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BUILDING TYPES STUDY: SPORTS ARENAS
FULL CONTENTS ON PAGES 10 AND 11

ARCHITECTURAL RECORD

FEBRUARY 1980

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Letters to the editor

Thank you for that really perceptive article on O'Neil Ford, Texas architecture's "conscience" (RECORD, December 1979, pages 126-136).

He has been my mentor, inspiration and good friend for 25 years, and I believe that you have described his elusive spirit as a human and his great value as an architect better than anyone else who has made the valiant attempt.

Frank D. Welch
Frank Welch Associates,
Architects and Planners
Midland, Texas

I greatly enjoyed Herman Spiegel's article "Le Corbusier: Structural Mastery Supports Art," in the mid-August 1979 issue of ARCHITECTURAL RECORD.

It was, I thought, very nicely conceived, written and photographed. It also made some real points, and made them clearly—a welcome relief from what I consider the pretentious overstatement of many articles in the architectural press.

As the (opinionated) wife of an architect, I'm interested in architecture; as a writer and editor, I'm interested in what gets written about architecture. For both these reasons, I try to read through the architectural journals fairly regularly. Sometimes that's a chore. But Mr. Spiegel's article made it a pleasure.

Joslyn Green
Green & Associates
Boulder, Colorado

It was so refreshing finally to read in RECORD an article addressed to the needs of real people in real-life situations ("Round Table: Housing and Community Design for Changing Family Needs," RECORD, October 1979, pages 97-104).

As a single mother working in a clerical position in an architectural firm in Boston, I am acutely aware of what is called "the worker's alienation from his/her work," in that all the residential design I see at the office, and most that I read about in trade publications, seems geared to just a tiny portion of our country's population: the professional, established, economically secure sector.

How wonderful that there are some people in the field who are trying to change all this, and that so respected a publication as RECORD supports the effort. I look forward to seeing some of these design ideas become reality in future issues.

Peggy Turchette
Wellesley, Massachusetts

I would like to bring to your notice a recent and important planning effort which is contributing to the revitalization of one of our major industrial

downtowns. I refer to Toledo, Ohio, and Barton-Aschman Associates CBD master plan, completed earlier this year. In the July issue of RECORD (Buildings in the News, page 41), you refer to Toledo's proposed Owens-Illinois tower, designed by Abramovitz-Harrison-Kingsland and the waterfront park designed by Sasaki Associates. You also mention central business district planning, but do not connect it with Barton-Aschman Associates, who were responsible for the downtown master plan, including commercial revitalization, street improvements, development planning and urban design.

Our work was undertaken in 1977-79 and set the stage and the development strategy within which both the Owens-Illinois headquarters and the waterfront park will be built. As a result of our efforts, the city was awarded a \$12-million UDAG grant (one of the first, and largest) for the public improvements our plans dictated for the O-I and other buildings.

John J. Pickard
Senior Associate
Director of Planning, Eastern Office
Barton-Aschman Associates, Inc.
Washington, D.C.

Correction

In our News in Brief report on new officers of the National Organization of Minority Architects (RECORD, December 1979, page 33), we mistakenly gave the names of the retiring secretary and treasurer as incoming. NOMA's newly elected secretary is Robert Perkins, AIA, of the New Orleans firm Perkins & James, and its new treasurer is Stanford Britt, AIA, of the firm Sulton and Campbell Associates, which has offices in Baltimore and Washington, D.C.

Calendar

FEBRUARY

14 Lecture, "Solar Energy and Community Planning," sponsored by UCLA School of Architecture and Urban Planning, Los Angeles, Calif. 90024.

21 Seminar, "The Light Years of Inner Space," sponsored by Marquard, Ludwig & Company, Inc.; to be held at the Salt Lake Hilton, Salt Lake City. Contact: Sharon Capella, Marquard, Ludwig & Company, Inc., 23011 Moulton Parkway, Suite E-1, Laguna Hills, Calif. 92653.

MARCH

2-6 "Interior Design International '80," sponsored by *Decor and Contract Furnishing* and *Interior Design* magazines; to be held in Olympia, London. Contact: Westbourne Exhibi-

tions United, Crown House, Morden, Surrey, SM4 5EB, England. Telephone: 01-540-1101.

2-6 ERDA 11th annual conference, "Optimizing Environments: Research, Practice, and Policy," to be held in Charleston, South Carolina. Contact: Stephanie Sanders, The Center for Metropolitan Affairs, The College of Charleston, Charleston, S.C. 29401.

16-18 1980 Construction Industry National Legislative Conference, to be held at the Sheraton Washington Hotel, Washington, D.C. Contact: The Construction Industry National Legislative Conference, 8224 Old Courthouse Rd., Vienna, Va. 22180.

17 The Energy Bureau's third national conference, "Cogeneration: New Directions," to be held at the Biltmore Hotel in New York City. Contact: Robert W. Nash, Executive Director, The Energy Bureau Inc., 41 E. 42nd St., New York, N.Y. 10017.

17-18 Conference/work session, "Strategies for Stopping Shopping Centers," sponsored by the Downtown Research & Development Center; to be held in New York City at Loew's Warwick Hotel. Contact: Ms. Mary Dalessandro, Coordinator, Downtown Research & Development Center, 270 Madison Ave., New York, N.Y. 10016.

18-19 Long Span Concrete Bridge Conference, sponsored by the Portland Cement Association; to be held in Hartford, Conn. Contact: Gordon K. Ray, Divisional Director, Public Works Division, Portland Cement Association, 5420 Old Orchard Rd., Skokie, Ill. 60077.

21-23 Chicago's second annual "City House: A Home Improvement Fair for Older Houses," sponsored by the City of Chicago under the auspices of the Commission on Chicago Historical and Architectural Landmarks; to be held at Chicago's Navy Pier. Contact: Edward Jeske, Room 800, 320 N. Clark St., Chicago, Ill. 60610, or call 312/744-3200.

21-26 61st Annual Convention/Construction Exposition of the Associated General Contractors of America, to be held at the Sheraton Waikiki Hotel, Honolulu, Hawaii. Contact: Bill Jayne, Director of Information, AGC, 1957 E St., N.W., Washington, D.C. 20006.

26-29 The 68th Annual Meeting of the Association of Collegiate Schools of Architecture entitled "The Language of Architecture," to be held in San Antonio's St. Anthony Hotel. Contact: ACSA, 1735 New York Ave., N.W., Washington, D.C. (202/785-2324).

27-28 COFPAES Federal Programs Conference 1980, to be held at the Sheraton Harbor Island Hotel, San Diego, Calif. Contact: Federal Programs Conference 1980, The American Institute of Architects, 1735 New York Ave., N.W., Washington, D.C. 20006.

ARCHITECTURAL RECORD (Combined with AMERICAN ARCHITECT, ARCHITECTURE and WESTERN ARCHITECT AND ENGINEER) (USPS 132-650)

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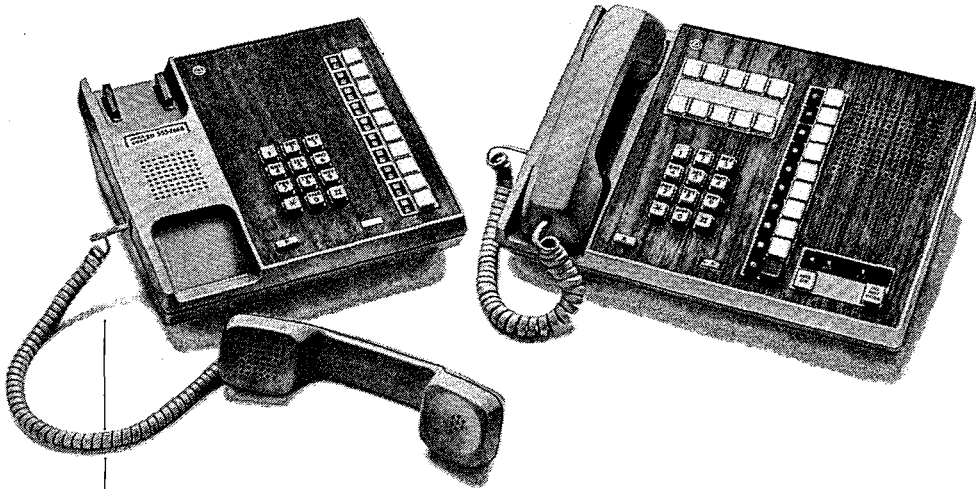
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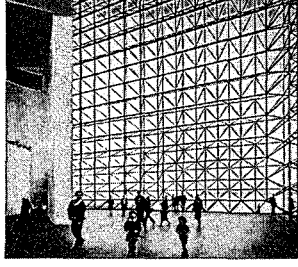
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THE RECORD REPORTS

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Interested in "better building through technological innovation and more rational regulation"? Who isn't?

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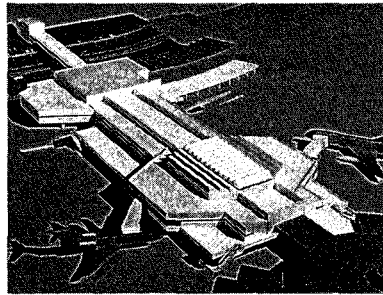
Short items of major national interest

36 News reports

New York City unveils I. M. Pei & Partners' design for a super-large convention and exposition center in Manhattan. The Department of Energy, in response to entreaty from the construction industry, extends the deadline for comments on its BEPS to April 25. The Museum of Modern Art exhibits fantastic buildings, both past and future, for Best Products showrooms.

41 Buildings in the news

International Passenger Terminal, San Francisco International Airport, California. Bus maintenance facility, Houston. Hyatt Regency Fort Worth Hotel, Texas. Grant Building, Atlanta. Harbor Loft Apartments, Lynn, Massachusetts. D & F Tower Offices, Denver.



Gerald Ratto

67 Required reading

Design Competitions

by Paul Spreiregen FAIA,
reviewed by Michael Seelig.

ARCHITECTURAL BUSINESS

63 Design and real estate economics: a partnership for adaptive-use

As we enter a new decade, the urban frontier is becoming increasingly more attractive to the development and investment communities.

Due to current economic conditions, an increasing volume of real estate is being purchased for appreciation rather than a need for short-term cash flow. However, the opportunities for urban reinvestment without recourse to public subsidies will continue to be highly selective and subject to intensive scrutiny by knowledgeable investors. Real estate economist Mel Gamzon explores this evolving problem.

FEATURES

81 Lighthouse on an era

The John Fitzgerald Kennedy Library, designed by I. M. Pei & Partners, illumines a profile of architectural courage over 15 years that would have impressed the 35th President's sense of history, politics, and art.

91 Conservation of County Courthouse in Michigan

The preservation of the Livingston County Courthouse in Howell, Michigan, is symbolic of the government and cultural continuity of this very small community, while an excellent design of combined restoration/rehabilitation. William Kessler and Associates are the architects.

97 Recalling familiar forms

Two houses designed by Connecticut architect Peter Woerner are derived from the traditional New England vernacular but, more important, they are imbued with interesting and welcome variations.



Robert Perron

103 The Douglas County Correctional Center by Dana Larson Roubal

Located in Omaha, Nebraska, this new facility has been designed as a prototype under various Federal programs for prison design across the country. It features a marked lack of visible restraints and a separation of offenders into like groups for rehabilitative purposes.

BUILDING TYPES STUDY 451

109 Sports arenas

This building type continues to be active and continues to compete for the public's discretionary dollars. The designers of the three arenas in this study faced an especially broad array of problems and solved them with exemplary skill.

110 U.S. National Tennis Center Flushing Meadow, New York

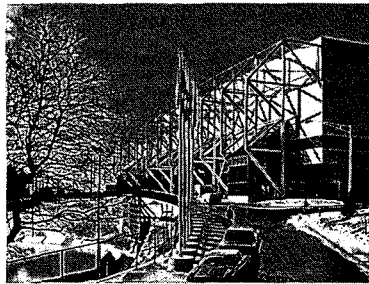
Architect David Specter had just 10 months to provide American tennis with a new and comfortable home.

115 Special Events Center

University of Texas, Austin, Texas
An exceptionally flexible facility designed by Crain/Anderson that successfully hosts a very long menu of events.

120 Olympic Center

Lake Placid, New York
Hellmuth, Obata & Kassabaum's splendid solution to the problem of designing to the highest Olympic standards without creating a building so specialized and so expensive to operate that it cannot be used after the Games.



George Cserna

ARCHITECTURAL ENGINEERING

125 Low-cost walk-on ceiling**gives access to ballroom equipment**

Because the space above the ballroom ceiling in an addition to the Hyatt Regency Chicago is crammed with air handlers, exhaust fans, sprinkler lines and other piping, convenient access for maintenance was required—in this case provided by a gypsum ceiling that cost half as much as catwalks.

127 Temporary floodgates protect a Houston hospital from a rainstorm's runoff

In 1976 Houston's Methodist Hospital Center suffered \$1.5 million damage and awkward operating conditions when runoff from a flash storm flooded passages and basements. The main remedy by Bovay Engineers was a series of demountable floodgates in front of below-grade ramps.

133 Product reports**135 Office literature****185 Classified advertising****188 Advertising index****191 Reader service inquiry card**

NEXT MONTH IN RECORD

Building Types Study: Low-rise housing

In a period of altering national expectations, American architects (and developers) must look at multifamily housing with altered perceptions of economics, energy and available building sites. Recent low-rise housing uses formerly overlooked urban sites, obsolescent buildings for low-cost recycled apartments, compressed in-fill sites, and small-scaled mixed use of offices, stores and residence.

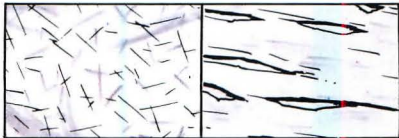
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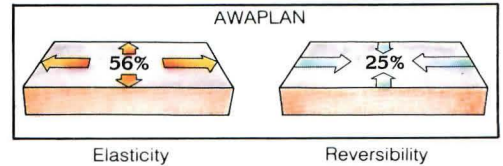
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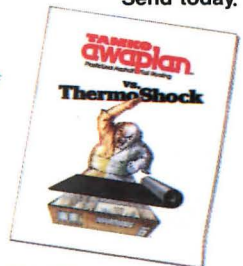


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Interested in "better building through technological innovation and more rational regulation"? Who isn't?

Who hasn't been frustrated by the maze of overlapping (and sometimes contradictory) regulation surrounding almost every phase of building? Who hasn't struggled with the questions (and the liability dangers) of considering a new product or system which seems just right as the solution to a design problem but is—well—"too new"? Well, there's now a way for anyone in the building industry—architect, engineer, builder, manufacturer—to assist in a frontal attack on those problems—and its name is the National Institute of Building Sciences. Some time ago, on this page, I urged readers to join NIBS and participate in its activities—or at least to keep up-to-date on its activities. I'm moved to do so again, having just read the just-released five-year program plan for NIBS entitled, "Better Building Through Technological Innovation and More Rational Regulation." It's an ambitious plan, but I'm full of hope that it will work because (unlike so many attempts before) NIBS' plan is well organized, well researched, and involves—through its Consultative Council which any architect, engineer, or member of the building industry can join—all of the various interest groups involved.

When NIBS was formed as a "quasi-public" organization, it was given two general responsibilities: "The promotion of a more rational building regulatory system through simplification . . . of building criteria, standards, and other regulatory provisions" and "Providing for the evaluation of existing and new technology in order to facilitate its introduction and acceptance at the Federal, state, and local levels." In support of these two principal activities, NIBS has now organized itself in two support areas: "developing and disseminating the data and information necessary to advance the Institute's aims;" and "developing and encouraging the participation of consumers, all levels of government, and all other building community participants in the activities of the Institute [through, again, its Consultative Council which anyone can join on a sliding scale reaching down to \$50 for a typical small architectural firm]." There are now well over 600 firms, organizations, and individuals who have joined the Council—and many are already actively at work on one of the programs. For example:

One of 12 major programs on NIBS's five-year plan is to establish "Performance Objectives of Criteria, Standards, and Regulations." This program is intended to determine the objectives and the proper performance

levels of building criteria, standards, and regulations; compare these with existing criteria, standards, and regulations; and recommend (with specific advice) re-evaluation of the existing requirements—wherever possible in performance, rather than prescriptive terms. Specifically, for example, this program would attempt to establish reasonable, non-overlapping, standardized criteria standards and regulations for fire safety, or structural stability. The desired performance levels, once established, would be put out for study by the building community and consumer groups. Since NIBS has already indicated that it will not attempt to write codes or standards, the input of existing regulatory bodies is of course critical to help ensure acceptance of the new performance criteria when they are established. NIBS' job, in short, will be to try and make sense of the regulations and requirements that govern building. The NIBS board has appointed Albert Bartosic, a senior legal counsel at Rohm & Haas as chairman of this program, and he has selected a 22-man steering committee from the 411 members of the Consultative Council who expressed interest in this area of activity when they signed up. Others will of course be invited to join task forces to study specific areas of performance objectives—and volunteers will surely be welcome.

Other major programs scheduled to get underway in 1980 are, for example, intended to assess the cost, benefits, and risk of Federal, state, and local building regulations; to monitor and participate in the development of statutes and regulations that will affect the building community; to advise and assist Federal agencies in establishing, for example, the Building Energy Performance Standards, Residential Energy Efficiency Standards, the Rehabilitation Guidelines Study, and the like; to study and improve the Federal regulatory process; to study and improve the building regulatory process at state and local levels; and to improve existing certification programs for building products and technologies—both existing and new.

These programs—as I suggested earlier—seem right down the alley of frustrated architects, engineers, contractors, manufacturers, and every other part of the building industry. These and other programs at least offer "a chance to do something." The first step is to call Dick Bullock, NIBS' vice president, Consultative Council & Information Services, for membership information. His phone is 202/347-5710. —Walter F. Wagner.

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the discussion is closed.



After years of skirmishing, New York City has finally unveiled plans for a convention center—designed by I.M. Pei, a large transparent building supported by a space frame, with reflective glazing. Details on page 36.

The Department of Energy has extended its deadline for comments on BEPS to April 25, in answer to construction industry complaints that a February date allowed too little time for thoughtful criticism. Details on page 36.

A decline in housing starts reduced construction contracting 8 per cent for the month of November, against last November, despite continued strength in multifamily and nonresidential activity, according to the F. W. Dodge Division of McGraw-Hill Information Systems Company. "With credit restraint choking off funds for housing, the Dodge Index of total construction contract value slumped [to its] lowest rate . . . in over a year and a half," said George A. Christie, Dodge's chief economist. At the same time, he added, "Contracts for nonresidential building, up 6 per cent in November at \$3.8 billion, showed little sign of impending recession."

Herbert Epstein, FAIA, will receive the 1980 Edward C. Kemper Award from the American Institute of Architects. The Institute grants the award to honor members who have "contributed significantly to the Institute and to the profession of architecture." Among other services, Mr. Epstein, who practices in Brooklyn, has for the past three years been the AIA's chief spokesman before Congress and Federal agencies on BEPS and solar energy.

The American Institute of Architects will present five medals at its convention in June: to the Rouse Co. for Boston's Faneuil Hall Marketplace; to Cyril M. Harris, architectural acoustician, teacher and lexicographer; to *Progressive Architecture* magazine's annual design awards program; to M. Paul Friedberg, landscape architect and urban designer; and to Lady Bird Johnson, a leader in national beautification efforts and natural preservation. Mrs. Johnson will also become an honorary member of the Institute.

The National Endowment for the Arts named Lance Jay Brown coordinator of its Design Excellence Project. Mr. Brown, who will head the Endowment's advocacy efforts to increase awareness of quality design in both private and public sectors, will take a leave from his architectural teaching post at the City College of New York and from his practice in the firm Brown & Bee Architects and Urban Planners.

For a recent show, the Museum of Modern Art unloosed six architects to design projects for Best showrooms and exhibited some of the catalog merchandiser's highly innovative buildings. Details on page 39.

The architectural firm Skidmore, Owings & Merrill has established the SOM Foundation "dedicated to the advancement of the arts through the preservation of archives, support for publications, study endowments and individual grants." Initial grants went to MIT for a fund in honor of John O. Merrill, Sr., to Cornell for the preservation of Nathaniel A. Owings' papers on urban development, to the University of Pennsylvania for the preservation of the Louis Kahn Collection, and to other universities as well as museums and orchestras....

The Committee on the Preservation of Architectural Records has given materials to the Library of Congress, which will continue and expand the New York City-based committee's National Catalog of American Architectural Records. Inquiries about the National Catalog should be directed to Ford Peatross or Mary Ison, Library of Congress, Prints & Photographs Division, Washington, D. C. 20540. The committee itself will resume its original work of preserving architectural materials for New York City and New York State; its address will be c/o New York City Chapter, AIA, 457 Madison Avenue, New York, New York 10022.

The Sunday School Board of the Southern Baptist Convention will sponsor the 1980 Architects' Workshop May 24 to 27 at the Maxwell House Hotel in Nashville, Tennessee. The Board's Church Architecture Department convenes national meetings for architects every three years. For information: Howard McAdams, Church Architecture Department, 127 Ninth Avenue, Nashville, Tennessee 37234.

NCARB urgently seeks the return of completed questionnaires that it mailed to 12,000 architects last March. The questionnaire is a major element in the organization's year-long practice analysis, a study of the "knowledge, skills, abilities and functions necessary for the practice of architecture in the United States."

Portland, Oregon, invites entries in a design competition for Pioneer Courthouse Square, a major downtown site adjacent to the city's Transit Mall and Pioneer Courthouse. Portland intends for the square to be the "missing link" in its system of downtown pedestrian walkways, parks and open spaces. Upon receipt of a written request and a \$25 fee, the city will mail a competition packet with program, submission requirements and background data. For information: Donald J. Stastny, AIA, Professional Adviser, c/o City of Portland Development Commission, 1500 S. W. First Avenue, Portland, Oregon 97201.



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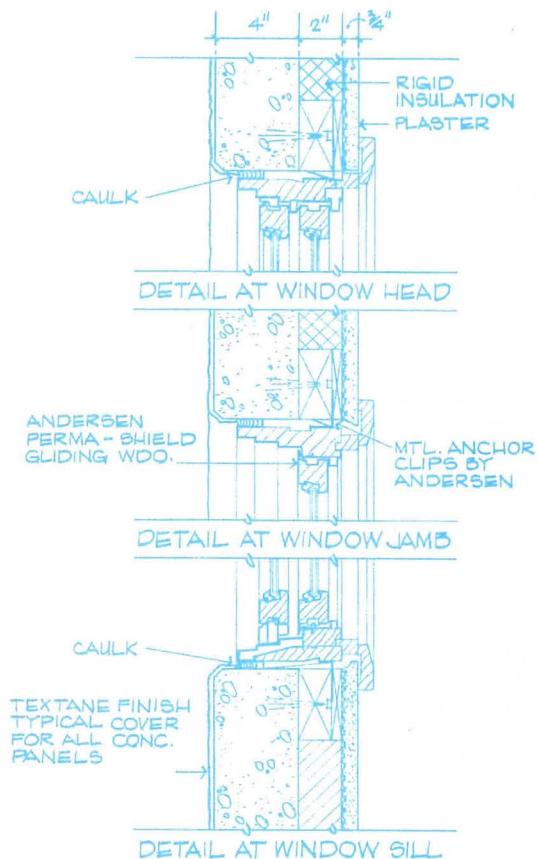
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New York City selects Pei to design convention center

After years of controversy, fiscal crisis, and three site changes, New York City and the Urban Development Corporation (UDC) have finally accepted plans for the Exposition and Convention Center. The final site is to the north of Manhattan's West 34th Street, a major crosstown thoroughfare, and along the Hudson River.

I. M. Pei and Partners, in association with Lewis, Turner Partnership, have designed an impressive \$375-million structure that will, it is hoped, "enable New York to assume a leading position in the highly competitive convention and trade show industry by offering the largest exhibition space ever contained within a single building." An equally important goal was to design a "world class" building to encourage public use and to integrate the building within the urban environment.

The multilevel Exposition Center will have a total floor area of 1.8 million sq ft, containing two major exhibition halls. Located in the upper level is the "largest single exhibition hall in the country to be built on one floor." This 500,000-sq-ft exhibition hall is adjacent to the skylit central entrance hall, which contains the building's highest and most dramatic interior space—with an over-all height of 100 ft, rising at a central point to 130 ft. Openings at intervals along a gallery, which runs from the entrance to the river, will enable the public to see the exhibition hall.

On the lower level are a 250,000-sq-ft exhibition hall and an additional 100,000 sq ft of meeting and special events rooms. Also included on the lower level are 35,000 sq ft of restaurant facilities.

The exhibition halls are organized in 90-ft bays, each serviced by independent mechanical systems to provide compressed air, water, elec-

tricity, telephones, and drainage. This modular mechanical system ensures that, except for minimal maintenance requirements, only that portion of the building in use will need to be heated or cooled. At the roof, space frames will be supported by 10- by 10-ft latticework columns that are reduced to 5- by 5-ft for the lower 20 ft.

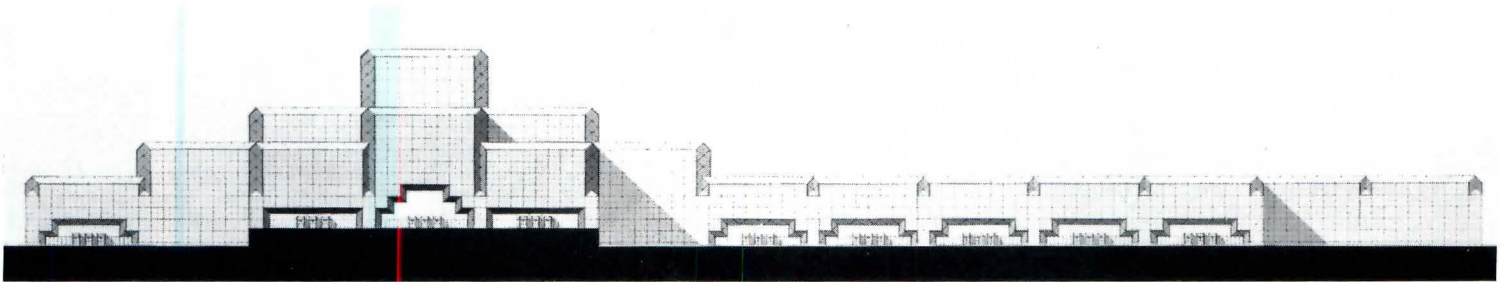
The 90-ft bays, the space frames, and the variety of interior heights serve to counter the potential oppressiveness of such a vast building. And on the exterior, the skin of the building is modulated by latticework and a range of reflective glasses.

The public spaces, visible through the building's transparent glass facade, are designed to display the movement of visitors through the entry hall and along the gallery. During the day reflective glass will mirror the cityscape, with views geared outward, and at night the building will be transparent, alive with lights and activity within.

A one-acre plaza across 11th Avenue will provide not only a visual counterpoint to the center, but an environmental link between the center and New York City. A two-way roadway, parallel to 11th Avenue and running underneath the pedestrian entry, provides 1,000 linear ft of bus and taxi drop-off.

James Ingo Freed, a partner in the I. M. Pei firm, is the architect in charge of the project, and the office of James Stewart Polshek and Associates serves as principal design consultant.

The Exposition and Convention Center is being developed by the Convention Center Development Corporation (CCDC), a subsidiary of New York State's Urban Development Corporation, and will be financed by \$375 million in project bonds. Construction is scheduled to begin in the summer of 1980, with the facility opening for business in the spring of 1984.



DOE extends its deadline for comment on BEPS

The U.S. Energy Department will accept comments on its building energy performance standards (BEPS) until April 25.

Originally, the Department had planned to shut off comments February 26. It changed its mind because numerous industry groups charged that they were unable to formulate a response so quickly.

Moreover, the Department itself experienced printing schedule delays for its 10-volume technical support documents. In early January, only photocopied versions of the documents were available.

With the extension of the comment period, there is a concurrent delay in public hearings on the standards that were formally unveiled November 28. Dates and locations of the hearings had not been announced at press time.

Meanwhile, industry reaction to the standards has been largely negative, with engineers and homebuilders arguing that the complex set of design rules cannot be absorbed as quickly as the government's timetable now dictates.

Only the American Institute of Architects has given the BEPS unqualified support. Institute President Charles E. Schwing says, "The Institute has strongly encouraged the establishment of Federally developed

building energy performance standards since issuing its first energy policy statement in 1974. Architects will continue to play a crucial role in maximizing energy conservation in the built environment. These proposed standards will achieve substantial energy savings, as well as allow architects to design innovative and dynamic buildings."—William Hickman, *World News, Washington*.

NYU applies \$1-million grant to new Urban Studies Center

New York University has received a \$1-million five-year grant from the Charles H. Revson Foundation to launch a comprehensive Urban Studies Center. The Center will study issues fundamental to New York City's future and provide information to decision-makers in government and other areas.

The primary research of the Center will enable city policymakers and planners to evaluate decisions in such areas as fiscal health, deterioration of housing and physical plant, demographic trends, and the provision of health, education and welfare services.

Dr. Ivan L. Bennett, Jr., acting president of the university, states, "The research program will be geared toward formulating the terms of reference for policymakers. The objective of the Center is to study

the process of urban growth, decline, and renewal in the years ahead. The Center's position as a permanent, autonomous unit of New York University will enable it to provide an ongoing assessment of the city's problems."

Creation of the Urban Studies Center follows a year of study and planning that reported a serious lack of sustained multidisciplinary research into underlying trends affecting the city. The study concludes that "independence is the key requirement for a research institution that hopes to improve public policy over the long term. The Urban Studies Center will have the independence to assess objectively the city's problems, and the expertise and resources to analyze these problems in depth. The Center will work with government agencies and others in response to their requests for information, but it will be free to set its own priorities."

The Center is currently looking for a director, who will hold a named chair in urban studies. The position will be funded by a five-year \$250,000 grant from Henry Taub, chairman of the executive committee of Automatic Data Processing.

The Center's Board of Advisors will include, among others: Ada Louise Huxtable, architectural critic of *The New York Times*, Michael O'Neill, editor of the *Daily News*, and Charles Hamilton, Professor of Government at Columbia University.

Government hopes to renew Federal revenue sharing

Federal general revenue sharing—the no-strings-attached aid to state and local governments—will be renewed for a five-year period if the Carter Administration has its way.

The Administration had been cool to a continuation of revenue sharing, but changed its mind under pressure from organizations of governors and mayors and the realities of election-year politics.

White House officials say Congress will be asked to approve \$6.9 billion a year beginning with fiscal 1981. One-third of the funds would go to state governments, the rest to local governments.

The extension proposed will continue the general purpose nature of the funds, meaning they can be spent however the jurisdiction prefers. As a practical matter, the funds tend to free-up local money to be used for such capital improvements as new buildings.

In addition to Administration reluctance, the proposal must still clear a congressional hurdle: Rep. Jack Brooks (D.-Tex.), chairman of the House Government Affairs Committee, is a staunch foe of the program and is expected to fight it. The National Governors' Association, backing the extension, nonetheless thinks it can win.—William Hickman, *World News, Washington*.

OCF honors four architects for energy-conscious design

For eight years now—since well before the memorable energy crunch of 1973—Owens-Corning Fiberglas Corporation has sponsored an Energy Conservation Awards Program to honor architects, engineers and building owners "who have made significant contributions to energy conservation and the environment through design and construction techniques." In December, at the most recent award ceremonies, the U. S. Department of Energy joined itself with the proceedings by presenting its own awards to the four winners and six honorable mentions in the 1979 program.

All of the award winners augmented solar-energy collection systems with an assortment of passive and mechanical energy conservation measures.

Award winners in the program's commercial category were engineers Syska & Hennessy, Inc., with Pflueger Architects for the California Farm Bureau Federations's headquarters in Sacramento (1). Beyond an active solar-energy system that includes an array of collectors for domestic hot water, and beyond such passive measures as earth berms and sunshades, the design includes a mechanical system that offers a) an economizer cycle allowing air to bypass chiller coils on mild days and thus reduce fan use; b) four underground thermal storage tanks and c) heat recovery from 24-hour air conditioning for the computer.

Chicago architect C. F. Murphy Associates received an award in the governmental category for the Department of Energy's Argonne National Laboratories Program Support Facilities in Argonne, Illinois (see RECORD, July 1979, pages 102-103). The building's form responds to the necessities both of solar-energy collection and of energy conservation. Its elliptical shape reduces the area of perimeter wall to minimize heat loss, while the one flat wall faces south to maximize the efficiency of solar-energy collection there. Skylights and windows shaded by the collectors provide 65 per cent of internal illumination with natural light on bright days, and task-ambient lighting, controlled by photocells, uses 1W/sq ft for 50fc of task lighting.

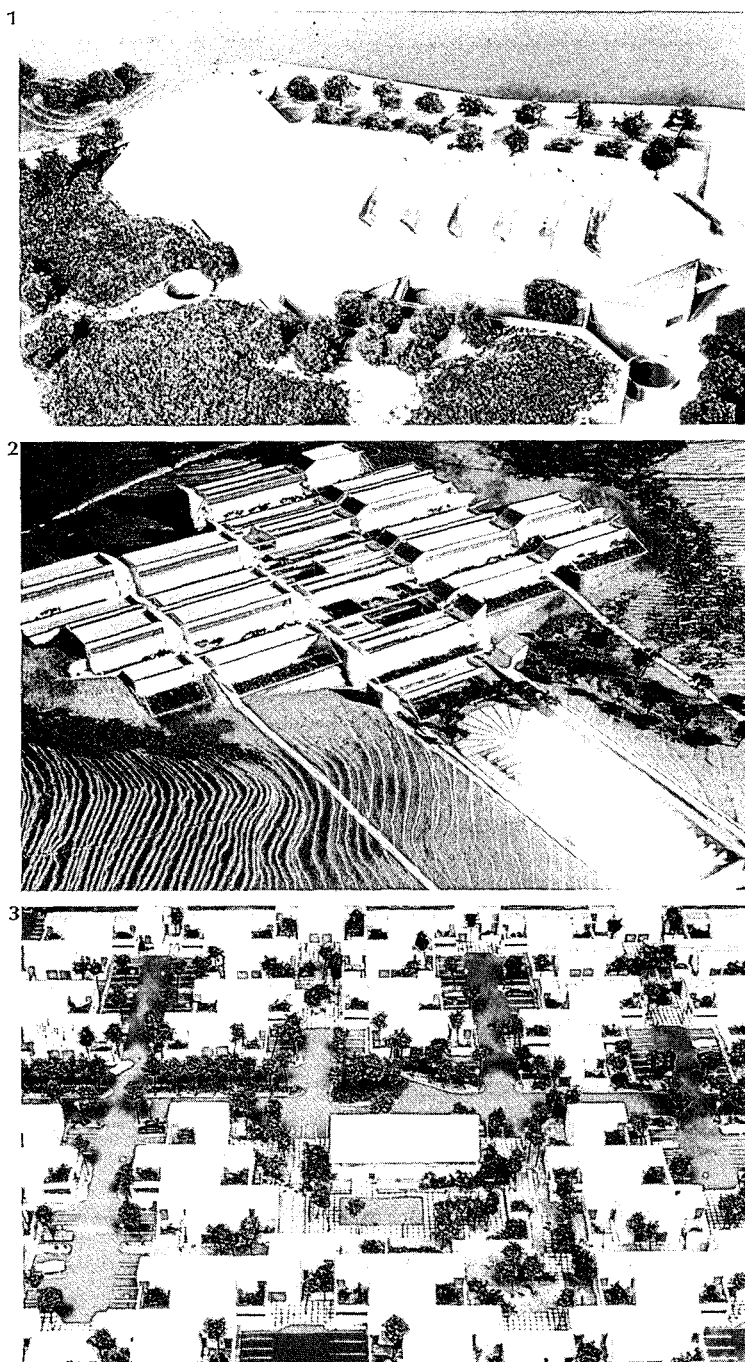
Again in the governmental category, a joint-venture of four firms took an award for the Solar Energy Research Institute (SERI) in Denver (2): Caudill Rowlett Scott, Architects, Engineers and Energy Planners; Dubin-Bloome Associates; Rogers-Nagel-Langhart, Architects; and John Anderson Associates, Architects. Energy sources for the complex will include a) a biomass steam turbine generator that will burn sawmill residue to provide 2mW, or 35 per cent of the project's energy needs; b) four solar-powered Rankine engines, the com-

plex's second largest use of a renewable source of energy, to produce 100kW each; c) a wind generator to produce 240kW; d) a photovoltaic solar-cell array to produce another 240kW; e) an experimental saltwater solar pond with heat exchangers at the floor for domestic hot water.

An award in OCF's special category went to the architectural team of Sam Davis, AIA, and Vladimir Bazjanac for the design of the Summertree Housing Development in Sacramento (3). Each of the project's 122 units is equipped with its own computerized solar collector system. The system stores hot water, which is pumped through coils in concrete floor slabs to provide 70 per cent of the project's domestic hot water and space heating needs; electronic sensors embedded in the slabs maintain constant temperature. In addition, units are clustered around courtyards

to provide wind and weather breaks and mutual sunshading.

Honorable mentions in the awards program went to: the Burns/Peters Group, Architects/Planners, for their own Sunstructure Office Building, Albuquerque; Jacques deBrer, AIA, and John Ellis, RIBA, for the San Francisco Downtown Airline Terminal; Walker McGough-Foltz Lyerla, P. S., for the North Spokane Branch, First Seattle National Bank; again to Walker McGough Foltz Lyerla for the Central Pre-Mix Concrete Company headquarters in Spokane; Kelbaugh & Lee, Architects, for the Milford Reservation Environmental Center, Milford Township, Pennsylvania; Saez/Pacetti, Architects/Planners, for the Gloria Floyd Elementary School, Miami; and Mackinlay, Winnaker, McNeil, AIA & Associates, Inc., for a solar house at Lake Tahoe, Nevada.



At year-end, Congress faces UDAGs, mortgages, transit

Just before adjourning for its Christmas recess, the U. S. Congress acted on a number of issues affecting architects. The lawmakers:

- Approved an increase in the urban development action grant program from \$400 million to \$675 million, and made hundreds of "prosperous" cities eligible for grants for the first time to help their "pockets of poverty" neighborhoods.

- Okayed the Federal government's 80 per cent share for completing the Washington area's heavy rail transit system, on condition that local jurisdictions identify a stable funding source for the remaining 20 per cent; the tab for completion of the 101-mile system—\$1.7 billion.

- Defeated a plan to repair Washington's Union Station and complete the National Visitors' Center there, despite prior spending on the project of \$44 million.

- Approved a new home mortgage plan designed for younger home buyers, under which payments at the outset are low, but gradually increase as income, presumably, rises.

- Temporarily exempted business and mortgage usury ceilings in some 18 to 24 states in an attempt to force states to liberalize their ceilings; the exemptions expire March 31, but Federal lawmakers hope many legislatures will take advantage of the interim to boost ceilings to market levels.

- Re-authorized the Endangered Species Act and extended coverage to plants as well as endangered fish and wildlife; in a softening of language, however, the law now only insists that Federal agencies planning construction projects certify that their projects "are not likely" to jeopardize an endangered species; previously, agencies had to determine that a project "does not" jeopardize a species.

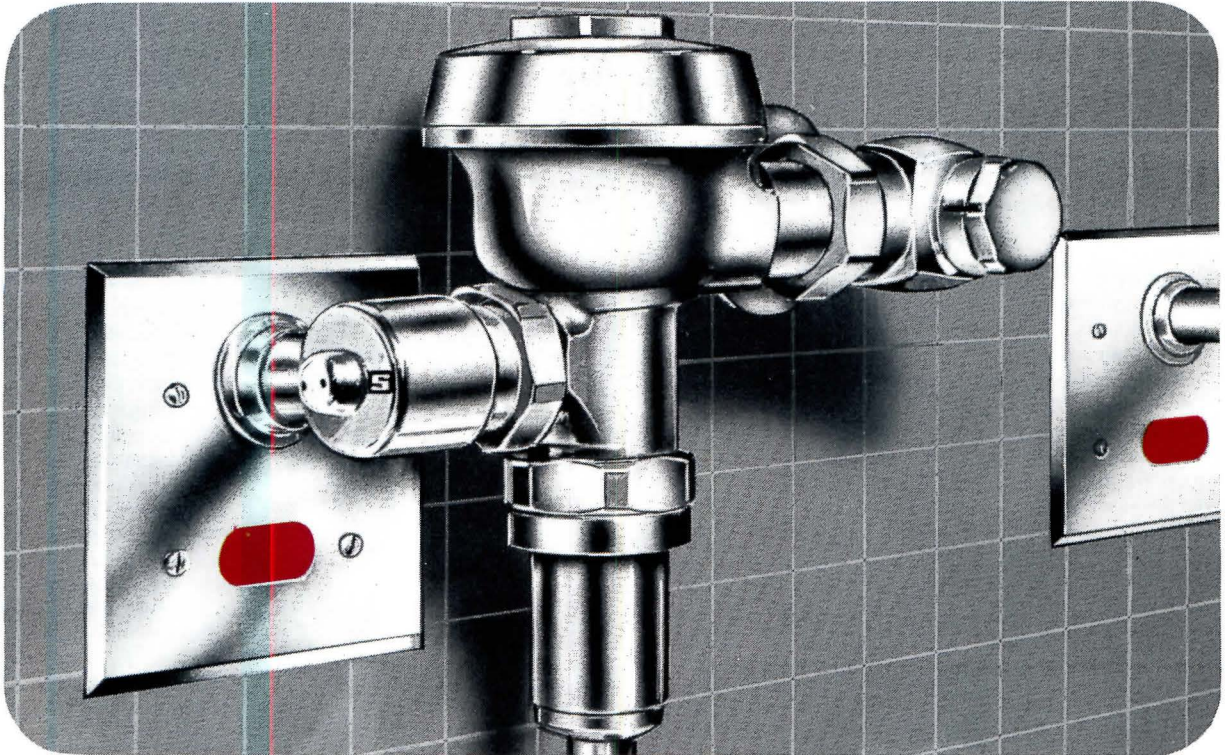
- On the energy front, the lawmakers neared compromises on a package of legislation that will raise the funds, streamline the regulatory machinery and create the business apparatus for producing more energy domestically; the final touches on these measures will be added early in the new sessions.—William Hickman, *World News, Washington*.

Economist Sabghir retires from Commerce Department

Aaron Sabghir, the Federal official who developed the basis for compiling economic statistics for the construction industry, retired from government service last month. He headed the Commerce Department's Construction and Building Division for the past 25 years.

In retirement, Mr. Sabghir will operate a construction industry economic consulting practice and will write on construction economics.

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Circle 26 on inquiry card

Museum of Modern Art exhibits SITE's inventive buildings for Best—and invites six architects to design new ones

The Best Products Company is the nation's largest catalog-showroom merchandiser, with 74 showrooms in 10 states. Beginning in 1972, the company began to build a series of innovative designs by the SITE architectural group, retaining the basic "brick box" prototype but manipulating facades (1) so as to create what Arthur Drexler calls "a sort of built commentary that starts with the original standard design, and, by implication, takes on commercial building, the consumer society, the uses of ambiguity, and the relation of architecture to art." Six examples of SITE's work, along with a recently completed showroom by Venturi and Rauch and an administration building by Hardy Holzman Pfeiffer, were exhibited recently at the Museum of Modern Art.

At the suggestion of Philip Johnson and in collaboration with the museum, Best asked Michael Graves, Allan Greenberg, Anthony Lumsden, Charles Moore, Robert A. M. Stern and Stanley Tigerman to address the problem, what do you do with a showroom building that is essentially a windowless box? Their individual responses range from the serious to the humorous.

Mr. Graves designed his portico to overwhelm and perhaps usurp the Best "box" by offering the possibility

of a colossal stoa (2). "We have extended the dimension of the facade with a covered pergola which allows smaller merchants to be housed on that route, or allows the primary tenant, Best, to offer that space to more loosely defined trade activities such as flea markets or antique fairs. Similar activity is structured along the street; pavilions with signage announce the presence of the primary tenant and allow certain selling functions to separate quite naturally from the large warehouse enclosure of Best."

Mr. Greenberg added a small, richly detailed portico to the "box" (3). In his statement about his project Mr. Greenberg makes explicit his unproblematic adherence to the classical tradition and its notion of the "beautiful." "The classical language of architecture simplifies the problem of providing shelter from the elements and physical identity for the retail outlet by using beautiful architectural forms that have been honed to physical perfection by the experience of centuries. . . . Contrary to recent dogma, the classical tradition is not dead, and its forms are neither overly expensive nor impractical."

Mr. Lumsden utilized glass technology to sculptural ends. His curved-glass project is an exploration of some of the themes first broached by

SITE. Mr. Lumsden writes, "The Best showroom project continues to investigate an architectural vocabulary I have used for several years: the membrane esthetic, the extruded facade, intersecting forms, and reversed curves. In this project, destruction of the box is intended without identifying with inversion and entropy as generative resources."

Mr. Moore's facade is a crystalline sculpture that fragments into reflecting facets of mirror. These facets combine to represent a group of 12 "guardian" elephants carrying howdahs. Mr. Moore has borrowed and rearranged the angular elephants originally devised for San Francisco's 1939 World's Fair.

Mr. Stern's project (4) recalls Henri Labrouste's 1829 reconstruction of the two temples of Hera at Paestum. He has placed images of such modern trophies as TV sets and tennis rackets across the facade. Describing the nature of the design, Mr. Stern writes, "The standard Best Products building is a box whose purpose is to supply the objects that are demanded by and in part define the lives of those who live out a version of the American Dream—a version in which material possessions, once the objects of religious sacrifice, now serve to mark out rituals of daily life. To a considerable extent our

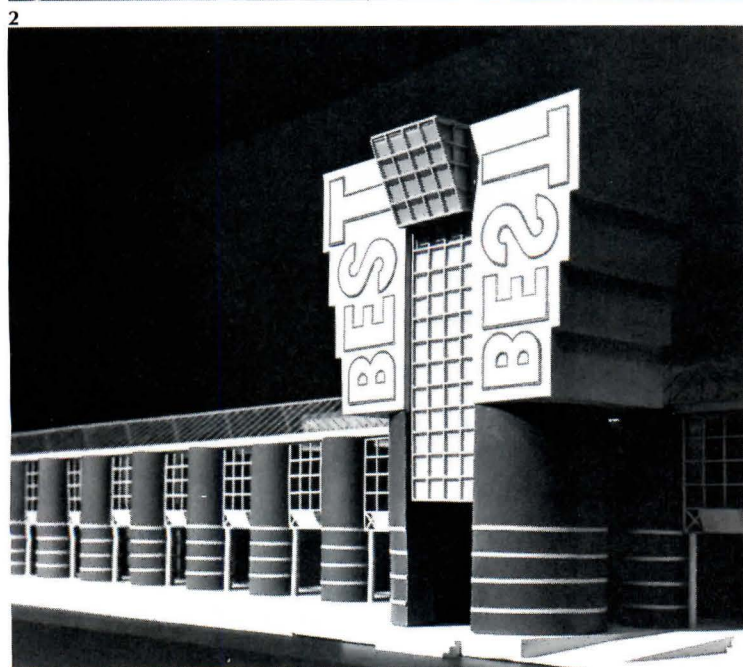
household goods have become our household gods."

In Mr. Tigerman's project, the entire building was converted into a typical suburban house on a warehouse scale. Rather tongue-in-cheek, about his suburban home/showroom, Mr. Tigerman notes in his catalog statement that "only one very small, alien element clouds the otherwise clear azure dome over suburban America—the un-euphemized, uncleaned, naked capitalist without any emperor's clothes at all—the commercial strip shopping center."

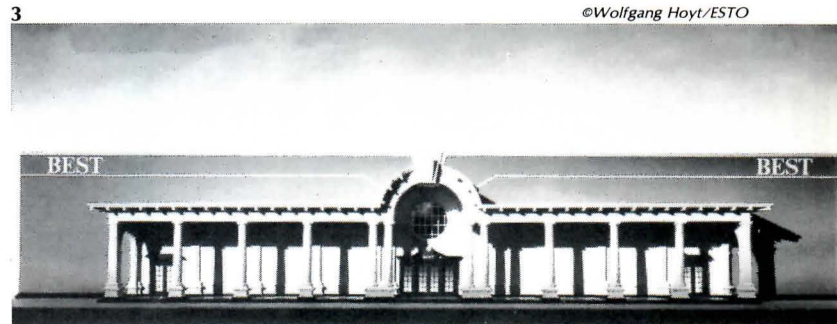
The over-all message of the exhibition is that, as Philip Johnson writes in his foreword to the catalog, "The Modern Movement seems really gone from the scene. But not modern architecture. *Modern can still include Venturi, Hardy Holzman Pfeiffer, Wines [of SITE]—as well as our six. Harder to define than the International Style, less arrogant and self-satisfied with their moral superiority than their ancestors, architects today are more inclusive, more permissive, more popular-oriented, indeed more popular, than the Modern Movement allowed.*" A catalog with statements from the six architects, a foreword by Philip Johnson, and an introduction by Arthur Drexler is available from MOMA.



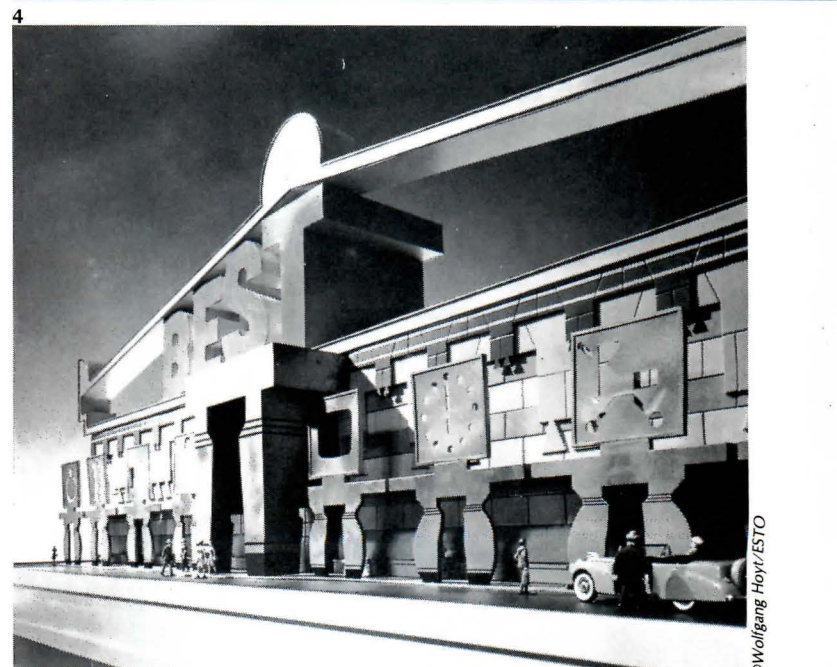
SITE photograph



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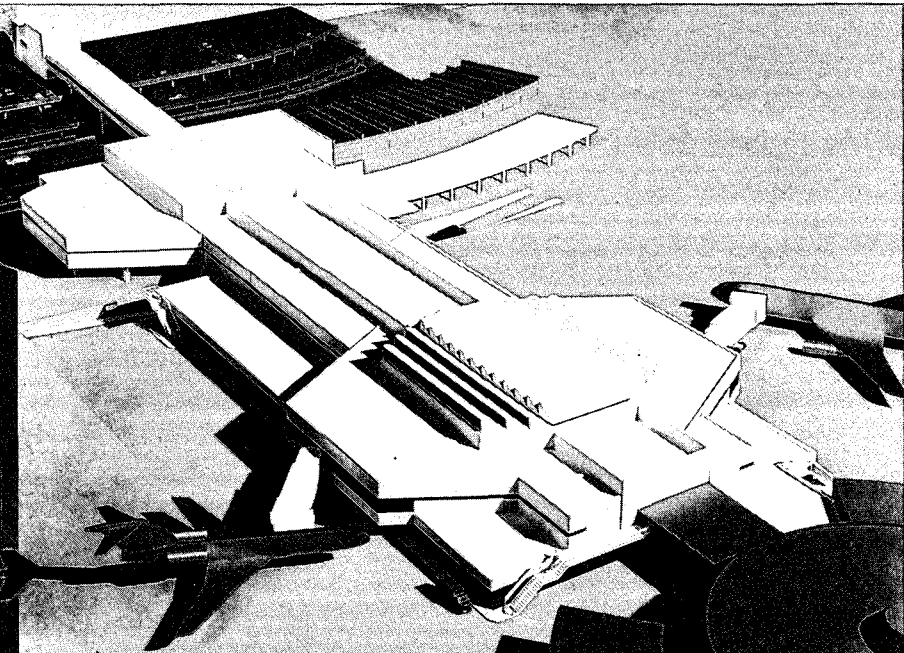


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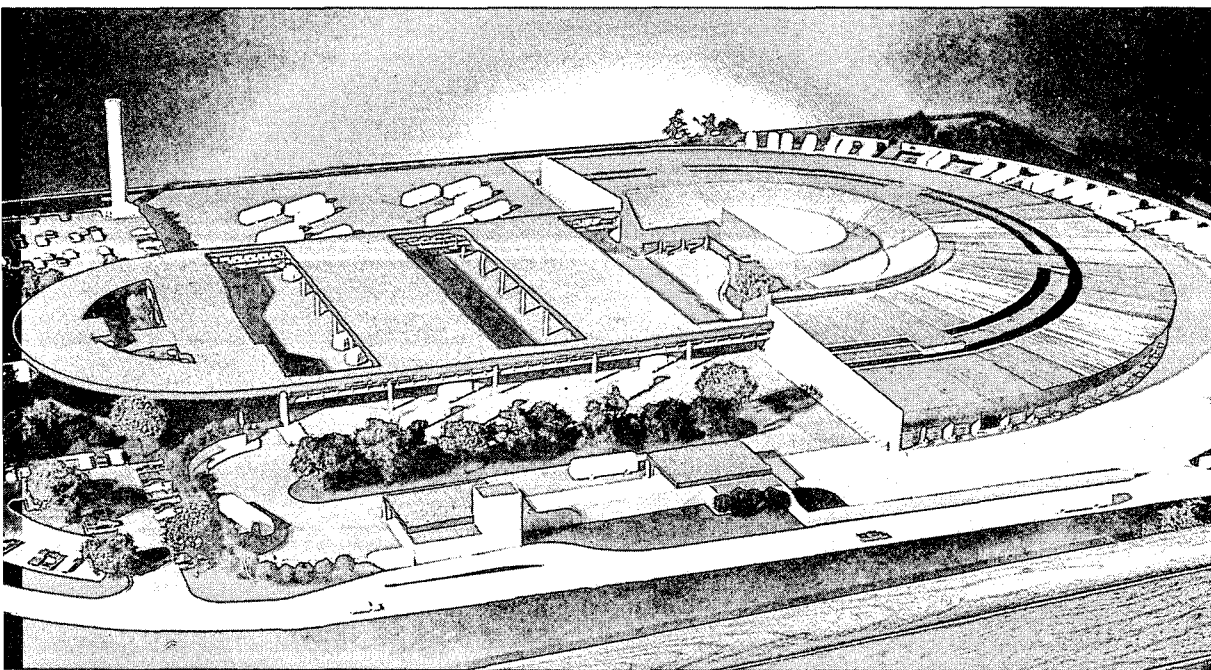
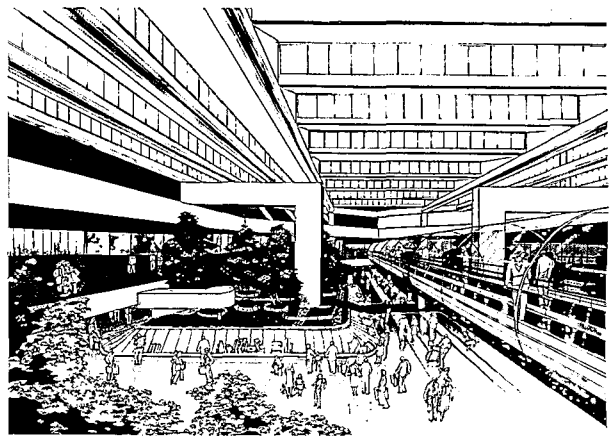
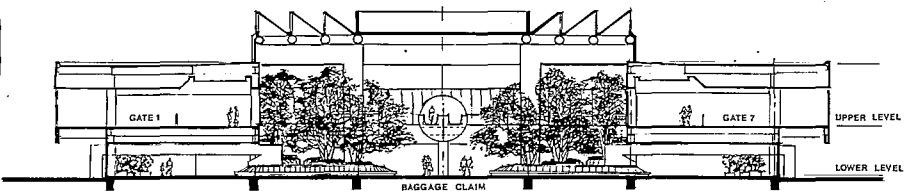
Circle 27 on inquiry card

New international air terminal will triple San Francisco's capacity for arriving passengers



The International Passenger Terminal now under construction at San Francisco International Airport will connect an existing terminal and the existing International Rotunda. Conscious that arriving passengers will have spent a good many hours flying from the Far East, architects Anshen & Allen took care to design a baggage area that will be "earthlike" rather than "panelike"—an expansive skylighted atrium containing fountains and gardens centered on four large

baggage carousels. Several new works of sculpture will include, in a sense, the structure itself: sculptor David Bottini advised the architects and structural consultants PMB Systems Engineering on the design of the atrium's steel bents and tubing. The Federal government joined in efforts to ease entry by establishing one-stop health, customs and immigration inspection. The new terminal will accept 1,100 passengers an hour, three times the airport's present capacity.



Houston intends bus facility for both work and glamor

Houston has undertaken a major effort to expand and modernize public transportation in a city more than ordinarily dependent on and attached to the private car. When the city decided to build a new bus maintenance facility, therefore, it wanted to make a statement as well. Architects Bernard Johnson Incorporated designed a sleek metal building with attention-getting red accents. The larger of two intersecting semi-circular wings contains three concentric arches, with stalls for running repairs on the circumference, rooms for engine overhaul at the core, and storage between. Offices will occupy the smaller wing.

continued on page 43



BURDINE'S Department Store, Broward Mall, Plantation, Florida. Ceiling and wall installation by Acousti Engineering Co., Ft. Lauderdale.

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Your clients will love your creative use of the Willard linear metal Ceiling and Soffit System from Nichols-Homesfield, Inc. They'll appreciate the dollar savings over more expensive systems even more... also the fast installation and easy, wipe-clean maintenance. You'll love the design flexibility which allows use on walls as well as ceilings, even on cove radii and serpentine walls.

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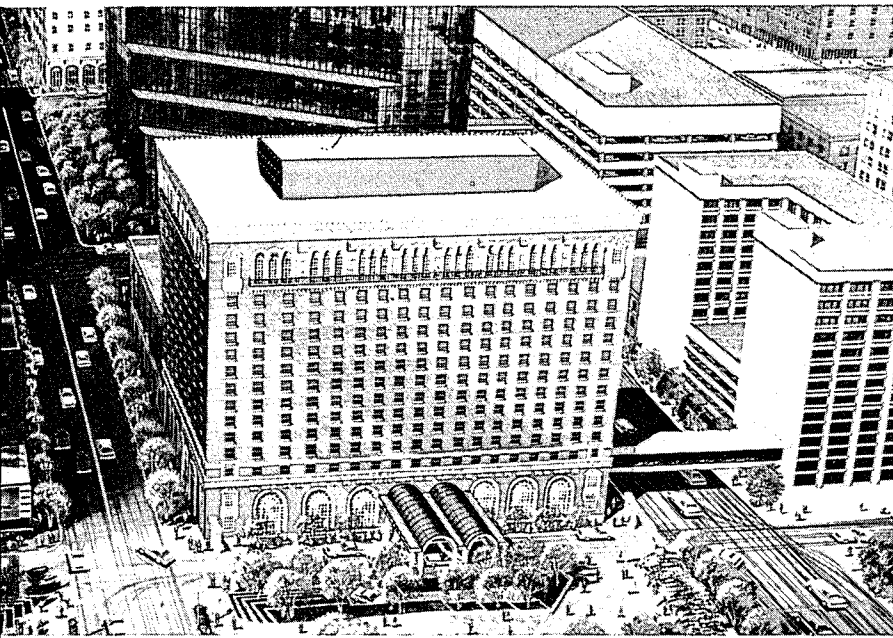
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Hyatt Regency will insert new into old for Fort Worth hotel

Hyatt Hotels Corporation will white the restored shell of the old Hotel Texas with a new 15-story atrium at the Hyatt Regency Fort Worth. The atrium, virtually a Hyatt trade-

mark, will contain a 26-ft waterfall, pools and meandering streams. The hotel chain will also restore the dark red brick exterior of the 60-year-old building and reglaze win-

dows with tempered glass. A pedestrian bridge will connect the 530-room hotel with an existing wing. Designers are JJP Architects and, for the interiors, Singer-Christianson.



Lynn, Massachusetts, will re-use four shoe mills as apartments

Four shoe mills will become 58 units of housing in the second phase of a Lynn, Massachusetts, downtown revitalization project designed by BT/Childs Bertman Tseckares and Casendino Inc. and developed by Harbor Loft Associates. The project will provide

210 units of Section 8 housing for the elderly and 148 market-rate units for families, a combination that the architects call the "cornerstone" of redevelopment for Lynn, a shoreline industrial city about 12 miles north of Boston. Phase One renovated indus-

trial property for relocation for the housing project, while Phase Three will relocate North Shore Community College to other nearby renovated mills, Phase Four will develop a Heritage Park on Lynn Harbor, and Phase Five will bring transit from Boston.

Atlanta developers renovate 1898 offices

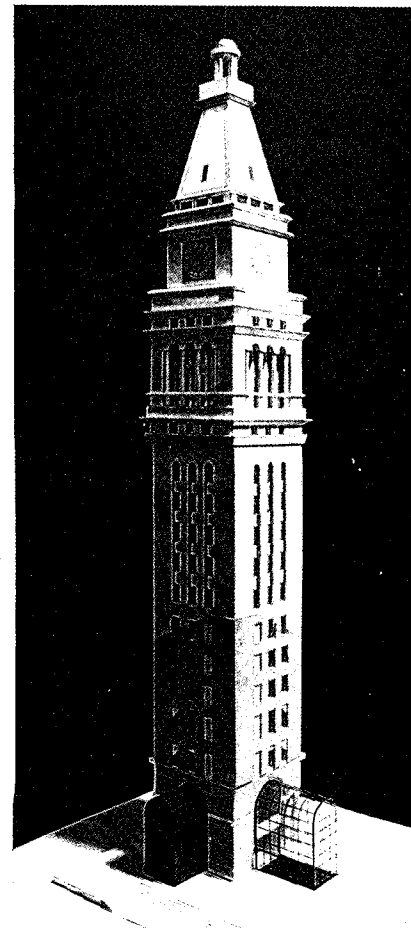
In 1898, when he designed the Grant Building for downtown Atlanta, architect Thomas Henry Morgan relied on Chicago steel-frame theory for the high-rise offices but hankered nonetheless after French Renaissance plasters, cornices and panels. Now architects

Toombs, Amisano & Wells, Inc., are renovating the landmark. Much of the work calls for the restoration of limestone, terra cotta and brick. In addition, storefronts will be recessed behind piers, windows fitted with gray thermal glass, and vav installed.



Denver recycles tower as condominium offices

Since 1972, when May D&F department store in Denver moved to modern quarters, the much-loved tower on the corner of the demolished old store posed at least a couple of problems—the ardent sentiment of citizens and preservationists, who objected to any external additions to the "neo-Italian Gothic" landmark, and the discovery of a valid and profitable use for the structure, which provides only 1,600 sq ft per floor. French & Co. acquired the property from the Denver Urban Renewal Authority to develop as condominium office space. Architects Gensler Associates will sheathe the "open wound" at the tower's base, which earlier joined the store, with dark brick contrasting with the original lighter brick. Owners will share conference space on the 14th floor, with french doors opening on the loggia, and a restaurant will occupy the plaza level. Recycling a landmark does not necessarily come cheap, however: construction will cost \$170/sq ft.





Design and real estate economics: a partnership for adaptive use

As we enter a new decade, the urban frontier is becoming increasingly more attractive to the development and investment communities. Due to current economic conditions, an increasing volume of real estate is being purchased for appreciation rather than a need for short-term cash flow. However, the opportunities for urban reinvestment without recourse to public subsidies will continue to be highly selective and subject to intensive scrutiny by knowledgeable investors.

The urban renaissance that is spreading throughout the nation must not be tarnished by adaptive-use failures. What may be an exciting and innovative design for an older structure may prove to be a financial disaster for a development entity unless a careful investigation is made of the real estate economic conditions that envelop the project. To date, several architecturally distinctive adaptive-use developments have been foreclosed by their financial backers. Considerations such as site location, marketing strategy, construction quality and management difficulties have inhibited the financial performance of these ventures.

In many respects, adaptive use is still in its embryonic stages. Through coordinated planning initiatives, economically obsolete structures can be transformed into tangible assets for both the developer and the community at large.

By Mel Gamzon

Throughout the nation, the adaptive use of economically obsolete structures is emerging as an important force in the development industry. Rising new construction costs, decreasing availability of large-scale buildable sites in urban markets, increased government regulations on new construction, and the ability to complement private investment for re-use projects with public financial incentives represent several reasons for the surge of developer interest in older structures. In addition, while the preservation community has a prime motive to preserve our built environment, cities and towns have become increasingly concerned about putting tax-delinquent properties back on the tax rolls and revitalizing the economic fiber of our urban areas.

A common thread, which links the objectives of each interest group, is the balance between design and real estate economic considerations of adaptive use. Are the re-use design options sensitive to market factors? Given the costs to rehabilitate the structure, is there a reasonable return on equity for a prospective developer and investor? And what will be the likely economic and fiscal impacts of initiating the adaptive-use venture? These are but a few of the many questions currently debated by the numerous interest groups involved.

Mel Gamzon is a principal and urban real estate economist in the Boston office of Economics Research Associates. Mr. Gamzon is a nationally-recognized re-use market and financial-development planning specialist. He has co-authored, with the Urban Land Institute, a book entitled *Adaptive Use: Development Economics, Process and Profiles*.

The bitter memories of the economic slowdown of the mid-1970s still ring loud and clear in the ears of many developers and their financial backers. Given the many uncertainties associated with urban redevelopment and the current over-all economic environment of the nation, the real estate economic function—the arithmetic of the marketplace—is likely to become increasingly important to the adaptive-use planning process.

Why the interdisciplinary approach?

Continual interaction between the architect and the real estate economist is essential because of a number of critical issues:

- Many older buildings are in locations that are extremely attractive because of their proximity to transportation, available markets, labor force, or "hidden" amenities (such as riverfronts), which have been neglected in the suburban rush of the past three decades. However, the location of an older building is not always an asset, and may have a negative impact on the marketability, and thus the financial viability, of the re-use venture. Considerations such as transportation access, the timing of proposed public improvements, compatibility with surrounding uses, parking availability and the quality of the neighborhood may, regardless of an exceptional design solution, play a significant role in the success potential of the project. An objective assessment of market opportunities and potential constraints will provide an insight into the likely economic performance of the venture.

- A thorough understanding of the physical characteristics of an older structure and its

market potentials can lead to unique adaptive-use development opportunities. For example, the specialty retail center concept has recently emerged as an important future direction for the shopping center industry. Several major specialty centers have been constructed within older structures in urban areas. However, it should be clearly recognized that Boston's Faneuil Hall Marketplace will not necessarily work in every market area. A thorough analysis of factors such as growth potentials within the resident market base, the employment market near the subject property, and visitors/tourists to the city, will provide the architect with a basis for the time-sequenced space allocation plan for the adaptive-use project.

Mixed-use developments also have been created within older structures. The Chattanooga Choo Choo complex in Chattanooga, Tennessee exemplifies a mixed-use development concept within a "controlled environment" setting. The development team purchased the former Chattanooga Terminal Station (1903) and the adjoining 24 acres from the Southern Railroad System. The train station was transformed into a 1300-seat restaurant. Former passenger train cars were converted into 48 hotel rooms that are part of a 248-room Hilton Hotel. Other project components include a conference center within a former freight building that accommodates 1,200 people, specialty shops adjoining the terminal building, and entertainment attractions including a skating rink, tennis courts, and a movie theater. An important consideration in executing this development was a thorough understanding of the market potentials. Located six blocks from the primary interstate highway system which links the Midwest to Florida, the Choo Choo complex is an ideal location to attract the millions of annual tourists who travel the passing Interstate. In addition, the Choo Choo development offers an attractive, theme-oriented environment for the expanding convention market in the region.

- In recent years the old notion of "new is good and old is bad" has clearly changed, with private lenders and investors becoming more willing to focus on an adaptive-use project's true economic potentials. Legislation, such as the Community Reinvestment Act of 1978, which mandates that banks lend a certain portion of their assets to urban developments, has provided a renewed

continued on page 65



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focus on the real estate opportunities in our cities. In addition, many financial institutions have a number of underutilized structures within their loan portfolios and may regard adaptive use as an alternative that should be considered. Obviously, lenders are looking to maximize their return on investment while minimizing their risks—a truth particularly crucial given the current economic uncertainties that prevail throughout the nation. To the best of my knowledge, there are no private lending sources specifically for preservation related projects. Rather, financial institutions will provide capital for financially self-sustaining shopping centers, hotels, office buildings, and residential developments, whether they be within old buildings or new construction. Re-use ventures that are marginal in terms of market and financial parameters may be extremely difficult to finance without reliance on government funding programs.

■ The assessment of municipal benefits and costs relative to urban developments has become increasingly important in the comprehensive planning for adaptive-use ventures. Because of limited supply of public financial resources, agencies on the local, state and Federal levels have begun to judge the relative merits of urban projects on the over-all economic and fiscal impacts which are likely to accrue. The interaction and relationship between the architect and real estate economist is critical to the accuracy of this analysis. Factors such as construction estimates, the timing and phasing of development and the levels of public and private investment will affect the economic and fiscal impact evaluations.

Typical impact assessment factors to be analyzed include 1) construction and permanent employment generated, 2) induced spending in the local economy, 3) tax revenues generated, 4) impact upon municipal costs, and 5) induced development impacts.

The interrelationship at work

The basic techniques used by the real estate economist in evaluating the market potentials for an adaptive-use development are comparable to those utilized for a new construction project. However given the complexities of urban redevelopment, the need to coordinate in-depth market and financial analyses with physical design alternatives may prove to be the difference between project success and failure.

The approach to preparing a comprehensive market evaluation will typically commence with a thorough evaluation of socio-economic and demographic characteristics within the market area(s). Projections of key economic indicators: population, employment, retail sales, income levels and the like, are prepared. In addition, recent development trends in the market area(s) are evaluated.

Preliminary re-use alternatives are then defined for more in-depth analysis by:

- 1) utilization of the preceding market information,
- 2) the development goals and objectives of the project sponsor, and

3) input of the architect regarding the physical suitability and capacity of the building for potential new uses.

The next major task is the preparation of a detailed market analysis for all the identified reuse alternatives. Specific market areas are defined for each use to be analyzed. Then, using appropriate growth factors, the existing and projected total market potential is quantified for each use within the market area(s).

Following this work, an evaluation of existing and planned competition is initiated. This task will be useful in identifying:

- 1) Operating characteristics of comparable facilities in the market area(s);
- 2) The extent to which other similar uses satisfy market demand;
- 3) Conceptual and pricing opportunities available to the proposed adaptive-use development project.

Through the inspection of both successful and unsuccessful projects, the apparent physical design preferences of potential uses and patrons will become evident.

The probable lack of directly comparable reuse projects in a specific market area(s) may necessitate the evaluation of projects outside that area, possibly in another part of the country. While distant re-use projects will not compete with the proposed development, they often can provide a frame of reference in regard to operating and physical characteristics of the proposed development.

The next important step is to take a thorough look at the locational factors which will affect the marketability of the adaptive-use project. With an understanding of these characteristics, one then can attempt to establish realistic, site-specific market capture rates and thus derive the potential demand for the use or uses being considered. If the proposed recycling effort is a major endeavor requiring an extended construction and

marketing program, a space absorption schedule will be prepared by the real estate economist.

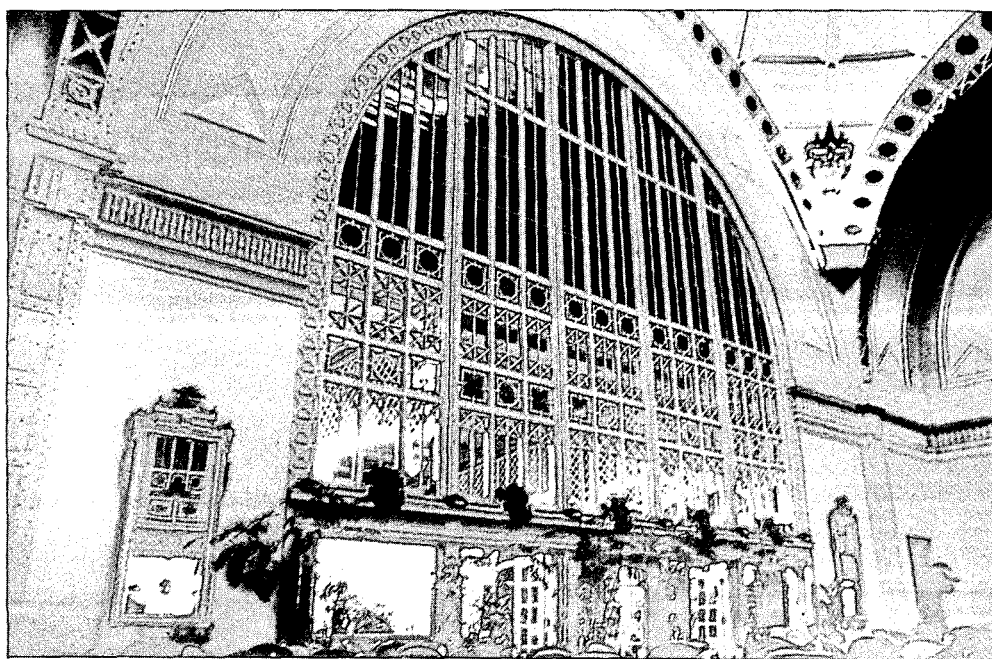
The final task is to prepare a market development program which will provide valuable input into the physical planning process. Detailed information will be generated regarding:

- 1) The development concept or concepts which should be considered from a market perspective;
- 2) the appropriate sizing and pricing of units;
- 3) special design features and amenities which will give the adaptive-use project a competitive edge over other similar uses in the market area and
- 4) parking requirements for space users and patrons.

Through utilization of this market information and in conjunction with the physical, structural and historical evaluation of the building, schematic designs are prepared. These alternative development programs, which should optimize the net-to-gross square foot ratio of the building, must then be tested for their financial viability.

Do the adaptive-use design alternatives reflect the development entity's financial objectives? What is the total private financial commitment which can be justified based upon the economic value of the development? How will public financial commitments and/or incentives affect the financial performance of the development?

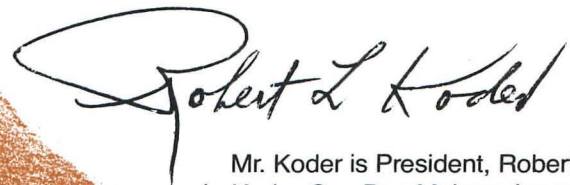
The resolution of these critical issues by the real estate economist, development sponsor and architect is likely to provide the framework for a successful adaptive-use project. As required, design alternatives may need to be adjusted to reflect the financial reality of the recycling venture while maintaining the historic and architectural integrity of the structure.



The Chattanooga Choo Choo complex in Tennessee exemplifies a mixed-use development of an old train station for restaurant, hotel, shops and recreation.

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Taking part

DESIGN COMPETITIONS, by Paul D. Spreiregen, FAIA; McGraw-Hill, \$24.95.

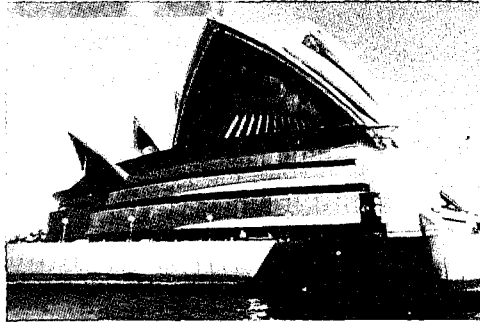
Reviewed by Michael Y. Seelig

This book is indispensable for anyone who considers sponsoring or organizing a design competition, as well as for those who consider entering one. The book accomplishes several tasks. It tells architects much about competitions and how to take part in them. It tells promoters how to organize competitions and run them. And it tells the general public much about the process and products of design competitions.

Spreiregen notes in his introduction, "It is the intent of this book to instate design competitions as a useful professional enterprise, serving society." In order to accomplish this goal, he must both convince designers that it is in their interest to participate in design competitions and persuade potential sponsors that it is in their interest to hold competitions. He succeeds admirably in accomplishing the first task.

Spreiregen's book is divided into four parts: the first includes a discussion of design competitions—their purposes, origin and history; types of competitions including non-architectural design competitions; and the author's personal views on competitions including his discussion of the "three myths of design competitions." The second part deals with competition operations—pros and cons are spelled out, and competition mechanics and codes are discussed. This is one of the most useful sections of the book, especially for those who might be involved in organizing a design competition. The third part of the book—recommendations—provides helpful hints to participants along with the author's proposals for an action plan on design competitions.

Throughout the three parts are examples and illustrations of over 100 design competitions held throughout the world, with United



The Sydney Opera House, Jorn Utzon architect (competition 1956-1957, completion 1973).

States examples dominating. These examples include such competitions as the United States Capitol and the White House, both dating back to 1792, but the majority of projects are of more recent vintage.

The Scandinavian countries no doubt have the most impressive record for holding design competitions, and several examples are included in the book. Spreiregen's discussion of the careers of Eliel Saarinen, Arne Jacobsen and Alvar Aalto and the illustration of their works demonstrate how important competitions can be for the career of an architect. The outstanding United States example is the Roosevelt Island Competition. It receives coverage of 17 pages, as compared with one or two pages for most, and thus enables the reader to understand and appreciate the effort that went into producing the winning design.

The final part of the book includes a summary of 30 selected articles and a bibliography of 18 books on the subject of competitions—this brevity only illustrates how little material exists. This is not to say that the bibliography is complete; perhaps the most important book omitted is Peter Collins' excellent *Architectural Judgment*.

Since Spreiregen intends this book as a strong plea in favor of design competitions, it is important to review critically how well it makes its case.

The author addresses himself to architects—which amounts to preaching to the converted. Developers, however, need much more persuasive arguments than this volume offers. Spreiregen's position is an awkward one. As a promoter of competitions, he would like to correct all the inequities which result from the competition process. But as an architect, he too seems to be one of the "converted," who sees few of the flaws of design competitions.

The most compromising chapter to the author's credibility with potential sponsors of

competitions is his discussion of the pros and cons of competitions. In elaborating on the pros, he establishes the benefits to designers, the design profession and society in general. Such benefits as "new talent is revealed" or "competitions boost morale in the office" do not convince sponsors that holding a competition would be advantageous to them. Indeed, even such benefits as "new design forms can result" or "accepted norms are tested as well as challenged" are generally the very "benefits" that developers fear. While they are unarguably benefits to the architectural profession and to society at large, Spreiregen would do well to cite some benefits of competitions which would whet the appetites of potential sponsors. One such benefit is the *relative* low cost of competitions as a means to attaining outstanding design. A developer has the opportunity to choose the best design of many without having to pay for them all.

When dealing with the disadvantages (cons) of competitions, the author reviews a series of 17 "problems" which are in fact straw men too easily discounted. Spreiregen has facile responses to these "problems." For example, "the cost of the competition to the client"—Spreiregen argues that the notion that a competition is much more expensive than a commissioned design is false. He claims that the cost of holding a competition adds less than one per cent to the total cost of construction. Even if one accepts this figure (it is based on a 22-year-old study which examined only four cases), one must also remember that by the author's own admission roughly one out of six of any type of architectural commissions is actually built. Allowing for a considerably better ratio for competitions we may assume that one out of every four competitions is built. The conclusion is that in one-quarter of the cases, the added costs of the project are less than one per cent, but what about the remaining three-quarters? Surely, holding a competition is several times more expensive than commissioning a single design which is then not used. Since even the best-intentioned client cannot be sure that his project actually will be built, design costs are often considered at the outset as a separate item related to developmental or promotional costs and not as part of the total construction costs.

Two shortcomings of competitions are omitted from the discussion in the book. The first is that juries of design competitions are dominated by designers. While this seems to be only natural, it is in fact a serious flaw in

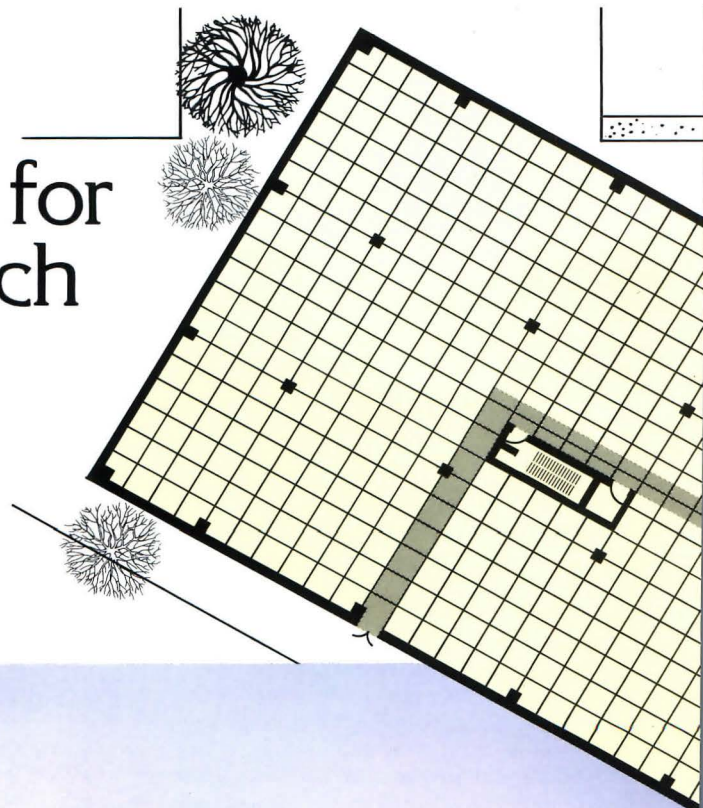
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Dr. Seelig is an architect and a city planner teaching at the University of British Columbia and a partner in the firm of Gutheim/Seelig/Erickson. His firm was responsible for organizing and conducting the International Design Competition for the Urban Environment of Developing Countries on behalf of the International Architectural Foundation.

Paul D. Spreiregen, FAIA, is the Chairman of the *Committee on Design Competition* of the American Institute of Architects. He served as the first Director of Architecture Programs for the National Endowment for the Arts.

Height restriction calls for unusual design approach

...steel helps provide most economical solution



How do you build a 136,558-sq-ft building on a 7.5-acre lot that's restricted by a three-story height limitation? The builders of this project, Bannockburn Executive Plaza, Bannockburn, Ill., solved the problem with a steel-framed, "Y"-shaped structure featuring 30-ft-sq bays.

"We considered most of the alphabet before settling on a basic 'Y' configuration," reports Harry Dolan, vice president for the developer, Terracom Development Group. "Ideally, a building with this much area requires about nine stories to insure optimum floor layout and depths. The challenge was to compress this height to only three stories, yet leave the site open with good sight lines."

Preliminary framing analysis (PFA) requested

Early in the final design stage, the project's structural engineer asked Bethlehem to prepare a PFA based on a 30 ft x 30 ft bay size. Earlier, the designers conducted a similar study on a concrete frame.

After the results of both studies were compared, the steel frame came away the winner. The structural engineer

reports, "Structural steel proved to be the best solution because of its economy, light weight, ease in spanning the 30-ft bays, and speed of erection." The frame was erected in about 10½ weeks at a cost of \$5.35 per sq ft. The unit weight of the steel frame was 7.5 lb per sq ft.

Construction economies were attributed to the ease by which the utilities and mechanical systems could be installed within the steel frame. Also, structural steel simplified the framing for the cantilevered balconies and the roof skylight in the center atrium.

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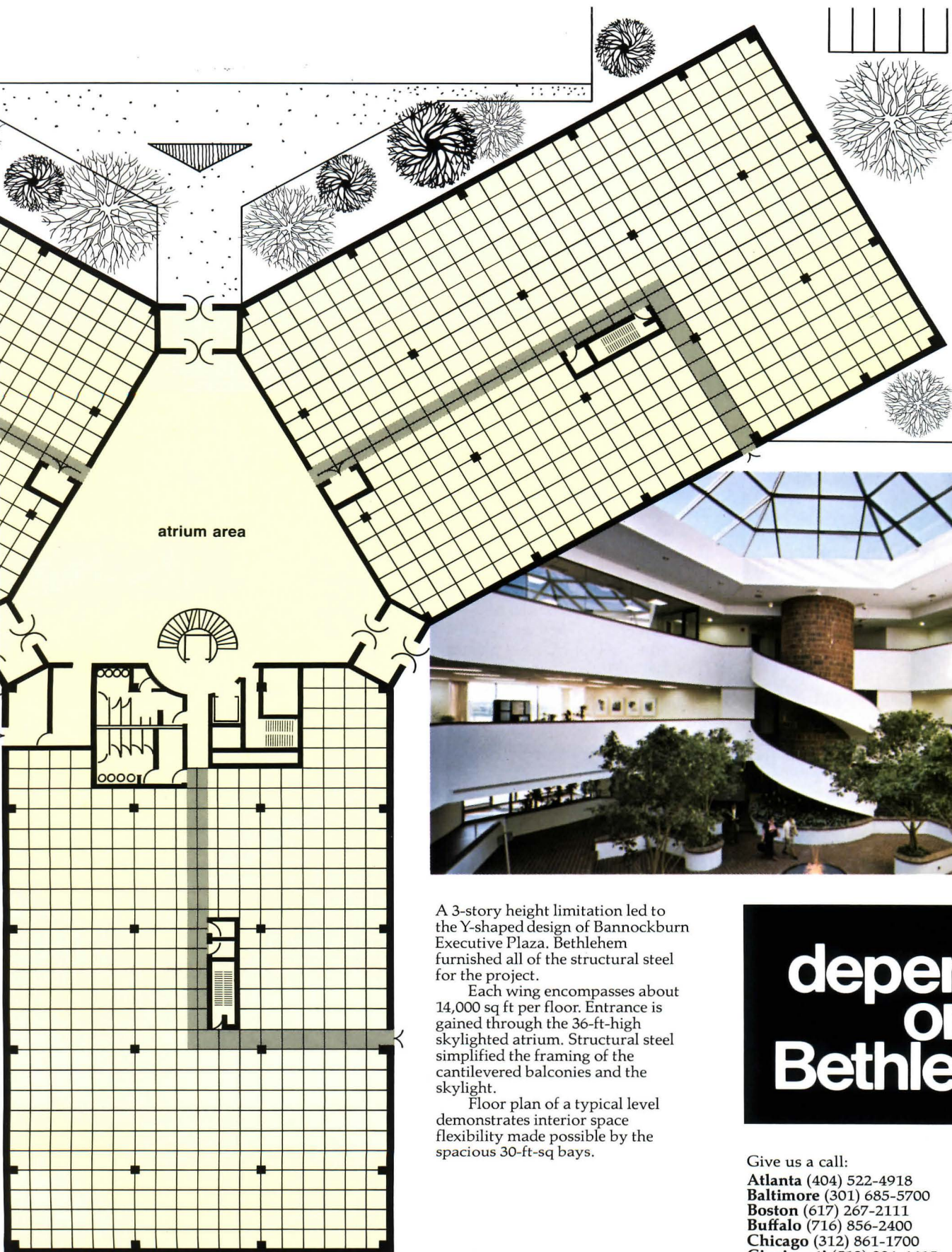
beams, in turn, are supported by composite floor girders.

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A 3-story height limitation led to the Y-shaped design of Bannockburn Executive Plaza. Bethlehem furnished all of the structural steel for the project.

Each wing encompasses about 14,000 sq ft per floor. Entrance is gained through the 36-ft-high skylighted atrium. Structural steel simplified the framing of the cantilevered balconies and the skylight.

Floor plan of a typical level demonstrates interior space flexibility made possible by the spacious 30-ft-sq bays.

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Architect:
Enviro-Technics Ltd., Skokie, Ill.
Structural Engineer:
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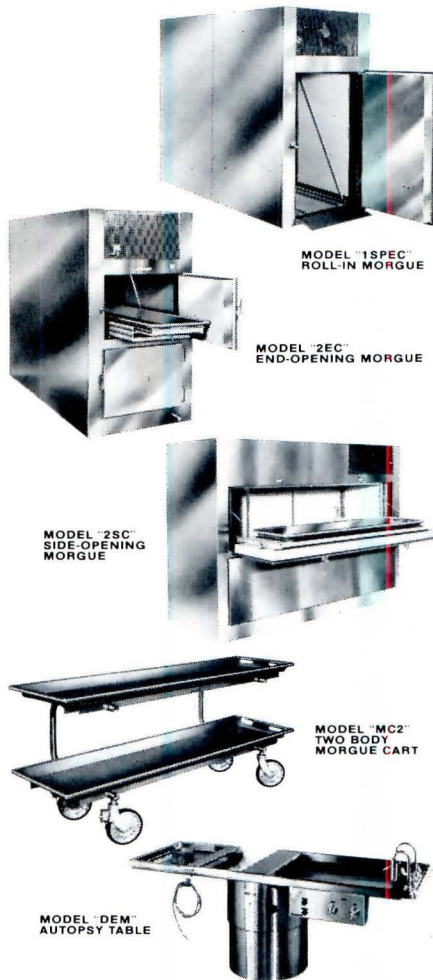


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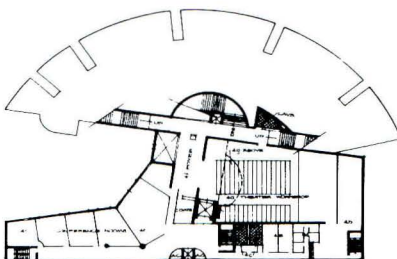
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view of the author's belief that entries should be evaluated as "total designs" (including the economics, etc.). Past experience indicates that design competitions are judged almost entirely on design criteria. Here we face a major dilemma: designers will always tend to judge a competition by the standards they best understand—namely standards of good esthetic and functional design, while failing to do justice to other aspects. On the other hand, if designs were to be evaluated equally on all aspects, a compromised and mediocre design would be the likely result. It would add credibility to competitions if they were conducted with the sole purpose of selecting the best esthetic and functional solution.

A second shortcoming of competitions, which Spreiregen does not mention, is the fact that once a winner has been selected, the client may be "stuck" with an architect with whom he does not have the rapport necessary to carry out the job. Most buildings that merit open competitions are large and complex and require a great deal of interaction between client and architect: working with an architect in an atmosphere of tension can never result in an excellent building. Perhaps one of the best examples of the importance of the relationship between architect and client is evidenced in Louis Kahn's Salk Institute. Both Kahn and Salk regarded this building as a major accomplishment, and both attributed the success to the chemistry that existed between them.

In spite of some flaws and omissions, *Design Competitions* contributes much to a subject that to date has not received the attention it deserves. Most architects have at some time in their careers participated in a competition and I am sure that most of them were intrigued by what goes on behind the scenes. Spreiregen's book provides some answers. Others relating to the process of judging architectural competitions can be found in *Architectural Judgment* (McGill-Queens University Press, 1971) and a full description of one specific competition can be found in *The Architecture of Self Help Communities* (Architectural Record Books, 1978). Together, these volumes are beginning to form a body of literature on a very important subject for architects.

Spreiregen's *Design Competitions* should sell well—established architects should find this handsomely produced book reasonably priced by today's standards. "Starving" architects will find it indispensable if they intend to establish themselves by taking part in competitions. It is well worth the purchase.



University of California Arts Center, Venturi and Rauch with Gerod Clark, 1965.

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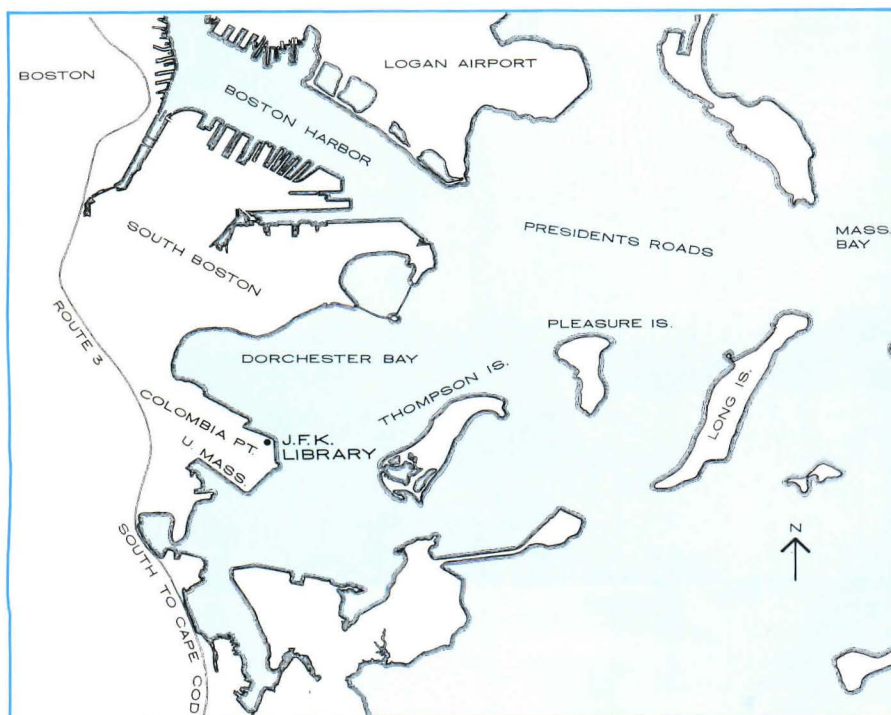
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"All this will not be finished in the first 100 days. Nor will it be finished in the first 1,000 days, nor in the life of this Administration, nor even perhaps in our lifetime on this planet. But let us begin."

So spoke John Fitzgerald Kennedy in his Inaugural Address in 1961. The torch would be passed to others 1,000 days later, and preparations for his library would soon thereafter be launched. But they were not to be finished in the next 100 days either, nor in the next 1,000, nor even in the life of three Administrations. The John Fitzgerald Kennedy Library was finished last October, and opened amidst all of the political color and pageantry of which the Republic is capable; it is dedicated "... to all those who through the art of politics seek a new and better world."

The Library is located on the outermost reach of Columbia Point in the old Irish stronghold of Dorchester to the south of Boston, the skyline of which can be seen to the north. The 113,000-square-foot building has the poise, activity, and articulation of the man it commemorates. It is a point of occasion, learning, reflection, and scholarship. It is also a point of orientation, looking out past Dorchester Bay to Boston Harbor, its necklace of islands, and out through the busy shipping channel called President Roads to distant Deer Island Light and the open sea beyond. Over toward the landside of Columbia Point is the sprawling brick campus of The University of Massachusetts. The approach road to the Library runs hard by it until, turning sharply, it sprints toward the far, open rise of the promontory with its long sea walls of granite. White bollards line the approach, and they have the effect of chaining the structure to the windswept site like a rakish Prometheus. The site falls away to the sea wall, and to a long, curving walk edging it, as one gets near. This slope has the sweep of dunes, and it is planted with dune grass, bayberry, Cape Cod rose bushes, and pine trees. The Library, culminating this procession, jabs the air with strong verticals and diagonals, just as President Kennedy used to in speaking. Yet if the Library seems victorious in its play of architectural volumes, it is largely due to the fact that this particular Point is so right, so naturally and relentlessly nautical in its bracing physicality and symbolism. After years of controversy about the originally planned location overlooking the Charles River near Harvard Square in Cambridge (see RECORD, December 1974), this victory is also that of all those who through the art of politics, the art of planning, and the art of compromise had to seek a new and better site.

The Cambridge controversy, as most people will recall, centered on the belief of several persistent, organized neighborhood factions—their belief later emboldened by an environmental impact statement that came out in 1975—that the museum part of the projected building would further choke Cambridge with traffic and inundate its historic, tightly woven character with tourists. The other key parts of the initial design—the archival, research, and storage facilities of the library *per se*; the Kennedy Institute of Politics; the Harvard School of Government—were not opposed. It was that museum part that was causing the trouble, and indeed there was a pitched battle mounted to keep all the other parts right there in Cambridge while seeing to it that the museum got shifted elsewhere. In contrast, the Columbia Point site—with the Institute of Politics and the School of Government now housed in another new building in Cambridge (see RECORD, June 1979)—has plenty of room for handling the pressures of traffic and tourists, the parking here being accommodated by a 300-car area that is handsomely landscaped, with summertime overflow to be accommodated by the nearby facilities of the University of Massachusetts. And



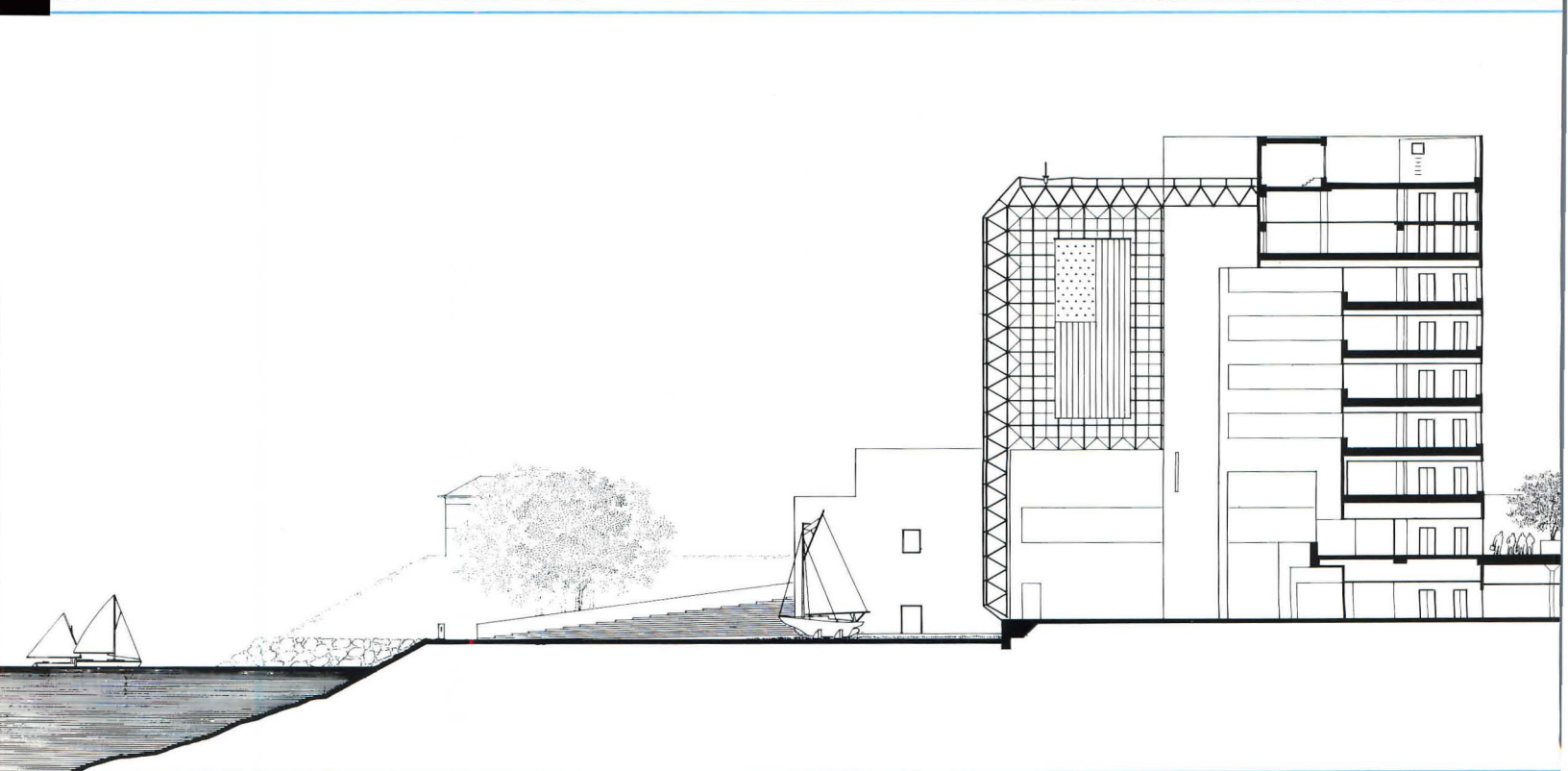
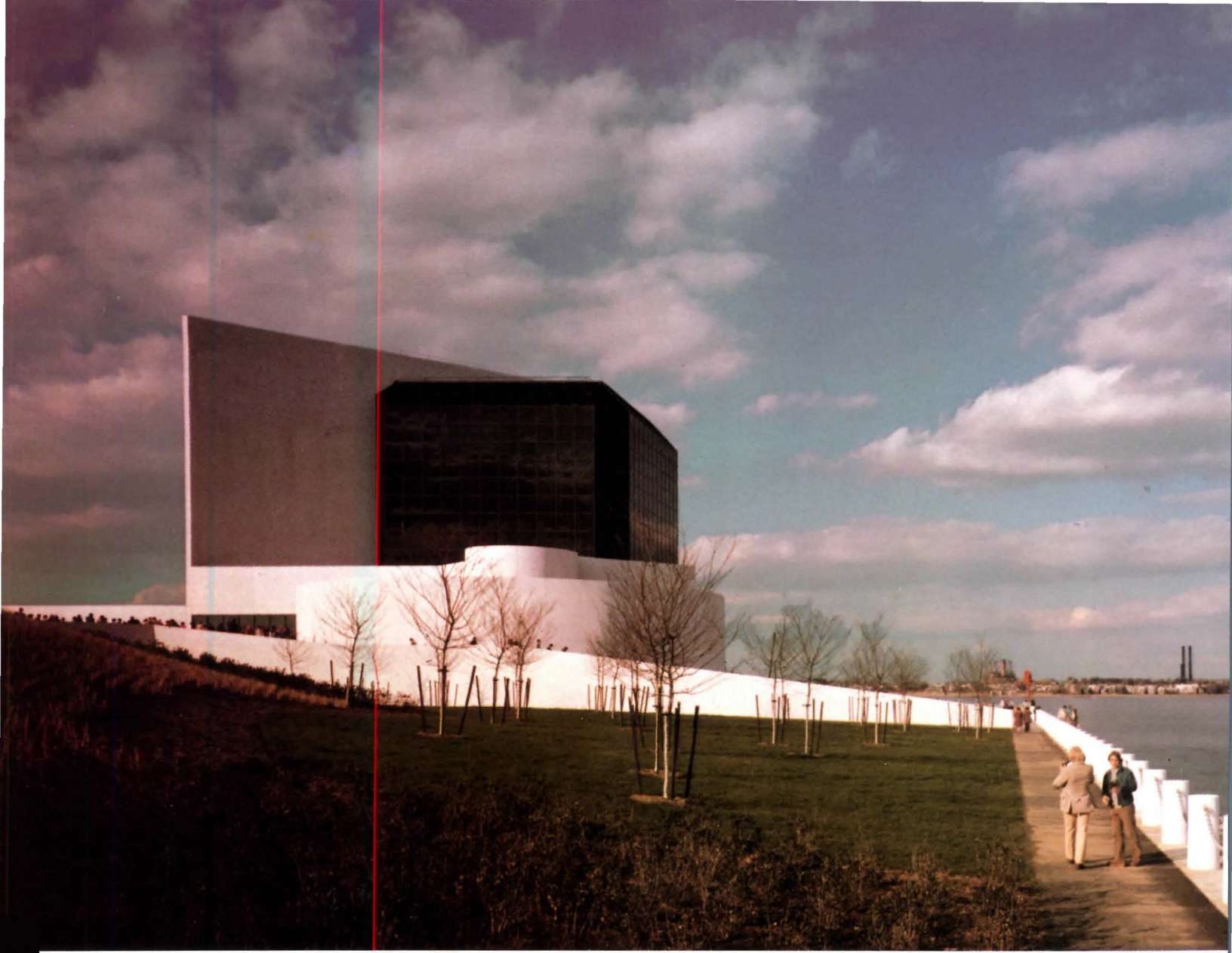
having resisted and finally rejected the idea of splitting the library and museum, now they throw lines to each other, as sailors say—just as the Kennedys and their architects envisioned from the start.

I. M. Pei & Partners, originally selected to design the Library in 1964, has created no frail shapes for this site, which was a virtual garbage dump when it was suggested. There is give and take, at once tenacious and tentative, between these shapes. One is an expansive circular form, laying low in the site and containing two levels. Its upper level, a few steps beyond the entrance lobby, has a large waiting area with a single six-foot-square window looking out on a plaza by the sea, next to which is President Kennedy's favorite boat *Victura*. Right away, coming into the building, people have a palpable, dramatic sense of the sea—both from the entrance lobby, which has a strong horizontal notch-like balcony overlooking the floor of a soaring pavilion one level below, and from the waiting area itself. But this sense is more in the nature of engaging glimpses, to be elaborated on later as the building is gradually experienced. The circle then unfolds two 250-seat theaters in which a half-hour film by Charles Guggenheim is shown; and unfolding still further, curving staircases then trek down to the lower level where the museum exhibit, designed by Chermayeff & Geismar, depicts the life of President Kennedy in a sequence of images, facts, events, and an engrossing collection of words and things that is beautifully paced, packed with memories, at points entertaining or liting, but never overly cloying in its call on either our emotions or regrets. A replica of the famous desk and of course the President's rocking chair are down here—occupying the central place of honor—but around them, intermittently brightened by displays of the glitter, heirlooms, and keepsakes of the Kennedy family and of Camelot, is solid information and serious educational experience. One comes away with a clearer sense of what it is like to be a congressman, senator, and President. The burden and the glory of the office is confided in bold relief: What about Cuba? What are the options? Is it to be "go" or "no-go" for launching that astronaut this weekend? What is the weather; should we chance it? And by a combination of words, recordings, film, and video tape, people are once again put in mind of the life of the word, of graceful and clear speech, of the power of language to move peoples, parliaments, aspirations, rockets and armies. It is a truly successful and unforgettable exhibit, and in a peculiarly apt way beyond the partisanship of party, for the attentive visitor comes away, not only with a sense of the history of one era but also with a sense of how each individual has a place and stake in participating in the affairs of the day. Then there is the big, final image—the President walking through the dune grass by the beach at Hyannis Port—and we are tugged into the second key geometric piece of the Library, deflected from compression to contemplation.

This is a soaring glass pavilion, 80 feet on each side and 110 feet high, where people can gather their thoughts amidst powerful views through the glass and its supporting spaceframe of charcoal-gray steel struts that are held together by aluminum hubs. The *Victura* is just outside now, and the seascape. Migrant memories converge. It is a deliberately "empty" domain with no confines other than those delineated by the play of light and water. It is also in the pavilion where the geometry of the square recalls its external relationship to the third geometric piece of the Library and latches onto it—the triangular tower containing the archival and research facilities, offices, and meeting rooms of the library proper.

This tower's appearance changes according to



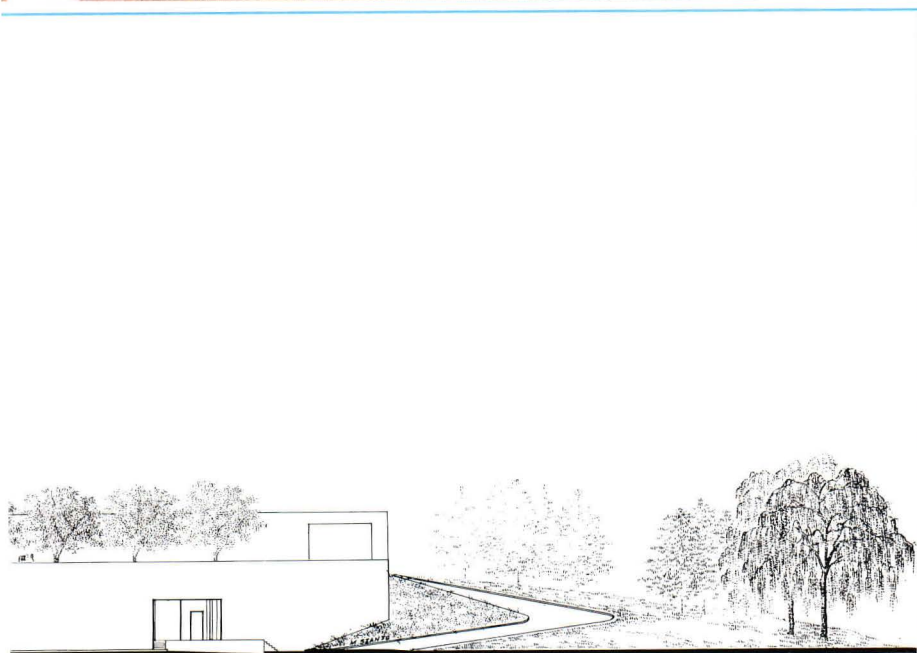




where one happens to be. Outside, moving around the building and down past the circular component to the waterside plaza by way of expansive granite stairs with the sweep of a sea swell, the tower is first a stark, thrusting volume and then is seen as a stark, firmly stated plane. Inside, looking up from the granite floor of the pavilion, the inner corner of the tower, containing six levels, is defined and supported by a hefty column, giving a sensation of hoist to this crucial point where the square and triangle are interlocking. A huge flag, like a ship in a bottle, hangs down in counterpoint. The second inner side of the triangle, above and just back from the column, has been scooped out to create an ascending concave curve with ribbons of glass demarcating each level of the tower and in effect creating balconied aeries for the library overlooking the pavilion. In a reciprocity that is both physical and symbolic, the pavilion thus acts as a vestibule for the archives, which is an important point. For far from being a repository and shrine to increase and galvanize the impact of a leader gone, the activities and programs and resources here—and these were being prepared and firmed up for a long time in anticipation of the building's actual construction—are geared to the study of contemporary issues across the board and across the country. It contains, in addition to millions of papers and six million miles of film and video tape, the papers of people who were associated with President Kennedy and his times in political, cultural, and intellectual terms (Ernest Hemingway's papers are housed here, for example). So while the architecture can scarcely be considered post-modern, the intent of these outreach programs can be considered post-partisan.

The building is clad with bright white panels of precast concrete measuring nine feet by 24 feet, with a nominal six-inch thickness, and weighing about eight tons each—the same weight, amazingly enough, of each of the strongly engineered spaceframes. The precast was chosen for its comparative economy, but it nevertheless manages to accentuate every nuance and contrast of light in an almost Hellenic interplay of effects. "Nature always has the personality of changing light," says Mr. Pei. That such visual and, indeed, emotional richness has been achieved within severe budgetary constraints—complemented by that of the exhibits and experiences inside, of course—is one of the building's most admirable qualities. There is an antique grandeur here, and if geometry has a memory, this has Euclid's. But it is achieved with materials that are economical and unostentatious and, with respect to some of the precast work, a little rough at the edges, as though the building has gone through a good game of touch football. It should be remembered that, as finally designed, the Library was being built at the end of the 1970s for only a few million dollars more than had been raised to build it at the Cambridge site by the end of the 1960s (the final cost of the building and its exhibit is \$13.6 million). The original fund came not only from corporations, foundations, labor unions, and wealthy individuals but also in the form of nickels, dimes, and an occasional dollar from school children and college students. This fact relates to Mr. Pei's sense of the commission from the start—as his Cambridge design evolved through the sixties, to the "first scheme" announced in 1973, and as a second more modest one was developed to calm the Cambridge situation in 1974. Along the way *his feelings grew more resolute about the larger "constituency" being served:*

"There is always the public realm in my considerations, and for me a building of this nature was to be a revelation of this realm, of our individual and collective responsibility to better it. Further, a building of this

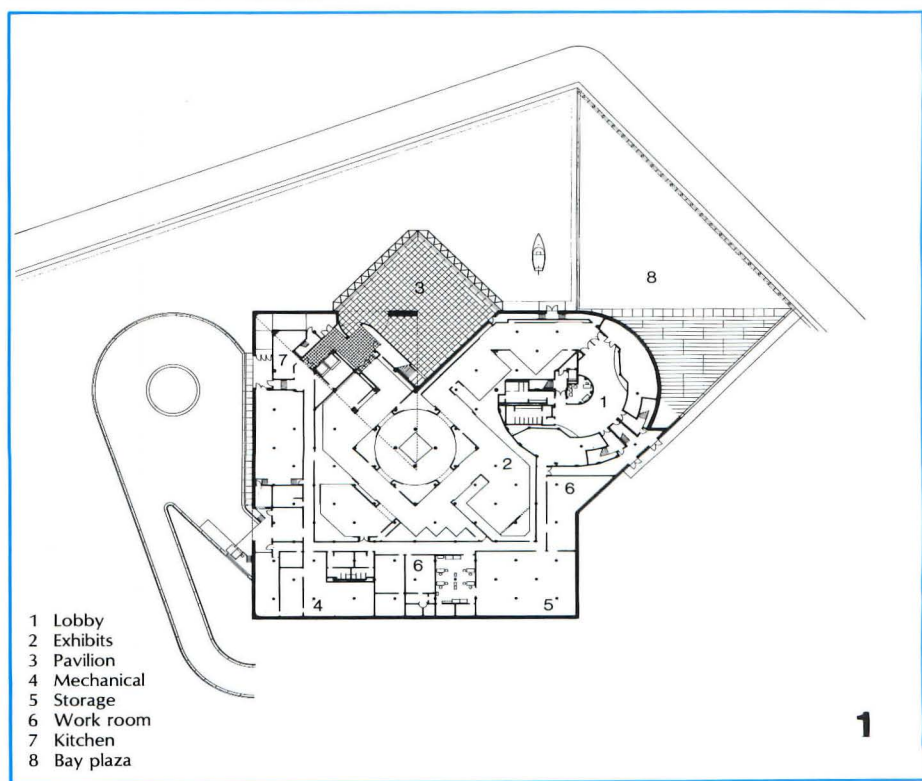
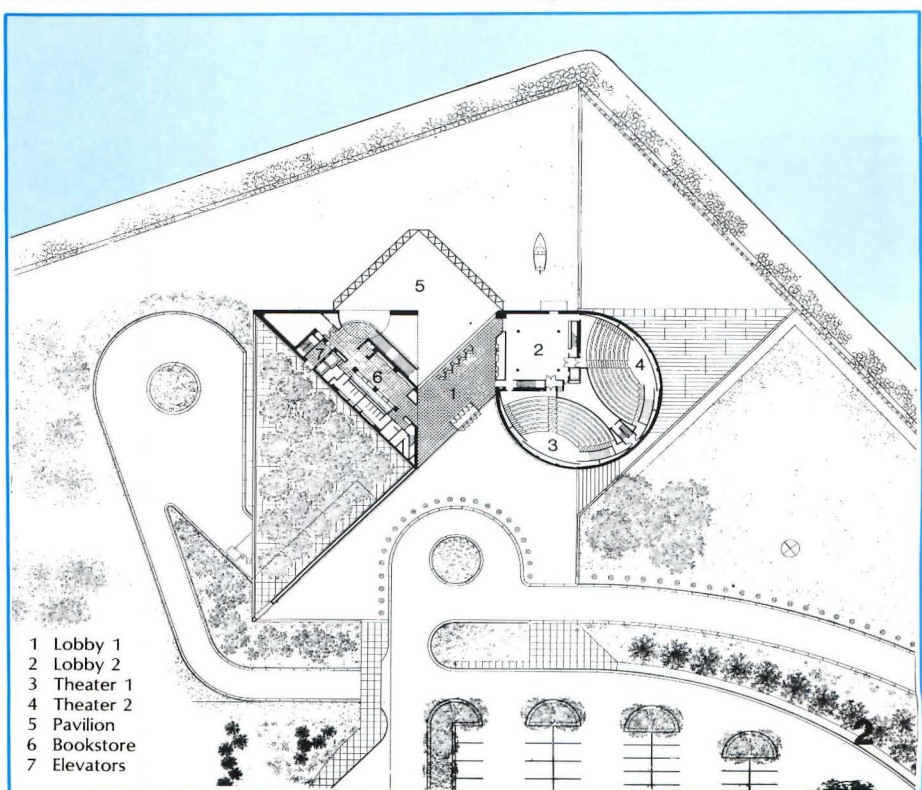


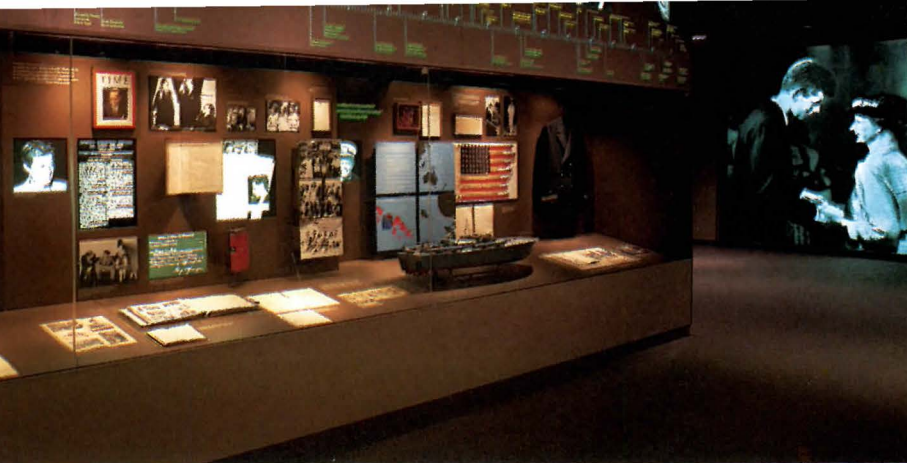
nature was to be a place where the *presidency*, as well as one Presidency, could be learned about—that is, the nature of the office, as well as what one man of bouyant confidence brought to that office. So when the Columbia Point site was settled on, and we were starting all over again, I was not about to do something like a yacht club. Instead I said, let's see what we're really trying to do for the presidency. If we were making a place for just the display and storage of things, we could have had 12-foot ceilings, artificial lighting, and let it go at that. Here, for a public-spirited president we needed to create a public-spirited building—a place where the impetus to serve, to educate, and to lead, could be sheltered, informed, and symbolized by the building and its contents. The imagery of the lighthouse appeared at once. I tend to be classical in my perception of architectural geometry. And when I felt that a proper relationship between that image, the many functions to be housed, and the geometry had been reached, I could never dispense with that formal image. And this 'proper relationship' was reached quickly, in a few days; after all, we had 'designed' this building several times already."

It is important in this context to go over the background of the commission, particularly with respect to the enabling legislation, the Presidential Libraries Act of 1955. The library part of such institutions can be just a scholarly place, a quiet place, but the legislation calls for a decidedly more public stance, which is where the museum part comes in. Therefore the idea of splitting the archival and research functions of the library from those of public exhibition—an idea that had gained some currency among those opposing the Cambridge site by the early 1970s and even among some whispering in the ears of the Kennedys—seemed inconsistent with the nature of this President's outlook. It was also inconsistent with the admittedly controversial nature of the legislation.

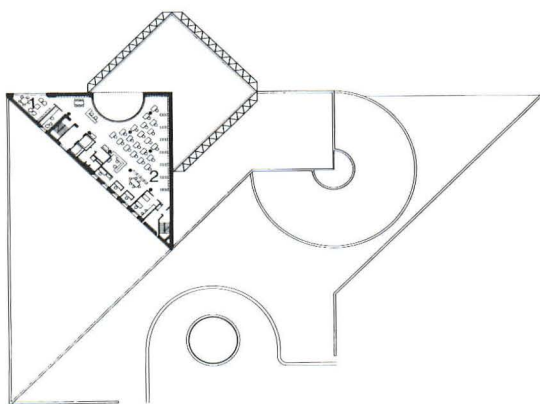
"We tried to wipe out the image of the past design, but not the intent of it," says Mr. Pei. "So in the design for Columbia Point [and there were studies done for a site elsewhere on the Point, over next to the University complex], I did not give up the *idea* of a square entering into a triangle; though that earlier, most controversial design, berated for 'monumentality,' was 60 feet high and the present building is 110 feet high. The idea was there from the start, including that transparent truncated pyramid, which was indeed meant to be monumental—at least in its emotional impact. Remember, we were trying to pay tribute to an *office*, as well as to a man, but then in the early 1970s, when the resistance in Cambridge came to a head, much of the country and its intellectual community had become blinded to, or otherwise despairing of, the integrity and meaning and value of the presidency."

To understand the Kennedy Library fully, it is helpful to think back briefly about the qualities of this President and of this architect. I. M. Pei's selection was the result of a unique, intense search. And it was as much a search for psychological and philosophical affinity as for a person with acknowledged brilliance and durability in architectural design. This was orchestrated by William Walton, whom the President had kept close as a cultural advisor *en famille*, and whom he had appointed chairman of the Washington Fine Arts Commission (a position that he would hold into the Nixon Presidency). Rarely had a culturally influential, artistically accomplished individual had such access to the Oval Office. The former First Lady, who assumed an energetic role in the selection, had on occasion affectionately addressed Walton as "My dear Baron . . ." referring to Baron Georges Haussmann, Prefect of the Seine in Paris.

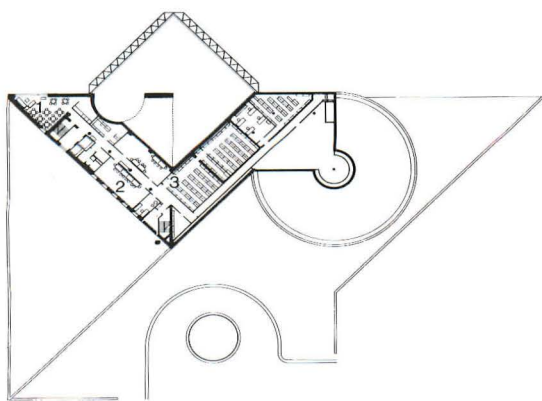




Steve Rosenthal photos

1 Lounge
2 Research

4

1 Lounge
2 Research
3 Storage

3

With the advice of John Carl Warnecke, who had met Kennedy years before, who designed the new brick "background" buildings around Lafayette Square across from the White House upon the President's decision that the historic buildings edging it not be demolished, and who would also design his memorial at Arlington—Walton drew up a list of 19 architects. Invited to Boston, they were asked to name the individuals they thought to be best qualified for the job. Counting the ballots in a hangar at Logan Field, Walton—taking into account the consensus that the architect should be American—listed the seven most often mentioned. Ludwig Mies van der Rohe was one, and indeed the courtliness of his demeanor and the classic, spare elegance of his style had great personal appeal for Mrs. Kennedy—but there was the logical if slightly somber question of whether Mies, then well into his seventies, would be able to give prolonged, personal attention to the commission. Warnecke and Gordon Bunshaft of Skidmore, Owings & Merrill were two others. Then came Paul Rudolph, Louis Kahn, Philip Johnson, and of course Ieoh Ming Pei. Books of their work had been prepared by all the architects, and going through these again, Walton and Mrs. Kennedy, often accompanied by the President's sister Jean Smith (her husband Stephen Smith would oversee the project for the Kennedy family), began traveling to visit the offices of several of the finalists. "It was quite something in those days," says Walton. "One tends to forget how it was, and how courageous but determined she was to get out, to pitch in, because all she had to do was be glimpsed and there would be these crowds."

Pei acknowledges that the Kennedys had comparatively little to go on when they selected him. It was not then long from the time in the 1950s when he and his associates were viewed by the profession (especially by some of its "ethics" men) as offshoots of the real estate development business—and from the time when Frank Lloyd Wright in first meeting Pei said, "Oh, I know you; you belong to William Zeckendorf."

What the Kennedys and Walton *did* have to go on was Pei's unquestioned command of city planning and all the attendant realities of finance and politics and compromise. This would certainly bode well—it was optimistically assumed—in Cambridge, where the need for delicacy and diplomacy in creating a major new building near hallowed ground was understood from the beginning. Pei, out on his own by the late 1950s with his own firm, had designed the Center for Earth Sciences in Cambridge for M.I.T., where he had graduated before moving on to Harvard Graduate School of Design as a student and later a teacher. He was also in the process of building the National Center for Atmospheric Research outside of Boulder, Colorado. But there were other factors, to be no less respected, in his selection. Pei was the same age as President Kennedy; like him, he had so much *more* work to do—his best works were ahead of him, he said. Walton recalls, "Mrs. Kennedy almost gave him the job right there and then." But there was more: Pei's lineage in China, the cultural, political, and civic perception that his background embodied. In the tradition of China, if one would be a poet, one would also be expected to be a public servant, ever mindful of the relationship between poetry and power. And that is a relationship that President Kennedy really cared about. The first sign that his selection was all but final came in late 1964. Summering with his family in the Italian town of Casteleoncello, staying in a villa of the Medici, word came that Walton wanted him to call. "When are you coming home?" he shouted over the wire. "We must discuss further the possibility of your being selected." And that was that . . . except for multiple forces lying in wait.

The harrowing years of trying to make the design work for the Cambridge site over the old MBTA train and bus yards, which the MBTA took years to clear out of because of prolonged negotiations for an alternate site for its facilities, are by now well known to the public and the architectural profession. Starting in Christmas of 1964, and working closely with his associate Theodore Musho, the preliminary scheme was developed, shown to Mrs. Kennedy at her Fifth Avenue apartment one evening the following May, and through the decade variations on this design were to be drawn up, shown again—leading up to the “first scheme” of 1973. “We pounded on every piece of action,” says Musho, “from the highly difficult soil and water-table conditions, the study of archival procedures, to attendance records and related traffic and environmental concerns, trying to ensure a building of suitable scale, repose, and functional efficiency. A building of this nature, both functionally and in its symbolism, is very complex to work out. Your desire to grasp at the uniqueness of something like this leads to constant redefinition, and recurrent analysis. Furthermore, as the opposition of the Cambridge community mounted, the Kennedys and ourselves were constantly assuming different, disparate levels of responsibility. We often had to wonder when it was all going to end (would we be in Cambridge or wouldn’t we?) and to wonder what it all meant. There was never a solution with fixed borders during this long period. There was always some proviso or another in response to many different positions and moods and priorities. People working on the job would peak out, even blow up, although an hour or day later we would be relaxing again with each other, listening to those colorful Irish jokes. We were working with an infinite equation, schemes upon schemes, wandering around amidst piles of paper, and finally—out of all the frustration, delay, adjustment, and through the design of 1973 and the one of 1974—the question was: not program, not cost, not even the physical reality of the building. The question was: How can you cope?” Booted out of Cambridge, the only alternative was to go out with great *élan*, and that (or an eloquent sigh of relief) is what has now taken shape at Columbia Point where, ironically enough, the Library, though distant from Cambridge, is every bit as much a “monument” to the spirited political and community participation that President Kennedy had recurrently urged on all Americans.

Once the writing, and the environmental impact statement of 1975, were on the wall, the forces that had been opposing the building began suggesting that while it was all right for the museum to be out of Cambridge—why not keep the library? This split did not sit well with any one who really understood President Kennedy’s ideas about public life. Very soon the Pei firm was studying with Steven Smith and the family alternate sites: at the University of Massachusetts at Amherst, at the Charlestown Naval Yard, one near Hyannis Port, and another in Fall River, Massachusetts, where the destroyer *Joseph P. Kennedy, Jr.* is moored. It was also suggested that the museum be horseshoed into the Kennedy Center for the Performing Arts in Washington, but again, splitting the museum from the library was a stressful tack for the Kennedy family to contemplate. Mr. Pei was resolute in his belief—and Mrs. Kennedy, now Mrs. Onassis, was in agreement—that this particular building must occasion, not only the creation of a vivid, inspiring public place, but also a place where people, either for the most deliberate scholarship or the most spontaneous enjoyment, would readily gravitate.

Cambridge, it may be ventured, is not the less for having ridded itself of more traffic congestion or—being a bit more honest about it—the untoward “spectacle”



The soaring pavilion of the Kennedy Library which visitors enter on the lowest level of the nine-story structure after seeing the exhibit, is a domain for gathering thoughts that seems to have no confines other than those given it by the surrounding light, water, and views. Looking at it from round about Columbia Point, from the sea, or from airplanes, it looms like a large lantern made of lucent gray glass, this being held by the silvery filligree of spaceframes, the struts setting up a subtle but engaging pattern of undulations as the metal, glass, and light play upon one another.



In the pavilion, which is briefly glimpsed by visitors through a long horizontal notch overlooking it from the main entrance, the geometry and structure of its upended rectangular volume and that of the triangular tower interlock, fastening firmly to each other. Two key and related aspects are the big column, supporting the inner corner of the triangle, thrusting up from the granite floor and the circular notch, with its ascending series of glass ribbons that the architects carved out of the triangle’s other inner edge. While visitors leave the pavilion by a gradual, graceful stairway framed by the column and notch, the pavilion’s rise to embrace the tower accents its symbolic function as a vestibule to the archives of the Kennedy era.



of tourists hanging around the vicinity of the venerable Yard with their cars, campers, and cameras. It may well be the less for not having gotten the kind of public experience that Pei envisioned, providing, as it would have, an impressive gateway into Cambridge, another more invitational one from Harvard, Brattle, and Elliot Squares, and connecting both by way of an arcade and landscaped open space that was to be alive with people sitting, talking, sipping espresso, and listening to frequent outdoor lectures and debates or to concerts and folk singers: Faneuil Hall turned inside out, in effect. So much for intellectual succor.

Finally, in 1975, Robert Wood, then president of the University of Massachusetts, broached the possibility and advantages of building the Library next to his Columbia Point campus, a huge structure of two and a half million square feet. That way, it was discussed, the President's desire for proximity to a place of learning could at least be symbolically fulfilled; besides which, too, as previously related, the Point, with 280 acres, provided plenty of room. Yet the nine-acre promontory on which the Library is now placed was arrived at only gradually, and with a little pain. Whereas this promontory represents the northeast tip, the southeast tip, right next to the University, was the site the architects were asked to deal with first. They worked reluctantly and in something of a resigned state on a scheme for this tight location; it was by no means the firm's best moment esthetically, though it was not its least brave.

(A "dump Pei" movement at this juncture was quickly squelched.) With his tact and patience, Pei explained why it was the wrong place to build: the relationship of the new building and the existing, overwhelming presence of the University complex would be awkward; the relationship of the edge of the Point to the roadway around its perimeter at this particular tip left miniscule margin for anything but the most uptight, forced solution; moreover, with a sudden 37-foot rise running east to west half way up the Point toward the north (accommodating an old sewer easement), the best views of the harbor, neighboring areas, and the distant city could not be taken full advantage of. It was finally decided to convene everybody concerned at this difficult site. There was a big flat-bed truck, and they climbed up on it to see all around. The truck was then moved to the rise of the sewer easement, where they climbed up again. Looking out at that northeastern tip, everybody, practically at once and led by Mrs. Onassis, got down off the truck, traipsed right down through the dump to the shore, and looking around and back, there was a chorus of agreement that this is where the Library really ought to be. Mrs. Onassis, seconded by Senator Edward Kennedy, made the decision. Then Ieoh Ming Pei and Theodore Musho got cracking with a creative conviction and renewed faith that they hadn't experienced on this job for a long time. "We were engaged again in finding out how to inspire and influence people with form, and this site gave us a leg up," says Musho, allowing as how jubilation was beginning to make up for frustration. Everything seemed, and seems, so right about this site. The President had been a new and active kind of leader; the site was new, and very active, what with the ships and boats on the bay and harbor, and with the jets overhead, gliding in and out of Logan. So the imagery and movement of sailing and of flight surround the building—also new and active. Taken together, these factors combine to present a very powerful perspective—all the more so because it changes according to where people happen to be walking, standing, sailing, or (in the case of many university students and faculty) jogging. Finally it comes full compass on the representational issue of the Presidency

itself—the shaping of visions and decisions, buffeted by changing winds and with an ear to the timbre of society's tides.

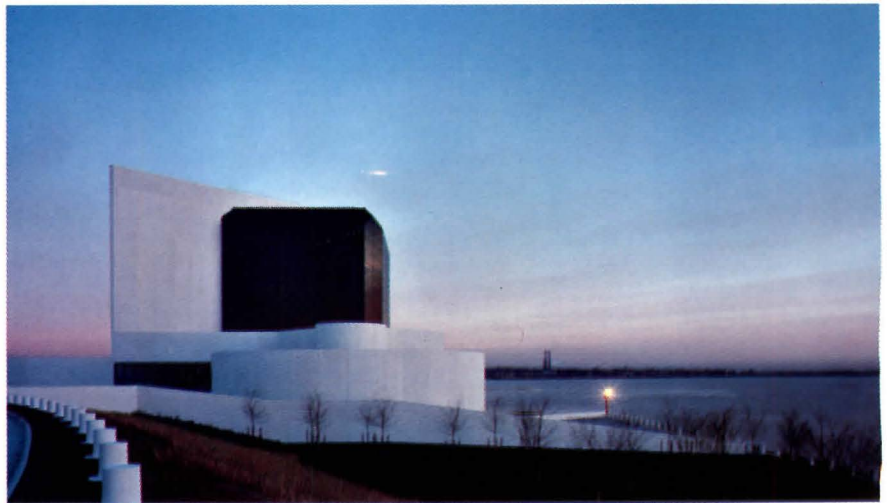
On the opening day last October, with thousands crowding a dream long in dry dock, one elder statesman was standing off to the side with another, down by the water's edge. He said, "I can't get over the drama of the discrepancy."

"What discrepancy is that?" said the other.

"The discrepancy between what each one of us here has done these last 16 years, in contrast to what each one of us might have done or wanted to do. Here we are with Jack. I feel it deeply. But he is a symbol of that discrepancy—as well as of the dreams he shared in his lifetime. And that man Pei got both! Look how these pieces touch each other, just so, and then take off. Well . . . old friend. We had better be getting back."

—William Marlin

THE JOHN FITZGERALD KENNEDY LIBRARY, Columbia Point on Dorchester Bay, Boston, Massachusetts. Architects: *I. M. Pei & Partners—Theodore Musho, architect-in-charge; Robert Milburn, project architect; Harry Barone, resident architect.* Engineers: *Weiskopf & Pickworth* (structural); *Cosentini Associates* (mechanical); *Haley and Aldrich, Inc.* (geotechnology); *Travers Association* (site and traffic); *Cerami & Associates* (acoustics); *Firepro, Inc.* (fire protection). Consultants: *A. T. Michaels* (kitchen facilities). Exhibit planners and designers: *Chermayeff & Geismar—Ivan Chermayeff and John P. Grady, partners-in-charge; Keith Helmetag, Priscilla Deichmann, Louis Scrima, exhibit designers; Pamela Smith, exhibit coordinator.* Consultants: *Howard Brandston Lighting Design, Inc.* (exhibit lighting); *McMillen, Inc.* (interior design for special rooms). Landscape architects: *Kiley, Tyndall, Walker; Rachel Lambert Mellon.* General contractor: *The Turner Construction Company.*



*Especially if their lading be a dream
Ships must go lonely if they'd voyage far;
Felling the up-surge, through each brace and beam.
Of fuming oceans; top and shrouded spar
Set to the following of a single star!—
There's no safe compass, when the hidden gleam
Sits behind clouds, and when blind tempests stream,
Except the guiding laurels faith would wear!
There often bide black gales and bursting beams,
And sails that fly in rags from broken spars:
There are no charts for ships that follow dreams
And crowd up sails against the beckoning stars:
Don't sign aboard—unless you're certain you
Can dare a wreck, and deem it glory, too!*

"Ultimate Challenge," by Harry Kemp
Provincetown, Cape Cod, Massachusetts
1883-1960

Conservation of county courthouse in Michigan

As the dominant visual reference point in the small town of Howell, Michigan, the Livingston County Courthouse is symbolic of community continuity and rejuvenation. Designed originally by architect Albert E. French in the Richardsonian Romanesque style and erected in 1889, its rebirth began in 1975 when architects William Kessler and Associates, with Chambers and Chambers as restoration consultant, set about to conserve the courthouse. The interlacing of restoration and adaptive use is exemplary, not merely a cosmetic modernization. The mix meant restoration of the exterior facade, selected interior spaces and resplendent detailing of both, and integration of modern mechanical and electrical systems and spatial rearrangement to increase functional capabilities—all without damaging the structure's historic character and classic ambience. —*Janet Nairn*



Balthazar Korab photos

The decision to save the courthouse was the result of "one of the biggest political battles in the County's history"



The restoration of the interiors is quite expansive and inclusive, composed of a maze of intricate details that combine for enormous visual impact. Color, form and pattern research led to remaking sculpted spaces like the stairway (above) and the impressive courtroom (right). One treasured detail is the mascarón (below) glistening above a doorway.



The revitalization of the 1889 Livingston County Courthouse in Howell, Michigan, near Detroit, is a preservation success story in which the architects restored the best elements of the original design while consciously creating an esthetically pleasing contrast between the old and the new. The courthouse was in a deplorable state with a leaky roof, fire hazards, and inadequate plumbing, mechanical and electrical systems. Once the city's commissioners realized the need for better working space, a Courthouse Preservation Committee was established to undertake necessary preliminary work to discover whether the courthouse was worth saving. The search for an architect was initiated. Twenty-four architectural firms were invited to submit their qualifications. With the aid of the County Planning Department and the Building Preservation Committee, the field was narrowed to three; after final interviews, William Kessler and Associates was hired, with Chambers and Chambers as restoration consultant.

In preparation of a feasibility study, it was discovered that the original drawings were lost. Instead of laboriously preparing measured drawings, rectified photography—a photographic method that allows negatives of predetermined size to be enlarged to a convenient architectural scale and printed on photo-sensitive drafting film—was used to create base information from which working drawings could be prepared. To augment this, historical records were unearthed, including old minutes recorded by the Board of Commissioners in 1889, construction specifications, postcards and photographs.

Despite the building's disrepair, the architects found it to be structurally sound. "The masonry walls were still strong, requiring only pointing to protect their integrity, and the wood floor joists were more than adequate for office loading," states architect Edward Francis, principal-in-charge. The feasibility study enumerated the social as well as the practical reasons for preservation—but emphasized the lower cost and reduced time for rehabilitation.

Financing became a dilemma. How does a small town raise the necessary funds for saving such a structure? "We rejected the traditional bake sale as a fund-raising method," declares Lynne Jamieson, a commissioner at the time, chair of Courthouse Preservation Committee, and prime crusader throughout the process. After the Board voted "in favor of practicality [of rehabilitation], referendum petitions appeared. Rumors abounded. Charges and countercharges were made. Recall was in the air. Every ill of county government was blamed on the courthouse . . . It became one of the biggest political battles in the County's history," continues Jamieson. "Friends of the Livingston County Courthouse" was created—a small but dedicated army that lobbied for passage of a bond issue to finance courthouse work. The majority of the final cost of \$1.5 million came from the passage of this

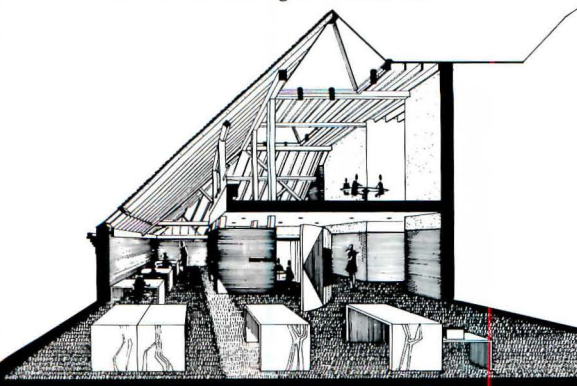




Conservation of the courthouse required "big" money; the traditional bake sale fund-raising method was rejected



The mezzanine as the newest space was inserted above the attic level, providing a partially enclosed employee lounge (above and below), with daylight from a skylight. The mixture of forms and materials seen from the stairwell between these two floors (far right) is particularly symbolic of the building's revitalization.



bond issue, supplemented by grants from the Michigan History Division, a department of the Secretary of State's office.

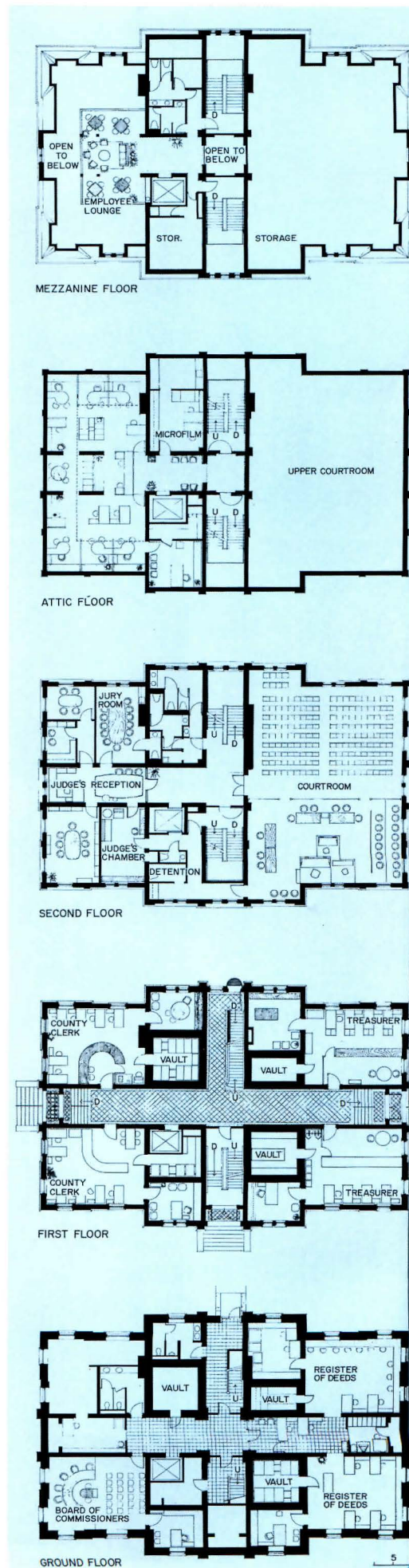
The scope of the work is quite diverse, with partial restoration and partial rehabilitation. While the exterior was restored, the prime focus was on the interiors. The courtroom had suffered greatly from past "modernization" attempts. The original coffered ceiling was discovered after the removal of a suspended acoustical ceiling. And to the surprise of workers, original and elaborate frescoes were exposed underneath four layers of paint. Furnishings—desks, chairs, shelving, hardware and wickets—and plaster wainscoting, called "adamant," were also intact. Because of the fresco work and acoustical considerations, there was an unusual approach to the new ceiling: the architects designed a vinyl-covered acoustical panel, suspended in the coffers, colored to match the background of the frescoes, onto which artist Darla Olson recreated the fresco design without affecting its sound-absorption qualities.

The restoration of the frescoes was accomplished by a small team of CETA employees under the direction of Darla Olson. Each of the painted patterns of the restored artwork was documented with a color photograph, tracing and rough sketch with dimensional notations and color hues.

Improvements also included the rearrangement of spaces on all floors to provide convenient work areas and better circulation for barrier-free and fire safety regulations; new plumbing, mechanical and electrical systems; addition of judge's reception area with special access to court and adjacent rooms; and a hydraulic elevator with a rear door for delivery of prisoners without crossing public areas. Most importantly, a mezzanine was inserted above but open to the formerly unused attic. Construction of a skylight on the inside faces of two existing roof pyramids permitted daylight into this space and unusual views to the clock tower.

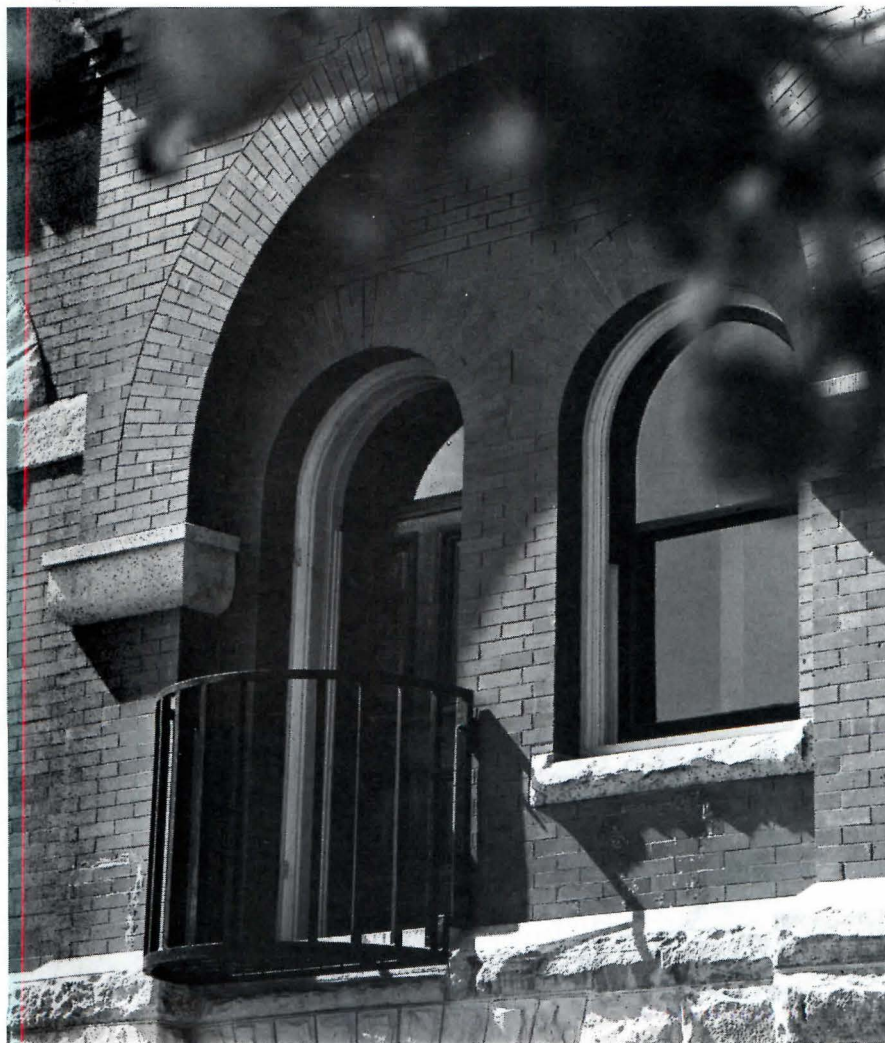
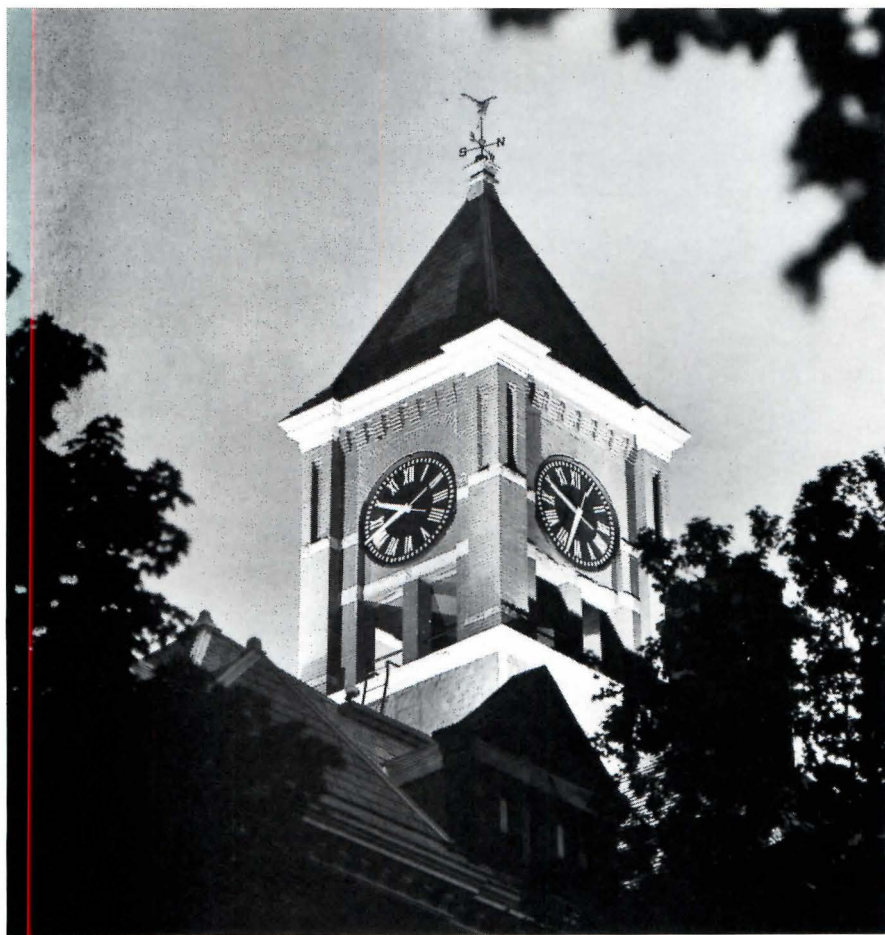
"The opportunity exists to maintain notable structures that humanize the townscape and serve to reinforce the rural tradition of the county," argues the architect. "The courthouse, restored to its earlier grandeur, stands as an impressive symbol of what can be accomplished when a community's citizens work together. It proudly demonstrates that the best from our past can retain validity and impact for generations."

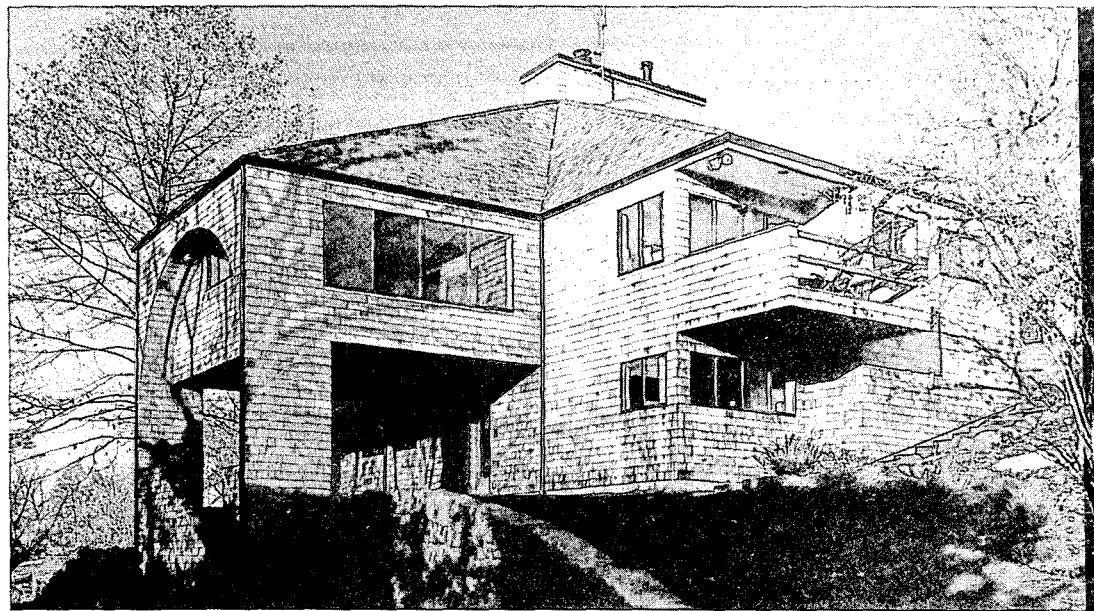
LIVINGSTON COUNTY COURTHOUSE, Howell, Michigan. Owner: *Livingston County Board of Commissioners—Commissioner Lynne Jamieson, owner's representative.* Architects: *William Kessler and Associates—Edward D. Francis, FAIA, principal-in-charge.* Engineers: *McClurg and Associates, Inc.* (structural); *Hoyem-Basso Associates, Inc.* (mechanical/electrical). Consultants: *Chambers and Chambers* (restoration architect); *Klepper, Marshall, King Associates, Ltd.* (acoustical); *Darla Olson* (artist and director of art restoration). General contractor: *Elgin Builders, Inc.*





The brilliancy of the original exterior detailing is a splendid example of Richardsonian Romanesque, the style adapted by the original architect, Albert E. French, for the Livingston County courthouse. Outstanding characteristics include round arches and massive articulated walls, here with rugged, rough-cut native stone in earthy colors. A large arch at the entrance, with a carved capital (middle, below), sets the stage for repetitious arched fenestration, underneath which is multi-patterned ornament (below). Above the arched windows on the lower level is a corbelled brick molding (bottom). One elevation sports a contemporary quirk—a carved doorway with semicircular private balcony (bottom right). The most visible and symbolic design element of the structure, however, is the clock tower rising above the other city buildings, seen from all roads leading into town.





RECALLING FAMILIAR FORMS: TWO HOUSES BY PETER WOERNER

New England has long been recognized as the fountainhead for what we traditionally think of as the quintessential American home. The almost ubiquitous architectural style that has emerged from this region has enjoyed such a degree of national acceptance and affection that the gables and shutters of the "saltbox" and the "shingle style" have been carried out of the Northeast, transplanting Cape Cod and Newport to Miami and Des Moines. Connecticut architect Peter Woerner is quite adept at working within the parameters of these traditional modes. The two houses featured here recall familiar forms, but, more interesting, they are imbued with welcome variations. Woerner has created a harmonious blend of the familiar and the unfamiliar to satisfy the nostalgic predilections of the region *and* the more contemporary requisites of his clients, site and budget. His work is clearly derived from the early vernacular designs of New England—but more than merely resuscitate, Woerner has managed to revitalize with sensitivity and ingenuity. —*Charles K. Gandee*



JOSLYN RESIDENCE, GUILFORD, CONNECTICUT

The Joslyn house was conceived as an evocation of a traditional barn-like saltbox, which was then subjected to some rather daring interpolations: the most striking example being the dramatic concave curve of the entry facade (photo top, previous page). This grand device lends formality to the design but also creates a welcoming embracing gesture—drawing attention from the street to the house. This celebrated play of curves, implying and altering space, is continued with the oversized bedroom windows (quarter-circles for the children's rooms and a half-circle for the parents'); and again in the living room with a massive half-circle glass ceiling which is sharply pitched to open the room to the sky and flood the space with light.

A central staircase dominates the entry, and, as seen through the glass doors (photo

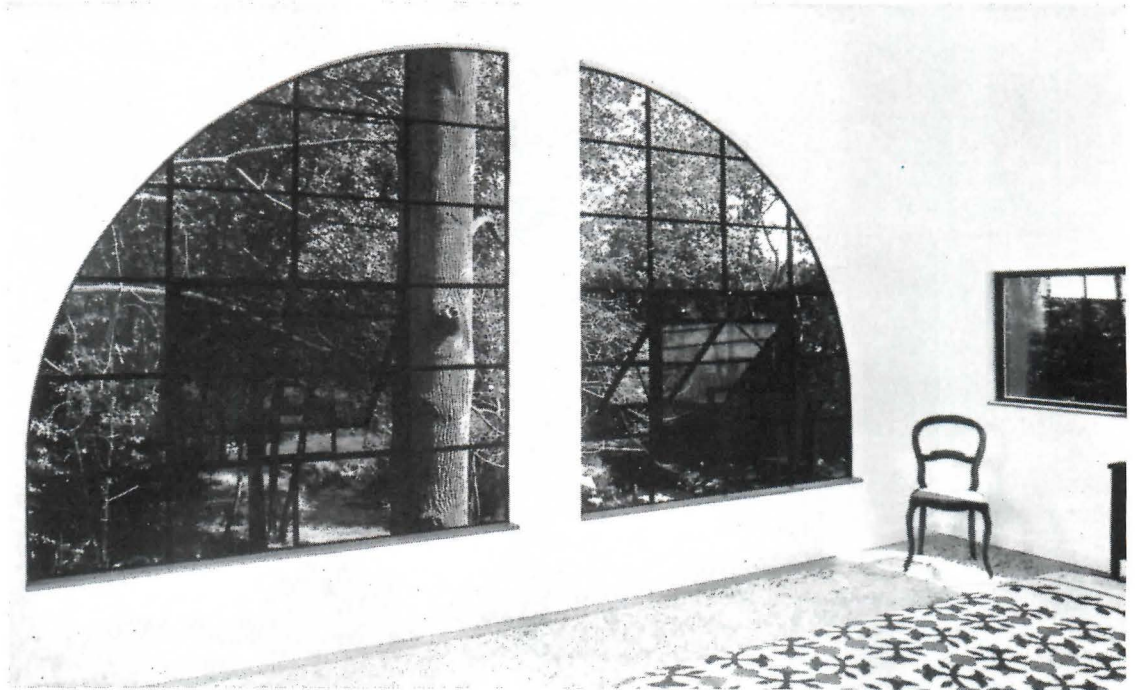
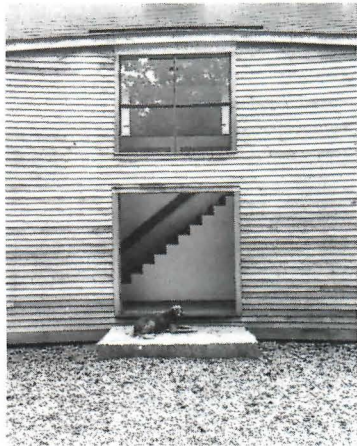
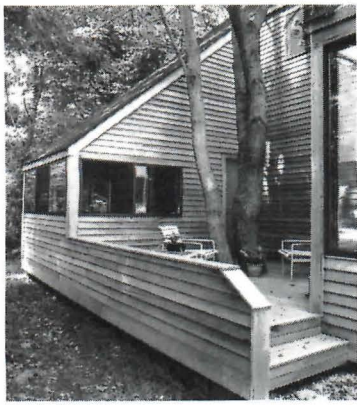
right), cuts a strong diagonal line to serve as yet another device for altering the expected and implying movement. Almost ironically, in the wake of such bold design tactics, the street-facing facade contains two deeply recessed garage doors tenuously offset by two small windows—a delicate and almost humorous balance.

The house has been arranged around a masonry chimney and central stair hallway which directs circulation for the first floor and separates the children's bedrooms from the parents' on the second (where it also forms a mezzanine to overlook the living room). The ground floor plan is open with spaces demarcated by platforms and dramatic shifts in ceiling heights. A low clear-fir ceiling and richly-hued Mexican tile floor create intimacy and warmth for the kitchen and dining area,

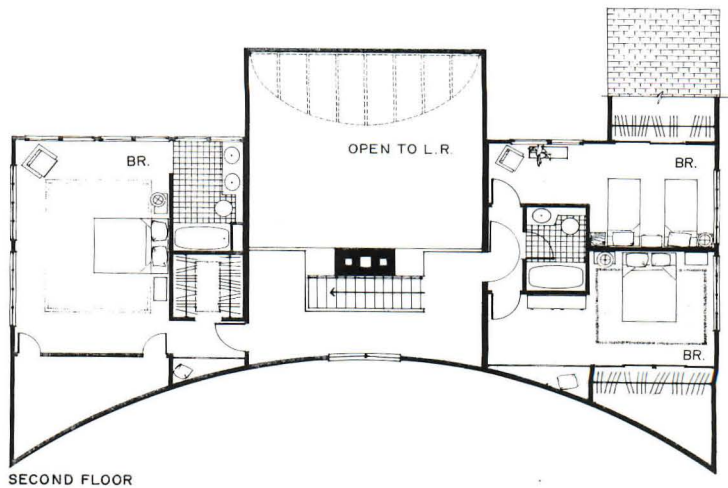
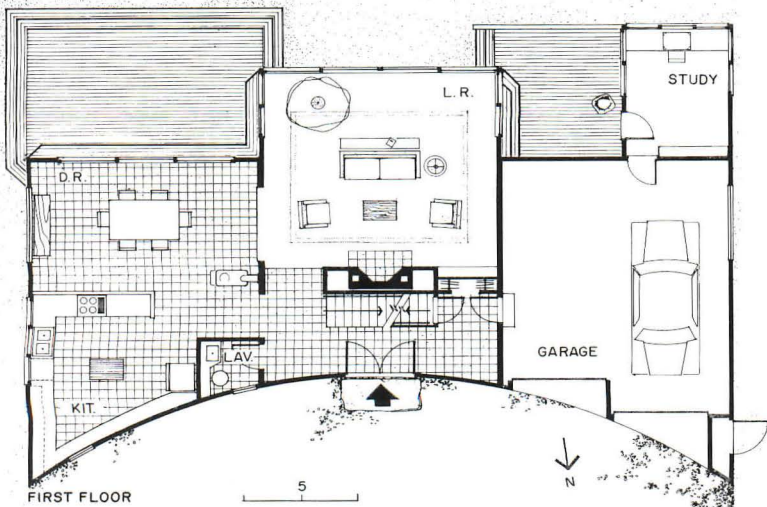
while the living room is slightly raised under the steeply pitched glass roof. Generous expanses of glass, along the rear of the house, open views to the heavily wooded property and a small pond.

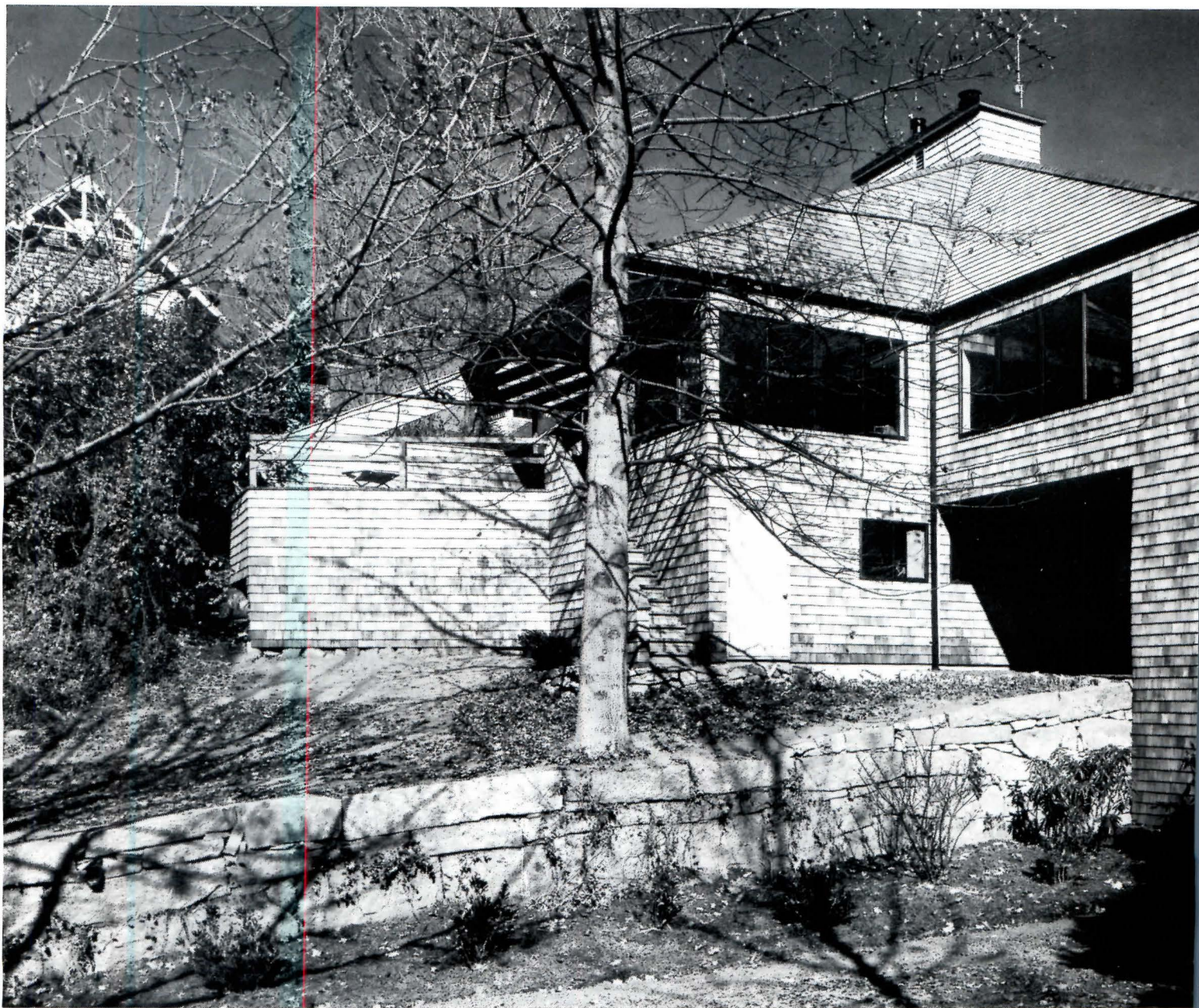
Energy efficiency was a major concern of both client and architect. An active solar hot water system and a passive solar air heating system (which is based on a standard forced hot air oil-fired system), along with careful orientation, kept total operating fuel costs to under \$600 for 1978-1979. The addition of insulated shading could further reduce costs and control the amount of heat and sun in the living room.

JOSLYN RESIDENCE, Guilford, Connecticut. Architect: Peter Kurt Woerner—job captain: Dan Haslegrave. Contractor: Woerner Associates, Inc.



The exterior materials have been chosen to blend comfortably with the sylvan two-acre site. The house is clad in red cedar clapboard with a gray asphalt shingle roof. A small isolated study extends from the garage and is separated from the living room by a Douglas fir deck (photo top). Solar collectors are strategically placed for southern exposure and maximum sun infiltration (photo left). The oversized half-circle window in the master bedroom (photo right) and in the living room open impressive views to a small pond and the densely wooded site.





METZGER RESIDENCE, STONY CREEK, CONNECTICUT

The driving force behind this modest shingle house on the Connecticut coast was an exacting triumvirate composed of client, site, and neighborhood. Woerner has successfully satisfied the formidable demands posed by each, and the result is an impressive display of design arbitration. There is a strong argument to be made that the Metzger house is merely a natural culmination—the physical effect of several controlling causes; which, more than choice, predetermined the architectural parti.

The architect's program was guided by a single client, who asked for a small house (slightly under 2000 square feet) that would incorporate spaces and living patterns from a former residence. The plan was to be open and unobstructed, and contain bedrooms for frequent guests. Outdoor decks and balcon-

ies were suggested to extend the interior spaces and create pleasant vantage points.

Orientation was determined by two important factors: the limitations imposed by a steeply inclined rock ledge, and the desire to exploit impressive views of Long Island Sound. And, as a result, the house is elevated, resting comfortably against the rock ledge, with the main living spaces on the second floor for unobstructed views. So what was initially irksome about the site has served to position the house—creating an empathetic rapport between structure and property.

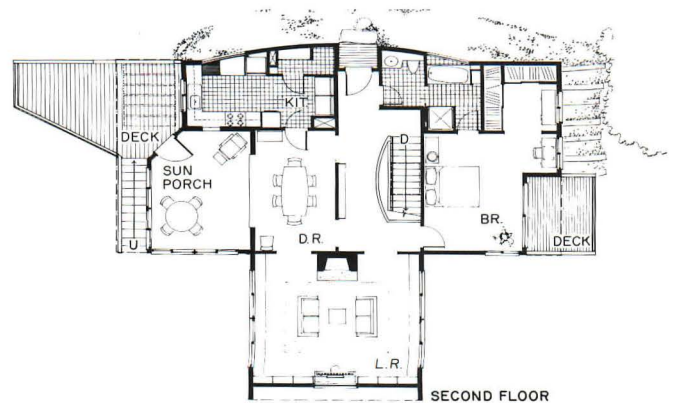
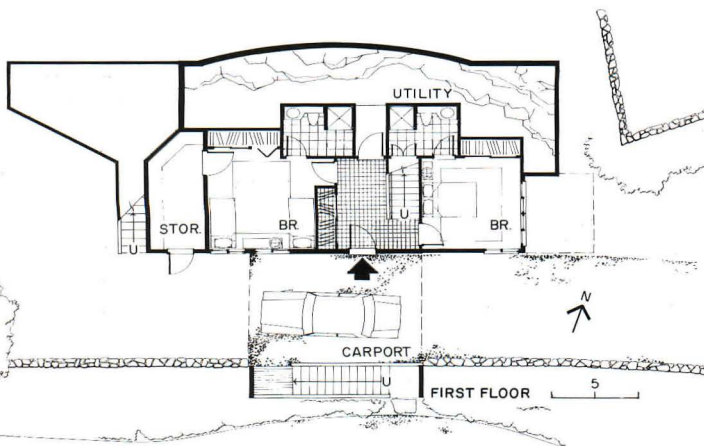
The immediate neighborhood is densely built in a consistent style, and from native materials. Architectural disparity was not perceived as a virtue, and consequently the house is built of the omnipresent cedar shingles and local Stony Creek pink granite. The

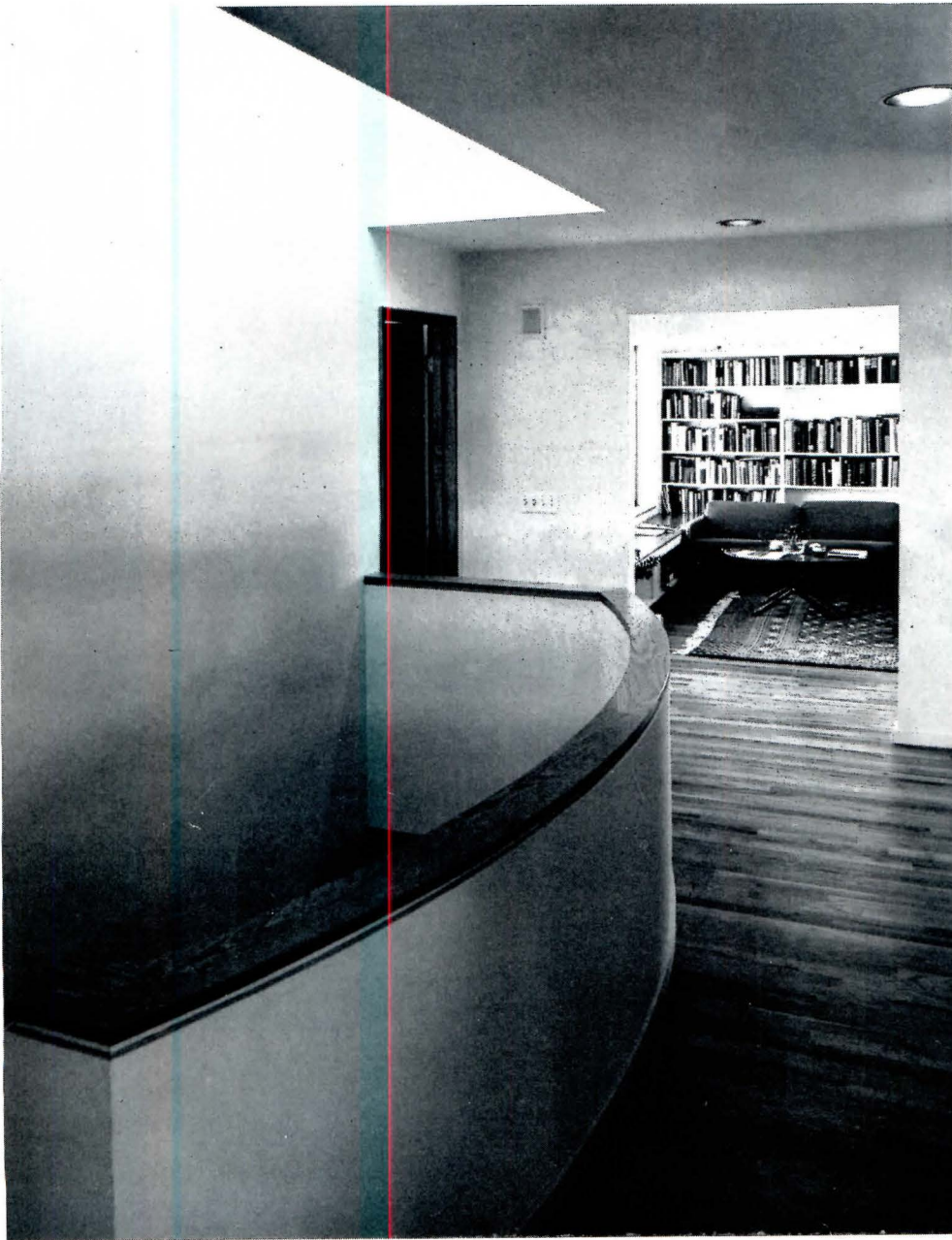
mandate for architectural continuity established certain design criteria—but within the traditional New England mode, the architect was left to work at will. Woerner has again chosen, as with the Joslyn house, to evoke and recall; although this time perhaps more self-consciously. The impressive porte cochère, the deeply inset arch, the slight bowing of the rear facade, and the extensive use of decks all join to form a pastiche, recalling the grand houses of H.H. Richardson in Newport. To the architect's credit, these posturings do not seem awkward or pretentious, but rather pleasant recollections in an appropriate context.

METZGER RESIDENCE Stony Creek, Connecticut. Architect: Peter Kurt Woerner—job captain: Eric A. Chase. Contractor: The George C. Field Co.



A difficult site and potentially impressive views served to determine orientation. The house is elevated, with the main living spaces on the second floor, for a clear view of Long Island Sound and to accommodate a formidable rock ledge. The exterior is completely clad in cedar shingles and designed to architecturally conform with the neighborhood. The rear facade is slightly bowed with only two small windows—creating a protected, almost fortress-like quality as it sits level upon the rock (to which the house is attached with metal pins). A small deck extends from the master bedroom and another more public deck opens from the solarium (photo top). The first floor contains a skylit entry, two small bedrooms for guests, and a storage room.

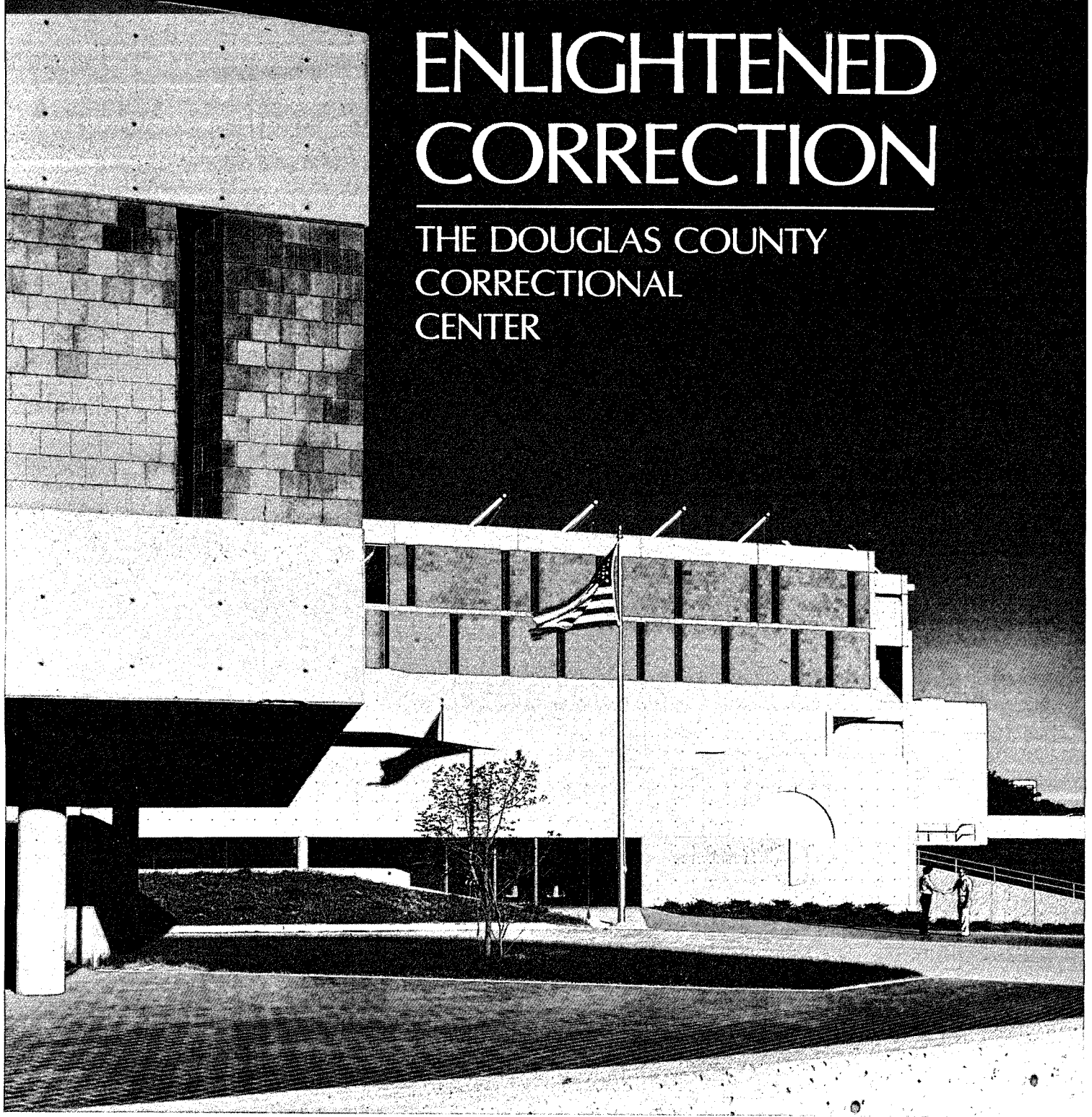




The most striking feature of the plan is the surprisingly expansive feel in such a small house (less than 2000 square feet). Windows have been carefully placed for cross-ventilation and to open views in three directions. The living room is suspended over the porte cochère and leads into a dining room and solarium (photo above). The protective half-wall of the stairwell replaces the more traditional balustrade and echoes the curve of the rear facade. And the wide bow welcomes sun from a skylight into the ground floor entry. A compact kitchen looks out onto Long Island Sound.

ENLIGHTENED CORRECTION

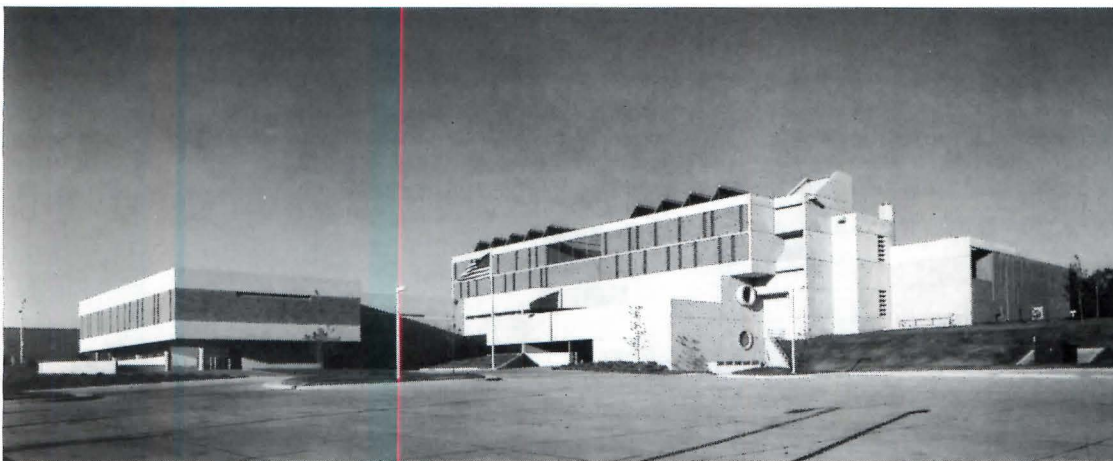
THE DOUGLAS COUNTY CORRECTIONAL CENTER



Located in downtown Omaha, this new facility for short-term incarceration has been funded by two Federal grants, with the idea of demonstrating current models for prison design, and especially for prison design at the local short-term levels.

What architects Dana Larson Roubal and Associates have created is a handsome new facility that incorporates many features that are currently thought to promote rehabilitation—but that have been seen until now only in the most progressive large facilities designed for long-term incarceration. And the results are well worth notice and future examination, because these local short-term facilities do hold a large portion of the beginning offenders—those who have the best chance to benefit from rehabilitation efforts. Also, the small physical size of institutions like the 202-person Douglas County Center offers the best opportunity to practice one of the basic tenets of rehabilitation: individual attention.

Both in conducive psychological terms, and in such practical terms as a solar-energy heating system, this new building represents an important advance in what is being built as part of the effort to solve social problems at the local level—C.K.H.

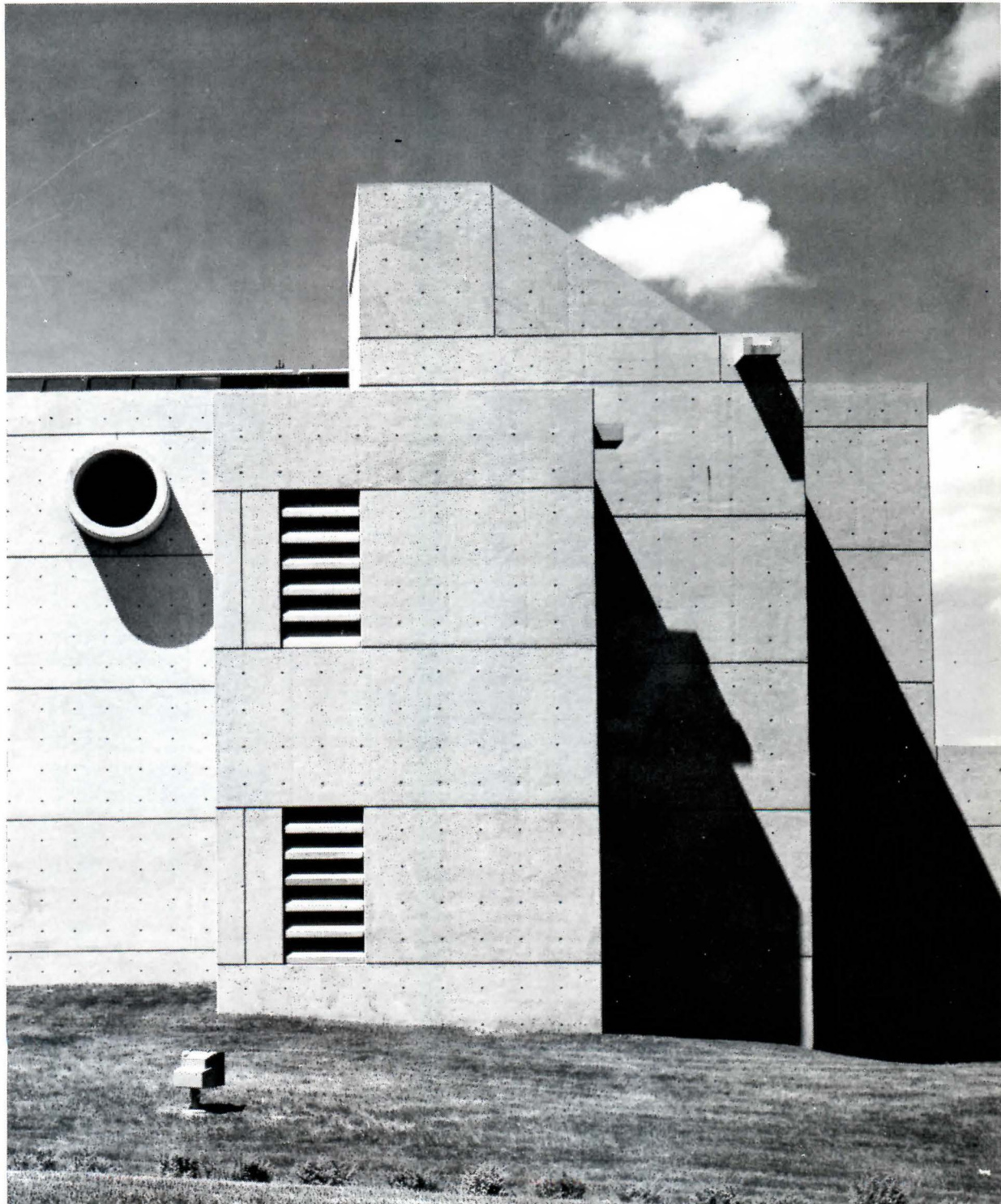
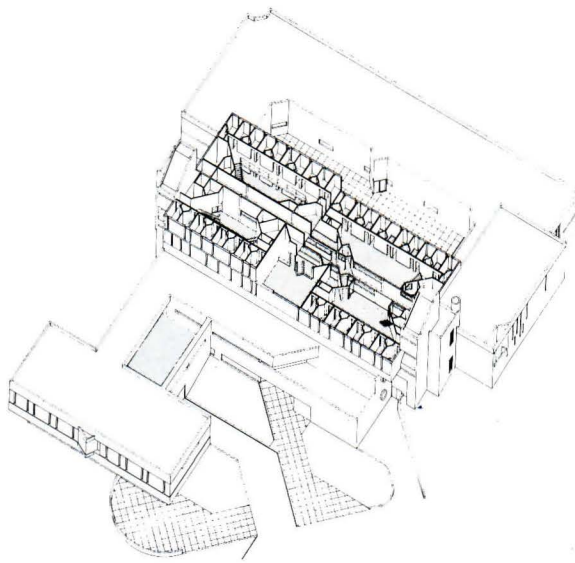
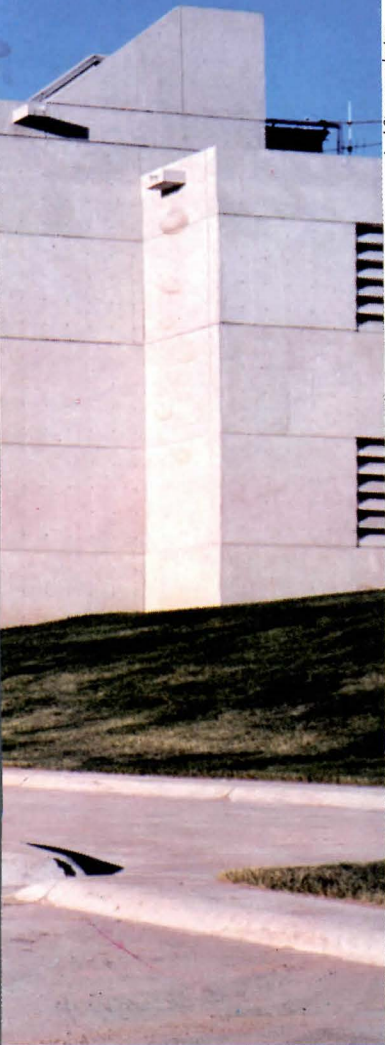


Architects Dana Larson Roubal and Associates helped Douglas County establish a program for its new correctional center based on the sponsoring Federal Law Enforcement Assistance Administration's mandate that the center would be a model for future centers, in terms of respecting the rights of the prisoners and in terms of providing a clean and humane atmosphere for residents and workers alike. And the potential for a true rehabilitative process was not lost on the pioneering County administration. The first step was the creation of a new administrative Department of Corrections in order to match the building

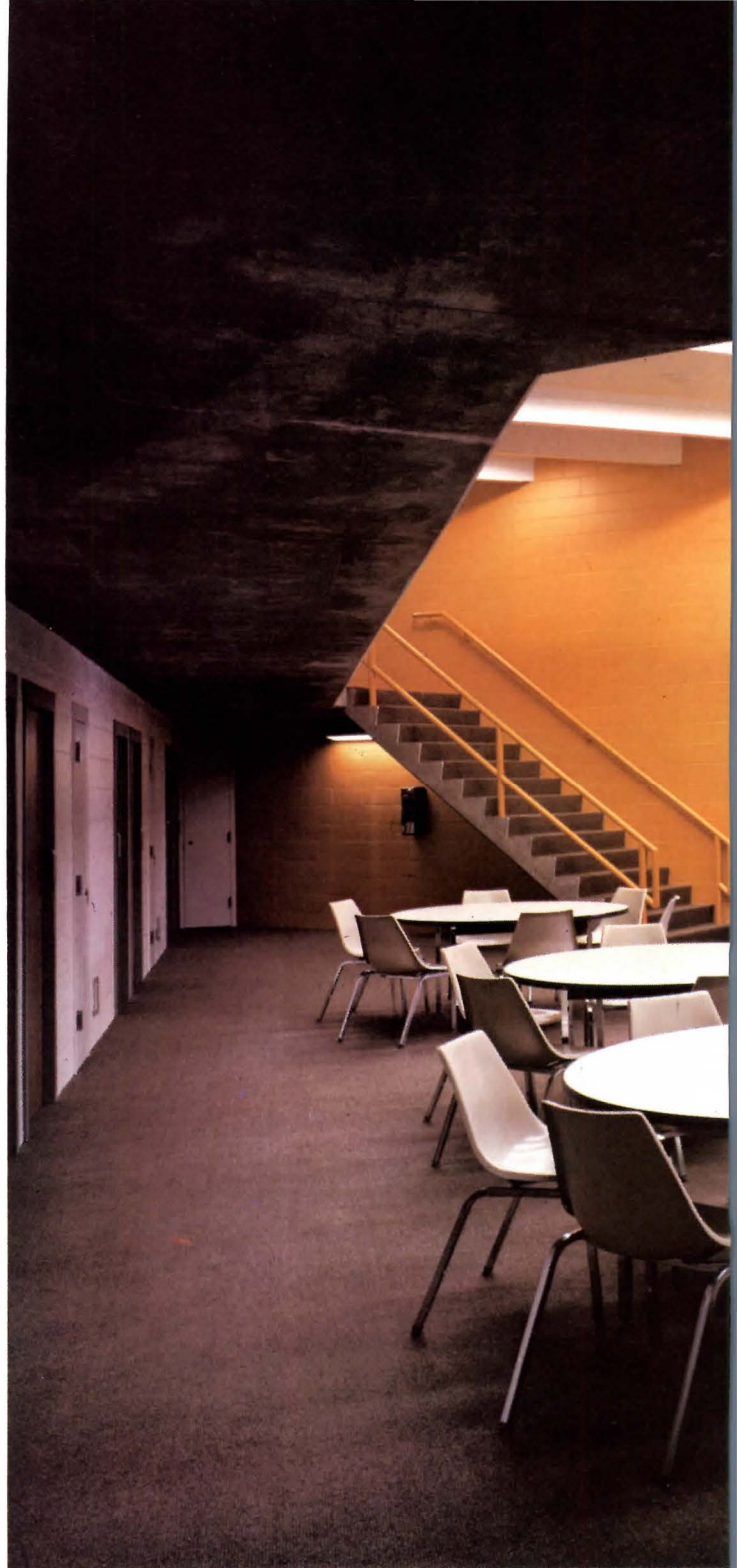
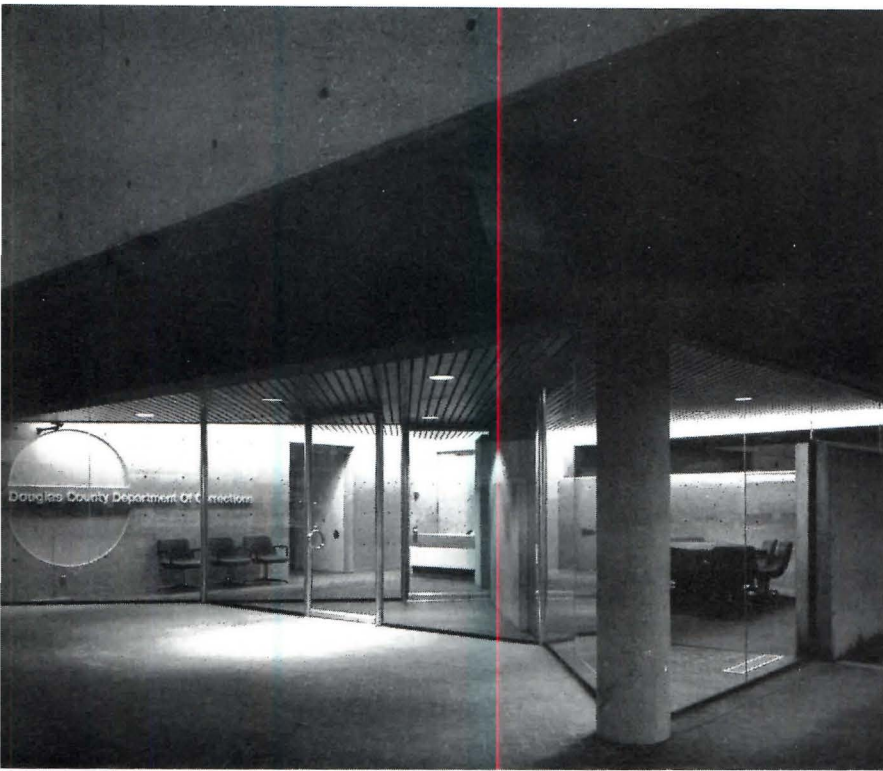
program with the way it actually would be used. It was a recognition that buildings alone—no matter how thoughtfully designed—cannot cure antisocial behaviour. In the design of the building, the architects established several criteria: all individual cells with natural light, minimal debilitating visual impact from security restraints, outdoor recreation spaces, and extensive facilities for visitation, counseling and self-improvement, such as a library. They also provided for the separation of various types of offenders into twelve groups around twelve two-story dayrooms. The most serious offenders are

located in four groups on the third, top story. Besides the more obvious social benefits of not mixing hardened with beginning law-breakers, the architects cite a very practical reason for this innovation: the entire facility did not have to be equipped with heavy-duty security equipment, hardware, finishes and plumbing. Such expense could be made only where there was the most disruptive behaviour. As part of the prototypical nature of the design, a solar heating system has been installed to supply 10 to 15 per cent of space heating needs and up to 75 per cent of the

continued on page 108



Most distinctive for its refinement of proportions and detailing in a building type that often seems to defy sensitive design by its very nature, this prison is built of standard poured-in-place concrete with brick infill. The program of separating various classifications of inmates was a help in producing a segmented, more humane scale, and the playfully exaggerated treatment of such elements as mechanical room intakes and exhausts and graphics further livened the visual interest. The sloping topography allows the building to nestle into the site.

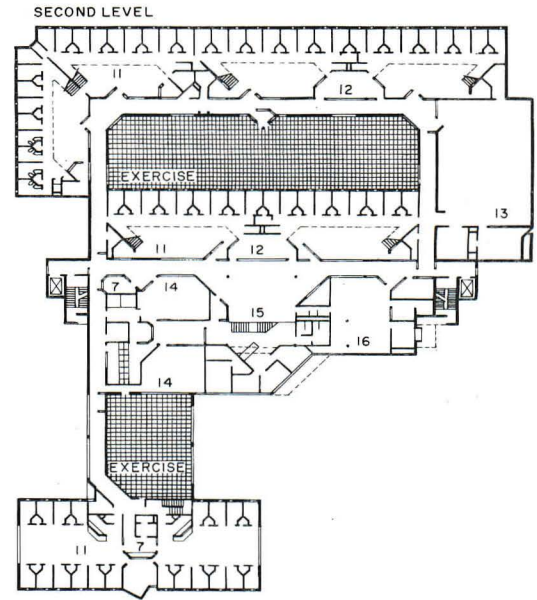
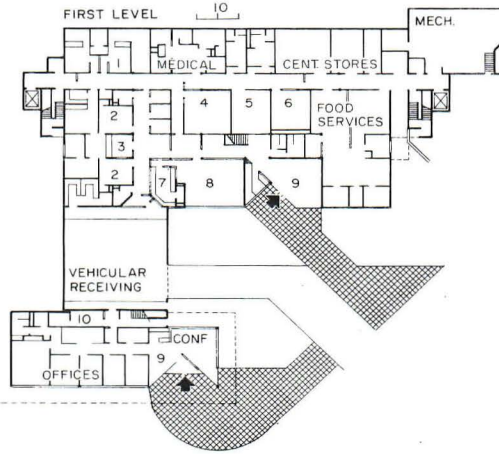


Innovations in accommodations include numerous spaces for social agencies, recreation, and visits by relatives and friends. These are generally located on the second level above the main entrance (see plan). Visitors reach this area by the stairs in the main lobby (photo above). The entrance to departmental offices and the women's detention area, located in the projecting wing, is seen in the top photo. Outside recreation is provided on three roof-top courts contained within the building (photo right). Twelve groups of cells surround dayrooms

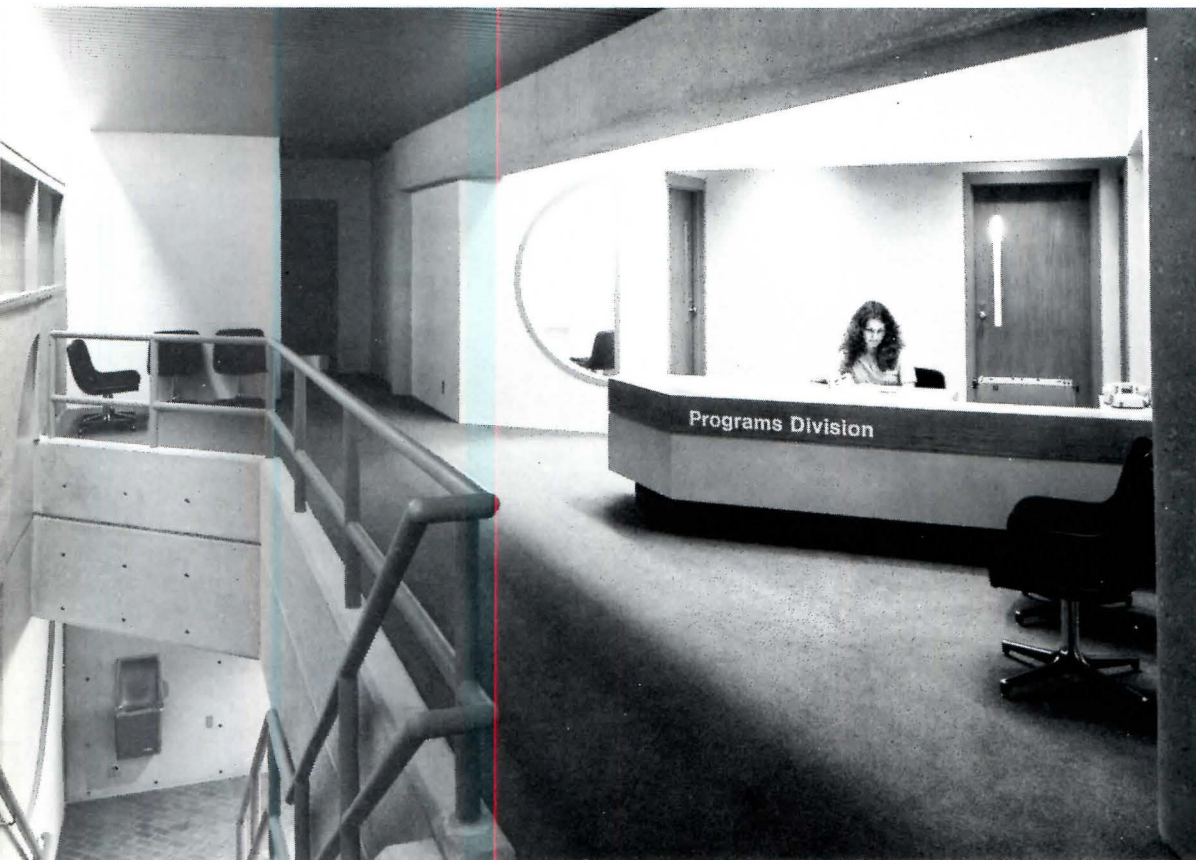




- | | |
|-------------------|------------------------|
| 1 Clothing | 9 Lobby |
| 2 Holding | 10 Female receiving |
| 3 Booking | 11 Dayroom |
| 4 Intake services | 12 Instructional areas |
| 5 Records | 13 Multi-purpose |
| 6 Lounge | 14 Visiting |
| 7 Control | 15 Recreation |
| 8 Operations | 16 Library |



(large photos), which are distinguished by strong architectural form, skylights, color and a consistent design language—such as the triangular metal projections that contain doors, and allow surveillance of spaces before entering. Two of these rooms are located in the women's section. A deck for outdoor recreation for the medium-security facilities is located above the main entrance (isometric shown on page 105). Rather than steel bars, security measures consist of electronically controlled vestibules and impassable 5-inch-wide windows in cells.



Cells around the dayrooms (top photo) are reached either directly or by a mezzanine-level balcony. Visitors ascend from the lobby on a flight of stairs that lead to the spaces for visitation, counseling and self-improvement (photo left). Electronic security controls replace steel bars (below).

continued from page 104

hot water. The 85,000-square-foot building was designed to house 202 residents, and cost \$4,635,000 without furnishings.

DOUGLAS COUNTY CORRECTIONAL CENTER, Omaha, Nebraska. Owner: *County of Douglas, Nebraska*. Architects and engineers: *Dana Larson Roubal Associates, Inc.*—project sponsor: *William Larson*; project designer: *Bryce Pearsall*; project coordinator: *Richard Pawelko*; mechanical engineer: *Ralph Nelson*; structural engineer: *Raymond Hicklin*; electrical engineer: *Victor Failla*; landscape architect: *Frank Tate*; contract administrator: *Richard Henningsen*. General contractor: *Charles Vrana & Son Construction Company*.





Wolfgang Hoyt

THREE NEW ARENAS

The familiar challenges of arena design were all present in the three projects that follow. But in each case, the architect had a special problem to solve. For David Specter, it was how to enlarge and convert an existing stadium (a stadium never designed for tennis) into a new national home for the sport. For Crain/Anderson the challenge was to design a facility that was adaptable to every sporting, cultural, and ceremonial usage that its university sponsors could envision. And to Hellmuth, Obata & Kassabaum, the special challenge was to design an Olympic skating facility that met the highest international standards but would still be economical to operate after the Games when it would host a variety of less glamorous, smaller scale events. It is the solutions to these special problems that gives these three arenas a unusual claim on the interest of the profession. —Barclay F. Gordon



The USTA National Tennis Center by David Kenneth Specter

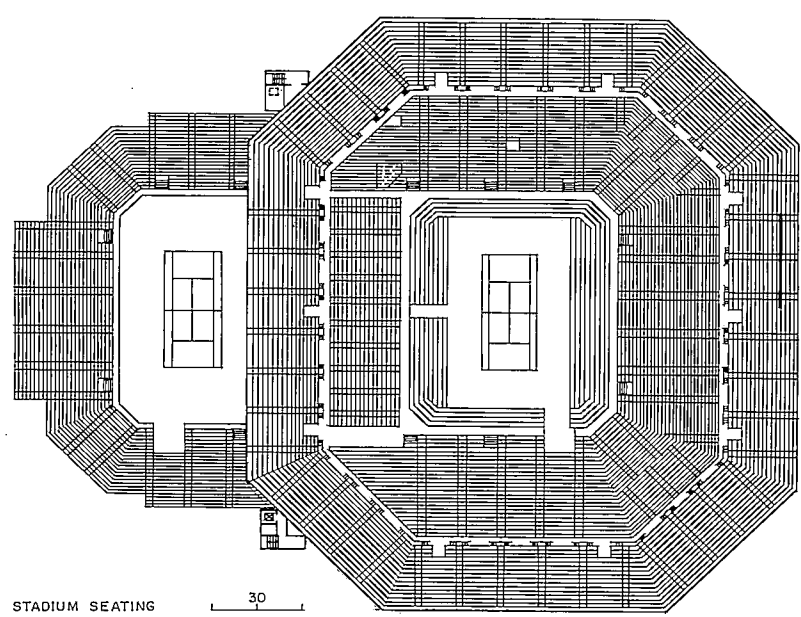
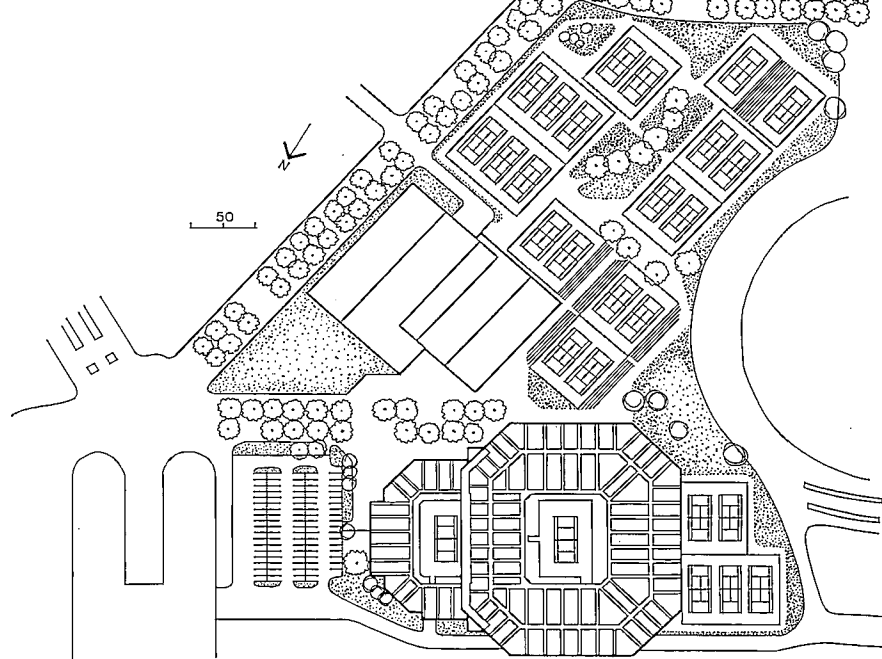
For the better part of this century, American tennis and Forest Hills seemed to be synonymous. The West Side Tennis Club—nestled amid the brick and Tudor houses of this tidy New York suburb—was the Mother Church of the sport (at least in America) and the scene each summer of a series of events that culminated in the staging of the U.S. National Championships. This was, of course, an event of considerable glamour and tradition, a tradition that was richly expressed in the West Side's handsome old half-timber clubhouse, its venerable stadium and its gracious expanse of beautifully manicured lawns. Even the surrounding community, built up around narrow, tree-lined streets with names like Dartmouth and Exeter, seemed to bestow an added measure of lordly dignity.

But even before 1968 when tennis began its great surge, Forest Hills had become a tight-fitting suit. After 1968, when the U.S. National Championship became the U.S. Open, American tennis needed a new home.

The new site, only a few miles from the old, was nevertheless very different in character. It centered on an all but derelict stadium left over from the 1964-65 World's Fair in Flushing Meadow. Originally called the Singer Bowl, later renamed after Louis Armstrong, the stadium was a shallow, rectangular tray ringed by a low grandstand of small capacity with most of its seating located too far from a potential center court—a court that would lie in the wrong axis for tennis anyway. But if the geometry was unpromising, the stadium was well

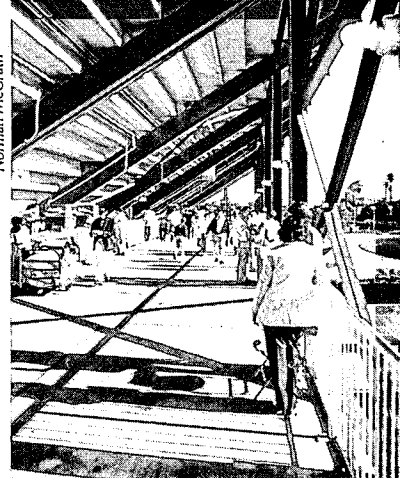
located with respect to transportation both public and private, and the surrounding space was more than ample.

These were among the considerations that USTA president Slew Hester and architect David Specter grappled with during feasibility studies. It was during one of these early meetings between Specter and structural engineer Ysrael Seinuk (principal in the Office of Irwin Cantor) that the idea of superimposing a new grandstand ring over a portion of the old stadium was first advanced. Obvious only in retrospect, it was an idea with powerful implications. It made it possible to bring large numbers of seats within comfortable viewing distance of a center court that could now be realigned *north-south*. And it left an existing area of seating to frame a smaller

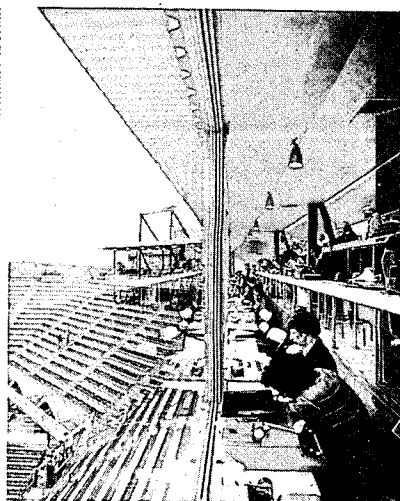


STADIUM SEATING 30

Norman McGrath



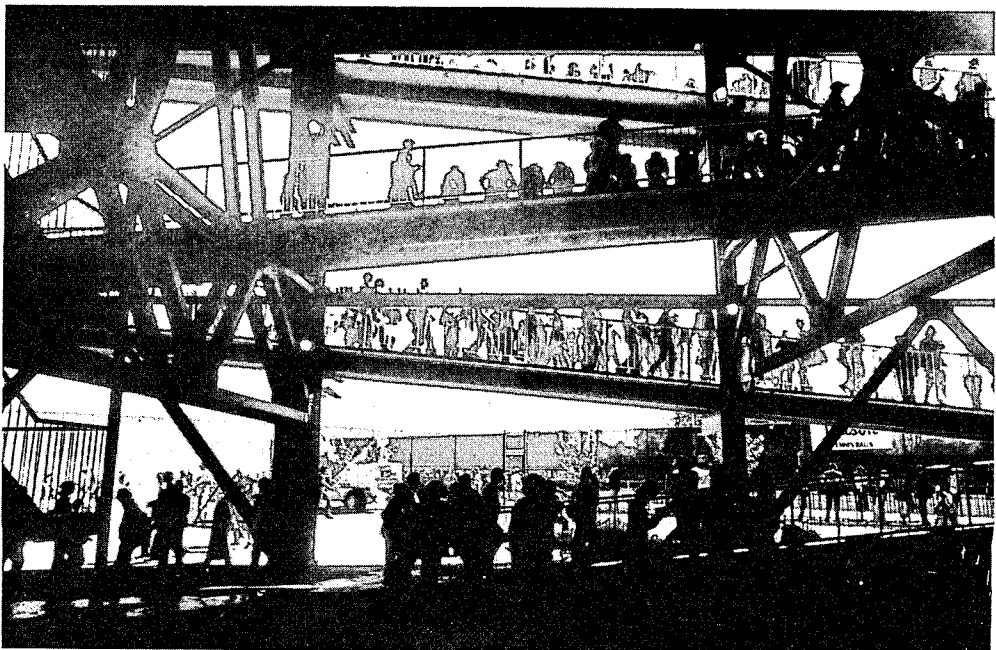
Norman McGrath



The extent of the new National Tennis Center is shown in the site plan and in the photo at upper left. The two structures of light industrial character to the left of the stadium house a total of nine air-conditioned, covered courts as well as locker rooms, lounges, restaurant, pro shop and administrative spaces. The Center also offers a total of 25 outdoor courts that during most of the year can be rented by the tennis-playing public.

secondary arena or "grandstand court." The decision was made to plunge ahead. Using fast-tracking techniques and a range of industrial materials and finishes, the project was brought to completion (or at least to a satisfactory level of completion) in the remarkably brief period of 10 months, a tribute not only to the architect but to USTA officials, responsible city agencies, and construction crews alike.

As built, the new stadium addition is structurally independent of the existing grandstand. Together they provide seating for just under 20,000 spectators in the main stadium with an additional 6,000 in the grandstand arena. (At the West Side Tennis Club, the seating capacity was between 14,000 and 15,000). Access to the new facility is easy and





on-site circulation routes are clearly developed.

Many of the problems that inevitably arise in a large new facility of this kind have been solved in the first two years of shake-down. Of those that remain, the most vexing results from the Center's location under a major air-traffic approach to nearby La Guardia Airport. The loud drone of low flying aircraft overhead is a continuing annoyance to players, spectators and broadcasters. A minor but continuing controversy also centers on the character of the playing surfaces. The courts are finished in *Deco Turf II*, a rubber-fortified, elastomeric coating over an asphalt base. Some prominent players argue that the surface is "too fast" and penalizes those players who learned the game on the

slower clay surfaces of Europe. It should be noted, however, that no court surface yet developed suits everybody, and that this surface was selected only after a thorough poll of player preferences. Apart from the question of surface, tournament players give the new facility high marks. They enjoy a privacy here that they never had at Forest Hills and the number of practice courts available for their use is generous.

One of the most important features of the new Center—and one that distinguishes it sharply from the West Side Tennis Club—is that for 10 months of the year, the Center is a public facility and adds importantly to the slender inventory of local, rentable courts. Under terms of an agreement worked out between the USTA and the City, the USTA

has exclusive use of the Center for 60 days each year and control during this period of all incoming revenues. For this, it maintains the facility year-round and pays the City a guaranteed annual minimum of \$125,000. It is a happy arrangement for both parties and one that could and might serve well as a model for cooperation between the public and private sectors everywhere.

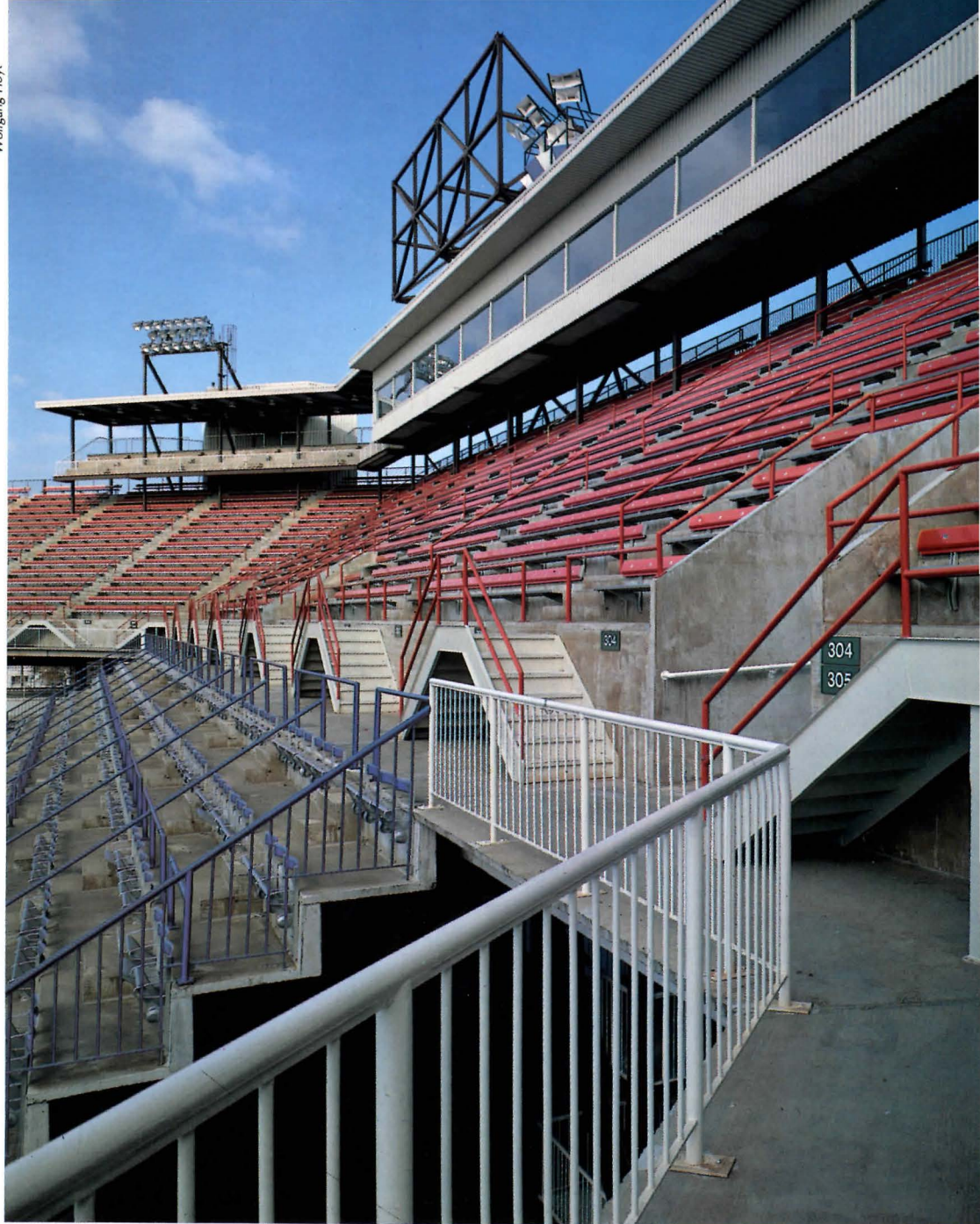
NATIONAL TENNIS CENTER, Flushing Meadow, New York: Architect and graphic designer: *David Kenneth Specter*—(*Rodger Braley, John Van Fossen*: project team. Engineers: *Office of Irwin Cantor* (structural); *Flack & Kurtz* (consulting). Landscape architects: *The Schnadelbach-Braun Partnership*. Directory: *Wade Zimmerman*. Construction manager: *Leonard Borgida, HRH Construction Co.*



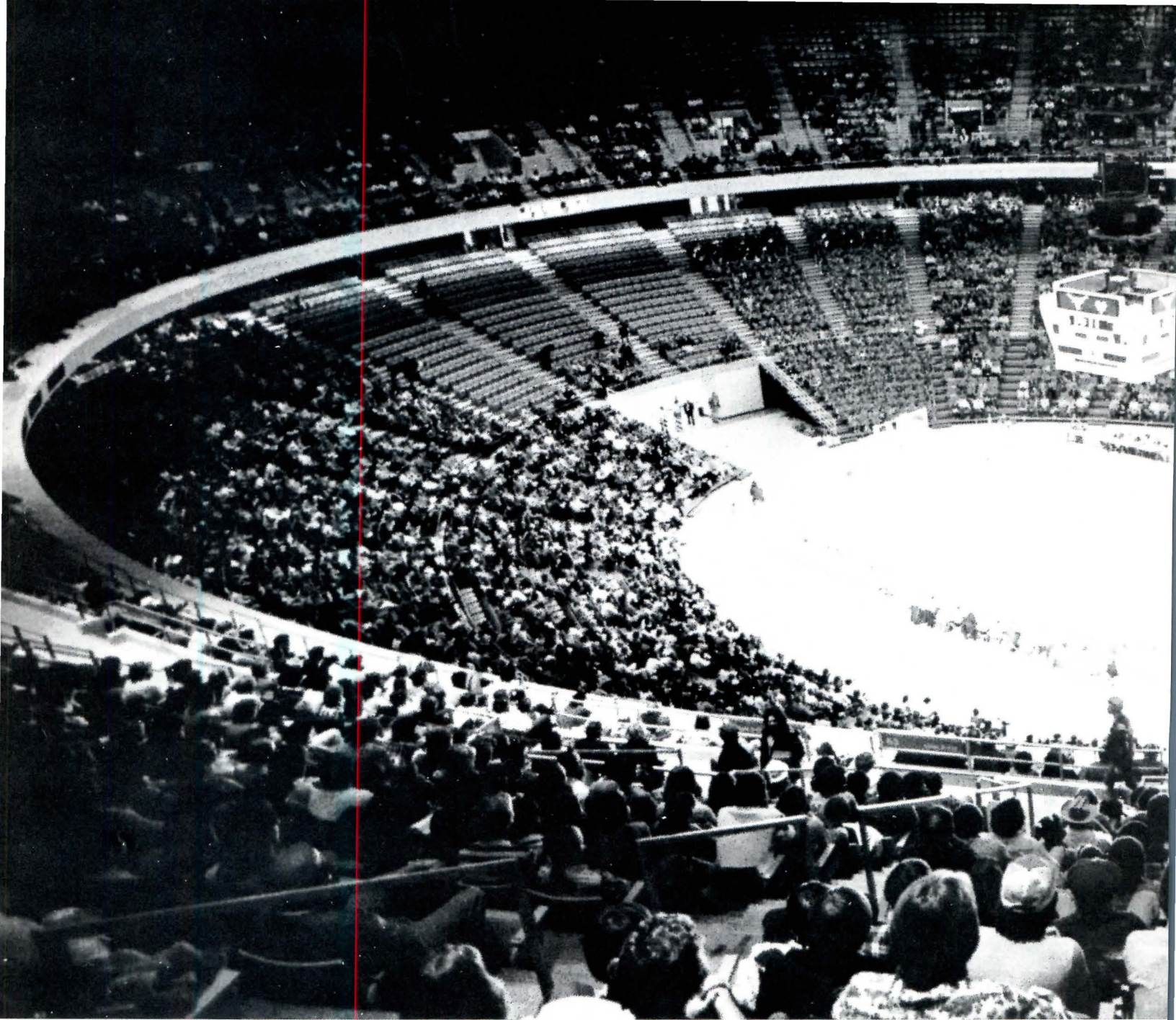
Norman McCrath

Dramatic in its massing and forthright in its execution and finishes, the new Center has become for some traditionalists a symbol for the changes that have come to tennis during the past decade. For these critics, the casting off of the game's elitist image (as symbolized by the move from Forest Hills) was a fall from grace itself. For others, however, the Center is a fitting expression of the sport's new strength and popular support.

Wolfgang Hoyt



Wolfgang Hoyt



Austin American-Statesman/Lou Cooper

Special Events Center, University of Texas, by Crain/Anderson

The Superdrum, as the Special Events Center is affectionately called by those who use it, is a remarkably flexible entertainment space. During one seven-day period in early 1979, for example, this facility was host to six large-scale events. The sequence began with a 2,000-guest banquet and dance. The next day crowds were treated to a show by the Royal Lippizan Stallions. Two days later, the University of Texas basketball team beat Rice. Right after the game, the floor was picked up and the proscenium erected to accommodate a performance of *The Wiz*. The following day, the floor went back down for the Harlem Globetrotters who were followed in turn an evening later by Boston, the popular rock group. In the two years since it opened, in fact, the Special Events Center has hosted ice

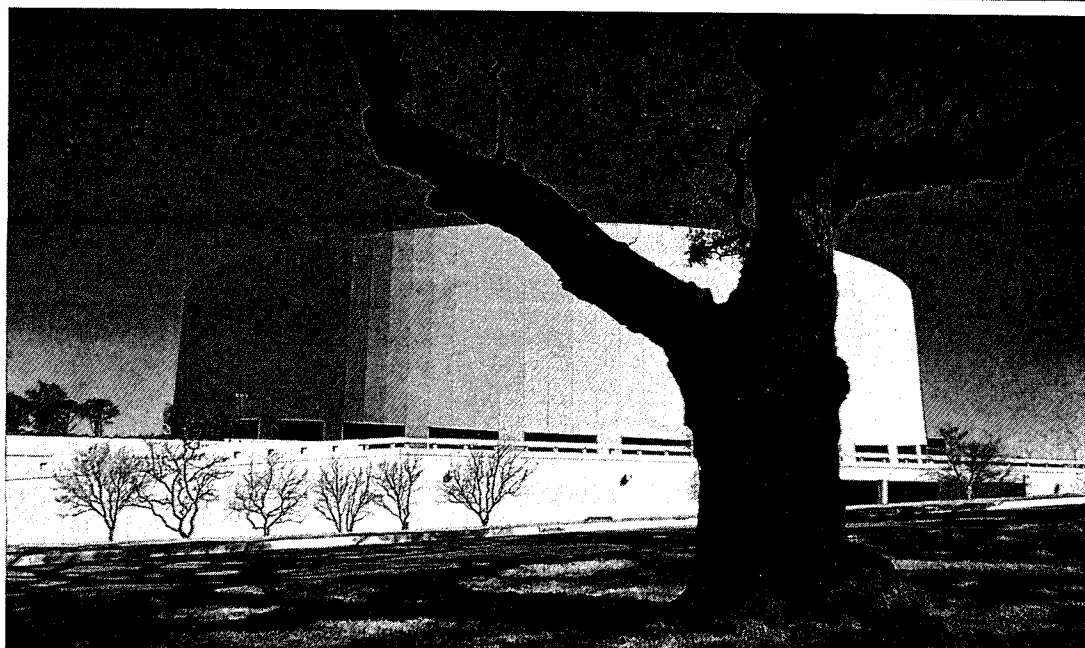
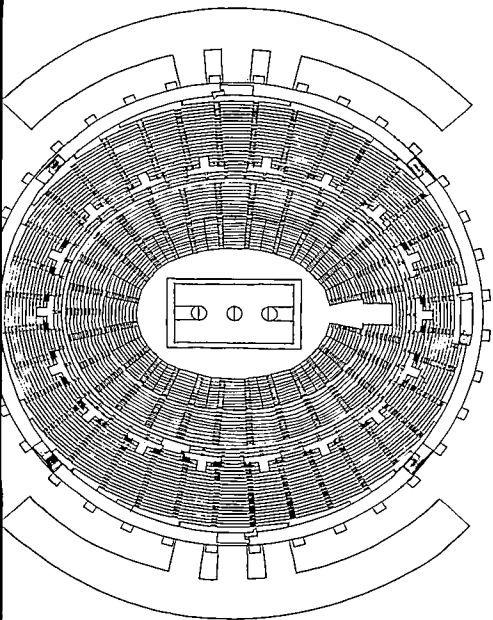
shows, circuses, symphonic and operatic performances, university convocations, commencement exercises, major political addresses—just about every sort of large-scale event to which the greater Austin community could be attracted. This community includes approximately 300,000 people.

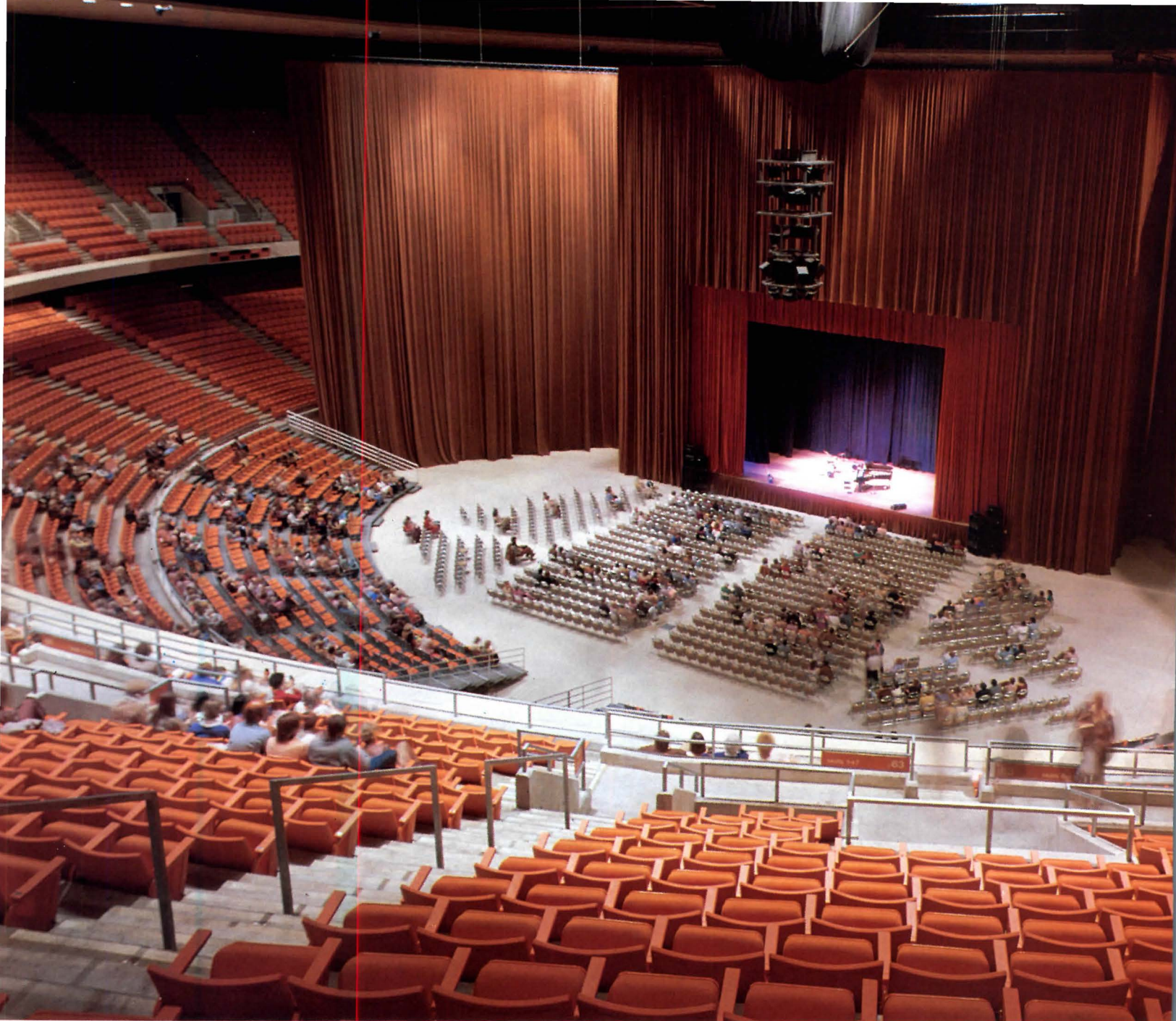
The basic enclosure is a drum with a base diameter of 402 feet and a height of 97 feet. The steel structure is clad in buff-colored precast panels and it rests on a large podium or terrace that serves as the main access to the building. Twenty-eight feet below terrace level is the 24,000-square-foot arena floor. This floor is surrounded by two tiers of seats with a combined capacity of 16,200. For theatrical events, the space can be arranged for theater-in-the-round or for conventional

stage by erecting a proscenium arch as shown in the photo next page. This configuration produces a stage that is 96 by 60 feet and enclosed by a system of tall drapes that can be stored when not in use. Lights and scenery can be flown in from a 32-line set grid system overhead.

The seating plan is essentially a series of concentric ovals inscribed within the circular plan of the drum. This arrangement provides more seating along the long sides of the playing area and therefore better viewing angles for more of the seats. By masking certain sections of the seating and retracting others, a wide variety of arrangements can be achieved.

In a structure with such a high level of convertibility, the acoustical system had to be





carefully engineered. It consists of two banks of speaker clusters that provide uniform sound coverage to the arena floor and the lower tiers of seats. The upper-level seating rings are equipped with digital delay devices on a separate speaker system, a condition that minimizes reverberation and echo. To complement the sound reinforcement system, the architects have installed perforated metal walls with fiberglass backing behind the upper tier, a suspended acoustical ceiling (also over the upper tier), carpeted walls and fully upholstered seats.

The Special Events Center has two distinct lighting systems. The first, for sports events, is itself highly flexible. It consists of 288 1000-Watt halogen lamps mounted on a high catwalk overhead and angled so that

there is no spill or glare to spectators. These units can be modulated according to the requirements of the events from boxing, which is tightly focused on a small area, to rodeo which extends to the full perimeter of the arena.

The theater lighting, designed by Abe Feder to accommodate either proscenium or arena stage, includes 96 ellipsoidal spotlights, border lighting and eight cradles of quartz lamps used as side lighting. Provision is also made for a range of portable units to be used when any of a variety of special effects is desired.

The very variety of events, their size and level of activity, required the deployment of a sophisticated and carefully zoned air distribution system that automatically maintains a 72

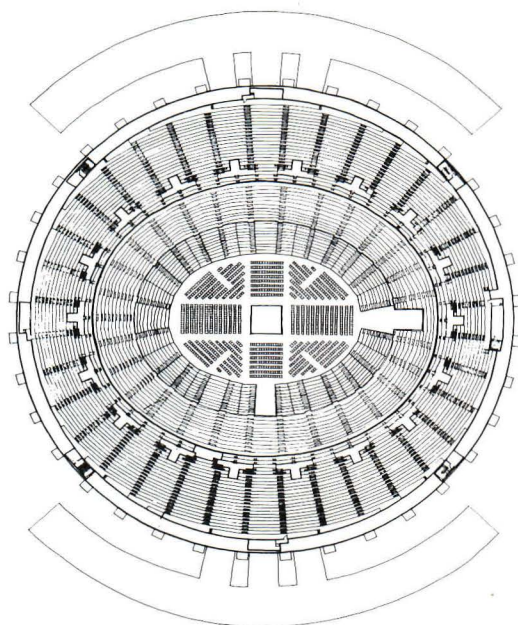
degree temperature at 55 per cent relative humidity.

In the first two years of its operation, this extraordinary facility has been highly successful. Unlike some other multi-purpose arenas—where only a fraction of their designed versatility is ever utilized—the flexibility of the Special Events Center has been continuously challenged and the challenge has been met again and again.

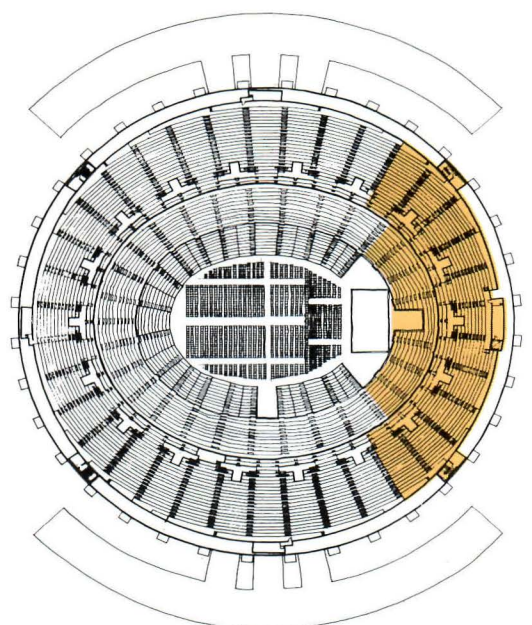
SPECIAL EVENTS CENTER, Austin, Texas. Architects: *Crain/Anderson, Inc.*—project team: *John K. Anderson, Robert J. Minchew* Engineers: *Walter P. Moore & Associates* (structural); *Cook & Holle* (mechanical). Consultants: *Lighting by Feder* (lighting); *Bouer & Associates* (acoustical). Contractor: *H.A. Lott.*



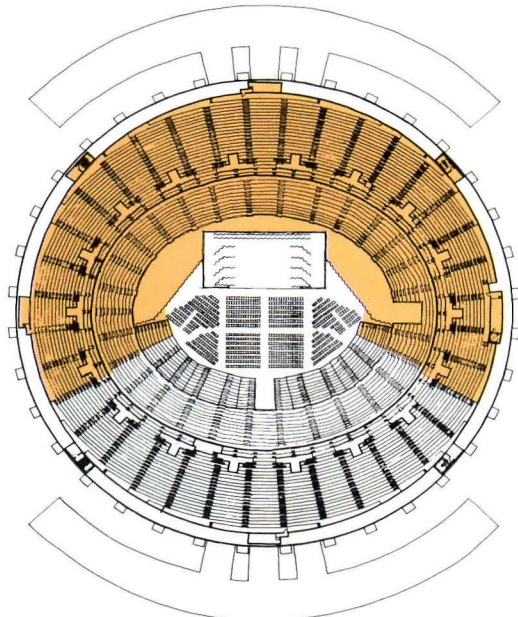
Richard Payne photos except as noted



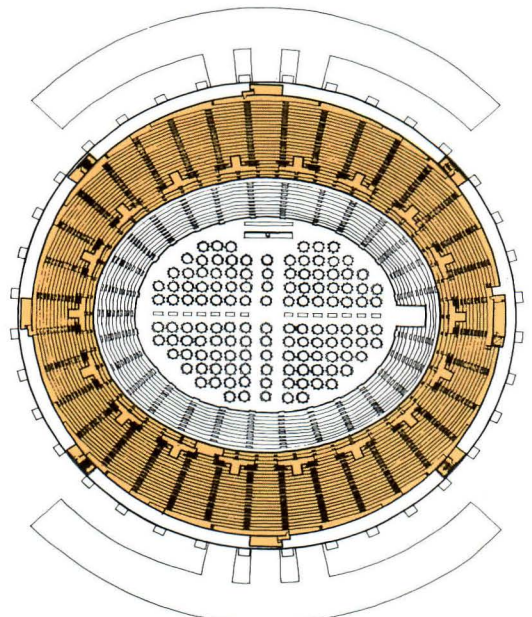
CENTRAL FOCUS EVENTS



ARENA STAGE

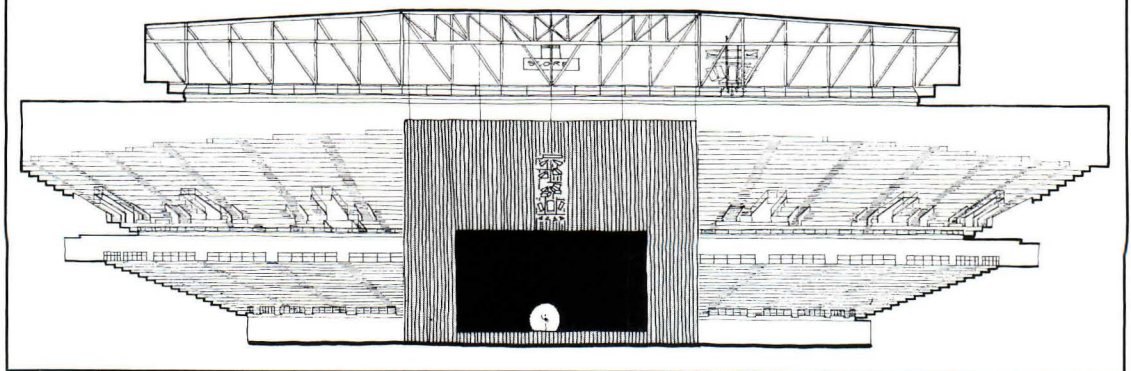


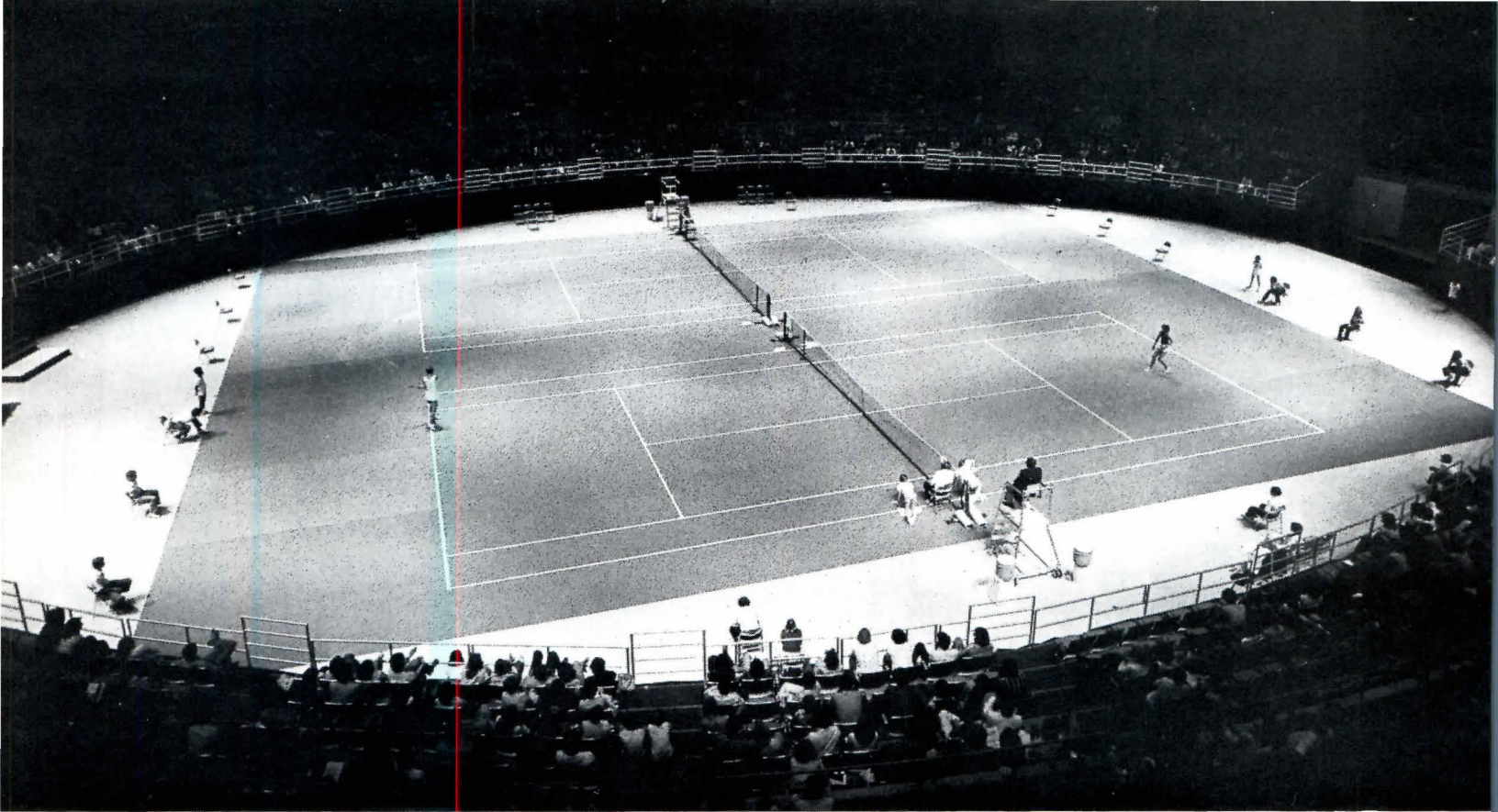
PROSCENIUM STAGE



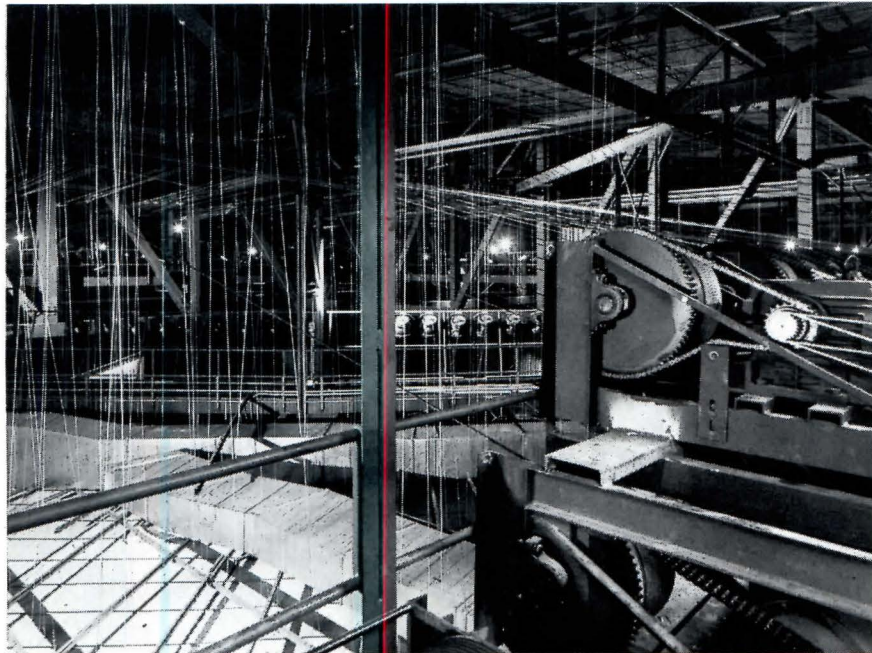
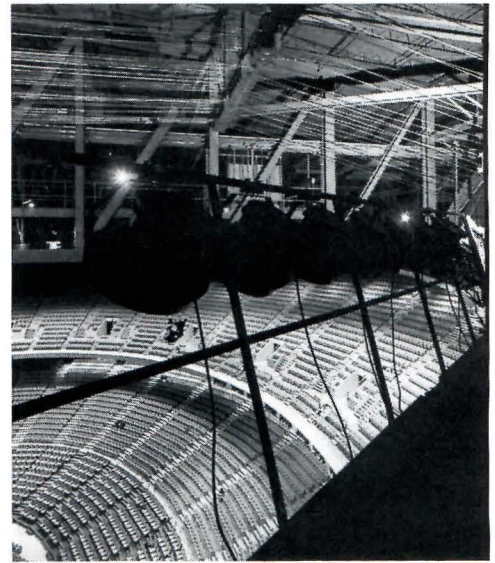
BANQUETS

Four basic seating arrangements—each tailored to a particular kind of event—are shown in diagrammatic form above. In the section below and in the photo at left, the arena is set for theater. The focus is a 40- by 60-foot proscenium opening. Most conversions of the facility can be accomplished in a day.

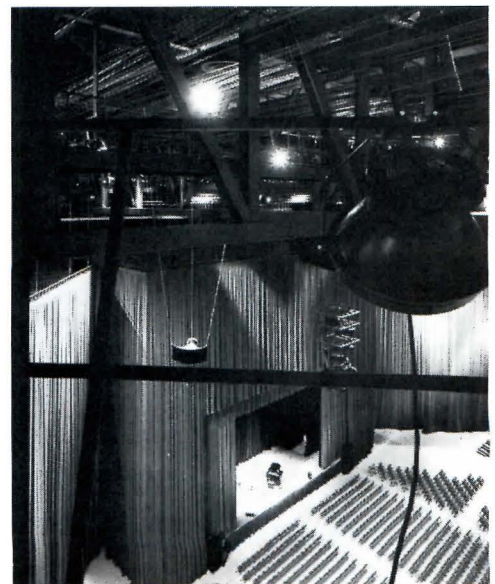




The roof of the arena is framed in a two-way steel truss system of sufficient depth to create a mechanical attic 28 feet high at its midpoint. These trusses span



386 feet and house a system of catwalks that provide access to the lighting and to the theatrical rigging and hoists shown in the several photos above and at right. The rigging process is facilitated by the design of a 30-foot-wide ramp at the building's south end, a ramp on which trucks can drive right on to the arena floor to load and unload.







A new Olympic Center for Lake Placid by HOK

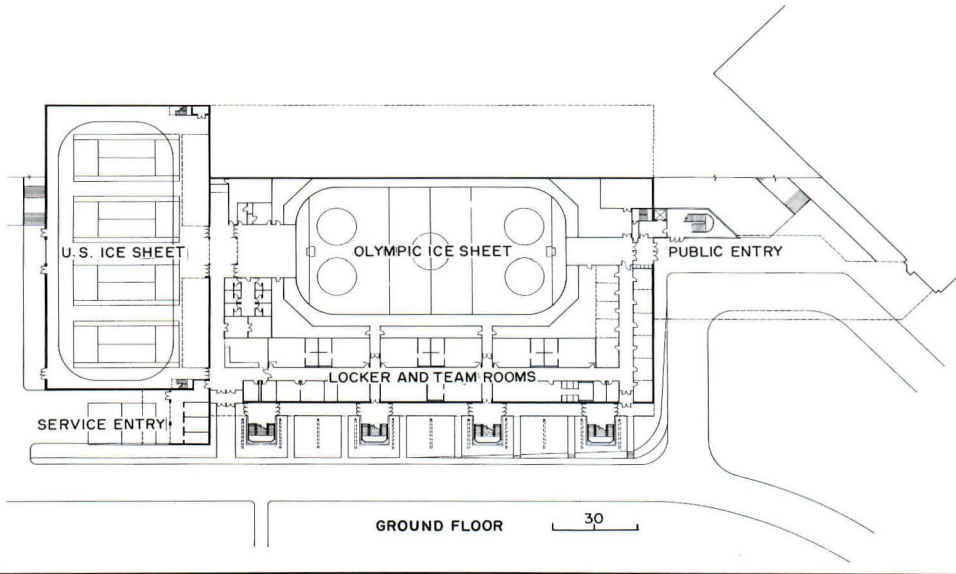
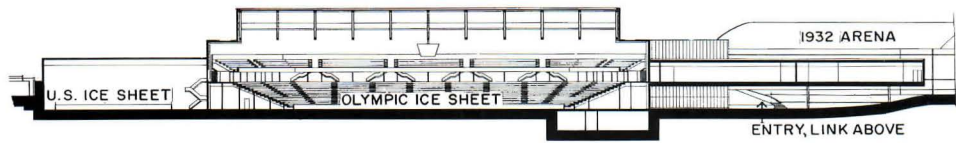
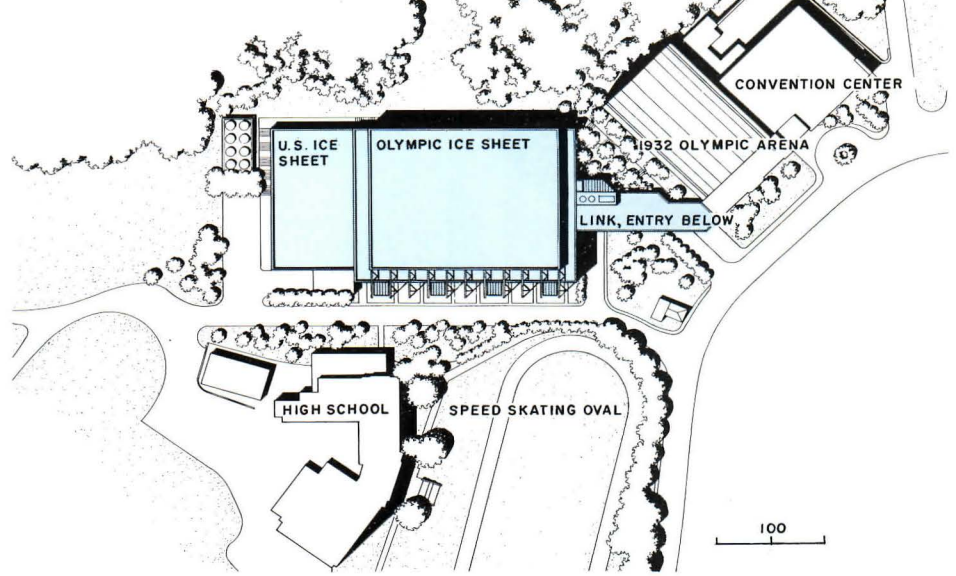
Years of planning and building will be crowned this month when 1400 athletes and an estimated 45,000 spectators descend on this picturesque Adirondack town to join in celebrating the XIII Winter Olympic Games. This is not the first time Lake Placid has been host to the Games. In 1932, at the lowpoint of the Depression, this upstate community staged the III Olympic Winter Games in what was, for then, sumptuous style. But in the years since, the Winter Games have grown and prospered to the point that the 1932 ice arena—an arena in which 19-year-old Sonja Henie won a gold medal—was far from adequate and organizers of the 1980 Games commissioned Hellmuth, Obata & Kassabaum to design a new arena.

The new building stands just to the

southwest of the old and is joined to it by a shared entry. Together they comprise the largest and best equipped indoor skating facility anywhere. The new program requirements included a 30-meter by 60-meter Olympic-sized ice sheet as well as a second sheet dimensioned to somewhat smaller United States standards which, during the Games, will see service as a practice arena and as a competition surface for skater's school figures. Both arenas are served by an extensive complex of dressing rooms, cafeteria, related support and administrative spaces.

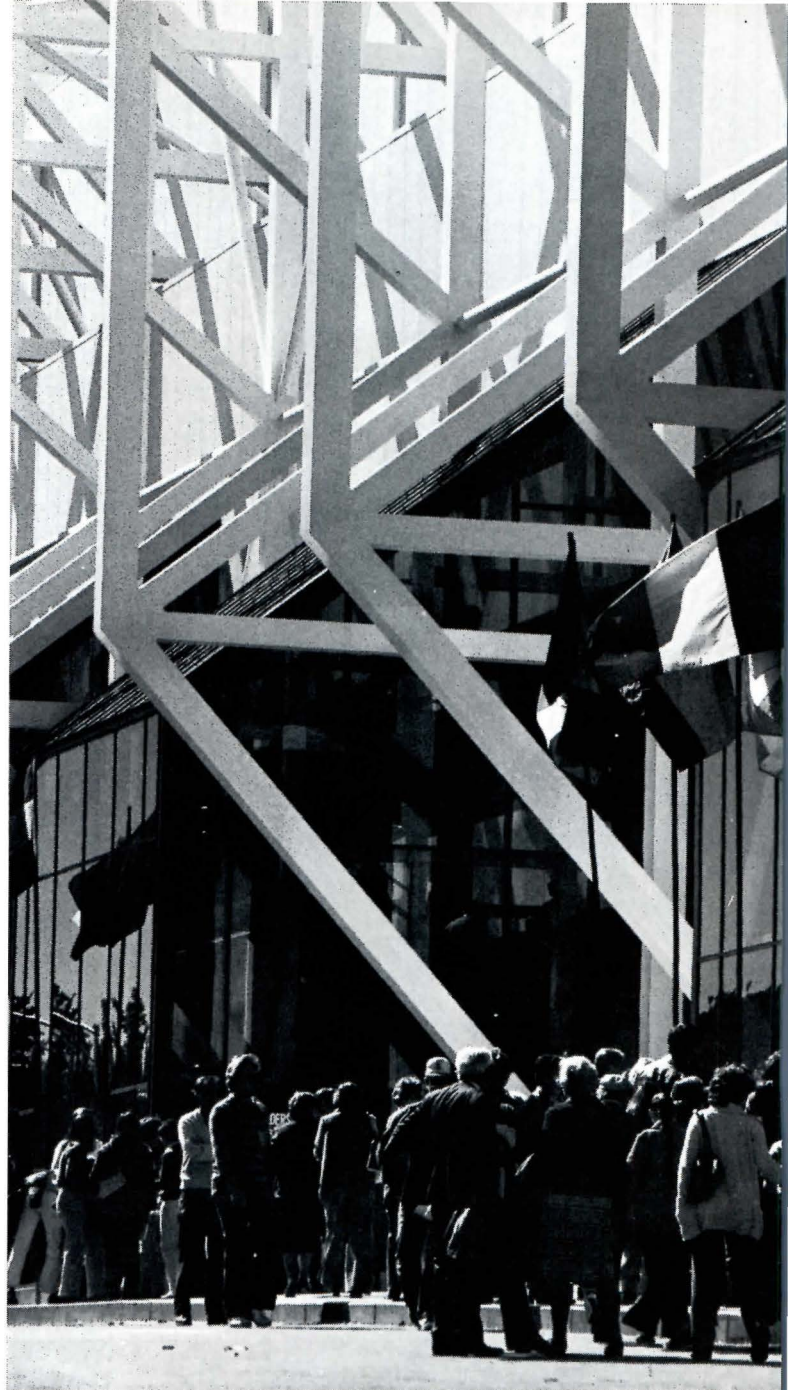
The building's most striking visual feature—and this is the image that Olympic viewers are most likely to absorb and retain—is the series of eleven trusses that run

vertically down the south face of the building, giving this elevation a very lively geometry both in form and shadow pattern. On the exterior, the trusses, made up of WF sections, are tied together to provide a lateral stiffness. Inside, the trusses span the main arena, a span of 240 feet, and their depth is sufficient to accommodate mechanical services and suspended walkways that give access to the lighting. Inside is a grandstand structure that is entirely independent of the exterior system of trusses and insulated metal panels. The two systems, though they remain structurally separate, interlock visually in the glass-enclosed stairways on the building's exterior. From these stairways, views of the adjacent speed-skating oval and the surrounding region are quite spectacular.



Fitted with care into a tight site, the new Olympic Center is seen above as a backdrop to the new refrigerated speed skating oval. The Center occupies a hillside site between the 1932 arena and the Lake Placid High School.





George Silk photos except as noted

The main public access and circulation for the Olympic arena is at the concourse level. From this level, spectators descend into one or another of the 5000 permanent seats that surround the ice sheet or climb up to the bleachers that will add 3000 "temporary" seats for the Games. Athletes have separate circulation routes at ice level. During pre-Olympic events, response from both participants and spectators has been encouraging. The sight lines are excellent and skaters appreciate the generous dimensions of the rink as well as the general ambience of color and light. It was the task of Jules Fisher & Paul Marantz to design lighting that will serve the facility effectively for the variety of smaller scale events that will follow the Olympics. This they accomplished using a range of high-

intensity, metal halide installations over the competition areas and fluorescent fixtures elsewhere. Some special lighting in the form of colored ice washers and spots is also included but a good deal of special lighting required for color television transmission will be brought in for the Games by broadcasters. It is hoped by all those concerned that, after the Games, Lake Placid will be not only an Olympic training center—where a new generation of skaters and skiers can be coached to international standards—but also a mecca for winter vacationers and sportsmen of every caliber. If that happens, it will boost the region's chronically weak economy. At the same time, it will test the flexibility of this fine new arena by providing it with a variety of events from trade shows to cultural programs

of many kinds. The budget for the Olympic Center was \$11,500,000 plus 10 per cent for contingencies. Hellmuth, Obata & Kassabaum brought the building in on budget in spite of the fact that certain redesign was required when the original steel contractor went bankrupt and had to be replaced.

OLYMPIC CENTER, Lake Placid, New York. Architects: *Hellmuth, Obata & Kassabaum*—project team: *Gyo Obata, Gerard Gilmore, Harry Culpen, John Way, Terry Harkness, Charles Reay*. Engineers: *Jack D. Gillum & Associates* (structural); *Cosentini Associates* (mechanical/electrical); *Ahrendt Engineering* (refrigeration). Acoustical consultant: *Robert A. Hansen Associates*; lighting design: *Jules Fisher & Paul Marantz, Inc.* Construction manager: *Gilbane Building Company*.

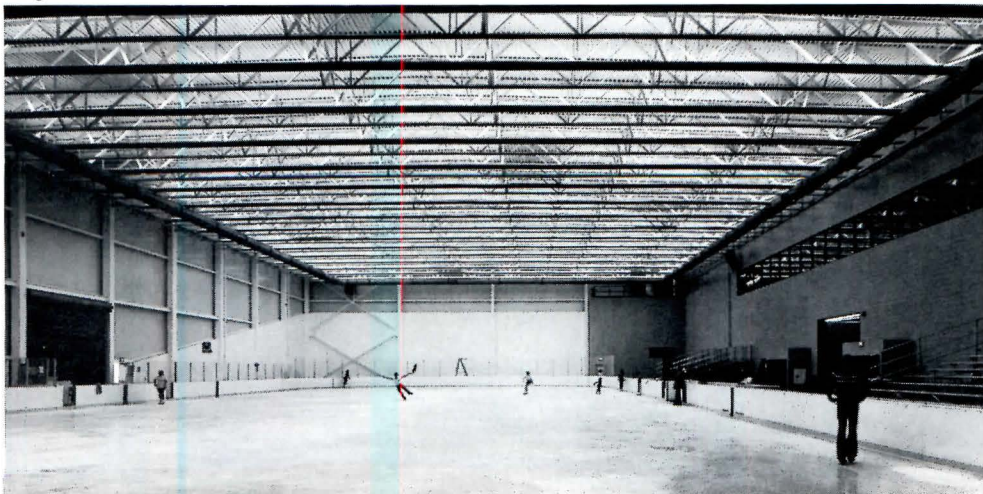
Much controversy centered on the structural design—specifically the design of the roof trusses. The failures of several roof systems that were faintly similar led to allegations of structural inadequacy first avoided by a member of the Lake Placid Economic Development Administration. Two investigations by independent engineering offices led to minor changes that could easily be accommodated within the system. With their completion, the controversy subsided.





Above and below right are photos showing the main arena in use during pre-Olympic figure skating events. The smaller U.S. ice sheet is shown in the photo below left.

George Cserna

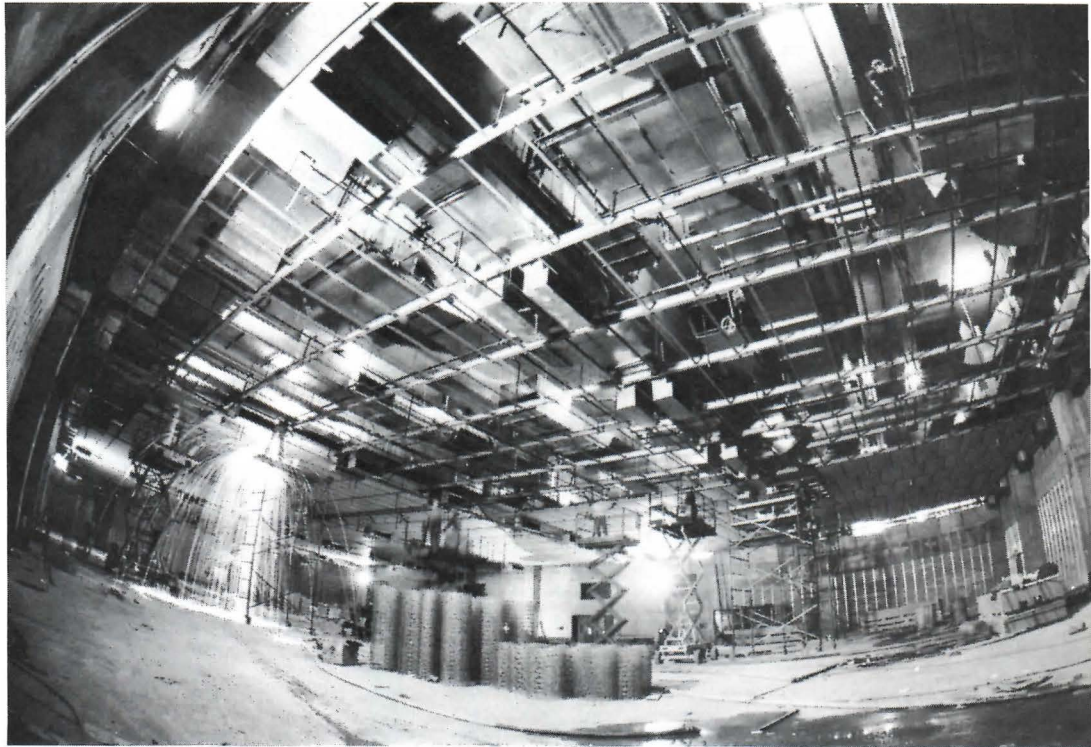


A low-cost walk-on ceiling gives access to mechanical space above a ballroom

The above-ceiling space in a new ballroom that is part of a major addition to the Hyatt Regency Chicago is crammed with air handlers, exhaust fans, lighting fixtures, ductwork, sprinkler piping and piping for a 4000-sq-ft reflecting pool—the major attraction of a glass-covered restaurant at grade level. The height of the mechanical space is 8½ ft, just 3½ ft more than the depth of the 5-ft-deep post-tensioned concrete girders that support the restaurant overhead, which in turn is directly in front of a new high-rise tower of guest rooms.

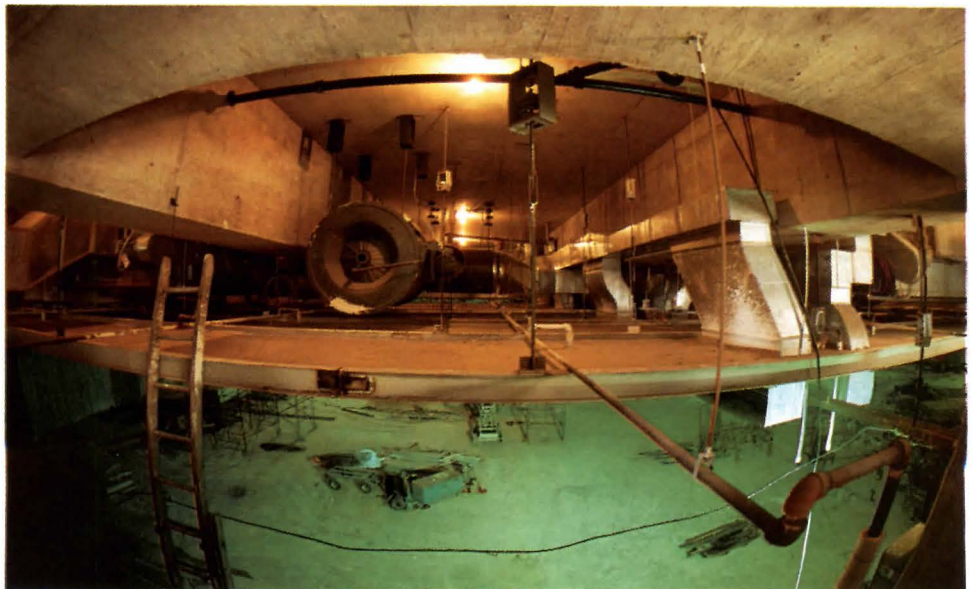


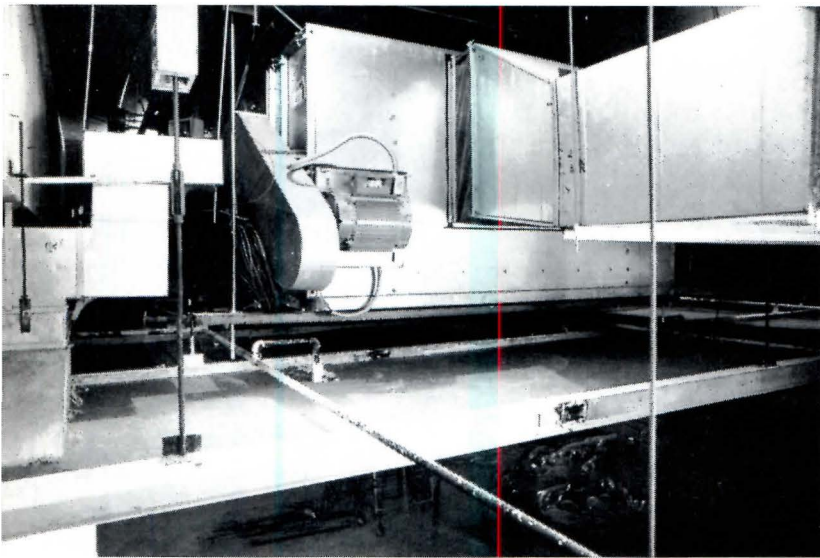
To make it easy for maintenance personnel to service the equipment in the mechanical space, the architects-engineers, A. Epstein and Sons, Inc., selected a walk-on platform/ceiling comprised of gypsum formboard and poured-in-place gypsum which, they say, cost half as much as the steel catwalks provided in the ballroom of the original facility. The walk-on ceiling assembly is also more convenient to use—providing complete access to the much more complicated and larger mechanical room in the new ballroom. The principal components of the walk-on platform/ceiling system consist of gypsum formboard supported by truss-type tee subpurlins, welded at their ends to supporting steel beams. These 6-in.-deep beams and the fans, too, were hung by rods from spring isolators to prevent vibration (and hence noise) from being transmitted a) to the ceiling system and b) to the slab above



All photos by Daryl D. Littlefield for Keystone Group

The two "fisheye" views illustrate the scope and components of the above-ceiling mechanical-room space for a new ballroom in the addition under construction at the Hyatt Regency Chicago. The installation features a lightweight walk-on ceiling of poured gypsum over gypsum formboard. All equipment was suspended from the slab, with ceiling beams and equipment utilizing spring isolators.





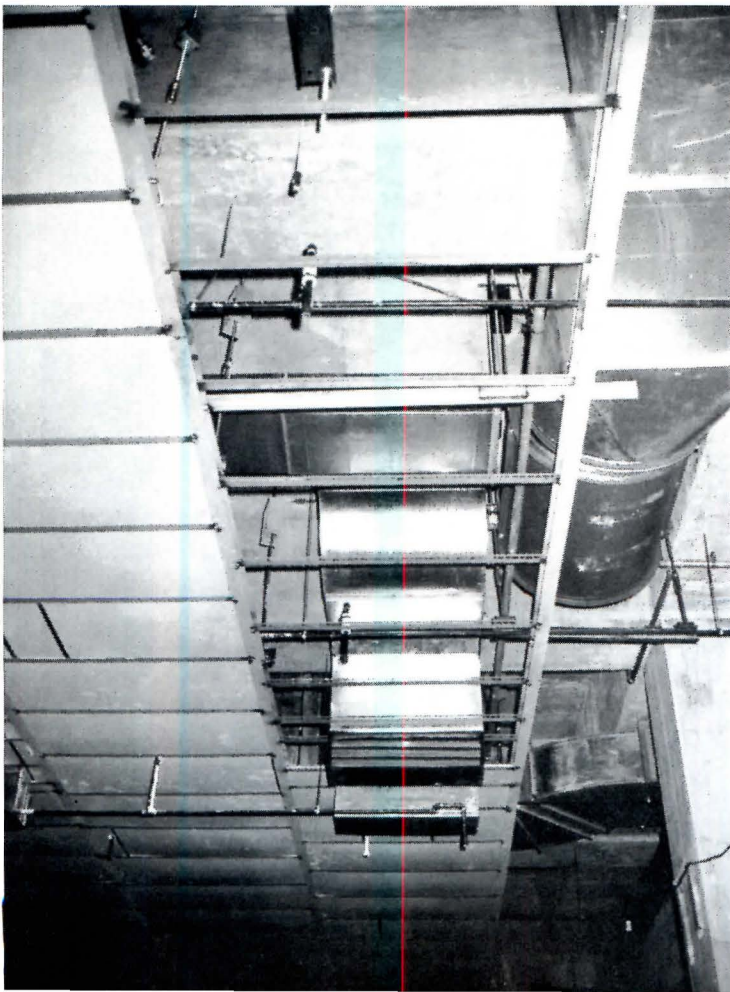
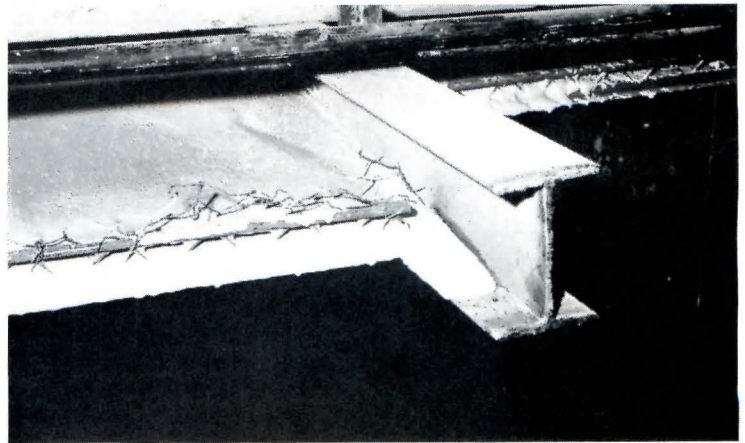
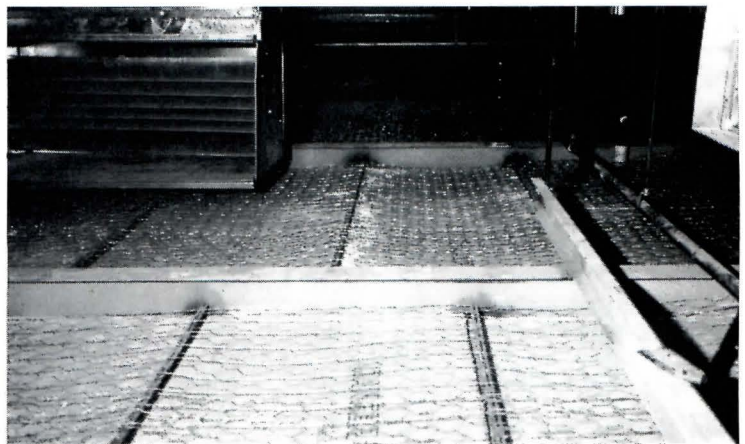
A low-cost walk-on ceiling

Suspension of equipment and ceiling beams by spring isolators is shown in the closeup photo above. Note that penetration for sprinkler piping is plugged to prevent a sound leak. The three photos at right illustrate the ceiling components and construction steps. The top photo shows the formboard in place with mesh draped over subpurlins—the assembly ready to receive the pumped wet gypsum mix (center photo). The bottom photo in the series shows a truss-type tee subpurlin welded to a 6-in. steel beam with gypsum top layer in place. Directly below is view up toward the ceiling showing an exhaust fan and duct and pipe penetrations.

by air handlers and exhaust fans. Wherever there were penetrations through the ceiling, as with sprinkler heads and ductwork, the cracks were plugged with acoustic sealant to prevent sound leaks. Lighting fixtures have sound shields of lead.

The project architect for the new addition—Walter Basich, a vice president of the Epstein firm—reports that a 2½ in. layer of poured gypsum was called for in this installation—the amount recommended by the firm’s acoustic advisor to achieve the requisite sound attenuation. Before the gypsum mix was placed over the formboard, wire mesh was draped over the subpurlins for added strength and structural soundness.

The slab above the mechanical room space, which is directly under the reflecting pool, was treated with a waterproofing material of urethane in a coal-tar base.



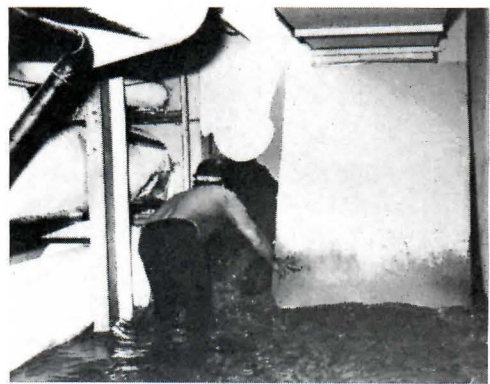
Stoplogs—a device borrowed from civil engineering—protect hospital from floods

After a deluge struck Houston in 1976 and flooded passageways and basements of the Methodist Hospital complex, hospital officials were eager for a floodproofing scheme: the 10 inches of rain that fell in nine hours wreaked over \$1.5 million in damage and forced the hospital to use emergency power (by means of portable equipment) for over two weeks.

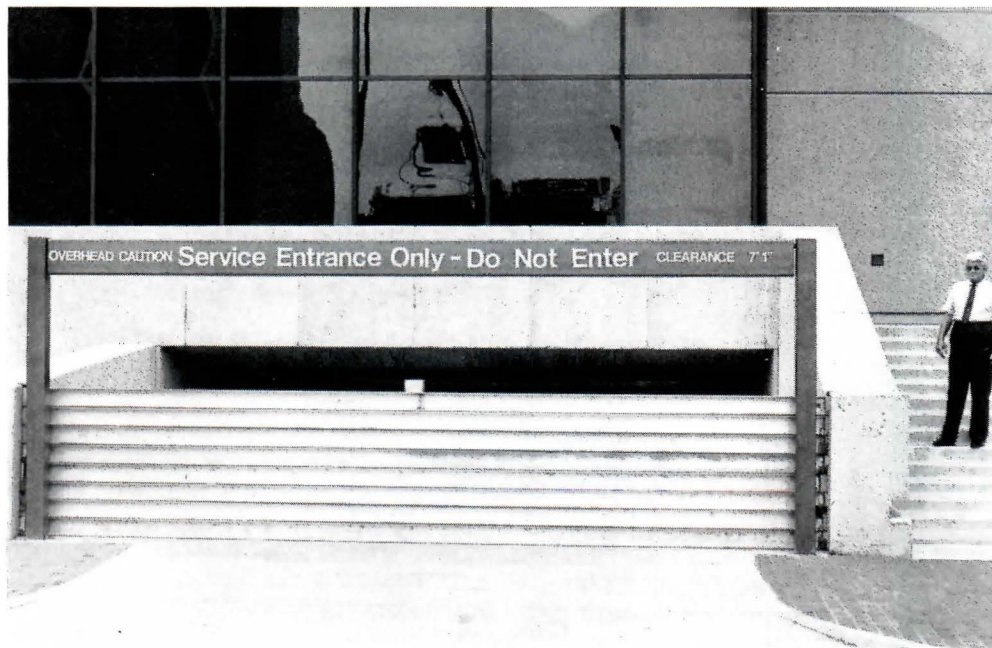
Floodproofing became a necessity because layout and elevation of streets and the runoff from adjacent properties created drainage problems. As more and more buildings were constructed in the area, less and less open ground was available to absorb the rainfall. Hospital officials turned to Bovay Engineers, Inc. of Houston, whose investiga-

tion of the flooding incident suggested that 1) vital electrical equipment (switchboards and emergency generator) had to be elevated above any potential flooding, and 2) temporary barriers were needed to prevent floodwater from running down ramps and entering the passageways and basements of the hospital complex.

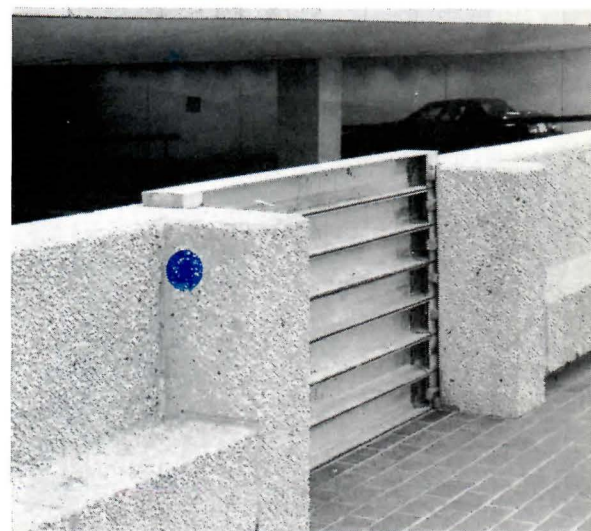
Bovay's ingenious solution to the latter problem was a series of floodgates comprising stacked aluminum stoplogs. The system (somewhat reminiscent of temporary barriers used for corrals and livestock chutes) utilizes 6-in. wide-flange aluminum beams with capped ends and neoprene seals cemented to the bottom of the flanges and also to the gate slots. Bovay Engineers, with C. B. Popkin as principal engineer, considered three different floodgate solutions. The first was a steel plate stored below grade with its top aligned flush with the concrete drive, which could be raised by winch and cable. The engineers discarded this idea because of potential damage from heavy vehicles. A second approach was a guillotine-type floodgate, but this was considered unsightly and unwieldy. The third approach was a small-scale application of stoplogs—a technique familiar to civil engineers for blocking flow of water in channels, and which had been used by the Corps

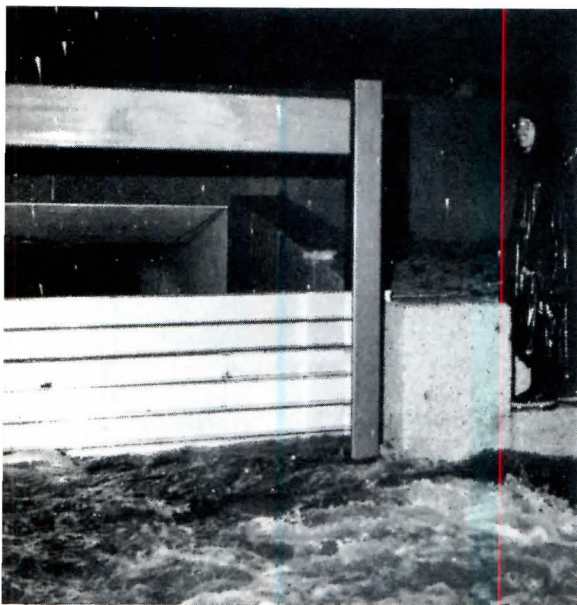


When 10 in. of rain fell in 9 hr in Houston in 1976, floodwaters poured down ramps and inundated passageways and the basement of the Methodist Hospital. The principal remedy provided by Bovay Engineers was five floodgates as shown below. To ensure that no water would breach the mechanical passageway, a bulkhead door was installed.



The adaptive application of the stoplog technique for floodgates in front of four descending ramps utilizes 6-in. wide-flange aluminum beams with welded plates on the ends which are returned back 6 in. on the sides. Neoprene on the bottoms of the beams and inside face of floodgate slots aid integrity of the system.





of Engineers to protect openings in the levee along the Houston Ship Channel and for the area around Texas City.

During the 1976 flood, water rose to a 15-in. height at the Fondren-Brown Buildings in the center of the complex and flowed down the automotive ramp into the basement. Water also poured into ingress/egress ramps of the Neurosensory Center that abuts the Fondren-Brown Buildings on the north, flooding the basement and the connecting tunnels and merging with the water coming into the Fondren-Brown Buildings. The passageways carried water into the Methodist Hospital basement where it rose to a height of 18 ft. Water also completely flooded the sub-basement of the hospital garage.

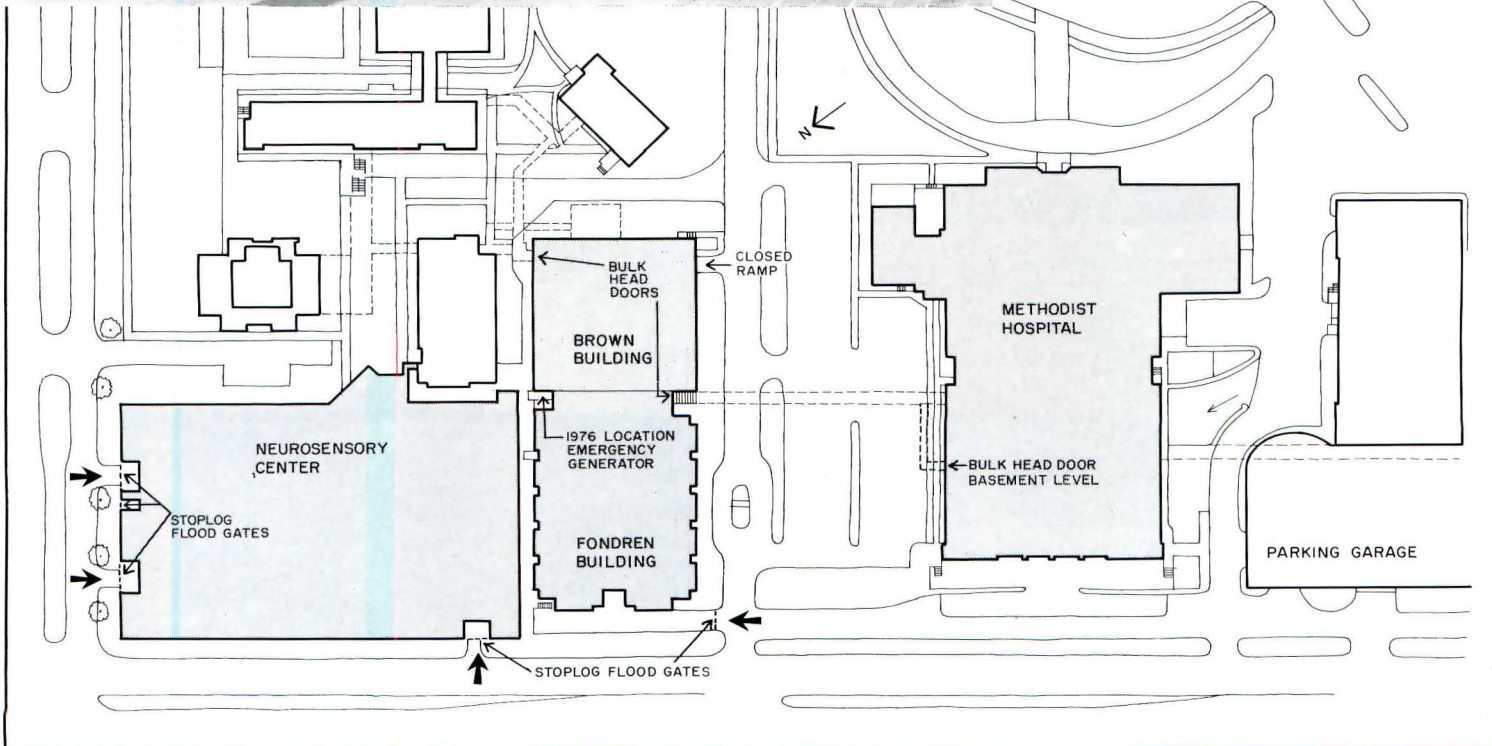
After the flood, Bovay Engineers made a topographic map of the hospital complex and the surrounding area, establishing grades at known high-water marks. They also established grades at flow lines and points of

entrance into the buildings. From this map they easily pinpointed five problem areas: two ramps on the north side of the Neurosensory Center, one ramp on the west side, and two ramps into the Fondren-Brown Buildings. Hospital administrators decided to eliminate the east ramp to this building, leaving a total of four potential flood entry points.

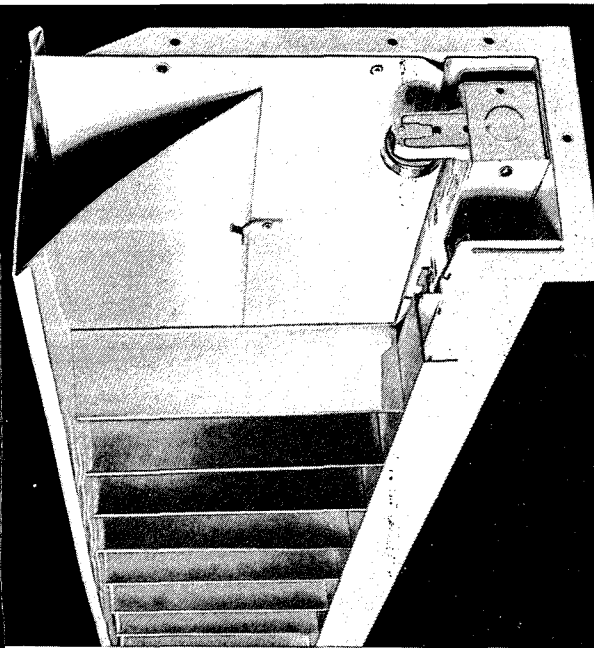
A concrete-filled brick wall built in front of the Fondren-Brown Buildings and concrete walls and steps in front of the Neurosensory Center serve as major barriers to keep water away from the buildings. To receive the stoplogs that prevent water from running down the ramps, concrete piers with slots in them were erected at entrances of the four open ramps. Rainfall running down ramps is collected in sumps and pumped away.

During the 1976 flood, all electrical distribution equipment in the basement of the main hospital building was submerged in 18 ft of water. After the flood, the hospital authorized relocation of all of this switchgear into space on the third floor. Also a new emergency generator building was constructed 6 ft above the known high-water mark on the east side of the Fondren-Brown Buildings. Another internal change was the installation of a steel floodproof bulkhead door in the mechanical pipe tunnel passageway where it enters the basement of the main hospital.

Though weather experts did not expect a flood like that of 1976 for another 100 years, a more concentrated rainstorm in April 1979 (eight inches in four hours) challenged the floodgates. Water rose to as high as 30 in., but the gates withstood the test.



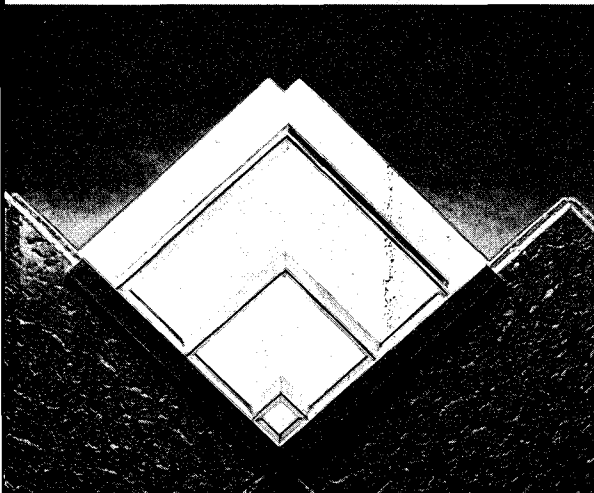
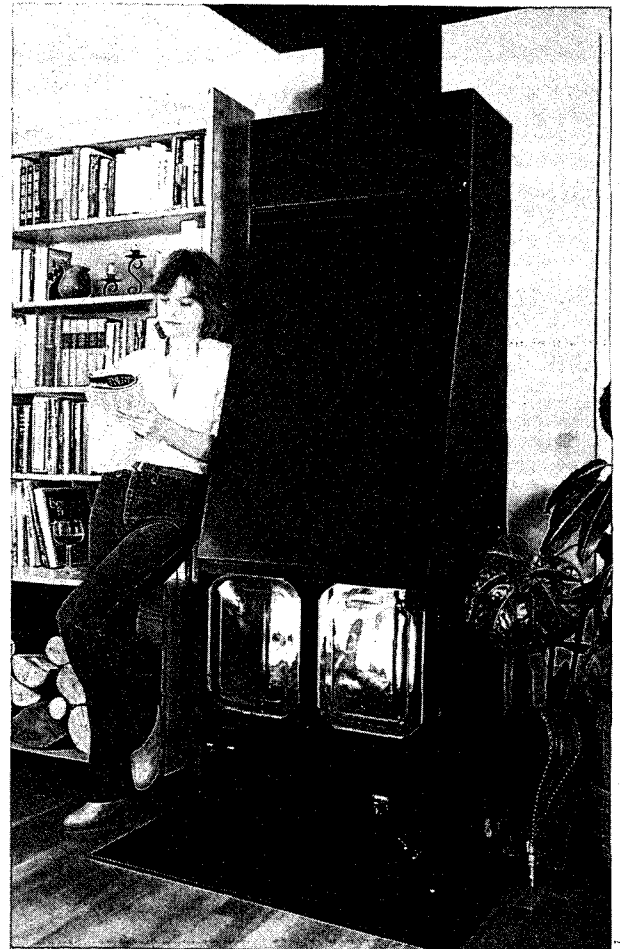
For more information, circle item numbers on Reader Service Inquiry Card, pages 191-192



Sleek design for woodstove/fireplace/furnace is energy efficient

The "Combitherm" unit (right) is a combination woodstove, fireplace and hot-air furnace, claimed to be an energy saver while able to warm a six-room house. Designed by Hugo Larson, it is based on a "balanced draft" system that pulls combustion air down from the top of the chimney and preheats it before feeding it into the fire. Heat exchangers transfer heat from gases escaping up the stack and channel it into the room through vents near the ceiling. It is well insulated to permit installation only 4-in. from a wall. Applications include new homes and rehabilitation projects, and can be used with solar units. Retail cost is \$2500. ■ Manufactured in Sweden by Luftkonditionering AB; distributed in the U.S. by Clivus Multrum USA, Inc., Cambridge, Mass.

circle 300 on inquiry card



Perimeter light system offers many configurations

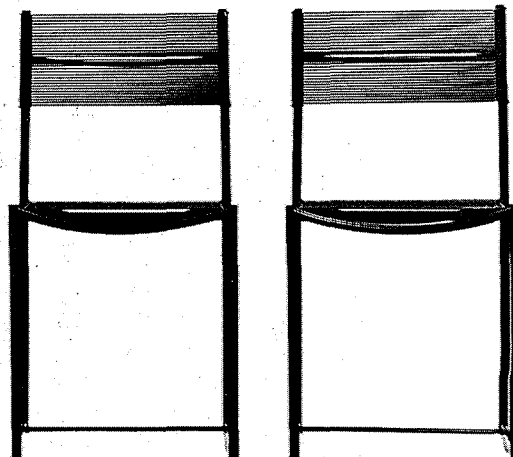
For effective vertical illumination, this company has introduced a linear ceiling light system. Called "Perimeter Trough System" (PTS), it has a telescoping feature, which permits easy installation of virtually any length, making custom construction unnecessary. PTS is offered in three versions—one is open at the bottom for maximum light output, a second utilizes parabolic cover blades for light concealment from normal angles, and the third offers a special

reflector for maximum vertical light distribution (these last two configurations shown top). The semi-specular reflector (an optional item) is intended for uniform light distribution. Inside (above) and outside corners allow the trough to follow the full contour of rooms. The unit has a unitized steel housing with extruded aluminum trim flange to be used with a fluorescent light fixture. ■ Lightolier, Jersey City, N. J.

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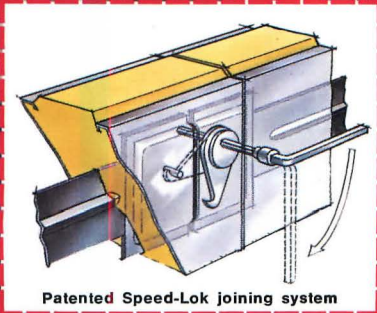
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Minimalist design for lightweight chair



The "Spaghetti Chair" (left) is a minimalist design, with an elegance to its proportions with slim, flexible strands of PVC. The frame is steel tubing, either chrome-plated or in baked epoxy colors. The strands are offered in colors matching the frame, or in transparent plastic with the chrome frame. The chair was designed by architect GianDomenico Belotti in 1960, but now is being mass-produced and distributed in the U.S. ■ ICF, New York City.

*circle 302 on inquiry card
more products on page 137*



Design lower-cost special-purpose buildings (or any portion of one) with heavily insulated Bally Building Panels

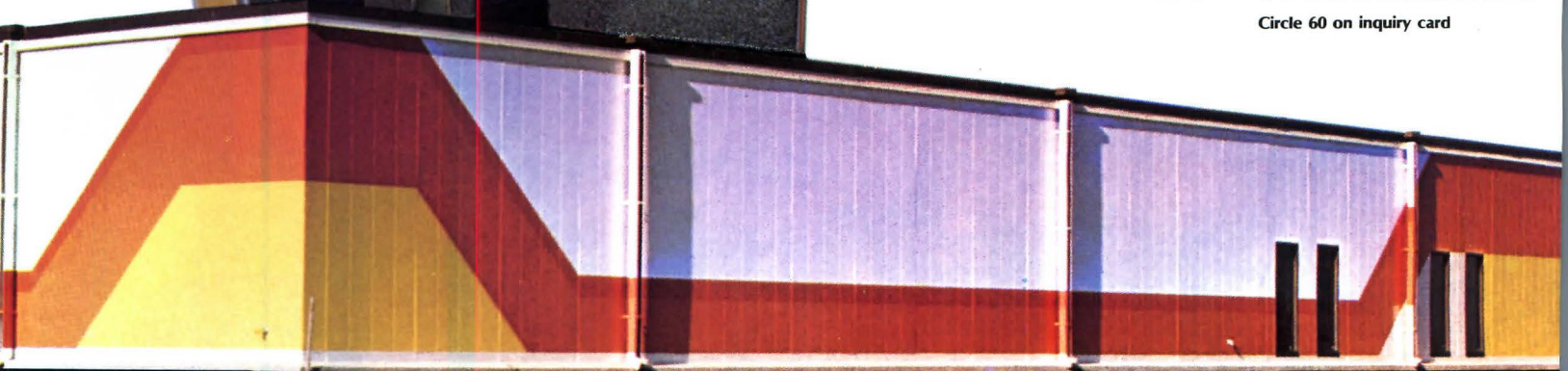
Bally insulated panels give you freedom to specify utilitarian building envelopes or any portion of them in any length, width or height. Locate windows, entrances or interior walls to meet user's requirements. Panels are ideal for extension or attachment to existing buildings. Your clients will realize shorter pay-back periods because Bally panels offer many life-cycle costing benefits including lower construction costs, energy efficiency.

Patented joining system locks panels together, fast, easy and with never-miss accuracy. Steel straps embedded in the insulation

and welded to locking pockets form panel-to-panel-to-panel bands. They gird the building for added structural strength. A socket wrench is all that's needed for assembly of Bally panels. Easy to disassemble for expansion or relocation.

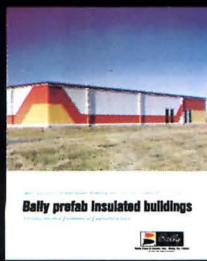
Panels are energy insulated with 4" foamed-in-place R34 rigid urethane. Slashes air conditioning and heating costs. Panels are load bearing. Smaller buildings require little or no structural steel. Finishes are galvanized steel/aluminum/stainless steel. Facade available in white and seven colors.

Circle 60 on inquiry card



BALLY BLDG PANELS

 **Bally**
 Bally Case & Cooler, Inc.
 Bally, PA 19503
 (215) 845-2311



Send for this data catalog for your file.

I'm looking forward to receiving the following from you.

- A call from a Bally representative.
- A Bally Bldg. Panel catalog.
- A sample of Insulated Panel.

Dept. AR 2

Name _____ Phone _____

Company _____

Address _____

City _____ State _____ Zip _____

For more information, circle item numbers on Reader Service Inquiry Card, pages 191-192

HALOGEN LIGHTING / "Design File" supplies product data sheets on the *Sunnex* line of high-efficiency halogen and conventional lighting systems for industrial and hospital use. Lamps feature a variety of mounting options: wall, desk top or edge, bed headboard, etc. The smoothly articulated arms on these *Sunnex* lamps are guaranteed for 10 years. ■ Sunnex, Inc., Needham, Mass.

circle 400 on inquiry card

SERVICE BOXES / Communications service boxes for residential and commercial telephone, CATV and sound systems installations are shown on product data sheets. Fast mounting all-metal boxes permit use of a common ground for all installations; service boxes with a 5/8-in. plywood backboard are also available. ■ Benner-Nawman, Inc., Pleasant Hill, Calif.

circle 401 on inquiry card

LIQUID-COOLED GENERATORS / Offered with optional carburetors so it can operate on either LP gas and natural gas, or combination gas and gasoline, the 450-lb *Kohler* 7.5 kW generator comes with heat recovery fittings to cogenerate electricity and hot water heat. Said to be quiet in operation, the 7.5 standby/prime generator set uses less than a gallon and a half of regular gasoline per hour at full load. Illustrated catalog sheets supply electrical, dimensional, and product application data. ■ Kohler Co., Kohler, Wisc.

circle 402 on inquiry card

1980 CALENDAR / Offered at a discount to architects and interior designers, the *Stendig* calendar measures 48-in. wide by 36-in. high, printed in black and white. Formerly distributed free-of-charge to design professionals, the 1980 calendar may be ordered for \$10 through *Stendig* representatives or directly from the publishers, Cromwell & Co., Inc., P.O. Box 24086, Nashville, Tenn. 24086.

RETROFIT LENS / Priced at approximately one-half the cost of the original *Radialens* unit, the recently introduced *R2* clear acrylic replacement lens provides a "radial batwing" light distribution pattern. A color brochure explains how the lens' flexible spacing requirements and tri-plannar prisms allow the user to remove two lamps and one ballast from each existing four-lamp fluorescent fixture and maintain at least equal "seeability." Photometric data and test results are given in the literature. ■ J. W. Carroll & Sons, Carson, Calif.

circle 403 on inquiry card

EXPANDED CORE PANELS / Capabilities brochure outlines the thermal, structural and economic advantages of *NorCore* plastic honeycomb expanded panels. Panels can be made in a variety of plastic compositions tailored for required mechanical, electrical, chemical, fire resistant and thermal stability properties. Suggested applications include replacement of particleboard in the manufacture of

casework and furniture; in graphics, exhibits and exterior signage; as security, impact and acoustical barriers, etc. ■ Norfield Corp., Danbury, Conn.

circle 404 on inquiry card

TRAFFIC MATS / Mats and runners of *Nomad* non-woven continuous filament vinyl trap dirt and water tracked in at entrances, pools, plant work areas, etc. Material is available backed or unbacked, and may be easily cut to fit with shears without fraying. A color brochure illustrates different *Nomad* products and color options, including personalized logos; physical property data is listed. ■ 3M, St. Paul.

circle 405 on inquiry card

WINDOW TREATMENTS / Colorfully illustrated 32-page booklet presents window blinds, verticals, roman shades and shutters made from a variety of woods, woven woods and grasses, macramé and aluminum. The *Curvilinear* wood *Shutter-Drape* is featured; photos show how this custom window treatment traverses and rotates for complete sun control, privacy and improved insulation. ■ Pinecrest Inc., Minneapolis, Minn.

circle 406 on inquiry card

COMMERCIAL BUILDING / All types of commercial structures clad in cedar are shown as examples in a new all-color 8-page brochure entitled "27 New Commercial Ideas in Cedar." ■ Red Cedar Shingle & Handsplit Shake Bureau, Bellevue, Wash.

circle 407 on inquiry card

ARCHITECTURAL GLASS / Color booklet gives performance and appearance characteristics for a complete line of high-performance architectural glasses for commercial and residential applications. Energy-saving glazing products featured include *Solarban* reflective insulating units, *Solarcool* reflective glasses, *Twindow Xi* glass-edge units, and high-strength laminated products for special constructions. Color photos show all glass products in a variety of construction projects. ■ PPG Industries, Pittsburgh.

circle 408 on inquiry card

ELEVATOR ENGINEERING STANDARDS / The recently published fifth edition of "Elevator Engineering Standards/Standard Layouts" provides dimensional data in both U.S. Customary and International metric systems, reflecting the increasing use of metric language in elevator construction. The 72-page book includes hoistway plans, sectional elevations and machine room drawings that cover the requirements for industry standard, electric and hydraulic passenger, hospital and freight elevators. The new "Elevator Standards" conform with American National and National Electric codes, as well as industry requirements for the handicapped. Copies cost \$4.00 each for one to nine "Elevator Standards"; quantity discount available. Write or phone the National Elevator Industry, Inc., 600 Third Ave., New York, N.Y. 10016; 212/986-1545.

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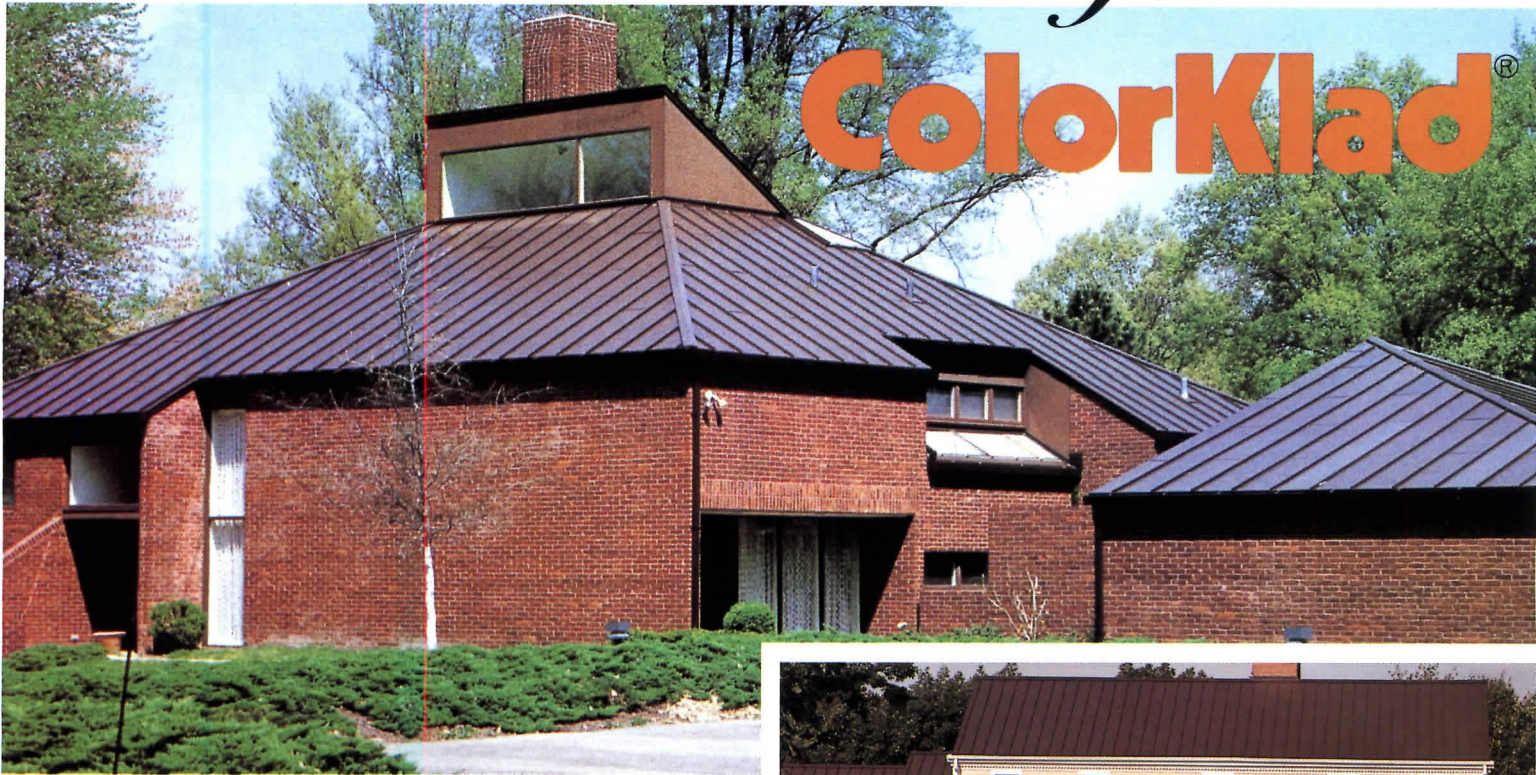
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Sheet metal contractor — Zero Breese Co., Cincinnati, Ohio.

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roofs!**



Wise architects, discriminating homeowners and buyers are recognizing the unique, lasting values of a roof sheathed in the beauty and permanence of ColorKlad.

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ColorKlad prepainted sheeting has earned a solid reputation for handsome appearance, strength, durability, ease of installation and maintenance as roofing and fascia on commercial structures. Now, these same qualities, plus some additional ones, are being recognized by architects, contractors and owners for new roofs on new homes or as replacement on prestigious older homes.

Whatever the climate (rain — snow — ice — wind — sun — fire hazards), ColorKlad roofs offer protection from perils of nature that used to plague designers and homeowners using conventional roofing materials.

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ColorKlad is available in nine exciting colors, two textures. A written 20 year warranty assures color integrity. Write for our free brochure and color samples.

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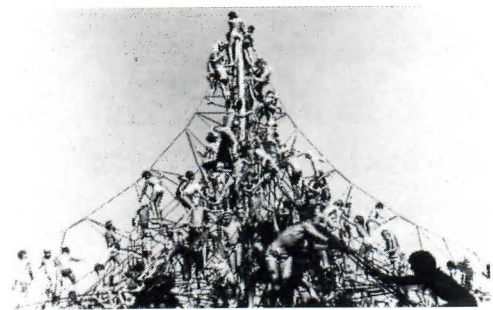


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Circle 61 on inquiry card



PLAYGROUND CLIMBER / The *Spacenet* heavy-duty climber provides a unique play experience for youngsters from age six through the teens; it can accommodate over 100 climbers at one time. The continuing three-dimensional *Corocord* networks and the gently sloping shape ensure maximum user security; widely used in Europe, the vandal-resistant *Spacenet* climber meets all German standards for playground equipment safety. *Corocord* rope consists of six strands of galvanized steel wire wrapped with flame-resistant nylon yarn. Galvanized steel mast and anchor plates are set in poured concrete; *Spacenets* should be installed on a minimum 12-in. base of sand. Three sizes are available: 20- by 20- by 13-ft; 30- by 20-ft; and, for \$23,500, a *Spacenet* measuring 40- by 40- by 25-ft. ■ Game-Time, Inc., Litchfield, Mich.

circle 303 on inquiry card



BAR UNIT / For the executive office or other contract applications, the "Baccus" bar provides three ample storage compartments and a drawer for glassware and accessories, and a locked cabinet to hold liquor. Drawer and compartments have natural cork bottom liners. The 60-in.-wide hardwood bar has bullnosed edges with mitered corners; wood species available include walnut, oak, and elm burl. All wood surfaces are protected with a closed-pore polyurethane finish; footrail is polished chrome. ■ Stendig Inc., New York City.

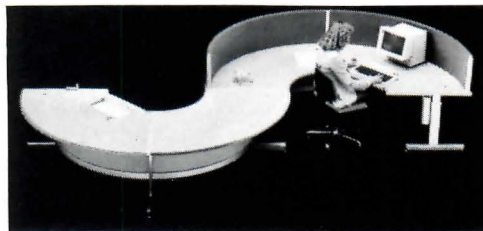
circle 304 on inquiry card

SPEAKER SYSTEM / "Soundsphere" speakers have been specified for use in a variety of indoor and outdoor locations at the 1980 Winter Olympics. The system uses conventional speakers in combination with a critically shaped reflector and sphere for precise, even sound distribution in an omnidirectional pattern. Future Sound, Inc., the official consultant and supplier of sound reinforcement systems to the Olympics, has designed a special arrangement of five speakers for better sound patterns throughout the Ice Arena. ■ Sonic Systems, Inc., Rowayton, Conn.

circle 305 on inquiry card

FOLD-DOWN BAR / From the manufacturers of *Iron-A-Way* concealed laundry cabinets, this space-saving bar fits into the wall area between studs. The decorative stained-glass door opens to reveal a 30-in. bar counter securely supported by a telescoping steel brace; four adjustable glass shelves hold glasses, bottles and accessories. Inside back of cabinet is lined with cork. The *Handi-Bar* measures 48-in. high by 16½-in. wide by 7¾-in. deep, and may be surface-mounted as well as recessed between the studs. Appearance options include a solid Danish walnut finished cabinet, smoked mirror glass instead of stained glass, etc. The bar is surfaced with black slate textured laminate. ■ Iron-A-Way Inc., Morton, Ill.

circle 306 on inquiry card



CIRCULAR OFFICE / The "Round Office" is a series of office furnishings keyed to the circle: a design by architect Sven Kai Larsen that is based on the principle that sharp corners mean wasted space or an undesirable table position. The basic curved and rectangular table sections form a quarter-circle unit for one person, an S-shape for several users, or a round conference table seating as many as 20. ■ Dux Interiors, New York City.

*circle 307 on inquiry card
more products on page 139*

solar storage tubes

Solar Components solar storage tubes are... practical!

Designed to be used in Passive Solar Energy Systems — the tubes are placed behind a "solar window" for direct collection and storage of solar heat. They utilize the efficiency of a cylindrical cross section. Four standard sizes with sealed bottoms easily accommodate any size energy collection system. The solar storage tubes are corrosion-free, lightweight, durable, and inexpensive! Best of all, they are proven in use in hundreds of projects coast-to-coast.

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Circle 62 on inquiry card



Photo courtesy of Virgil R. Carter, Architect: Environmental Planning & Research, Inc.

The sky's the limit.

Grinnell® Sprinklers Can Meet the Challenge of Your Most Challenging Designs.

When Bullock's in San Jose, California's Oakridge Mall installed the first fabric roof ever used in a department store, they chose Grinnell sprinklers.

The problem that faced the owners, the architects and the insurance company was how to provide needed sprinkler protection that could respond quickly and effectively to a fire when the sprinkler lines were suspended from cables as much as 17' below the fabric roof.

The roof structure, with its Teflon® coated fiberglass construction, made conventional pipe hangers impossible. The only practical manner to support the sprinkler system was from the suspension cables which were an integral part of the overall building design.

This innovative design called for an innovative technology, which was met by the use of Grinnell's Model F930 Quick Response Sprinkler. This sprinkler combines the time-tested Duraspeed Sprinkler with an additional heat detection device sensitive to a temperature rate of rise of 20°F. per second.

The sprinkler's quick-response device attaches in a matter of seconds to any standard Duraspeed soldered-type sprinkler. Thus, standard upright and pendent sprinklers (as well as horizontal sidewall models) were available for use in this overall design.

This unique fast-acting sprinkler, listed by Underwriters Laboratories, proved its capabilities in a test program witnessed by the owner's representatives and representatives of the insurance authorities.

Not only did the sprinkler prove to be effective in the laboratory test, but it also demonstrated the flexibility needed to adapt to the demands of the structure's unconventional roof lines.

When it comes to sprinkler designs from the traditional to the avant-garde, Grinnell has the technology to provide sprinkler protection to match your most demanding design requirements.

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Protecting Life and Property Since 1850

Circle 63 on inquiry card

FORM FILES / The *ThinLine Conserv-a-file* is a modular filing system designed for forms used by architects. The basic unit is available in the standard letter depth of 13³/₁₆-in., or the legal size of 16³/₄-in. Cabinets come with up to 16 slots per tier; systems can be expanded to create movable rollaway two- and three-unit stacks for high-density filing of forms. ■ Supreme Equipment & Systems Corp., Brooklyn, N.Y.

circle 308 on inquiry card



AIRPORT SECURITY / Shown here installed in San Diego's new West Terminal, *Dynafluor XV* direct view X-ray screening devices and a *Dynascreen* walk-through metal detector simplify security and permit a high rate of passenger traffic. The smaller size of the *Dynafluor* units, as compared to previous models, effectively enlarged the usable area of the security check point. ■ Philips Electronic Instruments, Inc., Mahwah, N.J.

circle 309 on inquiry card



DOUGLAS FIR PANELS / Said to require no maintenance in either interior or exterior applications, "Frontier Barnwood" is aged Douglas fir from Wyoming, available in one-in.-thick planks 6- or 8-in.-wide, in any length from 4- to 16-ft. The naturally weathered grain and coloration of the wood provides a rugged, Western appearance. "Frontier Barnwood" is shown here on the Wyoming Woolgrowers Building in Casper, Wyoming. ■ Frontier Barnwood Corp., Laramie, Wyo.

circle 310 on inquiry card

METAL RELIEF PANELS / The "Bonded Bronze 600 Series" is a group of four panels with a common design theme in low relief, which may be combined in a variety of ways to achieve interesting wall treatments. Special "Bonded Bronze" forms are available for elevator doors and interiors.

■ Forms & Surfaces, Santa Barbara, Calif.

circle 311 on inquiry card

ENGLISH-STYLE FIREPLACES / English Period fireplaces can be constructed *in situ* under the direct supervision of Dobson & Thomas Ltd. of London, using bricks individually handmade in England. Authentic Old English, Spanish or other style of brick fireplace may be custom made for residence, hotel, club, etc.; designs to individual specifications can be supplied by the firm's Los Angeles office. ■ Dobson & Thomas Ltd., Santa Monica.



circle 312 on inquiry card

GAS FURNACE / *Conservator II* residential gas furnaces are up to 82 per cent efficient based on DOE tests for Annual Fuel Utilization Efficiency, and are said to lower operating costs up to 24 per cent. The *Conservator II* is able to deliver high cfm of air with lower Btu/hr input, allowing the use of smaller-sized furnaces while still providing adequate volumes of air for add-on summertime cooling. A "skirted" vent damper system prevents heat from escaping during the furnace's off cycle while providing complete ventilation of flue gases during operation. Electronic spark ignition is standard. ■ Lennox Industries Inc., Dallas.



circle 313 on inquiry card
more products on page 141

Specify Aiphone. The intercom that's as good as your design.



You're the one who's put all that talent and effort into the project. So follow through, by specifying equipment of comparable quality. Specify Aiphone (say A-phone).

Aiphone means intercom, and only intercom. We're specialists, and we have been for 30 years. And we're versatile. We have 20 different intercom systems and over 120 items, so that you can have exactly what you want. And, thanks to our factory direct source of supply, our equipment is readily available. In fact, we ship the very day the order comes in to us.

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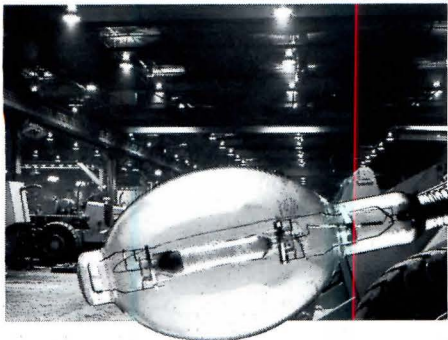
Four General Electric ways to save electricity for your business.

These lamps fit most existing sockets; no new fixtures required.

Unnecessary power usage should be curtailed. But where you must have light, here are ways you can reduce electrical consumption and still have the light you need.

Consider these four:

1 I-line Multi-Vapor® lamps can give you equivalent light for one-half the wattage.



If you're now using mercury-type 400-watt or 1000-watt lamps for industrial lighting – you may be lucky. For many such lamps, you can switch to 400-watt or 1000-watt I-line Multi-Vapor lamps from General Electric – and get equivalent light for about one-half the wattage. Usually with no time lost or money spent to change or modify fixtures. Because of the higher efficiency of I-line Multi-Vapor lamps from GE, you only need about one-half the number of sockets to achieve the light levels of the replaced mercury lamps.

2 Watt-Miser™ II F40 can save up to 14% on electricity for lighting offices.

Replace your standard four-foot F40 fluorescent tubes in typical two-lamp



open Rapid Start fixtures with Watt-Miser II F40 lamps from GE and you can save up to 14% on electricity consumed. In typical two-lamp recessed fixtures, the energy savings are about 11%.

3 Watt-Miser II Slimline can save up to 20% on electricity for store lighting.



When you replace a standard 8-foot Slimline lamp with a Watt-Miser II Slimline from General Electric, rated at 100 lumens-per-watt, you save up to 20% of the fixture wattage in a typical two-lamp fixture. With only modest light reduction.

4 This Elliptical Reflector lamp can reduce energy use by 50%.

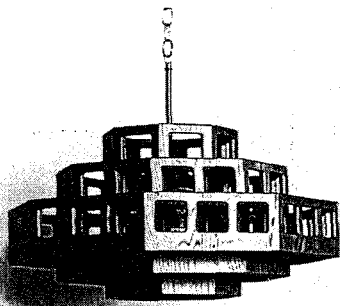


If you have recessed, baffled, incandescent ceiling lights in your store or office, you are probably using a 150-watt reflector flood bulb. Our 75-watt Elliptical Reflector lamp is a direct replacement and can give you the same average light level. So you can save about 75-watts, or 50% of the power consumption when you convert from incandescent 150-watt floods to our new ER lamps. For more light, still with substantial savings on electricity, use the 120-watt ER lamp.

Save the electricity and the money that these advanced GE lighting designs make possible. Call your local GE electrical distributor, our sales office or our toll-free number, 800-321-7170. (In Ohio, 800-362-2750). Learn more about GE energy-saver lamps, which let you turn lights on and still save electricity.

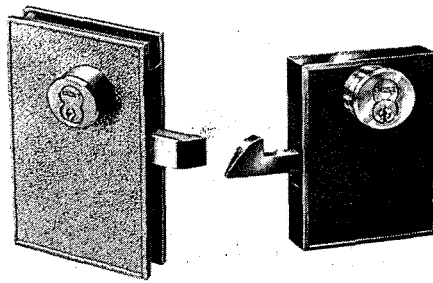
GENERAL  ELECTRIC

Circle 65 on inquiry card



WOOD CHANDELIER / One of a series of ten, this three-tiered octagonal chandelier is made of oak, or other woods, and oxidized brass. Illumination is provided by four concealed 30-W R20 downlights and four 25-W G25 uplights. Fixture measures 20-in. high by 24-in. over-all diameter. ■ Charles Loomis Inc., Kirkland, Wash.

circle 314 on inquiry card



GATE LOCKS / Swinging and sliding gates can be fitted with a flexible masterkey locking system, using either one or two interchangeable core lock cylinders. Hardware is satin brass in a satin bronze case. Locks may be mounted to latch either hand; single-cylinder locks have a recessed handle. ■ Best Lock Corp., Indianapolis.

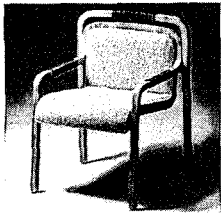
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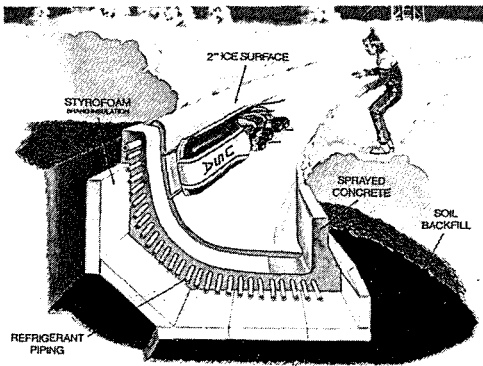
INTERLOCKING PAVING STONES / Synthetic iron oxide pigments provide natural earth-tone coloration throughout these interlocking paving stones laid in the entrance and concourse of San Francisco's Pier 39 tourist center. Made of crushed rock, sand and Portland cement, the stones are installed without mortar in a bed of sand. ■ Mobay Chemical Corp., Pittsburgh.

circle 319 on inquiry card

STACKING SIDE CHAIR / The "Handle" contract chair features leather wrapping on the oak-veneered, bent-plywood frame. Designed by O. J. Holohan, the "Handle" stacking chair has foam-filled upholstered seat and back for long-term seating comfort. ■ The Gunlocke Co., Wayland, N.Y.



circle 315 on inquiry card



OLYMPIC INSULATION / Over 1.5 million board feet of *Styrofoam* brand insulation, an extruded polystyrene, has been specified for almost every kind of athletic facility to be used in the 1980 Winter Olympics in Lake Placid. Two of the most unusual applications are for the bobsled (shown) and luge runs. Other applications include the Olympic Village, Village Center with two ice arenas and speed skating oval, Intervale ski jumps and the Alpine Center at Whiteface Mountain. ■ Dow Chemical Co., Midland, Mich.

circle 316 on inquiry card

WOOL CARPET / A wool carpet with an "Italizan Grid" pattern, manufactured by Bowater Carpets, is shown here in the Lake Placid Hilton Inn Restaurant. It is available in 100 per cent wool, or in an 80 per cent/20 per cent nylon blend. ■ The Wool Bureau, Inc., New York City.



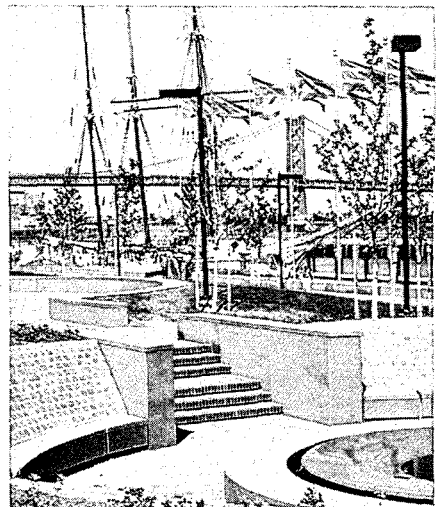
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Granite.

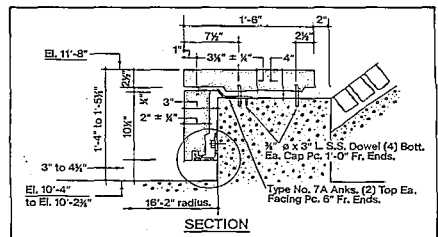
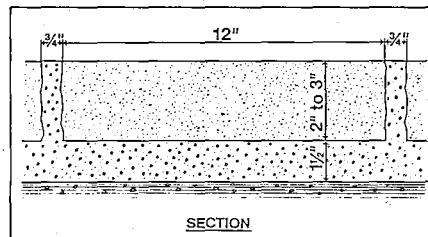
Not-so-pedestrian plazas for pedestrians.



Architect: Joe Karr & Associates, Chicago, IL
Sturr Young, Associate Architect, Oak Park, IL



Architect: Murphy Levy Wurman, Philadelphia, PA
Project Architect: Vincent Maiello, Philadelphia, PA



Granite is the elite paving material for plazas, walkways and mall areas where a combination of beauty, durability and ease of maintenance is required.

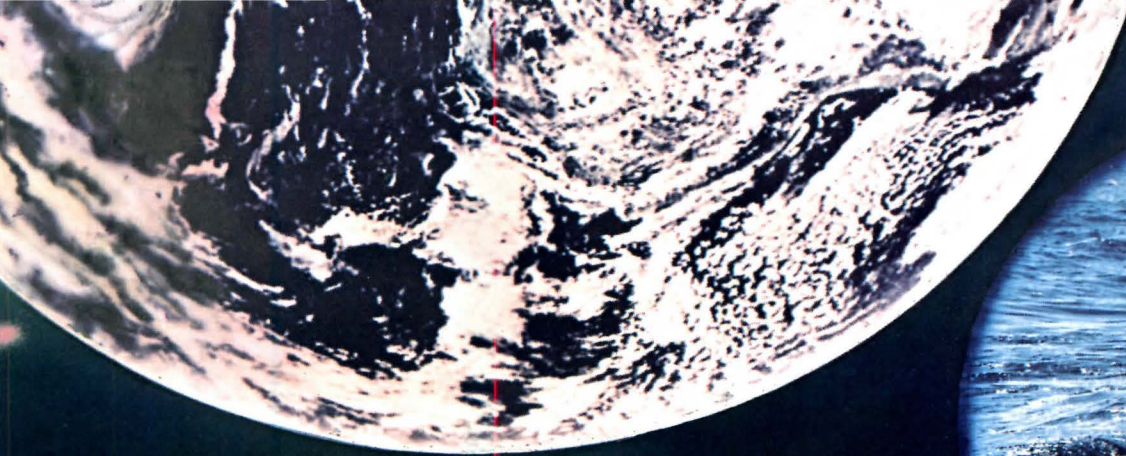
Granite is a natural building material and it naturally complements the landscaping portions of your architectural design. A wide selection of features including fountains and seating areas are available to enhance the overall appearance of your project.

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Cold Spring Granite Company, Dept. AR-2 202 South Avenue, Cold Spring, MN 56320

Circle 67 on inquiry card





News About Joint Design & Joint Sealants

For reprints, copies of literature or information about any topics mentioned below, please write: Marketing Communications, Dept. AR, Thiokol/Specialty Chemicals Division, P.O. Box 8296, Trenton, NJ 08650.

Thiokol LP® Polysulfide Base Sealants Offer 30-Year Track Record

Since 1947 building sealants based on Thiokol's LP polysulfide polymers have been specified by architects; and they continue to be the choice of architects and sealant applicators throughout the world.

Worldwide acceptance within the building trade of Thiokol LP polysulfide base sealants stems from more than 30 years of field performance, reliability and highly desirable sealant properties.

These properties include: excellent resistance to many types of oils and solvents; excellent resistance to aging, ozone, oxidation and sunlight; excellent adhesion to most common construction materials; and the ability to expand and contract with joint movement.

But the test of any sealant is actual performance. The buildings shown here are just a few examples of longevity in applications involving sealants based on Thiokol's polysulfide polymers.

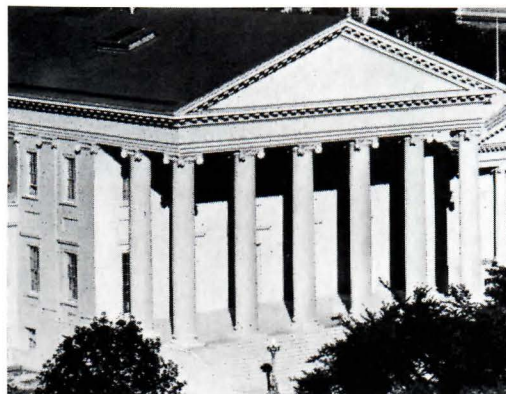
We'll be happy to tell you about other applications. Write for details.



California Telephone & Telegraph Building
Albany, New York, sealed with Thiokol polysulfide base sealant, 1947



Lever House
New York, New York, sealed with Thiokol polysulfide base sealant, 1954



State Capitol Building
Richmond, Virginia, sealed with Thiokol polysulfide base sealant, 1962

ARCHITECTS *Did You Know . . .*

THAT the amount of movement in a joint is dependent on the length and composition (coefficient of linear expansion) of a panel section and the temperature gradient that is encountered.

THAT in designing joints, the proper width-to-depth ratio must be specified so that the width of the joint is consistent with the capability of the sealant, to endure the daily and seasonal extensions and compression cycles for prolonged periods.

THAT as joints expand and contract, the sealant's shape changes accordingly, but the volume of sealant remains constant.

THAT joints must be designed so that the compression and extension of the sealant will not exceed the movement capability of the sealant.

THAT the technical tips listed above are described in a 20 page brochure, "Joints Design Digest". Send for your copy.

Have A Question About Sealants?

If you have a question about Thiokol polysulfide base sealants—questions regarding adhesion, expansion, contraction, conditions for applying the sealant, specifications, past performance—write us. We'll be happy to help.

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It's the growing consensus of the leading architectural and engineering firms in the land: the E&O program available through Shand, Morahan & Company is about the best coverage you can have, at a most competitive premium rate. That's why so many of the ENR top 500 design and construction firms are choosing our insurance.

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**SM Shand, Morahan
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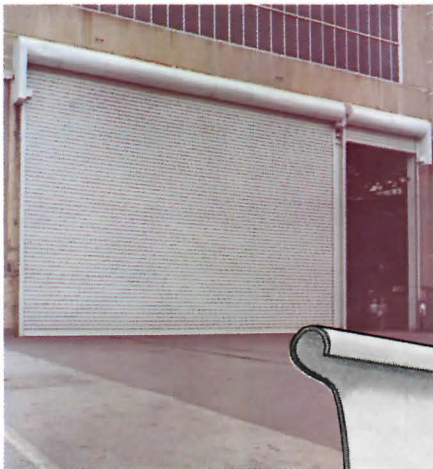
One American Plaza, Evanston IL 60201

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Tall orders call for Titan Doors.

The biggest.

North American™ Titan Rolling Doors hold their own among the largest steel rolling doors in the world. The carefully engineered slat design of Titan Rolling Doors makes them exceptionally suited to custom application where doors must be designed for extremely wide openings and adverse working conditions.



All of the components that make up a Titan Door are of heavy duty construction. Curtain construction in heavy gauge aluminum and in stainless steel are available

The strongest.

Titan Rolling Doors have been custom built up to 5 stories tall



and some reach widths over 50 feet. Doors this large must be strong and the Titan Door is the strongest.

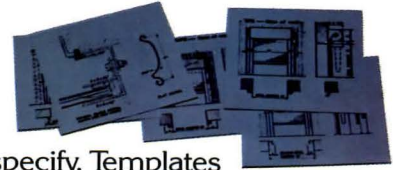
The #14 U.S. Gauge steel slat, with a minimum width of 6" and a crown height of 1 1/4", far exceeds the section modulus of smaller slats.

Support brackets are made of 3/8" steel or heavier if needed; galvanizing is available for guides, brackets and pipe shafts as well as the standard galvanized slats, hoods and

bottom bars. Titan Doors are your best choice for extreme wind loads, waterfront exposures, high impact resistance and where security must be considered.

The easiest.

In addition to the quality of North American Titan Rolling Door, it's the easiest door to

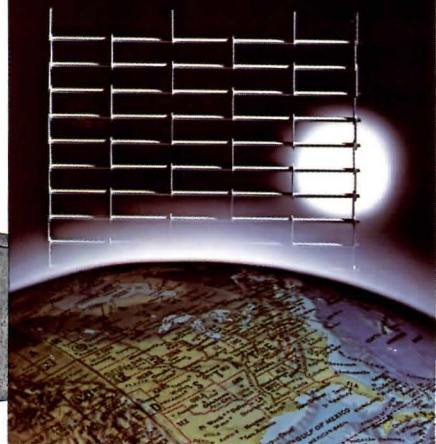


specify. Templates for all phases of operation are available in handy "peel and stick" blue print drop ins. Qualified specialists and consultants are on hand to provide assistance in determining maximum door capabilities under all conditions.

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American Titan Rolling Door — the Biggest, Strongest, Easiest Door you can specify and install. See North American Sweets Catalog 8.7/Nor for specifications, call toll free 1-800-645-5510.

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