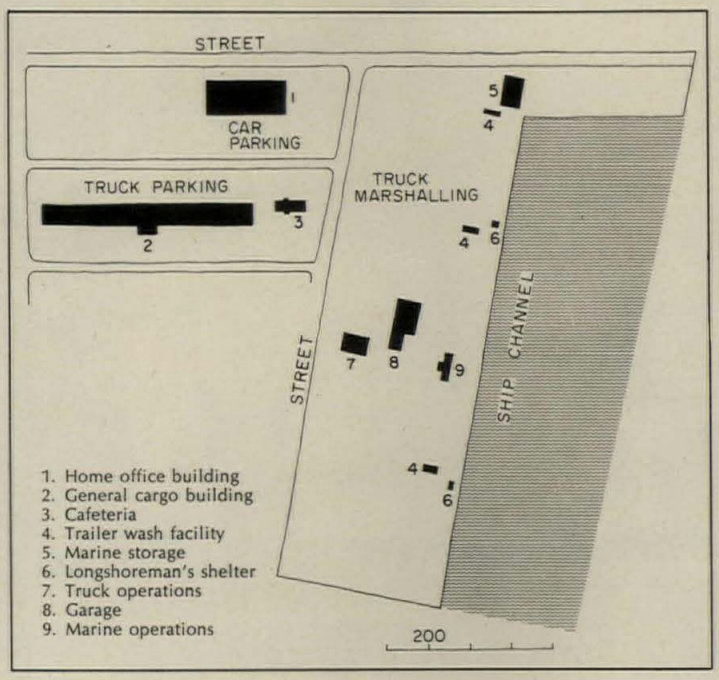


Port facility planned as integrated complex for trailer-ship transfer

The Sea-Land shipping terminal in Elizabeth, New Jersey is a completely new, intensively planned goods transfer facility in which trailer-size containers, trucked in from inland shippers, are transferred intact to water transport for ultimate delivery, unopened, to their destination. Planning involved not only the traffic lanes and marshalling spaces for a large and growing number of trucks and trailer-containers, but integration of these huge expanses with facilities for both regular and transient personnel, warehousing and cargo terminals for assembling less-than-trailer loads into full loads, and with the considerable paper work and control points involved in such operations. Situated on the highway side of the 92-acre compound is a

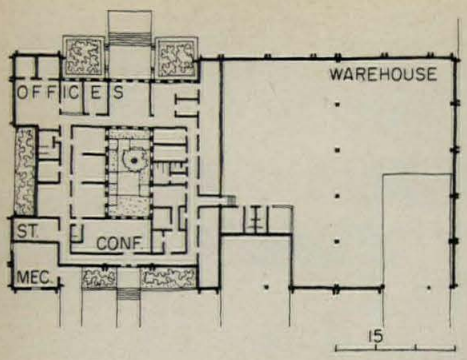
The site, which was formerly tidal marsh area, was filled by the Port of New York Authority by means of hydraulic pumps. The fill was dredged from the ocean bottom off Coney Island, barged to Elizabeth and pumped to shore until it was 20 feet higher than the proposed final level of the site. The extra sand was left to compress the lower sand for over a year, when it was removed down to grade. Wooden piles driven to underlying shale are used to support the buildings, while paved areas and utility lines are supported by compressed sand. Unity of design was achieved throughout by predominantly horizontal building forms and the consistent use of white glazed brick offset by black glass curtain and window walls in the office areas.

Alexandre Georges photos



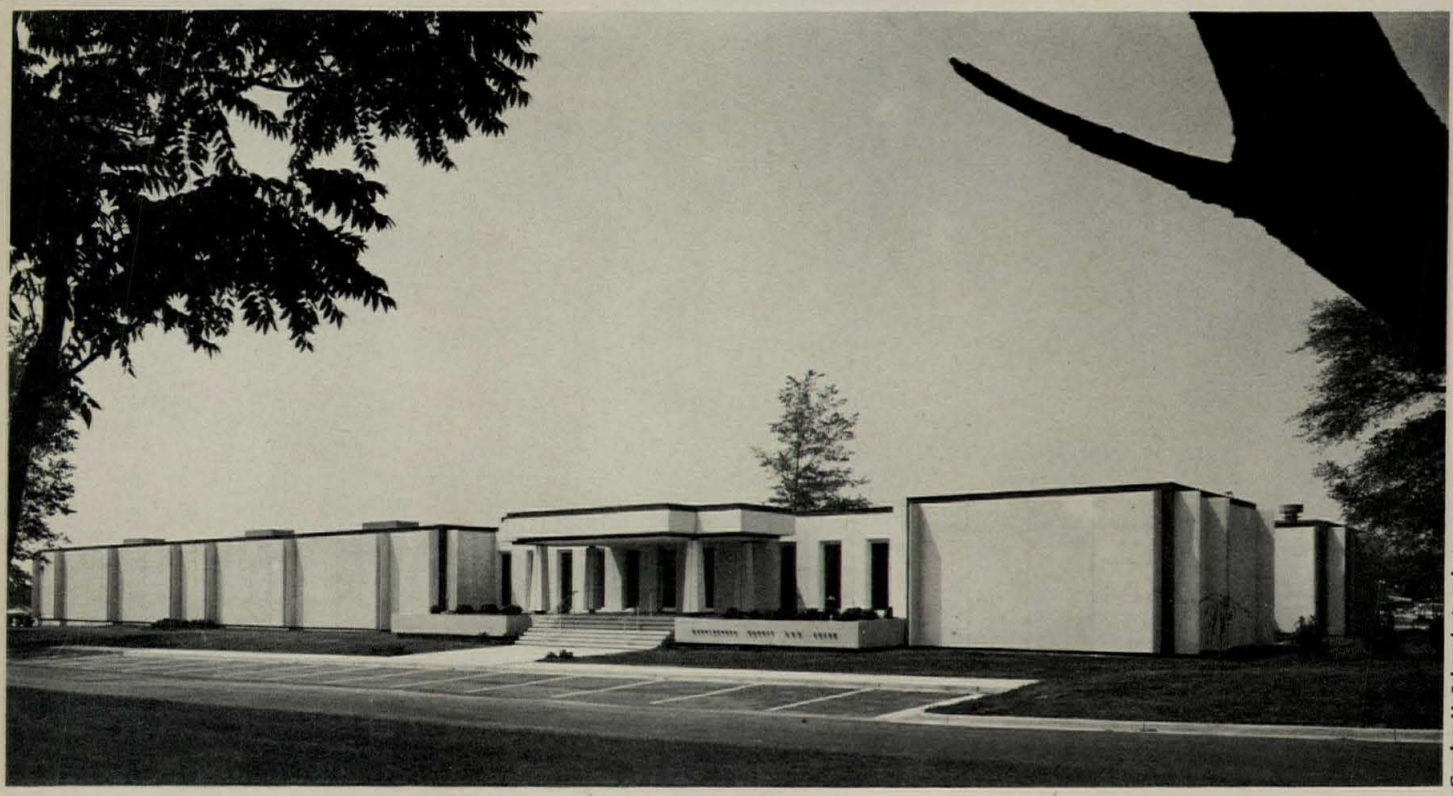
new home office building for Sea-Land Services Inc., which operates throughout the continental United States, Alaska and Puerto Rico. In addition to office facilities, this building contains a special computer room and a large staff dining room, which also supplies other cafeterias for teamsters and longshoremen at key locations in the compound. Across from the home office building is the long, low, general cargo building which incorporates a two-story office to serve its administrative needs. At one end of the cargo building, a depressed, dual railroad track runs inside to permit railroad cargo to be handled under cover. The interior of the building is a clear span space, 100 feet wide by 1,100 feet long. Adjustable docks for 170 trailers are provided along the sides of the building for loading and unloading less-than-trailer loads. The two-story truck operations building is flanked on either side by canopied trucking lanes which are equipped with electronic weighing scales and pneumatic-tube stations for the transmittal of documents to the offices inside. Trucks entering the compound go at once to this building, which is really the nerve center for all rolling stock, and contains a computer system on its raised first floor capable of plotting the whereabouts of every container or trailer. A fully equipped maintenance and inspection garage, wash-off facilities for trailers, a marine operations center, marine storage, and separate lounge areas, where the longshoremen can rest and relax, complete the complex.

SEA-LAND TERMINAL, Elizabeth, New Jersey. Architects: *Frank Grad & Sons;* structural engineers: *Weiskopf and Pickworth;* mechanical and electrical engineers: *Cosentini Associates.*



A planted courtyard provides a light well at the center of the office section, introducing natural light into most of the principal offices and permitting continuity of a virtually windowless concrete panel exterior for both office and warehouse wings. This exterior treatment facilitates maintenance of a controlled environment in both wings and unifies the exterior vocabulary throughout the building.

Interior finishes of office partitions are primarily vinyl fabric on plaster, while masonry bearing walls at the perimeter are left exposed and painted.



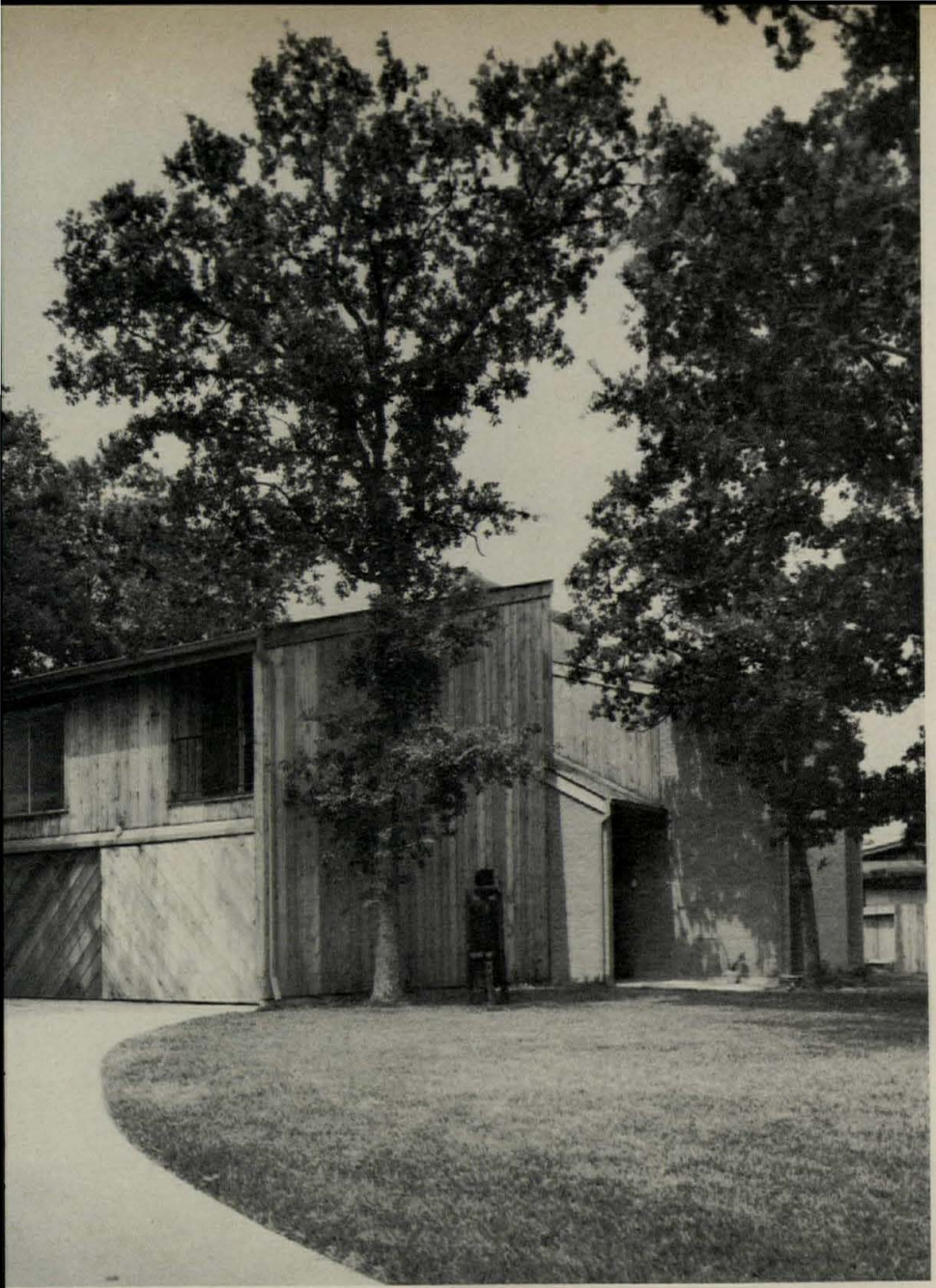
Liquor control center is first building in Charlotte urban renewal project

Three chief concerns guided the architects in choosing the structural system, exterior treatment and position on the site for this alcoholic beverage control warehouse and office building in Charlotte. Since the new warehouse is the initial building in a downtown urban renewal project, the owners agreed early that prime consideration be given its visual appeal. The other major goals were flexibility and ease of expansion, for the building was to house such diverse functions as general offices, communications center, interrogation headquarters, bookkeeping, warehousing and transfer space, as well as necessary facilities for servicing and maintaining vehicles.

In placing the building on its lot, care was taken for control of the various traffic patterns inherent in its operation so that they would not in any way interfere with the possibility of future expansion on the site.

Exterior walls throughout are precast concrete panels. In the office wing, panels are backed by block bearing walls, but inside the warehouse a precast concrete girder and column system bears up a double-tee roof of the same material, allowing exterior panels to provide the interior finish. The floor throughout is concrete slab on grade.

MECKLENBURG COUNTY ALCOHOLIC BEVERAGE CONTROL BOARD OFFICE AND STORAGE FACILITIES, Charlotte, North Carolina. Architects: *J. N. Pease Associates, Architects-Engineers.*



Paul Peters photos

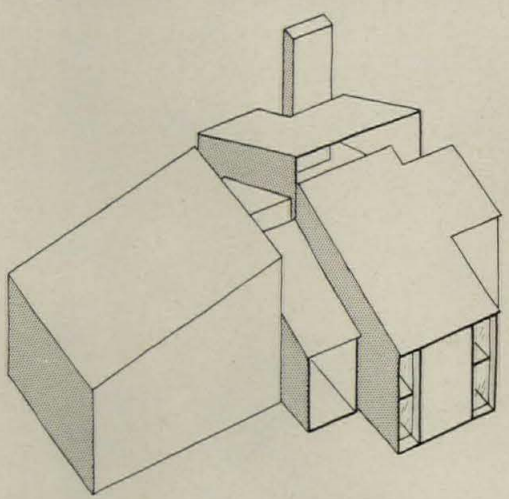
Imaginative two-story spaces dramatize low-budget house

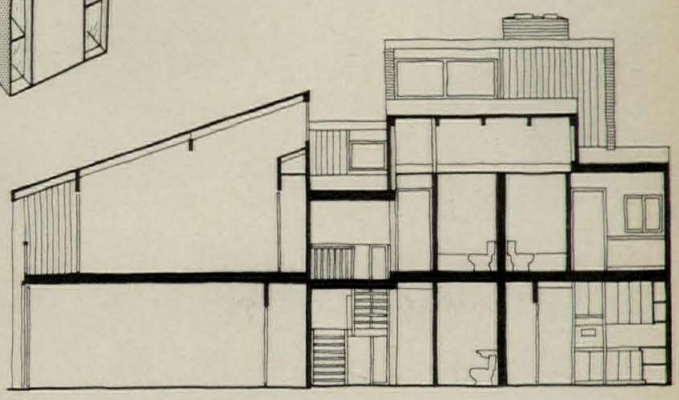
"Overlapping sheds with skylight spaces between forms" is Clovis Heimsath's description of his design concept for this house, which was built in Houston for a sculptor and his family. A strictly limited budget and the requirement for two studios in addition to comfortable family living areas made this a challenging program for the architect. Mr. Heimsath solved the problems by adopting a shed roof motif which allowed sufficient height and volume for the creation of exciting two-story spaces and constantly changing patterns of light and shade inside and out.

Visual continuity of space between floors was very important since budget restrictions limited floor area, but a "row of little rooms" would have been functionally and esthetically unacceptable to the clients and the architect. The height was emphasized by strategically placed skylights which serve to extend the experience of space.

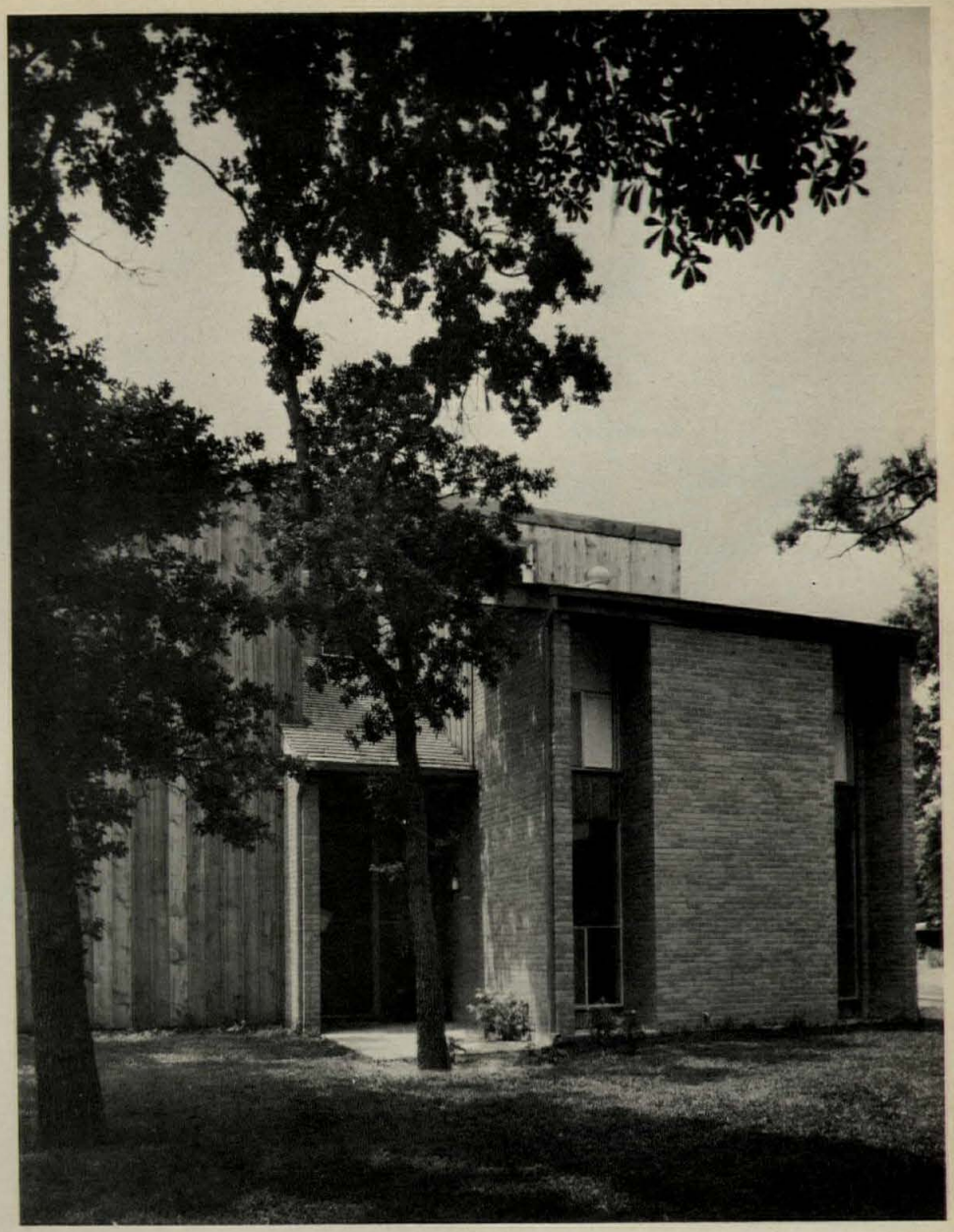
The first two-story space is the dramatic entry which is spanned by the hall on the second floor; the upstairs studio is a balcony above the sculpture studio on the lower level. The third two-story dimension is provided by the master bedroom which overlooks part of the living room.

The plan was developed around a central core, which consists of washer-dryer facilities and a powder room downstairs, two bathrooms above and necessary ductwork. The architect insists that this is where the scheme started. He says: "The design truly developed from plan to form. The clients had two children and might later add to the family, so the plan had to have three bedrooms, two studios, two and a half baths, living room and





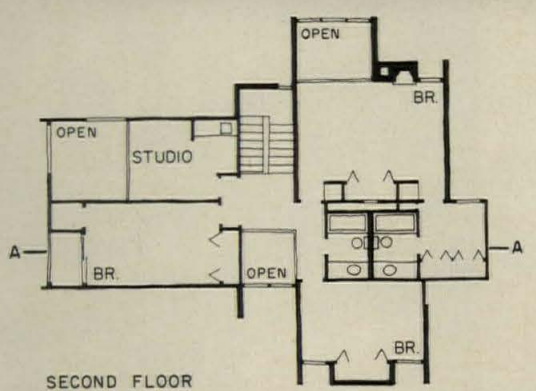
SECTION A-A



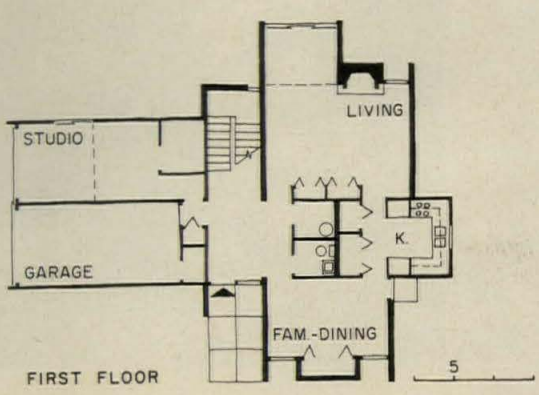
family-dining room. I started with the core and from there evolved a plan which placed the kitchen and family-dining room on one side, and the living room on the other. Upstairs the master bedroom and one other bedroom are separated by the bathrooms. The hallway had to be minimum, so the entry-stair hall relationship fell in place. It was at this point that the shed roof motif seemed appropriate to give me volumetric space, and to allow skylight spaces between the forms."

Mr. Heimsath says that he had some difficulty in deciding how to relate the studio wing with the rest of the house. The massing of the other forms built up into a "counter thrusting" relationship, but the studio wing had nothing to counter thrust against. It was therefore turned around "to play off against the rest of the house. Then it worked." The resulting scheme has a rather compact, sculptural effect, but the many skylights give it life and interest and save it from being too inward-looking. At a construction cost of $24,000, it does seem quite a remarkable solution.

Mr. Heimsath is convinced that no two rooms in one house should have the same spatial impact. By placing storage on the exterior wall of the family room—in contrast to the living room where it is on the interior wall, with the fireplace on the outside—he was able to vary the interior spaces and at the same time provide sufficient exterior massing to offset the dominance of the shed forms.

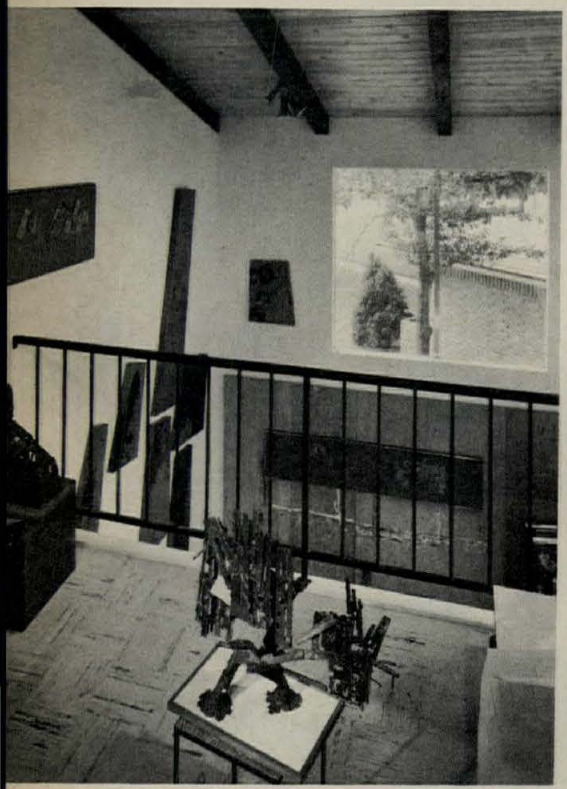


SECOND FLOOR



FIRST FLOOR

RESIDENCE for Mr. and Mrs. Robert K. Fowler, Jr., Houston. Architect: *Clovis Heimsath;* contractor: *W. A. Simmons.*



A certain amount of flexibility was provided by making the ground floor studio convertible to a garage if necessary, and the upstairs studio to a fourth bedroom if required. The house is set diagonally on its site, allowing a view up a bayou on one side. From the balcony of the children's bedroom above the garage, there is a pleasant outlook up the tree-lined street. Exterior materials of brick, rough-cedar and glass are well detailed and carefully related to each other.

BUILDING TYPES STUDY 365

RECREATION:

fresh opportunities for inventive design

ARCHITECTURAL RECORD's last Building Types Study on recreation (July 1965) argued that "the country is on the verge of what must be called a revolution in the concept of recreation, and—of more direct importance to architects and engineers—the amount of recreation facilities that must be planned and built."

That revolution now seems well underway. Item: The F. W. Dodge Construction Outlook for 1967 estimates a 6 per cent gain in this category—from $800 million to $850 million. Item: According to the Department of the Interior, we are now putting more undeveloped acres into recreational areas of all kinds than "are being swallowed up by urban development, highways, roads, airports, and similar installations. . . . During the year that began July 1, 1966 the acreage [going into recreational use] is expected to exceed 1.7 million acres." Importantly, 74 per cent of the new local, state and Federal outdoor recreation projects receiving financial help from the government are within two and a half hours' driving time of urban areas. Nearly half (49 per cent) of the projects assisted are small, with land purchases of less than $25,000. And over half of the acreage set aside is in the heavily populated Northeast and Pacific Southwest.

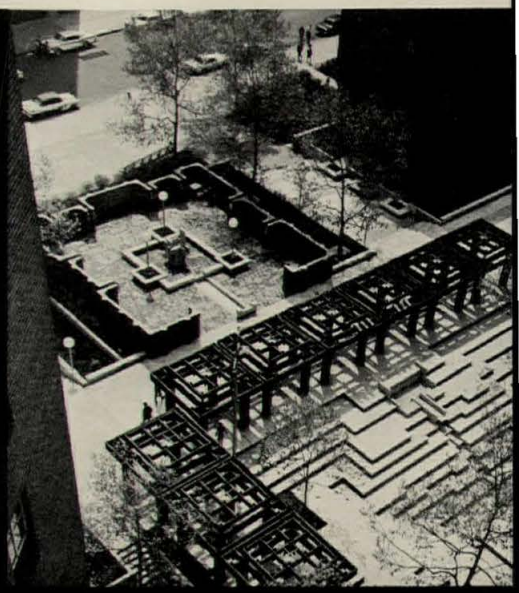
And if the quantity is going up, so is quality. This is a much more subjective judgment, of course—you must evaluate this with your eyes, not with government statistics. But it does seem clear that there is great excitement in the development of new ways to use specks of urban land tucked between high-rise towers or in the narrow spaces between schools and sidewalks, new concepts in the design and use of park spaces, and more building designs that effectively express their function as part of our leisure and recreational activities. On the following pages are a few examples. They are not all buildings, but they are all the work of architects—architectural solutions for an increasingly important part of our environment.

—Walter F. Wagner Jr.

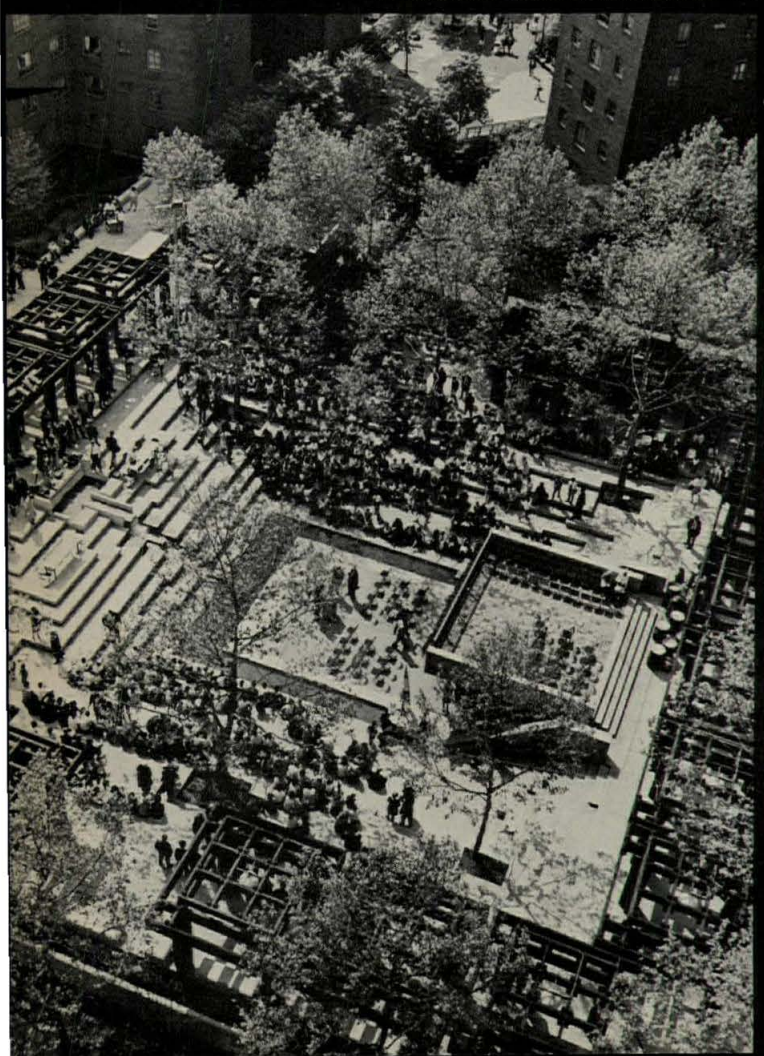
Riis Plaza: design with "keen understanding of human needs"

1

The site was a flat, grassy area "impossible to maintain, and a constant source of friction. One fence led to another . . ."



3 Just off the amphitheater is a quiet area, raised above grade with fill, and surrounded by a wall that makes it work as "an outdoor room."



2 Part of the area was scooped out to form an amphitheater, with a stage house, and surrounded by a peristyle that defines the area, provides shade, and supports lighting. The grades were worked out to save existing trees, and the area can become a spray pool on very hot days.

With a little earth moving, a little stone, a little wood, and a lot of design skill and imagination, architects Simon Breines and Ralph Pomerance, with landscape architect Paul Friedberg, transformed the useless and unused space between public housing units into "a living place" that attracts residents and neighbors of all ages all day long.

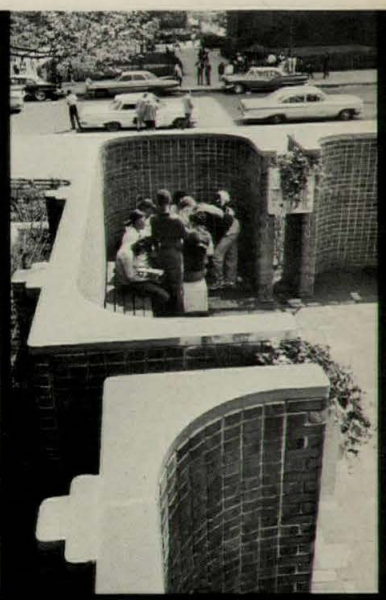
Key to the success of the project: a series of design ideas (photos and captions below) which create places for crowds and for the person who wants to be alone, for oldsters and for children, for organized entertainment or random play. There are no keep-off signs, link fences or worn grass.

The plaza has won an honor award in the first design awards program of the Department of Housing and Urban Development, and, said the jury: ". . . this open space development showed a keen understanding of human activities, and satisfied many human needs. It was noted that the plan permitted one to find places where one is almost alone. The details and the landscape development are excellent and of tremendous variety, but give no sense of clutter. Changes of level are skillfully handled and add a great deal to the interest and special quality of the design. The jury felt that this project showed very clearly that when large public projects do have intensive landscape development, the use and dignity of the out-of-door spaces is maximized and lends quality to developments." For other photos, in color, of this project, see July, pages 196 and 197.

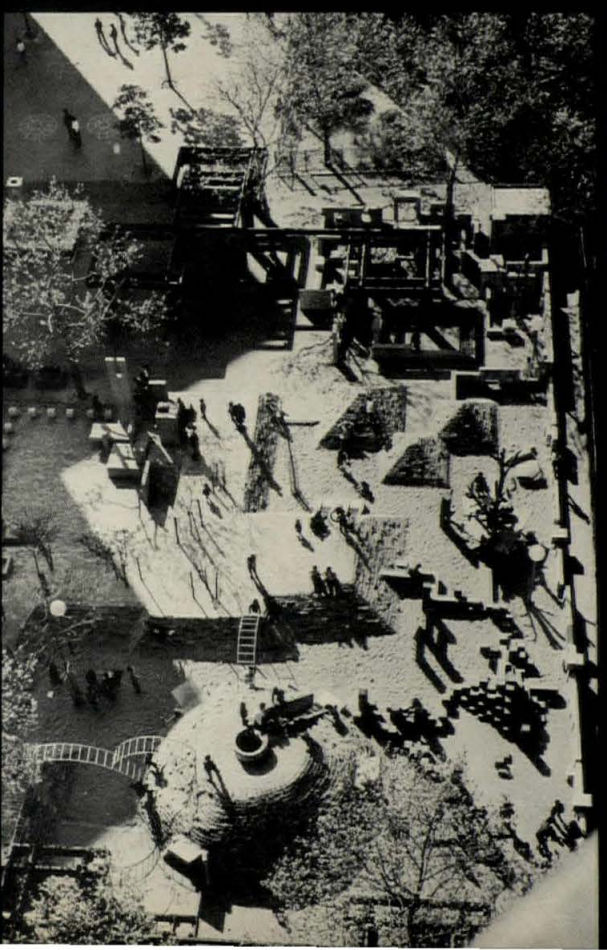
RIIS HOUSES REPLANNED OPEN SPACE, New York City. Architect: *Pomerance and Breines;* landscape architect: *M. Paul Friedberg and Associates;* building contractor: *W. J. Barney Corporation.* Owner: *New York City Housing Authority;* donor: *The Vincent Astor Foundation.*

The fountain is to look at . . . and to climb on and wade in.

For some, the wall has doors



. . . for others, it makes clubrooms.



4 In another part of the space is the noisy area—the playground—with things to climb on and slide down and walk through and hang from.

David Hirsch photos

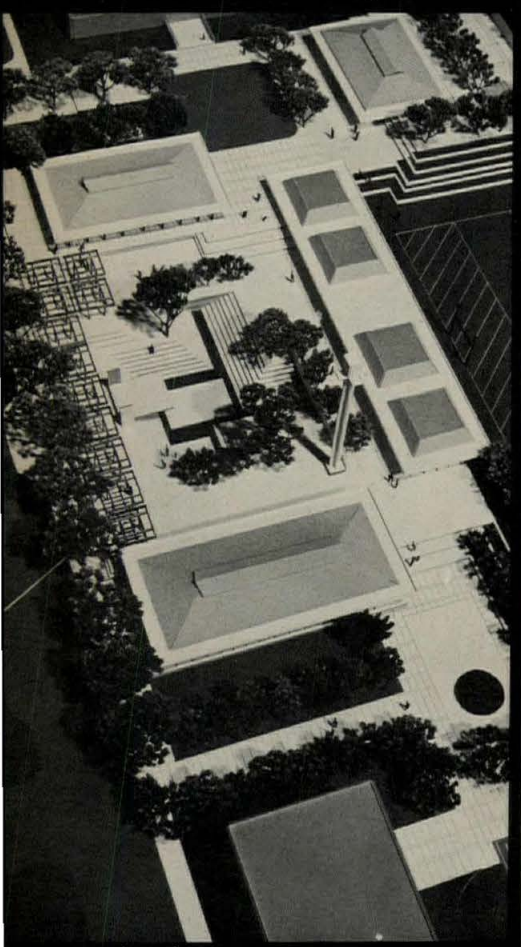
Two new projects expand the Riis ideas

What will soon be Capper Plaza is now five acres of dirt field in the midst of several square blocks of public housing in southeast Washington, D.C.

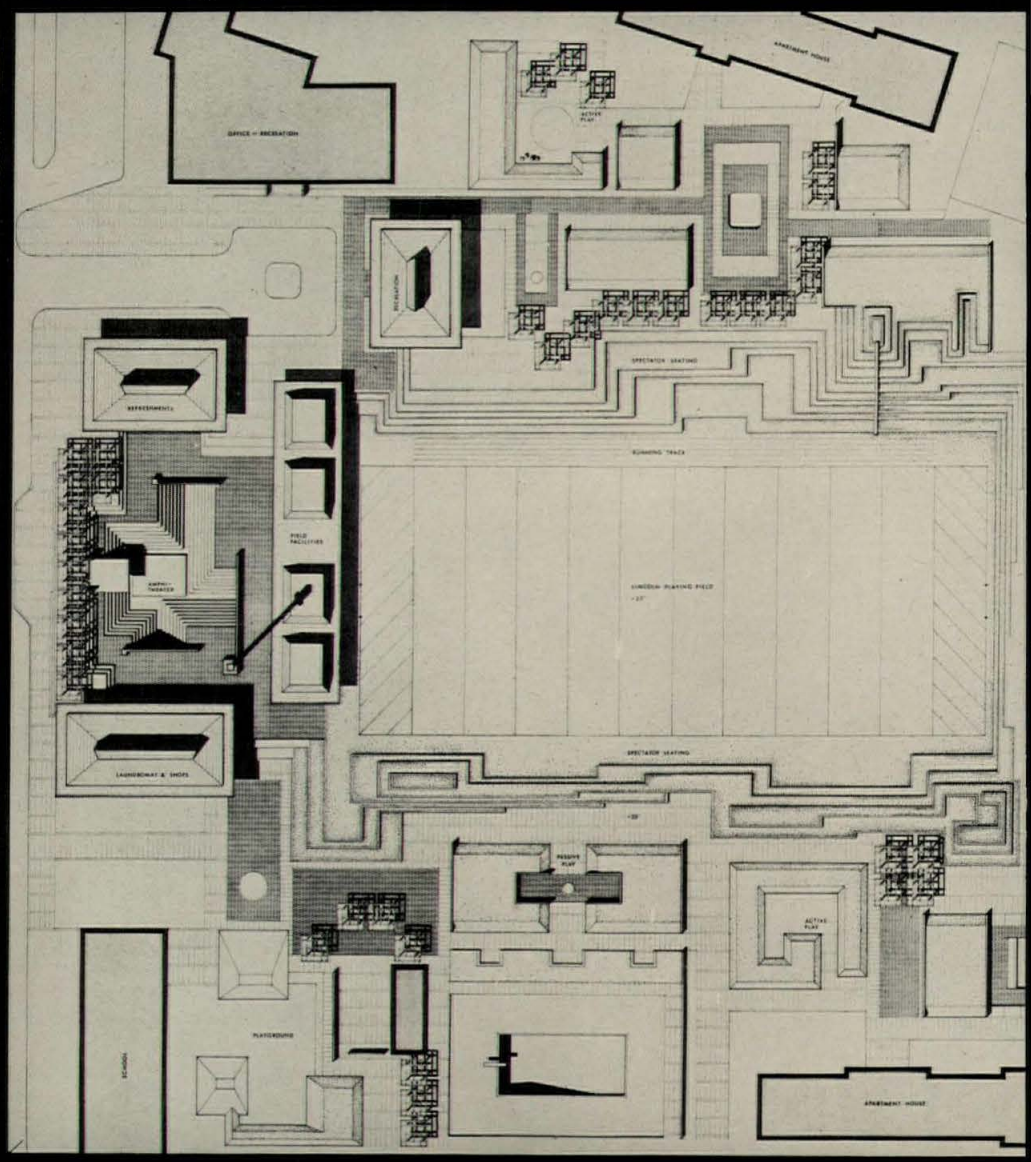
The focus of the new plan (below) is, as at Riis Plaza, an amphitheater which can be used for dramatic and musical entertainment, for sitting, minding the children, and conversation, But—and this is a new and eminently sensible idea—around it will be not just a refreshment stand; but a laundromat, a grocery and perhaps other facilities to be operated by concessionaires.

Further, there will also be facilities

Capper Plaza will use some of the ideas first tested at Riis—
mounding of earth and sunshades
create seating and separation of areas.
The amphitheater, which can be used
for dramatic and musical entertainment and
for minding children and conversation,
is bordered by shops, comfort facilities
and community rooms. Mothers will also like
the laundromat and grocery.



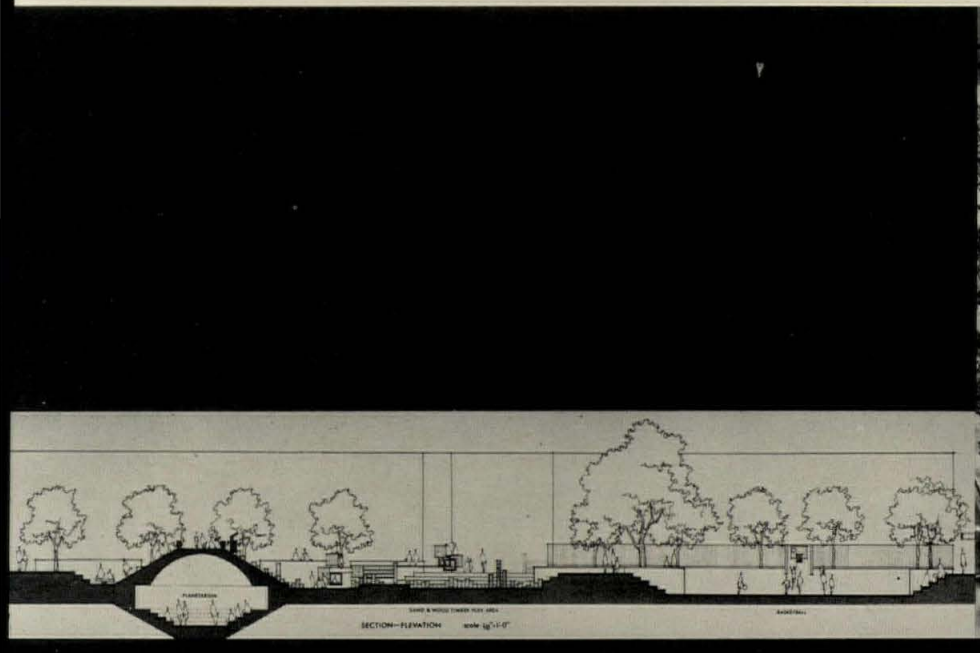
David Hirsch photos

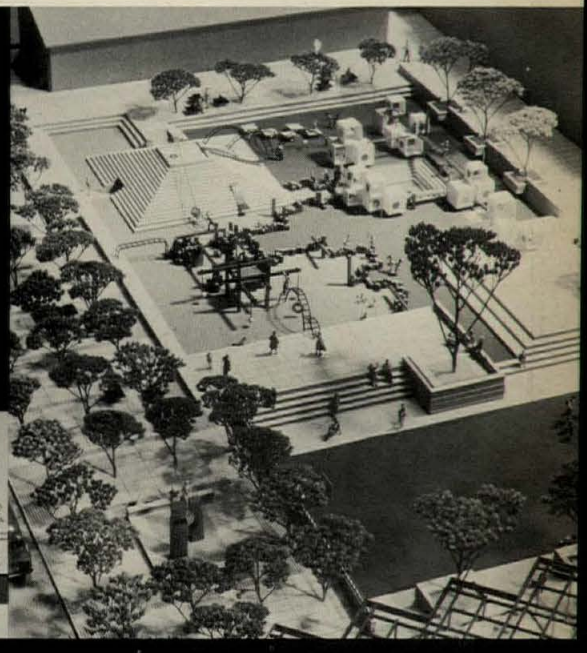


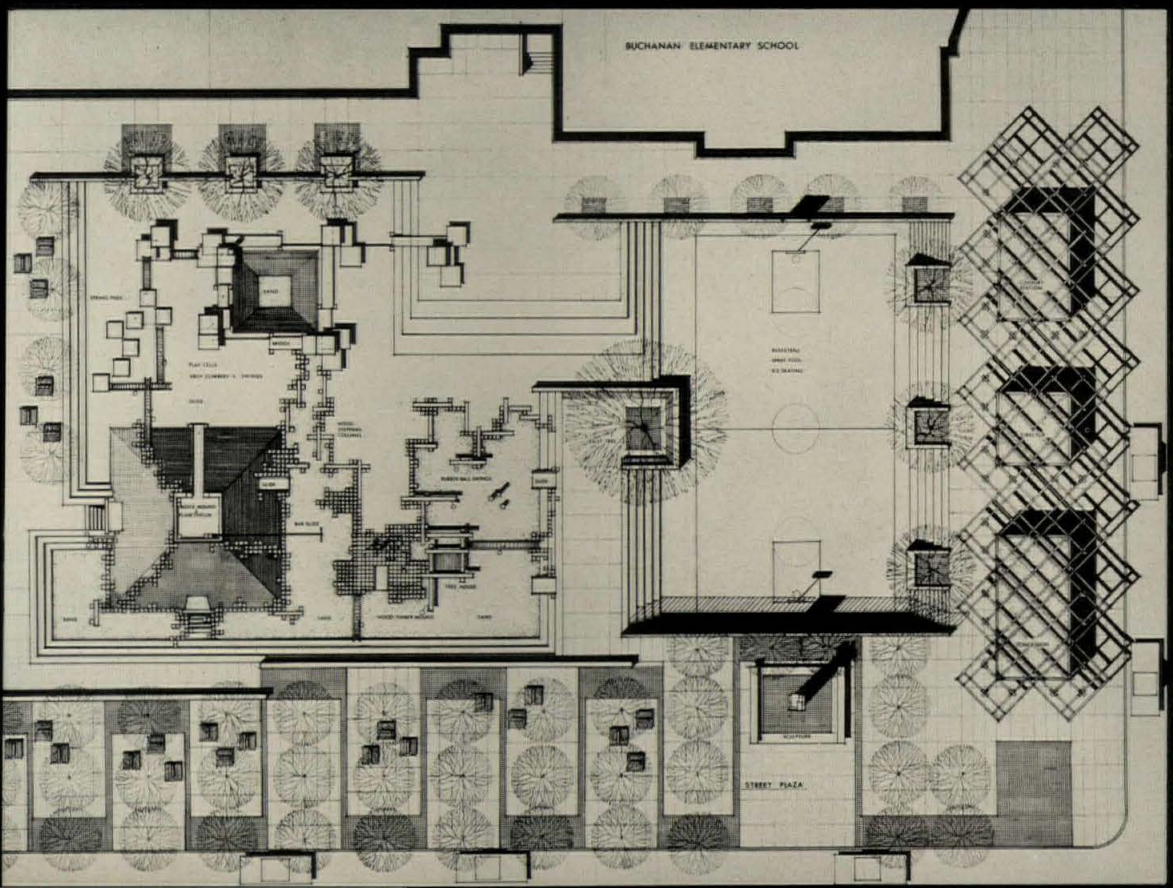
related to the playing field—restrooms (omitted, and needed, at Riis), showers, lockers, and storage space. A recreation building will have meeting and game rooms. The open field will include spectator seating on slopes contoured into the earth, and around the main field will be small play areas for children with shaded seating for mothers. As at Riis, peristyles will be used freely to help define various spaces, and as part of the walks and promenades connecting the area with the apartment courtyards (top and bottom in plan) and a nearby schoolyard (lower left).

The Buchanan Elementary School Playground (below, this page) is another soon-to-be-constructed project for southeast Washington. It is designed as "a new kind of environment attractive both to children for play and—outside school hours—to the adult public." Under the new scheme, the playground will have no fences, but its spaces will be defined. Much of the area will be excavated (see section) and the earth used to raise other areas and create mounds and pyramids for climbing by younger children. The lowered sections will be used for organized games, and can be used as an amphitheater. Besides mounds and pyramids, and of course slides, there will be wooden stepping blocks and plank bridges set in beds of sand. For adults there will be benches under trees and sun breaks, and, say the architects, "if these sunbreaks become favorite climbing places for children, we've designed them with this in mind." Everywhere, materials used are simple, tough, and require no maintenance and no "keep off" signs.

CAPPER PLAZA, and BUCHANAN SCHOOL PLAYGROUND, Washington, D.C. Architect: *Pomerance & Breines;* landscape architect: *M. Paul Friedberg & Associates.*







Buchanan School Playground will have no fences—"has it not become apparent that fences do not protect and that their coerciveness has a blighting effect on both the neighbors and the neighborhood?" Again, changes in level (section above), sunshades and paving patterns will suggest different "rooms"—help separate noisy areas from quiet areas, active play from seating areas.

Design that "exemplifies the idea of conservation"

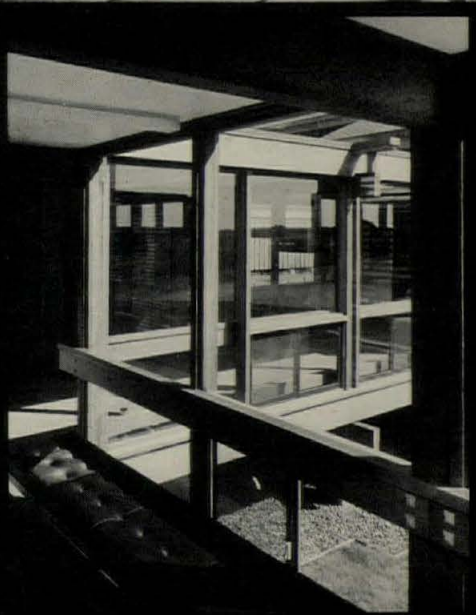
The complex is set on a rolling 42-acre site which is bordered by a wildlife area. Glass, opening to decks or terraces, offers sweeping views from all rooms. Broad roof overhangs and decks control sunlight. Courtyards, landscaped with trees and shrubs, will emphasize the connection between the buildings and the land.

The Missouri Conservation Commission had a full program of direct requirements for its new headquarters building—a series of offices and specialized work spaces for the staff, several visitor reception areas, and an auditorium for use by the staff and the public. But there was also a special program requirement: the new building had to "exemplify the idea of conservation."

To fill this special need, the architects developed a broad, open complex of six units connected by glass-enclosed corridors. The choice of materials (mostly redwood), and the use of glass walls and broad decks open to the view make the building "a visual and symbolic statement of naturalists' goals." Heartwarming sidelight: this building cost 20 per cent less than the estimated cost of a standard "state-office-building" design under consideration before this much more appropriate building was designed.

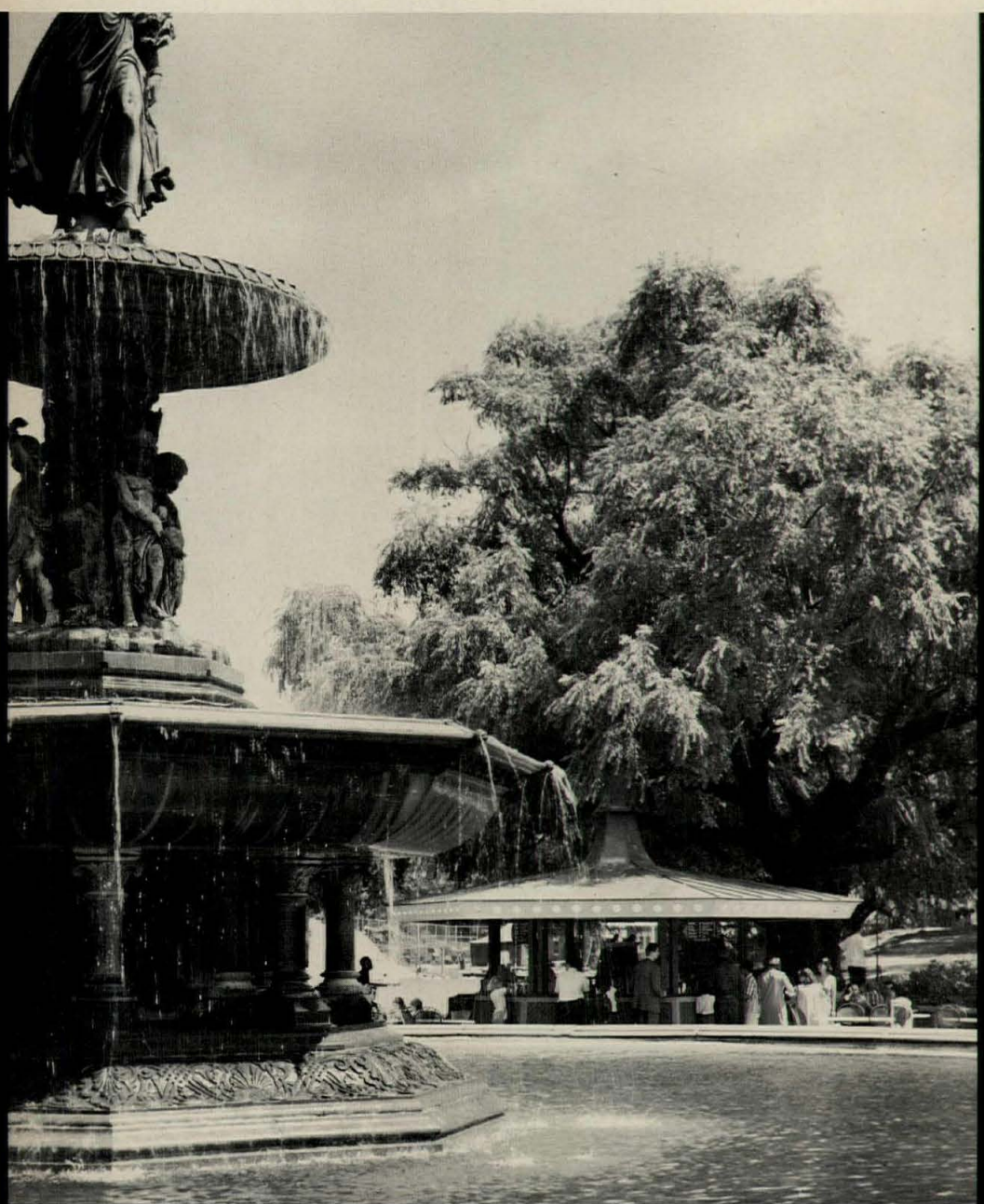
MISSOURI CONSERVATION COMMISSION HEADQUARTERS OFFICE, Jefferson City. Architect: *Hellmuth, Obata & Kassabaum, Inc.—Gyo Obata, principal in charge of design, Robert Edmonds and Daniel B. Gale, project architects;* structural engineer: *Albert Alper;* mechanical engineer: *Harold Brahm.*

Hedrich-Blessing photos



Detailing of the building is clean and precise. The complex has all the warmth and color associated with a wooden structure, but no suggestion of the "rustic" or "sticks and stones" feeling that so often creeps into buildings for recreational areas.

Fountain Cafe in Central Park: new life for a landmark



The refreshment kiosks which flank the fountain respect, in shape and color, the design of the monument—yet in no sense mimic it. Nearby seating, under umbrellas that in turn reflect the shape of the kiosks, offers a fine view of the boating lake, the planting, and the passersby.

For all its earlier-era elegance, the Bethesda Fountain and Terrace—like most areas of New York's Central Park far from the reassuring lights and traffic of the perimeter streets—has generally been a lonely spot. But as part of his imaginative and astonishingly successful program to make the park safer by filling it with people, Parks Commissioner Thomas Hoving has once again made the terrace a focal point. The magnet: this outdoor cafe.

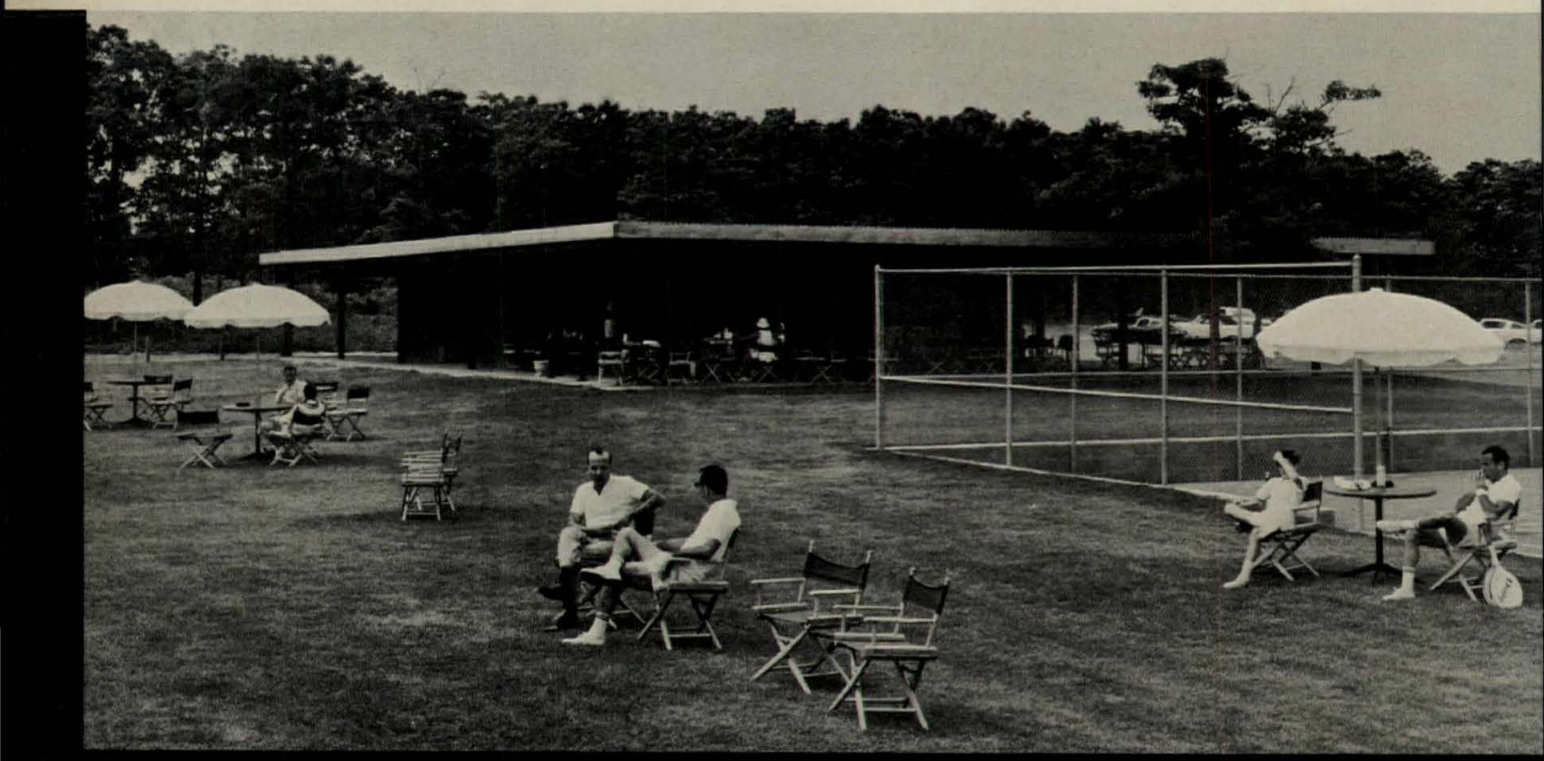
If architect James Lamantia's confection of striped canvas and kiosks is not architecture, it is an effective architectural solution to a real problem. And one can only be grateful that competition between the new additions and the century-old work of Frederick Law Olmsted, Calvert Vaux and Jacob Wrey Mould has been minimized. Example of respect for their work: when service lines were laid under the terrace, blocks were pulled one by one, marked, and replaced.

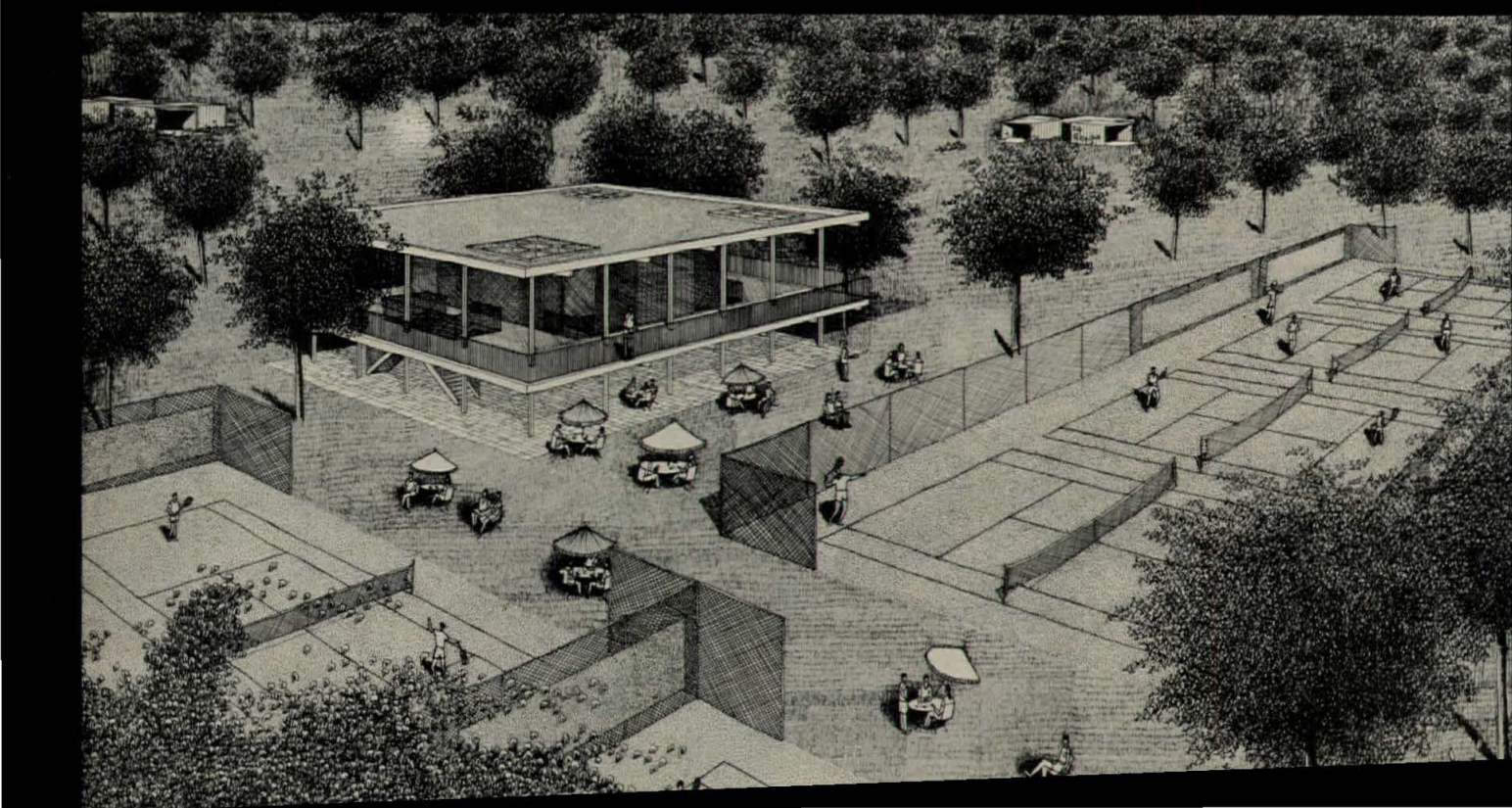
The main area (photo below) offers seated dining for 200, and a pair of kiosks flanking the fountain (photo far left) offer self-service refreshments.

FOUNTAIN CAFE, Central Park, New York City. Architect: *James Lamantia;* special consultant: *Elizabeth Gordon.*

The main terrace offers shade, but a fine open-air feeling. Heaters extend the outdoor dining season well into Fall. The kitchen is tucked in the arcades under the roadway.

A private tennis club: simple, disciplined, economical



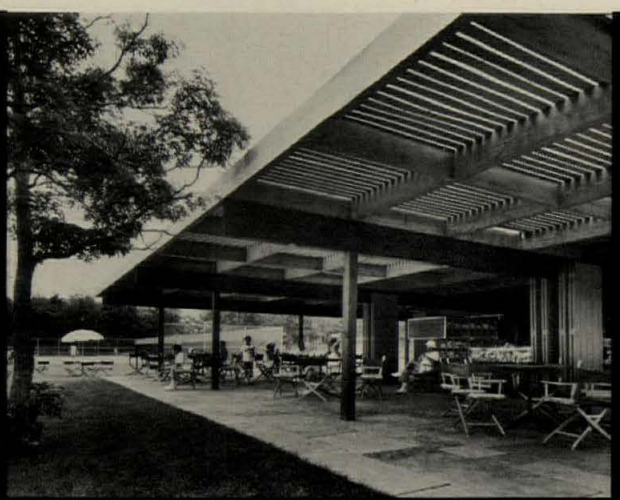


This club—being developed by two entrepreneurs who have built several outdoor and indoor tennis facilities in recent years—is being completed in two stages. The first stage, already in use: 12 clay courts facing the first floor of a proposed two-story building. The completed section has complete locker room facilities, the pro shop, and a snack bar sheltered under a broad slatted-wood roof.

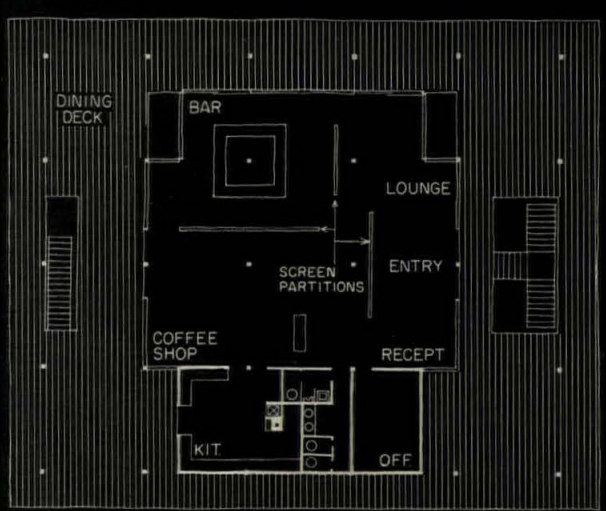
The second stage, shown in the rendering below, will add the second floor, which will include a cafe-bar, lounge, and offices, surrounded by a broad deck. Further proposed for the 26-acre site is a swimming pool, a series of four-plex units (sketch, lower right), and a few single-family houses.

The idea of building in stages is often inevitable for this type of building, where budgets are so often a problem. What is essential is—as in this case—a well-thought-out design that is at least nearly as functional and attractive incomplete as it will be when completed.

THE TENNIS CLUB AT EAST HAMPTON, East Hampton, Long Island, New York. Architect: *George Nemeny—associates, Richard Henderson and Debora Reiser;* contractor and owner: *Bernard Jacobsen and Joseph Fishbach.*



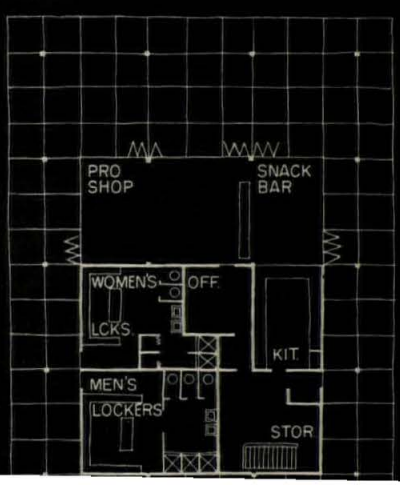
Louis Reens photos

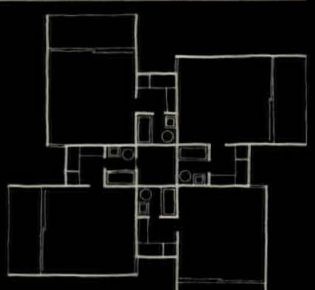


SECOND FLOOR

Detailing of the first-stage structure is simple, yet disciplined and full of visual interest. Folding partitions open the building's facilities (shown at right, the pro shop and snack bar) to the broad bluestone terrace. Slatted roof will become the deck of the second floor.

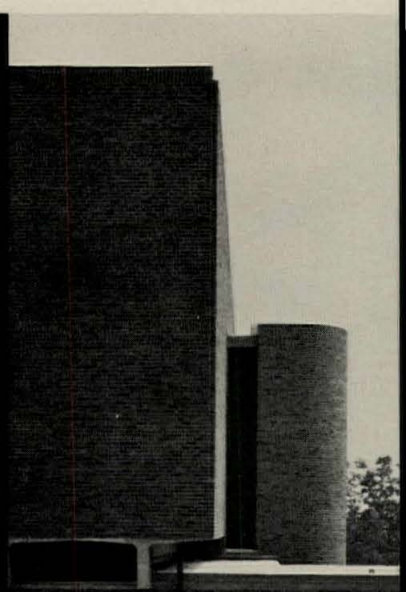
Housing units to be spotted through the wooded site have same simple, flat-roofed design. Each of units in typical four-plex will open through sliding glass doors to an individual and quite private terrace.

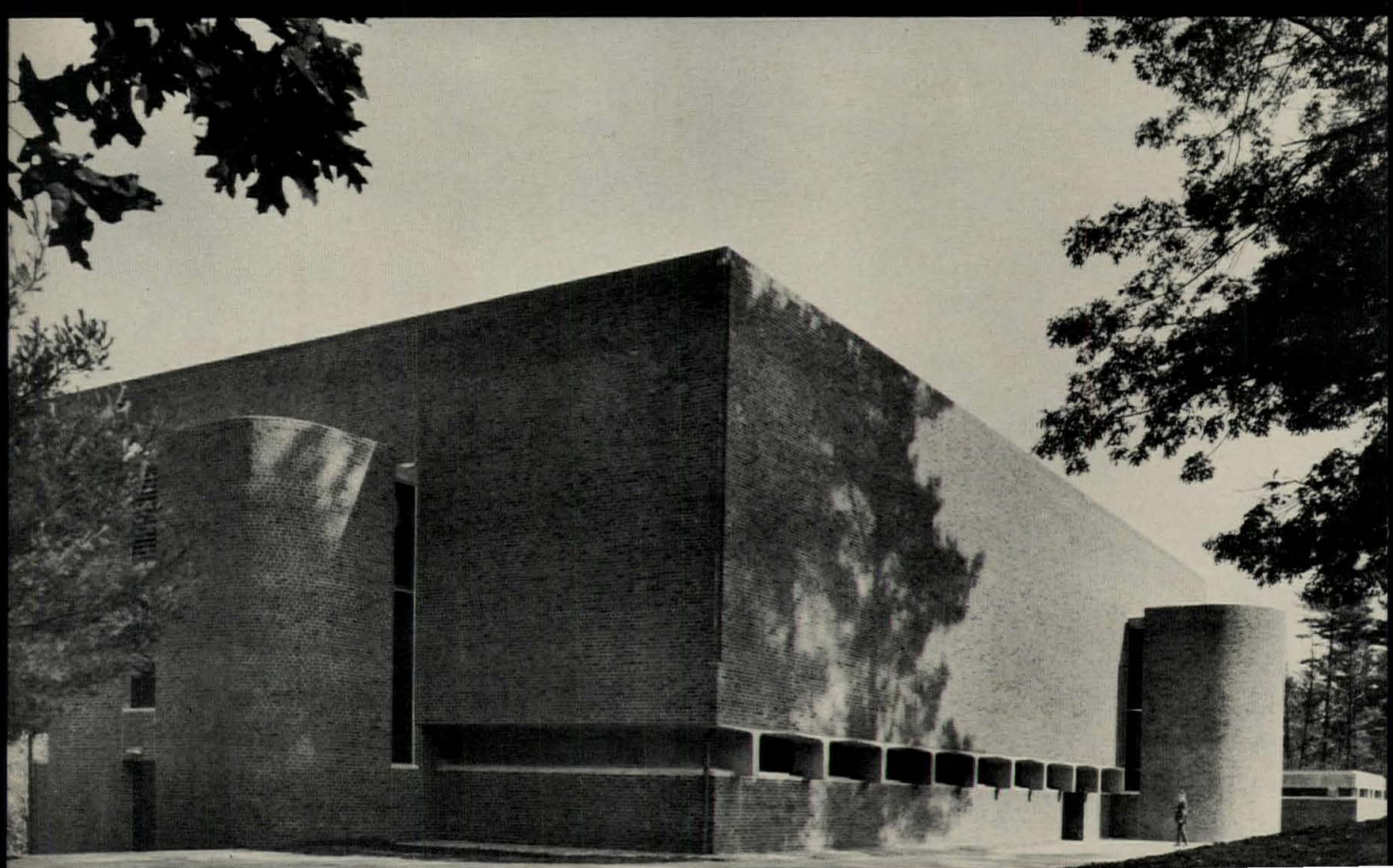




Student center for a school: contemporary for Cotswold

New building had to fit framework established by older buildings on the campus (typical example at left). Choice of material and rounded forms in stair towers and concrete tees helped create a design that is appropriate to the campus, but owes nothing to the past.



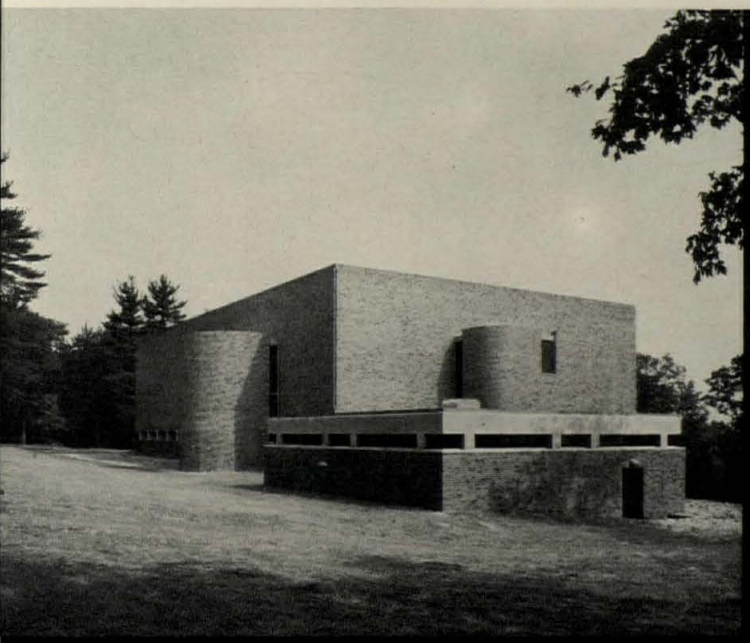


The original buildings of Avon Old Farms School were built in 1926 as "a Cotswold Village in Connecticut"—a difficult beginning for the design of this new student center. But the architect's choice of a warm brick and their use of rounded forms (for the stair towers) creates a contemporary yet harmonious solution.

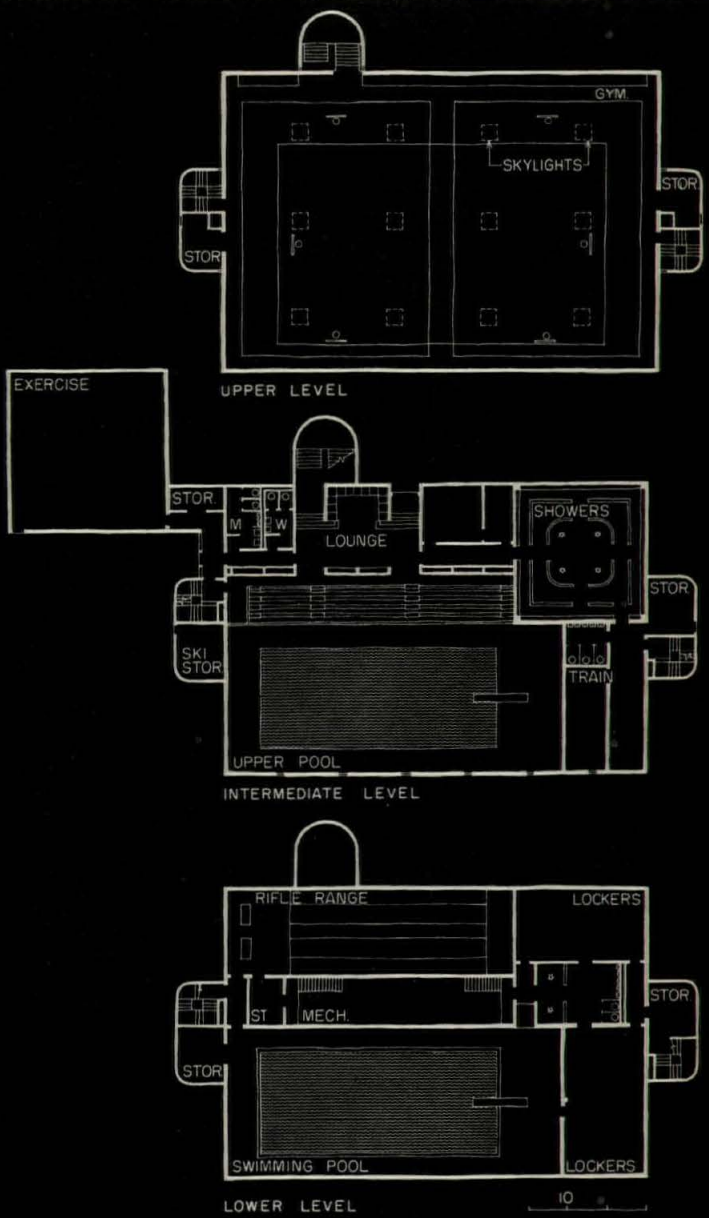
The program was further complicated by the fact that the swimming pool shown already existed. The pool was temporarily covered, then spanned with precast concrete tee beams resting on masonry bearing walls. Above this is the main gym area—also with masonry bearing walls but with wood beam roof structure.

Placing the entrance at an intermediate level (see plan) lowered the "eave" of the concrete tees, a device which helps suggest the small scale of the existing campus.

PIERPONT STUDENT ACTIVITIES CENTER, AVON OLD FARMS SCHOOL, Avon, Connecticut. Architects: *Sherwood, Mills and Smith—Thorne Sherwood, partner in charge, David Winfield Scott, designer;* structural engineers: *Fromme & Vosganian;* mechanical engineers: *Hill and Harrigan;* general contractor: *Bartlet, Brainard and Eacott Inc.*



Milton Weinstock photos



Brick is carried inside the building in reception and circulation areas, but activity areas have plainer finish. In the three-level plan, lockers are at intermediate level, close to both the pool below and gym above. Floor area is 25,300 square feet.

U.C.S.C. fieldhouse: bold solution to size, space problems

Philip Molten photos

The field house is set into the hillside, with only the bold copper-sheathed roof extending above grade. Playing fields are to left in both photos. View above is from entry road. Minimizing the bulk of the unit in this way minimized interference with view of ocean from the road and future college buildings further up the hill.

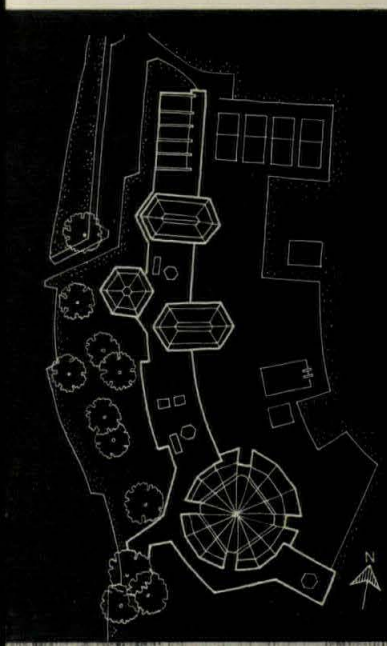
Making a field house seem like anything less than a field house is rather like trying to make a molehill out of a mountain. But that's just about the approach Callister, Payne & Rosse used in this field house, the first unit of the athletic center for the new campus of University of California at Santa Cruz.

This field house is located at the edge of a grassy slope facing Monterey Bay. It is built into the ridge, its main-floor level at the foot of the slope, or playing-field level. This lower portion is reinforced concrete, with a wood floor. Out of this structure—resting on its strongly articulated pilasters capped with shaped blocks that open a narrow strip for light—rises the bold, copper-sheathed hexagonal roof. Since the elongated hexagonal plan ruled out a one-dimensional framing system, a space frame of straight tubular steel elements, with all connections welded, was selected (photo just below). Purlins are wood, the decking insulation is cement-coated wood-fiber panels.

Extending from the big general purpose room under this high roof, is locker and shower area (plan) also let into the hill. Its roof serves as a terrace and as a grandstand for the playing fields.

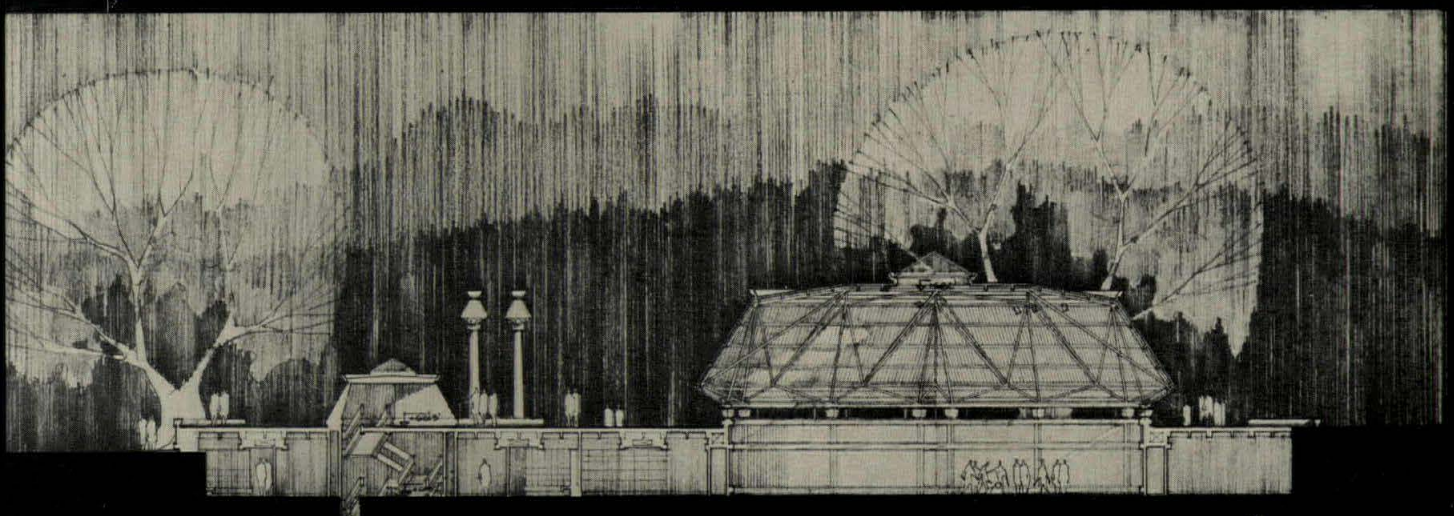
Future additions (site plan) will add other strongly roofed but varied structures, connected like beads on a string by added locker and service facilities dug into the slope in a curving line.

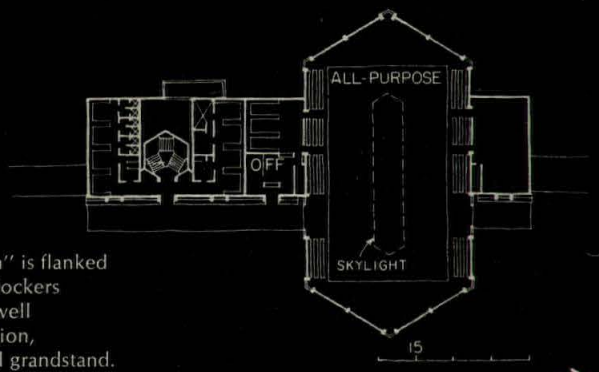
In developing this scheme, the architects followed the expressed program of the university that athletics would be primarily for recreation rather than for intercollegiate activity or as a curriculum requirement. Hence, the provisions are intended for unorganized spontaneous games and exercising, and include the large open space without the usual spec-



Site plan takes advantage of slope—puts this field house and future athletic facilities in a curving line, "connected like beads on a string."

At the springing directly above the window strip, the space-frame roof creates an eave, then proceeds in a series of planes to the central skylight.

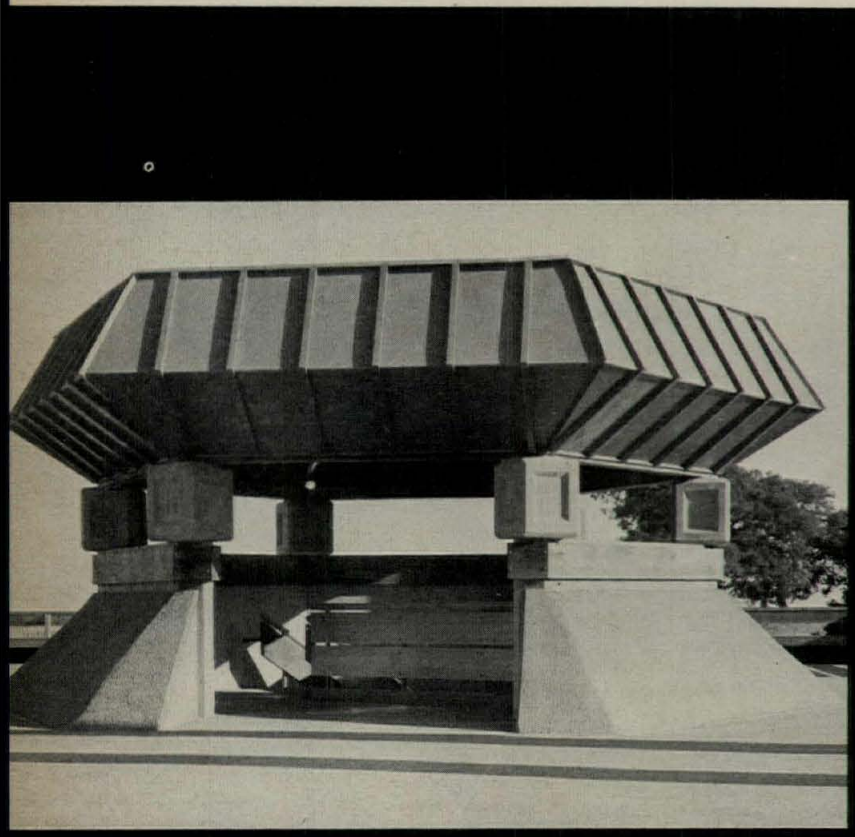




Big "general purpose room" is flanked by storage rooms, offices, lockers for men and women. Stairwell leads to roof of locker section, which serves as an informal grandstand. Total enclosed area: 13,284 square feet.

tator accommodations. The space does house one regulation basketball court with bleachers for 200; and the space can be converted to other small court games. Until the campus is more fully developed, the space will also serve as a 700-person capacity auditorium.

FIELD HOUSE FOR UNIVERSITY OF CALIFORNIA AT SANTA CRUZ. Architects: *Callister, Payne & Rosse—executive architect: J. Martin Rosse;* project architect for the University: *Bruce C. Lane,* structural engineer: *Stefan Medwadowski;* mechanical engineer: *Kasin, Guttman & Associates;* electrical engineer: *Mel Cammisa;* contractor: *Jasper Construction Inc.*



Detailing of both the roof and the reinforced concrete roof is handsomely executed. Above left: the head of the stairwell from the locker area—perhaps too heavy, but fun. Photo above right shows window strip between the concrete wall and the roof. Note shaping of concrete blocks atop pilasters.

ARCHITECTURAL ENGINEERING

What's happened since the "Great Blackout"?

A year after the Northeast power blackout, much remains to be done to assure greater protection to life and health of building occupants. It appears that even the hospitals are moving rather slowly in re-appraising their emergency power facilities—the obvious reason being cost for equipment and segregated wiring. In New York they will not be able to postpone decisions very long inasmuch as the Department of Water Supply, Gas, and Electricity will require that all hospitals have on-site standby power by July 1968. The emergency load must include power for all treatment and diagnostic areas, power for one elevator, and enough lighting for safety. The Department's Bulletin 110, however, is much less strict than the National Fire Protection Association's Standard 76. For example, New York's Bulletin 110 does not require an outlet in each patient room to be on an emergency circuit, but only outlets in nursing units and along corridors on 50-ft centers so that 100-ft extension cords can be used to serve patients' rooms. The use of extension cords for this purpose is an unsafe practice and actually a violation of the National Electrical Code and the New York City Electrical Code.

The cost of standby on-site generators has led some hospital administrators to consider dual-use standby plants. That is, the on-site engines might be used normally to drive refrigeration compressors, but in a power outage they would be used to operate standby generators. With this approach a much larger standby power plant might be justified, able to take most of the normal electric load, avoiding duplicate wiring systems—that is, extensive segregated wiring in addition to normal wiring. The overall owning costs for such a scheme might be much less in the long run despite higher investment. This approach needs careful examination, however, since adequate reliability would require multiple units and detailed consideration of maintenance and "downtime."

A less expensive approach than dual-use was described in the article, "Planning for Reliable Electric Power," AR, February and March. It requires a somewhat larger plant than minimum, but utilizes normal wiring combined with load-dumping features to achieve coverage of desired loads, while allowing complete freedom in planning for expansion and future loads.

There is some sign of activity, however, among owners of "name" multi-story office buildings. Several had standby generators before the blackout—Union Carbide and Chase Manhattan. Now four more are reported to have installed generators in the general range of 200 kw and one of 600 kw—with several more to come.

What have the utilities themselves done? The November issue of *Power* reports that the various utility pools have taken steps to improve communications, including new telephone and radio links. And a number of utilities are installing standby power generation to permit safe shutdown of equipment in case of emergency and for starting this equipment up again. The article in *Power* suggests that in the area of consumers' power systems, new regulations are needed to assure safety and that, "Potential disasters still exist in elevators of high-rise buildings, but there are no rules for powering them in an emergency."

THIS MONTH'S AE SECTION

Structural protection against explosions

A new approach to structural design to provide structural protection against accidental explosions in the storage and manufacture of explosive materials has been developed by Amman & Whitney, consulting engineers. Originating from research performed for Picatinny Arsenal, the design approach utilizes data obtained from tests on full-scale and model-size protective cubicles.

How to make houses more wind-resistant

Techniques to strengthen both masonry and wood-frame houses against the winds of hurricanes and tornados have been recommended by the U.S. Department of Housing and Urban Development, as a result of recent FHA studies in storm-damage areas. The survey, conducted by FHA's Office of Technical Standards, disclosed that construction failures typically occurred at material joints rather than through the materials themselves.

The recommended technique for concrete block construction is to use vertical reinforcing bars at corners and wall openings, securely anchored into the bond beam at the top, extending through block cores filled with concrete and anchored securely into the footing.

In wood frame construction, the suggested technique to tie the structure together and secure it to the foundation is as follows: Two continuous ⅛-in. by 1¼-in. steel straps are nailed to the tops of studs and wrapped around the perimeter. Vertical straps which hook over the plate and are terminated at the sill are tied to the foundation by anchor bolts. These vertical ties are placed at all openings and not more than 32 in. apart.

Reappraisal of engineering licensing urged

A Panel on Engineering Education organized by the Engineers Joint Council to assess a recent report on Goals of Engineering Education suggests that engineering licensing should be reviewed as a possible restrictive influence on flexibility and innovation in education. Chaired by John R. Kiely, senior vice president of Bechtel Corporation, the panel recommended that the principle of engineering licensing and the laws on which it is based should be reviewed and modifications considered by the professional and technical societies.

From the report:

- "By its established standards and minimum requirements, licensing manifests an incompatibility with experimentation and flexibility in engineering education. It tends to be a restrictive influence on this creative process by encouraging rigidity and adherence to fixed norms.
- "A broad appraisal should be made of the licensing principle and the licensing laws and their control over schools, courses, and accreditation procedures. Such a review should take cognizance of the requirements of the market place in demanding certain characteristics of engineering education.

High-rise concrete frames being checked for creep

The fact that concrete creeps under a compressive load is a fairly well appreciated phenomenon—being taken into account in the design of prestressed concrete for example. It follows that the concrete in columns of multi-story buildings must creep, too, and engineers would like to have more data on just how much to expect and how creep might affect some of their design details. Two of the deleterious side effects of creep that have been noted, as the columns shorten, are the crushing of exterior brick veneer walls, and the binding of sliding windows.

Just this sort of investigation is being undertaken by Professor William S. Kinne Jr. of the civil engineering department at the University of Wisconsin. Right on campus, Professor Kinne and his associates are studying creep in a 19-story, concrete-frame office and classroom building, and in Chicago, they will check a 70-story apartment building.

The U. of Wisconsin investigators have placed electric strain gages in the columns of these two buildings and will check shortening with vertical measuring devices.

Since they want to keep the normally fragile strain gages in working order over at least a two-year period, the engineers have devised a special technique for installing them. The strain gage wire is attached to a ⅜-in. bar 8 in. long. This strain gage is waterproofed and the bar is welded to the principal reinforcing steel of the column. Wire is strung from columns through partitions to measuring stations. A portable recording device is then carried from station to station to take strain measurements.

A new compendium of air conditioning data

A basic engineering handbook on heating, refrigeration, air conditioning and ventilation will be introduced in February by the American Society of Heating, Refrigeration and Air Conditioning Engineers. The "Handbook of Fundamentals" will supplement the continuing two-volume "Guide and Data Book" series which is being rearranged to provide a Systems and Equipment volume in 1967 and an Application volume in 1968.

Street lighting—a plea for design by professionals

The lighting of streets and public places suffers from the fact that "it is the responsibility of local authorities, with all decisions made by a lay committee advised by the engineers' department," in the view of John Bickerdike of Associated Architects and Consultants of London. Speaking at this year's annual meeting of the Royal Institute of British Architects, Bickerdike stated that, "street lighting seems to be based on an incredible amount of mumbo-jumbo, which only serves to envelop a fairly simple technical problem in complete mystery."

He said that general town lighting criteria were urgently needed, and that analysis of a town's functions, activities and character are needed, with many of the solutions being based on a set of controlled value judgments. Further, he stated, preoccupation with cost and efficiency can spring from difficulties in defining social and spiritual needs, resulting in their existence being ignored. The developing character of a town must be allowed to guide design activities, Bickerdike continued. In lighting design we must know when to reveal by direct lighting or by silhouette, when to change brightly lit busy regions for softly lit backwaters, and to appreciate the major contribution that light buildings can make to the night scene.

Overcoming hurdles to new product application

A new department of the General Electric Company, Community Systems Development Division, thinks that one way to overcome obstacles of labor union opposition and building code restrictions in introducing new products is to build new towns. G.E. is reported to be "looking for a new city site where the local political climate will be receptive to use of performance specifications and where labor and other groups will not offer resistance."

One possible product mentioned by G.E. is a baseboard that contains electrical wiring, water lines and air supply to reduce the cost of separate installations by plumbers, electricians and sheet metal workers.

What's the best way to build a house floor?

How strong does a house floor need to be? How rigid? What sizes and grades of lumber framing are adequate? What advantages does pre-assembly in section or panels offer? These are some questions the U.S. Forest Products Laboratory hopes to answer by building a subfloor five different ways in a new experimental house. The 28- by 40-ft floor is divided into five sections each 8 ft wide. Three of these sections have variations of a conventional subfloor framing covered with ¾-in. Douglas fir or southern pine plywood of sheathing grade. Preassembled drop-in panels of "T" design comprise another section, and the fifth is made up of stressed-skin plywood panels 4 ft wide by 14 ft long.

Two of the conventionally built sections consist of 2- by 10-in. joists and ¾-in. Douglas fir plywood. The joists in one section, however, consist of Douglas fir with a 1700f rating in bending. Those in the other section are of Utility grade Douglas fir, which is not stress rated. The stress-rated joists are spaced 24-in. apart and the Utility-grade joists, 16-in. In the third section, 1750f rated southern pine and 1700f Douglas fir joists are 2 by 8 in. and are spaced 16 in. on center.

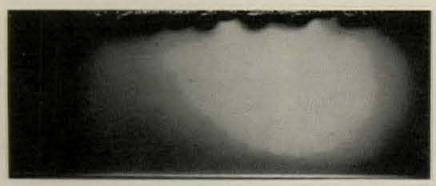
Finish floors will include conventional strip flooring and some experimental types in block and strip form, nailed or cemented to the subfloor.

Glazing recommendations for tinted glass

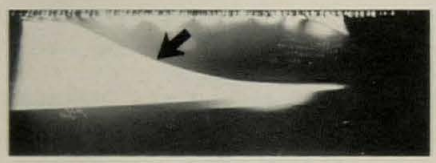
Tinted glass absorbs more solar energy than clear glass. Because of partial shading, particularly of the glazing rabbet on sunny elevations, the center of a light of glass gets hotter than the shaded edges. Since the center expands more than the cold edges, tension stresses result at or near the edges. Structural reliability requires that the edges and surfaces immediately adjacent be free from deep scratches, vents, nips and crushes near the center of jambs or sill. Below are photographs of acceptable, borderline and unacceptable edges.

Tinted clean cut edges

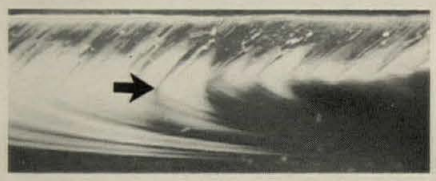
ideal



convolutions



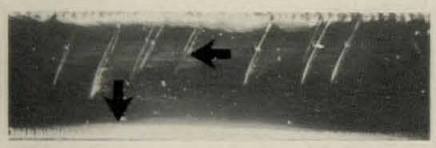
shark teeth



Tinted borderline edges

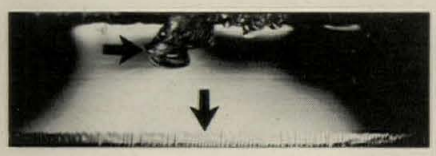
shark teeth

serration hackle



flake chip

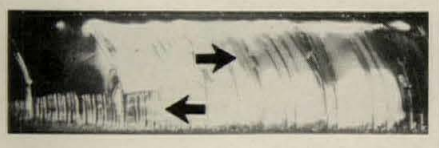
serration hackle



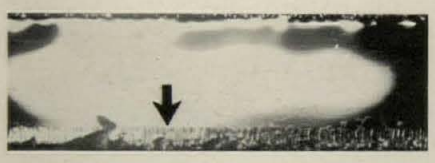
Tinted unacceptable edges

deep shark teeth

deep serration hackle



serration hackle with spalls



impact damage

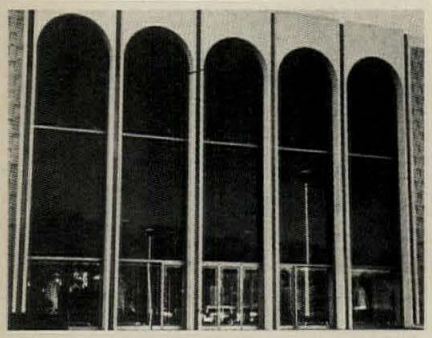
Tinted glass is generally used for three reasons: to reduce flow of solar heat into a building, to cut down sky glare and to enhance the appearance of the building. By its nature, tinted glass is a solar-heat absorbing glass, and greater care must be taken in the design and specification of this type of glazing, than with clear glass. The reason is simple: tinted glass exposed to sun is subjected to higher temperature stresses than clear glass, and thermal breakage can result if these stresses are excessive, or if the edges of the tinted glass are not cleanly cut and thermal stresses are high.

To encourage improved practices in the design, specification and installation of tinted glass, Pittsburgh Plate Glass Company recently developed a technical guide which sets out: (1) design and details for good performance, (2) cutting and glazing recommendations, and (3) reference information on estimating thermal stresses and glass edge strength required. This article summarizes the approach and major recommendations.

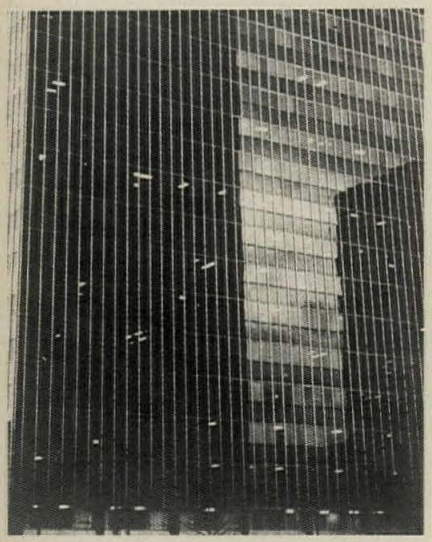
Stresses induced in glass by wind are different than those due to solar load: solar load stresses are greatest at or near the edge, while wind load stresses are greatest on the surface. It is essential, therefore, when tinted glass is to be used on sunny elevations that the glass edges be cleanly cut; that the fenestration design minimize the effect of solar load as much as possible; and that the glazing detail be designed to protect glass edges and allow glass installation without damage to edges.

The greatest temperature difference expected on a plate glazed in a building would be about 60 F or 3,000 psi edge tension stress. The temperature difference and edge stress is low with low heat capacity curtain wall construction but greatest with massive masonry mountings which resist change in glass edge temperature. Indoors, tightly closed drapes or blinds act as a heat trap, increasing glass temperature and edge stress. Partial shading from adjoining buildings, an offset or canopy in the construction of the building or mounting with glass set back from face of building increases edge stress at the shade line.

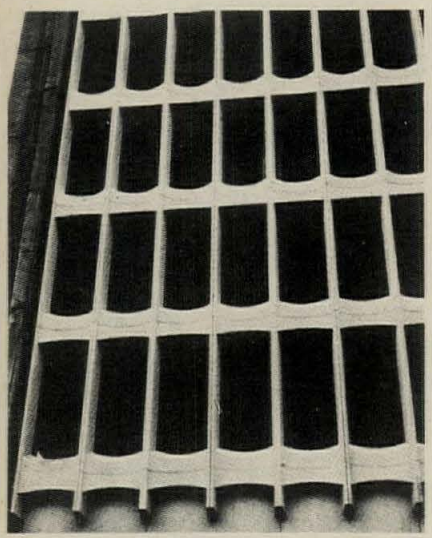
The ability of tinted glass to resist solar energy breakage is determined by edge strength. In-service edge strength depends primarily upon the size, thickness, type of cut, and edge treatment. Tinted clean-cut edges are the strongest presently attainable in annealed glass. Seaming, grinding, or polishing weaken a tinted clean-cut edge. The strength consistently attainable in a tinted clean-cut edge depends largely upon the skill and care of the glazier or glass cutter, and upon his tools and working condi-



Custom factory fabrication was required for the ½-in.-thick, pattern-cut tinted lights for this department store.



For lights of regular shape (rectangular or square) and less than 200 sq in. in area, tinted clean-cut edges will suffice.



Because of the thermal lag of concrete, tinted glass set in concrete frames may require factory cutting to assure strength.

tions. Tinted clean-cut edges on lights with edge area up to 200 square inches can be expected to carry thermal stresses of 3,000 psi. Heat strengthening increases edge strength by at least 2,000 psi.

Making straight clean cuts in large thick plates is difficult. Proper tools, cutting tables and skillful mechanics are essential. Cutting plates to a circular pattern is more difficult.

Normal practice followed with clear (non-tinted) glass is adequate for tinted glass on near-north elevations. Tinted clean-cut edges are essential on all sunny elevations. Tinted clean-cut edges must be called for in the specifications, and in the order, for openings where they are required. Custom factory fabrication (which may include heat strengthening or other processing) will be necessary where job conditions are likely to create edge tension stresses greater than the strength attainable in tinted clean-cut edges.

Heat strengthened glass is approximately 2.5 times more resistant to wind loads than an equal thickness of ordinary glass. One-quarter-inch heat strengthened glass will carry about the same wind load as ½-inch regular plate glass and may be more economical, too. Where uniform fenestration appearance is a design objective, it is desirable to glaze the entire building with one glass thickness (appearance varies with thickness).

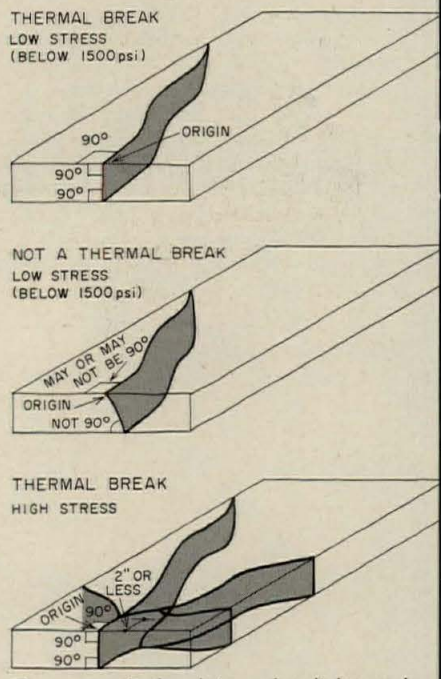
Heat strengthened glass of the same thickness can be used in larger openings and to resist higher wind loads to be expected at upper floor levels.

The architect can control several factors which determine the magnitude of solar stresses.

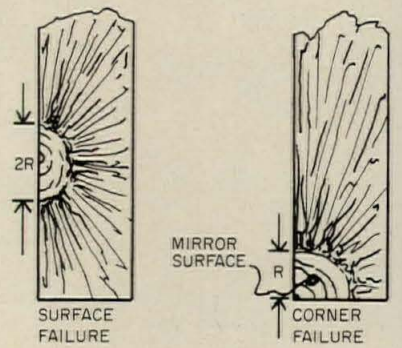
- 1. *Orientation of windows:* Windows facing north are exposed to little direct sunlight. Windows facing between N 60 W and N 45 E require normal glazing practice. All others must be glazed according to *recommended tinted glazing* practice.
- 2. *Size and shape* are important factors in evaluating the possibility of solar breakage. Large lights, usually thicker to withstand design wind loads, absorb more solar energy and may be exposed to greater edge stress.

Strong edges are necessary; they become difficult to obtain as edge area increases. Specify "custom factory fabrication" when edge area is greater than 200 square inches.

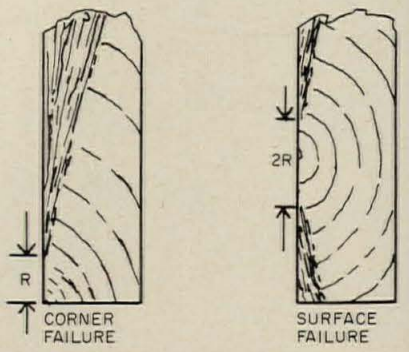
- 3. *Indoor shading:* Indoor shading reflects heat out through glass; thus the central area becomes hotter. Air between indoor shading and glass acts as an insulator, reducing the heat glass can dispose of, thus increasing central area temperature. The following indoor shading devices are listed in order of increasing glass stress:



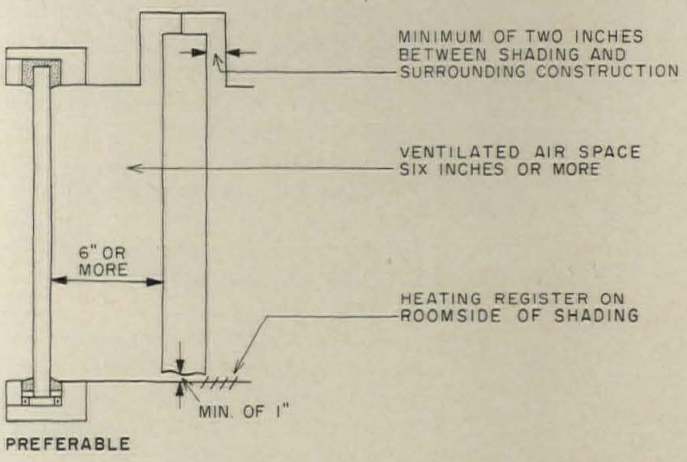
The cause of a break in a glass light can be deduced by examining the break origin. Here a "mirror" surface will be found whose radius increases as the stress causing failure decreases. If no radius can be measured, then the failure occurred at a stress under 1,500 psi. Since tinted clean-cut edges can take thermal stresses of 3,000 psi, such failures indicate either a poorly cut edge or that the edge was damaged.

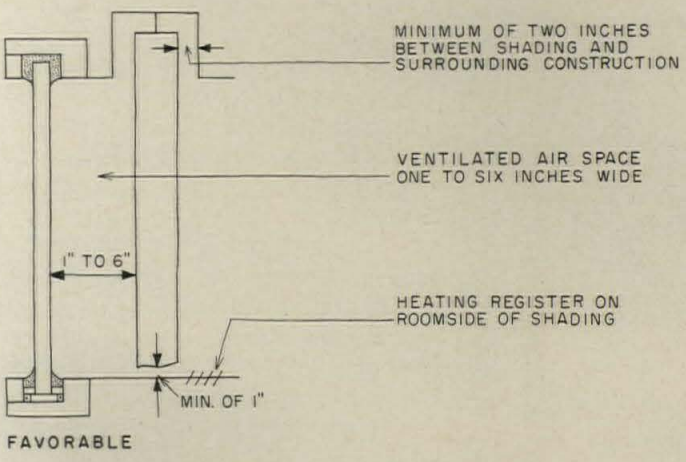


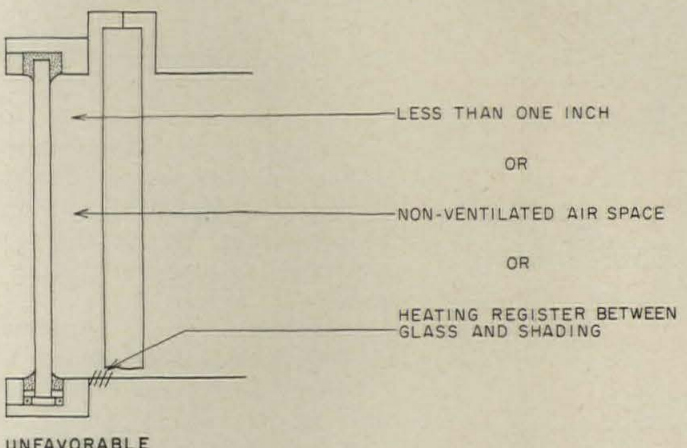
Pure tension failures (thermal break)



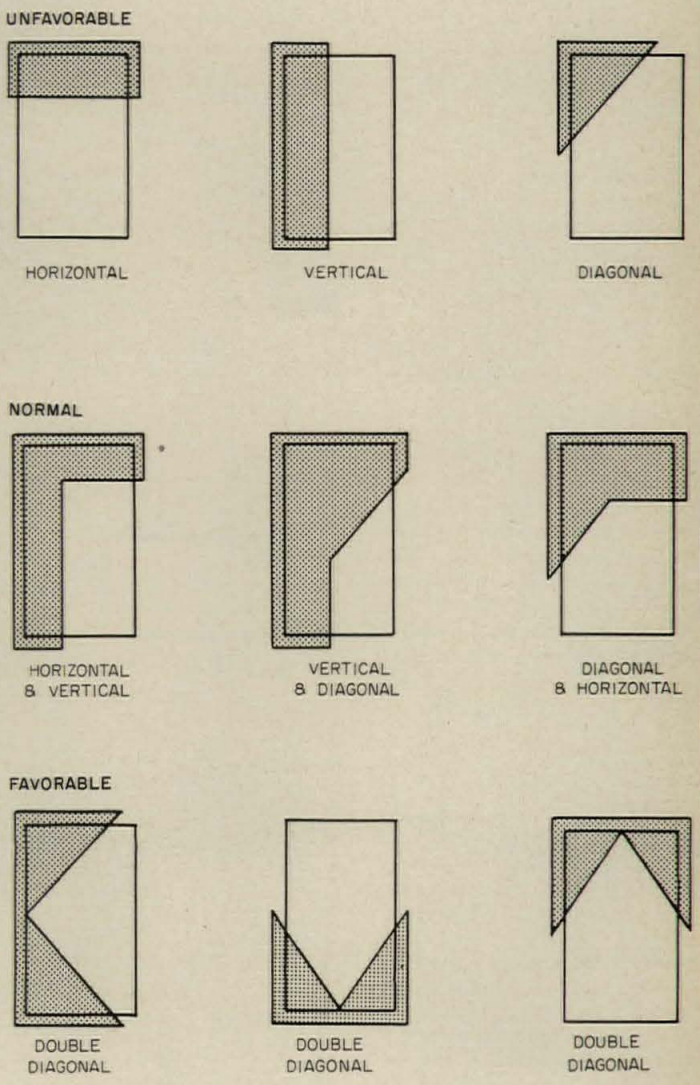
Failures due to bending



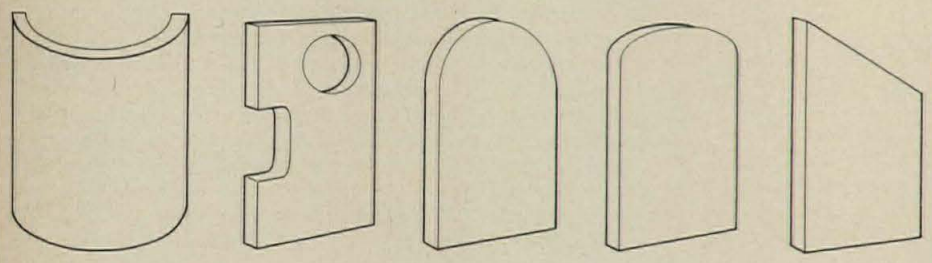




LEFT: effects of solar heat on tinted glass can be compounded if the heat that gets through is trapped by interior shading and if the air grilles are located between the glass and the shading. If the space between glass and shading is not ventilated, the trapped air forms an insulating layer which makes this air get even hotter, increasing the temperature of the glass. Natural ventilation can be provided by leaving a minimum of 1 in., but preferably 6 in. between the glass and the shading, a minimum of 1 in. at the sill and 2 in. at the head. The lighter in color, and the tighter the weave, of draperies, the more the heat reflected back toward the glass, and thus the higher the air temperature; closed venetian blinds trap even more



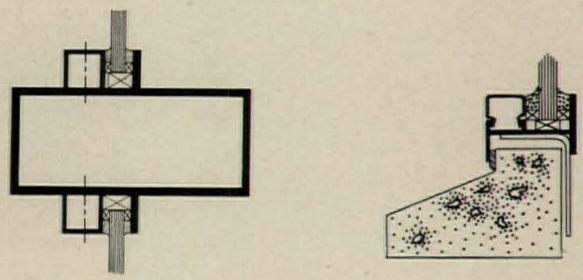
ABOVE: partial shading of glass due to building framing, louvers, balconies, etc. increase tension stress on glass edges. Plain horizontal, vertical and diagonal shading are less severe than double diagonal shading. The worst condition is a double diagonal shade line with a 70 degree included angle.



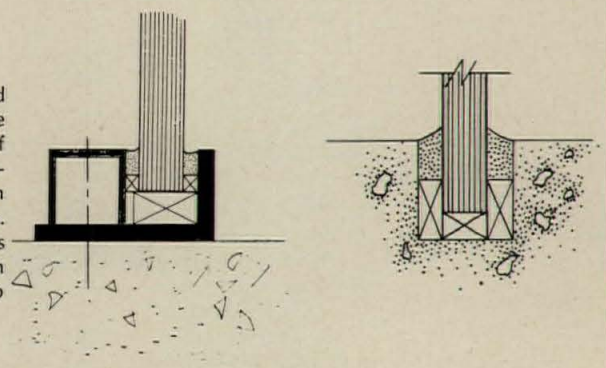
Examples of glass lights that require custom fabrication. Bent glass always must be obtained from the factory. Pattern-cut lights with holes or notches also must be factory fabricated. Curved and slanted-cut lights must be factory fabricated when over ¼-in. thick.

Favorable framing. Edge stresses are minimized when the framing has low heat capacity, such as with zipper gaskets. When sun strikes the window, both the glass and gasket become warm.

Normal framing. Lightweight metal mullions and rabbets also allow the edges to gain or lose heat fairly closely to that of the center of the glass, again minimizing edge stresses to solar heat.



Unfavorable framing. When tinted glass is rabbeted inside a massive concrete frame, the thermal lag of the concrete will cause large temperature differentials between centers of lights and the edges. Edges can be damaged when glass must be set in pocketed flush framing, since the glass needs to be joggled into place.



a. No shade
b. Dark open-weave draperies
c. Light open-weave draperies
d. Dark closed-weave draperies
e. Light closed-weave draperies
f. Dark venetian blinds
g. Light venetian blinds

▪ 4. *Air space between glass and indoor shading:* Where indoor shading is used, ventilating the air space will help to reduce edge stresses. Natural ventilation can be provided by leaving at least an inch between draperies and surrounding construction at sill, two inches at head. As glass-shade spacing is decreased, edge stress increases.

▪ 5. *Heating grille location:* Heating grilles should be located on the room side of draperies; never between draperies and glass. Grille vanes should direct warm air away from glass.

▪ 6. *Double window units:* Double window units with air space or integral shading, and windows in combination with storm windows, are more susceptible to solar breakage because of the insulation air space. Use heat-strengthened glass in double-glazed units with shading in the air space.

▪ 7. *Laminates:* Laminated glass has twice the perimeter of cut-edge, and it is difficult to obtain tinted clean-cut edges in laminated glass. Therefore, it is desirable to use heat strengthened glass in tinted laminates.

▪ 8. *Outdoor shading:* Tension stress on glass edges increases appreciably with partial outdoor shading. Balconies, awnings, framing members, louvers, trees and shrubbery, may introduce shading stress. Horizontal shading, diagonal shading, and vertical shading are less severe than double diagonal shading. The most severe shading is a double diagonal shade line with a 70 degree included angle between shade lines, intersecting at the middle of one edge.

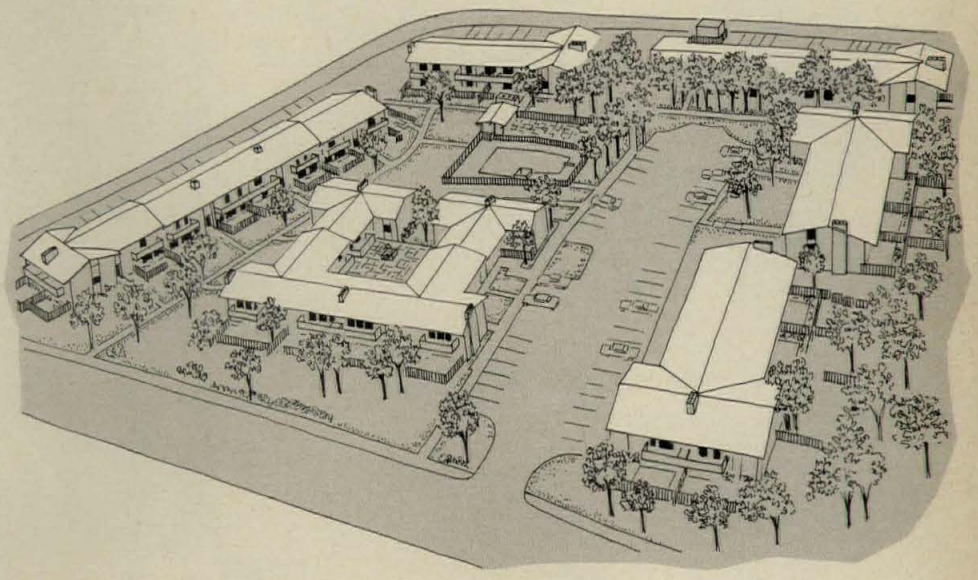
▪ 9. *Bent glass:* Custom factory fabrication required.

▪ 10. *Framing system:* Framing of low heat capacity tends to minimize edge stress. Structural zipper gaskets make excellent glazing rabbets because they are black and insulating. Metal glazing rabbets and frames are used frequently and successfully.

Massive concrete frames in thermal contact with glazing rabbets have great heat capacity and cause high edge stresses. Concrete becomes cold at night and does not warm up as fast as glass when the sun shines. Zipper gaskets or insulating sash tend to reduce stresses.

▪ 11. *Pattern cut lights:* All pattern-cut lights with holes or notches require custom factory fabrication. All pattern cut lights over ¼-in. thick require custom factory fabrication.

Total energy for five apartment groups



A combination of factors, including a centralized maintenance program, favored the use of on-site power generation and heat recovery in five apartment complexes in the Kansas City area. Natural gas engine/generator sets supply the electrical power and heat is recovered from engine jackets and exhausts.

The first apartment development was the 90-unit Mission Valley completed in 1964, and now a 246-unit project is in operation. Two other projects, one 385 units and the other 121 units (to be enlarged to 270) are partially completed, and a third of 334 units is under construction.

Apartment buildings represent a good application for total energy systems since the electrical load profile is fairly even throughout the day, except for small morning peaks and larger peaks at dinner-time. The electrical peaks obviously will be higher when cooking is done by electricity—which is the case with the first three projects. The fourth has gas ranges and domestic hot water heating is by gas hot water heaters in each apartment, rather than from the central system. All projects were engineered by Truog and Nichols, mechanical engineers and contractors.

Equipment payoff

The economic advantage of these installations is based on the fact that lower utility costs will amortize the additional cost of equipment, and give utility savings after equipment payoff. In the Mission Valley apartments it is estimated that equipment costs will be paid off in 10 years through fuel savings, based on utility savings of $14,500 annually. Costs of the 246-unit Kenilworth project equipment are expected to be amortized in six years, based on energy savings of $40,000 yearly. Additional costs of total energy equipment above that for central air conditioning is estimated by Truog and Nichols to be $500 to $600 per apartment.

Truog and Nichols have made total energy more attractive to owners by offering a regular maintenance service and emergency service. They have signed contracts for these services with owners of all of the projects, making prorated cost per installation much lower than possible for a single installation.

Moreover, to eliminate the need for permanent maintenance staff at each site, Truog and Nichols have installed a central monitoring system in their offices. Warning lights and sound signals give the alert when selected operating parameters are not within prescribed limits. Presently, two installations are completely monitored. The other two are tied only to the alarm system, but eventually they will also be completely monitored. Only two specialized maintenance men are needed —an engine mechanic and an air conditioning serviceman.

Kenilworth Apartments

Kenilworth development, designed by architects Boyle and Wilson, comprises 19 buildings surrounding a clubhouse. There are a total of 246 dwellings, ranging from one to three bedrooms; net rentable area is 264,467 sq ft, with an additional 19,727 sq ft in halls. The basements under the apartment buildings total 147,137 sq ft. Equipment is in the 4,940-sq-ft basement of the clubhouse.

The total energy installation includes two 450-kw natural gas engine/generator sets and two 225-kw sets, providing 60-cycle, 3-phase power at 480 volts.

At least one set is in constant operation, with the remaining sets on standby. Maximum demand load has been estimated at 750 kw. A control system parallels the engines and generators and automatically operates the installation according to pre-reset schedules.

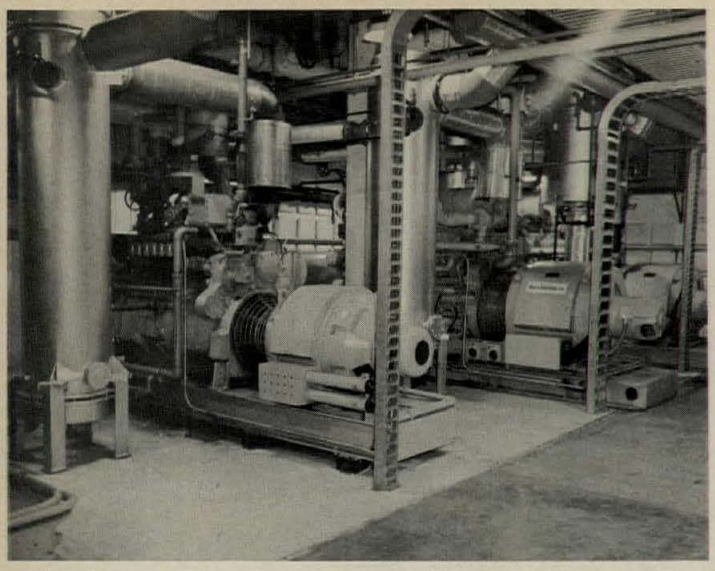
Heat recovery is by a vapor-phase system connected to each engine and producing about 6 pounds of 12 psi steam per kw generated. At an average power generation rate of 650 kwh, the heat recovery system delivers about 3,900 lbs of steam per hour.

Additional steam is available from two natural gas low-pressure boilers, each rated at 9,680,000 Btu/hr input and a maximum production rate of 8,000 lbs of 12 psi steam per hour. In the fall and the spring, when the heat recovery system produces more steam than needed, the steam is rejected to the atmosphere through an excess-steam condensor.

Cooling is provided by two absorption machines—one of 275-ton rated capacity, the other 250-ton, for a total of 525 tons.

Individual apartments are served by a two-pipe system. Chilled water is supplied at 45F and returned at 55F. Hot water for heating—via a converter—is supplied at variable temperatures, ranging from 90F to 160F, with a temperature drop in the return line of about 20F. Hot water temperature is governed by outdoor reset control.

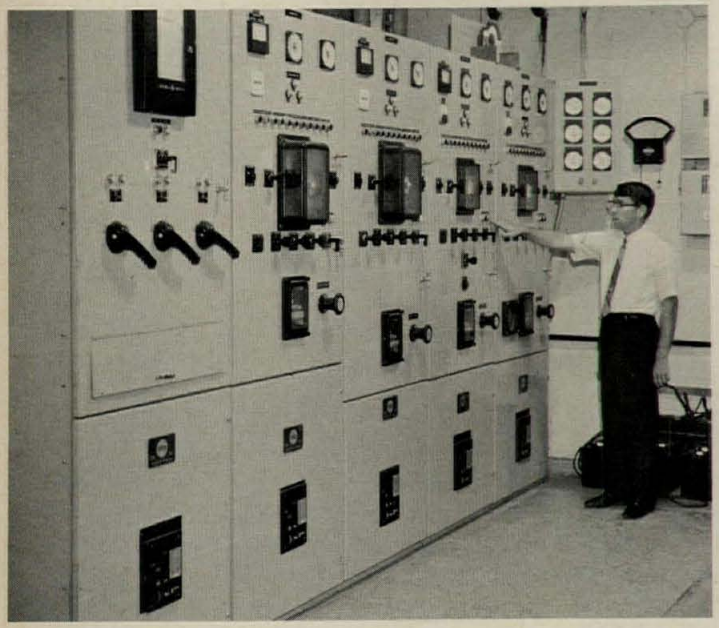
Change-over from the heating to the cooling cycle can be achieved automatically in about 30 minutes, from cooling



Gas engine/generator sets for Kenilworth apartments (three of four shown) satisfy a maximum demand load of 750 kw. There are two 450-kw units and two 225-kw units.

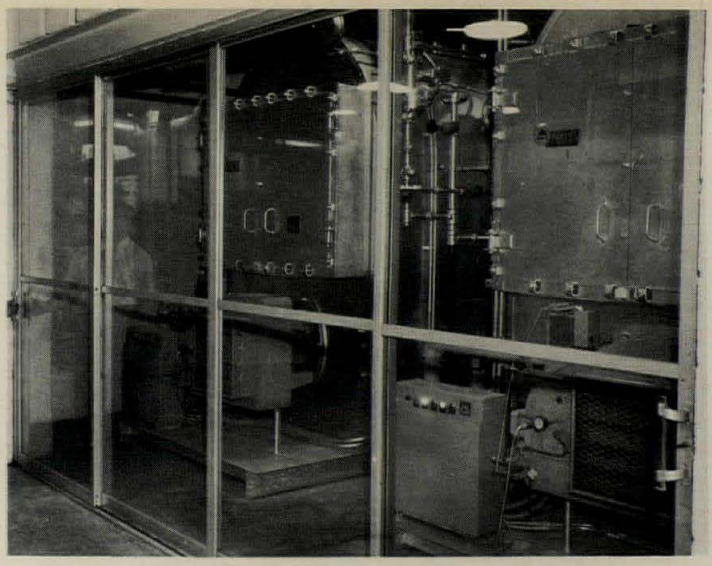
Equipment room for Kenilworth is in the 4,940-sq-ft basement of a clubhouse. In addition to engine/generators, space is required for steam separators, absorption refrigeration, units, boilers, convertors.

Monitor board at Kenilworth includes a scanner (center of board), gages for monitoring the four engine/generator sets, recorders to show engine heat recovery and steam consumption for heating and cooling, and temperature indicators for outdoor air temperature and heating and cooling water.



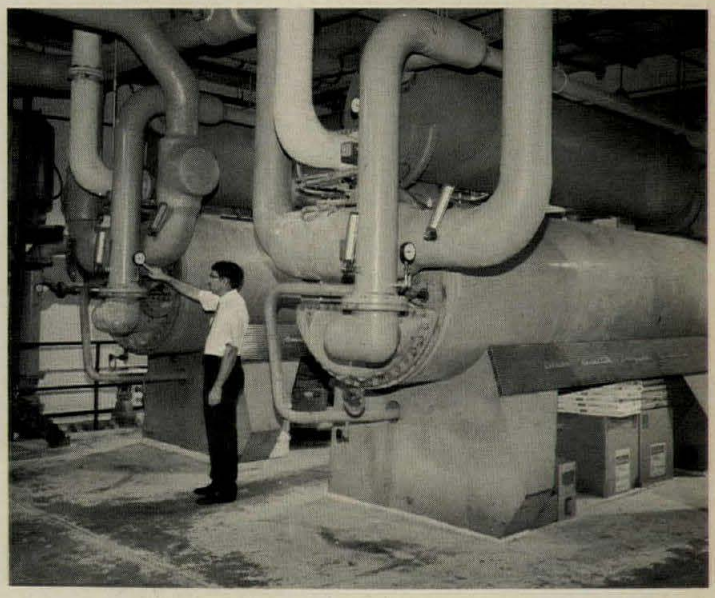
Main switchboard and generator control board for Kenilworth. Engine/generators are automatically paralleled.

Main distribution panel, with pull-out type switches serving various sections of the 246-unit apartment project at Kenilworth.



Two gas-fired steam boilers provide extra steam for the hot and cold weather. The boilers are behind glass because of negative pressure in the equipment room due to large amounts of ventilation air.

Two absorption refrigeration units provide chilled water for cooling the apartments. Total capacity is 525 tons of refrigeration.



to heating in about 15 minutes. An outdoor thermostatic sensing device actuates the cooling cycle when the temperature reaches 72F, and the heating cycle when the outdoor temperature drops to 65F. Design temperatures in the area are —10F in winter and 100F and 78F wb in summer outdoors, and 76F db and 64F wb indoors.

Each apartment is equipped with an air-handling unit installed in the basement. Most units are rated at 800 cfm; there are some 1,200 and 1,600 cfm units in the larger apartments. Air supply to the first floor is through ducts and outlets on the floor level at the perimeter, with returns high on the inside walls. For structural reasons, air supply on the second floor is from internal walls, with returns via the perimeter.

An interesting feature is the fact that the cooling towers, for esthetic reasons, are installed in the engine room; 200,000 cfm of air circulates through filters to the towers, with intake at ground level in front of the clubhouse, and exhaust through a slot in the roof, which runs the full length of the building.

An additional 30,000 cfm of outside air is circulated over the engines and an evaporative cooler, which supplies the carburetor intake of the engines with air at a temperature of 80F to 90F. Exhaust is through the cooling tower.

Because of the strong negative air pressure in the engine room, boilers are screened off behind a glass partition so as not to affect the burner operation. There is an air supply to the boiler room, with a balance exhaust.

Total electric load of the equipment room at peak operation is about 200 kw, including 50 kw for the cooling tower blowers. The clubhouse load is 45 kw.

All critical pumps and controls are in duplicate to prevent a breakdown, including pneumatic controls, compressors, boiler feed pumps, circulating pumps, and an excess steam condensor pump.

Georgetown Apartments

This Kansas City development has total energy and air conditioning system that is designed along the same lines as that at the Kenilworth Apartments. The 225 dwelling units currently completed have an average size of 950 sq ft. One hundred and sixty new apartments are being added. Architects were Linscott, Kiery & Haylett.

In the engine room below the clubhouse are two 450-kw natural gas engine/generator sets and one 225-kw set. A fourth set—also of 450-kw generating capacity—will be installed when the development is enlarged to 385 units.

There currently are two absorption machines—125 tons and 250 tons; another 250-ton unit will be installed later. About six pounds of steam are recovered per kw generated through the vapor phase system.

There are two natural gas boilers: one with a rated input of 6,925,000 Btu/hr input and a production of 6,886 lbs of low pressure steam. A third boiler will be installed later. Cooling towers are installed outdoors behind a brick lattice wall adjacent to the clubhouse.

The two-pipe system, air-handling units in the apartments, pneumatic controls, and other equipment are all comparable to that in the Kenilworth apartments.

Both clubhouses—for the Kenilworth and the Georgetown clubs—have 20-ton compressor-type air-conditioning systems for operation when the clubhouses need cooling while the central systems are on the heating cycle.

King's Cove

Eventually there will be 270 apartments in the King's Cove development, designed by architects Elswood, Smith & Carlson.

There are presently two 250-kw gas engine/generator sets, 480 volts, 60-cycle, with a third set planned for the future. There is one 188-ton absorption machine, and another machine will be added later.

The vapor-phase heat-recovery system produces about 4 to 5 lbs of 12 psi steam per kw generated. Additional steam is produced by a natural gas boiler, rated at 5,538,000 Btu/hr input and producing a maximum of 4,554 lbs of 15 psi steam. A second boiler is planned to produce 5,693 pounds of steam per hour.

There is a two-pipe system, with air-handling units in closets in the apartment, rather than in basement. Air supply is via the perimeter on the first floor and from high wall outlets in the second floor, with central return in both cases.

Total electric load at King's Cove is considerably lower than at Kenilworth and Georgetown—about 1.2 kw per apartment. There are several reasons for this: the apartments are smaller, an average about 860 sq ft; ranges are gas rather than electric; outside lighting is by gas rather than electric, and each apartment has a gas hot water boiler instead of being supplied with hot water from the central system.

A consulting engineer's lighting laboratory

As lighting design has grown more complex in terms of both its esthetic and functional aspects, the need has arisen for better ways to predict end results. The response of New York consulting engineers Syska & Hennessy is the establishment of their own lighting laboratory as an aid to their designers and specifications writers, and to their clients.

Perhaps the most demonstrable value of the laboratory so far is its use to build mock-ups of spaces in buildings under design. (One example is shown in the top photo.) Here Syska & Hennessy and their architectural clients can check room appearance, lighting levels and certain details of lighting fixture design such as ceiling recesses, flanges, etc.

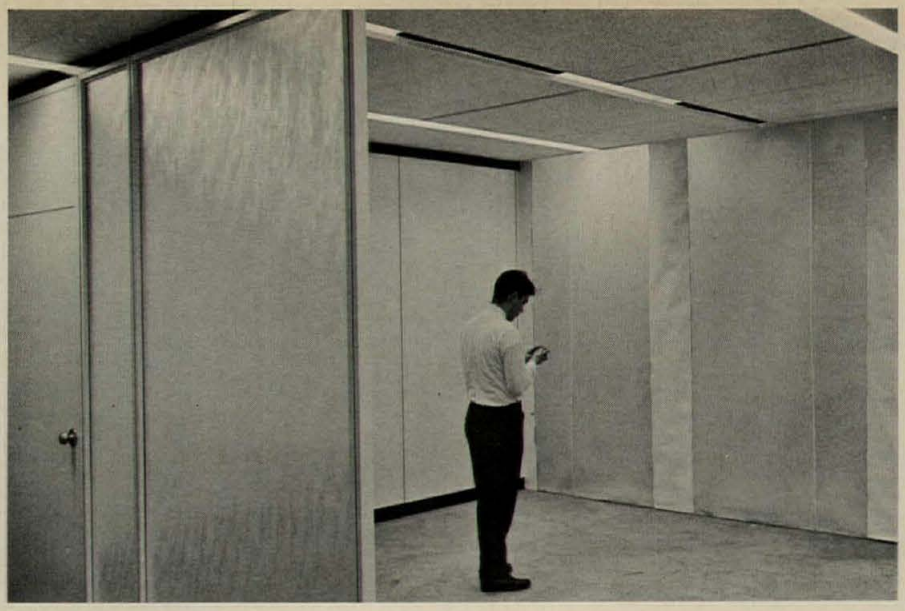
The laboratory has a total of 1,750 sq ft of space of which one-third is office and conference area, and the remaining two-thirds is work area for mock-ups and storage for samples of lighting fixtures and accessories.

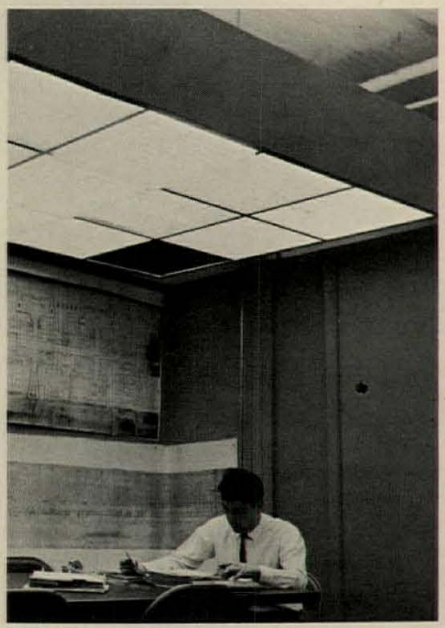
The working area can accommodate up to six mock-ups simultaneously, and the 12-ft ceiling permits architectural conditions to be duplicated. The ceiling has a grid of lightweight steel channels for suspending fixtures and ceiling materials and for erecting walls. The grid has electrified tracks for plugging in fixtures.

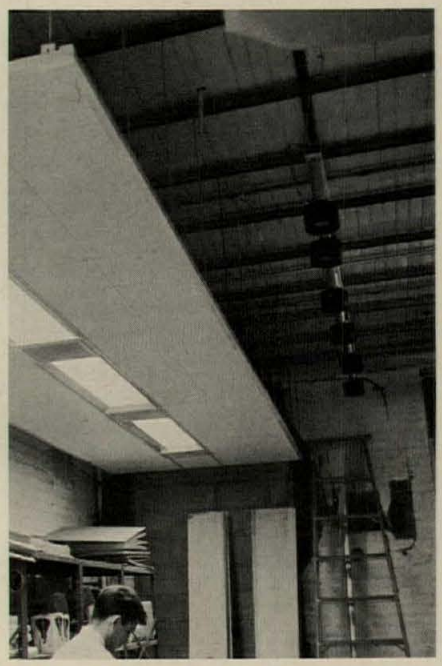
Short of constructing mock-ups to approximate fairly closely the appearances of spaces as to scale, color, ceiling arrangement, etc., sections of ceilings, or just the fixtures themselves can be hung from the ceiling grid to aid the architect's visualization of lighting fixture operation, performance, lighting effect achieved and installed appearance.

The conference area has a suspended luminous ceiling with a large variety of diffusing devices installed to demonstrate how various lighting equipment compares in regard to reflected glare, visual comfort, architectural appearance and efficiency. The ceiling is varied by: (1) exchanging louvers, lenses and diffusers; (2) varying the selection of fluorescent lamps; and (3) raising and lowering the ceiling.

In addition to designing and building mock-ups, the laboratory staff, under the supervision of Jules Horton, develops special lighting equipment; designs lighting systems for architectural projects; checks calculations; checks specifications and shop drawings; maintains a collection of lighting equipment for demonstration purposes and a file of technical literature and slides.







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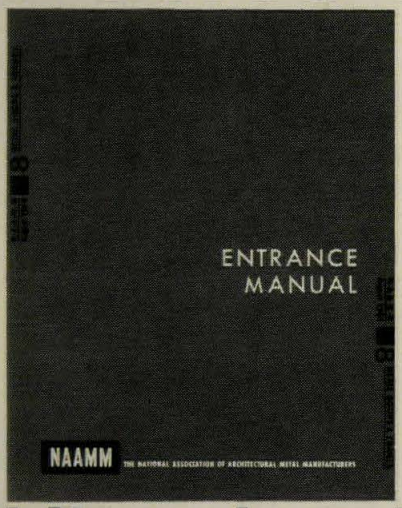

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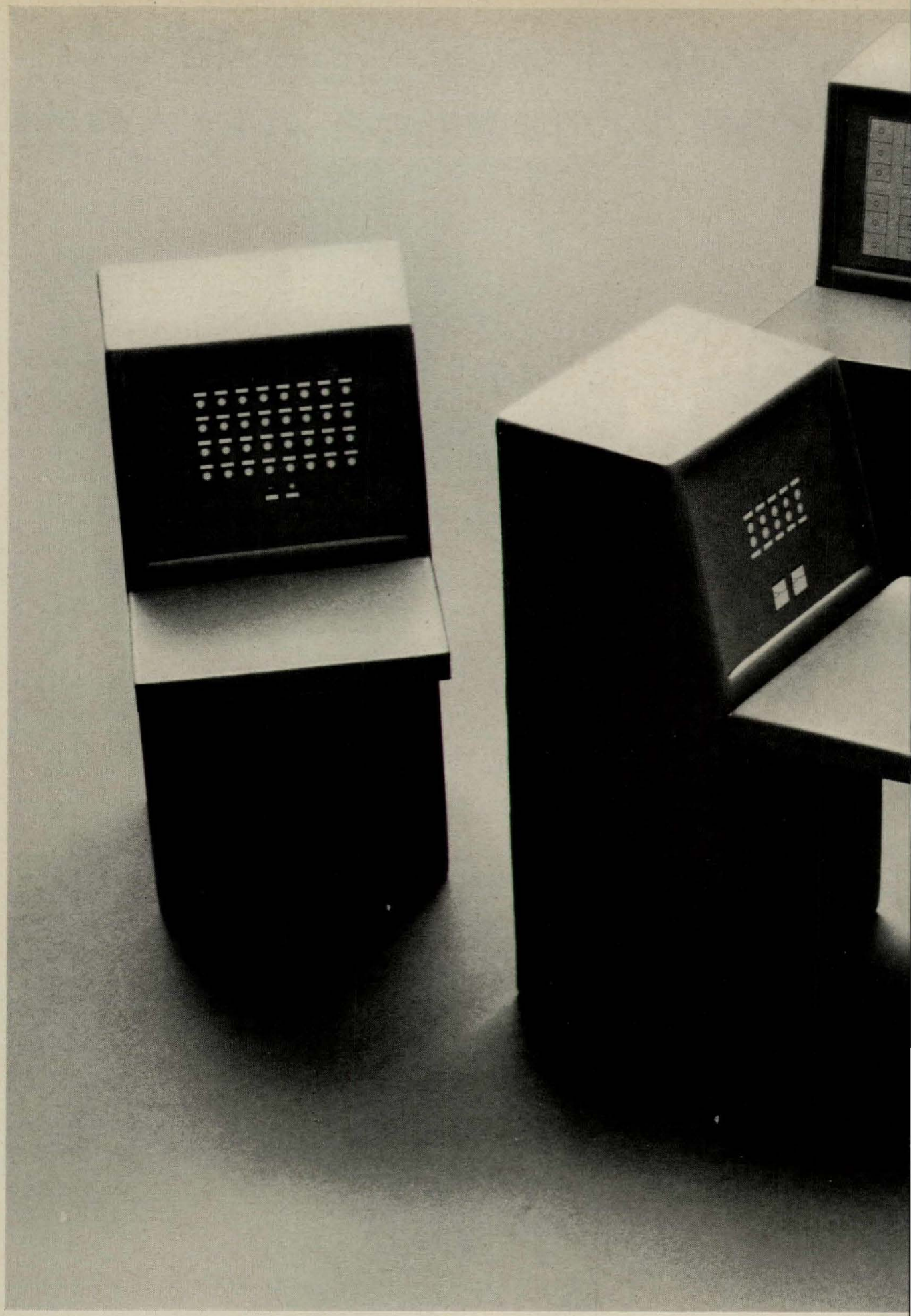

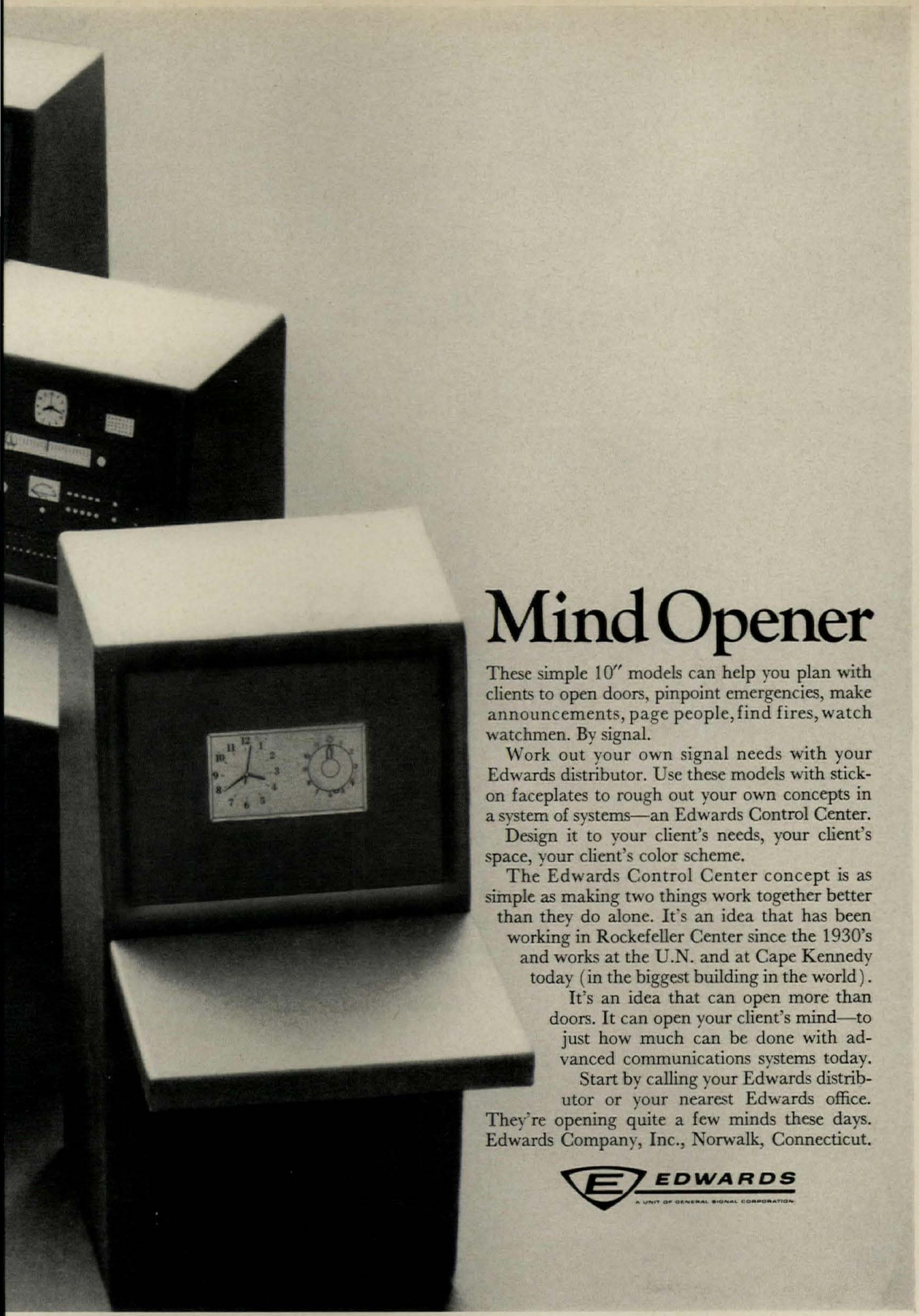

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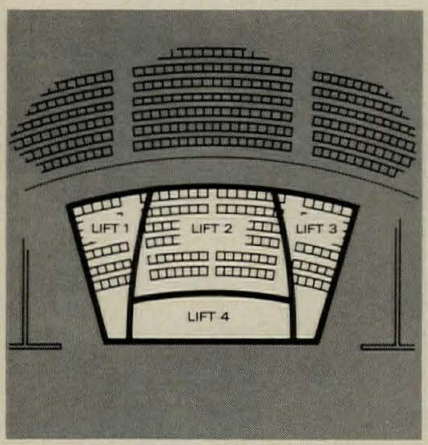
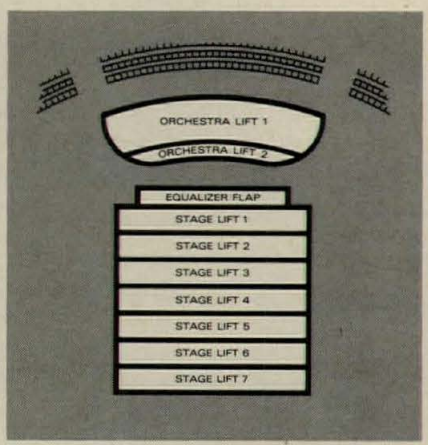
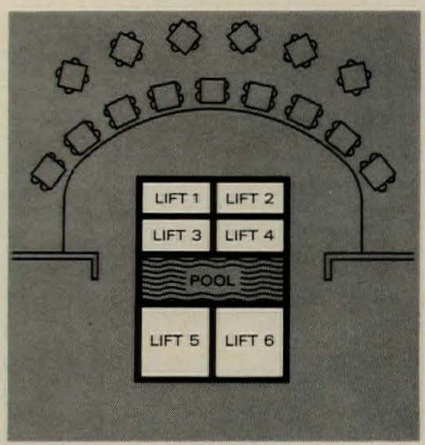


Loeb Drama Center, Harvard University—Four Dover Stage Lifts are used to create a theatre that easily converts for three different kinds of staging.



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.

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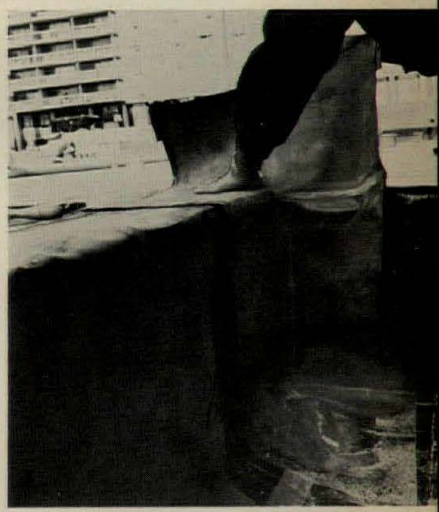
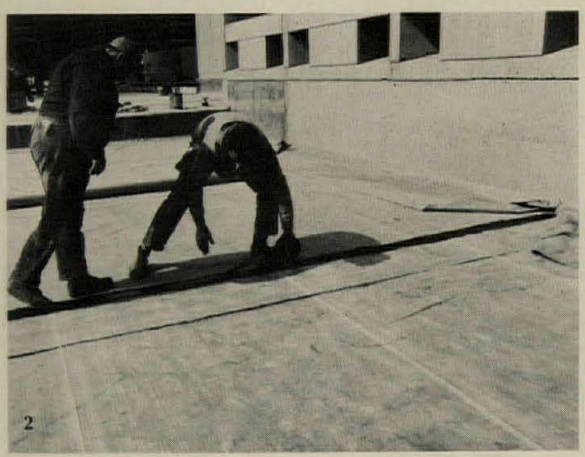
Roof of underground garage for Village Towers apartments by I. M. Pei & Partners was waterproofed entirely by butyl rubber membrane. Sheets were not adhered to the slab, but were made into a continuous membrane by using overlapping seams. **1.** Rolling top sheet back onto adhesive layer of bottom sheet. **2.** Seam is coated with adhesive and joint completed by covering with butyl tape. **3.** Prefabricated rubber flashing was used at inside and outside corners. **4.** The membrane was terminated at building walls with the main sheet serving as flashing. Sheet is held in reglet with steel wool; opening is caulked with butyl.

Richard Tran photos





Leak-free roof for underground garage

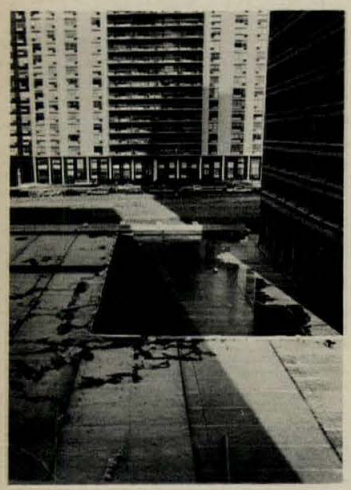
By K. A. Gruber, Carlisle Tire & Rubber Division, Carlisle Corporation

New materials and techniques are now being used to waterproof the roofs of such underground facilities as parking garages. The traditional built-up membrane system is being used less because tremendous areas are often involved and thermal expansion and contraction have potentially damaging effects. A case in point of the new approach is the garage directly under a 56,000-sq-ft park and plaza area for Village Towers apartments designed by I. M. Pei & Partners. The waterproofing installation is a butyl rubber membrane over a waffle slab roof deck, the surface being characterized by a number of different levels and sharp drop-offs, and projections such as exposed beams, piping and wiring.

The waterproofing system had to assure effective long-term performance under lawns, trees, sidewalks and cobblestone paving. The butyl membrane was specified on the basis of: (1) its ability to follow structural movements and expand and shrink without damage; (2) its tear and abrasion resistance, which allows it to withstand the construction traffic and operations before the membrane had been protected with an inch layer of concrete; (3) its immunity to damage by soil and agricultural chemicals, bacteria and aging; (4) and, of course, its excellent water impermeability. Tight specifications were written for splicing adjacent sheets of membrane, termination of the membrane at all points, flashing and corner details, and inspection and testing procedures.

The waterproofing contractor Wolkow-Braker Roofing Corporation, Brooklyn, estimated that the single-ply membrane installation required half as many man-hours as a conventional built-up roofing system. Rolls of the butyl rubber sheeting were factory-cut to predetermined dimensions to minimize waste. The membrane, 1/16 in. thick, was supplied in widths from 6 to 20 ft, and in lengths up to 94 ft. The installation was planned so that the widest membrane would be used wherever possible to minimize the amount of splicing.

The main waterproofing membrane serves as flashing for pipe penetrations such as the one in the photos, right: **5.** First, a hole is cut in the membrane and adhesive is applied to the underside around the hole. The pipe is coated with adhesive and butyl tape. **6.** The membrane is folded back over the pipe and pulled up around it. **7.** The membrane is rolled to assure good adhesion. **8.** Finally, the membrane flashing is coated with adhesive and butyl tape is wrapped around it. After the membrane waterproofing was completed, it was checked by damming test areas with felt and lumber to hold 3 in. of water.




5


7


6


8

The membrane was applied to the reinforced concrete deck without a bond. At all vertical surfaces, however, a special adhesive was required to assure contact between membrane and wall.

Wherever possible, the membrane was terminated at the building walls with the main sheet serving as flashing. The sheet was first bonded to the wall, then terminated in a reglet, where it was fastened with lead wool. The exposed portion of the reglet was then filled with butyl rubber caulking.

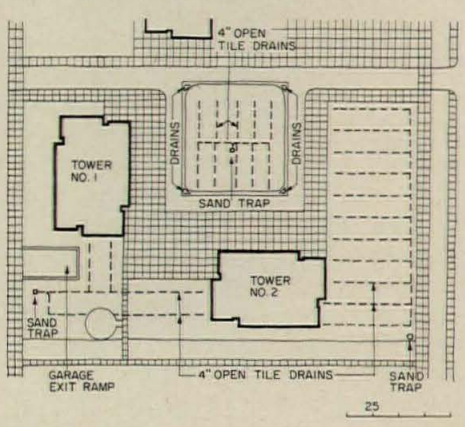
Where use of the main sheet was impossible for flashing walls, this was done by splicing sections of membrane to the over-all sheet, then the flashing was terminated at the reglets.

It was also necessary to line the interior and exterior of a sump in the central planting area to prevent the escape of water to the underlying slab. This sump collects water from the drainage field and serves as a sand trap. The sump trap extends 20 in above and 4 ft below the bottom of the planting bed.

The plaza area is made up essentially of two surface types: (1) planting area consisting of a bed of gravel covered with earth fill; and (2) concrete and paved surfaces over the gravel. The tree-planting area, for example, contains a 4-in. bed of gravel over the substrate, covered with a 4-ft bed of earth fill. A ½-in. blanket of fiber glass was placed over the gravel to prevent migration of silt from blocking drainage. The entire area above the waterproofing membrane is drained through porous concrete pipe that delivers the water to the sand trap.

The membrane was placed in position simply by unrolling it onto the deck for its entire length and width. Adjacent sheets were then formed into a continuous membrane by a standard splicing procedure that has demonstrated high seam strength.

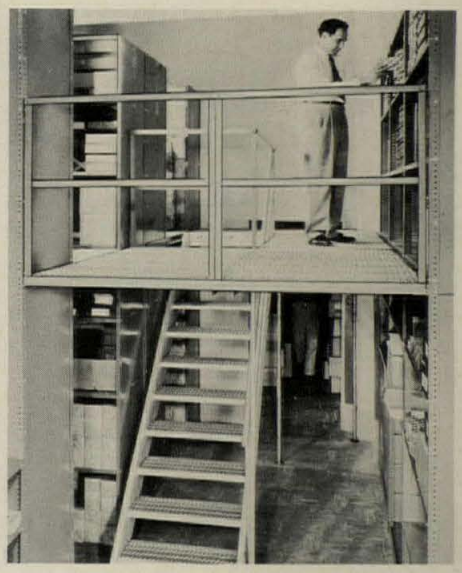
All joints were made through lap splicing. Adjacent sheets were first overlapped 3 in. The top sheet was folded back approximately 1 ft and the contacting surfaces of both the top and bottom sheets were coated with a special butyl cement. A strip of gum tape was then applied over the cement on the top sheet. The top sheet was folded back to form the overlap, and finally the exposed edge was covered with another layer of cement and butyl gum tape to complete the splice.



Installation of the membrane at corners, both inside and outside, was facilitated through the use of factory-fabricated corner pieces. Use of these preshaped sections is of particular importance where there are a great number of intersecting planes caused by different elevations.

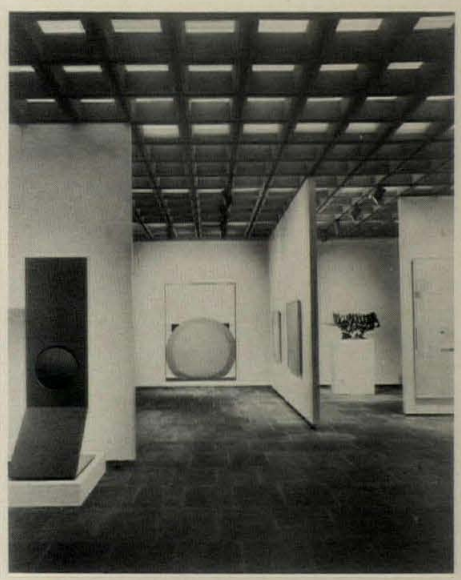
Because of the general layout of the rubber sheet, the membrane was rolled longitudinally over the exposed beams. The membrane was then cut along the length of each beam and the sheet brought up along its sides. Adhesive was applied to the top and vertical surfaces of each beam to hold the membrane in place. Application of flashing, applied to the top of the beam and then spliced to the main membrane, provided positive covering of the exposed section of the beam.

For more information circle selected item numbers on Reader Service Inquiry Card, pages 255-256



MEZZANINE SHELVING / These double-deck shelving units can be stacked for extra storage space without increasing floor space. Vertical splice connectors attach mid sections of the shelves to support catwalk flooring. Access to the elevated storage level is by especially designed stairways. ▪ Bernard Franklin Company, Philadelphia.

Circle 300 on inquiry card



MUSEUM INTERIORS / Marcel Breuer designed these portable gallery walls for three floors of the new Whitney Museum of American Art. The system is based on a 2-foot modular concept and features floor-to-ceiling *Novoply* particle-board panels with aluminum honeycomb cores. Panels are wedged between a heavy, concrete grid ceiling and rough, bluestone flooring. A variety of rectilinear space may be achieved—from no walls for an open floor plan exhibit to a 4-ft by 4-ft cubicle for display of a single work. A specially designed mechanical rig, operable by two men, transports and installs panels. ▪ U.S. Plywood Corporation, New York City.

Circle 301 on inquiry card

OFFICE AREAS / *Quik-Lok* shelving forms office working areas according to individual needs. The line includes standard and sloping shelving space, desk-size working surface, and storage areas with sliding doors. No bolting to walls or floors is required and walls can be easily adjusted to different shapes or moved to other areas. ▪ Aurora Steel Products Division, Hupp Corporation, Aurora, Ill.

Circle 302 on inquiry card

STUDY CARREL / This low-priced ($65 in volume) sturdy institutional unit is constructed of solid core modular units interlocked within an aluminum framework ▪ Uniline, Grand Rapids, Mich.

Circle 303 on inquiry card

PANELS / Architectural and decorator panels in several textures and colors, for outdoor and indoor applications can be mounted, drilled, or cut to desired shapes. Uses include area dividers, pool enclosures, cabinet doors, windows, suspended ceilings, skylights, and shoji screens. ▪ Leigh Products, Inc., Coopersville, Mich.

Circle 304 on inquiry card

FOLDING DOORS/Accordion folding doors and partitions with a tested acoustical rating of STC 38 and STC 25 have panels of laminated plastic. Five wood grains and three laminate patterns are available. Hinges connecting the panels are flame-resistant, extruded vinyl which, the maker says, can handle 950,000 flex cycles without wear or deterioration. ▪ Panelfold Doors, Inc., Hialeah, Fla.

Circle 305 on inquiry card

more products on page 176

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 255-256

FIRE PROTECTION STANDARDS / Three publications have been revised: "Standard for Fire Doors and Windows" (84 pages, $1.00); "Standard for the Installation of Sprinkler Systems" (188 pages, $1.00); and "Standard for the Installation of Air Conditioning and Ventilating Systems of Other Than Residence Type" (32 pages, $.60). ▪ National Fire Protection Association, 60 Batterymarch Street, Boston.

STANDARD MOULDING / A standard book for the softwood industry, entitled "WP Series Moulding Patterns," has been published by the Western Wood Products Association and the Southern Pine Association in cooperation with the Western Wood Moulding Producers. ▪ Western Wood Moulding Producers, Portland, Ore.

Circle 401 on inquiry card

DOORS / A 16-page booklet shows one hundred custom door styles, and suggests more. Says the manufacturer: "Whether it be primitive or modern, Victorian or Spanish Colonial, of wood, metal, or plastics, we will deliver what you wish." ▪ Architectural Specialties, Inc., San Francisco.

Circle 402 on inquiry card

ARCHITECTURAL POTTERY / A 53-page catalog and accompanying price list present sand urns, lanterns, umbrella holders, space dividers, sculpture, and fountains. ▪ Architectural Pottery, Los Angeles.

Circle 403 on inquiry card

PATTERNED CONCRETE MASONRY / A 16-page booklet suggests the many intricate shapes and designs possible with concrete screen block. The booklet pictures typical installations and discusses the properties of the block. ▪ National Concrete Masonry Association, Arlington, Va.

Circle 404 on inquiry card

DECORATIVE PANELS / Literature on *Decra-Guard* high density overlay decorative panels includes color illustrations of several woodgrain patterns available bonded to a variety of substrate materials, sizes and thicknesses. A file folder contains complete information on combinations of patterns, finishes and grades. There are performance data and test comparison tables. Send requests on letterhead. ▪ Simpson Timber Company, 2000 Washington Building, Seattle, Wash. 98101

HARDWOOD SCREENS / A 4-page color leaflet describes *Sculpturewood* screens for home, office and commercial applications. The leaflet shows the choice of patterns available in walnut, birch or poplar and notes that the screens, framed and finish-sanded, may be custom-finished. ▪ Penberthy Lumber Company, Los Angeles.

Circle 405 on inquiry card

STONE SCULPTURAL FACINGS / Two 4-page brochures on the complete *Stone Sculptural Facings Collection* and lightweight *Nova-Stone* wall-surfacing material include the recently introduced patterns by Perli Pelzig and Erwin Hauer, the Bjorn Wiiblad *Sun Wall Sculpture*, and the *Yucatan and Taniko Collections*. The brochures contain photographs of actual exterior and interior installations along with complete information on the stone. ▪ Arts for Architecture, Inc., Garden City Park, New York.

Circle 406 on inquiry card

STEEL DOOR AND FRAME / A 32-page illustrated catalog details steel door and frame lines. The catalog also includes a steel-frame selector guide, a frame anchoring system, and sections on hardware adaptability, transoms, and side lights. ▪ Amweld Building Products, Niles, Ohio.

Circle 407 on inquiry card

FOOD PREPARATION AND SERVING / A catalog lists over one hundred models of stainless steel and galvanized scullery sinks, and stainless steel dish and utility carts, plus a newly designed line of plastic laminate. ▪ Amtekco Industries, Inc., Columbus, Ohio.

Circle 408 on inquiry card

PARTITION SYSTEMS / A 40-page manual covers different kinds of non-load bearing plaster partition systems and various types of metal lath/accessories. Illustrations include photographs and detailed engineering drawings. There are fire resistance ratings and sound insulating data. ▪ Wheeling Corrugating Company, Wheeling, W. Va.*

Circle 409 on inquiry card

LAMINATED WOOD BEAMS / "Your Dollar's Worth of School Building" is a 16-page color brochure that shows typical classrooms, libraries, gymnasiums, cafeterias, auditoriums, and dining rooms built with laminated wood beams. Information on the complete line of beams and trusses and data on decking systems are also included. ▪ Portland, Oregon.

Circle 410 on inquiry card

LAMINATED MEMBERS / An 8-page illustrated booklet on standards for structural glued laminated members of Douglas fir and larch covers standards being followed by Western laminators. Tables cover strength levels most commonly used. ▪ Western Wood Products Association, Portland, Ore.

Circle 411 on inquiry card

INDUSTRIAL INSULATIONS / A 20-page brochure gives technical and application data on fiberglass industrial insulations. The brochure includes information about thermal and acoustical blanket insulations, insulation board, pipe insulation, and specialized fiberglass products. ▪ Gustin-Bacon Manufacturing Company, Kansas City, Mo.*

Circle 412 on inquiry card

GLAZE SYSTEMS / A 24-page catalog contains a simplified index for specifying specialized coating systems for interior or exterior walls, floors, and ceilings. Color photos showing finished applications are keyed to an index that describes the product and its uses. ▪ Cota Industries, Des Moines, Iowa.*

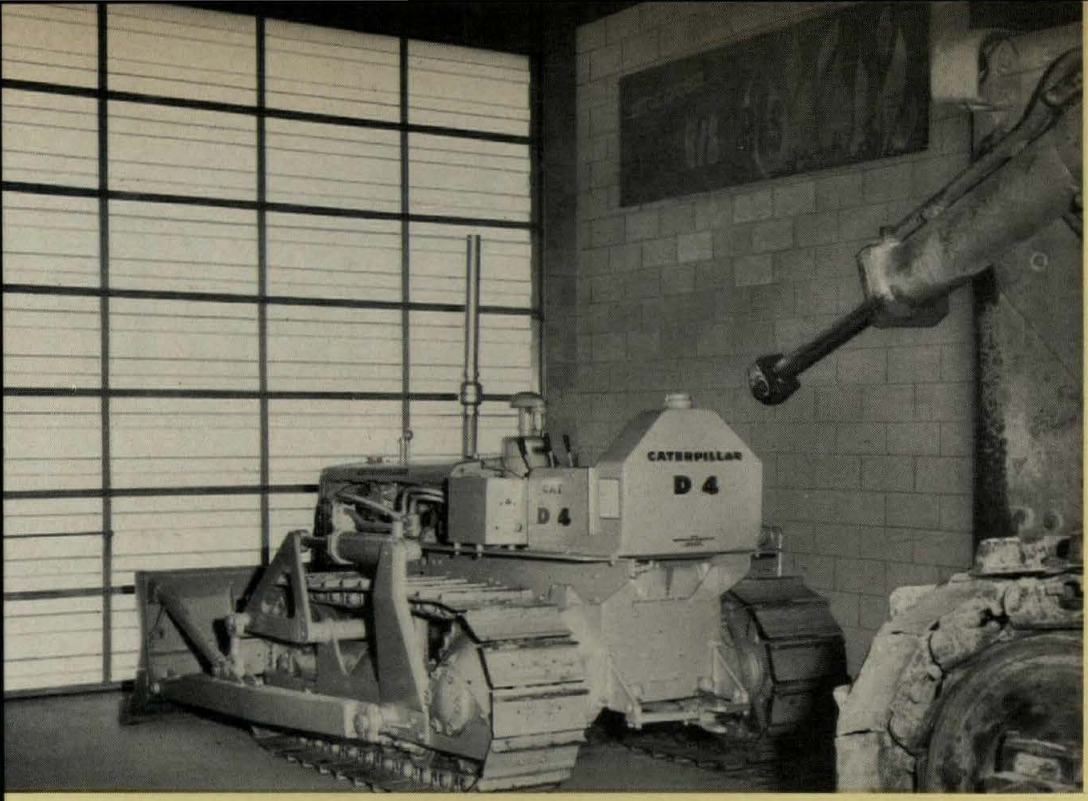
Circle 413 on inquiry card

DIRECTORIES AND LETTERS / In addition to a variety of building directories and letters, a 52-page booklet contains a miscellany of useful items: bulletins, trophy cases, crosses, tablets, plaques, emblems, flagpoles and art metals. ▪ Nelson-Harkins Industries, Chicago.

Circle 414 on inquiry card

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

more literature on page 223



Crawford Marvel-Lucent Fiber-glass Doors glide smoothly aloft on high-lift tracks to clear the cranes which operate in each service bay. The large, (224 sq. ft.) Marvel-Lucent door areas provide excellent light for working by transmitting up to 60% of outside daylight and diffusing it well back, into the service bays.

EXCELLENT NATURAL LIGHT A BONUS IN THIS MODEL SERVICE CENTER WITH CRAWFORD MARVEL-LUCENT DOORS

Taking advantage of the translucent character of Crawford Marvel-Lucent Fiber-glass Doors and the ability of this new white fiber-glass to transmit up to 60% of outside daylight, Michigan Tractor and Machinery Company has captured an important bonus in the form of excellent natural light in the work bays of the model Service Center in its new plant at Novi, Michigan.

The building which houses the Service Center is laid out in the form of the letter H with the "quick" Service Center forming the middle section or cross-bar of the H and connecting the front wing with the rear wing. This cross-bar is 150-ft. long, 125-ft. wide and 21-ft. 6-in. high. It covers six bays, each with its own pair of overhead cranes operating from the ends and giving great flexibility in handling the heavy bulky components in big, earth-moving units.

The bays run from south to north and at each end of each bay, a Crawford Marvel-Lucent door gives access and light. In each bank four doors are 16-ft. wide by 14-ft. high and two, for smaller equipment, are 14-ft. wide by 14-ft. high. All are operated by chain hoists, the doors being so light (one-quarter the weight of wood, for example) that no electric operators are needed.

Daylight transmitted by these doors reaches away back into the bays and not only supplements the light from ceiling fixtures above the craneways but creates a pleasant, exceptionally well-lighted working area which could hardly be achieved in any other way.

The front wing of the building is equipped with three large Crawford Wood Industrial Doors. All are operated by Crawford Model CJ Jackshaft Type Electric Operators with control by push-button inside the doors and in two remote locations.

In the rear wing there are seven more large Crawford Wood Industrial Doors—operated by Crawford Model CJ Jackshaft Type Electric Operators.

Crawford Marvel-Lucent Doors are made with a new formulation of fiber-glass resin which is unaffected by ultra-violet rays and which develops a finish so hard that it is practically unaffected by chemical factors, and by wind-driven rain and grit, traditional enemies of fiber-glass. Because of this new development in resins, this door is warranted for 20 years and is the only fiber-glass door so warranted.

For information on this and other notable features of this new door, write for Bulletin C D-3681.

CRAWFORD DOOR CO. *Subsidiary of JIM WALTER CORPORATION*
4270-30 High Street • Ecorse, Mich. 48229

WORKS LIKE MAGIC

For more data, circle 66 on inquiry card

Five of the 12 Crawford Marvel-Lucent Fiber-glass Doors in Michigan Tractor and Machinery Company's model Service Center in Novi, Mich. They are mounted on the north and south ends of service bays to diffuse natural daylight into working areas and supplement artificial lighting. Left: Three of the 10 Crawford Industrial Doors and Operators installed in other parts of the Service Center.

Want the most from electric heat? Consider Styrofoam.

That's because an installation system using Styrofoam® brand insulation board doesn't make demands on floor space the way other insulations do. The combination of properties offered by Styrofoam makes it unusually effective. So much so that you get more permanent insulation value per square inch, and get a maximum of usable floor space, too.

How else is Styrofoam good for electric heat? Once in, Styrofoam is in for good because it doesn't rot, mold, or deteriorate. It needs no vapor barrier. It's flame retardant. And is lightweight and easy to install.

Where does Styrofoam insulation go? Just about anywhere. Over walls of unit masonry or poured concrete, as form liners for conventional concrete, in foundations and slabs. And it makes an excellent base for gypsum wallboard, wood paneling or plaster.

Have we almost made a sale? Then to clinch it, write us or consult Sweet's Architectural File 10a/Do. The Dow Chemical Company, Plastics Sales Department, Midland, Michigan 48640.

Styrofoam is Dow's registered trademark for expanded polystyrene produced by an exclusive manufacturing process. Accept no substitutes... look for this trademark on all Styrofoam brand insulation board.

DOW

(It's the least you can do.)

Holophane's Round PAL– a recessed incandescent luminaire that's crisply styled where you see it...

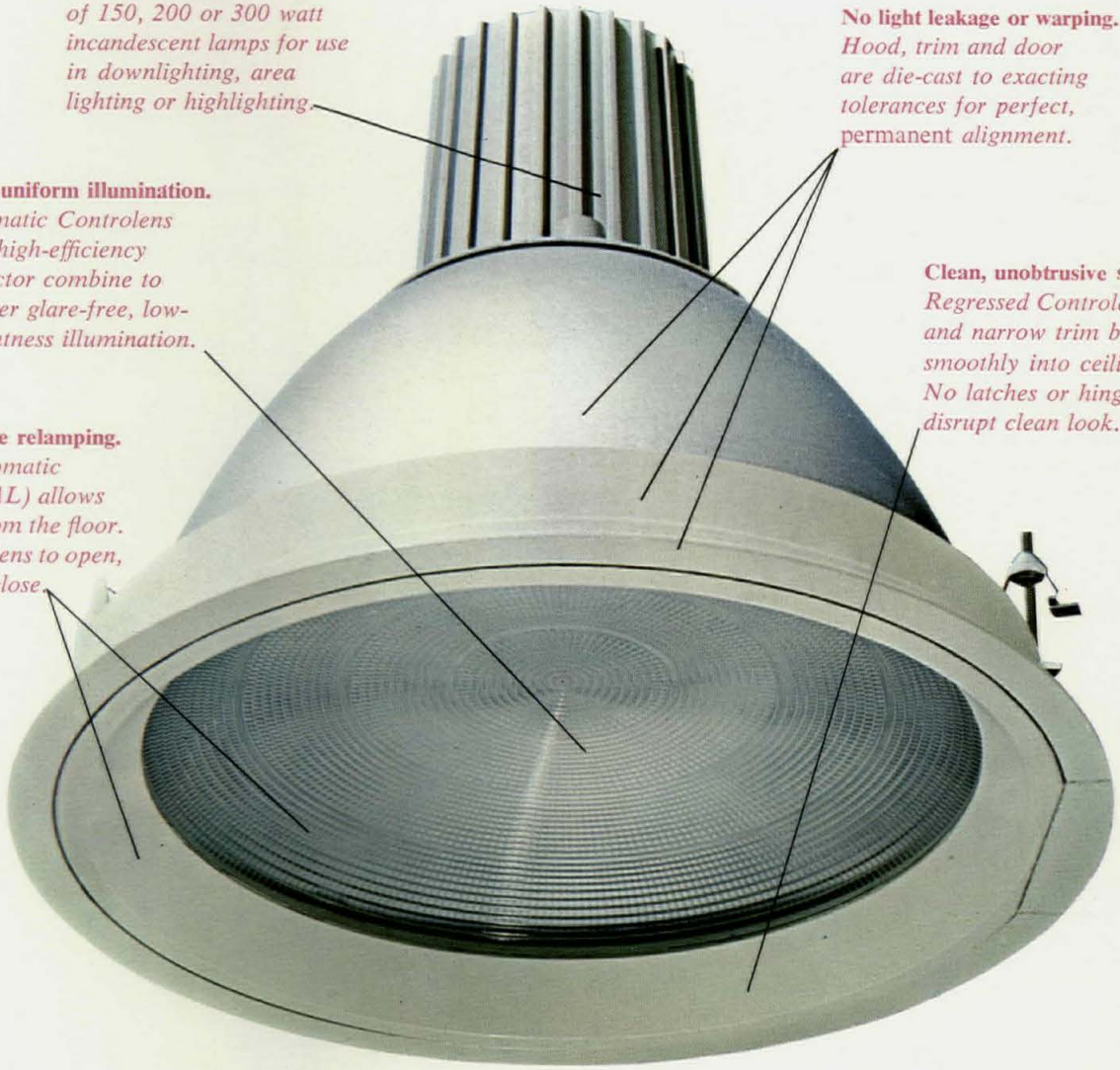
Versatility. *Adjustable collar permits choice of 150, 200 or 300 watt incandescent lamps for use in downlighting, area lighting or highlighting.*

Soft, uniform illumination. *Prismatic Controlens and high-efficiency reflector combine to deliver glare-free, low-brightness illumination.*

Rapid and safe relamping. *Positive Automatic Latching (PAL) allows relamping from the floor. Simply push lens to open, push trim to close.*

No light leakage or warping. *Hood, trim and door are die-cast to exacting tolerances for perfect,* permanent *alignment.*

Clean, unobtrusive styling. *Regressed Controlens® and narrow trim blend smoothly into ceiling. No latches or hinges disrupt clean look.*



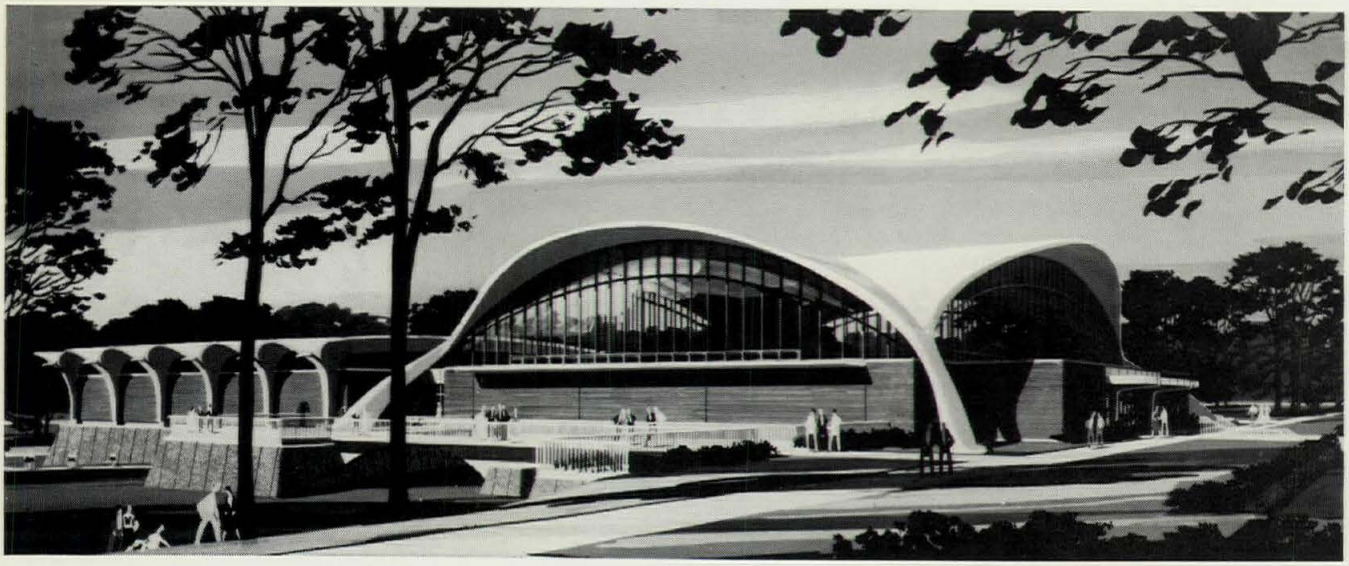
superbly engineered where you don't.

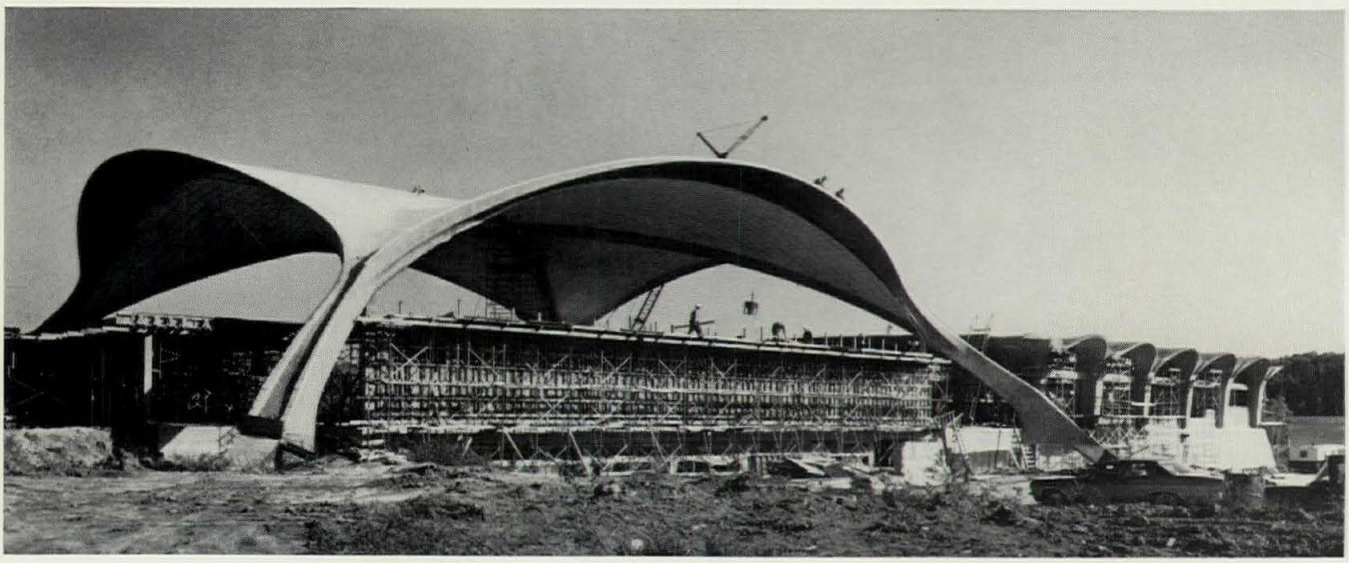
Holophane's new Round PAL. *Specify* Round PAL® for stores, banks, lobbies, restaurants, auditoriums, terminals and supermarkets. *Write* for a comprehensive brochure which includes electrical, mechanical and photometric data. Dept. H-12, Holophane, Company Inc., 1120 Ave. of the Americas, New York, N. Y. 10036

Round PAL by

HOLOPHANE

Concrete Reflects An Educational Concept





The Leisure and Creative Arts Center is the architectural highlight of the 14 buildings on the all-new campus of George Williams College. Great curving corner ribs, tied together underground with concrete encased post-tensioned tendons of steel, carry the two intersecting concrete barrel vaults for the gymnasium roof. Studios for painting, sculpture, photography and dance are beneath the gymnasium. Post-tensioned concrete ribs, 117′ long, support the concrete vaults over the natatorium. Both gymnasium and natatorium have unobstructed floor areas of 112′ x 112′ under the 4″ thick concrete roofs.

George Williams College is devoted to training leaders for youth groups, community agencies and humanitarian organizations throughout the world. This concept places emphasis on active student participation in many creative areas.

Imaginative design, with a free-form concrete motif, reflects the creativity of the activities to be housed in the Leisure and Creative Arts Center, featured here. This beautiful new structure has combined facilities for gymnastics, swimming and other sports as well as for painting, sculpture, photography and dance.

Here, as in many new trend-setting designs, the fine quality, ready mixed concrete was made with Lehigh Cement. Lehigh Portland Cement Company, Allentown, Pa.

Owner: George Williams College, Downers Grove, Ill.
Architects: Mittelbusher & Tourtelot, Chicago, Ill.
Wilson Connell, Jr., Partner-in-charge
Structural Engineer: John R. Gullaksen, Chicago, Ill.
Consultant: Dr. William Schnobrich, Urbana, Ill.
General Contractor: Turner Construction Company, Chicago, Ill.
Ready Mixed Concrete: E. A. Keller Co., La Grange, Ill.

LEHIGH CEMENTS

This could change your thinking from the ground up!

Ozite® Town 'N' Terrace Carpet made with Vectra® fiber proved attractive and durable on walkways, balconies, patios, porches, in kitchens, hospitals, offices, restaurants . . . with over 10 million yards in use! Where would you use it?

Use your imagination! Ozite Town 'N' Terrace Carpet has passed the test of time, with over 3 years of use in thousands of installations across the country. Snow, rain and hail won't hurt it. Resists mildew and fading. Won't rot...ever. Amazing Vectra fiber resists staining from food and drink...like mustard, ketchup, tea and coffee. Even household chemicals like bleach, ammonia and peroxide wipe clean quickly.

Use Ozite Town 'N' Terrace Carpet in kitchens and restaurants to add comfort, reduce noise, cut dish breakage. Put it in recreation rooms and bathrooms to give warmth, end floor scrubbing and waxing. Use it in new dramatic ways outdoors...on patios, walkways, balconies. Starting to get ideas? Read about the technical advantages of Town 'N' Terrace on the back, then mail coupon for full details.

Good Housekeeping GUARANTEES PRODUCT OR PERFORMANCE DEFECTIVE REPLACEMENT OR REFUND TO CONSUMER

As advertised in LIFE magazine

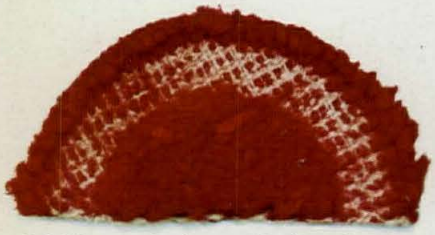
Available in 16 decorator colors

Ozite® TOWN 'N' TERRACE CARPET made with **Vectra®** OLEFIN FIBER

® Ozite is the exclusive trademark of the Ozite Corporation.

® Vectra is the registered trademark of the Vectra Company, a division of National Plastic Products Company, Inc., for its olefin fiber. Vectra makes fiber only, not carpets.

Tests prove the superiority of Ozite Town 'N' Terrace Carpet made with Vectra® fiber over floor covering costing twice as much!



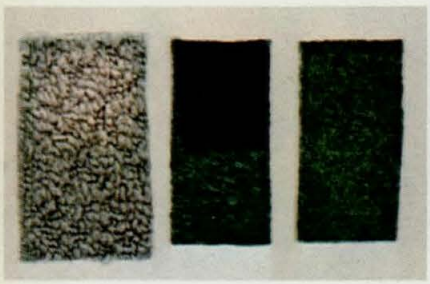
3,000 revolutions of abrasion test have $11.95 retail acrylic carpet down to the backing!

But, the abrasion wheel (Standard Taber Abraser), which can quickly spin off years of hard wear, barely makes a dent in new Ozite Town 'N' Terrace Carpet made with remarkable new Vectra polypropylene olefin fiber. Ozite's unique manufacturing method permits the use of staple fiber of higher tensile strength than normally used in regular carpeting.

Fadeometer Test

Wool 100 hours

Acrylic 160 hours



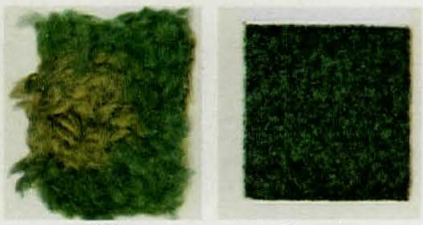
Nylon 100 hours

Polypropylene without stabilizers 216 hours

Polypropylene with stabilizers Over 2,000 hours

Most manufacturers of piece-dyed carpets try for 40 to 60 hours fade resistance. Even stock-dyed carpets strain to reach 200 hours. The special stabilizing chemicals used in the solution-dyed Vectra fiber enables it to resist ultra-violet rays —and permits Ozite to guarantee its carpet to withstand 500 hours of Fadeometer test without discoloration!

Stain Resistance

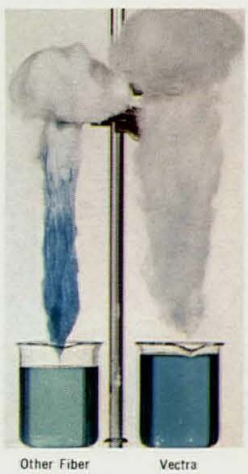


Wool **Polypropylene**

Vectra polypropylene fiber is resistant to most harmful chemicals that tend to bleach and stain competitive products, including most acids, alkalies, salts, solvents, and oxidizing agents. Ozite Town 'N' Terrace Carpet resists spotting and bleaching from ammonia, chlorine, coffee, tea, soft drinks, shoe polish, merthiolate, mustard, catsup—practically everything, including the accidents of dogs and children. Insects and mildew do not attack polypropylene. Fungus growth is not supported by the fiber itself, won't shrink, rot, or mildew. And it's virtually non-static. Non-allergenic, too.

Competitive carpet fibers absorb moisture to varying degrees, up to 27%.

A filament of Vectra reacts to water much like a solid glass rod. The water rolls right off. Vectra olefin fiber has zero (0%) moisture regain.



Other Fiber Vectra

Easy to install. Cuts with scissors or knife. Lies flat. Doesn't curl. No binding of exposed edges necessary. Does not need carpet cushion, tacking, or professional installation. However, if desired, it may be installed the same as conventional carpet. It is recommended that in most instances Ozite carpet be installed without permanent or semi-permanent adherence. Where it is desirable to adhere the carpet, the following methods of installation are recommended. Double faced tape or Ozite AP 400 waterproof adhesive may be used both indoors and outdoors.

And it's a breeze to maintain! Can actually be hosed clean. Simple to patch. Because Vectra fiber is impervious to moisture it can either be scrubbed clean or vacuumed. It dries fast. And patching for cigarette burns (can happen to any carpet, you know) is easily done in minutes with a razor blade and leftover pieces—and it won't show!

Installation and maintenance manual available on request.

Every claim guaranteed by the Ozite Corporation.

Write today for full information.

OZITE CORPORATION
Department AR
7-120 Merchandise Mart
Chicago, Illinois 60654

Please send me your 4-page color brochure with complete details on new Ozite "Town 'N' Terrace" Carpet, plus sample swatches of the carpet.

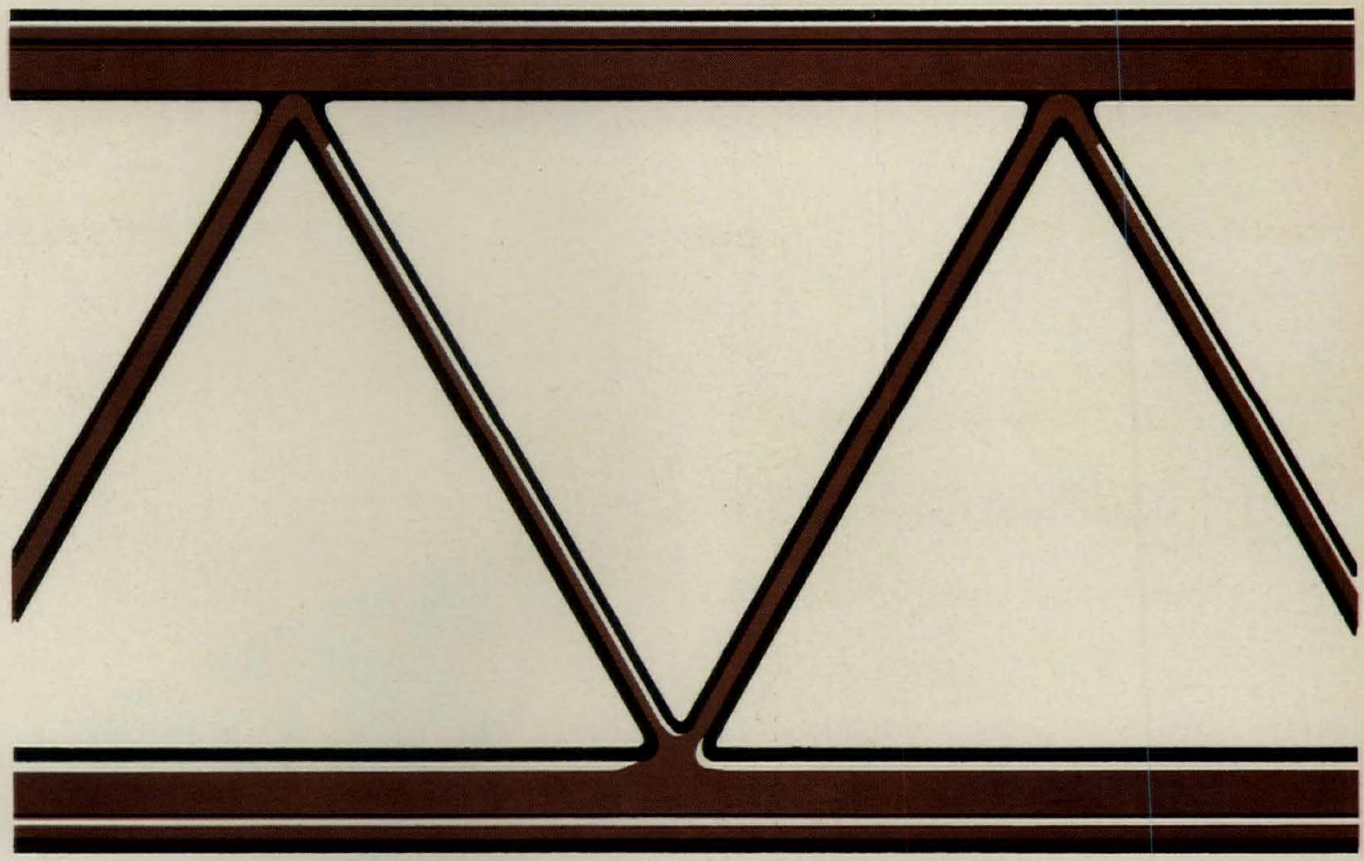
Name _____

Firm _____

Address _____

City _____

State _____ Zipcode _____



It's tough to find a better primer than the one we use for Sheffield Steel Joists

Any other primer you specify would cost you more, too. The red oxide primer applied on Sheffield Steel Joists was especially formulated to meet Federal Specification TT-P-636 c. Considering both economy and efficiency, this time-proved red oxide primer is the best that can be provided. Then too, it is non-bleeding, which simplifies the application of a finish coat of paint.

This red oxide primer provides protection, at no additional cost, when you specify a shop coat of paint on Sheffield Steel Joists.

Demonstrating the value of this primer, a test was performed by an independent testing laboratory, with salt spray (under Federal Test Method Std. 141). After 200 hours exposure to a 20% salt spray the sample showed *"no apparent change."* This was one of four tests used to show the dependability of this paint.

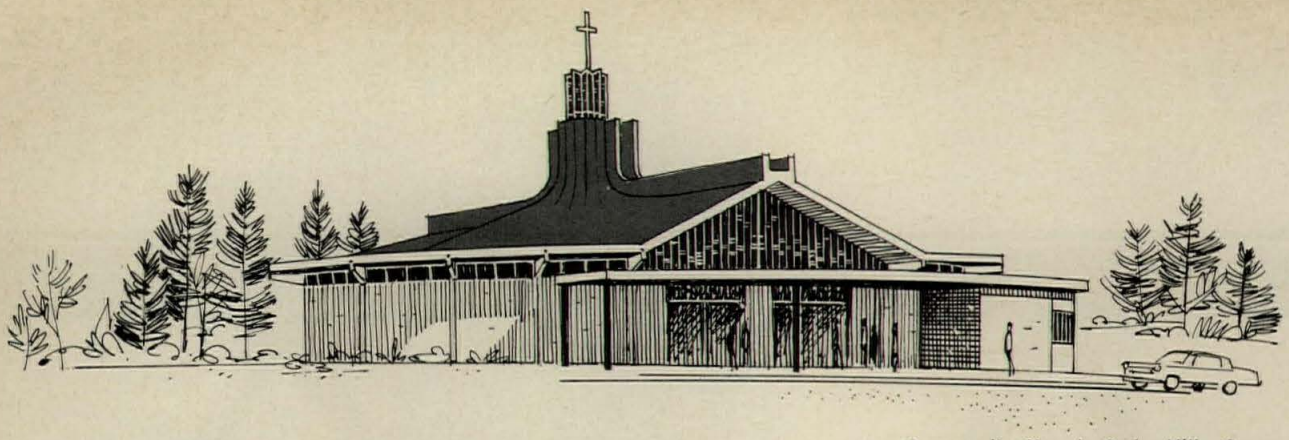
All Sheffield Shortspan and Longspan Steel Joists, made to the widely-accepted specifications of the Steel Joist Institute, are supplied with this durable and economical red oxide primer. Write us for our newest catalog. Armco Steel Corporation, Department W-7326, 7000 Roberts Street, Kansas City, Missouri 64125.

ARMCO STEEL

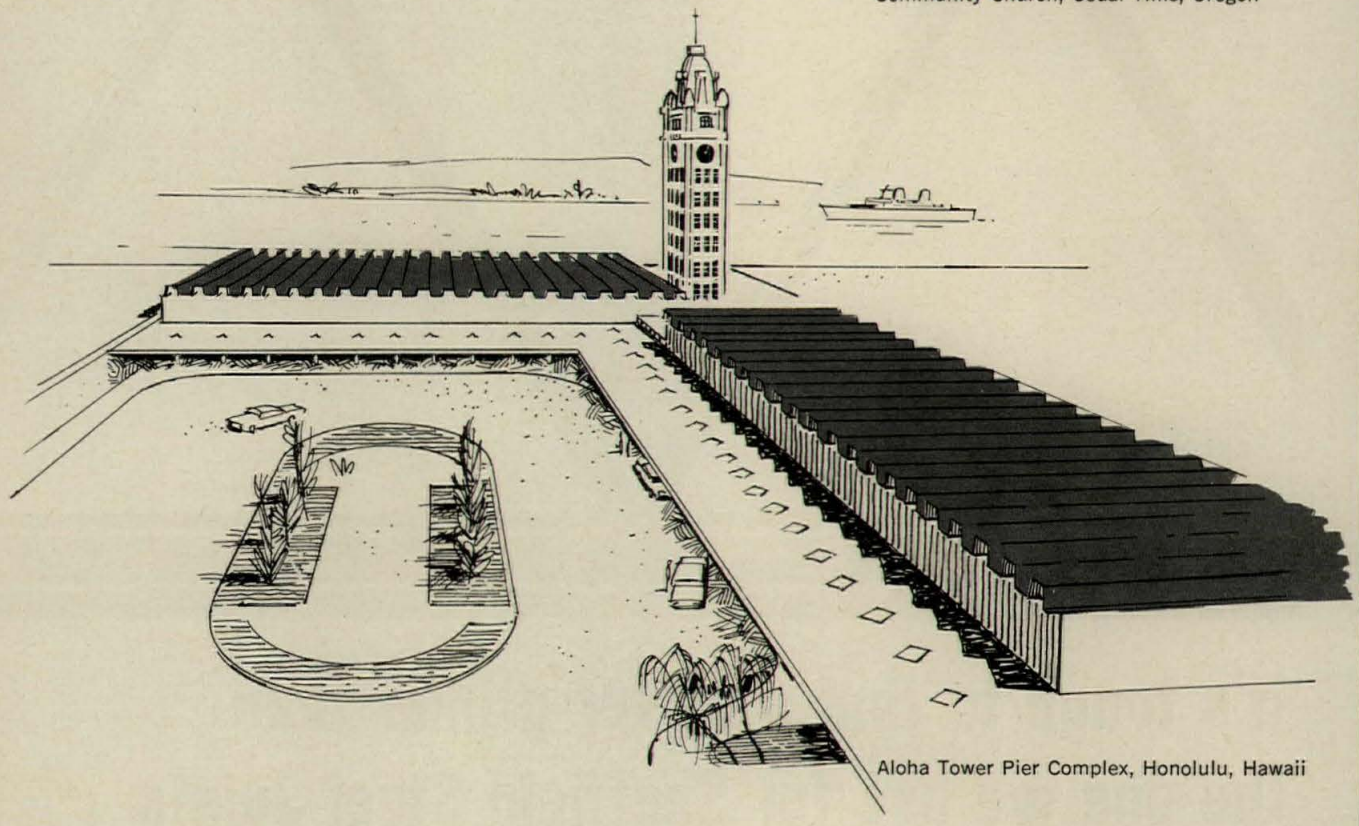
ARMCO

For more data, circle 71 on inquiry card

For more data, circle 70 on inquiry card



Community Church, Cedar Hills, Oregon



Aloha Tower Pier Complex, Honolulu, Hawaii

Solve two major design problems with flexible fluid roofing

Problem 1: Cover multifaceted roofs without design compromise. Example: vari-pitched roof of church shown here.

Answer: Specify fluid roofing of Du Pont Neoprene and HYPALON® synthetic rubber.

Problem 2: Cover long span, pre-cast concrete, subject to considerable contraction-expansion. Example: folded plate roof of pier complex shown here.

Answer: Specify fluid roofing of Du Pont Neoprene and HYPALON.

Fluid roofing is easily applied to these shapes . . . and to almost any curved hard surface. It cures quickly to form a tough, continuous weathertight membrane. HYPALON offers colorful surfaces that resist ozone, sunlight, heat, cold, industrial fumes and abrasion. Both Neoprene and HYPALON are flame resistant. This system gives years of watertight performance.

Du Pont makes both Neoprene and HYPALON, not roofing. Write for a list of fluid roof coating suppliers and literature on fluid roofing.

Du Pont Company, Room 4786
Wilmington, Delaware 19898

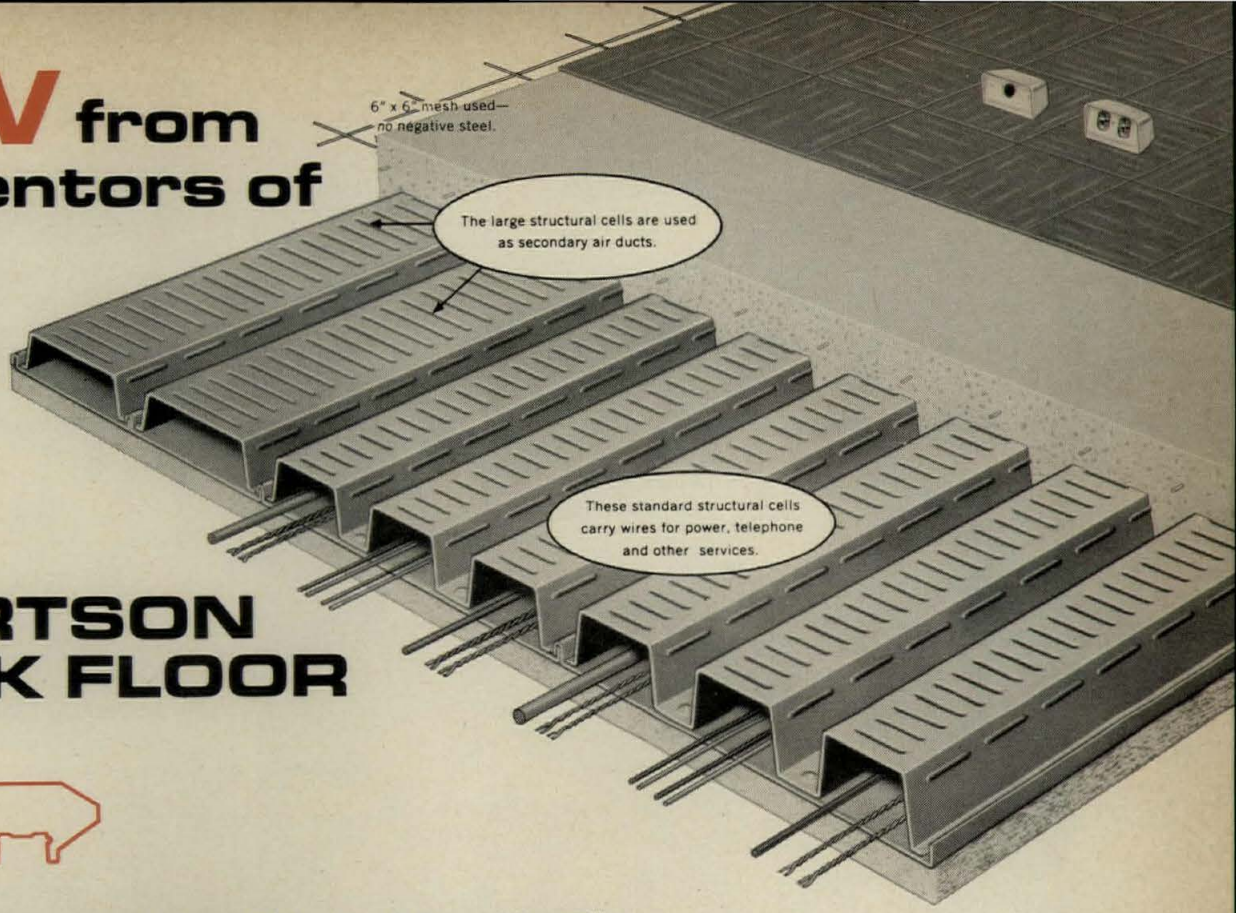
Du Pont
Neoprene
HYPALON

DU PONT
REG. U. S. PAT. OFF.

Better Things for Better Living
. . . through Chemistry

For more data, circle 72 on inquiry card

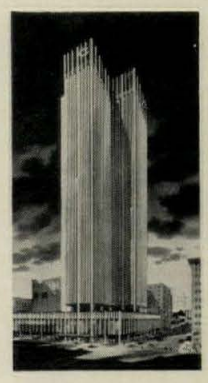
NEW from the inventors of cellular steel floor



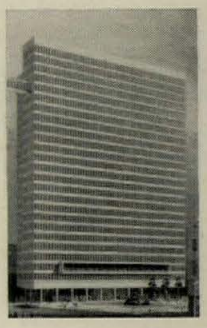
ROBERTSON Q-LOCK FLOOR

New Q-Lock Floor possesses all the virtues of Robertson Q-Floor while adding some new ones of its own. When concrete is poured over Q-Lock Floor, the scientifically-designed indentations and embossments rolled into the steel structural elements develop composite action. Therefore, this new design locks together the structural properties of both materials in a tight grip and results in a more efficient and economical use of both materials. Use the coupon or write to Robertson on your letterhead for literature.

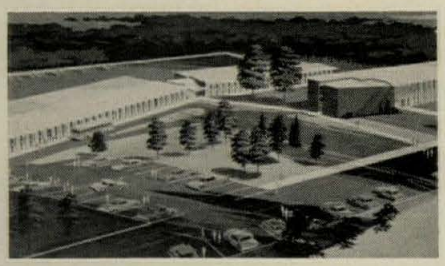
RECENT Q-LOCK INSTALLATIONS



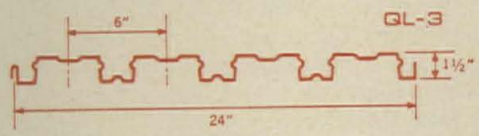
Crocker-Citizens National Bank, Los Angeles, Calif. William L. Pereira, Architect; Brandon & Johnson Assoc., structural engineers; William Simpson Construction Co. and Dinwiddie Construction Co., general contractors.



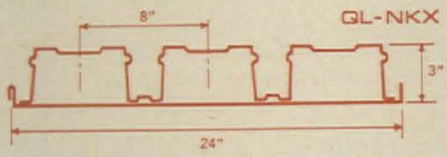
Atlanta Gas Light Tower, Atlanta, Ga. Edwards & Portman, Architects; J. A. Jones, Construction Co., general contractor.



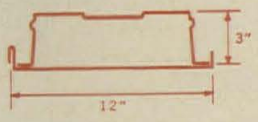
Vocational School, Springfield, Ohio. John L. Kline, architect and structural engineer; Fry, Inc., general contractor.



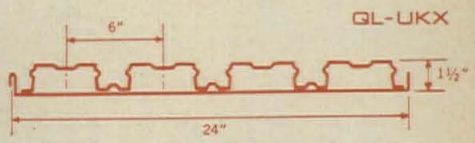
This is a highly economical deck where long spans are not necessary. Can be used with studs weldable through deck as a part of composite frame construction with further economies (often a reduction of 1 pound/sq. ft. in framing of structure of building).



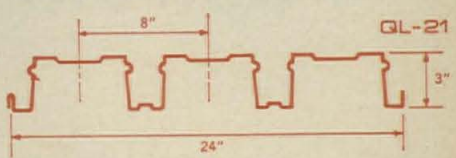
With the welded bottom plate this style provides electrical raceways.



This wide structural unit (used in pairs) also functions as a secondary duct for air conditioning.



This type is similar to QL-3 except that the flat bottom section gives it greater span capacity. It can be used electrically.



This is a heavy-duty deck which will take considerable load when working in combination with concrete.

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PITTSBURGH, PA.
Sales Offices In Principal Cities Throughout The World
U.S.A. Plants In: Ambridge, Pa. Connersville, Ind. • Stockton, Cal.

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I would like to have more information on Q-Lock floor. Please send literature.

Name_____

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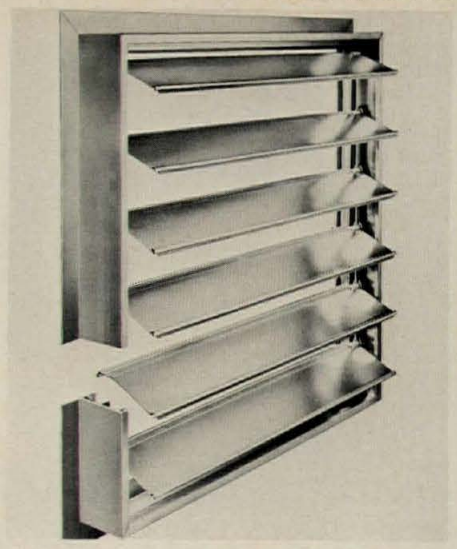
For more data, circle 73 on inquiry card

continued from page 165



BACKDRAFT DAMPER-WALL SHUTTER / This unit promises full weather resistant qualities when closed: The damper blade's design provides a 3/16-in. overlap on all four sides, including a vinyl-tipped edge which fits into a groove. The damper can be used in both horizontal and vertical applications without springs or special adaptations. ▪ M & T Engineering Co., Chicago.

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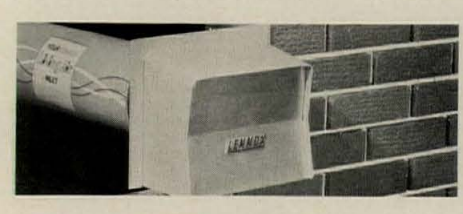
AUTOMATIC FIRE VENT / This roof vent for industrial, commercial, and institutional buildings is U.L. listed. The *Pyrojector* automatically opens when inside temperature reaches 212 deg F, thus allowing fire, smoke, and heat, which would otherwise be trapped and spread under the roof, to be vented outside. The unit, which is made of galvanized steel, will open against a 10 lb per sq ft snow or wind load. Weather-tight construction prevents water leakage even under storm conditions of 30 lb per sq ft uplift pressure. ▪ Swartwout, Inc., Kokomo, Ind.

Circle 307 on inquiry card



FRESH AIR INLET / This inlet introduces air directly into the return air side of a warm air heating and air-conditioning system where it is filtered before being heated or cooled and circulated in the home. A damper in the inlet pipe operated either manually or automatically controls both the amount of air intake and humidity. ▪ Lennox Industries, Marshalltown, Iowa.

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more products on page 180

IT'S HERE... 1967 Edition!

Specifications and Load Tables for High Strength Open Web and Longspan Steel Joists

It's the Steel Joist Institute's practical working handbook of everything you need to specify joists to carry uniform loads on spans up to 96 feet.

The 1967 Edition covers the following joists: J-SERIES, joists made from 36,000 PSI minimum yield strength steel; LJ-SERIES, longspan joists compatible with the J-SERIES; H-SERIES high-strength joists with chord sections made from 50,000 PSI minimum yield strength steel; LH-SERIES high-strength joists with chord and web sections designed on the basis of 36,000 PSI to 50,000 PSI yield strength steel. Send coupon for your free copy of this valuable handbook.

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New kind of glass keeps out noise: ACOUSTA-PANE®

When interior plans require offices near production lines, you can now provide full visibility plus effective sound control. Just specify ACOUSTA-PANE, the only *true acoustical* glass. Available in ratings high as STC 43, ACOUSTA-PANE reduces noise levels at all significant frequencies. It outperforms plate glass, and many "blind" materials, too. Yet ACOUSTA-PANE is a single glazing unit, installed as easily as plate glass in standard partition sections. (You can also use ACOUSTA-PANE for exteriors to shut out noise without cutting off the view.) ACOUSTA-PANE is produced clear and tinted—bronze or grey. Extra bonus: ACOUSTA-PANE is laminated safety glass and shatter-resistant. Find complete information in A.I.A. File No. 26-A-9, Sweets Architectural File. Or write to us.

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Amerada Glass Corporation is exclusive licensee of Bolt, Beranek & Newman, Inc. for the manufacture of multilayer sound-retarding glass.

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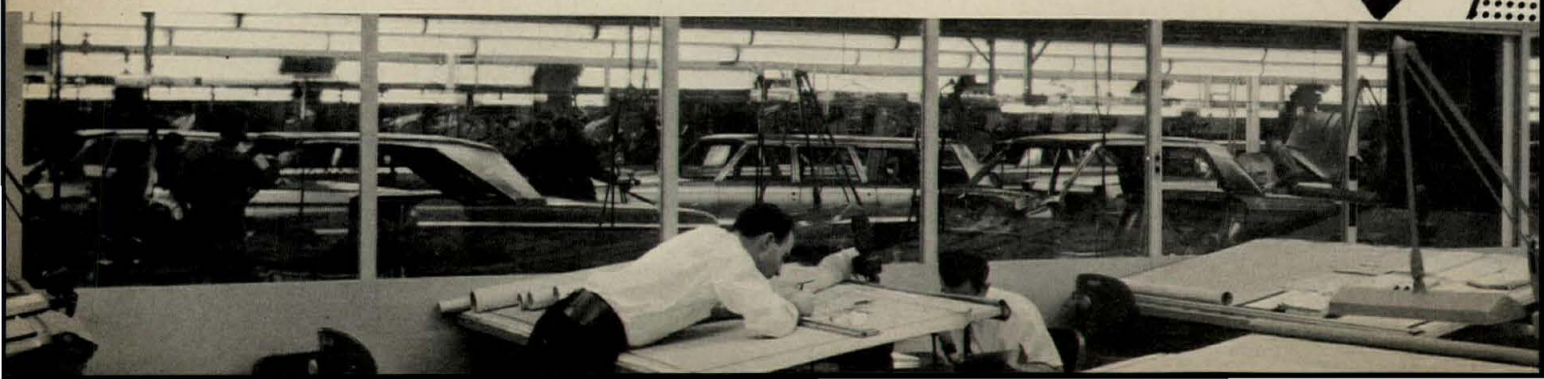
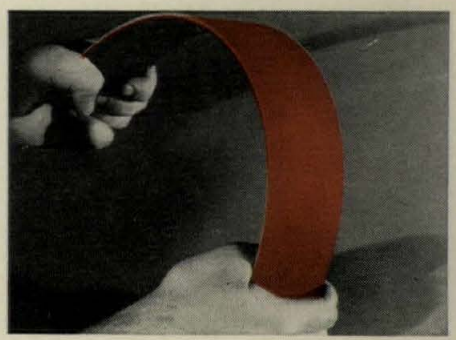


G-E Silicone Traffic Topping permanently hides unsightly surfaces, permanently protects new ones.

Waterproof. Traffic Topping prevents water penetration and moisture retention damage in concrete and other flooring construction materials. Protects against freeze-thaw cycles. Repairs previous damage. Ideal for outdoor ramps, platforms, walks, and traffic bearing roofs.



Permanently flexible. Made of silicone rubber, Traffic Topping keeps its resilience indefinitely. Won't harden, soften or become brittle, even at –65°F or 300°F. Provides a cushioned walking surface as it protects.

Wear resistant. Traffic Topping withstands wear and abrasion of shoes and vehicles. It's a superior surfacing medium for parking areas, garages, promenade decks, and light duty industrial floorings.

Quick, easy application. Traffic Topping adheres securely to most clean flooring construction materials, old or new. Needs no costly equipment. Cures to a tough, weatherproof surface. Looks great too. Six colors available.

Skidproof, too. Even when wet, Traffic Topping's textured surface assures safe, sure traction where it's needed most: pool copings, laundry rooms, public walking areas, tennis courts. And it even makes non-skid stair treads.

Fights chemicals. Because Traffic Topping resists many chemicals, organic acids, alkalis, salts and oils, it is an ideal surfacing medium for food processing and similar plants, where such materials present a problem.

For complete information and your distributor's name, write Section BG12248, Silicone Products Dept., General Electric Company, Waterford, N. Y. 12188

GENERAL ELECTRIC

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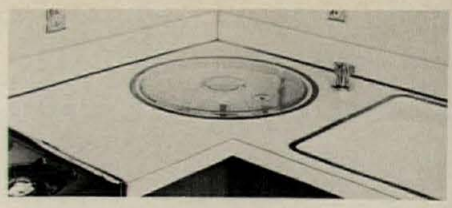
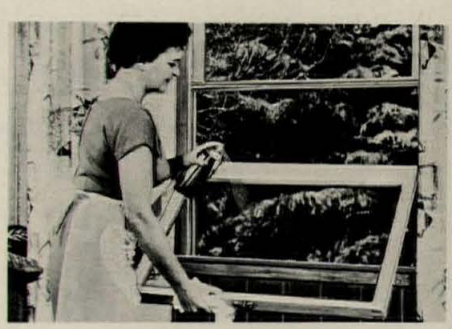
continued from page 176



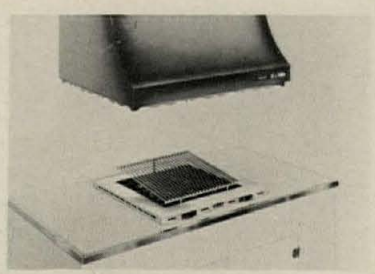
WATER PRESSURE DISHWASHER / This unit, which operates on water pressure, uses a turbine principle and has just two moving parts. The unit requires only 21 in. of cabinet space, making installation in the dead corner of an "L"-shaped top ideal. ▪ Vulcan Manufacturing Company, Inc., St. Louis.

Circle 309 on inquiry card



DOUBLE-HUNG WINDOWS / These windows, made of western ponderosa pine, permit washing both inside and outside window panes from inside the house. Raising or lowering the sash a few inches, and exerting a slight pull, releases the window. The windows which are completely assembled at the factory come in a range of sizes and a choice of glazing options. ▪ Marvin Millwork, Warroad, Minn.

Circle 310 on inquiry card



BUILT-IN BARBECUE GRILL / A compact grill that may be installed in standard wood or metal kitchen cabinets, or in masonry, is directed to apartment, small residential and summer home installation. All controls for the 17,500-BTU burner are recessed into the front of the top rim for working height accessibility and a spring-loaded grill-raising mechanism adjusts to many angles. ▪ Majestic Company, Huntington, Ind.

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more products on page 198

It's also crack, chip, peel, stain and fade resistant... because the surface panels are

VIDENE by GOODYEAR

Modern's new Videne surfaced wall systems offer you beauty and color styling unlimited: 34 colors, 6 patterns and 16 wood grains all architecturally coordinated. Videne surfaces are exceptionally tough and durable. They cost little more than wet finishes, last infinitely longer. Finishes are low-gloss, easy to clean, unaffected by temperature changes, and are highly moisture resistant.

For style, beauty, quality and economy, Modern wall systems, surfaced with Videne paneling by Goodyear, are in a class by themselves. If you'd like to know more about them, just write us. We'll be happy to assist you in developing a custom-designed movable wall system for any project you may have in mind.

The Videne wood-grain panels have realistic texture and figure... the natural beauty and feel of fine woods.

Here's some essential information about Modern movable walls with Videne surfaces.

Modern offers you four movable wall systems, to provide for the widest variety of styling, special requirement and budget situations.

Colors and designs—40 in all—have been styled to meet the most rigorous standards for architecturally oriented interiors. Special colors can be developed for larger projects.

Color stability. All colors are non-fading; color vibrance and intensity are assured for many years.

Wood-grain finished panels have a non-repetitive uniformity of pattern and grain that blend together without painstaking matching.

Wearing qualities. The Videne panel surfaces are tough and mar-resistant for long life, lasting beauty—up to three times as abrasion resistant as high-pressure laminates. Videne surfaces are dimensionally stable.

Maintenance is minimal. Smooth, low-gloss surfaces are easy to clean—shed dust and dirt. Highly resistant to stains. Surface abrasions and scratches can be removed, original luster restored, with ordinary cleansers.

Installation is quick, simple, low-cost. Panels are easy to saw, rout, joint, drill or shape with conventional tools. Extra-large, built-in raceways reduce wiring costs.

Maximum flexibility. Completely modular, non-progressive wall systems allow removal of any section without disturbing wiring or adjacent panels.

Several sound cores available—STC ratings from 30 to 43.

Matching Videne panel system for fixed walls. Complete with all moldings, match Modern movable partitions.

Matching doors, Videne surfaced, in a wide choice of styles.

Custom treatments. A choice of trim, and other special effects enable you to achieve individualized interiors.

Quality control of Modern movable walls is continuous throughout production. Extremely high standards of materials and workmanship eliminate costly on-site labor, assure life-long satisfaction.

SWEET'S CATALOG FILE NO. 22A/MO *VIDENE,™ for paneling, doors and molding systems. The Goodyear Tire & Rubber Company, Akron, Ohio 44316*

MODERN PARTITIONS, INC. **MODERN** HOLLAND, MICHIGAN 49423

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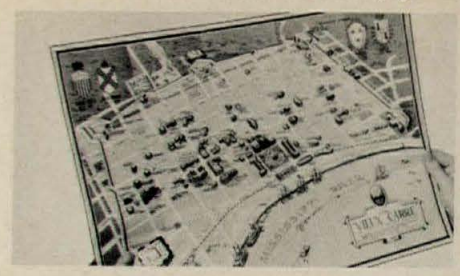
continued from page 180



PERSPECTIVE MAPS / Flat plans and photos may be converted into graphic three-dimensional maps. The angle—similar to an aerial view—shows streets and roads in scale, receding in the distance with buildings and natural features in relief. The *Perspecto Map* is available in any size, choice of colors, flat or folded and arranged to include copy. ▪ Perspecto Map Co., Chicago.

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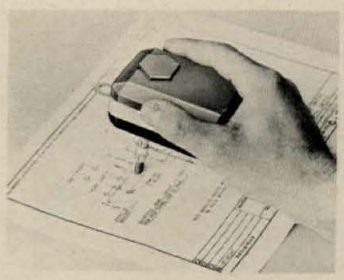
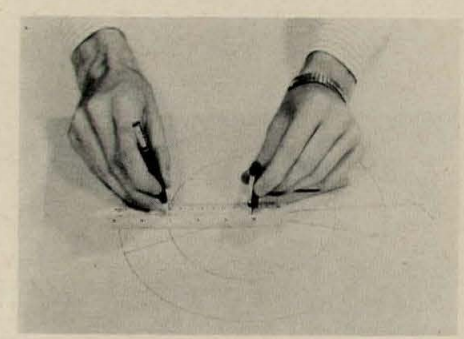


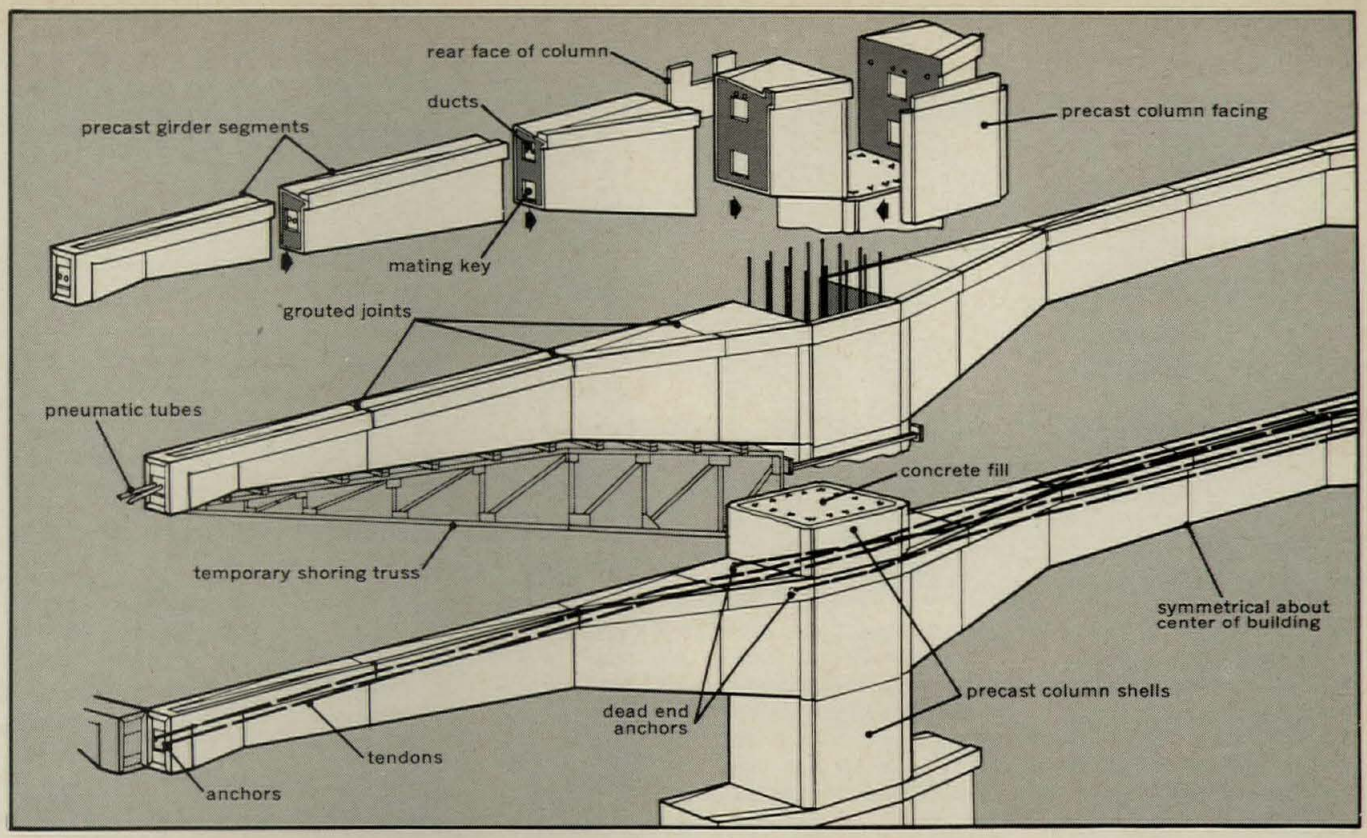
ELECTRIC ERASING MACHINE / A compact model weighs only 18 ounces. The *Deletor* comes in two models: one contains a built-in mercury switch that starts the motor automatically whenever the eraser is tilted slightly downward; the other has a push button switch. ▪ W. L. Engineering Company, Clifton Heights, Pa.

Circle 313 on inquiry card



RULER-MECHANICAL PENCIL / The *Comparule* replaces five tools—compass, protractor, rule, pencil and stylus—with two that are easy to carry in a pocket. The instrument draws circles with a diameter up to 10 in., measures or constructs any angle, and measures lengths to six in. Price is $1 ▪ The Comparule Co., 242 W. Portage Trail Ext., Cuyahoga Falls, Ohio.

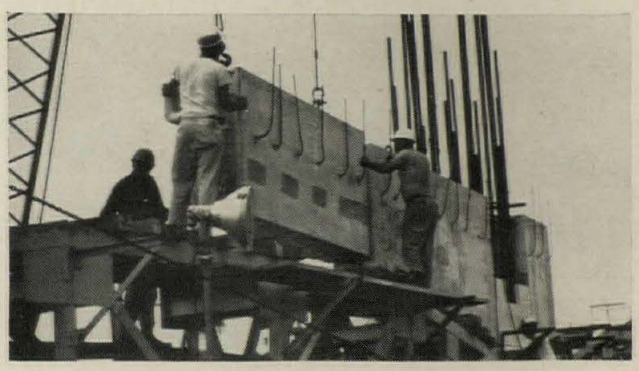
more products on page 205



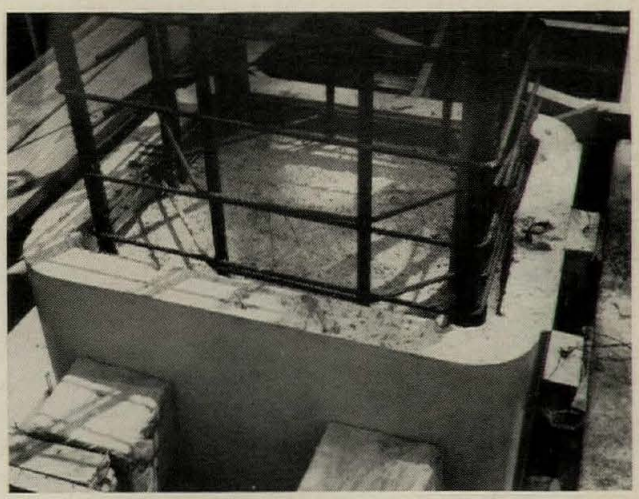
Posttensioned, precast segments form 133-ft. girder

The segmental posttensioning techniques used are simple, fast and economical. Although the erection sequence varies depending upon the number of tendons used, the fundamental steps are as follows:

- Precast column shell sections are placed and filled with lightweight concrete.
- Temporary shoring truss is secured in position.
- Precast girder segments are placed and aligned, sealing the periphery of the joint with gummed, foamed plastic tape.
- Rubber pneumatic tubes are threaded into mating prestressing ducts and inflated to 5 psi.
- With tape sealing periphery of joint and tubes sealing duct holes, the 1-in. space between segments is filled with high-early-strength grout. (3,000 psi in 24 hrs.)
- Tubes are deflated and withdrawn. Tendons are inserted, each consisting of twelve ½-in., 270 ksi strands.
- Tendons are stressed and anchored (Freyssinet Method) as columns above girder are placed.
- Ducts are pressure grouted to protect tendons.



Columns combine precast, cast-in-place techniques

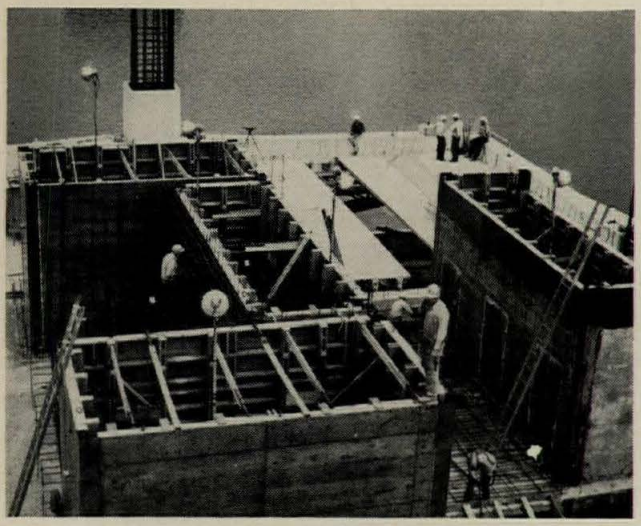


Each column is composed of a precast shell into which fresh concrete is placed. This provides uniform color and texture . . . and precludes the necessity for the decorative concrete mix throughout the entire column. Columns taper from a width of 6 ft. 9 in. at the third floor to 4 ft. at the penthouse, and are typically 5 ft. 6 in. deep. Mix design data for the column concrete fill are:

Portland cement, Type I	800 lbs.
Fine aggregate (sand)	1245 lbs.
Coarse aggregate (lightweight expanded shale)	735 lbs.
Water	43.8 gals.
Water/cement ratio	5.2 gal. per bag
Entrained air	4 percent
Slump	4.25 in.
Strength at 28 days	5000 psi

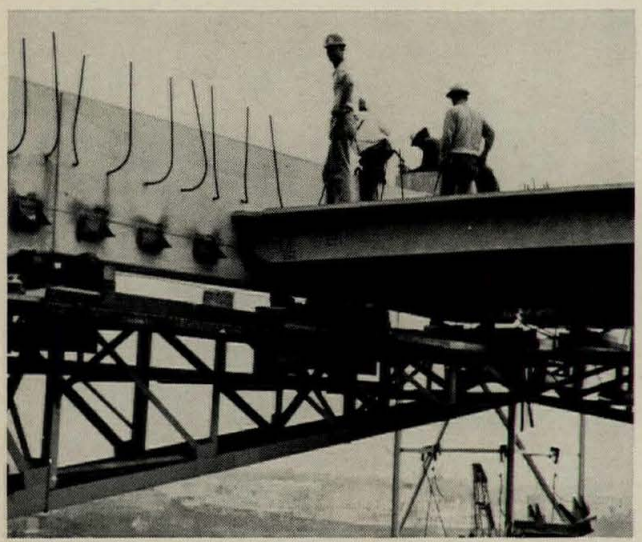
Turn page for more information

Construction of core walls

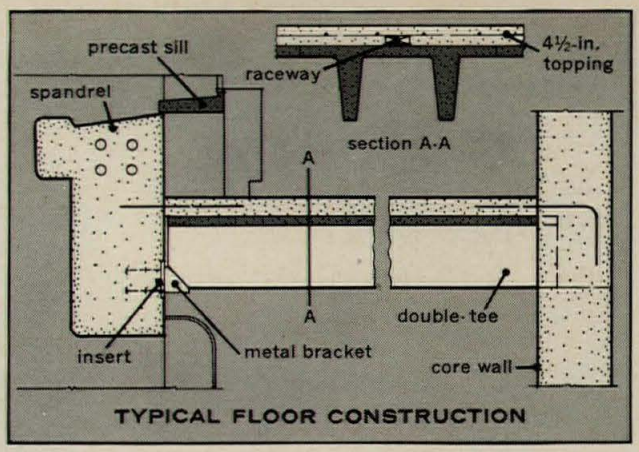


Core walls of Gulf Tower progressed simultaneously with the exterior precast concrete framework. Consequently, it was possible for the prestressed concrete double-tee floor slabs to be positioned directly atop the core wall. Wall forms were of ¾-in. plywood on 2x6-in. horizontal studs, backed up by double 2x8 vertical walers. Heavy-duty, 9,000-lb. ties held forms against concrete pressures. The structural core as designed resists all wind forces acting on the building.

Precast, prestressed concrete double-tee floor slabs span 40 ft.

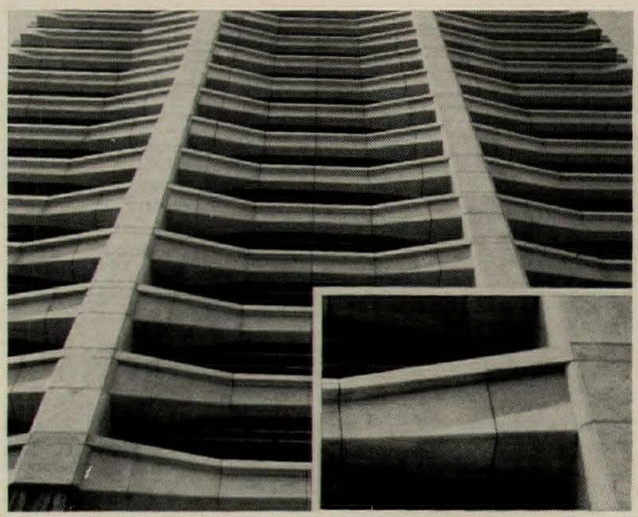


Metal brackets welded to inserts in the spandrel beams support one end of the 18-in.-deep double-tees. The opposite end rests in pockets cast in the core wall or on precast concrete planks which are part of a composite girder extending from the column to the core wall. Tees are placed in north-south, east-west directions on alternate floors to equalize load distribution on the columns. A 4½-in. lightweight concrete topping is placed over the double-tees providing flexibility in accommodating electrical raceways. Air conditioning units located under the window area have individual temperature controls for office space.



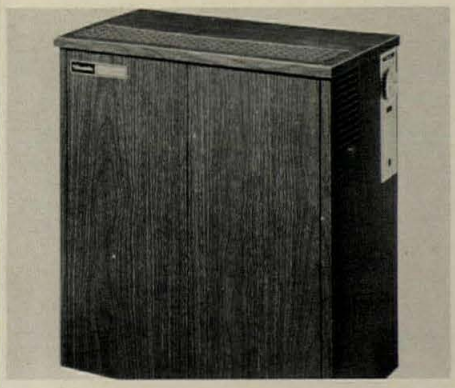
TYPICAL FLOOR CONSTRUCTION

Exposed white concrete sculpture ascends high above Jacksonville skyline



White cement and white quartz sand combine to create a bold sculpture which dramatically defines the individual "work areas" of the office building. Tinted glare-reducing glass contrasts sharply with the white concrete frame. The frame segments were cast in Tedlar-coated steel molds resulting in dimensional accuracy and uniformity of color and texture. The precast concrete exterior surface is permanent and will require little or no maintenance.

continued from page 198



PORTABLE HUMIDIFIER / This unit features automatic shut-off and a light that glows when the tank is empty. The unit is in a wood-grained cabinet with rolling casters that make it easy to move about. ▪ Skuttle Manufacturing Company, Milford, Mich.

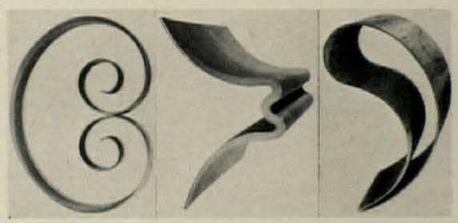
Circle 314 on inquiry card

WATER COOLER / A semi-recessed unit extends only 9½ in. from the wall. The cabinet is constructed of heavy-gauge steel with vinyl-laminate finish of Chestnut Tweed. It is also available in stainless steel or walnut vinyl-on-steel. ▪ Ebco Manufacturing Company, Columbus, Ohio.

Circle 315 on inquiry card

SLIDING DOORS / A versatile patio door, available in four multi-slides and five pocket configurations offers 45 variations. Security lock and all wool pile vinyl barrier weather stripping are standard. ▪ The Stanley Works, New Britain, Conn.

Circle 316 on inquiry card



MOLDED PLYWOOD / Various shapes, sizes, and dimensions of molded plywood may be mass produced. Almost any type of wood may be used and the number of veneer layers can range from 3 to 46 plies ▪ Molded Plywood Division, Plycraft, Inc., Lawrence, Mass.

Circle 317 on inquiry card

FASTENING SYSTEM / A concealed system has been designed to prevent vandalism and pilferage of bathroom accessories. There are no visible signs of attachment. ▪ G. M. Ketcham Manufacturing Company, Glendale, N.Y.

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more products on page 210

To resist acids, alkalis, wear, stain moisture that paint can't stand up to... here's a "tile" you can spray on with a gun!

PITT-GLAZE®, the exclusive, new Pittsburgh epoxoid polyester, gives cement block, metal or plaster protection as impregnable as ceramic tile . . . at about one-third the cost.

Pitt-Glaze is a unique coating that combines the best of epoxy and polyesters, with none of their disadvantages.

Like tile, Pitt-Glaze resists acids, alkalis, stains and moisture. And it's fire-resistant on noncombustible surfaces.

Yet Pitt-Glaze costs much less than many tiles.

Like paint, Pitt-Glaze goes on easily with spray gun, brush or roller. And it comes in 40 colors.

Yet Pitt-Glaze lasts 3 to 5 times longer than paint. And it won't yellow.

Available in semi-flat finish, as well as *high-gloss* and semi-gloss—all with the same tile-like appearance and durability.

Pitt-Glaze—another powerful new Pittsburgh coating.

Powerful new **PITTSBURGH** coatings ®

PITTSBURGH PLATE GLASS COMPANY

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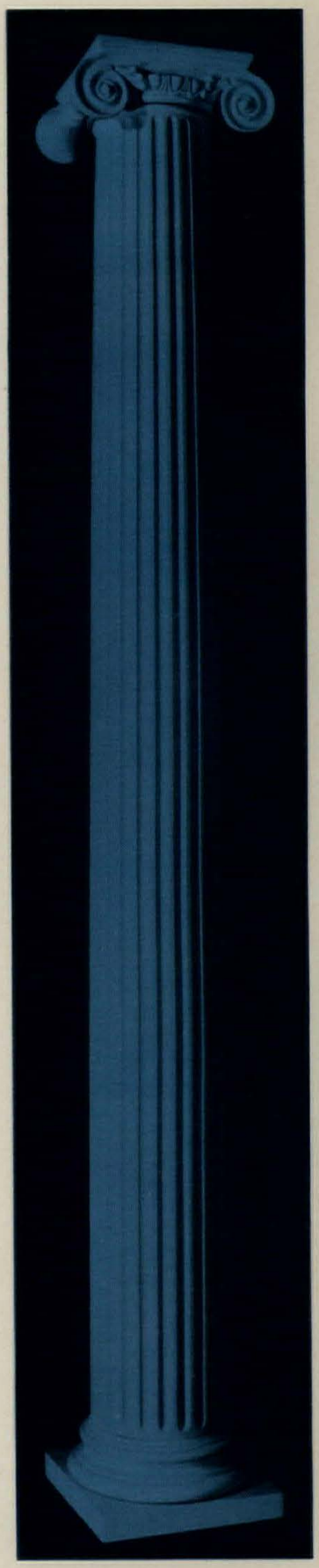
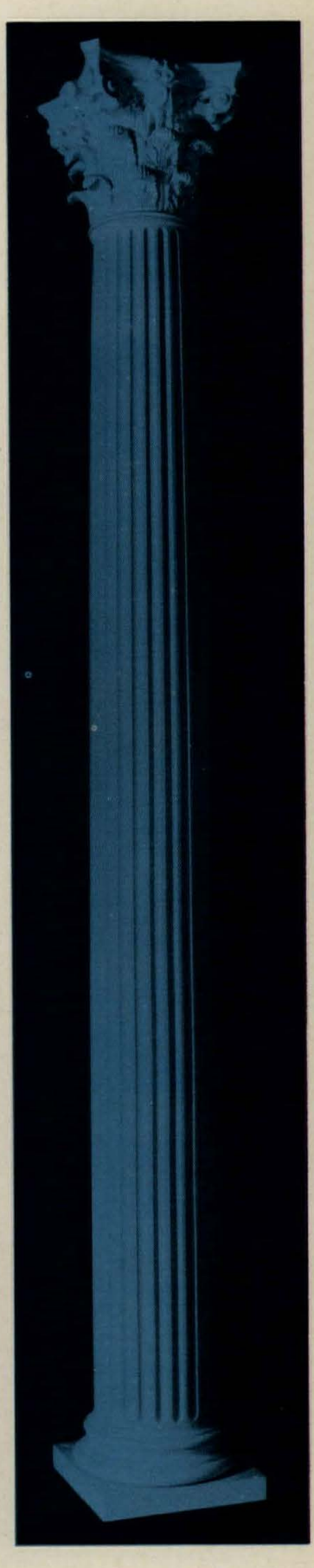




Column Right!

Every one. Whatever order. When they're made by Hartmann-Sanders.

Distinctively suitable for the individual architectural application. This is an accurate description of Hartmann-Sanders columns, which are the result of 65 years' experience, exceptional craftsmanship and topnotch quality control.

Not every project requires classical columns and a perfectly executed portico. But when one does, getting the finest is assured when you rely on Hartmann-Sanders. Satisfying the discriminating architect is a habit with us.

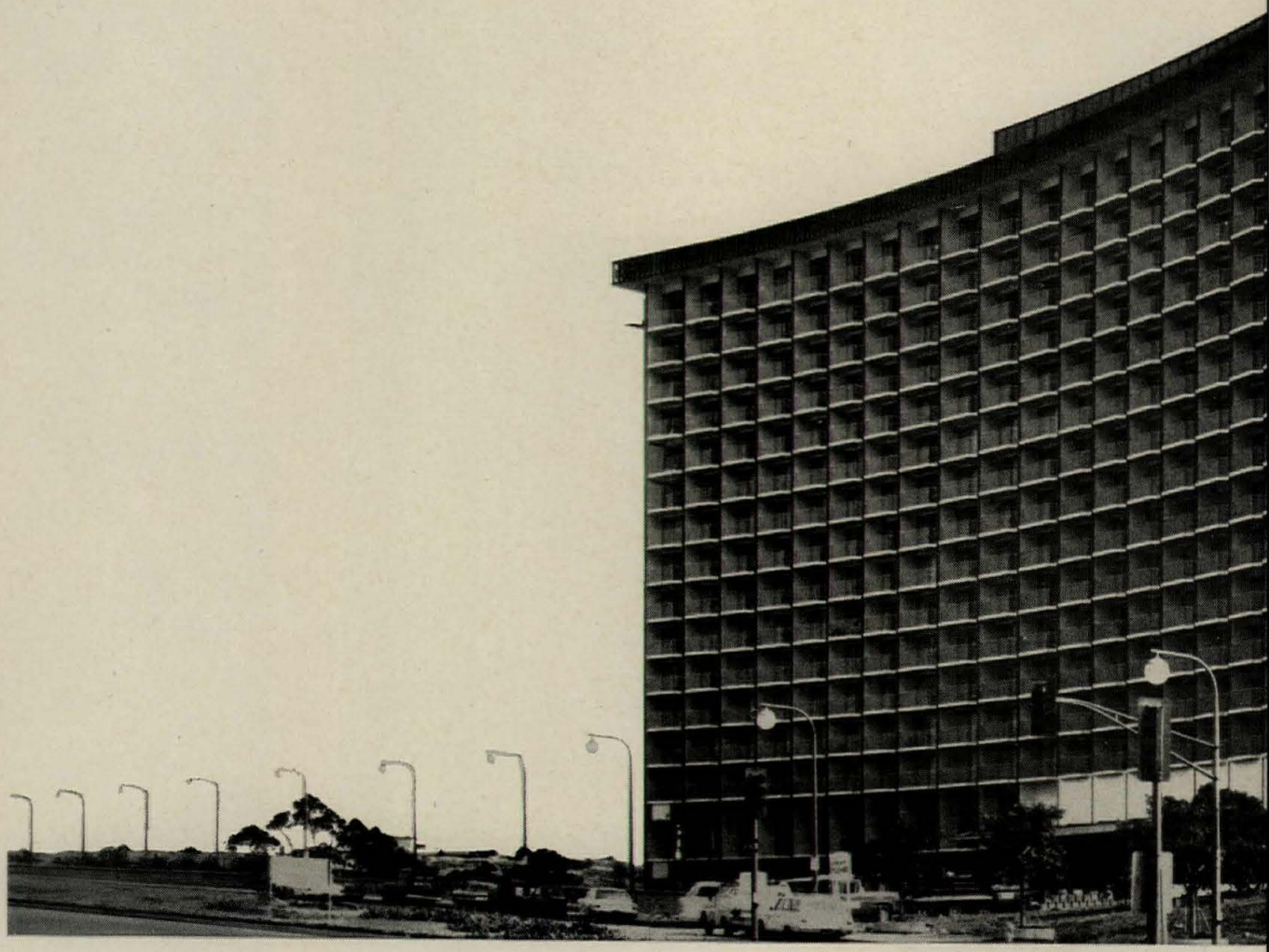
Be prepared. Send for your copy of the Hartmann-Sanders Wood Columns catalog. Keep it handy. It presents 16 design choices, and since all are manufactured to order, the diameter and length relationships are executed to your design requirements.

Use Hartmann-Sanders free Authentic Design Service, too. It can save you time and work. Write or phone for both today. You'll be glad you did. Honest.

Hartmann-Sanders Company

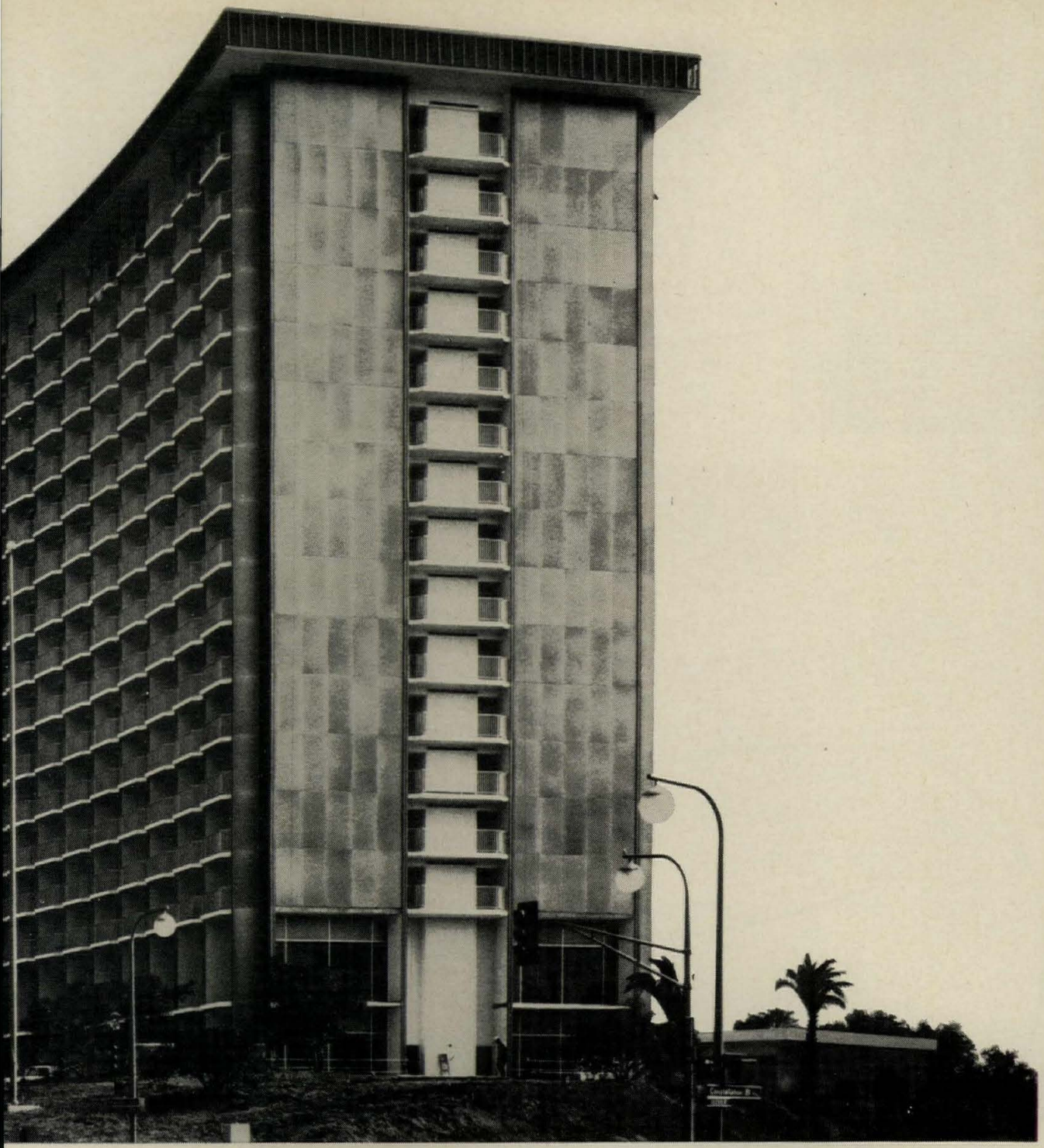
1717 Arthur Avenue
Centex Industrial Park
Elk Grove Village, Illinois 60007
Telephone 312-439-5600

For more data, circle 95 on inquiry card



Unique design to resist

The new Century Plaza Hotel in Los Angeles is 20 stories high and is located in earthquake Zone 3. In what is believed to be a first, the designers combined the ductility of the steel rigid frame and the stiffness of X-bracing to make this structure earthquake-resistant. The unique structural system permitted a story height of



earthquake forces

nly 8′ 10″ with a floor to ceiling height of 8′ 5½″, ith no beams projecting into the rooms or cor-idors. This integration of structural and archi-ectural space meant low unit cost and very low nit weight per square foot of floor area.

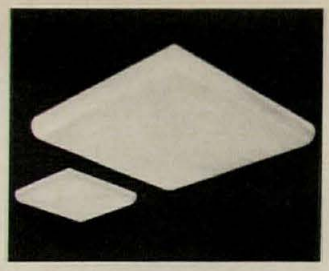
This is another example of what can be accom-lished with steel and imagination.

Architects—Minoru Yamasaki and Associates • Structural Engineers —Worthington, Skilling, Helle and Jackson • General Contractors— George A. Fuller Company, Inc. • Owner—Aluminum Company of America • Operated by—Western International Hotels • Fabricators and Erectors—American Bridge • Weight of Structural Steel—3,800 tons—ASTM A36

USS TRADEMARK

American Bridge
Division of United States Steel

continued from page 205



LIGHTING / Surface-mounted fixtures that look like floating luminous clouds come in several sizes and shapes to fit large or small areas. The soft translucent white diffusers have matte outer surfaces for more effective diffusion and lower surface brightness. ▪ Peerless Electric Co., San Francisco.

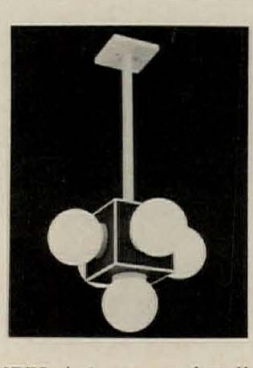
Circle 319 on inquiry card

PAGING LIGHT SYSTEM / A system that has been developed for industrial and office buildings offers fast, quiet communication between telephone switchboard and operating personnel anywhere in the building or on the grounds. Numbers are assigned to personnel who, when paged by a chime, look at a double-faced panel. The ceiling- or wall-mounted panel, visible up to 100 ft, shows the lighted number. ▪ Wrightco Corporation, Chicago.

Circle 320 on inquiry card

STREET LIGHTING / This residential luminaire has tough refractor panels made with polycarbonate resin. The panels protect fixture and mercury lamp against vandalism and make possible a low (10 to 14 ft) mounting height. ▪ General Electric, Pittsfield, Mass.

Circle 321 on inquiry card

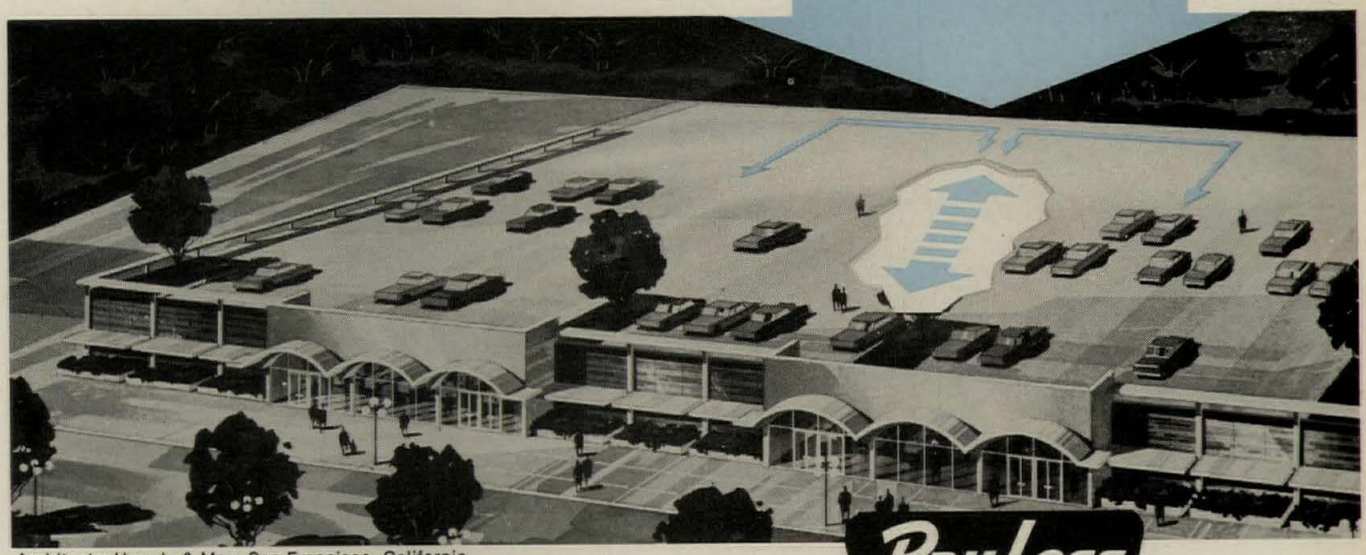


LUMINAIRES / A group of wall-, ceiling- or pendant-mounted fixtures for both outdoor and indoor use incorporates 5 in. spheres in modern geometric forms. The units may contain from one to nine lamps and combine painted or metallic housing with either cherry or American walnut vinyl film panels. ▪ Omega Lighting, Inc., New York, N.Y.

Circle 322 on inquiry card

more products on page 214

SANDVIK Movator....



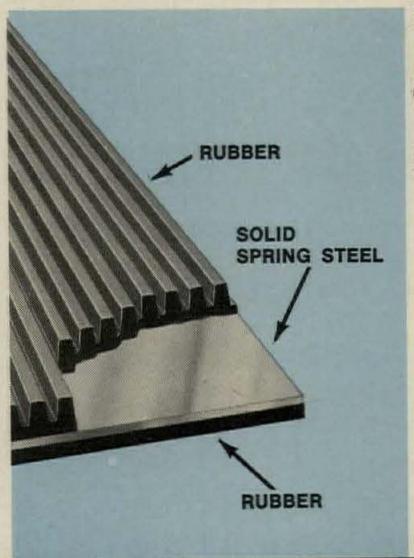
Architects: Harada & Meu, San Francisco, California

Pay Less
Guarantees Every Purchase!

....Gives A Unique Solution To Easier Shopping And Parking

At this new store in San Francisco, Skaggs Pay Less Drug Stores' customers will glide with stepless ease from rooftop parking to the floors below and then up again with **loaded shopping carts.** They'll be riding on SANDVIK MOVATORS . . . moving walks of rubber-covered steel.

SANDVIK MOVATORS provide an exclusive combination of advantages . . . a heavy-gauge, one-piece endless belt of solid spring steel gives rigidity and no-stretching . . . grooved rubber covering assures safe, non-slip surface . . SANDVIK wide-rib, narrow-groove tread and special landing plate design prevents heel-catching more positively than any other design. The MOVATOR installation for Pay Less is just one of many made by Sandvik in ten years of design, manufacturing, installation and service experience. Sandvik can apply this background to your requirements anywhere in the U.S.A. today. Write for SANDVIK MOVATOR booklet or contact your nearest Sandvik office.



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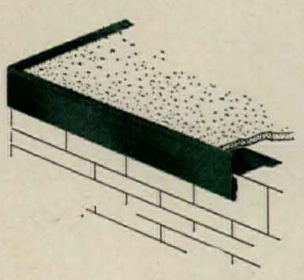
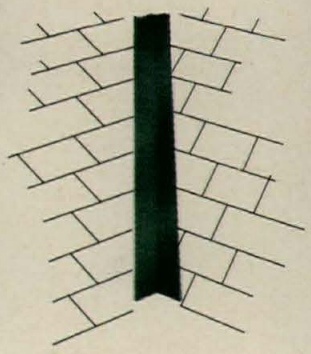
For more data, circle 97 on inquiry card

TERNE METAL: The Accessories

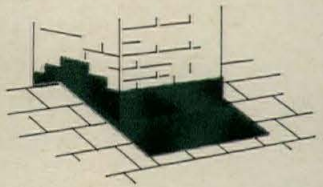
We believe most architects are now aware of terne's nearly unique design potential for visually significant roofs in the contemporary idiom. But terne is also among the best of accessory metals—probably the best when initial cost is balanced against durability. If considerably fewer architects are aware of it in this context, the fault is largely our own, for we frankly haven't found too many exciting things to say about gutters, flashings, valleys and gravel stops. Exciting or not, however, these commonplace items still play an important role in most buildings, and any failure can be very troublesome indeed. When next specifying them, therefore, why not give Follansbee Terne a trial? It should not only save your client money, but under normal exposure has a life-expectancy measured in generations rather than years.



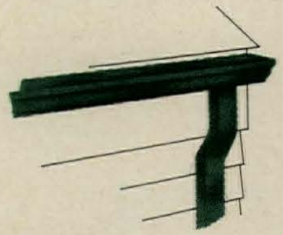
Combination Gravel Stop and Fascia



Valley



Chimney Flashing



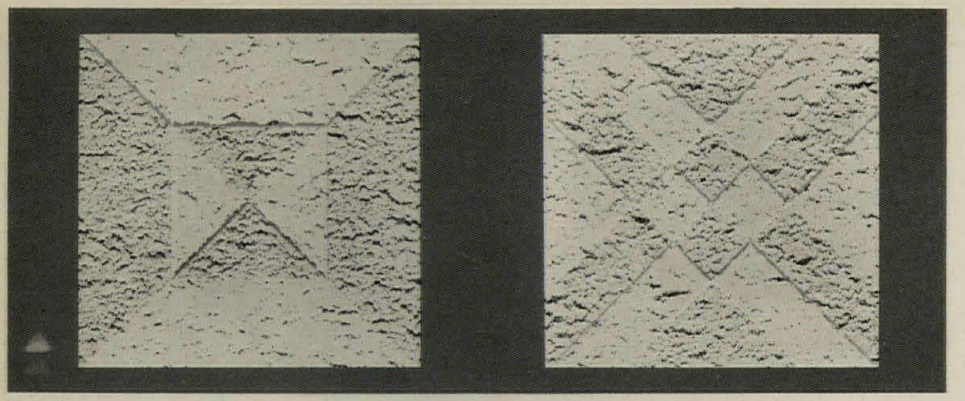
Gutter and Downspout

FOLLANSBEE STEEL CORPORATION

Follansbee, West Virginia

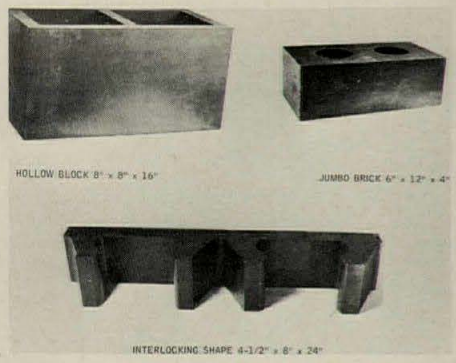
Follansbee is the world's pioneer producer of seamless terne roofing.

continued from page 210



ACOUSTICAL CEILING TILE / "Sculptured classic" patterns of mineral-fiber acoustical-ceiling tile may be used for ceiling accents in conjunction with other mineral-fiber tiles having the same surface texture. The patterns may also be used for an entire ceiling in executive offices and reception areas. Tiles have noise reduction coefficients of .65; K factor of 0.35; and a flame spread of 10 to 15. ▪ The Celotex Corporation, Tampa, Fla.

Circle 323 on inquiry card



BUILDING MATERIAL / A new material, BMX, made from soil and a petroleum-based binder, may be used in place of conventional masonry products such as concrete blocks and fired clay bricks. The manufacturer reports that tests in brick and block form and in varying shapes and sizes showed "engineering properties associated with premium masonry products." The product has smooth surfaces and close dimensional tolerances. ▪ Esso Research and Engineering Company, New York City.

Circle 324 on inquiry card

ROOF SYSTEM / A cold process, glass-reinforced, neoprene/Hypalon system, under the trade name of *Flex-A-Dek*, is described as "the most advanced, elastomeric seamless roof system available." It may be used for any slope, any contour, in any color. ▪ Addex Manufacturing Co., Wickliffe, Ohio.

Circle 325 on inquiry card

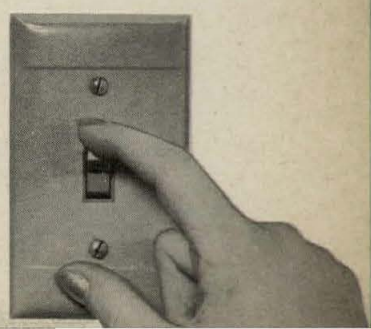
BELOW-GRADE WATER STOPPAGE / Corrugated kraft panels filled with bentonite provide permanent water control for below-grade construction. *Volclay Panels* are slightly overlapped when applied to below-grade vertical walls with staples or mastic, and then backfilled. Upon contact with water, the bentonite swells to a gel that is 10 times its dry volume, leaving a vertical wall of bentonite that expands into foundation cracks as they appear. ▪ American Colloid Company, Skokie, Ill.

Circle 326 on inquiry card

more products on page 218

Skylight?
No. KLITE®

This is K-44. The first 4′ x 4′ prismatic. A sky-size island of light. Beautiful. Like a BIG ONE should be. Sculptured in sparkling clear prisms that give you lighting as it should be. Don't compromise on white opal pans or louvers or two-piece enclosures. Go big with the BIG ONE. Specify K-44. You'll turn on 16 square feet of exciting lighting.



See!

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We're making a federal case

The case for PLIOLITE® paint resins is based on Federal Specifications TT-P-97b, TT-P-91b, TT-P-95a, TT-P-115c, TT-P-110b, TT-P-28c, TT-F-001098 and TT-P-618a.

These specifications put the official stamp of approval on synthetic binder resins like PLIOLITE . . .

For use in masonry paints (TT-P-97b). For concrete floor enamel (TT-P-91b). For swimming pool finishes (TT-P-95a). For traffic-marking paint (TT-P-115c) and paint used to obliterate traffic markings (TT-P-110b). For paint designed to withstand temperatures to 1200°F (TT-P-28c). For a filler for porous surfaces—cinder block, concrete, stucco—(TT-F-001098). And in a fast-drying zinc chromate primer for exposed metal surfaces (TT-P-618a).

Tough, chemically inert PLIOLITE resins have proven their durability in paint for over 15 years, in all parts of the country. And in the toughest tests described in Federal Specifications. For more information on PLIOLITE resins, and names and addresses of paint manufacturers who use PLIOLITE . . . send the coupon.

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Then render *your* verdict.

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APPLICATION

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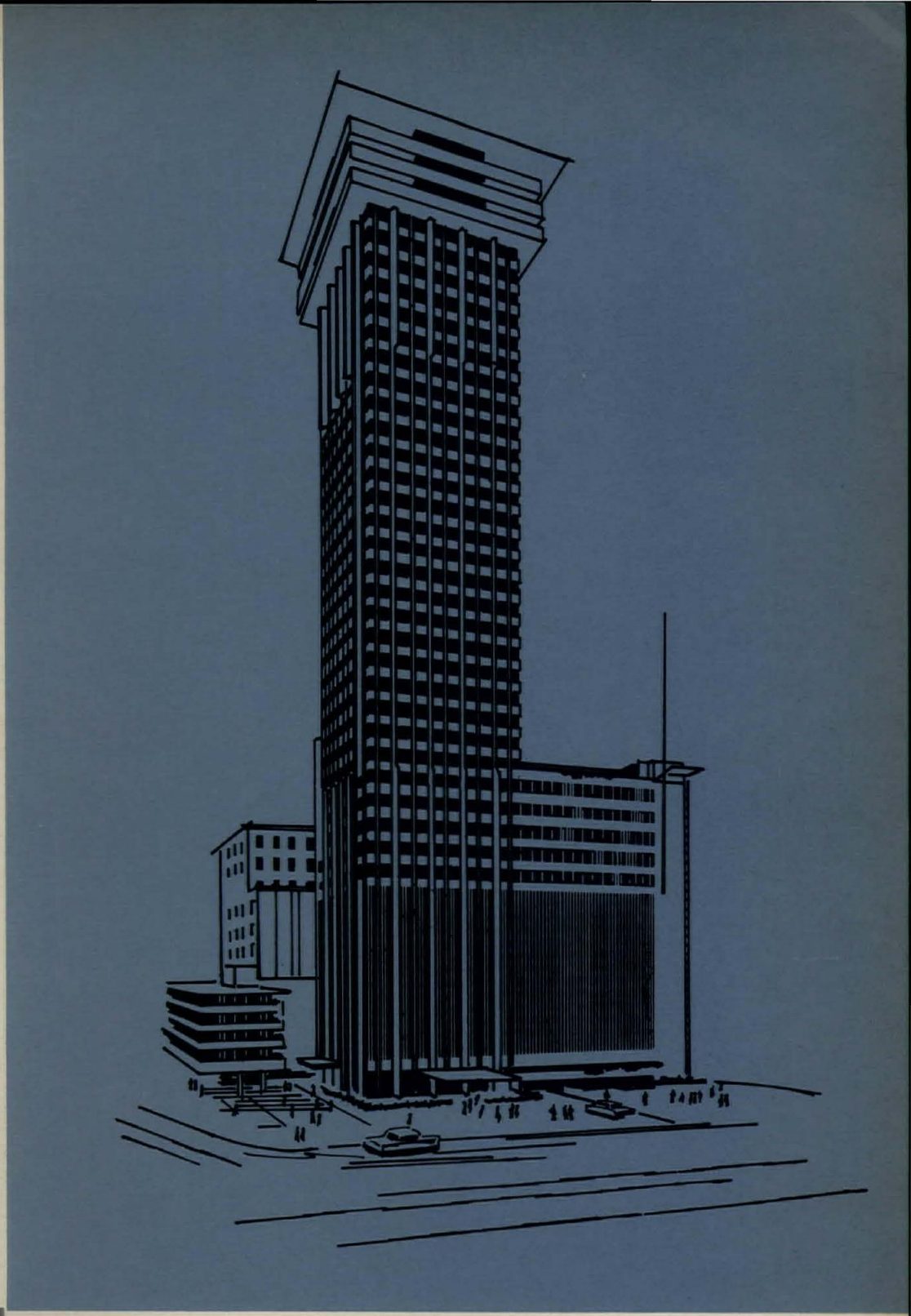
PLAZA TOWERS

—the pride of New Orleans—

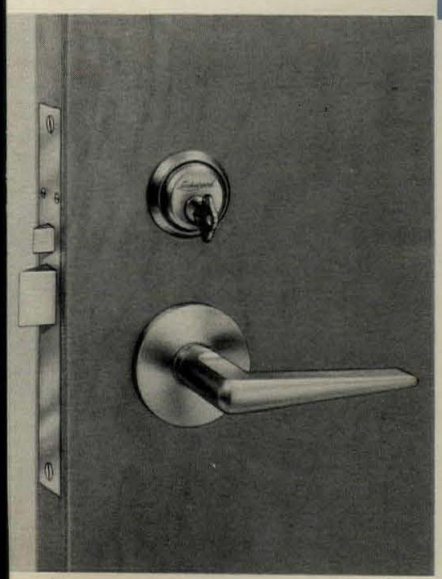
Locks up with Lockwood



Architect:
Leonard R. Spangenberg

Contractor:
George H. Fuller Company

Hardware Supplied by:
Woodward Wight & Co., Ltd.



The tallest peak on the New Orleans skyline is the brand new Plaza Towers. Beautifully designed, this office building sets the pace in modern architecture at the new Civic Center.

Above eight floors of underground parking, rise 29 floors of offices, topped by a heliport.

Lockwood is indeed proud to have Lockwood Hardware play such an important part in Plaza Towers—the pride of New Orleans.

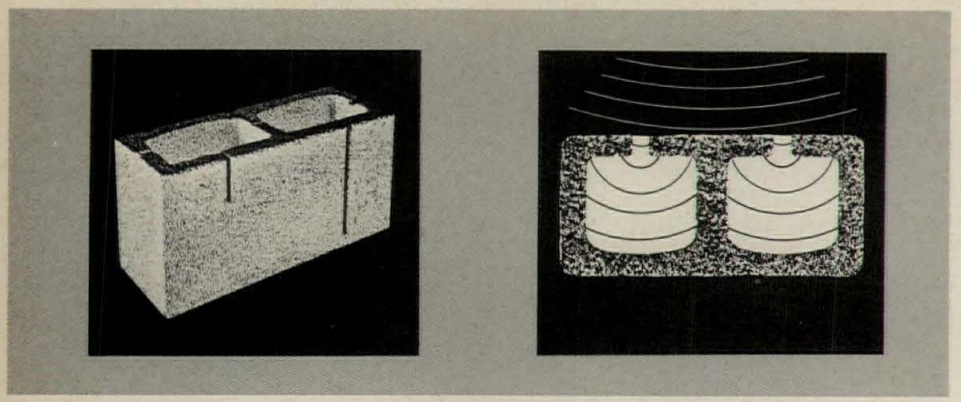
LOCKWOOD

LOCKWOOD HARDWARE DIVISION

INDEPENDENT LOCK COMPANY IDCO
Fitchburg, Massachusetts

For more data, circle 103 on inquiry card

continued from page 214

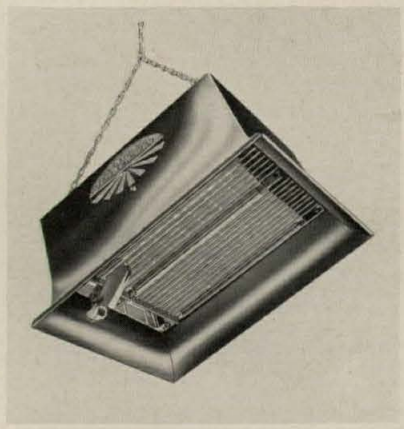


SOUND-ABSORBING MASONRY BLOCKS / These blocks, which make it possible for the structural part of a building to provide sound-conditioning, may be used for load-bearing walls as well as interior partitions. *Soundblox* derive their high sound absorption from a patented cavity-slot design: The cavities are closed at one end and have slots that enable the block cavities to act as damped resonators. Blocks can be coated with paint or glazed ▪ The Proudfoot Company, Greenwich, Conn.

Circle 327 on inquiry card

ROOF SLABS / *Tuflon*, reported to be "strong, lightweight and non-combustible," is made of perlite aggregate concrete, with reinforcing steel. The bottom or interior side of the slab, which is available in standard sizes and various thicknesses, provides an acoustical ceiling. ▪ Silbrico Corporation, Chicago.

Circle 328 on inquiry card



INFRA-RED HEATING UNITS / Three models offer 85- to 255-sq in. radiant surfaces and from 30,000 to 90,000 B.T.U. input with a radiating face temperature range of 1,600 to 1,650 deg F. The radiant source for the new line is all-ceramic tiles and patented high-temperature stainless steel rods, capable of withstanding 1,800-2,000 deg F. Heaters emit rays which do not heat the air, but merely the object they encounter. Benefits include: instant, uniform heat; silent operation; minimum dust circulation. ▪ Detroit Radiant Products Company, Detroit.

Circle 329 on inquiry card

For more data, circle 105 on inquiry card ▸

continued from page 166

METAL GRATING / A data and specifications manual describes welded and riveted steel and aluminum grating for flooring, platforms, walkways, decking and stair treads. The manual includes safe load tables and charts and load conversion formulae. ▪ Klemp Corporation, Chicago.

Circle 415 on inquiry card

STEEL COATINGS / Three bulletins describe ready-mixed *Galvanox Zinc-Rich* coatings and *Capox* catalyzed epoxy topcoats to provide high corrosion resistance for steel subject to high humidity and chemical contamination. ▪ Wyandotte Chemicals Corporation, Hackensack, N.J.

Circle 416 on inquiry card

ALUMINUM FACING SYSTEM / A brochure that explains a system of interlocking aluminum panels suggests a variety of design patterns and includes a color chart, product details, specifications, and design ideas. ▪ Kawneer Co., Inc., Niles, Mich.*

Circle 417 on inquiry card

BATHROOM ACCESSORIES—DOOR CHIMES / One color catalog shows the complete line of bathroom cabinets, mirrors and accessories. Another color catalog presents the full line of door chimes, bells, buzzers, transformers and push buttons. ▪ Miami-Carey Division, The Philip Carey Manufacturing Company, Cincinnati.

Circle 418 on inquiry card

GLASS APPLICATIONS / Dramatic and unusual use of glass is the subject of a 12-page quarterly magazine entitled "Creative Ideas in Glass." ▪ American Saint Gobain Corporation, Kingsport, Tenn.*

Circle 419 on inquiry card

CERAMIC TILE FOR BATH DECOR / Many decorative schemes are presented in a 32-page full-color booklet that shows powder rooms, second baths, family baths, and special baths for men, women and children. ▪ United States Ceramic Tile Company, Canton, Ohio.*

Circle 420 on inquiry card

CERAMIC TILE / A 16-page color brochure shows typical applications of tile for many rooms of the house, suggesting a variety of individual designs. Available for 10 cents. ▪ American Olean Tile Company, Lansdale, Pa.*

STEEL PIPE / "Basic Data—Structural Uses for Steel Pipe" contains examples that range from building frameworks to amusement park attractions to geodesic domes. ▪ American Iron and Steel Institute, New York City.

Circle 421 on inquiry card

STEEL SHELVING / Modern steel shelving (including mezzanine shelving) and efficient ways to use it are the subjects of a 24-page illustrated catalog. Topics include installations for business, industrial and institutional purposes. ▪ Penco Products, Inc., Oaks, Pa.

Circle 422 on inquiry card

STEEL BUILDINGS / A 20-page brochure on the use of *Stran-Steel* buildings in community and recreational projects ranging from schools to bowling alleys and churches discusses the styling, economy and investment aspects of the buildings. The brochure includes pictures and stories of buildings in which *Stran-Steel* systems were used. ▪ Stran-Steel Corporation, Houston.*

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

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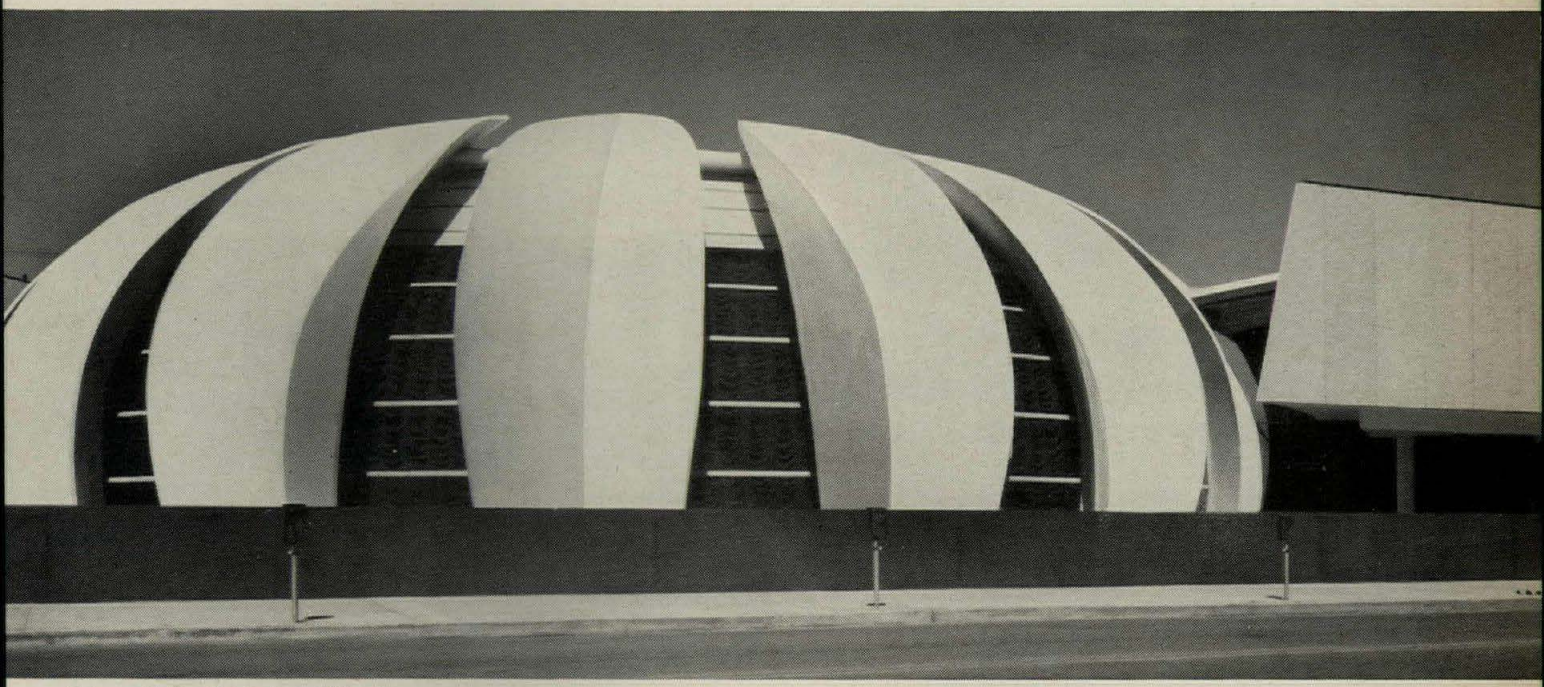
For more data, circle 106 on inquiry card


for individuality...
SKREBNESKI

reinforced concrete is the architects' design material

■ The coming of age in architecture in America lets architects exercise with complete freedom their artistic talents for highly creative building design. ■ In this architectural evolution, reinforced concrete is the preferred construction material. It can be molded freely into any contour and shape, and eliminates the many design restrictions imposed by all other construction methods for the achievement of architectural individuality, elegance, and sculptured form. ■ In this unique structure, the architect utilized a monolithic reinforced concrete frame with the large sculptured concrete leaves cast as separate monolithic units on mounds of earth by the contractor. ■ Decide now to utilize the greater design opportunities of reinforced concrete in your next building.

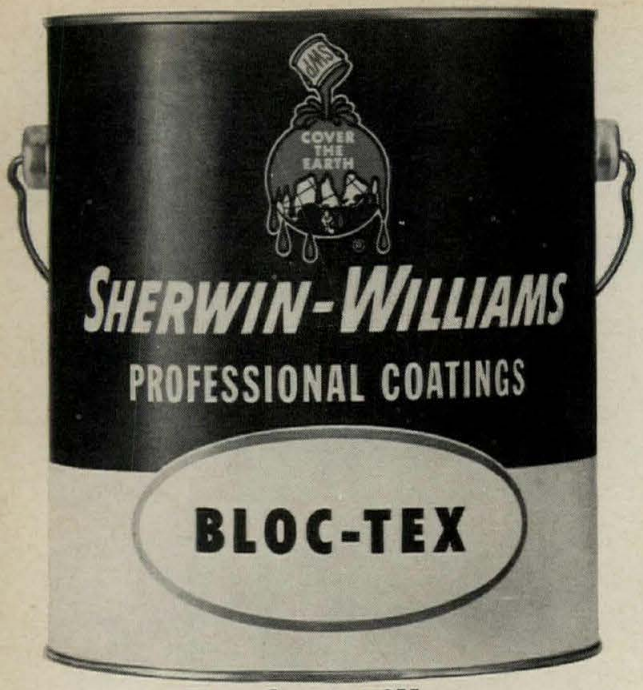


Wyoming National Bank, Casper, Wyoming
Architect: Charles Deaton
Structural Engineers: Ketchum, Konkle, Ryan & Fleming
General Contractor: The B. H. Baker Company

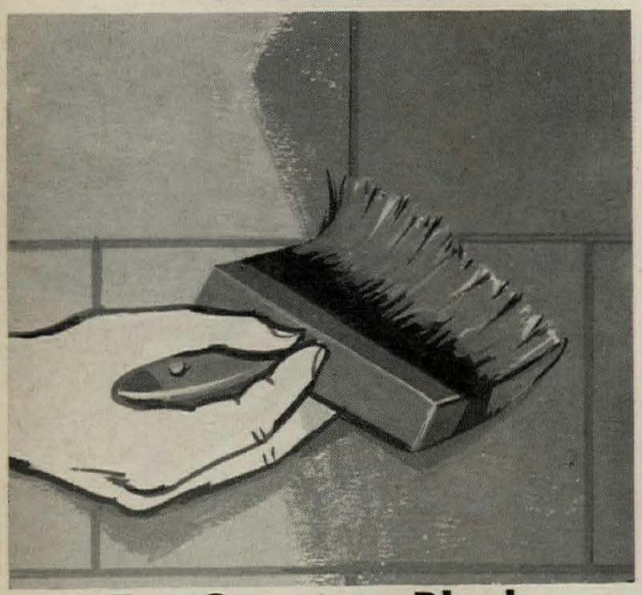
CRSI
FOUNDED 1924

4-65

CONCRETE REINFORCING STEEL INSTITUTE
228 North La Salle Street • Chicago, Illinois 60601



Perfect Filler



For Concrete Block

Sherwin-Williams Bloc-Tex® is a new type of block filler that produces smoother and superior cement block surfaces. □ An entirely new aggregate-free filler, it may be applied easily by brush, airless or conventional spray. □ Quick-drying Bloc-Tex dries to touch in 2 hours. It may be top coated, if necessary, in 24 hours. When finished with two coats of masonry type paint, exterior surfaces will withstand the most severe weather conditions. □ For complete facts on Bloc-Tex for filling concrete block, use the coupon below.

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THE SHERWIN-WILLIAMS CO.
101 Prospect Avenue N.W., Cleveland, Ohio 44101
Please send me your free brochure B-901 on Bloc-Tex for filling concrete block.
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Address_____
City_____ State_____ Zip_____

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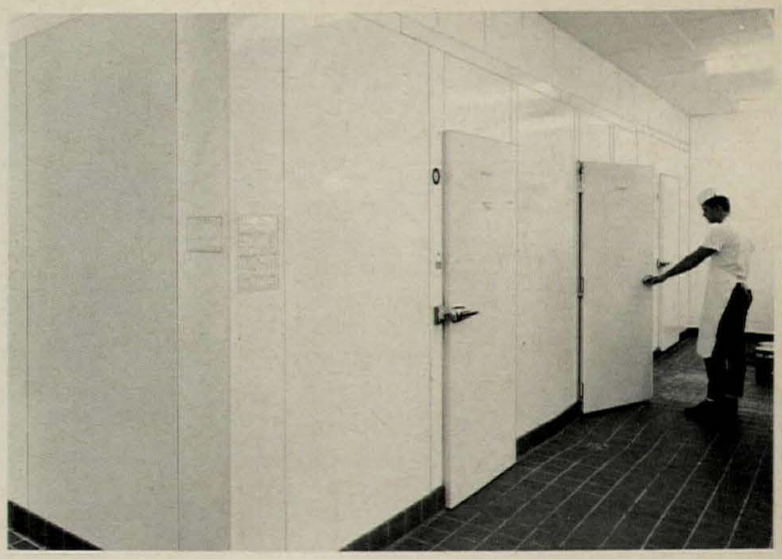
Schaefer Refrigerated Back Room Storage Walk-ins Offer

MAXIMUM DIMENSION FLEXIBILITY



If your next commission calls for *walk-in storage refrigeration*, you should know this: Schaefer prefabricated walk-ins can be specified in modular sections, allowing the exact wall, ceiling, floor sizes to fit your clients' precise needs. Medium, low and dual temperature units available. Before you specify any walk-in, look to Schaefer . . . one of the world's most trusted, experienced manufacturers of refrigeration equipment.

■ *Write today for free specifications. No obligation.*

COMMERCIAL REFRIGERATION DIVISION
SCHAEFER Studebaker CORPORATION
MINNEAPOLIS, MINN. 55401

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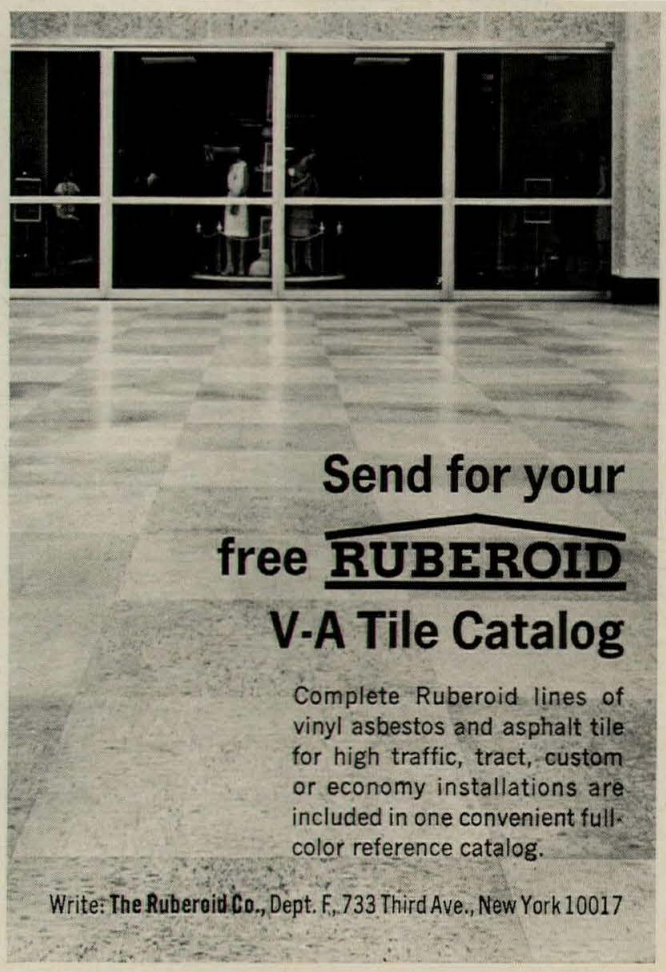
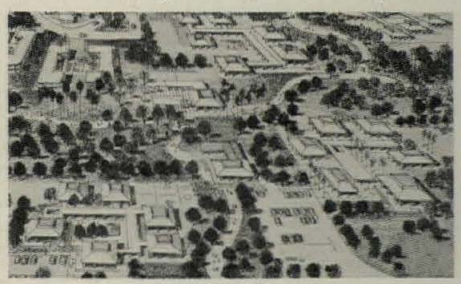


For more data, circle 107 on inquiry card

Litchfield Park: for some a paradise in suburban Phoenix

A 12,000-acre site—once a cotton farm—18 miles west of Phoenix, Arizona is being developed into a new town community under the sponsorship of the Goodyear Rubber Company. When finished in approximately 25 years time, Litchfield Park will have a population of between 75,000 and 100,000 people, who will live in a series of villages grouped on either side of a central core (rendering, right) which will include colleges, museums, hospitals, offices, regional parks and shopping facilities and will extend for about four miles through the center of the town. Victor Gruen and Associates, with Edgardo Contini as partner-in-charge, are developing the master plan.

The architects have adopted a neighborhood approach to town planning, with the basic residential neighborhood accommodating between 500 and 800 residential units—apartments, detached and patio houses and town house clusters—which will be built around some kind of central recreational facility, either pool, golf-course or equestrian trail. Each neighborhood will have its own elementary school, but the schools of adjoining neighborhoods will be grouped together in anticipation of possible changes to the education system, which might require several buildings on a single campus. Villages—consisting of two or four neighborhoods—will have small village centers (rendering, below) containing some



shopping and meeting areas for different age groups. Larger community centers with a high-school, shopping plaza and offices, will be sited to serve every 15,000 to 20,000 people.

The traffic plan provides a loosely interwoven grid of arterial roads, and a separate, secondary-path network connecting the neighborhoods and individual villages with one another. This secondary system is designed for pedestrians, cyclists and for electric carts.

Development work has already begun on the site of an existing small village, and designs for the first service station, community recreation and shopping centers are by Phoenix architect, Bennie Gonzales.

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

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

When you design the elements of flexibility into your schools be sure your thermal system will permit those elements to function.

Unit ventilators will not. They must be firmly anchored against a permanent wall and permanently connected to hot or chilled water supply.

A Lennox direct multizone system, in contrast, permits total flexibility. For example:

It is roof mounted. Requires no floor space. No permanent walls.

Its ducts are flexible. Outlets can be moved at will. Therefore walls can be moved, added, or eliminated. Shapes and sizes of rooms can be altered. Occupancy can be changed at will.

And if buildings are added, you simply put additional DMS units on the roof.

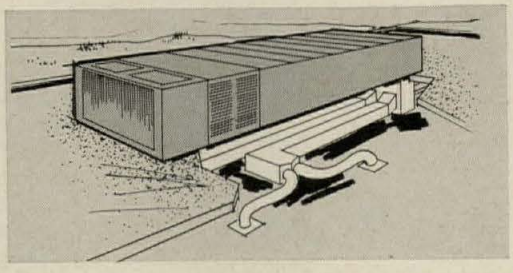
Each Lennox DMS provides room by room thermal control (up to 12 zones per unit). Each responds instantly to changes in weather or occupancy.

A DMS unit can provide 100% outside air to meet the ventilation demands of high occupancy or accelerated activity.

It will cool free, using outside air, any time temperatures are below 57°F. Mechanical cooling can be installed originally, or added any time.

A low silhouette (42"), and wide choice of outlet designs, impose no architectural limitations. In fact, design opportunities are unlimited.

The Lennox DMS provides the ideal learning climate, both thermally, and in terms of spatial flexibility. For information, write Lennox Industries Inc., 684 South 12th Ave., Marshalltown, Iowa.



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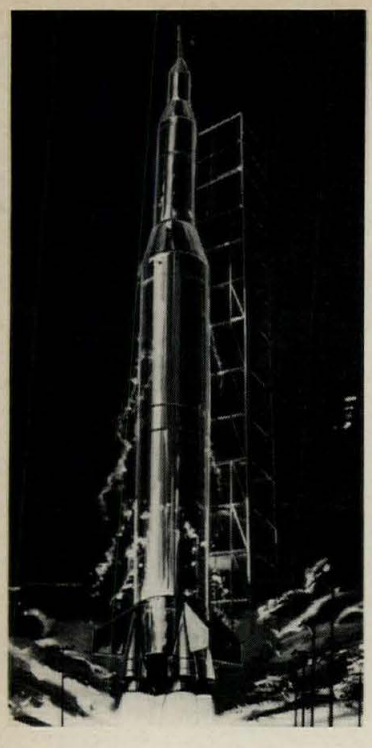
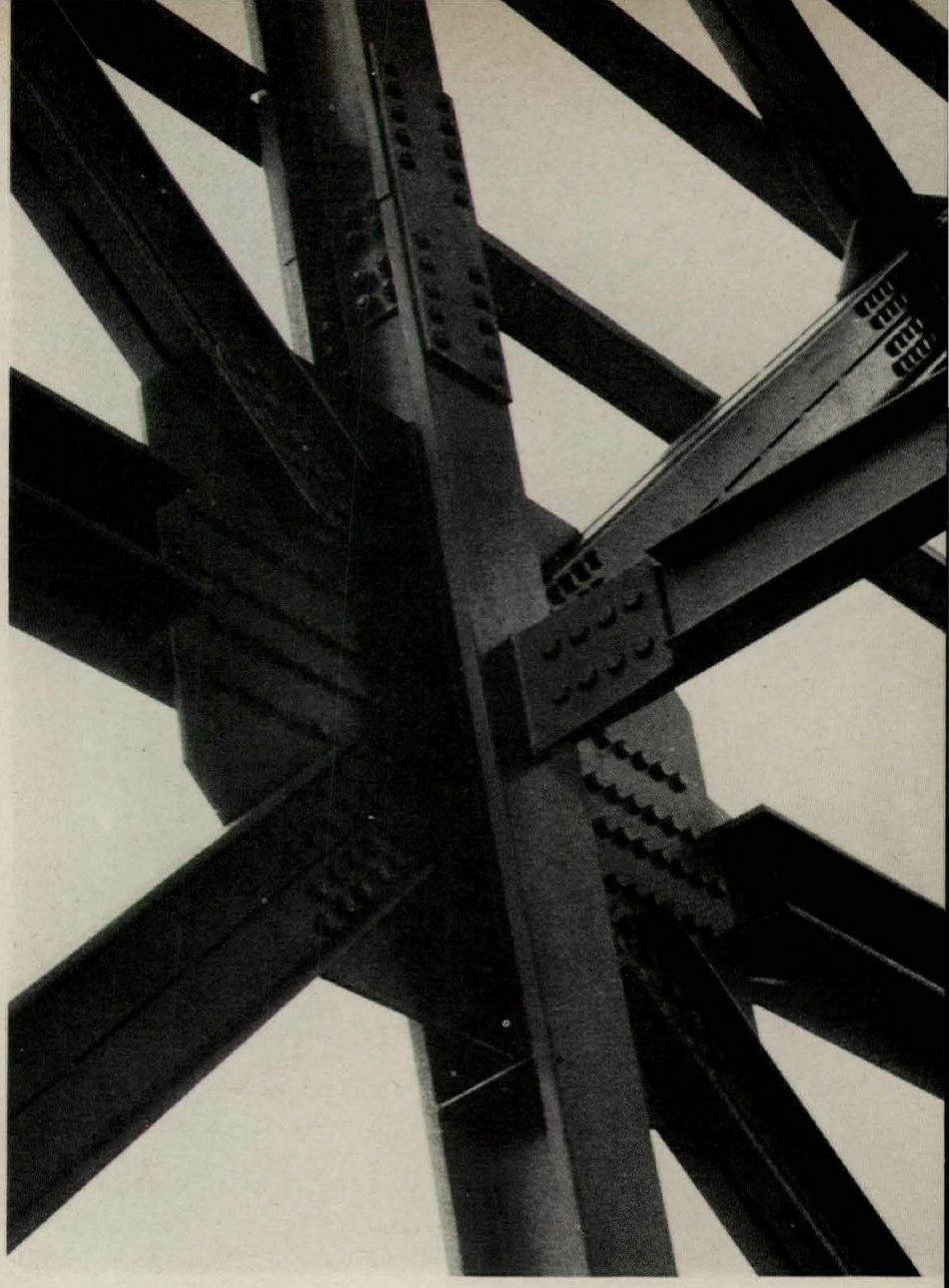




HOW TO SHOOT THE MOON

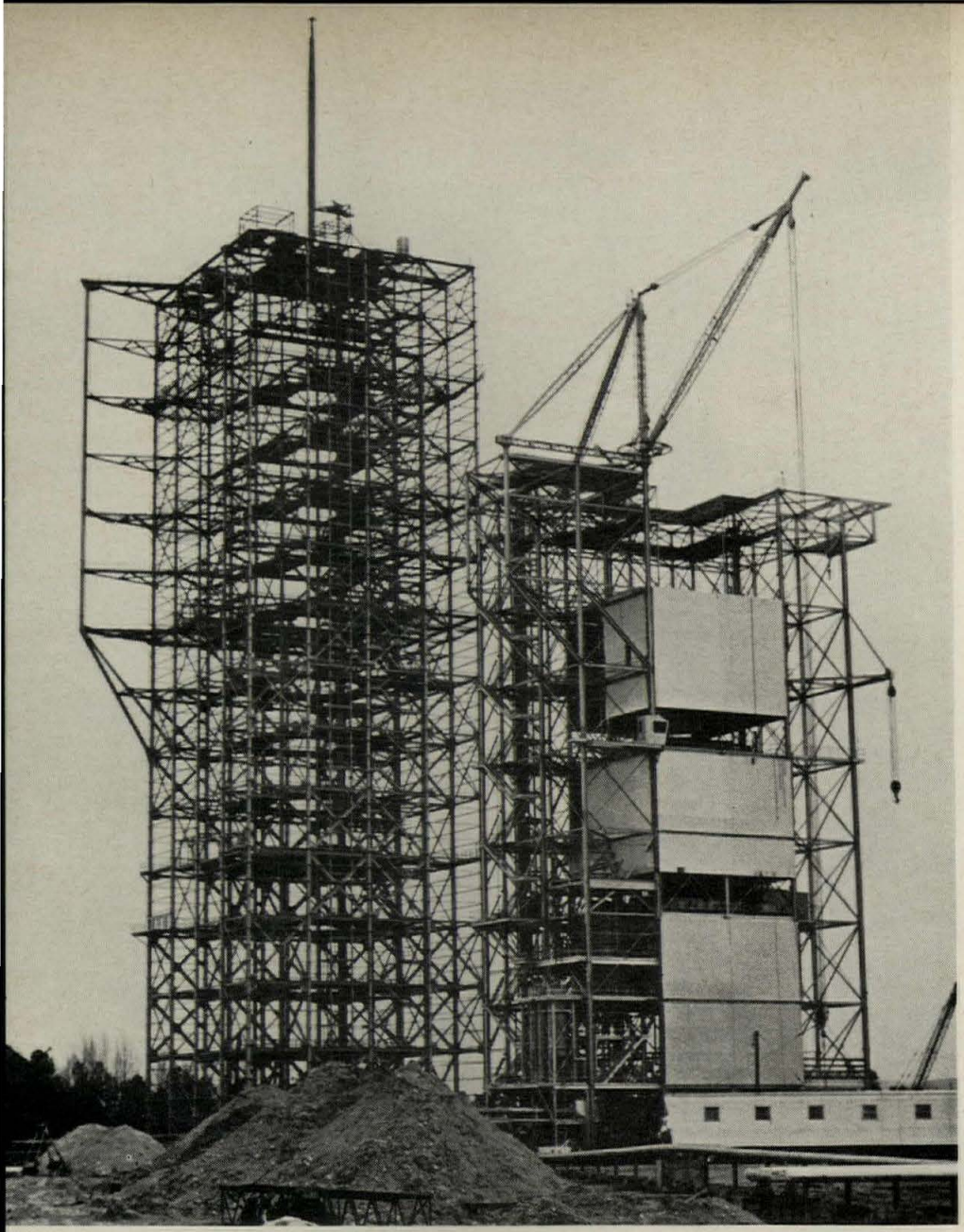
(without leaving the ground)

First, build a flight test tower using 200,000 Republic High Strength Bolts

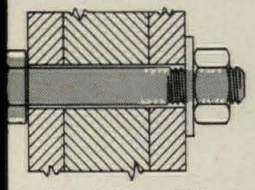
Soon, Saturn V, the largest, most powerful space vehicle ever launched, will thunder into flight for the first time. But, before this giant step in man's now certain journey to the moon, NASA's Apollo program engineers must have complete preflight knowledge of Saturn type vehicle's vibration and bending characteristics.

As one means of verifying the ability of the Saturn vehicles to resist stresses of launching and early flight, NASA's Marshall Space Flight Center, Huntsville, Alabama, has built the 360′ dynamic test tower, shown at left in the photo above. The Saturn V boost vehicle will be placed in this tower and subjected to extreme vibrations, simulating actual flight conditions. Information thus gained will then be incorporated in the design of the vehicle's electrical control systems.

Obviously, for such a test to be possible, the test tower itself must be capable of withstanding the same violent strains applied to the space vehicle. Republic High Strength Bolts used in the test tower are equal to the task. New Republic Heavy Head



lt design permits tightening to greater clamping loads an ever before. This tightening force is transferred to nts as clamping strength—an advantage impossible to plicate with any other fastening method. In addition, read length has been shortened to remove threads from e shear plane and assure maximum shear strength. Saving th time and cost in construction, Republic High Strength lts are the original *and* final fasteners—and saving re cost, no washers need be used under new AISC and EA recognized "turn-of-the-nut" tightening methods.



Could there be better proof that Republic High Strength Bolts are the ultimate in reliability? You don't have to be "shooting the moon" either, to take advantage of this remarkable new fastening method. Just call ur local Republic representative, or send the coupon. s worth your time, whether you're trying to rise to a e-story completion date or a 196x rendezvous in space.

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ON THE CALENDAR

JANUARY

3 22nd Annual Conference, Reinforced Plastics Division, Society of the Plastics Industry—Shoreham Hotel, Washington, D.C.; through February 3.

4-7 Winter Meeting, National Society of Professional Engineers—American Hotel, San Juan, Puerto Rico.

FEBRUARY, 1967

6-10 Environmental Engineering Conference, American Society of Civil Engineers —Statler Hilton Hotel, Dallas.

OFFICE NOTES

NEW FIRMS, FIRM CHANGES

Robert L. Mills, A.I.A. has opened an office on Water St., Blacksburg, Va.

Peter S. Sabin, A.I.A. has opened an architectural office at 230 California Ave., Suite 208, Palo Alto, Calif.

The White Plains office of the **Perkins & Will Partnership,** architects with offices in White Plains, Chicago and Washington, has elected **William J. McCoy, David L. Ginsberg, A.I.A.,** and **David K. Pyle, A.I.A.,** partners.

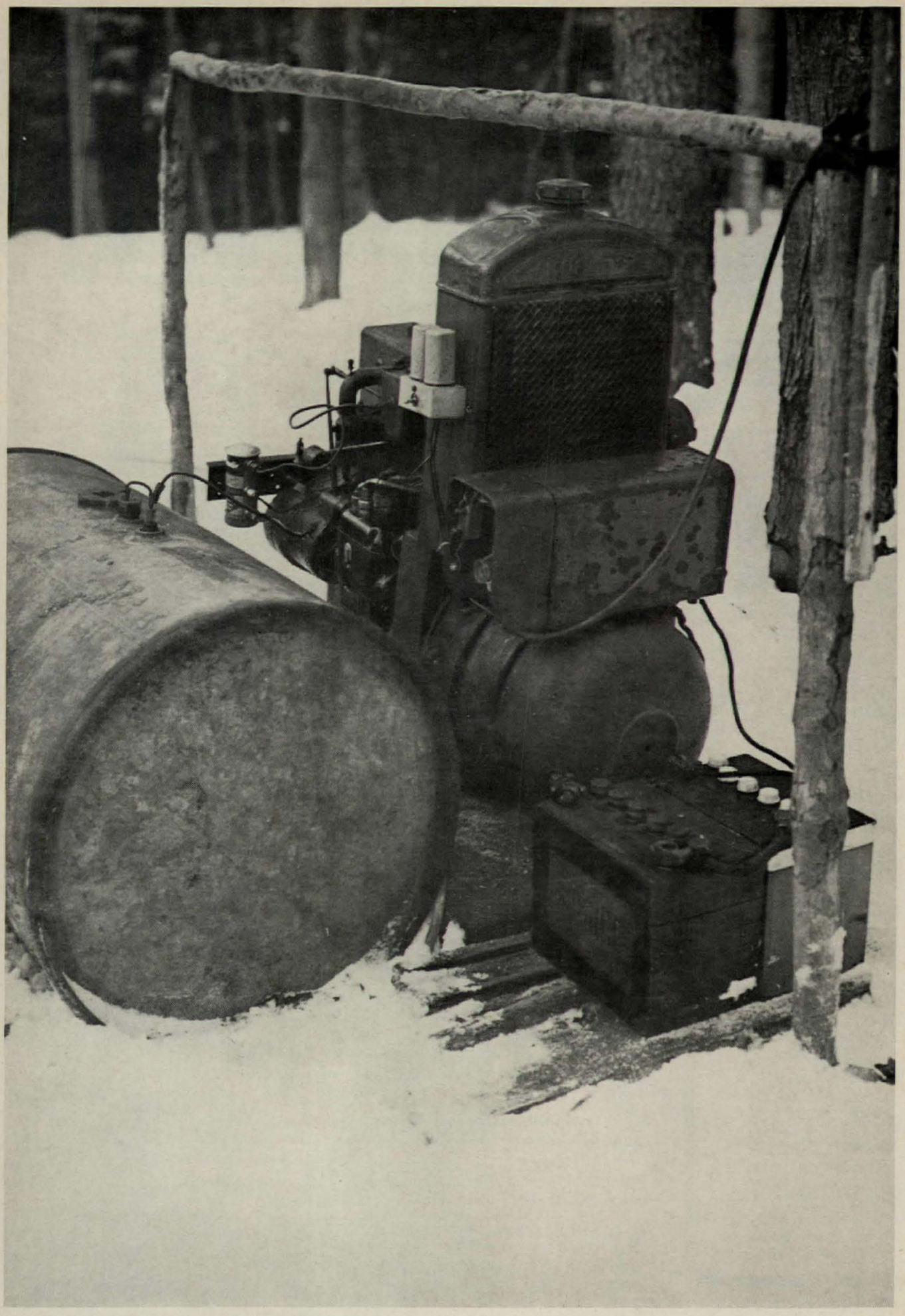
L. Edward Kime and **Dennis W. Queenan,** architects, and **H. Richard Hanson** and **James B. Erard** have been named associates by **Richards, Bauer & Moorhead,** Toledo architectural and engineering firm.

Shaver & Company Architects have formed a new partnership with **John A. Shaver, Leslie V. Appleby, John D. Smutz, Webb R. Isley, Lee J. Brockway** and **Robert I. McKay** as partners. Principal offices are in Salina, Kan.; Michigan City, Ind.; Beatrice, Neb.; and Palo Alto, Calif.

Donald W. Macpherson, Harry M. Kurki and **Robert P. Breading** have been named partners in the Philadelphia architectural firm of **Harbeson Hough Livingston & Larson.**

James H. Mildes, planner and architect, has joined the firm of **Albert A. Hoover And Associates Architects,** of Palo Alto, Calif.

continued on page 239



Kohler built this electric plant in 1922.

R. W. Twaddell bought it second hand in 1935

He'll probably never need to buy another.

Mr. Twaddell, of Sidney, New York, bought this 1922 model 1500 watt, 110 volt Kohler electric plant second hand in 1935. Today, after 44 years of service, it's still performing ...supplying power for house lighting, a water pump, toaster, vacuum cleaner, electric drill and radio. Occasionally it's also used as a battery charger.

Exceptional story? No. Exceptional electric plant. And the Kohler you buy today is just as exceptional. The same dependable performance and long life, whether you use it for home lighting, as a portable-mobile, standby source or for marine applications.

Says Mr. Twaddell, "This only serves to give you positive proof as to the quality of Kohler products. Whether 1922 vintage or current production models, we are definitely *sold* on the name of Kohler."

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MARKS OF VALUE

Check these Kohler marks of value. They're your assurance of the most reliable electric plant you can buy.

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- ✓ **Nationwide sales and service**—performed by Kohler-trained sales and service personnel.
- ✓ **Unitized design-plants** are completely assembled and tested at the factory, test certification is available.
- ✓ **Built-in vibro-mounts**—for quiet, smooth operation.
- ✓ **Automatic voltage and speed regulation**—maintain power at even level.
- ✓ **Units from 500 to 230,000 watts**—Gas, diesel and gasoline fuel options.
- ✓ **Integral exciter starting**—quickest, simplest, most positive, trouble-free engine starting available.

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Kohler Co., Established 1873, Kohler, Wisconsin

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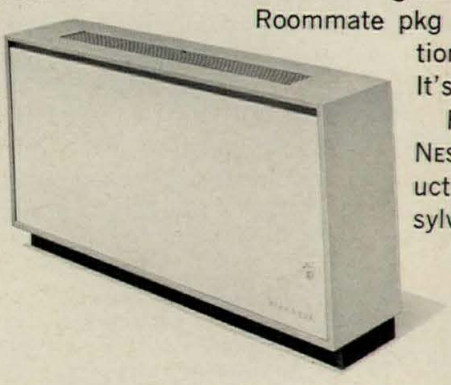
Try this simple test and hear how noisy air conditioners used to be.

Put your finger to your mouth and blow. Hear that? Now blow equally as hard without your finger. It's a lot quieter, isn't it? So is the new Roommate pkg air conditioner, when you put it to the test.

When Nesbitt engineers finished designing the Roommate packaged heating-cooling unit, they knew they had something on the quiet side.

To find out how quiet, they stood Roommate pkg next to the competitive models and turned them all on. The ear told the whole story. Roommate wasn't just measured quieter with sensory instruments, it was noticeably quieter.



Styled by Paul McCobb, the noted industrial designer, Roommate pkg has contemporary lines with two-tone grey or decorator colors. Cabinets are designed to fit any wall thickness.

Roommate pkg is the ideal unit for offices, hospitals, apartments, motels and hotels. Install it in new or existing buildings.

Roommate pkg will prove to be the air conditioner you can turn on and forget. It's that reliable... that quiet.

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continued from page 235

Howard Barnstone and **Eugene Aubry** have formed a partnership for the practice of architecture with offices at 1914 West Capitol, Houston.

Laurent J. Torno, Jr. has been elected to partnership in the St. Louis firm of **Berger-Landrum-Field Architects, Inc.**

The Pittsburgh architectural firm of **Deeter-Ritchey-Sippel** has named **Charles L. Christen** an associate; **James F. Dowden, Jr.** chief project manager; **James C. Armstrong, Jr.** chief of production; and **Samuel E. Zionts** senior architect, in charge of architectural, mechanical and structural coordination for the firm.

Admitted as partners in the Newark, N.J. architectural firm of **Frank Grad & Sons,** are **Kenneth D. Wheeler, A.I.A.; David R. Dibner, A.I.A; Arthur R. Miele, A.I.A.; Paul E. Falkenstein, R.A.; Harry B. Mahler, A.I.A.;** and **Frank W. Orleans, A.I.A.**

A new architectural firm has been established in New York City to be known as **Ronald W. Haase and Associates, Architects.** The firm is a partnership formed by **Ronald W. Haase, Richard Hammel, Curtis Green** and **Bruce Abrahamson.** It will concentrate on educational design problems, and will be supported by the engineering and production staff of a parent firm, **Hammel, Green and Abrahamson** of St. Paul and Minneapolis. The New York City office, at 221 East 48th St., will be directed by Mr. Haase.

I.S.D. Incorporated, interior space designers with offices in New York and Chicago, has promoted **(Mrs.) Nancy Klumb** to senior project manager in the New York office. The firm is affiliated with the **Perkins & Will Partnership,** architects with offices in Washington, Chicago and White Plains, N.Y.

Charles Luckman Associates' New York office announces that **Andrew R. Ewing, Jr.** has joined the planning and architectural firm's business planning department.

The architectural office of which **Douglas W. Orr** was senior partner will continue under the name of **Douglas Orr, deCossy, Winder And Associates,** at 111 Whitney Ave., New Haven, Conn.

Serge P. Petroff, A.I.A. and **Robert Wagenseil Jones, A.I.A.** have formed a partnership for the practice of architecture under the name of **Petroff & Jones Associates, Architects,** at 441 Lexington Ave., New York City.

Phillips and Finisy Architects is a new architectural partnership formed by **Gordon A. Phillips, A.I.A.** and **Morris Neil Finisy, A.I.A.** Offices are located at 503 D St., San Rafael, Calif.

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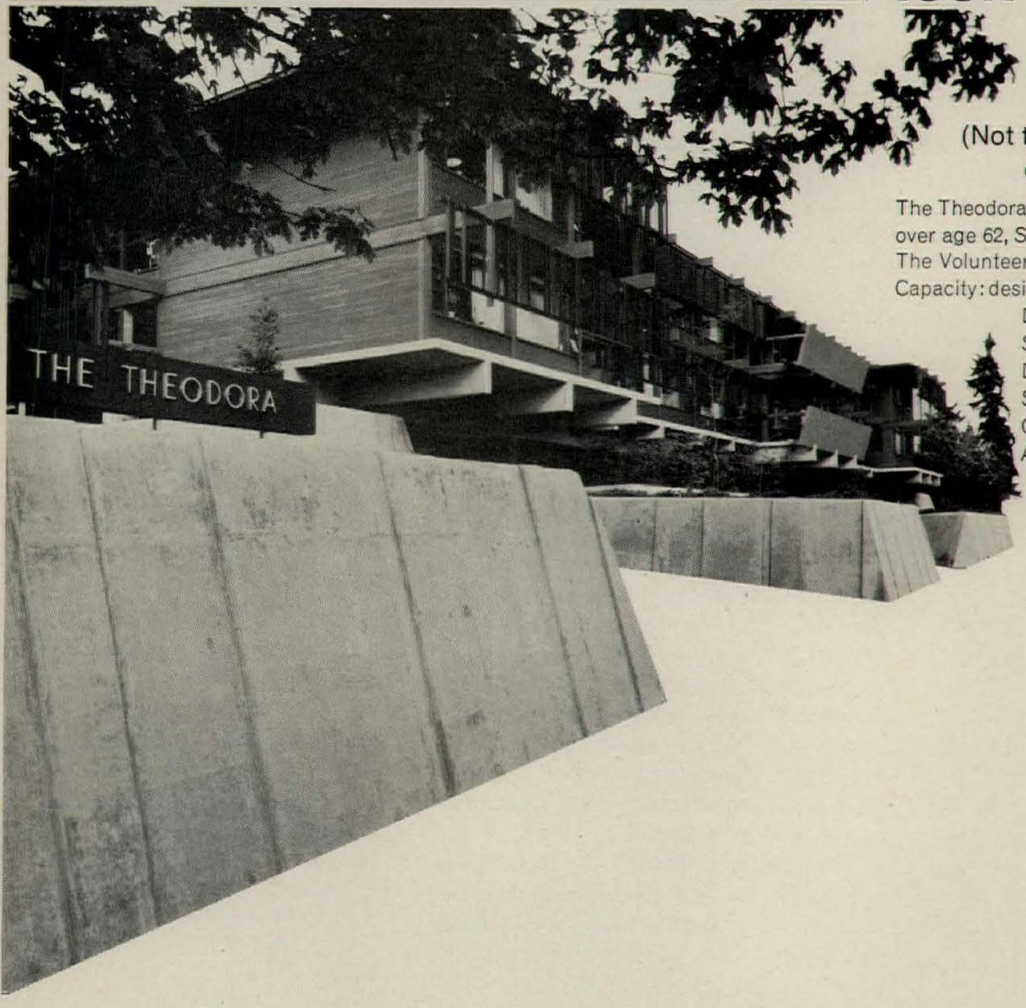
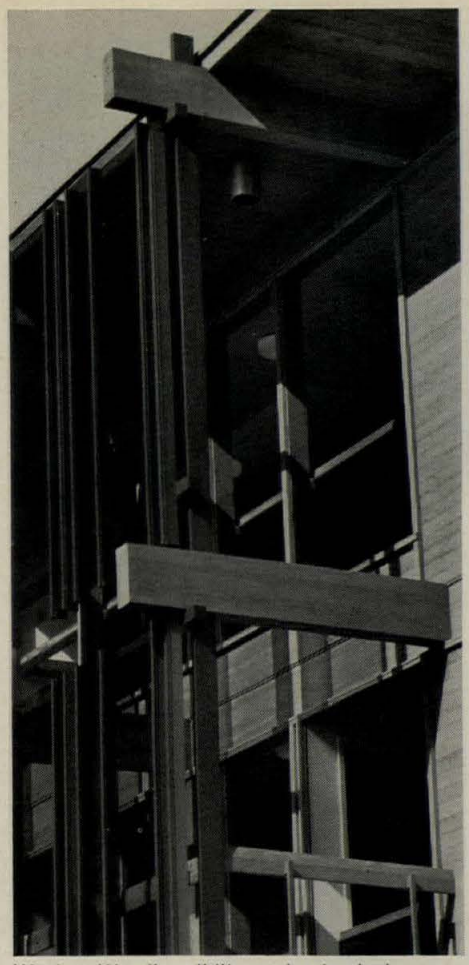


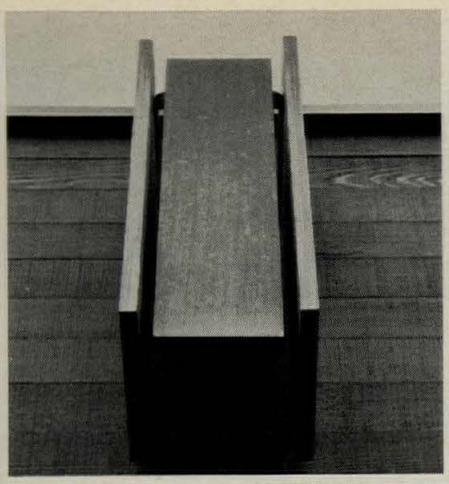
Who says an economy retirement home has to look cheap?

(Not the 173 senior citizens who love it here)

The Theodora, retirement home for persons over age 62, Seattle, Washington. Operated by The Volunteers of America.
Capacity: designed for 224 residents.
Designed and built under Section 202, Housing and Urban Development Program, United States Government. Architects: Grant, Copeland, Chervenak A.I.A. and Associates.

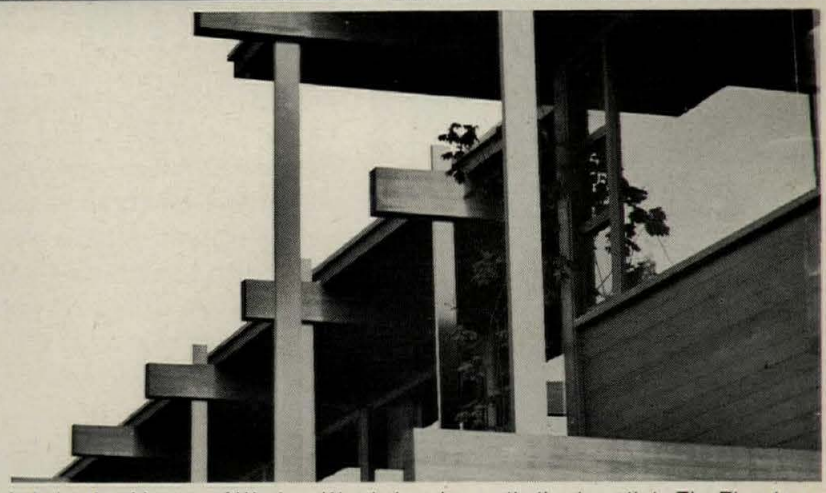


Western Wood's solidity contrasts nicely with reflective privacy screen.



TOP LEFT/Simple light box blends perfectly with the larger structural elements.

TOP RIGHT/Among the structural systems used in The Theodora is Machine Stress Rated trussed joist construction.



Laminated structural beams of Western Wood also give aesthetic strength to The Theodora.

Uncle Sam can be mighty cold and calculating. Especially when laying down the law for projects he's backing. Retirement housing is no exception. The rules demand safe, sound, serviceable, economical shelter. No frills. And that's what the Theodora had to be. But the architects faced a problem of not only creating shelter for its full-time residents, but of establishing an environment that would attract and keep them. And a building which would enhance the surrounding neighborhood. Something extra was needed . . . at no extra cost.

They solved the problem through simplicity of design and Western Wood. The result is evident in the illustrations here. The Theodora management was able to hang up the "sold out" sign even before advertising and promotional materials were prepared. And the structure is accepted by the community as a handsome architectural contribution to the area.

Most important to the residents (who range in age up to 102), Western Wood brings to the Theodora a continuity with the past . . . a warm, familiar environment where they feel proudly "at home" despite the contemporary lines of the building.

Western Wood can offset many of your budget limitations in institutional and commercial design. It's a material familiar to all concerned, holding on-site costs down and construction quality up. And it's available almost everywhere in a wide selection of styles, shapes, sizes, textures and grades.

Think Western Wood throughout your planning . . . you'll find it can stretch your design dollars for maximum effect.

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- ☐ Machine Stress Rated Manual
- ☐ Siding Guide

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continued from page 239

The Detroit-based architectural and engineering firm of **Harley, Ellington, Cowin and Stirton, Inc.** has named **Thomas A. Harkanyi, A.I.A.** administrative designer. The firm also has appointed **James A. Kilgore, A.I.A.** as assistant chief of its architectural department.

ADDENDA

In the news story about the John Fitzgerald Kennedy Federal Building (October, page 40), the credits for the project should have read: Design: The Architects Collaborative (Principals: Walter Gropius, Norman Fletcher. Senior Associate: Roland Kluver) and Samuel Glaser Associates (Principal: Samuel Glaser. Senior Associate: Clifford Towne); structural engineers: William J. LeMessurier & Associates, Inc.; and mechanical engineers: Joseph R. Loring & Associates, Inc. Guy B. Panero Engineers, Inc. (A Joint Venture).

Correct credits for the Youth Pavilion at Expo 67 (October, page 176) should have read: architects: les Architectes Ouellet, Reeves, Alain; interior designers: Francois Lamy and Associates.

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Roofing Company

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By Ludowici

Shelter for A House of Worship

As stone and brick was used for permanence in the construction of Temple Emanuel, so Ludowici-Celadon roofing tiles were chosen for their everlasting beauty and strength. Easily adapted to any design, these tiles soundly reject any and all elements. Available in a variety of shapes, styles and colors to complement any design for the life of the building.

Whether planning a new structure or replacing your present roof, be sure to consider the architectural advantages of a Ludowici-Celadon tile roof.

A special brochure is available upon request.

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Please—by return mail—send me your special architectural brochure illustrating *Ludowici* roofing tiles in full color.

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A four-pipe system isn't always the answer.

Want extra space for a pool and a garage?

Then consider a General Electric Zoneline heating/cooling system. The way architects Nowicki & Pollilo did with the William Penn House, Philadelphia, Pennsylvania, shown here.

G-E Zoneline gives you all the benefits of a four-pipe system. But, because it does away with pipes, ducts, boilers and cooling towers, it frees space—for a garage in the basement or a pool on the roof or both.

Other benefits:

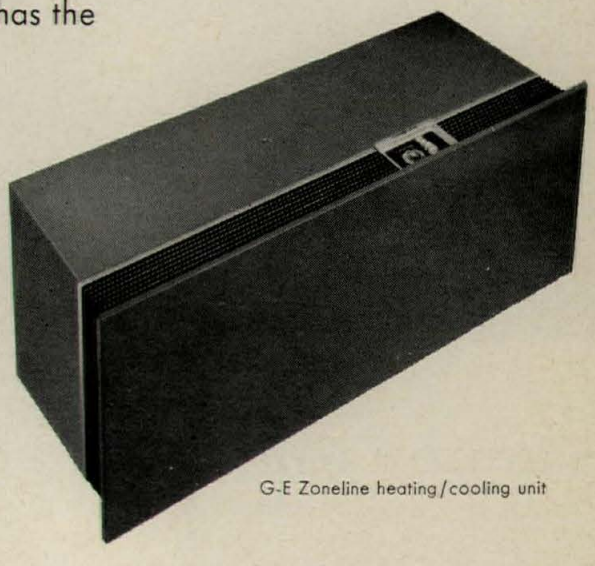
FIRST COST can be cut drastically. The General Electric system used for William Penn House was much less than estimates for a four-pipe system.

ROOM-BY-ROOM CONTROLS enable a tenant who is chilly to turn on the heat, even though everyone else has the air conditioning on.

CHOICE OF GRILLWORK is one you make. G-E Zoneline grille comes in two standard designs or can be treated architecturally to blend with building appearance.

INTERIOR FLEXIBILITY allows you to fit units over doors (Marina Towers, Chicago) or under window seats (Century House, Lincoln, Nebraska).

From motels to high-rise construction, Zoneline systems can make dramatic economies in space and first cost. Call your General Electric Zoneline Air Conditioning Representative for the facts.



G-E Zoneline heating/cooling unit

Air Conditioning Department, Appliance Park, Louisville, Kentucky

GENERAL ELECTRIC

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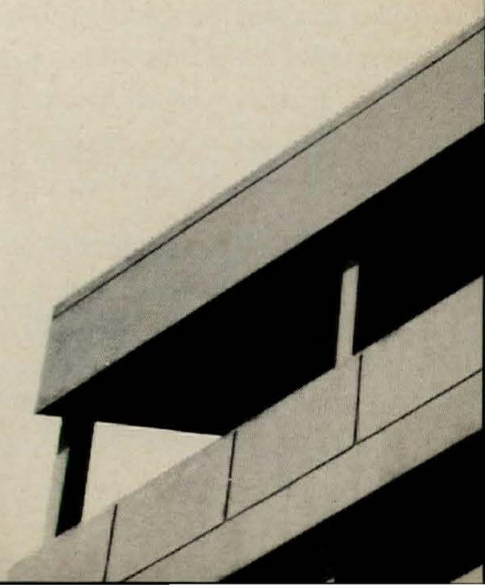

Owner: William Penn House, Inc.
Architect: Nowicki & Pollilo
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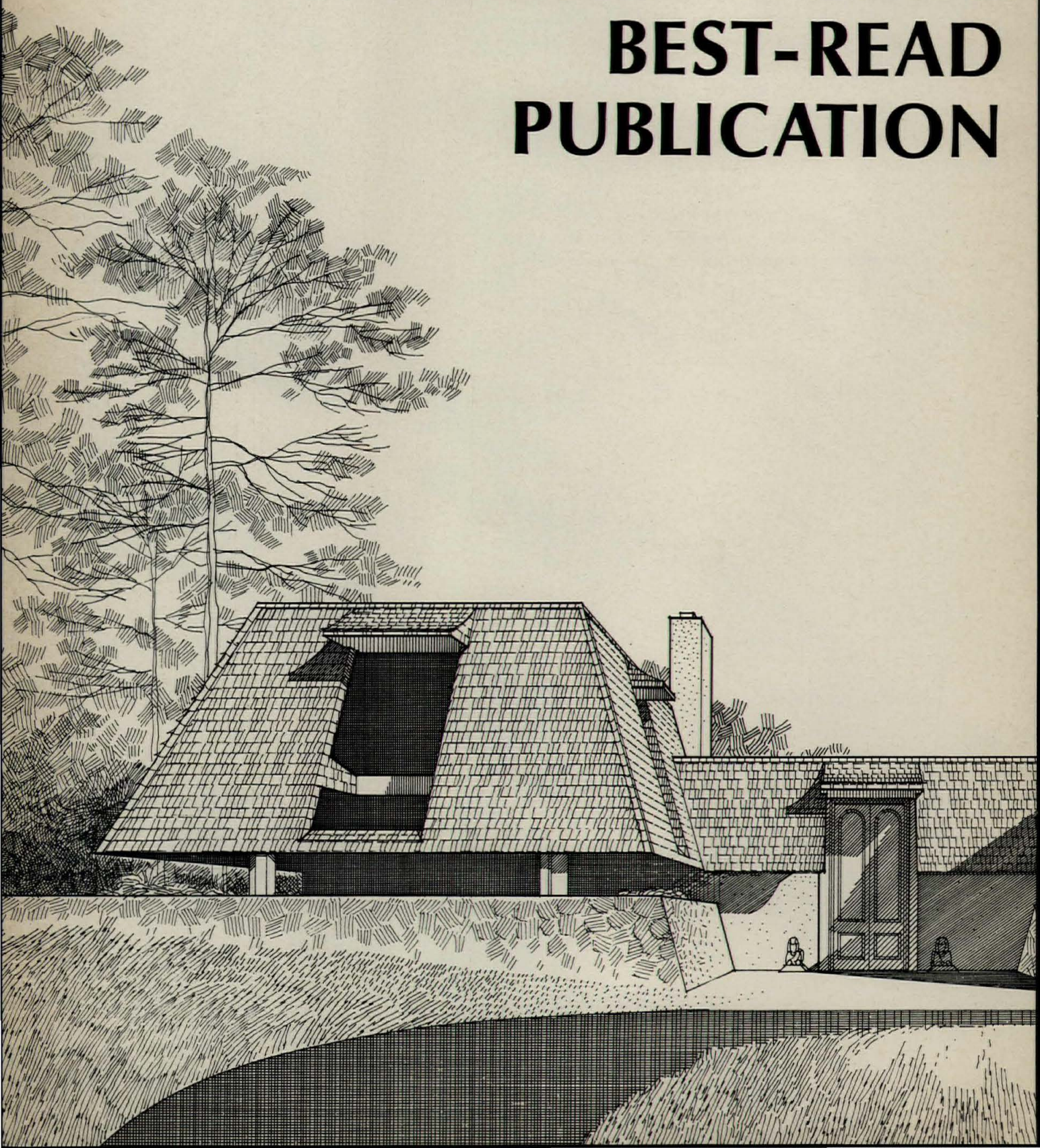

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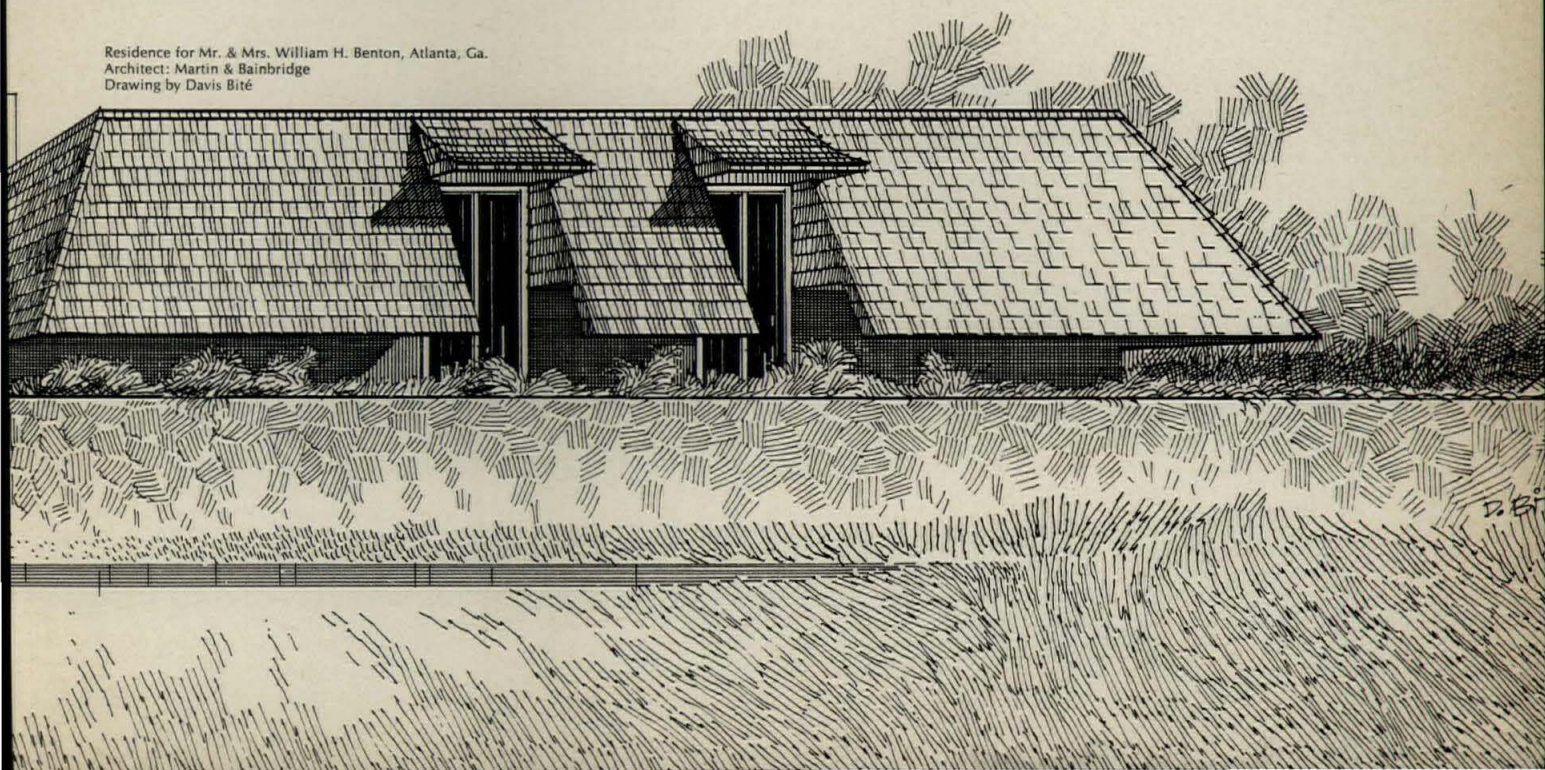

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SEMI-ANNUAL INDEX

VOLUME 140
JUNE-DEC. 1966

Readers using the index will find buildings, with only a few exceptions, entered in three ways: by architect's name, by owner's name, and by building type (apartments, hospitals, schools, etc.). Still other categories cover the special subjects dealt with in the magazine's engineering section (concrete, lighting, prefabrication, etc.). ABBREVIATIONS: BTS—Building Types Study; AE—Architectural Engineering; TSS—Time-Saver Standards; BC—Building Components; RR—Record Reports

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L Light Construction File (yellow)

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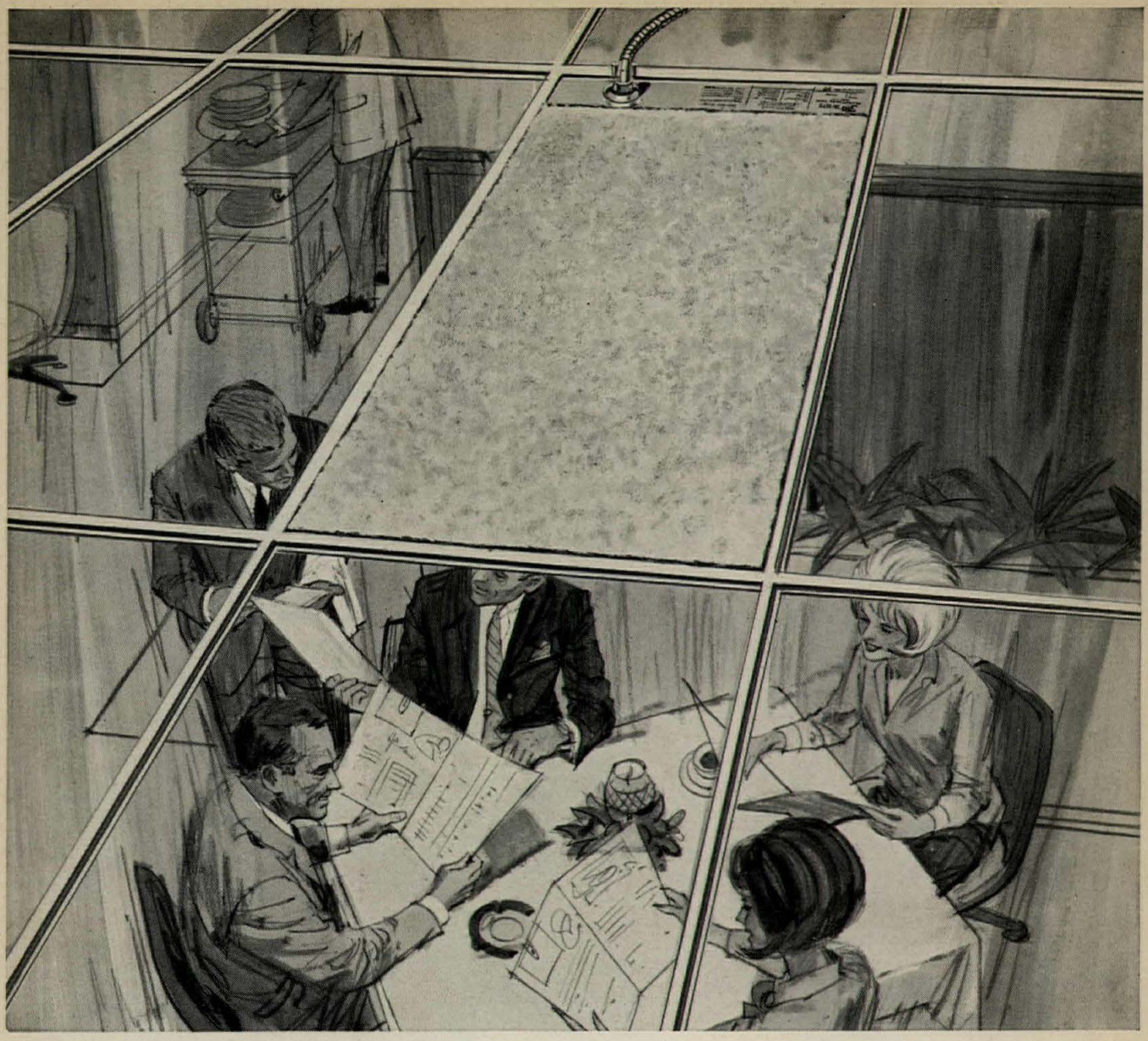
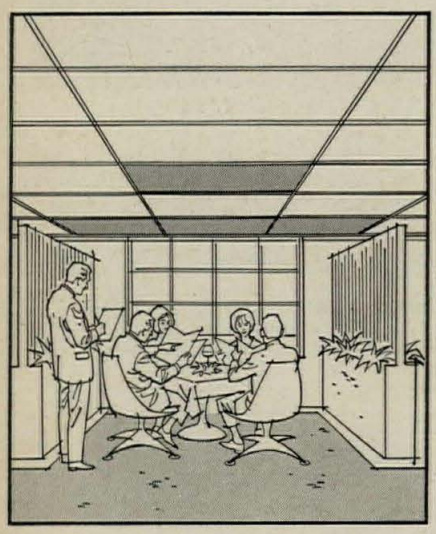


If your clients cater to comfort, why not drop in a heating system like this?



T-bar Ceiling Heat, using new 3M Brand Radiant Electric Heating Panels.

Even a gourmet dinner is more enjoyable if the diners are comfortable. And they will be. Everyone is, with a heating system incorporating new 3M heating panels.

They radiate gentle sun-like warmth. There are no drafts. The floor stays warm. Each room is thermostatically controlled. They are ideal for maximum comfort total heat, or for supplementing a central system in high heat loss areas.

This ceiling-mounted system does not interfere with ductwork, utilities, or structural members. You enjoy complete freedom of design.

3M Heating Panels have no moving parts to whir, rattle or wear out. They cycle on and off without a sound.

Designed specifically for drop ceilings, the panels are one-inch thin, and fit into the standard 2′ x 4′ T-Bar module. To install simply drop them in and wire up.

Supplied in flat off-white; they can also be painted to blend or contrast with surrounding panels of acoustical material or translucent lighting panels.

More information? Write Electric Products Division, 3M Company, Building 220-5W, St. Paul, Minn. 55119

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