BUILDING TYPES STUDY 483: **THE SEARCH FOR BETTER BUILDINGS AT LOWER COST**
1 + 1 = 3: A NEW EQUATION FOR COUNTING A NEW BUILDING'S COST / MORE FOR LESS: DESIGNING LOW BUDGET BUILDINGS WITH CAREFULNESS, THRIFT, AND ECONOMY OF MEANS / RECYCLING: ANOTHER ROUTE TO MORE PRODUCTIVE BUILDINGS / ADDING ON CAN GIVE NEW PRODUCTIVE LIFE TO EXISTING BUILDINGS

FULL CONTENTS ON PAGES 10 AND 11 / SEMI-ANNUAL INDEX ON PAGES 151-154

ARCHITECTURAL RECORD

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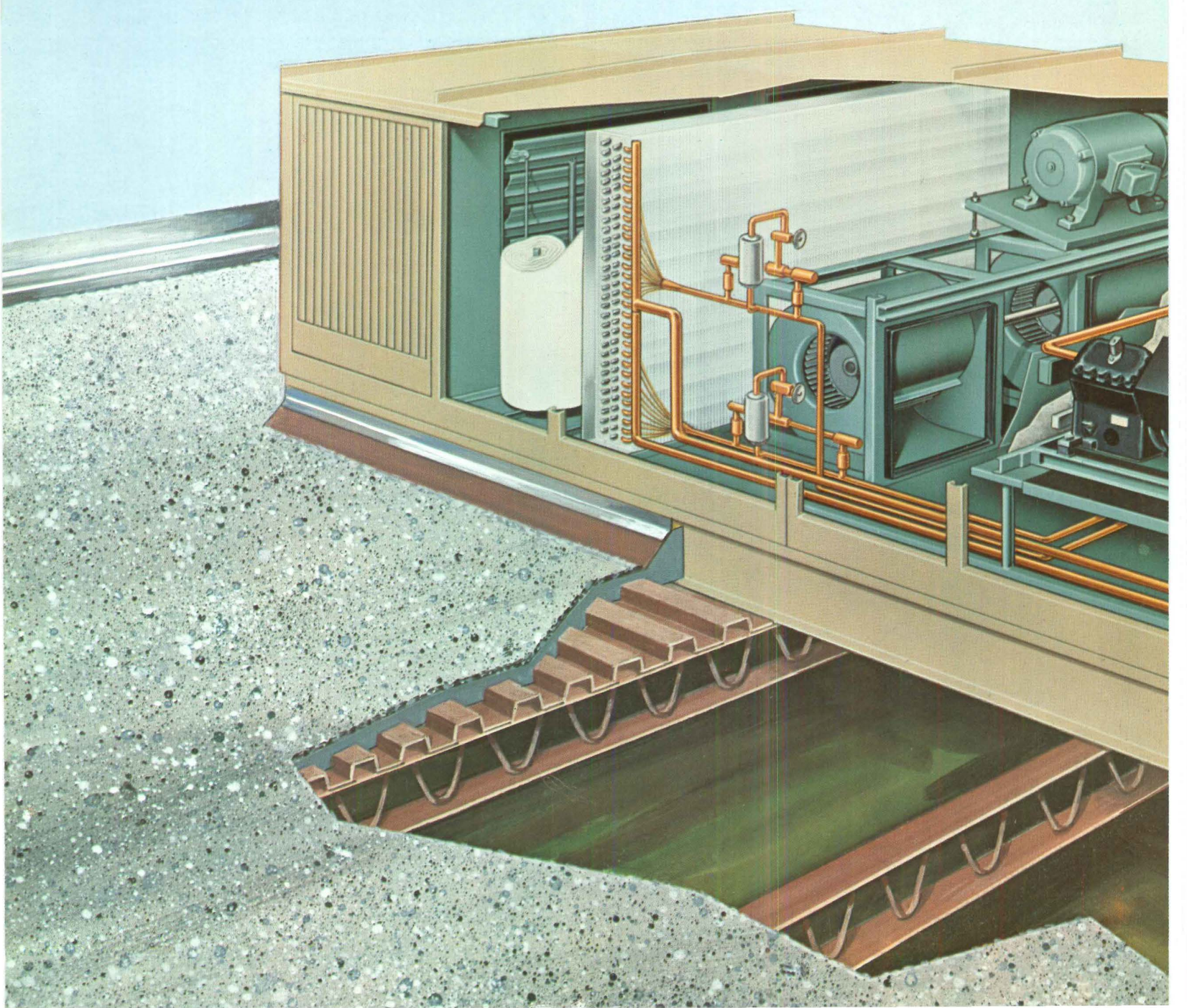

systems for low installed cost. for up to 50% energy savings, too.

served under the control of that area's thermostat. This new system is available in 24, 33 and 42-ton capacities at 4,000-15,000 cfm. A solid state control system, an outside air ventilation cycle and a dual refrigeration circuit are standard features of this new system.

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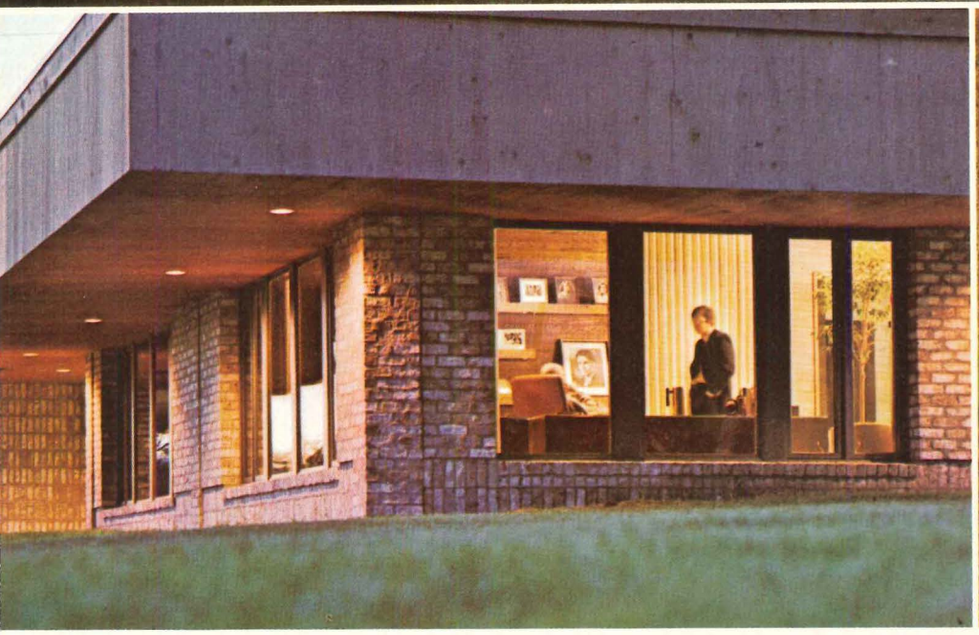

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(b)

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Architect: Ackerberg and Associates Inc. Architects *Builder: Nystrom Constructors Inc.* *Windows: Pella Clad Casement and Fixed Units*

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(d)

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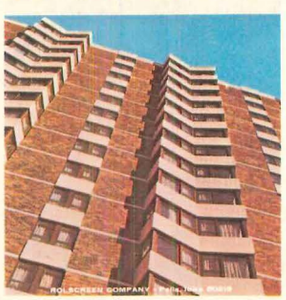

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Letters to the editor

The article about Roosevelt Island Competition in New York and the presentation of some of the entries [October 1975] is a remarkable achievement, in my opinion, of your magazine, in particular the concept of allowing the reader to evaluate the work of, as Mr, Allen put it "So to speak, losers."

By means of this presentation I have the opportunity to see the work, labeled "A mirror to Manhattan" by Clinton Sheerr and Susana Torre and "Et in arcadia ego" by Peter Eisenman, Peter Cook, Christine Hawley, Ron Herron, Tom Heneghan, Ingrid Morris, Keith Priest, Penny Richards, John Robins, and Gerry Whale.

Work of this kind let me see the truth of Hebbel thought that "In Art, as in everything living, there is no progress, but only varieties of one stimulus."

Ruben Tempone, AIA
New York City, N.Y.

The RECORD has long been known as a friend of Landmark Preservation. I was therefore somewhat distressed at reading in your October issue a kind of "postmortem" on UDC and its Roosevelt Island project, which completely ignored what I consider one of the greatest achievements, or better attempts of Ed Logue in his approach to housing design and construction.

Ever since the original master plan by Philip Johnson, a great deal of emphasis had been put on the expected impact of the seven historic Landmark Buildings on the Island on the urban texture and livability of the new town.

When properly "recycled" and re-used for today's needs, the work of Alexander Jackson Davis, of Renwick and of Withers—as well as the accomplishment of an early farmer—should have balanced the newly designed 20th century buildings completing the historical pattern of about 200 years of New York City life.

Unfortunately, the lack of interest and understanding shown by many of our great city organizations, public as well as private, left UDC officials to struggle by themselves with this problem.

Yet within the time it took to construct the first 2,000 apartments, it was possible to obtain the restoration and preparation for use as an information and educational center of the old, little farm house of Captain Blackwell.

It was also possible to arrange a special corporation to take over, for community purposes and ecumenical religious services, the Chapel of the Good Shepherd, designed by Frederick Withers in 1875.

I was lucky enough to be entrusted by Ed Logue with the work on both buildings.

I believe many of the passers-by on Roosevelt Island Main Street, near the Chapel or at Blackwell Park, must feel that with the preservation and restoration of these two buildings, Ed Logue has obtained for the Island an environment quite different from those of our many housing developments.

Giorgio Cavaglieri, FAIA
New York City, N.Y.

I feel that George Mann in his article The Health Planning Law: Crisis or Opportunity for Architects" (RECORD, September 1975), has done a credible job of focusing in on the new National Health Planning legislation, and is quite perceptive in noting that the primary intent of P.L. 93-641 is to "conserve dollars." I must take exception, however, with his conclusion that the architect's "new client will likely be the Health Systems Agency (rather than the individual institution)." Although it would be most desirable for a health care organization's architects to be sensitive to the new planning agencies priorities and concerns, it will, in fact, remain the responsibility of the individual institution to make the final decisions regarding its facilities design and construction. And this will be true so long as hospitals remain in the private sector.

What concerns me even more about Mr. Mann's article was the suggestion that at least some architects in the past have not been sensitive to the need to conserve dollars in the design of health facilities. These institutions are public resources, operated for the public good. To foist upon the public additional costs in the name of "design" is at the least unprofessional and perhaps even criminal. I trust that the new legislation will awaken the architectural profession to its responsibilities to the public it serves.

Peter P. Holman
Assistant Director-Planning
Greater Detroit Area
Hospital Council, Inc.

Mr. Mann's reply:
I believe my comments on the role of the health planner/architect vis-a-vis the new Health Systems Agency was somewhat misunderstood. Let me try again . . .

A regional approach to planning and design of health facilities is essential in order to conserve dollars. This regional approach won't add more dollars by building more hospitals. The approach will consolidate, merge, or close down medical facilities and make them more effective, and by utilizing in a more efficient manner our scarce health resources. I really believe this and have undertaken successful programs in regional planning throughout the U.S. and abroad. The HSA is the key to making this concept work and saving the public's dollar.

Calendar

DECEMBER

Current-January 4 The Architecture of the Ecole Des Beaux Arts, Museum of Modern Art, New York City. Contact: Arthur Drexler, Director, Department of Architecture and Design, MOMA, 11 West 53rd Street, New York, N.Y.

25-January 18 Nelson/Eames/Girard/Propst: The Design Process at Herman Miller, an exhibition of furniture, fabrics and interior architectural systems, Walker Art Center, Minneapolis, Minn. Contact: Walker Art Center, Vineland Place, Minneapolis, Minn. 55403.

JANUARY

18-22 National Association of Home Builders annual convention, Dallas, Tex. Contact: NAHB, 15th and M Streets, N.W., Washington, D.C.

29-30 A/E Federal Program Conference, a briefing by Federal officials on new Standard Forms 254 and 255, Federal construction budgets, competitive bidding, and overseas markets. Sponsored by the Committee on Federal Procurement of A/E Services (COFPAES). Contact: Marshall E. Purnell, AIA, 1735 New York Avenue, N.W., Washington, D.C. 20006.

FEBRUARY

2-4 The Southwest Air-Conditioning, Heating, Refrigerating Exposition, Dallas Convention Center. Contact: International Exposition Co., 200 Park Avenue, New York, N.Y. 10017.

MARCH

16-18 Third Annual Contract Marketplace—New York, Americana Hotel, New York City. Exhibition of contract furnishings, and seminars. Contact: Contract Marketplace, Ltd., Box 908, Larchmont, N.Y. 10538.

24-25 Symposium on building construction, for public and private building owners, National Bureau of Standards, Gaithersburg, Md. Contact: Harry Thompson or James Haecker, Center for Building Technology, NBS, Washington, D.C. 20234.

ARCHITECTURAL RECORD (Combined with AMERICAN ARCHITECT, ARCHITECTURE and WESTERN ARCHITECT AND ENGINEER)

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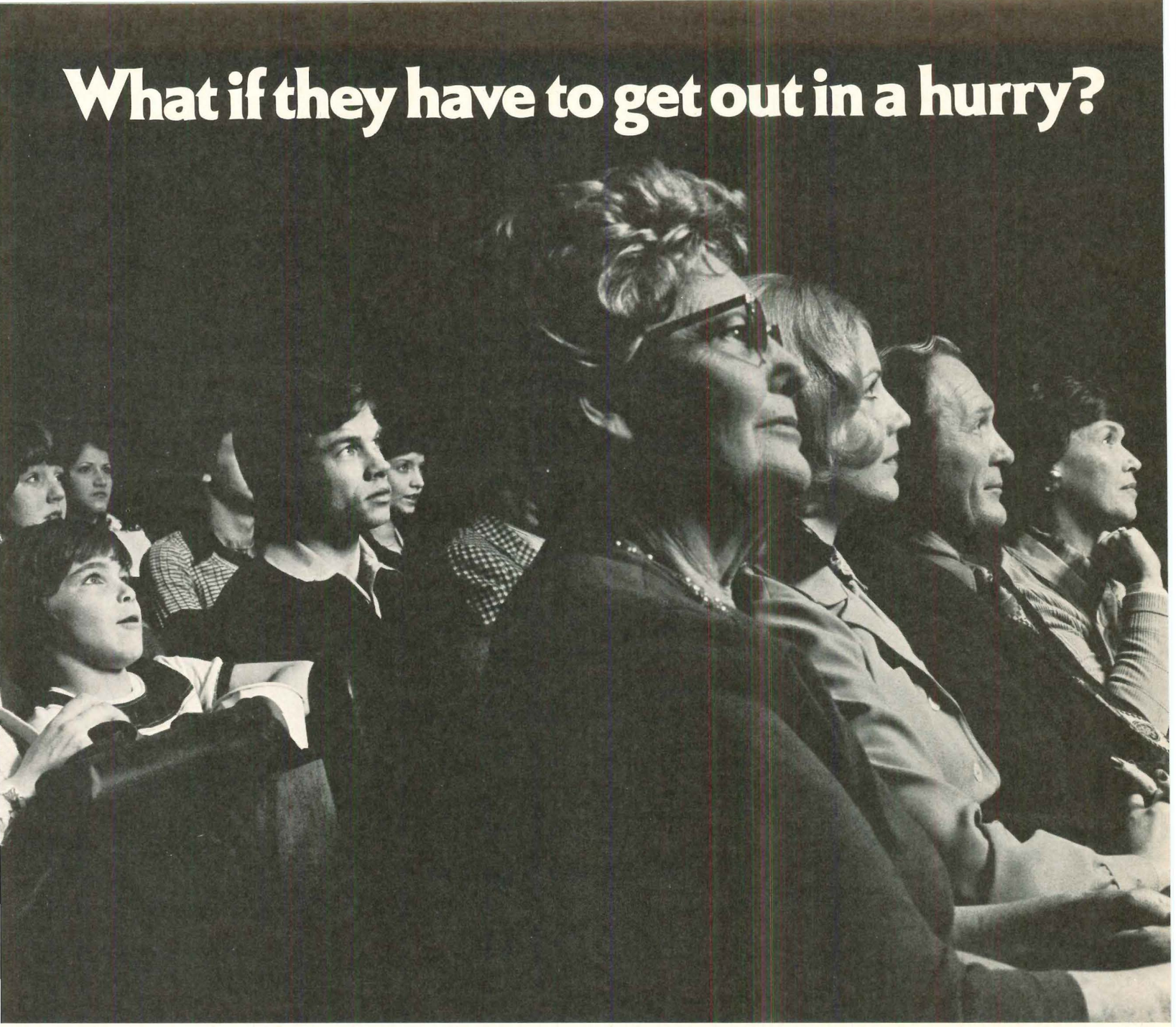

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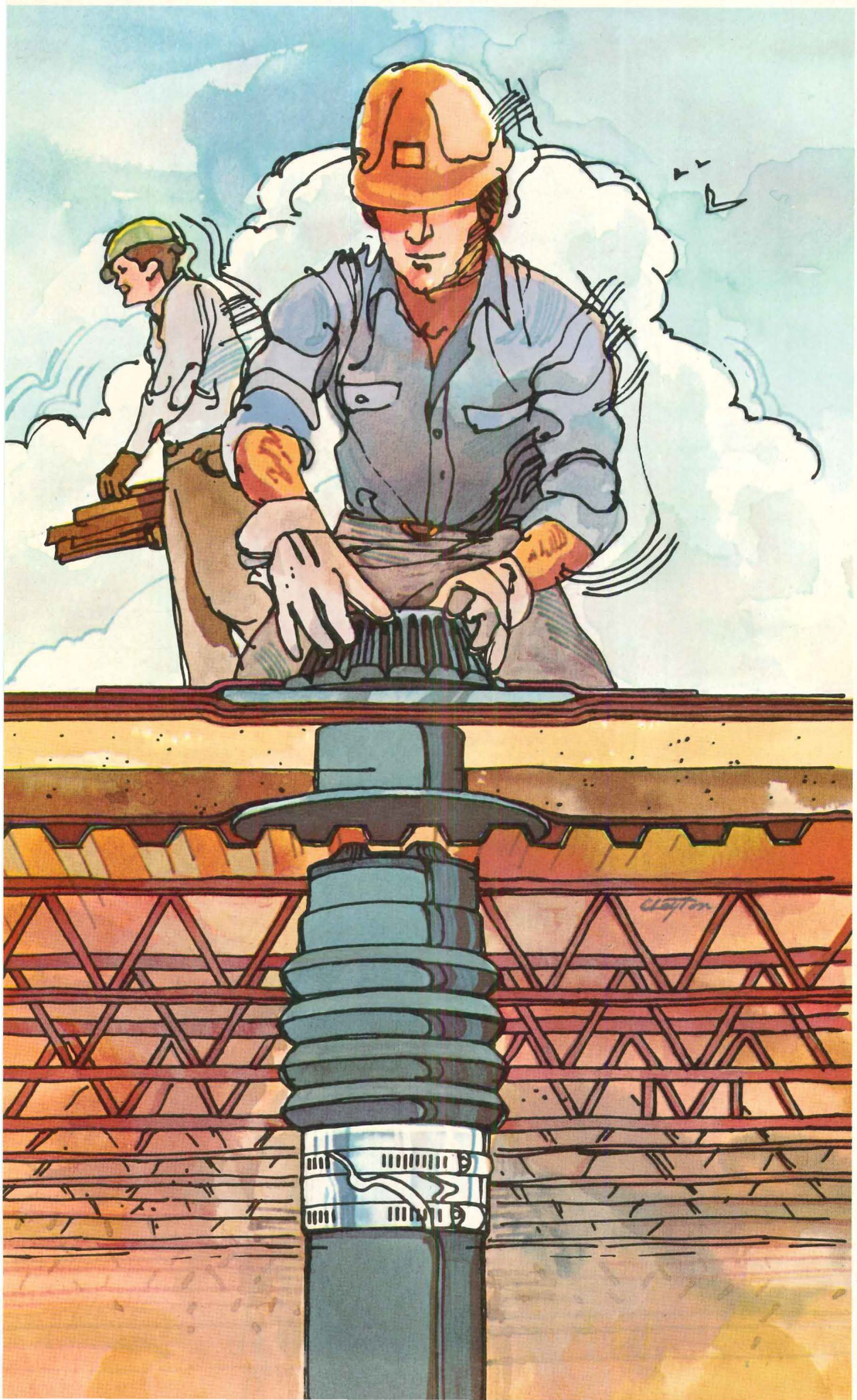
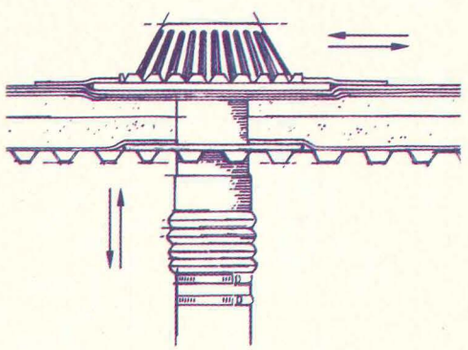


Traditional rigid drain systems may damage the integrity of the roofing system under the strain imposed by deck and pipe movement.

Unique Flex-I-Drain, the new, patented, *flexible* drain system from Johns-Manville, solves this problem.

Flex-I-Drain has a bellows-type neoprene body that *flexes* to automatically compensate for deck and pipe motion—both laterally and vertically. So the drain and the roofing system remain functional under most conditions.



Flex-I-Drain offers installation versatility, too. Consisting of two parts, installation of the first part with its no-hub sleeve connection, in conjunction with vapor seal or fire barrier membrane, results in a waterproof installation. With installation of the second part, the Flex-I-Drain sleeve adapts to any thickness of insulation up to 3¼", plus normal roofing membrane, and firmly locks the roof membrane flashing against the roof membrane.

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The single-source built-up roofing system.

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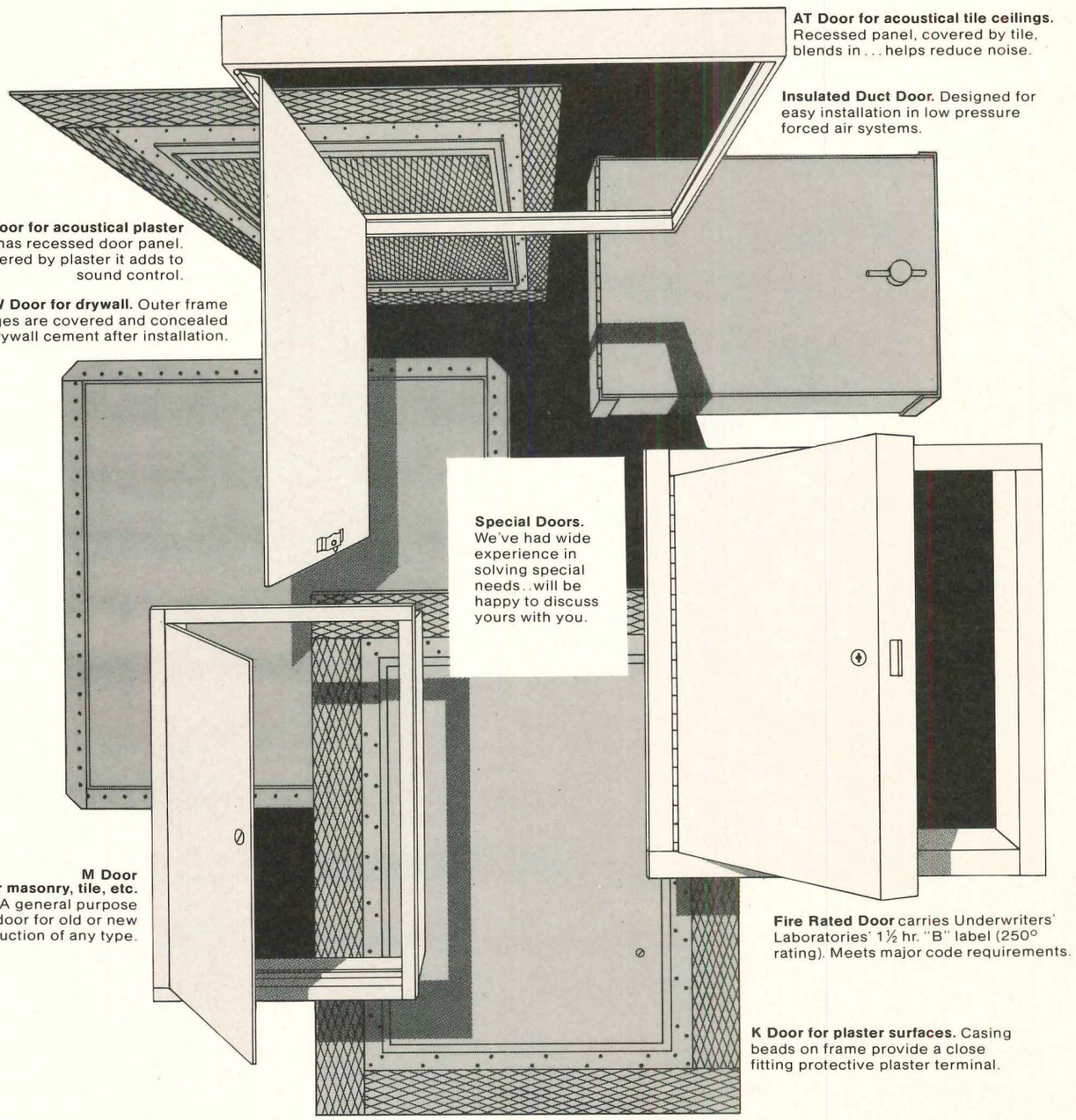

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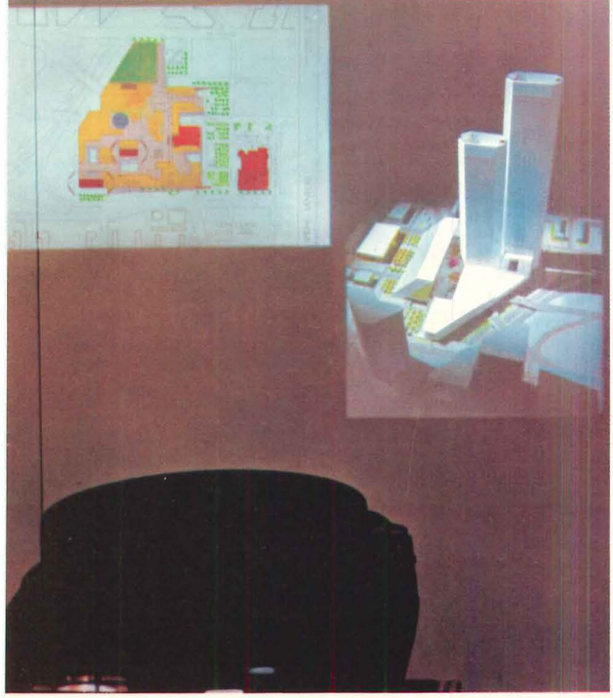

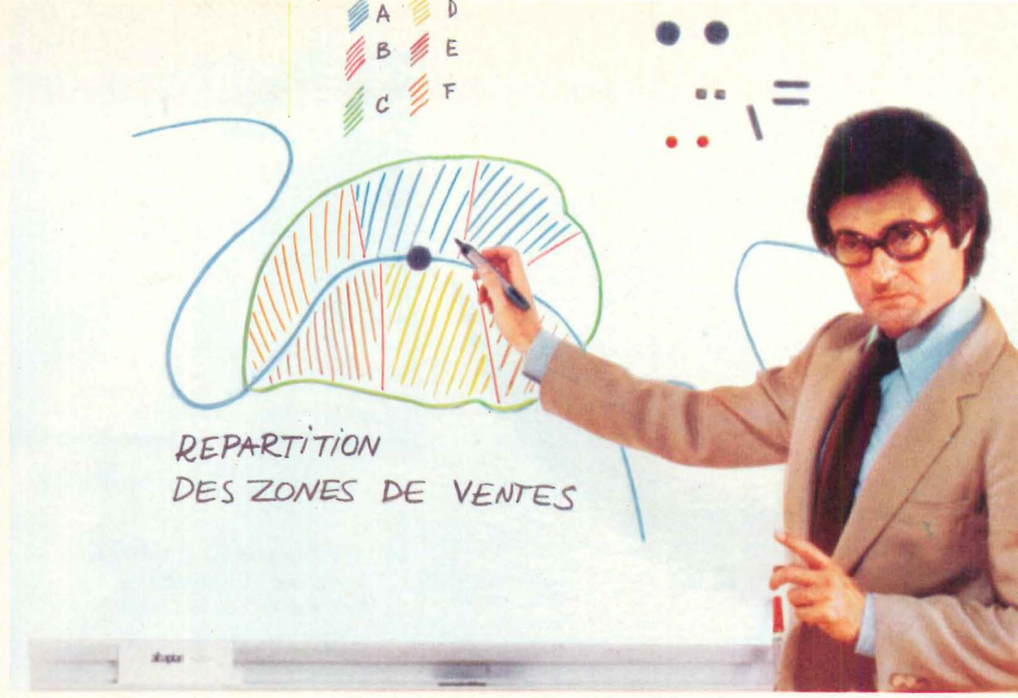

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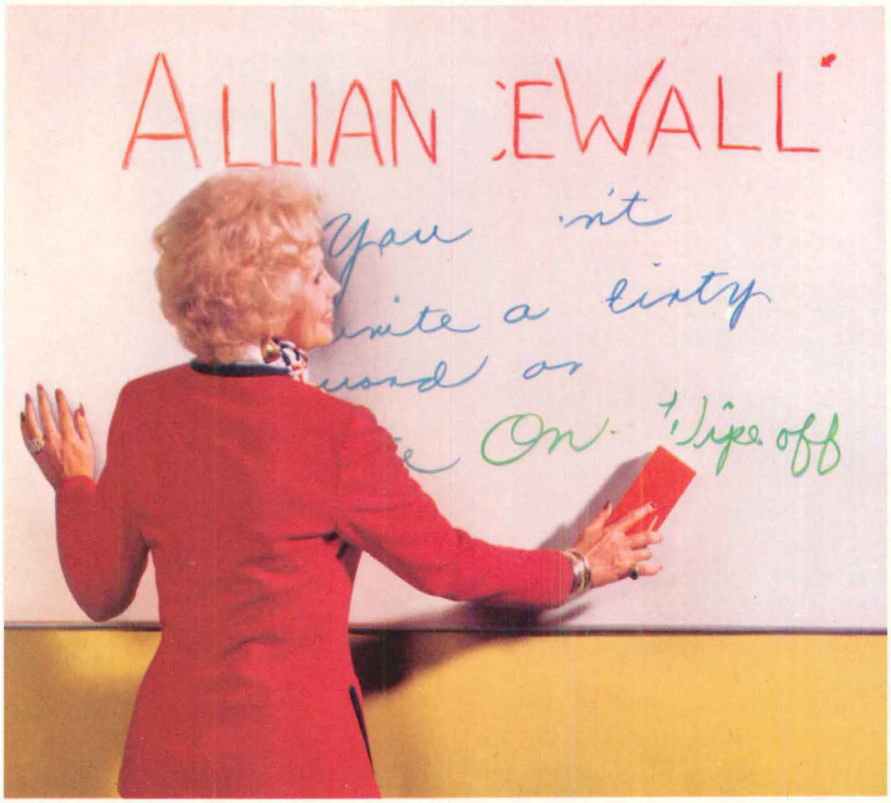

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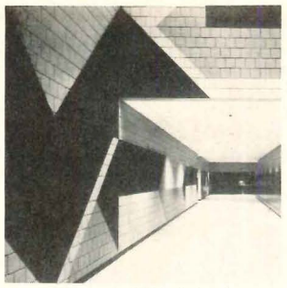

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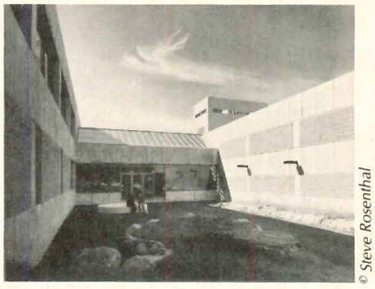

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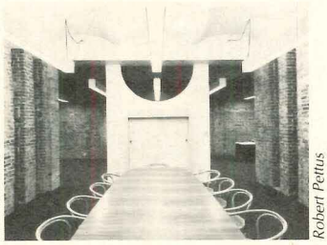

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ARCHITECTURAL BUSINESS

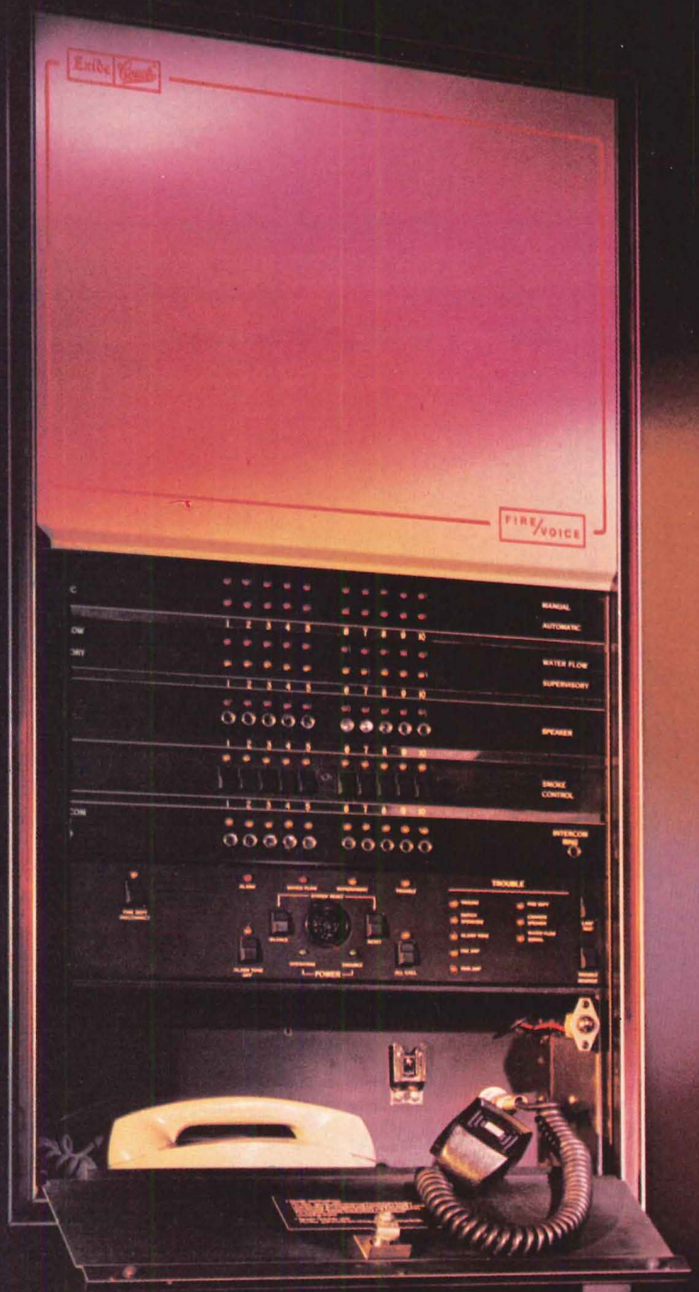
NEXT MONTH IN RECORD

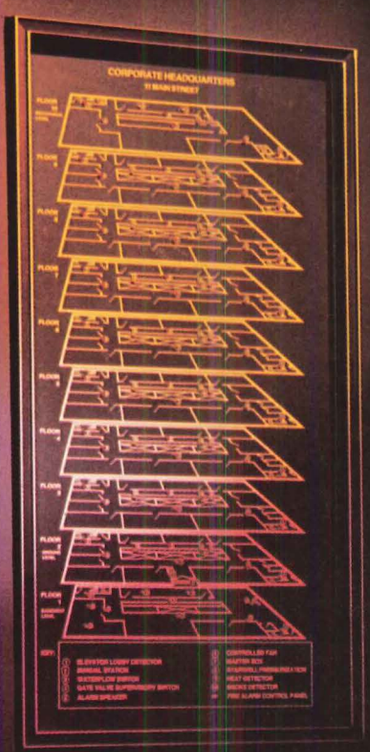
**Building Types Study:
Record Interiors of 1976**

In this annual feature, expanded this year to 28 pages, RECORD's editors present eleven of the most compelling architect-designed interiors in a wide range of building types.

High-rise fire protection from Exide/Couch

The beauty is more than skin deep





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Profits, production, and priorities: The BPEC produces some thoughtful comment

One might have predicted that this year's Building Products Executives Conference—an annual meeting sponsored by McGraw-Hill Information Systems Company—would be a gloomy affair. Most of the attendees—all top executives of building product manufacturers—have had one of their less successful years. But that wasn't the attitude, as I read it—the attitude was rather one of constructive concern over just exactly what can be done to get this industry rolling again.

George Christie, vice president and chief economist of McGraw-Hill Information Systems Company, offered the essential good news of a strengthening in the construction market (for full details, in case you missed them, see "Dodge/Sweet's Construction Outlook: 1976," RECORD, November, page 65). The key point was his prediction that construction contracts for 1976 will total $108.8 billion, up 15 per cent from this year's total; and that the seasonally adjusted Dodge Index will move to 197 from this year's 171 (against a 1967 base of 100).

Economist Christie's major reservation (to get to the subject of management as advertised in the headline of this piece): what the government will do, under its options for stimulating the economy or holding down inflation. Said Christie: "The immediate risk to the 1976 expansion of the 1975 recovery . . . is that the Ford Administration's ultra-conservative economic policies will turn it off before it really takes hold"—by continuing to minimize public spending, and by driving up money costs by competing in the money market. "It is axiomatic that construction cannot move ahead without either private lending or public spending, or a combination of both. Right now we aren't getting much of either."

The economist told the group that it is unrealistic to expect a complete reversal of economic policy from restraint to aggressive stimulation in 1976. But he pointed out the "compelling, non-economic reason" for expecting some stimulation—1976 is a political year, "and the practical politics of 1976 argue for more stimulation of the economy, such as a continuation of the tax cut and some easing of the money markets. . . ."

The political importance of Federal "management" was made clear by this reminder of the dimensions of our industry by speaker W. F. Newton, vice president of marketing of PPG Industries: "Construction accounts for 9.5 per cent of our Gross National Product . . ." more than food, four times as big as the automobile industry. "There are about 3.5 million people on contract construction payrolls, down from the recent norm of 4 million, making the construction industry one of the nation's largest suppliers of jobs. . . . Between 50,000 and 60,000 active builders are engaged in the construction of single-family homes and apartments during any given year. An additional 1,500 or so contractors specialize in commercial structures. About 6,000 manufacturers of building products serve this extremely complex and segmented industry."

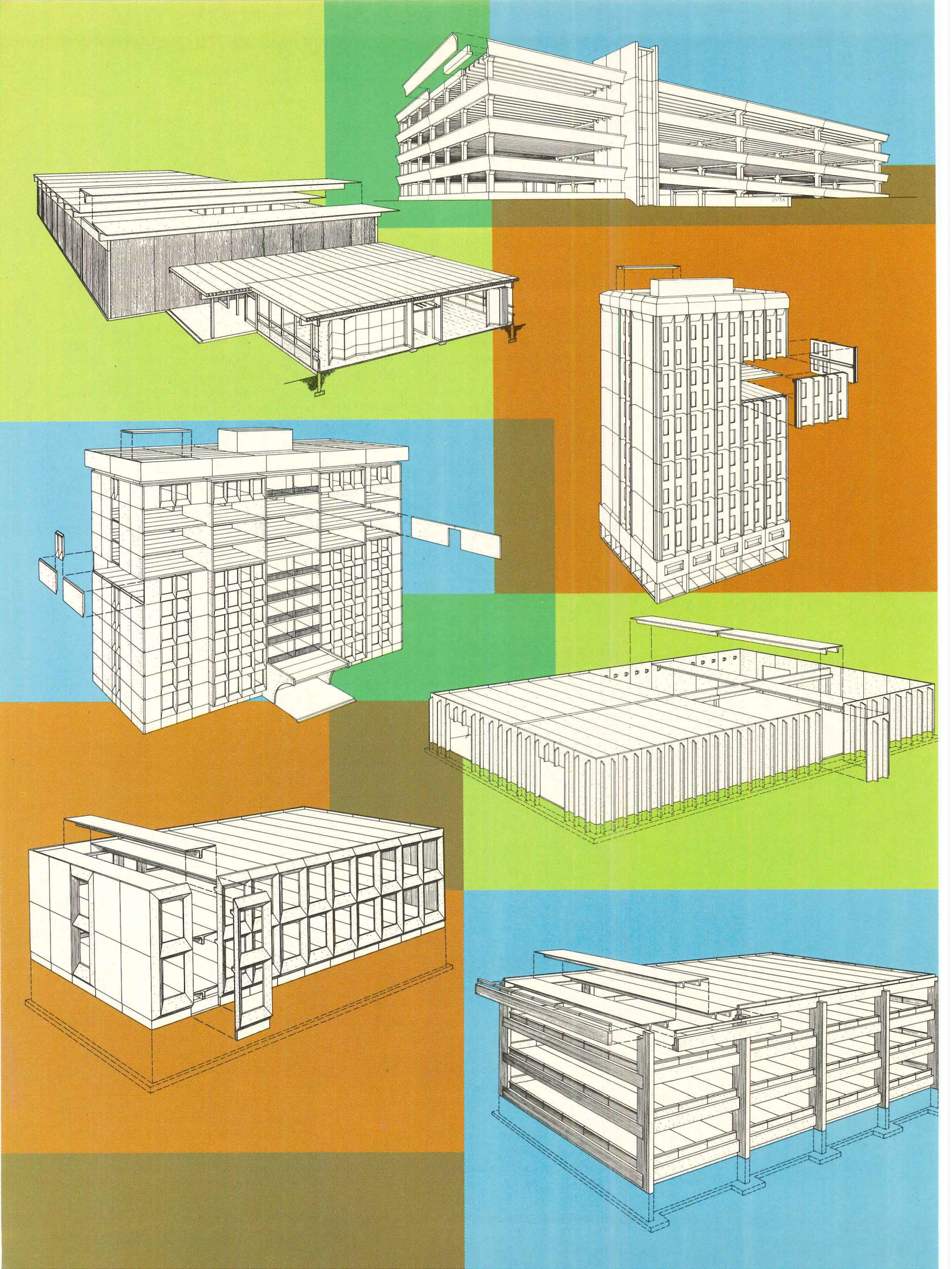
Mr. Newton sounded a fundamental warning applicable to all parts of our industry—producers, architects, engineers, and contractors alike: "Profits are the ultimate reality facing the construction industry now.

"From 1950 to 1970, construction industry profits averaged about 10 per cent. In the late '60s and early '70s, they climbed to about 12 per cent. Currently, they have dwindled to about two per cent. Clearly, something is very wrong . . . and we had better find out what it is."

Speaking directly to his fellow manufacturers and producers, Mr. Newton said: "The construction industry has always been a very large and risky business. Historically at least, it has also been a rewarding one. Because it remains risky, and also because industry profits have fallen to levels that are clearly unsatisfactory, those of us who wish to supply products to the industry must be aware of its problems and try to help with the solutions. . . .

"Construction has been such an important factor in our economy that recovery from all major recessions in modern times has been led by a strong resurgence in the construction industry (the resurgence that economist Christie sees for next year—if). And because construction has remained relatively flat during the current slow stages of recovery, we must not only beware of a false dawn, but also do everything we can to aid in the upturn."

A phrase from architect Phil Meathe's talk to BPEC summed up the concern of the meeting very well: "If we are going to waste our capital on unsound projects, there is not going to be enough sound money for the important ones. The government, the business community, and the financial world are going to have to make some hard choices about where our dollars should go. In essence, we are going to have to make some business-like priorities and *live by them.*" —*Walter F. Wagner Jr.*



Your building will go together faster, easier when you use

ARCHITECTURAL PRECAST CONCRETE and PRESTRESSED CONCRETE

When you make your decision to investigate the advantages of precast prestressed concrete, you're in for a revelation! You'll find you can get your building up quickly, and that the building will last for a long, long time. It may well put you ahead in both first cost and life cycle costing. It will save energy in its operation, provide full fire safety, give you almost complete flexibility in adapting for changing uses as years go by (long, prestressed spans eliminate columns); and, what's more, it will give everyone who walks into your building that quiet, solid, safe, permanent feeling so apparent in a concrete structure.

That is why more and more architects and engineers, contractors, developers, and builders are turning to precast and prestressed concrete—the component construction system developed specifically to meet your needs today. A building is usually comprised of basically simple components—columns, beams, floors, roof, walls, and other parts, such as stairwells. All these parts are precast in concrete.

Simple as 1, 2, 3

Now, the complete shell of your permanent, high-quality concrete building can be...

1. manufactured in a plant under ideal quality-control conditions, while...

2. foundation and preparation work proceeds at your site, then...

3. delivered and erected directly from truck to structure on a precise schedule.

Powerful combination

Precast prestressed concrete combines two basic quality materials—high-strength concrete and high-tensile steel—to give you the best of both.

Prestressing places predetermined engineered stresses in structural and architectural concrete to more than offset the stresses which occur when components are subjected to loads.

Versatility, quality, economy

Versatility of the precast concrete system is unmatched. All the primary components of your entire building—columns, beams, floors, walls, roof, facades, as well as internal structures such as stairwells—can be precast in one plant to your precise specifications and design. And mass production results in substantial economies through repetitive manufacturing operations under detailed step-by-step quality control.

Speed of construction

Since the concrete components can be precast during foundation preparation and erected directly from the delivery truck, on-site construction time is often reduced as much as one-half. This, of course, can save you many thousands of dollars in job-site labor costs, interim financing, and through earlier occupancy.

We have case after case to illustrate; for example: an all-precast six-story office building in Colorado, erected in only six weeks; a California parking structure, erected at the rate of 12,000 square feet per day; a 23-story motel in Boston, up in one year instead of an estimated two years.

Other advantages

- **Attractive appearance.** The pattern, texture, and color variations of architectural precast and prestressed concrete are practically unlimited. Its inherent beauty enhances the image of an occupant by suggesting good taste, stability, and permanence. This increases salability and rentability, keeps occupancy high.
- **Fire resistance.** Precast concrete's unique fire resistance assures occupant safety and low insurance premiums.
- **Low noise transmission.** The density of concrete provides excellent sound reduction properties.
- **Energy conservation.** Precast concrete provides several special advantages in reducing cost of heating and air conditioning.
- **Flexibility for expansion.** Precast components can easily be designed to facilitate future horizontal or vertical expansion.
- **Durability.** Precast concrete is exceptionally resistant to weathering, abrasion, impact, corrosion, and other ravages of time.
- **High load capacity.** This characteristic is essential to accommodate heavy manufacturing equipment.
- **Long spans.** Fewer support columns result in more usable floor space, greater flexibility, efficiency, and economy.
- **Long economic life.** Precast concrete buildings give added years of service with a minimum of repairs and maintenance.
- **Minimum waste space.** Floor-to-floor distance is almost always appreciably less in a precast prestressed building, thus reducing building height and space requiring heating and cooling.

For further information, call your local architectural precast or prestressed concrete producer, or his national association, the Prestressed Concrete Institute.

ARCHITECTURAL STRUCTURAL PCI PRESTRESSED CONCRETE INSTITUTE®

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Architect
Warren, Knight & Davis, AIA
Birmingham, Alabama

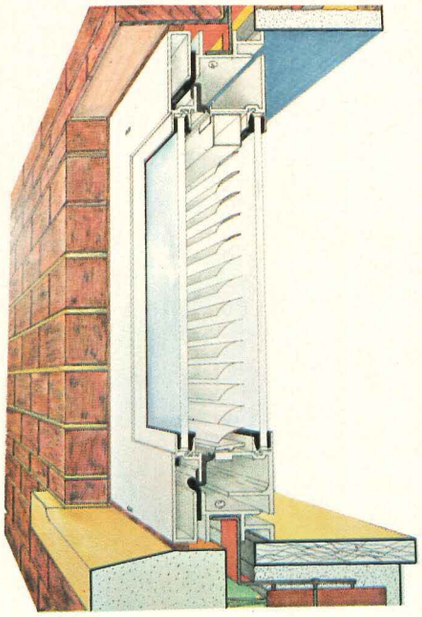
Consulting Mechanical Engineer
Harry Jeffcoat, Jr.
Birmingham, Alabama

Consulting Architect
Hoyle, Doran & Berry
Boston, Massachusetts

General Contractor
Brice Building Company, Inc.
Birmingham, Alabama

Glass and Glazing
Nelson/Brantley Glass Company
Birmingham, Alabama

Liberty National adopted a policy of energy conservation back in 1960



This foresight on the part of Liberty National Life Insurance Company is of benefit to the people of the United States of America now that the energy crisis has become a reality. Their contribution to reducing the energy crisis should set an example to builders in the future.

The Liberty National Life Insurance Company home office building tower is a modern high rise building with 340,887 net square feet of air conditioned general office space. Window exposures per elevation are north — 22.5%, east — 14.4%, south — 22.0%, and west — 23.3%.

The owner chose DISCO custom sized double glazed Weathertrol® Windows because he felt that the accumulative long range operating savings potential would be in excess of $160,000.00 over the expected life span of the building.

Records indicate that annual savings are in excess of $4,900.00 per year for cooling and heating. Since .85 pounds of coal is required to generate one kilowatt hour of electrical energy, we save approximately 89 tons of Alabama produced coal per year.

In addition we save an estimated 830,650 cubic feet of natural gas (which is predominately produced in the southeast) during the heating season.

Frank P. Samford, Jr., CLU
Chairman of the Board
Liberty National Life
Insurance Company

In the life insurance business we are accustomed to thinking in terms of investments and operations over long periods of time. We expect our home office building to be in use for many years in the future, and expect our investment in Disco Weathertrol® windows to be repaid many times over in savings in operating costs in future years. In addition to this we are very happy with the pleasant working environment which these windows create in our building.

Robert F. Farrell
Second Vice President, Properties
Graduate Architect

"Life Cycle Cost" and "Energy Crisis" are contemporary terms that have developed in the last few years. These words and phrases were seldom heard in 1960 when Liberty National prepared its master plan for a continuing construction program for our Birmingham Home Office building.

For an owner-occupant who provides in-house operation, maintenance and housekeeping, good planning has always been considered to relate to function, and equating savings both short and long term have been necessary considerations.

It was with this in mind that we selected DISCO windows for our building in 1960.

We feel that these windows have resulted in many savings. Dual glazing and insulated construction provide more economical operation and better control of our air conditioning system. The rotation of windows so that the exterior may be brought inside for cleaning has resulted in lower costs. Enclosure of venetian blinds between layers of glass has virtually eliminated cleaning and repairs. Tinted glass has reduced glare and fading of fabrics, and the use of anodized aluminum has made repetitive painting unnecessary.

All of these savings, when considered from an investment standpoint, have more than justified our decision. Additional construction completed in 1971 and proposed construction being planned will continue to utilize DISCO windows. Each cost increase in energy and wages makes our 1960 decision more valid.

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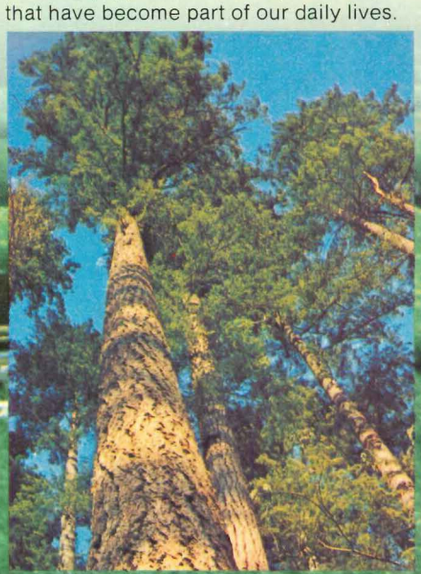
For more data, circle 10 on inquiry card

Growing ahead. For tomo

At Simpson, the foundation of our forest management program is sustained yield. The idea is quite simple, really. It means harvesting mature timber at a rate that's consistent with new timber growth, so there will always be a continuous supply of wood —for future generations as well as the present.

It's a program of intensive management, too. It begins in the nurseries, where we produce super seedlings, and continues on to the forests, where we carefully watch and nurture our trees for decades. And it had its beginnings in 1890 with our founder, Sol Simpson, who started the practice of forest management to attain a balanced harvest.

But, renewing our forests is only part of the story. We also believe in making better use of our raw materials today. And that's the job of our Research Center, where skilled scientists and technicians spend full time developing and testing products and processes to improve wood utilization, performance, and to meet the future needs of our industry. From this research Simpson has pioneered the way in many new building products, applications and special uses that have become part of our daily lives.



Ruf-Sawn Redwood Plywood

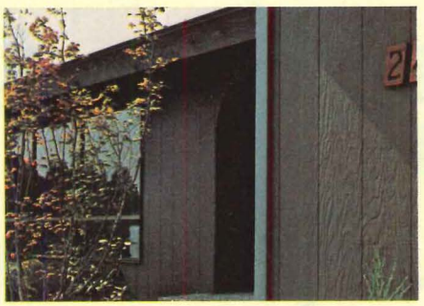
No other commercially available plywood has such a high reputation for sheer beauty in any setting as does Simpson Ruf-Sawn Redwood Plywood.

And it offers a whole lot more.

Its textured surface accepts and really holds semi-transparent stains. Or it can be left to weather naturally through a gradual aging process. Yet it's still an outstanding product for durability and economy of maintenance in any climate.

What's more, redwood's unique cellular structure gives it high insulative properties as well as enough strength to eliminate the need for sheathing or corner bracing.

And Ruf-Sawn Redwood Plywood is offered in a wide range of patterns to fit a multitude of designs and budgets.



Ruf-Sawn 316

Simpson Ruf-Sawn 316 is a proprietary product that's a direct result of Simpson research. It has all the desirable features of plywood panel plus one thing more—a textured, overlaid surface that makes it one of the best panel sidings for solid color finishes on the market.

The secret of its high performance is in the way it's made. Quality grade veneers are assembled with a phenolic resin impregnated fiber on top. The entire lay-up is then fused under heat and pressure into a single integral panel. During the bonding process, the overlay is deeply embossed with a natural woodgrain, rough-sawn texture.

It's available in a wide variety of patterns and sizes, too.

Simpson

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Korbel Redwood Nursery

row's products.

Redwood Amenities

Whatever your need for exterior amenities, Simpson Redwood lumber is the natural choice. It's available in a wide range of patterns, grades and sizes. And in rough sawn or smooth textures. It also provides unusually wide widths and extra long lengths of clear or tight-knot lumber—thereby offering greater latitude of design choices. And whenever wood is in contact with the ground, or where moisture is constant, there's virtually no wood with greater durability than all heart redwood.

But best of all, redwood's beauty is captivating. Its charm enriches every environment—urban or rural, commercial or rustic.

International Doors

Whatever the architectural style of the house, Simpson makes a door to harmonize with it. Choose from a wide variety of richly carved doors. Raised panel doors in literally dozens of patterns. And doors that combine fine wood, finely detailed metal grilles and various glazing patterns.

So no matter what style or option, if it's a Simpson International Door, you know it's built with pride of workmanship and top quality materials.

Columbia Doors

Simpson offers a full line of quality flush doors for residential, commercial and light industrial construction. This line includes prefinished hardwood, prefinished hardboard and unfinished hardwood doors. Plus, a variety of flush and louvered bifolds. Except for bifolds, all flush doors are available in a wide range of sizes. And they're all of solid quality.

The latest addition to our line, and one we're particularly proud of, is the U. L. labeled Type II, 1-3/4" solid core Smoke Control Fire Door (20 minute rated). It's available in a variety of attractive faces, hardwood or hardboard, prefinished or unfinished.

For more data, circle 11 on inquiry card

Put it up front, this cheering sign of refreshment, to brighten the lobby or main corridor. With the gleam and permanence of Polymarble and your choice of four captivating colors, these semi-recessed drinking fountains by Haws are always appropriate . . . always belong as a focal point of the decor.

Receptors are molded of polyester resin, with a constant shade of color throughout the material thickness. So Polymarble fountains are easy to maintain, with no fading or chalking. Sturdy bubbler and recessed push-button valve defy those of mischievous intent.

Get all the facts on Model 2205, and a Color Selector Chart. Contact your nearest Haws representative, or Haws Drinking Faucet Co., 1441 Fourth Street, Berkeley, CA 94710.

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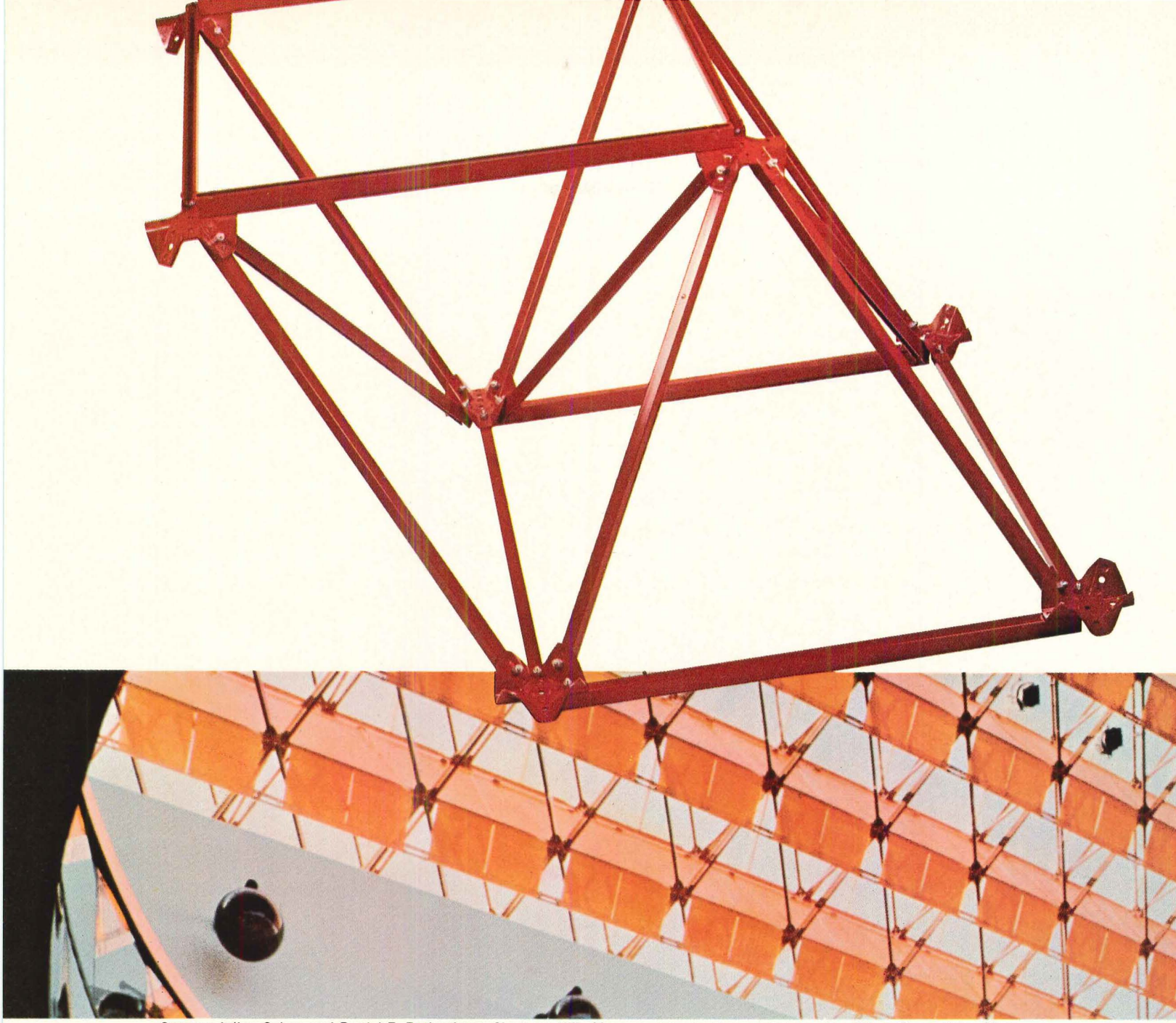
Haws®

DRINKING FOUNTAINS

Lend Elegance to Entryways with HAWS

semi-recessed drinking fountains.



Owners: Julian Cohen and Daniel E. Rothenberg, Chestnut Hill, Mass. *Architects:* Sumner Schein, Brookline, Mass. *Consulting Architects:* Pietro Belluschi and Jung Brannen, Boston, Mass. *General Contractor:* Barkan Construction Co., Chestnut Hill.

Beautiful structures exposed.

It's the MODUSPAN® concept.

Open, airy space-frames, all from standard production components. Bolted together into a single load-sharing modular truss.

Like the Mall at Chestnut Hill, Massachusetts. Here, Moduspan space-frames form wall and roof structures. They're painted a handsome orange and fitted with bright yellow shades to control sunlight.

Mass-produced Moduspan components are available in 4′ and 5′ systems, and six durable architectural colors, to help you create beautiful structures. Because they're standard, they reduce architect and engineer man-hours. And eliminate on-the-job delays caused by awaiting custom-designed fabrications.

Attachment of auxiliary items (light fixtures, glass, etc.) is simple, because the entire structure is made up of Unistrut channels.

Moduspan—an infinity of form from five basic parts. UNISTRUT Corporation, Wayne, Michigan 48184.

UNISTRUT CORPORATION

GTE SYLVANIA

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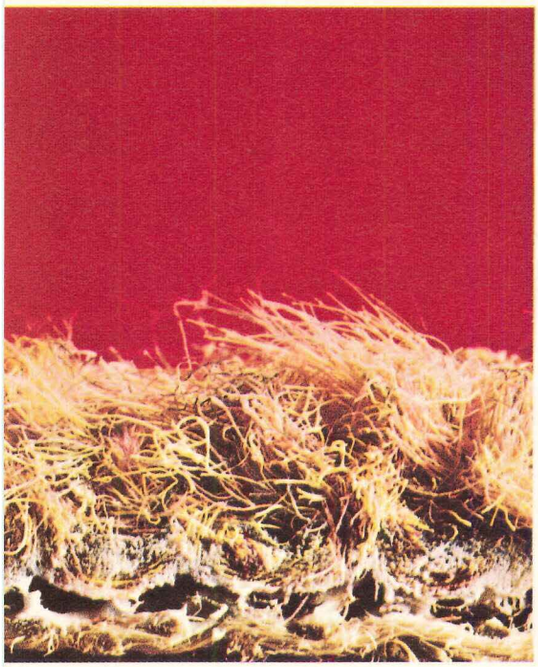
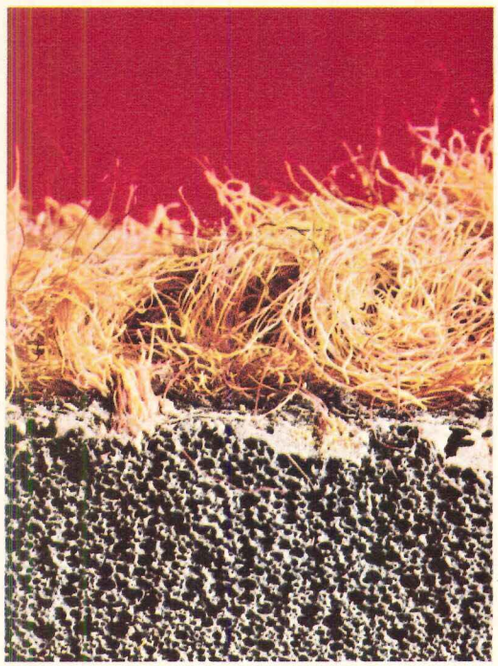
Wear tests prove quality high density latex foam cuts fiber loss up to 60%.



Sample A: 26-oz. fiber, jute backing



Sample B: 26-oz. fiber, 20-oz./yd.² Lo-D Foam

Sample C: 26-oz. fiber, 38-oz./yd.² Hi-D Foam

To prove that high density latex foam helps protect fiber against wear, we tested three different carpet samples in our labs.

All three samples had the same fiber content—26 ounces each. But sample "A" had a jute backing. Sample "B" had a 20-ounce latex foam backing. And sample "C" was backed by 38 ounces of RMA/CRI specification latex foam.

We subjected each sample to the same amount of fiber wear and abrasion. Then we measured the weight loss of each as a percentage of its original weight.

Sample "A"—which was not protected by latex foam—lost 40% of its original weight. Sample "B" lost 27%. But sample "C", with 38 ounces of high density foam backing, lost only 15% of its weight—60% less than sample "A".

The results speak for themselves. To protect the top of your carpet, you need quality high density latex foam on the bottom.

Your Goodyear Chemicals representative will be happy to discuss these test results with you in more detail. To get in touch with him, just write to Roger Gilruth at Goodyear Chemicals, Dept. 7151, Box 9115, Akron, Ohio 44305.

GOODYEAR
CHEMICALS

For more data, circle 14 on inquiry card

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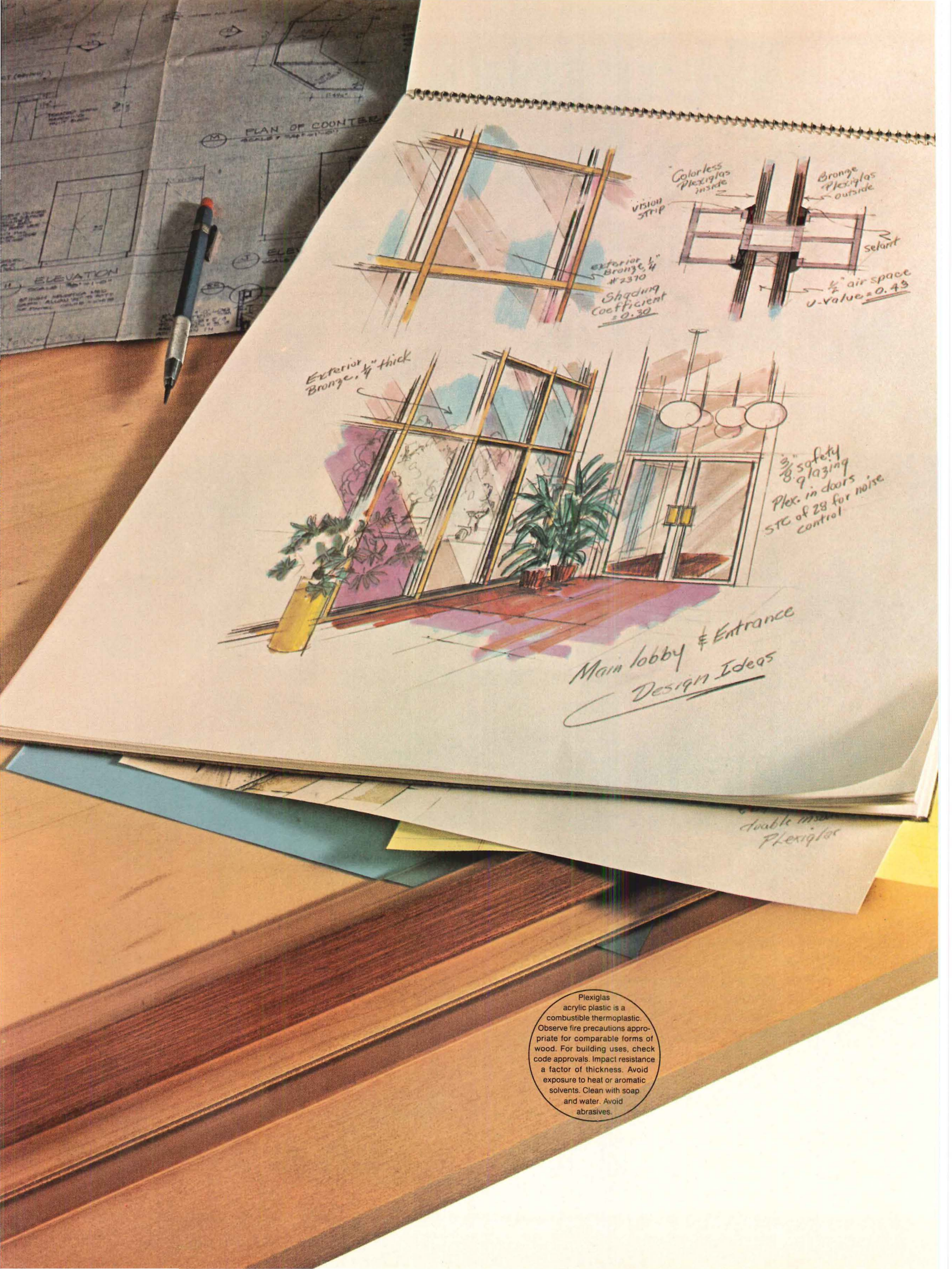
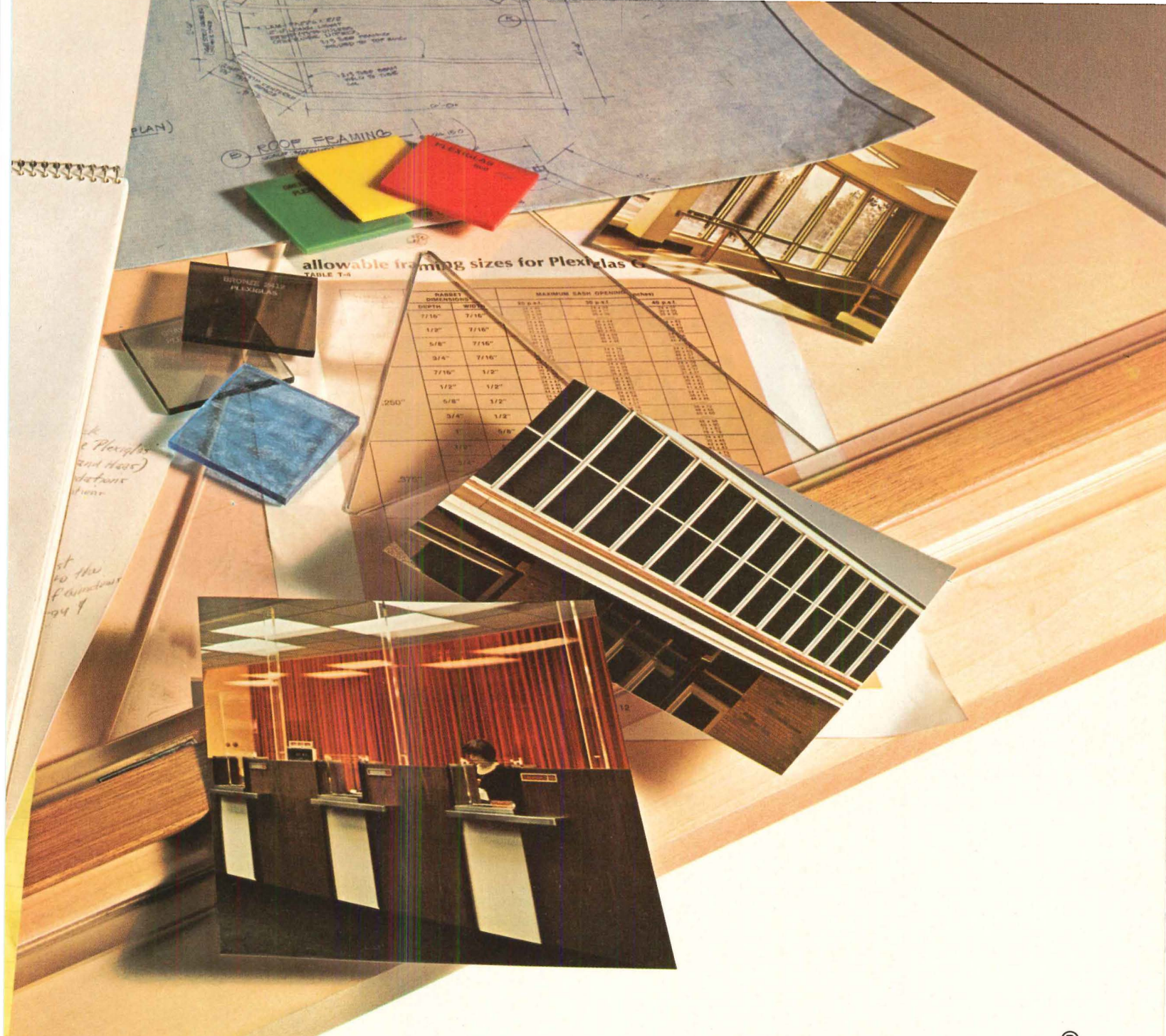


Plexiglas acrylic plastic is a combustible thermoplastic. Observe fire precautions appropriate for comparable forms of wood. For building uses, check code approvals. Impact resistance a factor of thickness. Avoid exposure to heat or aromatic solvents. Clean with soap and water. Avoid abrasives.



PLEXIGLAS®

has designs on your job

Chances are, Plexiglas brand acrylic plastic can benefit a glazing project on your drawing board right now. Neutral gray and bronze solar control tints are available in a range of densities and thicknesses. You can specify one that will satisfy your requirements for daylight illumination, glare and solar heat control within a building. U-values are better than glass in both single and double-glazed installations. And impact resistant Plexiglas is also an approved safety glazing material.

Flat or formed, clear or colored, patterned or mirror, Plexiglas is economical and easy to fabricate. Enhance your building with this lightweight, energy-saving plastic. For assistance with your design application, call (215) 592-6799. Or write to R. F. Bitler, Rohm and Haas Company, Independence Mall West, Philadelphia, Pa. 19105.

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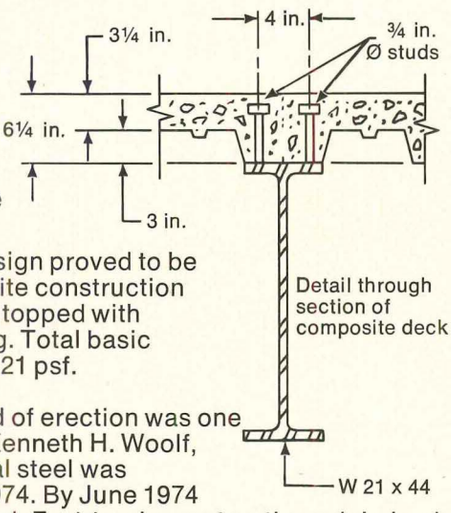
depend on Bethlehem

Preliminary frame analysis pinpoints most economical steel frame

A preliminary frame analysis, conducted by Bethlehem's Sales Engineering Buildings Group helped the owners of this Pensacola office building achieve optimum steel frame economy. The project's structural engineers, Phillip R. Jones & Associates, Inc., requested the computer analysis be based on a structure having 5 supported levels.

The analysis considered four basic framing schemes employing ASTM A36 steel in composite and non-composite construction; ASTM A572 Grade 50 high-strength steel in composite and non-composite construction.



Detail through section of composite deck

The most economical and efficient design proved to be a high-strength steel frame in composite construction with a 3-in. composite steel floor deck topped with 3¼-in. of lightweight concrete topping. Total basic steel frame weight was estimated at 7.21 psf.

Designed and built in 9 months. Speed of erection was one of the primary reasons the architect, Kenneth H. Woolf, A.I.A., favored steel framing. The initial steel was delivered to the site in mid-January 1974. By June 1974 the office was completed and occupied. Fast-track construction minimized the effects of escalating costs. Steel framing easily accommodated changes during the design/construction phase with the erection schedule closely following the finalization of floor plans.

Steel framing also permitted generous spans ranging from 26 ft, 9 in. to 32 ft. The increased strength achieved with composite construction allowed the steel beams to be spaced 10 ft on center.

Early involvement helpful. Our preliminary frame analysis program can be most beneficial to you and your client if the study is conducted before finalization of architecture parameters. This way, our Buildings Group and your structural engineer can develop an optimum frame design with minimum restrictions.

We'll be happy to tell you more about our preliminary framing analysis program along with the many other technical and advisory services we offer. Just ask for the sales engineer at the Bethlehem Sales Office nearest you. Bethlehem Steel Corporation, Bethlehem, PA 18016.

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ST. LOUIS (314) 726-4500
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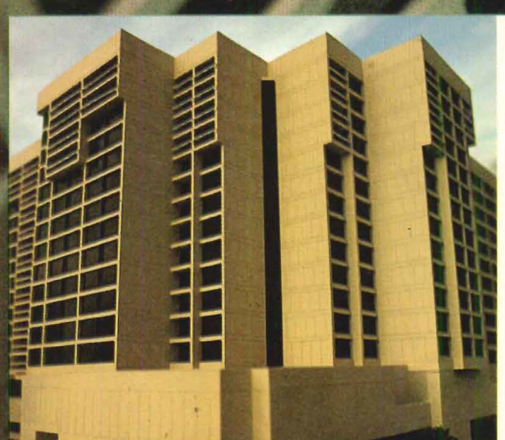
SEATTLE (206) 285-2200

Ask for Sales Engineer.

Bethlehem BETHLEHEM STEEL

The project's architect (right) reports, "The steel framing was quickly erected, easily plumbed, and by pouring one floor each day, the building was ready for the mechanical work within a week. We were delighted with the economy and speed of erection."

Owners: Baptist Hospital, Inc.;
Architect: Kenneth H. Woolf, A.I.A.;
Structural Engineer: Phillip R. Jones & Associates, Inc.;
Fabricator: Bell Steel Company;
General Contractor/Erector: Dyson & Company.
All of the firms are located in Pensacola, Fla.



Omni International Complex, Atlanta, Ga.

Developer:
International City Corporation

Architects:
Thompson, Ventulett & Stainback, Inc., Atlanta, Ga.

General Contractor:
Ira H. Hardin

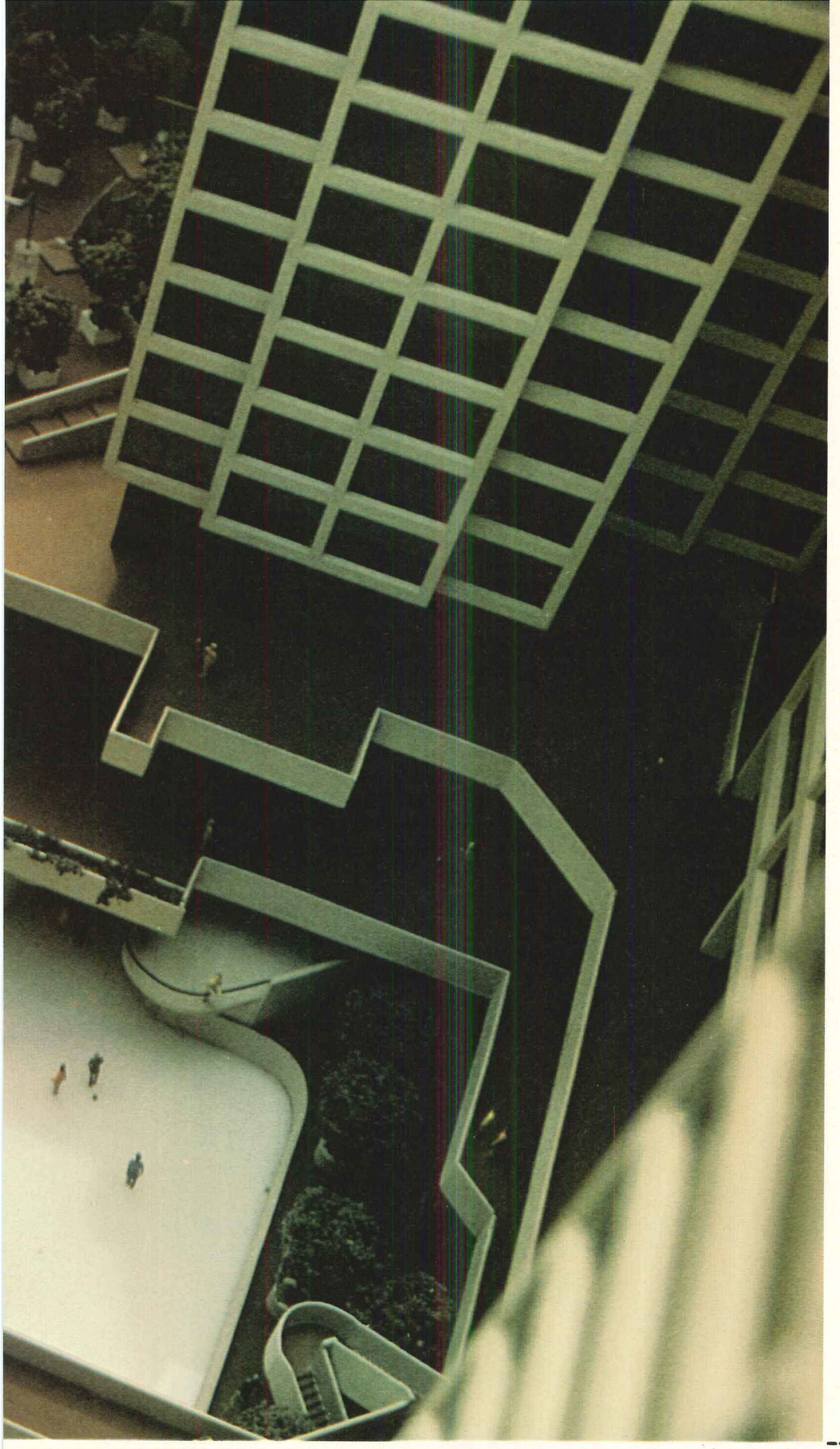
Curtain Wall Contractor:
F. H. Sparks Co. of Maryland, Inc.

Glass Contractor:
ACD Glass & Mirror Co.

6 Amarlite products specified for Omni International Megastructure

Omni International is a city within a city. Located on 5½ acres, the megastructure covers approximately 2,000,000 square feet devoted to work, sports, leisure, corporate offices, business facilities, retail shopping, dining, exhibitions, international banking, sculpture, hotel space (500 rooms), cinema and world trade.

The following Amarlite Aluminum architectural products were specified for this ultra contemporary structure: 245 exterior sliding doors (No. 703) which combine beauty with smooth operation and excellent weathering; 4-inch flush glazed glass holding system for entrance framing, ground floor, shops, etc.; 43 La Vista maximum vision doors;



PBS-380 on lower floors — a dry glaze system with a highly efficient thermal barrier and the PBS-383 which can be glazed from the interior; and the BTI-680, a stick system designed for high rise applications on which the architect desires a vertical accent and thermal insulation.

The Omni International is a kaleidoscope of activity within an environment unlike anything you've ever seen. The depth of the Amarlite line gave the architects, contractors and developers the peace-of-mind that comes with single source responsibility for the 6 Amarlite products specified.

Going places together with AMARLITE

SAFE, SECURE AND BEAUTIFUL SAFETYLINE ENTRANCES

• no injury at pivot stile thanks to cylindrical design • no injury at lock stile because of vinyl cushion • no forced entry since top and bottom rod locks open only by key and inset lock cylinder defies burglar tools • distinctive design, available in clear anodized, Amanodic bronze or black hard coat finish.

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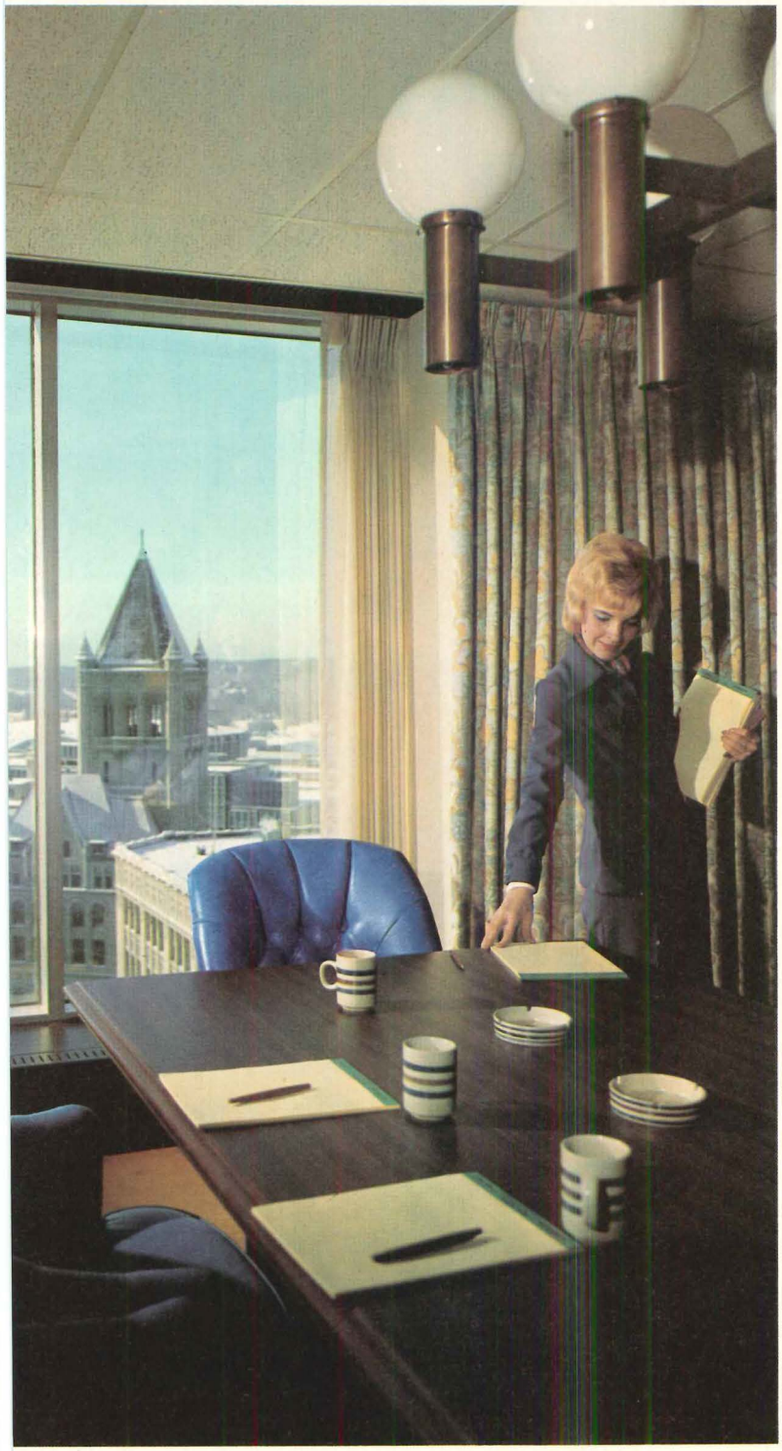
WHEN YOU'RE AN 34° BELOW OR MAKE IT AN INCH OF HIGH

Northern Federal Building, St. Paul, Minnesota. Owner: Yorktown Investment

INCH AWAY FROM 98° ABOVE, -PERFORMANCE GLASS.



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While extremes may not be the norm, the people of St. Paul, Minnesota, have stepped very quickly through −34° winter mornings, and sweltered through long 98° summer days. Under these extreme conditions, architects and owners select building materials very wisely. At the Northern Federal Building in St. Paul, wise meant selecting LOF reflective Vari-Tran® coated glass in Thermopane® insulating units for the tower.

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OVER $164,000 SAVED IN INITIAL A/C COSTS.

The total building cooling requirements were also reduced from over 900 tons to 736 tons. Over $164,000 savings in initial costs resulted. In fact, Vari-Tran 1-114's ability to cut solar heat gain has made the walls so efficient that during most of the summer only one of the two 368-ton A/C units installed is used.

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THE RECORD REPORTS

The National Society of Engineers' latest move in its two-year conflict with the Justice Department over priced competitive bidding is an offer to ban the use of all fee schedules and guides by its members. The U.S. District Court has urged both parties to come to an early out-of-court settlement. Details on page 35.

The September Dodge Index for total construction contracts dropped 25 per cent below the August figure, from 208 to 157. Dodge economists attribute the fall-off to an "unsustainable" number of energy-related projects in August. For the third quarter, the Dodge Index averaged 177, 4 per cent off the second quarter average but significantly better than the first quarter's 143. The September residential index surged 10 per cent ahead of August, and more importantly the value of apartment contracts jumped nearly one-third for the month. The nonresidential index fell 7 per cent in September, reaching its lowest level in two years.

The Senate has voted to limit debate on the common-situs picketing bill, which would allow construction unions to picket an entire building project rather than only a single trade. The decisive vote, 66 to 30, would appear sufficient to stave off future filibuster attempts. The House has already passed a bill granting common-situs picketing rights.

The air-supported roof over the new field house at the University of Northern Iowa was ripped and deflated by a tornado on November 8, only ten days after its inflation. Repair of the damage was expected to take about three weeks. Details on page 34.

The House Ways and Means Committee has tempered its formerly tough bill curbing real estate tax shelters, but tax reformers promise a floor fight on the issue. Details on page 35.

The American Institute of Architects has announced its support of three energy bills now under consideration in the Senate. Testifying before the Senate Subcommittee on Buildings and Grounds of the Committee on Public Works, Institute vice president John M. McGinty, AIA, expressed support for the Federal Facilities Energy Conservation and Utilization Act, the Conservation and Solar Energy-Federal Buildings Act and the Energy Conservation in Buildings Demonstration Act, though he added that the Institute has some reservations about the inflexibility of proposed standards for energy analysis. An article on energy measures presently under consideration in Congress is on page 35.

Architects and engineers seeking contracts with the Postal Service must submit new Federal forms for consideration: Standard Form 254, a general questionnaire on over-all professional competence and experience, and Standard Form 255, requesting consideration for specific projects. The order is effective January 1, 1976, and forms are available from the Government Printing Office and the General Services Administration, Washington, D.C. An article on Federal A/E selection appears in Architectural Business, page 49.

Arthur J. Fox, Jr., was installed as president of the American Society of Civil Engineers at its annual convention, held last month in Denver. Mr. Fox is the editor of *Engineering News-Record.*

Lewis Mumford, the American architectural and social critic, has been created an honorary knight (Hon. KBE) by Queen Elizabeth II. Details on page 35.

Two scholarships are offered by the New York Chapter of the American Institute of Architects: the $5,000 Brunner Scholarship for "study that will contribute to the practice, teaching or knowledge of the art and science of architecture," and the $2,500 James Stewardson Traveling Scholarship for a travel-study program here or abroad. Applications will be available from the chapter at 20 West 40th Street, New York, New York 10018 on January 16, 1976, for the Brunner and on January 1, 1976, for the Stewardson.

Corporate submissions are sought for the Seventh Annual Honor Awards Program for U.S. Corporations, sponsored by *The Environment Monthly.* According to William Houseman, editor of the publication, the program is designed to ". . . encourage the private sector to identify corporate objectives with timeless imperatives of the environment." Information is available from *The Environment Monthly,* 284 Alexander Avenue, Bronx, New York 10454.

John Burgee, AIA, has been named chairman of the 1976 Honor Awards jury of the American Institute of Architects. The honors program this year will, in addition, have a special category, and jury, to recognize projects for the restoration, rehabilitation and adaptive reuse of older buildings; Jean Paul Carlhian, FAIA, is chairman of this jury. Details on page 34.

A new Japanese-language architectural magazine, Nikkei Architecture, will be published bi-weekly by Nikkei-McGraw-Hill, Inc. The magazine will cover the architectural and engineering professions from the points of view of art, technology and socio-economic issues. Fumiro Murobusi is the editor-publisher of Nikkei Architecture, whose first issue will appear April 5, 1975.

Burgee named chairman of AIA awards jury

The American Institute of Architects has named John Burgee, AIA, chairman of its 1976 Honor Awards jury. Mr. Burgee is a partner in the New York firm Johnson/Burgee Architects.

Other members of the jury are Francis Gassner, FAIA, of Memphis, Gerald M. McCue, FAIA, of San Francisco, and Peter Tarapata, FAIA, of Bloomfield Hills, Michigan. The student juror is Harold E. Nash III, a student at the Boston Architectural Center.

In addition, the Institute has for the first time established a special category within the honor awards program to recognize projects for the restoration, rehabilitation or adaptive re-use of older buildings.

The special jury for this "extended use" category will be headed by Jean Paul Carlhian, FAIA, of Boston. The other architect jurors, all of whom have been engaged in restoration and preservation, are Georgio Cavaglieri, FAIA, of New York City, J. Everette Fauber, Jr., FAIA, of Lynchburg, Virginia, and Ralph R. Youngren, FAIA, of Chicago. John T. Graves, a graduate student at the University of California at Berkeley, is the student juror.

Tornado tears and deflates field house in Iowa

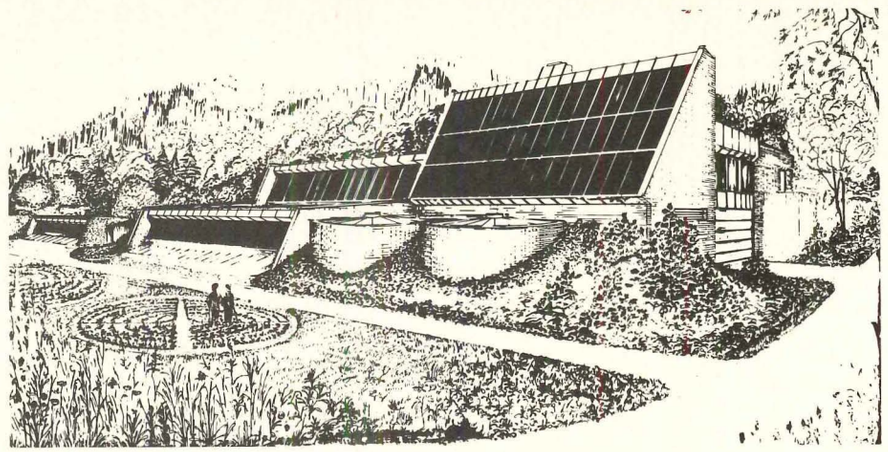
Only ten days after its inflation, the air-supported roof of the new field house at the University of Northern Iowa ripped and deflated during a heavy wind and rain storm during the evening of November 9 in Cedar Falls, Iowa.

The immediate cause of the trouble, both engineers and insurers believe, was a tornado that tore one of the diagonal panels above the vomitory at the southeast corner of the building. The situation was worsened by a power outage in the area that allowed the roof to deflate. Although power was restored in about 20 minutes and the roof partially reinflated, high winds continued to tear at the fabric and another three panels were damaged. (The emergency generator was not yet operating at this time.)

According to structural engineers Geiger Berger Associates, who designed the UNI-Dome roof, interior damage included broken seating and a vanished acoustic panel—one of the large fabric panels hung beneath the cables. The inner door of the air-lock chamber at the vomitory was wrenched out of the concrete enclosure and deposited 30 ft away. The fabric, whipped by the wind and impaled by debris, incurred still further tearing.

The nature of the damage and its limited range directly under the torn panel suggest that some severe twisting force was at work, and tornadoes were sighted in the area during the storm.

The cost of the damage was estimated at $25,000. Owens-Corning Fiberglas Corporation, who supplied the roof fabric, has shipped replacement material for the four damaged panels, and repairs and reinflation are expected to be completed within three weeks of the mishap. (An engineering story on UNI-Dome will appear in the January 1976 issue of ARCHITECTURAL RECORD.)



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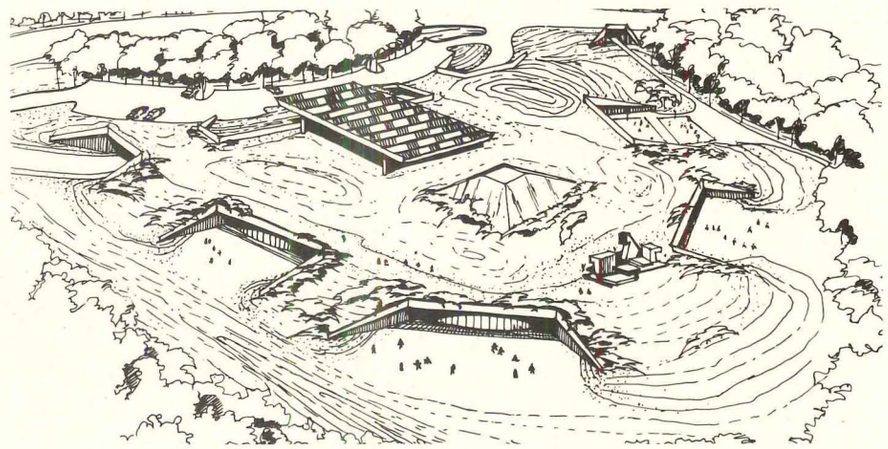

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OCF presents awards for energy conservation

Owens-Corning Fiberglas Corporation this year bestowed two Energy Conservation Awards and one honorable mention in its annual program, initiated four years ago, to recognize architects and engineers who incorporate thoughtful energy conservation measures at the building design stage.

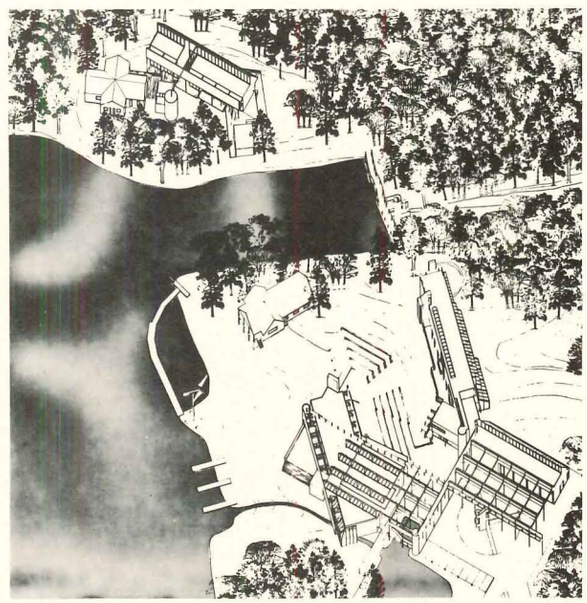
Commenting on this year's winners, jury chairman William Porter, Dean of Architecture and Planning at the Massachusetts Institute of Technology, observed, "There is no need to wait for new energy sources or governmental action to solve this part of the energy crisis. Totally integrated design approaches can produce energy-efficient structures that are economically justifiable. There need be no exotic solution."

First honors in the industrial category went to Douglas A. Wilke, architect and engineer, and Wright, Pierce, Barnes, Wyman Engineers, sanitary engineers, for the Wilton (Maine) Waste Water Treatment Plant (1). The plant uses three solar collectors, one of them to supply energy for processing sludge. In addition, methane gas produced by the process will be stored to run a gas boiler and an electric generator.

Top honors in the institutional category went to Davis, Smith & Carter, Inc., architects, and Vinzant Associates, mechanical engineers, for the design of Terraset Elementary School in Reston, Virginia (2). A 7,000-sq-ft solar collector system will provide energy for both heating and cooling, and two to three feet of earth on top of the school will provide natural insulation.

Harrison Fraker, architect, and Flack & Kurtz, consulting engineers, received an honorable mention in the institutional category for the Princeton Educational Center at Blairstown, New Jersey (3). The project, being built around a 12-acre dammed lake, will use hydroelectric power generated on-site; a 12-kw hydro-generator at the dam and a 6-kw experimental "sail wing" wind generator will provide 90 per cent of the center's electricity needs.

Members of the jury were Mr. Porter; Chih-Chen Jen, of Kahn and Jacobs/Hellmuth, Obata & Kassabaum, New York City; Ken Mahal, of L.K. Mahal & Associates, architects of Bloomington, Minnesota; Richard E. Masters, of Jaros, Baum and Bolles, Consulting Engineers, New York City; Robert R. Ramsey, of Leo A. Daly Company, Omaha; and Robert Wehrli, chief of the Architectural Research Section at the National Bureau of Standards.



3

Assorted energy bills move through Congress

Despite Congressional inaction on the keystone legislation establishing energy conservation guidelines, there was a flurry of activity last month on other, less comprehensive bills aimed at increasing the nation's energy efficiency in building.

House-Senate conferees were near agreement on a bill establishing grants-in-aid to states to pay for development of building codes and setting mandatory lighting efficiency standards for public buildings. This measure, combined with elaborate fuel-saving rules for automobiles, appeared headed for a Presidential veto.

In both the House and Senate, hearings were held on measures that would require all buildings constructed with Federal funds to use "the best practicable measures" for conservation of energy and the use of solar energy systems.

Another measure under consideration in the Senate calls for a demonstration program in energy conservation, using promising innovative technology to the maximum extent possible. The bill is directed at existing buildings and would provide Federal grants to pay states and cities for retrofitting existing public buildings.

Committees in the House are considering tax incentives to encourage building and home owners to install energy-saving materials and devices.

The main energy conservation legislation was stalled because the Senate Banking Committee, which has prime jurisdiction in the upper house, was involved in the New York City default question.—*William Hickman, World News, Washington.*

House panel retreats on tax-shelter curbs

The Congressional battle over real estate tax shelters is just beginning, even though the real estate interests won a victory over tax reformers in the House Ways and Means Committee.

Under heavy pressure from real estate lobbyists, the tax-writing committee backed away from its earlier decision to impose tough new curbs on the shelter, which real estate interests argue is a major source of funds for construction. Existing law permits real estate losses to be used to offset income from any source for tax purposes.

Late in the summer, the committee decided to curtail that flexibility sharply by allowing real estate losses to offset only income from the single property on which losses are claimed. But as the lobbying pressure began to build, the Committee first voted to postpone implementation of its decision for two years and then, in early November, further liberalized its ruling by allowing real estate losses to be used to offset income from any real estate holdings.

The real estate action was part of a general watering down of the reform package initially approved by the Ways and Means Committee. As a result of the last-minute Committee changes, Congressional tax reformers have vowed to carry their fight for curbs against tax shelters and other tax loopholes to the floor of both the House and the Senate.

That battle probably will not take place until sometime next year, however. With the White House and Democratic Congressional leaders now preoccupied with the battle over the size of proposed tax cuts next year, the Democratic strategy calls for separation of the tax cut proposals from the Ways and Means tax reform package. This would keep the tax cuts from being bogged down in the fight over tax reform, and would postpone the tax reform battle until at least next year.—*Frank Swoboda, World News, Washington.*

Betty Thompson retires, succeeded by Jan Nairn

Elisabeth Kendall Thompson, FAIA, has retired as senior editor of ARCHITECTURAL RECORD. Since 1947, Mrs. Thompson, who lives in Berkeley, California, has covered architecture in the West and has written as well on national architectual matters. Trained as an architect at Tulane University and the University of California, she was also a RECORD editor in New York from 1937 to 1941.

Mrs. Thompson was the editor of *Apartments, Townhouses and Condominiums,* published by Architectural Record Books, and is presently working on a number of other writing assignments.

Always active in American Institute of Architects' affairs, she received the Public Information Award of the California Council AIA in 1967, and was made a Fellow of the Institute in 1968. She is a member of the 1976 Institute Honors jury.

RECORD's San Francisco office will be the responsibility of assistant editor Janet Nairn, who will continue to cover Western news for the magazine and to contribute feature stories.

Lewis Mumford receives honorary knighthood

dekkun

Lewis Mumford, the architectural critic and social philosopher, was awarded the insignia of Honorary Knight Commander of the Most Excellent Order of the British Empire (Hon. KBE) at a ceremony held at the British Embassy in Washington, D.C., on November 5.

The honorary knighthood, one of the few ever bestowed on an American citizen, was presented on behalf of Queen Elizabeth II by Sir Peter Ramsbotham, British Ambassador to the United States. Given in recognition of Mr. Mumford's services to town and country planning in the United Kingdom, the honor is also a symbolic tribute to the high regard in which his ideas and writings are held in Great Britain.

In his brief remarks preceding the ceremony, the British Ambassador said of Mr. Mumford, "In the field of urban planning and the environment, he is truly a world citizen. His work and his influence are appreciated internationally, and perhaps above all in my own country. His writings have been required reading for town planners for many decades. Indeed, his major works have inspired a whole generation of architects, sociologists and planners throughout the world."

The knighthood is honorary by virtue of Mr. Mumford's American citizenship, and he will therefore not adopt the style of "Sir." Mr. Mumford is the author of 27 books, most recently *Architecture as a Home for Man,* a collection of his essays for ARCHITECTURAL RECORD, published in celebration of his 80th birthday on October 19 by Architectural Record Books, and *Findings and Keepings: Analects for an Autobiography.*

—*Martin Filler*

NSPE offers Justice Department a ban on the use of fee schedules

The National Society of Professional Engineers' defense of its ethical ban of priced competitive bidding entered a new phase last month when NSPE attorneys offered to outlaw the use of all fee schedules and guides by its members.

The Society itself publishes no guides, though many of its members use guides prepared by its state affiliates and other engineering societies. The offer to halt the use of all fee guides was made dramatically by NSPE Special Counsel Lee Loevinger in U.S. District Court.

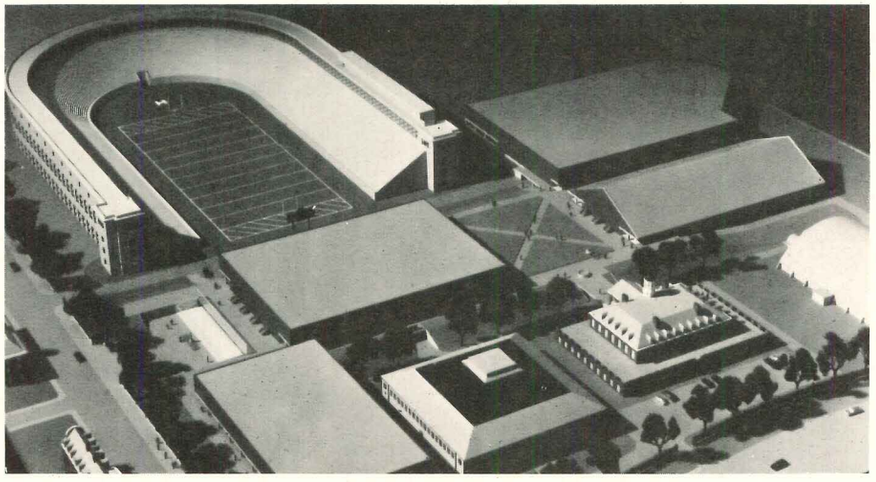
Loevinger was apparently trying to strike a bargain with the Justice Department, which has charged the Society with violating the Sherman Antitrust Act because its code of ethics bans priced competition. Justice's lawyer, Richard R. Favretta, was cool to the proposal, though the presiding judge, John Lewis Smith, Jr., suggested that the parties seek an early out-of-court settlement, if one is possible.

Several other societies representing architects and engineers have dropped bans on competitive bidding from their codes of ethics.

Judge Smith was hearing arguments on the case for the second time. Last December he ruled in favor of the Justice Department, which had argued that the ban on bidding was *per se* price fixing and thus in violation of the antitrust laws. The Supreme Court vacated this judgment and asked Smith to give the case a new look in light of a Court ruling on price fixing by Virginia attorneys in home-sale settlements. In last month's hearing, Loevinger argued for NSPE that the Supreme Court intentionally left the door open for the ban on price competition by observing, that a "rule of reason" should prevail in some cases involving professionals.

Judge Smith has implied that he will rule quickly on the case. Whoever wins, the case will again be appealed to higher courts.—*William Hickman, World News, Washington.*

TAC/Turner Team will design/build Harvard athletics center



Harvard University has awarded a $17-million contract for new and remodeled athletic facilities to TAC/Turner Team, a design-build joint venture formed by The Architects Collaborative Inc. and Turner Construction Company.

The project involves three new buildings at the university's Soldier's Field athletic center in Cambridge, Massachusetts—a hockey rink, a natatorium and a track and field hall (the flat-roofed buildings in the model).

In addition, the design calls for the remodeling of existing buildings, the construction of locker rooms and other user facilties, and extensive site work. The new buildings will be heavily bermed, with playing surfaces and user facilities at grade level. The platform running around the buildings and roofing the underground area will accommodate spectator circulation.

The new facilities are intended for use of Cambridge residents as well as for students, faculty, and intercollegiate and intramural sports.

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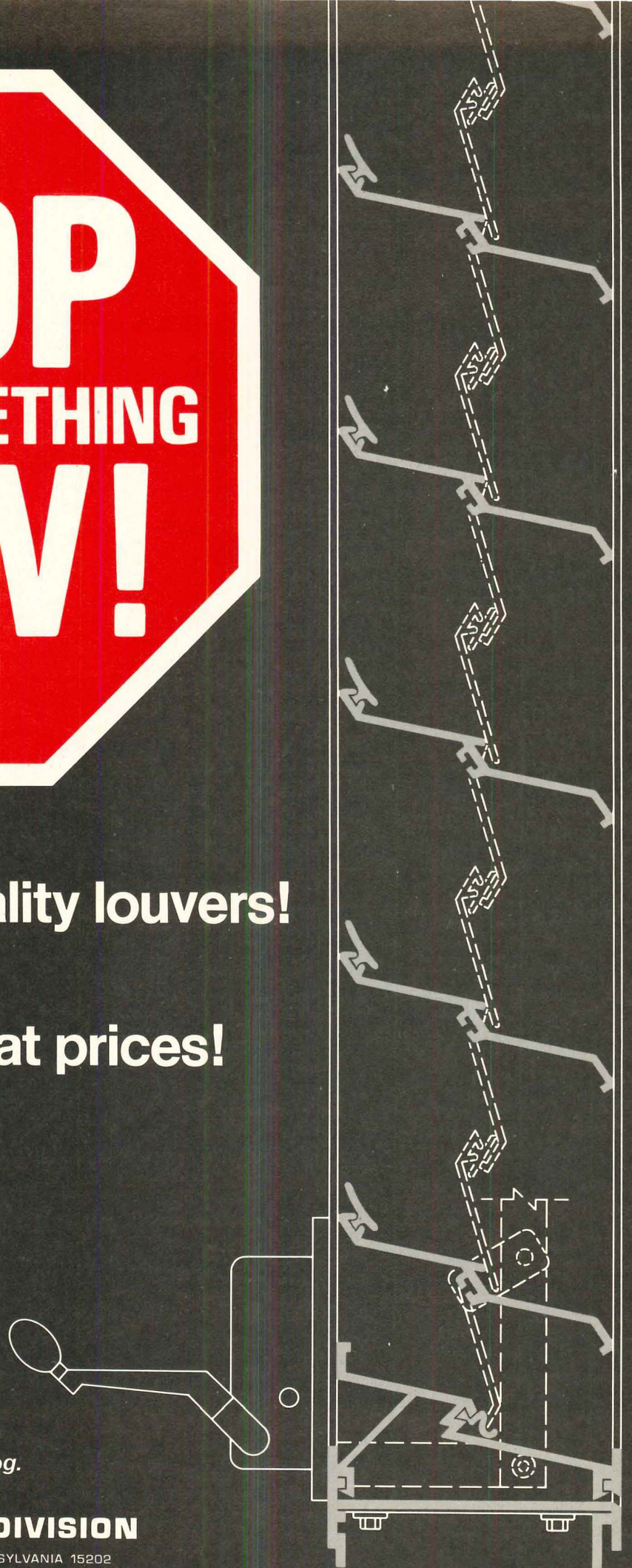

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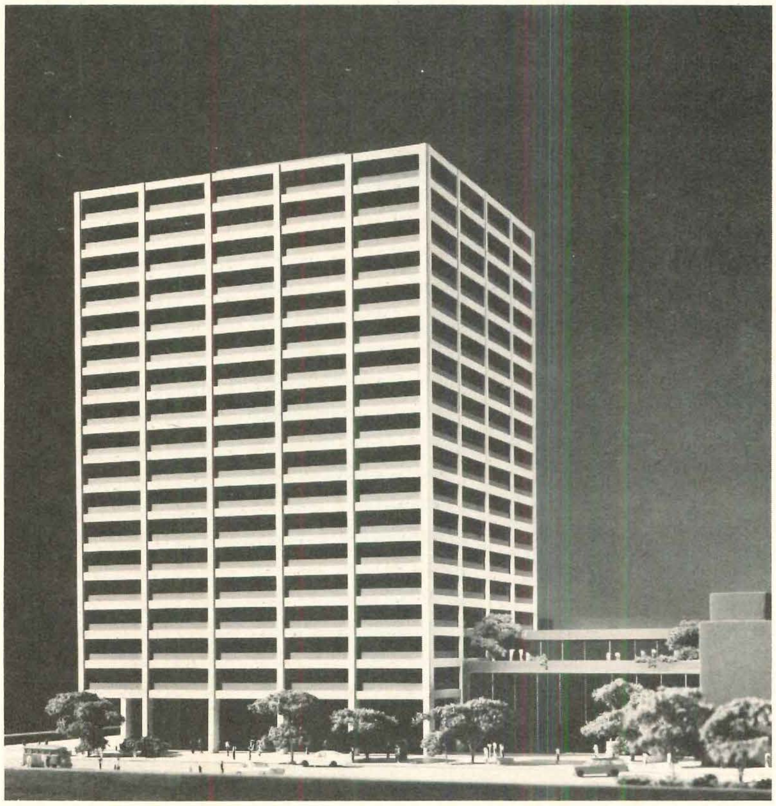
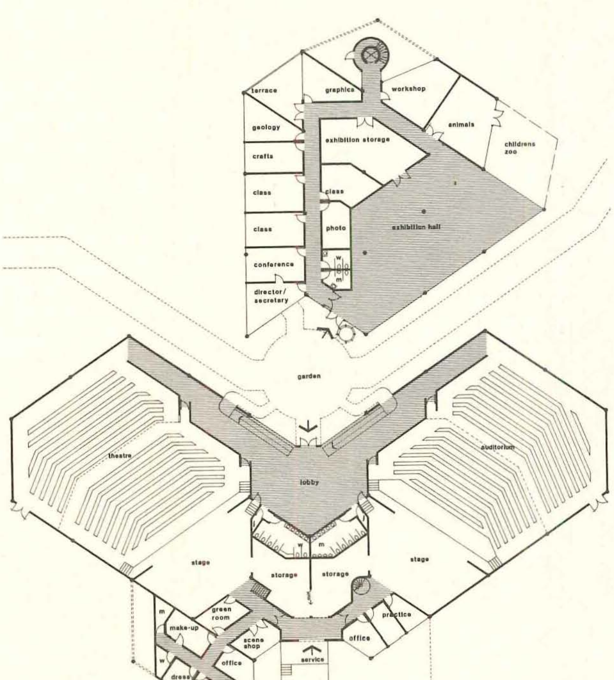
Evanston, Illinois, firm designs $24 million offices

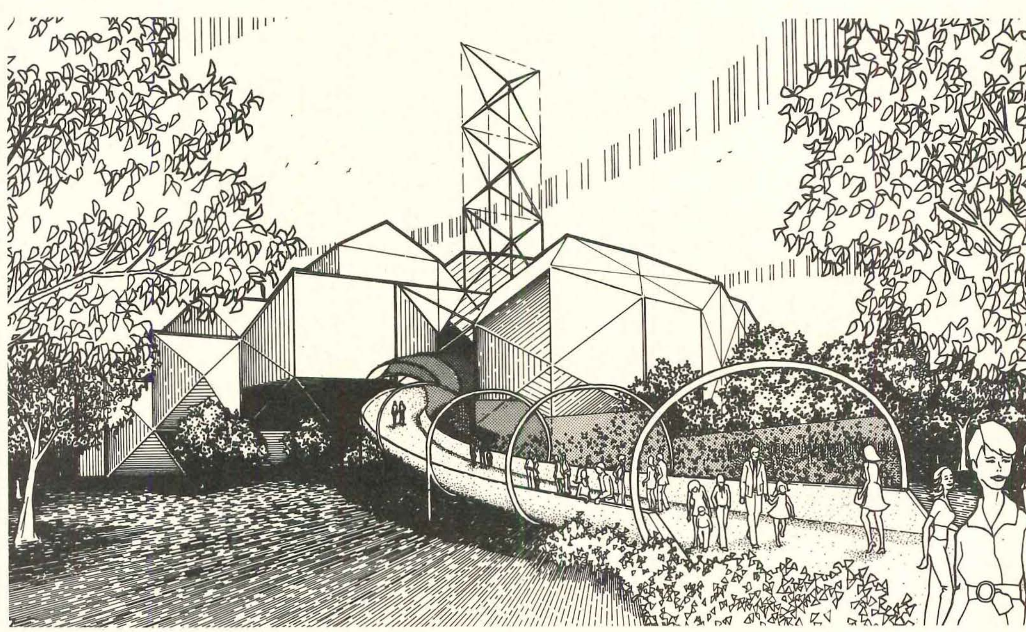
Groundbreaking ceremonies were recently held for this 18-story office building designed by Schipporeit, Inc. The building, being built in Evanston, will occupy one-half a city block and include an attached five-level, 380-car garage and a four-level shopping mall with skylighted atrium. In the office building, floors of approximately 12,000 square feet may be divided into a variety of sizes to suit tenants. The total area of the building is 400,000 square feet, with 282,800 feet allotted to office space and 53,700 feet to retail area. The steel building will be sheathed in reflective glass, and completion of the project is anticipated in the spring of 1977.



Houston office building takes rhomboid shape

S. I. Morris & Associates are the architects of this 25-story, $20 million office building to be known as the Allied Chemical Building. Completion is planned for mid-1977. The 525,000-sq-ft structure is Phase 1 of a project that calls for the eventual inclusion of at least two additional office buildings and possibly a hotel on the site located at Woodway and the West Loop in Houston. The exterior of the building will be alternating bands of stone and gray insulating glass. The first 20 floors will contain approximately 21,000 square feet each, with the top five floors recessed to provide each with a balcony at each end of the building. The interior is almost entirely clear span with only two primary column interruptions.





Art center will be first public building in Texas to use solar energy

The Brazos Valley Art Center in Bryan-College Station, Texas, is conceived as a regional arts facility demonstrating energy conservation and solar energy principles. Designed in a professional advocacy program by the Texas A & M University College of Architecture & Environmental Design, the center is a close packing of aluminum tetrahedrons, truncated tetrahedrons, dymaxions and truncated octahedrons. The column-free interiors thus created will accommodate orchestral performances, art gallery, dance studios and chamber groups in 70,000 square feet. Construction is planned during the coming year.

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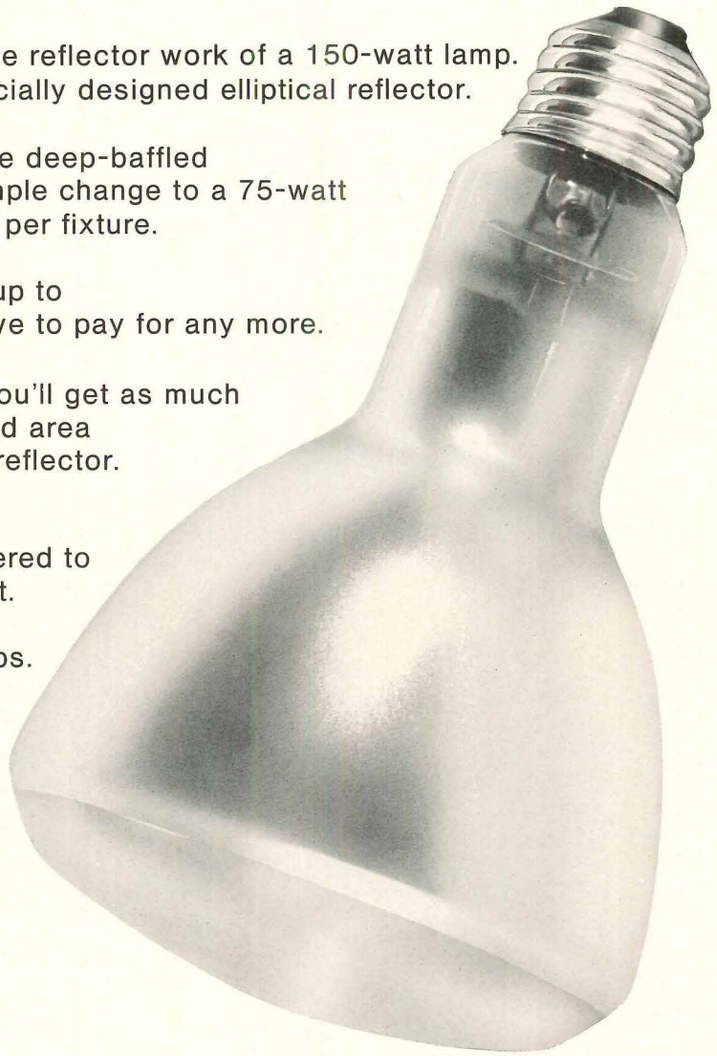

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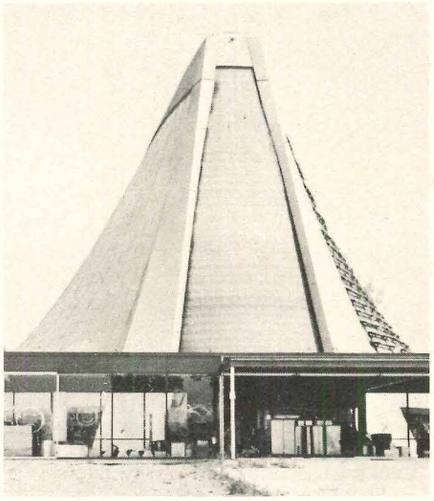

The towering, twisted columns of Beth El—inspired by the biblical "Tent of Meeting".

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Or to imagine columns more difficult to form.

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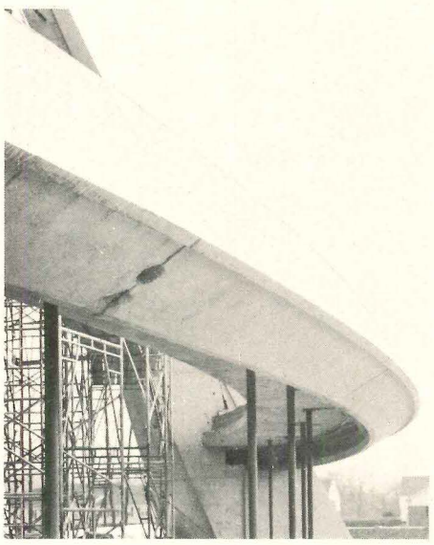
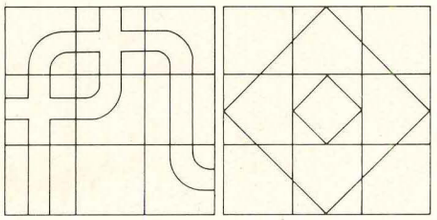
"Symons did an excellent job of this very complex, tight-tolerance forming task," reports Top 400 contractor A. J. Etkin. "Their custom forms produced a beautiful finish."

For full information, write for Case History No. 109.





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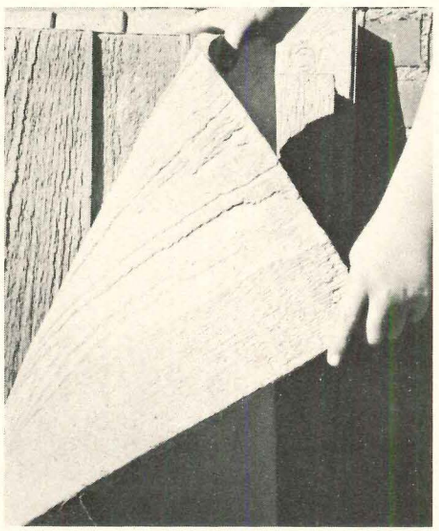

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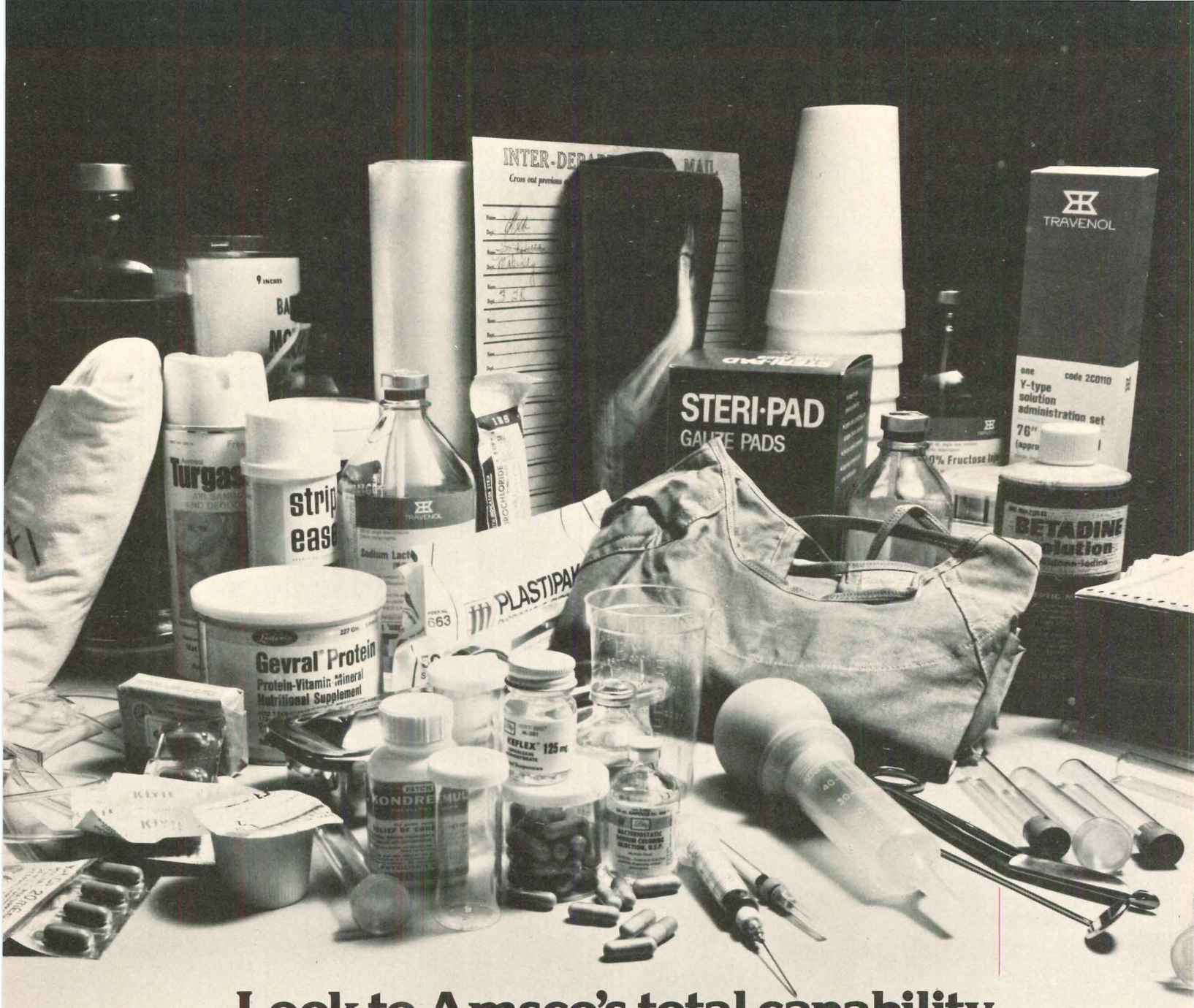

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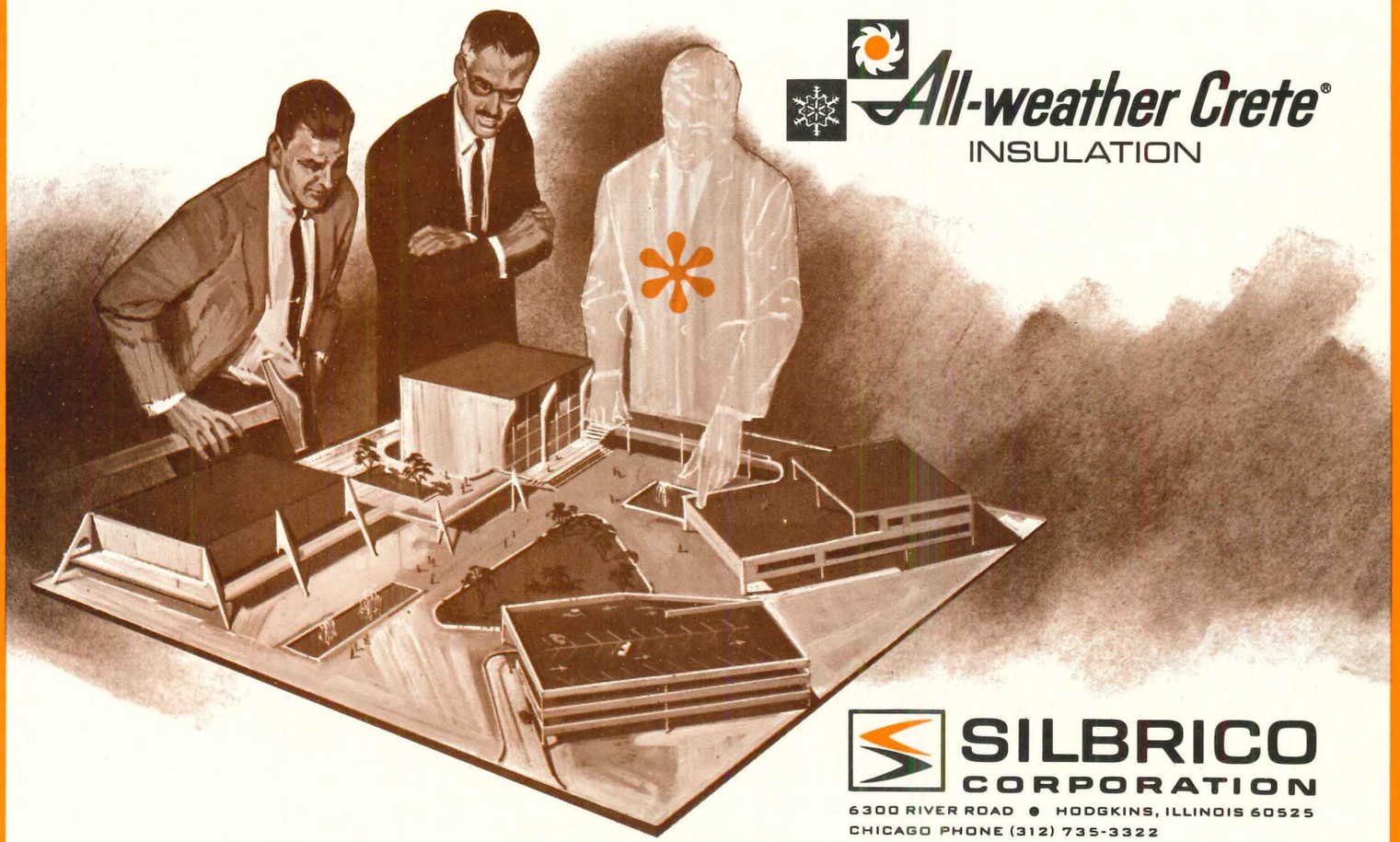

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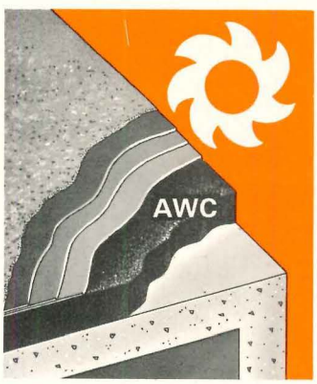

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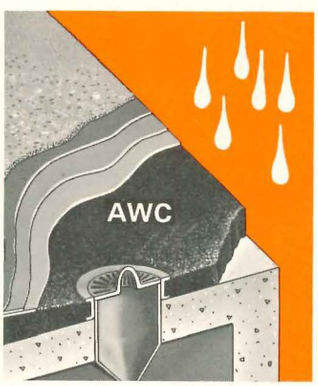

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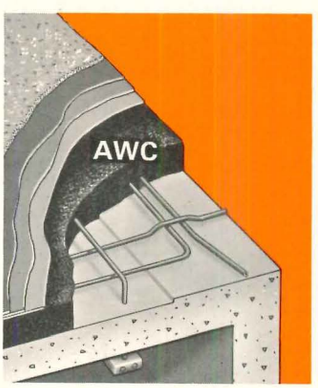

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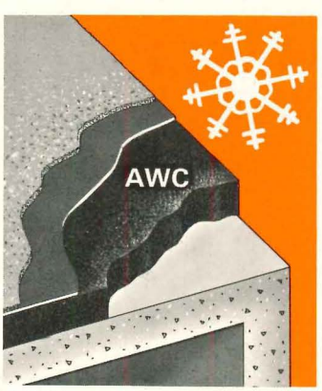

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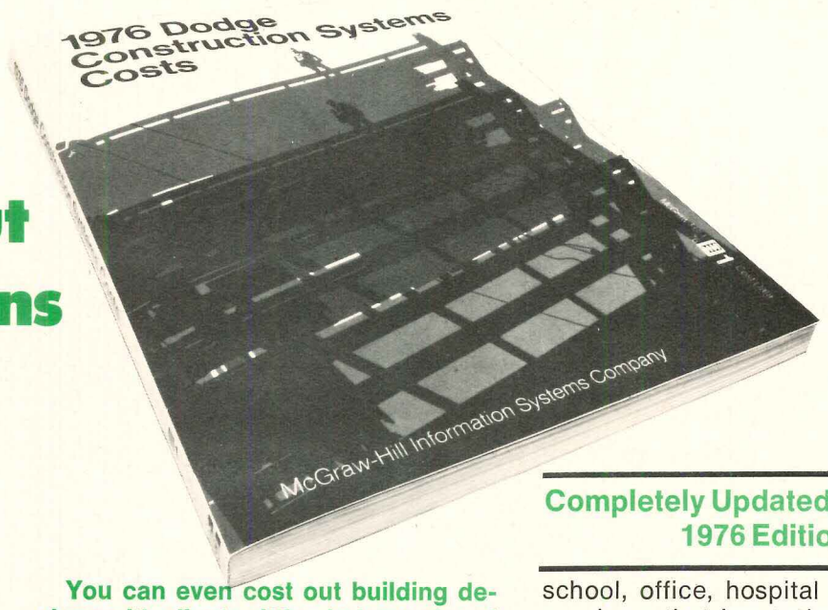

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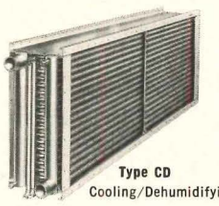

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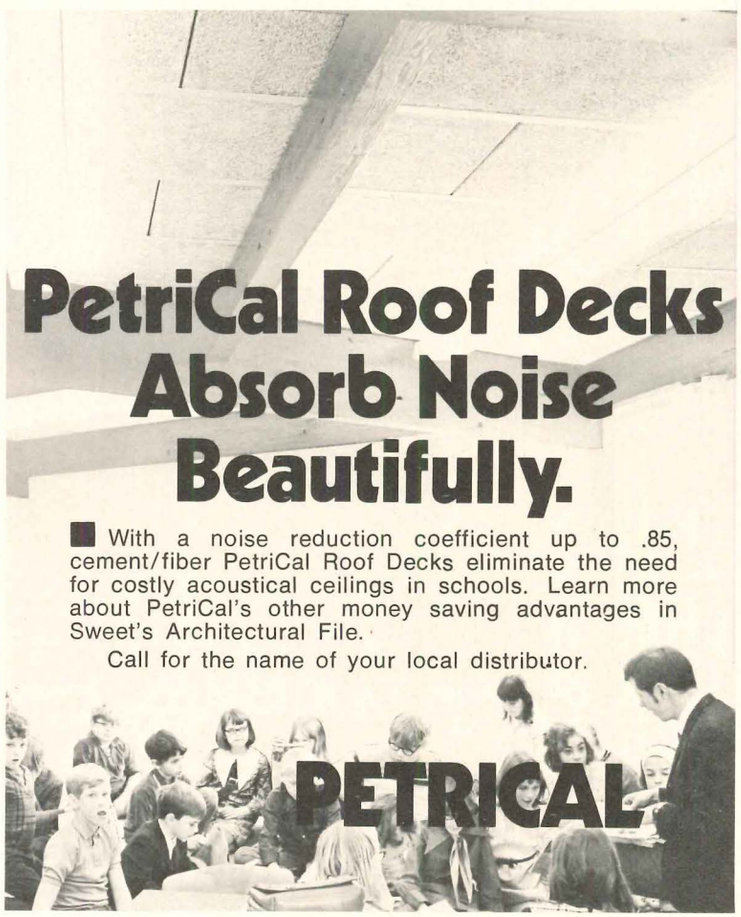

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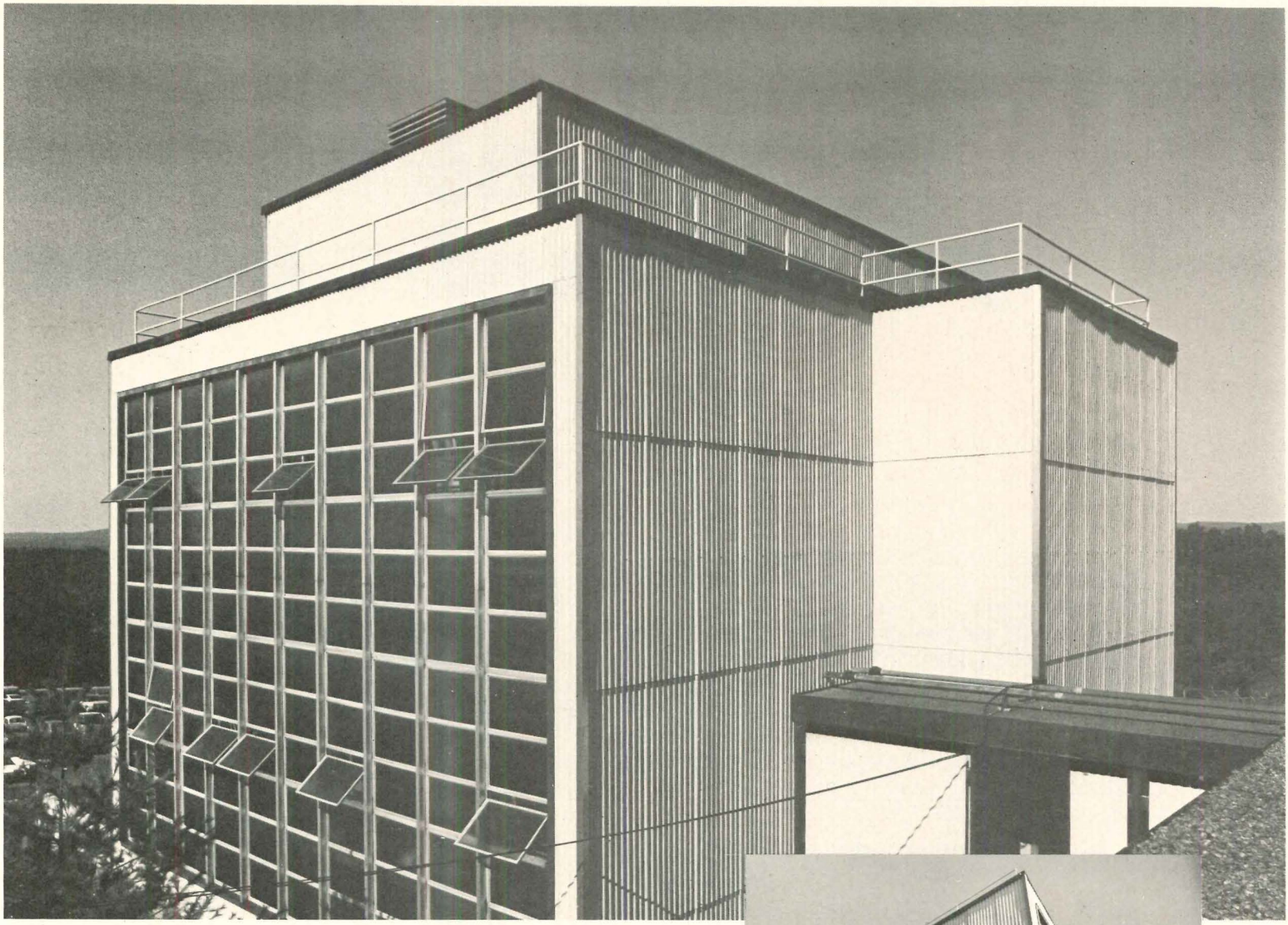

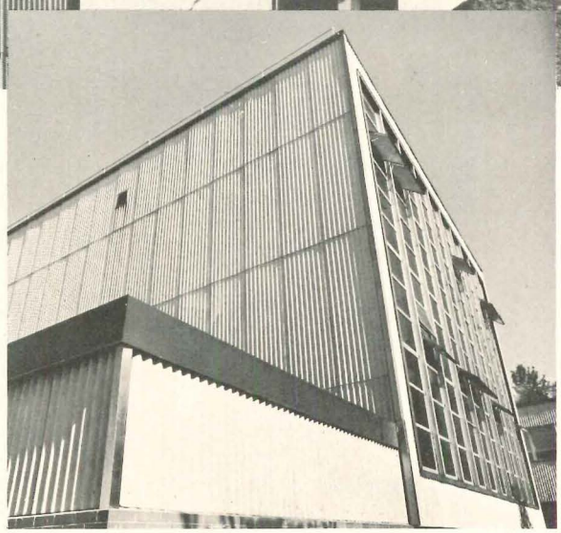

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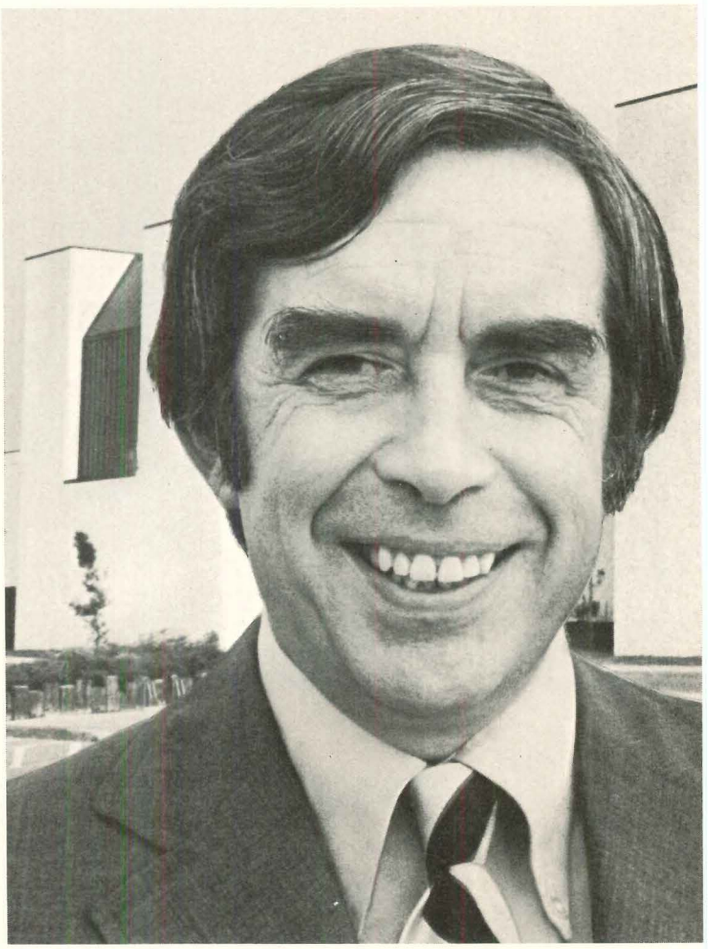

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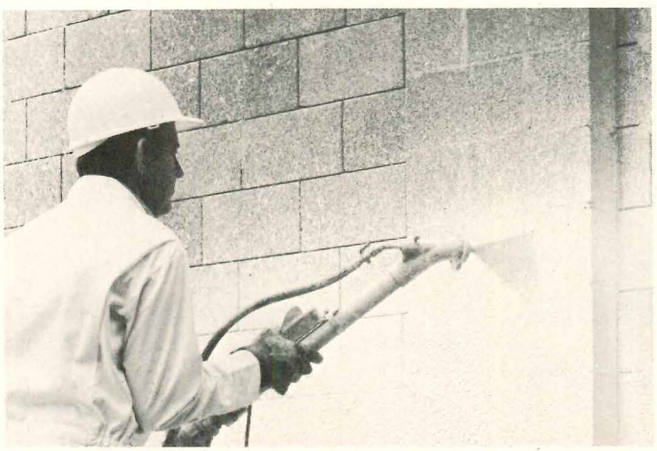

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Ken Miller and the Westwood Fashion Place Mall in Houston, Texas. Mall covers 750,000 square feet.

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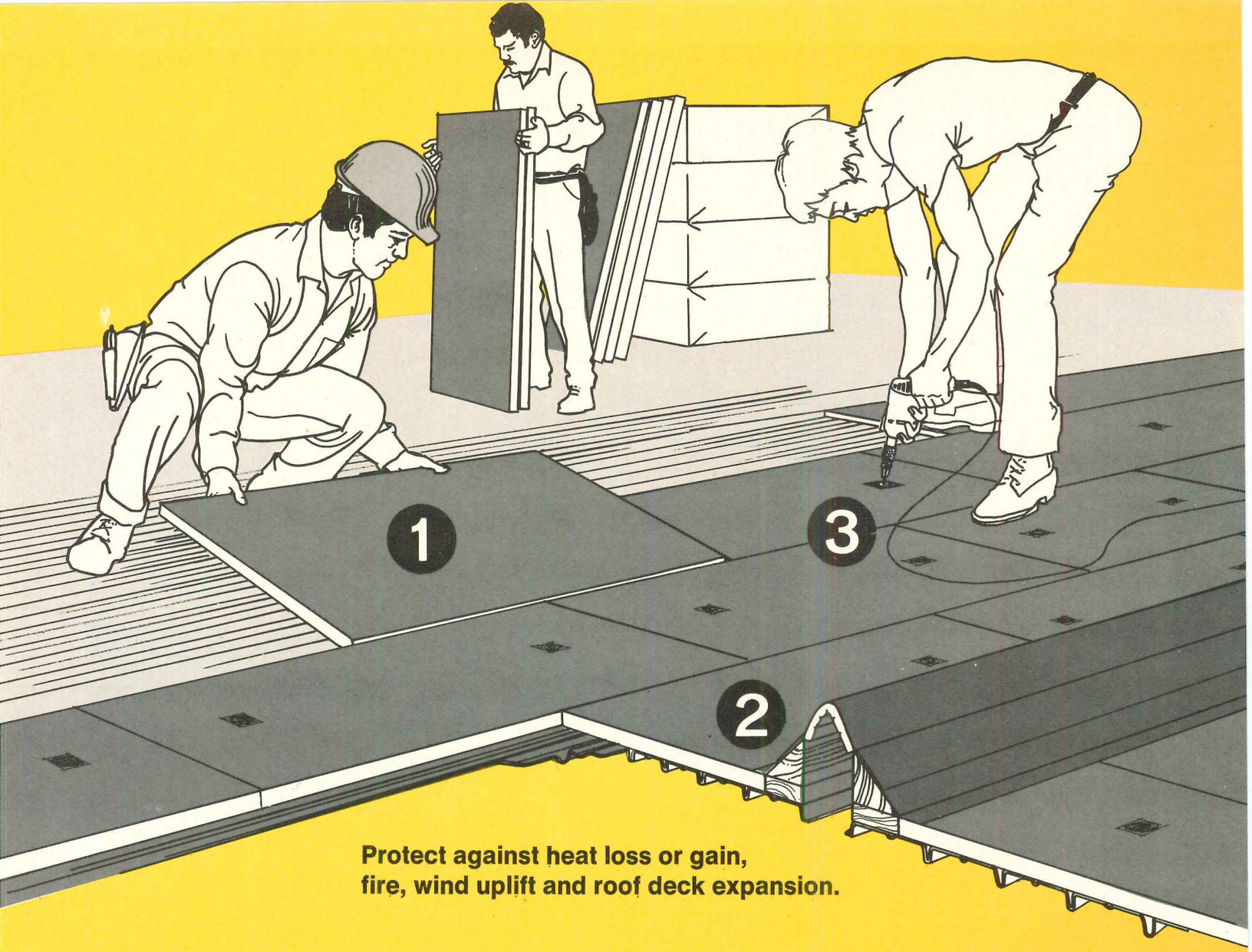

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Progress report: selecting the public architect

At the May 1972 AIA convention in Houston, delegates voted almost 2-to-1 to accept the Justice Department's consent decree removing from the AIA's code of ethics any prohibition against price quotations for architectural services. Since that time the design professions have witnessed—and been chief participants in—a three-and-one-half year controversy over the procurement of design services based on price competition. Just prior to the AIA consent decree, RECORD editor Walter Wagner said in his editorial [May 1972], "The whole idea of early emphasis on price, it seems to me, takes on the aspects of competitive bidding by architects with very different skills, staffs and experience—in the absence of identical documents for an identical end product, which is what contractors bid on the basis of."

Nowhere have professional selection criteria been more intensely debated than in the public sector, public clients being under enormous pressures to justify procurement of every service and commodity in terms of the lowest cost. The design professions in order to avoid becoming a commodity in negotiations with the Federal government sought and received protection in the Brooks bill, enacted in October 1972 (see RECORD, September 1972, page 55), upholding a 30-year-old selection system based mainly on A-E qualifications and competence, not price. However, that tradition is not without strong opponents in Congress and other branches of government, including an aggressive Justice Department, which continues to pursue its contention that professional attitudes on competitive bidding constitute a violation of the Sherman Antitrust Act. Besides the AIA, the American Society of Civil Engineers has signed a consent decree, and even the National Society of Professional Engineers—after a two-year court challenge of the Justice Department—appears willing to outlaw the use of all fee schedules and guides by NSPE members (see News Reports, page 35). The way *is* being cleared for some price competition.

Adding temporary strength to the competitive pricing arguments was the 1973 scandal in which several design professionals were indicted for providing kickbacks to Maryland political figures in exchange for consideration in the awarding of public works contracts. Swift repercussions included calls for campaign reform by AIA and NSPE and a recommendation for competitive bidding by a Maryland task force appointed by Maryland's governor to study the state's engineering contract procedures. (For some reason, however, by the end of the year, the regional reports to the AIA board showed surprisingly little attention to the pay-off affairs of a few months earlier.) Some hard lines were taken in several states and municipalities. In March of 1974, the Maryland House of Delegates unanimously passed legislation requiring competitive bidding for architectural services.

In March 1974, RECORD hosted a Round Table discussion on the problems of selecting A-E's for public work at which the major arguments of the day were aired. (RECORD, October 1974, page 107, and RECORD, November 1974, page 73.)

The Federal General Accounting Office position, presented at the Round Table by Vernon L. Hill, supported the notion that design procurement be subject to the requirements of competitive negotiations, as recommended in its 1967 report to Congress, entitled "Government-Wide Review of the Administration of Certain Statutory and Regulatory Requirements Relating to Architect-Engineer Fees." GAO did not support the Brooks bill, but, in a conciliatory gesture, Mr. Hill noted again at the Round Table, GAO does not want "the attention being paid to controls within the contracting procedures to obscure the broader objectives that form the need for competent A-E services."

GAO withheld support for the Brooks bill pending the report of a Congressional Commission on Government Procurement, which did not become available until December of 1972, after enactment of the Brooks bill. One of the recommendations of the report was that procurement of A-E services be based "on competitive negotiations, taking into account the technical competence of the proposers, the proposed concept of the end product, and the estimated cost of the project, including the fee." However, fee was not to be the dominant factor.

Still another commission was set up, this one in October 1973, to study the procurement practices of the General Services Administration. The commission, including the former editor of this department, William B. Foxhall, released its report in June 1974 (see RECORD, July 1974, page 65), effecting modifications designed to minimize the opportunity for improper influence in the selection of architects and engineers. But in receiving the report, then-Administrator Arthur F. Sampson announced a major modification not mentioned in the report, "fundamentally altering the basis for the selection of architect-engineer firms."

Under evaluation since early this year is the GSA "project proposal" concept for A-E selection. The following summary (next page) was authored by Walter A. Meisen, Assistant Commissioner for Construction Management, Public Buildings Service, GSA. The importance of this proposal for competitive A-E selection lies in its goals, not the least of which is, in the words of one GSA staffer, to defuse the pricing issue, which assuredly is not going away, but may be made more acceptable to design professionals if tied to open technical competition.

Although the following document has been widely circulated, we are reprinting it in a slightly abridged (for reasons of space) version for two reasons: The first is its potential influence. It is the consensus that government procurement at local and state levels closely follows Federal procurement practices, so the importance of this proposal as a model for all public procurement of professional design services cannot be overlooked.

The second reason for drawing attention to this document now is the implementation of Standard Forms 254 and 255, which became effective October 30, replacing the old SF 251. (A discussion of these forms will appear next month, but they are briefly described below.) SF 255 is currently being used in the GSA evaluation of project proposals.

Finally, we draw your attention to the January 29-30, 1976 national A-E Federal Programs Conference to be held in San Francisco. The meeting, sponsored by the Committee on Federal Procurement of A-E Services (COFPAES), will focus on implementation of the new Standard Forms 254 and 255; future Federal agency construction budgets; the issue of competitive bidding; and opportunities in overseas markets. Members of Congress and Federal agency officials will attend specifically to brief architects and engineers. Further details will be published in January, but individual questions may be directed to: Arnold J. Prima Jr., The American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006. Telephone: (202) 785-7374.

—Charles Hamlin.

(continued on next page)

Over the past decade, many forces have been acting for change in the construction industry. Results of these changes include, construction management, value management, phased construction, and project management, to name but a few, and although these changes have encountered some resistance on the part of the industry, they were initiated in order to overcome some basic deficiencies in the traditional processes for obtaining and implementing design and construction services.

At the same time that pressures for technological changes were being felt, similar forces were being exerted to change the traditional process for the selection of architects-engineers in the public sector. As with the technological changes, strong emotional issues quickly developed, emotions that were particularly severe in this case because they included allegations and instances of unethical practice, kickbacks, and favoritism in the selection process. Due to the emotional context and reaction, we have often tended to overlook the fact that the pressures for change in the procurement area were also founded in some basic deficiencies within the traditional public selection process.

"Emotions surrounding the issue of fee competition belie the basic fact that much improvement can be made in the procedures for technical competition."

Just as apprehensions tended to cloud the definition of the problems in the selection process, initially recommended solutions also tended to be reactionary and emotionally charged, frequently overlooking the root cause of the problem. For example, the concept of competitive bidding for professional services is often suggested to overcome current shortcomings. It is clear that strict price competition cannot and would not assure that the most qualified firms are selected for a project.

Price competition would not even assure objectivity in the selection process, unless it were the sole determining factor. What is not so readily apparent, is that if price was made the sole determining factor in the procurement of any services, the quality level of that service would of necessity, be diminished. The reason is that in order to have price competition, the procurement officials must specify the minimum level of quality acceptable under that procurement, and that minimum level of quality required must become the maximum level of quality offered, if the offerer is to remain price competitive.

Ignoring the price competition controversy, A-E technical competition can be improved

Recognizing the undesirability of this reduction in level of quality, virtually all recommendations for improvement to the selection process, including those from the Federal General Accounting Office and the Government Procurement Commission, have not recommended total price competition. As a matter of fact, all reasonable recommendations that have resulted from a thorough study of the problem have recommended instead, open competition based on technical qualifications. The major differences in approach have been that professional organizations generally recommend that fee not be considered as one of the factors, while the GAO and Procurement Commission have recommended that fee be considered as one of the factors in the technical competition. Emotions surrounding the issue of fee competition belie the basic fact that much improvement can be made in the procedures for technical competition.

If procedures could be developed to achieve meaningful technical competition for A-E services, it might very well be possible to include fee as one of the factors in arriving at the most qualified firm. However, rather than debate this last point, I think it more important that we meaningfully and professionally approach the problem of developing more competence and objectivity in promulgating technical competition. It is precisely for this reason that Arthur Sampson, former Administrator of the General Services Administration, on June 10, 1974, outlined a program involving project proposals as a means of achieving more technical competition among design firms. If we can accept the desirability of improving the procedures by which we achieve this technical competition, we may find that the issue of fee as a factor may, in fact, resolve itself. We would, therefore, like to outline how such a procedure for technical proposals might be developed.

Competitive selection entails minimum criteria regarding the professional

First, and essential to the understanding of our proposal, is the concept that there exists a minimum set of questions or criteria, which every prudent owner should ask or apply when selecting a design professional, and a maximum level of detail practical in any technical competition. Examples of a minimum level might include: information on the design team; a review of the firm's previous experience in the field; an understanding of the firm's financial stability; a determination of the ability to take on a new project by reviewing existing work on the boards; and other items. Federal construction agencies have recognized this minimum level concept in the development of the newly adopted Standard Forms 254 and 255, which must be filed by architects to be considered for Federal work. We might disagree on the specific elements of any minimum criteria, but certainly this minimum does exist. While application of these minimum criteria will not guarantee a successful project, the owner will certainly greatly improve his ability to identify the best professional for his project.

On the other hand, if each of the competing professionals submitted for the owner a completely developed conceptual design and a full discussion of the ramifications associated with that design, the ability to identify the best professional is easily quantifiable. An owner could compare the budget considerations, energy consumption, building efficiency or any other criteria, and select the product or design which best suits his particular needs.

Given this level of development, fee could reasonably be included as a factor in conjunction with qualitative factors, which at this level are measurable. Both the owner and the design professional would be protected since the competing designs would have been quantitatively and qualitatively defined. Accepting these two examples as the minimum acceptable and the maximum practical, our goal is to develop a professional selection process, based on technical project proposals, with measurable criteria that will:

- Ensure fair and impartial consideration for all qualified architects and engineers.
- Consider the changing national priorities, particularly socio-economics, and environmental priorities.
- Encourage new thinking, new solutions, and better management in the design profession.
- Respond to the concern for the production of the finest architecture and engineering.
- Ensure selection of the most competent available professional for the project.

Tailoring the criteria to the nature of the project

What elements should be included as part of the competition? How should the criteria be developed, and who should compete? These are questions which come to mind as we embark upon the development of the project proposal concept.

If we could establish the correct criteria, the next problem is to tune the criteria/measures to the characteristics of our design program, typically ranging from a $300,000 window replacement project to a $50,000,000 multi-use building project. Certainly the level and character of competition should be different at each end of the project scale, and extreme care taken to ensure we do not over invest administrative time and dollars and over complicate selection criteria for smaller, less complex projects. Neither can we expect private design firms to develop complex proposals for projects where the fee structure would prohibit this kind of investment. It would appear at this point, that the level of detail we could reasonably expect to receive in project proposals, lies somewhere between our examples of minimum and maximum, and is proportional to size and complexity of the program in question.

". . . fee could reasonably be included as a factor in conjunction with qualitative factors. . . ."

As a point of departure, we have chosen four major categories against which each proposal might be evaluated:

- Creativity. The ability to convert the many facets of existing technology into the proper solution for the problem.

- Organization. The right team, properly motivated with necessary tools to meet the project commitments in terms of production and time.
- Economics. An understanding of, and the ability to control, the options for the project to meet the economic goals; the best solution for the tax dollar expended.
- Community Impact. That set of criteria which, though not directly related to a successful project, encourages participation in social and cultural programs benefiting society on a broader plane.

An in-house group of GSA professionals is compiling detail criteria on each of these categories. The questions are being developed through three planes of evaluation.

The first plane is experience, the evaluation of work previously accomplished as it relates to performance on the proposed project. The second is approach. If awarded the proposed project, how would competing firms attack the problem? What design philosophy, management and cost control systems would be applied and why? The third plane at the upper end of our spectrum, is to conceptualize a solution, and develop the characteristics of that solution through each of the categories: creativity, organization, economics, and community impact. While the projected questions shown do not represent an end product, they do develop insight as to the kinds of data we feel will be pertinent as the project proposal concept matures.

Project proposals in the selection process: how do you begin?

Who will submit "project proposals"? How does this concept fit within the selection process?

The process will operate as follows:

Registration. This is the process through which architects and engineers may register their qualifications with GSA. The instrument through which to accomplish registration is the SF 254. Registering in this manner with the regional offices where you wish to be considered will get you into the system. You will be considered for work for which your firm is qualified. Consideration through registration, however, is a passive form of consideration. Interested firms have the option and are encouraged to supplement passive consideration with active application to specific project announcements as they are published.

Notification. Public Law 92-582 requires each Federal agency to publicly announce all requirements for architect-engineer services. Accordingly, when we have identified a particular project for which A-E services are required, a public announcement will be developed. The announcement will outline the particulars on the proposed project, location, scope, and criteria upon which a selection will be based. It may require supplemental data in order to be considered. Also, the announcement will identify the individual at GSA who will receive project applications.

The *Commerce Business Daily* is the principal means of announcing requirements, not only for GSA but for all Federal agencies. The exception is projects where the fee is less than $10,000. Regional offices may use local news media in lieu of the *CBD* in this case.

Application. Interested qualified architects and engineers are encouraged to respond to project announcement. Even if your firm has registered through the SF 254 process, make your interest regarding particular projects known. Response allows you to supplement your SF 254 with additional project related qualifications and ensure *active* consideration.

Review announcements carefully; supplemental data and a portfolio may be required. Applying in response to the project announcement allows your firm an opportunity to present your team and experience relevant to the particular project in question. This is your tool to control the consideration process.

Evaluation. All qualified applications will be screened and a group of three to five firms identified as the most qualified will be invited to submit project proposals.

On projects exceeding estimated construction cost of $500,000, this screening will be accomplished through our Regional Public Advisory Panels on Architectural and Engineering Services. This is a panel made up of professionals from private practice. Panel members are ineligible for GSA work during their term of service. On projects less than $500,000, this function will be performed by the in-house GSA Evaluation Board.

This group of highly qualified firms (3-5), will be provided additional available project data and the weighted detail selection criteria in preparation for submission of proposals and interviews. Proposals will be evaluated and interviews will be conducted by the Evaluation Board, after which a recommendation ranking the top three firms in order of preference will be forwarded to the GSA Administrator.

Selection. Final selection will be made by the Administrator. If he selects other than the firm ranked Number 1 by the Evaluation Board, his decision will be documented for the public record. Upon selection by the Administrator negotiations will commence. If a fee cannot be agreed upon, negotiations will be terminated with the Number 1 firm and discussion initiated with Number 2. Similarly, if an agreement with Number 2 is not reached, we will move on to the firm ranked Number 3. Should we be unable to negotiate a satisfactory contract with any of the selected firms, additional firms will be identified and the negotiation process continued until agreement is reached.

How GSA will implement the selection process

We have an approach. . . . We know the kinds of data we feel may be important. Our next step is to match the criteria to the size and complexity of the project in question, and develop a formula that will optimize the benefits of the selection criteria, but avoid unncessary complication of the process. We must not create a process so overburdened with administrative and review requirements that this cost cannot be justified through an improved selection capability and ultimately a better design.

If each competing firm were to develop a completed conceptual design (problem solution) in sufficient detail, we could easily rationalize a selection. We could apply a set of predetermined value-based assessments in each of our chosen evaluation areas and determine the best solution. Fee might be included.

For obvious reasons, this appears impractical for the wide range of projects in question. It would be costly to administer. Obviously some reimbursement would be necessary for the competing firms so that smaller firms would not be at an economic disadvantage. Would smaller projects warrant this effort? We think not. If not, what level of evaluation would be appropriate? Would only the traditional review of previous projects and reputation suffice? If not, then what?

We propose to develop a matrix of criteria, a matrix containing from four to five levels and moving from the smaller, less complex projects at level one, to the larger, most complex projects at levels four and five. More and more information would be required at each successive level.

To develop the final matrix we are implementing a test program, designed to build each successive criteria level only after using and evaluating the criteria in a real project situation. The test period for Level 2 has just been completed.

The goal: "A competitive selection system open to all qualified professionals, encouraging technical and managerial innovations, and design excellence."

It should be made clear at this point that this is a GSA program and will be mandatory only on GSA projects. However, we do propose to include participation by other Federal construction agencies and representatives of the design profession in this developmental phase. Additionally, the results of this program will be made available to other agencies as we complete each level for their optional consideration. If, on completion, the program seems to merit application on a broad Federal level, we would initiate the necessary implementation steps in conjunction with the other Federal agencies involved.

This program, to develop a new level of competition for award of design commissions, will provide new data for consideration in the discussions surrounding the A-E procurement issue. As we test the more complex levels of our matrix, we will gain insight into the value of improved technical competition, and hopefully, when we finish, we will not only have learned what criteria elements best enhance a competitive selection process, but also determined what they cost, both in terms of government administrative costs, and costs to the competing architect-engineers. With this data we can structure a system of selection criteria that will ensure the goals we have set for ourselves: a competitive selection system open to all qualified professionals, encouraging technical and managerial innovations, and design excellence.—*Walter A. Meisen*

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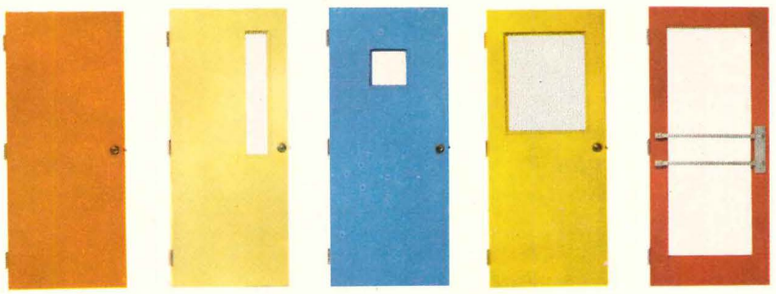

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REITs in the jaws of finance

Two of the heaviest casualties of the recession of 1974/75 were the design professions and the Real Estate Investment Trusts. It was more than coincidence that put architects and REITs in the same overcrowded boat that finally capsized when last year's economic storm came up. In recent years the REITs have become a potent force in commercial development—offices, shopping centers, hotels, condominiums, and apartments—all key markets for the services of architectural firms. And when the REITs went under, architects couldn't avoid getting a little "chewed-up" in the process.

Because it takes a heap of financing to get a commercial building project off the drawing board, and because REITs—like New York City—have become everybody's favorite example of how *not* to manage your financial affairs, it's worth a look at how the REITs got into trouble—and how they'll get out of it.

What are REITs?

A REIT is a business trust empowered to issue common stocks and bonds, much like a mutual fund, but different in that REITs invest principally in real property and mortgages instead of securities. Their main role in the 1970's has been to provide development and construction money for large-scale commercial projects.

Over-all investment policy of REITs is formulated by trustees, elected by the stockholders, who function like a board of directors. For their day-to-day operations, the trustees depend on "advisors"—typically financial institutions with expertise in real estate investment. Commercial banks are the leading REIT advisors, managing more than $6.8 billion of their assets (about one-third of the industry's total). Independent mortgage bankers, brokers, and real estate companies hold second place, handling some 15 per cent of total assets.

At the moment there are about 200 REITs in the United States, located in every state, with assets of $21 billion. Florida leads the nation with investments of more than $3.5 billion. The next four states—Texas, California, Georgia, and New York—together with Florida account for almost half of all REIT investments. A typical REIT operation could be described as follows: Using funds borrowed from a commercial bank, a REIT makes a short-term construction loan (averaging $7 million in amount and one to two years in duration) to a contractor who is building a condominium. When construction is completed, the contractor repays the loan with the proceeds of the mortgage—the project's long-term financing—which is usually arranged through another financial institution (an insurance company, a pension fund, or a savings and loan association, in most cases).

The REIT industry's composite balance sheet shows the sources and uses of funds of these institutions. Only about a quarter of REIT funds come from stockholders' equity; the rest is borrowed—most from commercial banks, and the remainder from the sale of commercial paper and other debt issues.

Development and construction loans are the main business of REITs, involving nearly two-thirds of their investments. The remainder is split about evenly between property holdings and long-term mortgages.

The growth years

A change in the Internal Revenue Code paved the way for the rapid formation of REITs between 1968 and 1973, opening a new pipeline between the money markets and the construction industry. For the small investor, the REIT offers an opportunity to get a piece of the action of some fairly large and often profitable real estate deals without much of an individual stake, and with the protection of diversification. To the trustees, the REIT is a vehicle for tapping the large reservoir of small investors' funds, channeling them in a way that brings special tax advantages. And to developers and contractors, the REIT has opened up a whole new source of capital.

REITs grew slowly at first. Industry assets were $300 million in 1961, and still only $1 billion by 1968. Then the REITs came into their own as the government's tight money policies of the early 1970's choked off the flow of funds through conventional real estate lenders who couldn't compete effectively in the capital markets. This was when the REITs unique ability to raise capital under highly competitive money market conditions paid off. Over the next three years, REITs raised over a billion dollars *each year,* and as much as $2 billion in 1971.

It hardly needs to be added that the boom in commercial and condominium construction during the early 1970's was in large part a creature of the REITs.

The boom ends

The collapse of the REIT boom was a two-stage affair, beginning with the "energy crisis" of the winter of 1973/74. Sudden scarcities of critical building materials in 1974 made it difficult or impossible for contractors to hold to their construction schedules. And sharply inflated prices of most building products at the time wiped out contractors' margins in many cases. One result: construction loans (held by REITs) fell behind, frequently going into default. And the REITs were left holding the bag.

What the energy crisis started, the recession of 1974/75 finished. By the end of 1974, the rapidly deteriorating economy left little incentive for developers and builders to finish the work they had in progress, much less start new projects. With vacancies rising sharply in condominiums and offices all around the country, and with major retail chains more concerned with closing down unprofitable stores than with opening new ones, many half-finished commercial projects went into abeyance. Others never made it past site-clearance. Cash flows to REITs fell to a trickle, leaving them unable to repay their outstanding debts (held mostly by the commercial banks). The crunch was on.

How will it end?

At present, the typical situation is that of a real estate investment trust holding a portfolio of which more than 50 per cent of its outstanding loans are earning no income (one of the biggest reports 70 per cent of its portfolio is "non-earning"), and its commercial bank creditor facing the unhappy choice of carrying the REIT or driving it into bankruptcy. Meanwhile, the rate of contracting for new offices, shopping centers and other commercial building continues to fade.

Two things have to happen before the commercial building market begins to show some of its former strength. The unknown quantity of stalled construction that exists in various stages of incompletion around the country must be moved ahead. The thing that will do most to make that happen is a vigorous recovery of the economy itself, and we finally seem to be moving in this direction. The other is that the atmosphere of financial insecurity hanging over the commercial building market must be dispelled. This will take longer.

Like New York City, the REITs face a grim period of adjusting to reality, and like the city, they will survive by a combination of self-discipline and outside help. Some of the weaker ones will go out of business; many with commercial bank affiliations will be bailed out; the stronger ones will, in time, make it on their own. One way or another, the REITs, as an institution will survive this crisis. They are too important to the real estate industry and all its related fields—most certainly including architecture—and simply just too good a financial concept to be allowed to fail.

—Henry C. F. Arnold

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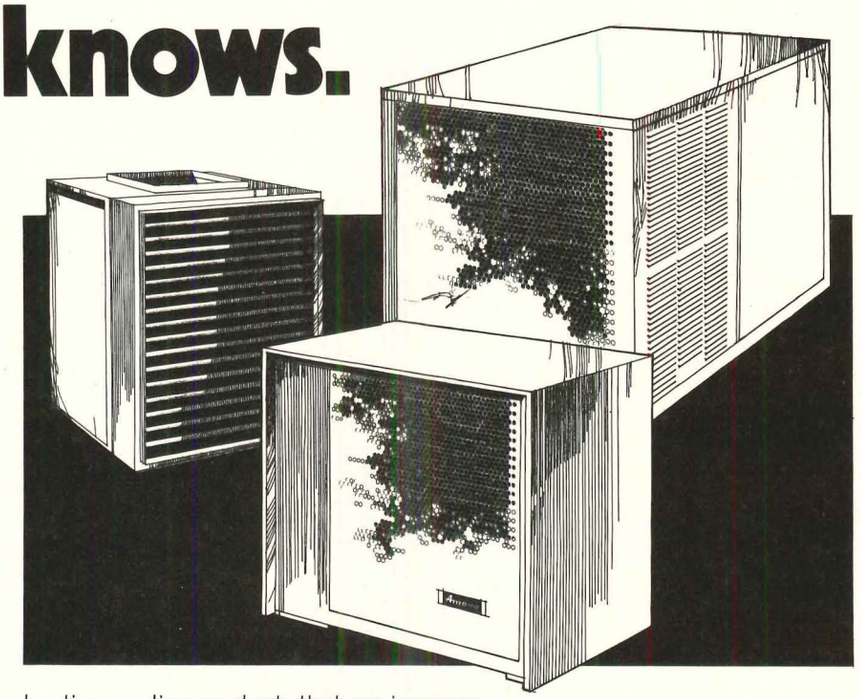

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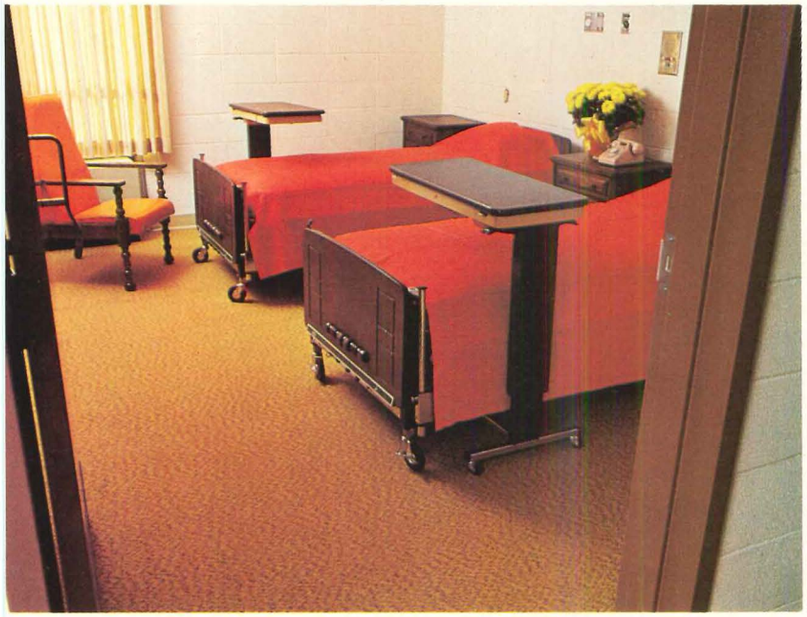
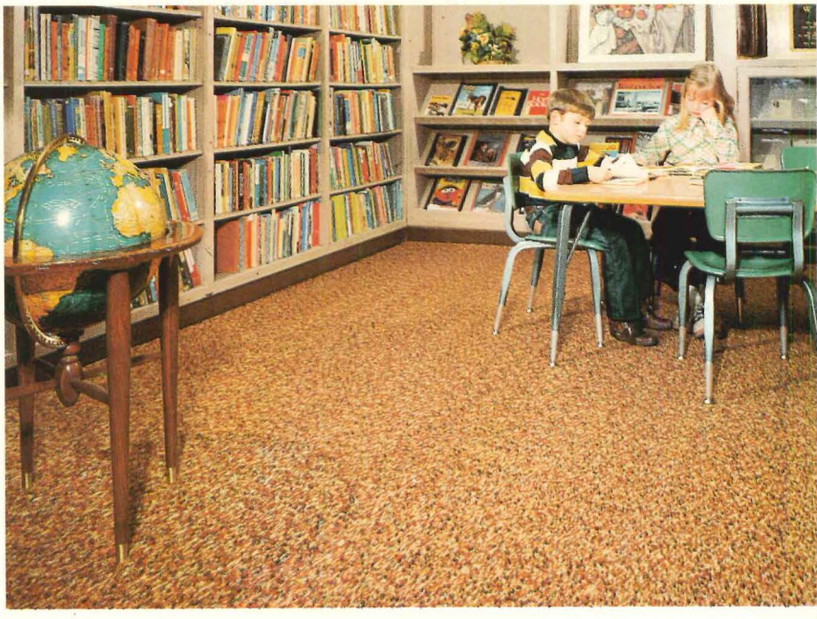


Bull Shoals Community Hospital & Clinic, Bull Shoals, Ark."Sandpiper" by Atlantic

Benton Bank, Little Rock, Ark."Chateau" by Brinkman

Hilton Inn, Myrtle Beach, S. C."Essentiale II" by Karastan



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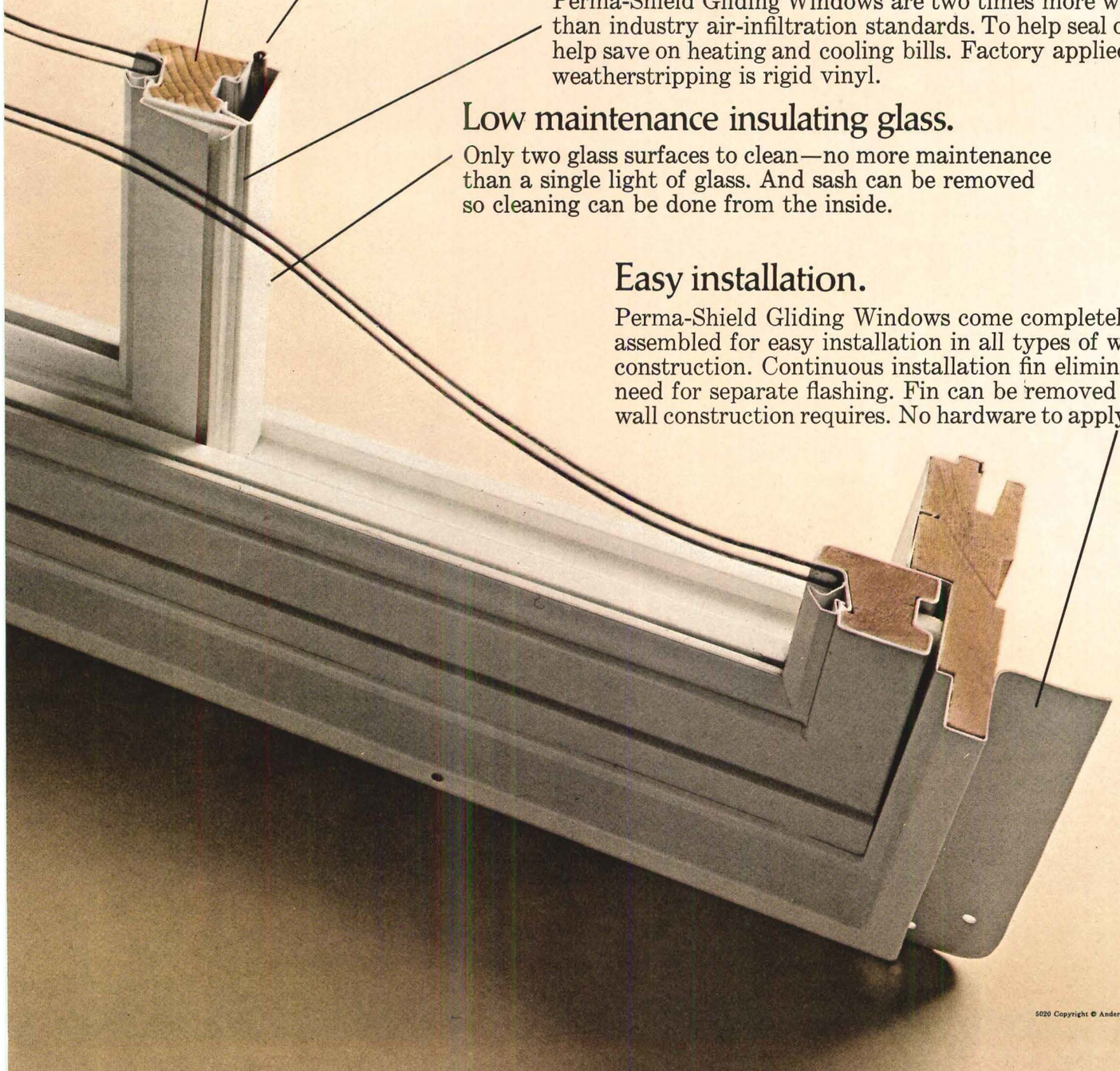

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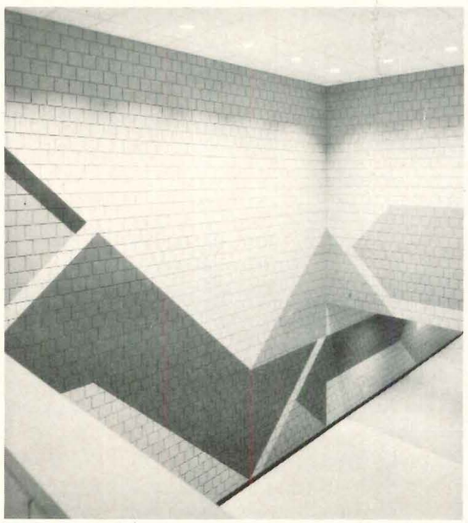

Wayne Soverns, Jr./

The high cost of building—as everyone knows—is a problem that requires a response. It is part of the reason for our longest- and deepest-yet recession. It is an important reason for the sluggishness of the recovery of the construction industry. It has been, and continues to be, a major and fundamental concern of architects, engineers, and builders as well as owners—for it is a problem that must be solved.

There have been—as everyone knows—major new developments in controlling high cost through management techniques: various approaches to more accurate and responsible budgeting, estimating, pricing, and cost control. Construction management. The development of phased construction or fast-tracking.

There have been—as RECORD has been arguing all along—some responses that will surely prove counterproductive in the long run—the "skinning out" of buildings to cut material costs; an emphasis on minimum first costs that has led to the use of too-cheap subsystems.

But, as we said in the October editorial, the response that seems to offer the most promise for basic, long-term cost reduction has not yet been well explored, and that is the architectural approach—the planning and design approach—to the problem of high and rising costs. And that is what this issue of RECORD is about.

This architectural response does not require any "revolutions"—even in attitude. Rather, it requires a return to the attitude of carefulness, of thrift, and economy of means in design.

It involves thinking more about ways to recycle old buildings to serve new activities—and to cheer the spirit. We've published hundreds of pages on "new life for old buildings" in recent years, including two special issues (December 1971 and December 1974)—and you'll find more good examples of sensitive re-design of worthy older buildings in this issue, beginning on page 96.

This architectural approach—in a related but less-established way of thinking—involves searching for ways that new and existing buildings can relate. This means far more than making sure that any new building respects in character and scale its older neighbors—a concept that has

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BUILDING TYPES STUDY ® 483

Thoughts on the architectural response to building costs by Earl Flansburgh

Mies van der Rohe said many years ago "less is more." His Spartan esthetic became one of the axioms of modern architecture. In today's society, with high construction costs, severely strained municipal, corporate and personal budgets, and a high rate of inflation, we are faced with the problem of developing excellent architecture around a new Spartan esthetic, "more for less." If we believe many of our economists "more for less" will be our architectural hallmark for at least the next decade.

More for less frequently means more space for less money or less space for the same amount of money as costs constantly climb. We believe that gradually these extraordinary inflationary pressures will cause the development of a new esthetic linked closely to cost control. This architectural approach for new construction will be founded on simplicity in design, durable but easy to erect materials, and planning and design innovation developed to produce the maximum esthetic benefit for the dollar. We have already seen its effect in the increased re-use of existing buildings.

Our basic objective has been formed around a simple idea: "well-designed architecture." The quality of design is important, but the use of the word "architecture" implies that the building is built. In today's tight economic market, in order for a building to be built, the design must be created within the client's budget framework. Like most architects we are proud of our drawing ability, but we take more pride in completed architectural projects. An excellent drawing on the wall, representing a project bid substantially over the budget, may be a work of art; but it is hardly a work of architecture.

There are two common methods of cost control: the scissors method, and the "continuous cost effectiveness method." The scissors method is quite simple. The space and material are put into the project, the estimate or bid is too high, and some of the space and some of the material is cut out of the budget. This *ex post facto* control method can be most charitably described as a poor process—unsatisfactory to the client, expensive to the architect, and disastrous to the architecture. It usually leaves the design on the cutting room floor and earns the individual architect and the profession as a whole a reputation of having no knowledge or interest in cost control.

The "continuous cost effectiveness" process, however, is built on mutual understanding between the architect and the client and a willingness to face the truth on the part of both. Most clients are reasonable men and women who know that buildings cost money. All they ask to know is a dollar figure early enough in the design stage to react to it. A reasoned reaction in the design stage is preferable to a panic reaction when the bids are too high. "Continuous cost effectiveness" is, as the name implies, an evaluation of the cost and cost implications of various pieces of the project at various stages of the design. It also means evaluating the total impact of the cost of an item, not just its unit cost. Cost effectiveness also means the architect is willing to accept the economic performance of a material or a structure as a guide in determining the appropriate architecture for his client. This produces an architectural vocabulary based on the economic characteristics of the materials as well as their esthetic qualities.

Continuous cost control can be achieved in two basic ways:

1. Technical skill and innovation.
2. Creative planning.

When we say continuous cost control, we mean that it must start at the beginning of the project with the program and the site selection as described below. Effective cost control is realized when the project is completed by careful attention to the details as well as the basic building form and structure. If "God is in the detail," it is important to make sure that the detail is not also shared by the Chancellor of the Exchequer.

One factor that we have found in terms of dealing with costs that is extremely important as far as the architect's credibility is concerned is a question concerning the cost estimate format and the information that is given to the client. A client is eager to know what his project is going to cost. That means he doesn't only want to know what the building is going to cost, but what will be the total expenditure he is going to have to make. As we indicated above, this means the cost of the building, the site, the furnishings, the equipment, the professional fees, the owner's costs, and any contingency that he must carry. Therefore, it is important to give a client only one kind of cost estimate; to tell him what the total project cost is, including furnishings, equipment, fees, contingency—everything. That way his bottom line figure is always referred to the same base point. He may very well keep the building the same, but double the budget for furnishings. This will cause the project cost to go up. He should be aware of where he is spending his money and always have the total project in perspective.

But in the end, our objective is still the same as it was in the beginning, to produce excellent architecture. That is to produce buildings that are built and buildings of quality, such that the architect is proud of his work. The planning process for many buildings stretches over a period of months, sometimes a period of years. When the bids come in high, the desecration of a design may take only a week or two. Unfortunately, the emasculated design lives with the user of the building for the entire life of the project, which may be 20, 50 or 100 years. It is very fashionable today to talk about the questions of the environment. We think it is important to deal with the questions of the architectural environment. We have a responsibility to produce handsome buildings, not just economical buildings. Our experience has been that if the architect is honest with the client in terms of how much his project is going to cost, in most cases the client is willing to spend the money. If he is not, since he is told the true cost of the project early in the planning stage, the client can modify his aspirations so that a real project emerges. This is why architecture is called a profession, not simply an art. It is our responsibility to see that a building emerges from the planning and design process, rather than simply having a building idea buried in a set of handsome working drawings that no one can afford.

It is our belief that the architecture of the future, at least the immediate future, will be architecture involving continuous cost effectiveness and continuous cost analyses. The architecture of the future will certainly require "more for less." And if Mies van der Rohe was correct and we are skillful, less will be more.

Mr. Flansburgh is the principal of Earl R. Flansburgh Associates, Inc., of Cambridge, Massachusetts—a firm with an excellent record of on-budget performance as well as design. This essay is supplemented by case examples beginning on page 84.

Robert Pettus

long been understood and applied by sensitive architects. It means examining whether the "insertion" of a critical new element cannot make worthwhile older buildings economical again—perhaps by connecting older buildings into a new and productive complex. Several case examples are shown on pages 102 through 107.

This architectural approach to economy involves designing new buildings in configurations that save materials and energy, that allow spaces to serve dual functions, that are truly flexible enough to meet changing needs, and that lend themselves to efficient construction and efficient use of subsystems, as in the handsome *and* efficient *and* low-budget schools analyzed on pages 84 through 95.

It also involves increasing the productivity of buildings by designing them so they can function for more than eight hours a day—through mixed and combined use. A few early examples are shown beginning on page 68.

Finally, as the introduction to the next article in this issue reminds us, "Economy, after all, is not represented by the cost of something, but by the cost relative to that thing's value," which in architectural terms must include not just the cost of a building, "but what it is like to be in, or to be next to, and what it does for the neighbors, or the community at large, or for the landscape—or, as a matter of fact, for just about anything else we place value on." And the article beginning overleaf explores in more detail, and with three case examples, the idea that value—not cost—establishes the real bottom line.

What does it all add up to? This issue is not a call for revolution. It is—like architect Earl Flansburgh's thoughtful essay in the box at left—a reminder of what architecture is all about. Part of the solution does lie in new management techniques; part in new technical ideas; part in more efficient building methods. But those are all part of architecture, let us never forget. The essentials—even as we face terrible cost problems—remain as they have always been: people, design, quality. Thus the only way to search for more productive buildings of long-lived quality—for better buildings at lower cost—is through architecture.

—The editors

1 + 1 = 3: A new equation for counting a new building's cost

Three new buildings and building complexes—the Galleria in Manhattan, Colony Square in Atlanta and the Simmons Company's Jones Bridge Headquarters near Atlanta—pose instructive new definitions of architectural economy by posing a new definition of value. Cost, they show, is not the same as value, nor is the lowest cost the same as economy.

In all of the available techniques for reducing the staggeringly high cost of building these days there are only two basic drives: either to reduce the cost of producing a certain architectural result, or else in the process of producing that result finding a way to produce something else as well—in other words, increasing the productivity of a building. Conspicuous among these techniques is the idea of life-cycle costing, which is exciting for its mind-boggling basic simplicity: It simply puts forth the notion (well within the grasp of any eight-year-old) that it makes no sense to achieve a lower first cost for a building at the expense of higher maintenance and shorter life. It is a concept that is hard to dispute (and, unfortunately, hard to implement in some cases). It also has a powerful meaning beyond its readily apparent one, and it is this: life-cycle costing removes, ever so slightly, the question of cost from the here-and-now of the accountant's current ledger and comes up with an alternative way of arriving at a building's cost. By doing this it springs open the possibility of finding still *other* ways to tell costs, and to ask the important question, "Where is the real bottom line?" Asking this question leads us on to the following truisms:

Economy, after all, is not represented by the cost of something, but the cost relative to that thing's value. A low price is obviously no bargain if we don't want what it buys, or don't need it, just as a high price can represent good value. But most often "value" in these formulations is thought of in terms of "durability," or "flexibility" or over-all "quality"—staple and negotiable aspects of a building. However, we can, with clarifying tautology, think of value as just plain value, as what we really want, and if we do the options for what it may consist of widen considerably to include questions like what a building is like to be in, or to be next to, or what it does for the neighbors, or the community at large, or for the landscape—or, as a matter of fact for just about anything else we ourselves might happen to place value on.

The problem here, of course, is that most of these latter concerns have in recent experience proved terribly fragile in the face of questions of immediate cost. This is not by any means to say that their value is less, only that they have not yet become socially and politically enfranchised as issues in the way that those directly affecting the pocketbook have been for centuries. It is undoubtedly fair to say that enfranchising these issues—issues about what is generally called the quality of the built environment—is the greatest challenge facing the architectural profession if it is to begin to achieve its socially beneficial aims. Fortunately, architects are just now being assisted in this task by the nascent realization on everyone's part that all of our resources are ultimately scarce, and that we cannot forever run to greener pastures from our environmental mistakes, the products of a too-hasty perception of where true value really lies.

The buildings shown on the right, and in more detail on the following fourteen pages, embody a broad perception of value. As exercises in cost cutting, they fall into the category of more productive architecture, and the something more they produce is realized on a dramatically relocated bottom line.

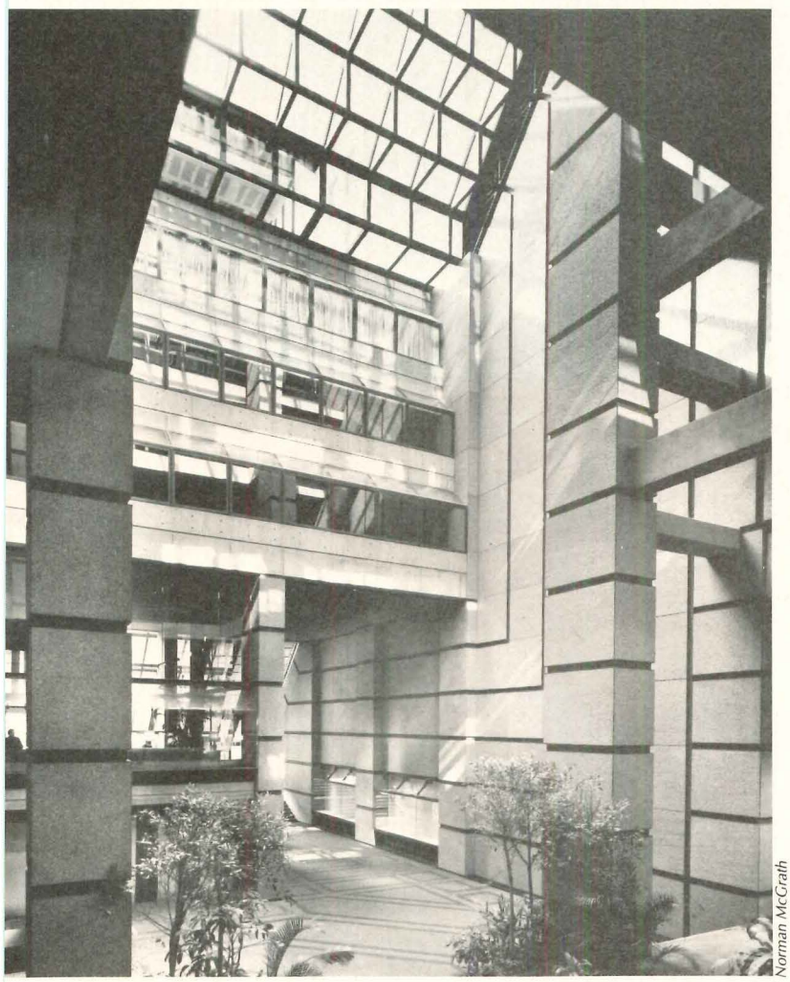
So we make no apologies for the fact that none of them is inexpensive. Colony Square in Atlanta is a large complex of offices, apartments, shops, restaurants and a hotel—all put together to make a *place* that it is hoped will be more memorable than any of the individual buildings that made it, because it is a symbiotic complex. The Galleria in New York, like Colony Square, assembles the facilities for a number of mixed uses (in this case apartments, offices, shops, a restaurant and a private club), but this time it collects them all in a single building in the heart of midtown Manhattan. The building, by virtue of the way it almost snuggles in among its neighbors and by its almost homely appearance on the skyline, seems to go to some lengths *not* to be special, and by doing this to preserve the already powerful Manhattan format. Having thus, as it were, made its neutral contribution to the city, it adds, on the inside, its most memorable feature, a skylit through-the-block space open to tenants and the public alike.

By contrast with Colony Square and the Galleria, the Simmons Company's headquarters building—the brainchild of Simmons' ecologically-minded chairman—carefully occupies an unsullied wooded site in rural Georgia and thereby assures its destiny as a natural preserve—even more effectively, it could be argued, than if Simmons had located itself somewhere else and left the land to the whims of less perceptive builders.

We maintain that all these buildings are economical—not because the initial cost was low (it wasn't, by the bye, prodigious either), but because their value in relation to cost seems high. It is the product of the architect's and client's ability, in the process of doing a set of things they wanted to do anyway, to do something else that was important as well—the product of their ability to make *one plus one equal three.*

Another quality we like about these designs is their

E. Alan McGee



Norman McGrath

E. Alan McGee

"both/and" aspect—which is a delicate way of saying we like showing them for their limitations as well as their successes. Readers may note, for instance, a number of design details in the Galleria that seem unresolved—possibly including the jazzy main entrance with its glass tunnel sloping on the forty-five to nowhere ("It doesn't continue the line of the street to me," one cynic observed, "it just looks like the street caved in"). They will undoubtedly notice as well that the whole building, for all its glamorous public spiritedness, is nonetheless the envelope for a number of high-priced commercial and residential activities in atypical Manhattan. We show it, though, because we are in favor of architecture that makes a civic gesture from any quarter—just as we are fervently in favor of the spirit of environmental conservation that led Grant Simmons to plan the Simmons Company headquarters as the politest of all possible intrusions on the banks of the Chattahoochee. The result, nevertheless, will seem to some a super-scale executive Valhalla with no evident message except for the fortunate few who work there (and perhaps not notable in environmental terms, since environmental successes unfortunately scream for attention less than environmental failures).

This is perhaps to say only that the Simmons building is a small success, which we are happy to hail it for, since from this late 20th-century vantage the chances of achieving a sweeping success seem to diminish in direct proportion to the chances of achieving, in a climate of increasingly diverse and circumspect opinion, any general agreement about what in fact a sweeping success would be.

Finally, there is the case of Colony Square in Atlanta. Its hard-nosed "Brutalist" forms may offend the stylistically opinionated, and there is as well the undeniable news, which we duly report in our description, that the entire development is in heavy financial distress. What gets lost, though, in all the bad news is, of course, the good news that the architects of Colony Square were, again, aiming for the civic gesture, putting the requisite buildings together in a way that at least tries to make them more than the mere sum of their parts.

So with all its problems we show Colony Square along with the Galleria and the Simmons Company headquarters as a part of our case against those who claim that accountants have the monopoly on bottom lines. We claim, by contrast, that real bottom lines are arrived at by broadly and soberly considering what it is we care about and need and what therefore is valuable, what renders us the greatest return for our money—which after all, we are pleased to remind our financier friends, is only the conventionally accepted negotiable symbol of what people value.—*Gerald Allen*

The new Simmons Company headquarters achieves productivity by being careful not to destroy the natural qualities of the site

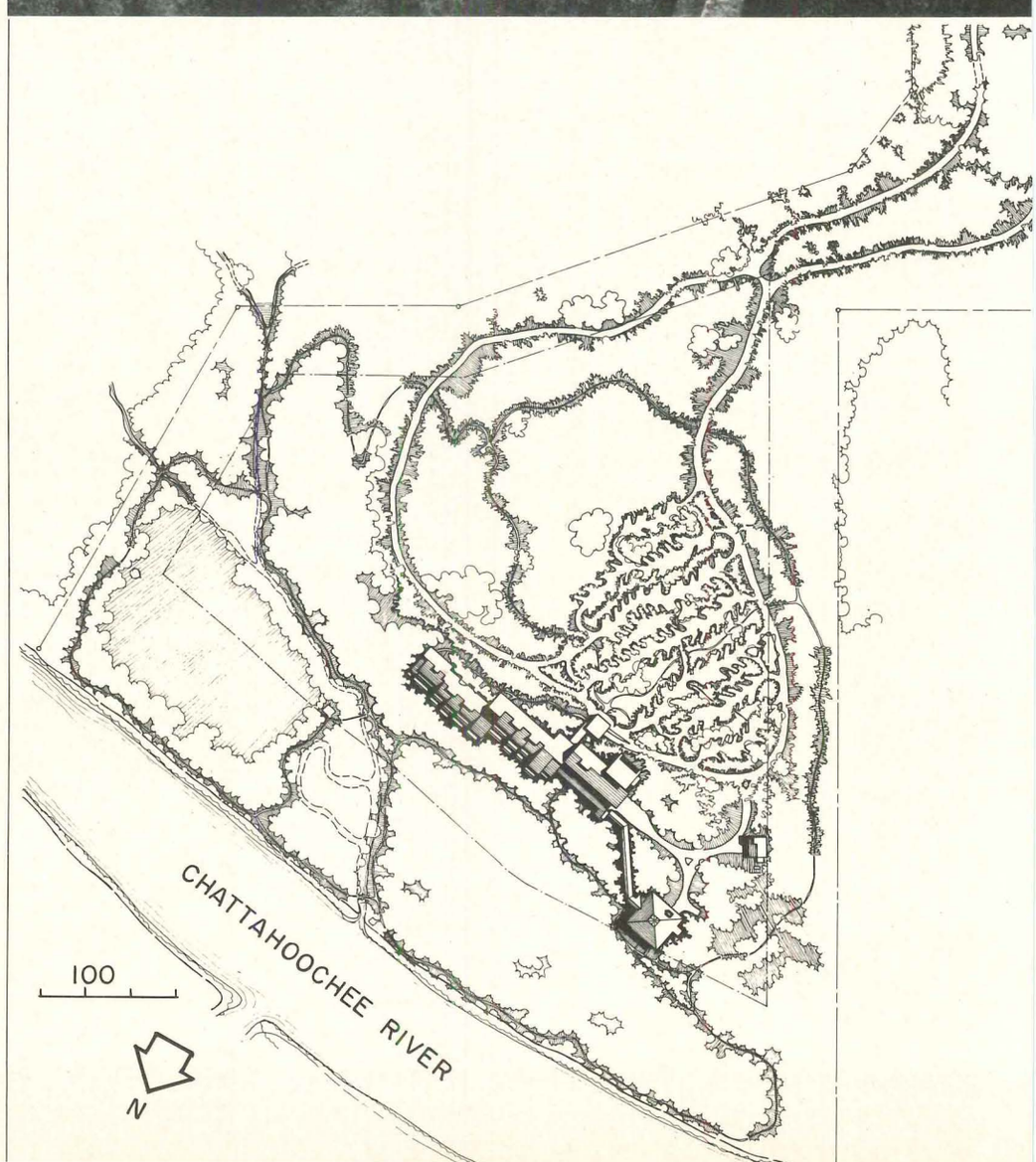
Until recently the Simmons Company, famous for its bedding products but in fact a diversified international company and a major manufacturer of home furnishings, had its headquarters on Park Avenue in New York, to which most of its executives commuted from the suburbs. The commute, it was reasoned, was wasteful of time and energy, just as the frenetic pace of the Manhattan business day was debilitating. And so Simmons decided to relocate itself on a large wooded site above the Chattahoochee River near Atlanta (and near its international airport), tethered to the outside world by telecommunications wires.

The new headquarters, according to Simmons' chairman Grant Simmons, was designed to be an "efficient work building" with "minimum impact on a heavily wooded, steeply graded slope." Accordingly, individual parking spaces (as well as the approach roads themselves) are slipped in among the existing trees, the building itself is sited, almost invisibly, 300 feet back from the river, but still below the crest of the hill, and raised on steel trusses in order not to interfere with the natural drainage patterns.

To minimize solar loading, the south or entrance elevation slopes outward, parallel to the worst sun angle, reducing the heat load in summer (which is the greatest energy problem in this climate) and allowing an extensive use of glass to provide views of the site from inside the building. On the north side of the building are all of the executive offices, each with its own terrace and its own view (see photograph, opposite page).

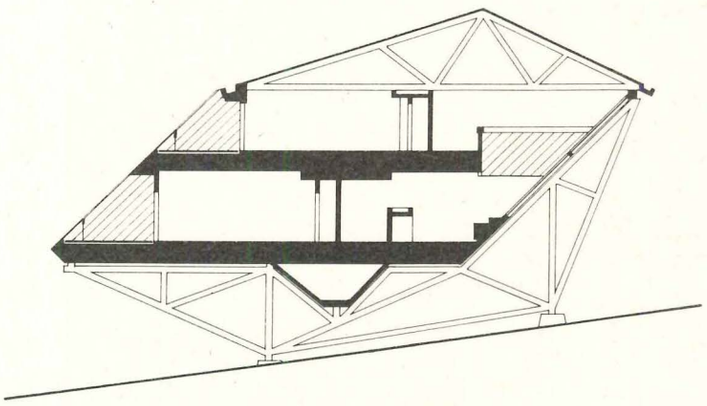
The steel trusses that support the building are low-maintenance weathering steel supported on concrete piers. Designed for similar low maintenance is the exterior red cedar siding, as well as the cedar shakes on the roof. Aside from the steel trusses, the building is framed entirely with heavy wood members.

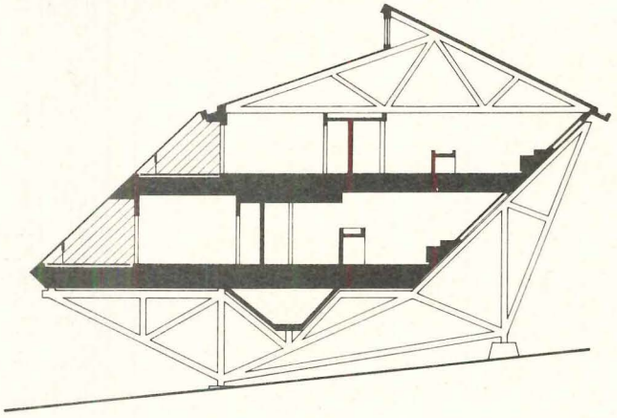
SIMMONS COMPANY JONES BRIDGE HEADQUARTERS, Atlanta, Georgia. Architects: *Thompson, Hancock, Witte & Associates, Inc.—chief designer: William R. Witte, project manager: Jessie R. Turner, III, job captain for dining room: Walter F. Pate, specification writer: James N. Davis.* Engineers: *William E. Edwards Structural Engineers, Inc.* (structural); *Soils Systems, Inc.* (soils); *Peters- Gupton & Associates* (mechanical); *Newman- Hibble & Associates, Inc.* (electrical). Consultants: *Virginia Petkas, Douglas Sackfield, David Poisal* (interiors); *Robert E. Marvin & Associates* (landscape). General contractor: *The Flagler Company.*

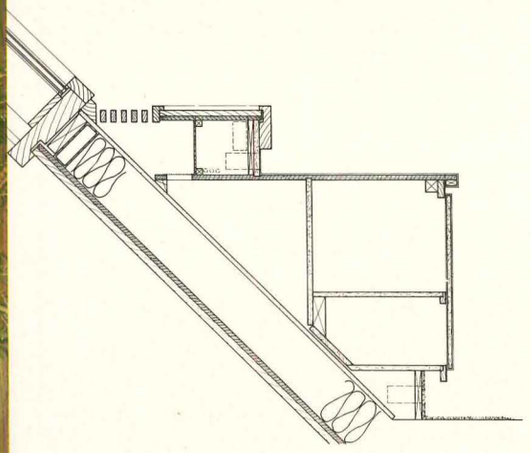


E. Alan McGee photos

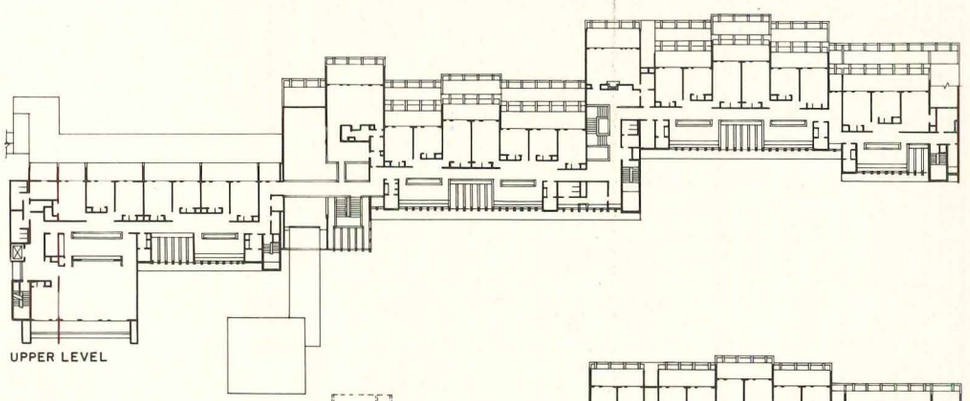
The photos left and below left show the main entrance pavilion to the Simmons headquarters, and the sections below show its basically two-story organization, with the long, linear space for mechanical equipment slung underneath. The large photograph on the right shows the eastern end of the building with its required fire stair—one of the few parts of the actual building that touch the ground.

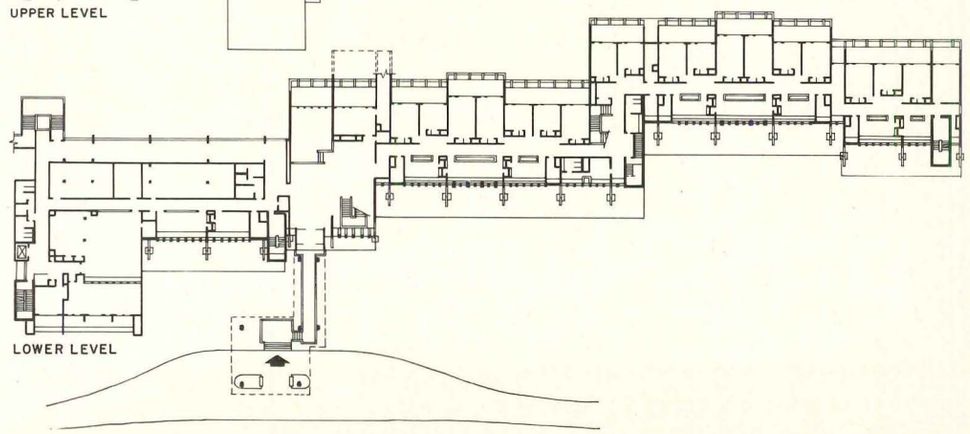


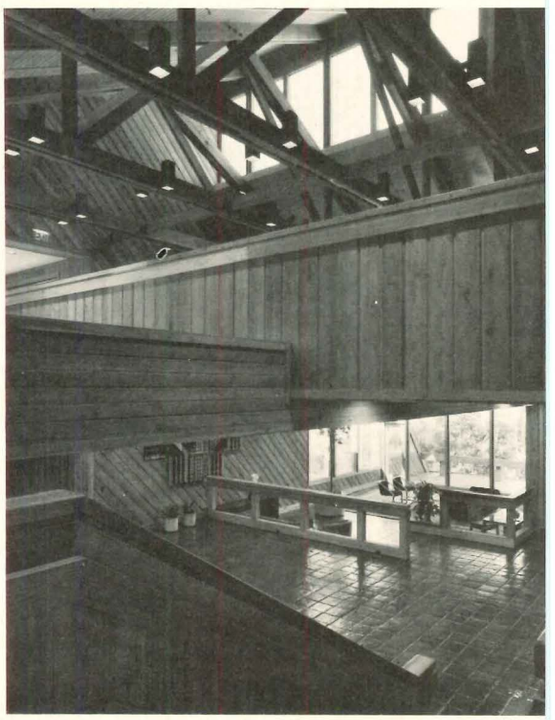




The main lobby of the Simmons headquarters is shown in the photo on the left, looking back from the waiting area to the entrance, and in the photo below, looking down from the stairway to the second level. The photo on the right shows a secretarial area adjacent to executive offices in a space that opens through the entire height of the building. Note how natural light enters from below and from the clerestory above.







Mixed-use in a single building is still a relatively new idea; the Galleria in New York explores this route toward more productive buildings

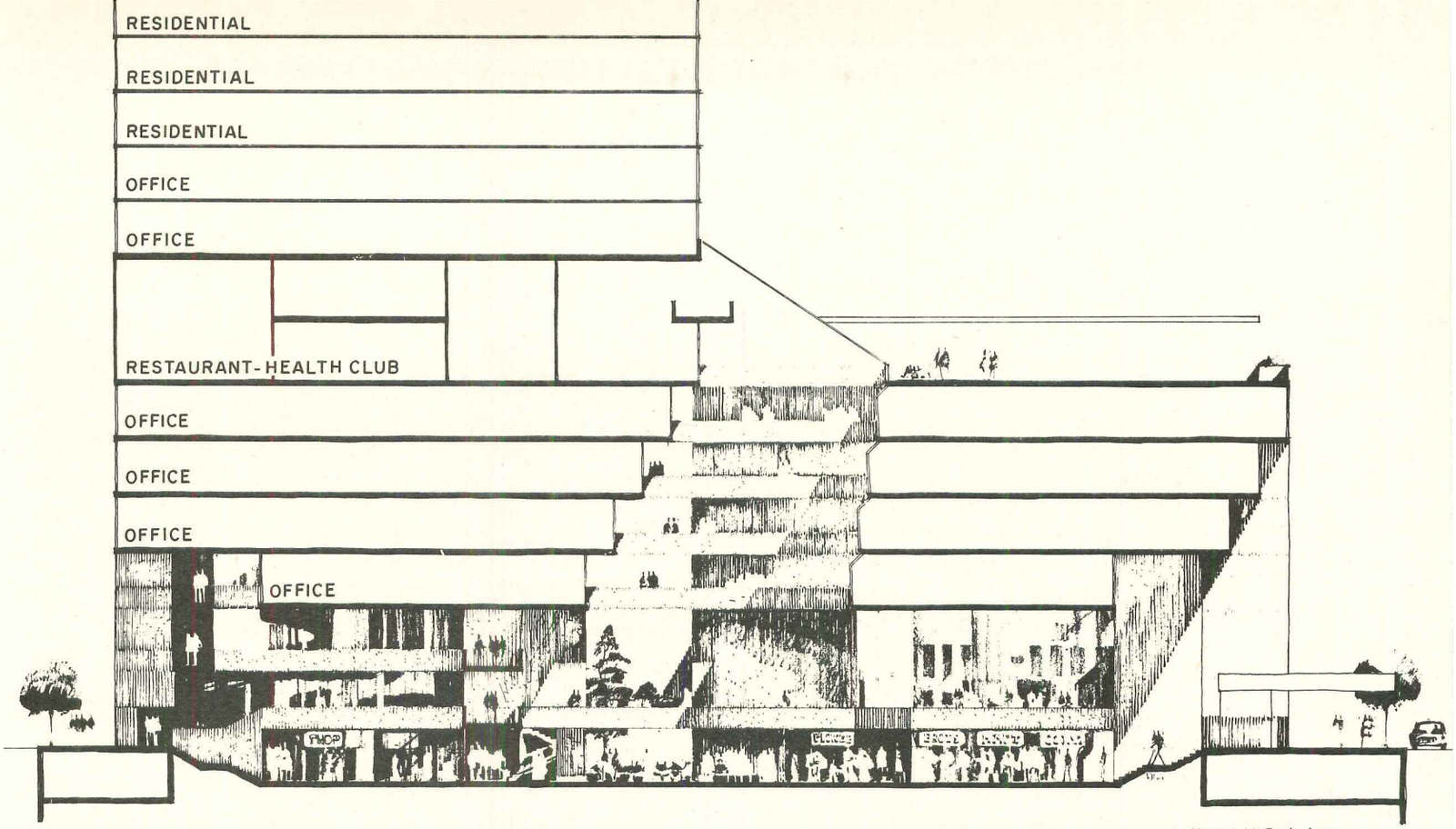
Rising amid a cluster of high-rises on a mid-block site in the center of Manhattan, Galleria is a bold experiment in mixed use, an offspring of incentive zoning that has in its chromosomes traces of Frank Lloyd Wright's Price Tower, New York's Olympic Tower and Chicago's Hancock Building. Like these others, Galleria represents an attempt to broaden and re-structure street activity in its district by combining commercial, office and residential usages in the same structure. At street level, architect David Specter has designed a through-block shopping mall that will be lined along its offset path with shops, boutiques and a small cafe. This multi-height arcade, skylighted from the south, is richly clad in granite slabs accented by bronze-colored steel channels that serve as scale-giving devices and important visual ligaments. The linear patterns these channels trace across broad and otherwise unrelieved planes of stone enliven the whole composition and help resolve the conflicting lines of force introduced by the canted entrance element.

Above the galleria and overlooking it are six layers of offices with an unusually handsome club with dining room (photo overleaf) sandwiched between. Rising for nearly 40 stories above the offices are condominium apartments that culminate in what will be an extraordinarily lavish, multi-level penthouse for philanthropist Stewart Mott—a penthouse, visible in the photo at right, that will include enclosed greenhouses for large-scale flower and vegetable gardening.

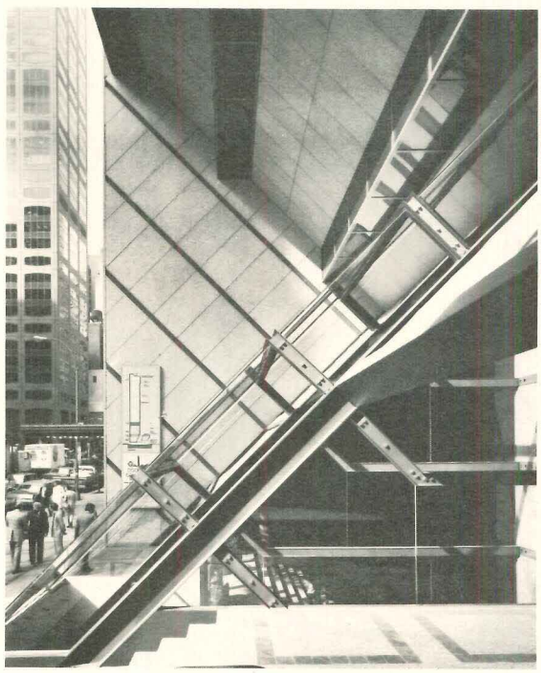
Set back from 57th Street but rising sheer from 58th, the gently articulated tower does not seem to shoulder aside its shorter neighbors. It takes its place in the skyline easily and unaggressively.

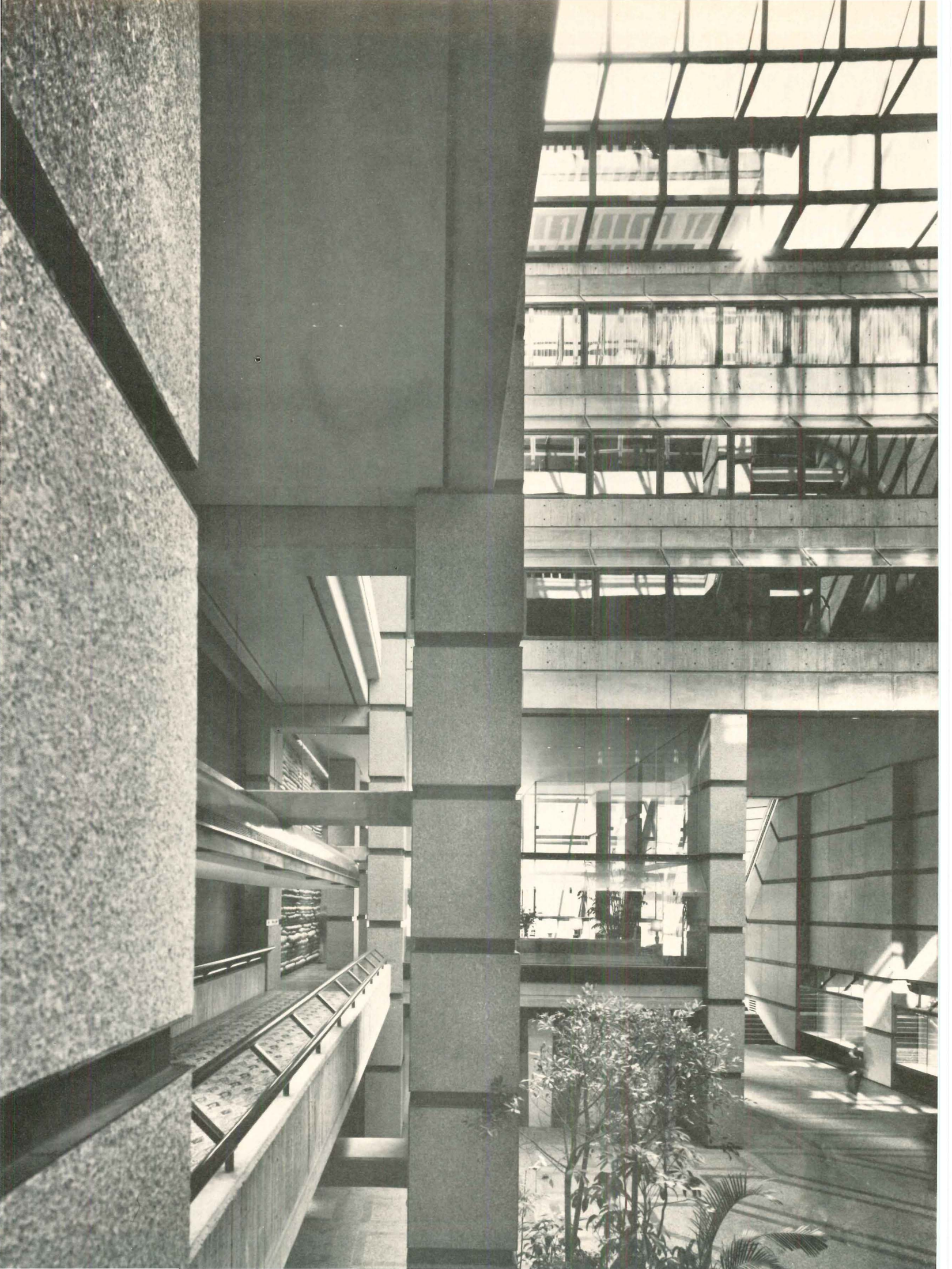
Whether the Galleria will get the heavy sustained use for which it was planned we cannot yet know. But if it helps to bring something that more nearly approaches 24-hour-a-day use to this important district, it will make a productive contribution to a city that, just now—and for the immediate future—needs all the help it can get.

GALLERIA, New York City. Architects: *David Kenneth Specter—Gerald L. Jonas, project architect; John Davison Allen,* duplex apartment designer. Architect for apartment residences: *Office of Philip Birnbaum.* Engineers: *Erwin Cantor* (structural); *Sidney Barbanel* (consulting); Interior design of club facilities: *Ellen L. McClusky & Associates.* Construction administrator: *H.R.H. Construction.*



Norman McGrath photos





The elegant dining facility (photo, right) is part of a club that includes saunas and workout rooms. The sketch (below) shows the galleria space itself where shoppers and strollers mingle with diners in a spatially stimulating and nicely appointed surround. The commercial space when fully rented, may include—in addition to a cafe—a flower shop, a delicatessen, a jewelry store and various boutiques. All will depend for their economic success on public support, not just patronage from within the building.

Atlantans have long been the beneficiaries of lively experiment in urban design; Colony Square continues that innovative tradition

During the seven years since planning began, Colony Square's designers have premised their work on the central theme that urban life cannot be full, varied and rewarding if certain physical criteria are not carefully met. Chief among these criteria is a generous mix of building types and, from the beginning, Colony Square has been a mixed-use project. Across its 12-acre, downtown site, the project includes townhouses and high-rise condominiums. It includes office space, a 500-room hotel, a shopping mall and landscaped plazas, a restaurant, a skating rink and three levels of below-grade parking. All these elements are sited in ways that make them share space and both the palette of materials and design vocabulary are selected with this unified theme in mind. Threading everything together is a series of landscaped courts developed with sensitivity and care—and enriched with art, through which users pass either singly or in groups without interference from automobiles or service vehicles. All parking and deliveries are confined to the levels below.

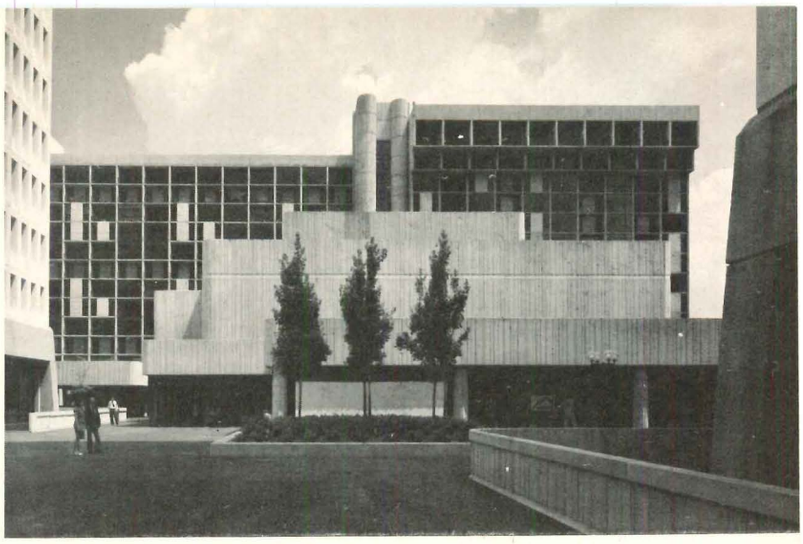
Achieving even the main points of a mixed-use credo is seldom easy. Existing zoning ordinances in Atlanta did not foresee a multi-use urban complex, so much patient dialogue with enforcement agencies was necessary before variances were issued. And the impact of the project on surrounding neighborhoods required detailed study and careful cushioning.

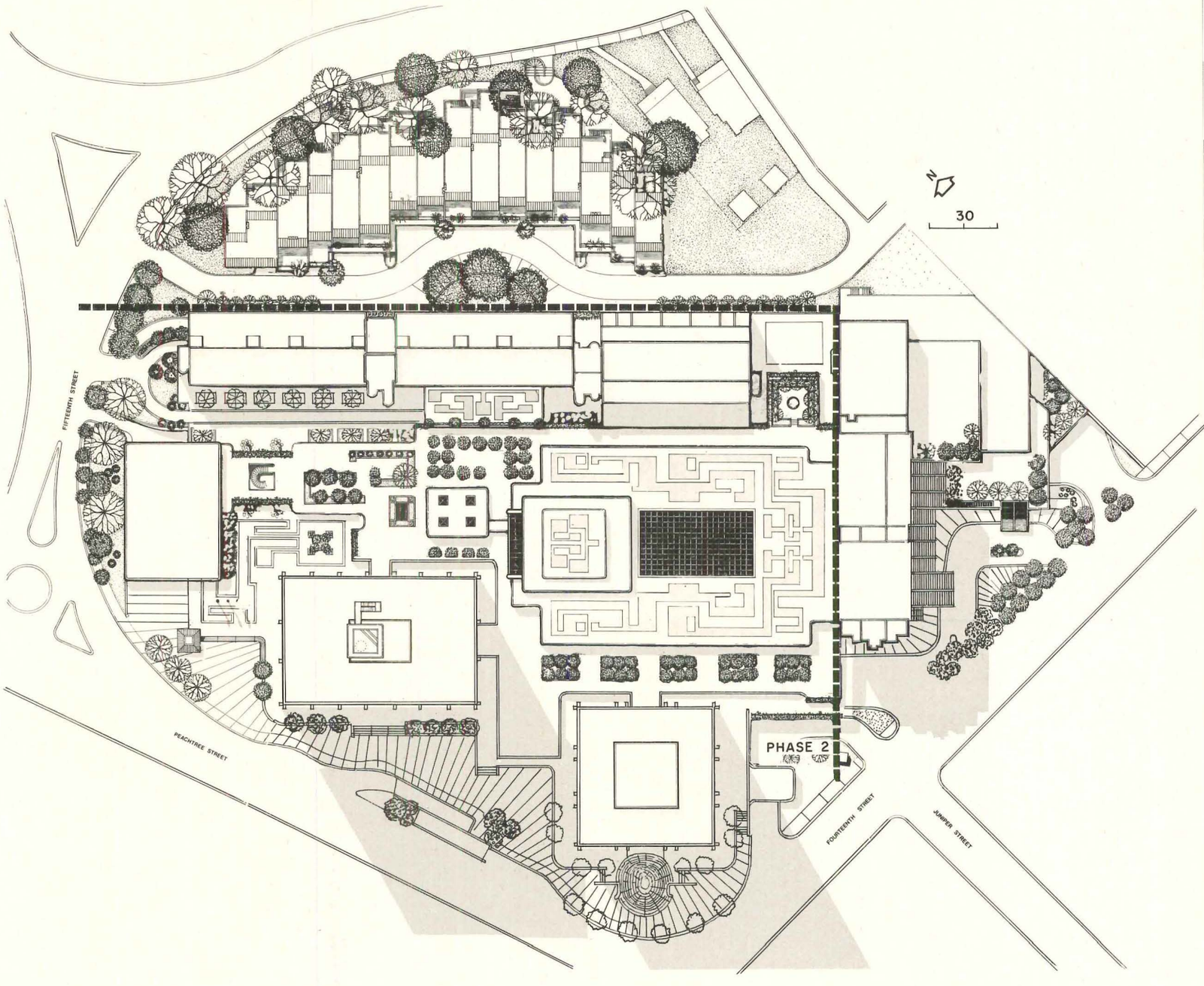
Colony Square, like so many current projects, has not been made exempt from the seventies. Caught in the credit squeeze, its financing has undergone revision recently and is still, at present writing, the subject of some uncertainty.

But what has happened here in Atlanta, and elsewhere, is that a group of buildings demonstrate that they can do more than meet their own individual requirements. Their overlapping functions have been made complementary and the amenities this situation creates provide one of the hallmarks of hard-working and distinguished urban space. More of the same would be welcome in cities large and small across the country.

COLONY SQUARE, Atlanta. Architects: *Jova Daniels Busby—Stanley Daniels, principal-in-charge; Brian Gracie, project coordinator; Joseph League, Jr., Robert Guinn, Kenneth Mattie, project architects.* Engineers: *Prybylowski & Gravino, Bennett & Pless* (structural); *Newcomb & Boyd* (mechanical). Contractor: *Holder Construction Company.*

E. Alan McGee photos

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FIFTEENTH STREET
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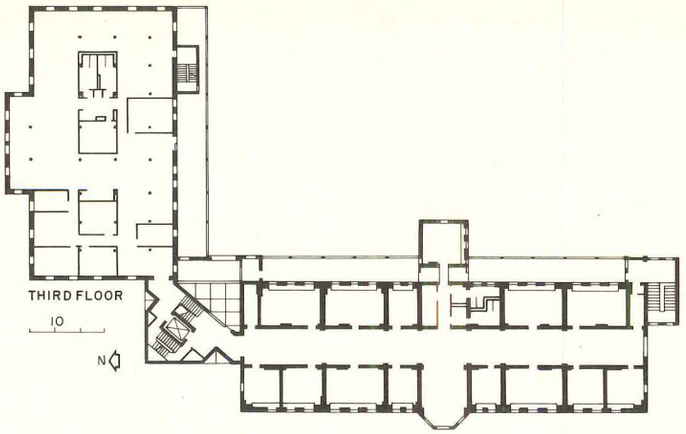
From hospital/poorhouse to office building/school: Federal interest in recycling bears fruit

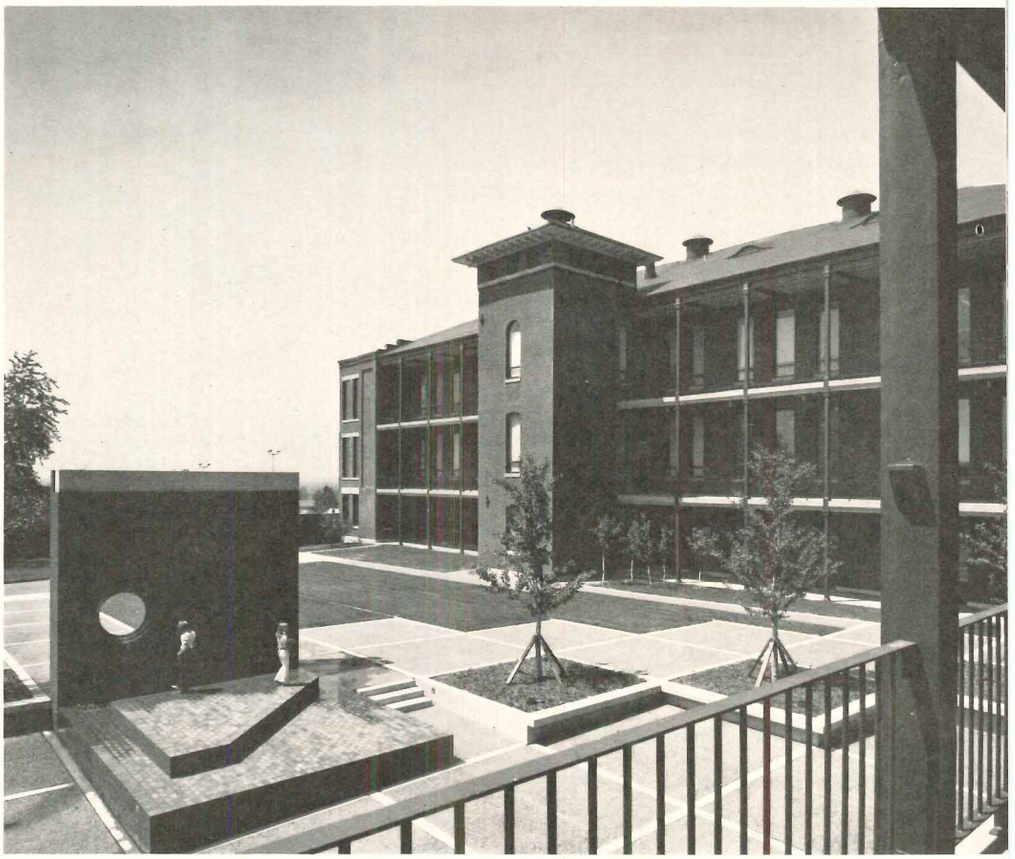


Located in St. Louis, Missouri, Cemrel is an institution devoted to speeding the results of educational research into widespread use in the classroom. As such, it functions partially as an innovative primary and intermediate-grade school where new principles and techniques can be observed in use in the fields of mathematics and esthetics.

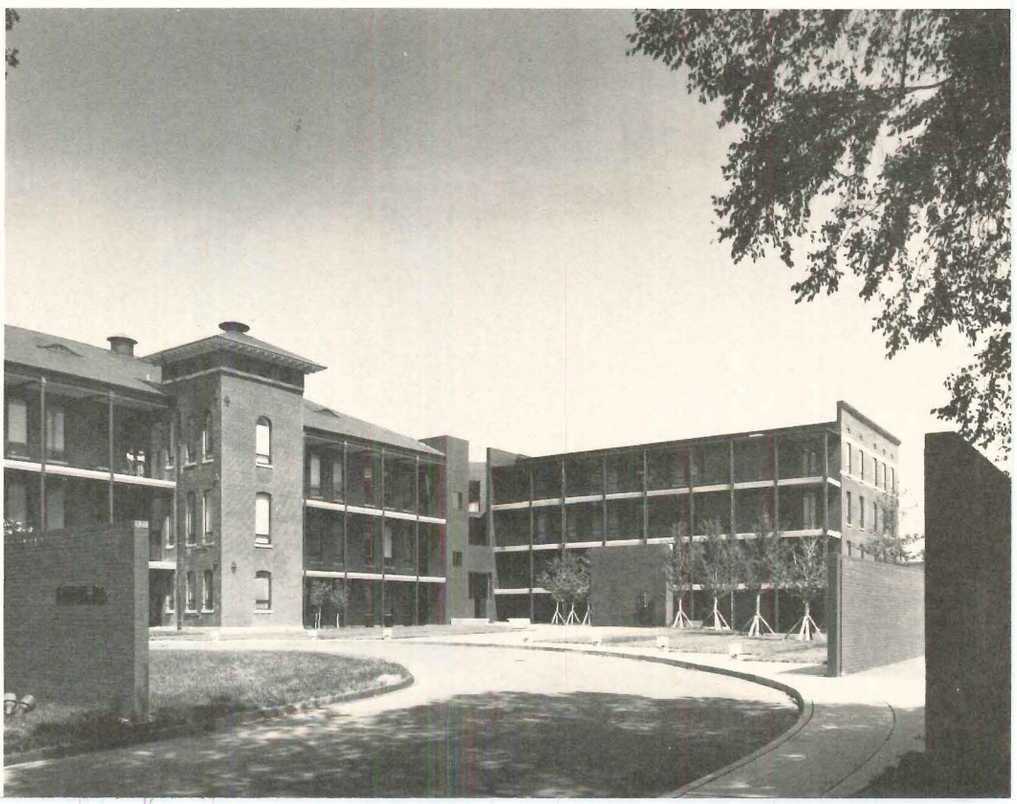
A Federal grant for a permanent facility specified that the building would be an existing one. After reviewing numerous possibilities, Cemrel staff members, along with architects Anselevicius/Rupe/Associates, settled on the two abandoned hospital buildings of the City Poor House, built in 1900 and 1903. While Rupe originally estimated that the existing buildings of 72,000 square feet might be worth $10 per square foot, the undesirably derelict property, including eight acres of land, was finally purchased for $325,000. It was rehabilitated and added to for $25 per square foot—not including extensive site work, landscaping and fees—but including all new utilities, an elevator and air conditioning. And while the estimated savings were $10 per square foot over a minimal new building, the obtained qualities of visual interest, structural solidity and the lofty spaces would certainly have cost much more than that difference in a new building. The staff is delighted with the results. The two buildings were united by a new vertical circulation tower (photo, opposite) containing the main entrance from a court created by the buildings and new walls.

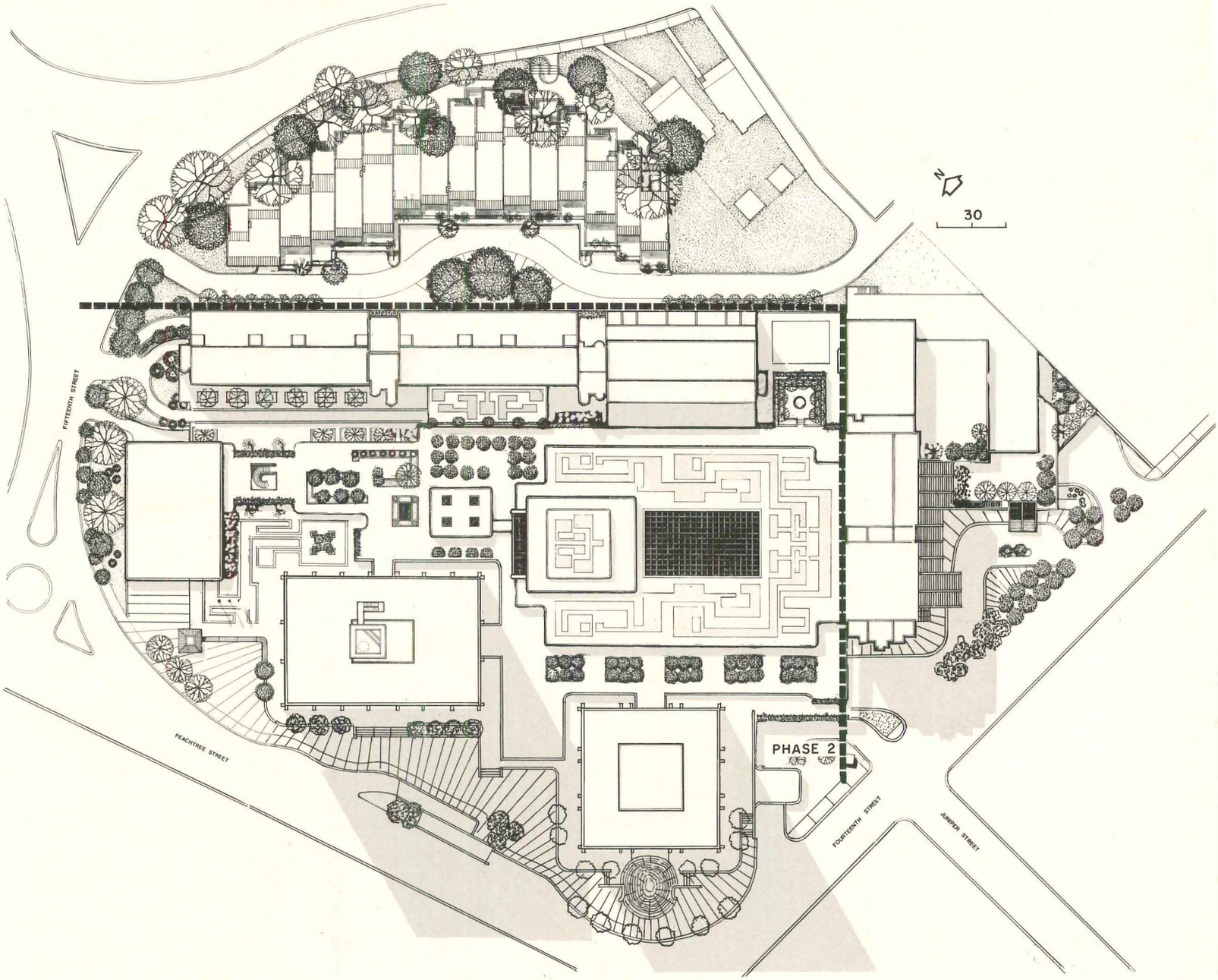
Cemrel obtained their "new" building in a year and a half from selection to occupancy. Because the grant also specified that construction had to begin before the end of the fiscal year, demolition of unusable plaster, partitions and existing utilities proceeded while design work was done and the general-construction contract let. Rupe cites two benefits besides speed from this process: an estimated $80,000 saving over inclusion of demolition in the general contract, and the ability to see conditions and problems revealed before design work was finalized. Preliminary research was also accommodated by a separate contract.

CEMREL, INC., St. Louis, Missouri. Architect: *Anselevicius/Rupe/Associates—project architect, John A. Kreishman.* Engineers: *LeMessurier Associates, Inc.* (structural); *Golder-Gass Associates* (foundation/soils); *William Tao & Associates* (mechanical/electrical). Consultants: *Lyle Yerges* (acoustical); *Carolyn Nuetzel* (interiors). Landscape architect: *George Dickie.* General contractor: *Robert Wright, Inc.*



Robert Pettus photos except as noted

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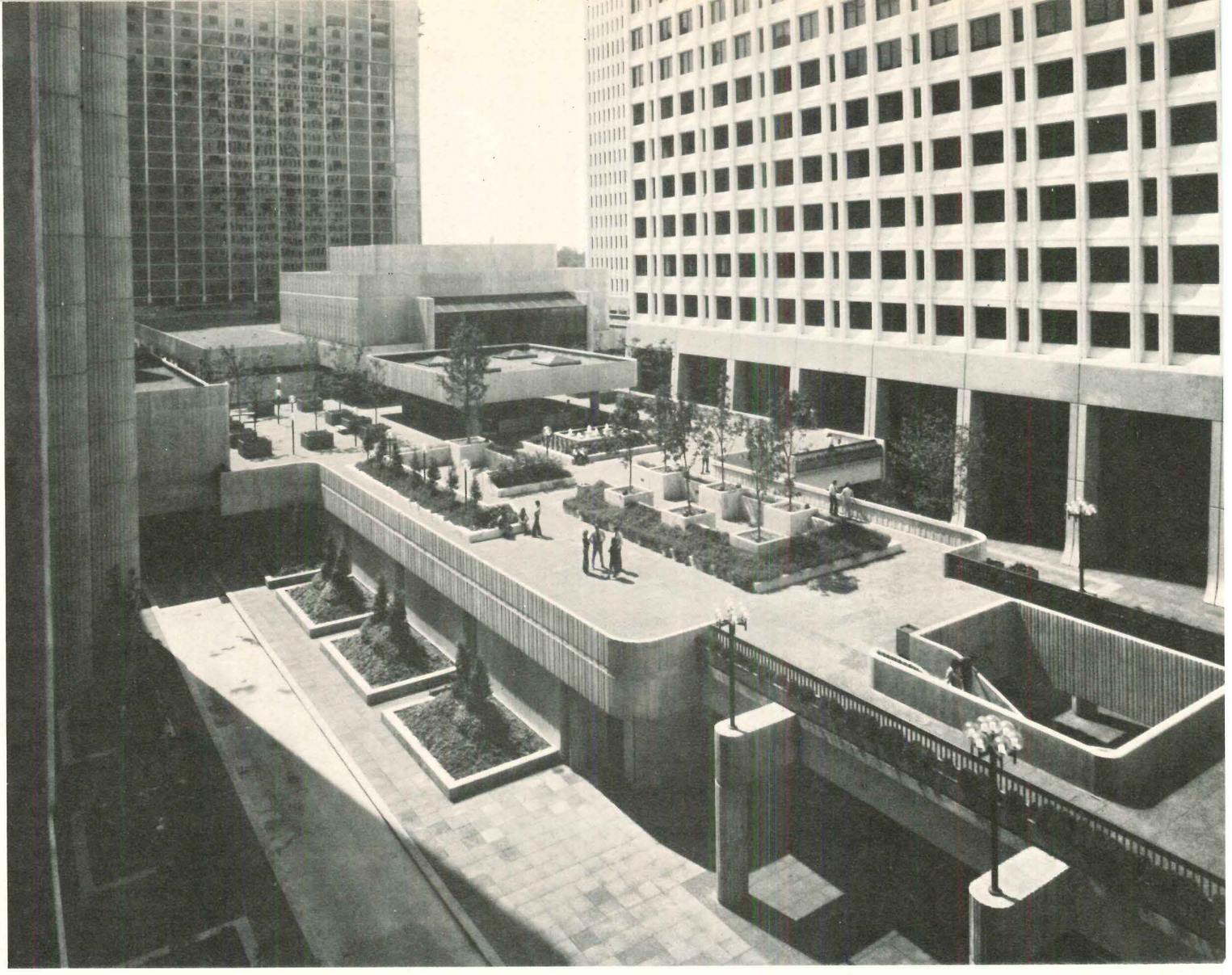

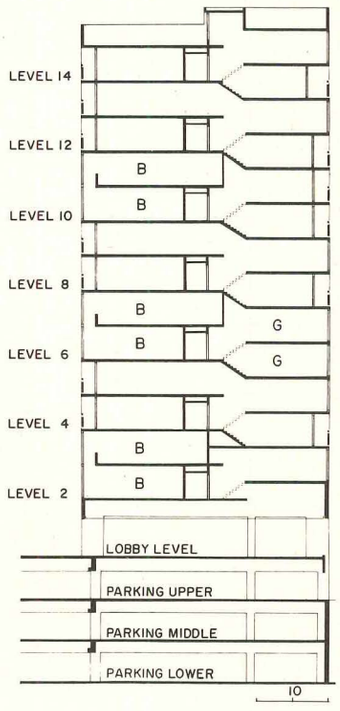
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PARKING UPPER
PARKING MIDDLE
PARKING LOWER
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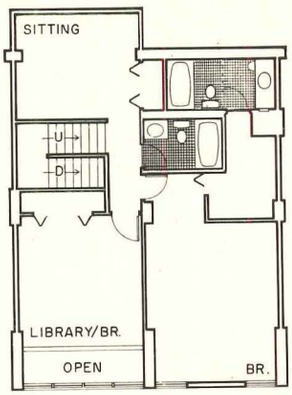
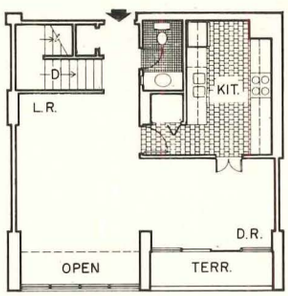
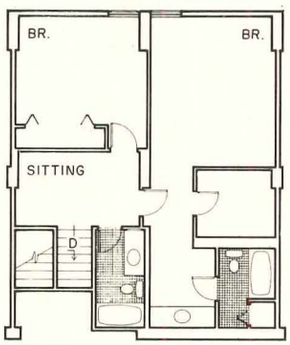


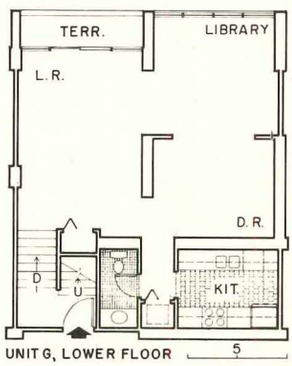
UNIT B, UPPER FLOOR



UNIT B, LOWER FLOOR

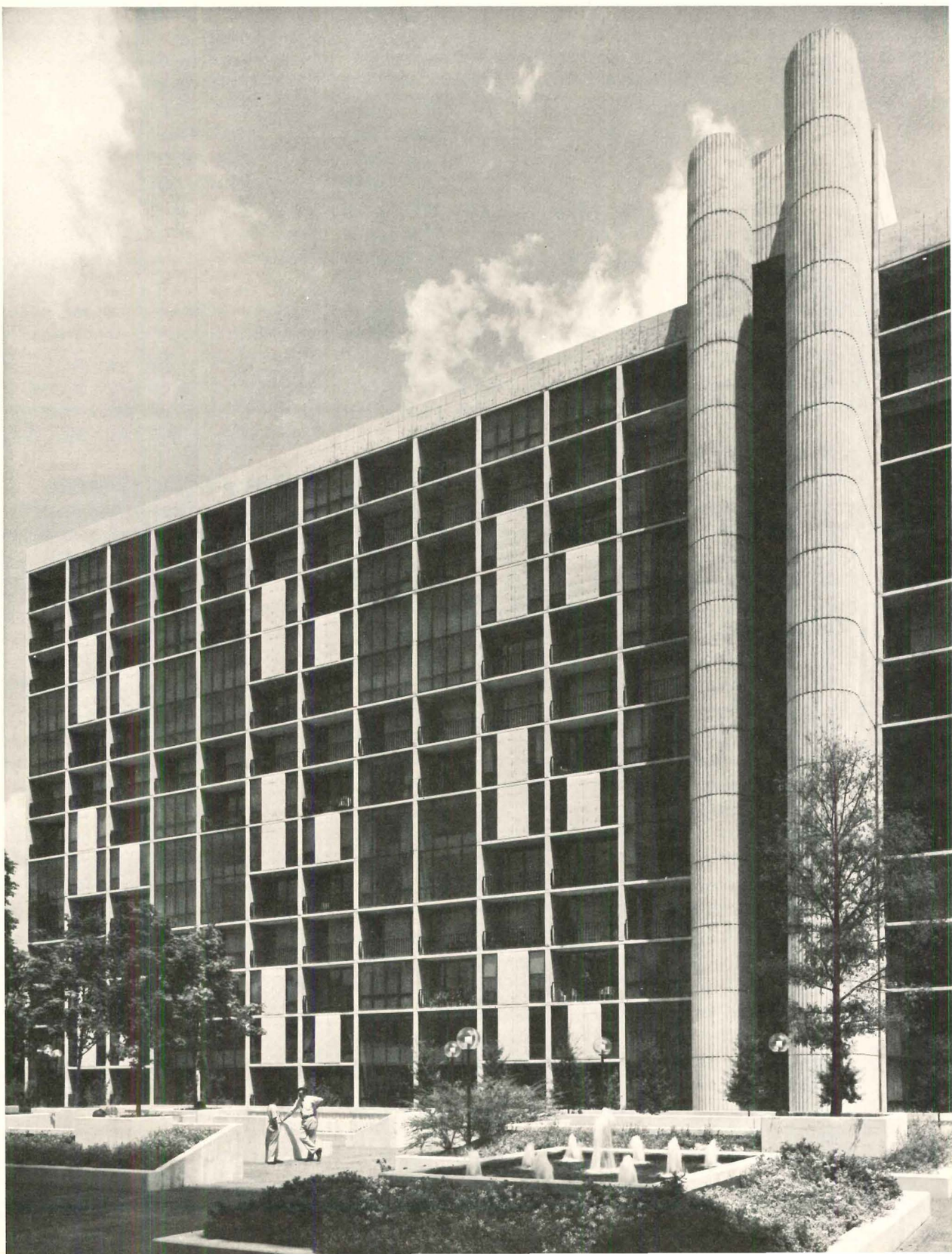


UNIT G, UPPER FLOOR



UNIT G, LOWER FLOOR

The section (opposite, left) is taken through Colony house, the project's 14-story apartment tower. Because of its unusual skip floor design, a wide variety of duplex plans are available, each with easy access from a double-height elevator lobby. Typical apartment plans (type B and G) shown (above), are located on the structure's sixth floor.



More for less: designing low budget buildings with carefulness, thrift and economy of means

by Earl R. Flansburgh, FAIA

The search for economical construction systems, cost-saving uses of materials, practical building details, timesaving construction processes and square-foot saving, multi-use space relationships and configurations goes on. Architect Earl R. Flansburgh of Earl R. Flansburgh and Associates, Inc. in Boston, believes that if "less is more," "least is most" (see box page 66). The firm is noted for its excellent low-cost schools—a building type for which relentless cost cutting must go hand-in-hand with high design and performance standards. In Flansburgh's office, the cost of construction for every school is continuously assessed from the programming and design stage through bidding and construction. In the article that follows, Flansburgh tells how this cost monitoring affects the design and building process—a scenario appropriate to any building type. Included are case histories of eight schools shown chronologically to reflect the growing design sophistication of his firm.—M.F.S.

Having worked in the public sector since the founding of our firm in 1963, we have almost always been involved with projects with substantial budget restrictions. We have tried to develop a number of techniques for creating "more for less." Some of our experience makes use of obvious economic principles, other approaches use more sophisticated techniques. All of our experience in cost control, although applied principally to the construction of public and private schools, has application to all building forms.

When we discuss cost we look at a project from the clients' view, that is the total project cost, not simply the cost of the building. This means including the cost of site development, the building, furniture and equipment, professional fees, the owners' miscellaneous costs and the project contingency expense in all our budget presentations, including the very first. One project solution, which may be developed around an inexpensive building design, may require extensive and expensive site development to make the inexpensive building possible. A project with an extraordinary amount of built-in furniture or casework may reflect a high building cost that in the total project cost is offset by savings in the furniture budget. In today's economy, in addition to the construction budget, we also must give considerable attention to the current and projected operating costs including estimated heat loss. Economical building configurations to reduce operating costs must be found.

To provide more architecture for less we are not necessarily talking about cost reduction. We may simply be talking about better allocation of project funds. If inadequate attention is paid by the architect to the character and cost implications of the project site, he may bury a substantial part of his budget in expensive foundations. The allocation of those funds to finish materials that are visible as opposed to unnecessary invisible foundations caused by insufficient site analysis can help to produce more architecture for less.

In an inflationary economy, cost stability is even a form of cost reduction in constant dollars. Cost stability may be achieved in a number of technical ways to be described. It can also be achieved by increasing the speed of project construction. This may be achieved through early site contracts that prepare the site on a large project while architectural working drawings are being prepared. Increasing construction speed is usually achieved by a variety of "fast track" construction methods now common on many projects. It is important, however, in assessing the success of fast-track techniques, to separate the savings achieved by a reduction in the contractor's normal overhead caused by a reduction in the normal construction time, from savings achieved by the advanced ordering.

Technical skill and innovation

Cost control through technical skill and innovation involves such simple ideas as the use of repetitive windows and doors. More complicated, but equally effective in terms of cost control, is the development of economical mechanical, electrical and plumbing systems. Economy can also be achieved through the pre-fabrication of various elements including exterior wall enclosures, structure and partitions. This leads to the industrialization of as many of the components as possible to produce a totally prefabricated construction system that uses flexible components, rapidly constructed. This industrialized system, as reflected in the BOSTCO systems program developed for the city of Boston (pages 88-89) allowed the construction of schools to be faster, better and cheaper. In Boston this meant: Faster—two $4 million demonstration schools built in 13 months; better—the components have substantial flexibility and many capabilities not found in normal school construction; cheaper—the two demonstration projects cost approximately six per cent less than comparable schools built in Boston.

Creative planning

No matter how skilled we become in the economical use of materials and the development of an architecture that reflects this understanding of economy, space still costs money. The better use of space by skillful planning can have a dramatic effect on project cost. Such planning begins with a careful analysis of the program before a single, preliminary line is drawn. These planning economies range from the simple use of repetitive plan configurations to the very sophisticated development

of plan alternatives through computer simulation (page 95).

One aspect of planning economy that is frequently overlooked is the joint use of space. By reducing the amount of area that must be built in a building, the cost can be reduced or funds may be made available for other purposes. In recent years, open planning in schools has allowed for the double use of space, coupling interior room circulation and general circulation. Because of the flexibility of open planning and the availability of sophisticated audio-visual equipment, the need for auditoriums in many schools has been reduced, although the television screen is no substitute for the human experience of a large gathering. When we have provided large auditoriums, they are often made divisible into lecture rooms, reducing the space requirements for lecture spaces and increasing the utility of the large assembly areas. A similar double use of space can be achieved by substituting a field house for multiple gyms.

Although much has been made of planning economies that can be achieved by reducing support spaces, such as heating by electric heat with no boiler room required, instead of oil or gas with a large boiler room, the fluctuating cost of all utilities makes the reliance on any truism in this area very difficult. One truism that is constant, however, is that the less circulation space you build, the less you will have to pay for, regardless of the method of heat (and/or cooling).

The use of air conditioning, especially in large buildings, has created planning opportunities that are frequently overlooked by architects who are accustomed to dealing with projects where air conditioning, expecially in northern climates, may be considered a luxury. If air conditioning is a given, the plan form assumed by a building can frequently generate more savings than all of the other approaches listed above. The efficiency of a planning form assumes the ultimate economy in the program, in the structure, and the HVAC. Exterior wall area and interior circulation space must be minimized, consistent with the requirements of the building's program. By selecting a plan configuration that best accommodates the program, taking advantage of air conditioning that allows more usable interior space, we are producing the maximum architecture within available funds.

There are two final points that I would like to make: The first is that we can spend a great deal of time talking about saving money, but there is one aspect of saving in the process that is extremely important. This concerns bidding. The more bids that you have, obviously the greater the competition, and usually the better the price. One way that we have found to stimulate competition is the personal notification of subcontractors and general contractors. In addition to vigorous local soliciting of bids through newspapers and *Dodge Reports,* we contact over a period of several weeks sub-contractors and general contractors whom we have used before. The result is that contractors pick up their plans in a timely fashion and we get good competition. Often the difference between the first and second bid or the third and fifth bid is only a matter of $50 or $100. This is because the contractors have had enough time to figure the job properly.

The second cost saving affects only public projects. The architect needs a broad picture of the cost of building a building. Having chipped away at the pieces of the cost of a building by simplicity, repetition, improved process and organized project development, the architect still needs a broad view of the entire cost saving picture. He may save five or 10 per cent and present a true cost of each phase. In the cost of financing the total project, however, the normal interest on 20-year bonds is an additional 40 per cent above the total project cost. If interest cost can be lowered, a significant saving can be made in the total cost to the taxpayer over the life of the bonds. Borrowing for 10 years instead of 20, for example, can save approximately 20 per cent of the total project cost. In a $10 million project with $4 to $5 million for interest above the $10 million project cost, the saving could be $2 to $2.5 million.

A shorter borrowing period, of course, represents a higher annual increase in taxes but for a shorter period. This may be acceptable in some communities because of the saving in total tax dollars over the life of the project. There is a publication by the Educational Facilities Laboratories of the Ford Foundation called "A Guide to Alternatives for Financing School Buildings" that discusses this problem in detail.

To sum up, cost savings can be achieved by reducing interest through borrowing for 10 years instead of 20, by seeking more careful bids from contractors by informing them early, by creating more interior space made usable by air conditioning, by minimizing circulation space and exterior skin, and by use of standardized windows, doors and structural framing or prefabricated building systems. Further savings can be achieved by the better allocation of construction funds, improvements in the scheduling of construction, and by the more careful analysis of project requirements with a view to the saving of built space. All this has made one principle more important today than it ever was before: Architecture is a team effort. The architect and all necessary consultants must work together from the beginning of the project. If it is possible, the owner or his representative should be a part of this team so that he not only appreciates the architecture but also understands it. It is only through this group effort that cost control can be achieved.

Case study 1: South Natick Elementary School Natick, Massachusetts (completed 1969)

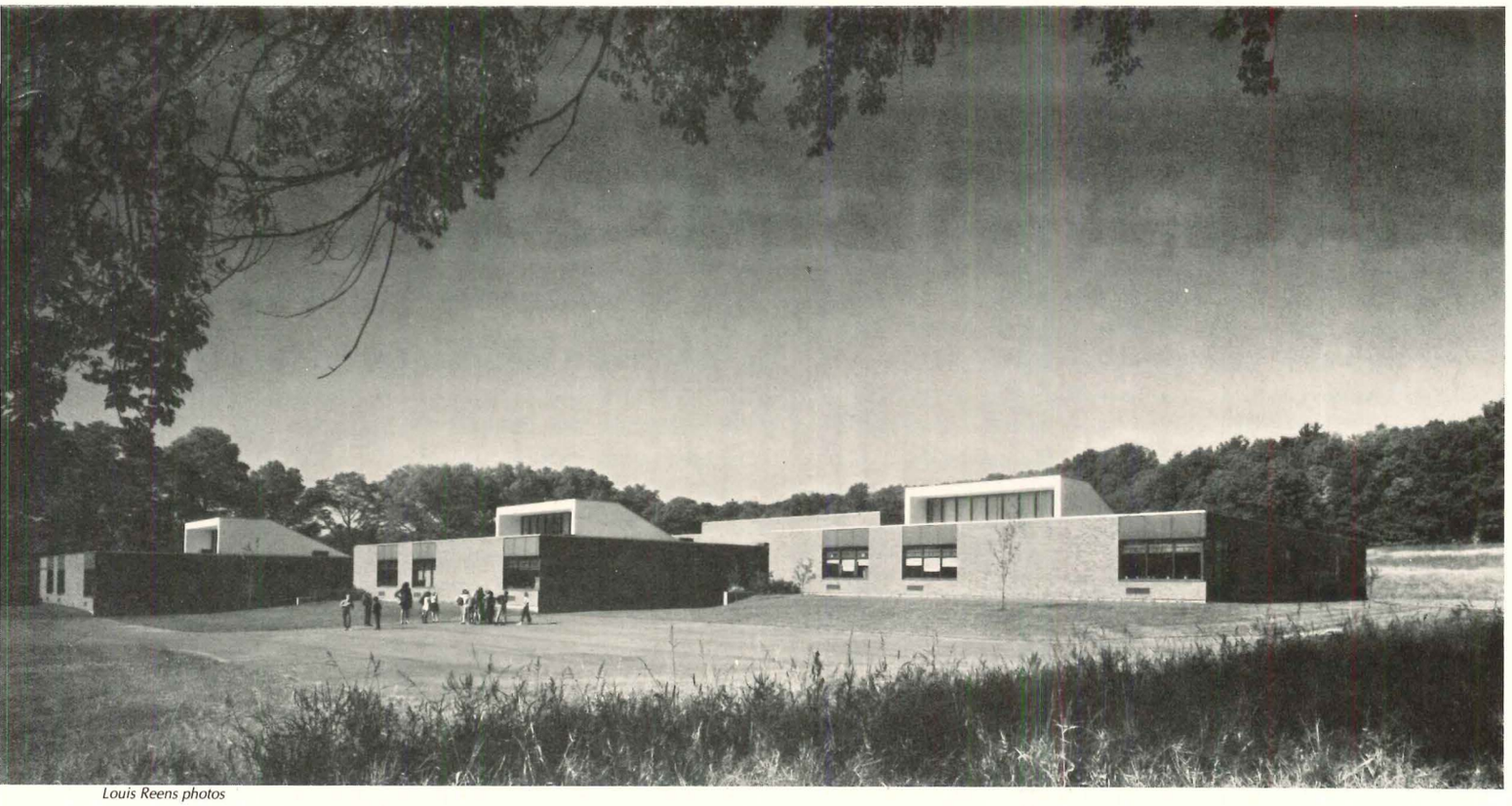
Technical efficiencies: A simple repetitive structure is used in the classroom clusters, which is not only economical, but esthetically effective in its cluster grouping and massing of simple blocks. Two window configurations using the same stock frame are used for the entire school.

Planning efficiencies: The circulation area for the classroom clusters is part of the project space so that the space has double use: circulation and student projects. The project areas are effectively skylit. This double space use saves approximately 100 square feet per classroom in the entire school. This school also has a combined lobby space for the physical education facility, the auditorium-cafeteria, lecture room, library and the school. The lecture hall space has vinyl tile on its main floor level to enable it to double as a small gym.

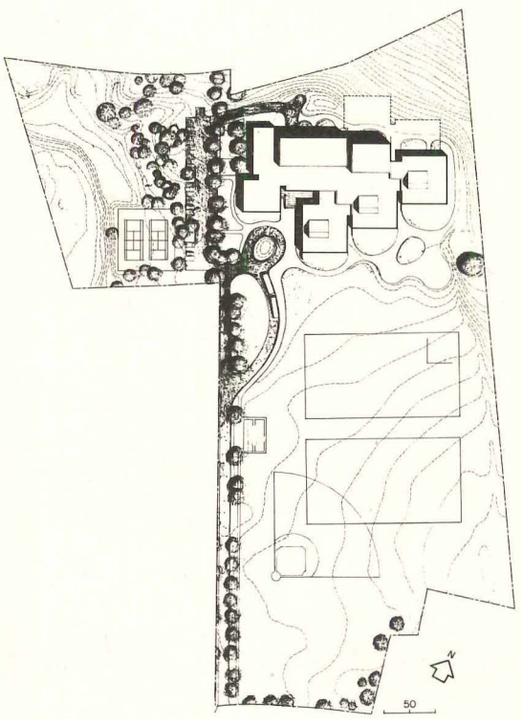
Possibly the most dramatic planning efficiency was in the use of the site. There was little money available in the budget for landscaping so the entrance to the site was placed at the extreme edge of the property along an existing stone wall to take advantage of the fact that the rows of trees normally found at property edges in rural New England were here spaced sufficiently apart to accommodate an adequate entrance driveway. Thus, for no additional cost, this school is approached through an alley of mature and handsome trees.

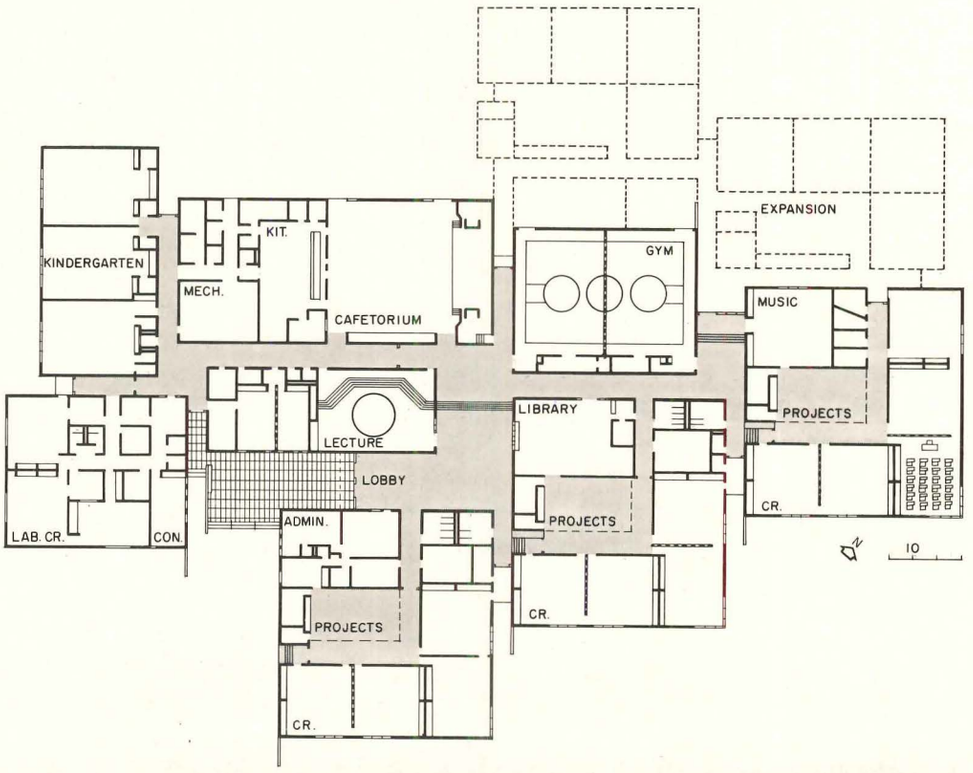
Locating the school at the rear of the site had the additional advantage of freeing level land for playing fields.

Architects: *Earl R. Flansburgh and Associates, Inc.—partner-in-charge: Earl R. Flansburgh; associate: Gregory Villanueva; job captain: Jane Weinzapfel.* Consultants: *Souza and True* (structural and mechanical); *Mason & Frey* (landscape). General contractor: *A. Mason & Sons.*



Louis Reens photos





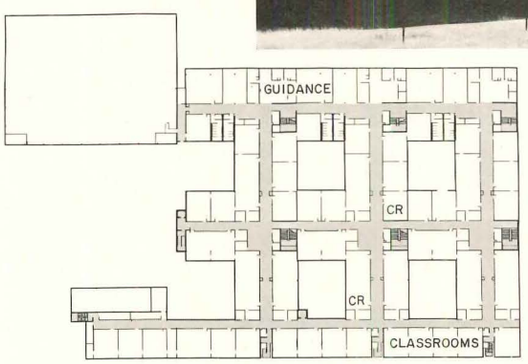
Case study 2: Veterans' Memorial High School Peabody, Massachusetts (completed 1972)

Technical efficiencies: The Peabody High School has repetitive structural bays and repetitive standard double-glazed window units throughout the major portion of the school. The siding was erected at a rate of 40 linear feet per day. The rapid erection of siding and the repetitive window frames of this building allowed this school for 2000 students to be started April 1st of one year and occupied in September of the following year. The structure in the Peabody High School is more regularized than the Burlington High School (pages 90-91) and is pointing toward the rationalization that reaches its zenith in the Marlborough High School (page 95).

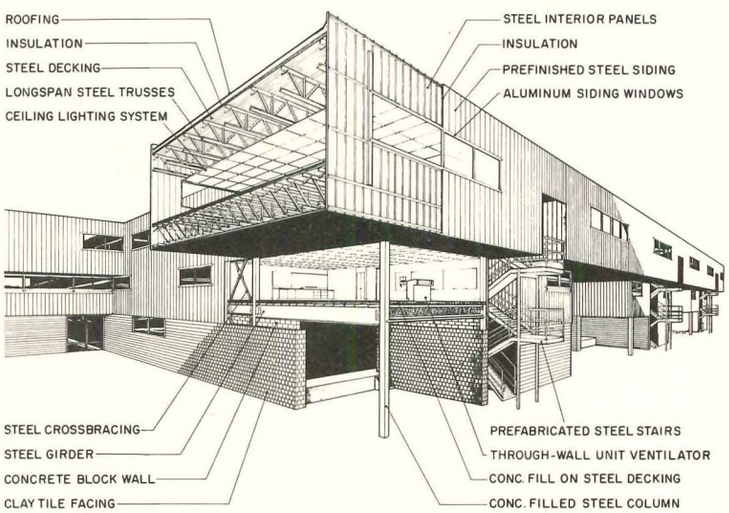
Planning efficiencies: Courtyards provide a human contact with the sky and trees and allow the mechanical system to exhaust directly to the outside without ducts. Because the exterior wall is stepped out, the mechanical system can vent directly down through the slab, saving the cost of expensive grilles going through the vertical exterior wall.

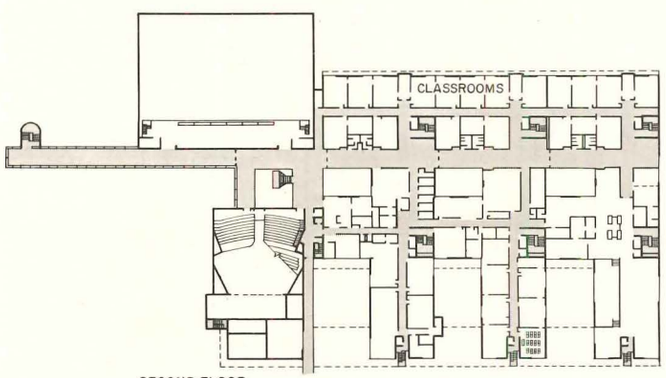
The 800-seat auditorium is divisible into three smaller lecture halls. A 20-foot-wide pedestrian "street" along the second level (the heart of the school which contains the administration space) allows the complete emptying of the school at normal dismissal in less than five minutes. It bridges the roadway to a bus loading stand.

Architects: *Earl R. Flansburgh and Associates, Inc.—partner-in-charge: Earl R. Flansburgh; project architect: Allen M. Lieb.* Engineers: *LeMessurier Associates* (structural); *Golder-Gass Associates* (foundations); *Francis Associates* (mechanical/electrical). Consultants: *Cambridge Acoustical Associates* (acoustical); *Mason & Frey* (landscape); *Leslie M. Buckingham* (costs). General contractor: *Fontaine Bros.-Walden Construction Co.*



THIRD FLOOR





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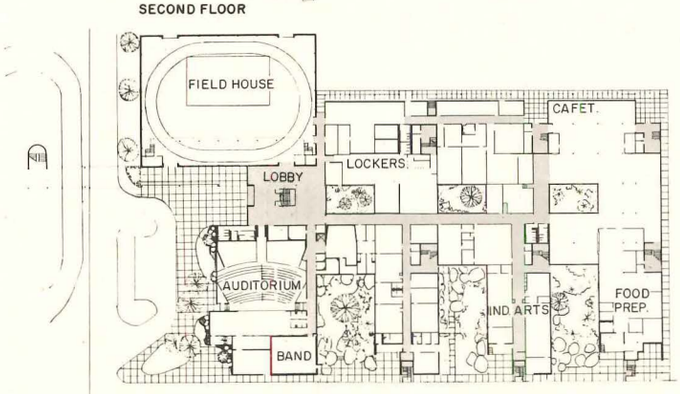
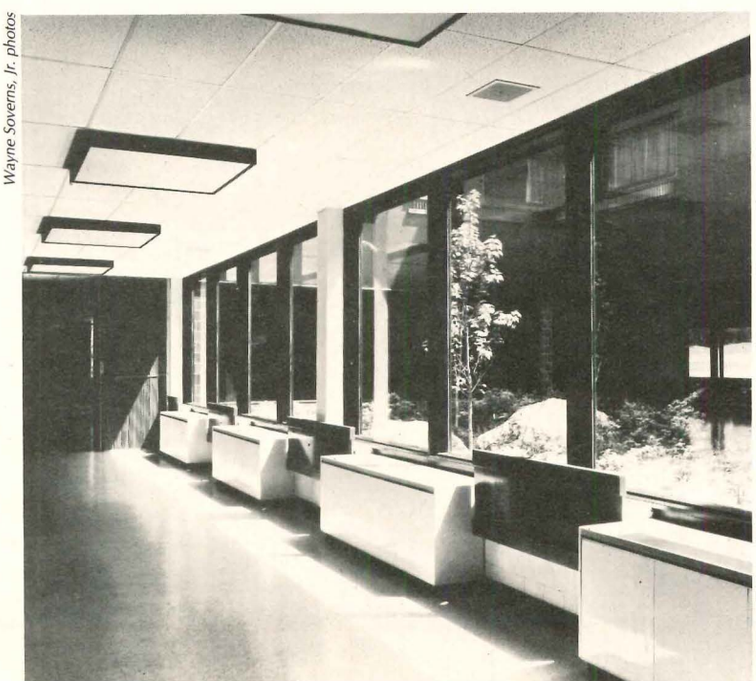


FIRST FLOOR

Wayne Soverns, Jr. photos



Case study 3: BOSTCO Track 1 Boston, Massachusetts (completed 1972)

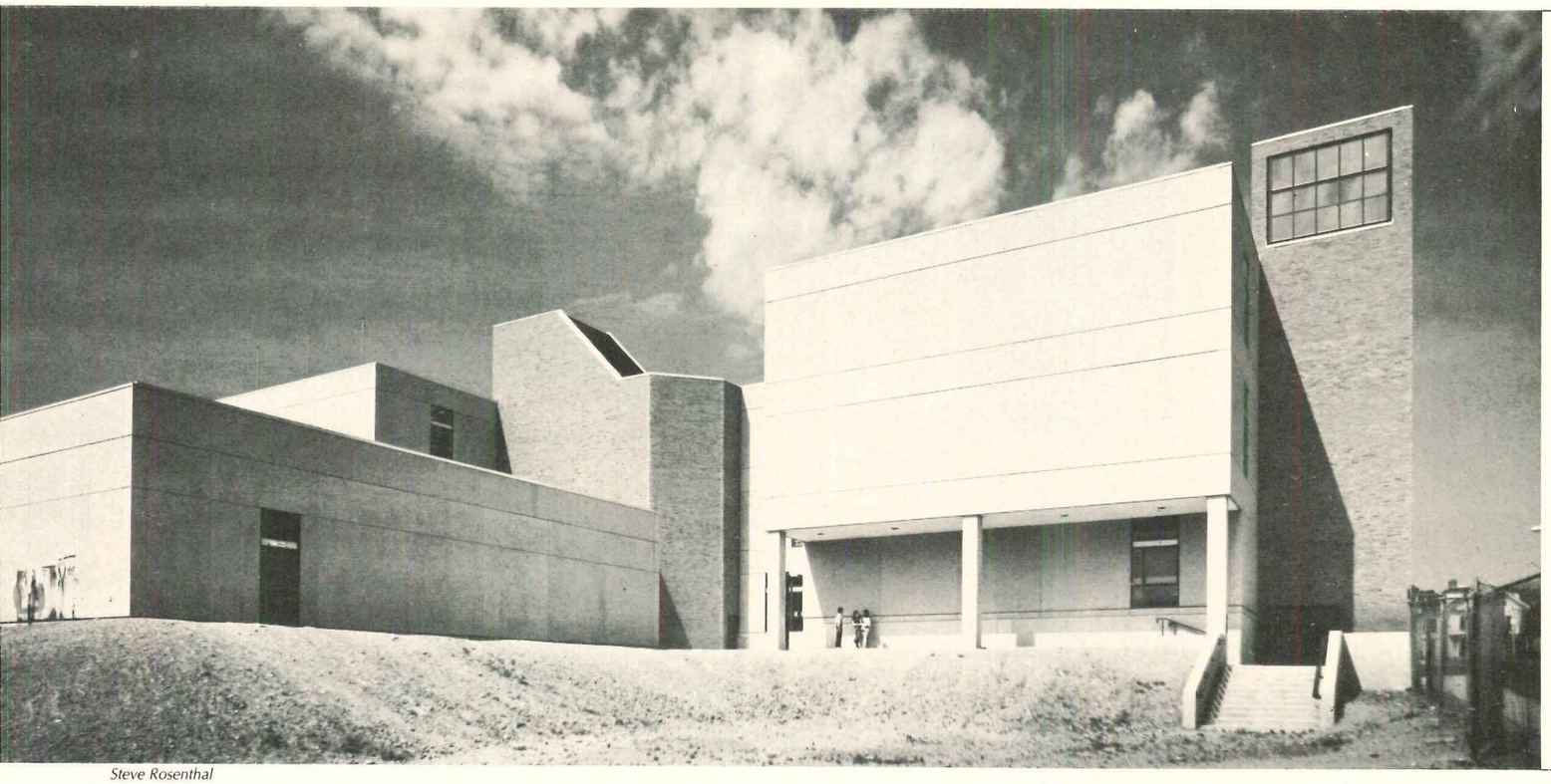
Technical and planning efficiencies: The BOSTCO Track I systems program, developed for the Public Facilities Department of the City of Boston, benefited from the experience of earlier experiments—especially the SEF program in Toronto. It was developed by Environmental Systems International, a common enterprise involving Earl R. Flansburgh and Associates, Inc. and Robbie, Vaughan, Williams, Jacques of Toronto and Albany.

This industrialized program made possible the construction of two demonstration schools (shown below and opposite) for approximately $4 million each, in 13 months construction time.

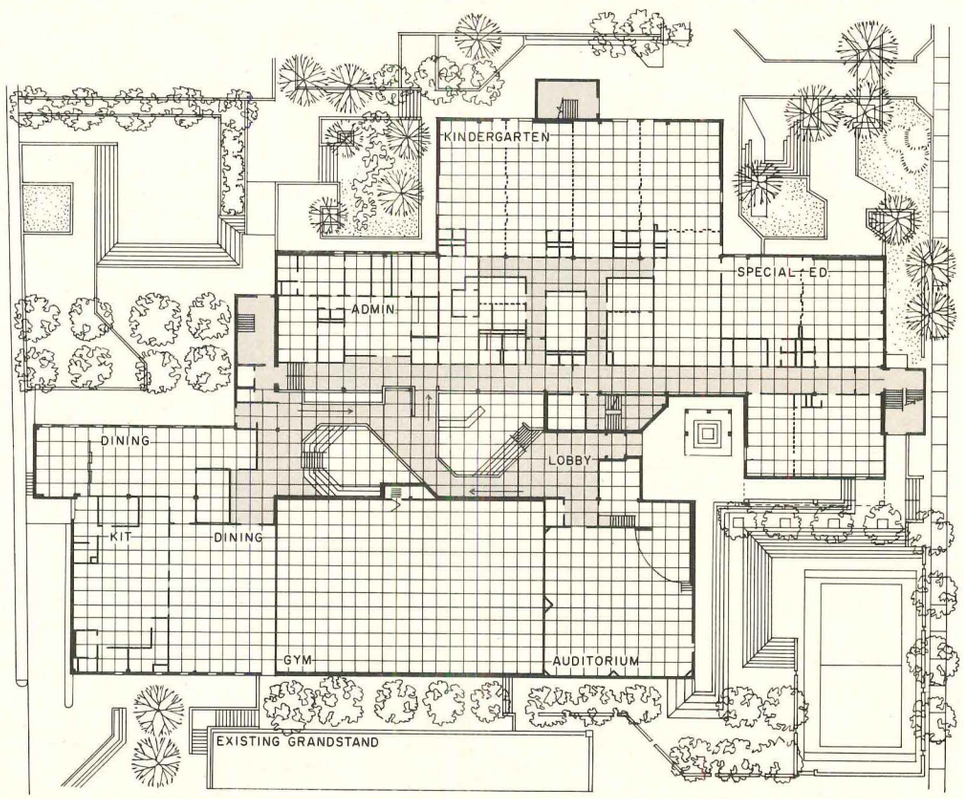
Using basically "off the shelf" components, this systems program specified an exterior enclosure that was either precast concrete with integral insulation (as in the Agassiz Elementary School below), or masonry (as in the Grover Cleveland Middle School addition on the opposite page). It comprised a lighting-ceiling system with extensive flexibility; an interior partition system that allowed easy changing of classroom configuration; and a heating and ventilating and plumbing system that allowed easy accommodation of classroom changes and was basically self-balancing.

The BOSTCO system, applying the most efficient and appropriate technology to the development and assembly of building components, achieved by speed of construction, overhead savings in dollars of between six and ten per cent. Flansburgh points out, however, that cutting 15 per cent of the volume of a building through more innovative planning techniques can save 15 to 20 per cent of its cost.

The experience with the BOSTCO Program led the Flansburgh office to turn their search for construction economy or "best investment" away

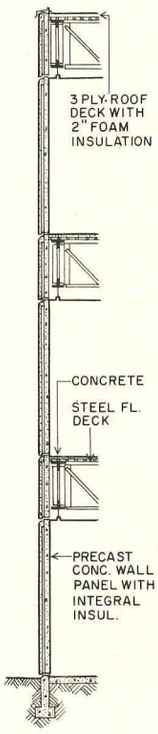


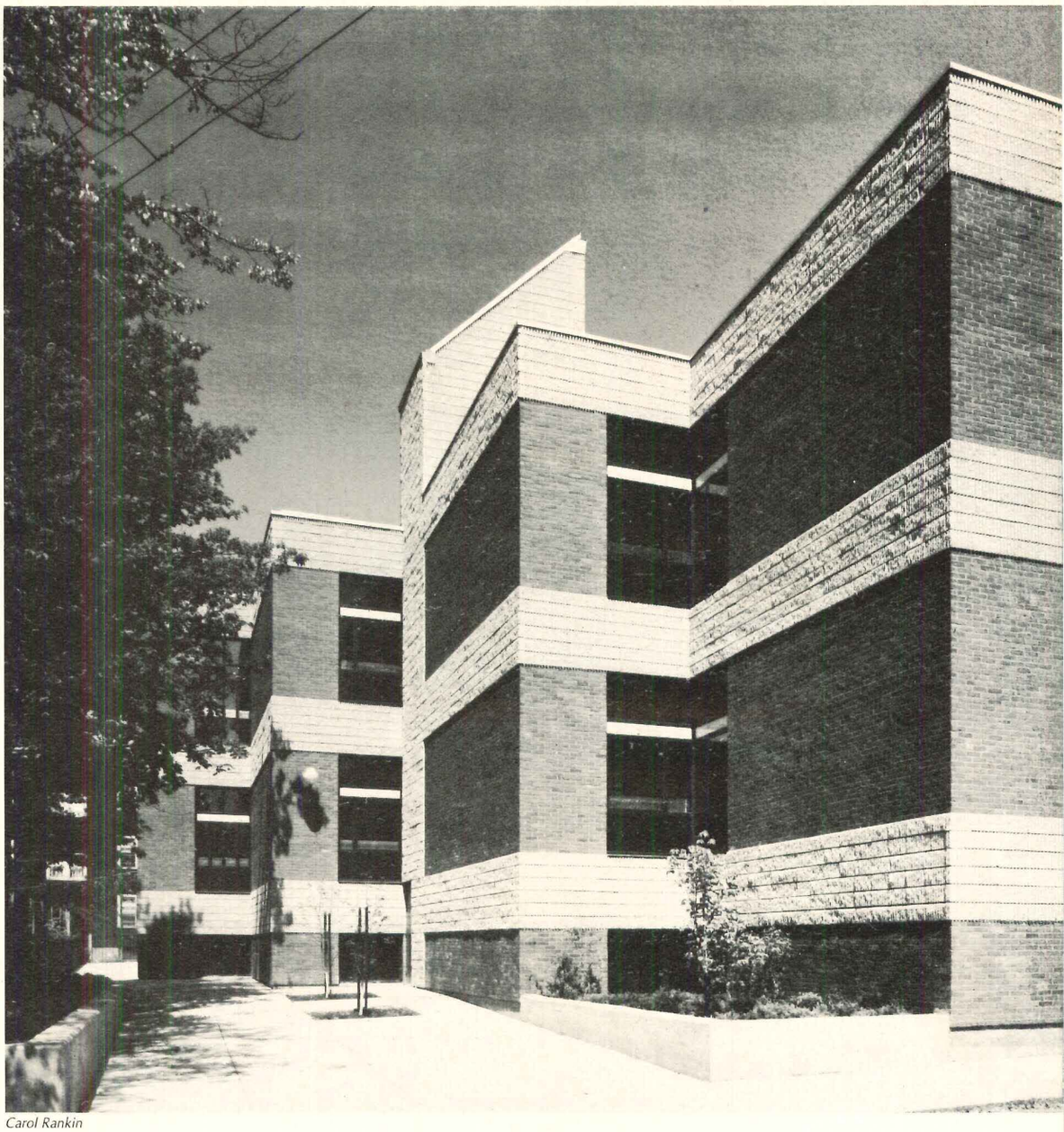
Steve Rosenthal



from fundamental reliance on technological efficiencies to planning efficiencies.

BOSTCO TRACK I: AGASSIZ ELEMENTARY SCHOOL AND THE GROVER CLEVELAND MIDDLE SCHOOL ADDITION, Boston, Massachusetts. Architects and systems consultants: *Environment Systems International—principals: Earl R. Flansburgh, Roderick Robbie, Richard Williams; associates: Wilson H. Rains, Douglas H. Flockhart, Douglas G. MacDuff; job captains: Jane Weinzapfel, Alan Dolmatch* (systems). Engineers: *Yolles and LeMessurier Joint Venture* (structural); *Associated Environmental Systems* (mechanical/electrical). General contractor: *Jackson-Vanbots, Joint Venture.*





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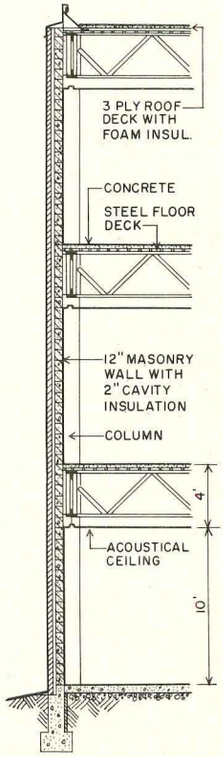
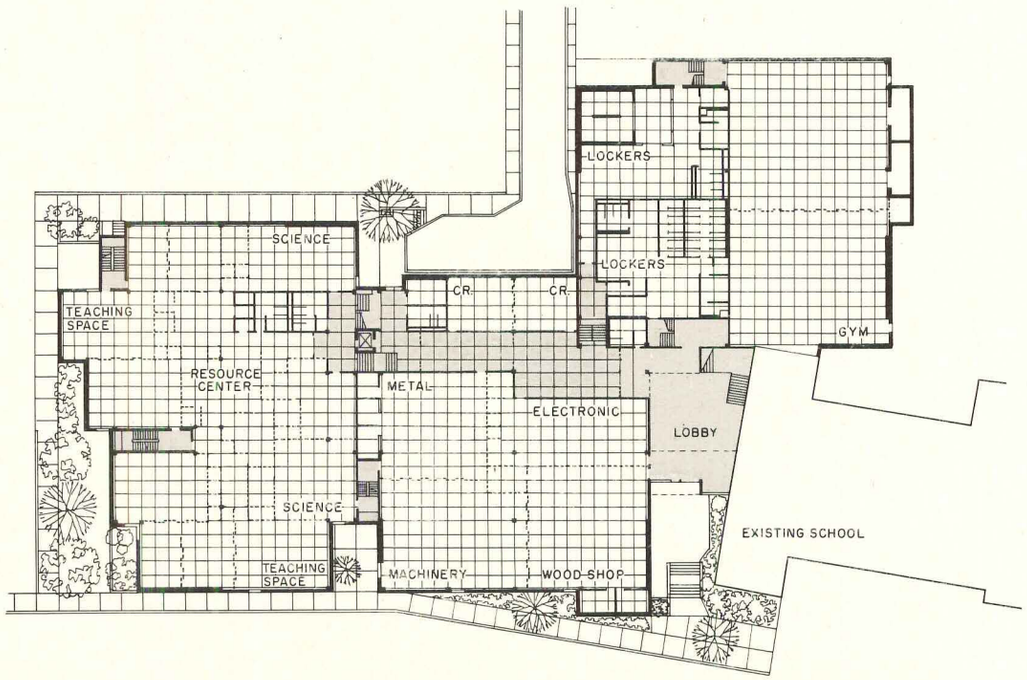




Case study 4: Burlington Senior High School Burlington, Massachusetts (completed 1973)

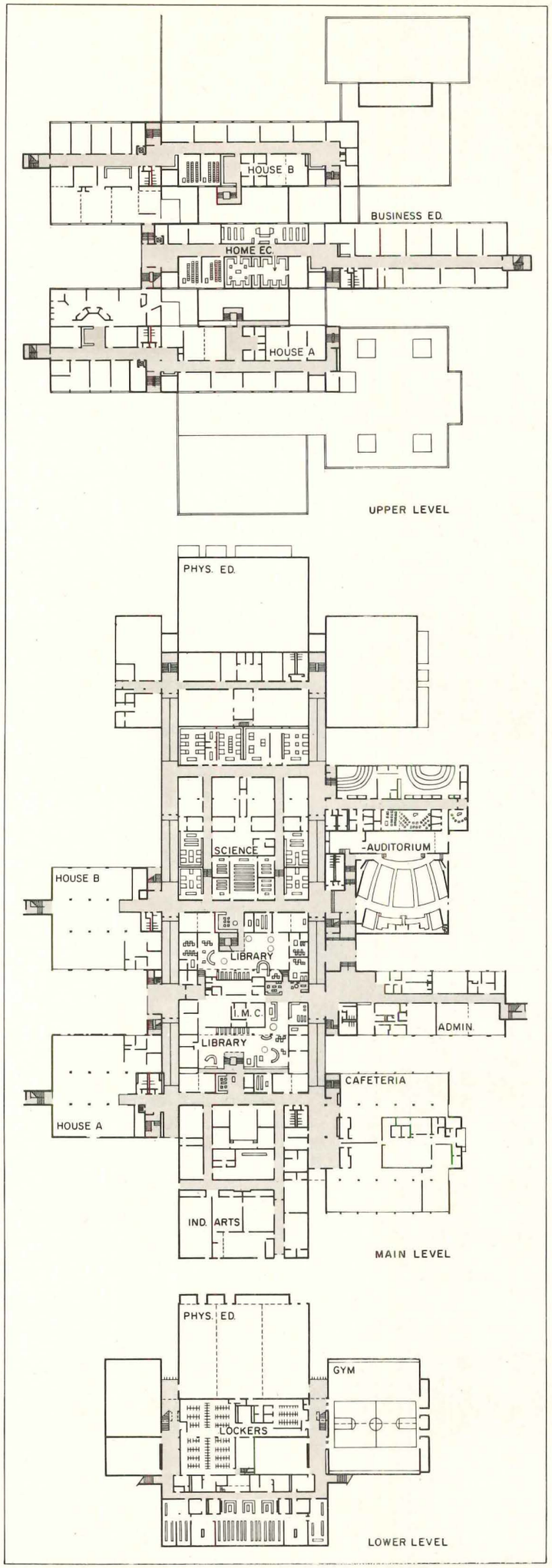
Technical efficiencies: This school has a repetitive concrete, pre-cast structure and a repetitive window pattern, but its principal innovations are in the planning, rather than the technical and systems areas.

Planning efficiencies: Open and closed plan spaces provide a variety of teaching opportunities. The main circulation through the building is by means of 19-foot-wide pedestrian streets that allow rapid movement through the building. The "streets" are just for circulation. Lockers and other corridor support areas are located off cross-corridors. In a way, this circulation pattern is analagous to a highway system with the streets as super highways and the cross circulation as country roads. Gross circulation area has been reduced by this scheme.

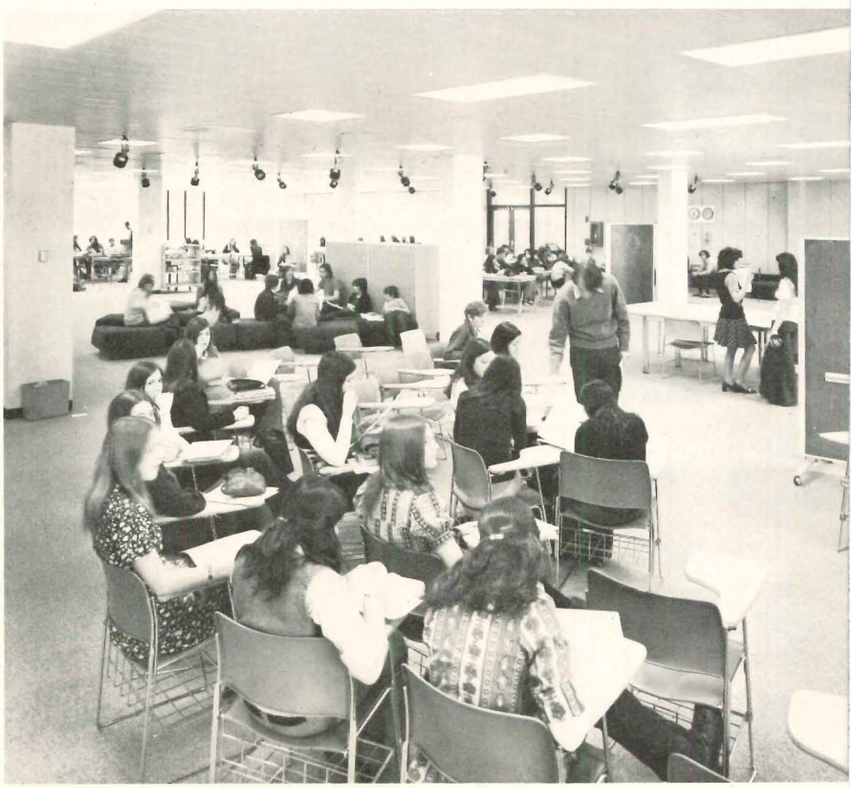
The central library is three levels high and offers access at each level. It was designed as a high and dramatic space as an economical and practical way to give the library identity, or a sense of place.

The plan configuration produces a series of outdoor courtyards at no extra cost. These reduce the apparent size of this huge school, bringing it into a more human scale.

Architects: *Architects for the Burlington High School—Architects Design Group Inc. & Earl R. Flansburgh and Associates, Inc.; partners-in-charge: Earl R. Flansburgh and Robert C. Abrahamson; project manager: G. Kutzemnieks.* Engineers: *Le Messurier Associates* (structural); *Golder Gass Associates* (foundations); *Progressive Consulting Engineers* (mechanical); *Lottero and Mason Associates, Inc.* (electrical). Consultants: *Bolt Beranek & Newman* (acoustical); *Hill Miller Friedlaender Hollander, Inc.* (educational); *Mason & Frey* (landscape); *Leslie M. Buckingham* (costs); *Hoffend & Sons, Inc.* (stage); *Flambert & Flambert* (food preparation). General contractor: *Franchi Construction Company, Inc.*



Steve Rosenthal photos



Case study 5: Falmouth High School Falmouth, Massachusetts (completed 1973)

Technical efficiencies: Because of its proximity to ocean salt air, the exterior siding of the Falmouth School is of pre-fabricated wood panels. These contain a heart of insulation between the exterior siding and an interior back-up panel. The siding at Falmouth occurs on the third floor, which at the front of the school is visually the second floor. A repetitive structural system and a repetitive window system is used throughout.

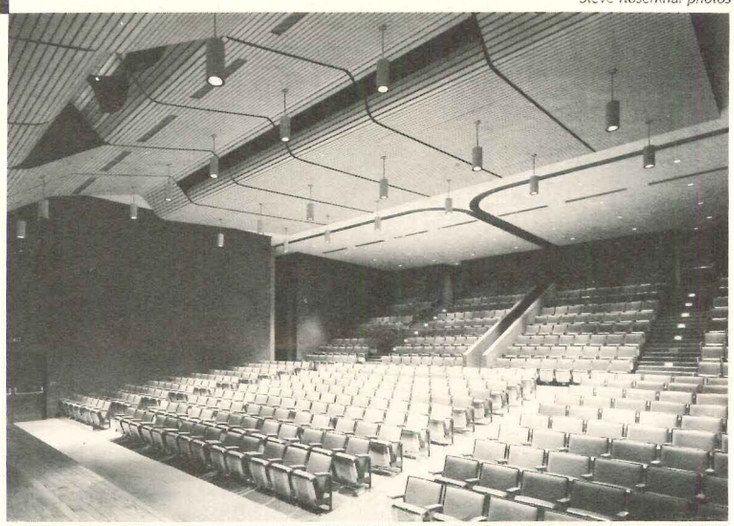
In Falmouth, as in Peabody, the first floor level is enclosed in masonry for maximum durability. Further economies are achieved through the use of oversize terra cotta masonry units.

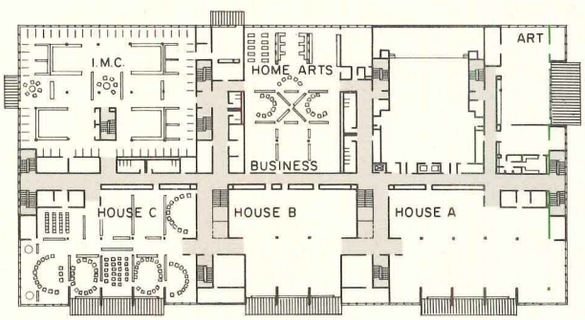
Planning efficiencies: Falmouth contains both open plan classroom facilities where inter- and intra-classroom circulation are combined and some closed classrooms for the use of audio-visual equipment and specialized requirements. The multi-purpose auditorium has motor operated dividing walls separating it into lecture rooms.

The Falmouth School's multi-purpose fieldhouse, like Peabody's, cost less per square foot than the construction of the two or three gymnasiums which a school the size of Falmouth would otherwise require. The structure's long spans cost less per pound of steel. Its bigger spaces take larger mechanical-electrical equipment units resulting in economy of size. Its bigger space also permits indoor track, and football and baseball practice.

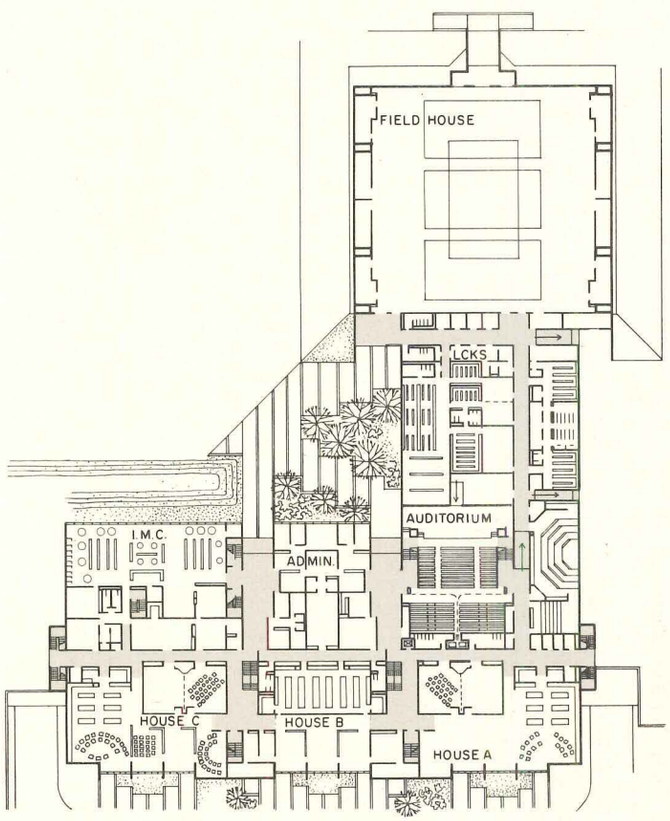
Architects: *Earl R. Flansburgh and Associates, Inc.—partner-in-charge: Earl R. Flansburgh; project architect: Allen M. Lieb.* Engineers: *LeMessurier Associates* (structural); *Francis Associates* (mechanical/electrical); Consultants: *Bolt, Beranek & Newman* (acoustical); *Leslie M. Buckingham* (cost). General contractor: *Northgate Construction Corporation.*

Steve Rosenthal photos

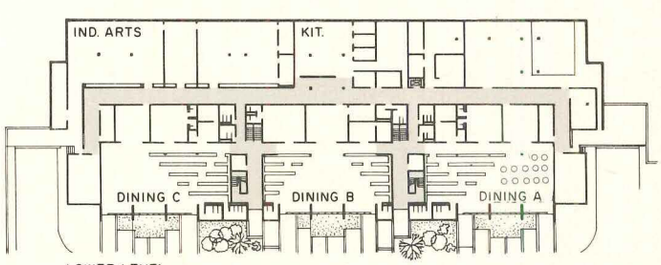




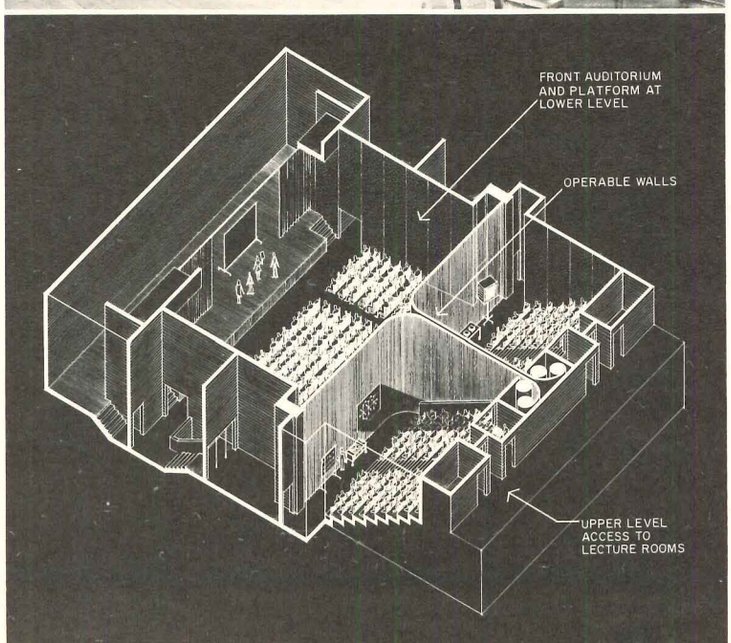
UPPER LEVEL



MAIN LEVEL



LOWER LEVEL



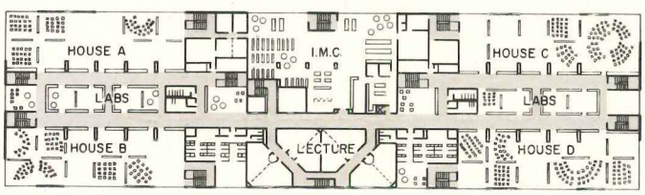
Case study 6: Methuen High School Methuen, Massachusetts (completed 1975)

Technical and planning efficiencies: At the time of the preliminary designing for Methuen, the Flansburgh office had begun to attempt to move the planning process to the same level of sophistication that had been attained by them in the technological process and to combine the two approaches. Because the cost difference between the use of several small mechanical penthouses and one or two large ones is substantial, Flansburgh has organized the functional spaces of this school in a manner that calls for two roof-top air-conditioning penthouses instead of three. These are combined with skylights to form 16-foot ceilings on the second floor. Not only do these high ceilings improve the acoustics, but they permit the use of high-intensity mercury-vapor lights with their attendant savings in wiring and other initial electrical costs.

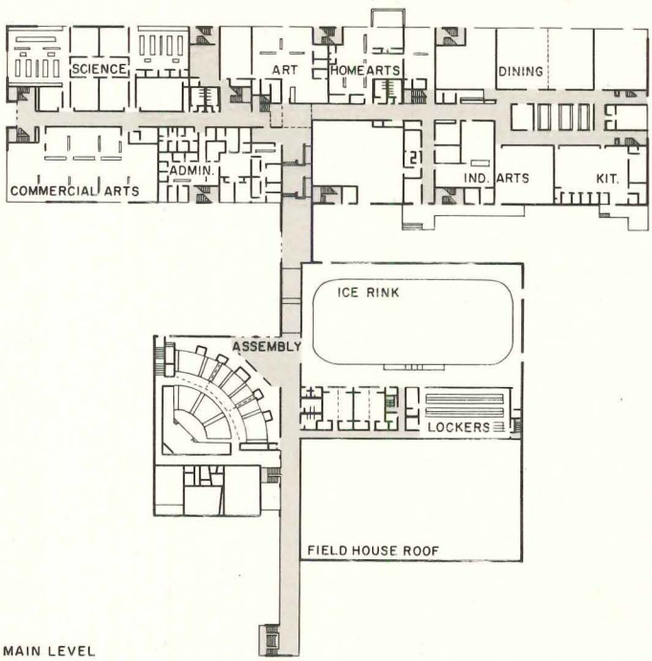
Further, the architects kept the ceiling height to the level at which the code did not require fireproofing, which often requires time delays that can significantly increase the cost. The cost of extending the exterior skin to accommodate a higher non-fireproofed ceiling was, however, relatively small. The skin itself is an economical split-faced concrete block.

The school is open plan as the perspective below indicates and utilizes a repetitive structure, repetitive windows as well as the repetitive mechanical systems.

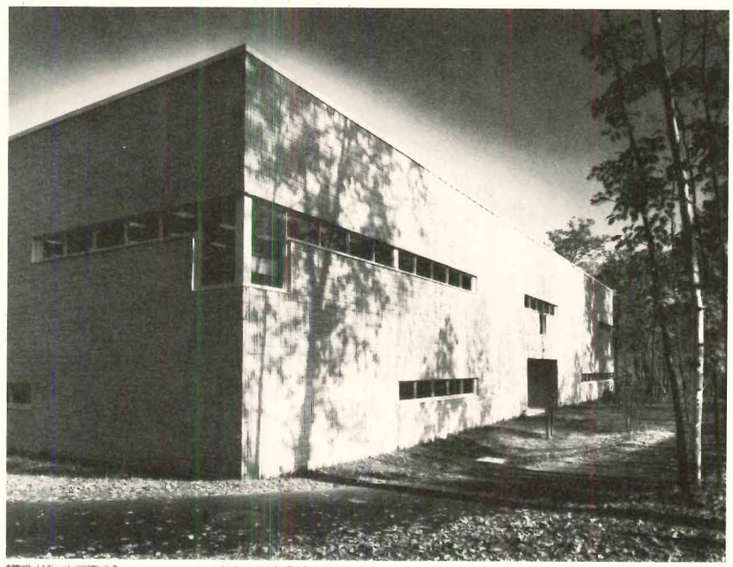
Architects: *Earl R. Flansburgh and Associates, Inc.—principal-in-charge: Douglas H. Flockhart; project manager: Allen M. Lieb, working drawings: Robert A. Fournier; job captain: Frank M. Locker; interiors: Kathy Klare.* Engineers: *Anderson Nichols and Co.* (structural, mechanical/electrical); *Raamot & Emerson* (foundations); Landscape architect: *John Crowe Associates.* General contractor: *Northgate Construction Corporation.*

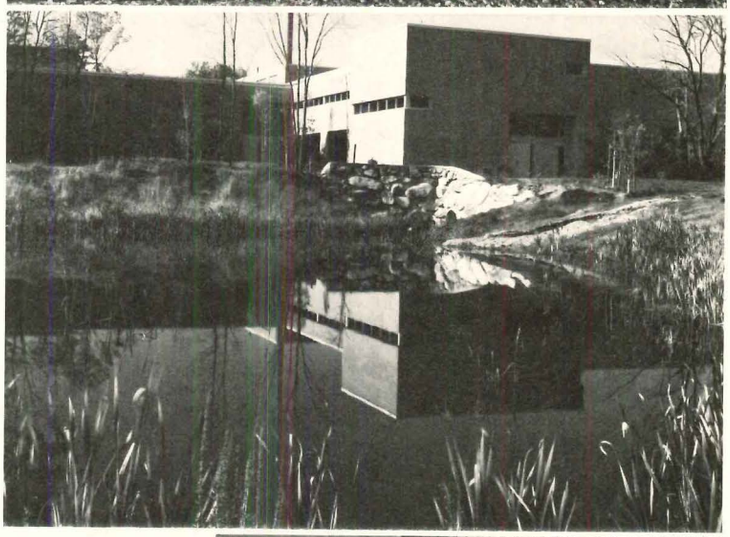


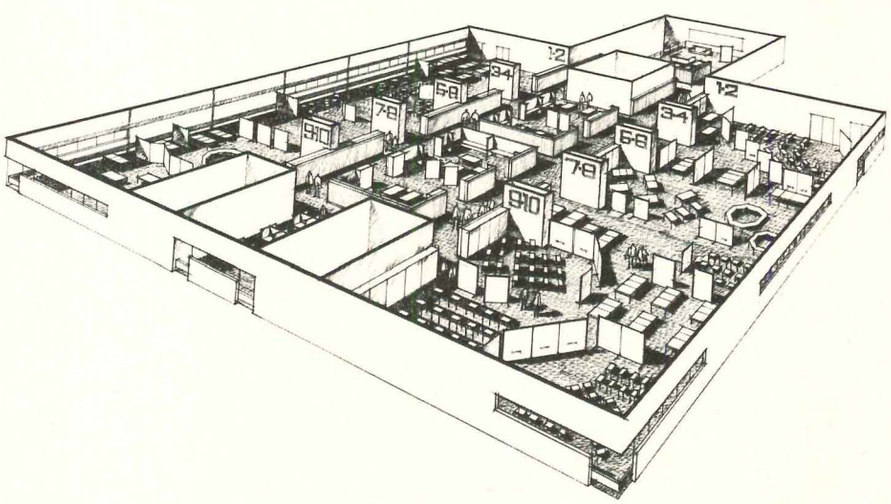
UPPER LEVEL

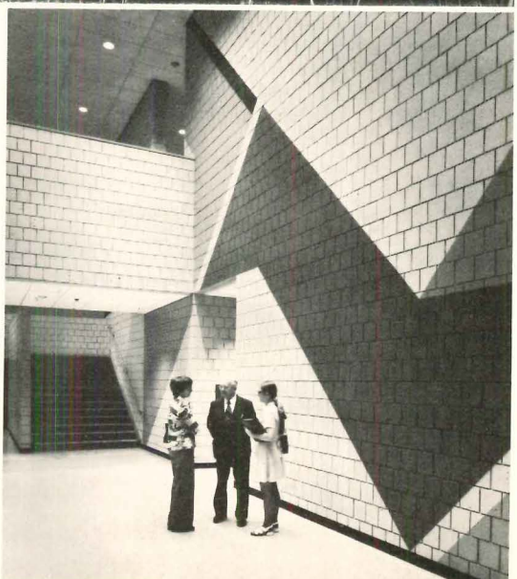


MAIN LEVEL









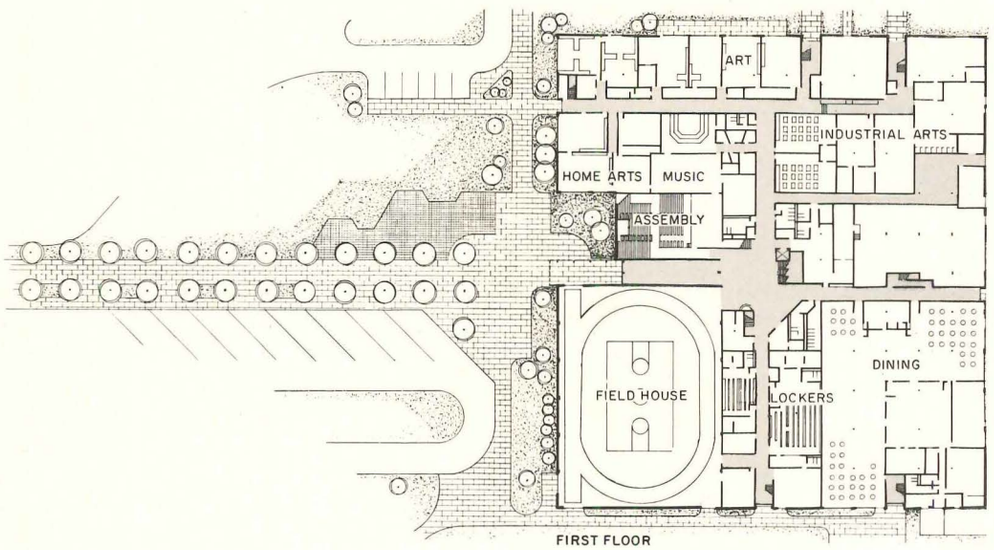
Wayne Soverns, Jr. photos

Case study 7: Marlborough High School Marlborough, Massachusetts (to be completed 1976)

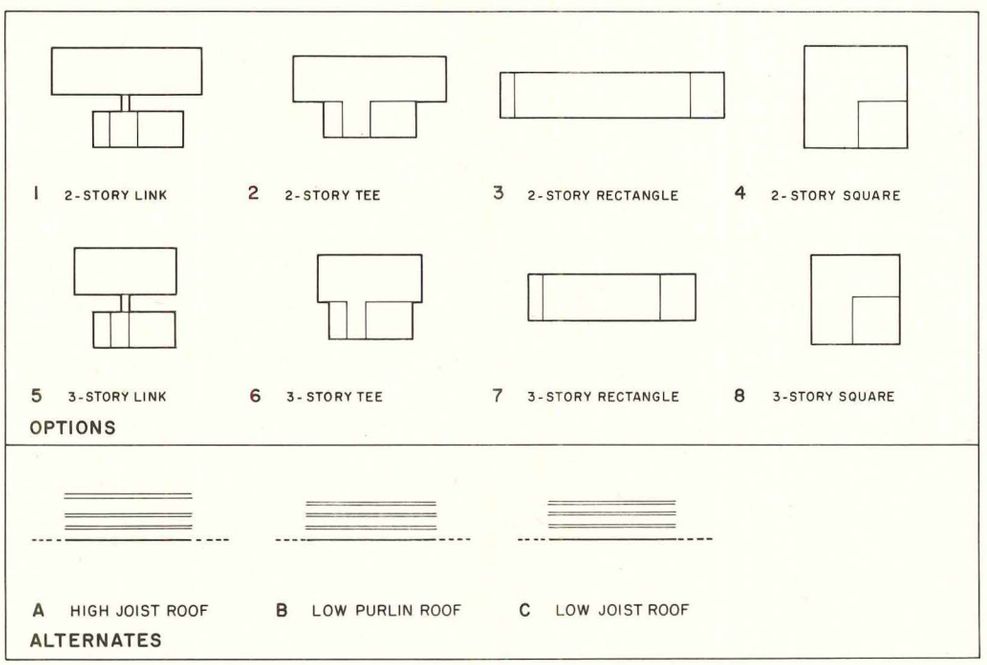
Technical and planning efficiencies: The joining of technical and planning efficiencies achieved in the Methuen classroom area was the genesis of the total planning process for the Marlborough High School. For this school Flansburgh resisted creating an architectural solution until he knew which of the eight plan configurations shown below would give the least expensive solution. All eight options would fit the site and comprised the required areas and adjacencies. All could meet such basic architectural considerations as: the requirements of human scale, the proportion of visually comprehensible areas, the efficiency of internal circulation, and access to an exterior wall.

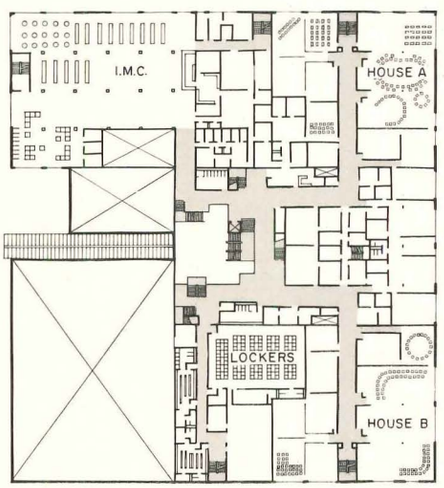
The Flansburgh office then worked closely with its engineers to develop the most economical plan form for the particular Marlborough program. Through the use of comparative computer simulations of various structure and mechanical systems, they were able to determine the most economical shape for the building to house the program of this school. Once the most economical shape was determined (which turned out to be the three-story square with the high joist roof) the detail planning could take place. The end product is a building that is highly efficient in terms of usable space, a building where the deletion of air conditioning would actually add more than $1 million to the cost (because of changes required in the plan configuration to make the space habitable) and where economies pushed to a high level in Methuen have been maximized.

Architects: *Earl R. Flansburgh and Associates—principals: Earl R. Flansburgh, Douglas H. Flockhart; associates: Robert A. Fournier, Gary L. Larson; job captains: John Ciccolo; interiors: Kathy Klare.* Engineers: *Anderson Nichols and Company, Inc.*

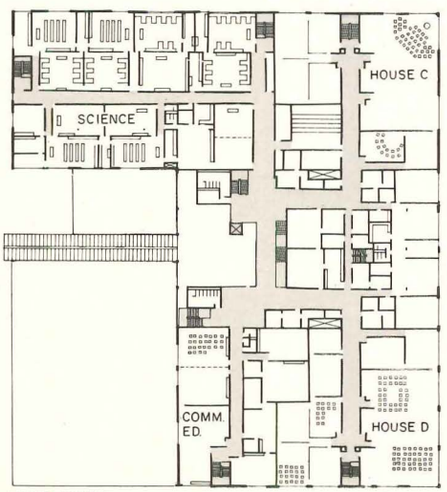


FIRST FLOOR





SECOND FLOOR



THIRD FLOOR

Recycling: Another route to more productive buildings

The concept is firmly established. With up to $10 billion committed to such construction in 1975 and over 90 per cent of the nation's architectural firms now participating, there is no doubt that recycling of older buildings is not only a big new opportunity for professional services; it is a proven method of obtaining better buildings at lower cost.

But—while the volume and great interest in this method are proof in themselves—there is a long way to go in providing the kind of standard knowledge on costing that is available for new construction. Part of this problem relates to the different inherent situations that are encountered from project to project, and to the extent of the recycling—which can range from simply cosmetic to largely-new construction. Costs can range from the recent production of apartments for $13 per square foot (purchase and rehabilitation) at the converted Chickering Piano Factory in Boston to the production of such an industrial conversion in San Francisco for over $40 per square foot. Clearly, there are not adequate criteria for comparisons. In 1973, the National Technical Information Service published a study that stated rehabilitation actually cost more on a life-cycle basis because of limited life-expectancy. But most of the architects whose work appears on the following pages expect their projects to last "indefinitely." Still, the belief that *all* older buildings are "over-built" is dangerous (see page 105). A more sympathetic study in progress by the National Endowment on the Arts may help; it is to establish bases for comparison of all factors—if there is really a way to cope with all of the variables. Another argument given against re-use is that it costs more on a life-cycle basis because of increased maintenance and utility costs. Conversely, The Cotton Exchange (see opposite page) has a relatively small air-handling system because of the natural insulating qualities of its thick walls. Most of the architects here agreed that long-term costs would at least balance out. Fortunately, attitudes have come a long way from those that *always* produced a "no" to invigorated older buildings on the basis of assumed formulas for the best return of an investment—and what constitutes a desirable "image." Still, by-and-large those who hold a concern per se have to be a determined group; Sympathetic developers *and* professionals have to enjoy the give-and-take of indefinite situations.

De Diego/Beekman Houses, Bronx, New York

Why is the concept good for the profession? While working within existing constraints may mean that architects "shelve" more comprehensive schemes for the moment, there is no doubt that this field offers opportunities, within the current limitations of the economy, attuned to many professionals' sympathies for conservation in the first place. Most of the architects here have been in this field long before it became "fashionable." Herbert McLaughlin, whose work is discussed on page 100, emphasizes that the professional has to be more involved with special aspects of costs and codes, and know more new ways of doing things. Because there are no standard formulas, the client is going to be more dependent on the architect's input from a project's initiation to its completion. Roger Lang of Stahl/Bennett (whose work appears on pages 103-106) describes the different ways in which a professional's time can go: because of extensive preliminary investigation, the firm budgets 20 per cent of production time to schematics, 25 to 30 per cent to field supervision; conversely design development is budgeted at only 10 per cent. William Rupe of Anselevicius/Rupe (see pages 98-99) estimates that there are about 25 per cent more man-hours involved. But Lang points out that the length of involvement is less, being an average of about 18 months from start to finish. For this reason, unexpected material shortages and the possibilities of financing "snags" are among the reduced production problems. For the engineer, analyzing existing structures for soundness and potential is vital. Special consulting services for the specialized new architectural techniques will also be vital—such as that now offered by architect Ezra Ehrenkrantz.

Stressing the economies involved, architects Beyer, Blinder, Belle have completed 1300 apartments in re-used structures in a formerly deteriorated section of the Bronx for the Continental Wingate Company (see photo above). Known as the De Diego/Beekman Houses, the project was completed for $27,000 for an average-sized apartment of two-and-a-half bedrooms. For this price, there was a radical revision of floor plans and completely new services and finishes. The projects on the following pages are also cost-effective answers to particular problems, and have clearly met their particular criteria successfully and with unusual appeal.—*Charles Hoyt*

Houston's Cotton Exchange: hard-headed economics in an almost-perfect restoration

Richard Payne photos

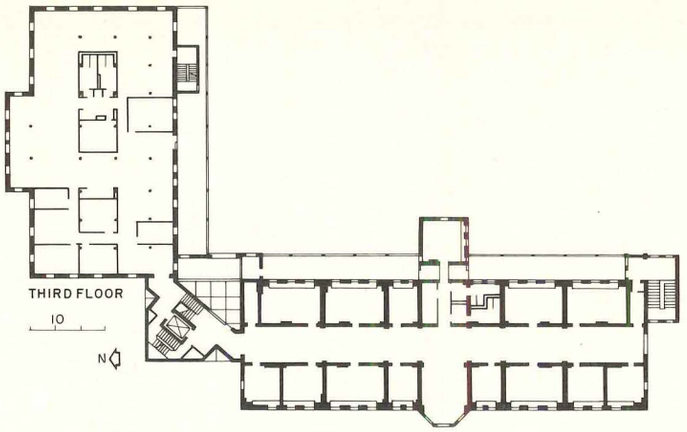
Houston's Cotton Exchange, a National Register building, was carefully restored by architect Graham Luhn to produce both a satisfactory return on invested capital, and—even more important financially—to produce an upgrading of an area of the city in which the owners have a vested interest. The substantially built and elaborately finished building symbolized the financial strength of the city's economy for many years after its construction in 1884—but the structurally sound, 22,500-square-foot building had been long abused and finally abandoned by tenants.

Purchased for little more than the land's value, the building still contained original brass hardware, office partitions, marble and inlaid-wood floors, and the elaborate exchange room with painted ceilings and gilt paneling. Recognizing the inherent value of these assets and the unique market that they would please, the developers and architect proceeded to restore as much of the building's interior (and intended functions) as possible. This included the now fully-rented, oversized offices (photo, below) on the top three floors—for lawyers who apparently appreciate proximity to the nearby courthouse. Rentals are approximately those obtained in new office buildings, while the amenities for tenants are much higher. And for the developer, the construction costs were much lower: about $22 per square foot (further reduced by a $25,000 grant from the state) for both restoration—which included three months of work on the ceiling paintings—and new work, which included a fire-rated stair-tower, 20-year roof, all mechanical and electrical services, and an elevator.

After the exploration of placement between beams, air-conditioning ducts were finally located behind dropped, acoustic-tile ceilings above office floors and under the exchange-room floor, as the one major concession to economy. Still, the offices have 12- to 14-foot ceilings (see photo, right). The renewed facilities were obtained in one year of construction time—and have both a prestigious and commercial/practical appeal that far exceeds many national commercial offerings. This is a true financial success.

OLD COTTON EXCHANGE BUILDING, Houston, Texas. Owners: *John Hannah and Jesse Edmundson.* Architect: *Graham Luhn.* Engineers: *Harold Horton (structural); Thomas Lightfoot & Associates (mechanical/electrical).* General contractor: *Stone Construction Company.*

From hospital/poorhouse to office building/school: Federal interest in recycling bears fruit

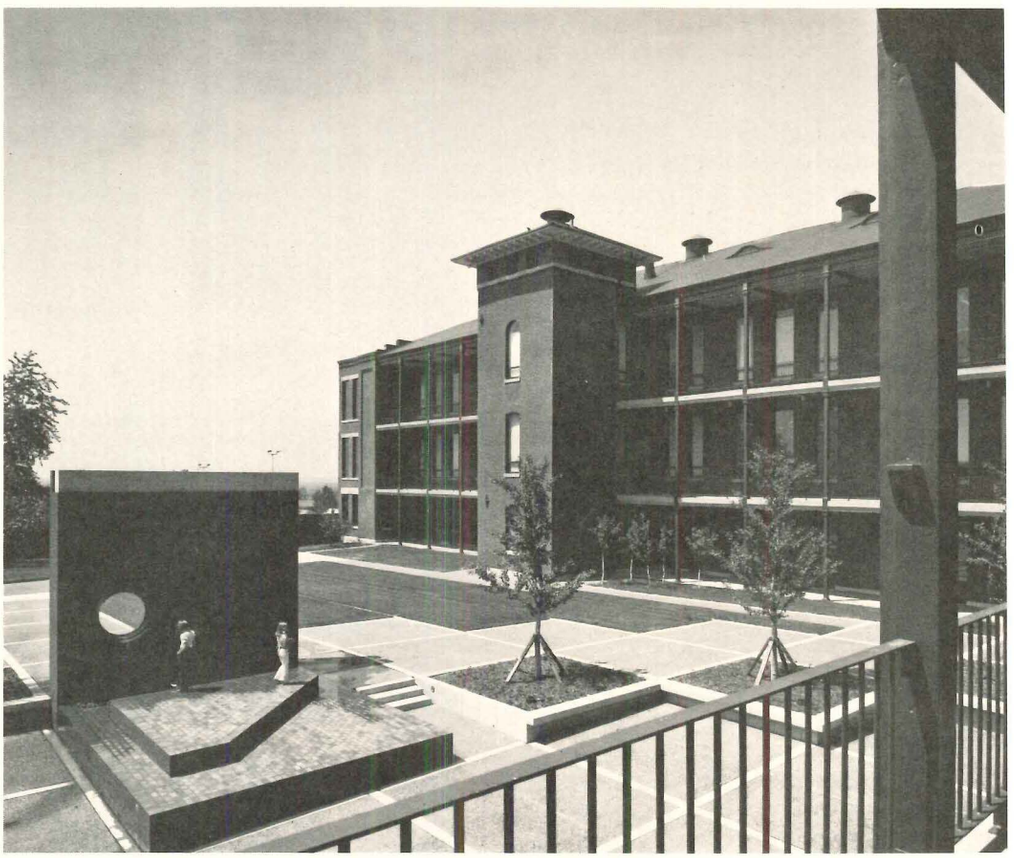


Located in St. Louis, Missouri, Cemrel is an institution devoted to speeding the results of educational research into widespread use in the classroom. As such, it functions partially as an innovative primary and intermediate-grade school where new principles and techniques can be observed in use in the fields of mathematics and esthetics.

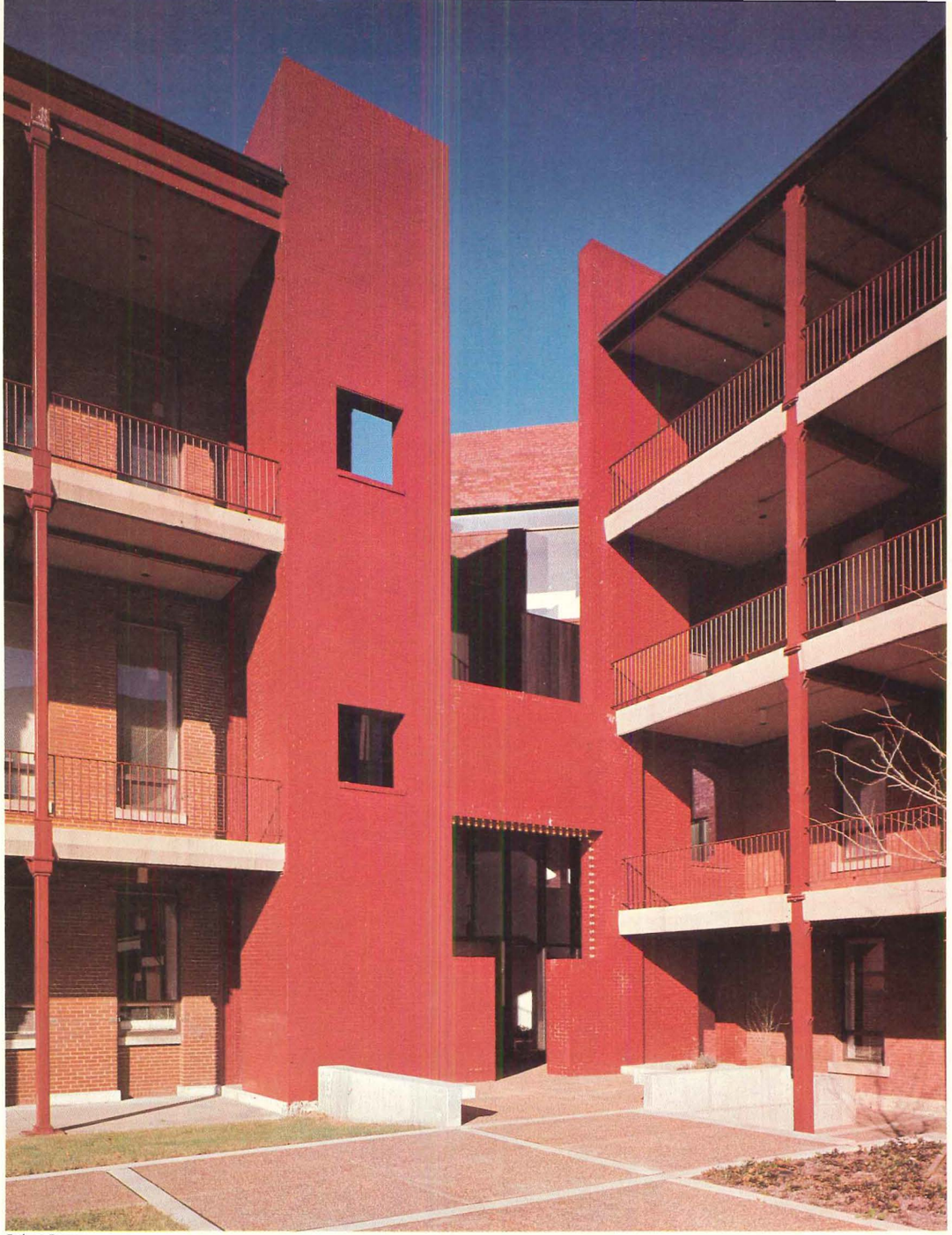
A Federal grant for a permanent facility specified that the building would be an existing one. After reviewing numerous possibilities, Cemrel staff members, along with architects Anselevicius/Rupe/Associates, settled on the two abandoned hospital buildings of the City Poor House, built in 1900 and 1903. While Rupe originally estimated that the existing buildings of 72,000 square feet might be worth $10 per square foot, the undesirably derelict property, including eight acres of land, was finally purchased for $325,000. It was rehabilitated and added to for $25 per square foot—not including extensive site work, landscaping and fees—but including all new utilities, an elevator and air conditioning. And while the estimated savings were $10 per square foot over a minimal new building, the obtained qualities of visual interest, structural solidity and the lofty spaces would certainly have cost much more than that difference in a new building. The staff is delighted with the results. The two buildings were united by a new vertical circulation tower (photo, opposite) containing the main entrance from a court created by the buildings and new walls.

Cemrel obtained their "new" building in a year and a half from selection to occupancy. Because the grant also specified that construction had to begin before the end of the fiscal year, demolition of unusable plaster, partitions and existing utilities proceeded while design work was done and the general-construction contract let. Rupe cites two benefits besides speed from this process: an estimated $80,000 saving over inclusion of demolition in the general contract, and the ability to see conditions and problems revealed before design work was finalized. Preliminary research was also accommodated by a separate contract.

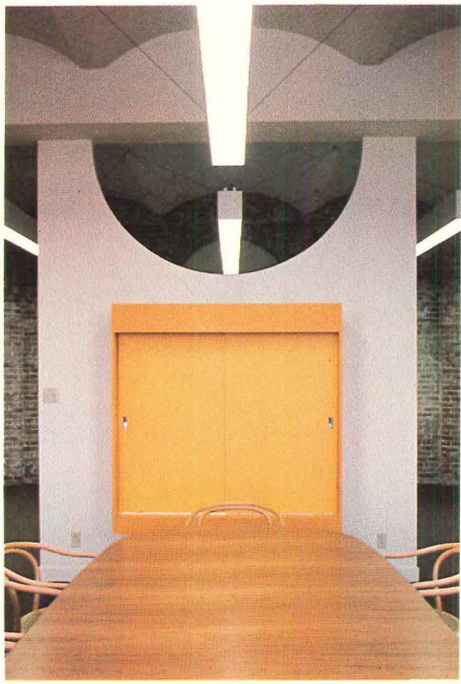
CEMREL, INC., St. Louis, Missouri. Architect: *Anselevicius/Rupe/Associates—project architect, John A. Kreishman.* Engineers: *LeMessurier Associates, Inc.* (structural); *Golder-Gass Associates* (foundation/soils); *William Tao & Associates* (mechanical/electrical). Consultants: *Lyle Yerges* (acoustical); *Carolyn Nuetzel* (interiors). Landscape architect: *George Dickie.* General contractor: *Robert Wright, Inc.*



Robert Pettus photos except as noted



Robert Perron



Robert Pettus photos

Offices and other administrative and research functions were placed within the contained spaces defined by bearing-walls in one building, while the unobstructed spaces created by a columnar structure in the other building are ideal for teaching (see plan). Secretarial desks utilize the existing extra-wide corridors in the first building (photo, left), which were stripped of decayed finishes (photo, above). Two views of the entrance court (opposite page) reveal the current pleasant aspect, where inmates used to walk behind bars on the balconies.

Urban landmarks are restored by an architect with a developer's thinking and cost attitudes

The once-derelict Victorian wood-frame structures shown on this page are only a few of many older buildings in San Francisco that have been turned into financial assets by the direct techniques of architects Kaplan/McLaughlin. Threatened by condemnation, the united complex of three buildings (photo, below) was bought by client Edward Conner, and converted from a maze of former rooms for let to 21 apartments, which were rented immediately. Much of the existing interior was maintained, although the original contortions of the plan made it difficult to provide even an accurate room-count. The process required a detailed knowledge of local codes (which the architects stress as a key factor in all of their re-use projects) and planning ingenuity. From the knowledge gained on this project, McLaughlin entered into a development partnership for the conversion of a vandalized house into six apartments (photo, top), and has gone on to become a developer of many reusable buildings since.

At a recent conference in New York City on neighborhood conservation, McLaughlin stated "You have to know how a developer thinks to make re-use work," and he went on to prove his point with charts illustrating the various areas where construction and operating costs were highest (land with building, repair reserve, interim operation and maintenance) and appreciably lower (site improvements, building construction, packaging and interim financing). While he stated that office space can be provided in older buildings at approximately half of the cost of new construction, residential conversions become more complex. To convert an industrial building into apartments, McLaughlin estimated that his costs were about equal to new construction in first cost ($40 per square foot) and operation, but that the rehabilitation of a residential building would be almost half of that amount. Of course, costs vary with locale and particular construction codes (which he sees as one of the drawbacks to the process, as few anywhere recognize the unique problems). By contrast, "similar" industrial conversions have been carried out for just over $13 per square foot. When asked for the best place to find developers for historic structures, McLaughlin joked "in the bankruptcy courts," but he acknowledges that he has made a good profit from re-use development. He sees a lack of knowledge of the factors, which he discussed as one of the greatest dangers for architects.

Joshua Freiwald photos

. . . and a once-deserted railroad station fills an important contemporary need

Completed in 1876, Savannah's railroad station had been totally unused for the last five years, when the local chamber of commerce leased the facility from the city for their own offices and a visitors' center. It has been renewed by architects Gunn & Meyerhoff. Recently, Savannah has enjoyed a 12-fold increase in tourists—to about 20,000 a month—spurred on by a pleasant ambiance and one of the richest architectural heritages in the country. (Gunn & Meyerhoff are adding to this ambiance with a Federally-funded project to turn the city's riverfront into a park.) The consequent need for a central source of information (and promotion) was acute, and the most appropriate location was logically one of the city's early gateways, its railroad station.

In this just completed project, the architects have reinforced the original design by eliminating latter-day additions. Even the original windows were re-used. In the former waiting room—now the active visitors' center (photo, top), the double arch, which appears to lack a central support, "was probably always that way": the configuration covers the apex of an inverted triangular truss. Paint colors approximate the original. Air-handling ducts (as well as the lines of all of the mechanical services) were "snaked-through" existing cavities between finishes and structure. The process helps account for a relatively high construction cost for the area of $26 per square foot, but the cost is low for the qualities of the space obtained. (On a cubic-foot basis, the rehabilitation cost $1.70.)

Robert Gunn is amused by the newness of the re-use concept in much of the rest of the country: "In Savannah we have always done this."

NEW OFFICES FOR SAVANNAH AREA CHAMBER OF COMMERCE & VISITORS CENTER. Owner: *Savannah Area Chamber of Commerce.* Architects: *Gunn & Meyerhoff.* Engineers: *William Hunter Saussy, Jr.* (structural); *White, Hobbs & McClellan* (mechanical); *J.A.M. Maddox* (electrical). Consultants: *Jane Furchgott, Rosolio's Inc.* (interiors). General contractor: *Atley Company.*

Robert Perron photos

Adding-on can give new productive life to existing buildings

Architects have long understood the necessity of producing compatibility between their new structures and those that exist around them—as do architects Prentice & Chan, Ohlhausen in their sympathetic design for the Henry Street Settlement in New York City (see photo, below). Just as they look ahead to those qualities that will make their own designs important and meaningful, they increasingly appreciate those different qualities that made buildings of the past meaningful: love of ornament and emphasized detail, structured proportions and a formalized, "up-front" elegance. The concept of stylistic obsolescence has been too long in dying; it has destroyed neighborhoods, wasted vast resources of our built environment deserted by "fashion,"

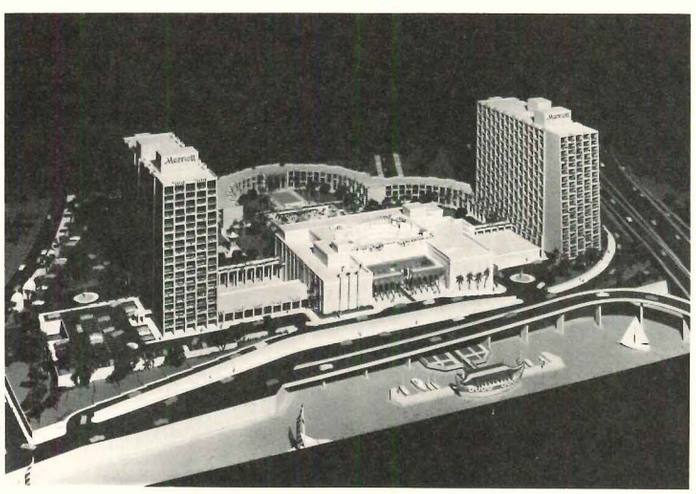
Eliot Fine

and—in the process—it has destroyed a great part of the sense of our vital past, which is necessary to see where we are going.

Architects are now developing the next step: new construction working in concert with existing structures to produce single projects, of combined vintage, that are better and more workable than any of their parts.

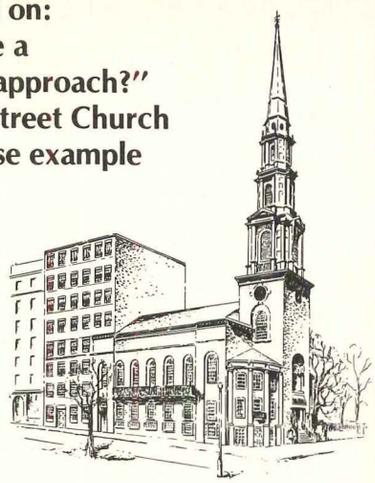
Projects are better because the existing resources of space and irreplaceable architectural quality are used, and more workable because the new construction has supplied the functional elements that were missing before. Two projects (see photos below) illustrate extremes of the concept. Architects Beyer, Blinder & Belle have helped to bring shopping back to downtown Paterson, New Jersey by The Lower Main Street Mall, created with existing buildings and a new glazed roof (photo right). This project uses minimum new construction to take advantage of existing resources. Architects Ahrens di Grazia Frizzell's plan to expand an existing palace in Cairo for a hotel (photo left) uses massive new construction to utilize the existing reception rooms at a commercially viable scale. The idea is the same in both cases: the new construction is less than it would have had to be, and it can be much simpler as well. It borrows its "grandeur" from that which was there.

On the following pages are four projects by architects Stahl/Bennett and one by architect Louis Sauer that answer recurrent questions about the practical advantages to be gained by inventive additions to existing buildings—and how to go about it. Most of the existing elements of these projects are distinguished landmarks, but the principles could certainly apply to more ordinary older structures. The existing buildings were incapable of continuing their present functions without more space. Faced with this situation in the past, owners have often just started over with new buildings; today the decisions in expansion often involve no more than the best method of doing it. The architects here have faced such decisions with inventiveness and a recognition of the individual merits of existing assets. And they have not "tacked on" photocopies of the original building—as Stahl/Bennett has been repeatedly asked to do (see opposite page). According to Tad Stahl, there is no merit in insulting authentic architecture with fake. Instead, his firm has made a clean break, and forcefully contrasted the era and thinking that produced both the newer and older structures. While respecting the existing elements of their projects in scale and materials, it has purposely avoided any unfortunate comparisons in the form of "similar" windows or other articulations of the facades which could be doomed as visual mockeries. These are clearly better answers.—*Charles Hoyt*



Peter Garfield

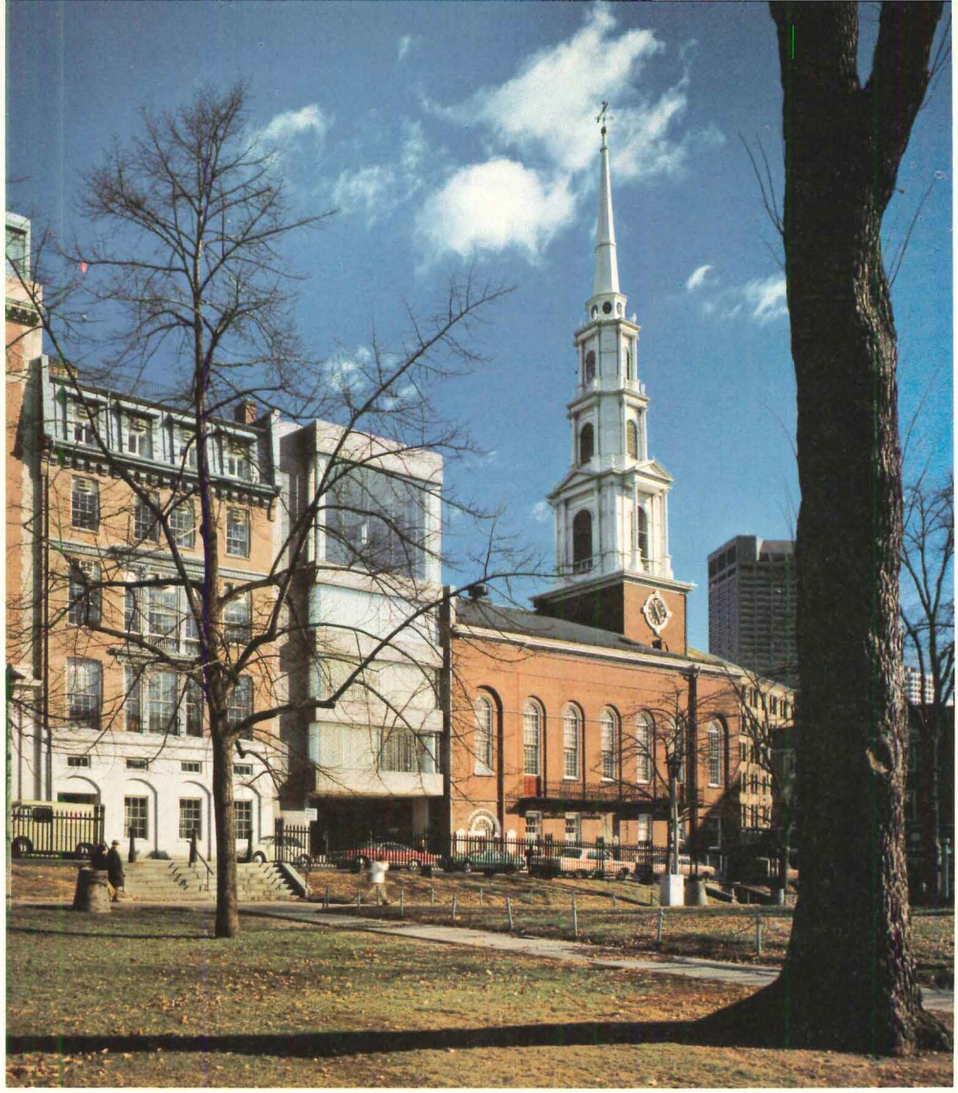
Adding on: Is there a "right approach?" Parks Street Church as a case example

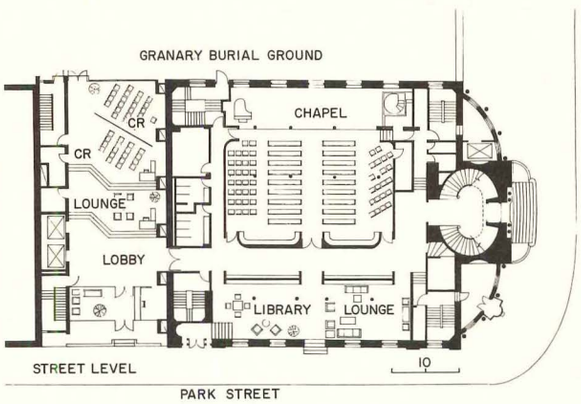


Architects Stahl/Bennett were selected for the new Ministries Building of Boston's architecturally distinguished Park Street Church of 1803 because of their previous restoration work on period buildings, and the client assumed they would produce a similar structure from "whole fabric." It took six months of dialogue to convince the building committee that a "reproduction" similar to that which the members envisioned (drawing above) would be insulting to an authentic building, unproductive to the church's causes (by producing a backward-looking image) and unworkable in practical terms. A phenomenon in current religious experience, Park Street is constantly growing in membership and (possibly causative) social and religious programs. Its space needs for Sunday School functions alone were projected to soon almost fill the 22,500 square feet of the eventual building. Other functions to be accommodated included administration, counseling, accounting, nursery, tourist orientation and social. (Recognizing the space demands, the original "in-house" proposal envisioned a building actually extending over the church.)

In order to reduce the visible bulk, the architects designed a truly loft-type building that could alternately accommodate the needed various functions within the same areas (a concept consistent with those discussed on pages 68-83)—placing a fixed-function gymnasium in an excavated basement. The concept of flexible and columnless floors is expressed on the exterior by the butt-jointed glass of the windows, giving an unobstructed view from within and inviting participation from without. Typical of many additive buildings, the structure consists of varied parts: a concrete wall on the elevator side and columns that allow the long-covered original wall of the church to be exposed on the other. Air handling ducts are run only vertically (between the columns and the church's wall) to reduce floor-to-floor heights. This helps to bring the new building into a desired height alignment with the existing building on the other side of the church.

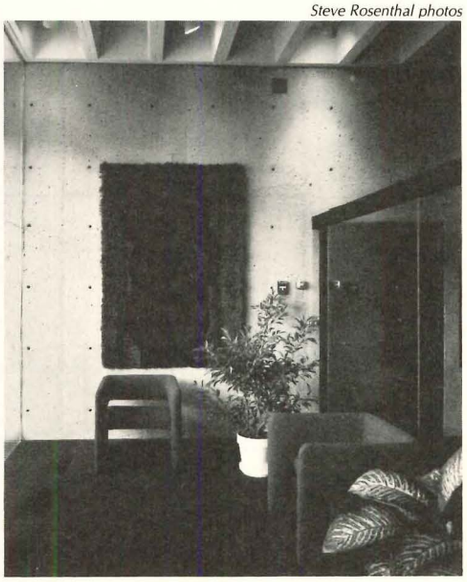
NEW MINISTRIES BUILDING, PARK STREET CHURCH, Boston, Massachusetts. Owner: *Trustees of the Park Street Church.* Architects: *Stahl/Bennett, Inc.—principal-in-charge: Frederick A. Stahl; project architect: Martin S. Lehman.* Engineers: *LeMessurier Associates, Inc.* (structural); *Golder Gass Associates, Inc.* (foundation/soils); *Shooshanian Engineering Associates* (mechanical/electrical). Consultants: *William Lam Associates* (lighting). General contractor: *Barkan Construction Co.*

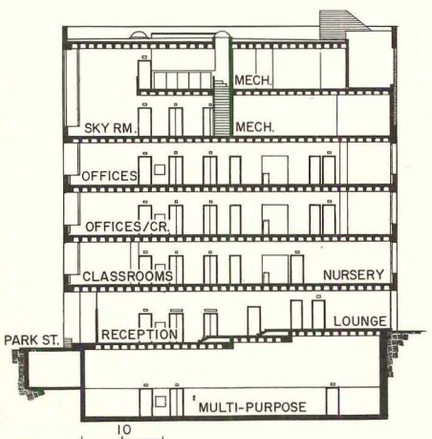




The client requirement of a dramatic space for social functions produced the double-height room at the top of the building facing the adjacent park (see section and photo, above). This room conceals the two-story mechanical space. Both the building and its furnishings (photo, below) are very different from that first envisioned by the client (drawing, top). Future plans call for the rehabilitation of the ground floor of the original church to accommodate expanded functions and tie the circulation of the two buildings together (plan, left). The second, third and fourth floors have movable furniture that allows the same space to serve as offices, meeting rooms, or Sunday school space.

Steve Rosenthal photos



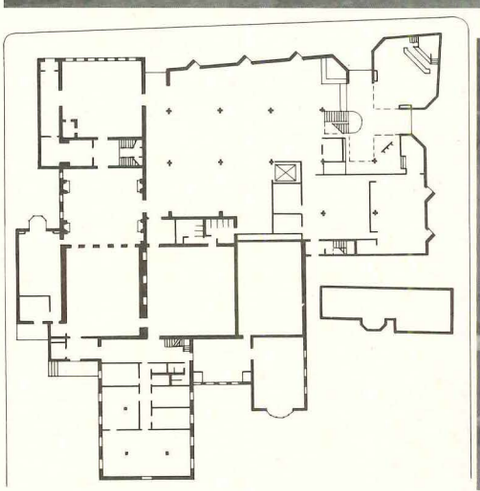


Adding on: Can a small building survive a larger-scale addition? The Peabody Museum as a case example

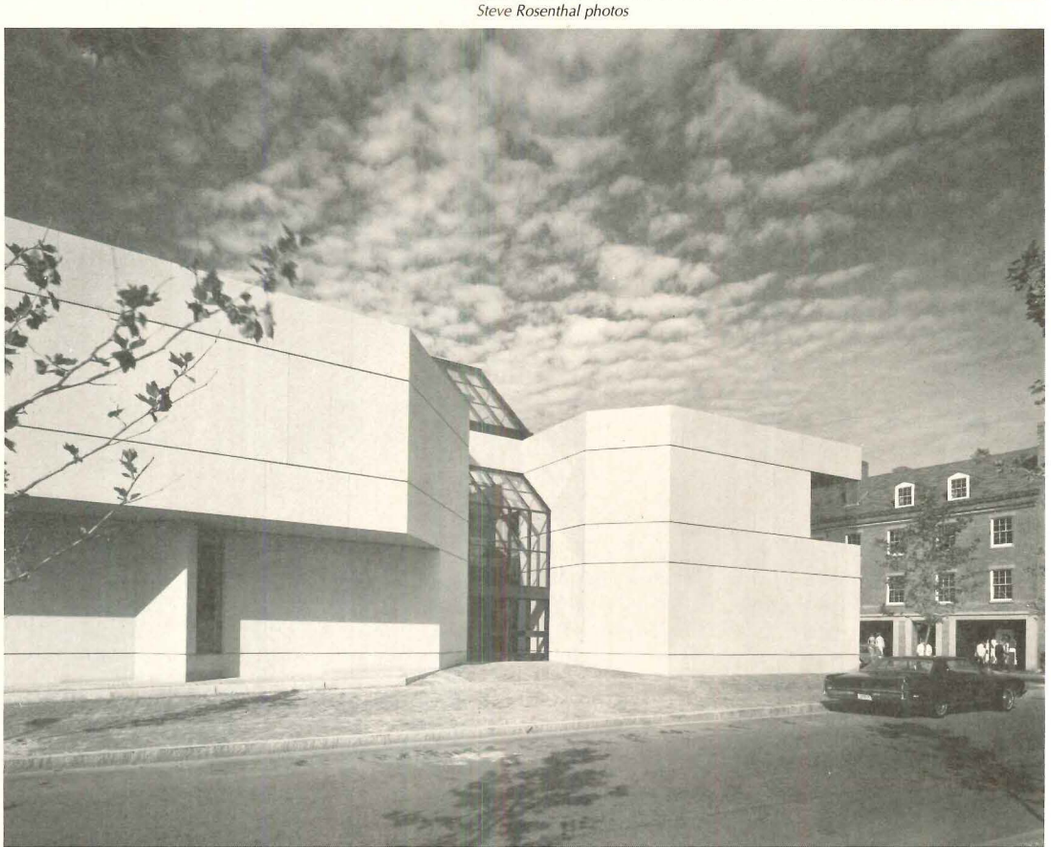
Facing planning problems similar to those at the Park Street Church (previous page), architects Stahl/Bennett were originally retained simply to program a needed massive addition to Salem, Massachusetts' visually delicate Peabody Museum built in 1824. "The board of directors had been trying to face the reality for 10 years, and finally they were prepared to just see how big it would have to be." The program called for 46,000 square feet of new construction. To promote an acceptance of the reality, the architects kept at the Museum a block model of the old building, the newer additions to its rear, and the volumes of new construction that would result from the program; and they invited the board of directors to work on it, arranging the new volumes as the individuals saw fit. "Originally they thought it was just a problem of the elevation."

What the board finally got, in their just completed building, was one level for internal functions below grade and two levels of exhibition space arranged to compete with the older building neither in fenestration nor in height. The original building became the counter part to a new pavilion at the opposite end of the block, and is isolated from the addition by a glazed connector that reveals the original once-exterior wall to passers-by (a typical technique for Stahl/Bennett). The new concrete-framed building is like a high garden wall clad in a granite veneer, matching that of the still-important original building.

While the 28-foot bays are framed with a deep-coffered concrete slab at the roof to conceal lighting and air-handling ducts, the second and ground floors are flat slabs in recognition of the low floor-to-floor heights that had to be matched in the original building. The cost was $2.5 million. In the plan, the original building is to the upper left, and the new building is to its right. Others have been added on (bottom), in intermediate years and they represent a "catalog" of industrial architecture for the periods in which they were built.



Steve Rosenthal photos



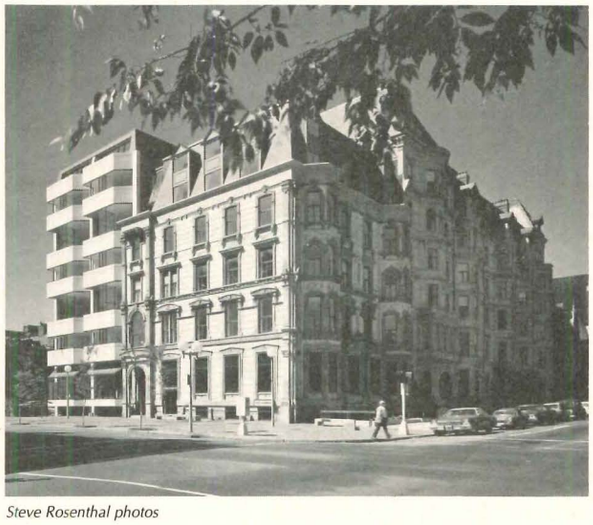
PEABODY MUSEUM OF SALEM, Salem, Massachusetts. Owner: *Trustees of Peabody Museum.* Architect of record: *Philip W. Bourne.* Program and design consultants: *Stahl/Bennett, Inc.—project architects: W. Eric Kluz, Martin S. Lehman.* Associate architect: *Bernard J. Harrison.* Engineers: *Souza & True, Inc.* (structural); *R.G. Vanderweil* (mechanical/electrical). Consultants: *William J. Cavanaugh* (acoustical); *William Lam Associates* (lighting); *Conmatan, Inc.* (specifications); *Leslie W. Buckingham* (cost). General contractor: *J.F. White Contracting Company.*

Adding on: Must new work match the original? The Vendome as a case example

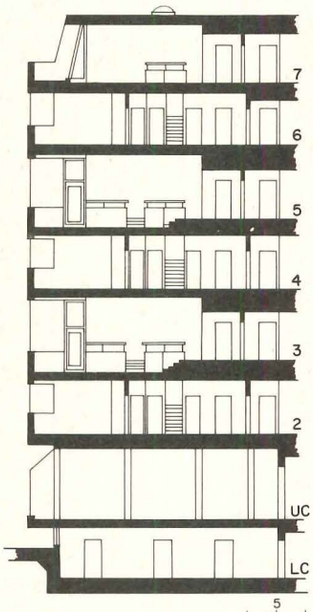
An innovative scheme for the re-use of the Vendome Hotel, built in the 1880's in Boston's elegant Back Bay, was hailed on its completion in 1972 as the prototype salvation for similar once-faded grandeur everywhere. The original plan had doubled-loaded corridors on each floor—with guests' rooms facing the outside, while servants' rooms faced a long central air shaft. Stahl/Bennett's redesign placed single-loaded corridors at the wall of that shaft, and larger apartments were created by combining the obsolete rooms with the guest rooms. Activity on the new corridors gave life to the consequent "galleria" within (see plan, below), which was completed with a commercial ground-floor mall of stores and shops.

All of that was before a fire demolished an entire section of the building (upper left corner in plan), and brought into question structural stability of the remainder. Destroying the myth that all older buildings are "overbuilt," Stahl explains that the 1880 structure was planned to exact tolerances and was no better or worse than what we build today. The decision to rebuild was made, but what was to be built? The architects' just-completed answer is a totally new segment with floors that align with the existing ones—but in ways that are even more appealing to current rental markets than the original. All of the new units are duplexes, and extra height for the new living rooms is borrowed from that of the bedrooms on the floor below (see section). The new units have large areas of glass and balconies, and they make more efficient use of floor areas. Most importantly, it was possible to create larger apartments than the studios and one-bedroom units in the rest of the building, because a locally required second means of egress for larger apartments is provided on alternate floors. The resulting contrast of eras seems to offer the diversity of a city within a single building. Typical of problems in additions, the local codes called for much more stringent new requirements than in the existing building. According to Stahl, codes need more recognition of rehabilitation and additions, to be effective.

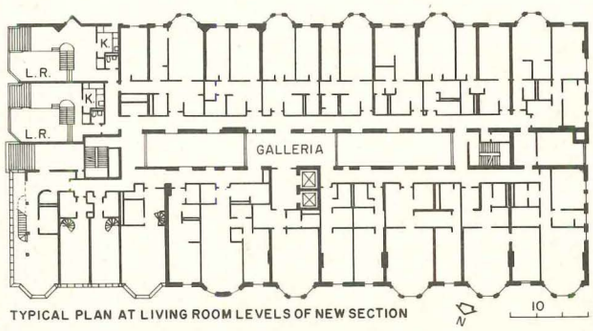
THE VENDOME CONDOMINIUMS, Boston, Massachusetts. Developer: *Franchi Development Trust.* Architects: *Stahl/Bennett, Inc.—F.A. Stahl, partner-in-charge; Roger P. Lang, director of restoration and renovation services; Frank C. Adams, project architect.* Associate architect for construction supervision: *Irving Salsburg.* Engineers: *LeMessurier Associates* (structural). General contractors: *Franchi Construction Co.*



Steve Rosenthal photos

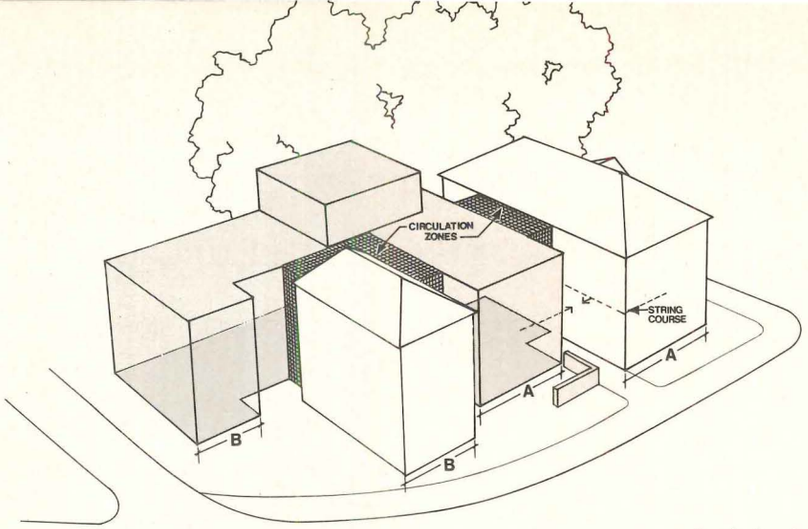


The older facade (photo, top) was once symmetrical before a fire completely destroyed the part of the building to the left. Replacement with a building of the original design not only raised questions of appropriateness and practicality, but did not recognize a potential for better planning and enough additional construction to help compensate for the new cost.

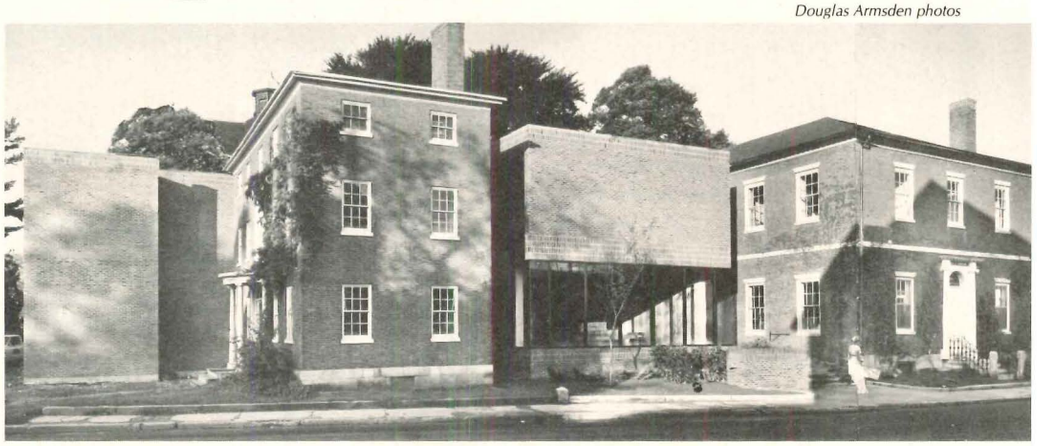


TYPICAL PLAN AT LIVING ROOM LEVELS OF NEW SECTION

Can one building be larger than its three parts? The Portsmouth Public Library



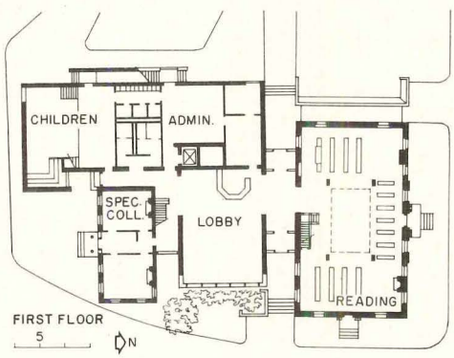
Douglas Armsden photos



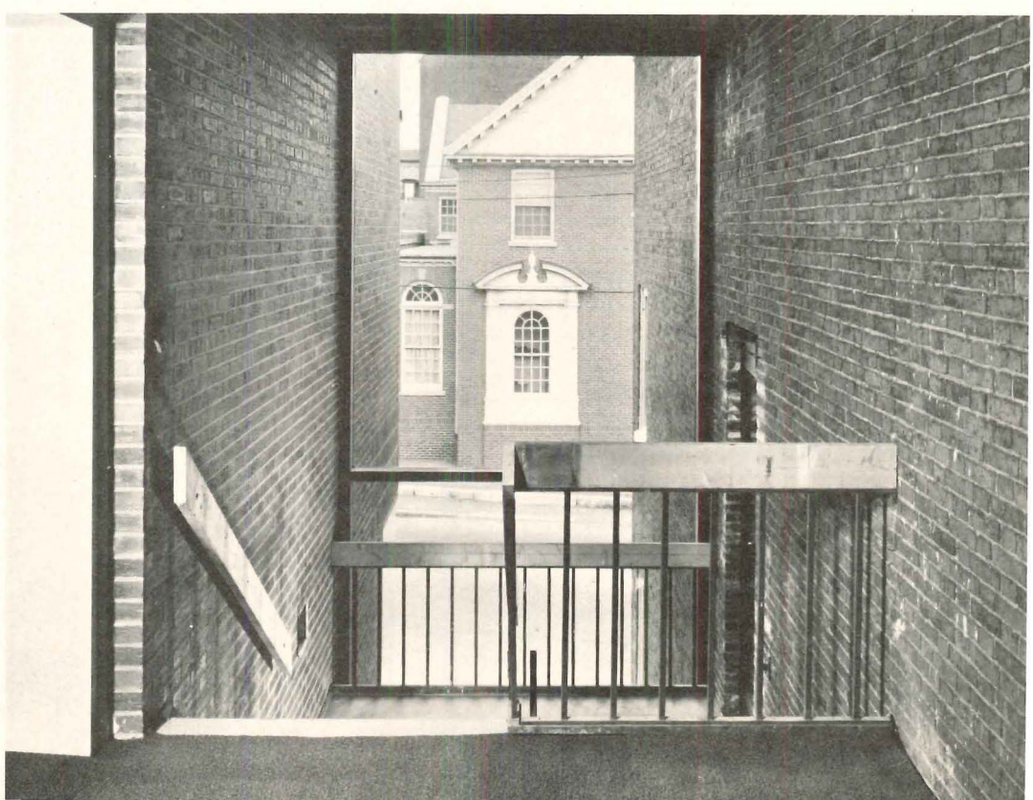
Nearing the completion of construction, the public library in Portsmouth, New Hampshire unites, by infill construction, two unused landmark buildings—which were a potential drain of maintenance costs on the municipal budget—to produce a needed civic amenity. And the financial advantages of utilizing "found" space have been increased by a sound knowledge of currently available funding.

The two joined early 19th century buildings, the Benedict House and the Academy, are an invaluable contribution to the aspect of Portsmouth and are listed on the National Registry. However, what the landmark-rich city needed was not two more museums; it needed a library which neither building could accommodate on its own. The program called for 10,000 square feet of space beyond that available in both. Accordingly, Stahl/Bennett's design has incorporated the two existing buildings for a special collections department, in the undisturbed rooms of the house, and for the major reading room in the large space of the public hall. Offices, a children's library and stacks (because of the heavy loading on floors) are placed in the new connector. As in the Peabody Museum (page 104), the disparate elements are separated by glass links that reveal the original walls of the older buildings. An added advantage to the links is the elimination of the juncture of the new brick facing and the old. Concrete plank floors were attached between the flanges of the steel beams to produce maximum ceiling heights and still align with existing floor levels—while accommodating mechanical services.

By drawing on funds to be spent by the Federal government, Portsmouth was able to reduce local cash commitment to 50 per cent of the construction cost of $700,000. About one-fifth of this cost was obtained through the State Library and over one-tenth through the State Historic Society. Most interestingly, 25 per cent of all municipal costs came from HUD in the form of a forgiven loan, because the project qualified as an ancillary support facility within an urban-renewal area.

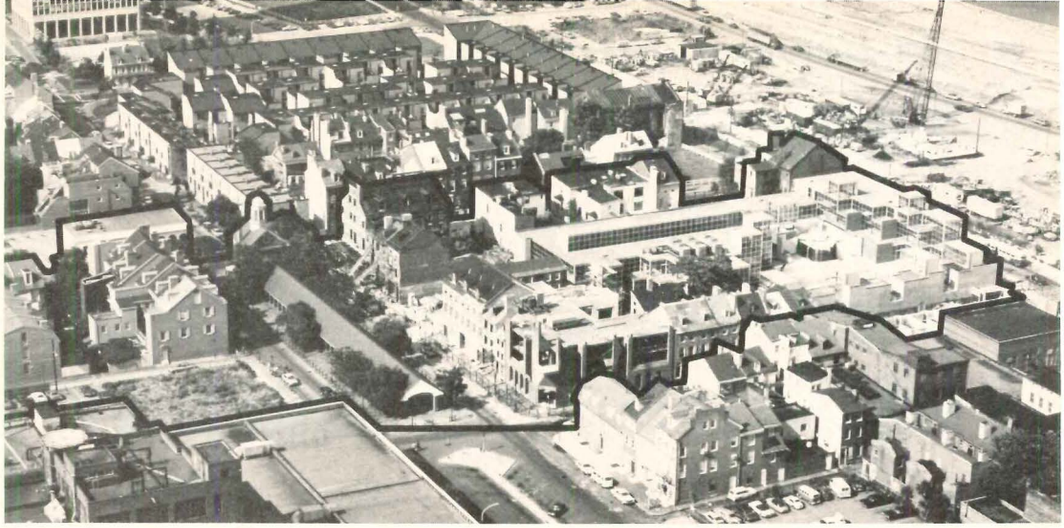


The new part is placed between and around a landmark house and a public hall (respectively left and right in the photo above). The new wing, to the far left, replaces a latter-day addition to the house. Competition between the different architectural styles is avoided by the lack of individual windows in the new building, which appears as a floating band of bricks (matching the original building's) that floats above a visually recessive band of dark glass. The glazed links can be seen, in the diagram at top.

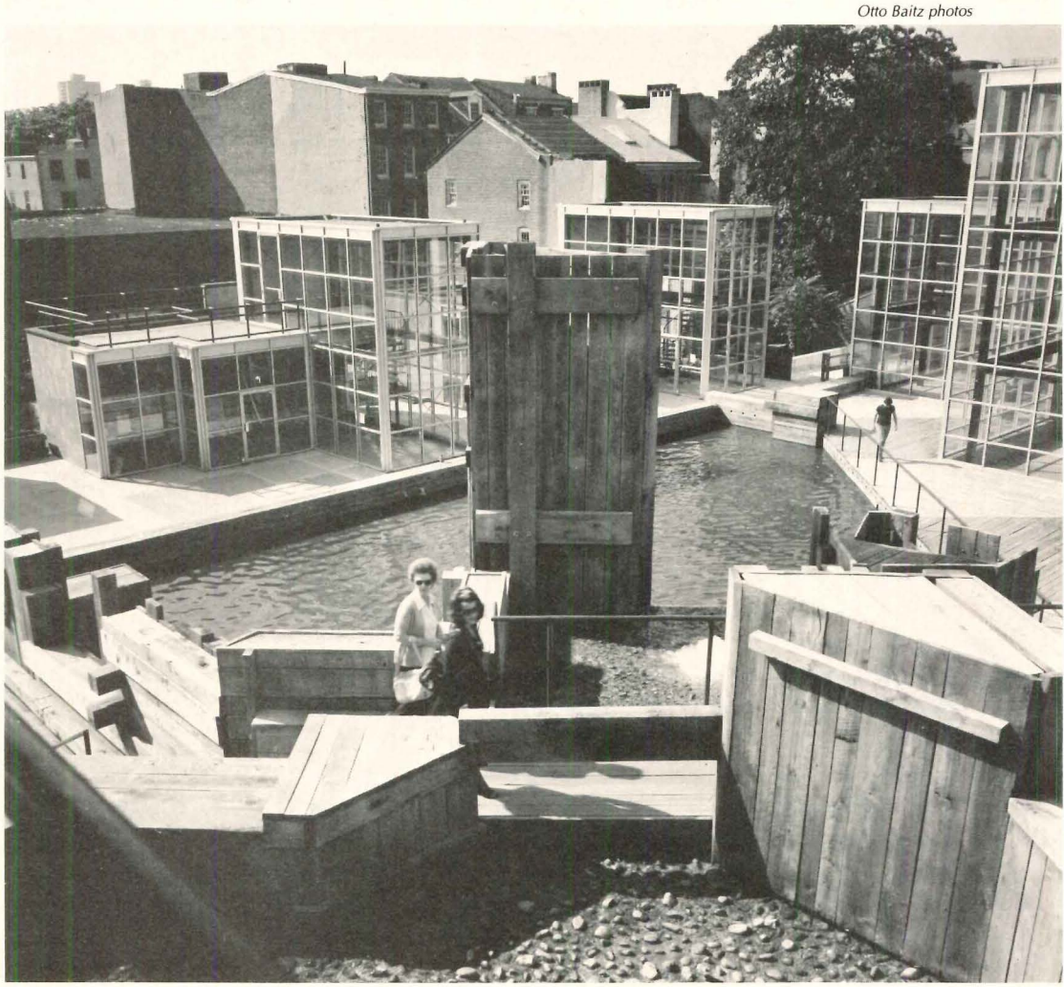


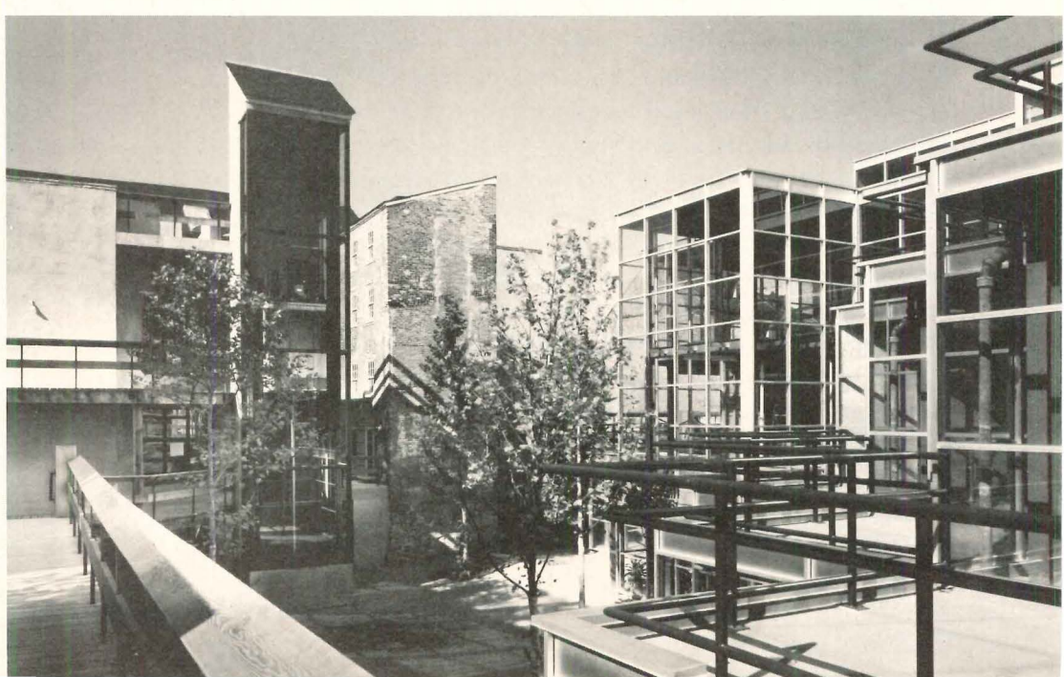
PORTSMOUTH PUBLIC LIBRARY, Portsmouth, New Hampshire. Owner: *City of Portsmouth. Architects: Stahl/Bennett, Inc.—F.A. Stahl, partner-in-charge; Roger Lang, director of restoration and renovation; Frank Adams, project architect.* Engineers: *Weidemann, Brown, Inc.* (structural); *AMC Engineers* (mechanical); *Metcalf Engineering* (electrical); *Conmatan, Inc.* (specifications). General contractor; *Picci Construction Co.*

Old and new construction combine as an urban shopping center: New Market in Philadelphia



Otto Baitz photos





Countering the trend towards suburban shopping centers, New Market in Philadelphia is nearing completion and offers a mixed-use answer to maintaining a low-rise ambiance with a style and sensitivity unobtainable in many suburban locations. Combining a number of 18th-century buildings (of course, low-rise) with the crisply new ones (see aerial photo) the project capitalizes on both irreplacable architectural assets and economic realities for its vitality.

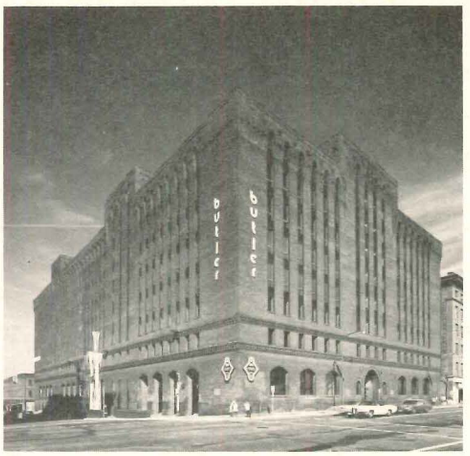
Like Stahl/Bennett (whose work appears on the preceding pages), architect Louis Sauer has chosen to make a clear visual break between old and new construction in his design for the steel-and-glass commercial buildings and the brick-clad townhouses that complete the complex (photos, right); except here the break is even clearer in that—while the massing is related—the cladding of the commercial buildings makes no attempt to echo (or compete with) the existing structures, which were painstakingly restored by architect Adolph Mark. Instead, the new buildings are an expression of current function: the exposure of goods and services within to the expected crowds of passers-by.

Stores and restaurants in both the new and restored buildings are related to four plazas within the complex, including that containing the fountain designed by James Hamilton (photo, center).

New Market is the result of a city-sponsored competition won in 1963 by developers van Arkel and Moss (also the developers of Quincy Market in Boston) who, together with Kravco, developers of a shopping center chain, own the complex. Kravco is also involved in a similar project in the Bedford-Stuyvesant section of New York City. This project satisfies almost all of the criteria which the developers seek in establishing "specialty centers" (shopping complexes without an anchor store): proximity to an urban center, to a highway exit and to a body of water, and the presence of historic structures and mixed uses—giving an unprecedented ambiance of the new and old.

NEW MARKET, Philadelphia, Pennsylvania. Owner: *Head House Venture.* Architects: *Louis Sauer Associates.* Engineers: *Joseph L. Hoffmann & Associates* (structural); *M. Michael Garber & Associates* (mechanical/electrical). Consultants: *Jules Fisher* (lighting); *Brown & Craig* (graphics); *Meridian Engineering, Inc.* (project management). Landscape architects: *Design Associates, Scenic Studio.* General contractor: *Irwin & Leighton, Inc.*

Summing up: A big old warehouse uncrates a rich mixture of activity and amenity

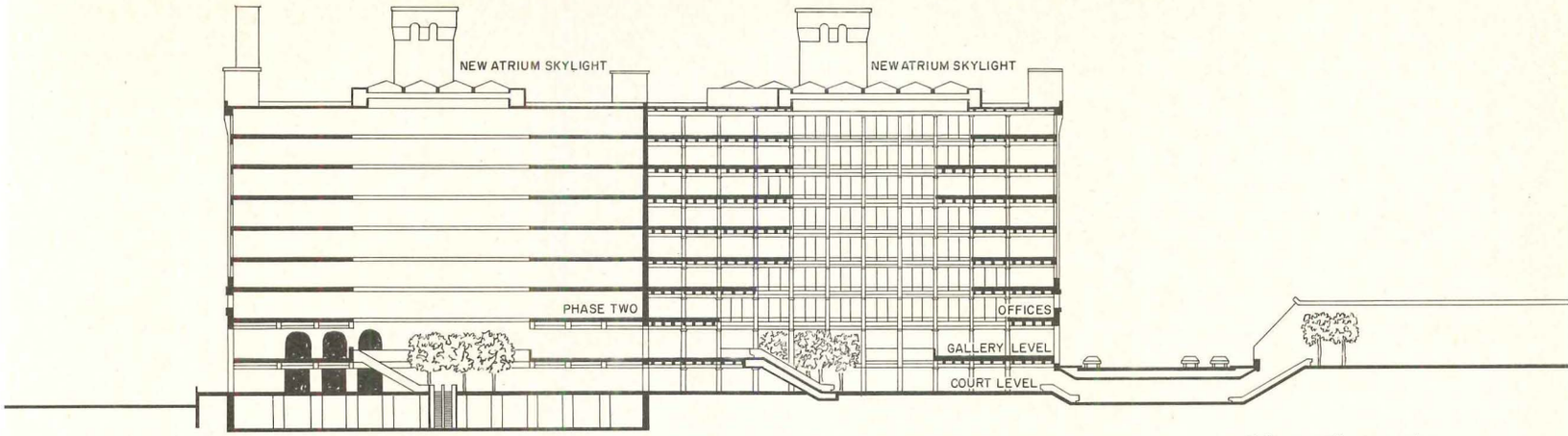


It is hard to beat Butler Square, until recently a burly red brick pile of a warehouse on the edge of Minneapolis' resurgent downtown, as a case-example wrap-up of this issue of the RECORD or, supplying a touchstone of architecture's transition, to wrap up this year. The reason is that this massive encrustation of thick walls, deeply recessed windows, arched entrances, corbeled cornices, and rampart-like towers is a lesson-laden example of what that articulate Englishman, Alex Gordon, said should be the primary premises of design strategy in coming years—"long life, loose fit, low energy." These are words that deserve to ring sonorously through the ages as have, say, "firmness, commodity, and delight." Design strategy can be heavy stuff, of course, especially when it comes up against, as it inevitably must, something even heavier—spending strategy. This is precisely what Gordon's thinking is directed at in contrast to most of the conceptual catch-phrases that have come and gone, over the last three-quarters of a century, in association with those "schools of thought" making up what has been called (get ready) The Modern Movement. It can be said that the Butler *really* did it because, for about $20 per square foot, this Teddy Roosevelt period-piece, put up in 1906, has been turned into a working combine of commercial, business, and public spaces. Not only that, it looks as though the place is, on the heels of a harrowing rent-up rate resulting from the sluggish economy, going to turn a profit, which also means, as such things go, that this wintry city of 430,000 skate-toting sports is going to have some tax revenue drifting in that it would not have had otherwise. Not everything has been jim-dandy about this job, as if everything about any job *ever* is. What is material here, besides an ardent adaptation of brick and timber, is the fact that it is still damned difficult to convince potential investors of the economic feasibility of taking a 70-year-old shard—even one singled out for national landmark status, as the Butler has been—and turning it into something other than it was originally. Oh, sure. It makes one feel mighty good to be able to say, "Ah ha. Told you so. And for just $20 per square foot." But the real story behind this building—or, so it would appear, inside—is what kind of cajoling and convincing it took to get to the point where there were dollars to pay for the proof. This connection between economics and esthetics has always existed—one of the most enduring, encompassing tendencies of culture. Physical durability, functional lee-way, budgetary thrift—the Butler makes the connection clear. Given the constraints of a believable bottom-line, and the necessity of stretching available resources, here is a bellwether ringing with beauty.—*William Marlin*

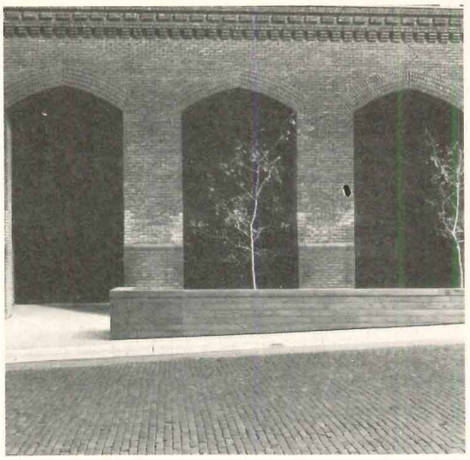
There is a certain legibility in the ordinary warehouses that are found on the back blocks of our cities. Looking at them, it is possible to make out what such a city has been about, or even plans to be. For these are structures where shirt-sleeved breadwinners helped write urban history in the course of doing, as the old saw says, an honest day's work for an honest day's pay. These plain, purposeful chips off the old American block are, even when idle, vivid with imagery and, especially when idle, with immediacy as well. A structure in place is a compaction of space, materials, and bound-up energy—all at the ready for resuscitation and renewed community service. There are few things as legible in these troubled times because society has squandered so many of its resources in its gluttonous pursuit of material gain. In feeding the forces of conservation, helping redefine and redirect the impetus for change, an honest day's work for an honest day's pay becomes a new saw for financing, designing, and operating buildings.

This is why the Butler Brothers Building in Minneapolis, now renamed Butler Square, is such a benchmark, not only one in terms of adapting older structures for new uses but, far more importantly, in terms of basic values that are applicable to spanking new structures.

The Butler, idle for 10 years, is back in business as an eye-catching collage of commercial, retail, and business activity that ranges up and around a skylit nine-story atrium. Here are office suites which, like lairs on the ledges of a chasm wall, look out upon one of the most animated but articulate public spaces to be created anywhere in recent years. Lively shops, cozy corners to sip or sup in, landscaped promenades to stroll along, spots just to sit—it's all here and, as one secretary put it recently, "I find that I'm in no particular hurry to leave at night." Such ebullience puts one in mind of something which that old architecture buff, Charles Laughton, once did upon entering a new structure by one of his favorite designers. Rotund and affable, he spread out his arms as if to hug the space and shouted, "Why can't *I* work here?" A lot of people around town have been having a similar reaction to the explosion of life and light within the recently sandblasted austerity of the Butler's thick and slightly mysterious exterior walls, which resemble some sort of Tuscan fortress. Inside, these walls encase a not-slightly sensational experience, a bounteous and beautiful



Phillip MacMillan James photos



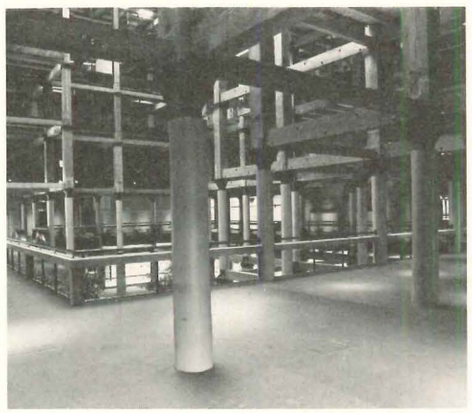
space bounded by the expressive edge of the building's fir-timber construction.

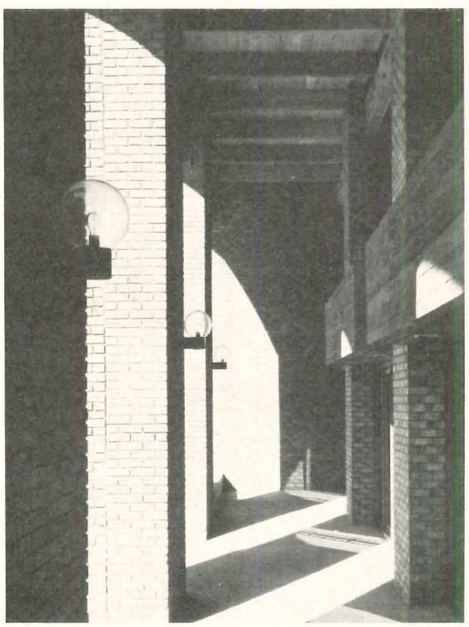
This phase of the project, open about a year, takes up half of the building's 500,000 square feet which, need it be said, is a lot of room. Work is shortly to begin on the second half, which is being adapted as a 300-room hotel called Butler House—something that is badly needed in business-busy Minneapolis. None other than Investors Diversified Services (IDS) will manage it and, so the company reports, the three hotels it already owns are presently turning away the equivalent of 60 per cent of occupancy. No two ways about it, the Butler is an example of the past, which is right on time and, considering this town's adventuresome plans for reweaving its fabric, it is even in the right place—something that can not be said for many proposed renovations, many of which never get anywhere precisely because the buildings at issue are located in areas beyond salvage or, if not, in areas where most people wouldn't dream of setting foot. The Butler's surrounds, while a little seedy with parking lots, gas stations, bars, and assorted porn-on-the-cob Americana, are not only salvageable but, because of all those "eyes of the Street," as Jane Jacobs used to say, are even safe.

The Butler counterpoints some of the nation's finest contemporary architecture. Most alluring, perhaps, is the IDS Center, but a few blocks away, designed by Philip Johnson. Its energetic masses shimmer around an expansive covered court in much the same uplifting mix of people and purpose that characterizes Butler Square. Taking the outside inside, one of The Modern Movement's early tenets, seems to be reviving here in Minneapolis with an especially urbane *elan.* Another variation of the idea is at John Carl Warnecke's Hennepin County building, a two-tower extravaganza connected by a skyscraping atrium that is, in turn, interlaced with varied levels, bridges, and bright landscaping.

The Butler was originally done by architect Harry W. Jones and built by T. B. Walker, who founded the Walker Arts Center. The new handiwork is by fine local talent, the firm of Miller, Hanson, Westerbeck, Bell in collaboration with Arvid Elness, the project architect in his days with MHWB who is serving as project manager on the second phase of work.

Here are some of the reasons this particular architectural team gets high marks. First of all, they didn't try to put on the dog and foist some notion of contemporary form upon an existing one. In what might be called the ultimate in originality, they deferred to that of the old building and kept their own quiet.





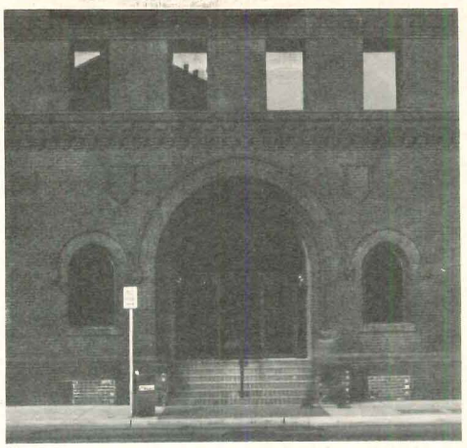
The sand-blasted sobriety of Butler Square's thick exterior walls is embellished with planting and banners (top), concealing the spacious, nine-story atrium inside (center and opposite page) around which rise promenades, commercial areas, and office suites. The tactile quality of the building is immediately clear (bottom) at the entrance where the brick-and-timber grammar of the original work grabs hold of the senses before releasing them inside.

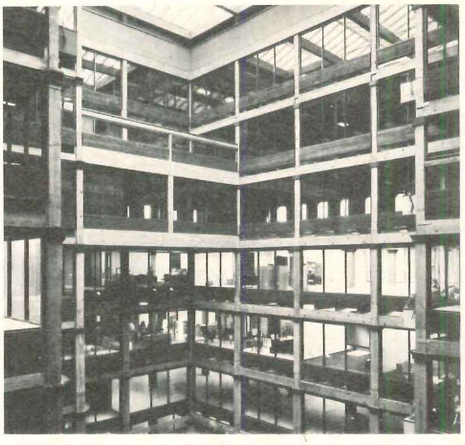
The Butler's interior stems from a succinct structural system. The heavy fir timbers taken from Walker's own tree farm and lumber mill way out in tiny Aitken, Minnesota, were put together on a module measuring about 16-by-14 feet. The columns, which receive the beams with cast-iron brackets, gradually diminish in size from 22 inches square on the ground floor to a spindly eight inches near the top. The atrium was created by disassembling this timber system toward the center of the building, and the removed material was then recycled to provide consistent details and finishes in the occupied areas.

The atrium is economic in nature, not just esthetic—as dramatic a visual event as it is. Without a substantial amount of its floor space given over to this, the 250,000 square feet that this phase takes up of the over-all building would have yielded floors of too vast a size to be well enough lighted or to be broken up in the more intimate configurations thought to be marketable in the "luxury" field.

This result, as architect Elness explains, "retains a certain integrity. No attempt was made to conceal elements of the existing structure." On the exterior, minimal change took place and, in fact, minimal change is all that was possible. "The only visible alteration," he says, "is the lowering of the window spandrels to accommodate pedestrian access at grade level, and that of floor-to-ceiling glass in the office areas." These modifications are limited to the original lines of the building so as not to detract from its somber simplicity.

Inside, these lines, expressing the elegant egg-crate effect of the structure, are like hyped-up vectors—racing one's sight and senses this way and that. The first two levels contain the commercial and retail activity around the tiled floor of the skylit atrium which, at this point, is landscaped plentifully and colorfully. The upper seven levels contain the offices—a wide variety of them, in fact. The module of the building, horizontally and vertically, proved to be marvelously flexible, and every floor, reflecting a lively mix of tenants, has turned out differently. While there may be a few tenants occupying large floor areas, the space concept was conceived along the lines of dividing each floor into quadrants, with the offices in each one ranging from 114 to 400 square feet. Yet





The original design features of Butler Square have been set off rather than shown up by the recent conversion such as (top) the retention of the early entrances and window openings enhanced by simple sheets of glass and unobtrusive fixtures, the powerful character of the interior atrium made possible by the disassembly of part of the timber frame, and the warm, sensate quality of the varied offices (bottom) that derives from having retained the natural materials throughout.

within each quadrant is still more flexibility, because, if more than one tenant is involved, the quadrant is accordingly adapted so that reception, secretarial, storage, and reference functions can be shared.

A feeling of cohesion between areas is supplied by the structural frame—one of material bearing and visual orientation—but, within this discipline, the almost communal vigor of the place can be readily grasped as the glassed-in offices overlooking the atrium reveal themselves through the hand-me-down curtain-wall of timbers.

It is here that the imagery of ordinary utilitarian buildings like this is most compelling, and the immediacy of their use to accommodating present-day needs so clear. Very little tinkering was needed to achieve the effect and, where tinkering did occur, it is not noticeable. For example, electrical, mechanical, and air-conditioning equipment is slid under a slightly raised floor surface so that the overhead beams and ceiling timbers could be retained and thus texture the place with tangible warmth. Even with such typical paraphernalia as overhead sprinklers, boxed lighting fixtures and, throughout, partitions of good old gypsum board, these offices are anything but the dumb fluorescent-lit deserts that routinely parch the environment of deep-down appeal—"efficiency"—while sending us working stiffs screaming for the nearest saloon at five.

The most important dimension, however, was measured by the developer of Butler Square—Charles B. Coyer of Washington, D.C.—who has always had a thing for old buildings and, having a thing for making them work financially, dramatized the profit potential of recycling them a few years ago with his much-acclaimed Canal Square in historic Georgetown.

Successful in having secured financing so far—the General Electric Pension Trust should be given an AIA medal for having taken the step to back the Butler Square phase—Coyer, still trying to mobilize money for Phase Two, is hardly sanguine in discussing the recurrent obstacles.

"With dollars so tight," he comments, "and with investors justifiably concerned about slow rent-ups, there was probably not a worse time to try to find money for this. We're around 50 per cent rented now, with another 25 per cent spoken for, but for a while, there, things were pretty much touch and go. It is not that there were no interested parties but, a year ago, there were a lot of clouds in the future of a lot of firms, and it was naturally difficult for them to make a move. Now, with things looking a little brighter, we've found an encouraging number who stayed bullish on the place and are coming back to reconsider.

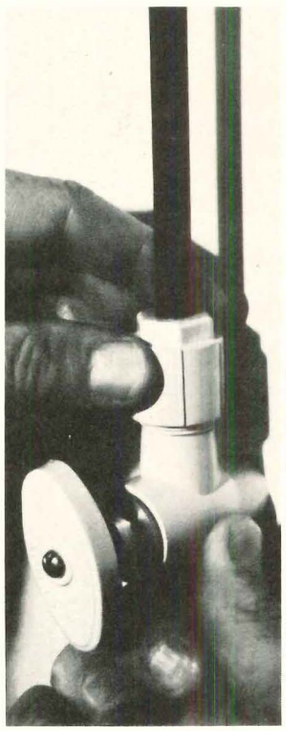
"But the single greatest challenge in our field today is convincing the financial community, even in the best of times, that just because a building is 70 years old doesn't mean that it's not a good investment. The fact is that, in the long term, it can be one of the best but, the trouble is, investors still tend to figure in a dollar-figure for what it thought of as depreciation. And the reason they still do is that there is a feeling that something old is automatically of less monetary value; in other words, they decide on the basis of the existing shell instead of on the basis of what value might accrue as a result of what is done with, or within, that shell. So what happens is this. Say you figure that you need, $6 million. The investor is liable to offer you in the neighborhood of $5 million or, in tough times, even less. Once you add up all the finance charges and other fees, it is not unusual for the actual amount of money put in by investors to amount to only 25 per cent of the over-all cost of accomplishing the job, and by accomplishing the job I mean all the costs of getting to the point where, with adequate income from rents, you can turn a profit."

Butler Square is the compleat conversion—evidence that a strategically sited building, located in an area that has been declared ripe for renewal otherwise, can be turned to the service of commonly recognized commercial and business needs.

But more than this, it is a reminder, in fundamental design terms, that the resources of the past and the requirements of the present-day not only hinge upon each other in these belt-tight times. They can enhance each other. While it is recognized today that the profession of architecture is in a state of retrenchment, it is also in a state of reflection. At Butler Square, there are elements of both, and a good look at architecture's future—as it really was.

BUTLER SQUARE, Minneapolis, Minnesota. Owner: *Development Associates, Washington, D.C.* Architects: *Miller, Hanson, Westerbeck, Bell (in collaboration with Arvid Elness, project architect).* Engineers: *Frank Horner (structural); TAC Engineering (electrical and plumbing); Temperature Engineering Corp. (heating and ventilation systems).* Contractor: *Knutson Co.*

For more information, circle item numbers on Reader Service Inquiry Card, pages 159-160.



Playground slide features add-on components, stainless steel construction

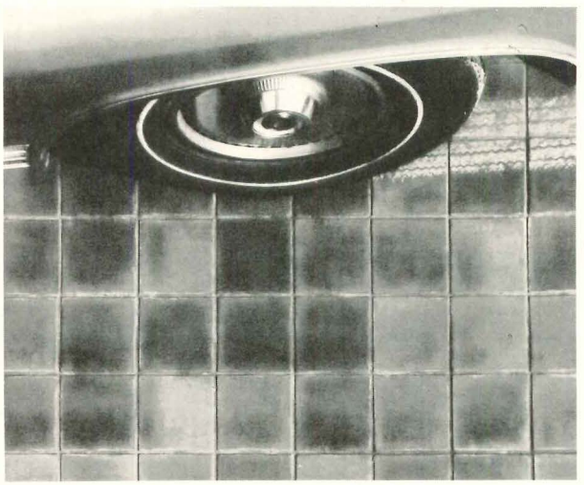
The company's "Mark IV" ski slide features a colorful tower, reached by a 12-gauge safety tread stairway or by a chain ladder on the opposite side. The 4-by 6-ft galvanized deck can accommodate a group of children and includes a paneled safety railing. The tower is supported by 1¼-in. steel pipe corners joined by steel color panels welded into a single structure. ▪ Miracle Recreation Equipment Co., Grinnell, Iowa.

Circle 302 on inquiry card

Riser tube plugs into fixture shut-off valve

A plumbing fixture shut-off valve is said to make fixture hook-ups almost as easy as plugging in a lamp, and a water-tight, pull-out proof riser tube connection is said to be effected by non-skilled labor. The patented connector is called *Genogrip*. Flexible riser is cut to length with a knife and inserted into the fitting. Hand tightening completes the connection. ▪ Genova, Inc., Davison, Mich.

Circle 300 on inquiry card

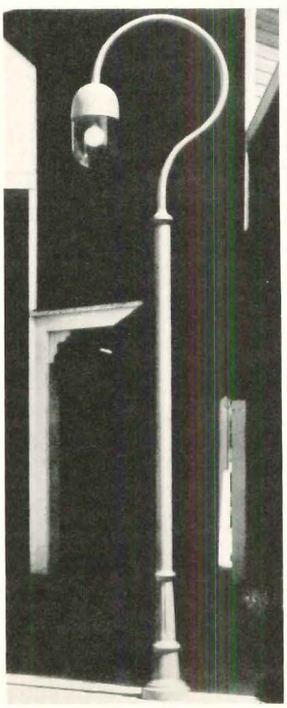


Observation elevators on a budget

These "ride with a view" elevators have been pre-engineered in economical types for low-rise, limited-budget buildings. With rear walls of clear laminated safety glass, the standard hydraulic elevators meet ANSI A17.1 code requirements, and range from 1500- to 4000-lb capacities. ▪ Otis Elevator Co., New York City.

Circle 304 on inquiry card

more products on page 117



Nostalgia inspires outdoor lighting

The "Nostalgia" series of luminaires, poles and brackets is recommended for outdoor lighting applications. With a choice of mercury vapor, incandescent and T10 lamps, the lighting series is constructed of aluminum and acrylic, with the metal finished in high gloss, colorful acrylic enamel. ▪ Architectural Area Lighting Co., Santa Fe Springs, Calif.

Circle 301 on inquiry card

Thin pavers provide individual joint control

This manufacturer of architectural fired clay tile, thin pavers, and pre-cast polymer-concrete architectural tile-faced building panels has introduced its "3A" individual control joint paving system employing a combination of ⅝- or ¾-in. frostproof thin pavers bonded to a wet screed bed in one operation. The system can be applied over a membrane on new or worn structural decks, on a suitably compacted new base, or over old worn pavement. Properly installed, it is designed to accommodate uneven loading, heaving and uneven compacting of the base, flexing and cracking of old paving beneath it without compromising the integrity of the individual pavers. Tile contractors can install 3A. Installations are guaranteed for three years. Minimum bed depths are: 1 in. for pedestrian traffic, and 1¼ in. for light vehicular traffic. ▪ Structural Stoneware Inc., Minerva, Ohio.

Circle 303 on inquiry card

Versa-Tile™ molded ceiling modules let you turn your imagination loose.

Ceilings like these happen easily with Versa-Tile molded modules by Johns-Manville.

They open up a whole new world of design possibilities, giving you flexibility and freedom to custom-create ceilings that are boldly and dramatically innovative.

Versa-Tile molded modules come in a broad range of standard shapes and a variety of textures and colors. Or we can custom-make them to conform to almost any design you create.

And this design flexibility is not at the expense of practicality.

Versa-Tile modules are light in weight, only one to two pounds per square foot.

They have an excellent strength to weight ratio.

They're durable.

They're easy to maintain.

They're easy to install in standard modular grid systems.

And, when used in our total ceiling system, they readily accommodate air-handling, sprinkler and lighting sources.

Find out more about J-M Versa-Tile ceiling modules. Contact John Busch, Johns-Manville, Greenwood Plaza, Denver, Colorado 80217. Telephone 303/770-1000.

JM

Johns-Manville

For more information, circle item numbers on Reader Service Inquiry Card, pages 159-160.

PLASTIC PLUMBING / Thermoplastic pipe used in modern residential plumbing can pose a fire hazard and be damaged by improper care without informed handling by installers and users, according to the September issue of *Dimensions/NBS*. The monthly news magazine of the Commerce Department's National Bureau of Standards reports that the plumbing configuration within the wall, and construction details such as the depth of the wall and the sealing of plumbing penetrations, significantly affect the ability of the wall to resist the spread of fire from one dwelling unit to another. *Dimensions/NBS* is available by subscription for $9.45 annually (add $2.40 for foreign mailing); single copies may be obtained for 80 cents. Orders should be placed with the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Include SD Catalog No. C13.13.

HEAVY-DUTY DOCKBOARDS / The company's line of 35,000- and 50,000-lb mechanical recessed dockboards for continuous heavy-duty use is presented in this bulletin. The design incorporates a ramp and lip-hinge configuration that eliminates front hinge mounting plate and attaches lip-to-load beam supports. Ramps accommodate a 4-in. right or left tilt and service truck beds from 12 in. below to 12 in. above dock level. Dockboards are available in ramp widths of 6 and 7 ft, and lengths of 6 and 8 ft. ▪ Kelley Co., Inc., Milwaukee, Wis.

Circle 400 on inquiry card

HVAC CATALOG / General Catalog 875 includes 16 pages with more than 60 product photographs. Special emphasis is placed on the *Rainbow* power humidifier, but also described are automatic air valves, balancing valve adapters, automatic humidifiers, float control valves, strainers, saddle valves, needle valves, and steam vents. Application drawings are utilized to show recommended usage, and dimensions and capacities are posted throughout the catalog. ▪ Maid-O'-Mist, Chicago, Ill.

Circle 401 on inquiry card

PIPE RAILING / The 16-page brochure contains complete engineering, design, and installation information as well as diagrammed illustrations of component parts of "Connectorail." The use of formulas contained in the booklet enables the designer to select railing components that will meet and exceed OSHA and other building code regulations, according to the company. Proper installation procedures are also outlined. Prefinished aluminum and stainless steel components are available from stock for immediate shipment. ▪ Julius Blum & Co., Inc., Carlstadt, N.J.

Circle 402 on inquiry card

ARCHITECTURAL ALUMINUM / A 24-page brochure entitled "Aluminum In Architecture," describes sulfuric acid and *Kalcolor* anodized aluminum for building construction, including sections devoted to renovation and remodeling applications for anodized aluminum window frames. ▪ Kaiser Aluminum & Chemical Corp., Oakland, Calif.

Circle 403 on inquiry card

CONCRETE REINFORCEMENT / A 16-page brochure describing "Tufwire" and "Tufwire Strand" for prestressed concrete applications includes physical properties, strand elongation and stress-strain curves, suggestions for cost reductions, and photos and descriptions of a variety of construction applications. ▪ Armco Steel Corp., Kansas City, Mo.

Circle 404 on inquiry card

LOCK DESIGNS / Designed to show the company product line in compact form, the S75 catalog features new lock designs and finishes. An insert in Sweet's Architectural Catalog file, the catalog provides information for comparing, selecting, specifying, and installing company locks. ▪ Schlage Lock Co., San Francisco, Calif.

Circle 405 on inquiry card

TRANSIT SHELTERS / A brochure describing the use of *Lexan* "MR-4000" sheet for passenger transit shelters is now available. MR-4000 sheet, a transparent, high-impact polycarbonate plastic, offers weatherability and mar-resistance, and it can be fabricated with conventional tools, according to the company. ▪ General Electric Co., Pittsfield, Mass.

Circle 406 on inquiry card

DIMMING SYSTEMS / A four-page brochure available on solid state architectural dimming systems features "Versaplex" controls that allow dimming of mercury vapor, fluorescent and incandescent light sources. A slide control or preset touch-button dimming suggests application in conference rooms, projection booths, lecterns and board rooms. ▪ Lutron Electronics Co., Inc., Coopersburg, Pa.

Circle 407 on inquiry card

CONVERTIBLE FANS / Two types of "T" line convertible fans are described in this Bulletin 420. All tubeaxial fans in the line are convertible to higher pressure vaneaxial fans by the attachment of a separate vane section. The vane section attaches to the discharge and becomes an integral part of the fan. The line has been expanded to include standard models with heavy gauge steel casings and optional models with aluminum casings. Capacities range from 3551 m^3h (2029 cfm) to 219,174 m^3h (129,000 cfm), depending on type of fan and drive. ▪ Aerovent Inc., Piqua, Ohio.

Circle 408 on inquiry card

FLIGHT INFORMATION DISPLAY / A 24-page monograph titled "A Guide To Flight Information Display Systems" prepared by the company's display engineering staff for architects, engineers, and system designers concerned with the display of information throughout an airport complex, discusses what has been done in airport display and what can be done. ▪ Conrac Corp., New York City.

Circle 409 on inquiry card

FIRE PROTECTION SYSTEMS / A brochure, that details trends and developments in the field of life-safety fire protection systems, features sections on the special fire protection problems in high-rise buildings; the growth of Federal and state-mandated codes requiring sprinkler systems; the construction cost savings from installing sprinklers, and the rise of public opinion demanding safe buildings and several new types of sprinklers. ▪ Grinnell Fire Protection Systems Co., Providence, R.I.

Circle 410 on inquiry card

DOOR CATALOG / An eight-page catalog, giving technical information on a line of custom doors and adjustable frames has been released by the company. The doors are available in four different core constructions: hollow, solid wood staved, solid wood flake, and lead shield. The doors can be finished in a range of colors, textures and patterns, as well as any high-pressure laminates. ▪ Marlite Custom Products, Dover, Ohio.

Circle 411 on inquiry card

more literature on page 125

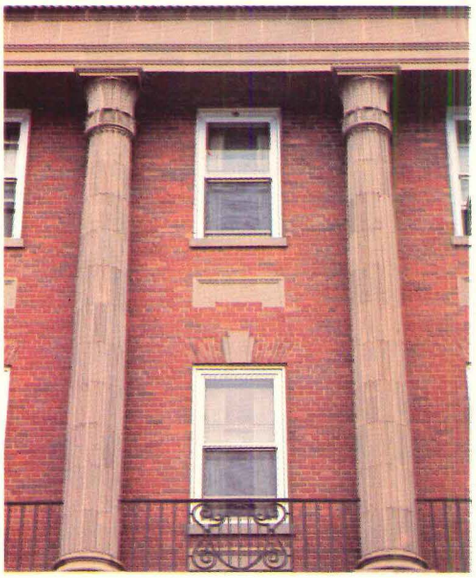
CURE THE COMMON OLD.

With replacement windows protected by DURACRON® enamels from PPG. More and more, the usefulness of old buildings is being saved from the wrecking ball. Thanks to modern technology and companies such as Season-all Industries of Indiana, Pennsylvania. Season-all manufactures custom-made replacement window units to refurbish old buildings and extend their life. For example...

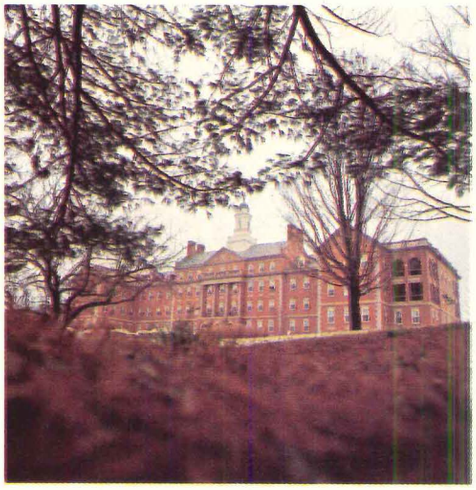
Allen County Courthouse objection overruled. Drab, weathered sashes and frames made this Lima, Ohio courthouse look shabby. *NuPrime** extruded aluminum window units by Season-all, with DURACRON thermosetting acrylic coatings from PPG, improved the appearance and reduced heating and maintenance costs.

Huntington VA Hospital rehabilitates more than people. At this West Virginia VA hospital, the leaky old windows were letting weather in and comfort out. Season-all *NuPrime* units pre-coated with DURACRON enamel stopped all that.

**NuPrime is a registered trademark of Season-all Industries, Inc.*



Huntington VA hospital improved both its appearance and efficiency with replacement window units protected by DURACRON coatings from PPG.



Garfield Junior High learns a lesson in economics. Aging windows in this Johnstown, Pennsylvania school were costing the school system money for maintenance and heat loss. New Season-all units with DURACRON enamel now hold comfort in and keep maintenance costs down.

DURACRON coatings from PPG help cure the old. Year after year. Because the color resists fading and chalking, and the coating itself resists chipping, cracking and peeling. Get full details on how you can improve your image while you reduce maintenance and energy costs. With extruded aluminum replacement window units protected by DURACRON color coatings.

Check Sweet's Architectural or Industrial Construction Files 9.10/PPG. Or, contact the Market Manager, Extrusion Coatings, PPG INDUSTRIES, Inc., Dept. 16W, One Gateway Center, Pittsburgh, PA 15222.

PPG: a Concern for the Future

Extrusion Coatings

PPG INDUSTRIES

For more data, circle 44 on inquiry card

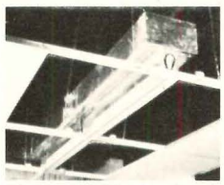
BUILDING AUTOMATION / "Modular Command" is designed to perform security as well as heating, ventilation and air-conditioning functions for commercial, industrial and institutional buildings. The product combines computerized analysis and response to sense environmental change. The sensors may indicate intrusion, breaches of security routes, fire symptoms or other security-oriented data, or they may indicate conditions associated with climate control such as environmental temperatures, boiler feedwater levels or steam pressures. A CRT terminal can be provided for visual information and a printer can provide written records of systems operations. "Modular Command" operates over standard telephone data circuits or microwave carriers. ▪ Esterline Electronics Inc., Costa Mesa, Calif.

Circle 305 on inquiry card

EXHAUST/LIGHT FIXTURE / Bathroom exhaust and ceiling lighting are available in one combination fixture HV1 certified for quiet operation and air delivery at 60 cfm. Unit installs between standard ceiling joist widths, and is UL-listed. ▪ Rittenhouse Div., Emerson-Chromalox, Honeoye Falls, N.Y.

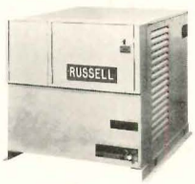
Circle 306 on inquiry card

AIR TERMINAL / "Moduline" 37AG and 37AJ air terminals operate as slave or control units. The 37AG handles 20 to 200 cfm; the AJ handles 10 to 100 cfm. Self-contained controls afford fast response, and allow zone changes with simple above-ceiling control connections, according to the company. ▪ Carrier Air Conditioning Co., Syracuse, N.Y.



Circle 307 on inquiry card

CONDENSING UNITS / A line of compact condensing units for high-, medium- and low temperature applications includes 21 models from 3hp to 15hp. Units are available for either indoor or outdoor installation. ▪ Russell Coil Co., Brea, Calif.



Circle 308 on inquiry card

CEILING FAN / This chrome-plated 52-in. ceiling fan has wood blades with pecan finish, and two speeds to circulate air. The chrome model comes with or without a light. Four other ceiling fans are available in several styles in 36- and 52-in. sizes. ▪ Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.

Circle 309 on inquiry card

more products on page 119

Seacrest ACOUSTONE®
CEILING PANELS
Foil-backed to save energy.

Count up the savings reflected by the exclusive foil backing in this large module ACOUSTONE panel. Installed resistance to heat flow to an R-Value of 11.08 lowers cooling costs up to 40%, heating costs as much as 10%. Permits smaller equipment capacities. And decreased "breathing" reduces soiling to cut maintenance costs. Count on foil-backing for better sound attenuation, too. These panels deliver .70 to .80 NRC, 35 to 39 STC performance. When it comes to aesthetics, Seacrest pattern ACOUSTONE has it all for you. The fresh, frothy, deep-textured look of a surfing sea. And its high light reflectance allows for energy-saving wattage cut-backs, too. For specifics on fire, acoustical and thermal properties, consult SA-905 in Sec. 9.1 of Sweet's Architectural File. Or call your U.S.G. Technical Representative.

Write now for free brochure!

United States Gypsum, 101 S. Wacker Dr., Chicago, Ill. 60606, Dept. AR–125.
Yes, send a copy of your new brochure, "Foil-backed ACOUSTONE Tile Ceilings" to:

NAME & TITLE_____

COMPANY_____

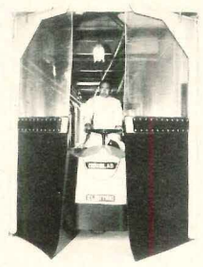
ADDRESS_____

CITY_____ STATE_____ ZIP_____

UNITED STATES GYPSUM
BUILDING AMERICA

For more data, circle 46 on inquiry card

DOUBLE-ACTING DOOR / The door's upper half is of flexible transparent PVC and the lower panel is of heavy-duty abrasion-resistant rubber. Other features are a rubber joining plate, horizontal spring hinges, and flat steel retaining strip across top edge and down the vertical edges. Panels overlap to prevent drafts. The product is available in double- or single-panel models. ▪ Clark Door Co., Inc., Cranford, N.J.



Circle 310 on inquiry card

CONDUIT COUPLINGS / Expansion/deflection couplings are intended to protect rigid conduit runs and ground continuity where seismic disturbances, ground settling and thermal expansion or contraction may cause conduit movement. Available in 1-in. through 6-in. NPT sizes, these couplings adjust for axial expansion or contraction up to ¾ in., angular misalignment of coupled conduit runs in any direction up to 30 degrees, or parallel misalignment of conduit runs up to ¾ in. ▪ Crouse-Hinds Co., Syracuse, N.Y.

Circle 311 on inquiry card

STACKING CHAIRS / This chair is plastic, imported from Finland, and designed by Esko Pajamies. In a choice of three colors, it stacks, and is shipped knocked-down in individual cartons. No tools are required for assembly. ▪ Stendig, Inc., New York City.

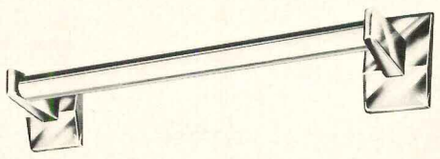
Circle 312 on inquiry card

SKYLIGHT PANEL / Prefabricated glass block panels are strengthened with thick aluminum extrusions and use notching dies that interlock the grid members. This assembly technique forms a monolithic grid immovable even under wide temperature variations, according to the company. Further, a butyl sealant is applied under heat between all joints of the panels, ensuring a watertight construction with a five-year warranty. ▪ Circle Redmont Corp., Stamford, Conn.

Circle 313 on inquiry card

DIRECTIONAL LIGHTING / Each unit is equipped with an energy-saving reflector said to boost light output from a 60-watt inside frost "A" lamp to the equivalent of a 100-watt lamp. A choice of shades in white and chrome and brass metal finishes and a selection of several models for wall or ceiling are included in the series. Each light rotates 358 deg in one direction and 180 deg in the other direction. ▪ Inlite Corp., Berkeley, Calif.

Circle 314 on inquiry card



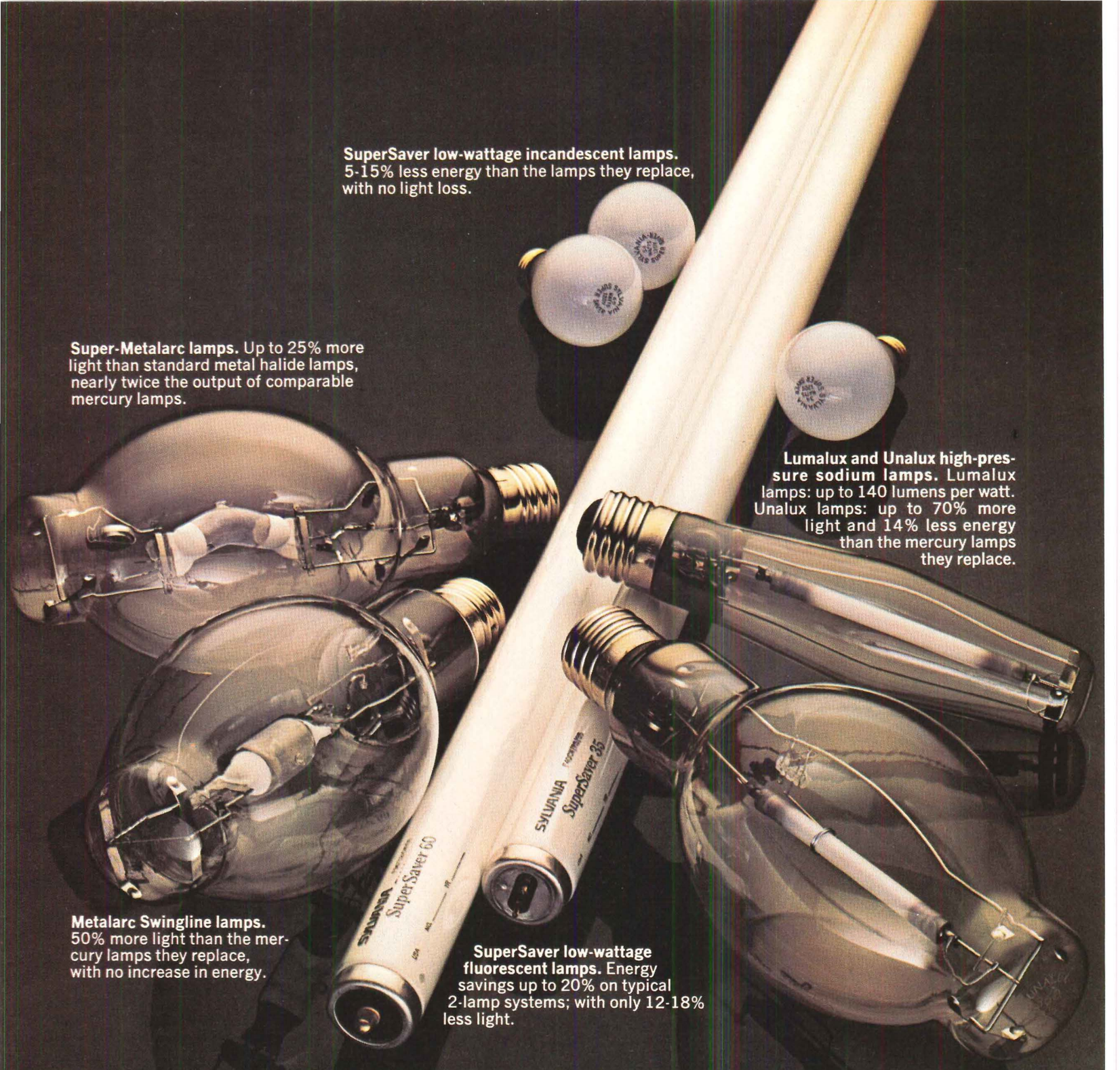
TOWEL BAR / Constructed of type 302 satin or bright finish stainless steel, the round towel bar features all-welded construction of the flanges and posts to provide firm support for the slip fitted bar of ¾-in. diameter .049 wall tubing. The towel bar is available in lengths of 18, 24 and 30 in., with either rectangular or round flanges. ▪ The Charles Parker Co., Meriden, Conn.

Circle 315 on inquiry card

FILING AND STORAGE / A line of mobile carriages for filing and storage systems features track and carriage systems that permit use of either existing or new shelving. The company offers a choice of manual or electric systems, ranging from 3-ft mini units to 60-ft carriages with capacities up to 60,000 lbs. Floor space, is said to be reduced by nearly 50 percent. In the non-electrical manual filing and storage systems, with capacities up to 6000 lbs, less than one-half of one per cent, or seven pounds of effort, can move a ton of material, according to the company. ▪ SpaceSaver Corp., Ft. Atkinson, Wis.

Circle 316 on inquiry card

more products on page 121



The stingy bunch.

A lot more light from every watt.

Just because there's an energy shortage, don't think you have to turn the lights out.

Instead, look into these Sylvania energy-saving lamps. Our "Kilowatt Cutters."

They squeeze more light (lumens) out of every watt. Which means you can cut power consumption and still have plenty of light. And, in most cases, all you do is replace the lamps you're using now.

Thanks to Sylvania's Kilowatt Cutter lamps, you can be stingy with energy and still be generous with light.

See your Independent Electrical Distributor. Or write to Sylvania Lighting Center, Danvers, Massachusetts 01923.

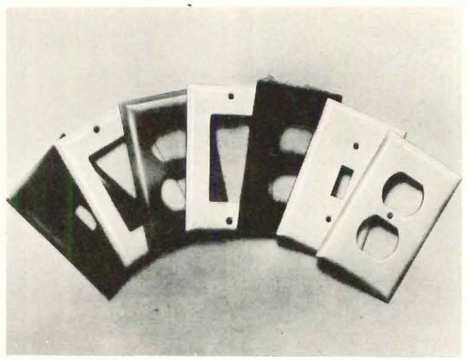
GTE SYLVANIA

FILING SYSTEM / The "Slimstak" filing system consists of two rows of files, one stationary and one mobile. The mobile row in front contains one less filing section and glides back and forth, allowing access to the stationary files behind. Filing can be expanded by stacking shelves on existing sections, or by starting new rows. Optional doors can be added which pull down to the horizontal position. Heavy-guage construction and choice of colors are offered. ▪ Interstate Industries, Inc., Michigan City, Ind.

Circle 317 on inquiry card

EXECUTIVE CHAIR / The arms are slightly lower than usual and the arm fronts are recessed 2 in. from the front edge of the chair and then curved to avoid scuffing from desk edges. This chair is available in a selection of fabrics and leathers. The upholstery seams are saddle-stitched. ▪ Fortress Inc., Los Angeles, Calif.

Circle 318 on inquiry card



HOSPITAL WALLPLATES / *Lexan* wallplates for use with hospital/industrial grade duplex receptacles are available in single gang switch types and single gang duplex receptacle plates in brown, ivory, gray, white and red. These wallplates are said to be practically indestructible and eliminate the possibility of a shock hazard or short circuit when a poorly wired cap comes in contact with the wallplate. ▪ Slater Electric Inc., Glen Cove, N.Y.

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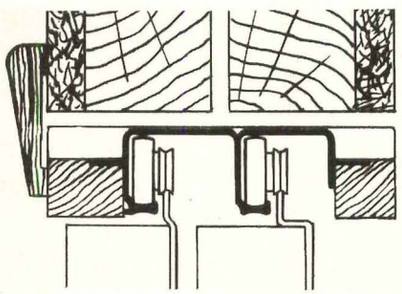


HEADER / A pre-finished header for wardrobe openings has an aluminum by-pass door track included. This header fits into dadoed side jambs for either dry or wet wall construction. Finishes are walnut or oak tone. The header is available in 4-, 5-, 6- and 8-ft widths. ▪ L.E. Johnson Products, Inc., Elkhart, Ind.

Circle 320 on inquiry card

more products on page 123

SCHLAGE®

Handcrafted Hardware

The world's most respected name in locks.

Florence
2¼" Knob
2½" x 17½" Rose
Bright Brass
Blackened 610(7)

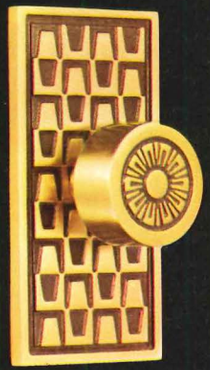
Versailles
2½" Knob 9½" Rose
Satin Bronze Blackened 616(11)

Haida
2½" Knob 6" x 9" Rose
Verde Antique 472(22)

Dahlia
2½" Knob
2 3/16" Rose
Bright Bronze &
Dark Brown 617(13D)

Chancellor
3 11/16" Lever
2¼" Rose
Satin Bronze
Blackened 616(11)

Lily
4⅛" Lever
2⅛" Rose
Satin Nickel
Blackened 620(15A)



Sahara
2⅞" Knob
4⅜ x 8⅜" Rose
Satin Brass
Blackened 609(5)

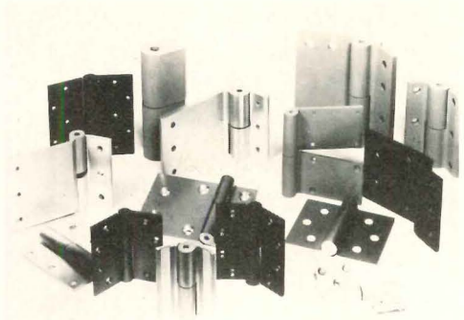
Palace
1⅝" x 2⅝" Knob
2⅝" Rose
Satin Brass
Blackened 609(5)

Jasmine
2 13/16" Knob
2⅝" Rose
Antique Copper 489(8)

Cavalier
3⅝" x 18½"
Bright Brass 605(3)

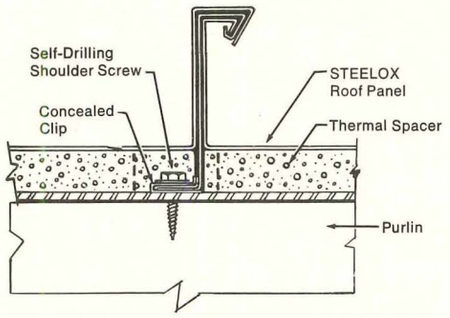
Majorca
3½" x 18½"
Bright Brass
Blackened 610(7)

For more data, circle 51 on inquiry card



MOVABLE-PIN HINGES / In the "Roto-Pin" series hinges, the pin rotates on anti-friction bearings sealed against dirt and moisture. Hinges are available in special designs with capacities for doors of up to 75 tons. The same rotating pin principle will satisfy any standard door application. The hinge features a built-in load equalizer that distributes the weight of the door equally, because each hinge is engineered to individual specificiations. The hinge can be adjusted to move the door up or down at any time, without removal of the door. ▪ Kason Hardware Corp., Binghamton, N.Y.

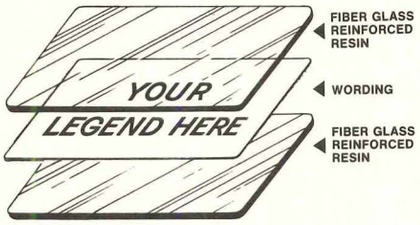
Circle 321 on inquiry card



SECTION THRU CLIP
(Insulation not shown)

ROOF SYSTEM / "Steelox CF" roofing offers a weathertight, durable exposed metal covering system with economical thermal characteristics for energy conservation, according to the company. The system consists of purlins, standing-seam roof panels and a concealed clip fastening method with a nonconducting thermal spacer to allow variable thicknesses of blanket insulation. Fasteners penetrating roof panels at the ridge and eave have weather seal washers. ▪ Armco Building Systems, Middletown, Ohio.

Circle 322 on inquiry card



FIBERGLASS SIGNS / These safety directional and information signs are designed for indoor and outdoor use, and are reinforced with fiberglass for use in harsh environments. Sign legends are embedded between layers of glass and resin and are said to resist color fading. Hundreds of stock legends are offered, all conforming to OSHA size, color and legend specifications. Signs are supplied with grommeted holes for installation. ▪ W.H. Brady Co., Milwaukee, Wis.

Circle 323 on inquiry card

Stark S.G.F.T. walls can help save up to 8% of all energy used in the U.S.

...beautiful!

The real point of the energy crunch is not "if" we can conserve energy but "how much."

Recent government estimates indicate that "structures" account for 33% of all energy used in the U.S.

50% of this energy is used for heating and cooling and with existing techniques, one-half of this h/c energy could be saved . . . a resounding 8% of all U.S. expended energy.

Although "U" factors are only one guide for calculating wall performance (along with thermal amplitude, conductance, inertia, thermal resistance, wall color, insulation capacity, etc.)—they provide a relative comparison. A composite masonry wall of 4″ brick—2″ polystyrene—4″ structural glazed facing tile yields a "U" factor of only 0.072 BTU/hr/sq.ft./degree F.

Clay masonry saves significant energy in production, too . . . mere fractions of the energy needed to produce steel, aluminum, glass and cement.

And there's more . . . minimum maintenance, no paint, coatings . . . or finishing.

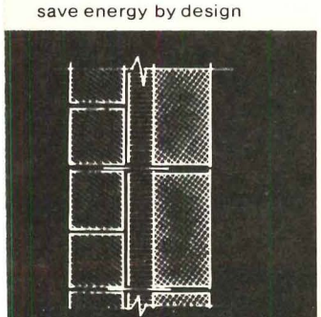
"Energy" is a big word in future growth . . . "conservation-by-design" is one way that designers and builders of our structures can lead the way to savings. Best of all, SGFT costs less in-place than many products that burn, peel, shatter, rust, rot.

Write for more facts on all the beautiful forms of Stark Glazed Facing Tile.

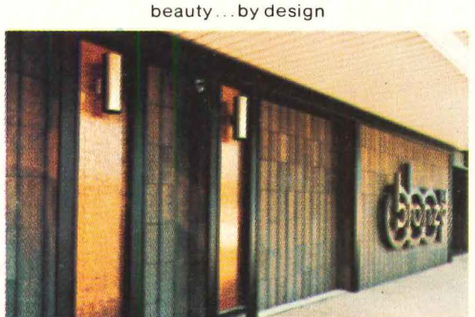
STARK
CERAMICS, INC.
P.O. Box 8880 • Canton, Ohio 44711

For more data, circle 53 on inquiry card

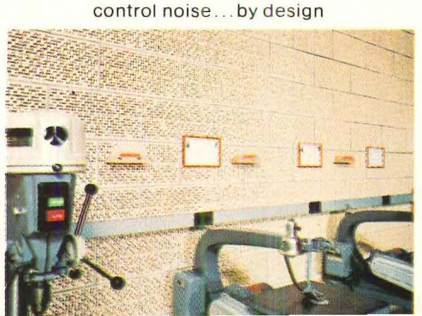
save energy by design



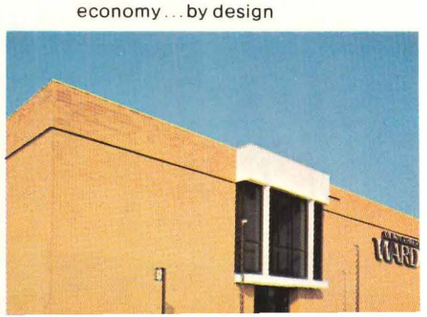
beauty . . . by design



control noise . . . by design



economy . . . by design



TWO-FAMILY DWELLING CODE / A 1975 edition of the "One and Two-Family Dwelling Code," the model code document co-published by the nation's three model code organizations, is now available. It incorporates all revisions approved by the active memberships of the joint publishing organizations, and contains a new Appendix B, comprised of the existing span tables for joists and rafters. The price of the Code is $7.00 per copy for BOCA members and $8.00 per copy for non-members. Address orders to BOCA's Publications Order Department, 1313 East 60th Street, Chicago, Ill. 60637.

PLYWOOD GUIDE / The newly revised "Plywood Residential Construction Guide" contains 32 pages of plywood systems for floor, wall and roof. The systems are detailed in drawings and recommended plywood grades and thicknesses are listed in reference charts. The booklet also gives information on plywood grades, finishes, sound control, condensation and stapling plywood sheathing. ▪ American Plywood Assn., Tacoma, Wash.

Circle 412 on inquiry card

ROLLING METAL DOORS / The company's 1976 catalog presents architectural details on rolling metal doors and fire doors, rolling grilles, rolling shutters and packaged units, rolling fire shutters and sliding grilles. The catalog features the company's new M58A solenoid release for rolling fire doors and shutters. This new control provides positive closing when activated by smoke or heat detectors, but is not affected by power lapses or failures. ▪ Cornell Iron Works, Inc., Mountaintop, Pa.

Circle 413 on inquiry card

TRENCH DUCT BULLETIN / A four-page brochure on *Railway* trench duct illustrates the component nature of the product and shows how the pieces fit together. Also, the drawing is keyed to descriptive paragraphs that outline the major features of this product, a concept in underfloor raceway. The various components can be ordered from stock and assembled right on the job site, usually by a single worker. The brochure also covers the dual pre-set inserts, utilized when cellular steel decking is used as an auxiliary raceway, and the flush floor fittings that provide finished floor access to the pre-set insert. ▪ Square D Co., Middletown, Ohio.

Circle 414 on inquiry card

UNIT VENTILATORS / A 32-page engineering catalog offers selection and installation data for unit ventilators with self-contained refrigeration. Much of the data in the catalog was assembled in response to requests from engineers and contractors for more precise information on the "SC UNIvent" air-conditioning systems. Sequence-of-operation drawings are provided for both hydronic and electric heat units, along with charts showing the exact position of all dampers and step switches at anytime during the heating, ventilating and cooling cycles. ▪ American Air Filter Co., Inc., Louisville, Ky.

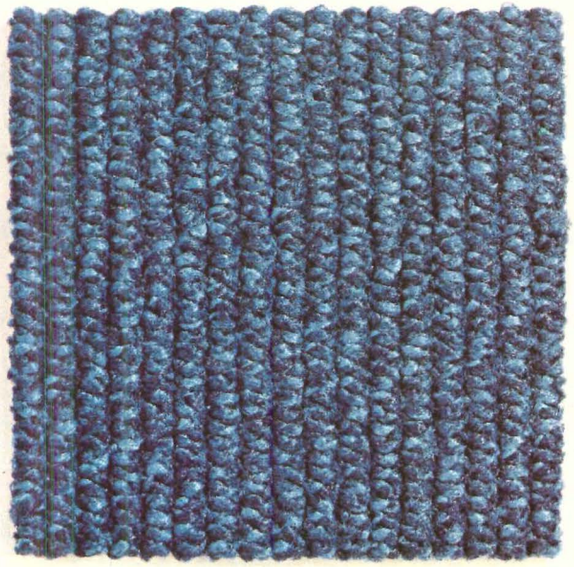
Circle 415 on inquiry card

Erratum

In the September 1975 issue, we indicated that the City-County Building published on page 41 was designed by McCarty Bullock Holsaple, Inc., with Lindsay & Maples, Architects, Inc. This is in fact a joint venture, with both firms listed as associated architects. We apologize for the inaccurate reference.

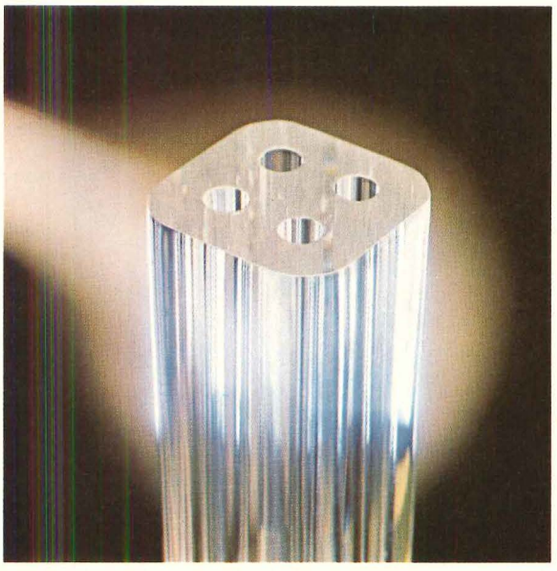
Expect quality carpets And expect their

to be in Antron® nylon. look to last.



What you see is what you'll get for a long time. "Antron" is a soil-hiding carpet fiber. It is the leading commercial carpet fiber brand with more than twice the available styles in "Antron" than those made of the next brand. Its ability to diffuse light helps blend soil concentrations into the overall look of the carpet (normally they would show up as spots). Also, being nylon, "Antron" gives carpet exceptional durability and crush resistance.

General Telephone & Electronics Corporation wanted commercial carpet that didn't look commercial, a style to complement the distinctive architecture of their new world headquarters in Stamford, Conn. At the same time GTE wanted to take full advantage of the long-term appearance retention inherent in carpet with pile of Antron* nylon. From the wide variety of styles now available in "Antron" they specified this ribbed-texture construction in four custom colors for a total of 35,000 sq. yds.



How "Antron" keeps carpet looking fresh. Its filament structure is remarkable, as simulated in this greatly enlarged model. The four microscopic holes scatter light to minimize rather than magnify the dulling effects of soil, while maintaining an attractive, subdued luster. This property of the fiber, together with its outstanding wearability, helps the look of the carpet to last.

NEW: "Antron" III nylon for static control is now available in selected styles.

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

For more data, circle 55 on inquiry card

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

Only the stylish are part of the night life in Cancún.

When the sun goes down on this exciting tropical resort in the Mexican Caribbean, the night is brightened by beautiful people. And by beautiful lighting. Spectra VIII* HID floodlights from Wide-Lite.

The Spectra VIII style starts with a classic, linear shape. And its good looks will last, thanks to its standard UltraClad finish. A space-age polyester powder finish, electrostatically fused to the all-aluminum fixture housing. For the combined advantages of porcelain and baked enamel, in your choice of tasteful colors.

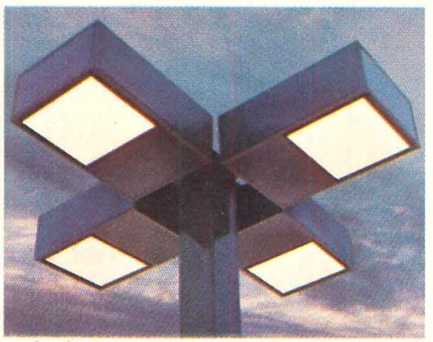
But the beauty of Spectra VIII is more than skin deep.

Its computer-designed stepped (or faceted) reflector is made of anodized high-grade specular aluminum. It offers extraordinarily efficient control of lamp output; up to 20% more efficient than other fixtures with similar candlepower distribution. This unique reflector makes for fewer fixtures and fewer poles per job. And it comes in a choice of distribution patterns for area or roadway lighting.

This reflector design gives Spectra VIII its low-angle control and exceptionally sharp cutoff. For smooth, high-level illumination without offense to neighboring areas. So important to a romantic setting like Cancún.

Cancún won't be having maintenance problems with its Spectra VIII floodlights either. The separate ballast compartment has a heat barrier for cooler operation. And the encapsulated ballast is factory tested for reliable operation in ambient temperatures as high as 150°F. The standard clear glass lens is tempered for strength and durability, too.

But a chic resort isn't the only place that calls for enduring beauty and exceptional control of light. So write for our brochure and find out how Spectra VIII from Wide-Lite can brighten your surroundings. With style.



Wide-Lite

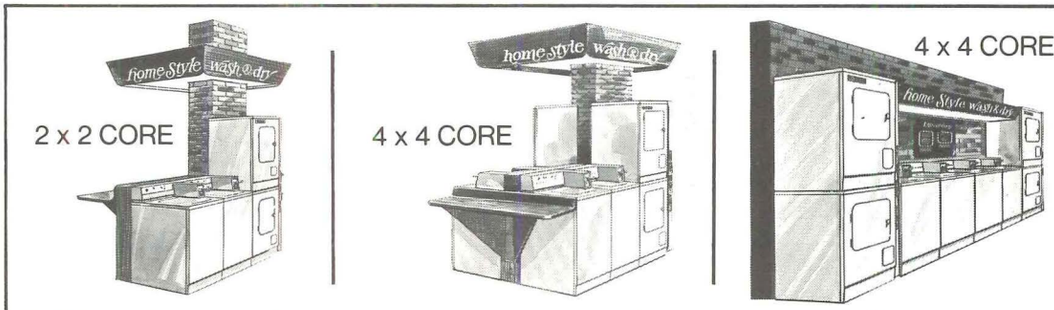
*PATENTS PENDING POST OFFICE BOX 191, HOUSTON, TEXAS 77001
WIDE-LITE* PRODUCTS ALSO MANUFACTURED IN AUSTRALIA, BELGIUM (FOR EUROPE), CANADA, MEXICO AND GREAT BRITAIN.
A COMPANY OF THE ESQUIRE LIGHTING GROUP

For more data, circle 56 on inquiry card

New Maytag-equipped *home style* Laundry. It can cut your costs, while giving tenants homelike comfort and convenience.

Everything's grouped in a functional cluster, like in a home laundry room.

Save as much as 40% to 50% on gas with the new Maytag D21 Dryer, compared to regular 30-lb. dryers.



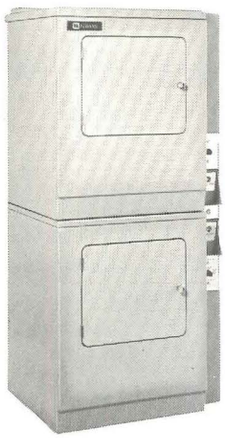
Flexibility is the keynote. Washers and dryers can be arranged in a variety of configurations to fit your needs.

Another "first" from the dependability people, this Maytag breakthrough can help you cope with the space, money, and energy crunch.

In small space, with a small investment, the exclusive Maytag-equipped Home Style Laundry lets you provide tenants with a totally unique laundry with homelike atmosphere and step-saving convenience, plus equipment for optimum care of all fabrics.

And look at the possible advantages for you compared to traditional laundry rooms: Lets you use areas never before practical. Smaller space needed. Smaller initial investment. Lower operating cost. More profit per square foot. All-Maytag equipment for dependability and tenant satisfaction.

Mail card now for free facts. No postage needed.



Two separate dryers in half the space of one large dryer.

Made possible by the energy-saving new Maytag D21 Dial-A-Fabric™ Dryer.

- It's actually two single-load dryers stacked one on top of the other. Each is functionally independent.
- It can save you 40% to 50% on gas compared to regular 30-lb. dryers. Or 20% to 30% compared to 30-lb. dryers with electric ignition, factory-built heat reclaimers, and lowered Btu input. Electric model uses half as much electricity as 30-lb. electric dryers.
- Choice of coin or exclusive ticket-operated models which use an electronic ticket, helping avoid coin-box problems and improving security.

MAYTAG
THE DEPENDABILITY PEOPLE
THE MAYTAG COMPANY, NEWTON, IOWA 50208

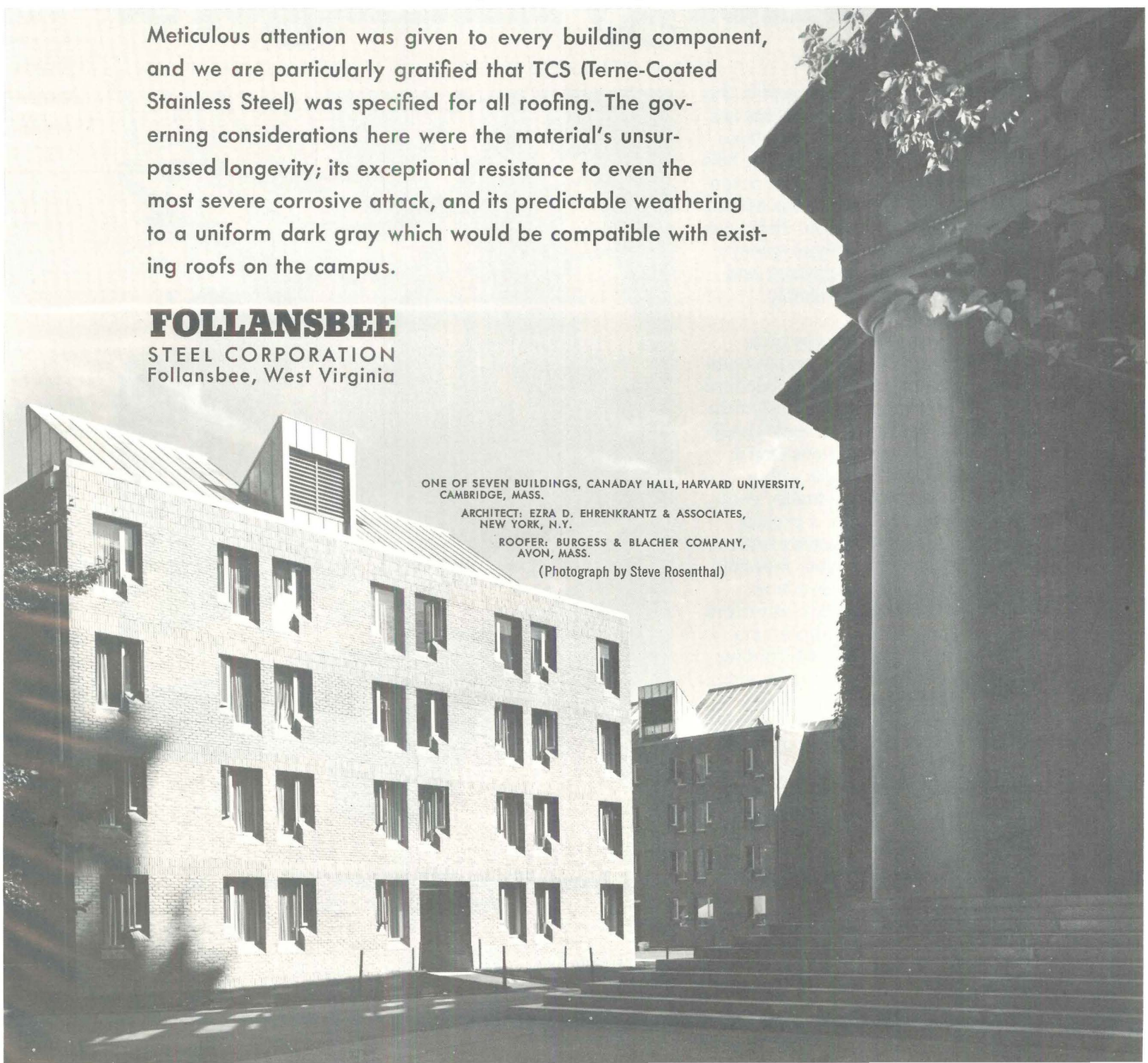
For more data, circle 57 on inquiry card

SITE... FORM... FUNCTION...

One of the most difficult architectural tasks is the successful incorporation of a highly functional contemporary building into a traditional and eclectic setting. This was the problem confronting Ezra D. Ehrenkrantz and Associates when they were commissioned to design three dormitories to be located in Harvard Yard, the University's hallowed inner campus; the success with which they resolved it has already been nationally acclaimed.

Meticulous attention was given to every building component, and we are particularly gratified that TCS (Terne-Coated Stainless Steel) was specified for all roofing. The governing considerations here were the material's unsurpassed longevity; its exceptional resistance to even the most severe corrosive attack, and its predictable weathering to a uniform dark gray which would be compatible with existing roofs on the campus.

FOLLANSBEE
STEEL CORPORATION
Follansbee, West Virginia



ONE OF SEVEN BUILDINGS, CANADAY HALL, HARVARD UNIVERSITY, CAMBRIDGE, MASS.

ARCHITECT: EZRA D. EHRENKRANTZ & ASSOCIATES, NEW YORK, N.Y.

ROOFER: BURGESS & BLACHER COMPANY, AVON, MASS.

(Photograph by Steve Rosenthal)

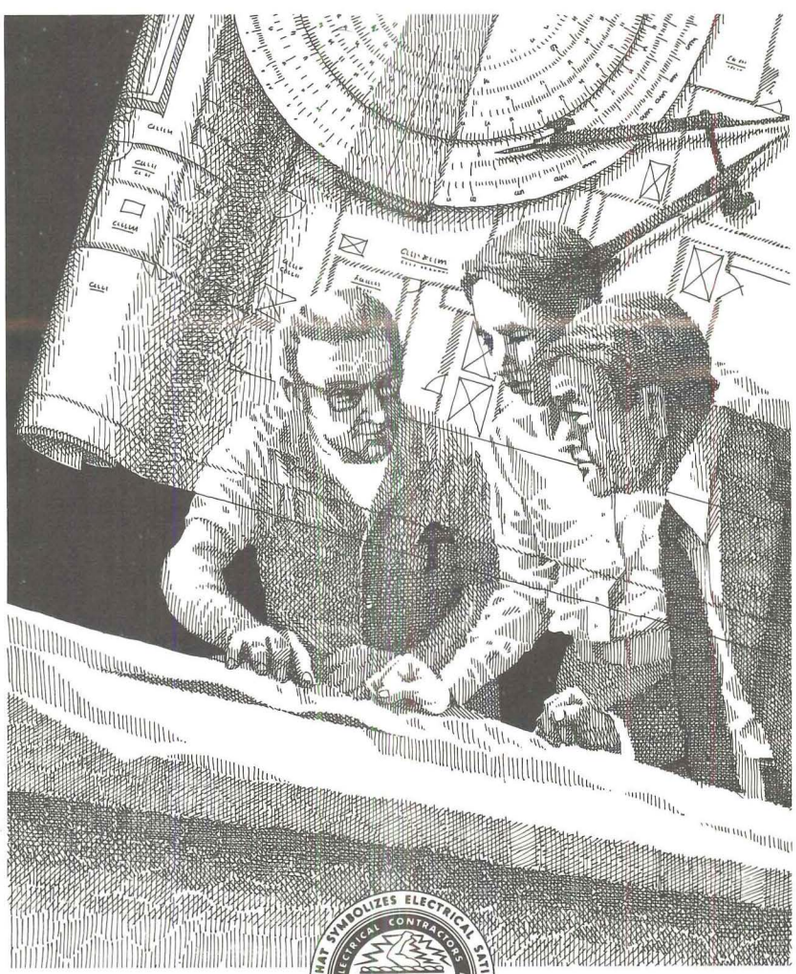
Professional electrical contractors. The electrical energy managers.

One thing you can be sure of in the current energy situation; clients are no longer taking electrical systems for granted. People who pay the bills now are concerned about the potential cost of future operations as well as the cost of installation. That goes for *all* users and specifiers: government, commercial, industrial, and residential. But you probably already know that.

You also know that electrical systems should be designed to operate as efficiently as possible, because when the time comes to install cable, conduit, and fixtures, it might be too late to save energy. That's why it could be helpful to work with a qualified electrical contractor early in the design stages of a project. Planning an efficient electrical system is a lot easier than trouble-shooting a fuel-waster after construction.

Professional electrical contractors can give you just the support you need. They're familiar with lighting, heating, communications, security, motors, standby and emergency power, automatic controls, and a lot more. You'll be obtaining the benefits of specialized manpower, the latest installation equipment, and professional job-management expertise. Can your clients afford anything less?

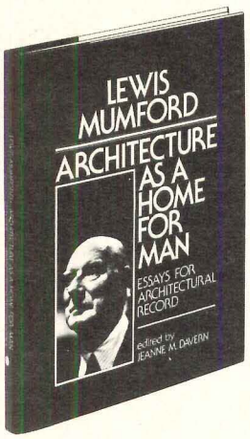
Professionalism doesn't cost. It pays.



National Electrical Contractors Association, Inc.
Washington, D.C. 20014

The essential one-volume Mumford on Architecture

LEWIS MUMFORD
ARCHITECTURE AS A HOME FOR MAN



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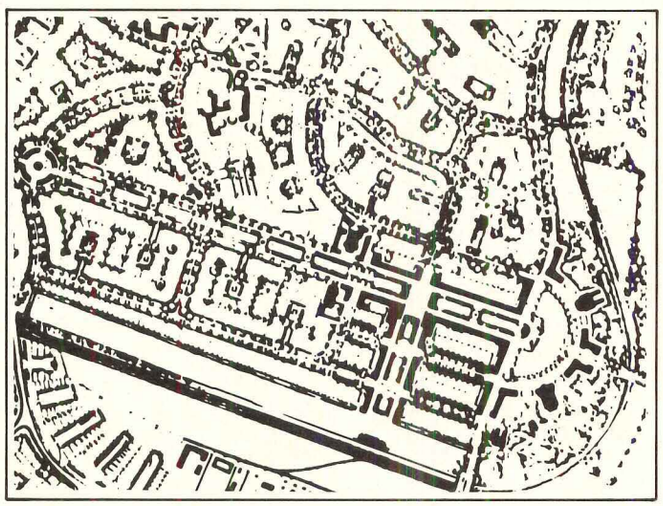

Lewis Mumford's complete writings for *Architectural Record* are now collected together in one definitive volume. These 24 important essays span 50 years of the career of America's foremost architectural and social critic, and show the wide scope of concerns that have earned Mumford a unique place among the major thinkers of the 20th century.

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12-75

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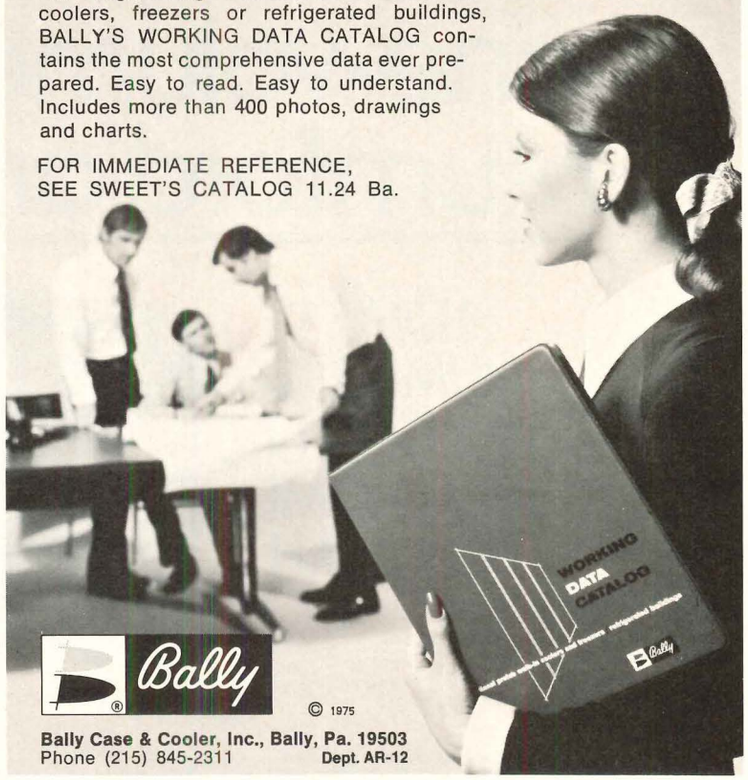

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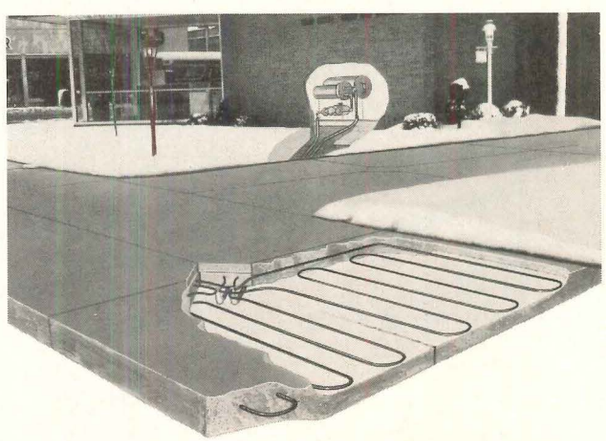

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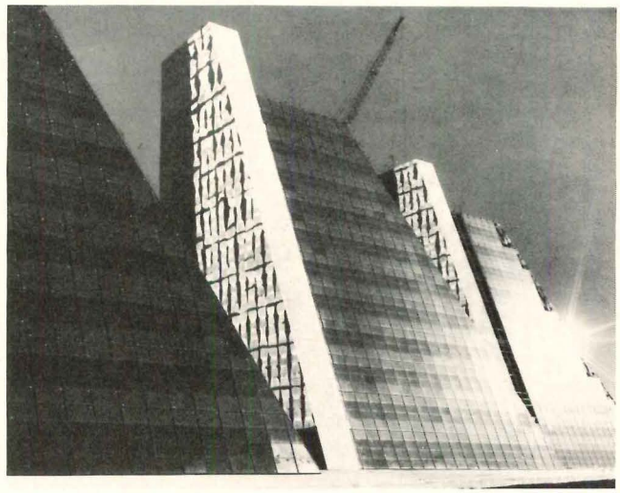

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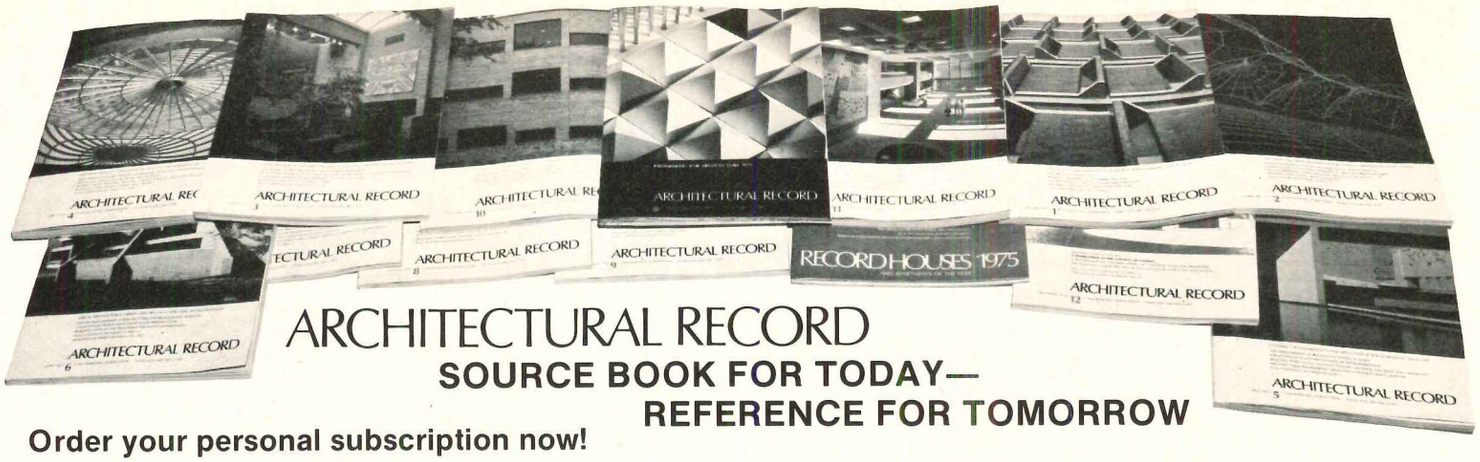

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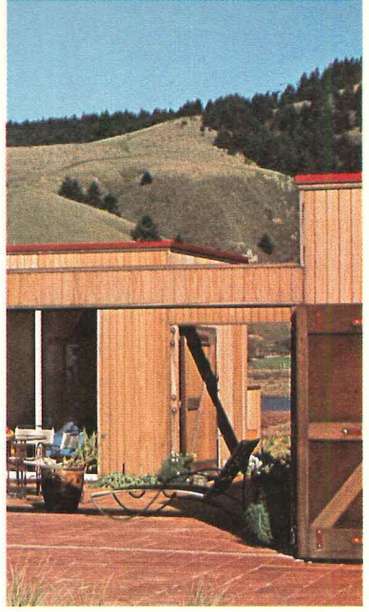

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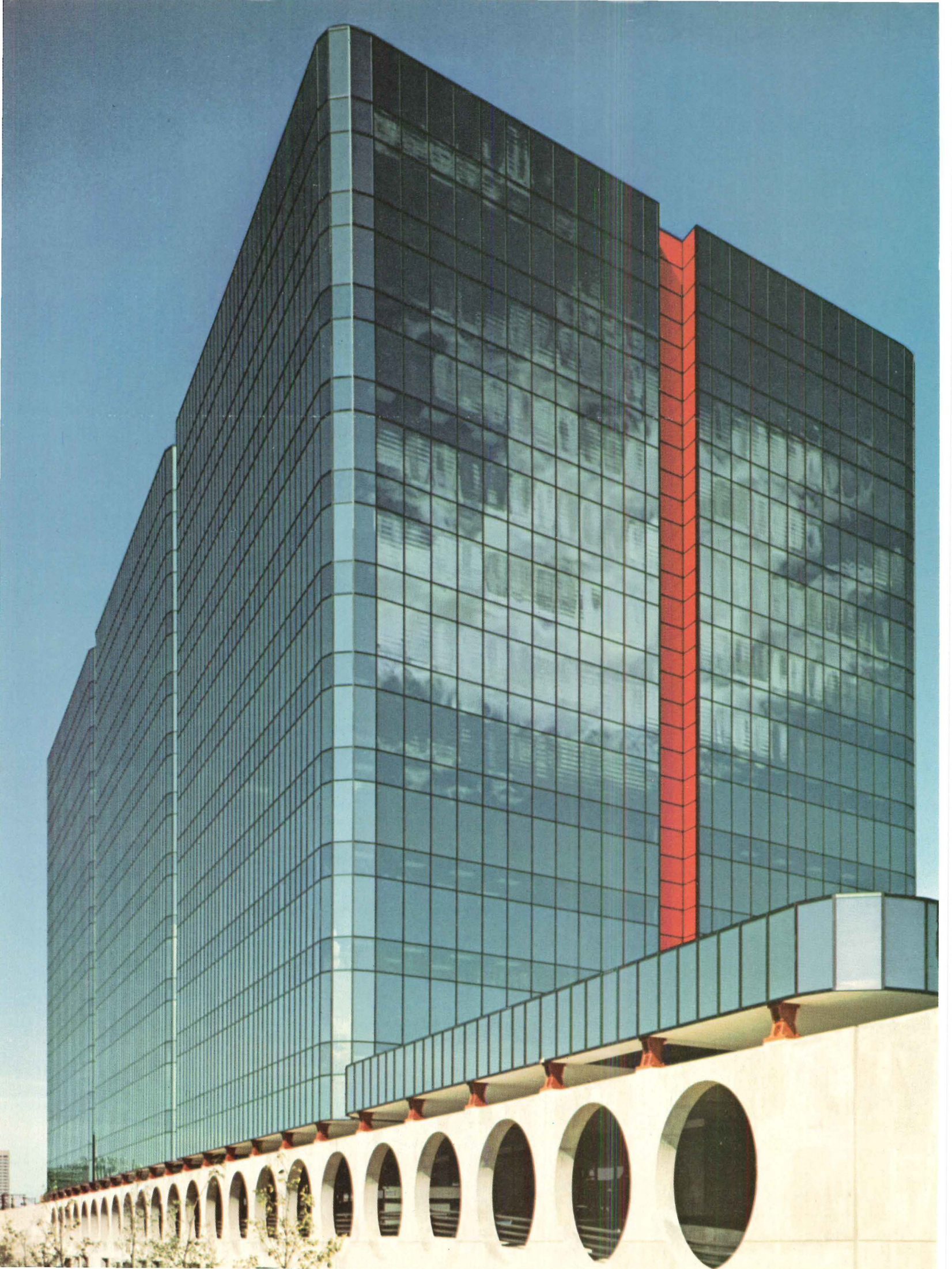

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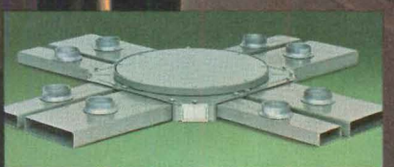

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TEXTONE Vinyl-faced Gypsum Panels give you high fashion walls without the high cost of field-applied vinyls. They come to the site completely predecorated with heavy-duty vinyl in your choice of 27 colors and textures. Installation can be immediate, so there are no delays in scheduling and, of course, none of the mess of field-applied jobs.

Matching mouldings are available. For details, see Sweet's Architectural Catalog File under 9.12Ug. To reach the nearest U.S.G. representative, call Sweet's BUYLINE® toll-free telephone inquiry service. For a sample swatchbook, write to us on your letterhead to United States Gypsum, 101 S. Wacker Dr., Chicago, Ill. 60606, Dept. AR-125.

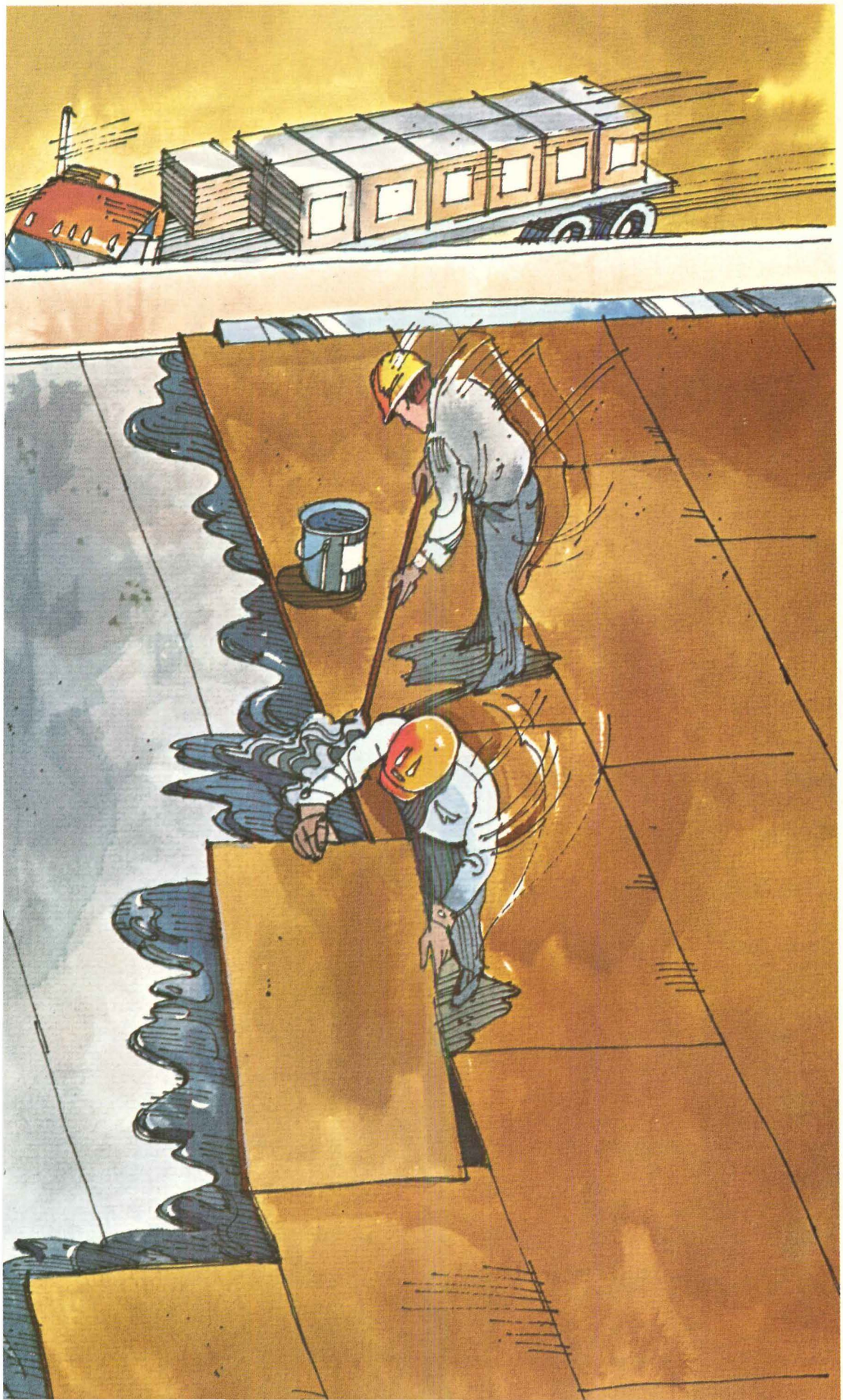
Reg. U.S. Pat. & TM. Off.

Other U.S.G. products in Sweet's File listed under codes: 3.4/Un, 7.14/Un, 8.2/Ke, 8.14/Un, 9.1/Ce, 9.1/Una, 9.5/U, 10.1/Uni, 10.1/Vau.

UNITED STATES GYPSUM
BUILDING AMERICA

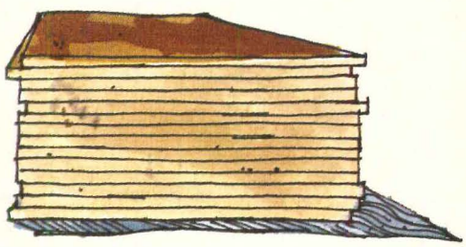
For more data, circle 70 on inquiry card

J-M roof insulation builds savings into built-up roofing systems.

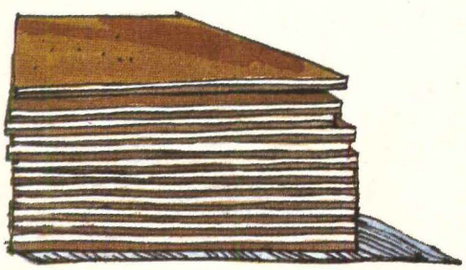


Thermal insulation between roof deck and roof membrane in built-up roofing systems can provide you with important savings in both fuel and initial heating/air-conditioning equipment costs. All of which shows up as a benefit in life-cycle costing.

Johns-Manville offers two roof insulation boards specifically designed to provide an effective thermal barrier in built-up roofing systems.



FESCO® Board for intermediate thermal requirements, with C-values from 0.48 to 0.19 and R-values from 2.08 to 5.26, combines economy with performance.



FESCO-FOAM™ Roof Insulation for high thermal requirements, with C-values from 0.15 to 0.05 and R-values from 6.67 to 20.00, offers outstanding thermal efficiency.

To upgrade insulation means the building will probably cost more to begin with. But, it's an investment that will pay off in savings and comfort in the years that follow.

For more information, write for BU-274, Johns-Manville, Greenwood Plaza, Denver, Colorado 80217. Or call Peter McCracken—303/770-1000.

The single-source built-up roofing system

Johns-Manville

For more data, circle 71 on inquiry card

Take it from Dave Lennox . . .

NOW, YOU CAN DESIGN YOUR OWN

NIFTY WEATHER MACHINE.

The new Lennox DSS1 system lets you design your own single zone HVAC package. For commercial rooftop installations, it offers extraordinary flexibility . . . efficient operation and service . . . exceptional energy savings . . . and consequent cost savings.

Here are a few of the many DSS1 options that give you the right size, right energy, right cost for your application.

- Dual range selection (26 & 30 ton cooling; up to 770,000 Btuh heating).
- Two-speed, first stage compressor saves energy.
- Heat recovery package (allows recovery of heat from refrigeration in supermarkets and restaurants; controls humidity without losing heat).
- Power Saver™ package (allows use of outdoor air for cooling).
- Power Saver II™ package (allows recovery of heat from lighting).
- Return air fan and exhaust fan (allows finer air balance).
- Electric heat (oil, gas & hot water systems at your option).
- Solid state, energy-saving control system.

Get the facts. Find out how you can design your own heating and air conditioning package with our new, unique single zone system: the DSS1. Write: Lennox Industries Inc., 576 South 12th Ave., Marshalltown, Iowa 50158.

LENNOX "Attaboy, Dave!"

AIR CONDITIONING • HEATING

Nifty problem-solving ideas from Lennox.

For more data, circle 72 on inquiry card

SEMI-ANNUAL INDEX

VOLUME 158
JULY-DEC. 1975

Readers using the index will find buildings entered in three ways: by architect's name, by building or owner's name, and by building type (banks, hospitals, schools, etc.). Other categories cover subjects in the engineering section (concrete, lighting, prefabrication, etc.). ABBREVIATIONS: AB—Architectural Business; AE—Architectural Engineering; BA—Building Activity; BTS—Building Types Study; CM—Construction Management.

A classroom building on the curve.

ELEVATORS BY DOVER

The new Olin Hall of Engineering at Vanderbilt University presents a striking curvilinear front to its campus neighbors. Inside the 10-level building are classrooms, offices and laboratory space for programs in chemical engineering and materials science and engineering science, as well as the center for water quality management. Three Dover Geared Traction Elevators serve student and faculty needs. For more information on Dover Elevators, write Dover Corporation, Elevator Division, Dept. U, Box 2177, Memphis, TN 38101.

Olin Hall of Engineering, Vanderbilt University, Nashville, Tn.
Architect: Robinson Neil Bass & Associates, Nashville, Tn.
Contractor: Joe M. Rodgers & Associates, Inc. Nashville, Tn.
Dover Elevators installed by Nashville Machine Co., Inc., Nashville, Tn.

DOVER

ADVERTISING INDEX

Prefiled catalogs of the manufacturers listed below are available in the 1975 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)

ARCHITECTURAL RECORD

McGraw-Hill, Inc., 1221 Avenue of the Americas, New York
New York 10020
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Edward C. Weil, III, 55 Public Square, (216) 781-7000

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Harry B. Doyle, 123 Speer Blvd., #400 (303) 837-1010

Detroit 48202
John W. Maisel, 1400 Fisher Bldg., (313) 873-7410

Los Angeles 90010
Richard R. Butera, 3200 Wilshire Blvd.-South Tower (213) 487-1160

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Blair McClenachan, 1221 Avenue of the Americas (212) 997-3584

Philadelphia 19102
Robert G. Kliesch, George T. Broskey, Three Parkway
(215) 568-6161

Pittsburgh 15222
Edward C. Weil, III, 2 Gateway Center, (412) 391-1314

St. Louis 63011
Richard Grater, Manchester Rd., (314) 227-1600

San Francisco 94111
Richard R. Butera, 425 Battery Street (415) 362-4600

Overseas Offices:

Brussels
Galerie Porte de Namur, 22-26, Chausée de Wavre
1050 Brussels, Belgium

Frankfurt/Main
Elsa-Brandstroen Str. 2, Frankfurt/Main, Germany

London
34 Dover Street, London W.1, England

Milan
Via Baracchini No. 1, Milan, Italy

Paris
17, rue Georges Bizet, 75 Paris 16e, France

Tokyo
2-5, 3-chome, Kasumigaseki, Chiyoda-ku, Tokyo, Japan

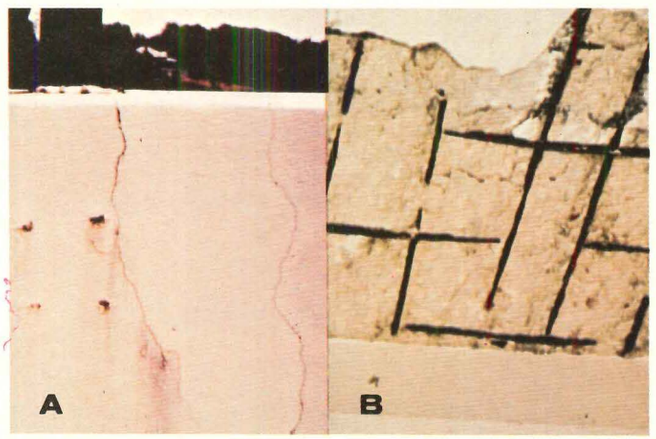
For more data, circle 74 on inquiry card

CONCRETE FAILURE

CAUSE

This magnification shows how rust expands as steel corrodes.

EFFECT



The rusting of ungalvanized reinforcing bar creates a pressure which can crack and spall concrete. Photo A shows a portion of the facade of the Charleston, S.C. Post Office which has been cracked and stained by subsurface rust expanding and "bleeding" through. Photo B shows the underside of a veranda roof in Bermuda where rebar corrosion caused a large section of concrete to fall off.

PREVENTION

Galvanizing — the metallurgical bonding of zinc *into* steel — has proven its ability to protect rebar against rust before, during and after installation. This is recognized in the revision of General Services Administration guide specification PBS4-0344.01 as follows: When concrete cover on exterior surfaces is less than 1½ inches... reinforcing bars and mesh shall be zinc coated...in accordance with ASTM A-123.

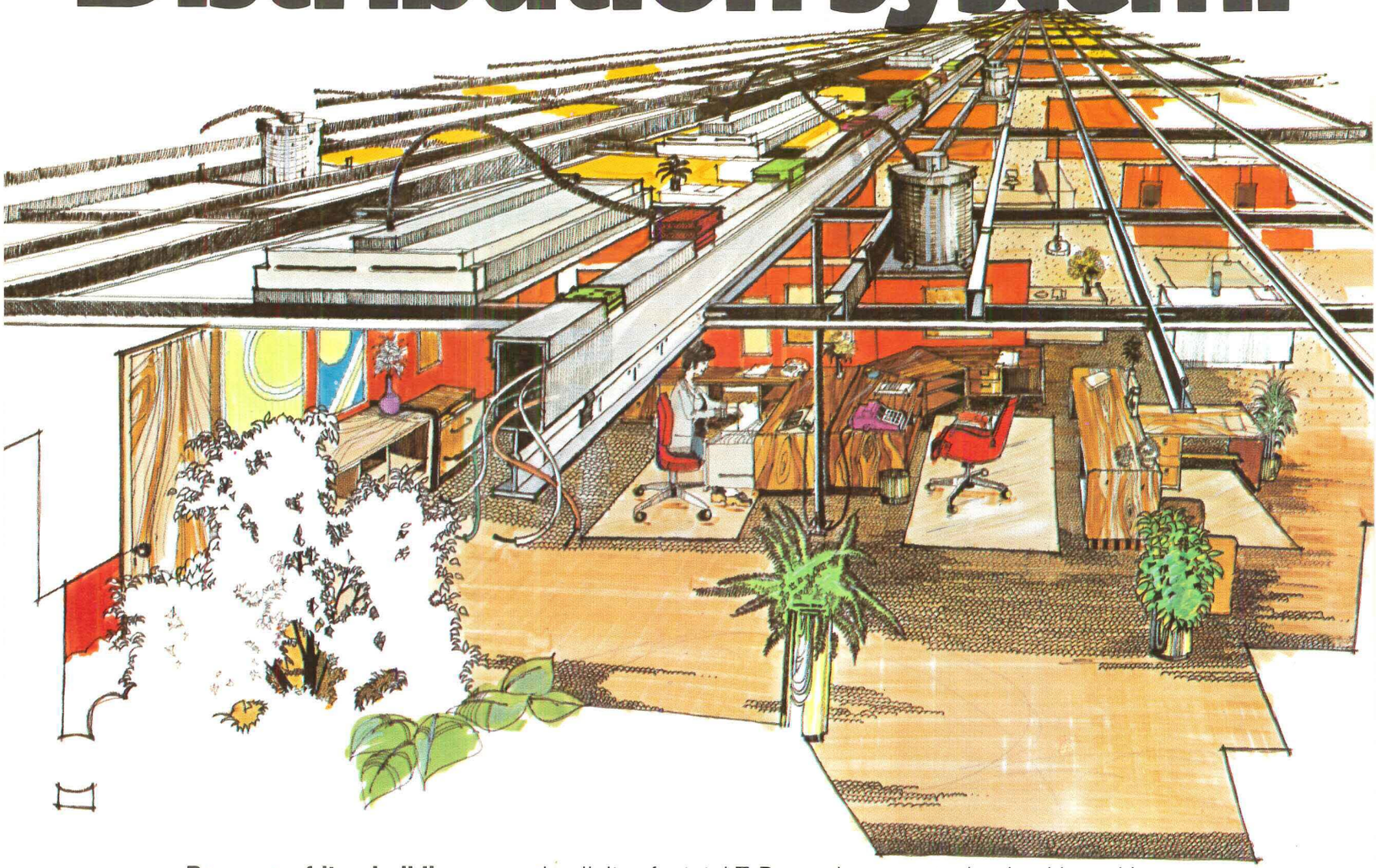
ZN-640

If you would like to know more about this subject, write on your letterhead for our new booklet "Galvanized Reinforcing Bar— Undercover protection for concrete."

ST.JOE
MINERALS CORPORATION

250 Park Avenue
New York, N.Y. 10017

Announcing the 3M Modular Distribution System.



Because of it, a building can be flexible for a lifetime. 3M Brand Modular Distribution System answers your problems of distributing electrical power, electronics and communications at the time of installation and throughout the life of a building.

It offers you design flexibility, reduced installation, labor and maintenance costs, improved life cycle costing, and the simplicity of a total T-Bar and pole system for open-office landscaping. All out of the way, because it's part of the ceiling.

The basic component of the 3M Modular Distribution System is the Power T-Duct, a factory pre-wired raceway that is permanently mounted to a specified T-Bar ceiling system.

3M Modular Distribution System is UL-listed, and is factory pre-wired for receptacle circuiting with both 120 and 277 volts.

Want to know more about the only complete T-Bar system that works as long as your building lasts? Write Dept. EAY-3, 3M Electro-Products Division, Bldg. 223-4N, 3M Center, St. Paul, MN 55101.

3M COMPANY

For more data, circle 75 on inquiry card