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THREE SMALL MOVIE THEATERS IN REMODELED SPACES

HACKLEY SCHOOL ADDITION BY JANKO RASIC

BUILDING TYPES STUDY: AIRPORTS

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ARCHITECTURAL RECORD

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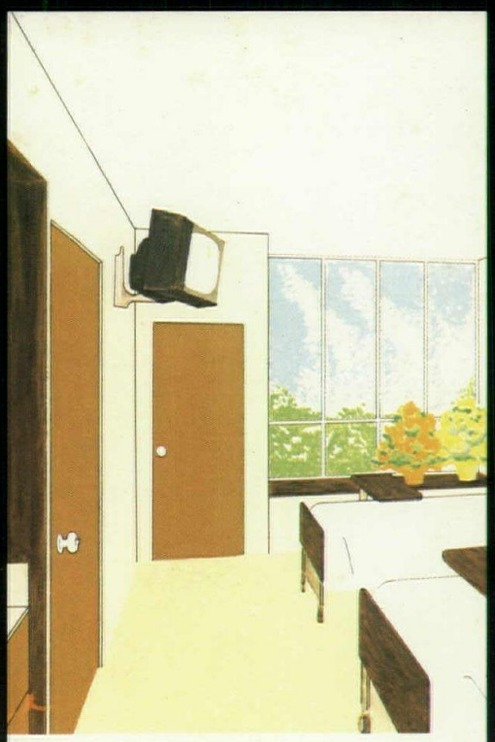

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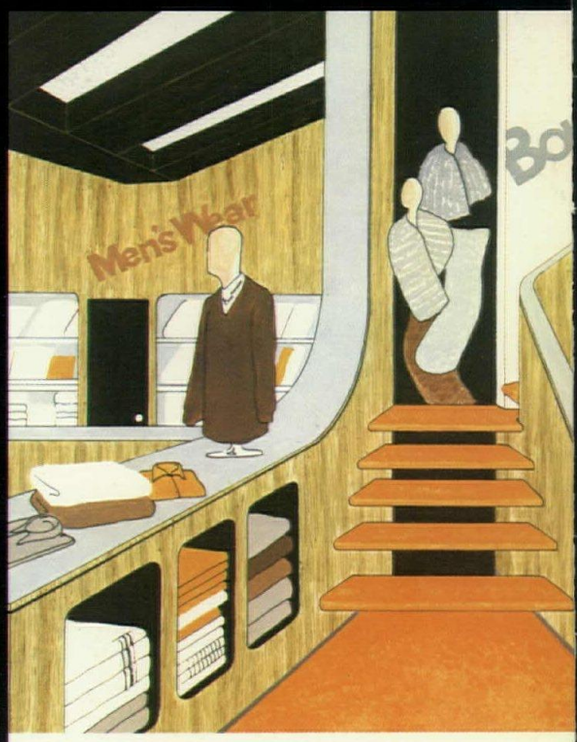

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Imaginations can run free with design ideas—all carried out with beauty and with functional benefits. That's what the Wilson-Art Look in laminated plastics is all about! Write for Brochure #103

When the chips are down, you can depend on Wilson-Art.

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RALPH WILSON PLASTICS COMPANY
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And because Wilson-Art specializes in contract we can offer you—the specifier—a total "hard-surface" decoratives package. Wilson-Art DOR-

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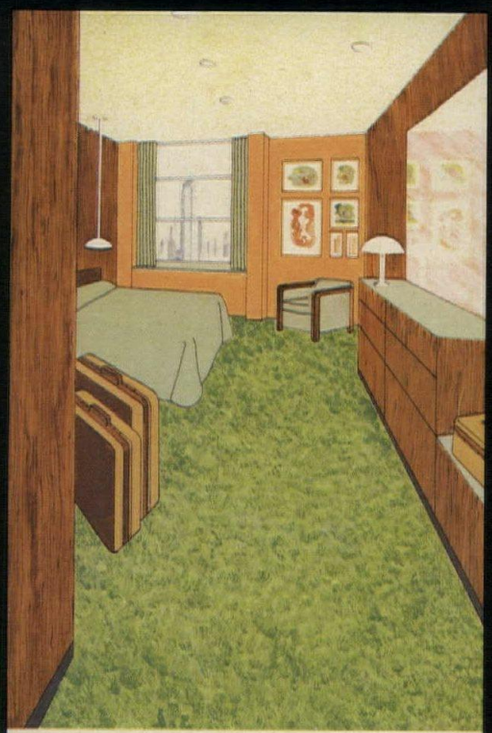

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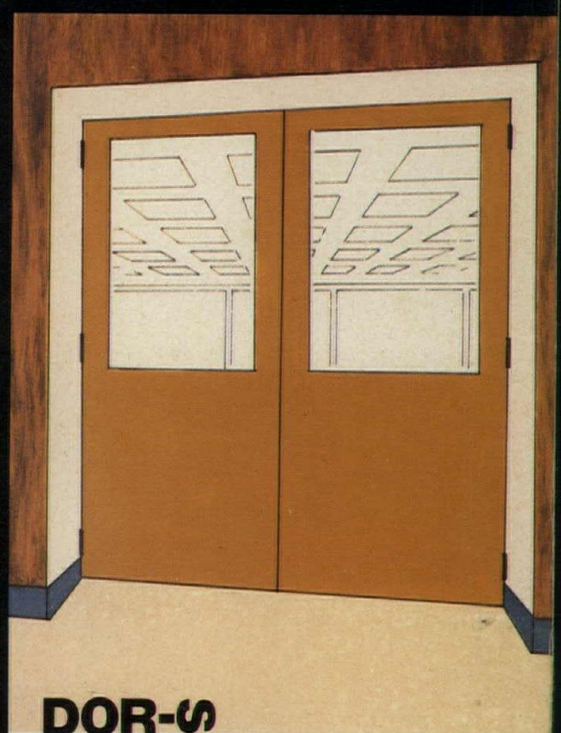
A simple change in specifications—you've got two (or two hundred) uniquely distinctive rooms, all from the same basic design . . . all specified from more than 140 Wilson-Art laminated plastic woodgrains, solids and patterns! Write for Brochure #105



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—a tough new face, from Wilson-Art! Doors surfaced with 1/8" thick Wilson-Art laminated plastic DOR-SURF are exceptionally tough, impact and abrasion resistant, and cost about the same as conventionally finished doors. (Matching Wilson-Art for fire doors also available.) Write for Brochure #106

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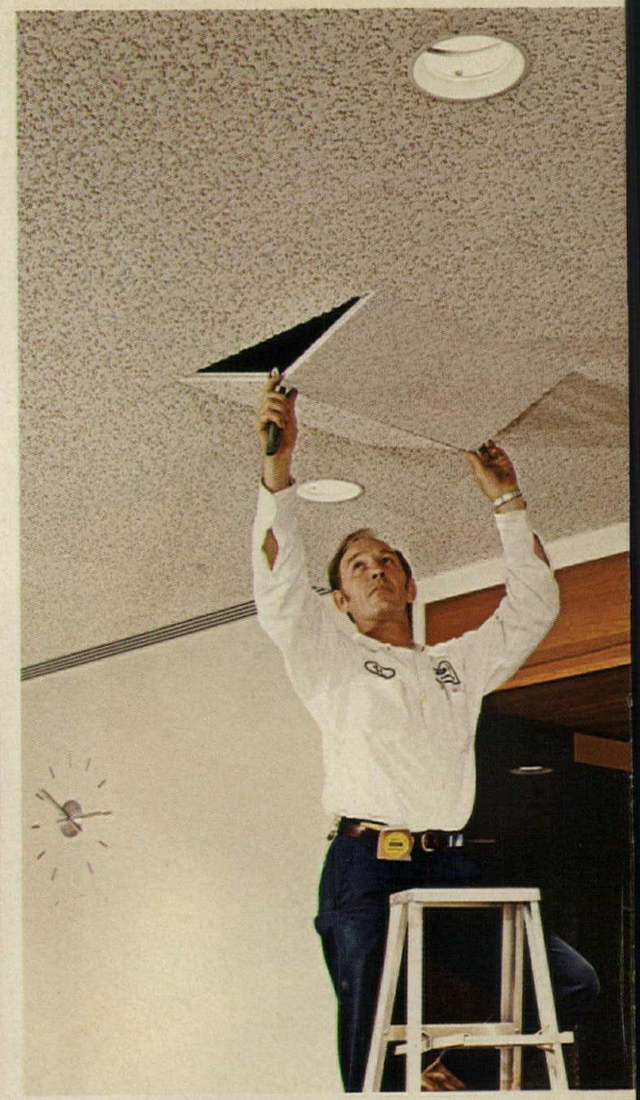
What makes this ceiling right for this job?



It's pleasing to look at, and easy to look into.

Meet a functional ceiling with a decorative look. Meet the Armstrong Accessible Tile System.

In this unique ceiling, every tile is a downward-opening access panel. Using only a special hook knife, any amount of ceiling can easily be removed and replaced for fast access to wiring, lighting, and all services anywhere in the plenum. Ceiling selection is from a wide range of surface designs. With ATS, they provide the aesthetics of tile plus the total accessibility of the more commonplace grid and panel ceiling. Shown here is the elegant Sanserra design in Armstrong Travertone™.

The building is the Michigan Blue Cross and Blue Shield office tower in Detroit. Executive offices on the top floor are done in the landscaped concept, which makes the excellent acoustical properties of this ceiling especially important. On the lower floors, demountable partitions in many executive and general office areas are attached firmly to ATS. In the cafeteria, a ventilating ATS ceiling provides quiet, draft-free diffusion of conditioned air.

For full details on our Accessible Tile System and other Armstrong Ceiling Systems, write Armstrong, 4210 Rock Street, Lancaster, Pa. 17604.

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GENERAL CONTRACTOR: Utley-James Inc., Division of Donovan Construction Company, Pontiac, Michigan
CEILING SYSTEMS CONTRACTOR: Service Art Plastering Company, St. Clair Shores, Michigan

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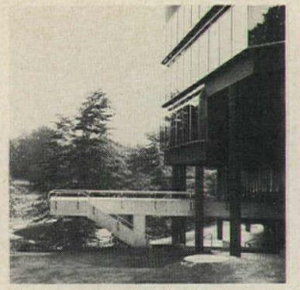

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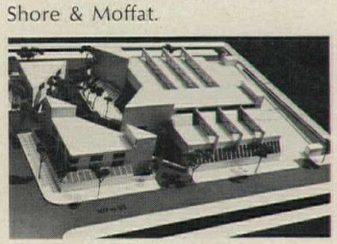
THE RECORD REPORTS



ARCHITECTURAL BUSINESS

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OCTOBER 1972 ARCHITECTURAL RECORD

FEATURES

James K. M. Cheng

BUILDING TYPES STUDY 440

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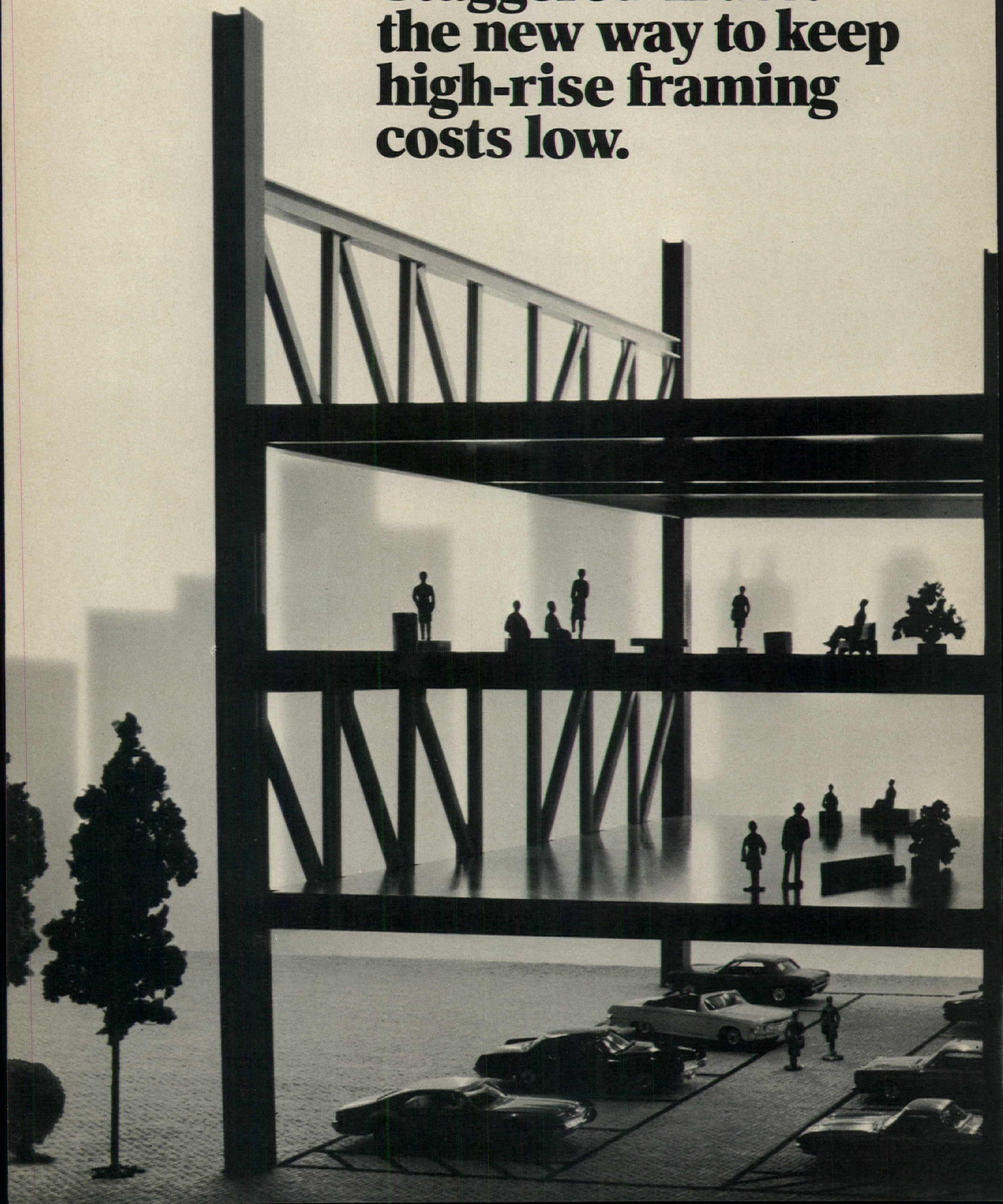
Staggered Truss: the new way to keep high-rise framing costs low.



On your next light occupancy, high-rise building, the staggered truss can save your client time and money and generate earlier revenue for him.

Developed by M.I.T. for U.S. Steel, this system has undercut concrete framing bids in a number of recent buildings.

How the staggered truss works.

As the model shows, the staggered truss consists of story-high trusses that span transversely between exterior columns, and occur in a staggered pattern from floor to floor. The floor system acts as a diaphragm and transfers lateral loads in the short direction to the trusses. Lateral loads are thereby resisted by the truss diagonals and are transferred to direct loads in the columns. So the columns receive no significant bending moment in the transverse direction.

Design Flexibility.

The staggered truss results in column-free interiors, providing almost unrestricted space utilization. Truss spacing can be varied to accommodate a number of unit sizes between them. The system can be used efficiently with a curvilinear plan, or in combination of offset rectangles—and it accommodates a wide variety of vertical stacking possibilities.

How the staggered truss trims costs.

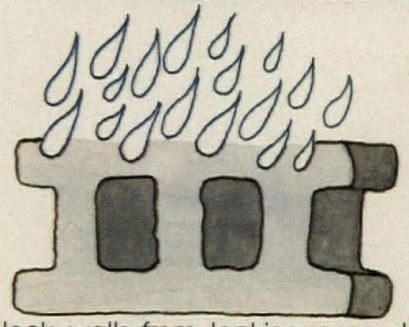
First, the staggered truss requires surprisingly little steel. Second, it requires simpler and less costly foundations. Third, the staggered truss speeds construction, resulting in earlier rental income and lower cost construction loans.

Write for detailed information.

Our new 26-page book works out a typical 20-story apartment building in detail. For your copy, call the nearest U.S. Steel District Sales Office and ask for a Construction Representative, or write United States Steel, P.O. Box 86, Pittsburgh, Pa. 15230.

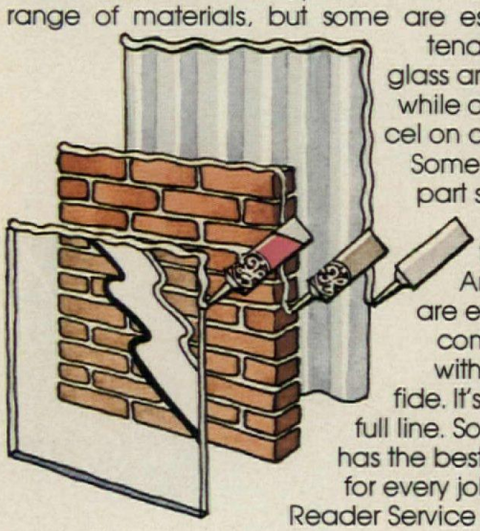
United States Steel USS TRADEMARK

Q.1 **What? A leakproof masonry wall?**
Q.2 **What's the closest thing to a truly permanent sealant?**
Q.3 **Who's got butyl beat on urethane foam roofs?**
Q.4 **Outdoor finishes that last 10 years? Really?**



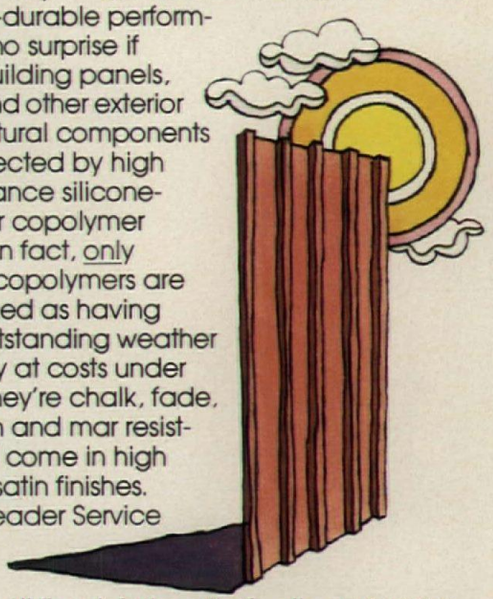
A1 Sure. If it's coated with GE Silicone Weather Coating. It stops masonry, concrete and cinder block walls from leaking even during driving rains. Just roll it on. It won't chalk, blister or deteriorate. And it lasts and lasts for only 4-1/2¢ more per square foot than top quality paint. That makes it a bargain even if you don't have leaks. Circle Reader Service No. 127.

A2 Any of GE's 12 silicone construction sealants, because they don't compromise anything. They're the most age and weather resistant sealants ever invented. They bond well to a wide range of materials, but some are especially tenacious on glass and metal while others excel on concrete. Some are one part silicones; others, two part. And some are even cost competitive with polysulfide. It's the only full line. So only GE has the best sealant for every job. Circle Reader Service No. 128.



A3 We do. GE Silicone Weather Coating is the only one that lets trapped water vapor escape at almost the same rate as urethane foam, which helps prevent blistering. And silicone lasts much longer than butyl. It shrugs off rain, ozone, ultraviolet light and –65°F to +300°F. Yet, silicone can be sprayed or rolled on at nearly the same installed cost as butyl. For case histories, circle Reader Service No. 129.

A4 Definitely. A decade of maintenance-free, weather-durable performance is no surprise if metal building panels, siding and other exterior architectural components are protected by high performance silicone-polyester copolymer finishes. In fact, only silicone copolymers are recognized as having really outstanding weather durability at costs under 2¢/ft². They're chalk, fade, corrosion and mar resistant. And come in high gloss or satin finishes. Circle Reader Service No. 130.



For all the details, write Section BG10370, Silicone Products Dept., General Electric Co., Waterford, N.Y. 12188.

GENERAL ELECTRIC

GE silicones. The answer.

See Reader Service numbers above

Platform Report No. 2:

Architects drive some more nails

Back in August, we reported on the considerable success that the AIA (in the person of Archibald Rogers, chairman of the Task Force of National Policy) had in working with the Democratic platform committee towards developing planks related to the Task Force recommendations. The summary reached in that editorial: "One down . . . and to pretty good avail." I also promised to report on the AIA's efforts with the Republican platform writers. Herewith:

Arch Rogers reports, happily, that the hearings and general Task Force impact on the President's platform "went well"—though the approach had to be much less direct than with the Democrats. The reason, of course, was that the Republican platform was written well in advance (as befits the incumbents). Knowing this well in advance, the AIA had made its views known (both formally through the Task Force, and informally—on an architect to platform-committee member through the Minute Man program) well ahead of Miami Beach. This effort, then, supplemented by an appearance before the Resolutions Committee at Miami, clearly did have an effective result. To wit (as reported by Ernie Mickel, RECORD's Washington editor and editor of *Architectural Record Newsletter):*

"Promise of major reform of Federal community development programs and a new philosophy to cope with urban ills is contained in the Republican platform.

"The platform acknowledges," Mickel continues, "that some Federal programs just aren't working, that after outlay of billions of dollars and the future commitment of billions more, 'we know that many existing programs are unsuited to the complex problems of the 1970s.'

"Reliance on revenue sharing and other aspects of the 'New Federalism' is apparent in the platform's wording. Increased Federal assistance to state, county, and municipal governments is promised.

". . . the Nixon administration pledges to continue its policy of encouraging development of new towns to afford a wider range of residential choices, though the platform opposes use of housing or community development programs to impose shelter programs on unwilling communities."

The platform document further pledges:

- Continued housing production for low- and moderate-income families, which has—first under 221d3, later under the troubled but still effective 235 and 236 programs, and under HUD's Turnkey 1—sharply increased since President Nixon took office.
- Improvement of housing subsidy funds and expansion of the mortgage credit activities of Federal housing agencies "as necessary to keep Americans the best-housed people in the world."
- Continued development of technological and management innovations to lower housing costs—a program begun with Operation Breakthrough.
- Recognizing the seriousness of the abandonment of increasing numbers of housing units in the large cities, the Republicans call upon state, county and municipal governments to actively seek solutions to the problem.
- The Republican emphasis on revenue sharing was also reflected in the platform stand on transportation policy. It notes that the Administration has proposed a new single Urban Fund which would provide nearly $2 billion annually by 1975 to state and metropolitan areas to aid local authorities in solving their transportation problems in their own way.
- The platform also reaffirms support for "new standards of excellence in all [Federal government] design endeavors . . ." the new program developed by the National Endowment for the Arts (Nancy Hanks, Prop.) which includes a national Assembly on Federal Design, a resurrection of "The Guiding Principles" developed during the Kennedy Administration, and a program of improved graphics.

So what's the scorecard—from the point of view of AIA positions—on the Republican platform? I'd say, even though:

1) The Republican platform contains less direct input from Arch Roger's Task Force, since it was written ahead of convention, and:

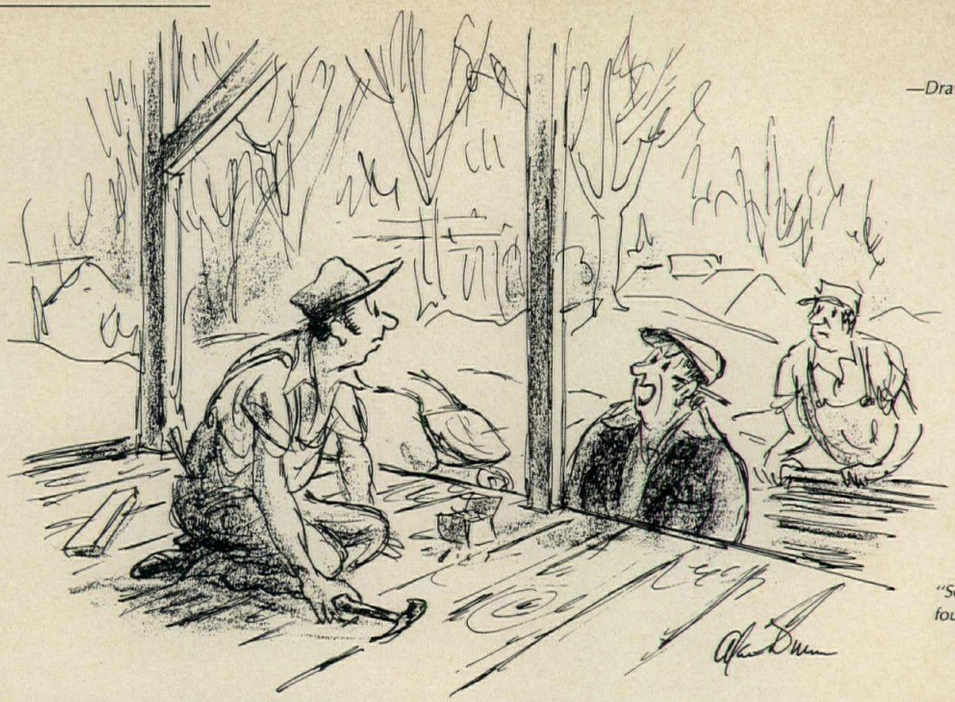
2) As I pointed out in the earlier editorial in August, it is "very difficult for an incumbent party to be all that critical of what it has been doing by calling, in its platform, for drastic change. . ."

. . . I'd say that the AIA had a considerable and useful impact on the Republican platform.

Items: As in the Democratic platform, there is a call for a unified transportation fund. Here called Revenue Sharing, there is a call for money for local development of urban neighborhoods. There is good language in terms of new town development. There is a strong suggestion (though not in the terms that AIA called for) of national growth policy. And there is a strong plank calling for excellence in Federal design.

Which is, it seems to me, a pretty good input by The Assembled Architects. I haven't got the nerve to try to compare the results in re the Republican platform with the results in re the Democratic platform; and anyway all of us will probably vote on other bases anyway; but again I'd like to say—no matter who wins next month—hooray for the AIA for moving into the political arena. For as I said in August: "If architects don't know what to suggest in terms of the physical environment, who does? I, for one, am glad that the profession is now fighting (lobbying if you will) and that it is beginning to be heard."

—Walter F. Wagner Jr.



—Drawn for the RECORD by Alan Dunn

"See here! Under metrification we don't ask for a two-by-four! We ask for a 3.810 by 8.890!"

On making the public aware of architecture. . . .

Breathes there an architect with soul so dead who never to himself has said If Only the general public understood?

Well, a pretty good prototype for doing something about public understanding seems to be developing in New York State. The New York State Council on Architecture has announced the receipt of a one-year grant from the National Endowment on the Arts, which is being matched by the state government, to implement a "program for the development of public awareness of architecture and the quality of the manmade environment." The Council—charged by its own enabling legislation with encouraging and stimulating excellence in architecture—hopes in this program to "stimulate a concern, a visual sensitivity, and an awareness of physical surroundings."

In the first year, the Council hopes to develop a general information brochure on the goals and activities of the program to be broadly disseminated through the state. Further, a Community Leader's Notebook will be produced and distributed to city planners, urban renewal leaders, community development groups, mayors, and other local officials. It will include "basic environmental design information on the design/construction process for these decision-makers. It will be looseleaf so that frequent mailings from the Council such as commissioned documents, AIA materials, excerpts from magazines, speeches, important legislation, sources of funding, etc. can be readily inserted. Conferences, seminars, study tours, award programs, travelling exhibits, and other communications media are to be developed as part of the program."

The program will be under the direction—and hooray to them for setting it up—of George Dudley, chairman of the Council, and John Jansson, its executive director; in coordination with Bill Lacy, Director of Architecture and Environmental Art of the National Endowment for the Arts.

At the risk of seeming parochial, I have to point out that this is yet another area where New York State seems to have taken an important lead (earlier areas: the State University Construction Fund, the NYS Health & Mental Hygiene Facilities Improvement Corporation, the UDC, et al). The New York State Council on Architecture is itself a prototype for similar (though I'm sure still not as well organized) Councils in all of the other 49 states. All might profitably study this new effort to create awareness and—perhaps—try doing likewise. We could all use a lot more awareness, huh?

Hooray for some more direct action by AIA

The editorial on the other side of this sheet of paper is in praise of the AIA for its direct political action.

Herewith another piece of praise for some direct action in the marketplace. To wit:

In the September 12 issue of the *Wall Street Journal* and the September 16 issue of *Business Week,* under the headline "Four Myths about Architects" the AIA has taken full-page ads to help dispel—in the minds of business/industrial clients—the notions that 1) "To the architect, time is no object," 2) "He loves to spend your money because his fee is a percentage," 3) "His estimate in an underestimate," and 4) "He cares more about the way it looks than the way it works."

What the ad does (in case you missed the WSJ or BW ads) is to demonstrate that some architects, at least, are "both concerned and competent in the areas of budget, scheduling, and functional efficiency." The ad will appear at perhaps monthly intervals in those publications, and will appear in a special mid-October issue of the RECORD, Product Reports 73. It's worth reading, for . . .

If some of the arguments in the ad seem maybe apologetic, what we all need to remember is that the ad was not written for professional, but for clients who do indeed hear a lot of "myths about architects", and who sometimes make some pretty bad decisions about new projects as a result. I say hooray for the AIA taking this kind of direct action towards clients on behalf not just of the profession as a whole but on behalf of individual architects having individual problems in front of individual clients or building committees.

A post script: The ad offers a booklet containing 10 case histories of client-architect relationships by writing to the AIA in Washington. I did, and found it an effective piece of work. I bet if you wrote you could have one to show doubtful prospective clients.

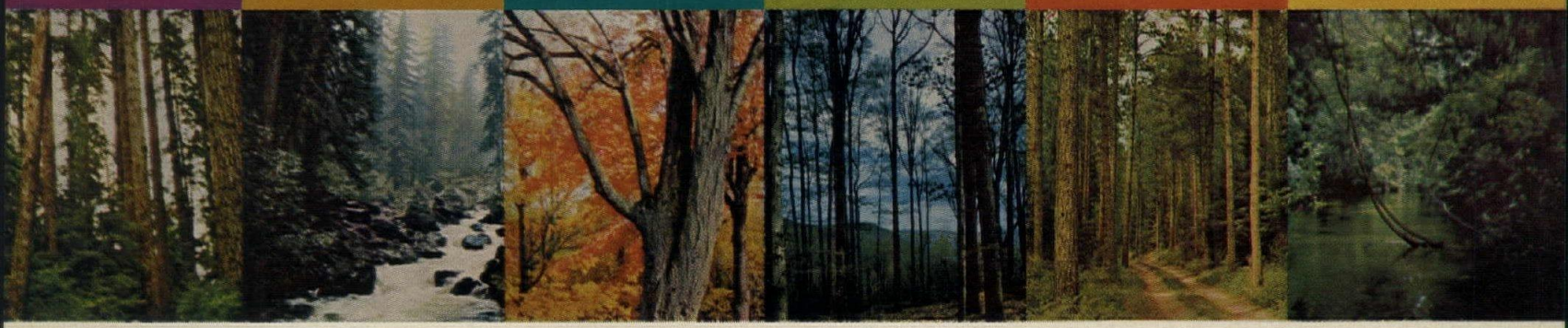
The December blizzard That came in August

In response to our "Invitation to submit work for a December special issue on The Young Architects [RECORD, July, page 94 et seq.]" we've been—happily—buried in mail.

You may ask, what did we expect? That young architects aren't doing much work these days? Well no, but the 420 submissions, most containing several projects, perhaps a thousand in all, left us slightly snowed under. The submissions themselves ranged from one- or two-page letters to large boxes filled with brochures as well as hefty rolls of working drawings. Many are elegantly concise, clear descriptions of the designer's intentions (which draw our attention no matter what the quality of the work), while some are so crude that it seems impossible that an architect could have made the presentation. But we are impressed by the large number of substantial projects being done by firms whose principals are 35 years of age and under. Most of all, we are impressed by the thoroughly professional approach these people, so often bypassed for older, more experienced firms, exhibit in their work.

We're having an intensely interesting piece of work planning and producing the December issue, and we're sure—no matter what your age—you'll have an interesting time reading it. You may love it or hate it—but I don't think you'll be able to forget it. —*W.W.*

The great American forest is closer than you think.



Wherever you are.

Because after giving up land to build our cities and highways, after meeting our constantly growing demands for wood and paper products, we still have three-fourths as much forestland as we had when Columbus landed.

Even more surprising, this 761 *million* acres is still widely distributed all across the country—it's not all just "out West" or "down South." 51% of New York State is forest. 65% of Rhode Island. And 51% of New Jersey—the most densely populated state. As a matter of fact, more than half of the forest in the continental United States is located in the eastern part of the country.

Because America's forest is truly an *American* forest, growing in many different elevations and rainfalls and temperatures and soils, its six distinct natural regions provide us with a constant variety, too, from the Douglas firs of the Northwest to the hardwoods of the Northeast.

Much of the forest has been harvested and regrown three or four times. And, public or private, government or individually owned, much of it is available for hunting and fishing, picnicking and camping—as millions of outdoorsmen from Maine to California can tell you. So if you haven't seen it lately, why wait?

It's right there in your backyard, keeping America green—and growing.

For the whole story on America's forest today, get "Forests USA." For your copy of this full-color, 16-page booklet, send 25¢ to AFI, 1619 Massachusetts Avenue, N.W., Washington, D.C. 20036.

Name

Address

City

State Zip

American Forest Institute 29

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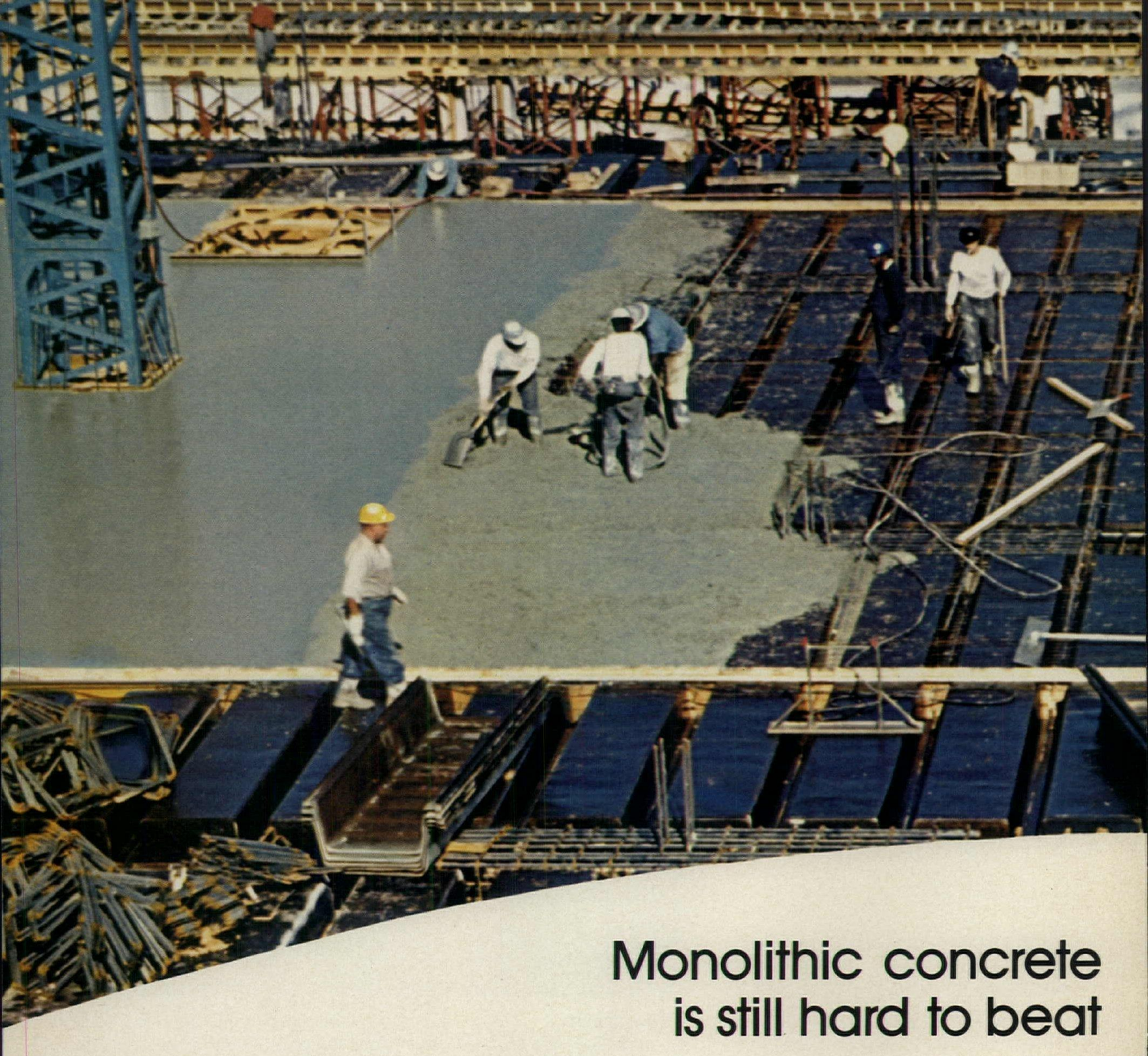

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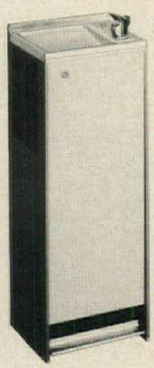
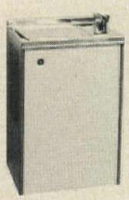
Westinghouse Nationwide Sure Service . . .Prompt, complete, professional service, anywhere in the U.S.A., with free parts and labor for a full year.

Contact your nearest Westinghouse Distributor for complete information on models and sizes.

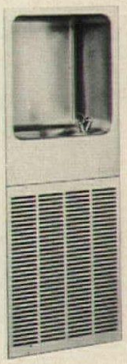


Floor Models



Wall-Mounts

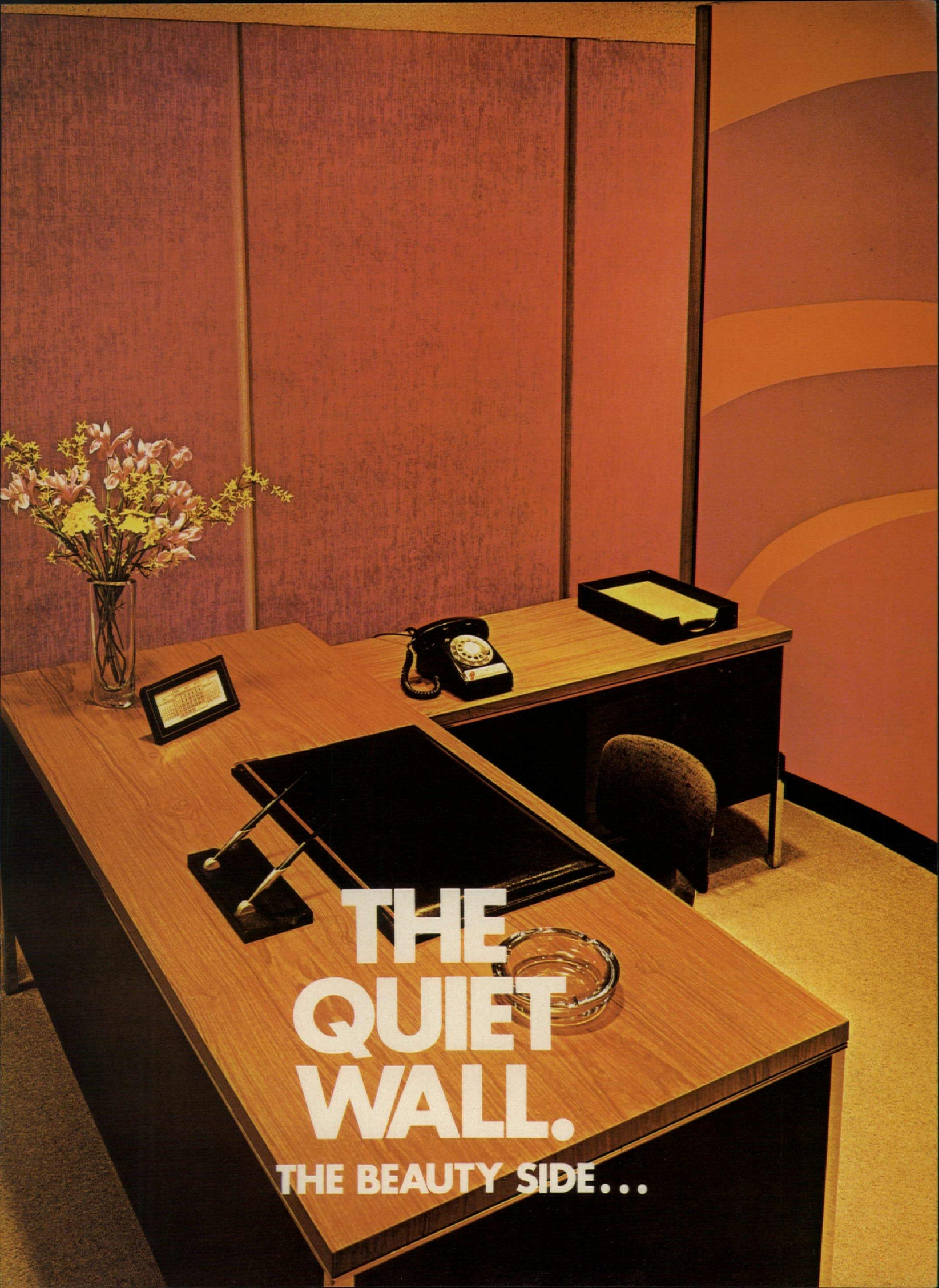
Semi-Recessed



Totally Recessed

You can be sure . . . if it's Westinghouse

For more data, circle 6 on inquiry card


THE QUIET WALL.
THE BEAUTY SIDE...

THE QUIET WALL.

THE QUIET SIDE.

Vicracoustic® wall panels* combine the beauty of vinyl with the sound absorbency of glass fiber. This means you can achieve improved acoustical environments and more desirable working conditions. The resulting wall panel system is both beautiful and functional.

These panels are more impact resistant than conventional acoustical walls, and if required, offer effective insulating qualities. Acoustically, they've been engineered to provide acoustical absorption and to assist in the improvement of sound transmission. Specifically, Vicracoustic wall panels, with a 1-inch core, have a Noise Reduction Coefficient of 0.80 – 0.85 and with 2-inch cores, 0.85 – 0.90. This translates to quietness.

And quietness is only half of the story.

Beauty is the other half. All the different colors and unique patterns of Vicrtex® are available in Vicracoustic wall panels. A wide range of sizes is also available. This broad selection gives our panels great versatility. They can be used to compliment most non-acoustical walls by simply matching the Vicrtex vinyl pattern and color. And it goes without saying, these panels are the perfect addition to any well-balanced interior space.

Finally, Vicracoustic wall panels are easy to install. Once installed, they're easy to care for. Any office, any suite, any room or space that needs a touch of elegance and a measure of silence needs Vicracoustic wall panels.

Enough said. We'd like to let our panels speak for themselves. Just fill out the coupon and listen. It's quite a story.

*Patent applied for.

Sir: I'm listening.

☐ I'd like to hear more about Vicracoustic wall panels.
☐ I'd like more acoustical and decorative information.
☐ I'm involved in the following wall application:

_____

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

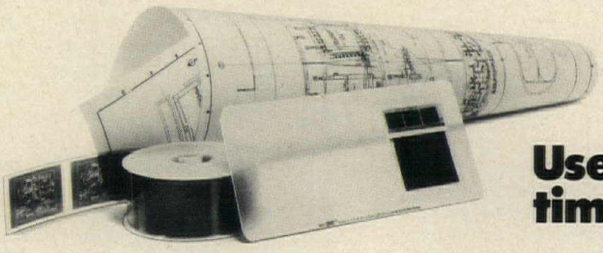
☐ I'd like to have a salesman call.

LE CARPENTER AND COMPANY — A DAYCO COMPANY

964 Third Avenue, New York, N.Y. 10022 (212) 355-3080

For more data, circle 7 on inquiry card

"DRAFTING ROOM DELAYS ARE KILLING US!"



Use Kodak products for time-saving shortcuts.

Perhaps you've discovered how much time you can save—and how much more efficiently you can work—when you use Kodagraph films and papers for producing new drawings or revising existing ones. But that's just the beginning of what Kodak products can do for you.

For example, your drawings will be more accessible if they're on Kodak microfilm . . . more convenient to handle, too. And you can get high-quality distribution prints faster—and for lower cost—thanks to other Kodak products.

There's even more. Just fill in and mail the coupon, and we'll send you the complete story.

I'd like to know more about Kodak photoreproduction products. Please send me your free literature.

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City_____ State_____ Zip_____

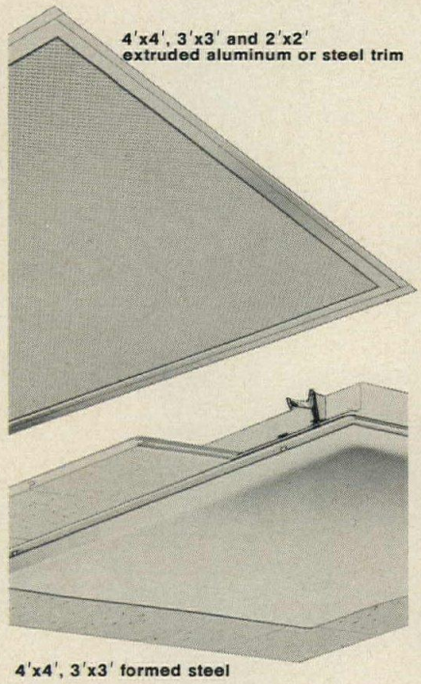
Eastman Kodak Company
Business Systems Markets Division
Dept. **DP 881**, Rochester, N.Y. 14650

DRAWING REPRODUCTION PRODUCTS

Kodak

For more data, circle 8 on inquiry card

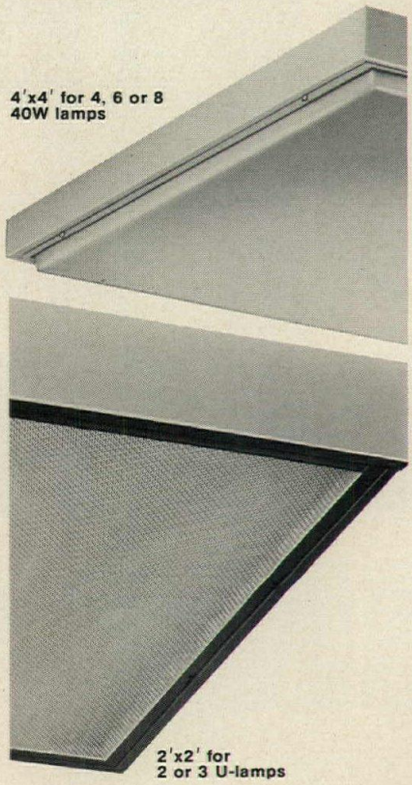
LPI designs for specific applications



LPI troffer squares

4'x4', 3'x3', or 2'x2' versatile squares with lots of options.

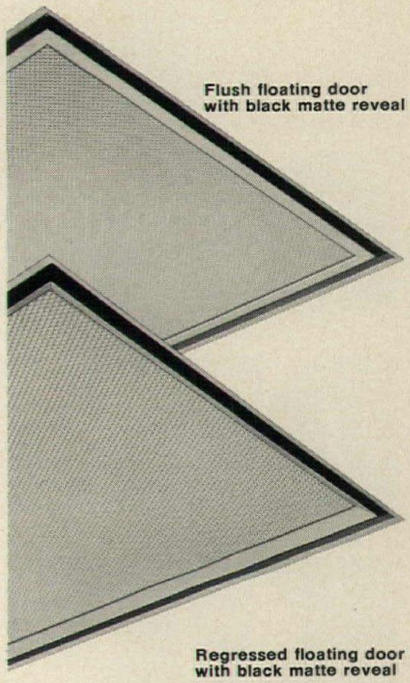
LPI troffer squares provide beautiful solutions to a variety of lighting problems. Formed steel troffers are offered in 4'x4' and 3'x3' sizes for individual or continuous row installation. Four-foot squares for lay-in or flange type ceilings, are offered for 4, 6, or 8 lamps. Three-foot squares, for lay-in installation only, are offered for 4 or 6 lamps. These troffers are only 4-3/4" deep and are available with a choice of many diffusers. They are rigid and light tight, providing efficient lighting as well as architecturally beautiful installations. Doors hinge to open from either side with heavy-duty, positive-action metal hinges and latches. LPI also makes extruded aluminum or steel-trim troffer squares, including air-handling models, in 2'x2', 3'x3', and 4'x4' sizes. Just 5" deep, with a crisp, clean, contemporary appearance that results in an unusually attractive installation. Write for data.



LPI surface squares

4'x4' and 2'x2' mates for our full-line Versataire series.

LPI's surface-mounting 4-foot squares are handsome large-area units that fill many contemporary design lighting needs. They may be used alone, or matched with our wide line of Versataire II luminaires in a system that presents an architecturally uniform design. These 4-foot squares are only 4" deep and are offered for 4, 6, or 8 lamps, each with a choice of many diffuser types. The many optional combinations meet a variety of lighting needs while contributing to the beauty of the installation. Matching 2'x2' Versataire II series squares only 3-3/8" deep for two or three U-lamps are also available. Doors on all models can be hinged to open from either side or removed entirely. Write for complete specifications and photometric data.



LPI air troffer squares

4'x4', 3'x3', and 2'x2' with extruded aluminum or steel trim.

These LPI air troffer squares perfectly match our attractive, crisply styled full-line series of extruded aluminum and steel-trim troffers. There's the same wide selection of diffuser types, mounting for all common ceiling systems, choice of regressed floating door or flush floating door (both door styles of strikingly beautiful extruded aluminum with attractive black matte reveal). The same rugged construction and unique LPI design features for fault-free service and easy maintenance are there, too. Available for air supply and return, air supply and heat removal, or heat removal only. Or you can order identical non-air squares matching the above. All 2'x2' troffer squares are available for four 20W lamps or 2 or 3 40W U-lamps. You can order 3-foot squares for 4 or 6 30W lamps and 4-foot squares for 4, 6, or 8 40W lamps. Write for data.

LPI designs for extraordinary performance

1-217

LPI offers a wide choice of fluorescent luminaire types and models to meet a wide variety of specific application requirements—without compromising on lighting function and overall luminaire performance. Nor on quality: LPI luminaires are thoughtfully engineered and ruggedly built for trouble-free installation and long in-service performance. There is an important difference in luminaire quality—a difference you can see. Ask your LPI representative or write for data on luminaires that are function-matched to your application.

LPI FLUORESCENT LIGHTING

Lighting Products Inc., P.O. Box 370, Highland Park, Ill. 60035

For more data, circle 9 on inquiry card

For more data, circle 10 on inquiry card

What makes this All-Steel chair so comfortable?

An inner steel "H" frame in back and seat has been designed into the new 200 Series chair to give you back support and comfort where you need it most, in the lumbar area. This unique structural design also provides added strength and rigidity for years of dependable chair service. 20 models. Choose from a wide selection of colorful fabrics and expanded vinyls.
For more information write: All-Steel Equipment Inc., Aurora, Ill. Showrooms in New York, Chicago, Los Angeles, Aurora. In Canada, B. K. Johl Inc., Montreal, Toronto, Vancouver.

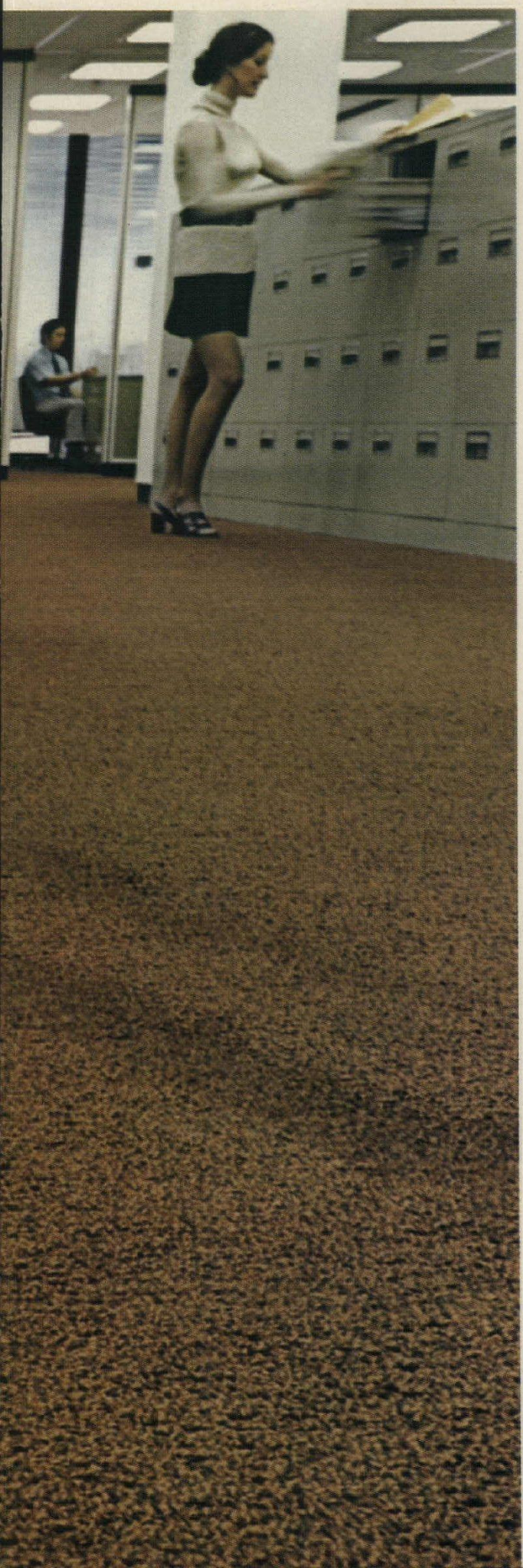
All-Steel®
one of the CIT companies

200 SERIES

"Carpet of Antron® gives us

S. S. Kresge Company, International Headquarters, Troy, Michigan

a look we know will last."



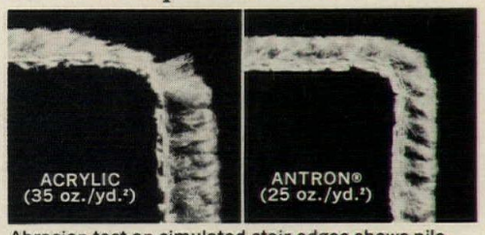
For the new International Headquarters of S. S. Kresge Company, Smith, Hinchman & Grylls Associates, Inc., architects and engineers, specified carpet made with pile of Antron* nylon.

Reason for choosing carpet of "Antron": the combination of "looks and life." It has the ability to retain its original appearance longer than carpet of other fibers. And, being nylon, it wears exceptionally well (see simulated stair-edge test results).

The lightscattering structure of "Antron" minimizes the appearance of soil. Concentrated spots tend to even out and blend with the overall color and texture of the carpet. Maintenance costs are minimized by the need for fewer wet cleanings than with carpet of other fibers. And, even after repeated shampooings, carpet of "Antron" returns remarkably close to its original appearance.

This glue down installation required a crush resistant pile fiber to stand up to heavy, daily traffic. Resilient "Antron" readily meets this test.

Specify "Antron" for high-traffic commercial carpet. It has no equivalent in long-term appearance retention.

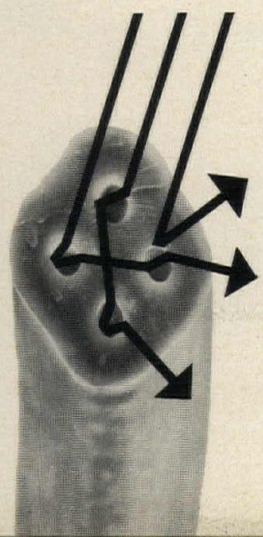


Abrasion test on simulated stair edges shows pile wear in level-loop carpets after equal exposure.

For more details, write Du Pont, Contract Specialist, Room 105AR, Centre Road Building, Wilmington, Delaware 19898.

For more data, circle 11 on inquiry card

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



How "Antron" hides soil. This cross-section magnified 1000X shows the four symmetrically located interior voids that run through each filament. They scatter light like the facets of a diamond to minimize the appearance of soil, with little loss of color clarity and luster.

*Du Pont registered trademark. Du Pont makes fibers, not carpets.

Recommend the Carrier 16JB gas absorption machine. Your client will thank you for years.

The Carrier 16JB is so trouble-free that your clients can put it in and just about forget it.

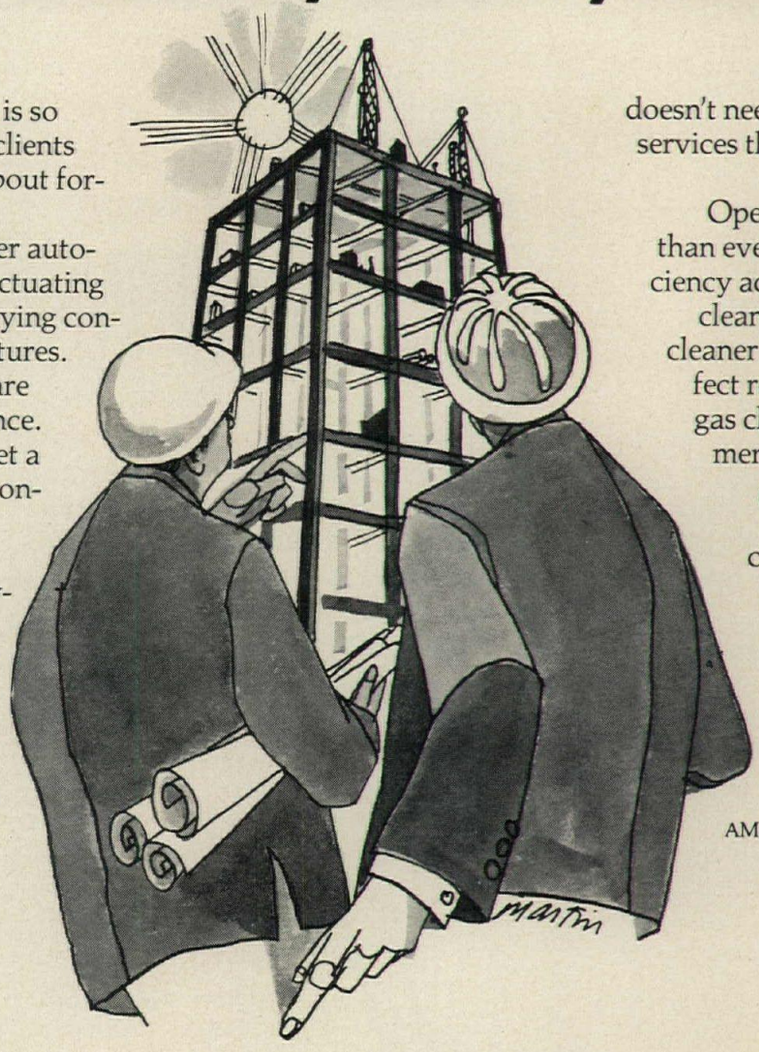
This unique chiller automatically adjusts to fluctuating steam pressure and varying condensing water temperatures.

It needs only a bare minimum of maintenance. Your clients can even get a planned maintenance contract from the factory.

You can put the machine just about anywhere. There's no vibration and very, very little sound.

The building's first costs can be kept down because the 16JB doesn't need the heavy electrical services that mechanical equipment needs.

Operating costs are lower than ever, too. The 16JB's efficiency actually saves gas—the clean energy we need for a cleaner world. So it's the perfect replacement for an *old* gas chiller, as well. Recommending the Carrier 16JB gas absorption chiller makes for a satisfied client. And that's good business. For the details, contact Carrier Air Conditioning Co., Carrier Parkway, Syracuse, New York 13201



AMERICAN GAS ASSOCIATION

Conserve natural gas. It's pure energy.

Carrier

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Bally belongs.

In mass feeding for active kids and on-the-go parents Bally Prefabs set the standard for Walk-In Refrigeration

Bally Walk-In Coolers and Freezers belong everywhere mass feeding takes place. They can be assembled in any size for indoor or outdoor use from standard panels insulated with four inches of foamed-in-place urethane, UL 25 low flame spread rated. Choice of stainless steel, aluminum or galvanized. Easy to enlarge . . . easy to relocate. Refrigeration systems from 35°F. cooling to minus 40°F. freezing. Subject to fast depreciation and investment tax credit. (Ask your accountant.) Write for 28-page book and urethane sample. **Bally Case and Cooler, Inc., Bally, Pennsylvania 19503.**

Bally

ADDRESS ALL CORRESPONDENCE TO DEPT. AR-10

For more data, circle 13 on inquiry card

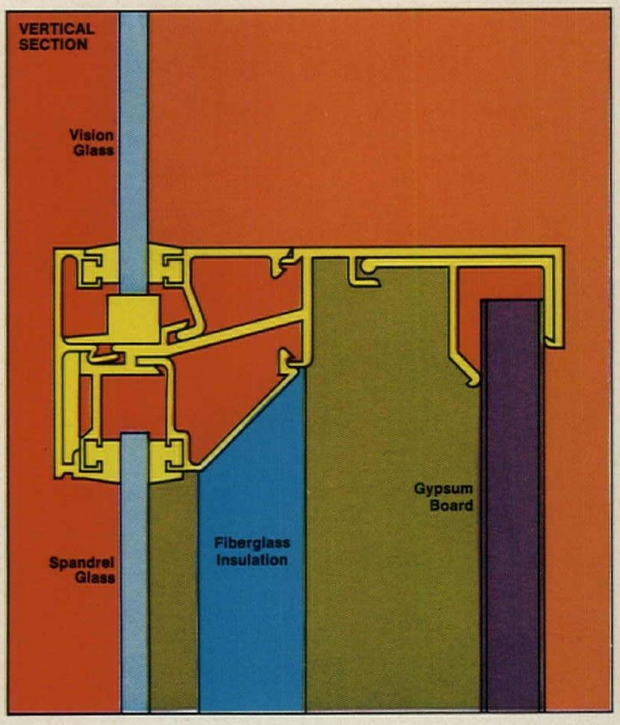
High-rise or low-rise. Alcoa knows the best approach to curtain-wall problems.

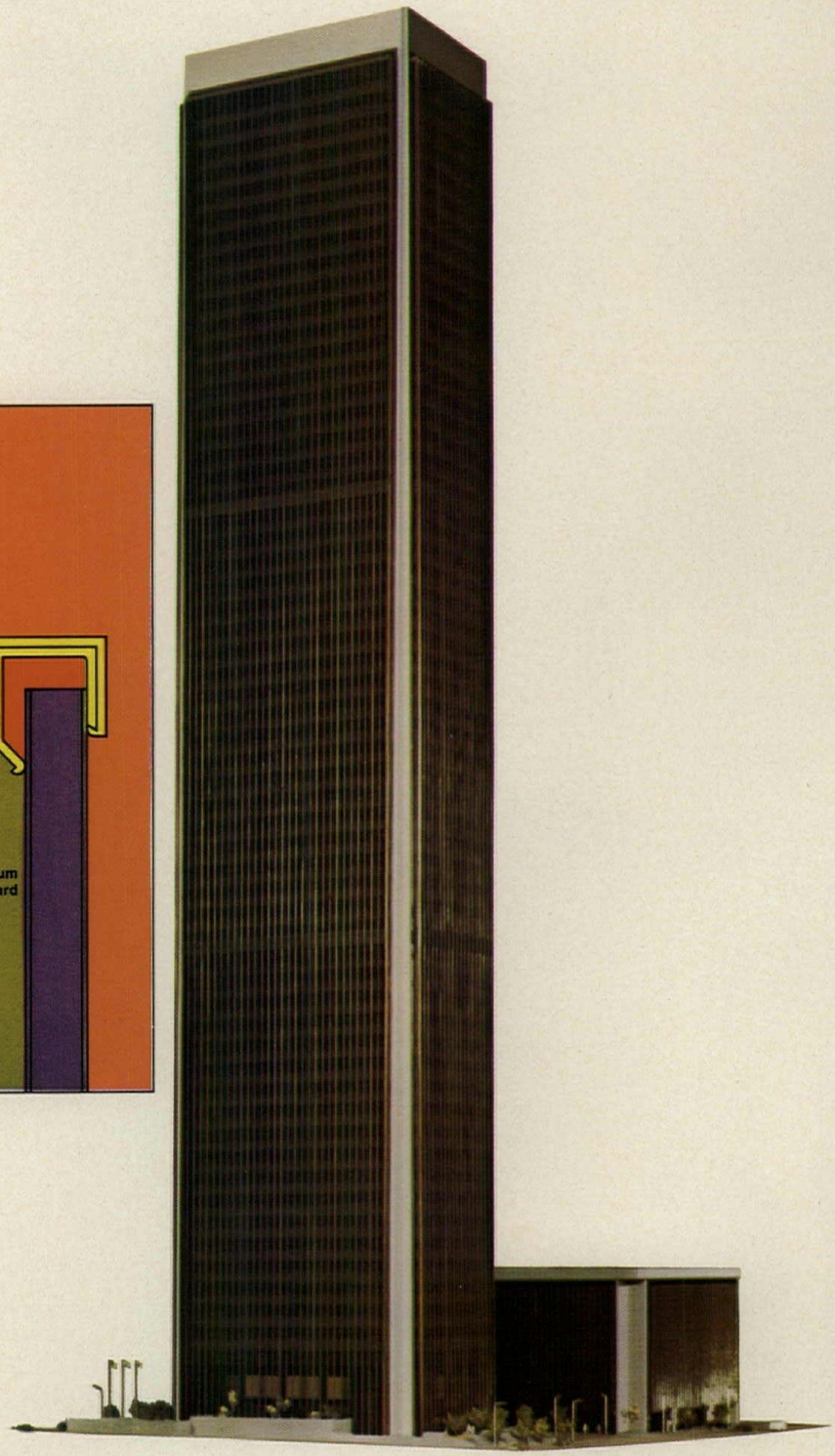
The team approach . . . a curtain-wall team of owner, architect, contractor, fabricator and curtain-wall erector. Highly successful throughout Alcoa's 25 years of construction experience, the curtain-wall team is again proving its effectiveness on the new United California Bank tower now rising in the Los Angeles central city.

The UCB team is giving this 62-story high-rise an aluminum wall system that will combine bronze-hued solar glass with an aluminum grid finished in a Duranodic* coating, medium bronze #312, and Alcoa® Alumilite* beige on the four tapered corners. Behind this rich-looking exterior will be a system of triple protection against thermal conductivity. Backing the spandrel glass will be both fiberglass and gypsum board insulation blankets.

Any way you add it up, Alcoa's curtain-wall team approach is good to have on your side. On a high-rise like the United California Bank, or a low-rise, like the headquarters of Combustion Engineering, Inc., Windsor, Connecticut. Here the curtain-wall team used an Alply® wall system to create

High





Architect: Charles Luckman Associates
Los Angeles, Calif.
Engineering & curtain-wall subcontractor:
Northrop Architectural Systems
Los Angeles, Calif.
Contractor: C. L. Peck—
Diesel Contractors
Los Angeles, Calif.

a high-performance insulating wall at minimal material and installation costs. Composed of a polyurethane core, sandwiched between finished interior and exterior facings, each Alply panel† is an integral, economical, prefabricated unit, containing insulation and a vapor barrier. The architect was able to achieve a compatible appearance with an existing concrete building by selecting an off-white Fluropon‡ finish for the new metal wall building.

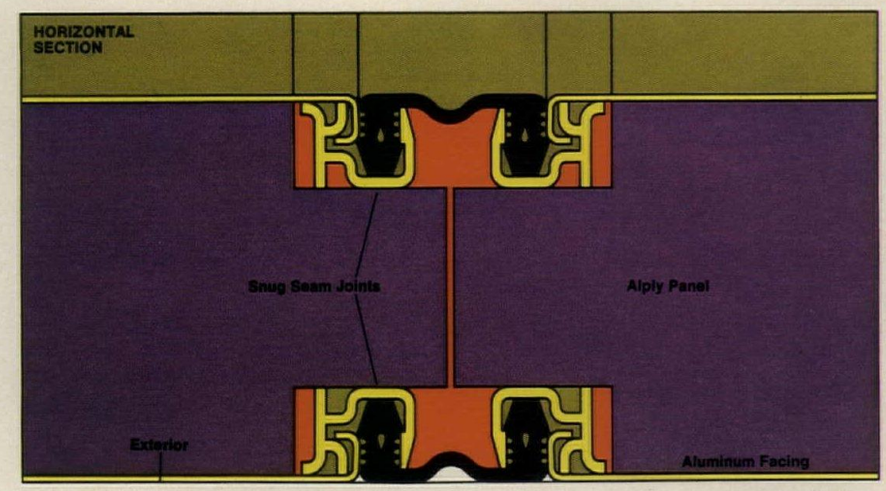
Architects, designers and owners should know about the network of Alcoa wall systems contractors. These curtain-wall fabricators and erectors are experienced in the erection of Alcoa wall systems and assume full responsibility for the curtain-wall "package," from design through erection. You can benefit from working with Alcoa wall systems contractors.

High- or low-rise, Alcoa's curtain-wall team approach is available to you. Remember that Alcoa aluminum can make as significant a contribution to your suburban office building or industrial plant as it is now making to the imposing UCB tower in Los Angeles.

*Trade Name
†For additional information about Alcoa wall systems, see Sweet's Architectural or Industrial File, or circle Reader Service Card.
‡Tradename—Desoto, Inc.

Low

Architect: CE Maguire, Inc.
Waltham, Mass.
Contractor: The H. Wales Lines Co.
Meriden, Conn.
Curtain-wall Fabricator and Erector:
Whelan Manufacturing Company
Trenton, N. J.



Change for the better with Alcoa Aluminum

ALCOA

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for design, flexibility, service in door automation

NORTON® AUTOMATIC DOOR OPERATOR SYSTEMS

TRANSOM MOUNTED OPERATORS (SERIES 2000)

Here's an unobtrusive, self-contained package; designed to be attractive in any location, styled to compliment any decor. Single units are contained in a smart, clean, aluminum housing. Double doors can be accommodated with two units mounted individually, or two units in a single housing. All installations are a pleasing addition to your overall design.

Here's reliable electro-hydraulic door automation that's easily installed on both new or existing construction. Ideal as a replacement for faulty in-floor operators. Or, they can be applied with surprising simplicity to any existing door. And, of course, all control schemes are available; for single or multiple door, one-way, or dual traffic.

Service is simple and always available. A replacement operator can be mounted in place in minutes to get your door back in action. And, the Norton Service Organization is nationwide, only a phone call away. Installation and service personnel are under direct factory supervision to assure you prompt, satisfactory work.

OVERHEAD CONCEALED OPERATORS (SERIES 4000)

For complete concealment in the smallest transom header; only 5″ of height and 4″ of depth. Fits easily into most manufacturer's headers; can be supplied already assembled into the header tube.

SLIDEAWAY SLIDING OPERATORS (SERIES 5000 & 9000)

For the safety and space saving of side sliding doors. Available in separate or simultaneous operating, single or double doors; all types of controls systems. Also, available as complete entrance packages.

EATON
Security Products & Systems

For complete details, contact your Norton Representative or Eaton Corporation, Lock and Hardware Division, Norton Marketing Department, Box 25288, Charlotte, North Carolina 28212.

1193 C

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We've carpeted more hospitals than anyone else.

We've got a system.

Since we invented the Medicarpet System, we've put it in one hospital after another. There's a reason. We know what hospitals need.

One of the most important needs is fire safety, and we have a wide range of Medicarpets that meet all government requirements.

Among the benefits for Medicarpeted hospitals are: Maintenance costs reduced by 33% or more. Improved floor safety (reflected in insurance rates, too). Up to 40% noise reduction. From 50% to 70% less airborne bacteria.

In addition to knowing what hospitals need, we know how to fill these needs, including the ability to plan a comprehensive maintenance program. We even have our own line of heavy duty maintenance chemicals.

Medicarpet is made of commercially engineered Anso nylon, densely packed for maximum wear resistance. The hard-wearing surface stands up to the toughest traffic, and provides a barrier to soil and spills. It's available with built-in, fire-retardant B. F. Goodrich sponge rubber cushioning and has an integral static control system. Installation is guaranteed.

Everything about CCC's Medicarpet System is designed to satisfy the hospital's patients, personnel and administration. What's more, we can prove it. Use the coupon below, or look us up in the yellow pages. ANSO B.F.Goodrich

CCC **Commercial Carpet Corp.**
10 W. 33 St., New York, N.Y. 10001 AR-10
Attention: Mr. Walter Brooks

- ☐ Please have your representative call.
- ☐ Please send brochure.
- ☐ Send maintenance chemicals information.

Name:_____

Title:_____ Phone:_____

Organization:_____

Address:_____

City:_____

State:_____ Zip:_____

For more data, circle 15 on inquiry card

Monumental in porcelain-enameled steel

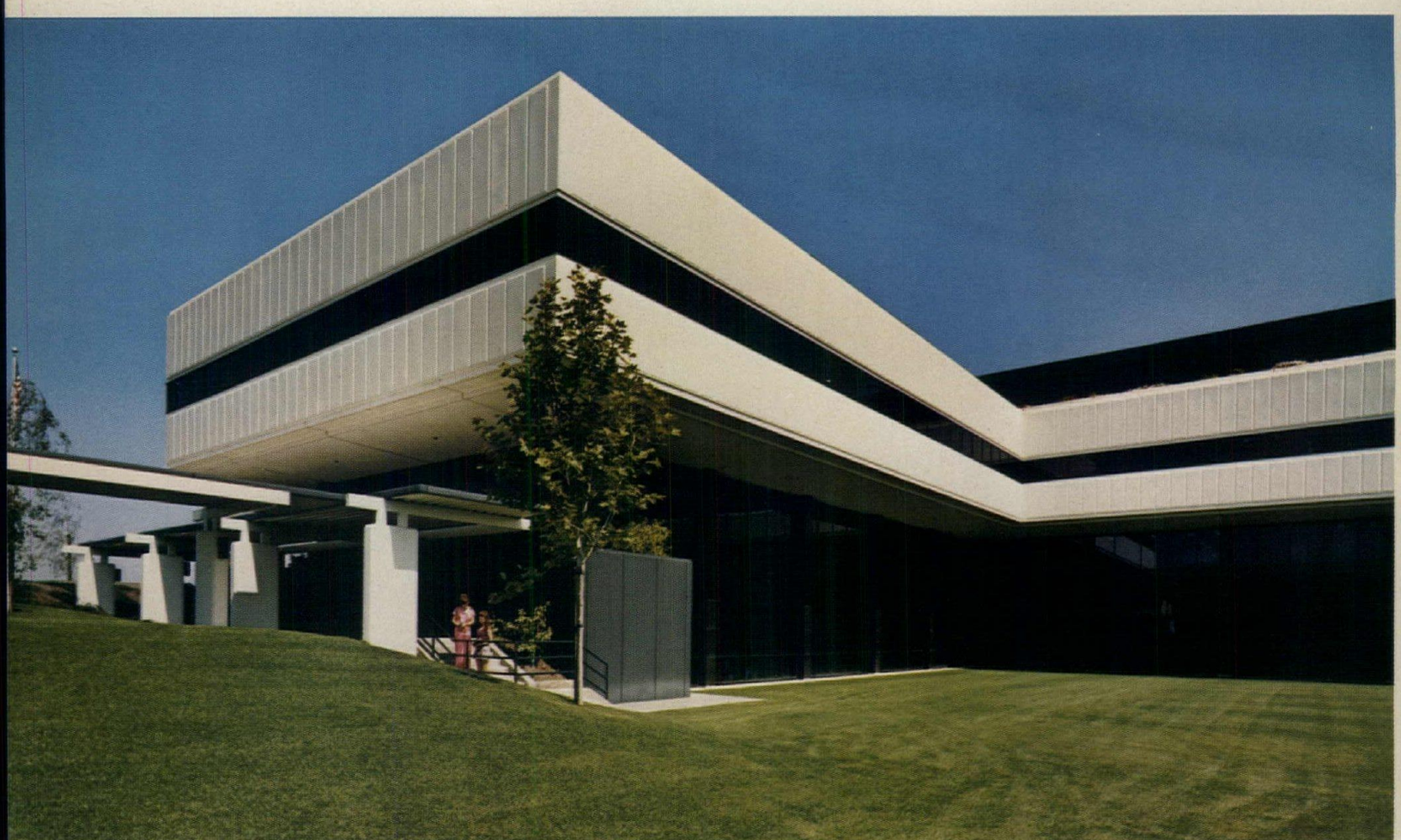
Memorex Corporation's new headquarters building etches a bold line across a softly verdant site in Santa Clara, California. Its sweeping cantilevers derive from structural steel. Its crisp white profile was achieved with porcelain-enameled steel panels.

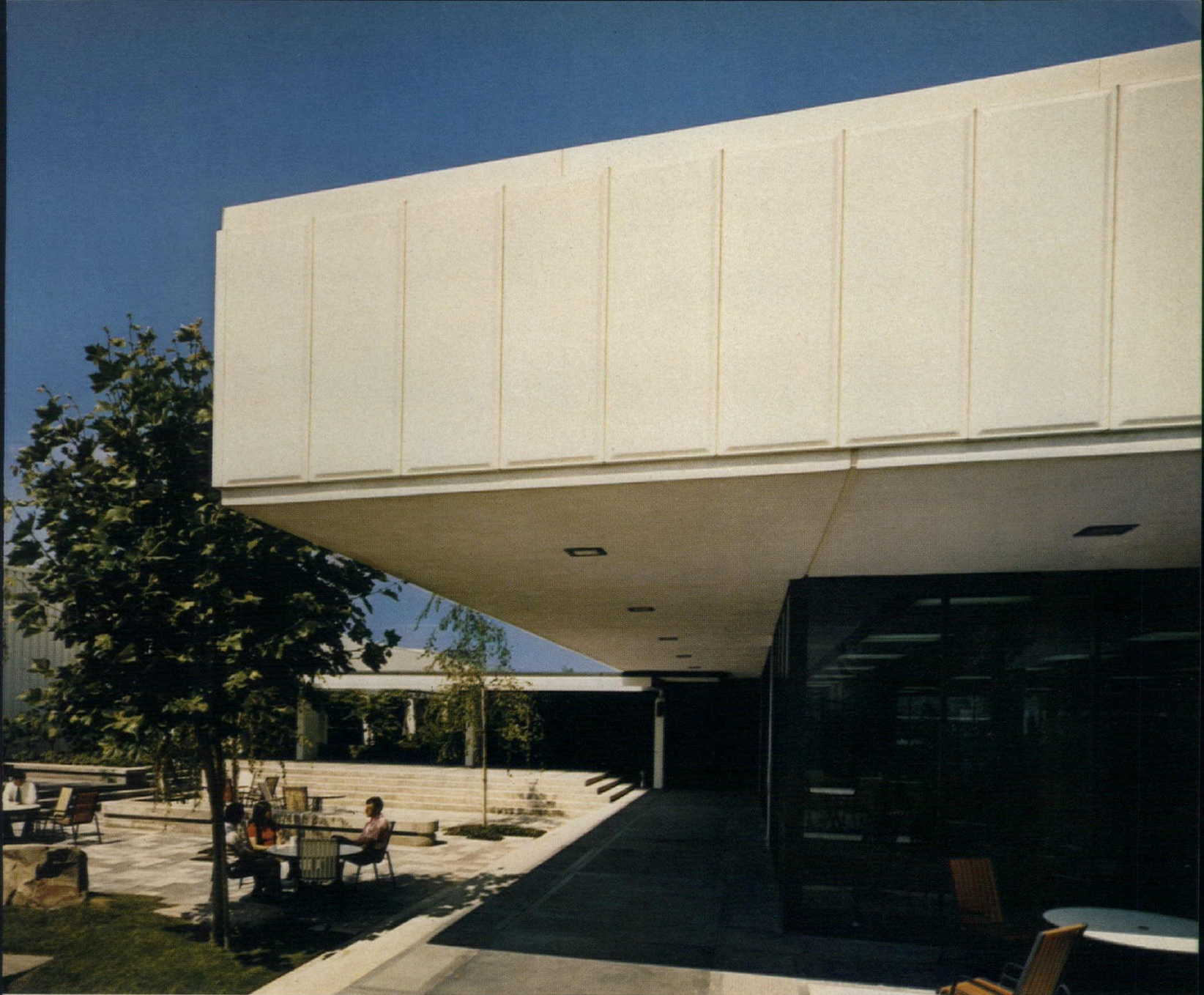
Architects are making increasing use of porcelain-on-steel to create notable designs and artistic effects. And in so doing they are endowing their structures with the built-in advantages of porcelain panels—such advantages as resistance to weather and atmospheric corrosion; lasting colors; cleanliness; light weight; rigidity; and economy.

Porcelain enameled panels can be specified in just about every imaginable hue. In addition, twenty-four matte-finish Naturetones are available for the soft, understated look of contemporary design. Wide varieties of textures and embossments are also possible.

Bethlehem furnishes special enameling sheets to fabricators who produce architectural panels. Panels of enduring beauty. Bethlehem Steel Corporation, Bethlehem, PA 18016.

BETHLEHEM STEEL





Architects: Leland King & Associates
Menlo Park, California

Engineers: Simpson, Stratta & Associates,
San Francisco, California

Porcelain Panels: Ferro Enameling Company,
Oakland, California

Mark 2028, fully compatible with standard construction methods. The new dimension in gas fireplacing. Exclusive 30″ wide firebox fits into standard recess between studs. Requires only 13″ minimum depth. Allows complete framing before installation.

Dramatic wall-hung Mark 5880. Here's the exciting look in gas fireplacing. Cantilevered base, raised hearth and gradually receding hood add contemporary flair. Trimmed in satin-finish stainless steel. Primed, ready for painting.

Discover the latest in Heatilator gas fireplacing simplified

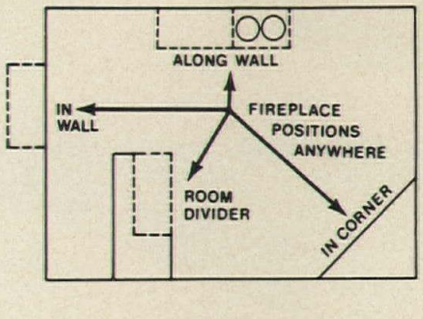
Simplified installation—built-in or wall-mounted fireplaces; low initial cost; extra rental profits and a strong competitive edge on rental and sales appeal. You give your clients all these advantages when you include Heatilator factory-built gas fireplacing in your plans.

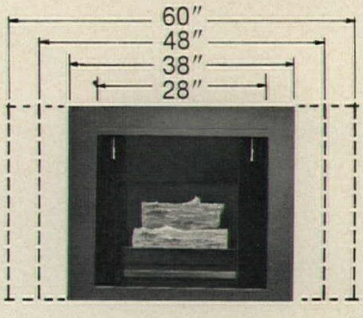
Fast, easy installation. Install Heatilator gas fireplaces anywhere in any room. Set directly on a wooden floor or platform, against combustible wall materials—no masonry needed. Uses standard B-vent. Burner pilot is self-generating —does not connect to building electrical system. Natural or L.P. gas. A.G.A. design certified and tested.

Unlimited decorating options. Built-in models self-trim and require no additional finishing. However, decorative surround may be painted or concealed with brick, stone, glass, marble, etc. Wall-mounted model is a prime-coated for painting any color.

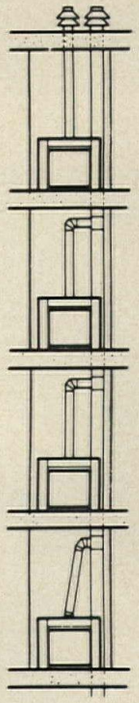
Renters now paying premium rent—up to $15 more per month for real fireplacing. Your prospects will appreciate the convenient pushbutton control, the charm of realistic Oak logs and flame, the clean, carefree gas operation.

Send for FREE Heatilator Architectural File. Write Heatilator Fireplace, A Division of Vega Industries, Inc., 33102 W. Saunders St., Mt. Pleasant, Iowa 52641. (Also available in Canada).





Increased visual impact. Screen extension packages available to extend screen width from the standard 28″ size to 38″, 48″ or 60″.



Uses standard B-vent for single or multi-level arrangements.

heatilator®
AMERICA'S LEADING FIREPLACE SYSTEMS

SEE CATALOG IN SWEET'S LIGHT CONSTRUCTION FILE

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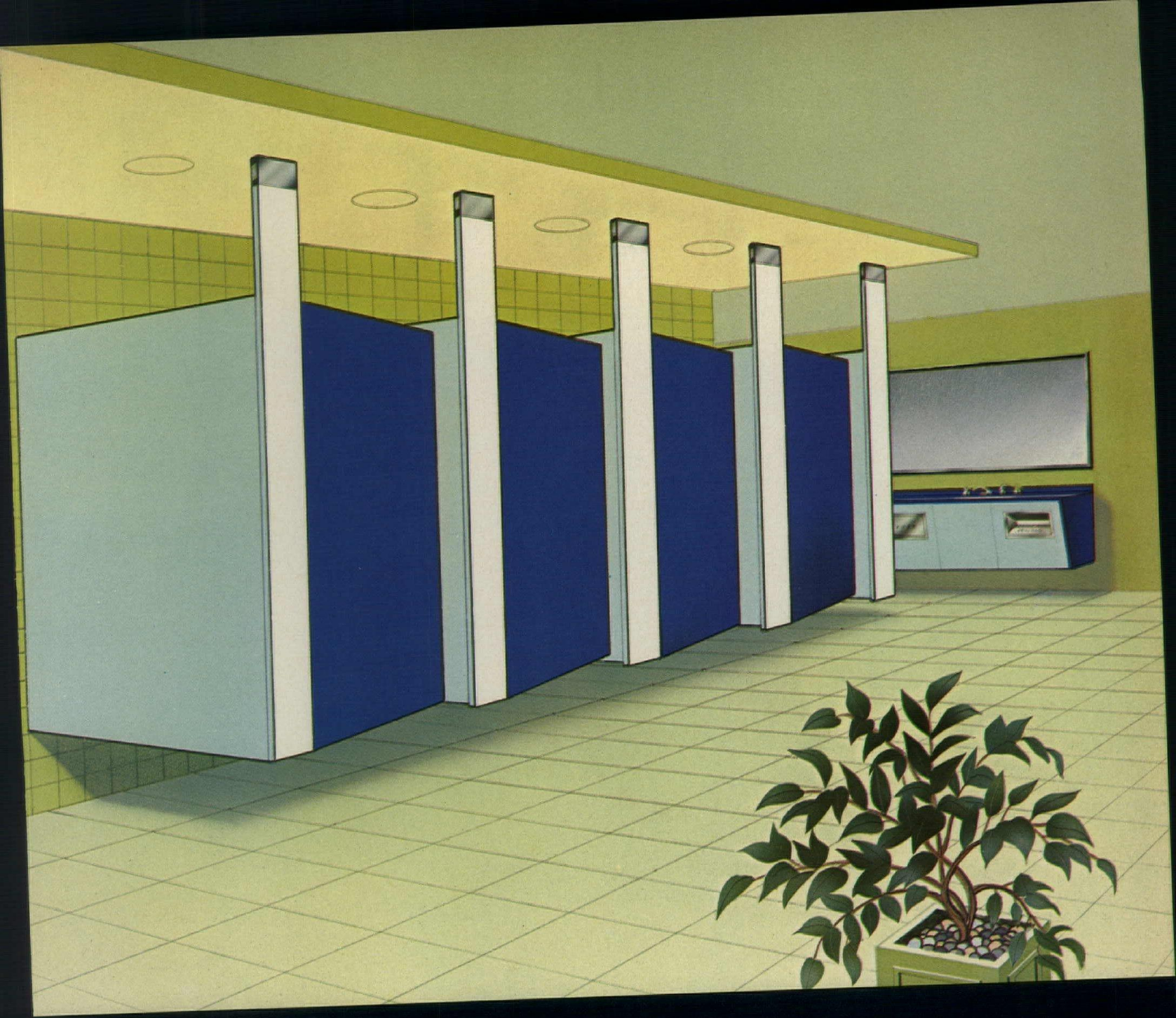
For more data, circle 17 on inquiry card



Hidden Hardware...Hidden Strength

BOBRICK LAMINATED PLASTIC TOILET COMPARTMENTS

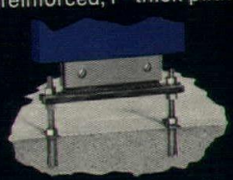
All the stainless steel hardware is concealed inside the compartment. This... together with uniform 1" thick pilasters, wall posts, panels and doors... creates that attractive flush front appearance.

Bobrick pilasters have another hidden feature. An 11 gauge steel reinforcing core is factory welded to a 3/8" thick steel leveling device, forming a single structural unit. Three ply sandwich construction of doors and panels impregnated with resin, provides extra strength and dimensional stability.

And still another hidden feature . . . all holes for hardware are factory drilled and furnished with threaded steel inserts, to assure maximum holding power and precise alignment.

Get the "inside story". Send for our new Toilet Compartment and Vanity Center Catalog: Bobrick Architectural Service Dept., 101 Park Ave., New York.

Steel reinforced, 1" thick pilasters



Factory-installed leveling device

Threaded steel inserts for hardware

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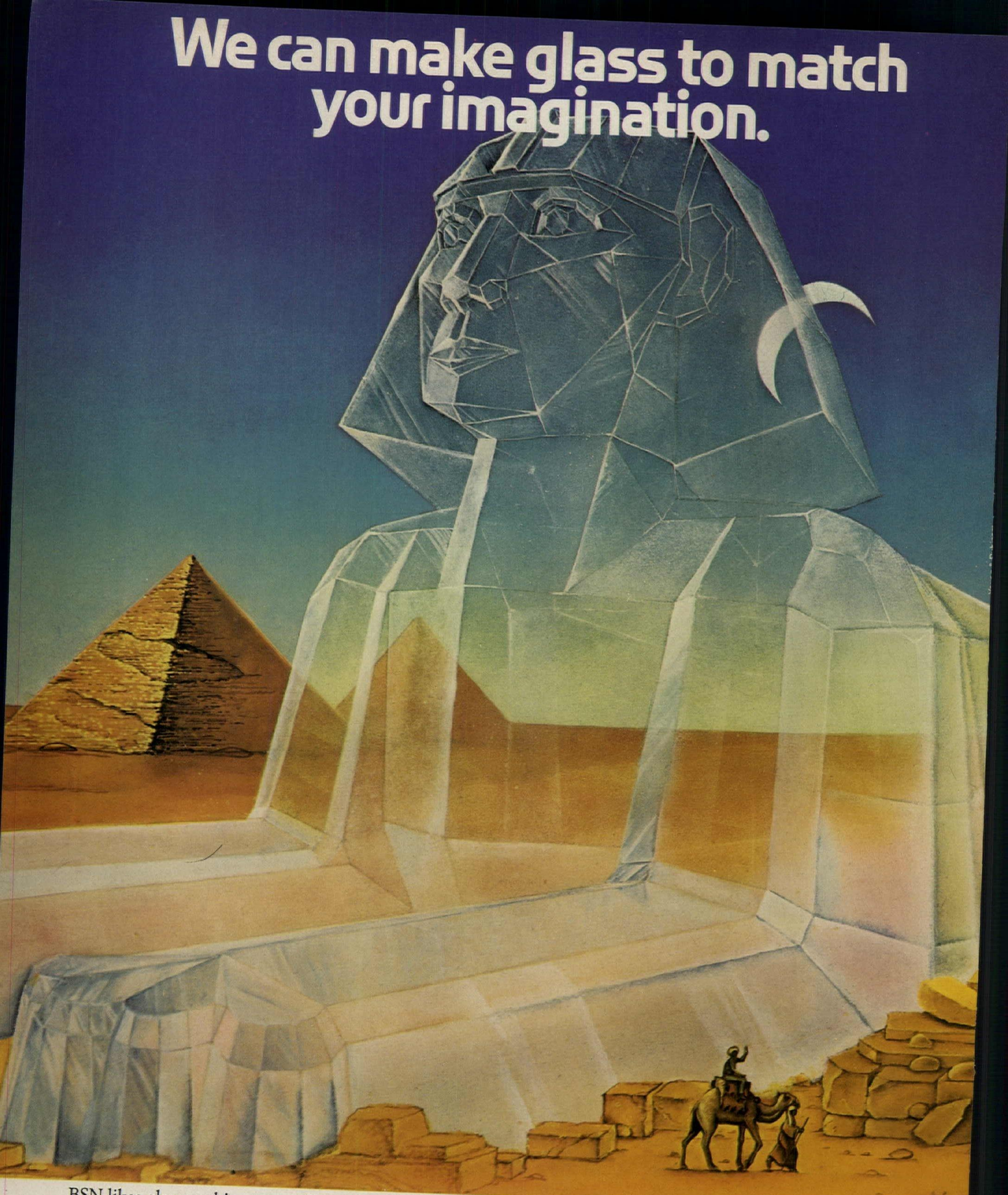

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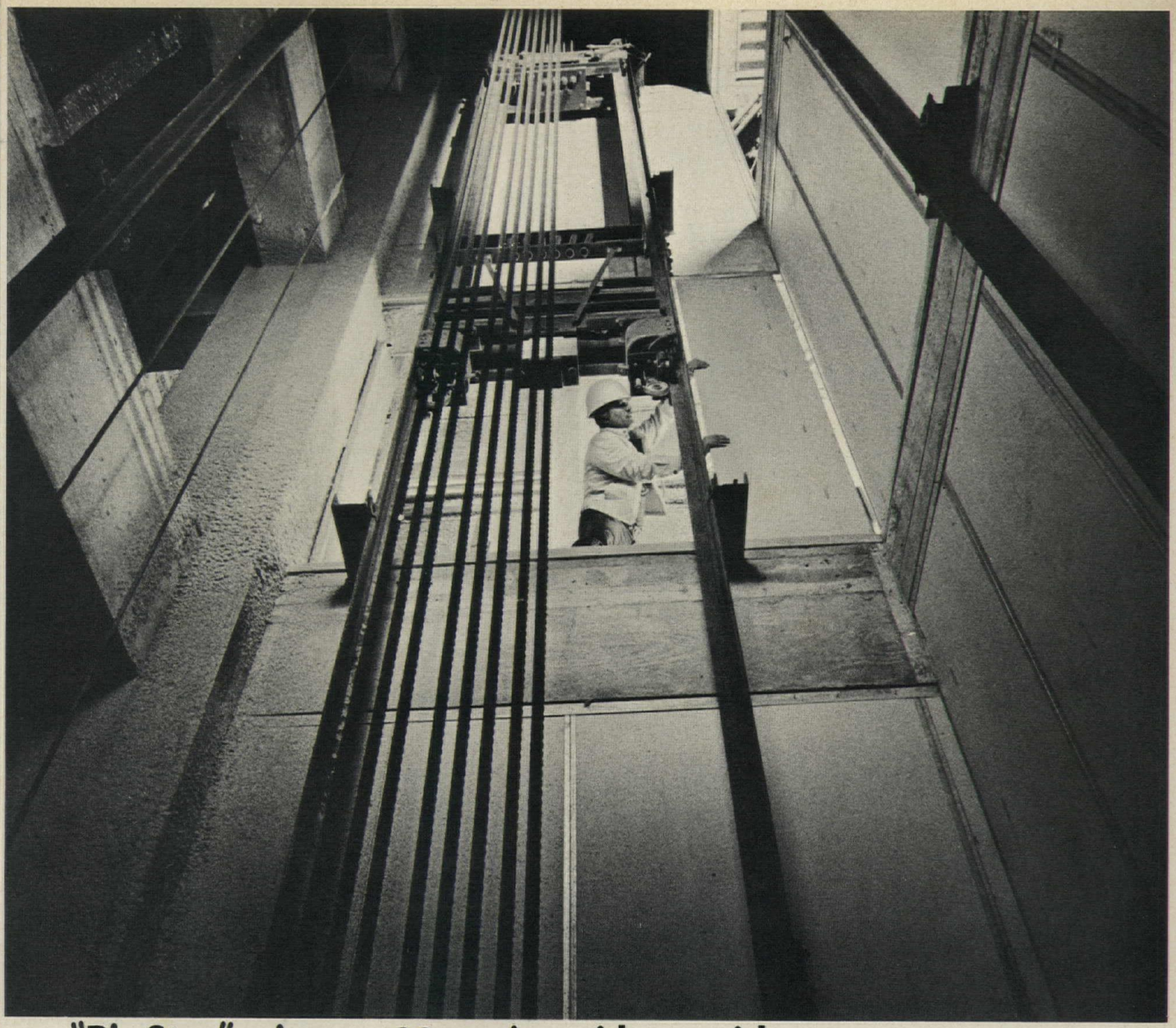
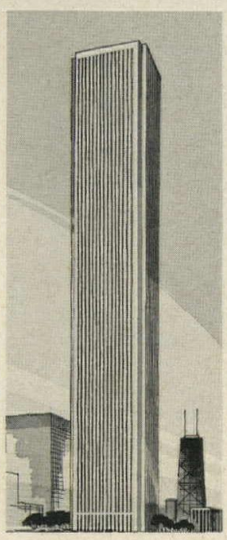


"Big Stan" going up 80 stories with new idea in elevator shafts



Based on the tube concept with perforated steel shell walls, "Big Stan" will rise 1,136 feet above ground level. Architects: Edward Durell Stone & Associates, New York; Perkins & Will, Chicago. General Contractor: Turner Construction Company of New York and Chicago. Shaft Wall Contractor: McNulty Bros. Company, Chicago.

USG® CAVITY SHAFTWALL SYSTEMS are going up fast at the new Standard Oil Company (Indiana) headquarters building on Chicago's lakefront. This original concept was developed by United States Gypsum working with architects and general contractors. It combines the speed of gypsum panel installation with easy erection from the corridor side. And in-place costs are so convincingly low, these systems are also being installed at Sears Tower, Chicago, One Shell Square, New Orleans, and other megastructures nationwide. For good reasons:

Faster Installation. Takes less manpower, less time to build. *Gets elevator cars running sooner.*

Lighter Weight. Only 10 lbs. per sq. ft., 78% lighter than masonry. Reduces dead load to save on structural steel.

Eliminates Extra Work. System includes vertical chaseway to speed installation of electrical conduit.

Meets Any Design Need. Simplifies handling of special heights at lobby and mechanical floors. Unique design of steel components allows for ceilings up to 18 feet high, shaft pressures up to 15 psf.

UNITED STATES GYPSUM *101 S. Wacker Drive, Chicago, Illinois 60606*

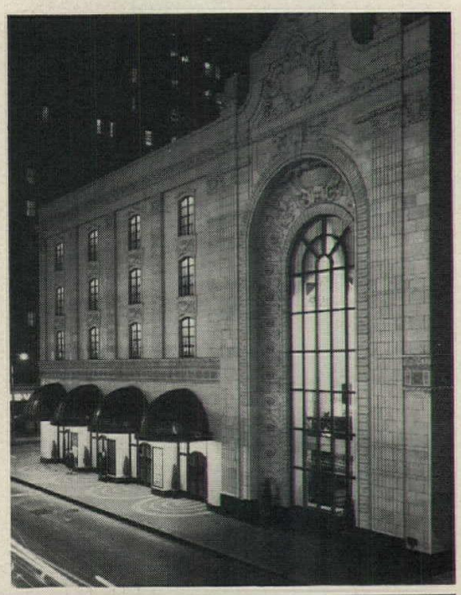
BUILDING AMERICA

For more data, circle 20 on inquiry card

Dover Stage Lift helps recycle an old movie palace

In a Cinderella-like transformation, the old Penn vaudeville and movie theater in Pittsburgh has become a showcase for the arts.

Now known as Heinz Hall for the Performing Arts, this unique building is not only the new home of the Pittsburgh Symphony, Pittsburgh Opera, Civic Light Opera, Pittsburgh Ballet and the Pittsburgh Youth Symphony, but also offers complete theatrical and film facilities for international attractions.



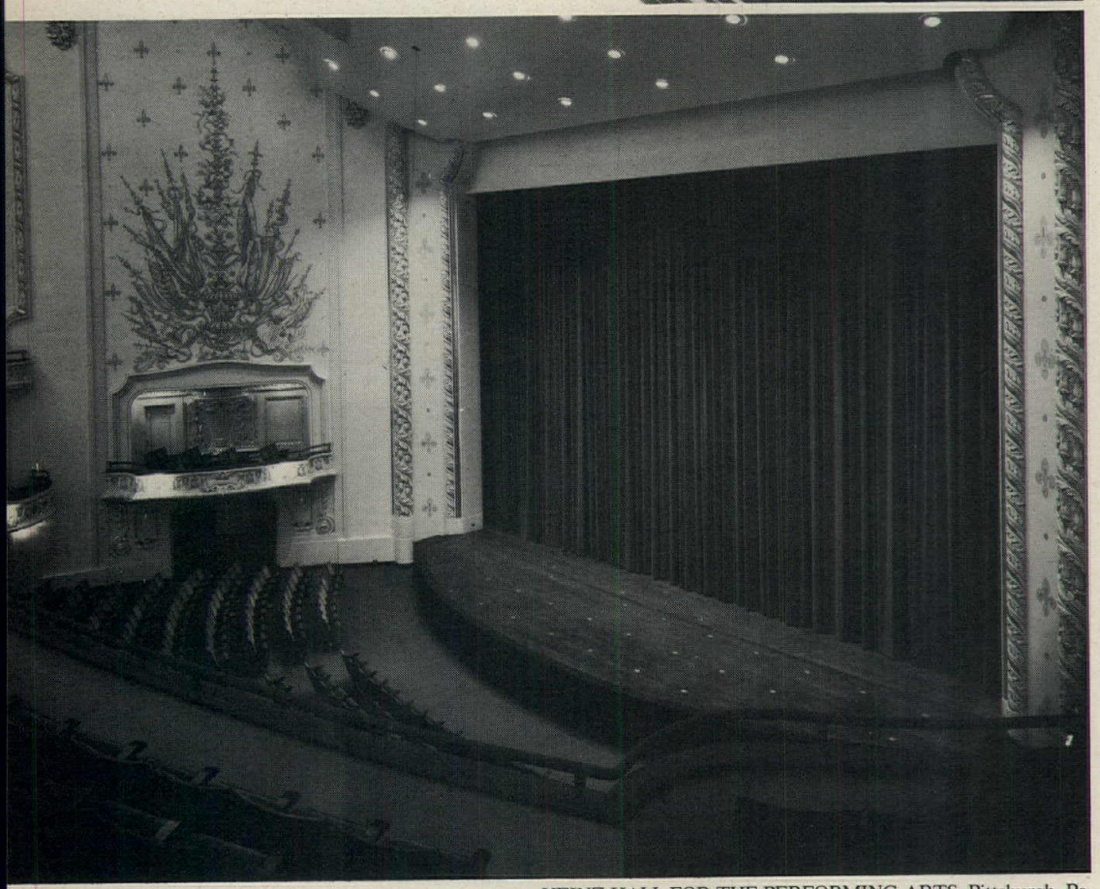
Much of the neo-Baroque opulence was retained in the multi-million dollar renovation project. But extensive revamping was necessary for conversion of the old movie palace into a building that functions efficiently and beautifully for its diverse new tenants.

A major addition was a Dover Stage Lift, 14′ x 54′ in overall dimensions. Raised, it provides a needed extension of the stage area; lowered, it serves as an orchestra pit.

Dover Stage Lifts are used in theaters, concert halls, opera houses and drama centers throughout the country to provide more flexibility and imagination in staging musical and dramatic presentations. Call us in for design and engineering assistance, or check our catalog in Sweet's Files. Dover Corporation, Elevator Division, Dept. A-10, P. O. Box 2177, Memphis, Tenn. 38102. In Canada: Dover/Turnbull.

DOVER Stage Lifts

For more data, circle 21 on inquiry card



HEINZ HALL FOR THE PERFORMING ARTS, Pittsburgh, Pa. Architects: Stotz, Hess, MacLachlan and Fosner, Pittsburgh. General contractor: Mellon-Stuart Co., Pittsburgh. Acoustical and stage lift consultant: Dr. Heinrich Keilholz. Engineers: George Levinson, Inc. (structural); Meucci Engineering Inc. (mechanical); Hornfeck Engineering, Inc. (electrical). Interior designer: Verner S. Purnell. Dover Stage Lift installed by Marshall Elevator Company, Pittsburgh.

News in brief

An extra billion dollars of new construction was added to this year's Dodge Construction Outlook in the mid-year review and update, it was announced by F. W. Dodge Div. of McGraw-Hill Information Systems Company. This brings the estimated total of new construction contract value for 1972 to $86 billion, eight per cent higher than last year's amount.

Frank Lloyd Wright's home and studio in Oak Park, Illinois is now being offered for sale on a best offer basis. The large (25 room) structure was built in 1895 and is sited on a 90 x 205 foot suburban lot. Inquiries can be made to: Avenue Realty & Mortgage Company, 201 North Harlem Avenue, Oak Park, Illinois 60302.

The Organization of Architectural Employees, by a vote of its membership, has cast its lot with the United Brotherhood of Carpenters. OAE leaders are proceeding immediately to draft an affiliation agreement with Carpenters representatives and agreement is expected by mid-October.

The Building Systems Information Clearing House of the Educational Facilities Laboratories has just published, in a single volume, two recently completed studies of SCSD schools. Copies of the publication are available from BSIC/EFL, 3000 Sand Hill Road, Menlo Park, California 94025

It will cost the Federal government an estimated $14.5 million in five years to achieve a hoped-for conversion to the metric system of measurement. This is the figure carried in the Senate Commerce committee's report on S. 2483, the bill that slipped through the Senate quietly on calendar call just before the convention recess. The House Science and Astronautics committee had not scheduled action on its measure, but in view of the Senate's move, new attention will be paid to this in the next few weeks. In final form, the Senate's version calls for a Federal policy of conversion over a 10-year period based on guides worked out by an 11-member National Metric Conversion Board composed of nine private citizens appointed by the President and one each from the House and Senate. This board would have 18 months to work up its plan for conversion.

A cliff-hanger in the Senate on the question of dividing up the Highway Trust Fund for other-than-highway purposes (that means mass transit) was developing last week as two major committees had reported the current transportation bill. The committee that traditionally handles this legislation—Public Works—narrowly defeated an effort to dip into the fund for transit purposes and sent its bill to the Senate with the recommendation that fund monies be kept for road building purposes only. Shortly thereafter, the Senate Banking, Housing and Urban Affairs committee reported the bill recommending an amendment which would open the trust fund to mass transit participation. The measure goes to the Senate in the Public Works committee form, with the sacrosanct fund still intact, but the other committee amendment was to be offered on the floor, seeking to permit use of $800 million annually for rail transit improvements. These developments came after Transportation Secretary John A. Volpe appeared before the Banking panel to urge more flexibility in the program. He argued strongly, as does AIA, for recognition of wider transit needs.

The House Banking committee has completed work on the omnibus housing bill for 1972; a monumental task that required most of the summer. The Senate passed its version with a single dissenting vote last spring and if the complicated House measure gets through the full House, as expected, there remains only conference committee deliberations, final enactment by both branches of Congress and Presidential approval to present the nation with its most comprehensive law covering housing and urban renewal in many years.

Designers Saturday Inc. extends an invitation to architects to participate in Designers Saturday—a showing of new furniture designs by 25 companies in their mid-Manhattan showrooms. The dates are Oct. 13-14. For information: Erik Norup, Designers Saturday, P.O. Box 1103. F. D. Roosevelt Branch, N.Y.C., N.Y. 10022.

The Association of Collegiate Schools of Architecture, in an effort to locate potential faculty members from among women and minority groups, encourages all persons from such groups who are interested in teaching, to send their resumés to: Office of the Executive Secretary, Association of Collegiate Schools of Architecture, 1785 Massachusetts Avenue, N.W., Washington, D.C. 20036.

An architectural concrete seminar, sponsored by the Chicago Chapter of the AIA and conducted by the Architectural Concrete Consultants and the Trinity Division of General Portland, Inc., will be held October 25, at the Chicago Circle Campus, University of Illinois. The seminar will be repeated on November 14 at the Ohio State campus under the joint sponsorship of the School of Architecture and the Ohio Chapter of AIA.

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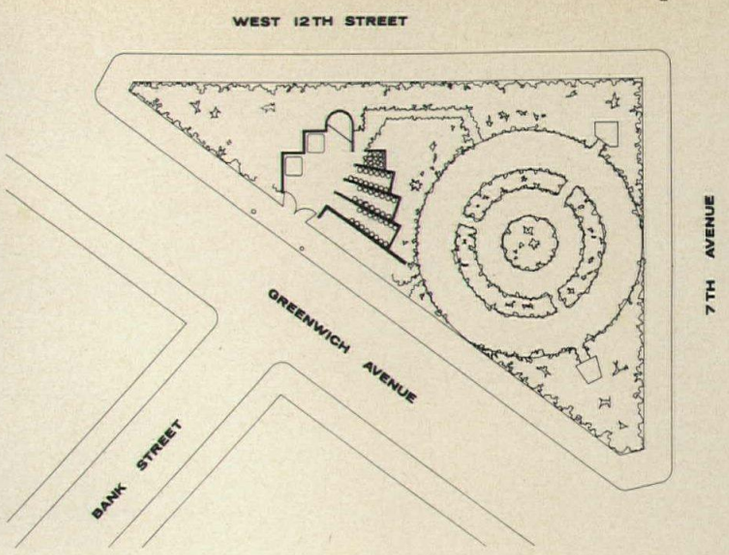

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BART'S FIRST SEGMENT STARTS OPERATING

This country's first new rapid transit system in 50 years began operating in mid-September in the San Francisco Bay Area. Known as BART (Bay Area Rapid Transit), the system will eventually traverse 75 miles of line laid in the three Bay Area counties which voted in 1962 to tax themselves $9.6 million to build the system. (Costs have escalated over the years, and construction of the system will cost $1.4 billion in the end.) The first segment, operating in Alameda County, uses 28 miles of track, most of it on "aerial" lines.

The new line is unquestionably the most advanced in passenger comfort, computerization, ticketing and, in certain respects, design. Its trains run quietly on steel rails; its cars are carpeted wall to wall; their seats are upholstered and their large windows provide fine views during the long stretches of aerial runs. The trains quickly reach their running speed of 80 miles per hour. Works of art embellish the stations, most of them integral with the station design. The stations are barrier-free, unlike most other rapid transit stations, so that users of wheel chairs can go from ground level by elevator to platform to train without impediment.

Along the just-opened line are 12 stations, designed by seven architectural firms and three engineer firms. In all, when the system is finished, there will be 34 stations, all distinctive, for whose design some 16 architectural firms and three engineering firms will have been responsible. Coordinating the architectural and engineering design for both the Joint Venture Engineers and for BART is Tallie Maule, who has both insisted on and had the authority to require high standards of esthetic and functional results.

The stations now in use were designed by Maher and Martens; McCue Boone Tomsick; Joseph Esherick and Gwathmey-Sellier-Crosby; Gardner Daily & Associates (now Yuill-Thornton Warner & Levikow); Reynolds & Chamberlain; Wurster, Bernardi & Emmons; and Kitchen & Hunt. Engineering firms are Bechtel Corporation; Parsons, Brinckerhoff, Quade & Douglas; and Tudor Engineering. Three of the stations are below ground (but receive daylight through skylights or monitor windows); the other eight are on aerial tracks.

Another line—to Berkeley and Richmond—is to be open at the end of 1972. Early in 1973 the last leg of the East Bay Lines will open, and in June 1973 the Bay tube and San Francisco line will go into operation.

N.E.A. GRANTS TO STUDY THE EDGES OF THE CITY

The National Endowment for the Arts has announced that it is receiving applications for a new $500,000 program entitled CITY EDGES. This program will sponsor planning and design studies of problems confronting cities in their treatment of freeways, riverfronts, suburban fringes and other natural and man-made "edges of cities." The unifying theme of CITY EDGES was selected to describe these unique urban features around which the Endowment will focus a major portion of its funds for physical design research during the coming year.

Proposals which provide for a broad interdisciplinary approach to "city edge" problems and which possess real possibilities for implementation will be given priority. Deadline for completed applications will be December 11, 1972. Review of applications and selections will be made by a panel of planning and design professionals.

For application forms and further information: Director, Architecture and Environmental Arts, City Edges Program, National Endowment for the Arts, Washington, D. C. 20506.

2

FOUNDATION FUNDS RECYCLING CENTER

With a good deal of private initiative and a modest grant from the Vincent Astor Foundation, a group of concerned citizens, calling themselves the West Village Committee, have established a recycling center in New York's Greenwich Village. Located temporarily on a triangular lot owned by St. Vincent's Hospital and bounded by Greenwich Avenue, Seventh Avenue and West 12th Street, the recycling center, now fully operational, was designed by architect Peter Szego and is administered by the Village Green Recycling Team, Russell Childs, chairman.

The center is enclosed by eight foot high wood fencing—soon to be painted in a bright optical pattern. Behind this fencing, recyclables are sorted and stored for later removal by the Environmental Action Coalition which will truck away all materials except newspaper. Newspaper will be collected, on a regular basis, by the Department of Sanitation.

Not only does the Village Green Recycling Center focus attention on the increasingly critical problem of waste disposal, it also provides a constructive format for future community action.

AIA BOARD HOLDS SUMMER SESSION IN WYOMING

The 18 directors of the American Institute of Architects, its officers and 11 staff members met in Jackson Hole, Wyoming last week in the board's regular September session. Also scheduled for attendance were William L. Slayton, executive vice president; the three Commission chairmen; Don Edward Legge, chairman of the Council of Architectural Component Executives; Norman C. Fletcher, architect for the new AIA headquarters building, and Frank J. Whalen, Jr., attorney.

A full agenda schedule included approval of 1973 committee appointments, officer and staff reports, budget approvals and a host of other matters related to Institute operation. Board policy on the sale of membership lists was to be clarified and a full accounting of the new special assessment program was given Government Affairs Commission Chairman William Marshall, Jr.; staffer James Donald, and AIA's Treasurer Elmer E. Botsai.

With no real interest generated for the Broward, Florida chapter's proposal that the Institute emblem be redesigned, the idea was expected to be dropped. The Commission on the Professional Society and the AIA Planning Committee had discussed the suggestion with neither expressing sympathy for a change.

At Jackson Hole, the board members discussed a resolution brought before them by the Commission on Environment and Design, placing the Institute on record urging a halt to all logging, road building, and other development in the Alpine Lakes Region in North Central Cascade Mountains of Washington State until Congress can act on the matter. The point was made that this area contains a portion of the Pacific Crest Trail and is within one hour's drive of more than one and one-half million people. This resolution also supported creation of an Alpine Lakes National Recreational Area of 926,000 acres, about a third of which would remain wilderness forever.

Other agenda items included a look at bylaws of the National Architectural Accrediting Board for possible revision, recent AIA position statements and a rundown of the AIA awards programs.

One item for consideration involved a waiver of registration as a requirement for membership in the Institute. This was presented by Director Hugh McK. Jones, Jr., chairman of the Commission on the Professional Society.

There was evidence that the organization is moving more deeply into the national legislative arena with discussion of a resolution on reimbursable health care costs. This came from the Committee on Architecture for Health and urged that legislation and programs include such reim-

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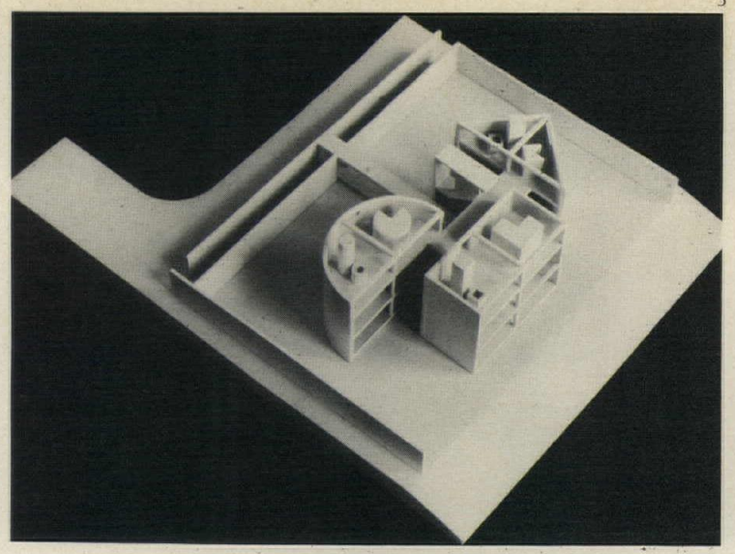

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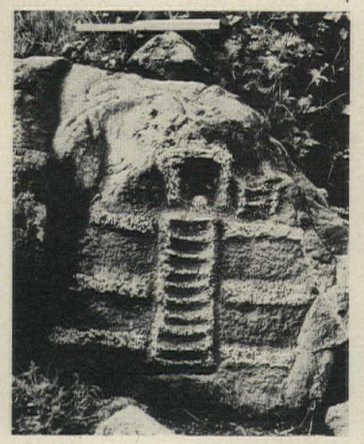

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bursable costs as a means of providing a source of funds for appropriate construction of health facilities.

The committee submitted a supporting policy statement on national health legislation and insurance programs.

Correctional architecture also came in for special consideration as the board entertained a resolution endorsing the report of its task force on this subject. Here, again, the report and task force recommendations were outlined in a supplementary statement. The TF urged AIA to participate with other organizations in seeking solutions to what it called the "critical environmental problem" of outdated approaches to correctional building design. It also was asked that the Task Force be made a continuing committee of the Institute in 1973.

Board members heard a report on AIA efforts to obtain a federal grant for a study of the effects of the occupational safety and health law on the construction industry and a report on the new headquarters structure by architect Fletcher. Proposed document changes were reviewed and approved and several award nominations were presented.

3

HEJDUK TO HAVE ONE-MAN SHOW

John Hejduk, chairman of Cooper Union's Department of Architecture, will present a one-man show of his work in Paris from October 4 to November 16. The exhibition will consist of six models and over 100 drawings (photo sample above). These projects represent Hejduk's interest in "generating principles of form and space" over the last twenty years. The exhibition, "Projects/John Hejduk, architect" will be sponsored by *Fondation Le Corbusier* and will be held in the *LaRoche-Albert Jeanneret House, 10 square du Docteur-Blanche Paris, 16.* This will be the first show of its kind mounted by an American at *Fondation Le Corbusier.*

The National Endowment for the Arts awarded Professor Hejduk a grant of $5,000 to help defray costs of the exhibition and its circulation within the United States.

AIA ANNOUNCES WINNERS OF HOUSING AWARDS

Two developments in San Francisco and one in Minneapolis have won top honors in the 1972 awards programs for nonprofit sponsored low- and moderate-income housing. Six other projects were given Awards of Merit in the design awards program sponsored biennially by The American Institute of Architects, Nonprofit Housing Center Inc. and the American Institute of Planners.

The three Honor Awards were given to:

- Martin Luther King Square, San Francisco; Sponsor: Fillmore Community Development Association; architect: Kaplan & McLaughlin, San Francisco.
- Ebenezer Tower, Minneapolis; Sponsor: Ebenezer Homes Society; architect: Thorson & Thorshov Associates Inc., Minneapolis.
- Friendship Village, San Francisco; Sponsor: First Friendship Institutional Baptist Church; architect: Bulkley & Sazevich, San Francisco.

The six projects winning Awards of Merit were:

- Maplewood Terrace, Middletown, Connecticut; Sponsor: Greater Middletown Community; architect: Charles W. Moore Associates, Essex, Connecticut.
- Western Park Apartments, San Francisco; Sponsor: Northern California Presbyterian Homes Inc.; architect: Thomas Hsieh, San Francisco.
- Village Park, Amherst, Massachusetts; Sponsor: Development Corporation of America and Interfaith of Amherst; architect: Stull Associates Inc., Boston.
- Harmony House Co-op, New Haven, Connecticut; Sponsor: Congregation Beth Israel; architect: Louis Sauer Associates, Philadelphia.
- Jamestown Homes, St. Paul, Minnesota; Sponsor: St. James A.M.E. Church; architect: Williams, O'Brien Associates Inc., Minneapolis.
- Hale Mahaolu Elderly Housing, Kahului, Maui, Hawaii; Sponsor: Hale Mahaolu; architect: Hirshen & Partners, Berkeley, California.

In making the selection out of 69 entries, the jury noted particularly that the architectural quality of the nine winners was exceptionally good, which, it said, "refuted a widely held premise that housing for the low- and moderate-income citizen must look and be poor."

4

COLUMBIA TEAM FINDS ANCIENT MEXICAN CITY

Using early Spanish records and modern aerial photographs, Dr. Shirley Gorenstein, of Columbia University's Department of Anthropology, uncovered a town with a 2,000-year history in Guanajuato, Mexico.

Dr. Gorenstein and six students, five from Columbia and one from New York University, returned in August from a two-month expedition in central Mexico. They brought back scores of pottery and stone fragments and hundreds of photographs from the settlement they had discovered 90 miles northwest of Mexico City. Nearby farmers called the place simply "Cerro Chivo," meaning "goat hill," but the Columbia team, the first archaeologists to see the site, found remains of human settlement dating back to 500 B.C.

Seven structures, probably from the 15th and 16th centuries, were found in ruins, two of them large, stepped, truncated pyramids with small temples on top. The scientists also found more than 30 natural rock outcrops bearing carvings that depict the pyramids (photo above), some in three dimensions. They may be the first such architectural petroglyphs, or prehistoric carvings in natural stone, ever positively identified in Mexican archaeology. The Columbia expedition also found what Dr. Gorenstein describes as a "superb stele"—a deeply carved ornamental slab of stone that may have stood as a symbol to mark a calendrical period.

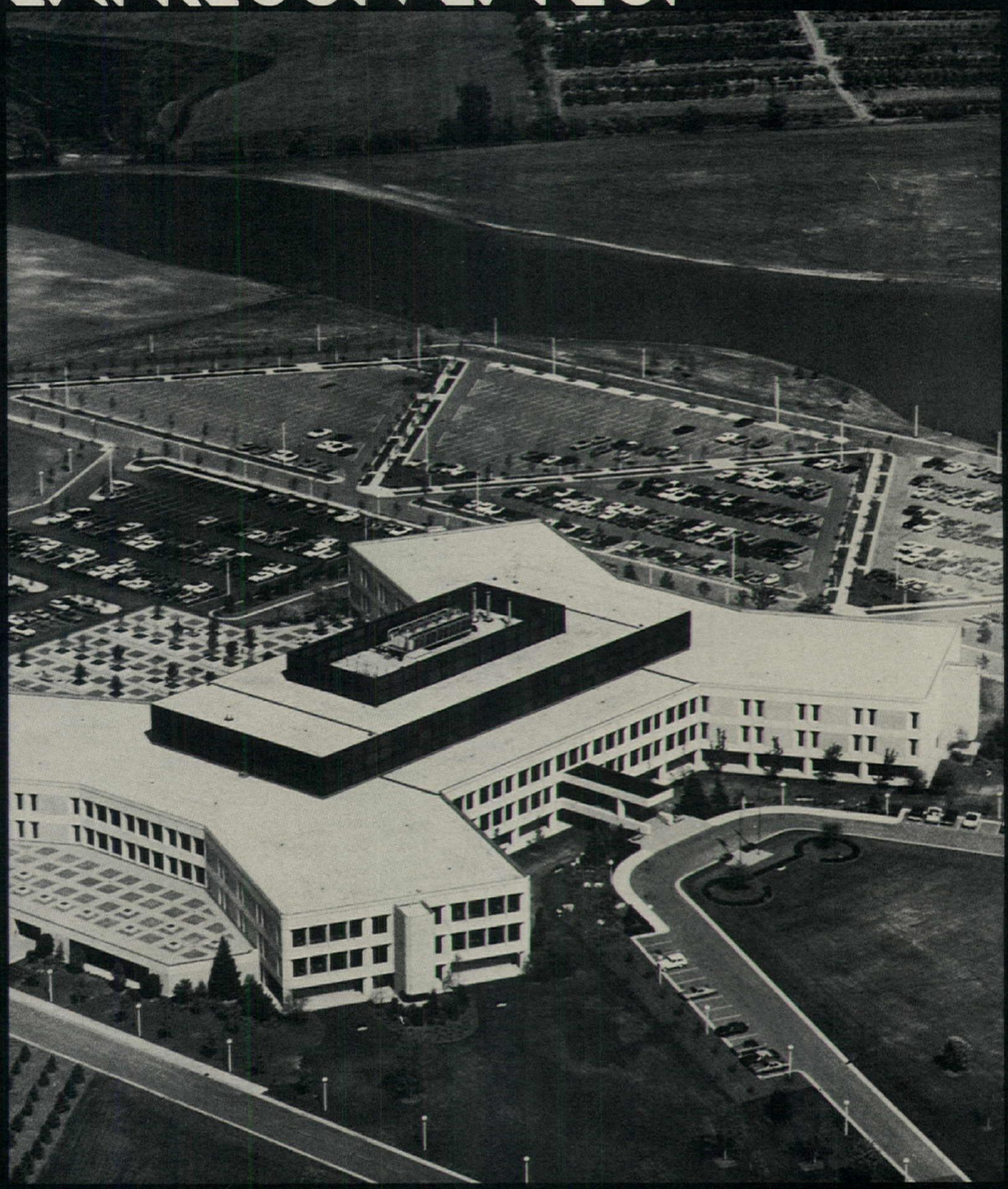
Sponsored by the Columbia University Council for Research in the Social Sciences and the Ford Foundation, exploration of the site will continue next year.

5

PARTICIPATORY PLAYGROUND

The 46th Street Park between Ninth and Tenth Avenues—in an area on Manhattan's west side once known as Hell's Kitchen—is looking up. A recently completed mural—on a 60- x 67-foot-high wall—by Arnold Belkin may launch a wave of social protest murals in New York akin to the mural movement now enlivening Chicago. This mural portrays the victims of drugs, poverty, disease and urban renewal on the left; in the center an ethnically mixed group resisting these evils with education, planning and peace represented respectively by a book, a blueprint and flowers; and on the right, the bright future of a planned neighborhood. In the foreground with the shovel is John L. McGraw, Chairman of the Board of McGraw-Hill Inc. which has contributed the art works to the park. Sculptor Phil Danzig is holding one of approximately 500 sandcastings which have been designed and made by community residents under his supervision and will be hung on one of the walls facing the park. Glazed ceramic tiles, likewise made by the residents under the direction of ceramacist Marilyn Fox, some of which have been incorporated into the sandcastings, will also be used in the playground paving. These are some of several participatory ideas designed into the park by architect Michael Altschuler with the intention of encouraging a protective and proprietary interest in the people who use the park which has in the past suffered severe vandalism. The art works have been done this summer for maximum involvement of the residents and to keep the playground open at its peak season. It will be completely rebuilt over the winter.

REINFORCED CONCRETE: EXPRESSIVE, YES.



Kemper Insurance Group Corporate Offices, Long Grove, Illinois.
Architects: Welton Becket and Associates, continuing the practice of Childs & Smith, Inc., Chicago.
Structural Engineers: Alfred Benesch & Co., Chicago.
Contractor: W. E. O'Neil Construction Co., Chicago.

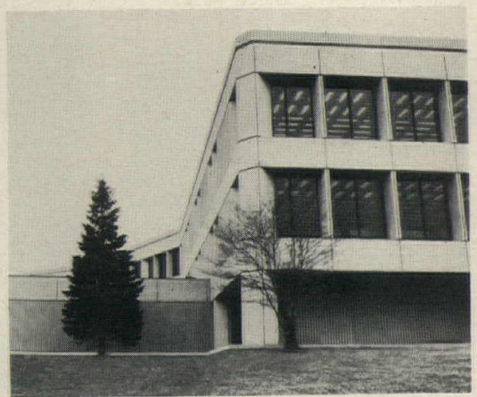
EXPENSIVE, NO.

More than a building—a planned environment.

Visualize a building site surrounded by 600 rolling acres of beautiful countryside. Suppose you had to design the corporate headquarters for the Kemper Insurance Group near Long Grove, Illinois. Your client wants a total planned environment—manmade lakes, wildlife refuge, parking areas shielded from view, with the building in harmony with its natural surroundings. Of course, he is concerned with costs, earliest possible occupancy, and due to the nature of his business, vitally concerned with fire safety. What's your solution? Compare it with the architect's choice: an expressive design, strikingly realized in reinforced concrete.

Cast in place to keep costs in line.

One of the design goals was to keep the massive structure low in proportion to the natural site, and give it a human scale. Four wings are angled obliquely from the rectangular main portion of the building. Earth-tone concrete using buff cement, with exposed aggregate panels between reinforced concrete structural members, provides visual harmony with the surroundings. Columns, mullions, and spandrels form a frame for recessed windows. In some instances, precast fluted concrete panels replace the windows. This design freedom was made possible by cast-in-place reinforced concrete columns (4,000 psi strength) and waffle-slab joist floors (complete waffle-slab designs can be selected from CRSI Design Handbooks to conform to latest codes.)



Detail of interesting exterior with exposed reinforced concrete sandblasted for texture.

The 500,000 square feet of interior space consists of free-flowing, large-bay areas. Here again, reinforced concrete construction, using Grade 60 rebars, delivers more usable, more flexible floor space. Proof that expressiveness can go hand-in-hand with economy is shown by the final cost of $6.51 per square foot for the reinforced concrete structural frame. More than 2000 tons of rebar were used.

How to insure a maximum fire rating.

Naturally enough, the Kemper Group specified that its own corporate headquarters must have the highest fire rating attainable in light of current technology. The high fire rating required was provided by use of a 4-inch lightweight concrete topping on all structural slabs. And all other materials were carefully chosen for fire resistance or given special flame-retardant treatment.

Finishing up with months to spare.

The speed and ease of construction with cast-in-place reinforced concrete, plus the immediate availability of rebars, are once again demonstrated in the Kemper complex. All phases of construction proceeded smoothly and the structure was completed a full five months ahead of schedule. Figure that in rent and depreciation savings! Contributing to this time-saving, money-saving performance was the use of Grade 60 rebars in straight lengths with simple lap splices.

Grade 60 and the benefits of Strength Design.

Grade 60 reinforcing steel permits complete utilization of Strength Design. Its 50% greater yield strength enables the designer to plan for slimmer columns, more usable floor space, and lower construction costs.

Reinforced concrete: expression without the expense.

Get away from the stereotypes and into the building system that has it all: design freedom, fast construction and early starts, less maintenance, proven economy. Cast-in-place reinforced concrete lets the imagination soar, while budgets stay down-to-earth.

Send reader service card for further technical data.

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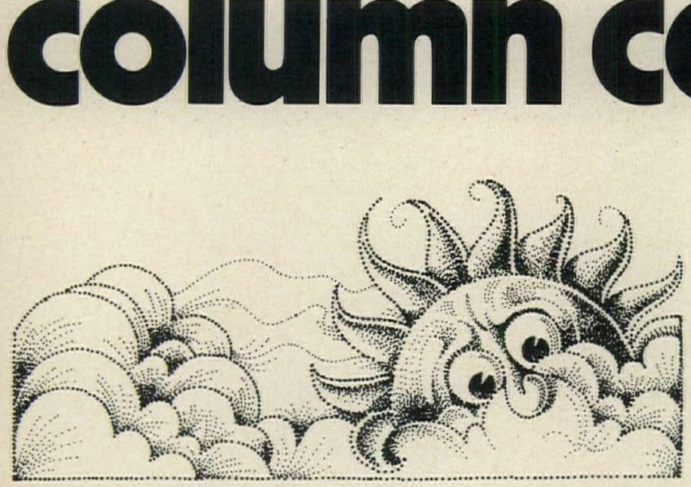
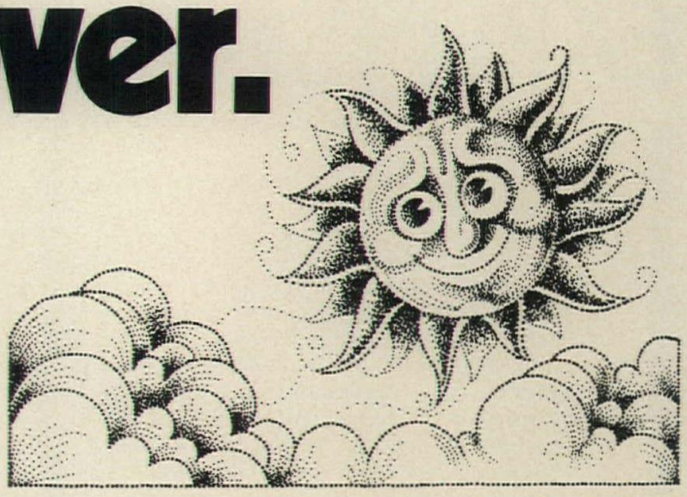
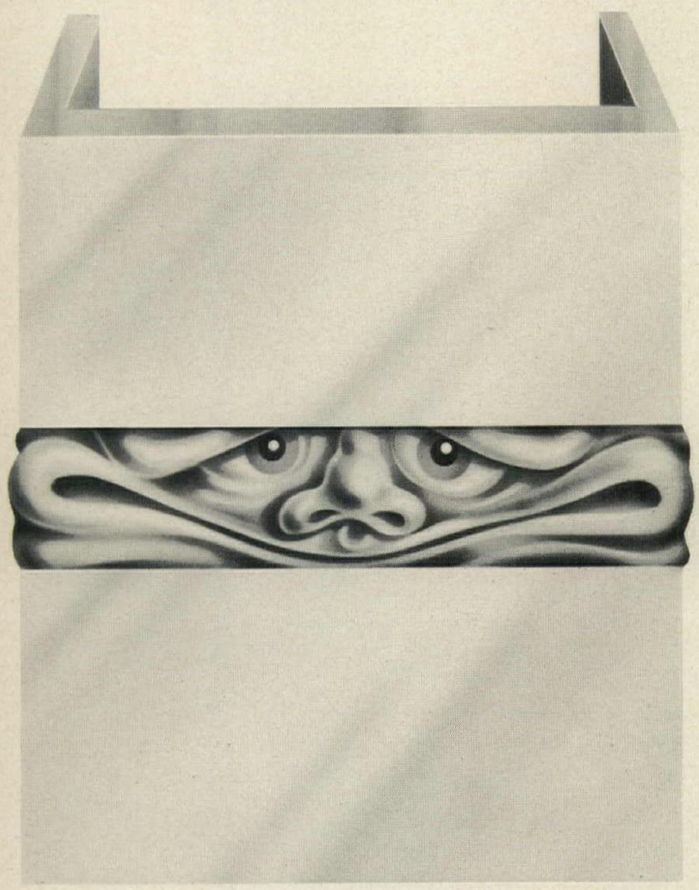
228 North LaSalle Street, Room 1204 • Chicago, Illinois 60601

For more data, circle 22 on inquiry card

Mating habits of the all-aluminum column cover.





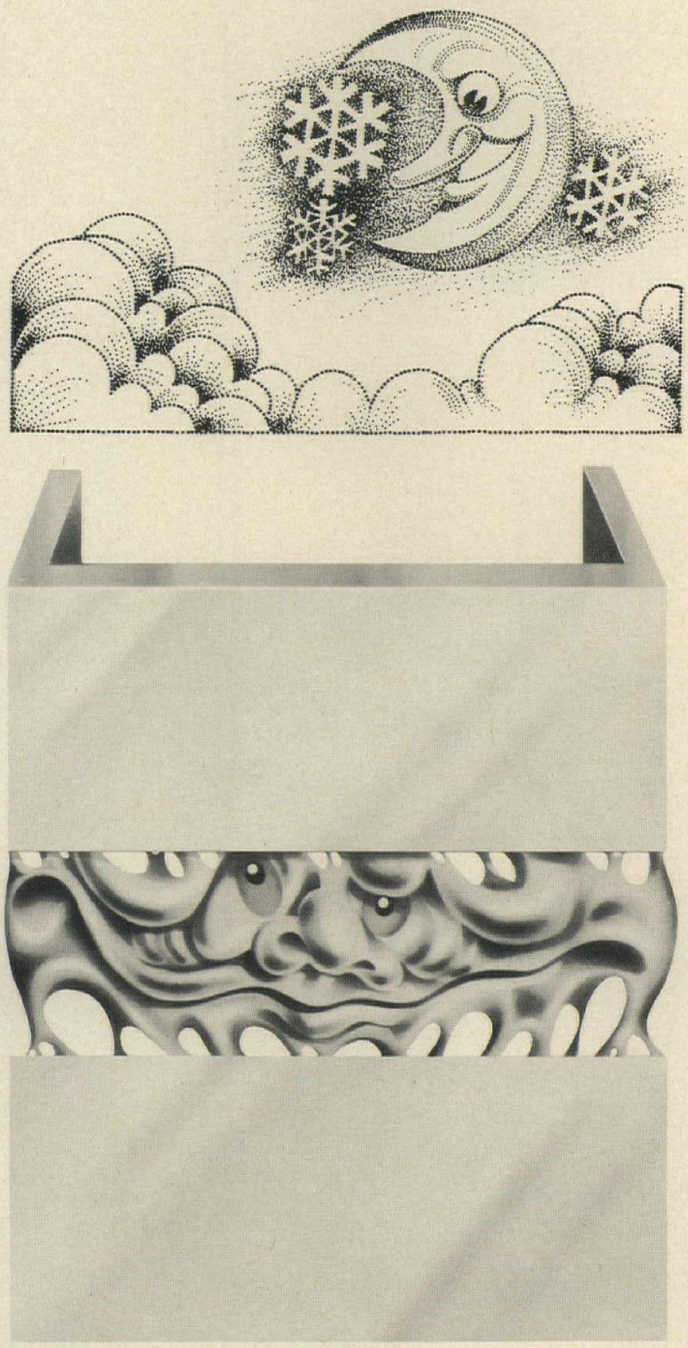


By itself an aluminum column cover is a thing of joy and beauty forever. The trouble starts when you try to make a waterproof joint between a pair of them.

Let's say the job calls for a ⅜″ joint between 12-foot panels. The panels are set in place at 8:30 a.m. The temperature is 50°F when the sealant is applied. (Above, left).

But now the temperature starts to rise. By 4:00 p.m. it's 85°. And those dark-colored, dull-finished, insulated panels are up to 175°. The joint has compressed to ¼″. This is normal building movement. But look what's happened to the sealant. (Above, center).

Heat speeded the cure. And by 4:00 p.m. the sealant has cured to a firm bead ¼″ wide.



Now the temperature drops. By 9:00 p.m. it is 20°; the joint opens up to $\frac{7}{16}$". And while the job called for a $\frac{3}{8}$" cured bead that could move 25% either way, it actually winds up with a $\frac{1}{4}$" cured bead that must elongate more than 50% to $\frac{7}{16}$". It probably won't stick it out. (Above, right).

Here's how you can avoid this problem.

Design the joints at least $\frac{1}{2}$" wide. This way, you will wind up with a $\frac{3}{8}$" cured bead that has to move just 25% of its cured width.

If it is aesthetically feasible, use 6-foot instead of 12-foot panels. You'll cut panel expansion in half and stay well within the sealant's movement capability.

Better still, you might talk to us while you are still in the design stage. We're Tremco. And we cope with aluminum column cover sealant problems every day of the year. We also have some 15 basic sealant formulations to work with – including such familiar names as MONO (our job-proven acrylic terpolymer), DYmeric (our Tremco-developed polymer), and Lasto-Meric (our polysulfide).

With all this going for you, you can stop worrying about the mating habits of the all-aluminum column cover. Because Tremco will come up with a sealant system that will stick with you for years on end. The Tremco Manufacturing Company, Cleveland, Ohio 44104, or Toronto 17, Ontario.

TREMCO
The water stoppers

OFFICE NOTES

NEW FIRMS, FIRM CHANGES

Abbott Merkt & Company, Inc., a New York based firm composed of architects and engineers, announced a change in the name of its wholly owned recently acquired architectural firm subsidiary known as **Alfred A. Lama Associates, Inc.,** to **Abbott Merkt Architects, Inc.**

William F. Bernbrock, AIA president of the firm of William F. Bernbrock, AIA, Architects and Engineers, Inc. located at 1630 Fifth Avenue, Moline, Illinois takes pleasure in announcing that **William H. Meyer, AIA** is now a corporate member of the firm to be known as **Bernbrock-Meyer, Inc., Architects-Engineers,-Consultants.**

John W. Tullock Jr., Landscape Architect-Site Planner announces the opening of an office providing professional Landscape architectural and site planning services for architectural and planning firms, private, commercial, and industrial land owners and developers, federal, state, and local agencies.

Michael J. DeAngelis, FARA and Associates, Architects-Engineers would like to announce that they have opened a new branch office in the Western Savings Fund Building at Broad and Chestnut Streets, Philadelphia, 19107.

William K. Quinter, AIA wishes to announce that he is now engaged in the general practice of architecture with offices at 156 Congressional Lane, Suite F, Rockville, Maryland 20852.

Robert T. Morris AIA announces the relocation of his offices to 5572 Newanga Avenue, Santa Rosa, California.

Robert Platt and Associates Inc. is pleased to announce the relocation of their offices for the practice of Architecture, Engineering & Planning to 1844 Third Avenue, San Diego, California 92101. The new telephone number is (714) 236-1818.

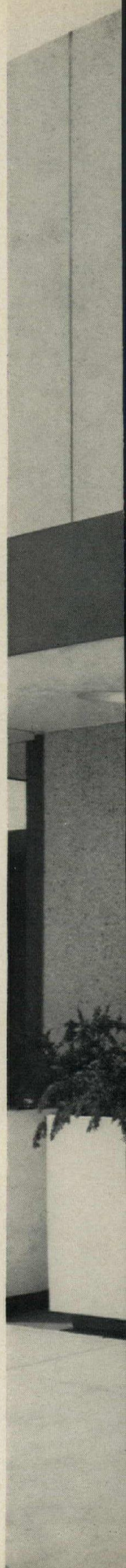
Saunders, Pearson & Partners, the Alexandria firm of Architects-Engineers-Planners, have announced the admission of **C. James Appleton, III, AIA** and **Tung C. Cheng, AIA** as Partners. Appleton will assume the position of Managing Partner and the firm will now be known as Saunders, Pearson, Appleton & Partners.

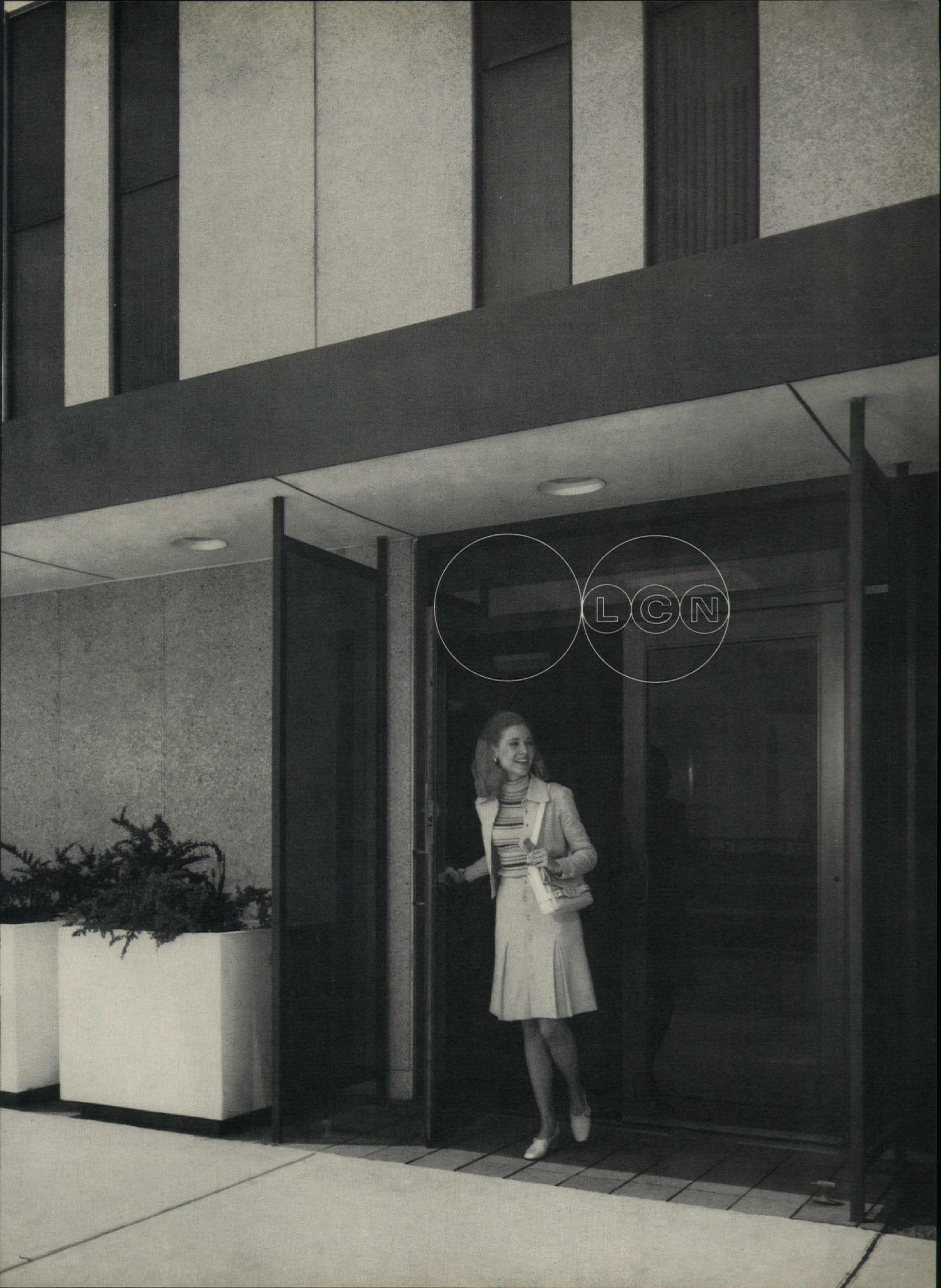
A. Epstein and Sons, engineers and architects have appointed Ralph Jones, AIA to chief architect in the New York office.

M. Paul Friedberg & Associates, Landscape Architecture and Urban Design are pleased to announce the appointment of William B. Kuhl and Allen C. Pearson as associates in the firm.

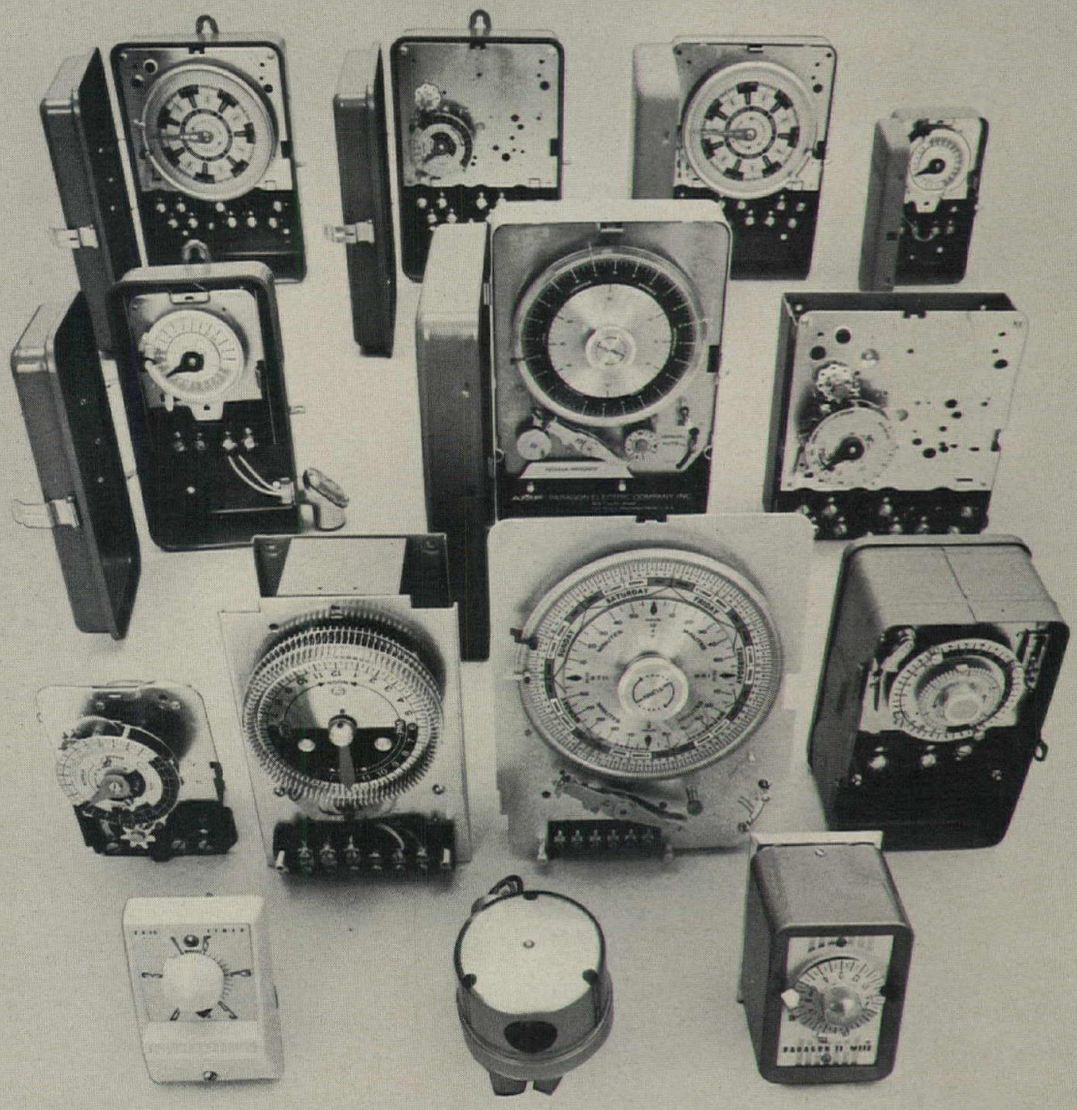
ERRATA

In the credits for Kennedy Plaza Apartments by Ulrich Franzen & Associates, published in RECORD, September 1972, pages 158-160, Regi Goldberg should have been given acknowledgement. She was project architect on the job.




LCN

AMF Paragon offers you over 1000 different ways to solve your control problems...



You can specify most every type of time control for industrial, commercial and municipal heating, cooling, air conditioning and lighting jobs from a single source. AMF Paragon. With full-line availability from the industry's largest network of stocking distributors.

Everything from standard 24-hour and 7-day time controls to momentary contact, photo-initiated, and program instrument models . . . photocells . . . contactors . . . carry-overs, and special enclosures. Even specialty time controls for security and environmental needs.

And, to provide optimum on-the-job performance, many AMF Paragon controls feature an exclusive slider bar switch mechanism for positive "make and break" contact, lubricated-for-life motors, dial clutches for a positive cycle check, and molded pheonolic terminal boards.

So, when time controls are part of your specification—look to AMF Paragon. The complete control source. If you don't have our full-line catalog, write or call, today, AMF Paragon, 1600 12th Street, Two Rivers, Wisconsin 54241. (414) 793-1161

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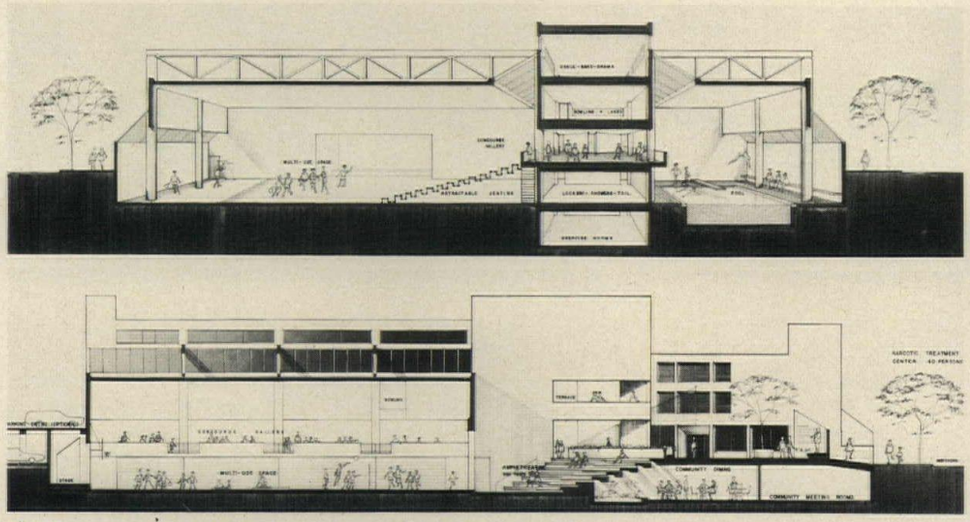
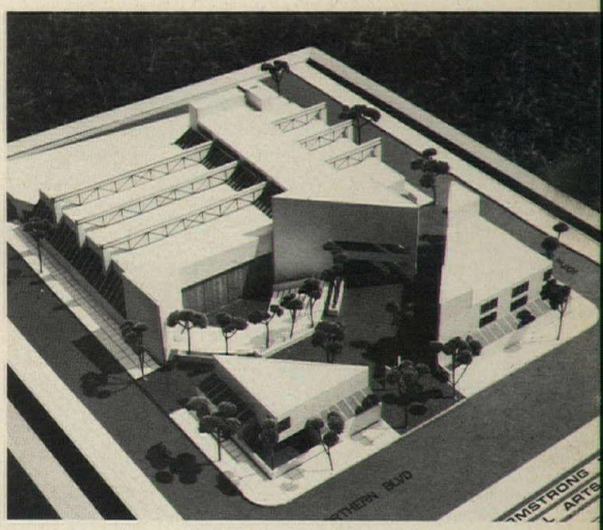
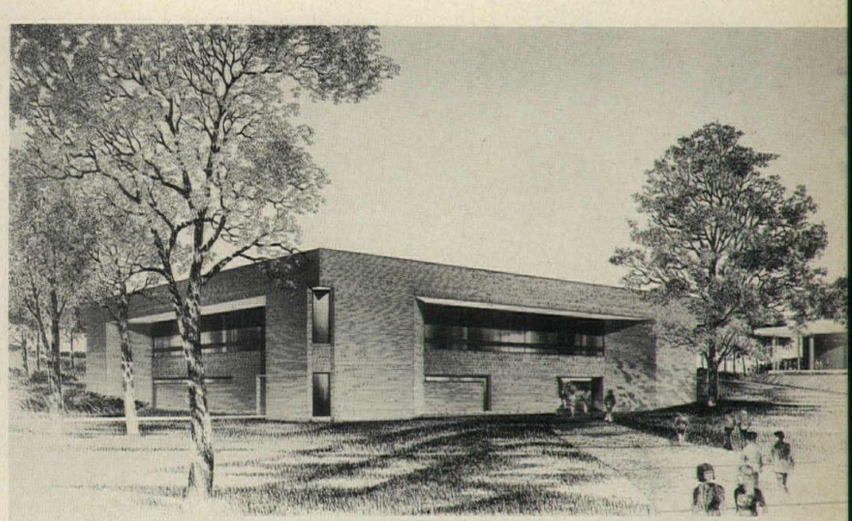


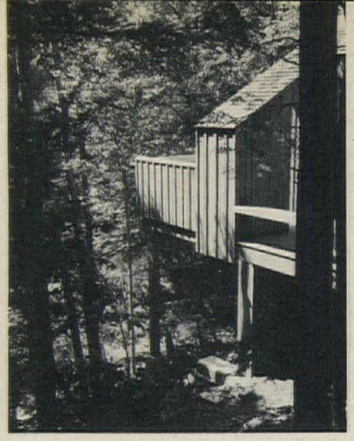


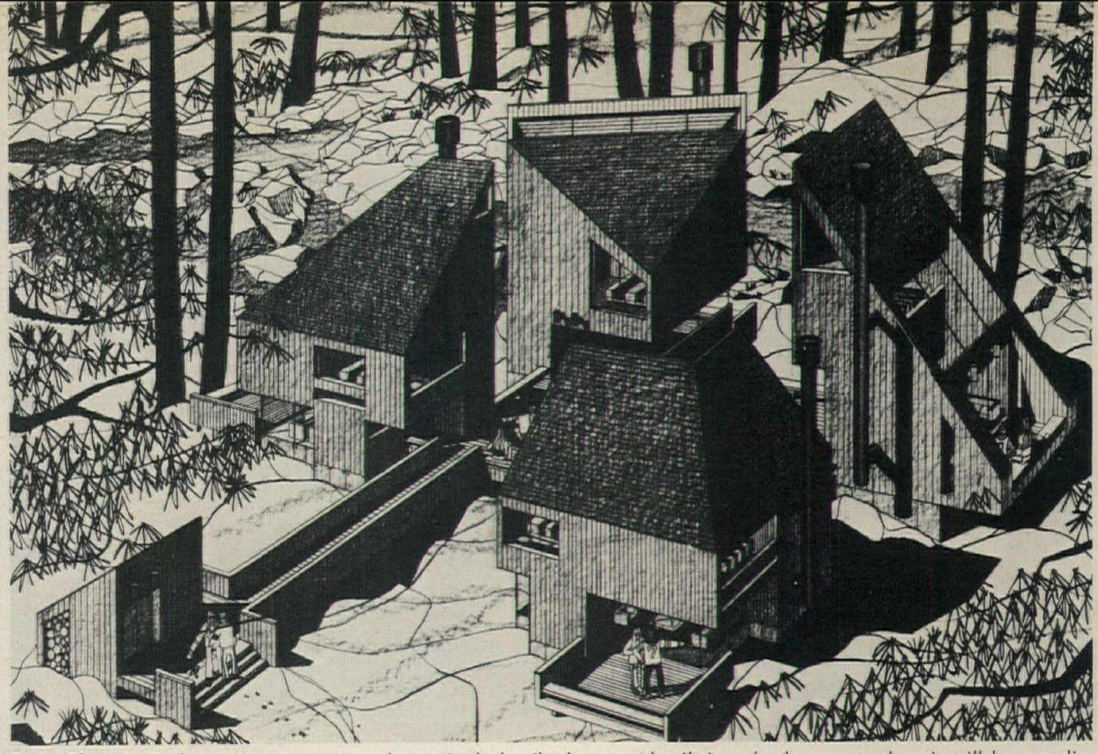
The Louis Armstrong Memorial Cultural Arts Center by Harry Simmons, Jr. is a community memorial to the musician to be built in the neighborhood where he lived. The animated design provides equally well for performers and spectators, has flexibility without loss of definition, is full of light and emphasizes interaction and interrelatedness. A life-size statue of Armstrong at the apex of the plaza will overlook an outdoor amphitheater and the entrances to all parts of the center: the nursery school with its private courtyard on the left, the narcotics treatment center and administration on the right, and the recreational-cultural complex behind. On the lower level are meeting rooms and a kitchen which connects with the nursery and gym-banquet-auditorium space as well as the dining room lit by windows in the amphitheater seats (top section). Beneath the narcotics center which has lounges overlooking the plaza is the education center with library and classrooms lit by a court onto which the swimming pool opens. The core of the recreation building has exercise rooms, lockers and showers below a spectators' concourse opening towards both the pool and gym, and a bowling alley topped by dance, band and drama rooms. Colorful wall panels and brick will enhance the liveliness of the plaza.

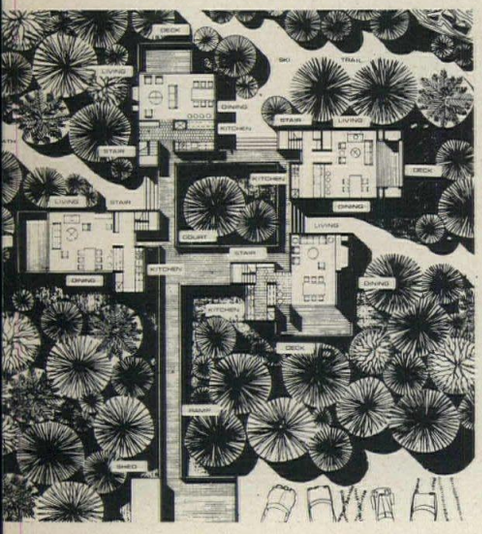
The National Association of Home Builders new national headquarters and showcase center on a triangular site on Massachusetts Ave. N.W. between 14th and 15th Streets in Washington, D.C. was designed by Vincent G. Kling & Partners. The office space is basically rectangular with utilities in the triangular sections at each end of the trapezoidal building. The south wall is solar tinted glass and sloped outwards to eliminate the sun load. The entrance plaza will have outdoor exhibits, a pool, jet fountain and cascade. There will also be a private courtyard for employees with a pool and waterfall, the architect placing importance on contributing to the Capitol's open space program. The ground floor will have an exhibition area and office services and there will be four floors for offices above.



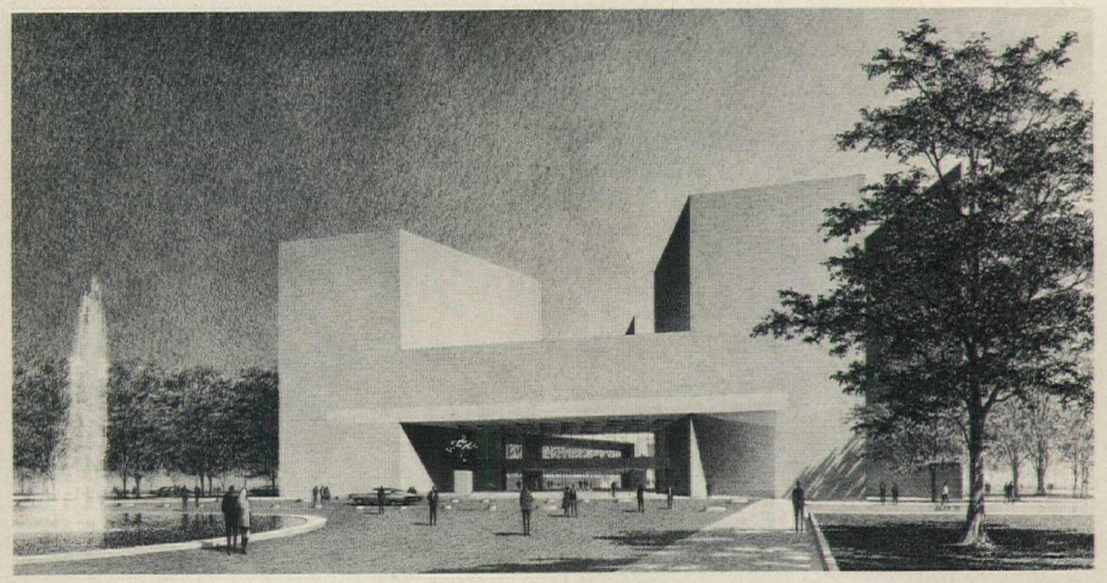
The Student Union Building for Oakland Community College near Detroit by Jickling & Lyman is now under construction. It is a 30,000 square foot facility costing $1,084,000.

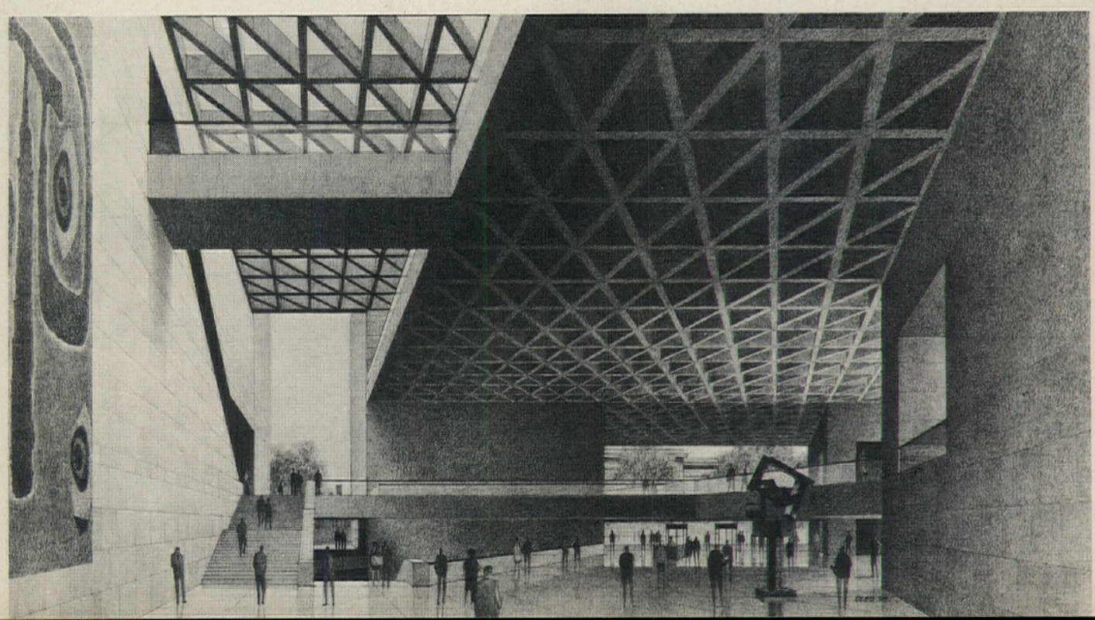






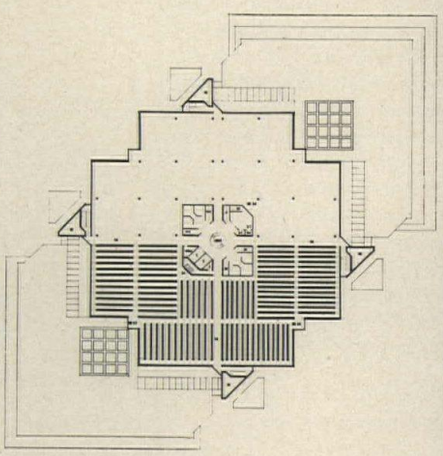
Dana Place in Jackson, New Hampshire is a 300-acre planned vacation community at the base of Mount Washington in the midst of the 750,-000 acre White Mountain National Forest. The firm, A Design Association, with two partners, Thomas Van Aarle and Michael Gebhart (both of whom are employed by TAC), has designed three single-family homes (detail in photo left) and a swimming pool/bath house enclosure which have been completed. Construction will begin this fall on the first cluster of four units shown in the drawings. The architects have discarded prefabrication or modular design feeling that at this scale local workmanship can do better for less, so each unit will have a distinct design. The cluster plan offers maximum privacy—the units do not share walls—and the security of three neighbors. Savings will result from simultaneous construction of the four units in a cluster and shared maintenance services. The designers are directly involved with the financing

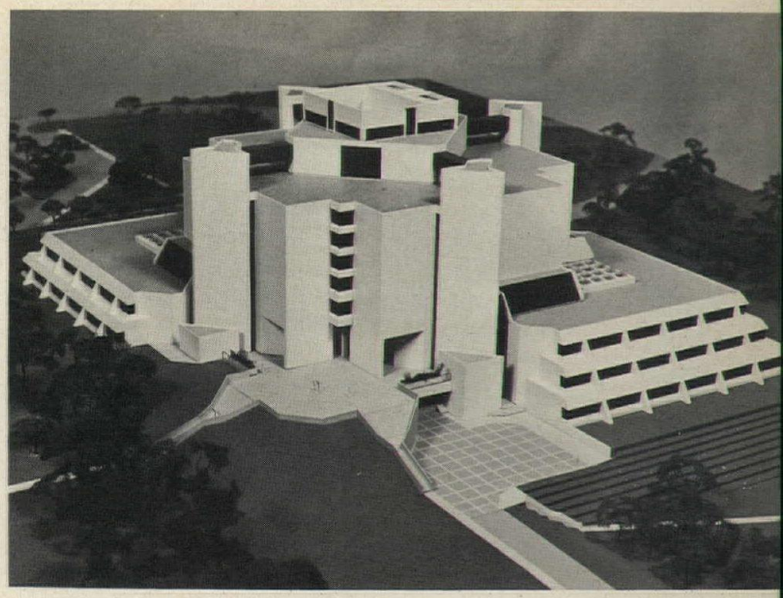


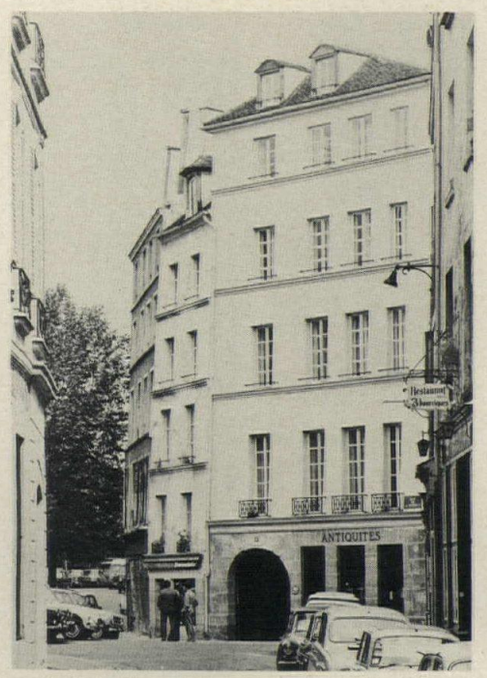


The National Gallery East Building in Washington by I.M. Pei is pictured here in two prize-winning renderings by Steve Oles, who, with these drawings has won the Architectural League's national Birch Burdette Long Memorial competition for the second time. The jury included Ivan Chermayeff, Bernard Spring and Richard Meier. Above is the main entrance of the building which has 400,000 square feet above grade. Beneath the plaza in the foreground is 150,000 square feet including the thoroughfare between new and old buildings, cafeteria, shops for exhibit preparations, education department, mailing and dock facilities. Below is the central orientation space which will be treated like a semi-outdoor space with paving and planting.

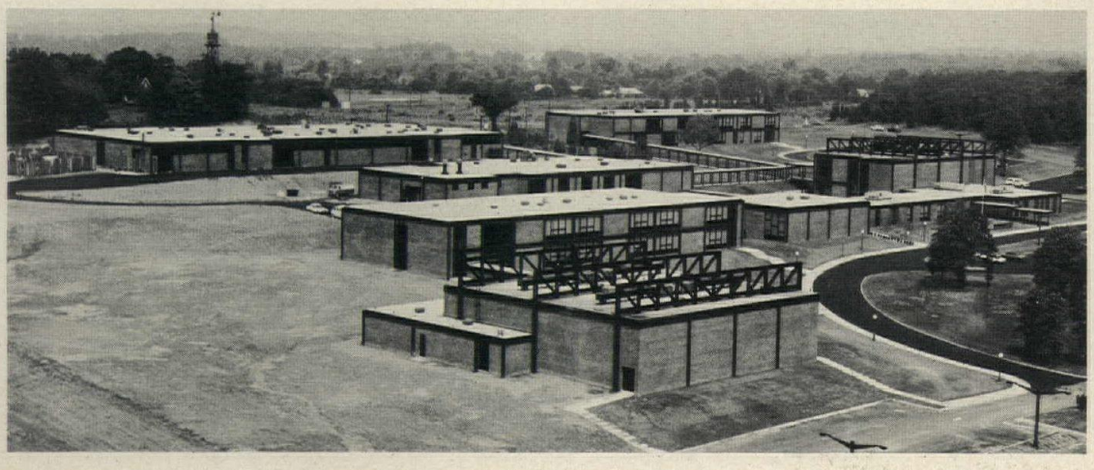
The National Science Library at the National Research Council in Ottawa by Shore and Moffat and Partners has stack space for two million volumes and will permit use of the latest techniques for storing, retrieving and disseminating information. The plan consists of two four-storey, L-shaped office wings flanking a nine-storey cruciform central stack section with a core of elevators, stairs, book lift, stack stations and reader areas. The stacks are separated from the office wings by a 24-foot skylit space providing natural light in the major reading areas and giving the office area light from two sides. Four vertical towers serving as emergency exits and mechanical shafts define the entrances. Corner windows in the stack areas will provide orientation and relief. Completion is scheduled for late 1973.







Paris Latin Quarter renovations by Jean Daladier have changed a North African laborers' ghetto into a fashionable residential area now housing politicians, generals, a top journalist, famous artists and an American banker. Eight years ago Daladier bought and renovated the most deteriorated building (above) which he lived in until selling it recently to Jacques Duhamel, the Minister of Culture. The arched carriageway leads to a courtyard garden. Daladier's move persuaded the planners to spare the area. As of now he has done fifteen buildings and other architects are copying him. He is against the usual French restoration approach and adapts old forms to modern uses of space as well as modern construction techniques. The U-shaped 17th century building (right) directly opposite Notre Dame was to have been razed for street widening. Daladier carved an arcade out of the building so the sidewalk can become part of the street. The arcade extends through other buildings.



Somerset County Vocational High School in Somerville, New Jersey by Scrimenti, Swackhamer and Perantoni is now complete with a three-truss gym (center) and four-truss auditorium (right). The architect says the trusses "were left exposed to add emphasis to the very same technology the school seeks to teach. For the same reason, each building has an exterior frame."

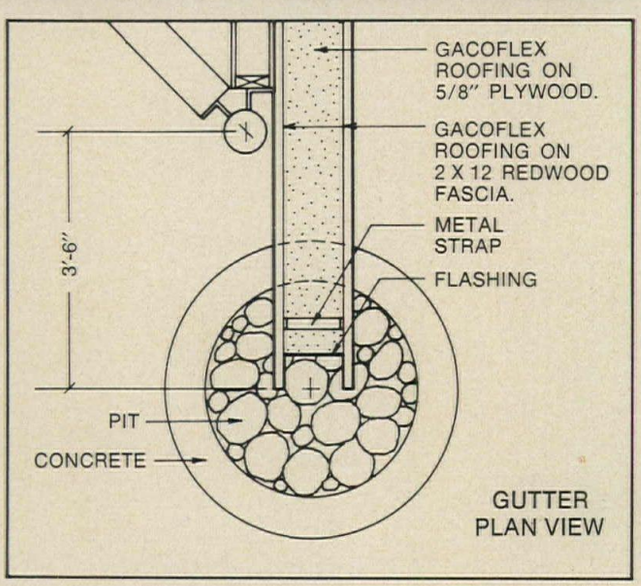
PLYWOOD SAVINGS PLANS

#15-20

What's up in plywood roof systems?

SAVINGS PLAN #15

Award winning library with Gacoflex roof and a very important gutter.



Library in Corte Madera, California.

Tucked away among eucalyptus, pine and poplar trees in Marin County, California, is the Corte Madera Branch Library, winner of a 1972 APA® Plywood Design Award.

Architect Douglas Barker (Smith Barker Hanssen of San Francisco) chose a plywood diaphragm roof system for each of the 12 sawtooth roofs.

Gacoflex (Neoprene-Hypalon, an APA qualified coating) was rolled on the weather surfaces.

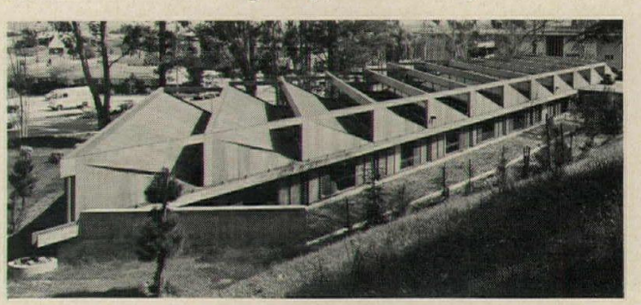
Although it's more expensive than conventional roofing, Neoprene-Hypalon is self-flashing. And that saves money.

The roof system consists of 5/8-inch plywood on 2 x 8-inch joists spaced 16 o.c. Each roof slants 25 degrees to a Hypalon-coated gutter, and each gutter drains into one long spout (see photo).

Talk about earthquake proof. Along the upper perimeter are stabilizing beams that tie all the members to steel pipe columns inside the building. These beams and the plywood diaphragm construction provide terrific shear resistance.

A jury comment from the 1972 APA Plywood Design Awards:

"The roof drainage alone typifies the entire structure—utter simplicity, masterfully executed."



Gacoflex roof

SAVINGS PLAN #16

The hyperbolic paraboloid roof: A good clear-span design. When money is tight.

H.P. roof

A youth center in Tilton, New Hampshire.

The H.P. roof, according to architect Daniel Tully, saves considerably more than $1 per sq. ft. compared to conventional roof systems.

No additional framing needed.

No interior supports.

And it prefabs beautifully.

The proof is a gym and a classroom building at the Spaulding Youth Center, where the H.P. roof helped to lower construction costs to around $19.30 per sq. ft. The design-construction time was reduced by 50 per cent.

Tully's H.P. roof system consists of components fabricated on a form that simulates the exact size and shape of beams used in the actual building.

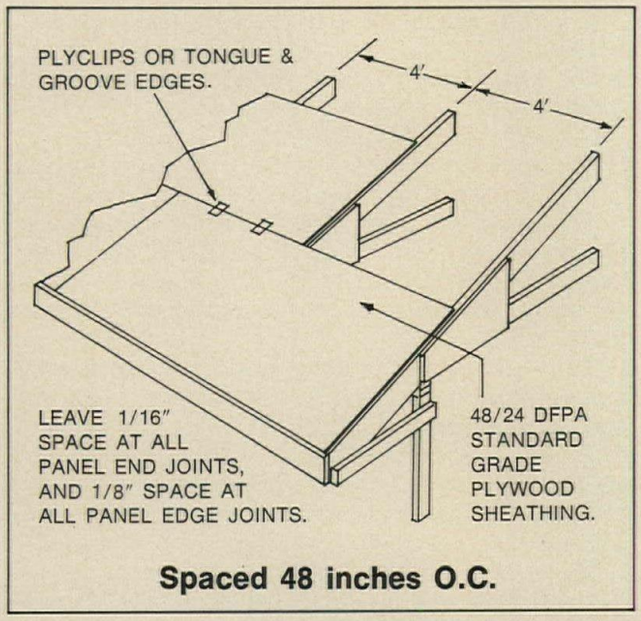
Tongue and groove 1 x 4 spruce boards were applied to provide a nicely finished ceiling.

These sections were shipped to the site, erected by crane and attached to laminated wood beams.

The entire job was designed and supervised by the architect and by Creative Building Systems, Inc., of Melrose, Massachusetts.

SAVINGS PLAN #17

Plywood over trusses spaced 48 inches. "I saved 30¢ per sq. ft."



Spaced 48 inches O.C.

Boys' academy near Thomson, Georgia.

"I saved 30¢ per sq. ft. and I hope to save 50¢ per sq. ft. on my next job," says contractor R. A. Pannell, Jr., of New Era Realty Corporation.

On top of that savings, Briarwood receives one of the lowest insurance ratings in the state because of fire retardant lumber and plywood.

The job was a truss roof for the Briarwood Academy.

The contractor normally used 3/8-inch plywood over trusses spaced 24 inches. This time he tried something different. Thicker plywood on trusses spaced 48 inches.

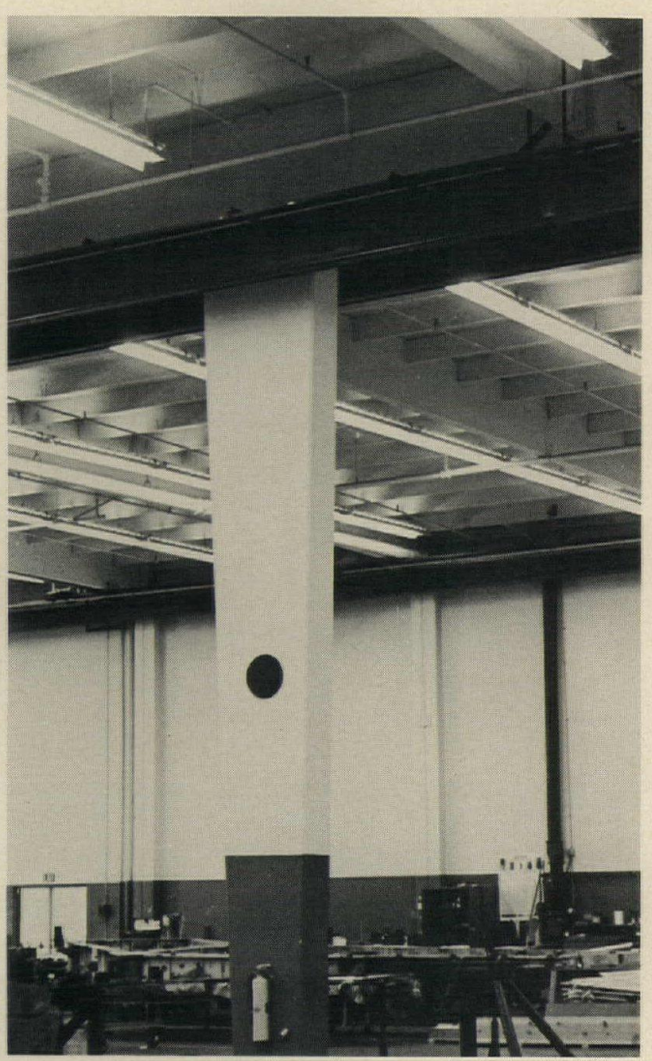
It worked. He saved truss material and labor.

Here's the Briarwood system: Prefabricated wood trusses lifted in place and spaced 48-inches. The roof sheathing over the trusses was 3/4-inch plywood with exterior glue.

"Now we build all our non-residential hip roofs with thicker plywood on trusses spaced 48 inches," said Pannell.

SAVINGS PLAN #18

A fire story: Heavy timber roof with 1⅛-inch plywood. A low-cost story: It saved $62,000!



Heavy timber/2·4·1 roof

A plant in Brea, California.

Consolidated Aero Structures has a 72,000 sq. ft. roof that meets all the fire protection requirements, and more.

Here's the story: Architect Ray Johnson first considered a plywood roof deck with gypsum-board ceiling at $1.33 per sq. ft. Except for cost, this system seemed perfect: long clear spans, strong enough to withstand seismic and crane loads, plus a one-hour fire rating.

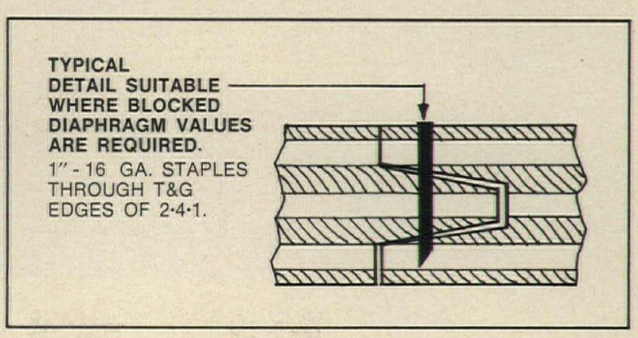
But Ray Johnson kept looking. It was a good thing he did. The system he finally settled on was a Heavy Timber roof using 1⅛" plywood (2·4·1) and here's why: It figured at 80¢ per sq. ft. It was 240 tons lighter than the first system. Codes recognize it as equivalent to a one-hour fire rating.

Best of all, the total cost of the building came in $62,000 under the plywood/gypsum board system.

The 2·4·1 Heavy Timber system consists of concrete T-columns supporting a glulam-and-purlin roof. The 2·4·1 plywood decking (1⅛" tongue-and-groove) is supported at 4-foot centers with 3 x 12 lumber purlins spanning 20 feet.

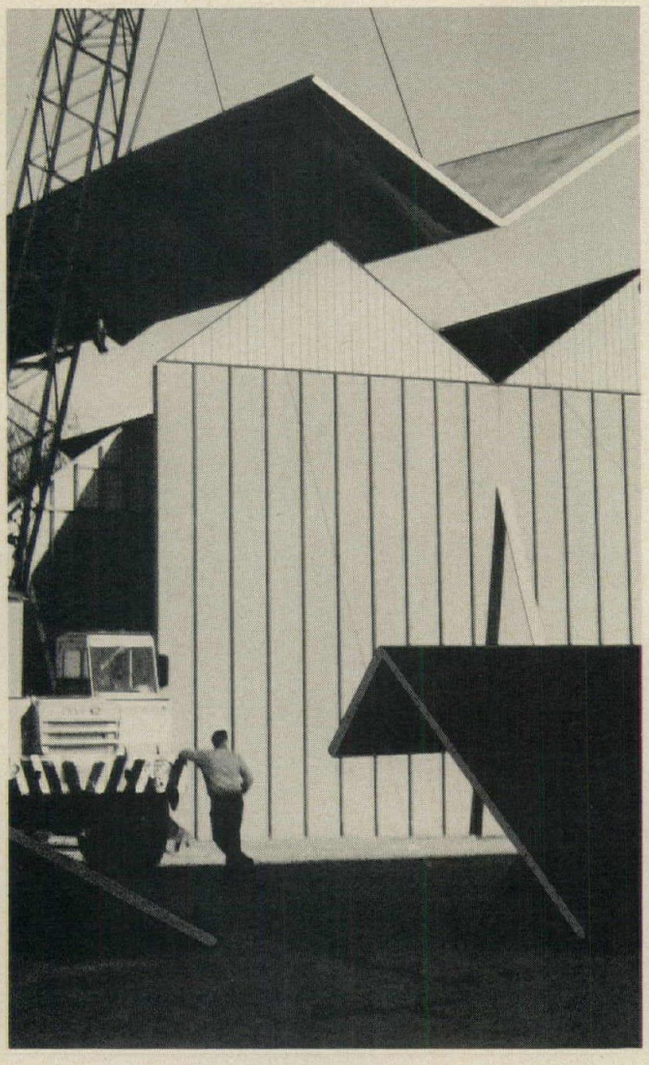
All regional codes accept T & G 2·4·1 plywood roof decking as Heavy Timber construction.

A great fire story.



SAVINGS PLAN #19

This folded plate roof clear spans 70 feet. Looks custom. And costs $1.58 per sq. ft.



Folded plate roof

A factory in Cincinnati, Ohio.

They wanted 15,400 sq. ft. of unobstructed space.

They wanted to keep costs down.

They wanted an attractive design. (Factories can be imaginative, even beautiful. Olivetti in Italy proved it. Others in this country are proving it more and more.)

The solution for this Cincinnati factory was a componentized folded plate roof.

Cost: $1.58 per sq. ft.

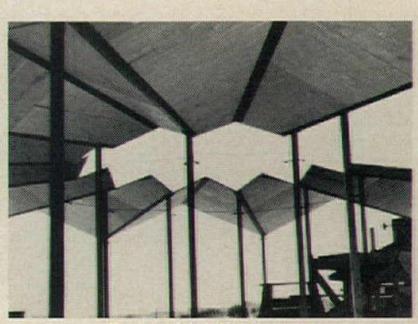
The system in a nutshell consists of 22 folded plates set at a 35° pitch, on a foundation system of piers carrying a perimeter grade beam to support the load bearing walls.

The stress-skin roof panels are 12 x 88 feet, 4⅜-inch thick. Top skins are 1/2-inch plywood, bottom skins are 3/8-inch plywood. Rafters are 2 x 4's on 16-inch centers. Skylights are in alternate roof plates.

This folded plate is only one of many plywood diaphragm roof possibilities.

Trapezoidal diaphragms, radial folded plate, and space planes are a few more. (See back page for a new booklet on plywood diaphragms.)

With a low-cost plywood system you can do a lot. Even build a beautiful factory.

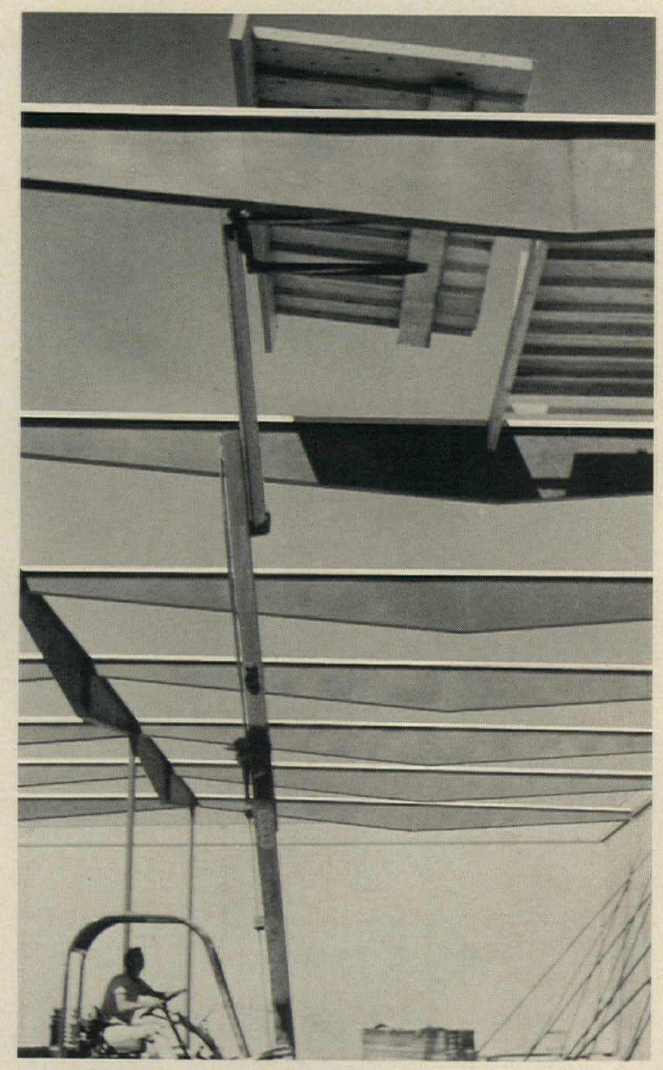


Trapezoidal diaphragms

Space planes

SAVINGS PLAN #20

Preframed plywood wins over steel. Saves $11,000 on one warehouse alone. Fourteen went up.



Preframed plywood

Warehouses in Arlington, Texas.

Preframed plywood for roofs is a big system in Arlington.

It all began with 14 warehouse roofs at the Great Southwest Industrial District of Arlington.

The first two were built using steel bar joists and metal decking.

Then the roof contractor, Applied Structures of Texas, Inc., ran a cost study for the developer, Dunn Industrial Builders of Texas, Inc.

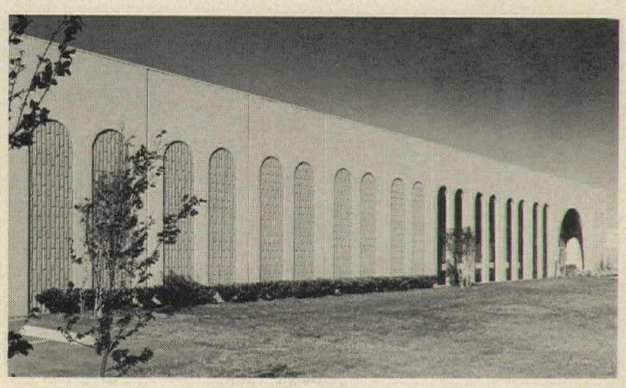
Result of the cost study showed a 37 percent labor savings if they used the plywood system.

With 12 buildings to go, they switched immediately to plywood, saved $11,000 on one building alone and about 15¢ per sq. ft. overall.

Their cost-saving system: 4 x 8-foot panels preframed on 24-inch centers, transported 12 miles to the jobsite, then nailed to 4 x 16-inch lumber purlins. These final sections (8 x 20-foot with purlins on 8-foot centers) were forklifted in position between the steel support members.

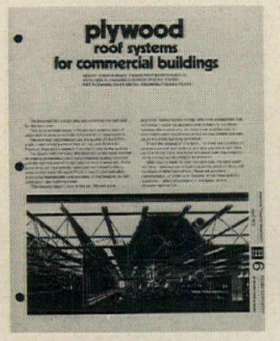
The plywood roof system finished at 75¢ per sq. ft., plus 14¢ for roofing.

A big savings. Even in Texas.



The full details on what's up in plywood roofs.

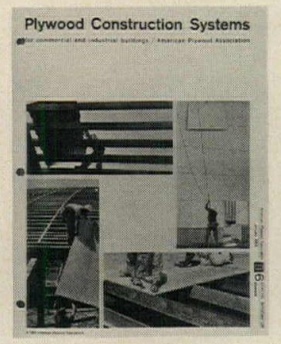
Write here.



Plywood roof systems for commercial buildings.

Brand new. Seven case histories on how to cut costs, save labor and meet code requirements. Four of the roofs in this ad are covered in detail. (1) Heavy Timber. (2) Space Frame. (3) Preframed Panels. (4) Hyperbolic Paraboloid. (5) Wide-spaced Truss. (6) FRT Plywood over Metal Framing. (7) Folded Plate.

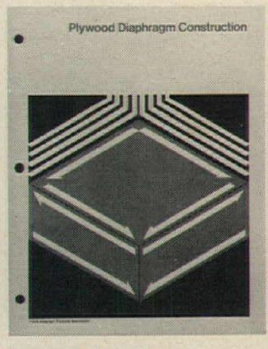
Reader Service No. 25



Plywood construction guide for commercial building.

All-purpose tool for architects, engineers and builders. Plywood roof, wall and floor construction. Illustrated details and connections. Load-span data. Building requirements. The nuts-and-bolts of cutting costs for builders who want to beat the economy.

Reader Service No. 26



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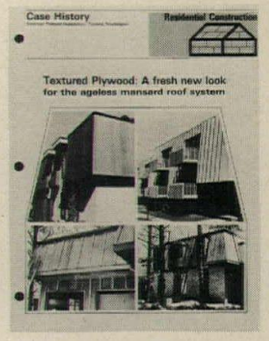

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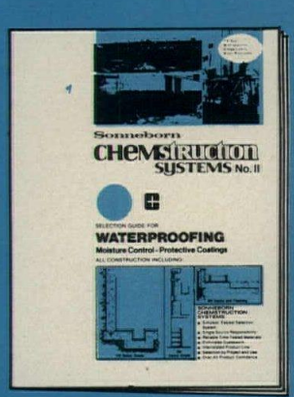

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Computers as automated practice aids

By Bradford Perkins
Vice president, D'Orsey Hurst and Co., Inc., a division of McKee-Berger-Mansueto, Inc.

How to use automated practice aids, especially the computer, is one of the major management questions facing professional firms today. An architectural firm in the midst of deciding whether or not to use computers in its operations is faced with a bewildering maze of alternatives. To date this maze has been made all the more difficult as a result of the seriously misleading claims put forth by many writers for time-sharing companies, software firms and others who have been promoting automated practice technology.

Some computer applications are feasible in many firms, large and small. Thus, the purpose of this article is to provide an outline guide to answering such typical questions as: should we use a computer; what applications, of the many now available, are feasible and cost-effective; how to obtain use of the best applications available, how to select the right hardware, how much will it cost and how much will it save; and what personnel and organizational impact will the computer have on the firm?

The first question for a firm to answer is, of course, whether or not it should ever use a computer. There are no strict, quantified guidelines. Many small offices have used automated practice technology effectively while some of the largest have not. The rules of thumb identifying those who probably can or cannot use it effectively, however, can be listed:

1. The firm's size is an important factor. Engineers talk of a firm being able to justify approximately $50 to $70 per man per month in computer-related costs. Architectural firms typically cannot justify as high an average figure because of the smaller number of available and relevant applications. A few architectural firms spend in excess of $80 per employee per month, but most cannot justify more than $20 to $30 unless a significant portion of their routine business accounting is automated.
2. The firm's scope of services is also a factor. Very specialized firms—such as those designing only one or two building types—are often able to automate far more than general firms. Those with in-house engineering and other services with high computer utilization potential are also likely users. In general, the greater the number of cost-effective uses a firm has for automation, the more likely it is that it should be using the computer.
3. Since it can be expensive for a firm to first set up to use a computer, many computer applications are restricted to those firms with some spare personnel and financial resources.
4. A firm's geographical and/or business location can also be important. If it is in an area with a service bureau with design-firm experience or if the firm can share a computer facility with one or more other design offices, it is more likely to find automated techniques cost-effective.
5. Individual projects at times justify one-time uses of automated techniques. For example, a large, hospital project can justify special applications in space planning, equipment selection and other areas while an equally large project of an another building type might not.
6. Probably the single most important factor is whether or not there is someone in the firm sufficiently interested in automated practice techniques to take responsibility for making a chosen application work within a firm. Computer utilization—in particular the first few applications a firm tries—is almost never successful unless a senior member of the firm is really interested in making it so.

As the above list indicates, the common criteria for computer use do not exclude the majority of architectural firms. Moreover, by this time there are available automated practice tools for a great many aspects of architectural practice. Unfortunately, the overwhelming majority of the tools available have not been cost-effective nor have they achieved the expected results.

Therefore, a firm's second question should be "what computer applications and automated practice tools are cost- and quality-effective?" There are many applications which meet this test, but it is helpful to remember another rule of thumb: The computer is best used to make large numbers of repetitive calculations or to manipulate large quantities of simple data. It operates as an immensely rapid sorting file.

An integrated process improves cost-effectiveness

Each phase of the plan-design-build process has relevant applications. To date only a few firms have begun to integrate them into a comprehensive architectural system. While ultimate integration is a reasonable objective, individual parts also have proved to be valuable tools for many firms. A review of those with some general applications may provide clues as to where a firm might start.

- *Architectural programming and planning.* Most of this group of applications require large machines and experienced operators and, thus, are usually only cost-effective if used through a consultant or on large, complex projects that can warrant a major investment. Among the specific applications are traffic analysis, mapping of census data, optimization of land-use within the context of a local zoning code, statistical analysis, space requirement projections, and storage and manipulation of standard functional area data. There are other areas such as gaming and simulation which are occasionally justified as adjuncts to other programs. One important initial planning application open to all firms is financial feasibility analysis. These programs, which test various programming assumptions for privately financed projects, are easy and inexpensive to use and increasingly popular among clients.
- *Conceptual design.* Very little has been done in this area beyond a variety of space allocation, building optimization and limited perspective applications. By themselves, these tools are rarely cost-justified and are only effective when part of a large group of applications. This is the case because of the cost of the hardware and software required and, in some cases, the need for considerable sophistication in data input by the user.
- *Design development.* Again this is an area where very few firms have been able to use the computer effectively. There are a number of increasingly sophisticated applications including ones for selecting the structural and design modules, storage retrieval and manipulation of standard room designs, site cut and fill calculations, elevator selection (if not done by the mechanical engineer), and a few other applications. Again, by themselves, these applications usually require too much user sophistication in both staff and hardware to be justified except through a consultant or as part of a larger group of applications.
- *Contract documents.* A few firms use the computer as a draftsman, but beyond firms with practices that consistently involve projects such as large repetitive multi-family residential, motel, subdivision, and possibly office building programs this area is not cost-justified.

Even automated specifications have not yet proven themselves on either a technical or a cost basis. As in so many other areas, differences in approach between firms, the

relatively small incremental savings that can be achieved through any single automated practice application, and the general resistance to change have all combined to minimize the widespread acceptance of automated specifications.

Certain other related applications are also expanding computer usage in these latter design phases. They include equipment and furniture schedules, manufacturers' data retrieval and other data storage, retrieval and manipulation programs.

- *Construction management.* As was pointed out in an earlier article (Computerized Estimating Is Ready Now-Almost, RECORD, February 1970) the most talked-about construction management application—computerized budgeting and estimating—is still in the development stage. The programs exist, but the data for many building types do not. Because of the massive data required, this is one of the areas that should be bought rather than developed internally. No single firm can justify the large expense required. Other construction management applications, such as critical path method scheduling, are widely used through service bureaus and on in-house hardware. And recently, this tool has been integrated with project cost controls to provide integrated construction controls, automated progress payment requisitions, change order control, shop drawing schedules and other tools for construction phase management.
- *Office management.* This has been and will continue to be the largest application area in design firms. The available applications include financial management (accounting, job cost controls, cost management, etc), manpower scheduling, and miscellaneous data such as address lists, Christmas card mailing lists, etc. Of these, financial management is the most important and the easiest to solve, but to date no one has. Even the new AIA system, which is one of the best available, is missing some important pieces and is priced in such a way as to limit its cost-effectiveness. Moreover, few firms are willing to adjust to a standard system and, thus, architectural firms use hundreds of slightly different financial management programs. This is a logical application area, however, and should be followed in accordance with the guidelines noted in an earlier article in this series (Financial Management of the Professional Firm, RECORD, May 1972).

Manpower scheduling, address lists and other miscellaneous office management applications are only justified in large offices or during unusual peak periods. One final guideline: all of the office management applications combined will not justify any significant in-house installation. If the firm does not have at least an equal number of non-office management applications, it probably should use an outside service bureau.

The somewhat negative tone running throughout the above summary should not be interpreted as meaning firms should not use the computer. On the other hand, it should be interpreted as a warning to be realistic about what areas are really appropriate and cost-effective.

All of the above applications are commercially available. Unfortunately, in spite of their availability too many firms decide to reinvent the wheel. For example, the three-volume Computer-Architecture-Programs abstracts by Teicholz, Stewart and Lee published by the Center for Environmental Research in Boston includes as many as 25 versions of some programs. In engineering, some applications have been written at least 50 times.

This duplication of effort is appallingly wasteful of technical manpower in a field where so much remains to be done. There are many firms that specialize in making this software available and in providing instruction in its use. (The Omnidata Services division of MBM is one such.) In many cases, programs that cost up to $20,000 to develop are now available for a small fraction of their original development cost.

Preparing to use computers can be a major investment

Whether the software is developed in-house or outside, architectural users must remember another important rule. The computer program that performs the calculations or sorts the data or projects and moves an image on a cathode ray tube is typically a relatively inexpensive and minor part of the user's problem. This problem is almost always overshadowed by cost and complexity of defining the problem, developing and organizing the data, and integrating the system into the operations of the firm. The cost of solving the latter problems can often run more than ten times the cost of the software itself.

The above costs also typically far outweigh the hardware investment. Nevertheless, it is still important to carefully control the hardware costs. Most design firms have four major options:

1) A service bureau is the most commonly selected option because so many firms already have their accounting done by an outside consultant. There are problems in computerizing these operations, however. In most cases architects are small accounts. Moreover, the service bureau's operations and programming staff is likely to be unfamiliar with the special needs of design firms. The combination of these two factors—as well as others—has led to considerable dissatisfaction on the part of many architect users.

In response to this, several service bureaus are developing specialized services for the design professions. These firms are usually staffed by design professionals and are often affiliates of major design firms.

2) A few people share computer facilities with several other firms. In spite of the cost-sharing advantages of this approach, it is still a rarely followed option.

3) Some firms use typewriter terminals tied to large time-sharing installations. This can be the most economical approach if the firm makes limited but fairly regular use of large machine applications such as space allocation, information retrieval, and financial feasibility analysis—which require rapid turnaround. The most common mistake made here, however, is to think that the cost of this option is only the $130 to $220 per month for the typewriter terminal and some amount for each time a program is used. There are many other charges such as connect-time, storage charges, program rental charges and others which often are not fully understood until the first bills begin to arrive. It is not uncommon for firms to spend as much on time-sharing as they do for a modest in-house facility.

A more expensive version of time-sharing involves remote batch entry terminals. These terminals, which permit a firm to quickly enter large input problems such as CPM accounting, detailed cost estimating, and specifications rent from $800 to $1,800 per month. Thus, they are not typically cost competitive with a local service bureau unless a firm has a very large volume of large machine, batch-oriented problems.

4) Some of the larger architectural firms—as well as a large number of engineers—have gone to in-house hardware. IBM hardware—in particular the 1130 and recently the System 3—is by far the most common. These are predominantly batch-oriented machines suitable for specifications, accounting, scheduling, information sorting, calculations and similar large applications. They are not typically suitable as architectural design tools—even if they have a plotter attached—because they are not interactive. That is, there is not a continuous man-machine interplay.

These installations range from a minimum configuration costing approximately $2,000 per month to installations of a few large plotters, larger memorexes, faster printers and other peripheral equipment that can cost about $4,500 per month.

One firm that has committed itself to the upper end of the in-house hardware expenditure range, has helped develop an in-house installation that is also a design tool. Perry Dean and Stewart, in cooperation with the software firm Design Systems and the hardware manufacturer Digital Equipment, have put together a hardware/software combination that permits the designer to interact with a design image on a cathode ray tube. This installation, which costs approximately $4,000 per month, is commercially available but requires a user willing to make the extensive financial and organizational commitment necessary to modify, expand and integrate the system into his operations.

Hardware and software are, of course, only two of the three major considerations. The third is personnel. Not only can the computer require a considerable commitment of staff resources, but also it can have a significant organizational impact. Both must be evaluated.

Most architectural applications and computer installations do not require a large staff. The essential staff are usually one chief—a senior member of the firm committed to overcoming the many potential roadblocks to the successful introduction of the first applications—and one technician—an individual with some programming sophistication, interested and able to deal with the large number of day-to-day problems of implementing and operating any computer application.

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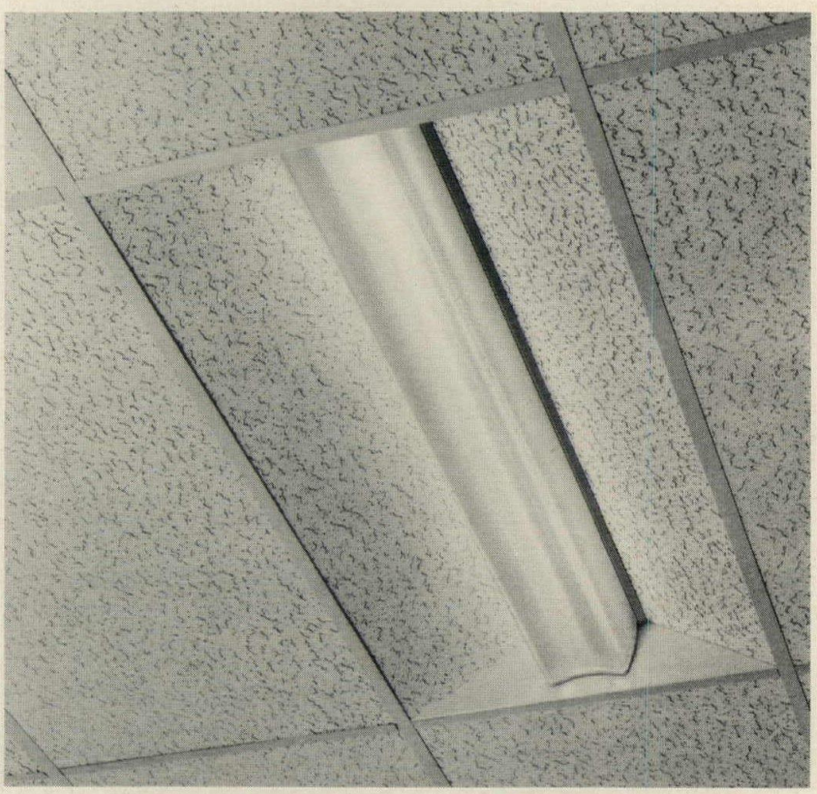

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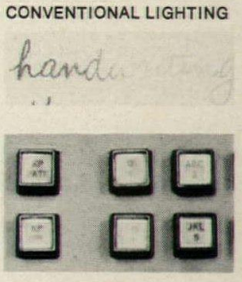

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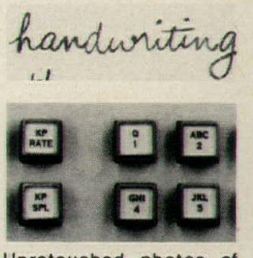

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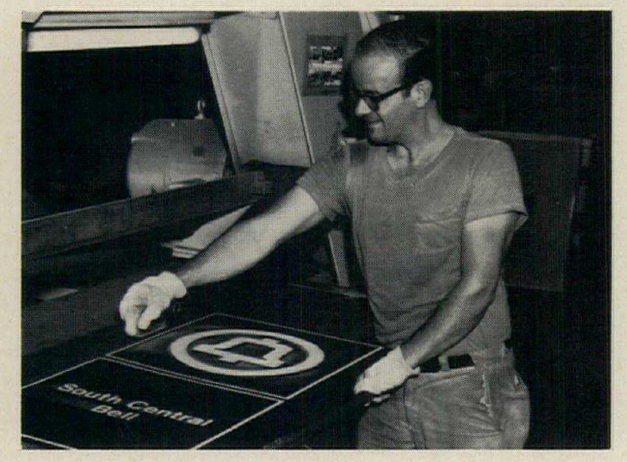

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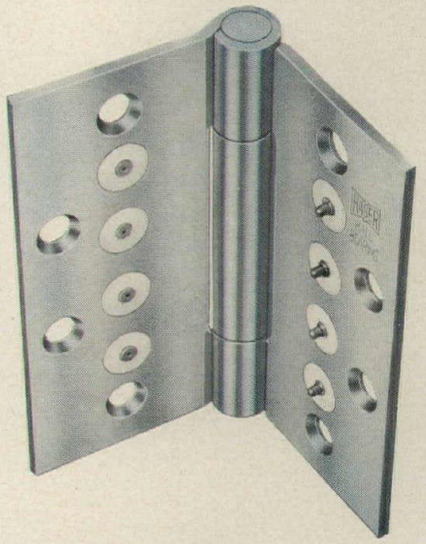

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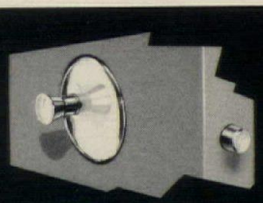

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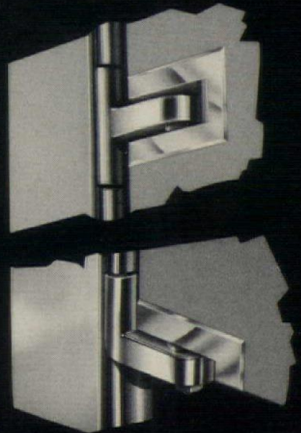

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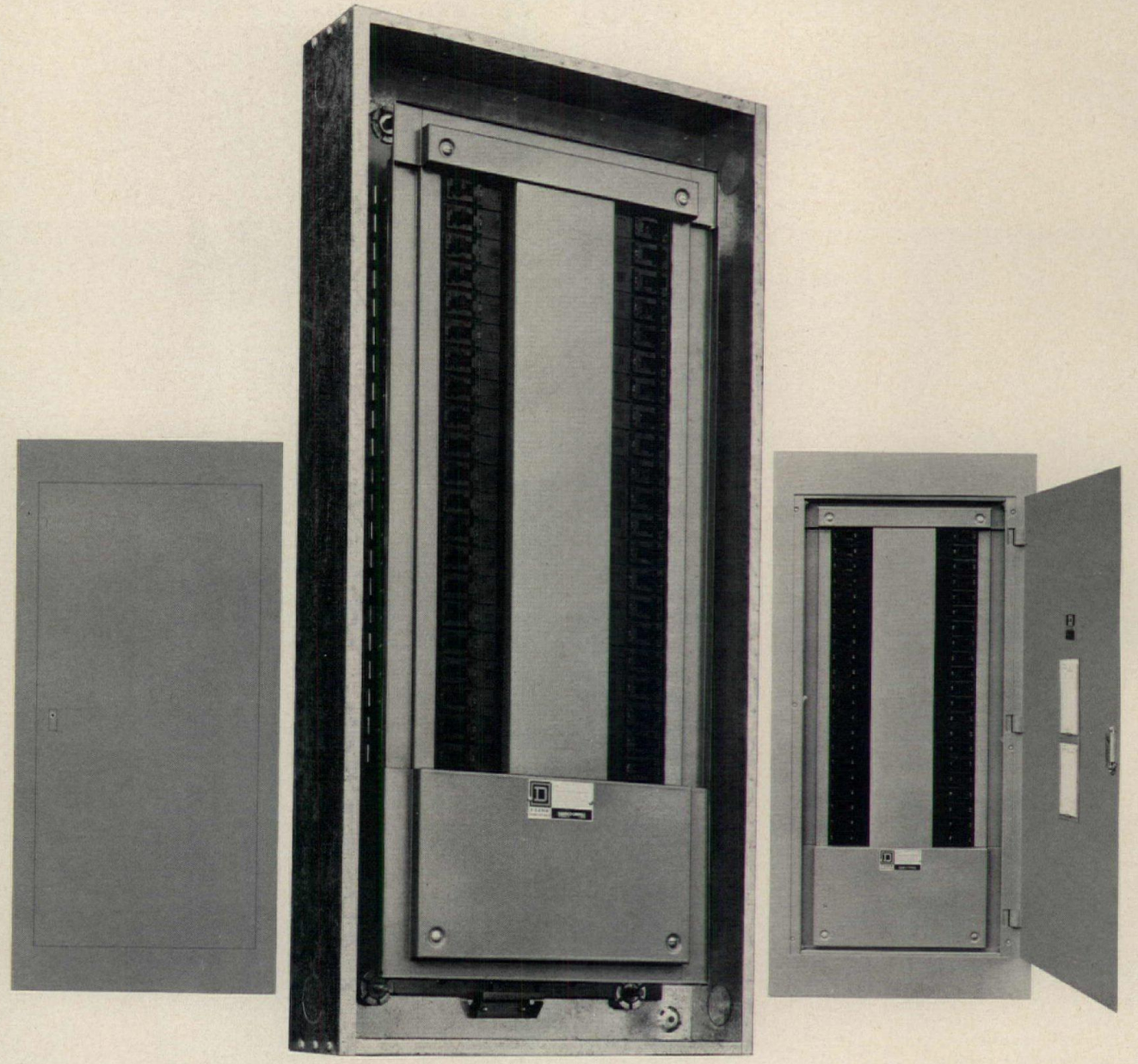

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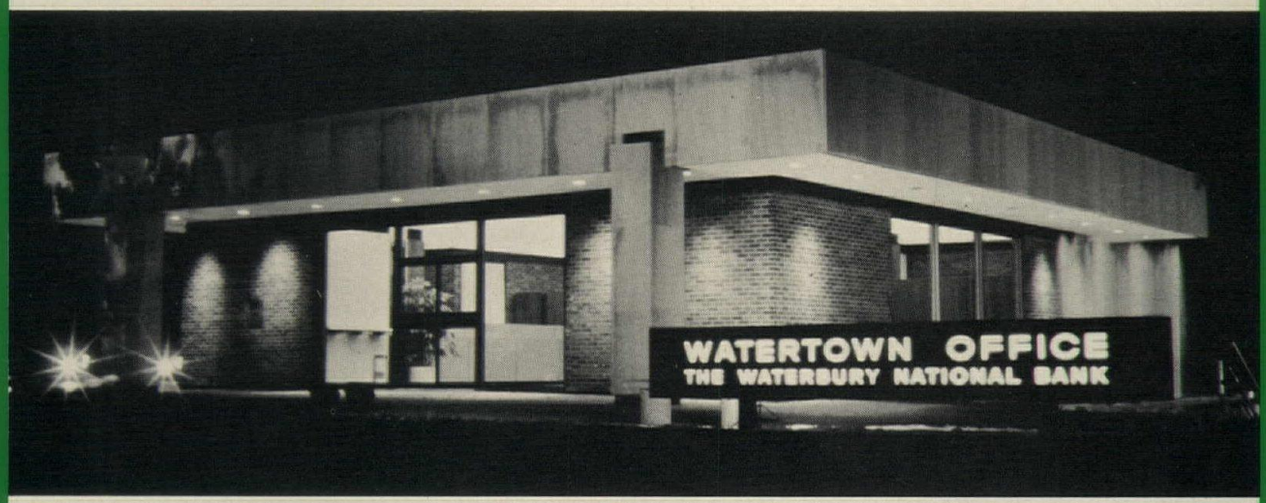

The City National Bank is situated on a corner lot in a suburban business district of Watertown, Conn.

PROJECT: The City National Bank, Watertown, Connecticut. ARCHITECTS: Cohen & D'Oliveira, Waterbury, Connecticut. CONSULTING ENGINEER: Richard Shipman Leigh, Woodbury, Connecticut.

DESIGN CHARGE: To design, on a corner lot, a small branch bank that would contain a banking lobby with four teller stations, a board room, customer and employee lounges, private and general offices, a vault, storage areas, drive-in teller station and on-site parking.

DESIGN RESPONSE: Architects Cohen and D'Oliveira designed a handsome structure of dark green pottery-glazed brick, wide expanses of glass, and a flat roof with a six-foot overhang supported by four concrete piers. The placement of the building on the irregularly shaped corner site permits a setback for landscaping and provides an entrance walk accessible from both streets. Because the lot sloped steeply, an extensive concrete platform protected by a retaining wall was built to provide a site for the building, a parking area, and an attractive plaza. The plaza features a pool containing three fountains, benches, and appropriate landscaping, including a magnolia tree.

The same attention to elegant detailing is evident in the interior of the building as well. The green pottery-glazed brick used on the exterior is used on the inside walls. The floors are carpeted in dark green wool and an open metal grid ceiling floods the banking lobby with daylight. The banking lobby, customers' lounge, board room, officers' platform, vault, and cash room are all located on the ground floor. A lower level, below grade, contains an employees' lounge with kitchenette, utility rooms, and storage.

One of the objectives in the design was to provide a heating and cooling system that would respond flexibly to varying solar and occupancy loads. The system chosen employs four independently controlled electric split-system air-to-air heat pumps with air handling sections installed within the building and the compressors mounted on concrete pads outside. Two of the units are rated at 5 tons each, with 9.4-kw auxiliary strip heaters. These feed directly into a ring of perimeter ducts around the main floor ceiling with air being returned through the plenum above the open metal mesh ceiling. One 2-ton unit serves the basement areas. The air handling section of a second 2-ton heat pump located above center ceiling of the main floor is used in warmer weather only to help carry off the lighting heat.

"The electric system has met all of the major design objectives regarding ease of operation and maintenance, cleanliness and flexibility," Architect Andrew S. Cohen reports, adding, "The owners are very impressed with its performance."

SEE REVERSE SIDE FOR DETAIL INFORMATION

Gentlemen:
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Name and Profession: _____
Firm, University or other affiliation: _____
Address: _____
Zip Code: _____

1 CATEGORY OF STRUCTURE:
Commercial—Bank Building

2 GENERAL DESCRIPTION:
Area: 3828 sq ft
Volume: 33,495 cu ft
Number of floors: one plus a full basement
Number of occupants: 5 plus patrons
Number of rooms: 10
Types of rooms: banking lobby, conference room, vault, cash room, lounge areas, utility and storage areas

3 CONSTRUCTION DETAILS:
Glass: double
Exterior walls: 4" brick, 2" expanded polystyrene insulation (R-7), 4" brick; U-factor: 0.10
Roof and ceilings: built-up roof with gravel on 4" rigid urethane insulation (R-28), vapor barrier over metal deck, steel trusses, open metal mesh ceiling; U-factor: 0.033
Floors: concrete slab, 2" perimeter insulation
Gross exposed wall area: 1750 sq ft
Glass area: 456 sq ft

4 ENVIRONMENTAL DESIGN CONDITIONS:
Heating:
Heat loss Btuh: 105,000
Normal degree days: 6000
Ventilation requirements: 500 cfm
Design conditions: 0°F outdoors; 72F indoors
Cooling:
Heat gain Btuh: 125,000
Ventilation requirements: 500 cfm
Design conditions: 95F dbt, 70F wbt outdoors; 72F, 40% rh indoors

5 LIGHTING:
Levels in footcandles: 75-125
Levels in watts/sq ft: 3-5
Type: fluorescent

6 HEATING AND COOLING SYSTEM:
The building is conditioned year around by four independently controlled electric split-system heat pumps with compressor sections mounted on pads outside the structure. Two 5-ton units, each with 9.4 kw of auxiliary strip heaters, serve the main floor through a perimeter duct system. Air return is through the open mesh ceiling. One 2-ton unit supplies the basement areas through ducts and a second 2-ton heat pump, which operates in the warmer months only, empties directly into the plenum above the ceiling of the main floor.

7 ELECTRICAL SERVICE:
Type: underground
Voltage: 120/208, 3-phase, 4-wire, wye
Metering: secondary

8 CONNECTED LOADS:

Heating & Cooling (14 tons)	35 kw
Lighting	18 kw
Water Heating	4 kw
Other	50 kw
TOTAL	107 kw

9 INSTALLED COST:

General Work	$135,498*	$35.40/sq ft
Elec., Mech., Etc.	46,900	12.25/sq ft
TOTALS	$182,398	$47.65/sq ft

Building was completed 2/68
*Includes extensive site work

10 HOURS AND METHODS OF OPERATION:
9 a.m. to 5 p.m. on four weekdays and 9 a.m. to 6 p.m. on Thursday only.

11 OPERATING COST:
Period: 12/22/70 to 12/21/71
Actual degree days: 6225
Actual kwh: 136,960*
Actual cost: $2979.76*
Avg. cost per kwh: 2.18 cents*
*For total electrical usage

Billing Date	Degree Days	Demand	kwh	Amount
1/21/71	1383	42	13,600	$ 246.53
2/22/71	1250	50	13,440	283.11
3/24/71	917	42	10,960	236.36
4/22/71	608	42	10,800	233.87
5/24/71	328	50	11,040	246.03*
6/23/71	38	41	11,200	232.03*
8/23/71		49	13,360	299.88**
9/22/71	10	49	12,880	293.48
10/21/71	197	42	12,400	276.80
11/22/71	563	50	13,920	316.49
12/21/71	931	48	13,360	315.18
TOTALS	6225		136,960	$2,979.76

*Estimated bills
**Two months bill, adjusted for estimates

12 FEATURES:
An auxiliary 2-ton split-system air-to-air heat pump has its air handling section installed above the open mesh ceiling at the center of the main banking floor. This unit operates usually only in warm weather to help remove the heat created by the high-level fluorescent lighting. A timer automatically closes the outside air dampers in all air handling units during unoccupied hours.

13 REASONS FOR INSTALLING ELECTRIC HEAT:
A feasibility study indicated that the electric heat pump system would provide multiple zone heating and cooling at lower first cost than a comparable system using a flame fuel for heating. It would also be easier to operate and maintain.

14 PERSONNEL:
Owner: The City National Bank
Architects: Cohen & D'Oliveira
Consulting Engineer: Richard Shipman Leigh
General Contractor: Summit & Summit, Inc.
Electrical Contractor: Watts Electric
Mechanical Contractor: Wesson Heating & Air Conditioning
Utility: The Connecticut Light & Power Company

15 PREPARED BY:
James L. Coleman, Commercial Representative, The Connecticut Light & Power Company.

16 VERIFIED BY:
Andrew S. Cohen, AIA

Richard Shipman Leigh, P.E.

NOTICE: This is one of a series of case histories of buildings in all structural categories. If you are an architect or consulting engineer; an architectural or engineering student; an educator; a government employee in the structural field; a builder or owner, you may receive the complete series free by filling out the strip coupon at the left and mailing it to EEA. If you are not in one of the above categories, you may receive the series at nominal cost.

ELECTRIC ENERGY ASSOCIATION, INC. 90 Park Avenue, New York, N.Y. 10016

Professional critics have been virtually unanimous in regarding Harry Weese's Arena Stage as a major landmark in American architecture. Wholly original in concept, superbly functional, and elegant in detailing, it has "an ambiance which suggests that magic is made, after all, in a working place," as one commentator remarked. Among other significant developments which were foreshadowed in this exciting structure was the utilization of roof perimeters as an important element in contemporary design, particularly when executed in metal.

Our initial gratification when Mr. Weese and his associates selected Follansbee Terne for these roof areas has thus merely been enhanced with the passage of time. And we were therefore doubly gratified, nearly a decade later, when Terne was again specified on the adjacent Kreeger Theater, a building of comparable distinction.

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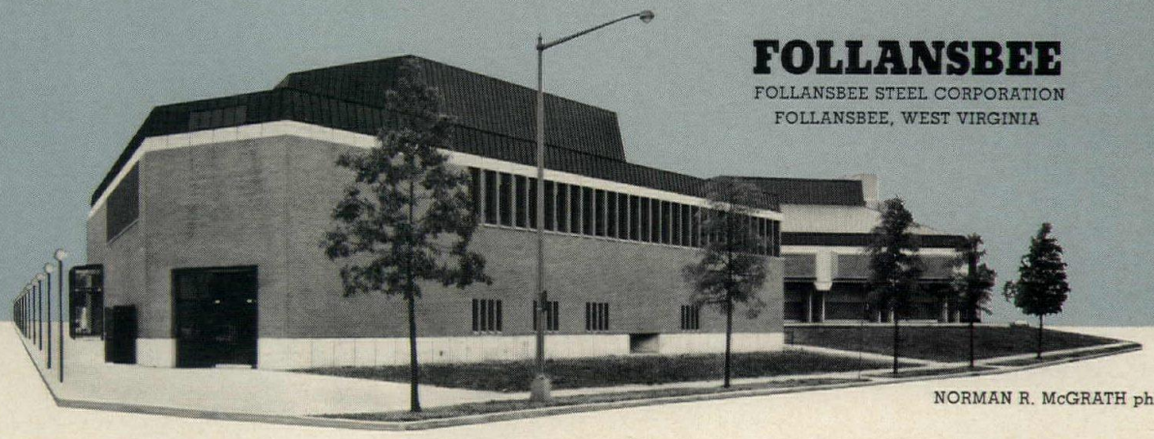

NORMAN R. McGRATH photo

KREEGER THEATER, WASHINGTON, D.C. WITH ARENA STAGE IN BACKGROUND.
ARCHITECT: HARRY WEESE AND ASSOCIATES, CHICAGO, ILLINOIS, WASHINGTON, D.C.
ROOFER: MATHY COMPANY, FAIRFAX, VIRGINIA.

For more data, circle 39 on inquiry card

CURRENT TRENDS IN CONSTRUCTION

James E. Carlson
Manager, Economic Research
McGraw-Hill Information Systems Company

The migration effect on the regional building profile: II

Last month's article concluded that, as far as places to live are concerned, all regions are *not* created equal. People move from one region to another, not because of random processes based on individual whims or fancies, but in response to definite sets of value preferences. People are, in fact, lured from one region to another by a variety of determinant factors, ranging all the way from a more agreeable climate, to a higher paying job. And, in this respect, the West, and more recently, the South, have been the main beneficiaries of these migration patterns. This month, we want to assess the impact these migrations have on the regional pattern of construction activity.

The initial impact of a shift in migration patterns *should* come in the area of housing. More specifically, the region benefiting from the net inflow of people should immediately experience increased pressure on its stock of existing housing. Vacancy rates should drop, and rents and the prices of homes should be bid up. Conversely, of course, a rising incidence of abandonment and a rise in vacancy rates should be typical in the region suffering the losses.

Things are not always what they should be, however.

The experience of the West over the past decade, and more recently the experience of the South, (the two regions benefiting from net migration inflows), have been that a *higher* average level of vacancy rates has prevailed than was the case in either the Northeast or Midwest, (the two regions suffering net population losses because of migration).

Similarly, trends in rents and the prices of homes have not differed significantly among the regions.

These surface inconsistencies are partly a reflection of the housing industry's hair-trigger response to shifts in prevailing market conditions. Basically, the "Housing market," is really the sum of a great number of diverse, localized submarkets, each keenly sensitive to minute changes in demand conditions, but with a sensitivity that tends to be asymmetrical. Builders seem always to respond immediately to any upward shift in market demand. But history has shown them to be much less sensitive to the forewarnings of market downturns.

There are other factors affecting the vacancy rate as well. Housing markets that are experiencing sharp gains due to migration inflows are obviously more dynamic markets than those characterized by lower rates of growth, or no growth at all. Sellers in this type of market need bigger inventories to effectively transact their business. In addition, this dynamic aspect enables them to sustain a higher average level of vacant units, because the time between any given unit's completion and its sale, or rental, as in the case of apartment units would be shorter under these conditions. Also, competition for the prospective buyer's or renter's business under these market conditions will generate a greater variety of styles and designs being offered for sale or rent.

REGIONAL MARKET SHARES, 1965-1972
Total Construction

Year	North-east	Mid-west	South	West	Total U.S.
1965	25%	25%	29%	21%	100%
1966	25	25	30	20	100
1967	24	27	30	19	100
1968	26	25	30	19	100
1969	26	25	29	20	100
1970	26	25	30	19	100
1971	25	25	31	19	100

Another consideration is the fact that a lot of the housing needed in the Northeast and Midwest is core area urban housing of the low-income type. Since the private builder finds this the least desirable housing market in which to involve himself, the gap must be filled by the somewhat slower route of government subsidies.

As would be expected, the regional building "mix" is significantly affected by these trends. In every year since 1965, the South's share of total residential building in the nation has been *higher* than its share of total nonresidential building. In the West, this has been the case in every year but one. Conversely, the residential building shares in both the Northeast and Midwest have been *below* their respective shares of nonresidential building in every year since 1965.

It is easy to sort out the direct impact of migration on some nonresidential building types, but others are difficult to analyze. Just as it spurs new housing, net in-migration always creates a derived demand for service-type buildings like stores, and community facilities like schools, hospitals and churches. Expanded rates of building activity in these areas either parallel, or immediately follow any major upward shift in migration into a region. (This fact holds true for urban-suburban population shifts as well.) Higher rates of building activity in such types as industrial plants or office buildings, however, may either precede or follow increased levels of net in-migration. Activity in these types might even be unrelated at all to the levels of net change through migration.

In a situation where economic factors are the prime force behind the population shift, and this is the case with most inter-regional moves, we have assumed, higher rates of business building (manufacturing plants and offices) would have almost certainly been experienced first. The expansion of a region's economy for whatever reason, must necessarily entail an accelerated rate of growth in the number of structures that "house" the "machinery" of that economy. It happened in the West in the late fifties and early sixties; and it's happening in the South now. In addition, if these migration patterns are to continue, higher levels of business building must parallel further population shifts. To the extent that other factors besides population shifts have a direct bearing on business building, the causal links will become blurred.

In the area of nonbuilding, or heavy engineering work, the construction-migration link is less discernible. While it's true that new communities and expanding populations need the basic services of sewage treatment and water distribution facilities, much of this type of construction in recent years has been going to upgrade or rehabilitate the aging systems in the Northeast and Midwest. A similar situation exists in the area of electrical utilities, where the replacement needs of these two regions create a construction demand that, proportionally, can overshadow the construction demand of the South and West in any given year. Highways, too, are an area where demand patterns are subject to variation because of these replacement and upgrading factors.

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INDEXES AND INDICATORS

Dodge Building Cost Services
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BUSINESS OUTLOOK IS OPTIMISTIC

In an early analysis of the business outlook for 1973, Douglas Greenwald, chief economist of the Department of Economics, McGraw-Hill Publications Company, forecasts a record-breaking year for output, profits and capital investments. Observing the trends apparent in closing weeks of the third quarter of 1972, Greenwald projects that the gross-national product this year will be up 9.8 per cent over 1971. Real economic growth, excluding price inflation by converting the GNP to 1958 dollars, will add up to 6.2 per cent this year, a significantly higher rate of annual growth than the 2.4 per cent average of the last five years. Price increases will account for only a 3.3 per cent gain this year.

In a period of rapid expansion, the rates of both inflation and unemployment are declining (except for farm and food products) but some increase in the pace of inflation is expected in 1973. The price index (based on 1958 = 100) is expected to average 152.2 for 1973, an increase of 4 per cent over the 1972 average.

Capital spending by private industry, which includes but does not separately identify spending for new construction, will increase 11.8 per cent this year over last—and is expected to gain another 12.4 per cent next year. One of the very few declines next year will be housing starts, down 14.7 per cent, Greenwald predicts. The outcome of the presidential election might affect the mix but probably not the over-all extent of economic growth.

1941 average for each city = 100.00 (except as noted)

October 1972

Metropolitan area	Cost differential	Current Indexes non-res.	residential	masonry	steel	% change last 12 months
U.S. Average	8.3	390.1	366.3	382.0	372.1	+ 10.73
Atlanta	7.9	502.5	473.8	488.5	477.8	+ 10.94
Baltimore	8.2	426.3	400.8	416.0	402.7	+ 15.54
Birmingham	7.4	361.7	336.4	349.3	344.4	+ 12.74
Boston	9.1	398.3	376.3	395.3	382.6	+ 15.19
Buffalo	9.0	429.9	403.6	424.7	410.9	+ 11.69
Chicago	8.4	449.3	427.2	435.6	427.0	+ 12.59
Cincinnati	8.6	414.8	390.3	403.2	393.2	+ 9.30
Cleveland	9.3	434.1	408.5	423.2	413.2	+ 8.70
Columbus, Oh.	8.3	410.8	385.7	398.5	391.0	+ 8.30
Dallas	7.7	388.9	376.5	381.3	373.2	+ 12.12
Denver	8.2	418.8	393.9	413.9	399.6	+ 9.16
Detroit	9.5	436.7	416.0	438.3	421.0	+ 11.56
Houston	7.5	368.4	345.9	359.9	352.2	+ 7.43
Indianapolis	7.9	362.6	340.4	353.5	346.0	+ 9.01
Kansas City	8.2	370.5	350.1	361.1	351.5	+ 10.23
Los Angeles	8.2	432.6	395.4	419.7	411.2	+ 12.36
Louisville	7.7	388.8	365.1	379.4	370.6	+ 11.99
Memphis	7.6	368.7	346.2	355.9	350.1	+ 9.40
Miami	8.0	410.1	390.6	399.0	390.2	+ 9.74
Milwaukee	8.4	438.9	412.1	432.6	419.1	+ 8.00
Minneapolis	8.8	416.2	391.6	409.9	398.1	+ 11.77
Newark	8.7	379.8	356.6	374.4	365.1	+ 7.84
New Orleans	7.4	373.2	352.3	366.7	358.2	+ 11.62
New York	10.0	431.6	401.3	419.1	408.2	+ 10.63
Philadelphia	8.9	422.9	402.9	418.9	407.2	+ 16.61
Phoenix (1947 = 100)	7.8	221.9	208.3	214.3	210.4	+ 12.51
Pittsburgh	8.8	383.2	360.5	377.3	365.7	+ 11.35
St. Louis	8.7	406.5	383.7	399.8	388.5	+ 10.78
San Antonio (1960 = 100)	7.5	149.5	140.4	145.8	142.1	+ 3.45
San Diego (1960 = 100)	7.9	152.1	142.8	148.7	145.4	+ 7.31
San Francisco	9.4	572.3	523.0	566.6	549.0	+ 15.92
Seattle	8.5	379.9	339.9	376.3	361.6	+ 5.99
Washington, D.C.	7.9	372.3	349.6	360.5	353.0	+ 12.38

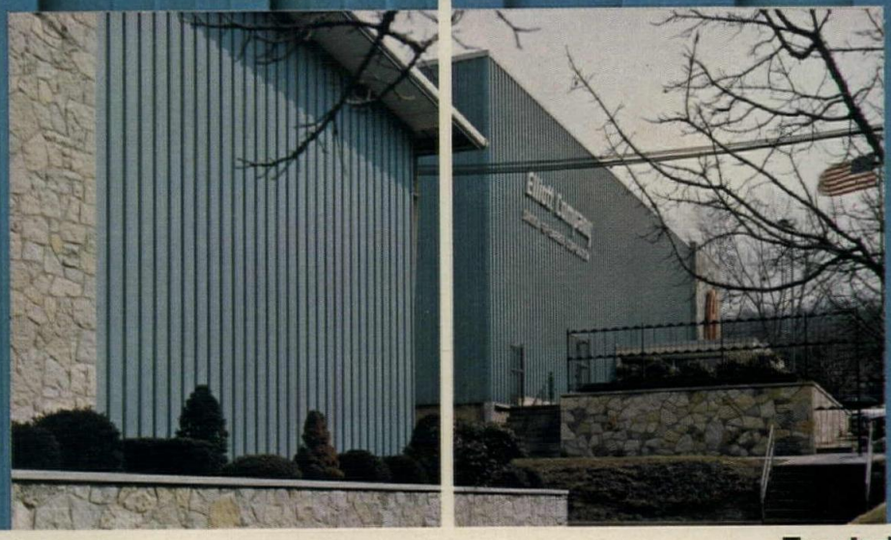
Cost differentials compare current local costs, not indexes.

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

1941 average for each city = 100.00

Metropolitan area	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Quarterly) 1st	2nd	3rd	4th	1972 (Quarterly) 1st	2nd	3rd	4th
Atlanta	298.2	305.7	313.7	321.5	329.8	335.7	353.1	384.0	422.4	424.0	445.1	447.2	459.2	472.5	473.7	496.1	
Baltimore	271.8	275.5	280.6	285.7	280.9	295.8	308.7	322.8	348.8	350.3	360.5	362.5	381.7	388.1	389.3	418.8	
Birmingham	250.0	256.3	260.9	265.6	270.7	274.7	284.3	303.4	309.3	310.6	314.6	316.4	331.6	340.4	341.6	356.7	
Boston	239.8	244.1	252.1	257.8	262.0	265.7	277.1	295.0	328.6	330.0	338.9	341.0	362.0	377.3	378.5	392.8	
Chicago	292.0	301.0	306.6	311.7	320.4	328.4	339.5	356.1	386.1	387.7	391.0	393.2	418.8	422.8	424.0	442.7	
Cincinnati	258.8	263.9	269.5	274.0	278.3	288.2	302.6	325.8	348.5	350.0	372.3	374.3	386.1	399.9	401.1	400.1	
Cleveland	268.5	275.8	283.0	292.3	300.7	303.7	331.5	358.3	380.1	381.6	391.1	393.5	415.6	415.2	416.4	427.7	
Dallas	246.9	253.0	256.4	260.8	266.9	270.4	281.7	308.6	327.1	328.6	341.4	343.4	357.9	364.9	366.1	385.0	
Denver	274.9	282.5	287.3	294.0	297.5	305.1	312.5	339.0	368.1	369.7	377.1	379.1	392.9	398.3	399.5	413.8	
Detroit	265.9	272.2	277.7	284.7	296.9	301.2	316.4	352.9	377.4	379.0	384.6	386.8	409.7	416.9	418.1	431.5	
Kansas City	240.1	247.8	250.5	256.4	261.0	264.3	278.0	295.5	315.3	316.6	329.5	331.5	344.7	348.7	349.9	365.4	
Los Angeles	276.3	282.5	288.2	297.1	302.7	310.1	320.1	344.1	361.9	363.4	374.2	376.4	400.9	407.8	409.0	422.9	
Miami	260.3	269.3	274.4	277.5	284.0	286.1	305.3	392.3	353.2	354.7	366.8	368.9	384.7	391.5	392.7	404.8	
Minneapolis	269.0	275.3	282.4	285.0	289.4	300.2	309.4	331.2	361.1	362.7	366.0	368.0	417.1	401.7	402.9	411.3	
New Orleans	245.1	284.3	240.9	256.3	259.8	267.6	274.2	297.5	318.9	320.4	327.9	329.8	341.8	350.9	352.1	368.1	
New York	276.0	282.3	289.4	297.1	304.0	313.6	321.4	344.5	366.0	367.7	378.9	381.0	395.6	406.5	407.7	421.5	
Philadelphia	265.2	271.2	275.2	280.8	286.6	293.7	301.7	321.0	346.5	348.0	356.4	358.4	374.9	394.2	395.4	417.9	
Pittsburgh	251.8	258.2	263.8	267.0	271.1	275.0	293.8	311.0	327.2	328.7	338.1	340.1	362.1	364.5	365.7	378.7	
St. Louis	255.4	263.4	272.1	280.9	288.3	293.2	304.4	324.7	344.4	345.9	360.0	361.9	375.5	385.5	386.7	400.9	
San Francisco	343.3	352.4	365.4	368.6	386.0	390.8	402.9	441.1	465.1	466.8	480.7	482.6	512.3	535.3	536.5	559.4	
Seattle	252.5	260.6	266.6	268.9	275.0	283.5	292.2	317.8	341.8	343.3	347.1	349.0	358.4	363.0	364.5	369.9	

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.



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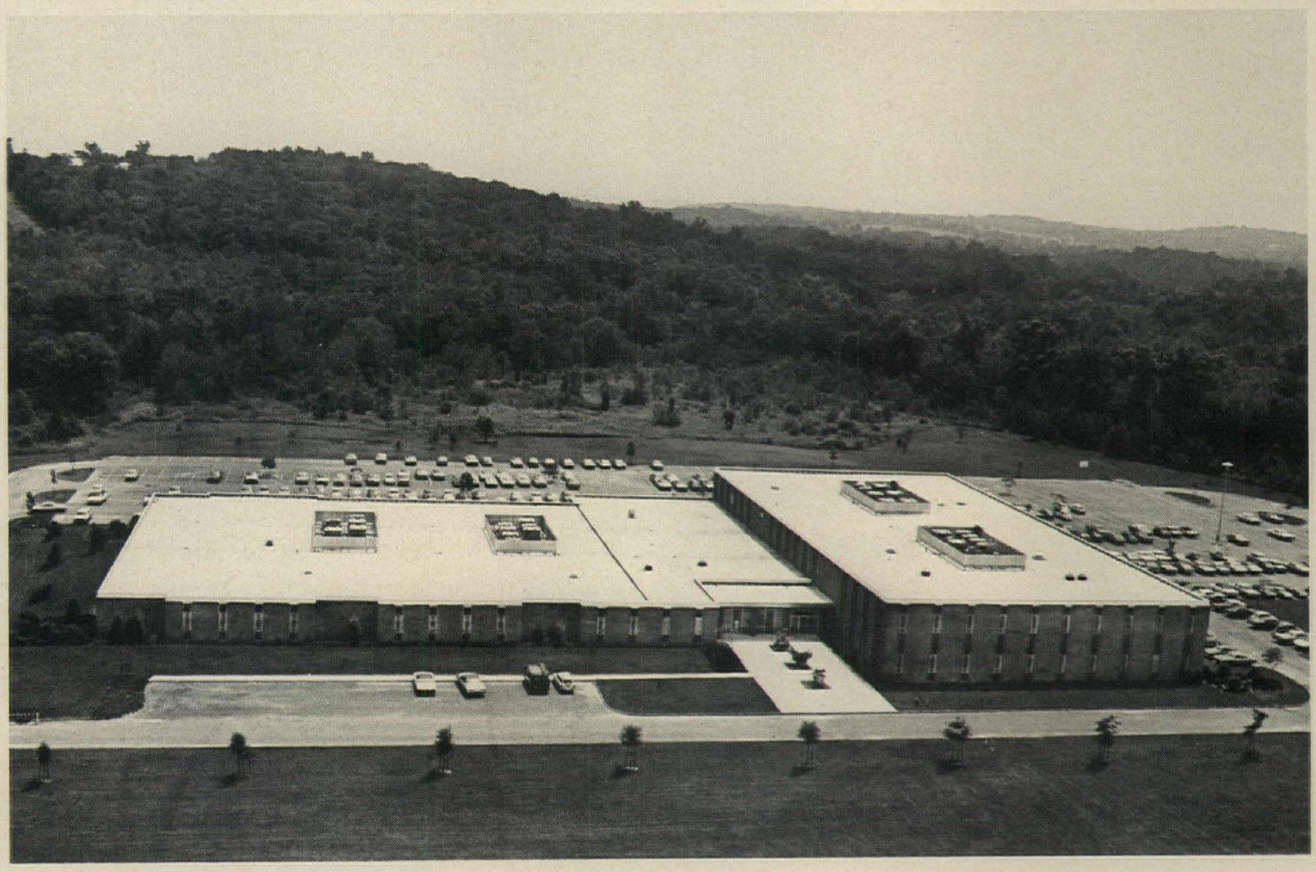

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We use our exclusive Spine Fin™ condenser coil design, because it eliminates 90% of the brazed joints (which are potential leaks) of a conventional plate fin design.

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These reliable air conditioners come in 3, 4, 5, 7½, 10, 15 and 20 ton capacities. With them you can design zone-by-zone cooling into areas as small as a reception room or as large as an auditorium.

And since we're a major integrated manufacturer of air conditioning, we can deliver. For people, or computers.

GENERAL ELECTRIC

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Everybody takes copper plumbing for granted. Clog-free, corrosion resistant and non-contaminating, copper quietly does its job for the life of the building, needing less maintenance than other materials. It's the dependable one.

Contributing to the long range economy of copper is its fast, easy installation. Copper requires no flammable joining compounds, needs no extra supporting hardware. Copper doesn't sag with heat or get brittle with cold. What's more, it can be altered easily and economically if a system change is ever needed.

Most important, copper does not create a potential fire hazard. Copper will not burn and decompose to toxic gases or conduct fire through floors, walls and ceilings.

So, keep taking copper plumbing for granted. Copper is a quality product, backed by years of proven service and code acceptance everywhere. It may cost a little more to begin with, but first cost is the least cost when it's the last cost.

For a booklet listing 44 solid reasons why copper is your best buy, write: Copper Development Association Inc. 405 Lexington Avenue, New York, N.Y. 10017.

Copper plumbing. The dependable one.

Andersen Perma-Shield® Windows fit right in with school remodeling.

When the New Albany, Indiana, Senior High School was remodeled recently, Andersen Perma-Shield Windows fit right in. Not only did they fit the character of the building, they also fit into the structure without alteration to frame or masonry. In fact, the architect was able to use standard window units with only small auxiliary trim members to fit existing openings. On the interior the head, jamb and sill trim of the original windows was retained. Other windows considered would have called for extensive installation work.

This wasn't the only way in which Andersen Perma-Shield saved the taxpayer's money.

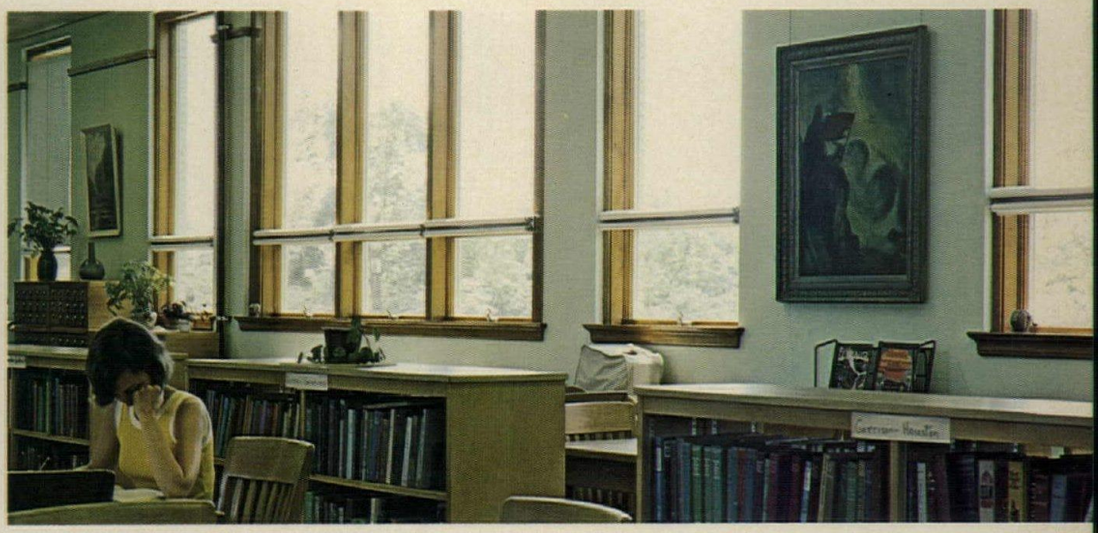
One of the objects in renovat-

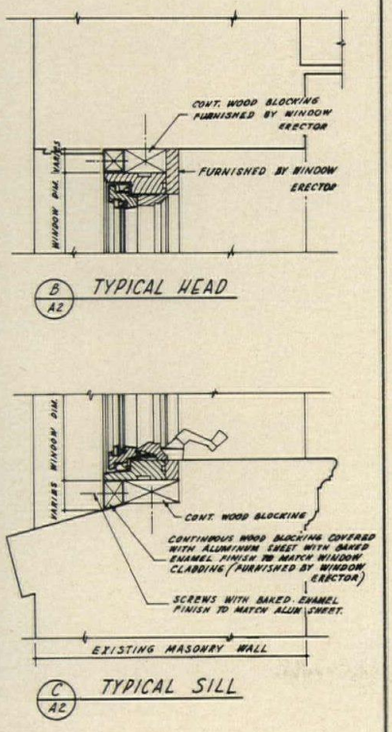
ing this 1929 school was to reduce heating and cooling costs. So the superior insulating properties of Andersen Windows was another reason for their selection. Their stabilized wood construction, double-pane welded insulating glass, and close-fitting tolerances, all help to reduce heating and cooling losses and condensation.

The low maintenance features of Perma-Shield will save the school money year after year. They will not need painting—the exterior vinyl sheath does not fade, crack or corrode—and they call for minimal cleaning.

Faculty and students like the new windows, too. No longer do they have to sit in cold drafts; Andersen has made the building snug.

In any school renovation, Andersen Windows can make important contributions toward holding down costs. For details on all Andersen Windows and Doors, see Sweet's File (Sections 8.16/An and 8.6/An), your Andersen distributor, or write us direct.





Renovations to New Albany, Indiana, Senior High School for New Albany-Floyd County Consolidated School Corporation.

Architect: Walker, Applegate, Oakes and Ritz, New Albany, Indiana.

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The new concept includes four basic components: (1) KEYDECK Truss T's that act as steel reinforcing for the structural system and as supports for the leave in place forms; (2) Keydeck forms, light in weight and easy to snap into place; (3) Keydeck temperature reinforcing to minimize surface cracks; (4) Cast in place concrete providing desirable structural, acoustical, and fire resistant properties.

Most importantly, this system has low material and placement costs . . . is quick and easy to install. Consider it for your next job. For detailed information write or call Construction Products Division (309) 697-0200.

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KEYDECK Truss T steel support

KEYDECK leave in place fiber forms

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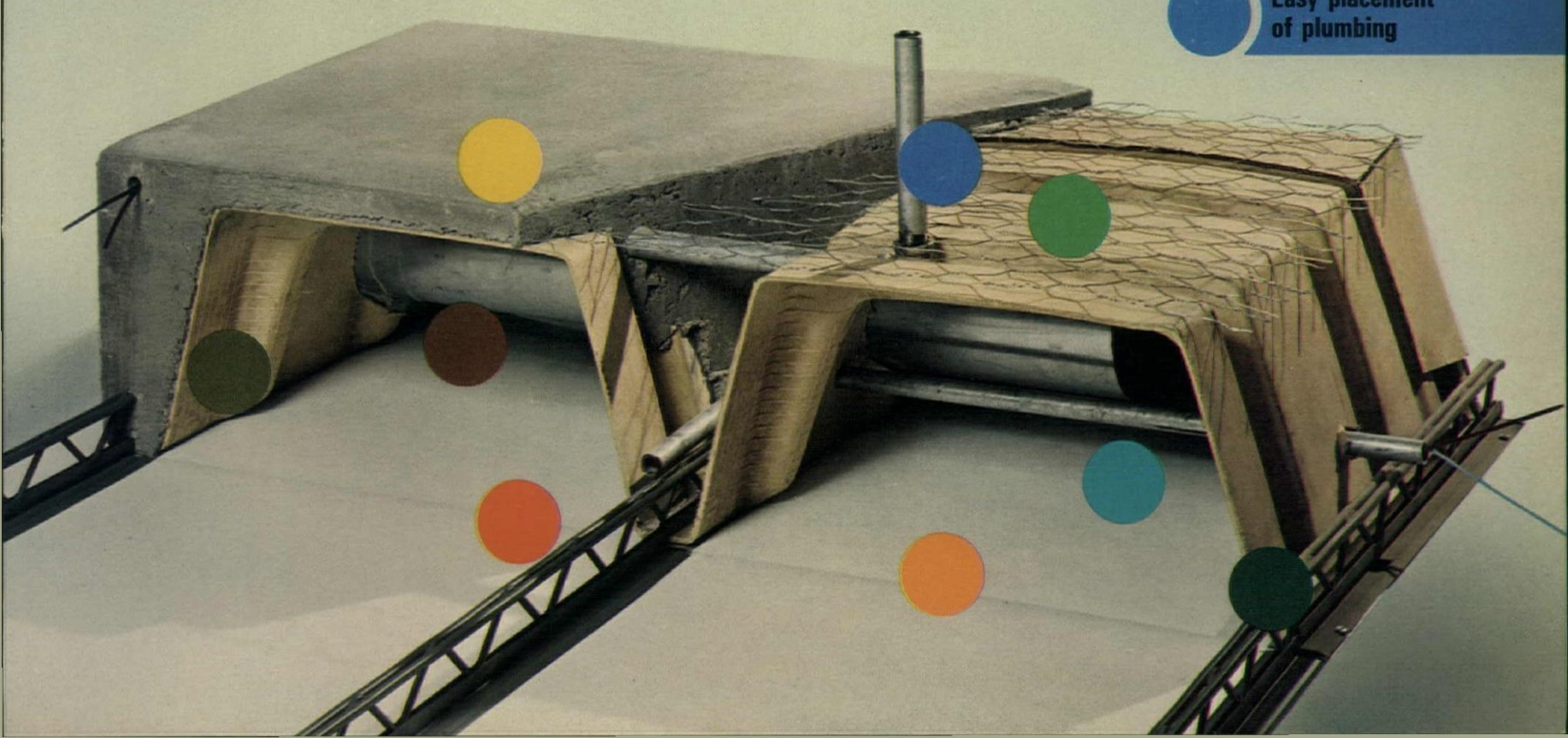
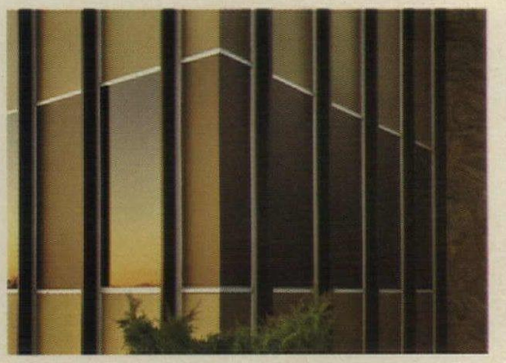


Basking bronzes.
Introducing sun-loving Kalcolor® in handy Mirawal® building panels.



Dark statuary bronze and medium amber hues of Kalcolor aluminum are now available in light, rigid, easy-to-use building panels from Kaiser Mirawal.

Mirawal Kalcolor Building Panels.

You can order them as veneer or insulated panels in the sizes you need.

Being Kalcolor aluminum they provide a unique extremely hard-anodic color coating, unsurpassed for long life against sun, weather and wear. And for beauty indoors or out.

For samples—and to see other ideas in today's widest range of building panel types, colors and facings—write Kaiser Mirawal, P.O. Box 38C, Port Carbon, PA. 17965.

We'll show you oceans of possibilities.

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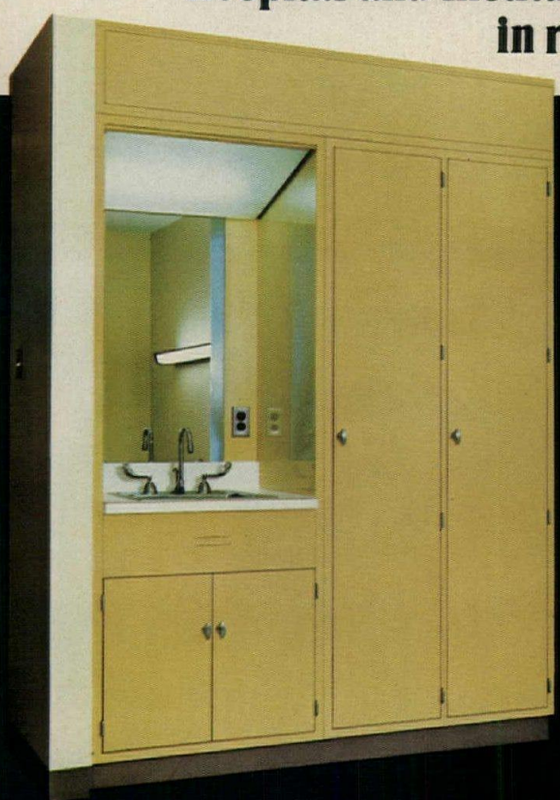
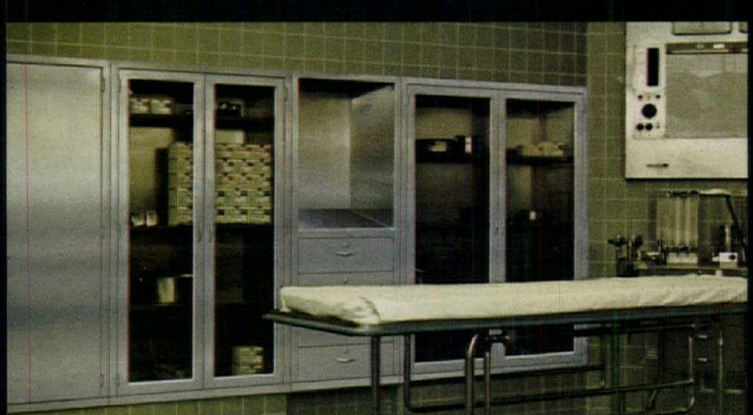
The Indest

Hospital and institutional casework in steel... beautifully finished in rich, enameled colors or in gleaming stainless.



Wadsworth Rittman Hospital, Wadsworth, Ohio

Northside Hospital, Atlanta, Georgia



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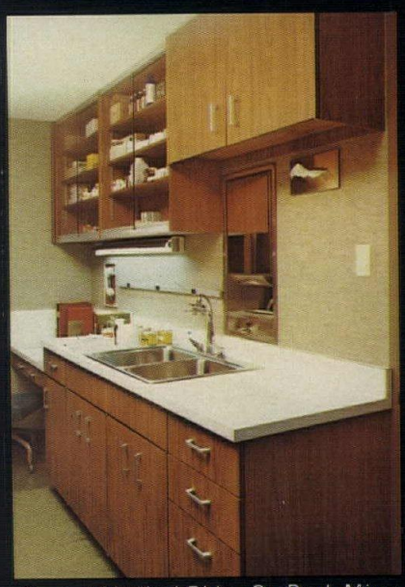
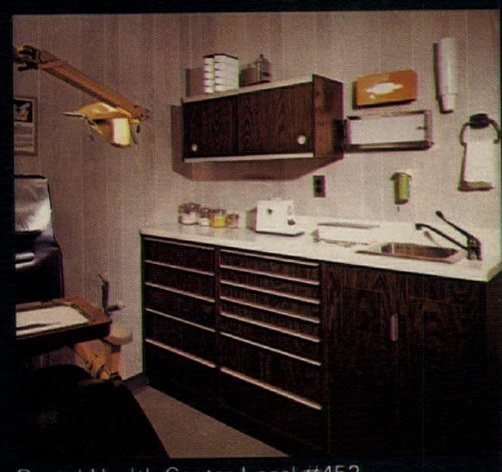


Central Medical Bldg., St. Paul, Minn.

St. Thomas Academy, St. Paul, Minn.



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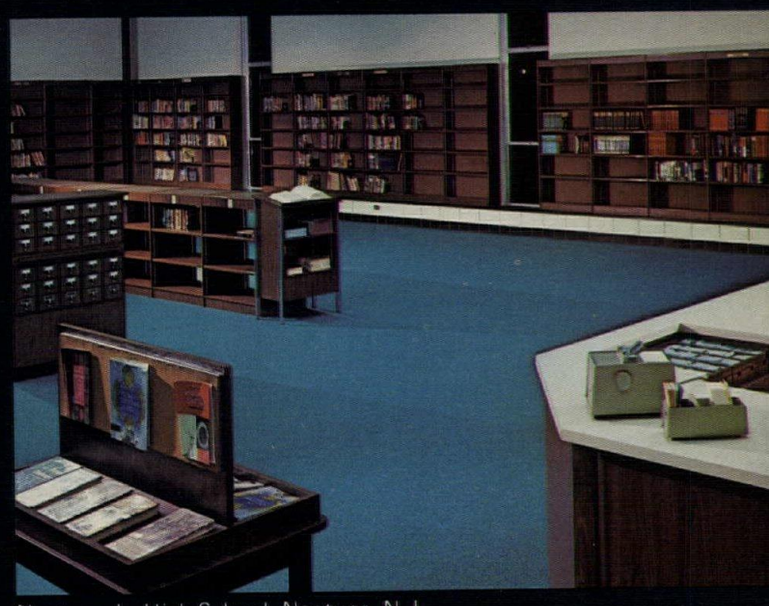

Neptune Jr. High School, Neptune, N.J.

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Mickey shows friends the way to Disneyland's monorail station—on a Goodyear Speedramp system.

This Speedramp has carried over 40 million people, plus an occasional mouse

It was installed in 1969. Since then, this Goodyear Speedramp passenger conveyor system has carried thousands of Disneyland visitors a day to and from the monorail. Like the other eight Goodyear "moving ramp" units at Disneyland, it has done its job smoothly, safely and efficiently.

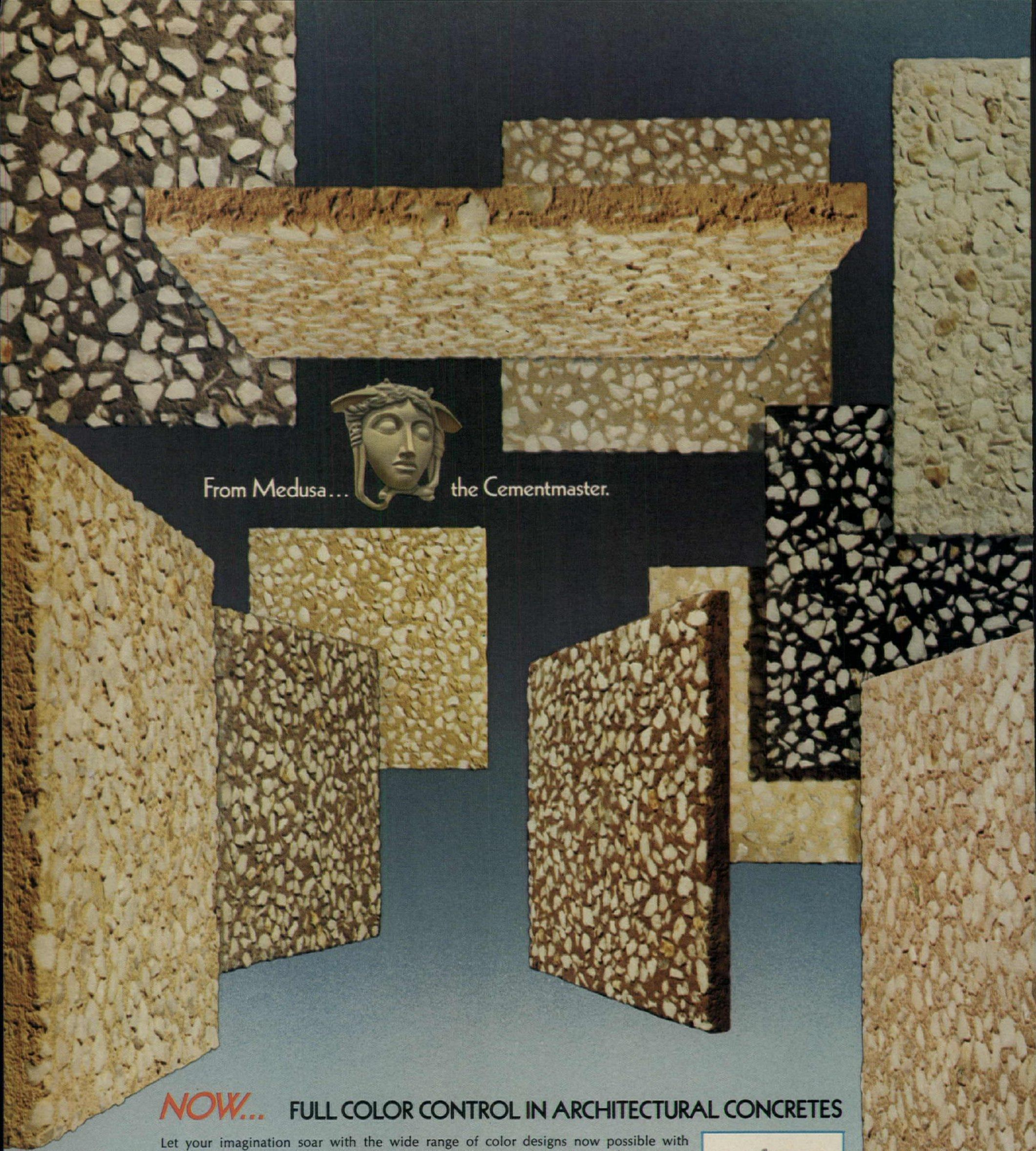
Which is why the Disneyland organization installed additional Goodyear systems at its new Walt Disney World in Florida.

In fact, over 150 Speedwalk and Speedramp systems are in service today. In airports. Shopping centers. Department stores. Stadiums. Industrial plants. Many have been on the job for almost 20 years, carrying people, shopping carts, pets and baby carriages. And keeping downtime, maintenance costs and insurance expense to a minimum.

If your problem is moving people up and down between levels, the Speedramp system is your answer. It handles crowds easily, cuts down congestion and confusion. It has no disappearing steps to worry the elderly and the very young. It even lets wheelchairs roll on and off safely and smoothly.

And if you want to move people horizontally—through long corridors or between buildings and adjacent parking areas—the name to remember is Speedwalk. For full information on both these proven passenger conveyor systems, write: Goodyear Tire and Rubber Company, Transport Systems, Box 52, Akron, Ohio 44309.

GOODYEAR
TRANSPORT SYSTEMS



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Let your imagination soar with the wide range of color designs now possible with Medusa's new colored portland cements. They offer creative freedom with assurance of color and strength uniformity to the architect and precast producer.

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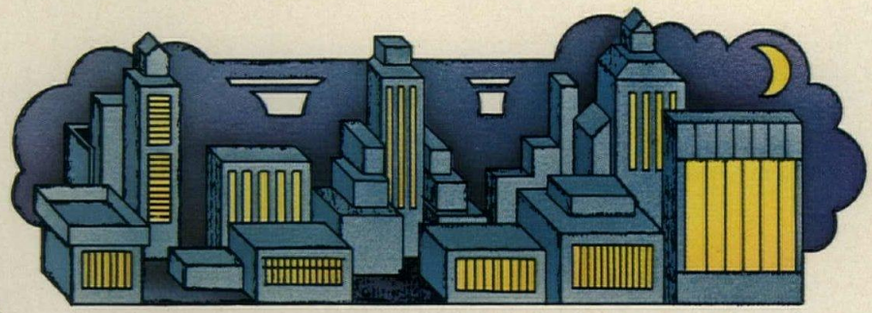
to save money and energy.

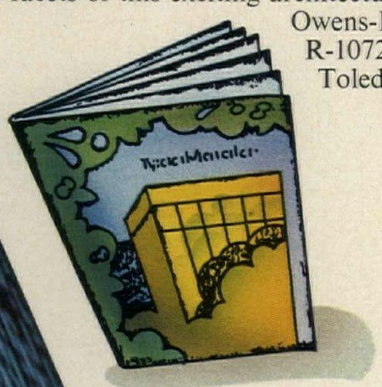


Vari-Tran—The Conservation glass.

We started out by calling Vari-Tran the "Hi-Performance" glass because it improved the inside working and viewing environment. Now we'd like you to think of it also as the "Conservation" glass, as it helps reduce the need for energy and resources in a community.

Send for our Vari-Tran booklet.

With so many new Vari-Tran options to consider, you'll need a copy of our colorful new booklet "Reach for a Rainbow". It tells about the expanded Vari-Tran line and explains all the facets of this exciting architectural glass. Write: Libbey-Owens-Ford Company, Dept. R-1072, 811 Madison Ave., Toledo, Ohio 43695.



Making progress in architecture

L O F

The Greenwich Savings Bank, New York City.

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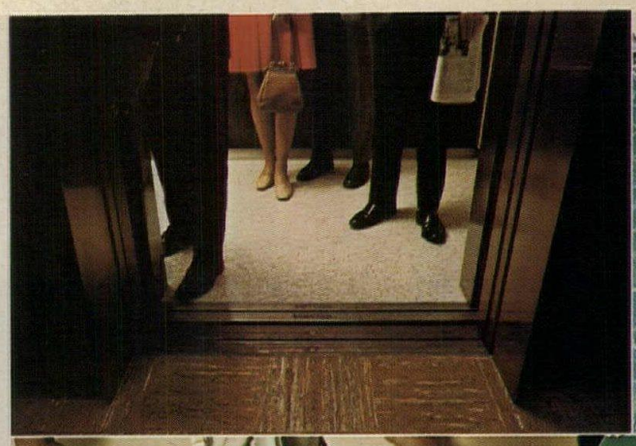
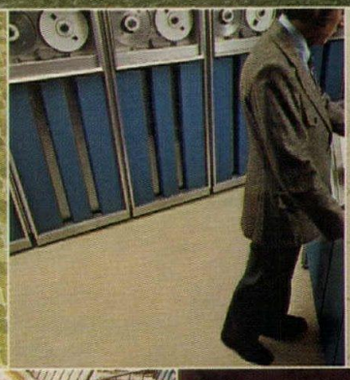
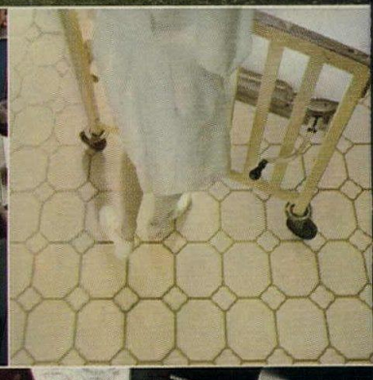
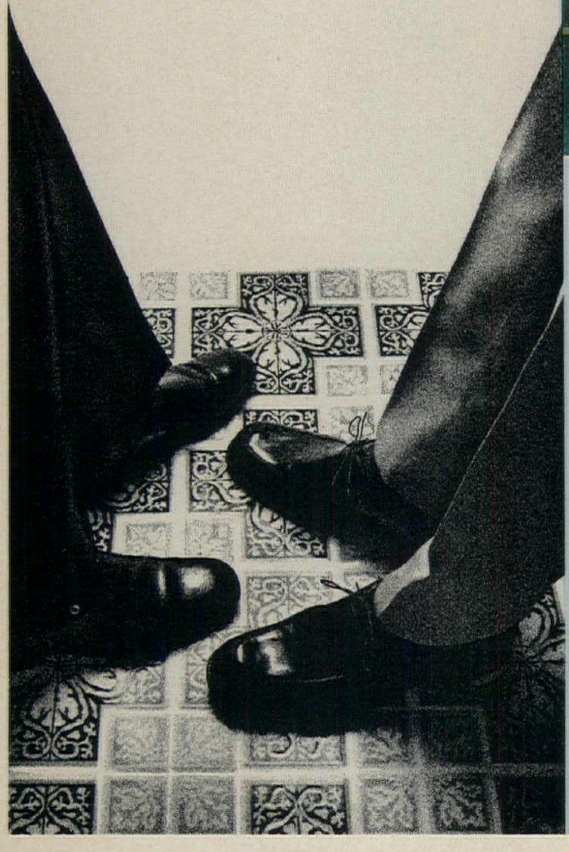
GAF MAKES FLOORINGS FOR ALL KINDS OF FEET.









A floor covering should be chosen not only to withstand the number of feet that will go over it, but for the particular type of feet as well.

That's why, when it comes to resilient floorings, GAF makes over 300 types, patterns, and colors—to try to have exactly the one you'll need.

For instance, for a medium traffic area you might choose new Fashioncraft(TM) floor tile. This 3/32" grade comes in a striking assortment of high-fashion designs, making it a worthy candidate for residential areas, too. Or ask us about the GAF Thru-Chip® lines which offer no-wax maintenance in heavy traffic areas.

But perhaps you'll decide sheet goods can do the job better.

In that case, GAF offers sheet vinyl that comes up to 12' wide, is cushioned for softness and quiet, and needs no waxing or scrubbing.

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All are fire-safe; and meet Federal specifications where applicable.

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gaf® Bright Future VINYL FLOORS

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What's standing between a noisy county airport and PepsiCo's quiet corporate headquarters?

1,809 insulating glass windows.

And a 20 year old proven performer—a sealant based on LP® polysulfide polymer.

Such a move makes indisputable sense. And has done so for nearly 20 years, the period during which insulating glass manufacturers have been assembling their units with sealants based on LP polysulfide polymer from Thiokol.

In the case of the new corporate headquarters of PepsiCo, Inc., Purchase, N.Y., such a sealant proved itself because it eliminated moisture condensation and practically all outside noise.

Which happens to be exceedingly important in this particular case because the headquarters building is only a mile and a half from busy Westchester County Airport, right in the flight path.

Now we're not attributing all of the success to the sealant—a two-part polysulfide-base compound. But we are claiming that this sealant played an extremely important role.

Here are the facts upon which this claim is based: For one thing, after careful evaluation, this sealant based on our polymer was found to give the best seal between the window's neoprene gasket and aluminum. And between neoprene and glass. And between one piece of aluminum and another.

This resulted in a firm seal that helps prevent fissures or ruptures that could substantially impair the window system's sealed-in atmosphere. Hence, the threat of sweating and fogging is eliminated.

What's more, this sealant proved to have the capability of withstanding all sorts of vibrations and atmosphere turbulences caused by the heavy traffic at the nearby airport.

As a result, it was ideal for the window design which included a special pressure-compensating system that eliminates barometric and thermal differences within the 3½ inch air space.

Besides, this sealant also proved it could measure up to sealing out noise. Right now, in fact, the sealed double-glazed window units screen out more than 80 percent of the sound which would come through ordinary single-pane units.

Again, this is another example of how a sealant based on LP polysulfide polymer comes through with flying colors. For more information, write Dan Petrino, Thiokol Chemical Corporation, P.O. Box 1296, Trenton, N.J. 08607.

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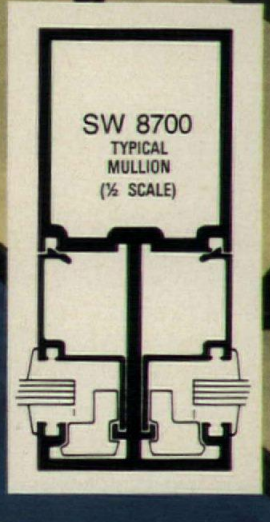
Whatever wall system you

have in your plans, you can plan on Kawneer.

With Kawneer, you choose the design features, the performance standards, the glazing options, and the finishes that are right for your project. □ Kawneer's broad spectrum of wall systems are engineered for high performance and designed for a practically unlimited variety of architectural applications. Choose from gasket, stick, unitized or thermal break options. □ And with Kawneer you also have your choice of vents, windows, or entrances to complement the system . . . all from a single supplier. □ Now there's even more to choose from. SW 8700 is the latest addition to Kawneer's comprehensive family of walls. It's a new, prefabricated stick wall that features a flush grid of minimum exterior projections, emphasizing glass with "to the front" glazing. □ The key to a successful building design using a curtain wall is the selection of a manufacturer that has consistently displayed reliable performance in every step of supplying walls. On your next project, consider Kawneer wall systems. They'll give you everything you planned for.



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OPTIMIZING THE STRUCTURE OF THE SKYSCRAPER

Examples from SOM in Chicago show a clear, logical progression in structure and its expression, as skyscrapers go up and up

The Chicago office of Skidmore, Owings & Merrill, located in the city where the skyscraper originated, is taking this architectural form to new-found heights, and in the process is producing architectural forms that express the rationality of the structural systems, and that exploit their planning potentialities.

Early skeleton frames still carried heavy loads of masonry, though the exterior walls merely supported their own weight. Wind load was not much of a problem then, but it became one when buildings shed their heavy masonry skins, and the structures had to do all the work.

When buildings are not very high, rigidly connected beams and columns can carry the wind. But the post-and-beam approach becomes inefficient after about 20 stories. Other systems that supplant post-and-beam also reach limits in efficiency as they reach greater heights.

The result is that as structures have thrust higher—20, 40, 60, 100, 110 stories—new families of structural systems have evolved, each suitable for given ranges of heights in steel, concrete, or their combination.

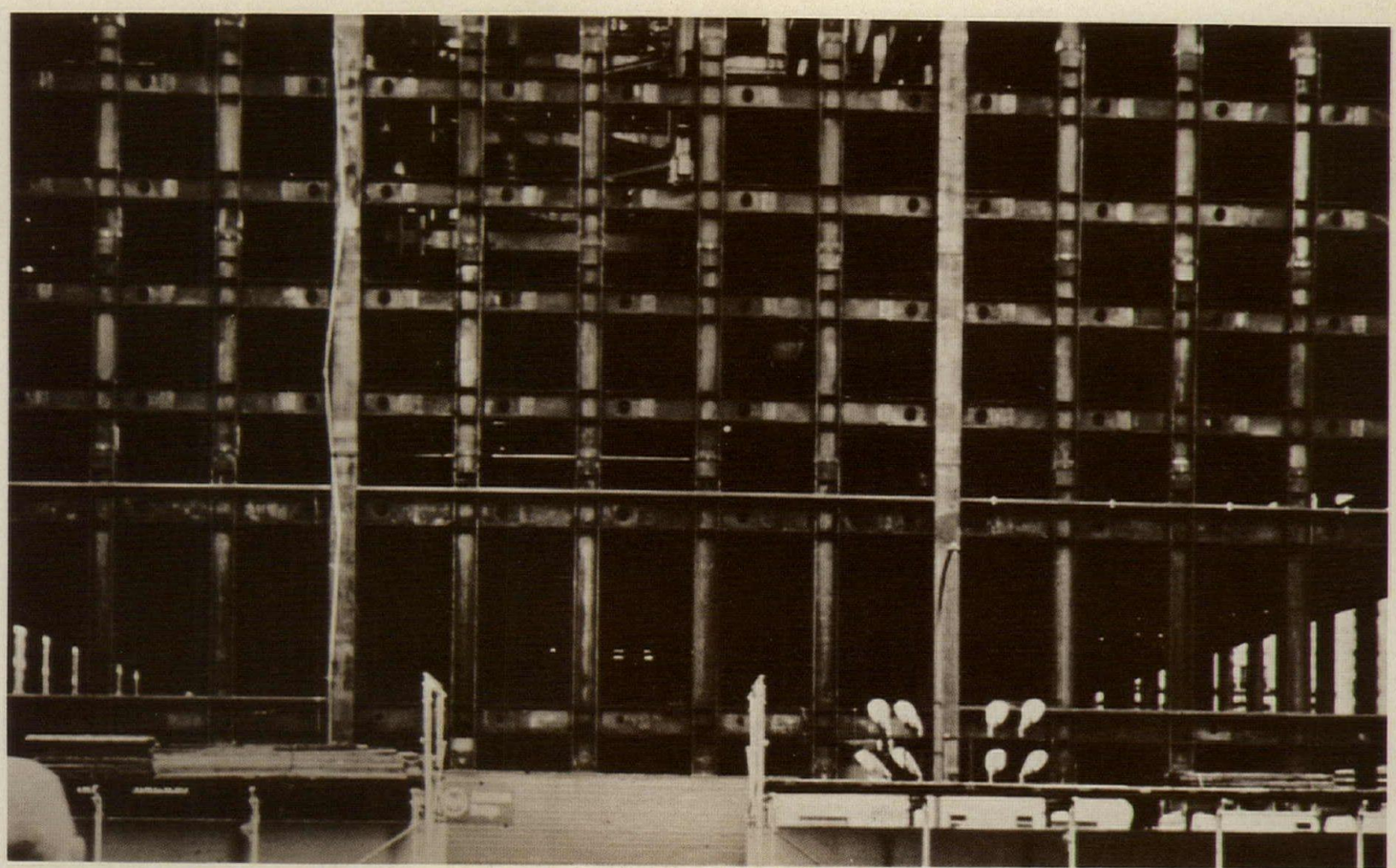
What these families of systems are can be seen most clearly in the work of the Chicago office of SOM over the past decade. Their achievements in the skyscraper genre stem from the unique combination of individual, plus the emphasis put on very early collaboration between engineers and architects. And it can do so because of having both strong engineering and architecture inputs in-house. Discussions start when only the building program is more or less known —and nothing has even been sketched. Architecture and engineering are then discussed together to try to synthesize them into a coherent building form.

The buildings and structures that then emerge from the SOM office are a result not only of this philosophy, but also of the types of people involved: the structural engineer has to be somewhat of an architect, and the architect somewhat of an engineer. A very close interaction between their thoughts must occur.

A case in point is Sears Tower. The bundled tube structural concept Fazlur Khan developed meshed with design partner Bruce Graham's search for a shape that could gradually drop off floor areas as the building rose higher, to give the different sizes of floors the client wanted.

Khan feels that teaching is a very important part of his professional life—the work with students helping to stimulate new ideas and concepts, as well as to think them through. He proudly points to the high competence-level of engineers in his department—attributing a high efficiency of output, in conceptual and technical terms to this fact. He believes the engineer's role, as the architect's, is to make solutions as simple and as direct as possible. That out of simple logic and simple structural solutions, good, and great, architectural forms can develop.

—Robert E. Fischer



The architect seeks a flexible, uncluttered plan, and an economic height; the engineer seeks the simplest way to bring loads down to the ground

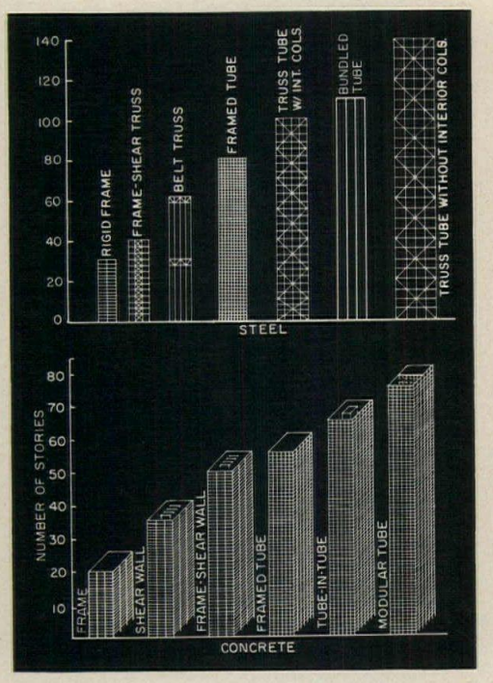
When the skyscrapers really began to go "up" in numbers and height in Chicago about 10 years ago, significant changes in structural design approaches began to emerge from the office of Skidmore, Owings & Merrill, there. Even before that in 1958, the firm produced a bold, husky expression for Inland Steel's 60-ft-clear-span rigid frame of 19 stories. Three years later saw the 20-story Hartford Building which gave a clear, strong expression of a concrete flat plate design in 22-ft-square bays. Then in 1964, SOM stretched the bay sizes to 36 ft in the 19-story BMA building in Kansas City. The rigid-frame steel structure is welded, and high-strength steel was used in the 36-ft-long girders. Projecting in front of the glass, the structure is one of the clearest expressions of a steel rigid frame.

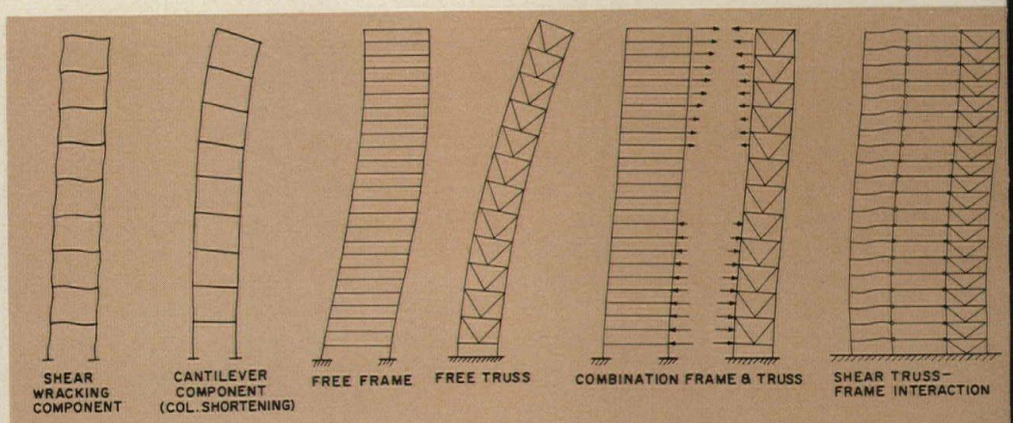
In a frame structure, the total lateral drift caused by wind is due to two primary factors: 1) bending moments in the girders (65 per cent of the total), and bending moments in the columns (15 per cent); and 2) axial stresses due to the overturning moment, resulting in column shortening and lengthening (20 per cent). Obviously drift has to be controlled to prevent undue wracking of partitions and windows, and to avoid building movement being unpleasantly perceptible to the occupants.

Fazlur Khan, partner and chief structural engineer of SOM, Chicago, has demonstrated in a number of technical papers that the structural performance of a rigid frame can be improved when a vertical shear truss or shear wall is combined with it. The drawings below show that the frame tends to pull back the shear truss or wall in the upper portion of the building, and push it forward in the lower portion. As a result, the frame is more effective in the upper portion where the wind shears are less (they go from zero at the top and build up to maximum at the base), and the shear wall or truss carries most of the shear in the lower portion of the building, where the frame cannot afford to carry high lateral load. This construction in which the shear truss interacts with the frame has been used in a number of buildings in the 40-story range.

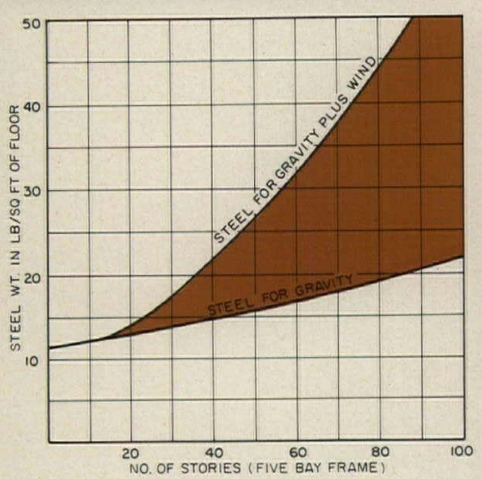
For example in the Chicago Civic Center (C. F. Murphy and SOM, associated architects), the upper half of the building is a pure rigid frame construction, while the lower half is a shear truss-interaction structure. When a rigid frame is combined with a shear truss, the lateral sway is frequently reduced to 50 per cent of that if the truss had been used alone, and, further, the distortion of the floors is less.

This same approach works in concrete, too, with the "shear truss" being replaced by a "shear wall." SOM's example here is the 38-story Brunswick building in downtown Chicago. Finished in 1962, it was one of the first major-size buildings in Chicago





The taller buildings become, the stiffer they need to be to resist wind economically. The evolution of structures, including new concepts, to do this is shown, left. Low buildings up to 20 stories use rigid frames to limit sway, with wracking accounting for about 90 per cent of it. The 19-story BMA building (below) is a classic expression of a steel rigid frame. Because rigid frames are limber to some extent, they are inefficient for taller buildings. A first step to improve them is to add a shear truss (see above) which increases stiffness of the frame.



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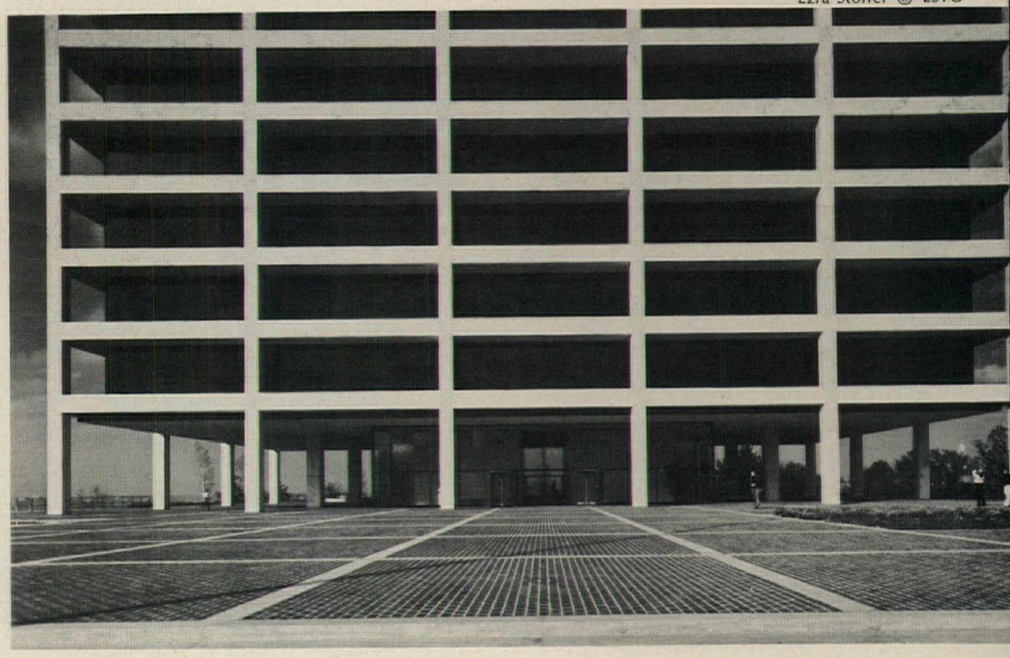


to be built after the Prudential building. The program called for deeper space than usual—a 38-ft span from perimeter to core. In plan there is a 38-ft free span, a 38-ft corridor, and then another 38-ft free span.

At first SOM's engineers thought that the structure would be designed so that the core's shear walls would carry all the wind load, while the columns would carry only gravity load. But because of the long clear spans, columns had to be closer together than ordinarily—in this case 9 ft 4 in. apart, which was double the building module, and equal to the size of a "minimum" office. Obviously the columns of the exterior wall would not just "sit there." Because the frame was concrete, the columns and beams had a natural continuity. In essence, then, the building had shear wall-frame interaction. As a matter of fact, the engineers determined that with the building designed, the shear walls alone would allow the building to drift 13 inches with the strongest wind. But combining the shear walls with rigid frame action, the drift would be reduced to only 3 inches.

Concrete was chosen because at that time it was on the order of $1 per square foot cheaper than steel. Further, the closely spaced columns and the spandrel beams provided a natural frame for the windows.

In order to create adequate spaces for entry to the building, the individual loads of the closely-spaced columns had to be picked up by a huge transfer girder, 24-ft high and 8-ft deep, supported by 7- by 7-ft columns spaced 56 ft apart. Though the girder was huge, it served well the problem of caisson-to-rock foundations, and the space behind it was used for location of the boiler and mechanical equipment.

A one-way joist type of slab was used between the exterior columns and the core, and this led naturally to a two-way waffle system at the corners. Because columns at the edge of the waffle are loaded more than the others, the columns were made deeper. Water riser details were manipulated at the other columns to match the two deeper ones near the corners. In later SOM buildings, the columns have been allowed to project on the outside, forming part of the visual expression.

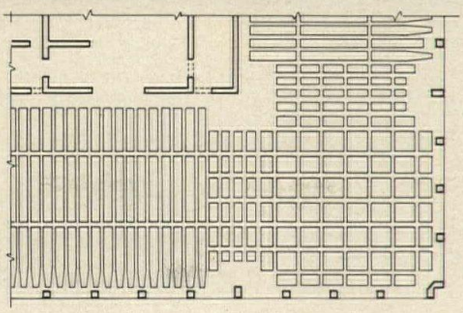
For steel buildings in the 50-story range, the efficiency of the structure has been increased by tying the exterior columns to the core with belt trusses

It was pointed out earlier that the rigid frame structure, with bays of fair size, is inefficient because of the bending in the columns and beams. This can be improved upon, however, by connecting all exterior columns to the interior shear truss by means of belt trusses, which can increase the stiffness of the structure by about 30 per cent. When the core tries to bend under wind load, the belt truss, acting like a lever arm, throws direct axial stresses into the columns—compression on one side, and tension on the other. (An outrigger truss of this type was used in the U.S. Steel

Hedrich-Blessing

Hedrich-Blessing

The shear truss is more effective at lower floors, where the loading effect of the wind is largest, because effect of cantilever bending there is least (see diagrams across page). In Chicago's Civic Center, above, wind is resisted by a shear truss, rigid-frame combination in the lower floors, and by the rigid frame, alone, in upper floors. A similar kind of structural behavior is obtained in concrete by using an exterior rigid frame working together with concrete shear walls in the core. This approach was used in 1962 in the Brunswick building in Chicago by SOM. The floor framing is a one-way joist system, except for the corners which are two-way waffle slabs. Columns at the transition between the one-way system and the waffle slab are larger because of carrying more waffle weight.



building and interior lateral trusses are being used in the I.D.S. building in Minneapolis—designed by other engineers).

Fazlur Khan first proposed belt trusses for the BHP Headquarters building in Melbourne, designing the structure for it. Comparative deflection curves for that building, with and without the belt truss system, are shown below. Obviously, the steel belt truss system at mid-height of the building contributes substantially to the stiffness of the building, as does the one at the top.

A similar system has been employed in the 42-story First Wisconsin Center in Milwaukee by SOM. Here, not only are belt trusses used at mid-height and at the top, but a truss at the bottom is used as a transition member to collect column loads.

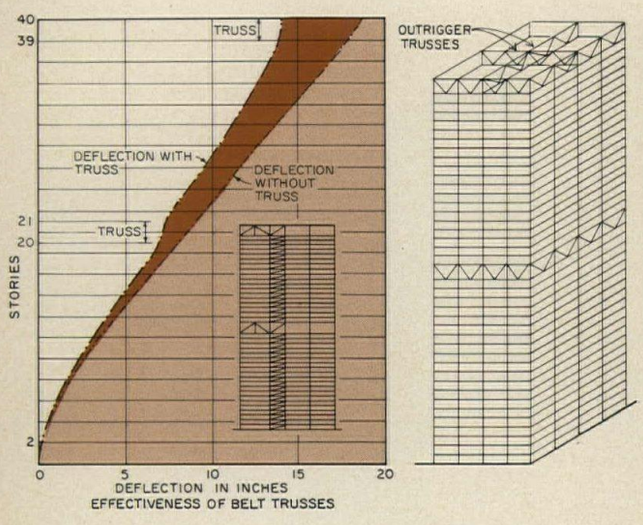
Shear wall design long has been a means for stiffening apartment buildings up to 30 stories and office buildings up to 20 stroies or so. Studies for SOM projects have shown that over 30 stories, lateral sway as well as wind stresses begin to control the design, and structural elements designed only for gravity loads need to be made larger for stiffness and strength.

All approaches for optimizing tall skyscrapers have one thing in common: increasing the rigidity of the structure so it performs as a cantilevered tube

The floor plan of an apartment building wants to be more flexible than that of an office building; further the core is smaller, so it is better from these standpoints if the exterior walls alone could do the work in resisting wind, and that the shear walls be omitted. Maximum efficiency for lateral strength and stiffness, using the exterior wall alone as the wind-resisting element, can be achieved by making all column elements connected to each other in such a way that the entire building acts as a hollow tube cantilevering out of the ground.

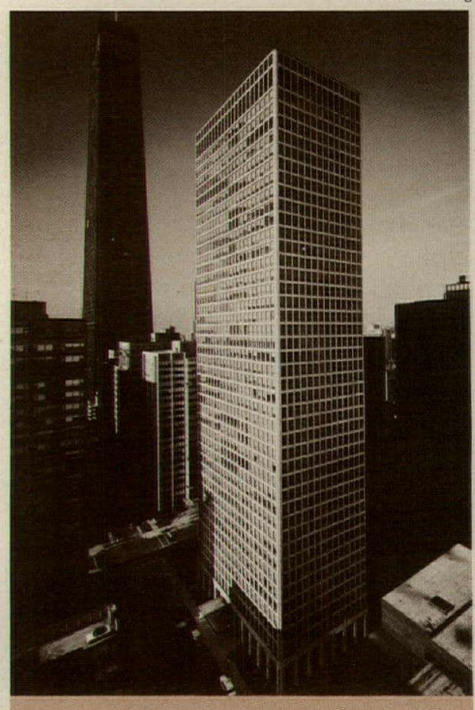
Such a scheme was conceived in 1961 for the 43-story DeWitt Chestnut apartment building on Chicago's north side. The structure was thought of as a cantilevered tube with holes punched in it for windows, with smaller holes in the lower part and larger holes at the top because forces are less in the upper part. This tube was achieved in practice by having closely spaced columns (5 ft 6 in. centers) acting together with the spandrel beams, and this system is called the "framed tube."

The framed tube has limitations when used in buildings over 400 ft high because although the system looks like a tube, the two faces parallel to the wind act like a multi-bay rigid frame. As a result, the bending moments in the columns and edge beams become the controlling factor in unusually tall buidings. Further, of the total lateral sway, only about 25 per cent is due to column shortening caused by the cantilever action of the framed tube; 75 per cent is caused by frame wracking. The phenomenon is known as shear lag, and is shown at the bottom of page 101. Ideally the shear transfers should be a linear rela-

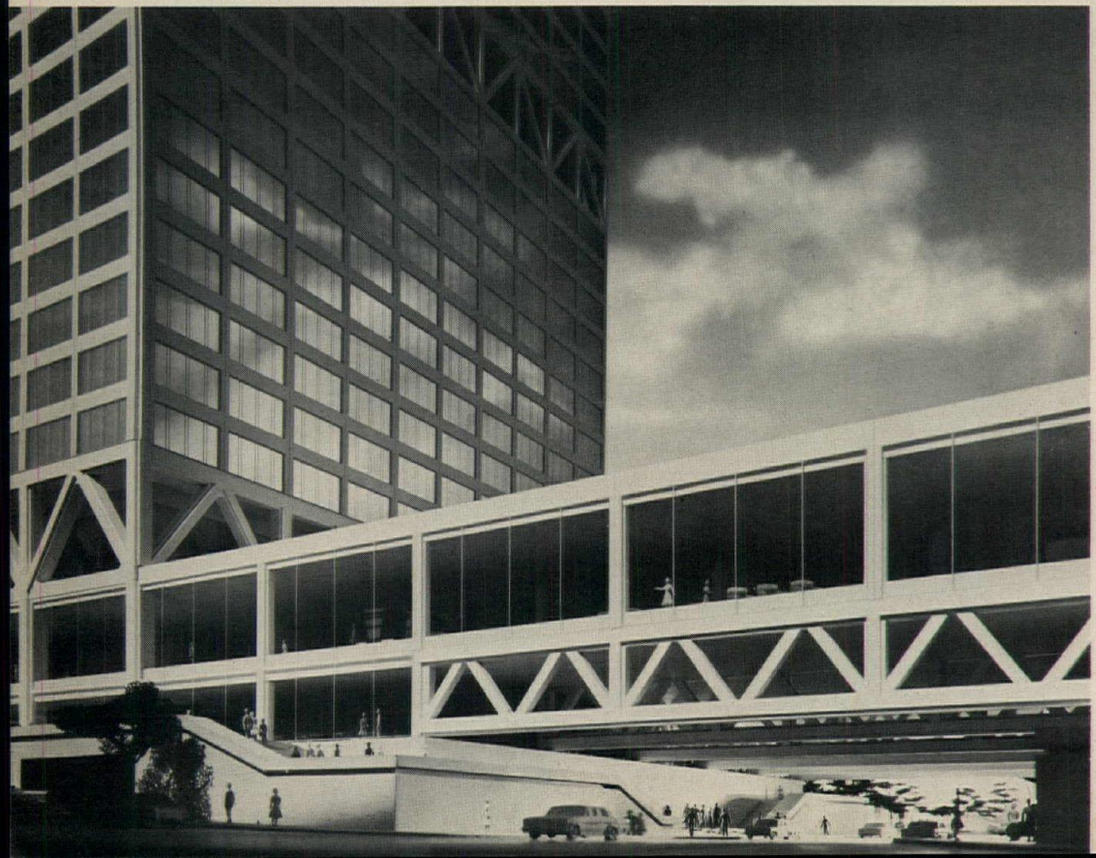


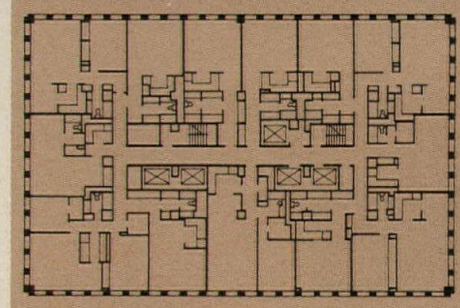
Above 40 stories the shear-truss, rigid-frame combination requires more and more steel for wind load. The effectiveness can be increased, however, by tying the shear truss to the exterior columns with belt trusses. The belt trusses, working as lever arms, throw direct axial stresses into the exterior columns. When the shear truss tries to bend, the exterior rows of columns act as struts to resist this movement. These belt trusses can be used not only at the top of the building, but midsection as well, increasing the stiffness of the building by 30 per cent. This approach has been used by SOM for the 42-story First Wisconsin Center in Milwaukee shown in the model photo below.

Hedrich-Blessing



Ezra Stoller © ESTO





Rigid frames in concrete can be made more effective if the columns are spaced closely enough together so that the exterior structure works like a cantilevered tube when wind-loaded. The approach is especially favorable for apartment buildings, such as SOM's DeWitt Chestnut, in which core areas are small and planning flexibility is very desirable.

tionship; i.e., stresses in the building faces parallel to the wind should be direct tensions and compressions. But because of wracking of the frame, bending occurs, and columns at the corners of the building have to take more than their share of the load, while columns in between do less work than they ought to—so efficiency is reduced to the extent that beams and columns are limber, and consequently to the extent the frame wracks.

Framed tubes suffer from a problem called shear lag because the columns and beams bend when the wind blows. One remedy: stiffen the wall with diagonals

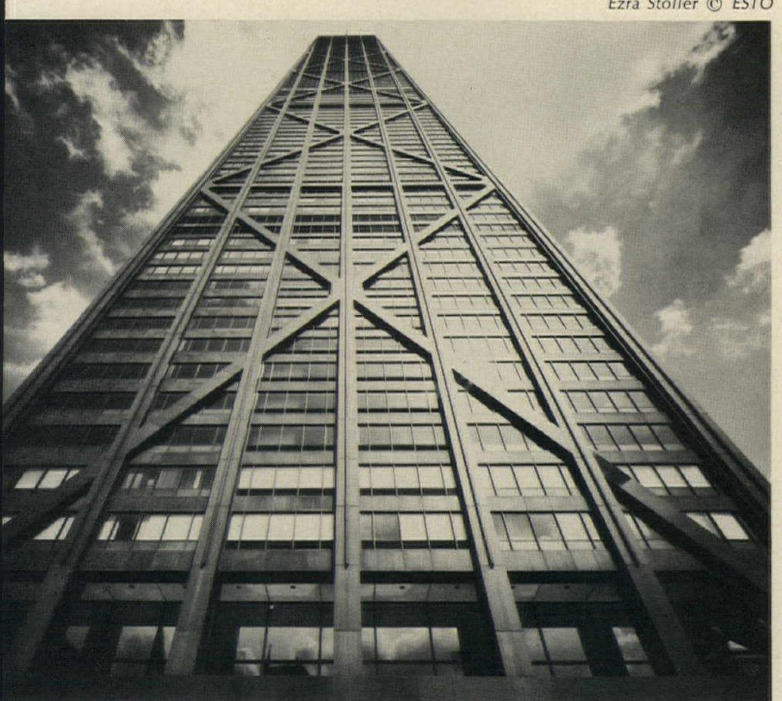
Exterior wall frames can be made stiffer and more rigid to mitigate wracking, however (and thus so-called shear lag). One method is to use diagonals in the wall, and, of course, the most striking example of this approach is the 100-story John Hancock building. The system used is the optimized column-diagonal truss tube. Obviously the most effective tube action would be obtained by eliminating vertical columns and replacing them with closely spaced diagonals in both directions. But this not only presents problems in terms of window details and the large number of joints between diagonals, but the diagonals are less efficient than vertical columns in bringing gravity loads down to the ground. The column-diagonal tube, therefore, is an efficient compromise. The exterior columns have normal spacing, but are made to act together as a tube by the widely spaced diagonals. Except at levels where diagonals meet at corners of the building, the spandrels will resist the internal forces between columns and diagonals, but at these points it is necessary to provide a large tie spandrel to limit the horizontal stretching of the floors, and to make the diagonals function more efficiently as inclined columns, and as primary load-distribution members.

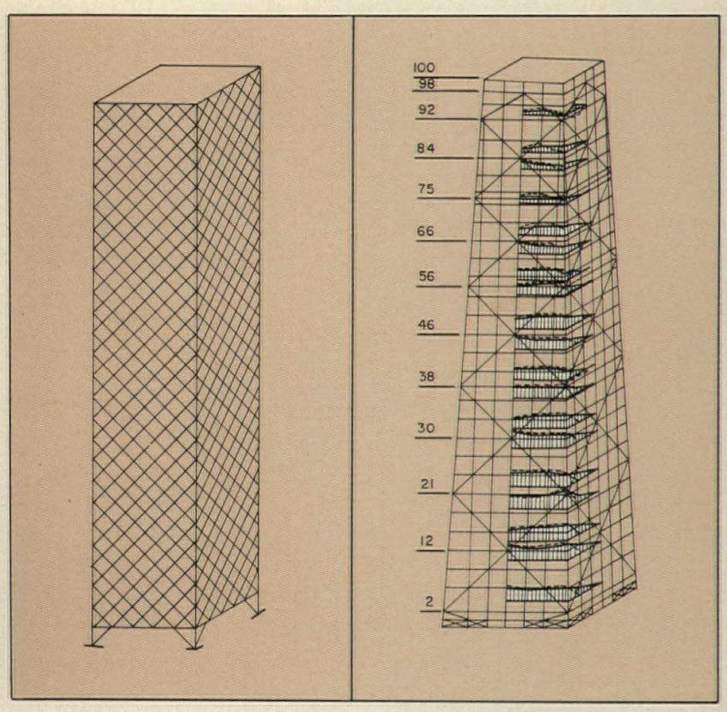
A similar approach can be worked out in concrete, as well. With the rigid tube type of design it should be possible for concrete buildings to go 70, 80, even 100 stories. In contrast, with conventional beam and column framing, the practical height limit is on the order of 20 stories.

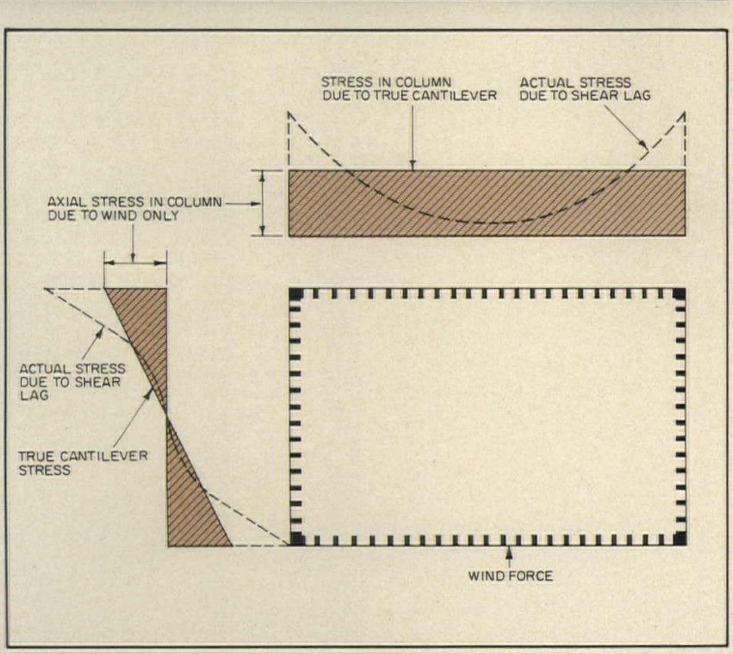
One way the rigidity can be achieved is with the column-diagonal approach. The diagonals can be created by filling in what normally would be windows in a diagonal pattern. With a rectangular building the diagonals will not cross on the wider faces, but they need to on the narrower faces for efficient transfer of wind load. Symmetry occurs about the corners, but not the faces of the building.

Still another approach in concrete that produces nearly 100 per cent rigidity is the interior bracing of the tube. A wall grid of closely-spaced columns is in effect "glued" to cross shear walls, so that the wall grid acts like the "flange" of a huge "beam," and shear walls act like "webs." Shear lag would be minimized, and stresses in the walls would be primarily axial.

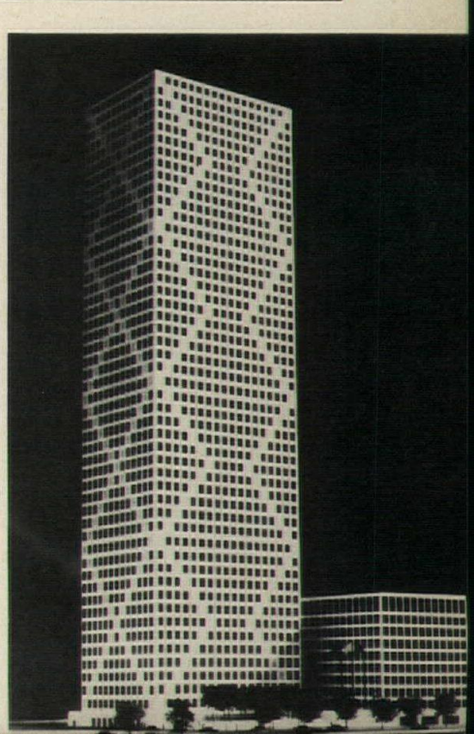
Ezra Stoller © ESTO







"Framed tube" is the designation given to structures that use closely-spaced columns in the exterior wall for wind load. But efficiency of framed tubes drops off in taller buildings (about 50 stories in concrete, 80 stories in steel). Ideally, columns and beams of a rigid frame would be infinitely stiff. But because these elements bend, a phenomenon occurs called, "shear lag," illustrated at left. Columns near corners do more work than they should; the others less. Shear lag can be greatly reduced by stiffening up the exterior; the stiffest means would be to replace vertical columns with diagonals. A more optimum approach from standpoints of overall efficiency and practicalness is to combine columns and diagonals as in the 100-story John Hancock building.



Efficiency of the framed tube can be improved if the interior core is also a tube, or if the exterior walls are braced by cross stiffeners

This scheme was used in a hypothetical 92-story apartment building by one of Fazlur Khan's students at Illinois Institute of Technology. For the system to work the shear walls have to be relatively continuous. With apartments having only an 8 ft 8 in. floor to floor height, openings in the shear wall for corridors could not be all in a vertical line because the shear wall "web" would be too weak. The problem is solved by using two different floor plans for alternate floors so that corridors, and thus openings, are staggered floor-to-floor.

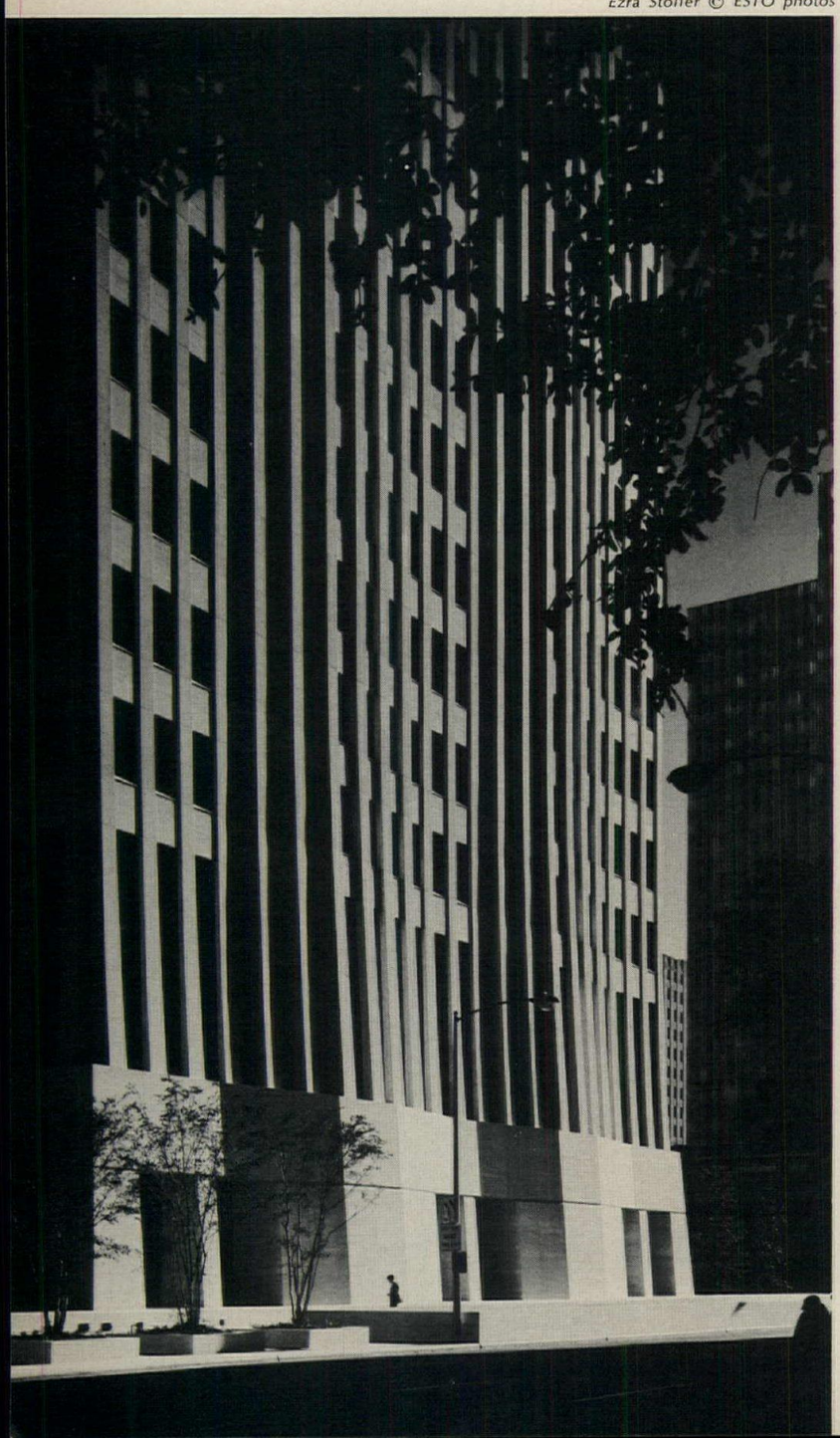
A model was built in plastic, load tested, and found to be amazingly efficient. The system appears so simple and efficient that its actual application in an ultra-high rise building seems inevitable one of these days.

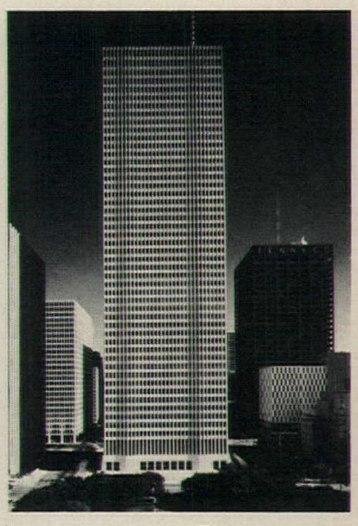
It has been shown that a concrete rigid frame and shear walls could interact to improve the performance of both, as in the Brunswick building. Going a step further, if the exterior wall is comprised of closely spaced columns so that it performs as a tube, and shear walls at the core also work as a perforated tube, then the structure becomes a "tube within a tube." The framed tube and shear wall-frame interaction concepts have been combined, and Fazlur Khan used this approach with the 52-story One Shell Plaza building in Houston. The building, at 715 ft, is the world's tallest reinforced concrete building, and the tube-in-tube concept made it possible at the unit price of a 35-story shear wall structure. The entire system is so efficient that all columns, shear walls and floors need be sized only for gravity loads. As with Brunswick, one-way joist system was used, in this case spanning 40 ft from exterior to core; columns were spaced 6 ft apart. The corners are a two-way waffle slab, and again, as in Brunswick, exterior columns near the corners of the waffle are more heavily loaded by gravity than the other columns. But, in contrast to Brunswick, these columns get gradually deeper, the additional depth is allowed to project out from the face in the building, and this gravity-load-carrying picture is expressed "plastically" in the building's exterior. In further contrast to Brunswick, the base of the building is pierced by much smaller openings, and the bold, massive base itself gathers up the columnar loads.

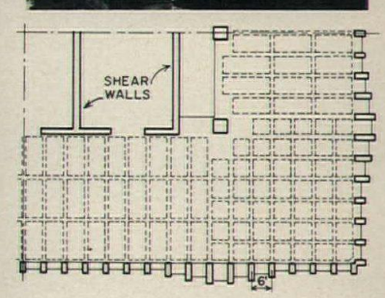
Such a tall building would not have been possible in Houston—because of poor soil conditions—if the structural engineers had not searched out the possibilities of high-strength lightweight concrete in the range of 6,000 psi for the entire structure. With conventional stone concrete, 35 stories would have been about the limit.

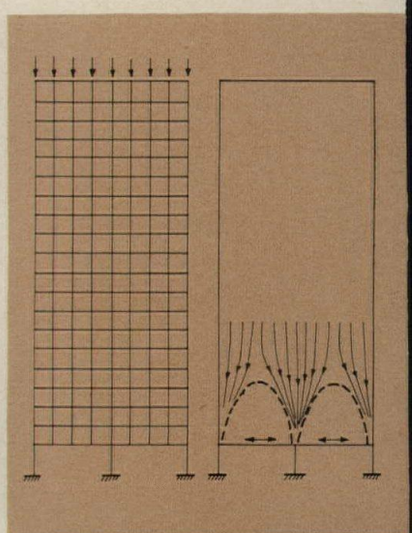
Further, the plan shape was changed from an original 120 by 240 ft (a tremendous "sail" area for Houston's 40 lb per sq ft wind load) to 192 ft by 132 ft—a ratio of

Ezra Stoller © ESTO photos









The concrete framed tube can be improved by making a structural tube out of the shear walls. The approach—called "tube-in-tube" was used for the 52-story One Shell Plaza. A picture of the increasing gravity loads in the columns next to the waffle slab can be seen in the undulated exterior. Increasing sophistication in collection of gravity loads of exterior columns is manifested in both One Shell Plaza, left and above, and in Rochester's Marine Midland bank, right. In the former, a massive base is pierced for access. In Marine Midland, the structure grows like a tree at the base.

1:1.45 rather than 1:2. The foundation consists of a concrete mat sitting 60 ft below ground; it is over 8-ft deep and projects out 20 ft from the perimeter of the superstructure.

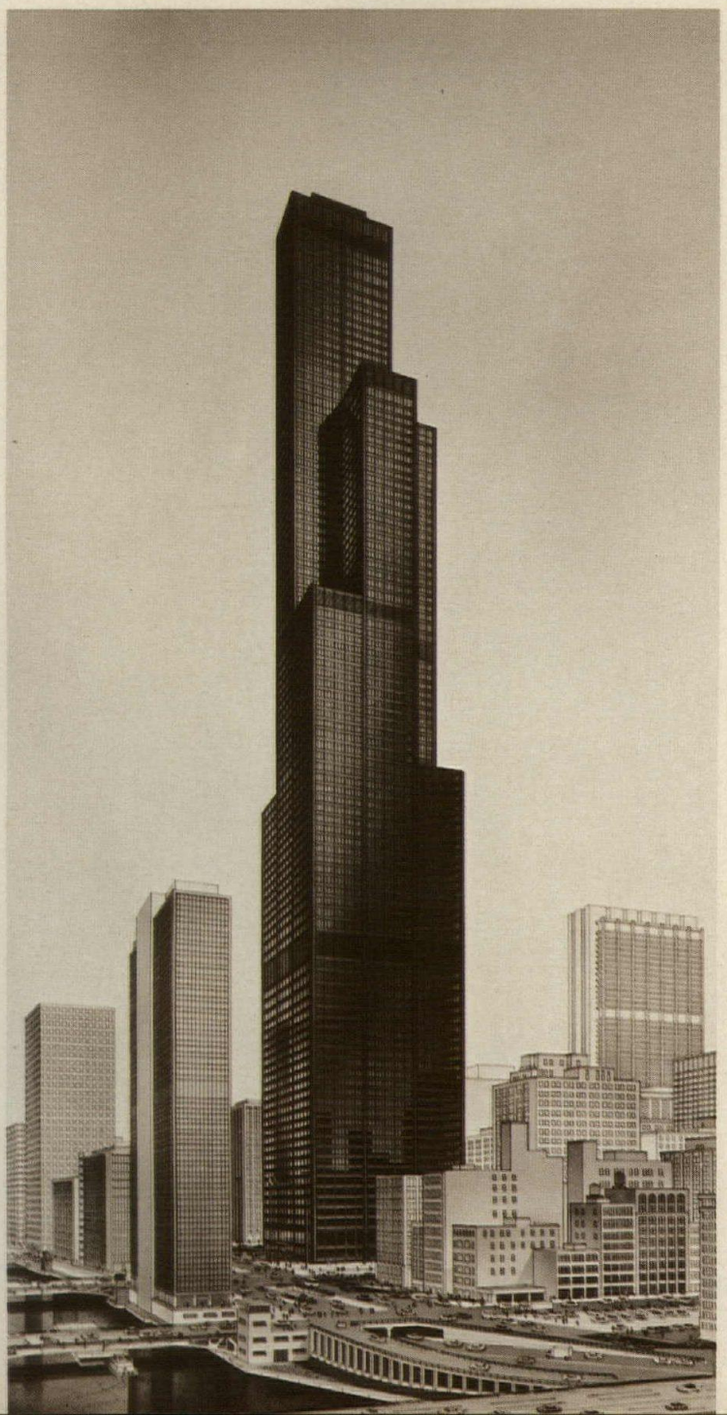
Funneling the gravity loads of closely spaced columns into wider-spaced columns at the base in the structural design also makes possible new visual expressions

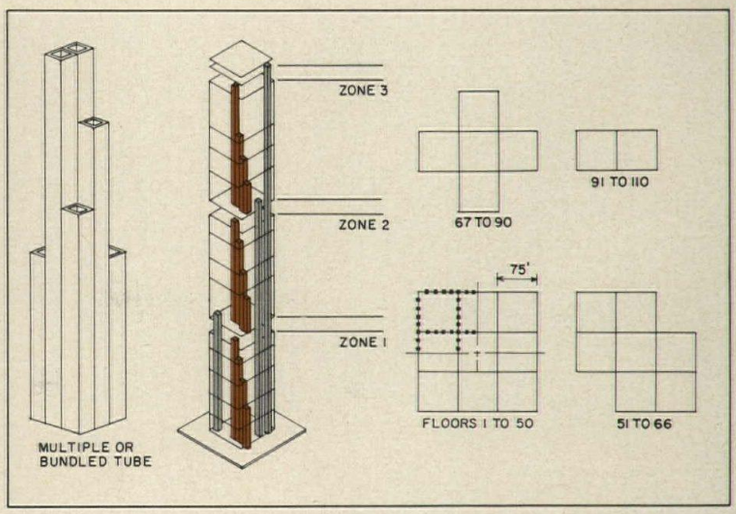
Collecting the columnar gravity loads by means of a deep transfer girder is rather a brute-force approach, inasmuch as the girder has to work in inefficient post-and-beam fashion. So, more recently, SOM's architects and engineers have taken a closer look at the load flow in a rigid wall of closely-spaced columns, supported by widely-space columns at the base. The natural load flow is for columns to gradually shed their load toward the base columns. The wall, in effect, actually works as an arch. Recognizing this, SOM has done several buildings in which columns and spandrel beams grow larger as they approach the base columns. The most sophisticated of these buildings so far is the Marine Midland Bank building in Rochester in which each individual grid element up to the 6th floor is shaped so as to define and express the structural strength to take the flow of forces. The result is an expression akin to traditional bearing wall arches.

In steel buildings, the column-diagonal frame provides the most rigid tube, and this type of building acts most nearly like a cantilever sticking out of the ground as it is loaded by wind. But what if the owner doesn't want diagonals in the exterior wall? This was the problem that SOM faced when it was decided that the Sears headquarters would take the shape of a tower structure rather than a 42-story, but larger-plan building (130,000 sq ft per floor). After this, a two-building scheme was also considered—one 60 stories high, and the other 40 stories. In any event, Sears management wanted on the order of 50,000 sq ft per floor for their own use, but smaller floor areas were felt desirable for rental tenant spaces. The final choice—as is well known—was a building of nine bays, 75 by 75 ft, or a building 225 by 225 ft at ground level. Beyond the first 50 stories (which Sears is taking) the building peaks in sets of bays, with two bays rising the last 20 stories to the F.A.A. limit of 1,450 ft at 110 stories. Total gross area is 4.4 million sq ft.

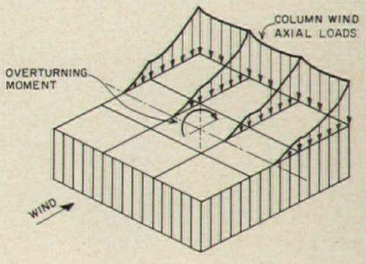
Achieving efficient frames in ultra-high buildings without using stiffening diagonals has led to the bundled tube concept, with great planning flexibility

SOM's design partner for Sears, Bruce Graham wanted to create an open, pleasant space for the plaza level which implied a tall building rather than a squat one that would take the whole site. Engineer Fazlur Khan was sympathetic to the "environment" idea, but also wanted to achieve a tall building at lower-building costs. And





Perhaps the most intriguing concept to evolve in the ultra-high skyscraper — from both architectural and engineering aspects—is the one known as the "bundled-tube" approach, which was conceived for use in the 110-story Sears Tower. The building consists of a series of framed tubes, each of which has its own structural integrity, allowing the tubes to be dropped off as the building rises, yielding a variety of spaces for tenant floors which occur above the 50th floor. The tubes are 75-ft square, so the building is 225 by 225 ft at the base. Columns are optimally spaced 15 apart. At each corner of the tubes is a larger column that "terminates" the tube structurally with respect to wind shear transfer. Shear lag is greatly reduced, compared with an ordinary framed tube, as illustrated at right. The elevator system is divided into three zones, with two-story sky lobbies serving the double-deck elevators from the two lower zones. Sky lobbies also are served by express banks.



Robert E. Fischer

Graham was looking for a structural system that would let him drop off floor areas, so that part of the building would continue to rise in a prismatic way, but not the whole floor area.

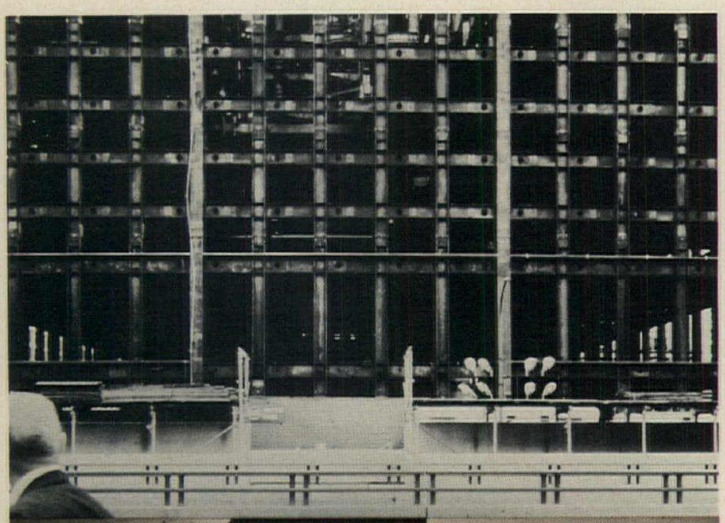
With the shear-lag problem in mind, the idea occurred to Khan of putting two cross-stiffener frames (diaphragms) in each direction that would divide the building into nine cells. Then, as the building soared, cells could be dropped off, with others remaining independent. Cell size was one question. But a more important one, structurally, was that of column spacing. As the spacing gets very close (8-, 6-, 4-ft) the cost of steel and fabrications goes way up. But if columns are spaced more than 15 ft apart, the frame no longer works as a tube. So a spacing had to be found where the cost was least, but tube action would still exist. By many parametric studies (a number of simple equations and studies) it was found that 15-ft spacing worked well, while at the same time being in accord with the building module. Computer studies showed that shear lag was greatly reduced, and that there was very little premium in square-foot costs for height. Further, there was no need to use an extremely high-strength steel (50,000 psi was highest).

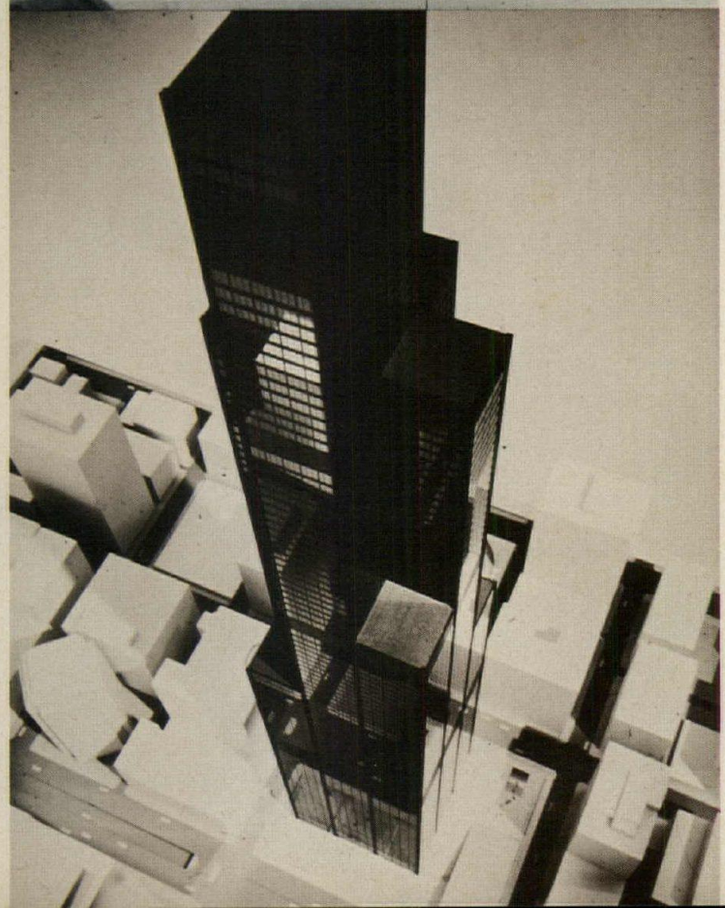
With the Sears type of structure, which has been called the "bundled-tube," shear lag occurs, but it takes place in segments, which has the effect of squashing the peaks of direct stresses in the columns. What happens is that, as far as shear lag is concerned, each of the tubes appears to act independently, and the shear lag diagram drapes (like a transmission line does) from the peak at the corners, to lesser and lesser heights to the center of the building.

Because the individual tubes are independently strong with respect to wind load, they can be bundled in any sort of configuration and dropped off at will, as the building rises higher. They could be bundled five in a row and still be efficient; or placed with four around a central tube (cruciform); or have two tubes by four tubes (an L-shape). With the tube concept there is a new vocabulary of architectural space possibilities.

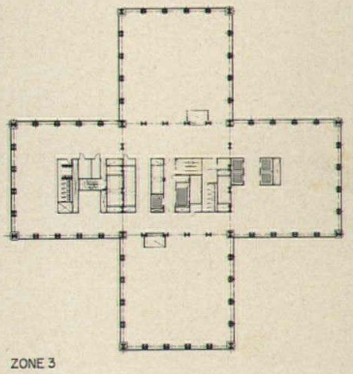
SOM found that concrete tube-in-tube systems, while efficient in terms of materials, were diminished in a practical sense because of the time involved to produce poured-in-place construction.

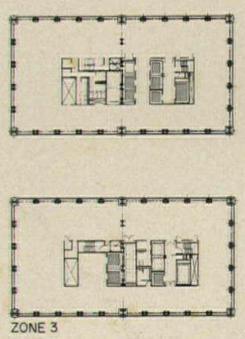
They had to find a system that has the advantages of a concrete building, but not the disadvantages. One way to eliminate the disadvantage was to make the inside of the building steel, and only the outside (lateral-stability) portion a concrete grid. What has happened is that the framed tube concept has been combined with the traditional steel frame. So far the concrete exterior frames have been made using traditional formwork as well as with precast concrete forms that were left in place to form the finished exterior. Cost savings have been $1 to $1.50 per sq ft over all-concrete buildings.

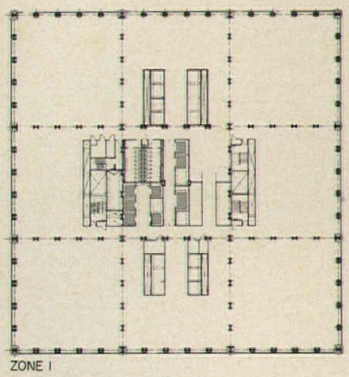


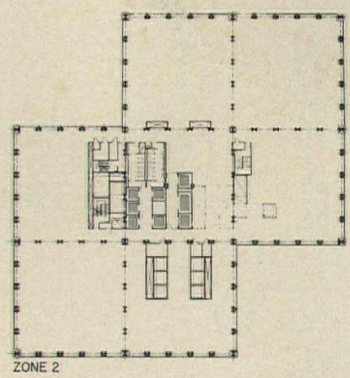


The different types of floor plans that result from "dropping off" of bundled tubes are shown below. The upper plan of Zone 3 is the observation floor. In each of the zones, except for the top, are clear-span spaces, 75 by 75 ft. The curtain-wall system expresses the tubular nature, but not the framing of each of the tubes. While the tubes have been bundled in this particular configuration for Sears Tower, many others are possible, depending upon planning requirements. The ultimate structure, for structural efficiency, would appear to be a bundled tube with diagonals in the walls for increased stiffness.

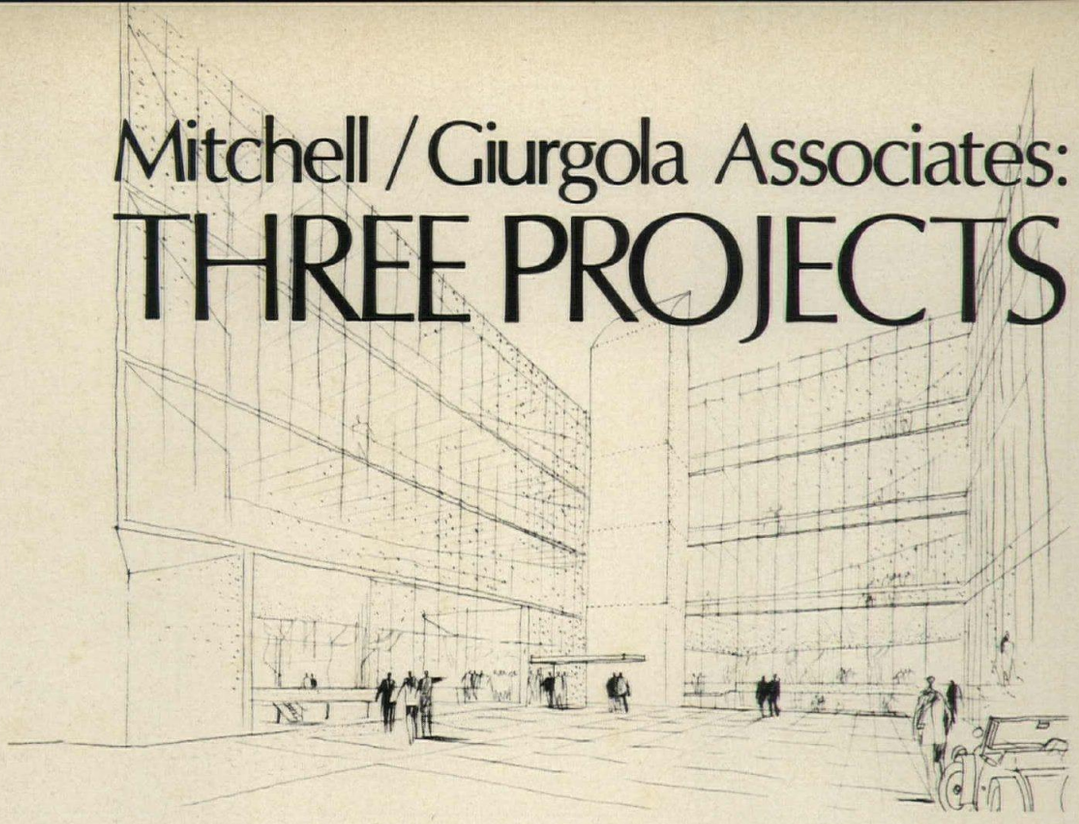








Mitchell / Giurgola Associates: THREE PROJECTS



The three completed works on these pages represent a clear body of ideas about architecture from the firm of Mitchell/Giurgola Associates, and it is correct in this instance to talk about the designs of the *firm*, rather than of the principals. Romaldo Giurgola is an influential theorist in American architecture, but neither he nor his partner, Ehrman Mitchell, dictate design; no tracing paper sketches appear miraculously on Monday morning, to be merely "worked out" by others. Rather, design is accomplished in a dialogue between groups; associates are given major design problems, and their solutions are used.

Giurgola, however, is the originator of the ideas about architecture just mentioned: if the architecture is consistently drawn, we should be able to "see" the ideas within the forms, and we can. Giurgola does not believe that any single building today can be complete within itself; he does not believe it can be finite, with a beginning and an end, or create any kind of private world. Rather, he prefers the conception of buildings as fragments; as part of, and related to, an order in nature, or part of a larger social context that is best seen today in the cities. Giurgola may thus think of his work as part of an itinerary of events; commenting on or clarifying his perceptions of the physical, social, or political context of a building, but never believing he may include *all* these ideas in the formal metaphors that become the architecture. In fact, it is impossible to include them all; our culture is too complex. Giurgola says the realization of this complexity, and the gradual rejection of the wholistic classicizing ideas of Mies or even parts of the theoretical basis in Le Corbusier's work, are a major event in modern architecture's evolution to maturity.

A projection of the fragment idea can be seen in MDRT Foundation Hall (pages 106-109). In either plan or elevation, additions are possible to the building without harm to the esthetic whole. The long columns, the irregular silhouette, the lack of symmetry in the voids and in the rhythms of the walls in relation to windows, are a projection (frankly man-made) of the elegant natural context around MDRT Hall. The building, in this way, is a continuation of the events around it, a part or fragment of the events. The South End Branch Library in Boston (pages 110-111) is a part of the urban events around it through its community park (the largest part of the site), the blending of its brick with the nineteenth century brickwork of the neighborhood, or through the specific program requirements of community rooms, children's facilities, etc.

In the library, and particularly in MDRT Hall, the strong diagonal walls in plan are themselves a representation of "fragment." Diagonals cut through the established rectilinearity of Mitchell/Giugola's plans as if to cut off any "harmony" or completeness before it begins; they are perhaps the central formal device of the architecture. Diagonals also create changing vistas and interesting shifts in proportion as people walk through a building, and are useful in directing traffic patterns; Giurgola mentions both these purposes when suggesting that the firm's use of diagonals is not capricious. At the same time, Giurgola says the "fragment" idea cannot be allowed to dissipate into everything around it; he believes that in his writing, Robert Venturi is wrong to suggest too much "inclusiveness" of cultural or formal pressures, wrong to become "non-selective."

Giurgola contrasts some of these ideas within the firm of Venturi and Rauch to some of the ideas within his own because both are prominently associated with the University of Pennsylvania, Louis Kahn, and the new arguments about architecture that have grown out of those sources within the last ten years. As Giurgola points out, he continues to believe in the fundamental basis of modern architecture—in our cultural conception of technology and scientific rationality as remaining the most powerful generating force for modern form. He says they still allow a first critical stance—a place to begin—and we can see the polished geometric machine in MDRT Hall, at the same time that we accept Giurgola's changes in parts of the original theory. But he believes technology is not capable of developing forms adequate to the substance of human aspirations; he says that technology solves needs, but that architecture comes from hope.

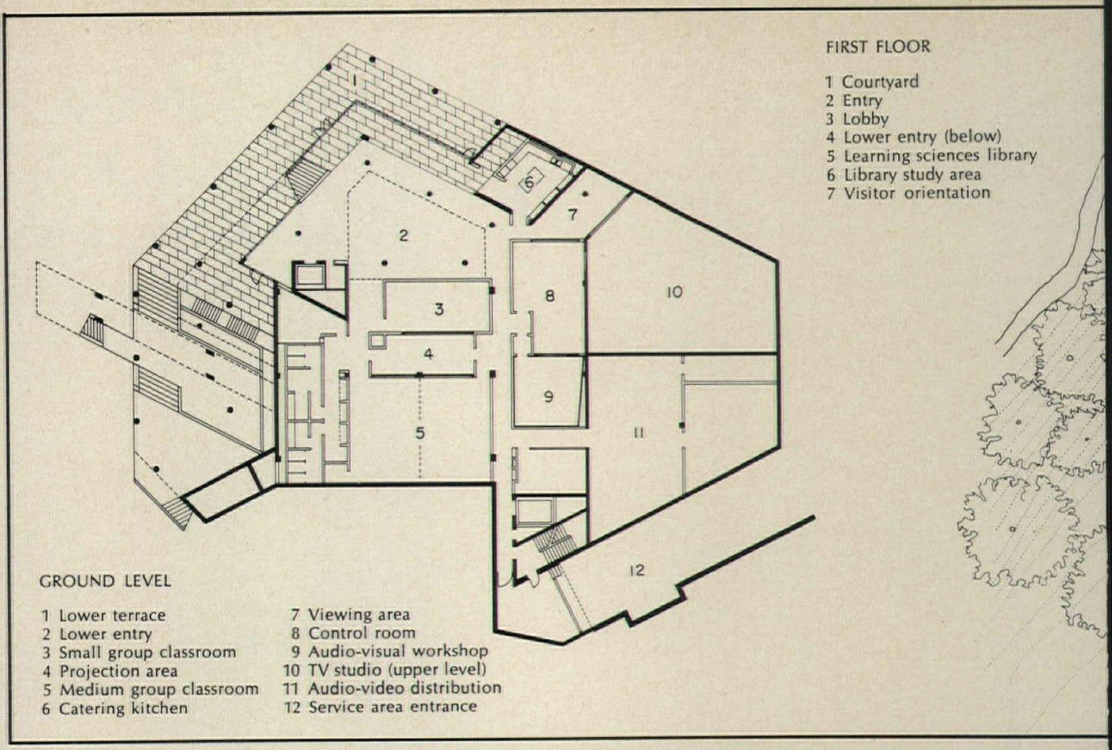
Thus Mitchell/Giurgola is not "building Venturi and Rauch," as some seem to believe; these two firms, rooted in Kahn's reformulations are taking separate directions. Venturi and Rauch's buildings attack the legitimacy of scientific rationality itself, as well as the basic formal metaphors of technology from which modern architecture springs; in that sense they are an attack on "modern architecture." They attack by emphasizing imagery and allusive forms, by working to build literary associations in a viewer's mind, by emphasizing the importance of applied symbol and de-emphasizing the expression of structure, material, and technique—all of these actions reject some of the fundamentals of modern style.

Venturi and Rauch are not alone, for there are persuasive arguments made today about the inadequacy of technology as a base from which to project our hopes for the future, and arguing that rationality founded chiefly in science is never truly "rational." But they are doing one thing, and Mitchell/Giurgola is doing another; what we see in the comparison is the contrast. Through these ideas we see the individuality in the work of Mitchell/Giurgola Associates, what the firm is trying to do and what it is not. —*Robert Jensen*

MDRT Hall: a machined abstraction in the landscape

Mitchell-Giurgola's building is a powerful abstraction in its idyllic landscape. It is modeled from the simplest geometric solids of rectangle and trapezoid but the designers have carved out acute-angled pieces from these root forms, twisted them in perspective, and most of all, made their surfaces gleaming and precise. The resulting mood generated—a mood of rational futures, clear hierarchy, efficient management—is a reflection of the client's desired image, and of the work that goes on inside. The client is the American College of Life Underwriters, a group founded in 1927 that has grown into a principal professional society of the insurance industry. The College now administers an elaborate series of courses taken through extension techniques by insurance professionals around the U.S., ending in their being allowed to use the professional title CLU after their names. The building, called MDRT Foundation Hall by the ACLU, is the newest addition to their 45-acre campus in Bryn Mawr, Pennsylvania, and is now their main adult learning research facility. The structure is entirely framed in reinforced concrete, and over it the architects wanted some applied finish material that would frankly acknowledge the main characteristic of its being "applied." Brick is ambiguous in that it may be either structural or a veneer, so they chose a German brick-red tile that still is compatible with some of the older brick buildings on campus. The heat-reflective insulating glass is set in precise, very narrow aluminum mullions that become an organizing grid over the glass wall of the courtyard, and the glass bands of the upper floors. The bands project beyond the plane of the tile about ten inches, allowing an operable ventilation opening on the underside of all window panes.

MDRT FOUNDATION HALL, American College of Life Underwriters, Bryn Mawr, Pennsylvania. Architects: *Mitchell/Giurgola Associates—Robert E. York,* project architect; *Charles E. Held,* interiors. Engineers: *Harry Palmbaum* (structural); *Paul H. Yeomans, Inc.* (mechanical). Contractor: *Turner Construction Co.*

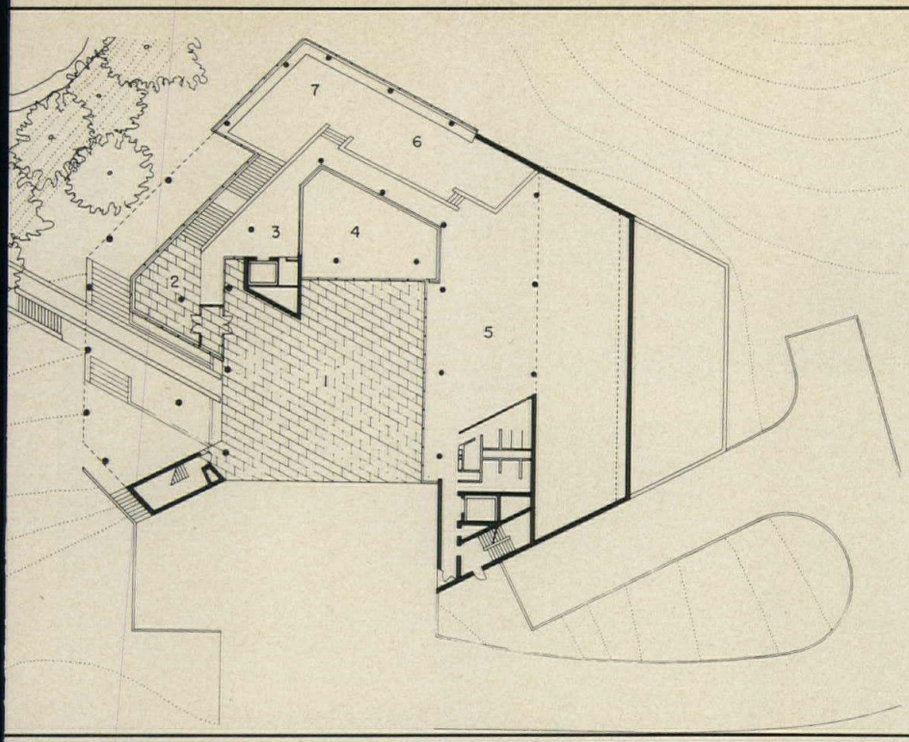


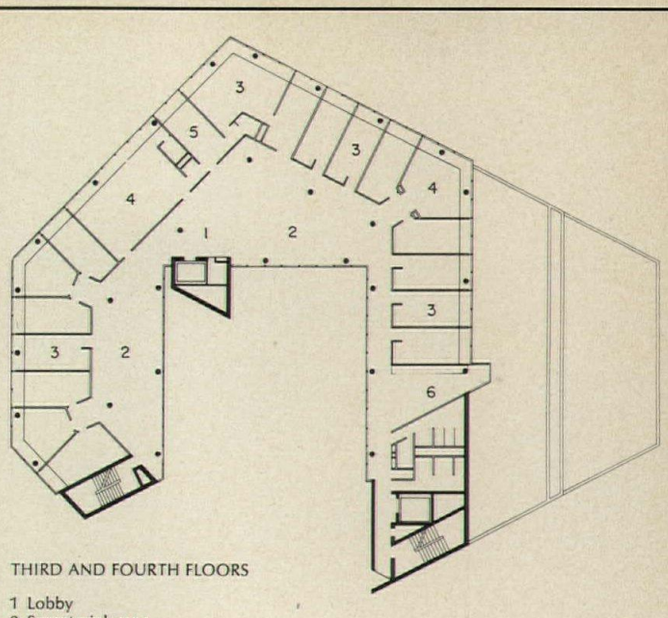
GROUND LEVEL

1 Lower terrace
2 Lower entry
3 Small group classroom
4 Projection area
5 Medium group classroom
6 Catering kitchen
7 Viewing area
8 Control room
9 Audio-visual workshop
10 TV studio (upper level)
11 Audio-video distribution
12 Service area entrance

FIRST FLOOR

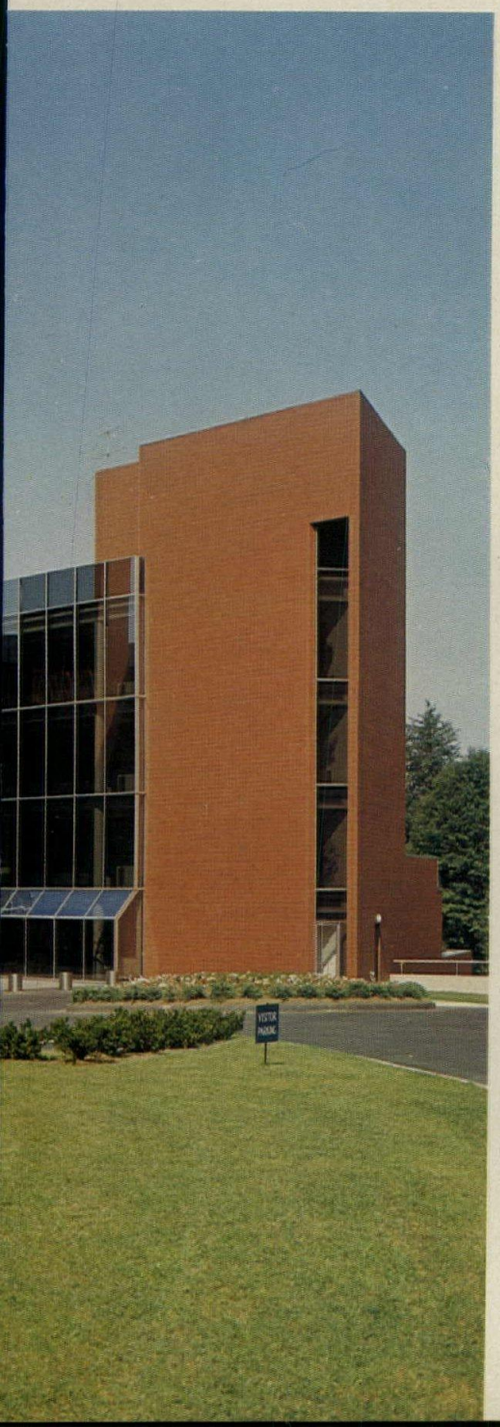
1 Courtyard
2 Entry
3 Lobby
4 Lower entry (below)
5 Learning sciences library
6 Library study area
7 Visitor orientation



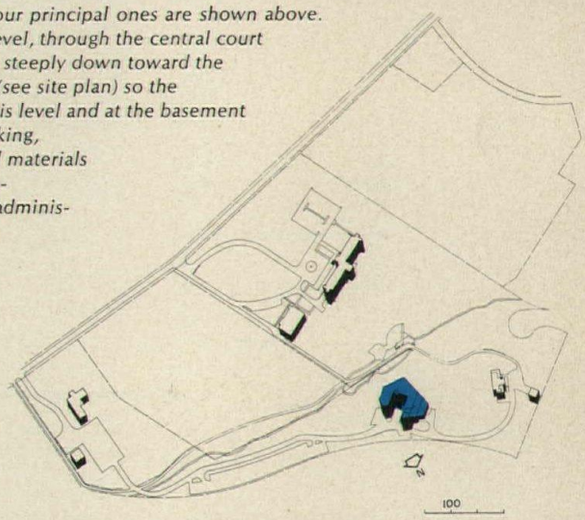


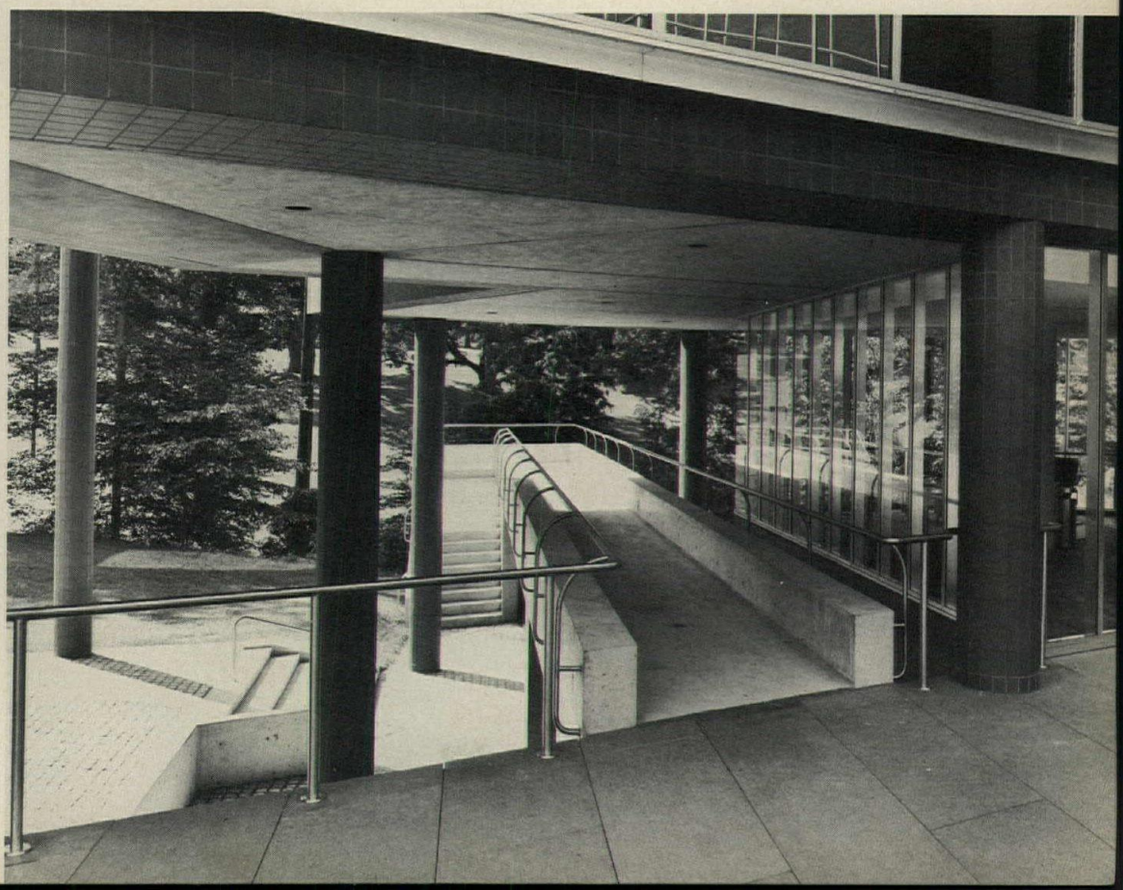
THIRD AND FOURTH FLOORS

1 Lobby
2 Secretarial area
3 Office
4 Conference area
5 Study area
6 Lounge

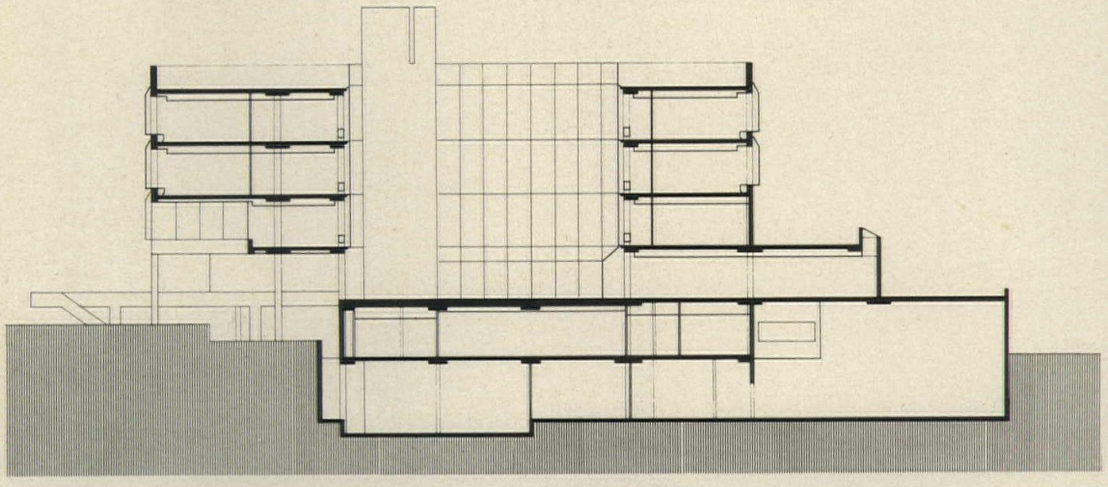


The new research center has six levels, and the four principal ones are shown above. The main pedestrian entrance is on the first floor level, through the central court (plan above, photo left). From here the land slopes steeply down toward the back (south side) of the building to a small stream (see site plan) so the ground level is one story below the entrance. At this level and at the basement level (not shown) are elaborate studios for film making, radio and television, where the various educational materials for CLU courses may originate. The building's occupancy is ninety, including secretarial, educators, administration and media staffs, with most of these offices on the second, third and fourth levels.





Rollin LaFrance photos



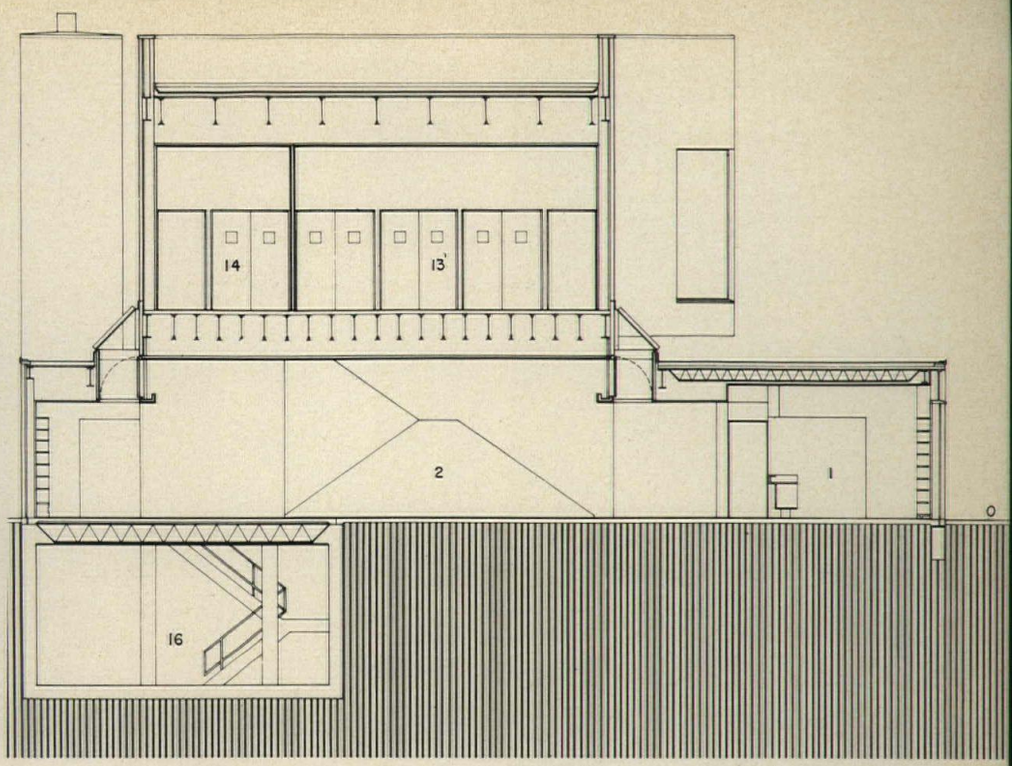
The section at left reveals how much of the apparent interior volume is occupied by the courtyard, and the large amount of studio space that has been placed at the ground and basement levels, below the main entrance. The carefully laid exterior tile—that resembles brick in scale and color, until close inspection—is 6 in. by 6 in. by ⅝ in., except the narrow tile of the columns. It is grouted directly to the reinforced concrete surfaces. Inside, the Mitchell/Giurgola office was responsible for all furniture selection, and designed some furniture themselves. The photo at right was taken at the first floor level, looking toward the library and eventually toward the lounge (photo far right, below).

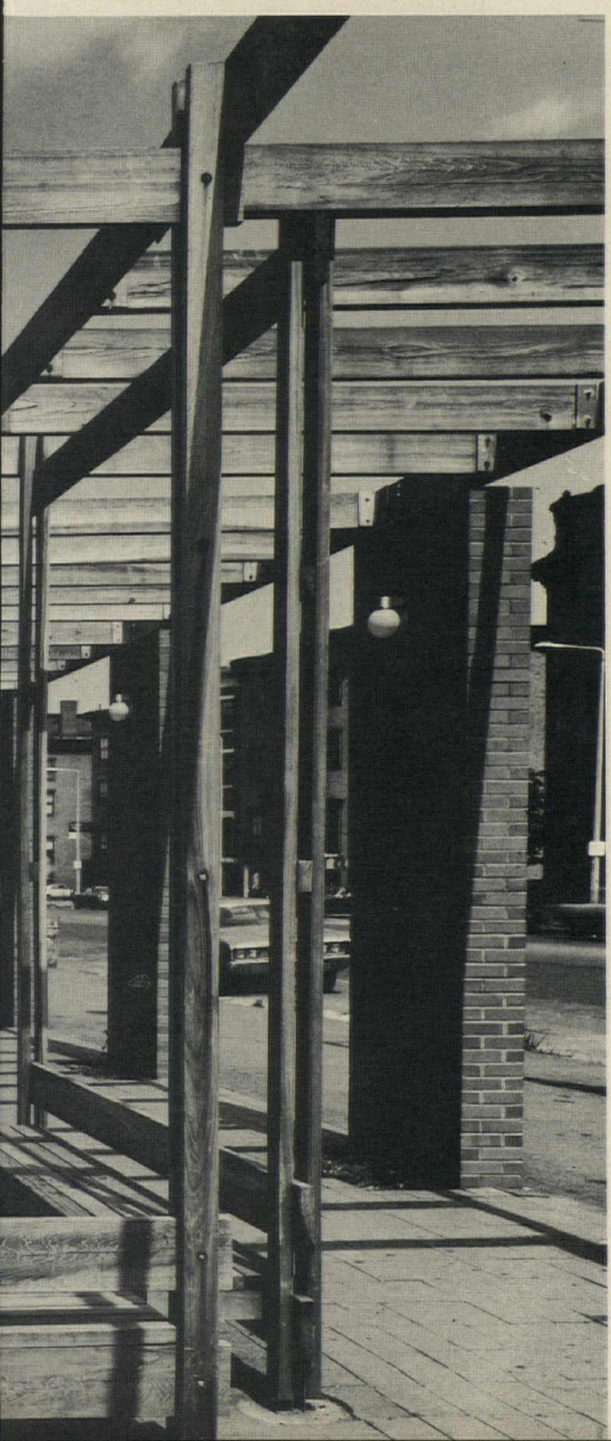
Boston library: lighting and the context were principal issues

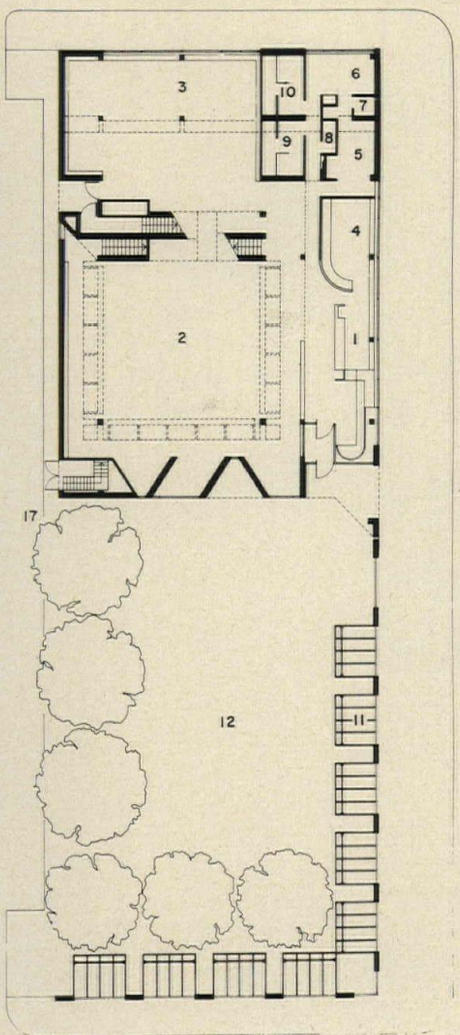
South End Branch Library in Boston is only recently completed, but it was designed over a two-year period between 1967 and 1969, and so reflects earlier ideas than the Bryn Mawr research building. It is most interesting for its manipulation of light and for the ways it has tried to relate to the low-income neighborhood around it. The main adult reading room is defined by a band of clerestory lighting on three sides, which is controlled by an inventive system of shuttering that never permits direct rays of the sun inside, but always gives reflected daylight. The shuttering panels can be seen in the color interior above, and in the section; when the shutters are raised, the light comes straight in vertically to the floor and when lowered, the light comes diagonally into the center of the adult reading room itself. An indoor lighting cove runs around the reading area too, so at night the shuttering may be used to keep most of the artificial light inside, or allow it to shine up through the clerestory to the neighborhood. The deep diagonal walls at the front create niches for more private casual reading, and again baffle direct sunlight. The community reading room on the second floor is heavily used by the community, and is a concrete expression of the symbols of community integration that the design itself carries outside. The red brick exterior matches many of the nearby row houses on the streets, and the mortar joints have been colored to make them less prominent, as in the fine nineteenth century brickwork of neighborhood houses, which seem often to have no mortar joints at all. The on-site park has been made accessible to the whole neighborhood, and the grass happily shows it. Vines have been planted now to grow on the trellises around the park, so it will become the rich and shady place it was intended to be.

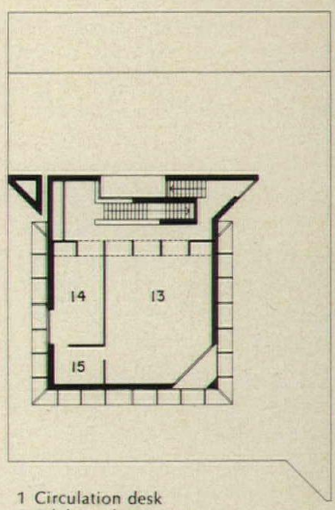
SOUTH END BRANCH LIBRARY, Boston, Massachusetts. Architects: *Mitchell/Giurgola Associates—Harold S. Guida*, project architect. Engineers: *Harry Palmbaum* (structural); *Vinokur-Pace Engineering* (mechanical). Contractor: *Sabia Construction Co.*

Wayne Soverns, Jr. photos

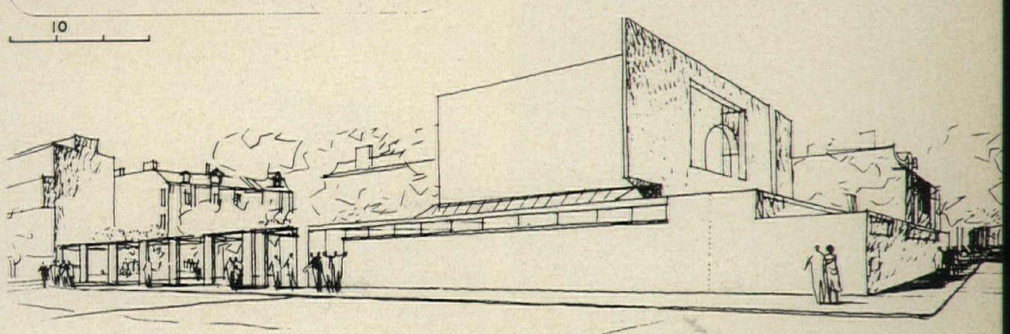








1 Circulation desk
2 Adult reading room
3 Children's reading room
4 Workroom
5 Librarian's office
6 Staff room
7 Staff toilet
8 Janitor
9 Men
10 Women
11 Covered walkway
12 Garden
13 Community meeting room
14 Language room
15 Storage/kitchenette
16 Basement mechanical room
17 Parking

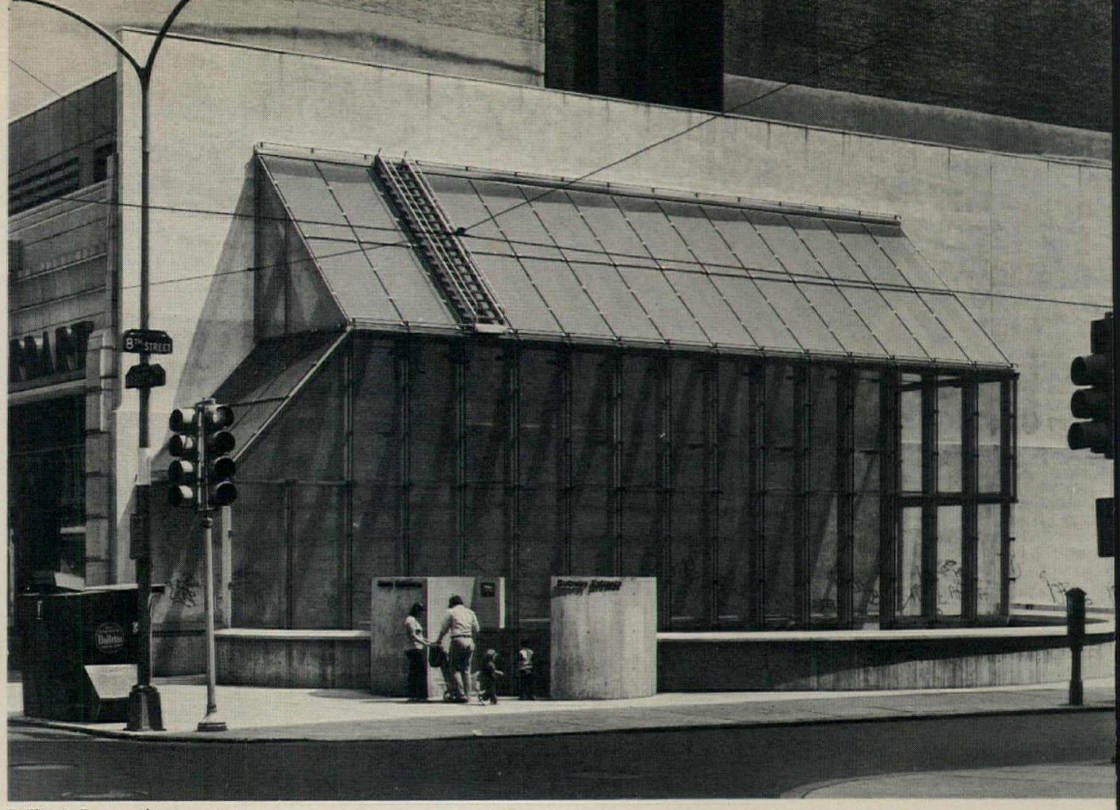


8th St. subway: Philadelphia strengthens its urban core

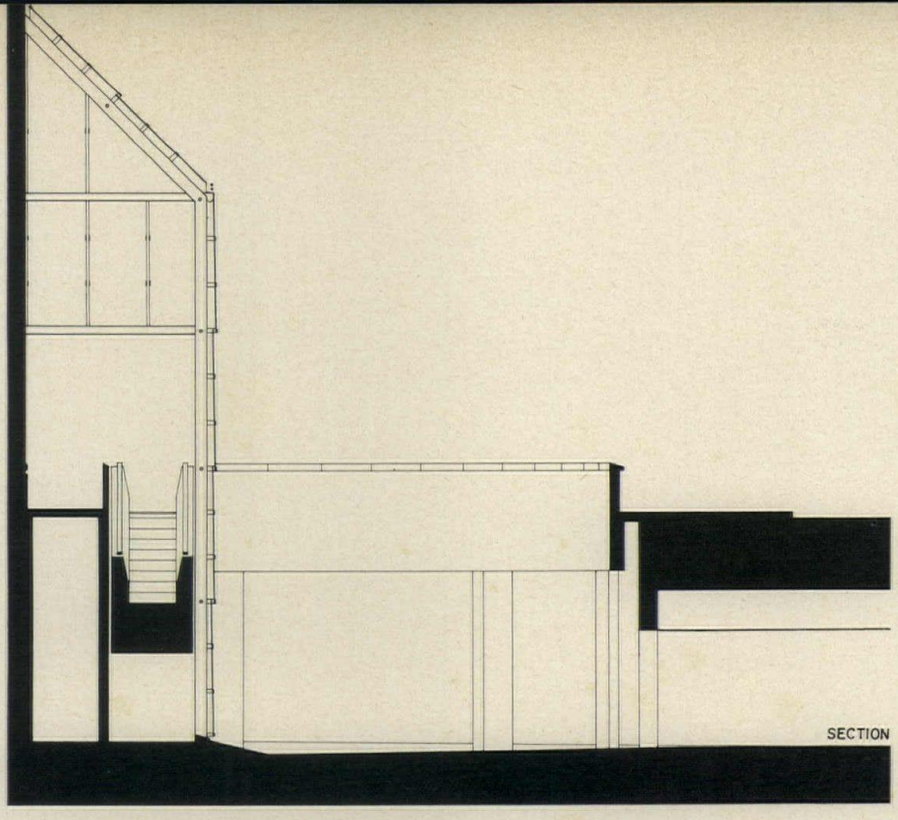
The 8th and Market Street subway entrance is a *place* more than it is a building, but it nonetheless has an important architectural impact. It is seen in the course of a year by many Philadelphians, because it is the one point where all four of the main city lines can be reached: the main east-west (Market Street) subway is here attached to the main north-south line (Broad Street) by the Ridge Street connector, and there is another connector line for the high-speed New Jersey commuter trains. This new entrance replaces what was before just a stair leading down from the sidewalk, and it is the city's intention to line the concourse level with commercial shops, although neither these nor the structure intended for the adjacent street level vacant lot have been started yet. Mitchell/Giurgola also has proposed a continuous slide show of advertising that would be projected on the cement plaster wall of the glass-enclosed area at night, and the city has accepted this idea enthusiastically.

Facing the 8th and Market corner are three of Philadelphia's major department stores: Strawbridge and Clothier, Gimble's and Lit Brothers—whose nineteenth century building is seen at the center of the color photo, right. Its facade is a combination of cast iron and brick and details of these active, lacy facades are a contrasting foil for the simple forms of the Mitchell/Giurgola scheme, and are usually reproduced in the reflective surface of the glass. As can be seen in the section (right), the upper glass panels lap over the panels below like huge shingles, so reflections are always fragmented. A large weathering-steel sculpture is being prepared for placing on the concourse level, among the patterned floor bricks, and it will complete this rejuvenation of an important subway stop in Philadelphia.

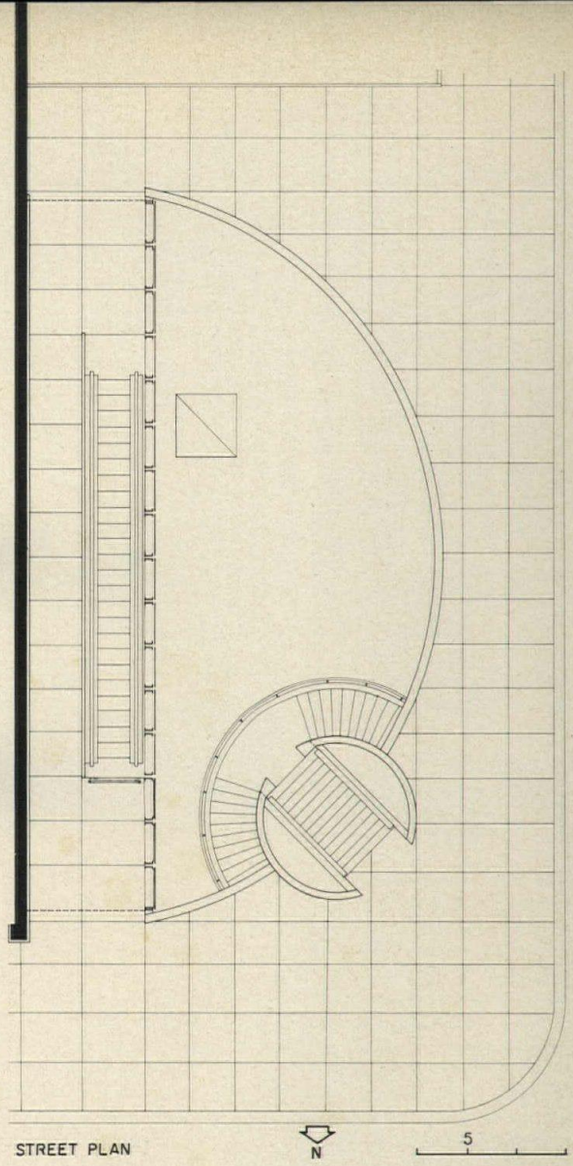
8TH AND MARKET STREET SUBWAY CONCOURSE, Philadelphia, Pennsylvania. Architects: *Mitchell/Giurgola Associates—James K. Wright*, project architect. Engineers: *Schulcz and Padlasky* (structural); *Vinokur-Pace Engineering* (mechanical). Contractor: *Lane Company*.

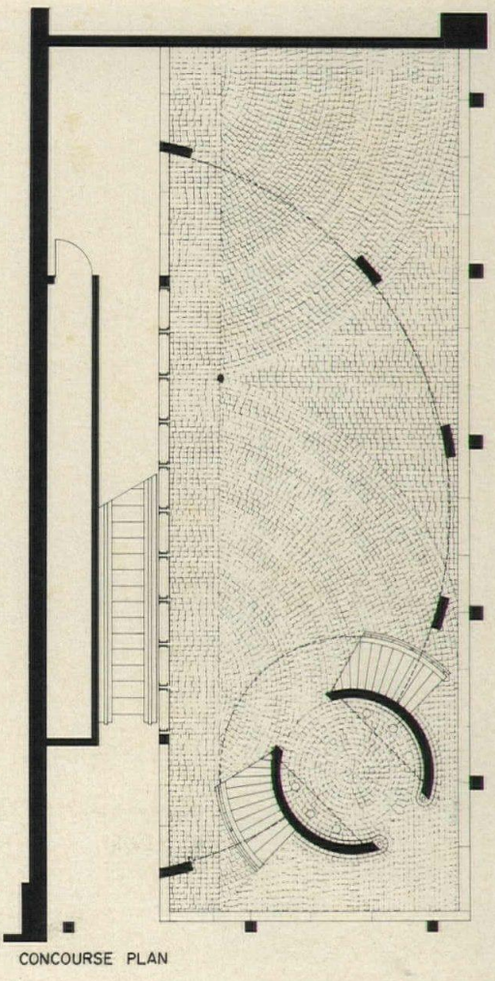


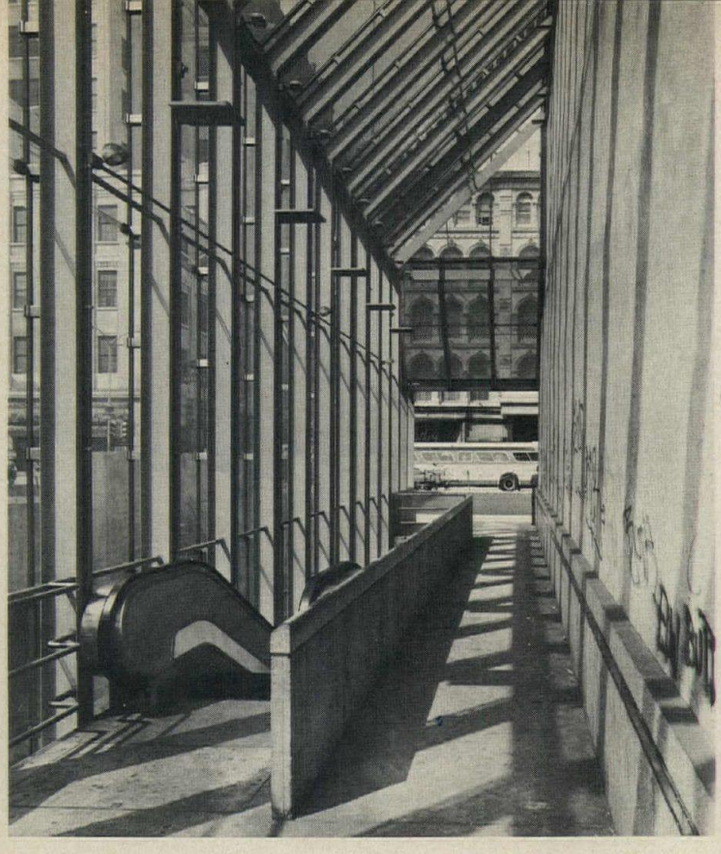
Rollin LaFrance photos

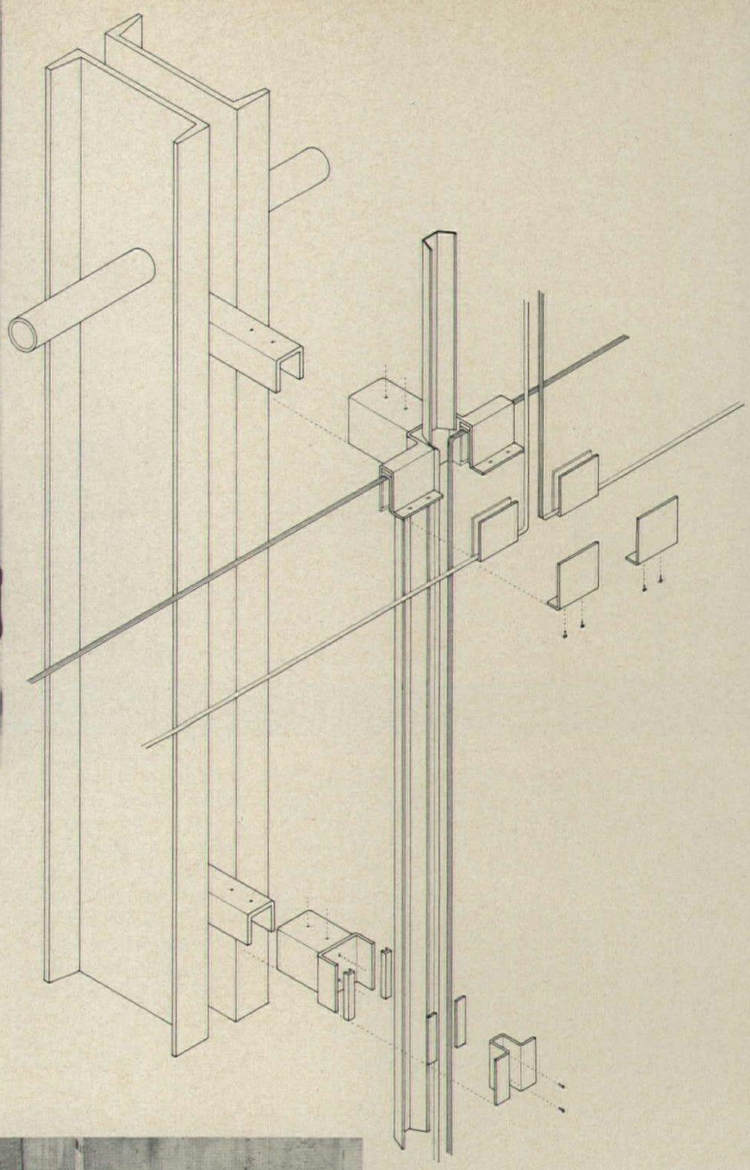


The subway stop is a simple redevelopment of the street level and the concourse level (plans, right), with a protective glass enclosure for the main escalator between the two. There is a generous stairway that has also become an architectural event, with the inside surface of the stairway cylinder painted a bright yellow. The escalator housing is open to the outside at all times and unheated, and the blank concrete walls are beginning to carry the ubiquitous and sometimes expressive Philadelphia graffitti.









The glass escalator enclosure will eventually support five slide projectors on the shelves in place above, so paid advertisements may be shown on the opposite blank wall at nights. The projected slides will be visible from the street through the glass. A detail of the glass and steel construction is shown at right, indicating how one glass panel overlaps the panel below it, with no attempt to seal the joints between. In spite of its lacy quality, the enclosure is very sturdy, and should withstand the substantial abuse that city subway entrances seem to receive. The only finishes on the project are the paints applied to the concrete stair inside, and to the steel of the enclosures; all the rest of the concrete is exposed.

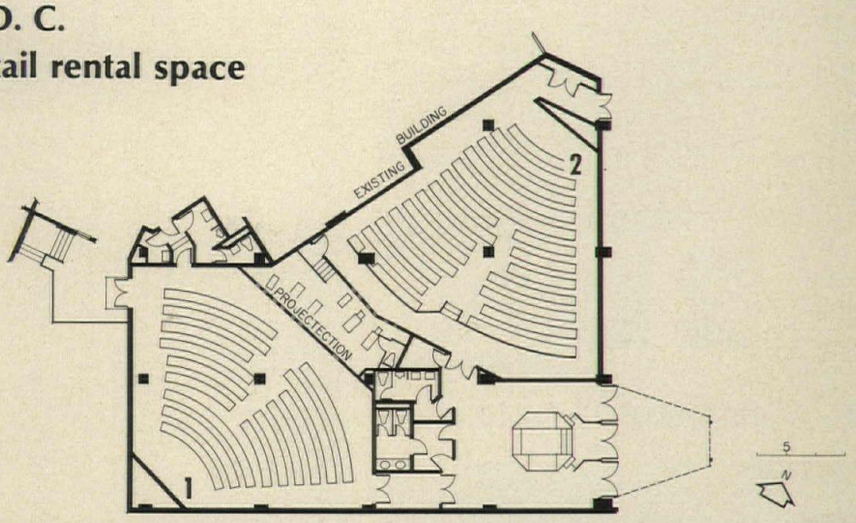
3 THEATERS

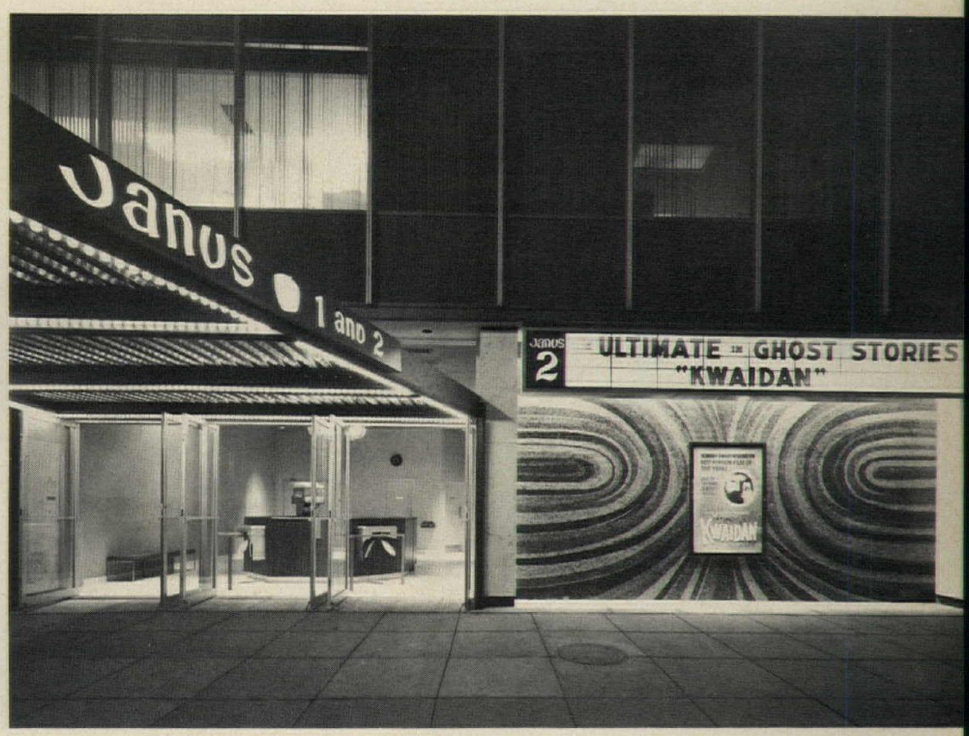
The small theater—intimate in size, convenient in location, sophisticated in both its decor and in its programs—is an unusual and increasingly frequent use of downtown space, provided there is parking available either on premises or nearby. In the three theaters shown here, all in downtown areas, two have on-premise parking, and one uses permanently available off-site parking. All are in remodeled space, all maximize the character of that space and minimize, through careful and imaginative design, such problems as structural columns, sight lines and traffic flow.

1 Janus 1 and 2 Theaters, Washington, D. C.
A double theater fits into ordinary retail rental space

One of the problems of the downtown movie theater is parking space: you can't get patrons unless they can leave their cars. This double theater, located in the street level retail rental space of a Connecticut Avenue office building in Washington, D.C., uses the building's below-grade parking garage in its off-hours—nights and Sundays, the theaters' hours of operation. The colorful ceramic tile wall mosaic, designed by the architects, attracts attention and also acts as sign board, a happy compromise which the city's restrictions on signs in this area made necessary. The marquis, permitted by code, is a good-looking landmark. One theater seats 153, the other, 180; one lobby serves both. Multiple mirrors make possible film projection from a single booth.

JANUS 1 & 2 THEATERS, Washington, D.C. Architect: *John Louis Field*. Associated architect: *Hugh Newell Jacobsen*. Contractor: *Tuckman-Barbee Construction, Inc.*

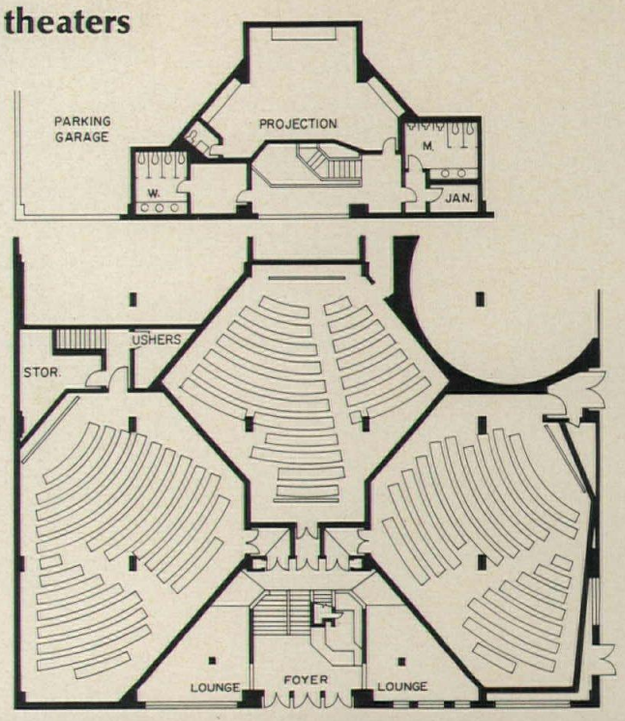


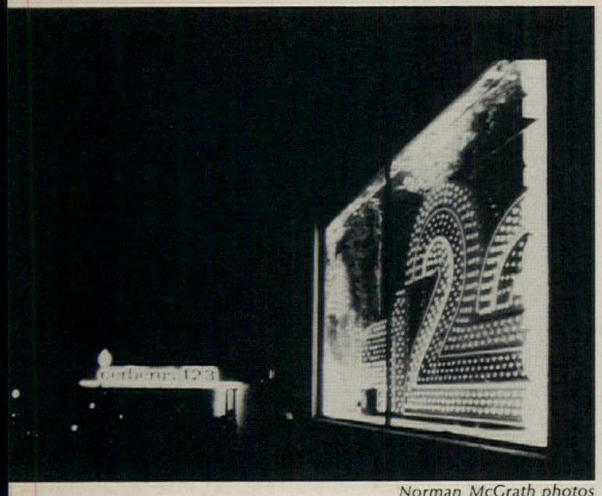


2 Cerberus Theaters, Washington, D.C.
An ex-automobile agency becomes three movie theaters

This conversion of one and a half floors of a former automobile sales agency into three intimate theaters is remarkably handsome and workable especially since the building's upper (garage) floors provide essential parking space. The theaters range in size from 130 to 170 seats, and are served by one lobby with one employee who doubles as both ticket-seller and concessionaire. A short flight of steps from the lobby leads to the mezzanine off which the theaters are entered. Above the theaters are the restrooms and projection room, reached by the dramatic stairway painted bright red. Mirrored ceilings add to the apparent size of the mezzanine which serves as a waiting area.

CERBERUS THEATERS, Washington, D.C. Architects: *Bull Field Volkmann Stockwell—John Louis Field,* partner-in-charge. Associated architects: *Wilkes & Faulkner.* Graphics: *Reis and Mainwaring.* Contractor: *Coleman & Wood.*





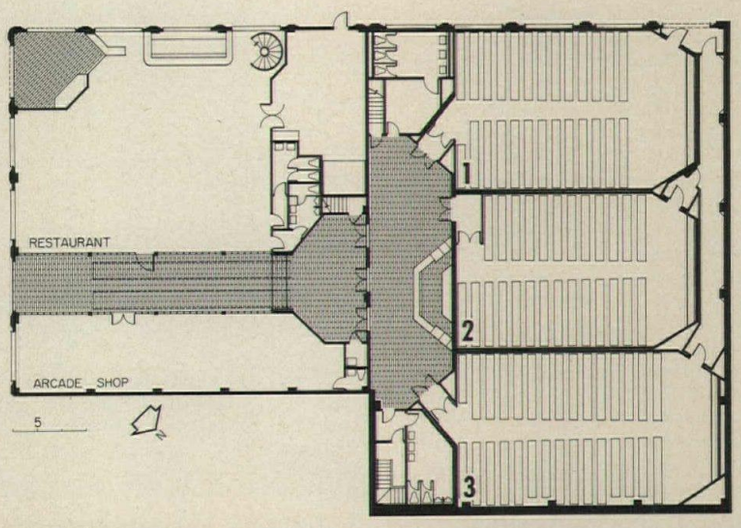
Norman McGrath photos

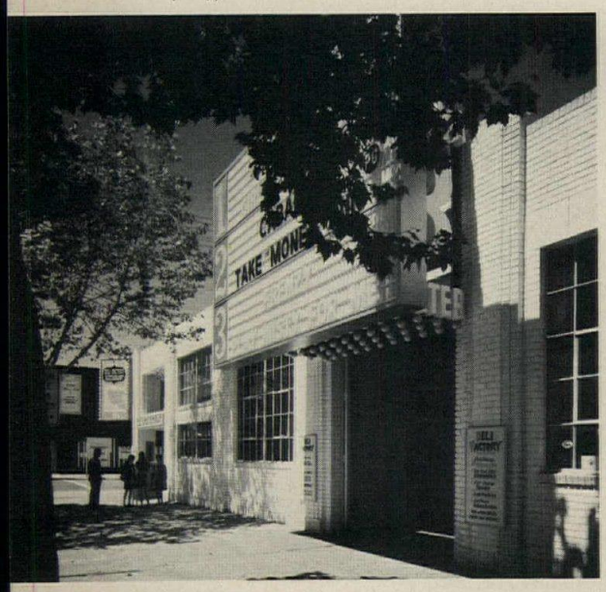
Entering the lobby and waiting areas of the Cerberus Theaters invites a complete change in pace—even, as the architects say, a "suspension of the familiar habits of space." The sophisticated and essential simple interiors —dark grey walls with accents of bright color and mirror ceiling brilliantly reflecting the bare electric bulbs—make a particularly effective introduction to the world of the art film. Advance ticket sales reduce the need for a large ticketing lobby, and a staggered schedule of film showings makes a large waiting area unnecessary. The theater's exterior, a radical but again simple, transformation from its former appearance, meets ingeniously the Georgetown restriction against theater signs: the architects and their graphics consultants designed a 60-foot-long light mural for the old auto display windows which, by its color and changing design, is a traffic-stopper. Incandescent and neon lighting in the three bands of color is multiplied by the mirror-lining of the window box. The light mural incorporates the theater name and the billboard for the three theaters.

3 Cinema 3 Center, Oakland, California. Three movie theaters join an arcade, a shop and a restaurant

These three theaters do indeed make up a cinema center, as their name suggests. Located in two former warehouses, they are reached by a skylighted arcade off which also open a restaurant and a shop. This combination of commercial facilities is warranted by the location of the buildings: they are in a rapidly developing tourist section of Oakland, adjacent to highly successful Jack London Square. The arcade provides waiting area for patrons and is wide enough to allow the traffic flow in both directions. It also takes care of the problem of joining usefully the two buildings, one of which originally was entered from a side street. In addition to the arcade, these theaters also have a large lobby.

CINEMA THREE CENTER, Oakland, California. Architects: *Bull Field Volkmann Stockwell—John Louis Field*, partner-in-charge. Structural engineers: *GFDS Engineers*. Acoustical consultants: *Fitzroy/Dobbs*. Interior Design: *Bull Field Volkmann Stockwell*. Graphics: *BFVS*. Contractor: *Strauss Construction Company, Inc.*

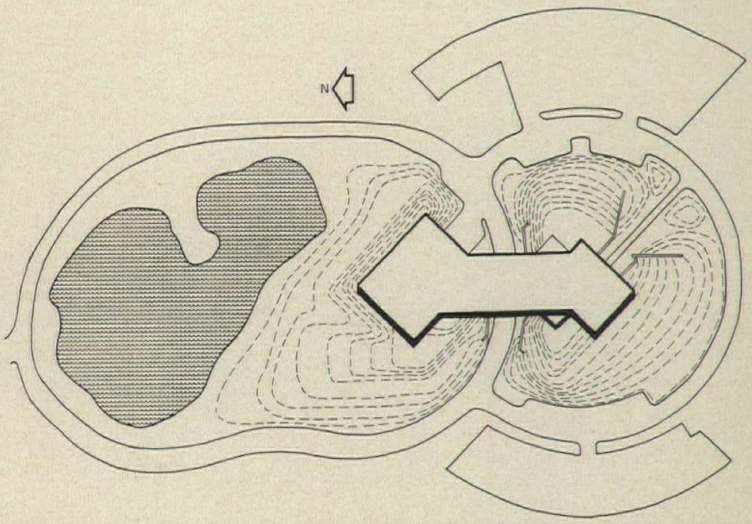




Jim Cheng photos

Forceful bi-nuclear plan for the Jacaranda Country Club polarizes its social and recreational functions

Encouraging their client, the Gulfstream Land & Development Corporation, to depart from the local tradition of "ship's wheel and stuffed sailfish" design motif, architect Donald Singer and interior designer Terry Rowe have created a private country club that is thoughtfully planned, elegantly appointed and well suited to function as the recreational focus on an 850-acre, planned residential community on Florida's fast-growing Atlantic coast.

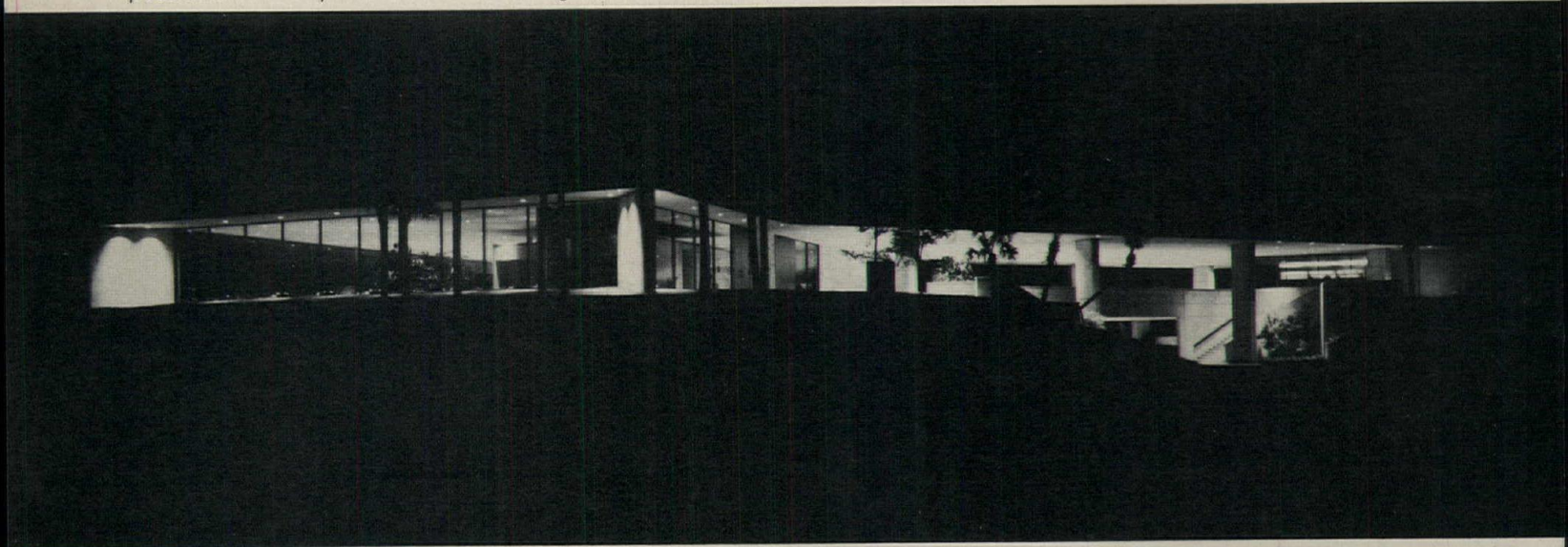


Singer's decision to polarize the club's recreational and social functions led to the binuclear solution shown in the plans on the opposite page. The dining room, cocktail lounge and kitchen facilities are grouped together to form a social area that flows gently around its own service core. The golf shop, locker rooms and cart storage area form a second, quite separate, nucleus. The two sections are linked at the upper level by a bridge that spans the access road and provides, in the swale below, a natural point of arrival. Golfers alight from their cars under the bridge and proceed up to the locker rooms while their cars are parked and their golf bags transferred to carts. The procedure is reversed at the end of play.

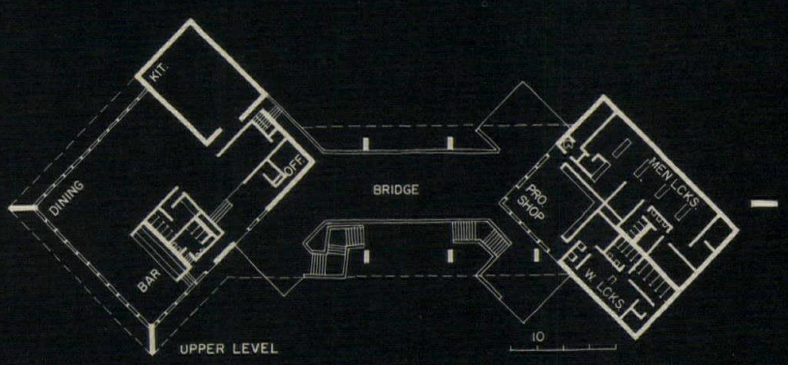
Singer sought to achieve a feeling of repose and harmony with the surrounding landscape by keeping the building mass low and stringing the destination points out horizontally for maximum "stretch." This elongation and emphasis on horizontal movement, says Singer, "makes the user aware of his role in a pageant he himself is creating." The two man-made hillocks are visual shock absorbers that cushion the impact between building and site while strongly reinforcing the duality of the scheme.

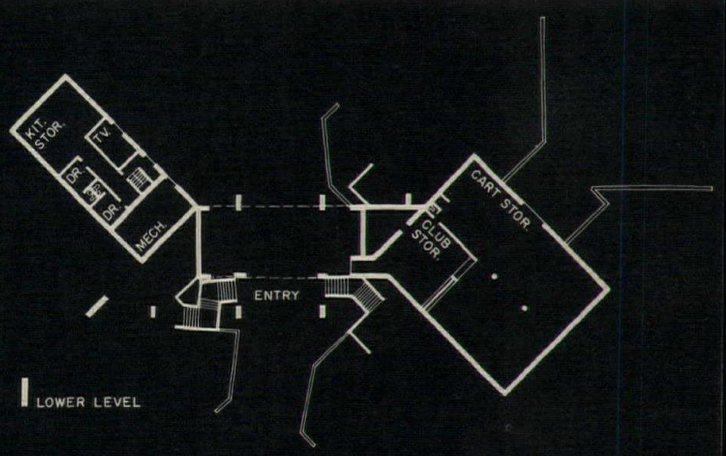
The elevations are handled with appealing simplicity in concrete and glass. Because there is so much design interest at grade in the form of level changes and retaining walls, the roof line is smooth and continuous, broken only as the building turns on its site. Concrete bearing walls have been lightly sandblasted to remove stains and tie holes have been packed with lead

Alexandre Georges photos



The materials used consistently throughout the interiors are wool carpet, concrete, aluminum and glass. Other materials find occasional use: the lounge tables, bar top and waitress station are black granite; the reception area and bridge deck are finished in river gravel. The whole building is air conditioned using a multi-zone, air-to-air system.



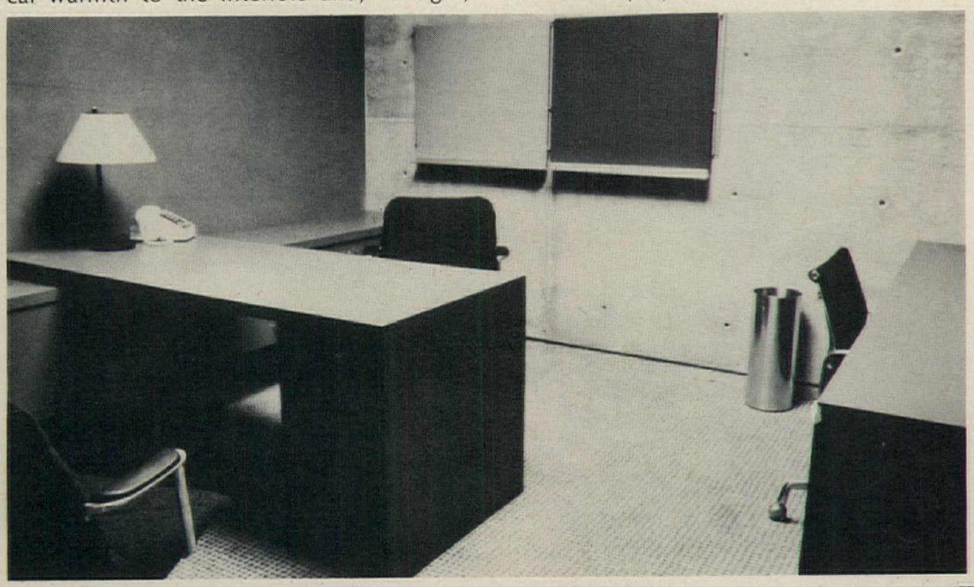


wool. The roof structure, although originally designed as a waffle slab, is framed in steel.

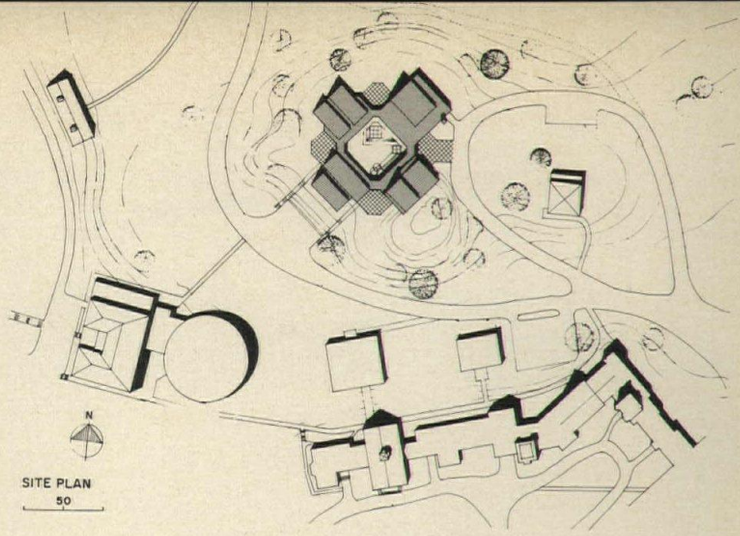
The interiors, although more stylish and self-conscious, reflect the same consistency in material and detail. Singer and Rowe, collaborating for the first time, have produced a sequence of elegant spaces, heightened by careful lighting and enriched by powerful color accents. The dining room and the cocktail lounge (see page 120) are inviting and intimate—their scale made easily manageable by fitting them around an internal service core. The locker rooms (photo below) treated as low grade space in so many clubs, at Jacaranda are detailed, textured, appointed and furnished with really meticulous care. Thoughtful lighting, much of it recessed or concealed, imparts a lyrical warmth to the interiors and, at night, bathes the building's perimeter, and its principal approaches, in a luminous medley of powerful, form-revealing highlights (see photos pages 120-121).

If the design intention had simply been to create a handsome structure that unmistakably conveyed an aura of suburban elegance and ease, then the designer's task would have been easier. For, although the Jacaranda Club expresses these qualities in abundance, it also generates in its users an important sense of community focus and purposeful play.

JACARANDA COUNTRY CLUB, Plantation, Florida. *Architect:* Donald Singer; engineers: *Gaston DeZarraga* (structural), *Luis Aguirre* (mechanical); interior design: *Terry Rowe Associates, Inc. in collaboration with Donald Singer;* contractor: *Caldwell Scott Construction Company.*



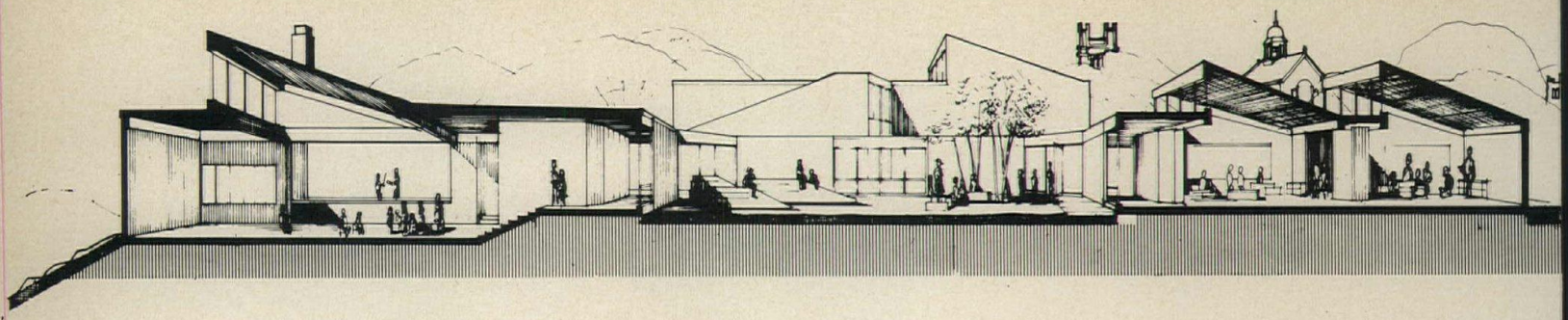
The club manager's office (photo left) continues the theme of concrete wall and speckled carpet. In the dressing rooms (photo below), custom lockers were molded in gray fiberglass. The molding process was reversed so that the locker's exterior surface is rough textured while the inside is smooth and white. Plastic laminate, chrome, and mirror glass are used as contrast to the concrete walls.



The Hackley School addition: Classroom clusters and an open-centered, cruciform plan

When the Board of Hackley School, a preparatory school in Tarrytown, New York, decided recently to open the school's program to younger children, it commissioned a Hackley alumnus, architect Janko Rasic, to design a 180 pupil elementary school. The wooded site (plan above) is a portion of the 81-acre existing campus and an important portion of Rasic's task was to make his building compatible with older, surrounding structures. The remainder of the task was to create a mini-learning community scaled so that small children (pre-kindergarten through 6th grade) could be made to feel comfortable.

Rasic's cruciform plan has an almost diagrammatic simplicity. Four groups of classrooms are clustered about a central, closed quadrangle. Two of the groups are subdivided into classrooms that, with various modifications, can become either open or closed teaching spaces or used for team teaching. The other two clusters contain a multi-purpose space and facilities for nursery- and kindergarten-age children. Above the spaces for the youngest children are a small library and art room (not

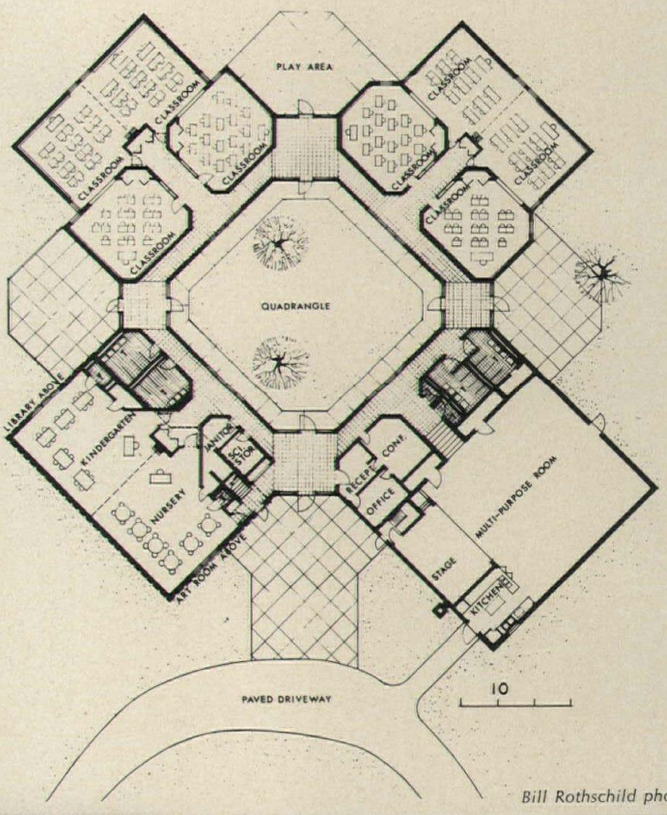


shown in plan). Circulation is along the inside perimeter—a series of short corridors that link entry and exit points which occur at the inside corners where the arms of the cross intersect.

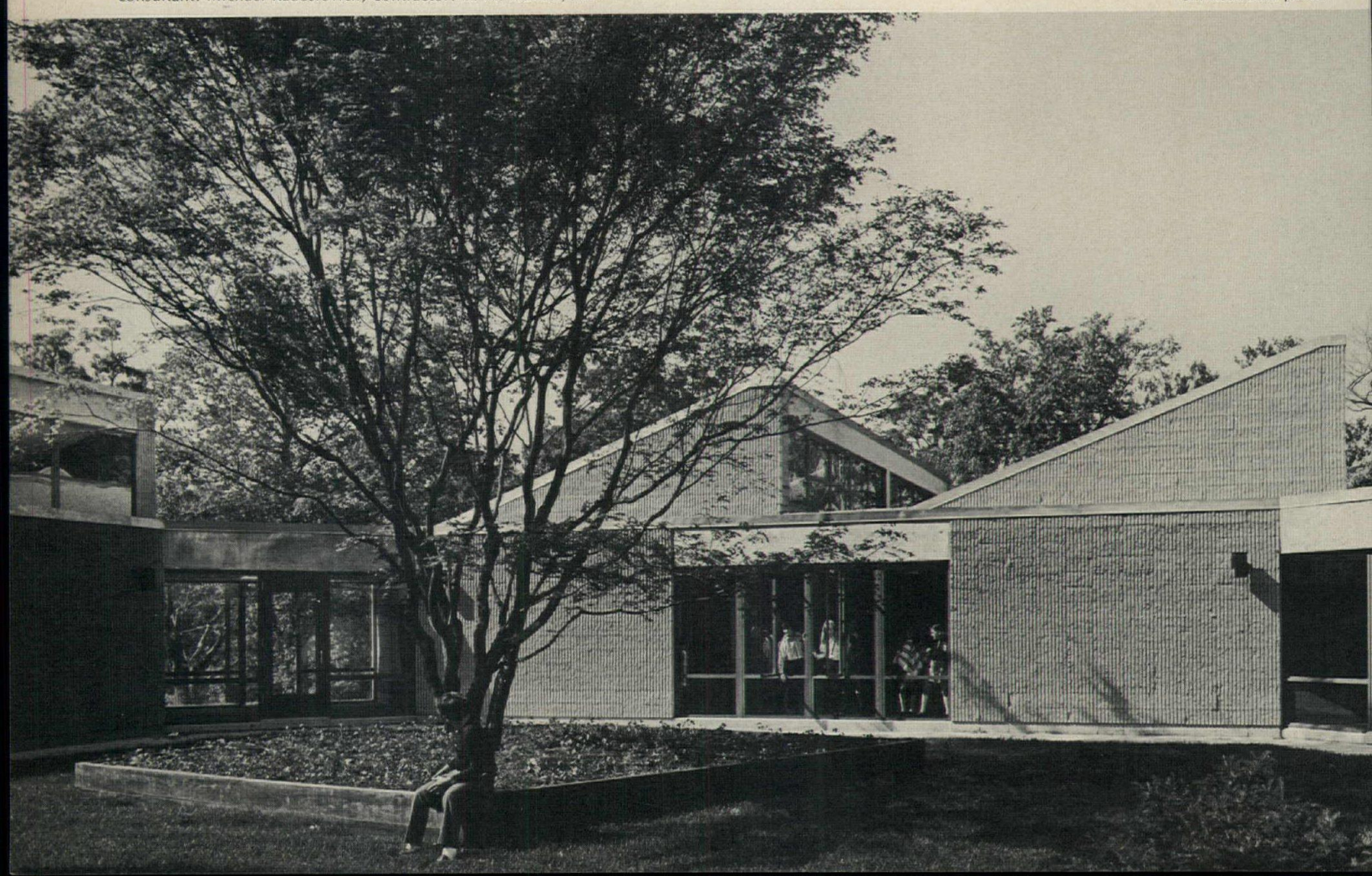
The appealing simplicity with which the architect has translated the diagram into three dimensions shows in the photographs and in the section above. The spaces are shaped by sloped roofs and clerestories and, in the multi-purpose space, by a substantial change of level. The elements are unified by a consistent construction vocabulary that includes concrete block faced with a four-inch split rib block for exterior walls, exposed precast plank for ceilings, gypsum board for interior partitions.

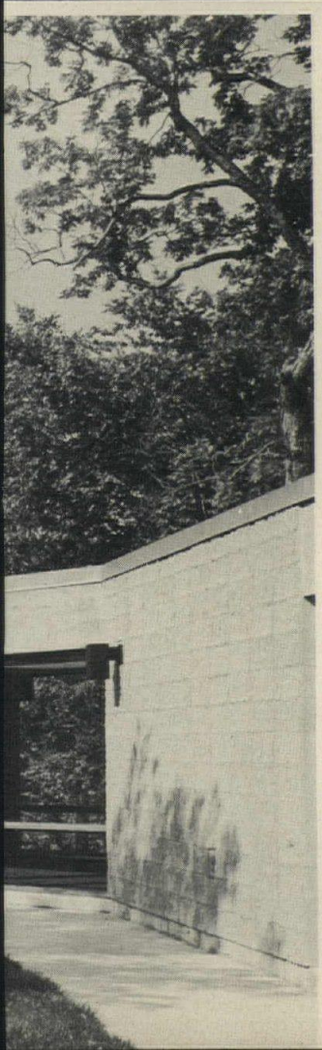
By any measure—architectural or educational, owner and architect can feel justifiably pleased.

KATHLEEN ALLEN SCHOOL of the Hackley School, Tarrytown, New York. Architect: *Janko Rasic;* engineers: *Severud Associates* (structural), *Piccirillo & Brown* (mechanical); landscape architect: *Eugene Detmer;* educational consultant: *Michael Radoslovich;* contractor: *A. M. Hunter, Inc.*



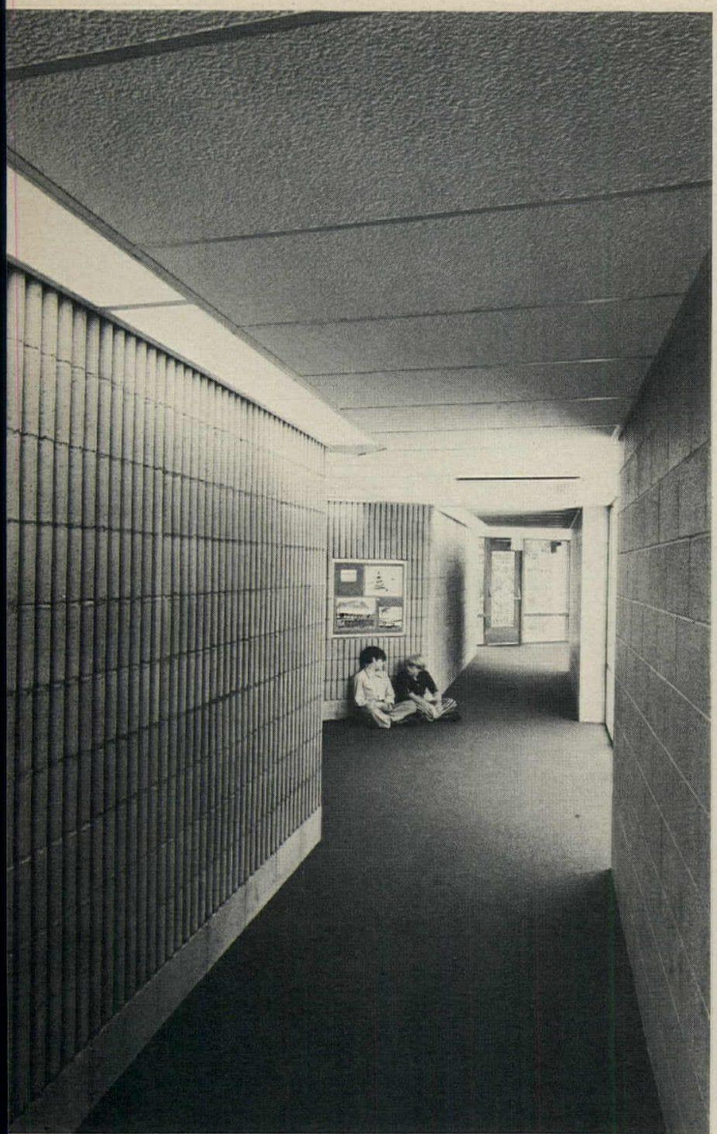
Bill Rothschild photos



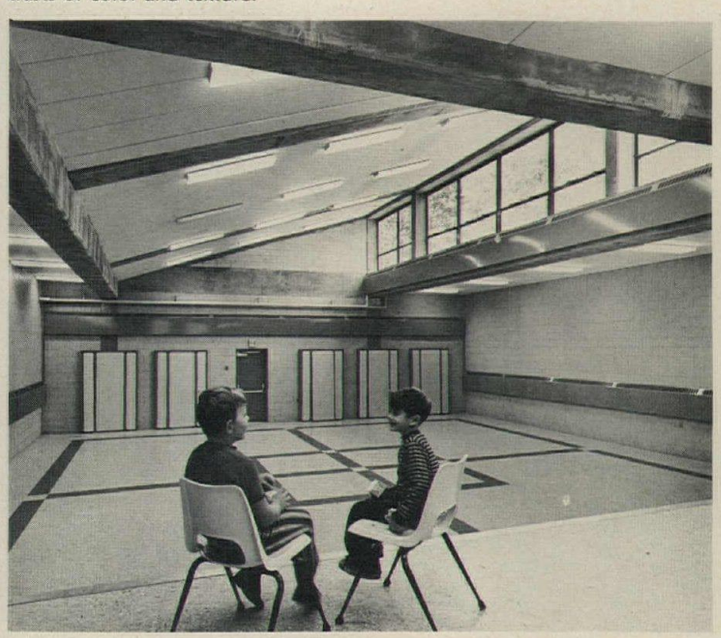


From inside the quadrangle (photo left), the sense of enclosure is softened by the transparency of the corner vestibules, and the relationship between the quadrangle and the surrounding site can be visually established without difficulty.

The library (photo above) employs only ordinary elements—books, shelves and card catalogs—but furniture can be arranged in a variety of flexible groupings.



Pre-kindergarten children play and learn in a flexible teaching space finished in durable materials but sensitively scaled to their needs. Multi-purpose space (photo center) includes a small stage and kitchen facilities where hot lunches can be served. Throughout the building, the simple vocabulary of finish materials provides rich contrasts of color and texture.

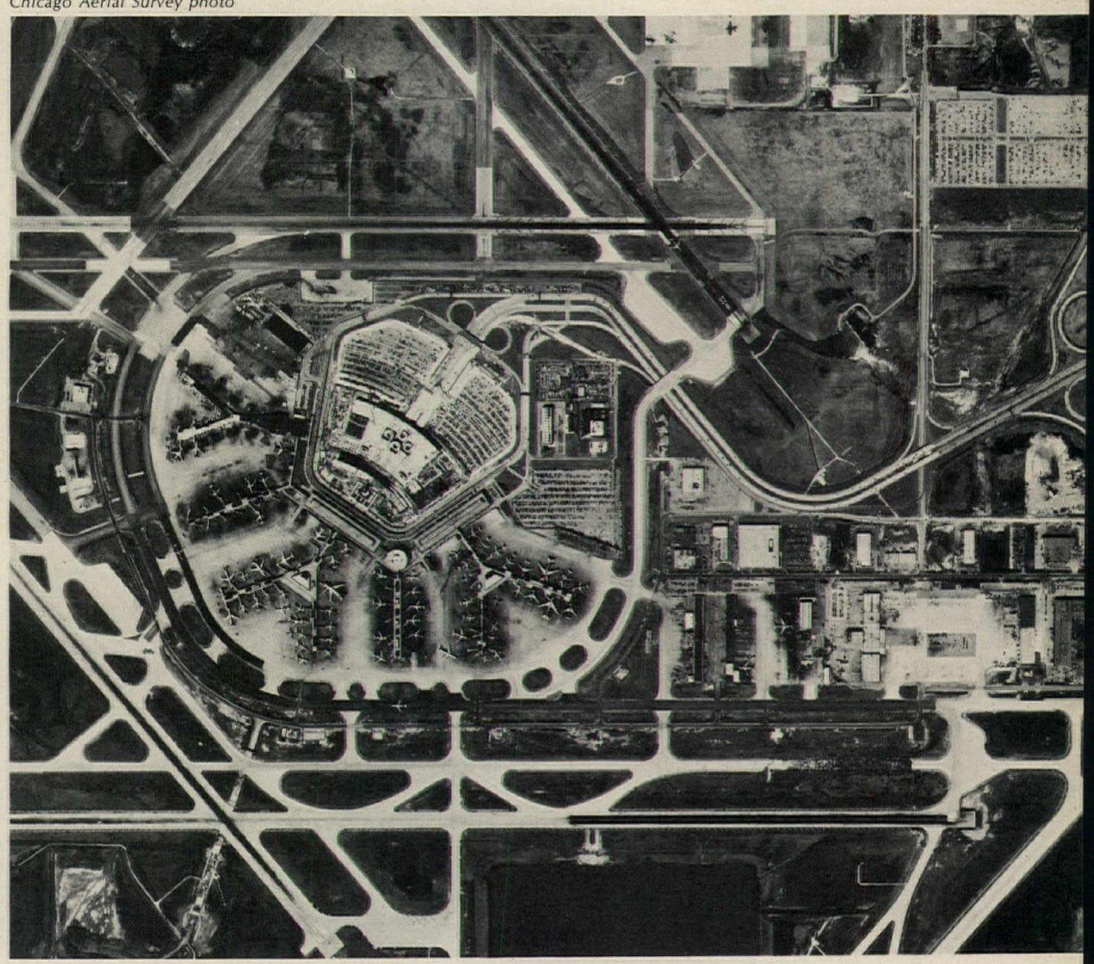


AIRPORTS

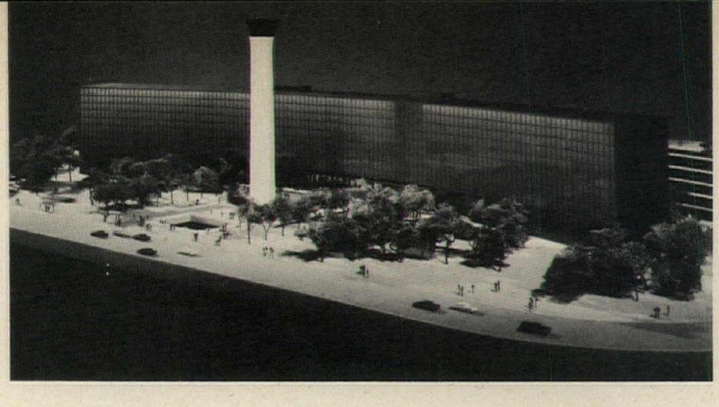
The airview of Chicago's O'Hare International Airport below tells an all too familar story of hectic activity and stretched out fingers of docking facilities for ever larger aircraft. Air transport authorities in many cities are facing hard decisions as to whether they should abandon existing facilities and start over with fresh concepts of configuration on new locations. The decisions at O'Hare, to remodel domestic facilities, add new ground facilities and relocate international activities elsewhere on the same airport, follow a long term master plan described on the following pages. Other large airports (Kansas City and Tampa are examples shown) demonstrate the evolution of a central and virtually universal idea: greater convenience for the traveler and higher efficiency for the airport through closer linkage between ground transport and aircraft. Smaller airports (Pittsburgh and Ke-ahole) demonstrate two strong roles for architects in airport design. First, the inventive development of economic structural systems and layout for interim facilities and second, the ability to design such facilities without sacrifice of appearance and amenities. Evolution is still dynamic and some of its directions are reflected in continuing inventiveness of designers in their modes of bringing passengers to aircraft with minimum demands upon the time and energies of each.

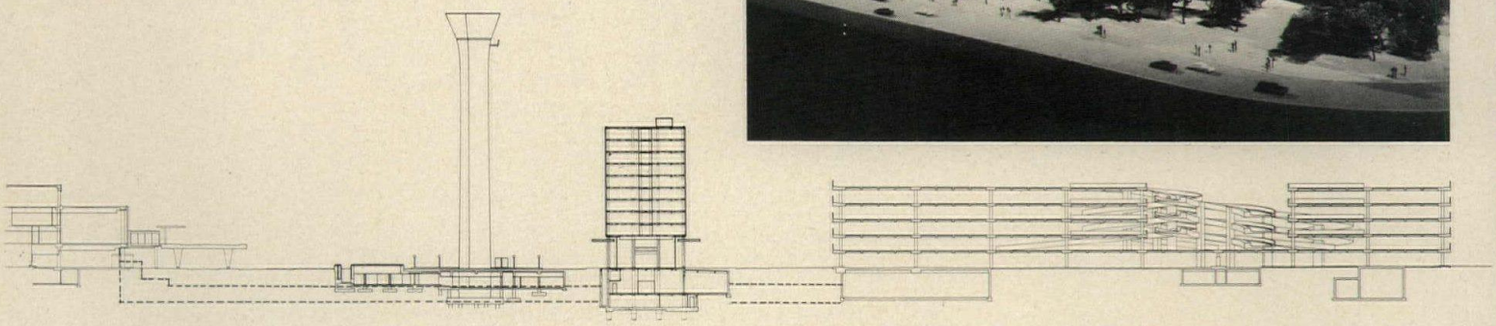
— William B. Foxhall

Chicago Aerial Survey photo



MASTER PLAN FOR O'HARE COMMITS CHICAGO'S AIRPORT TO UPDATING ON ITS PRESENT SITE





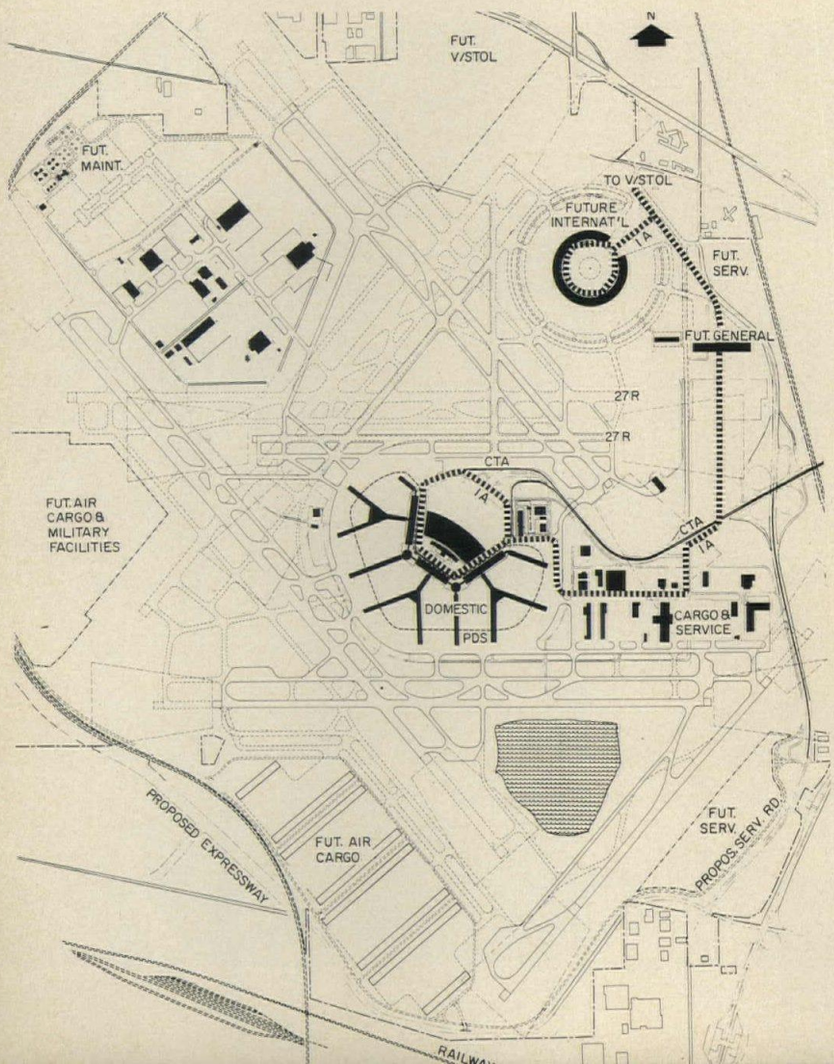
Since the opening of O'Hare International Airport in March 1963, traffic at this giant Chicago hub has increased rapidly; and many a weary traveler can testify that walking distances and confusion have increased proportionately and have obscured an active and successful master plan for expansion. The plan exists, however, and through it vast sums will be expended on behalf of the traveling public.

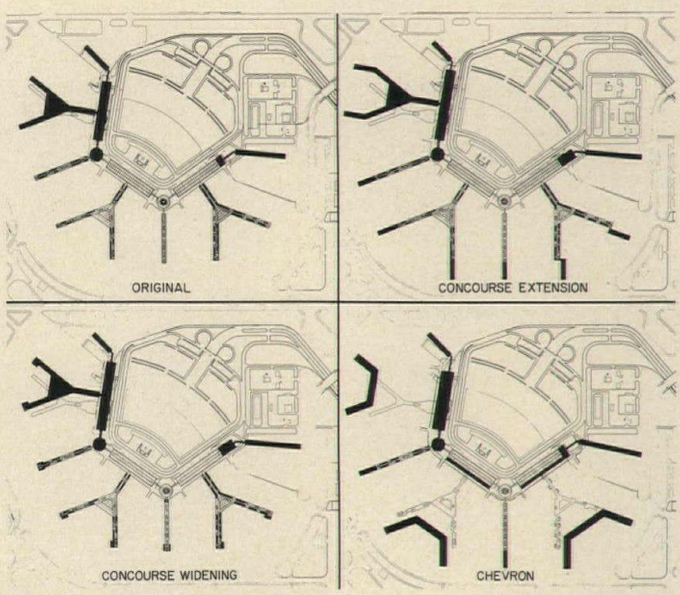
The first phase of the expansion will be completed in 1972. It will include primarily the construction of new landside elements: a six-level parking structure for 9,350 cars, a 1,000-bed hotel, pedestrian tunnels connecting these facilities to the terminals and many interim modifications within the terminal concourse area. The increase in traffic from eighteen to about thirty million passengers within a three-year period and the advent of the 747 and other wide-bodied aircraft have spurred interim modification and expansion of hold rooms and airline operational areas including baggage make-up and claim areas.

None of these interim modifications is considered final, or even completely adequate. But they have permitted continuous operation while major elements of the master plan were being implemented through a complex series of political, financial and physical considerations. An activity flow chart 12 feet long can be seen on the wall in the offices of C. F. Murphy Associates, architects and engineers for the project. It looks like a CPM network diagram and records hundreds of activities, beginning with regional system considerations and proceeding through planning and design procedures. These include evaluation studies of alternatives and periodic review by city and federal officials and planning consultants. Some idea of the scope of these considerations can be gained from the conceptual flow chart on the opposite page.

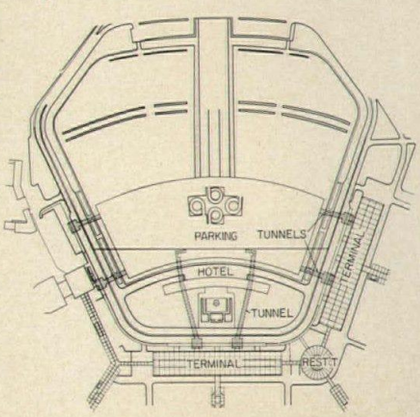
New parking structure and hotel

The parking garage and hotel are in fairly close relationship to the terminal complex. The hotel is being built by Midwestern Hotels, Inc., a subsidiary of Madison Square Garden Corp. It will be a 981-room facility of 584,000 square feet. It is scheduled for completion in December 1972 at a construc-





The relocated international terminal at O'Hare is shown at left as are the proposed three transport systems: an extension of CTA public transit from the Loop, an intra-airport connection from domestic to international terminals and a people distribution system for interline transfer at the domestic terminal. The four sketches above show alternatives studied for expanding the domestic terminal.



tion cost that will be about $14.5 million.

Guest access is either by automobile from a new roadway or by pedestrian tunnels from airline terminals and the new parkink structure. Tunnels are planned to include moving sidewalks and a future inter-line baggage handling system that will allow complete guest ticketing, baggage check-in and baggage claim at the hotel.

The floor plan is a rectangle 56 by 750 ft bent to a long-radius curve with rooms laid out along a conventional double-loaded corridor. The nine-story structure is 102 feet high and contains meeting rooms and executive offices on a mezzanine level. At grade-level are restaurant and ballroom areas in addition to guest registration. Specialty restaurants and shops are contiguous to tunnel entrances on the lower level.

Structural system of the hotel is flat-plate concrete sheathed with gray-tinted acoustical glass in black anodized aluminum curtain walls. The air handling system will have charcoal filters to control the effects of jet exhaust.

The parking structure being erected by the city is located on the south half of the existing grade parking area, as shown in the section and plans opposite. It will provide 180,000 square feet of self-parking area on each of six levels. There are four ramp systems, two in and two out.

Each set of ramps serves a six-hundred-car area on each floor. Each of these areas is divided into two-hundred car units which are tied to an electronic and graphical traffic control system. Basically, the system is related to convenient distances from each parking unit to the various airline gates. Ramp signage is electronically controlled to indicate when the most convenient area is full, and cars are then directed to the nearest one of the other units where space is available. Car rental space is on the grade level of the structure.

Convenience in the parking structure will be augmented by an elevator system, clear directional graphics and, ultimately, the ability to check or claim baggage near the parked car.

A second expansion phase, already well along in planning stages, entails: 1) major additions to and modifications of the existing terminal area including mechanical baggage handling and a people-distribution system for passengers between terminal concourses; 2) extension of Chicago's CTA system of public transportation from the Loop to the terminal building; 3) relocation and construction of a new international terminal remote from the domestic complex but still within the runway system; 4) an intra-airport people conveyance system between the present domestic complex and the new international terminal; 5) a new cargo terminal area; 6) expansion of the hangar and fuel farm area; 7) new general-aviation and v/stol areas.

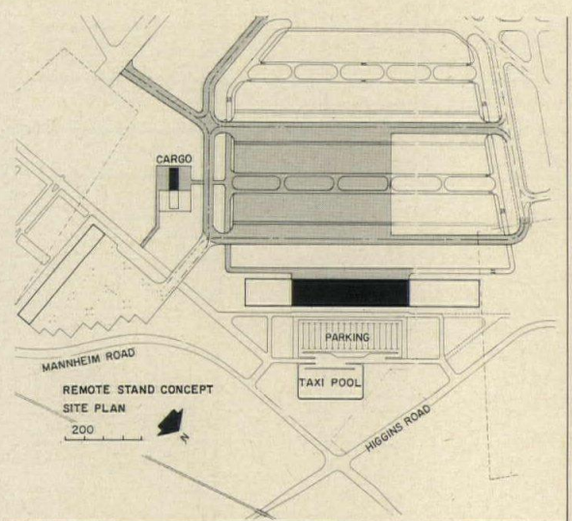
Project organization and development

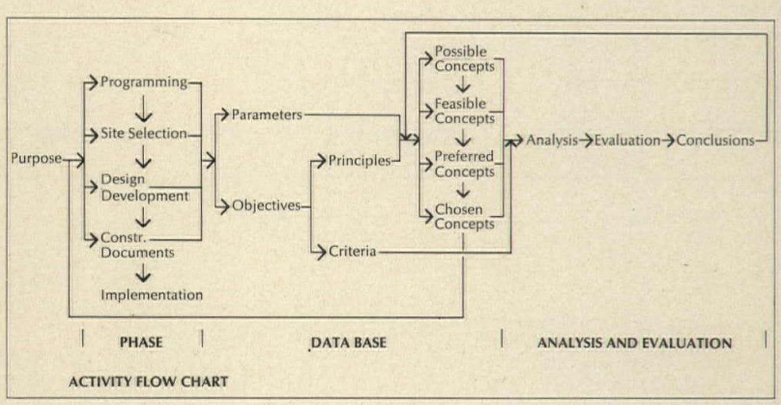
Planning for the airport is monitored by the O'Hare Planning Committee consisting of a member from each of the following organizations: Chicago's Department of Public Works and Department of Aviation, United Airlines, American Airlines, TWA and C. F. Murphy Associates. All studies are initiated and reviewed by the planning committee.

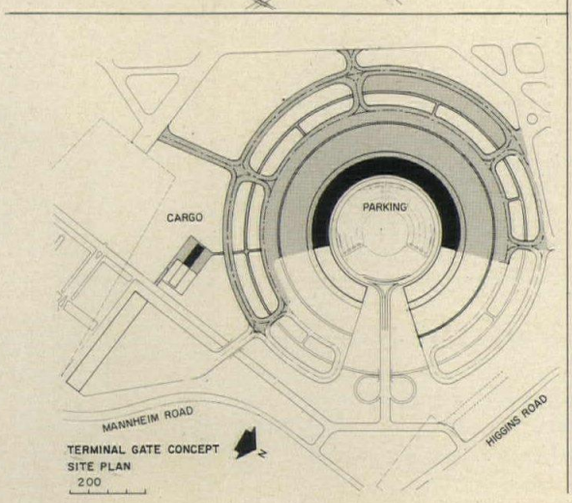
A statement of purpose initiates each study. Study phases, as indicated in the chart below, are: programming, site selection, design developments, construction documents and construction implementation. The study basis for each phase is established by development of parameters and objectives. The objectives govern determination of planning principles and criteria. The criteria are in turn used to evaluate options and concepts of each step. Information developed at each step is capable of feedback to earlier steps. The planning options selected as feasible on the basis of study are further analyzed in more detail and evaluated in terms of the criteria.

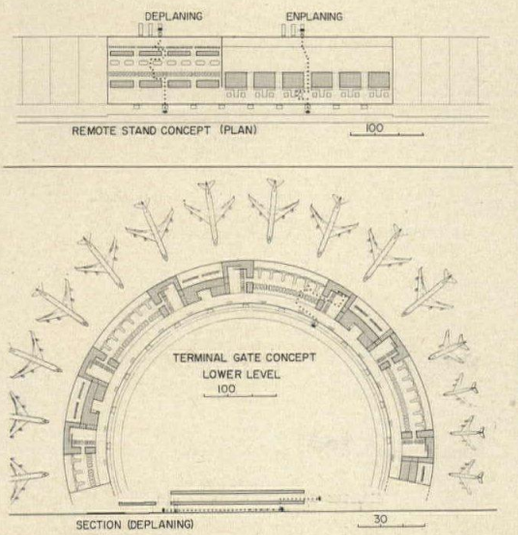
The process as it relates to the international terminal serves as an illustration. No complex study was required to determine that existing international facilities at O'Hare had become inadequate. Expansion at the present location on the eastern end of the domestic complex is not feasible because of site limitations.

Objectives, planning principles and criteria for a new international terminal were analyzed for: 1) optimum site utilization, 2) maximum flexibility, 3) operations and 4) total annual cost. The array of considerations for each objective was similar to those









Two alternative configurations for the relocated international terminal are shown at left. Evaluation studies of the remote-stand concept and terminal-gate concept are described on the following pages. The activity flow chart above outlines basic approaches to the planning process as described in the text based on data supplied by Goetz Pahl and Bert Lenz of the architect's planning department.

shown for the flexibility objective in the chart below.

Planning options for the landside, interface and airside were analyzed in accordance with the chart shown below.

Feasible concepts for basic configuration of the international terminal were analyzed for their overall response to criteria such as site utilization, public convenience, construction and maintenance costs, expansibility of sub-systems and efficiency of customs operation. Six terminal configurations were studied. Two of these, the terminal-gate concept and the remote-stand concept, are illustrated at the bottom of the previous page. Other concepts studied were: satellite (in which the terminal is centralized and gates are at satellite positions reached by corridor), the concourse concept (in which all gates are at finger-shaped concourses as they are in the domestic facility) and combinations of these various ideas.

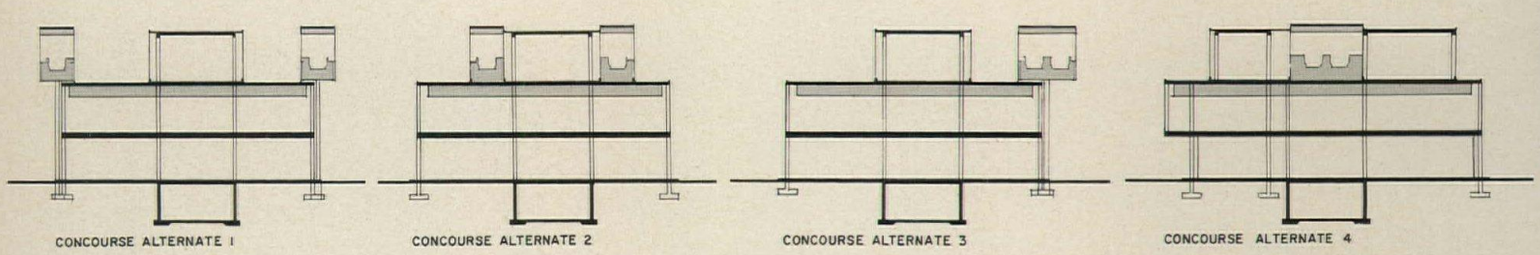
The technique was to set up a system of graded symbols showing five levels of response from "better" to "worse". These symbols were then registered in a chart listing criteria and showing the level of acceptability of response of each of the terminal concepts. For example, the remote-stand concept registers "better" for site utilization but "worse" for public convenience. Each concept is evaluated for walking distances, passenger transfer, operation, etc.

The following is a list of conclusions and recommendations based on this study:

- *All concepts* accommodate the projected growth in international air traffic through the year 2000 without changes in relative peak periods of flight schedule.
- *The terminal-gate concept* achieves maximum public convenience due to short walking distances within the terminal and due to passenger transfer by means of jetways, but shows the highest costs, both explicit (the sum of construction cost, terminal-apron maintenance and operations cost and airlines operation costs) and implicit (determined by the expansibility of the facility and required duplication of federal inspection and custom services).
- *The remote-stand concept* achieves minimum explicit and implicit costs. Public convenience is less than in the terminal-gate concept due to the use of transporters in lieu of jetways for passenger transfer.
- *The satellite concept* achieves less public convenience than the terminal-gate concept due to larger walking distances within the terminal. It shows minor advantages in explicit costs but no advantages in implicit costs.
- *The combined terminal-gate-concourse concept* achieves less public convenience than the terminal-gate concept due to larger walking distances. It shows relatively minor advantages in explicit costs but no advantages in implicit costs.
- *The combined terminal-gate-remote-stand concept* shows explicit costs similar to those of the terminal-gate concept. The advantages in construction cost and maintenance and operation costs, however, are offset by additional airline operation costs related to transporter operation.
- *The concourse concept* does not meet acceptable requirements in public convenience because of inheret walking distances.
- *Recommendation:* The terminal gate and remote stand concepts are to be developed further to allow detailed analysis related to specific configurations.

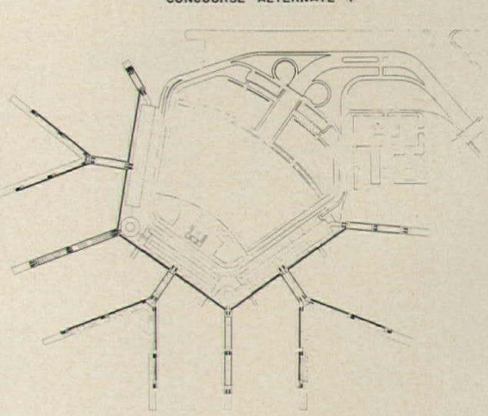
A similar planning-option technique was applied to evaluation of four alternative modes of expanding domestic terminal feasibilities illustrated on page 128. These modes are: additional fingers on the original concept; concourse extensions; concourse widening; and chevron shaped outlying concourses fitted between existing concourses. These were evaluated on a basis of ramp frontage, construction cost and disruption cost. The extension concept proved the "better" overall idea. A massive study of baggage handling systems is similarly under way, and a study of people-mover systems for the domestic terminal (fractionally illustrated below) offers hope for O'Hare's leg-weary travelers.

O'HARE INTERNATIONAL AIRPORT, Chicago, Illinois. Owner: City of Chicago. Architect and Engineer: *C. F. Murphy Associates—Carter H. Manny, Jr., partner-in-charge; John Novack, project architect, phase 1;* airport layout and program consultant: *Landrum and Brown, Inc.;* other consultants: *Lyle Yerges,* acoustical (hotel); *Norman De Haan Associates,* interiors (hotel); *Richard C. Rich Associates,* parking (garage); general contractors: *Consolidated Construction Company,* garage; *James McHugh Construction Company,* hotel.

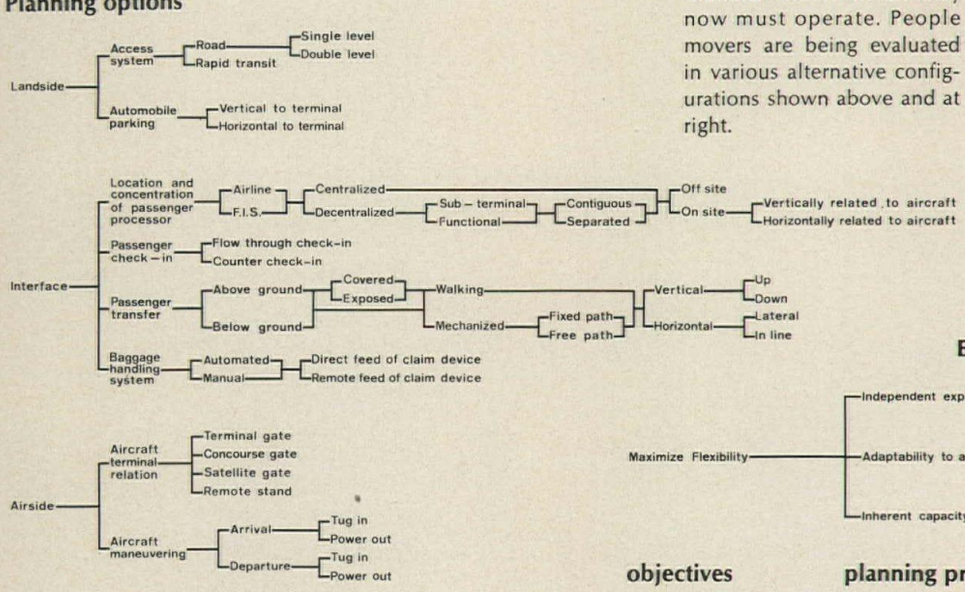


CONCOURSE ALTERNATE 1 | CONCOURSE ALTERNATE 2 | CONCOURSE ALTERNATE 3 | CONCOURSE ALTERNATE 4

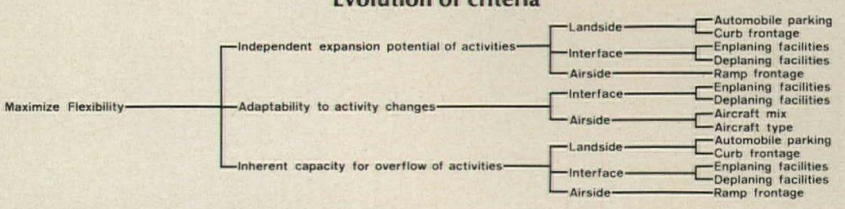
Planners at O'Hare are serious about overcoming the walking distances inherent in the finger concourse configurations within which they now must operate. People movers are being evaluated in various alternative configurations shown above and at right.



Planning options

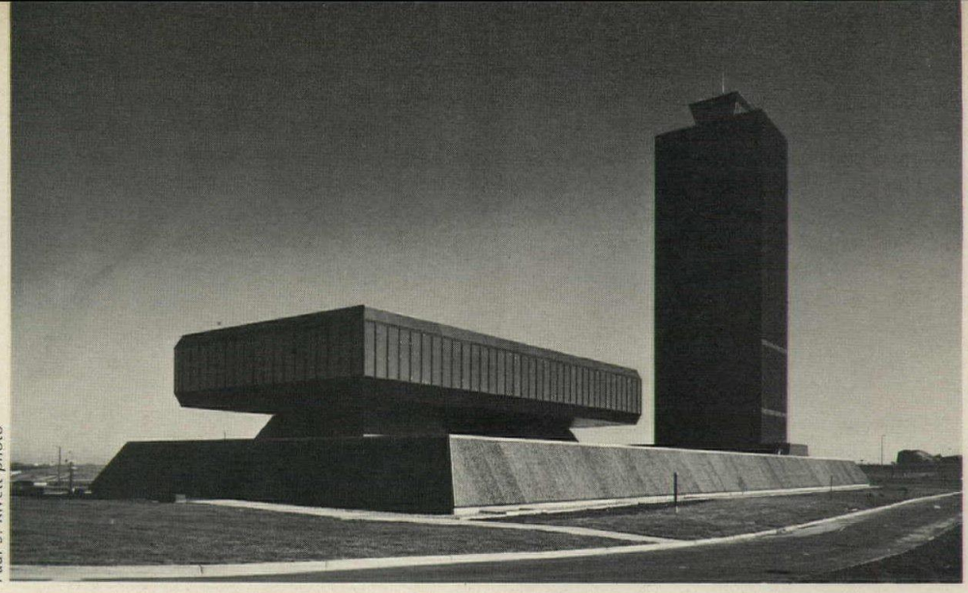


Evolution of criteria

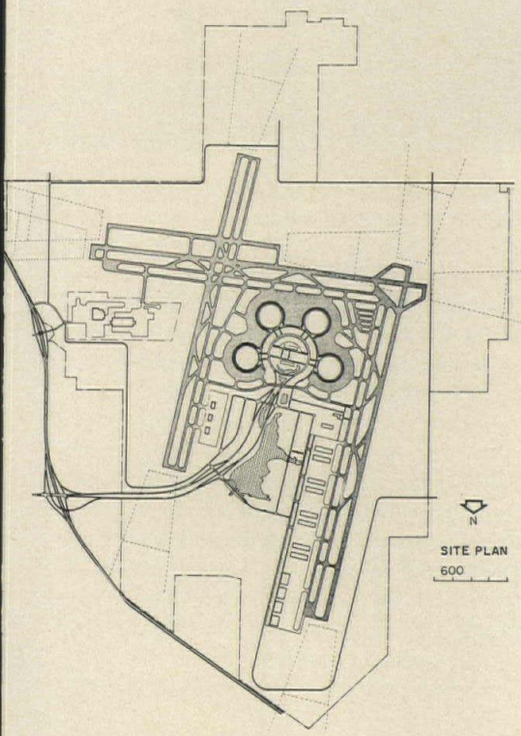


objectives **planning principles** **criteria**

KANSAS CITY INTERNATIONAL AN AIRPORT DESIGNED FOR SHORTER WALKS, QUICKER SERVICE



Paul S. Kivett photo



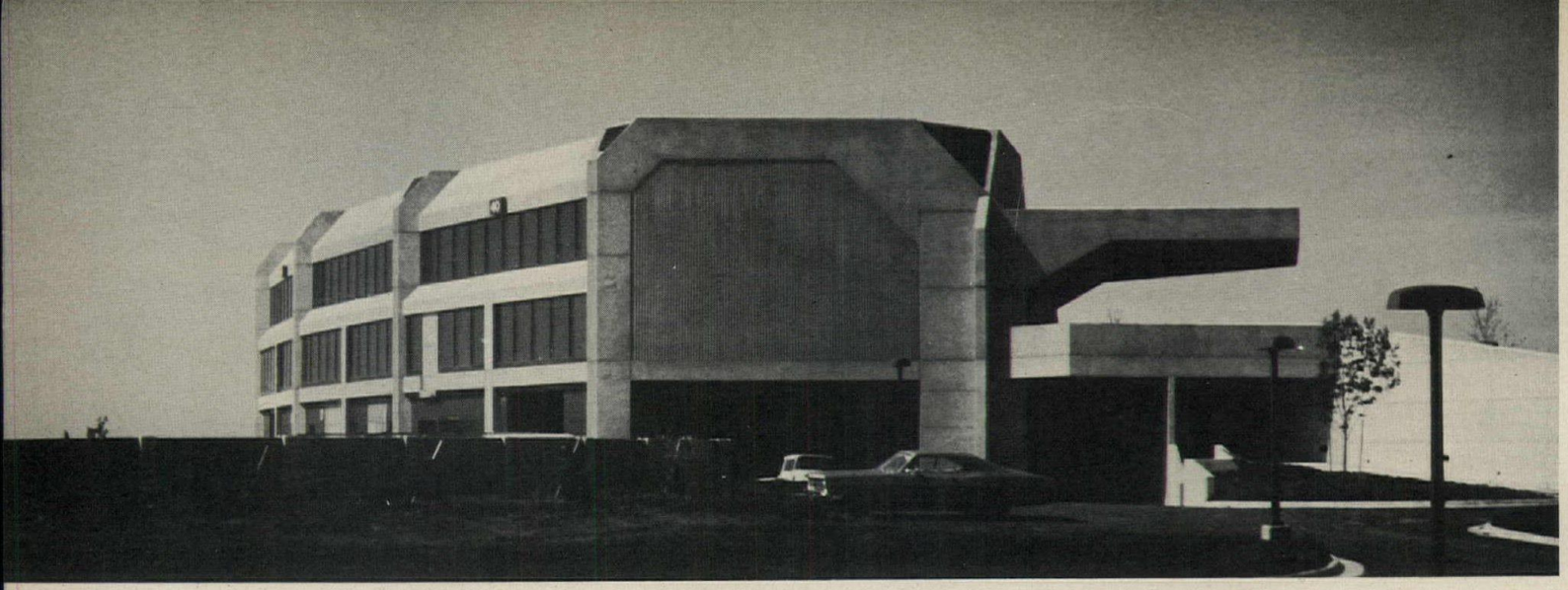
The 5,000-acre site, expansible by land purchase to 10,400 acres, is 19 miles by expressway from downtown Kansas City, Missouri. Cloverleaf configuration of access roads and close-docking terminals is a variation of the short-walk, decentralized, spine-oriented design.

The close coupling of land transportation and the airplane will gain important demonstration when the new $250-million Kansas City International Airport opens in November of this year. Architects Kivett and Myers in association with Burns & McDonnell Engineering Company began in 1965 to develop the master plan and concept which they call the "drive to your gate" system. This involves much more than the simple geometry of walking the 75 feet from highway curb to boarding gate. It is a completely integrated system that makes possible decentralized passenger processing, baggage handling and automobile parking on an individual gate position basis. Implicit in such a system is a massive coordination effort in adapting operating methods of the eight participating airlines and the expertise of multiple consultants in graphics and other information and technical areas.

Configuration of the terminal buildings adapts the highway-spine, terminal-docking, straight-through concept, bent by the logic and limits of the 5,000-acre site into three (eventually four) circles, each 1,000 ft in diameter. These are in cloverleaf tangency to a larger circle of access highway which surrounds the control tower, administration, utility and support facilities. Each terminal building encompasses about 80 per cent of its circle and provides 2,100 ft of curbspace serving 15 gates per unit.

Basic idea for the system was pre-

Midwest Research Institute photo



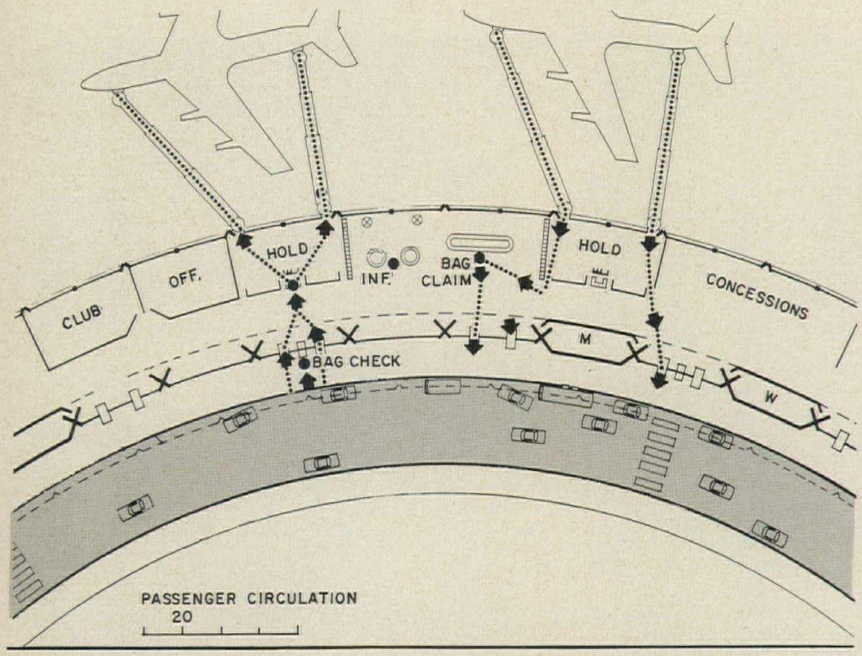
pared by Eldon E. Slaughter, director of system construction and engineering for TWA and first chairman of the Airline Technical Committee for concept development. Additional planning input was received from the other user airlines: Braniff, Continental, Delta, Frontier, North Central, Ozark and United. City officials, including Frank S. Pittenger, director of aviation, contributed at key points in the planning process, and a management information center, reminiscent of a NASA briefing room, was set up on the eighth floor of city hall by Midwest Research Institute, management consultants for the project.

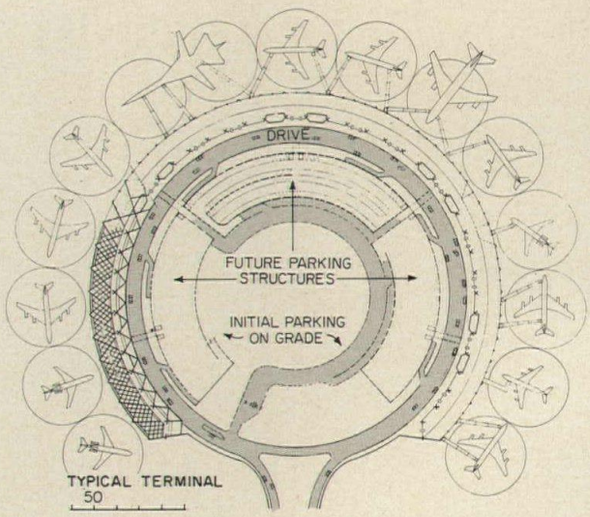
Specific segments of each terminal are exclusively assigned to the tenant airlines. This allows each carrier to develop its own processing and operational facilities within the general criteria established by the architect and the city's Aviation Department. Generally each airline provides separate ticketing facilities for one jumbo or two 707-size aircraft gate positions and baggage claim stations for every three or four gates.

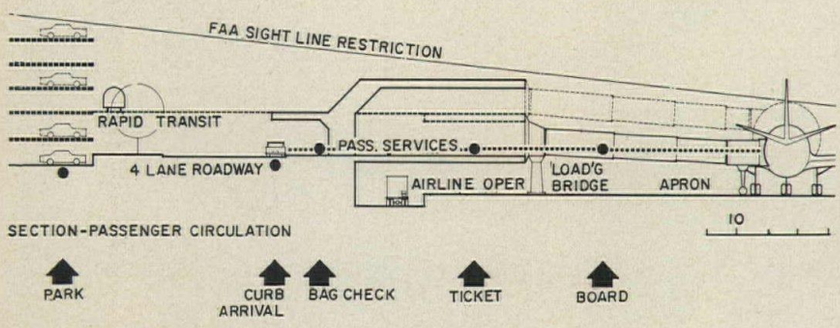
Relatively fixed gate allocations also help to simplify problems of information and approach signage. Highway signs direct the passenger to his airline as located in terminal A, B or C. Then he finds his flight number displayed at curbside opposite his proper gate. If he is driving himself, he drives to one of 900 grade-level parking spaces within the road loop. (The farthest row of cars is only 560 ft from his actual boarding gate and he just might park as close as 155 ft.) Layered parking structures with bridges over the roadway to terminals are planned for the future and will provide a combined total capacity of 16,800 cars for the four terminals.

Passengers arrive and depart at a common curb at the mid-level of the three-layer terminals. All passenger transactions and traffic occur at this level. The lower level contains utilities and apron service facilities, baggage sorting and distribution, personnel lockers and lounges and storage spaces. A mezzanine level above the passenger concourse will provide space for restaurants, special lounges or airline offices.

Nearly column-free space, 65 by 2,300 ft,

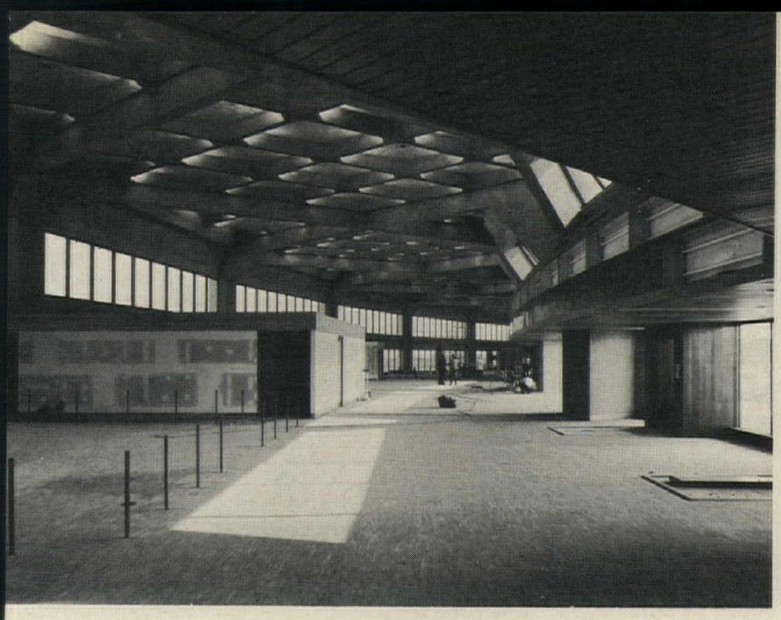






The "Drive-to-your-gate" principle is expressed as an integrated system of four-lane access drive to curbside check-in or departure pick-up at a common curb at KCI. (Arrival and departure occur at separate levels in some airports designed to a similar close-coupling principle.) Further, at KCI, decentralization of ticketing and baggage claim to multiple stations, each serving a minimum number of gates, is essential to the system, as is close-in parking. Shown in section at left is future layered parking structure with walkway over drive to mezzanine loading level that may be required for far-future plane configurations. Control tower sightline limits height of parking and terminal.

Some minimum walking distances: entrance to gate, 65 ft; parked car to gate, 155 ft; gate to bag-claim to exit, 125 ft.



is provided by a system of cast-in-place roof bents—42 for each terminal. The landside columns thus formed support a 25-ft cantilevered canopy over the curb and roadway. Ceiling structure is a waffle slab with diamond-shaped pans about 10 ft on a side. Cement and aggregates for architectural concrete were selected to produce a buff color typical of regional rock. Repetitive concrete elements with sand blasted and sealed finishes helped reduce construction costs to about $24 per square foot—not including land, fees, furnishings or tenant improvements.

While KCI will be one of the first operational demonstrations of the close-parking concepts earlier described, other airports here and abroad using those principles are nearing completion. Dallas-Fort Worth, for example (RECORD August 1970), takes advantage of a huge 18,000-acre site by straightening out the main access highway and deploying semicircular terminals (with separate driveway levels for enplaning and deplaning) in series along each side of the highway.

Some speculation on the future at KCI itself may be in order. Hannon Kivett has pointed out that working of the system could be improved if airlines can find a way to provide pre-ticketed passengers and the plane-meeting public with advance notice of both arrival and departure gate numbers prior to their journey to the airport.

Further, the discipline of the circle has brought hard lessons home to designers of all kinds of facilities including airports, hospitals and arenas. Where change and expansibility are inherent parameters of the program, the elegance of the optimum design radius confronts the increasing demands of events and shapes that crowd the inevitably fixed circumference. This is not likely to be a serious problem at KCI for years.

KANSAS CITY INTERNATIONAL AIRPORT, Kansas City (Platte County), Missouri. Owner: City of Kansas City, Missouri. Architects: *Kivett and Myers;* engineers: *Burns & McDonnell Engineering Company;* landscape architects: *Sasaki, Walker Associates* with *Kivett and Myers;* consultants: *R. C. Coffeen & Associates,* acoustical; *Wheel-Garon, Inc.,* lighting; *Architectural Graphics, Inc.,* graphics; *Richard C. Rich,* parking; general contractors: *Dell E. Webb,* terminal buildings; *Sharp/Kidde,* central control area.

Paul S. Kivett photos

KE-AHOLE AIRPORT BUILDS AN INTERISLAND OASIS ATOP HAWAIIAN LAVA FLOW

Like a Polynesian village set in the midst of a desolate plain, the interisland terminal of Ke-ahole airport forms an oasis of hut-like clusters and palm-decked landscape in the midst of a plateau of lava from Mt. Hualalai on the Kona coast of the "big island" of Hawaii. The airport, opened in the summer of 1970, is about five miles north of Kona town and fifteen miles north of Kona airport, which it replaces.

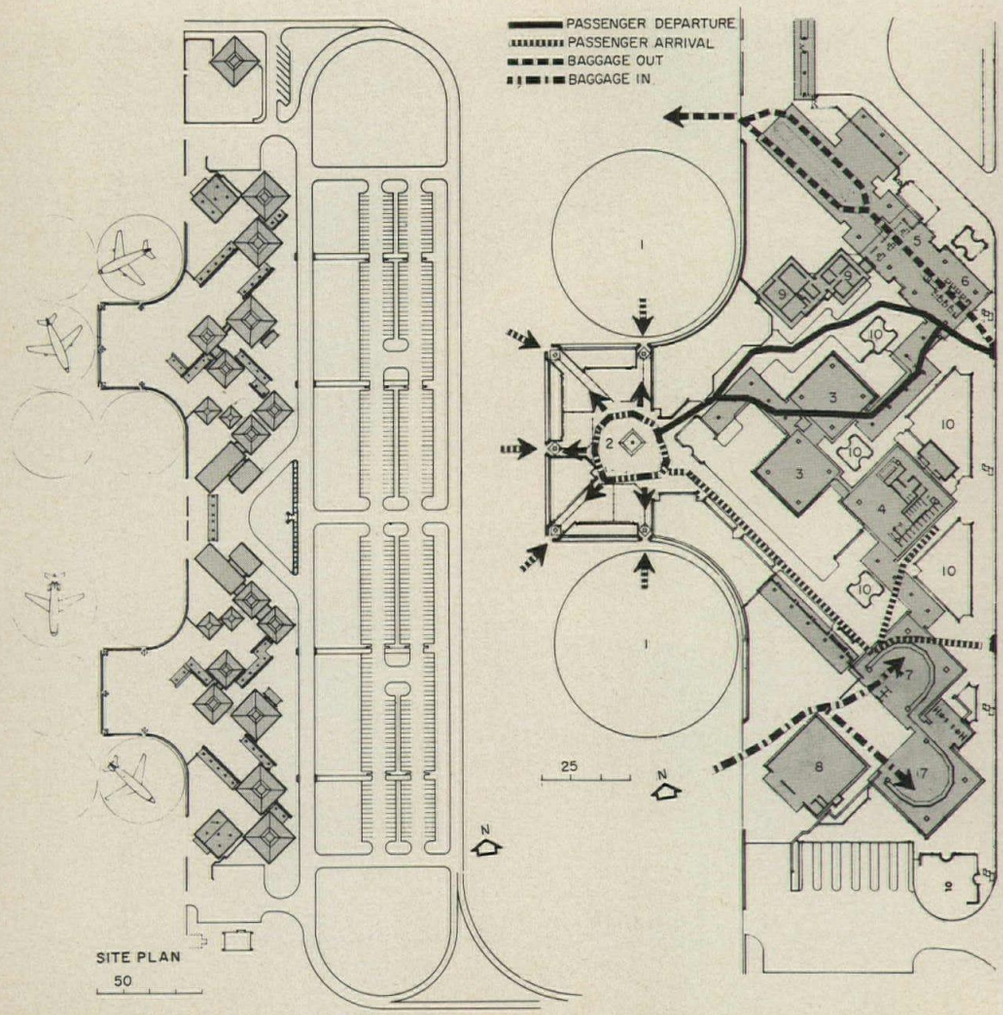
The design objective was to create a Hawaiian environment preserving the cultural and physical heritage of the islands within the context of land and air traffic of the jet era. Restraints on design at the interisland were: the five million dollar budget, the 4½ months allowed for design and construction documents and the high construction cost due to a lack of skilled craftsmen and conventional construction materials in western Hawaii.

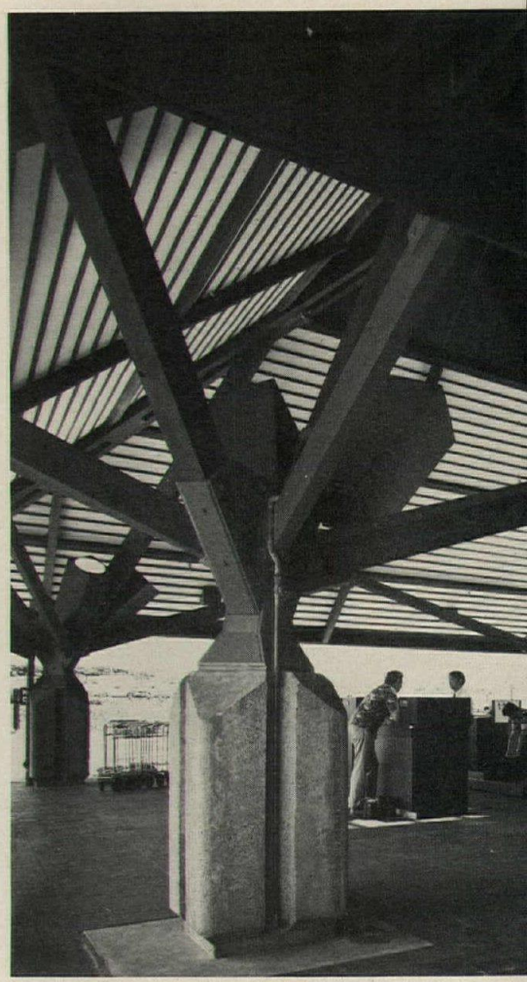
The solution was to devise a construction system adaptable to available labor skills using materials and colors indigenous to the area. A series of 15 clustered huts, interconnected by covered walkways was developed. The relatively dry climate and comfortable year-round temperature enabled the buildings to be open to the moderate trade winds for natural ventilation.

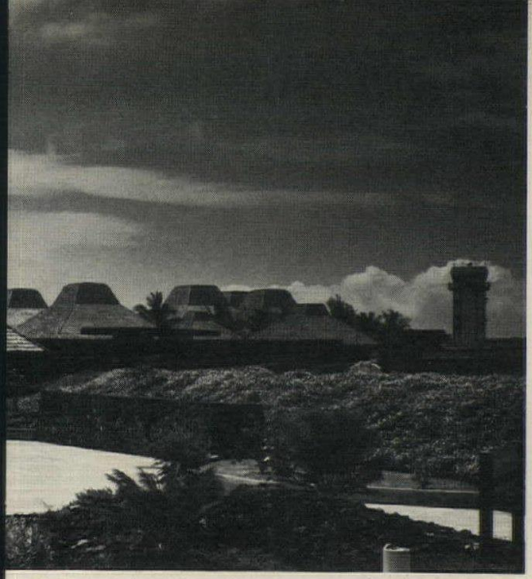
A system of two roof sizes to fit all basic arrangements was developed. The larger roof houses baggage claim and lounge areas, and the smaller roof houses ticketing activities. The roof shape achieves simplicity in keeping with the islands, and the use of laminated beams in the framing of roof trusses permits large spans to be supported by pin connections at the tops of concrete columns in each structure. The beams were pre-cut at the factory for assembly at the site. Roof decking also came in 4-ft modular width, so that assembly of the structures is as simplified as possible.

Construction began in May 1969. As the field force gained experience with the repetitive structural system, work progressed rapidly to completion in December 1970.

The airport's 6500-ft runway and terminal foundations were literally carved out of lava rock. Representatives of Bechtel Corporation, who served as engineering and construction managers on the project, reported: "The spot we had to reach to start





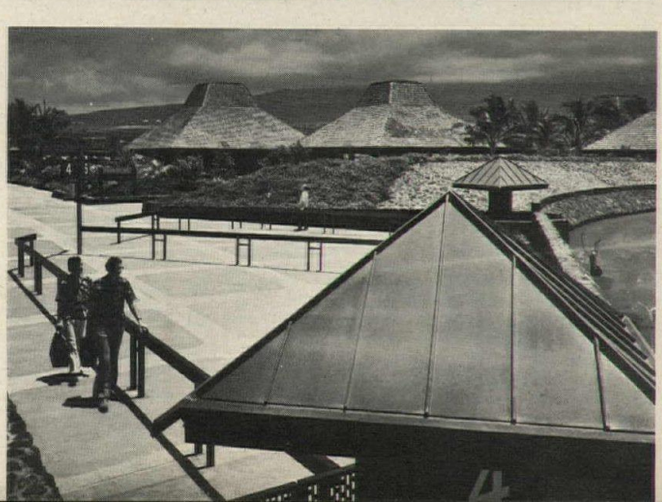


work was eight miles from where the graded road ended. On our first visit, the lava formations were so abrasive that nearly three hours were needed to cover the distance by jeep." Despite its difficulties, lava was used as construction material for blast-retainers and landscaping walls, enhancing the native aspect of the complex.

INTERISLAND TERMINAL, KE-AHOLE AIRPORT, KAILUA-KONA, HAWAII. Owner: State of Hawaii, Department of Transportation. Architect: *Aotani & Oka Architects, Inc.; George Walters & Assoc.*, landscape; engineers: *Nishimura & Oki Engineers, Inc.*, structural; *Lange & Thom, Inc.*, mechanical; *Douglas V. MacMahon, Ltd.*, electrical; *Stanley S. Shimabukuro & Assoc.*, civil engineer; consultants: *Dr. Iwao Miyake*, acoustical; *Tom Lee Design, Inc.*, graphics; *Edward K. Harada*, cost; general contractor: *Glenn Construction Corp.*

Julius Shulman photos

Open-air terminals topped by shingled roofs supported by glulam trusses give an impression of spaciousness, but the actual walking distance from parking to ground level arrival and departure aprons are less than those at most airports. Hut-like buildings are in two symetrical clusters providing airline identity and full service at two apron areas directly across the approach drive that separates the terminal buildings from close-in-parking. The Airport Beautification Award program of the FAA gave Ke-ahole, Airport a certificate of commendation in March 1971.



TAMPA INTERNATIONAL AIRPORT
A FRESH LOOK AT
MAN AND MACHINE IN TRANSIT

The wholly new terminal complex at Tampa International Airport, opened for business in April 1971, is an optimum solution to some basic design directives by the Hillsborough County Aviation Authority: to keep walking distances short; to make apron and docking facilities for all sizes of aircraft both efficient and expansible; to accommodate both the automobile and the aircraft as machines for the speed and convenience of travelers; to simplify and clarify both highway approaches and internal operations; to say "Florida" in every physical aspect, inside and out.

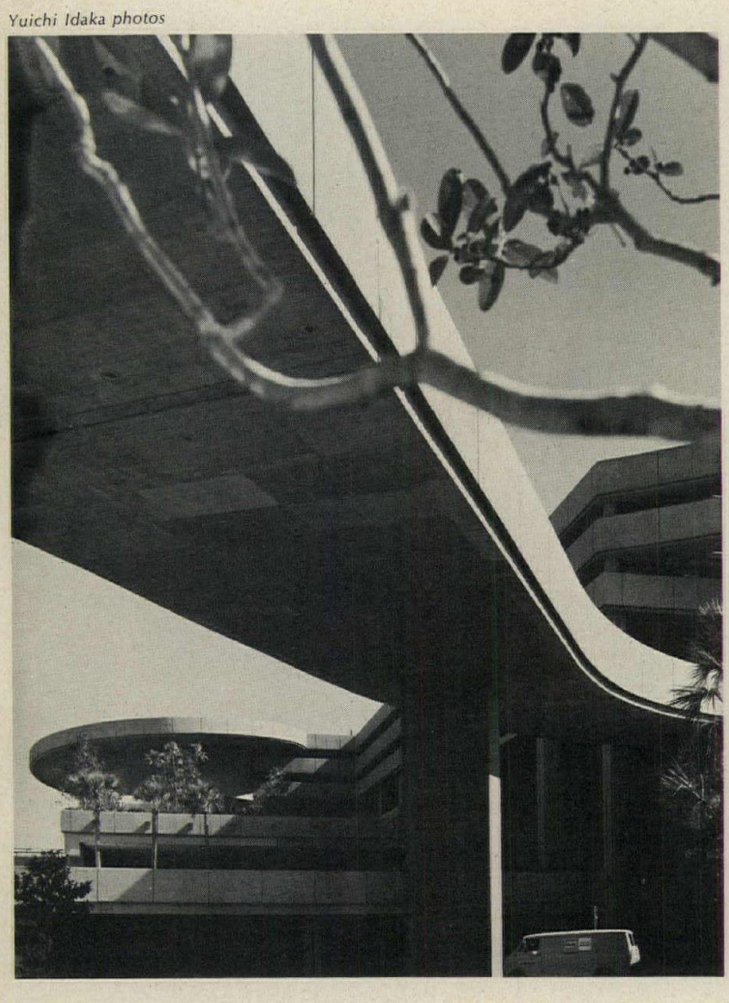
The $80-million complex represents more than eight years of study, planning and construction. The landside/airside concept of its design is based on functional separation in five separate buildings. A central landside building, 300 by 450 ft, provides three levels of ground-based passenger processing and amenities, topped by three levels of parking structure. Four flanking satellite airside buildings provide space for servicing, loading and unloading of aircraft. These satellite buildings are connected to the third level of the landside building by straight, 1,000-ft trestles, each bearing two tracks on which electrically operated buslike vehicles (styled by Eliot Noyes for Westinghouse) shuttle passengers on 40-second rides between buildings.

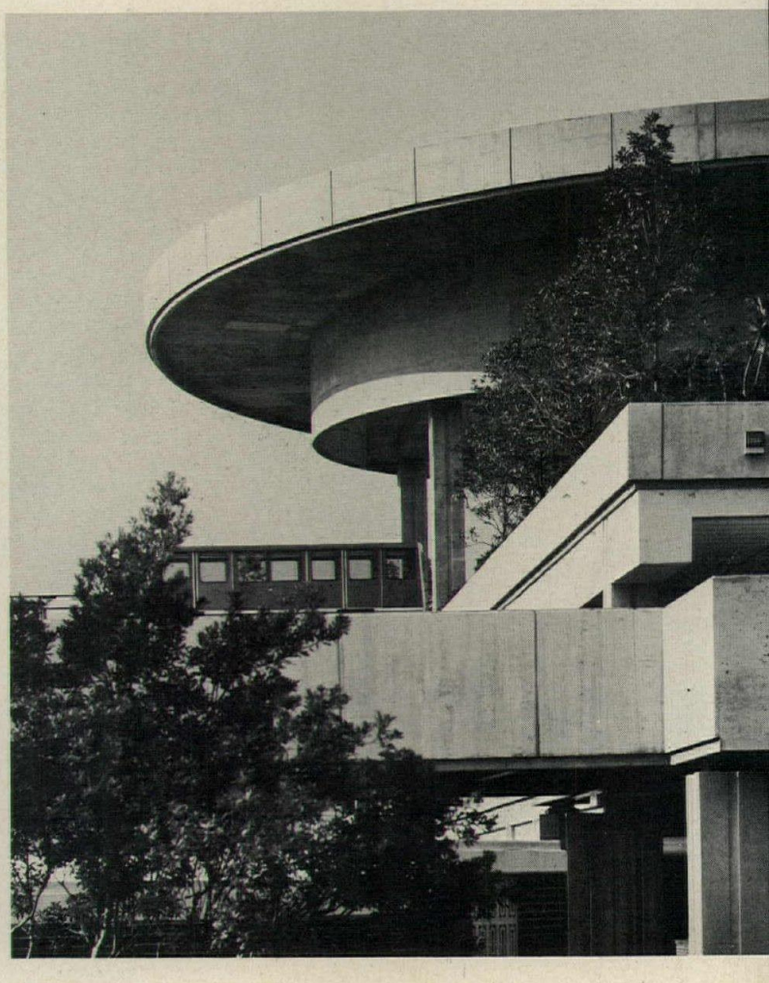
It is this shuttle system, a $5-million commitment, that makes the whole system work. Not only does it remove the airside satellites far enough away from landside activities to permit the free maneuver and parking of planes, but the 20-ft clearance of trestles over the ground permits road access on all four sides of the landside building. This provides about 1,200 ft of curb front at both enplaning and deplaning levels of the terminal. Trestle clearance also permits tug drives and service roads to circulate freely.

While the airside satellites are nearly a half mile apart, no passenger has to walk more than seven hundred feet to change from one line to another. He simply takes the shuttle to the landside terminal, crosses the transfer lobby and takes another shuttle to his second airline.

The second walk-saving feature of the new Tampa terminal is the vertical stacking of passenger-oriented activities in all build-

Yuichi Idaka photos

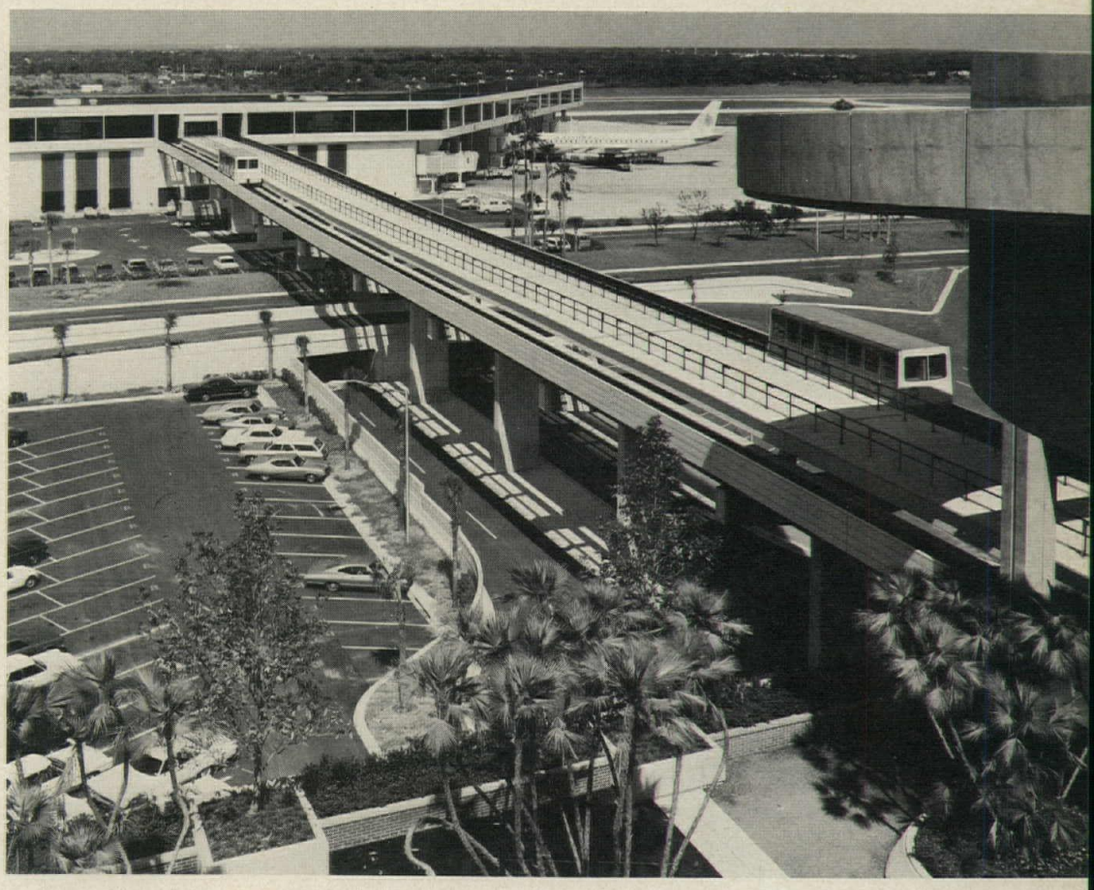


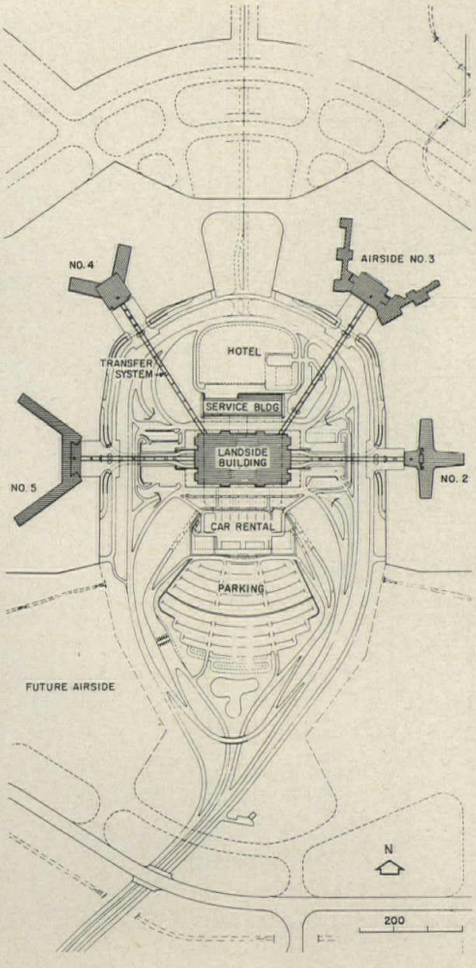


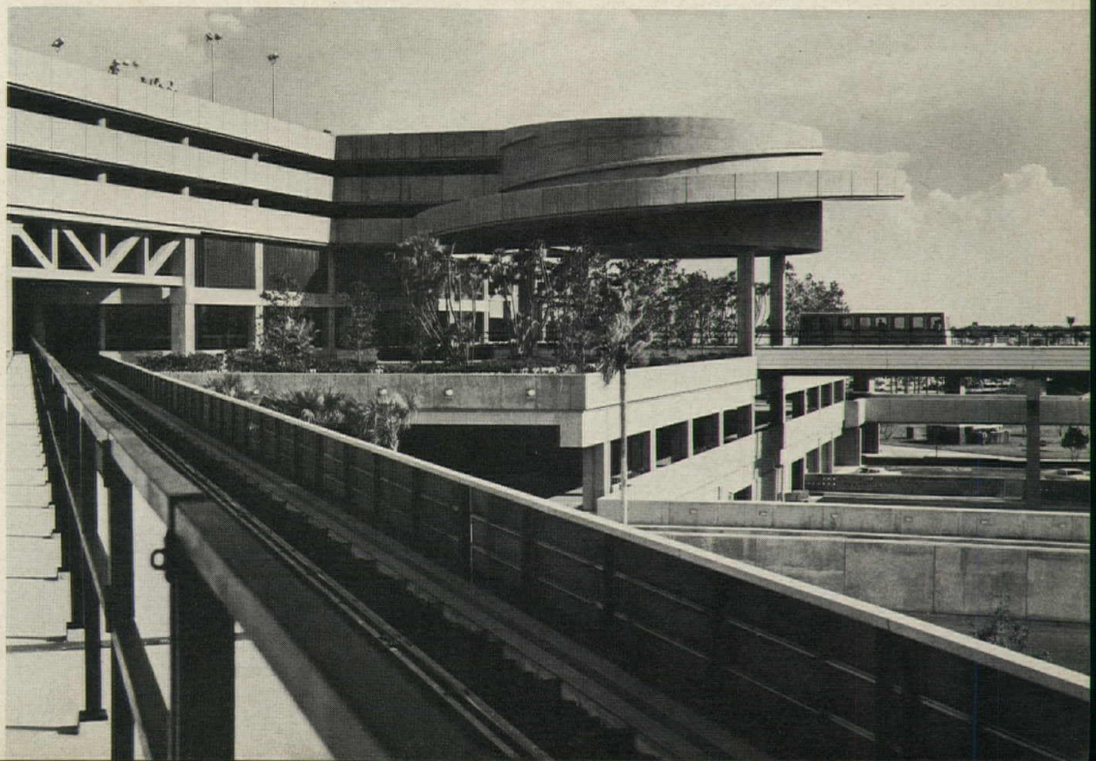
ings. Vertical transport between levels in the landside building is accomplished by sixteen elevators and ten moving stairs with a combined capacity of almost two thousand passengers per minute in either direction, up or down.

The first phase now in service is designed to handle eight to ten million passengers a year. Ultimate expansion will add two more airside satellites and three more parking decks for a design capacity between 12 and 15 million passengers a year. Present loading is about 3.1 million and the current phase is expected to be sufficient until 1980.

A major road-building project was preamble to construction of the terminal complex. A grade-separated parkway system,







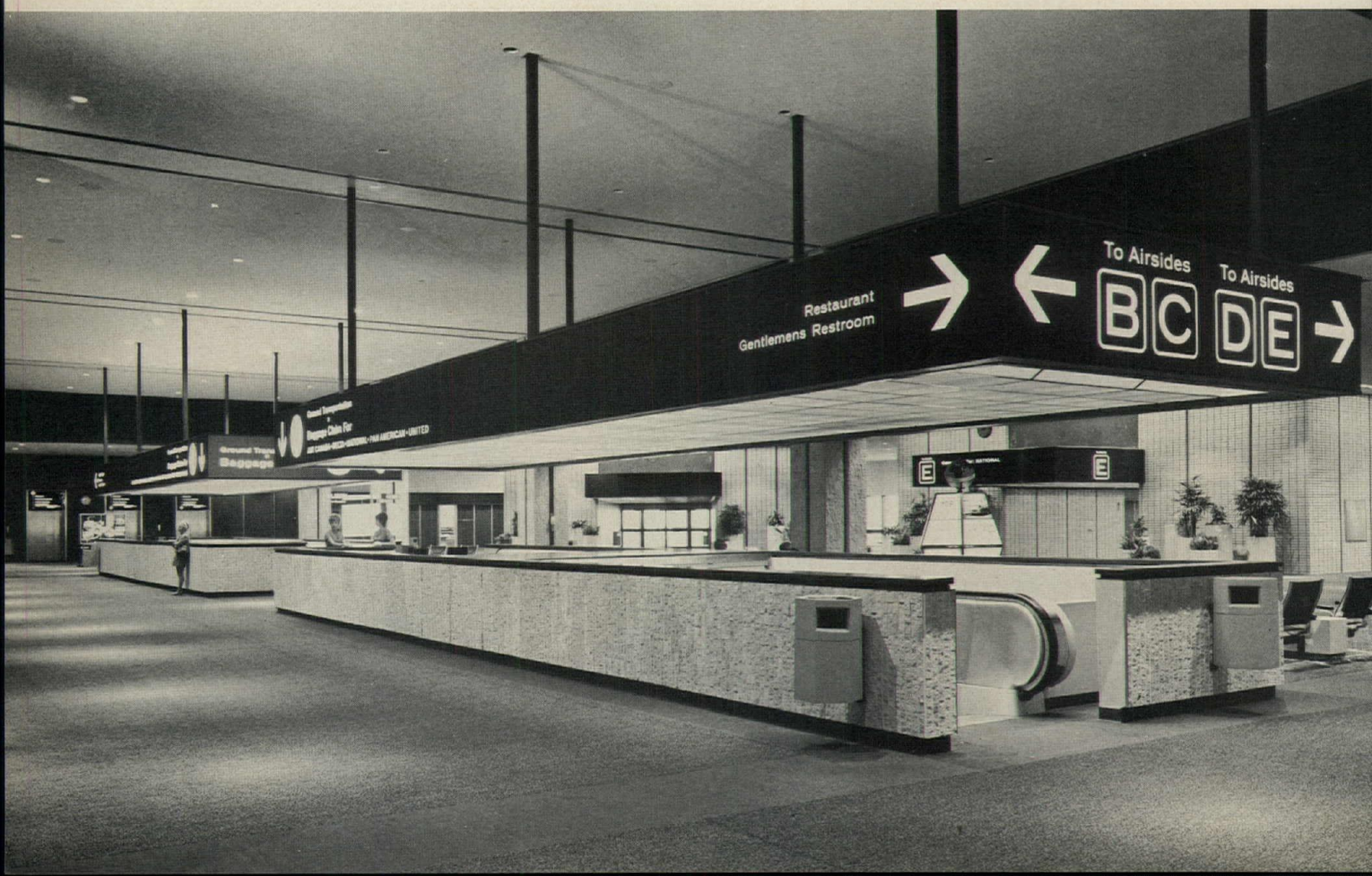
more than three miles long, serves the two curbside levels for arrival and departure. One of the first contracts let was for construction of an overpass capable of carrying an 850,000-lb aircraft over the access highway. Thus, both ground transportation and aircraft can maneuver full circle around the terminal without conflict.

Because of the double-fronted, two level curbside design, the aviation authority, in concert with graphics consultants, decided upon a color-coded directional sign system. Airlines grouped in the north half of the landside terminal are in the red sector. Those in the south portion comprise the blue sector. The parkway signage system and internal directional guides make use of the color code as well as printed message in a truly unified design concept.

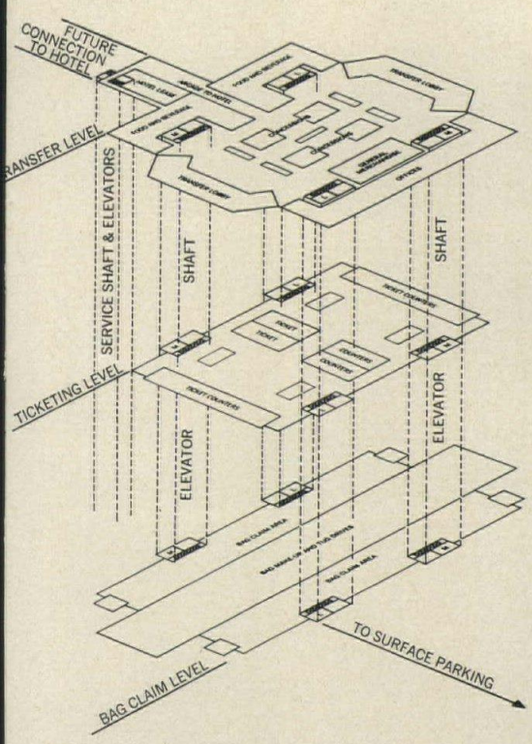
Search for the optimum

Tampa's search for a new terminal design began in 1961 when airline passenger traffic reached one million per year. A further surge of traffic increase was expected because of the recently prior (1959) release by CAB of multiple route certificates for Tampa. These had already increased the number of user-lines from four to ten. The old single-level terminal could not be expanded for proper handling of expected loads. The Aviation Authority, having decided to develop a new section of the airport, commissioned its planning consultant, Leigh-Fisher Associates of San Francisco, to make a six-month analysis of other airports and, from their collective strengths and weaknesses, evolve something new and better. The Tampa concept then emerged as architecture uniting many disciplines.

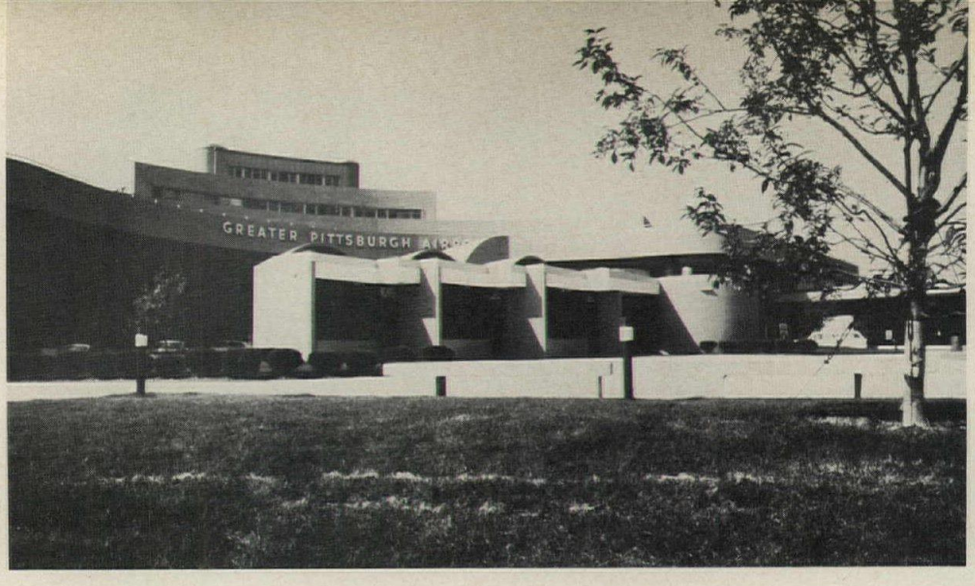
TAMPA INTERNATIONAL AIRPORT, Tampa, Florida. Owner: Hillsborough County Aviation Authority. Architects and engineers: *Reynolds, Smith and Hills;* general technical management: *J. E. Greiner Company, Inc.;* landscape architects: *Stresau, Smith and Steward;* interiors: *Joseph A. Maxwell Associates;* sculptor: *Roy Butler;* consultants: *Leigh Fisher Associates,* airport planning; *Architectural Graphics Associates,* graphics; *Applied Parking Techniques, Inc.,* parking; *R. C. Coffeen and Associates,* communications; *Westinghouse Electric Corporation,* transfer system; *Service Engineering Associations, Inc.,* building maintenance. General contractors: *McDevitt & Street Company.* RSH partner in charge: *Ivan H. Smith;* project designers: *Robert E. Boardman* (landside), *W. Stanton,* (airside).




Greeting Cards
Cameras Films


FUTURE CONNECTION TO HOTEL
TRANSFER LEVEL
SERVICE SHAFT & ELEVATORS
SHAFT
SHAFT
TICKETING LEVEL
ELEVATOR
ELEVATOR
TO SURFACE PARKING
BAG CLAIM LEVEL

GREATER PITTSBURGH AIRPORT REMODELS AND EXPANDS WITH INTERIM FACILITIES



The original program for expansion at Pittsburgh International Airport was outlined by the Department of Aviation working with consultants Landrum & Brown of Cincinnati, Richardson, Gordon Associates of Pittsburgh and TAMS of New York. As architects and planners of the remodeled and expanded interim facilities, the firm of Tasso Katselas developed and expanded that original outline into present facilities.

Traffic at the Pittsburgh Airport exceeded five million passengers per year in 1970 and is projected to about 18 million for 1980. This will represent about 248,000 commercial aircraft operations.

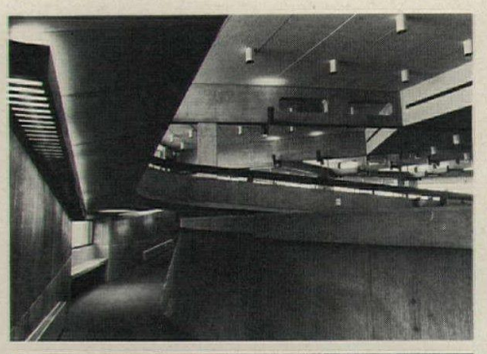
The existing Greater Pittsburgh International Airport is twenty years old. The only addition had been an international wing which forms the stub of the new west dock (see plan). Katselas designed new interiors for this wing as part of the overall interim facilities program.

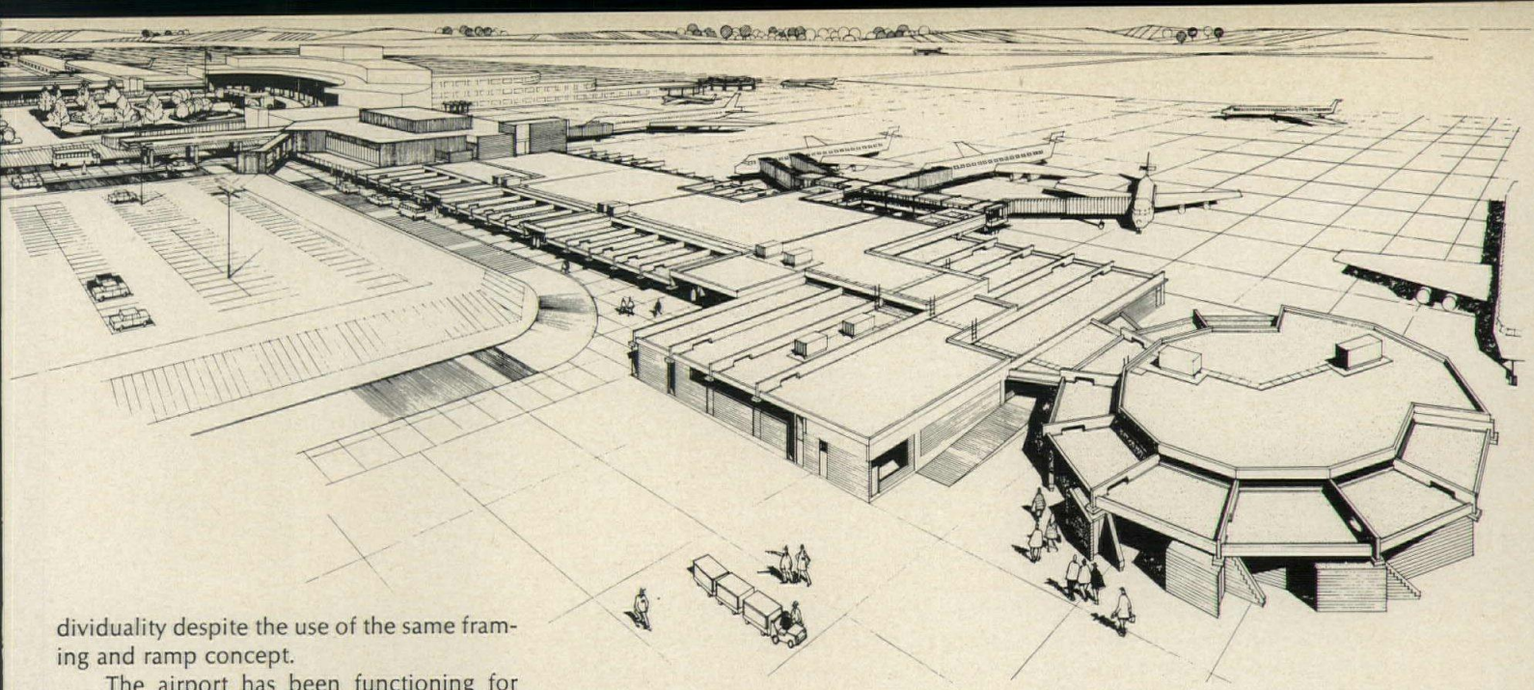
The objective of the interim program was to provide a facility that would last eight to ten years until a new terminal for the area can be planned and built. Therefore, the new structures for the present project were developed as an inexpensive, yet dignified solution to short-term projected traffic loads, taking advantage of existing facilities whenever possible.

The whole expansion project involved extensive remodeling of the field level of the existing terminal, adding major extensions at the south and east docks, a new wing on the west dock, and a new car rental pavilion on the land side of the existing central terminal. The total area developed was approximately three hundred square feet, providing thirty-seven gate positions and other associated, baggage handling, ticketing and associated spaces.

Coupled with the interior renovation of wing extensions were coordinated programs in graphics and landscaping. Since all extensions had to be made at the field level, a means had to be devised for loading to aircraft through jetways from the ground floor. This was accomplished by a series of internal ramps which act as departure balconies from the field level. These balconies were linked to the aircraft by the conventional jetway system. Each docking rotunda was handled differently so that the airlines maintained in-

Mark Perrott photos

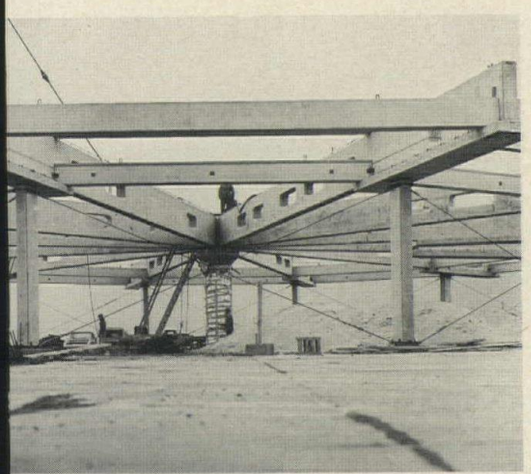


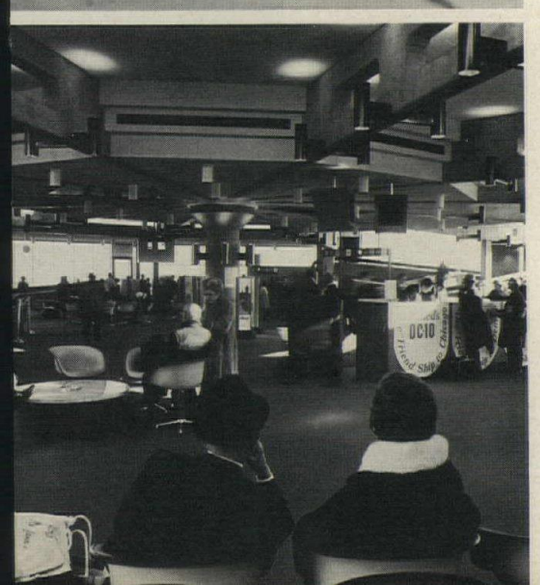


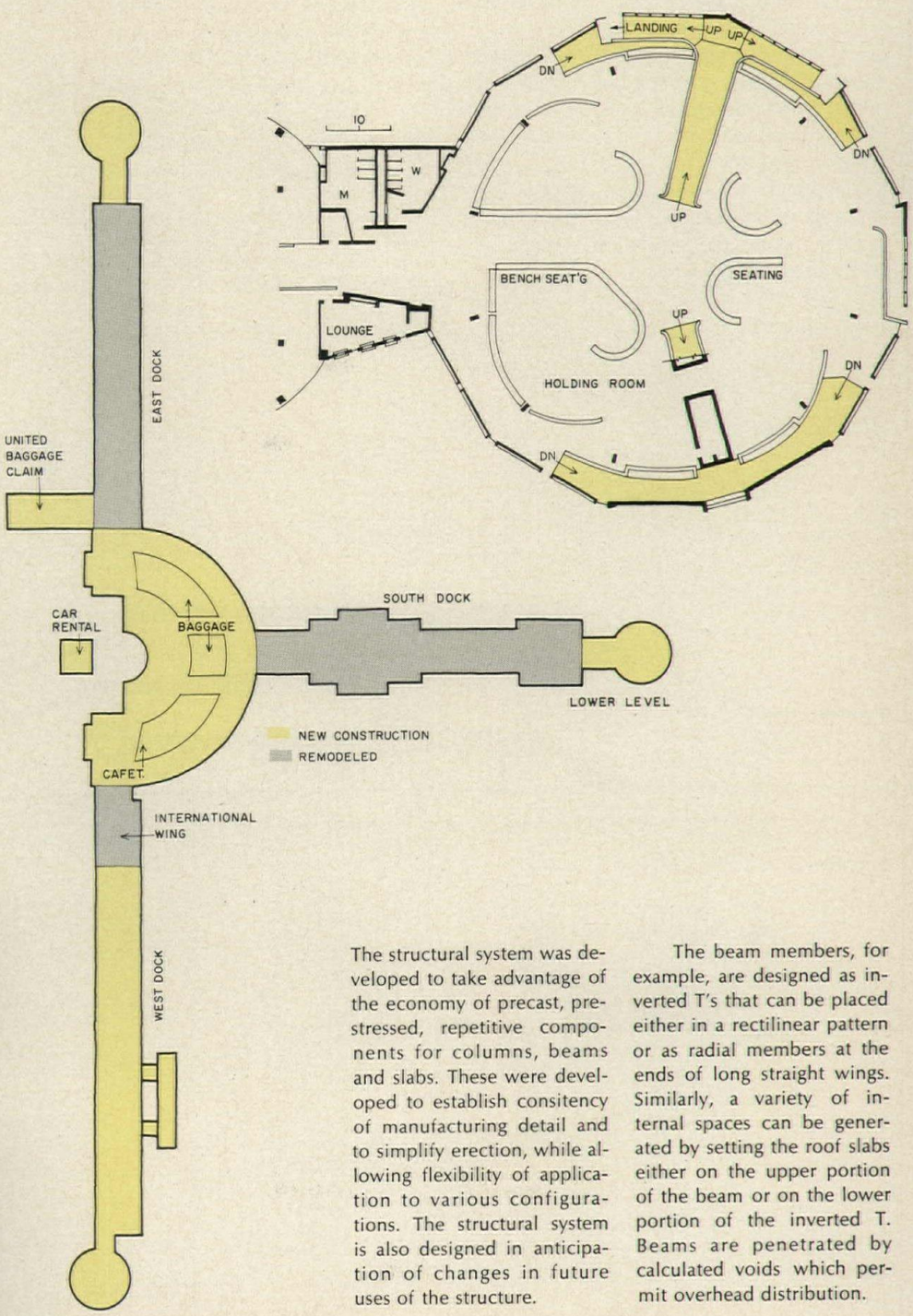
dividuality despite the use of the same framing and ramp concept.

The airport has been functioning for several months, and the evaluation of such major decisions as carpeting in all major areas and the use of the unusual ramp system has resulted in enthusiastic response—and even fan mail to the county authority.

GREATER PITTSBURGH INTERNATIONAL AIRPORT, Moon & Findlay Townships, Pennsylvania. Owner: Allegheny County Department of Aviation. Architect: *Tasso Katselas;* engineers: *R. M. Gensert Associates,* structural; *Hornfeck Engineering,* electrical; *Sanders & Thomas,* mechanical; landscape architects: *Joseph A. Hajnas & Associate;* consultants: *John F. Maguire Associates,* lighting; *Paul Planert Design Associates,* interior; *Francis R. Esteban,* graphics; general contractors: *Navarro Corporation, Rea Construction Co., Mosites Construction Co.*



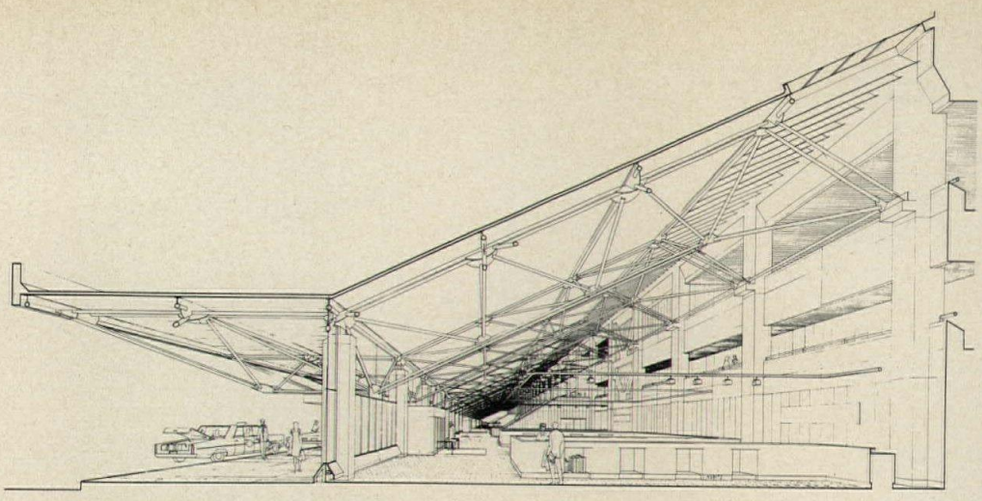




The structural system was developed to take advantage of the economy of precast, prestressed, repetitive components for columns, beams and slabs. These were developed to establish consitency of manufacturing detail and to simplify erection, while allowing flexibility of application to various configurations. The structural system is also designed in anticipation of changes in future uses of the structure.

The beam members, for example, are designed as inverted T's that can be placed either in a rectilinear pattern or as radial members at the ends of long straight wings. Similarly, a variety of internal spaces can be generated by setting the roof slabs either on the upper portion of the beam or on the lower portion of the inverted T. Beams are penetrated by calculated voids which permit overhead distribution.

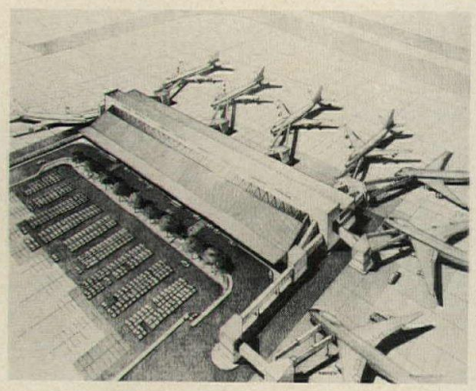
NEW INTERNATIONAL TERMINAL AT BOSTON'S LOGAN AIRPORT HAS MANY INNOVATIONS



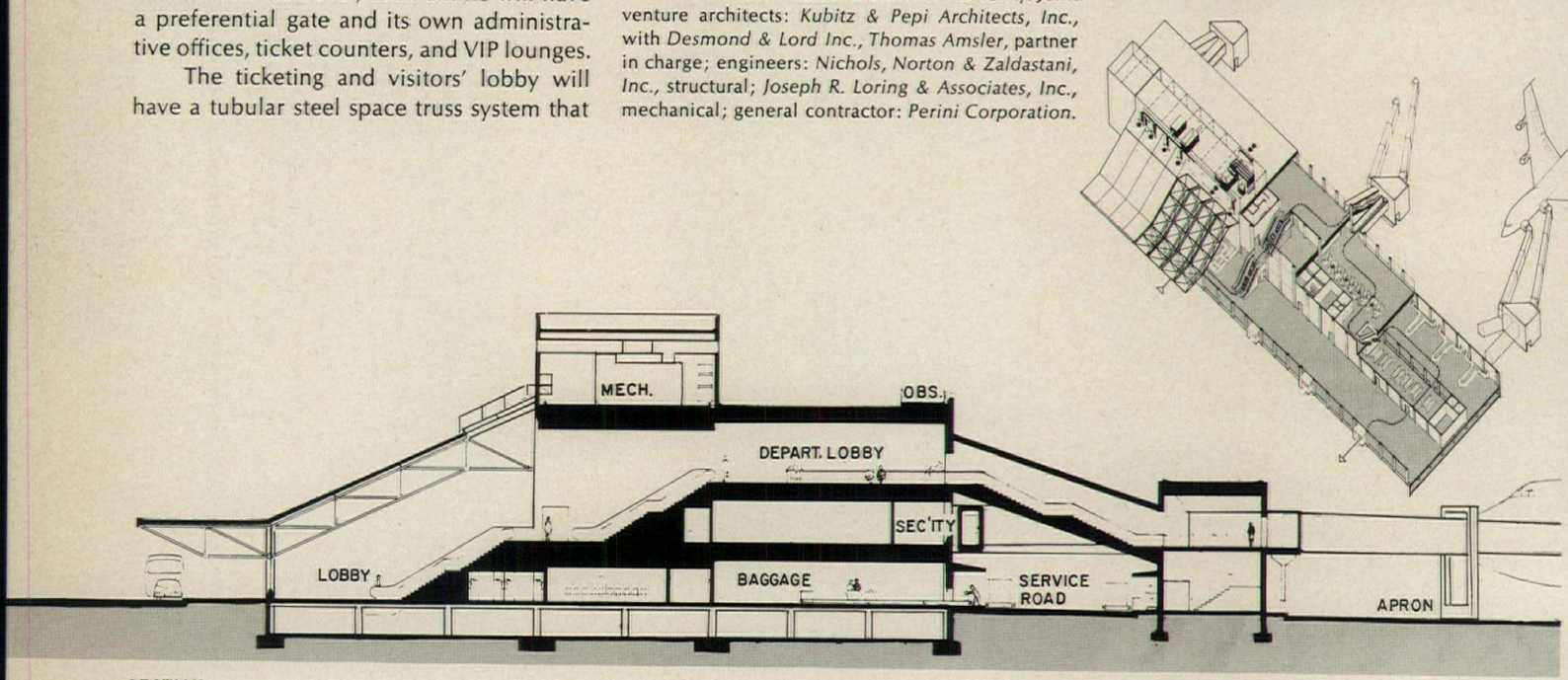
Now under construction at Boston's Logan Airport is the new International Terminal which will be linked by a passageway to the building now serving as the international wing. As the steel frame nears completion, one can appreciate the linear, terraced form of the new structure.

Planned to accommodate eight simultaneous jumbo jet operations, the new terminal embodies several innovations. One is the common waiting room running the full length of the structure (792 ft long by 56 ft wide) which will be shared by all of the tenant airlines. However, each airline will have a preferential gate and its own administrative offices, ticket counters, and VIP lounges.

The ticketing and visitors' lobby will have a tubular steel space truss system that can be shop fabricated in large sections and erected on site. The terminal will be faced on the exterior and on the interior walls of the public space with a smooth flush skin of porcelain enamel panels and glass. In general, concern for maintenance and corrosion resistance as well as field assembly were prime factors in the selection of the materials. The three-level operating section of the terminal, with out-rigger satellite loading connections, is designed for flexibility.



NEW INTERNATIONAL TERMINAL BUILDING, LOGAN INTERNATIONAL AIRPORT, Boston, Massachusetts. Owner: Massachusetts Port Authority. Joint venture architects: *Kubitz & Pepi Architects, Inc.*, with *Desmond & Lord Inc., Thomas Amsler*, partner in charge; engineers: *Nichols, Norton & Zaldastani, Inc.*, structural; *Joseph R. Loring & Associates, Inc.*, mechanical; general contractor: *Perini Corporation*.



SECTION

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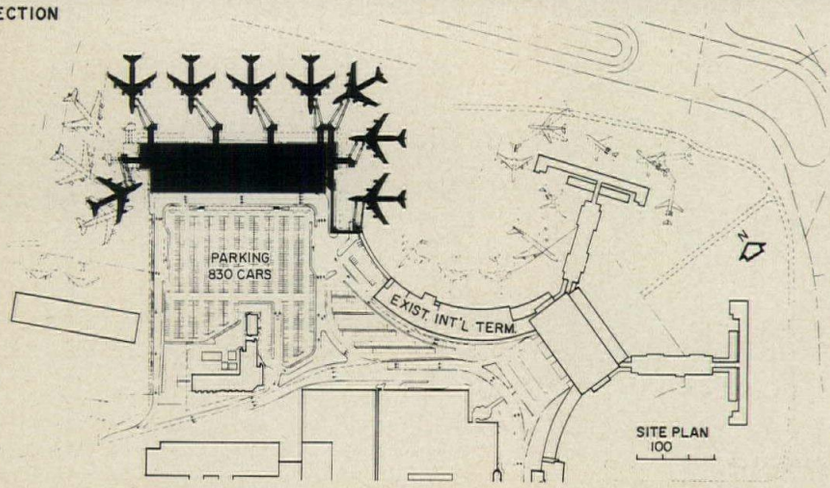


Since peaks of arriving and departing do not coincide, a single level of access road will provide 1000 feet of curb space, which may be doubled by the addition of a pedestrian island.

Departing passengers will enter at the street level, check their luggage, and travel by escalator to the third floor waiting room. When the flight is ready to depart, the travelers will proceed to a second floor "satellite" and then via a loading bridge to their airplane. Arriving passengers will be processed through imigration inspection at the second floor and then claim their luggage and clear US Customs at ground level.

The building has a central spine from which all mechanical systems originate. Larger functions, such as lobbies, common waiting area, inspection and baggage claim, occur adjacent to it, while the smaller functions, such as offices, concessions, and wash rooms, are contained within the spine.

Entraliter® makes light of dark situations

Hard-to-light areas take on a bright new look with Hubbell Entraliters. These ruggedly built fixtures with prismatic refractors assure high quality illumination in nearly any difficult spot. Airports, loading docks, parking garages, recreational areas, industrial lots, walks between buildings . . . Entraliters belong in all these locations where safety and security is a must.

Choose from wall and ceiling mount styles for use with up to 400 watt mercury vapor or metal halide lamps, 250 watt high pressure sodium and up to 300 watt incandescent. Each is built and performance-proven to assure weatherproof operation and vandal-resistance. Hubbell's Entraliter II is constructed of one-piece, molded aluminum housing with protective top visor—an Entraliter exclusive. Lexan® polycarbonate shields are available for special applications as well as stainless steel wire guards and other accessories.

Contact Hubbell or your nearest authorized distributor for full details or a free lighting demonstration. All you've got to lose is a lot of darkness.

HUBBELL . . . lighting innovations to believe in.

HUBBELL **lighting division** ™

For more data, circle 64 on inquiry card

Lighting Division HARVEY HUBBELL INCORPORATED 2700 West Roosevelt Road, Broadview, Illinois 60153

Bright idea

Beautiful way to brighten washrooms and cut costs: new, polyester fiberglass-reinforced Bradglas Washfountains. The smart-looking, colorful, new Washfountain materials add a touch of drama to any washroom. They weigh up to 80% less than precast stone, yet have a strength-to-weight ratio approaching that of steel. The smooth, non-porous bowls and panels are highly resistant to abrasion, acid, and corrosion. And will not chip, peel, or flake. Vandalproof Washfountains serve up to eight people with just one set of plumbing connections, reducing installation costs as much as 80%. Washfountains also save about 25% on both floor and wall space. And because they're foot-operated, they're more sanitary than ordinary washfixtures. Circular and semi-circular 54" diameter models are available in your choice of decorator colors. For details, see your Bradley washroom systems specialist. And write for literature. Bradley Corporation, 9109 Fountain Boulevard, Menomonee Falls, Wisconsin 53051.

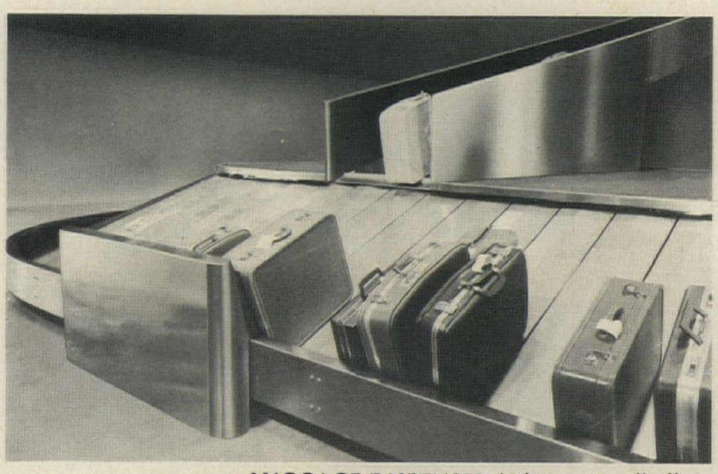
from Bradley!

BRADLEY

Leader in Washroom Fixtures and Accessories

For more data, circle 65 on inquiry card

For more information circle item numbers on Readers Service Inquiry Card, pages 225, 226

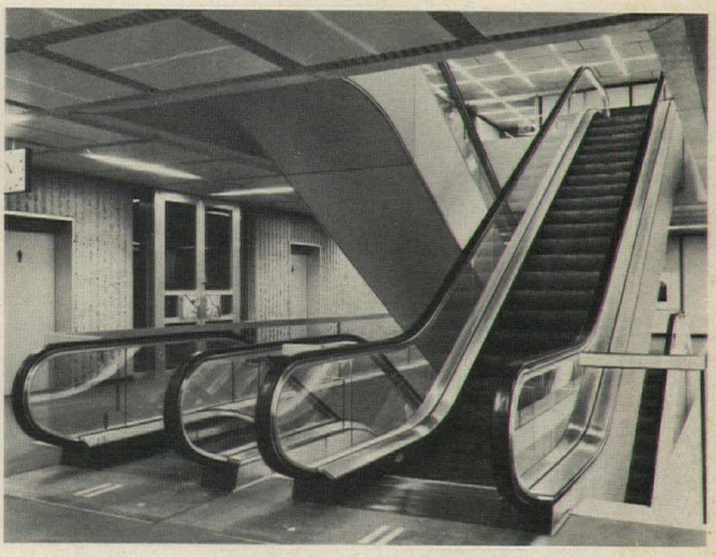


LUGGAGE DISPENSER / This unit will allow loading of all luggage from a DC-10, 747, and L-1011 onto a single claim device. It provides the architect with a wide choice of shapes and materials to match terminal design. A simplified drive arrangement reduces maintenance. A variety of shapes is possible, including oval, square or triangular. Space saving is achieved. ▪ Matthews Conveyor Div., Ellwood City, Pa.

Circle 300 on inquiry card

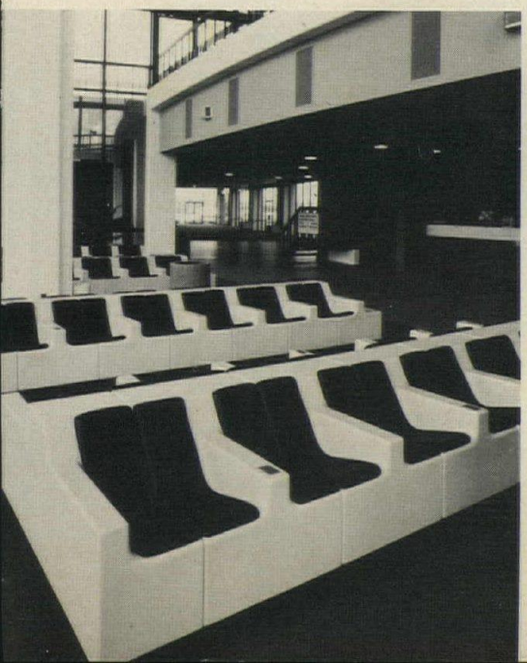
FREE-STANDING CRYSTAL BALUSTRADES / This option on the company's escalators is constructed of ½-in. structural glass. The balustrades have no obstructions from top to bottom and will harmonize with any environment. ▪ Montgomery Elevator Co., Moline, Ill.

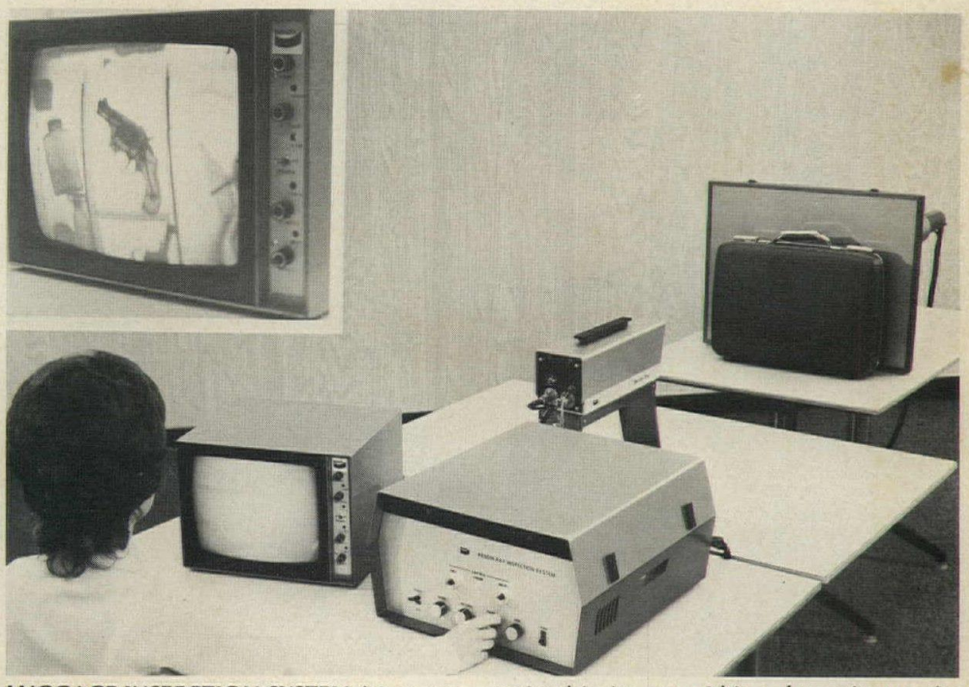
Circle 301 on inquiry card



PUBLIC SEATING/The *TMS* series is free of visible connectors, legs or other impediments to cleaning, thereby offering seating islands for simplified visual massing and easy maintenance. Upholstered and unupholstered seats are offered. For indoor and outdoor use, the seat modules are molded of integrally colored fiberglass. ▪ Group Artec, Los Angeles.

Circle 302 on inquiry card





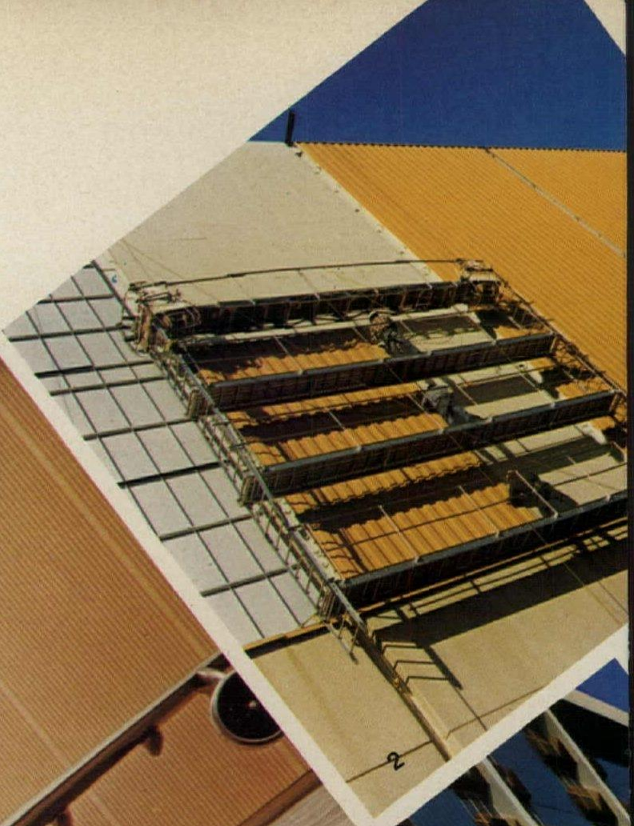
LUGGAGE INSPECTION SYSTEM / A system that uses a low-dose, short-pulse X-ray to detect illegal guns, explosives and other concealed contraband in airport luggage, briefcases and parcels has been developed. The portable radiographic inspection system is operated by one person who can be trained in its use within a few minutes. An example of baggage contents that can be seen on the system's video monitor is shown in the upper left of the photo. Contents of luggage will not be affected by the radiation. ▪ Bendix Corp., Southfield, Mich.

Circle 303 on inquiry card

More products on page 156.

A NEW LOOK AT INRYCO® WALL PANELS

1



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3

4

1. **Delta Air Lines, Inc. Maintenance Facility, Atlanta, Ga.** Low first cost, fast erection, easy repairability and image-building good looks dictated material selection here. 2. **Duane Arnold Energy Center, Iowa Power & Light Co., Cedar Rapids, Iowa.** Inryco Metal Wall Panels need no costly heavy equipment to install, and only light framing. Large pre-fitted panels speed the job and save time on labor. 3. **Office/Manufacturing Building, Diversey Chemicals, Des Plaines, Ill.** Inryco Panels were selected for durability, noise control, fire resistance. Installation was fast, economical. 4. **Low Income Housing, Kansas City (Kans.) Housing Authority.** Effective insulation, attractiveness and durability were key factors in selection of Inryco Panels for this application. 5. **Westinghouse Nuclear Components Plant, Tampa, Fla.** Inryco Wall Panels were chosen to resist high winds, sun-and-salt environment on this huge building. 6. **Centralia Plant, Pacific Power & Light Co. and the Washington Water Power Co., Portland, Ore.** Three years passed between installation of first and last wall panels. Yet there was no visible difference in color.

The end of the plain wall. Massive windowless walls have always presented a special design challenge. Most materials look out-of-scale, or they're too costly, or they're impractical for other reasons. But Inryco wall panels meet the challenge superbly, and with economy. With a dozen profiles to choose from, and hundreds of blends possible, they add visual interest to large flat surfaces—and afford striking contrasts with traditional materials. Metal wall panels are no longer a substitute. They have a new design validity of their own.

Colors that last. Inryco wall panels pre-finished with Duofinish 500™ retain their original color year after year. This is important in buildings such as power plants which may take years to complete, or where individual panels must be replaced. Both Duofinish 500 and economical regular Duofinish are applied in the-coil and oven cured for long-life color fidelity. Inryco also offers panels in COR-TEN weathering steel, and in stucco-embossed aluminum, to meet a broad variety of requirements.

They do their job well. Inryco wall panels are lightweight, easily and quickly installed. They meet all code requirements, and are comparable to other wall systems in U factors, fire tests and air infiltration tests. They are vermin-proof, dimensionally stable, and strong—to resist damage both in handling and in place. And liner panels are available to provide excellent thermal insulation and noise control characteristics.

More than just wall panels. Inryco offers a host of helpful services, too. They include engineering detailing, installation assistance, sub-contracting, testing, special product adaptation, and more. Inland-Ryerson district offices are located conveniently throughout the country to provide prompt, complete assistance for all your metal wall panel needs.

Send for free booklet. Colorful 16 page booklet, "A New Look at Inryco Wall Panels," is yours for the asking. Write Inland-Ryerson Construction Products Company, Building Panels Division, Dept. J, 4033 West Burnham Street, Milwaukee, Wisconsin 53201.

For more data, circle 66 on inquiry card

INLAND-RYERSON

General Offices: Melrose Park, Ill.

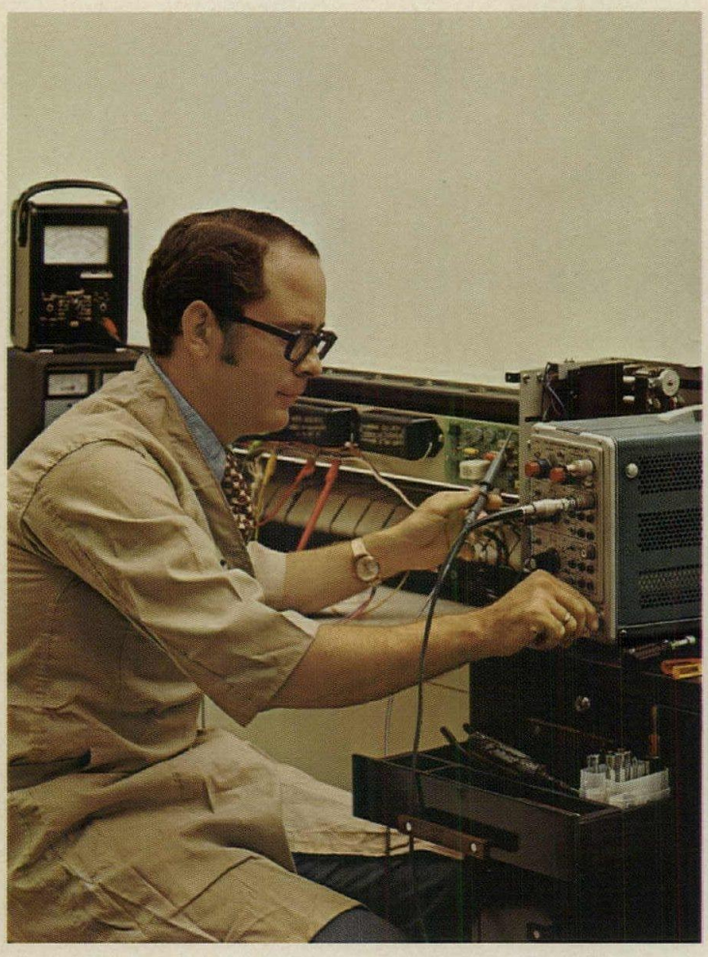
A member of the INLAND steel family

Bruning takes 5 extra your business.

First, we're the one company serving the total engineering graphics field with an extensive, continuing research and development program. This means we are continually offering you something better. New processes, new machines, new materials, new supplies, new services.

Second, only Bruning gives you a meaningful *choice* in engineering reproduction machines. Your Bruning man will demonstrate the capabilities of our Revolute, PD, and Copyflex machines—and then give you unbiased advice on which types and models will best serve your operations.

Third, we produce our industry's most complete lines of drafting media, papers, and supplies. And in addition to choice, you get Bruning's *consistent* high quality. For example, our years as a diazo machine builder give us unmatched experience in the development and production of diazo papers. And we share this know-how with you in advice on how to achieve



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superior reproduction of *your* documents.

Fourth, no one else even comes close to offering Bruning's kind of personal service. There are always Bruning sales representatives ready to help you. And our group service organization of over 1,700 people is close by to keep your Bruning equipment humming.

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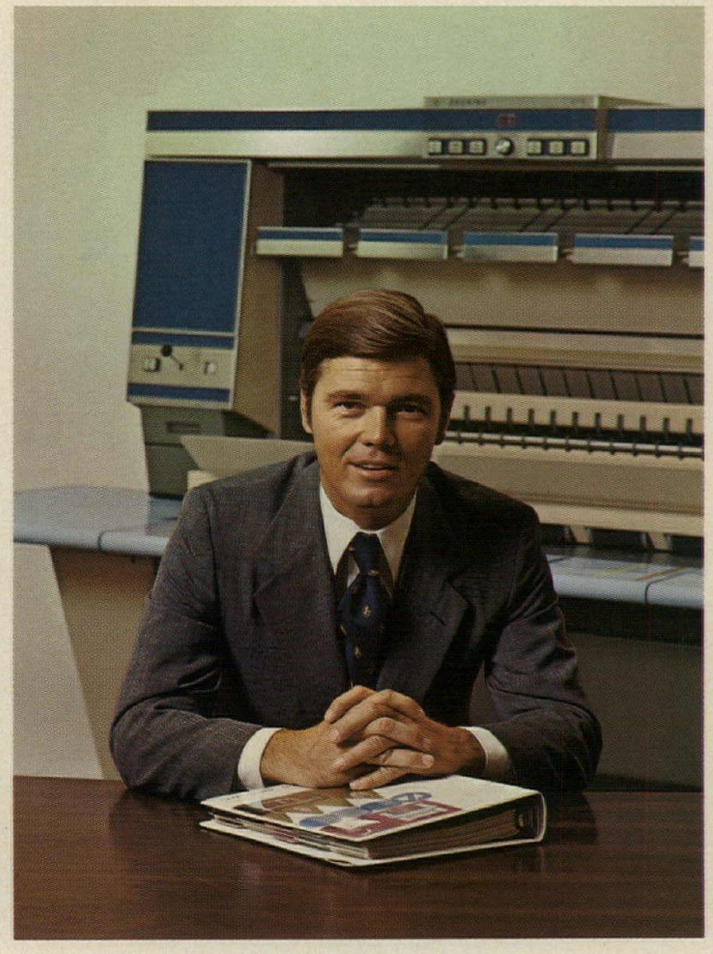
If you are not now a Bruning customer, give us the chance soon to take extra steps for you. Call your nearby Bruning Sales Office. Or write us at Bruning, 1834 Walden Office Square, Schaumburg, Ill. 60172.

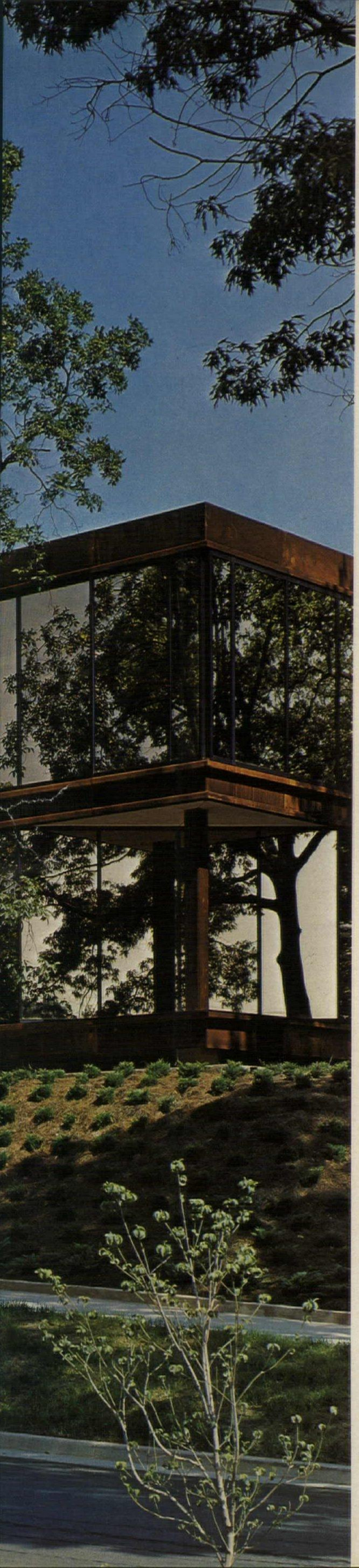
Your single best source in engineering graphics.



BRUNING AM

DIVISION OF ADDRESSOGRAPH MULTIGRAPH CORPORATION

For more data, circle 67 on inquiry card



Fits Glazing Functions Eight Ways

C-E GLASS

Names to remember for specific performance . . . whatever the light, heat, glare, sound or safety control you want to build into structural walls:

POLARPANE® Insulating glass units with 20-year warranted moisture-free construction.

POLARPANE® Reflective insulating units with pure gold mirror-like coating. Choice of insulating and visible light values.

ARM-R-BRITE® Insulated spandrel panels fully tempered and tailored to your color specifications. Also available heat strengthened as Ceramalite®

ARM-R-CLAD® Tempered safety glass. Clear, tinted and textured. All standard thicknesses from ⅛".

SOUND CONTROL POLARPANE® Hermetically sealed units designed for maximum sound transmission loss.

SUN CONTROL POLARPANE® Hermetically sealed units with rotating venetian blind between glasses.

MISCO® Wired glass listed fire retardant by Underwriters' Laboratories, Inc. In seven popular patterns.

MISSISSIPPI® PATTERNED GLASS In wide variety of general purpose and decorative patterns.

See our Catalog in Sweet's 8.26/Ce when you want to refresh your memory and consider patterns, colors or specifications.

For additional catalogs or information contact your local C-E Glass representative or write C-E Glass, 825 Hylton Road, Pennsauken, N. J. 08110.

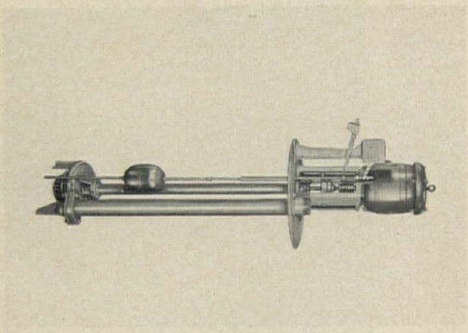
C-E GLASS

A SUBSIDIARY OF COMBUSTION ENGINEERING, INC.

For more data, circle 68 on inquiry card

Owner: Phipps Land Co.
Architect: Toombs, Amisano & Wells
Stopray #2016 glazed by PPG, Atlanta

continued from page 149

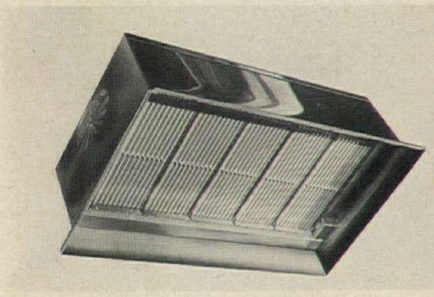


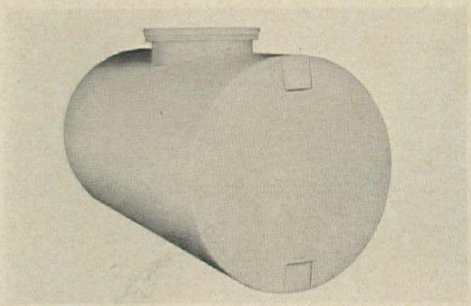
SUMP PUMP / Units handle drainage water or any liquid waste containing small, non-fibrous solids and assure uninterrupted service, according to the manufacturer. ▪ Weinman Pump Co., Hamden, Conn.

Circle 304 on inquiry card

SPACE HEATER / Gas infrared industrial space heaters have BTU input ratings of 30,000 up to 160,000 and all are AGA certified. All models operate on L.P. gas, and are controlled by thermostat or manually-operated switch. ▪ Detroit Radiant Products Co., Detroit, Mich.

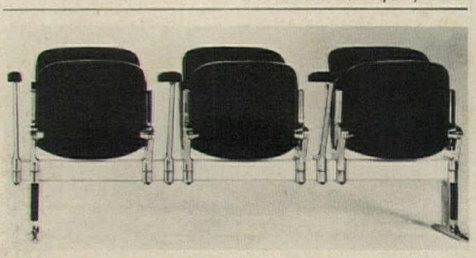
Circle 305 on inquiry card





STORAGE TANK / A horizontal tank of high-density polyethylene is said to be impervious to most chemicals and corrosion-resistant. Recommended for use as septic tanks, or for general storage and distribution of liquids. ▪ Molded Products Corp., Port Washington, N.Y.

Circle 306 on inquiry card

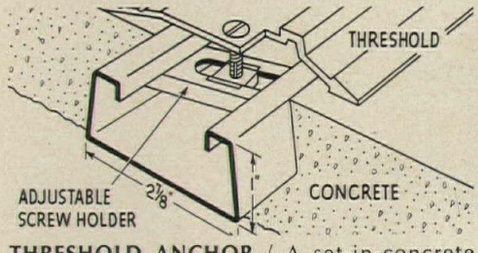


AUDITORIUM SEATS / The *Axis 4000* design features structural components and bases of mirror-finished aluminum. The seat is spring-loaded and tension can be adjusted. Offered in oak, walnut or rosewood veneer, six fabric colors, or eight vinyl colors. ▪ Krueger, Green Bay, Wis.

Circle 307 on inquiry card

FOAM INSULATION / A thermal and acoustical material, this product can be applied in walls, ceilings, floors, partitions, pipe chases and other building cavities. There is no further expansion after the material leaves the applicator gun. *U.F.C.-Foam* is cold-setting and forms a low-density, resilient plastic form. Fire-protective and moisture resistant, the product is non-toxic. ▪ U.F. Chemical Corp., Woodside, N.Y.

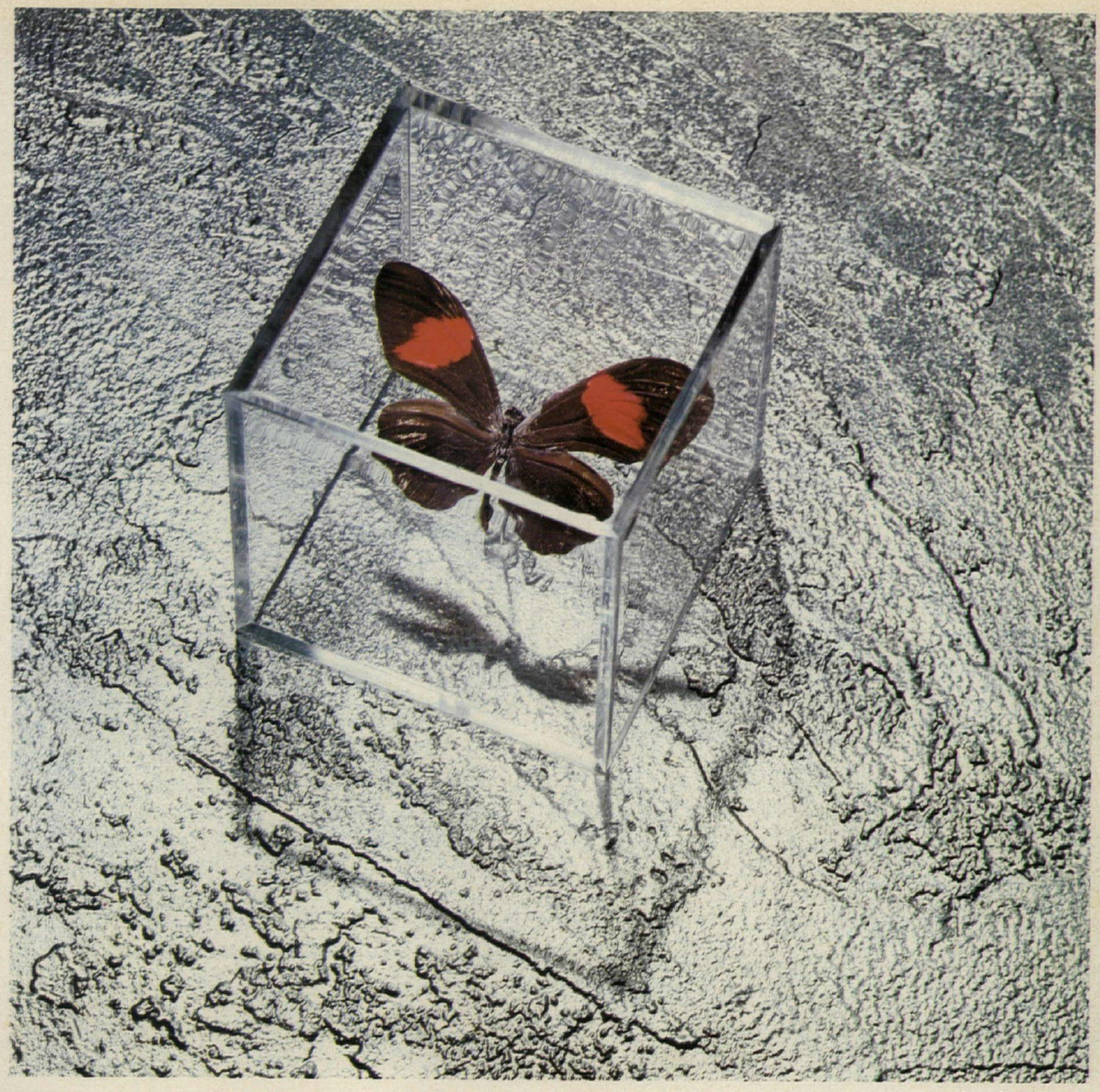
Circle 308 on inquiry card



THRESHOLD ANCHOR / A set-in-concrete threshold anchor that accepts any threshold, this product allows readjustment of the threshold at any time, up to ½ in. on either side of the center line. Anchor is galvanized steel, with danger of rusting reduced by cadmium-plated anchoring cam. Slight variations with floor do not interfere with setting the threshold, according to the producer. ▪ Pemko Mfg. Co., Emeryville, Ca.

Circle 309 on inquiry card

more products on page 168



Silver Slate, 760

The Silvery Spectacular

Silver Slate is a striking new dimensional laminate that can turn any surface into a shimmering swirl of color and motion. Its chrome-like brilliance and bold, deeply embossed texture bring it alive with highlights and shadows.

And the real beauty is that when you specify Silver Slate, you're selecting an exclusive FORMICA® brand laminate that stays bright and new looking for years. Designed for any vertical or light horizontal application, the durable surface resists scuffs, dents and scratches.

Silver Slate is one of eleven exciting new colors and patterns that make this a vintage year. Deeply textured dimensionals, fabulous Quatramatic woodgrains and subtle patterns. They're all part of the biggest laminate line available. See them all in Sweet's Architectural File 6.14/Fo. Contact your Formica representative or write Dept. AR-10

Leadership by design

FORMICA® BRAND
laminated plastic

For more data, circle 93 on inquiry card

Design out water hammer. Specify Wade Shokstops.

Water hammer is the shock caused by the sudden build-up of energy when a quick closing valve suddenly stops the flow of water in a piping system.

Specify Wade Shokstops to solve the problem.

These stainless steel water hammer arrestors are manufactured in six sizes for commercial piping systems. They can protect batteries of plumbing fixtures, or a single quick closing valve. They have been tested and certified in accordance with PDI Standard WH-201 and also conform to ASSE Standard 1010.

For piping systems larger than 2 inches (such as laundry machines), Wade offers pre-pressurized units in seven sizes and capacities, all designed to absorb large amounts of energy. Upon request, Wade Engineering will size and locate the units for large piping systems or for special equipment applications.

So design out the problem. Put Wade Shokstops in the specs.

For your new Wade Shokstop Specification Manual, write Box 2027, Tyler, Texas 75701.

W-100

Member,
Plumbing and Drainage Institute

Tyler Pipe
Subsidiary of
Tyler Corporation

"Wade stainless steel Shokstops shall be installed as shown on the mechanical engineering plans or shall be sized and located in accordance with Plumbing and Drainage Institute Standard WH-201."

For more data, circle 73 on inquiry card

A splash of summer sunshine

That's Eljer's Sunnygreen — the irrepressible new decorator color that's right in tune with today's decorating trends.

Eljer offers Sunnygreen in a wide selection of lavatories, toilets and tubs to brighten any bath or powder room.

Bring a splash of summer sunshine into the baths of the homes, apartments or commercial buildings you design. Ask to see Sunnygreen. Or write for our "Splash of Summer Sunshine" brochure: Eljer, Dept. AR, 3 Gateway Center, Pittsburgh, Pa. 15222.

ELJER®

Eljer Plumbingware Division/Wallace-Murray Corporation

For more data, circle 74 on inquiry card

LHR® SOLARBRONZE

GLASS FROM PPG.

How a PPG Glass contributes to Vancouver's urban fabric.

Westcoast Transmission Company wanted an office building that reflected its pioneering nature. So the architects and the consulting structural engineers created a lively, contemporary structure—a unique cable-suspension design. In addition to its dramatic esthetics, this design had other advantages. It allowed the architects and engineers to raise the building as high as necessary to take advantage of a spectacular view. And since the building was hung on a central core and raised several stories above ground level, passers-by could look under the building to catch a glimpse of the harbor and mountains.

To complement their light, "spidery" design, the architects selected PPG's *LHR Solarbronze* Glass for its high reflectivity. The result is a beautiful facade that provides a constantly changing mural of the varying patterns of sky colors and clouds. City officials have said: "The Westcoast Building is a great esthetic contribution to the urban fabric of Vancouver."

See PPG about your next building. Early in the design stages. There's a PPG Environmental Glass that you can use as an active design medium to meet esthetic considerations, help solve environmental control problems, and contribute to significant cost savings for your client. Write PPG Industries, Inc., One Gateway Center, Pittsburgh, Pa. 15222.

For more data, circle 75 on inquiry card

PPG: a Concern for the Future

PPG INDUSTRIES

Owner: Westcoast Transmission Company Limited, Vancouver, B.C.
Architect: Rhone & Iredale, Vancouver, B.C.
Structural Engineer: Bogue Babicki and Associates, Vancouver, B.C.

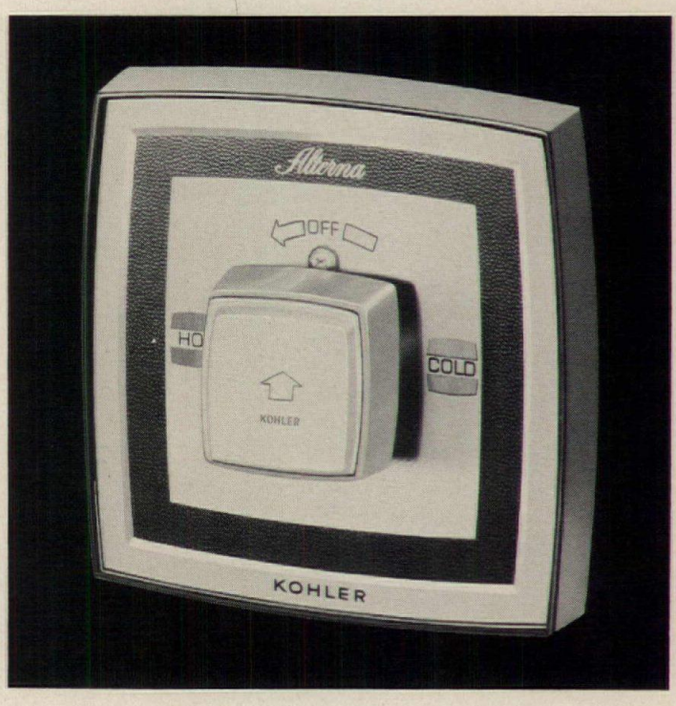
Fine-tunes the water temperature, then locks it in.

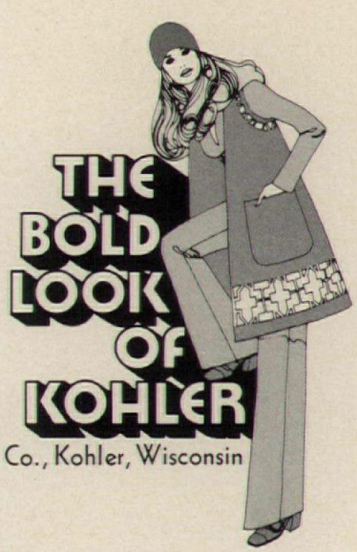
That's Rite-Temp—from Kohler. A pressure balance mixing valve that does away with sudden bursts of hot and cold water caused by fluctuations in water pressure.

With Rite-Temp you simply adjust the single control to mix hot and cold to the desired temperature . . . and regardless of pressure changes in the water supply, Rite-Temp maintains your selected temperature.

Rite-Temp—for easy installation, just one hole to cut; low maintenance; constructed to combat "lime" build up; closes with water pressure for positive shut off.

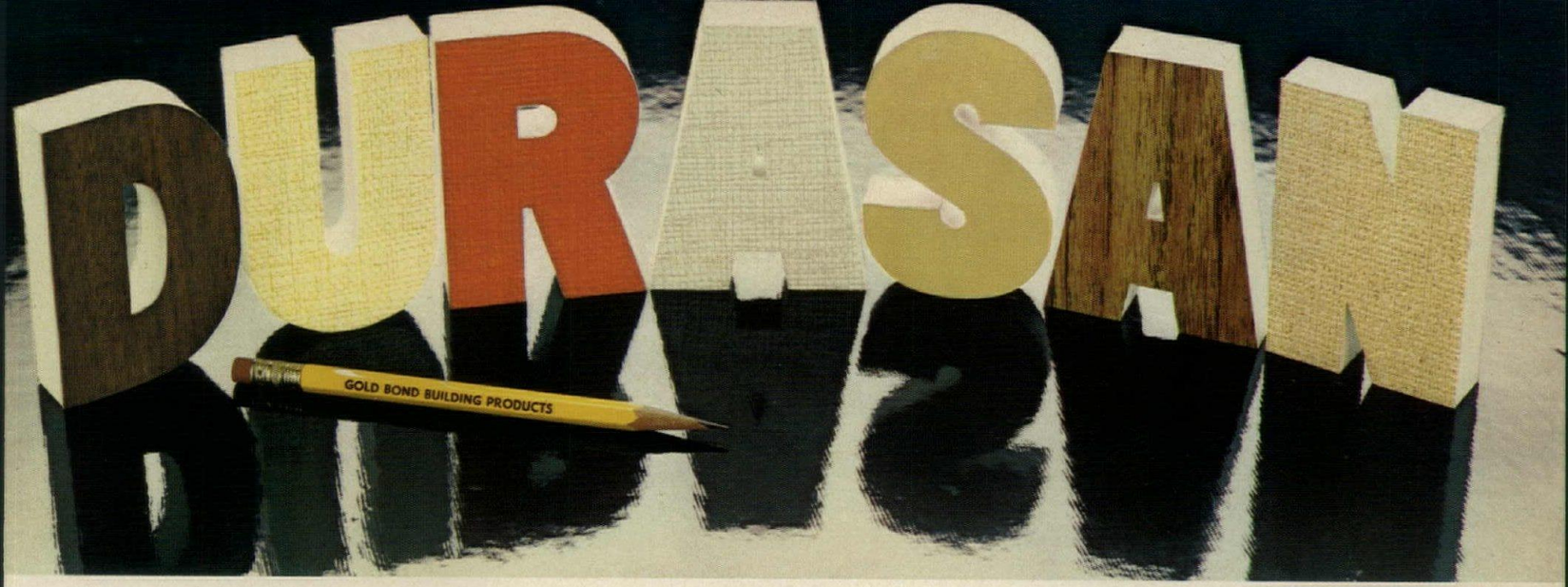
Pictured—Rite-Temp in Alterna, in polished or brushed chromium or gold electroplate. Also available in Triton II. For more information, write Rite-Temp, Kohler Co., Kohler, Wisconsin 53044.





Kohler Co., Kohler, Wisconsin

For more data, circle 76 on inquiry card



Durasan is gypsum drywall with a factory-applied vinyl surface.

It is low-first-cost, low-maintenance-cost, has a quality contemporary look and meets all the important fire codes.

And it gives you plenty of elbow room for design.

You can swing a little with Durasan®. Color progressions here. Contrasts there. It comes bright, muted and in-between. In woodgrains, burlaps, stipples, grass cloth and classic patterns and textures.

Once up, you've got a wall that resists abrasions, fading and stains. A damp sponge makes it look new for years.

And it's noncombustible. Durasan meets all requirements of the American Insurance Association. Fire ratings are comparable to regular gypsum wallboard in our recommended systems.

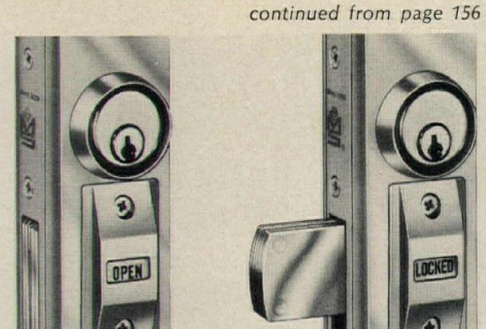
All this at a cost less than building a wall and applying a comparable grade of vinyl. And you have your choice . . . 4-foot wide panels with prefinished edges or . . . panels with loose vinyl flaps for monolithic applications. Then it's easy-up with matching mouldings and color pins . . . or adhesive. All part of the Durasan system.

Durasan could solve a lot of problems for you — aesthetic problems, functional problems, budget problems. Durasan, like so many of our products, is a constructive suggestion because it solves a number of your problems at once. For details, write Gold Bond Building Products, Division of National Gypsum Company, Dept. AR-102G, Buffalo, New York 14225.

Gold Bond®
BUILDING PRODUCTS

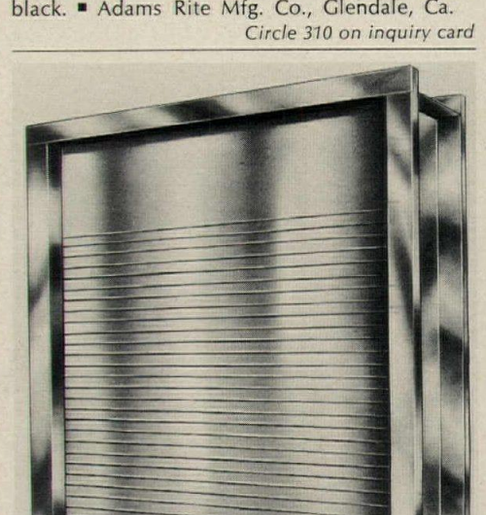
For more data, circle 77 on inquiry card

continued from page 156



EXIT INDICATOR / Automatically-actuated by the lock's deadbolt, a horizontal-reading indicator signals "Locked" in red letters or "Open" in black. ▪ Adams Rite Mfg. Co., Glendale, Ca.

Circle 310 on inquiry card



ROLLING FIRE SHUTTER / A labeled fire door and frame assembly for service counter openings, the *Fyr-Pac* unit carries the "B" UL Classification for 1½ hrs. Unit comes ready to set into the roughed-in opening, and consists of #4 finish stainless steel. A torsion spring provides counterbalance weight. Sill suits the specified wall thickness. ▪ The Kinnear Corp., Columbus, O.

Circle 311 on inquiry card

SHADOW MOLDING / Designed for use with lay-in acoustical panels, this molding features a flattened hem at 2 or 4 ft intervals providing a flush supporting surface at the intersection with the exposed grid. Reveal is ½ in., painted black. ▪ Donn Products, Inc., Westlake, O.

Circle 312 on inquiry card

more products on page 178

Where ZINC guards the Coast Guard

Design Specifications by Design Branch, Civil Engineering Division, U. S. Coast Guard. Concrete Panels by Southern Block & Pipe Div., Lone Star Industries, Inc. General Contractor, Fred C. Gardner Co., Inc.

The Coast Guard's own designers took the "drab" out and zinc will keep the rust out of this beautiful new concept in military quarters. ☐ This handsome building is the new U. S. Coast Guard Barracks at the Elizabeth City, N. C. Air Station. The zinc is on the galvanized steel reinforcing rods below the surface of the 237 precast concrete panels used for both interior and exterior walls. Galvanized steel was specified because of its proven ability to prevent subsurface rust which could cause staining, cracking and spalling of the concrete surface. ☐ While the use of galvanized re-bar is especially important in marine environments, it is also specified in inland locations to protect against general moisture and other corrosive atmospheres. ☐ Used in concrete or as a separate material, galvanized steel provides the most practical combination of strength, corrosion-resistance and economy.

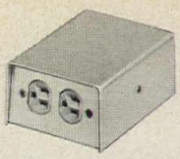
ST. JOE
MINERALS CORPORATION

250 Park Avenue, New York, New York 10017, Tel. (212) 986-7474

ZN-534

For more data, circle 79 on inquiry card

This Single Fitting Delivers Phone, Power and Signal Service



THE GRANCO CEL-WAY®/COFAR® SYSTEM

Only visible evidence of the system is the handsome floor fittings, each furnishing telephone, power and signal services wherever needed throughout the floor.

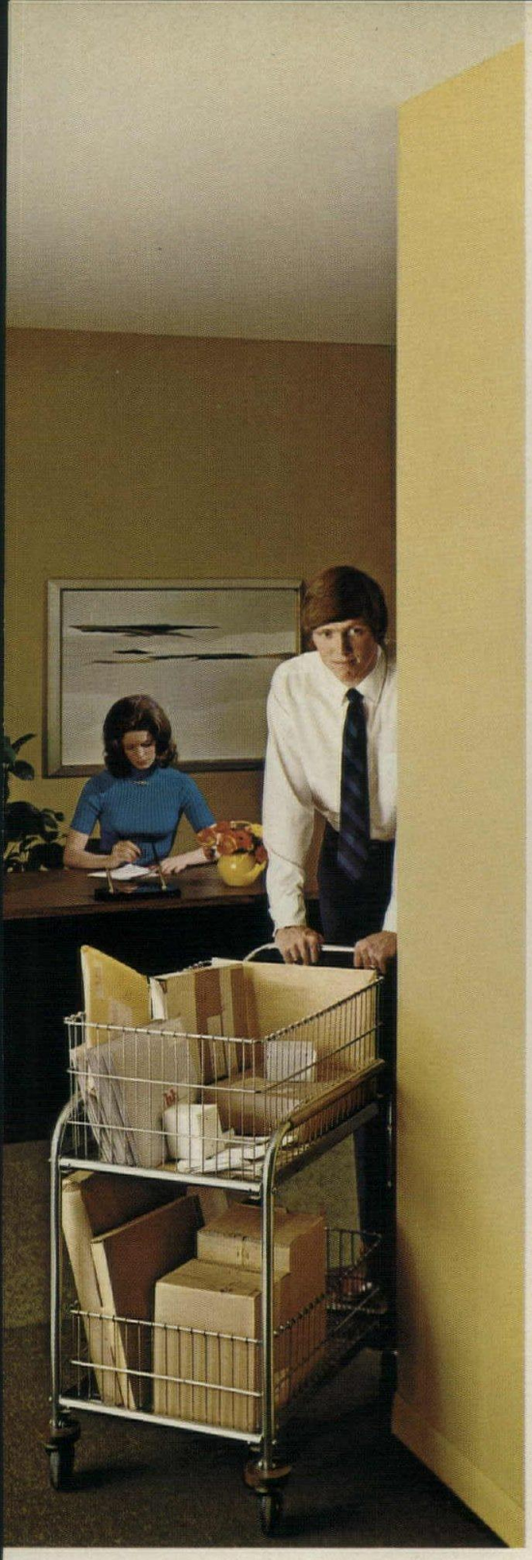
Concealed within the 5¼" floor slab is a network of electrical cells, factory-installed pre-set inserts and Granco's new Feed-Way high capacity header. Granco's Cofar floor deck (combined form and reinforcement) completes the system.

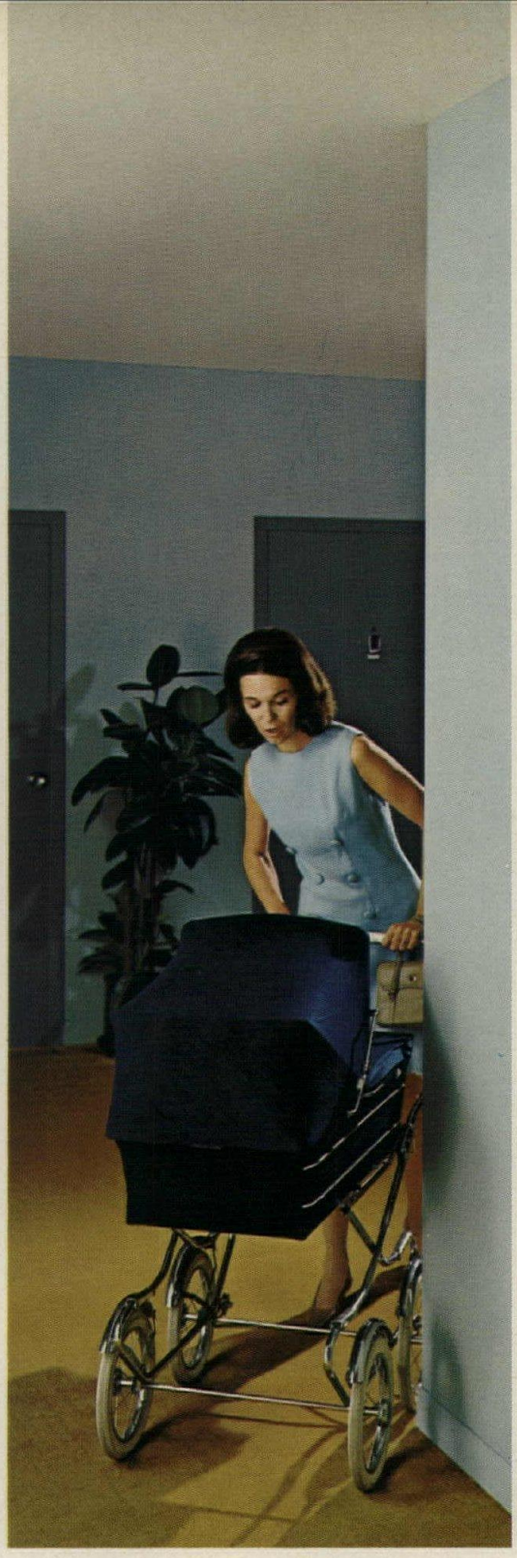
Pre-set inserts permit future installations of additional floor fittings without core drilling. Desks and partitions can be changed whenever desired.

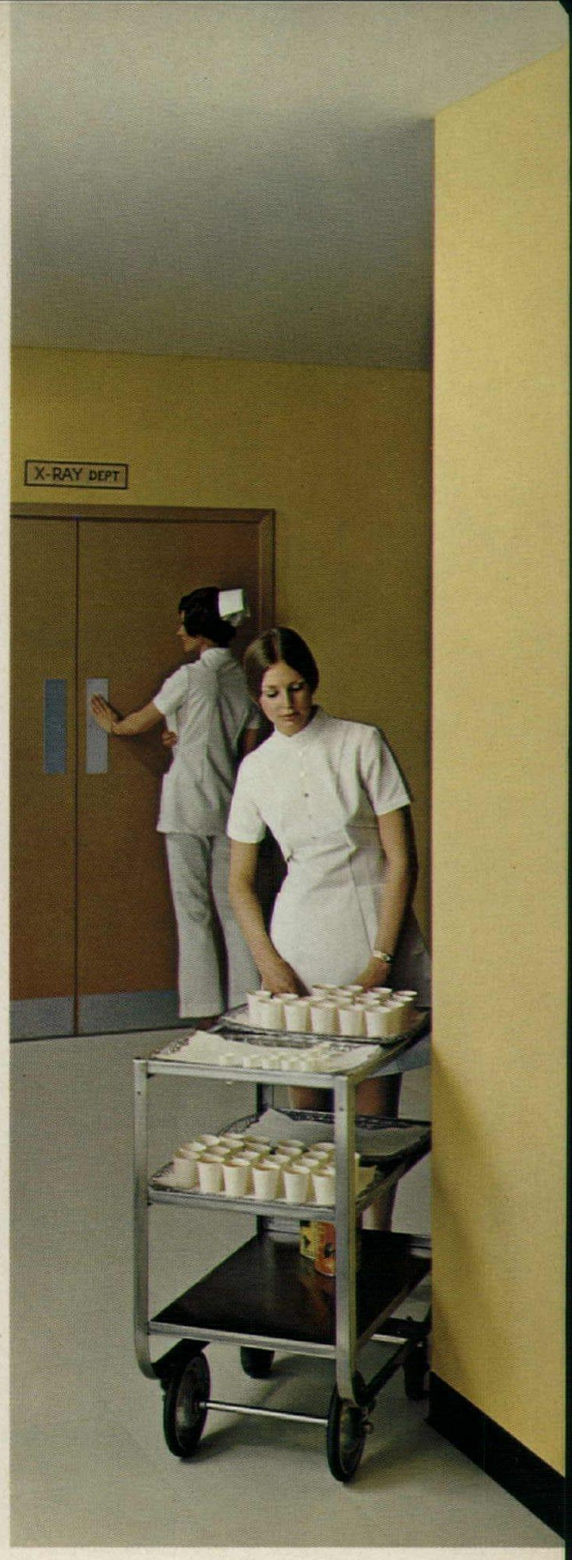
Get the complete story on CEL-WAY/COFAR in-floor electrification. See Sweet's 5.5/Gr and 16.2/Gr, or write for new product design manuals. Granco Steel Products Company, 6506 N. Broadway, St. Louis, Mo. 63147.

Granco Steel Products Company
A Unit of
National Steel Corporation

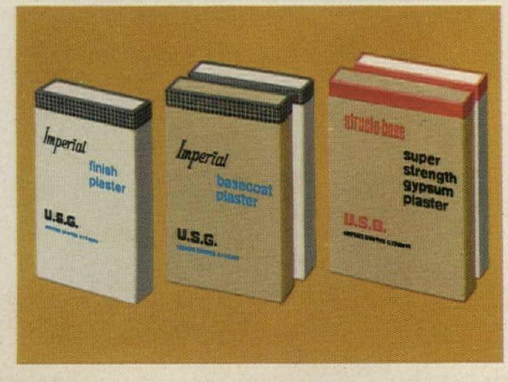
For more data, circle 80 on inquiry card







All 3 walls are alike. All 3 are different. You have a "hard" choice.



USG® Hard Wall Systems are all built to take abuse. Each finish tests at 3,000 psi compressive strength. All have withstood abrader tests far beyond normal requirements. And all provide high fire and sound transmission ratings, too. Yet, each is different to fulfill the different needs of your building's functions.

For living areas, IMPERIAL* One-Coat Veneer provides the low-cost lasting beauty of plaster walls. In commercial structures, where the ultimate in appearance is desired, owners can profit from Two-Coat Veneer. And in the high-traffic areas of institutions, the practical answer is STRUCTO-BASE* Base Coat, STRUCTO-GAUGE* Plaster and lime finish.

Building functions, continuing cost, use and maintenance are just some of the variables to consider when choosing your partition systems. We try to make this "hard" choice easy by offering you three systems. For details, see your U.S.G. representative, or write to: 101 S. Wacker Drive, Chicago, Illinois 60606, Dept. AR-102.

*Reg. U.S. Pat. Off.

UNITED STATES GYPSUM
BUILDING AMERICA

For more data, circle 81 on inquiry card

Part of this lighting

Over 25,000 Sylvania Curvalume lamps light up the interior of S. S. Kresge Corporation's new headquarters in metropolitan Detroit.

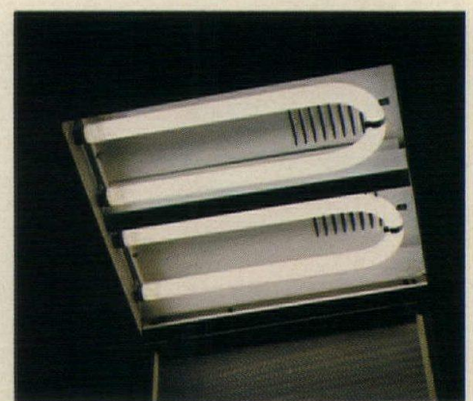
With two Curvalumes to a fixture, Kresge got the lighting they were after—and much more.

The heat from the U-shaped lamps and ballasts is saved and recirculated into the building. It's a conservation-of-energy concept with Curvalume lamps at its heart.

The bent lamps make it possible to use 2 x 2-foot fixtures that can be evenly spaced over the modular ceiling. This makes for even distribution of air as well as light.

In Kresge's contemporary

story is a lot of hot air.



building, these long-lived fluorescents last even longer. They're never turned off, which lengthens their life. The constant circulation of air around them increases their efficiency.

This handsome installation gives lighting levels of 100 footcandles or more in the general offices, and the color of the lamps blends in beautifully with the interior decor.

There are other good reasons for choosing Curvalumes.

Compared to using four straight two-foot fluorescents, Curvalume lamps need only half the number of ballasts and sockets and deliver 20% more light per fixture. They also last 60% longer.

For Kresge, the savings include fewer replacement lamps and less maintenance.

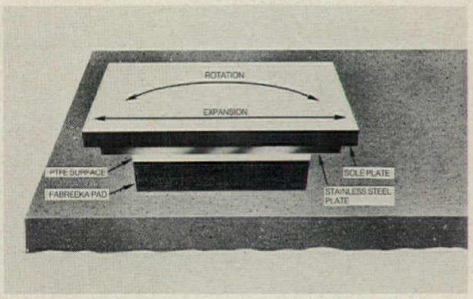
The moral of this story is: when you're thinking big, think bent.

For more about Curvalumes, call your Sylvania representative or local distributor (in the Yellow Pages under Lighting). Or write to: Sylvania Lighting Center, Danvers, Mass. 01923.

GTE SYLVANIA

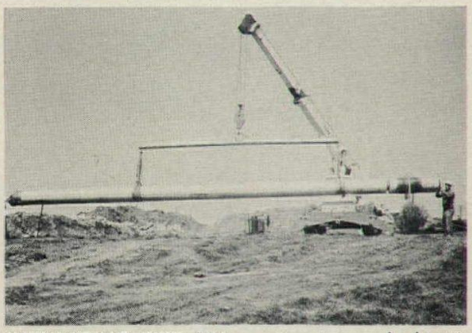
For more data, circle 82 on inquiry card

continued from page 168



EXPANSION BEARINGS / Included in each unit are sole plate, stainless steel face plate and pads with low-friction surfaces. The bearings are said to accommodate multidirectional loads and are self-compensating under load rotation. Pre-assembled and custom-engineered to individual load-bearing and dimensional requirements. ▪ Fabreeka Products Co., Boston, Mass.

Circle 313 on inquiry card



INSULATING PIPE / Non-corrosive and electrically non-conductive, *Fiber-Guard* is factory-fabricated. It is composed of an ADI-FRP conduit and a steel pressure carrier pipe insulated with calcium silicate. ▪ Ric-Wil, Inc., Brecksville, O.

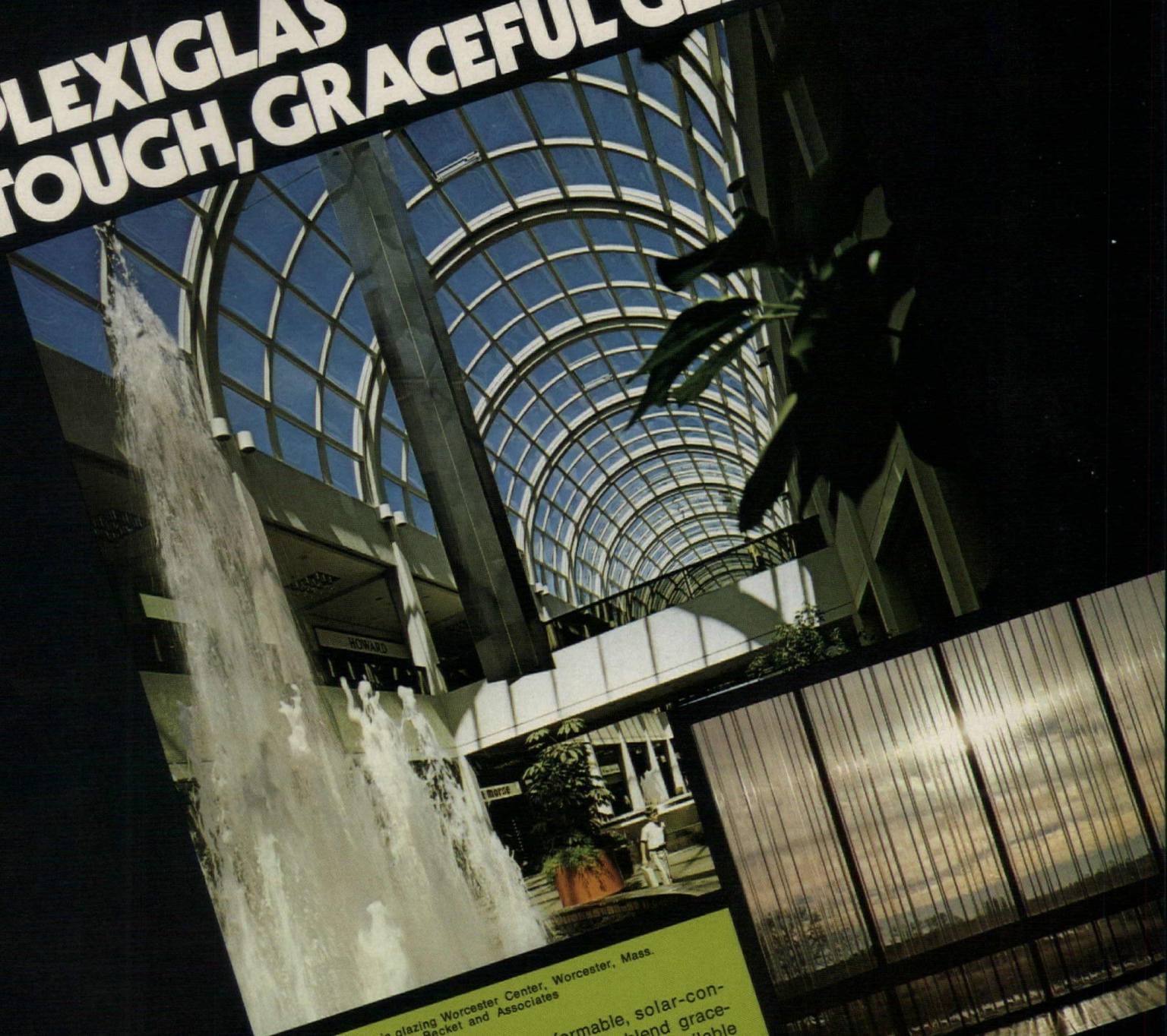
Circle 314 on inquiry card

STACKING CHAIR / The *Chorus Line* stacking chair consists of a polished chrome frame gripping a maple-veneered seat and back. Available in six translucent colors. Stacks vertically as well as in a tight horizontal group. ▪ Thonet Industries, Inc., New York, N.Y.

Circle 315 on inquiry card

more products on page 186

PLEXIGLAS®
TOUGH, GRACEFUL GLAZING



Domed galleria glazing Worcester Center, Worcester, Mass.
Architects: Welton Becket and Associates

Breakage-resistant, thermoformable, solar-controlling Plexiglas acrylic sheet will blend gracefully with your most demanding designs. Available in a broad selection of sizes and thicknesses, Plexiglas is light in weight and installs with a minimum of supporting members. The Solar Control Series of Plexiglas sheet gives you a choice of six bronze and six grey transparent tints permitting aesthetic flexibility with a range of light and solar heat control. Write for our latest brochure.

Corrugated solar control glazing Southwestern Indian Polytechnic Institute, Albuquerque, N.M.
Architects: W. F. Krueger and Associates

ROHM AND HAAS
PHILADELPHIA, PA. 19105

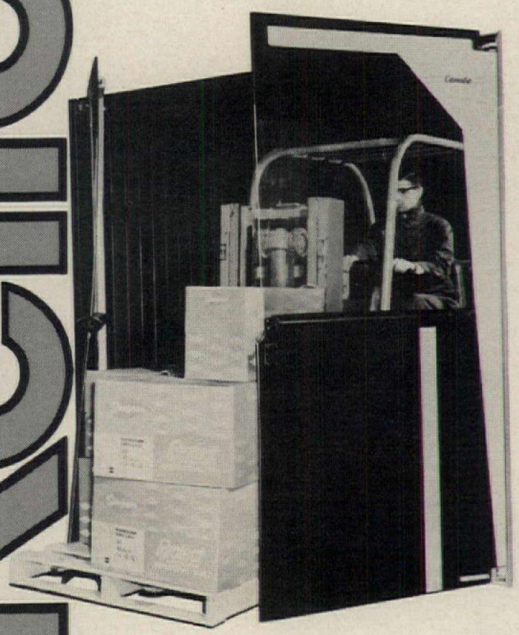
Where building codes limit areas of plastic glazing, approvals of large area Plexiglas enclosures must be applied for on a special permit basis. Rohm and Haas Company can supply engineering and building code information on specific request.

ANSI—Z97 APPROVED

Plexiglas acrylic sheet meets the requirements for a safety glazing material as defined by the American National Standards Institute.

For more data, circle 85 on inquiry card

Kelley "Camatic" TRAFFIC DOORS THE PROBLEM SOLVERS



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Our new, 32-page SPRINKLER SYSTEM GUIDE lays it all out. Building codes . . . insurance considerations . . . fire protection costs . . . and much more we can't tell here. Dozens of explicit illustrations. It's free. Send for it . . . before you get burned!

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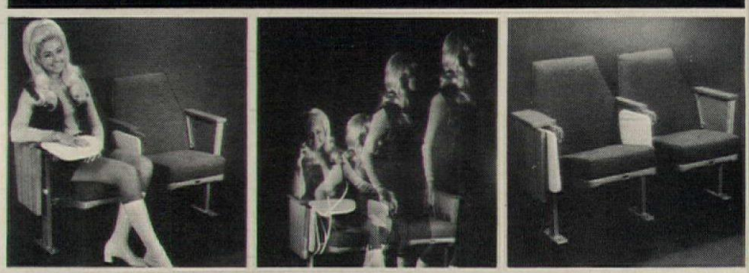
RETROFLEX 180

As you start to rise, the RETROFLEX 180 Tablet Arm retracts by itself, at a single touch, in one simple automatic cycle. (In fact, you can't get out of the chair without the arm folding, unless you are a contortionist!) Patented return mechanism eliminates tablet arm damage occasioned by half-folded or incompletely returned tablet arm, and clears the aisle for quick exit. Another innovation to keep you sitting pretty from

Massey seating co.

NASHVILLE, TENNESSEE 37208



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Going places by design. Versatile high performance 1-and 2-story aluminum glass holding system opens new design avenues! Mullion depths from 6 to 10¾-inches! ¼-inch single glazing or 1-inch insulating glass! This extremely strong aluminum monumental system, designed primarily for first and second floor application, eliminates the necessity for steel reinforcement for most installations. Mullion depths can be varied to accentuate the verticals. The face of the vertical mullions has a 2½-inch clean sight line, eliminating possibility of mismatched finishes on split mullions. You will find that the HPS-610 adapts to many conditions, giving you greater freedom in design options. *Write for specification data.*

Going Places by design with AMARLITE/ANACONDA

AMARLITE PRODUCTS — ANACONDA ALUMINUM ARCHITECTURAL PRODUCTS DIVISION

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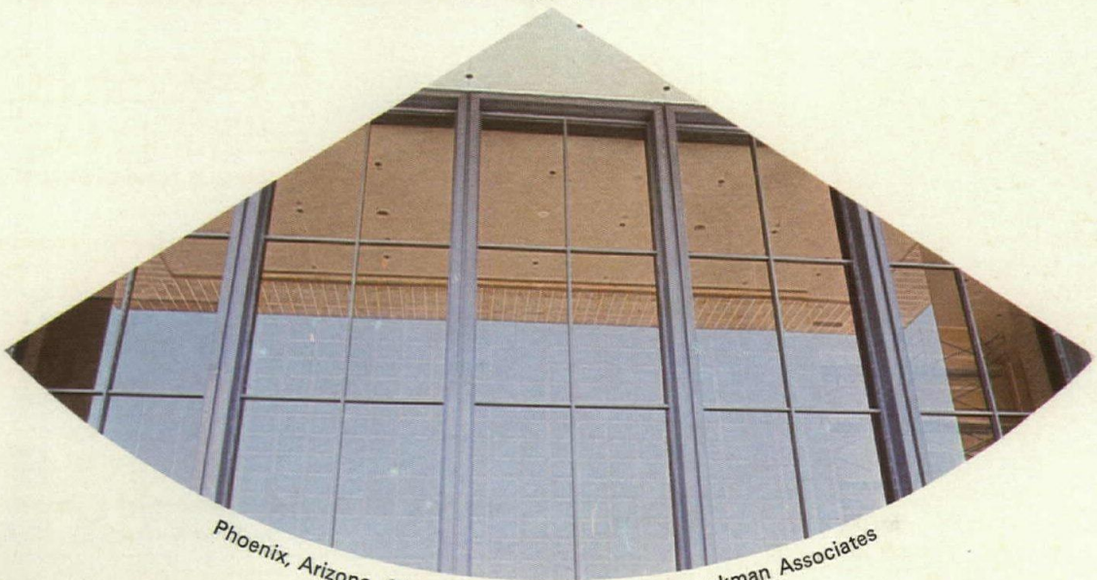

Phoenix, Arizona, Civic Plaza, Architect: Charles Luckman Associates

HPS-610 SPEC-DATA® Available

Robertson's Frank Dane knows his territory from Boston to Kuwait.

Kuwait?

You read it right. Frank Dane is the Robertson man in Boston; however, he has just finished four years' work on Shuaiba South, an electrical power and de-salination project in Kuwait. With an American consulting engineer, Chas. T. Main International, Inc.; a Japanese contractor, Taisei Construction Co.; subcontractors from Greece and Lebanon, and laborers from Pakistan, this installation presented Frank with unusual challenges. With the help of Robertson's agent in Kuwait, Abdul Aziz Alghanim, he overcame differences in language, local "standard" building design and opinion. Assisted by Robertson's Alan Tompkins in Beirut, and on-site supervision by Robertson's Dean Keys of Pittsburgh, Frank coupled the efforts of production, packaging and engineering specialists in several Robertson plants, and contracted for an installation that went into place in a uniquely unproblematic way. The parties involved in this project counted on one man—Frank Dane—to attend to all aspects of Robertson's contract for roof, wall and floor systems.

In your town, there's a Robertson man—like Frank Dane—who's ready to help. With plants and offices in 60 countries, Robertson men have a world-wide network of experienced specialists to call upon for help in solving problems. Call your local Robertson man. He will demonstrate our ability to take "single responsibility" for the product design, engineering, manufacture, shipment, and installation of our walls, floors, roofs, and ventilation systems. One supplier. One contract. Your Robertson man is the man to see. His territory is world-wide, but he is a local call away.

We have prepared an interesting, in-depth Project Profile on the Kuwait project. For your copy, or for more information on Robertson's international capabilities, write Dept. 7203, H.H. Robertson Company, Two Gateway Center, Pittsburgh, Pennsylvania 15222.

Robertson

For more data, circle 90 on inquiry card

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Our stone facing goes up as easy as

1

Stone wall cladding that installs with ordinary carpenter's tools? That's Sanspray,® the great stone facing from U.S. Plywood. On top, a handsome natural stone aggregate. Bonded beneath, a sturdy panel of exterior plywood.

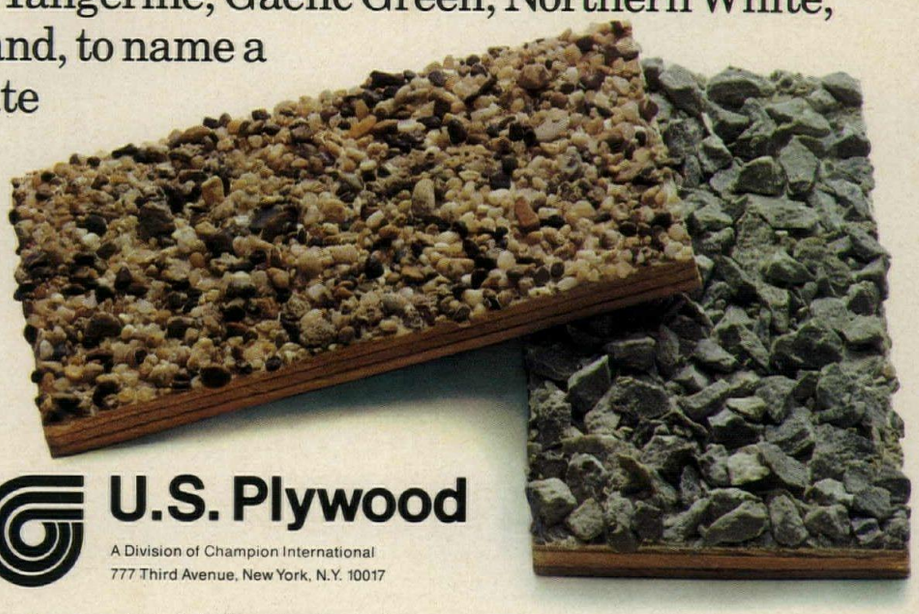
The result: a distinctive cladding that does great things for residential and light commercial exteriors. At a far lower cost than conventional stone and masonry treatments.

2

Sanspray panels cut with a power saw. They can be nailed or glued to wood, masonry or steel frame constructions. They are relatively light and easy to handle. So installation costs are cut way down. Once in place, Sanspray is virtually maintenance-free, in all climates.

3

Sanspray comes in two aggregates – large and regular, both of which are shown below. And a wide selection of natural stone colors – like Tangerine, Gaelic Green, Northern White, Pearl Gray and Monterey Sand, to name a few. But to really appreciate Sanspray, you ought to see and feel the real thing. We'll be happy to supply you with hand-sized samples, as pictured, if you'll call your local U.S. Plywood Branch Office. Or, if you prefer, write directly to our New York office.



U.S. Plywood

A Division of Champion International
777 Third Avenue, New York, N.Y. 10017

For more data, circle 92 on inquiry card

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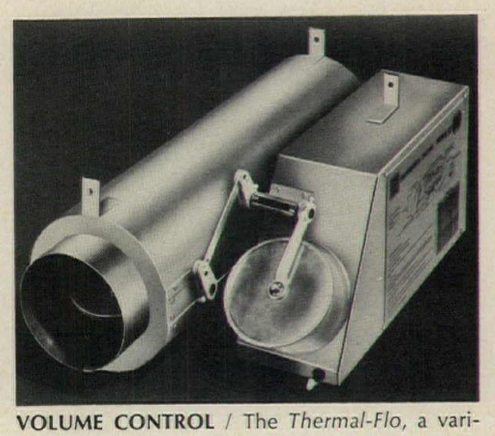
continued from page 178

AIR DIFFUSER / With built-in adjustable damper and pattern control, this model delivers a full 360-degree pattern. Available in a wide range of standard sizes. Surface areas are finished in baked white enamel. Interior surfaces are flat black. ■ Connor Engineering Corp., Danbury, Conn.

Circle 316 on inquiry card



VOLUME CONTROL / The *Thermal-Flo*, a variable volume unit, selects the correct amount of air conditioned air to satisfy space cooling loads. Powered by duct air pressure, the unit requires no external energy source. Connection to a pneumatic room thermostat completes the control system. Available in six sizes from 100 to 3,200 CFM. ■ Barber-Colman Co., Rockford, Ill.

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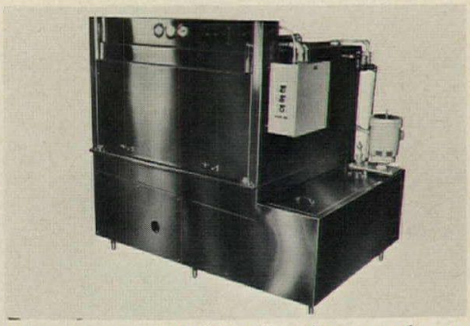

WASH-RINSE UNIT / For fast clean-up of pots, pans, utensils and similar items, this compact unit features easy loading and self-cleaning stainless steel spray nozzles. Recommended for high volume food preparation operations. ■ Metalwash Machinery Corp., Elizabeth, N.J.

Circle 318 on inquiry card

more products on page 200

Tex-Tiles are the ideal flooring material for today's offices. Floor plans can be reconfigured without recarpeting.

Specify a permanent floor without making a permanent decision.

Collins & Aikman has developed a group of bi-component vinyl backing systems, each integrated with a super dense, man-made commercial fiber surface. They're called Tex-Tiles.

These unique 18″ squares are simple to install securely... yet can be arranged and rearranged with ease for maximum good looks, maximum wear. Wherever you want outstanding beauty with minimal care.

Choose from a full range of styles, textures and colors.

For more information, write or call Collins & Aikman, 919 Third Ave., New York, N.Y. 10022. Tel. (212) 371-4455

COLLINS & AIKMAN

Where 10% of the floor gets 90% of the wear, like this office lobby, moveable Tex-Tiles solve the problem.

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PLEASE SEND ME MORE INFORMATION ON NOR-LAKE WALK-IN COOLERS.

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Doors should be like people. Interesting.

You should agree with that thought. Doors needn't be drab or dreary.

Republic *stylable* steel doors certainly aren't.

"Stylable" means you pick the light and louver treatment you want. Installation is done by your local Republic distributor right in his warehouse. At standard prices and without delivery delay.

Plus, you can choose from 36 door sizes, and 8 standard styles, prime-coated or prepainted in one of 19 colors.

And everything — doors, frames, and FRAME-A-LITE stick system — comes ready to install. They hang in a breeze, too. And, they look good — so good that we use them in The Environmental Home, Republic Steel's new residential building system that uses prefabricated steel panels and components that lend themselves to mass production and easy on-site assembly.

Want to know more? Check the Yellow Pages under Doors — Metal, and call your nearest distributor. Or write Republic Steel Corporation, Manufacturing Division, Youngstown OH 44505.

SDI STEEL DOOR INSTITUTE

Republicsteel
Manufacturing Division

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Palmer Porter
Painting Contractor
Hixon, Tennessee

"One of my men sprayed 3200 square feet of wall and ceiling area in one hour and five minutes with *Hide-A-Spray*™"

"Not only is it time-saving," Mr. Porter added, "but it gives the customer a top quality job." A 15 gallon test application convinced Mr. Porter that *Hide-A-Spray* High Build Interior Flat Latex Paint met all of his requirements for the coating to use on this particular project in Dayton, Tennessee consisting of 110 units of one and two story apartments. They were good hiding, good airless spraying quality and a competitive price.

Used in airless spray application, *Hide-A-Spray* covered walls and ceilings with one coat—without priming. Taped, spackled and sanded joints completely disappeared beneath this remarkable high build latex coating. Added Mr. Porter, "*Hide-A-Spray* is the most marvelous paint ever to come on the market for the painting contractor." It can be airless sprayed on unprimed dry walls, in up to 40 mils wet thickness, if necessary, without sagging. However, it is usually applied at 6-10 mils wet. It dries quickly. Accidental scuffs from moving equipment touch up without showing through, and dirt wipes off with a damp cloth.

It's no wonder then that Mr. Porter was so enthused about *Hide-A-Spray* Flat Latex Paint. We would like to tell you more.

Descriptive literature is available. Write PPG Industries, One Gateway Center, 3W, Pittsburgh, Pa. 15222.

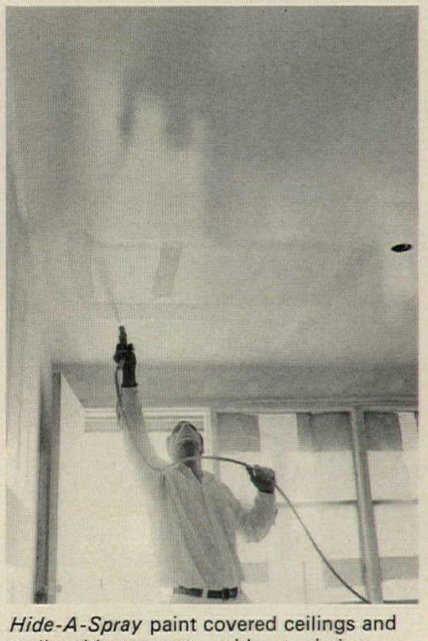
PPG: *A Concern for the Future*

PITTSBURGH® PAINTS

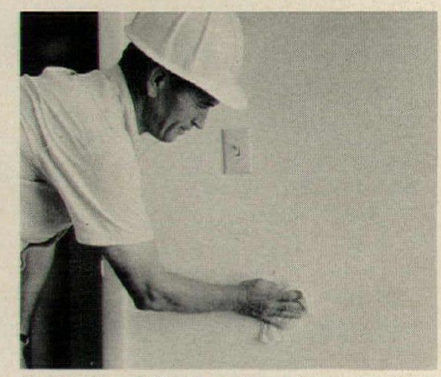
Dayton Housing Authority Project, Dayton, Tennessee. 110 apartments, 30 shown above. Jack Tyler & Associates, Architects.

James Durham, Project Manager for General Contractor H. E. Collins, Chattanooga, Tennessee, discussing progress with Project Superintendent Roy Earnhart. Says Mr. Durham about *Hide-A-Spray* paint, "it expedites the job—gets it done quickly—keeps our labor costs down—improves production. A two in one type thing—increases production and cuts cost."

Hide-A-Spray flat latex was used on all trim as a primer for a finish coat of *Speedhide* Lo Lustre Enamel. *Hide-A-Spray* holds out the enamel—won't let it seep in.



Hide-A-Spray paint covered ceilings and walls with one coat—without priming. Taped joints were completely concealed.



Clyde King, DHA Inspector, cleans smudges off *Hide-A-Spray* with a damp cloth.

PPG INDUSTRIES

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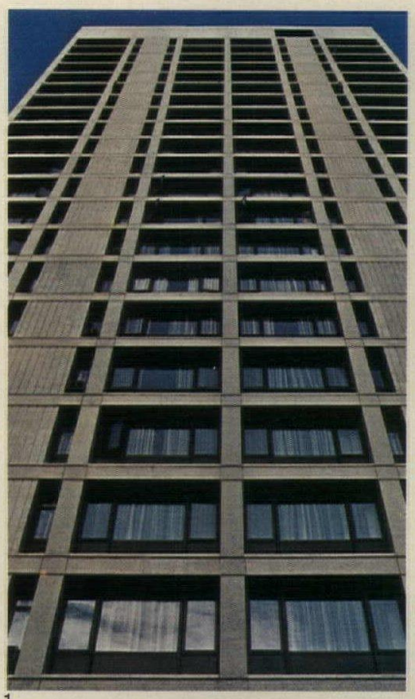
More Environmental Control with Shatterproof Insulating Glass



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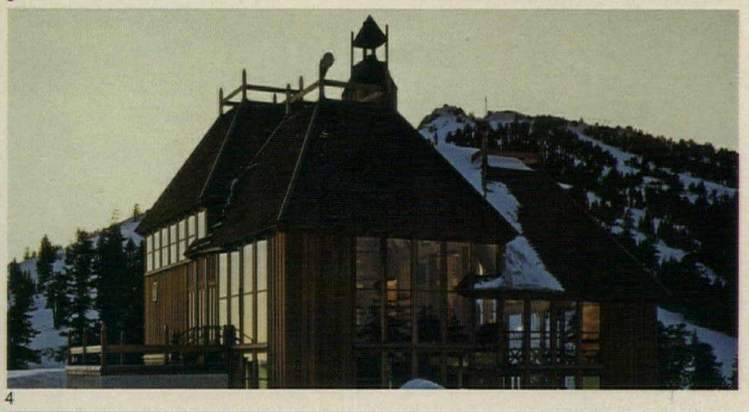

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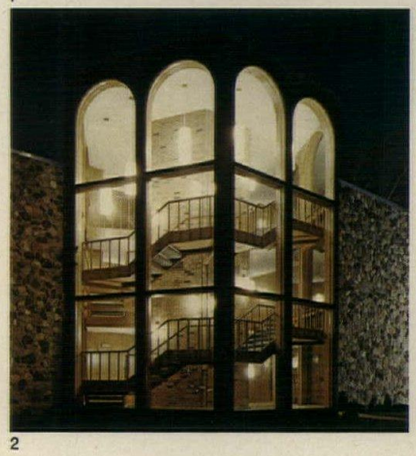

2

5

1. Residential Complex, The Children's Hospital Medical Center, Boston, Mass. Architects: The Architects Collaborative, Cambridge, Mass.
2. Imperial House Apartments, Kenosha, Wisconsin
Architect: Sheldon Segel, A.I.A., Milwaukee, Wisconsin
3. Delta Airlines Waiting Rooms, Standiford Field, Louisville, Kentucky
Architect: Pierce, Wolf, Yee & Assoc.
4. Ashland Ski Bowl, Ashland, Oregon
Designer: Robert L. Bosworth, Medford, Oregon
5. Bismarck Municipal Airport Terminal, Bismarck, North Dakota
Architects: Ritterbush Brothers, Bismarck, North Dakota

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. . . Alone or in combinations. It's our most comfortable glass.

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GLASS CORPORATION *Architectural Division*

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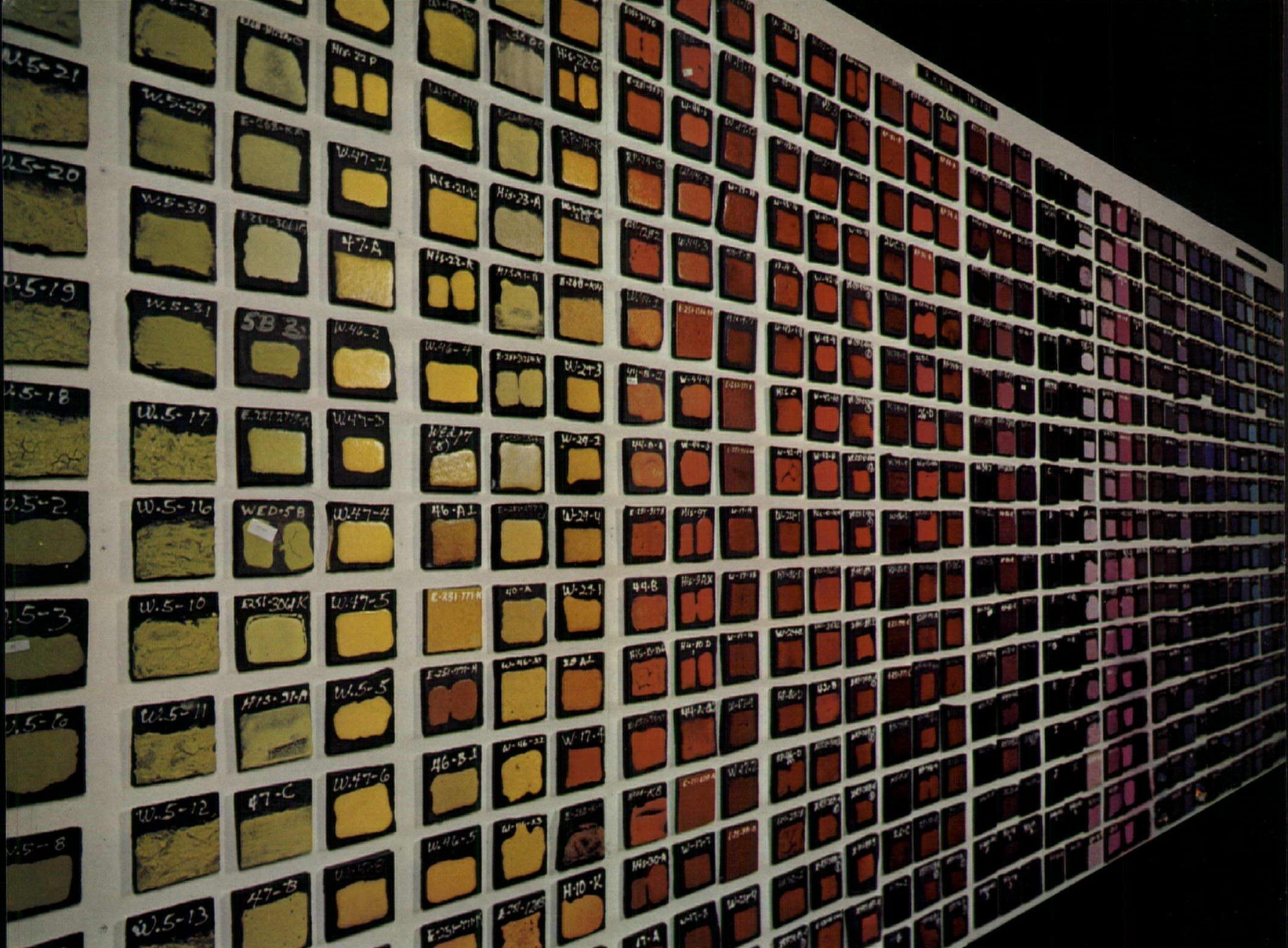
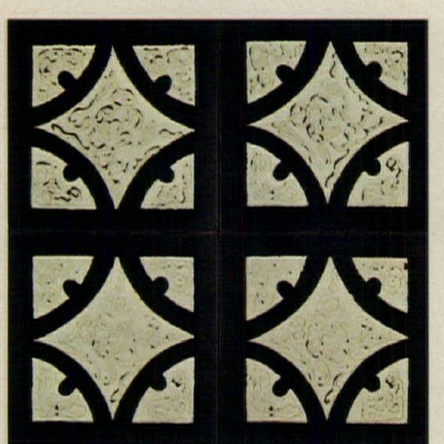
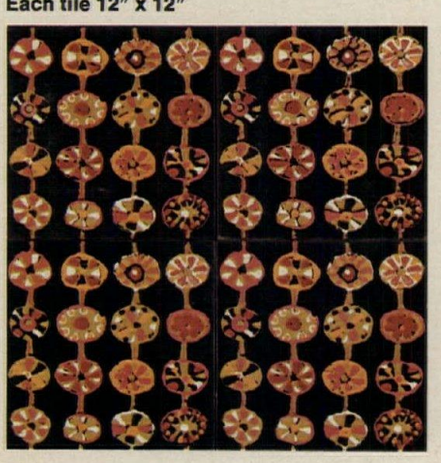




Each tile 12″ x 12″



Something exciting is happening at Interpace!

A whole new world of colors and textures in ceramics is being created at INTERPACE. An exciting world in which—for the first time—you can have made in ceramic wall and floor coverings anything you can design. Create your own individual design and INTERPACE can execute it in over 1500 colors, in glaze effects which range from gloss to mat and smooth to heavily textured and in relief of considerable dimension depending on the design.

This is a new concept made possible by new technologies. A concept based on a capability to service your customized aesthetic needs rather than the traditional concept of a product line. In essence we offer you your own plant to exploit the potential of ceramics in the full expression of your creativity.

Excited? Challenged? Then send for a brochure or call us today.

INTERPACE
CORPORATION

2901 Los Feliz Boulevard
Los Angeles, California 90039
Telephone (213) 663-3361

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Parsippany, New Jersey
Telephone (201) 335-1111

For more data, circle 101 on inquiry card

AE / UPDATE

A classified advertising section devoted to helping architects and engineers keep up to date on building product manufacturers.

CLIENTS COMPLAINING ABOUT THEIR NEW CARPETS? Spots are what they are most concerned about... and methods of spotting that require the selection of individual spotters went out with Argosheen® users 18 years ago. Write for information including tests which prove that cleaners *cannot* mix with soil and dry to a powder which can be vacuumed away, how to avoid rapid resoiling and special instructions for cleaning some of the new carpets with extreme soil release problems. Argosheen®, P.O. Drawer 2747, Spartanburg, S.C. 29302

For more data, circle 102 on inquiry card

A TOTAL-OPERATION CONCEPT for self-service laundry facilities is offered by many Independent Maytag Distributors. These specialists do more than just install Maytag Commercial Washers and Dryers. They will consult with you on layout and planning. They make available to you and your clients tested principles and techniques developed through many years of experience in every phase of the self-service laundry field. Some of the services available to you include expert assistance in selecting location and equipment, service and maintenance, and management control. For the distributor serving your area, write: Maytag Company, Dept. AR-10A-72, Newton, Iowa 50208.

For more data, circle 103 on inquiry card

A NEW FOUR PAGE BROCHURE explaining the research and development of a new technique to mask unwanted sounds and conversations in open landscaped offices, schools and hospital wards is now completed. The booklet analyzes the problems of acoustical privacy and suggests solutions. It explains how SonoMask® provides an electronic curtain of pleasant sound to screen annoying noises. On your letterhead, write New Jersey Communications Corporation at 760 Fairfield Avenue, Kenilworth, New Jersey 07033, for your copy.

For more data, circle 104 on inquiry card

ACOUSTICAL CONTROL ROOF DECK SYSTEM—PERMADECK, with average noise reduction coefficient of up to 85%, offers economical method of controlling noise in industrial and educational installations. U. L. listed system is rapidly installed for fast dry-in and provides a structural roof deck and insulation as well as acoustical control. Roofing can be applied immediately and "U" value is there from the start as there is no drying time. Sweet's Architectural File 3.4/Con or mail card. Concrete Products, Inc., Box 130, Brunswick, Georgia 31520.

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Mobil Chemical

proudly announces the availability of

MOBILFLUOR™

Fluoropolymer Enamels
the newest coatings based on

KYNAR 500®

For complete information contact:
Industrial & Automotive Coatings Dept.
901 N. Greenwood Ave.
Kankakee, Illinois 60901
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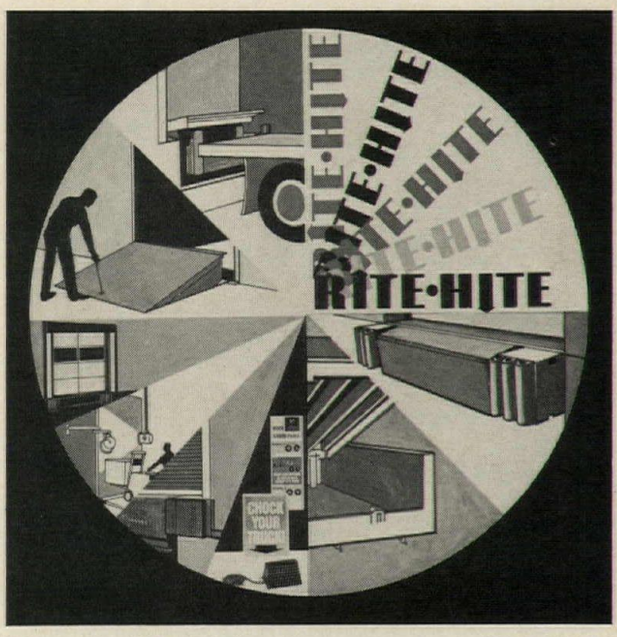

THE RITE APPROACH TO DOCK SAFETY

Your most complete line of fully-mechanical truck and railcar dock levelers plus bumpers, chocks, door seals, loading-lites, and safety signs. Meets OSHA standards.

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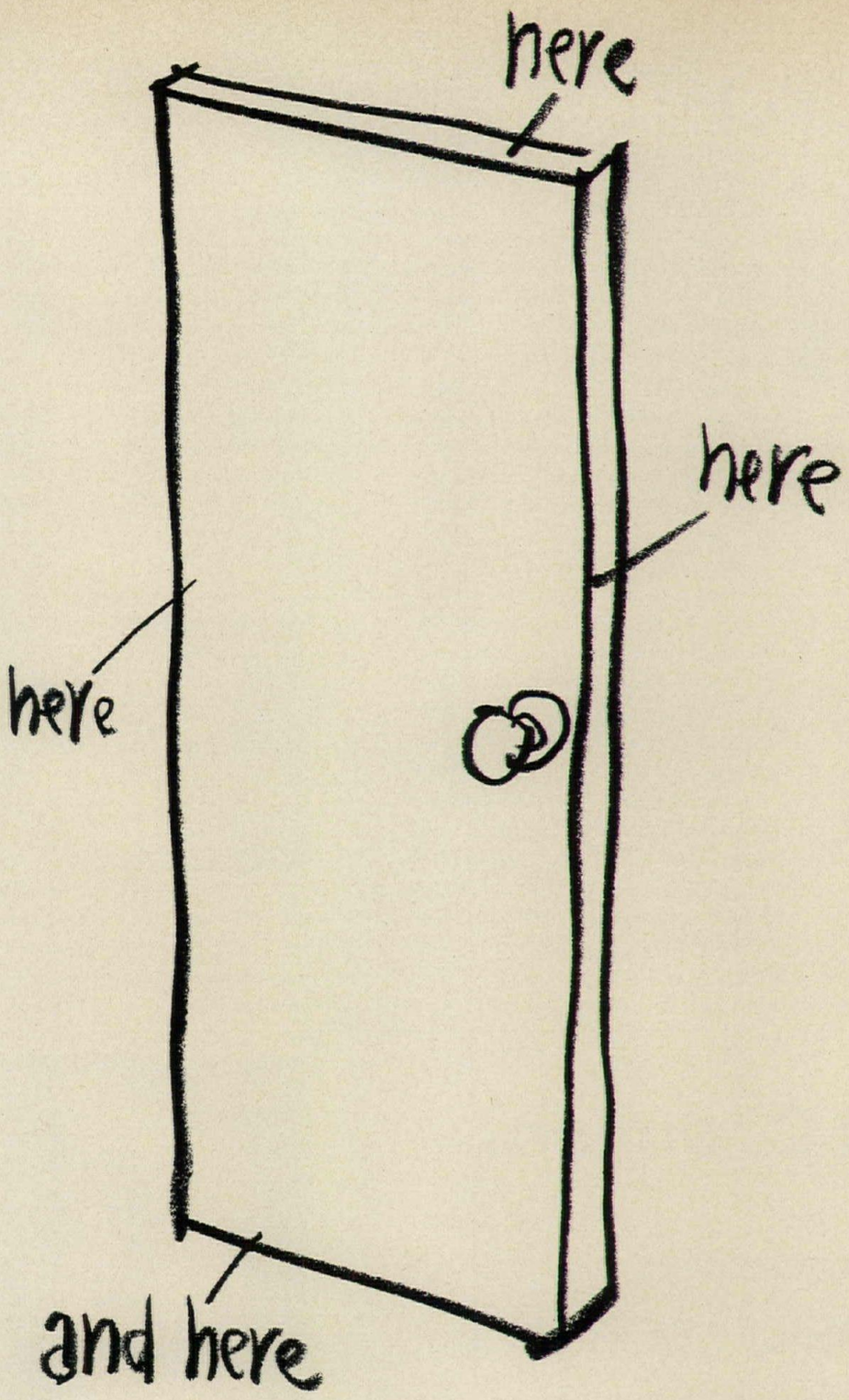


Announcing several small changes in our 3/4-hour fire door.

You can now match the wood on the top, the bottom and the side edges of this door with the wood on the face.

There used to be two choices for the edges, Birch or Maple. (Have you ever tried to make Birch look like Oak?) Now you have seven choices for edges and face veneer: Cherry, Teak, Birch, Oak, Walnut, Lauan and Elm.

Another small but important change. This door doesn't have (or need) fire retardant treatment, which eliminates the possibility of unsightly stains bleeding through the finish. (The mineral core, not the fire retardant treatment, is what makes this door an effective fire barrier.)

Of course, you can still depend on these unchanging features: a UL rating for Class C openings, sizes to 4x10 feet, lifetime interior guarantee and incombustible mineral core.

For complete details, write Weyerhaeuser, Box B-9133, Tacoma, Washington 98401.

Weyerhaeuser

A shopping center needs pretty-tough carpet.

Until now you had a choice of pretty carpets that weren't very tough. Or tough carpets that weren't very pretty.

But in many contract installations you need both. So we conceived carpets that are pretty and tough.

You can choose handsome original designs from our Masterworks Design Program. Or we'll create an exclusive design to meet your specific requirements.

But these carpets are a lot more than pretty. They're made from 100% ANSO nylon so they hide dirt better. And they're tough enough to stand up to your heaviest traffic areas.

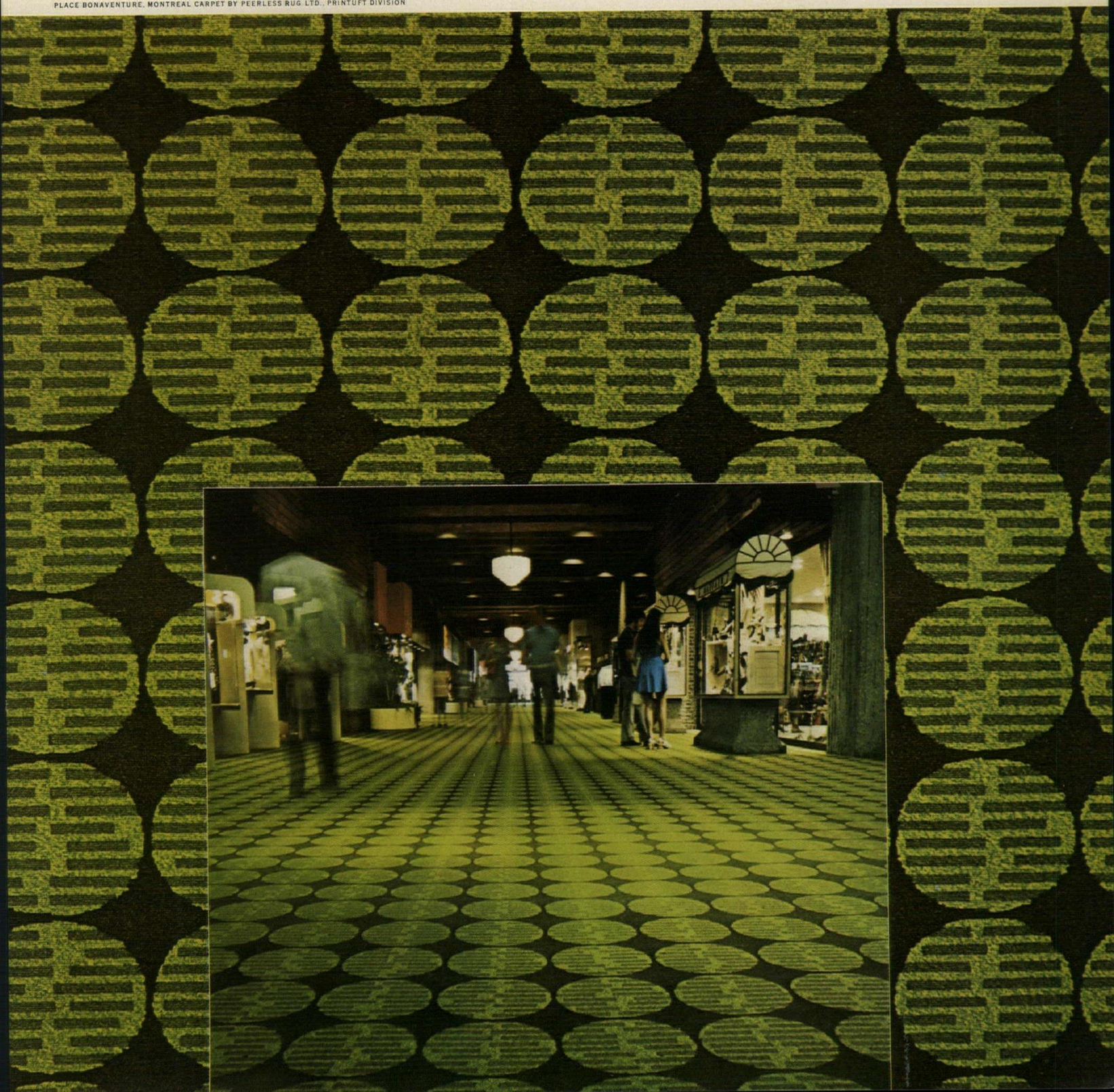
In fact, Allied Chemical guarantees carpets of ANSO nylon against excessive wear for 5 years. (We've got more guaranteed carpet fiber installed than anybody—over 50 million square yards.)

If you need pretty-tough carpet, ask for ANSO. Or contact Allied Chemical Corporation, Fibers Division, Contract Department, One Times Square, New York, N.Y. 10036. Phone: (212) 736-7000.

®ANSO Allied Chemical

Guaranteed nylon carpet.

PLACE BONAVENTURE, MONTREAL CARPET BY PEERLESS RUG LTD., PRINTUFT DIVISION

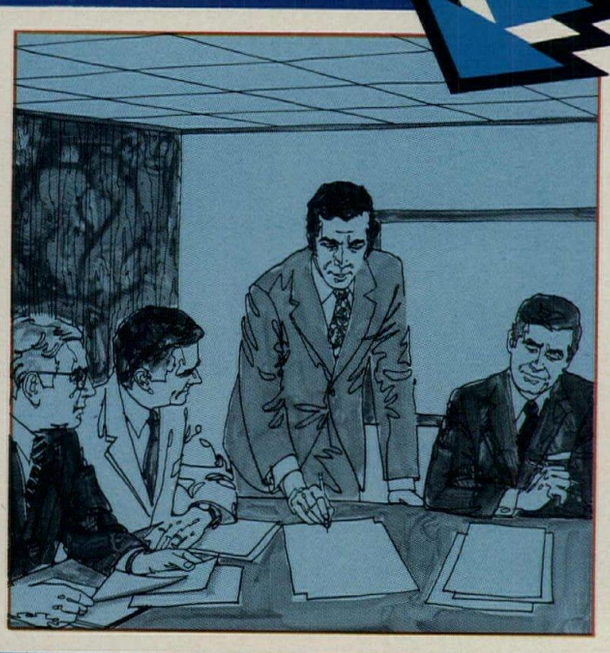


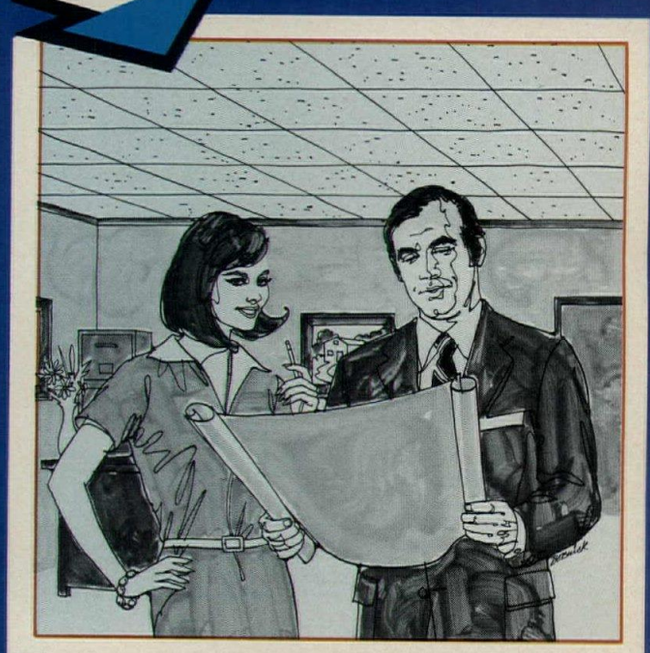
New! Titus total

self-controlled
air systems

superior air
distribution with
a complete
selection of
diffuser types

optimum
"zone-demand"
comfort control





comfort systems

3 complete-package environmental systems from Titus that set a new standard of economy, efficiency and flexibility in air distribution and air control

Titus has put it all together! Variable air volume / self-controlled air system / superior air distribution / and maximum freedom of architectural ceiling design.

THE RESULT – 3 complete Titus Total Comfort Systems (TTCS) that have the unique sensitivity and flexibility to meet the most rigid comfort demands on a highly zonalized basis – plus being able to satisfy a wide range of architectural design requirements.

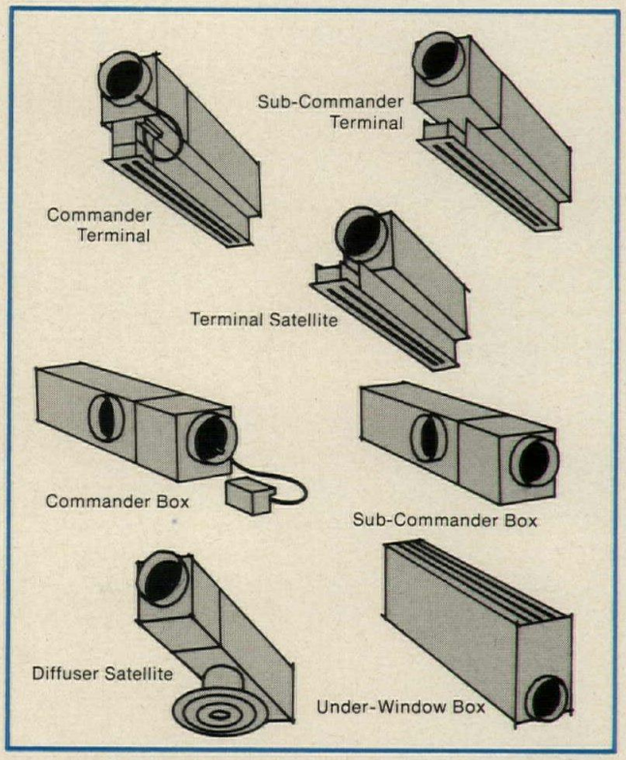
In all 3 Titus Systems, temperature is controlled automatically – in each individual zone – by simply varying the air volume. All are single duct systems which saves space, saves money.

TTCS I features Variable Volume Commander, Sub-Commander and Satellite Terminals which mount in the ceiling out of sight. The Commanders are totally self-contained with their own integral, fully adjustable linear TITUS Modulinear or T-Bar Diffusers, thermostat and automatic air control *(Johnson Service Company). Require no wiring or compressors because they are system air powered.* The design permits a wide range of thermostat locations for maximum effective sensing.

TTCS II utilizes Commander and Sub-Commander Boxes and Diffuser Satellites with adjustable Area Comfort Controllers to provide just the right amount of air, automatically – correctly diffused – for maximum comfort in each individual zone.

TTCS III features special-type Commander and Sub-Commander Under-Window Boxes for perimeter installations.

You have complete freedom of architectural ceiling design – you make no compromises in air diffusion efficiency when you specify Titus Total Comfort Systems. That



is because all types of Titus diffusers – rounds, squares, rectangulars, linears, perforateds, light troffer diffusers – to exactly fit your requirements, can be used with Titus Total Comfort Systems.

For complete details, mail coupon for new Titus Catalog TTCS/72. *NOTE:* All of the Titus Systems above are available for viewing at Titus Laboratory West, Waterloo, Iowa.

☐ Rush me new Catalog on the new Titus Total Comfort Systems.

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Title_____

Company_____

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TITUS®

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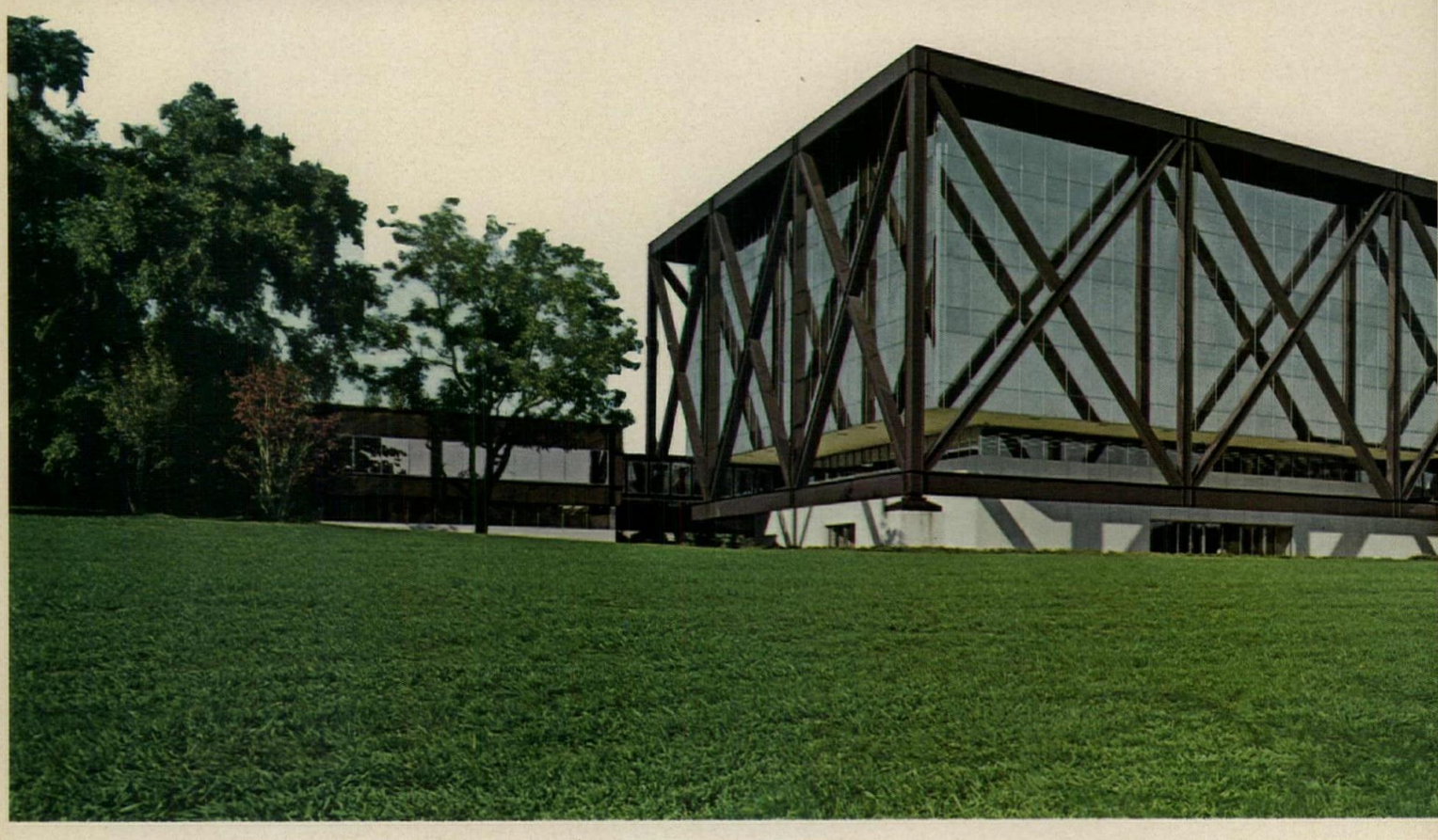
For more data, circle 111 on inquiry card

A Bold Corporate Look..

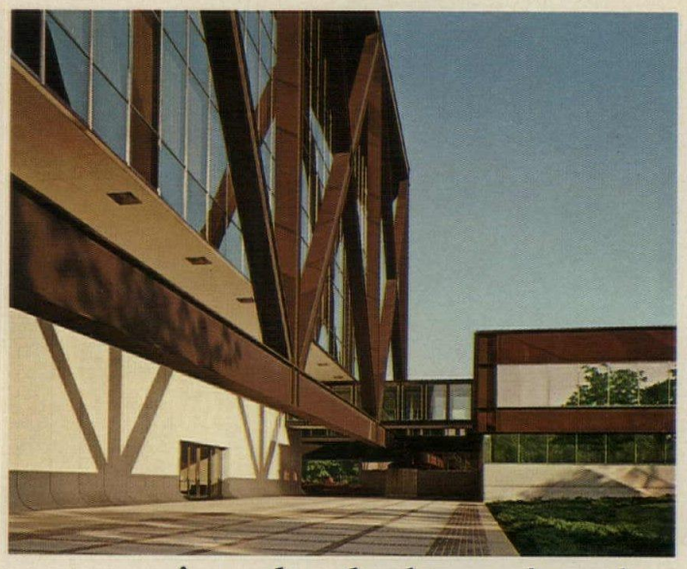
Exposed steel, mirror glass and a park-like setting are the distinctive and highly visible elements of Burlington Industries' bold new Corporate Offices at Greensboro, North Carolina.

The requirements for a structure which would project the owner's corporate identity and provide maximum flexibility were handsomely met by steel–used both structurally and aesthetically.

The complex is comprised of two distinct structural systems. The dominant, six-story tower of exposed painted steel trusses and reflective glass, houses executive and staff functions. The tower is 152′ square with a welded, steel-framed central core housing its services. The top four floors are suspended by hangers from the roof grid while the lower two floors are supported by columns on a caisson foundation. Surrounding the tower on



Defined in Steel



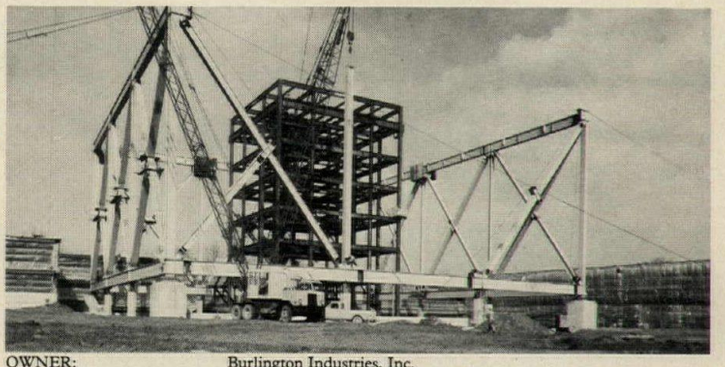
three sides and connected to it by three pedestrian bridges is a bolted, steel-framed, three-story structure which houses corporate, departmental and divisional offices and auxiliary functions.

Exposed steel in the trusses and in the 5/16-inch plate facia around the low-rise structure were painted a dark earthen hue.

Studies to determine the materials to be used indicated that steel would be the most economical system to satisfy both functional needs and the strict timetable that was set for completion of the structure.

For more detailed information, we'll be happy to send you a copy of our new Structural Report titled Burlington Industries Corporate Offices (ADUSS 27-5084-01). Contact a USS Construction Marketing Representative through your nearest USS Sales Office or write: U. S. Steel, 600 Grant St. (USS 7451), Pittsburgh, Pa. 15230.

USS TRADEMARK **United States Steel**



OWNER: Burlington Industries, Inc.
ARCHITECT/ENGINEER: Odell Associates Inc., Charlotte, N.C.
GENERAL CONTRACTOR: North Carolina Division, Daniel International Corp., Greensboro, N.C.
STEEL FABRICATOR: Carolina Steel Corp. of Greensboro, N.C.
STEEL ERECTOR: Southern Contractors Service, Columbia, S.C.

continued from page 186

PARKING GATE / The *Soft-Touch* gate arm will cease its downward motion instantly should it encounter any obstruction. Rubber-sheathed leading edges make the gate even safer. The gate housing is heavy gauge steel, designed for all-weather protection. ▪ Cincinnati Time Recorder Co., Cincinnati, O.

Circle 319 on inquiry card

CARD-CONTROLLED GATE / This model incorporates all standard parking systems, including card, coin, token, ticket dispenser and remote pushbutton, for both one- and two-way traffic. A lot capacity counter automatically deactivates entrance controls. ▪ Coin Handling Div., Keene Corp., Chicago, Ill.

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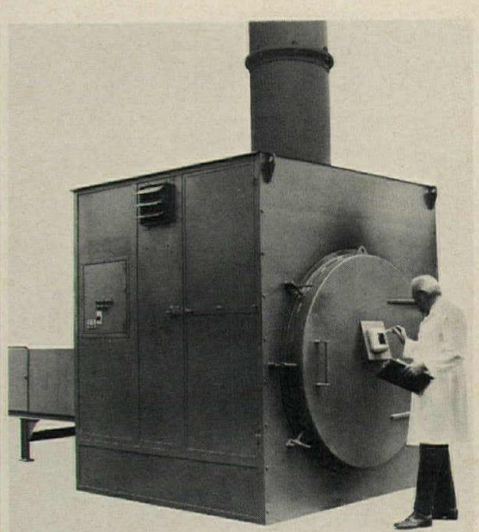

WASTE DESTRUCTOR / This *CA* unit destructs all types of organic waste while conforming to all state and federal air pollution requirements. Capacities range from 30 to 2,500 lbs of waste per hour. The unit operates without a scrubber and therefore needs no water or special drainage site. ▪ Besser-Wasteco Corp., Roanoke, Ill.

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more products on page 221

Are you ready for this?

Announcing the Sixth Biennial Design in Steel Award Program.

Have you completed any new projects in steel since January 1, 1970? Take advantage of American Iron and Steel Institute's 1972-73 Design in Steel Award Program and win yourself recognition for your favorite job.

You can submit projects in any of the 14 broad categories, ranging from appliances to business machines, industrial equipment to steel sculpture, and of course, several housing categories. Two awards are offered in each category—design excellence for aesthetic appearance—and the best engineering use of steel as a medium.

So, if you are a practicing architect, designer, engineer or artist . . . working alone or as a team . . . you're eligible to have your favorite projects judged by the distinguished panel of your peers. No entry fee required.

Take the first step toward entering this important biennial competition sponsored by AISI. Mail this reply coupon today, and we'll have your complete entry kit on its way to you.

DESIGN IN STEEL AWARD PROGRAM
Room 2302, 201 E. 42nd St., New York, N.Y. 10017

Gentlemen: Please send me your Free Entry Kit for the 1972-73 Design in Steel Award Program.

Name
Company
Address
City
State
Zip

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Do we need a Chinese Wall around America?

Not so long ago, most of us got a good look at the Great Wall of China, in living color.

It is quite a sight.

Built where it is.

But some people would like to build a "Great Wall" around America. And that would be a different sight entirely.

The specifications for the wall are contained in the Burke-Hartke Bill, now before Congress. The key provisions of this bill would:

- Establish permanent quotas on foreign imports into the U.S., at about 60% of current levels.
- Regulate, and severely restrict, the export of U.S. capital and technology.
- Impose a form of double taxation on the foreign earnings of U.S. companies.

The Great Wall of China was built to keep out invaders. The Burke-Hartke Wall goes the Chinese one better. It has *two* sides. One to keep out, and one to keep in. One to shut out foreign competition, and one to shut in *American* competition—in the form of American products, or of American initiative and enterprise.

The clear prospect is that the Burke-Hartke Wall would do far more shutting in than shutting out, at the catastrophic expense of most of U.S. business and industry, most of U.S. labor, and all American consumers and taxpayers.

The even grimmer prospect is that this hostile and defiant act—the United States against the world—would trigger an international trade war. Which would be an economic, political and moral disaster for all concerned.

Why take such an obviously extreme, desperate and dangerous step?

Because, say the supporters of Burke-Hartke, our case is desperate. Foreign competition and the export of U.S. capital and technology have created a "national crisis." We face the "destruction of major industries" and the "loss of one million American jobs."

It is time to set some things straight.

For 77 years, from 1893 through 1970, the U.S. exported more than it imported. The net result was a constant, cumulative increase in U.S. jobs and wages.

In 1971, for the first time in this century, we imported more than we exported—by $2.9-billion. The net result, at least in theory, was to displace $2.9-billion worth of domestic goods with foreign imports—and to reduce total U.S. output and employment accordingly.

Total U.S. output in goods in 1971 was well over $600-billion. The possible loss in output attributable to the $2.9-billion trading gap was, consequently, 0.5% of the total—and the presumable loss in employment about the same. That is, less than one-half of one percent.

These are the exact dimensions of the "crisis" as it relates to trade.

The facts about the "outflow of U.S. capital and technology" are equally plain.

In 1971, the capital outflow—the additional investment made by U.S. companies in foreign operations—amounted to $4.5-billion. But the capital inflow—the return on previous investment—reached $7.3-billion. Leaving a positive balance of $2.8-billion.

Similarly, the previous export of U.S. technology produced a cash inflow, in the form of royalties and fees, that amounted to $2.0-billion in 1971.

The idea that the outflow of U.S. capital and technology costs U.S. jobs is quite simply a delusion.

The foreign subsidiaries of U.S. multinational companies are essentially local businesses. 92% of what they produce is sold abroad—and, in most cases, can *only* be made and sold abroad. It *cannot* be made in the U.S., shipped abroad and sold competitively against domestic products.

Thus, to put it bluntly, the "lost" jobs never existed, and cannot exist. Except in the imagination of those willing to ignore reality to make a case.

The plain truth of the matter is that the "crisis" that has produced the Burke-Hartke Bill is not national, and has nothing to do with exports—of goods, or of capital and technology.

This Bill is the result of the very particular and special problems of certain industries and companies that find themselves unable, for a variety of reasons, to compete effectively against foreign imports.

With all due regard for the reality and seriousness of these problems—and for the industries, companies and people concerned—the Burke-Hartke Bill is *not* the answer.

To protect their interests, it is proposed that we ignore all other interests, all other considerations, and all possible consequences. To (perhaps) save their jobs, it is proposed that we gamble the jobs of another, larger group of Americans.

The trouble is, it won't work—for anybody. It is a bad idea, and a worse gamble.

The Burke-Hartke idea, in brief, is to deliberately demolish the entire delicately balanced structure of international trade and commerce, kick aside the pieces, and declare "a whole new ball game."

The gamble, on which everything rides, is that we can play the game by *our own rules*—with the outcome fixed in advance, in our favor.

The Burke-Hartke rules arbitrarily and unilaterally cut U.S. imports almost in half—from $47-billion in 1971, to a fixed annual rate of about $28-billion.

This presents the other nations of the world with an ultimatum—and two equally bleak alternatives.

They can accept an $18-billion annual loss in sales *to* the U.S., while continuing to buy at the rate of $40-50-billion *from* the U.S.—thus accepting a *permanent* trading gap on the order of $20-billion a year.

Or they can cut their purchases of U.S. goods, build their own walls, and let the trade war take its ruinous course.

A hard choice. But can there be any doubt as to the answer? And the results?

Walls, in the general experience of mankind, are rooted in fear, built on delusion, and doomed to futility.

The Burke-Hartke Wall is no exception.

It is a product of fear, based on the delusion that the answer to competition is to refuse to compete.

It is a symbol of panic and despair—crying, "Stop the world, we want to get off."

But the world won't stop, we can't get off, and we don't need a wall, but a way.

A way, quite simply, to make this country what it can and should be. Strong, productive, and confidently competitive in a competitive world.

This is the way—the *only* way—to really save our jobs.

And our self-respect.

We at McGraw-Hill believe in the interdependence of American society. We believe that, particularly among the major groups—business, professions, labor and government—there is too little recognition of our mutual dependence, and of our respective contributions. And we believe that it is the responsibility of the media to improve this recognition.

This is the fourth of a series of editorial messages on a variety of significant subjects that we hope will contribute to a broader understanding.

Permission is freely granted to individuals and organizations to reprint or republish these messages.

John R Emery

John R. Emery, President
McGraw-Hill Publications Co.

San Antonio Convention Center
Architects: Noonan, Krocker and Dockery,
San Antonio, Texas

When you specify clay tile floors, specify Hillyard Onex-Seal II® to keep them like new.

Clay tile floors have a striking beauty all their own. But without a protective seal, severe disintegration from within and unsightly staining from without can dramatically reduce the life of the floor.

Onex-Seal II is a penetrating finish that effectively seals the grouting against moisture, to prevent both efflorescence and discoloring stains. It's your best assurance that the clay tile floors you specify will provide long-lasting beauty and ease of maintenance for your client.

And your client's clay tile floors will look better longer when you specify regular maintenance with products like Hillyard Super Shine-All®. Abrasives, alkalis, soaps, acids, oils, and solvents commonly used in floor maintenance programs have harmful effects on clay tile. But, Super Shine-All is a powerful, yet gentle, neutral cleaner for all clay tile surfaces. It's just one of the quality Hillyard products that will keep tile new-looking and keep maintenance costs low.

A Hillyard Architectural Consultant will be happy to recommend the best products and procedures to include in your specifications. Just say the word and we'll have him get in touch with you. Or look us up in Sweet's or ask for our Uniformed Numbered File with complete information on clay tile.

HILLYARD
FLOOR TREATMENTS

ST. JOSEPH, MISSOURI USA
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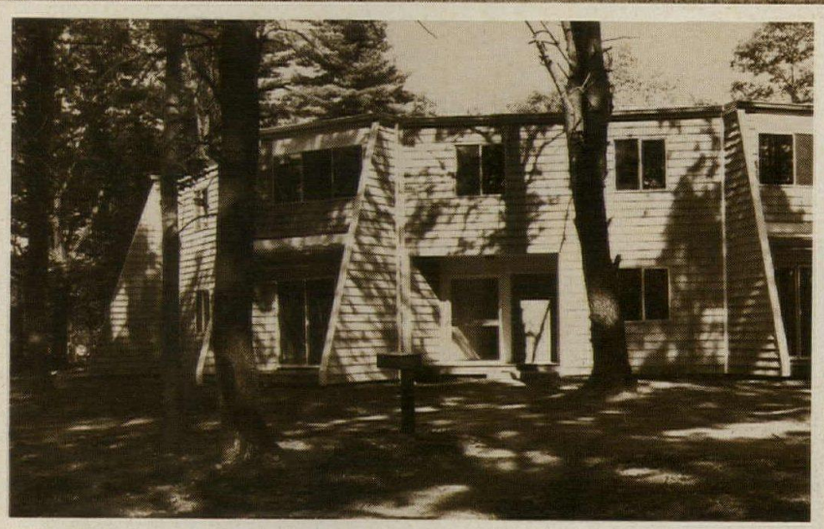
The most widely recommended and approved treatments for every surface

For more data, circle 113 on inquiry card

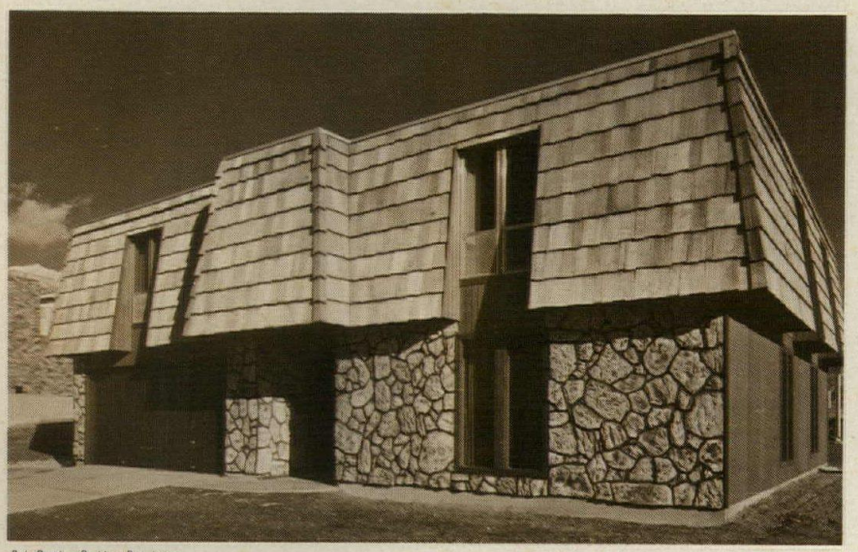
Shakertown
SHAKES AND SHINGLES



"Modular in the Round," student housing at Hampshire College, Amherst, Mass. Fontaine Modular Structures, Inc., designers, builders and engineers

IN 8-FOOT PANELS

• APPLY FASTER • ATTRACT CUSTOMERS • MORE DESIGN FLEXIBILITY



Bob Rand—Builder, Developer

Western Red Cedar shake and shingle textures are always popular for enhancing the design of the building. The rustic face and heavy butt lines increase the texture dimension for side-walls and the various Mansard expressions. Shakertown bonds the individual shakes and shingles into a convenient 8-foot panel which saves time on the job and gives a tight, weather protection to homes and apartments. Available in a variety of textures in natural cedar or a choice of semi-transparent colors with either 7" or 14" exposure. Matching color nails and matching corners finish the job.

SEE OUR CATALOG IN SWEET'S ARCHITECTURAL FILE OR WRITE FOR COPY

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VANCOUVER 3, B.C.
P.O. BOX 2042

For more data, circle 115 on inquiry card


CATERPILLAR

Du Pont invents carpet cushion for heavy traffic.

Gas-filled cells won't flatten under load.

Pneumacel is a first.

Structurally, it's a new form of matter—a carpet cushion of tough fibers, each made up of billions of tiny closed cells inflated with an inert gas and air.

Functionally, it's a pneumatic wonder. The cell walls are impermeable to the gas. Yet they breathe air. In and out.

This means that pneumacel never compresses completely. There is always a cushion of gas to give resiliency—even after years of heavy traffic.

Gives carpet longest life, luxury feel.

Pneumacel is the first cushion to combine underfoot luxury with carpet pile protection.

By spreading the load and never bottoming out, it eases the crush on the pile face and the strain on the backing material.

It extends carpet life more than waffle rubber, polyurethane foam, hair-jute or all-hair cushions.

In addition, pneumacel was engineered to give carpet the underfoot feel overwhelmingly preferred in consumer panel tests.

Muffles noise. Retards flame. Won't stretch.

Acoustical tests show that pneumacel transmits the least impact sound of any cushion.

It meets or exceeds recognized industry and government standards for fire retardancy, smoke and fume generation.

Completely stable, it lays flat and stays flat. Won't rot, swell or degrade.

Backed by eight years of testing, it has proved its exceptional performance in a variety of heavy-traffic installations.

Specify pneumacel. It combines everything you want in carpet cushioning.

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

Pneumacel Carpet Cushion

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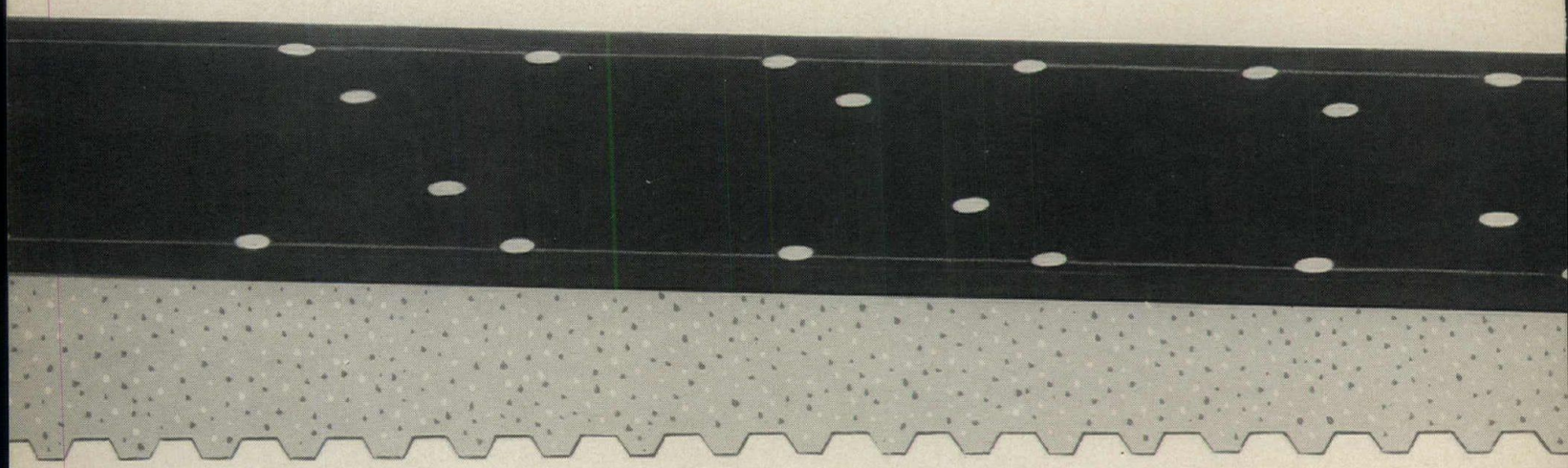
Here are 12 ways that ZONOLITE ROOF DECKS help you- now and in the long run.



A roof must do its job.

The objective is to protect the building and its contents. A roof design which does not give the required protection is a potential problem for everyone.

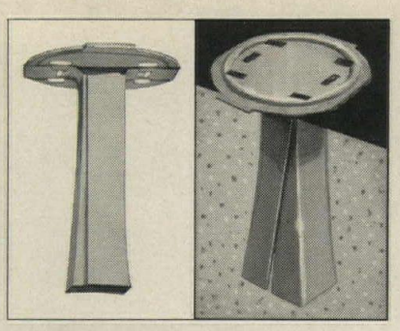
Properly designed ZONOLITE ROOF DECKS meet this objective in 12 ways:

1. EASILY SLOPED FOR DRAINAGE. Water won't form ponds on a sloped ZONOLITE deck. Ponding damages roofing, causing leaks that lead to roof failures.

2. FREE OF SEAMS AND JOINTS. Smooth continuous slabs with no network of joints, ridges, or seams to weaken roofing and allow water penetration.

3. STRONG. Less susceptible to damage. Compressive strengths of 100 to over 350 psi, compared to rigid board's 5 to 40 psi.

4. LONGER ROOFING LIFE. Higher density reduces thermal fluctuations which tend to shorten roofing membrane life.



5. NAILABLE. Positive attachment obtainable with easily-nailed ZONOLITE® Base Ply Fasteners shown here. Important in resisting hurricane-force winds.

6. WON'T DETERIORATE. Unlike rigid boards, ZONOLITE decks contain only inert materials.

7. WIDE RANGE OF INSULATION VALUES. "U" values from .05 to .20. Meets any design or climatic need.

8. CONTINUOUS THERMAL BARRIER. No heat-leaking seams, common to jointed rigid insulation.

9. FIRE-SAFE. Non-combustible, under Factory Mutual design classifications. Many ZONOLITE deck assemblies are UL fire-tested. This often results in lower insurance costs.

10. WIND-RESISTIVE. Meets Factory Mutual wind-resistance standards. Further improves possible insurance premium reductions, while serving to reduce costly maintenance and replacement.

11. EARTHQUAKE-RESISTANT. Properly designed ZONOLITE ROOF DECKS resist lateral loads caused by earthquakes or wind forces.

12. CERTIFIED CONTROLLED APPLICATION. National network of skilled approved applicators and competent ZONOLITE field personnel provide certified application and job-site quality control.

ZONOLITE ROOF DECKS are less expensive to install than comparable quality systems. Almost anywhere. And they're certainly a lot more economical to maintain and repair (if ever necessary).

There are many more reasons why you should consider ZONOLITE ROOF DECKS. For details, just call us. We'll be glad to send an expert who can furnish facts and figures.

Or write for literature to W. R. Grace & Co., Construction Products Division, 62 Whittemore Avenue, Cambridge, Mass. 02140.

GRACE ZONOLITE

For more data, circle 117 on inquiry card

This may seem like an unusual place to run a help wanted ad

But, we're looking for men a cut above the usual and we thought you might be able to help.

At present, we have 125 highly qualified sales representatives in the United States and Western Canada but our growth has been so rapid that we need at least 20 more right now and double that number within the next year.

By rapid growth we mean that we have tripled our sales of TRUS JOIST products in the past five years and that this year they will be more than double 1970's total.

We think that kind of growth represents a real opportunity for men who have a background in construction, architecture or engineering; men who can talk the language and who can find real enjoyment in selling a top quality product. However, by selling we mean actually assisting the architects, engineers, developers or builders in getting the best possible roof or floor structural system for the least possible cost. That means he must have a genuine feel for construction and a technical competence which is above average.

His earnings will also be above average and he'll find that we have an excellent profit sharing plan along with a superior medical and hospitalization policy which is company paid. Advancement? If he has management potential he can go far and fast. As for location, there should be no problem since we can use good men in almost every section of the country.

If you know a man who would welcome such an opportunity, we'd appreciate it if you'd mention our company to him and ask him to send a resume to Keith Patterson, TRUS JOIST Corporation, 9777 Chinden Boulevard, Boise, Idaho 83702.

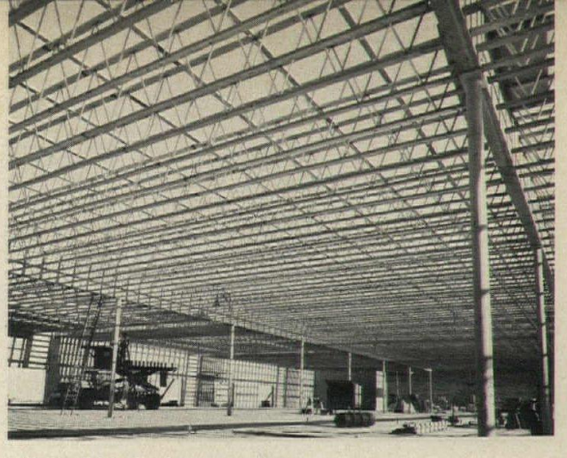
He'll appreciate it too.

trus joist TJ® Corporation

PHONE 208/375-4450 ■ 9777 CHINDEN BLVD. ■ BOISE, IDAHO 83702

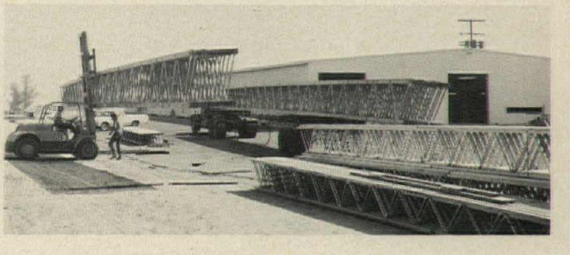
For more data, circle 120 on inquiry card

The TRUS JOIST marketing team is acknowledged in the industry as one of the most skilled and knowledgable groups in the structural component field.



L Series joists in shopping center. Lightweight, fast erection, nailable chords, open webs and labor savings are features which have led to rapidly increasing sales.

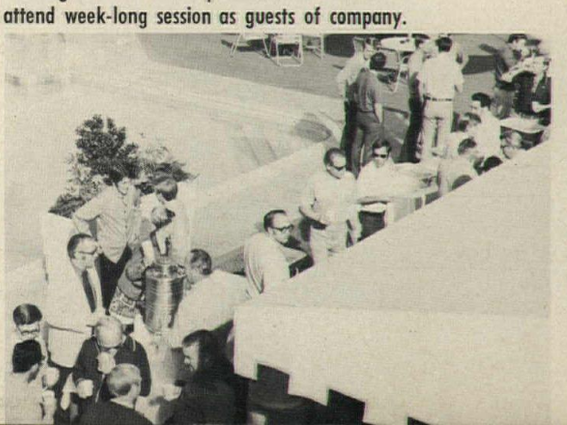
Apartment builders crowd TJ booth at New York trade show. Ron Pittillo (facing camera under TRUS JOIST sign) has written a million dollars in TJ orders in past year.

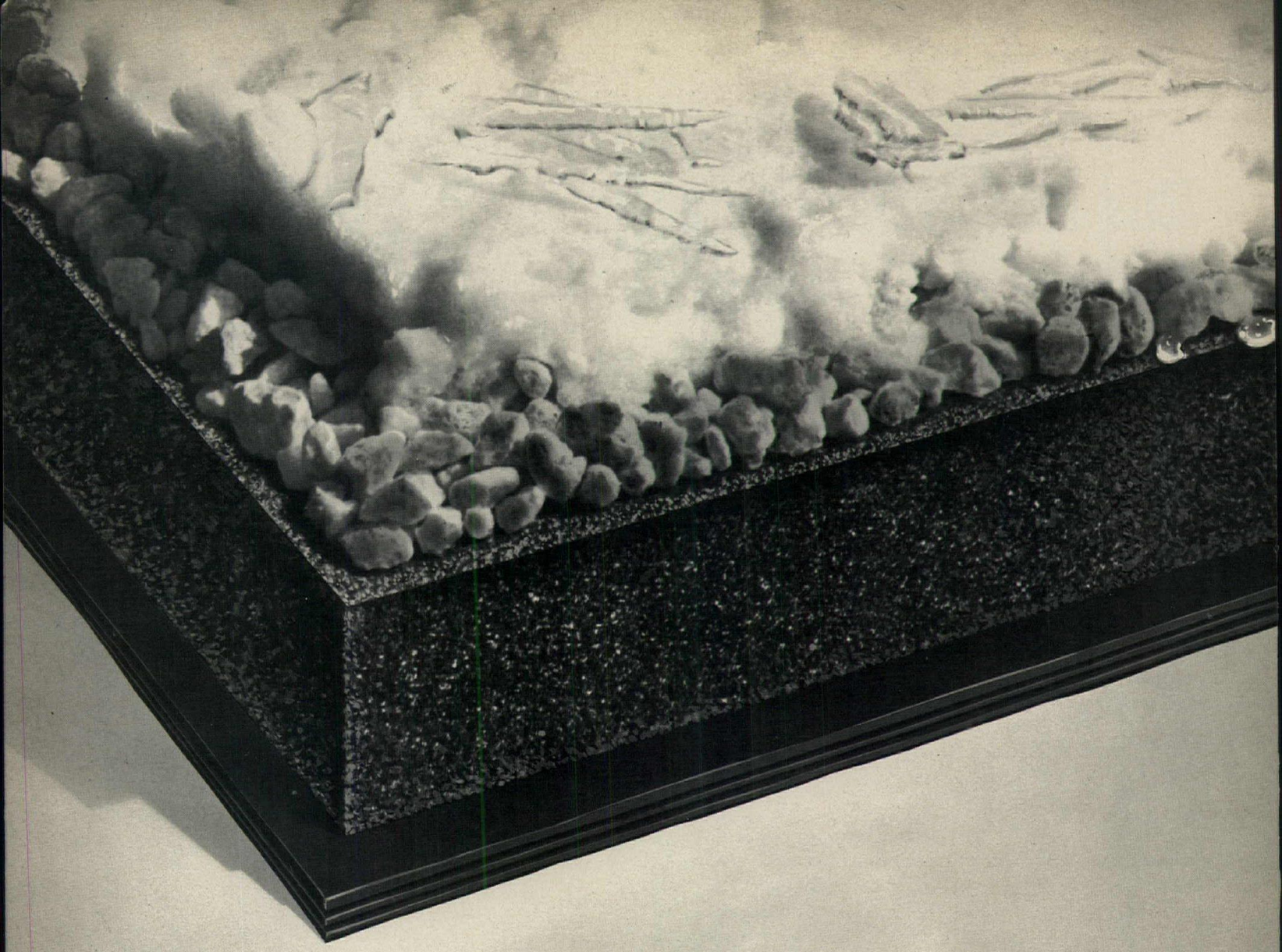


Long span H Series TRUS JOISTS being loaded at California plant; one of eleven TJ plants in the United States and Canada. Company also has 75 sales offices.

New low cost I Series joist has had tremendous acceptance from apartment and town house builders, with sales more than doubling each year.

Coffee-break time at mid-winter Arizona sales meeting. All TJ sales representatives and wives attend week-long session as guests of company.





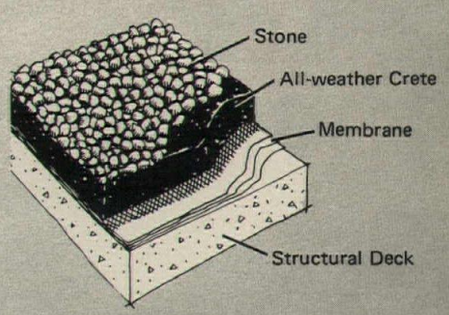
freezing water will never reach this roof membrane to tear the guts out of it!

That's because it's protected with the All-weather Crete Insul-top System! This new concept places the insulation over the waterproof membrane (where it belongs) to protect it from extreme temperature cycling. The major cause of stress on roofing membranes is the expansion and contraction due to temperature changes. An unrestricted membrane can move 2½" in 100' during a temperature change of 130° and progressively shrinks slightly each time! This permanent deformation is one of the leading causes of water leakage where the membrane has pulled away from flashing and parapets.

All-weather Crete over the membrane reduces expansion and shrinkage to a negligible point. The All-weather Crete Insul-top System protects the membrane keeping it "alive" and waterproof for years. All-weather Crete is tough. It is not affected by freezing and thawing and its thickness of from 1½" to 5" or more also protects the membrane from accidental puncture.

Consider this new concept on your next project. You may like the feeling of "leakproof" roofs.

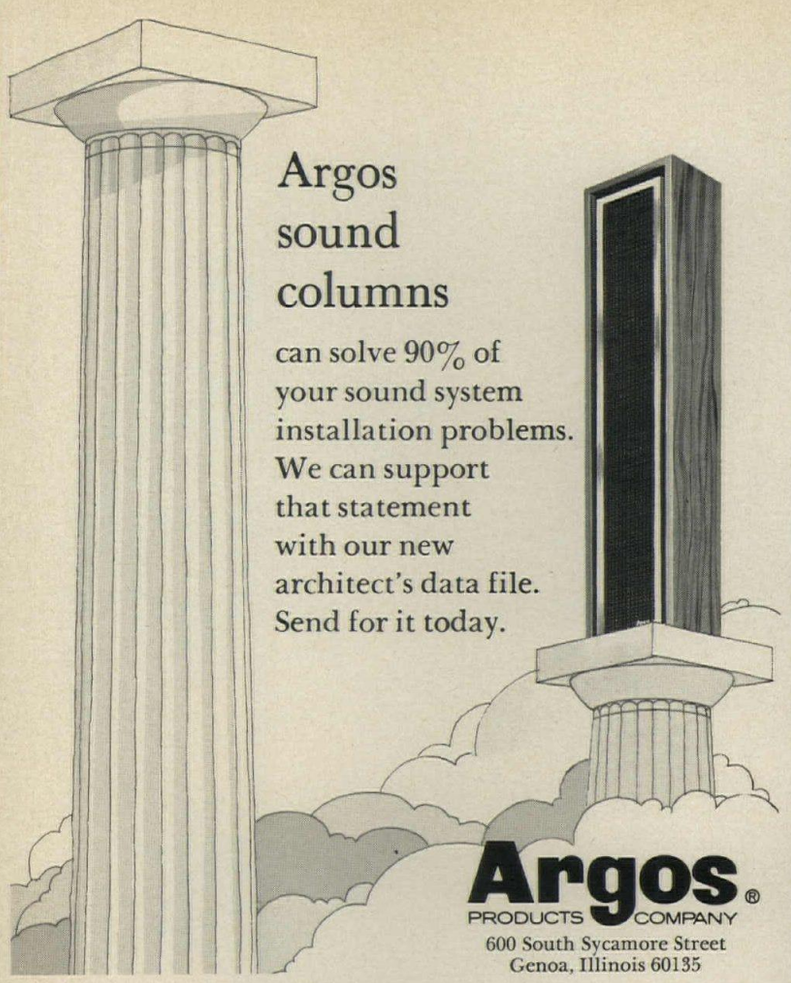
Write for the 16 page technical booklet "Designing a Leak Proof Roof". Silbrico Corporation, 6300 River Road, Hodgkins, Illinois 60525.



All-weather Crete® Insul-top System

SILBRICO

For more data, circle 125 on inquiry card



Argos sound columns

can solve 90% of your sound system installation problems. We can support that statement with our new architect's data file. Send for it today.

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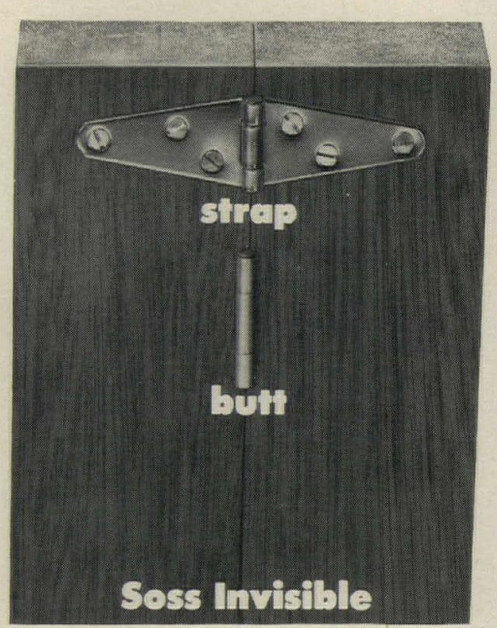
For more data, circle 70 on inquiry card

Pick the hinge that hides



Compare the Soss look of invisibility with any strap or butt hinge and you'll choose The Soss Invisibles. These amazing hinges hide when closed to blend with any decor. With The Soss Invisibles you can create room, closet, or cabinet openings which are unbroken by hinges or gaps . . . the perfect look for doors, doorwalls, built-in bars, stereos, or T.V.'s. The Invisibles are extra strong, open a full 180 degrees, and are reversible for right or left hand openings. See listing in Sweet's or write for catalog: Soss Manufacturing Company, Division of SOS Consolidated, Inc., P.O. Box 8200, Detroit, Michigan 48213.

the SOSS Invisibles

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For more data, circle 72 on inquiry card

down with the boredroom!

Give a room the gift of life . . . Krueger 3200 Series arm chairs. Cheerful, colorful, comfortable fiberglass shells with seat cushion option, or padded and completely upholstered in fabric or vinyl. Pedestal bases with optional tilt action control and casters. Also available in side chair styles. Write for full color brochure.

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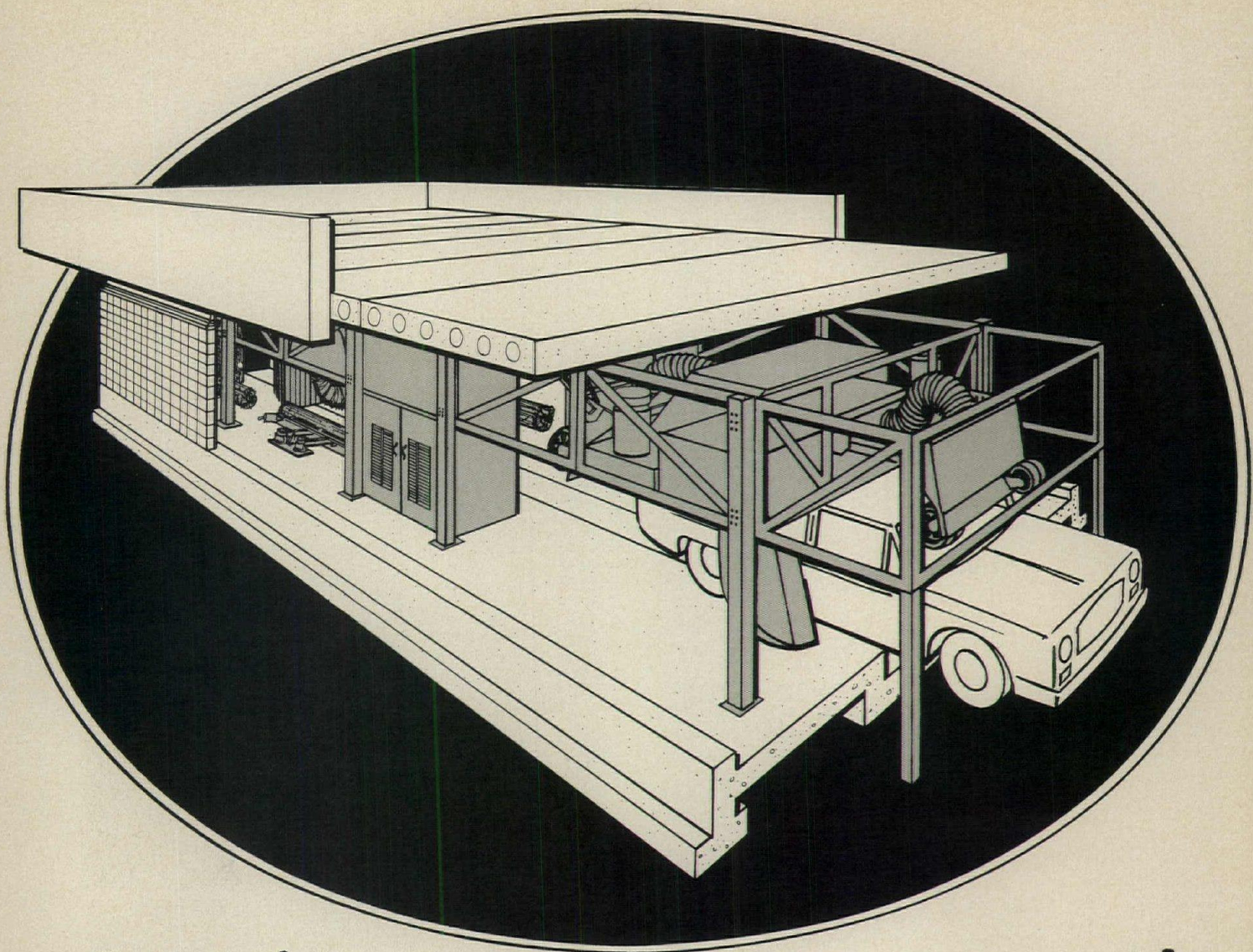

the designer's car wash

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Hanna Industries, the leading designer and manufacturer of automatic car wash equipment and systems recently introduced a totally new concept in car wash equipment design.

This revolutionary design structurally integrates both equipment and building into a complete package.

The equipment is overhead mounted in modules that are suspended by vertical steel support posts.

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For more information on the Designer's Car Wash write or call:

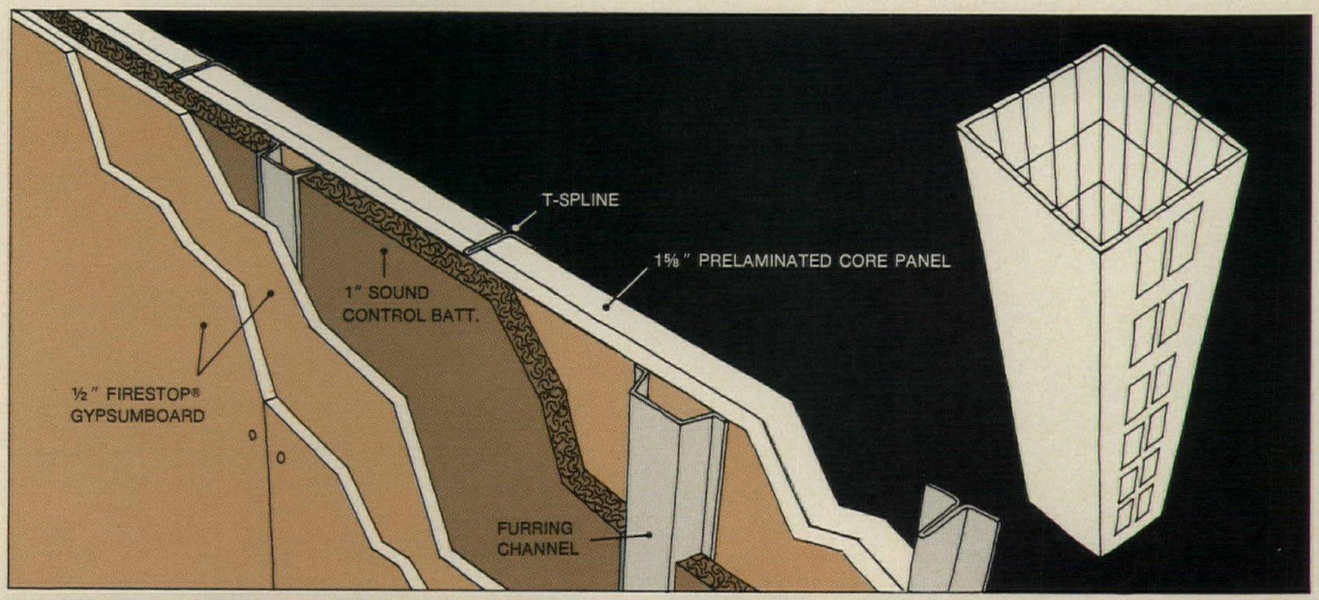
HANNA INDUSTRIES

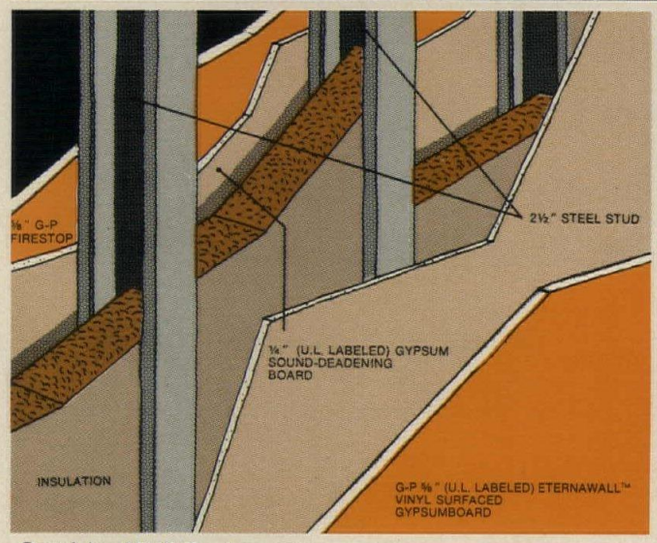
Post Office Box 3736, Portland, Oregon 97208—Area Code 800/547-7911 (toll-free).

For more data, circle 3 on inquiry card

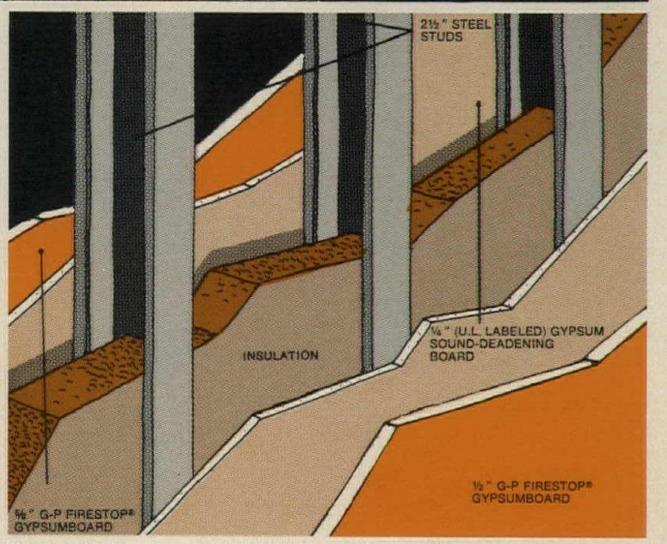
G-P has the answer to economical fire and sound control in high-rise construction.

New Cavity Shaft Liner System. G-P's new system weighs about 10.5 lbs. p.s.f. compared to 34 lbs. p.s.f. or more for masonry shaft walls. It has a 2-hour fire rating from both sides without insulation. An STC of 47 with 1" sound control batts in the cavity. Other systems available with ratings up to STC 50. And it's easy to install. Prelaminated panels are installed in top and bottom runners with a T spline placed between panels, 24" on center. Next, furring channels are attached midway between the T-splines. Then 2 layers of ½" FIRESTOP® gypsumboard are attached to the furring channels with the joints staggered. And that's it. You save time, money and space.





Corridor Wall System. This economical wall system gives you an STC of 54 and a one-hour fire rating. On the interior side of 2½" steel studs with fiber glass friction-fit insulation, G-P's ¼" (U.L. labeled) Gypsum Sound-Deadening Board is attached. Then, ⅝" FIRESTOP® gypsumboard is applied to the Sound-Deadening Board. On the corridor side, G-P's ⅝" (U.L. labeled) Eternawall™ is attached to the Sound-Deadening Board. And you've got a corridor that's tough. Colorfast. Stain and abrasion resistant. And beautiful.



Party Wall. With G-P's party wall system, you get an STC of 50 and a one-hour incombustible fire rating. First erect 2½" steel studs and then install 2½" fiber glass insulation. Then, on both sides of the studs, G-P's ¼" (U.L. labeled) Gypsum Sound-Deadening Board is attached. Applied to the Sound-Deadening Board is G-P's ½" FIRESTOP® gypsumboard. Easy! Fast! Inexpensive!

Georgia-Pacific

Gypsum Division
Portland, Oregon 97204

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Salary commensurate with required experience along with outstanding benefits in a healthy professional environment.

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Associate Architect—For client relation, design and contract document responsibility in growth oriented firm with diversified practice in university, commercial, industrial and governmental programs. Related experience necessary. Unlimited advancement opportunity. Salary open. Offices Houston and Beaumont, Texas, with multi-state practice. Exceptional family community and sports opportunity area. Forward resume, including salary history, to Pitts, Phelps and White, Architects, Planners-Engineers, 470 Orleans Street, Beaumont, Texas 77701—indicated "confidential."

Architect—Design-Build firm working on imaginative structures has opening for architect capable of assuming job captain responsibility. Broad experience (construction, specification writing, design, cleint contact, etc.) highly desirable. Must have excellent references. 4-day week, profit sharing plan. Salary open. Send resume to Mr. Cellucci, 140 N. Virginia St., Reno, Nevada 89501.

Architectural Senior Draftsmen—Project leader minimum five years experience in institutional work, primarily schools. Experience required in development of preliminary plans and working drawings. Medium size, fast-growing office. Health and retirement plans. Advancement and salary commensurate with ability. J. Prentiss Browne, Inc., Architects/Planners, 2435 North Calvert Street, Baltimore, Maryland 21218.

Senior Architectural Draftsmen—Small Office—Environmental & Design Orientation; Residential, Multi-Family, Commercial; Office location in firm's 10 acre rural professional-shop community, Stuart, Florida; 35 miles north of Palm Beach, on Ocean and Rivers; county population 29,000. Peter Jefferson, A.I.A., 35 East Ocean Blvd. Stuart, Florida 33494 (305) 287-5755.

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Manufacturer's Reps wanted by well established manufacturer of new and proven systems for fastening to concrete and steel. Want reps presently calling on architects for "Spec" items. Many territories open. Commission and call basis. No stock to carry. Write to C. B. Waud, Buildex Division, Illinois Tool Works Inc., 801 North Hilltop Drive, Itasca, Illinois 60143.

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Take Your Company Away From It All—Classic brick mill in 200 year old country town in southern New Hampshire needs new owner. Easily converted to office or plant for you or your client. 5000 sq. ft. located on a lakefront astride a clear stream in a town flourishing with new businesses—a perfect New England setting. Long term lease or purchase. Respond: Box 647, Ridgewood, New Jersey, 07451.

continued from page 200

EXHIBIT SYSTEM / This modular display system comes with sturdy adjustable chromium-plated uprights and canvas-covered screens. Optional accessories include shelves, book supports and lockable showcases. ■ Library Bureau, Herkimer, N.Y.

Circle 322 on inquiry card

CENTRAL VACUUM / Now available in a wide range of commercial and industrial applications are central vacuum cleaning systems with remotely located dirt exhausting units. The system offers both wet and dry pick-up. ■ Lamson Div., Diebold Inc., Canton, O.

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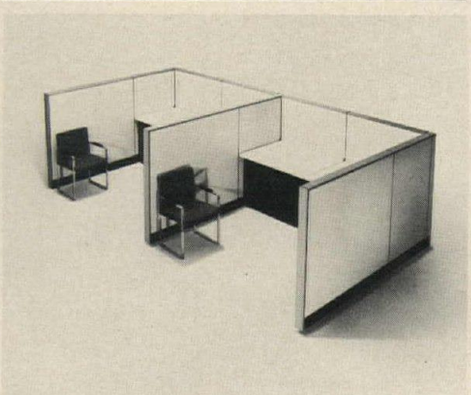

PARTITION SYSTEM / Available in surfaces of wood, high pressure laminate, cork or upholstery, the units offer channels for all communications and electrical service. Add-on components include returns, credenzas, desks and shelves. ■ JG Furniture Co. Inc., Quakertown, Pa.

Circle 324 on inquiry card

ADVERTISING INDEX

Pre-filed catalogs of the manufacturers listed below are available in the 1972 Sweet's Catalog File as follows.

A Architectural File (green)
I Industrial Construction File (blue)
L Light Construction File (yellow)
D Interior Design File (black)

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Quiet plus

McQuay® central station fan coil and water chiller systems offer quiet economical operation.

Quiet is easy to understand. Like a morning in the woods. No clatter, no bang, little moving but time. That's the kind of quiet you get with McQuay central station fan coil systems. One nearly silent fan and motor are the only moving parts in the room. Contrast that with the through-the-wall packaged terminal air conditioner units in many motels, hotels and apartments. The compressor, condenser fan and motor, and evaporator fan and motor introduce a relatively high noise level into the room. In the McQuay system, the compressor, condenser fans and pump are isolated in one central remote point so they won't disturb tenants and guests.

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For complete information about the quiet economy of central station fan coil and water chiller systems, contact your McQuay representative or write McQuay-Perfex Inc., Box 1551, 13600 Industrial Park Blvd., Minneapolis, Minnesota 55440.

Look to the systems leader . . .

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