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BUILDING TYPES STUDY: RETAIL MALLS
FULL CONTENTS ON PAGES 10 AND 11

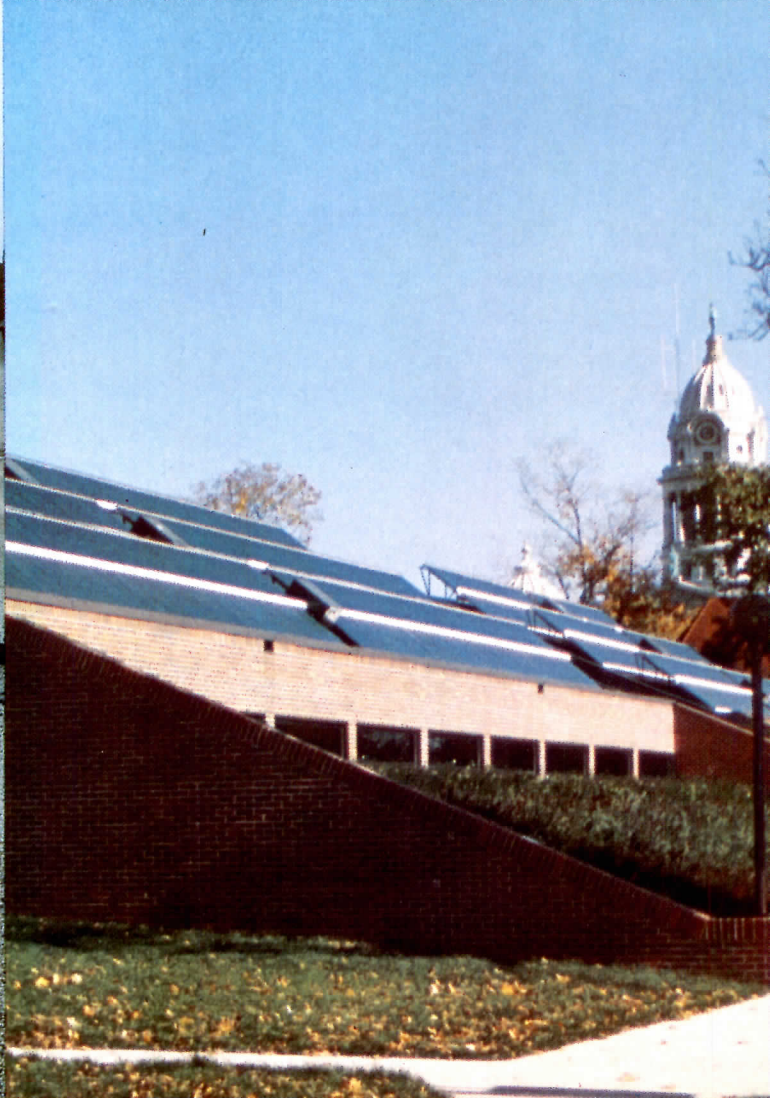
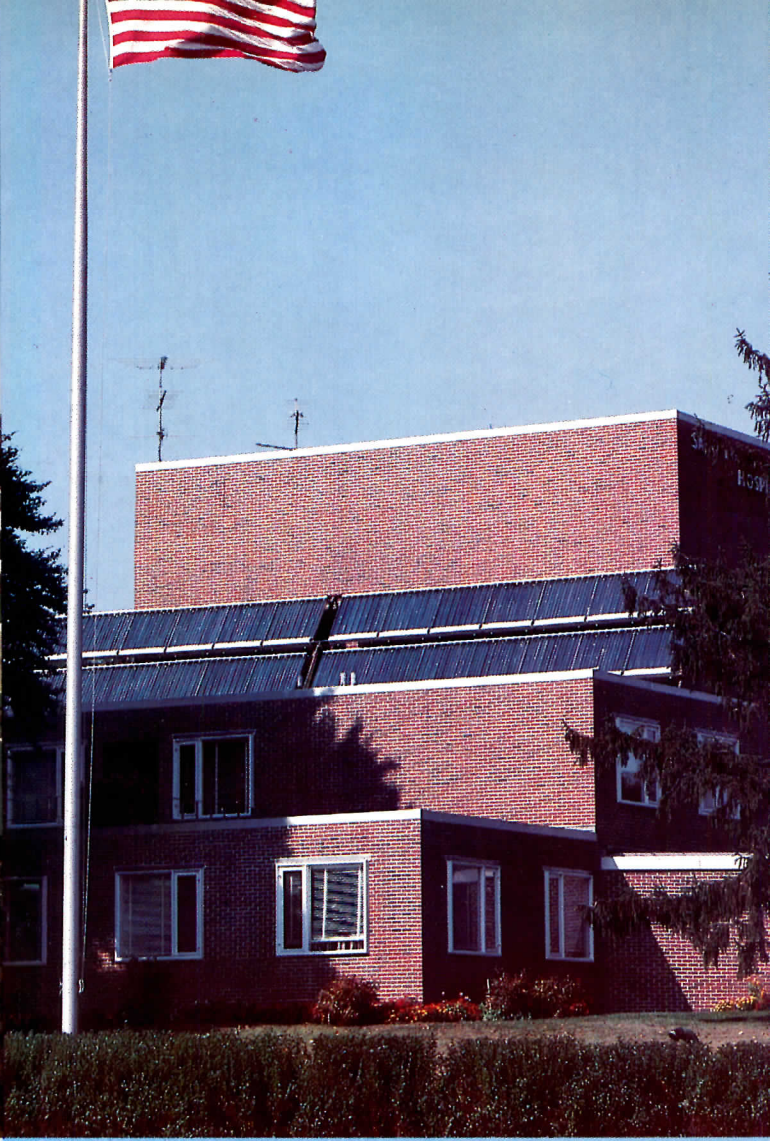
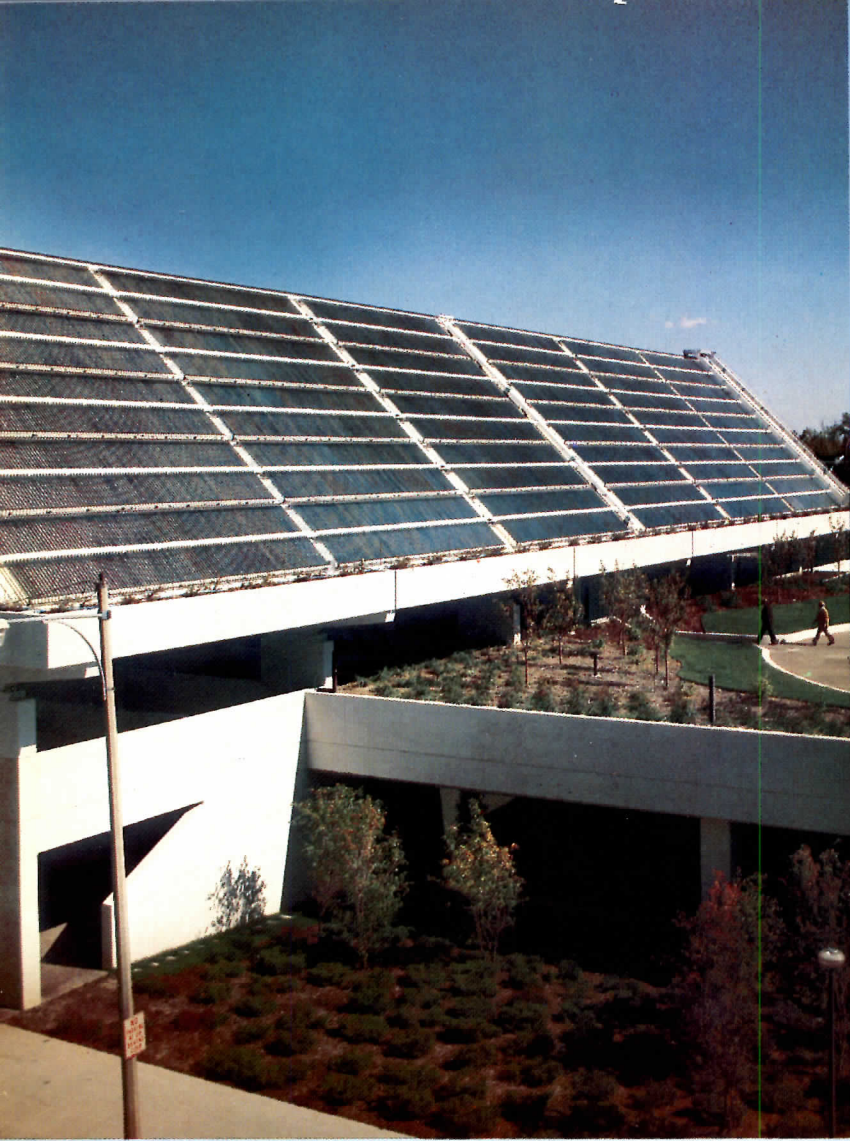
ARCHITECTURAL RECORD

FEBRUARY 1979

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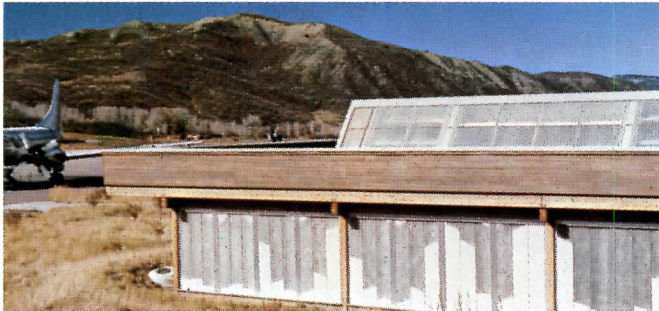
PITKIN COUNTY AIR TERMINAL, ASPEN, COLORADO. This is the first public building in America to complement solar heating with *moveable* insulation systems.

On cloudy days and at night, one system automatically covers skylights with insulated louvers.

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"Here is living proof that advanced energy technology and human values can dwell together. If you have to get stuck in an airport, this is a nice place for it to happen."—Jury



Buford Duke, Jr., AIA—Benham-Blair & Affiliates of California, Inc., Los Angeles, California.





James Copland, Tim Hagman, Larry Yaw—Copland, Finholm, Hagman, Yaw Ltd., Aspen, Colorado.



STATE OFFICE BUILDING, SACRAMENTO, CALIFORNIA. This building design was already a winner.

It beat out forty other entries in a design competition held by the State of California in their search for a truly energy-efficient state office building.

Once built, the building will come close to achieving the impossible: maximum exposure for solar generation, minimum exposure for energy conservation.

For maximum exposure, there will be a six-story office tower. Solar panels covering the south side will generate energy for heating and cooling.

To conserve energy, the rest of the office space will be built underground, around a great sunken courtyard. Light wells will provide natural lighting. Overhead, an urban park will provide insulation.

"Here is a clear, strong, architectural statement relating to energy conservation through design."—Jury

MUSEUM OF SCIENCE AND INDUSTRY, TAMPA, FLORIDA. The roof will be the energy center of this building.

It will be canted on one side so it shades the museum. Roof vents will provide natural ventilation. Rainwater from the roof will be recycled for use inside the building.

A proposed photovoltaic solar system would generate electricity.

These systems will be exposed and displayed so museum visitors can see them work.

"This will be a national demonstration of the most progressive principles of energy conservation."—Jury



Thomas P. Reilly, AIA, Victor D. Langhart, AIA, Ronald L. Whatley—Rogers, Nagel, Langhart, Inc., Denver, Colorado.



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H. Dean Rowe, AIA—Rowe Holmes Associates, Inc., Tampa, Florida.



BUS MAINTENANCE FACILITY, AURORA, COLORADO. Ventilation and temperature control are big problems when three hundred city buses have to be serviced and stored under one roof.

The solution is a *direct-feed air solar system*. Air intake will be regulated by bus activity and smoke sensors.

Landscaped earth berms not only insulate outside walls, they also soften the scale of the building (349,000 sq. ft.).

"The sensitive contextual design doesn't give up major responsibility to energy conservation."—Jury



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For more information, write X.S. Meeks, Owens-Corning Fiberglas Corp., Fiberglas Tower, Toledo, OH 43659.



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NEXT MONTH IN RECORD

Building Types Study: Office buildings
One of the most active areas of design and construction is office buildings. The office building boom of the early 1970's reached its peak in 1973 with the creation of so much space that there was a glut in the marketplace. This excess space has now been utilized and the demand for more space is urgent. Development is expected to be so strong that the RECORD will focus in the March Building Types Study on three meritorious designs, each having met different and complex contemporary demands, including projects in both suburban and center-city locations.

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The National Institute of Building Sciences: Joining up looks like a very good investment

The National Institute of Building Sciences, now entering its second year of official existence, is now actively soliciting members. It hopes for a good representation of members from all of the segments of the building industry—from manufacturers and producers, from trade associations, from involved academicians, from appropriate government agencies, from contractors, from subs, from homebuilders—and from architects and engineers. If NIBS is to fulfill its role as an effective force serving all segments of the building industry, it needs members from all those segments—and I for one urge you to make the small monetary commitment involved to indicate your support.

For those of you who haven't been listening, a brief review of what NIBS is all about. It's all about something everyone in the industry has been complaining about for years: the crazy-quilt of overlapping and sometimes conflicting codes and regulations and systems for the introduction of new technology; the proliferation of government bureaus and task forces and private associations and research groups. NIBS was established by Congress to work with the building industry "to devise a more uniform, efficient, quicker way to introduce the benefits of science and technology into housing and building."

NIBS has a series of specific objectives:

1. To set up a system for evaluating materials, components, products, and systems on the basis of performance capability.
2. To devise uniform testing and evaluation procedures for performance standards development.
3. To work with model code groups and regulatory bodies to develop building codes based on performance standards.
4. To speed the flow of new products and systems into the building market with a system for qualifying innovations that meet the performance standards.
5. To devise an equitable way of handling disputes that arise from the development of new performance standards.

In addition, NIBS has already begun undertaking specific projects such as identification of areas where uniform standards are needed, development of a national data collection and dissemination system, and will also address itself "to various topical issues confronting the public such as energy conservation, earthquake-hazard reduction and improved fire safety. The Institute will achieve

these objectives by working with existing research organizations and model code groups with the continuing advice of the building community and the public."

In its first year, with a staff of 20, NIBS has underway or has completed an extraordinary number of timely studies; including:

- a study of guidelines for rehabilitation work, for the many such jobs where codes are difficult to apply,
- a codification of mobile home standards,
- a study of product-liability warranties and guarantees,
- a study of insulation needs and standards,
- a study of the impact of regulation (primarily Federal) on construction,
- a study of the technical information needs of the building community—what's needed, and how to get it out,
- a study of the need for solar energy codes, based on a concern that premature codes would tend to freeze technology. . . .

Another study, recently completed, was the development of an implementation plan for the new energy standards—a study that is astonishingly thorough and thoughtful, and which is reported on page 133 of this issue.

NIBS hopes to undertake a lot more studies, as its membership (and funding) grows. Congress has appropriated funds to get NIBS on the road—but that commitment closes down in five years. Future work will be funded grants from private organizations and government agencies, research project funding from industry or agencies, administration fees for projects in testing and evaluation of products or standards, services fees derived from the data collection/dissemination program—and from membership dues. Manufacturers and producers are joining NIBS now at a great rate—at dues of up to \$1000 per year. On NIBS' sliding scale, most architectural and engineering firms would be eligible for a membership at \$250 per year—and it is possible to join as an "individual participating member" at \$30 per year or a "subscribing member" (who does not actively participate but will be kept advised of activities) for \$20—all tax deductible.

NIBS does appear to be off to a good start—and it seems to me that its work and its potential is *well worth* the interest of architects and engineers. At least write to Richard Bullock, vice president, at the National Institute for Building Sciences, 1930 Pennsylvania Avenue, NW, Washington, D.C. 20006 for membership information. —W.W.

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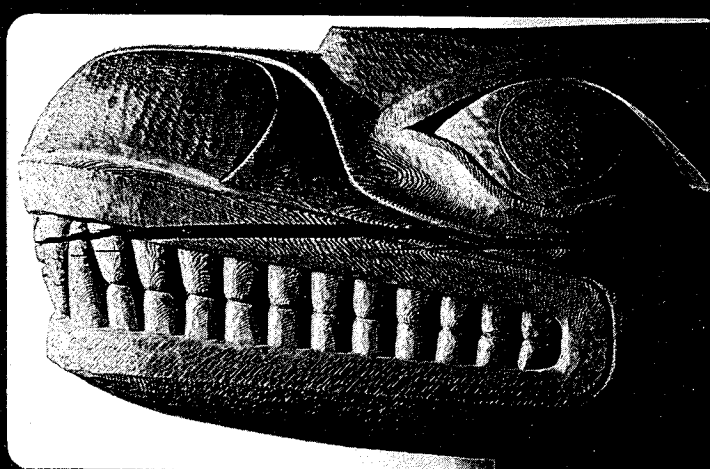
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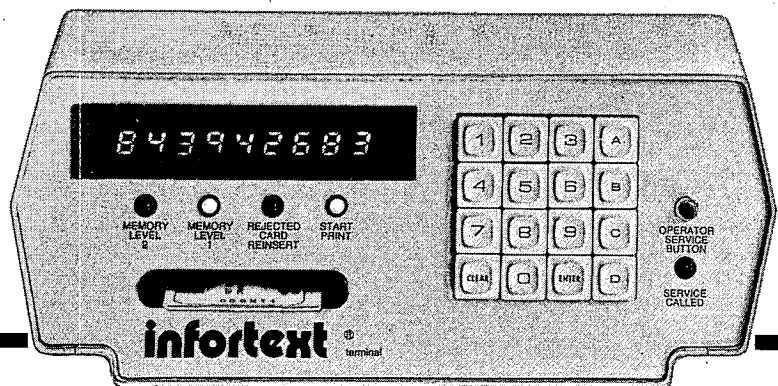
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Geddes, Brecher, Qualls, Cunningham of Philadelphia will receive the AIA's 1979 Architectural Firm Award. Announcing the award, which is given "to a firm which has consistently produced distinguished architecture for a period of at least ten years," the Institute further commended the firm's continuing commitment to architectural education. The honor follows on the heels of the Pennsylvania Society of Architects' award of its Silver Medal to GBQC for the design of the Market Street Renewal and Restoration in Corning, New York.

Pier Luigi Nervi died January 9 at the age of 87. The Italian engineer's dramatic designs in reinforced concrete included the Turin Exhibition Hall, three buildings for the 1960 Olympics in Rome, and the George Washington Bridge Bus Station in New York City. Mr. Nervi received the AIA's Gold Medal in 1964.

New director of National Endowment for the Arts' Architecture, Planning and Design Program is Michael Pittas. Mr. Pittas has served as a city planner in Trenton, New Jersey, and New York City, as a teacher of planning at Harvard, and as a private consultant. The Endowment has also announced the appointment of Charles B. Zucker as assistant director of the program; Mr. Zucker previously worked as a private planning consultant and educator.

The rate of construction "faded" in November, dropping 11 per cent below October's near-record level, according to the seasonally-adjusted Dodge Index, reports the F. W. Dodge Division of McGraw-Hill Information Systems Company. Nonetheless, the month's contracts totalled 13 per cent more than in November 1977, and Dodge chief economist George A. Christie observes that "the construction market is holding up surprisingly well, considering the recent escalation of monetary restraint." Contracts for stores, factories, warehouses and, especially, office buildings "soared" 53 per cent over last November's contracts, and residential contracts were up 10 per cent. Mr. Christie described the endurance of the housing boom as "simply amazing."

Two more major designs have been commissioned for Washington's Pennsylvania Avenue redevelopment: Harry Weese and Associates will complete the Federal Triangle on the south side of the street, and Hardy Holzman Pfeiffer Associates will restore the landmark Willard Hotel on the north side. Details on page 36.

A Justice Department proposal would have states establish panels to pass on the merits of malpractice suits and thus encourage pretrial settlements and lower the costs of litigation and insurance. Details on page 39.

The AIA will present its Edward C. Kemper award for 1979 to Herbert E. Duncan, FAIA, of Kansas City, at its national convention in June. The award honors significant contributions to the Institute and the profession, and the Board of Directors specially cited Mr. Duncan's "established record of durability and hard work" as chairman of 15 committees and task forces since 1970. The AIA also announced the names of three men who will address the convention: Norris K. Smith, chairman of the Department of Art and Archeology at Washington University, St. Louis; James Q. Wilson, former director of the MIT/Harvard Joint Center for Urban Studies; and I. M. Pei, who will deliver the Gold Medal Address.

The Department of Energy has completed a policy review suggesting means of increasing the use of solar energy, the Associated Press reports. The review offers three policy options: 1) continue present policy, under which solar energy might fill 8.6 per cent of U. S. energy needs by the year 2000; 2) increase government investment to \$2.5 billion over five years (1980-85) and achieve a level of 10.6 per cent reliance on solar energy by 2000; 3) increase government investment to \$113 billion over a 20-year period and achieve a level of 25 per cent reliance by 2000. Secretary James R. Schlesinger favors a goal of 20 per cent reliance on solar energy by 2000, says AP.

The American Academy and Institute of Arts and Letters has elected architect I. M. Pei its chancellor. Mr. Pei is the first architect in the history of the predominantly literary academy to hold the position.

The Michigan Society of Architects has published a *Handbook for the Construction Industry.* In addition to a directory of MSA members, the handbook includes sections on "Practice Aids" (e.g., building codes, arbitration codes) and "Directories" (e.g., national and state associations, government agencies). Copies are available, at \$25 each, from Rae Dumke, MSA, 553 East Jefferson, Detroit, Michigan 48226.

Melbourne, Australia, offers \$100,000 for an idea for a landmark that will be "famous throughout the world," something comparable to the Eiffel Tower or the Sydney Opera House. The landmark would occupy an 80-acre site that separates the Yarra River and parkland from the central city. Premier R. J. Hamer of the State of Victoria says the idea need not be architectural or engineering—it could be social or artistic. But it must be "practical." The competition closes April 30, and entry is by purchase of an official brochure for \$10 Australian (\$11.40 U. S.) from Competition Landmark, Landmark Committee, 49 Spring Street, Melbourne 3000, Australia.



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Moore installs his "vertebrae" in front of Dallas City Hall

"Now the building is complete," I. M. Pei declared when Henry Moore's monumental sculpture, commissioned for the new Dallas City Hall by private donors, was assembled in front of the 560-ft-long building.

Mr. Moore said he found the structure "so impressive, so powerful" that it required "a certain scale of sculpture." He admitted to "lying awake all night" before the final placement of the work, being "very concerned about the scale." But when he saw the finished installation, he said, "I think we got it right."

The three-piece bronze, 16 ft high, is the largest work created to date by the 80-year-old British sculptor. Cast at the Morris Singer Foundry in London, the 27,000-lb sculpture was shipped to the port of Houston, then transported by train to the park in front of City Hall, where Mr. Moore and Mr. Pei spent two hours directing the crane that placed the pieces among the trees.

Originally, Mr. Moore titled the \$450,000 sculpture *Vertebrae—Three Pieces*. Now he simply calls it "the Dallas piece." He explained that while the work is a variation on his

"vertebrae" theme, it is unlike other versions, which are locked together. In the Dallas piece, the elements are freestanding so that people can walk between them. Each of the parts has a triangular composition, and this triangular rhythm, says Mr. Moore, has been expanded in the arrangement of the three pieces in relation to each other.

The sensuous, rounded but powerful forms complement and contrast with Mr. Pei's massive, modular building, whose sloping facade forms a canopy over the sculpture.

Public reaction to the sculpture, as expressed in letters to the newspapers, varies widely. At the same time, however, hardly anyone passes by without rubbing or thumping the piece, and a good many people walk through the space within the sculpture.

This is the third Pei-designed building for which Mr. Moore has created a sculpture. The building has a cantilevered front that slopes outward at a 34-degree angle, with each floor projecting nine feet beyond the one below. —Lorraine Smith, *World News, Dallas*.



Lorraine Smith photo

Justice Department suggests screening of malpractice suits

The U.S. Justice Department thinks it has a partial answer to the problem of high-cost professional malpractice insurance.

It proposes legislation that will require all states to set up screening panels of experts in the various professional disciplines to pass on the merits of malpractice claims before they are forwarded to the courts.

The panels would not be able to prevent anyone from filing suit if they were dead set on doing so. But an official finding that the professional acted properly may be useful in discouraging plaintiffs from pressing ahead with litigation.

Likewise, a panel finding that malpractice did exist should encourage defendants and insurers to settle without going through with the expense of a trial.

This plan is the Justice Department's response to a White House call for ideas to dampen inflation. Department attorneys say that by lowering the cost of malpractice litigation, malpractice insurance premiums would also fall.

Department officials would not say last month just what mechanism the Federal government would use to force the program on the states. But they presumably could threaten to cut off some forms of Federal aid to states that refuse to establish a program.

Justice lawyers say the program will focus first on medical malpractice, but will be expanded to include architects, engineers, and other professionals if the program works for the physicians. —William Hickman, *World News, Washington*.

Ramachandran of India takes office as UN Habitat director

On October 12, the UN Center for Human Settlements (Habitat) became officially established—with headquarters at Nairobi, Kenya—through the Secretary-General's Bulletin issued from UN Headquarters in New York City to all members of the Habitat staff and to the United Nations system generally.

The Bulletin defines the broad functions and scope of the center, which accord with UN General Assembly Resolution 32/162, adopted in December 1977. The center assumes the functions of various organizations of the UN system concerned with human settlements, including those of the UN Habitat and Human Settlements Foundation, the UN Environment Program, the Department of International Economic and Social Affairs, and the Department of Technical Cooperation for Development. In practical terms, the last transfer is important as it relates to the execution, management, budgetary control, contracting, purchasing, recruitment and training for human settlements projects, together with all corresponding posts.

The modalities of cooperation with the UN Development Program, the UN regional commissions and the other organizations remain to be worked out between the heads of the organizations concerned. The Director of the United Nations Audiovisual Information Center for Human Settlements (VISION-HABITAT)—the depository, with regional offices, for the vast heritage of films produced for the Habitat Conference held two years ago at Vancouver—will also report to the Executive Director of the Center for Human Settlements.

In step with the establishment of the new Center for Human Settlements, Arcot Ramachandran of India took office as Executive Director in October of last year, following his appointment at the undersecretary-general level by UN Secretary-General Kurt Waldheim.

Mr. Ramachandran formerly served as Permanent Secretary to the Government of India in the Department of Science and Technology. Born April 6, 1923, he obtained his Bachelor's degree with honors from the College of Engineering, University of Madras, in 1943, and was awarded a Master of Science degree in 1947 and a Doctorate in 1949 by Purdue University, India. He served as a post-doctoral fellow at Columbia University and the Massachusetts Institute of Technology.

Before assuming his present post, Mr. Ramachandran served, from 1967 to 1973, as Director of the Indian Institute of Technology in Madras. Since 1977 he has also served as Director General of the Indian Council for Scientific and Industrial Research. Still earlier, from 1957 to 1967, he was professor and head of the Department of Engineer-

ing at the Indian Institute of Science in Bangalore.

Mr. Ramachandran faces many problems in getting the work of the new center under way. In terms of resources, very few of the developed countries have seen fit to pledge or make voluntary contributions for the UN's work in human settlements, despite the repeated appeals of the UN General Assembly, which established a four-year target of \$50 million for this purpose.

A "unified pledging conference" of governments for seven UN development organizations and agencies, including the UN Habitat and Human Settlements Foundation, was held at UN Headquarters in New York last November. The total pledges or contributions for Habitat amounted to only \$942,000. Only two developed countries, Belgium and the Netherlands, had previously contributed to the foundation for the Habitat cause; their contributions totaled about \$250,000.

Although many developing countries have pledged or contributed, the amounts are generally modest, totaling less than \$2 million.

The largest donor to the foundation remains the Philippines, with its pledge of \$1 million, on which it is making installment payments over a four-year period.

The United States is not contributing to the UN's human settlements program. Although Canada was the major sponsor of Habitat: UN Conference on Human Settlements, held in Vancouver in 1976, and, together with Sweden, was the primary promoter of the UN resolution fixing Nairobi as the headquarters for the new center, it was the first country to announce that it would not contribute to the UN program for human settlements. Sweden, similarly, has declined to pledge or contribute, even though the Chairman of the UN Commission on Human Settlements, Ambassador Göte Svensson, is a distinguished Swedish authority on housing.

The new Habitat Center also faces problems of relocation of personnel to Nairobi from UN Headquarters in New York City. As of December, only four professionals had actually transferred to Nairobi. The next meeting of the 58-member UN Human Settlements Commission will be held in Nairobi from March 26 to April 6, 1979. The Commission will have a full agenda. —Eric Carlson, *UN Habitat and Human Settlements Foundation, Nairobi*.

Preliminary planning for Habitat Center, to be built at Gigiri near Nairobi, has been completed by an international architectural consortium composed of Britain's James Stirling, Italy's Giancarlo DeCarlo and Kenya's Mutiso Menezes International (RECORD, May 1978, page 37).



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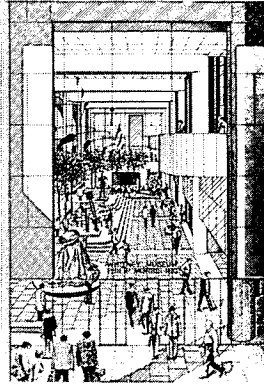
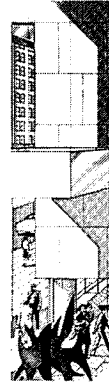
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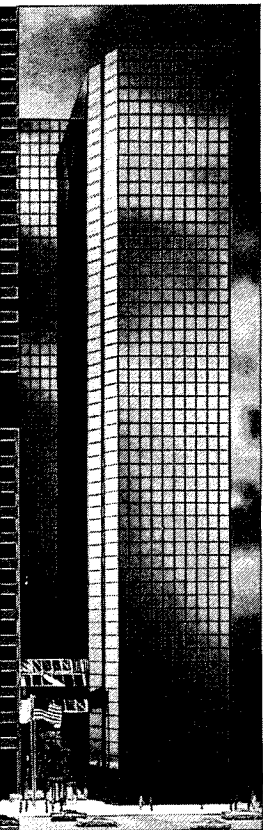
In Manhattan, Franzen designs a tower for Park and 42nd...

The new corporate headquarters for Philip Morris Inc. will attempt to mesh both private and public concerns. Designed by Ulrich Franzen & Associates, the 26-floor, 600,000-sq-ft structure, to be built on the site of the former Airlines Terminal Building at Park Avenue and 42nd Street, will house a midtown branch of the Whitney Museum of American Art. The sculpture gallery, funded by Philip Morris, will be encased in a 42-foot-high glass pedestrian plaza. This public open space permits Philip Morris to cover 100 per cent of its site, and the

building has been allowed to grow even larger because of Penn Central Co.'s sale of some of its air rights above Grand Central Terminal across the street. Philip Morris paid \$2 million for 75,000 sq ft of the Terminal's air rights, which the landmark itself cannot utilize. The main entrance on Park Avenue will have a classically heavy base and an ornamental facade with vertical strips of gray granite. The 42nd Street side will be encased in a darker gray granite, with no longitudinal emphasis—a modest facade deferring to the Beaux-Arts station.

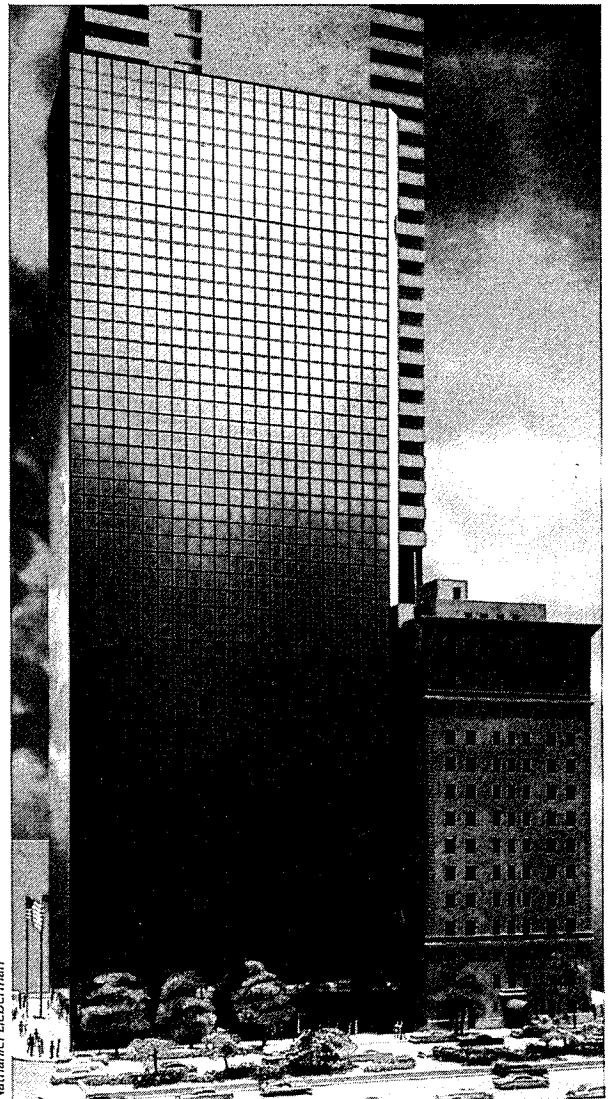


and I. M. Pei designs another for the corner of Park and 59th



A speculative office building that will provide 250,000 sq ft of space will occupy the southeast corner of Manhattan's Park Avenue at 59th Street. Designed by I.M. Pei & Partners for developer George Klein, the glass tower is expected to appeal to luxury tenants such as international firms. The faceted structure, composed of gray heat-absorbing-glass vision and spandrel panels, has wraparound glass exteriors to offer a view of Central Park two blocks away. However, transparent glass is used for the covered plaza that houses a 60-ft-high-

sculpture garden and runs diagonally through the building leading to the concourse level—15,000 sq ft of space that will be leased to boutiques and showrooms. Individual heating, cooling and ventilation systems will enable each of the 25 floors to handle its own environmental control, thereby increasing energy efficiency. Finally, to ensure flexibility in office design, James Freed, Pei's partner-in-charge of this project, has placed elevators and other core features at the rear of the building. Completion of the project is scheduled for early 1980.



Nathaniel Lieberman



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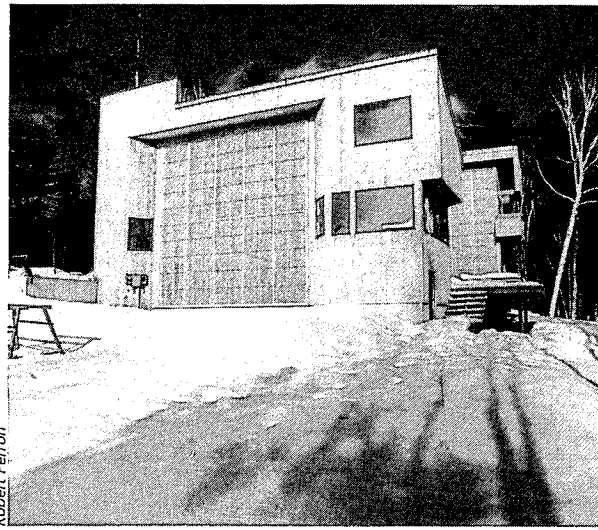
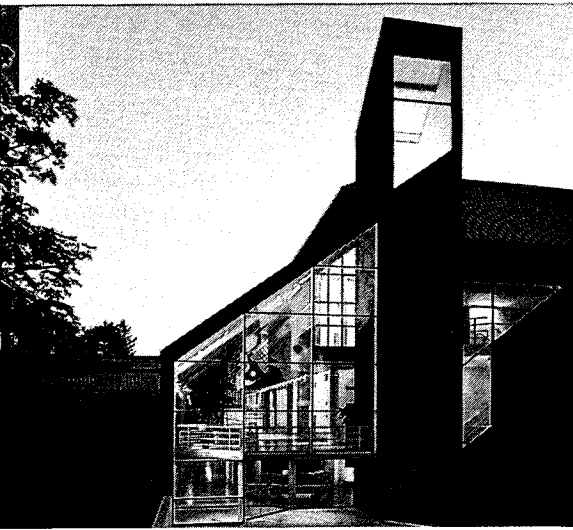


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Robert Perron

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Design awards program honors six buildings designed by New England architects

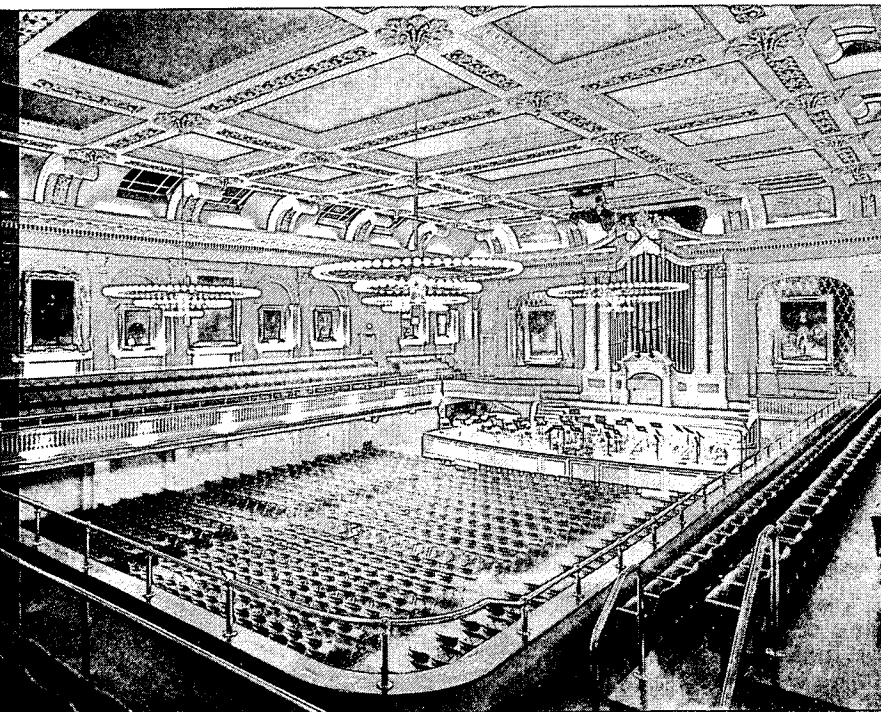
its conference late last year, the New England Regional Council of the AIA selected six New England projects as award-winners. (1) Ainsworth Gymnasium, Smith College, Northampton, Massachusetts; The Architects Collaborative. This building fitted onto a traditional campus and was raised for its form, which responds to the angular approach to the building. The aer gym was put to good

re-use as part of the new structure, and architect-designed banners add brightness. (2) C.S. White House, Vermont; Banwell White & Arnold, Inc., architect. The jury was impressed by the architectural sensitivity with which the solar energy system was handled and said that, "Solar collectors achieve an integrated appearance in the structure." (3) Exeter Street Theatre, Boston; Childs Bert-

man Tseckares & Casendino, Inc., architect. An urban landmark that had become a white elephant was revitalized by inclusion of a street cafe and improvements in the lobby and the circulation in the theater. "The glass cafe," said the jury, "brings a vitality to the street and modifies the fortress-like appearance of the building." (4) Mechanics Hall of Worcester, Massachusetts; Anderson Notter Finegold Inc.,

architect. Another landmark which had fallen into disrepair was rescued, says the jury, by the sensitive, restrained handling of the great central space, and the compatible way in which the lighting and ventilation systems were added. (5) Kimball Carriage House, Andover, Massachusetts; Crissman & Solomon Architects, Inc. This conversion of a carriage house to add study and dining space, was

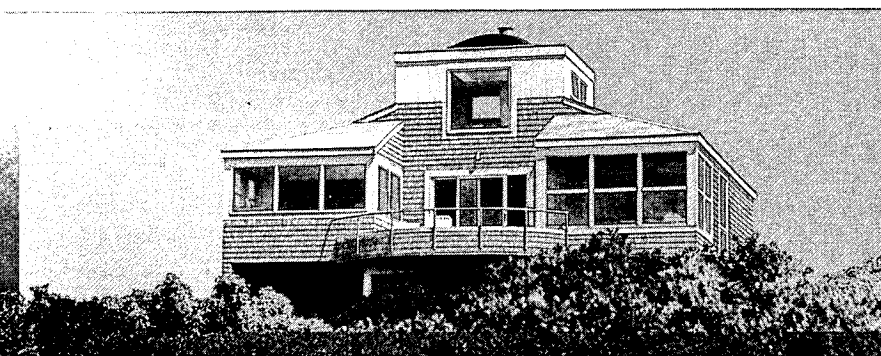
considered highly successful by the jury, who said, "Boldly shaped openings that cut into the old shingled exterior give this an open looking quality." (6) Block Island House, Rhode Island; Donald Watson, architect. The jury noted that the home was "Kahn-Venturi influenced but clearly not derivative," and felt it was "exceptionally powerful and serene in the landscape and in keeping with its surroundings."



Steve Rosenthal



5



6



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(See page 50 for program details)

March 12-13, 1979 Los Angeles
April 23-24, 1979 New York

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(See page 52 for program details)

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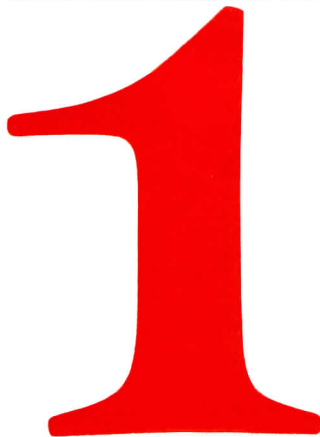
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FOR REGISTRATION INFORMATION, SEE PAGE 56.



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- Drainage
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- Heat rejection
- Estimating fuel savings
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- Designing storage systems
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* As evidenced by these recent news items:

On September 8, 1978 President Carter signed into law a military construction bill that is expected to generate \$50 million in solar architect-engineering funds in 1979, and \$100 million in solar design and construction funds for several years thereafter. The law requires that all new military housing use solar energy equipment if cost effective, and that at least 25 per cent of all the other military construction do the same, on structures started after December 8. —*Business Week, September 25, 1978*

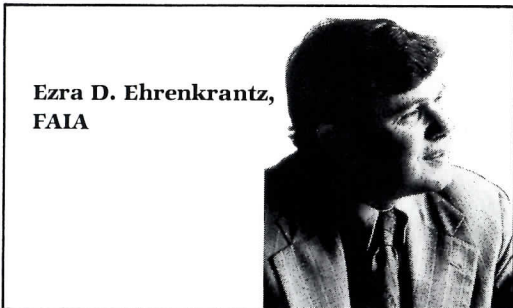
Energy Secretary James R. Schlesinger declares that solar "may soon be the fastest growing part of our energy supply." He shortly will ask the Office of Management & Budget to nearly double for fiscal 1980 the \$500 million that his agency will spend on solar research and development in fiscal 1979. —*Business Week, October 9, 1978*

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Energy conservation has been one of the key objectives of The Ehrenkrantz Group since the firm was founded in 1964. In recent years, the firm has been involved in the design of solar heated buildings, including housing, office buildings, schools, hospitals, shopping centers, and industrial plants. Clients for whom the firm has provided energy-related services include: AIA Research Corporation, Exxon Enterprises, Department of the Air Force, Department of Defense, HUD, Department of the Navy, and Department of Energy.

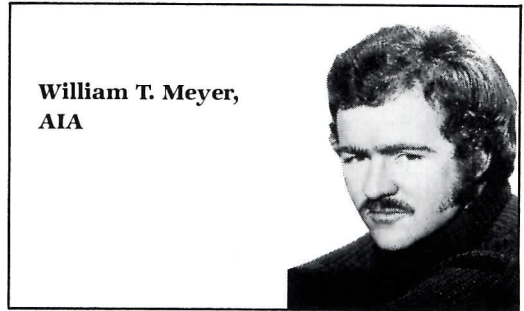
Of special importance is the firm's current work—with mechanical engineers Syska and Hennessy—to provide baseline data on the energy performance of recent buildings as part of HUD's development of energy consumption/performance standards for residential and non-residential buildings.



Ezra D. Ehrenkrantz,
FAIA

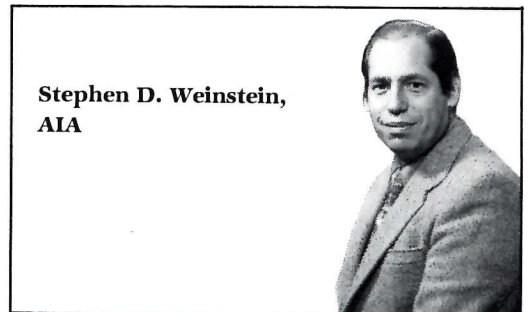
Mr. Ehrenkrantz is president of The Ehrenkrantz Group in New York City. In private practice since 1959, Mr. Ehrenkrantz has considerable experience in passive heating and cooling systems. For two years during the mid-fifties, he worked with the British Building Research Station developing low-technology techniques for accommodating the climate requirements for building construction. These principles and techniques have been applied in the design of many buildings here and overseas. In 1965, Mr. Ehrenkrantz led in the organization of Building Systems Development (BSD) and pioneered the first United States building systems program, School Construction Systems Development (SCSD) in California. He is an author, and lecturer at Yale University and MIT. Mr. Ehrenkrantz was *Engineering News Record's* "Construction Man of the Year" in 1968. He is registered in nine states. In 1977, The Building Research Advisory Board of the National Research Council gave Mr. Ehrenkrantz its Quarter Century Citation for his "significant and lasting contribution to the state of the art and construction

technology" during the period between 1950 and 1975. Mr. Ehrenkrantz is one of only seven architects to be so honored, among whom are Walter Gropius, Eero Saarinen and R. Buckminster Fuller.



William T. Meyer,
AIA

Mr. Meyer, vice president, joined The Ehrenkrantz Group in 1968, and heads all research undertaken by the firm, including work in energy conservation and solar heating of buildings. Mr. Meyer's skills focus on building technology, design and economics. His professional experience includes the management of a solar heating demonstration program for the Department of Defense; the analysis of solar energy for housing uses for the AIA Research Corporation; and design and cost-benefit analysis of energy conscious model houses for Exxon Enterprises, Inc. Mr. Meyer teaches at Pratt Institute and Columbia University, and is the author of numerous articles, including the building system section of the *Fifth Edition of Timesaver Standards*. He has been a speaker at many conferences and seminars on the subject of energy conservation. He is registered in New York and California.



Stephen D. Weinstein,
AIA

Mr. Weinstein is a vice president of The Ehrenkrantz Group, and serves as Director of Technical and Production Services. He is currently providing technical consultation to the Department of Energy in the management of the grant program for the placement of solar systems. He is reviewing and making recommendations on the plans and specifications of all non-residential facilities applying for DOE Demonstration Program funding. Under the auspices of the Department of Energy, Mr. Weinstein and The Ehrenkrantz Group have been preparing a comprehensive design guide for active solar heated buildings.



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- Luminaire selection and surface finishes
- Luminaire layout
- Operation of lighting systems
- Utilization of daylight and ASHRAE 90-75
- Lighting design and the question of initial vs. operating costs
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* This seminar is an *updated* presentation of a program offered last summer.

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I obtained both a general and specific grasp of upcoming regulatory requirements and design trends. Highly useful for our anticipated office review discussion.

Robert Belcher, Architect/Broome, Oringdolph, O'Toole, Rudolf, Portland, Ore.

”

“

I thank you for a very good seminar. It was one of the best I have attended. The slides and examples used... have been excellent. Your overall knowledge of this subject was put across to us in a very successful manner.

Raymond M. Knowles, Architect, Vista, Calif.

”

“

Subject matter was very timely. Speakers well qualified and communicable. Broad spectrum of problem areas discussed.

Noray Sarkisian, Vice President and Chief Electrical Engineer/Cunningham Engineers, Birmingham, Mich.

”

“

Good exposure to some of the latest (current) thinking in the energy area.

Voy Madeyski, Principal Designer/Perkins & Will, Chicago, Ill.

”

“

Very informative and has satisfied expectations. Information should be made available to other design architects.

Moises A. Cordovi, Construction Manager/Lester B. Knight & Associates, Chicago, Ill.

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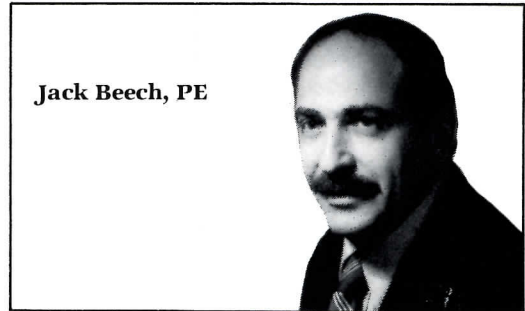
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I felt that the program and the staff selection was excellent. My time was well spent as I took many good ideas back with me.

David Lorincz, Architect/NASA Langley Research Center, Hampton, Va.

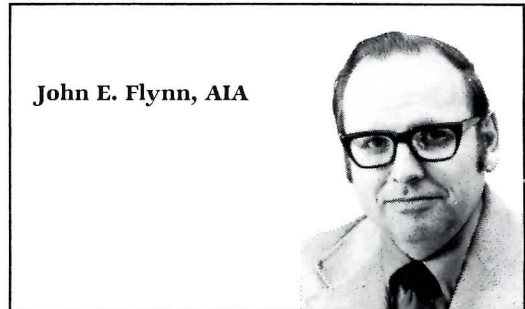
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Jack Beech, PE

Jack Beech, PE is vice president and chief mechanical engineer for Joseph R. Loring & Associates, Inc., New York. Mr. Beech's 25 years' experience includes all facets of hvac system design, with a special emphasis in recent years on energy conservation. Among his latest projects are the Citicorp Center in New York and the South Terminal at Logan Airport in Boston. Mr. Beech holds a degree in mechanical engineering from City College of New York, and a Bachelor of Science degree (physics) from Brooklyn College. He is a registered Professional Engineer in New York, Massachusetts and Connecticut.



John E. Flynn, AIA

John E. Flynn, AIA is a registered architect and professor of architectural engineering at The Pennsylvania State University, University Park, Pa. His experience includes nine years as resident architect for research and application at the General Electric Laboratories at Nela Park in Cleveland. He has been a visiting lecturer at Yale University and currently lectures at the University of Pennsylvania. Mr. Flynn is the co-author of two books, "Architectural Lighting Graphics" and "Architectural Interior Systems" (Van Nostrand Reinhold, New York). He is a Fellow in the Illuminating Engineering Society, and a member of the U.S. National Committee of the International Commission on Illumination, Paris.

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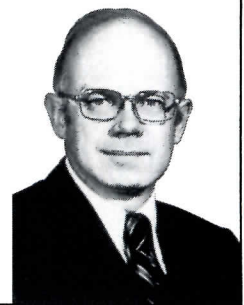
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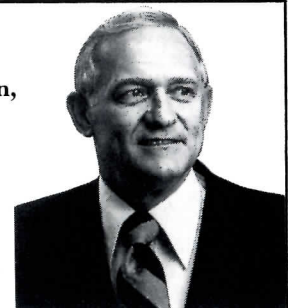
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**David R. Miller,
F.ASCE**



David R. Miller is senior vice president and manager of corporate development for Daniel, Mann, Johnson, & Mendenhall, architect-engineers, in Los Angeles. With more than 30 years of diversified engineering, business development and management experience, Mr. Miller has 27 years of service with DMJM where he directs all business development (international and domestic) of the firm, with annual sales in excess of \$35 million. A registered engineer in seven states and the District of Columbia, Mr. Miller is a member of numerous professional organizations including the American Society of Civil Engineers, American Academy of Environmental Engineers, and the Academy for the Advancement of Engineering. He is also a member of the Water Pollution Control Federation. Mr. Miller has worked on many key DMJM sanitary and water supply projects, including: Sepulveda water reclamation plant and Terminal Island AWT plant, City of Los Angeles.

**Jack E. Washburn,
PE**



Jack E. Washburn is director of professional services for Boyle Engineering Corporation, engineers, architects, planners and environmental scientists located in Newport Beach, California. Mr. Washburn recently came to this position from the U.S. Environmental Protection Agency headquarters where he served as Chief of Construction Operations for the waste water treatment construction grant program under PL 92-500. Mr. Washburn is a professional engineer, a member of the American Society of Civil Engineers, and a member of the Civil Works Committee of the American Consulting Engineers Council. He also serves on the Government Affairs Committee of the Water Pollution Control Federation.

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A step forward: uniform grading of the design exam

For many years, one of the architectural profession's notable distinctions has been its success in persuading all of our states, plus several other jurisdictions, to use the same examination for testing their candidates for registration. These nationally administered exams, prepared by NCARB, are taken by approximately 10,000 individuals each year. Two of these exams—the Professional Examination for holders of a professional degree from an accredited school, and the Qualifying Test for other candidates—are machine-graded. A third examination, called simply the Design Examination, gives candidates an opportunity to demonstrate competence in the design process by requiring them to solve "a small but appropriate architectural problem by graphic methods." Of necessity, the Design Examination is graded, not by machines, but by human beings. Specifically, the candidates' design solutions to an 11-hour problem are graded by registered architects serving on behalf of one or another of NCARB's 55-member registration boards. These architect-graders, wherever they happen to be, are provided with uniform grading criteria—and urged to apply it with consistency and evenhandedness. Not always, however, have all graders in all jurisdictions adhered to the recommended grading criteria as effectively as NCARB would hope. NCARB's analyses of grading results in recent years have suggested that some graders have sometimes been influenced not only by personal bias, a natural and unavoidable factor, but also by such cultural considerations as regionalism and parochialism. To combat grading inconsistencies, the members of NCARB's Examination Committee decided to try something new last year.

by Sid Frier, FAIA

They proposed to the annual meeting delegates that instead of establishing the grading criteria, then standing aside while each state graded its own candidates' design solutions, NCARB might better serve as a catalyst for achieving greater uniformity. The Exam Committee felt that greater uniformity of evaluation might be realized if two things happened. First, the architect-graders from a great many states and various regions should be encouraged to gather and carry out their grading task as a single, carefully coordinated effort. Second, the graders should have an intensive training session on exam evaluation principles before the grading.

Meeting in two locations on consecutive three-day weekends last July, 166 registered architect-graders from across the nation graded some 5,300 candidates' design projects. At Denver, 56 graders evaluated the design solutions of 1,600 candidates from Southern and Western states, plus Guam. At Cherry Hill, New Jersey, another 110 architects graded 3,700 solutions from Eastern and Midwestern candidates.

But before they evaluated a single solution, the graders at both Denver and Cherry Hill attended a four-hour seminar. They came equipped with a *Grader's Manual*, which served as a textbook on how to evaluate the design solutions with consistency and reliability. And to help reduce the "spread" between

Design Problem Information Booklet, 30 days prior to the examination date. The booklet describes in considerable detail the nature and specific requirements of the examination subject, "a public branch library." Included, for example, are the climatological and environmental aspects of the project; site and facilities use specifications; and detailed instructions as to how the candidate's graphic presentation should be developed.

The booklet also builds an important bridge between the exam candidate and the grader. It not only spells out the six evaluation criteria by which the design solutions are graded; it also specifies the range of percentage values that are assigned to each criterion. The six criteria are: analysis of program, climate and site influences, organization of functions, quality of design, selection of systems and materials, and finally, clarity of communications.

Does the design exam reward the skilled delineator? Many architects have worried about the relevance of drawing ability as a decisive factor in assessing competence in the design process. They might find reassurance in the instructions to both candidates and graders. "You will be judged," the *Design Problem Information Booklet* states, "not only on the final solution presented but also on your logic and thought processes as shown by your diagrammatic sketches. Your study sketches need only be of sufficient clarity to communicate your thought processes and solutions to the graders."

Both the candidates and the graders are advised that for each of the six evaluation

the graders at opposite ends of the judgmental scale, the entire grading corps was "walked through" a slide show of actual design solutions. When the grading task was undertaken, the graders were not only familiar with the nature of the problem itself; they also shared a common understanding of the evaluation criteria by which the 5,300 design solutions should be graded.

A public branch library was assigned in the 11-hour design examination

The design examination process for the 11-hour problem actually began with the candidates themselves, when they received the

One of the 166 graders.



criteria, the candidate is expected to submit the "required graphic material needed to explain." At the same time, however, the *clarity of communication* criterion, in which the graphics virtuoso might be expected to shine, counts for a scant 5 per cent of the six criteria's total value.

The grading procedure attempted to minimize individual grader bias

Noting that "there is not complete agreement among well-intentioned and competent persons who evaluate solutions," the *Grader's Manual* details a grading procedure developed "to minimize the biases of individual graders and to maximize the degree of uniformity and consistency in the evaluation of design solutions."

The Grader Evaluation Sheet (see illustration) represents a synthesis of the grading procedure formulated by the NCARB Examination Committee, which is the author of the design exam. As a grader evaluates a solution, a score of 0, 1, 2, 3 or 4 in each of six evaluation criteria must be awarded. The 0 signifies that a solution is "incomplete." Scores of 1 and 2 are designated "poor" and "weak"; both are failing scores. Scores of 3 and 4 are designated "satisfactory" and "excellent"; and both are passing. The examples at right received "4" grades.

But the grader's work isn't yet finished. Under each of the major evaluation criteria are listed more explicit criteria which, taken together, comprise the specific components of a major criterion. The grader is asked to identify and check the weaknesses of a solution in these subordinate categories. Thus, for those candidates who fail the exam, the indicated weaknesses presumably will guide them in their preparation for another time.

What about grader bias? The greatest insurance factor against undue bias is the requisite that every grader attend the four-hour training session, where the exam process, philosophy and specific evaluation criteria are thoroughly explained. A second insurance factor is implicit in the fact that every solution must be evaluated by three graders working independently. Moreover, if two graders give a solution either a passing or failing score and a third grader disagrees, the solution is evaluated by a fourth person: a coordinator whose job it is to assist in resolving borderline cases.

Educational Testing Service of Princeton, New Jersey, which has assisted NCARB in preparing its examinations for nearly 20 years, organized both grading sessions with a precision usually associated with war games. College students were hired and trained to fetch, retrieve, stack, haul and store the thousands of solutions to be graded—each at least three times. These student aides had to be on their toes, since a mix-up in handling might have produced a clerical nightmare.

While the grading process won high marks, the designs rated only "fair"

After the graders had evaluated their last solution on the third day for the third time, they were given still another job to do. Since

this process was a "first" in the grading of design examinations, they were given a questionnaire by NCARB and asked to render opinions of their experience.

The responses to the six questions indicated substantial agreement among the graders that: 1) the design solutions graded were, for the most part, no better than "fair"; 2) this year's design problem was rated "moderately difficult" or "easy"; 3) the schools aren't training the students to resolve the programmatic elements in an architectural problem, by graphic means, as effectively as they might; 4) the design problem format, overwhelmingly, is regarded as a satisfactory means of testing design competence; 5) by a margin of roughly 3-to-1, the graders feel the schools, as well as the profession, are not adequately preparing the exam candidates for this kind of exam; and 6) a substantial majority of the graders rated the grading process itself "excellent."

Considering the questions one by one:

1. What is your general impression of the quality of the design solutions you graded?

Typical of the answers from the many graders who rated the over-all quality only "fair" was this one from an Alabama practitioner: "The majority of the solutions that passed over my desk lacked basic quality. Many were obviously the result of being unable to analyze a simple design problem in successive steps, and to organize a thought process on a given time schedule." To a number of educators who served as graders, however, this was not surprising. Said one, "I don't know of any school in the country that requires its students to execute 11-hour sketch problems."

2. How would you rate the degree of difficulty of this year's design problem?

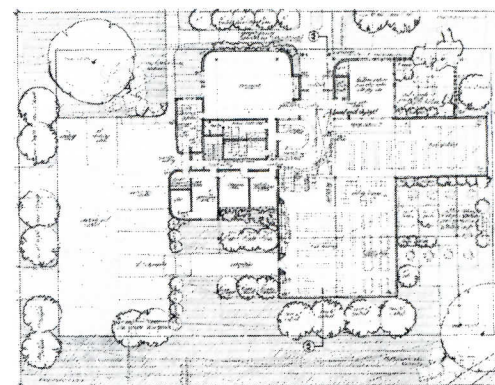
Graders' written responses to this question were remarkably of a piece: whether they indicated the problem was "easy" or "moderately difficult," nearly everyone considered it to be fair and responsible. "The problem format," said a Louisiana grader, "was well defined and very typical of commissions in a small- to medium-sized architectural practice." A registration board member-grader from Kentucky observed, "A very good problem, the size and type of project that any candidate with proper education and training should solve; yet it was difficult enough that the poorly trained should not pass."

3. Assuming that approximately 70 per cent of the candidates were accredited degree holders, what inference might be drawn from your grading experience?

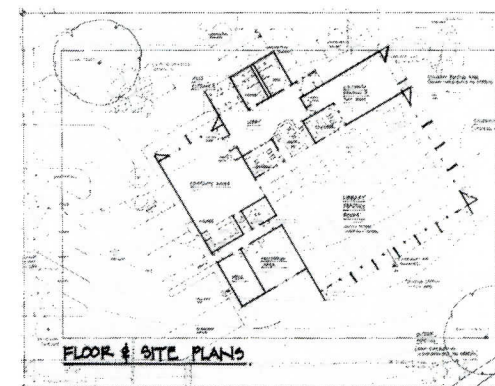
Admittedly a somewhat loaded question, it elicited generally negative responses. Said a Hawaii practitioner-board member, "They know how to make bubble diagrams but can't put them together in a solution." A Michigan grader noted, "Having a degree does not necessarily qualify a candidate for registration. Experience or stronger emphasis on design is required." And an Oregon practitioner declared, "The quality of the schools of architecture has declined horribly."

Over and over, the graders expressed

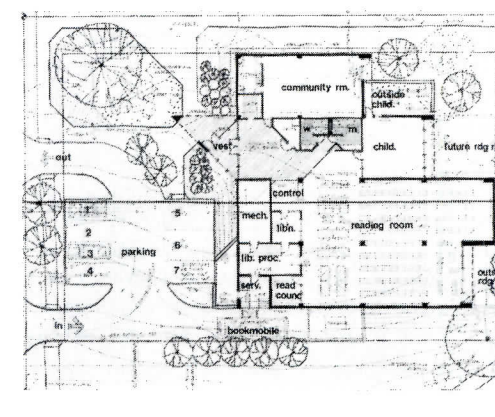
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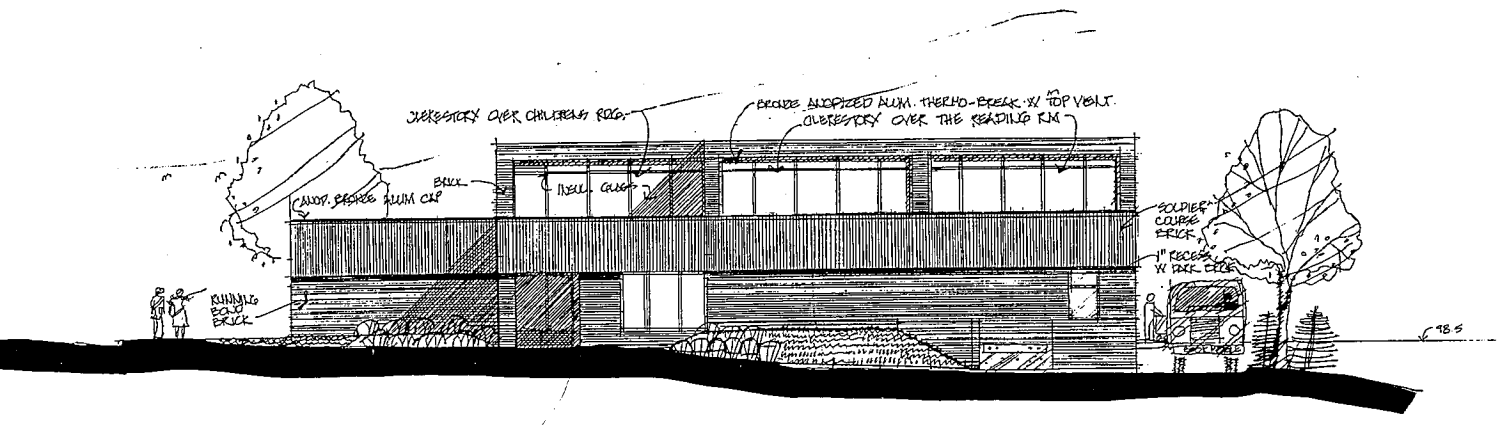
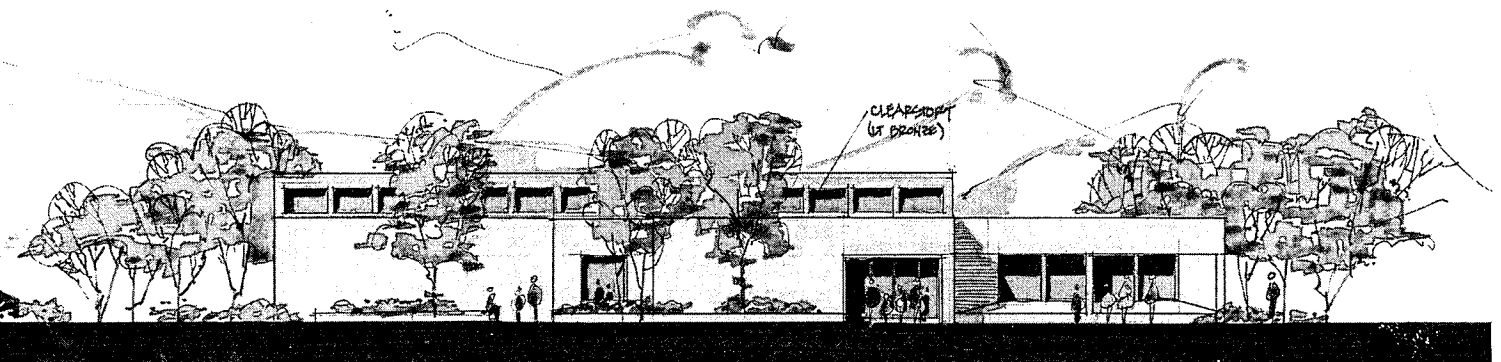
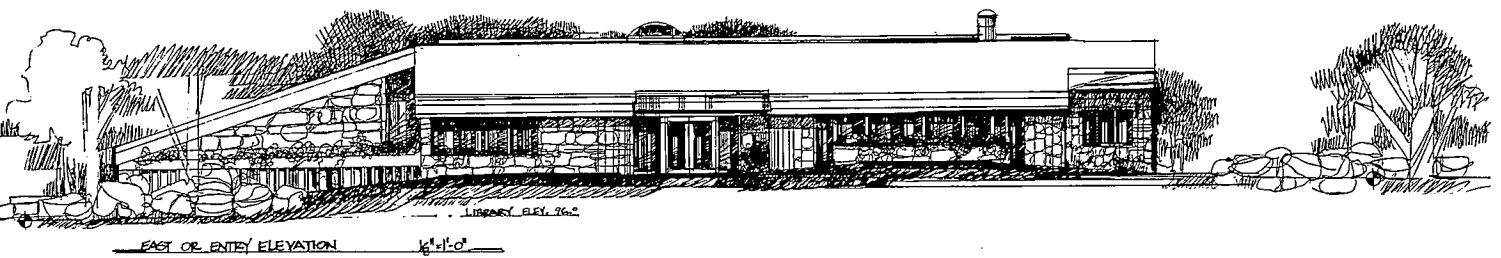
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the view that the schools should place more stress on design, or even particular design techniques. "With the educational institutions concentrating on three-dimensional design techniques," observed a Colorado practitioner, "there seems to be a lack of skill in two-dimensional presentation and study techniques as required for the exam and in everyday practice."

Even some of the educators were dismayed. One found the grading experience "devastating." Another asked, "How many schools give sketch problems involving whole buildings?" And a third educator sought to pinpoint a dilemma when he said, "I don't think we do too well at teaching design in the schools, but then the profession also does young people a great disservice. Most never get a chance to participate in design activity—and nobody learns to design by reading, talking or theorizing. You only learn by doing design—over and over."

4. In your opinion, does the design prob-



em format provide a satisfactory means of testing for design competence?

All but a few of the graders answered "Yes." Many, in fact, appeared to seize on this question to release pent-up feelings. "Emphatically yes!!!" said a practitioner-board member.

Yet a number of graders felt the concentrated 11-hour exam unfairly inhibited some candidates. Noted an Arizona practitioner-board member, "I feel there were a number of near-passing solutions by candidates who seemed capable of improving on their work, and probably would have, if they could have come back the next day to finish." An Idaho member suggested, "Perhaps the building design problem could be done in 10 hours the first day, then the second day the candidate could be given two or three hours to do a site plan of his previous day's design." And a Georgia practitioner wished to remind NCARB and anyone else who cared, that "passing the problem doesn't mean the candidate

is a designer, or ever will be. But even a spec writer or field man must have some understanding of good and bad design."

5. *Generally speaking, do you feel that the schools are adequately preparing their students for the design exam?*

Although a majority of graders answered "No," some educators questioned the question itself. One answered "Yes," then remarked, "However, I don't think the schools' main function should be to prepare students for the design exam!" Another educator-grader felt most schools were adequately preparing their students, but snapped, "Is the criterion for a quality education in architecture the ability to pass an 11-hour design exam?"

6. *How would you rate the grading process itself?*

Only one grader rated the process "poor." And although a majority were highly complimentary, some had reservations. "A great deal of subjectivity is still involved,"

remarked an educator-practitioner, "but to the extent that none of us is infallible, it is difficult to achieve true objectivity."

For those of us on the NCARB Examination Committee, the results of this ambitious grading experience are greatly encouraging. We find it significant, for example, that many graders jotted at the bottom of their questionnaires such positive comments as, "It was hard work, but I enjoyed every minute of it." And, "If I can help again, please call on me." And, "At last, we're coming to grips with our toughest problem."

The process is far from perfect yet. But I believe the profession made a breakthrough at Denver and Cherry Hill. And we are going to keep trying, again and again, to develop and evaluate the Design Examination as an instrument not only for testing the young people seeking to enter the profession; but even more important, we see an opportunity here to educate the professional and to improve the quality of the environment.



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Federal agencies continue quiet incursions on building design

In the past ten years, Congress has created a number of major Federal agencies in an attempt to achieve various social and political objectives. Charged with responsibilities for occupational safety and health, consumer protection, the environment, fire safety and energy, these agencies have shown little outward concern for the practice and liability problems of architects and other design professionals. However, the rules, regulations and standards flowing from these agencies are having an increasing effect on professional practice, and further influences are beginning to be identified in recently reported construction industry litigation. Despite the identifiable impact of the Federal sector on architectural practice, and its uncertain future scope and direction, there has been little organized effort by architects to deal with the Federal regulatory process.

by Arthur T. Kornblut, Esq.

Today, superimposed on the traditional range of local code and code-like requirements that must be considered by architects are regulations emanating from the Federal sector. With this additional regulatory burden, however, there often is no clear guidance for resolving conflicts, determining priorities, or supplementing inadequate information.

The first (and probably most widely known) of these new Federal agencies is the Occupational Safety and Health Administration. OSHA has adopted and made law out of thousands of national consensus standards originally published by such voluntary, private organizations as ANSI, NFPA and ASTM. It is doubtful if the drafters of these standards ever envisioned that someday they would become Federal law; in any event, it is reasonably certain their development did not withstand the public scrutiny that normally precedes the enactment of statutory or administrative requirements.

Even though the primary statutory burden of OSHA as an employment safety code is placed on the employer, many OSHA standards affect building design in exactly the same manner as the local building code does. OSHA standards need to be reviewed to identify those that might affect project design. Clients may have to confirm their project's functional requirements, and the OSHA standards related thereto, to avoid future problems with OSHA inspections. While there is no way an architect can guarantee a project's design will comply with OSHA (the government won't review the drawings or tell you, and there is no way to

Mr. Kornblut is a registered architect and practicing attorney in Washington, D.C.

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predict how an inspector will interpret the standards in the future), a reasonable effort can be made to identify relevant OSHA standards. This should reduce the possibility of the owner receiving an OSHA citation after occupying the project, and then bringing a professional liability claim for a design condition that led to the citation.

OSHA standards are increasingly used as evidence of negligence in civil cases

If the building code-like effect of OSHA were not enough, a major new problem is emerging: the increasing use of OSHA standards in civil litigation as evidence of negligence. The OSHA Act, as enacted by Congress, states that it does not "enlarge or diminish or affect in any other manner the common law . . . liabilities of employers." Courts have interpreted this to mean only that OSHA does not create a new basis for employees to sue their employers. Unfortunately, the courts have not been as conservative in adjudicating the impact of OSHA in lawsuits involving traditional causes of action such as negligence. Numerous courts have permitted violations of OSHA standards to be admissible as evidence to prove a defendant's negligence. An extreme example of this occurred recently in a case decided by the Supreme Court of the State of Washington.

The plaintiff was seriously injured when he fell from an upper floor of a building under construction. The subcontractor (the plaintiff's employer) received an OSHA citation for having failed to comply with an OSHA standard calling for netting beneath the floor where the work was being performed. After collecting workmen's compensation insurance, the injured workman could not sue the subcontractor. Suit was brought against the general contractor, among others, for failing to maintain the site in a safe condition.

Successfully recovering damages from the contractor amounting to \$720,000, the plaintiff's case was enhanced when the Court permitted the OSHA violation to be introduced as evidence of the contractor's negligence, even though the subcontractor, and not the contractor, received the citation for the violation. The Court's rationale seemed to be based on the general contractor's over-all contractual duty to maintain safety at the site. The use of OSHA standards on an evidentiary basis in civil litigation (a function for which it is doubtful they were ever intended) is a very disturbing trend, and will only serve to exacerbate liability problems.

Consumer Product Safety Commission powers are wide-ranging, embracing design

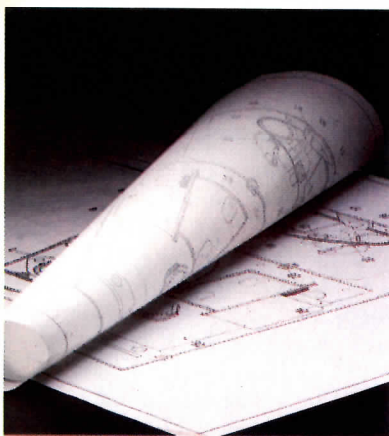
Another Federal agency with the power to affect building design (and the correlative power to cause liability problems) is the Consumer Product Safety Commission. Established in 1972, the CPSC has received less publicity than OSHA even though it has potentially wider ranging powers and enforcement mechanisms.

Indications are that everything that goes into a dwelling unit (including the unit itself) may be considered a consumer product by this agency. In 1978, a Federal appeals court affirmed a claim by the CPSC that it has the authority to investigate aluminum electrical wiring used in residential construction. And in 1977, the CPSC issued a mandatory standard for architectural glazing. Few architects were aware of this at the time, even though the CPSC took more than two and a half years to consider the standard.

In addition to OSHA and the CPS Act, Congress has enacted a Federal Fire Prevention and Control Act, environmental protection legislation and, most recently, energy-related laws, all with implications for the practicing architect. During this period of Federal legislative activity, the organizations and societies representing architects and engineers have spent thousands of dollars and countless hours to respond to, and defend against, allegations of anti-trust violations. Much attention, let alone dollars and effort, has been focused on the Federal assault on professional ethics. Far less attention, let alone dollars and effort, has been given to the unglamorous but potentially more insidious Federal regulatory incursion into the design professional's domain.



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Design, development opportunities center on four retailing trends

Are the boom days of large shopping centers over? Where is retail growth likely to occur? What form of retail complexes will survive and prosper in future years? These are but a few of the many difficult questions which, in recent years, have been debated by retail developers and planners. Clearly, retailing is at a significant crossroads. Adjustments in development style and standards are being guided by consumer attitudes in addition to economic, physical, social, environmental, and political forces.

by Mel Gamzon

These adjustments are being felt by urban retailers who are attempting to increase their business productivity and conform to the emerging urban lifestyle. At the same time, the shopping center entrepreneur is seeking to conquer untapped markets in both urban and non-urbanized areas. Over the past two decades the shopping center industry has flourished as a cornerstone of American life. In 1957, there were 940 shopping centers in the United States. Today this number exceeds 18,700, with total sales in 1977 estimated by the International Council of Shopping Centers at between \$250 and \$255 billion. The outward migration of population from our nation's cities and the convenience offered by the automobile have combined to fuel the success of the shopping center industry. However, recent retail building trends have reflected a sudden sense of caution towards the future. Between 1974 and 1977, the average annual volume of gross leasable area being constructed in shopping centers throughout the nation has averaged 22 per cent below building levels reported for the 1970 to 1973 period. A recent survey of shopping center construction by members of the International Council of Shopping Centers indicates that 92 per cent of new shopping centers contain less than 300,000 square feet. These facts indicate that not only are shopping centers tending to be smaller, but a decreasing number of such facilities are being constructed as the availability of vacant land in prime markets diminishes in many areas of the country and the marketplace becomes saturated.

For many retail developers, the usefulness of the "Lear Jet" strategy of flying over

potential shopping center sites is rapidly waning. Formerly, one could pinpoint a prime regional shopping center development site by merely inspecting its proximity to suburban population growth, access to roadway systems, and locating any possible competition. However, to a large extent, suburban population growth in many markets has abated especially in the urbanized markets of the Northeast and Midwest.

In addition, the proliferation of shopping centers over the past 25 years has saturated many of the conventional retail markets. As a result, the issue which is ringing loud and clear in the ears of the development community is: How many additional times can the market pie be segmented and still provide viable financial opportunities for investors?

What emerges from recent experience is the recognition that primary retail locations in many suburban markets are rapidly diminishing. The retail developer is being forced to assess those secondary and even tertiary building location options which ten years ago would never have been considered for development. The one certainty which evolves from the trend to identify new and diversified retailing opportunities is the need for an in-depth understanding of market characteristics. The quantification of existing and projected population growth, in addition to disposable income which is available for retail goods and services, will continue to provide direction for the design professional and the developer in future years.

Specialty retailing is a factor in a spreading urban renaissance

Four principal retailing strategies are capturing the attention of the development community. These strategies include an increased emphasis on specialty retail center activity; the re-emergence of the "downtown" as a functional retail environment; continued shopping center development in selected growth regions around non-metropolitan areas; and modernization of existing shopping centers in anticipation of accelerating market penetra-

tion within these facilities.

The market acceptance of specialty retailing is closely aligned with shifting consumer preferences for specialized goods combined with a broader food and entertainment orientation. Experience has revealed that the demand for specialty retail and restaurant facilities increases geometrically with increases in per capita disposable income. Such factors should be considered in planning such facilities.

The specialty shopping center is distinguished from traditional shopping centers by five generic characteristics: 1) a unified architectural and merchandising "theme" is presented in merchandise, restaurant, and public event space; 2) unique merchandise is found in the specialty shops; 3) these centers cater to the resident and the tourist or visitor markets to the area; 4) at least 40,000 square feet of leasable area is typically required to create a viable commercial and entertainment attraction; and 5) restaurants function as "anchors" for such facilities. Typically, at least 30 to 40 per cent of the leasable area in these complexes is devoted to food and restaurant space as compared to the 10 to 15 per cent standard found in many conventional shopping centers.

The recycling of economically obsolete, older structures into specialty retail, restaurant, and entertainment complexes has been widely acclaimed. This recycling should continue as a primary force in transforming existing building spaces which are liabilities into economic and social assets for the community at large. These projects, in conjunction with innovative, newly designed specialty center complexes, will continue as a major factor in realizing the urban renaissance which is spreading throughout the country.

Public sector initiatives are spurring downtown retail districts

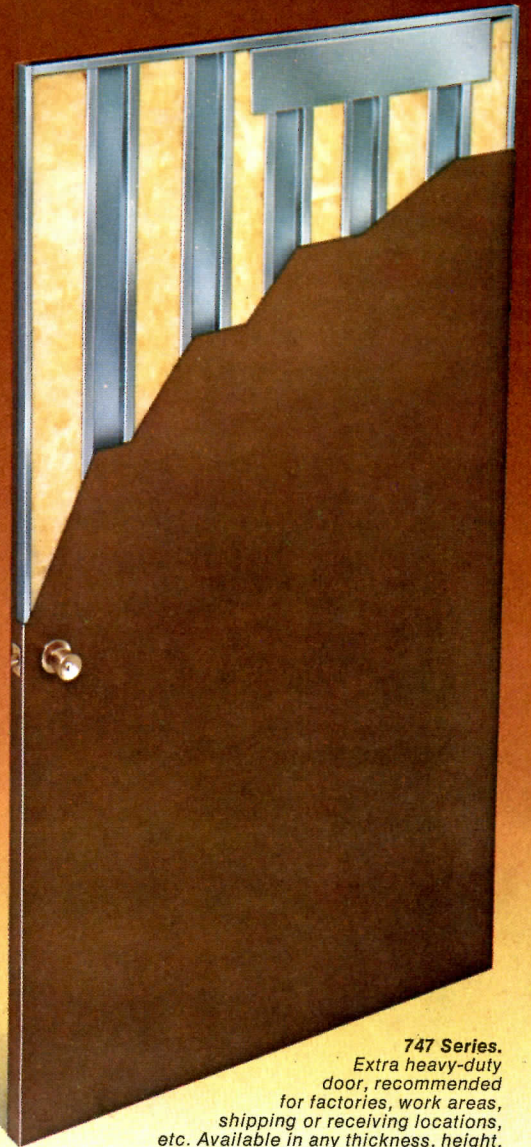
Downtown retail districts, which have been victimized by the extensive competition from suburban shopping centers, are also finding new strengths by capitalizing upon the diversified urban marketplaces which may include not only residents, but also downtown employment, tourists, and business visitors. However, the majority of urban retail development does not function solely within a private sector vacuum. In many cases, public sector planning and financial initiatives are the initial force which induce private investment.

continued on page 73

Mel Gamzon is a senior associate and real estate economist in the Boston office of Economics Research Associates. Mr. Gamzon is a specialist in the preparation of market and financial feasibility studies for commercial and residential developments, and he is a frequent speaker on the subject of urban revitalization planning. He has recently co-authored, with the Urban Land Institute, a book entitled *Adaptive Use: Development Economics, Process, and Profiles*.



707 Series.
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747 Series.
Extra heavy-duty door, recommended for factories, work areas, shipping or receiving locations, etc. Available in any thickness, height, widths up to 5'. Steel-ribbed, with either cold rolled or galvanealed 14-, 16- or 18-gauge face skins. Like 707 Series, utilizes U-shaped, hinged reinforcing channel and a continuous, beveled 1/8-inch in 2-inch lock edge channel.

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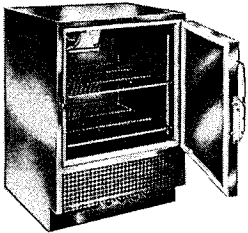
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For more details, call him. (He's in the Yellow Pages.) Or see Sweet's 8.2/Cur. Curries Manufacturing Inc., 251 9th St. SE, Mason City, Iowa 50401. (515) 423-1334.



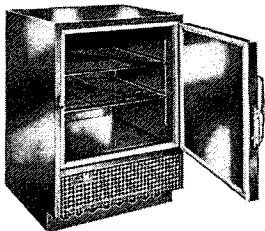
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UC-5-F-BC freezer is equipped with automatic timer electric defrost.
Capacity—5.4 cu. ft. (155 ltr.)

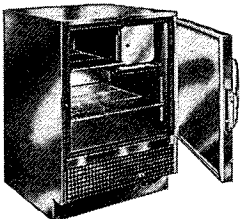


C-5-CW* refrigerator with cold wall cooling system is equipped with push-button defrost, automatic reset and condensate evaporator.
Capacity—5.4 cu. ft. (155 ltr.)

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

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With explosion proof interior only.



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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.



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Refer to Sweet's Catalog 11.20/J for quick reference.

BUILDING ACTIVITY *continued from page 71*

Downtowns are rapidly becoming "intown" environments through the united commitments of both sectors. Accordingly, the integration of newly created retail and entertainment uses, within the context of mixed-use developments in our center cities, will provide the nucleus for increased developer and community economic prosperity in the years ahead.

Conventional shopping centers have a bright future in selected markets

For the construction of new, conventional shopping centers, the near-term future looks bright within selected markets. Recent reports prepared by the U.S. Department of Commerce, Bureau of Economic Analysis, indicate that the most significant population and personal income growth over the next decade is likely to occur in non-standard Metropolitan Statistical Areas (SMSA's). The Department of Commerce reports that although SMSA's had a 16.6 per cent population growth during the 1960-1970 period as compared to 6.8 per cent for non-SMSA's, the trends have shifted. Between 1970-1976 SMSA population gain was a mere 4 per cent while non-SMSA's grew by 8.2 per cent. Increased conventional retail development is likely to occur in the areas which will have the largest increase in purchasing power over the next five years, such as the South Atlantic, Mountain, Pacific, and eastern South Central regions of the country.

Modernization of existing centers is an important retail trend

Lastly, the purchasing, modernization, and enlargement of existing shopping centers in prime locations has become an important component of the growth in retail development. Considerations such as lower renovation costs as compared to new construction, existing shopper identity, fewer government regulations and the ability to refinance existing facilities represent several important factors which are resulting in the maximum utilization of existing retail facilities. Responding to consumer preferences, store sizes are becoming smaller with a greater emphasis on specialty goods. Fashion-oriented establishments are capturing a greater role in tenant mix, and department stores are emphasizing lifestyle departments.

This article has described several retail development opportunities which will become increasingly important in future years. The architect will need to respond through creative design solutions to both the physical characteristics of the retail project and the market capacities, which can dictate the ultimate success or failure of these ventures. The interrelationship between the architect, real estate economist, and development entity is critical as fewer and more specialized retail opportunities become available.

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For a list of leading laminated glass manufacturers' names, write: Monsanto Plastics and Resins Company, an operating unit of Monsanto Company, Dept. 804, 800 N. Lindbergh Blvd., St. Louis, Missouri 63166.

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Construction cost increases ease: up 6.8 per cent

The bad news: Construction costs are still climbing. The good news: the rate appears to be slowing.

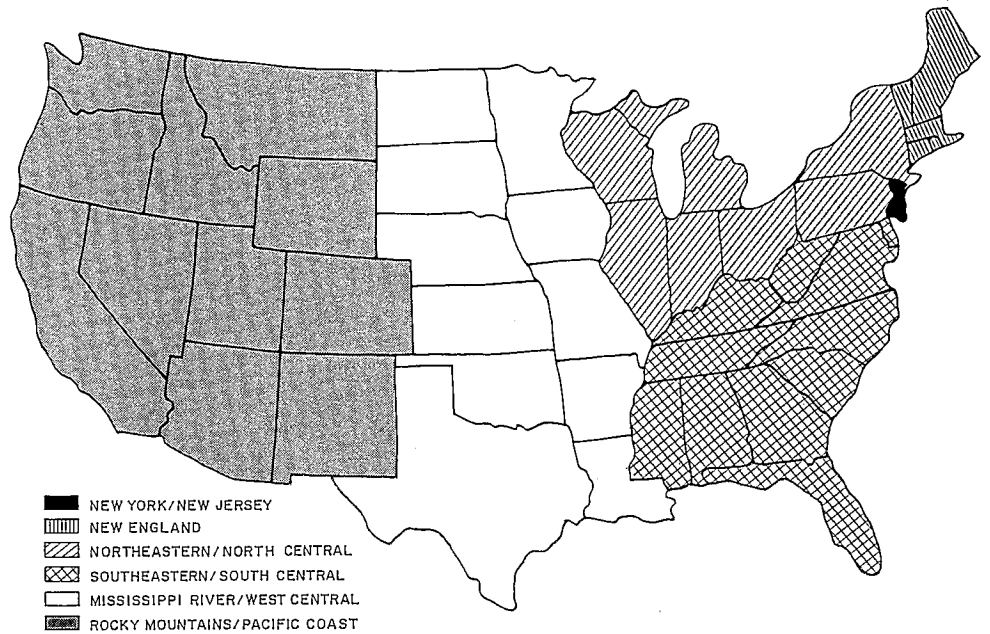
From September 1977 to September 1978, surveys by Dodge Building Cost Services, a unit of McGraw-Hill Information Systems Company, show building material costs have climbed only 5.9 per cent. This contrasts with a 12 per cent increase in the

period from September 1976 to September 1977.

The rate of increase in construction labor rates was 8.2 per cent for the latest 12-month period ending in September; a year earlier, the increase was at an 8 per cent rate. Construction cost changes for individual regions and specific cities continue to show wide variations. In some markets, local condi-

tions—as reflected in mark-ups for contractor overhead and profit—are making a sizable impact on costs. California and Florida are areas where local market conditions are resulting in mark-ups, which are respectively higher and lower than the national average. In California, the once-feverish pace of homebuilding has slowed, stabilizing lumber and wood product prices.

Districts	Number of metro areas	3/78 to 9/78	9/77 to 9/78
Eastern U.S.			
Metro NY-NJ	16	3.0%	6.4%
New England States	21	3.1	6.4
Northeastern and North Central States	46	2.7	5.2
Southeastern and South Central States	39	4.2	8.0
Average Eastern U.S.	122	3.3	6.5
Western U.S.			
Mississippi River and West Central States ..	35	3.5	6.7
Pacific Coast and Rocky Mountain States	26	3.7	7.5
Average Western U.S. ..	61	3.6	7.1
United States: Average ..	183	3.5	6.8

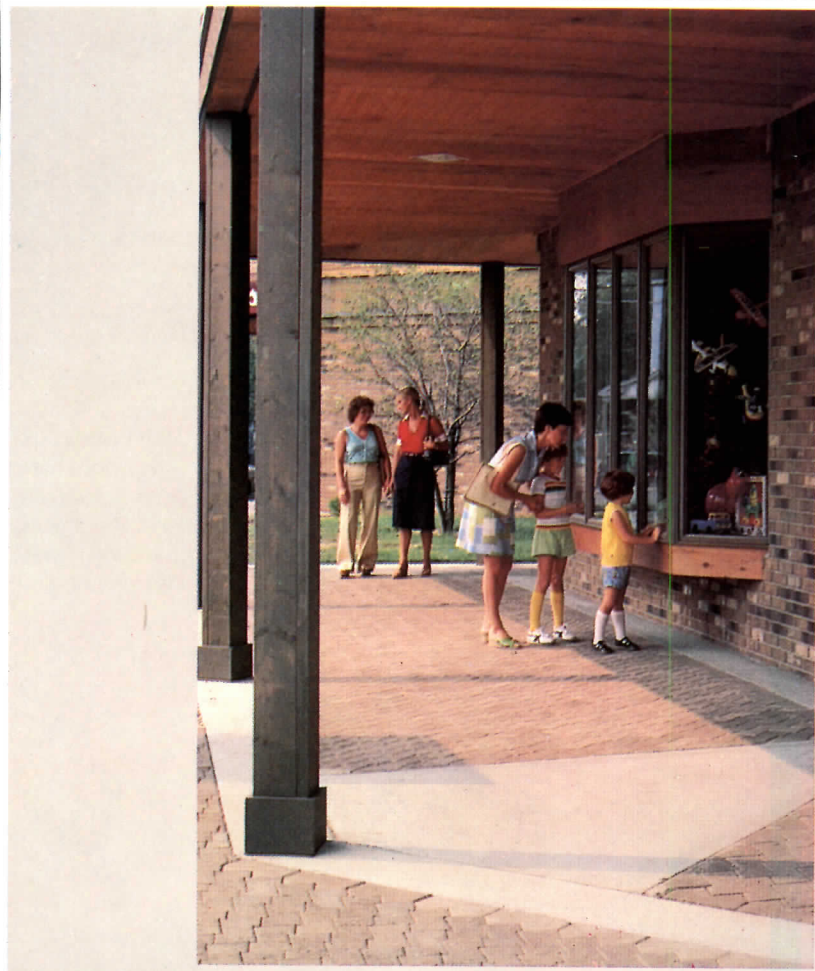


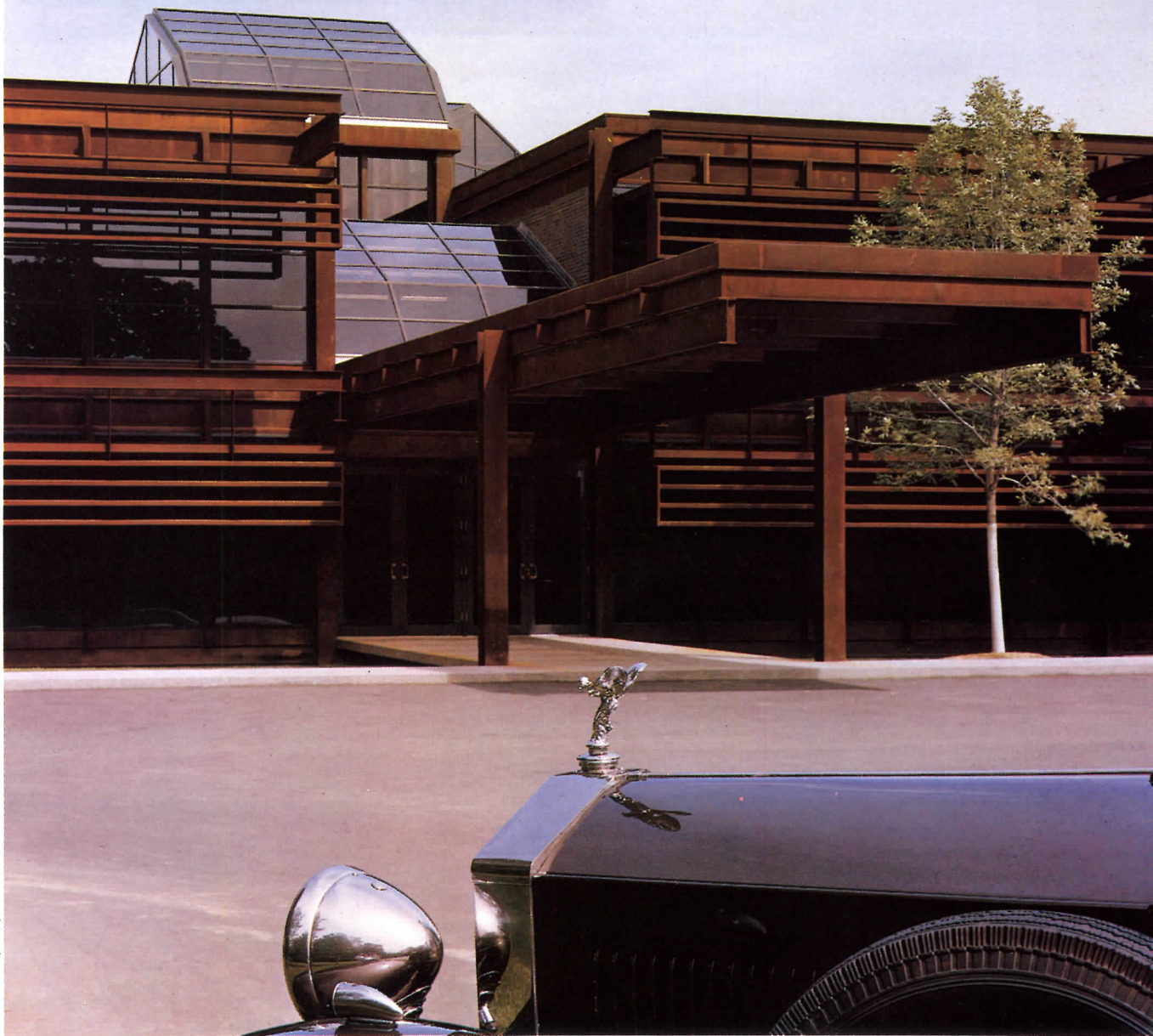
HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL NON-RESIDENTIAL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977 (Revised Quarters)				1978 (Revised Quarters)			
										1st	2nd	3rd	4th	1st	2nd	3rd	4th
Atlanta	353.1	384.0	422.4	459.2	497.7	544.8	575.0	598.7	657.1	701.5	712.0	704.3	714.2	724.0	746.8	769.6	783.1
Baltimore	308.7	322.8	348.8	381.7	420.4	475.5	534.3	581.1	585.0	605.7	614.8	628.1	635.6	643.2	656.0	668.9	680.6
Birmingham	284.3	303.4	309.3	331.6	358.3	402.1	421.2	448.9	551.9	543.8	551.9	575.9	585.4	594.8	603.4	613.9	624.6
Boston	277.1	295.0	328.6	362.0	394.4	437.8	462.5	513.2	555.9	567.7	576.2	581.3	587.7	594.1	605.4	616.7	627.5
Chicago	339.5	356.1	386.1	418.8	444.3	508.6	529.6	560.1	635.2	662.2	672.1	683.4	689.9	696.4	711.0	725.6	738.3
Cincinnati	302.6	325.8	348.5	386.1	410.7	462.4	500.1	550.6	609.8	615.6	624.8	650.7	656.6	662.4	673.6	684.9	696.9
Cleveland	331.5	358.3	380.1	415.6	429.3	462.2	509.5	531.0	632.9	619.4	628.7	615.1	625.2	635.4	655.6	657.7	667.2
Dallas	281.7	308.6	327.1	357.9	386.6	436.4	477.9	499.6	538.5	560.1	568.5	611.6	615.2	618.9	631.6	644.3	655.6
Denver	312.5	339.0	368.1	392.9	415.4	461.0	510.0	553.6	616.0	656.3	666.1	691.7	703.8	715.9	723.0	730.2	753.0
Detroit	316.4	352.9	377.4	409.7	433.1	501.0	538.7	597.5	617.2	634.2	643.7	649.4	664.2	679.0	738.3	797.6	811.6
Kansas City	278.0	295.5	315.3	344.7	367.0	405.8	444.9	509.1	547.3	568.2	576.7	592.1	603.0	614.0	626.0	637.9	649.1
Los Angeles	320.1	344.1	361.9	400.9	424.5	504.2	531.8	594.1	673.1	709.2	719.8	748.2	756.8	765.4	777.6	789.9	803.7
Miami	305.3	392.3	353.2	384.7	406.4	447.2	485.5	558.9	592.5	604.6	613.7	616.7	628.4	640.1	644.9	649.7	661.1
Minneapolis	309.4	331.2	361.1	417.1	412.9	456.1	488.6	538.0	564.1	593.0	601.9	617.9	629.4	640.8	646.9	653.0	664.4
New Orleans	274.2	297.5	318.9	341.8	369.7	420.5	442.1	494.7	534.8	580.2	588.9	609.2	614.7	620.2	631.0	641.9	653.1
New York	321.4	344.5	366.0	395.6	423.1	485.3	515.3	533.5	580.8	607.7	616.8	607.7	619.8	632.0	641.2	650.3	661.7
Philadelphia	301.7	321.0	346.5	374.9	419.5	485.1	518.5	567.5	579.2	615.8	625.0	655.8	658.8	661.7	673.6	685.5	697.5
Pittsburgh	293.8	311.0	327.2	362.1	380.3	424.4	465.6	509.5	526.3	549.5	557.7	579.7	589.6	599.4	608.7	618.0	628.8
St. Louis	304.4	324.7	344.4	375.5	402.5	444.2	476.7	528.9	537.1	605.8	614.9	611.9	617.1	622.3	632.2	642.0	653.2
San Francisco	402.9	441.1	465.1	512.3	561.0	632.3	672.5	753.3	820.8	904.5	918.1	954.2	963.2	972.3	983.0	993.7	1,011.1
Seattle	292.2	317.8	341.8	358.4	371.5	424.4	450.2	515.1	570.5	603.7	612.8	620.6	629.6	638.6	656.5	674.4	706.6

Costs in a given city for a certain period may be compared with costs in another period by dividing one index into the other; if the index for a city for one period (200.0) divided by the index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than the costs in the other. Also, second period costs are 75% of those in the first period (150.0 ÷ 200.0 = 75%) or they are 25% lower in the second period.

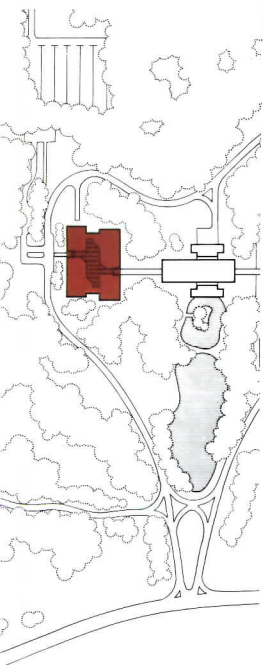


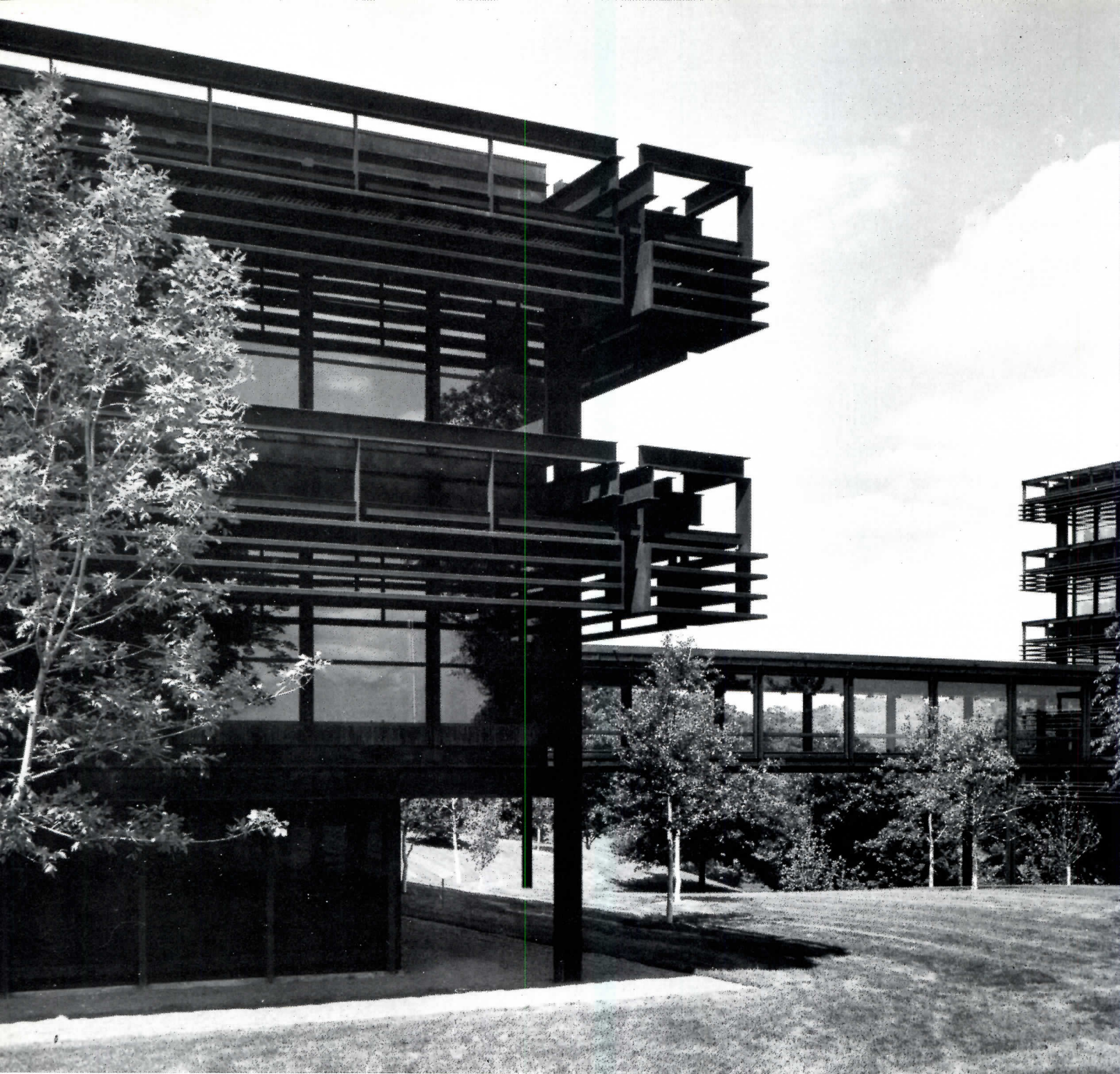


Deere & Company photos

EXCELLENCE ATTRACTS EXCELLENCE

KEVIN ROCHE, JOHN DINKELOO & ASSOCIATES DESIGN A NEW
BUILDING FOR DEERE & COMPANY, REAPING A POWERFUL PRECEDENT





Roche, Dinkeloo & Associates photos, by Ronald Livieri, except where noted

Some years back, Frank Lloyd Wright argued, "To say that business will some day know good architecture suited to its purpose—before art, science, education, and religion are able to recognize it—may be astonishing, but I believe, nevertheless, true.

"Perhaps this recognition by business is not so much perception of the eternal fitness of things as it is again the flair for the best new expedient, or for good advertising.

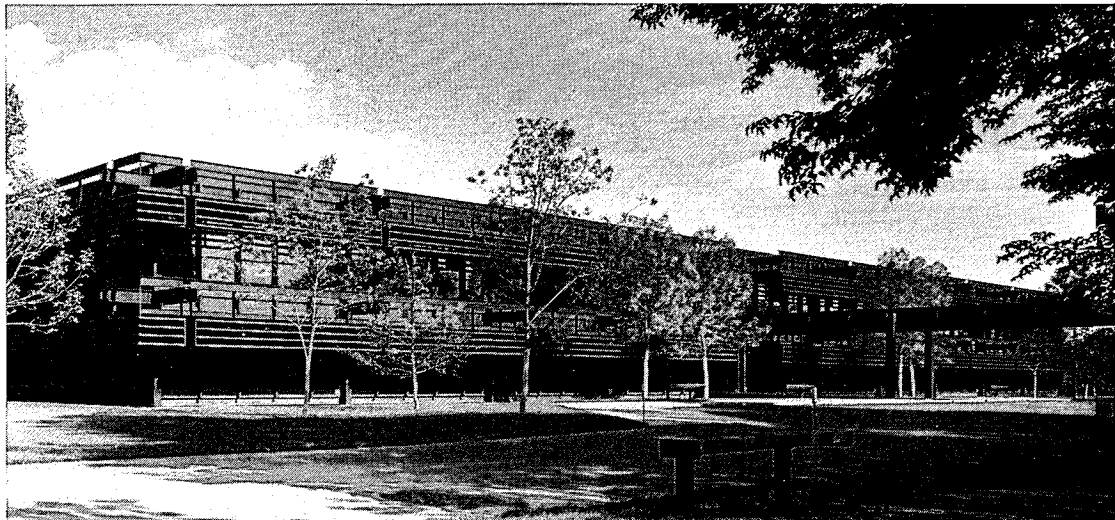
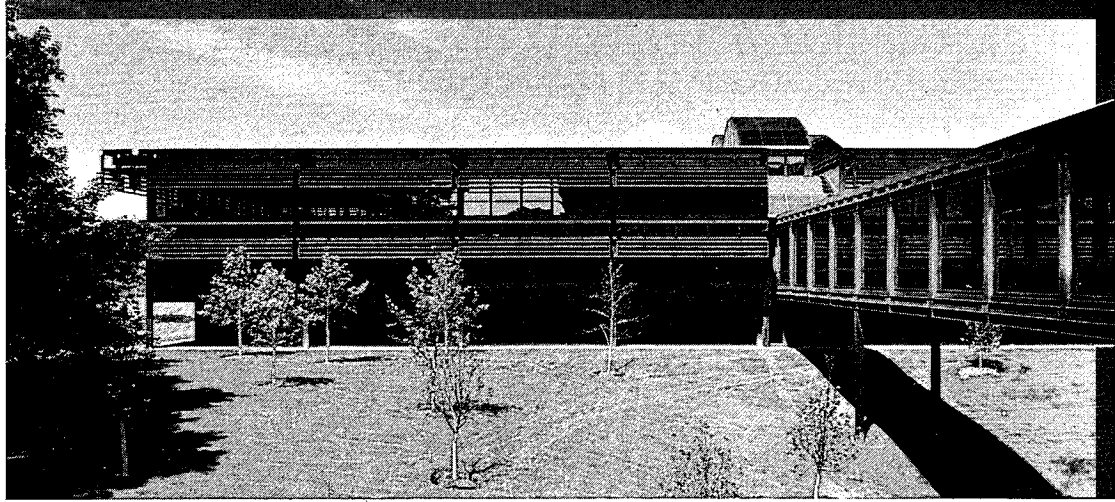
"It would seem, however, that good business *is* heading in toward good architecture. The manufacturer, world over, has been the leader in this. Perhaps this is because culture, in quotation marks, had no place for it; but in the final decisions of business the mind of the superior businessman was more free than the academic to accept the kinds of change that constitute real progress."

Thus Wright put his finger on part of what has been behind the enduring creative drive of Deere & Company and its chairman, William A. Hewitt, who is indeed a superior businessman. Yet it was not just a new expedient, or good advertising, that he sought in selecting Eero Saarinen to design the company's headquarters, back in the late 1950s—or in selecting his celebrated lineage, the firm of Kevin Roche, John Dinkeloo & Associates, to design its recent 200,000-square-foot addition. Hewitt's resolve reflects an eternal fitness of things, and experiencing Deere's 1,044-acre preserve, overlooking the Rock River outside of Moline, Illinois, is to till the very soil and soul of the American dream.

It is not just because Deere makes farming equipment—and gardening equipment, and construction equipment (sales are at four

billion dollars a year)—that one can indulge agrarian, agricultural images in dealing with Deere's architecture. Over-all, this composition, without parallel in American business life for its physical repose and visual poignancy, speaks to a standard of life generally. It shows that while America goes through a back-to-the-land *and* a back-to-the-city movement simultaneously, we can have an architectural expression embodying the best, most creative energies of both the land and the city without the disadvantages of either.

If there is any place in the country where one can honestly feel that architectural homage has been paid to both nature's nature and man's nature, it is this ravine-spanning, contour-clutching structure of weathering steel, a delicately detailed tracery of columns, beams, mullions, and sunscreens



which has been darkened by time from its original rusty color to a deep brownish-purple hue.

From product design, to building design, to landscaping, to the placement of sculpture, paintings, and other works of art, to the thoroughbred automobiles, horses, and tractors that rollick around the terrain—in all of this, it is clear that Hewitt's vision, even as he is as insistent about productivity and profitability as the hardest-nosed businessman, has seen to the evolution of an environment in the image of his own exacting, but ebullient, personality. The vast majority of his employees, visitors, and guests find it all irresistible. As for actually working around here, this cumulative architectural achievement, where in efficiency and enchantment are at parity, is a fine "incentive system."

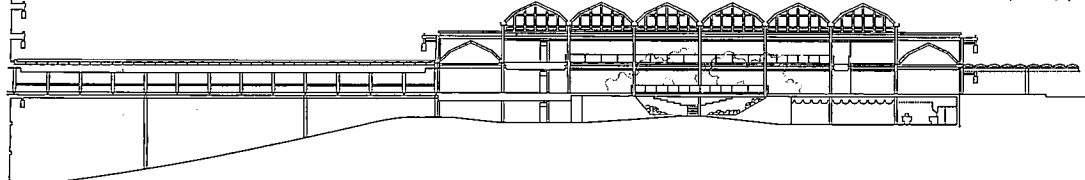
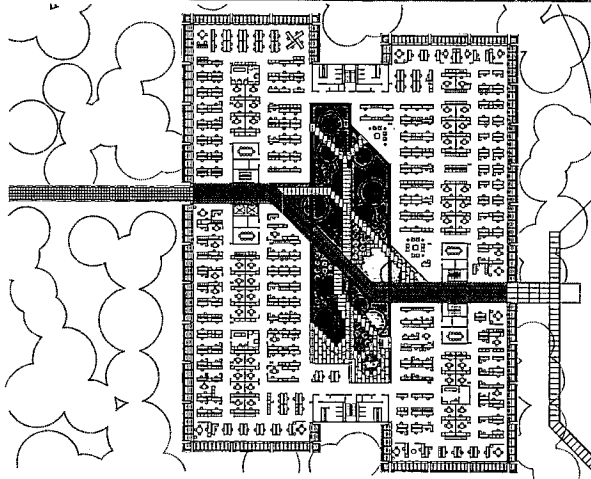
It has taken 20 years, this sowing and reaping of rural vision. Avoiding any sense of an elitist, intrusive paternalism, any hint that Hewitt has been bent on showing people the one, true way to live and work and think, he has accomplished, employing architecture as his tool, much what Emerson once described, seeing a farmer trundling out into a field with a cartload of tiles: "He altered the climate by letting off water which kept the land cold through constant evaporation, and allowed the warm rain to bring down into the roots the temperature of the air and of the surface soil; and he deepened the soil, since the discharge of this standing water allowed the roots of his plants to penetrate below the surface to the subsoil, and thus accelerated the ripening of the crop."

Roche, Dinkeloo & Associates, designing

Deere West, by Kevin Roche, John Dinkeloo & Associates, is nestled into a hillside next to Eero Saarinen's ravine-spanning original Administration Center for Deere & Company, completed in 1964. The rusty hue of the new building, reached by a 200-foot-long bridge, will gradually weather to the dark brownish-purple tracery that Saarinen's work has taken on. Roche and Dinkeloo's structural steel detailing—its columns, beams, mullions, and runs of sunscreens—virtually repeat the technology and thesis of the original. But both the bridge entry and the main westerly entrance (middle photo above), embrace a delightfully different interior environment.



Long gambrels of light-filtering glass, rather reminiscent of barn roofs, shelter and liberate the interior garden of Deere West. The bridge flying over to this hillside oasis, from Saarinen's larger elegant container, threads into and flies across this garden, its parapets composed of mirrored glass, thus picking up on and concentrating reflections of the scenery. The multi-level features of this scenery, strewn with boulders and lushly landscaped, are as thoroughly "detailed" as the building's structural elements and joints. The bridge bends to embrace the main entrance (above), which is also skylit.



this three-level addition to the seven-level original—completed in 1964, three years after Saarinen's sudden passing—have shown their ability to leave well enough alone. While picking up on the terse steel verse of the original, they have managed to beat their own poetics out of the plowshares forged by Saarinen's and Hewitt's close collaboration.

The new building, called Deere West, nestles up the hill to the west of the main building. It is the site designated by Saarinen himself for eventual expansion. A 200-foot-long, steel-framed, glassed-in bridge connects the two, flying over from the fourth level of the headquarters to the second level of the addition, with the slope of the grassy ravine running beneath. The original composition has a corresponding fourth-level bridge, eastward, and this latches into a high, airy hall for



the display of the company's products and, just adjacent, a 400-seat auditorium theater where, among many other things, cultural events and musical performances for the company, as well as the area's citizenry, are frequently held. Once over the ravine and into the display hall, this bridge turns into a mezzanine—a promenade, really—from which one can look down into the hall, taking in Saarinen's triumph and Deere's tractors.

Similarly, the bridge that Roche and Dinkeloo have created threads into Deere West, building anticipation as one moves along; and once "inside," one discovers an "outdoors"—an 11,000-square-foot multi-level garden which rises the full height of the building to a series of long glass gambrel-shaped skylights, rather reminiscent of barn roofs. The allusion is sufficiently subtle to

seem inadvertent—until one remembers that nothing that Roche and Dinkeloo think up is ever inadvertent. The sense of ease within and around this garden is real and even unrelenting; a sense of peace permeates the place. It is a space where one can, or must, reflect on many things, just as the physical elements composing and interconnecting the space reflect on many things. The parapets of the inner bridge itself are composed of mirrored plate glass, three-quarters of an inch thick. These surfaces flash constantly changing images, moods, and conditions of light back and forth, depending on the time of day and on where one happens to be walking or sitting. Looking down toward the bridge from the upper ranges of the garden or, from any number of places, up at the bridge, one sees concentrated, linear reflections of the envi-

ronment flying across the room. More than a connector, the bridge is a promontory for surveying Roche and Dinkeloo's scenery with its stepped granite pathways. A separate, complete set of working drawings and specifications were followed for this landscaping, right down to the seasonal rotation of flowers, the positioning and proportioning of bushes, trees and plants, the extent to which pixy ivy wanders, or climbs, and the extent to which the 150 big stones—heavy with iron ore, quarried in Missouri, hardly rollable—should be allowed to gather club moss.

Just as Saarinen had tilled the countryside—its every contour, tree, and vista reined in to fulfill the architecture—Roche and Dinkeloo have made the most of it by interpreting and internalizing its gentle qualities. It is almost as though they had come upon a



Alexandre Georges photos

rocky, forested glen, and trucked it over here, intact, as the seed-bed for their own characterization—and indeed, for the contrast they felt was appropriate. Given Saarinen's comparatively stark, if elegant, simplicity, they have softly staked their own conceptual claim. The distinction between the original building and the new building lies in this: the first faces the countryside; the second virtually enfolds it.

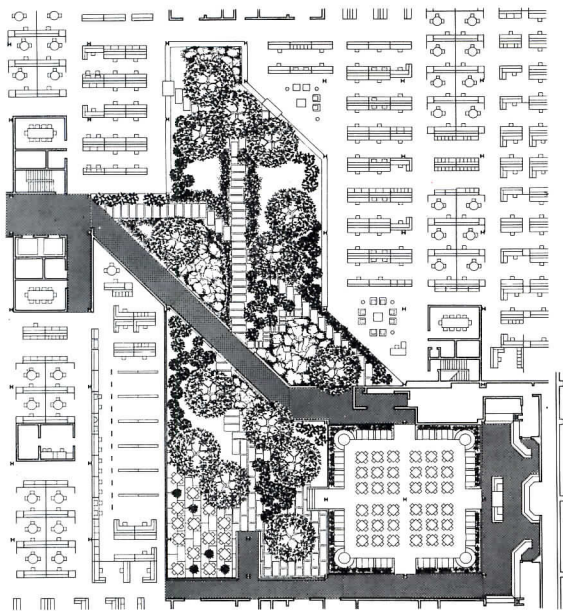
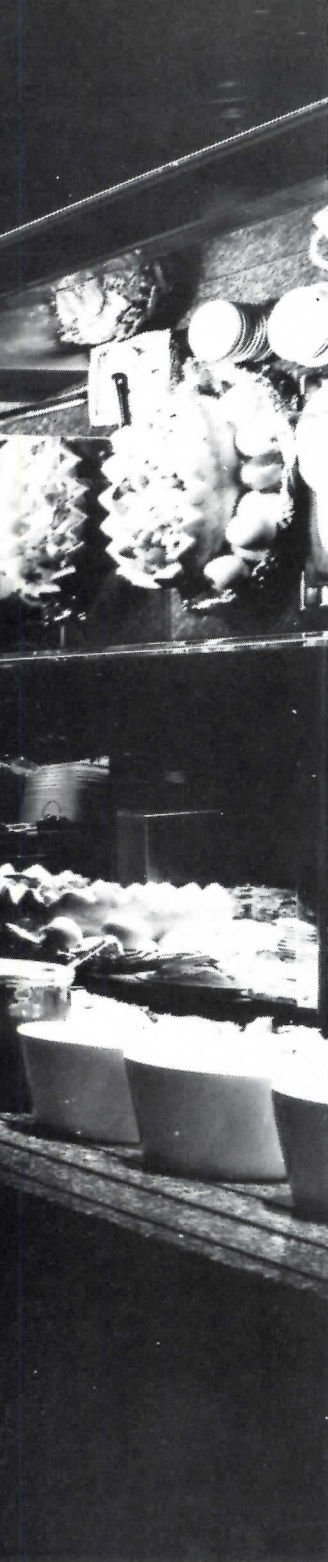
Ranged around the edges of this Rousseauesque patch are the office areas. These are on the second level, where that bridge flies across, with more, still to be occupied, on the third level. Eventually Deere West will house about 900 employees, the main building housing about 1,000. The way in which these new office areas are laid out also contrasts with Saarinen's and Hewitt's original

approach. In the main building, the offices, however spacious or small, are *rooms*—rooms off the long, wide central corridors, all of them embellished by art from the company's collection. Giving out through the glass to the green farmlands, gotten up with the same exquisite detailing and fittings throughout, there is nevertheless a certain disciplinary character to these rooms, the modules marching along with the stately cadence and flourishes of a trumpet voluntary.

Roche and Dinkeloo's office areas, all of them open, are not the usual garden variety of "open-office landscaping" to which the corporate world has accustomed itself in recent times. The work areas, stations, and more-or-less private offices are partitioned off from each other with panels and filing units that are covered with a soft, sound-

absorbent fabric. The floors are carpeted in a beige Belgian weave of wool. The lines drawn between the office areas and the big skylit garden are clear, even as the garden's play of light, view, and movement animate the place as a whole. In other words, these open offices have a certain disciplinary character too, although an entirely contrasting atmosphere is working here to inspire concentration, collaboration, and indeed, gazing either outdoors through the sun-screen-shaded windows or indoors to the garden, it seems to inspire contemplation.

Lighting in the office areas is installed along the top of fabric-covered furnishings, and since these partitioning elements do not go up to the ceiling, the light is directed upward to the ceiling, which is composed of aluminum slats, and these reflect it back



The eating areas in Deere West, seating 300, are not the usual meat-and-potatoes type. Some of the tables are out in the garden, simulating a sidewalk cafe. Looking upward, southward into the garden, its rich panoply of space, light, and patterns of movement can be fully absorbed. The dining room a few steps "inside" is lined with teak booths and banquettes, its ceiling consisting of billowy taffeta that is draped, albeit with considerable discipline, between reflective metal channels. This sumptuous room lets out to the garden, and connects farther inside with a glowing cafeteria (left). Deeply entrenched in the hillside as it is, a ceiling of reflective aluminum slats, along with slanted, mirrored surfaces above the food selections, serve up mood selections as well.



down. Along with the light, they also pick up intriguing, soft reflections of the furnishings, art works, movement, people, and the garden. This ceiling system, without any lighting installations of its own, is as much an amenity as a necessity—plus being an energy-conserving feature. With all of the natural light coming in from the outside, and with these fixtures installed the way they are, quite ample and quite delightful conditions are achieved at three watts per square foot. The individual work stations do have downlighting, that can be turned on as need has it, but as in the indirect system, the fixtures are hidden. So what one experiences, throughout; is the effect of light, in many variations—not the hardware. It is as though the architecture, from within its every element, is the source of illumination.

Finally, even in these comparatively rigid shirt-sleeved precincts where all the unromantic stuff of business is seen to, the layout, lighting, and ceiling conspire to let the feeling of the garden into the most sequestered cubicle. There are two worlds in Deere West—that of sensory splendor, and that of plain hard work—but without abrasive physical or psychological borders, they work together for mutual benefit.

As one worker said, "It's really great working in here, and, you know, I *even* get paid." Admittedly, there are a few others who will let one know that there can be some disquieting aspects to all this ... quiet. Office clutter generally, along with the placement of personal and assorted kinds of paraphernalia, is severely controlled. By and large, however, people working here, whether at

Deere West or in Saarinen's building back across the bridge, acknowledge that the architecture has had, and is having, an intangible but important effect on their own sense of themselves. "It is not just a place to go in the morning," said one man punching away at a computer terminal. "It is a place to grow to." That is not the off-the-cuff eloquence one hears around most office buildings.

Walking down the granite steps, past the weeping figs, coffee trees, Southern yews, and even orange and bamboo, a ground-level eating area, glimpsed from various distances and vantage points, makes one wonder whether they shouldn't have planted potatoes, carrots, tomatoes, cabbages, peas, and squash. This area seats 300 people. Some of the tables are "outside," looking up at and around the garden, but most are a few steps



Alexandre Georges photos

Of the three levels in Deere West, the top two are given over to office areas which edge and overlook the skylit garden. Eventually, when the topmost level is occupied, some 900 people will be working in here. The contemplative but eventful character of the garden is reflected into the office areas, although a rather clear line is drawn between them. Greenery gives way to the office carpeting, the steps of granite leading up from the garden overlapping with it. The offices, where no-nonsense corporate tasks are seen to, are comparatively rigid, although their own "open landscaping" of fabric-covered partitions is meant to make them seem as relaxed and uplifting as the views of the garden or, looking outside through the sunscreen-shaded windows, of the surrounding forested farmlands. The ceilings above the offices, of reflective aluminum slats, have no lighting fixtures; rather, they reflect light that is directed upward from fixtures installed in the tops of the partitioning elements. Thus the ceiling itself becomes an energy-saving feature, while also reflecting soft, constantly changing images of the garden, people, and works of art.

Bali. These richly intricate works, a good many of which could be classified as folk art, are carefully framed and hung at many points around the garden, office areas, reception areas, and ground-level corridors. Even at the most unsuspecting moment, one will round a corner, passing infill walls of ebony-colored brick, such as those lining the entrance areas and elevator cores, only to come upon a solitary, but strategically placed, fabric hanging. One glances on toward the garden, a flash of its variegation and greenery framed a quick lop away, then glances back at the hanging. Whichever one is being looked at or, more usually, closely studied, these works are the perfect counterpoint to the architecture—and they are not expensive, relatively speaking. With some 20 large pieces punctuating the big space, and some 100 smaller pieces scattered about, the \$100,000 budget for the art in Deere West was kept to, constituting a real buy and a recurrent, but never overbearing, revelation of many cultures that have lived close to the land. Implicit in all this is the sense that living close to it has expressed, in many times and places, a tight weave of practical, spiritual, and artistic factors. Roche, Dinkeloo & Associates, taking this building and its embellishments as an entity, have successfully extended far more than *just* an architectural tradition. And that, one suspects, is a crucial, telling test of whether any building, taken as *just* architecture, has successfully stood up to its fullest "functional" potential.

Not long ago, out in the fields stretching beyond the buildings, William A. Hewitt's plaid-shirted, bluejeaned hands were showing off a number of the company's farming machines: four-wheel-drive tractors, cotton pickers and strippers, planters, seeders, and tillers, and drills, moldboard plows and chisel plows, cultivators and bedders and sprayers and balers, plus mowers and rakes. Then Kevin Roche and John Dinkeloo came upon a huge metallic creature, a hillside combine harvester. Designed to negotiate rugged, uneven, or especially steep contours, this harvester showed how it could lean way over in one direction, as if it were going down on one knee, and then way over in the other direction (the operator looking like he was on a carnival ride), as if it were going down on the other.

"I suppose it's engaged in a form of prayer," Roche whispered. Looking back over the fields, toward the hillside combine that Deere has built these last 20 years, it was possible to see all of the beauty and character of the land that one had seen long before—and to see more, because of the buildings. They, too, had been a form of prayer.

—William Marlin

more, inside, where a dining room—distinctly a class-act of a "cafeteria"—is located. In addition to the tables, this room is lined with teak booths, cozy and curved banquettes at the corners, carpeted with green wool, and enlivened with views back "outside." The ceiling is draped with long runs of rayon taffeta, woven in France.

This cafeteria, compared to the more extensive fare available in the main building, has a self-service salad bar, lots of freshly carved sandwiches, and a grill. Roche and Dinkeloo, as is their wont, have practically eliminated signs, lettering, and graphics to explain the menu. Instead, mirrored surfaces slant outward, above the runs of food and preparation stations, so the variety of food available can be readily sized up just by looking ahead, up at the mirrors. This treat-

ment, taken together with the delightful features of the adjacent dining room and its extension into the garden, offers a festive set of options for lunch. At other times of the day, or sometimes during the evening, the area can be used for either simple relaxing or for the most elaborate, ceremonious dinners or receptions.

Tucked deeper into the ground level of the building are a variety of support, service and storage areas, a reference-and-research library, and a special facility for taking care of the art collection.

This collection now includes many examples of fabric art, gotten together by the architects, from all over the world—Italian and French tapestries, ancient head scarfs, rugs, ceremonial robes, throws, shawls from the Middle East, India, the Far East, and even

DEERE WEST, DEERE & COMPANY ADMINISTRATIVE CENTER, Moline, Illinois. Architects: Kevin Roche, John Dinkeloo & Associates. Engineers: AZCO Downey, Inc. (mechanical); L.K. Comstock (electrical). Consultants: Tropical Plant Rental, Inc. (garden landscaping); Lankenau-Damgaard & Associates (exterior landscaping). General contractor: Turner Construction Co.

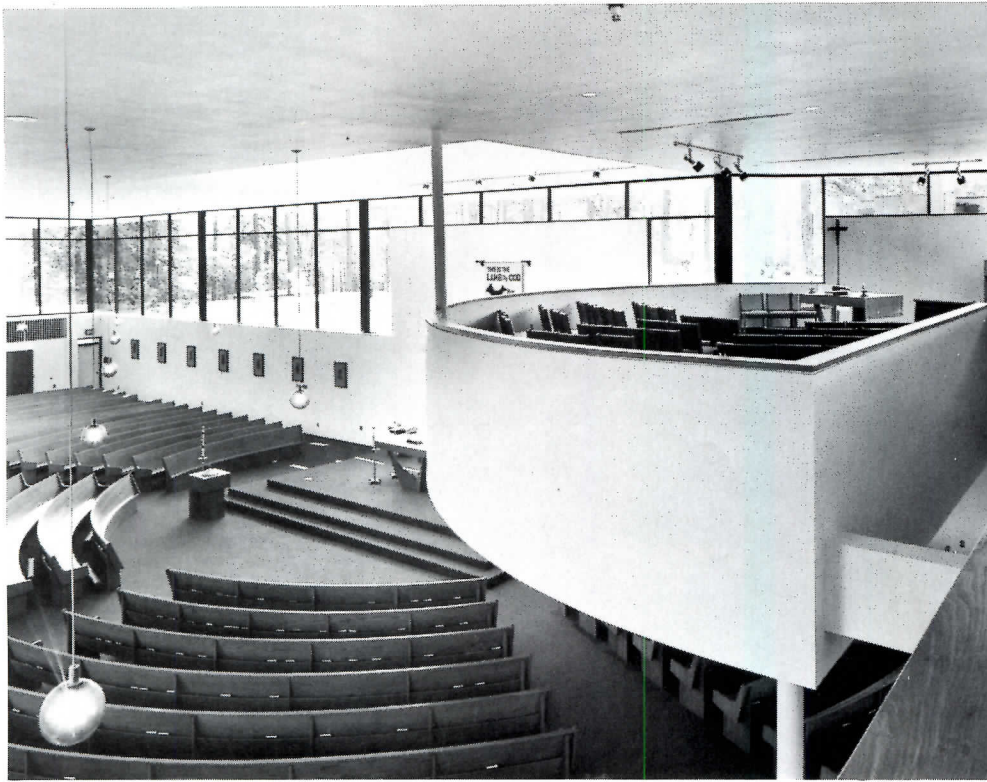


Gordon H. Schenck, Jr. photo

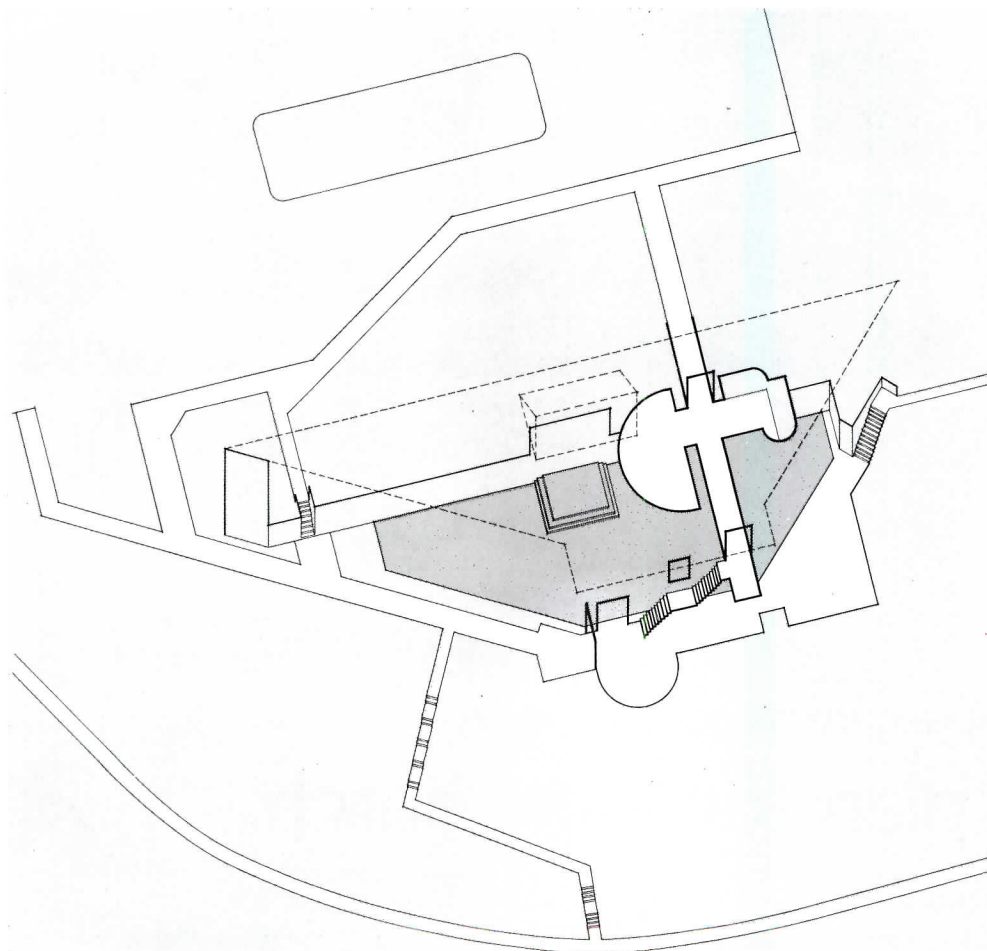
ABANDONING THE STRAIGHT AND NARROW

A new plan for the Church

At a time when architects almost everywhere are interested in returning to the architectural past, the design for this small Roman Catholic church in North Carolina blithely ignores nearly two thousand years of ecclesiastical tradition to place itself on a special site and to set the stage for a new attitude towards worship.



Gordon H. Schenck, Jr. photos



Given the fact that Christian churches have been built in profusion all over the world for the past two millenia, it would be hard to imagine that at this point any altogether original one could be devised—yet the church shown here comes remarkably close. For most architects in the past—as well as for many in the present, including Edward Larabee Barnes in his handsome design for the

Roman Catholic Cathedral in Burlington, Vermont (RECORD, January 1979, pages 129-136) the shape of the whole building has sprung from the linear notion of a straight processional route from the entrance to some object of focus, almost always an altar. This is the basilica plan, as in Old St. Peter's in Rome or, for that matter, as in just about any plain barn of a church in rural America.



Its opposite plan is that of centrality, with the focus in the middle, based on the model of the Roman Pantheon. But in its pure form this has had appeal only rarely and, when it has appeared, it has usually been combined with the first idea of a single processional path—or two of them, crossing at the focus, as in the New St. Peter's or almost any other church, however humble or grand, that has a



cruciform plan.

The modest parish church of Our Lady of Lourdes in Raleigh—designed by Roger Clark, who teaches at the School of Design at North Carolina State University—abandons all of these formal traditions, for its altar is skewed relative to whatever focus the building's irregular enclosure may have, and it is reached by a series of processional routes

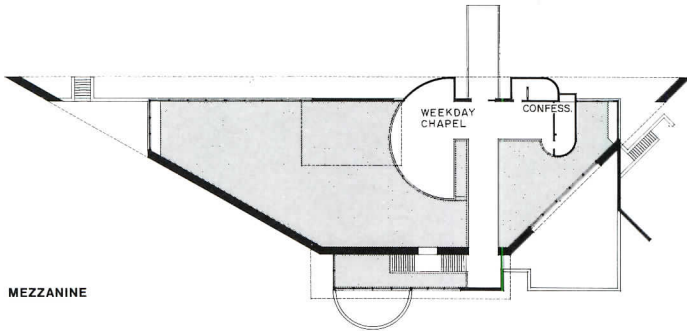
which dip, swerve, and intermingle before finally arriving at the holy place. One entrance path begins on the uphill side of the building and proceeds on a bridge across the upper part of the interior of the church, straight through the opposite wall, then down a flight of stairs. On its way, it passes a small chapel for weekday use (seen in the photograph above left), and, on the lower level, it

joins another entrance way, itself the conflation of two other paths from the outside.

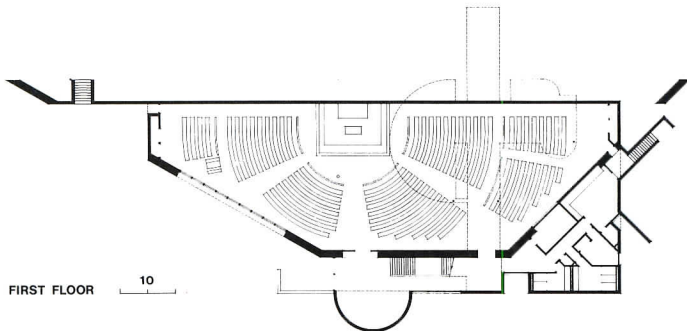
The effect is strange and novel: a drama of variety and surprise, a drama of sequence, has replaced the one of single-minded impressiveness. Inside, other varieties await: that of sitting near the altar with many people or farther away and relatively alone, that of being in a high space or sheltered beneath



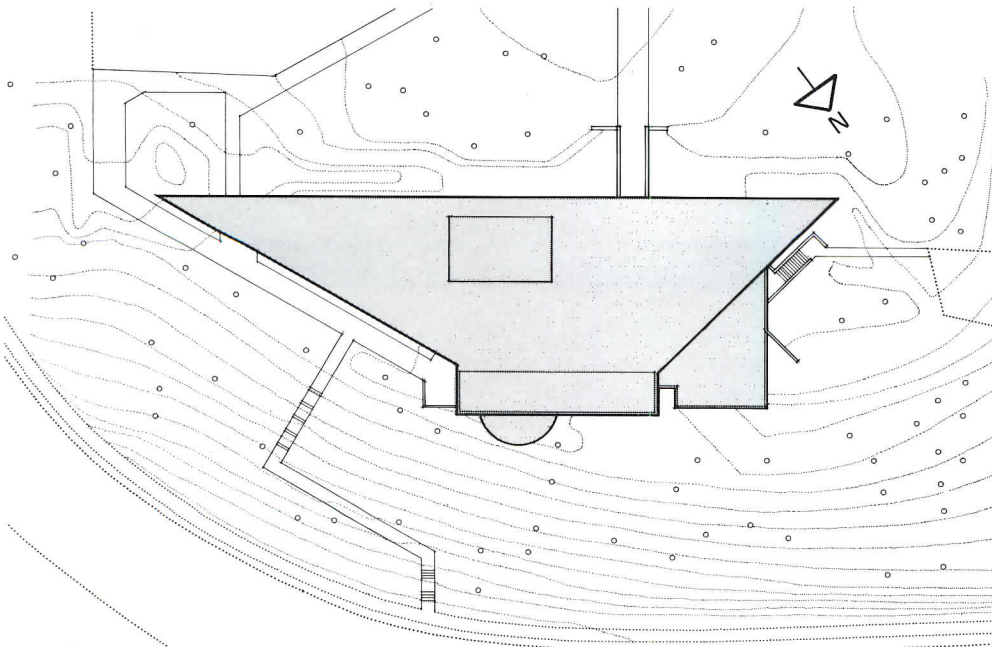
Gordon H. Schenck, Jr., photos



MEZZANINE



FIRST FLOOR



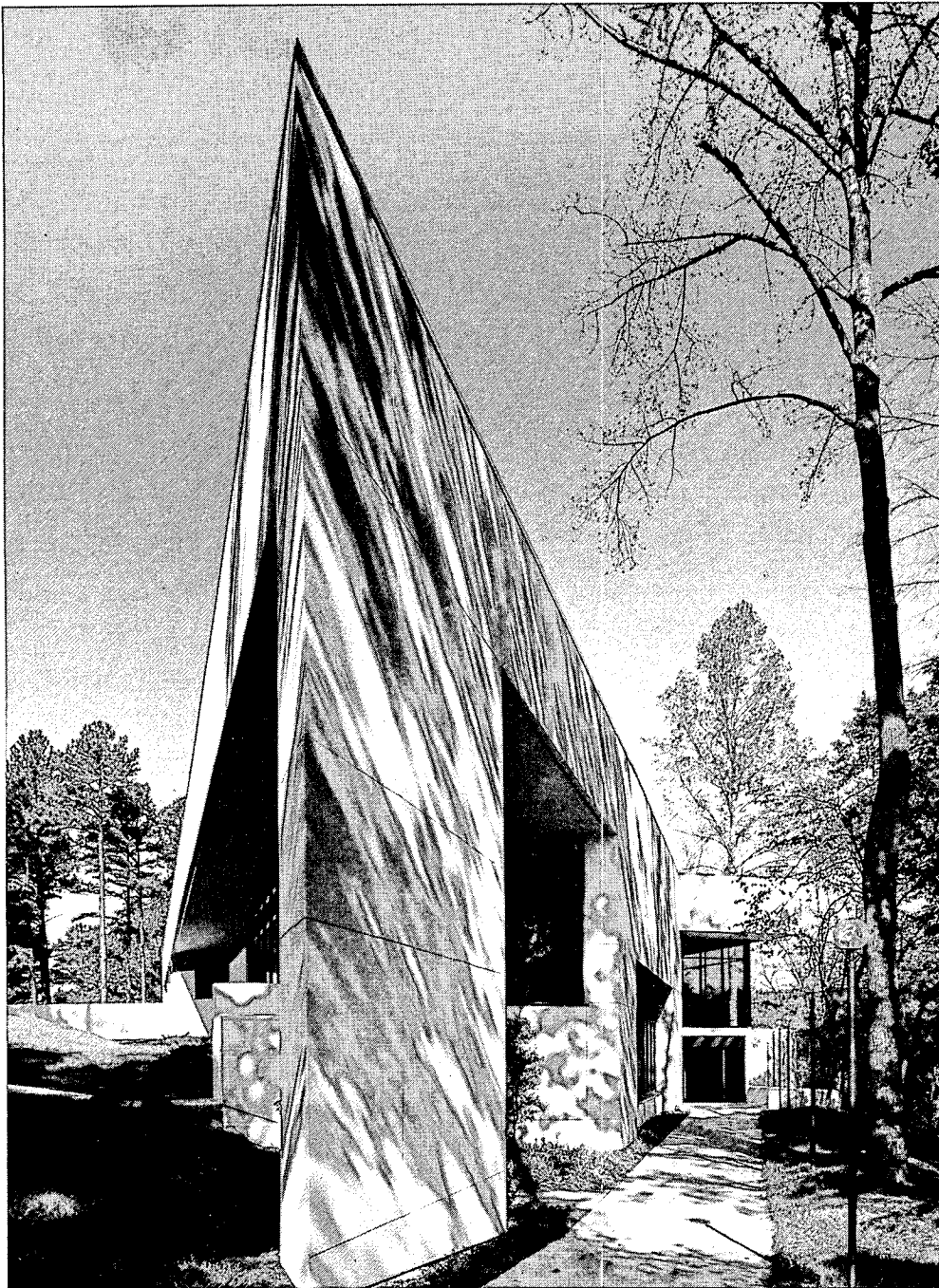
the bridge which passes overhead. And— notably, in a building of Modernist vocabulary—there is the pleasure of looking through windows that do not simply celebrate the apparent union between indoors and out but instead consciously frame and compose a variety of views. All of these things amount to an architectural success—though a success, granted, that is not undiminished by several



disappointments. In its fabric (as opposed to its form) the church does not look much like a church, and this will be regarded as a minus by the considerable number of people who think that a church should. A more general statement of the same problem—and one less dependent on personal taste—is that the chosen materials, detailing, and furnishings do not serve as much as they might have served

to enrich the power of the building's really remarkable design. What finally makes the design remarkable—and what also relates it closely to many of today's architectural passions—is that it seems it is not so much an object, a thing in itself, as the generator of a series of impressions. In this respect, it is very much like Ralph Adams Cram and Bertram Goodhue's St. Thomas Church in

New York (RECORD, April 1974, pages 113-118). Buildings that are "objects," of course, also create "impressions," just as buildings that create impressions are also objects, so the distinction is one which depends on balance. Nonetheless to see here the scales tip in such an original way toward the point of view of the beholder provides cause for rejoicing.—Gerald Allen



Gordon H. Schenck, Jr., photo

The photograph above stresses the church's resemblance to drive-in banks and its sharing of recent fetishes for acute angles, but it also shows how, as in a pilgrimage church, many different paths lead to it. The building is on a steeply sloping site, and parking is in several separate areas, including the street below. The entrance which leads to the interior bridge described on the previous pages can be seen in the background on the left, while another pathway also on the left can be seen passing through an exterior void in the building and joining the path seen straight on. This in turn leads to the entrance beyond, where it is joined by still another route that ascends the hill from the street.

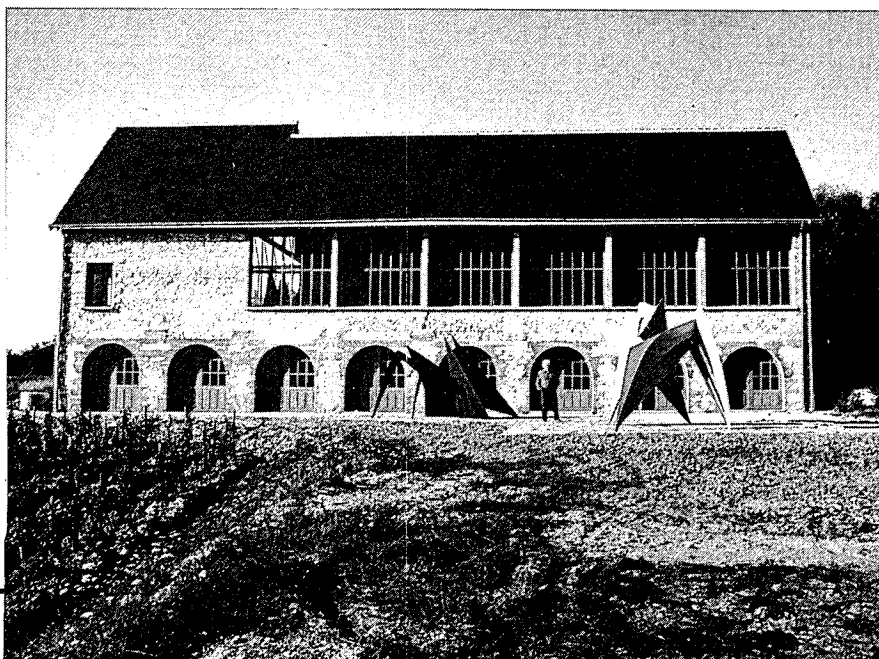
OUR LADY OF LOURDES ROMAN CATHOLIC CHURCH, Raleigh, North Carolina. Design architect: *Roger H. Clark*. Architects and engineers: *John D. Latimer and Associates, Incorporated*. General contractor: *Saieed Construction Systems*.

On a hill above the village of Saxe, near Tours, and overlooking the valley of the Indre River, one of America's most lovable artistic legends created a hearty household for all comers. . .



Alexander Calder's place in France





Alexander Calder's house and studio in the French village of SACHE, seen above at the right and left respectively, have a style very much in keeping with the local vernacular of farm buildings, yet have an unadorned amplex of space and personality that is evocative of the artist's own human qualities. Outside, between the buildings—the house was put up in 1969, the studio in 1962—he husbanded an orchard of his stables. Inside the house proper (opposite), mobiles waft above a jumble of tables, chairs, rugs, pots, kitchenware, and other eating and cooking utensils—most products of Calder's ingenious, gadgeteering nature. The mobiles seem to hold the room together, or maybe the roof up.



Pedro E. Guerrero photos

Alexander Calder, with his mobiles and stables, put the welcome mat outside art's door. It was quite a big welcome mat, with bright colors, and by the time he left this world, late in 1976, this world knew that art's house could be a playful, unpretentious, yet very profound experience.

Calder gave a tinker's darn about every detail of daily life, and never having been full of himself, this explains why his own households and workshops were always so full of himself. You didn't cross the welcome mat into a building, visiting him and his wife Louisa; you crossed it into a *being*—one who put as much inventiveness into coming up with the perfect fork, soup ladle, baking dish, door latch, or rug as he did into his mobiles.

In 1953, having lived and worked in Roxbury, Connecticut for some 20 years, Calder discovered the French village of Sache, where his friend and future son-in-law, Jean Davidson, the writer, had a place. Buying an ancient house, with a couple of outbuildings that he used for studios, he began living half of each year in Sache—proceeding with his work on the mobiles, turning out gouaches, coming up with household gadgets and utensils, and generally whispering sweet (sometimes earthy) somethings into the ear of the *world of art*. He was the best American "event" to have happened in France since Ben Franklin.

By the early 1960s, however, Calder was running out of room. He was working on bigger pieces by this time, mobiles as big as airplanes, and now the stables, which though they weren't meant to move invariably gave the impression of intending to. So Calder, working with Davidson, set about building a new, bigger, three-level studio on a hill nearby—a simple stone-and-timber building, with a slanting skylight and arched windows. The workshop clutter soon became as hopeless as ever, but at least the models of the stables had more elbow room, and Calder, amid the clutter, thought of it all as the end-all and be-all of organization.

In 1969, he and Davidson set about building a new house, right next to the studio—its own slanting skylight, steeply pitched roofs, and high windows picking up on the grammar of the first building. Davidson, in effect acting as contractor and clerk-of-the-works for Calder, did consult a "real" architect about basic plans, structural details, building approvals, and the like. But he and Calder, the *real* architect (originally trained in engineering, by the way), essentially ignored, if ever so tactfully, the notations of the other architect who "... approached the house," Davidson recalls, "by carving up the spaces, putting specific labels on them." Calder liked his concepts whole. Into the 1970s, the house and studio grew together. In between them, an orchard of stables blossomed. History will be picking from it for quite some time to come.

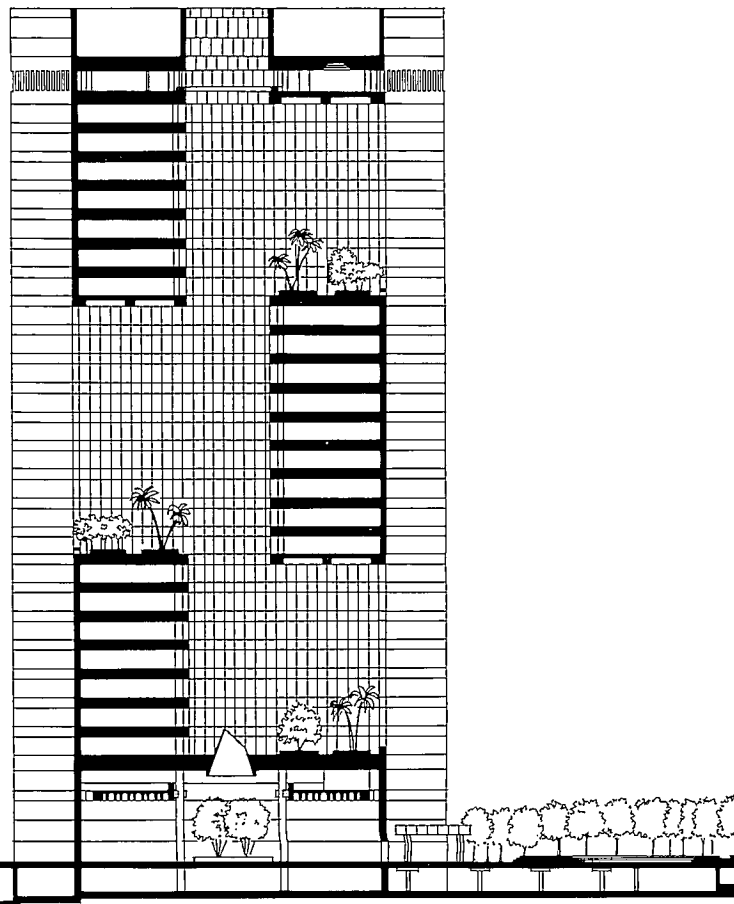
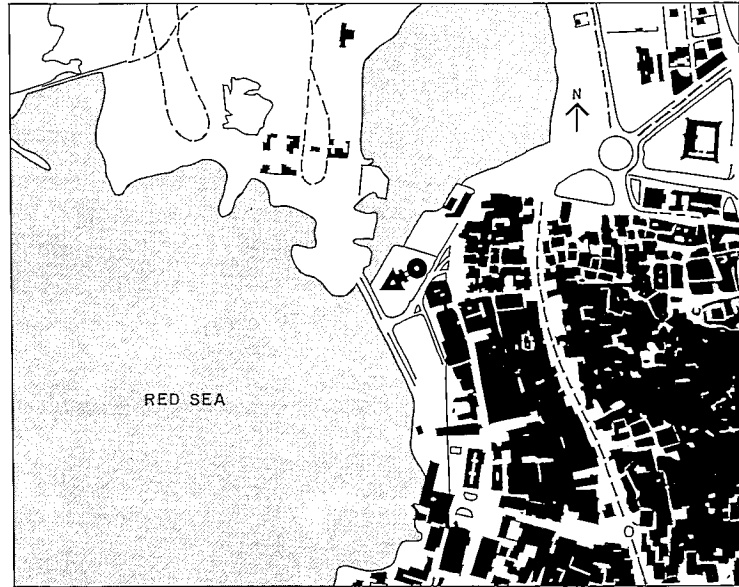
SOM's new tower in Jeddah . . .

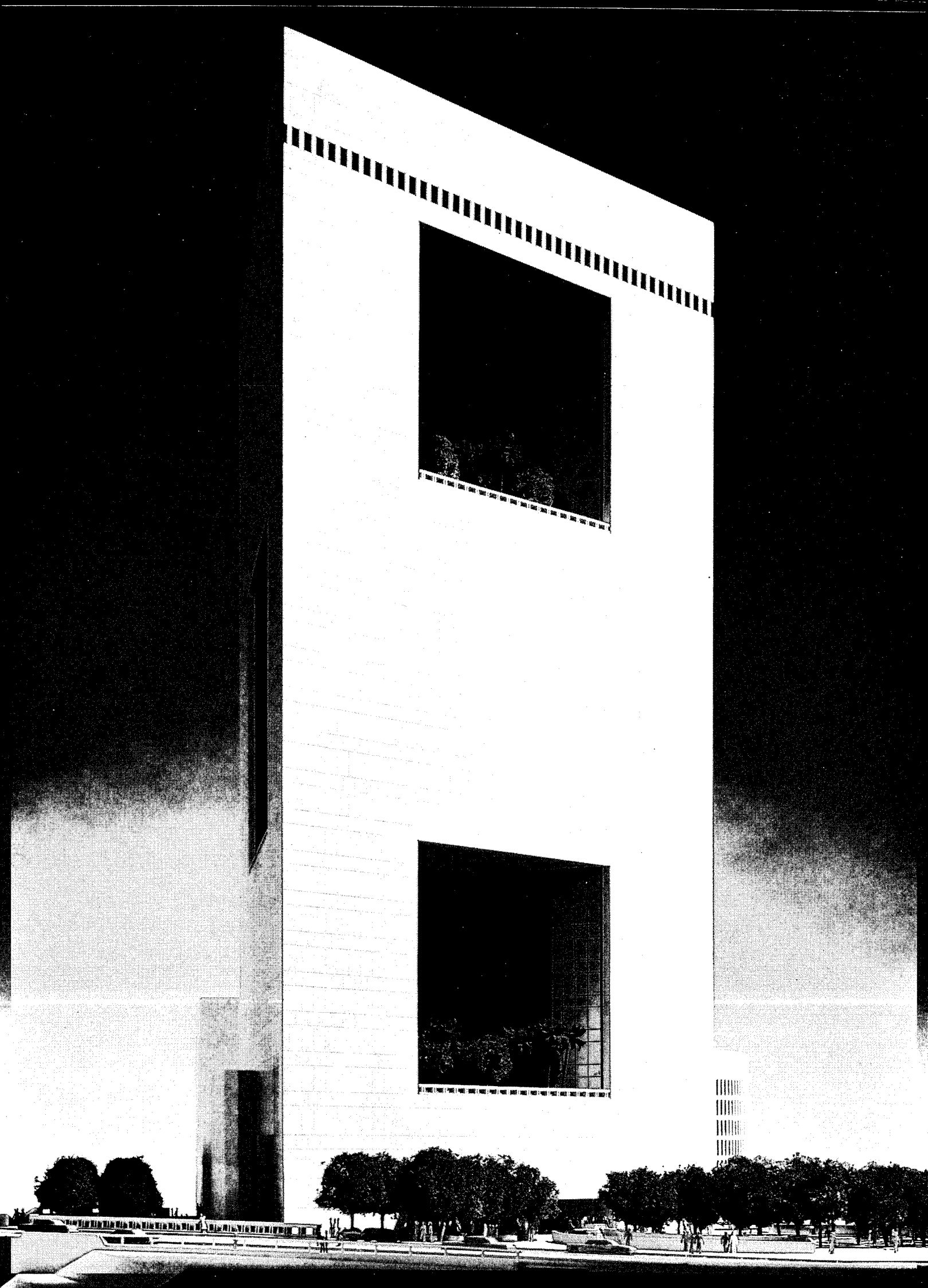
. . . is both a symbol and an exploration: a symbol of Saudi Arabia's new and more urbane aspirations; an exploration of a bold new tower form that grows from centuries-old ideas about ventilation and shading—and a form that may open new thinking about contemporary design in hot and windy places around the world.

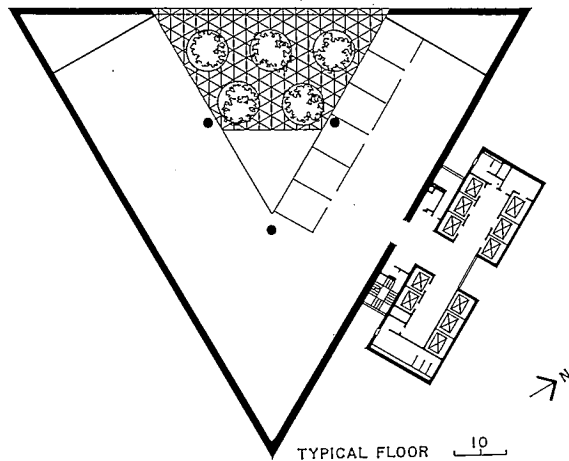
Not far from the stalls of Jeddah's ancient fish market, a new tower for The National Commercial Bank is about to become a dominant reality on the Red Sea shoreline. It will be a beacon marking not only the entrance of Jeddah's harbor (which is quickly to be surrounded by a new commercial center), but also a whole new set of aspirations and desired self imagery for the Saudis. Unlike the mud brick construction of previous eras or the sprawl of unimaginative construction that has plagued the country in more recent times, the monumental bank—for any questions it may raise in Western minds about appropriateness—will bear a strong new message of a prosperous, settled and urbane people.

Indeed, there has been a major design effort to develop this monumental building in a way that is particularly appropriate to the harsh climate. Instead of individual windows in the tower's outer marble enclosure, colossal openings will allow views from and light into the interior across three landscaped courts that alternate position on two sides of the triangular shaft (see photo opposite). Each of the resulting V-shaped floors of 18,000 square feet (see plan overleaf) will thus be shielded from the direct effects of sun and wind, while a central well that extends from the skylit ceiling of the first-floor banking room through the roof will allow accumulated heat to rise out of the courts. In developing this form, Gordon Bunshaft has incorporated at least two indigenous traditions: the principle of ventilation and—more importantly—the principle of turning the building inward.

Contributing to the massive scale of the unbroken expanses of travertine walls and the openings in them, the height of the 27-story building has been extended to over 400 ft by unusual individual floor heights. The fact that this is a high-rise building at all in a country where construction has traditionally spread out instead of going upward has to be viewed in the light of Jeddah's well-established role within Saudi Arabia. Despite its proximity to Mecca—the physical heart of the Moslem religion—Jeddah has been for many generations the window to the West—a more commercial, slightly more permissive place than the rest. Western standards are actively sought here, and—in this case—will be achieved to spectacular effect. —C.K.H.





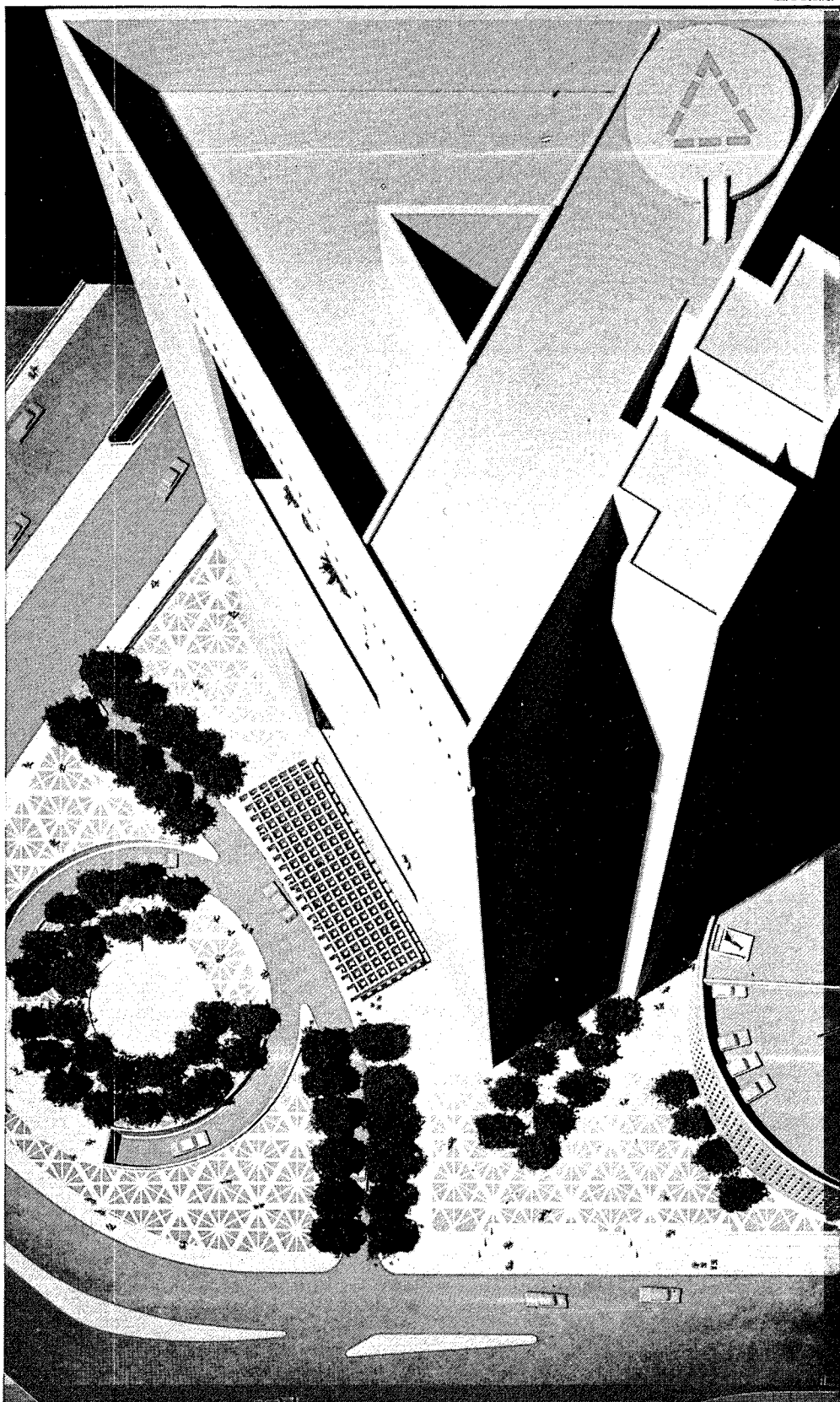


In an incredibly detailed series of models, SOM has shown both the building and many of the individual floors. The forecourt will feature the greatest of luxuries in arid lands: water and trees—in addition to the circular ramps for a garage that will fill part of the level below. The rest of this lower level, which will extend over the entire site, will be devoted to mechanical equipment and loading docks. The remainder of the spaces for 575 cars will be located in a circular structure, from which clients and personnel will be able to enter the building in comfort and privacy.

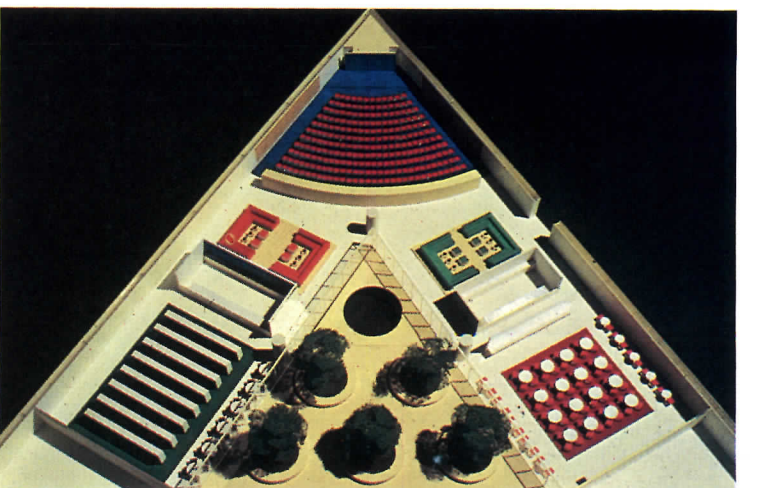
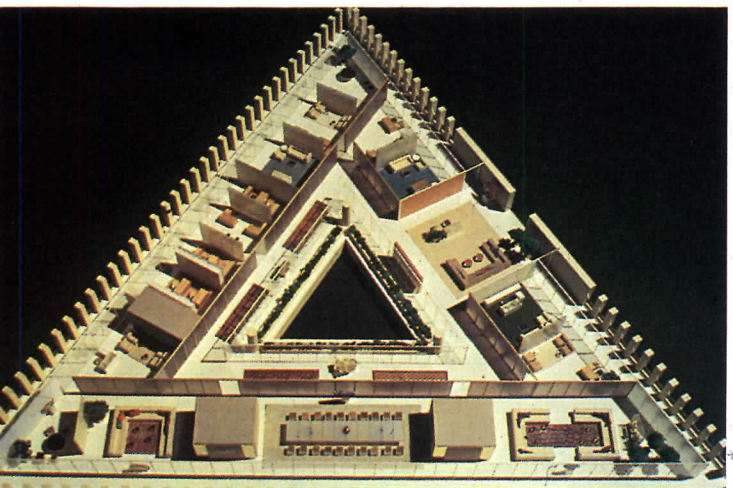
Above the banking floor (see overleaf), a floor of common facilities (photo opposite, bottom right) will surround the lowest of the courts recessed into the tower. The V-shapes of the typical office floors (plan above) will open to views either to the south or to the west, depending upon which court they overlook.

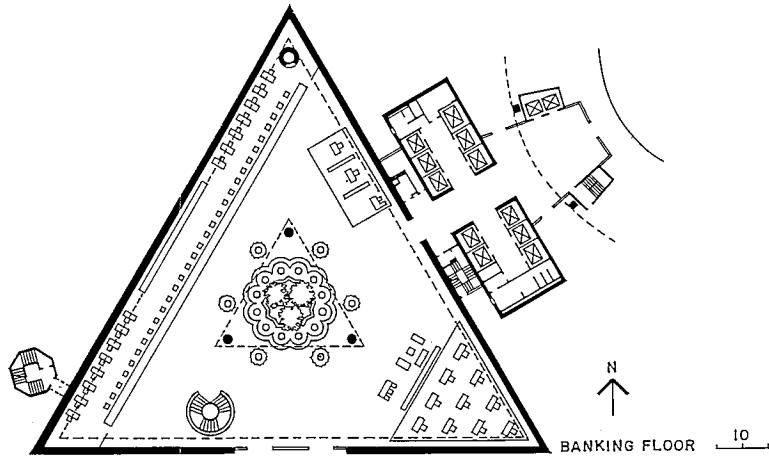
But it will be on the top executive floor (photo opposite, bottom left) that the true opulence of this project will be expressed. This floor will be the only one to have windows opening to views in all directions—and even these windows are set back behind sheltering arcades. The chairman's suite, including the central board room, will occupy the entire south side of the building. This immense space will be divided by partitions into a series of meeting rooms that—with the exception of the board room (photo opposite, second row, left)—will maintain the traditional furniture arrangement for meetings: couches around a central space. The director's personal space (third row right) will be a triangular area on a corner of the building to be separated from one of the meeting rooms by a panel. Offices for four managers and two directors will complete the facilities. As indicated in the models, the furnishings program has called for the most sumptuous of Saudi Arabian art work—including immense antique rugs.

NATIONAL COMMERCIAL BANK, Jeddah, Saudi Arabia. Architects: *Skidmore, Owings & Merrill—partners-in-charge: Gordon Wildermuth (administration), Gordon Bunshaft (design), Srinivasa Iyengar (structural design), Parambir Gujral (mechanical design).* Associate partners: *Michael Keselica (project manager), Thomas Killian (architectural design); job captain: Herbert D. Warrington.* Traffic consultants: *Wilber Smith & Associates.*

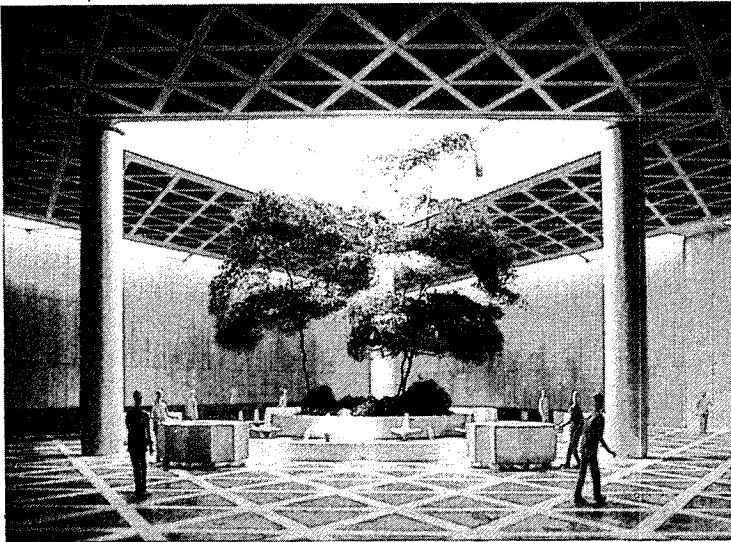


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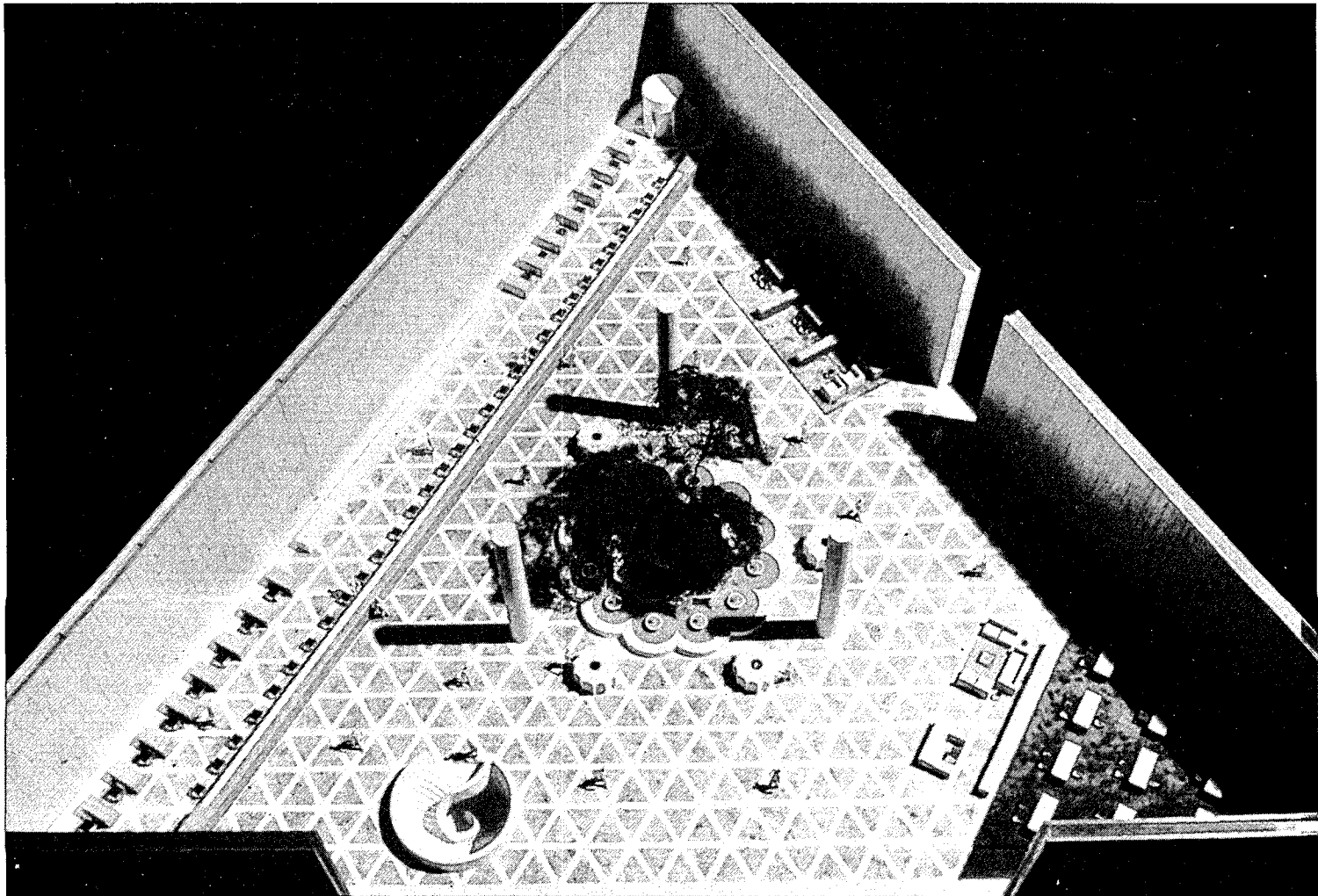
Jack Horner photos

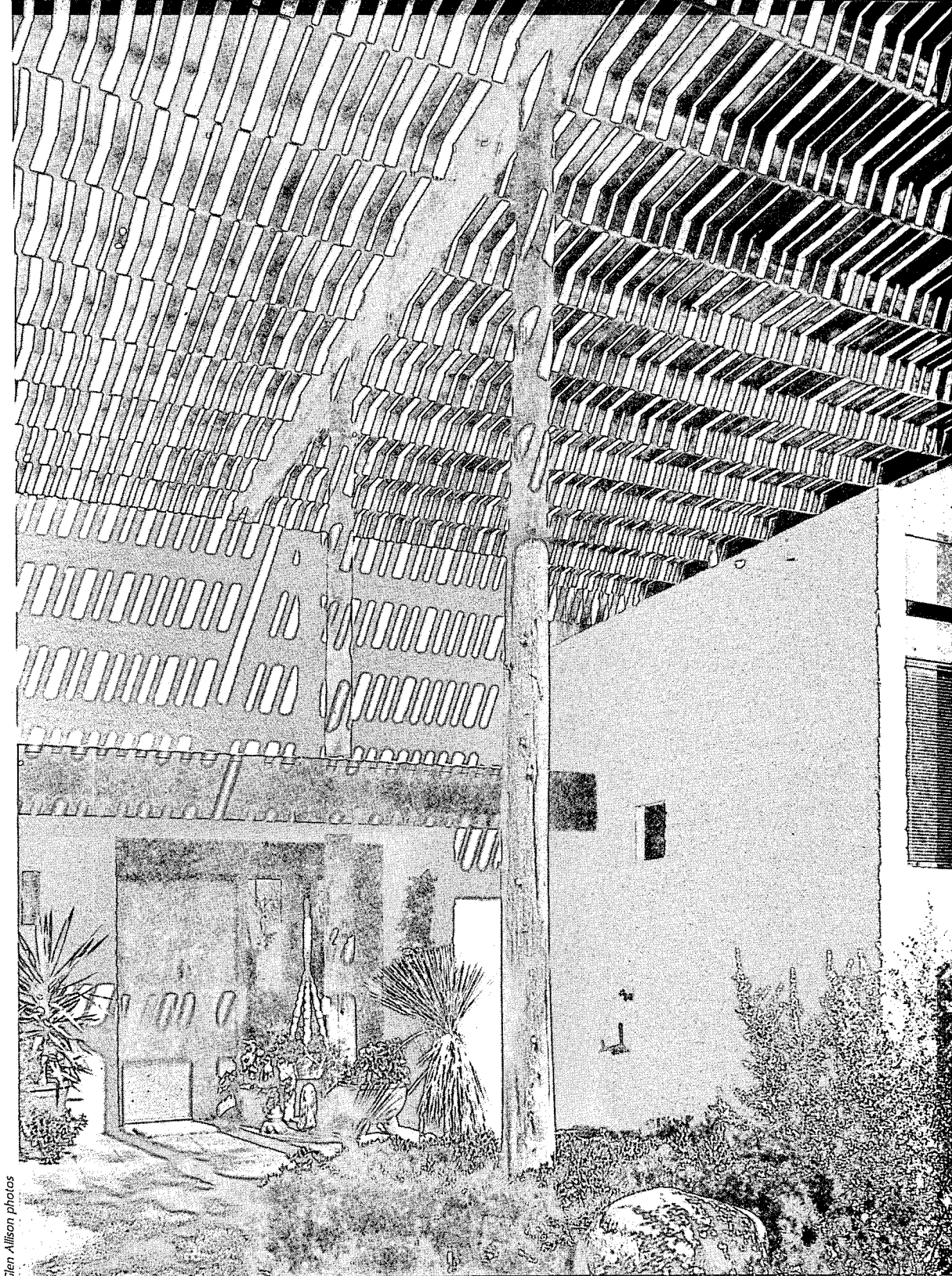


The public banking room will be located on the first floor and will be entered from the forecourt under the sheltering canopy, shown in the aerial view of the building on the previous pages. This immense triangular room will be paved in a pattern of green marble that repeats the coffers in the ceilings above. A central fountain with trees will be lighted by a skylight, through which the entire height of the building can be glimpsed in the central well directly above. A mezzanine will hold desks and offices for managers and a credit department. This level will be held away from the travertine walls, so that the

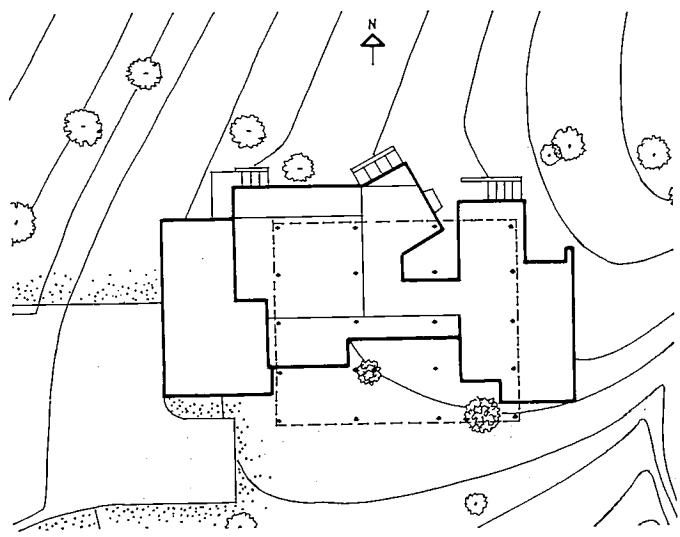
entire two-level space can be sensed from the floor below. The circular stair will lead to safe deposit boxes on the level below the main floor.

From the circular parking structure, access to the upper floors will be possible without entering the banking room. A separate tower of elevators (upper right in plan) will be attached to the main building like the shaft of an arrow pointing out to sea. A bonus of this separation: the expanse of the banking room is uninterrupted except for the three central columns. The exterior tower to the left in the plan will provide safety exits from the lowest floors.



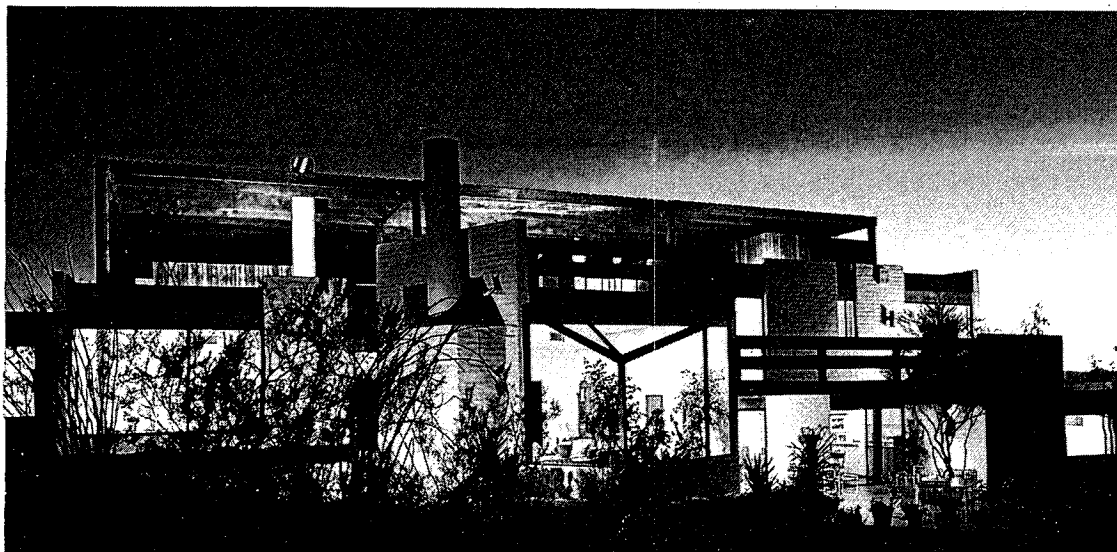
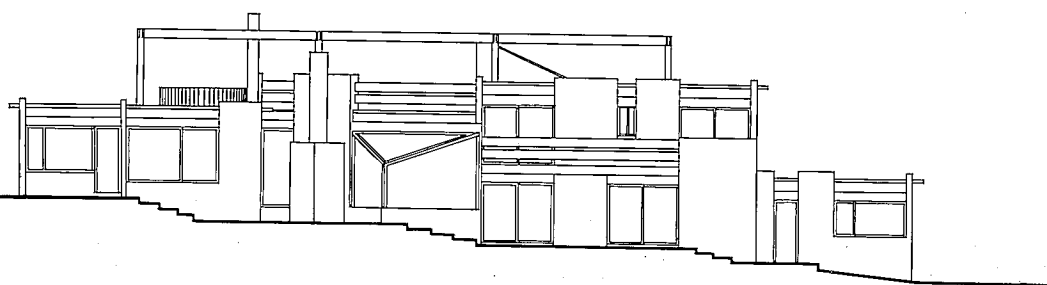


Glen Allison photos

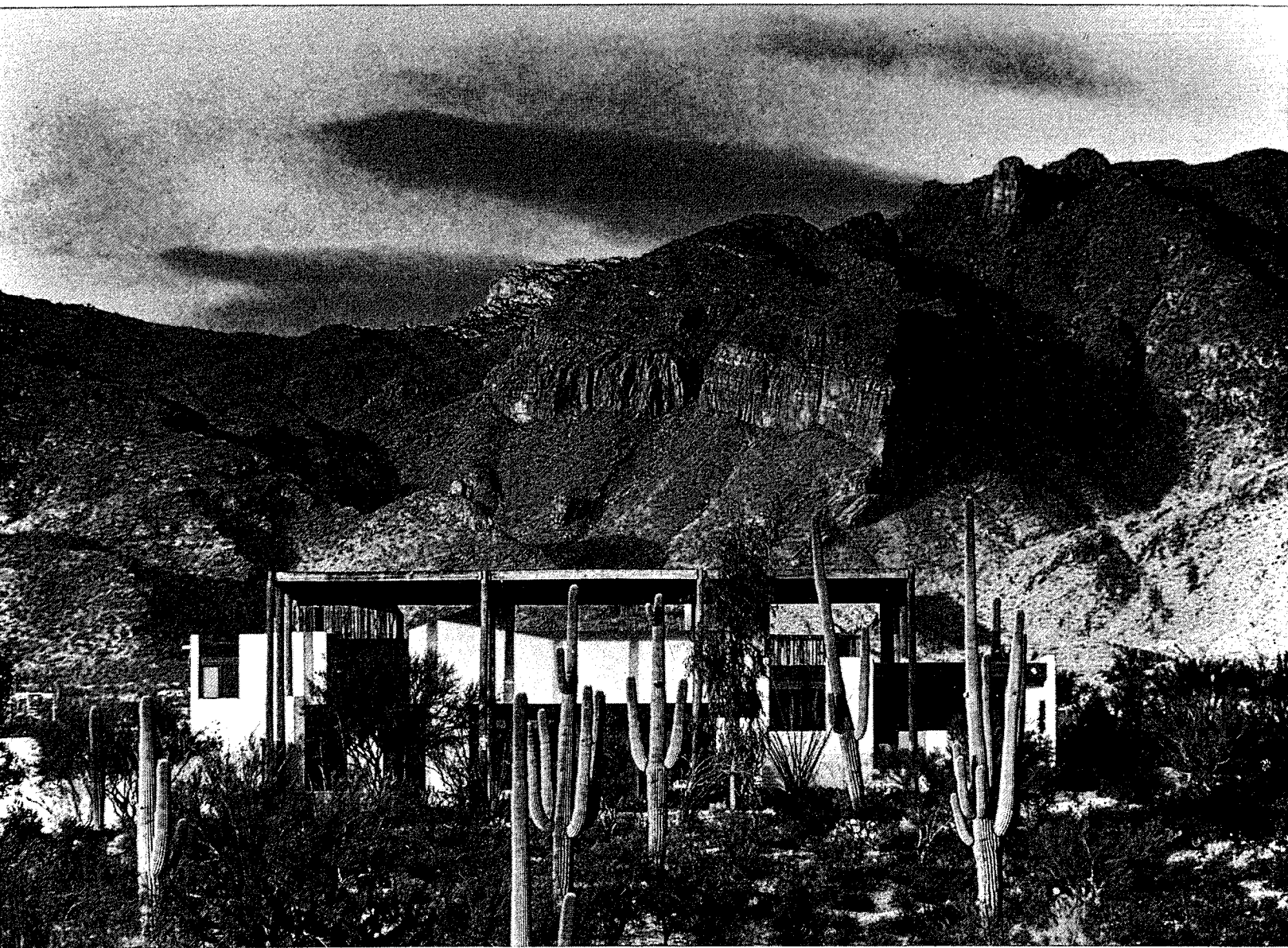


A DESERT HOUSE REVIVES ITS REGION'S TRADITIONAL FORMS

In the design of this Arizona house, architect Judith Chafee has achieved a fresh, unaffected approach to residential architecture in the Southwest—using some of the simple forms of the “Pueblo Style” to create a contemporary structure that functions better because of its traditional heritage. The most important of these forms is a large sun screen that floats over the house, controlling light and heat within while visually softening the impact of the house on the grand landscape.

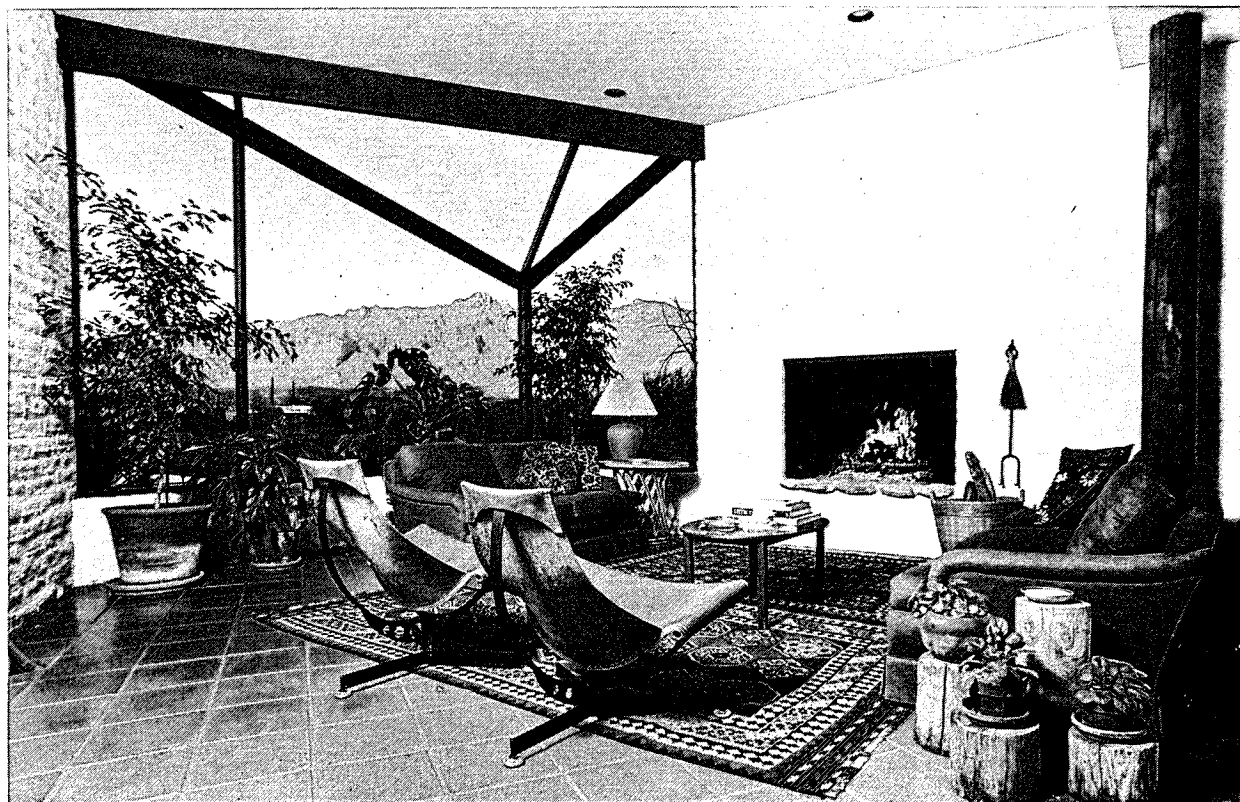


The design of this house on the desert is deceptively simple and unobtrusive in appearance against its mountain backdrop—but in reality it is quite complex, with a diversity in form that contrasts a heavy, ground-hugging masonry structure with a superimposed light and airy wooden sun screen. A large house of 4,300 square feet, its impact on the 12-acre site is lessened—nearly camouflaged—by the large sun screen, 26 feet high on the southern elevation (top left). The screen extends over most of the house, both the enclosed and open spaces. While this type of “double roof” has a historical tradition in the Southwest, and is rarely used today, Chafee has made it an integral element in the design to solve a multiplicity of problems created by the unrelenting desert climate. The canopy greatly reduces the



A prominent feature of this house is a sun screen (top left) that eases the cooling load on the house and is effective enough to permit opening up the northern elevation (below left) to mountain views.

cooling load on the house by partially shielding the sun's rays and by setting up a channel or slot through which air is drawn naturally on any breeze. The subtleties of light control also pay off in this kind of climate, and the sun screen—by allowing larger windows—permits a higher natural light level through the house. The screen is particularly helpful at the entrance (shown on preceding page) by creating an intermediate light zone, a passageway from acute daylight glare to shaded interior light. Unlike the simple lines on the southern elevation, the northern elevation (left) is complex with pronounced spatial volumes created by a second story. —Janet Nairn

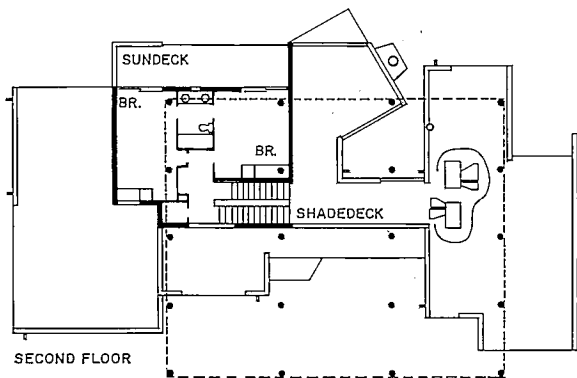
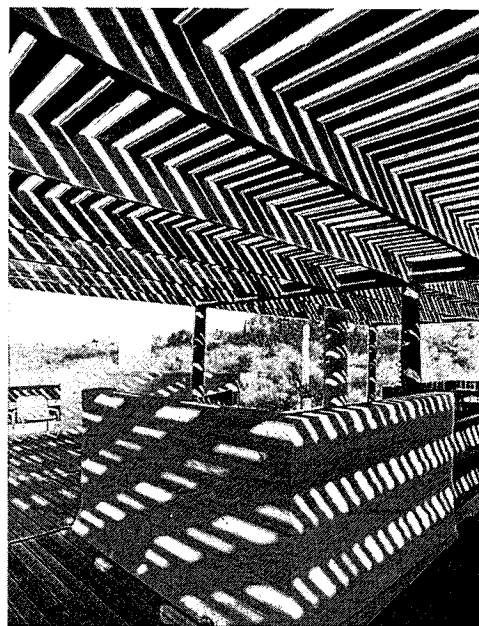
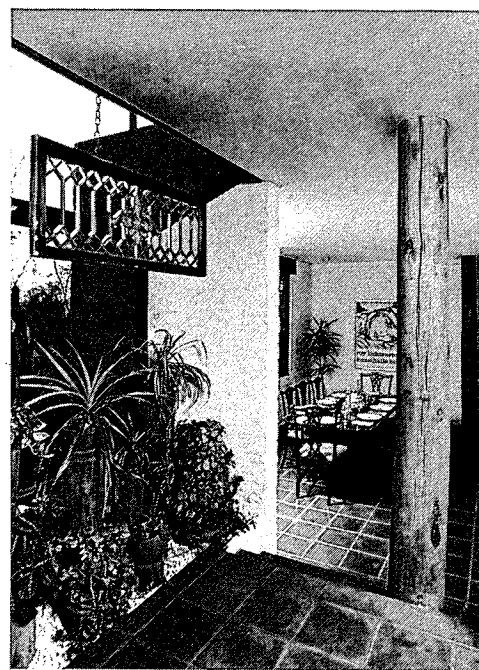


PRIVATE RESIDENCE, Southern Arizona.
 Architect: *Judith Chafee*. General contractor: *George Mehl Construction*.

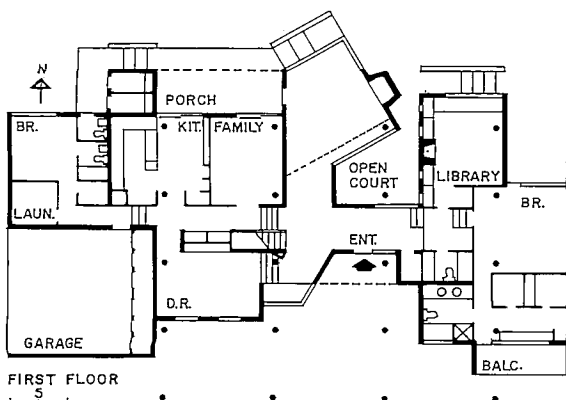


This desert house is sited on a north-south axis with the entrance and few major rooms on the southern elevation. The principal rooms face north with glorious views to the foothills and mountains. The living room (preceding page) was set at an angle to provide a court (bottom right), conveniently located between the living room and entrance (top, right). The only portion of the interior

space that is open underneath the sun screen is the court, which receives a different quality and pattern of light than any other space in the house. The walls are slump block masonry like the exterior, and the floors are a locally-produced ceramic tile. Twenty wood columns support the sun screen—each exposed and incorporated into the main living areas, each a reminder of the unseen sun screen.



SECOND FLOOR



FIRST FLOOR



JSSR, Erich Lessing, Magnum Photos, Inc.

A LIVABLE WINTER CITY

by Frederick Gutheim AIP

A livable winter city is a city which is livable the year round. To enable the snow belt to strike back at the sun belt, noted author and planner Gutheim urges that we once again pay attention to climate in our urban design programs. In this article, based upon a lecture he gave to the World Affairs Center at the University of Minnesota, he considers the northern city from two standpoints: its historical dimensions and its physical design, as both relate to weather. What can we learn from the design of Minneapolis, Portland, Ottawa, Montreal, Vladivostok, Bucharest, Geneva and Bordeaux (all on the 45th parallel) or cities further north near the 60th parallel like Bergen, Helsinki, Leningrad and Yakutsk? Are we paying enough attention to Nome and Reykjavik, medieval Trondheim or Oulu at the top of the Baltic? Gutheim argues that in our infatuation with Italy and Greece, we have built broad piazzas and boulevards which have no place in northern climes, and that the design of northern cities should be rooted in the forms of the north, not the Mediterranean—for cities which have been well designed for the cold are often surpassingly lovely.

*"Perhaps the greatest theme
for the winter city
is the oldest. . . .
Color it gold . . .
the color of the sun
these northerners worshipped,
preserved by art
the year long."*

USSR, Elliot Erwit, Magnum Photos, Inc.

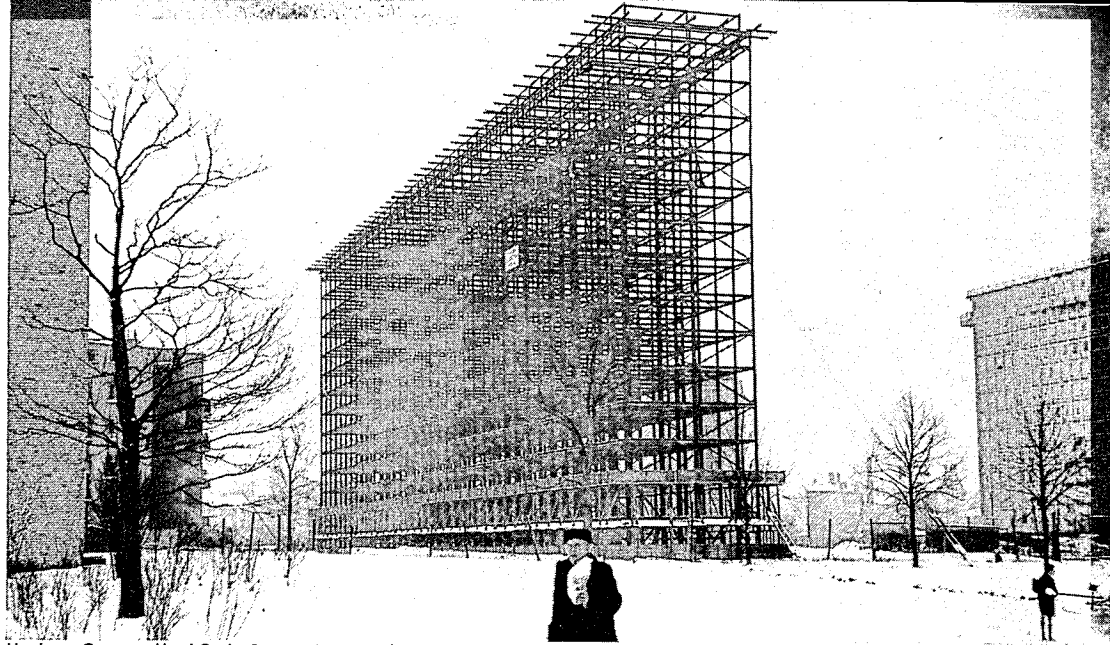


Tsarkoysezo, USSR, Bruce Davidson, Magnum Photos, Inc.

USSR, Erich Lessing, Magnum Photos, Inc.



"In the struggle to find a universal language, the International Style, we have ignored a lot of things—particularly the regional realities."



Hamburg, Germany, Henri Cartier-Bresson, Magnum Photos, Inc.



he cities we know inherit 10,000 years of urban development that has moved from south to north, especially in the years since the Renaissance. The wide boulevards, civic spaces, monumental buildings at focal points that were characteristic of the "city beautiful" movement have their origins in the Mediterranean. The significance of these origins to "the livable winter city" has received little critical analysis.

In their infatuation with Italy, the British Victorians thought to reproduce the piazzas of that charming land, complete with their fountains. In the pages of the *London Brick-builder* of 1856 one can read a cautionary response that is equally applicable today. "Better than a memorial fountain, given the realities of the British climate," a correspondent wrote, "we should create an eternal flame."

Everywhere our cities suffer from what Arthur Koestler has called "architectural esperanto." In the struggle to find a universal language, the International Style, we have ignored a lot of things—particularly the regional realities. And, as the Greeks said, "When the gods wish to punish us, they answer our prayers." Our urban environments are what we have made them.

That we cannot escape environmental reality seems the first conclusion to draw from experience. That we have the ability and agility to adapt to environment is the second. That intelligence, imagination, and creative art will lead us to the best adaptation is the third. One may also conclude that creating synthetic environments both postpones the ultimate reckoning and cripples the human ability to grow through adaptation.

In terms of social planning the winter city will be relatively dense and compact. It should increase face-to-face contact and promote social cohesion. It should further round-the-clock urban life, especially in public environments. The urban firms and institutions which can promote such an urban life must be found and encouraged. If new solutions appear radical it will be in contrast to city building practices derived from warmer climates. Because the cities we have developed in a unique period of cheap land, cheap energy and an unrealized cost for

municipal services, it was possible to overcome environmental conflicts with the Mediterranean urban model by brute force techniques. It is unlikely that we can continue to pay the cost of these techniques.

With the greater awareness of ecology and environmental impacts, a special burden has been imposed on northern cities in their energy and transportation arrangements. In the short run this will probably have an adverse effect upon the region's growth. But northern settlement cannot be restrained, and technological development is on its side—although perhaps not for another twenty years or so. At least northern cities will not have those exorbitant costs for air conditioning. Cities like Minneapolis will respond to development in the Arctic north, just as a rising tide lifts all boats. Not only do such cities provide the natural bases for northern expansion; they also share in the technological advance.

The livable winter city has detail as well as broad strokes in its design. What should we consider at domestic scale? Improving the welcoming, cheerful appearance of our homes and other buildings need not be reserved for the Christmas season. In Finland the advent of winter is announced by city dwellers returning from the country with pine boughs that are trimmed into a green doormat that brushes the snow from the feet and manages to last most of the winter. Such touches are useful reminders of the human bonds of the city, the togetherness that winter conditions promote.

This human closeness is more vividly brought home to me on every trip to the north. Against the severe climate, human cooperation becomes a spontaneous imperative. A mechanical breakdown of a snowmobile is a life-threatening situation demanding and receiving community priority. The wayfarer is sheltered without question.

The livable winter city must look to the arts. Much of our winter's leisure is spent in concert halls, museums, galleries and other places of culture and entertainment. In the artistic imagination are born many of the most useful individual and social adaptations to the climate. Most important is the role of the arts in the celebration of life in "the livable winter

city." The animating and invigorating element must be the celebration of the human condition, the unique province of the arts.

Those who would discover the secrets of life in the north should not settle for the standardized, machine-produced environments of the present, but turn to the great ages of the past. Consider literature. Those frost-etched Siberian winter scenes in *Dr. Zhivago*, with snow-plastered trains, filmed in fact on the Manitoba prairie, are a powerful visual statement. Even more than the snow-packed streets of 1909 Petrograd, this image of the endless steppes cannot be erased. What the film provides as an image is deepened by Pasternak's novel, an ageless classic of love in a northern climate.

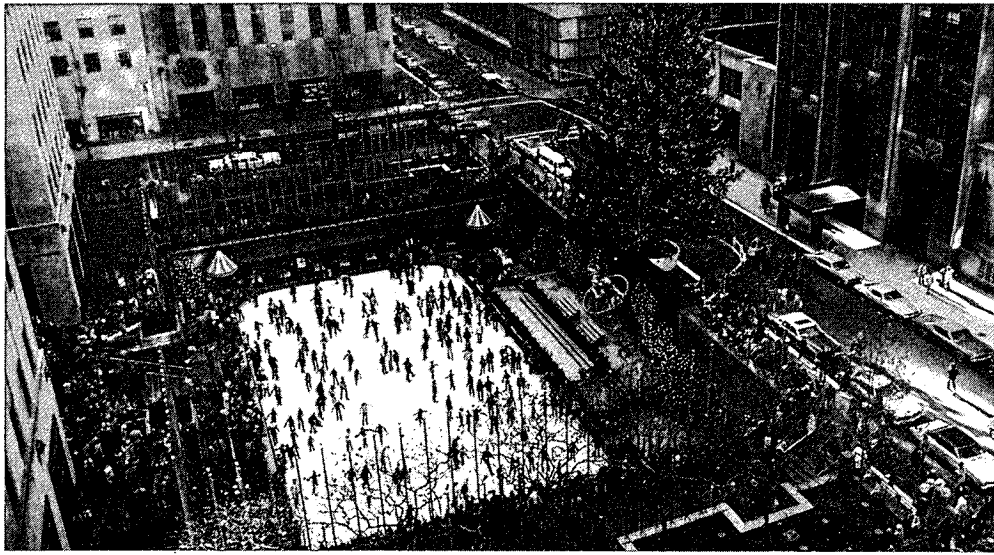
Those who doubt the effect of environment on character may consider W. H. Auden's poem, "Good-bye to the Mezzogiorno," which concludes:

"... if we try
To 'go southern,' we spoil in no time, we grow
Flabby, dingily lecherous, and
Forget to pay bills..."

Perhaps the greatest visual theme for the winter city is the oldest. In the Norse sagas, perhaps more in *Beowulf*, one finds both the architectural formula and the psychological adaptation to the winter environment. Color it gold, is the advice they give. Gold is the color of the banqueting halls, gold to echo the living flames of the hearth, gold reflected in the polished steel of armor and shields that hang the walls. Gold, the color of the sun these northerners worshipped, preserved by art the year long.

But designing the environment and inventing appropriate technologies was not the end of the Viking response to the climate. The heroic posture they contrived, of which the sagas themselves are an expression, offered the plunge into the icy waters and other equally chilling behavior as evidence that they were undeterred. If you think we are not effete, read the sagas of *Beowulf*. There, little is heard of snow and ice, and much of plunging into mid-winter's raging ocean waters, steel armor, sword, battle-axe, and all.

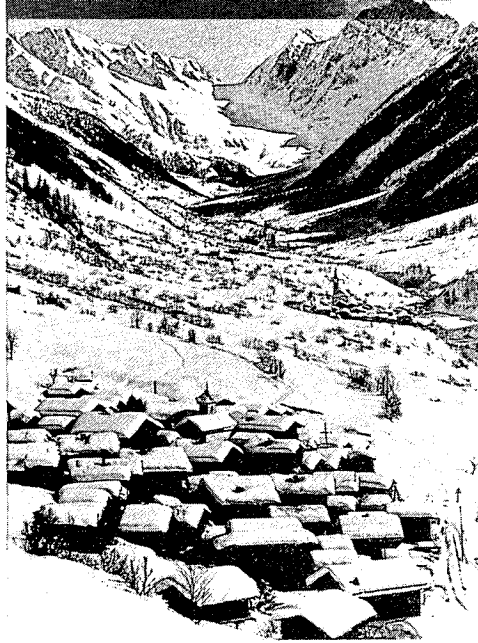
And what of the built environment in the ninth century, the Golden Age of the Vikings?



Rockefeller Center, New York City, courtesy Rockefeller Center, Inc.

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It should increase face-to-face contact
and promote social cohesion.
It should further round-the-clock
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is brought home to me
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Against the severe climate,
human cooperation becomes
a spontaneous imperative. . . .
The wayfarer is sheltered
without question."*



Switzerland, The Bettmann Archive, Inc.

That architectural glory, the stave church, had not arrived. The great building was the Banqueting Hall, the club of ruler, soldiers, distinguished visitors, and seafarers. Under its great golden rafters and roof-tree, the chamberlain organized feasts. The opening sections of *Beowulf* describe "the erection of a building that should be the greatest banquet hall ever known, in which [Hrothgar] could apportion to young and old everything that God had entrusted to him, with the exception of public lands and human life . . . Tall and wide-gabled, the hall towered overhead." Here one heard "the harp-music, and clear song of a poet relating the creation of man from earliest times." In this timbered hall, "embellished with gold," was the seat of Hrothgar, and the most celebrated building in the world, whose splendor blazed abroad over many lands, the glistening home of heroes. The doors were secured by wrought iron bars, and the hall was stoutly braced with iron clamps "forged by skilled craftsmen. Its interior was inlaid with ivory, and even the benches were inlaid with gold." Further, "golden tapestries gleamed along the walls." Adding to the decorative effect were polished shields, swords, helmets, and corselts, all reflecting the blazing open fires.

Gold—the color of sunlight, and living flame, reflected everywhere from mirror polished surfaces—is the theme of these great halls. What greater contrast to the northern darkness, the perilous sea, the gothic forest? It was a contrast as great as the hearty fellowship of the banquet gatherings to the lonely dangers of combat or the hunt.

I offer these responses as enduring ones. Have we improved upon them in the north today? In place of the banquet hall and the Viking gold we have the climatic bubbles of northern settlement, the megastructures, the enclosed shopping malls, the educational complexes like the University of Duluth or Lethbridge. The roots of these environments are more likely to be found in the psychologically-oriented, synthetic interior design absolutely detached from the environment of the earth. But hanging plants, whether real ones or of plastic, are less a constructive response to the northern environment than a pitiful recollection of a faraway temperate zone.

We have not resolved the human problems of such design. The search for a livable winter city must recognize that it is not ergonomics or hardware, but *people* who are the heart of the matter—living in artificial environments, in certain juxtapositions with each other, at high population densities, under peculiar stress.

Our present circumstances, for a variety of reasons including the "heat island" canopy over many large cities, snow removal practices and the increasing pollution load, have produced a dark and dirty urban scene for much of the winter season, slushy roadways necessitating overshoes rather than mukluks, heavily moving traffic, something between seasons rather than a crisp winter character. The answer to this is obscure, but it is probably the same as for urban visual litter—to attack the problem rather than to add to it with touches of synthetic cheer. Would more snow be better? Perhaps we need snow machines in the winter city as well as on the ski slope. Would it help to zone the city into snow and non-snow districts?

The problem faced by the "lower northern cities" has been greatly complicated by auto and truck traffic. The individual may have attained comfort and convenience; the public environment has not. Farther north, where snow stays after it falls, it can be rolled down or sculptured into a fairly reliable part of the urban environment. In the Yukon, it has been estimated that snow highways can be built over the tundra for \$200 per mile. In Finland's winter war of 1939 the ice road between Helsinki and Petsamo carried trucks for hundreds of miles over land and lakes. Within the memory of many, snow was not scraped away, or removed with chemicals or salt, but smoothed and used as a traffic bed. Each successive snowfall (in many parts of the north an almost daily increment), powered and refreshed the snow pack. Then the winter city at least looked clean and it was possible to think seriously about a winter wonderland of sleighbells and steaming horses, if not reindeer.

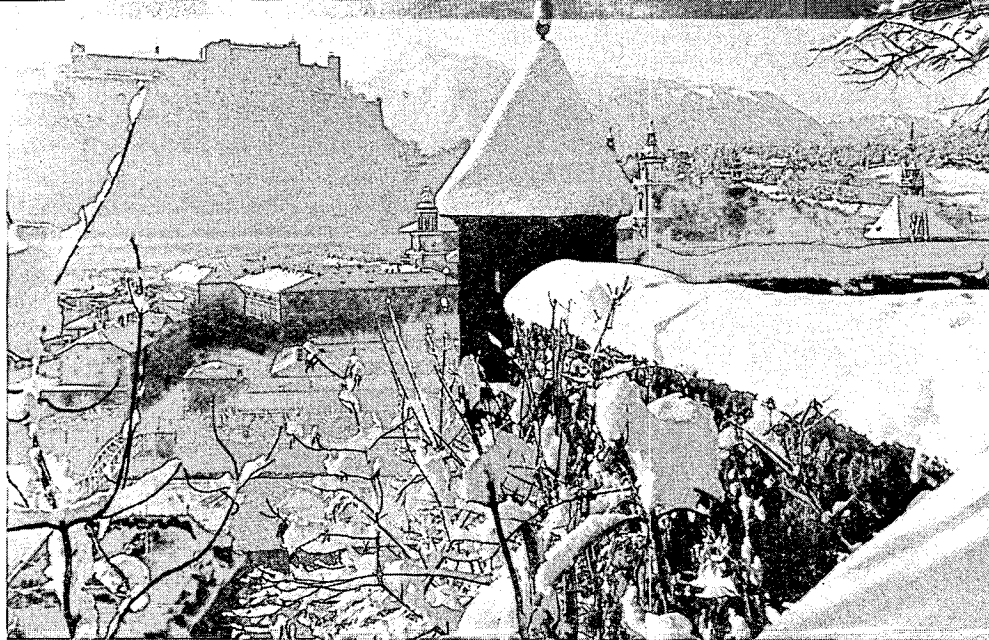
Let us be specific about what is needed. Before we can address with reasonable precision the livable winter city, we have to define more closely just what makes the winter city

different from other cities. Is it the cold, the dark, the snow? Is it transportation or communication differences? Is it the higher cost of public or environmental services?

How should the environment of the livable winter city be expressed in housing, community development, the work environment, the central business districts, and other distinctive parts of the city including its suburbs, in transportation and communication, in its water and sewer systems, and in other environmental arrangements? In each of these sectors we need to ask specific questions about the winter conditions that make this a distinctive environment.

Have we a technology appropriate to these conditions, making the most of them and meeting their specific requirements, or are we using standardized designs and solutions developed elsewhere for other and different conditions? Does the livable winter city have different standards for recreation, room sizes in housing, the design of expressway ramps, and other details of the city? Do we need to take the conception of city parks indoors, as at the vast Winter Club in Winnipeg? Stockholm is almost entirely served now by central district heating, but many northern cities in America have had such systems for decades—Oak Park, Illinois, for nearly half a century. How should this experience be re-evaluated in terms of energy conservation or today's higher costs of fuel?

The snowbelt/sunbelt question is not a matter of longitude or of climate. It is a question of people. It must be looked at in terms of social fluidity, or migration. If we are to strike a blow against total social fluidity, it must be in the north; let it be there that we assert the values of stability, continuity, the three—or more—generation family, community life and established institutions, heritage and patrimony, the past. And assert these values against the rootless, dusty, sprawling, cultural aridity and inadequate public services of the more southern regions. The past has endowed the north with great institutions, universities, medical services; inherited architecture and great parks; libraries, symphony orchestras, operas, and museums; the investment of generations in the good life. We should build on these foundations.



Salzburg, Austria, The Reitmann Archive, Inc.

Northern resources, transportation, and defense considerations have today stimulated national, bilateral, and regional interest in exploration, research, and technological development and urbanization. New institutions have appeared in very recent years that express this interest: the Institute of Northern Studies at Walcott, Vermont; the Centre d'Etudes Arctiques, Paris; the University of Alaska's Man in the North program; the Scott Polar Trust in Cambridge, England, are representative developments. Urban development in the north is characterized by the new northern Swedish town of Kiruna, a center of stainless steel production; the northern Quebec settlement of Fermont, a key center of iron ore production; the emerging new capital city of Alaska near Willow, just north of the transportation, defense, and resource metropolis of Anchorage; or any one of scores of Soviet northern settlements of which Novosibirsk is the most celebrated.

From these developments important new urban technologies and development strategies are emerging. We must look to this body of experience not simply as it relates to snow, ice, and cold, but as it deals with more universal problems of cities in arid climates, in isolated locations, or as parts of larger urban systems. A specialized agency such as the U.S. Geological Survey can afford to focus narrowly on a single problem, such as perma-frost construction, but those facing the larger concerns of urban development and design must embrace the broader fields of urban ecology, metropolitan planning, human biology, and fields of equal complexity. Here we are at the frontiers of human knowledge. Urban ecology is hardly more than a concept—yet one that can be translated into the economic-environmental trade-offs in urban areas. Human biology knows relatively little about the human body, its health and life expectancy as they are affected by northern conditions or the constraints of artificial environments. Nor do we know much about the urban stresses to which northern populations are exposed.

In terms of broad urban strategies, northern cities can move in two well-defined directions. They could take as a model the nuclear submarine that stays submerged for

months at a time, or the space craft totally separated from the earth, and in this fashion strive for a wholly independent, detached, self-contained environment, one that within itself satisfies every biological and psychological requirement, that disposes of all human wastes and pollution. Alternatively, they can develop the model of an urban settlement that is highly integrated with the surrounding environment. The dimensions of such development and its feasibility are suggested by a winter visit to popular parks: thermal clothing, snowmobiles, winter camping equipment are only a part of it. By half-track vehicles, aircraft, mobile homes, and the larger technology, the north is being conquered—or at least changed—in more fundamental ways.

In modern times in the U.S.S.R., a vast demonstration of more than a hundred northern settlements has produced a significant laboratory. The initial big plans for new towns were supported by the not inconsiderable powers of the Soviet state over employment and the migration of population. A turnover of 100 to 200 per cent a year in the population of these towns has proved as intractable as putting a ceiling on the growth of the city of Moscow.

Nothing less than the recycling of nearly all of these towns, now in progress, will suffice to produce more humanly acceptable settlements, which as they are now, represent a step backwards. Many of these northern settlements are now being treated as "construction camps." They are inhabited largely by men who periodically are given leave to join their families farther south. This is an environmental "cop-out," a less gold-plated version of the Alaska pattern where intensive northern labors are alternated with periods in Hawaii or southern California.

We must abandon the "construction camp" approach to the design of winter cities as surely as we must abandon the attempt to create synthetic southern environments in the north. We must remember that we can fashion our urban environments closer to our hearts' desire. When we speak about the "livable winter city" we are talking about concepts that can be formulated in terms of design, that can be tested and that can be executed.



RETAIL MALLS

The old image, slightly tarnished by its long association with strip development and careless suburban sprawl, is fast disappearing. New developers, in more competitive markets, are building tighter, more specialized, more sophisticated designs—sometimes with help from local government, or even Federal agencies.

BUILDING TYPES STUDY@527

Prime suburban sites around heavily populated metro centers are now scarce. These kinds of locations, long the retail developer's bread and butter, are saturated. Developers, as a result, have been forced into important choices. Some have turned to re-use projects on difficult, land-short inner-city sites. Others are taking a second look at more thinly populated regional markets that until now have been bypassed in favor of potentially more lucrative locations. In either case, the developer's tools for market analysis have had to become more sophisticated while his ground rules for site development are being re-examined and adjusted to new circumstances.

Private venture capital for downtown projects is not plentiful; government assistance is sometimes indispensable

To those who turn to inner-city retail development, municipal, state and even Federal agencies (HUD and DOT) have sometimes been willing to offer assistance in the form of grants or important tax incentives—incentives that made the project a "go" instead of a "no go." Joint development was the case at The Gallery, Market Street East in Philadelphia (RECORD, March 1978) where the city and the Rouse Company shared development costs—and where sales are now said to average an astonishing \$350 per square foot. Other downtown ventures have not been as rewarding. Experts argue that several conditions must exist to make these urban rehab projects viable. Most agree that such projects must have sufficient "critical mass" (not less than 30,000 square feet) to draw customers in large enough numbers. They must have evening as well as daytime hours. They must be tied securely into the city's transport pattern and, increasingly, they must specialize in the kinds of goods and services they offer. Few urban re-use projects are large enough to house department stores and the most successful seem to be those that have formed around a single theme—food, fashion, furniture. . . .

Many interesting re-use projects are now underway. Typical in some ways is Arcade Square in Dayton, Ohio, an historic block of four interconnected buildings with a gross leasable area of 110,000 square feet. It is being converted into a specialty retailing center by Halcyon Ltd. of Hartford, Connecticut. Another and somewhat similar project is St. Anthony Mall (pages 130-132), a new shopping center specializing in restaurants, converted from an old mattress factory in downtown Minneapolis. Common to both projects is a downtown location, a venerable but under-utilized structure, an urban context suitable for commercial development, and ready access to markets with significant disposable income. Both projects, at this early stage in their development, seem headed for success.

New market regions are small but growing—and so is developer interest

"They're going back and picking up the loose grain that fell to the

ground the first time around," comments William Scott, principal economist for Real Estate Research Corporation, Chicago. Quoted in a recent issue of *Chain Store Age Executive*, Scott's terse description reflected the developers' increasing interest in the small (population 100,000 and up) regions that until recently seemed too small to bother with. When a site is well located in a region anticipating real growth, development often becomes attractive. Roanoke, Chattanooga, and Paducah, Kentucky are but three of plentiful examples of growth markets, mostly in the South and Southeast, where population and income will increase rapidly and where development opportunities are thought to beckon. New England and the Midwest, by contrast, will experience the lowest percentage gains.

New trends in tenant mix show an increased willingness to experiment

Food of every kind is an increasingly important ingredient at most centers—urban or regional. New regional centers typically devote 15 per cent of their space to food tenants—everything from pizza to gourmet delicatessens to high-priced sit-down restaurants. Because individual shops tend to be smaller today, space is used as efficiently as possible. Food tenants are typically clustered in new projects and share common seating areas in the mall. In larger malls some developers are experimenting with ice-skating rinks, theaters and other entertainment functions—including areas for electronic games and a limited range of athletics. Day care or supervised recreation space for youngsters is available at some new centers and selective health care services are being offered at others. Shoppers at two Northeast malls, for instance, can have dental work done by licensed dentists in mall clinics. Patients either call and make an appointment or drop into the first available chair, much as they might at a barber shop.

In large projects as in small, the shift toward specialty retailing—toward design around a central retailing theme—continues. At Beachwood, for instance, outside Cleveland (pages 118-121), the presence of both Saks and Higbees as anchors will give the project a strong fashion flavor.

Smaller shops, narrower malls (30 feet is becoming typical) more skylighting, more efficient lamps and lenses, more careful clustering of tenants for cross shopping; all these are trends with obvious architectural implications. Not so obvious is the analysis that goes into site selection and development. In each of the four case studies that follows, the developer was asked to summarize his development strategy while a companion statement by the architect focuses on how this strategy was physically implemented. Together the statements reflect more than the shared objective of economic success. They reflect the readjustment to changing circumstances and the new opportunities these changes invite.

BEACHWOOD PLACE

RETAIL MALLS

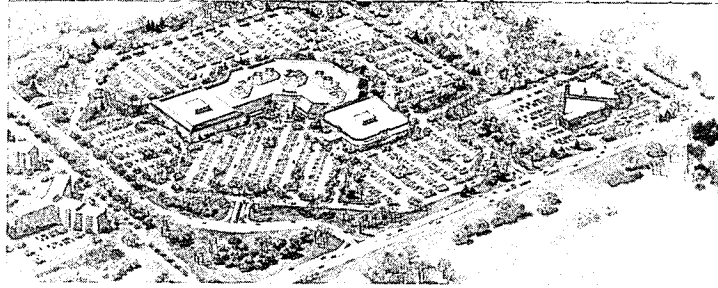
"The design goal of casual elegance is reinforced in detail throughout the center from its banners and light fixtures to the touch of brass inlaid in the wooden in the wooden handrails."

The Rouse Company's Scott Ditch sketches out a strategy for serving an affluent suburban market: "Beachwood Place provides a setting for Saks Fifth Avenue's entrance into the Cleveland market. The site is well located with respect to the presumed customers of fashion and specialty stores. The nine towns immediately adjacent to and including Beachwood are among the ten highest income subdivisions in the Cleveland metropolitan area. The 140,000 people in the towns have an average per family income of \$34,000.

"In addition to Saks' 105,000-square-foot store, the center includes a 135,000-square-foot Higbee's and 220,000 square feet of other stores, shops and restaurants. A two-level center of only 460,000 sq ft offers interesting design possibilities.

"First, the scale of the entire project allows an arrangement

Implementing the developer's ideas, says Gary Bowden of RTKL,



whereby no parking space is more than a city block from an entry. Second, by emphasizing the very best features of the well-designed interior court, the entire plan becomes a series of courts rather than the more conventional mall design. Each court thus provides a quality and character of its own, and each is a shopping place in an unhurried and intimate scale.

"Beachwood is a clear departure from the giant, multistoried mall. It presumes that a comprehensive mix of shops, services and restaurants in regional context can be brought together in closeness that will win a high degree of customer acceptance and loyalty. Early results at Beachwood Place have happily justified that presumption."





side of the mall he is walking.

"The central court is the focal point of the mall. The design concept organized the court functionally into three distinct areas. There is a water feature/planting area, an exhibit area, and a retail kiosk area. The physical design was developed in response to these activity centers. A large concrete column is located centrally in each of the three areas, supporting an octagonal roof pod where bands of skylight are integrated. Attached to each column are red-oak wood screens and special incandescent lighting. The wood screens and special lighting are on the mall's axis and very visible from the upper level mall entrance and each department store. They are also visible at night from the major highway access through the skylights on the mall roof. The "Valley Fare" food court is adjacent and visually a part of the central court at the lower level. The food court consists of a number of small food tenants all sharing a common seating area.

"There is continuity of design throughout the mall including

department store courts where skylights and natural planting are used extensively. Although each retail tenant was designed independently, a set of architectural criteria were established to assure compatibility between tenants and design feeling. In addition to the decorative wood screens in the central court, a 3-inch-diameter red-oak double rail is used continuously around all openings at the upper level. Wood screens are also used in the ceiling for the entire length of the upper level as a transition area between mall and department store courts. Red-oak siding is used in the "Valley Fare" food court for walls and tenant signing bands. Custom wood benches are used throughout the mall at both levels.

"Energy conservation was an important consideration in the design of the mall. Skylights are glazed with reflective glass which reduces heat gain (air conditioning load) but still provides excellent natural light for people and plants. A minimal lighting footcandle level is maintained at night and typical mall lighting is energy-efficient mercury and fluorescent fixtures."



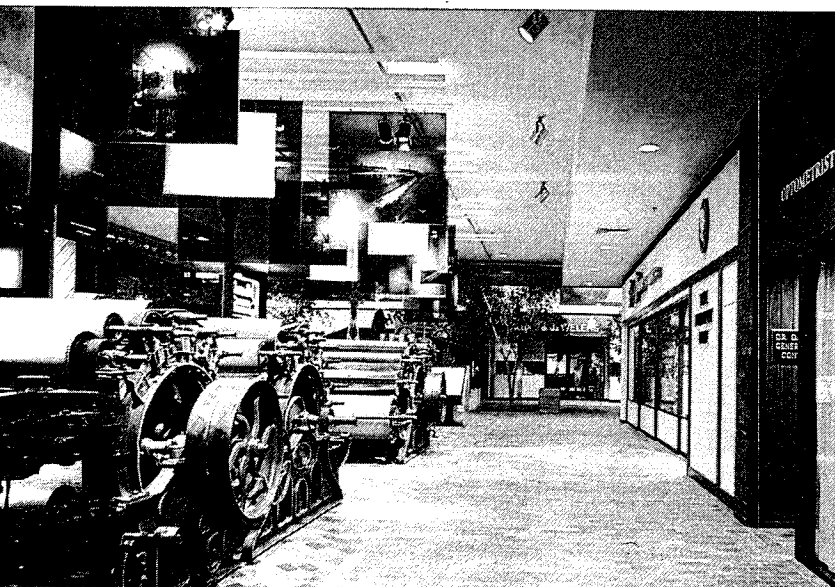


THE MALL OF NEW HAMPSHIRE

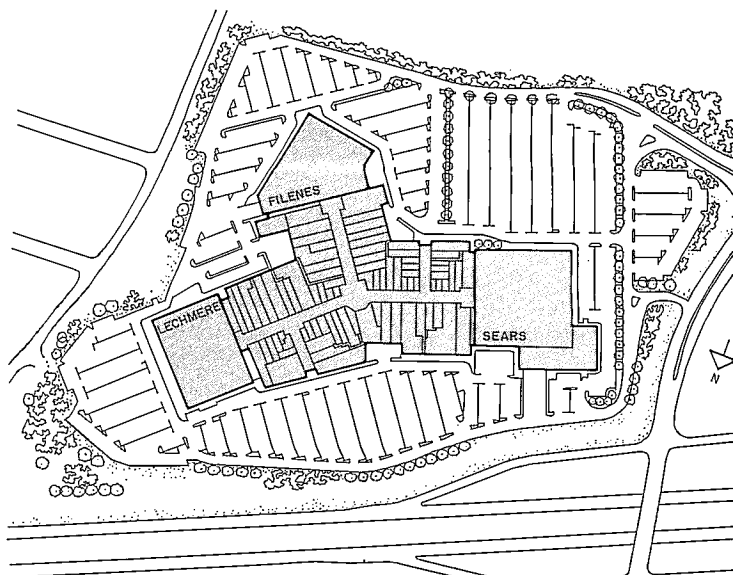
A regional center
located at the intersection of
Interstate 193 and Route 28,
outside Manchester, New Hampshire,
a region of high growth potential

Steve Karp of State Properties Inc., the developers of the Mall of New Hampshire, explains some of the thinking that has helped this complex draw shoppers from well over 50 miles away: "... The Mall is anchored by an innovative combination of major retailers: Filene's (Federated), New England's leading exclusive fashion chain; Lechmere Sales (Dayton Hudson), New England's largest-volume, exclusively hard-line mass merchandiser; and internationally known Sears, Roebuck & Company. This creative mix of anchor stores was designed to effectively serve the unusual characteristics of the market, by expanding the list traditionally thought to be suitable to a regional mall. Initially, food tenants were grouped to act as a third anchor. Although this location was subsequently committed to Dayton Hudson, the restaurant complex is positioned nearby and still helps to attract heavy customer traffic at this end of the mall. Department stores worked closely with the developer, creating specialized store size and layouts commensurate with the market. These major stores complement each other ...

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©Randolph



"With the existing city sanitary system located one mile away, the developer and the city reached agreement to extend the sewer up to the Mall site. This extension would be a benefit to the residents of the area as a pro rata share would be paid by the Mall over a 20-year bondable period as a betterment of the area and would be deducted from the developer's real estate tax bill. In addition, a two-acre retention basin was designed to hold storm drainage so as not to increase water flow under the Interstate highway.

"The location along a major interstate roadway was excellent. However, the site was less than ideal because of a severe grade problem. The solution was the relocation of 170,000 cubic yards of ledge and the addition of gravel fill. South Willow Street was widened and traffic signals installed to accommodate mall access. These improvements were designed and constructed entirely at the cost of the developer and today the South Willow Street entrance is the only location in the state having two left-hand-turn lanes. Although the cost of this site development might have appeared

economically impractical, the developer, after an analysis of the market area's potential, deemed the project feasible.

"The ratio of ground floor anchor store area to remaining leasable space (exclusive of mezzanines) is almost one-to-one. The depth of leasable area was designed to have no stores of over 10,000 square feet and to maximize diversity in the tenant mix. There are 85 tenants in 222,000 square feet of gross leasable space for an average store size of 2,600 square feet. Parking areas afford a ratio of five cars to 1,000 square feet of gross leasable space. During peak periods, arrangements have been made to bus employees from the nearby airport where 1,000 additional spaces are normally available.

"Memory Lane, the largest food tenant in the complex, is a full-service restaurant and remains open daily from 11 A.M. until 1 A.M.

"The success of the Mall of New Hampshire has established a precedent for developers and department stores in similar market



Photo far left: An 1884 Davis & Furber carding machine recovered from a local mill for permanent display in the Mall. The machine was reconditioned by Randolph Langenbach who also prepared the accompanying exhibit of cibachrome transparencies displayed overhead behind sheets of tinted acrylic.



areas which might previously have been overlooked. Although the Mall of New Hampshire has been open for just fifteen months, average gross sales per square foot are already exceeding projections and are far above national averages. . . .”

And architect Arthur Schein of Sumner Schein describes “the game-like process” of putting the disparate pieces together in a symbiotic way: “The principal requirement in a project of this nature was to manipulate anchor store locations, mall entry points, private and public spaces and service arrangements to achieve the greatest trading potential for all the discrete clients. It was further complicated by the fact that the three department stores, 85 small store tenants and the mall developer all had their own design teams and contractors. An additional factor influencing architectural planning was ownership by the department stores of their own buildings and land and their own design teams and contractors. An additional factor influencing architectural planning was ownership by the

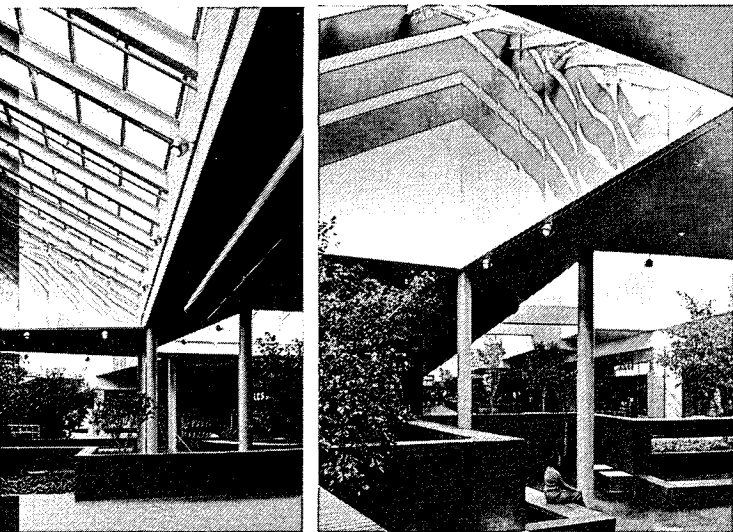
department stores of their own buildings and land and their reservation of certain design approvals. As the developer’s architect, our general coordination of work by tenants and department stores was a significant function in addition to conventional services.

“Scheduling controls were rigid and required the earliest possible start date for site preparation, foundation work and structural frame erection. This work proceeded while final design and construction documents were being completed for the negotiation of the general contract.

“Through a game-like process the varying physical requirements of the constituent parts were juggled against the scheme of store distribution. The parameters governing the game were generated by the department stores and the developer’s leasing concept. It was common for these rules to change several times during the design stage and for everything else to change with them. Since, by lease provision, the developer has a direct interest in the tenant’s financial success, the leasing process affected all aspects of design.

Hutchins Photography, Inc. photos





"The enclosed mall is seen as the central and most densely used element of the complex. A picturesque three-branch configuration was chosen to minimize the perceived distance to anchor stores. This geometry maximized the number of small store locations, eliminated difficult-to-lease areas, and balanced complementary shopping patterns. Three waterfall displays symbolically collect the mall branches together in a central court and provide a pleasant acoustical background. Extensive skylights save lighting energy and establish a healthful atmosphere. An inviting nighttime theme is set by low wattage glitter lights. Diverse ceiling heights, landscaped seating areas and natural wood furnishings contribute to a secure interior setting for pedestrian shopping. Reflective ceiling materials mirror people and furnishings below and incorporate their movement and color into the architecture. Ductwork is exposed, carefully detailed and painted red to become an integral feature. Floor materials are a combination of textured brick, granite pavers and end-grained wood blocks.

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ST. ANTHONY MAIN

An old mattress factory in Minneapolis converted to restaurants and shops.

Phase One is now complete and attracting hungry shoppers

Developer Louis N. Zelle of the Jefferson Company says: "We pick one piece at a time and do it very well" in describing how his firm approaches the task of converting this run-down, eight-building complex into a lively and thriving retail center. Phase One, the transformation of an old mattress factory into three restaurants and a dozen shops, is now complete. Zelle is pinning his hopes for success on the riverfront's natural pull, on the site's historic significance and on the firm's ability to select tenants that make an interesting, high-quality mix. "What Minneapolis needs," he argues, "is a place with a different sort of taste, with darn good design and with a sense for pleasure." So far the project includes Mexican, Oriental and seafood restaurants, and shops that sell a broad range of plants, housewares and craft items—many of them imported, but not all of them expensive.

"Major retail chains are becoming oriented to the masses," adds Zelle, "and this makes room for small shopkeepers who know their products well and are excited about them."

©Bob Flack



"We'd rather sit on a space than lease it to the wrong business," says marketing director Larry Nelson. "We know what kind of tenants we want, so we go find them."

For Phase Two, Jefferson is looking for an indoor market for fresh produce, poultry, fish, herbs and cheeses. Nelson hopes to add a bakery specializing in French pastry, a chocolate shop and a wine store.

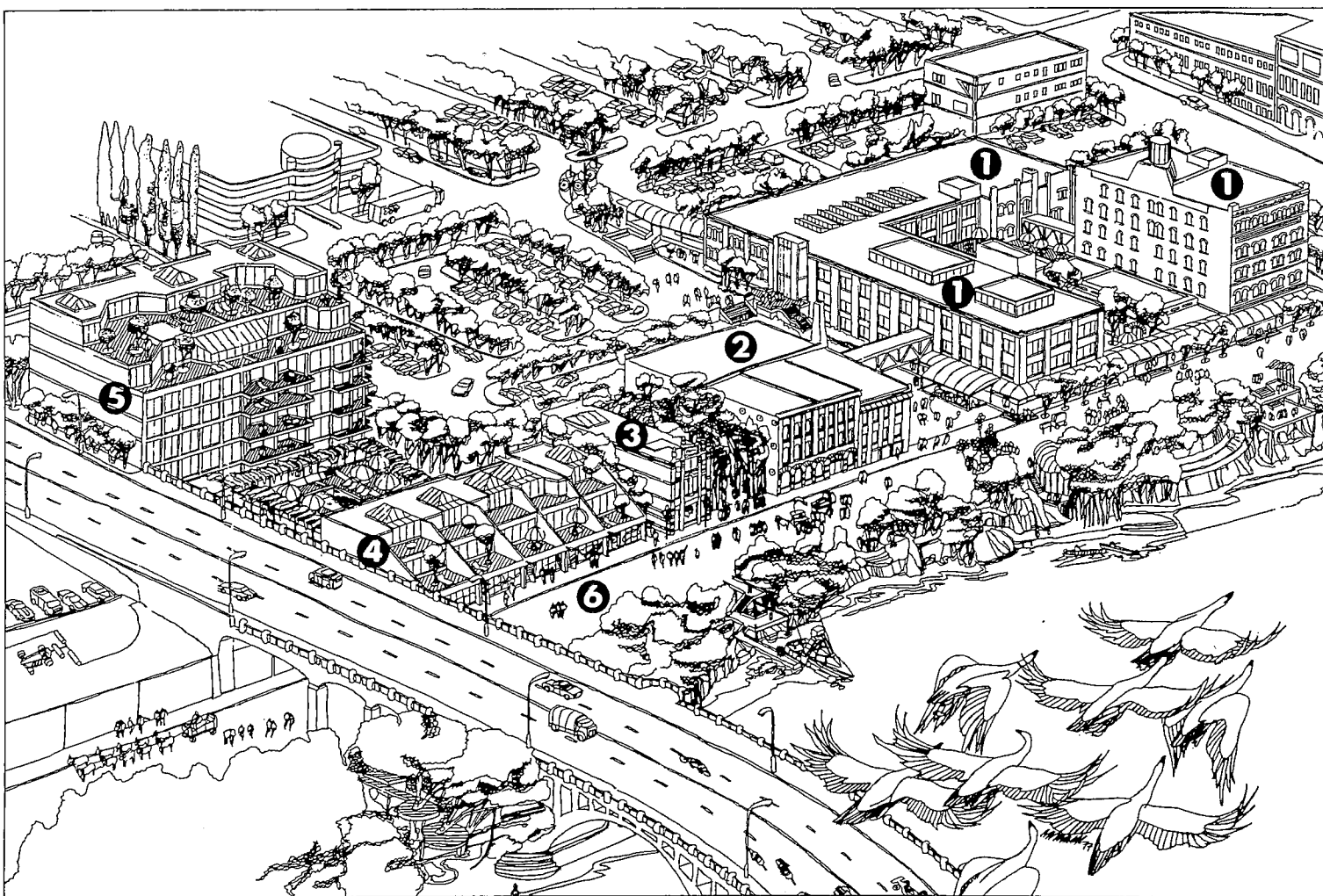
The Jefferson Company will spend about \$20 million in developing St. Anthony Main. Six million dollars more is coming from the City of Minneapolis. This will be used to recobble the sections of Main Street that front on the complex, to landscape portions of the area, and to provide light fixtures and other street furniture.

Unlike typical ventures in retail development, St. Anthony Main will also include approximately 20 condominium apartments and six townhouses that will sell for \$75,000 and up. Work is proceeding on these various residential units briskly for Zelle himself is anxious to move into one of them.

Architect Ben Thompson will take maximum advantage of a site until now somewhat neglected—a site with important physical amenities: "St. Anthony Main, utilizing old commercial buildings on the city's original main street along the Mississippi River, is conceived as a busy pedestrian avenue complemented by handsome new buildings. Animated with activity, shops, things to do and see, St. Anthony Main will be a self-contained village where people live, work, dine, shop, enjoy the view, and mingle with others, day and evening.

"Unique to this project is the Mississippi River outlook to the falls, and the local historical milling and manufacturing tradition. The rejuvenation of these venerable mills for contemporary use has been designed to generate urban activity, as well as renewed awareness of the riverfront's unusual urban importance.

"The careful mix of unique merchandise and innovative eating places combined with bright contemporary space is making St. Anthony Main a vital new neighborhood in Minneapolis."



Aerial perspective (above):

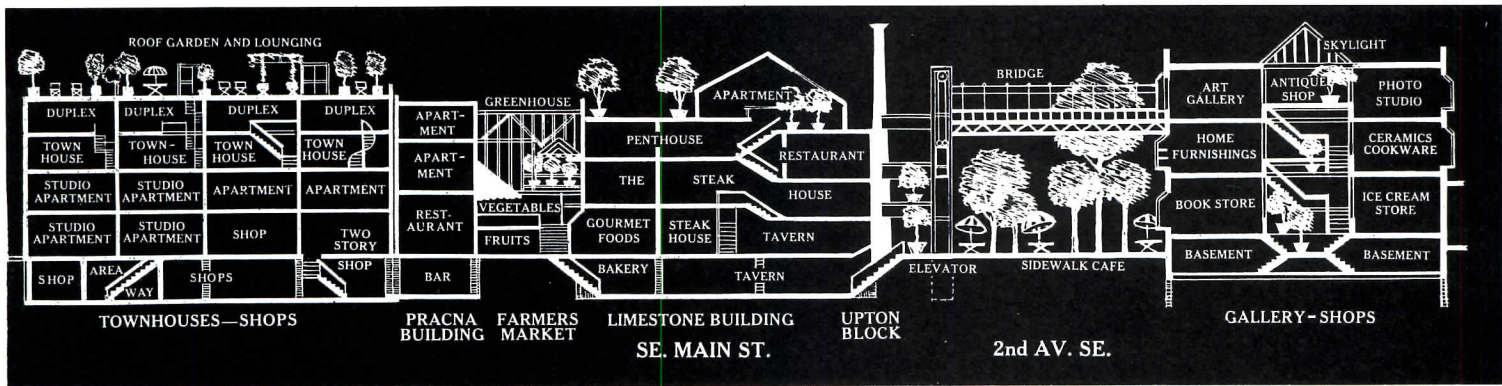
- 1. Salisbury Mattress Factory and Phase One of St. Anthony Main
- 2. Landmark buildings to be converted to shops and restaurants
- 3. Existing restaurant (separate management)

- 4. Group of luxury townhouses to be built
- 5. Prince Street Building to have condominiums added over existing structural frame
- 6. Historic Main Street Part of city's massive redevelopment program





Two of the spaces that make up the project's first phase, now complete. The inviting human scale, important in this kind of development, is as readable in both the section and perspective (below) as it is in the photographs above.



A first look at the proposed Federal energy performance standards

The Department of Energy has issued its proposal for energy performance standards that are being studied and debated by design professionals and many professional bodies. This article describes the standards and the vast array of problems facing their implementation. The big question is: since energy conservation has become second nature to architects and engineers, should we press the government for more time to work out the technical problems and problems of compliance?

In November, the Department of Energy published its first version of building energy performance standards for buildings (known to the cognoscenti as BEPS)—a step that could lead to final promulgation in August this year, followed by obligatory adoption of these standards (or their equivalent) by the states in February of 1980. That the Federal government had these standards in preparation came as a surprise to many in the building community—perhaps because more than 40 states have adopted, or are about to adopt, codes based upon ASHRAE Standard 90, and because the timetable for developing them has been extremely short, considering how complex the problem is.

Performance standards were mandated by Congress in the Energy Conservation Standards for New Buildings Act passed in August, 1976, and the AIA actively encouraged passage of the Act in an effort to promote conservation, but also to put its authority behind the performance-standards approach. The Act provided for promulgation no later than 1981, but the Carter administration has advanced the timetable by one year.

In an unusual step, on November 21 the Department of Energy published the standards in an Advance Notice of Proposed Rulemaking (ANPR) in the Federal Register "...to make available to the public the form of the Standards as presently envisioned by the Department, as well as support information available at the time of publication, and to invite the public's review and comments on the standards." The actual Notice of Proposed Rulemaking is scheduled for publication this month. Public meetings (not hearings) for discussion and comment on the ANPR were held in Washington, Chicago and San Francisco early in December. For lack of publicity, they drew only limited audiences, not a spectrum of the building community except in San Francisco, where some spirited and helpful discussion took place. The

McGraw-Hill Information Systems Company presented meetings in New York City and Kansas City for building product manufacturers on the new Standards, at which DOE and HUD officials explained the basic proposals. The National Institute of Building Sciences sponsored a workshop in Washington at which these officials spoke, and for which an impressive workbook was prepared covering a dozen significant issues such as energy-budget format, state and local compliance, sanctions, and residential and commercial-building impacts.

Given an Administration anxious to have energy standards, and a building community—in particular the engineers and the code officials—with a vast number of concerns and reservations about them, DOE seems to be betwixt and between. And for this reason, perhaps, at the public meetings DOE's Dr. Maxine Savitz emphasized some of the alternatives DOE has asked Battelle Pacific Northwest Laboratories to evaluate in the environmental assessment of the BEPS required by law. The range of alternatives includes: 1) no action, or the repeal of the legislated mandate for the Standards; 2) design energy budgets set at three different levels, the first as chosen for the Standards, the second less stringent, and the third more stringent; 3) component performance standards instead of building performance standards; 4) the Standards with tax incentives; 5) prescriptive standards; 6) education and dissemination of information instead of the promulgation of standards; 7) different methods to encourage the use of renewable energy resources; and 8) energy pricing to effect conservation.

What are the proposed standards like, and how were they developed?

The energy performance standards (the BEPS) are "design energy budgets" for buildings over-all, rather than their parts, expressed in Btu per square foot per year that are applica-

ble at the design stage of the construction process. They were given in the ANPR for 16 different building classifications and for seven different climatic zones. They were not given for assembly buildings, which might need a finer breakdown in classification, for industrial buildings in which it is difficult to separate process and non-process energy, for restaurants where there is a high ratio of process to non-process energy, or for warehouses where there were some high, unexplained energy consumptions in the original data.

The design energy budgets in the ANPR are also source-energy related—through the use of multipliers known as resource utilization factors (RUFs) which are intended to account for the energy losses involved in delivering non-renewable resources to a building site.

With oil and gas, transportation results in a small loss from origin of the fuel to delivery at the building site; with electricity, losses inherent in the generation process (the largest percentage) and in distribution mean that for every Btu of fuel used at the power plant, about one-third of a Btu equivalent of electricity is delivered to the site.

The design energy budgets in the Advance Notice are not the numbers determined by evaluation of the statistical sample of 1,661 buildings, but are larger to the extent of the multiplication by the RUF factors. For purposes of presentation in the Advance Notice, the RUFs were based upon the original statistical sample. The RUFs are different for every building classification and also for the different climatic zones because of the typical fuel usages in the various regions. The individual RUFs in the Advance Notice for oil and gas were set at slightly over one, but the individual RUF for electricity is 3.0.

An example of how this was applied in the Advance Notice: The preliminary unadjusted design budget for a small office building (less than 50,000 sq ft) in Climatic Zone 2

was determined to be 55,000 Btu per sq ft per yr. The combined RUF for small office buildings in Zone 2 was set at 2.5—indicating that the energy usage is to a large extent electricity (for air conditioning and for lighting), with other fuels for heating. Multiplying 55,000 by 2.5 would give an allowable design energy budget of 137,500 Btu per sq ft per yr. The Advance Notice does not indicate what a building designer would do if he is using a different mix of energy sources than those assumed in the proposed standards. It is not clear whether or how building designers could determine their own RUFs.

The advance notice states that "Theoretically RUFs can be computed for individual sites, but the practical application of this theory is, in reality, quite complex." On the other hand, the ANPR also states that, "...ongoing studies relate to setting RUFs equal to or less than zero for renewable resources, in order to encourage their utilization. . . ." To account for sociological considerations (such as fuel availability, economics, health and environmental impacts, etc.) DOE is examining the effects of applying resource impact factors (RIFs), but this concept is still embryonic.

Three months after the energy act (Public Law 94-385) was passed, AIA and ASHRAE formed a Joint Energy Budget Committee to investigate the feasibility of energy performance standards. The committee considered a proposal for collecting actual energy usage by real buildings to provide a reference base, and also discussed the merits of developing prototypical buildings for different building types, with detailed calculations of energy requirements for specified operating condi-

tions and schedules. Shortly thereafter the AIA Research Corporation, independently, began negotiations with HUD for a research contract to develop energy performance standards. Earlier HUD, which had the original responsibility for developing and implementing the standards, had asked for a proposal from the National Bureau of Standards, but this did not proceed, apparently because of time and cost factors. Meanwhile the Joint Committee had been expanded to include three more professional societies: American Consulting Engineers Council, Illuminating Engineers Society, and National Society of Professional Engineers (NSPE/PEPP). AIA/RC subsequently asked the committee to serve as a Technical Advisory Committee, and in the spring of 1978, the National Association of Home Builders and the Manufactured Housing Institute were added.

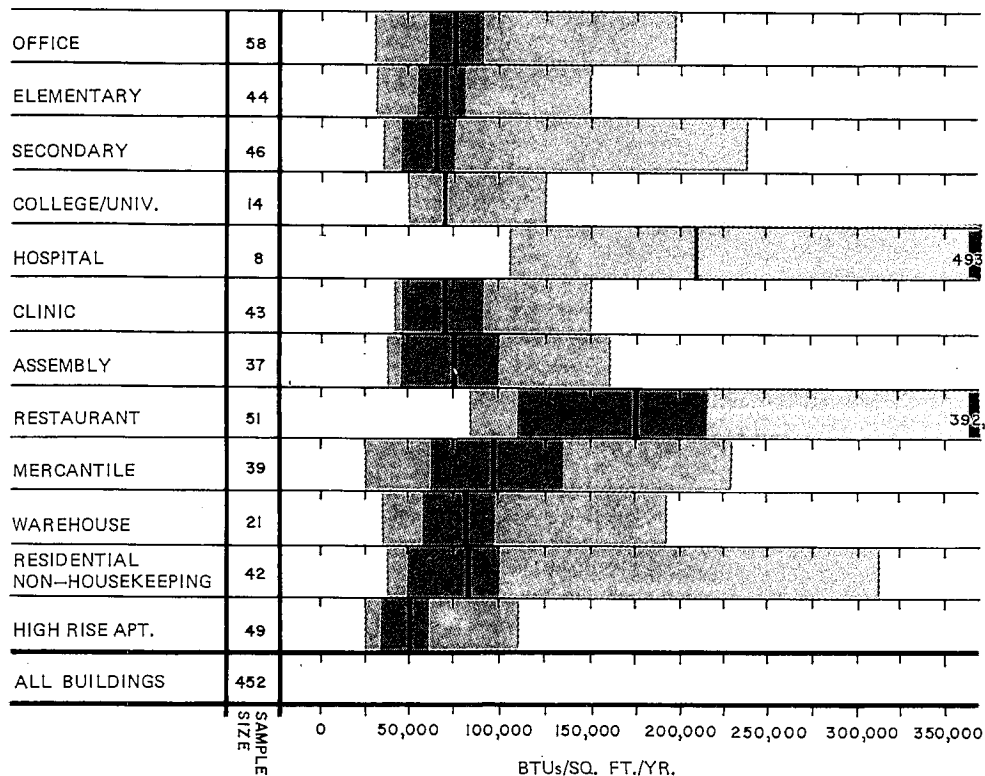
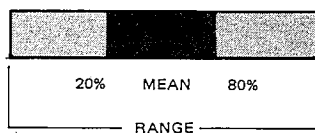
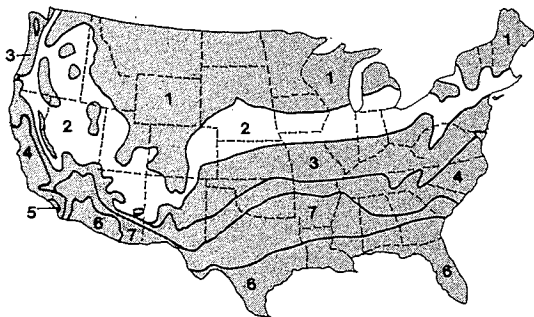
AIA/RC signed a contract with HUD in the spring of 1977 to conduct a study basic to the establishment of standards for energy consumption in buildings—a study that became known as the "Baseline Project." The first phase of the project, conducted from May through November of 1977, was designed to assess the amount of energy that buildings are currently designed to use. Though the AIA/RC's Technical Advisory Group (TAG) had hoped that actual operating data would be gathered for a reference base, and that prototypical buildings could be developed and analyzed in detail, AIA/RC decided against this approach because they said HUD did not want to consider buildings designed prior to the 1973 oil embargo. Further, it is reported that AIA/RC felt that use of actual consumption data would imply a

consumption standard rather than a design standard, and thus aggravate liability concerns of design professionals.

For data collection in Phase I of the project, buildings were broadly divided into nonresidential (which included high-rise residential) and residential, which included single-family homes, low-rise multifamily housing, and mobile homes. Consultants to AIA/RC estimated that an average of 30 buildings of each building type in each climate region would produce summary estimates of sufficient accuracy for design consumption figures. This yielded a total sample of approximately 3,200 buildings which was obtained from *Dodge Construction Reports*. Of this total, 1,661 survey forms were returned sufficiently complete and consistent for analysis. This number, then, provided a representative sample of recent building designs, and a baseline for the evaluation of alternative energy standards.

For Phase II, AIA/RC selected 168 commercial/multifamily buildings out of the 1,661 and paid the architects and their consultants to do energy-conscious *redesigns* of their buildings to achieve the most feasible levels of energy conservation to arrive at realistic limits for energy efficiency.

To obtain energy consumption data for the 1,661 buildings in Phase I, a modified version of the AXCESS Short Form energy analysis computer program was used, with data requirements being on the order of 100 to 125 data points per building. Consulting engineers Syska & Hennessy processed the data and developed supplemental and default values as inputs where data on the survey forms were incomplete or missing. For



the residential sample, data were collected from existing surveys representing 125,000 single-family homes, 45,000 multifamily low-rise units, and 175,000 mobile homes.

Who will be most affected by standards, and what problems loom for enforcement?

The groups that would be most affected by energy-budget type standards are architects, engineers and building code officials. The designers have to develop a building that meets the energy budget figure, proved through some type of simulation procedure, most probably a computer program. Building code officials have to find some way of assuring themselves that the energy consumption figures were calculated correctly.

The technical standards as presented in the Advance Notice were developed by DOE/HUD from the data presented to them by AIA/RC, and this is where most of the emphasis has been placed so far. But the standards cannot be more than voluntary, until their implementation has been worked out in the form of regulations that spell out what must be done to comply with the standards, and tell the states how to determine whether or not the standards they have in their codes are "equivalent" to the Federal standards.

The Energy Act of 1976 specified that the National Institute of Building Sciences provide advice and assistance to "identify procedural obstacles or technical constraints inhibiting implementation of such standards," and pursuant to this NIBS has conducted an "issues" study, a "code equivalency" study, and four case studies on states' experience with energy-conservation standards for build-

ings, including California, Colorado, Massachusetts and Virginia.

Implications of the building energy performance standards as they now stand

NIBS analysis of the Advance Notice developed the following. . .

- The design-energy budget format represents a significant departure from the formats of existing energy standards;
- The simplicity of a "single goal" is complicated by the diverse nature and use of the nations' building stock;
- The BEPS are design standards, and actual energy usage may depart significantly from design goals;
- The assumptions associated with the design energy budgets (energy uses included/excluded, the distinction between process/non-process energy, and operating profiles) may be artificial or remote in regard to a particular project, causing the designer to design the project for one set of conditions and calculate it for another.
- The state of the art of energy-analysis techniques is such that it will cause problems in providing an accurate calculation of a building's design energy consumption;
- Existing computer programs do not always provide the same result when applied to a single building, which further compounds the problem of obtaining an accurate energy consumption level;
- The use of a computer program to do the energy analysis adds effort and, presumably, cost to design and construction;
- It is not clear whether energy analyses will have to be done for each change during construction;

- Problems of coming up with an accurate design level of energy consumption for a single building will certainly compound the problem of establishing equivalency between the BEPS and an existing standard that a state or locality wishes to have certified;
- There may be confusion between the BEPS as a design standard and the building owner's expectations of the building's total annual energy-consumption levels once the building is in use;
- The DOE Advance Notice does not compare the preliminary standards with design levels of energy consumption resulting from use of codes based upon ASHRAE 90-75R, and thus the magnitude of the code-equivalency problem is yet unknown;
- BEPS may lead to site inequities within a given climatic region because of the wide range of climates-within the region;
- RUFs will markedly affect energy selections in new construction, which may or may not correspond to proper economic decisions;
- RUFs will require additional education at all levels of the design, contract and construction cycle;
- RUFs have far-reaching, long-term implications for utility planning, specifically in the areas of load management, capital expansion requirements, and rate structures;
- RUFs will tend to be a divisive factor among energy suppliers;
- BEPS will require an infusion of new financial and staffing support for many building code departments;
- The scheduled period of approximately four months for the public to review and comment on the standards and regulations may be too short for concerned groups to be

DESIGN ENERGY CONSUMPTION (MBTU/SQ. FT./YR)	CLIMATIC ZONE						
	1	2	3	4	5	6	7
20% BASELINE	50	49	49	47	47	54	47
30% BASELINE	56	55	55	53	53	60	55
50% BASELINE	56	64	64	62	62	70	64
80% TECHNICAL REDESIGN	49	47	47	46	46	52	47
LOWEST TECHNICAL REDESIGN	29	45	20	*	*	39	*

* - Not available.

CLIMATIC ZONE	1	2	3	4	5	6	7
PHASE II PARAMETRIC BASELINE BUILDING LINE DESIGN ENERGY CONSUMPTION (MBTU/SQ. FT./YR)	56	55	55	53	53	60	55
COMBINED RUF	2.6	2.5	2.7	2.8	2.7	3.0	2.8
DESIGN ENERGY BUDGET (MBTU/SQ. FT./YR)	145.6	137.5	148.5	148.4	143.1	180.0	154.0

The source of numbers for the design energy budgets was the Baseline Study of the AIA Research Corporation on 1,661 buildings designed in 1975 and 1976, and the redesign of 168 of these to determine maximum feasible energy savings. The chart across the page shows the range of design energy consumptions for the buildings that were in Climatic Zone 2. For office buildings, these ranged from about 30,000 Btu per sq ft per yr minimum to 200,000 maximum. The chart includes the total population of office buildings. The design energy consumptions and energy budgets shown in the tables on this page are for small office buildings (i.e., under 50,000 sq. ft.) The top table shows that 20 per cent of these buildings in Climatic Zone 2 had design consumptions of 49,000 Btu per sq ft

per yr. The 30th percentile was up to 55,000, and the 50th percentile was up to 64,000. DOE chose the 30th percentile figure for all the building types except where the 80th percentile of the redesigned buildings turned out to be higher, and in such cases the 80 per cent figure was used. The 30th percentile figure was felt to be low enough to encourage energy-conscious design, while still not imposing economic hardships. The design energy budgets were obtained by multiplying the design energy-consumption numbers by resource utilization factors (RUFs) that account for energy losses between source of the energy and the building site. For example, for the small office buildings in Climate Zone 2, 55,000 Btu per sq ft per yr-is multiplied by a RUF of 2.5 to give 137,500.

both comprehensive and detailed enough to shape standards and regulations;

- Given the apparent technical complexity in formulating and administering the BEPS, it may be impossible for a number of states and local jurisdictions to achieve compliance by the scheduled date (February 1980);
- Widespread noncompliance resulting from an unrealistic implementation schedule could seriously undermine the BEPS program.

Engineers are concerned about the cost of proving compliance, and about liability

Government officials and others have suggested that administrative problems at the code-jurisdiction level might be mitigated if building designers certified that buildings designed with assumed operation and weather conditions would consume given Btus/sq ft/yr. This worries engineers familiar with the BEPS program, who say that their liability insurance will not allow them to "certify," and who envision nuisance suits from building owners who do not understand the difference between "design" and "operating" energy budgets, and who might have operated the building differently than assumed by the designers. Attorney/architect Arthur Kornblut, who writes for RECORD on legal matters, says that the law does not expect professionals to guarantee results, and that language might be used on the order of "to the best of our knowledge, information and belief," or "to the best of our professional experience, we certify that. . . ." A California engineer says that jurisdictions his firm has worked with have accepted the phraseology recommended by a West Coast insurance carrier somewhat to the effect that "the documents have been reviewed and are in substantial conformance with the regulations." The California energy code allows either a BEPS approach or a subsystem energy performance standards approach (SEPS) that has been based upon ASHRAE Standard 90-75R. A consulting engineer from the East says his insurance carrier states that by "certifying" performance, *per se*, the professional would have contracted away the carrier's rights, but that the professional can file an affidavit with acceptable language on the order of "to the best of our knowledge and belief. . . ."

Costs of demonstrating compliance are a moot question at this time since methods have not yet been specified by the government. Nonetheless, computer time plus the engineering firm's time is said to be at least \$1,000 for a small multizone building. A Pennsylvania engineer states that preparation for and running the AXCESS Short Form for a large elementary school might cost \$1,200 or more; preparation for and running the Long Form AXCESS might cost \$3,000 to \$4,000. These figures could represent from 10 to 25 per cent of the engineer's fee for this kind of building. One study reported by NIBS in its issues analyses indicated that an office building has to be over 220,000 gross square feet before the "commensurate design fee is adequate to support a computer analysis of two alternative mechanical designs, let alone

an analysis of a building's total estimated annual energy consumption." On the other hand, a computer services firm involved in building energy simulations believes that buildings with simple plans might be simulated for fees on the order of a few hundred dollars.

Engineering societies, the TAG and ad hoc groups say more work needs to be done

If building energy performance standards are going to be promulgated, ASHRAE feels that Standard 90-75R should be the vehicle, primarily because of the consensus approach employed, says ASHRAE president Morris Backer, not because it is "the ultimate refinement in energy conservation"—admittedly it is not, having gone through several revisions already, and ferment is developing for still further improvements. Of course this standard is a subsystem performance standard primarily with respect to the building envelope and lighting. Architects got behind the building energy performance standards approach in the beginning because they felt the building envelope was being unduly singled out. Section 10 of Standard 90-75R permits trade-offs between the envelope and interior systems as demonstrated by energy simulation analysis, but the building first has to be designed according to Sections 4 through 9. Architects apparently have relaxed a bit about Standard 90, if the experience in California is any measure. Given the option of either a BEPS approach or a SEPS (subsystem-oriented energy performance standards) approach in the state's energy code, building designers are reported to be taking the SEPS approach most of the time—though this could be because the SEPS approach is simpler and less costly to do. One California consulting engineer comments that for conventional design the SEPS approach does not pose unreasonable constraints. When his firm has done energy simulations of building designs, they generally have been for public-building clients.

The Technical Advisory Group gave kudos to the AIA/RC project in some areas, but also expressed some concerns. Among the positive results cited: 1) the project was an enlightening educational experience for a broad segment of design professionals, 2) the project indicates that energy can be saved through a cooperative effort of design professionals, 3) a broad base of valuable information has been accumulated on recently designed buildings, 4) the project should enlighten the government on the complexity of buildings and the difficulty in implementing a performance standard.

Some of their concerns were: 1) even though 1,661 teams of design professionals responded in Phase I, "this was a volunteer effort, and the quality of data collected left something to be desired," 2) process loads, including domestic hot water, elevators, office machines, computers, etc., were not considered in the energy calculations in Phase I, 3) the lack of an adequate reference base on actual energy use of existing buildings made it impossible to validate the computer

results in Phases 1 and 2.

Another group, the ad hoc Design Professional/Federal Agencies Conference on Energy Standards wrote a resolution that could be adopted by professional societies: ". . .this Society endorses the concept of energy performance standards and recognizes that the proposed design energy budgets, though tentative and incomplete, will provide guidelines for future improvements." But, "before design energy budgets can be considered as adequate performance standards, considerable sustained effort will be required to develop and resolve key technical issues and economic factors."

More complex than technical issues are those of compliance and equivalency.

The government has a number of options to ease assimilation of standards

The equivalency of state and local codes to the Federal Standards is likely to become an important issue because most states have adopted, or plan to adopt, codes derived from ASHRAE 90-75R which the Federal government helped finance under Public Law 94-163.

A study by NIBS says it appears that the Federal government could take any of a number of administrative approaches to equivalency, such as making an administrative determination that a state code is in compliance with the Federal Standards, or incorporating a code version of ASHRAE 90-75R into the Federal Standards.

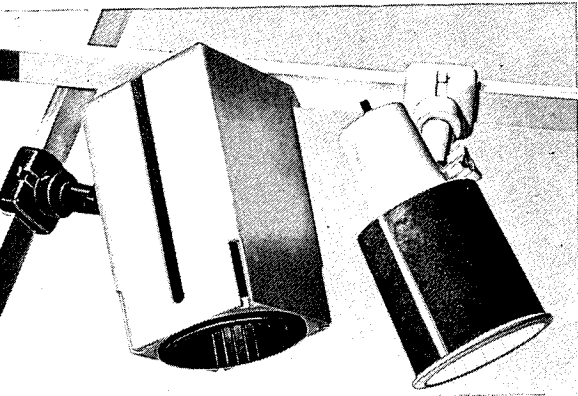
Or the government could take technically-based approaches to equivalency. These are too numerous and the ramifications too involved to discuss here, but suffice it to say that one type is *absolute equivalency*, which means that any building designed under a local standard must consume an equal or smaller amount than under the Federal Standards, or *statistical equivalency*, which means that some acceptable portion of buildings designed under a local standard consumes an equal or smaller amount than the Federal Standards. It is doubtful that most localities could meet absolute equivalency without adopting the Federal Standards.

A still different approach the Federal government might take, according to the NIBS report, is a "multiple-path" approach under which it might promulgate both standards that establish Btu per sq ft goals and standards based on ASHRAE 90-75R. Under this "multiple-path" approach, states and localities would then have the option of which standard to follow.

And finally, the government might write the regulations that go with the Standards so that the program takes effect in steps over time, with SEPS-type standards (like ASHRAE 90-75R) in effect to start, and BEPS-type standards being made mandatory at some future date.

So the question becomes—shall we go ahead with performance standards with their greater flexibility but with their vast implementation problems, or shall we proceed with deliberate speed to arrive there at a later date?

For more information, circle item numbers on Reader Service Inquiry Card, pages 203-204



New design in tracks for track lighting

A new design in track lighting permits flexibility and minimizes unsightliness of tracks. Snaptrak" (above) snaps together easily like "model train tracks" according to the manufacturer. No special connectors are needed for straight runs, and one flexible plug-in connector handles any angle connection. Each track is

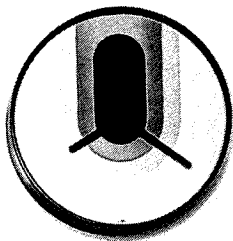
smooth, half-inch-thick and flat. Conductors are accessible only through narrow slots on the sides of the track sections. The entire system is made of high-strength, lightweight plastic. All components are UL-listed. A variety of styles and finishes are available. ■ Progress Lighting, Philadelphia.

circle 300 on inquiry card

Contemporary graphic design for clocks

The new "Sculpture" ten series of wall clocks provides a sophisticated accent for all kinds of interior spaces. Designed by William Sklaroff Design Associates for Howard Miller Clock Company, the collection uses interesting graphics, demonstrated here with one of the line (right) which has a duranodic bronze finish on a metal case with glass dial crystal and black hour and minute hands. The clock shown has a diameter of 12⁷/₈-in. and a depth of 3¹/₈-in. ■ Howard Miller Clock Co., Zeeland, Mich.

circle 301 on inquiry card

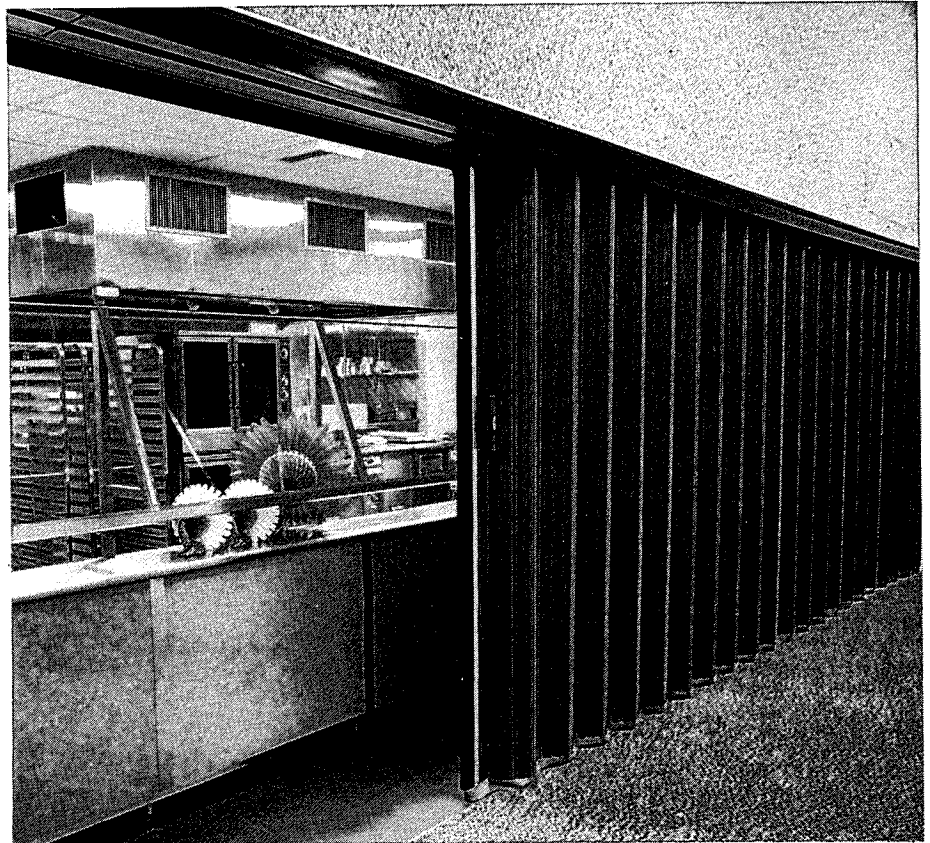


New line of security equipment available

The first in a new line of video and audio equipment by Philips for surveillance and security purposes (right) has been introduced. The product range gives a choice of six cameras with various power options and sync modes to allow for client selection. Monochrome

video monitors come in a variety of sizes. Also available are automatic Video Sequential Switchers and Video Time-Date Generators. ■ Philips Audio Video Systems Corp., Mahwah, New Jersey.

circle 303 on inquiry card
more products on page 145



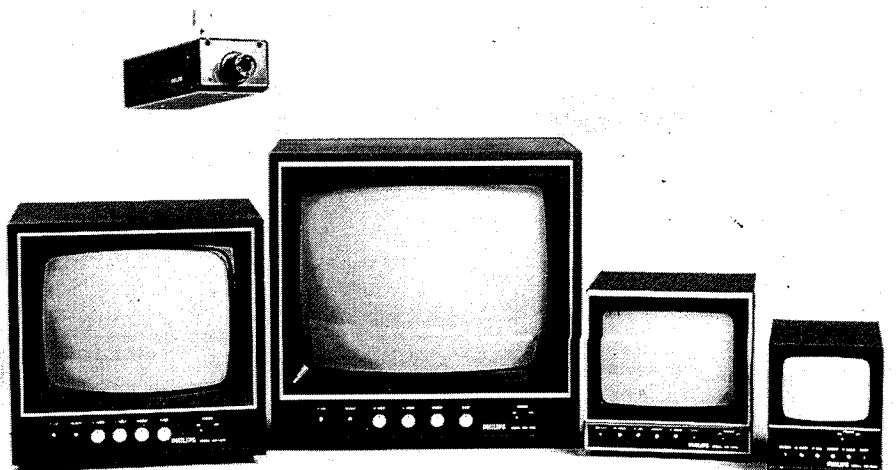
Folding partition has been designed with exceptional fire-resistant qualities

A new and unique folding partition (above) has been designed by Won-Door that is fire-resistant and battery-operated to automatically close when a fire is detected and open automatically when pressure is applied to an inter-connected floor mat (particu-

larly useful for the handicapped). Tested by UL it is approved for both 1-hour and 1½-hour applications as a "special purpose fire door." Added acoustical and shock resistant capabilities are possible because of the door's "double wall" construction.

The partition is composed of two floor-to-ceiling sections hung close together with an air space between; each section is lined with a fiberglass shield and supported by pantograph-designed frame. ■ Won-Door Corp., Salt Lake City.

circle 302 on inquiry card



The Roof System you can specify with confidence.

Panel seams are locked into position by striking along the seam length with a rubber mallet (no crimping devices or sealing machines). Clips hold panels to purlins.

American's Standing Seam Roof is available in colors.

1. Female leg of Standing Seam Panel
- 1A. Factory Applied Mastic
2. Clip bolted to purlin
3. Male leg of Standing Seam Panel
4. Clip bolted to purlin
5. Purlin

American's Standing Seam Roof System*...with a class 90 wind uplift rating by Underwriter's Laboratories.

As one of the industry's largest manufacturers of pre-engineered steel buildings, American Buildings Company has been an innovator in research and development. Perhaps the most innovative of all is our Standing Seam Roof System. Its installation is so remarkably simple and its performance has been field-proven for nearly five years.

Because of the roof panel's locking configuration and special purlin clips, fasteners are used only at panel end laps. Roof penetrations are minimized.



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For these reasons we believe you'll find it desirable to know more about American buildings and our Standing Seam Roof System. For your copy of our Catalog for Architects, write on your letterhead to American Buildings Company, P. O. Box 800 A, Eufaula, Ala. 36027.

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Circle 52 on inquiry card

For more information, circle item numbers on Reader Service Inquiry Card, pages 203-204

SELF-CONTAINED AIR CONDITIONER / An illustrated 28-page booklet supplies product information, engineering data, and operation sequence diagrams for the "EDPAC" vertical unit ventilators for modular air conditioning. This equipment is designed to meet the special requirements of educational facilities; the literature emphasizes "EDPAC's" easy adaptability to existing school buildings. ■ AC Mfg. Co., Cherry Hill, N.J.

circle 400 on inquiry card

CONDUIT FITTINGS / A catalog page describes a line of conduit deflection fittings that provide expansion or contraction of conduits up to 3/4-in., and allow angular movement up to 30 deg from the normal. The UL-listed fittings are watertight (NEMA 4); sizes vary from 1/2- to 6-in. conduit size.

■ Spring City Electrical Mfg. Co., Spring City, Pa.

circle 401 on inquiry card

PREFORMED WALLS/ROOFS / "Energy Conservation through Retrofitting" is a 6-page folder describing a free analysis service offered by this building products manufacturer. The energy efficiency of any existing construction can be analyzed, refacing methods recommended and the resulting savings projected by computer. The print-out will estimate the amount of investment required, fuel and cost savings effected, return on investment and the projected payback period.

■ H. H. Robertson Co., Pittsburgh.

circle 402 on inquiry card

BELOW-GRADE SEALANT / *Insul-Seal*, developed primarily to help maintain the actual rated performance value of exterior below-grade insulation by preventing energy transmission through water migration, is described in a product data sheet. The water-catalyzed compound is packaged in cartridges for direct application to seams and joints by caulking gun. ■ Effective Building Products, Inc., Deephaven, Minn.

circle 403 on inquiry card

ROOF INSULATION / "The Cost-Efficient Roof" contains a series of U.S. maps that provide specifiers with recommended roof insulation standards for their region of the country. Three "new construction" maps cover heating only, cooling only, and buildings with both heating and cooling systems. The re-roofing map covers buildings with both heating and cooling systems. Each diagram indicates, in "R" and "C" factors, the economic insulating value to use in each zone. ■ W. P. Hickman Co., Asheville, N.C.

circle 404 on inquiry card

ROOFING SHINGLES / Individual product brochures and a full-line architectural catalog are available for this manufacturer's residential roofing products. Fiberglass and organic felt shingles are included, as well as roll roofing. Color photographs illustrate typical installations and color selections; complete product data, including fire hazard classifications, are given. ■ Johns-Manville, Denver.

circle 405 on inquiry card

RESIDENTIAL INSULATION / Written for the homeowner, "Almost all about home insulating" explains the advantages of foamed-in-place insulation, and describes the methods used in insulating new and existing construction. ■ Scientific Applications, Inc., Mt. Pleasant, Iowa.

circle 406 on inquiry card

ARCHITECTURAL SKYLIGHTS / Illustrated with full-color installation photographs, a 24-page catalog features both custom and standard metal-and aluminum-framed skylights; turret-type lights; ventilating skylights; and fire, smoke and explosion vents. Glazing and finish details are included; recent projects in all areas of the country are listed for reference. ■ Fisher Skylights, Inc., West Nyack, N.Y.

circle 407 on inquiry card

GLARE-FREE LIGHTING / A 12-page color catalog shows the various mounting options for the *Paracyl* adjustable luminaire, said to provide glare-free illumination from the walls of buildings out to pole-mounted areas. Architectural, urban and street lighting applications are included; HID wattages, photo-metric data, and full dimensions are listed.

■ Moldcast Lighting, Pine Brook, N.J.

circle 408 on inquiry card

AIR HANDLING EQUIPMENT / Units designed for special industry requirements are cataloged in an 8-page bulletin. Air handling equipment with inspection windows, interior lights, double-wall insulation, low-leak dampers, direct drive, and explosion-proof options is included. ■ American Air Filter Co., Louisville.

circle 409 on inquiry card

ELECTRICAL SERVICE / The "Coachman II" line of metered service pedestals, for use as entrance equipment in mobile home parks, street lighting, remote sign lighting, and at service entrance to construction sites, is detailed in an 8-page brochure. The modular construction of "Coachman II" equipment includes power pedestal, power outlet panel, and power fittings. ■ GTE Sylvania, Jackson, Miss.

circle 410 on inquiry card

LIGHTED CEILINGS / A general catalog features the most recent additions to this line of luminous skylights, decorative and modular ceilings, mirrored installations, etc. Technical and fire hazard data, maintenance information and application suggestions are also provided. ■ Integrated Ceilings, Inc., Los Angeles.

circle 411 on inquiry card

WATT TRANSDUCER / Intended for load manager systems and other power usage applications, the "Model 341" solid-state watt transducer converts AC current and voltage to a true power analog signal ranging from 0-1000 millivolts DC. A data sheet covers four basic transducers, for 120-, 208-, 240- and 480-volt AC service, which accommodate up to 10 utility service configurations.

■ Pacific Technology, Inc., Renton, Wash.

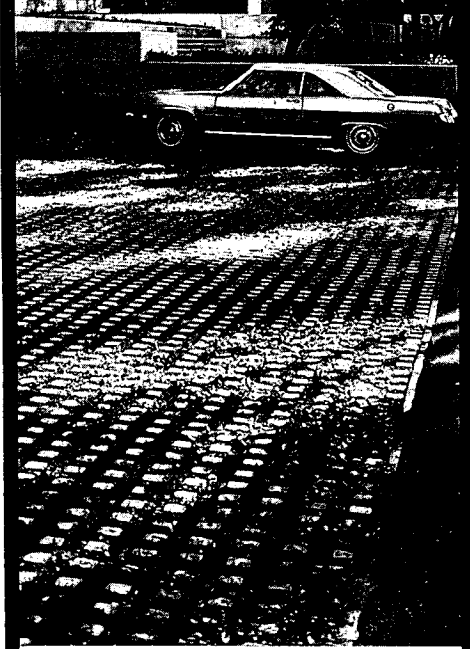
circle 412 on inquiry card

INDUSTRIAL LIGHTING / A 16-page color brochure contains complete data on applications, luminaires, lamps and accessories. Prismatic glass reflectors and refractors provide energy-efficient, precise lighting for problem areas, using HPS, metal halide or mercury lamps. The brochure provides illumination data, showing photometrics for 28 different luminaire/lamp combinations; vertical stack lighting for warehouses; mounting options, metal finishes for corrosive atmospheres; and decorative covers for non-industrial applications.

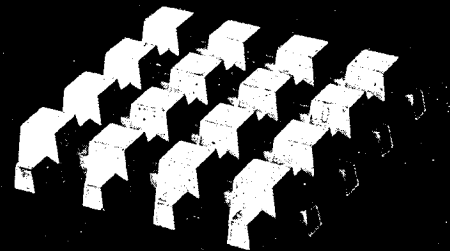
■ Holophane Div., Johns-Manville Sales Corp., Denver.

circle 413 on inquiry card

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Hastings Checker Block provides the solution to the problem of overflow parking, emergency vehicle and service roads where a grass surface is preferred.

Projects from Maine to California have used Checker Block because they are manufactured as close to each jobsite as possible.

Each paver is 24"x24"x4", reinforced with 8 gauge wire and has a minimum 5,000 psi. Checker Block offers an environmental advantage because they offer the highest ratio of grass to concrete of any similar material, permitting water to be returned to the earth. For descriptive literature, write Hastings, 410 Lakeville Road, Lake Success, N.Y. 11042.



Circle 53 on inquiry card



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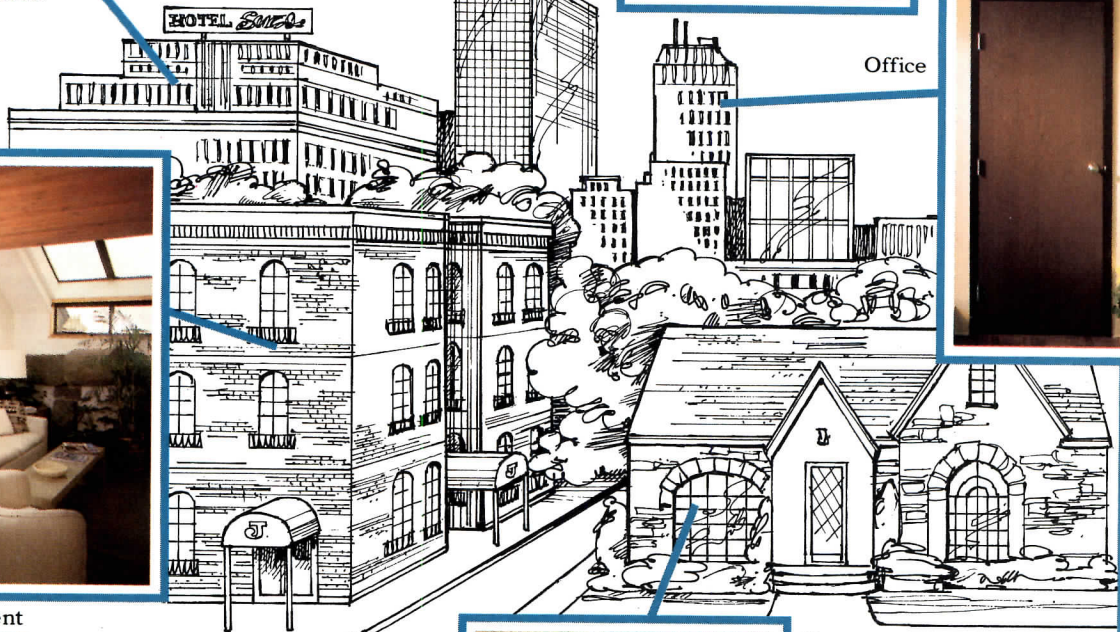
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Whether installed in a popular San Francisco hotel or a fashionable Boston apartment complex, Legacy faced doors are at home. Since Masonite Corporation introduced Legacy five years ago, the doors have been installed in thousands of homes, apartments, offices, schools, condominiums—in every type of building where a passageway exists. That kind of endorsement and acceptance has to be earned. And Legacy has done it. Proven its worth by standing up to abuse and wear while maintaining its deeply embossed, pre-finished good looks.

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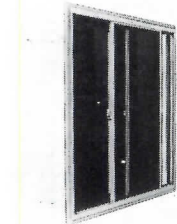
Circle 54 on inquiry card



COMPUTERIZED CRISIS CONTROL / The "KDS" system is said to be a low-cost computer installation for the detection, control and prevention of "crisis" situations in buildings: it monitors fire alarms, security systems, sprinklers, audio communications, patrol tours, access control, equipment function and closed circuit TV. A microprocessor-based system, "KDS" uses telephone circuits or inexpensive wire pairs, and can be completely managed and modified by the owner. ■ Douglas Randall Div., Walter Kidde & Co., Inc., Pawcatuck, Conn.

circle 304 on inquiry card

ROLLING PANEL WINDOWS / Said to provide the energy-saving features of insulated glass in thermal-break frames which are virtually frost-free, these aluminum windows are offered in side-vent, and center-vent rolling panel designs. "E-700 Series" windows are available in a full range of enamelled and baked-on colors as an optional extra. The fixed panel in all models can be removed without tools after the rolling panel has been removed. All panels, including the optional exterior screen of fiberglass mesh, can be removed from inside the building. ■ Capitol Products Corp., Subsidiary of Ethyl Corp., Mechanicsburg, Pa.



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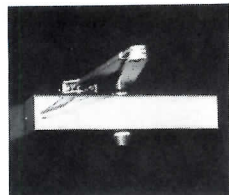
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NUCLEAR-POWERED EXIT SIGN / An emergency exit sign universally approved for all building uses, the fully self-contained unit uses low energy Beta particles, emitted by tritium gas sealed in phosphor-coated glass tubes, to continually produce a green glow visible from 250 ft. The OSHA-approved sign is explosion-proof, and needs no electrical power or batteries for operation. The signs have survived rigid crash and vibration testing; tritium-powered exit signs are used on all commercial U.S. aircraft. Guaranteed for 10 years, the self-energizing sign costs \$144. ■ American Atomics Corp., Tucson,

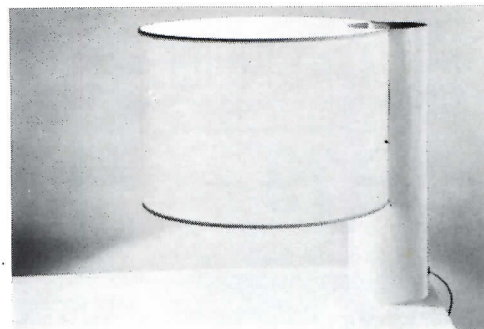
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DOOR CLOSERS / The "Century 2000" series of surface-mounted door closers consists of three units, for interior, high-frequency interior, and exterior openings. The UL-listed closers are designed to provide uniform opening and closing forces throughout a building, without the need to size and adjust closers to each individual door. Product features include a multiple spring backup to the hydraulic system; independent stroke and on/off latch valves. Non-handed, the closer can be inverted for top jamb mounting without loss of efficiency. Backcheck capability, offered as an option on some models, is easily field-adjusted between 50 and 180 deg. ■ Rixson-Firemark, Inc., Franklin Park, Ill.



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circle 307 on inquiry card



DESK LIGHT / The "Circle in a Circle" lamp shown has a white linen shade inserted into a chrome or white cylinder. The light stands 18-in. high, with a floating appearance over the table or desk. The fixture lists for \$79.00. ■ Koch+Lowy, New York City.

*circle 308 on inquiry card
more products on page 148*

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When it comes to roof deck protection, Atlanta's C & S Bank has it! All-weather Crete insulation. The insulating dry fill that's compacted in place. No seams. Just one monolithic blanket that's sloped to the drains providing thermal protection as well as positive water drainage. All-weather Crete, applied by licensed applicators, is one of those unique building materials that provides the architect with an outstanding, trouble-free roof deck insulation, the contractor with a fast job (no curing time with All-weather Crete), and the owner with a maintenance-free roof deck that protects and saves fuel costs year after year after year. Get the facts — see why most of this nation's outstanding architectural achievements utilize All-weather Crete for roof deck and plaza insulation. Contact Silbrico Corporation, 6300 River Road, Hodgkins, Illinois 60525, (312) 735-3322, or see Sweets for the address of your local applicator.



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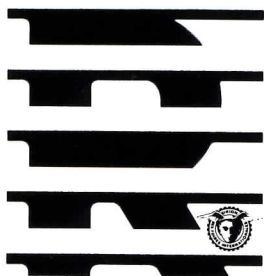


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Building Science/Structures position Department of Architecture of the college of environmental design at the university of California Berkeley is seeking candidates for a position at the assistant professor level to teach Building Science/Technology and Architectural Design with an emphasis on structures and construction at both the undergraduate and graduate levels. Experienced in computer assisted design and advanced academic work in structures will be essential—experience in model testing would be desirable. Instruction in structures and construction will involve lecturing and work in computer and Building Science Laboratories. Studio work will emphasize derivation of built form from information from building Science. Responsibilities will include course and program development in an integrated program in Building Science. This position is the possible second position referred to in a previous advertisement for which the deadline was January 15, 1979. Those who applied for the previous position need not re-apply for this second position. Contact the secretary of the faculty search committee dept of Architecture University of California Berkeley Ca 94720 for further information and application forms. Applications must be received by the University of California Berkeley is an Affirmative Action Employer.

Project Designers—An expanding medium size A/E firm has a position open for an experienced project designer. Registration is preferred, but openings are also available for architects in training with three to five years experience. Recent hospital experience is preferred, although not essential. We are a multi-disciplined design-oriented firm with a wide variety of project types. We are located in a Big Ten university community with outstanding opportunities for cultural and athletic activities. Iowa City provides an excellent environment for family-oriented activities as well as personal growth potential. We offer a full benefit package and a salary commensurate with experience. Call Duane Rogg at 319/354-4700 for further information or send resume, in confidence, to Hansen Lind Meyer, P.C. Drawer 310, Plaza Centre One, Iowa City, Iowa 52240. An equal opportunity-affirmative action employer. M/F.

Architect—Demonstrated marketing skills and design abilities needed for growing 100 man Maine/New Hampshire architectural firm. Broad range of projects includes housing, medical, educational and municipal facilities. Attractive coastal location. Salary commensurate with skills. Stephen Bowers, Wright-Pierce, 99 Main St., Topsham, Maine 04086.

Design Studio and Theory (full or associate professor). Environmental Control and Design Studio (associate or assistant professor). For application and further information: G. Anselevicious, Chairman, Architecture Department, Hayes Hall, State University of New York, Buffalo, NY 14214. SUNYAB is an affirmative action, equal opportunity employer.

Sr. Design Architect—Lead Design position available with major A/E firm located in NE. Qualified professional should possess degree and registration in addition to 8+ yrs. comprehensive exp. in design and/or design direction of major commercial and office building projects encompassing both high and low rise systems. Individual should also have ability to interact with clients and conduct oral presentations coupled with the desire to assist in future marketing efforts. Position open due to firm's growth and offers excellent compensation and future. Please respond in confidence with resume to our representative: G. Marshall Assoc.—P.O. Box 66083—Chicago, Il. 60666.

PROJECT ARCHITECT: A respected professional architectural firm in the Midwest offers an exceptional opportunity for a skilled architect with management ability. The selected individual will take charge of all elements of a project from design concept through construction completion. It is intended that this person will become a partner within 5 years and participate in directing the organization. Starting salary is in the \$30,000 range. At least 8 years experience is required in general architectural design. Replies will be held in confidence by an independent consulting firm and will not be disclosed without candidate permission.

Send resume to:

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Architect/Health Planner—Position open with major firm exhibiting excellent growth history. Qualified professional should possess highly design oriented background of 8-10+ yrs. in the health care and/or teaching facilities area with additional professional expertise in complete facilities Master Plan and programming. Supplementary qualifications should include the ability to conduct effective oral and written communications while supervising project personnel and assisting in some services marketing efforts. Position offers excellent compensation along with future personal growth. Please respond in confidence to our representatives: G. Marshall Assoc.—P.O. Box 66083—Chicago, Il. 60666.

Chairperson—Construction Systems Technology—Searching for chairperson, August, 1979, in ECPD accredited two and four-year programs in Construction Engineering Technology and two-year Drafting and Design Engineering Technology program. Associate degree in Fire Protection Technology seeking accreditation in the four-year Drafting and Design program. Primary responsibilities are administrative with some teaching assignments. Advanced degree preferred—or exceptional related work experience. Must have proven administrative abilities; teaching experience desirable. Salary negotiable. Apply with resume by March 17 to: Professor T. T. Sires, Construction Systems Technology Department, The University of Nebraska at Omaha, 60th & Dodge Streets, Omaha, Nebraska 68182. Affirmative Action/Equal Opportunity Employer.

POSITIONS VACANT

Director For Architecture Program, School of Design, North Carolina State University. Involves administration, teaching and curriculum development in undergraduate and graduate professional programs, beginning July 1. Rank and salary negotiable. Send resumes to Vernon Shogren, Chairman, Search Committee, Architecture Program, School of Design, Raleigh, North Carolina, 27650. An Equal Opportunity Employer.

Two Architecture Faculty: North Carolina State University, Fall 1979 to teach studio and one or more: Architecture Theory, Graphics, Structures Environmental Technology, Urban Design, Architecture History, Building Technology. Apply by March 31. Send resumes, references and statement of teaching interest to Search Committee, Architecture Program School of Design, North Carolina State University, Raleigh, North Carolina 27650. An Equal Opportunity Employer.

Rice University seeks 2 full time Assistant Professors to join the School of Architecture faculty. Fall 1979. Teaching responsibilities include advanced undergraduate design studio and at least one lecture course in a specialized field. Candidates must hold a Master of Architecture degree from an accredited institution. Application deadline 21 February 1979. Contact Search Committee, School of Architecture, Rice University, P.O. Box 1892, Houston, TX 77001. An equal opportunity/affirmative action employer.

Positions Open—Carnegie-Mellon University, Department of Architecture, seeks applications for the following: 1. Assistant or Associate Professor in Architectural Design beginning September 1979. Advanced degree in Architecture, practice and teaching experience preferred. Responsibilities: Architectural design studio, middle or upper levels; additional design-related course, and/or research. Those with interests and experience in an additional discipline will be given special consideration. 2. Position in Architectural Technology beginning September 1979. Advanced degree in Architecture and/or Engineering. Candidates with teaching experience (and professional experience) will be given preference. Responsibilities: Lecturer in courses in environmental systems, with emphasis on active and passive systems. Some knowledge of electrical distribution and illumination desired. In addition, critic in design studios, with or without emphasis on technical issues. 3. A one-year appointment in Architectural History beginning September 1979. Ph.D. degree and teaching experience required. Responsibilities: Two courses per semester within program of general architectural education. 4. Position in Architectural Computer-Aided Design beginning September 1979. Advanced degree in Architecture. Special interest will be given to applicants qualified in areas complimentary to those existing in the Department. Such areas might be: building technology, computer-aided instruction, construction management. Responsibilities: Selected person will be expected to participate in and expand teaching and search of Ph.D. students in this area. Salary and rank for each category will be negotiable dependent upon qualifications. Send curriculum vitae and names of three references to John Pekruhn, Chairman, New Faculty Search Committee, Department of Architecture, Carnegie-Mellon University, Pittsburgh, Pennsylvania 15213. Carnegie-Mellon University is an Affirmative Action-Equal Opportunity Employer and Encourages Applications From Minorities and Women.

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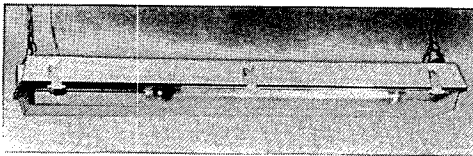
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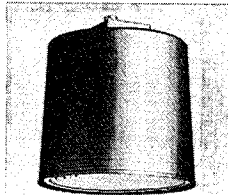
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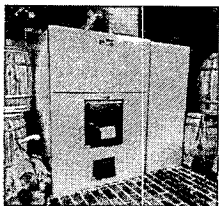
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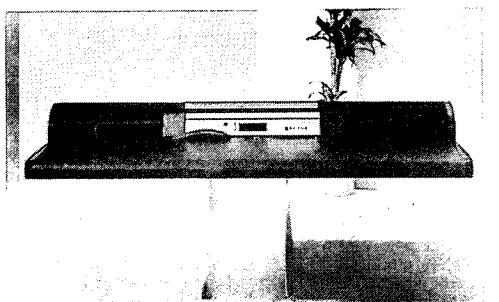
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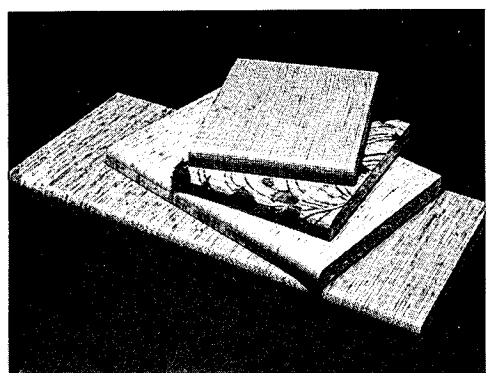
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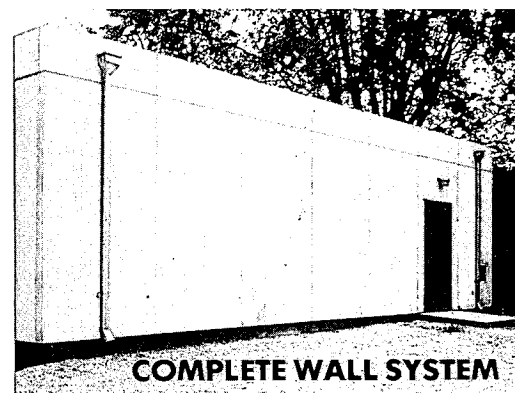
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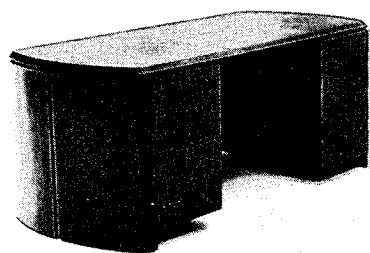
1 The permanence and appearance of pre-cast concrete at one-eighth the weight. Window wall unit was glazed and insulated in the factory offering substantial cost savings at the job site. Insulation was installed within the panel without any loss of floor space. Architect: Simpson, Usher, Jones, Inc., Anchorage, Alaska. Manufacturer: Olympian Stone, Redmond, Washington.



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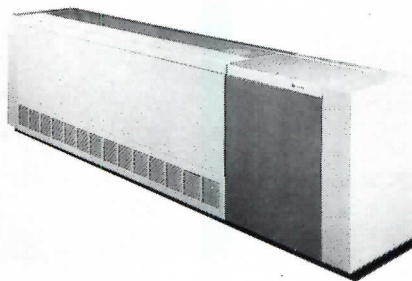
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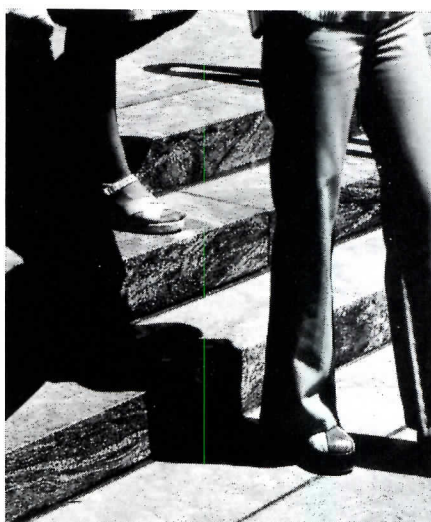


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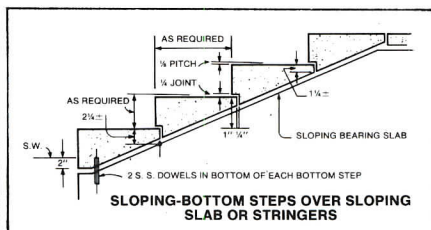
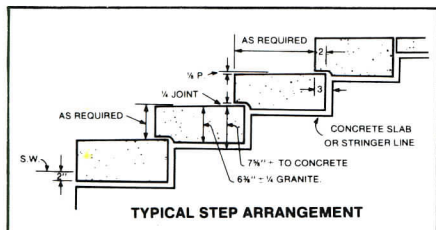
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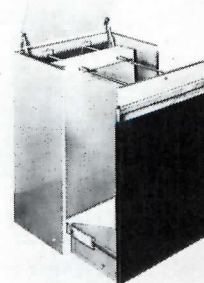
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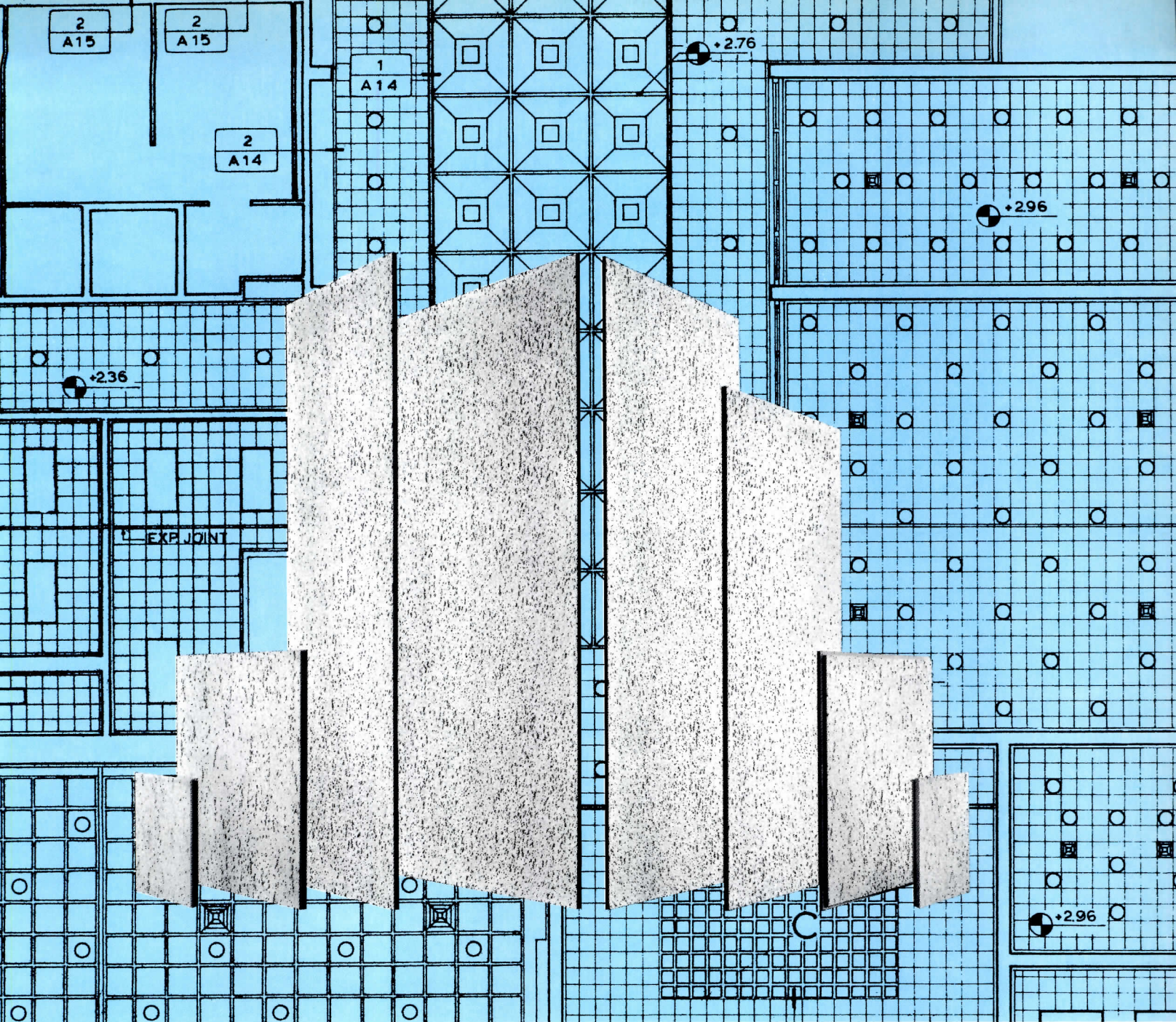


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