



YALE CENTER FOR BRITISH ART, BY LOUIS I. KAHN, WITH A COMMENTARY BY VINCENT SCULLY, JR.
TRADITION AS MODEL AND METAPHOR: TWO HOUSES BY CHARLES W. MOORE
REFLECTIONS ON PEI'S JOHN HANCOCK TOWER
BUILDING TYPES STUDY: INDUSTRIAL BUILDINGS
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ARCHITECTURAL RECORD

JUNE 1977

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Letters to the editor

It is, indeed, very thoughtful of ARCHITECTURAL RECORD to have a global coverage of events relating to human settlements, with particular regard to developing nations. The problems relating to housing in such countries are quite staggering, and admittedly tremendous efforts need to be dedicated to providing means to overcome them. Dean Kilbridge (RECORD, April 1977, page 37, and May 1977, page 37) has in a very perceptive manner captured the main theme of the problem—a tendency on the part of the cities of the developing world to start off as “transplanted European cities” and to attempt to continue in that manner.

A similar parallel seems to have been generated from the transfer of medicine to the developing world—disease and mortality rates dropped sharply only to be substituted by population explosions. This is not to say that human suffering from disease should have been disregarded; to the contrary, some foresight and understanding of social and cultural patterns, in particular those relating to resistance against birth control, would have gone a long way towards instituting a plan involving both a proliferation of medicine and mass education.

In relation to the point made by Dean Kilbridge on the precedence food, health services and education must take over housing, I wish to state that this may not be entirely so. The problem relating to human settlements is woven into a far more intricate socioeconomic infrastructure than the article seems to reveal. The European social patterns have been transplanted in addition to the mere physical transplant of the European city to the developing world. And, not much unlike Western society, significant emphasis seemingly is placed on the location of the house (the neighborhood), the size and quality of the house; in fact, people react in a compulsive manner and will part with jewelry and whatever little they have to be able to have a house in a decent neighborhood with sufficient lighting, sanitary provisions and other “necessities.” The driving force is more often than not the “keeping up with the Joneses” syndrome. The answer, once again, seems to be a somewhat more integrated approach involving basic education, in addition to directing the urban growth process in a planned manner. Once again the problem seems to find its answer in the Western institutions of research and education—perhaps a mistake being repeated.

It is my personal opinion that a

very close contact needs to be established with the appropriate authorities in the developing world. The mere understanding of physical symptoms and their subsequent diagnosis is not sufficient. The way people live in those parts of the world, their cultural and social background, their economic microstructure, and above all their mentality should be grasped. This undoubtedly would require dedication before the problems can be understood at their roots and solutions are found to solve them.

M. Iqbal Qamar
Structural Dynamics Research Corp.
Cincinnati, Ohio

Your article on the revised AIA documents [March 1977] makes very timely comments on the standardized form contracts, especially those sections which have rarely so far been brought to light. I, as a foreigner, hope you continue to exert successful endeavors in this field of construction and professional practices.

Fumio Matsushita
Osaka, Japan

What a pleasure to see RECORD credit my father for the two photos of River Oaks Shopping Center reprinted 37 years later. Well done!

Steven Peters, AIA,
PGA Associates, Houston, Texas

Our client, Paul Thoryk, was very pleased with your coverage [April 1977] of his design for the Broad house.

Unfortunately, the name of the structural engineering firm which was given to you was incorrect. The credit should be R. E. Foley & Associates.

Robin Maydeck, Vice President
The Gail Stooza Company
La Jolla, California

Your Housing the Aging article in May covered the field remarkably well, I think, and key problems were examined in a concise and informative way.

Peter Samton, FAIA
Gruzen & Partners, New York City

Your positive coverage of the Dailey-Butler Renovation of the Chicago Navy Pier was both responsible and stimulating. After reading the eight-page coverage of the project, I yearned for further details. Instead I found eight pages of the “Best” calamity. How could you desecrate the old structure by including the latter in a professional magazine, much less the same issue? Is this an insinuation that “Architecture” is in the past?

Gregory S. Brezinski, Architect,
Yorktown, Virginia

Calendar
JUNE

12-17 The 27th Annual Conference of the International Design Conference in Aspen, “Shop Talk.” Contact: Mary Apple, IDCA, P.O. Box 664, Aspen, Colo. 81611.

13-14 Conference, “Design and Construction Opportunities in Arab Countries,” sponsored by *Business Week* and *Engineering News-Record*; Waldorf Astoria Hotel. Contact: McGraw-Hill Conference & Seminar Group, 1221 Avenue of the Americas, New York, N.Y. 10020.

14-17 Construction Specifications Canada Annual National Convention, Bayshore Hotel, Vancouver, B.C. Contact: John Garenkooper, Construction House, Construction Specifications Canada, 2675 Oak St., Vancouver, B.C.

16-17 “Planning Long Term Health Care Facilities,” seminar sponsored by the University of Wisconsin-Extension; University of Wisconsin-Madison Campus. Contact: Raymond C. Matulionis, AIA, Program Coordinator, University of Wisconsin-Extension, Department of Engineering, 432 N. Lake St., Madison, Wisc. 53706.

19-23 The Building Owners and Managers Association International 70th Annual Convention, “Ideas for Profit,” Dallas Fairmont Hotel. Contact: BOMA International, 1221 Massachusetts Ave., N.W., Washington, D.C. 20005.

20-July 28 The Third Annual Summer Institute in Environmental Design and Community Development, sponsored by the College of Environmental Design and Continuing Education in Environmental Design, University Extension, University of California, Berkeley. Contact: Continuing Education in Environmental Design, UC Extension, 2223 Fulton St., Berkeley, Calif. 94720.

21-22 Seminar, “Engineering and Architectural Considerations of High Winds and Tornadoes and Their Effects on Buildings,” sponsored by the University of Missouri-Columbia; Hilton Plaza Inn, Kansas City, Mo. Contact: Engineering Conferences, 1020 Engineering Bldg., University of Missouri-Columbia, Columbia, Mo. 65201.

20-22 The Construction Specifications Institute’s 21st Annual Convention and Exhibit, Denver. Contact: Tom Cameron, CSI, 1150 Seventeenth St., N.W., Washington, D.C. 20036.

20-24 70th Annual Conference & Exhibition sponsored by the Air Pollution Control Association, Sheraton Center Hotel, Toronto, Ont. Contact: Daniel R. Stearn, Public Relations Manager, APCA, 4400 Fifth Ave., Pittsburgh, Pa. 15213.

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

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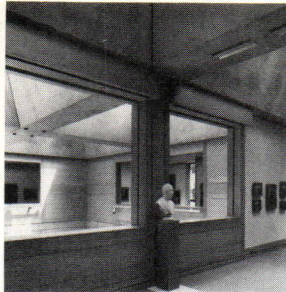
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71 Business development Writing for marketing impact: letters, brochures, proposals

Communications consultant Stephen A. Kliment reminds design professionals that in marketing communications, "It's not creative, unless it sells."

FEATURES

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In his final building, completed after his death, Kahn, according to Yale History of Art professor Vincent Scully, "arrived at a kind of order which was itself not far from the old classicizing mode: static, trabeated, and laconic. . . . All movement, all voices, all color, are outside and around the British Center, like the reflections in its window panes. Avoiding speech, it is the wordless image of Kahn's deep constructor's soul."

105 A theatrical approach to shopping center remodeling

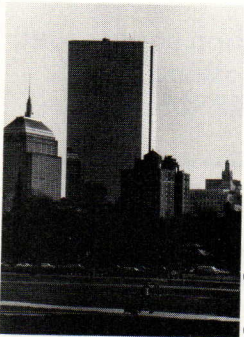
The remodeling of the Stanford Shopping Center in Palo Alto, California, has just been completed. The design thrust concentrates on creating a lively vibrant shopping complex from a 900-foot-long existing mall by predominantly non-structural architectural devices. Architects are Bull Field Volkmann Stockwell.

109 Two houses by Charles Moore: contrasted

Designed for clients with dissimilar needs, each house evokes its owners' beliefs, fantasies and feelings in forms shaped by Moore's mastery of style.

117 Some reflections on the John Hancock Tower

A lot of life, fortune, and sacred honor is tied up in this 60-story glass-sheathed skyscraper by I. M. Pei & Partners.



George Cserna

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127 Industrial buildings

To the client planning an industrial building, nothing is quite as meaningful as initial cost and speed of construction. But a growing number of owners are going one step farther, requiring building solutions that—at no extra cost—also respond to broader, long-range goals of environmental soundness and improved working conditions.

**128 Hewlett-Packard Company
Santa Rosa, California**

John Carl Warnecke & Associates, architects.

**130 Sears Distribution Center
Elk Grove, Illinois**

Skidmore, Owings & Merrill, architects.

**132 Windsor Winery
Healdsburg, California**

Roland/Miller/Associates, architects.

**134 Saginaw Road Development Plan
Midland, Michigan
BP Oil Corporation
Marcus Hook, Pennsylvania**

HOK Associates, Inc., architects.

**136 The Logan Leader/News Democrat
Russellville, Kentucky**

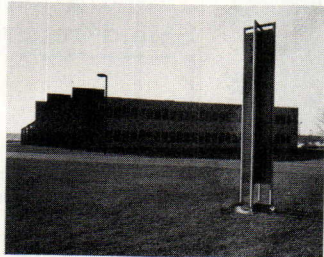
Ryan, Cooke and Zuern Associates, architects.

**138 Public Service Facility
Sterling Heights, Michigan**

Straub, Van Dine, Dziurman, architects.

**140 Joseph E. Seagram & Sons, Inc.
Des Plaines, Illinois**

Pasanella & Klein, architects.



Robert Thall

**142 Central Power House
Utica, New York**

Rogers, Butler & Burgun, architects.

ARCHITECTURAL ENGINEERING

**143 Parking deck saves money with
tube columns and weathering steel**

In downtown Detroit, a "bare" steel, six-level parking deck used tubular columns for structural efficiency and to avoid guards required for wide-flange columns. The weathering steel exterior eliminated need for painting hard-to-reach areas.

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NEXT MONTH IN RECORD

Building Types Study: Religious buildings

Religious buildings offer to the architect some of the most challenging design problems he or she ever encounters, with rewards as great as the perils. Next month's Building Types Study features a rich collection of churches and church-related buildings from across the United States and from foreign countries as well. It gives a good look at the current state of the art of design as applied to programs for religious buildings.



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Solar energy: some hopes and some concerns

I had the very good luck to attend a very good conference¹ on solar energy utilization last month. I came away—after listening to some very thoughtful and very experienced speakers—with a conviction I hadn't had before: that solar energy can make a major contribution to the energy problems in this country, and that it stands—with energy conservation—altogether on the side of the angels. That is to say it uses no non-renewable resources (indeed, is infinitely renewable for, say, the next couple of million years), requires no environmental intrusions, and generates no waste to be disposed of into the air or into salt mines where it ticks away for 25,000 years. And there's a feeling about solar energy that those who have worked with it for a long time seem to share, and which also seems important. It is well expressed in architect Donald Watson's fine new book, *Designing and Building a Solar House*². He writes: "A solar house, in its relation to the land and the surrounding community, can embody our most profound feelings about living with nature and with society. And through the intelligence of the design, it can bring into form the ideals with which we hope to live. . . ."

I do not pretend to have become an expert on solar energy in a day and a half, but I did come away with some thoughts on advancing the cause. Herewith:

1. What is involved here is not technological revolution. The talks by some very sophisticated architects and engineers—Don Watson of the Yale School of Architecture, Byron Winn of Colorado State University (both of whom talked primarily about solar energy at the residential scale), Fred Dubin (whose many energy conserving designs include the well-known Manchester, New Hampshire, prototype), and Harry Fischer of Oak Ridge National Laboratories—made clear that the technology has long been understood, and what is needed now is urgent professional effort to perfect not just the collectors (the glamorous part everyone looks at) but the heat storage hardware, the controls, and the over-all system design.

2. One of the most important concepts is that—before solar energy can work effectively—all of the passive tools of energy conser-

vation need to be designed in first. We're not here talking about a new tool which can even hope to overpower—as we have learned to do with hvac systems—our design mistakes.

Once all of those techniques have been used and applied by the architect, *then* a solar energy system, carefully designed, can make that major contribution. . . .

Some of the thoughts I took away from the conference are concerns:

3. A solar system—even one designed with the greatest possible skill—may not ever "pay off" in the time span that we seem to have come to expect. The five-year "return on investment" for solar hot-water heating which the enthusiasts proudly point to (it's longer for solar heating—even in just the right parts of the country) is not the kind of number which gets the undivided attention of your average speculative developer. Which means, I think, that along with continuing efforts to try to perfect solar systems and market the hardware, we need to try to promote *the need* for using solar energy—for all the reasons that we need to conserve energy.

4. The other concern I left the conference with is the danger of over-promoting solar energy. It seemed apparent, to this uninitiated, that the hardware and system design for solar energy usage are far from perfected. We need to press on, for all of the reasons stated, as quickly as possible; but I think we need to make that speed carefully. We cannot stand, in the name of progress, to build too many Edsels.

I think the responsible manufacturers in this field need to find a way to police the peddlers of dubious technology who are bound to be attracted to such a "glamor market" with a product that can be produced in a garage.

Finally, I think we need to worry a lot about the fact that there are precious few professionals in this country who are really experts in solar-system design. Besides Don Watson, Byron Winn, Fred Dubin, and Harry Fischer (who spoke at the meeting), one thinks of Frank Bridgers, George Löf, Dick Rittleman, Marx Ayres, Malcolm Wells. There are undoubtedly many more—but I doubt there are ten times as many. If there are 100 times that many, that is not enough to ensure quality system design (not to mention responsive building design) if solar really starts moving.

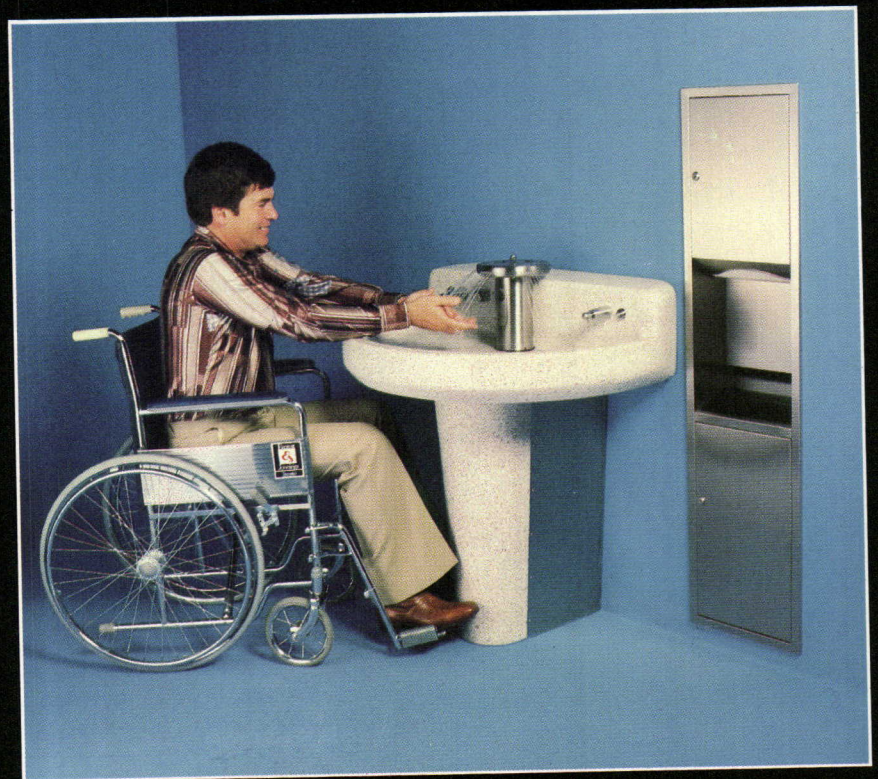
And so—I hope those involved in solar-energy design and manufacturing do not announce a revolution; but press with all responsible speed for an important evolution.—

Walter F. Wagner, Jr.

¹Sun Utilization Now, Knoxville, Tennessee, May 12th and 13th; sponsored by University of Tennessee's Center for Industrial Services and Environment Center, East Tennessee State Continuing Education, Energy Opportunities Consortium, Greater Knoxville Chamber of Commerce, and ASG Industries, Inc.

²Garden Way Publishing, Charlotte, Vermont 05445. 282 pages, \$8.95.

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NEWS REPORTS
HUMAN SETTLEMENTS
BUILDINGS IN THE NEWS
REQUIRED READING

President Carter's eagerly awaited energy program was offered to Congress last month. The legislative proposals would include standards for new buildings and money to retrofit old ones. Unlike the sections covering fuel production and consumption, the sections affecting construction are likely to move through Congress with little difficulty and with only minor changes. Details on page 34.

March contracts for new construction moved nine per cent ahead of last year's figures to total \$9,936,784,000, according to the F. W. Dodge Division of McGraw-Hill Information Systems Company. Nonresidential contracts, at \$3,002,531,000, were up 22 per cent, with a strong showing in the commercial and industrial sector. "Almost all of March's increase was concentrated in commercial and industrial building contracts (up more than 40 per cent), as institutional building value was little improved over last year's amount," said George A. Christie, Dodge chief economist. Residential contracts gained 42 per cent to reach a record dollar volume of \$5,149,193,000, while nonbuilding contracts, which recorded not a single new electric power project, fell 41 per cent.

Sert, Jackson and Associates of Cambridge, Massachusetts, have received the Architectural Firm Award for 1977 from the American Institute of Architects. Jose Luis Sert, then Dean of Harvard's Graduate School of Design, Huson Jackson and Paul Zalewski founded the firm in 1958; they were later joined by principals Paul H. Krueger and William Lindemulder. Conferring the honor on the firm, the AIA Jury on Institute Honors called its work "a humanist endeavor to enrich the quality of life through the physical environment."

Eliel Saarinen's Christ Lutheran Church in Minneapolis will receive the AIA's 25-Year Award, an honor conferred on architectural design of enduring significance and restricted to structures at least 25 years old. Saarinen's last completed work was designed in association with his son Eero and with Hills, Gilbertson and Hayes, and was completed in 1950. The AIA jury praised the building as "a living symbol of architectural integrity providing inspiration to countless architects attempting to understand the unique requirements of a changing church."

Richard Meier, FAIA, has received the \$25,000 R. S. Reynolds Memorial Award for his design of the Bronx Developmental Center in New York City. Details on page 35.

The AIA has distinguished 17 architectural designs in its 29th Annual Honor Awards Program, including six projects receiving Honor Awards for Extended Use and five receiving Bartlett Awards for their attention to the needs of the handicapped. Details on pages 41-43.

The U.S. League of Savings Associations has undertaken a major study on financing neighborhood rehabilitation in an effort to ward off unwanted government controls. Details on page 34.

The Administration proposes to reduce capital spending for hospitals by 50 per cent—much of that money intended for the new construction. Details on page 37.

A National Advisory Committee on Earthquake Hazard Reduction would be established by legislative proposals now under consideration by both houses of the Congress. Details on page 37.

Architect Robert S. Hutchins, FAIA, of New York City, has been elected president of the National Academy of Design. He succeeds Alfred Easton Poor, FAIA, who had served since 1966. At the same time, the Academy announced the election of Lawrence B. Anderson, FAIA, as an Academician.

The Second Annual Building and Construction Exposition and Conference will be held November 1-3 in Chicago at the Merchandise Mart under the aegis of the Producers' Council. The 1977 BCEC, designed to attract architects, engineers, contractors, building owners and operators, developers and producers, will include an Alternate Energy Conservation Division for solar, wind and geothermal energy systems and energy conservation products.

The American Academy in Rome has named recipients of its 1977-78 Rome Prizes in Architecture and Design: Judith DiMaio, Lexington, Kentucky, for Architecture, and Gordon Corcoran Baldwin, Taos, New Mexico, and Donald Lee Peting, Eugene, Oregon, both for Environmental Design. The fellowships each carry about \$10,000 in expenses and stipend for a year's study at the Academy.

The second edition of "Hospital/Healthcare Building Costs," published last month, offers construction professionals in this field such material as average cost figures for different types and qualities of structures, a 183-city index for making local cost adjustments, and case histories. Available for \$42 (prepaid, with appropriate sales tax) from Dodge Building Cost Services, Room 2051, McGraw-Hill Information Systems Company, 1221 Avenue of the Americas, New York, New York 10020.

President Carter offers his comprehensive energy program to Congress

Jimmy Carter may not be able to win approval of his entire energy program, but those portions dealing with the built environment seem assured of favorable Congressional action. As a result, new business opportunities should open up for construction designers and builders who will be employed to improve the energy efficiency of buildings and homes.

The debate over the President's plan centers on various proposals to reduce gasoline consumption in automobiles and to manipulate the price of oil and natural gas. By contrast, the sections dealing with more energy efficiency in buildings and homes are winding their way through the law-making process with relatively little notice.

Congress is sure to put its stamp on the buildings section. The changes are likely to be minor, while the thrust will remain the same as that offered by President Carter.

Interest groups were at work immediately upon Carter's announcement, quibbling with some details and seeking modifications in their self-interest. The President expected as much.

John M. McGinty, president of the American Institute of Architects, wired the President to pledge the organization's support, saying "this is one interest group that won't fight" the proposed measures.

A couple of weeks later, however, an AIA spokesman went to Capitol Hill to argue against two legislative proposals—one requiring life-cycle cost-benefit analysis, and another establishing solar equipment standards. Neither were specifically part of Carter's plan, but both could be lumped in with what is now being considered a comprehensive energy program.

Herbert Epstein, an Institute vice president, said the two popular proposals had laudable goals, but said they could actually frustrate energy savings objectives. He warned that life-cycle analysis is subjective and

might result in a finding that energy efficiency was unnecessary. Solar standards, Mr. Epstein said, could stifle technological innovation.

Be that as it may, most organizations representing construction designers and builders applauded Carter's plan and offered encouragement. Homebuilders, professional engineers, mortgage brokers, and contractors, reacted favorably.

A notable exception was Don Gilchrist, president of the National Association of Home Manufacturers. "Carter and his people are throwing insulation at the problem," he complained, "and the problem is the whole building envelope and everybody knows it except them."

Mr. Gilchrist proposes the use of existing model codes "that are there and ready to go." But, he adds, "We've heard nothing really specific from Carter on new buildings."

Actually, Carter did—at least obliquely—address the problem of new buildings. He ordered his Department of Housing and Urban Development to advance the writing of new energy efficiency building codes, expressed in performance terms, within one year. While this proposal was lost in the debate over other matters, it is significant that Carter does not need Congressional concurrence. By executive fiat, the President ordered the new code into use by September 1, 1980—that is, a year earlier than the deadline imposed by last year's energy legislation. Virtually all code-writing jurisdictions must go along, or builders there will be unable to use Federally insured or chartered lending institutions.

Joseph Sherman, who heads the office at HUD writing the codes, says the implementation date will be moved up one year by compressing the code preparation time about six months and by winning their enactment on the local level six months more quickly than planned.

Carter made a deliberate effort to boost solar technology into a major in-

dustry. He proposed fat tax credits—up to 40 per cent—for homeowners willing to buy and install solar appliances, at the same time promising businessmen faster write-offs and investment tax credits for their use. He also proposed a major purchase of solar equipment for Federal office buildings in a move calculated to interject economies of scale in solar equipment manufacture.

Only in those areas of Carter's plan which place new responsibilities on electrical and natural gas utilities are the new programs subject to tough lobbying. The proposal to force the utilities to provide energy efficiency analysis and improvements, and then to bill the homeowners for the cost of this effort, is particularly controversial. This, too, is expected to get approval though perhaps with modification.

Carter's energy campaign may result in benefits even before specific legislative proposals are enacted. For example, the National Association of Home Builders took the occasion of Carter's announcement to report that it has developed a set of energy conservation guidelines for its members. These guidelines are the product of a special committee on energy headed by builder Ivan Wohlworth of Long Island, New York. If followed, the NAHB says, they will result in a 16 per cent increase in energy efficiency over present practices. A greater improvement is hard to achieve, an association official says, "because we found builders are doing a pretty good job already."

Once in use, the NAHB guidelines would enable a builder in any section of the country to determine what sort of energy conservation materials and practices he should adopt in his market. "Rate cost, climate cost—everything—will be plugged into it," says an association spokesman. "And it will be easier to understand" than other similar guides for homebuilders.—William Hickman, *World News, Washington*.

S&Ls will write a program for city neighborhood lending

The Carter Administration is committed to an enlarged Federal program for neighborhood preservation—which means using incentives, loan guarantees, grant programs, tax credits or other financial leverage to modernize housing and to build the infrastructure to forestall neighborhood blight.

The lending industry, which has been under heavy fire for redlining and otherwise contributing to the decline of central city housing, is at work trying to come up with a plan of its own that would stave off unwanted Federal regulation. The U.S. League of Savings Associations hired Nathaniel H. Rogg, recently retired executive vice president of the National Association of Home Builders, "to draft a program aimed at expanding the housing rehabilitation industry, including the promotion of increased lending in city neighborhoods."

The idea, according to League president John A. Hardin, is to "propose ways of involving in rehabilitation work some of the residential construction resources—expertise, management, equipment and labor—now concentrated in new construction."

Mr. Rogg agrees that now many S&L loan officers know how to make inner-city loans. There is a different risk, he says, compared to their normal practice of lending only to the affluent who are financing homes in the best suburban neighborhoods. He says, "No big national program is going to solve the problem." But he adds that the leadership of the S&L industry "knows they'd better get into this."

The savings and loans have favored co-insurance of riskier loans, which would have the Federal government taking perhaps 80 per cent of the risk, but there is no unanimity on this.

Jonathan Brown, with Ralph Nader's Public Interest Research Group, thinks co-insurance will be the Administration's answer in the end. In addition, HUD Assistant Secretary Larry Simons says that, given the fiduciary responsibility of the S&L's, "There has to be a [government] guarantee down the road."

One of the most successful neighborhood revival programs is that of the Urban Reinvestment Task Force, run by William Whiteside under the sponsorship of the Federal Home Loan Bank Board.

The task force, operating through the "neighborhood housing service," has organized neighborhood groups in 50 cities, bringing in city officials and local banks to help homeowners catch a declining neighborhood before permanent blight becomes inevitable.

Mr. Whiteside is fighting attempts by Federal officials and legislators to make a "national program" out of something that has been successful in large part, he claims, because he has insisted on small projects and slow growth.—Donald Loomis, *World News, Washington*.

Carter's energy program in brief

- Building codes: HUD is ordered to promulgate mandatory performance building codes for energy conservation by September 1, 1980—a year earlier than had been scheduled. This means that all jurisdictions will have to adopt the codes, or builders there will risk borrowing sanctions.
- Conservation loans: the government will open a secondary market for residential energy conservation loans through the Federal Home Loan Mortgage Corporation and the Federal National Mortgage Association to ensure that capital is available at reasonable rates from private lending institutions.
- Insulation tax credits: homeowners will be entitled to a tax credit of 25 per cent of the first \$800 and 15 per cent of the next \$1,400 spent on conservation measures, if the spending occurs between April 20, 1977, and December 31, 1984.
- Installation labor: recipients of funds from the Comprehensive Employment and Training Act (CETA) will provide labor for the weatherization program for low-income families.
- Master metering: the government would outlaw a single master electric meter for a structure, such as an apartment house, and insist instead on metering for each individual unit.
- District heating: utility commissions will encourage district heating schemes, such as small central steam plants, through regulatory

provisions involving siting certification and rate-making rules.

- Appliances: mandatory energy efficiency standards for appliances such as air conditioners, furnaces, water heaters and refrigerators will be set as soon as possible.

- Utility assistance: gas and electric utilities would offer customers a residential energy conservation audit and then, if necessary, would install energy efficient equipment and offer loans to be repaid on monthly utility bills.

- Low-income assistance: the existing low-income residential conservation or weatherization program will increase to \$130 million in fiscal year 1979 and to \$200 million in the two subsequent years.

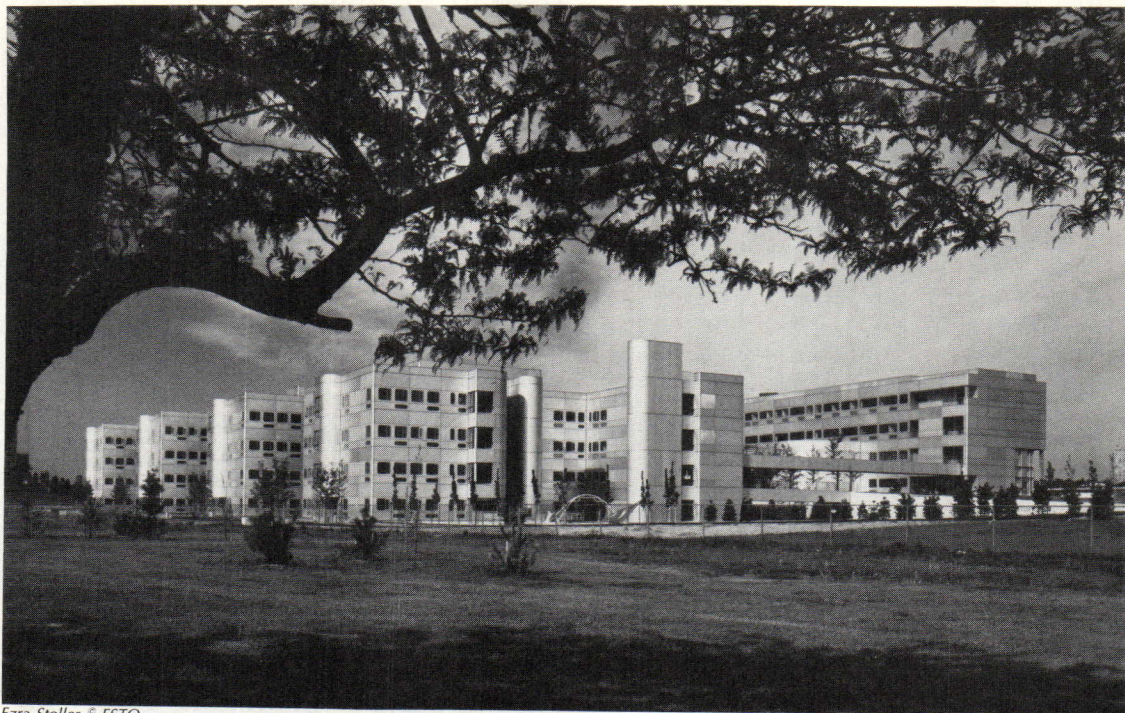
The 1977 Reynolds prize goes to Richard Meier

Richard Meier, FAIA, of New York City, has received the 1977 R. S. Reynolds Memorial Award for his design of the Bronx Developmental Center, a complex planned for the training and housing of the mentally retarded. The award, which carries a \$25,000 honorarium, is conferred annually for distinguished architecture using aluminum. (This is the second award bestowed on Mr. Meier's building within a month; see AIA Honor Awards story on pages 41-43.)

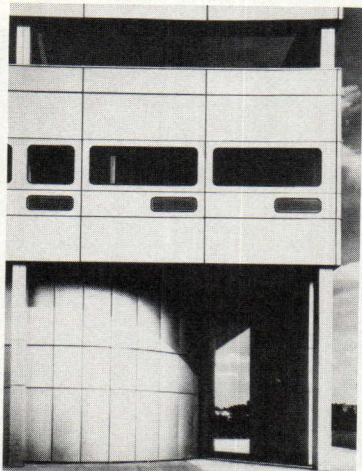
Commissioned seven years ago for New York State's Department of Mental Hygiene, the complex has lately been entangled in a great controversy over the proper treatment of people with developmental disabilities. Its opening and even the completion of its interiors have been delayed by a public debate whether institutionalization should be the preferred method of handling these patients.

Whatever the merits of that disagreement, however, no one disagrees that the building is a masterly work of architecture—critic Ada Louise Huxtable has called it "a landmark before its doors open."

The center comprises two main buildings—one for resident patients, and one housing educational facilities for residents and outpatients. The buildings are joined by the gymnasium wing at one end and by two bridges—one of them enclosed—spanning and defining the large interior courtyards. The residential building, where curvilinear stair towers mark discrete wings, will house 384 patients in small units designed to maintain an intimacy of



Ezra Stoller © ESTO



family-like groupings—a group of eight will share a suite containing three bedrooms and a living room, and two of these groups will share dining and recreational facilities. The education wing contains classrooms as well as a cafeteria and offices, and the gymnasium wing provides a swimming pool and other therapeutic and athletic facilities.

To the passing motorist, however, it is the bright taut skin wrapping and dramatizing the building's form that rivets the eye. The panelization system—there are 15 different panel configurations—produces a fenestration pattern of ordered complexity. Various shaped penetrations in the

natural-colored aluminum panels accept round-cornered lights: long horizontal windows in classrooms and corridors, smaller windows—and corner windows—in the residential units, small floor-level windows, offering a view out to children playing on the floor, represent one of the measures taken to expand the sensory impressions offered to patients.

In addition to the honorarium, Mr. Meier will also receive, as part of the award, an aluminum sculpture specially commissioned from Ilya Bolotowsky. Members of the jury were Louis de Moll, FAIA, Robert B. Marquis, FAIA, and last year's award winner, Norman Foster, RIBA.

East Germany restores Gropius's Bauhaus workshop for its 50th anniversary



Wolf Lücking

Walter Gropius's Bauhaus workshop building at Dessau, East Germany, is the very embodiment of modern architecture and the International Style. To celebrate the 50th anniversary of its dedication, the national government and the town of Dessau restored the building, now a protected landmark, to its original condition.

Abused during Hitler's regime, the building suffered grievous damage during World War II, when, among other devastations, the famous glass curtain wall was completely destroyed in bombing. The structure was enclosed to provide much-needed shelter immediately after the war, but these emergency repairs altered the

building's appearance almost beyond recognition.

The team of restoration architects and artists, who had assistance and advice from former Bauhaus members now living in East Germany, worked with special care, even constructing a mock-up of the curtain wall. (A plan to use thermal glass here was rejected

when it proved that the heavy millions required would destroy the proportions of the original fenestration. Plate glass was installed instead, as in the original building.)

The floor plan of the building, which had been adapted to a variety of uses over the years, was restored, as were the colors and wall decorations conceived originally by Gropius and the Bauhaus workshop. In addition, 160 metal chairs designed for the building by Marcel Breuer, and reconstructed from photographs, were installed.

On December 4, 1976, 50 years after the building's first dedication, the East German government arranged a gala attended by former members of the Bauhaus and by scholars from both East and West Germany. Suggested uses for the restored building include a school and a museum of Bauhaus-produced objects such as ceramics and hangings. A number of plays have already been produced in the theater.

Further restorations of Gropius' buildings are also planned, among them the Faculty Houses for the Bauhaus masters, the Unemployment Office, and housing for Dessau-Toerten.



Red cedar shakes help a church convert a barn.

How do you convert a structure of different exterior elements into a form that offers both a warm appearance and consistent scale?

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Church, Morton, Illinois. Architect, Donald L. Brooks-Miller, AIA.

AIA retrofits headquarters for energy conservation

Energy consumption in the headquarters building of the American Institute of Architects will be reduced by one half under a retrofit effort now being planned. Institute officials want the structure to be an energy efficiency model for the nation.

In announcing the program, the Institute said the four-year-old building is already more efficient than most similar structures, but because it was designed—by The Architects Collaborative—and built before the era of energy consciousness, it reflects the “national attitude” that energy would always be plentiful and inexpensive.

Specific steps to improve energy efficiency have not been determined, but options include a reduction in artificial lighting and cutting the solar heat load.

The prime consultant for the work is Sizemore and Associates of Atlanta, with the engineering assistance of Newcomb and Boyd.—*William Hickman, World News, Washington.*

Administration cuts funds for hospital construction

The Federal government plans a further reduction in the amount it is willing to pay in support of the construction of new hospitals.

This became clear last month when the Administration provided details for its hospital cost containment program. There is a proposal for a 50 per cent cut in capital spending—most it meant for new construction.

The slash is substantial, since Federal support for capital spending is now running at about \$5 billion annually. But the country can easily absorb the cut, the Administration reasons, because roughly 100,000 of the more than 900,000 hospital beds in place are not needed.

The Administration also proposes to limit increases in in-patient revenues by roughly 6,000 acute-care hospitals in the nation.

Congress is expected to okay the construction spending reduction.—*Michael Mealey/William Hickman, World News, Washington.*

Proposed law would create earthquake advisory group

Legislation intended to reduce damage from earthquakes through government-sponsored development of economical earthquake resistant structures and materials seems assured of Congressional approval this year.

Both houses of Congress are considering the proposal, which has generated little opposition. The bills call for three-year funding, beginning with \$690 million in fiscal year 1978 and continuing with \$80 million in fiscal 1979 and \$85 million in fiscal 1980.

The legislation calls for creating a new 15-member National Advisory Committee on Earthquake Hazard Reduction. The chairman is to be ap-

pointed by the President, with the other members drawn from research institutions, government, and industry.

As stated in the legislation, the basic purpose is to perfect earthquake technology and to develop design and construction methods for areas of high seismic risk.

Functions of the program would be divided between the U.S. Geological Survey and the National Science Foundation, with half a dozen other agencies contributing.—*Seth Payne/William Hickman, World News, Washington.*

Mass transit may receive transferred highway funds

The Highway Trust Fund, long considered sacred, may come in for changes under the Carter Administration.

The Federal Highway Administration (FHWA) is preparing to offer a plan for the transfer of Trust Fund money into a surface transportation fund. Doing so should mean more money for urban transit systems.

William M. Cox, Highway Administrator, says that changing the Fund's mission is an option in an upcoming reorganization of the Department of Transportation.

“A unified fund would more adequately reflect the interdependency of one mode on the other,” says Mr. Cox. He concedes that road construction would not get the same level of funding that it gets now, but it may be unnecessary. Once the interstate highway system is completed, the Highway Administration will be reduced to just two functions: researching highway programs and funding highway maintenance.—*Roger Smith/William Hickman, World News, Washington.*

Carter Cabinet ferments ideas for urban rehabilitation

The Carter Administration's plan for tackling urban rehabilitation will be explained to skeptical city officials in mid-June against a scramble by three Cabinet officers who want this job for their own departments.

Treasury Secretary W. Michael Blumenthal touched off the rivalry recently when he proposed an “urban bank” to help market city debt instruments and to make loans to developers. This idea may lose favor, however, because it threatens to create a new bureaucracy and may distort the municipal bond market.

Another suggestion, by Commerce Secretary Juanita M. Kreps, has her department's Economic Development Administration (EDA) combining grants and loans to help private developers play a larger role.

Still another scheme is proposed by Secretary Patricia Harris of the Department of Housing and Urban Development. It would combine an EDA-like agency and the already proposed \$400-million “action grant” to finance specific urban rehabilitation projects.—*Herbert Cheshire/William Hickman, World News, Washington.*

HABITAT plus one: what gives?

On the first anniversary of HABITAT: the UN Conference on Human Settlements held last year, and in answer to RECORD's curiosity about the real consequences of that event, the UN's Eric Carlson submits this report on human settlements activity over the last year. Mr. Carlson, who is with the United Nations Environment Programs (UNEP) in Nairobi, was a guiding light in the preparatory stages of HABITAT and has followed both the conference and its aftermaths with close attention. His report will appear in two parts: this month he discusses actions taken—or not taken—by UN bodies, and in July he will conclude with a view of recent governmental and non-governmental efforts influenced by HABITAT.

A year has passed since HABITAT: the UN Conference on Human Settlements, held in Vancouver after three years of preparatory efforts in all regions, and costing millions of dollars. HABITAT was to begin the building of a new international order for human settlements, where people's shelter would find its priority place in national planning endeavors. It produced 230 films and a mountain of documentation and national reports. It also produced a declaration of principles, 64 recommendations for national action, and an inconclusive resolution on an international program.

But was it all simply show-and-tell? What actions have really been taken since HABITAT adjourned? And what remains to be done?

On the official scene, the UN General Assembly took up the HABITAT Conference recommendations at its 31st session in New York, but still did not “bite the bullet” regarding the decisions required to establish an international program for human settlements. Instead, the General Assembly decided to defer until its session this fall action on the type of intergovernmental body for human settlements and on the “organizational link” and location of the proposed human settlements secretariat. In effect, the General Assembly passed the buck by requesting that the UN Economic and Social Council (ECOSOC) at its session in Geneva in July 1977 take up the whole matter of follow-up to the HABITAT Conference at the “expert or highest appropriate level” and submit to the General Assembly “concrete recommendations on definitive institutional arrangements for human settlements within the [UN] system.”

The General Assembly did, however, adopt six resolutions and two decisions in response to HABITAT. Some of the key operative paragraphs:

1. “Urges the Governments of all member states to consider, on a priority basis, the recommendations for national action contained in the report and to take those recommendations into account when reviewing their existing policies and strategies in the field of human settlements.”

2. “Calls upon the regional commissions and urges all other international organizations within and outside the [UN] system to take intensified and sustained action in support of national efforts, including exchanges of information and assistance . . . in the formulation, design, implementation and evaluation of projects to improve human settlements.”

3. “Requests the Secretary General to convene regional meetings . . . to establish guidelines for the coordination, within each region, of action to be taken in order to deal with human settlements and to report to the General Assembly on the results of their deliberations no later than at the 32nd session.”

4. Requests member states and the Secretary General “to bear in mind the measures that protect the decent living environment of the most vulnerable social groups, such as children, youth, the elderly and the handicapped.”

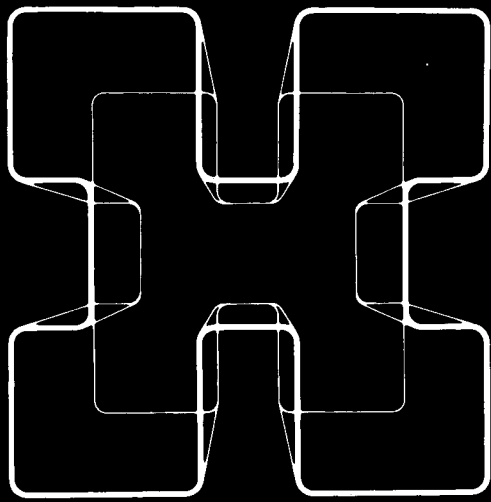
5. Invites the Secretary General to ensure that the international bodies responsible for implementing HABITAT recommendations “study the specific possibilities and effective conditions for collaboration between the [UN and] non-governmental organizations.”

6. “Authorizes the Secretary General to conclude an agreement with the appropriate Canadian authorities for the latter to provide the facilities and financial support to the [new] UN Audio-Visual Information Center to carry out the Center's responsibilities for the custody, reproduction and international distribution, [and] to ensure the widest possible use of the material by governments and other interested bodies, for the period up to March 1980, of the audio-visual materials prepared for the Conference, and calls for a review of the agreement in 1979.”

7. Requests all the United Nations bodies concerned, particularly the United Nations Development Program, the United Nations Environment Program, the Center for Housing, Building and Planning, and the United Nations Habitat and Human Settlements Foundation, to ensure that the recommendations of HABITAT are taken into account in their respective terms of reference, and to make their consultative services and resources available, as appropriate, for the implementation of national programs of action and in strengthening regional cooperation.

8. As for the two draft decisions transmitted by ECOSOC, one refers to the United Nations Habitat and Human Settlements Foundation, and “affirms the significant role of the Foundation in promoting the implementation of the objectives and recommendations of HABITAT; invites the Foundation to promote regional cooperation for human settlements; invites non-governmental organizations, financial and other institutions to collaborate with the Foundation . . . ;

continued on page 39



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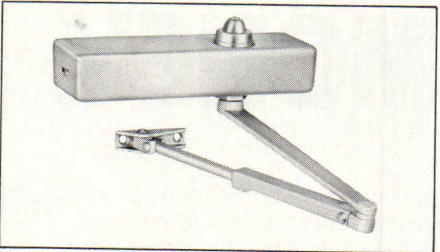
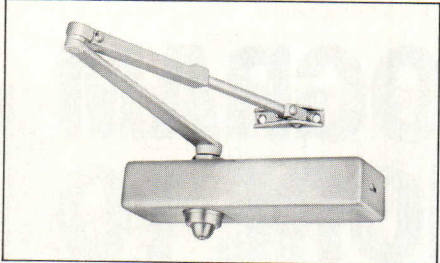
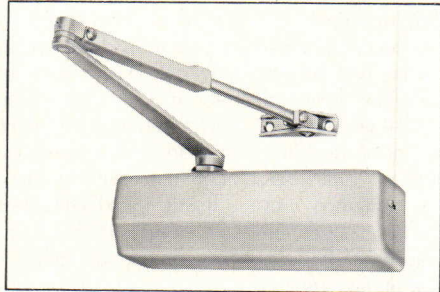


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HUMAN SETTLEMENTS

continued from page 37

urges governments to support the Foundation on a voluntary basis [and to promote] the implementation of the objectives and recommendations of the Conference; and affirms that the Foundation should be appropriately strengthened so that it may achieve the full potential envisaged for it. . . ."

These conclusions hardly reflect the maneuverings that took place during General Assembly discussions, as one draft resolution after another was tabled in the effort to line up sufficient support on the institutional arrangements question. But the ball is now in the court of ECOSOC, a body of 58 member states, which will have special sessions this month in Geneva to come to grips with the questions of international institutional arrangements.

Meanwhile, at the regional level, there is considerable progress. For Latin America it has been decided that there will be a regional office for human settlements established in Mexico, under the wing of CEPAL, the UN Economic Commission for Latin America. For the African region, it has been agreed also that an intergovernmental committee on human settlements will be established, with a strengthened secretariat, to function under the Economic Commission for Africa. ESCAP, the UN Economic and Social Commission for Asia and the Pacific, held its regional meeting on HABITAT in May, in Bangkok. All of the regional activities will benefit from support of UNEP for research and demonstration projects on innovative "human settlements technology."

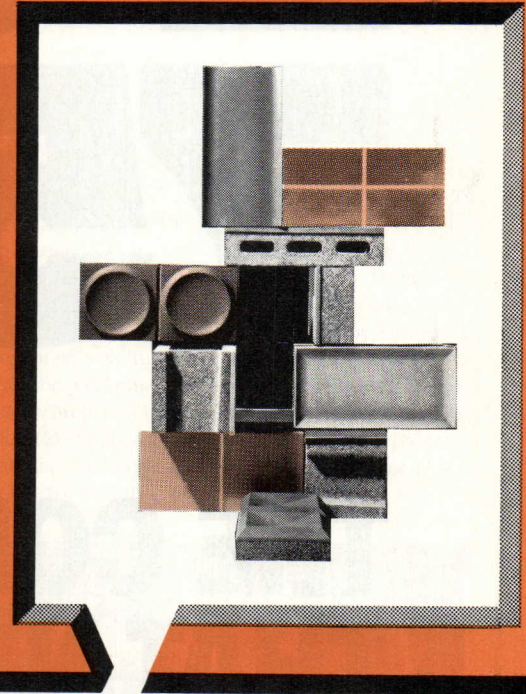
The new UN Audio-Visual Information Center for Human Settlements, established at the University of Vancouver, is also progressing. A group of international experts met last month in Vancouver to propose a series of suggestions for its policies and operations. Canada will give this Center significant support to ensure that the audio-visual presentations prepared for HABITAT will receive worldwide utilization and distribution.

Another important area is that of financing. The UN Habitat and Human Settlements Foundation convoked an International Workshop on Housing Finance in London in March for a selected group of experts from developing countries as well as representatives of key financing institutions, including the World Bank and regional banks. The Workshop developed a series of recommendations for expanding the flow of international capital in the field of human settlements, taking special account of the requirements of long-term investment in conditions of inflation. The Workshop recommended that an international housing investment service be established where client countries and potential investors could come to grips with investment package requirements for different situations, including guaranty terms.

To be concluded in July.

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lately?

The new buildings earning AIA Honor Awards this year include: (7) Bronx Developmental Center, New York City; Richard Meier and Associates. Bartlett Award. *Jury comment:* "This is a very elegant construction of aluminum and glass at a pleasing and communal scale." (See also page 35.) (8) Vacation House, Mt. Desert,

Maine; Edward Larrabee Barnes, FAIA. *Jury comment:* "Simple, understated and restrained, these buildings as a group make a mini-community out of a 'house' on a very special piece of the Maine landscape." (See RECORD, mid-May 1976, pages 72-73.)

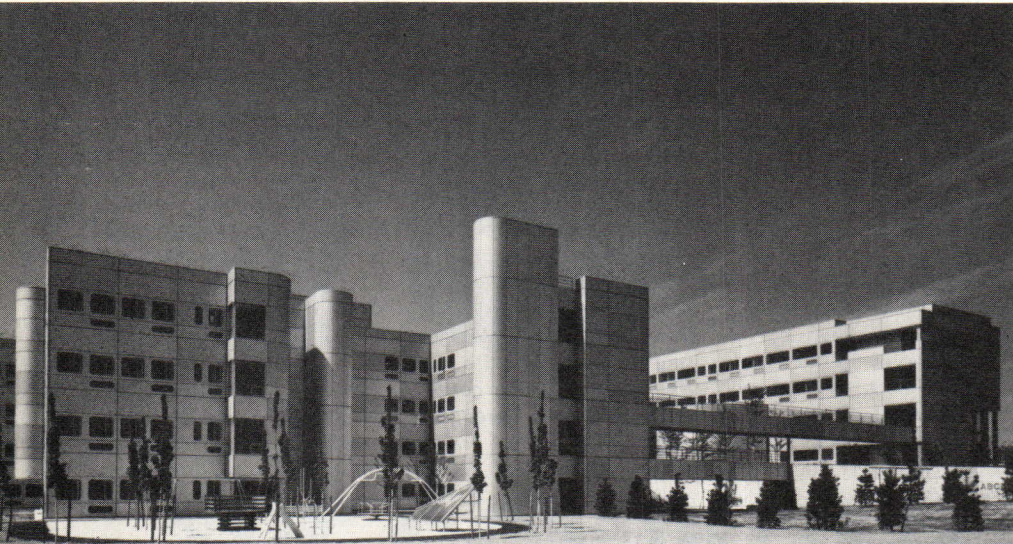
(9) Elderly Residential Project, Cidra, Puerto Rico; Jorge

Del Rio, AIA/Edwardo Lopez. *Jury comment:* "This charming little complex exemplifies the manner in which the problems of restricted budget, restricted scale and, very likely, restricted quality requirements can demonstrate that Federal housing projects need not be inhumane or unattractive." (10) John Hancock Tower, Boston; I. M. Pei &

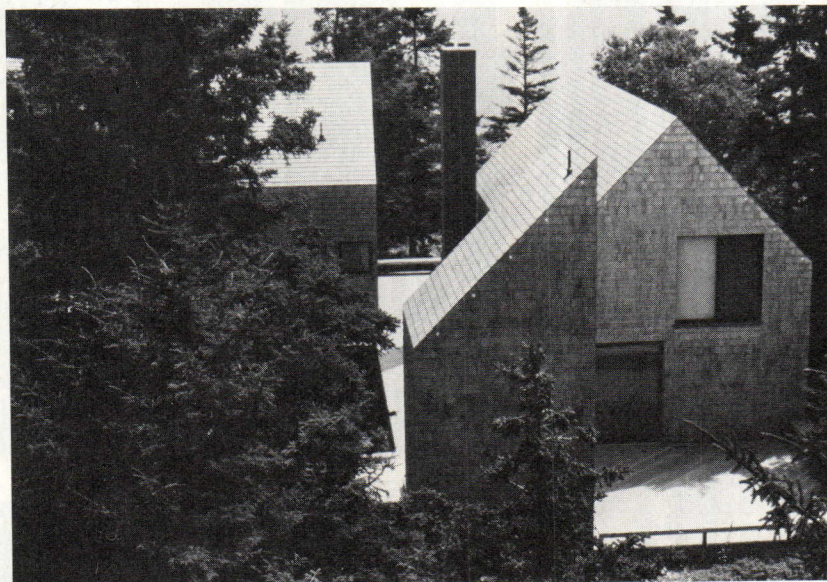
Partners. *Jury comment:* "It is perhaps the most handsome reflective glass building; history may show it to be the last great example of the species." (See also pages 117-125.) (11) The Penn Mutual Tower, Philadelphia; Mitchell/Giurgola Architects. *Jury comment:* "This office tower addition to an older area in Philadelphia sensitively

retains the remnants of the original townhouse facades, integrating them with the new high rise structure behind them."

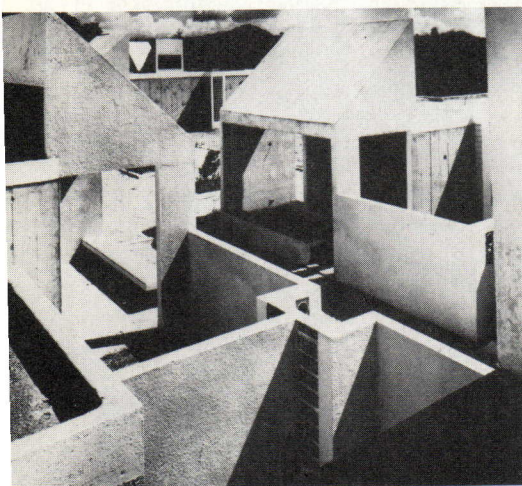
(12) 1199 Plaza apartments, New York City; Hodne/Stageberg PARTNER Bartlett Award. *Jury comment:* "This great brick construction effectively a city within a city. Its mass steps down toward the



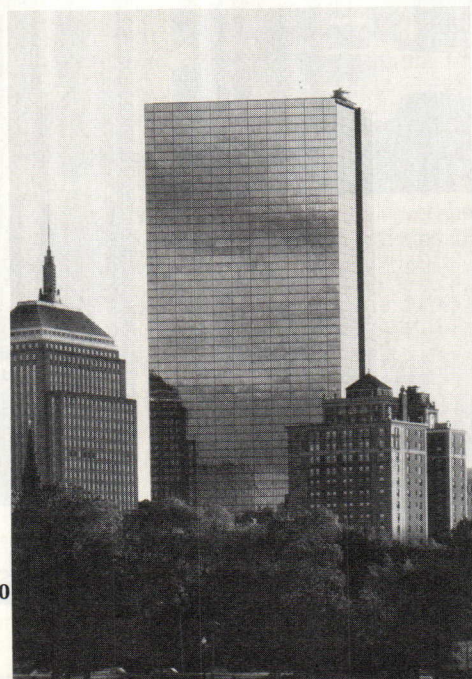
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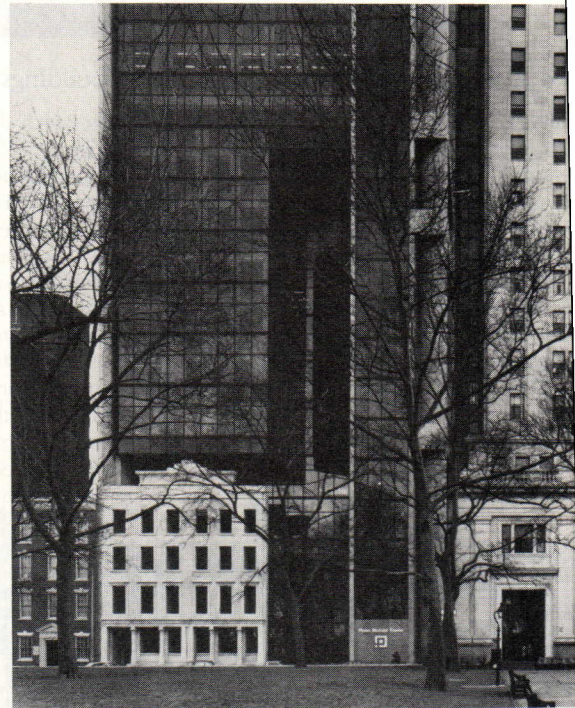
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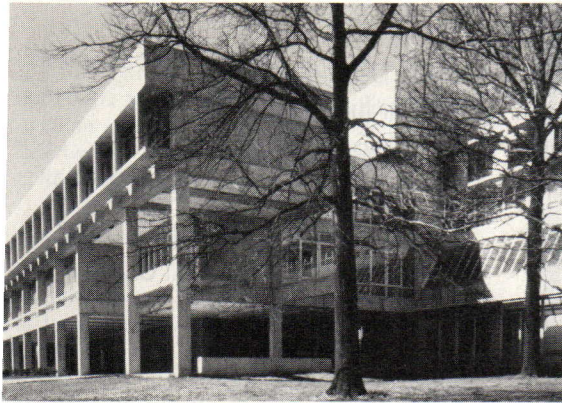
erfront, giving the complex a sense of presence. . ." (13) Humanities & Social Science Building, Southern Illinois University, Carbondale; Geddes, Scher, Qualls, Cunningham. Plett Award. *Jury comment:* "The rhythm is varied, allowing penetrating cross-campus walkways and providing classrooms and offices on several stories."

(14) William J. Campbell Courthouse Annex, Chicago; Harry Weese & Associates. *Jury comment:* ". . . an architectural attempt to overcome the traditional barred jailhouse image. The narrow windows in random pattern indicate a special use, but one does not find an inhumane correctional facility image projected on the commu-

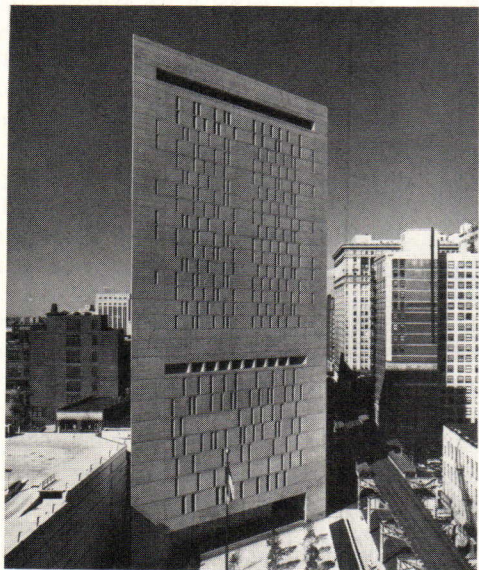
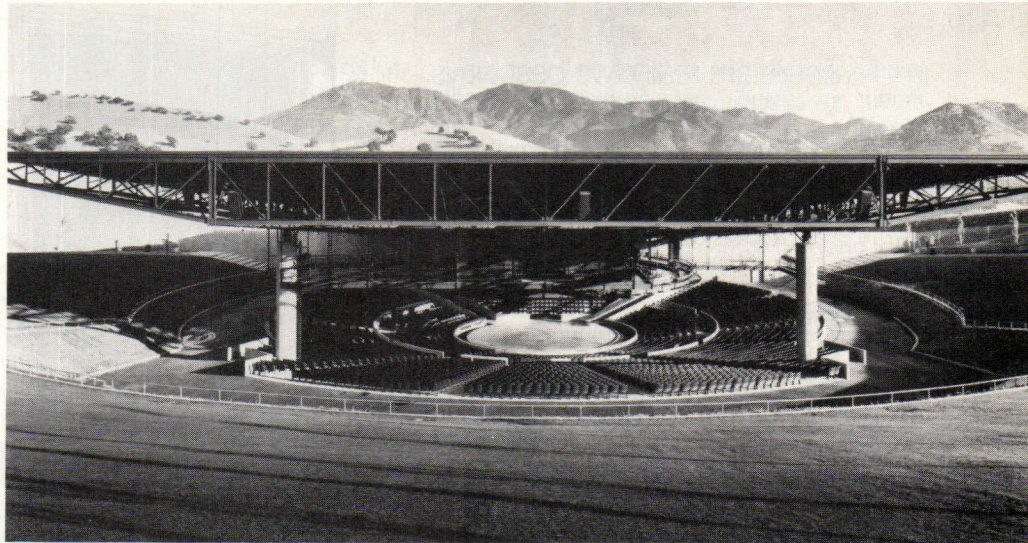
nity." (15) Spelman Halls, Princeton University, New Jersey; I. M. Pei & Partners. *Jury comment:* "The building maintains a geometric relationship to the existing highly ornamented dormitories and the resulting tension between the two systems sets up a special sense of place." (See RECORD, January 1976, pages 123-130.)

(16) Concord Pavilion, Concord, California; Frank O. Gehry & Associates. *Jury comment:* "The rolling California hills are emulated by the earth berms shaped to form a natural bowl enclosing a central stage . . . seems an effortless solution to gather thousands of people for theatrical and musical enjoyment." (See RECORD, June

1976, page 97.) (17) Pennzoil Place, Houston; Johnson/Burgee Architects. *Jury comment:* "This speculative high-rise [office building] is . . . a sophisticated urban composition that dominates in a pleasant way from a distance and enhances the human environment at close range." (See RECORD, November 1976, pages 101-110.)



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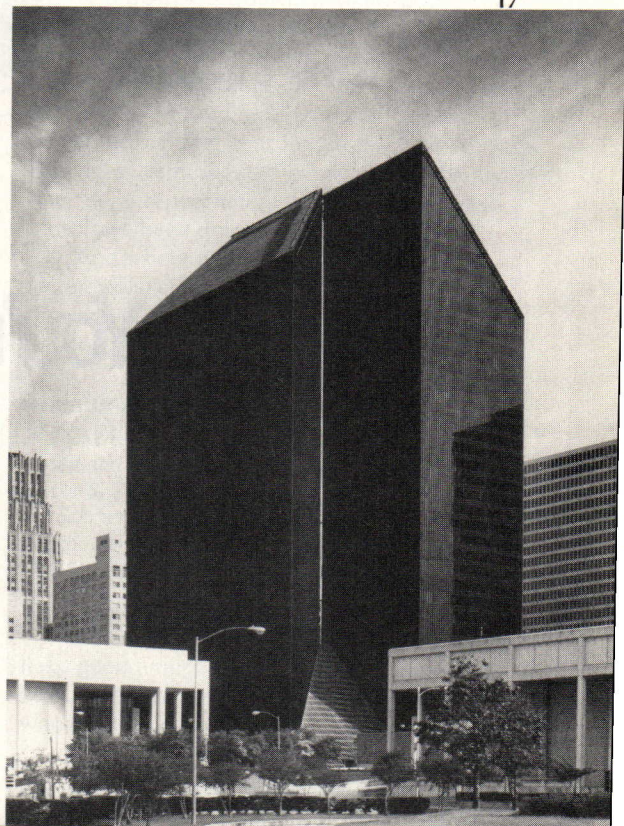
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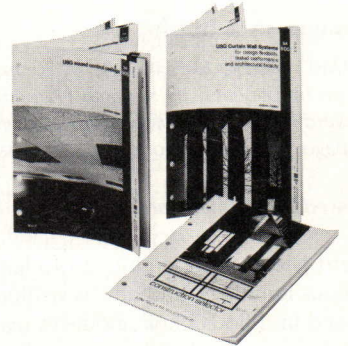
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others to do the same. The many fans of the late Robert W. Schmertz FAIA—an architect and teacher of architecture whose avocation was writing and performing ballads about his native Pittsburgh, architecture, life, love and other subjects—will be happy to know that the legacy preserved in his recordings has now been augmented by a songbook.

Publication has been made possible by the efforts of Gretchen Schmertz Jacob, a daughter of Mr. Schmertz, Jo Davidson and other members of the group of Pittsburgh folk-singers who performed his songs with Mr. Schmertz over the years on and off the recordings. It was a labor of love for all concerned.

And what a songbook! The page layouts were designed, lettered and illustrated by Mr. Schmertz himself, an occupation of many years completed after he retired from practice and teaching and only a few weeks before he died in June 1975 at the age of 77. The drawings combine the innocence and verve, and the pure joy in color, of a child's drawings with the sophisticated irreverence and sure technique of a master cartoonist. The drawings were done in pencil, in crayon or in water-color, according to the impulse of the moment, and are a delight in themselves for all who love drawing. They are superbly reproduced, and credit is in order for the craftsmen responsible—Buzzards' Nob Associates, Dover, Pennsylvania, and Printing Plate Craftsmen, York, Pennsylvania.

And then there are the songs, 21 of them, transcribed and arranged "for the parlor pianist" by Lee B. Thomssen, who has thoughtfully pitched them into normal voice range. Though Mr. Schmertz wrote scores of songs, and played and sang hundreds more, he could neither read nor write musical notation; and few of his songs were in print until Mrs. Thomssen some years ago offered to transcribe and arrange them. Mrs. Thomssen also drew the musical manuscripts for printing.

For those who know the songs, it will be enough to say that those included in the book range from "Monongahela Sal," "The Forks of the Ohio" and "Mon Petit Lapin" to "Palazzo Massimi," "Hyacinth Harry" and "The Queen Anne Front (and the Mary Ann Behind)." For those who don't know the songs, perhaps it should be added that these are ballads which describe the adventures and misadventures of human experience, and sometimes of architecture, with delicious impertinence, wit and erudition, at once irreverent and compassionate. Above all, they are songs for *singing*, from a loving heart.

The best way to get acquainted with the songs of Bob Schmertz always was to be one of the crowd in somebody's living room when he played his banjo and sang his own songs. (It made for the best session at many an AIA convention.) Now the best introduction would have to be the records, but no songfest in any architect's living room ought to be without the Robert Schmertz songbook.

Jeanne M. Davern, a freelance architectural journalist and editorial consultant, is a former managing editor of ARCHITECTURAL RECORD.

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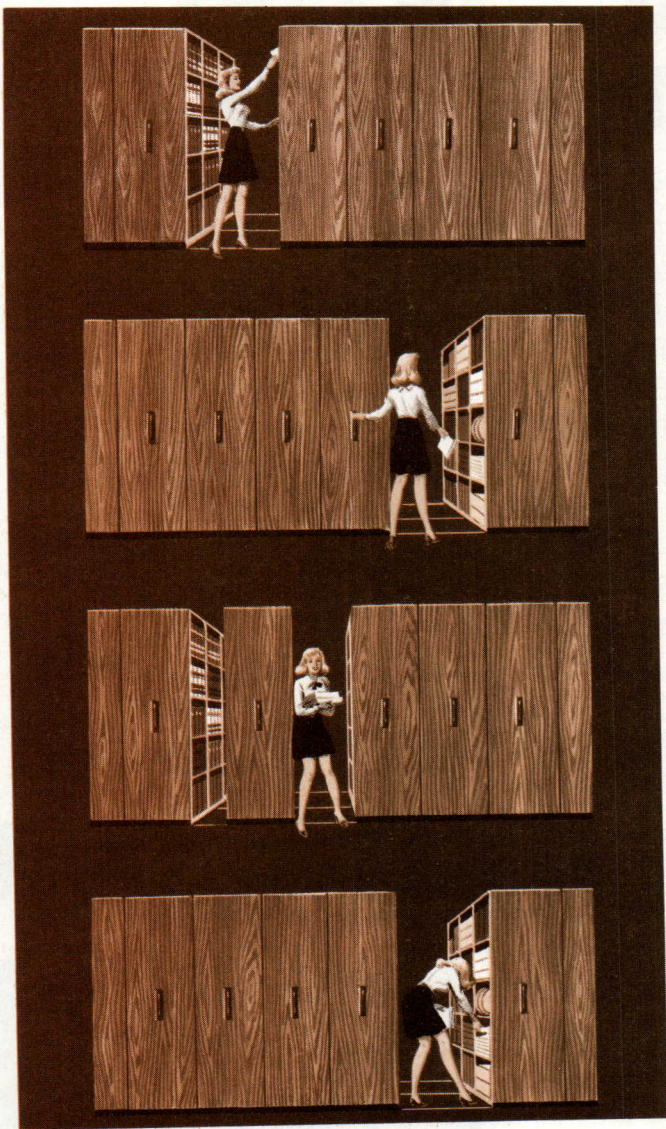
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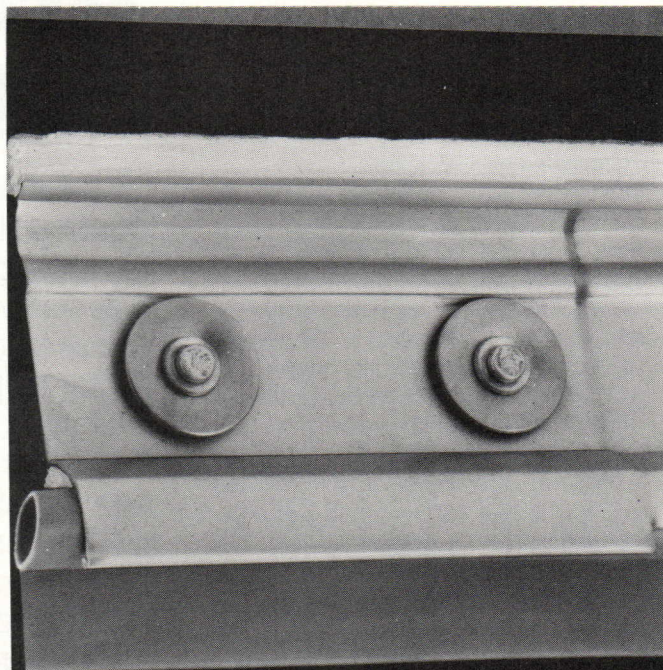
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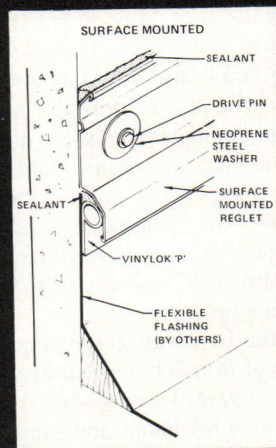
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Regulatory codes: one firm's check list for industrial projects

by Joseph E. Compton

We are now in an era where code requirements at the Federal, state and local levels make it mandatory for architects, engineers and planners to take positive steps to prevent possible violations before they occur, rather than to take expensive and time-consuming action after the fact. The time is past when the local triumvirate of planning, zoning and building department regulations were the only criteria that the building owner had to meet. Regional, state and Federal bodies, led by OSHA and EPA, have superimposed a host of new regulations, not always predictable and/or reasonable, that must be met under penalty of delay and possibly, legal action and restraint. In an attempt to keep abreast of these changes in requirements at all levels, Smith, Hinchman & Grylls has set up a systematic approach to the review of building, structural, mechanical and electrical systems, as well as manufacturing processes when the building is an industrial facility. While the system is applicable to all SH&G buildings, it takes on an extra importance in the industrial area which, by its very nature, includes more serious elements of noise, heat, dust, pollutants and safety.

Our most common assignment is that of providing A/E services for a new industrial facility, beginning with an analysis of the site itself. By their very nature, industrial facilities tend to involve large plots of land, suburban or rural, in which many adjoining property owners—as well as the general public—have an interest. Where forest cover must be cleared, or where drainage or run-off affects a stream, the environmental impact takes on paramount importance. Only rarely is the architect consulted on the basic decision of land selection or purchase, and SH&G relies heavily on the expertise of the environmental planning firm of Johnson, Johnson & Roy, Ann Arbor, Michigan, to identify environmental problems that must be considered in our building decisions. In almost all of our recent major industrial commissions, JJR has been involved at the earliest date, and has worked closely with our civil engineers as well as our designers, to ensure that the building has the least possible adverse effect on the surrounding environment.

As a check-point for all of our disciplines, we have set up the position of "Code Specialist," whose primary responsibility is to keep informed of the latest information and rulings of the various regulatory agencies to prevent the designing-in of violations, and the time-consuming delays in the approval of plans by agencies with review responsibility and authority. (Even worse are citations for violations that are issued after the facility has been completed and production begun. If the first is expensive, the second is catastrophic.)

We insist that the Code Specialist be present at the initial review of the over-all scope of

work, along with the client, the project manager, and the architects and engineers. During these early discussions, the Specialist will identify all areas of decision-making that require code review, using a check list (see illustration) of all of the applicable Federal, state and local codes. Most frequently, this involves those regulations governing fire door exits, washroom facilities in relation to the number of employees, and identification of hazardous areas. This check list identifies 21 different subjects of various codes, as well as an all-encompassing "Other." The specialist will report to the designers (in all disciplines) any specific criteria with which they may not be familiar.

At all design stages, plans are reviewed for code violations

Upon completion of the design development stage (as well as all Owner reviews and changes to date), the Code Specialist will again review the drawings and the outline specifications in greater detail, in order to determine potential areas of code violation.

Like preventative medicine, this review is far more effective and less costly than remedial treatment. Recently, we worked on a plant that called for a Materials Laboratory including a room that the owner had designated as a "paint room." Had this room actually been used for the purpose that the name implies, it would have meant the use of volatile solvents, and would have required special ventilation, hazard-proof electrical gear, blow-out panels, non-static materials and other precautionary equipment. However, our staff made further inquiries of the owner and found that the materials involved were actually finished and painted strips, which were brought into the "paint room" for physical tests. Therefore, sim-

Subject	Applicable Code
Building	UBC, BOCA, NBC, SSBC, city and state
Mechanical	Local building jurisdiction/state
Plumbing	Local building jurisdiction/state
Employee safety	OSHA
Electrical	Local building jurisdiction/state
Energy conservation	ASHRAE 90-75
Air conditioning	Local building jurisdiction/state
Refrigeration	Local building jurisdiction/state
Physically handicapped	ANSI or state
Pressure vessel	Local building jurisdiction/state
Elevator	Local building jurisdiction/state
Fire	Local building jurisdiction/state
Hospital	Local building jurisdiction/state
X-ray	Local building jurisdiction/state
School	Local building jurisdiction/state
Highway & road	Local building jurisdiction/state
Sewer & garbage	Local building jurisdiction/state
Water pollution	Local building jurisdiction/state
Air pollution	Local building jurisdiction/state
Incinerator	Local building jurisdiction/state
Zoning	Local building jurisdiction/state
Other	

This SH & G code check list, based in the firm's experience, identifies key code areas affecting the design of most buildings. Generally, applicable codes are provided by local and/or state building jurisdictions except in the case of employee safety, energy conservation and handicapped provisions, where there are Federal guides. In identifying codes, this check list deals with life-safety issues only, and does not identify possible insurer requirements for the protection of structure and contents.

ply changing the name of the room avoided a costly delay in obtaining the permit, and the economic burden of needless precautions.

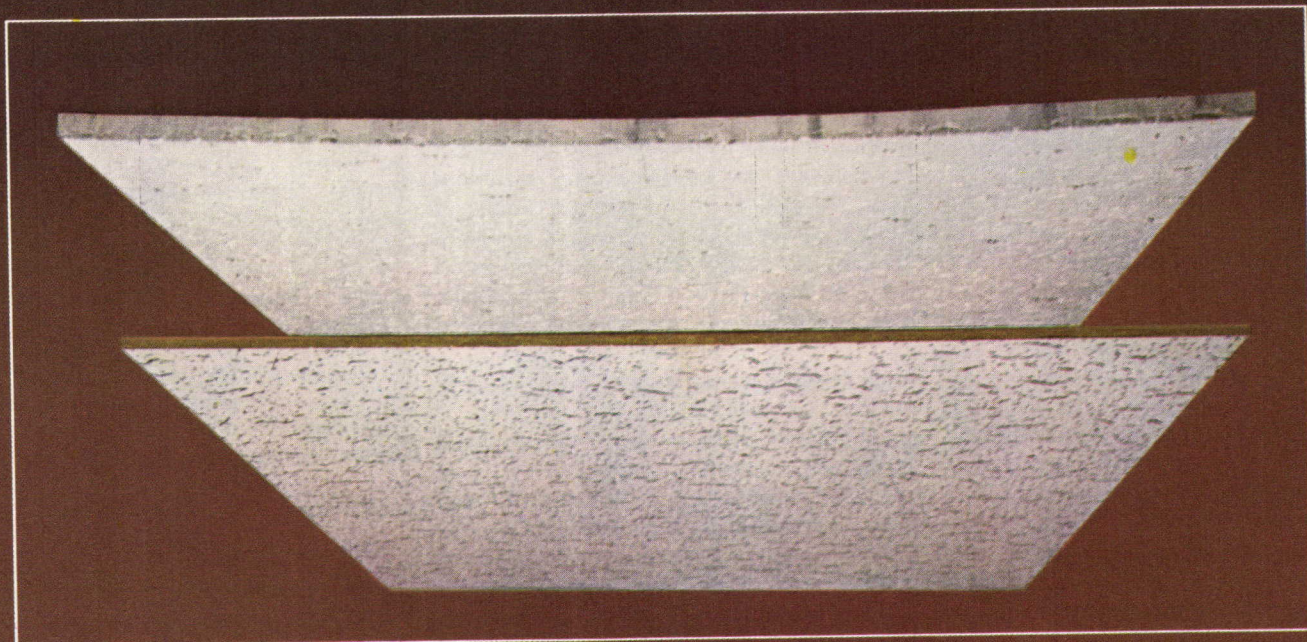
During the development of the final drawings and specifications, the Specialist is once again consulted for code interpretations, which are not always clear and unambiguous in their wording for a complex building (like a hospital). He would normally review the contract documents when they are approximately 80 per cent complete.

Changes in manufacturing techniques can save violations and money

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Mr. Compton is vice president and director, Industrial Division, Smith, Hinchman & Grylls Associates, Inc., Detroit, Michigan.

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continued from page 65

dition to our normal A/E services, to provide plant layouts, manufacturing process layouts, materials handling systems, etc. During the development of the manufacturing processes, a number of discipline specialists are responsible for reviewing the designs and plans in order to avoid code violations. This group is composed of specialists in materials handling, air handling and ventilation, metal cutting, piping and foundry engineering. Each discipline is charged with reviewing the manufacturing process at its conceptual stage to avoid design errors involving codes. They check for code infractions for noise, heat, stress, safety, air and water pollution, and all other pertinent areas.

The Director of Manufacturing Engineering and the Manager of Foundry Engineering, where appropriate, review all final plans and specifications completed by their staffs for possibly overlooked violations. Recently, a routine check at this level provided us with the opportunity to delete a spray oil mist used for cooling a machine cutting operation, and to substitute a flood of oil over the part being machined. This simple change reduced the amount of mist produced; the amount of ventilation required in that area of the building to remove oil and dirt from the air was greatly reduced, along with energy requirements.

Where OSHA or EPA are involved—and the building in which they are not involved is becoming a rare assignment, indeed—we require that the SH&G corporate discipline heads (civil, mechanical, electrical and structural engineering; architecture and design) also overview all the plans and process situations that might create environmental problems. If such are identified, the discipline head will consult with the designer and the project manager to see if the problem can be mitigated or eliminated by a change in process. Since this involves production itself, the owner is the key member in any decision.

An excellent example of this occurred last year, when our Manager of Foundry Engineering was asked by the owner to submit recommendations for reduction of air pollution, which had resulted in a citation from a regulatory agency. The owner's first reaction was to request additional ventilation and the addition of air scrubbers to combat the pollution, but SH&G's engineer concluded that it would be to the owner's benefit to first review the molding operation that was producing the pollution. This study showed that by changing from a "green sand molding" system to a "no-bake" system, the benefits in both cost and effectiveness would be substantial. Not only was the air pollution problem resolved, but the foundry's castings could be produced more economically. In addition, since the "no-bake" process requires considerably less machinery, the ambient noise level was decreased, and a safer environment was provided for the workers. A completely unforeseen benefit was a substantial savings in the amount of energy

used as a result of the reduction in the quantity of sand required in the alternate process.

In a final check for code violations, it is our practice to have all plans produced by our firm checked by our Construction Management Division to assure ourselves that the project has been designed in as safe and compliant a manner as possible for actual construction. In fact, no plans may be put out for bid until they have been signed off by Construction Management. While it is not the primary function of this check to review for code variations, the personnel who do the construction checks are familiar with code requirements and they, too, will flag any situation which looks questionable. This gives us a belt to supplement the suspenders of the earlier system.

When a new building is commissioned, this properly puts primary emphasis on anticipatory planning; many current clients are asking that we help them correct existing situations that are no longer acceptable to regulatory agencies, and for which citations may have already been received. In these cases, we are asked to provide solutions for problems, the most common of which involves air or noise pollution, heat, safety, or stress. Here, our architects and engineers must locate the source of the problem and suggest solutions within the owner's budget, always guided by the special expertise of the Code Specialist.

Several new requirements have further complicated the design and engineering of buildings: the "barrier-free" requirement that takes into account the physically handicapped, and the needs of women in what were formerly male-only employment situations.

An example occurred when an in-plant office was located near an access stairway to the roof. It seemed logical to put a concrete slab over the offices and to locate a stair landing at the slab level, which could then be used for minor storage of office supplies, and for access to certain electrical equipment. Unfortunately, the logic of this planning escaped the city inspector who looked at the slab in relation to its possible use by the handicapped. When the contractor took the plans to the agency for the building permit, the inspector insisted upon an elevator servicing the storage area for use by handicapped personnel. Although this may appear far-fetched, it was only through the owner's persistence, and a referral to a higher ranking state agency that the ruling of the local body was overturned and the elevator requirement eliminated. We finally had to add a handrail around the edge of the slab and install a ship's ladder for secondary egress from the area. Needless to say, our Code Specialist as well as our architects, review all situations where a requirement may be the result of a unique interpretation of a local agency.

Water management is most important in industrial plants

The amount, and volume of waste water emanating from buildings and their sites is closely monitored by environmental bodies. We use

computer programs for the prediction of storm water run-off from the large roofs and parking areas of a modern industrial plant. These programs anticipate the various loads that rain will put upon the municipal sewer or waterway that receives it, and acceptable ponding that the roof or the parking area can contain in order to reduce the run-off to a manageable volume. Again, an early determination of this problem can provide the best siting of both building and parking, and can provide the building designers with the data they need.

In another example, our industrial engineers, working with our waste treatment group, were able to decrease the amount of waste water from a plant through the re-use of rinse water for a chrome plating system. They set up a hierarchical system in which the waste water is passed from the cleanest rinse stage to the dirtier initial rinse stages. The dirtiest water is then treated in a concentrated form. Previously, wherever water and energy were cheap, the owner would pipe city water through each stage and divert the waste directly into sanitary sewers or into nearby streams. By use of the new system, large amounts of water were saved, and the waste treatment simplified considerably. And the entire change was brought about by a request that we look at the waste treatment facilities to determine a better way to treat the water.

There are many areas in which the willingness of the owner to review, and modify, his operations will reduce pollution, heat, noise and stress. For instance, where furnace emissions are given off during a pouring operation, ventilation hoods have not always proven successful due to the operating equipment required in these constricted areas. Often, by isolating these areas with partitions, the fumes can be trapped and adequately treated.

And there is one code check area—nuclear operations—where there is no practical solution that will reduce the danger of this harsh environment to man. However, in most cases, the answer is to remove the employee from the operation and substitute a robot. This particular situation is rare enough that both owner and A/E will bring to it the highest degree of awareness and caution.

Laws affecting buildings and the workplace are likely to become more all-encompassing and more restrictive—as can be seen by the constant additions of categories to the SH&G code check list. We have attempted to bring a systematic approach to the identification and solution of these new problems, so that their consideration will become second nature to our designers. And since responsibility of all becomes responsibility of none, we feel that the creation of the Code Specialist function and responsibility is the best route to full compliance with often very contradictory and arbitrary interpretations of governmental agencies. Anything short of full compliance can result in expensive and production delaying rulings against our owner, and after all, it is his interests that we serve.

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A basic guide to pitfalls in foreign contracts

by Philip F. Purcell

During the past four years, the overseas work of some U.S. architects has expanded rapidly, associated primarily with the tremendous construction programs being undertaken by the Middle Eastern countries. Work in foreign countries—and in particular the Middle East—poses legal and financial problems that are far different from those encountered in this country; these are problems that deserve serious consideration by the architect and his legal and accounting advisors at the very first contact with a prospective foreign client. For example . . .

Compensation. Usually, foreign contracts have lump-sum compensation arrangements that include both fee and out-of-pocket expenses. It is rare to find compensation based on percentage of construction cost or on technical labor timecards. The difficulties inherent in calculating and administering the cost of travel, foreign incentive payments to employees and overseas housing and subsistence in a lump-sum contract are readily apparent.

Payment. Unless an architect wishes to speculate in foreign currency, he should attempt to have payments made in United States dollars in the United States—where most of his costs will be incurred. However, in most Middle Eastern countries the fee is paid in local currency, which exposes the architect to fluctuations in the foreign currency market. For example, if it takes 3.5 monetary units of a particular country to equal \$1 at the time an architect's fee is negotiated, he will ask for a fee of 350,000 monetary units if he wants a fee of \$100,000. If subsequently the dollar strengthens and it takes 4 monetary units to buy a dollar, the architect will have a fee of \$87,500. Currency maintenance clauses which peg the exchange rate should be given consideration; however, in many countries (for example, Algeria) finance ministry regulations prohibit such clauses.

If an architect is to be paid in a foreign currency, he must determine whether there is free transfer of the currency out of the country. Should his fee be blocked, he will, of course, be unable to return it to the United States. At the present time, free transfer exists in most of the countries in the Middle East, but this is not true in parts of North Africa or Europe.

Taxation. Some countries, such as Kuwait, have no income tax; and others, such as the United Kingdom, have an income tax with high rates. The applicability of foreign tax to the architect's work, as well as the deductibil-

ity of expenses incurred by the architect outside of the taxing country, must be determined. If a country refuses to allow certain home-office expenses, the architect's profit for tax purposes will be greatly overstated. Also, if a country assesses income tax on profit arising from services performed in the United States, the architect will be subjected to double taxation because there is no tax credit given by the U.S. for foreign tax paid on services which are performed in the United States.

Liability. Frequently foreign contracts will contain clauses imposing a standard of care upon the architect which is not insurable because the clauses require a standard of perfection (for example, "the architect will be held to the highest standard of care" or "the architect will guarantee that the plans and specifications will be free of defects"). Professional liability policies written in this country or in the London market are predicated upon a standard of negligence which presupposes that the architect will conduct himself as a reasonable, but not perfect, architect. There also may be requirements that the architect indemnify and hold harmless the owner from all manner of disaster, whether or not related to the performance of the architect's work. Most of these provisions are not insurable.

Additionally, liability may be imposed by statute. Those North African and Middle Eastern countries which have derived part of their legal system from France have incorporated the 10-year liability provisions of the French Civil Code. The 10-year, or decennial, liability laws provide that the architect and the contractor are liable for 10 years for the destruction in whole or in part of a building due to bad construction or defects of the soil. The owner is not required to prove negligence. Once damage has occurred, liability is imposed. Compliance with all laws, building codes or accepted architectural standards is not a defense. Furthermore, in some countries this liability cannot be shifted to others by contract.

Guarantees. Middle Eastern countries usually require performance guarantees of 10 per cent of the contract amount which is held

until the contract has been completed. Performance guarantees may be collected by the owner at his sole discretion. In some countries, such as Saudi Arabia, performance bonds may be accepted in lieu of performance guarantees for certain work. If an advance payment is made to the architect, as may occur in the Middle East, the entire amount of the fee advanced must also be guaranteed. The guarantee decreases as progress payments are made to the architect.

All guarantees must be backed by letters of credit which, if they are from Western banks, must be confirmed by local banks. Because letters of credit are carried on the liability side of the architect's balance sheet, banks treat them as loans, which tie up the architect's borrowing ability.

Resolution of disputes. Many Middle Eastern countries require that disputes be submitted to a three-man panel for resolution; one man each is selected by the architect and owner, but the third member will be named by the government if the architect and the owner cannot agree. The law of the country in which the project is being constructed usually applies. In some limited instances, arbitration by an impartial body, such as the International Chamber of Commerce in Paris or the London Court of Arbitration, may be utilized. Even here the format is different from that in the United States; a hearing is optional and cross-examination is not provided for. Once there has been an arbitration award, it may be difficult to enforce unless the countries of the architect and the owner are parties signatory to the Convention for the Recognition and Enforcement of Arbitration Awards.

Arab boycott. Some Middle Eastern countries require to varying degrees compliance with the Arab boycott of Israel. Any such requirement may create problems for the architect under the export regulations of the Department of Commerce, the Tax Reform Act of 1976, antitrust laws of the United States, and a variety of state-enacted boycott legislation. Additionally, there are several bills pending in Congress which will have an impact on this area.

While there are a myriad of other matters to be considered, the above problems are basic to any foreign contractual arrangement. Despite the seeming difficulty of resolving some of these problems, the stakes are high. Those architects who jump in must simply do so with their eyes wide open.

Mr. Purcell is an attorney with the Chicago and Washington, D.C. law firm of Isham, Lincoln & Beale. With a background in construction contracts and litigation, he is a frequent speaker at numerous design-profession and construction industry seminars.

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Writing for marketing impact: letters, brochures, proposals

by Stephen A. Kliment, AIA

"It's not creative unless it sells" was the title of a two-page ad in the February 21, 1977 issue of *Business Week*. Buyer of the ad was a major Madison Avenue advertising agency, and the ad's copy skillfully debunks the approach to ad design that creates attention but does not create sales. So it is when you compose your letter of interest to a prospective client, write a proposal, or prepare materials for your firm's brochure. Jargon-filled language setting out in detail your firm's history and design philosophy must be subordinated to the one central purpose of all marketing writing, which is to influence the prospective client to retain your services. If you ignore this, you will not create sales and you may not even create attention. The way you use words must, therefore, be client-oriented rather than architect-oriented, "you-oriented" rather than "we-oriented."

Before a client hires your firm, he needs to know all about you.

1. *Have you experience in solving his kind of problem?* This can cover a number of factors. It could involve simply experience with designing a particular building type. But it could go beyond this, to include, say, problems of reconciling conflicting internal wants of a complex client such as a hospital or university; or planning a major energy retrofit while the facility keeps operating; or developing a service station systems package for a large oil corporation.
2. *Have you a solid record in bringing projects in within the budget?* Many offices keep close track of this data. Even though in many cases the matter is outside the architect's control, over the years the firm with a high caliber of cost estimating and good cost control has been able, if not always to meet the budget, at least to meet the final estimates. The prospective client wants to know this.
3. *Have you managed projects so they were completed on schedule?* As before, this matter is sometimes outside your control. If you have developed management techniques such as fast-track that speed up the sluggish traditional design and construction pace, tell the client. He wants, above all, reassurance that he can move in according to plan.
4. *Have your completed projects stood the tests of time and use?* This one is harder to document. Success is proven easier by a tour of the facility and a talk with the owner than by a written statement. In that case, make the offer in your letter. For a brochure fact sheet on the project, use any evidence of recognition you can get—a testimonial from the client if you

can, or excerpts from a favorable article, or both.

5. *Do you have a high caliber of professional and support staff?* Demonstrate this by means of narrative biographies. Rewrite to tailor to large prospective commissions, to bring out those qualifications that will have the greatest impact. Another key factor is compatibility of your staff with the client and his staff. That is hard to put in writing, but draw on past experiences where you can.
6. *Do you have solid recent working contacts with specialized consultants, contractors and other sources of expertise that may be required for the project, but which you lack in-house?* A simple statement, with names, will do.
7. *How are you prepared to manage matters when either the project or the client (or both) are in a remote location?* What ever plan you have (association with a local firm, your own Lear jet, opening a local office if the project is large enough), reassure the client on this important point.
8. *Are you capitalized to stay in business for the length of the project?*
9. *Are you affordable?*
10. *Are you available?*
11. *Are you interested?*

Some of the answers to these questions will vary from project to project. The brochure is no place for these. The letter of interest and the brochure must complement each other. The brochure deals with the general; the letter and proposal with the particular.

How to tell the client what he needs to know

Having identified the kinds of information the client needs to know, how do you convert it all into a convincing written style? As noted, the main purpose of these written marketing tools is to convince the client you thoroughly *understand his problem*, based on information known to you at the time.

When you are planning to follow-up a lead with a letter of interest, start out with great care. It is often the first formal contact between you and the client, and requires a delicate touch. Depending on the stage of his project, he will be interested in some, but not all of the 11 preceding points, and not necessarily in the order listed.

Take this example. Your market development staff has learned that a major out-of-town developer is planning a large shopping center on your city's outskirts. He, you have learned, will shortly be looking for an architect to plan and design the center. He is known as quality-conscious, but also a stickler for time and cost ceilings. Your experience is strong in all these areas, and you know and have worked with several reputable in-state and out-of-state general contractors, should he wish to go the design-build route. He has completed his market studies but has not yet chosen among three candidate sites. You have decided to write to him indicating your interest in being considered for the job.

The first step is to look into his motivations. He clearly will need an indication as to: a) your interest in being considered; b) your track record in the field; c) your ideas as to possible joint arrangements with the builder.

On the other hand, he will not expect, in this first overture, much talk as to potential fees.

Your approach therefore will be to structure the letter in such a way to project an aura of confidence; a sense of awareness of his main concerns (costs, schedule); ease of liaison and rapport; and, last but not least, an indication of strong interest in the job. The letter should be short—not over a page or two—and leave a unique flavor of you and your firm.

One way in which such a letter could be written is seen in Figure 1 (page 73). You may add support materials to a letter of interest, but they should be few at this stage (probably no more than a printed pamphlet about your firm and a few fact sheets of similar projects, if any). The point is not to anticipate and try to consider all the prospective client's questions, but rather to get him interested enough in you to invite you to submit a more detailed proposal—one geared to specific requirements.

This letter contains a mere 260 words—just enough to fill a single-spaced page—yet it gives the prospective client a clear picture as to your performance, priorities and interest.

continued on page 73

Mr. Kliment, an architect and communications consultant in New York City, will lead a four-day course on "Communications for the Design Profession," a joint program of the Harvard Graduate School of Design and the MIT School of Architecture and Planning, July 18-22, on the Harvard campus in Cambridge, Massachusetts.

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GRACE

Figure 1

Dear Mr. Pratt:

We understand you will shortly be interviewing architects to help you develop a new shopping center on the outskirts of Elm City. We are most interested in being retained for this challenging assignment.

We have had a general architectural and planning practice in Elm City since 1960. During this period, we have been responsible for design of a number of commercial projects. These have included a 400,000-sq-ft suburban commercial complex comprising two department stores, a branch bank, a large food retail outlet and several specialty stores along with appropriate parking and landscaping. We have also designed several rental office buildings; a medical office building; and a 500-car parking structure.

On most of these projects, in addition to traditional services, we prepared predesign feasibility studies and developed the program jointly with the client. In one case, we also carried out a post-construction, in-use study of one building which showed high productivity, a high level of staff and retail customer satisfaction, and operating costs that are in line with budgeted costs.

On the commercial complex, we worked as a team with Smithson Builders, Inc., a highly qualified general contractor with an excellent record of performance throughout the state. We and Smithson are prepared to collaborate again on your project.

All these projects were completed on schedule, in part thanks to our use of phased construction; all were built at or below the owner's budget and reflect true energy-conscious design. To expand our staff's programming, planning and design skills, we have long-standing working relationships with several local structural and mechanical/electrical engineering firms, the well-known graphics consulting firm of Elm City Associates, and with Four Dollars Inc., the economic consultants.

To tell you more about our firm, we attach a basic brochure and four project fact sheets.

We look forward to meeting with you to discuss our qualifications in more detail.

Sincerely,

Figure 2

"Construction management is a better way to build because: you can start construction quicker and avoid the costs of inflation, you can purchase part of your building directly from manufacturers, you can get construction expertise in the design process, and most importantly, you get a strong management team to control cost and schedule throughout the entire design and construction process."—*CM Associates, Inc.*

Note, above all, the need for directness. Avoid a long build up. Write in a "you" and a "we" oriented vein. What applies to letters of interest applies as much to writing proposals and to the various elements of your brochure system. A fine example of a "you" oriented lead-in is this first paragraph from the statement of services of a construction management firm's brochure (Figure 2).

The matter of style

An article is perhaps not the place to discuss writing style, which is better dealt with at seminars and workshops. Even so, keep in mind certain principles. Write as you would talk. Keep sentences short. Avoid architectural trade jargon. Be concrete, not abstract. Use active verbs and phrases, not passive. Create human interest by tying activities to people ("You will need to . . ." not "It will be necessary to . . ."). And above all, pare your text to a minimum. Your client's time is valuable.

The one time you may have to allow long-windedness to creep into your style is in case of certain detailed proposals, such as those addressed to Federal agencies. This kind of proposal (but not its summary sheet and letter of transmittal) may need to concern itself closely with fine meanings. For this, you may have to resort to multi-syllable words that will convey those meanings.

Let us suppose you have decided to submit a proposal to a Federal agency to develop a building system that could be used to build a network of expandable ambulatory care clinics. That means you will have to define user needs, convert needs into performance requirements and performance requirements into a performance specification on which interested manufacturers can bid. You must differentiate the various tasks and subtasks in the proposal so the agency's review panel knows exactly what you have in mind. This need has spawned a special brand of English known as "proposalese," especially in the use of verbs.

No matter how clumsy such language, there is the argument in its favor that the words have precise, definitive meanings to the review board, which usually comprises technical specialists. What is more, by using words such as "to document" or "to implement," you are in effect telling board members that you speak their language. *In other words, you are writing to influence a specific audience.*

Yet using long but very focused words does not excuse obscure style. To obtain clarity, be succinct. The message you need to convey—whether it is through a letter of interest, proposal or brochure—is seldom so technical as to pass up simple sentences and the other elements of good style. Aim always to influence, not peers and colleagues, but the client, the media or the public, as the case may be. And those groups will consider professional jargon and other dense forms of style not only puzzling but, what is worse, suspect.

Writing for marketing impact consists simply of analyzing your client and his motivations, and wording your qualifications in a way that will appeal to those intentions. Draw attention to *his* problem; do not parade your own brilliance. "It's not creative unless it sells."

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Figure it out for yourself.

Number of
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Number of gallons
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saves compared
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gallons wasted
by flush tanks
on every flush

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of gallons wasted
by unnoticed leaks

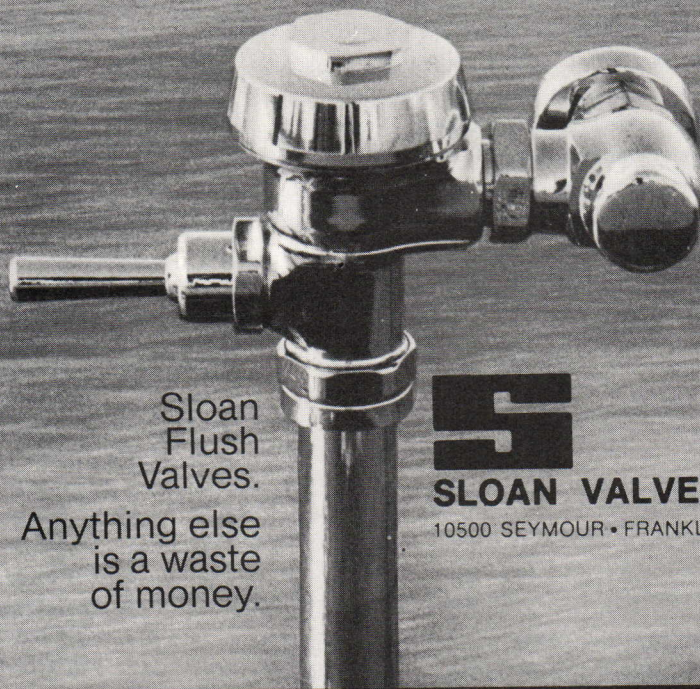
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No matter what figure you got, remember it's only for a single flush. Think of how many times all the toilets in your building are flushed every day. Every month. And since every Sloan Flush Valve uses 0.64 gallon less than a flush tank, think of how much water you could be saving, instead of wasting. What's more, a Sloan Flush

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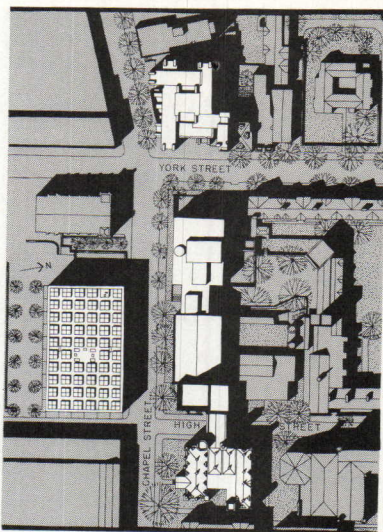
YALE CENTER FOR BRITISH ART

LOUIS I. KAHN, ARCHITECT

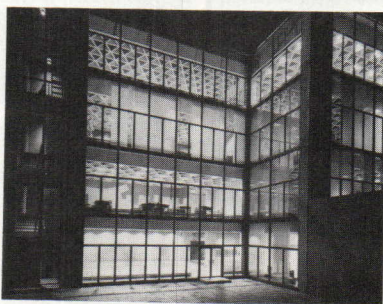
with a commentary by Vincent Scully, Jr.

Louis I. Kahn's Yale Center for British Art was an unexpected culmination of his career. Two decades earlier, Kahn had set out to free himself from the volumetric envelope of Mies van der Rohe's design. He had also done his best from that date onward to eliminate glass, or its visual expression, from his work. But in the British Art Center, effectively his last constructed building, he not only went straight back to the volume and the bay system of Mies but also brought glass forward to operate at its maximum capacity for visual magic in translucency and reflection. The British Center's special site and function surely had something to do with these surprising developments. Directly across the street from it stands the earliest of Kahn's mature buildings: the first in his great sequence of inventive designs. It is Yale's Art Gallery of 1953. There Kahn had employed the Miesian envelope and had also fought it, as something inherited and unwanted, with every resource at his command. In it he had thrown out Mies' gently scaled bay system in favor of an enormous semi-space frame in concrete, awesome in scale and permitting (how Kahn was later to regret this fact) the utmost flexibility in interior arrangement. He had also rigorously banished all glass from the major plane of his facade on Chapel Street, while at the west, on York Street, he had left glass, concrete piers, and steel mullions in an unresolved mix along a single plane. Only on Weir Court to the north were the central service core and the wide-spanned gallery spaces made visible on the exterior. Stirred, even infuriated, by all these compromises, Kahn had then gone on, like Wright before him, to break out of the classicizing box and the ubiquitous classic bay. He had thus done much, by the time of the Richards Laboratories of 1960, to bring the last phase of the International Style to a close by connecting architecture once again with its more material nineteenth-century traditions and by breaking an agonized path toward new, apparently more varied, certainly physically more convincing forms.

But now, in his last urbanistic dialogue—this time in large part with himself—he turned around and went back to Mies, as if he were saying, all right, let's do it right this time. He produced a perfect box, its long side pressed flat to the street and stretched along it. The bay system, very moderately scaled, reappeared and was released to act as the major visual determinant of all the facades. The box was thus made pure, like one of Mies' at IIT redone in



Location of the British Art Center



Kahn's earlier Yale Art Gallery, 1952

Lionel Freedman photos

Vincent Scully, Jr., is Professor of the History of Art at Yale University and author of many works of architectural criticism, including *Louis I. Kahn* (George Braziller, New York City, 1962).

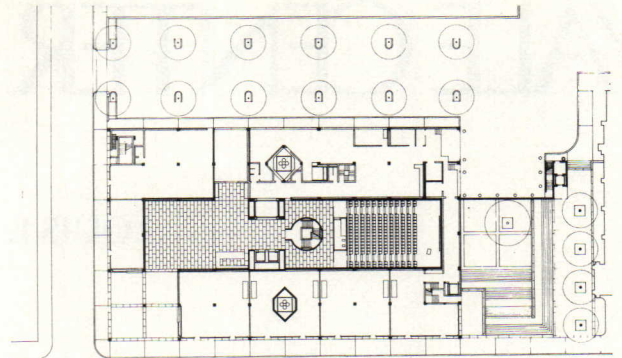
concrete. On the street the impatient masonry plane of the Art Gallery on the other side was eliminated. The concrete skeleton was exposed there as everywhere else, and it and its drip molds and its panels of gray stainless steel and (in this context) dark glass were joined with precise shadow lines to create a poetry of connection more than worthy of Mies. Gone were the hollow mountains, pierced by glassless voids, of Dacca and Ahmedabad; gone even, here on the outside, the lucidly cast concrete walls of Salk. The whole became taut and linear; the columns thinned as they rose, the steel between them very matte ("pewter," Kahn called it) looking surprisingly like his gray slate at Bryn Mawr. Most of all, the enormous panes of glass were set tightly up to the wall surface and were minimally framed without reveals, so that the light, dying on the dull steel, explodes as it slides across them, lighting up reflections of blue sky and streaming clouds which are reminiscent of the reflecting pools of classic French gardens. Big elements of tan masonry cornices from the Beaux-Arts Art Gallery across the street also swim into place; at this scale, and so magically fragmented, they recall Piranesi's Rome, which Kahn had always loved. The panes of glass vary in size and somewhat in placement, so that their reflections play that added counterpoint to the otherwise inflexible order of skeleton and plane. On the roof the metal casings of the skylights gleam like shiny mansards, and they somewhat offset the reflections on the surface glass below them with the muted flood of overhead light they admit to the top floor. But in general the building envelope is everywhere impenetrable and, except for three bays where the slab of the second floor is suppressed for a two-storied library within, it is wholly without opening or gesture, eloquently cold and remote as the studied aristocrat it is. Aristocrat indeed: because it is surely the best at what it is doing, perfect in its closed form and exquisite details, entirely self-sufficient and self-contained, scorning rhetoric, persuasion, or movement of any kind. At its west flank, along the street, a rather unconvincing set of broad stairs, large in scale and complex in landing planes, plunges one level downward to a sunken restaurant-terrace perhaps not appropriate to the building, which really can have no intermediary terracing between it and the rest of things. There are no integral connections possible between it and anything else. Like some of Kahn's early work, but now with a truly

text continued on page 102

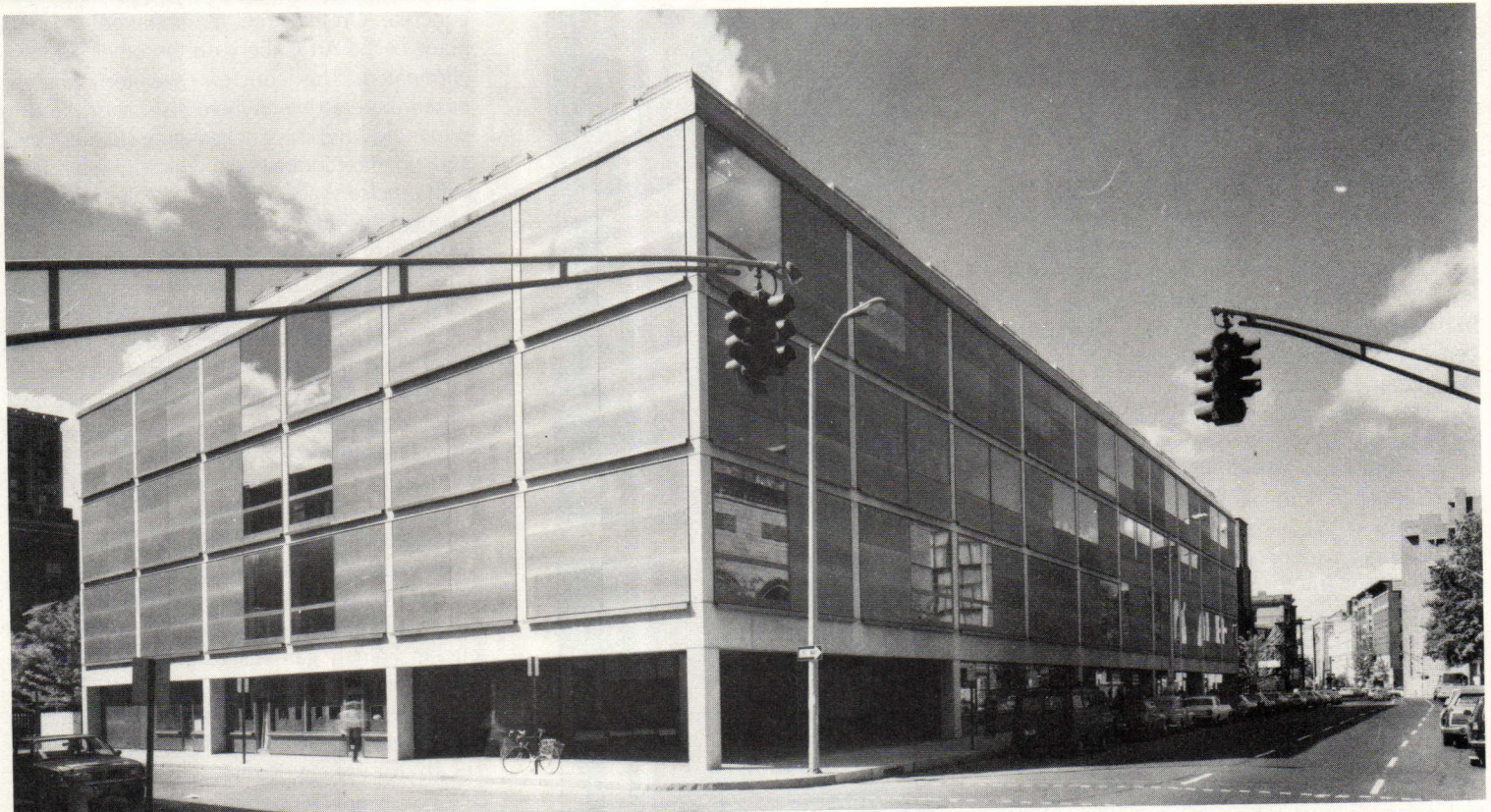


Kahn used exposed reinforced concrete for the structure of the building and, to define the non-structural parts of the wall, he used glass and pewter-finish stainless steel. The main part of the building is 200 feet by 120 feet, and it rises four stories above the street level. Kahn continues the visual line of the street by placing the building right up against the sidewalk and by relating its height to that of the buildings across the street. The rhythmic unit at street level is 40 feet—double the 20-foot spacing of the columns on the three floors above.

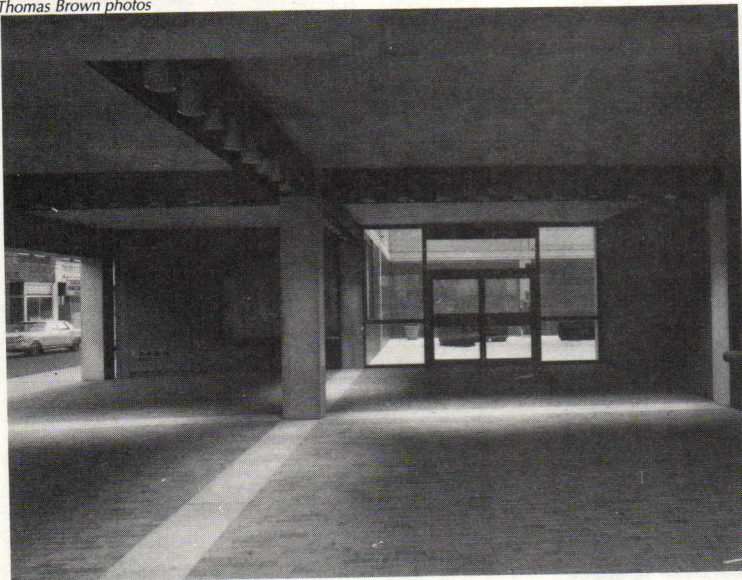
drawings © 1977 Pellecchia & Meyers, Architects



SITE AND GROUND FLOOR

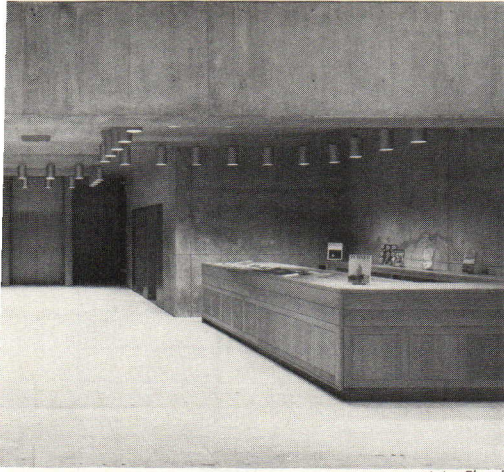


Thomas Brown photos

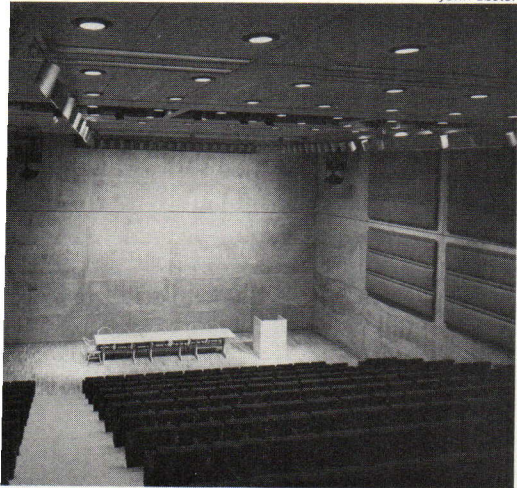


John Ebstel

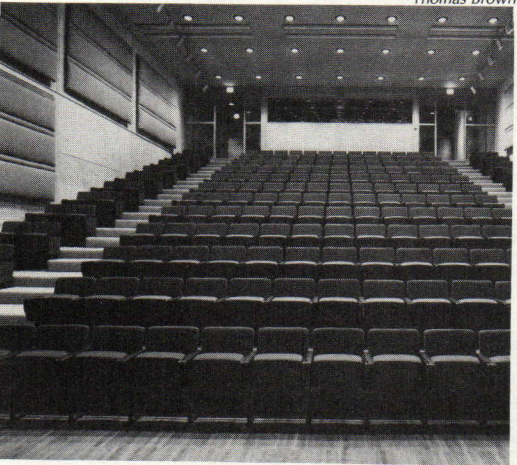
Thomas Brown



John Ebstel

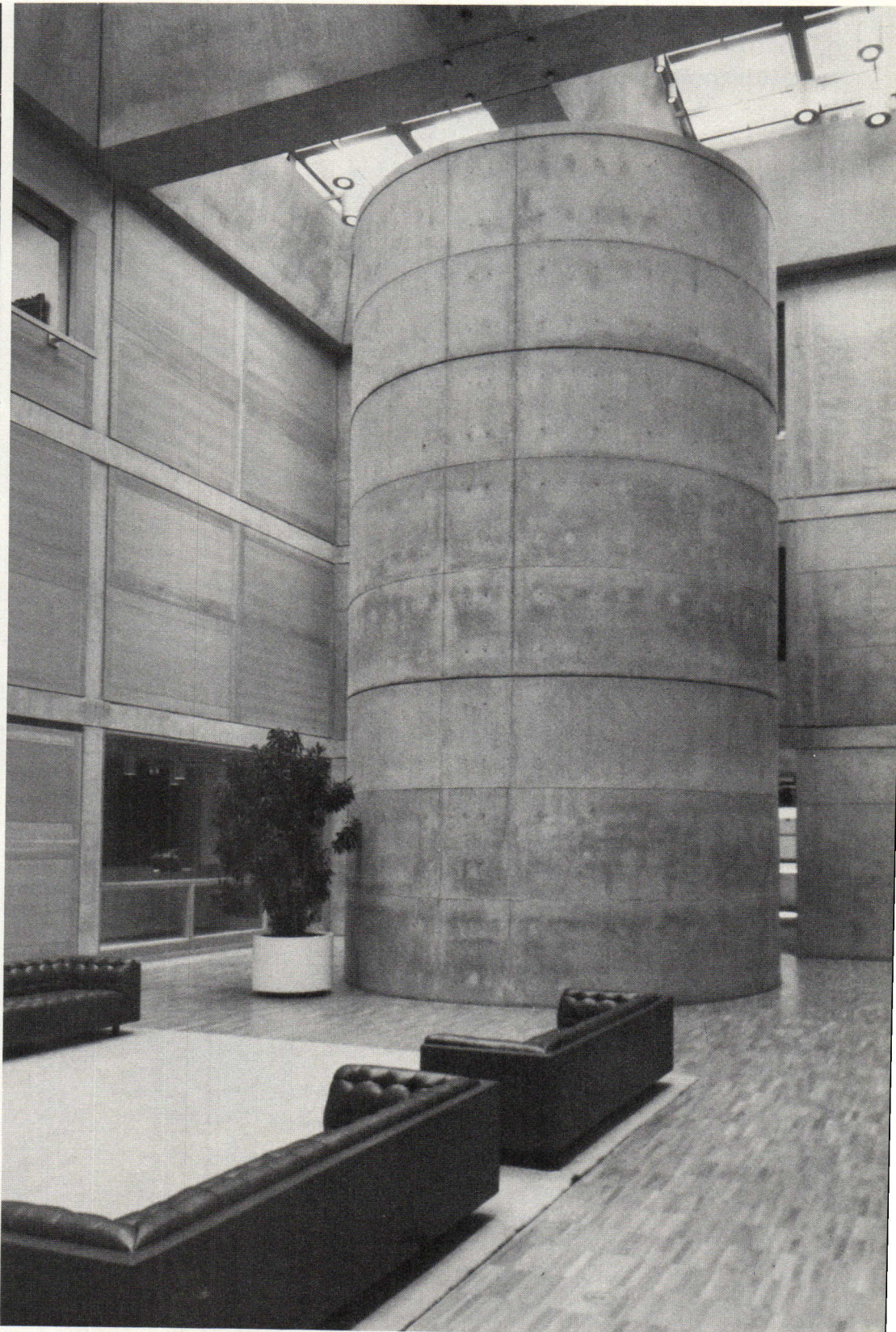
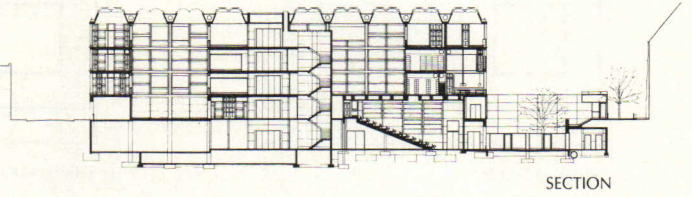


Thomas Brown

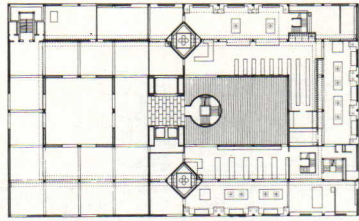


The color photograph at the bottom of the opposite page shows the entrance court in the Yale British Art Center. From this court the photograph immediately on the left is taken. This shows the main sales desk and, beyond that, the entrance to the concrete stair drum and, further still to the left and right the way into the auditorium, which is shown in the two photographs below left. Below right is a view of the stair drum, which rises through the large interior court that begins on the second floor of the British Art Center.

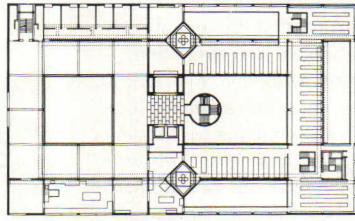
drawings © 1977 Pellecchia & Meyers, Architects



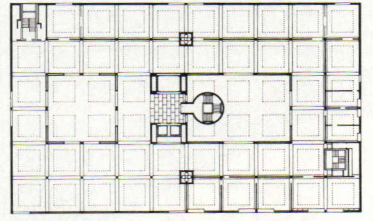
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SECOND FLOOR



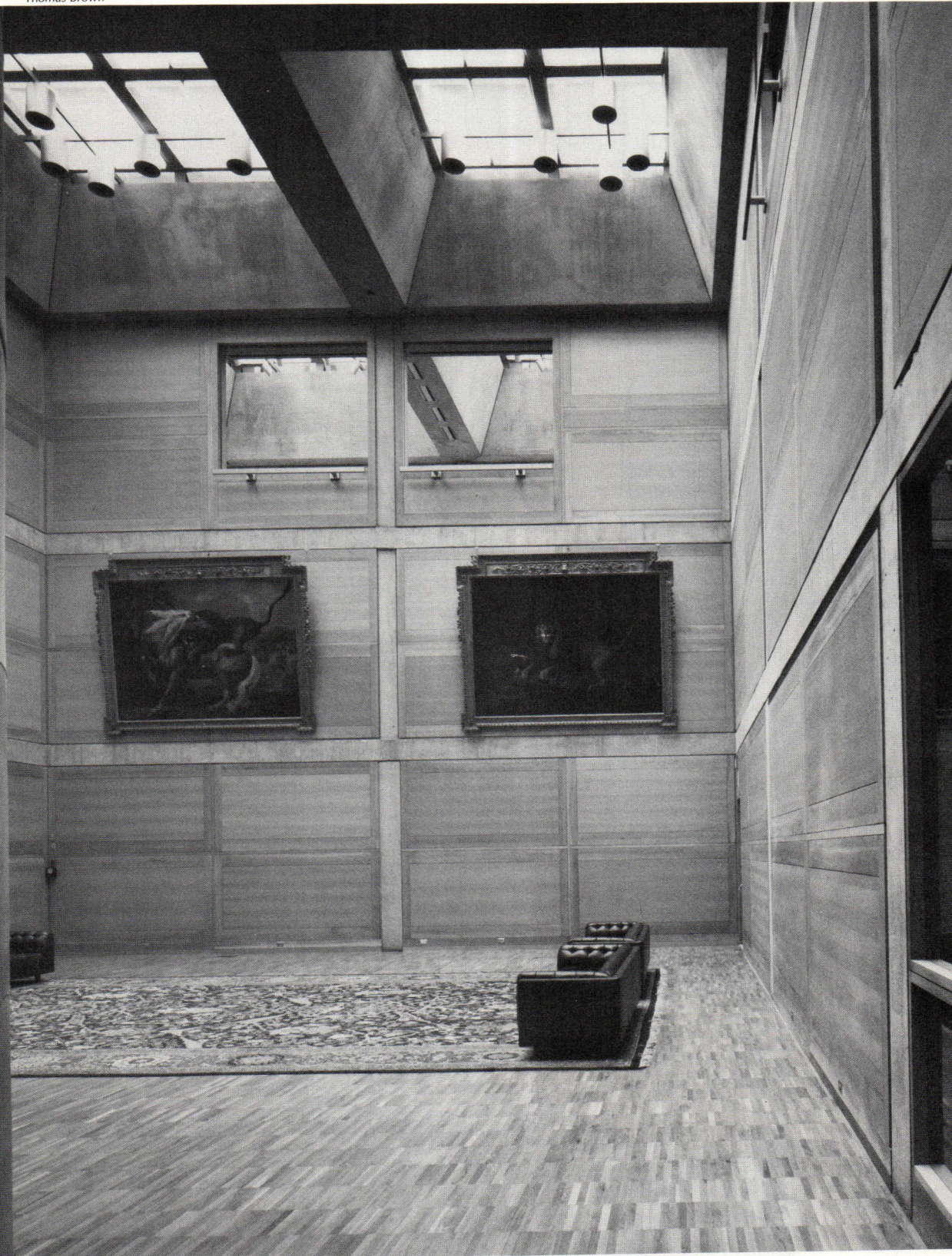
THIRD FLOOR



FOURTH FLOOR

Thomas Brown

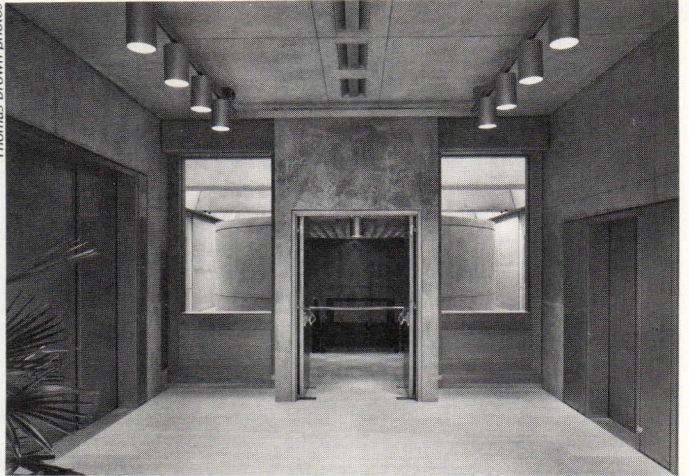
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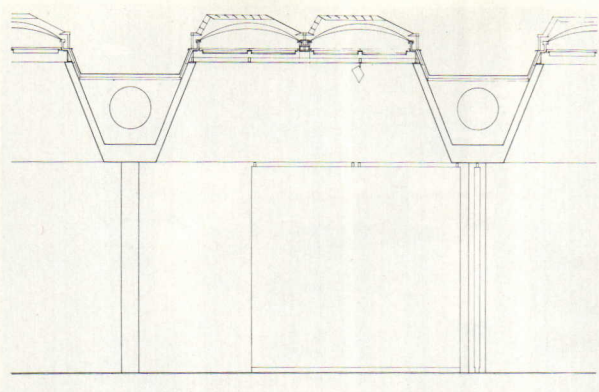


The photograph below on the opposite page shows the three-story interior court, roofed over by a skylight system supported by giant concrete V-beams. The photograph below shows one of the two library spaces which open off the interior court on the second floor and which are each two stories high. The pewter-finish stainless steel air shaft in the background is one of two which rise through the entire building, and it and the exposed satin-finish aluminum ducts are evidence of Kahn's concern for expressing a building's mechanical systems.



Thomas Brown photos





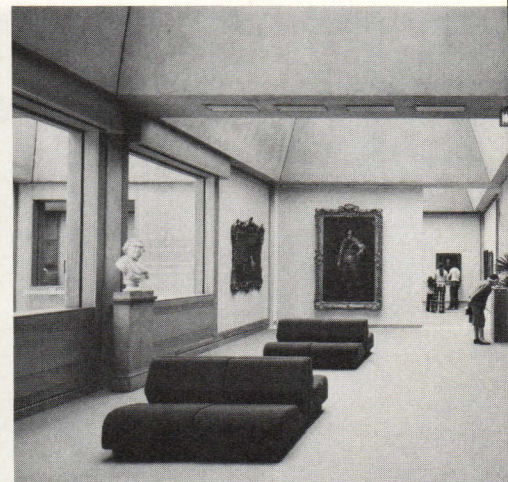
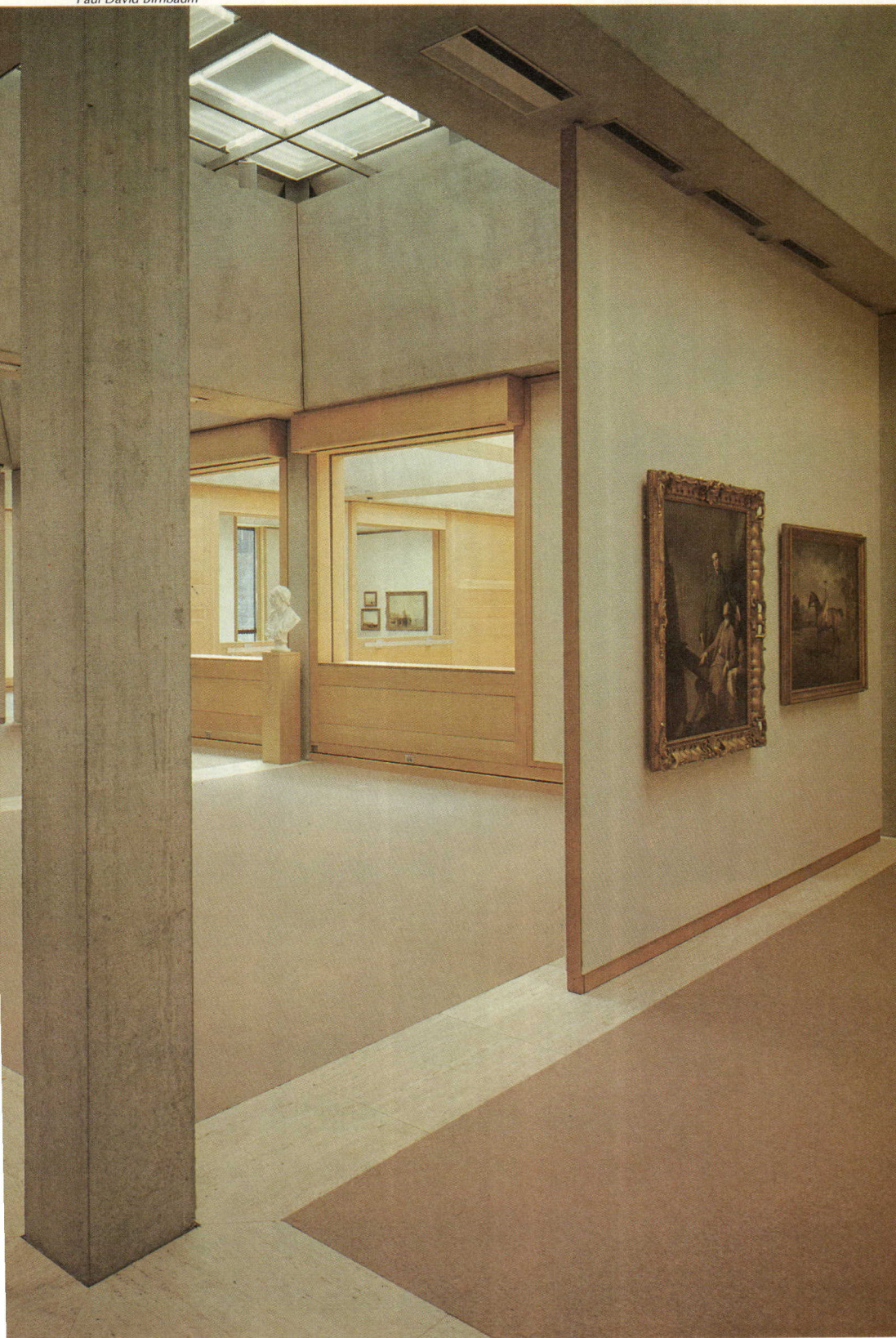
TYPICAL FOURTH FLOOR BAY

Thomas Brown



Kahn's wish was to make a series of room-like spaces for the paintings to hang in. On the fourth floor, shown here, each of the 20- by 20-foot bays is topped by concrete V-beams, which form coffers to support the skylights. These have baffles, filters, and diffusers, which modify the light without masking its changes. The interior, though muted in tone, is richly colored nonetheless. The materials are natural concrete, white oak paneling, linen wall covers, and natural wool carpets with Roman travertine borders.

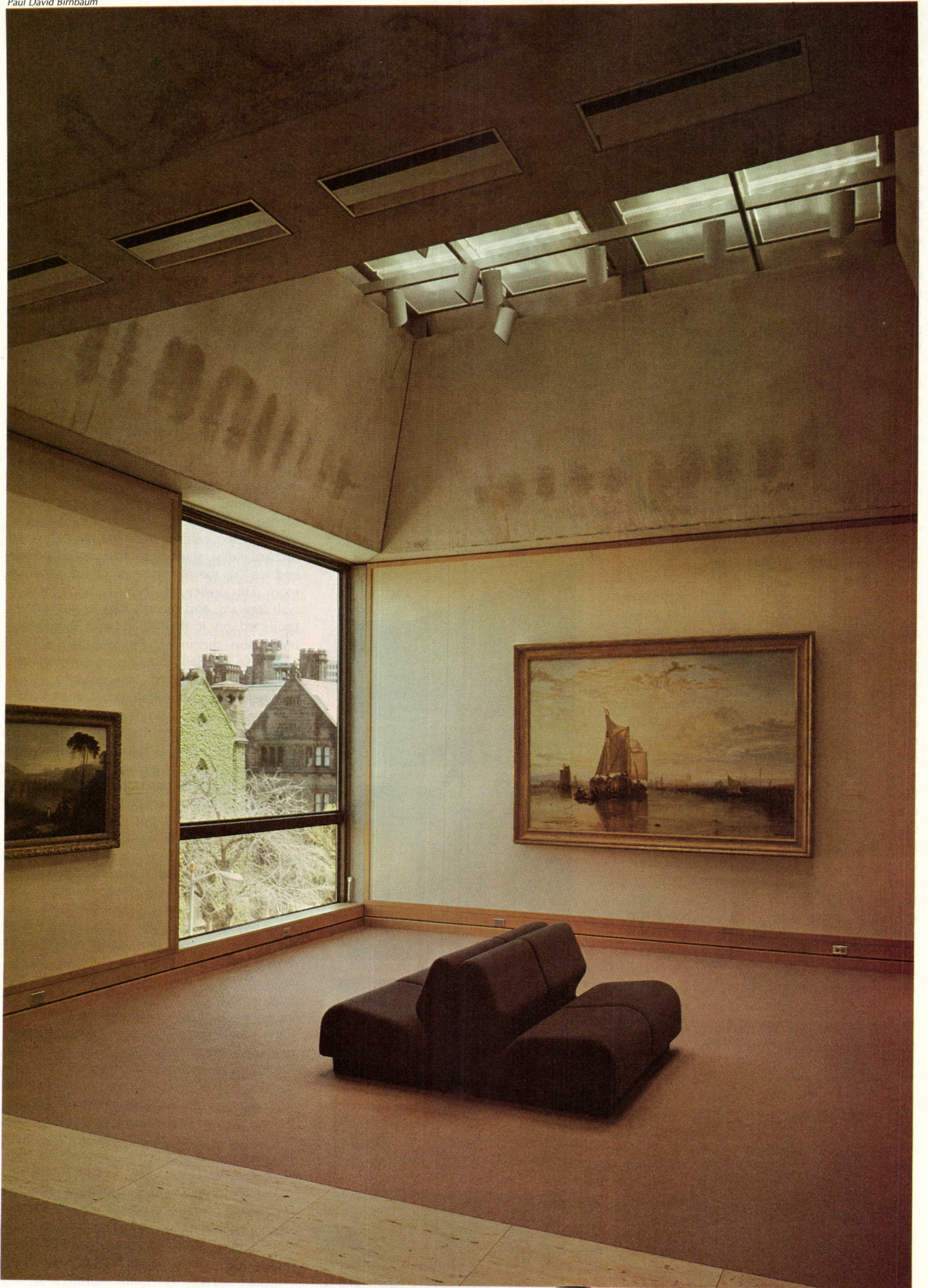
Paul David Birnbaum



John Ebstel photos



YALE CENTER FOR BRITISH ART, New Haven, Connecticut. Architect: Louis I. Kahn—completed after his death by Pellecchia and Meyers, Architects. Engineers: Pfisterer, Tor & Associates (structural); van Zelm, Heywood and Shadford (mechanical and electrical). Consultants: Harold R. Mull, Bell and Associates, Inc. (acoustical); Richard Kelly (lighting); Benjamin Baldwin (interiors); Robert Zion, consultant to Yale University, and Dan Kiley, consultant to Yale British Art Center (landscape); Pellecchia and Meyers (graphics); International Consultants, Inc. (cost); Joseph M. Chapman, Inc. (security). General contractor: George B. H. Macomber Company.



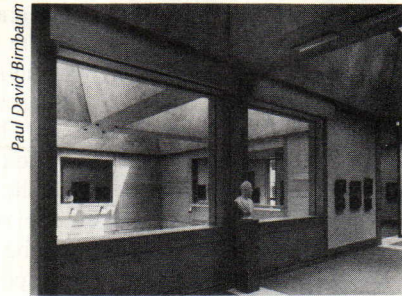
magisterial finality, it wraps itself in itself, a sarcophagus at architectural scale, a somber, pre-YALE BRITISH ART CENTER

sions of the "pogo panels" that Kahn and George Howe had designed for the Art Gallery. Now the whole system, though flexible, is still tight enough with its bays to preclude too much redesigning later—something Kahn vowed he would do after later directorships destroyed his original spatial concept in the first gallery. Here tiny but momentous decisions in design come into play. Should the panels be placed so as to touch the columns? I think yes; Kahn, the gallery people, and Pellecchia and Meyers decided no. The flat battens he projected to mask the edges of his cloth-clad panels which are set for hanging purposes between the columns of the exterior walls may also be questionable. It doesn't matter much perhaps, although everything matters some in this honed-down, rationalized articulation of elements. But the over-all space of flanking bays and open court seems one of Kahn's ultimate triumphs. The effect is of absolute peace and silence. Now it is we who stand high up and look out the windows. The views are releasing and mysterious. We look deep down to the entrance and across the lighted volume of the court to where the far gallery walls are bathed in their special overhead light deep behind the windows. We think of the lighted rooms behind rooms of seventeenth-century Dutch interiors with their pictures on the walls.

The climax, and I think there is one, occurs at the northeast corner, high above the entrance void. There Turner's great yellow shining view of the Dort packet-boat, his homage to Cuyp, is hung. Its skylight bathes it, the slanting slabs canopy it, and one of the panes of facade glass flanks it too, just about at its own majestic scale. In the room before it some late golden Turners shimmer, and a vast wild Constable glooms and glitters on the wall of the bay-space beside it. But the light off the great Dort draws us and, reciprocally, directs our attention to the enormous window beside it. Outside, across Chapel Street, the tawny mass of Addison Swartwout's Art Gallery of 1928 was never so well seen, weirdly framed as in some giant cartographer's lens. Next to it, to the right across an arching bridge, stands Peter Wight's Street Hall of 1866-69, and to the left Kahn's own Art Gallery diminishes in impeccable perspective with, beyond it, the lifting piers of Paul Rudolph's Art and Architecture Building, of 1963, culminating the sequence and closing the diagonal of the street. It is a view of all of Kahn's predecessors in the building programs for the arts at Yale, himself in middle age among them. And sitting in front of the great Turner with its fat boat becalmed (where the directorship has indeed most thoughtfully placed a seat) one thinks once again about how Kahn chose to confront that range of buildings on the street. His original proposal, when the scheme was intended to be much larger than it eventually became, was for what amounted to two concrete-framed buildings side by side, facing Chapel Street and divided only by an expansion joint between their contiguous end columns. Entrance was to have been around those central barriers; from the very beginning, access to this museum seems to have been regarded as physically difficult, to

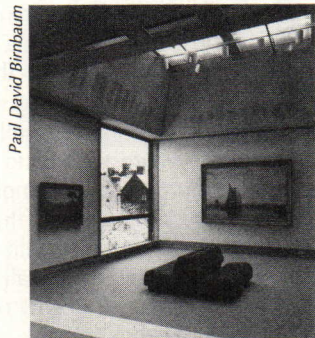


Old Allen



Paul David Birnbaum

Fourth-floor gallery, British Art Center



Paul David Birnbaum

Turner's "Dort packet-boat" in the British Art Center

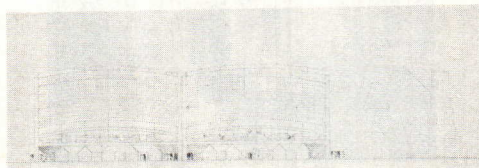


Joseph Molitor

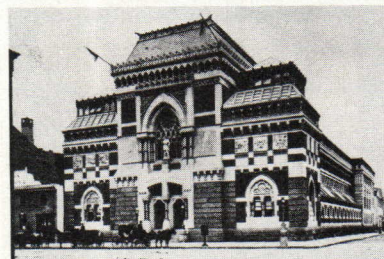
Buildings facing the British Art Center on Chapel Street



Joseph Molitor



An earlier scheme for the British Art Center by Kahn



The Philadelphia Academy of Fine Arts, by Frank Furness

be somehow impeded. (Furness had somewhat similar intentions in his Pennsylvania Academy.) Various service spaces were articulated as subsidiary massing elements, and great play was made with arched Vierendeel trusses spanning the long way along the street and lifting the building in two big spasms. This certainly constituted a gesture on Kahn's part, and a spectacular one, demonstrating a rather knock-your-eye-out approach to the problem

vate, a public museum but a monument (so labeled in the court) to a private collection and

of the street and of the massed predecessors across it. The colors were to have been warm, as of white concrete and rosy brick, and the effect seemed generally ebullient, bright, and aggressive. Slowly, and in part (but only in part) as the projected budget dwindled, Kahn disciplined all those gestures and all that color out. In a way, one cannot help but regret their loss, even though nobody regarded them with much enthusiasm when they were first unveiled in presentation drawings. In the end Kahn came to their opposite, the strictly volumetric block, the rationalized bay with its skylights, the cold gray panels of stainless steel, the flat closed surface wrapped proudly around. One feels a diminution, a dwindling, but the longer one looks at the building the more one feels its power as well. It has a solemn force that is compacted and distilled out of its integral process of construction, out of that careful assemblage of beautifully shaped materials and that clarity of joining we have had occasion to note all along. The effect is of an intelligence and a dignity which may well resist many challenges by taste and time. Again one recalls Mies, but there is even more thought and body here. Avoiding the signs, symbols, and above all the gestures of his greatest successors, ignoring the "linguistic" virtuosity of so much recent architecture and criticism, which may well have challenged, perhaps even annoyed him somewhat, Kahn builds. There is no way to avoid that impact. It convinces us of the building's permanence, makes it "classic," and does indeed reflect that "primitive classicism" to which I referred earlier. With it, like Poussin late in life, Kahn clearly hoped to defeat mortality and—always a human dream—to pass beyond shifting choices to an eternal system. Long before, in the nineteen-forties, he had prowled between the drafting tables in Weir Hall and, having as yet built almost nothing himself, had talked passionately about what he called "order." What he meant by this nobody knew, nor did he himself at the time. Since then he had turned up many kinds of order, some of them approaching the concept of The Orders themselves, like the "Brick Order" of Dacca and Ahmedabad, itself directly derived from Rome. Most of all, over the years, he had painstakingly learned how to put things together, as if his most intrinsic passion for order was really there.

In the British Art Center he finally arrived at a kind of building order which was itself not far from the old classicizing mode: static, trabeated, laconic—but far indeed from the indulgent mysticism into which his own verbal "philosophy" sometimes rambled. So to the edgy cubes of Gothic Revival Street Hall, the expansive gestures of the American Beaux-Arts Art Gallery, the tense compromises of his own Art Gallery, and the rather operatic thunders of Rudolph's A and A, Kahn presented, smothering the street, Silence: column, lintel, panel, concrete, steel, and glass. All movement, all voices, all color, are outside and around the British Center, like the reflections in its windowpanes. Avoiding speech, it is the wordless image of Kahn's deep constructor's soul, his incomparable memorial and his classic tomb.

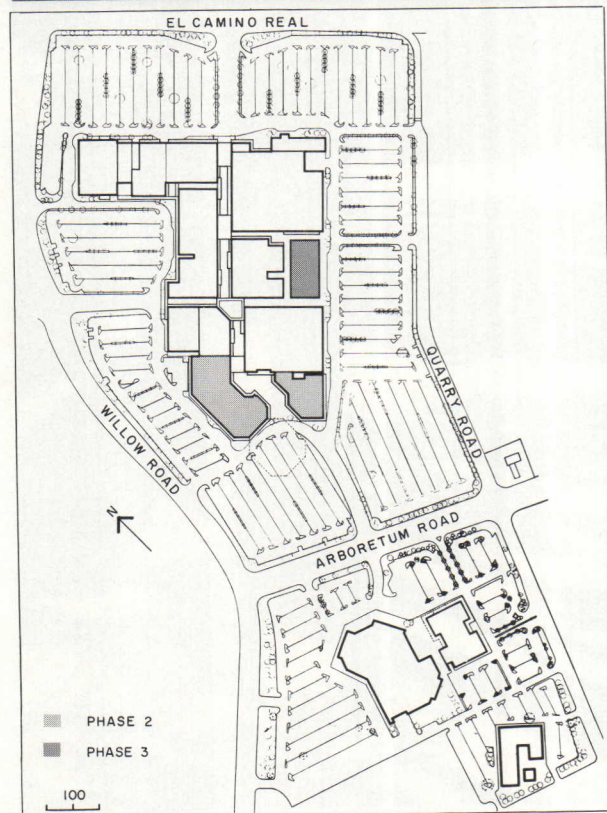
A THEATRICAL APPROACH TO SHOPPING CENTER REMODELING

Architects Bull Field Volkman Stockwell used a theatrical approach to modernize the outmoded Stanford Shopping Center in Palo Alto, California. Much of the work is like a stage-set design, creating not just a new facade but a new and festive atmosphere. Underlying such devices as new loggias, arches, outdoor display areas and graphics—all interconnected by an unusual framework system of bent pipe—is a new and ordered spatial development, enhanced by lush landscaping. It offers the retailer marketing flexibility while providing a vibrant and lively environment for the shopper where there was none before.—*J.N.*



Gary Wincott

Jeremiah O. Bragstad photos except as noted

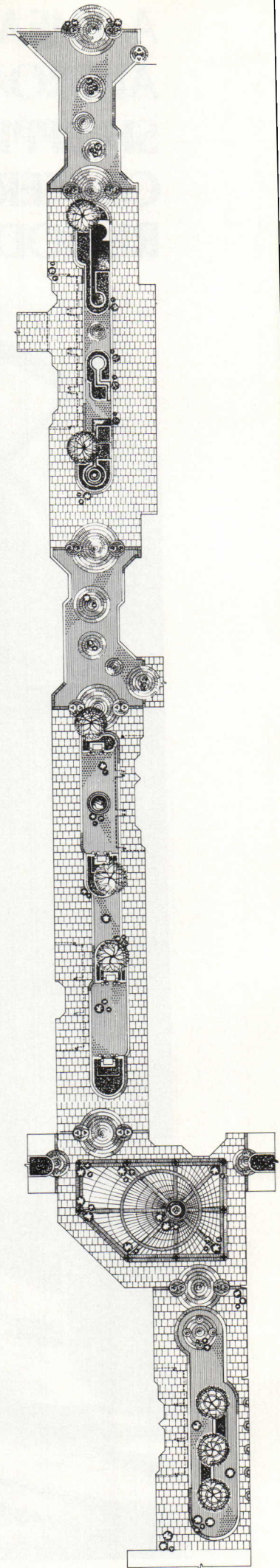


Stanford Shopping Center (owned by and located near Stanford University) was remodeled at an estimated total cost of \$10 million for three phases of remodeling and new construction. The design problem was clear: how to turn a 1950s-style shopping complex into an attractive, unified whole with renewed vitality; maintaining the existing structures and the linear mall, while creating new retail space. The architect's solution was to de-emphasize the multi-form structures, using them as a backdrop, and to center remodeling efforts on the 900-foot-long mall.

"The design concept was to create a sequence of spaces—a parade with a strong cadence and ceremony," explains John Field, architect-in-charge. It is this sequential experience highlighted by an incredible but integrated array of forms—in arches, loggias, fountains, awnings, landscaping and lighting—that have altered the entire atmosphere of the mall.

The main design device used to articulate the spaces and modulate the visual experiences is a dramatic change in scale from one area to another—producing a sequence of grand- and intimately-scaled forms and spaces. The visitor rambles in and out of covered pathways along varying widths of the mall, around rusticated modern columns, landscaping, fountains and sitting areas, through the large volume of pavilion display space, and continually through arches formed from a bent-pipe framework system. The arches separate the different sections, and echo the Romanesque arches prevalent in the architecture of Stanford University. There is a further deliberate attempt to focus the shopper's attention on display windows by limiting the over-all background color scheme to muted colors; and yet by the positioning of arches directing views into other areas, the shopper is subtly enticed to continue moving to experience what's ahead.

REMODELING OF STANFORD SHOPPING CENTER, Palo Alto, California. Architects: *Bull Field Volkman Stockwell—John Louis Field, architect-in-charge; Sherwood Stockwell, master plan architect; David L. Paoli, project architect; Daniel Chung, Gary Fong and Paul J. Meade, project director.* Engineers: *L. F. Robinson & Associates (structural), Cooper Clark & Associates (foundation), Gayner Engineers (mechanical/electrical), Brian Kangas Foulk & Associates (civil).* Consultants: *John Smith (shopping center advisor), Frank Henry and Associates (project manager for Stanford University), Charles M. Salter (acoustical), William Lam Associates Inc. (lighting), Fire Protection Engineers (fire protection), Reis & Company and Intrinsic (graphic design), Clyde Winters (graphic fabrication coordinator), Peter Adamson (cost).* Landscape architects: *Fong & Larocca Associates.* General contractor: *Rudolph & Sletten.*





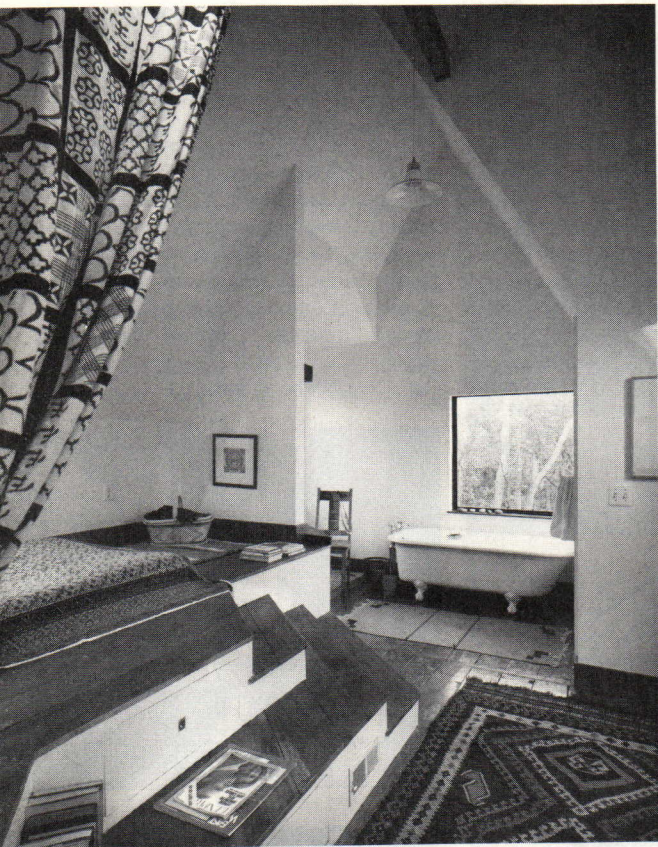
John Field

The shopping center, as designed in the 1950s (left and right), was laid out with a linear mall surrounded primarily by four large anchor stores. The redesign makes much more of the mall with semi-circular loggias, covered with bronze-colored acrylic plastic replacing corrugated aluminum walkway covers. Each loggia is lined with lights every 10 feet adding a sparkling quality at night. With the buildings painted muted tan and white colors, the only splash of color is in the banners hung from the loggias. These banners also break the long, linear view under the walkways.

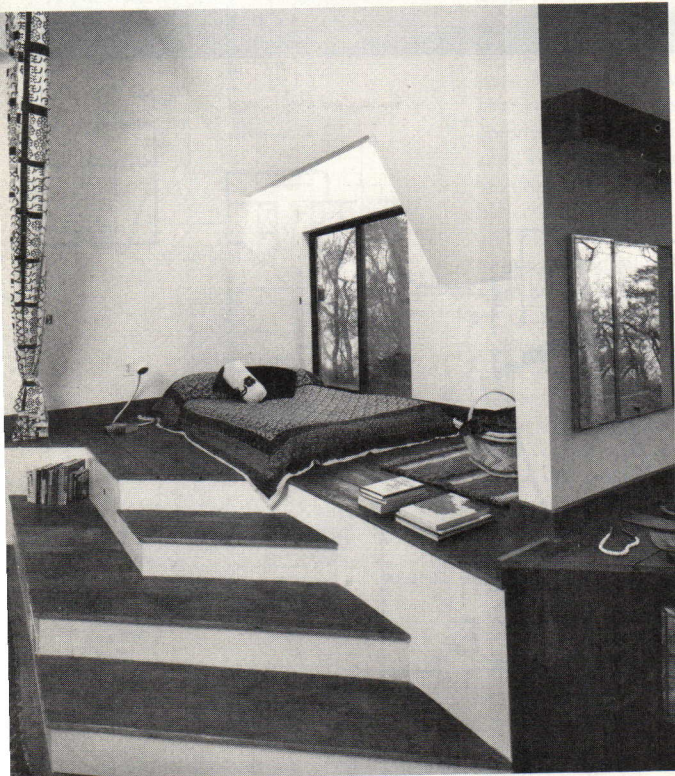


John Field

In the Swan house the rooms are arranged around a central chimney for war



Simone's bed is a stepped platform with cedar-lined drawers below. She likes the idea of sleeping, bathing and dressing in the same room so her bedroom accommodates an old claw-footed bathtub next to a window with a view of Long Island Sound. The narrow, high interior of the house is divided by a double fireplace, which separates the living room (opposite page) from the kitchen and dining areas (right top and bottom). The wood from an old barn is used to great advantage as collar ties and trusses in the two-story living room, and on the lower dining and kitchen ceiling.





Moore's large houses are an aggregation of self-contained ample rooms like



The house has a central conservatory—which is also the main circulation element—(below and opposite page) and which changes direction several times as it meanders through what is unmistakably a Moore house. All the elements are there: the cheerful collage of building materials—tile floors, stone walls, other walls of wood siding with trim—and the intriguing complications—steps, orange trees and other plants, skylights, a bridge and a fountain, two round wooden columns with curious brackets and the occasional interior panel with a window. In contrast, the rooms this hall interconnects are surprisingly formal and elegant.





The bedrooms of the large house are shaped by their roofs



The guest bedroom (left) has a carpet of painted flowers. The bedroom of one of the sons is at the highest point of the house where the old-fashioned double-hung windows are stepped upward toward a cluster of chimneys and cupolas. The master bedroom (below right) is under a roof supported by a diagonal truss whose horizontal member becomes a dragon as its tensile stresses are continued by cable.





George Cserna photos except where noted

Some reflections on the John Hancock Tower

It may turn out that what we know about this notoriously vulnerable Boston building is not half as important as what we do not know. But it is hard to figure out which is which. If a design, and a brilliant one at that, was ever bedeviled, this was it. What combative spirits possessed the John Hancock Tower? What was it like for a conscientious architectural team, headed by Harry N. Cobb of I. M. Pei & Partners, to be cast in the role of exorcist? And how is it that the tower can stand there now, cozying up to historic Copley Square, as if nothing had happened—one of the best-looking, best-behaved buildings ever to set foot in a city? A lot of life, fortune, and sacred honor is tied up in the truth, whatever *that* turns out to be.

Thirty tandem elevators are divided among five banks. Odd-numbered floors are served from the lobby-level; even-numbered ones, from the mezzanine, reached by escalator. The former are color-coded yellow; the latter, red. Bank one serves the first 16 floors; two, floors 15-26; three, floors 25-36; four, floors 35-48; and five, floors 47-60. People cross from one bank to another on the overlapping levels.



In its material finishes, sequencing of scale, and circulation of public space, the lobby and mezzanine levels of the Hancock, starting from the high entrance space and trailing back behind the elevator banks, are nothing short of brilliant. The same black matte-finish aluminum that appears outside is brought into these spaces, and big sheets of it pervade the core, setting off the colorful graphics, and the lobby columns and mezzanine railings that are clad in stainless steel. The two-level street-like part of this area, to the rear of the elevator banks (above and top right) is a lively, tactile counterpoint to the Karnak-quality heights of the main lobby.



initially given Pei by the client's building committee led to a circular, poured-in-place concrete design with below-grade parking for 800 cars. But this scheme, which would have been even taller than the present building, was too expensive, even for a corporate totem, and there were instincts afoot in the company to try to convey as much clout and class as possible, but in a cost-conscious fashion.

In the spring of 1967, to consult on real estate planning and building costs, the company retained Max Philippon, of New York, to conduct a thorough review of operations as they related to space needs and to translate the facts into a statement of requirements. Evaluating construction methods and materials, considering assorted modules for optimum economy and efficiency, Philippon was also to prepare and award the architectural contract and to review and approve the architect's consultants, this in addition to coordinating their over-all performance, preparing and awarding construction contracts, reviewing subcontractors and suppliers of the general contractor, and establishing cost and time schedules.

Together with Mr. Philippon, the building committee came back to the Pei firm with a whole new raft of requirements, and these included a pretty tight set of specifications, not to mention a pretty tight budget. The new building, its conception and execution policed by Philippon, was going to be, come hell or high water, an investment-grade structure, with the attendant squeezing of standards and expenses, and every penny was going to be accounted for. There would be *one* building, not, as first proposed, both a big circular one and, on the site of the Clarendon building, a second new building. Structural steel framing, not concrete, was to be the grammar of construction. And the tower, so the requirements went, would have about two million square feet, between 55 and 60 stories, enough to contain the maximum amount of space allowable under zoning, apparently assuming that getting a variance would be no problem (which it turned out to be), the floors of the base building would have about 45,000 square feet, and those of the tower about 30,000 square feet. The tower's shape was not to be circular, and the parking was to be separate from it.

The company, for a number of well-founded reasons, was in a great hurry. For one thing, it really was running out of room for its actual, not to mention projected, personnel complement. Boston officials of the time also recall that the Hancock company, wanting to time its formal announcement of the project by December of 1967, would also be giving outgoing Mayor John Collins a great send-off. In fact, having the imprimatur of Collins on the project was considered a definite plus by the company, which would soon learn, to its chagrin, that Collins' successor, Kevin White, who is still mayor, was not in such a rush, mainly because the vocal, impassioned architectural fraternity of Boston had officially made its opposition to a *carte blanche* zoning variance known. So had a number of others, including the urban design staff, the Advisory Design Committee, the development administrator of the Boston Redevelopment Authority, and

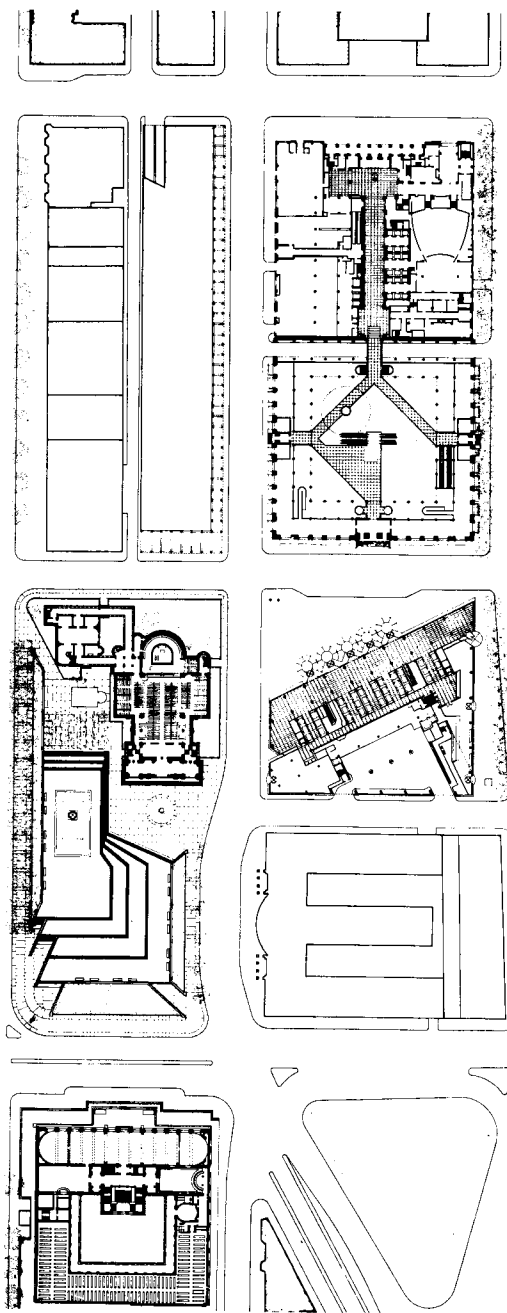
former BRA chief Edward Logue. Just about the time that the Hancock company was announcing its plans, the application for a zoning variance was turned down cold.

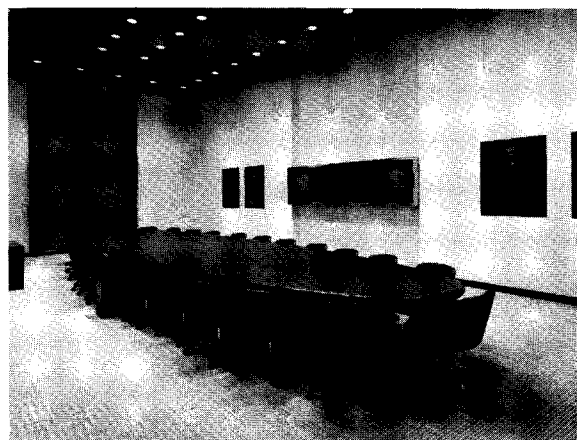
An appeal was immediately registered. The variance requested was for an F.A.R. of 25 instead of routinely permitted 8, for dispensing with required setbacks, and for allowing nine off-street loading bays, instead of 15.

The urban design staff of the BRA had voiced serious objections to several key assumptions of the plan; namely, that the proposed creation of an open plaza, in front of the east facade of the rhomboidal tower, sloshing across Clarendon where the existing building was to be torn down, would detract from the expected cohesion of a refurbished Copley Square for which a national competition was being held. The Hancock company had furthermore said that it would only be occupying three-fifths of the projected building for the first few years, leasing the rest, and so the agency understandably questioned whether such a tall building, requiring such a variance, was really necessary—bludgeoning, so many professionals believed, the qualities of the area. Wouldn't a two-stage program be more sensitive and suitable, thus minimizing the height of the first-stage tower? The Design Advisory Committee of the BRA adamantly agreed with the agency's staff on these points and, therefore, Kevin White was cautiously disposed toward trying to find a compromise. But the BRA board, within two weeks of the formal announcement of the project, overrode its own staff and advisors, endorsing the variance, followed in late December by endorsement of the Board of Appeals.

In a rush, the Boston Society of Architects appointed a prize committee, chaired by Huson Jackson of Sert Jackson & Associates, to review the proposal; and White came out publicly for the Board of Appeals to wait to hear what the architects had to say. The Society, to put it mildly, found the design wanting—and attempted to ameliorate the situation by saying that the architect was being forced to work under certain imposed physical conditions. Accordingly, the Appeals Board reserved judgment on the variance, even as prominent spokesmen, including the then-board chairman, Samuel Tomasello, were plainly agitated at what they construed to be an affront to economic progress and Back Bay revitalization. In an interestingly prophetic bit of legalese, he chanted that if Hancock were to look at its *entire* 233,430 square feet of holdings in the area, or 5.5 acres, instead of applying for a variance for just the 73,000-square-foot tower site, it might be feasible to consider spreading the zoning allowance over the *wider* tract, thus coming down pretty close, if not to, the routine allocation of 8 for the tower site itself. That spreading around of F.A.R. was exactly what later happened.

Certainly, it became the key strategy of the company and its architects in putting across the notion that in applying for a variance for the tower site, per se, it had to be understood that this particular project was part of a larger development package that the company intended to carry out. Harry Cobb, who had





Top management offices in the Hancock are predictably plush, with the most dramatic ones occurring at the corners or where the continuous vertical bevels, which are seen on the north and south facades from the outside, notch into the floor plan. Average office floors are covered with pieces of carpet, laid down like tile, that are a sort of tired-gray-mouse color and open-office landscaping, also coordinated by the client, creates a cacophonous if colorful composition of curvy wall partitions that denote work spaces. The architect's evenhanded, impeccable approach to providing a

package for all this can be seen in the detailing of the rail-like convectors, wrapping around the perimeter of every floor, their divisions aligned with the curtain-wall mullions. The dignity of the 59th-floor boardroom (left) discloses a Pentagon-style complement of corporate communication equipment. A democracy of good design is distributed between the executive dining spaces (below) and the supermarket-style 1,000-seat employee cafeteria, the walls of which are embellished with hand-lacquered fiberglass apples by artist Donn Moulton (opposite below).



spicuous neighbor.

Glass, to try to clarify the most notorious aspect of the building's history, has variant properties, unlike steel. There is no guarantee that every piece of glass in a building is going to behave like every other piece. Most building codes, including Boston's, recognize this. The Boston code says that glass breakage should not exceed eight lites out of a thousand, a ratio agreed on by the manufacturers as a whole.

Another thing about glass is that it can not take damage. Scratching or pitting, even if it may be almost undiscernible to the eye, can dangerously diminish its strength.

To clear up one of the major myths, then, it was mainly *damage* to many, many lites of glass, occasioned by the actual *breakage* of comparatively few lites, that accounted for the grotesque Gothic novel of a building that people began peering at, not without foreboding, in early 1973. There had been sporadic breakage as early as 1971, some of it explained, some of it not. But in January of 1973, a storm, with gusts up to 75 miles per hour, hit Boston, the building, and broke 16 lites, damaging 49 more fatally. And the fragments from all of these lites, raining down the west facade of Hancock, damaged hundreds more.

At once, extensive laboratory and on-site testing began. In June of 1973, Cobb notified the Boston building commissioner that the one-inch-thick insulating glass on the lower part of the building was defective, a charge adamantly denied by the manufacturer. By this time, almost 2,400 lites had been removed, replaced with plywood, 2,080 of them being the one-inch stuff. Then in late September, Cobb sent off another letter to the commissioner's office, which had meantime ordered tests on its own, stating that the glass in the upper stories was also defective, a charge even more adamantly denied by the manufacturer.

One can surmise, and not inaccurately, that the showdown meetings taking place inside the Hancock company must really have been something. It is not hard to conjure up a scenario in which all parties, their lawyers darting back and forth from room to room, are seen scratching their heads and fidgeting with their ties, perhaps as a substitute for slamming the other guy against the wall. Was the glass inherently defective as Cobb had written the commissioner, or wasn't it? Was the glass inherently undefective but simply not up to tolerating the thermal or mechanical stresses experienced by the building in normal use, or wasn't it? What were Hancock officials and its lawyers saying to the architect and the manufacturer and the contractor and the subcontractors by September 1973? Did Hancock itself ever conclude, and state, that the glass was defective, or didn't it? The thing we know that they said, for sure, is "Shut up." And though the company did not formally sue everyone until two years later, muzzles were evenly distributed. The company's own consultants, Hansen, Holley & Biggs, affiliated with M.I.T., who had begun rigging the troubled building like a cardiac case right after the January 1973 storm, are also muzzled, dammit.

The first Hansen report came in May, 1973. There is no way of telling what it said about the cause of the glass breakage, but we

do know that Hansen proceeded with a second study, and this was completed in the summer of 1974. Is it all that wild to surmise that this cardiac case, having been turned inside and out from January to May of 1973, had so much up its sleeve of an unforeseen nature as to have necessitated even more tests to explain findings that no one, in their wildest imagination, would have thought possible?

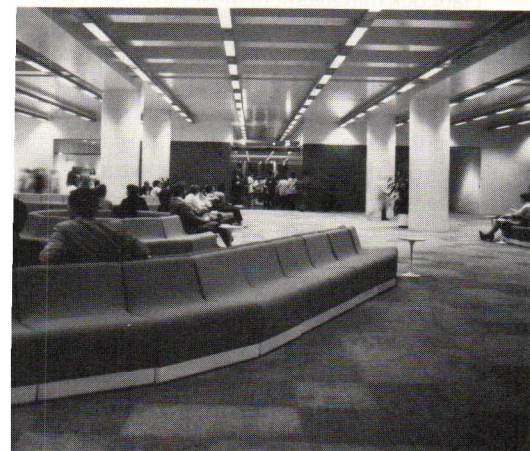
As of the spring of 1973, there was a glass problem. We know that. Did the investigation of the glass problem, and its possible relationship to "something else," result in findings that indicated that this "something else" might be even more of a problem, presently or potentially, than the glass, *per se*?

Hancock may have gone into court, as it did, to recover expenses and losses occasioned by replacing the glass and by delays in occupying the building—those are heavy enough. But careful consideration of all of these moves, and one guess *is* as good as another, suggests the heaviest worry, unrelated to the glass itself, was being confided by the building's anatomy, not its apparel.

It might even be suggested that who wins or loses the battle in court, dealing with the glass, is a frivolous issue. What, then, is the issue? The original glass was rated for pressures like 35 to 40 pounds per square foot (the new lites are rated for 220). But it is a reported fact that the many lites of glass broke at pressures well below that rating. Can it be said—as it has, *ad nauseum*—that this tall, slender structure, twisting in Boston's capricious and often vicious wind gusts, lost its glass just because of the wind, even recognizing that a shape such as this tends to move more than, say, the usual rectangular volume? Or did studies of the wind-loading conditions affecting the structure reveal behavioral properties of both the wind and the structure—properties which, put together and acting on each other in synergistic ways, created yet another condition?

We know that in the spring of 1975, with the reglazing of the building 85 per cent complete, and with interior finishings proceeding well, the Hancock, on the recommendation of a consulting team brought aboard by the Pei firm, Dr. Bruno Thurlimann of the Swiss Federal Institute of Technology and Dr. A. G. Davenport, Director of the Boundary Layer Wind Tunnel, University of Western Ontario, decided to install stiffening members within the core of the new building.

This was done, the company reported, to ensure "satisfactory performance over the long term," taking into account those extreme, rare wind conditions which could possibly occur over the next 100 years—a reference to what experts call the 100-year storm. The frightening thing about a 100-year storm, of course, is that a particular building, like the Hancock, has absolutely no affect on when it can happen. A 100-year storm, with both area-wide winds and surface turbulence building up and imploding on each other with a power so terrific that it is statistically rare, can happen 100 years from now, or 100 days from now. And its effect on a structure, any structure, can be catastrophic. Question. Would it take three major studies, and from January of 1973 to March of 1975, to determine what caused the



be located in two of the linkage portions of the buildings.



TYPICAL CONDITION

HEWLETT-PACKARD MICROELECTRONICS PLANT

SEARS, ROEBUCK DISTRIBUTION CENTER

Competitively priced, this handsome warehouse belies the fact that compared to the contents, the building is virtually expendable

One of the hard facts that architects of warehouses must face is that the contents of the building are often—in the owner's mind—more important than the building itself. Such is the case of the Sears National Catalog Fashion Distribution Center, designed by Skidmore, Owings & Merrill, in suburban Chicago.

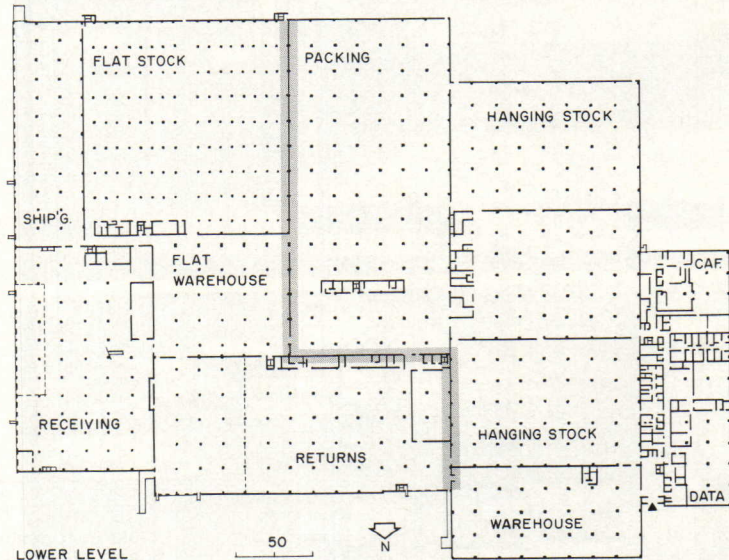
Compared to the value of the stored apparel this warehouse is inexpensive. Therefore one of the essential design goals here was to minimize the loss of contents, particularly by fire. The Sears insurance carrier insures against only the loss of one half the building's contents. Thus, the direct design response to this information—referred to as Maximum Foreseeable Loss (MFL)—is a building that is actually two, separated by a Z-shaped double fire wall (MFL wall) running north and south (plan). Each wall is made of 8-inch blocks. Along this line, the building is engineered so that in the event of uncontrollable fire in one half of the building, the structure of the burning half could collapse without pulling down the non-burning half. Where the MFL wall is penetrated by conveyors, the opening is surrounded by a concrete box on either side of the wall, each fitted with a fire door. Should one fire door fail to close, the other exists as a back-up. The entire building is sprinklered, and individual areas within each half of the building are protected by an 8-inch fire wall.

All elements of the 935,000-square-foot building and 89-acre site are arranged to serve the highly automated processing of merchandise, and anticipated future expansion. (Footings exist to the west of the present building, in preparation for doubling its size.) The various areas identified in the plan were programmed almost as individual buildings, for maxi-

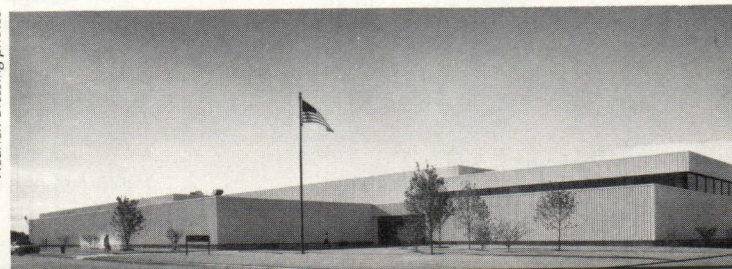
imum efficiency and economy, with dimensions and structural bay systems consistent with the storage apparatus used. Some merchandise is stored flat, while other apparel is kept in high bay hanging storage (lower photo, far right). The entire operation relies on a computerized conveyer system designed by the consulting firm of Lester B. Knight. Goods are received in one half of the loading dock area and assigned storage by computer. When an order arrives from one of the Sears retail stores, the computer retrieves the items, and sends them by conveyor to packing. Packed goods again go by conveyor to chutes that lead to the proper loading docks (photos, right).

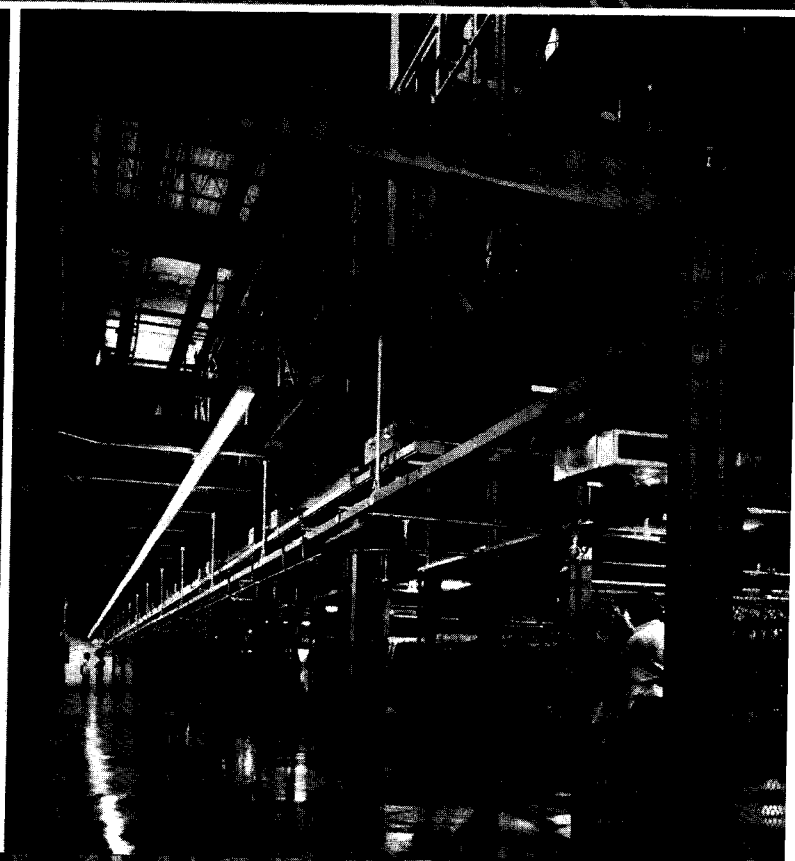
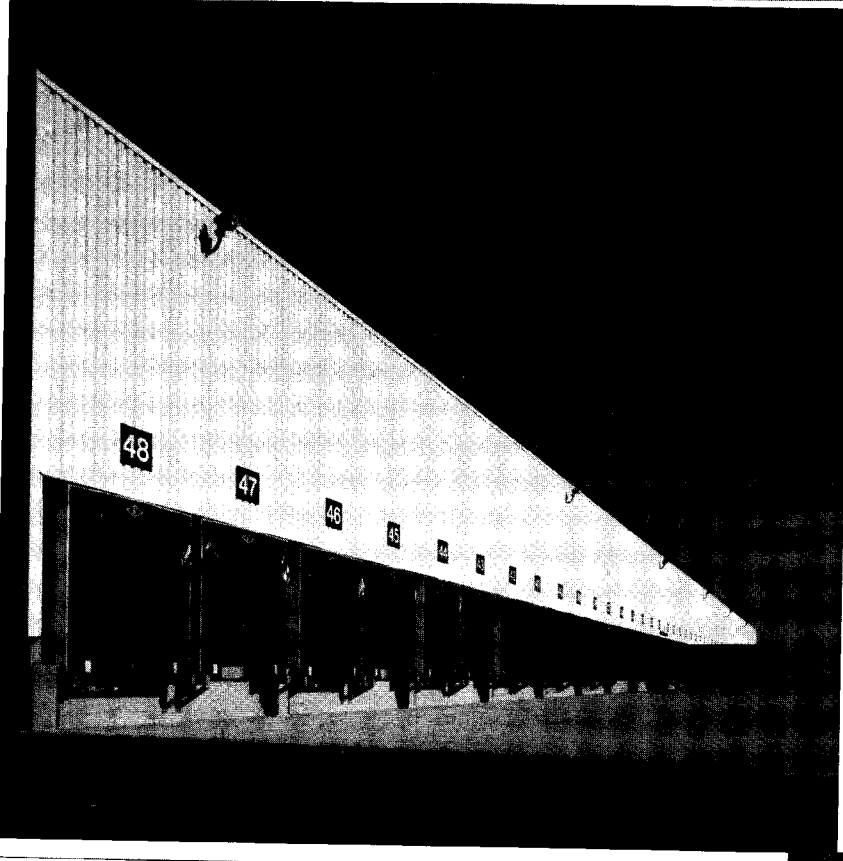
Phase I of this project was completed on a fast-track schedule in early 1976 at a cost of \$20,000,000, including the sitework: landscaping, parking and trucking areas, a fire protection reservoir and storm-water retention pond.

SEARS, ROEBUCK AND COMPANY NATIONAL CATALOG FASHION DISTRIBUTION CENTER, Elk Grove, Illinois. Owner: Sears, Roebuck and Company. Architects: Skidmore, Owings & Merrill—partner-in-charge of design: Robert Diamant; administrative partner and project manager: Richard Lenke; senior designer: Robert Siegle; technical coordinator: Joseph Vanecko; structural engineer: Lauren Carpenter. Engineers: Jaro, Baum & Boles (mechanical/electrical); Schirmer Engineering Corporation (fire protection). Construction managers: Morse/Diesel, Inc.



Hedrich-Blessing photos





STERLING HEIGHTS PUBLIC SERVICE FACILITY

The basic beauty of straightforward and economical construction is matched with operating efficiencies in this storage and repair building

The Sterling Heights (Michigan) Public Service Facility consolidates the community's street, equipment, water, and sewer maintenance divisions in one 70,000-square-foot structure located in a heavily industrialized area. It was conceived as a large warm and ventilated box into which are inserted numerous smaller boxes for work and storage functions—a universal space reservoir to be tapped as needed for discrete tasks.

The building is, as the architects say, the least expensive enclosure of the most possible space—using a simple long span repetitive steel bay structure with minimal modifications, and a skin with few manipulations in its surface (a minimum of doors or special conditions). It is not necessary to belabor the basic beauty of this straightforward and economical approach.

Completed in 1976 at a cost of \$23 per square foot, the building idea evolved from a concentric schematic of three kinds of space requirements: personnel (locker rooms, lunch/meeting room, time clock); garage (basically a large, enclosed parking lot); and work and storage (tools and parts, workrooms, offices). Placed at the center of the scheme, personnel spaces are equally distanced from all work areas, and vehicles. The garage—the middle space—permits full circulation. A driver going in any direction has an exit. Work and storage areas on the outside ring permit the overhead door access required by some areas.

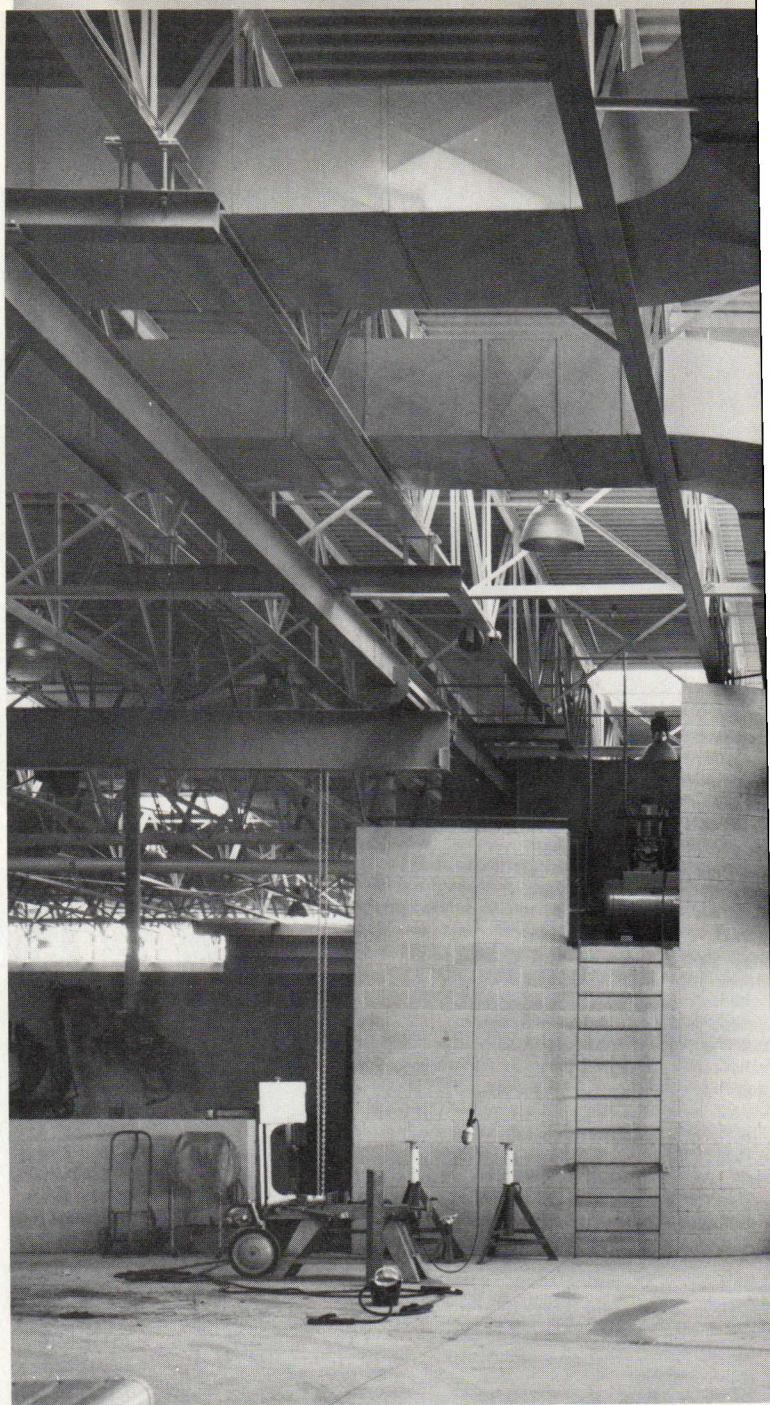
In order to minimize outdoor paving and overhead doors, most of the work areas are accessed from inside the building. They are defined and positioned in several ways, depending on current need. Some, requiring mechanical systems, are permanently set, while others are ad hoc. For instance, lengths of culvert or snow plows are "parked" in areas defined by painted lines on the floor, remind-

ing us that the building is in essence a big parking lot and spaces can be occupied by either vehicles or work activities, depending on need.

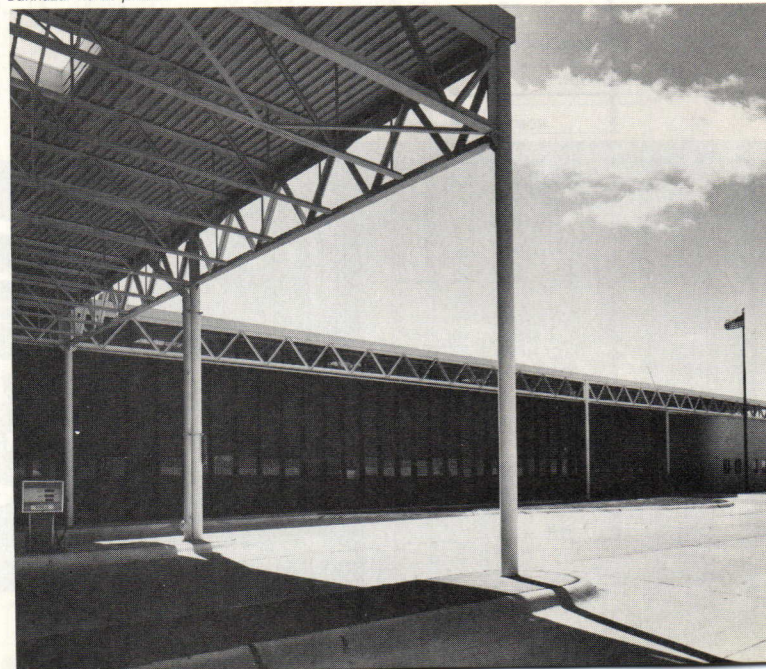
Notably, the building is constructed entirely of "off-the-shelf" materials. Its economies of construction are matched by operating efficiency as well. The client reports an anticipated two-year payback, for instance, on the 90 six-foot square skylights, which deliver sufficient natural light to the interior to eliminate the need for supplementary metal halide ceiling lighting on all but the darkest or shortest days of the year. (Note that the interior photos were taken in natural light.) The skylights, placed on 30-foot centers, are augmented with a 4-foot continuous clerestory window strip at the truss level.

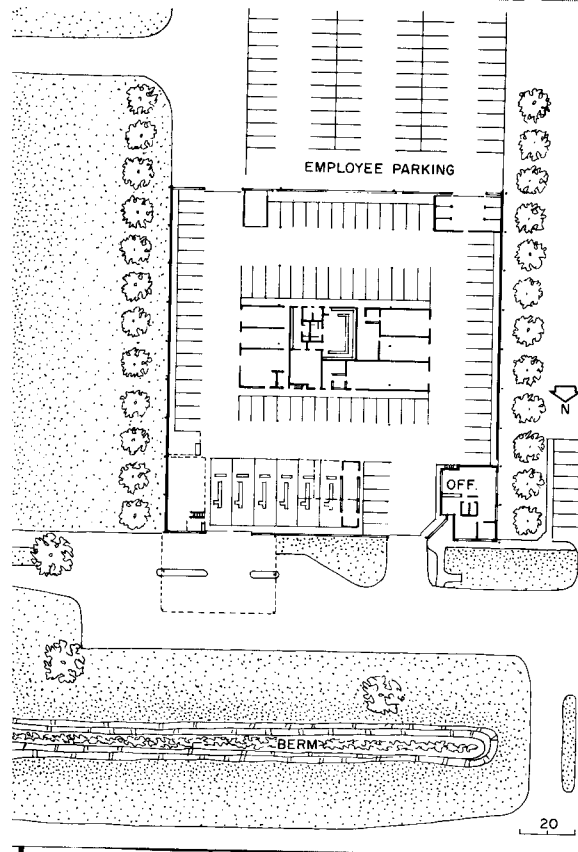
A conventional steel frame of columns, long-span joists, and flat trusses—all with their lower chords at the same elevation for unobstructed clearance—support the entire large flat metal deck. Enclosure is made with concrete masonry unit walls on the east and west elevations, and a black anodized aluminum curtain wall on the north and south. When expansion occurs—at the south end—the curtain wall structural members, black porcelain insulated panels, louvers and overhead doors will be demounted and re-deployed.

STERLING HEIGHTS PUBLIC SERVICE FACILITY, Sterling Heights, Michigan. Owner: City of Sterling Heights. Architects: Straub, Van Dine, Dziurman Architects—principal-in-charge: Harold Van Dine. Engineers: McWilliam and Keckonen, Inc. (structural); A.O. Carmichael Associates Inc. (mechanical); Hoyem-Basso Associates, Inc. (electrical). Cost consultant: Edward Colvert/Systems. General contractor: Mario Autunno Construction.

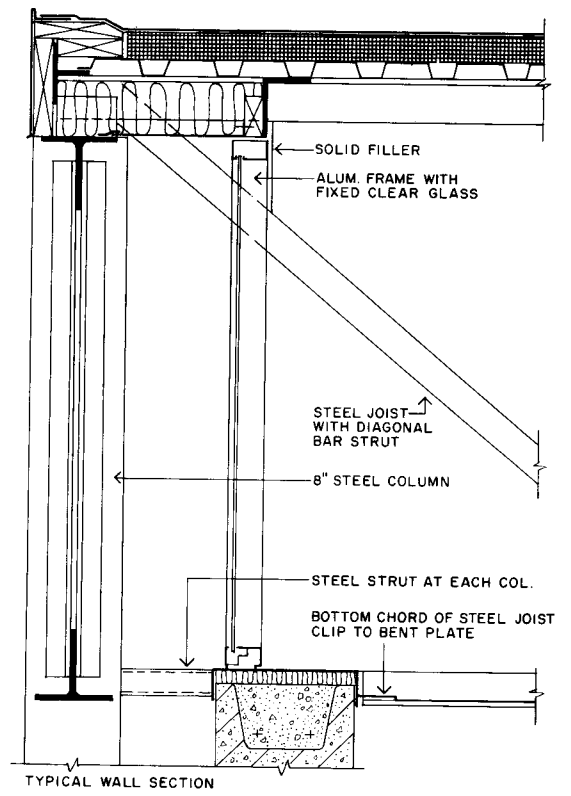


Balthazar Korab photos

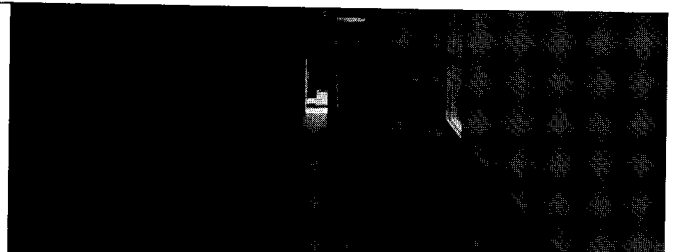
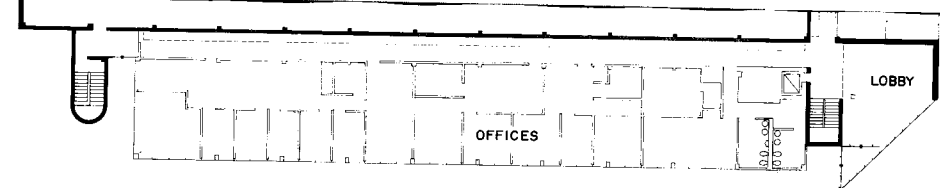




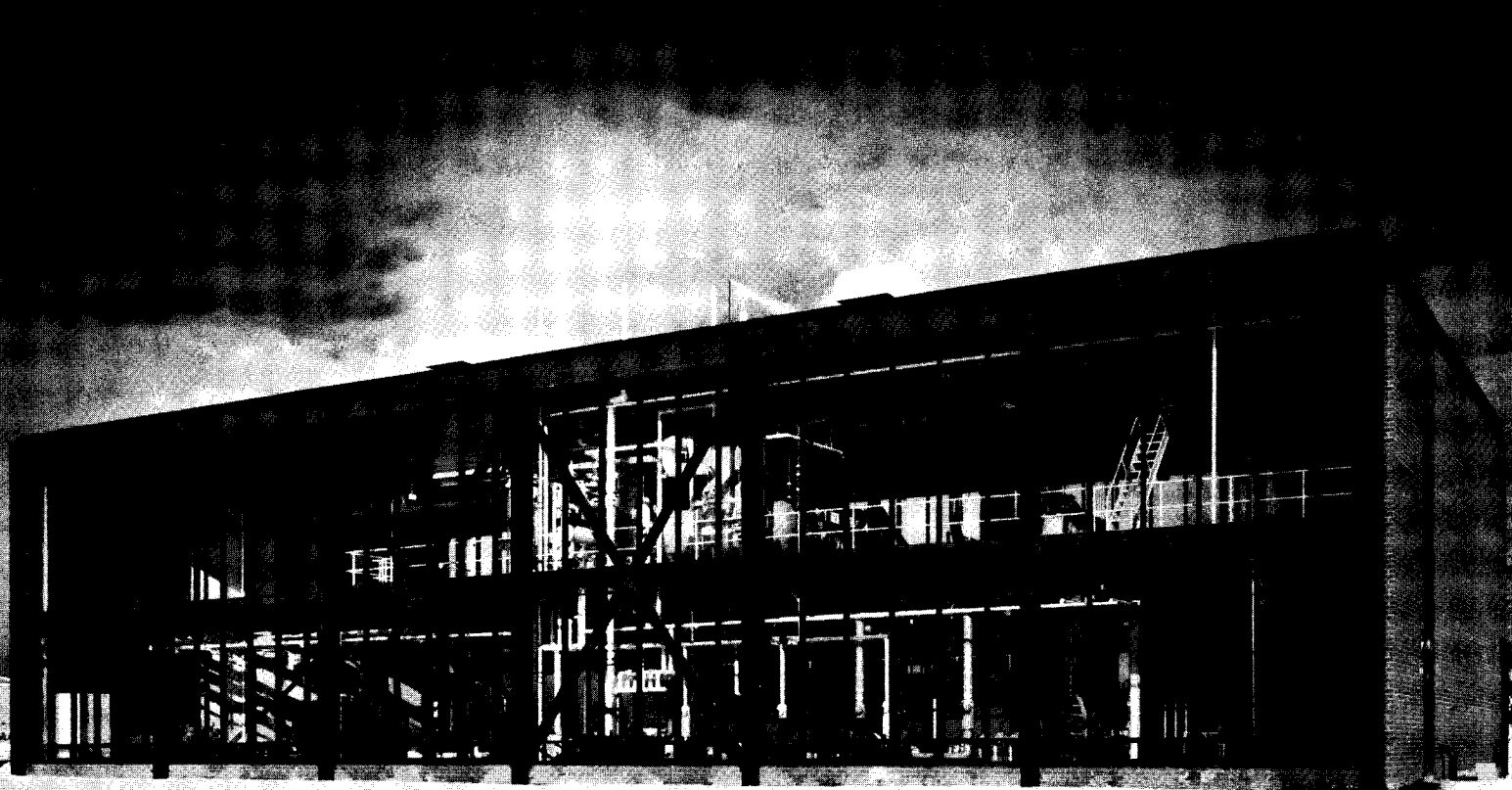
Wherever a steel joist's diagonal bar strut must pass through the clerestory window (detail drawing, right) —every 6 feet on center— the steel fabricator provided a slot in the vertical mullion. This slot, which permits free movement of the bar, is sealed with a gasket. No additional fabrication costs were incurred.



TYPICAL WALL SECTION



A competitively priced office and



Otto Baitz photos

CENTRAL POWER HOUSE

A purely utilitarian need prompts a hospital and its architects to develop a showcase powerhouse for the community

Located between two main roads in the community, this 8000-square-foot power plant for a Utica, New York, hospital is intended to be enjoyed by people passing by.

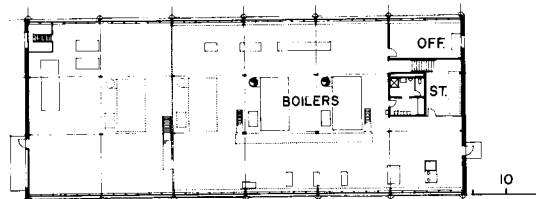
Large glass facades to the northwest and southeast provide good natural illumination and a pleasant view inside. A simple structure of H-section columns topped with large spandrel beams—all in weathering steel—supports the dry gasketed glazed walls. In all, this is a low maintenance, attractive solution to a purely utilitarian building need.

Completed one year ago, the building is part of a master plan for hospital expansion, and as such can accommodate two additional high-pressure steam boilers. A 13.2 KV electrical system and emergency generators are housed here as well.

Included in the \$3.9 million budget, the existing plant in the hospital was removed, and a new incinerator put in its place. A tunnel was constructed from the hospital to the new plant.

All work was accomplished without interruption of service to the essential areas of the hospital. After a four-week test period, the new plant was tied into the existing steam distribution network, and the old plant was taken apart.

CENTRAL POWER HOUSE, Utica, New York. Owner: St. Luke's—Memorial Hospital Center. Architects: Rogers, Butler & Bergun—partner-in-charge and project designer; Hussein Shahine; project architect: Joseph Levey. Engineers: Snyder, Burns & Associates (structural); Richard P. Marche, PE (mechanical). General contractor: Charles A. Gaetano Construction Corporation.



Parking deck saves money with tube columns and weathering steel

Use of welded steel tubes for the interior columns and other exposed-steel framing of this downtown Detroit parking garage were, to a large extent, responsible for the low over-all cost of the structure—\$4.9 million, or \$3,283 per car.

Designed by Albert Kahn Associates, Inc., architects and engineers, this parking deck was being worked on when the old Detroit Building Code was still in force, which greatly restricted the use of exposed steel framing. But, because adoption of the new BOCA code—which allowed such construction—was anticipated, an appeal was made to the building department to allow a "bare" steel parking structure. To allay the architect's own initial apprehension regarding an unprotected structure, as well as the building department's concern, the architect proposed the use of concrete-filled tubes for the structure's columns. The steel tubes were designed for the entire column design load as an added safety factor.

In addition to its efficient structural configuration, the square tubular shape offered an additional advantage: the tube column does not require the rather costly 3- to 4-ft-high guard needed for protecting the outstanding

edges of wide-flange sections from bumping by cars. The tube columns are either 14 by 14 in. or 16 by 16 in.

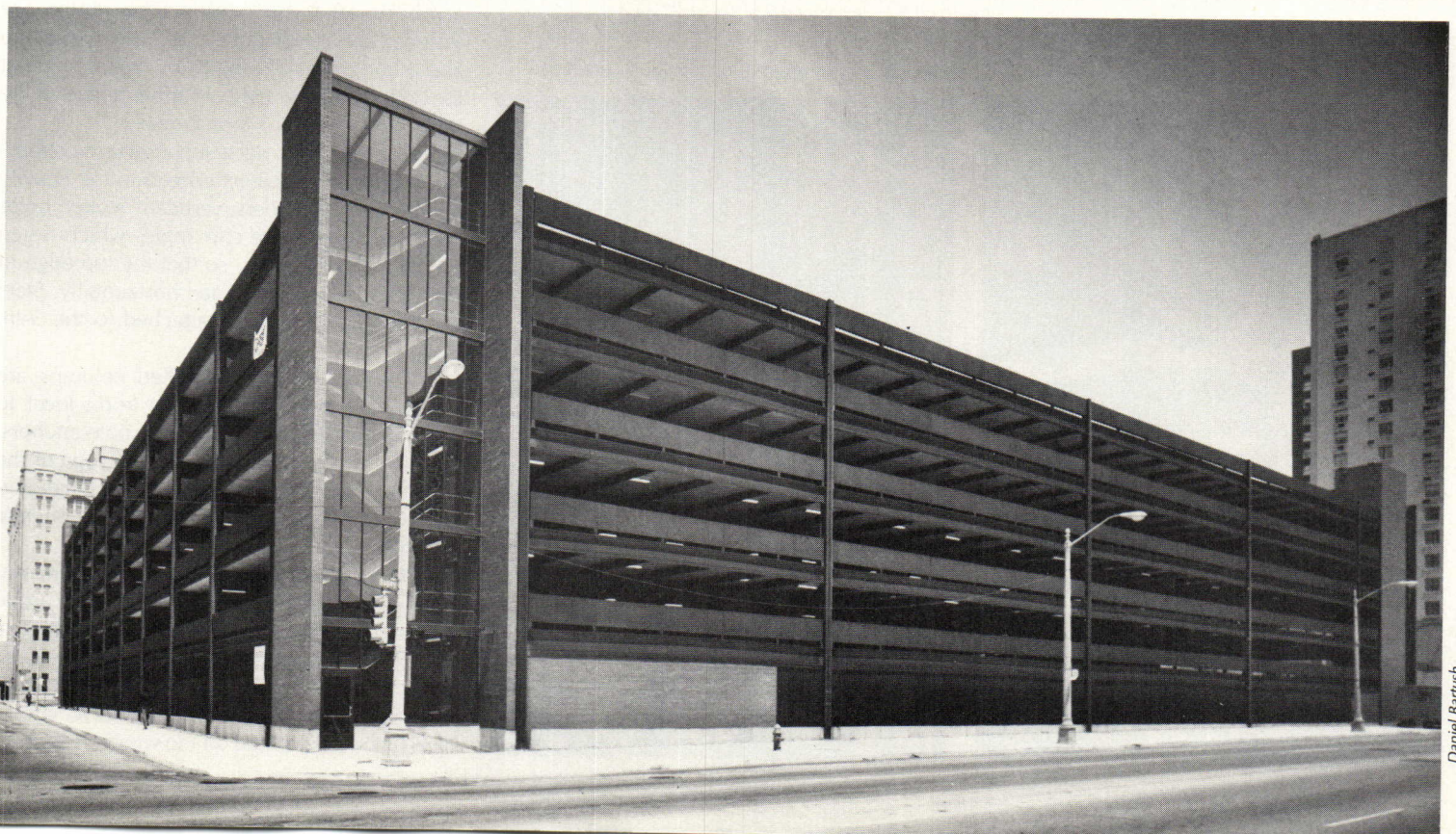
All steel, except for the interior columns, is weathering steel. The architects convinced Detroit's municipal parking department that the savings in painting costs would more than offset the added initial cost of weathering steel. The tubular columns were specified, however, as A572 Grade 50 steel rather than A588 weathering steel because weathering steel tends to become brittle in the manufacturing process of tubular columns. Since the tubular columns are all interior and only 9-ft 6-in. high, they can be painted without the need for scaffolding. The exterior weathering steel columns were made from pairs of wide-flange sections, welded toe-to-toe. Since this arrangement formed a box-shape section, these columns also could be concrete-filled.

Occupying an entire city block, the parking garage is 321 by 278 ft, and is designed for self-service, 90-degree parking for 1523 cars on five support levels and on ground level. There are two interior, independent, two-way ramp systems. This avoids the appearance of sloping floor decks on the exterior. To allow

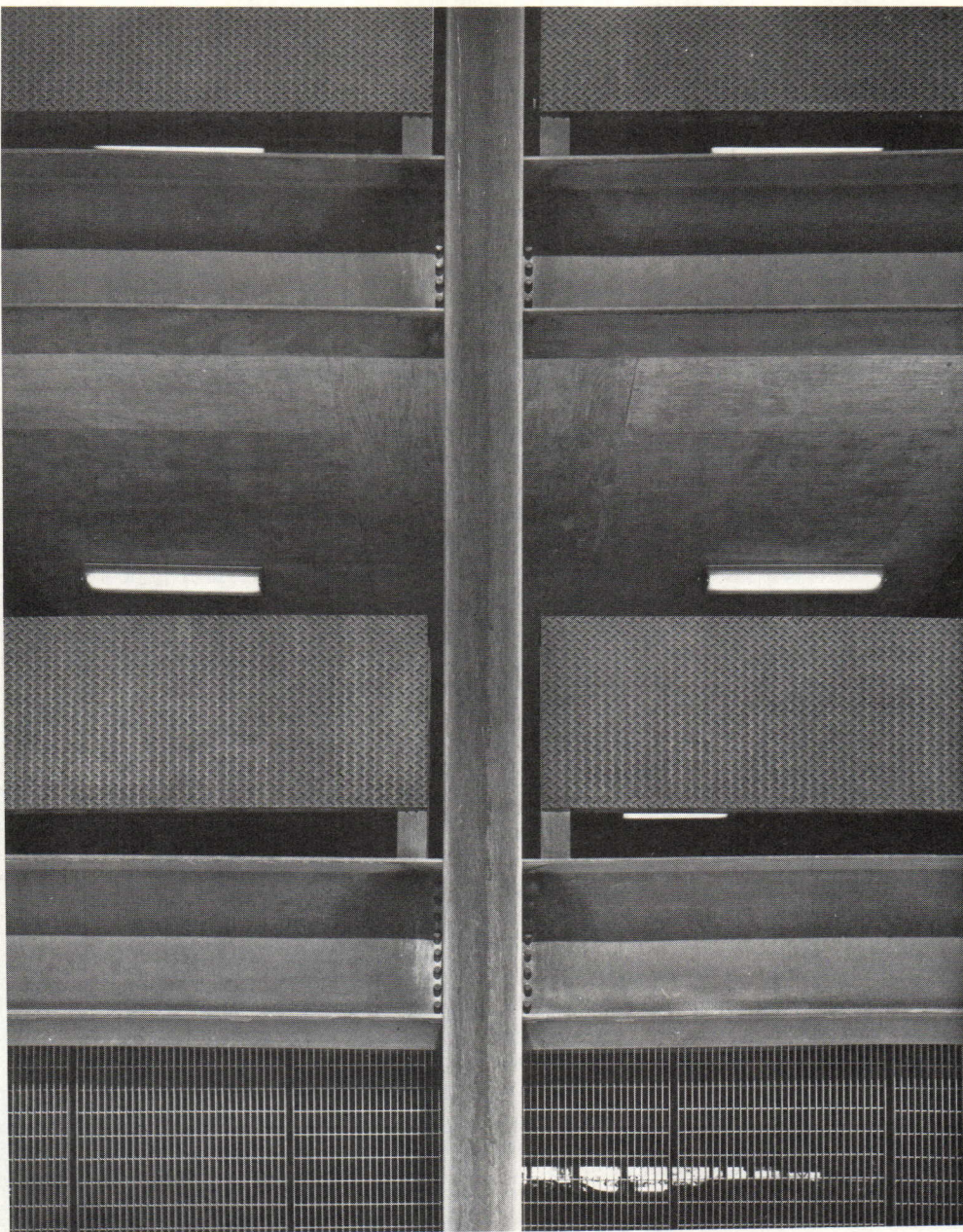
maximum utilization of the available area, parking is provided not only on the flat decks, but also on ramps.

Interior columns are 64 ft on center in the longitudinal direction, and 27 ft in the short direction. W30 by 99 steel girders span the long direction, and W14 by 22 beams span between girders at their sixth points. A 6-in. deck of 4000-psi concrete is combined in composite action with the beams.

To avoid standing water, the designers cambered the 64-ft girders 6 in. at mid-point,



Daniel Bartush

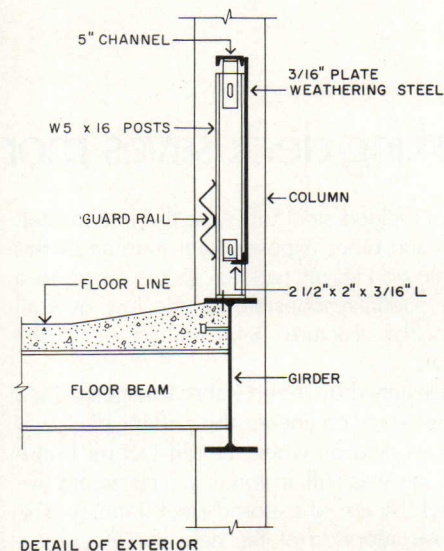


Above and right: exterior has checkered plates on 5-in. posts. Girders are cambered to facilitate drainage.

Below: thermal expansion of girders is provided for by sliding joint comprised of bracket and Teflon pad.



Robert E. Fischer photos



assuming a permanent crown of about 4 in. after creep and dead-load deflection of the girders had taken place.

Because of the large dimensions of the structure, it was divided into four freely-moving units via two expansion joints near the center. The east-west expansion joint was accomplished with the use of double columns. The north-south expansion joint was effected by the use of a bracket welded to one side of a single column to provide support for sliding connections of the girders.

Exterior elevations are formed at each floor by a 3-ft-high screen made of $\frac{3}{16}$ -in. weathering-steel checkered plates. They are located between the exposed exterior columns, and are backed up by W5 by 16 posts at about 10 ft on center. The plates are stiffened by a horizontal 5-in. channel at top and a horizontal $2\frac{1}{4}$ -by-2-by $\frac{3}{16}$ -in. angle at the bottom and by vertical stiffener angles of the same size at $2\frac{1}{2}$ to 3 ft on center.

Since the 5-in. posts supporting the checkered plates are directly fastened to the heavily cambered edge girders, vertically slotted holes were provided in the clip angles which fasten the plates to the posts, so that the top edge of the plates could be aligned horizontally. Steel bumper guards also are attached to the 5-in. posts.

The tubular concrete-filled columns are extended 4 ft above the sixth (roof) level to serve as guard posts and lighting pole anchors. Initially, a 2-ft void was left at the tops of the columns; dowels were inserted for the lighting-pole base plates, and the remaining concrete was placed.

Recognizing the staining effect of weathering steel during its early oxidation, the architects specified an 18-in. strip of wood chips in lieu of concrete between the face of the grade beam and the edge of the sidewalk. The wood chips can be replaced with concrete after a hard oxide has formed on the weathering steel.

more information, circle item numbers on Reader Service Inquiry Card, pages 225-226.

"Matrix" stack chair on view at NEOCON

High-density stacking capability is major feature of this new chair, to be shown at NEOCON, in the Chicago Merchandise Mart, June 22-24. Available with a storage dolly, 45 "Matrix" chairs—when stacked—occupy a height of 67¼ in. Seats and backrests are

textured polypropylene with moderate flex. The chair is offered in eight colors with solid steel rod frames finished in bright duplex nickel chrome or white nylon. Options include a tamper-resistant tablet arm.

■ Krueger, Green Bay, Wis.

Circle 301 on inquiry card



Harter will show "Muffin" chair

Designed by Kuypers Adamson Morton Ltd., the "Muffin" chair can be seen at NEOCON in Chicago, June 22-24. The chair, with a molded shell, is offered with a five-year warranty. Eight office task models come with various upholstery, pedestal and arm options. ■ Harter Corp., Sturgis, Mich.

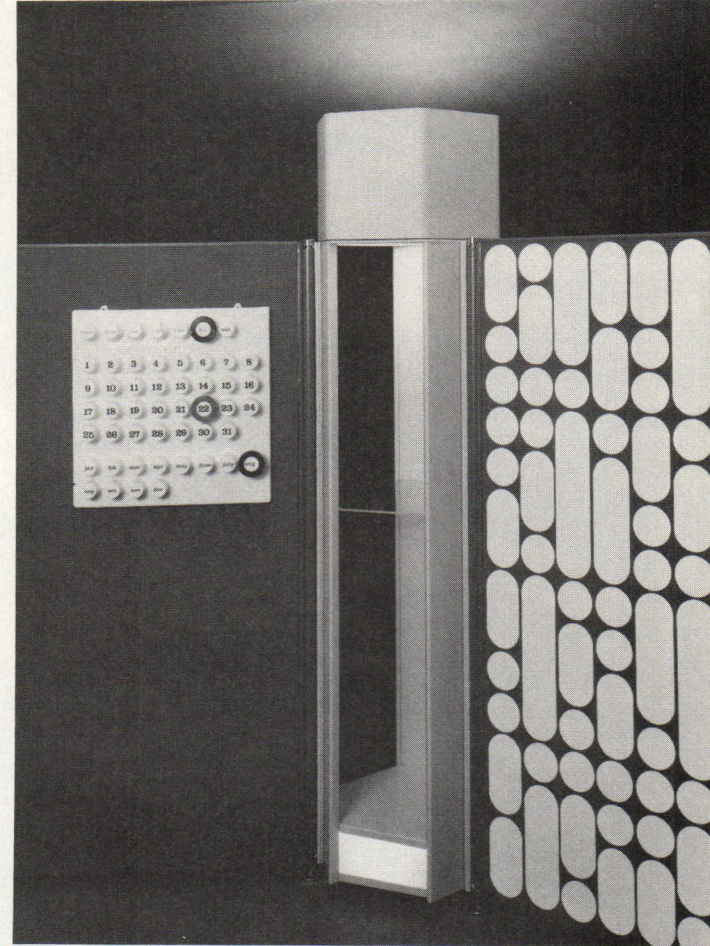
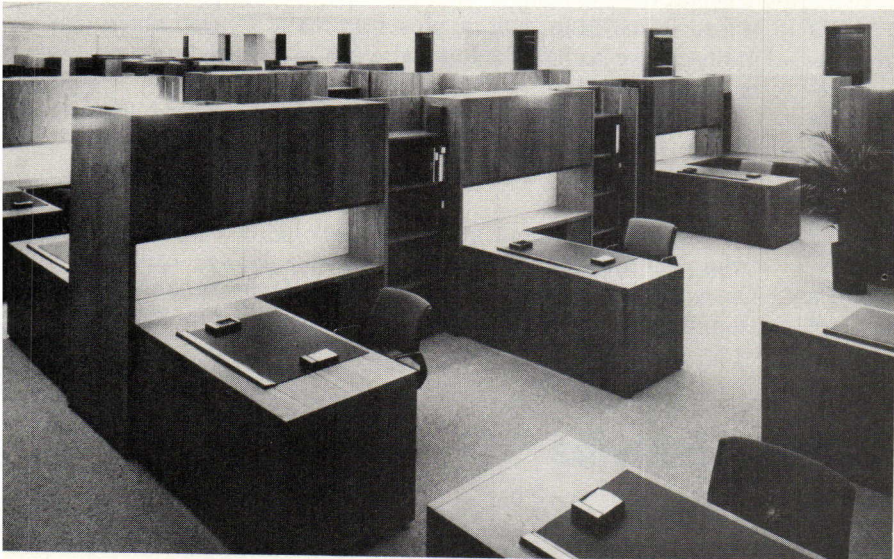
Circle 300 on inquiry card

Ambient/task lighting tested in Federal installation

The "Emetric" system is equipped with metal halide ambient fixtures (250 watts) and fluorescent task lights, a combination that recently tested at 1.65 watts per square

foot in a Federal demonstration project. Lighting in work stations was supplemented by light towers. ■ Eppinger Furniture Inc., Elmsford, N.Y.

Circle 302 on inquiry card



Hauserman announces HID ambient and task lighting

During the NEOCON contract furnishings market, Hauserman will show its new line of HID ambient lighting (*Amblite*) and fluorescent lighting (*Tasklite*) units as part of a total office work station system. Shown is the hexagon *Amblite* free-standing kiosk unit, which uses a 250-watt high efficiency,

metal halide lamp. Other fixtures, also hexagonal, mount on low or high screens or walls. The task units are available in 30- and 44-in. lengths, and can be hung on screens or mounted under wall-hung components. ■ Hauserman Inc., Cleveland, Ohio.

Circle 303 on inquiry card

"Series 454" chair is Steelcase NEOCON offering

Based on a double shell design, this chair features oval shaped polished chrome steel arms, and a five-prong tubular steel base said to require less space than a four-prong base. The chair's inner shell corresponds to contours of the human body, and the outer shell is polypropylene with a deep accent reveal on the back. Upholstery features deck seams. ■ Steelcase, Grand Rapids, Mich.

Circle 304 on inquiry card
more products on page 152





Energy-efficient Holophane lighting. Now appearing in leading stores everywhere.

There are many reasons why Holophane® Multilume™ HID luminaires are being specified for more and more store lighting applications. They're energy efficient. So monthly electrical bills are cut down considerably. And they make a store owner's merchandise sparkle attractively.

One 2' x 2' Multilume, with a 400-watt metal halide lamp, does the job of three 2' x 4' fluorescent fixtures. That decreases the number of fixtures that must be installed and maintained by 67%. And cuts ceiling clutter by 83%.

For all its practicality, Multilume also offers you a broad range of design options. You have your choice of

lenses, frame trims, colors, plus a dramatic 2" deep black multi-groove baffle. The luminaire can be recessed or surface mounted.

These are just a few of the features that make Multilume an excellent choice for stores as well as lobbies, showrooms, banks—in fact, wherever good looks and efficiency are important.

Learn more about energy-efficient lighting solutions from your local Holophane representative. He's an expert. Or, write to Johns-Manville Sales Corp., Holophane Division, Dept. AR-6, Ken-Caryl Ranch, Denver, Colo. 80217.

JM Johns-Manville

For more data, circle 63 on inquiry card

For information, circle item numbers on Reader Service Inquiry card, pages 225-226.

SOUND CONTROL / A 12-page booklet shows how this firm's "Commercial Wall Insulation" systems can reduce noise transmission in non-residential buildings. Material reviews noise transmission testing, compares the acoustic control benefits of different methods, and offers recommended construction practices to achieve sound control in commercial structures. Also available is a brochure explaining the various product types, installation methods, and energy-saving thermal performance features. ■ Owens-Corning Fiberglas Corp., Toledo, Ohio.

Circle 400 on inquiry card

MASONRY CLEANER / A color brochure describes the uses of *Sure Klean 600* detergent, a heavy-duty cleaning compound designed to remove excess mortar, stains and job dirt from new masonry surfaces, particularly light-colored stone, brick, block and tile. Application procedures are explained. ■ ProSoCo, Inc., South Plainfield, N.J.

Circle 401 on inquiry card

FIRE PROTECTION DESIGN / "Designing Fire Protection for Steel Trusses" is one of a series of fire technology publications prepared by the American Iron and Steel Institute. This illustrated 16-page brochure contains recent ASTM test data, as well as a mathematical formula intended to allow the designer to develop acceptable protection ratings. Special emphasis is given to two recent structural concepts: the staggered truss system, and the interstitial space design. Different methods of truss fire protection as they relate to various occupancy requirements are discussed. ■ Engineering Div., American Iron and Steel Institute, Washington, D.C.

Circle 402 on inquiry card

SAFETY RAILING / Photos of each component, detail drawings, and engineering data are included in a 12-page catalog on *RigidRail* barriers. These weld-free extruded aluminum handrails and safety railing systems meet or exceed all OSHA requirements, and are suitable for water and waste treatment facilities, power plants, industrial and commercial buildings. A line of ornamental balcony railings for motels, etc., is also presented, along with information on corrosion-resistant, snap-on color sleeves made of an acrylic/vinyl material. ■ Construction Specialties, Inc., Cranford, N.J.

Circle 403 on inquiry card

PIPE RAILING SYSTEMS / This 68-page catalog shows railings, tubing, bars and shapes in aluminum, bronze, steel and stainless, with all components color coded for easy metal identification. Design information and code data are given on the *Colorail* plastic and aluminum handrail series; *Carlstadt* railings of aluminum, bronze, stainless and acrylic/wood constructions; and the *Connectorail* non-welded aluminum and stainless pipe systems. ■ Julius Blum & Co., Inc., Carlstadt, N.J.

Circle 404 on inquiry card

TRUCK DOCK SHELTERS / Advantages of reduced energy costs, increased safety, product protection, better security and lower maintenance are claimed for these truck dock shelters, covering the gap between the building and the rear of loading or unloading trucks. A 22-page catalog illustrates design and construction features, fabric choices and options for a complete line of shelters. Information is also given on specialized equipment such as metal hoods, door gap seals, traffic doors and flexible strip doors. ■ Frommelt Industries, Inc., Dubuque, Iowa.

Circle 405 on inquiry card

GRAPHIC ART / Full-color catalog of contemporary art works includes original limited edition signed prints, art posters, Aubusson tapestries and sculpture multiples available to design professionals. Special services and visual materials for client presentation are described; a poster catalog lists works on the Federal Supply Schedule. ■ Pace Editions Inc., New York City.

Circle 406 on inquiry card

CARPETING GUIDE / A carpet specifier's guide to *Ultron* nylon fiber includes applicable flammability testing and performance certification; durability characteristics; appearance retention and static control for carpet; and carpet construction requirements and special needs for different use situations. ■ Monsanto Textiles Co., Atlanta, Ga.

Circle 407 on inquiry card

CEILING PANELS/TILE / In-use color photos are featured in a 16-page brochure on *Travertone* ceiling tile and lay-in panels. Constructed of fire-retardant mineral-wool fiberboard, each *Travertone* ceiling pattern is embossed with a distinctive textured surface. The ceiling provides acoustical, fire-resistive, and light-reflective benefits, according to the manufacturer. ■ Armstrong Cork Co., Lancaster, Pa.

Circle 408 on inquiry card

VINYL FLOORING / An illustrated catalog describes how *Conductile* static-conductive vinyl flooring is used in hospital operating rooms, laboratories and intensive care units, munitions plants, computer rooms, and other critical areas to reduce the threat of explosion, fire or equipment malfunction. *Conductile* is available in 36- by 36-in. sections that are heat-welded for a seamless floor, or in 12- by 12-in. *Micro-squared* tiles. ■ Vinyl Plastics, Inc., Sheboygan, Wis.

Circle 409 on inquiry card

BUILDING PANELS / Illustrated product brochure gives use and application information and physical property data for a full line of fiberglass-reinforced plastic building panels. All three panel types—*Glasbord* frp flat, *Glasbord* frp ribbed, and *Kemply* frp surfaced plywood panels—are USDA-accepted for use in food processing and storage areas, shower rooms, etc. Shatterproof glazing panels and fire retardant product types are also explained. ■ Kemlite Corp., Joliet, Ill.

Circle 410 on inquiry card

MOBILE PLATFORMS / The space-saving advantages of movable, folding platforms, stages, runways, bandstands, and speaker stands are outlined in a product brochure. ■ Hamilton Industries, Two Rivers, Wis.

Circle 411 on inquiry card

WASHROOM ACCESSORIES / Sixteen-gauge stainless steel is used in the construction of the "Simplicity 16" series of heavy-duty, vandal-resistant towel and soap dispensers, and other washroom accessories. A catalog provides dimensional data on all units, which may be either surface- or recess-mounted. Dispensers have cylinder locks, keyed alike for faster servicing and maintenance. ■ Accessory Specialties, Inc., New York City.

Circle 412 on inquiry card

DOCK LEVELERS / Brochure gives details on a complete group of mechanical and hydraulic levelers, railcar ramps, lip holders, dock lights, bumpers and safety units. ■ RiteHite Corp., Cudahy, Wis.

Circle 413 on inquiry card

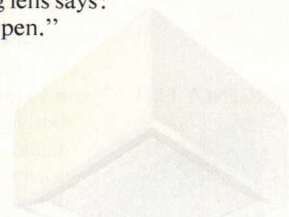
more literature on page 162

More energy-efficient Holophane lighting solutions.

Holophane makes the selection of attractive, high efficiency lighting easy. Our HID luminaires are designed for easy installation, easy maintenance and good looks.



Multilume with dropped pyramidal lens featuring prismatic sidewalls is ideal for stores. The sparkling lens says: "We're open."



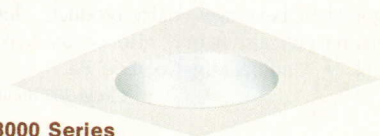
Multilume, surface mounted, provides a clean, crisp alternate design option.



5000 Series is an open-bottom HID downlight. Prismatic glass reflectors provide wide range of light distributions. Extra low brightness option (ELB).



Bantam 5000 Series features smaller diameter openings for clean, elegant appearance. Ideal for boutiques.

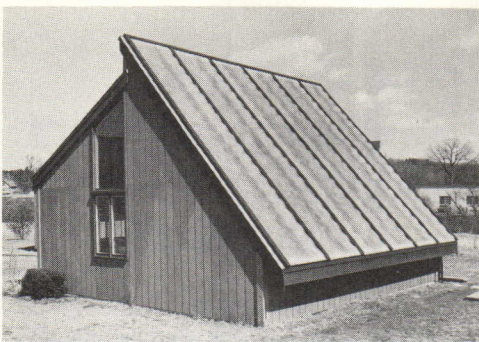


3000 Series is an excellent choice when appearance must be combined with economy. Available with natural, champagne or black anodized color reflectors.



Johns-Manville

For more data, circle 63 on inquiry card



SOLAR HEATING / The adaptable *Sunwave* solar energy collecting system includes 4- by 20-ft collector/roofing panels and a 2,000-gal water storage tank. Solar collectors consist of a polyester fiberglass glazing panel with frame; a copper tubing grid with an attached black-painted aluminum absorbing surface; 2-in. fiberglass insulation; a waterproofing membrane and a fir plywood back which can double as roof sheathing. The water tank is wood-framed, vinyl-lined and insulated. *Sunwave* is marketed as a complete kit, or as individual components; one version of the collector is suitable for domestic hot water needs only. ■ Acorn Structures, Inc., Concord, Mass.

Circle 305 on inquiry card

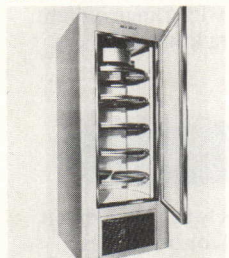
EMERGENCY EXIT / These single- or double-faced



exit sign units have integrated emergency battery power, UL-listed for 90 minute operation. Charger is solid state; load transfer is automatic; the low-maintenance nickel cadmium 6-volt battery has a visible test indicator and switch. As an option, a solid-state intermittent 68 dB audible alarm with flashing light is offered with the emergency power exit. Exit complies with OSHA, state and local codes. ■ ITT-Art Metal Lighting, Vermilion, Ohio.

Circle 306 on inquiry card

COLD STORAGE DISPLAY / The "Kold-Vue" refrigerated merchandising case provides 20 cubic feet of storage on revolving shelves behind a full-vision glass door. The unit requires one sq yd of floor space, and needs only an electrical connection. The "Kold-Vue" case is suitable for the display and lighting of beverages, dairy products, flowers and pharmaceuticals; it may also be used as a blood bank. ■ Uniflow Mfg. Co., Erie, Pa.



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Circle 307 on inquiry card

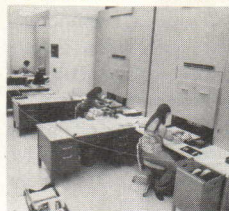
COMMERCIAL CARPETING / "Business Square" 53-oz cut and loop carpet carries the *Zefstat* five-year anti-shock carpet warranty. The tufted geometric pattern is available in three fiber types for heavy commercial traffic: 100 percent *Zefran* acrylic Berber yarns, and two different *Zefran* blends of acrylic/modacrylic. "Business Square" features subtle shade variations of heather and natural tones. ■ Customweave Carpets, Inc., Fountain Valley, Calif.



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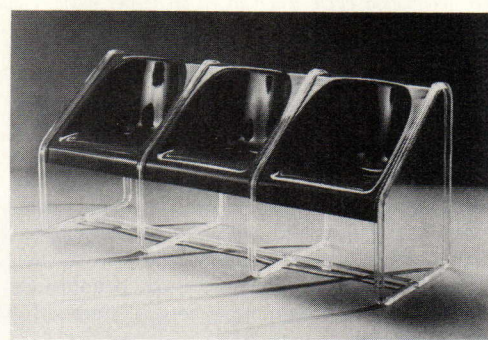
Circle 308 on inquiry card

AUTOMATED STORAGE / Thousands of engineering drawings required for major construction projects are said to be easily and quickly accessible with the *Conserv-a-Trieve* system, pictured installed in the New York City offices of Ebasco Services Inc. File bins are stored within a rectangular enclosure on facing banks of columns. An electronically controlled transporter rides on track between columns, and positions itself next to desired bin. Bin containing drawings (system also may be used with microfilm) is delivered to operator seated at front console. The *Conserv-a-Trieve* system offers controlled-access and locked-door security, as well as savings in time and space needed for record storage. ■ Supreme Equipment & Systems Corp., Brooklyn, N.Y.



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Circle 309 on inquiry card



ACRYLIC SEATING / This line of modular seating, designed by Robert Alan Martin, is intended for use in public lounge areas and institutions. Clear acrylic structural frames provide a light, suspended character to the units. Seating is constructed in one- to four-seat modules, interspaced with tables, planter units, ash containers, etc. ■ Vivid, Los Angeles, Calif.

Circle 310 on inquiry card



IT'S YOUR BUSINESS,
YOUR CLIENT,
YOUR REPUTATION.

MAKE MORE OF IT WITH ELKAY



LCR 4322-C



LR 250-C



LCMR 3322-C

Elkay offers a complete line of stainless steel sinks. They're the finest stainless steel sinks money can buy, but then, that's what you'd expect from a company with a 50-year reputation for dependability and superiority. Ask to have our representative call on you, or send for our latest literature.

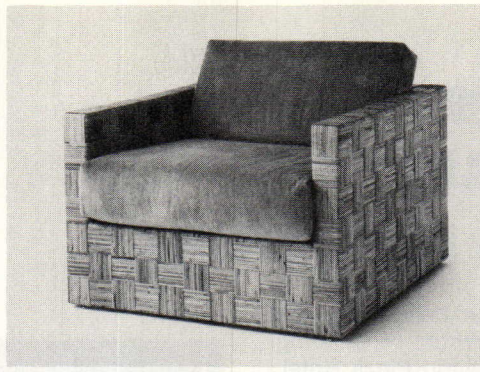
Elkay versus the ordinary. There's no comparison.

ELKAY
MANUFACTURING COMPANY
2700 South Seventeenth Avenue
Broadview, Illinois 60153, Department 40-20



CONTRACT FURNITURE / Rounded radius corners are featured on all pieces in the "Perimeter" line of contemporary desks, credenzas, lounge seating, sofas and chairs, designed by Stan Hutchinson. Furniture is available in oak, teak and walnut, as well as Macassar Ebony, Brazilian Rosewood, and Zebra Wood. ■ Sandline Industries, Inc., Compton, Calif.

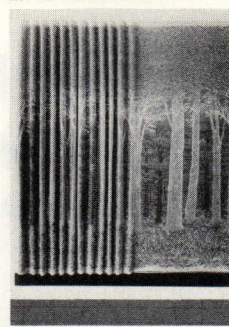
Circle 311 on inquiry card



NATURAL FIBER CHAIRS / Latania, cane, and wicker woven by Haitian craftsmen cover wood- and steel-framed furniture in the "Artisan Collection." The cane parquet chair shown is also available as a two- or three-seat sofa. ■ Harvey Propper, Inc., New York City.

Circle 312 on inquiry card

LINEN DECORATIVE FABRICS / Shown is "Forest,"



a panel print picturing trees framed by leafy branches and foliage. The linen/cotton fabric, by Elenhank Designers, Inc., comes 9-ft-high; panel repeats may be ordered in any length. "Forest" is one of several patterns, by different firms, using Belgian linen for contract upholstery, drapery and wallcovering fabric applications. All fabrics can be treated with stain repellent finishes, laminated, and fireproofed to meet architectural specifications. ■ Belgian Linen Assn., New York City.

Circle 313 on inquiry card

HVAC CONTROL / The "Programmed Energy Saving Optimizer" is a seven-day optimal time clock designed for night temperature setback with variable warm-up time. Unit includes a wind-compensated outdoor air sensing element, and ten hours of spring override in case of a power failure. The entire control is housed in a steel cabinet with a hinged door and keyed latch. Fuel savings of up to 38 per cent are said to be possible with the "Optimizer." ■ Barber-Colman Co., Environmental Systems Div., Rockford, Ill.



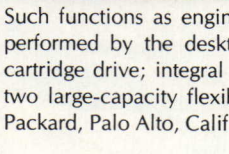
Circle 314 on inquiry card

DRAFTING TABLE / Persons in wheelchairs can work comfortably and efficiently at this completely adjustable drafting table, the manufacturer claims. All lifting, lowering and tilting controls are combined into one hand-operated lever, clearing the area beneath the table for wheelchair occupancy. ■ The Huey Co., Franklin Park, Ill.



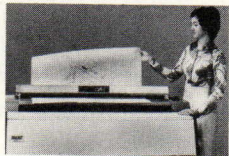
Circle 315 on inquiry card

COMPUTER / Model "9896A" BASIC-language desktop computer is said to be a cost-effective system designed especially for small- to medium-sized commercial and scientific organizations. Such functions as engineering calculations can be performed by the desktop computer with built-in cartridge drive; integral keyboard and display; and two large-capacity flexible disk drives. ■ Hewlett-Packard, Palo Alto, Calif.



Circle 316 on inquiry card

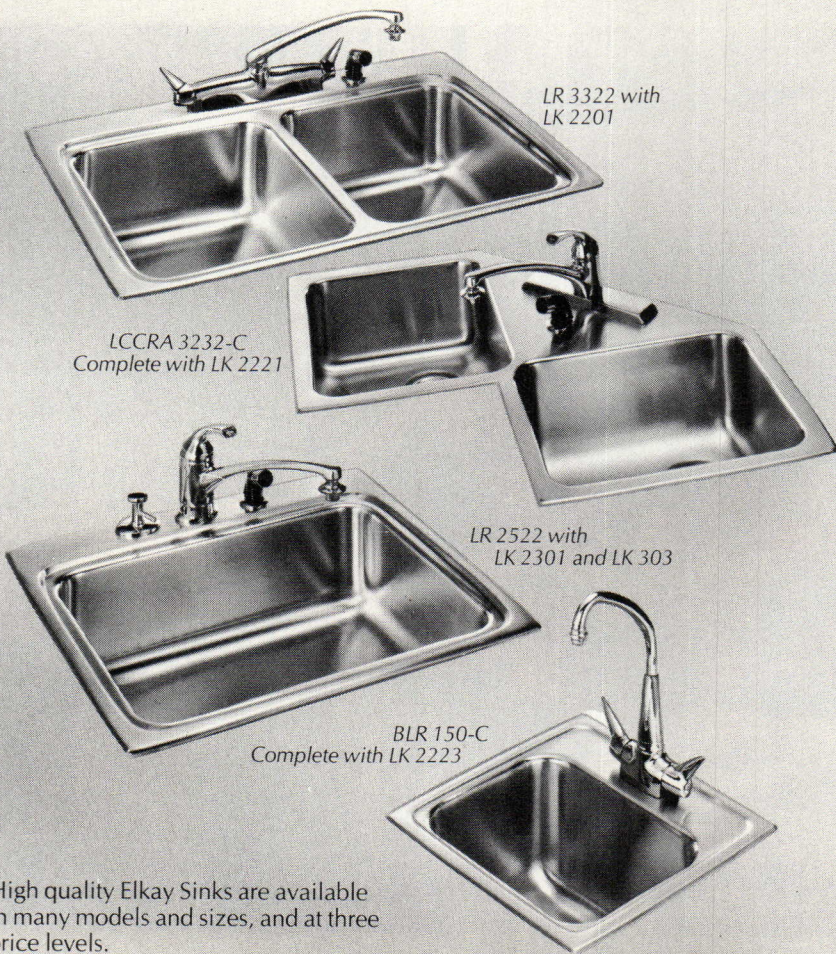
TABLETOP COPIER / The Dart 130 whiteprinter makes diazo copies up to 130 cm (51 in.) wide at printing speeds up to 20 ft/min. When used with the optional stand, shown, the Dart 130 forms a console unit with paper storage compartment. A heated stainless-steel developer offers instant on-off operation without warm-up; the printer section consists of a Pyrex glass cylinder and a fluorescent diazo lamp. ■ Diazit Co., Inc., Youngsville, N.C.



Circle 317 on inquiry card

more products on page 155

There's almost no function that Elkay Sinks and Faucets can't accommodate.



LR 3322 with LK 2201

LCCRA 3232-C Complete with LK 2221

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BLR 150-C Complete with LK 2223

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For more data, circle 64 on inquiry card

All-steel walls give real privacy for Stouffer's meetings

"The great thing about these walls in our ballroom is the way they stop noise," Keith Covelle, Director of Catering and Convention Services at Stouffer's Dayton Plaza Hotel, tells us. "I never get any complaints from adjoining meetings."

Stouffer's uses these walls to divide their ballroom into two, three or four sound-protected meeting rooms like the ones shown in this ad.

Each group has the privacy they deserve because Acousti-Seal® 900 Steel Panels keep sound where it belongs. Steel is strong to take hard use. Steel will not burn, providing added fire safety.

Easy operation of Acousti-Seal 900 makes quick changes simple to handle.

For more information on how these steel maximum privacy walls can help you get more meeting business, write Modernfold, P. O. Box 310, New Castle, Indiana 47362. Ask for "Acousti-Seal."



Passdoors can be built into the panel for room-to-room access. Panels stack neatly in storage pockets when not in use.



Meetings on either side of this room are effectively insulated from annoying sound transfer. Steel walls do the job.

Modernfold . . . A better way to make better use of space

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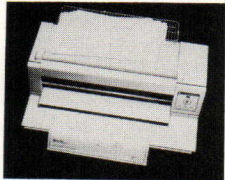
For more data, circle 65 on inquiry card



TOILET COMPARTMENTS / The "Tempo" line of toilet partitions is surfaced with a selection of several solid colors and woodgrain designs of *Formica* decorative laminate. This competitively-priced partition unit is offered in configurations for floor-mounted, ceiling-hung, or overhead-braced installation. All hardware is corrosion-resistant chrome plate, with vandal-resistant fasteners; "Tempo" compartments are warranted against defects for two years. ■ **AMPCO Products, Inc.**, Hialeah, Fla.

Circle 318 on inquiry card

WHITEPRINTER / Intended for medium-volume applications, the "170" is a 42-in.-wide dry diazo whiteprinter which can operate at speeds up to 40 ft per minute. The top-mounted stacking tray accommodates prints up to 24-in. by 42-in. A Q.C. ammonia developing system minimizes developer handling; the printer has an ammonia waste eliminator. Other features include a roll stock compartment housing a 50 yd. roll of paper; fast developer warm-up provided by a quartz heating rod; and an energy-saving 115v power line. ■ **Addressograph-Multigraph Corp.**, Bruning Div., Schaumburg, Ill.



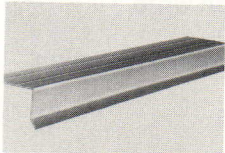
Circle 319 on inquiry card

LADDER/STAIRWAY / The tallest "Ship's Ladder" stair—10-ft 7-in. high—requires only 3 ft 8-in. of floor space. The steel stairs, in heights from 3 ft, are suitable for roof top applications to reach multi-levels or over fire and retaining walls, as well as for platforms, over pipes, to exit windows, etc. Self-cleaning stair treads have oval holes, with raised nubs for safe footing. Handrails extend 42-in. higher than the top step to allow user to hold rails stepping off onto a roof or platform, etc. ■ **Equipto**, Aurora, Ill.



Circle 320 on inquiry card

ROOF EDGING / Roll-formed from galvanized steel, the "201" roof edge can be used with shingles or built-up roofs. The roof edge is one of a full line of building products, including light-gauge steel structural studs, track, bridging, and drywall and lathing accessories. ■ **Wall-Rite Systems**, West Middlesex, Pa.



Circle 321 on inquiry card

BUILDING MANAGEMENT / The "SMS-500N" is a multiplex building management system designed to provide maximum protection at minimum cost, controlling such functions as energy consumption, card access to secured areas, fire protection, security, mechanical systems operation and life safety. Sensing data received from up to 8000 input and output points are transmitted on two pairs of wires, eliminating balancing and hardwiring each individual sensor to the central console. In addition to automatic system commands, up to 320 manual commands may be activated via a console board. A strip printer records the date, time, numerical location and coded message for each system event. Closed circuit TV module and an intercom/door control are options with the "SMS-700." ■ **Sentinel Electronics Corp.**, St. Paul, Minn.



Circle 322 on inquiry card

CONCRETE FORM / "Vented Slabform" is a galvanized, corrugated steel sheet designed for use as a permanent structural support with lightweight insulating concrete roof decks. A series of uniformly spaced slots in the valley of the corrugations permit release of water vapor pressure from the concrete fill roof during the curing and drying process, and later. Product is available in 20- to 28-gauge steel; in various corrugation and slot configurations; and with span capability ranging from 4- to 10-ft between supporting members. Photo shows welder attaching "Vented Slabform" to supporting structural steel roof members. ■ **Bethlehem Steel Corp.**, Bethlehem, Pa.

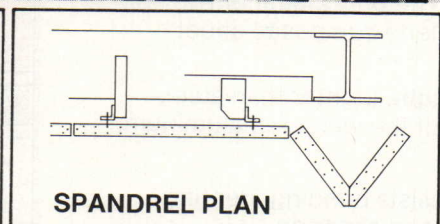
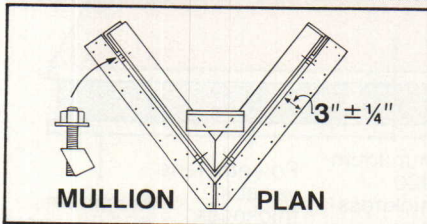
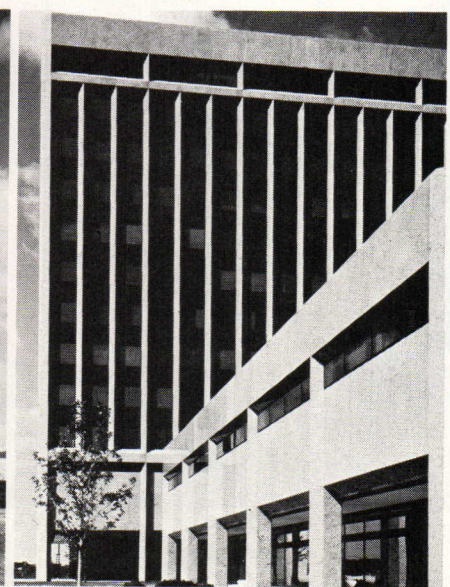


Circle 323 on inquiry card

more products on page 161

Granite.

The best in first impressions.



The first impression is the important one. Granite can make that impression more vivid than any other building material available. That's why Motorola, Incorporated selected Cold Spring's Texas Pearl for their corporate headquarters in Schaumburg, Illinois.

Granite affords the architect a resource from which he can create a building that reflects an image of quality... a corporate image. For lasting first impressions, specify Cold Spring Granite.

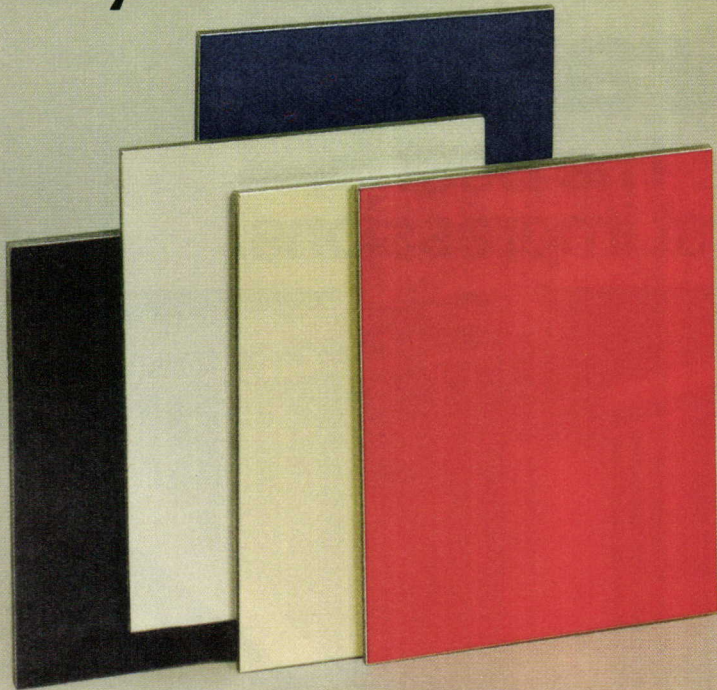
For more information, plus a free copy of our 16-page, full-color catalog showing all 18 Cold Spring colors available, call toll free **800-328-7038**. In Minnesota call (612) 685-3621, or write to the address below.



Cold Spring Granite Company, Dept. AR-6 202 South 3rd Avenue, Cold Spring, MN 56320

For more data, circle 66 on inquiry card

Introducing AlucobondTM sheet: an aluminum-polyethylene composite for exteriors, walls, ceilings, displays, exhibits and signage. It's so light-weight, rigid, easy to fabricate and weather-resistant...



(there's nothing
like it.)

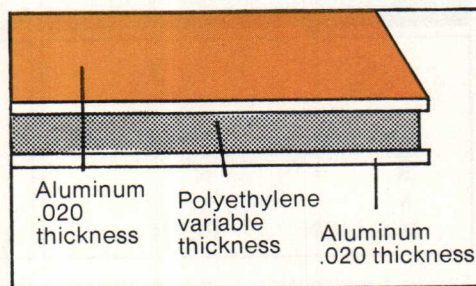
Unique. The only aluminum-polyethylene composite sheet.

Light-weight. Lighter than steel, nearly half the weight of aluminum.

Rigid. Resists bending, denting, buckling and shearing.

Weather-resistant. This tough aluminum alloy plus anodized coatings and paints will hold up for years to corrosive industrial or seaside climates and abrasive conditions.

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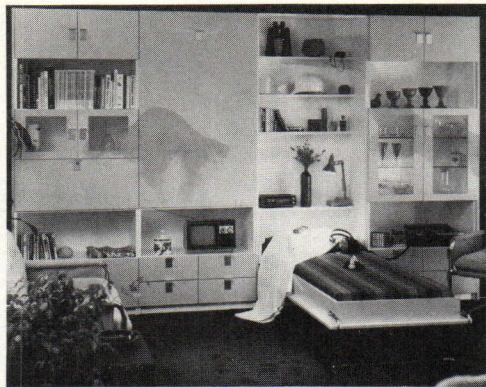
Sound Deadening. Damps vibration faster than homogenous metals.

There really is nothing like it. AlucobondTM sheet from Consolidated Aluminum.

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P.O. Box 14448
St. Louis, MO., 63178

CONSOLIDATED ALUMINUM

For more data, circle 67 on inquiry card



MULTI-FURNITURE / Designed by Robert Whalen for the residential and apartment market, the "Omniwall" series provides wall storage components for bedroom, dining and living room. The unit shown above features a pull-down bed and table, finished in white and yellow. Wood veneers of rosewood and walnut are also available; different shelving arrangements accommodate books, stereo or television equipment, etc. ■ Omni Products, Vernon, Ala.

Circle 324 on inquiry card

SPORTS LIGHTING / Pictured is one of a series of four luminaire models designed to provide outdoor lighting for a variety of professional, semi-professional and amateur sports.



All floodlights have an aluminum housing, and thermal-shock and impact-resistant lens. Units are fully gasketed for all-weather protection. Sports lighting models come in metal halide, quartz, mercury vapor and high-pressure sodium versions, each factory wired and UL-listed. ■ Hubbell Lighting Div., Christiansburg, Va.

Circle 325 on inquiry card

WATERPROOFING SEALER / Said to cure all problems of water leaks and seepage through cement and masonry, *Eco-Seal* protective coating "breathes" to allow trapped moisture to escape, preventing vapor block and minimizing the possibility of freeze-thaw damage.



The colorless liquid can be painted, rolled or sprayed on clean masonry, bridging small cracks and sealing the surface against water and chemicals. *Eco-Seal* may also be used as a primer and bonding agent. ■ Eco Industries, Inc., New York City.

Circle 326 on inquiry card

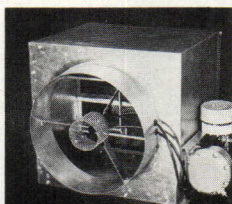
DECORATIVE LAMINATES / The "Natural Finish" woodgrain series of *Nevamar* high-pressure plastic laminates now includes "Golden Ash," "Butcher Block," and "Beechwood" patterns, as well as "Silvan Teak." The low-luster finish has no gloss or shine; spray wax may be used to give a wood-like sheen to the surface.



All four woodgrain laminate patterns are available in general purpose H-5 grade, in most standard sheet sizes for contract and commercial applications. ■ Exxon Chemical Co. U.S.A., Odenton, Md.

Circle 327 on inquiry card

AIR HANDLING SYSTEM / A variable volume air flow assembly, said to save energy while increasing indoor comfort, is a single-duct system containing a pneumatic computer sensitive to micro-pressures.



The *Enviro-Master* air handler is especially suited for installations in which the load and system pressure may vary extensively, and where precise control is desired. A "flow-logic analyzer" resets the damper actuator to continuously adjust air quantities for maximum efficiencies. Three different *Enviro-Master* designs provide for a range of pressure and limit control requirements. ■ Environmental Element Corp., Titus Products, Dallas, Tex.

Circle 328 on inquiry card

REPLACEMENT WINDOW / These *NuPrime* aluminum windows come complete with panning systems to cover the entire window area.



All sashes remove for cleaning from inside the building; units are custom-made for ease of installation and minimal wall alteration. Panning attachments are available for this full line

of residential and commercial replacement windows including double-hung, slider, picture and basement window models. ■ Season-all Industries, Inc., Indiana, Pa.

Circle 329 on inquiry card

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available. In fact, we ship the very day the order comes in to us.

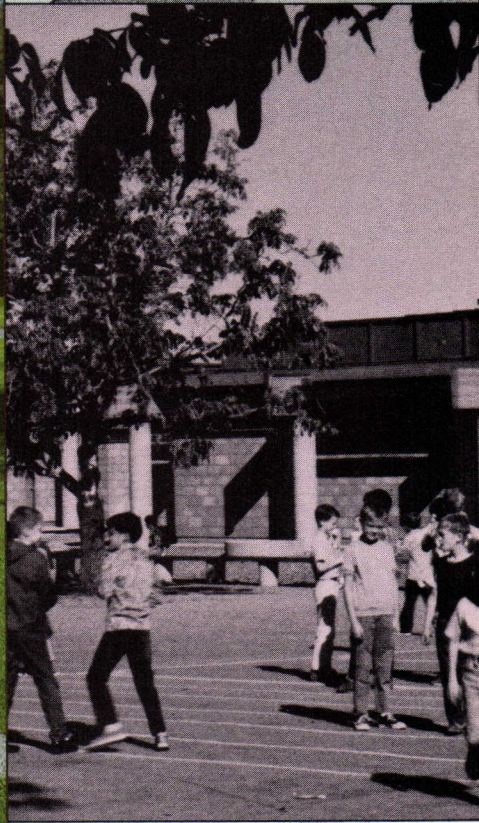
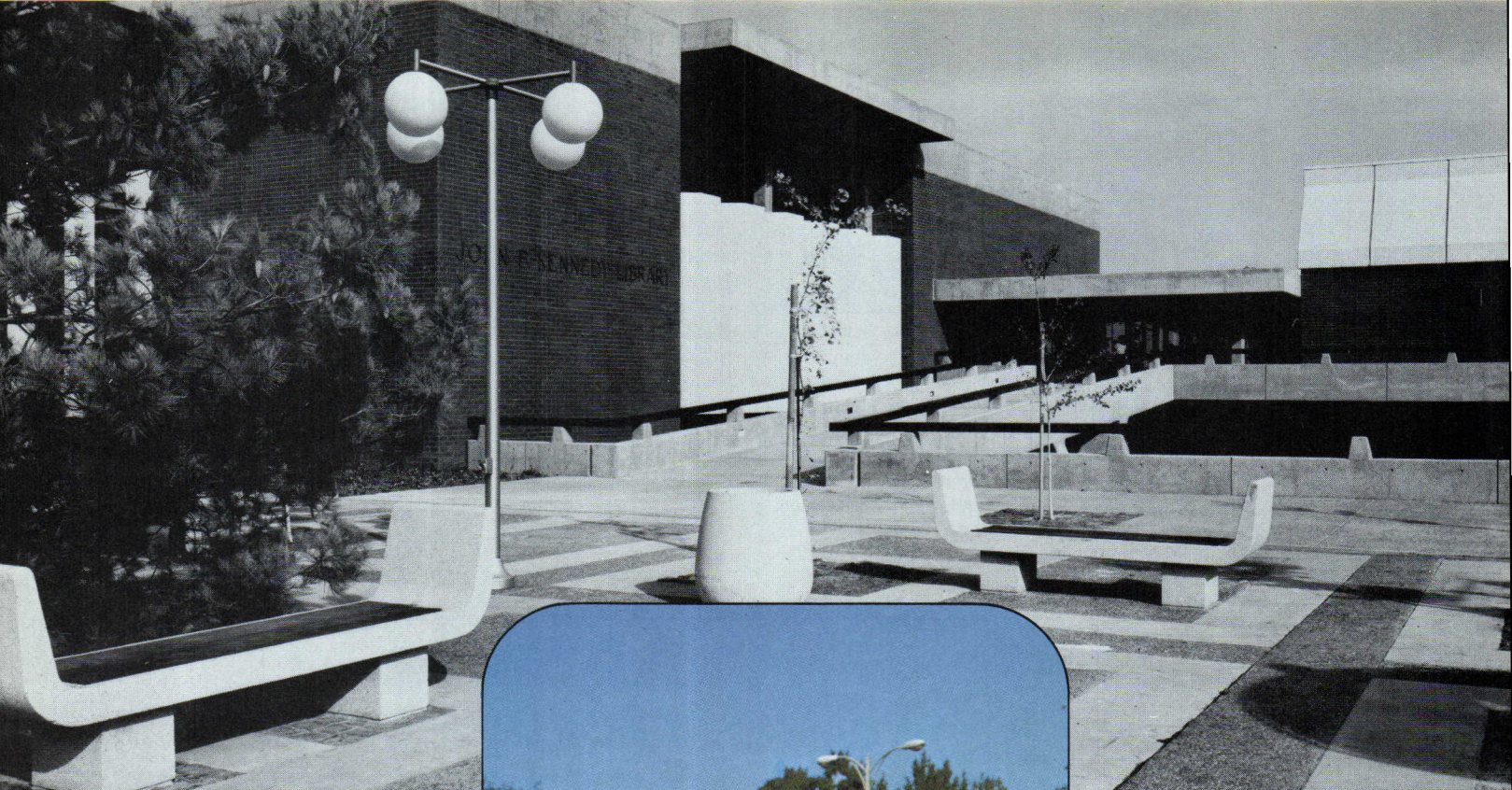
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its truly functional cantilevered design for both handicapped and general public users. It features two lever handle valves for either left- or right-hand operation and is available in light sandblast or exposed aggregate finish, as shown.

Get all the facts; contact Haws Drinking Faucet Company, 1441 Fourth Street, Berkeley, CA 94710.

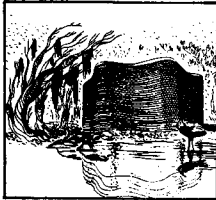
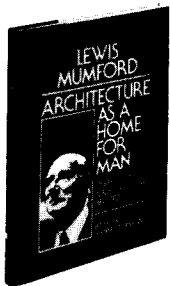
This Haws unique concrete pedestal drinking fountain will enhance your exterior planning with



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KITCHEN EQUIPMENT / Product bulletin describes the "Model RT-7A" one-man pot and pan washer, with a continuous rotary conveyor which eliminates racks, door and timers. Full dimensional and capacity information for the stainless steel units is given.

▪ Metalwash Machinery Corp., Elizabeth, N.J.

Circle 414 on inquiry card

MEDICAL LABORATORY EQUIPMENT / Binder catalog covers a full line of refrigerators, freezers, morgue and autopsy equipment for hospital and laboratory installation. Four models of blood bank refrigerators with automatic temperature monitoring are featured; comprehensive drawings provide dimensions for each product. ▪ The Jewett Refrigerator Co., Inc., Buffalo, N.Y.

Circle 415 on inquiry card

STORAGE/RETRIEVAL SYSTEM / A "User's Report" details an actual installation of *Deep-Reach* truck and *Order Pick* retrieval vehicles in an auto parts supply house, where parts of different sizes, shapes and weights had to be handled by the storage system. ▪ The Raymond Corp., Greene, N.Y.

Circle 416 on inquiry card

CONCRETE RETARDERS / A full-color folder illustrates the variety of aggregate reveal possible with *Boldcast*, *Tuf-Cote* and *HI-V* retarders. Heavy, medium, and light aggregate exposure—from marble chips to boulders—are shown in job photos. ▪ Preco, Plainview, N.Y.

Circle 417 on inquiry card

CONCRETE FORMING / A 36-page catalog lists over 150 products, divided into eight sections: snap ties; coil ties; heavy concrete construction; hanging systems; re-bar supports; screening devices; inserts; and miscellaneous accessories. Product application and safety notes are included. ▪ Vimco Mfg., Inc., Devon, Pa.

Circle 418 on inquiry card

CONCRETE FORM COATING / Brochure compares on-the-job performance characteristics of basic types of form release agents, and explains *Magic Kote* coating's ability to prevent many form and stripping problems. ▪ Symons Corp., Des Plaines, Ill.

Circle 419 on inquiry card

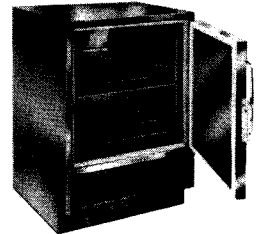
IRRIGATION SYSTEM DESIGN / A recently published manual, "Irrigation System Design Handbook," is intended to provide an in-depth treatment of the principles of hydraulics, selection of sprinkler components and design techniques. Technical data provided includes pipe friction loss tables and fitting, valve and water meter pressure loss charts. Textbook is available for \$18.00 from Rain Bird Sprinkler Mfg. Corp., P.O. Box 37, Glendora, Calif. 91740.

DECORATIVE FOUNTAINS / A 16-page catalog presents over 40 color photos of *Custom Crafted Fountains* for parks, hotels, malls, corporate offices, etc. These are said to achieve unique *Water Sculpture* effects using multichannel nozzles to expand solid water streams into fountains of prismatic crystals many times larger than the original stream. These "Group C" fountains are said to produce an infinite array of motion, texture and color with economical use of electric power. A companion catalog illustrates the "Group B" series of smaller bowl fountains up to 8 ft in diameter. ▪ Rain Jet Corp., Burbank, Calif.

Circle 420 on inquiry card

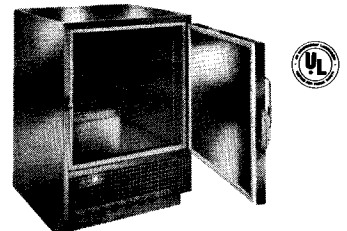
WE FIT IN

STAINLESS STEEL UNDER COUNTER LAB REFRIGERATORS AND FREEZERS



UC-5-BC refrigerator has a blower coil cooling system with automatic off-cycle defrosting and condensate evaporator in condensing unit compartment. Two adjustable stainless steel shelves are provided.

UC-5-F-BC freezer is equipped with automatic timer electric defrost. Capacity—5.4 cu. ft. (155 ltr.)

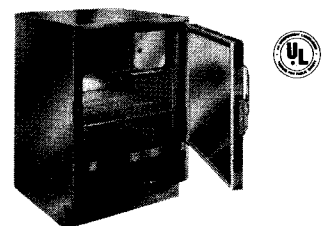


UC-5-CW* refrigerator with cold wall cooling system is equipped with push-button defrost, automatic reset and condensate evaporator. Capacity—5.4 cu. ft. (155 ltr.)

UC-5-F-CW* freezer is equipped with manual hot gas defrost. Capacity—4.6 cu. ft. (130 ltr.)

UC-5-CW-E refrigerator has the same interior features as the UC-5-CW but modified to make it *totally explosion-proof*. Capacity—4.9 cu. ft. (140 ltr.)

*With explosion proof interior only.



UC-5 features a two-tray ice cube cooling system with manual defrost and stainless steel defrost water tray. The cooler section has two adjustable stainless steel shelves. The entire UC-5 series features polyurethane insulated thin wall construction and air-tight neoprene thermo-break door seals. Capacity—5.4 cu. ft. (155 ltr.)

Jewett also manufactures a complete line of blood bank, biological, and pharmaceutical refrigerators and freezers as well as morgue refrigerators and autopsy equipment for world wide distribution through its sales and service organizations in over 100 countries.



For more data, circle 71 on inquiry card



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New associates, promotions

Jones/Mayer and Associates, Inc. has announced the appointment of **Carl D. Reinhardt** as director of housing and residential development.

Raymond Lo, AIA, is named director of architectural design of Robert and Company Associates.

F. Jack Harden, AIA, has joined Gee & Jensen Engineers-Architects-Planners Inc.

Lowell Brody, AIA, is the new director of project development for Marcel Breuer & Associates.

Fujikawa Conterato Lohan and Associates have announced **Peyton Abbott III, James P. Cagnina**, and **Melvin J. Wilson** as associates to the partnership.

New directors of Shepley Bulfinch Richardson and Abbott are **George R. Mathey, Lloyd P. Acton**, and **Leo O. McEachern**.

Hugh Stubbins and Associates Inc. has elected **Hugh A. Stubbins, Jr.** as president; **Merle T. Westlake** and **Edwin F. Jones** as vice presidents and directors; and has announced the appointment of **W. Easley Hamner, Richard J. Green**, and **Hugh Stubbins III** as new vice presidents and directors.

New addresses

Donald R. Goldman, AIA has established a new practice at 3920 Third Avenue, San Diego.

Perry Dean Partners Incorporated, and Stahl Associates Incorporated, have announced the formation of **Perry, Dean, Stahl & Rogers Incorporated**, with offices at 177 Milk Street, Boston.

Michael S. Adams, AIA, has opened an office of architecture and planning at 1204 Hollis Avenue, Cherry Hill, New Jersey.

The Lincoln, Nebraska firm of Clark & Enersen, Hamersky, Schlaebitz, Burroughs & Thomsen has changed its corporate name to **The Clark Enersen Partners**.

Charles Hugh Crain and Keith A. Petitjean announce the formation of **Charles Hugh Crain Associates, Architects**, located at 233 rue France, Lafayette, Louisiana.

F. Daniel Cathers, AIA, and **William W. Lukens** announce the opening of **Cathers/Lukens Architects**, The Farmhouse, Great Valley Corporate Center, Morehall Road, Malvern, Pennsylvania.

Robert D. Kirk, AIA, and **Kay D. Kennedy, AIA**, have established the firm of **Architectural Concrete Associates Inc.** with offices and laboratory at 15304 B. Dooley Road, P. O. Box 953, Addison, Texas.

Douglas T. O'Donnell, P.E. and **Myron B. Silberman, AIA, ASCE**, have formed the architectural and engineering firm of **O'Donnell & Silberman Associates, Inc.**, 604 East Fourth Street, Marshfield, Wisconsin.

James B. Phillips and **Kent D. Dounay** have formed **Design Group, Inc.** at 4131 North 48th Street, Phoenix, Arizona.

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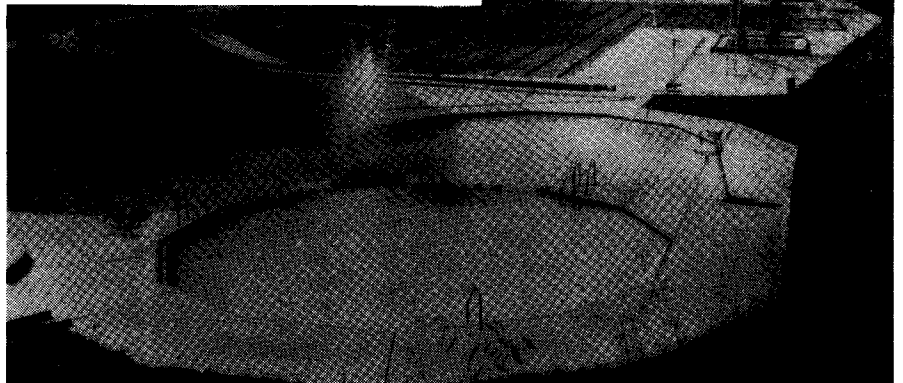
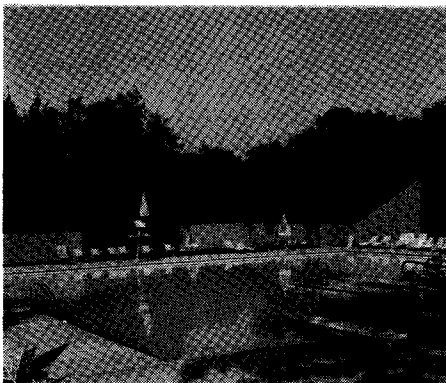
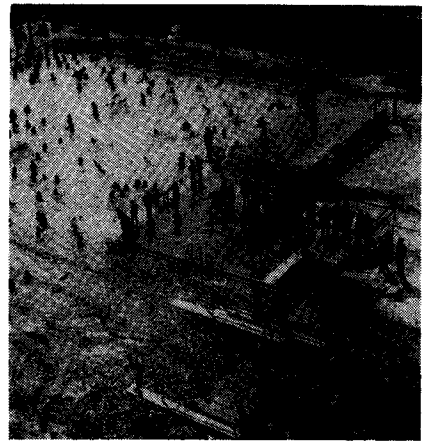
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For more data, circle 115 on inquiry card

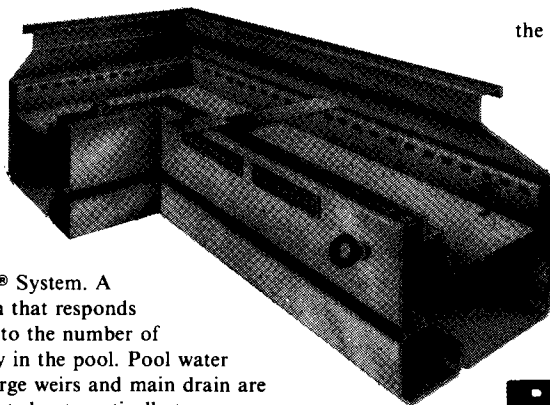
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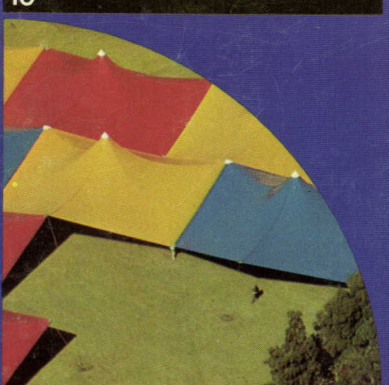
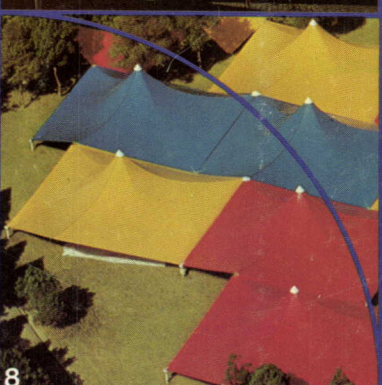
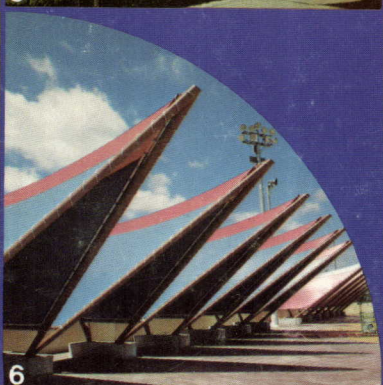
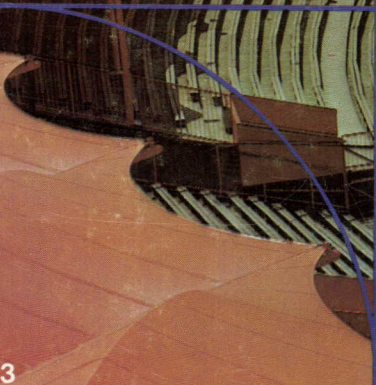
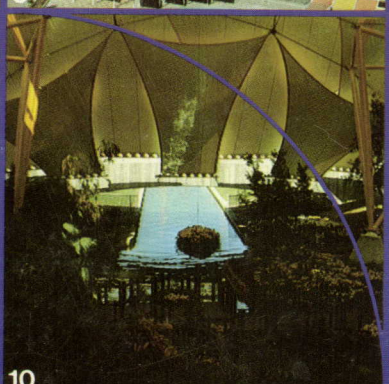
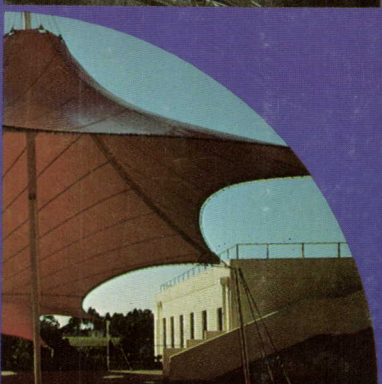
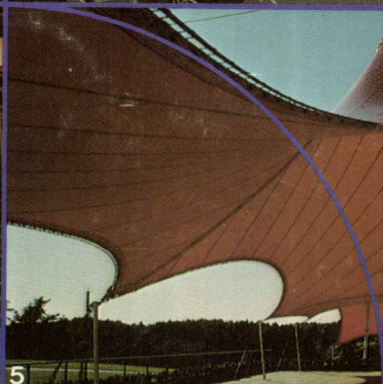
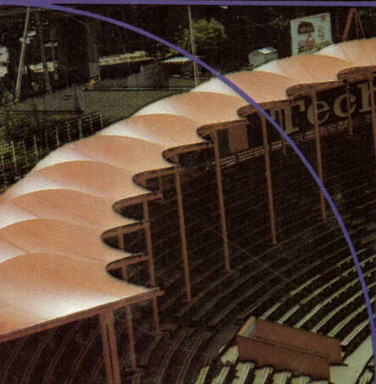
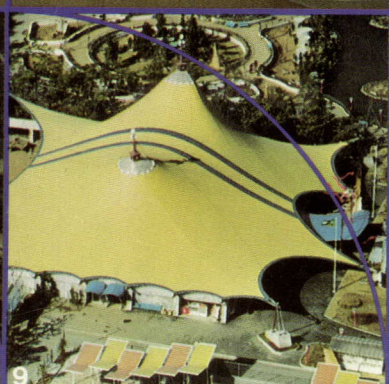
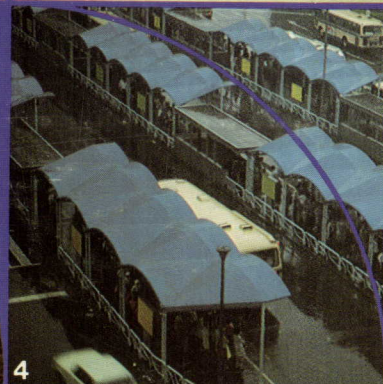
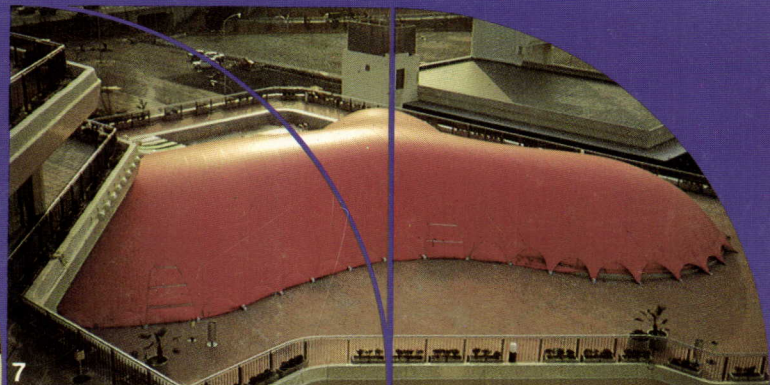
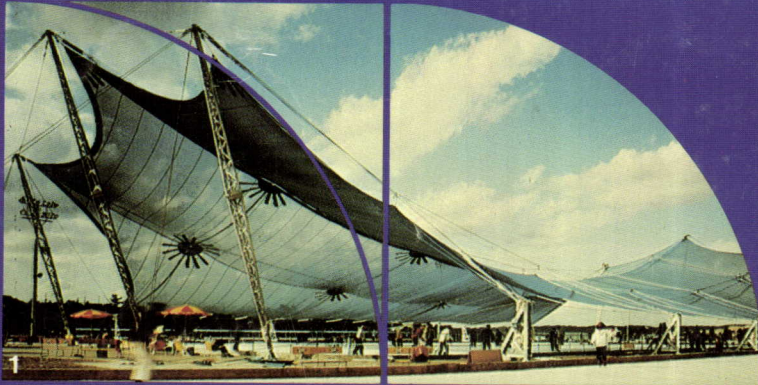
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1. Ice skating rink
2. Picnic table shelter
3. Baseball grandstand shelter

4. Bus stop shelters
5. Golf club sun shelters
6. Poolside sun shade

7. Air-supported pool structure
8. Conference/convention structures

9. Amusement park theater
10. Floral pavilion, Calif. State Exposition