



THE JULLIARD SCHOOL AT LINCOLN CENTER

RECORD INTERIORS OF 1970

NEW WAYS TO PRACTICE: URBAN DESIGN AS PART OF THE GOVERNMENTAL PROCESS

BUILDING TYPES STUDY: HEALTH FACILITIES

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# ARCHITECTURAL RECORD

JANUARY 1970 **1** A MCGRAW-HILL PUBLICATION TWO DOLLARS PER COPY



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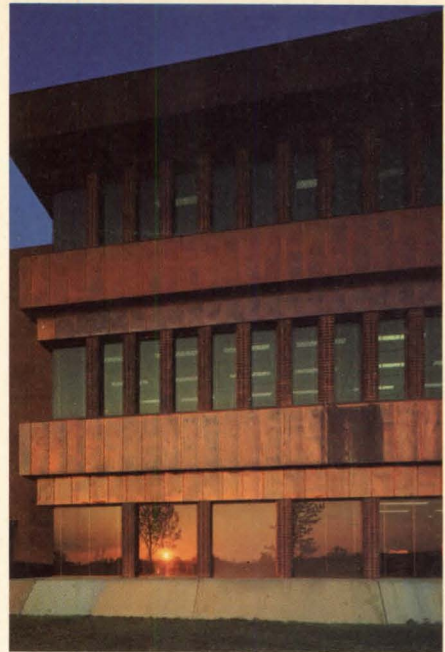
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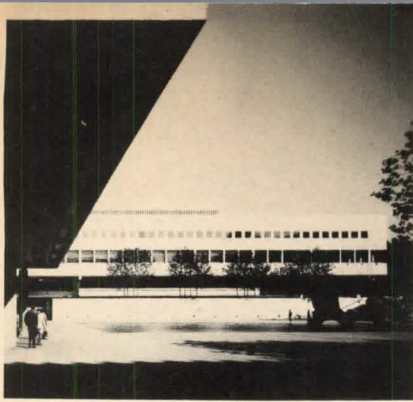
VISTA DEL RIO, Kansas City, Missouri. ARCHITECTS: John Lawrence Daw & Associates, Architects & Planners, Kansas City. GENERAL CONTRACTOR: J. E. Dunn Construction Co., Kansas City. Dover Elevators Installed by Dover Elevator Co., Kansas City.

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Cover: The Juilliard School,  
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Pietro Belluschi, Architect; Eduardo Catalano and  
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Norman McGrath

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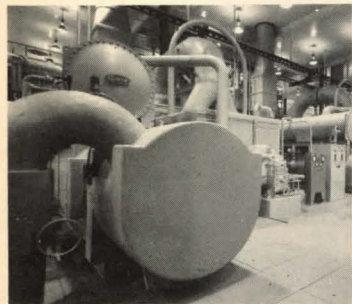
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### BUILDING TYPES STUDY: COLLEGE BUILDINGS

Next month's Building Types Study will feature two college complexes by Davis Brody and Associates which are of particular interest as examples of design and planning at a bold new scale facilitated by an enlightened public client within the framework of an effective administrative process: a 6,000-student college for the State University of New York at Buffalo and a 600-student dormitory and dining hall complex for the State University College at New Paltz. Also to be featured are three science centers, two by the firm of Douglas Orr, de Cossy, Winder and Associates and one by Campbell, Aldrich and Nulty, and an academic complex at Grand Valley State College at Allendale, Michigan, by Tarapata and MacMahon Associates.

### FOUR PROJECTS FROM THE JOHN ANDREWS OFFICE

The central issue of the four projects—all of them now under construction—has been the rationales used in the process of their designs, and these processes will be discussed in detail. Principally, each project is founded on a rational circulation scheme as a generator of its form.



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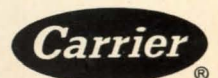
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## New Dimensions of Architectural Practice

A paradox, a paradox, a most confusing (and damaging and destructive) paradox.

This is a time when architects are talking (and worrying) more than ever about their professional identity, their role in the scheme of things, their ability to adjust to the changes in practice that are sweeping across the profession, their participation in the creation of the "new America" that we as a people are planning to build—and indeed must build.

This is also a time, as argued in these pages in July, when architects stand in the strongest position they have held for a very long time. The opportunity for architects has never been greater, the need for architects has never been greater, and the influence of architects has never been greater—at every scale of practice, in private and public work.

Beginning now, in the pages of the RECORD, we will be emphasizing these "New Dimensions of Architectural Practice," an editorial theme intended not to argue—but to demonstrate—the growing influence and range of practice of architects and the engineers who work with them.

This is not something that has happened in a revolutionary fashion. It has been clear for some time. Let's look at just a few of the demonstrations the RECORD has published in just the past year:

- "Urban Housing: A Comprehensive Approach to Quality" (January) described the work of a team of young architects and planners to raise the design quality of much of the Federally-aided housing in New York, under a system which directly involved the mayor of the city in lightening the hand of

bureaucratic review. This is a new kind of influence—and practice—for architects.

- In the introduction to the Issues in Architecture series, managing editor Jeanne Davern wrote: "If the architecture of the early Fifties seemed often too absorbed in stylistic polemicism to be much aware of 'humanity, our client,' the architecture of the late Sixties seems more likely to be seduced by non-architecture, or even anti-architecture. At least there actually appear to be doubts in some architectural circles that the visual ordering of the environment is any longer an appropriate cause. (If people are the cause, does architecture matter?) The great issues of our time concern the architect, and the architect-to-be, as never before. This architectural generation is aware of human problems, all right, and wants to be, indeed demands to be, involved in their solution. But how? This is the great debate that engages the professions: practitioners, teachers and students. In a time that cries for reason and reflection as well as passions, the RECORD begins a new series of critical articles on 'Issues in Architecture.'" And those "critical articles"—written through the year by architects William W. Caudill, Richard Llewelyn-Davies, Benjamin Thompson, Edmund Bacon and Albert Mayer—have indeed spoken with passion, and reason and reflection, about the needs of humanity, the needs of people, and therefore the need for architects and the need for the architecture they produce.

**New problems require that architects work on a broader scale—and they are**

One example, noted on this page just two months ago, is the new official policy of the

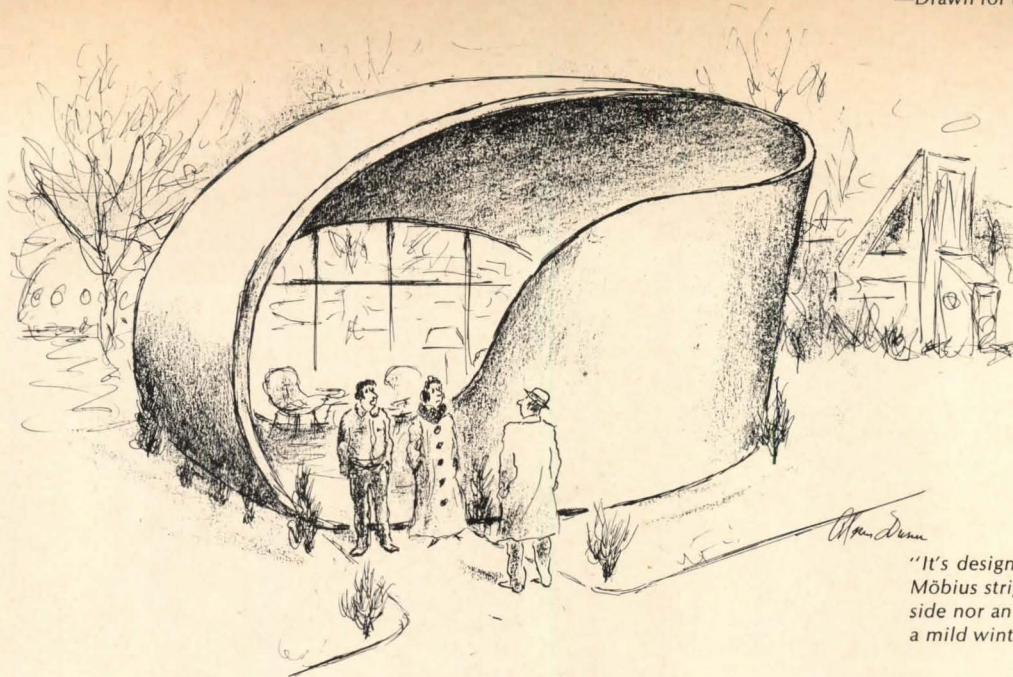
A.I.A. that henceforth A.I.A. programs must be structured to achieve "responsible involvement in those areas—the human and physical sciences, economics, politics, public education—which shape the physical environment and represent constraints in the creative process." That means involvement—among other things—on the legislative front.

- While the bulk of work for almost any architect is still designing buildings for clients in the traditional manner, new problems—ranging from the design of subway stations and subway trains (as Skidmore, Owings & Merrill's Chicago office has just done) to the design of prototype space stations (as Eliot Noyes and Warner Burns Toan Lunde are doing)—are being accepted and handled well.

- More and more planning—from neighborhood-block scale to city scale—is being done on a three-dimensional rather than a two-dimensional basis, and this is leading to essentially new kinds of teamwork between professional planners and architects. For one example, see the article in this issue (page 131) on the work of New York City's Urban Design Group in the development of the city's new Comprehensive Plan.

- On quite a different scale is the growing involvement and influence of architects in the design of interiors. RECORD INTERIORS OF 1970 (page 97) shows the work chosen by the editors as best architect-designed interiors of the year—including work done as part of the design commission for the building, or as separate interior commissions. In a survey of architect-readers of the RECORD (June), 64 per cent of the architects surveyed practiced interior design as part of their professional service; and three quarters of them intend to expand that part of their practice. New roles, broadening range of practice.

The emphasis of the architect's involvement in all of these problems—what the architect wishes to contribute and is unique-



"It's designed on the principle of the Möbius strip, which has neither an inside nor an outside. We're praying for a mild winter."

ly qualified to contribute—is a rare skill in translating into buildable designs a sensitivity to a broad range of human values.

### Today's broader scale brings new practice problems, and they are being solved

One example of that scale (and probably an unprecedented one) is the construction under way by the 45 agencies of the State of New York. Last year, those agencies had under construction \$3.6 billion of new buildings and facilities, and will have under construction next year over \$5 billion. The design for 98 per cent of that work is done by private architectural and engineering firms, and its over-all quality is extraordinarily high.

Just one of those 45 agencies is the State University Construction Fund, whose general manager, Dr. Anthony Adinolfi, has commissioned well over 100 architectural firms to work on over 30 campuses within the state. Over 20 firms are involved so far in the planning of a 1,200-acre campus for the State University of New York at Buffalo, which will by 1975 have a total enrollment of 36,000, and over 5,000 staff and related people; and will be the catalyst for the development of a whole "new town" now in the planning by another state agency, Edward Logue's new Urban Development Corporation.

That Corporation, which will operate on an unprecedented scale, and which has enormous powers including eminent domain and bond issuance, has under commission some of the state's most distinguished architects. How does this "new kind of client" retain architects? As reported to interested parties in "Oculus", a publication of the New York Chapter of A.I.A.: "Mr. William Chafee, an architect formerly with I.M. Pei & Partners, heads the Research & Development Department. He receives brochures and interviews prospective architects and then makes recommendations to Edward Logue . . . and the final selection is made. There is no 'Mayor's List.' There is

no selection by seniority . . ." Which is, it seems, so simple and believable (and traditional) a practice as to put into perspective all kinds of vague and never defined concerns about the architect working with "the new client." There are few problems more "new scale." And good architects—with the help of good clients—are solving those problems effectively.

### What other "new problems" can affect the role and influence of the architect?

■ Take housing. Those 26-million housing units are a crucial national problem—now being attacked boldly on many fronts: by Operation Breakthrough, by other Federal programs, and by state and local programs across the country. The enormous boom in mobile homes notwithstanding, does anyone really feel that the people (not the statistical people, but the people one by one) are ready for a housing package, like an automobile package? "Units" are not enough; we need homes. This housing must and will be built—and when anyone (even the Federal government) is playing with that kind of blue chips it calls on (indeed demands) all the skill it can get. Consider that the exploding demand for housing (especially since an increasing percentage of it will inevitably be high-density) will see not a diminishing role for the architect and his traditional professional partners but an overwhelming increase in their role and influence.

■ Take "the new competitors." As pointed out in the July issue, it is one thing to say that there are new breeds of design-oriented consultants, new kinds of construction management consultants, new kinds of "systems people"—and another to say that the architectural profession is in danger of losing its role in the building process. To repeat: "Let us remember that architects have long worked in a businesslike, professional, mutually advantageous relationship with a great many professional advisors . . . that most architects thoroughly understand the

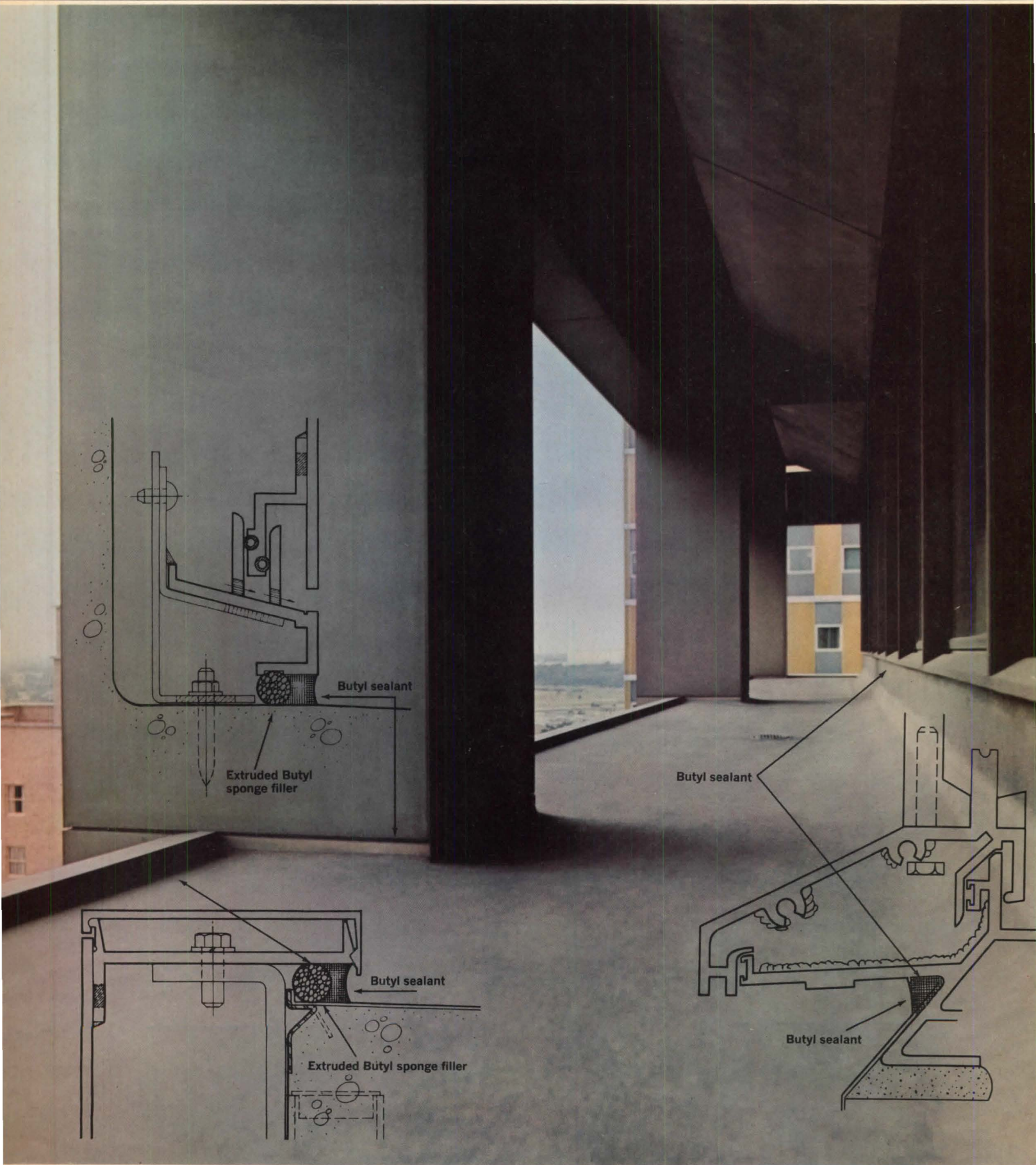
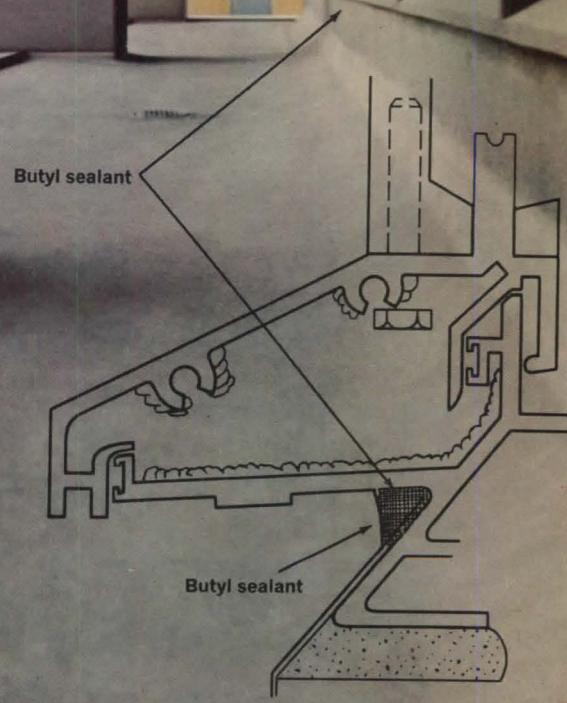
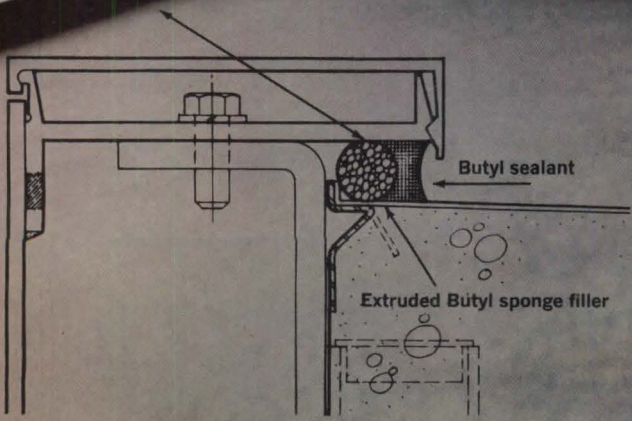
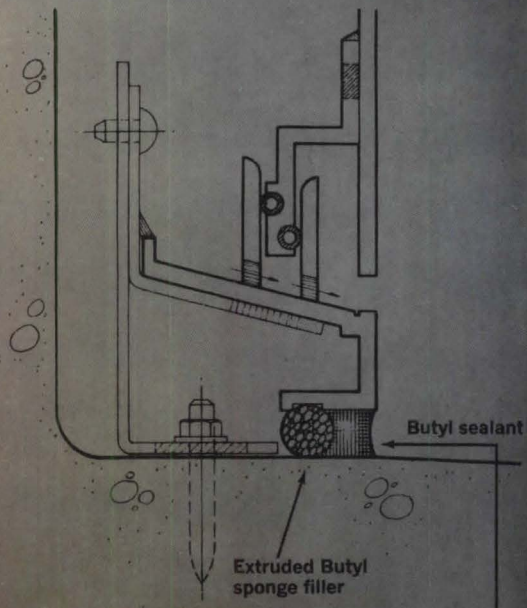
relative costs and merits of various building configurations, construction techniques, mechanical arrangements, and material and product options . . . and that systems analysis cannot create a design that offers something beyond the functional solution and responding to human needs—which is a terribly important role of the architect."

■ Take construction activity. As everyone is aware, the building industry faces some uncertainty next year. But while there is uncertainty about 1970, there can be no uncertainty about the 1970's. The demand is too strong. The "building of a second America" is not a slogan, it is a hard, measurable national need. To meet that need, we will need all of the capabilities of all of the facets of the building industry. And some new capabilities. Of course architecture and the practice of architecture is going to change. In his extraordinary speech to the 1951 convention of the American Institute of Architects—"Humanity—Our Client"—John Ely Burchard asked some searching questions that are still being asked today: "If he [the architect] is to be the conductor of this orchestra, what talents must he develop? If he is to play a lesser role, that of concert master, or just that of a member of the orchestra, what yet is required of him?" He answered, after defining the architects' client as "nothing less than all humanity," that "this is no time in the history of the Western World to espouse fear or disclaim beauty. This is not a time when every sinew in every man should be strained only for the attainment of the practical. It is not a time when we should fall easy prey to the fallacy of defining a few types of men as useful and the rest as expendable. Artists and architects should go out to meet this challenge head on. They must not trim their ideals to every blast but must rather incessantly seek in their work the gay, the pleasant, the human, the moving, the beautiful . . ." In 1970—as then—that is still the dimension of architecture.

—Walter F. Wagner, Jr.

Elastomers in Industry/Engineered Construction.





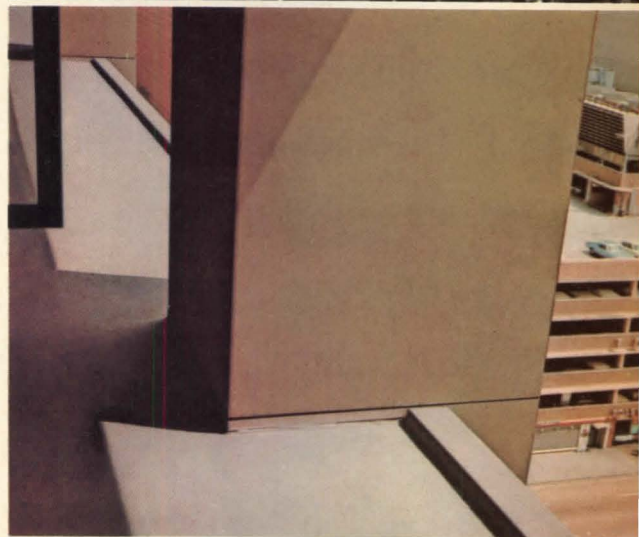
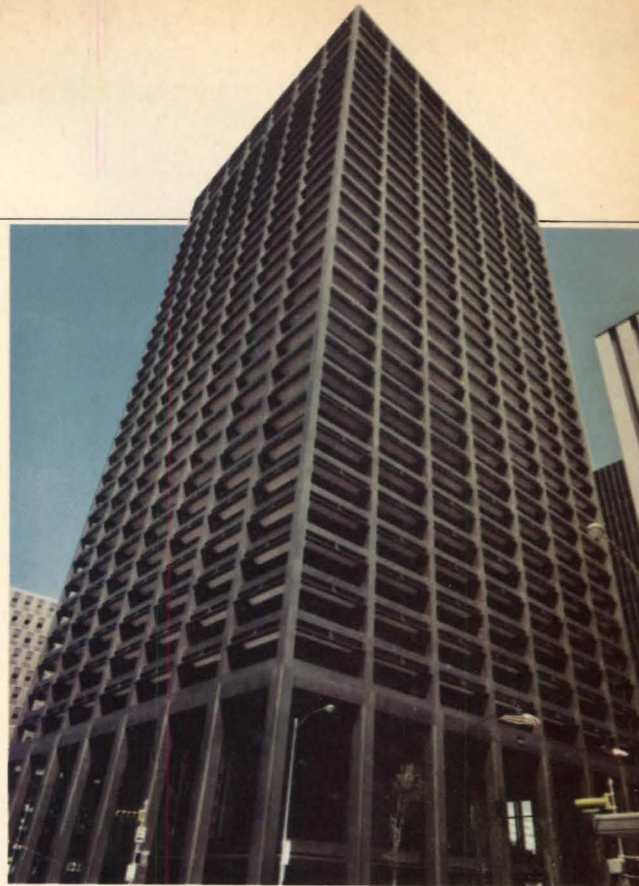
# Sealant based on Enjay Butyl rubber used extensively on striking Houston landmark.

The Tenneco Building — a notable feature of the Houston, Texas skyline — owes much of its distinction to its unusual sunshaded facades which permit setback of the glass walls four and five feet.

A compound based on Enjay Butyl rubber was used exclusively to seal three key joints on each setback. The photo at left shows all three — the long snap-on aluminum copings at the outer edge of the setback floor, the supporting column base joints, and the undersides of the slanting sills below both the windows. An extruded sponge void-filler made with Enjay Butyl rubber was first pressed into position under the aluminum floor copings and at the column bases and then covered with the Butyl sealant.

The Butyl sealant was chosen because it has excellent adhesion to construction materials and is non-corrosive to metals. It provides outstanding weatherproofing and long life over a temperature range of  $-20^{\circ}$  F to  $200^{\circ}$  F. It has little heat or electrical conductivity, cures with minimum shrinkage. The one-component compound has excellent container stability and is easily applied with conventional tools. It can be colored to match other materials.

Owner: Houston National Company  
Architect: Skidmore, Owings & Merrill  
Sealing Contractor: Kawneer Company, Inc., a subsidiary of American Metal Climax Inc.  
Sealant: Construction Products Div., W. R. Grace & Co., Cambridge, Mass.



For more data, circle 5 on inquiry card

Enjay Chemical Company  
Synthetic Rubber Division  
Adhesives Intermediates Dept.  
60 West 49th Street  
New York, N.Y. 10020

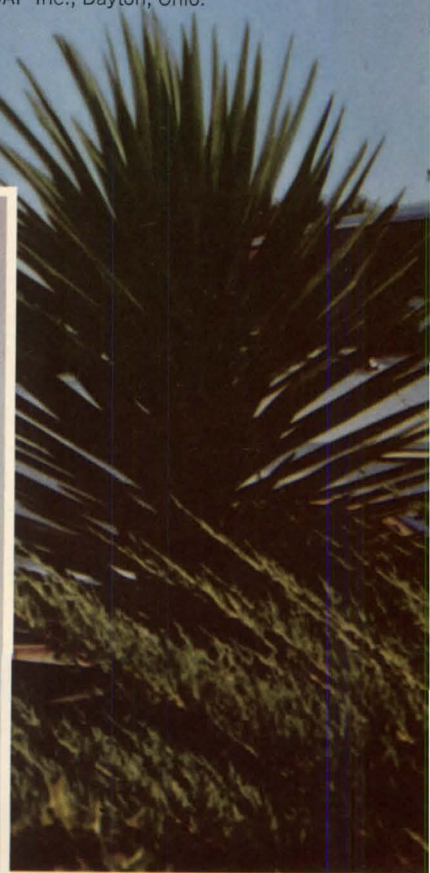
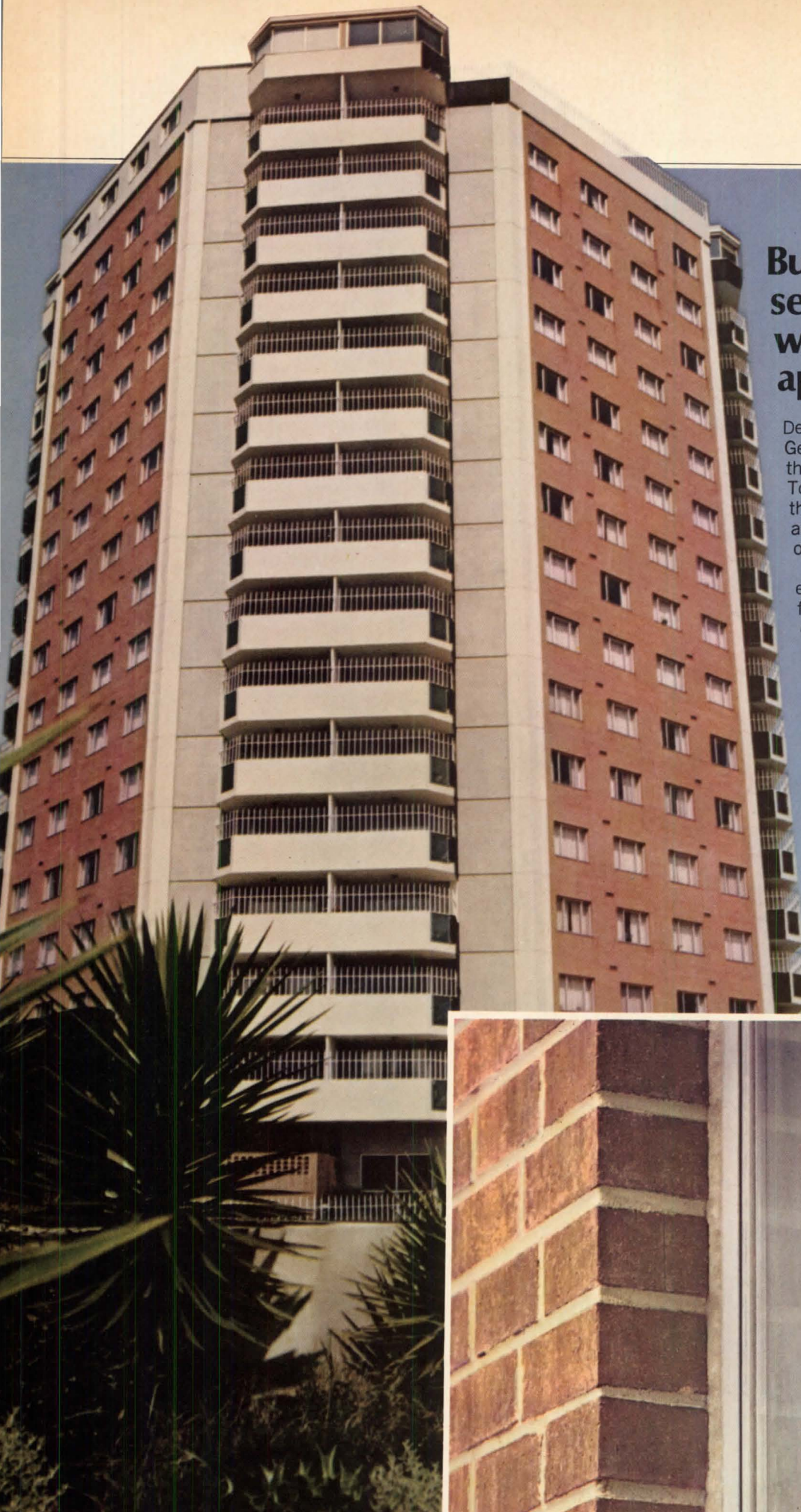


## Butyl rubber compound seals all joints around windows and doors of new apartment tower.

DeKalb Tower #2, now nearing completion in Decatur, Georgia, is the tallest building in DeKalb County—the “bedroom” of Atlanta. Like its twin—University Tower #1, which was completed three years ago—this 184-apartment structure has all its window and door openings sealed with a compound based on Enjay Butyl.

The Butyl sealant was used because of its excellent weatherability and permanent flexibility. It lasts up to five times longer than conventional oil-based caulks over a wide range of temperatures. It was applied to both these Decatur buildings with a caulking gun from five-gallon drums. The compound is, “reasonably priced and easy to apply,” according to the caulking contractor on this job. His firm has been using it for a long time.

Owner: The Frances Wood Wilson Foundation,  
Decatur, Ga.  
Architect: Wise, Simpson and Aiken, Atlanta, Ga.  
Caulking Contractor: Holbrook Waterproofing Co.,  
Charlotte, N. C.  
Sealant: DAP Inc., Dayton, Ohio.









## Only **Visi-Trip** circuit breakers show right where the trouble is

Now QO breakers with Visi-Trip provide positive, visual trip indication. When a fault occurs, a breaker trips and opens the circuit. But up to now, there has been no quick, easy way to tell which breaker has tripped—that is, not until Square D developed Visi-Trip indication.

The Visi-Trip indicator shows bright red, even in the dimmest light. Visible only when the breaker is tripped, the indicator disappears

when the breaker is reset and service has been restored.

You'll find this exclusive Visi-Trip indicator only on Type QO circuit breakers. For the ultimate in protection and convenience for your customers, with no extra cost to you, insist on QO. For details, write Square D Company, Dept. SA, Lexington, Kentucky 40505.



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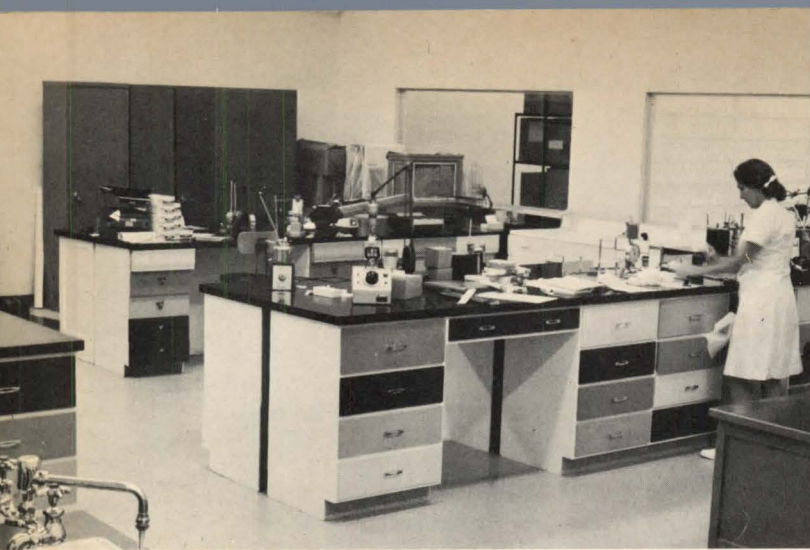
# growthability in plant comfort: a case of "micro-climates" flexibility

For a manufacturer, growing room is basic in a new building design — for headquarters, branch or expanding complex. One growthability factor is a flexible heating/air conditioning/ventilating system. This is provided easily and economically by the "micro-climates" of Lennox packaged modular systems — add-on comfort zones that can expand with the building.

*continued...*

New 200,000 sq. ft. home of Kerr Manufacturing Company, Division of Sybron Corporation, in Romulus, Michigan, near Detroit. Offices and production areas are heated, air conditioned and ventilated by Lennox rooftop equipment. Architects: Robert Geudtner & Associates. General contractor: Butler Manufacturing Company. Mechanical contractor: Commercial Heating & Air Conditioning.





Critical laboratory testing of dental materials—daily routine in Kerr Manufacturing's Chemical Quality Control—calls for accurate temperature control and fresh air ventilation. Both are supplied by Lennox modular systems.



Careful planning is shown by Kerr's data processing room, with underfloor cable space for future equipment. Such rooms are isolated—but with broad expanses of glass for a "wide open" feel. The necessary "micro-climates" are provided by DMS and other Lennox modular systems.



Kerr employee comfort and laboratory-accurate temperature control are both provided by Lennox rooftop DMS units. Eleven such units have a total output of 192 tons of cooling and 5,350,000 Btuh heating. Twenty-three other Lennox modular units supply supplementary heating and make-up air. POWER SAVER™ equipment on DMS units provides free cooling when outdoor temperatures fall below 57°F.

*continued . . .*

## **growthability in plant comfort**

The "how to" of facilities expansion often is a major bugaboo for a fast-growing company. But a great deal of those growing pains can be eased by thorough growth planning—not only of the building itself, but of such mechanical systems as heating, cooling and ventilating. These growth needs can only be met completely by such flexibility as that of Lennox modular systems.

An example of this advanced planning is found in the design of the Kerr Manufacturing Company building. The new home of this 78-year-old dental products manufacturer combines the growthability of Lennox "micro-climates" with that of modular Space-Grid construction by Butler Manufacturing Company. Walls, roof and comfort of the 200,000 square foot building system can be extended to keep pace with company growth—and without interrupting existing facilities.

Kerr's spacious and strikingly appointed cafeteria (center photo, preceding page), allows employees to gather in a relaxed atmosphere. The cafeteria has two separate comfort zones, individually controlled by thermostats mounted on opposite walls. Thus, air freshness and temperature are maintained, regardless of occupancy on either side.

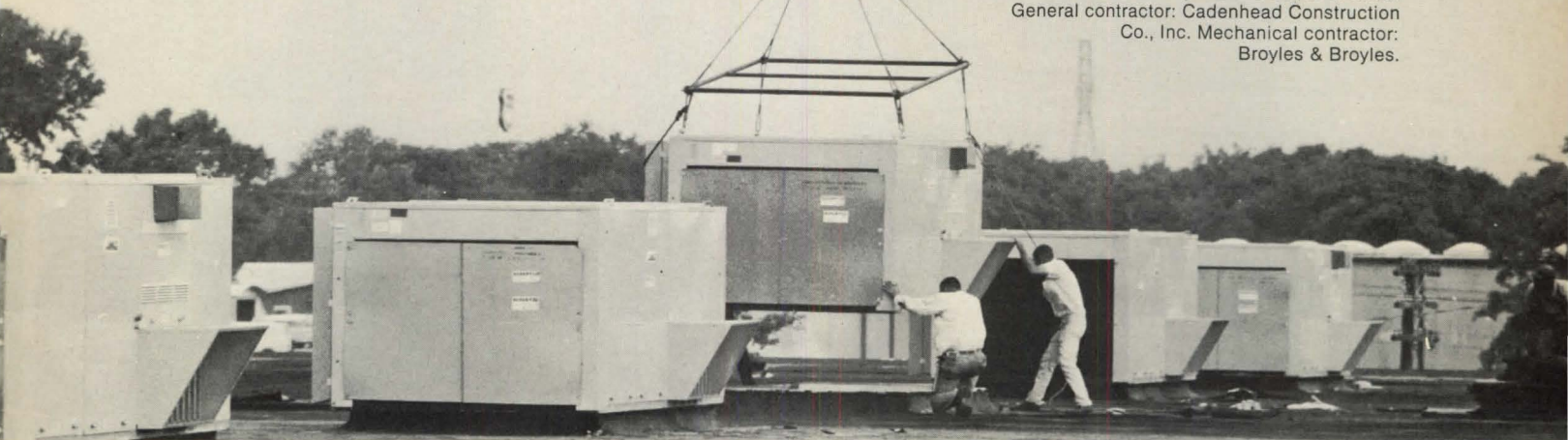
No design restrictions are imposed by Lennox systems. For instance, Lennox Direct Multizone System (DMS) low-profile units can be concealed on the roof with little or no enclosure needed. They never steal valuable floor space. And their light weight allows use of non-loadbearing walls.

Roof-mounting frame reduces on-site labor. And the units are completely assembled, wired and tested at the factory. This is single-source responsibility, single-source savings: Lennox.

Bell Helicopter Company's new Logistics Center at Fort Worth is 209,000 sq. ft. of international customer service. Lennox rooftop modular systems here include both single-zone and multizone heating/air conditioning units. A Bell Model 205A aircraft lifted the units to the rooftop.



Bell's Logistics Center is served by 34 Lennox hidden rooftop units, with a total capacity of 700-plus tons cooling. Architects: Kirk-Voich. Engineers: Yandell & Hiller. General contractor: Cadenhead Construction Co., Inc. Mechanical contractor: Broyles & Broyles.



Lennox units are available for multizone or single-zone control, each compatible with the other. Gas, electric or oil heat source.

When you're planning a plant—or any other building—check first to learn why Lennox should be specified. See Sweet's 29a/Le—or write Lennox Industries Inc., 489 South 12th Avenue, Marshalltown, Iowa 50158.

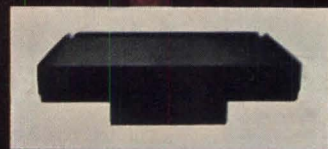
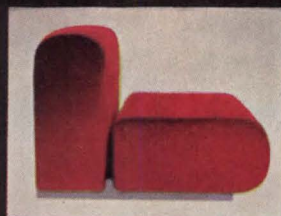
**LENNOX**  
AIR CONDITIONING • HEATING



Tachtronic Instruments, Inc., New Ulm, Minnesota, utilizes Lennox DMS for the critical temperature control ( $\pm 1^{\circ}\text{C}$ ) required by their sensitive electronic components. The DMS automatic heating/cooling cycles also control humidity in this 24,000 sq. ft. plant. Engineers: Toltz, King, DuVall, Anderson & Associates, Inc. General contractor: Heymann Construction Co. Mechanical contractor: Osborne Plumbing & Heating.

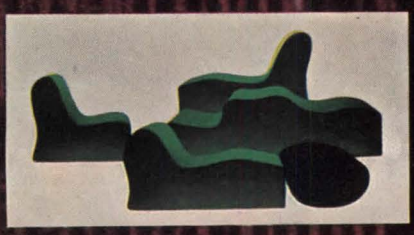
For more data, circle 8 on inquiry card

For more data, circle 9 on inquiry card



Knoll introduces the Gavina Group with designs by Breuer, Takahama, Magistretti, Tippet, Scarpa, Matta and Castiglioni.  
Knoll International Furniture and Textiles, 320 Park Avenue, New York, New York 10022. Knoll International operates in 20 countries.

# SCORPION

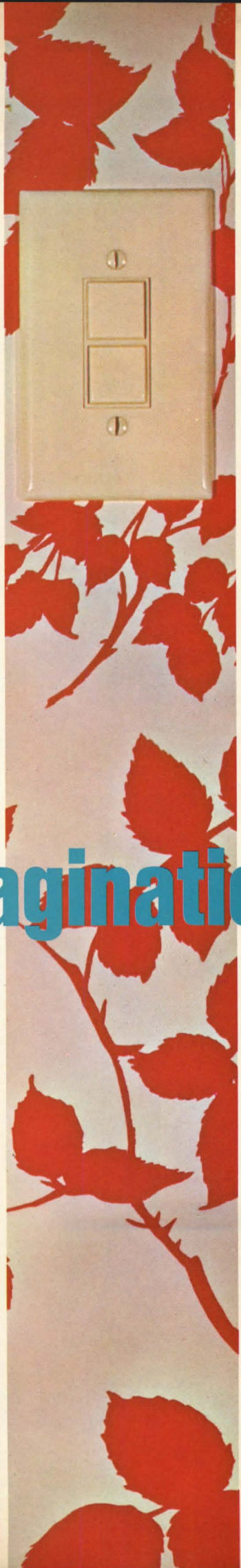
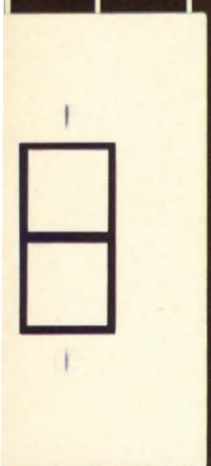




**The only limit on Centura...**

*Background and color combinations selected by Edna Kucher of Van Summern and Weigold, AIA Architects and Design*





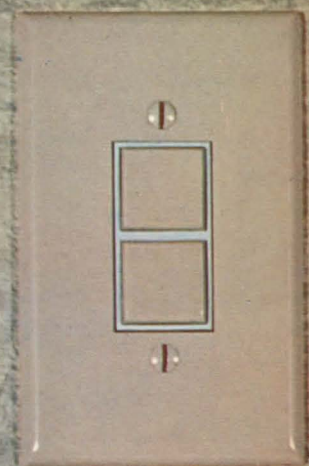
The choice of wall switches and receptacles is no longer a mundane decision. By combining elegant styling with bold, contemporary colors, Leviton now offers a new dimension in design never before available. It's called Centura.

Centura is the world's most advanced design in wiring devices. The touch-button AC switches fit flush against the wall and provide effortless finger-tip lighting control. An illuminated model is also available.

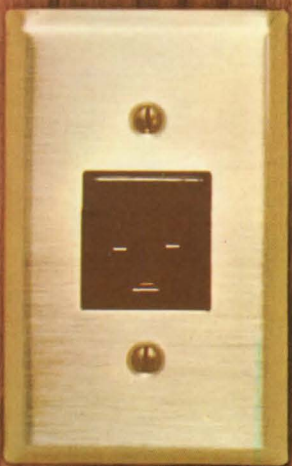
Design freedom in Centura starts with nine colors plus brass, aluminum and stainless steel wall plates. Centura can be color coordinated with any decor. A virtually infinite variety of color combinations can be selected by using contrasting colors for the switch, switch frame, and wall plate. U-ground receptacles and wall plates can also be color contrasted for dramatic effects.

Centura, backed by Leviton's unprecedented 25-Year Guarantee of Performance and listed by UL and CSA, already has gained professional acceptance in such projects as the CBS and General Motors Buildings in New York, Boston City Hospital, Las Vegas International Hotel and Marco Island, Florida.

For more information on this exciting new design as well as Leviton's other advanced Spec Grade wiring devices, use the coupon below.



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For more data, circle 10  
on inquiry card



# Keene announces the instant-access ceiling.

## *New Accesso™ Concealed Suspension System for acoustical tiles and pans*

Just tilt a tile up and lift it out. Then slide it back in again. It's that easy with the new Accesso fully concealed suspension system.

There's no need to strong-arm tiles down with a tool. Or force fragile tile end joints. Or anchor tiles into a grid so rigid the ceiling has to be dismantled for servicing overhead utilities. No need for special access panels, either—*every* Accesso tile is an instant-access panel.

And because Accesso members aren't locked permanently, you're not locked into the building module. You have absolute freedom to locate lighting fixtures and air-handling devices wherever you like—then relocate them as building needs change.

What's more, the Accesso system—exclusively—can also be used to suspend metal-pan ceilings in kitchens, laundries and other high-humidity areas. You can specify just one ceiling system for the entire building!

Any standard tile can be used in the new Accesso system, with no special machining. But for instant beauty to match instant access, specify richly fissured Styltone or other acoustical tiles from Keene. For full details, write Keene Corporation, Sound Control Division, Box 458, Trenton, New Jersey 08602.

**KEENE**  
CORPORATION

**SOUND CONTROL DIVISION**

**We've just begun to grow.**

*For more data, circle 11 on inquiry card*



*Heublein, Inc. selected an Accesso "instant-access" ceiling system for this modern corporate headquarters building in Hartford, Connecticut.*



*Tiles fit snugly to form a smooth, almost seamless ceiling with Accesso concealed suspension. The design here called for 12"x24" tiles, but 12" squares are equally convenient in the Accesso system. Note that overhead systems can be serviced easily without interrupting office operations. Just push a tile up and lift it out. No tools needed with the Accesso system. And every tile is an access panel!*



“A lending institution created to serve the financing needs and solve the financing problems of professional health-care organizations”

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American medicine faces an acute need for new, improved and expanded hospitals, nursing homes, extended-care institutions, research centers and related facilities. At present, this need is not being satisfactorily met and

could, one day, reach crisis proportions. Despite a wealth of professional management and planning, the health-care field suffers from a poverty of adequate financing.

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licly-owned mortgage trust, was established to come to grips with this pressing problem. It will create interim, “wrap-around” and permanent financing for non-profit, private and governmental projects.

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# 2:am

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## Thank goodness!...Time for a comfort break in a heavenly Krueger AFKA chair...

Ah, another weary one caught up in the cushiony comfort of an AFKA chair. Comfort aside, can such a chair be practical for concourse seating? You better believe it!  AFKA'S fiberglass shell is a lifetime shell. And, the smart wrap-around design protects both seat and backrest cushions.  Sure, in time the AFKA cushions will naturally wear. But you can replace them easily. Just slip out the old, insert the new. Presto! You have new seating without having to repurchase a complete seating unit. Talk about economy!  Bases? AFKA offers three extra-durable types (including floor-mounted's). They can take any abuse most people can dish out.  AFKA Colors? Forest Green, Ebony Black, Pearl White and Otter Brown fiberglass shells. Cushions in 12 designer colors of Scotchgard-treated wool/nylon fabric (and the full range of "Decor 64" in U. S. Naugahyde).  
Want to know more? We can show and tell you more. Write for our special brochure on AFKA and other "concourse" seating — *On your letterhead, please.*

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# The epoxy/aggregate wall; So tough, it's beautiful.



This distinctive natural stone aggregate bonded with Shell EPON® Resin is four times stronger yet eight times lighter than concrete. Here's a beautiful way to create innovative architectural surfaces that can withstand anything from tropical to sub-zero temperatures, sunlight and humidity.

The wall matrix is easily trowelled onto vertical surfaces regardless of contour. Or, panels can be prefabricated and installed at a much lower cost than precast concrete. The matrix system dries in 24 hours to a self-cleaning finish.

Available in a wide range of colors and styles, epoxy/aggregate walls are beautiful inside or out. The unique mural effects are a stimulating challenge to a creative architect and designer. Write on your letterhead if you'd like a supplier of EPON resin-based surfacing to contact you. Shell Chemical Company, Polymers Division, 113 West 52nd Street, New York, N. Y. 10019.

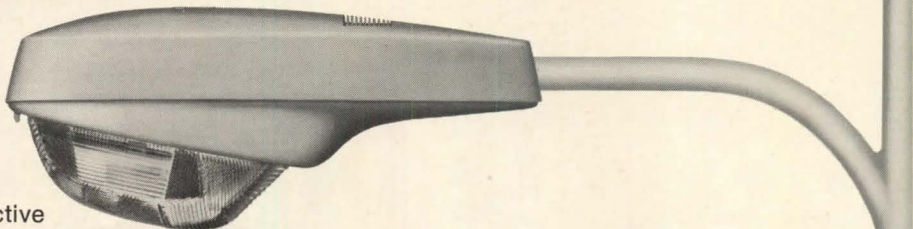
Shell EPON Resin is used in these exposed aggregate coatings installed by Desco franchised applicators and manufactured by Desco Chemical Co., P. O. Box 74, Buffalo, N. Y.

*For more data, circle 14 on inquiry card*



# Landmark is performance in lighting

**Landmark Horizontal Luminaires** are designed for functional and esthetical performance. They are especially effective for teamwork lighting of areas such as parking lots and shopping centers. Landmark horizontals resist weathering, withstand excessive vibration and are positively sealed against contamination. Mercury and metallic vapor from 100 through 1000 watts in three compatibly sized profiles. Contact your electrical distributor, or write for catalog.



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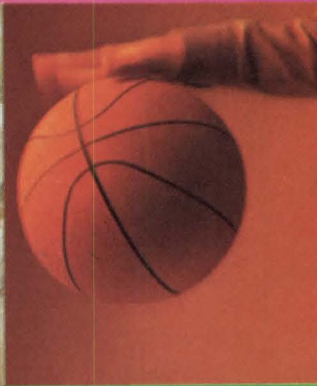


**LANDMARK LIGHTING**  
Southaven, Mississippi 38671





# The epoxy/seamless floor; So tough, it's beautiful.



This epoxy seamless flooring based on Shell EPON® Resin is a roller-skating rink. And a basketball floor. A shuffleboard court. A kid's playground. And a church.

One sweeping and the all-purpose floor of the MacArthur Blvd. Baptist Church in Dallas, Texas is ready for services.

Is there an idea here for your next flooring job? Epoxy-based resilient seamless floors "pay for themselves" with long service life and easy maintenance. The thermal curing top-coat stays crystal clear, absolutely odorless, and *never* needs waxing.

*Versatile* enough to play on. *Beautiful* enough to pray on. Write on your letterhead if you'd like a supplier of epoxy resin-based flooring to contact you.

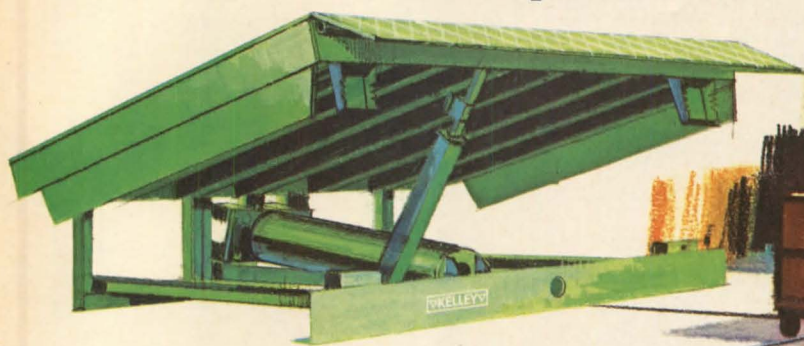
Shell Chemical Company, Polymers Division, 113 West 52nd Street, New York, New York 10019.

Porette-1000 with Pytrol (Pat. app. for) flooring by Hallmark Chemical Corporation, Subsidiary of National Chemsearch Corporation, P.O. Box 10723, Dallas, Texas 75207.

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**Without  
this  
component...**



**a material handling system is  
missing one of it's most critical parts**

"In-plant" material handling systems often stop or start at the dock and make no provision to move goods and materials across the dock and into and out of trucks and rail cars. To help your clients effectively handle goods and materials in this critical dock area, Kelley offers a complete choice of Permanent Adjustable Dockboards. Kelley Dockboards offer patented safety and

operating features which insure smooth, safe, efficient transfer of goods and materials. If you would like more information on planning this area, we will be happy to send you a copy of the third edition of "Modern Dock Design." Please return the inquiry card, or write: Kelley Company, Inc., 6768 North Teutonia Avenue, Milwaukee, Wisconsin 53209, (414) 352-1000.

World's largest manufacturer of permanent adjustable dockboards



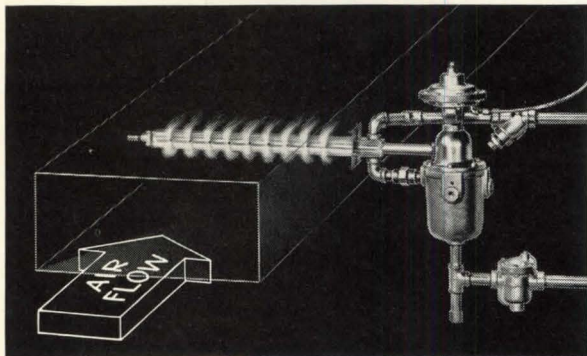
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*the building you are working on  
won't be completely air conditioned...*

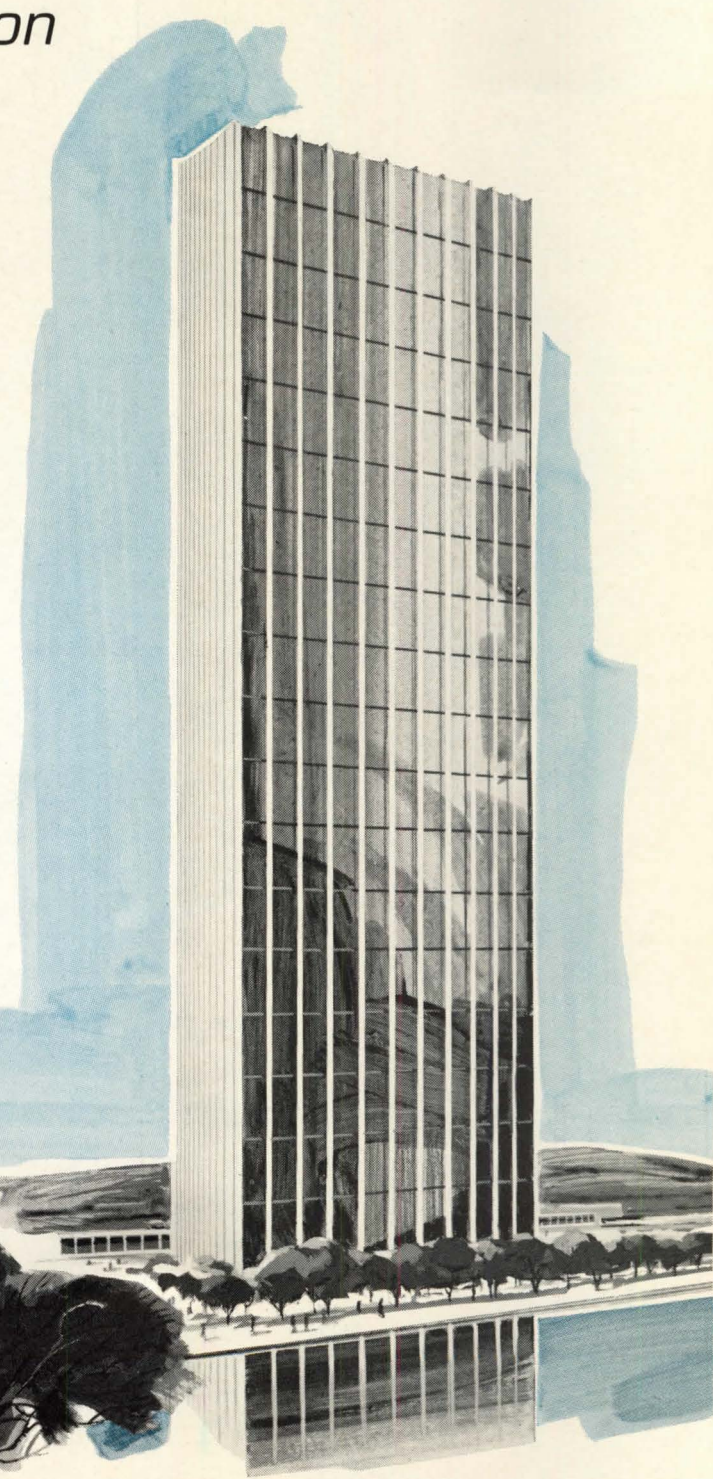
*...unless you specify  
controlled humidification*

Environmental control is not total until provision is made to add moisture to the air when relative humidity falls below the levels recommended for optimum health and comfort. And as public awareness of the health and comfort advantages of properly maintained relative humidity grows, the demand for controlled humidification mushrooms.

The Armstrong Humidification Book explains how controlled humidification contributes to health and comfort, how it prevents accumulation of static electricity charges, how it maintains the moisture content of hygroscopic materials. It is a complete basic textbook on humidification that can be very helpful to you. Write for your copy, today.



The many problems of adding moisture to the air that once existed have been solved with Armstrong Dry Steam Humidification. It provides accurately controlled humidification without drip, mess or maintenance.



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ARMSTRONG MACHINE WORKS**

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*Manufacturers of specialties for the mechanical trades*

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## Are you utilizing this man on your design team?

He is your trained All-weather Crete sales engineer. This specialist can assist you in planning the most economical roof drainage patterns utilizing All-weather Crete insulation. He can illustrate many successful types of plaza systems so that you may select the one design most appropriate for your building. He can provide your staff with scaled detail drawings illustrating the many roof deck and plaza system components adjacent to All-weather Crete such as drain types, membrane systems and wearing surfaces.

This man is also your trained All-weather Crete applicator who helps make your design come true. He is a highly specialized contractor licensed by Silbrico Corporation. This skill and selective licensing protects designers and owners alike with the assur-

ance of expert All-weather Crete application and its exceptional performance for years to come.

Consider the importance of roof and plaza insulation . . . hidden from sight, covered by membranes and wearing surfaces, applied over every conceivable sub-strate, this insulation is asked to perform many functions. Contact your local AWC specialist to assist you. Use his special knowledge on your next building project. (There's no obligation, of course.) If you don't know his name, write us — we'll have him contact you.



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## News in brief

**HUD's Operation Breakthrough has announced eight prototype sites, and has narrowed to 37 the housing systems it is considering** (about 20 will finally be chosen for construction.) Architects worked on a large proportion of the 37 systems. (Full story on next page.)

**Reciprocal licensing for British and American architects will begin this January.** An American who wants to practice in Great Britain will simply fill out a form identical to the NCARB form for U.S. licensing. An Englishman wishing to practice in America, in addition to completing the form, must take an examination (usually oral) in the state where he wishes to practice. While laws in about twenty states still prevent foreign registration, NCARB expects those states to accept reciprocity within the next year or two. Canada, which recently formed its own national registration organization, may soon join the U.S. in the program; and several other countries, including Mexico and Australia, are interested. (See August, page 67.)

**A major reorganization of HUD takes effect January 1.** The change is designed to streamline the \$2.6 billion-a-year department, dividing it into six major "functional groupings" on the national level, each under an assistant secretary, increasing to 10 the number of regional offices, and creating HUD area offices in every state (which will have important decision-making powers, including final responsibility in processing all multi-family housing projects). HUD expects processing time will be greatly reduced through this decentralization and cutting of red tape. One of the first steps planned by the FHA is the establishment of a single set of construction standards for all government-assisted housing.

**Congress is studying possible restoration of the Capitol's West Front** instead of the \$45-million 4.5-acre expansion proposed by the Capitol Architect, engineer J. George Stewart. The American Institute of Architects strongly encourages preservation of the original walls (October, page 36).

**Housing, cities, social change and natural resources will be major priorities** among American Institute of Architects concerns and programs during 1970. The A.I.A. Board of Directors took this action at its December meeting, also decided to investigate several professional practice issues in order to evaluate 1970 A.I.A. programs.

**Six hundred architects and engineers from all 50 states are expected in Washington February 17-18** for the American Institute of Architects and Consulting Engineers Council Public Affairs Conference to talk with national leaders about such topics as the environment, finance and design quality.

**The Construction Industry Foundation will be advised by three architects,** Robert F. Hastings, F.A.I.A., Jack D. Train, F.A.I.A., and Robert W. Cutler, F.A.I.A. The non-profit New York foundation, set up last May, will work on ways to lower costs and raise quality, and will also serve as an educational source and watchdog.

**Glenn Stanton, thirty-third president of the American Institute of Architects, died October 16, 1969.** He was 74. Mr. Stanton was very active in professional and civic affairs, serving twice as president of the Portland Planning Corporation. Born in Iowa, he graduated from the University of Oregon and M.I.T.

**The San Diego Stadium has received the first annual Bartlett Award** from the President's Committee on Employment of the Handicapped for consideration of the handicapped in its design. The stadium was designed by the San Diego firm of Frank L. Hope and Associates.

**The Society of Architectural Historians will meet in Washington January 29-31** with the over-all topic, "The Classic." Speakers will include Henry A. Millon, Ada Louise Huxtable and Henry-Russell Hitchcock.

**Elliott Carroll, F.A.I.A., will be deputy executive vice president of the A.I.A.** Mr. Carroll will continue to be Director of Public Services, and will work on a wide variety of assignments.

**Quote for 1970:** "We live on a spaceship—the spaceship Earth. This too is one of the spin-offs from our \$24-billion space program. Once you realize you live on a spaceship, you realize that there is no way to throw anything 'away.' There is no 'away.' All we can do is throw things in each other's back yards, in each other's streams, in each other's atmospheres."—Barrett Hardin, professor of bioscience at the University of California at Santa Barbara, at the 1969 convention of the California Council, the American Institute of Architects.

## Breakthrough names semi-finalists

The Department of Housing and Urban Development has moved Operation Breakthrough—its scheme for stimulating new approaches to producing housing across the nation (September, page 36, October, page 131)—one more step forward; but there is still a long way to go. From initial submissions of some 236 Type A proposals (Type B proposals are still being evaluated), HUD has selected 37 developer-designer-builder consortia with which HUD will begin final negotiations, eventually selecting "about 20" as winners. These winners will then be assigned sites on which to build. Eight sites around the country, ranging in size from an 80-acre suburban area outside Indianapolis to a 6.5-acre inner city site in Jersey City, have already been selected, and two more will be added to that total.

Eleven planning groups have also been selected by HUD for "further discussions and negotiations." Each of the planners finally selected will be responsible for preparing an over-all plan uniting a particular hous-

ing scheme to a particular site. The eleven "site planners"—almost all architects—are: Building Systems Development, Inc., San Francisco; Caudill Rowlett Scott, Houston; David A. Crane, Philadelphia; Eckbo, Dean, Austin & Williams, San Francisco; Hellmuth, Obata & Kassabaum, St. Louis; Miller, Wihry & Brooks, Louisville; Perkins and Will, Chicago; Reynolds, Smith and Hills, Jacksonville; RTKL Inc., Baltimore; Skidmore, Owings & Merrill, Washington, D.C. and Wurster, Bernardi and Emmons, San Francisco. Of the 37 housing consortia selected, 23 had architectural firms listed prominently as team members.

Secretary Romney, when asked about funds committed, said that \$15 million will be used from HUD's site acquisition funds, was vague about what other sources were immediately available, stressing "regular" HUD funds, and mentioned that the "largest bulk" of money will come from private financing—which of course does not usually produce low-income housing.

## Urban schools new film subject

"A Child Went Forth" shows how schools can destroy a child or allow him to grow, with some powerful examples of both possibilities. The movie was produced by the American Institute of Architects with Educational Facilities Laboratories (New York) and the U.S. Office of Education. The 28-minute film was shot on locations across the U.S. by Larry Madison Productions of New York, and it emphasizes the need for a sympathetic and exciting school environment.

It opens with a nightmarish sequence in Harlem: crowded ancient buildings, bullied children, assembly-line feeding—and interviews with dropouts. Then it shows how good design and good teaching can make radical differences in children's lives in schools whose architects include Skidmore, Owings & Merrill (New Haven), Caudill Rowlett Scott (Cleveland and New York) and Fridstein and Fitch (Chicago). But the designers

go uncredited: the medium is the message.

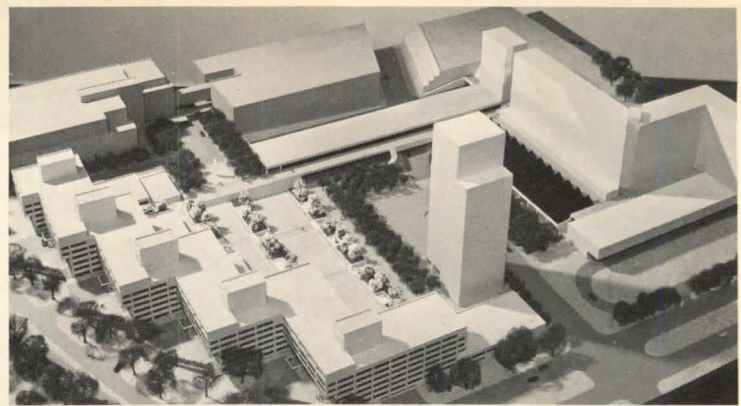
The movie is available for purchase or rental from the A.I.A. in Washington, D.C.



## Julian Clarence Levi honored on 95th birthday at Architectural League

Friends and admirers of all ages crowded the Architectural League of New York on December 5 to celebrate the 95th birthday of Julian Clarence Levi, architect and for most of his life ambassador extraordinary for U.S. architects around the world.

The cake was presented (above) by Helen Treadwell, mural painter and long-time doyenne of the League's social activities and tradition.



## "City within a city" to rise in Missouri

Crown Center, an 85-acre business, entertainment, and residential community, master planned by Edward Larrabee Barnes as a "single interrelated space," will be built near central Kansas City, Missouri. The complex, being constructed by Hallmark Cards, will separate pedestrian and vehicular traf-

fic, with parking underground.

Mr. Barnes will design first phase offices, a bank, and the retail-entertainment complex; Harry Weese will design a 750-room hotel; and Norman Fletcher, of The Architects Collaborative, will plan the first 600 apartment units.

Office buildings, hotel, and entertainment-shopping complex appear above.



## Apartment towers first in U.S. to use European prefab system

The first of three 20-story apartment towers (above) using the French TRACOBA system will rise in Yonkers, N.Y. this spring in an estimated ten weeks and at a hoped-for substantial cost reduction.

Architect Renato Severino, of New York City, designed the building in consultation with Yonkers architect Lawrence M. Rothman, structural engineer Paul Weidlinger of New York City, Industrialized Building Systems, Inc., and Cosentini Associates, mechanical engineers.

The project is a joint venture of American Standard, Inc., Celanese Corporation, and Module Communities, Inc., run by Harold Bell, head of Columbia University's Urban Action and Experimentation Program. The system, a Breakthrough contender, uses non-loadbearing exterior walls and panels which come from the factory fully finished.

## Victorian Pittsburgh community restored

On the theory that "preservation must look beyond the individual landmark," the Pittsburgh History and Landmarks Foundation is organizing the rehabilitation of the city's declining Mexican War Streets district.

The Foundation is using a revolving fund to modernize rundown house interiors and restore facades; and it is urging sympathetic investors and local residents to do the same. No government money is being used.

In order to preserve the fabric of the community while injecting new life into it, restorations "range from the pure and exacting to the moderate" so as to offer housing for all incomes.

The Foundation hopes its approach can become a major tool for a "true renewal" of America.

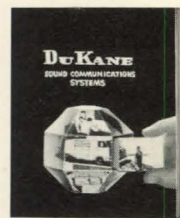


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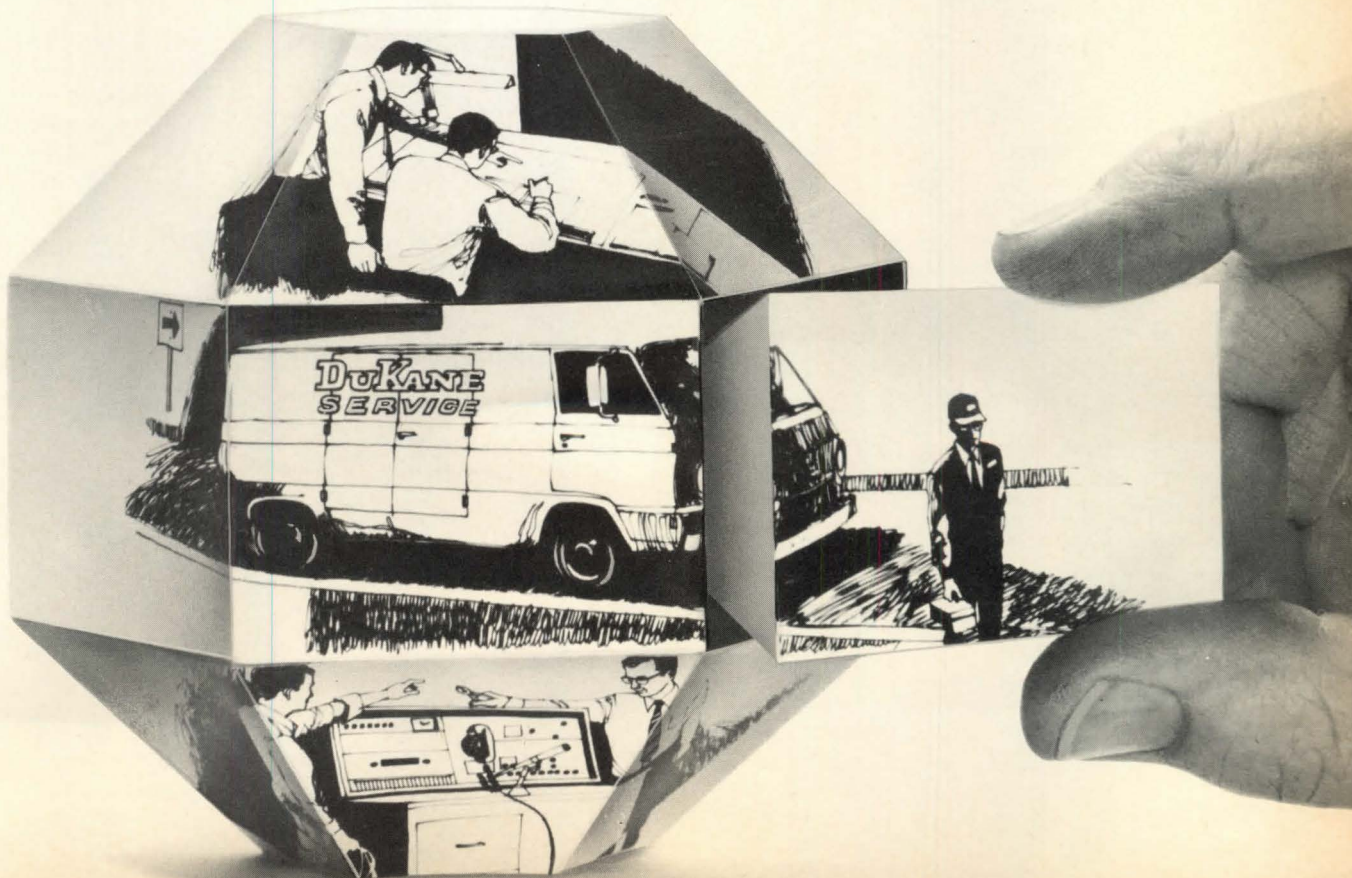
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## Southern California Chapter A.I.A. announces awards in triennial program

The award of honor, the Chapter's highest recognition, was presented to three architectural firms for four buildings. These are shown below. In addition, Merit Awards were presented to the following firms: Honnold, Reibsamen and Rex; A. Quincy Jones, F.A.I.A. and Frederick E. Emmons, F.A.I.A.; Carl Maston, F.A.I.A.; Albert C. Martin, F.A.I.A. and Associates; Leroy B. Miller, A.I.A.;

Maxwell Starkman, A.I.A. and Associates; Daniel, Mann, Johnson and Mendenhall; and Daniel Dworsky, F.A.I.A. and Associates.

The jury: Charles Bassett, A.I.A., Skidmore, Owings & Merrill, San Francisco; Harwood Taylor, F.A.I.A., Neuhaus & Taylor, Houston; and Elisabeth K. Thompson, F.A.I.A., senior editor ARCHITECTURAL RECORD, San Francisco.



Marvin Rand

**Stephen S. Wise Temple**, Los Angeles; Daniel Dworsky, F.A.I.A. and Associates.

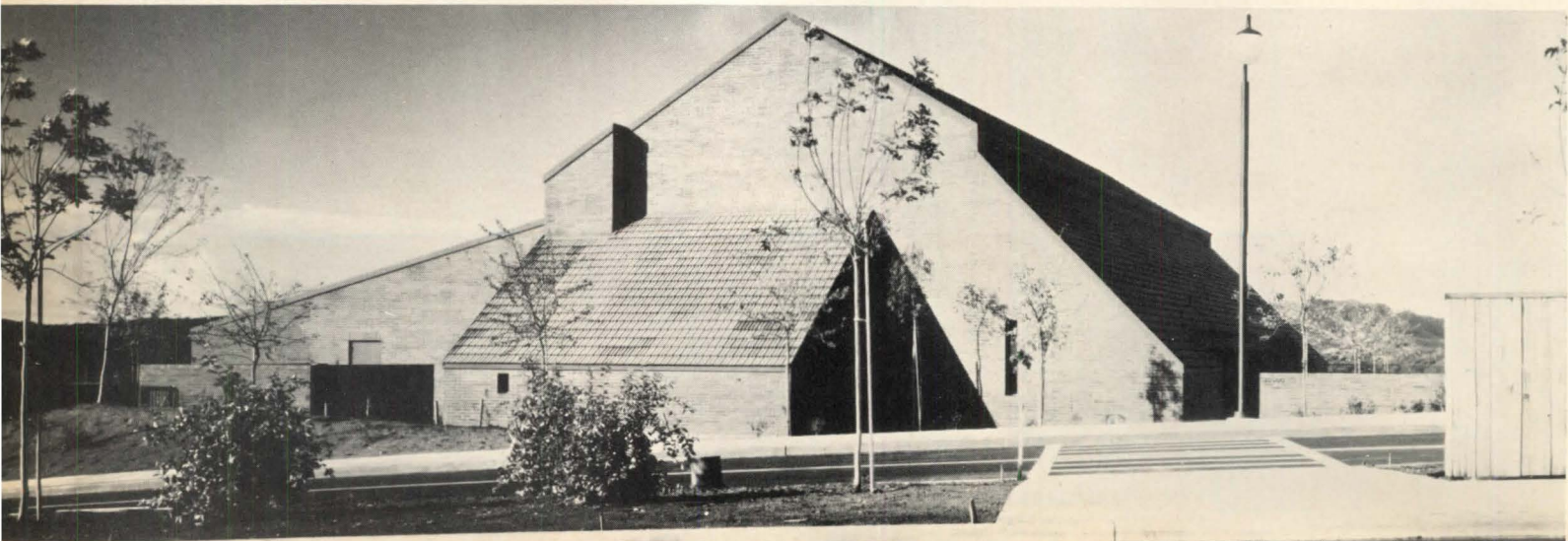
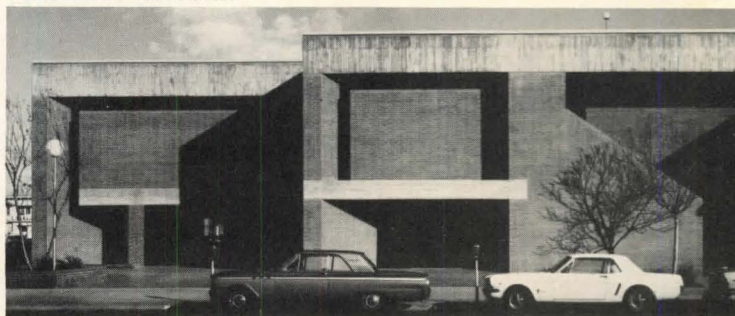
**Worldway Postal Center**, Los Angeles; Daniel, Mann, Johnson & Mendenhall.



Marvin Rand

**Joseph Magnin's store**, Costa Mesa; Frank O. Gehry, A.I.A. and Associates.

**Equitable Savings and Loan branch**, Long Beach; Daniel L. Dworsky, F.A.I.A. and Associates.





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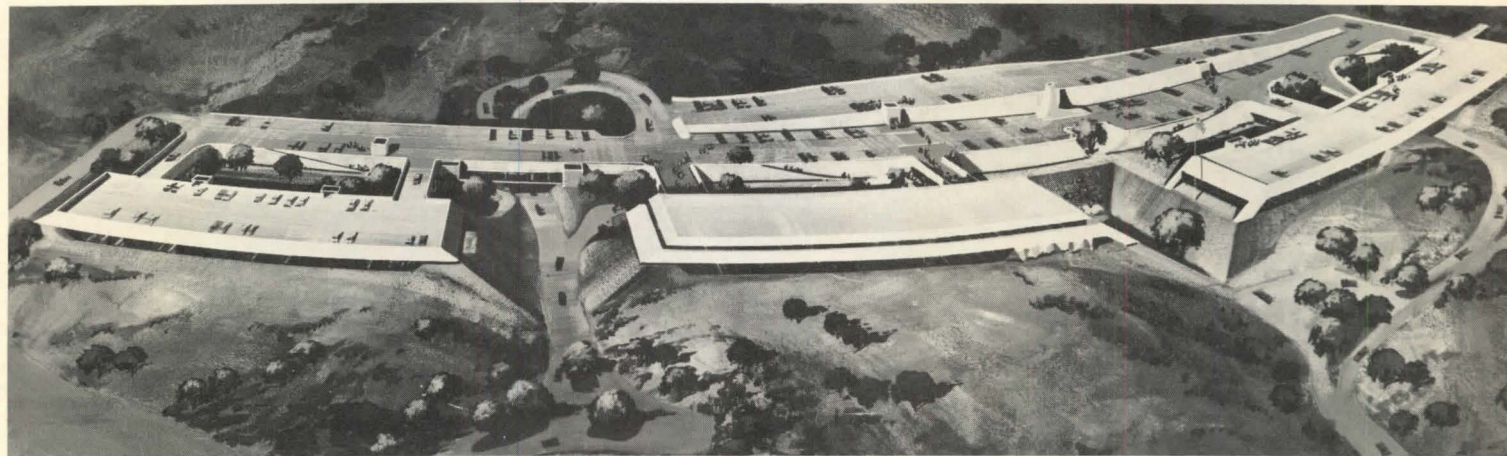
**The U.N. Center**, Kevin Roche John Dinkeloo and Associates, architects, will be a two-block addition to the United Nations complex in New York designed to make life in the city easier for delegates, while "bringing the city closer to the United Nations."

The Center will contain extensive tourist facilities, including bus docking, information centers and restaurants, to ease the burden of 2-million yearly visitors. There are three 40-story towers for the use of United Nations missions and international organizations, bordering a

glassed-in court also 40 stories high, a 700-room hotel for United Nations visitors and permanent residents, shopping arcades, theaters, 280 housing units and an enclosed public park.

The buildings will be sheathed in the highly reflective glass first

used for Eero Saarinen & Associates' Bell Laboratories, Holmdel, New Jersey (RECORD, October 1962). Glass awnings will help unify the stores with the street, and glass-roofed entrance plazas (above right) will bring the life of the city into the Center.



**First place winner** in the National A.I.A. competition for a civic center for the City of Thousand Oaks, California is designed by Robert Mason Houverner of San Diego. The jury

was composed of: Charles W. Moore, A.I.A. Cesar Pelli, A.I.A., George W. Davis, and Dr. Raymond Olson. Their statement on the winner: "The scheme, without any

major disturbances to the hill and oak trees, creates a simple, yet beautiful building which gains its strength from the hill. The plan works well . . . this scheme will be

built within the economical recommendations of the city." There were 158 entries, with three runners-up receiving a total of \$7000 and seven honorable mentions.

**National Airlines'** new \$40-million passenger facility at Kennedy International Airport was designed by I.M. Pei and Partners. The 382-foot-long by 30-foot-high main building is covered by a space frame of steel bracings, supported on massive perimeter concrete pylons, outside glass-enclosing walls. Besides this building, there is an arrivals unit, which houses the baggage area and a restaurant, and two circular satellites for boarding and deplaning passengers.





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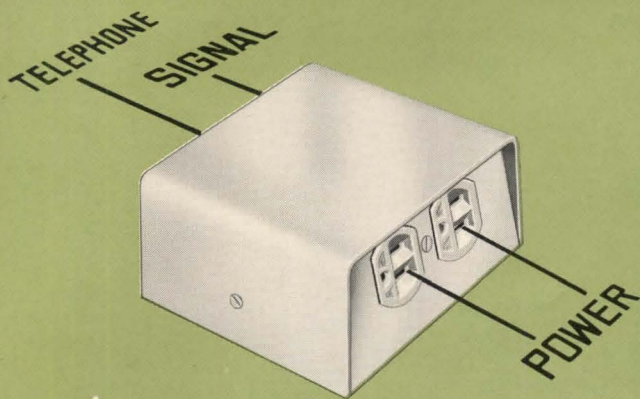
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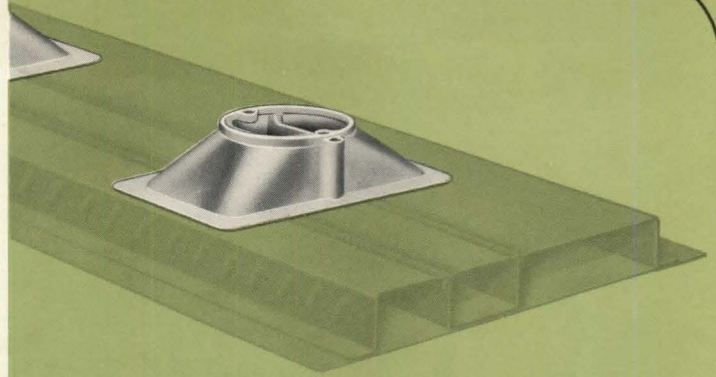
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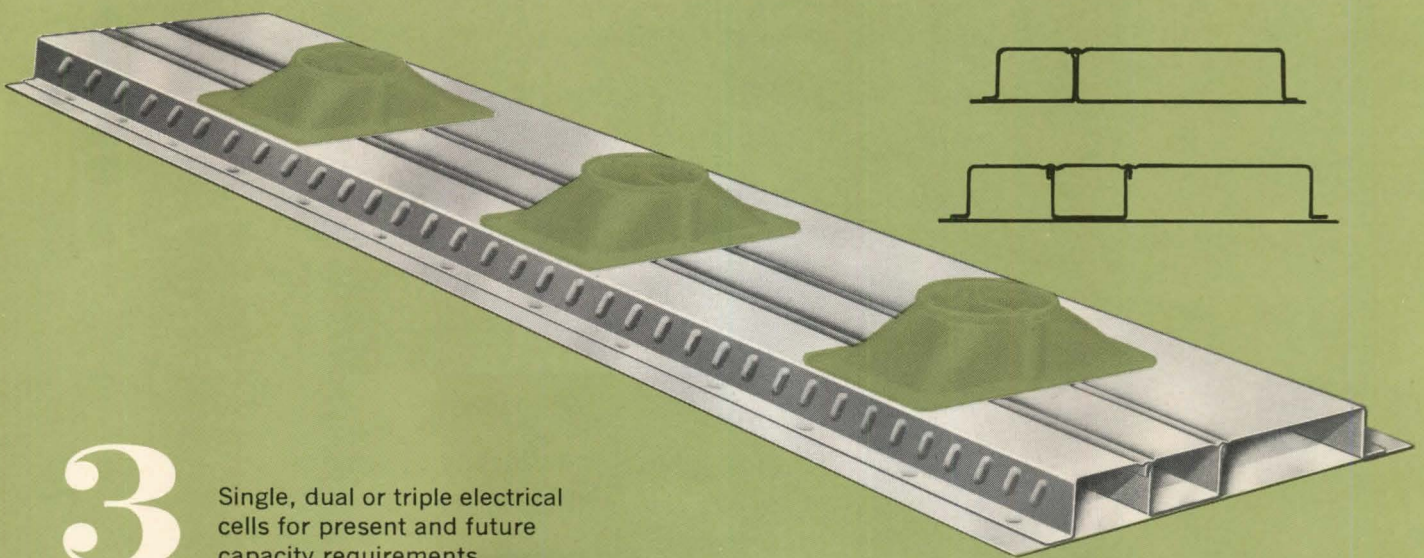
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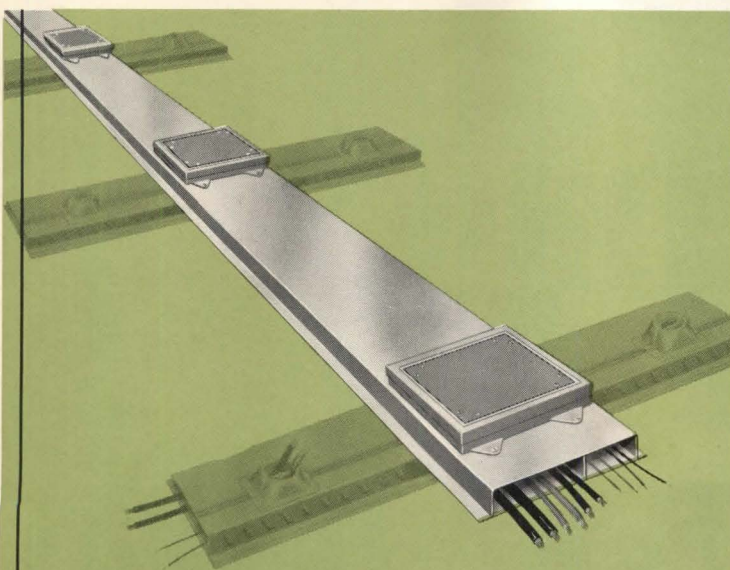
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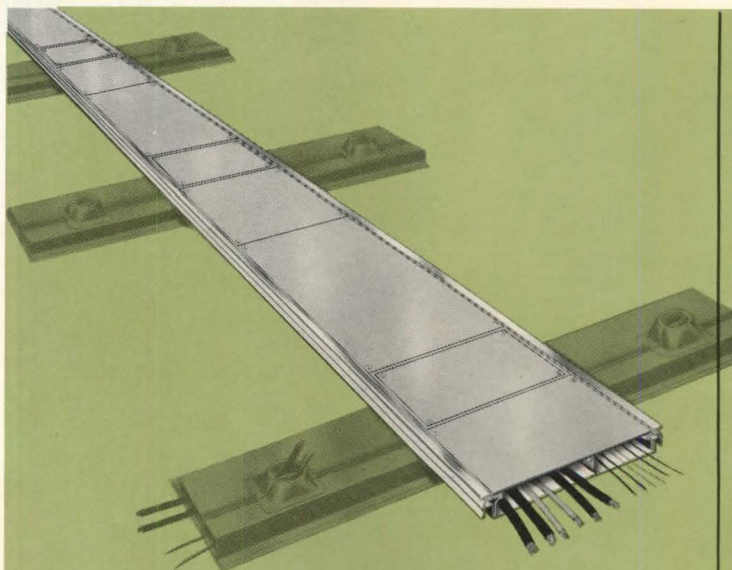
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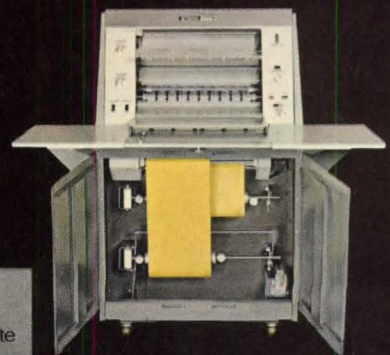
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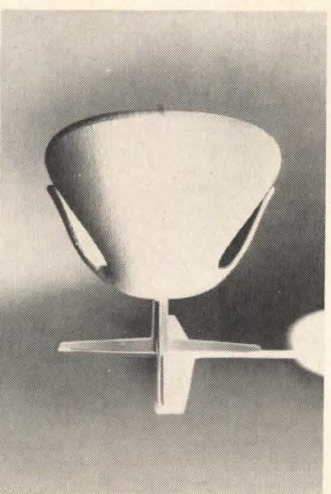
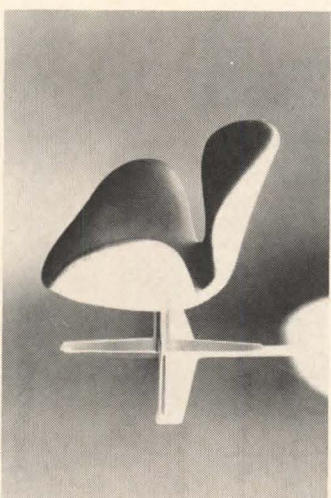
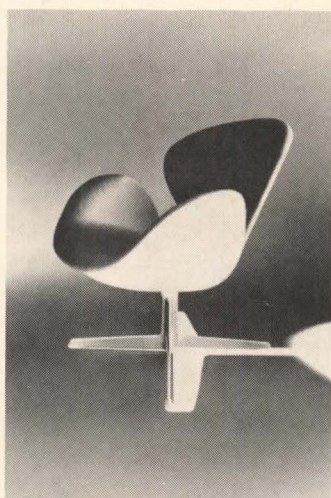
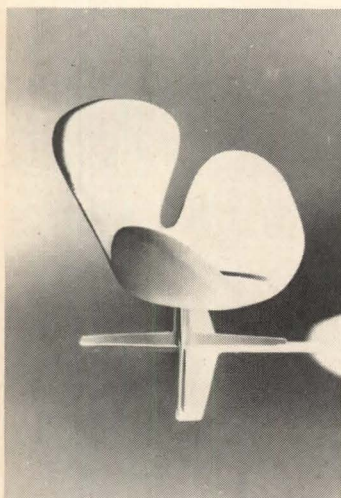
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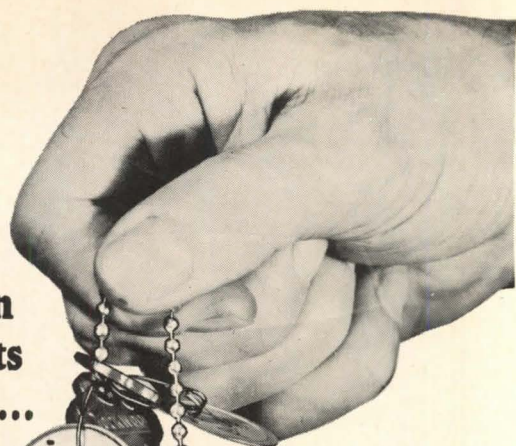
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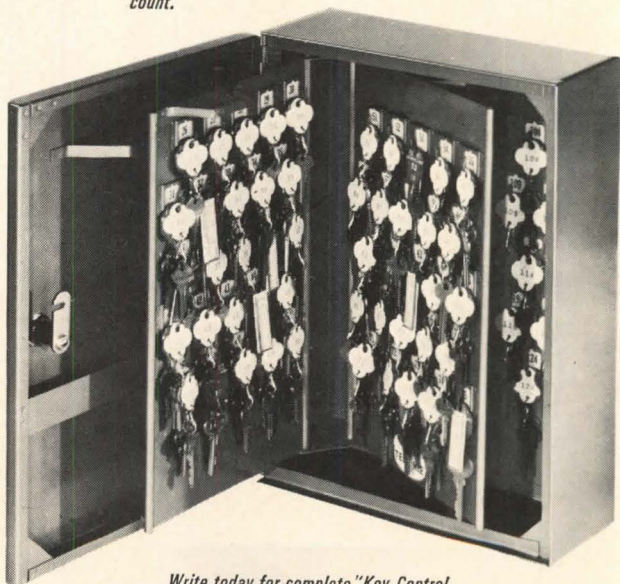
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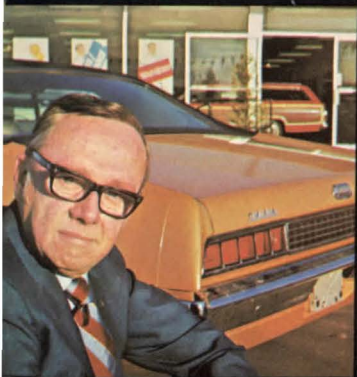


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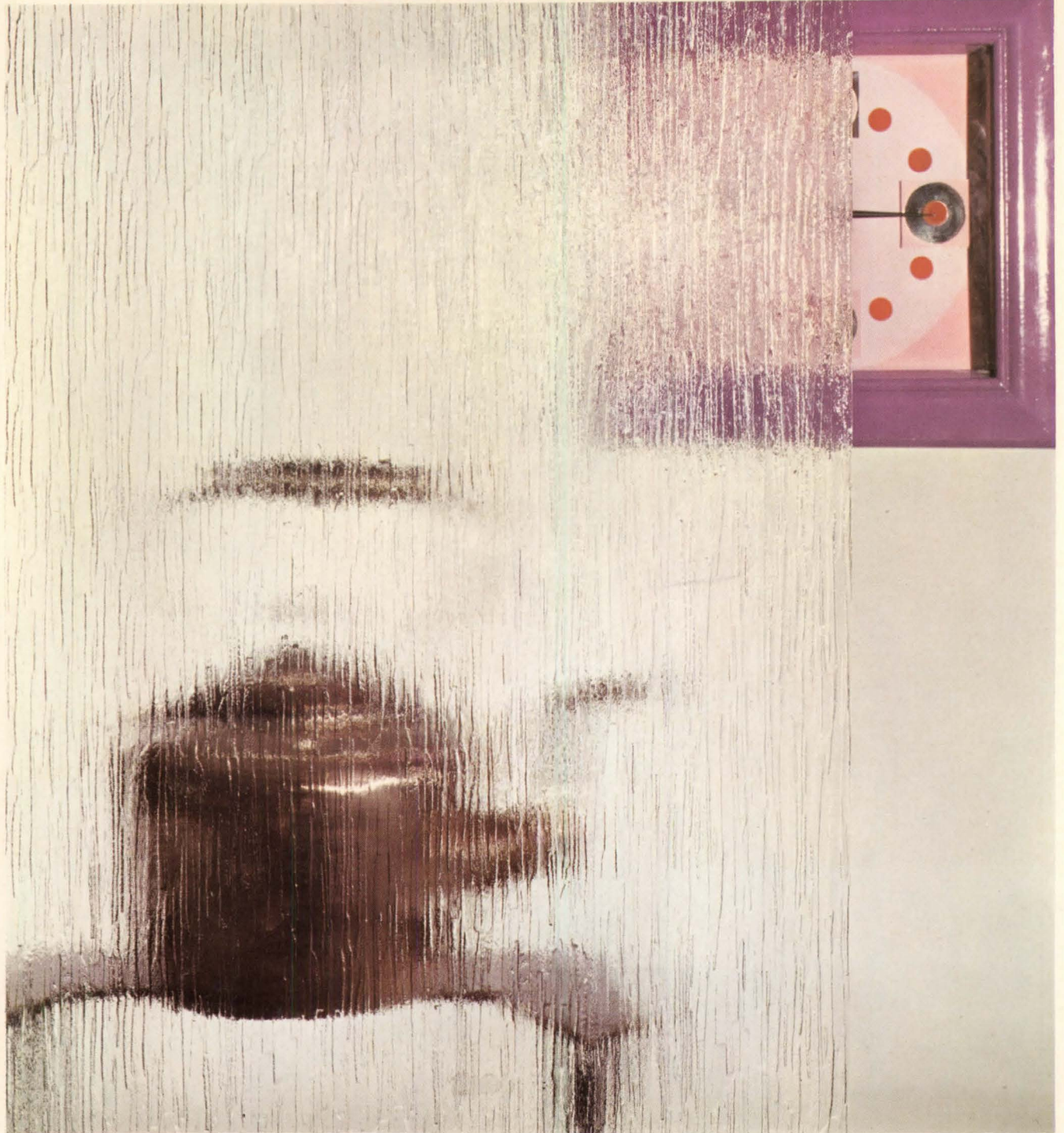
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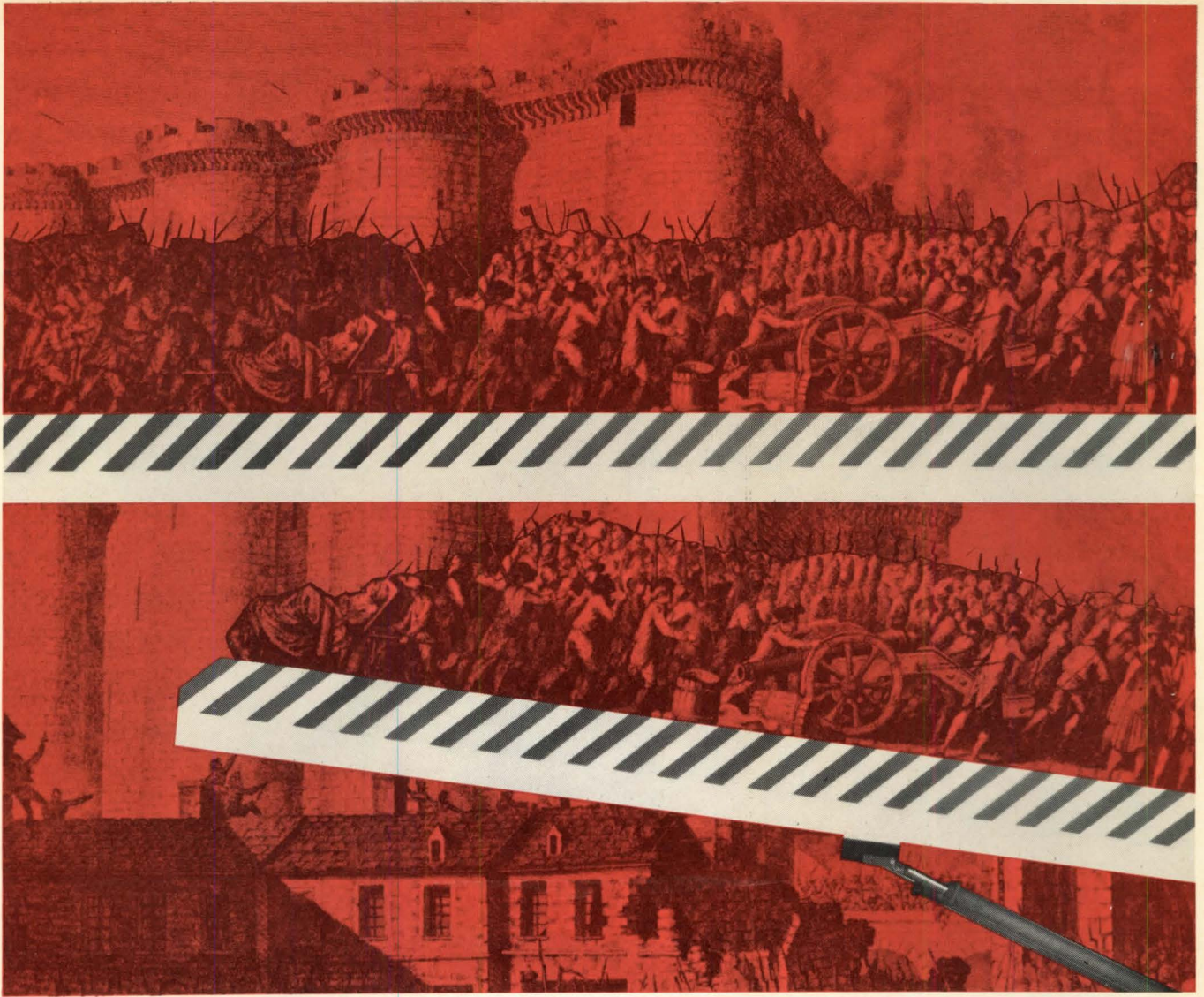
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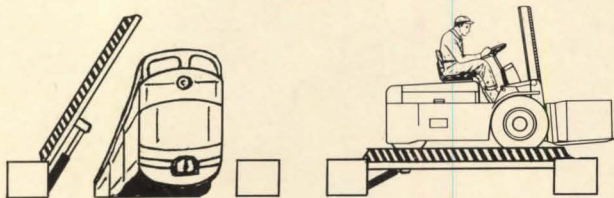
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## Some common errors in cost control programs

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

"If you were to outline for architects the basic guidelines of an effective cost control program, you would insult the architects' intelligence." This statement (by an industry expert) is true, by and large, but under today's increasingly complex operating conditions even the profession's more sophisticated firms are prone to misapply or ignore simple rules of cost control that can only be called basic guidelines.

The three case histories that follow illustrate some common mistakes and the lessons that should be learned from them. While these cases are based on actual experiences of architectural firms, they are not intended to imply that the profession is not concerned with building costs. But the growing complexity of design and construction processes—as well as additional problems of inflation—have made it far harder to avoid fundamental errors. Hence, the following case histories are not an indictment, but they do illustrate how faulty approaches to cost problems can be damaging to the reputation of the profession and to the purchasing capability of its clients.

■ **Case One:** A private hospital board submitted a program for a new hospital and an inflexible budget of \$11 million to its architect. After a brief examination, the architect accepted the program and budget as reasonable.

After design development, a detailed review of the project and its potential cost showed that the project would cost \$16 million. Independent consultants agreed there was virtually no "fat" in response of the design to the program. The simple fact was that the project, as programmed, could never have been built for \$11 million.

Many of the country's most unhappy owners have been outraged by the results of similar over-optimism on the part of their architects and themselves. All project programs and budgets should be given critical analysis at the beginning of the project—not at the end of design development or after bids have been opened.

Few owners have highly flexible construction purchasing ability that can respond to post-design increases. Public bodies, in particular, are being squeezed by severe fi-

ancing problems, and a rate of inflation augmented by padded bidding so that it often exceeds that for private work. Therefore, unless there is a clearly-stated understanding between the architect and the owner that the project budget may have to be revised at the bidding phase, the budget should be assumed to be fixed.

The architect must make a careful review and analysis of the program and budget whether the budget be fixed or not. This is important for buildings, such as hospitals, which are rigidly constrained by building codes and the interdependency of the program elements. A large cost estimating mistake is hard to correct later in such a project.

A good review process takes into account more than updated square-foot costs of similar projects. It considers other influences on bids such as how busy local contractors and labor are likely to be at the time of bids, the size of the project, and the amount of interest contractors are likely to show. Large public projects, for example, are currently having a difficult time finding responsive bidders. Contractors are understandably wary of projects that run beyond the life of local labor contracts and are subject to the slow payments and extra administrative costs for which public projects are notorious.

Recent bids on a community college near New York City illustrate what can happen. The project was originally budgeted at \$12 million, and the architect convinced the client that the building called for in the program would probably cost as much as \$16 million. This estimate did not take into account the lack of interest that contractors were showing for such projects, and the bids came in at \$30 million.

This type of overrun is usually impossible to predict, but the owner and architect should be aware of situations in which

it is likely to occur. Moreover, they should take steps to avoid such situations.

This architect did take one important step. He told the owner that the budget was unrealistic. Some architects are hesitant to do this. They fear that if they tell the client the project cannot be built for the budget, the client will find another architect who will say that it can.

Ethical considerations should prevent the architect from keeping silent; and practical considerations make a straightforward approach imperative. The architect faced with an unrealistic budget should take action to convince his client that increased funding is necessary. If the architect's persuasive powers and the weight of his own cost data are not enough, he should obtain additional support from a consultant. If the owner still is not convinced, the architect must develop a design approach which is compatible with a restrictive budget. Under no circumstances is it wise to ignore this problem, for the consequences later in the project are costly for both the architect and the owner. None of the post-design solutions—of which there are only three—are very palatable to either the architect or his client.

The first solution is to try redesign. Unfortunately, if the budget is tight or the program is rigid, the first sacrifices are usually the materials, details and special areas which are so important to the esthetic and environmental quality of the project.

The second solution is to find construction techniques that can reduce bid levels. These include phasing construction and letting many small, rather than several large, contracts. This solution has been used with considerable success but it is always a gamble. Moreover, the extra construction administration costs and headaches for both owner and architect may be prohibitive.

Another solution is to cut the program, and this is a last resort on almost all projects.

■ **Case Two:** An architect was commissioned to design an \$8-million school in a town far from his office. An independent estimate of his design solution revealed that the probable bids would be over \$13 million. His mistake: he did not understand the

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construction "habits" and requirements of the area in which the school was to be built.

Understanding the construction process is vital for effective cost control. Typical of the design decisions that showed construction naiveté in this case was the architect-specified special window system. These windows had to be shipped from the architect's home area to the project site, and were difficult to install.

Every architect knows that special items cost more money, but understanding the reason why is equally important. On major items, such as foreign-made electrical or mechanical systems, a contractor will prepare a higher bid which includes a contingency allowance for installation problems, labor objections and similar unknowns. On smaller items the contractor's justification is based primarily on the possibility of installation problems.

This happened with the window system in this case. The contractor was correct to include a contingency amount, for he found that the window system was hard to integrate with the wall system and that there were delays in delivery and installation. Specification of equipment and materials which local contractors know and understand will often minimize such problems.

Esthetic and environmental considerations will make some expensive items justifiable. Nevertheless, the architect should be aware of the potential construction problems caused by all such design decisions.

Once the architect is aware of these potential problems, it is possible to attempt value engineering. Value engineering is a design effort to achieve the same result for less cost. On a recent project, the architect found that a seemingly insignificant simplification of one detail, which was repeated throughout the project's interior, reduced the millwork bid by half. The detail was redrawn to minimize the work required of the carpenters.

In the case of the school project under discussion, the most serious error was a failure to understand the local construction requirements. The project's precast concrete requirements, for example, were beyond the capacity of the local construction industry.

This particular example may seem atypical, but it is actually illustrative of a type of error which many architects make. Architects in an area with many skilled carpenters will design a complicated poured-in-place concrete structure for an area where the necessary skilled labor is not available; designers in colder climates over-design for weather conditions in more temperate areas; and many other design professionals have shown similar disregard for the limitations and opportunities which exist in every locality.

Failure to adhere to these guidelines results in costly redesign, unhappy clients, a problem-plagued construction phase and all the other well-known headaches which accompany over-budget projects.

■ Case Three: A New York City community college was bid recently as a single package for each of the four major trades. The resulting bids totaled \$103 million. This total was far more than the final estimate of \$55 million. These bids, which represented a square-foot cost of almost \$100, were clearly unreasonable, and they were rejected. New bidding packages were split into five phases which are coming in at or near the original \$55-million estimate level.

This case is not an illustration of a major mistake. It has been included to show the value of intelligent contract-award planning.

Spiraling labor costs have received virtually all of the blame for the construction industry's chronic inflation, but, as this case shows, there are other significant forces behind high bids. The most important of these other forces are the contractors. Contractors in today's construction market often push bids far above reasonable levels. This is due in part to the over-burdened, non-competitive nature of much of the industry, and in part to the poor contract-award planning of the owner and architect.

Contracts can be planned to minimize costs. In an over-burdened construction market, careful planning of this single area can often lead to larger savings than careful selection of materials or careful design of the project's systems and details.

A well-planned contract is usually the result of at least three major actions on the part of the owner and architect—the establishment of an appropriate project schedule, the development of a project package which is attractive to a competitive group of contractors, and the selection of a qualified contractor.

Project scheduling is particularly important in this period when costs are escalating at a rate which now exceeds one per cent per month in many areas. Careful scheduling, through the use of the Critical Path Method or other techniques, allows the owner and architect to compare the feasibility of expediting procedures, such as phasing or crashing, to avoid part of the inflationary spiral, with a more conventional construction schedule.

Other benefits of careful scheduling can lead to even more significant savings than those achieved by merely shortening the period to completion. Scheduling can permit owners and architects to put projects out to bid during lulls in construction activity, to avoid the higher bids associated with unrealistic completion dates and to begin construction during a month which is best for local contractors and construction techniques.

The architect of a project which could possibly run into bidding difficulty can evaluate whether any special approach to contract scheduling is warranted by getting answers to some simple questions: Will the contract run beyond local labor union contracts? Are there large unpredictable cost areas, such as unknown subsoil conditions,

included in a lump sum contract? Is the contract too big for all but a few already busy contractors? These and many other contract provisions, such as slow payment procedures or excessive inspection conditions, can lead to unnecessarily high bids.

Three examples of changes that might be recommended are: for unusual subsoil conditions, a separate cost-plus contract; where there is a shortage of interested large contractors, dividing the contract to interest smaller firms; and phasing a long construction period to match bidding periods to local labor contracts. The latter two approaches were the ones chosen for the project in Case Three.

None of these actions are guaranteed solutions, and, if not handled carefully, all can have negative repercussions. For example, separate contracts usually mean more management problems, and a single lump sum bid can at times be lower than a phased or split-contract approach. Nevertheless, when carefully planned and implemented, many of the special contract-award approaches discussed above can often result in significant reductions in construction costs.

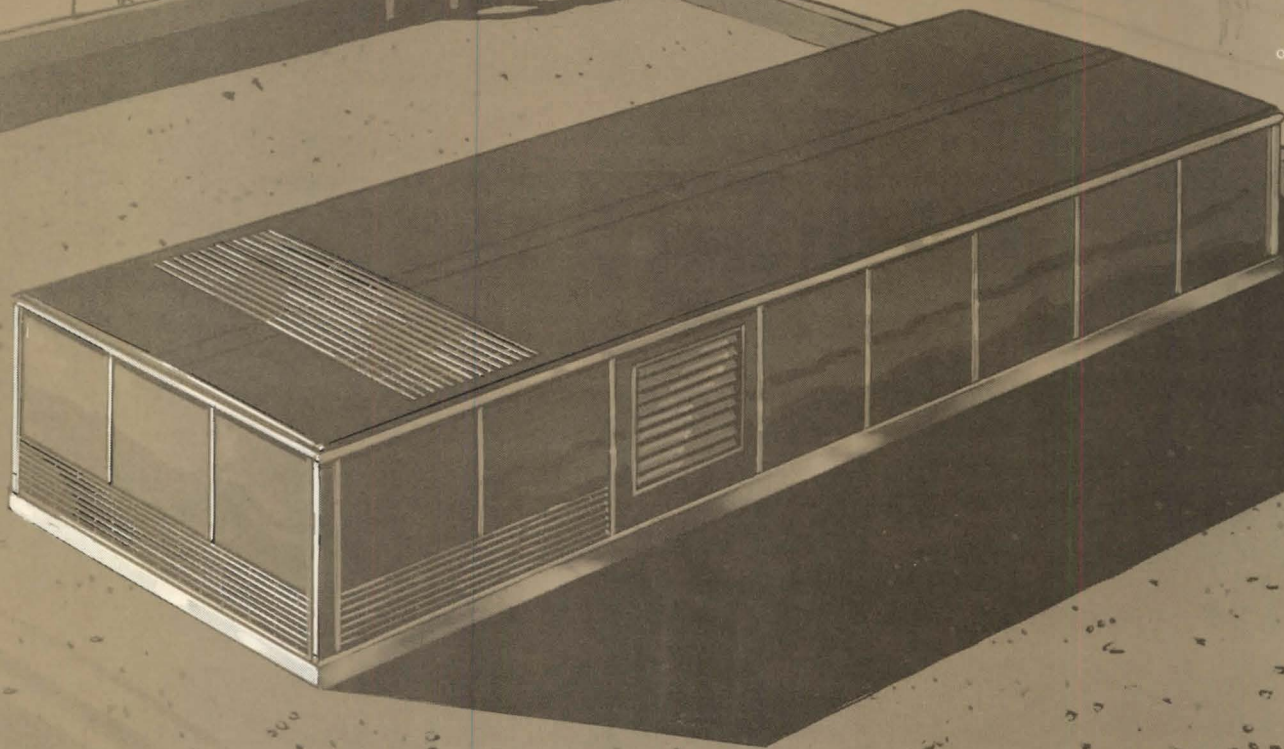
All of the above recommendations are, of course, of little value if the project is built by an incompetent contractor. Wherever possible, the architect should help the owner encourage qualified contractors to bid, and disqualify those who are not fully capable. A good pre-qualification procedure evaluates each builder's workload, experience with buildings similar to the project, ability to undertake work of the project's size and reasons for failing (if ever) to complete a previous project.

Ability to handle the project is probably the most important of the above considerations, for contractor failure is a growing problem for both owners and architects. In 1967, for example, over nineteen per cent of the nation's business failures were bankrupt contractors. The cost of contractor failure for all parties is well known and has been pointed out in an earlier article, "A growing problem: Liabilities of contractors who fail" (RECORD, February 1968, page 77).

The contractor's experience with similar projects is also a very important consideration. Recently, a large financial institution hired a noted architect and a competent contractor to build a housing project on a cost-plus basis. The original budget was \$8 million, but the contractor's estimate was \$12 million. Inflation, an inefficient design, and several other factors accounted for part of this overrun. A significant portion of the increase, however, was due to the contractor's complete lack of experience with housing. Because of residential construction's many repetitive elements, builders specializing in this type of work have been able to develop many cost-cutting shortcuts. The owner's failure to choose a firm which knew these shortcuts was a major cost error.



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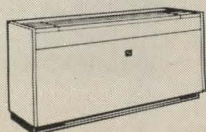
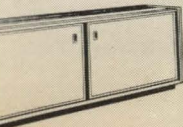
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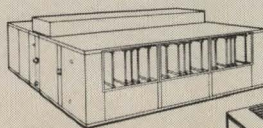
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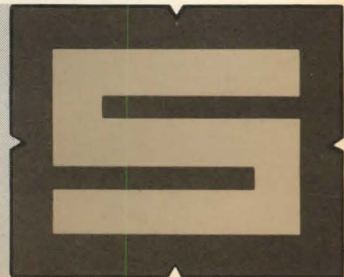
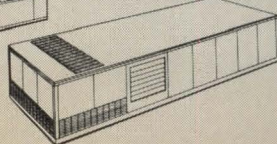
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## INDEXES AND INDICATORS

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### BUILDING COST INDEXES

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

The indexes are computed on a basis of 40 per cent labor rate and 60 per cent materials price. Wage rates for nine skilled trades, together with common labor, are used. Prices of four common building materials are included for each listed city.

Metropolitan area	Cost differential	Current Index		% change year ago res. & non-res.
		residential	non-res.	
<b>JANUARY 1970</b>				
U.S. Average	8.6	...	....	+ 7.50
Atlanta	7.4	95.5	101.3	+ 8.70
Baltimore	7.9	95.7	101.8	+ 4.54
Birmingham	7.4	94.3	101.4	+ 6.65
Boston	8.4	95.8	101.4	+ 6.43
Chicago	8.9	96.5	101.5	+ 4.84
Cincinnati	9.1	95.4	101.4	+ 7.64
Cleveland	9.8	95.5	101.5	+ 8.03
Dallas	7.7	97.8	101.0	+ 9.49
Denver	8.2	95.2	101.2	+ 8.46
Detroit	9.4	96.4	101.2	+11.55
Kansas City	8.3	95.8	101.4	+ 6.27
Los Angeles	8.4	93.5	102.3	+ 7.47
Miami	8.5	96.5	101.3	+ 7.84
Minneapolis	8.7	95.2	101.2	+ 7.02
New Orleans	8.0	95.7	101.4	+ 8.47
New York	10.0	95.2	102.4	+ 7.16
Philadelphia	8.6	96.4	101.2	+ 6.37
Pittsburgh	9.2	95.2	101.2	+ 5.83
St. Louis	9.1	95.7	101.4	+ 6.64
San Francisco	8.7	93.5	102.3	+ 9.47
Seattle	8.5	91.9	102.7	+ 8.70

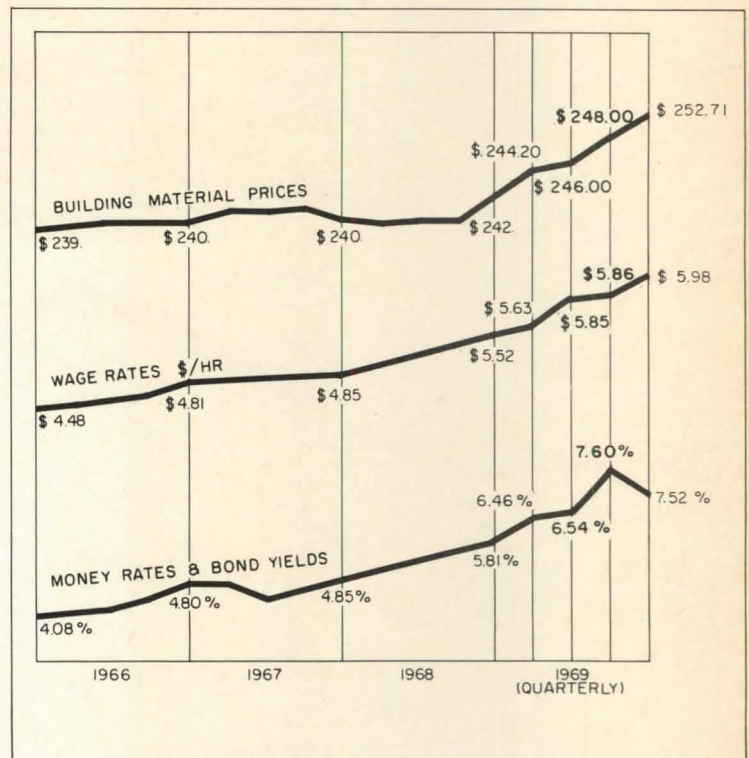
Differences in costs between two cities may be compared by dividing the cost differential figure of one city by that of a second; if the cost differential of one city (10.0) divided by that of a second (8.0) equals 125%, then costs in the first city are 25% higher than costs in the second. Also, costs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

### ECONOMIC INDICATORS

Indicators are intended to show only general direction of changes. **BUILDING MATERIALS**—The U.S. average price of a "package" of common materials.

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

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



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

Metropolitan area	1941 average for each city = 100.00														
	1961	1962	1963	1964	1965	1968 (Quarterly)				1969 (Quarterly)					
						1st	2nd	3rd	4th	1st	2nd	3rd	4th		
U.S. Average	264.6	266.8	273.4	279.3	284.9	286.6	297.5	301.5	302.6	309.3	310.0	314.9	316.5	332.4	333.0
Atlanta	294.7	298.2	305.7	313.7	321.5	329.8	335.7	345.6	346.7	352.3	353.1	364.2	365.9	382.8	383.4
Baltimore	269.9	271.8	275.5	280.6	285.7	290.9	295.8	302.9	304.1	307.9	308.7	311.4	313.0	321.8	322.3
Birmingham	249.9	250.0	256.3	260.9	265.6	270.7	274.2	278.5	279.5	283.6	284.3	288.4	289.9	302.4	302.9
Boston	237.5	239.8	244.1	252.1	257.8	262.0	265.7	269.3	270.3	276.3	277.1	278.2	279.6	294.0	294.5
Chicago	289.9	292.0	301.0	306.6	311.7	320.4	328.4	329.4	330.0	338.7	339.5	340.4	342.1	354.9	355.5
Cincinnati	257.6	258.8	263.9	269.5	274.0	278.3	288.2	291.4	292.5	301.8	302.6	309.8	311.5	324.8	325.3
Cleveland	265.7	268.5	275.8	283.0	292.3	300.7	303.7	316.5	318.3	330.7	331.5	334.9	336.7	357.1	357.7
Dallas	244.7	246.9	253.0	256.4	260.8	266.9	270.4	272.3	273.4	281.0	281.7	287.2	288.7	307.6	308.1
Denver	270.9	274.9	282.5	287.3	294.0	297.5	305.1	304.9	306.0	311.7	312.5	317.9	318.5	337.9	338.5
Detroit	264.7	265.9	272.2	277.7	284.7	296.9	301.2	309.2	310.4	315.5	316.4	326.8	328.5	351.8	352.4
Kansas City	237.1	240.1	247.8	250.5	256.4	261.0	264.3	267.5	268.5	277.2	278.0	281.0	282.3	294.5	295.0
Los Angeles	274.3	276.3	282.5	288.2	297.1	302.7	310.1	312.0	313.1	319.3	320.1	323.7	325.4	343.0	343.6
Miami	259.1	260.3	269.3	274.4	277.5	284.0	286.1	293.1	294.3	304.5	305.3	309.6	311.2	328.3	328.8
Minneapolis	267.9	269.0	275.3	282.4	285.0	289.4	300.2	300.0	301.0	309.0	309.4	310.6	312.2	330.1	330.7
New Orleans	244.7	245.1	248.3	249.9	256.3	259.8	267.6	270.6	271.6	273.9	274.2	285.5	287.1	296.6	297.1
New York	270.8	276.0	282.3	289.4	297.1	304.0	313.6	315.9	317.0	320.6	321.4	324.9	326.6	343.4	344.0
Philadelphia	265.4	265.2	271.2	275.2	280.8	286.6	293.7	293.3	294.2	300.9	301.7	304.6	306.2	320.0	320.5
Pittsburgh	250.9	251.8	258.2	263.8	267.0	271.7	275.0	293.0	284.2	291.3	293.8	297.0	298.6	310.0	310.5
St. Louis	256.9	255.4	263.4	272.1	280.9	288.3	293.2	293.7	294.7	303.6	304.4	306.8	308.3	323.7	324.2
San Francisco	337.4	343.3	352.4	365.4	368.6	386.0	390.8	396.4	398.0	401.9	402.9	415.6	417.5	439.9	440.5
Seattle	247.0	252.5	260.6	266.6	268.9	275.0	283.5	286.2	287.2	291.6	292.2	296.1	297.5	316.8	317.3

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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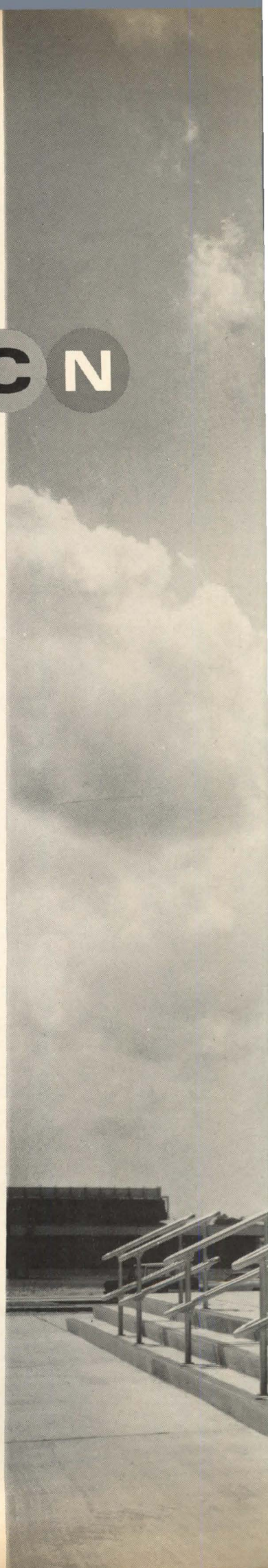
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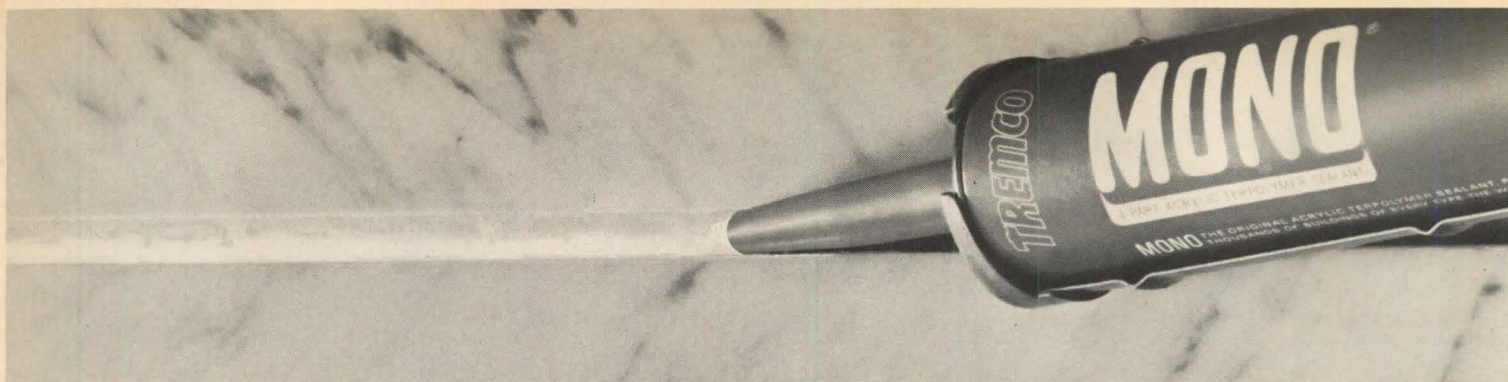
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CURRENT TRENDS IN CONSTRUCTION

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

Construction versus inflation: Part 1

This month: the general conditions of demand and constraint

Next month: specifics of supply and productivity

Early in September, President Nixon proclaimed a 75 per cent reduction in new contracts for government construction, beginning his announcement with the statement that "The cost of building a home or an apartment house has become exorbitant." Although there is considerable room for debate over the means chosen by the administration to attack the problem, nobody has questioned the truth of that opening statement. Construction costs of new housing—as well as office buildings, factories, schools, hospitals and just about every other type of construction—have become exorbitant, at least in relation to what they used to be or compared with price increases of most other goods and services. Inflation is the nation's number one economic problem today. With the exceptions of public transportation and medical care, the construction industry has experienced the greatest degree of inflation of any major economic activity in the Sixties.

Take a look at the record. The left-hand chart below compares the rising costs of all construction and of non-residential building with the basic index of costs for all goods and services—the one used by the Commerce Department to adjust its Gross National Product statistics for price changes. This is what they show:

- Since 1958, construction costs have consistently risen faster than the costs of all goods and services. The total rise through 1969 was 40 per cent in construction and 27 per cent for the adjusted GNP.
- Within the construction industry, inflation has been more severe in non-residential building—which includes most of the architect-designed building types—than for

the average of all construction. The eleven-year increase in this category has been more than 50 per cent.

- Prior to 1965, in a period of relatively mild inflation, the over-all price index was rising at a 1.5 per cent annual rate, while total construction costs were climbing at a two per cent rate and non-residential building costs were rising at 2.5 per cent a year.
- In the more recent period of severe inflation, the general price level has gone up at a 3.5 per cent annual rate, total construction costs have gone up five per cent a year, and the annual cost rise in non-residential building is now over six per cent.
- In 1969, the gap widened even further, as the GNP deflator rose 4.5 per cent, total construction costs went up seven per cent, and the average non-residential building costs 8.5 per cent over the previous year. This latter increase was almost as great as the total rise in costs from 1958 to 1962.

The right-hand chart describes what is behind the sharp rise in construction costs by showing trends in the two major cost factors: wages and materials. (On a typical job, materials account for about half the cost of the finished project, exclusive of land, while the on-site wage bill represents between a quarter and a third of the total.) Up until 1965, it is apparent that rising wages were largely responsible for the increase in construction costs. Indeed, materials prices, on the average, had remained virtually unchanged for over seven years. Since 1965, both wage rates and materials prices have contributed to the over-all construction cost rise. Hourly earnings of construction workers have jumped 25 per cent in the last four years, and materials prices

have moved up over 20 per cent, with most of that coming in the last two years.

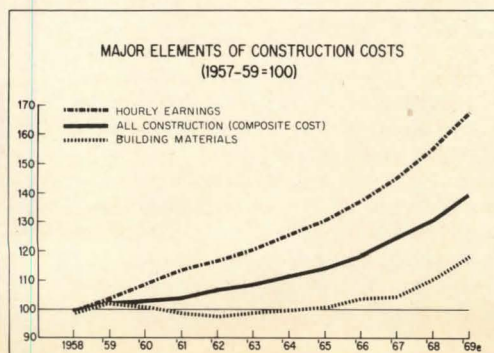
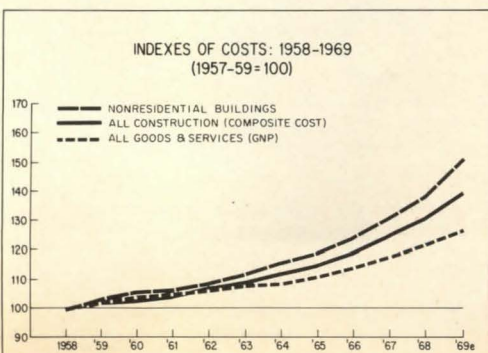
These indexes describe what's been going on in construction costs and the major elements in these costs. In effect, they are symptoms of the inflationary problem. But they don't explain why costs in these areas are climbing so fast, or why construction has been singled out for especially severe inflationary tendencies.

In considering some of the broader aspects of inflation and the characteristics of construction that have made it so susceptible to inflationary forces, one should bear in mind that there are two basic kinds of inflation. The "demand-pull" type simply means that there is an excess of demand in relation to capacity, and prices are bid up. This is usually temporary, for the higher prices encourage the creation of new capacity and sooner or later balance is restored. The current round of inflation started out that way, when huge Federal budget deficits poured more money into the spending stream than the productive capacity of the economy was able to absorb.

The other kind of inflation—usually referred to as "cost-push"—is much harder to deal with, for it results from built-in rigidities in the system that prevent the competitive forces of the market from achieving the automatic balance that leads to price stability. Examples of these strictures that abound in the construction industry are:

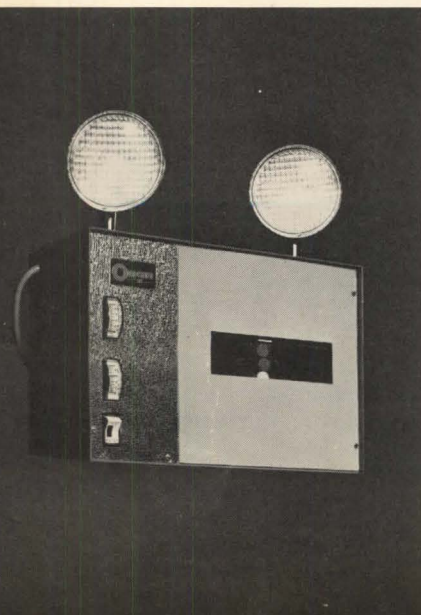
- Union policies that restrain growth of the construction labor force and inhibit technological advances.
- Low productivity due to the low ratio of capital equipment to number of workers.
- Lack of standardization of design components, especially in mechanical and structural systems, that might be overcome to some degree by more uniform building codes.
- The seasonality of construction, which results in excessive overtime and high labor turnover.
- The high rate of failure among building contractors.

Not all of these restrictions are either avoidable or undesirable, but they all contribute to inflation. The cutback in Federal construction contracting deals only with the demand side—which is important at a time when both types of inflation are in operation—but the longer term solution of inflation in construction requires a concerted attack on the forces that persistently prevent stability in the industry.



# Caught in the dark?

## Light up with **Illuma-Pac**... Onan's new battery-powered emergency lights.



These are the trusty ones. Onan's new Illuma-Pacs—the emergency lights that always go on the *instant* power goes off.

Contacts close automatically. 6-volt lamps light immediately — keep shining for up to 3½ hours.

How about the batteries? Take your choice — lead acid or nickel cadmium. Both types have built-in solid state chargers and controls. So they never overcharge (or undercharge, either).

Illuma-Pacs are available in 7 models—from 120 volt to 277 volt—all compact enough to mount on pillars, walls, over stairways, escalators, or fire escapes.

And every Illuma-Pac comes with a 2-year warranty—and all the dependability you'd expect from a product that carries the name Onan.

For more data, circle 43 on inquiry card

So, why be caught in the dark? Look to Onan — and light up with Illuma-Pac. For more information, see your nearest Onan distributor. Or send the coupon. And trust the rest to us.



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A DIVISION OF STUDEBAKER CORPORATION  
We build our future into every Onan product.

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City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

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AR-10





Nothing says success so clearly as the All-Steel Environment. Efficient performance and the look of success are built-in advantages of All-Steel furniture. The wide selection of styles, fabrics, and finishes gives you versatility in planning an office environment that will say success for you and your client . . . and at a price that will please. For office planning catalog write All-Steel Equipment Inc., Aurora, Illinois 60507. Showrooms in New York, Chicago, Los Angeles, Aurora.

**All-Steel**<sup>®</sup>  
one of the **CIT** companies

For more data, circle 44 on inquiry card

# THAI-TEAK

## keeps costs down at floor level

Thai-Teak makes a prestige floor with rich, full lifetime beauty that sells itself. It costs no more than many custom vinyls, many wood floors, many wall-to-wall carpetings . . . in large installations.

Competitively priced quality that is unique and praiseworthy. Installation is quick, easy, precise and maintained at low cost. Keeps labor prices right down on the floor.

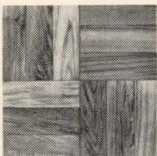
Thai-Teak resists termites, rot, decay. It helps you make more permanently satisfied clients and customers. Isn't that what you really want?

Send for **FREE brochures on 150 patterns and technical data.**

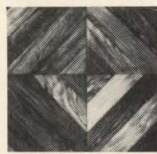
(Illustrated)  
Four of  
150 available  
patterns



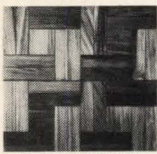
HERRINGBONE



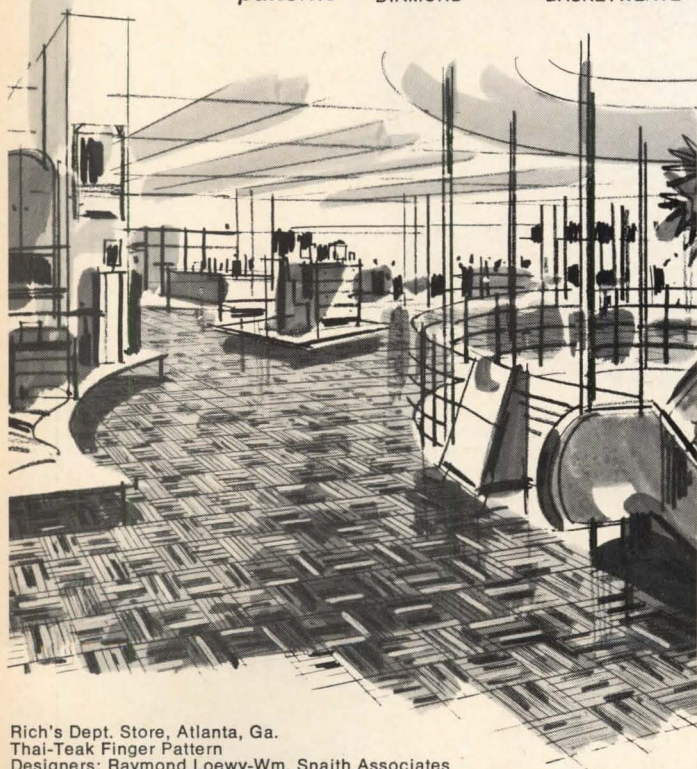
FOURSQUARE



DIAMOND



BASKETWEAVE



Rich's Dept. Store, Atlanta, Ga.  
Thai-Teak Finger Pattern  
Designers: Raymond Loewy-Wm. Snaith Associates

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GENUINE IMPORTED  
**THAI-TEAK**™ Product of  
PARQUETRY FLOORING  
**BANGKOK INDUSTRIES, Inc.**

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### Wimsley, Bosch & Bruber, A. I. A.

Thanks for making our restroom what it is today!

Us girls love those dual-vend dispensers with both Kotex® napkins and Kotex® tampons. Not like the restrooms in our old office building. Now every gal has the kind of protection she wants.

One out of two women today use tampons. So restrooms need both tampons and napkins. Bobrick Dispensers, Inc. makes a number of excellent dual-vend dispensers. We'll be happy to send you a free catalogue. Or see Bobrick, in Sweet's.

As usual, the architects' names aren't for real. But the gals' needs are.

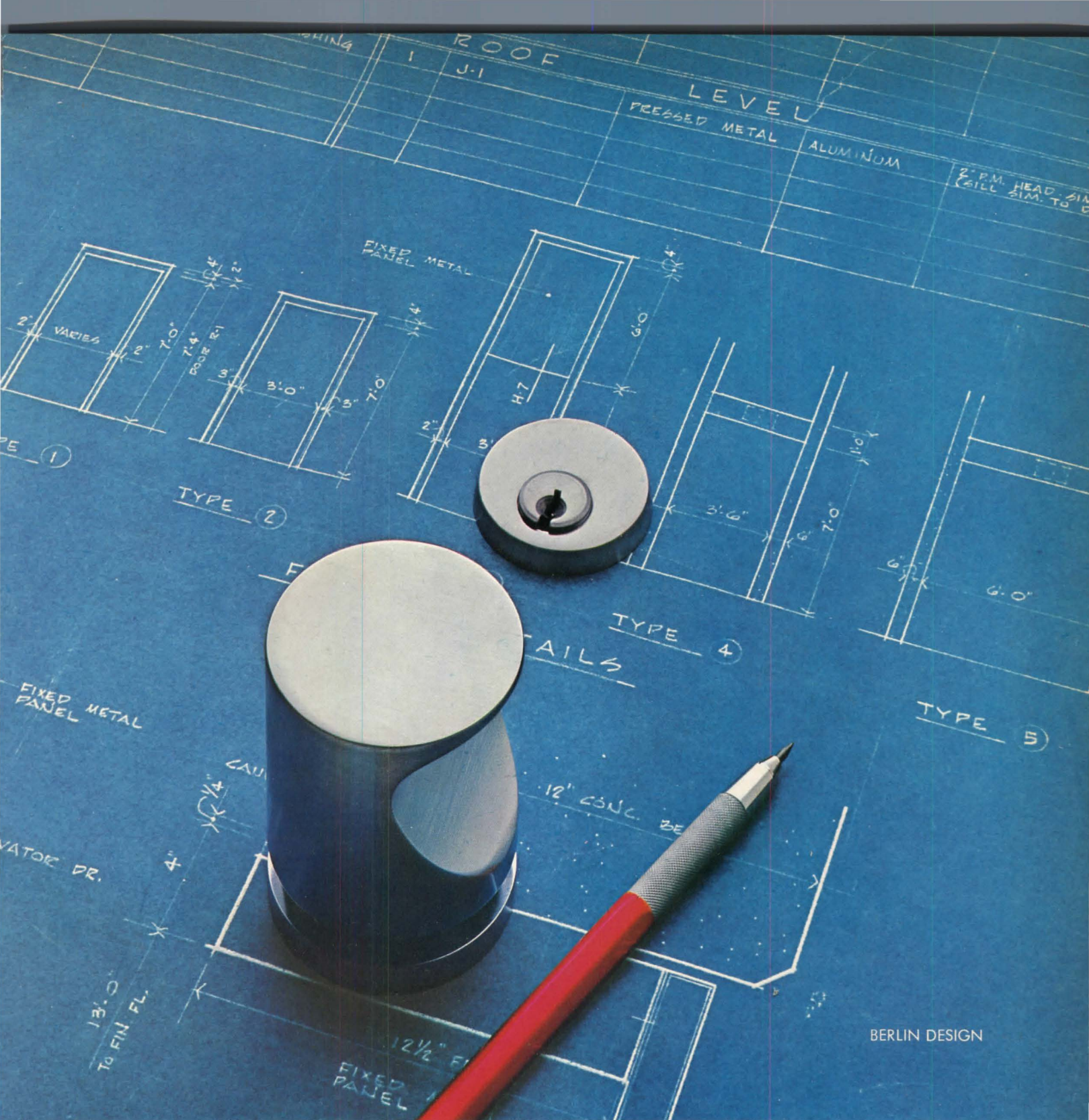


**Kimberly-Clark Corporation**  
Commercial Department Neenah, Wisconsin

KTX-189

For more data, circle 46 on inquiry card

For more data, circle 47 on inquiry card



BERLIN DESIGN

# For security's sake, plan ahead With Russwin Ten Strike\* Mortise Locksets

Help stamp out dull door decor!  
Design the bold beauty of Russwin's  
new Berlin design into all your buildings.  
It's decidedly different . . .  
an exciting excursion from the everyday.  
And there's more to it than meets the eye.  
When you turn it, you'll know you've come  
to grips with truly great knob design!  
Created to cradle the hand comfortably, yet firmly,  
it gives you action you'd expect only with a lever.

What's more, Universal mounting puts  
the "concave cradle" in any desired position.  
Another top-scoring "Ten Strike" Lockset.  
Available in a wide choice of metals,  
color tones and all desired functions.  
Contact your Russwin distributor or write for  
latest brochure. Russwin, Division of Emhart  
Corporation, New Britain, Conn. 06050.  
In Canada — Russwin Division  
of International Hardware.



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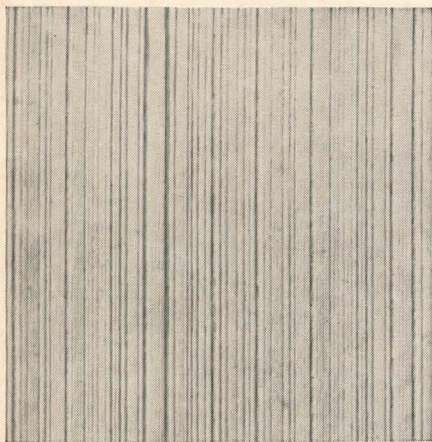
◆ For more data, circle 47 on inquiry card

\*"Ten Strike" is a trademark of Russwin, Division of Emhart Corporation, New Britain, Conn. 06050.

## OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 247-248.

# NEW!

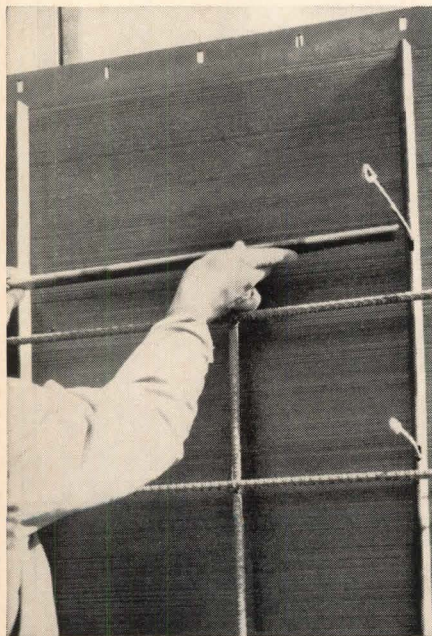


### SYMONS DEEP GROOVE STRIATED FORM LINER

Symons Deep Groove Striated Form Liner leaves a soft, handsome effect to exposed concrete surfaces. Of prime benefit to the architect is the manner and ease of finishing the deep groove striations, reducing the exposure of any imperfections that may be present due to rock pockets, honeycombs and bug holes.

Normal size of the liner is 4' x 8', but can be ordered in any size up to 4' x 16'. It is made entirely of a wood composite, which can be easily attached to the forming surface.

Striated form liner may be used in conjunction with Symons Rustication Strip, illustrated below. Ties are inserted through the Rustication Strip, leaving the tie hole in the impression, and not in the face of the concrete. Complete details about the striated form liner and rustication strip are available upon request.



 CONCRETE FORMING EQUIPMENT  
SYMONS MFG. COMPANY  
122 EAST TOUHY AVE., DES PLAINES, ILL. 60018

**MORE SAVINGS WITH SYMONS**

For more data, circle 49 on inquiry card

**STAIR COVERINGS** / "The 1970 Architects' Catalog" is 48 pages of descriptions and specifications of stair coverings and various rubber and vinyl mats, matting and aluminum mat frames for commercial, industrial and multiple residence applications. ■ The R. C. Musson Rubber Co., Akron, Ohio.\*

Circle 400 on inquiry card

**CONTROLLED HEAT** / "Controlled Heat Engineering" is a booklet describing various types of controlled heat applications and explaining the company's experience and capabilities in these fields. Some applications described: pollution control through industrial waste incineration; glass annealing lehrs; moist fuel cells; hot air furnaces; and high temperature roller hearth furnaces. ■ Bigelow-Liptak Corporation, Southfield, Mich.

Circle 401 on inquiry card

**STEEL EQUIPMENT** / The "Steel Equipment Reference Manual No. 493" contains over 100 pages of standard steel storage, shop and office equipment. Over 17 pages are devoted to new products added to a line of more than 3,000 products. ■ Equipto, Aurora, Ill.

Circle 402 on inquiry card

**GAS ENGINE PRODUCTS** / A 24-page catalog features a complete line of gas engine drive products for refrigeration applications. The catalog gives design features, mechanical specifications charts, diagrams, photographs and application data for products ranging from 20 to 280 tons. ■ Acme Industries, Inc., Jackson, Mich.

Circle 403 on inquiry card

**SHIELDING GASKET** / A 4-page data sheet covers technical information on *Teckstrip*, a resilient EMI/RFI shielding gasket combined with a solid extruded aluminum mounting strip. Supplied ready-to-mount, *Teckstrip* can be attached directly to an electronic enclosure by spot welding, screwing, riveting or similar fastening techniques. ■ Technical Wire Products, Inc., Cranford, N.J.

Circle 404 on inquiry card

**SURFACE FLUORESCENT** / Modular surface fluorescents are described in an 8-page booklet. Units are said to have positively true dimensions with no variations and provide perfect modular characteristics to achieve a maximum variety of ceiling patterns. ■ Silvray-Litecraft Corporation, Passaic, N.J.

Circle 405 on inquiry card

\* Additional product information in Sweet's Architectural File

THIS SPACE CONTRIBUTED BY THE PUBLISHER


# WHAT HAVE YOU DONE LATELY FOR THE LOVE OF YOUR LIFE?

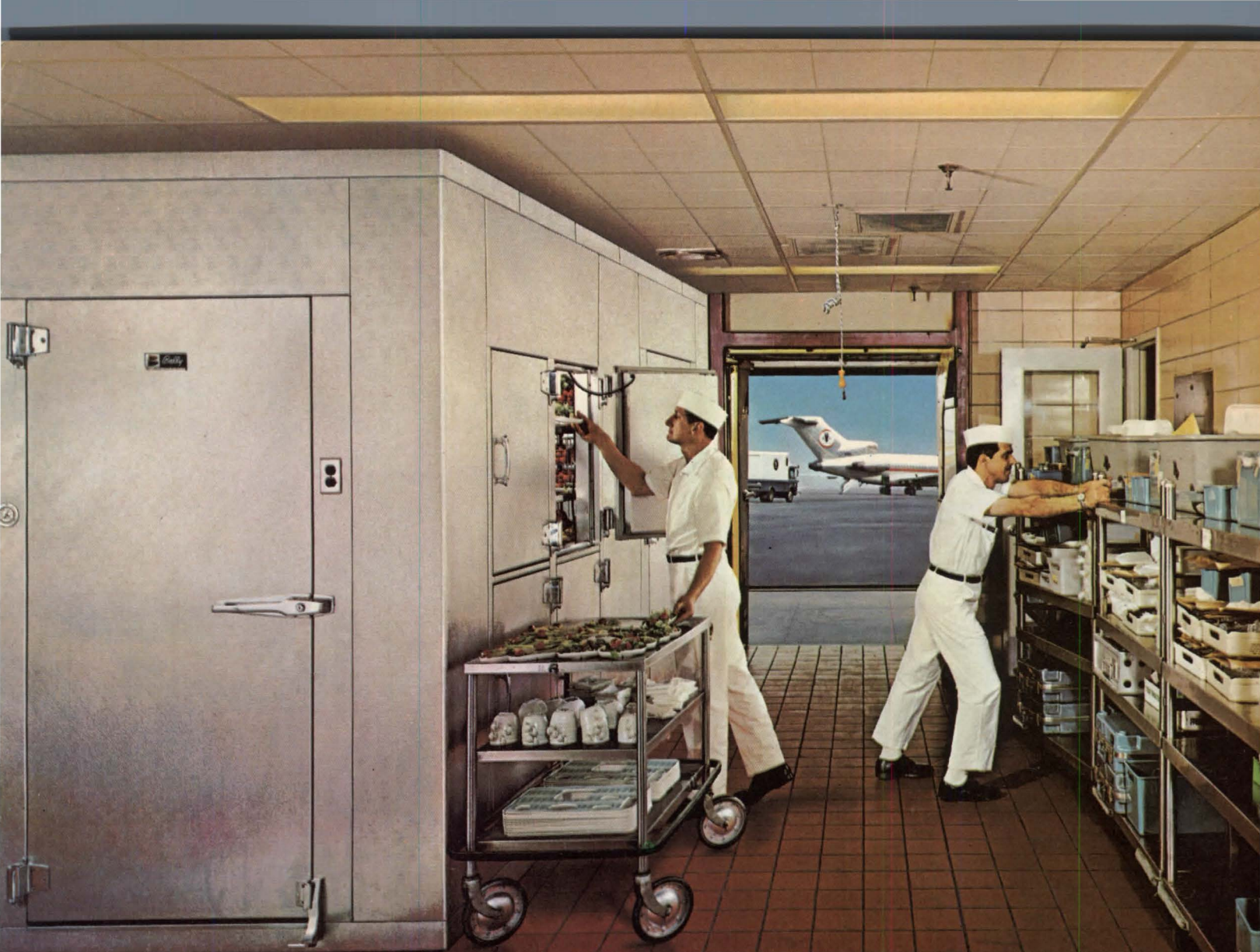
We have some suggestions.

For your lungs, stop smoking cigarettes. For your skin, avoid excessive sun. For your mouth, get regular dental checkups. For colon-rectum, if you're over 40, get an annual procto. If you're a woman, examine your breasts once a month. And have a Pap test regularly.

And if you're smart, get a complete health checkup once a year. Even if you never felt better in your life.

## It's up to you, too.

American  
Cancer Society 



*Prefab*

**Put a Bally Walk-In Cooler/Freezer in the kitchen. Airborne diners like their food fresh, fancy, and on time. Qualify with flying colors by equipping flight food centers with dependable, clean Bally Walk-In storage. Insulated panels can be assembled in any size or shape to fit the most challenging locations. Learn about other features from our 32-page booklet and urethane wall sample.**

**There's an  
evolution in the  
kitchen**



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# Spec 30: The 25-year interior

You are looking at something totally unique—not only in appearance and concept, but function as well. Spec-30 is a flexible, 5' x 5' modular system of interior components designed, manufactured and installed entirely by one company—Keene Corporation.

The ceiling materials are manufactured by Keene Sound Control Division. The lighting fixtures, handling both supply and return air distribution, are by Keene Lighting Division. Partitions and doors by Keene Metal Construction Products Division. And all products are interdesigned and installed by Keene Interior Systems Division—with total single-source responsibility.

Architects and owners, recognizing the value of interiors that can be easily and quickly rearranged, over and over, now design entire buildings for modular flexibility. Over-all dimensions, including core configuration and window-mullion spacing, are designed on a 5' x 5' planning module. And even HVAC systems incorporate multiple reheat coils for dividing each floor into many zones—again so that partitions may be rearranged frequently in future years.

Basically, Spec-30 has the same design characteristics as all Keene In-

terior Systems. Each 5' x 5' module contains illumination, air distribution and acoustical control—forming a complete ceiling with all the services needed for its 25 square feet of floor space. The ceiling grid not only structurally supports the ceiling elements, but also provides channels for the movable partition walls. What's more, each 5' length of grid has a capped opening for electrical and phone line routing from above the ceiling into partitions. And to permit frequent wall relocation without damage to floors, Keene partitions do not require shooting or nailing to the floor.

If you're looking for coordinated interior products to match the useful life of the rest of your building's components, please write and tell us your needs. Keene's total capability includes design, delivery and installation of over 8,000 combinations of products to meet every interior system requirement. Keene Corporation, Interior Systems Division, Route 206 Center, Princeton, New Jersey 08540.

**KEENE**  
CORPORATION

**INTERIOR SYSTEMS DIVISION**

**We've just begun to grow.**

*For more data, circle 51 on inquiry card*

# Cincinnati fields a winner.



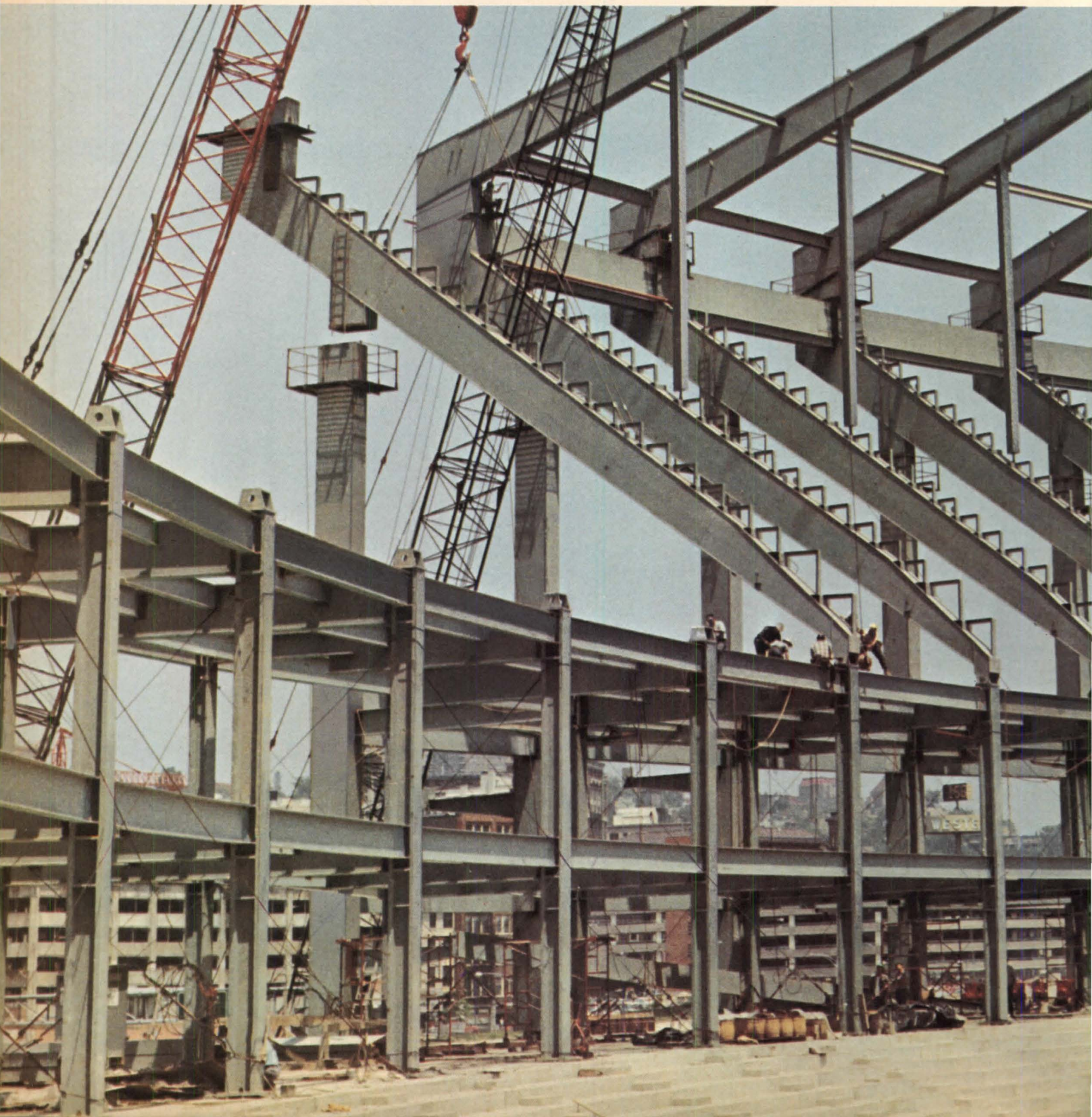
**Prefabricated steel plate columns and high strength bolting speed work on a great new stadium.**

It's a new sports spectacular for Cincinnati! This time everybody wins: Redlegs, Bengals, and 55,000 cheering fans! It's a brand new ball game for sure at this great new Riverfront Stadium.

We're proud to have a strong steel hand in speeding its construction.

More than 4,000 tons of Republic A-36 carbon steel plate were prefabricated by Ingalls Iron Works, Birmingham, Alabama, into 72 massive structural columns. The efficiency of shop prefabrication plus easy welding of this plate combined to help speed the job.

Fast installation and predictable strength were also demanded for structural bolts. That's why Republic high





strength structural bolts were used to fasten intermediate beams on upper levels.

Republic bolt design insures fast setting and proper torque-tension. Consistent accuracy of tension setting cuts inspection time and eliminates costly resetting. Shortened thread design provides gripping power unaffected by structural stresses.

Speed up *your* next project with Republic structural steel plate and high strength structural bolts. They'll help you field a winner every time.

## REPUBLIC STEEL CORPORATION

BOLT AND NUT DIVISION  
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### CINCINNATI RIVERFRONT STADIUM

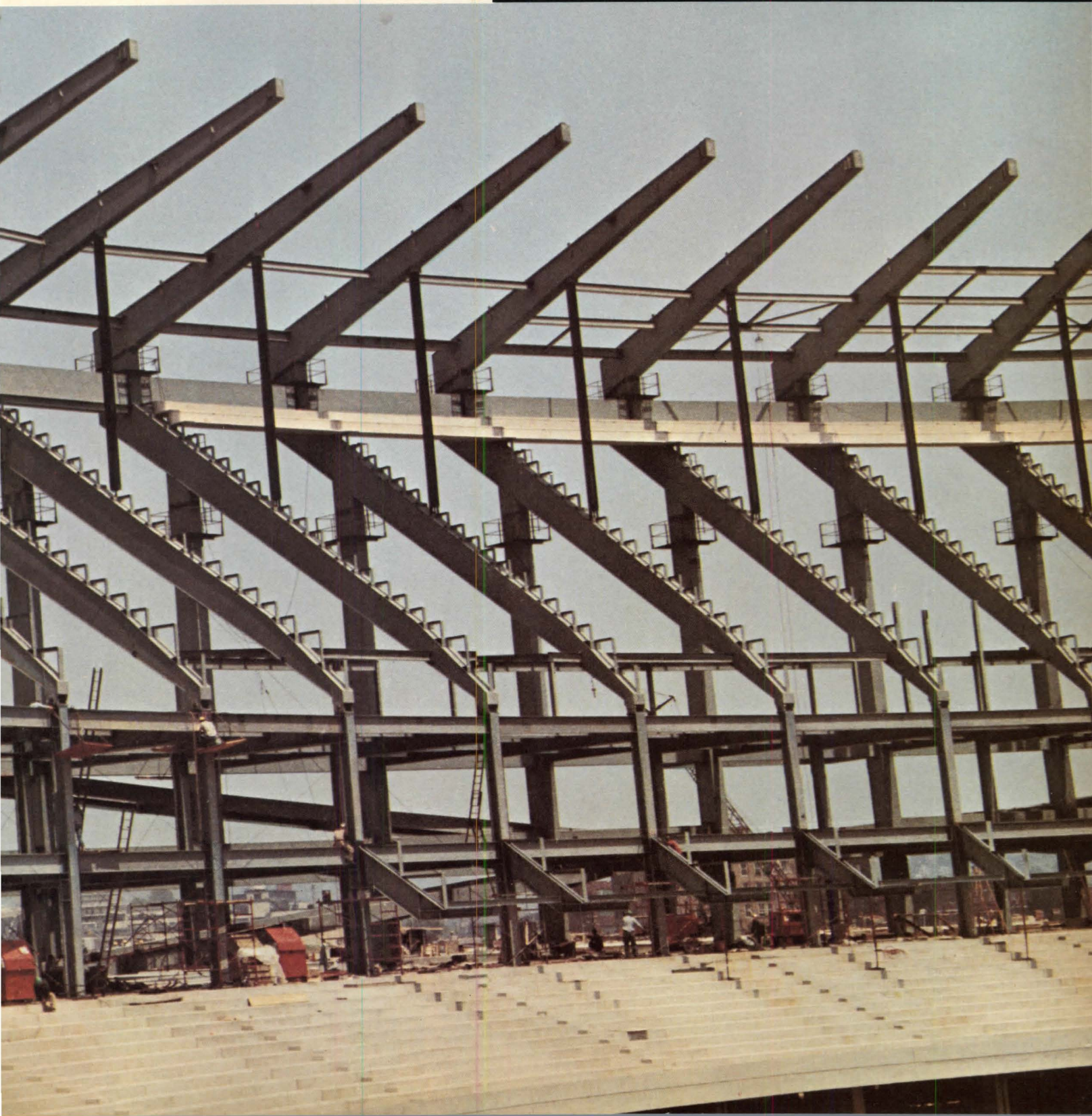
**Architects:** Heery & Heery, Atlanta, Georgia  
Finch, Alexander Barnes, Rothschild, & Paschal  
Atlanta, Georgia

**Consulting Engineers:** Prybylowski and Gravino, Atlanta, Georgia

**Structural Erector:** Don L. Fruchey, Inc., Ft. Wayne, Indiana

**Construction Supervisor:** Roy Baker, Engineering Department  
City of Cincinnati

**Structural Prefabrication:** Ingalls Iron Works, Birmingham, Alabama



# 30 voice power



## in a 30-man meeting...

Today, whether the meeting is a businessmen's seminar, a teachers' workshop, or a debate on the floor of a State House, *everybody* wants to be heard. They *will* be heard, if each participant has his own microphone. That's the Shure concept of Total Communications: Every man with something to say has a microphone close at hand . . . so he *can* be heard.

To meet these changing concepts of modern meeting

dynamics, Shure offers a broad range of specialized microphones, along with a selection of unique microphone mixers and associated circuitry products that let you connect those microphones through a single amplifier and loudspeaker set-up.

For you, they're easy to install. For your customers, they're easy to use. And for the people with things to say, they're a must!

**SHURE**

### TOTAL COMMUNICATIONS

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# Attention, all other elevator control systems:

## The Houghton 1090 computerized system can outperform you.



With all the sound and fury about elevator control systems these days, it's time for facts.

Like this one: a given number of elevators under new Houghton 1090 computerized control can move more people with speed and comfort than any other contemporary system you can specify.

Performance records for 1090 installations in buildings coast-to-coast prove it.

There isn't room here to tell you all the reasons why 1090 is the number one system in elevating today. But we think everyone with a voice in elevator decisions for new buildings or modernization

should have the full 1090 story.

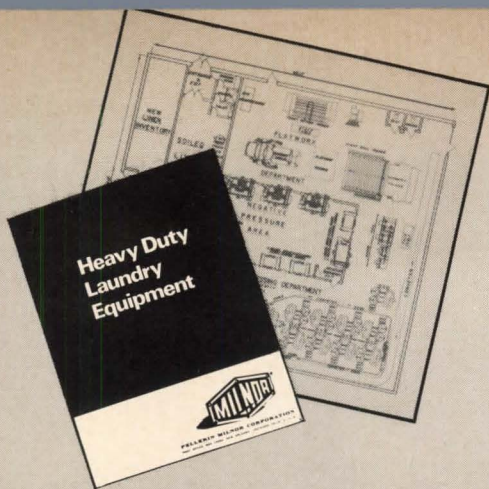
It's a convincing one. Otherwise, our 1090 system wouldn't be gaining so fast on the competition.

Your Houghton representative is just itching to give you all the facts. Get in touch with him at your convenience. Or, write to us.

**HAUGHTON**  
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## Planning an Institutional laundry? Send for this FREE kit today!

A helpful guide for planning space-saving laundry arrangements in hospitals, nursing homes, schools, hotels, motels. Includes planning check-sheets from which we will make free analyses of your requirements for specific projects. For your FREE kit, write to PELLERIN MILNOR CORPORATION, P. O. Box 398, Kenner, La. 70062 (a suburb of New Orleans).

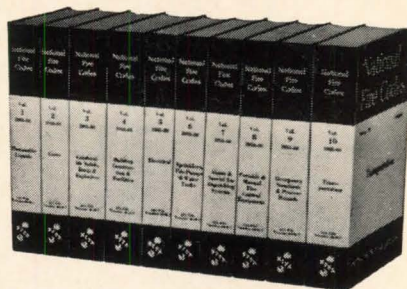
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## NATIONAL FIRE CODES



7,762 pages (10 volumes) of the latest technical data on fire prevention and protection. All 202 NFPA Codes, Standards and Recommended Practices. Published by NFPA — worldwide, the leading authority on fire protection. Indispensable guide for architects, engineers, safety directors, property owners, fire officials, equipment suppliers. \$40 per set, f.o.b. Boston. Ask us to bill you — or enclose check with order to Dept. D4.

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60 Batterymarch St., Boston, Mass. 02110  
Telephone (617) 482-8755

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## NOISE TRANSMISSION CONTROL *Kinetics*® Isolation Systems Offer Positive Solutions to Universal Problems



*Kinetics*® has pioneered in the development of floating floors, resiliently suspended ceilings and resiliently supported partitions for the reduction of sound transmission between noisy and quiet areas in buildings. Specific information is available in Bulletin 13 offered at right. Kinetics will work with you in preliminary design to achieve the optimum systems required to maintain a noise and vibration-free environment. We design, manufacture and supervise installation to assure conformance to your requirements. Call us for more information.



### NOISE CONTROL

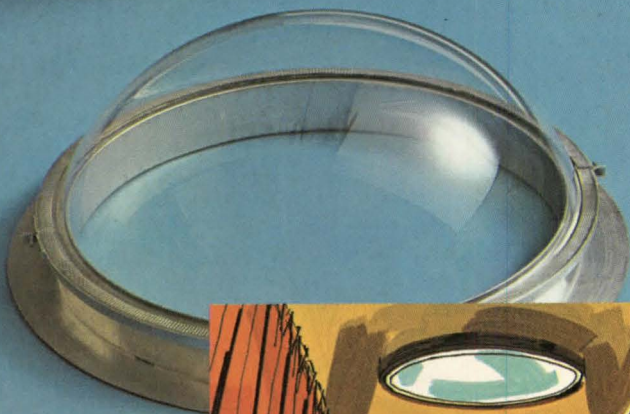
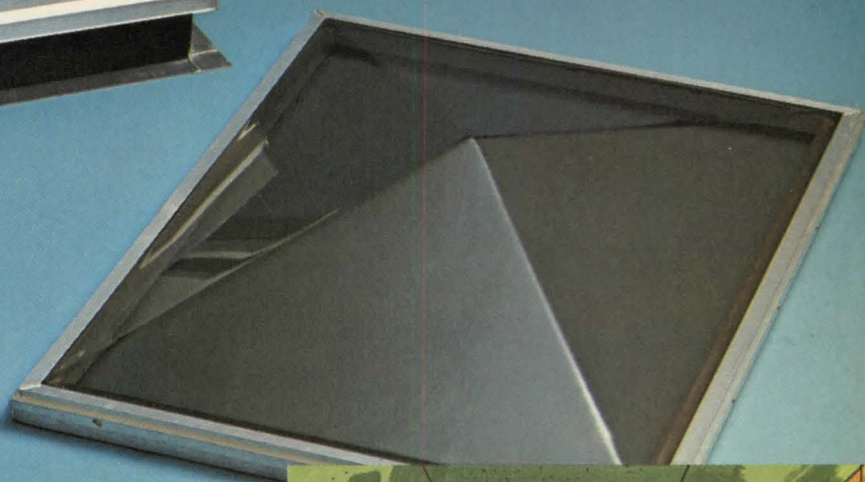
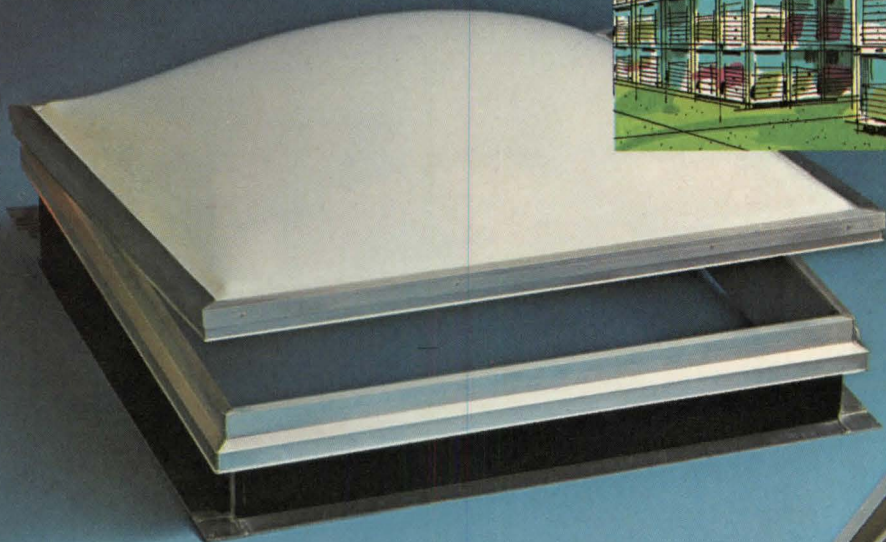
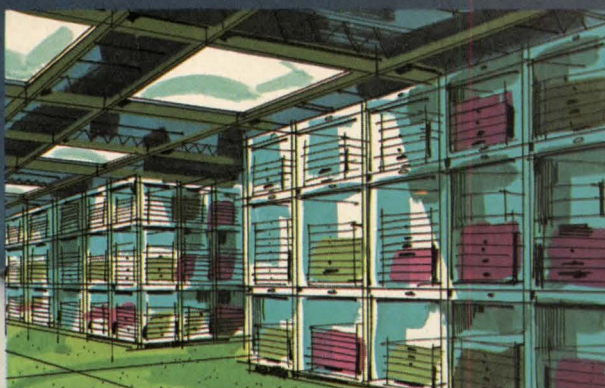
Architectural specifications and details are given for the isolation of high noise sources such as mechanical equipment, musical instruments, aircraft fly-over, pedestrian foot-fall, data processing equipment, etc.

ASK FOR BULLETIN 13.

C90

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You have a virtually unlimited choice of ready-made, well-designed and highly functional skylights to work with when you specify the one and only time-proved plastic skylight glazing material—Plexiglas acrylic plastic.

Skylight shapes in Plexiglas include domes and pyramids in circles, rectangles and squares. Both single and double domes can be specified in

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Plexiglas is the only plastic skylight material that has more than a quarter of a century of successful outdoor use to prove its weather and breakage resistance. Its daylight transmitting properties are unsurpassed by other skylight glazing materials.

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So you'll never again have to rely on scattered sources to get everything you need in wash-room equipment.

Instead, you can now specify on a convenient, time-saving systems basis.

Everything from washfixtures.

And showers.

To contemporary design-coordinated wash-room accessories.

Bradley's bright ideas for plumbing fixtures and accessories are just about all you'll ever need or want. From a single source.

And they're built the only way we know how to build things. To last.

For example, the Cole valve mechanisms on our Bradpack wash centers are designed never to leak. Or wear out. Ever.

Bradley. The washroom systems specialists with the most complete line of washroom fixtures and accessories.

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Butler County  
Community Junior College  
El Dorado, Kansas

Architects: Schaefer-Schirmer  
& Eflin

Roof: Designer Early American  
by Ludowici-Celadon Co.

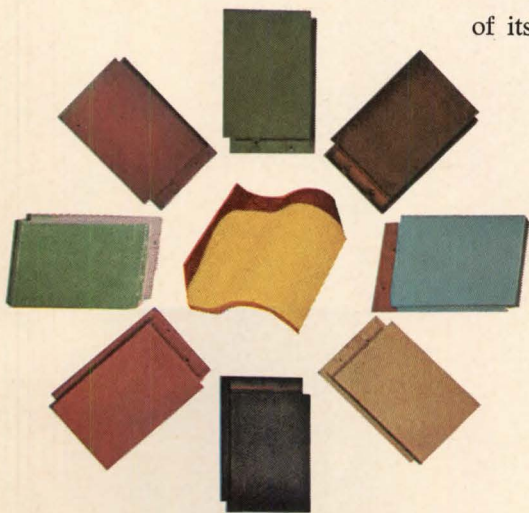
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The roofs of these graceful college buildings are the focal point of attention—provide distinctive styling that set the pattern for the overall structural design.

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Varied patterns, colors and surfaces offer an unlimited choice of roof styling in hard-burned clay—all architecturally sound and with award-winning quality of design.



WIDE SELECTION OF OTHER PATTERNS,  
TEXTURES & COLORS

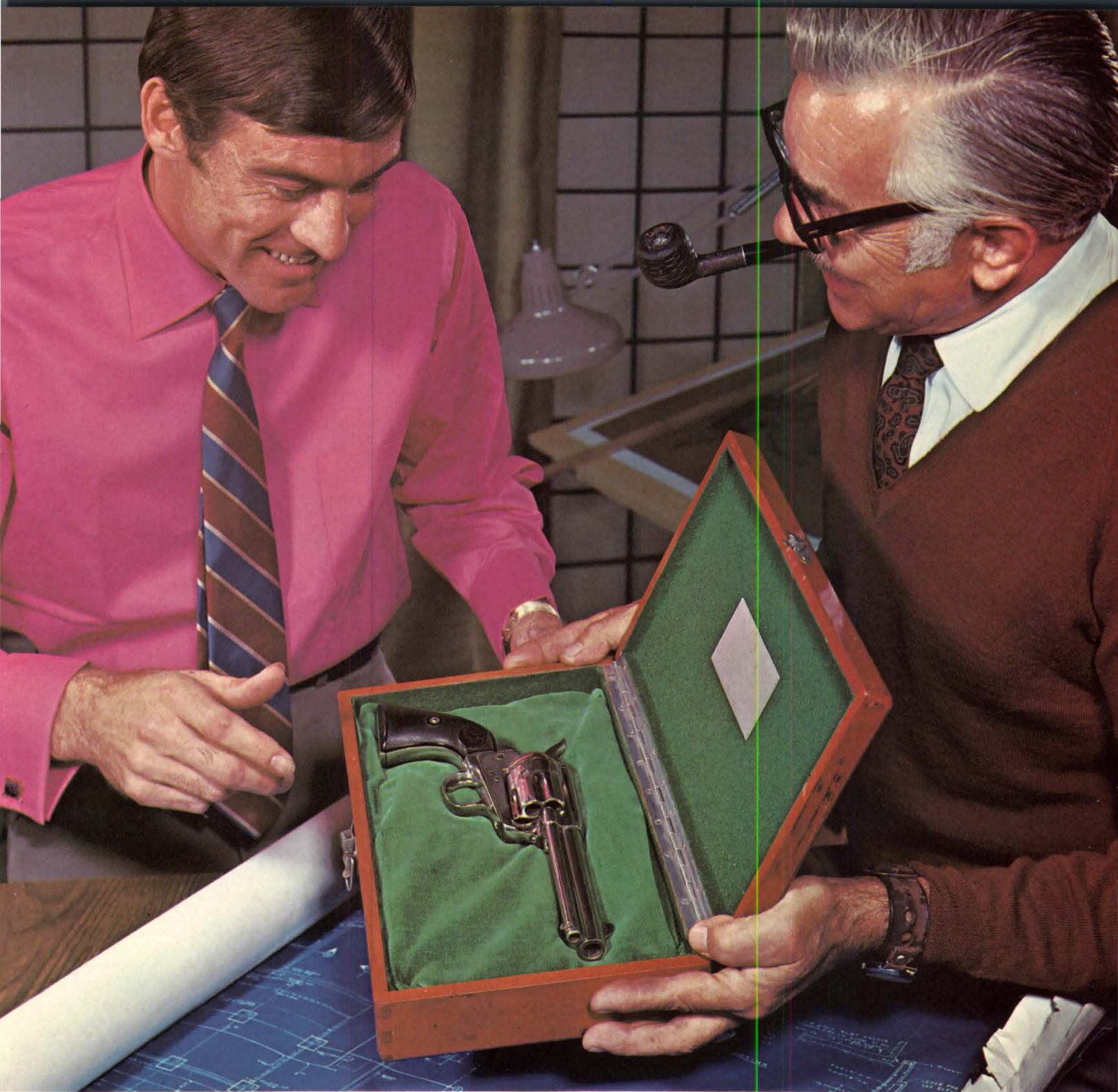
For additional information write or phone:

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

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

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UNMISTAKABLE VALUE. One of the original Colt Peacemaker revolvers . . . the gun that won the West. There's a history of value behind every new Jamison door, too . . . in quality construction, performance, and Jamison service.

## Architects who value Value specify Jamison every time

Did you know that Jamison technical assistance and engineering help are *immediately* available in every section of the U.S.? To save your valuable time in solving any problems you may have relative to the efficient use of cold storage doors, Jamison has established a nationwide network of service centers. Extensive reference material and detailed information covering door

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COLD STORAGE DOORS BY  
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... a beautiful drinking fountain shouldn't be too obvious. Agreed? Carefully-sculpted to enhance your ideas ... clad in the native splendor of cast stone (five colors, two finishes). The Haws Model 30 outdoor drinking fountain stands exquisitely in harmony with its setting ... any setting. A fountain? It could almost pass for a work of sculpture. Yet this sly harmonizer is incomparably rugged—a fountain for all seasons, kid-proof, weather-proof, freeze-proof! Write **Haws Drinking Faucet Co., 1441 Fourth St., Berkeley, Calif. 94710.**

*The drinking fountain that looks better than a drinking fountain—Haws Model 30 in vivid stone.*



**DRINKING FOUNTAINS**

For more data, circle 62 on inquiry card

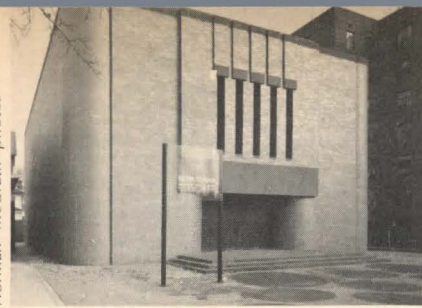
The inventive, skillful and unified results that typified an overwhelming majority of the entries in this year's Record Interiors awards program not only made the editorial selection of the twelve designs presented here an unusually lengthy and highly deliberated one, but strengthened our great conviction that there is, indeed, a very special architectural approach to the design of interiors that deserves recognition. It is an approach that creatively melds functional, economic and esthetic requirements into a unified spatial environment. Among the ones cited here—which range from a manufacturing plant to a synagogue—this approach holds true whether the interiors are part of a structure

## Record Interiors

the architect has designed himself, or a refurbishing of an existing one. In making the selections an effort was made to reflect at least a small range of the many types of interiors that more and more architects are designing. More examples selected from among the submissions will be presented on a regular and continuing basis in later issues. Another search for significant work of the year will be made next fall, with a deadline for submissions on October 1st and publication a year from now.

Each of the owners and architects of the twelve interiors shown on the following pages will receive certificates citing them for the excellence of the design solution based on the particular program for the project. The range is from very low budget to quite generous, from warm and textured to sleek, and from a relatively conservative contemporary to a near-mod. Each, it was felt, was very appropriate for its stated objectives and carried out with creativity and professionalism.

—Herbert L. Smith, Jr.

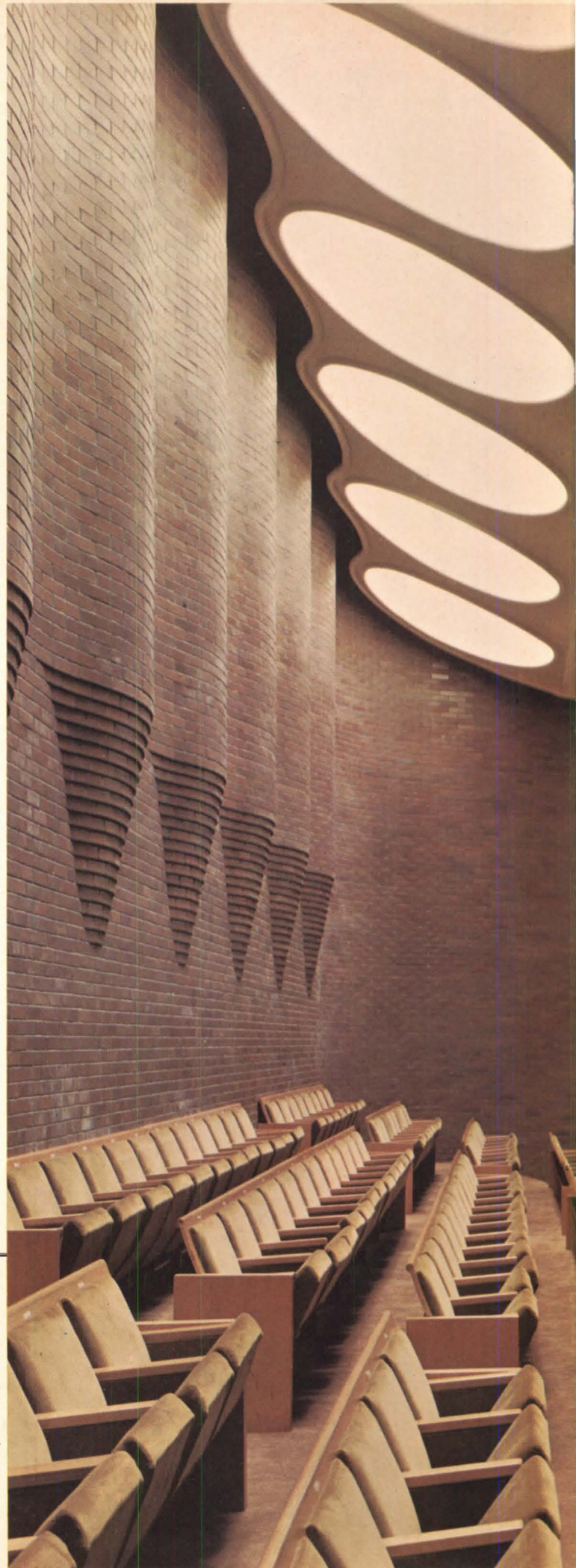
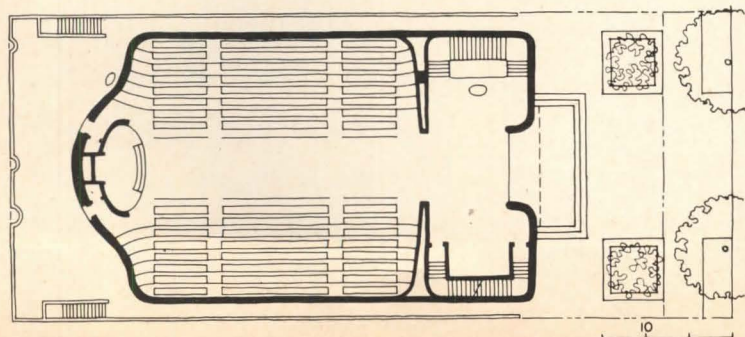
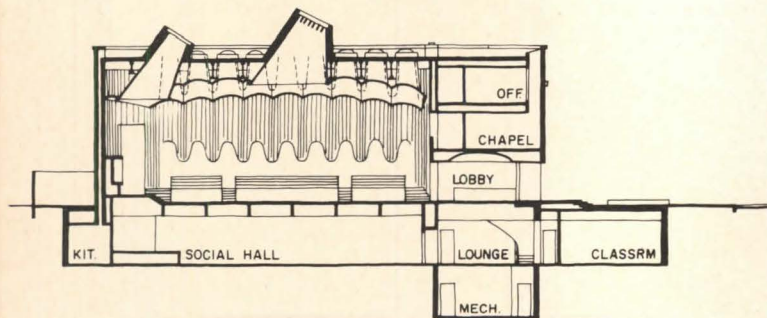
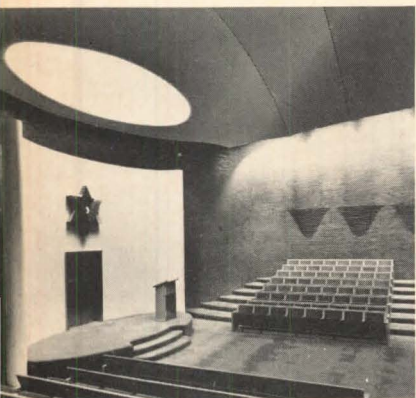


## Congregation Beth Torah, Brooklyn, New York Architect: Richard Foster

The sanctuary of this new synagogue for an Orthodox community evokes a warm and sensitive religious ambience by simple, yet powerful, architectural means. It is on a limited site closely flanked by a tall apartment house and two-family residences, which precluded any effective use of side windows. Top lighting which plays on the undulations and curves of the interior walls provides not only an apt solution to the problem, but has been developed into the major design feature of the space. The skylights, fitted with artificial lights as well, are concealed by a sculptured plaster ceiling molded to give form and scale to the room, and by deep, slanted wells acting as a cut-off for the lights. In addition to those ranging the side walls, two larger ones in the middle focus light and attention on the centrally placed Bema and on the concave shaped Ark

wall where such significant symbols as the Ark, Eternal Light, and Star of David read as isolated elements on the white plaster surface. Richard Foster chose an interesting ironspot brick for the interior and the exterior because of its self-cleaning quality, the depth of coloration, and the ease of obtaining the various required shapes. Stone, where used, is red sandstone and

the ornamental metal work is black anodized aluminum. The contractor was Herbert Construction Co.; engineers were Zoldos and Meagher (structural) and Meyer, Strong & Jones (mechanical); consultants were Emil Antonucce (sculpture and graphics); Ranger Farrell & Associates (acoustics) and Richard Kelly and John L. Kilpatrick (lighting).





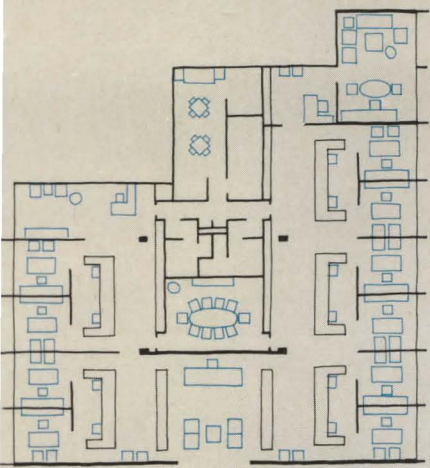


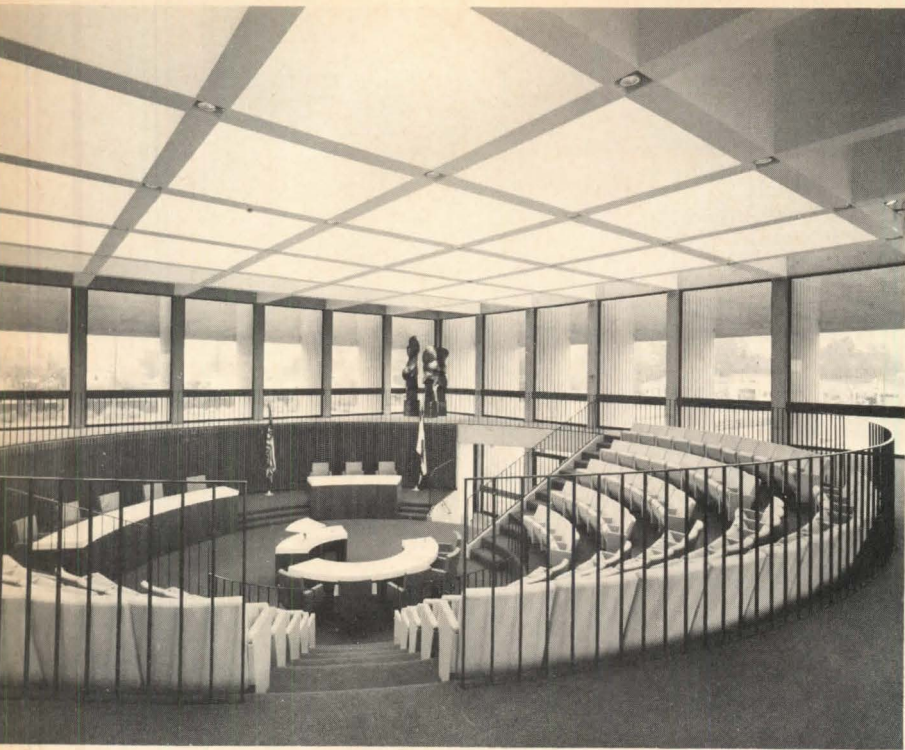
MFB Insurance Offices,  
Atlanta, Georgia  
Architects: Wolf Associates



The trim, clean-cut sophistication that pervades these regional offices for an insurance company results from meticulous organization and a discerning selection of contemporary classics in furniture. The general monochromatic color scheme of white/off-white/brown/black is sparked by fabric wall panels in the major spaces: red in the reception area (top left); gray flannel in the conference room (left); and beige raw silk as a background for red upholstered furniture in the executive office (top right). The perimeter offices all have interior partitions of full height, six-foot-wide teak veneered doors, which completely pocket into twelve-foot sections of matching teak walls. A highly efficient incandescent light unit, especially developed for the project, allows the use of a six-foot grid spacing.

A special part of the project is an internal "core" scheme containing conference room, toilets, supply room, storage, telephone equipment and a lunchroom. The passageway connecting the two sides of the "core" gives access to the interior function and provides a link between MFB's offices and those of a sister company which adjoin this project. Especially noteworthy in the design are the very trim, well organized secretarial spaces and files. Color and fabric consultant was R. G. Kromelow.



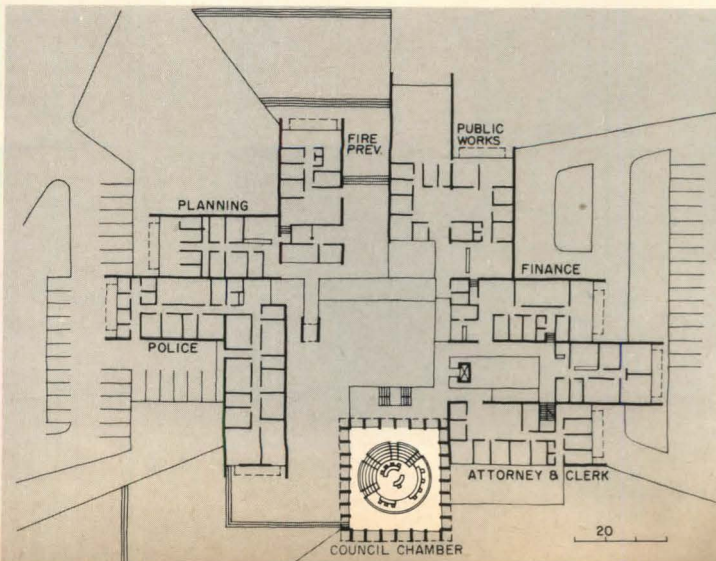
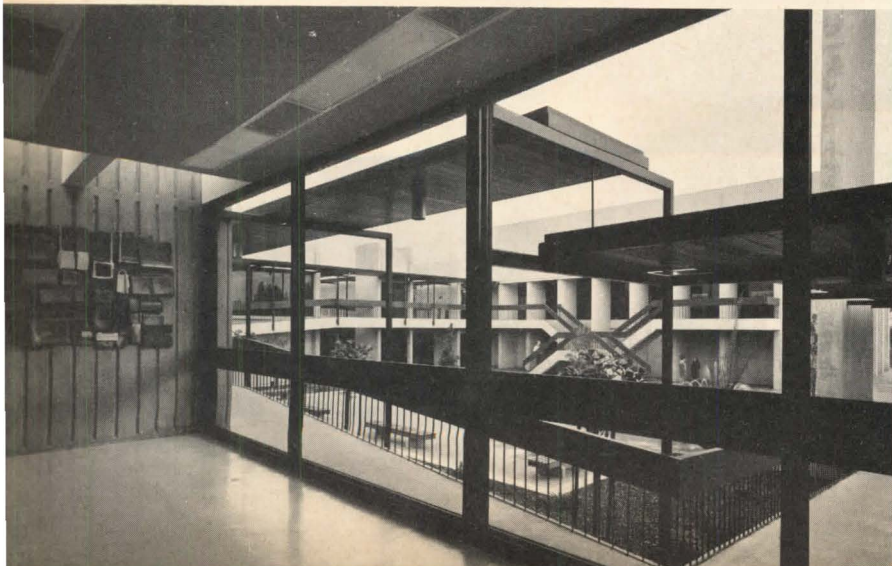


**City Hall for Santa Rosa, California**  
**Architects: Jacques DeBrer,**  
**Richard Heglund**

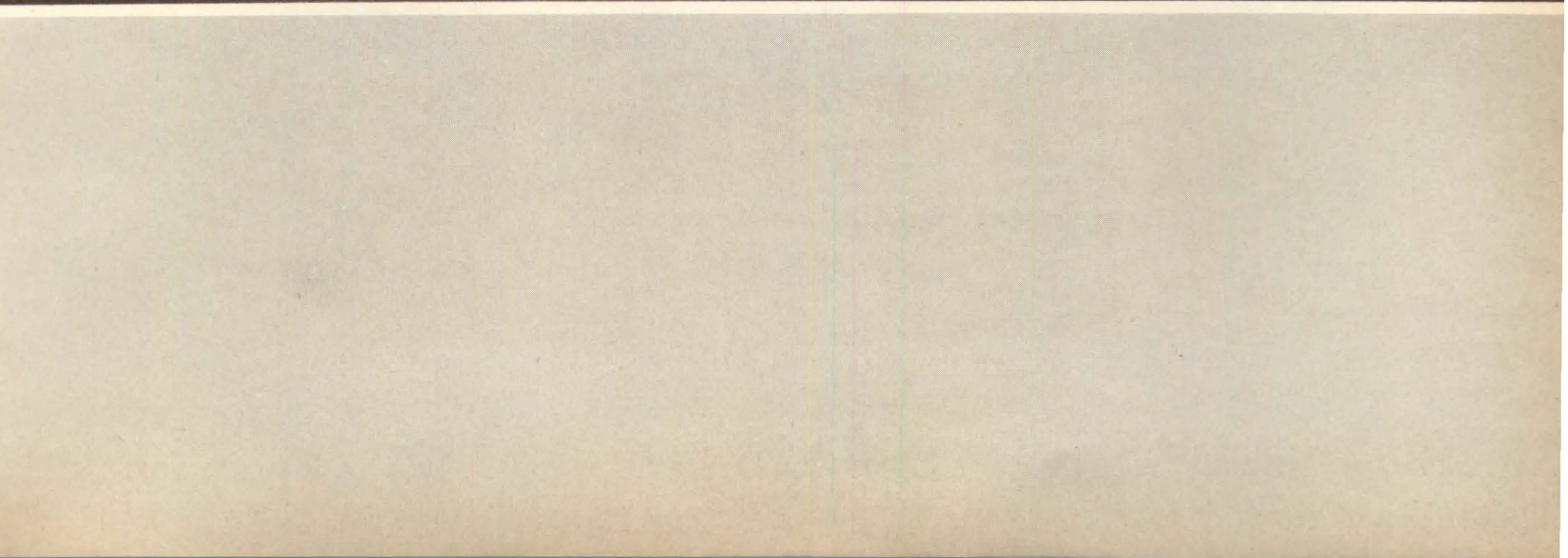
The offices and council chamber of this city hall for a town of 42,000 people show an unusual degree of sophistication and awareness of the arts for a community of its size. And, as the structure and furnishings were planned together by the architects, the total environment of the building has an unusual sense of unity and appropriateness. The architects' design won first prize and the commission for construction over a field of seventy-five architects from Northern California in the Santa Rosa City Hall competition. First phase requirements were 48,000 square feet, with planned expansion for the future of 24,000 square feet. The sandblasted concrete structure of the building forms the major design focus for the interiors, with warm colors, simple contemporary furniture and some well chosen sculpture and paintings used to accent, rather than dominate, the pleasant and varied architectural spaces.



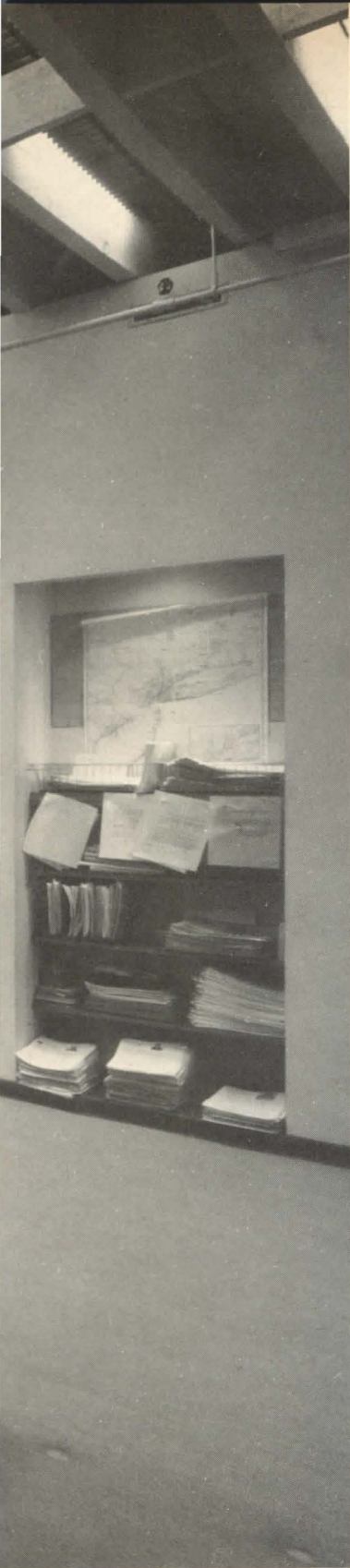
Barbeau Engh photos





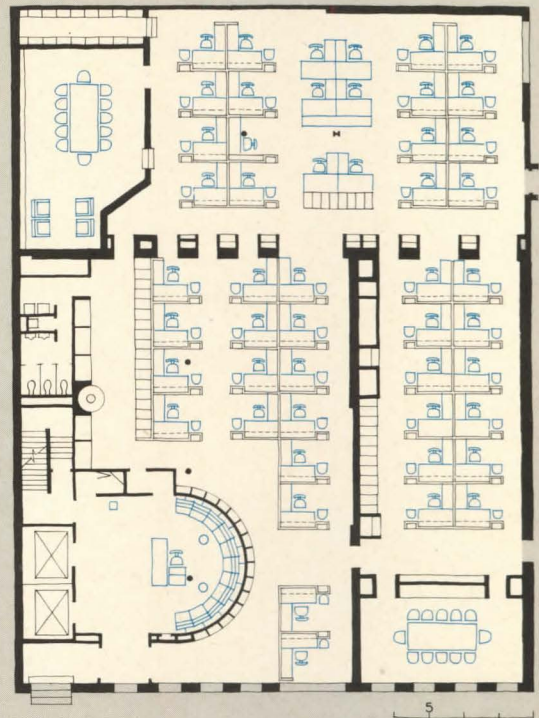






Offices for  
The American Field Service  
New York City  
Architects:  
Harold Roth-Edward Saad

This trim rehabilitation of a sound old loft building to expand the adjoining offices of a non-profit foreign student exchange organization represents a sensitive, economical example of urban renewal. The architectural endeavor was to restore the straightforward factory aspect of the 1880's building by exposing the timber joists and brick bearing walls, and by making all necessary alterations to the exterior conform in scale and detail to the original. On the interiors, all exposed surfaces are painted off-white with bright splashes of color in built-in niches used for bookshelves and file cabinets. All these are bathed with incandescent light. Floors are carpet, except for quarry tile in the entrance lobby and in wash rooms. Special carrels were designed for use as individual work stations to provide some acoustical and visual privacy without resorting to completely enclosed offices. The result is a very fresh, congenial ambience created at low cost. Engineers were Associated Engineering (structural) and John L. Altieri (mechanical and electrical); the contractor was Raberg, Nusser & Raberg; the lighting consultant was Sylvan R. Shemitz.



Robert Perron photos



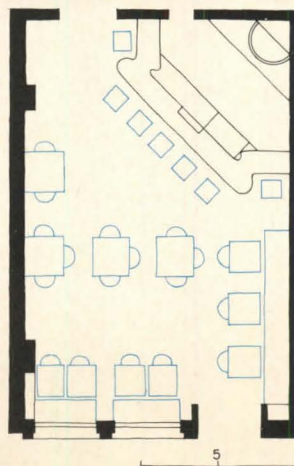


Clydes Bar, Washington, D.C.  
Architect: Hugh Newell Jacobsen

Space-expanding techniques with mirrors and beautiful craftsmanship give a sense of unusual ease and quality to this addition to Clydes Bar in Georgetown. All woods are a lustrous, clear white oak: oak strips for the hung ceiling covering the air-conditioning ducts; lacquered oak flooring for the walls; an oak laminate for banquettes, tables and bar. To contrast with all this wood, all floors are surfaced with a white, unglazed ceramic tile. The chairs are also oak and covered with black plastic. The comfortable bar stools were fabricated from brass-plated tractor seats; this metal is echoed in a mirror-finished brass gutter to the bar, and in all hardware. Great spaciousness and sparkle are added to this monochromatic scheme by extremely effective lighting and a knowing use of mirrors. To visually extend the height of the walls, mirror was laminated to the existing ceiling around the perimeter of the room; the bar and banquettes are visually extended by floor-to-ceiling mirror strips. With the careful, handsome detailing and execution of everything in the bar, Jacobsen has clearly met his design objectives: "Clydes Bar opened in 1966 with dark-stained, beaded-siding walls of pine, bentwood chairs, Tiffany lamps and low camp. It was a howling success. I was retained to add more room in the building next door. Under the premise that any camp is too much, my objective was to use traditional materials in a new way, but to keep the pub saloon-like atmosphere that had proved so successful." The contractor for the project was Edwin Davis.



Robert C. Lautman photos

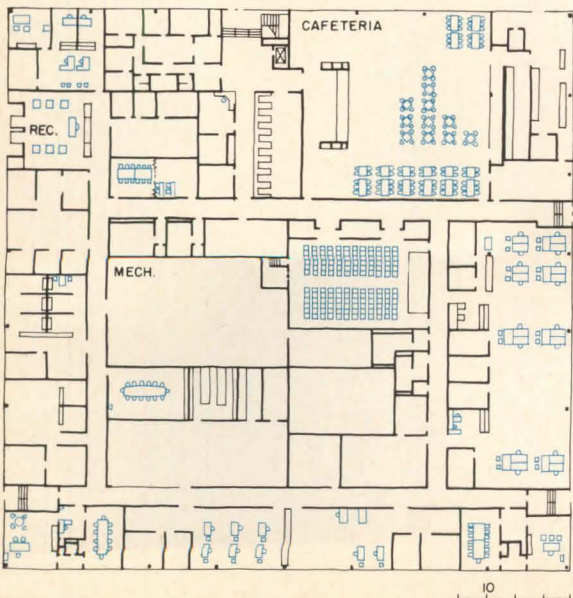




Joseph W. Molitor photos

## Westinghouse Electric Corporation Nuclear Turbine Plant Charlotte, North Carolina Interior design: ISD Incorporated

Perkins & Will's interior design division, with John King, officer in charge, and Anne Lewis, project designer, have created an unusually urbane and vibrant environment for the personnel of this manufacturing plant. The interiors are simple and clear cut to serve as an appropriate setting for a fine collection of art selected by Charles King, manager, architecture and interior design department, Westinghouse Corporate Design Center. Brilliant wall colors relate well to the primary colors of the collection, which includes pop, op, impressionist and hard-edged expressionist. Supergraphics representing a part of the Westinghouse logo are used on the long walls of the auditorium. For similar effect in the cafeteria (far right), wall hangings of Marimekko fabric panels are hung like contemporary banners; porcelain enamel graphic panels by Barbara Stauffacher serve the same purpose in the reception room (top right). The furnishings combine a well selected group of fairly well known contemporary pieces, which quietly and elegantly complement the more exuberant art and graphics. The basic background color throughout is off-white.

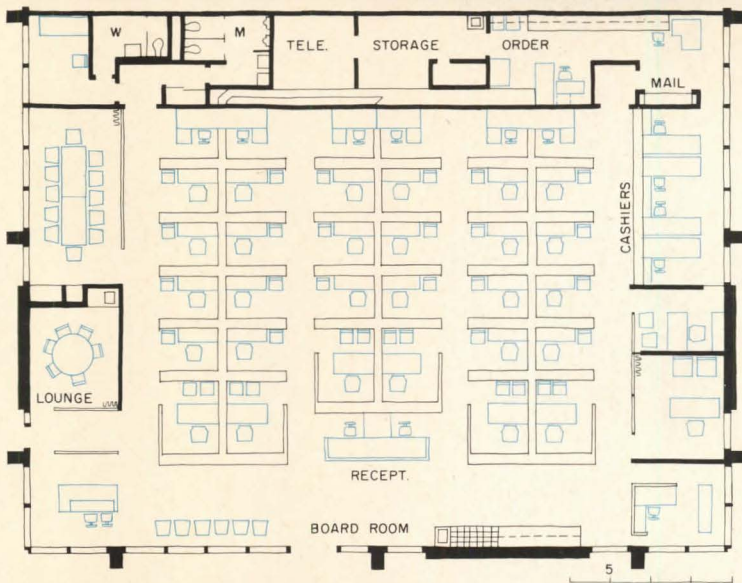






Branch offices for  
**Shearson Hammill & Company**  
 Newport Beach, California  
 Architects:  
**Cambridge Seven Associates, Inc.**

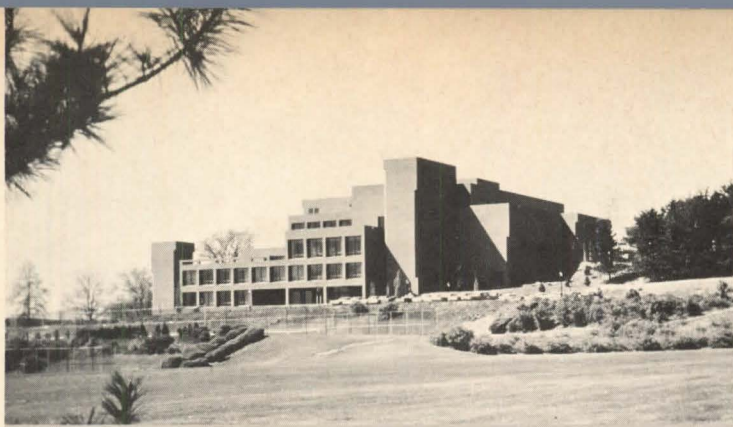
A spirited, high quality environment, combined with specifically planned facilities for the efficient handling of peak volume markets, highlights this branch investment office. One of a large number designed by the architects for the same firm, this facility skillfully merges a reassuring order with a fresh, contemporary milieu of primary-colored walls and panels, and compatible furnishings and paintings. The executive work stations are carefully designed to incorporate the necessary communications, electronic and other equipment, and to adapt to the individual characteristics of operational needs. Program was sparked by David Teiger, first vice president for Corporate Planning. The principal in charge for Cambridge Seven Associates, Inc., was Paul E. Dietrich; associate principal was Erling Falk, who also formed the design team with Franklin Allen for this branch.



Julius Shulman photos

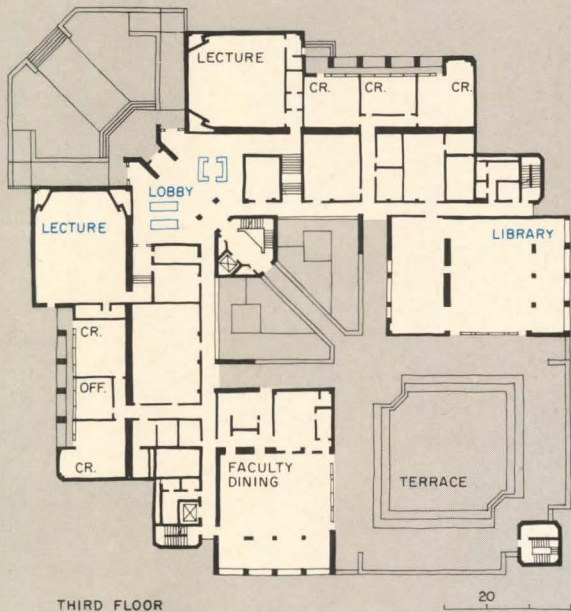




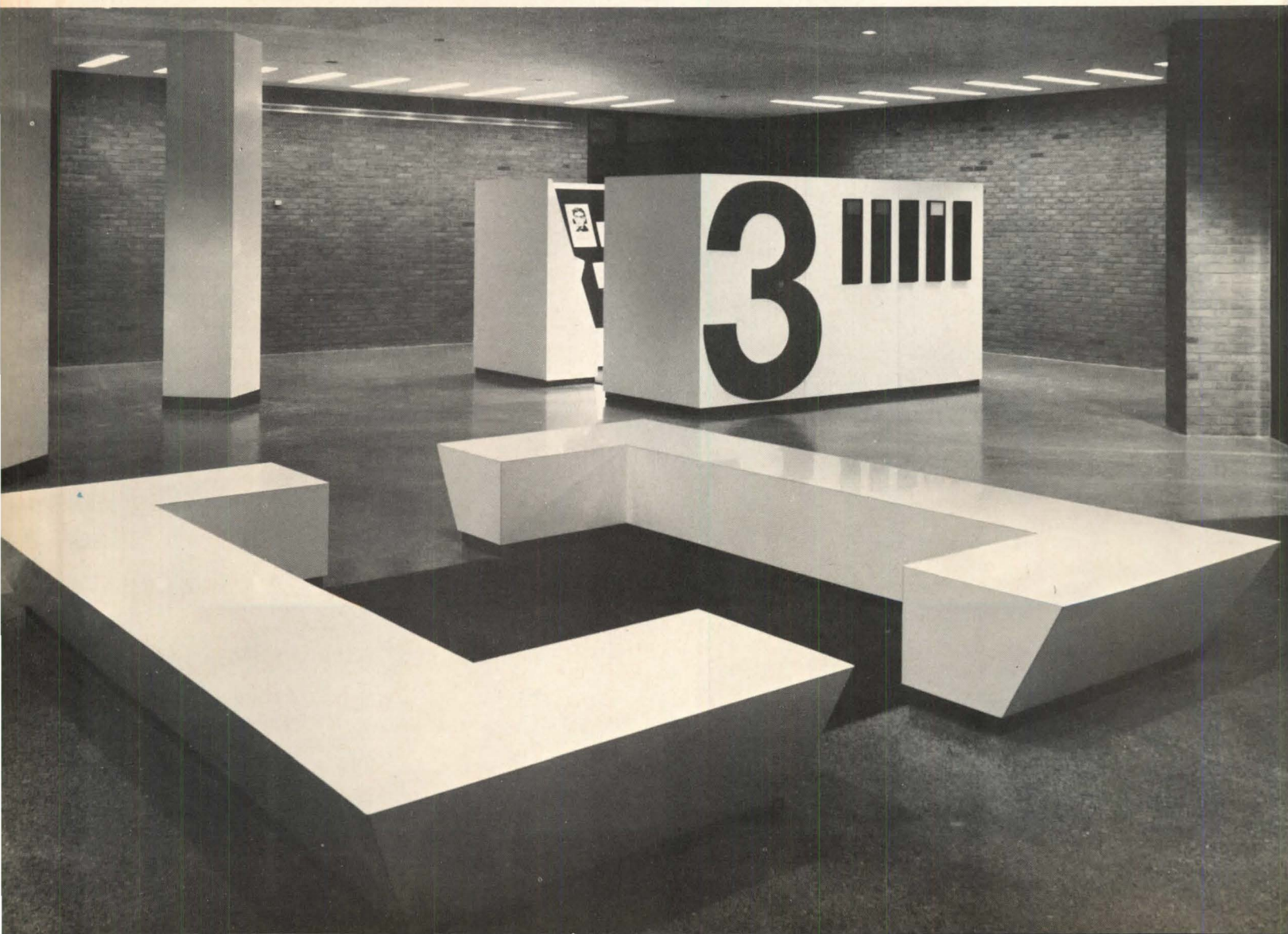


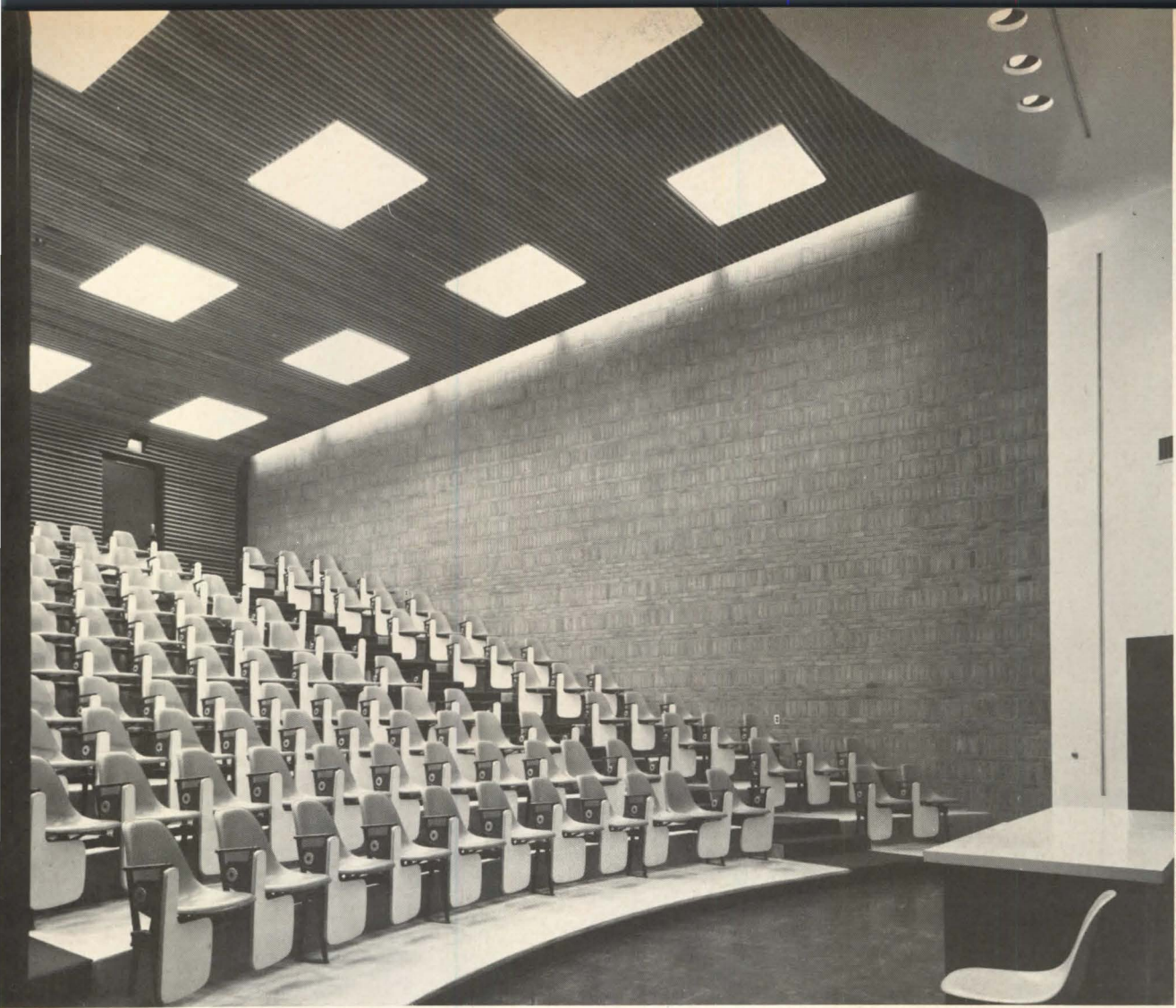
Amherst College Science Center  
Amherst, Massachusetts  
Architects: Campbell, Aldrich and Nulty

The strong, warm and colorful interiors of this new science center were explicitly designed by the architects to reflect their design for the structure. The exterior materials of brick and masonry are also used inside to emphasize the continuity. Colorful graphics and carpeting are used in public spaces inside to accent the building's boldness and provide a humanizing quality to contrast with the functional, utilitarian laboratories. Offices and the middle floor (shown here), with the library, dining hall and lecture halls, are the most completely furnished for ease and comfort. The library (below right) has oak study carrels and oak chairs upholstered in brown tweed. Easy chairs have red/orange vinyl sling seats and backs. The carpet is a copper color in an acrylic grospoint weave. In the lecture hall (right) the chairs are floor mounted, molded fiberglass shell and upholstered in plastic. The architects' interior design team includes Jan K. Sterling, Robert Lucas, Deborah Chase, and Linda Grossman for graphics. Engineers were Le Messurier Associates (structural) and Francis Associates (mechanical). The contractor was Daniel O'Connell's Sons, Inc.



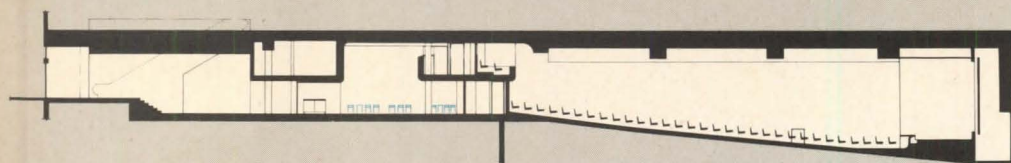
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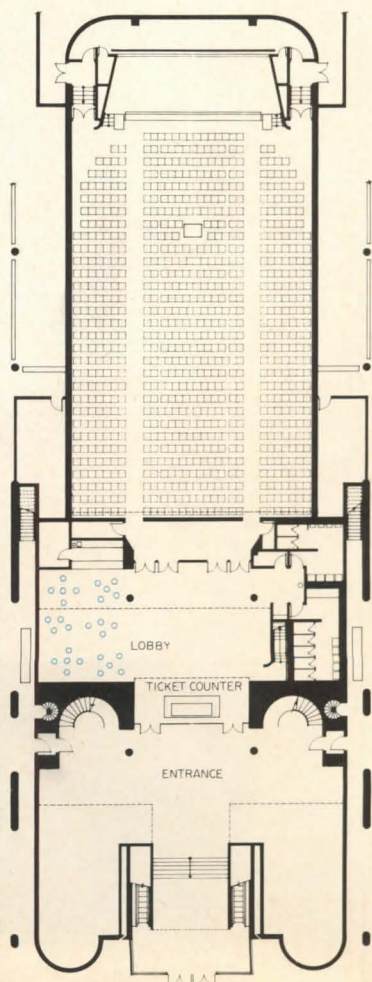
© Ezra Stoller (ESTO) photos

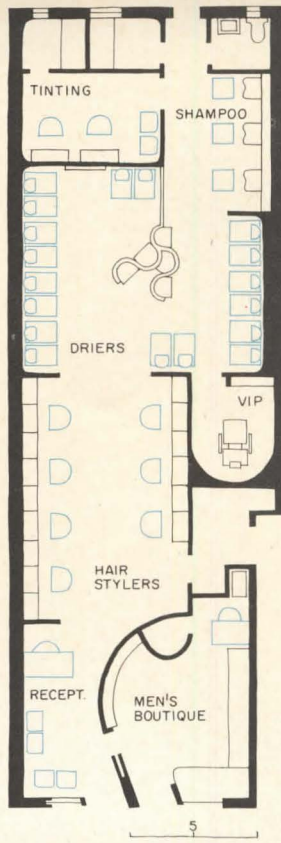




**L'Enfant Theatre**  
**Washington, D.C.**  
**Architect: Jan Hird Pokorny**

The restrained, warm elegance of its design is extremely appropriate for this highly sophisticated theater which is used as a multi-media communications center by day and as a cinema in the evening. Among its remarkable array of electronic equipment is a color TV system which will receive, project and simultaneously transmit both picture and sound through a Comsat satellite link-up. The lobby, canopied by sparkling, clear incandescent globes, serves as a reception area and extra viewing space for slides and films. A quiet color scheme of black, beige and walnut, with four shades of purple in upholstery, is repeated in the very simple but effective auditorium. Stuart Pertz was associate in charge for the Pokorny office; Ben Schlanger was consultant; Flack & Kurtz were mechanical engineers; and Tuckman Barbee was contractor.





Norman McGrath photos

**"metamorphosis", Great Neck, New York**

**Architect: Alan Buchsbaum**

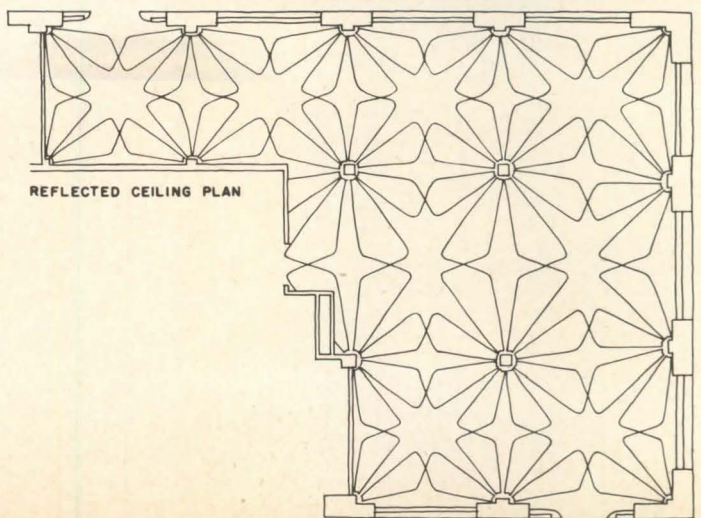
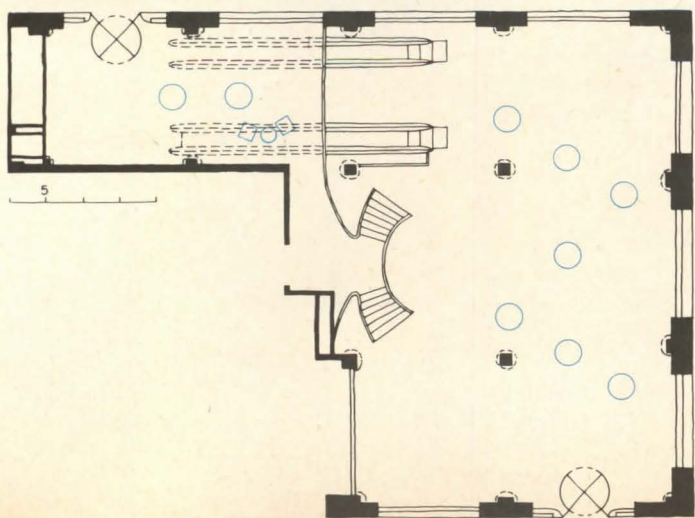
Verve and a good dash of supergraphic color give strong identity to this otherwise trim and functionally designed beauty parlor and men's boutique. The idea of combining the two types of shops is to get the women to buy presents for their husbands after having their hair done. The basic finishes and fittings are white: painted walls, vinyl floors, vinyl chair covering and plastic laminate cabinets. Color is concentrated at the entrance, accent floor inlays around chairs and in silhouette fin-walls. The shop is by Design Coalition/Alan Buchsbaum, architect; Alan Mitelman, graphic designer. The contractor was John Blom.

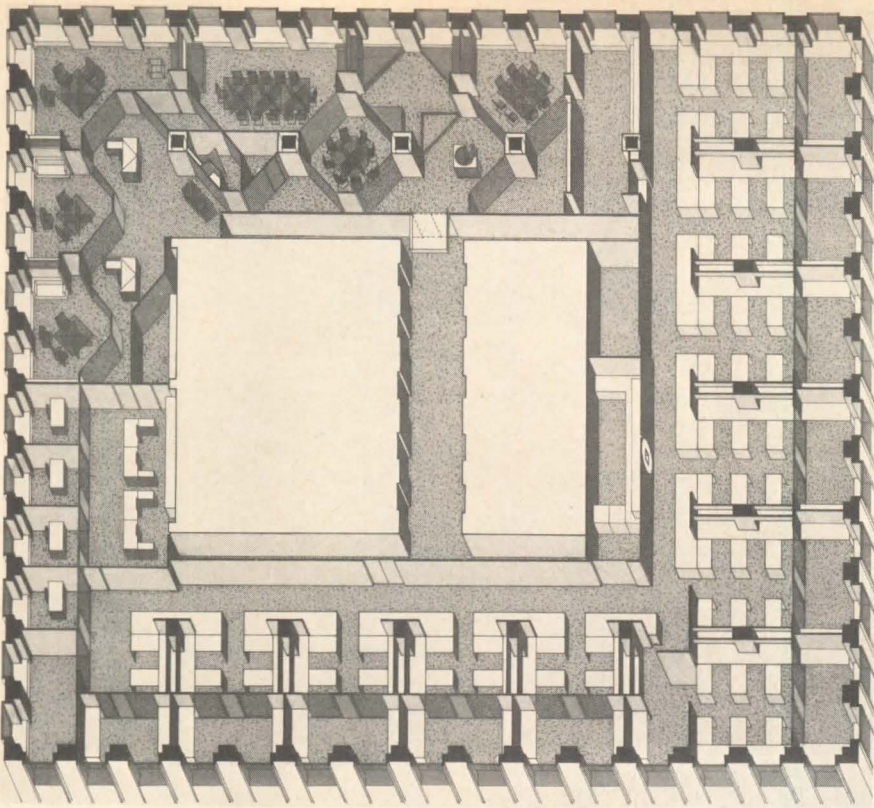


Singer Company  
Showroom  
New York City  
Architect:  
Victor A. Lundy

In a space previously occupied by a French restaurant in La Maison Francaise at Rockefeller Center, Victor Lundy has created an extremely effective and intriguing two-level showroom for the Singer Company. Continuing his interest in creating very architectural interiors by the use of laminated wood forms, he has unified and dramatized the big space here with a series of wood "flowers" which create a series of bays and vistas, all reflected and extended by mirrored walls. Neutral beige tones dominate the scheme as a foil for the brilliant colors of the fabric displays. With the exception of the chairs, Lundy designed all the interior furnishings, such as tables, display tables of glass and wood, and counters. Grasscloth covers walls not mirrored, and the entire space is carpeted. Chairs and stools are upholstered in linen velour. The lighting throughout was carefully planned for the dual function of highlighting displays and emphasizing the dramatic shapes of the "flowers." An open well and escalators are used to interconnect the two levels. Rockefeller Center, Inc. acted as contractor; engineering consultants were Jaros, Baum & Bolles (mechanical) and Edwards & Hjorth (structural).



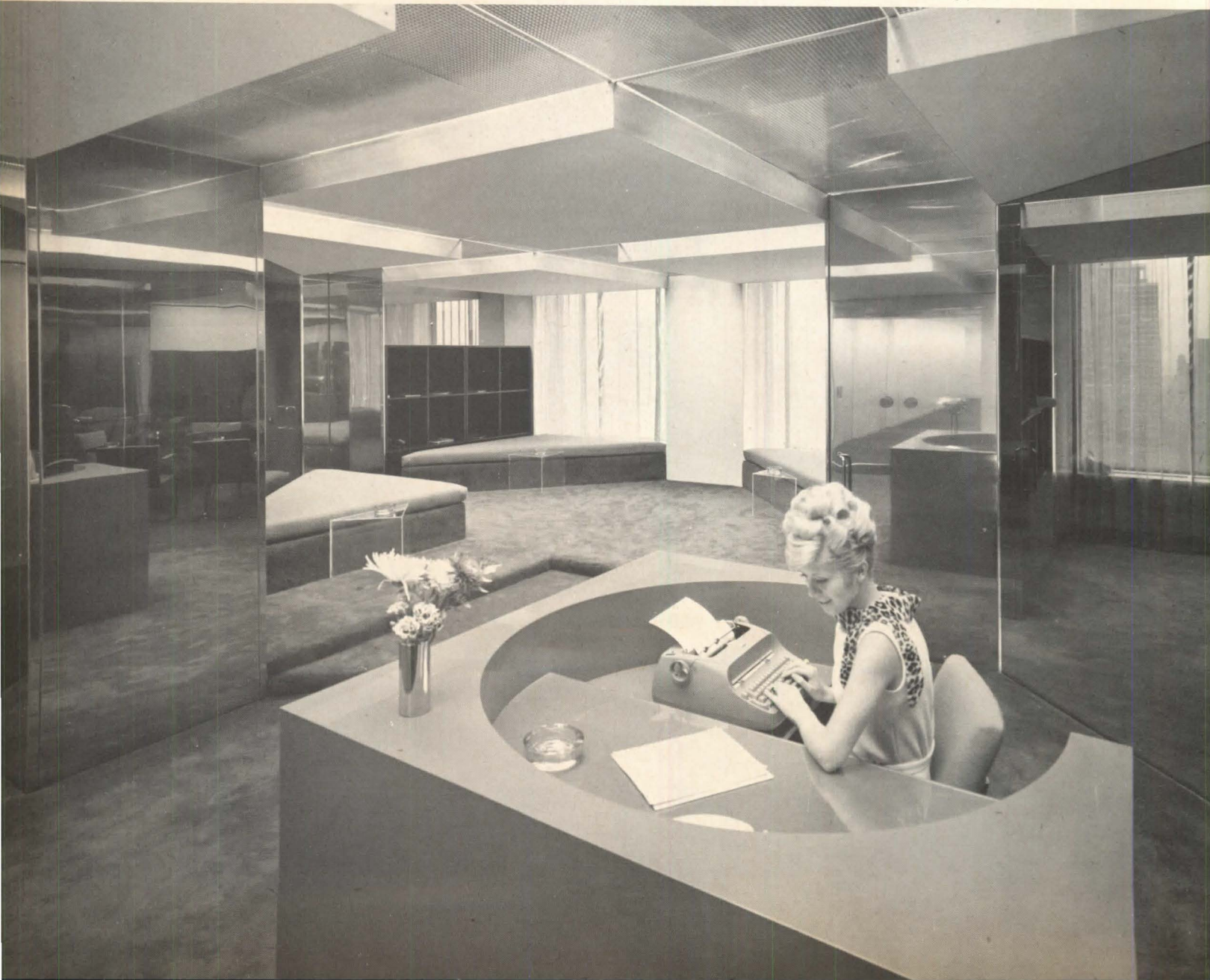




Offices for  
W. A. Di Giacomo Associates  
New York City  
Interiors by: K & J Designs, Inc.  
Project designer, Der Scutt, AIA,  
Architects: Kahn and Jacobs

These unconventional but brilliantly executed offices for an engineering firm strongly reflect the growing inventiveness and color experimentation of Der Scutt. The owners requested that the architectural design of the office represent a direct statement of the firm's image, and that all materials, forms and colors completely reflect the materials and "energy sciences" which relate to the engineering design performed by the firm. This led to a vigorous, brightly colored interior formed of metals, plastics and glass, which achieves space divisions by ceiling and floor modulations, suspended wall units, tinted gray glass partitions, highly polished stainless steel doors, and a quantity of custom-designed furniture and fittings. It has all been brought off with sufficient skill and flourish to form a very interesting and stimulating place to work.

John T. Hill photos







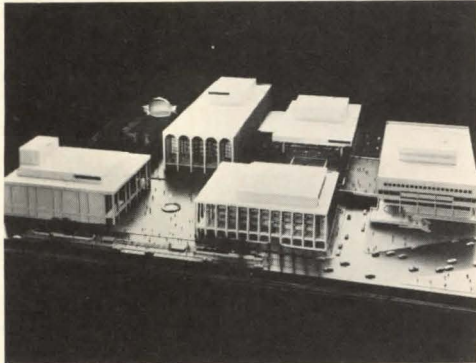


The Di Giacomo offices provide the same sense of comfort, color and sleek finish in the offices, secretarial areas and drafting rooms as in the reception and conference areas shown on the preceding page. Der Scutt's use of gray glass in full or partial partitions tempers the varying colors of adjoining spaces to a sufficient degree that one is only fully aware of the colors of the room one is in. Lighting and mechanical services are incorporated in the special ceiling.



# THE JUILLIARD SCHOOL

**A conservatory for the performing arts—and one of the most complicated buildings ever made—completes the construction of Lincoln Center.**



Model: Lincoln Center for the Performing Arts

Contained within the serene, well-ordered, simple and rather innocent facades of the new Juilliard School (the world's first conservatory for all the performing arts) is an almost infinite variety of spaces fitted together with a sorcerer's skill in an arrangement as intricate as a Chinese puzzle. In the process of developing the kind of spatial organization required to satisfy the complex Juilliard program in a tight urban site with severe height limitations, Pietro Belluschi and his associate architects Eduardo Catalano and Helge Westermann have managed to tuck and fit the assorted instructional and performance facilities of a good-sized campus into one integrated structure.

Solving the structural, mechanical, acoustical and theater engineering problems posed by the organization of elements in this building called for all the skill and ingenuity at the command of the architects and their consultants. Rooms which on a larger site would normally be widely separated for acoustical reasons are stacked above each other, overlap or nestle side by side. The column-free larger halls which in most performing arts complexes are composed as separate elements under their own long-span roofs, are here framed to carry eccentric loads from the complicated spaces on the floors above. Minimum clearances due to the height restrictions made the coordination of structural elements, mechanical ductwork and stage equipment a challenging problem.

In the 12-year struggle to get Juilliard

designed and built, the architects, with great patience and willingness to start over, produced about 70 different sets of preliminary drawings. The architects and engineers produced over 300 on-the-job sketches to coordinate structure and equipment during the construction process.

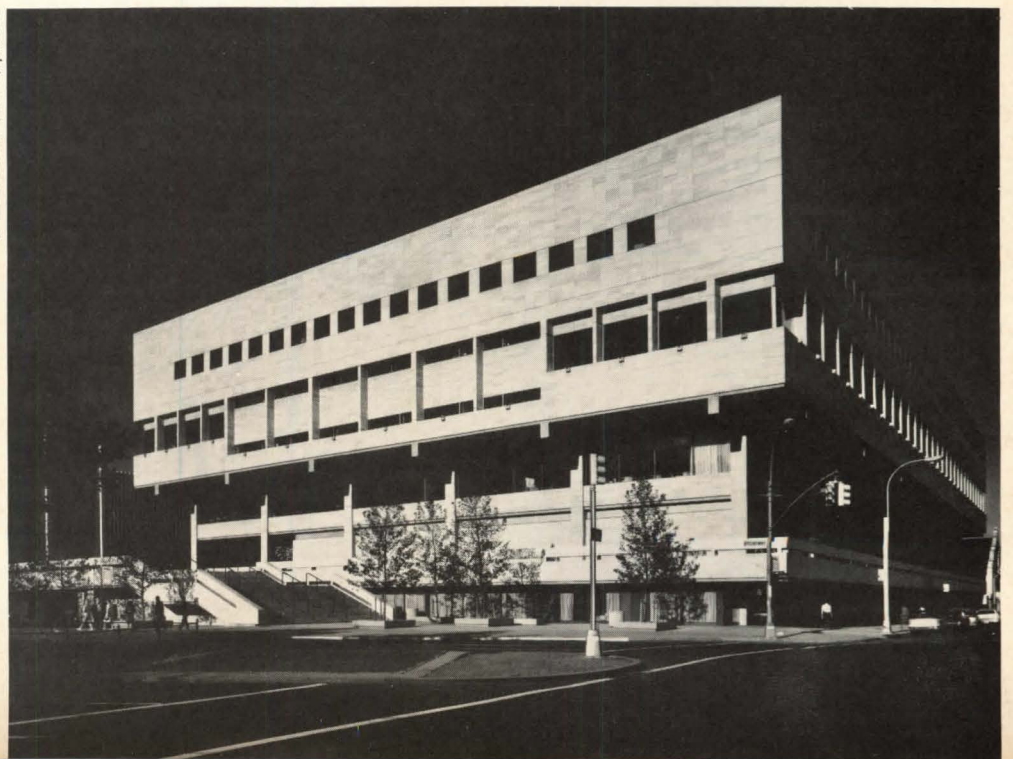
Because Juilliard remained in the design stage for so long and was begun last, its designers learned from the mistakes made in the other buildings at Lincoln Center. There was time, also, to sensitively adapt the school to its surroundings as it gradually became evident what its surroundings would be. Juilliard's travertine-sheathed exterior, a gift of the Italian government, is sympathetically related to the handsome facades of the Vivian Beaumont Theater by Saarinen with which it shares a small plaza to the north of the main square (see cover).

Juilliard's interiors are in some ways better than those of the other buildings. Its beautifully shaped wood panelled auditoriums, for example, prove that it is possible to create elegant halls in contemporary terms without resorting to skimpy evocations of the gilt, plaster and crystal decor of the great halls of the past.

The art with which the arts are housed affects them profoundly for the better. It is fortunate, therefore, that the incredible effort on the part of Belluschi and his team has produced such a fine building. Since Juilliard is a school for the musicians, actors and dancers of the future, it is appropriate that the best building at Lincoln Center should be theirs.

—Mildred F. Schmertz

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THE JUILLIARD SCHOOL, New York, N.Y. Owner: Lincoln Center for the Performing Arts, Inc.; constituent institution: The Juilliard School. Architect: Pietro Belluschi—Eduardo Catalano and Helge Westermann, associated architects; Frederick Taylor, Robert Brannen and Joseph V. Morog, project architects; Austris J. Vitols, Robert P. Burns and William E. Pederson, designers; Joseph Zelazny, resident architect and engineer. Structural engineer: Paul Weidinger; mechanical and electrical engineers: Jaros, Baum and Bolles; stage design consultant: Jean Rosenthal Associates, Inc.; acoustical consultant: Heinrich Keilholz; special structures engineer: Olaf Soöt; organ consultant: Walter Holtkamp; interior furnishings: Helge Westermann; contractor: Walsh Construction Company.

**A complex program for a tight site, to be solved within the severe height restrictions**

**of Lincoln Center.** Early in 1957 Juilliard voted to accept the invitation from Lincoln Center to move from Morningside Heights and relocate in a building to be constructed for the school by the Center. Great benefits were foreseen from having young artists in training at Lincoln Center.

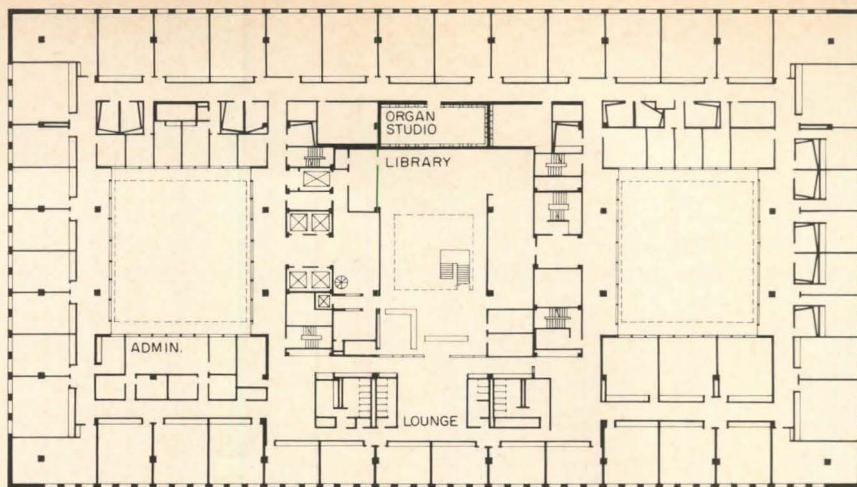
The school's requirements kept changing and expanding, however, as the plans developed. In the early design period the size of the site had not finally been decided upon. (The land upon which Juilliard is built was not part of the original Lincoln Square Urban Renewal Project and was acquired separately without the urban renewal write-down.) During the design process the Drama Division was added to the school and George Balanchine's School of American Ballet was invited to function within Juilliard as an independent unit. At one time a multi-use complex was conceived which would have included shops and restaurants. The architects, further, had to adapt to changes in the administrative leadership of both Juilliard and Lincoln Center.

Juilliard is connected to the main plazas of Lincoln Center by a broad bridge across 65th Street. The principal access from Broadway is by means of a monumental stair and terrace. Extending for a distance of 350 feet along 65th and 66th Streets and 200 feet on Broadway, the building includes four stories below the street level and six (not including the mechanical equipment penthouse) above. The building contains approximately 500-thousand square feet and 8-million cubic feet of space. The cost, with furnishings, is \$29.5 million.

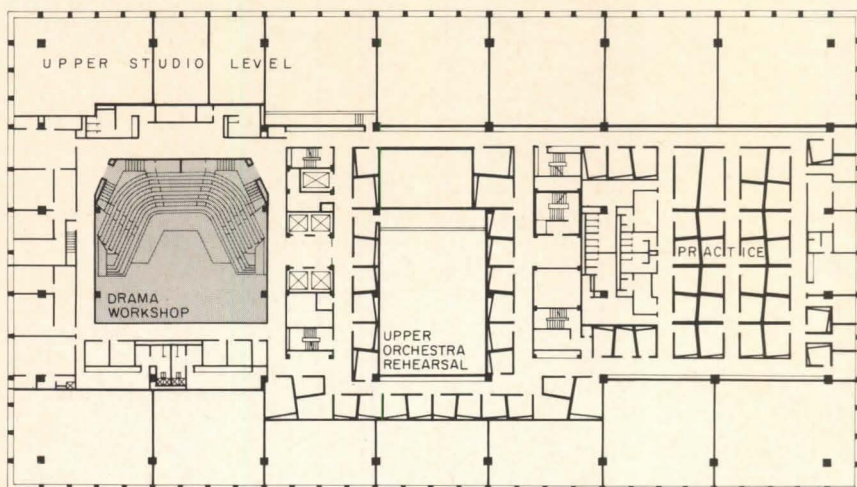
Three of five entrances, one on 65th Street, another on 66th Street, and one at the Plaza level from the bridge all lead to a central lobby which serves the Juilliard Theater, Paul Recital Hall and the elevator corridor leading to the instructional and administrative facilities of the school. An entrance below the terrace serves Alice Tully Hall.

As the sections indicate, the Juilliard School has three general zones from the sub-basement to the penthouse. Beginning four stories below the street, the lowest zone includes the performance areas of the Juilliard Theater and Alice Tully Hall, their supporting facilities, and a portion of the mechanical equipment. The uppermost zone, below the mechanical penthouse, consists of three instructional floors.

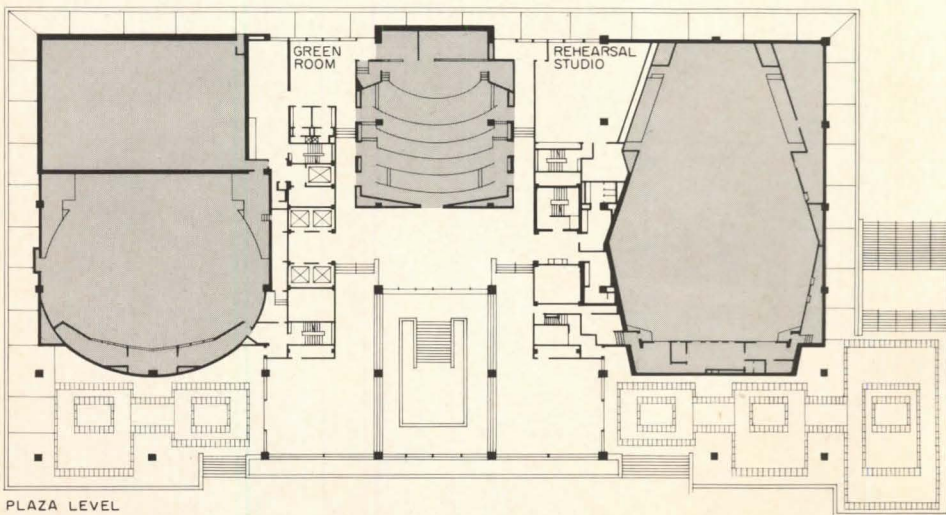
This intermediate zone contains the public areas, administrative services, lounges, Paul Recital Hall and the Drama Workshop.



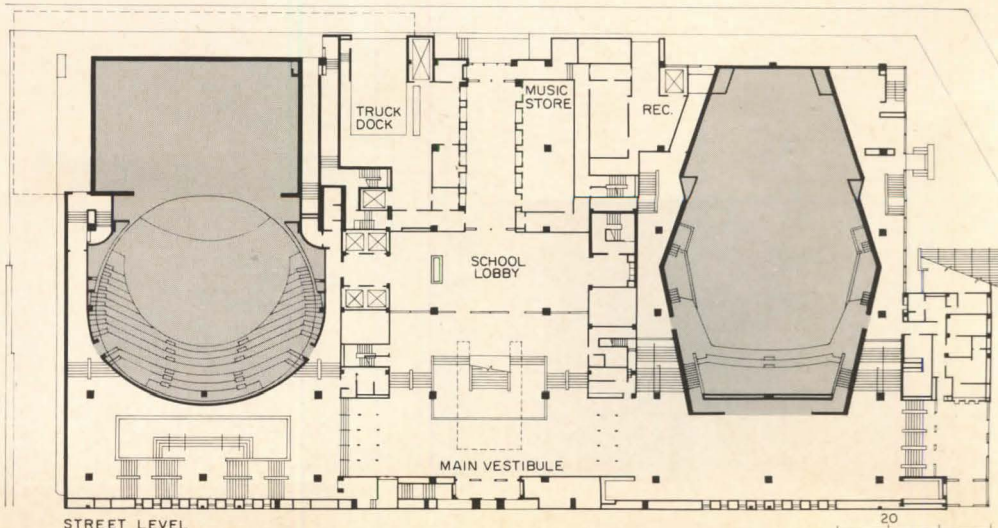
CLASSROOM LEVEL



PRACTICE ROOM LEVEL

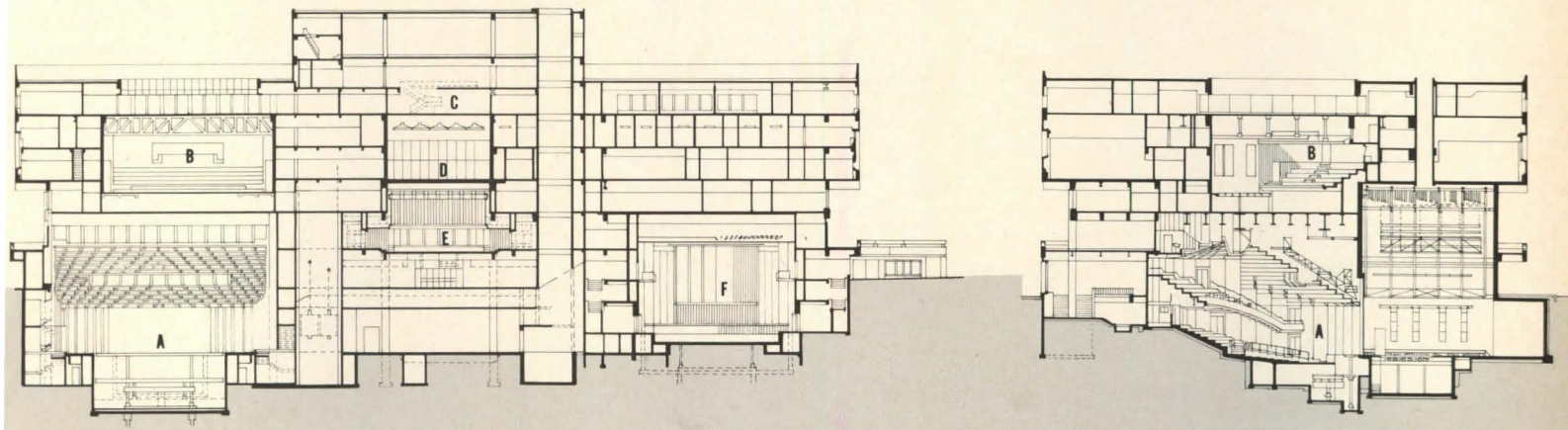


PLAZA LEVEL



STREET LEVEL

- A. Juilliard Theater
- B. Drama Workshop
- C. Lila Acheson Wallace Library
- D. Orchestra rehearsal and recording studio
- E. Paul Recital Hall
- F. Alice Tully Hall



Mal Gurian Assoc. photo



**Terraces and lobbies  
both public and private  
are generous and well-scaled,  
but economical**

**in materials and finish.** Although the facades are of travertine (a gift) and the floors are carpeted wall-to-wall (wherever appropriate to reduce noise levels) Juilliard is by no means luxurious. Because of rapidly rising costs, finish details were simplified wherever possible throughout the structure and more expensive materials abandoned. The wood paneling, for example, which had been designed for the principal lobbies, was eliminated and the concrete left exposed.

The photo (top left) shows the bridge across 65th Street connecting Juilliard to the north plaza of Lincoln Center. The top row of windows provides light and views for the large private studios and classrooms for group teaching located on the top floor. The large windows directly below illuminate the large double-story rehearsal studios on the north and south sides of the building which have two levels of single-story supporting facilities in the interiors. Underneath the overhang is another level of double-story rehearsal studios and below these, at bridge level, are the principal administration offices. All the outside windows of the studios and classrooms are triple-glazed to keep out street noise.

The photo (bottom left) was taken from the Broadway terrace over the entrance to Alice Tully Hall. A corner of Philharmonic Hall appears on the left. Both the Vivian Beaumont Theater and the Metropolitan Opera House can be seen in the background.

The lobby of Alice Tully Hall (opposite page, top left) has a purple carpet and gold accents. Miss Tully, the donor of the hall, took an active interest in its decor. The Juilliard Theater lobby (top right) is carpeted in crimson. The handsome globe-shaped lighting fixtures are of standard manufacture and are also used in Paul Recital Hall.

The principal lobby (opposite page, bottom) interconnects the Juilliard Theater and Alice Tully Hall. Stairs lead to the Paul Recital Hall directly above.





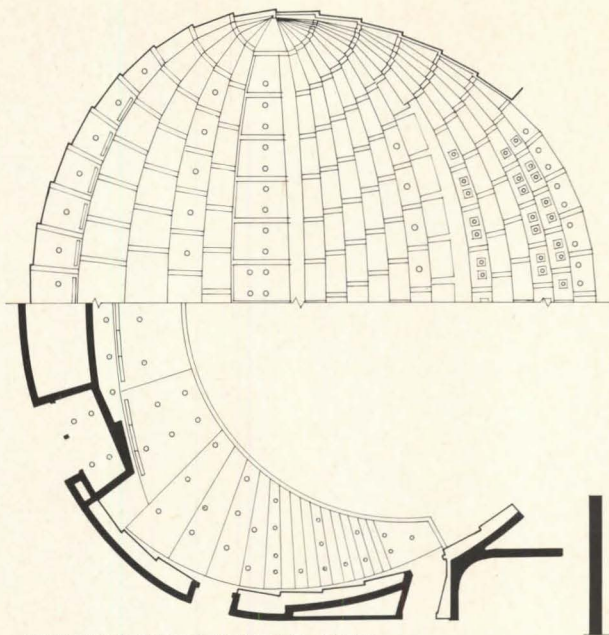
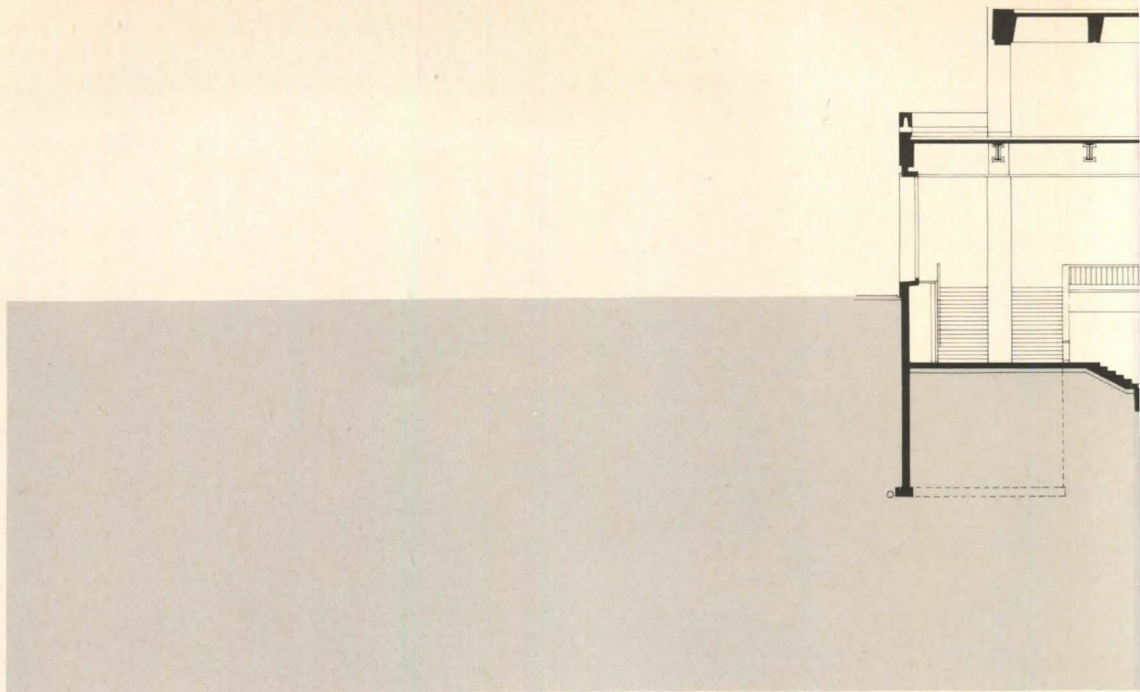
**A handsome room with an adjustable ceiling designed for opera production and training, yet suitable for drama and dance.**

The most remarkable feature of this 960-1,026 seat theater is its movable ceiling which adjusts to three positions within a seven-foot range to change the angle of reflection of sound from the stage and pit and reduce the volume (and thereby the reverberation time) of the room for drama, or increase the volume and reverberation time for the performance of music. This ceiling, finished in basswood and cherry to match the sidewalls, forms a sound reflective shell, made of horizontal, overlapping curved and tapered tiers. It includes platforms and light bridges for stage lighting and provides access to all other overhead services. Since the entire structure is located over the audience, safety was of prime importance. The architects and the ceiling engineer Olaf Soöt chose a long-span one-piece structure over several smaller movable units. The selection of a long-span structure on heavier but simple machinery minimized the maintenance requirements, reduced the over-all cost, and provided a fool-proof "fail-safe" system.

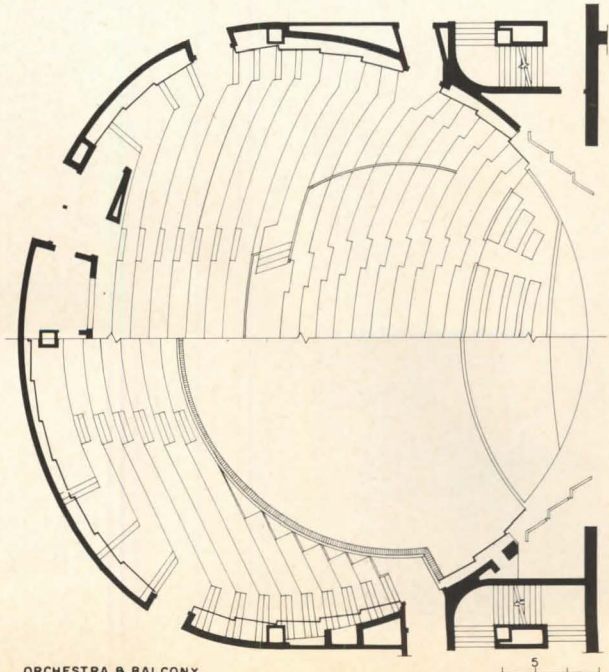
The basic structure consists of two main box trusses tied together by box-type secondary trusses. This box truss system forms the self-braced structural support for all the secondary framing, catwalks and ceiling panels. It is supported by four self-locking jackscrews and is held laterally by four guide columns, one near each jackscrew.

Each pair of jackscrews is driven by one main drive assembly. Because of the large distances between each pair of jackscrews, it was impractical to connect the main drives by mechanical means and, therefore, electrical synchronization with self-compensating leveling at predetermined stops was employed. Should any of the shafts or other drive train components become disconnected from the associated jackscrew drive, the ceiling will stop and cannot be operated unless the repairs are made. Additional interlock systems protect personnel and machinery. The ceiling is operated from a control station within the auditorium, but for the ceiling to move another button must be kept under constant pressure by an operator located in the catwalks with a full view of the service area.

The stage and lighting facilities of the Juilliard Theater and the three other halls were planned by Jean Rosenthal Associates, Inc. The associate engineer-in-charge was Clyde L. Nordheimer.

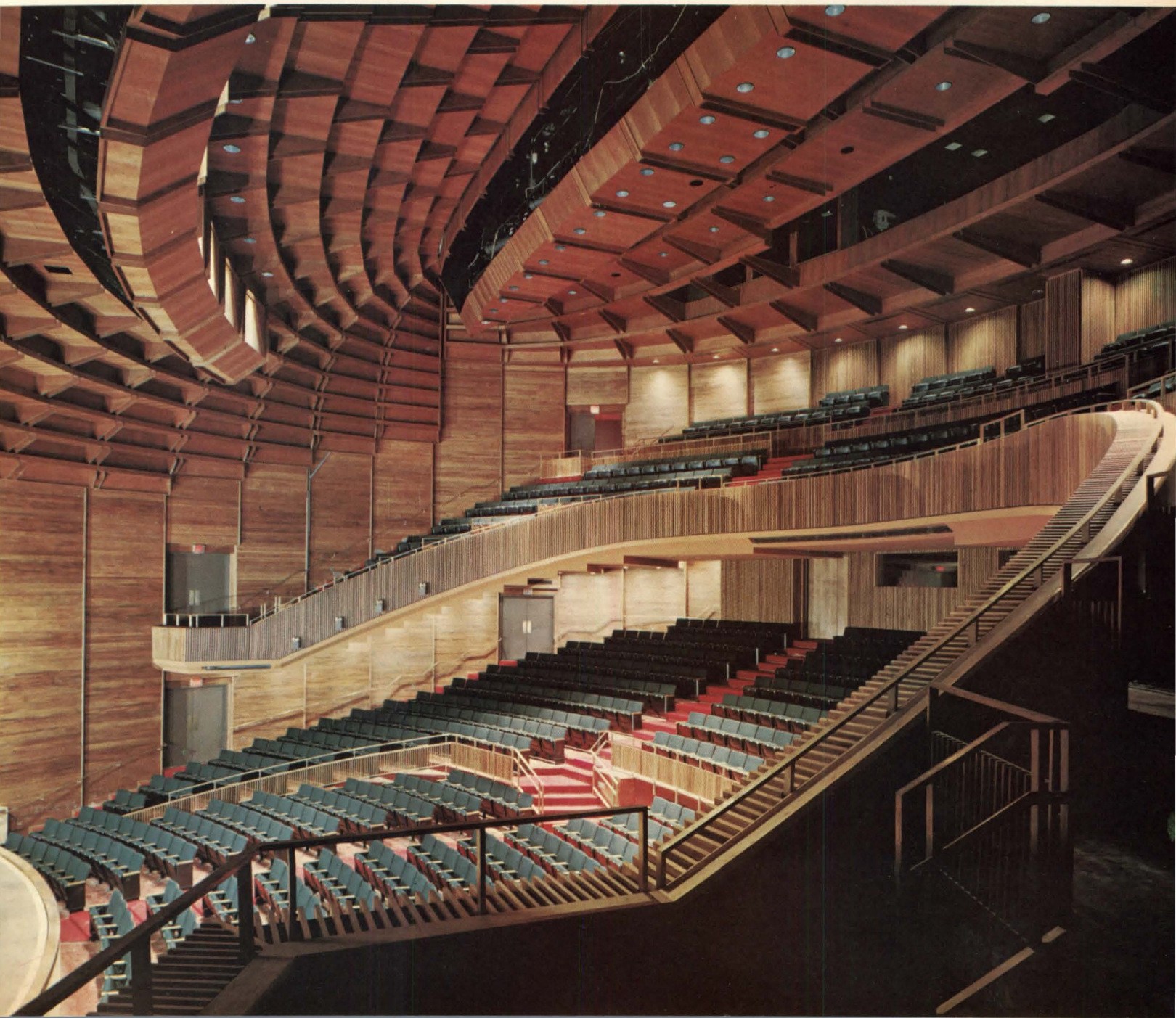
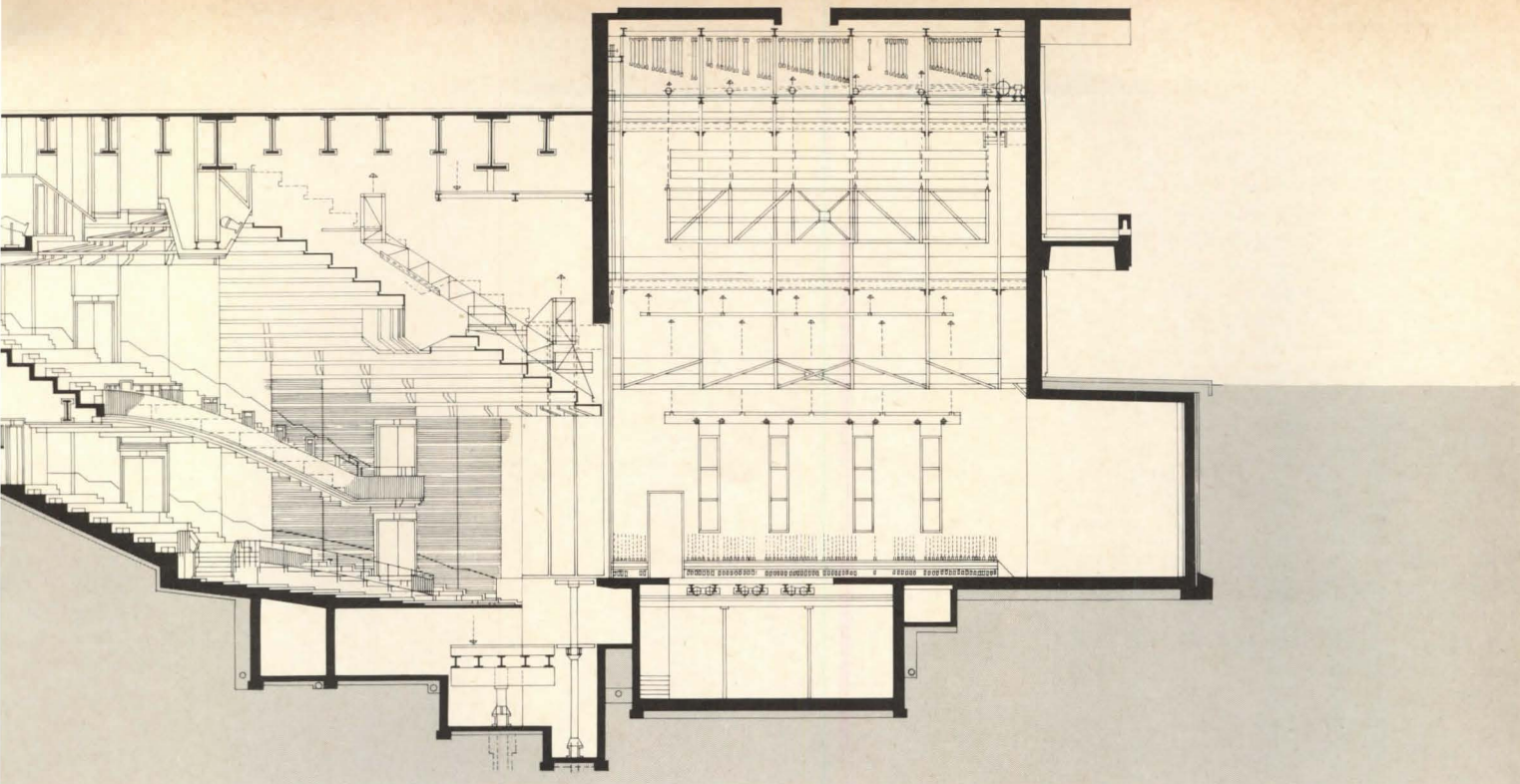


ORCHESTRA & BALCONY REFLECTED CEILING



ORCHESTRA & BALCONY





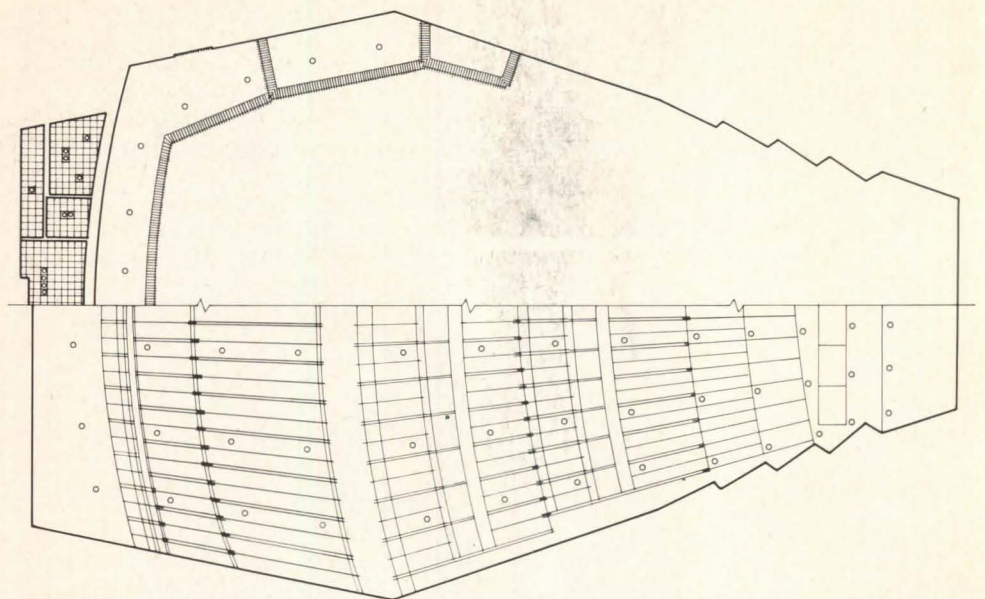
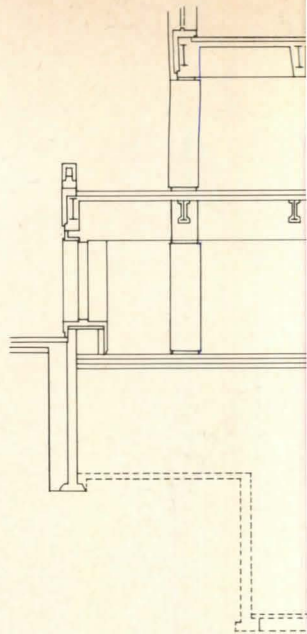
**A Lincoln Center facility  
and Juilliard's  
only public hall  
designed primarily for  
recitals and chamber ensembles.**

This hall, unlike the Juilliard Theater, is not acoustically adjustable, and therefore cannot approach an ideal for each type of performance which will take place there. Lincoln Center, Juilliard, the architects, and their acoustician Heinrich Keilholz, considered of first importance that the hall meet recital and chamber music requirements. The 1,096-seat hall is not too large for this function and critical response to the acoustics for this type of performance has so far been good. Acoustician Keilholz points out that Tully Hall should not be used by large orchestras, and adds that if the acoustics prove good for other musical purposes than those for which the hall was designed "it will be a gift!" He attributes part of Tully Hall's acoustical success to the use of wood as a resonant material and points out that musicians like to have it around them. Dampening has been inserted where needed behind the wood battens.

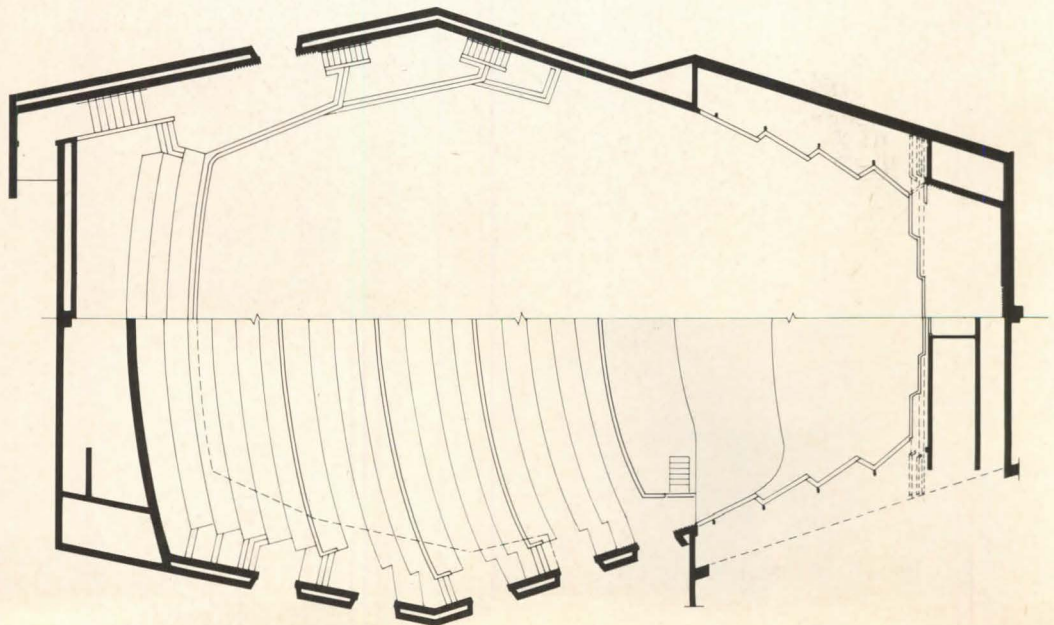
The recital stage has a depth of 23 feet and an average width of 50 feet. An organ can be raised into position or lowered and concealed at the rear. For small orchestras an additional 14 feet of stage depth is obtained by stowing the first three rows of seating under the stage and raising a lift to stage level. This configuration will also accommodate modest theatrical performances. Draperies, lighting, pipes and other scenic devices are suspended from electric winch systems above the stage ceiling. The side walls pivot for access from back stage and a traveler curtain can be drawn across the stage.

In addition to the standard concert lighting, Tully Hall is equipped with a complete theatrical lighting system. If an orchestra pit is required, two additional rows of seats can be stored under the stage.

Facilities for film presentations have been designed into the space. A complete projection booth and sound system have been installed.

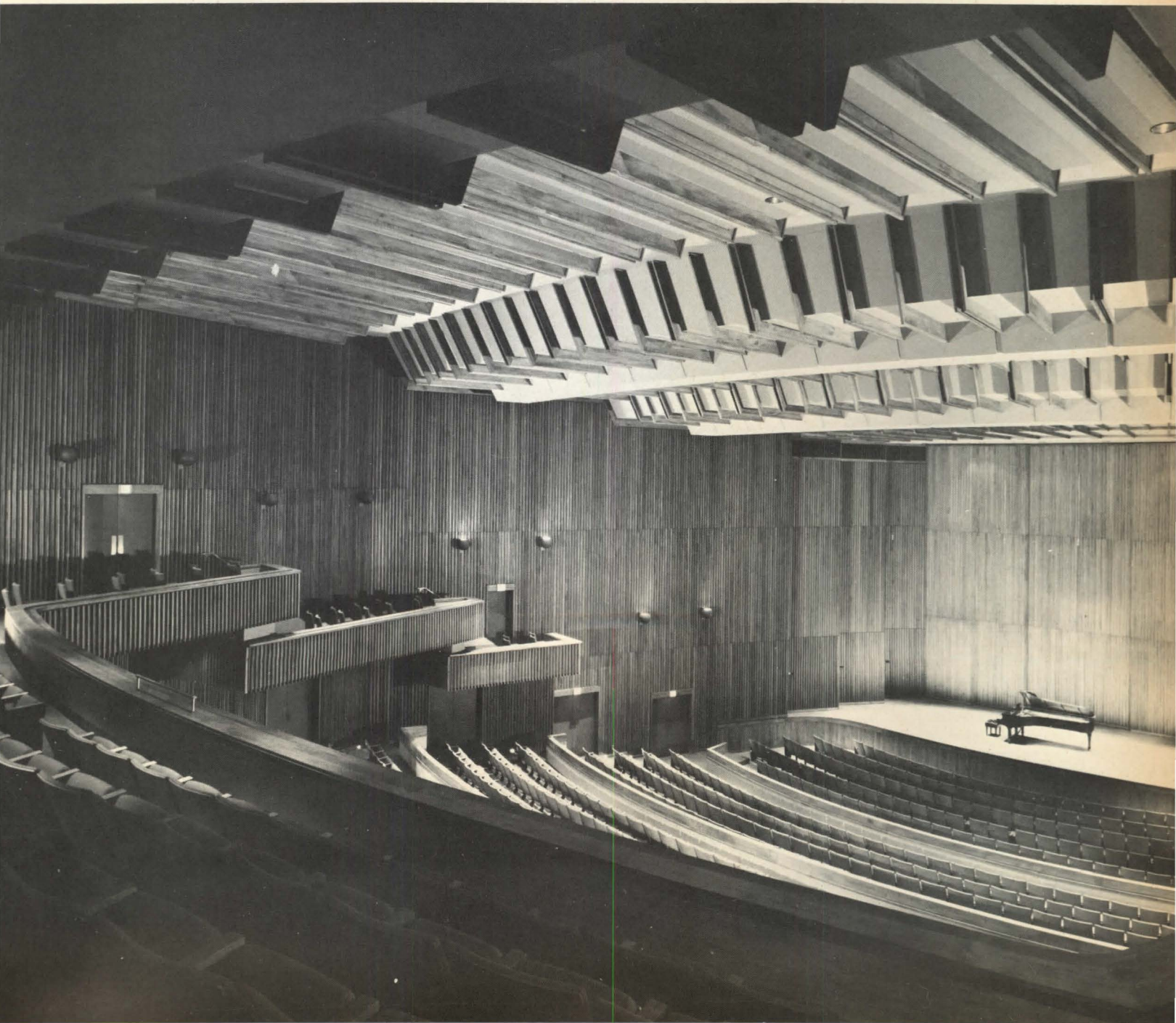
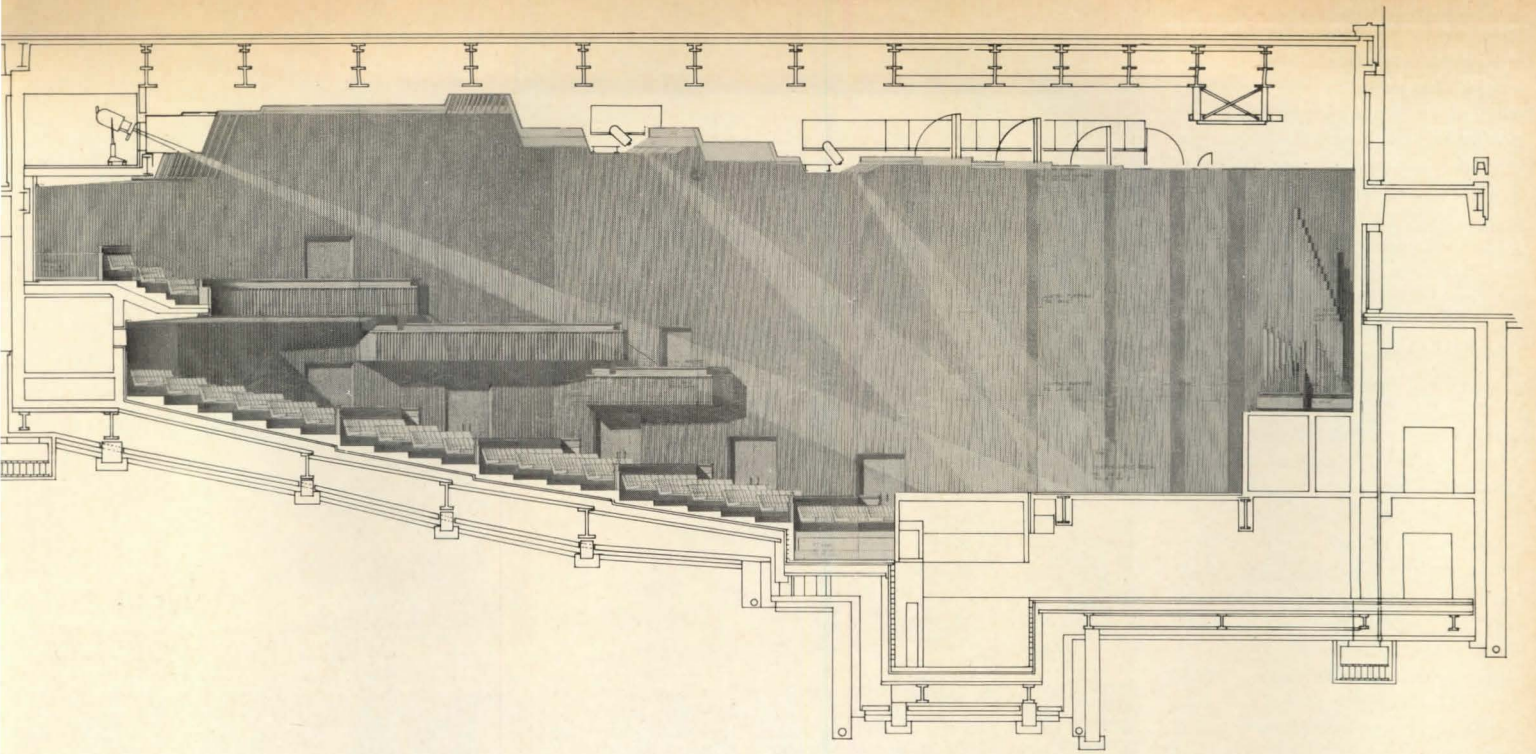


ORCHESTRA &amp; BALCONY REFLECTED CEILING



ORCHESTRA &amp; BALCONY

5



## THE JULLIARD SCHOOL

**Special purpose spaces require unique acoustic treatments and varying surfaces and particular volumes to challenge the structural engineers.**

The Paul Recital Hall (top) seats 277 people. Its side walls and ceiling are paneled in cherry wood. Ceiling coffers are sloped to create optimum diffusion of sound. It is used for instruction on the Holtkamp organ, for recitals and as a lecture hall and has been volumetrically sized for these purposes. Private teaching studios (middle left) are carefully sound insulated, as are the practice rooms. These spaces had to be of minimum size to get as many as possible into the available space but large enough to provide proper sound diffusion and reflection. The organ practice rooms (middle right) required special wall and ceiling treatments to prevent the organ sound from becoming too "hard." The Lila Acheson Wallace Library (bottom) is located directly above the orchestra rehearsal and recording studio, which floats free of the structure to inhibit the transmission of sound.

All major sound-producing spaces are insulated from the structure. Each has a unique volume and special wall, floor and ceiling treatments. As a result, no two floors of Juilliard are alike, and floor slab elevations constantly vary. The building has cavity walls, solid walls, walls with insulation and walls without. Because of the intricacy of the plan, there is no direct transfer of loads to the foundation. Floor loads are huge and range from 250 to 280 pounds per square foot, including the concrete slabs, secondary slabs and floor finishes. The dance rehearsal floors, for example, are 18 to 20 inches thick and include steel springs 20 inches on centers. Because the biggest column-free spaces are near ground level, structural members are quite large to handle the long spans and the loads from above. There are steel composite girders which are 104 feet in length. Joseph Zelazny and Matthys Levy, associates of Paul Weidinger, the structural engineer for Juilliard, point out that in spite of these complications there is a structural module of sorts. At the east and west ends of the building over the two major halls are 93 foot spans. Between them the columns are 46 feet on center. Spans are 35 feet the opposite way.

Of special interest is the fact that the northeast corner of Tully Hall is only 20 feet from the IRT subway. A special envelope was made for the hall. The engineers inserted a one-inch thick asbestos pad lined with cork between the foundation and its solid rock bearing. The perimeter wall of the theater was isolated from the structural columns so that the subway vibrations would not be transmitted.



# URBAN DESIGN AS PART OF THE GOVERNMENTAL PROCESS

by Jonathan Barnett

*A group of architects working for the New York City Planning Department is developing new professional skills to help shape urban growth and change*

Everybody talks about what's wrong with our cities, but relatively few people have been prepared to do anything about them. Over the past four years I, and a group of other architects and planners, have been involved in an effort to bring our professional competence to bear on the problems of New York City—not by making yet another sweeping proposal for the city of tomorrow, but by participating in the governmental process, trying to create comprehensive answers to the intractable problems of today.

We didn't realize it when we began, but we are only one example of a national movement of architects and other professionals towards a greater degree of social involvement. Very few, however, seem to have taken the path that we have chosen, if for no other reason than that we were incredibly lucky to have received the opportunities that came our way.

As a result, I think we have had a chance to develop some new techniques that would not have been thought of had we not been in the right place at the right time. The story is a complicated one, but, if you will bear with me, I think you will see why we have come to believe that an architect has some special abilities to deal with certain kinds of city problems; and that there are reasonable grounds for saying that cities can be a product of design.

New York is a particularly frustrating place for anyone who knows about architecture and planning. At first it would seem that all the ingredients are present for a new kind of city that would surpass in amenity, liveliness and excitement any other city ever built. In midtown and downtown Manhattan, building construction is almost continuous. Every year, without the aid of urban renewal, a dozen new structures spring up that

would be large enough to dominate the skyline of an ordinary city. In New York they are simply lost in the crowd. New York possesses hundreds of miles of waterfront, beautiful parks, great educational and cultural institutions. It is the headquarters city for the country's commerce and industry. The municipality itself spends over a billion dollars a year on capital construction. With such an awesome combination of public and private resources there ought to be no limit to what the city could achieve.

Unfortunately, the city's physical problems are as awe-inspiring as its opportunities. Each new building in the center of Manhattan seems to diminish the environment, not add to it. The waterfront is decaying, parks are deteriorating, congestion and pollution are everywhere; and there are more apartments and houses in bad condition in New York City than there are *people* in Baltimore, Maryland. Something has gone very wrong, and the city's great, dynamic energies have been somehow misdirected.

Tantalizingly enough, there is just a sufficient number of examples where the system has worked to show what could be made to happen everywhere in New York. Riverside Drive is a good demonstration of what can be achieved by a strategic combination of public investment and private enterprise, with the government-built park, roadway and waterfront making the frontage an attractive real-estate opportunity. Eastern Parkway in Brooklyn is another example, a boulevard that equals or surpasses any of its famous counterparts in Europe. The Promenade in Brooklyn Heights and Carl Schurz Park in Manhattan show what can be done with the highway in the city; Grand Central Terminal is a classic example of the successful separation of automobiles from pedestrians: a solution to urban congestion that is often prescribed but seldom achieved. Rockefeller Center, Tudor City, Sunnyside in Queens, and the Grand Concourse in the Bronx are examples of successful urban environments created by design and planning.

In fact, however, for every opportunity like these that has been taken, a dozen others have been

Jonathan Barnett, an architect and a former associate editor of ARCHITECTURAL RECORD, was one of four founding members of the Urban Design Group of the New York City Planning Department. He is now that department's Director of Urban Design.

**“Even the shortest acquaintance with the way physical planning decisions are made in American cities . . . is enough to convince that often things could just as easily have been done according to design.”**

missed; and architects and planners who can see the possibilities are continually confronted by the lost city that could have been built.

It is a fashionable attitude at the moment to ascribe these failures of the physical environment to the failures of the larger social order: no wonder nothing works when “the system” is rotten to the core. An architect, who knows how difficult it is to make even a small house come out right, can have a somewhat different perspective on the problem. Even the shortest acquaintance with the way physical planning decisions are made in American cities—or, for that matter, by private industry—is enough to convince that often things could just as easily have been done according to design.

If you suspect, as we did, that with a thorough understanding of the decision-making mechanism, we could produce significantly different results, what should you do next?

Well, the five of us, Giovanni Pasanella, Jaquelin Robertson, Richard Weinstein, Myles Weintraub and myself, decided that the 1965 election campaign of John V. Lindsay afforded us the opportunity to try to win acceptance for concepts that we had long been discussing.

We were clear about what we were trying to do. We were not working on the basis of a political ideology, and we were not seeking careers in government or politics. We simply wished to identify the places in the decision-making process where the wrong choices were being made and then to point out what the better alternatives would be.

Naturally we were both more audacious and more ignorant than we knew. Nevertheless, looking back four years later, it seems to me that we had chosen the right point of view. We had recognized that the city is a design problem, analogous in many respects to the design of a building, and decisions about it were proceeding as if a building were being designed in pieces by a hundred architects and engineers. We saw that the city could use the kind of coordination and fitting together of disparate elements that architects are used to, but we recognized that the result would not be like a building. It is the design process which is important, and we were sufficiently astute to have an open mind about what the result ought to be.

All the same, we were lucky. Without fully recognizing it, we had picked one of the few political figures who would let us try what we wished to do. If you want to make changes in a decision-making process, you need the wholehearted support of the man at the top of the decision-making tree. These changes don't get made lightly; they aren't slipped through without people noticing, and you need a great deal more than a vague commitment to certain goals; you need tough, specific, political support.

In John Lindsay we had hit upon a political figure who was interested in and knowledgeable about architecture and planning, and not just mouthing appropriate phrases fed to him by his speech writers. We later found that, if he thought you were

right, he would back you all the way—even in the face of formidable political problems.

We were also extremely fortunate that, in our first encounter with the Lindsay campaign organization, we were introduced to one of the few men in it with the patience and interest to work with a group of people such as ourselves: Donald Elliott, now the Chairman of the City Planning Commission, then on leave from his law firm to work in the campaign's research section. Elliott, in addition to a skeptical and incisive intelligence, has another quality which has been very useful to him as a city planner: he never gives up. It is truly amazing how many lost causes can be won by sheer staying power and will; and Elliott has achieved success where many another planner would have thrown up his hands in dismay.

Elliott immediately put us to work studying the state of planning and renewal in New York. We thought at the time that we were advising him; but of course what we were really doing was educating ourselves. We were astonished by what we found out. We assumed that things were bad; we had little idea how bad the situation really was.

In 1965, planning in New York City was just waking up from a long sleep; but the housing and renewal programs were nearing total paralysis. Four years earlier, under then Planning Commission Chairman, James Felt, New York City had passed the first comprehensive zoning revision since the original ordinance of 1916. The importance of the new law was just beginning to be understood in 1965. Although criticized in some quarters for not being innovative enough, the revised zoning had turned out to represent a tremendous accretion of power to the Planning Commission, with ample possibilities for discretion and innovation. Felt's successor, architect William F. R. Ballard, was struggling manfully with the enormous new work load that the revised zoning procedures had created. With inadequate staff and resources, the Commission was just barely able to keep up with routine business, and with furnishing unglamorous, but necessary, statistical information to other city agencies. Ballard did find funds, however, to commission the Lower Manhattan Plan, an urban-design study by three consulting firms: architects Whittlesey and Conklin, landscape architects Wallace and McHarg, and transportation consultants Alan M. Voorhees and Associates. Work on this study was then in progress.

In urban renewal, the city's former practice of selecting certain residential areas for total clearance was coming to a complete halt. A heightened awareness of the consequences of relocation, plus growing alertness and militancy on the part of local neighborhoods, spelled the end of large-scale clearance policies. The City had also just about run out of large tracts of vacant or marginally utilized land for development purposes, and the amount of low- and middle-income housing “in the pipeline” (as renewal officials like to call it) had slowed to a trickle.

Complicating the situation even further was a completely bizarre renewal procedure, the result of the creation of a whole sequence of different agen-

cies with overlapping jurisdictions. Spelled out in the *Pratt Planning Guide*, a straightforward exposition of the necessary steps in the renewal process became something of a classic of dead-pan humor.

The same situation had been reached at more or less the same time in many other American cities, and the causes lie deep within our attitude to the role of government. City planning strikes many people as something of an undemocratic concept. The idea that the state can specify the future course of development for pieces of private property has always made Americans nervous, and vast redevelopment and highway projects, with their sweeping social consequences, have made us more nervous still.

Thirty years ago, city governments were only expected to provide essential services, and city planning was a form of municipal engineering, a governmental service like clean streets and city water. Planners were careful to keep to straightforward regulations based on concepts such as preservation of light and air, appropriate drainage gradients and the like. Great care was taken to appear as objective as possible, and anything that might appear in the least arbitrary or subjective tended to be put rigidly out of mind.

Today the popular expectations of government are very different and the influence of government is well on the way to becoming all-pervasive. City planners and other responsible officials can no longer take refuge in a cult of objectivity and impersonality, because a decision-making process that does not consider the social consequences of an action does not relieve the government of responsibility for the results.

However, the kind of control over society implicit in a coordinated use of existing governmental powers, and actually exercised in many European countries, is unacceptable to Americans today. The result is the familiar scenario of dithering on the part of public agencies, followed by angry confrontations with various local groups, followed by more dithering, and so on.

The existing institution which seemed to us to offer the most hope for a way out of this impasse was the Community Planning Board. The New York City Charter of 1963 had specified that the Planning Commission divide the city into Community Planning Board districts, each of which would have a board of citizens to advise the city on decisions affecting their area. These boards were not yet operational, although they existed on a local basis in several of the Boroughs. The trouble with these boards is that there is no corresponding administrative unit in the city to work with them, so that their role is not only advisory, but without a context as well.

Working with Elliott, we spent much of the election campaign formulating a partial decentralization of the city government, based on the planning board districts and local branches of the Mayor's office. This proposal, called the Neighborhood City Halls Program, seemed to us to offer the most direct avenue to changes in planning and renewal policy,

because it would permit the city to exercise its powers in a context that provides appropriate checks and balances.

We used the Coney Island district of Brooklyn as a sample area, and, when Lindsay gave a campaign speech there, he presented some of our work. The speech was very well received because the grasp of local issues that it exhibited took it out of the category of ordinary campaign oratory. It was a good demonstration that even a rudimentary involvement in the local community was worth a great deal of theorizing back at headquarters.

After Lindsay's election, a whole series of study groups and task forces were set up to find ways to make planning more effective and to discover how to start the renewal process on its way again. We were appointed to a study group charged with preparing of a detailed program for the Neighborhood City Halls. Unfortunately, it was soon clear that these, I think, high-minded, proposals would get nowhere in the City Council, where they were denounced as an attempt to set up political clubhouses at government expense. However, Mayor Lindsay gave an assistant, Robert Blum, the job of starting pilot Neighborhood City Halls using foundation grants and existing City funds, and we may yet see the full program established.

When our report was completed, we all staged a quite genuine Cincinnatus act—back to our regular jobs to catch up with our work. I think that our political friends were impressed with our lack of interest in the possibility of office; of course, the state of planning and design in New York at that time was such that there really would not have been a place for us in any case.

While we were working on the Neighborhood City Halls, another, better-known study group was assembled under the direction of Edward Logue. It is no secret that Logue was being asked in effect to write his own job description; and the message of his report was "thanks, but no thanks." Surveying New York in the light of his extensive experience in New Haven and Boston, Logue concluded that a successful planning and renewal program would not be possible in New York without a large-scale consolidation of the city government—including the merger of the renewal agency and the Planning Commission—and something like a sixfold increase in Federal funds. As neither of these goals seemed achievable in the near future (they required, respectively, extensive revisions to a brand new City Charter and a re-orientation of national priorities), Logue returned to Boston. The report contained many valuable suggestions, however, and David Crane's lengthy appendix on planning and design contained many concepts that were ultimately put into effect.

The Logue report was not completed and published until September, 1966—almost a year after Lindsay's election. In the meantime, the Mayor had to make decisions about a great many housing and renewal policies. In January 1966 Elliott became Counsel to the Mayor and Chairman of the Housing Executive Committee, and Mrs. Eugenia Flatow took over as acting head of the Housing Co-ordinator's

**"We had recognized that the city is a design problem, analogous in many respects to the design of a building, and decisions about it were proceeding as if a building were being designed in pieces by a hundred architects and engineers. . . ."**

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office, a position which had been established in the last years of the previous administration in an attempt to bring order out of the tangled mass of different agencies.

Elliott, with his customary resilience, proceeded to devise an approach to planning that possessed many of the same characteristics of community participation and neighborhood orientation that we had envisaged would result from the Neighborhood City Halls. A forerunner of the N.D.P. programs that would be part of the 1968 Housing Act, this was the vestpocket program, so-called because it substituted smaller housing and rehabilitation sites for total clearance. Instead of relatively limited urban renewal areas, five whole neighborhoods were designated in which planning consultants, working with a committee of neighborhood residents, would prepare a comprehensive development plan and select housing and rehabilitation sites.

Elliott proposed to us that we take on the job of planning one of these areas as a pilot study of our neighborhood planning and design concepts. The J. M. Kaplan Fund, a foundation noted for its support of experimental urban projects, agreed to finance the study, and the Institute of Urban Environment at Columbia University accepted responsibility for administering the grant.

At the same time, Arthur Drexler, director of Architecture and Design programs at the Museum of Modern Art, asked us to prepare an urban planning concept for an exhibition on the design of cities.

**T**his combination of circumstances marked the point at which we began to turn away from the more or less well-marked paths of the architectural profession into a new form of activity for which there were few precedents. Jaquelin Robertson and Richard Weinstein decided to leave their jobs at Edward L. Barnes's office to work full time on these projects. Giovanni Pasanella already had his own office, and Myles Weintraub and I continued to sandwich this work in between other commitments.

**N**othing could have provided a greater contrast than working on these two projects at the same time.

The most striking feature of our job in the Bronx was the tremendous wave of suspicion and hostility that swept over us whenever we tried to contact the people of the area. The record of the city was so bad, there had been so many arbitrary actions and broken promises, that no one would believe that we represented a new approach. We were shouted down at meetings, and a local planning board seriously debated whether it would talk to us at all. Eventually, some local community leaders—not professional politicians, but neighborhood association presidents and clergymen—put their own personal prestige on the line to assure us a hearing; and the process of planning with the community was able to begin.

In the meantime, we were also attending meetings in the lofty members' lounge of the Museum of Modern Art. Drexler's purpose in preparing the exhibition was to demonstrate that cities could be the

product of design. It was a courageous decision, as it opened him up to criticism from both sides: from partisans of art, who opposed so much contact with sordid reality, and from the partisans of planning, who complain that the design of cities is not an art but a science.

For our part, we were concerned that the exercise be as realistic as possible, while still presenting a comprehensible urban design concept. Our project (there were three others) concerned a proposal to redevelop the air rights over the elevated railway viaduct that runs along Park Avenue from 97th Street to the Harlem River, with the aim of removing a blighting influence and, at the same time, opening up the possibility of major change in a densely populated area with little open land. Our engineering consultant was David Geiger, who developed the basic structural concept; construction consultant Edward Friedman and Johnson, Muser, Rutledge, and acoustical consultant, Michael Kadaras, as well as Alfred Schimmel, helped us to keep the project as feasible as possible.

We thus had the useful experience of approaching the problems of the city from two different directions: On the one hand we began to learn how to make the small-scale decisions necessary to conserve and improve the existing urban situation, while, at the same time, developing ways to bring about major change.

**I**n the meantime, events were taking place that would end by drawing us into the New York City government. Upon the completion of the Logue Report, the Mayor decided to carry out those aspects of it that did not require the lengthy and uncertain course of charter reform, as part of the general process of administrative reorganization he was applying to all city departments. Donald Elliott became the Chairman of the City Planning Commission and of the Model Cities Policy Committee. Mrs. Flatow became the executive secretary of Model Cities, and Jason R. Nathan, an able and experienced urban renewal administrator, agreed to take on the newly-consolidated Housing and Development Administration—despite the fact that the Logue Report had, in effect, defined the job as an impossible one.

The Mayor also set up a new study group to be concerned specifically with urban design in both the private and public sector. This group was headed by William S. Paley, Chairman of the Board of the Columbia Broadcasting System, and included architects I. M. Pei and Philip Johnson. Jaquelin Robertson was also a member of this group, as was architect and editor Walter McQuade, who was later to become a member of the City Planning Commission.

The Paley group stayed away from charter changes, and, instead, hired management consultants Booz, Allen, and Hamilton to try to find the most strategic decision-making points in the city's design process. Their report concluded that one of the most effective actions the city could take would be to add a group of urban design professionals to the staff of the City Planning Commission. This recommendation was part of the final report issued in February, 1967.



And so we had been rather neatly woven into the web of circumstances. Between the Paley report and Donald Elliott's position as Chairman of the Planning Commission, we seemed to have very little choice. In the spring of 1967, all of us, except for Giovanni Pasanella, whose architectural practice was too well-established to leave, agreed to put aside our ideas about starting an architectural practice and join the City Planning Department staff.

Working for a city government belongs to that category of experience that no description will convey: it has to happen to you. We now feel, however, that such an initiation into the mysteries of the governmental power structure is a prerequisite for making successful design proposals about cities. What seems to the outsider to be a simple change may in fact turn out to be practically impossible, while a seemingly difficult accomplishment may really be very easy to bring about. In private life, decisions most frequently have a simple cause-effect relationship. Someone wishes to do something, and it is done; someone wishes to prevent something, and it is not done. In government, the factors involved are so diverse that the decision-making process is best visualized by remembering those resolution-of-forces diagrams that are found in elementary engineering textbooks. A number of interests are pulling in different directions; and the course of action is the *resultant* of all the forces being exerted.

This tendency produces a situation where agreement is valued for its own sake, and is the chief reason for the frustration and lack of influence of professional planners and architects working in governmental situations. A professional architect or planner does not want to split the difference with his opponents in order to preserve harmony; he remembers Abraham Lincoln's dictum that there can be no compromise between right and wrong. The politician on the other hand is professionally distrustful of absolute positions.

Elliott's great contribution to city planning has been his ability to mediate skillfully between these two points of view. He encourages his professional staff to be as undocinaire as possible; at the same time they find themselves exercising far more influence over city policy than they ever did before. Naturally he receives pot shots from both sides, with some professional planners considering him apostate, and a lot of politicians finding him difficult to deal with. Elliott, however, seems quite content to let himself be judged by his results.

Elliott established the four of us as the nucleus of an Urban Design Group to serve, in effect, as an in-house design consulting organization; and he told us to recruit our own staff. At the same time he also began building a planning office for each of the city's five boroughs, a capability that the planning department had not possessed up to this time, and an important step in realizing the kind of neighborhood planning capacity once envisaged as part of the Little City Halls programs. As things turned out, we became as much involved in these borough offices as

in urban design; indeed, the two functions have proven to be as closely related as we originally predicted.

Elliott was careful to set up these new offices as flexible—and relatively unstructured—organizations; and he gave them a great deal of personal attention during their formative stages. This kind of special treatment was very important, as it is hard to do innovative work through “normal” channels, and it took a while for our new areas of responsibility to define themselves. Our approach, worked out experimentally over a period of about a year, was to take the Planning Commission's existing powers, some of which, as Elliott says, are rather blunt instruments, and make them more specific and effective. The Planning Commission's authority is essentially negative in nature; it can turn down a proposal, but the Commission's approval is not necessarily a guarantee of the project's success. In many cases, the Commission has neither the leverage nor the desire to reject a proposal outright, and the Commission would be almost powerless if it did not have the means to study other possibilities and suggest alternative courses of action.

The ability to suggest alternatives generally requires extensive staff work, and the key to Elliott's program has been to render the Commission's powers more effective by increasing its ability to say: “We won't approve this, but why not try this instead?”

What are the powers of the Planning Commission, then, and how do you go about turning them to account?

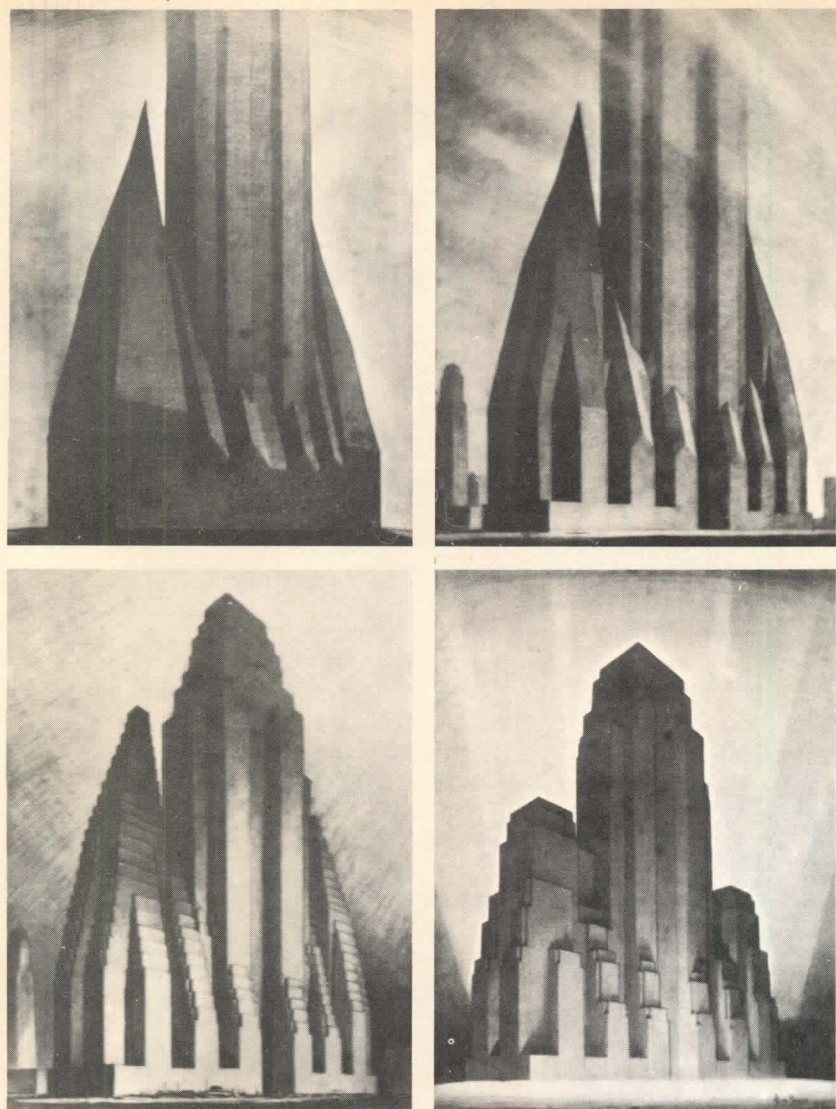
The Planning Commission, through zoning, determines the land use and density of development for all the real estate in the city, except for land controlled by the State and Federal governments. The 1961 Zoning Resolution sets far more stringent limits on development than New York's earlier regulations, in fact it exercises what amounts to direct control over the shape and size of building development in most of the areas where developers wish to build the maximum allowable floor area. Zoning traditionally has been a series of restrictions and limits, but we found that by relatively minor modifications we could make zoning the directing force for whole sectors of the city—to the benefit of both the developer and the public.

The Planning Commission must also approve the location and configuration of any new street, and any street closing or other change. This power has proved immensely valuable for our attempts to redirect the growth of outlying areas of the city. In conjunction with cluster zoning, it has permitted large sectors of vacant land to be developed privately according to a co-ordinated plan.

The Commission also designates areas for urban renewal and publicly-aided housing, and reviews and approves urban renewal plans—a critical power for achieving neighborhood planning goals.

On the following pages are some specific examples of the ways in which zoning, mapping, site selection and renewal powers can be made to work together, which give a clear indication of what we have been trying to accomplish.

**“What seems to the outsider to be a simple change may in fact turn out to be practically impossible, while a seemingly difficult accomplishment may really be very easy to bring about. . . .”**



WHAT ZONING IS, AND HOW IT WORKS

Zoning regulates two things: land use and intensity of development. The principle behind the regulation is to minimize any adverse effects that the development of a piece of land might have on adjoining property and the public interest.

A map is demarcated into various zones showing what land use and building bulk are permitted in each area. These zones are determined according to a municipality's general policy plan, and should apply equally to any property inside a zone, no matter how large or small.

**Land uses** generally fall into three categories: residential, commercial and industrial; and the various kinds of commercial and industrial uses are generally sorted out into groups on the basis of such considerations as the noise or traffic generated.

**Building bulk** was originally regulated in New York by means of the so-called zoning envelope, which is most readily imagined as a roughly pyramidal shape covering the whole building site, the angle of the sides being determined in relation to the width of the street. This familiar series of drawings by

Hugh Ferriss shows buildings being "carved" out of the New York City zoning envelope.

Intensity of development is now regulated in New York, and in many other cities, by floor area limits. Each zone has a ratio which determines how many square feet of floor area can be built on any given lot. For example, if you have a 10,000-square-foot lot, in a zone which has a floor area ratio of 2, you can build a 20,000-square-foot building. (There are some complications in computing exactly how much of the building counts as area for zoning purposes, but we can ignore them in this summary.)

Many of the envelope controls have also been carried forward into New York's most recent zoning regulations, along with provisions designed to create more open space at ground level.

The 1961 zoning resolution also incorporated a system of floor area bonuses designed to encourage the provision of plazas, and, to a limited extent, arcades; and it suspends the envelope restrictions for towers that occupy less than a certain percentage of the site.

**Zoning laws are among the most powerful urban design tools available in cities like New York.** We have to admit that we once regarded zoning as a collection of boring regulations; and the less we had to know about them, the better we used to like it. It was something of a shock to discover that a great many of the stereotyped buildings that we had been prone to dismiss as the work of unimaginative architects and greedy developers were in fact the direct result of the Planning Commission's zoning requirements.

Zoning's primary purpose is the very necessary one of regulating population density and land use; but, in New York at least, it has come to have some undesirable side effects.

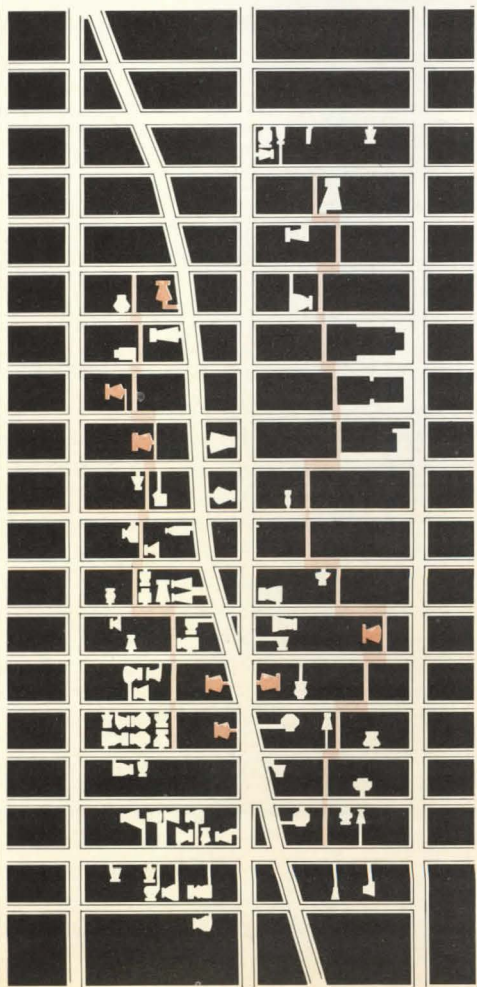
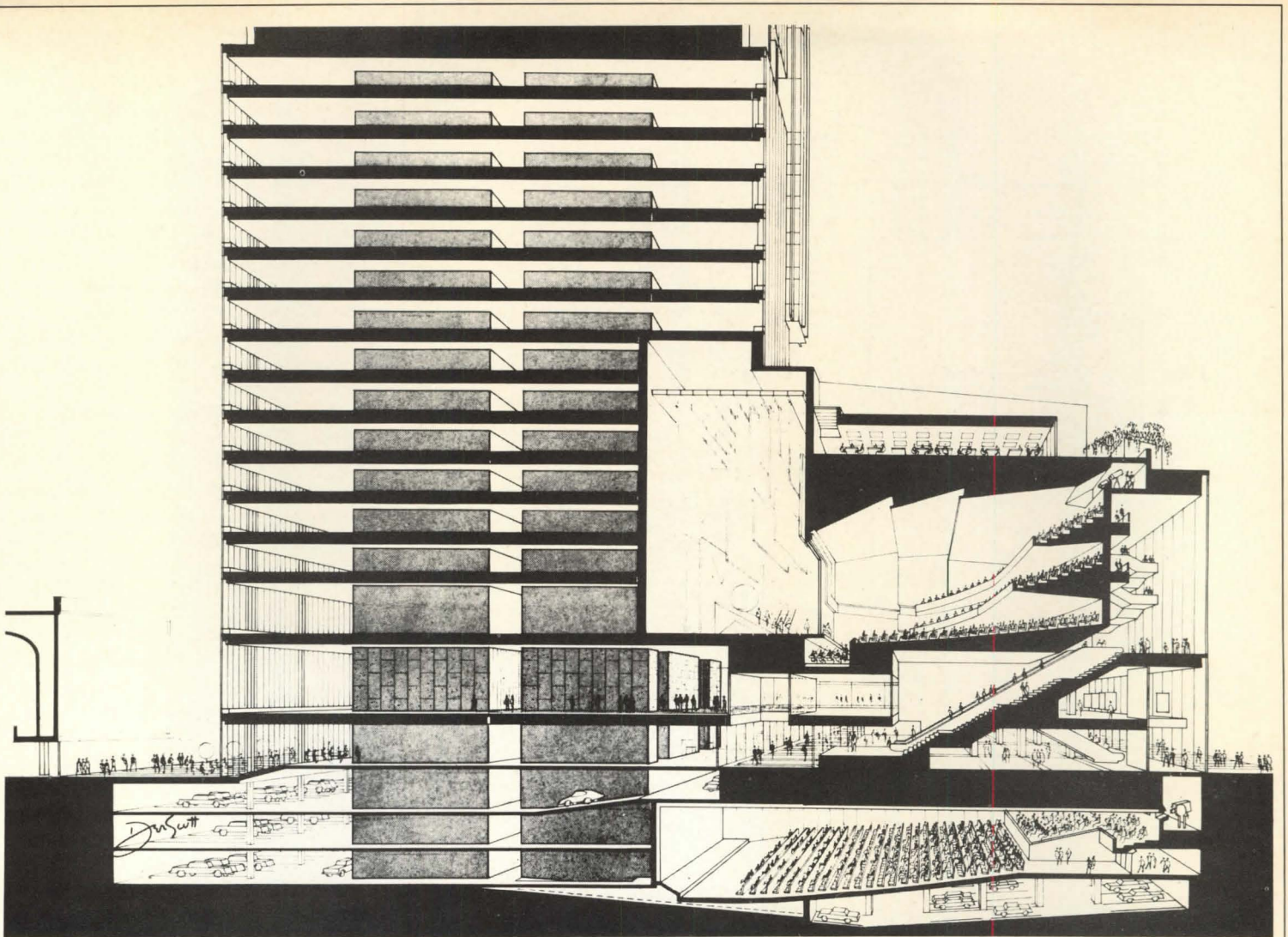
New York's zoning regulations, like most others, tend to pull development inward, away from property boundaries, in line with the traditional zoning concept that the segment of the public interest most in need of protection is represented by the rights of adjoining property owners. In the case of a highly complex urban center like midtown Manhattan, the public interest is much better guarded by the interconnection of buildings; and, even in suburban areas, the public is often better served by the clustering of development than by even distribution at the same density over large areas. Traditional zoning thus makes large-scale, co-ordinated development very difficult to accomplish.

In addition, seemingly objective setback, tower and plaza regulations are really based on unstated design concepts, which become institutionalized without taking account of topography, orientation or existing physical features—such as a church in the middle of the block. The resulting buildings, and often whole sectors of the city, are more the product of circumstance than a designed response to program and site conditions. Some exceptions: the Ford Foundation Building, CBS, Seagram's have been accomplished at a considerable sacrifice of permissible floor area.

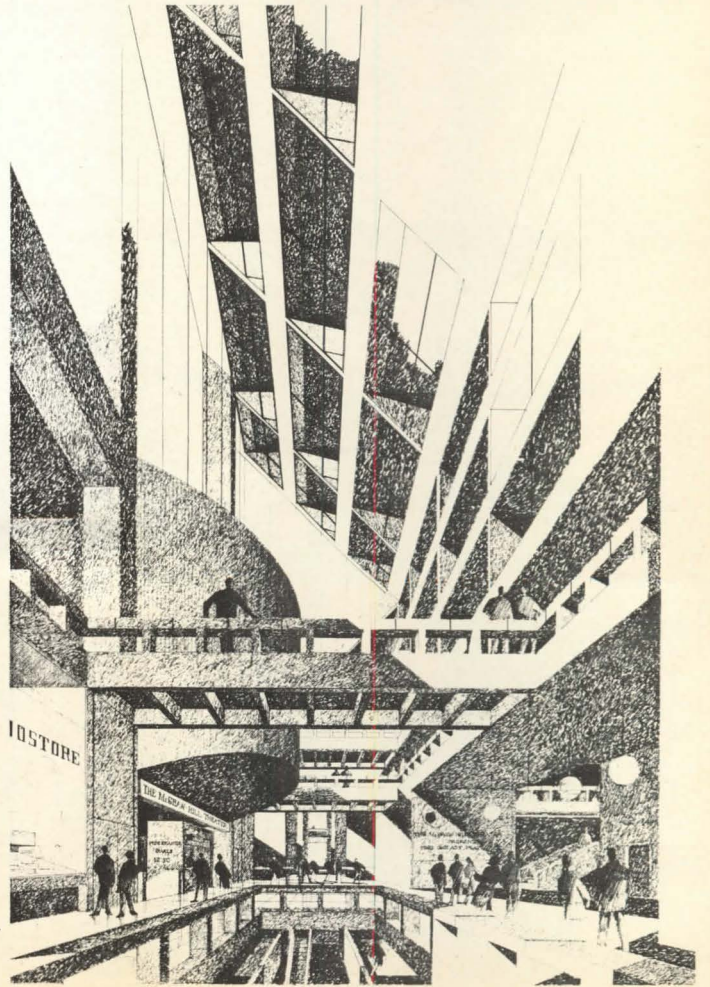
If zoning has in fact become a direct development control, planners clearly have an obligation to encourage the most desirable forms of development. An important step in this direction was taken in New York's 1961 zoning resolution, which provided a 20 per cent floor area bonus for plazas in certain high-density districts. This incentive provision has been widely used, and the results from the point of view of urban design have been at least partially successful. Unfortunately, the proliferation of plazas has accentuated the tendency of zoning to pull development into the center of the block and isolate individual buildings.

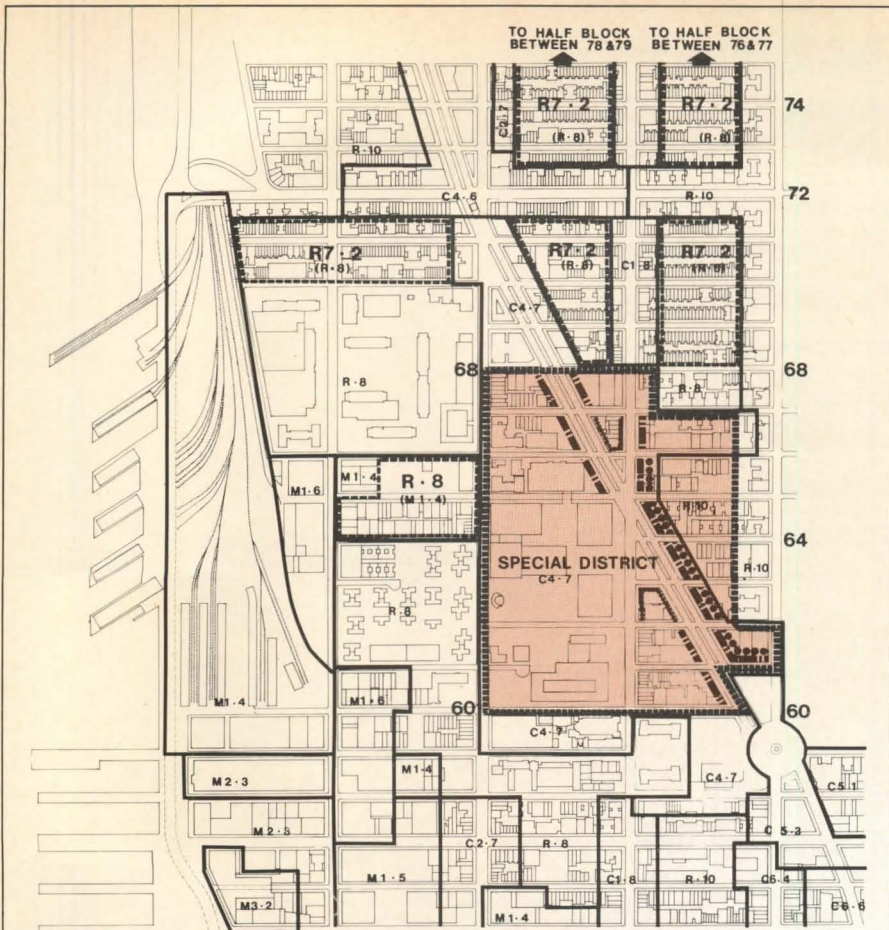
**The concept of a zoning incentive, however, represents a very useful line of development. Our first provision along these lines was the special theater district in the Times Square area of midtown Manhattan.**

The expansion of the midtown office concentration had begun to threaten the



Above: section of the first building to be constructed in New York's special theater zoning district, in which developers are given a bonus of up to 20 per cent more floor area if they build a legitimate theater that meets the Planning Commission's specifications. In this example, now going up on the site of the old Hotel Astor, theatergoers will ascend by a series of escalators to a tall, glassed-in lobby overlooking Times Square. The architects for the building are Kahn and Jacobs; rendering by architect Der Scutt, who is also project designer. The map, at left, shows projected new theaters and mid-block connections in the district, which runs from 40th Street to 57th Street and from the Avenue of the Americas to Eighth Avenue. Four new theaters in three buildings are presently under construction. They range in size from a 2,000-seat house designed primarily for musicals to the 300-seat new home of the experimental American Place Theater. A rendering of an Urban Design Group proposal for a mid-block connection is shown at right. While nothing this elaborate has yet been agreed to by a developer, many links in the system are already committed. The rendering is by William Pedersen.





LINCOLN SQUARE ZONING PROPOSALS

- Mandatory building to lot line (85' to set back)
- Mandatory building to lot line (no set back)
- Mandatory arcade
- R 8 rezoned to R 7-2

Above: Map shows a second special zoning district for the area around the Lincoln Center for the Performing Arts. Developers receive bonuses of floor area for adhering to an urban design plan. Certain features of the plan, such as holding the street line along Broadway to a specified height, are mandatory. Below: This photo-collage was made to try to persuade a developer that a covered interior plaza with suitable bonuses would be a superior alternative to a plaza.

Photo-collage by Jerry Spearman



continued existence of the legitimate theaters, which were an economic land use only because they were old and had been paid for long ago. No private developer can afford to build a major legitimate theater today, and there was no way for the city to insure the preservation of the old theaters.

New York without its Broadway theaters and the Great White Way would not be New York, and the loss of a concentrated theater district would have a destructive effect not only on the theater, but on the city's hotel, restaurant, and tourist buildings—as well as diminishing one of the major attractions that produced the office building concentration in the first place.

Within our new zone, extending from 40th Street to 57th Street and from Eighth Avenue to the Avenue of the Americas, developers can be given a bonus of additional floor space, similar to the one already granted for providing a plaza, if they build a new legitimate theater as part of their building. The profits from this additional floor space offset the losses that can be expected from the theater.

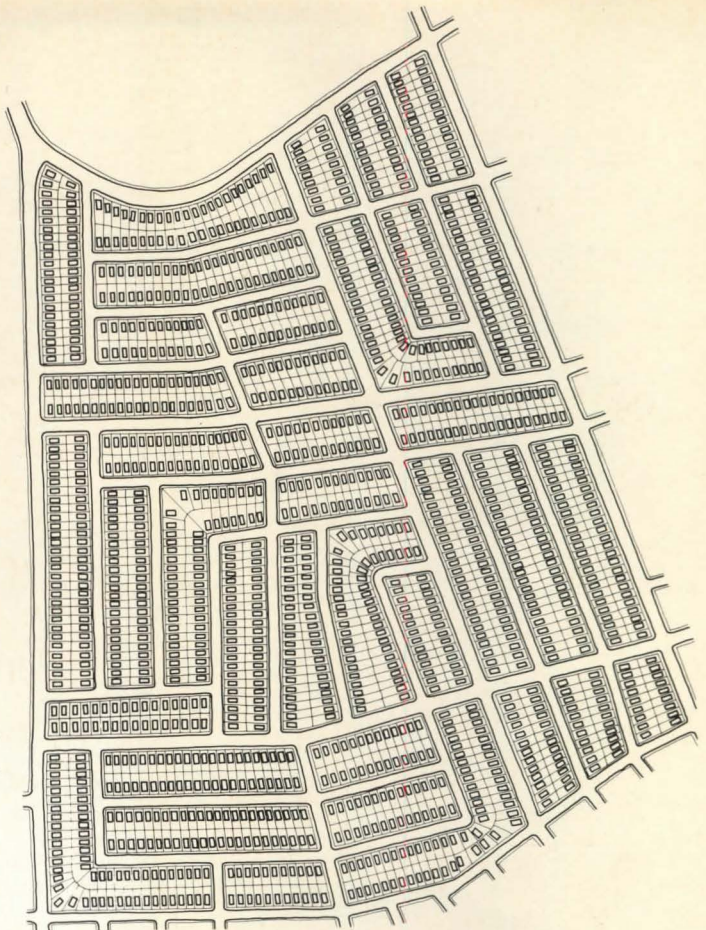
The bonus is discretionary up to an upper limit of 20 per cent, and the Planning Department retained an economic consultant, Richard Steyert, to help determine the appropriate bonus in each case. Developers are also encouraged to provide improved pedestrian circulation, by means of concourses, arcades and mid-block plazas.

**A second special zoning district, created around the Lincoln Center for the Performing Arts, defines the public interest more explicitly and also makes certain requirements mandatory.**

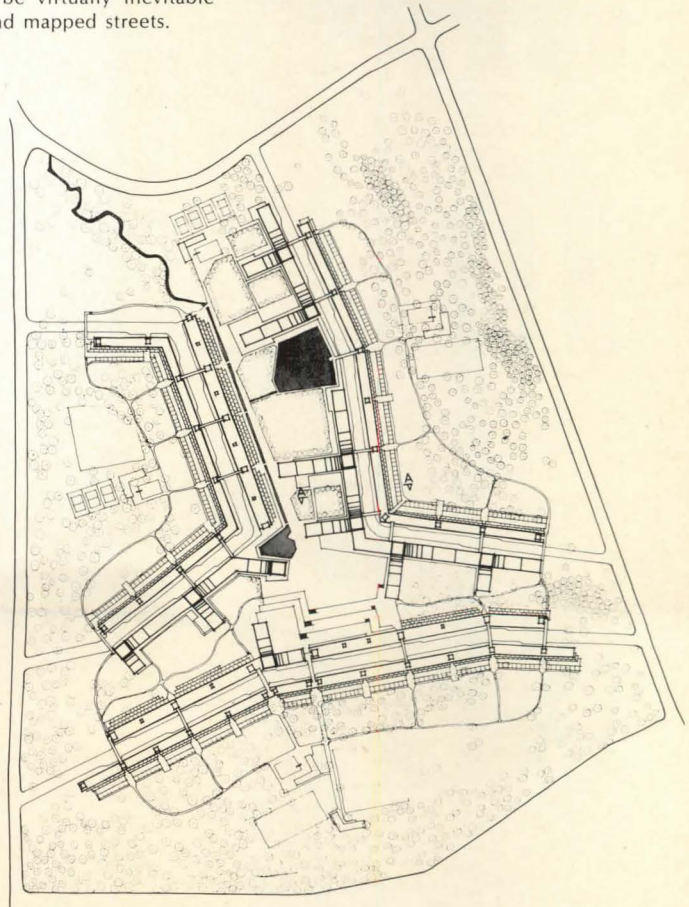
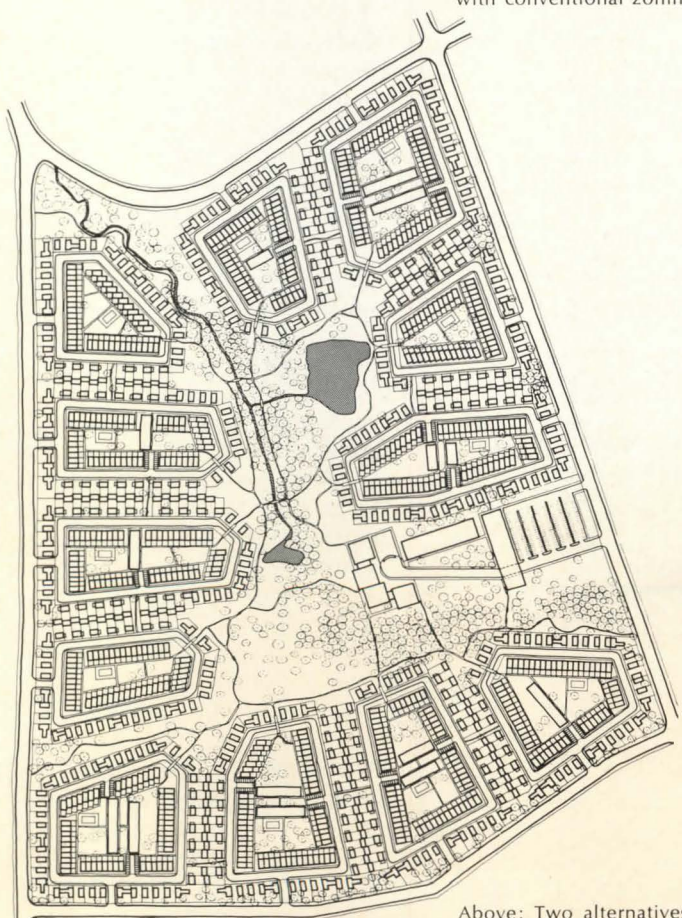
Developers are encouraged to provide a continuous arcade along the east side of Broadway, creating a uniform backdrop for Lincoln Center, as well as a sheltered pedestrian promenade. Plazas for these buildings would be on their eastern side, forming a series of mid-block parks. The law also contains provisions designed to stimulate the construction of gallerias, covered public spaces, and connections to the subway.

**An analogous approach to urban design can be seen in our published standards for cluster development in low-density residential areas.** Cluster zoning is a familiar concept, but there were few precedents for cluster housing at New York densities of 12 to 20 units to the acre. Sweeping changes in the mapped street system proved at least as significant in making cluster development work as easing zoning's minimum spacing and setback requirements.

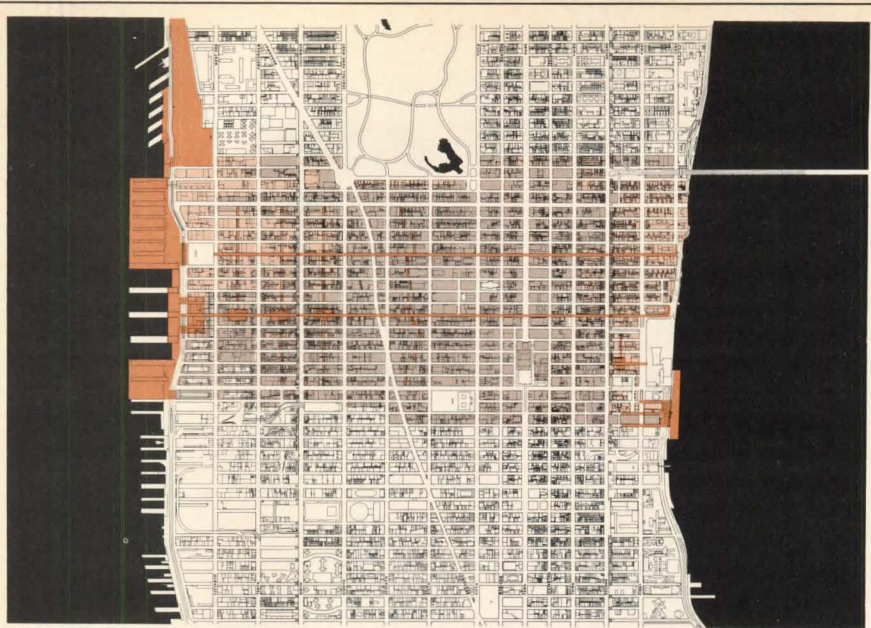
Special zoning districts and cluster development provisions both demonstrate the premise that it is the functional and spatial relationships between buildings that are of most importance to the public, not the design of individual structures. On the following pages, you will see how this type of legislation, combined with more conventional renewal techniques, can make it possible to design whole sectors of a city.



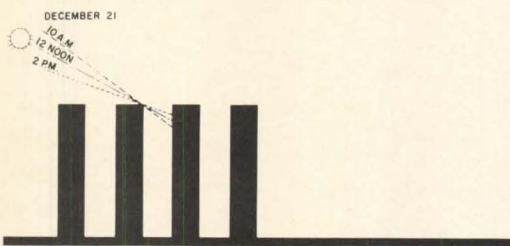
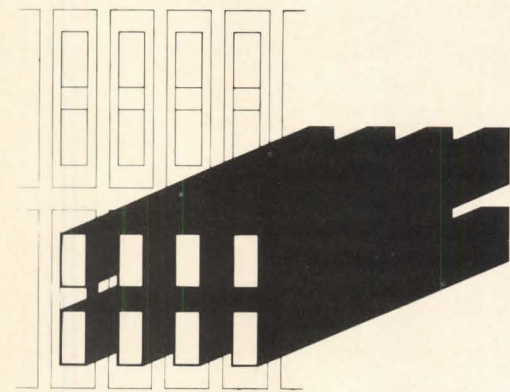
Above, left, the site plan of a large tract of undeveloped land on Staten Island; and, right, the type of development which would be virtually inevitable with conventional zoning and mapped streets.



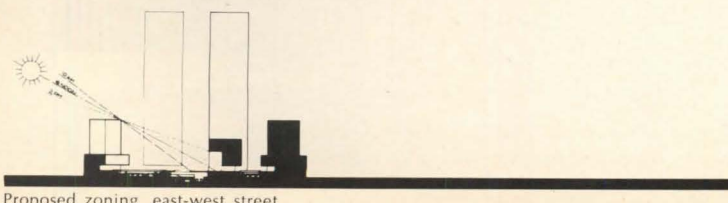
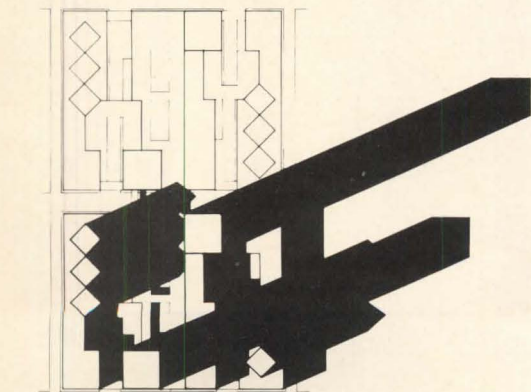
Above: Two alternatives to conventional development available under cluster zoning at the same mapped density. A site plan substantially like the one at left was adopted and building has begun.



Above: Map shows the beginnings of a planning and design policy framework for midtown Manhattan. New cross-town transit links are under study, and one, across 48th Street, has already been funded. This transportation will open the area west of Ninth Avenue to high-density commercial development for the first time. It is proposed to concentrate the first increment of new office construction in a four-block-wide strip along 48th Street, reserving the area to the north for residential buildings, and to the south for later commercial expansion. This concentration of development permits the design of a coordinated plan that provides a circulation and servicing system far more complex and sophisticated than could be achieved by use of the street alone. Also shown are first steps in recapturing the waterfront for general recreational use above and around the new liner terminal on the Hudson, and adjoining the U.N.'s expansion along the East River. At left is a series of diagrams contrasting the effect of conventional zoning regulations with a coordinated design plan. The top two drawings show that, although a primary purpose of zoning is to safeguard light and air, very little of either is preserved in intensively developed districts. The contrasting drawings show the superior effect of a design plan that takes orientation and topography into account.



Existing zoning, east-west street



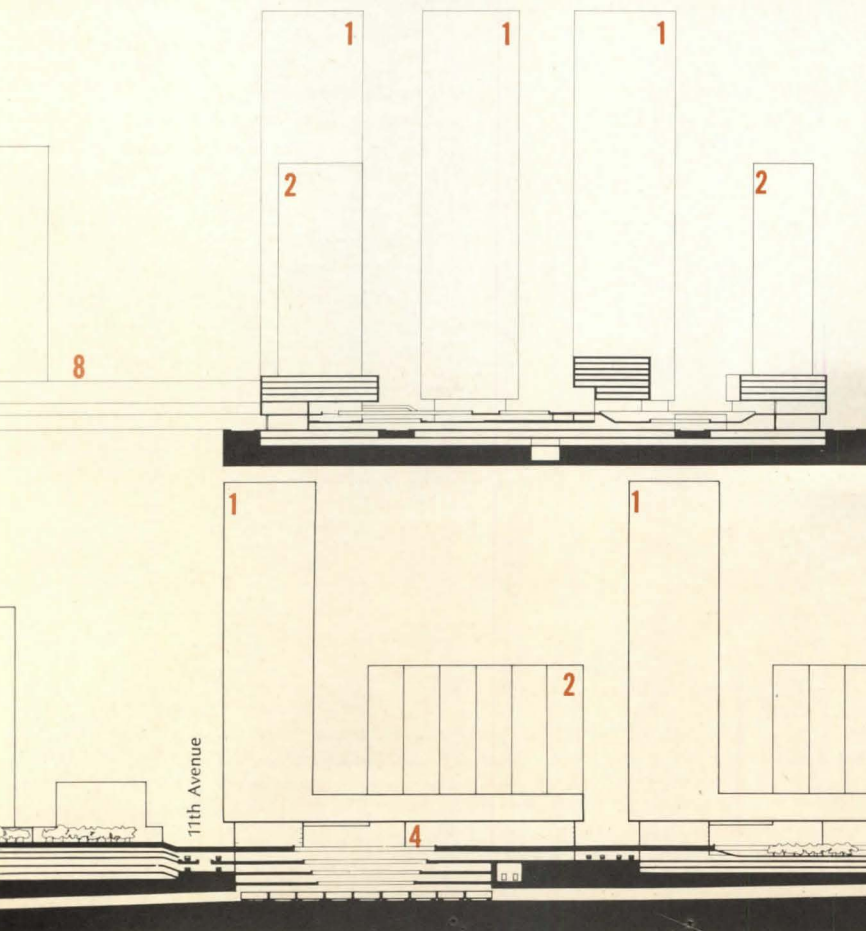
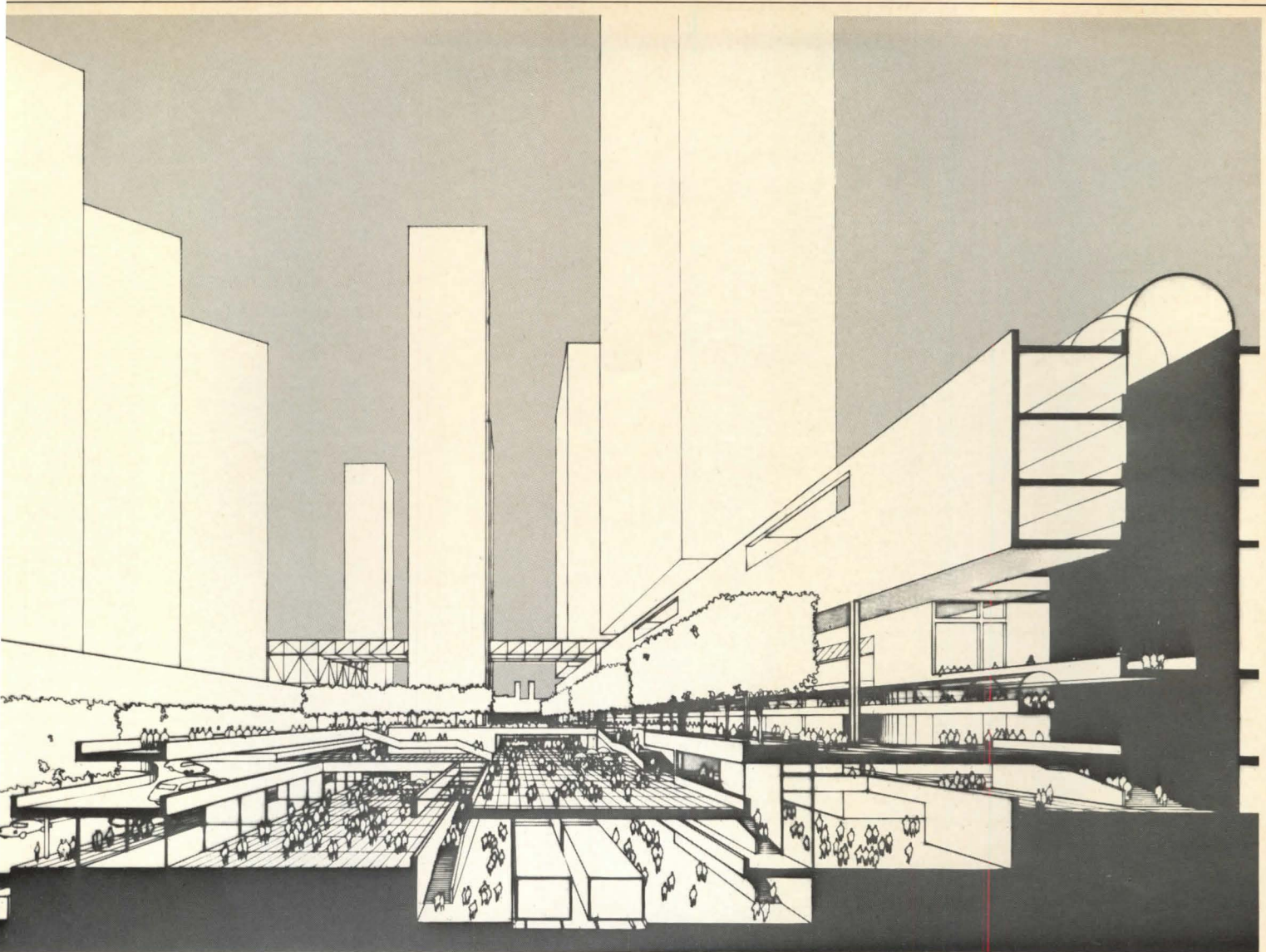
Proposed zoning, east-west street

One of the most critical aspects of the recently published New York City master plan is the programmed expansion of Manhattan's business center in order to preserve New York's role as the nation's center of business, finance and the arts. The visitor to Manhattan may not believe that further expansion is possible, and, indeed, this concept of increased concentration has been the plan's most controversial provision.

There is in fact plenty of physical space for such an expansion of commercial and office buildings, but the manner in which this change occurs is absolutely critical. Multiplying the type of plot-by-plot growth which has taken place in the last 20 years would be disastrous. What is required is a three-dimensional physical design which will describe a coordinated expansion plan. This plan should provide for underground truck service, pedestrian concourses running directly from the subway to the buildings served, and covered pedestrian malls, as well as second-level connections that will take people across intersections and provide extra shop frontage. Provisions of this sort not only would make increased office density tolerable, but would create a framework that could be gradually extended to take in earlier development.

These kinds of remedies have been prescribed often enough in the past. However, past proposals have always required the municipality to take on major new capital expenditures; and, with the current state of city finances and priorities, relatively little money is available. It is the construction of a new subway across 48th Street (funded by a state bond issue) that provides an opportunity to plan the expansion of the midtown area. This subway will open up prime office building sites that have been inaccessible up to now. In the past the increased land values created by the subway would fall to whomever happened to own land in its path. This time, it is proposed to condemn a two-block wide strip along the subway route at rates based on current valuation, and transfer the land at cost to a development corporation which will set design controls. This form of capitalization, plus incentive zoning devices accompanying the necessary zoning changes, should be able to finance development like that shown at right. The proposal also includes a new passenger liner terminal at the Hudson River and New York City's first full-sized convention hall.

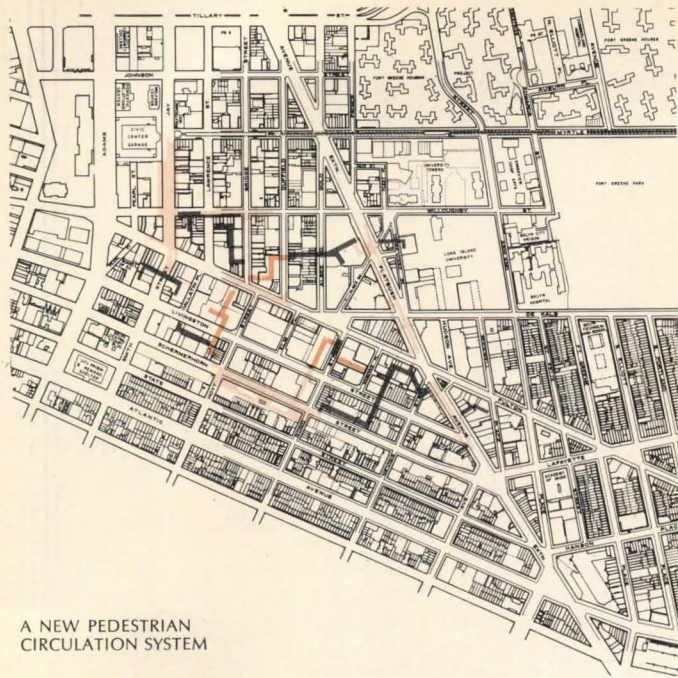
The plan also contains provisions for rehousing present residents of the area, many of whom have low incomes and have lived in the neighborhood for years. New housing is to be built around DeWitt Clinton Park, some five blocks to the north, and zoning and housing policies already enacted confirm this area as a residential neighborhood for all income levels.



- 1 Office tower
- 2 Housing
- 3 Hotel
- 4 Retail
- 5 Theater
- 6 Museum
- 7 Superliner terminal
- 8 Convention center

The drawings on this page show a more developed version of the coordinated zoning section indicated in the diagram at the bottom of the preceding page. As the section perspective, above, shows, it is the design of the relationships between the buildings that is important, not the appearance of the individual office and apartment towers. These will be developed at different times by a variety of architects, and the details of their design are left up to them. Note the effect of topography on the section at the bottom of the page. Pedestrians entering the complex at grade along Eighth Avenue will cross over the West Side Highway at the same level five blocks to the west.

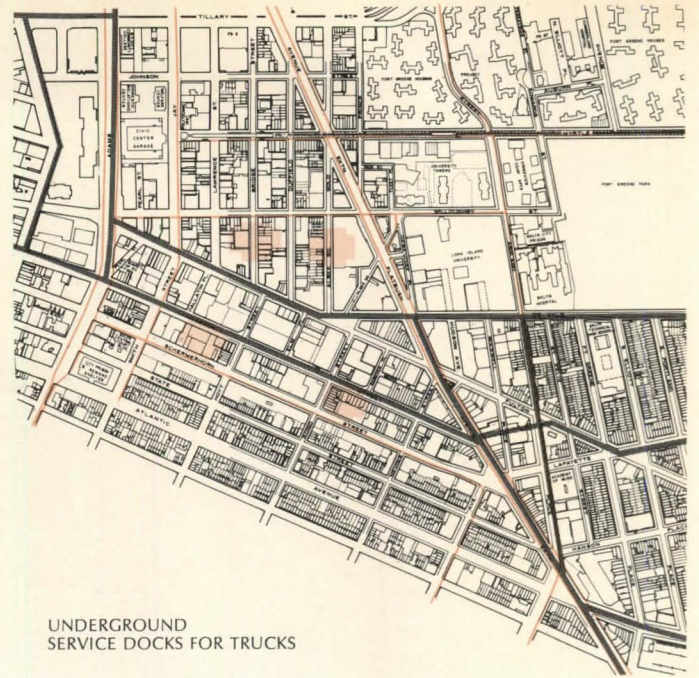
GOALS FOR DOWNTOWN BROOKLYN



A NEW PEDESTRIAN CIRCULATION SYSTEM

- Existing subway concourse and platforms
- Concourse system—existing
- Concourse system—extensions

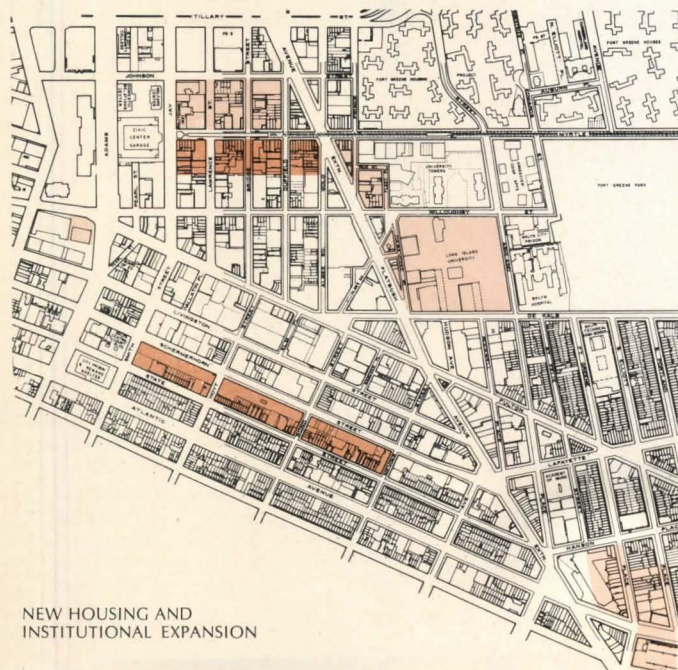
Downtown Brooklyn's existing transportation system is one of its major assets. All the city's transit lines are funnelled through this small area, which is only one stop from lower Manhattan. The extensive existing subway concourses provide an opportunity to create a second-level pedestrian concourse system, analogous to the one in Montreal. The missing links could be paid for by a zoning incentive system.



UNDERGROUND SERVICE DOCKS FOR TRUCKS

- Underground truck distribution centers
- Bus routes
- Car routes

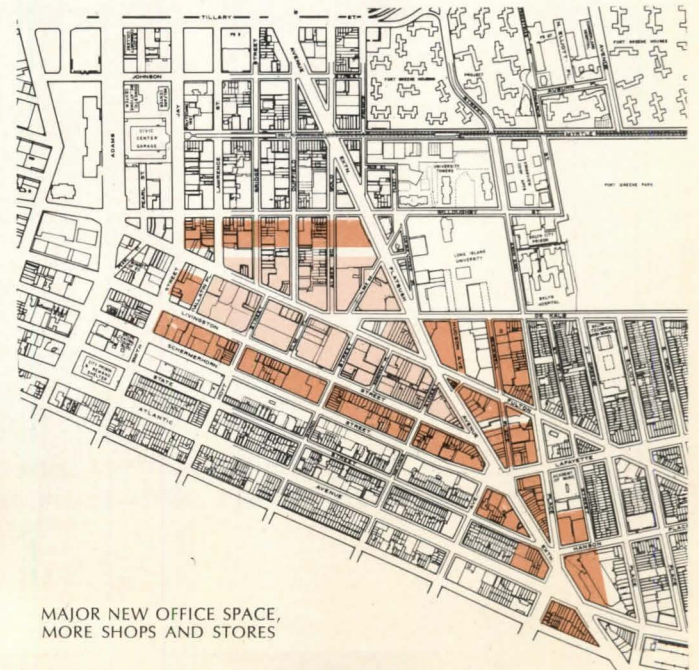
The major cause of traffic congestion in downtown Brooklyn at this time is the presence of trucks making deliveries to stores and warehouses. By providing a system of underground truck docks, partly on city property, servicing could be taken off the streets as part of a development plan. This move would create greater capacities on certain avenues, allowing them to become through traffic routes. Fulton Street, the main shopping artery, could then become a restricted street with wider sidewalks, special bus stops, and bus traffic only.



NEW HOUSING AND INSTITUTIONAL EXPANSION

- New residential (5,000 units)
- Expanded and new educational facilities

There is enough vacant or under-utilized land surrounding the downtown Brooklyn commercial center to provide space for 5,000 badly needed new housing units, as well as expansion room for some of the most severely restricted of downtown Brooklyn's many educational institutions. Some of the new housing can be for faculty and students at these colleges and universities. Stronger educational institutions, and more residents, would, of course, both have a beneficial effect on the shopping and office center.



MAJOR NEW OFFICE SPACE, MORE SHOPS AND STORES

- Intensified commercial
- New office center

The capacity of the existing shopping area is large enough for at least one new department store, probably two, as well as additional secondary frontage. In a separate city, such a large commercial area would almost certainly have generated considerable office building development. In downtown Brooklyn today, there is almost no office space; but consulting studies indicate that a potential demand exists. The presence of a ring of new offices around the commercial district will strengthen the shopping street, while the presence of good shopping helps attract the offices.



**Downtown Brooklyn, just across the East River from Lower Manhattan, is New York's second largest shopping center,** but it is more similar to the downtown area of a separate city like Cincinnati or Dallas than to midtown or lower Manhattan. Downtown Brooklyn's proximity to the Wall Street area has tended to blind everyone to its independent significance; it has been largely overlooked by real-estate developers and has not received the kind of urban renewal attention that a commercial center of comparable size would have received in any other location.

Although downtown Brooklyn today is a thriving commercial complex, its immediate surroundings consist of vacant land and decaying warehouse buildings. The increasing number of suburban shopping centers in the outer parts of Brooklyn and in Nassau County on Long Island suggest that downtown Brooklyn is at a turning point: it can either take advantage of the growth opportunities surrounding it and improve its competitive position, or the process of decay may begin to set in.

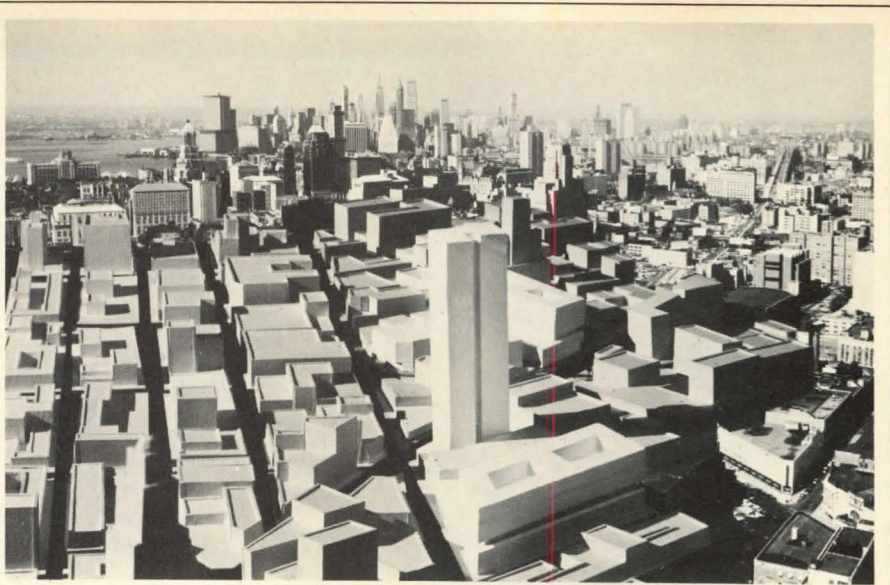
An examination of downtown Brooklyn's problems and assets reveals a very favorable balance. There is an excellent existing system of mass transit access; major educational and cultural institutions surround the center on three sides, and there are several prosperous nearby neighborhoods. The problems stem largely from traffic congestion (caused by truck deliveries to the stores and traffic crossing Brooklyn on its way to and from Long Island) as well as fragmented land holdings and an intentionally conservative zoning pattern.

Our plan is based on the assumption, reinforced by a number of consulting studies, that there is a strong potential for further commercial and office building development in downtown Brooklyn, with office tenants representing both an overspill of "back office" space from lower Manhattan and those seeking a Brooklyn location.

If governmental powers are used to increase the allowable building bulk and to help assemble land, we believe that the downtown Brooklyn center can be virtually self-renewing, without subsidies. In fact, we intend to use this combination of incentives to enable private capital to build the underground truck service and pedestrian concourse system which is needed to make such a new business center work.

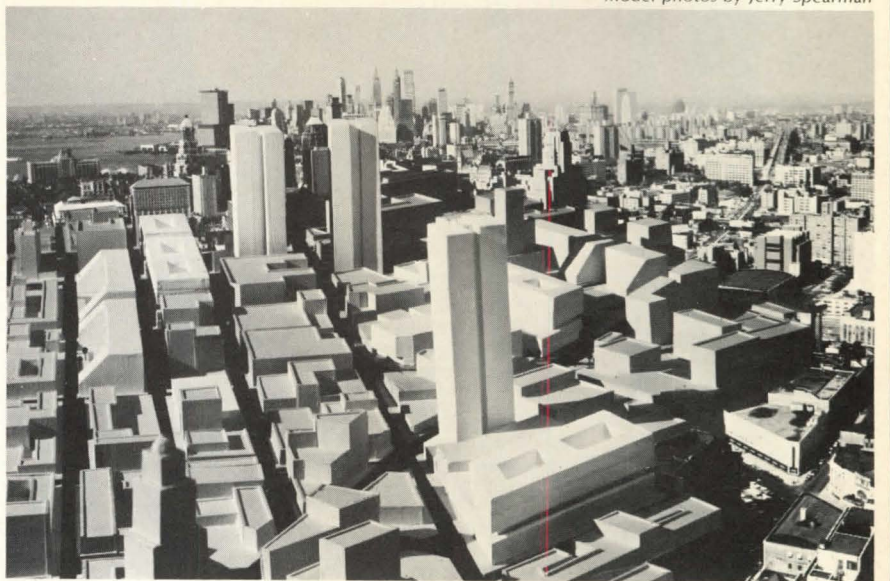
One of our consultants, Vincent Ponte, has helped us to work out a system of renewal that is staged over a 15-year period. Existing subway concourses will be linked into a new system comparable to the one in Montreal, the four underground truck docks will enable a new traffic pattern to be created, and there will be balanced increments of new commercial space, housing, and parking garages.

Again, as in midtown Manhattan, our design effort has centered around the functional relationships between buildings, and in finding an appropriate financial mechanism to see the plan carried out.



Downtown Brooklyn Development Plan, stage one: 1975. The first development centers around Fulton Street's weaker eastern end, includes a new office tower, a department store, and the first garage and truck dock.

*Model photos by Jerry Spearman*



Downtown Brooklyn Development Plan, stage two: 1980. The next stage includes additional office towers, the beginning of residential construction, and the first stage of special large-floor office buildings.

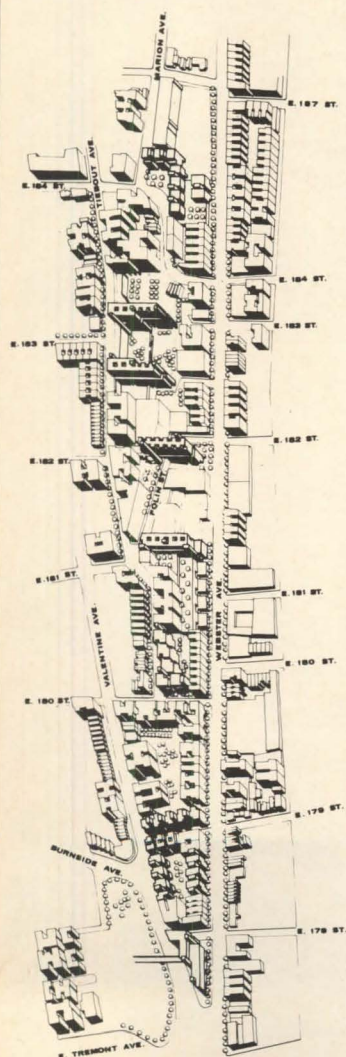


Downtown Brooklyn Development Plan, stage three: 1985. This final photograph shows the full extent of development. Plan is based on construction by private enterprise, without government land subsidy, but with government-assisted assemblage, and special zoning incentives.

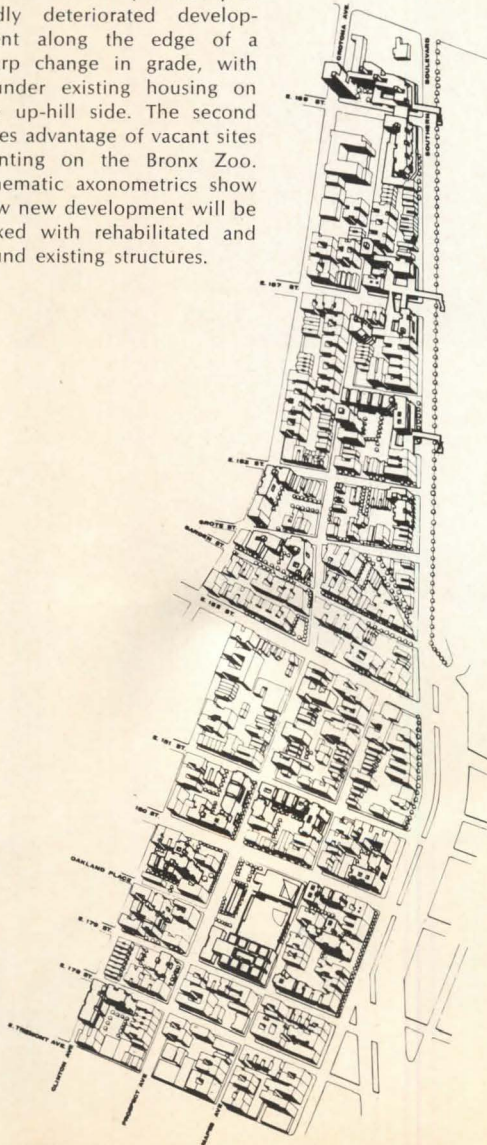


Map, above, shows area in Bronx of pilot neighborhood planning study. On basis of surveys and consultation with community groups, two areas of concentration were selected. One occupies a strip of badly deteriorated development along the edge of a sharp change in grade, with sounder existing housing on the up-hill side. The second takes advantage of vacant sites fronting on the Bronx Zoo. Schematic axonometrics show how new development will be mixed with rehabilitated and sound existing structures.

TWIN PARKS WEST



TWIN PARKS EAST



There are vast areas of New York where no thriving real-estate market exists to be channeled through zoning and the other kinds of incentives described on the foregoing pages. These neighborhoods require a totally different approach.

Traditional urban renewal was based on the assumption that physical decay in the city could be treated surgically—by removing diseased areas and replacing them with sound development. The 1965 report of the Community Renewal Program made it clear that these kinds of renewal programs could never catch up with the city's housing needs. At the same time, extensive community opposition to various renewal proposals made it equally plain that total clearance of whole neighborhoods was no longer acceptable anywhere in the city.

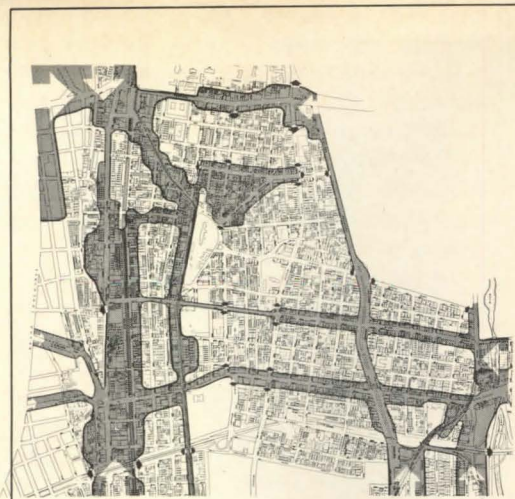
In an urban area as completely built up as New York, the combination of these two factors amounted to a dead end; and, when the Lindsay administration took office, the renewal process was almost at a standstill. A totally new approach had to be devised. The solution was to take the idea of smaller, "vest-pocket" housing projects, which were already being tried on an experimental basis, and deploy them strategically in the context of neighborhood planning programs designed to promote rehabilitation and maintenance of the existing housing stock. This concept was later made part of the Federal Housing Act of 1968.

Neighborhood planning requires the active participation of the present residents of the area, if only because they will be the future residents as well. We believe that community participation also improves the quality of the plan by providing information and criticism somewhat analogous to that given by the client during the design of a building. Community participation also keeps local residents informed about what is being planned, and helps to build a constituency to assure implementation.

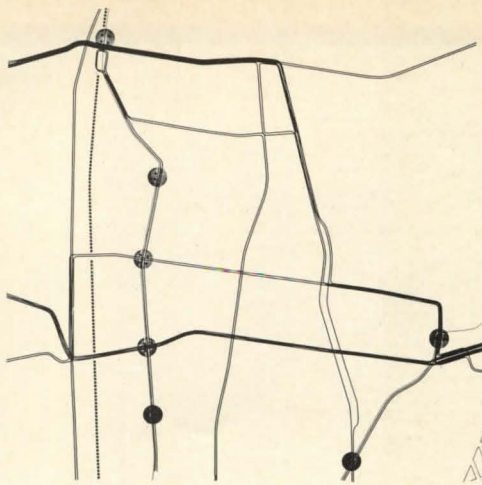
Our assignment in the East Tremont area of the Bronx was to work with various community groups to select "vest-pocket" housing sites, and, in the process, to start defining which decisions can appropriately be left to neighborhood residents and which must remain the primary responsibility of planning and design professionals.

Our approach, shown on these pages, was to select two areas of concentration where we felt new construction would have the most beneficial effect. Within these areas, renewal is programed as a staged combination of new buildings and rehabilitation. At the same time, we drew up a framework for future planning decisions.

Vest-pocket housing is primarily a conservation program; it is not designed to produce substantial increases in the city's housing supply or sweeping changes in the character of a district. The new buildings are more costly—and more trouble to design—than conventional structures, but these costs are justified by the social stability and physical conservation obtained by planning in a neighborhood context.



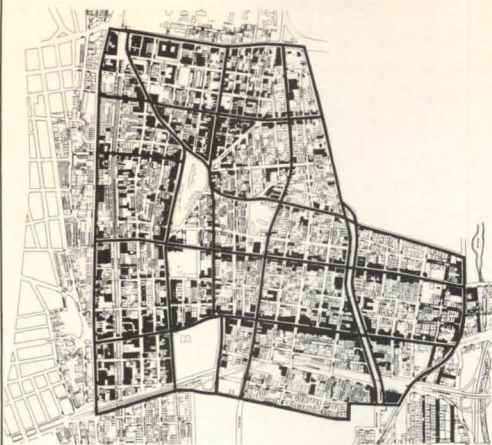
1. Map shows pattern created by existing zoning. Commercial and industrial districts create residential sectors.



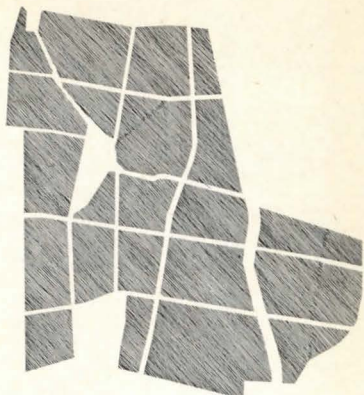
2. Bus and rapid transit routes reinforce zoning pattern. Circles indicate rapid transit stations, single lines bus routes.



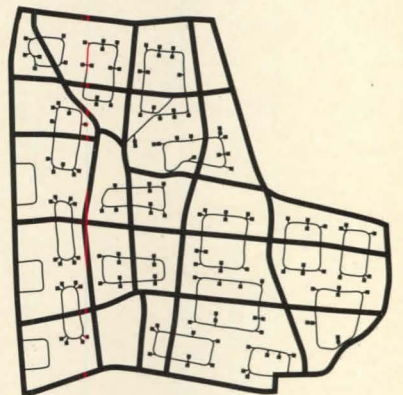
3. Streets that are blacked in are used primarily for access to fronting property, rather than for traffic.



4. The remaining traffic streets, shown blacked in on this map, relate closely to existing commercial frontages.



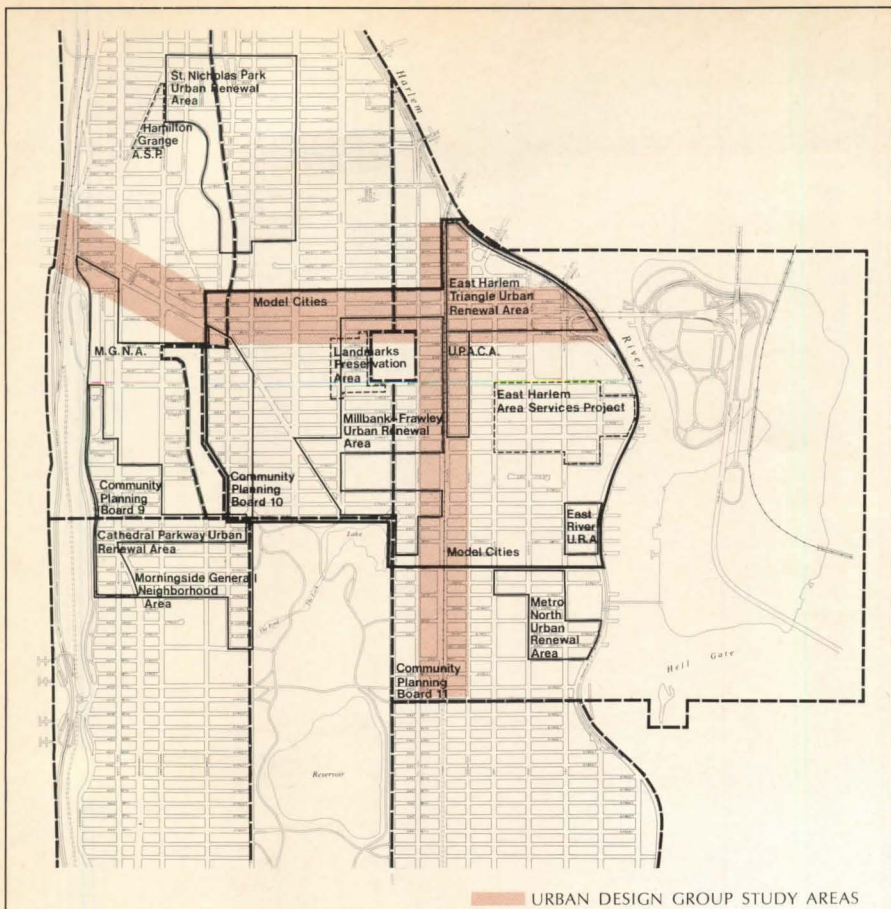
5. A synthesis of the above four factors produces a sector map that corresponds closely with local neighborhoods.



6. New street map shows how access streets could be looped, and given parking cul-de-sacs, leaving land for parks.

Map at right shows first-stage housing and rehabilitation sites in relation to evaluation map of whole area. Local residents, using evaluation map and neighborhood structure analysis can make more informed decisions about priorities for future housing sites.

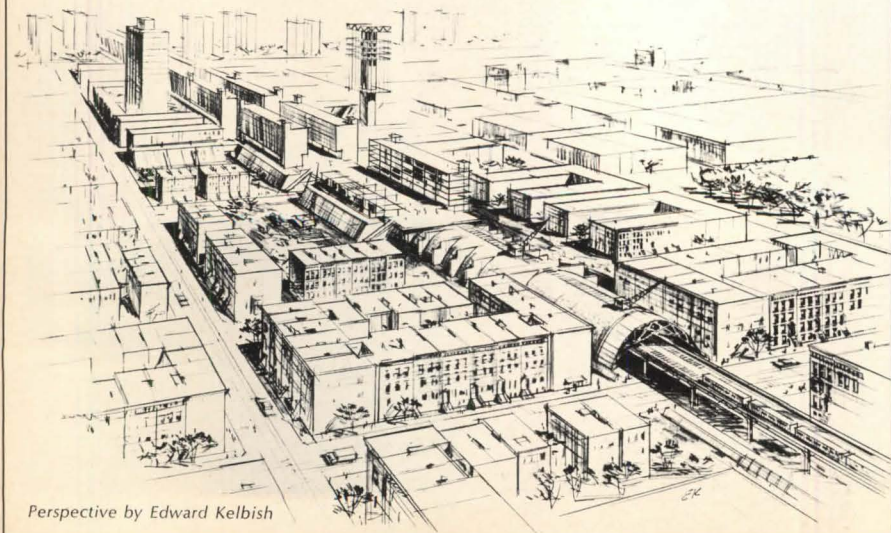




URBAN DESIGN GROUP STUDY AREAS

The perspective, below, was drawn for an exhibition at the Museum of Modern Art done by founding members of the Urban Design Group before they joined the New York City Planning Department staff. Sketch shows redevelopment of air-rights over Penn-Central railroad between 97th Street and 134th Street in Harlem. Concept required that all construction be done in two- to three-year period. Map, above, shows some of overlapping political and planning jurisdic-

tions in Harlem, one reason why only incremental development is practical suggestion. Maps on facing page, for the same railway air-rights corridor and for 125th Street, show possible responses to this situation. Zoning proposals for 125th Street depend on through traffic being shifted to streets on north and south. Railway air-rights proposal is based on zoning and street mapping powers of city, and does not specify physical design concepts in detail.



The Harlem Model Cities area is a part of New York where the kind of "vest-pocket" programs discussed on the previous two pages cannot solve all the problems. There is no ready alternative, however, as Harlem is a densely populated and fully developed area where there are few opportunities for large-scale redevelopment that do not involve the displacement of large numbers of people.

Earlier city policies accepted this relocation factor as inevitable, in fact desirable. Planners were working towards a thinning of residential densities, and wide swaths of new housing were cut through the Harlem area. Few of the people displaced by this process were able to return by the time the new housing was finished. If there had been a large number of good apartments available elsewhere in the city, this displacement policy might have been acceptable. With the housing shortage as serious as it was, however, the result was hardship for the people who had to move, and a multiplication of crowded conditions in other parts of New York.

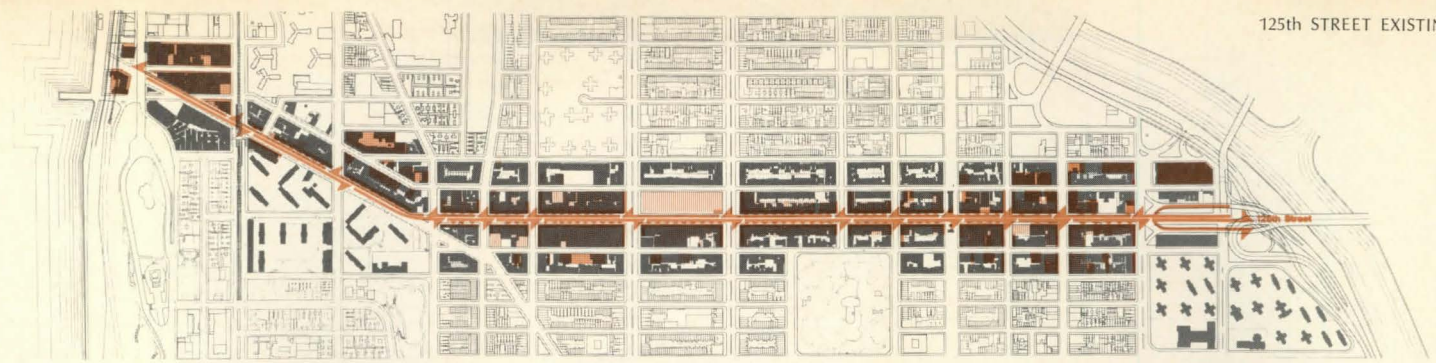
We made this problem our subject for an exhibition on urban planning that was shown at the Museum of Modern Art in January of 1967, and we were immediately struck by the strategic position occupied by the elevated railway viaduct that runs along Park Avenue from 97th Street to 134th Street and the Harlem River. This viaduct has been both a barrier and a serious blighting influence; but the air rights over it represent a major opportunity as one of the very few areas of potential development in Harlem that do not require much relocation.

The question we asked ourselves was whether the cost of developing the air rights and the immediately adjacent frontages was in any way comparable to the cost of condemning and clearing a similar quantity of land under conventional renewal procedures. The work done for the exhibition indicated that we had the beginnings of a feasible project; and, when we began to work for the city, we were asked to investigate these air-rights possibilities in more detail.

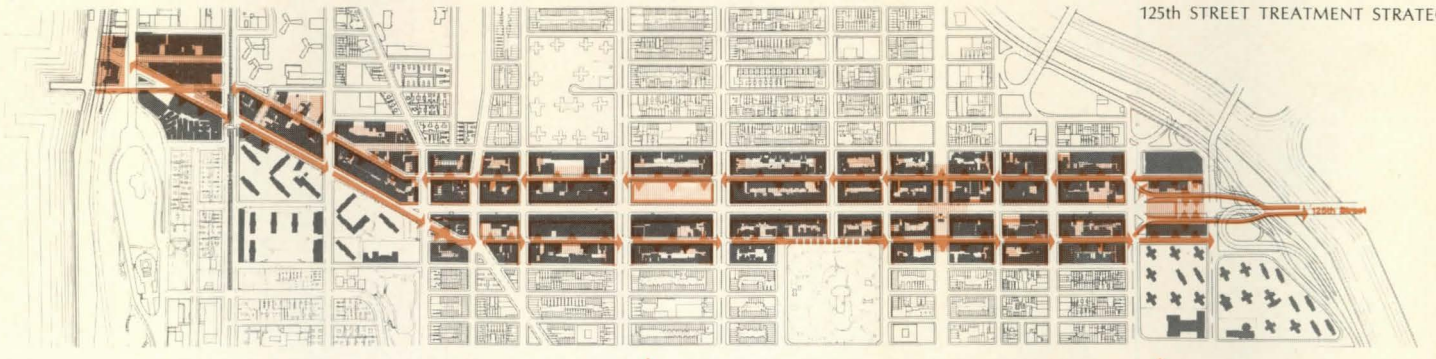
These studies have been complicated by the near impossibility of retaining engineering consultants under the city's contract procedures, by suspicion on the part of neighborhood residents (quite justified, in view of previous city actions) and by the political complexity of the various Harlem communities.

However, we have been able to reach a number of conclusions, some of which are shown on these pages. We now realize that the ability to accomplish redevelopment in increments is essential for feasibility, and that the air-rights development is only part of the complex series of questions relating to residential density in all of Harlem. We have also extended our work to include the development potential of 125th Street, Harlem's major shopping area, which might help finance the cost of new housing in a manner similar to that envisaged for the west midtown development.

125th STREET EXISTING



125th STREET TREATMENT STRATEGY

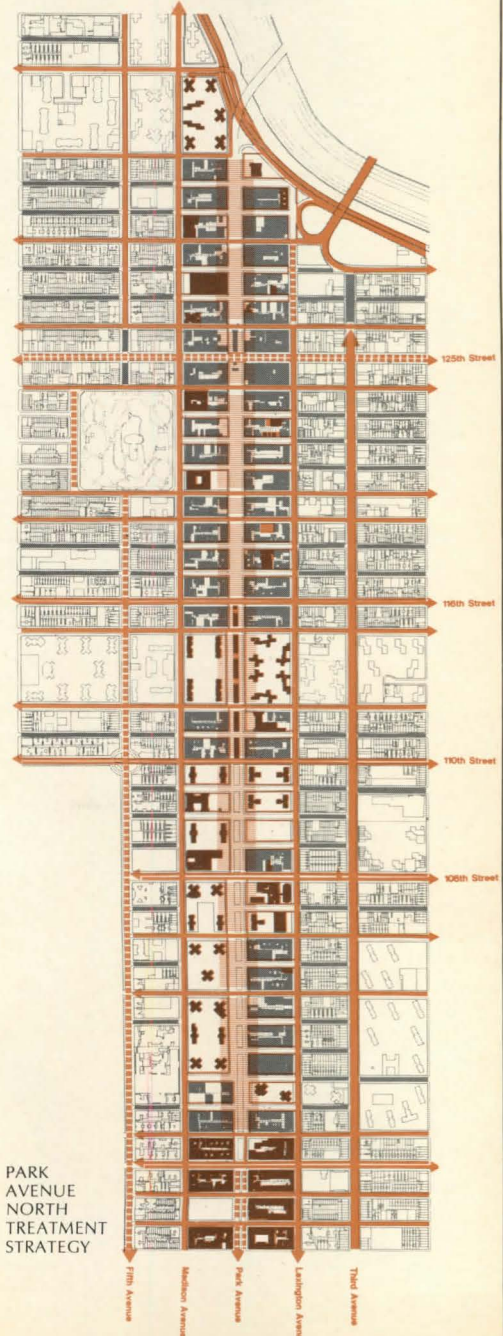
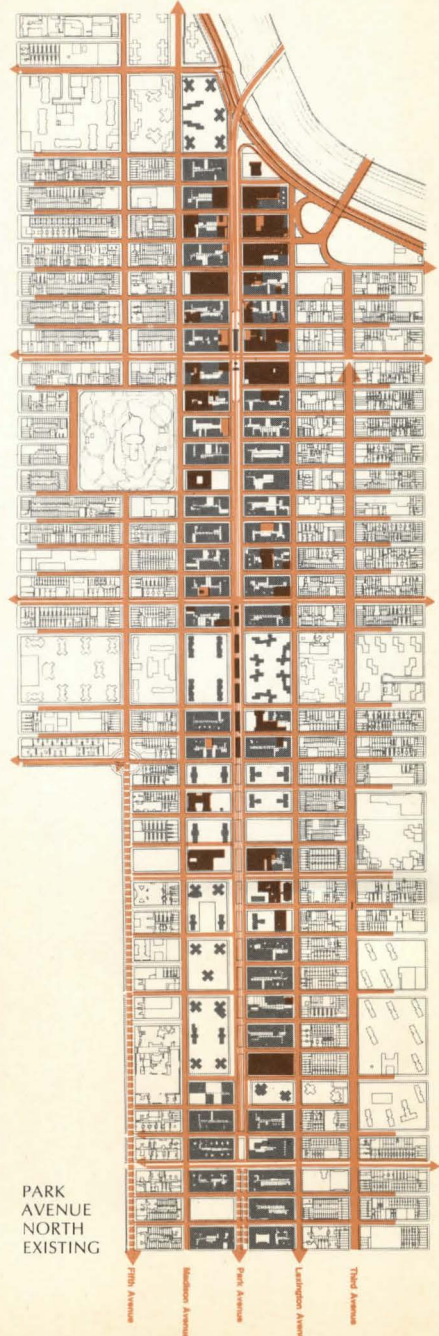


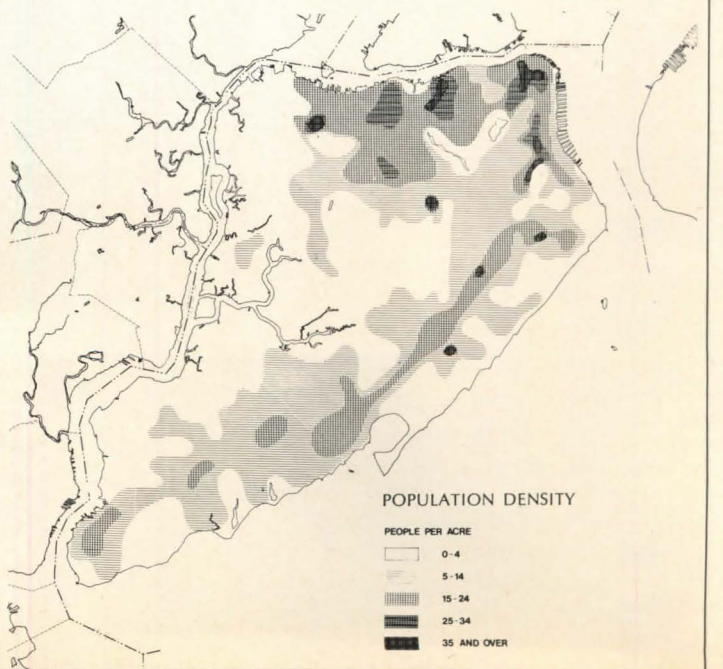
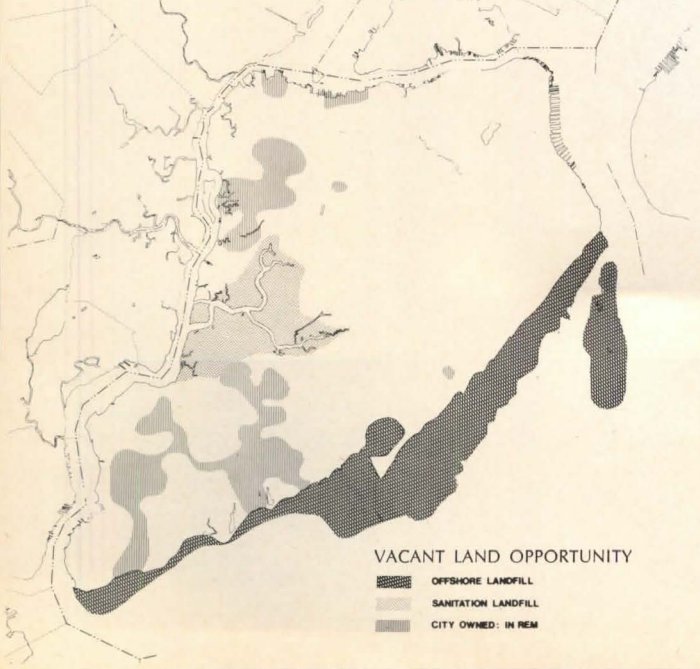
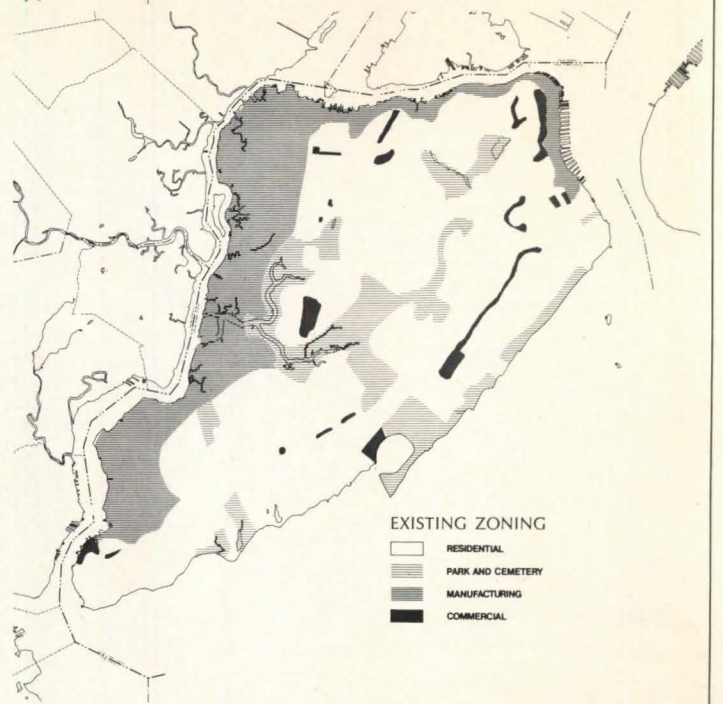
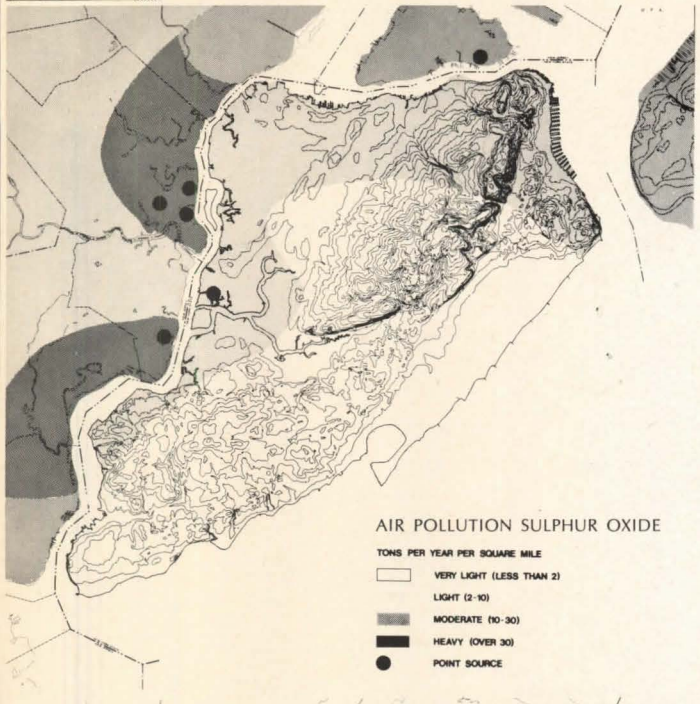
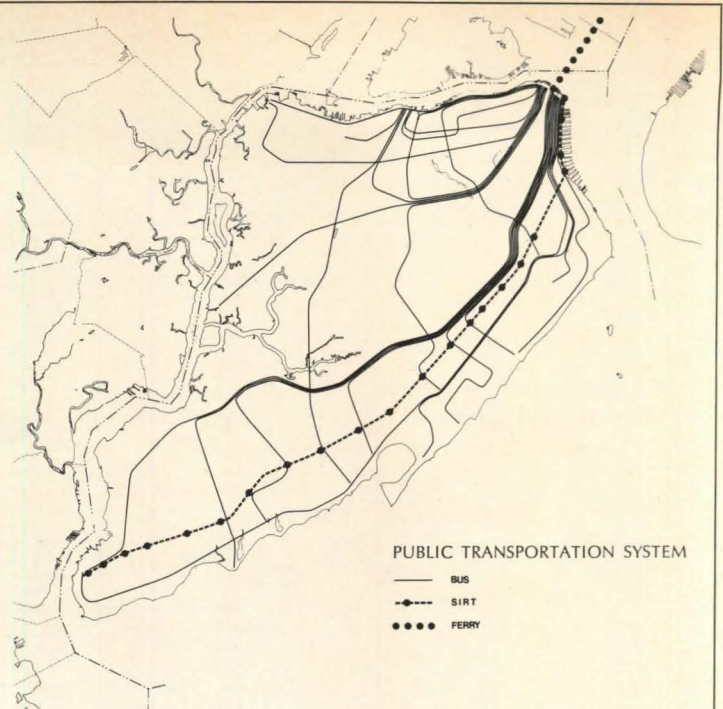
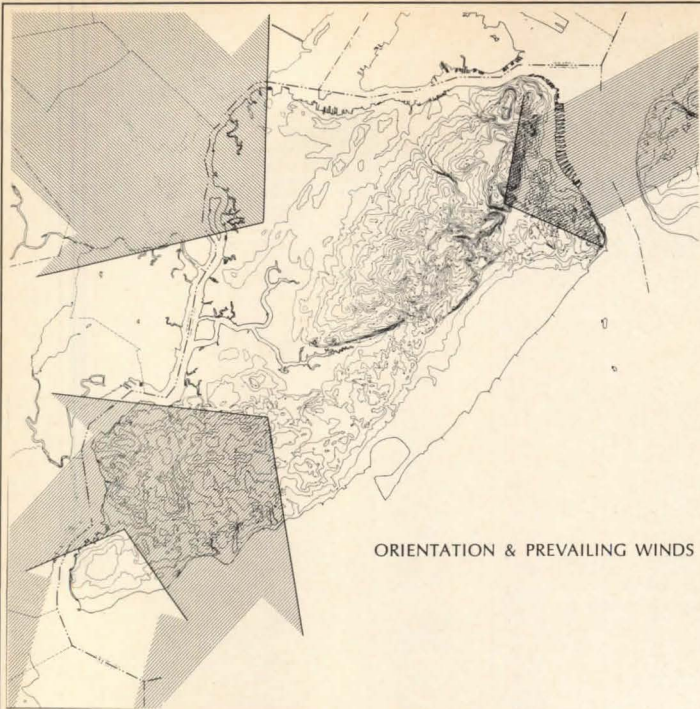
- 125th STREET EXISTING**
- Street level retail
  - Retail—commercial
  - Manufacturing, warehouses, parking structures
  - Parking & servicing
  - Major traffic flow

- 125th STREET TREATMENT STRATEGY**
- Street level retail
  - Retail—commercial
  - Residential—commercial
  - Residential
  - Industrial
  - Parking & service entrances
  - Major traffic flow
  - Increased pedestrian ways

- PARK AVENUE NORTH EXISTING**
- Traffic right of ways
  - Traffic—non-commercial
  - Railroad viaduct
  - Residential land
  - Non-residential land

- PARK AVENUE NORTH TREATMENT STRATEGY**
- Thru traffic streets
  - Non-commercial traffic
  - Local traffic streets or potential street closings
  - Special treatment area
  - Residential land
  - Potential increase in residential land
  - Hard areas





The idea that the city itself could be the product of design is generally viewed as a desirable goal; but most successful examples have required the exercise of almost despotic power. If Baron Haussmann had had to accept community participation, Paris would still be a medieval city. In the United States, the city beautiful movement was at its most successful when it dealt with parks and waterfronts. Where the interests of large numbers of people would have had to be sacrificed for this kind of physical planning, it was usually the plan—and quite correctly—that ended up being sacrificed.

We have begun to see, however, that the design process is a useful tool for studying large-scale policy questions that are generally not associated with urban design at all. The series of maps shown on these pages is part of a much larger sequence that shows how the entire borough of Staten Island can grow from its present population of less than 300,000 to an area with a population of well over a million, a growth possibility that could improve the city's flexibility in dealing with its housing problems.

There are really three different kinds of map involved. The first is a series of inventory drawings that document existing physical conditions such as topography, prevailing winds, air pollution, and existing transportation, as well as opportunity areas such as under-utilized or vacant land.

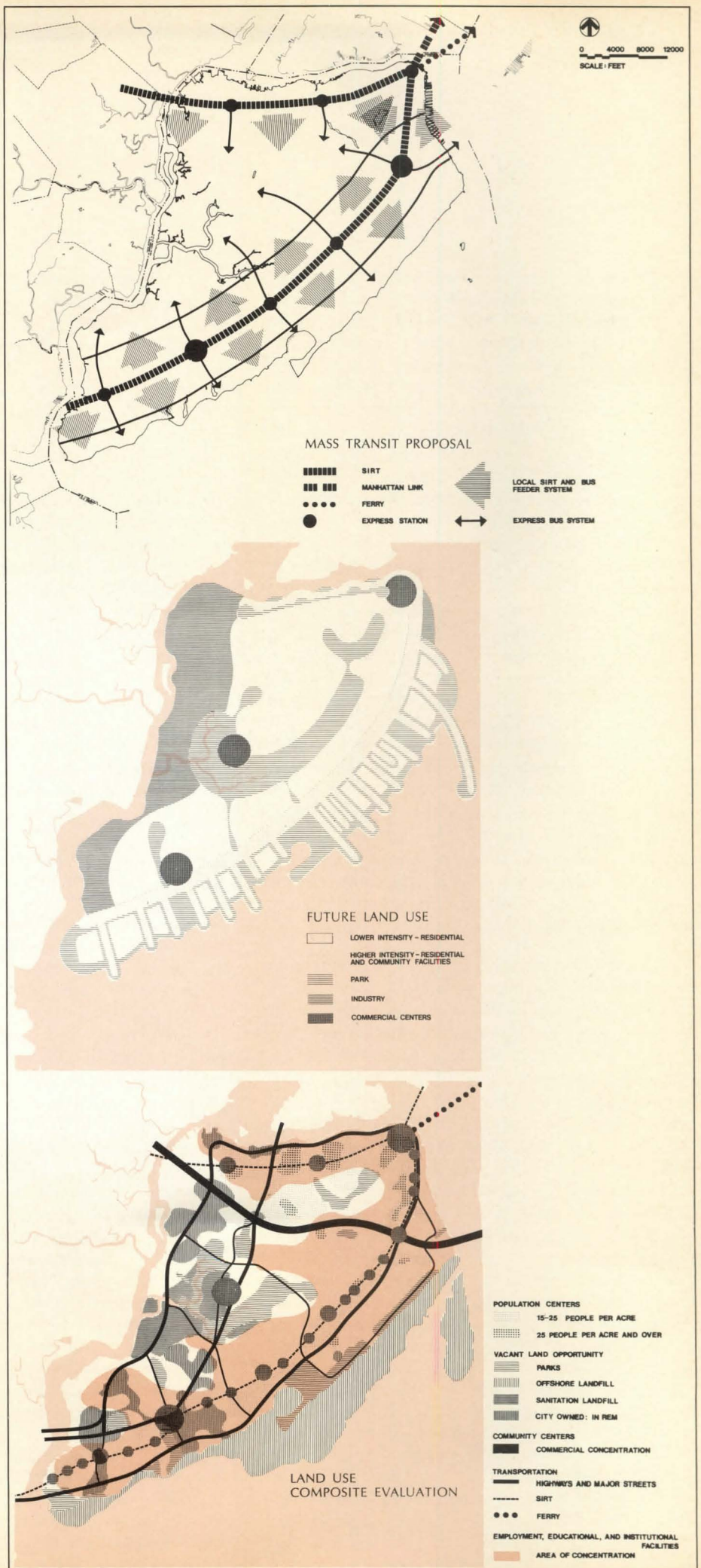
The second set represents a synthesis of these physical factors into a policy hypothesis. For example, topography, climate, transportation and many other factors all indicate that the eastern part of Staten Island is the most logical area for high-density development.

Finally these policy hypotheses are tested against the available opportunities. There is actually more vacant land in the western part of Staten Island than on the east, but air pollution and lack of public transport indicate that it is more desirable to make this western land available for industry or low-density housing, and to use land fill to create more land on the eastern shore. These decisions are then related to highway plans and street patterns to produce the final result.

This analysis may seem so straightforward as to be obvious without such an elaborate presentation, but in fact, earlier, and less systematic, policy studies identified only the southern part of Staten Island as a major opportunity area, because only certain kinds of vacant land were considered.

There are strong similarities between this map series and a set of drawings articulating the steps by which a building is designed, although the result is very abstract, and is simply a large-scale policy framework for more detailed subsequent studies.

We believe that an analogous approach can be used to analyze the city's more built-up and populous boroughs, and that ultimately it is possible to produce a series of policy maps which will frame the alternatives for growth and change in New York over the next several decades.



New York's recent mayoral election naturally caused us to stop and evaluate our progress to date. In the not quite three years since we began working for the New York City government, we feel that we have participated in a considerable record of accomplishment. The New York Times, in a lead editorial on the Sunday before the November mayoral election, stated that in no field had the Lindsay administration done more "than in the broad and fundamental area of planning and urban design—which is the concrete expression of the vision of the city's future."

"Urban Design," the editorial went on, "has been dealt with in a way that makes it possible for the first time to foresee city trends and draft solutions. The city's zoning laws have been revised and reshaped to make New York a better place to live and work, not just reduce it to a profitable pulp. The city has moved forward decisively with community participation and planning. Urban renewal processes have been radically revised."

The editorial also commented on the proposal by one of the Mayor's opponents that the Mayor's special development offices, the Urban Design Group, and other planning efforts be abolished to save money. "Never in the city's history," said the editorial, "would false economy exact a more formidable price." The editorial concluded that "at stake with the Lindsay administration's urban policies is the future of New York in the largest sense."

The Mayor's reelection insures the continuation of these urban policies, and we hope that the next four years will see their consolidation to the point where the formidable vested interests that sought their abolition will have to accept them as part of the status quo.

Lindsay's re-election also insures the uninterrupted publication of the city's Comprehensive Plan, the first in the 32 years of city planning in New York. The first volume, containing general policy statements, was published in November; and volumes covering each of the five boroughs will be issued in the course of the winter. This massive effort—the six volumes are each 17 inches square and their combined weight is 19½ pounds—is basically one of Donald Elliott's achievements. Although there had been previous drafts, almost all of the final version has been produced within the last three years.

The Plan provides a context for Administration policies and an orderly framework for deciding what the future of the city should be. To insure the widest possible participation in the planning process, a special effort has been made to present the Plan in such a way that the ordinary citizen can understand it.

The existence of the Plan helps to insure the effective execution of urban design concepts, and virtually all of our work over the last few years has been incorporated into the Plan.

A further guarantee of the continued influence of these concepts has been the movement of people associated with our urban design effort into important administrative positions related to their previous work.

In January of last year Jaquelin Robertson became the director of the Mayor's new Office of Midtown Planning and Development, and, more recently, Richard Weinstein took over as director of the Mayor's Office of Lower Manhattan Development. Alexander Cooper, who joined us in August of 1967, and did an outstanding job directing the production of a neighborhood plan for the Coney Island area (one of several significant projects we have had to leave out of this article because of lack of space) is now the director of design in the city's Housing and Development Administration. Michael Dobbins, who joined us right at the beginning of our work for the city, is now the director of planning for Staten Island.

The Urban Design Group itself now numbers some two dozen highly skilled professionals, who are acquiring the experience to move on to important responsibilities in their turn; and we now have a complete set of urban design titles established under civil service.

We remain optimistic about the future of New York and other cities. The wealth and energy to make changes is there, although the problems are enormous and a successful outcome is far from certain. Ultimately, all the efforts of the cities will be futile unless there is a major reallocation of our nation's resources in the context of a national planning policy.

There is still much worth doing at the local level, however. In our own field, there is a long way to go before urban design considerations really become an integral part of the City's decision-making process. Even the City's own capital construction program is far from being the effective design force that it ought to be. Readers of the *Record* will recall the articles describing the innovative design approaches of the City's Parks Department and Housing and Development Administration; but much remains to be done along these lines in other areas.

We now know, however, that even the efforts of a small group can make an appreciable difference; and we hope that it will become the practice of many people in our field to spend at least a few years tussling with the problems of government. It is impossible to exaggerate the educational value in discovering how the decisions that shape our environment are made. Graduates of jobs such as ours will emerge, we are certain, with a new definition of what constitutes an effective architectural practice.

In the meantime, the problems of our society are complex and formidable, and there is no escape from them. We are all in this thing together, and everyone ought to lend a hand.

The following are some of the people who have contributed to the work shown on the foregoing pages:

**Theater District:** Richard Weinstein, Jaquelin T. Robertson, Jonathan Barnett, Myles Weintraub; Norman Marcus, Counsel to the City Planning Commission, and Richard Steyert, economics consultant.

**Lincoln Square Special District:** Richard Weinstein, Jaquelin T. Robertson, Rachel Ramati; Norman Marcus, Counsel to the City Planning Commission, Marilyn Groves, Commissioner Harmon Goldstone, and Richard Steyert, economics consultant.

**Cluster Zoning:** Michael Dobbins, Jonathan Barnett, assisted by Frank A. Rogers, Gregory Matviak, Millard Humstone, principal planner, and Samuel Joroff, deputy director of Staten Island Development.

**Midtown Manhattan:** Jaquelin T. Robertson, Ajzyk Jagoda, Lauren Otis, assisted by John G. Turnbull, Romy Shroff, Alexander Caragonne, Terry Williams.

**Downtown Brooklyn:** Jonathan Barnett and Richard M. Rosan, Vincent P. Ponte, planning consultant; assisted by Joan Franklin, Peter Woll, Jung Ling Wang.

**Original Twin Parks Plan:** (in alphabetical order) Jonathan Barnett, Giovanni Pasanella, Jaquelin T. Robertson, Richard Weinstein, Myles Weintraub, assisted by Lucinda Cisler, E. T. Seabury-Kramer, Heidi Konwalinka. **Neighborhood planning diagrams** by H. Merrill Pasco, assisted by Leila Serroussi, Carol Woodward, Bruce Prince.

**125th Street and Park Avenue:** Lauren Otis and Edwin Woodman, assisted by Frank A. Rogers, W. Joseph Black, Joyce Saginaw.

**Staten Island Planning Diagrams:** Michael Dobbins and Gregory Matviak assisted by Jeremy Walsh, Christopher Clews and Robert Bratvett.



# HEALTH FACILITIES:

## IMPROVEMENT THROUGH MANAGEMENT AND MONEY FOR ARCHITECTURE

As the public client at every level of government has poured increasing billions of dollars into construction of all kinds, two important effects have emerged. First, the sheer volume has called for fresh approaches to management of both design and construction processes. Second, the response of the architectural profession has been to reach for new dimensions in practice commensurate with the size and complexity of new work.

Health facilities demonstrate these changes more aptly than some other building types—partly because of the increasing penetration of the public client into programing and design development, and partly because of the rapidly changing medical techniques new facilities are called upon to accommodate. In the field of mental health, especially, new therapies have had a two-fold effect on architects' involvement. One effect has been the rapid obsolescence of existing facilities, which has called for new client sophistication in programing and new administrative approaches to reconstituting state facilities. A second effect has been the emergence of entirely new kinds of mental health facilities for which few design precedents exist.

The facilities described on following pages have been designed (with one exception) under a construction program initiated in 1964 by the New York State Department of Mental Hygiene and implemented by a funding and management agency now called the New York State Health and Mental Hygiene Facilities Improvement Corporation. The facilities shown are a sampling of the following kinds of work handled by the Corporation:

- Rehabilitation centers. As tranquilizers and other modes of therapy permit a more truly psychiatric interchange between physician and patient, rehabilitation becomes a major activity replacing the mainly custodial care of former programs. Hence, a new series of some 15 rehabilitation centers is being developed for the New York system. Characteristically, these are separate day-centers located on hospital grounds and designed to implement training for return to outside communities. See page 154.
- Schools for the mentally retarded. In 11 new designs for these schools, the architectural goal, again, is to reinforce development of the maximum capacities of the retarded rather than simply provide custodial housing. See page 164.
- Psychiatric hospitals for children. There are seven such planned for New York's mental hygiene program. In addition there will be a series of some six hospitals newly designed for mentally ill adults. See page 162.
- Narcotic addiction rehabilitation centers. These are commissioned by the state's Narcotic Addiction Control Commission, and the design and construction management are handled through the Corporation. See page 160.
- Research facilities. At least two separate facilities for scientific research in psychiatric problems are in work. One of these, the Institute for Basic Research in Mental Retardation, was initiated prior to 1964, but is being completed under the Corporation's management program. See page 157.

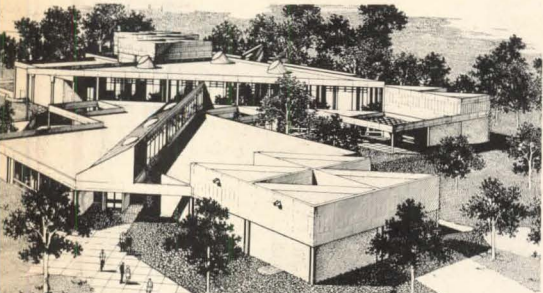
The article beginning next page describes the role of the Corporation in fostering a working climate in which new dimensions of architectural and construction practices may thrive.

—William B. Foxhall

**Architects in private practice, mustered by enlightened public policy, are upgrading New York's health and mental hygiene facilities**



Buffalo Rehabilitation Center  
Architects: Milstein, Wittek, Davis & Hamilton



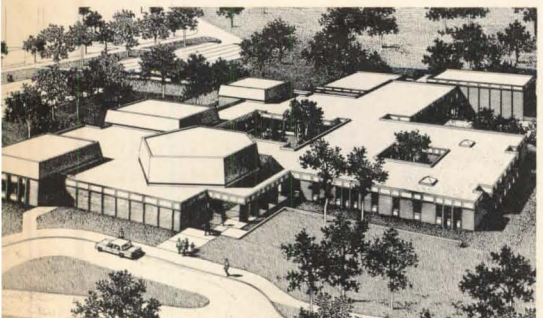
Hudson River Rehabilitation Center  
Architects: Cadman & Droste



Central Islip Rehabilitation Center  
Architects: Armand Bartos and Associates



Syracuse State School of Mental Retardation  
Architects: Sargent-Webster-Crenshaw & Folley



Kings Park Rehabilitation Center  
Architect: Edgar Tafel

One public agency that has been a proving ground for methods of maintaining architectural quality while meeting unprecedented demand for new kinds of health facilities is the New York State Health and Mental Hygiene Facilities Improvement Corporation. That name, cumbersome though it may be, grew to its present length as visible testimony of the Corporation's success in handling some 1500 projects valued at over \$855 million.

The agency started out simply, in 1964, as the Mental Hygiene Facilities Improvement Fund. It was created by the New York Legislature, on behalf of the Department of Mental Hygiene, as a means of accelerating the flow of money and construction know-how into updating old and developing new kinds of mental health facilities. Success of the fund's operation led to new assignments, first for the Narcotic Addiction Control Commission and later for general health facilities. The latter assignment was launched by a \$700-million appropriation by the 1968 State Legislature in a bill directing the Corporation to help cities and counties in the construction of general hospitals and changing the Corporation's name to its present mouthful.

The funding methods established in the charter of the Corporation in 1964 are essentially self-sustaining. Money for a given mental health project is appropriated by the State Legislature at the request of the Department of Mental Hygiene. Bonds through which the money is repaid are sold by the Housing Finance Agency. When the facility is completed and in operation, fees from patients are used to pay off construction bonds and the program continues as a self-funded agency without excessive load on the state tax structure. As a public agency, the corporation is accountable to the State Bureau of the Budget, but otherwise maintains substantial freedom of action in the management of its own affairs.

**Selection of architects is flexible and fair**

The role of the corporation is not only to administer funding but also to award architectural commissions and to manage construction of facilities for client agencies (the Department of Mental Hygiene, the Narcotic Addiction Control Commission, and now various city and county departments).

The procedures for selection of architects are substantially more flexible than those of some other public agencies. For example, there is no "approved list," so the

whole membership of the architectural profession is available to the program. The scope of work is such that there are opportunities for all. Firms do have to qualify for a given project by showing capability to produce quality work within restrictive budgets. And they must have the capacity in manpower to design the proposed project without adding considerable staff. Since the design and development staff of the Corporation, consisting of staff architects, engineers and construction experts, operates in the New York office of the Corporation where development meetings at regular intervals are held, the architects responsible for design must be able to be present at those meetings.

On mental health projects, for example, the process might work as follows. The Corporation's director of design development, Roy Harlow, may receive a letter of request from the State Department of Mental Hygiene. He will review a number of available firms considering scope and location of the project, and discuss these firms informally with the executive director of the corporation, Milton Musicus. The executive director then puts a recommendation for some of the firms on an agenda for consideration at the next meeting of the client department. For general health services, architects are similarly proposed and are finally chosen with the consent of the local agency for whom the facility is being designed. At the invitation of the client, city or county, the Corporation may identify three firms which have demonstrated abilities. Or the client municipality may itself suggest three or more prospective architects who are invited to make presentations to the various officials involved and to the Corporation staff. The Corporation seeks strong assurance that the project architect assigned to work commissioned to a particular firm is at an executive level and fulfills the requirements of responsibility implicit in the firm name.

Corporation staff architects and engineers review plans and specifications at various stages of development as a check against omissions or errors that could eventually develop into change orders. This review process as well as much of the follow-up on construction schedules is done under the administration of John Yurtchuk, coordinator of construction management.

**Construction management: one key to quality and cost**

One of the decisions of the corporation has been to commission an independent con-

struction manager accepted by the architect to work on each project. The construction manager is usually a representative from one of the large contracting organizations which have elected to participate in management consultation rather than bid on any of the basic contracts involved in the job. By law, jobs are bid under at least four contracts: one each for general construction, HVAC, electrical equipment and plumbing.

The larger general contractors are not always available or willing to bid on the multiple contract basis, but their skills in overall construction management are brought to bear on Corporation projects by inducing them (with a moderate percentage fee) to assign some of their top people to act as construction managers. The caliber of management personnel is checked at approval interviews with the Corporation's board.

The selected construction managers are sophisticated not only in the wide variety of technologies involved but also in the practices employed by certain marginal bidders in making up for extremely low bids by encouraging the proliferation of change orders and other opportunities for profit. The Facilities Improvement Corporation sought for many years to coordinate the required four contracts under the general surveillance of the prime construction contractors. In many cases, however, the construction contractor was not equal to the task. Moreover, he often had a self-interest in disputes that involved other contractors.

The answer to this quandary was the establishment of the construction management program.

As projects increased in size and complexity, difficulties emerged in obtaining responsible bids even under the four-contract system. The Corporation decided to make greater use of its well-developed construction management potential and to further divide bidding into as many as 30 trades involved on a given project. The results of this ultimate diffusion of the bidding process are not all in, but on those few projects to which it has been applied, it seems to be working well.

One of the encumbrances on earlier process involving four prime contractors had to do with the flow of money. Now smaller contractors who may be of good quality but not substantially capitalized have an opportunity to participate as primes and can be directly and promptly reimbursed by the corporation rather than being subject to the delays of transfer between prime and sub-contractors. The rate of payment has

been accelerated to three-week intervals so that the demands on resources of smaller contractors are alleviated.

#### **Regular meetings help solve communications problems**

One of the major advantages of the construction management operation has been the ability of the Corporation to involve the construction managers in design development conferences among architects, Corporation personnel, the client agency and various consultants. The advantage to the architect is two-fold. First, he gains assurance that his own administrative time will not be dissipated in coordinating and scheduling problems. Second, he gains some feedback of the manager's familiarity with local conditions in the region where the building will be located. This pertains not only to the resources of local contractors but also to the capabilities of local trades in using optional materials that vary in availability and cost from one locale to another.

In design meetings which (for a major hospital, for example) are regularly held at the New York headquarters of the Corporation, there may be as many as a dozen agencies represented, including the client agencies, the Health and Hospital Planning Council and the State Department of Mental Hygiene. That Department may be brought in at both city and state levels, because most large general hospitals now are introducing substantial mental health facilities. The medical personnel of the hospital will also be represented either by the administrator or various department heads.

This technique of large preliminary meetings seems cumbersome at first, until it is realized that one of the most inhibiting conditions that has slowed the process of development and construction has been the increasing multiplicity of agencies and bureaus with some stake in the outcome and some responsibility for review during the development process. This overview process has reached the point where it is quite normal for a ten-year lapse between the emerging need for a facility and its ultimate completion. Further, the facility design itself not only suffers compromise for the mere sake of expediency in getting it approved, but is likely to be obsolete, or at best inadequate in scope, by the time it reaches completion.

There is some temptation to castigate the burgeoning process of overview as bureaucratic empire-building, but the fact is that the growth of multiple surveillance has

been a direct response to public pressure. The consequences of direct action by individual public officials in the expenditure of public funds for construction have often been dire, politically, for responsible officials whose aim was only to "get things done." The human response of inviting multiple backup to share responsibility is at least understandable.

Historically, from the architect's point of view, the result has been an increasing proliferation of basically architectural decisions made, or at least controlled, by non-architectural bureaucrats. But, under the state system, with face-to-face presence of all parties concerned at preliminary meetings, the review homework has already been done at the end of each meeting, and the understanding of the purposes and cross-purposes of participating bodies is aided by verbal exchanges, heated or otherwise, rather than cumbersome and lengthy exchanges of correspondence.

One of the side effects of this conference process has been an educational interchange among parties involved. A city official from, for example, the Bureau of the Budget may not only increase his own comprehension of a project but may also get quick answers, without political repercussions, to some of the technical or costing questions that might have encumbered his approaches to a purely documentary presentation of the project.

Not the least contribution to this educational process is an opportunity for everyone present to rationally evaluate cost figures of a particular job rather than superficially compare square-foot-cost records of previous and not necessarily comparable projects. The essential components of the square-foot cost can be simply explained, and the realities of the particular situation brought to bear.

On the subject of square-foot costs, the Corporation has made detailed analyses of comparable mental health facilities. They have turned their attention to categorical analyses of the costs of recreational space, therapeutic space and dormitory space; this analysis then becomes a guide, but not a constraint upon, the emerging cost figures as the project develops. It is a useful tool of the estimating technique rather than a catalogue of limits.

Endless details of invention and control have made of this whole program a demonstration of how money, management and architecture can unite in new dimensions of public benefit.

**New centers at state hospitals**  
**designed for rehabilitation, not custody**

Middletown Rehabilitation Center is the first completed of 15 such centers New York State is building at existing mental hospitals. The design objective is to bring together and express, in community-related rather than austere institutional buildings, new programs in pre-discharge therapy that had become fragmented and poorly housed in state hospitals during recent years.

The Middletown center is designed to actively enhance mental rehabilitation procedures in advance of patients' return to their own communities. For that purpose, the architects sought to achieve the effect of a busy small town. The building's one-story and two-story elements enclose two courtyards that contain towering oak trees. Patient traffic traverses the larger courtyard that is partially sunken and has an outdoor dining area that functions as a miniature town square (see page 156). Glassed arcades that surround this courtyard lead to workshops, classrooms, the cafeteria and to other parts of the building. The second courtyard is a quiet grassy space (right) surrounded by a terrace that provides access to the library, classrooms, and therapy areas. The superstructure in the photo is the cooling tower. Photo at bottom, opposite, is a high-bay exercise game room near the swimming pool and joined by glass arcade to the gymnasium. The vocabulary of brown brick and yellow fascia is sustained throughout.

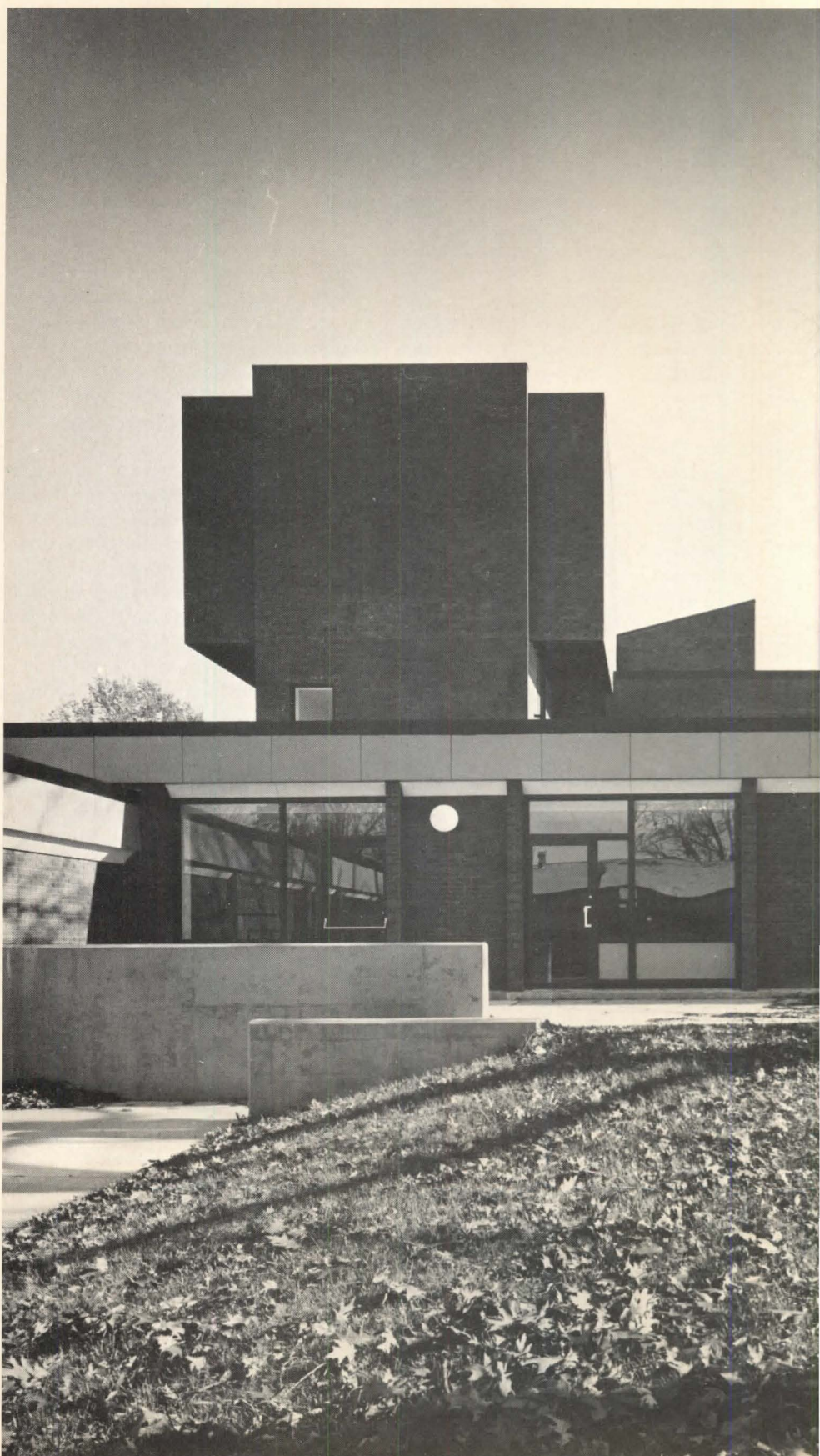
Entrance to the complex through the "town square" courtyard is approached from the outside through a passage bridged by second-story offices (top, opposite).

Directly across the "town square" from the bridged passageway is an entrance to the lobby of a 400-seat, multi-purpose chapel-auditorium. This lobby also has a terraced entrance from the grounds outside the complex and another door leading to a gymnasium and other recreation facilities which extend around the south end of the town square and terminate in a cafeteria to the left of the bridged entrance passage.

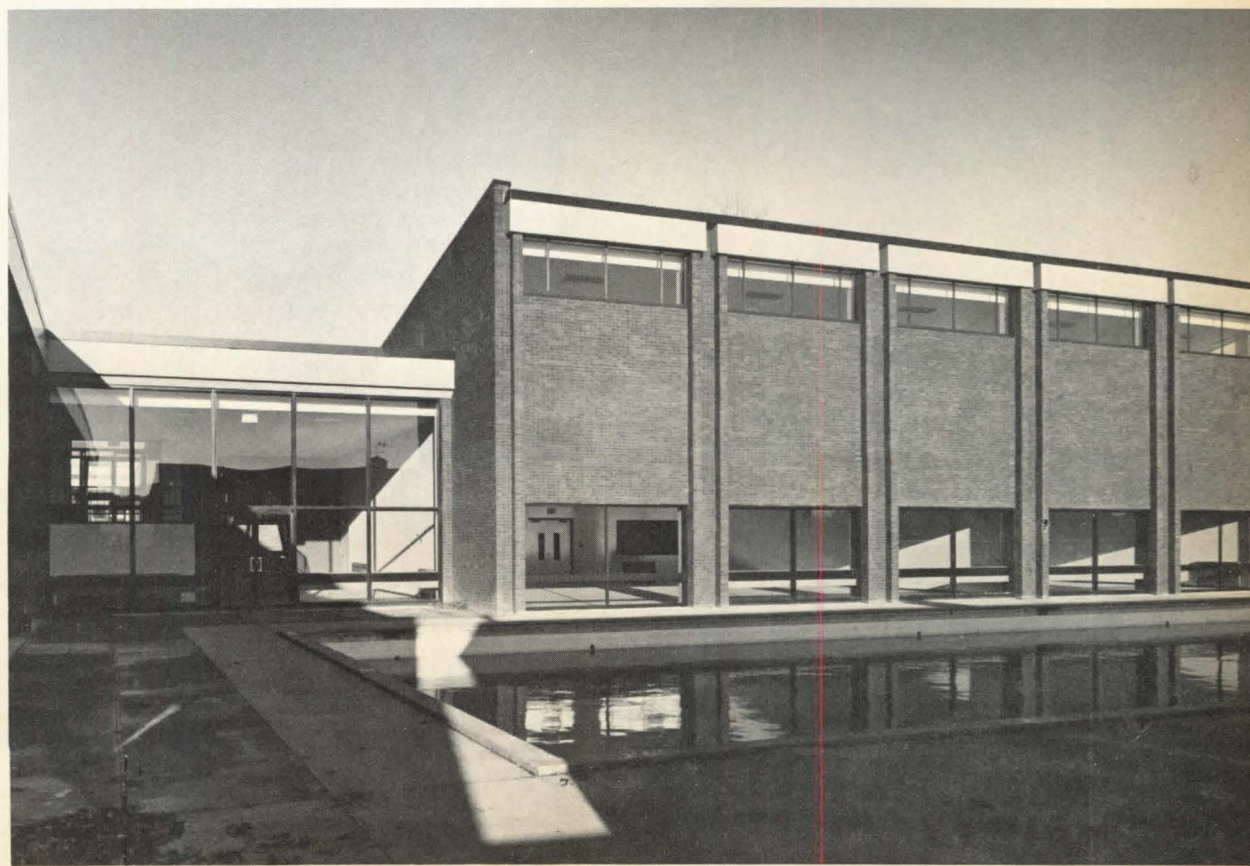
The rehabilitation program seeks maximum development of each patient's capacities for self-sufficiency. For this, the center offers medical, counseling and testing services and a variety of educational and vocational activities.

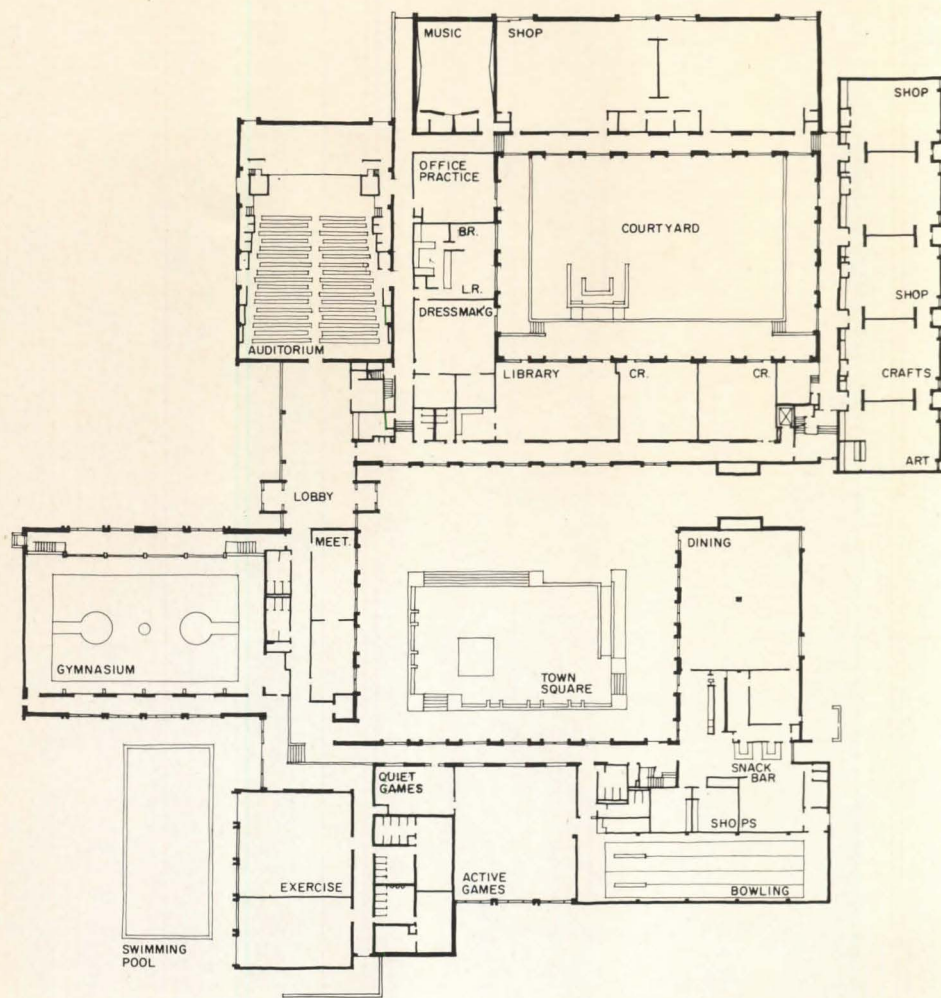
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REHABILITATION CENTER, Middletown State Hospital, Middletown, New York. Architects: *Helge Westermann/Richard Miller Associates*; mechanical engineers: *Caretsky & Associates*; structural engineers: *Lev Zetlin & Associates*; landscape architects: *Robert Zion & Harold Breen*.

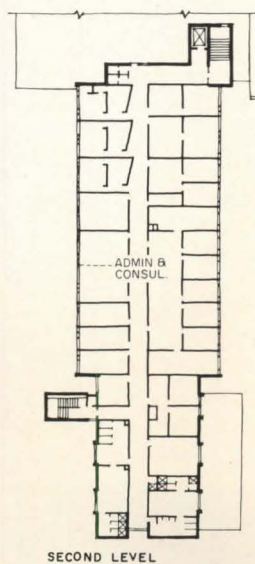


Bill Rothschild photos





GROUND FLOOR



SECOND LEVEL

Designed around courtyards to function as a cluster of buildings rather than as a single building, the Middletown Rehabilitation Center has many features in common with other community centers. The large court (photo top left) is called the town square, and the arcade surrounding it gives access to classrooms, gymnasium and meeting rooms. The administration offices are on the second level bridging vehicle and pedestrian access to the larger court. Interior rooms such as the secretarial space (left) have clerestory windows facing the court side. Activities are carefully zoned but are related visually across courts and sequentially in terms of patient traffic. The objective has been to enhance the sense of scale and place with reference to ultimate community experience.

## Retardation research lab has total flexibility for basic sciences

Robert Damora photos

The \$12-million Institute for Basic Research in Mental Retardation, located on Staten Island adjacent to New York's Willowbrook State School for the mentally retarded, is the first institution in the state (and perhaps in the world) to focus programs in eight to ten disciplines in the basic sciences entirely on mental retardation with all facilities housed in one structure. The building has been finished and construction and outfitting of its laboratories are now under way.

The structure is of steel and prestressed concrete, and stone panels. It consists of a 5-story concrete research tower, to which are joined three single-story wings. One wing contains administrative offices. Another has wards for 40 patients. The third wing houses experimental animals.

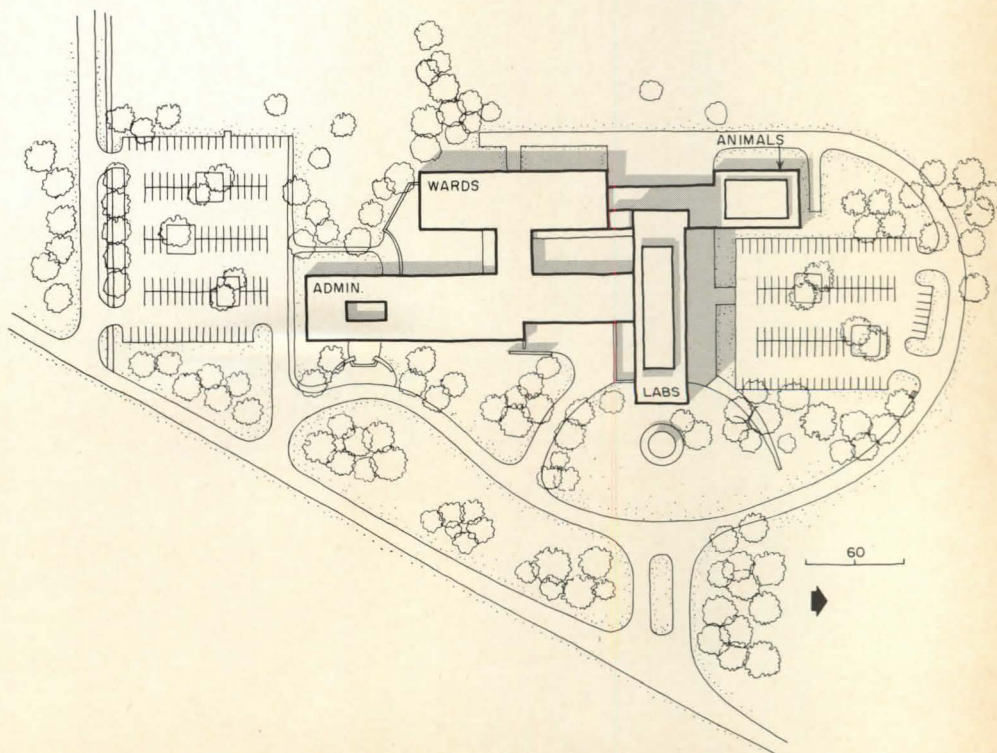
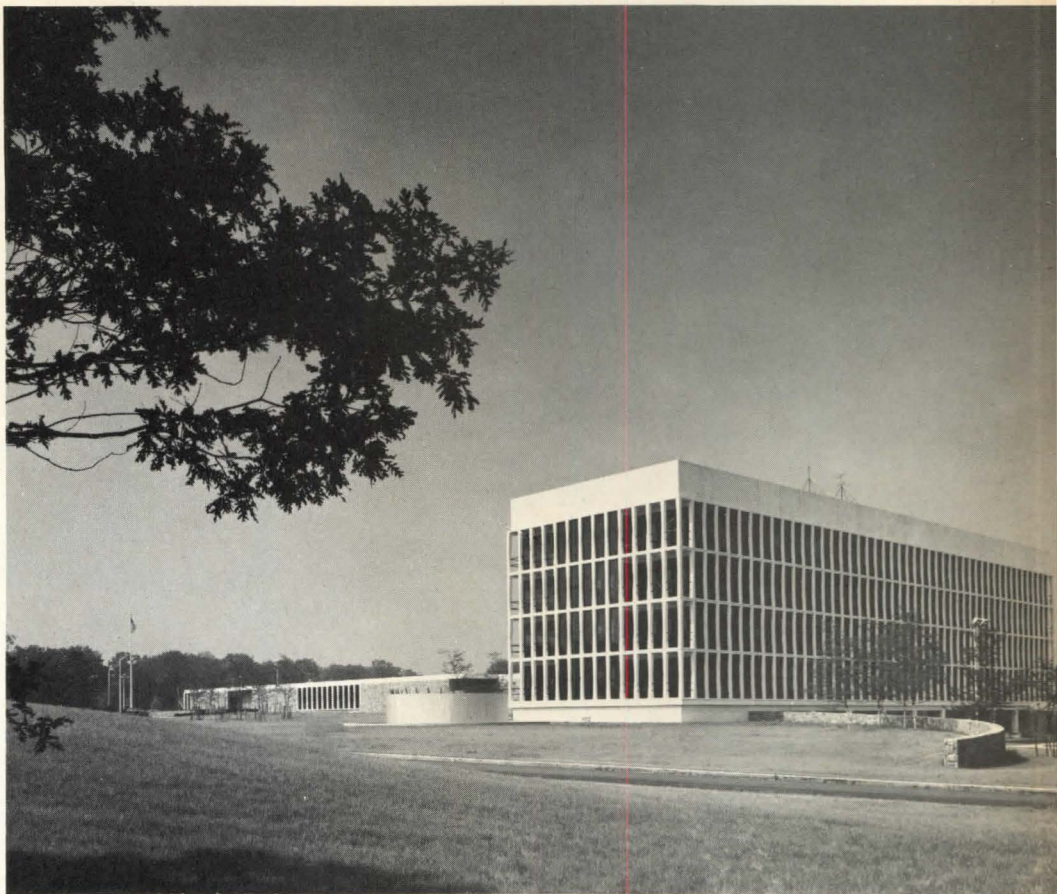
An important element in the design of the building is the flexibility that has been built into the laboratory spaces to accommodate changes in research techniques and the diversity of procedures of many disciplines. The structural module is 25 by 10 feet, and each laboratory floor is laid out in 40 such modules. Movable walls allow rearrangement of space within the module system as research presses in new directions.

Also serving flexible layout of laboratories is a vertical distribution system for utilities at module intervals (see page 151). Further, each laboratory floor has a 5-foot mechanical space above its walk-on ceiling, with many knockout panels for access so that utility lines can be serviced without disturbing laboratory work.

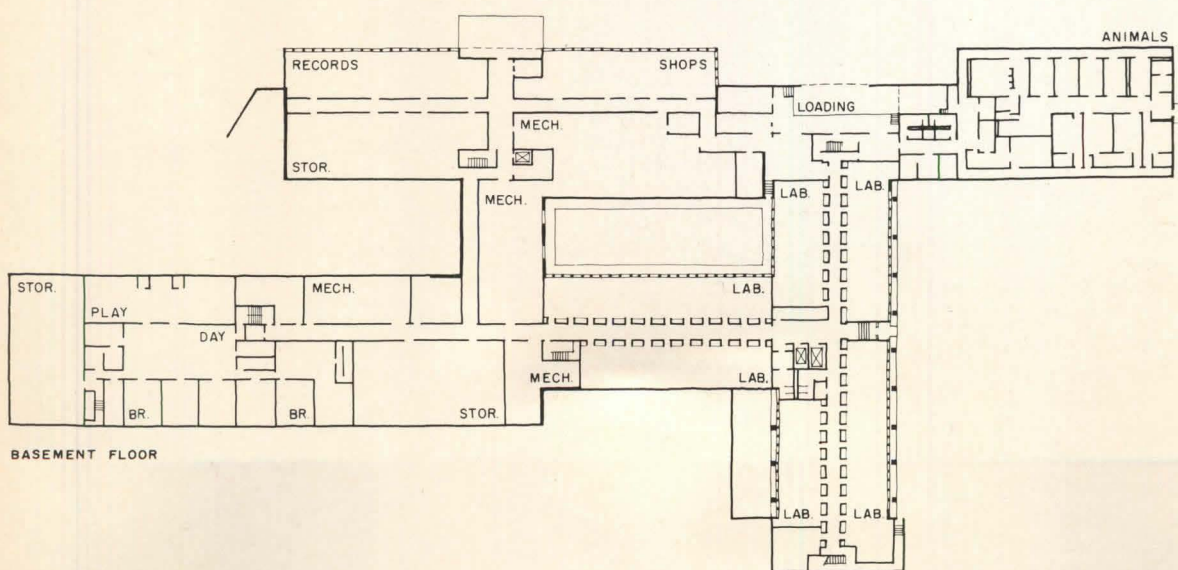
Laboratories have been laid out so that any scientist can get from his work area to the administration section or to the wards without passing through any other scientist's work area.

The same principle of flexibility is built into the wards which are designed so that patients selected from the Willowbrook population for specific research projects can be studied under controlled conditions in groups of two to forty. These wards are solely for patients under observation.

In the administration area, there is a divisible multi-purpose room for scientific meetings in addition to interview rooms specifically designed and equipped with instruments and projectors.

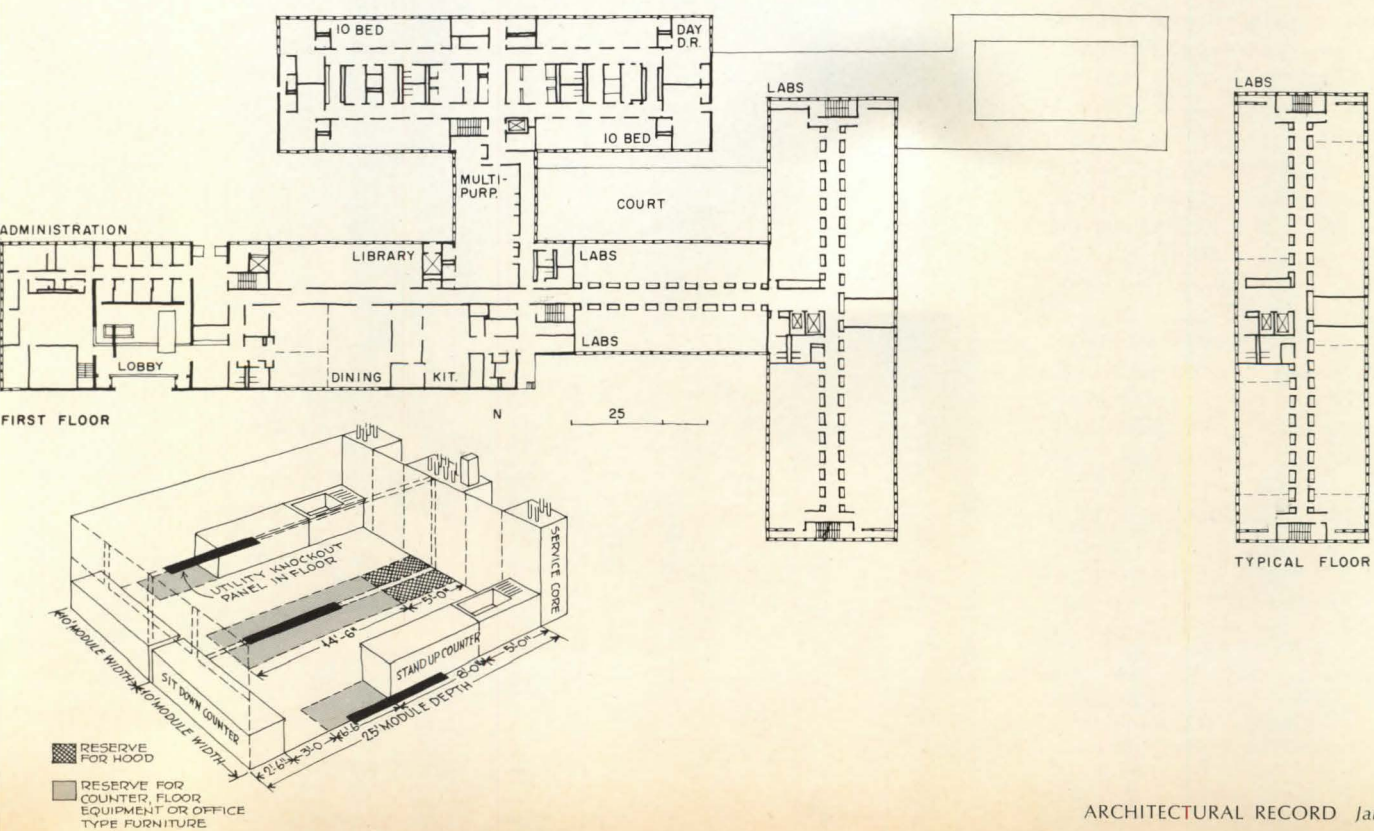
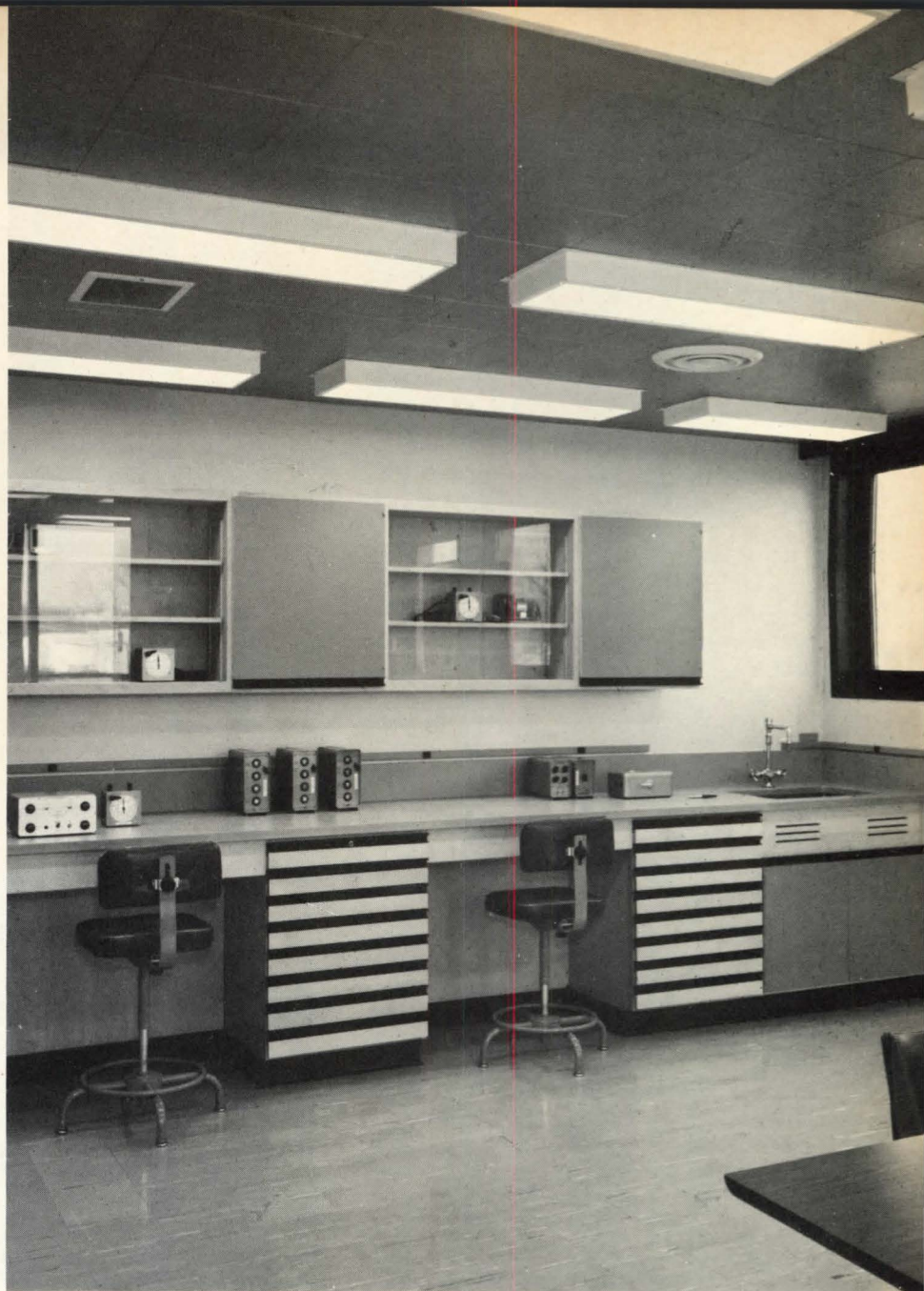


INSTITUTE FOR BASIC RESEARCH IN MENTAL RETARDATION, Staten Island, New York. Architects: Fordyce & Hamby Associates (now Hamby, Kennerly & Slomanson); consulting engineers: Syska & Hennessy, Inc.



Virtually total flexibility in laboratory design was the objective of architects and engineers at the Institute for Basic Research in Mental Retardation. The basic design module is 10 by 25 feet with wide ceiling span as shown in the photograph above for unlimited options in placement of partitions according to discipline requirements. Mechanical spaces over ceilings and vertical service cores with a variety of piped fluids placed at ultimate module intervals (opposite) further support flexibility. The two-level support facilities house general administrative and operating spaces and a small patient wing in which selected patients from nearby Willowbrook State Hospital for the Retarded are housed during some phases of research. Special rooms for controlled atmospheres and pressures aid patient research.





## Architecture to help drug addicts calls for speed and inventiveness

The response of architects and the Facilities Improvement Corporation to program requirements of the New York State Narcotic Addiction Control Commission has been prompt and varied. Facilities tend to center in the environs of New York City where the majority of the state's addicts are located. The pressures of time and urban location have demanded that architects and commission programers use great inventiveness in the design and rehabilitation of urban facilities.

This Manhattan Rehabilitation Center, designed by Gueron Lepp and Associates, demonstrates some of that inventiveness. It is a 400-bed narcotics rehabilitation facility for women and consists of three separate buildings served by common mechanical and kitchen facilities. The two buildings which form the treatment portion of the center were existing structures which were extensively renovated. One of these is an old public library which was converted to a treatment center. The other was a motel building which was converted for dormitory and activity uses.

The third building is an entirely new structure (right and opposite) which serves as a reception and administration building. This building also has facilities for housing 50 patients during detoxification.

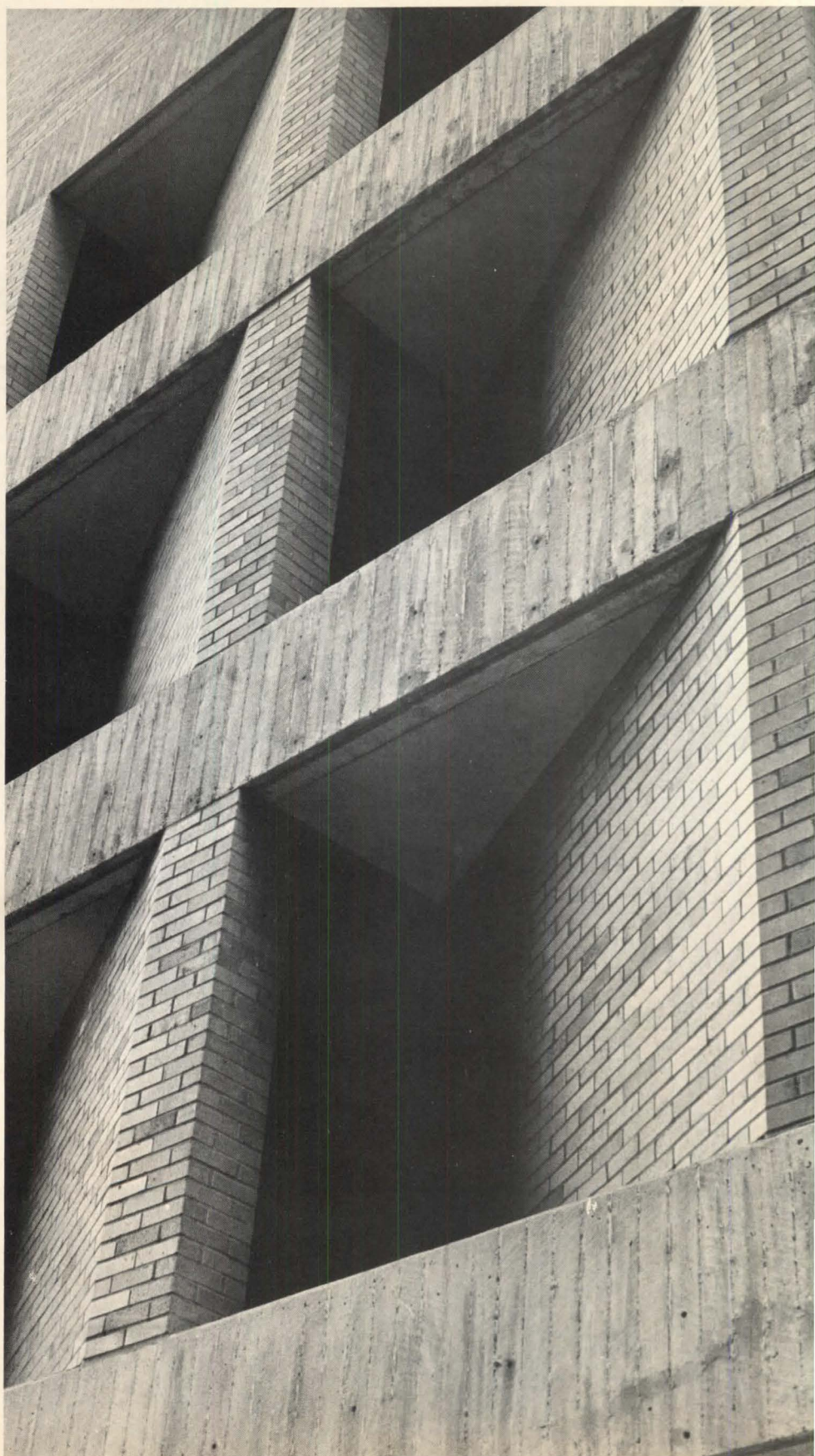
One major problem in conversion of the motel was to screen the view from the street and provide some security at windows. This was solved by the addition of a bronze-tinted aluminum screen on the street side of the building. There are bedrooms for 350 women in addition to classrooms and sanitary facilities on converted motel floors. The ground floor and the basement (formerly lobby and parking garage) were converted to administrative support offices, infirmary, visitors' lounge, food services and mechanical spaces.

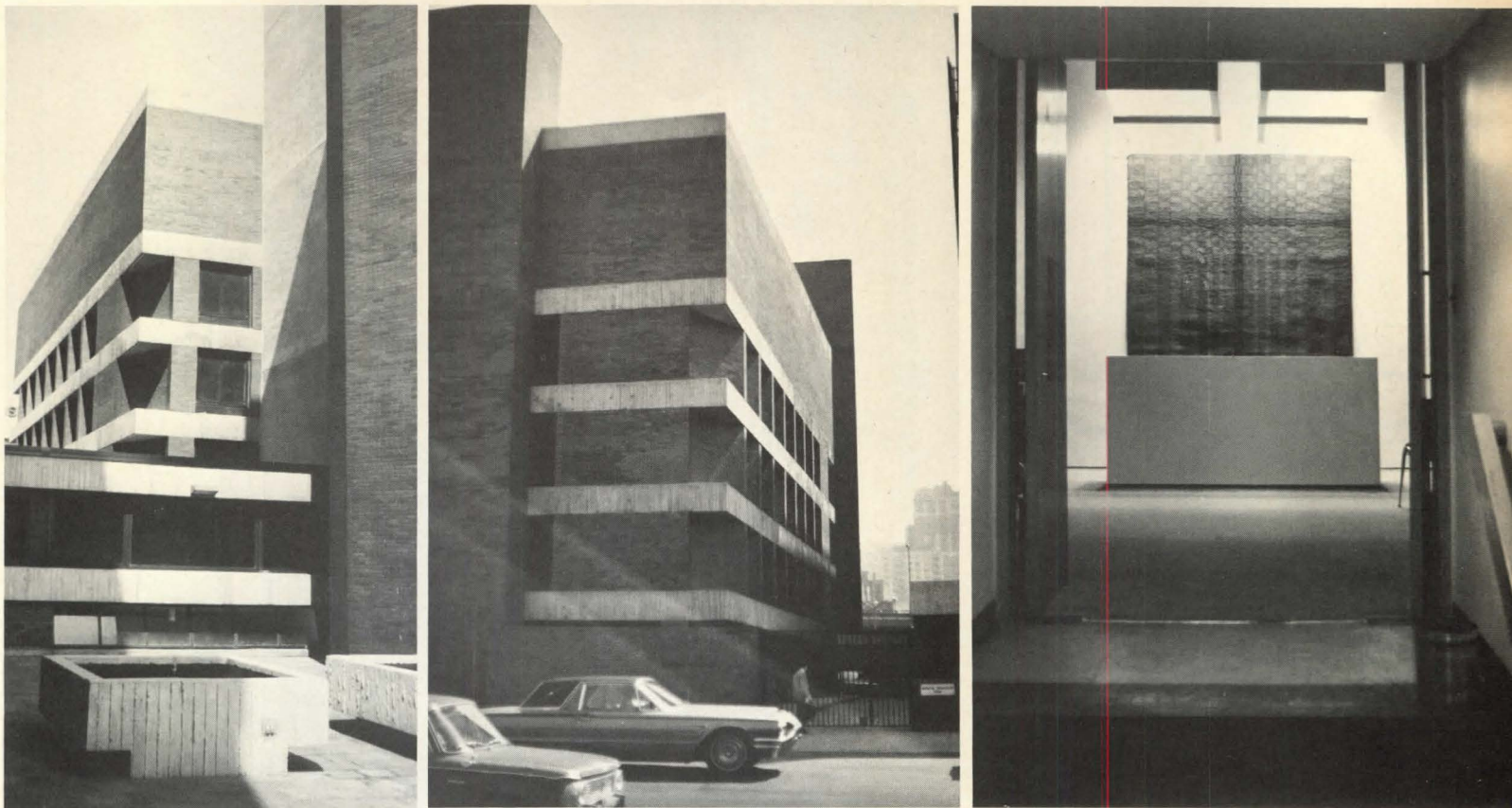
The library building completes the interior court on this site and provides additional classrooms and vocational training areas as well as a library and gymnasium.

The architects and commission programers were able to discern the general potential of the existing buildings as more or less conventional spaces to which addicts might respond. The special problems of early confinement and analysis were handled appropriately in the new structure.

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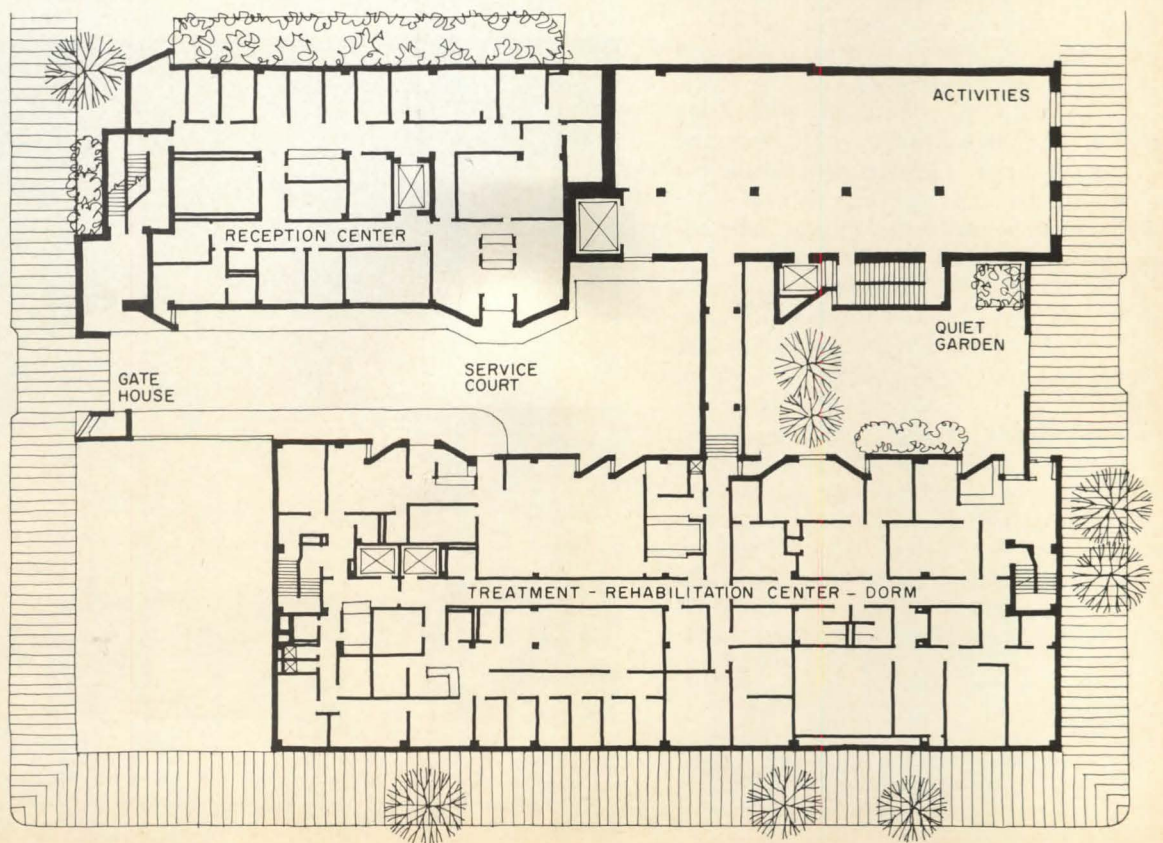
MANHATTAN REHABILITATION CENTER, New York, New York. Architects: *Gueron, Lepp and Associates*; mechanical engineers: *William Kaplan & Associates*; structural engineers: *Zoldos & Meagher*; construction contractors: *George Rosen & Son Inc.*





Exterior of the new building at Manhattan Rehabilitation Center is an expression of the concrete frame with splayed walls of dark brown brick to harmonize with a bronze-colored aluminum security screen on the adjoining dormitory building, a converted motel. Spaces in the new building include combined dining and recreational rooms, doctors' offices, treatment rooms, admissions facilities and an exercise room.

A small multi-faith chapel (above right) was included in the rehabilitation of the existing library, which now adjoins the new building. All patient "activities" are housed in the sturdy, turn-of-the-century structure including classrooms, vocational training shops, library, gymnasium and beauty shop. Large story heights in the building permitted addition of mezzanine floors for the patients' library and two additional classrooms.



### A great house for children cope with the urban scene

Houses for 192 psychotic children 5 to 16 years old have been designed and scaled to relate not only to the residential experience of their occupants but also to the massive urban scene surrounding their site on the grounds of the Bronx State Hospital. The urban scene is not new to these children. But the overwhelming presence of high-rise, and the street canyons from which many of the patients come, have been counteracted in this facility by design emphasis on residential aspects and human scale. This was done in spite of the enormous problem of housing almost 200 children in what is, in fact, a single building.

The planning concept involves clusters of domicile units in which small-group living will be enriched by easy access to central facilities reflecting community participation within the scope of the young patients. The center of the complex will also contain facilities for intensive psychiatric and medical therapies. It is enlivened by an irregular succession of courts in which colorful sculpture and wall decorations enhance the sense of childhood participation. The children are housed in a series of eight two-story buildings. These buildings are arranged to permit each group of eight children to live in some semblance of family relationship in four double bedrooms opening on a living room. Three such 8-member groups will live on a ward floor with common social and dining spaces on each floor.

The first floor of each two-story living unit will adjoin diagnostic, evaluation and therapy sections as well as educational and administrative spaces. Each second floor will contain a small infirmary and some educational spaces.

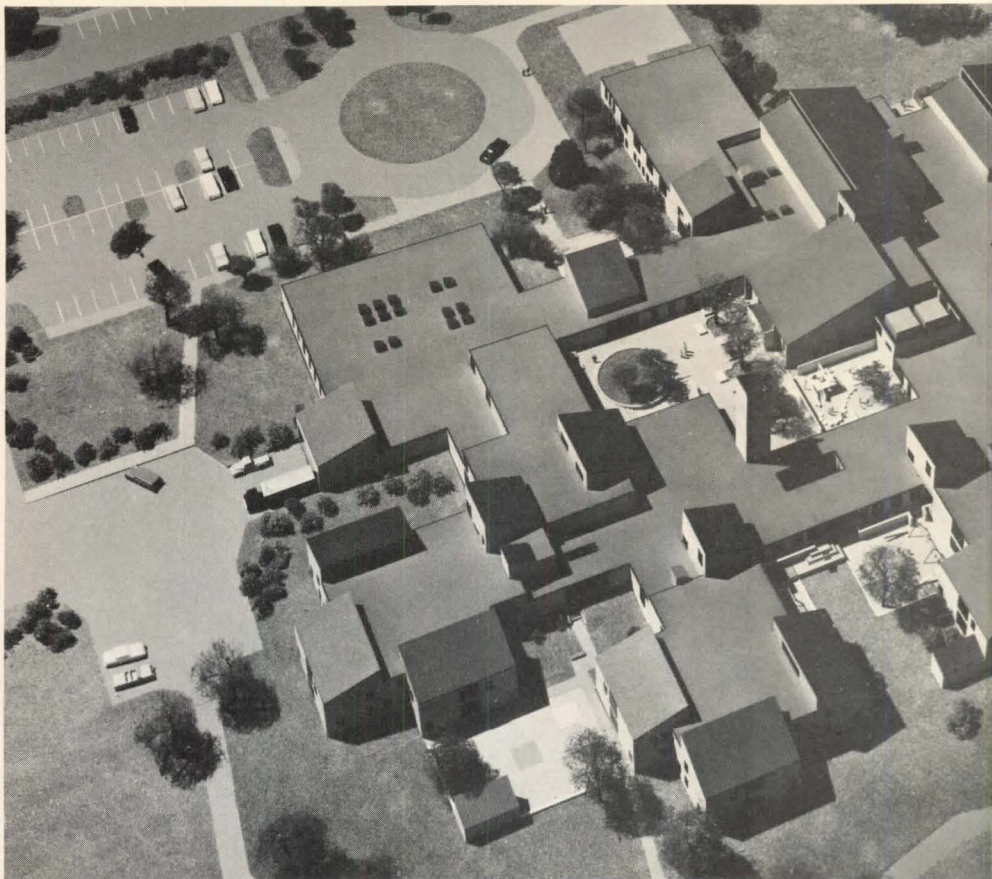
In addition to the central courtyards, there are ample spaces for outdoor recreation with playing fields and picnic areas as well as sheltered play terraces adjacent to the complex.

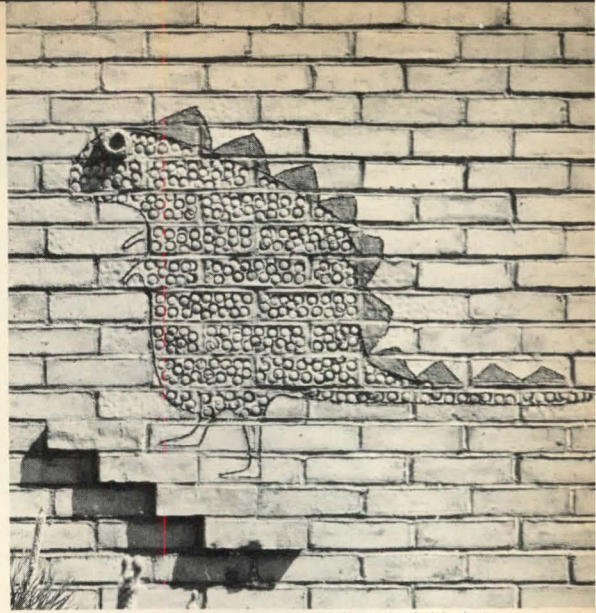
The exteriors are of brick bearing wall construction with steel joist framing, concrete plank roofs and concrete floor slab.

Although interior materials and decoration had to be selected for durability, the architects strove for warmth in color and texture by the use of painted block walls and vinyl asbestos floors with accent colors.

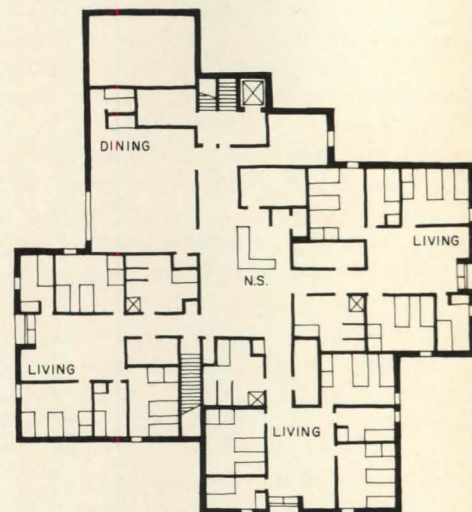
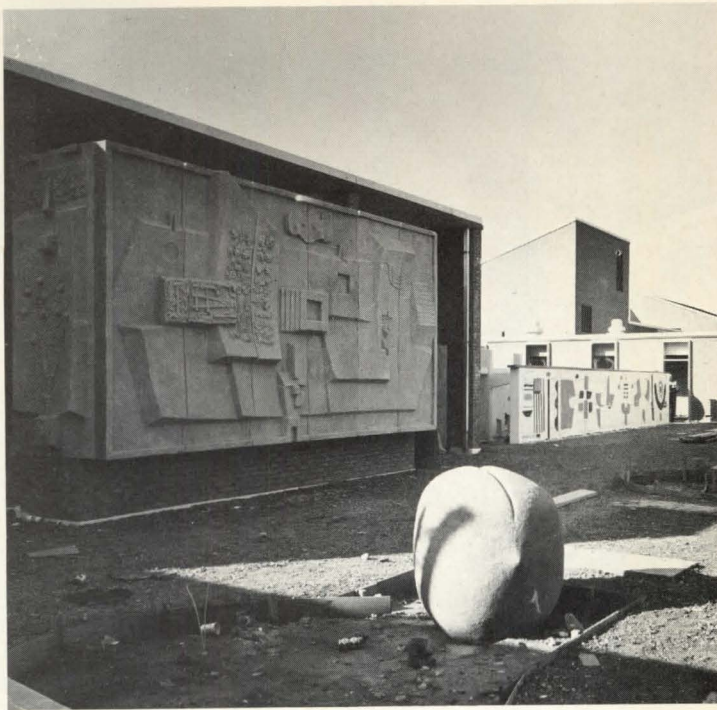
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BRONX CHILDREN'S PSYCHIATRIC HOSPITAL, Bronx State Hospital, Bronx, New York. Architects: *The Office of Max O. Urbahn*; structural engineers: *Wayman C. Wing*; mechanical engineers: *Tizian Associates, Inc.*; site engineers: *Seelye Stevenson Value & Knecht*.



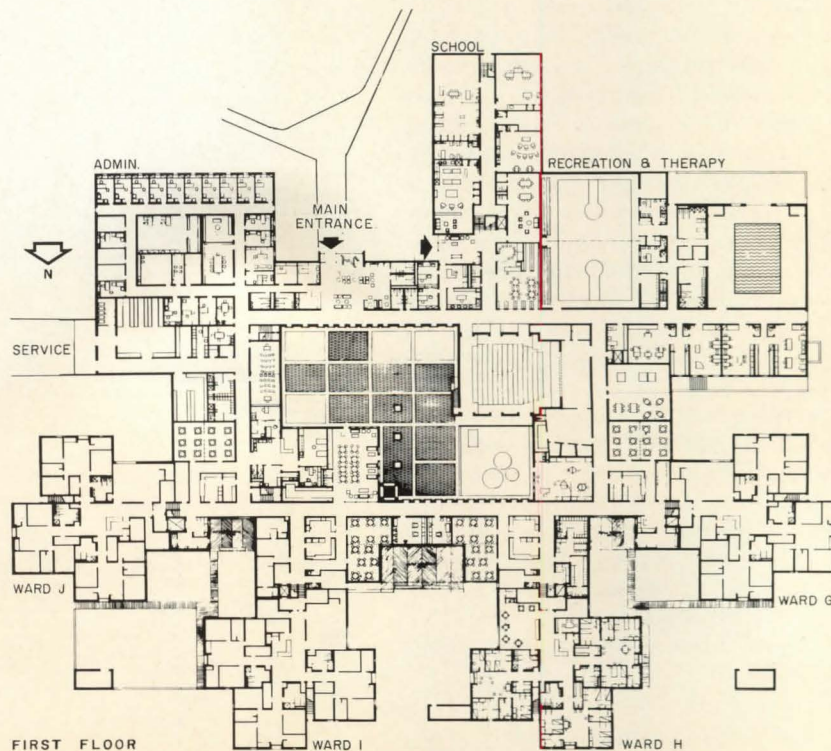


Bill Rothschild photos



TYPICAL SECOND FLOOR

Plan of the Bronx Children's Psychiatric Hospital encompasses the huge problem of handling almost 200 boys and girls of varied diagnoses in a single giant complex with a full panoply of interdisciplinary psychiatric, medical and educational services. Division of the children into family-sized residential groups with opportunities for interaction are aspects of the design intended to pre-adjust the children for return to the outside communities from which they come. The use of sculpture and decoration was a strong design component—inside and out—and was implemented by the architects' personal visits to the brickyard for design and casting of gay figures into brick walls and the Nivola sculptured animals and relief in concrete as shown in photos above. The plan shows division of the complex into three main categories of space.



FIRST FLOOR



## Architectural stimulus and response in a school for the mentally retarded

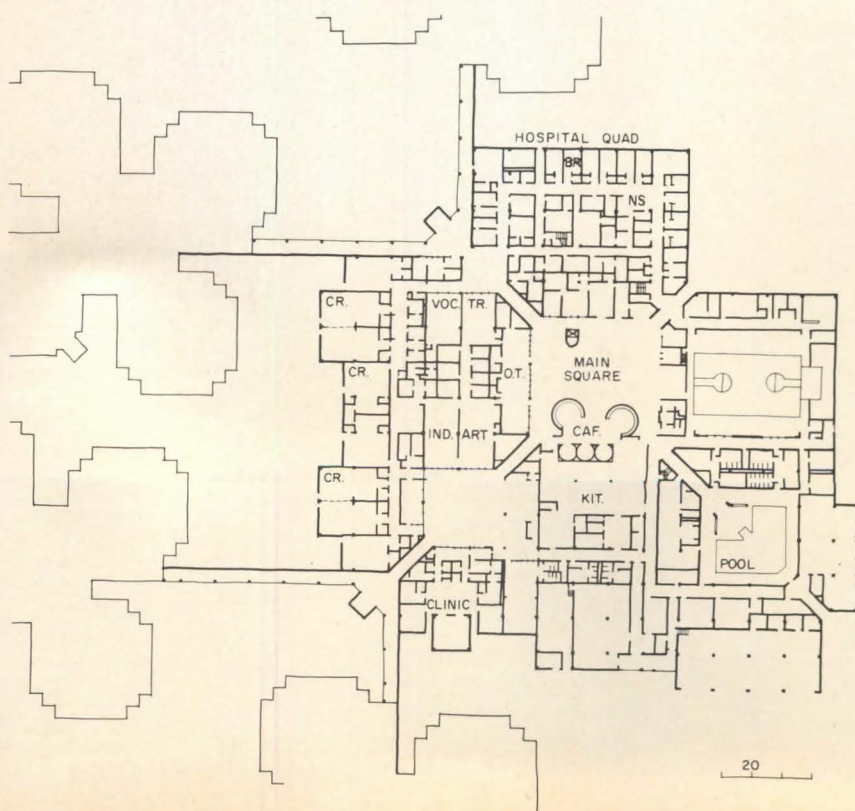
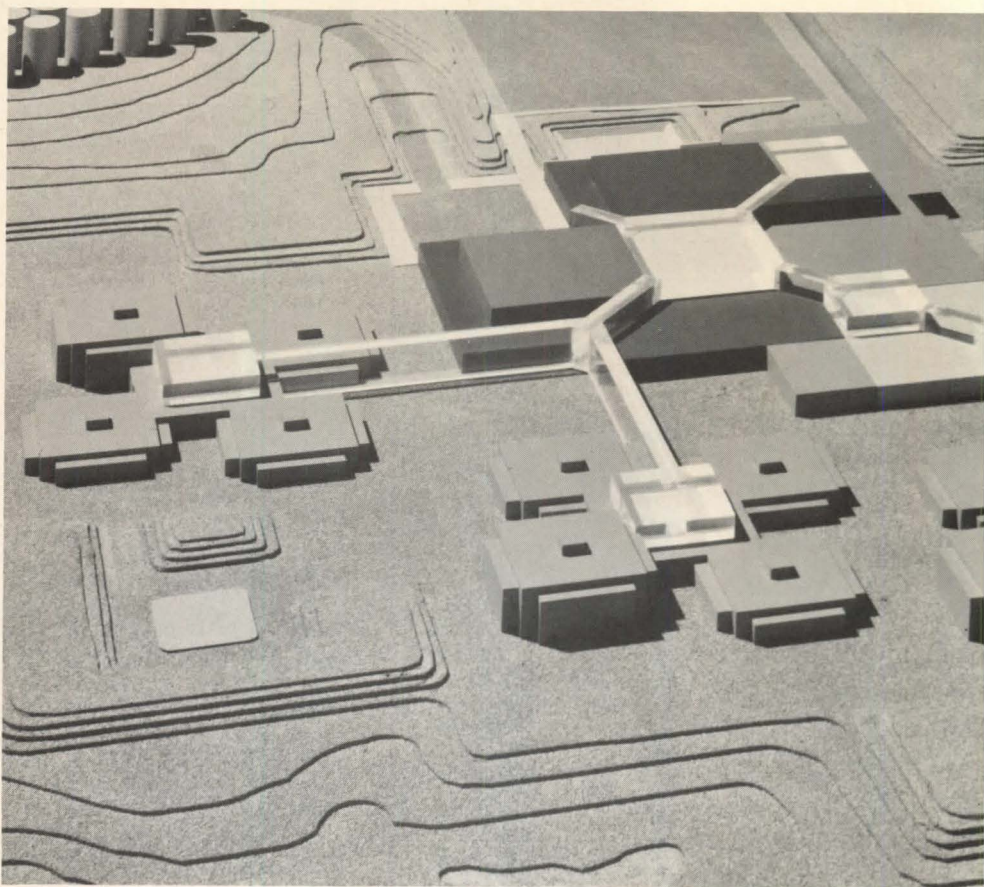
The Wilton State School for Mentally Retarded is the first of 11 such new facilities planned for New York State. It will house a population of 500 mentally retarded children and adults. The program of the school calls for each resident to be scheduled for activities suited to his needs and capacities. Training will include activities of daily living and a full program of educational and pre-vocational training for those who may be able to develop personal independence.

The architects' interpretation and development of the program, in cooperation with the Department of Mental Hygiene, took into account the fact that the inhabitants would be indoors for nine or ten months of each year, so that the concept was directed to provide a complete community experience indoors. The over-all plan, therefore, simulates a system of streets and houses with as much diversity as those terms imply.

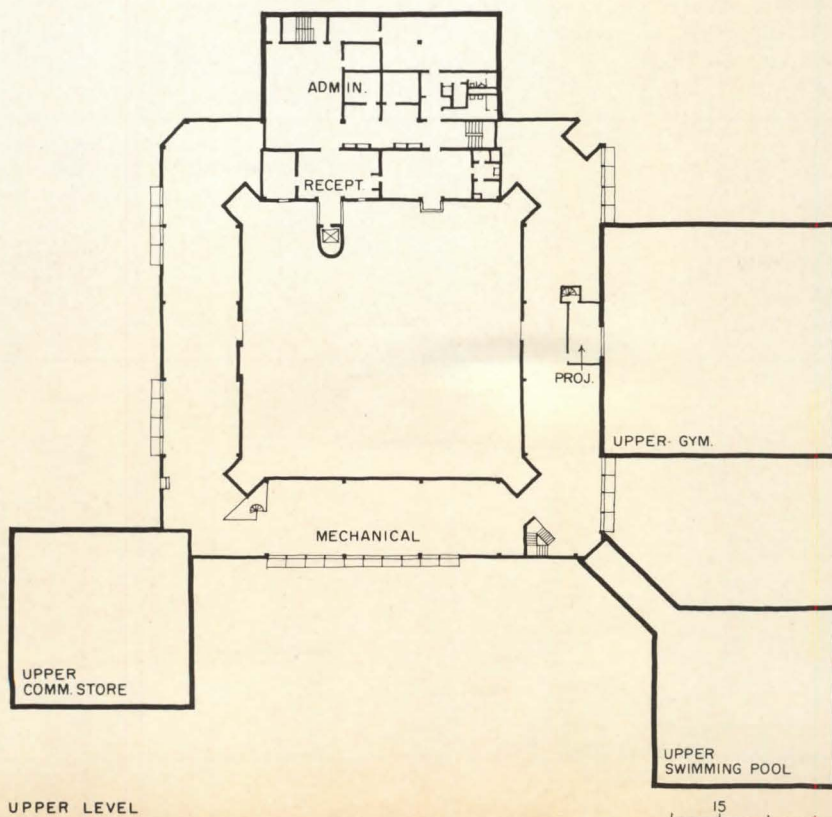
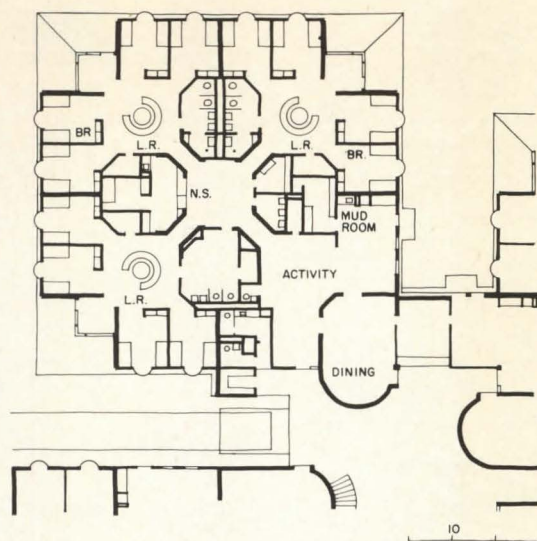
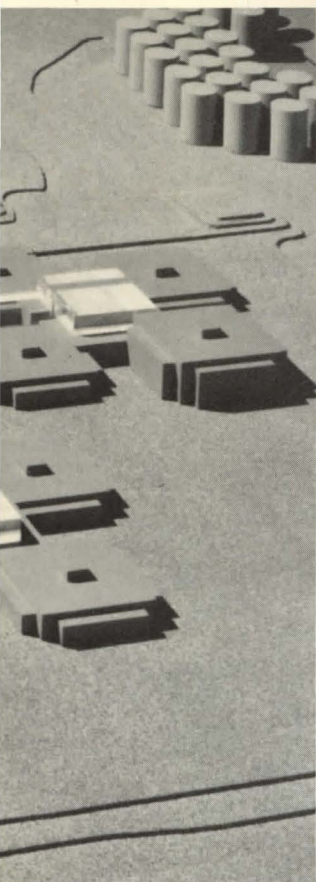
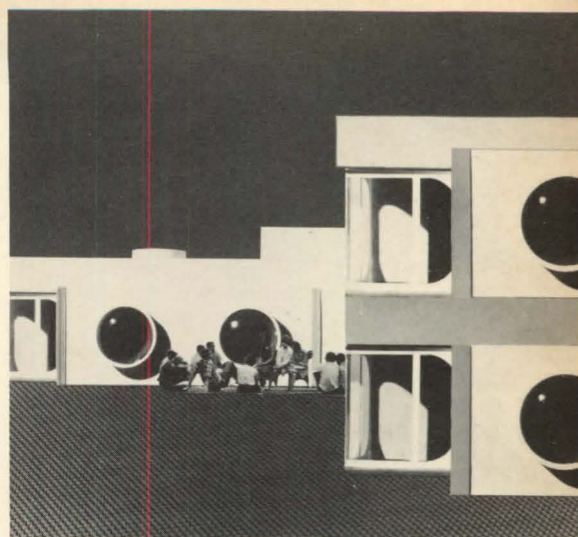
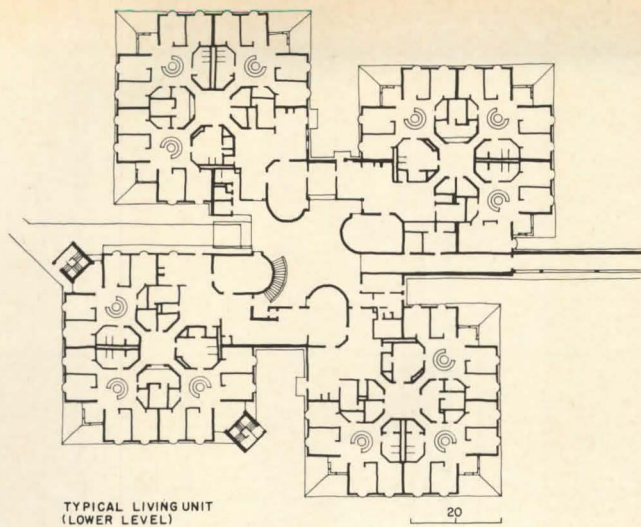
A sense of residence is generated in living units which are arranged in four clover-leaf clusters of four structures each. One structure in each cluster is a two-story unit so that there is a total of five house-size patient floors in each cluster.

Each floor is divided into three corner-groups of four two-bed rooms opening onto a two-part living room made up of a central activity area and a glazed corner. Each two-bed room has built-in storage for personal belongings and a round plastic window designed to relate to the outdoors while preserving a sense of security. Each 24-patient floor has a common activity area and dining space and each cluster hub is a two-story high space called an environmental center which serves as a near-home gathering plaza and directional clue to the passageway connection to the central activities building. Each cluster looks out on a peripheral play area and in toward its own environmental center.

The main building has learning spaces connected by "streets" and divided into quadrants allocated to identifiable categories of activity. Quadrants for recreation, education, medical services and occupational shops and kitchens are arranged around a central square which students identify as a main plaza and to which the four "streets" from living quarters enter on diagonals at the corners.

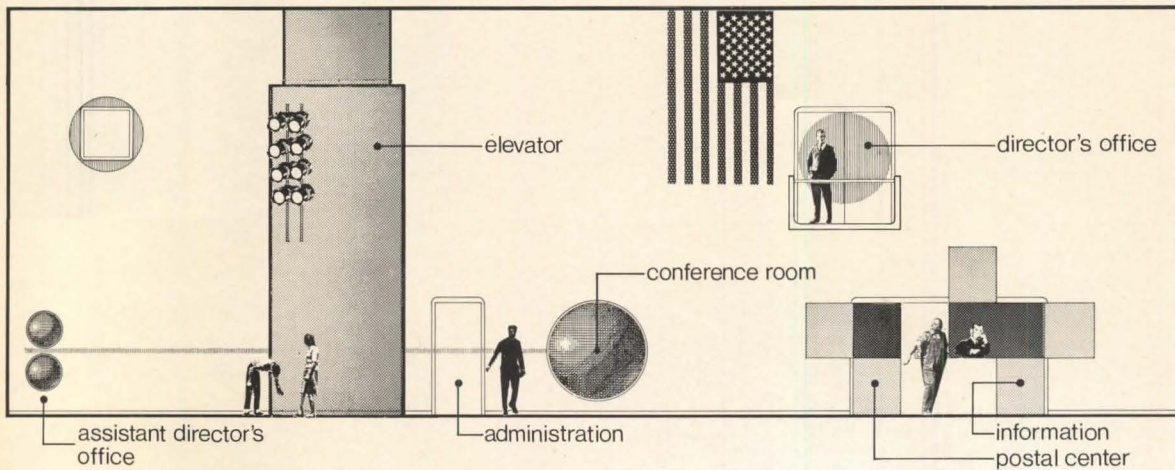


WILTON STATE SCHOOL, Wilton, New York. Architects: Conklin & Rossant; structural engineers: Zetlin Desimone & Chaplin; mechanical engineers: Caretsky & Associates.

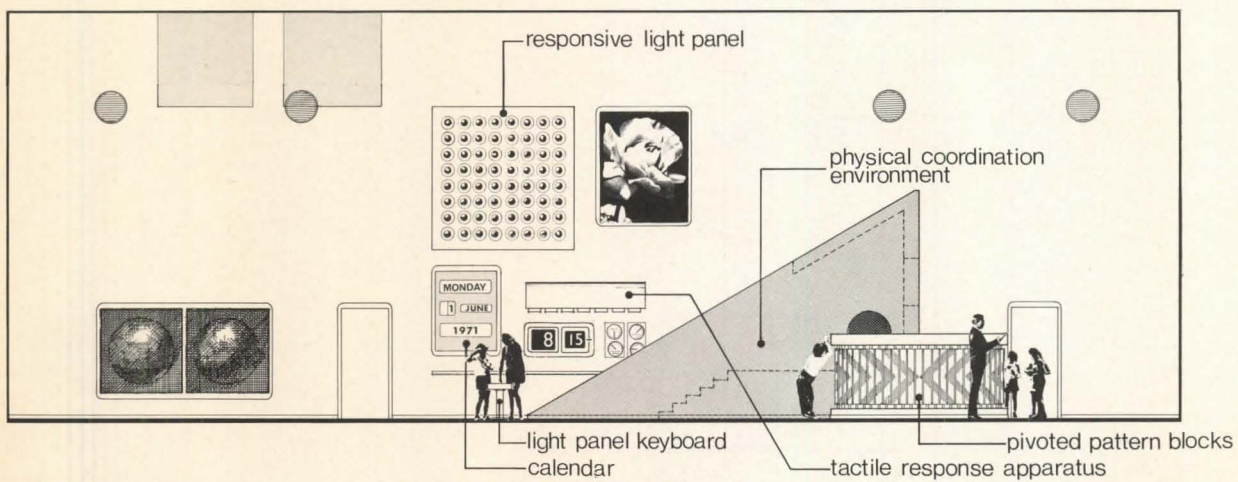


The street idea in the Wilton school plan is reinforced by four smaller squares peripheral to and visible from the main central square. Two of these sub-squares identify linkage to the corner meeting points of pairs of living-unit passageways. The other two relate to and identify activity areas which are grouped as recreational, educational, clinical or occupational in quadrants of the central building. Each sub-square can be readily identified by a characteristic drug store, barber shop, or other street-corner aspect. The main plaza has a cafeteria for noon meals which is laid out to include three smaller circular dining areas intended to preserve some aspects of residential scale. The main plaza also has "teaching walls" with lively lights and sound devices to stimulate outgoing responses of residents as shown in elevations on page 166.

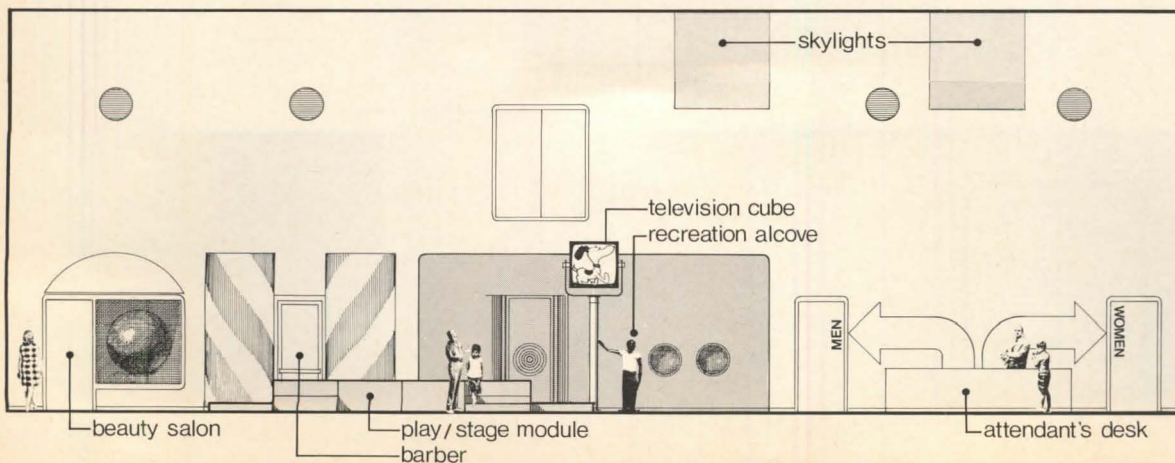
North



West



East



Rendered elevations of three of the walls of the main square in the central building at Wilton State School for the mentally retarded restate and underscore fundamental design objectives: to increase innate capacities of residents to the fullest possible extent so that they may not vegetate as their affliction inclines them to do in the purely custodial situation. For example, the overstated graphics and human presence at the toilet-training station on the east wall, the physically responsive light panel and apparatus on the west wall, the "establishment-oriented" reminders on the north—all stimulate and guide the outgoing response.



## Central plant heats and cools California's capitol

A year ago California began operation of a central heating and cooling plant that promises to save the state government \$1 million annually in air-conditioning and heating costs.

Instead of using individual decentralized heating and cooling systems in each of the old and new buildings presently surrounding the 95-year-old Capitol, the engineers built a \$13-million central heating and cooling plant and distribution complex fueled primarily by natural gas. M. A. Nishkian & Company, design engineers and consultants, Long Beach, California, developed the new system, which is one of the largest facilities of its kind in the West.

The new system is part of a three-stage construction project known as the California State Capitol Mall, developed under the direction of the State of California's Department of General Services, Office of Architecture & Construction.

The initial increment contains four large centrifugal refrigeration machines with

a combined air-conditioning capacity of 9,650 tons, driven by six natural gas turbines and one steam turbine in the central plant. In addition, the plant has an initial nominal steam generating capacity of 120,000 lb/hr at 275 psig, using two gas-fired 60,000 lb/hr steam boilers, with short duration capability of 80,000 lb/hr each. The system will eventually be expanded with the addition of two more gas turbine-driven centrifugal chillers plus another steam turbine-driven centrifugal chiller, as well as two more steam boilers. Ultimate plant capacity is projected at 16,000 tons of refrigeration and 240,000 lb/hr of steam generating capacity.

At present, the central plant supplies steam and chilled water via piping in an underground tunnel system to about 4.5-million square feet of floor space in 15 old and new buildings of the Capitol Mall. By 1980, the system is expected to be serving about 6.6-million square feet of floor space in 34 buildings. This load is scheduled to increase to 8.8-million square feet in 44

buildings by the turn of the century, 31 years after the plant went on-stream.

### Diversity factors a key to initial and operating economies

Before the state engineers decided to proceed with the central plant's design, they commissioned an exhaustive study by the Nishkian staff. They reported that a substantial advantage in central plant economics is achieved by recognizing the diversity factors—the relation between calculated building design loads and actual experienced loads.

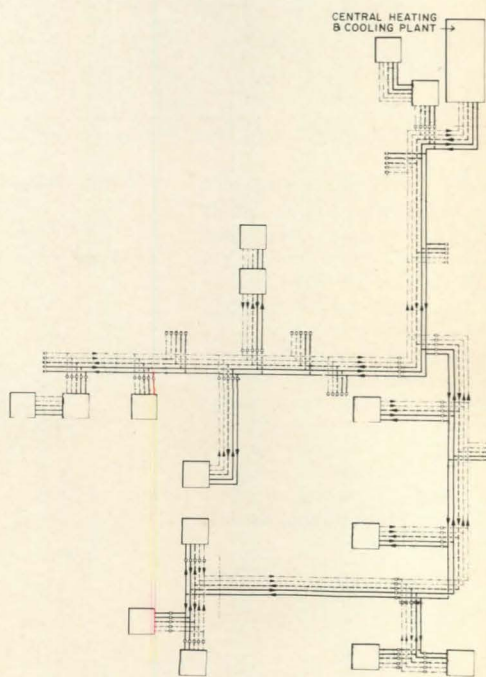
Governing factors to be used in calculating diversity include: number of buildings connected to the central system; variations in building occupancy; correction of building system design safety factors; effects of building exposure to direct sun or elements; and length and capacity of distribution system as related to the "flywheel" storage effect.

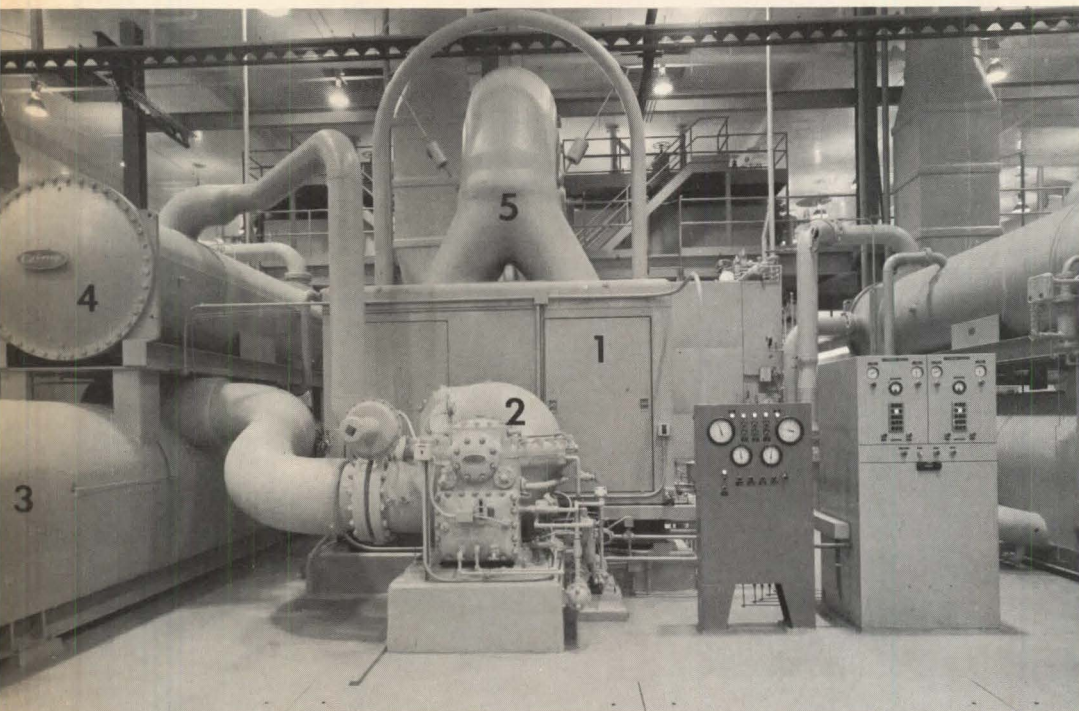
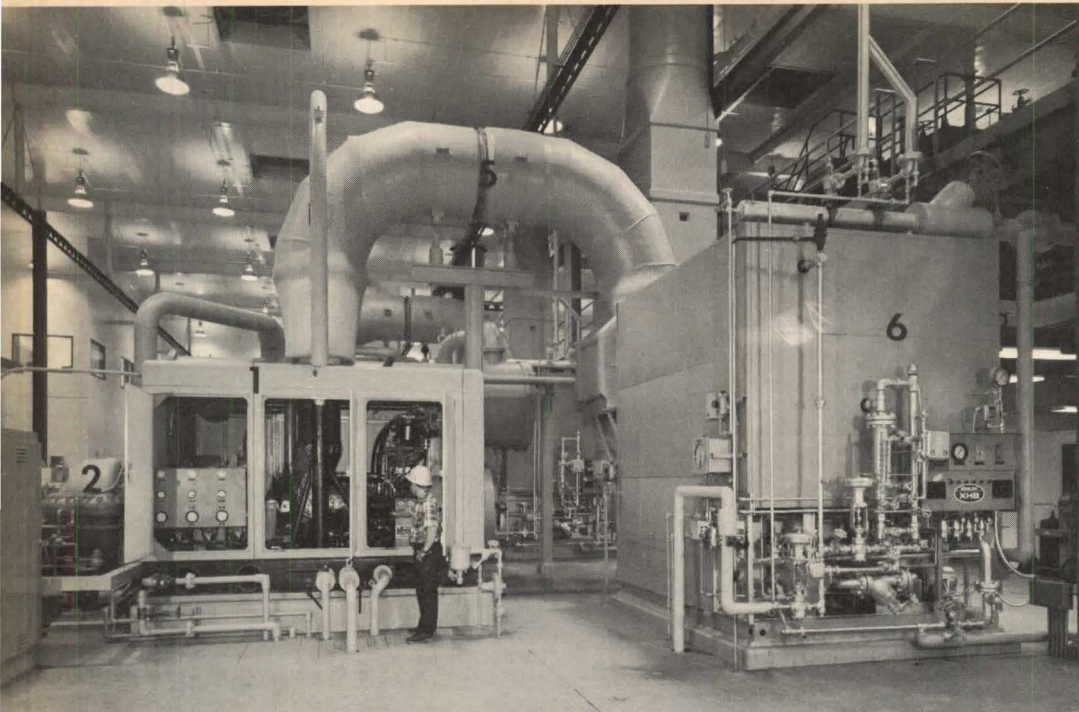
Numerous central plant systems had been designed by the Nishkian staff before



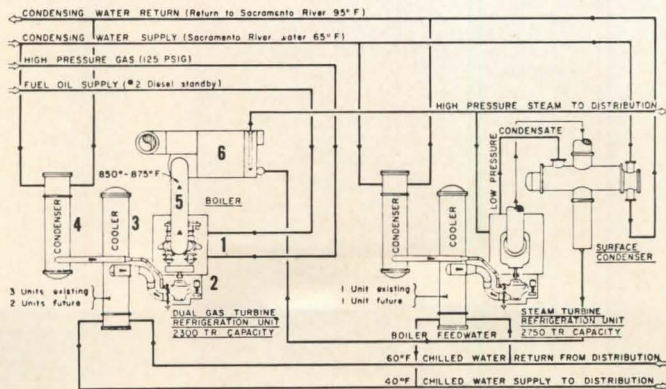
The new high-rise office buildings in the foreground are just two of the 15 buildings served by a huge \$13-million central heating and cooling plant (low building at right) and distribution complex. The central plant supplies steam

and chilled water via an underground tunnel system to about 4.5-million square feet of floor space which includes the Capitol building, the library, the archives and a number of state agency buildings.





Numbers on the photos and on the drawing, right, identify principal pieces of equipment producing motive power and refrigeration: 1. dual gas turbine drive, 2. refrigerant compressor, 3. water chiller, 4. refrigerant condenser, 5. gas turbine exhaust, 6. heat-recovery boiler. The top photo shows the doors open on the sound-attenuating cabinet of the gas turbine unit. Heat recovery boiler is behind the turbine unit in the photo directly above.



they began work on the Sacramento project. One of these projects was a central thermal environmental control plant serving the Los Angeles County Civic Center. Designed in 1955-56, the Los Angeles plant was considered a similar type of facility serving generally similar types of buildings in a climate that bears comparison with that of Sacramento.

Operating data of the Los Angeles plant, compiled over a 12-month period, was used to arrive at a realistic load estimate and diversity factor for the Sacramento plant. Climatic loads were based on U.S. Weather Bureau statistics. Maximum summer temperatures were found to be 5 F higher in Sacramento than in Los Angeles, while Sacramento's lowest winter temperatures were 15 F below those of Los Angeles.

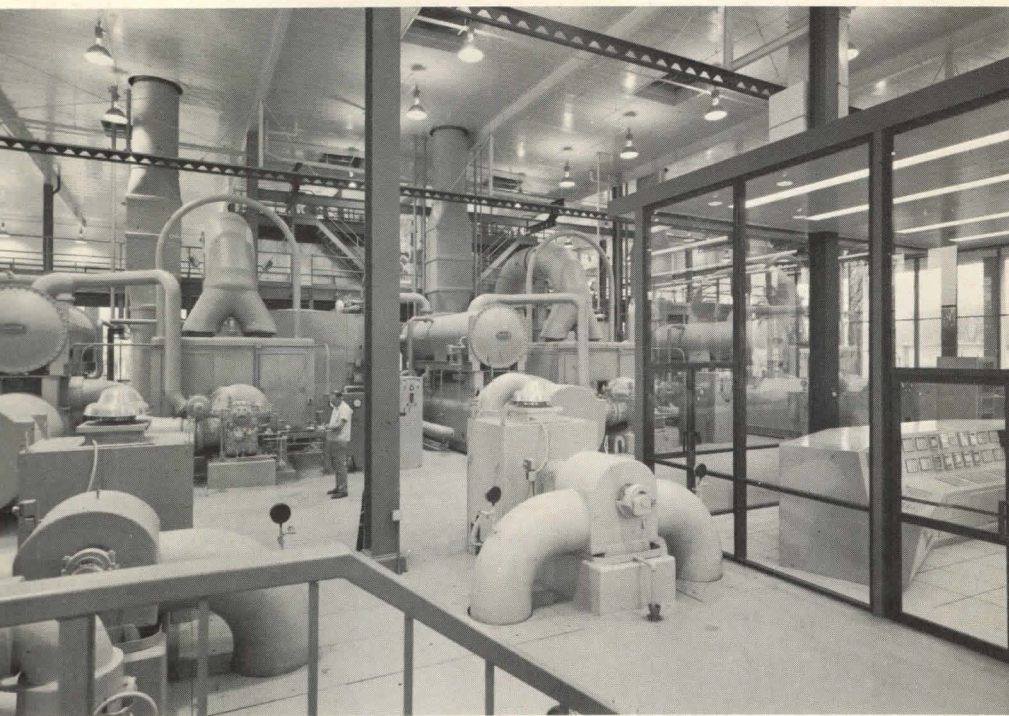
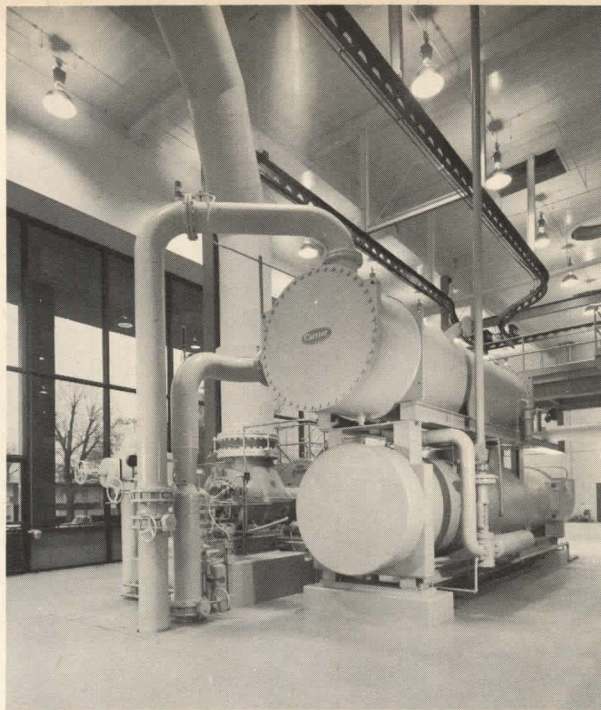
After adjusting all the pertinent analytical statistics to compensate for the differences between the two plants, the engineers established the various factors and estimating criteria for the California State Capitol Mall's plant. On this basis, it was estimated that only 65 per cent of the gross floor area in the buildings would require air conditioning. Instead of the normal cooling load factor of 40 Btu/net sq ft, the engineers worked with a diversity factor of 85 per cent and an adjusted cooling factor of 34 Btu/net sq ft in their estimates. The normal heating load factor used for estimates is 33 Btu/net sq ft, but a 90 per cent heating diversity factor lowered this to 29.7 Btu/net sq ft. Accuracy in the estimates of annual operating costs was established by defining a realistic load factor (the ratio between the available plant capacity, based on calculated maximum peak requirements, and the actual plant capacity utilized over a year). After due consideration of all the variables between the Los Angeles plant and Sacramento plant, the operating load factor for both heating and cooling systems of the Sacramento facility was established at 30 per cent, the figure on which annual operating cost estimates were based.

### Energy cost comparisons lead to system selection

Once the feasibility study established that a central plant-type system was desirable, the Nishkian staff surveyed design considerations for the cooling and heating systems. Three alternate cooling systems were considered: 1) a combination of natural gas and steam turbines driving centrifugal type water chilling units; 2) electric motors driving centrifugal chilling units; and 3) steam turbines driving centrifugal units, in combination with absorption type water chiller units. Two alternate water heating systems were considered: steam and high temperature hot water.

The choice of a steam-heating system over a high-temperature hot water system was justified in this case by cost savings produced by the substantially lower over-all costs of the steam system as compared to the HTHW system. In addition, some of the existing buildings were already using

Steam generated by the heat recovery system is the source of power for a steam-turbine driven centrifugal chiller that provides 2,750 tons of refrigeration. When all six gas turbines are operating, there is enough "free" steam to run the 2,750-ton centrifugal. The center photo shows an over-all view of the central plant with two of the gas turbine units in the background. The bottom photo shows the console from which all equipment can be monitored and controlled.



steam-heating systems while others had hot water systems. Nishkian's engineers felt that a steam supply was less expensive to convert to hot water systems than a hot water supply would cost to convert to steam systems. Finally, hot water was not compatible with any of the three cooling systems, but the steam generating capacity of the plant could be used for the production of chilled water in two of the proposed systems. Natural gas was specified from the beginning as the primary fuel for the boilers. This was due to its economy at interruptible rates for such a large-tonnage project and its clean burning characteristics.

Of the three cooling system alternatives, Nishkian's staff recommended Alternate No. 1, which would ultimately include five gas-turbine driven centrifugal chillers. Annual estimated plant operating costs in this system included: \$296,620 (fuel gas); \$41,140 (electricity); \$864 (water); \$7,765 (water treatment); and \$37,800 (maintenance). Total annual operating costs were estimated at \$384,189 for Alternate No. 1, as compared to \$470,523 for Alternate No. 2 and \$461,896 for Alternate No. 3.

Annual costs of direct investment for the full Alternate No. 1 system were estimated at \$793,222, as compared to \$738,823 for Alternate No. 2 and \$755,722 for Alternate No. 3. Annual operating labor cost was estimated at \$70,000 for each of the three systems. Grand total of estimated annual operating and owning costs for Alternate No. 1 was \$1,247,411, as compared to \$1,279,346 for Alternate No. 2 and \$1,287,618 for Alternate No. 3.

These figures indicate an annual saving of \$31,935 in favor of Alternate No. 1, based on a 35-year amortization period. Nishkian's figures indicated that Alternates No. 1 and No. 2 were approximately equal in total annual operating and owning costs when a 16-year amortization period is used, but beyond that point, Alternate No. 1 showed an advantage that increased progressively as the amortization period was lengthened.

Although the electric-driven centrifugal units required the least capital investment, the natural gas and steam turbine combination offered an annual saving of \$86,334 in operating and maintenance costs. The difference in cost between the two systems allowed the payout of the higher direct investment costs in only 16 years.

Key to the economy of Alternate No. 1 is the practice of "piggybacking"—recovering the waste heat included in the turbine exhaust gases and using it to generate steam in a cascading supply until the combined supply is capable of powering a full condensing steam turbine driving a centrifugal chiller. Heat energy in the natural gas fuel supply powers the turbines that drive chillers; the surplus heat is transferred to the exhaust gases and would be vented to the outside air unless a heat recovery system is employed. At the California State Capitol Mall plant, the exhaust gases of each pair of gas turbines are passed through a heat recovery unit, and much of the "ex-

haust" heat is converted into steam that powers a 2,500-horsepower steam turbine driving a 2,750-ton centrifugal water chiller.

#### **Design innovation by engineers permits economy-sized equipment**

Each of the three chiller units driven by gas turbines in the Sacramento plant is rated at 2,300 tons of cooling capacity and requires a 2,100-horsepower prime mover. The limited module size of gas turbines available in 1963, when the feasibility study was conducted, presented a problem in matching turbine-chiller selections without including too many chiller units.

This problem was solved in the Sacramento plant by using a unique equipment configuration. First in its field, the configuration was designed by M. A. Nishkian Co. engineers. Two gas-fueled 1,050-horsepower turbines were paired to power each of the centrifugals. Both turbines start simultaneously when the centrifugal unit is activated. Space limitations in the central plant's building, combined with the objections to operating and maintenance problems, prevented the use of 10 separate smaller chiller packages that would have allowed the use of single low-horsepower prime movers.

Maintenance costs of the complete refrigeration equipment were estimated at \$1.00 per installed ton per year (a total of \$12,400 annually), while maintenance of the steam system equipment was estimated to cost one cent per 1,000 lbs. generated (an annual cost of \$5,400). Two maintenance men were budgeted at \$10,000 per year each. Total annual maintenance cost of the full plant was therefore estimated at \$37,800. Maintenance of the gas turbines consists of a monthly preventive maintenance procedure and teardown after 10,000 hours for inspection purposes, conducted by state engineers. Life of the gas turbines is projected at 30 years.

Natural gas for the turbines and the boilers is supplied at 150 psi by the Pacific Gas and Electric Company on an interruptible gas rate, billed monthly. Standby fuel for the gas turbines is No. 2 diesel oil, stored in two tanks with a total capacity of 50,000 gallons. Switchover to the standby fuel is manual; the system is checked once each month. Average monthly gas usage by the eight turbines was estimated at 24,200,000 cubic feet, plus 39,400,000 cubic feet of gas for the four boilers, or an estimated total monthly gas bill of \$24,718. Actual gas bills for the first six months of operation averaged \$21,719 per month.

#### **Well water for condensers eliminates cooling towers**

Another unusual feature of the central heating and cooling plant is the absence of cooling towers in the Capitol Mall area—a rigid esthetic requirement imposed by the state's architects. Condensing water needs of the cooling tower system are about 36,290 gallons per minute (based on a 14 F temperature differential), which would have re-

quired a 50-cell cooling tower measuring 30 by 26 by 180 ft. This would not only have taken up valuable property space but would also have occasionally generated objectionable clouds of vapor.

Instead of a cooling tower, the central plant draws up to 16,200 gpm of condensing water from a collector well adjacent to the Sacramento River. The 80-ft deep well produces 56-62 F water that is piped 3,800 ft to the central plant, via direct buried underground concrete pressure pipe. Condensing water requirements are reduced by the extremely clean well water to one gallon per ton of refrigeration. Return water is aerated before it is fed to the river, a protective measure to prevent the fish from being harmed.

Although the initial cost of the well-type collecting system was nearly double the cost of a cooling tower, Nishkian's engineers reported that maintenance and amortization costs over a 35-year period resulted in an annual cost difference of only \$1,124 in favor of the cooling tower. Since the collector well system requires virtually no maintenance and meets the esthetic requirements of the state's architects, Nishkian recommended its use over either a cooling tower or direct use of river water. The use of direct surface river water was rejected because of high turbidity and its associated costs, wide variation in river water temperatures, and possible interference with marine life.

#### **Tunnel system houses water and steam lines**

Two methods of distributing the steam and chilled water from the central plant to the 15 buildings were considered. One involved the direct burial of pre-insulated conduit, which would have been less expensive to install than the alternative system of reinforced concrete pedestrian tunnels. However, maintenance of a buried system that includes about 5,000 ft of main line piping plus 5,200 ft of secondary piping is next to impossible.

The pedestrian-type tunnel system was considered to be more in keeping with the over-all concept of the master plan and central plant design, even though it represented the largest single portion of the proposed project in terms of the dollar investment. Basic advantages inherent with the tunnel system were: inspection and maintenance of pipes, valves and expansion joints is convenient; failure points can be easily located and damage repaired without the inconvenience of excavation, etc. The main backbone tunnel is 10 ft square, while the secondary tunnels are 6 ft by 8 ft. Initial cost for the distribution system serving up to 34 buildings (to the year 1980) was estimated at \$8,223,071, plus additional work of \$1,580,000 to the year 2000.

#### **Some of the details on plant load and operation**

Buildings currently in the California State Capitol Mall range from four stories to 17

stories in height and include a total of about 4.5 million sq ft of floor space. About half of the buildings in the complex are more than 30 years old.

Existing air-conditioning systems in these buildings varied greatly, depending on the nature of use. For example, the legislative chambers in the Capitol were air conditioned in 1950 using two 200-ton centrifugal chillers in the basement. The Capitol is open around the clock, seven days per week, and most of the other buildings have at least some 24-hour areas.

Another air-conditioning factor is the growing number of computers in the complex. Ten large systems are now in use, each occupying 10,000 sq ft or more.

Combustion air for the gas turbines driving the centrifugal chillers is supplied at the rate of up to 250,000 cfh through a unique underground air shaft, 6 ft in diameter. Acoustically treated air intakes for the system are inconspicuously integrated into the corners of the building.

#### **Central plant cuts down on cost of labor**

State and municipal codes impose rigid regulations on the number of operational and supervisory personnel required for environmental control systems. Almost every plant that generates steam in excess of 15 psig requires attended operation.

A plant that requires a minimum of one operator per shift actually needs a total staff of five men. The extra employees rotate for days off, vacations, holidays, sickness, etc. Direct costs of operating and maintenance manpower are further increased by 25 or 30 per cent because of fringe benefits that the building owner must provide.

Before the California State Capitol Mall's central heating and cooling plant began operation, there was a total of 57 plant engineers in the buildings of the complex. The central plant's staff has been reduced by attrition to 22 engineers—there were no layoffs.

#### **Cost savings projected from first six months' operation**

At this time, the central-heating-cooling plant is about 65 per cent completed, as compared to its final equipment schedule. However, its savings in energy and manpower costs are already dramatic.

When contrasted against the operating costs of individual in-building plants, the new central plant will save the State of California a total of \$444,846 during its first year of operation. Actual recorded costs of the first six months of operation were projected for the remainder of the year to obtain this figure. Of the total, \$203,060.00 represents utility cost reductions, while \$241,786.00 is produced by manpower curtailments.

California's engineers expect the annual savings to increase to an average of \$1 million when the plant reaches maturity. These savings will be about equally divided between utility cost and manpower cost reductions.

DESIGN LIGHT IN...

Polished

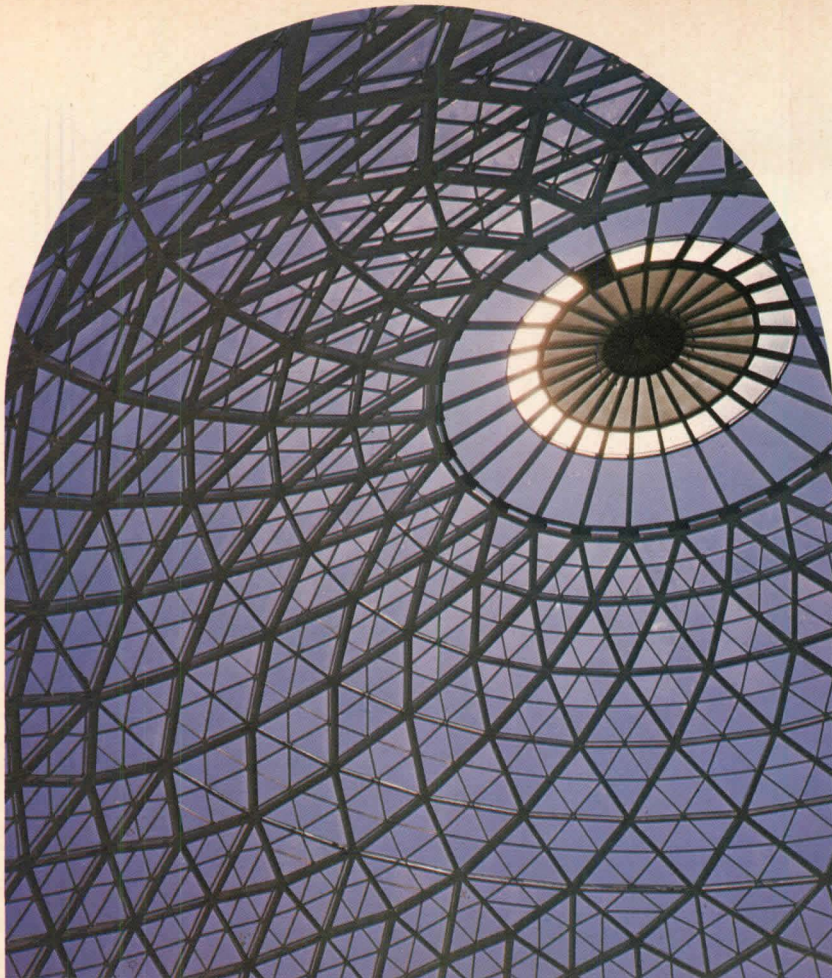
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\*To qualify for this "Fire Retardant" listing, Mississippi Wire Glass had to withstand the furnace test given by Underwriters' Laboratories, Inc., Wire glass windows in a removable wall are placed in a gas-fired furnace. Temperature is raised to 1600° F. in 45 minutes and held at this point for 15 minutes. The wall is then removed and the glass is subjected to a 1½" stream from a fire hose at 35 to 40 lbs. of pressure. The glass must remain in the sash, substantially unchanged except for any cracking due to thermal shock. Actual test scenes are shown in our 30 minute film "Rolled Glass by Mississippi."

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## FULL-VIEW DOORS

with fire retardant glass

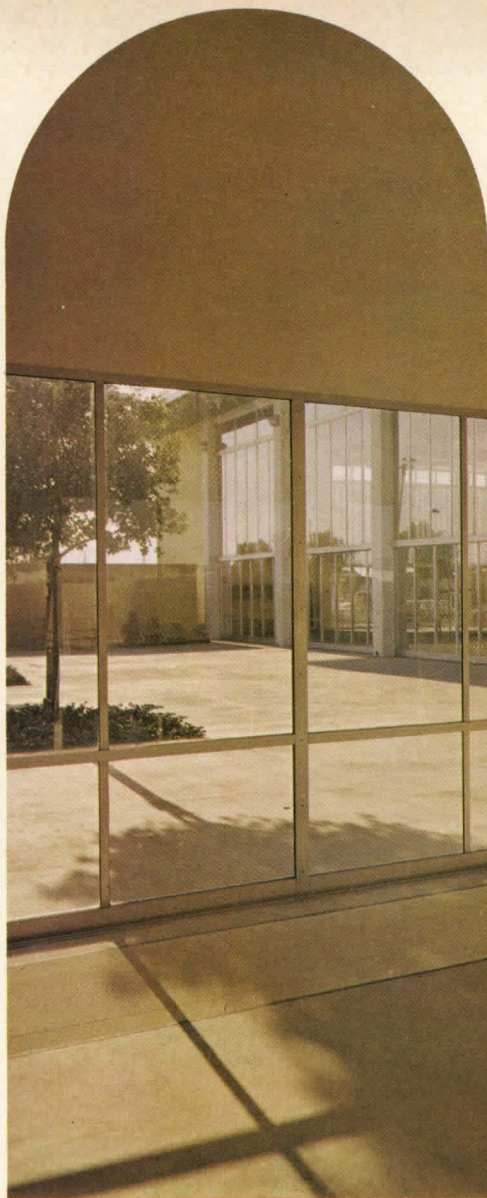
Polished MISCO gives clear vision, so important to safety at busy doorways. It can take abuse and still stand by, ready to fulfill its complete fire retardant function. The way it holds against intense heat seals the doorway against drafts that speed through any openings and spread the smoke and flame. The wire webbing is unobtrusive yet it subtly blends with entrance areas so the glazing adds an interesting design feature as well as a safety function.



## ATTRACTIVE WALL SECTIONS

with full-vision range

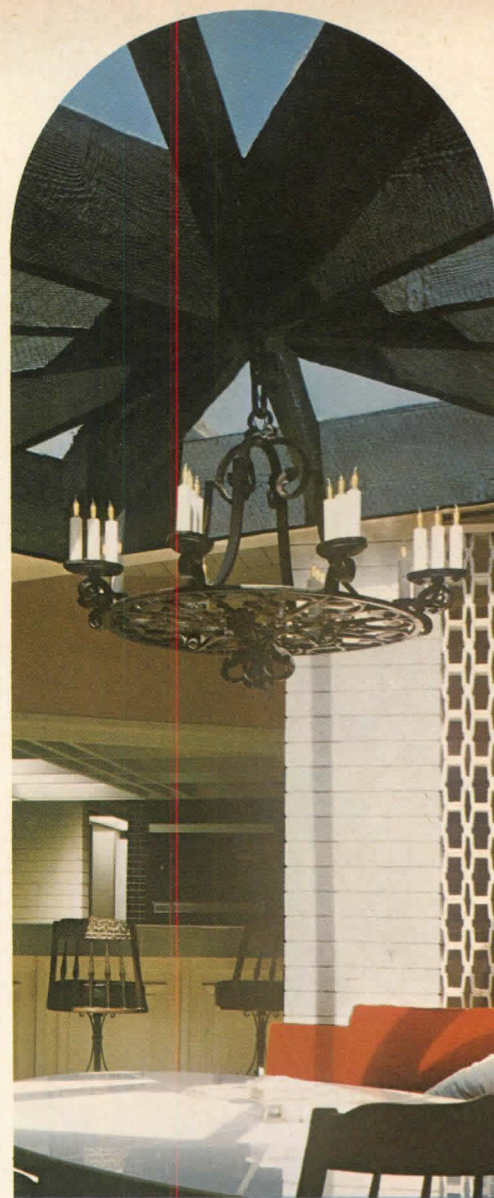
Give the "open" feel to interiors through walls that make full use of natural light. The smooth surface of Polished MISCO makes attractive wall sections that are easy to keep that way. The diamond-shaped mesh is inconspicuous... just visible enough to ward off floor traffic accidents from unawareness of glazed openings. Its basic fire retardant ability checks smoke and flame. The sturdy steel webbing holds glazing fast in its frame under prolonged heat exposure.



## PROTECTIVE WINDOWS

that give clear view

Transmit natural daylight through windows that are glazed sentinels against fire, breakage, vandalism, and forced entry. Polished MISCO provides window areas with fire retardant protection, while maintaining clear vision and the sense of spaciousness that comes from greater light transmittance. Mississippi Wire Glass has been looked to by architects and engineers as the approved fire retardant glazing through more than 60 years.



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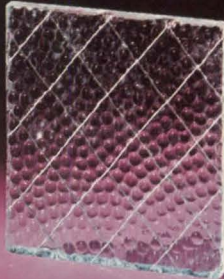
No need for protective screening above and below. MISCO's strong steel diamond-shaped webbing is already fused in where it not only protects against impact from above or below but also prevents shattering that releases ordinary glass for dangerous fall out. Listed "Fire Retardant" by Underwriters' Laboratories, Inc., Polished MISCO holds fast against fire spread under intense heat. Bring more light in from above safely, with fire retardant Polished MISCO.

# Patterned MISCO

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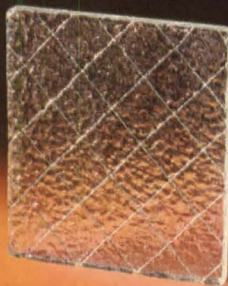
HAMMERED MISCO



BURLAP MISCO



SMOOTH ROUGH MISCO



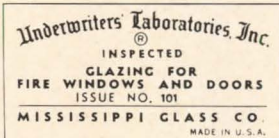
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## Curtain-wall elements attached to concrete frames with self-drilling fastener

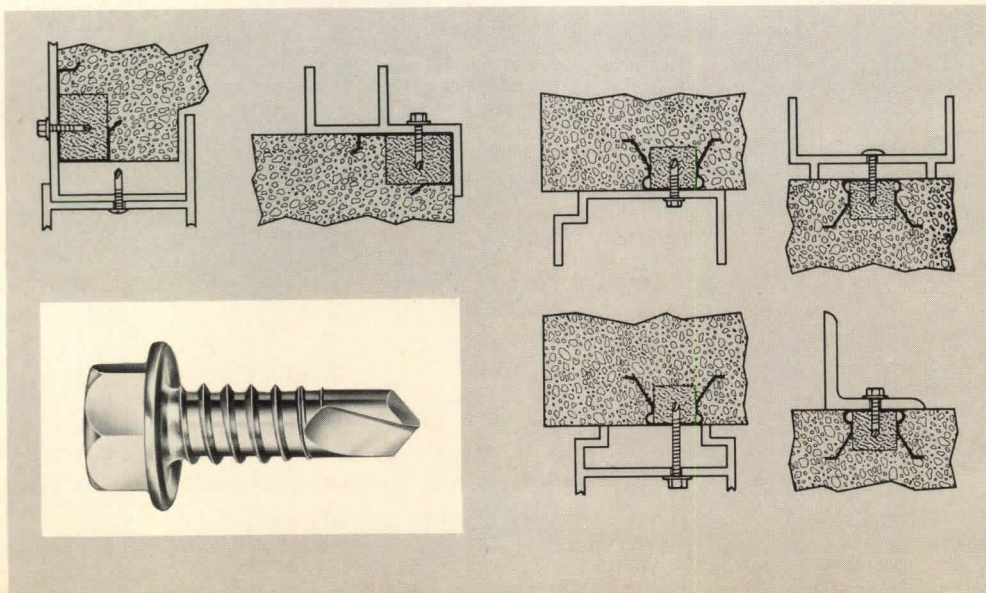
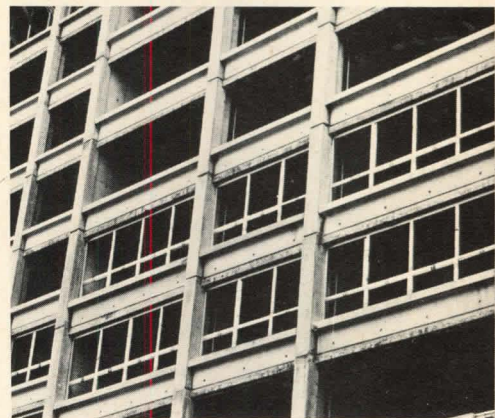
A new fastening system for concrete is comprised of two basic elements—a fastening plate made of galvanized metal and a self-drilling fastener. The fastening plate is a pre-pour insert that provides an exposed metal fastening plate flush to the concrete surface. The fastener incorporates a metal drilling point with a threaded screw which drills, taps and fastens in one operation.

The system, developed by the Buildex Division of Illinois Tool Works, Inc., provides a fastening plate in continuous form in lengths up to 40 ft. It is being used in the installations of window frames, roof decking, metal building base anchoring and metal siding.

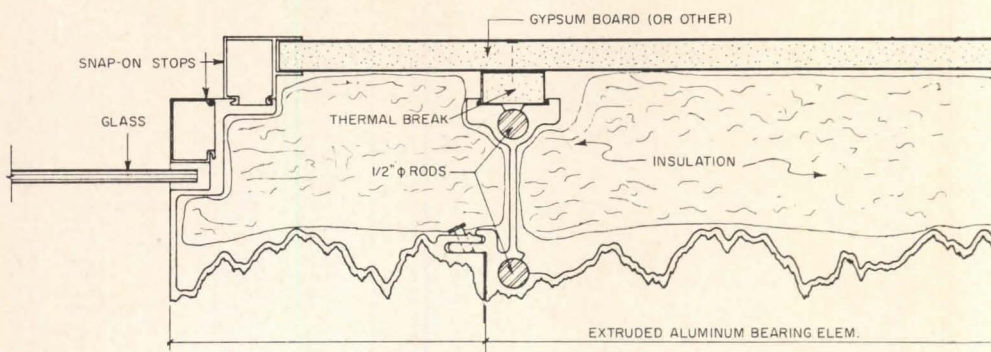
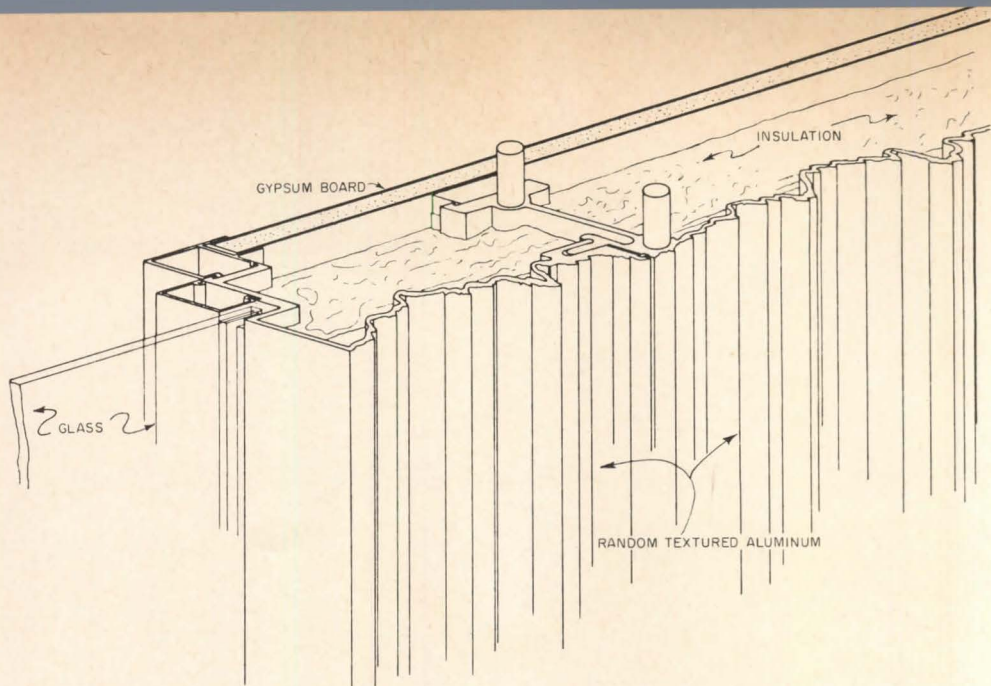
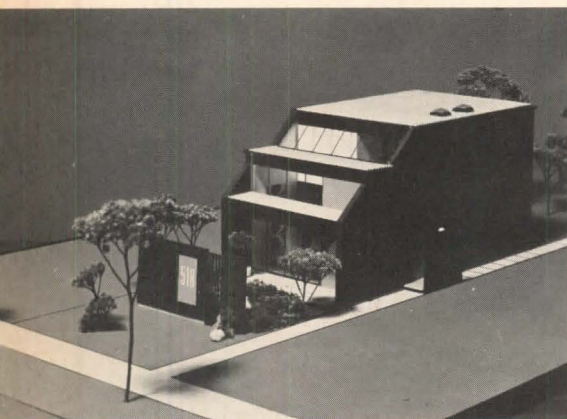
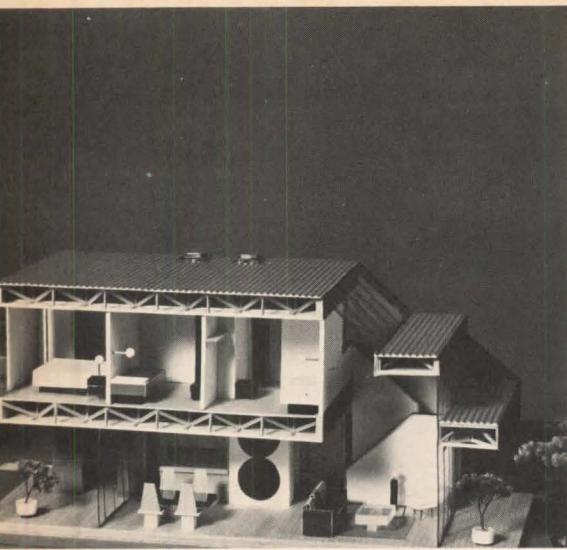
The most recent use of the system is in high-rise concrete buildings in the Chicago area. With fastening plates located in window openings, the metal framing members are quickly fastened.

The fastening plate is available in continuous or spot (2 in.-length) form. In continuous form it has a pull-out value of 3,000 lb per ft in average-strength concrete.

The basic advantages of the system include the ease with which the fastening plate is installed in the forms, the ease of fastening to the plate and the latitude the plate provides in the placement of fasteners.



Self-drilling fasteners are installed with a power drill that embeds them in a galvanized steel fastening plate. Inset within the plate is a piece of polystyrene foam to provide a void into which the fastener can penetrate. The fastening plate is attached to the concrete forms by means of nails. The details at left show the variety of window framing elements that can be installed using this technique. Photo left shows the self-tapping fastener. Because the fastener is self-tapping many time-consuming operations are eliminated.

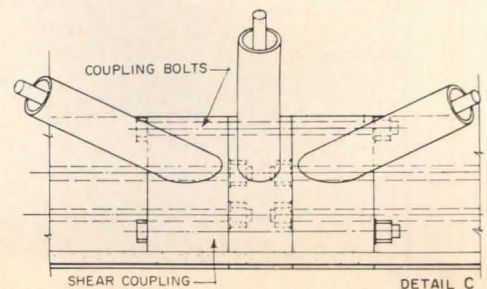
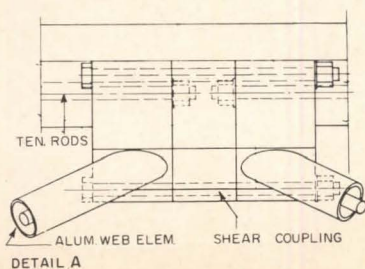
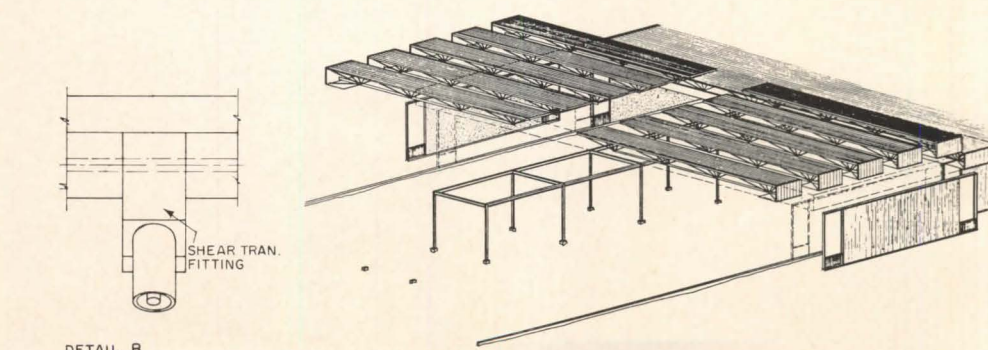
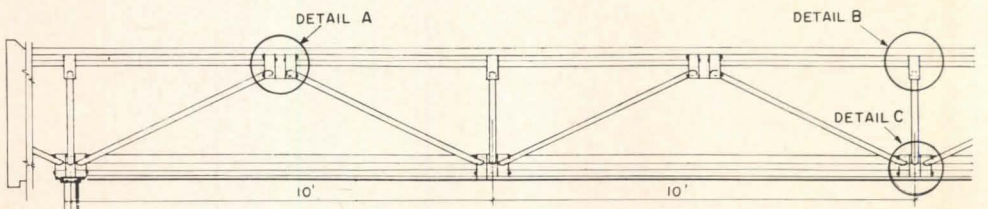


## Toward more effective use of aluminum: a thin-skin load-bearing wall

Designers have long sought to use aluminum more effectively for building frames. But, despite its many advantages such as light weight, corrosion resistance and ease of forming, most approaches have not enjoyed success because of basic economics. The system shown here hopes to overcome this problem via inventive design and off-site fabrication of elements.

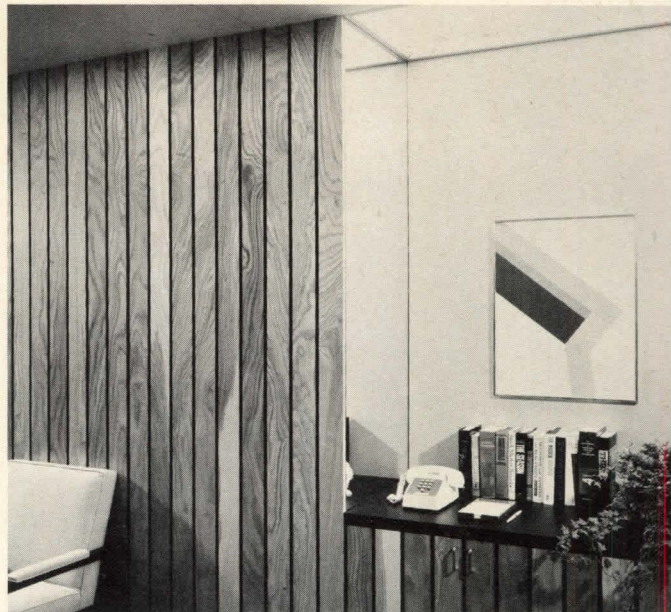
The most innovative element of the system is a load-bearing aluminum wall comprised of large structural aluminum extrusions textured in random manner and finished with a hard-anodic coating. These sections, together with insulation, interior surface (gypsum board, metal, etc.), head and sill members, are shop assembled in 10 ft by up to 40 ft-long segments by Aluminum Structures Company of Wilmette, Illinois. (See also *RECORD*, February 1969, pages 167-168.) The aluminum space frame roof structure is fabricated in completed elements 5-ft wide by 35-ft long, or as required for shipment to the job site.

The model shown in the photos is an aluminum load-bearing wall system house designed by architects O'Connell, Wicklund, Pigozzi for a competition sponsored by the Chicago Dwellings Association and the Chicago Chapter, A.I.A.



For more information circle selected item numbers on Readers Service Inquiry Card, page 247-248

An exciting collection of wall coverings in varied veneers and patterns

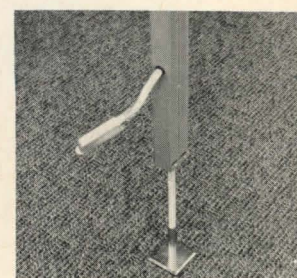
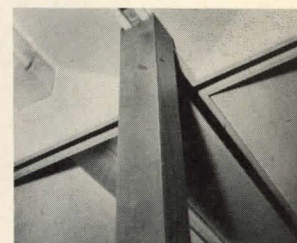


**ELEMENT I** includes basic designs that encourage distinctive interiors. *Palisades* (left) is created with U-shaped profiles that support the illuminated ceiling and act as a background for the desk. In *Ionic* (above) highly figured veneers alternate with reveals.

*Butcherbloc* (top right) is a random pattern inlaid in vertical rows. And *Collage* has veneers of varying lengths and widths that overlap vertically and horizontally. ■ U.S. Plywood, New York City.

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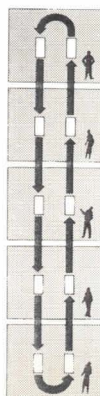
VERTICAL MAIL CONVEYOR BY



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Phoenix Mutual Life Insurance Co., Hartford, Conn. *Architect:* Harrison & Abramovitz. *Contractor:* George A. Fuller Co.



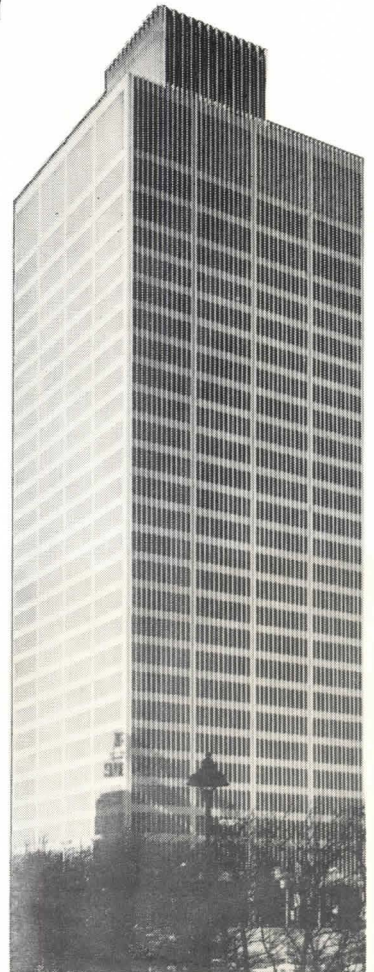
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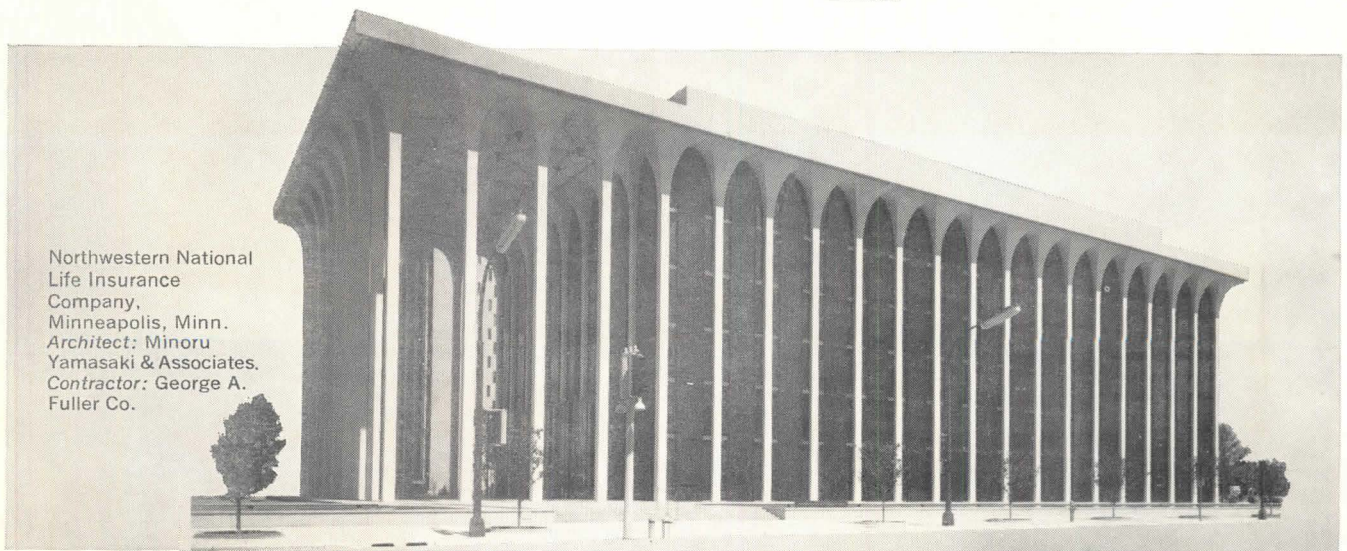
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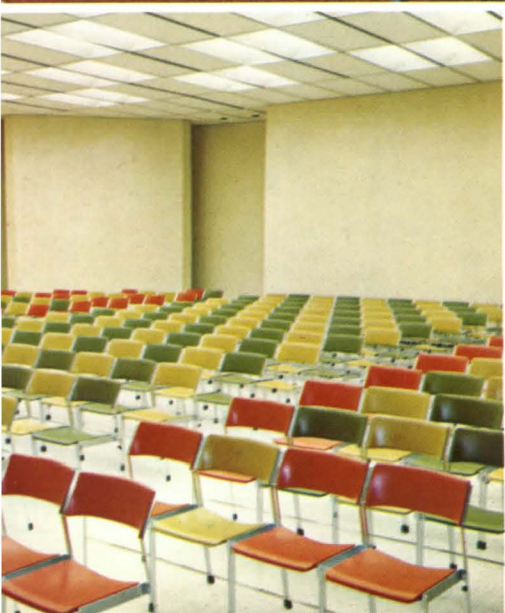
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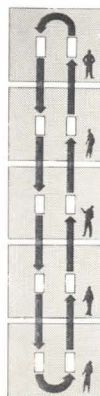
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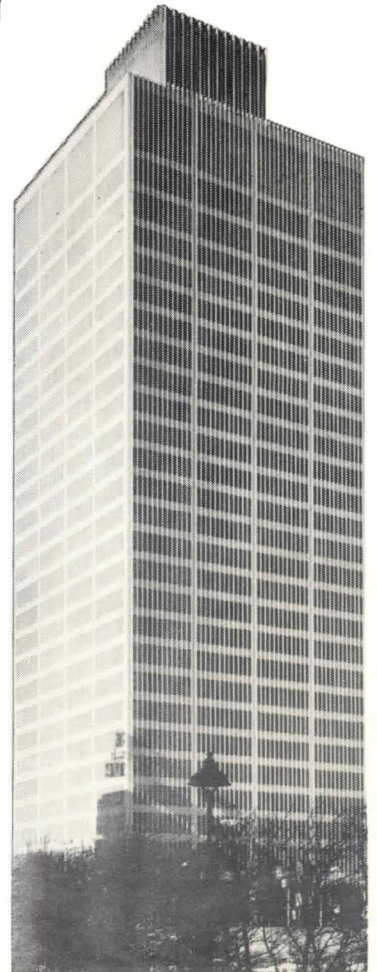
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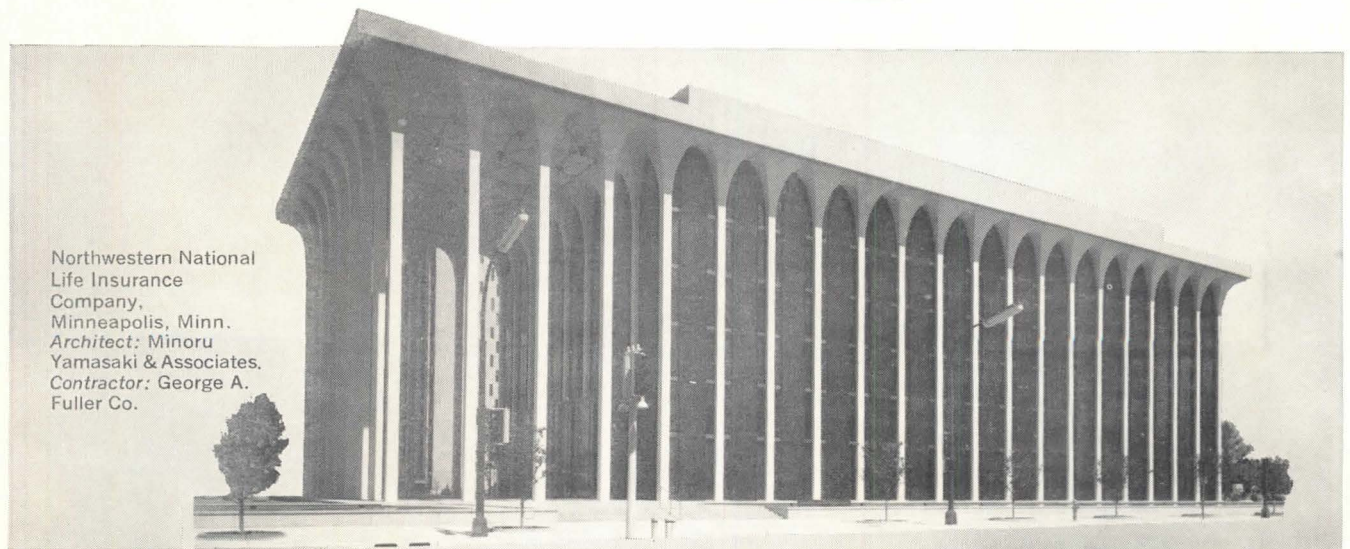
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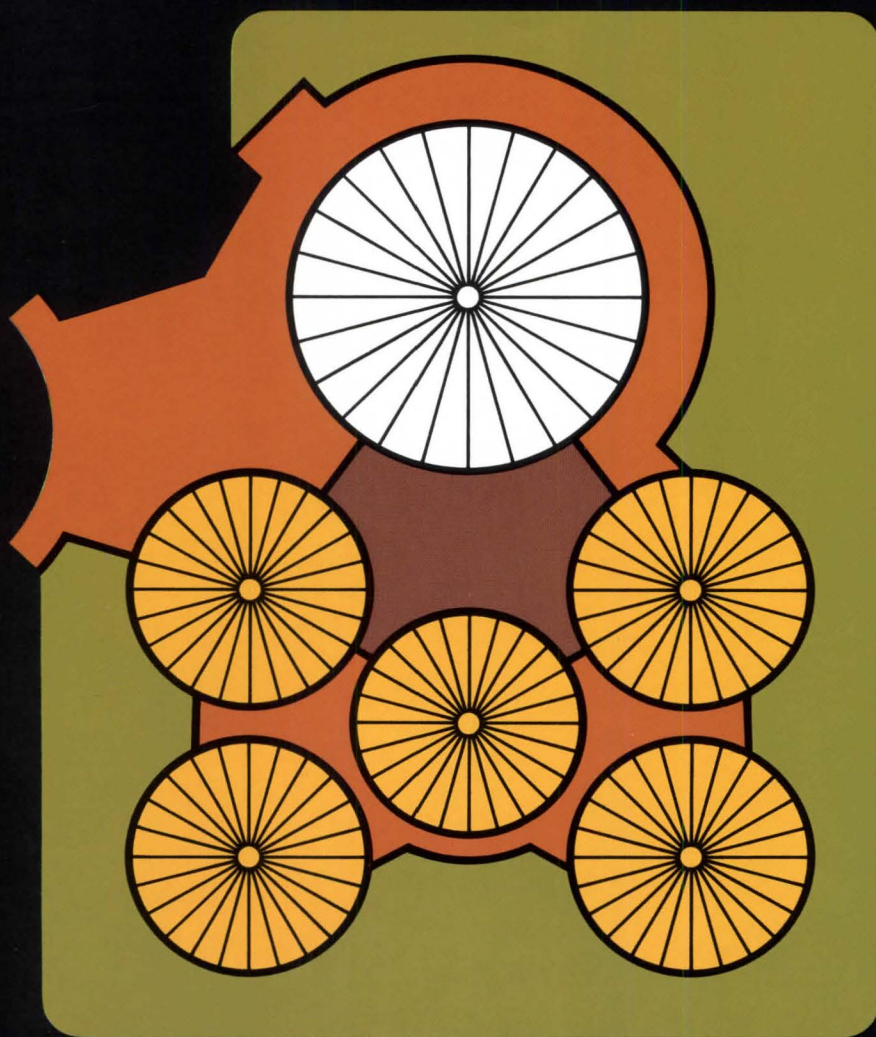
**Get details.** Write for new illustrated *Recordlift* Bulletin 153. Describes operation, shows various addressing systems, gives dimensional requirements. Standard Conveyor Company, 312-A Second St., North St. Paul, Minn. 55109.



Michigan Consolidated Gas, Detroit, Mich. *Architect:* Minoru Yamasaki — Smith, Hinchman & Grylls. *Contractor:* Bryant & Detwiler Co.

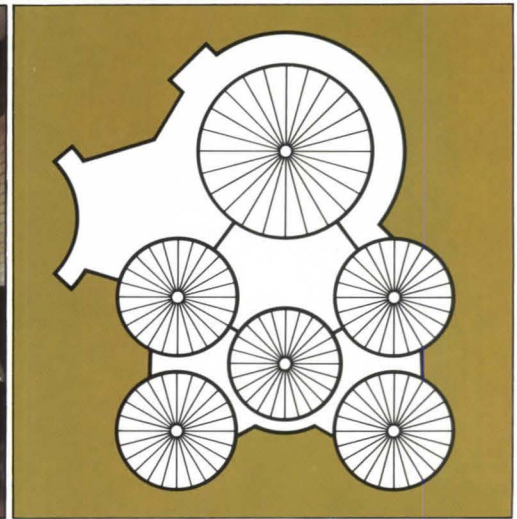


Northwestern National Life Insurance Company, Minneapolis, Minn. *Architect:* Minoru Yamasaki & Associates. *Contractor:* George A. Fuller Co.



School design is always a challenge to balance function, aesthetics, and cost. But sometimes the bold departure in design costs *less* instead of more. To wit: exposed laminated wood beams and arches used in circular pod design.

On the following pages you'll see specific examples of how Koppers products have helped architects and engineers control the effects of environment and obtain greater latitude of design, saving money for clients. Koppers building products are either permanent in themselves, or give permanence to other materials.





Education in-the-round at just \$13.94 per square foot.

Here's a school construction story to warm any taxpayer's heart. It's the new Central High School at Natchitoches, Louisiana. Housing 1,000 students, the structure was completed for \$1,540,808, including land acquisition.

Architect Oscar C. Butler credited the low cost per square foot to Koppers exposed laminated wood beams and arches in the common roof system joining the six circular pods. "Cost of other structurals and their required concealment for interior beauty would have jumped our construction costs considerably. Another cost-savings factor," he added, "was the ease of handling the wood laminates and speed of erection."

Nearly 700 laminated wood beams and arches were used in the school. The teak-finished structurals add a touch of warmth and graceful symmetry to the interior design. Most of the sections radiate like spokes from the hub of a wheel on each pod. Others flare out from the perimeter walls of the pods to frame corridors, the main entrance lobby, and a spacious student commons area (combination auditorium and dining room).

With 87,500 square feet of floor space, the total cost averaged \$13.94 per square foot, about 20-25% under the rule-of-thumb figures advanced by architects and builders for present-day school construction. Check the coupon for the full story on Koppers structural systems.

Architect: Butler & Dobson, Natchitoches, Louisiana



# KOPPERS

## Architectural and Construction Materials

Problems	Low-cost Koppers solutions
<b>Built-up roofing</b>	Reinforcement fabrics, coal tar roofing pitch
<b>Waterproofing</b>	Reinforcement fabrics, coal tar roofing pitch, coal tar waterproofing pitch
<b>Dampproofing</b>	Same as waterproofing, plus Durethane® polyethylene film
<b>Corrosion protection for steel</b>	Bituminous coatings, synthetic resin coatings
<b>Corrosion protection—concrete &amp; masonry</b>	Bituminous coatings, synthetic resin coatings, coal tar waterproofing pitch
<b>Protection of asphalt pavement</b>	Pavement sealers
<b>Insulation</b>	Dyllite® foam plastic board
<b>Low-cost piling, poles and structures</b>	Pressure creosoted wood
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<b>Termite, rot and decay protection</b>	Pressure creosoted wood, Cellon® pressure-treated wood, Wolmanized® lumber
<b>Sound control</b>	Aircoustat® sound traps
<b>Waterproofing adhesive for wood</b>	Penacolite® adhesives
<b>Structural systems</b>	Laminated arches, beams, decking; reinforced plastic structurals
<b>Environmental control</b>	Aircoustat sound traps, electrostatic precipitators, Acoustilouvres

For more information, clip and mail coupon.

Earl F. Bennett, Mgr., Architectural Sales  
Koppers Company, Inc.  
Room 1322, Koppers Bldg.  
Pittsburgh, Pa. 15219

V -1

Please send me additional information about the products I have checked:

Aircoustats and Acoustilouvres     Built-up roofing     Laminated wood arches and beams

Other (Please specify) \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Address \_\_\_\_\_

Company \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Buildings should be seen and not heard

The New England Telephone Company Administration Building now under construction in Manchester, New Hampshire, has a heating and cooling system that will be the first of its kind in the state. It will also be one of the quietest.

The building will be electrically heated and cooled by a centrifugal dual condensing refrigeration machine and supplemental steam boiler. Koppers duct silencers and acoustical ventilation

louvers will hush the noise generated by this equipment and reduce the overall noise level both inside and outside the building.

Designers were particularly concerned with the air intakes and discharges located near the entrance of the three-story brick and glass structure. To prevent the noise from bothering passers-by, they are installing Koppers Acoustilouvres. The Acoustilouvre not only performs all the functions of an intake louver but

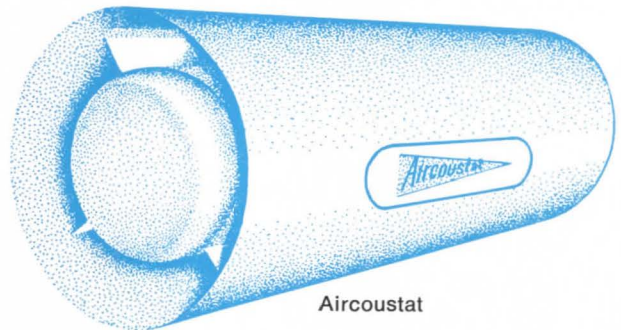
absorbs fan noise, without interfering with air flow. To reduce fan and duct noise inside, Aircoustats® are being installed in the duct system.

Koppers makes a variety of sound conditioning systems and sound traps, plus modular component units for absorbing sound in a wide variety of commercial and industrial enclosures. Check the coupon for complete information.

Architect: Hoyle, Doran and Berry  
Boston, Massachusetts



Acoustilouvre

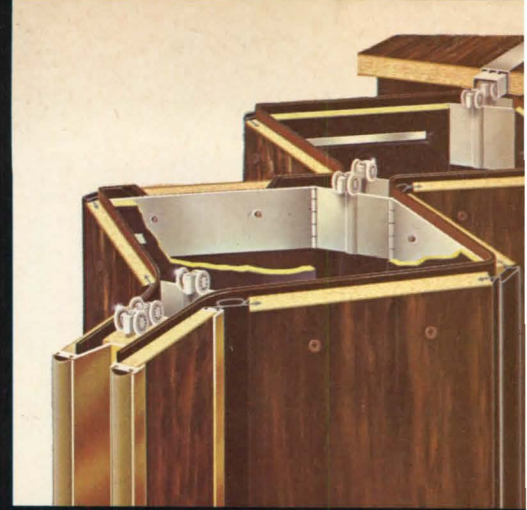


Aircoustat

**KOPPERS**  
Architectural and  
Construction Materials



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an exciting new concept in wood



TWIN PANEL SONICWAL



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SONICWAL/88 • STC 40



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Panelfold manufactures a full range of wood folding doors and partitions in both Single Panel and Twin Panel configurations. Four, Six, Eight and Twelve inch panel widths are offered. For each design or construction condition there is an appropriate Panelfold product to fill your acoustical requirements (STC 25 through 40), resolve area flexibility dilemmas or satisfy the aesthetic need dictated by room size. The Panelfold national sales team is ready to help you with the details.



SCALE/6

SCALE/4



ARCHITECTS:

- Pancoast/Ferendino/Grafton (1)*
- Connell Associates, Inc. (2) (3)*
- James Merrifield (4)*
- Arthur Perrin (5)*
- Alfred Browning Parker (6)*



1090 E. 17th Street, Hialeah, Florida 33010

For more data, circle 71 on inquiry card



1



2



3



1 and 2. Upper Willows Condominium. Architect: Fredric Benedict & Associates, Aspen, Colo.

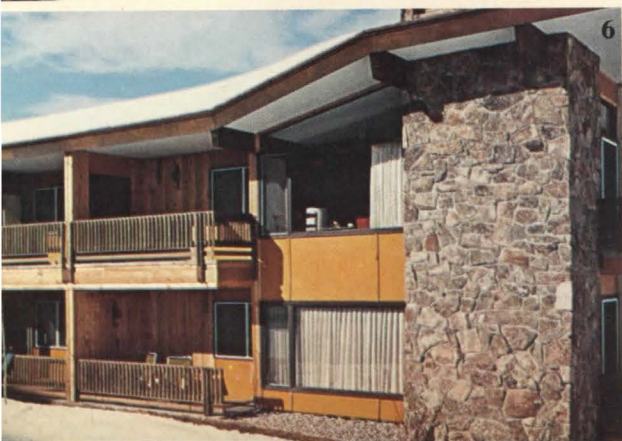
3. Arbeiterdorf Employee Apartments. Designers: Zejdklik, Harmala, Hysell and MacKenzie, Inc., Minneapolis, Minn.

4 and 5. Snowmass Inn. Architect: Art Preusch, Aspen, Colo.

6. Shadowbrook II Condominium. Architect: Fredric Benedict & Associates, Aspen, Colo.

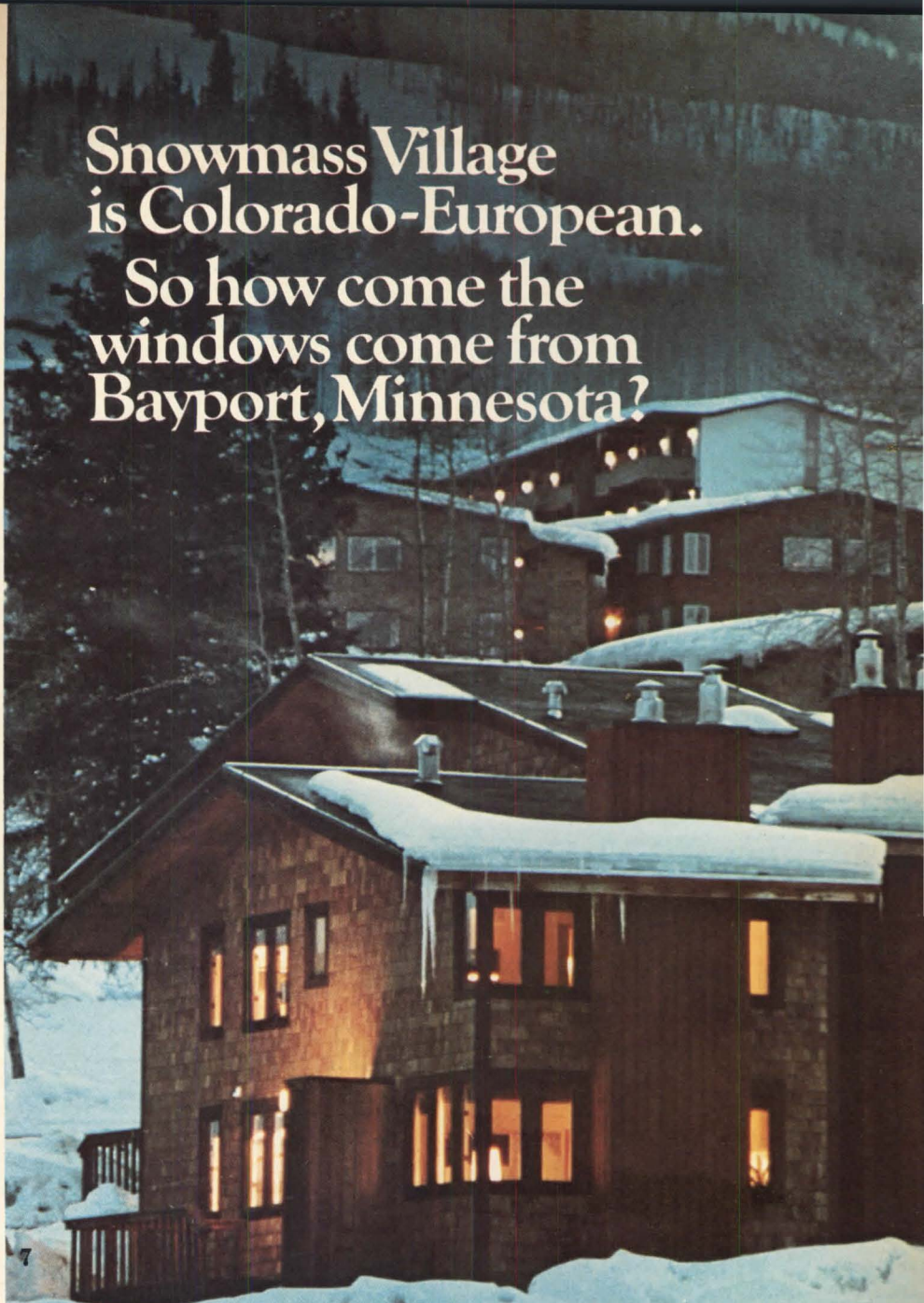
7. Tamarack Condominium. Architect: David J. Flood & Associates, Beverly Hills, Calif.





## Snowmass Village is Colorado-European.

So how come the  
windows come from  
Bayport, Minnesota?



Snowmass, Colorado.

The most European ski village in America. A charming cluster of buildings—terraced up the mountainside, centered around a cobblestone mall.

It took inventive architects—working with native Colorado stone and natural wood—to create this unique Rocky Mountain hamlet.

It also took Andersen Windows.

Andersen offered the architects the freedom of design they wanted—with stock wood windows in six styles and hundreds of sizes.

Wood Casements—to harmonize with rustic wood exteriors. Wood Gliding Doors—to lead to poolside sun decks. Wood Picture Windows—to

frame majestic mountain scenery.

Just to name a few.

Then, too, the Snowmass architects wanted windows that would seal out biting winter winds. (Skiers, like everybody else, like their winter weather . . . outside.) Here again, Andersen offered the extra weathertightness needed—up to 4 times tighter than ordinary windows.

So that's how come America's most European ski village ended up with windows from Bayport, Minnesota.

But that's only the beginning. For the rest of the reasons, check your Sweet's Architectural or Light Construction File. Or talk to your nearest Andersen distributor.

# Andersen Windowalls™



*Window Beauty is Andersen*

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# Security— Uptight or Out-of-Sight.

Cookson Steel Rolling Doors and Counter Doors provide the widest range of applications in all types of commercial, industrial, government and institutional buildings. They meet the most demanding architectural and design specifications. When locked up tight, they deliver the greatest possible security and protection against damage; yet they roll up, out of sight, into a compact hood whenever desired. Smooth and easy operation, trim appearance, reliability, reasonable installation and maintenance cost—all are Cookson Steel Rolling Door and Counter Door by-words. As are many exclusive special features to fit your specific needs.

For more complete information on Cookson Steel Rolling Doors and Counter Doors, "Service" Fire Doors and Counter Fire Doors, Rolling Grilles, Side Coiling Grilles and Operable Walls, write for Bulletin 7001, or see us in Sweet's:



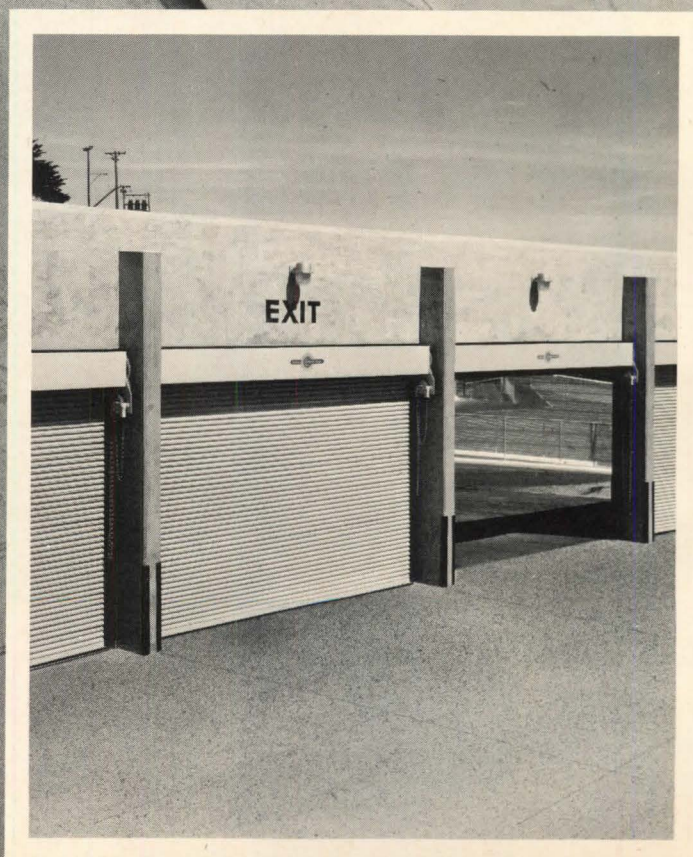
*"Best way to close an opening"*

**THE COOKSON COMPANY**

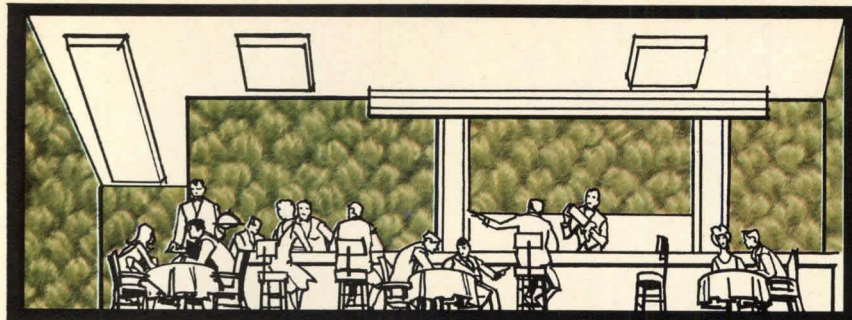
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San Francisco, California 94107



Counter Door



Steel Rolling Doors



# Hush up the walls with Burlington Wallscaping™ of Verel®

Noise. Is any modern building without it? Now Burlington does something beautifully constructive to muffle it. Wallscaping is a new, pile-textured wall surfacing of 100% Verel modacrylic. It absorbs much of the distracting din in an office, theatre lobby or museum. It's luxurious looking, too, so you can cover walls with imaginative textures and colors. Even hang pictures without leaving marks. Cleaning? Just vacuum it right on the walls. And because Verel is flame-resistant, Wallscaping offers important safety benefits. Check Wallscaping at Lees Carpets Division of Burlington Industries, Inc., Valley Forge Industrial Park, Norristown, Penna. 19401.



EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, 1133 AVENUE OF THE AMERICAS, NEW YORK, N. Y. 10036. Verel is the trademark for Eastman modacrylic fiber.

For more data, circle 73 on inquiry card

◆ For more data, circle 72 on inquiry card



## Putting stainless on the roof of a schoolhouse But it will save the taxpayers money.

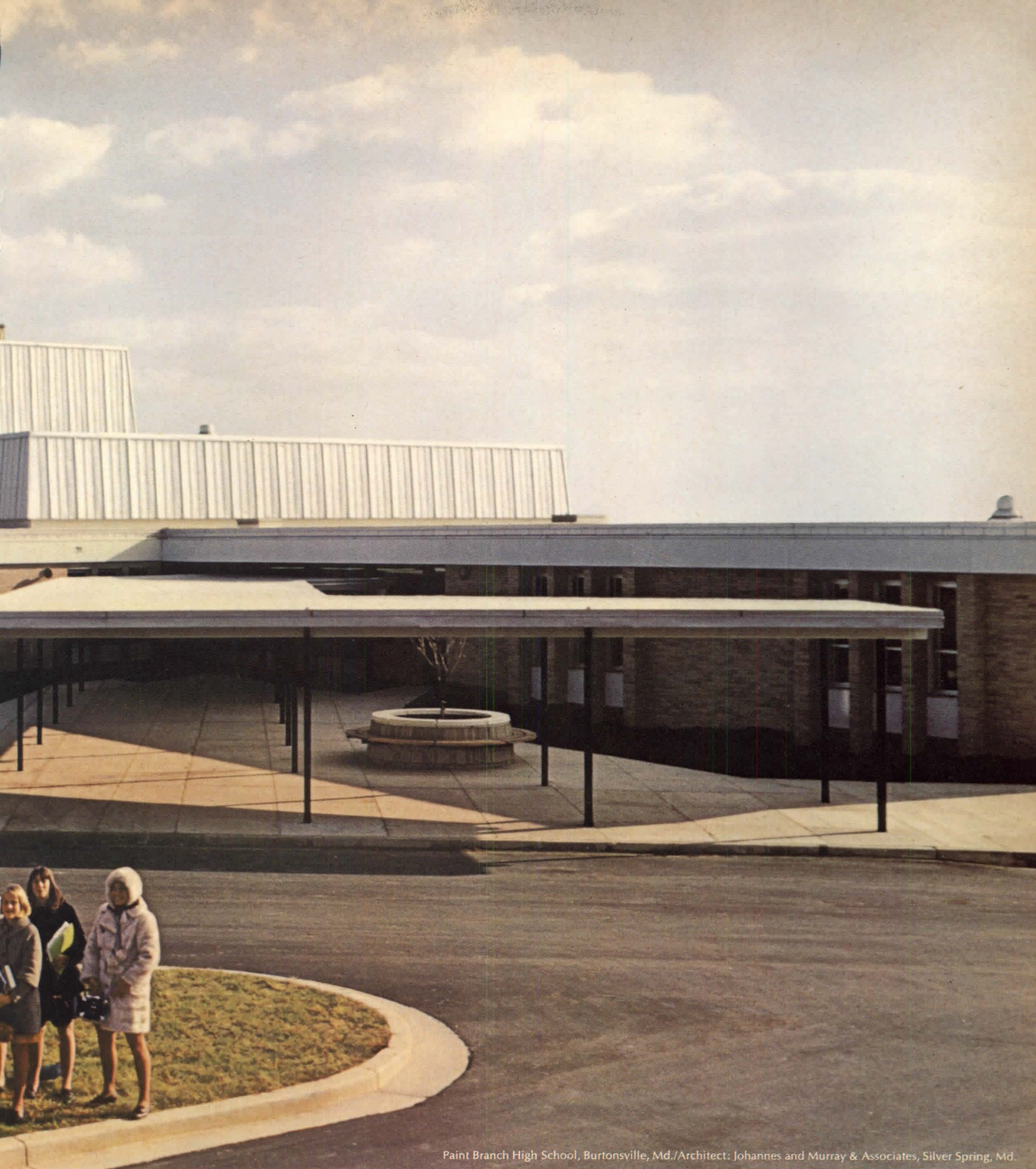
The cost of fixing roofs is sky high and still climbing. In the case of schools, maintenance money could be better spent for teachers, books and/or footballs.

You can do the taxpayers a long-range favor by putting a maintenance-free nickel stainless steel roof on your next school. Stainless steel is a long-lasting, low-maintenance material that

paint, and never stains adjacent masonry.

Stainless is so much stronger than other architectural metals that thinner, economical gauges can be used. This lightweight design feature helps reduce the first cost of stainless to a highly competitive point.





Paint Branch High School, Burtonsville, Md./Architect: Johannes and Murray & Associates, Silver Spring, Md.

**won't get all the seniors into good colleges.**

roof siding, fascia, flashing and downspouts for Paint Branch High School. For a fact sheet that can help your stainless designs pass the finals, write to The International Nickel Company, Inc., 67 Wall Street, New York, N.Y. 10005. In Canada, The International Nickel Company of Canada, Ltd., P.O. Box 44, Toronto-Dominion Centre, Toronto 111, Ontario.

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## NEW SW SERIES MINI-COOLERS —

Only 20½ inches from fountain top to bottom of cabinet. Can be mounted at low level for small children.

**Two Capacities** — 8.0 and 13.5 G.P.H. of 50° water.

**Cabinets** — Vinyl-clad steel, silver spice, and mocha brown; also stainless steel and gray baked-on enamel.

**SPECIAL FEATURES** — Can be vandal-proofed. Two-stream, mound-building projector is squirt-proof.

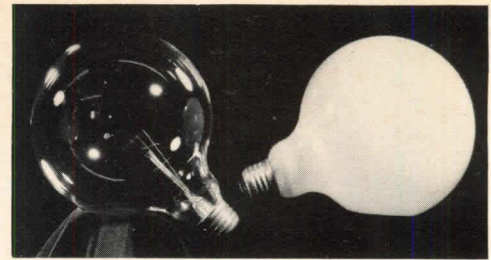
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 1560 Thomas Road, Warren, Ohio 44481  
 SUBSIDIARY • KING-SEELEY **KST** THERMOS CO.



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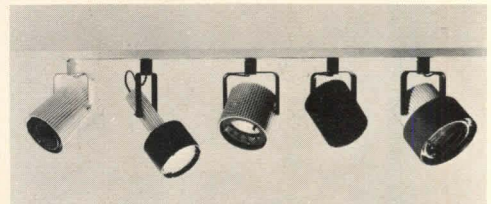
## PRODUCT REPORTS

continued from page 177



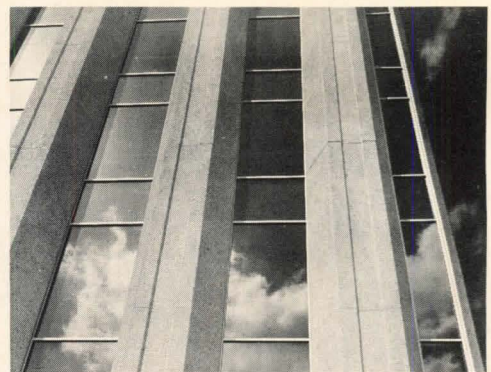
**GLOBE LAMP** / A decorative 5-in.-diameter incandescent lamp is a self-contained fixture that needs no glass globe. It can be used in flush sockets or chandeliers and is available in 40-, 60- and 100-watt sizes in clear or white. ■ Sylvania Electric Products Inc., New York City.

Circle 302 on inquiry card



**LIGHTING SYSTEM** / Basic system consists of continuous lengths of electrified *Light-Tracks* that provide support and power distribution for a variety of *Track-Lights* that attach, disconnect and slide to any point along the track. The ribbed surfaces act as radiating fins to afford optimum heat dissipation and cooler lamp operation. Lights have individual switches and units can swivel both horizontally and vertically for optimum flexibility of direction and position. Exact control of color and quality of light is achieved with a variety of optional color filters, spread lenses and louvers. ■ Gotham Lighting Corporation, Long Island City, N.Y.

Circle 303 on inquiry card



**COATED GLASS** / The 2300 West Loop Building in Houston was recently completed using *Vari-Tran/Chrome* coated glass for all vision and spandrel areas. The glass was chosen because of its "environmental control characteristics of reducing heating and cooling loads and for visual comfort." The sky and surroundings are reflected in the glass. ■ Libbey-Owens-Ford Company, Toledo.

Circle 304 on inquiry card

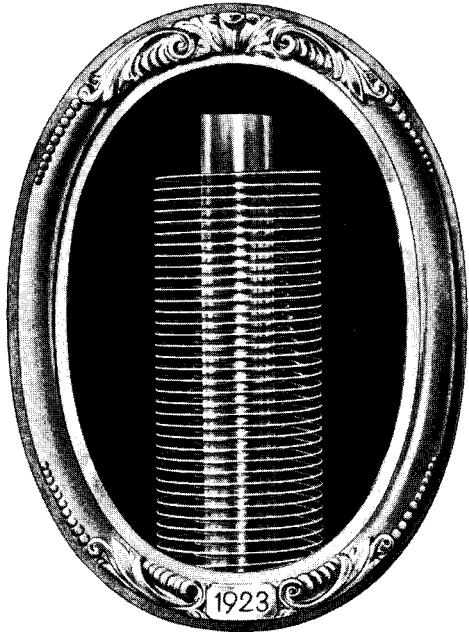
more products on page 208



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To do a lot of different things.  
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Aerofin's helical fin is wound on its tube under pressure, with fin and tube ending up as an *integral* unit. Each finned tube in the coil is then free to *expand or contract independently* of its adjacent finned tube.

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Lynchburg, Virginia 24505

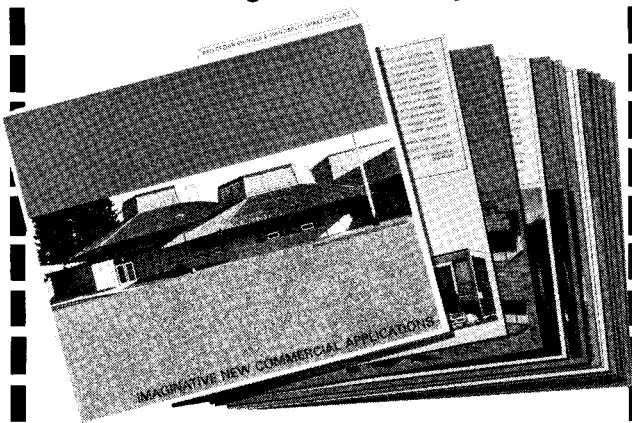
Aerofin is sold only by manufacturers of fan system apparatus. List on request.

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Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

For more data, circle 76 on inquiry card

## Massey put it together.

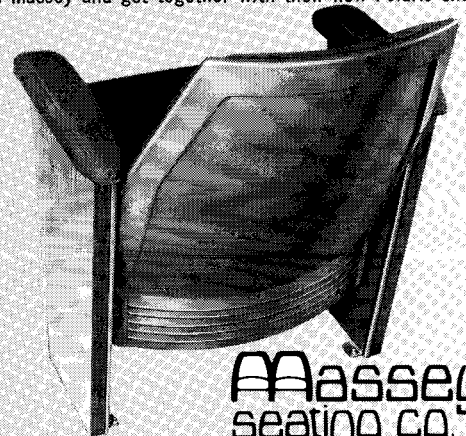
A new chair with a one-piece moulded plastic back. The Polaris chair. Massey put a lot of thought into the Polaris chair. To make it just right.

They put it together with a one-piece back. Because it's stronger. Looks better. Because they could eliminate ugly seams and exposed screws that snag clothing. And because there's no fold to catch dust and candy wrappers.

They put it together with 2" of foam on the back and a foam cushion over springs on the seat. Because they knew it would sit better. Be more comfortable. Hour after hour.

They put it together of moulded plastic. To keep its beauty for a lifetime. To keep it from getting scratched and marred in heavy day to day traffic.

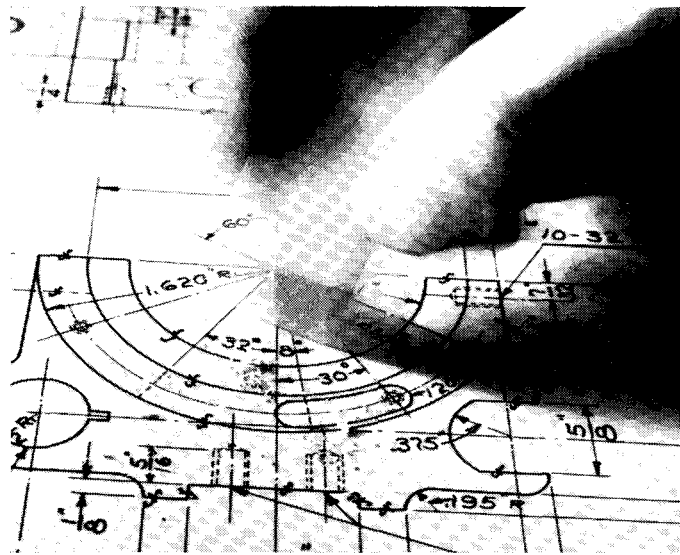
They put it together to give you a chair that can meet the public. Over and over again. Put it together yourself. If it adds up. Write Massey and get together with their new Polaris chair.



**Massey**  
seating co.  
NASHVILLE, TENNESSEE 37208

For more data, circle 77 on inquiry card

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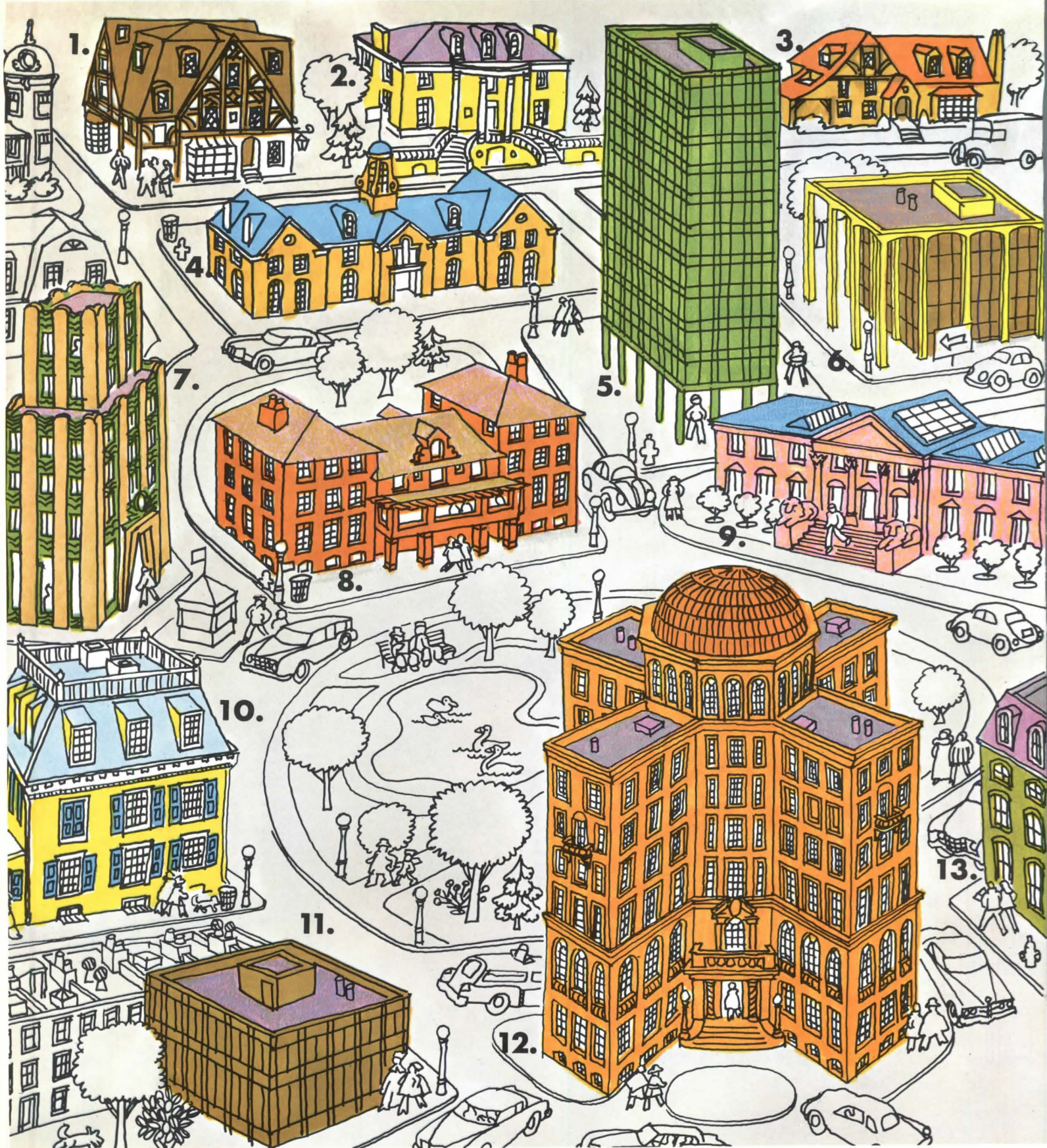
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CHICAGO

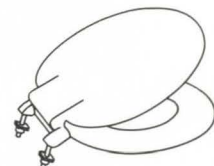
NEW YORK

WASHINGTON, D.C.

SAN FRANCISCO

TORONTO

PARIS





## *Denver Convention Center:*



The Currigan Exhibition Hall, Denver Convention Complex was designed by Muchow, Ream and Larson, architects. Consulting engineers: Ketchum, Konkel, Barrett, Nickel, Austin. General contractor: F. R. Orr Construction Company, Inc. Steel fabricator: Burkhardt Steel Co. Owner: City of Denver.

# Showcase for Mayari R Weathering Steel panels

Denver's new \$7 million exhibition hall features an exterior of weathering steel panels and an unusual structural steel space frame that is visible from both the interior and exterior of the building.

About 60,000 sq ft of cold-rolled 18 gage Bethlehem Mayari R weathering steel, in panels 10 ft wide and 30 ft high and suspended from the frame, form the striking exterior curtain wall.

The light, strong, richly textured weathering steel adds warmth and beauty to the structure. Tall slender

windows pierce the walls, above which elements of the interior space frame are visible. The wall panels are constructed as sandwich sections, with weathering steel on the outside, painted steel paneling inside, and insulation in between. Bethlehem Mayari R takes on deep russet tones as it ages, developing a dense protective oxide coating.

The convention hall will have an exhibit area with 100,000 sq ft of completely column-free space because of the unusual space frame roof design. This system is one of inverted steel pyramids fabricated





The Bethlehem Mayari R panels are constructed with painted sheet steel panels on the inside.



H. H. Robertson Company textured and shaped the panels to add warmth and shadow effects. Weathering steel plate was used to frame each window. Mel Elward Company assembled and erected the wall panels.

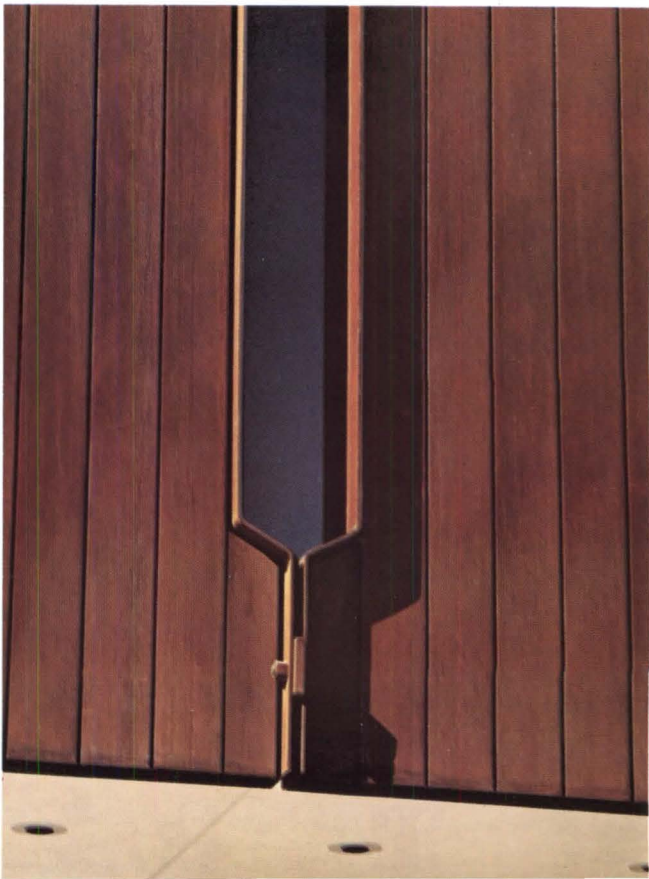


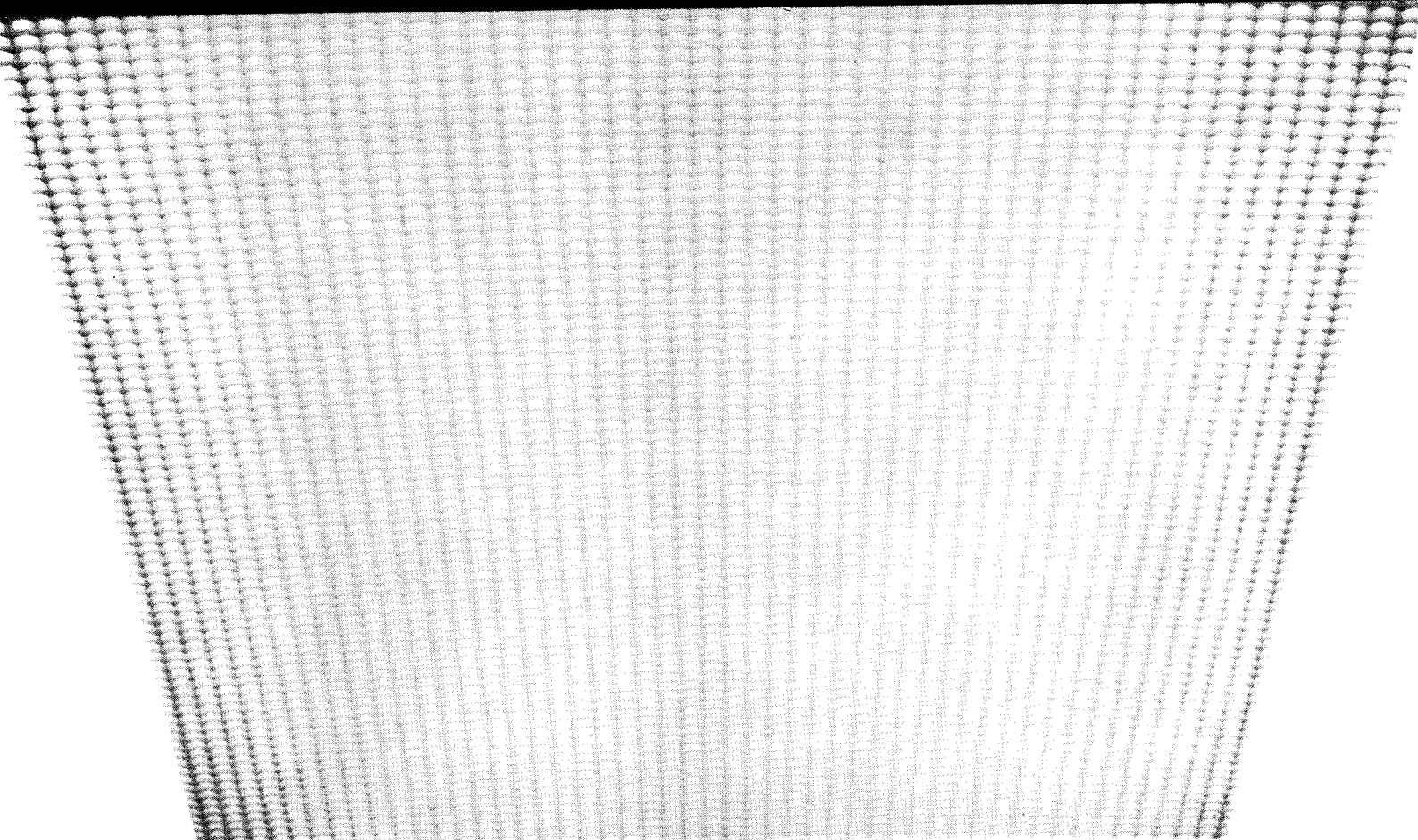
from some 48,000 L-shaped structural sections, combining carbon steel with high-strength, low-alloy steels for extra strength and less weight.

The spaces in the roof structure are utilized for handling air-conditioning ducts and the building's electrical system. Painted white, the exposed space frame contrasts with the rich tones of the weathering steel panels below.

Our new booklet discusses weathering steel in detail, both as to design potentials and properties. A copy of the booklet can be obtained from the Sales Engineer in the nearest Bethlehem sales office, or write to Bethlehem Steel Corporation, Bethlehem, PA 18016.

**BETHLEHEM STEEL**

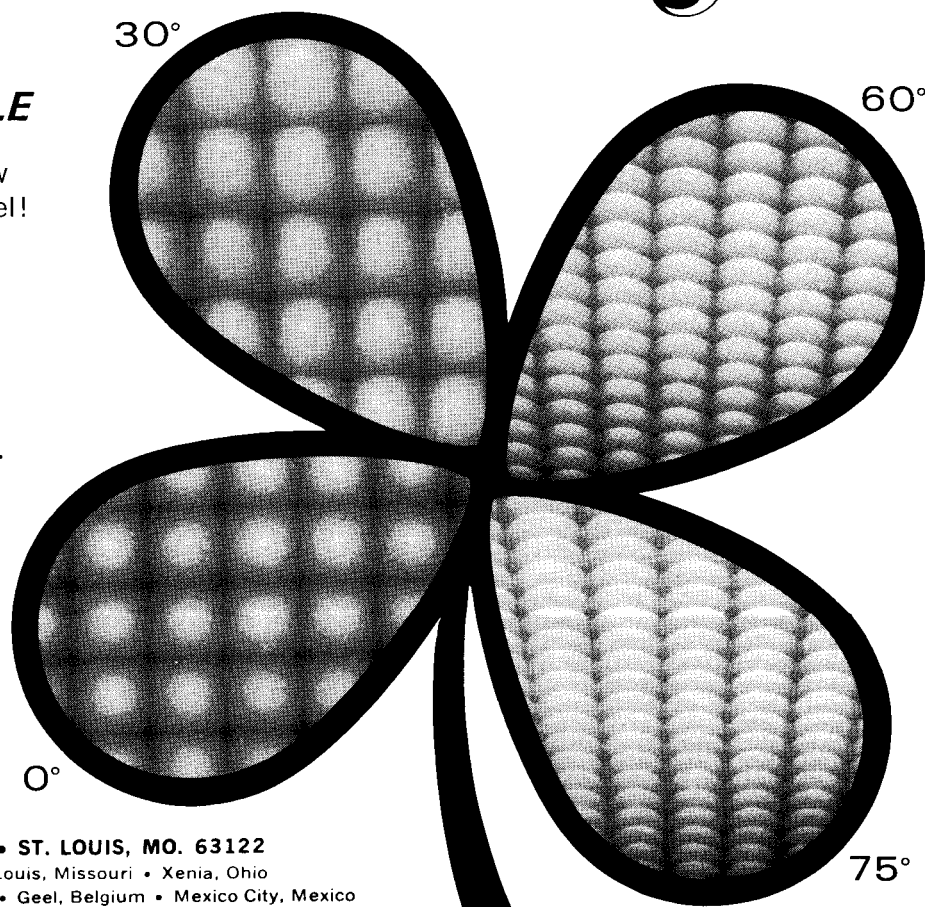




# A Beauty.

## FROM EVERY ANGLE

K-S-H scores again with the new KSH-15 white opal lighting panel! Big  $\frac{3}{8}$ " square design in .200" thickness! The look of a lattice-like louver. The lighting quality and maintenance advantages only a panel can bring you. And KSH-15 comes in the big sizes—3 x 3 and 4 x 4. So you can use it in place of the pans you've been using for big area lighting. From every angle . . . here's a great one. Specify KSH-15 soon!



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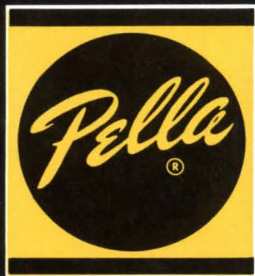
# wonders

Designer and Builder: Wm. A. Nunnelley, Jr.



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PELLA De Luxe Casement Windows combine the beauty of wood with the extra strength of a concealed steel frame. Wood also provides the best insulation against cold and heat, condensation is minimized. Stainless steel weatherstripping seals against drafts and moisture. All exterior surfaces are factory-primed. Slimshade feature is available for solar control and privacy.

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• Builder: Carlton Krabbe



Architect: John J. Flad & Associates • Builder: J. H. Findorff and Son, Inc.

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

- Windows:  Casement  Double-Hung  Awning  
 Sliding Glass Doors  
 Folding Doors and Partitions



Name \_\_\_\_\_

Firm \_\_\_\_\_

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Also available throughout Canada.  
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Window Care is So Easy!

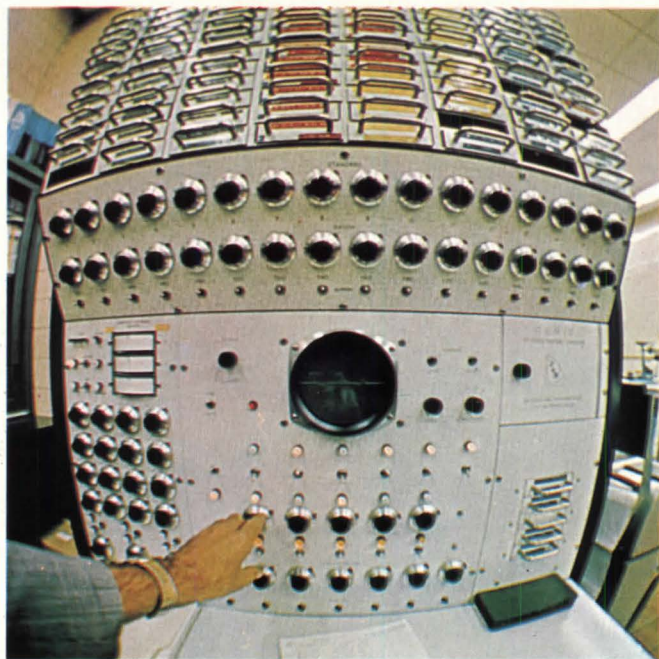


With PELLA De Luxe Casement Windows all you do is roll up the screen, remove the self-storing storm panel and all glass can be washed easily from inside!

**MAIL CARD TODAY**  
Answered within 24 hours

Pick any carpet color under the sun. Avondale's computers can match it.





# All you want...of any color, from the same dye lot. Avondale can do it.

Avondale Mills pioneered raw stock dyeing, far and away the most superior method of imparting color to carpets. Long experience has given them an expertise unmatched in the industry.

Supplying quality yarn in the *exact* color that you specify is made possible by highly refined standards control testing equipment and analysis and programming by computer.

Regardless of the fiber—wool, acrylic, polyester, or nylon—Avondale yarns give carpets greater durability, loftier surface interest, light fastness, resistance to soiling, and ease of cleaning.

Consult your Sweet's Interior Design File for more information about Avondale carpet yarns and the leading manufacturers who use them.

**World's largest manufacturer of spun sales yarn**



Sylacauga, Alabama

**the  
show-off**



## **CONCORDE SIDING**

**For the expensive look of hand-split wood shakes on mansard roofs, as well as sidewalls.**

Use this man-made siding on homes. Apartments. Motels. Shopping centers. On any building you want to stand out—beautifully. ■ CONCORDE won't burn, rust, dent, or rattle. It's termite-proof. Resists rotting, peeling, blistering. Needs no painting. And all 8 colors

are protected by an invisible polymer-plastic shield. ■ Show off your good taste, your good judgment, with CONCORDE, the show-off siding. Your U.S.G. man has the facts. Or write us: 101 S. Wacker Dr., Chicago, Ill. 60606, Dept. AR-01 .

### **UNITED STATES GYPSUM**

*For more data, circle 83 on inquiry card*

# Water problems on your roofs? Solve them with FOAMGLAS® insulation.

FOAMGLAS cellular glass insulation is *waterproof*. It doesn't get wet from roof leaks and can't absorb vapor from inside the building. Dimensional stability and high compressive strength of FOAMGLAS provide a solid base for roofing. No other insulation has this combination of properties.

FOAMGLAS is available in FOAMGLAS-Board and the Tapered FOAMGLAS system, for a sloped roof on a flat deck. FOAMGLAS is the only roof insulation guaranteed for 20 years. For more information, write Pittsburgh Corning Corporation, Dept. AR-10, One Gateway Center, Pittsburgh, Pa. 15222.

The Insulation People



For more data, circle 84 on inquiry card



**MOVABLE PARTITIONS** / A new partition system is reported to be "demountable, easily job-installed, and maintenance free." In addition, it meets building code requirements and offers interior design versatility. The system consists of factory-assembled modular panels and a patented metal joining system, plus doors, glass, gasketing and hardware. ■ Formica Corporation, Cincinnati.

Circle 305 on inquiry card



**BATHROOM PANELS** / Moisture-resistant panels for hard-use areas such as bathrooms and kitchens come in two series, both 4 ft by 8 ft in size. Shown is "Gossamer Blue," a white background with color puff added. ■ Masonite Corporation, Chicago.

Circle 306 on inquiry card



**EXECUTIVE OFFICE FURNITURE** / This desk and storage unit is part of a new versatile series of executive office furniture designed by Roger Sprunger. The rosewood and English oak desk with return-L is designed to stand alone or, as shown, to accommodate a tambour-door cabinet. ■ Dunbar Furniture Corporation, Berne, Ind.

Circle 307 on inquiry card

more products on page 220



# IDEAL

# WHITE

## CEMENT FOR TERRAZZO



New "224" Office Building, 3-M Center, St. Paul, Minnesota. Terrazzo by Twin City Tile and Marble, Minneapolis

### The Material of Imagination

Here is the enduring beauty of portland cement terrazzo... chosen for this employees' entrance of a new office building at the St. Paul, Minnesota complex of the 3-M Company.

Even where traffic is heaviest, portland cement terrazzo maintains its original beauty and color, and maintenance costs are the lowest of any flooring.

Ideal White Cement, used in the terrazzo matrix in pure white form, or tinted to the architectural specifications, brings out the highest color fidelity in the terrazzo's marble chips.

Summary? Ideal portland cement terrazzo, at surprisingly low first cost, offers unexcelled beauty, plus low-cost, carefree maintenance. Your terrazzo contractor has the know-how! Ideal has the white cement!

A product of the Ideal Cement Company  
A Division of Ideal Basic Industries, Inc.  
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# MODULAR AIR HANDLING

Through competitive analysis and first-hand experience . . .

Quaker Oats chose

Multi-Vent® high capacity air diffusers

## . . . designed for modular installation and continuity of ceiling appearance

Interior wall and desk arrangements would be subject to change—these were the requirements which made movable, modular air diffusers a must as Quaker Oats set about to modernize its offices in the Merchandise Mart, Chicago.

The final choice was to use Multi-Vent High Capacity Air Diffusers. The reasons were several:

### Prior investigation plus installed experience

The company's impressive computer center had previously been equipped with 24" x 48" high capacity Multi-Vent diffusers. Thorough field and laboratory investigation preceded the installation. Performance under super-critical requirements was flawless. In the new areas to be modernized, there could be no compromise with performance—"blend-in" appearance was a must.

### 12" x 12" diffusers unobtrusively blend with overall design decor

When you look up, you don't really see air diffusers. Eye-appealing angular throw apertures keep moving air from soiling ceiling tile. And the blend with the lighting fixtures is beautiful as this photograph of the engineering offices demonstrates.

### Again, a check before purchase

Though recommended because of prior performance, the more compact modular design was laboratory evaluated. A trip was also made to an Atlanta bank to inspect an actual installation.

### Installation economy bonuses are many

For instance: Multi-Vent diffusers are interchangeable with the ceiling tile. Duct work was planned and installed to accommodate future interior wall changes knowing that moving and attaching Multi-Vent units are not only a quick process but would cost less.

Time-saving air distribution balancing is a simple adjustment of a readily accessible set screw. Air loads can be re-distributed easily when needed in the event of greater concentration of personnel in a given area.

The time-saving sequence of installation alone reduced the overall cost.

To learn more about this and other successful installations of Multi-Vent air diffusion systems, do as The Quaker Oats Company did . . .

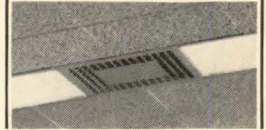
Write:

MULTI-VENT PRODUCTS DIVISION  
Dynamics Corporation of America  
1400 North Kostner Avenue  
Chicago, Illinois 60651



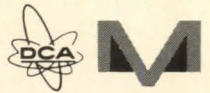
Threaded attachment of flexible air duct from above.

Blending modular appearance as seen from below.



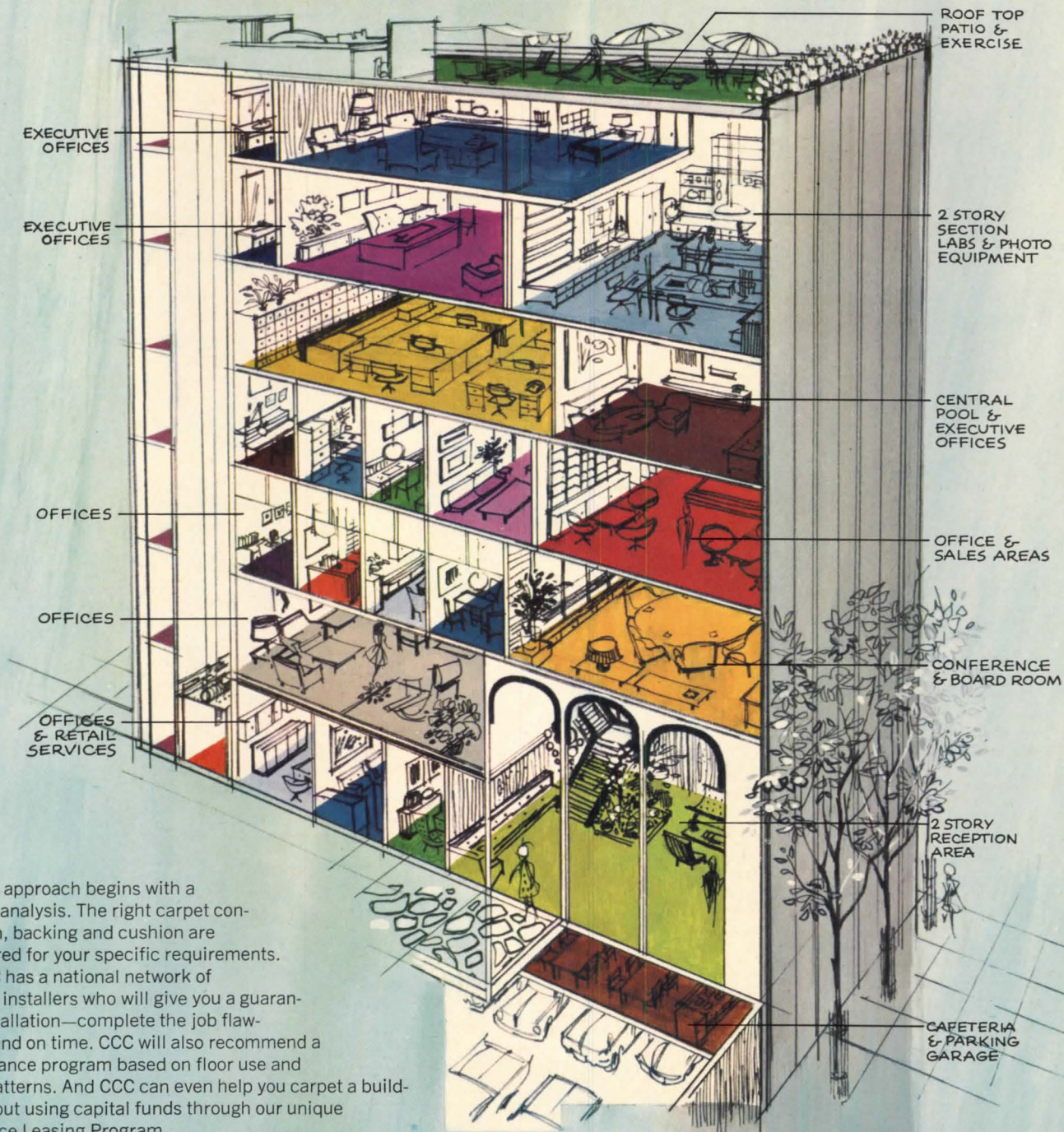
Mechanical Contractors: R. B. Hayward

For more data, circle 86 on inquiry card



# There are many ways to carpet a building—only one way to be sure.

CCC Building Carpet Systems with Acrylic 73 provides Single Source Responsibility for product selection, installation and maintenance.



The CCC approach begins with a detailed analysis. The right carpet construction, backing and cushion are engineered for your specific requirements. And CCC has a national network of certified installers who will give you a guaranteed installation—complete the job flawlessly—and on time. CCC will also recommend a maintenance program based on floor use and traffic patterns. And CCC can even help you carpet a building without using capital funds through our unique Showplace Leasing Program.

Acrylic 73 is a CCC exclusive blend of 70% long-staple Creslan® acrylic and 30% long-staple commercial nylon which has unequalled durability both in wear and appearance retention. You get clean, soil-resistant colors without pilling, fuzzing or webbing. And now, thanks to the addition of static reduction elements, Acrylic 73 is virtually static-free, ending the annoying problem of shock.

CCC is the world's largest manufacturer of commercial carpet systems. Every one of our carpet specialists is an expert, who is fully qualified to help you solve your carpet problems. Mail in the coupon and let us do the rest.

Creslan is a product of American Cyanamid Company, New York

**CYANAMID** **Creslan**<sup>®</sup>  
LUXURY ACRYLIC FIBER



Commercial Carpet Corporation  
Dept. A 1  
10 West 33rd Street  
New York, New York 10001

Attention: Mr. Walter Brooks

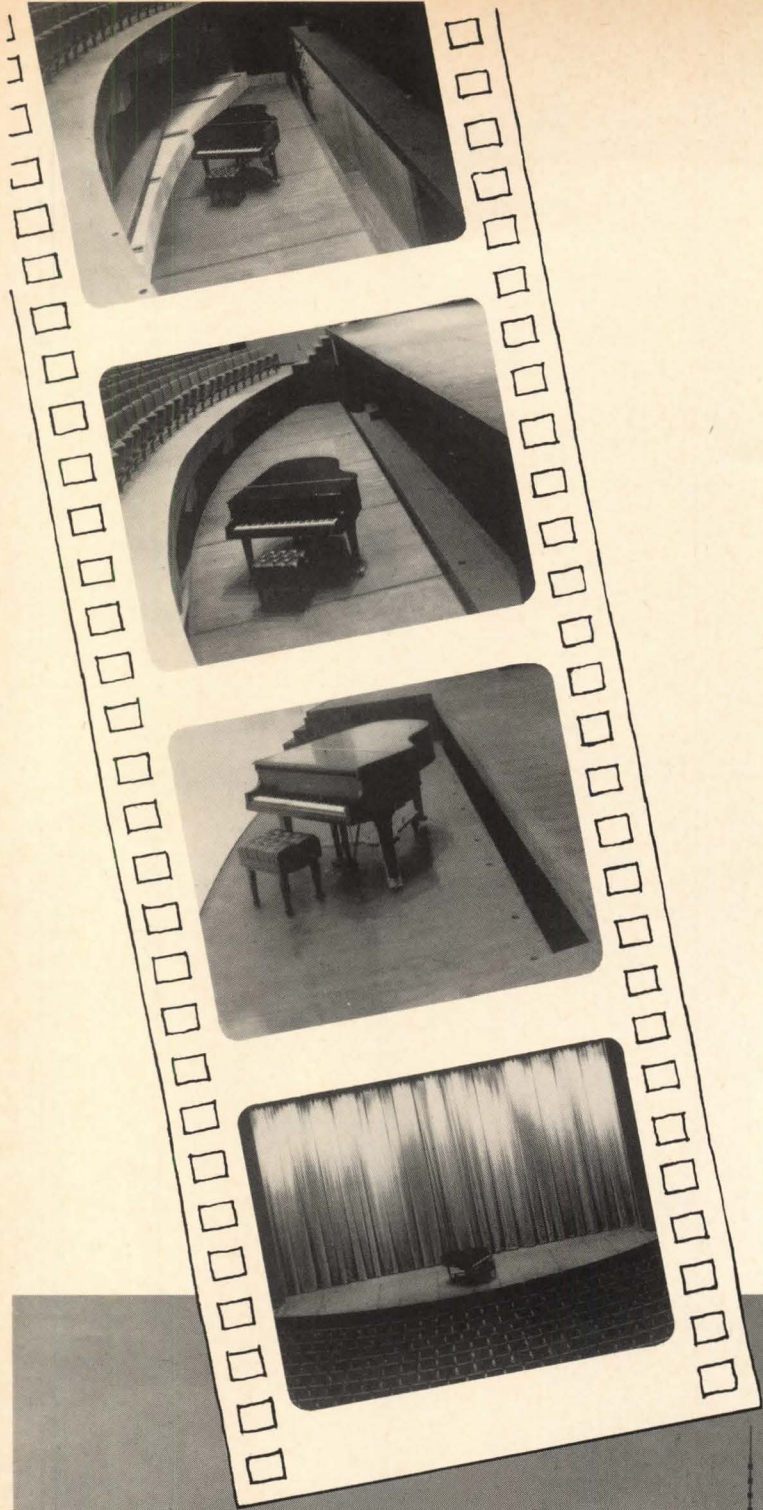
- Please have a CCC consultant contact me.
- Please send me a copy of the booklet, "Office Carpet Systems".
- Please send information on Showplace Leasing Program.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_



## Montgomery set the stage for Wichita's new Century II

Our detail photos show the theatre forestage lift in Wichita's Century II Civic Culture Center. This is one of three forestage lifts (the largest 543 square feet) and eight other elevators and lift mechanisms built for Century II by Montgomery Elevator Co. Montgomery strength in engineering, equipment design, construction, installation, and service helped set the stage for the 12.5 million dollar Century II. Montgomery can help you move people, freight, and equipment, with a wide range of products and a wealth of experience, too! There are more than 120 Montgomery Elevator Company offices throughout the United States, Canada, Mexico, and the Caribbean. May we set a successful stage for you?

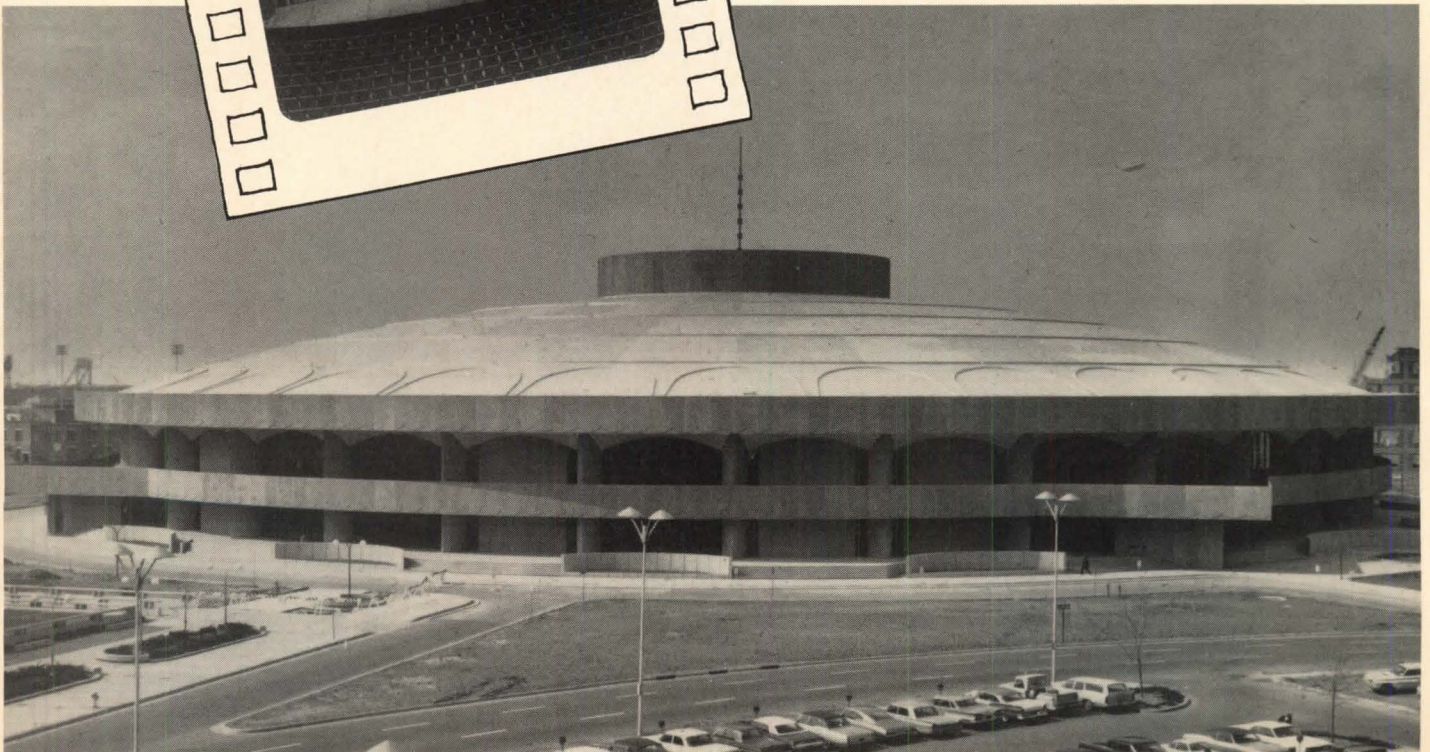
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**Architect:** John M. Hickman Associates and Kruse Roberts, Smith, Associate Architects, Wichita, Kansas

**General Contractor:** Martin K. Eby Construction Company, Inc., Wichita, Kansas





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Select from a variety of scored units to reduce scale with the economy of large 8x16 block . . . Build, decorate and finish in a single operation. Thru wall, load bearing units eliminate expense of back-up wall . . . Specify **SPECTRA-GLAZE®** glazed concrete units in your base bid to realize their unique advantages of design flexibility combined with lower-in-the-wall costs . . . Local delivery, world-wide.

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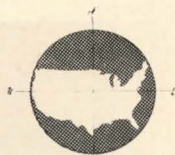
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*Brooks, Harvey & Co., Inc. will succeed to the business formerly conducted by Brooks, Harvey & Co. and will offer to the real estate developer and to the industrial corporation and institutional investor contemplating real estate development or investment a combination of real estate and corporate financing experience to assist in meeting the challenges and opportunities of the future.*

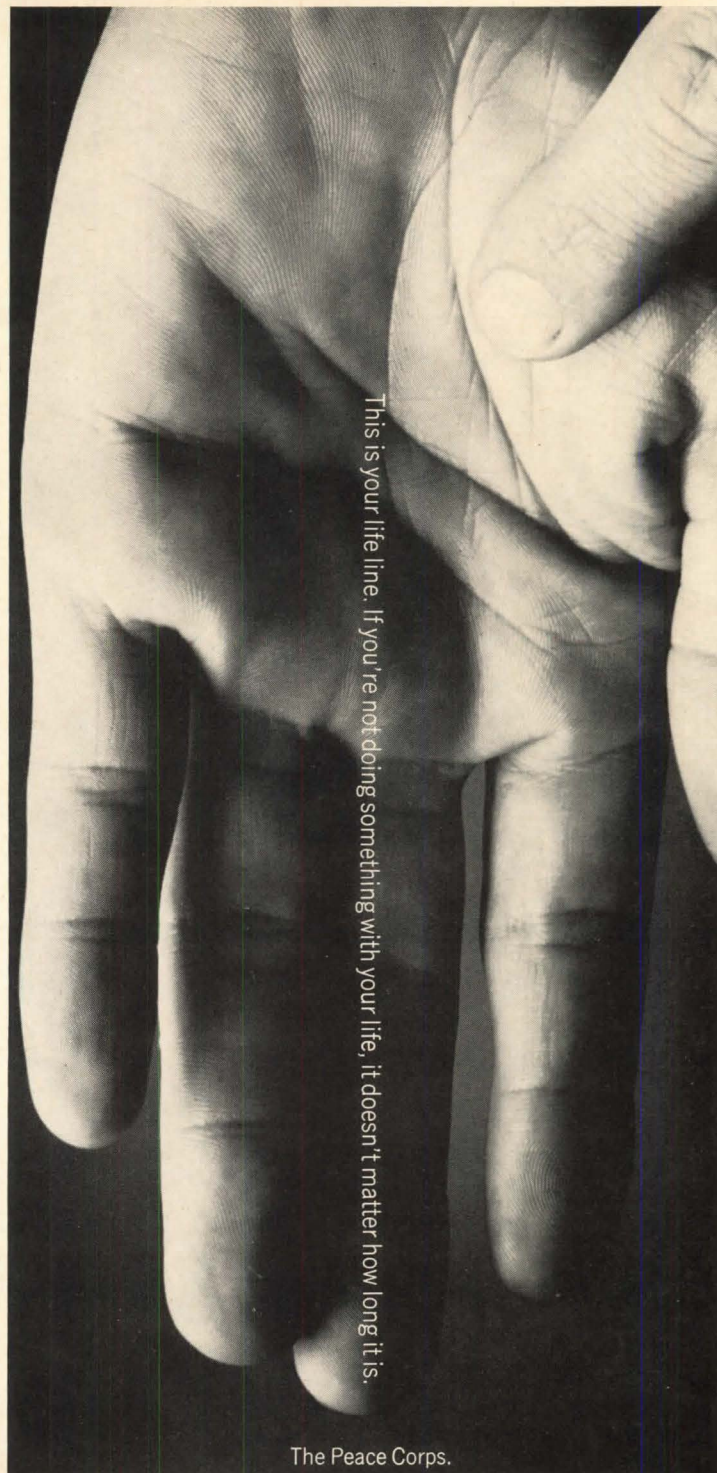


**Creative Financing**

December 11, 1969.

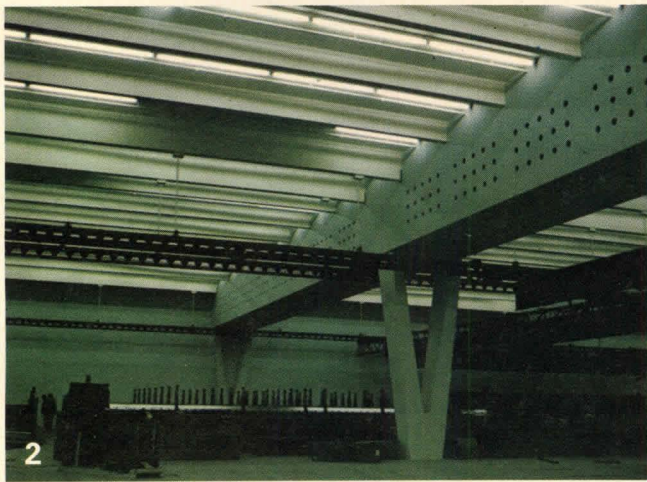
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This is your life line. If you're not doing something with your life, it doesn't matter how long it is.

The Peace Corps.



ARCHITECTS: (1) J. ALFRED HAMME & ASSOCIATES; (2) HARRY PAYNE & ASSOCIATES;  
 (3) ALEXANDER KEAY & ASSOCIATES; (4) J. ALFRED HAMME & ASSOCIATES;  
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*brings the wide-open spaces inside!*

When your design calls for a broad sweep of column-free floor space, prestressed concrete gives you the long span muscle you need. Without premium cost. Ceilings have a clean, modern appearance because mechanical and electrical systems can be channeled between the stems of well proportioned structural members, providing easy access.

Get in touch with your nearest PCI producer member for complete information on how prestressed concrete can give you more design freedom in your next project. His experience can help you most in the earliest stage of planning.

*Professional membership in PCI can be of value to you in many ways. Send for membership information.*

PRESTRESSED CONCRETE INSTITUTE  PCI

ARCHITECTURAL STRUCTURAL

205 West Wacker Drive, Chicago, Illinois 60606



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Sound absorbent furniture is here.

Our new TAG furniture is surfaced with Artitex, a nylon finish that swallows up noise. Artitex looks and feels like velvet, wears like iron and comes in 13 glorious colors.

TAG also restores visual privacy to open offices. With Artitex-coated screens that keep out eyes as well as noise.

And TAG is flexible. For instance, you can switch drawers and panels from one desk to another without tools or muscles. Much easier than moving a whole desk.

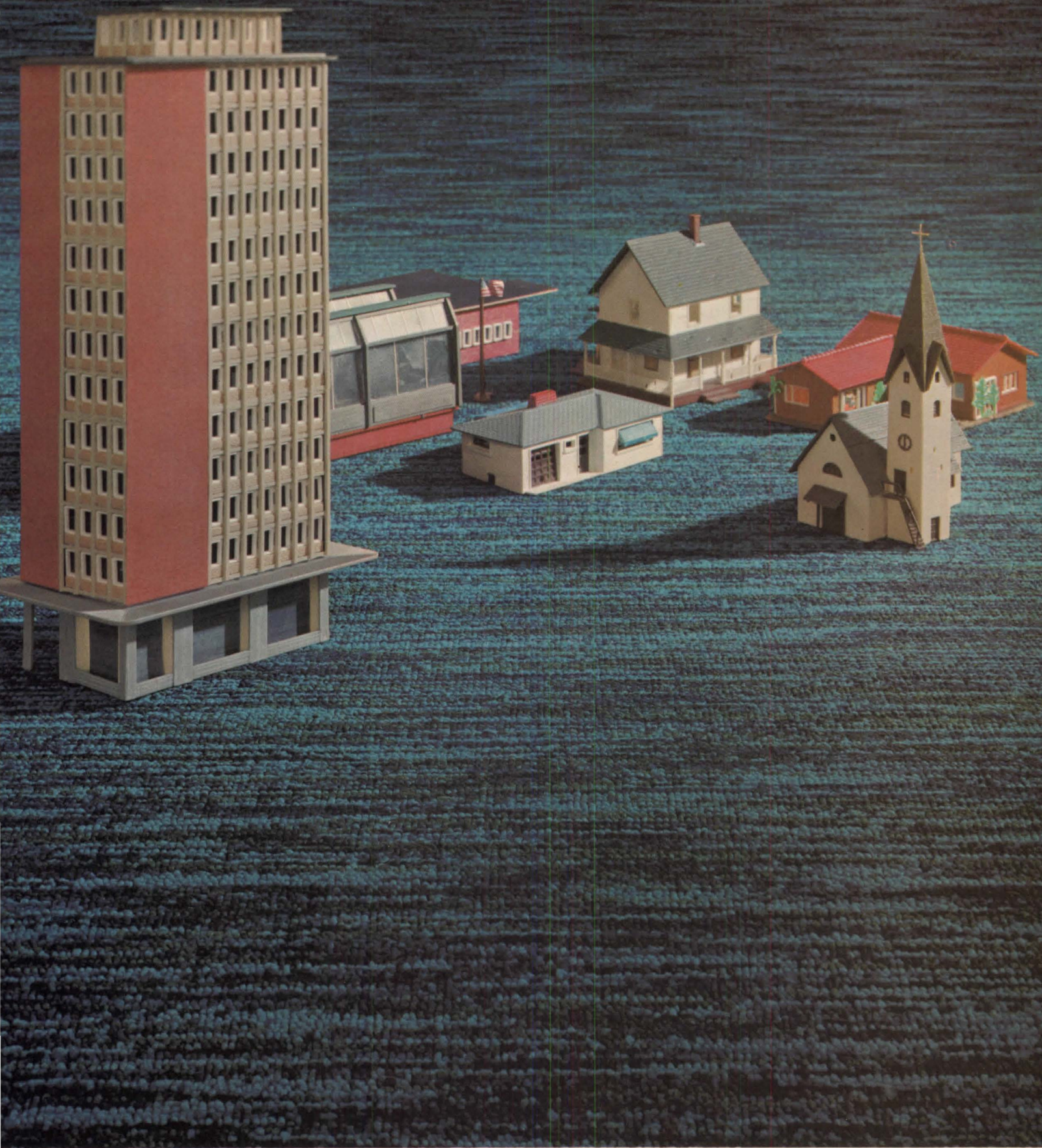
The TAG (Task Administrative Group) Collection was designed for the noisiest office. That's why it's best in every office. Like all Art Metal furniture, TAG looks beautiful and works beautifully. Write for name of dealer.



**ART METAL**  
JAMESTOWN NY







## The beauty we show here is "BONNIE BRAE"

"BONNIE BRAE" by PATCRAFT... gives you a distinctive, custom look... with clear, bright colors that will retain their fresh look even in heavy soil areas... because it's constructed of Antron® II nylon—DuPont's newest and best fiber! The super-tight construction assures no texture change in traffic areas and above-standard weight assures years of good wear. A unique space dyeing technique permits up to 3000 yards of matching dye lots.

Specifications and sample swatches furnished upon request.  
PATCRAFT MILLS, INC., Dalton, Georgia.

*For more data, circle 94 on inquiry card*

the finishing touch  
... carpet  
by





Northwestern National Bank Building, Saint Paul, Minnesota  
Housing and Development Authority of the City of Saint Paul, sponsors  
L. J. Sheridan & Company, developers/Capital Centre Associates, owners  
Northwestern National Bank, major leaseholder  
Grover Dimond Associates, Inc., architects-engineers  
Naugle Leck, Inc., general contractor

## Accent the spectacular with Ceco's Curtainwall

# experience

This is the Northwestern National Bank Building of St. Paul, in the Capital Centre . . . an exciting part of an architectural revitalization program encompassing 12 blocks of the downtown area. The Northwestern bank is modern, functional, colorful, and beautiful to behold. Ceco experience in curtainwalls played a vital role in bringing the architect's concepts into reality.

Ceco developed and manufactured a "strip" curtainwall system for the tower portion. Vertical sight lines are created by strip windows and panels alternating with precast stone panels. Steel mullions and insulated panels surround

fixed windows . . . all permanently clad in dark brown polyvinyl chloride, an impervious finish called Cecoclاد.

Both lower levels are enclosed with Ceco custom steel curtainwalls, with the "skyway" banking-floor portion using windows 18' high, 14' wide and 15" deep. Huge sharp-cornered panels using  $\frac{1}{4}$ " steel plate were included.

You can be sure of accuracy and quality worthy of your most exciting design by including Ceco Experience in your next building. The Ceco Corporation, general offices: 5601 West 26th Street, Chicago, Illinois 60650.





## Our services improved theirs

Services in Divine Savior Nursing Home Chapel, Portage, Wisconsin, are looking better than ever lately. The difference: L-O-F Thermopane® insulating glass with a silvery Vari-Tran® reflective coating that substantially reduces solar heat and glare. Inside — comfort and privacy; a Sunday-best look every day of the week. Outside — see how the windows reflect the beauty of the chapel's campus-like surroundings. Vari-Tran reflective coatings, silvery and golden, come in light transmissions of 8, 14, and 20% to help solve a wide variety of functional and aesthetic problems. Details on every L-O-F hi-performance glass are in Sweet's. Or get in touch with an L-O-F Architectural Construction Specialist. Libbey-Owens-Ford Company, Toledo, Ohio 43624.



L-O-F HI-PERFORMANCE GLASS

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# Movable walls, permanent look.



**Kwik-Wall gives you the look and feel of permanent walls in track-mounted or free-standing movable partitions. These versatile, no-maintenance walls are erected or stored in minutes, by anyone. Sound-retarding partitions lock solidly in place with simple one-hand, twist of the wrist motion. Positive mechanical lock assures rigidity. Over 1500 custom finishes to complement any decor. Send for details.**

**KWIK-WALL CO., Box 3267, Dept. AR  
Springfield, Illinois 62708**



The permanent look in movable walls

Name \_\_\_\_\_

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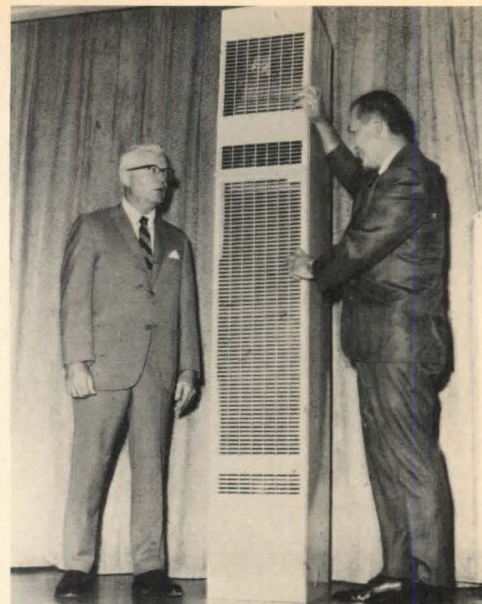
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**CENTRAL HEATING-AIR CONDITIONING / Hydrowall** is a total gas energy combination air conditioning and recessed wall furnace designed to provide year-round comfort for as many as four rooms without requiring duct-work. The unit, which is developed for apartments, motels, offices and residential applications, may be installed freestanding or it may be partially or fully recessed in the wall. ■ Holly Division, Lear Siegler, Inc., South Gate, Calif.

Circle 308 on inquiry card



**STEEL STUDS /** Individual, galvanized steel studs for the construction of non-load-bearing walls in single and multi-family dwellings are a variation of the 25-gauge galvanized steel studs used in the 4-ft by 8-ft modular panel. The C-shaped steel studs are said to be "easily installed, using top and bottom plates which are slotted to accept a specially designed tab that is conventionally nailed." To allow for minor variation in floor to ceiling dimensions, the slotted floorplate allows the new steel stud to be adjusted to fit tightly without time-consuming field cutting. ■ United States Steel Corporation, Pittsburgh.

Circle 309 on inquiry card



Globe Union, Inc.—Glendale, Wis.—Reception Area  
Charles Harper and Assoc., Architects

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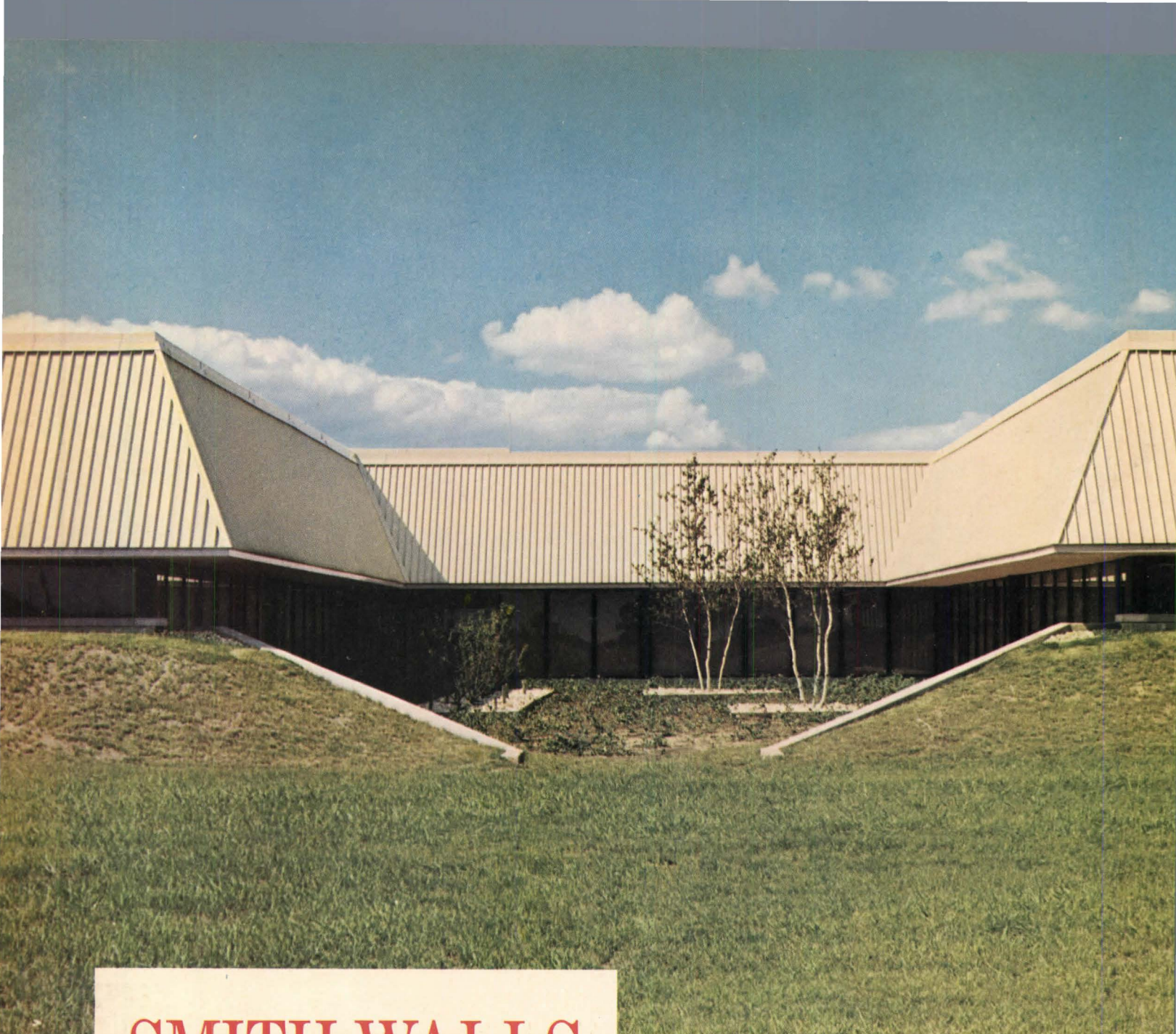
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1AR



# SMITH WALLS

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Graphic Systems Division Plant of RCA, Dayton, New Jersey  
Architect: Vincent G. Kling and Associates, Architects, Philadelphia, Pa.  
General Contractor: Hughes-Foulkrod Construction Co., Philadelphia, Pa.

This Smith Wall is used in a distinctive canted design. It is equally suitable for an industrial building . . . office . . . school . . . or store. Its versatility, as with any Smith Wall, is limited only by the imagination of the architect.

Design freedom in Smith Walls starts with the metal configurations. Twenty different basic profiles are available, including flat panels. And that's only the beginning. You can add Smith decorative mullions to your design to provide unusual and interesting architectural

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When you specify Smith Walls in place you get more than just design freedom. You get a Single Responsibility installation. Smith personnel design, fabricate, deliver and erect Smith Walls . . . to your specifications . . . to your customer's satisfaction.

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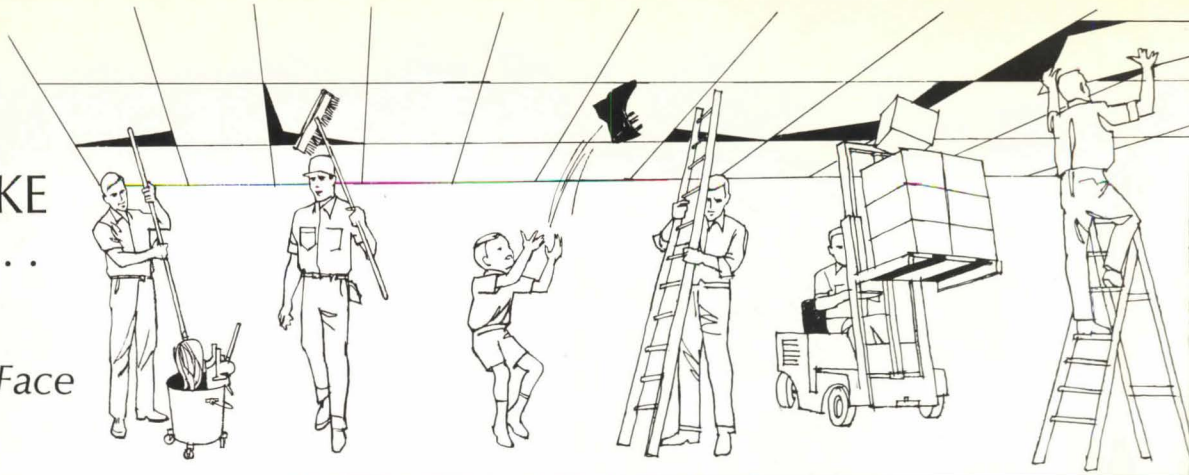


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Now, a lay-in ceiling panel designed for areas where ceilings receive abuse. Conwed Rock Face Panels can take normal blows and scuffs including rough handling during installation and maintenance. The secret is a specially compounded, ultra-hard, mineral surface with superb impact resistance. As an added plus the surface has a beautiful, natural texture.

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Conwed "Rough" Rock Face, a deep, naturally textured, white surface pattern; 5/8" thick panels 24" x 24" or 24" x 48".

For more information about this exclusive ceiling development by Conwed Corporation, including specifications, installation and application data, refer to Conwed Products in Sweet's Architectural Catalog File 14a or write:  
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Conwed Corporation, Dept. C3  
332 Minnesota Street  
St. Paul, Minnesota 55101



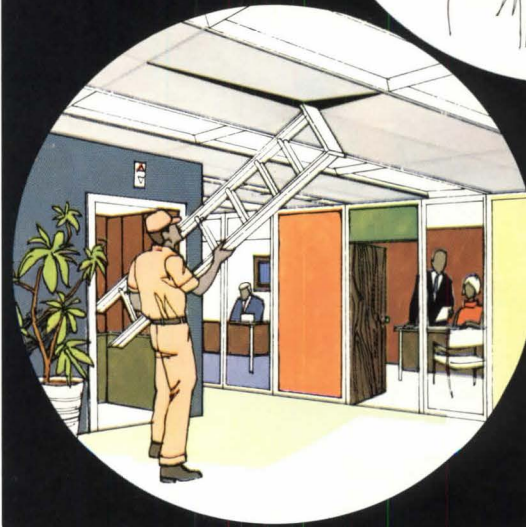
Products for Enduring Beauty



In the locker rooms of plants, clubs, and schools, Conwed Rock Face Panel ceilings shrug off impact, stay clean and fresh looking under daily abuse.



Where ceilings are entered regularly for plenum maintenance — in hospitals, schools, industrial buildings, etc. — durable Conwed Rock Face Panels reduce upkeep costs.

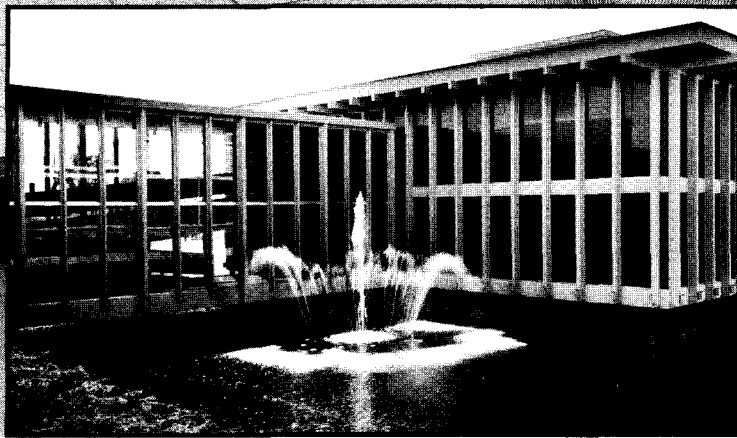


In the corridors and halls of offices, industrial buildings and other areas of heavy traffic, Conwed Rock Face Panel ceilings combine beauty, cleanliness and endurance.

FRONT PAGE PHOTO:  
School corridor scene photographed in Upper Midwest.  
Emphasizing the rugged beauty of Rock Face by Conwed.



# 120,000 sq. ft. of free-access Weberfloor...



## speeds construction of Administrative & Research Center

Globe-Union, Inc. of Milwaukee gave architect Charles W. Harper of Harper-Drake Associates two demanding goals for its new administrative engineering and research complex. First, a 10-month completion deadline requiring steel erection in less than 30 days. Second, complete flexibility in building design to accommodate constantly changing services of all kinds.

With Weber's access flooring, electrical and communication lines, the special plumbing required for laboratories, heating and ventilating ducts and mechanicals of all kinds could be installed after the floor slabs were poured. These utilities were designed while the building shells were being completed. Once the buildings were closed in, installers of the various services were able to work faster and more accurately under comfortable indoor conditions.

With unrestricted access to all services under the Weberfloor, Globe-Union has the flexibility it needed for modifying or relocating these utilities at any time. Offices and laboratories can be rearranged without tearing up expensive flooring and without the expensive mess of drilling through concrete to conventional raceways.

With savings in electrical, plumbing and mechanical services deducted, Globe-Union's finished Weberfloor, about half of it carpeted, netted out to approximately \$1 per square foot.

**Write for free booklet**, giving many other advantages of Weberfloor in general construction. Please contact Weber Architectural Products, Division of Walter Kidde & Company, Inc., 1340 Monroe N.W., Grand Rapids, Michigan.

*For more data, circle 101 on inquiry card*

Architects seldom get involved in the specifying of shower valves.

They should. Because it's details like shower valves that can turn lackluster shower rooms into award-winning designs.

We make the Symmons Safetymix simple to specify in every way.

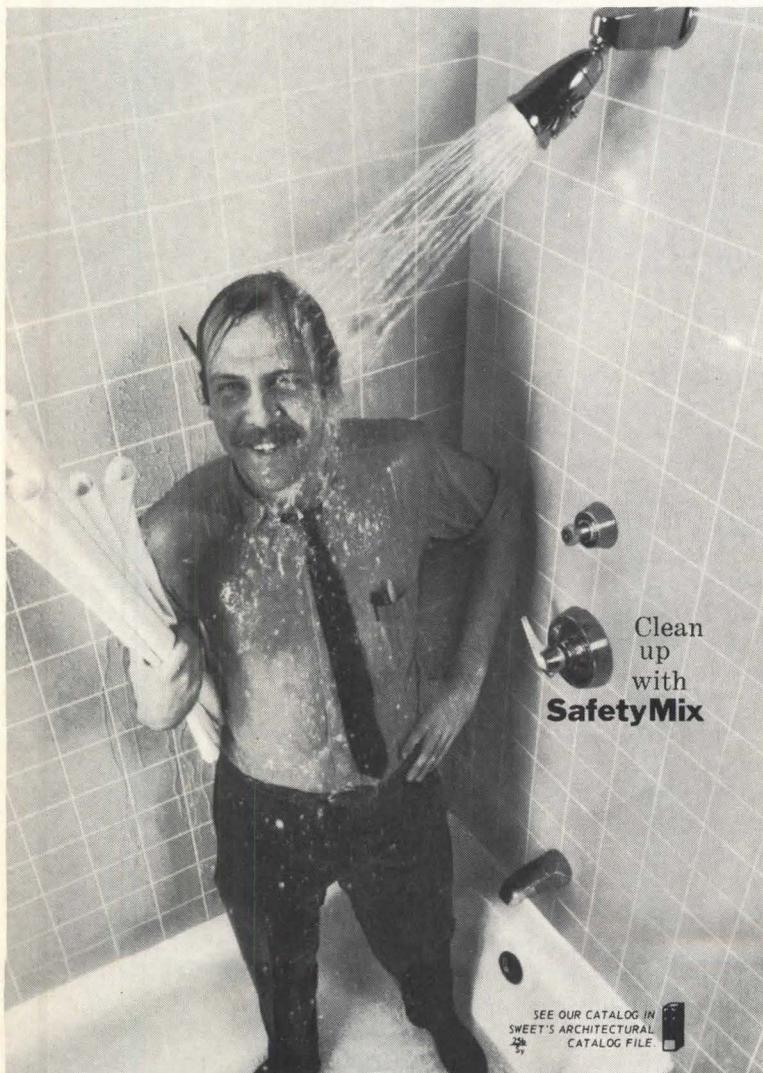
This pressure-actuated, non-scald shower valve has only four basic parts which make it durable, dependable, easy to install and good looking enough to put in anywhere you need shower systems.

Even with pressure fluctuations up to 85%, the water temperature is maintained at  $\pm 2^\circ$ .

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Specify the Symmons Safetymix®, the shower valve that's simple and safe whether you're standing under it or building a reputation on it.

**Architects are doing some of their best work in the shower.**



**Symmons Engineering Company**  
31 Brooks Drive, Braintree, Mass. 02184

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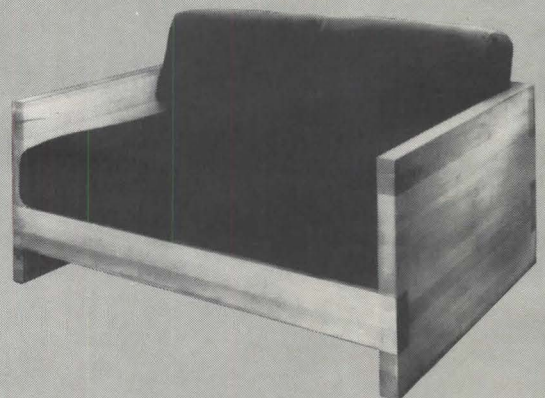
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**FENESTRA all-steel FOLDING CLOSET DOORS**

Fenestra Folding Closet Doors are the finest quality in the industry. Savings result from quick, fool-proof installation. Sizes and designs to meet any decor. Check your local Fenestra distributor... he's listed in the Yellow Pages under "Doors-Metal." Or write for full color brochure.



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Rugged, handsome, utilitarian. Ideal for institutional use. That's the Thompson butcher block love seat. Its lines are clean and simple. Finish is flat, hand rubbed, velvety to the touch and protected by three coats of polyurethane. Permanent and non-staining, the finish is resistant to alcohol and abrasion. Simply wash it to clean. The Thompson love seat, at home in dormitory or library or wherever. List price \$520.00. Also available in 3 and 4 seat sofas. Send for free brochure. Samples of butcher block illustrating construction and finish will be sent upon request.

**THOMPSON**

Manufacturing Company, Inc.  
Lancaster, New Hampshire 03584

For more data, circle 104 on inquiry card

# GSR® FUSEAL® PROCESS SPEEDS LABORATORY INSTALLATION AT KAISER RESEARCH CENTER

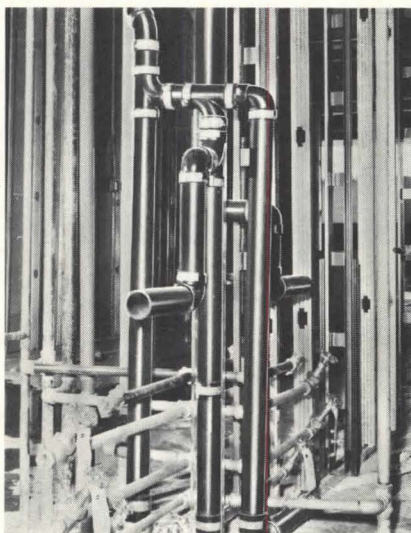
**Plumbing superintendent finds electrical fusion method "very fast . . . thoroughly reliable"**

Corrosive resistant polypropylene pipe and fittings, joined by the electrical fusion GSR® Fuseal® process, make fast work of laboratory drain-waste-vent installation. The high efficiency of the Fuseal process was proved in the extensive, complex laboratory facilities of Kaiser Aluminum and Chemical Corporation's new 300,000-square foot Research Center in Pleasanton, California. A basic two-man crew installed more than 8,700 feet of GSR polypropylene pipe with 2,000 fittings ranging from 1½ to 4 inches in diameter in the center's ultra-modern laboratories. More than 5,000 joints were sealed by the GSR Fuseal heat-fusion method.

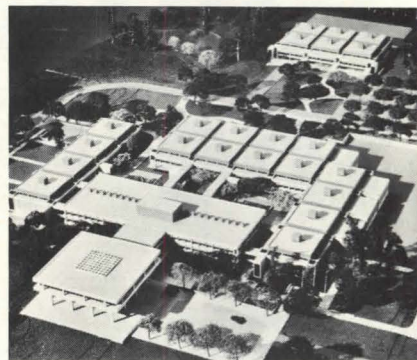
**THE SPEED AND DEPENDABILITY** of the Fuseal process were praised unanimously by supervisors of University Mechanical and Engineering Contractors, the Oakland firm which handled the installation. "It is fast—very fast—and thoroughly reliable," said plumbing superintendent Jerry Gottstein. "We've checked most of the system with a 35-foot head, and I don't think we have had one leak in 500 joints. A remarkable process! With a half-dozen other trades depending on the mechanical work to finish on schedule, this dependability is every bit as important as the speed and simplicity of connecting pipes and fittings.

Before the development of the Fuseal system, the advantages of polypropylene for handling corrosive laboratory wastes and vapors were offset by the difficulty of the thermal bonding that is necessary. Heating the socket and pipe separately—either automatically or manually—was time-consuming, awkward, and undependable. The Fuseal process has changed all that. Now a simple resistance coil, im-

bedded in polypropylene, is slipped over the end of the pipe before it is inserted into the socket. This is connected to the Fuseal power unit to apply timed, temperature-controlled heat to the interface between pipe and socket. The result is a solid, homogeneous joint accomplished in about 90 seconds.



**THE ADVANTAGES** of this unique process can be seen in the complex layouts and tight working space on the Kaiser project. Although many of the D-W-V hookups were bench-assembled, there was a great deal of fitting to do in extremely close quarters around vertical risers and along the walls. With several Fuseal power units mounted on a portable stand, as many as five joints could be fused simultaneously.



**ANOTHER IMPORTANT FUSEAL** advantage is the ease of reswinging a completed assembly to accommodate last minute changes in fixture placement. The joint is simply reheated and the fitting swung to its new location—a simple solution to a formerly difficult problem.

University's project manager, Floyd Garry, summarizes the advantages of the GSR Fuseal process: "First, polypropylene itself is easy to handle. It won't break and it is light. Second, making up the joints is extremely fast, particularly when you use multiple power units. Third, the low incidence of leaks cuts the very expensive remedial work."



These important benefits mean Fuseal can be economical on your next laboratory specification. Write today for complete information.

**R & G SLOANE MANUFACTURING COMPANY, INC.**, 7606 North Clybourn Avenue, Sun Valley, California 91352.

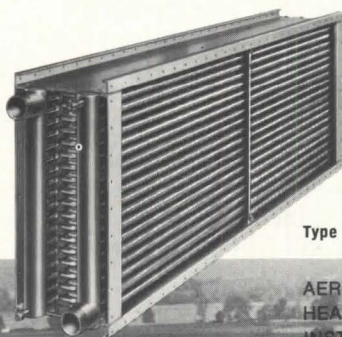
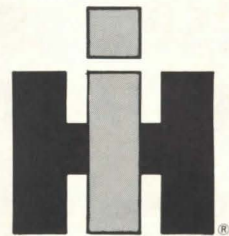


**GSR® FUSEAL® JOINT FUSION PROCESS**

PLANT, WAREHOUSE AND SALES OFFICE: 6100 Hillcrest Dr., Cleveland, Ohio 44125 • Tel. (216) 524-8600  
WAREHOUSE AND SALES OFFICES: 3126 Brinkerhoff Road, Kansas City, Kan. 66115 • Tel. (913) 371-0412 □ 1669 Litton Dr., Stone Mountain, Ga. 30083 • Tel. (404) 939-6644

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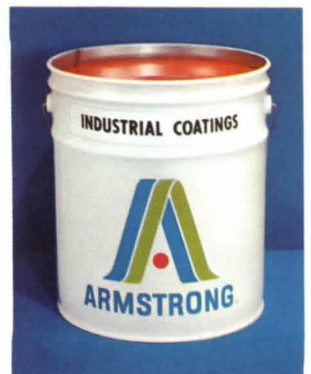


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No paint solves all corrosion problems. People do. Let Armstrong field coating specialists and laboratory men recommend or formulate the coating that will do the job best for you. Each day our research and testing facilities help fight corrosion in every major industry: railroad, chemical, petroleum and marine. We make silicone-alkyds, polyurethanes, polyesters, epoxies and even the most sophisticated coatings containing "glass"! The answer to your corrosion problem could be as near as your phone. Call or write for service today.

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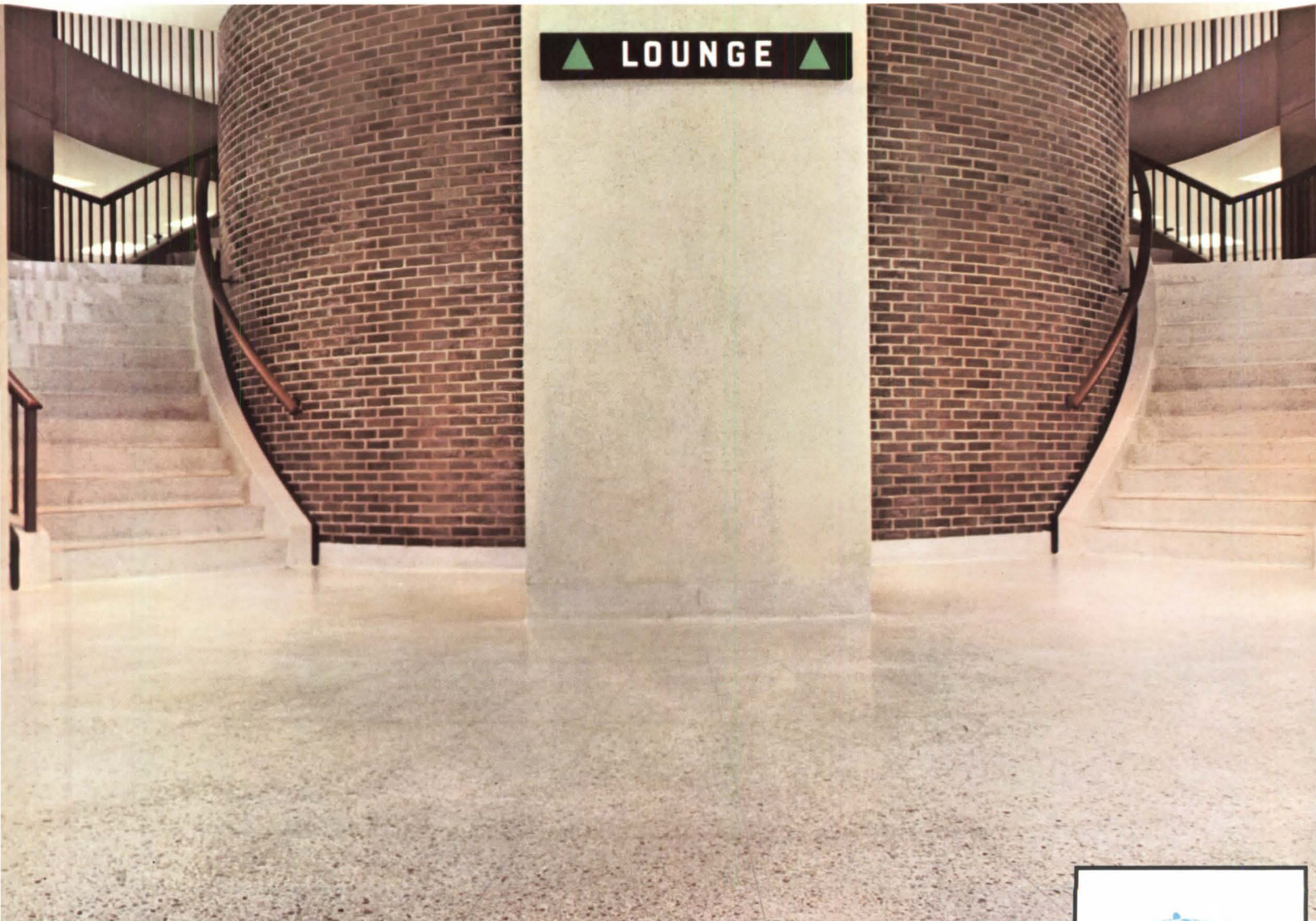
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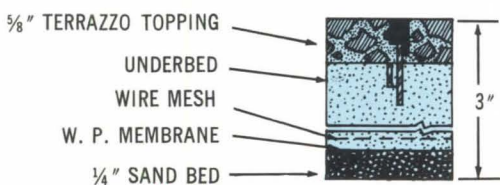
CLEVELAND HOPKINS INTERNATIONAL AIRPORT (South Concourse.)  
 Architect: The Outcalt Guenther Partners, Cleveland Ohio  
 General Contractor: W. Passalacqua Bldrs., Inc., Cleveland, Ohio  
 Terrazzo Contractor: The Interior Marble & Tile Co., Cleveland, Ohio  
 \*Craftmanship Award 1969 from Builders Exchange Inc., Cleveland



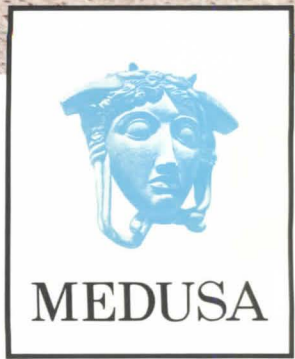
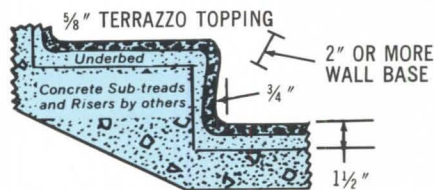
Fisheye view looking down terrazzo stairway.\*



SAND CUSHION OVER CONCRETE



STAIRS CAST IN PLACE



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anti-static yarn for the carpet of shock-free performance

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of dust and dirt particles, it also allows the soil to vacuum out more easily.

Zefstat is, in fact, anti-everything except anti-social. Ideal for schools, hospitals, hotels, business buildings and all public areas that require non-shock, static-controlled carpet.

Discover Zefstat. And be prepared to offer your customers the latest advance in yarn technologies. With a performance that *guarantees* human comfort for the life of the carpet or five years.

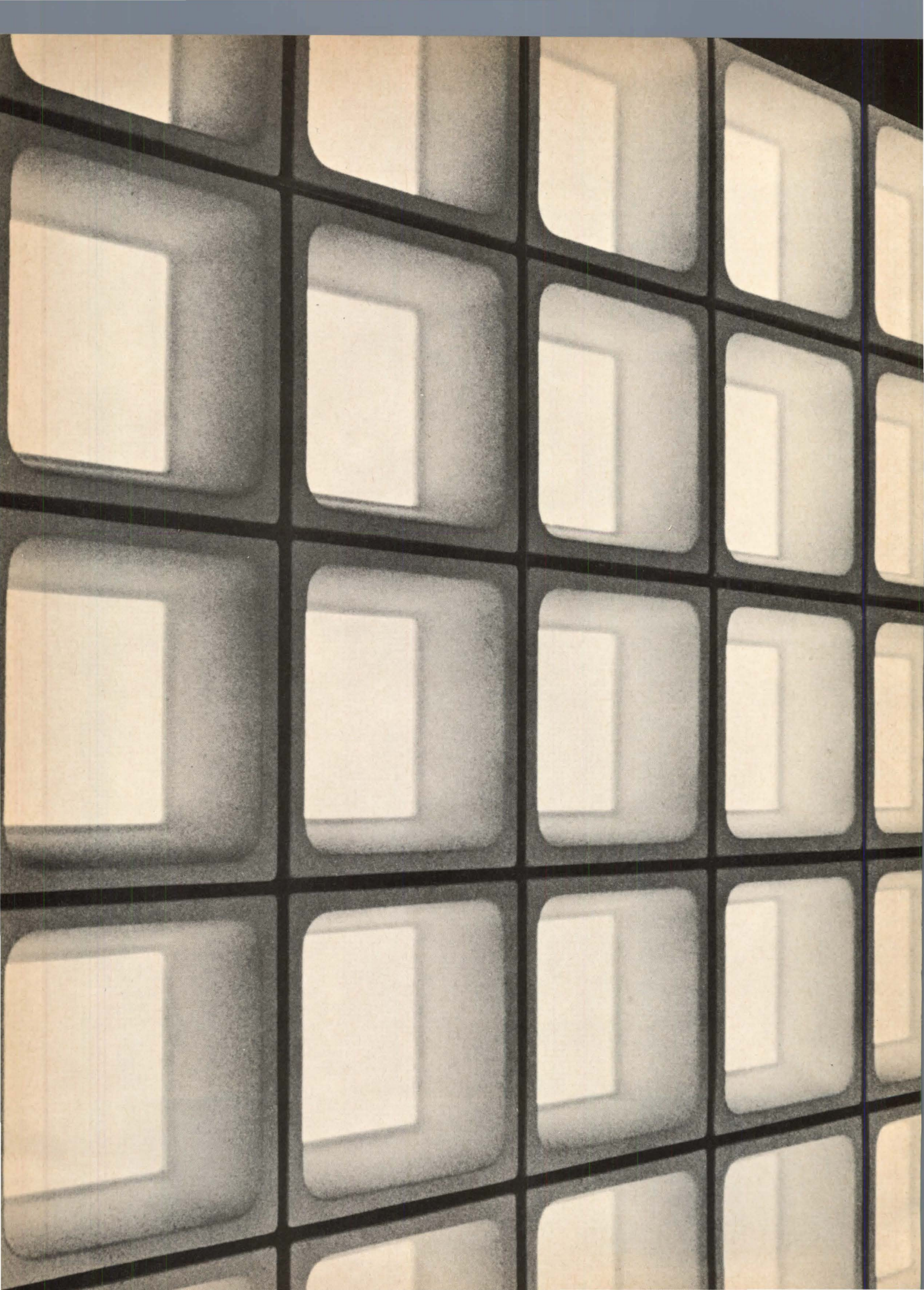
For the names of the quality mills currently working with Zefstat, please call or write Dow Badische Company, 350 Fifth Avenue, New York, N.Y. 10001 (212) 244-6000.



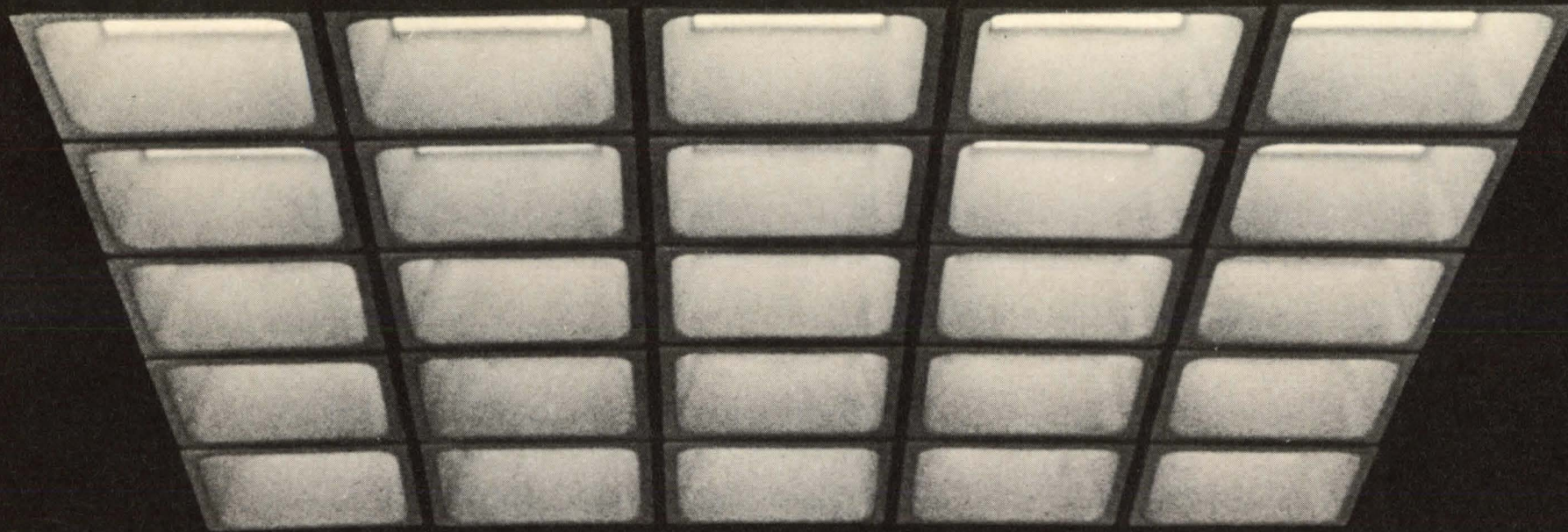
Zefstat is a trademark of Dow Badische Company, 350 Fifth Avenue, New York, New York 10001.

Patents pending

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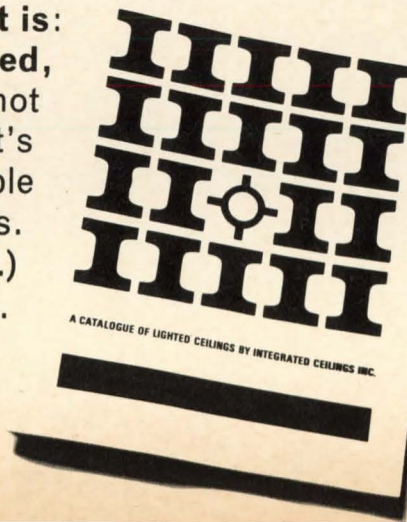






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(You're looking at the 3' x 3' modules.)  
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Tell me about Sculptura. (And send me your  
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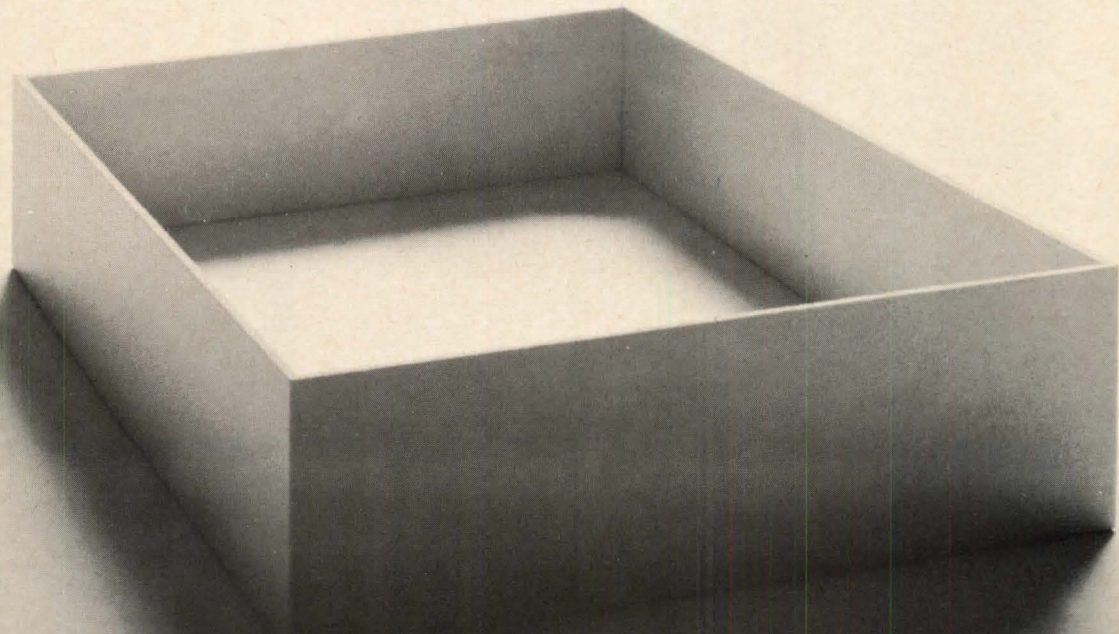
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Dept. E-569, Box, 180,  
Cleveland, Ohio 44141.



For more data, circle 109 on inquiry card

**Here are quotations from the four major building codes regarding "increased building height":**

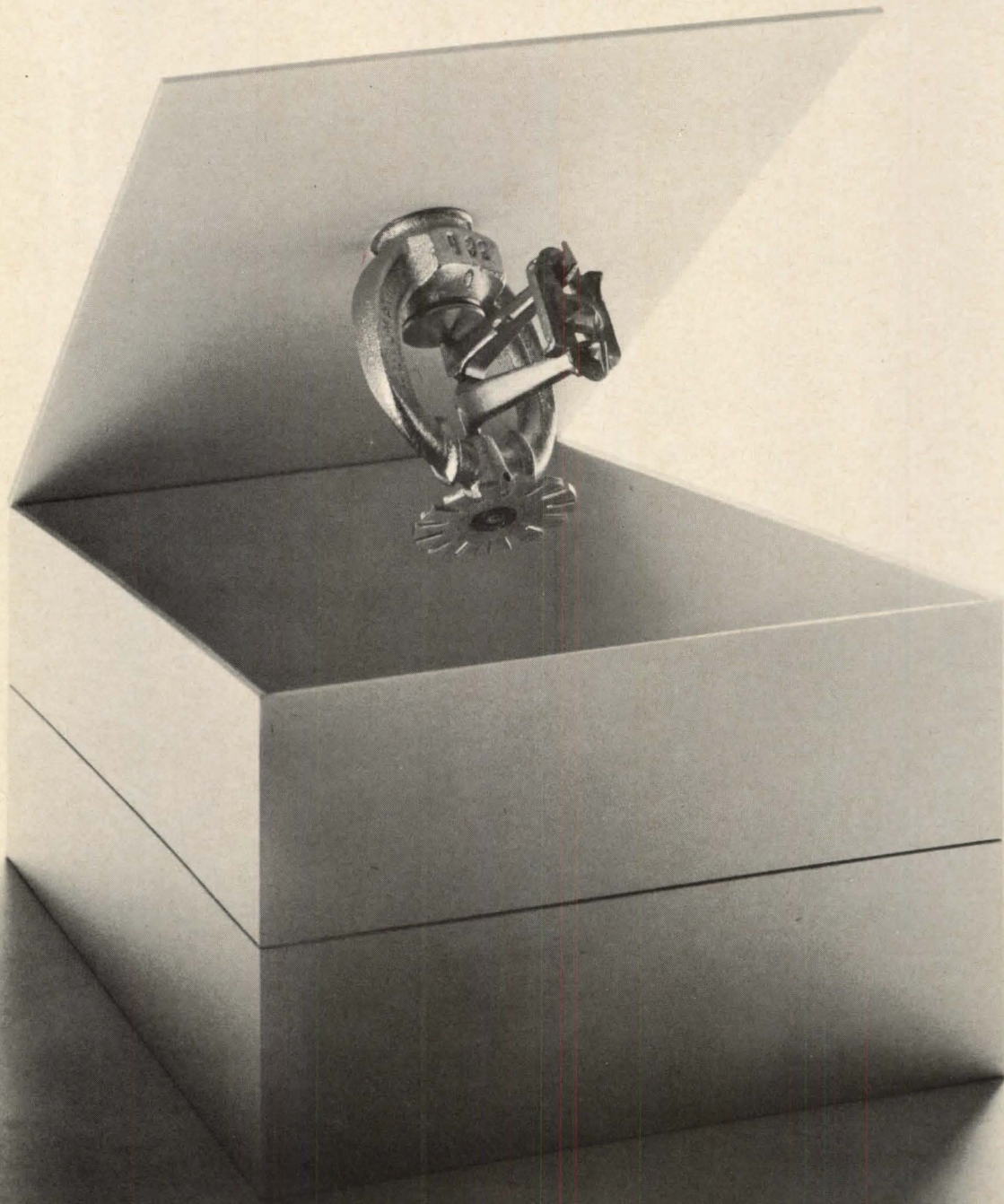
**The Uniform Building Code:** (SEC. 507) "The limits set forth in Table No. 5-D may be increased by one story if the building is provided with an automatic fire extinguishing system throughout . . ."

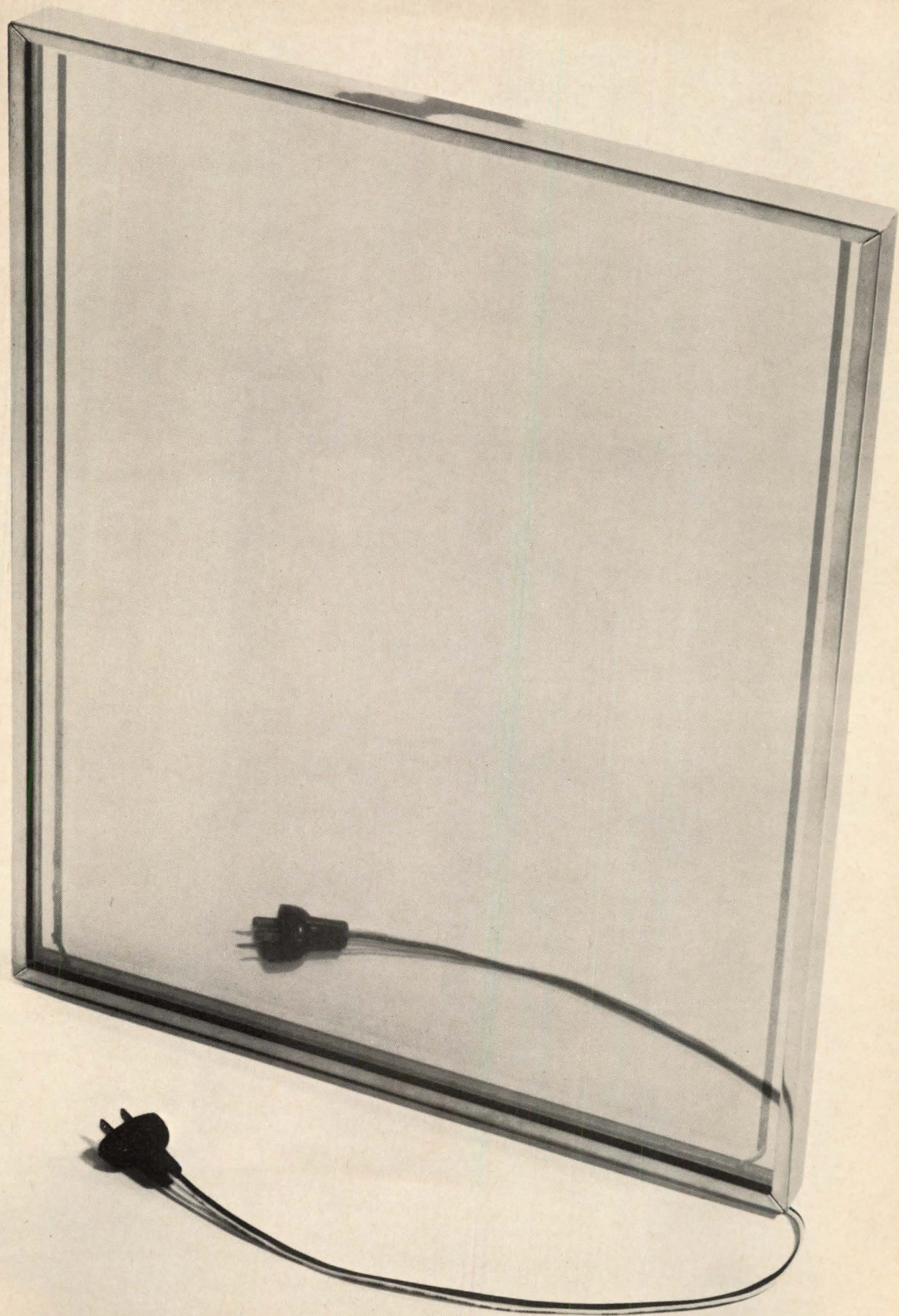
**The National Building Code:** (SEC. 812.2) "Approved automatic sprinkler

systems shall be installed in buildings that are: (1) Occupied as bowling lanes, restaurants, or for the manufacture, sale or storage of combustible goods or merchandise, and exceeding the areas (and heights) in Table 812.2."

**The Southern Standard Building Code:** (SEC. 402.6) "The maximum allowable number of stories may be increased by one story if the building is provided with automatic sprinklers throughout."

**The Basic Building Code: (SEC. 310.2)** "Except in buildings where automatic sprinkler equipment is a requirement of article 4 or article 12 for special uses or occupancies, all structures of fireproof, non-combustible, and exterior masonry wall construction, designed for business, industrial, mercantile, low or moderate hazard storage uses may be erected one (1) story or twenty (20) feet higher than specified in table 6 when equipped with an approved one-source automatic sprinkler system."





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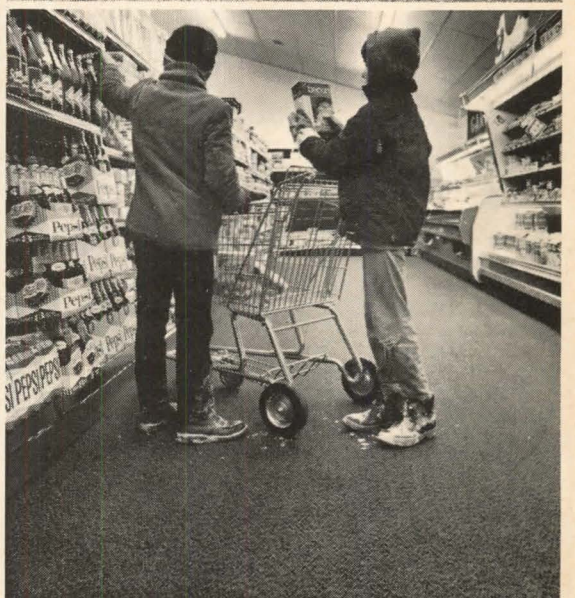
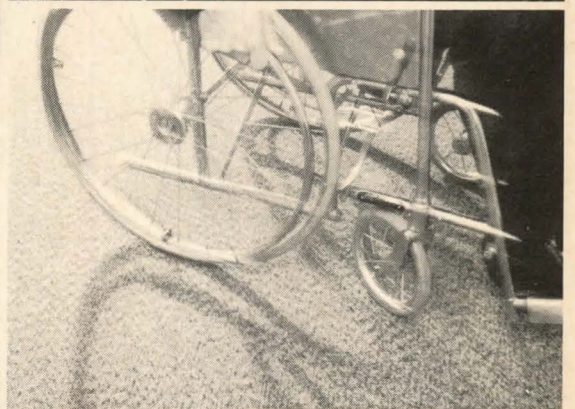
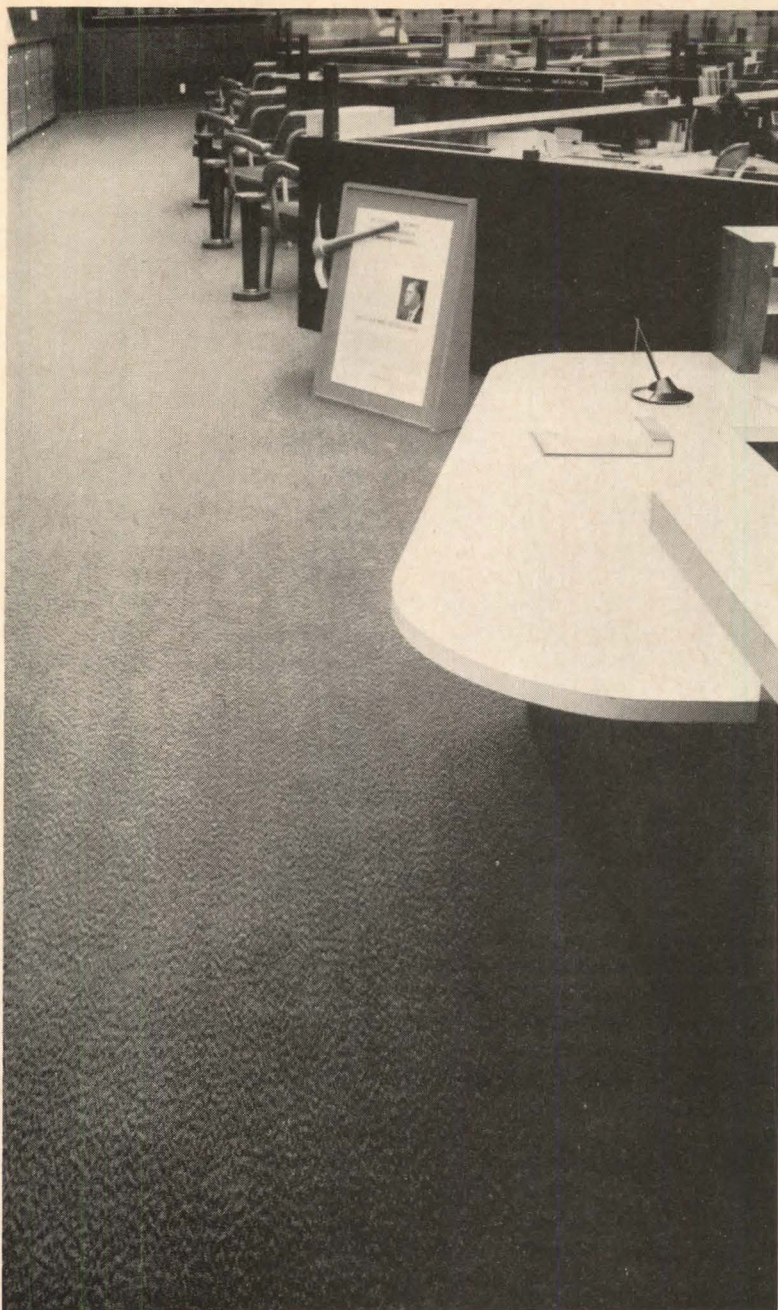
All you do is plug it in.

For information about this remarkable new window for custom installations, write for our new booklet. Mr. George Catlin, PPG Industries, Inc., One Gateway Center, Pittsburgh, Pa. 15222.

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If it weren't for Powerbond™ Pile Vinyl's outstanding durability, low maintenance, excellent sound deadening properties, sure footedness, beauty and general superiority for use in any high traffic area, we could stop right here about what has helped push Powerbond Pile Vinyl into such wide acceptance.

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There are a few "almost-likes" but nothing exactly like Powerbond Pile Vinyl. Which is what you'd expect

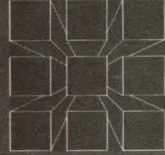
from something that has set the standard for floor covering.

Please send me more information and swatches.	74
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Firm _____	
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# A book is a reference, is a teacher, is a tool, is a godsend when you're stuck for an answer.

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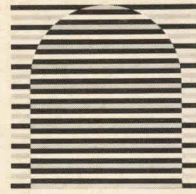


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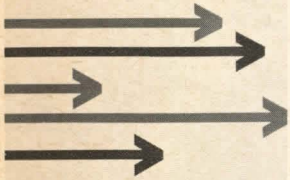
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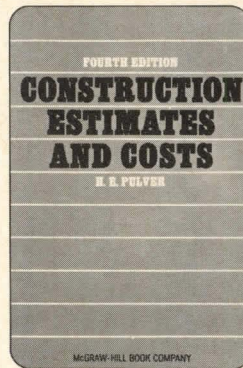


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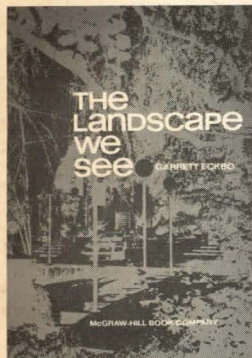
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## THE LANDSCAPE WE SEE



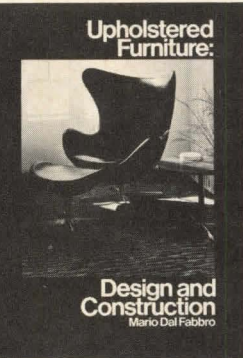
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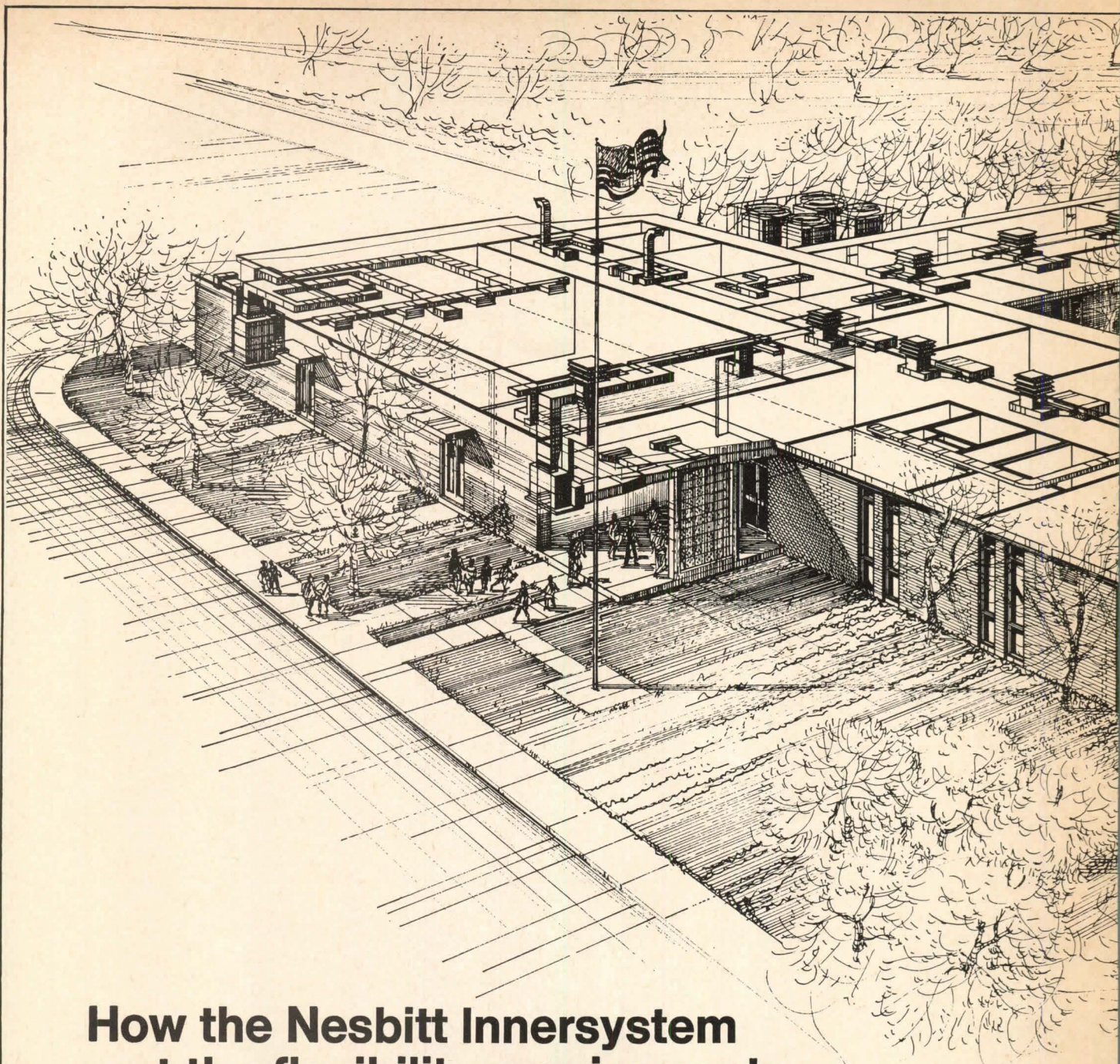
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## How the Nesbitt Innersystem met the flexibility requirements of Tibet Avenue School at \$2.77 per sq. ft.

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

You see, the Innersystem provides year-round heating, ventilating and air conditioning to service learning spaces in all shapes and sizes. And if the school district has forgotten about that—the reason is plain. The Nesbitt Innersystem isn't

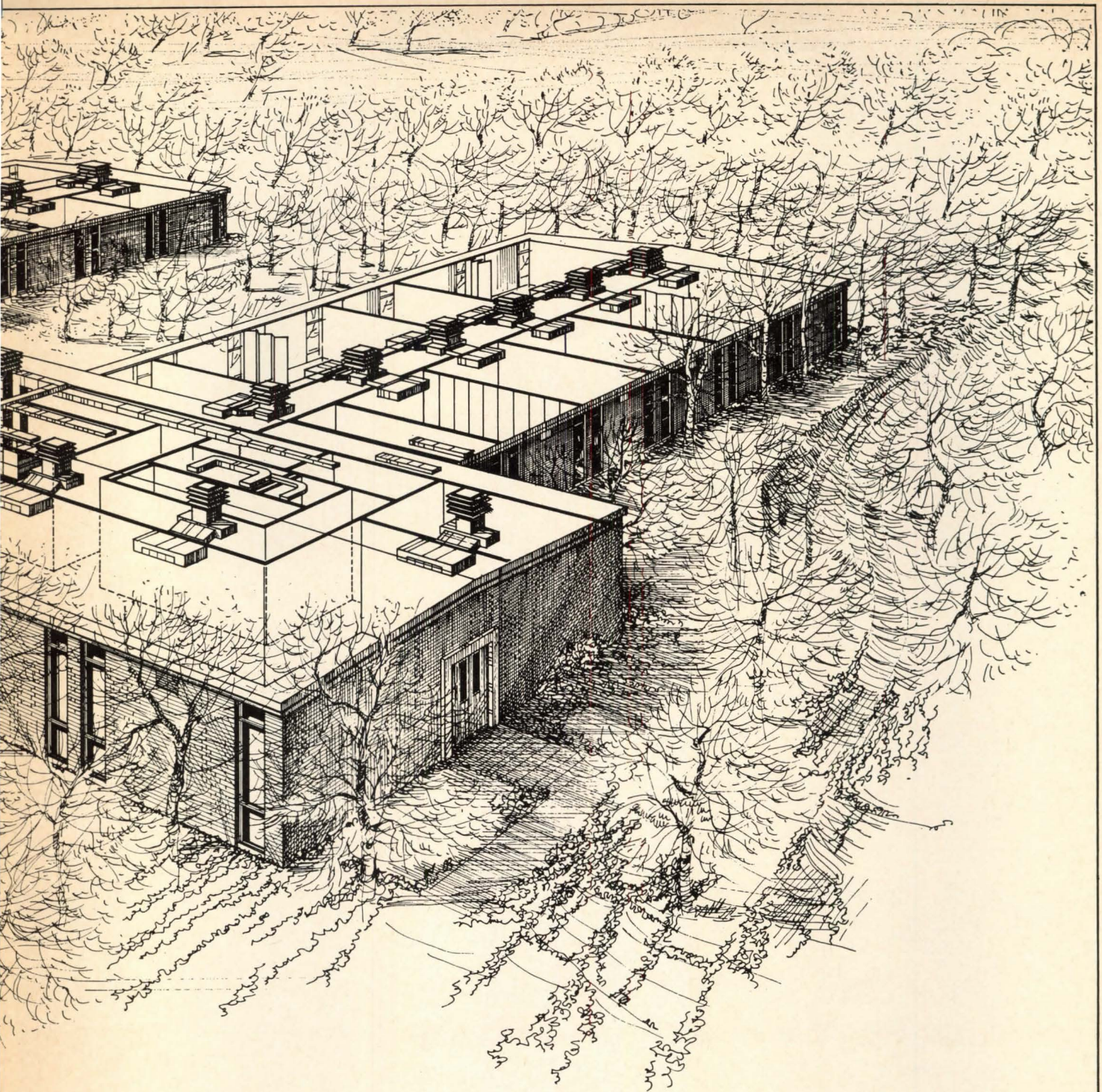
in view! It was designed to fit at the ceiling or in the ceiling sandwich, out of sight, saving valuable floor space.

The versatility of the Innersystem is unmatched for air conditioning, heating and ventilating. Hydronic, electric or a combination of hydronic and electric. Add to this, simplified maintenance provided by the exclusive Nesbitt Vac-Clean filter. You can see how easy it is to forget about the Innersystem. Actually, the Vac-Clean filter never needs changing. When the filter

media in use becomes dirty, a timer light signals the custodian. He advances the reel of filter media to clean section. Once every two years, he vacuums the entire reel of permanent filter media. That's it, no ladders required at any time.

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





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

The Savannah School District bought the best possible comfort conditioning system available for \$2.77 per square foot. With the Nesbitt Innersystem, individual area comfort is always maintained. This means that one area can demand heating while another cooling

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to be located in perimeter walls. Doing so could defeat educational flexibility. You see, the Nesbitt Innersystem was developed out of educational demands. It is the most reliable system for answering the call for flexibility.

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

**NESBITT** **ITT**

For more data, circle 112 on inquiry card

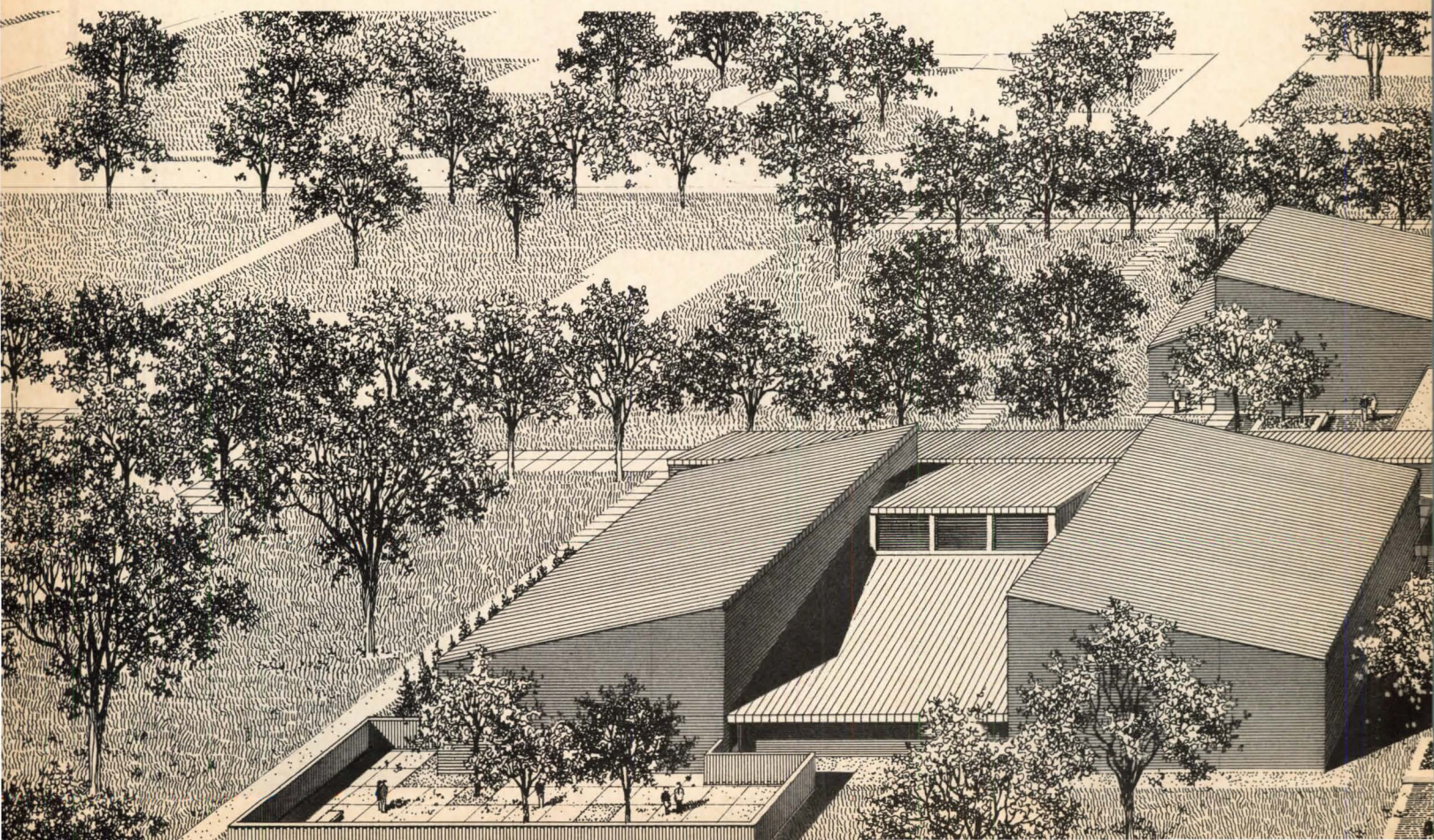
# TCS:

Rehabilitation Center  
Buffalo State Hospital  
Buffalo, New York

Rendering by Brian Burr

Architects: Milstein, Wittek, Davis & Hamilton  
Buffalo, New York

A project of the New York State Health and Mental Hygiene  
Facilities Improvement Corporation for the New York State  
Department of Mental Hygiene



# THE LOGIC OF ITS USE.

The reasons for specifying TCS (Terne-Coated 304 Stainless Steel) can be even more various than the many advantages which are inherent in this superbly functional material.

In the case of the Buffalo State Hospital Rehabilitation Center, the architects were primarily motivated by the fact that TCS weathers naturally to a uniform dark gray, and that it is resistant to corrosive attack under even the most severe atmospheric exposure.

Your own problems may well be different, but TCS provides equally cogent solutions in virtually every situation involving either roofing or weathersealing.

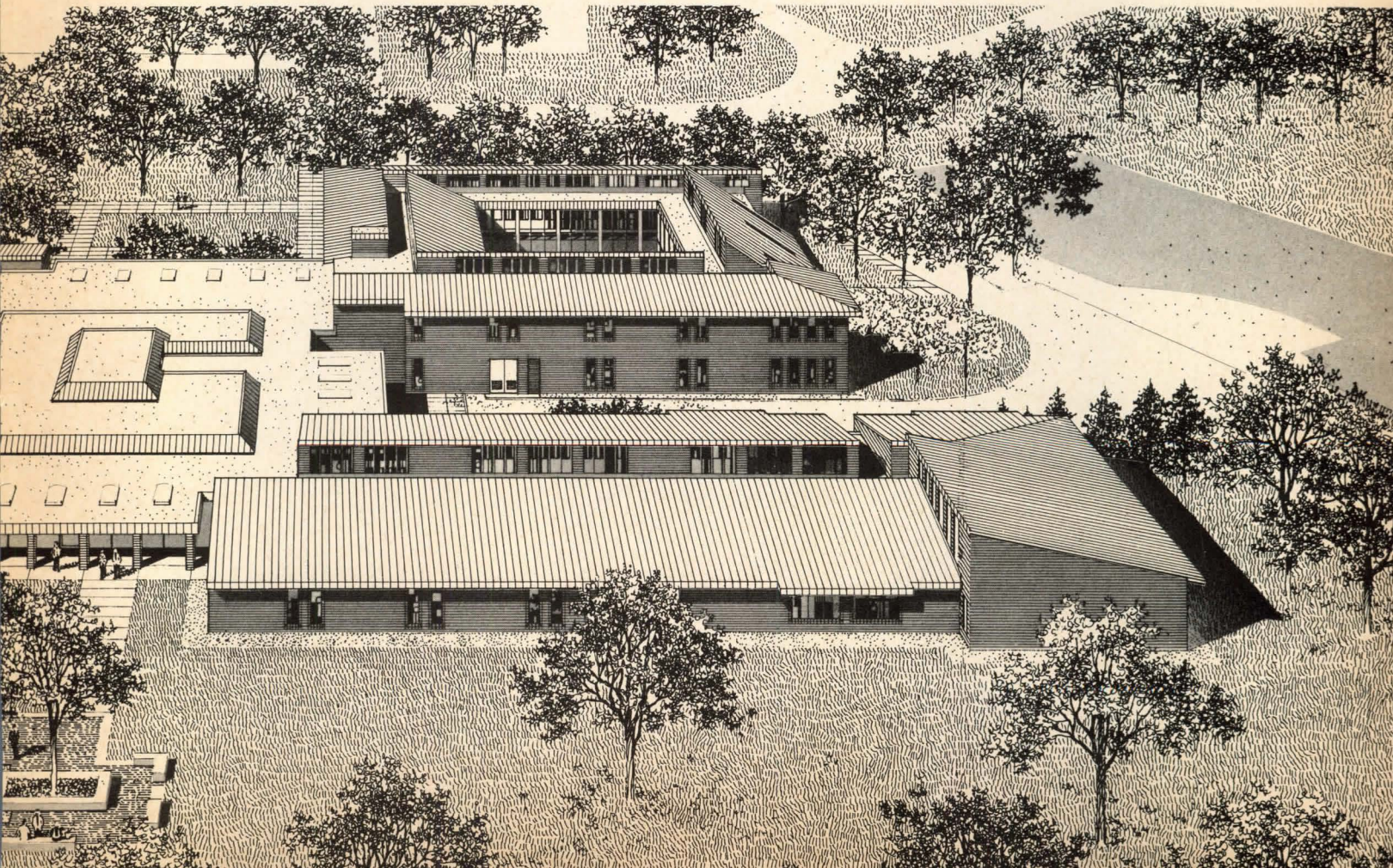
May we send you the substantiating evidence?

---

## FOLLANSBEE

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*For more data, circle 113 on inquiry card*



# ADVERTISING INDEX

Pre-filed catalogs of the manufacturers listed below are available in the 1970 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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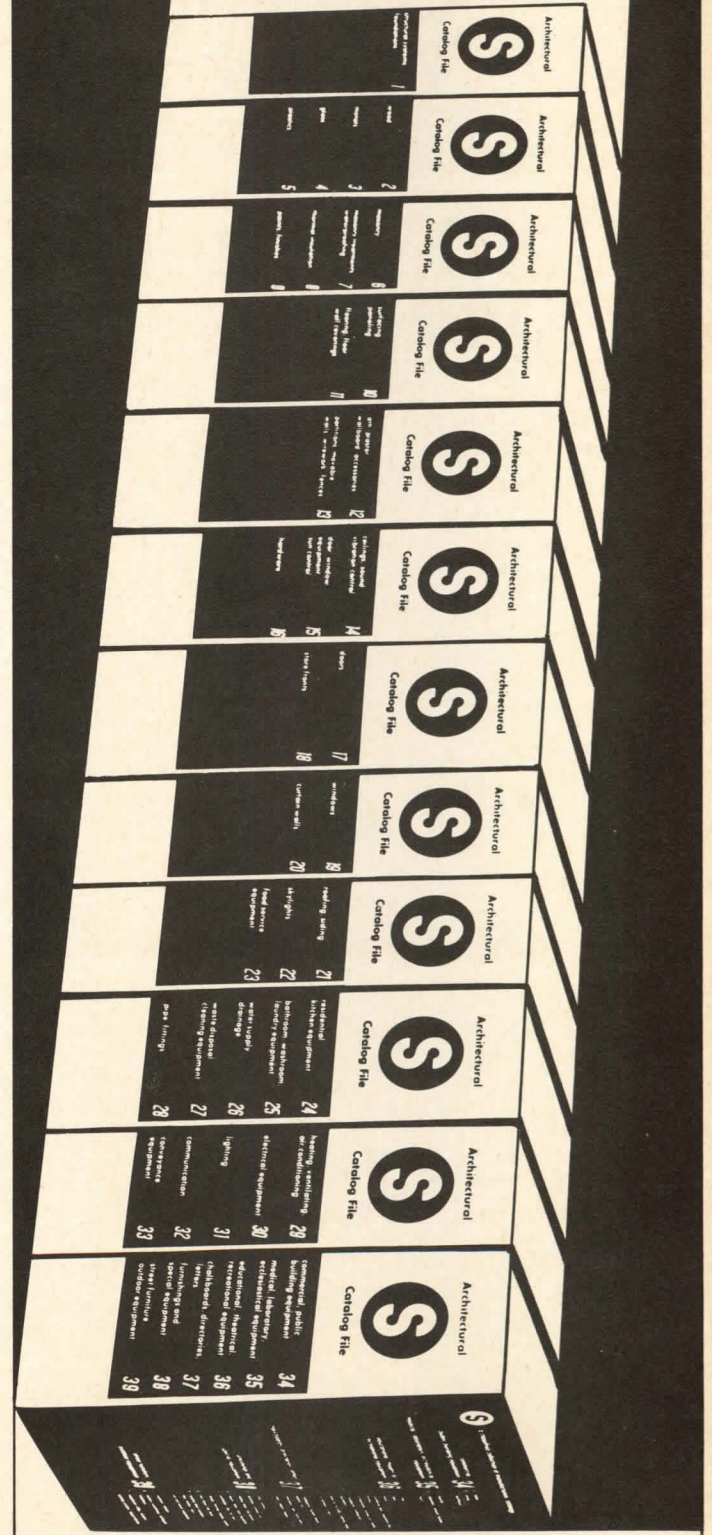
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